

# FCC RF Test Report

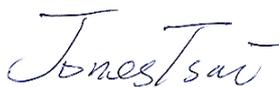
APPLICANT : ZTE CORPORATION  
EQUIPMENT : LTE/CDMA HOTSPOT  
BRAND NAME : ZTE  
MODEL NAME : MF96U  
FCC ID : SRQ-MF96U  
STANDARD : 47 CFR Part 2, 22H, 27H, 27L  
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Oct. 23, 2013 and testing was completed on Nov. 11, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



# TABLE OF CONTENTS

REVISION HISTORY..... 3

SUMMARY OF TEST RESULT ..... 4

**1 GENERAL DESCRIPTION ..... 5**

    1.1 Applicant..... 5

    1.2 Manufacturer..... 5

    1.3 Feature of Equipment Under Test ..... 5

    1.4 Product Specification of Equipment Under Test..... 6

    1.5 Modification of EUT ..... 6

    1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator ..... 7

    1.7 Testing Site..... 9

    1.8 Applied Standards ..... 9

**2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 10**

    2.1 Test Mode..... 10

    2.2 Connection Diagram of Test System..... 12

    2.3 Support Unit used in test configuration and system..... 12

    2.4 Measurement Results Explanation Example..... 13

**3 TEST RESULT..... 14**

    3.1 Conducted Output Power Measurement ..... 14

    3.2 Peak-to-Average Ratio ..... 23

    3.3 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement..... 41

    3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement..... 51

    3.5 Conducted Band Edge Measurement ..... 86

    3.6 Conducted Spurious Emission Measurement ..... 152

    3.7 Radiated Spurious Emission Measurement ..... 249

    3.8 Frequency Stability Measurement..... 283

**4 LIST OF MEASURING EQUIPMENT ..... 296**

**5 UNCERTAINTY OF EVALUATION ..... 297**



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.2	27.53(d)(5)	Peak-to-Average Ratio	<13 dB	PASS	-
3.3	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt	PASS	-
	§22.913(a)(2)	Effective Radiated Power (Band 5)	ERP < 7 Watts		
	§27.50(c)(10)	Effective Radiated Power (Band 12) (Band 17)	ERP < 3 Watts		
3.4	§2.1049 §22.917(a) §27.53(h)(3)	99% Occupied Bandwidth and 26dB Bandwidth	Reporting Only	PASS	-
3.5	§2.1049 §22.917(a) §27.53(g)(h)	Conducted Band Edge Measurement	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §27.53(g)(h)	Conducted Spurious Emission	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §27.53(g)(h)	Radiated Spurious Emission	< 43+10log <sub>10</sub> (P[Watts])	PASS	Under limit 20.61 dB at 8552.000 MHz
3.8	§2.1055 §22.355 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-



# 1 General Description

## 1.1 Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.2 Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.3 Feature of Equipment Under Test

Product Feature	
Equipment	LTE/CDMA HOTSPOT
Brand Name	ZTE
Model Name	MF96U
FCC ID	SRQ-MF96U
EUT supports Radios application	CDMA/EV-DO/LTE/WLAN 2.4GHz 802.11bgn HT 20
HW Version	xs5A
SW Version	USCC_MF96U_V1.0.0B01
EUT Stage	Identical Prototype

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

### 1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
<b>Tx Frequency</b>	LTE Band 4 : 1710.7MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
<b>Rx Frequency</b>	LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
<b>Bandwidth</b>	1.4MHz / 3MHz / 5MHz/ 10MHz / 15MHz / 20MHz (Band 4) 1.4MHz / 3MHz / 5MHz/ 10MHz (Band 5) 1.4MHz / 3MHz / 5MHz/ 10MHz (Band 12) 5MHz / 10MHz (Band 17)
<b>Maximum Output Power to Antenna</b>	LTE Band 4 : 23.05 dBm / 0.2018 W LTE Band 5 : 23.80 dBm / 0.2399 W LTE Band 12 : 23.61 dBm / 0.2296 W LTE Band 17 : 23.67 dBm / 0.2328 W
<b>Antenna Type</b>	LDS Antenna
<b>Type of Modulation</b>	QPSK / 16QAM

### 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

### 1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW	Maximum ERP/EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 27L	LTE Band 4	QPSK	1.4MHz	0.3141 W	0.005 ppm	1M10G7D
Part 27L	LTE Band 4	16QAM	1.4MHz	0.2382 W	0.005 ppm	1M10D7W
Part 27L	LTE Band 4	QPSK	3MHz	0.3311 W	0.006 ppm	2M74G7D
Part 27L	LTE Band 4	16QAM	3MHz	0.2535 W	0.006 ppm	2M74D7W
Part 27L	LTE Band 4	QPSK	5MHz	0.3162 W	0.005 ppm	4M52G7D
Part 27L	LTE Band 4	16QAM	5MHz	0.2438 W	0.006 ppm	4M52D7W
Part 27L	LTE Band 4	QPSK	10MHz	0.2786 W	0.005 ppm	9M16G7D
Part 27L	LTE Band 4	16QAM	10MHz	0.2138 W	0.006 ppm	9M08D7W
Part 27L	LTE Band 4	QPSK	15MHz	0.2729 W	0.005 ppm	13M5G7D
Part 27L	LTE Band 4	16QAM	15MHz	0.2094 W	0.005 ppm	13M6D7W
Part 27L	LTE Band 4	QPSK	20MHz	0.2655 W	0.006 ppm	18M7G7D
Part 27L	LTE Band 4	16QAM	20MHz	0.2099 W	0.005 ppm	18M8D7W
Part 22H	LTE Band 5	QPSK	1.4MHz	0.2056 W	0.012 ppm	1M10G7D
Part 22H	LTE Band 5	16QAM	1.4MHz	0.1567 W	0.013 ppm	1M10D7W
Part 22H	LTE Band 5	QPSK	3MHz	0.1875 W	0.008 ppm	2M72G7D
Part 22H	LTE Band 5	16QAM	3MHz	0.1406 W	0.010 ppm	2M74D7W
Part 22H	LTE Band 5	QPSK	5MHz	0.1698 W	0.010 ppm	4M50G7D
Part 22H	LTE Band 5	16QAM	5MHz	0.1324 W	0.007 ppm	4M50D7W
Part 22H	LTE Band 5	QPSK	10MHz	0.1954 W	0.012 ppm	9M12G7D
Part 22H	LTE Band 5	16QAM	10MHz	0.1607 W	0.011 ppm	9M12D7W



FCC Rule	System	Type of Modulation	BW	Maximum ERP/EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 27H	LTE Band 12	QPSK	1.4MHz	0.1432 W	0.016 ppm	1M10G7D
Part 27H	LTE Band 12	16QAM	1.4MHz	0.1127 W	0.014 ppm	1M10D7W
Part 27H	LTE Band 12	QPSK	3MHz	0.1503 W	0.015 ppm	2M74G7D
Part 27H	LTE Band 12	16QAM	3MHz	0.1180 W	0.013 ppm	2M74D7W
Part 27H	LTE Band 12	QPSK	5MHz	0.1377 W	0.016 ppm	4M50G7D
Part 27H	LTE Band 12	16QAM	5MHz	0.1079 W	0.017 ppm	4M52D7W
Part 27H	LTE Band 12	QPSK	10MHz	0.1276 W	0.017 ppm	9M16G7D
Part 27H	LTE Band 12	16QAM	10MHz	0.1007 W	0.014 ppm	9M16D7W
Part 27H	LTE Band 17	QPSK	5MHz	0.1517 W	0.014 ppm	4M52G7D
Part 27H	LTE Band 17	16QAM	5MHz	0.1109 W	0.014 ppm	4M52D7W
Part 27H	LTE Band 17	QPSK	10MHz	0.1476 W	0.016 ppm	9M20G7D
Part 27H	LTE Band 17	16QAM	10MHz	0.1161 W	0.014 ppm	9M16D7W



### 1.7 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.			
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
<b>Test Site No.</b>	<b>Sporton Site No.</b>			<b>FCC Registration No.</b>
	TH01-KS	03CH01-KS	OTA01-KS	149928

### 1.8 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 22H, 27H, 27L
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission. (Y plane for LTE Band 4 and Band 17; Z plane for LTE Band 5 and Band 12)

Frequency range investigated for radiated emission: 30MHz to 10<sup>th</sup> harmonic.

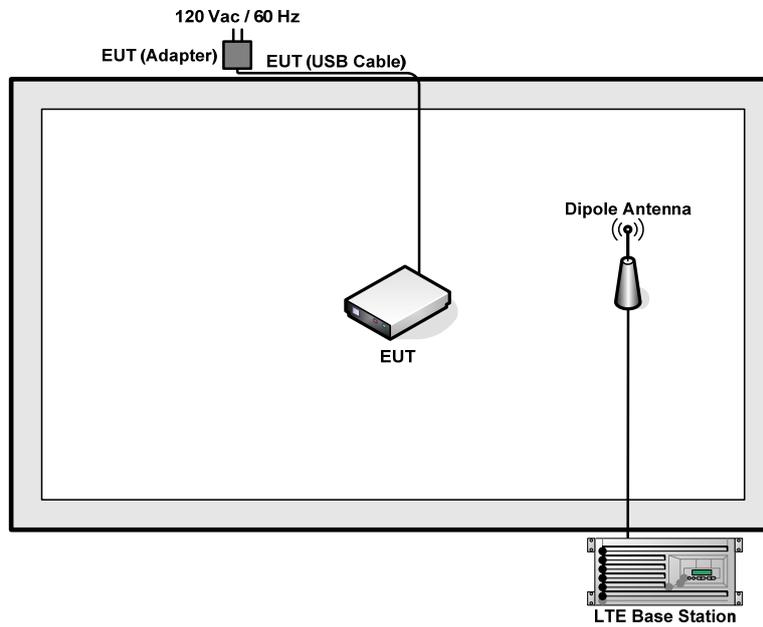
Test Modes			
Band	Radiated TCs	Conducted TCs	
LTE Band 4	BW 1.4MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 3) Link</li> <li>■ LTE (RB Size 6) Link</li> </ul>
	BW 3MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 8) Link</li> <li>■ LTE (RB Size 15) Link</li> </ul>
	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 12) Link</li> <li>■ LTE (RB Size 25) Link</li> </ul>
	BW 10MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 25) Link</li> <li>■ LTE (RB Size 50) Link</li> </ul>
	BW 15MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 36) Link</li> <li>■ LTE (RB Size 75) Link</li> </ul>
	BW 20MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 50) Link</li> <li>■ LTE (RB Size 100) Link</li> </ul>
LTE Band 5	BW 1.4MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 3) Link</li> <li>■ LTE (RB Size 6) Link</li> </ul>
	BW 3MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 8) Link</li> <li>■ LTE (RB Size 15) Link</li> </ul>
	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 12) Link</li> <li>■ LTE (RB Size 25) Link</li> </ul>
	BW 10MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 25) Link</li> <li>■ LTE (RB Size 50) Link</li> </ul>



Test Modes			
Band			
	Radiated TCs	Conducted TCs	
LTE Band 12	BW 1.4MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 3, RB Offset 1) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 3) Link</li> <li>■ LTE (RB Size 6) Link</li> </ul>
	BW 3MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 8) Link</li> <li>■ LTE (RB Size 15) Link</li> </ul>
	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 24) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 12) Link</li> <li>■ LTE (RB Size 25) Link</li> </ul>
	BW 10MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 24) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 25) Link</li> <li>■ LTE (RB Size 50) Link</li> </ul>
LTE Band 17	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 24) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 12) Link</li> <li>■ LTE (RB Size 25) Link</li> </ul>
	BW 10MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 49) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1) Link</li> <li>■ LTE (RB Size 25) Link</li> <li>■ LTE (RB Size 50) Link</li> </ul>

**Note:** The spurious emission was performed by conducted and radiated methods. From conducted spurious emission measurement (QPSK and 16QAM), the modulation related spurious emission out of the band was not identified and the radiated spurious emissions results on 16QAM were not worse than QSPK mode during exploratory test.

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m



## **2.4 Measurement Results Explanation Example**

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 5.6 dB and 10dB attenuator.

Example:

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 5.6 + 10 = 15.6 \text{ (dB)} \end{aligned}$$

### 3 Test Result

#### 3.1 Conducted Output Power Measurement

##### 3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

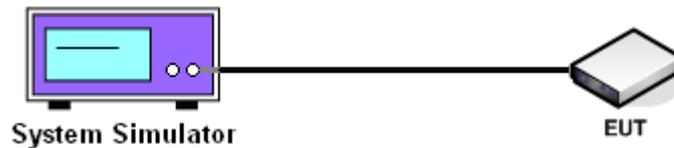
##### 3.1.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

##### 3.1.4 Test Setup





3.1.5 Test Result of Conducted Output Power

<LTE Band 4 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20050</b>	<b>20175</b>	<b>20300</b>
<b>Frequency (MHz)</b>				<b>1720</b>	<b>1732.5</b>	<b>1745</b>
20	QPSK	1	0	23.04	23.05	22.88
20	QPSK	1	49	22.74	23.02	22.81
20	QPSK	1	99	22.77	22.81	22.72
20	QPSK	50	0	21.69	21.59	21.61
20	QPSK	50	24	21.62	21.58	21.50
20	QPSK	50	49	21.54	21.46	21.42
20	QPSK	100	0	21.64	21.50	21.46
20	16QAM	1	0	21.95	21.95	21.99
20	16QAM	1	49	21.85	21.69	21.37
20	16QAM	1	99	21.79	21.88	21.57
20	16QAM	50	0	20.72	20.54	20.50
20	16QAM	50	24	20.70	20.50	20.54
20	16QAM	50	49	20.56	20.43	20.55
20	16QAM	100	0	20.60	20.43	20.56
<b>Channel</b>				<b>20025</b>	<b>20175</b>	<b>20325</b>
<b>Frequency (MHz)</b>				<b>1717.5</b>	<b>1732.5</b>	<b>1747.5</b>
15	QPSK	1	0	23.00	22.75	22.94
15	QPSK	1	37	22.91	22.59	22.89
15	QPSK	1	74	22.72	22.74	22.70
15	QPSK	36	0	22.84	22.72	22.74
15	QPSK	36	18	22.83	22.71	22.83
15	QPSK	36	37	22.74	22.59	22.66
15	QPSK	75	0	21.66	21.49	21.43
15	16QAM	1	0	22.24	22.08	21.96
15	16QAM	1	37	21.56	21.49	21.95
15	16QAM	1	74	21.85	21.95	21.77
15	16QAM	36	0	21.92	21.76	21.87
15	16QAM	36	18	21.88	21.83	21.74
15	16QAM	36	37	21.77	21.75	21.76
15	16QAM	75	0	20.63	20.51	20.43



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20000</b>	<b>20175</b>	<b>20350</b>
<b>Frequency (MHz)</b>				<b>1715</b>	<b>1732.5</b>	<b>1750</b>
10	QPSK	1	0	22.96	22.65	22.98
10	QPSK	1	24	22.88	22.61	22.87
10	QPSK	1	49	22.65	22.57	22.75
10	QPSK	25	0	21.81	21.68	21.57
10	QPSK	25	12	21.80	21.65	21.59
10	QPSK	25	24	21.71	21.60	21.72
10	QPSK	50	0	21.65	21.49	21.47
10	16QAM	1	0	22.14	21.99	21.94
10	16QAM	1	24	22.10	21.92	21.93
10	16QAM	1	49	21.59	21.63	21.56
10	16QAM	25	0	20.87	20.48	20.54
10	16QAM	25	12	20.75	20.63	20.66
10	16QAM	25	24	20.77	20.46	20.70
10	16QAM	50	0	20.61	20.46	20.49
<b>Channel</b>				<b>19975</b>	<b>20175</b>	<b>20375</b>
<b>Frequency (MHz)</b>				<b>1712.5</b>	<b>1732.5</b>	<b>1752.5</b>
5	QPSK	1	0	22.93	22.78	22.89
5	QPSK	1	12	22.92	22.76	22.81
5	QPSK	1	24	22.85	22.74	22.73
5	QPSK	12	0	21.85	21.67	21.79
5	QPSK	12	6	21.94	21.70	21.73
5	QPSK	12	11	21.88	21.66	21.74
5	QPSK	25	0	21.77	21.57	21.70
5	16QAM	1	0	21.72	21.95	21.79
5	16QAM	1	12	21.71	21.81	21.59
5	16QAM	1	24	21.58	21.90	21.78
5	16QAM	12	0	20.89	20.69	20.87
5	16QAM	12	6	20.87	20.63	20.74
5	16QAM	12	11	21.00	20.70	20.80
5	16QAM	25	0	20.82	20.51	20.58



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>19965</b>	<b>20175</b>	<b>20385</b>
<b>Frequency (MHz)</b>				<b>1711.5</b>	<b>1732.5</b>	<b>1753.5</b>
3	QPSK	1	0	23.02	22.66	22.81
3	QPSK	1	7	22.85	22.58	22.79
3	QPSK	1	14	23.01	22.65	22.78
3	QPSK	8	0	21.97	21.69	21.86
3	QPSK	8	4	21.91	21.65	21.69
3	QPSK	8	7	21.91	21.61	21.75
3	QPSK	15	0	21.80	21.59	21.68
3	16QAM	1	0	22.07	22.03	21.75
3	16QAM	1	7	22.01	21.93	21.68
3	16QAM	1	14	21.63	21.01	21.53
3	16QAM	8	0	20.91	20.65	20.89
3	16QAM	8	4	20.90	20.61	20.77
3	16QAM	8	7	20.85	20.49	20.76
3	16QAM	15	0	20.81	20.65	20.66
<b>Channel</b>				<b>19957</b>	<b>20175</b>	<b>20393</b>
<b>Frequency (MHz)</b>				<b>1710.7</b>	<b>1732.5</b>	<b>1754.3</b>
1.4	QPSK	1	0	22.99	22.77	22.92
1.4	QPSK	1	2	22.96	22.72	22.85
1.4	QPSK	1	5	22.98	22.65	22.77
1.4	QPSK	3	0	22.94	22.68	22.74
1.4	QPSK	3	1	22.97	22.65	22.83
1.4	QPSK	3	2	22.95	22.67	22.79
1.4	QPSK	6	0	22.03	21.70	21.68
1.4	16QAM	1	0	22.05	21.81	21.75
1.4	16QAM	1	2	21.99	21.52	21.48
1.4	16QAM	1	5	21.78	21.48	21.46
1.4	16QAM	3	0	22.04	21.74	21.59
1.4	16QAM	3	1	22.00	21.76	21.58
1.4	16QAM	3	2	22.03	21.69	21.65
1.4	16QAM	6	0	21.06	20.60	20.76



<LTE Band 5 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20450</b>	<b>20525</b>	<b>20600</b>
<b>Frequency (MHz)</b>				<b>829</b>	<b>836.5</b>	<b>844</b>
10	QPSK	1	0	23.70	23.65	23.80
10	QPSK	1	24	23.60	23.40	23.78
10	QPSK	1	49	23.22	23.39	23.27
10	QPSK	25	0	22.58	22.48	22.78
10	QPSK	25	12	22.37	22.38	22.62
10	QPSK	25	24	22.12	22.25	22.20
10	QPSK	50	0	22.16	22.12	22.25
10	16QAM	1	0	22.39	22.82	23.16
10	16QAM	1	24	22.38	22.66	23.05
10	16QAM	1	49	22.32	22.47	22.10
10	16QAM	25	0	21.51	21.04	21.66
10	16QAM	25	12	21.31	21.20	21.62
10	16QAM	25	24	21.09	21.54	21.13
10	16QAM	50	0	21.14	21.06	21.21
<b>Channel</b>				<b>20425</b>	<b>20525</b>	<b>20625</b>
<b>Frequency (MHz)</b>				<b>826.5</b>	<b>836.5</b>	<b>846.5</b>
5	QPSK	1	0	23.70	23.58	23.51
5	QPSK	1	12	23.69	23.43	23.11
5	QPSK	1	24	23.55	23.34	22.92
5	QPSK	12	0	22.69	22.55	22.43
5	QPSK	12	6	22.75	22.43	22.16
5	QPSK	12	11	22.72	22.22	22.19
5	QPSK	25	0	22.48	22.19	22.03
5	16QAM	1	0	23.00	22.62	22.62
5	16QAM	1	12	22.34	22.47	22.21
5	16QAM	1	24	22.36	22.29	22.14
5	16QAM	12	0	21.67	21.15	21.43
5	16QAM	12	6	21.75	21.38	21.32
5	16QAM	12	11	21.68	21.55	21.26
5	16QAM	25	0	21.42	21.32	21.00



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20415</b>	<b>20525</b>	<b>20635</b>
<b>Frequency (MHz)</b>				<b>825.5</b>	<b>836.5</b>	<b>847.5</b>
3	QPSK	1	0	23.74	23.62	23.16
3	QPSK	1	7	23.68	23.43	23.02
3	QPSK	1	14	23.70	23.31	22.85
3	QPSK	8	0	22.69	22.62	22.18
3	QPSK	8	4	22.70	22.50	22.10
3	QPSK	8	7	22.71	22.35	22.00
3	QPSK	15	0	22.68	22.27	22.10
3	16QAM	1	0	23.02	22.72	22.12
3	16QAM	1	7	22.62	22.46	22.04
3	16QAM	1	14	22.84	22.54	21.94
3	16QAM	8	0	21.64	21.64	21.13
3	16QAM	8	4	21.61	21.42	21.21
3	16QAM	8	7	21.62	21.38	20.95
3	16QAM	15	0	21.52	21.40	21.02
<b>Channel</b>				<b>20407</b>	<b>20525</b>	<b>20643</b>
<b>Frequency (MHz)</b>				<b>824.7</b>	<b>836.5</b>	<b>848.3</b>
1.4	QPSK	1	0	23.71	23.58	22.92
1.4	QPSK	1	2	23.68	23.46	22.91
1.4	QPSK	1	5	23.69	23.35	22.75
1.4	QPSK	3	0	23.65	23.55	22.91
1.4	QPSK	3	1	23.66	23.40	22.82
1.4	QPSK	3	2	23.66	23.21	22.82
1.4	QPSK	6	0	22.72	22.33	21.94
1.4	16QAM	1	0	22.93	22.46	22.39
1.4	16QAM	1	2	22.88	22.31	22.22
1.4	16QAM	1	5	22.60	22.25	22.24
1.4	16QAM	3	0	22.67	22.42	22.33
1.4	16QAM	3	1	22.79	22.27	22.32
1.4	16QAM	3	2	22.61	22.35	22.31
1.4	16QAM	6	0	21.89	21.44	21.31



<LTE Band 12 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>23060</b>	<b>23095</b>	<b>23130</b>
<b>Frequency (MHz)</b>				<b>704</b>	<b>707.5</b>	<b>711</b>
10	QPSK	1	0	23.31	23.24	23.43
10	QPSK	1	24	23.61	23.49	23.44
10	QPSK	1	49	23.25	23.41	23.36
10	QPSK	25	0	22.15	22.17	22.05
10	QPSK	25	12	22.28	22.26	22.16
10	QPSK	25	24	22.22	22.10	22.07
10	QPSK	50	0	22.05	22.01	22.00
10	16QAM	1	0	22.14	22.00	22.40
10	16QAM	1	24	22.77	22.47	22.55
10	16QAM	1	49	22.26	22.33	22.22
10	16QAM	25	0	21.05	21.10	21.02
10	16QAM	25	12	21.27	21.17	21.19
10	16QAM	25	24	21.28	21.06	21.28
10	16QAM	50	0	21.01	20.91	21.04
<b>Channel</b>				<b>23035</b>	<b>23095</b>	<b>23155</b>
<b>Frequency (MHz)</b>				<b>701.5</b>	<b>707.5</b>	<b>713.5</b>
5	QPSK	1	0	23.29	23.25	23.34
5	QPSK	1	12	23.51	23.33	23.47
5	QPSK	1	24	23.50	23.22	23.52
5	QPSK	12	0	22.26	22.41	22.41
5	QPSK	12	6	22.31	22.31	22.51
5	QPSK	12	11	22.34	22.25	22.47
5	QPSK	25	0	22.17	22.07	22.28
5	16QAM	1	0	22.15	22.10	22.23
5	16QAM	1	12	22.38	22.26	22.11
5	16QAM	1	24	22.21	22.05	22.52
5	16QAM	12	0	21.26	21.37	21.42
5	16QAM	12	6	21.21	21.37	21.58
5	16QAM	12	11	21.37	21.19	21.47
5	16QAM	25	0	21.23	21.08	21.35



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>23025</b>	<b>23095</b>	<b>23165</b>
<b>Frequency (MHz)</b>				<b>700.5</b>	<b>707.5</b>	<b>714.5</b>
3	QPSK	1	0	23.33	23.54	23.45
3	QPSK	1	7	23.26	23.42	23.48
3	QPSK	1	14	23.50	23.34	23.37
3	QPSK	8	0	22.25	22.40	22.55
3	QPSK	8	4	22.24	22.23	22.48
3	QPSK	8	7	22.32	22.17	22.38
3	QPSK	15	0	22.25	22.24	22.41
3	16QAM	1	0	22.02	22.63	22.64
3	16QAM	1	7	22.08	22.53	22.67
3	16QAM	1	14	22.15	22.29	22.50
3	16QAM	8	0	21.25	21.35	21.56
3	16QAM	8	4	21.14	21.32	21.41
3	16QAM	8	7	21.27	21.23	21.50
3	16QAM	15	0	21.20	21.29	21.44
<b>Channel</b>				<b>23017</b>	<b>23095</b>	<b>23173</b>
<b>Frequency (MHz)</b>				<b>699.7</b>	<b>707.5</b>	<b>715.3</b>
1.4	QPSK	1	0	23.25	23.30	23.35
1.4	QPSK	1	2	23.38	23.29	23.18
1.4	QPSK	1	5	23.13	23.35	23.38
1.4	QPSK	3	0	23.41	23.26	23.31
1.4	QPSK	3	1	23.37	23.34	23.46
1.4	QPSK	3	2	23.34	23.26	23.38
1.4	QPSK	6	0	22.30	22.31	22.48
1.4	16QAM	1	0	22.13	21.97	22.35
1.4	16QAM	1	2	21.93	22.45	22.43
1.4	16QAM	1	5	22.39	22.47	22.33
1.4	16QAM	3	0	22.32	22.24	22.45
1.4	16QAM	3	1	22.35	22.33	22.30
1.4	16QAM	3	2	22.32	22.23	22.51
1.4	16QAM	6	0	21.43	21.37	21.48



<LTE Band 17 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>23780</b>	<b>23790</b>	<b>23800</b>
<b>Frequency (MHz)</b>				<b>709</b>	<b>710</b>	<b>711</b>
10	QPSK	1	0	23.42	23.28	23.45
10	QPSK	1	24	23.29	23.38	23.32
10	QPSK	1	49	23.49	23.57	23.67
10	QPSK	25	0	22.08	22.15	22.17
10	QPSK	25	12	22.13	22.16	22.18
10	QPSK	25	24	22.33	22.30	22.36
10	QPSK	50	0	22.01	22.02	22.09
10	16QAM	1	0	22.02	22.65	22.25
10	16QAM	1	24	22.06	22.51	22.66
10	16QAM	1	49	22.34	22.49	22.42
10	16QAM	25	0	21.12	21.08	21.02
10	16QAM	25	12	21.12	21.10	21.27
10	16QAM	25	24	21.28	21.26	21.32
10	16QAM	50	0	21.04	21.01	21.15
<b>Channel</b>				<b>23755</b>	<b>23790</b>	<b>23825</b>
<b>Frequency (MHz)</b>				<b>706.5</b>	<b>710</b>	<b>713.5</b>
5	QPSK	1	0	23.55	23.29	23.29
5	QPSK	1	12	23.15	23.36	23.41
5	QPSK	1	24	23.35	23.48	23.65
5	QPSK	12	0	22.43	22.24	22.45
5	QPSK	12	6	22.46	22.31	22.44
5	QPSK	12	11	22.28	22.44	22.56
5	QPSK	25	0	22.14	22.18	22.40
5	16QAM	1	0	22.80	22.20	22.11
5	16QAM	1	12	22.65	22.29	22.31
5	16QAM	1	24	22.51	22.15	22.35
5	16QAM	12	0	21.39	21.19	21.41
5	16QAM	12	6	21.45	21.37	21.58
5	16QAM	12	11	21.25	21.49	21.65
5	16QAM	25	0	21.11	21.17	21.32

Note: Maximum average power for LTE.

## 3.2 Peak-to-Average Ratio

### 3.2.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

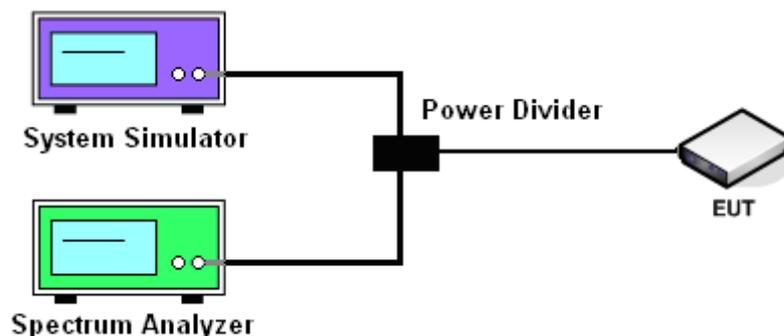
### 3.2.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. For LTE operating modes:
  - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
  - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
3. Record the deviation as Peak to Average Ratio.

### 3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

Modes	LTE Band 4			
BW / Mod.	1.4MHz / QPSK	1.4MHz / 16QAM	3MHz / QPSK	3MHz / 16QAM
Peak-to-Average Ratio (dB)	5.00	6.36	5.08	6.36
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.24	6.40	5.52	6.32
BW / Mod.	15MHz / QPSK	15MHz / 16QAM	20MHz / QPSK	20MHz / 16QAM
Peak-to-Average Ratio (dB)	5.92	6.84	6.44	7.16

Modes	LTE Band 5			
BW / Mod.	1.4MHz / QPSK	1.4MHz / 16QAM	3MHz / QPSK	3MHz / 16QAM
Peak-to-Average Ratio (dB)	5.52	6.60	5.44	6.68
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.64	6.72	5.60	6.64

Modes	LTE Band 12			
BW / Mod.	1.4MHz / QPSK	1.4MHz / 16QAM	3MHz / QPSK	3MHz / 16QAM
Peak-to-Average Ratio (dB)	5.44	6.32	5.28	6.28
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.44	6.28	5.64	6.48

Modes	LTE Band 17			
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.40	6.32	5.64	6.44

Note:

The maximum RB configurations of the PAPR summary as below:

BW1.4MHz RB setting : RB Size 6, RB offset 0

BW3.0MHz RB setting : RB Size 15, RB offset 0

BW5.0MHz RB setting : RB Size 25, RB offset 0

BW10MHz RB setting : RB Size 50, RB offset 0

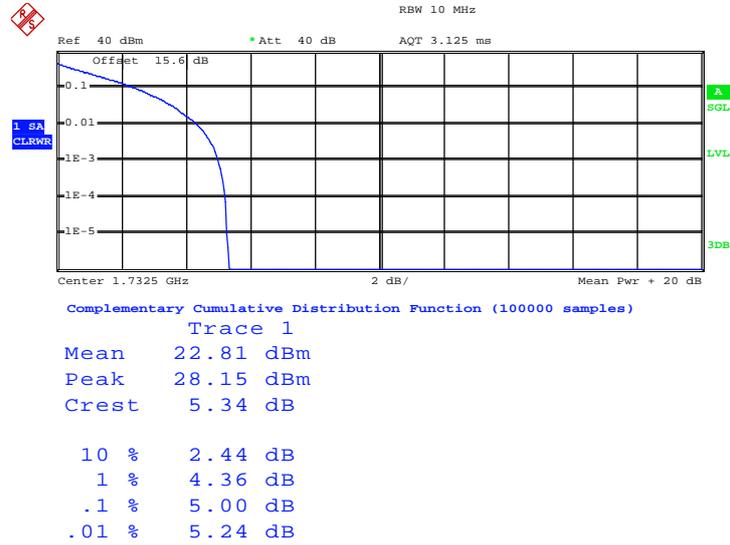
BW15MHz RB setting : RB Size 75, RB offset 0

BW20MHz RB setting : RB Size 100, RB offset 0

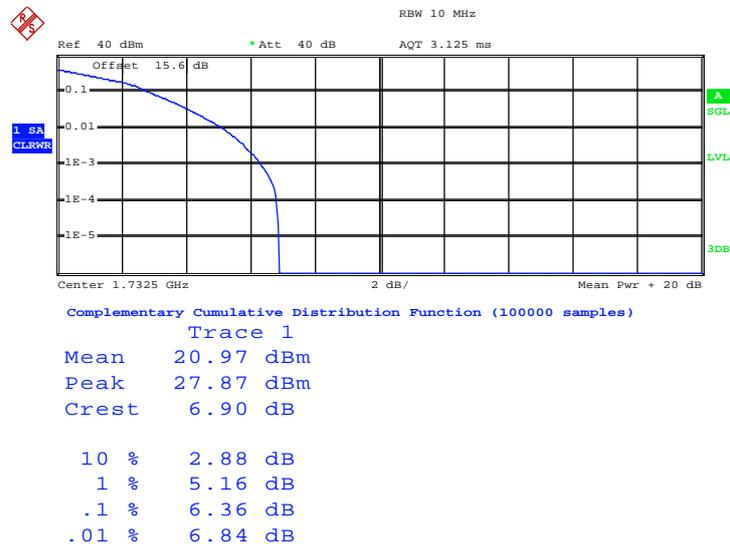


### 3.2.6 Peak to Average Power Ratio

#### Peak-to-Average Ratio on LTE Band 4 1.4MHz / QPSK

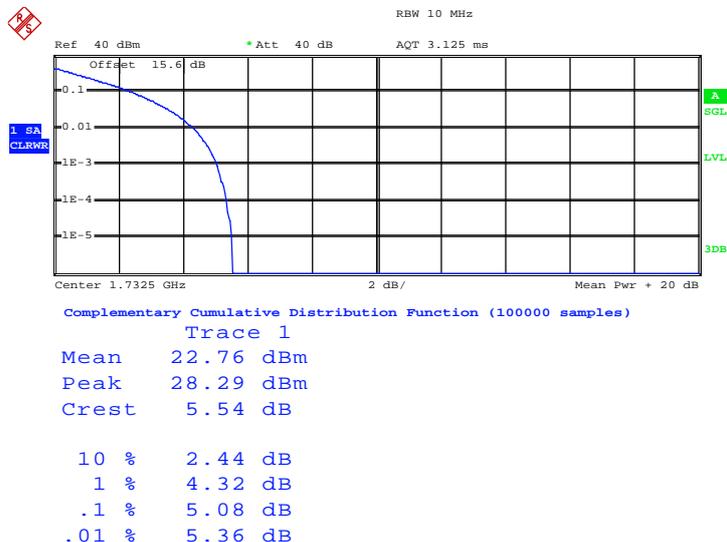


#### Peak-to-Average Ratio on LTE Band 4 1.4MHz / 16QAM

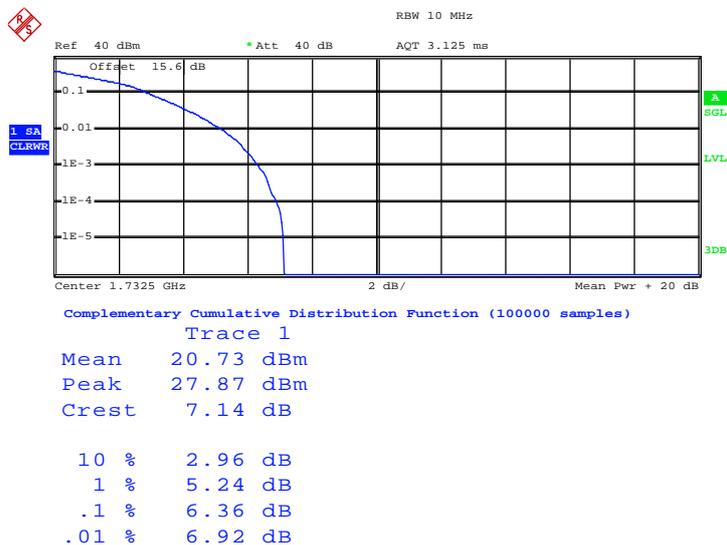




Peak-to-Average Ratio on LTE Band 4 3MHz / QPSK

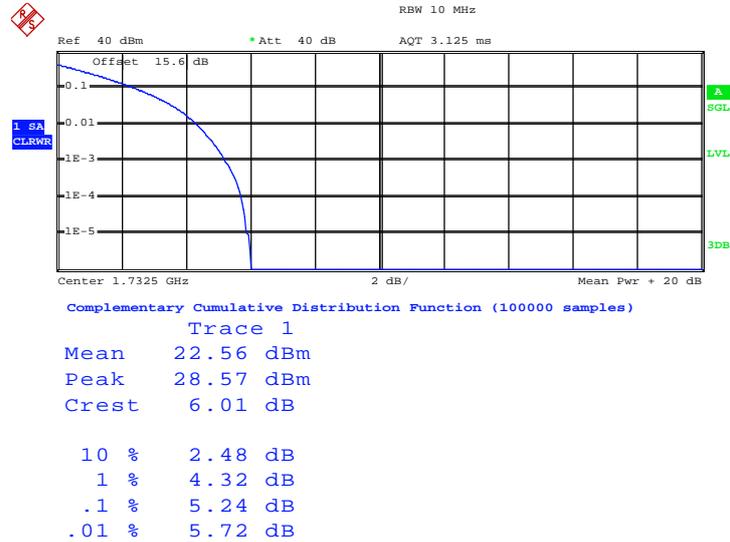


Peak-to-Average Ratio on LTE Band 4 3MHz / 16QAM

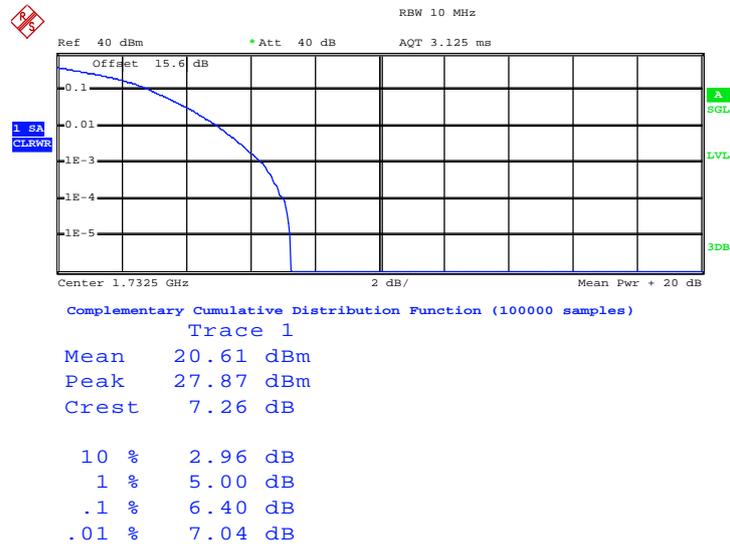




### Peak-to-Average Ratio on LTE Band 4 5MHz / QPSK

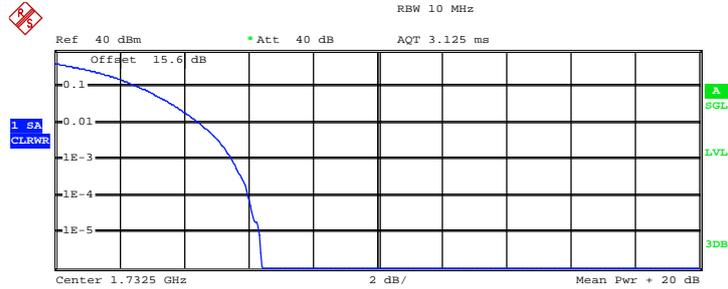


### Peak-to-Average Ratio on LTE Band 4 5MHz / 16QAM





Peak-to-Average Ratio on LTE Band 4 10MHz / QPSK



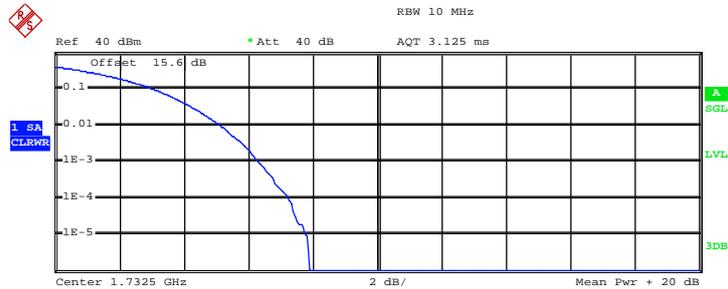
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 22.24 dBm  
 Peak 28.65 dBm  
 Crest 6.41 dB

10 % 2.64 dB  
 1 % 4.52 dB  
 .1 % 5.52 dB  
 .01 % 6.00 dB

Peak-to-Average Ratio on LTE Band 4 10MHz / 16QAM



Complementary Cumulative Distribution Function (100000 samples)

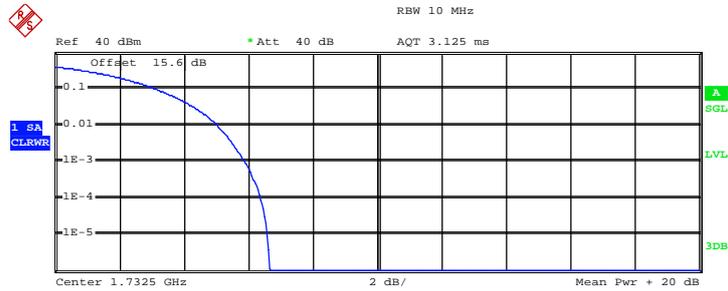
Trace 1

Mean 20.26 dBm  
 Peak 28.15 dBm  
 Crest 7.89 dB

10 % 3.12 dB  
 1 % 5.16 dB  
 .1 % 6.32 dB  
 .01 % 7.24 dB



Peak-to-Average Ratio on LTE Band 4 15MHz / QPSK



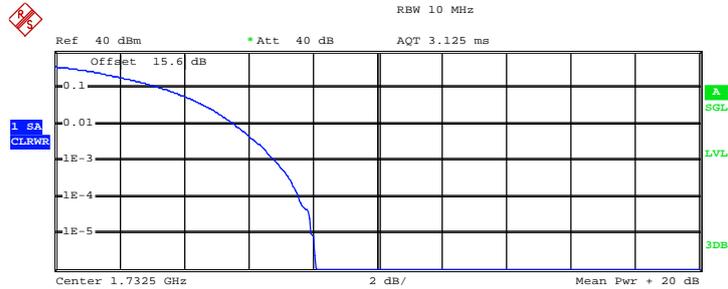
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 21.08 dBm  
 Peak 27.73 dBm  
 Crest 6.65 dB

10 % 3.20 dB  
 1 % 5.04 dB  
 .1 % 5.92 dB  
 .01 % 6.40 dB

Peak-to-Average Ratio on LTE Band 4 15MHz / 16QAM



Complementary Cumulative Distribution Function (100000 samples)

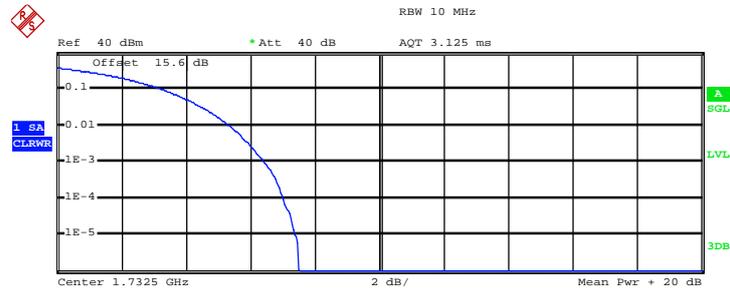
Trace 1

Mean 19.15 dBm  
 Peak 27.23 dBm  
 Crest 8.08 dB

10 % 3.40 dB  
 1 % 5.60 dB  
 .1 % 6.84 dB  
 .01 % 7.56 dB



### Peak-to-Average Ratio on LTE Band 4 20MHz / QPSK

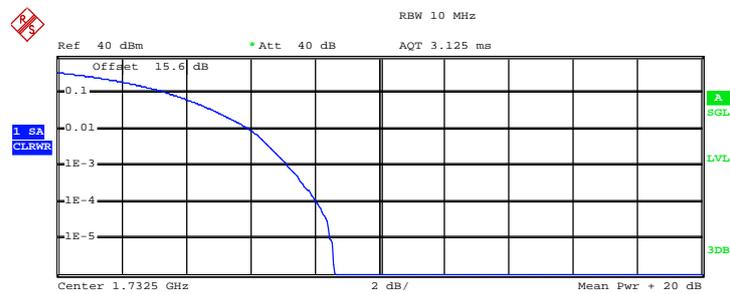


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
Mean 19.72 dBm  
Peak 27.23 dBm  
Crest 7.51 dB

10 % 3.32 dB  
1 % 5.36 dB  
.1 % 6.44 dB  
.01 % 7.04 dB

### Peak-to-Average Ratio on LTE Band 4 20MHz / 16QAM



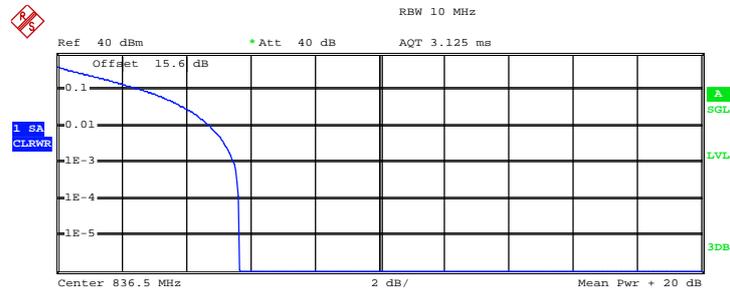
Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
Mean 17.86 dBm  
Peak 26.46 dBm  
Crest 8.60 dB

10 % 3.52 dB  
1 % 6.00 dB  
.1 % 7.16 dB  
.01 % 8.08 dB



Peak-to-Average Ratio on LTE Band 5 1.4MHz / QPSK

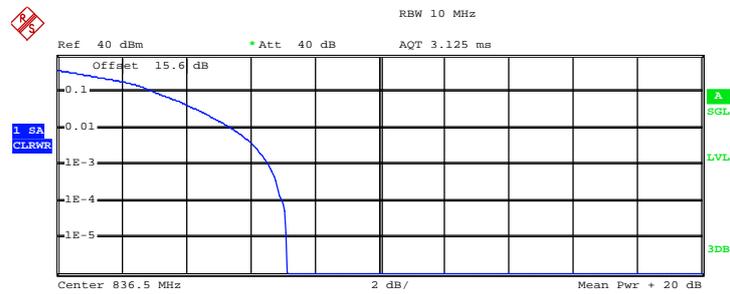


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 23.19 dBm  
 Peak 28.86 dBm  
 Crest 5.66 dB

10 % 2.72 dB  
 1 % 4.76 dB  
 .1 % 5.52 dB  
 .01 % 5.64 dB

Peak-to-Average Ratio on LTE Band 5 1.4MHz / 16QAM



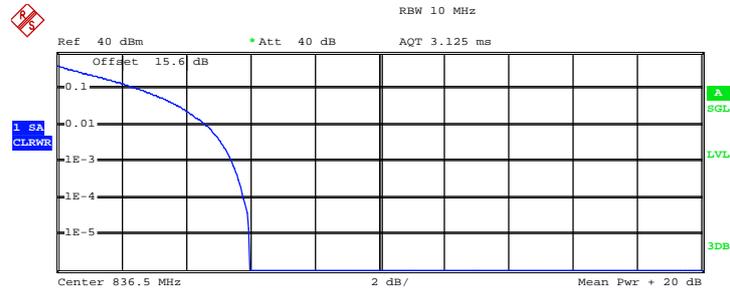
Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 21.39 dBm  
 Peak 28.50 dBm  
 Crest 7.12 dB

10 % 3.08 dB  
 1 % 5.44 dB  
 .1 % 6.60 dB  
 .01 % 7.00 dB



Peak-to-Average Ratio on LTE Band 5 3MHz / QPSK

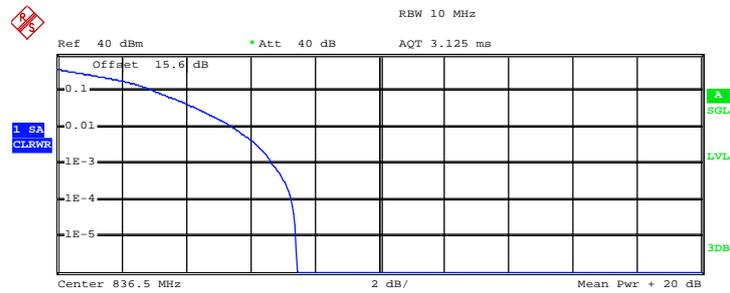


Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	23.02 dBm
Peak	29.00 dBm
Crest	5.98 dB
10 %	2.60 dB
1 %	4.64 dB
.1 %	5.44 dB
.01 %	5.80 dB

Peak-to-Average Ratio on LTE Band 5 3MHz / 16QAM



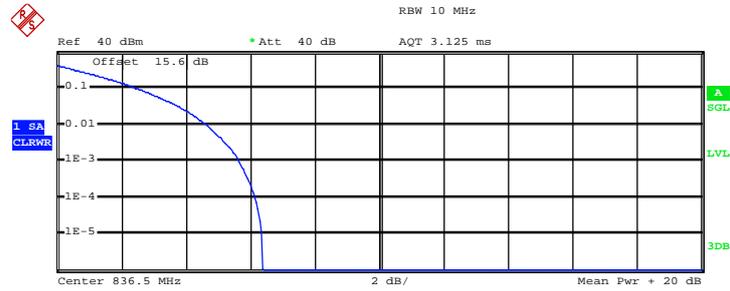
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	21.28 dBm
Peak	28.72 dBm
Crest	7.43 dB
10 %	3.08 dB
1 %	5.48 dB
.1 %	6.68 dB
.01 %	7.28 dB



Peak-to-Average Ratio on LTE Band 5 5MHz / QPSK

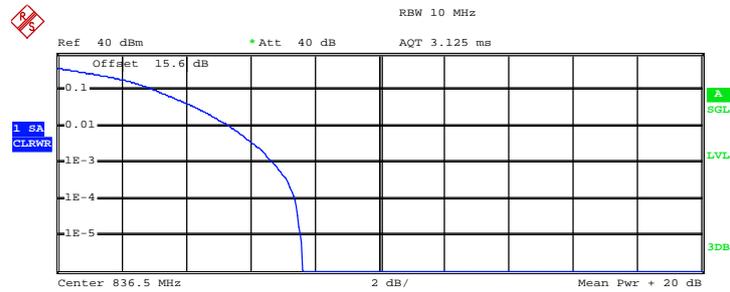


Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	22.89 dBm
Peak	29.28 dBm
Crest	6.39 dB
10 %	2.56 dB
1 %	4.64 dB
.1 %	5.64 dB
.01 %	6.16 dB

Peak-to-Average Ratio on LTE Band 5 5MHz / 16QAM



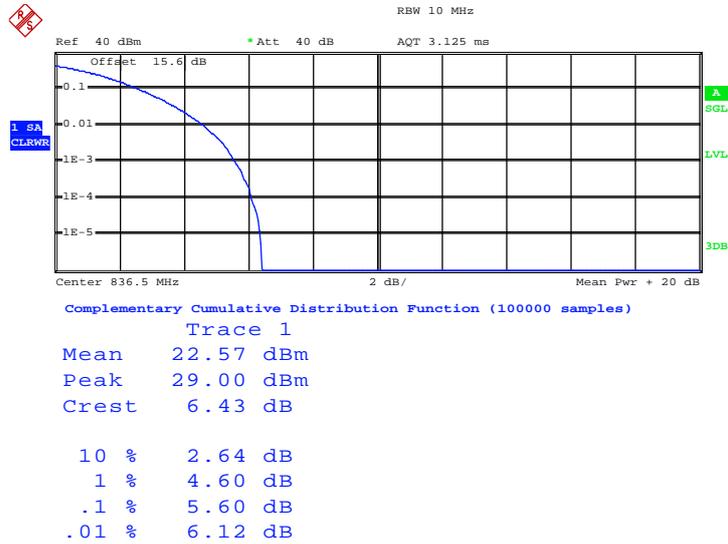
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

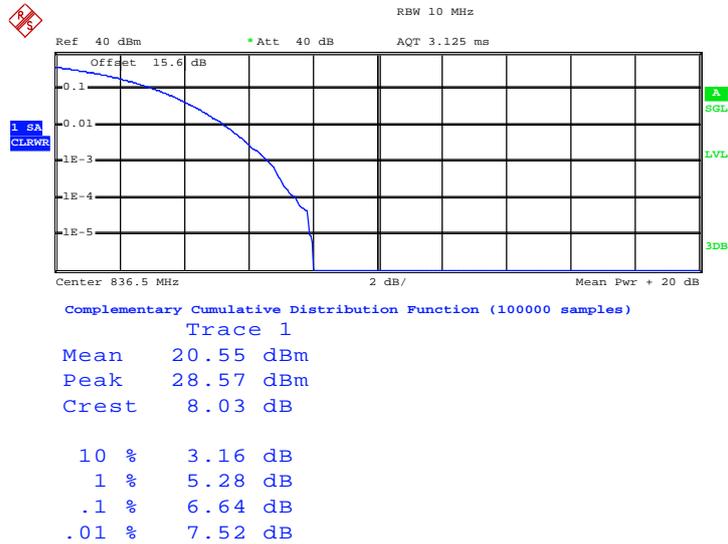
Mean	20.94 dBm
Peak	28.57 dBm
Crest	7.63 dB
10 %	3.08 dB
1 %	5.40 dB
.1 %	6.72 dB
.01 %	7.40 dB



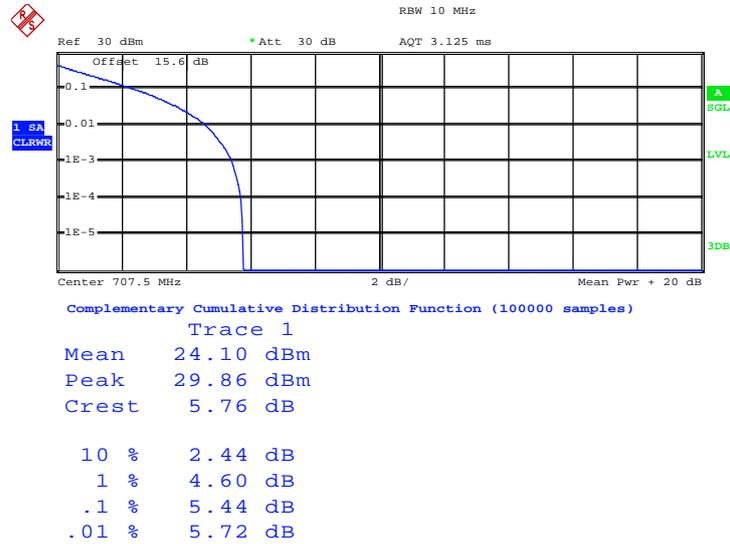
Peak-to-Average Ratio on LTE Band 5 10MHz / QPSK



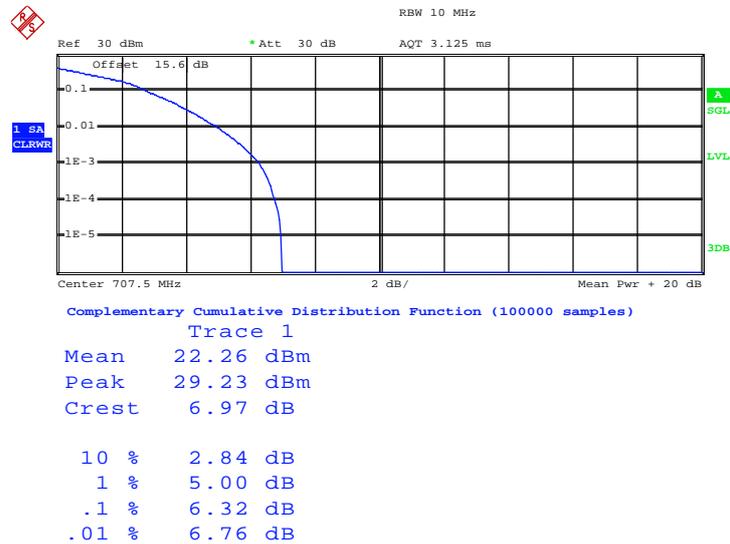
Peak-to-Average Ratio on LTE Band 5 10MHz / 16QAM



**Peak-to-Average Ratio on LTE Band 12 1.4MHz / QPSK**

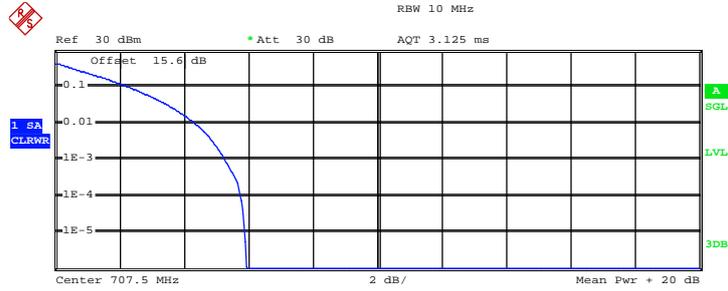


**Peak-to-Average Ratio on LTE Band 12 1.4MHz / 16QAM**





Peak-to-Average Ratio on LTE Band 12 3MHz / QPSK

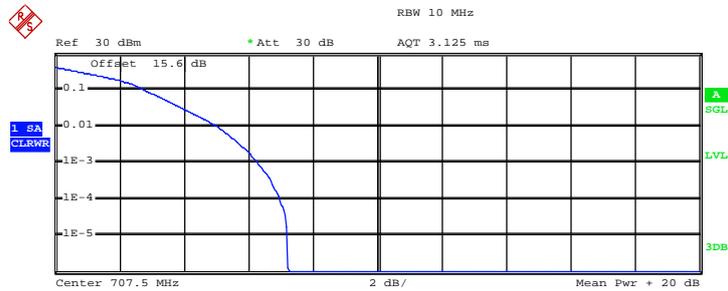


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 23.99 dBm  
 Peak 29.93 dBm  
 Crest 5.95 dB

10 % 2.32 dB  
 1 % 4.36 dB  
 .1 % 5.28 dB  
 .01 % 5.76 dB

Peak-to-Average Ratio on LTE Band 12 3MHz / 16QAM



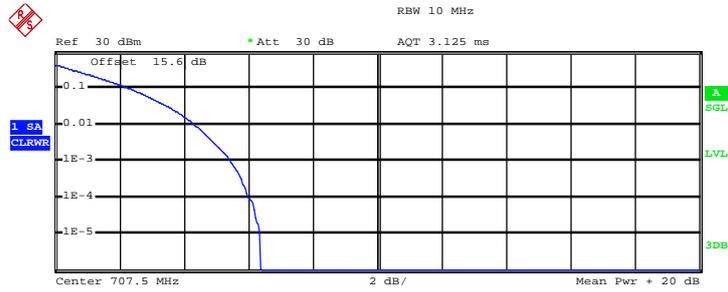
Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 22.07 dBm  
 Peak 29.30 dBm  
 Crest 7.23 dB

10 % 2.84 dB  
 1 % 5.08 dB  
 .1 % 6.28 dB  
 .01 % 7.00 dB



Peak-to-Average Ratio on LTE Band 12 5MHz / QPSK



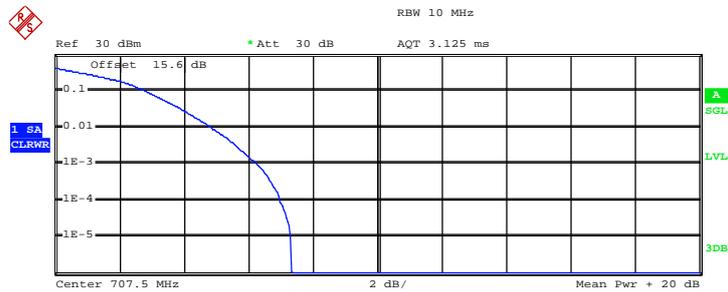
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 23.83 dBm  
 Peak 30.22 dBm  
 Crest 6.39 dB

10 %	2.36 dB
1 %	4.36 dB
.1 %	5.44 dB
.01 %	6.00 dB

Peak-to-Average Ratio on LTE Band 12 5MHz / 16QAM



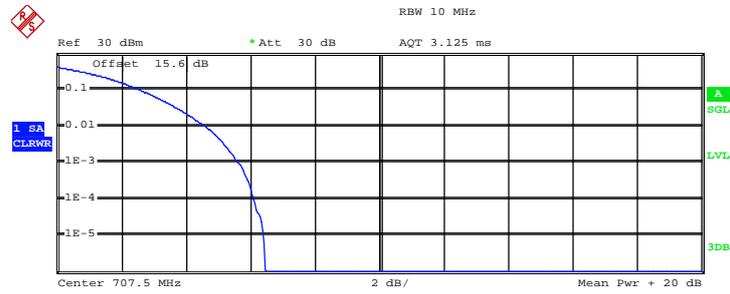
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 21.89 dBm  
 Peak 29.23 dBm  
 Crest 7.34 dB

10 %	2.84 dB
1 %	4.88 dB
.1 %	6.28 dB
.01 %	7.00 dB

Peak-to-Average Ratio on LTE Band 12 10MHz / QPSK

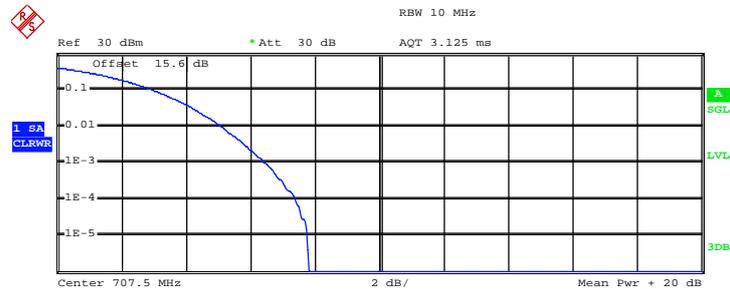


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 23.53 dBm  
 Peak 30.00 dBm  
 Crest 6.47 dB

10 % 2.64 dB  
 1 % 4.64 dB  
 .1 % 5.64 dB  
 .01 % 6.12 dB

Peak-to-Average Ratio on LTE Band 12 10MHz / 16QAM



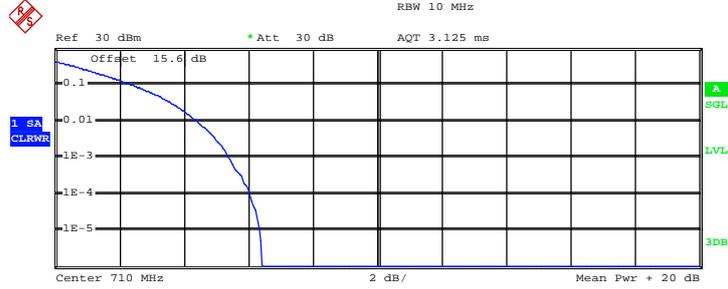
Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 21.57 dBm  
 Peak 29.37 dBm  
 Crest 7.80 dB

10 % 3.04 dB  
 1 % 5.12 dB  
 .1 % 6.48 dB  
 .01 % 7.40 dB



Peak-to-Average Ratio on LTE Band 17 5MHz / QPSK

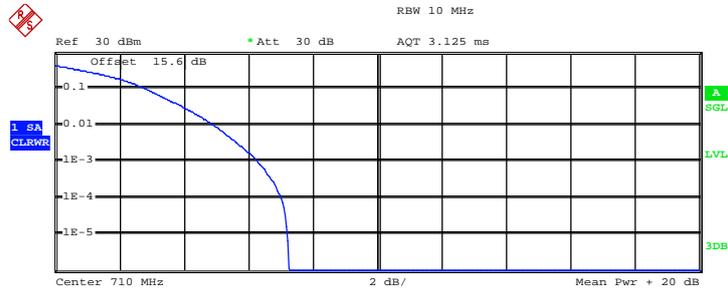


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 23.86 dBm  
 Peak 30.29 dBm  
 Crest 6.42 dB

10 % 2.44 dB  
 1 % 4.44 dB  
 .1 % 5.40 dB  
 .01 % 6.04 dB

Peak-to-Average Ratio on LTE Band 17 5MHz / 16QAM



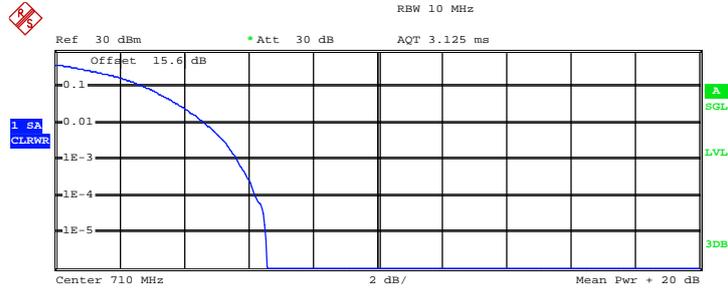
Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 21.89 dBm  
 Peak 29.16 dBm  
 Crest 7.27 dB

10 % 2.88 dB  
 1 % 4.96 dB  
 .1 % 6.32 dB  
 .01 % 7.04 dB



Peak-to-Average Ratio on LTE Band 17 10MHz / QPSK

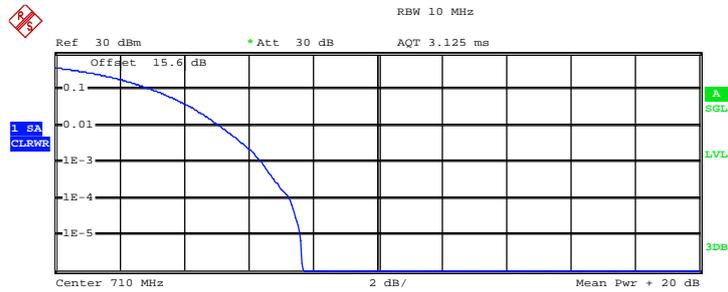


Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 23.62 dBm  
 Peak 30.22 dBm  
 Crest 6.59 dB

10 % 2.84 dB  
 1 % 4.68 dB  
 .1 % 5.64 dB  
 .01 % 6.24 dB

Peak-to-Average Ratio on LTE Band 17 10MHz / 16QAM



Complementary Cumulative Distribution Function (100000 samples)

Trace 1  
 Mean 21.55 dBm  
 Peak 29.23 dBm  
 Crest 7.68 dB

10 % 3.08 dB  
 1 % 5.12 dB  
 .1 % 6.44 dB  
 .01 % 7.28 dB

### 3.3 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement

#### 3.3.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5 and 3 watt with LTE Band 12 and band 17.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 1 watt with LTE band 4.

#### 3.3.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

#### 3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer which used a channel power option across EUT's signal bandwidth per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

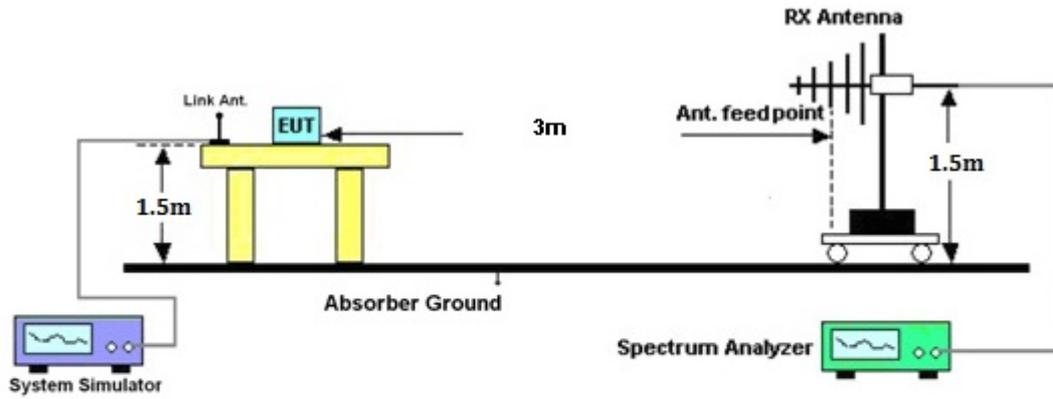
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

$R_t$  : The highest received signal in spectrum analyzer for EUT.

$R_s$  : The highest received signal in spectrum analyzer for substitution antenna.

### 3.3.4 Test Setup





3.3.5 Test Result of ERP/EIRP

LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	1.4	QPSK	1	0	1710.7	24.41	0.2761	H
4	1.4	QPSK	1	0	1732.5	22.43	0.1750	H
4	1.4	QPSK	1	0	1754.3	24.81	0.3027	H
4	1.4	QPSK	1	0	1710.7	23.88	0.2443	V
4	1.4	QPSK	1	0	1732.5	22.34	0.1714	V
4	1.4	QPSK	1	0	1754.3	24.97	0.3141	V
4	1.4	16QAM	1	0	1710.7	23.32	0.2148	H
4	1.4	16QAM	1	0	1732.5	21.48	0.1406	H
4	1.4	16QAM	1	0	1754.3	23.69	0.2339	H
4	1.4	16QAM	1	0	1710.7	22.76	0.1888	V
4	1.4	16QAM	1	0	1732.5	21.34	0.1361	V
4	1.4	16QAM	1	0	1754.3	23.77	0.2382	V
4	3	QPSK	1	0	1711.5	24.45	0.2786	H
4	3	QPSK	1	0	1732.5	22.42	0.1746	H
4	3	QPSK	1	0	1753.5	25.15	0.3273	H
4	3	QPSK	1	0	1711.5	23.96	0.2489	V
4	3	QPSK	1	0	1732.5	22.35	0.1718	V
4	3	QPSK	1	0	1753.5	25.20	0.3311	V
4	3	16QAM	1	0	1711.5	23.33	0.2153	H
4	3	16QAM	1	0	1732.5	21.34	0.1361	H
4	3	16QAM	1	0	1753.5	23.90	0.2455	H
4	3	16QAM	1	0	1711.5	22.86	0.1932	V
4	3	16QAM	1	0	1732.5	21.27	0.1340	V
4	3	16QAM	1	0	1753.5	24.04	0.2535	V



LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	5	QPSK	1	0	1712.5	24.31	0.2698	H
4	5	QPSK	1	0	1732.5	22.35	0.1718	H
4	5	QPSK	1	0	1752.5	24.81	0.3027	H
4	5	QPSK	1	0	1712.5	23.68	0.2333	V
4	5	QPSK	1	0	1732.5	22.25	0.1679	V
4	5	QPSK	1	0	1752.5	25.00	0.3162	V
4	5	16QAM	1	0	1712.5	23.16	0.2070	H
4	5	16QAM	1	0	1732.5	21.15	0.1303	H
4	5	16QAM	1	0	1752.5	23.69	0.2339	H
4	5	16QAM	1	0	1712.5	22.65	0.1841	V
4	5	16QAM	1	0	1732.5	21.08	0.1282	V
4	5	16QAM	1	0	1752.5	23.87	0.2438	V
4	10	QPSK	1	0	1715	24.36	0.2729	H
4	10	QPSK	1	0	1732.5	22.36	0.1722	H
4	10	QPSK	1	0	1750	24.45	0.2786	H
4	10	QPSK	1	0	1715	23.69	0.2339	V
4	10	QPSK	1	0	1732.5	22.15	0.1641	V
4	10	QPSK	1	0	1750	24.35	0.2723	V
4	10	16QAM	1	0	1715	23.20	0.2089	H
4	10	16QAM	1	0	1732.5	21.37	0.1371	H
4	10	16QAM	1	0	1750	23.30	0.2138	H
4	10	16QAM	1	0	1715	22.75	0.1884	V
4	10	16QAM	1	0	1732.5	21.13	0.1297	V
4	10	16QAM	1	0	1750	23.19	0.2084	V



LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	15	QPSK	1	0	1717.5	24.36	0.2729	H
4	15	QPSK	1	0	1732.5	22.71	0.1866	H
4	15	QPSK	1	0	1747.5	23.52	0.2249	H
4	15	QPSK	1	0	1717.5	23.93	0.2472	V
4	15	QPSK	1	0	1732.5	23.32	0.2148	V
4	15	QPSK	1	0	1747.5	23.52	0.2249	V
4	15	16QAM	1	0	1717.5	23.21	0.2094	H
4	15	16QAM	1	0	1732.5	21.72	0.1486	H
4	15	16QAM	1	0	1747.5	22.38	0.1730	H
4	15	16QAM	1	0	1717.5	22.80	0.1905	V
4	15	16QAM	1	0	1732.5	21.28	0.1343	V
4	15	16QAM	1	0	1747.5	22.42	0.1746	V
4	20	QPSK	1	0	1720	24.24	0.2655	H
4	20	QPSK	1	0	1732.5	22.77	0.1892	H
4	20	QPSK	1	0	1745	22.87	0.1936	H
4	20	QPSK	1	0	1720	23.87	0.2438	V
4	20	QPSK	1	0	1732.5	22.41	0.1742	V
4	20	QPSK	1	0	1745	22.72	0.1871	V
4	20	16QAM	1	0	1720	23.22	0.2099	H
4	20	16QAM	1	0	1732.5	21.82	0.1521	H
4	20	16QAM	1	0	1745	21.72	0.1486	H
4	20	16QAM	1	0	1720	22.82	0.1914	V
4	20	16QAM	1	0	1732.5	21.49	0.1409	V
4	20	16QAM	1	0	1745	21.56	0.1432	V



LTE Band 5 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
5	1.4	QPSK	1	0	824.7	22.29	0.1694	H
5	1.4	QPSK	1	0	836.5	23.13	0.2056	H
5	1.4	QPSK	1	0	848.3	20.53	0.1130	H
5	1.4	QPSK	1	0	824.7	5.66	0.0037	V
5	1.4	QPSK	1	0	836.5	7.62	0.0058	V
5	1.4	QPSK	1	0	848.3	6.93	0.0049	V
5	1.4	16QAM	1	0	824.7	21.35	0.1365	H
5	1.4	16QAM	1	0	836.5	21.95	0.1567	H
5	1.4	16QAM	1	0	848.3	19.32	0.0855	H
5	1.4	16QAM	1	0	824.7	4.77	0.0030	V
5	1.4	16QAM	1	0	836.5	6.26	0.0042	V
5	1.4	16QAM	1	0	848.3	5.73	0.0037	V
5	3	QPSK	1	0	825.5	22.21	0.1663	H
5	3	QPSK	1	0	836.5	22.73	0.1875	H
5	3	QPSK	1	0	847.5	20.40	0.1096	H
5	3	QPSK	1	0	825.5	5.90	0.0039	V
5	3	QPSK	1	0	836.5	7.25	0.0053	V
5	3	QPSK	1	0	847.5	6.62	0.0046	V
5	3	16QAM	1	0	825.5	21.27	0.1340	H
5	3	16QAM	1	0	836.5	21.48	0.1406	H
5	3	16QAM	1	0	847.5	19.33	0.0857	H
5	3	16QAM	1	0	825.5	4.91	0.0031	V
5	3	16QAM	1	0	836.5	6.12	0.0041	V
5	3	16QAM	1	0	847.5	5.54	0.0036	V



LTE Band 5 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
5	5	QPSK	1	0	826.5	22.10	0.1622	H
5	5	QPSK	1	0	836.5	22.30	0.1698	H
5	5	QPSK	1	0	846.5	21.28	0.1343	H
5	5	QPSK	1	0	826.5	5.83	0.0038	V
5	5	QPSK	1	0	836.5	6.86	0.0049	V
5	5	QPSK	1	0	846.5	7.07	0.0051	V
5	5	16QAM	1	0	826.5	21.22	0.1324	H
5	5	16QAM	1	0	836.5	21.14	0.1300	H
5	5	16QAM	1	0	846.5	20.15	0.1035	H
5	5	16QAM	1	0	826.5	4.90	0.0031	V
5	5	16QAM	1	0	836.5	5.60	0.0036	V
5	5	16QAM	1	0	846.5	6.00	0.0040	V
5	10	QPSK	1	0	829	22.16	0.1644	H
5	10	QPSK	1	0	836.5	21.02	0.1265	H
5	10	QPSK	1	0	844	22.91	0.1954	H
5	10	QPSK	1	0	829	6.22	0.0042	V
5	10	QPSK	1	0	836.5	5.20	0.0033	V
5	10	QPSK	1	0	844	7.96	0.0063	V
5	10	16QAM	1	0	829	21.19	0.1315	H
5	10	16QAM	1	0	836.5	19.79	0.0953	H
5	10	16QAM	1	0	844	22.06	0.1607	H
5	10	16QAM	1	0	829	5.05	0.0032	V
5	10	16QAM	1	0	836.5	4.33	0.0027	V
5	10	16QAM	1	0	844	7.10	0.0051	V



LTE Band 12 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
12	1.4	QPSK	3	0	699.7	19.85	0.0966	H
12	1.4	QPSK	1	5	707.5	20.31	0.1074	H
12	1.4	QPSK	3	1	715.3	21.56	0.1432	H
12	1.4	QPSK	3	0	699.7	5.33	0.0034	V
12	1.4	QPSK	1	5	707.5	5.44	0.0035	V
12	1.4	QPSK	3	1	715.3	6.31	0.0043	V
12	1.4	16QAM	1	5	699.7	18.80	0.0759	H
12	1.4	16QAM	1	5	707.5	19.23	0.0838	H
12	1.4	16QAM	3	2	715.3	20.52	0.1127	H
12	1.4	16QAM	1	5	699.7	4.34	0.0027	V
12	1.4	16QAM	1	5	707.5	4.33	0.0027	V
12	1.4	16QAM	3	2	715.3	5.21	0.0033	V
12	3	QPSK	1	14	700.5	20.81	0.1205	H
12	3	QPSK	1	0	707.5	20.53	0.1130	H
12	3	QPSK	1	7	714.5	21.77	0.1503	H
12	3	QPSK	1	14	700.5	6.31	0.0043	V
12	3	QPSK	1	0	707.5	5.78	0.0038	V
12	3	QPSK	1	7	714.5	6.59	0.0046	V
12	3	16QAM	1	14	700.5	19.64	0.0920	H
12	3	16QAM	1	0	707.5	19.50	0.0891	H
12	3	16QAM	1	7	714.5	20.72	0.1180	H
12	3	16QAM	1	14	700.5	5.14	0.0033	V
12	3	16QAM	1	0	707.5	4.68	0.0029	V
12	3	16QAM	1	7	714.5	5.60	0.0036	V



LTE Band 12 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
12	5	QPSK	1	12	701.5	20.62	0.1153	H
12	5	QPSK	1	12	707.5	20.20	0.1047	H
12	5	QPSK	1	24	713.5	21.39	0.1377	H
12	5	QPSK	1	12	701.5	6.08	0.0041	V
12	5	QPSK	1	12	707.5	5.29	0.0034	V
12	5	QPSK	1	24	713.5	6.06	0.0040	V
12	5	16QAM	1	12	701.5	19.54	0.0899	H
12	5	16QAM	1	12	707.5	19.25	0.0841	H
12	5	16QAM	1	24	713.5	20.33	0.1079	H
12	5	16QAM	1	12	701.5	5.11	0.0032	V
12	5	16QAM	1	12	707.5	4.32	0.0027	V
12	5	16QAM	1	24	713.5	4.99	0.0032	V
12	10	QPSK	1	24	704	21.06	0.1276	H
12	10	QPSK	1	24	707.5	20.17	0.1040	H
12	10	QPSK	1	24	711	20.97	0.1250	H
12	10	QPSK	1	24	704	6.39	0.0044	V
12	10	QPSK	1	24	707.5	5.26	0.0034	V
12	10	QPSK	1	24	711	6.21	0.0042	V
12	10	16QAM	1	24	704	20.03	0.1007	H
12	10	16QAM	1	24	707.5	19.23	0.0838	H
12	10	16QAM	1	24	711	19.88	0.0973	H
12	10	16QAM	1	24	704	5.55	0.0036	V
12	10	16QAM	1	24	707.5	4.36	0.0027	V
12	10	16QAM	1	24	711	5.19	0.0033	V



LTE Band 17 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
17	5	QPSK	1	0	706.5	21.06	0.1276	H
17	5	QPSK	1	24	710	21.81	0.1517	H
17	5	QPSK	1	24	713.5	21.43	0.1390	H
17	5	QPSK	1	0	706.5	6.34	0.0043	V
17	5	QPSK	1	24	710	6.68	0.0047	V
17	5	QPSK	1	24	713.5	5.71	0.0037	V
17	5	16QAM	1	0	706.5	20.04	0.1009	H
17	5	16QAM	1	12	710	19.72	0.0938	H
17	5	16QAM	1	24	713.5	20.45	0.1109	H
17	5	16QAM	1	0	706.5	5.34	0.0034	V
17	5	16QAM	1	12	710	4.53	0.0028	V
17	5	16QAM	1	24	713.5	4.79	0.0030	V
17	10	QPSK	1	49	709	21.69	0.1476	H
17	10	QPSK	1	49	710	20.45	0.1109	H
17	10	QPSK	1	49	711	21.17	0.1309	H
17	10	QPSK	1	49	709	6.31	0.0043	V
17	10	QPSK	1	49	710	5.45	0.0035	V
17	10	QPSK	1	49	711	5.53	0.0036	V
17	10	16QAM	1	49	709	20.65	0.1161	H
17	10	16QAM	1	0	710	20.51	0.1125	H
17	10	16QAM	1	24	711	19.87	0.0971	H
17	10	16QAM	1	49	709	5.52	0.0036	V
17	10	16QAM	1	0	710	4.97	0.0031	V
17	10	16QAM	1	24	711	4.85	0.0031	V

### 3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26dB occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal 26 dB.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

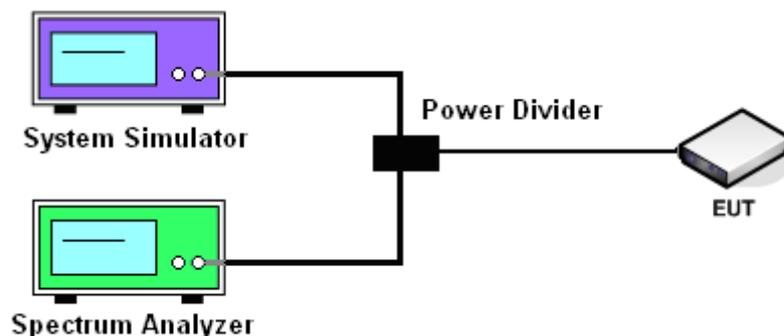
#### 3.4.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

#### 3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF powers with full RB sizes were measured.

#### 3.4.4 Test Setup



3.4.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Modes	LTE Band 4			
BW / Mod.	1.4MHz / QPSK	1.4MHz / 16QAM	3MHz / QPSK	3MHz / 16QAM
99% OBW (MHz)	1.0976	1.1032	2.7360	2.7360
26dB BW (MHz)	1.2824	1.3160	3.1080	3.1200
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
99% OBW (MHz)	4.5200	4.5200	9.1600	9.0800
26dB BW (MHz)	5.1000	5.0400	10.0400	10.0800
BW / Mod.	15MHz / QPSK	15MHz / 16QAM	20MHz / QPSK	20MHz / 16QAM
99% OBW (MHz)	13.5000	13.5600	18.7200	18.8000
26dB BW (MHz)	14.7600	14.8200	21.2800	21.3600

Modes	LTE Band 5			
BW / Mod.	1.4MHz / QPSK	1.4MHz / 16QAM	3MHz / QPSK	3MHz / 16QAM
99% OBW (MHz)	1.1032	1.1032	2.7240	2.7360
26dB BW (MHz)	1.2880	1.3104	3.0960	3.1200
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
99% OBW (MHz)	4.5000	4.5000	9.1200	9.1200
26dB BW (MHz)	5.0600	5.0800	10.1200	10.0400



Modes	LTE Band 12			
BW / Mod.	1.4MHz / QPSK	1.4MHz / 16QAM	3MHz / QPSK	3MHz / 16QAM
99% OBW (MHz)	1.1032	1.0976	2.7360	2.7360
26dB BW (MHz)	1.2852	1.3076	3.1200	3.0840
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
99% OBW (MHz)	4.5000	4.5200	9.1600	9.1600
26dB BW (MHz)	5.0200	5.0100	10.1000	10.0600

Modes	LTE Band 17			
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
99% OBW (MHz)	4.5200	4.5200	9.2000	9.1600
26dB BW (MHz)	5.1000	5.1200	10.1200	10.0000

**Note:**

The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

BW1.4MHz RB setting : RB Size 6, RB offset 0

BW3.0MHz RB setting : RB Size 15, RB offset 0

BW5.0MHz RB setting : RB Size 25, RB offset 0

BW10MHz RB setting : RB Size 50, RB offset 0

BW15MHz RB setting : RB Size 75, RB offset 0

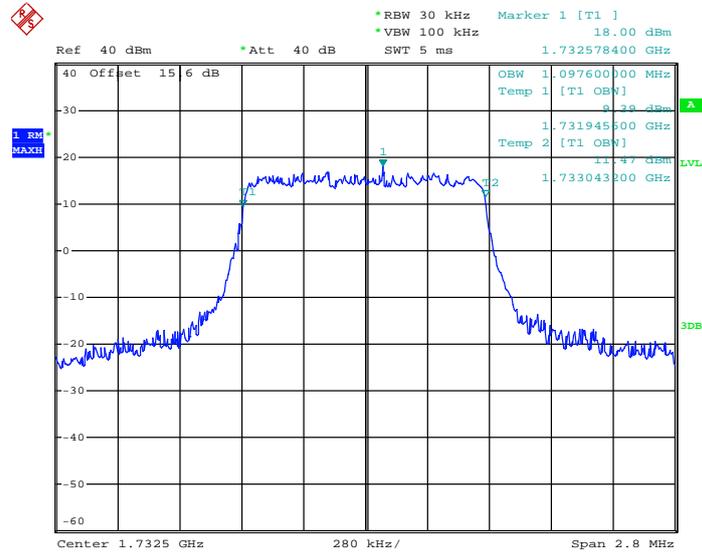
BW20MHz RB setting : RB Size 100, RB offset 0



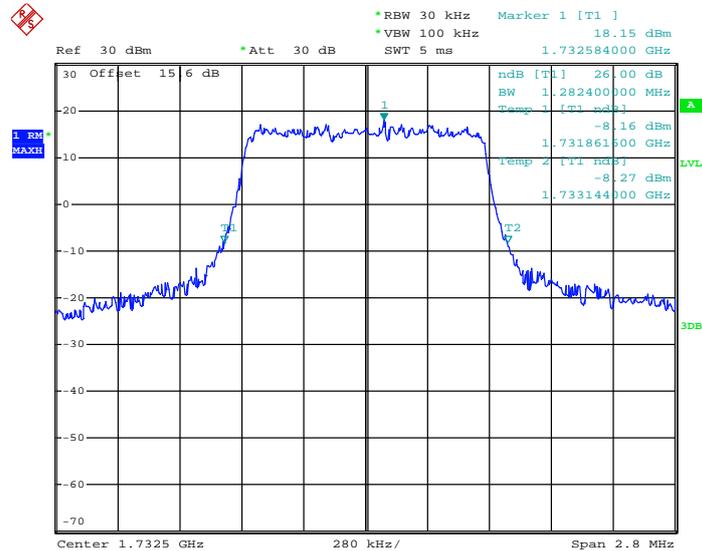
3.4.6 Test Plots of 99% Occupied Bandwidth and 26dB Bandwidth

Band :	LTE Band 4	BW / Mod. :	1.4MHz / QPSK
--------	------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 20175



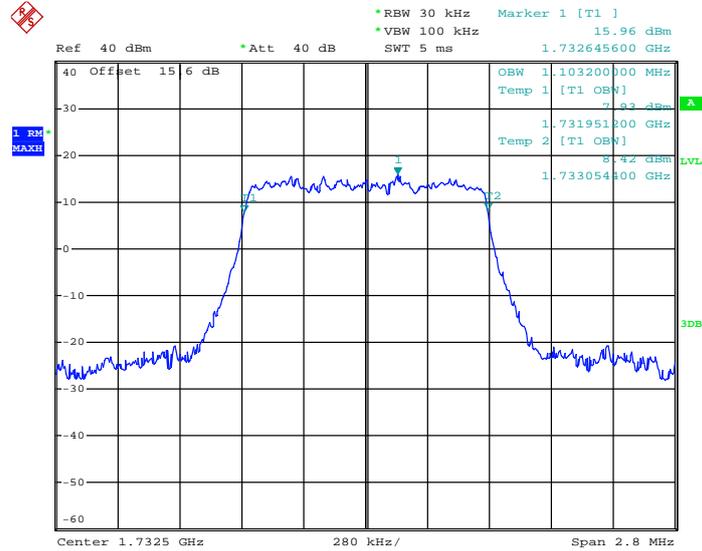
26dB Bandwidth Plot on Channel 20175



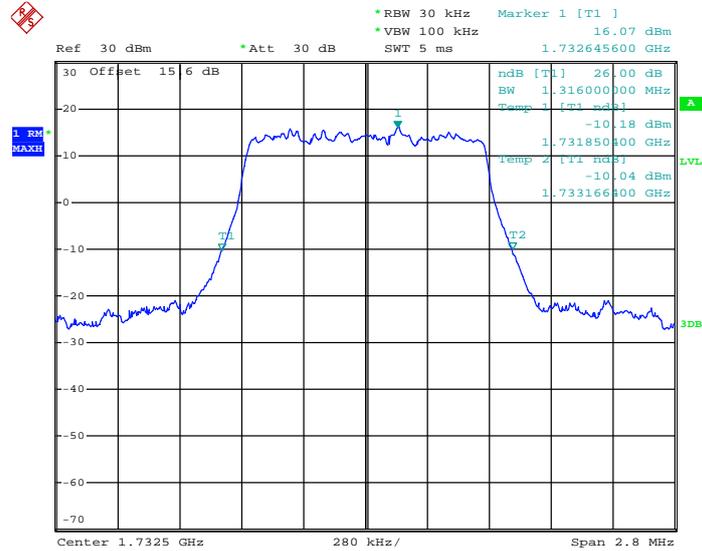


Band :	LTE Band 4	BW / Mod. :	1.4MHz / 16QAM
--------	------------	-------------	----------------

99% Occupied Bandwidth Plot on Channel 20175



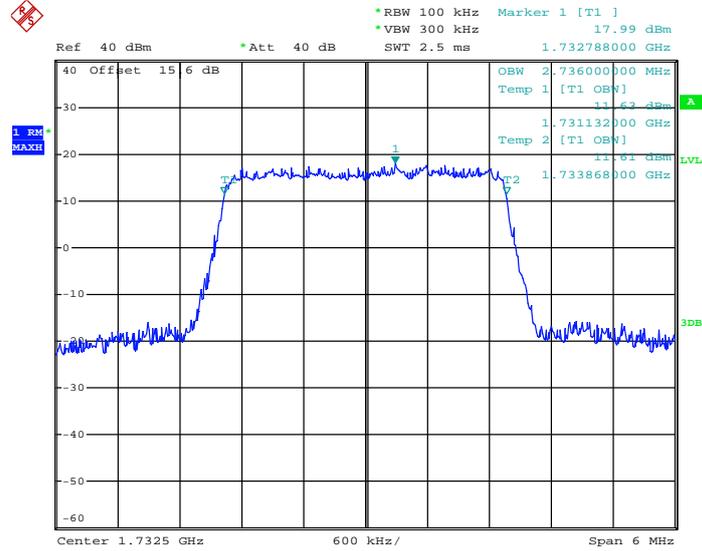
26dB Bandwidth Plot on Channel 20175



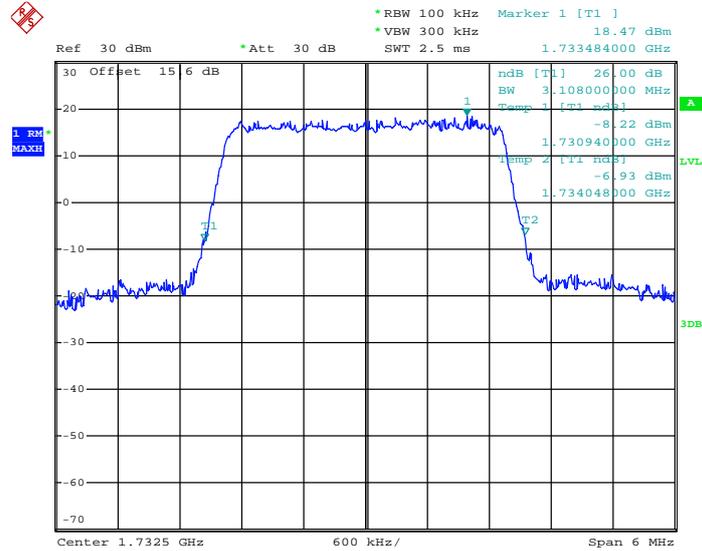


Band :	LTE Band 4	BW / Mod. :	3MHz / QPSK
--------	------------	-------------	-------------

99% Occupied Bandwidth Plot on Channel 20175



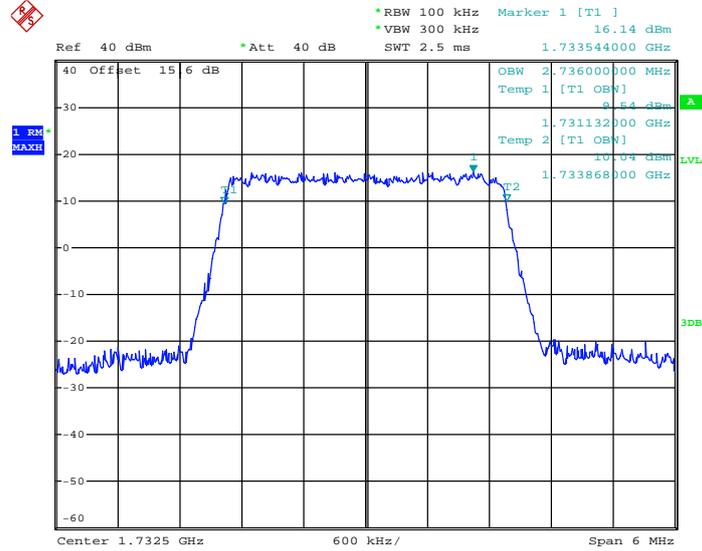
26dB Bandwidth Plot on Channel 20175



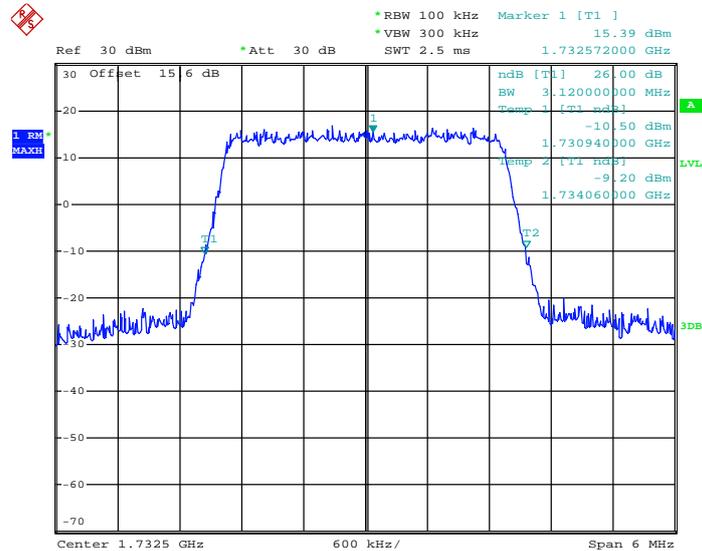


Band :	LTE Band 4	BW / Mod. :	3MHz / 16QAM
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20175



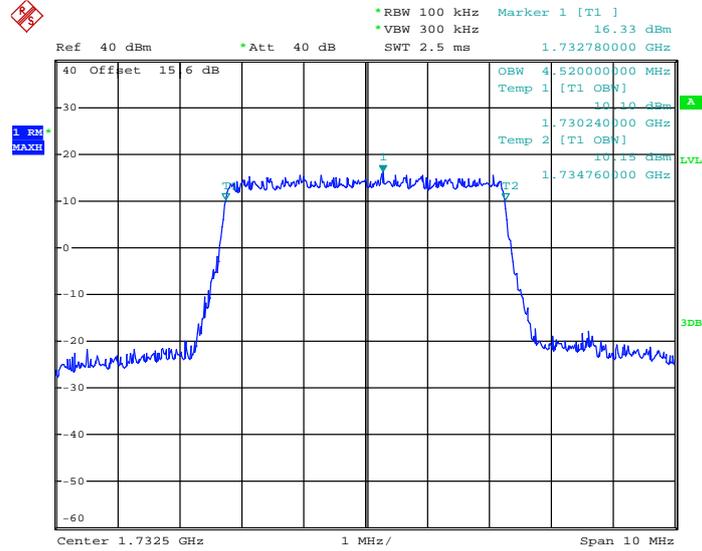
26dB Bandwidth Plot on Channel 20175



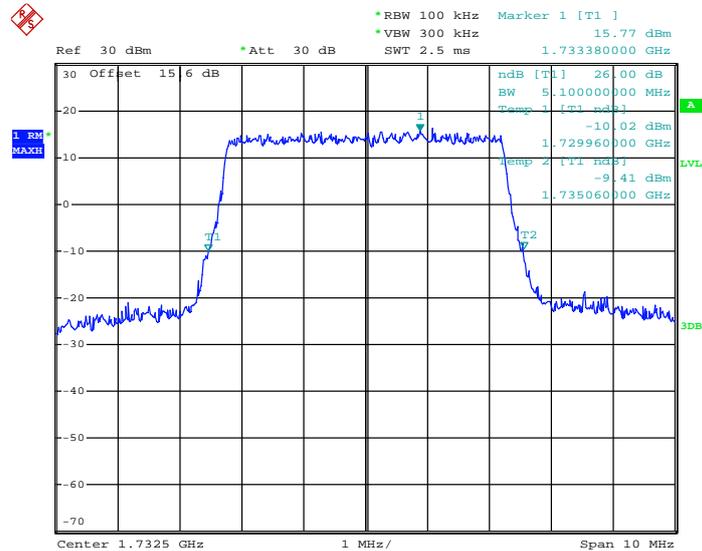


Band :	LTE Band 4	BW / Mod. :	5MHz / QPSK
--------	------------	-------------	-------------

99% Occupied Bandwidth Plot on Channel 20175



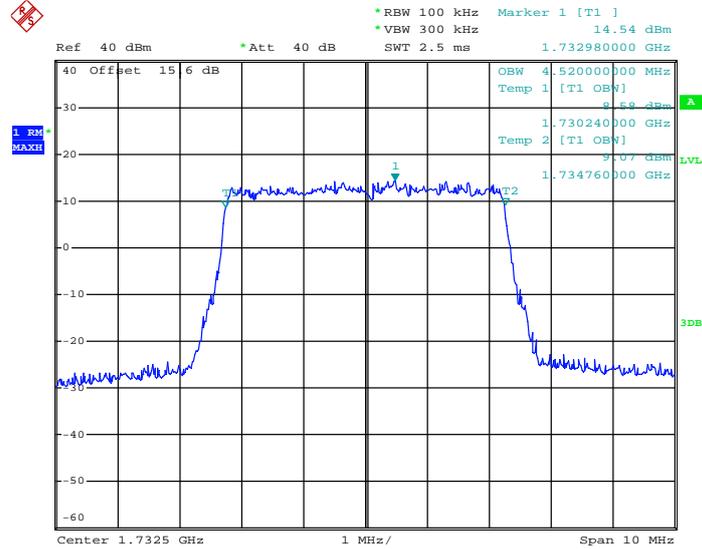
26dB Bandwidth Plot on Channel 20175



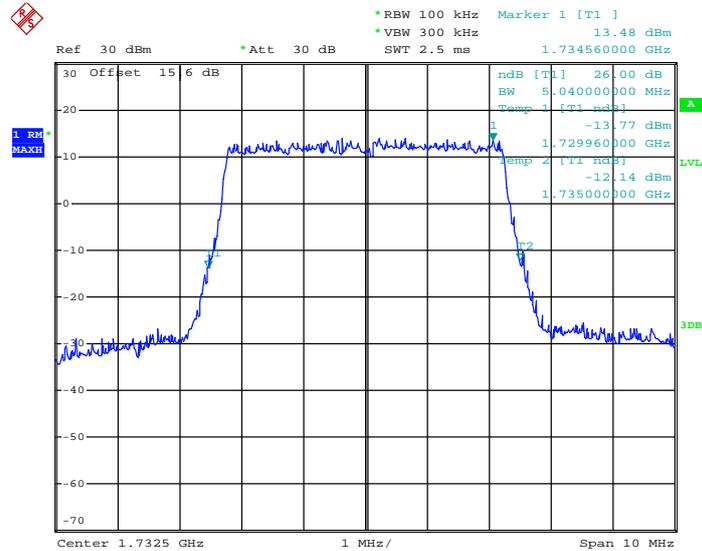


Band :	LTE Band 4	BW / Mod. :	5MHz / 16QAM
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20175



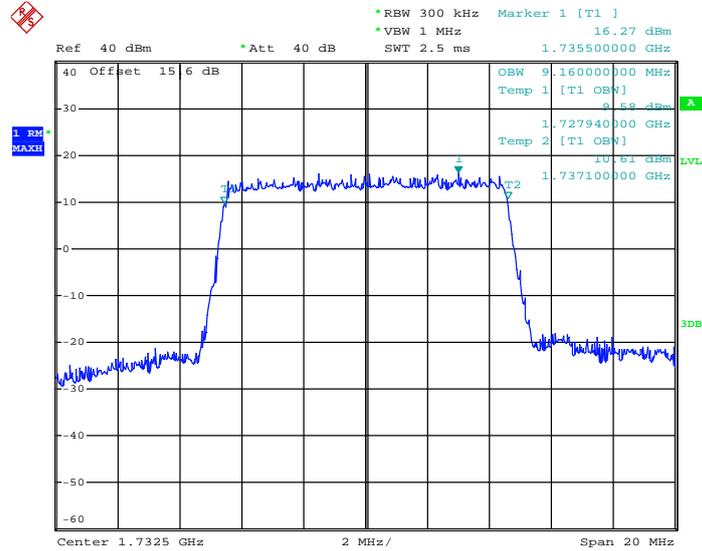
26dB Bandwidth Plot on Channel 20175



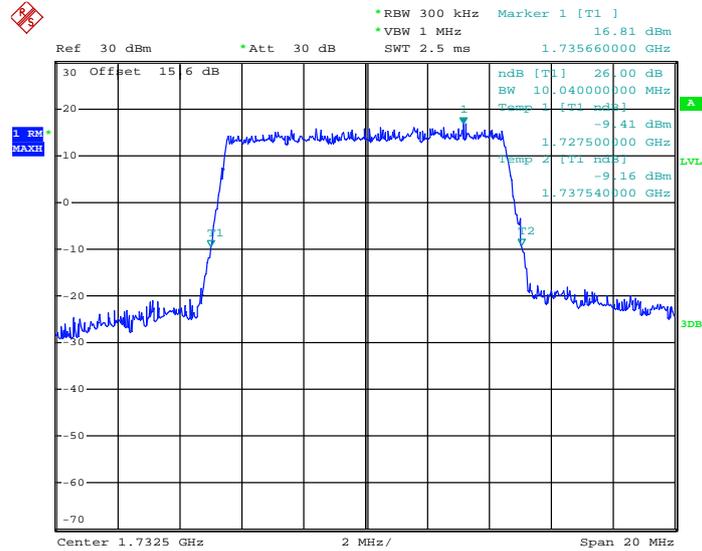


Band :	LTE Band 4	BW / Mod. :	10MHz / QPSK
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20175



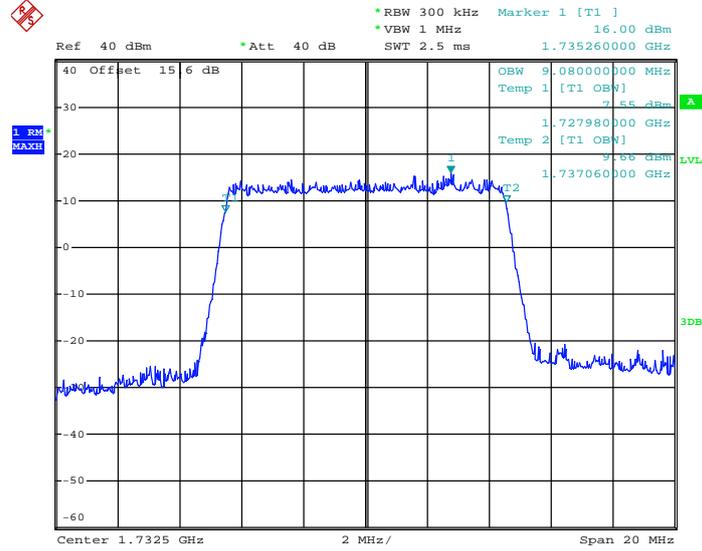
26dB Bandwidth Plot on Channel 20175



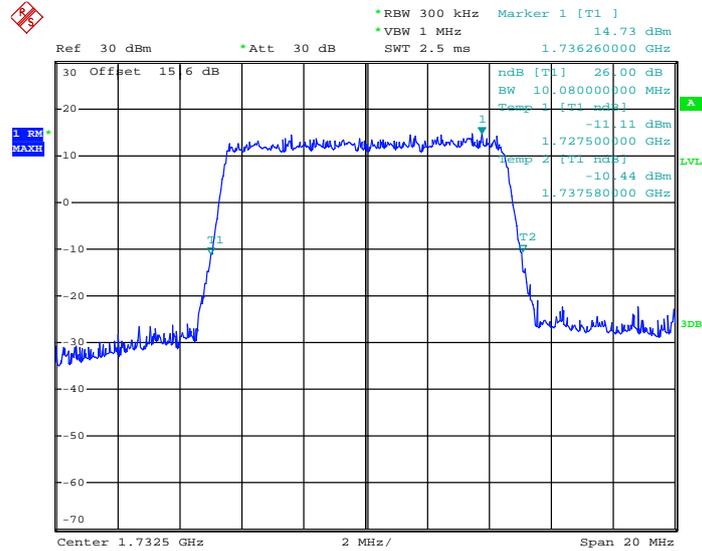


Band :	LTE Band 4	BW / Mod. :	10MHz / 16QAM
--------	------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 20175



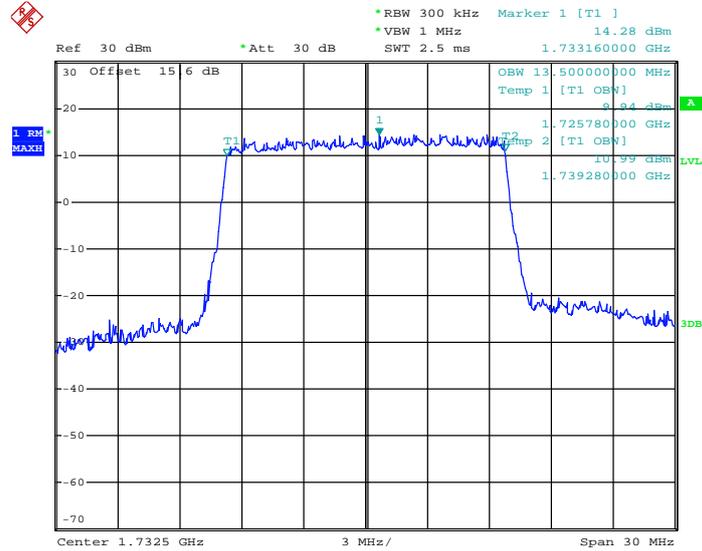
26dB Bandwidth Plot on Channel 20175



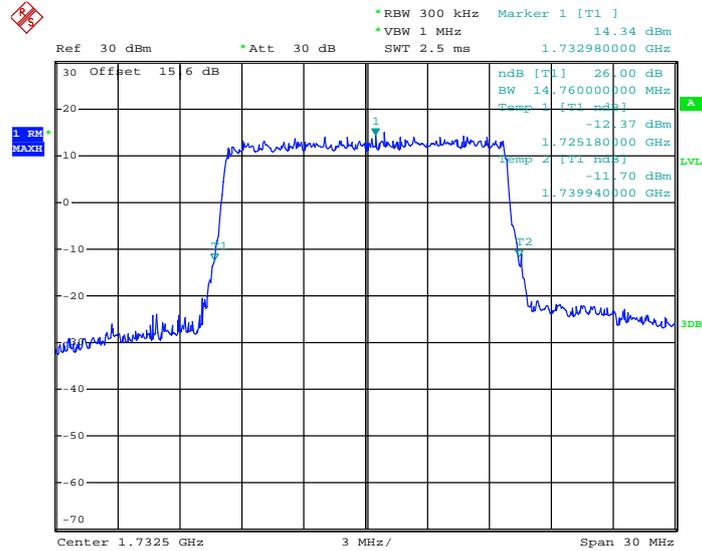


Band :	LTE Band 4	BW / Mod. :	15MHz / QPSK
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20175



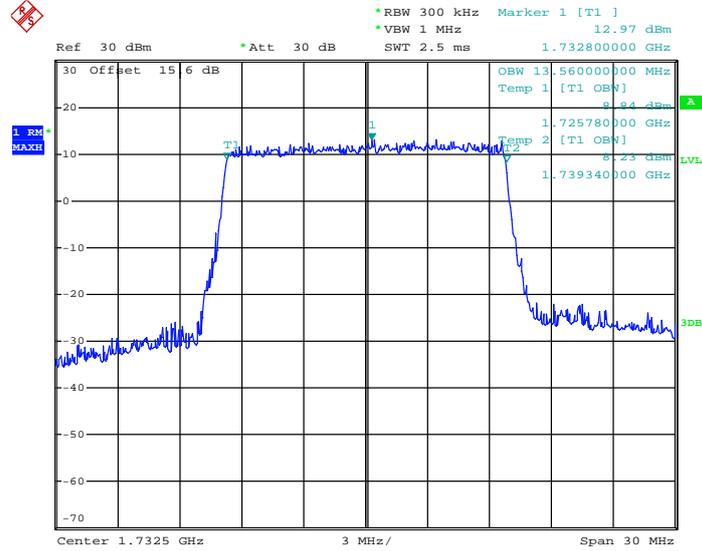
26dB Bandwidth Plot on Channel 20175



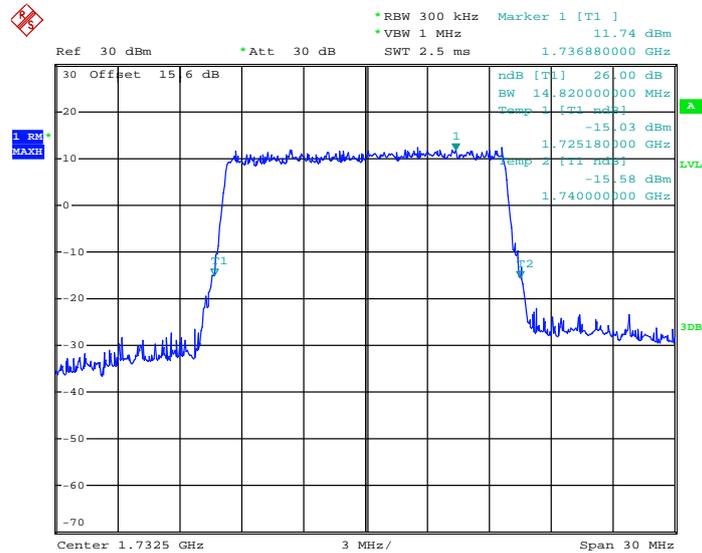


Band :	LTE Band 4	BW / Mod. :	15MHz / 16QAM
--------	------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 20175



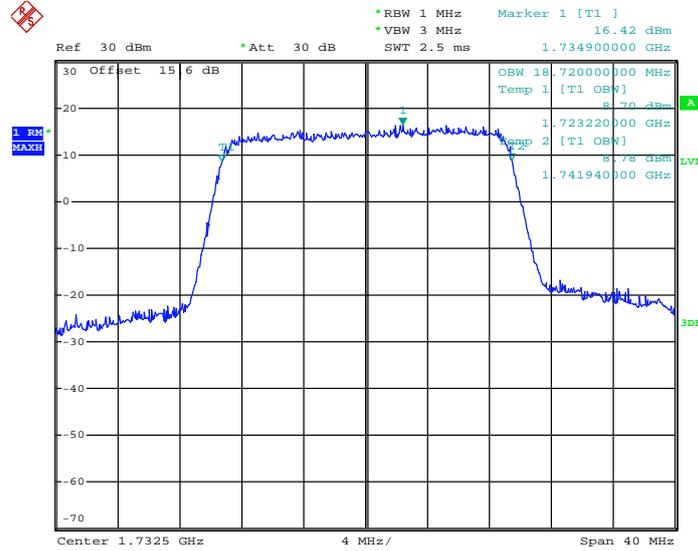
26dB Bandwidth Plot on Channel 20175



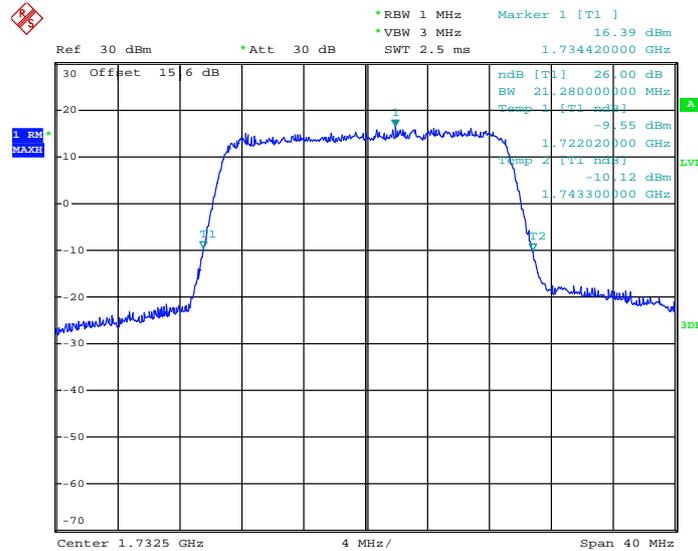


Band :	LTE Band 4	BW / Mod. :	20MHz / QPSK
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20175



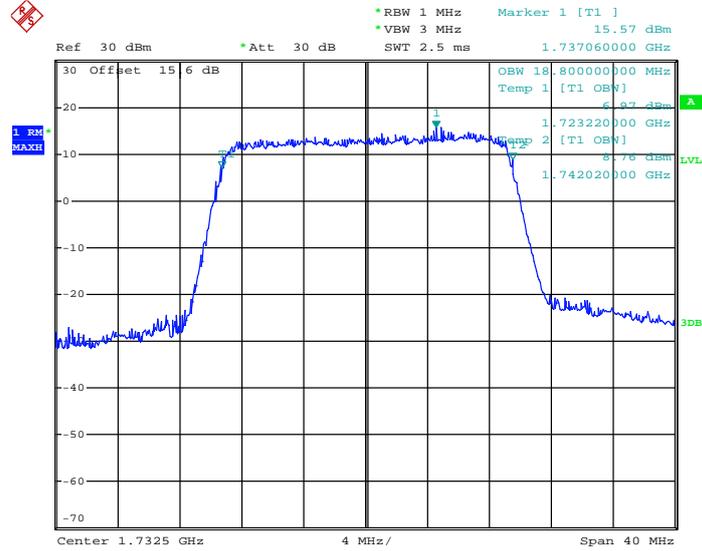
26dB Bandwidth Plot on Channel 20175



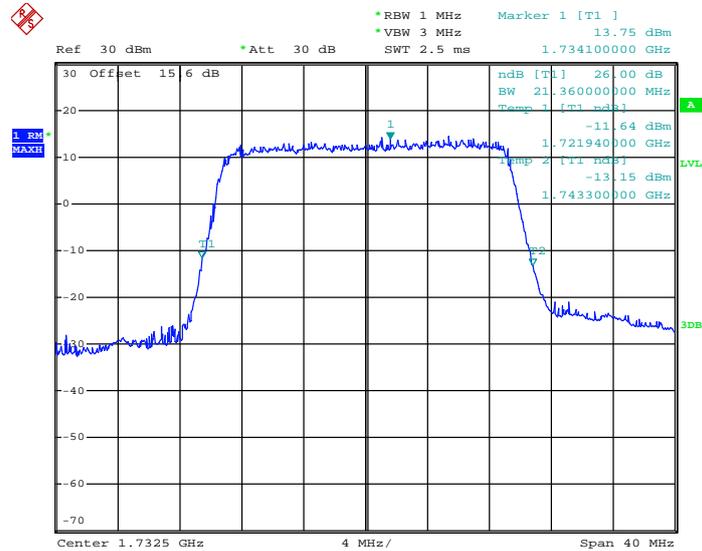


Band :	LTE Band 4	BW / Mod. :	20MHz / 16QAM
--------	------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 20175



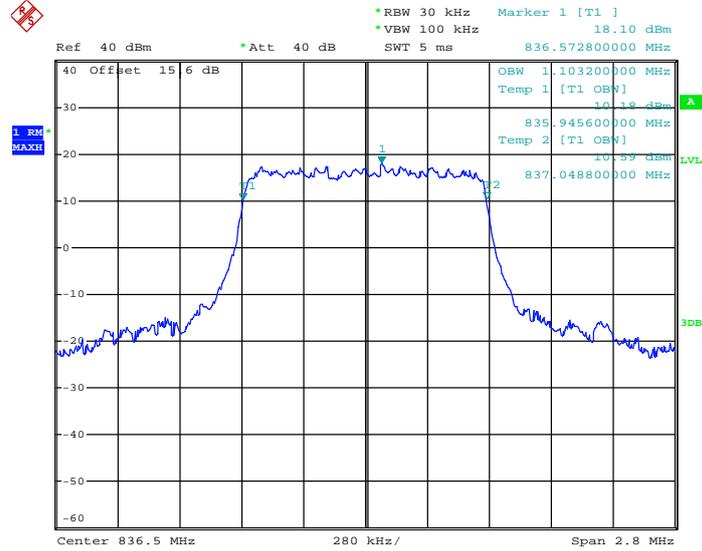
26dB Bandwidth Plot on Channel 20175



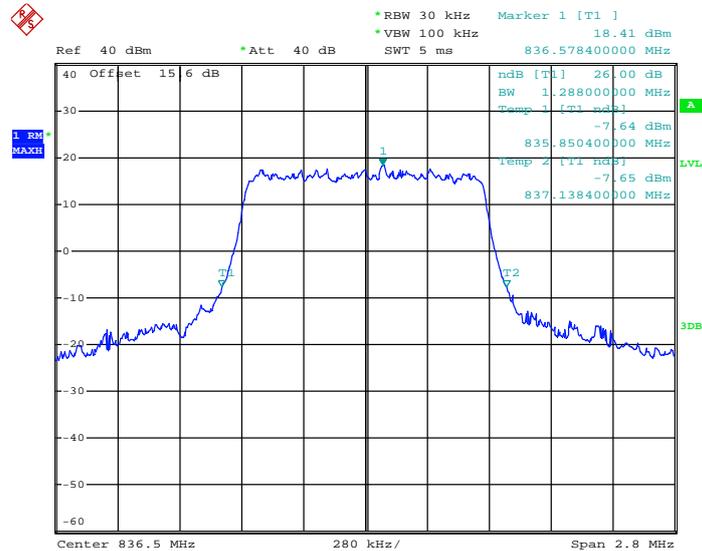


Band :	LTE Band 5	BW / Mod. :	1.4MHz / QPSK
--------	------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 20525



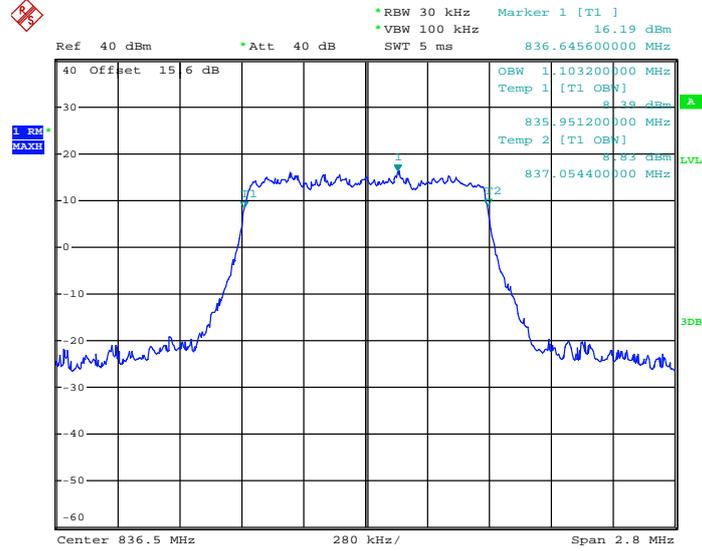
26dB Bandwidth Plot on Channel 20525



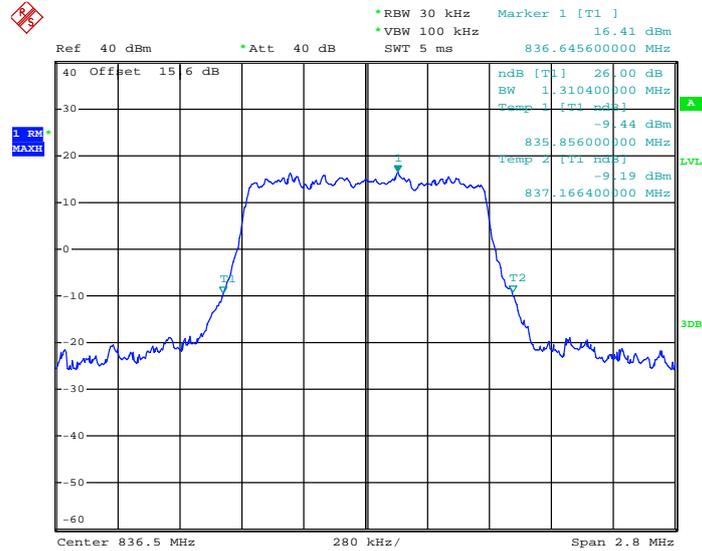


Band :	LTE Band 5	BW / Mod. :	1.4MHz / 16QAM
--------	------------	-------------	----------------

99% Occupied Bandwidth Plot on Channel 20525



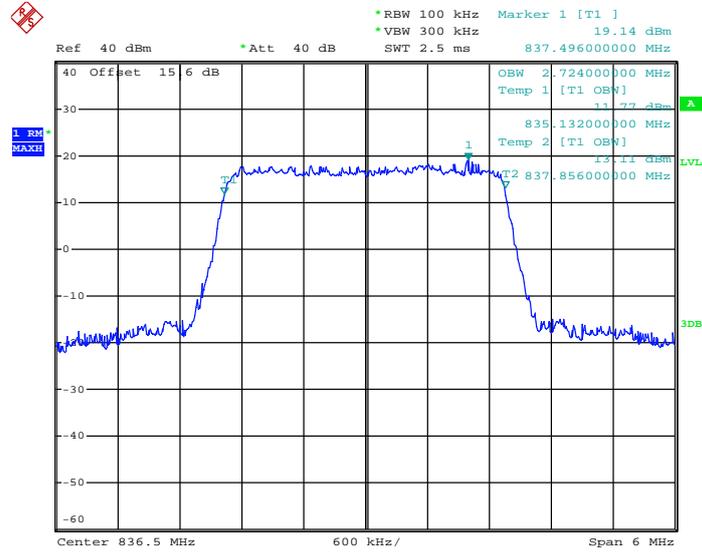
26dB Bandwidth Plot on Channel 20525



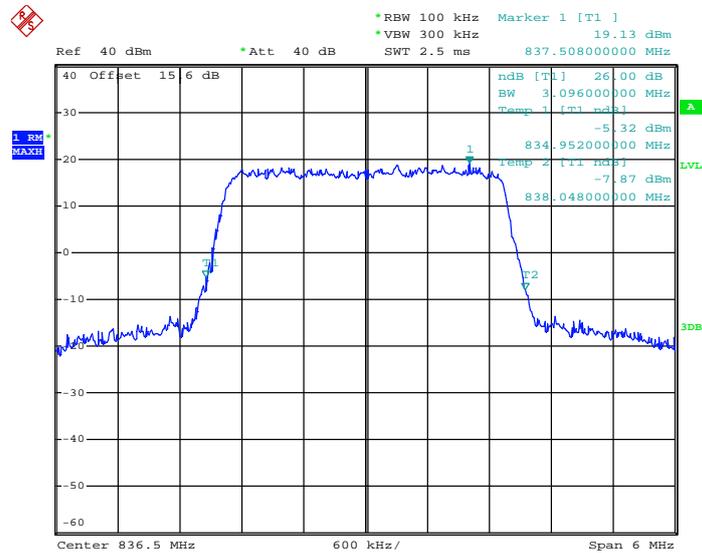


Band :	LTE Band 5	BW / Mod. :	3MHz / QPSK
--------	------------	-------------	-------------

99% Occupied Bandwidth Plot on Channel 20525



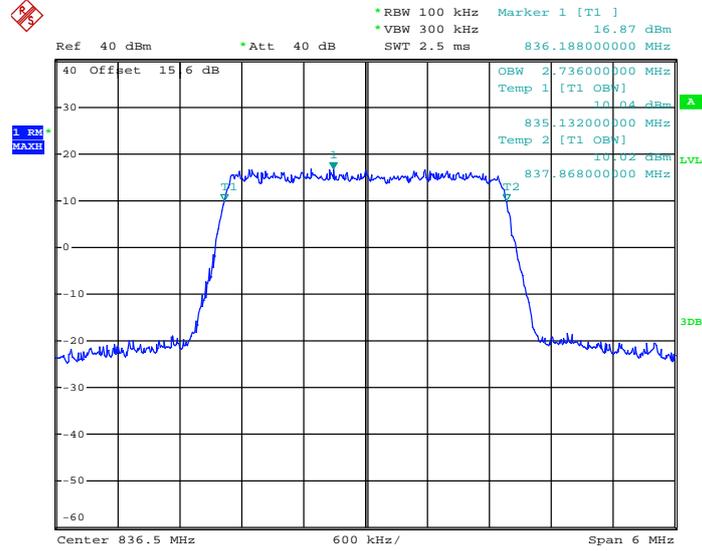
26dB Bandwidth Plot on Channel 20525



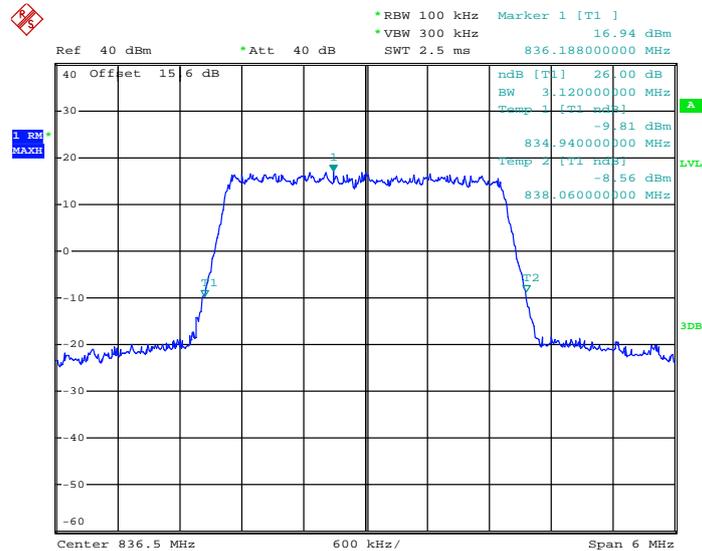


Band :	LTE Band 5	BW / Mod. :	3MHz / 16QAM
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20525



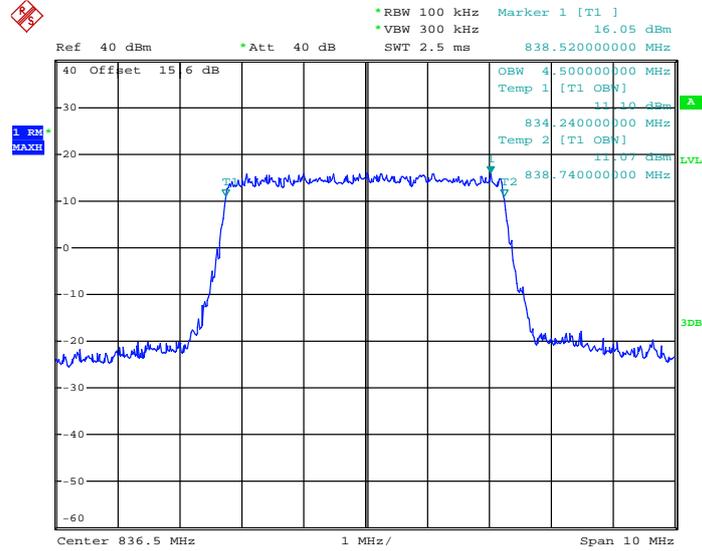
26dB Bandwidth Plot on Channel 20525



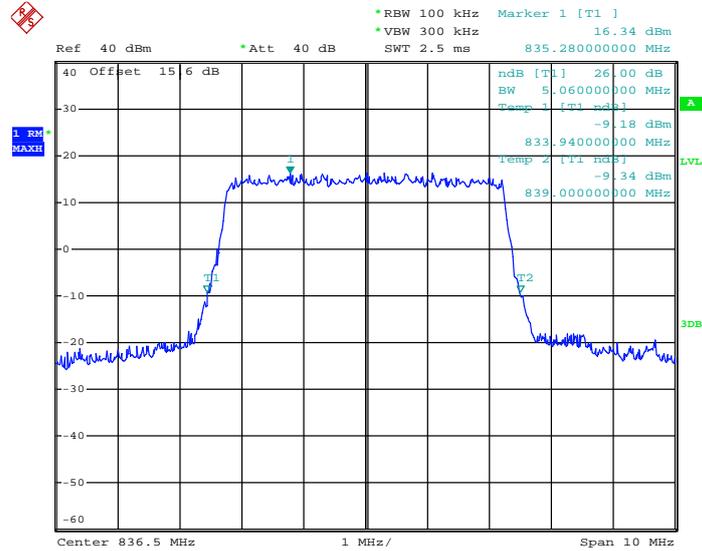


Band :	LTE Band 5	BW / Mod. :	5MHz / QPSK
--------	------------	-------------	-------------

99% Occupied Bandwidth Plot on Channel 20525



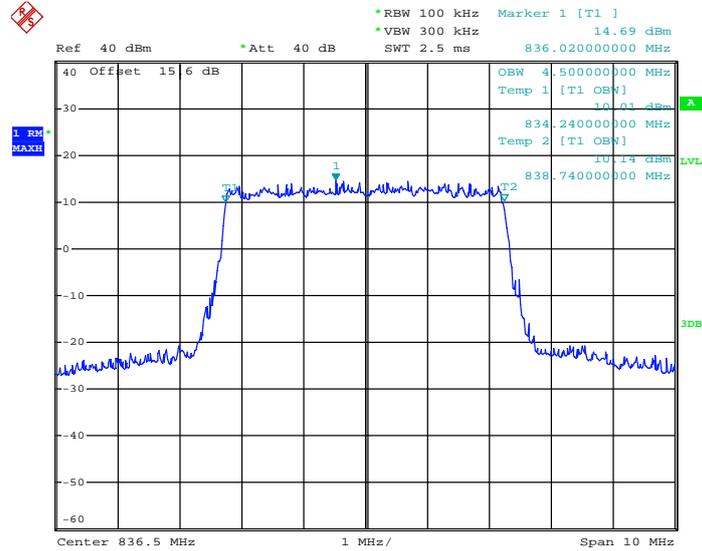
26dB Bandwidth Plot on Channel 20525



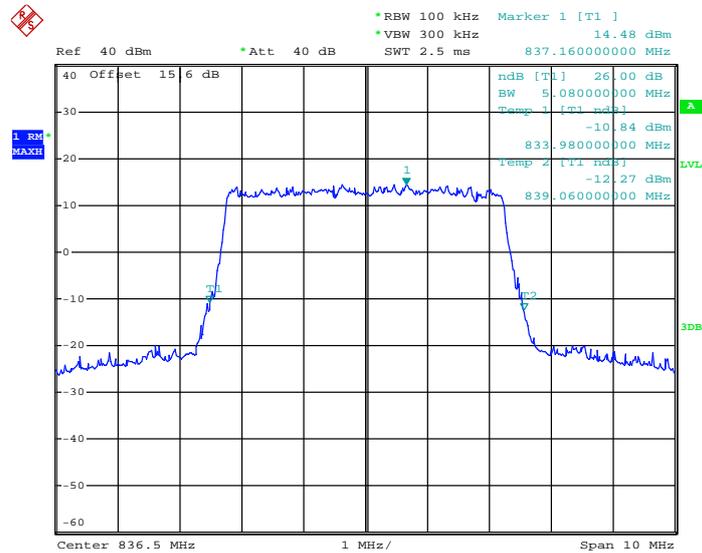


<b>Band :</b>	LTE Band 5	<b>BW / Mod. :</b>	5MHz / 16QAM
---------------	------------	--------------------	--------------

99% Occupied Bandwidth Plot on Channel 20525



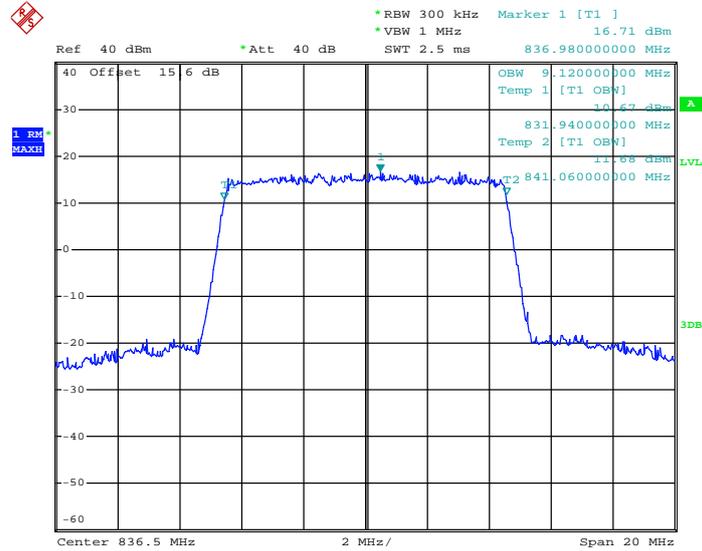
26dB Bandwidth Plot on Channel 20525



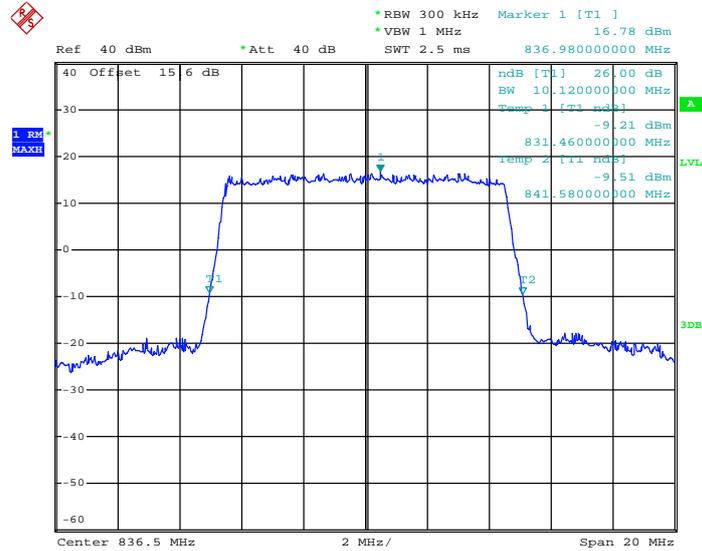


Band :	LTE Band 5	BW / Mod. :	10MHz / QPSK
--------	------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 20525



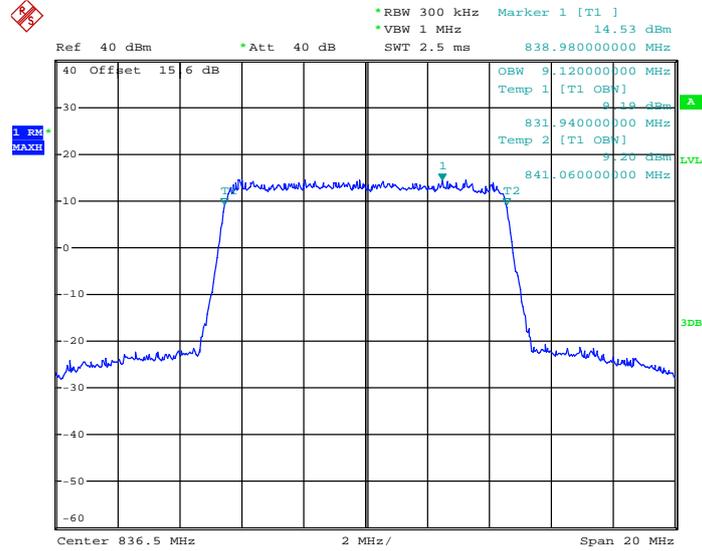
26dB Bandwidth Plot on Channel 20525



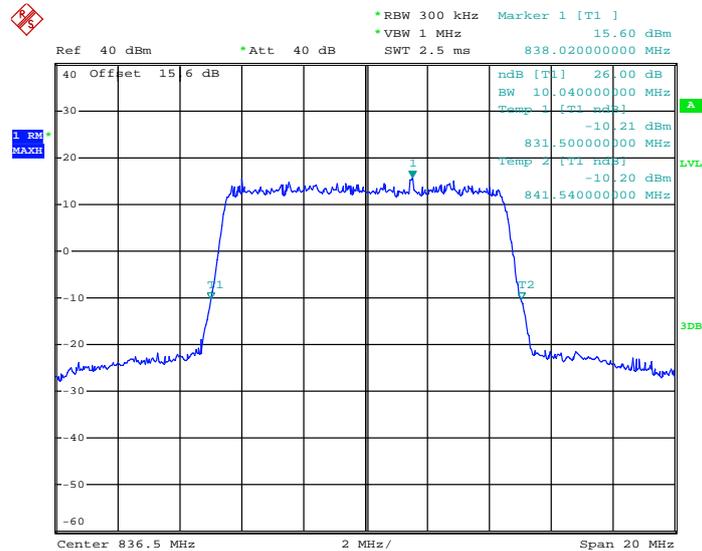


Band :	LTE Band 5	BW / Mod. :	10MHz / 16QAM
--------	------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 20525



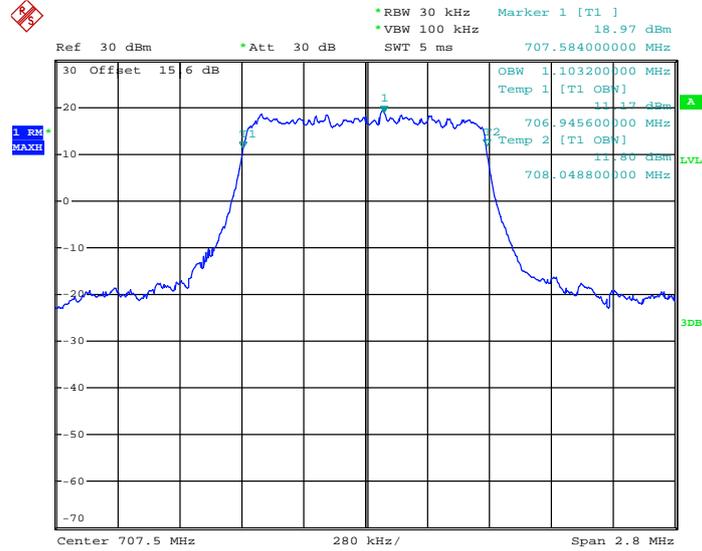
26dB Bandwidth Plot on Channel 20525



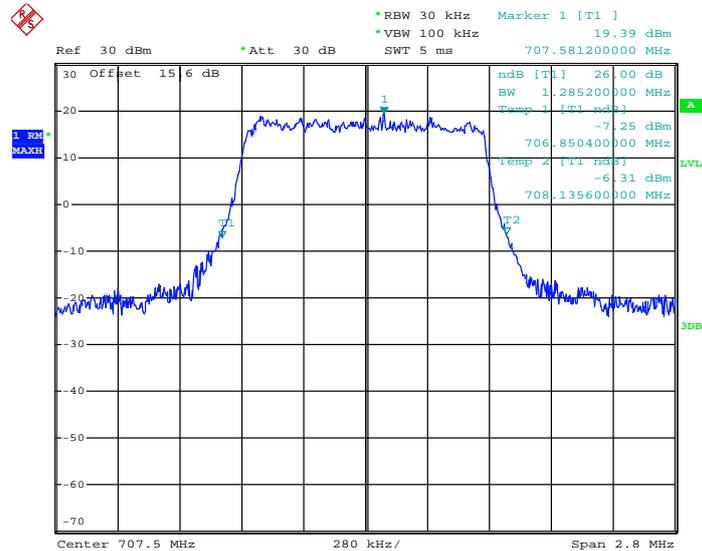


Band :	LTE Band 12	BW / Mod. :	1.4MHz / QPSK
--------	-------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 23095



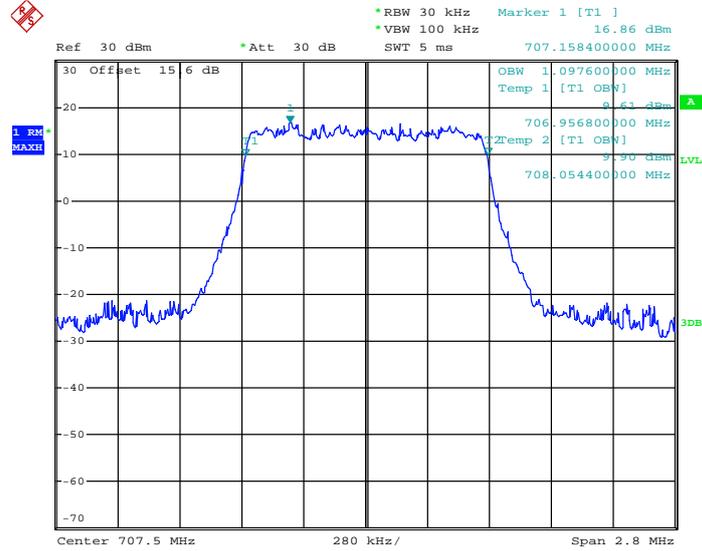
26dB Bandwidth Plot on Channel 23095



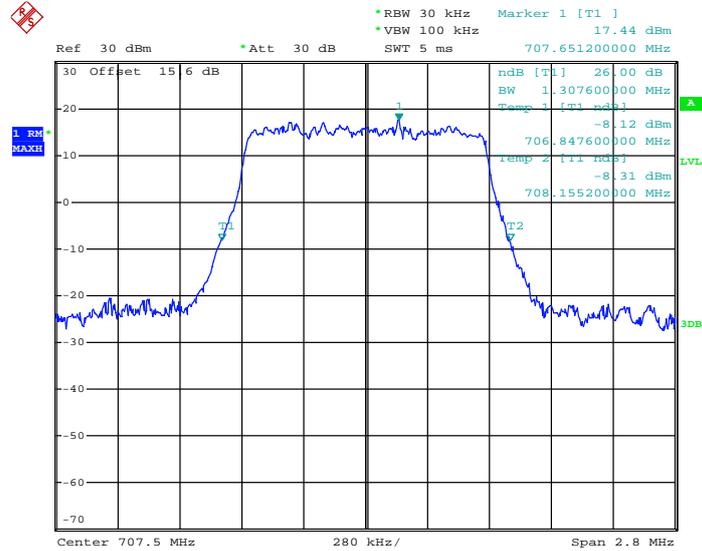


Band :	LTE Band 12	BW / Mod. :	1.4MHz / 16QAM
--------	-------------	-------------	----------------

99% Occupied Bandwidth Plot on Channel 23095



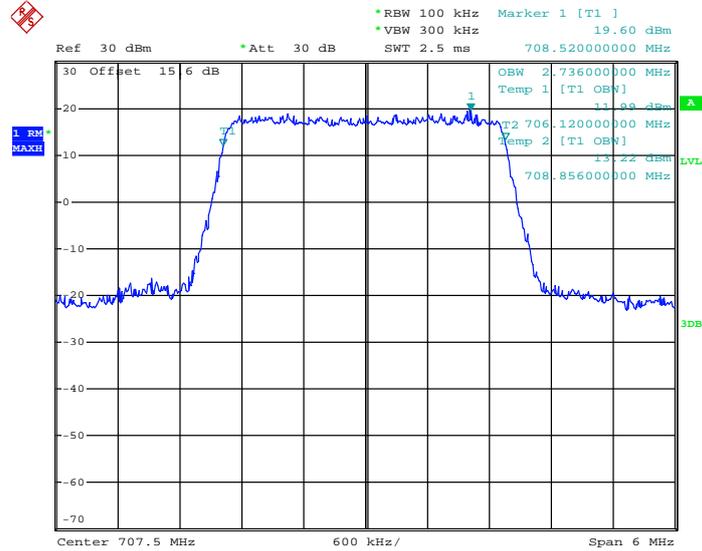
26dB Bandwidth Plot on Channel 23095



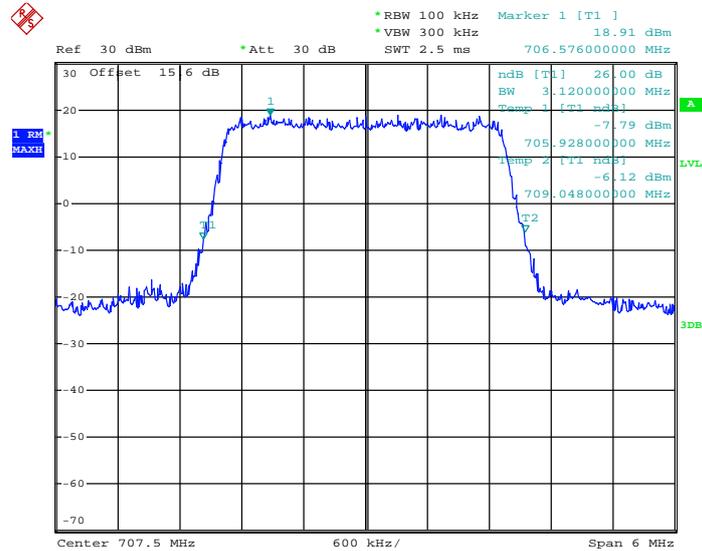


<b>Band :</b>	LTE Band 12	<b>BW / Mod. :</b>	3MHz / QPSK
---------------	-------------	--------------------	-------------

99% Occupied Bandwidth Plot on Channel 23095



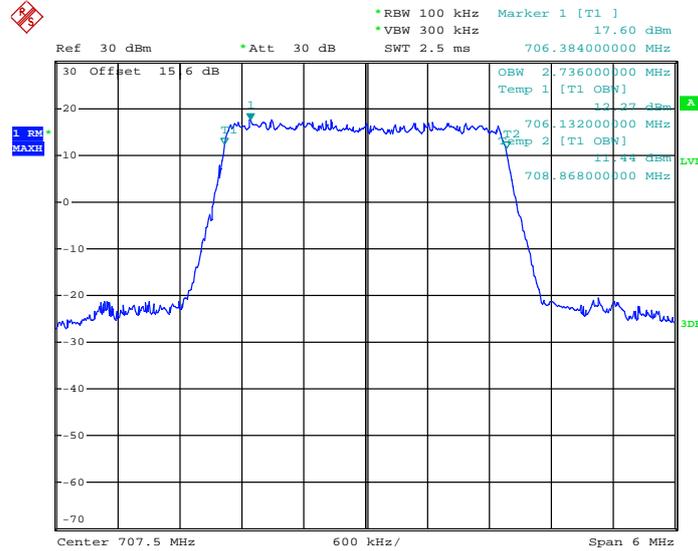
26dB Bandwidth Plot on Channel 23095



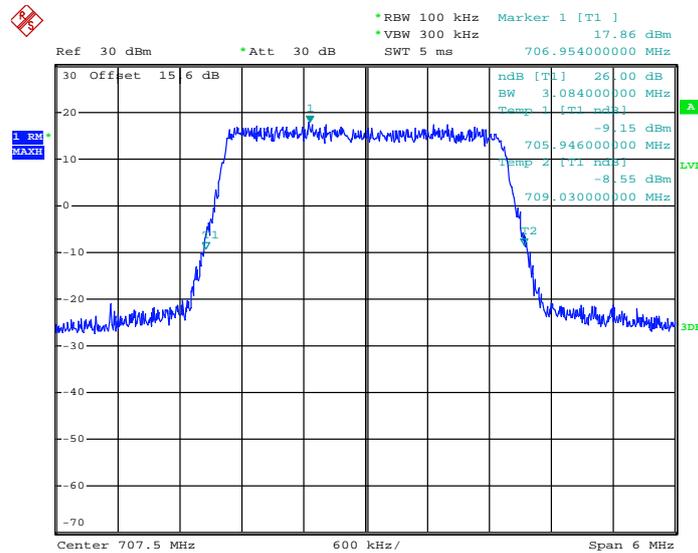


Band :	LTE Band 12	BW / Mod. :	3MHz / 16QAM
--------	-------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 23095



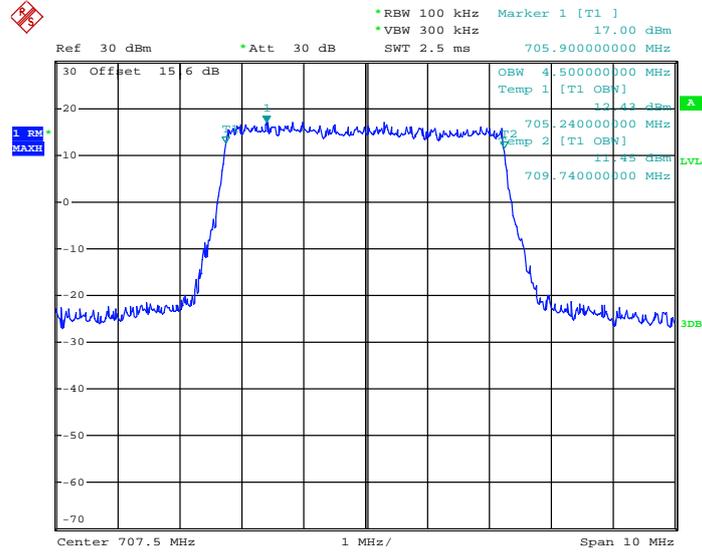
26dB Bandwidth Plot on Channel 23095



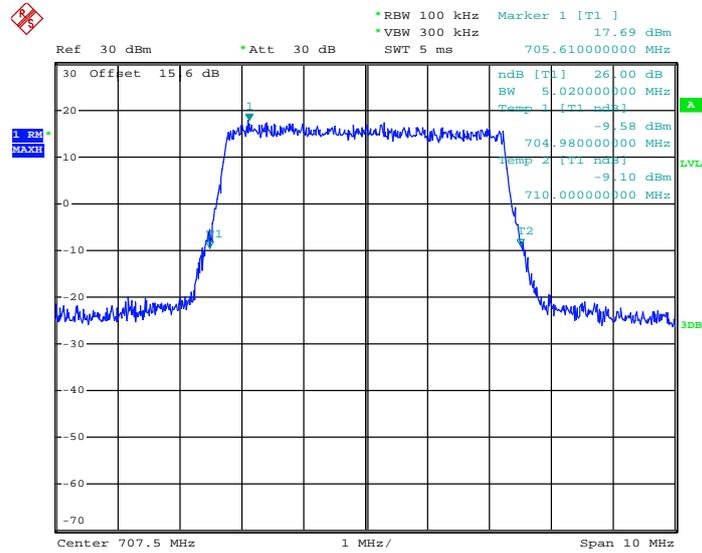


Band :	LTE Band 12	BW / Mod. :	5MHz / QPSK
--------	-------------	-------------	-------------

99% Occupied Bandwidth Plot on Channel 23095



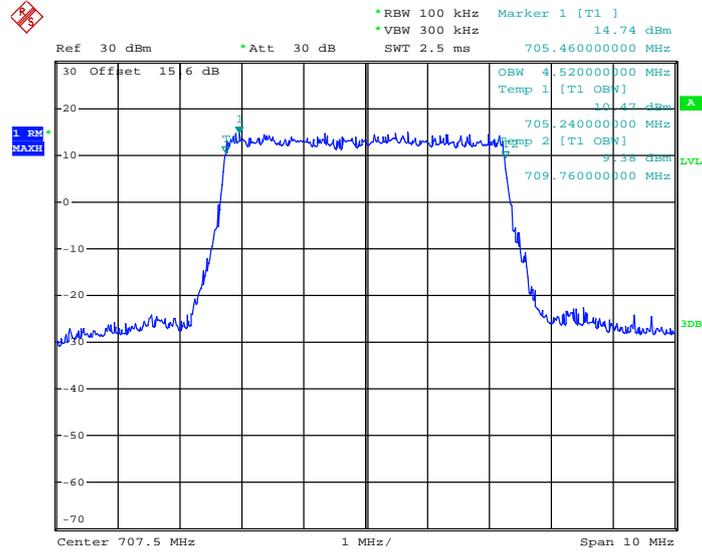
26dB Bandwidth Plot on Channel 23095



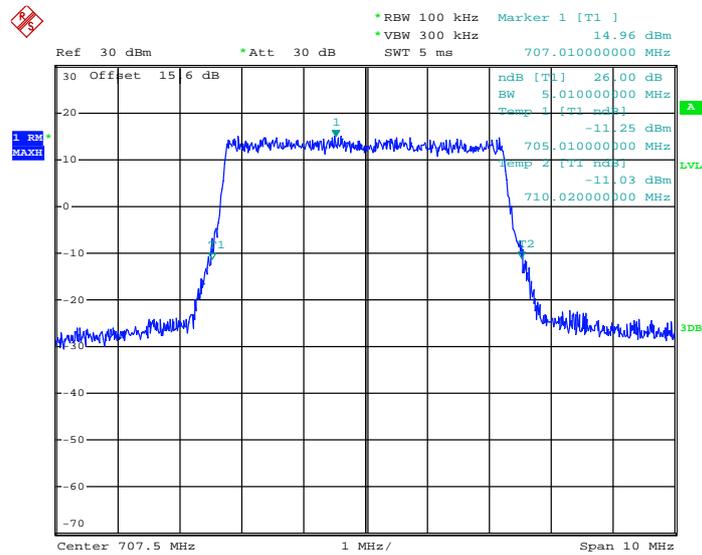


Band :	LTE Band 12	BW / Mod. :	5MHz / 16QAM
--------	-------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 23095



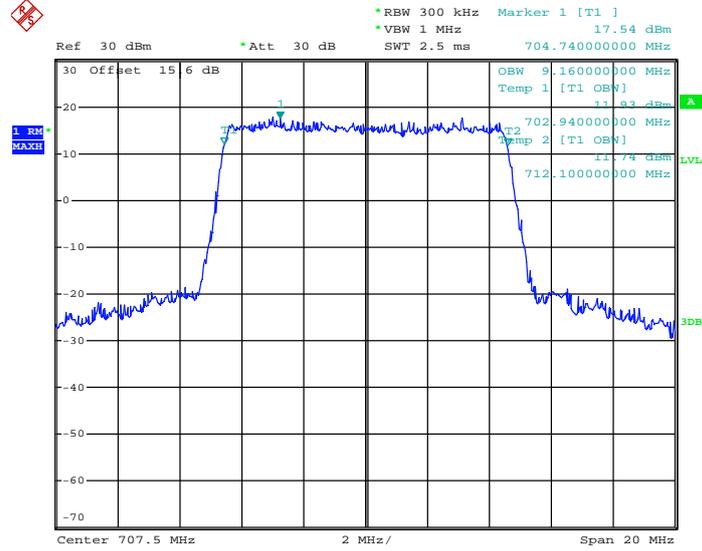
26dB Bandwidth Plot on Channel 23095



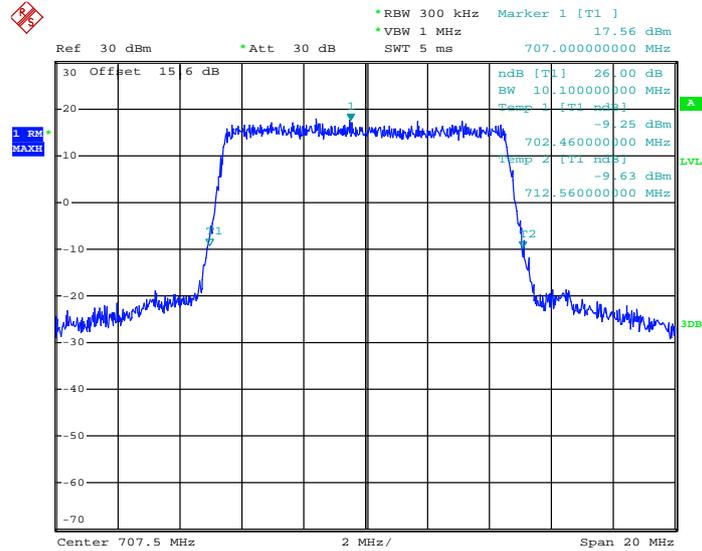


Band :	LTE Band 12	BW / Mod. :	10MHz / QPSK
--------	-------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 23095



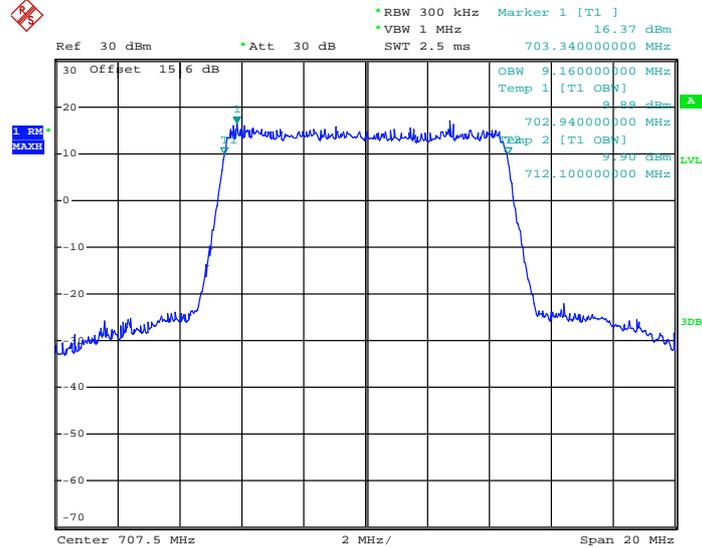
26dB Bandwidth Plot on Channel 23095



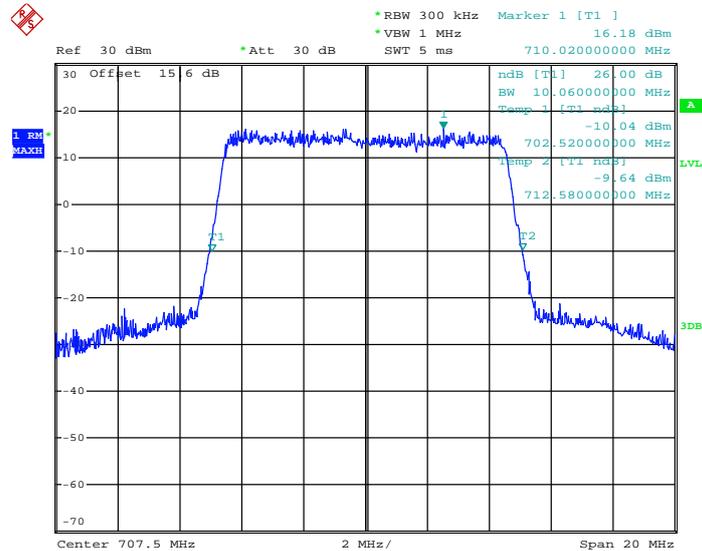


Band :	LTE Band 12	BW / Mod. :	10MHz / 16QAM
--------	-------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 23095



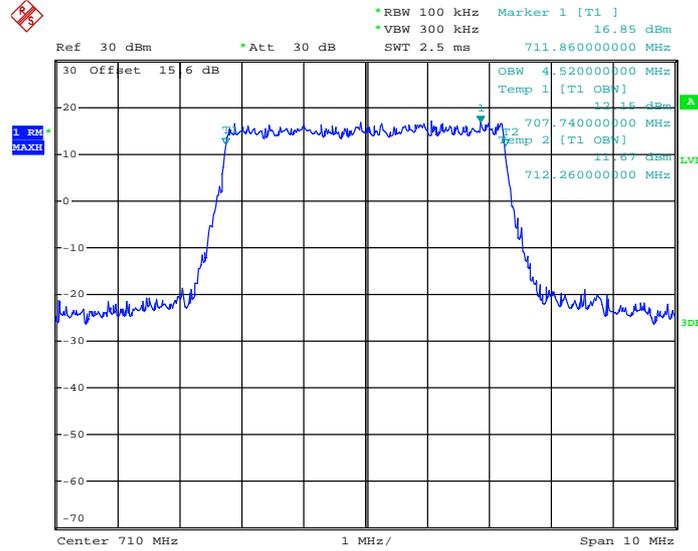
26dB Bandwidth Plot on Channel 23095



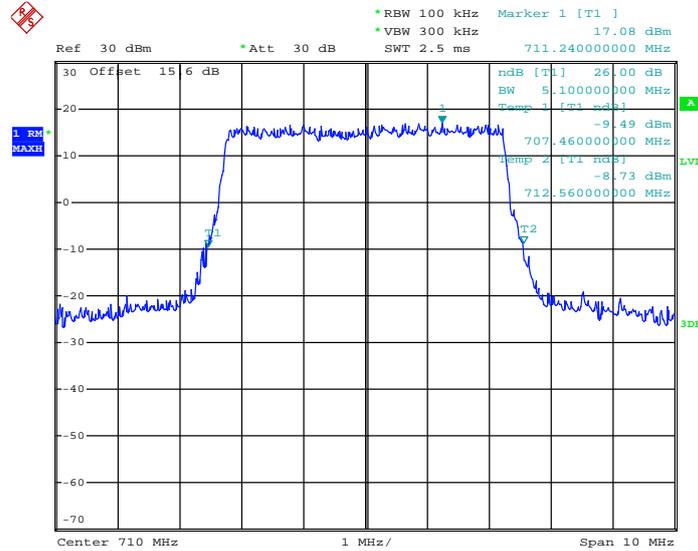


Band :	LTE Band 17	BW / Mod. :	5MHz / QPSK
--------	-------------	-------------	-------------

99% Occupied Bandwidth Plot on Channel 23790



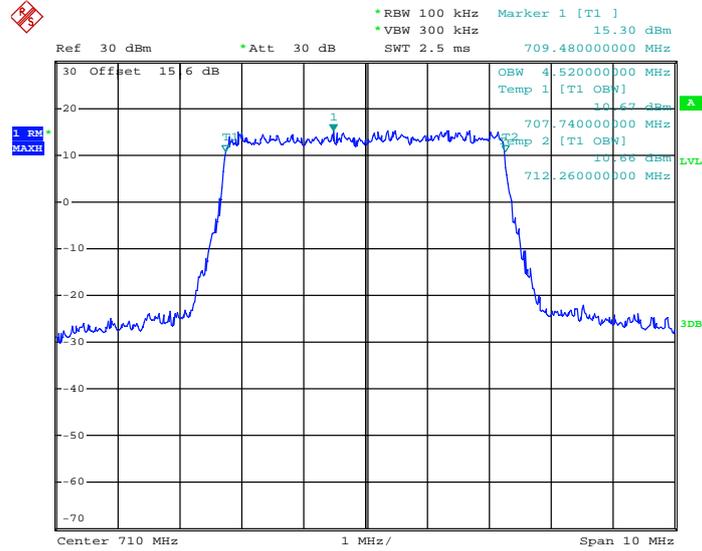
26dB Bandwidth Plot on Channel 23790



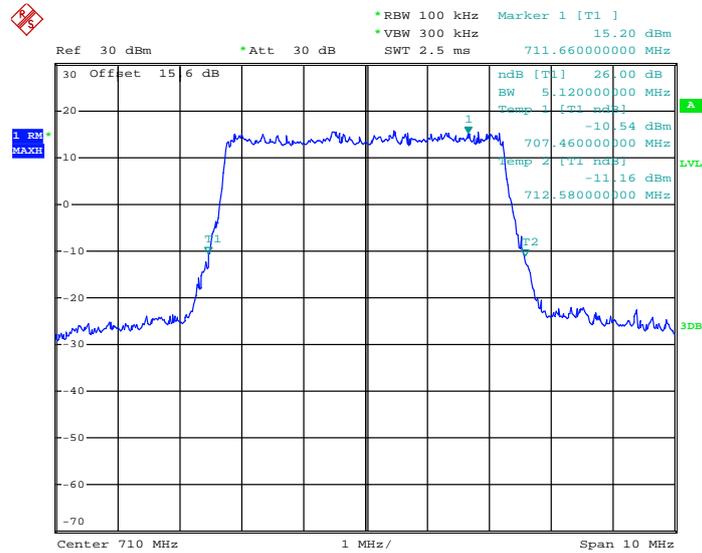


Band :	LTE Band 17	BW / Mod. :	5MHz / 16QAM
--------	-------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 23790



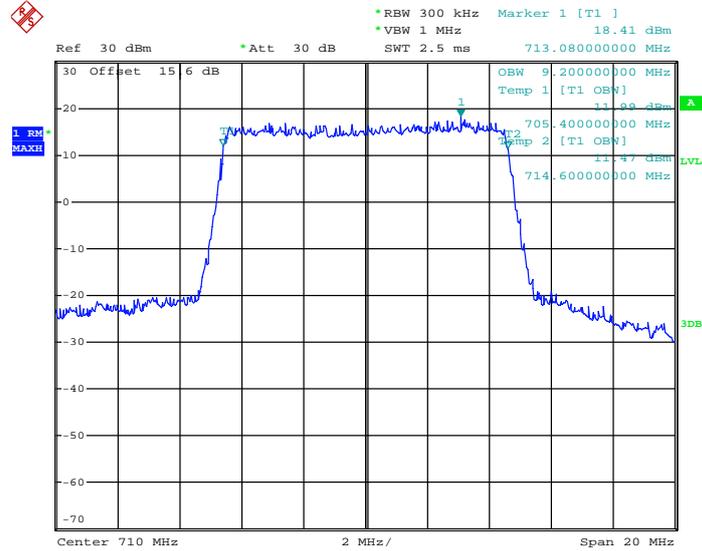
26dB Bandwidth Plot on Channel 23790



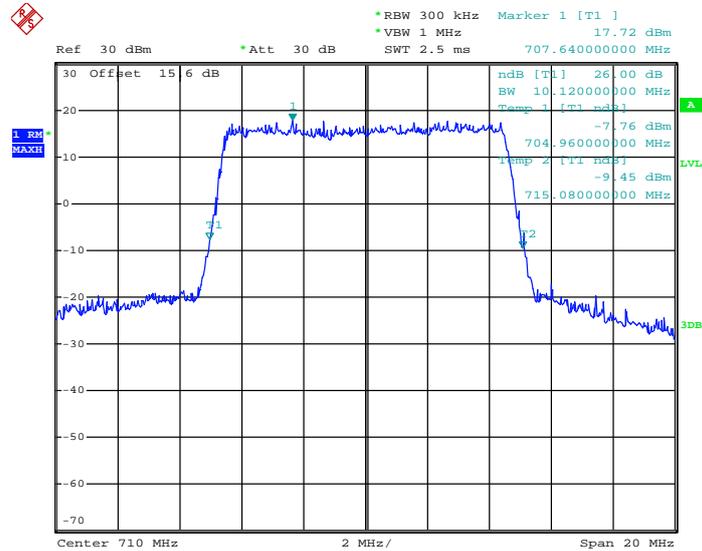


Band :	LTE Band 17	BW / Mod. :	10MHz / QPSK
--------	-------------	-------------	--------------

99% Occupied Bandwidth Plot on Channel 23790



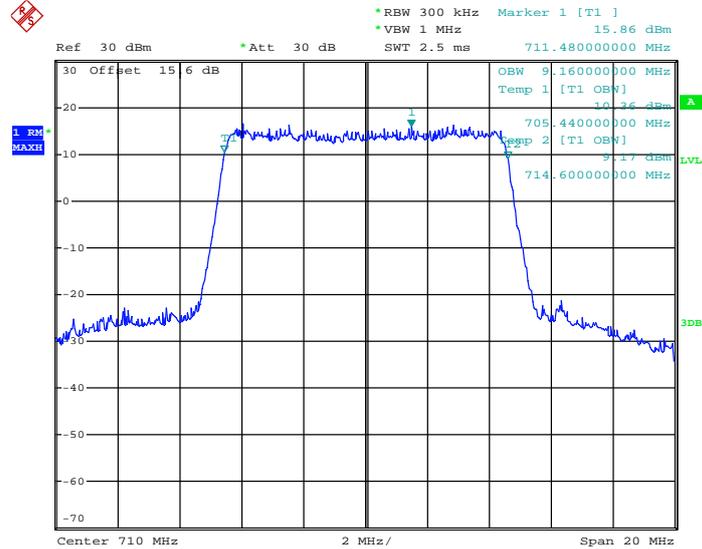
26dB Bandwidth Plot on Channel 23790



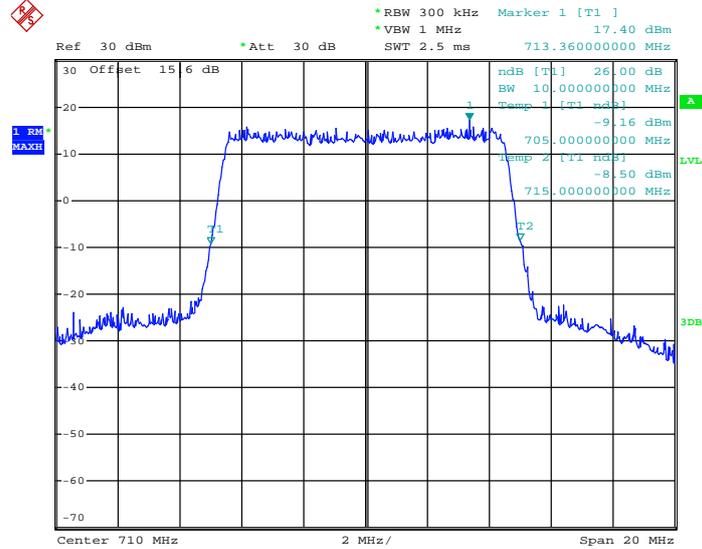


Band :	LTE Band 17	BW / Mod. :	10MHz / 16QAM
--------	-------------	-------------	---------------

99% Occupied Bandwidth Plot on Channel 23790



26dB Bandwidth Plot on Channel 23790



## 3.5 Conducted Band Edge Measurement

### 3.5.1 Description of Conducted Band Edge Measurement

27.53 (h) For Band 4

For operations in the 1710 – 1755 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

22.917(a) For Band 5

For operations in the 824 – 849 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (g) For Band 12, 17

For operations in the 698 -746 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

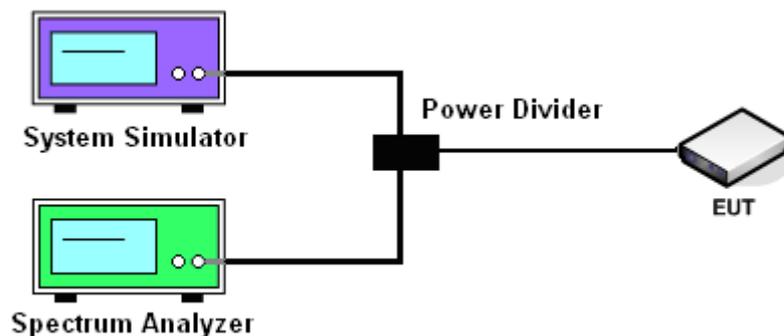
### 3.5.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

### 3.5.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting  $RBW \geq 1\%$  EBW, and measuring bandwidth = 1MHz.
3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
4. The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)]$  (dB)  
 $= [30 + 10\log(P)]$  (dBm) -  $[43 + 10\log(P)]$  (dB)  
 $= -13$ dBm.

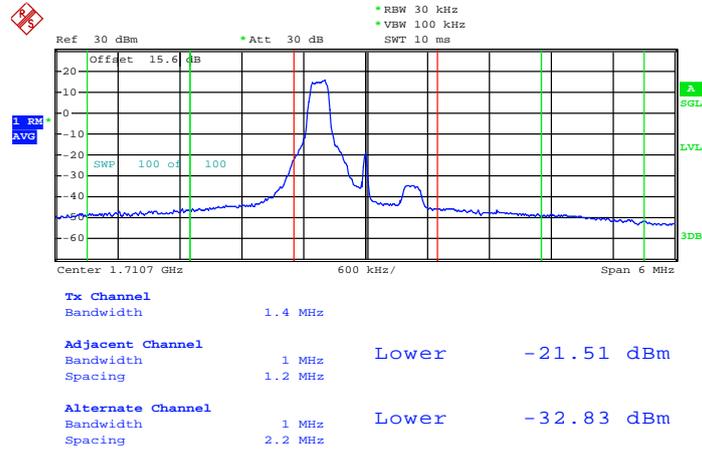
### 3.5.4 Test Setup



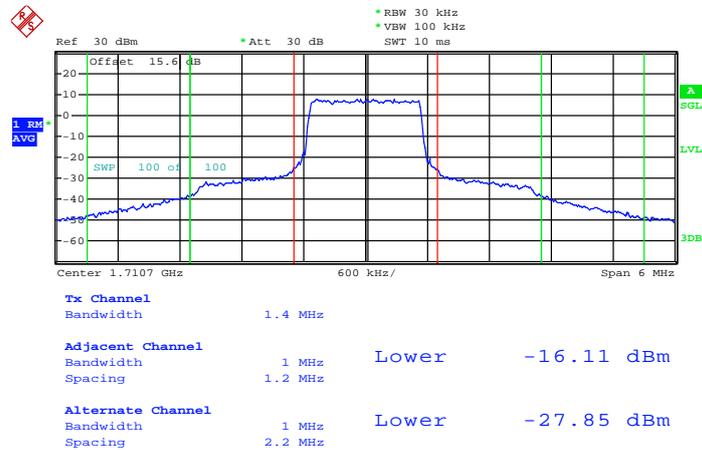
### 3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	LTE Band 4	Band Width :	1.4MHz / QPSK
--------	------------	--------------	---------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

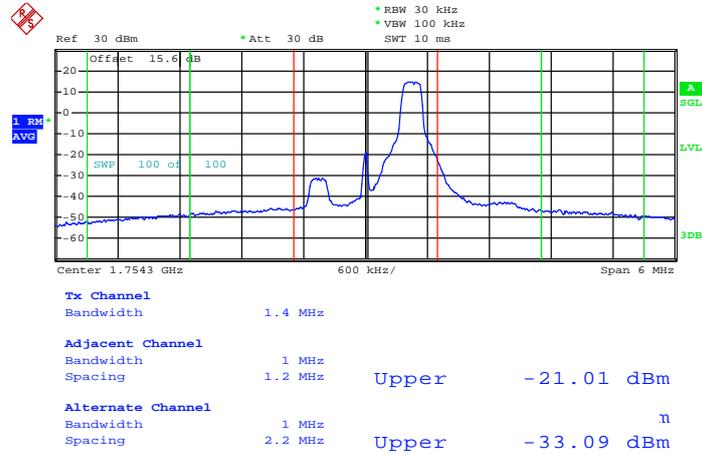


Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0

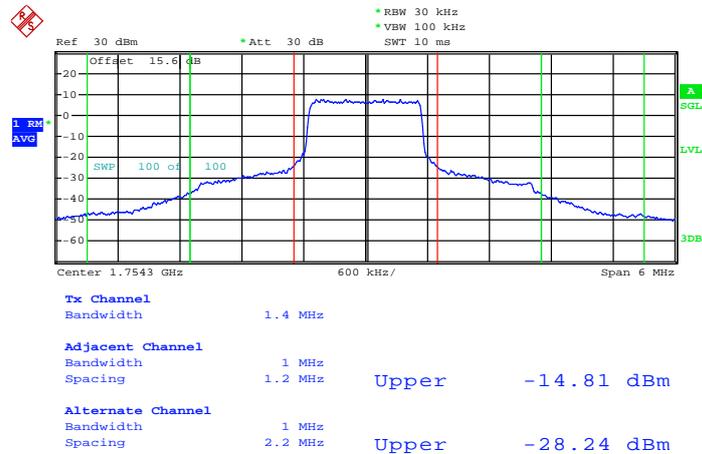




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



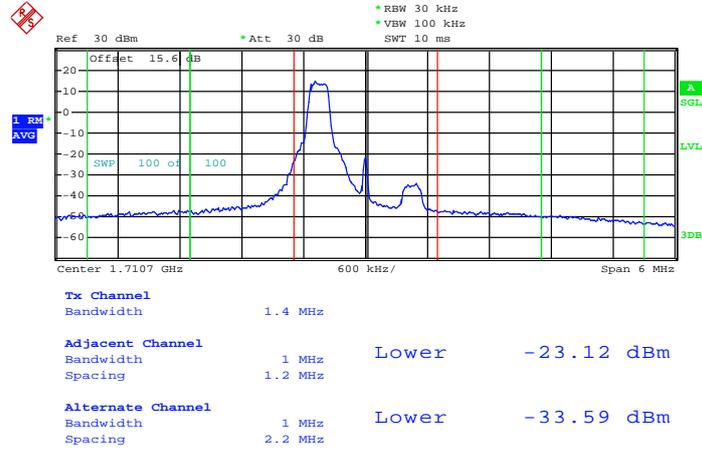
Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0



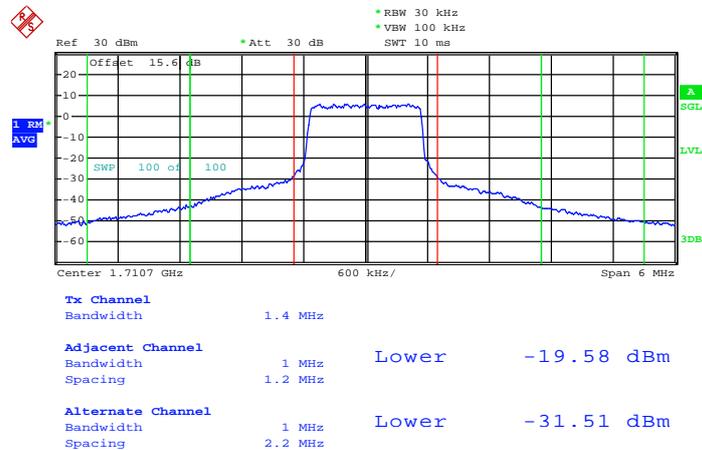


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	1.4MHz / 16QAM
---------------	------------	---------------------	----------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

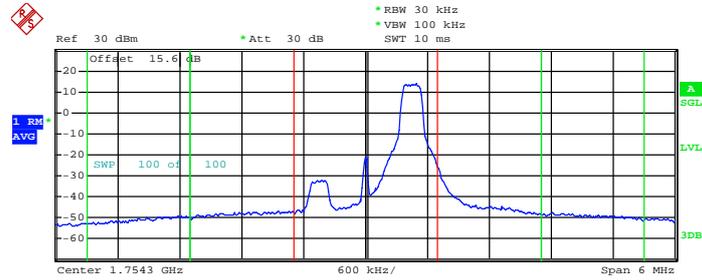


Lower Band Edge Plot for 16QAM-RB Size 6, RB Offset 0



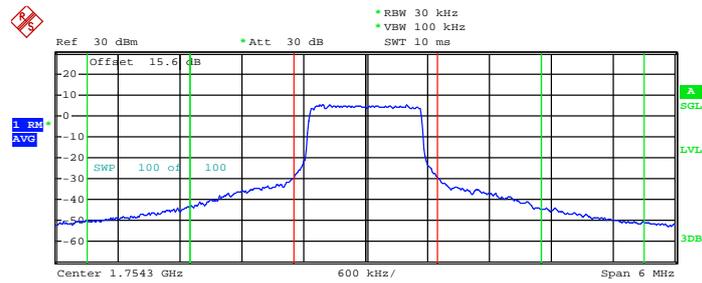


### Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 5



<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	1.2 MHz	Upper	-23.76 dBm
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	2.2 MHz	Upper	-34.14 dBm

### Higher Band Edge Plot for 16QAM-RB Size 6, RB Offset 0

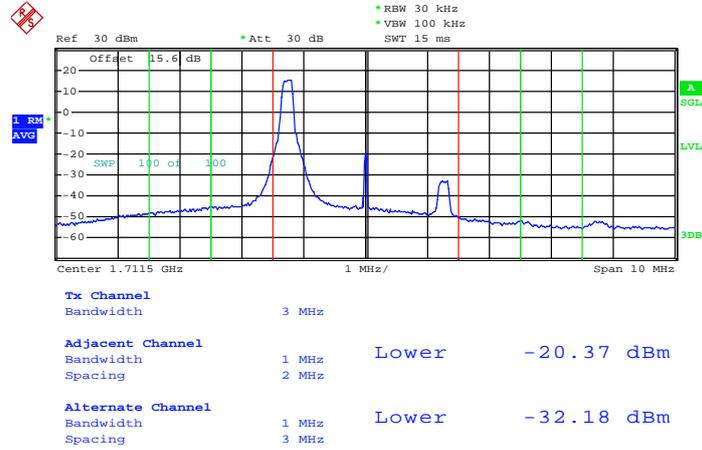


<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	1.2 MHz	Upper	-21.39 dBm
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	2.2 MHz	Upper	-32.66 dBm

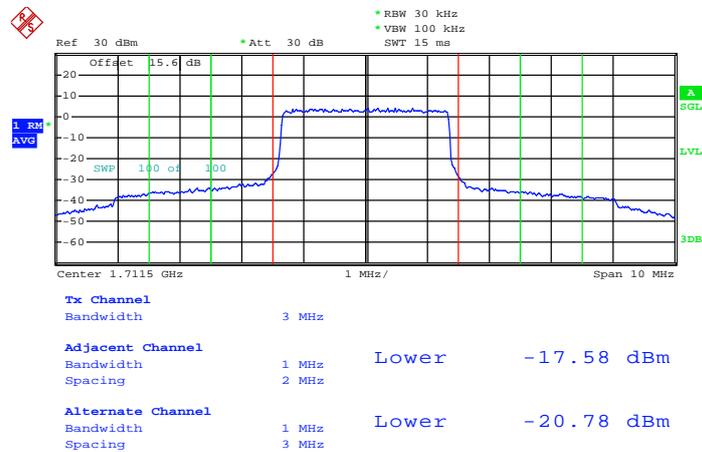


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	3MHz / QPSK
---------------	------------	---------------------	-------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

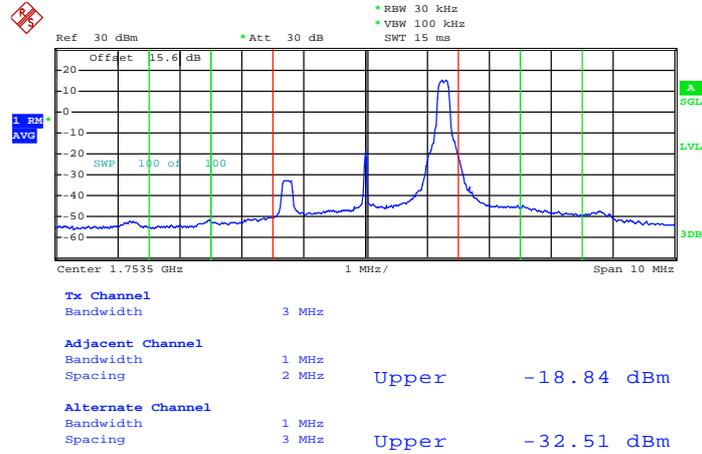


Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0

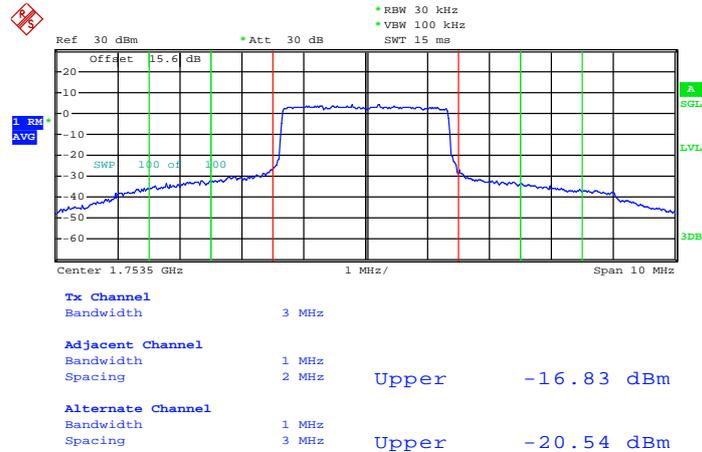




### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



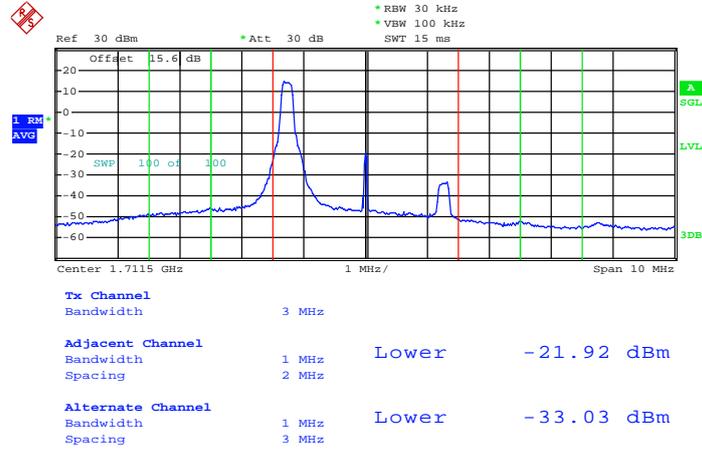
### Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0



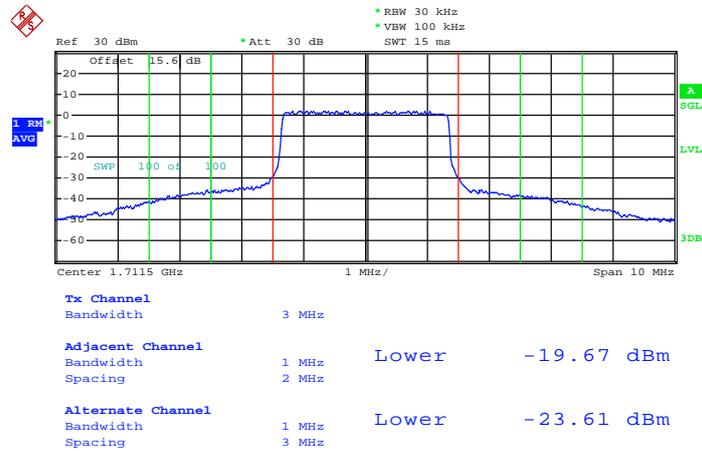


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	3MHz / 16QAM
---------------	------------	---------------------	--------------

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

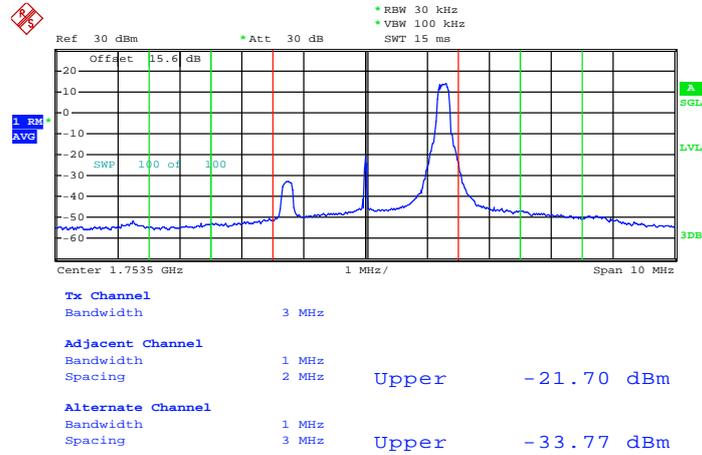


Lower Band Edge Plot for 16QAM-RB Size 15, RB Offset 0

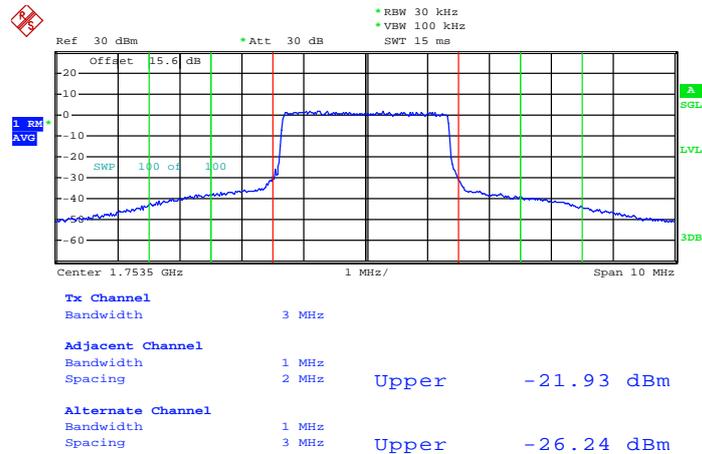




### Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 14



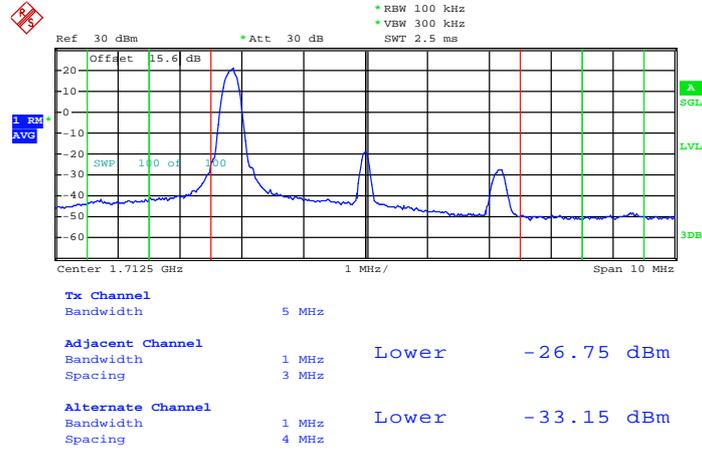
### Higher Band Edge Plot for 16QAM-RB Size 15, RB Offset 0



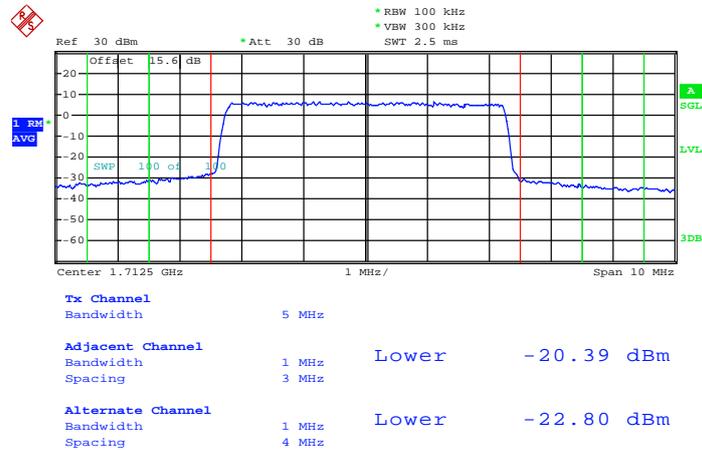


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	5MHz / QPSK
---------------	------------	---------------------	-------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

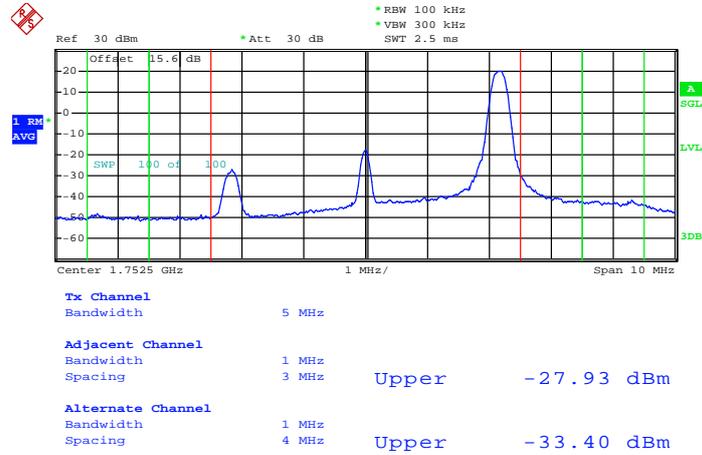


Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0

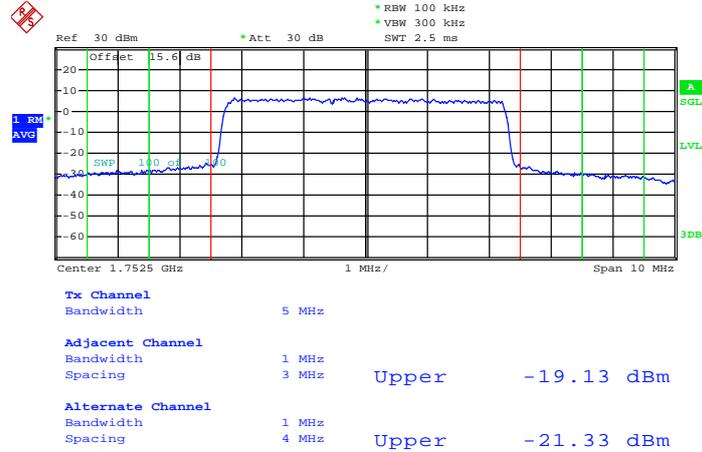




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



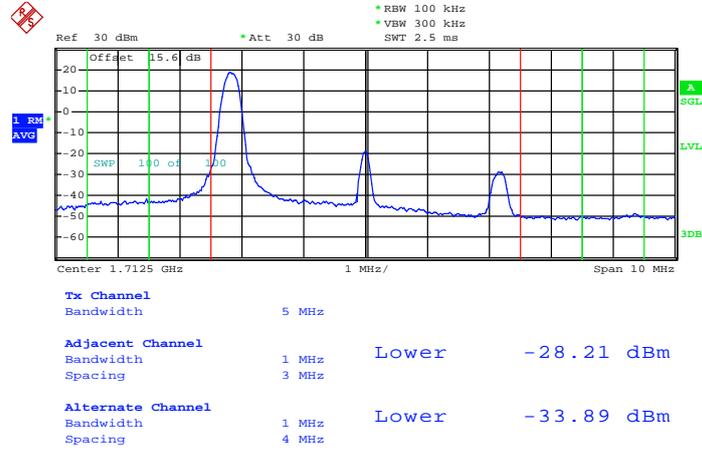
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



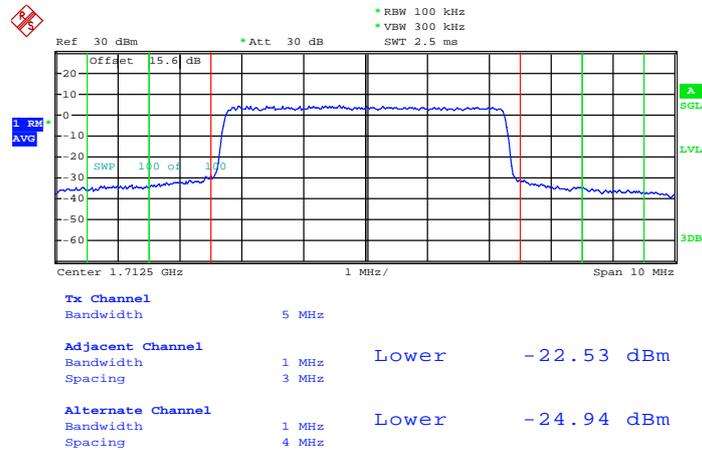


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	5MHz / 16QAM
---------------	------------	---------------------	--------------

**Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0**

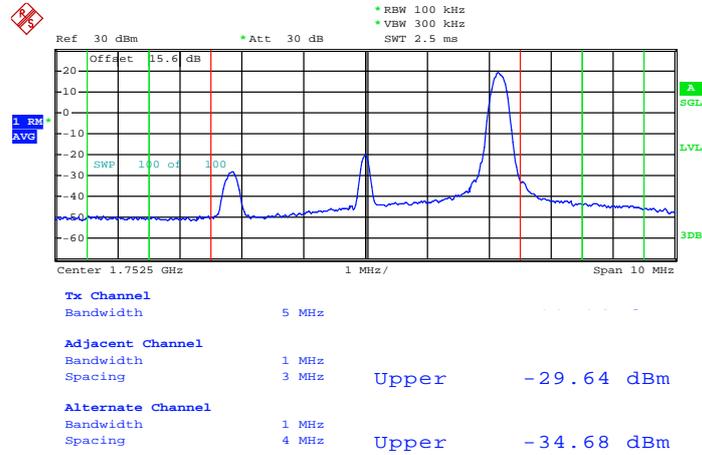


**Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0**

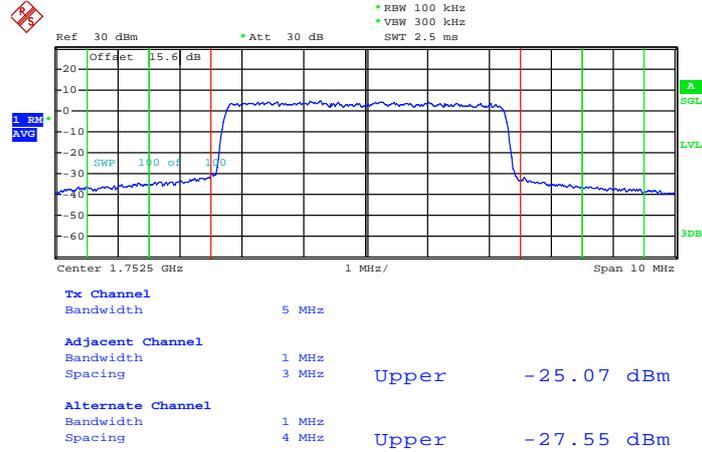




Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



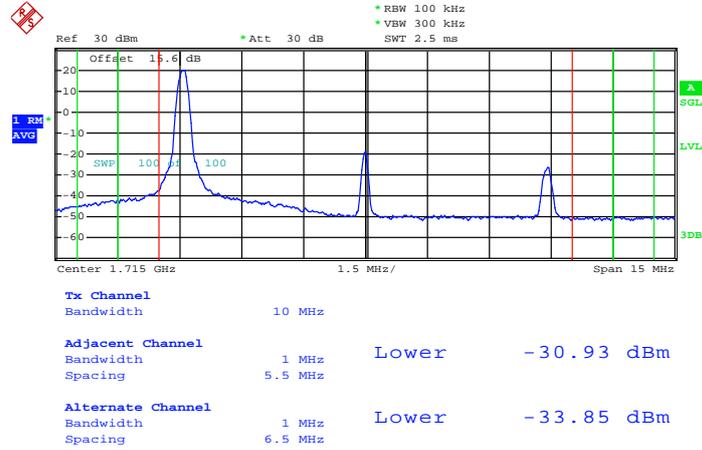
Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



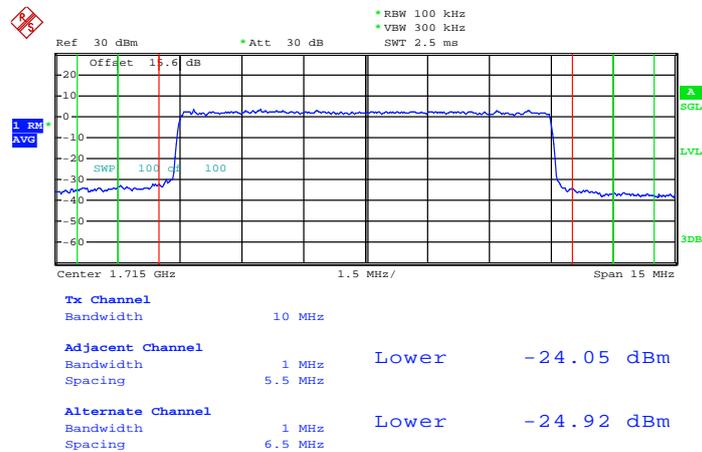


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	10MHz / QPSK
---------------	------------	---------------------	--------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0

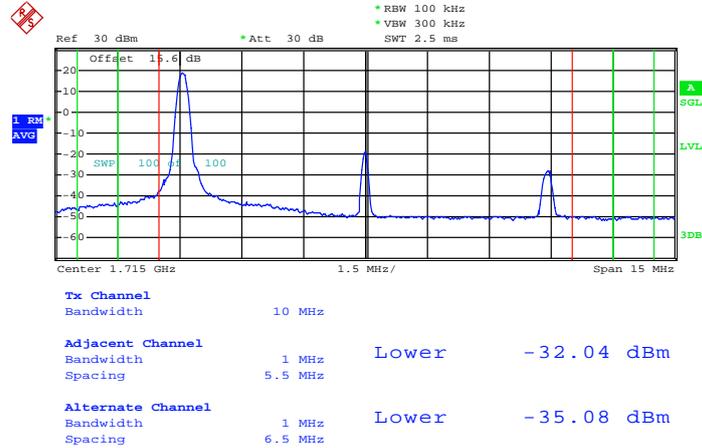




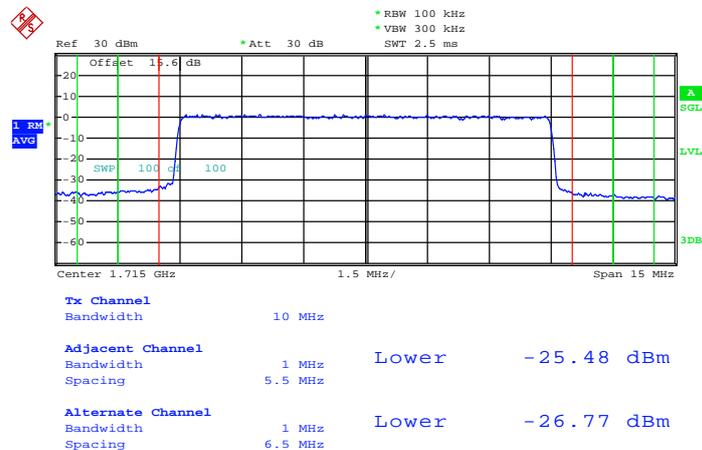


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	10MHz / 16QAM
---------------	------------	---------------------	---------------

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

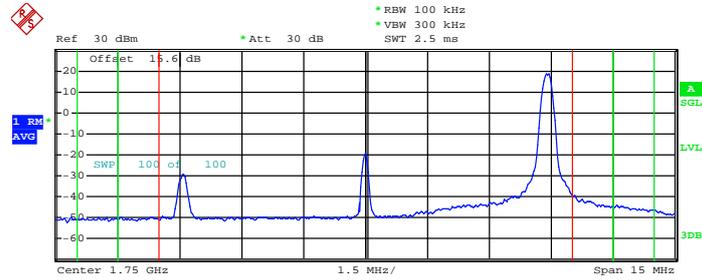


Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



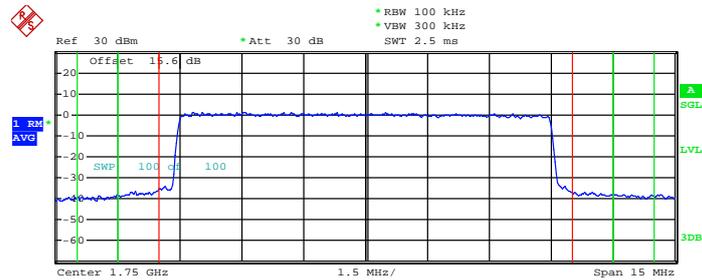


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	5.5 MHz	Upper	-32.76 dBm
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	6.5 MHz	Upper	-35.82 dBm

Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0

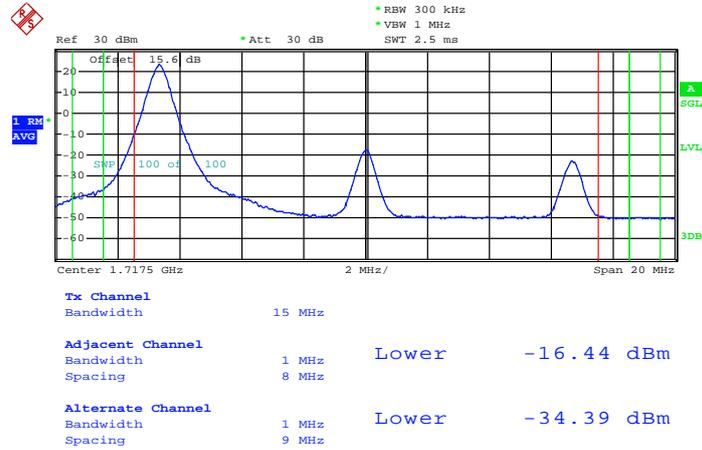


<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	5.5 MHz	Upper	-28.05 dBm
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	6.5 MHz	Upper	-28.99 dBm

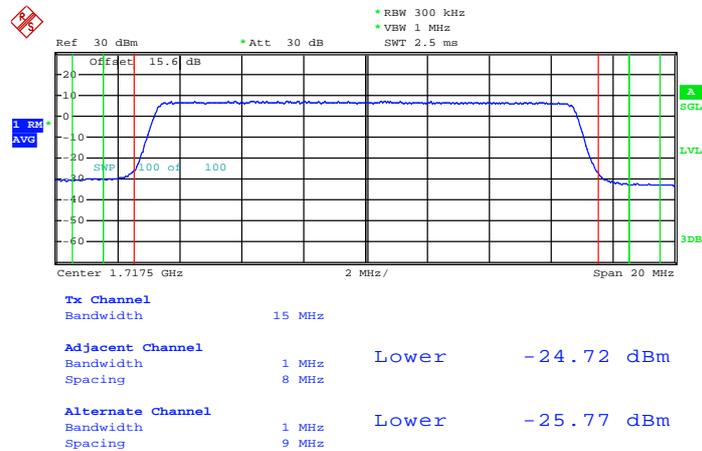


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	15MHz / QPSK
---------------	------------	---------------------	--------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

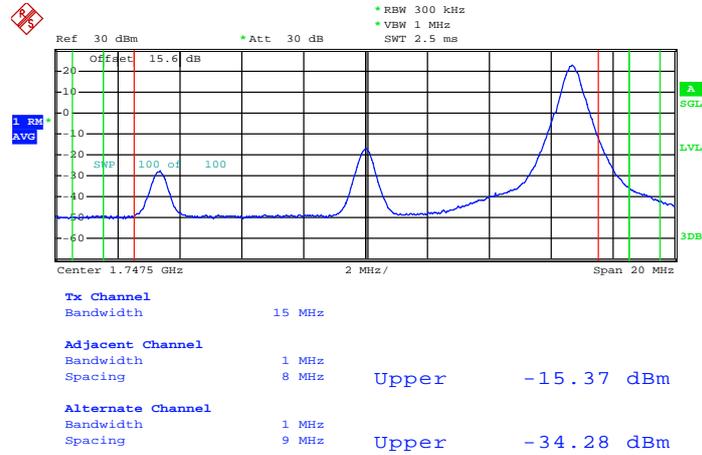


Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0

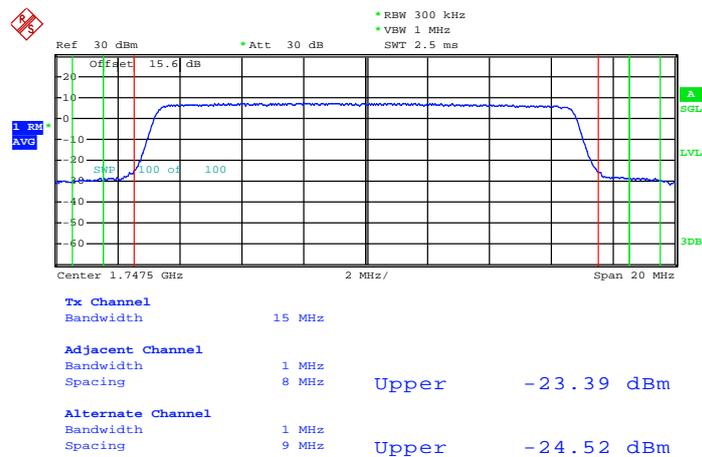




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74



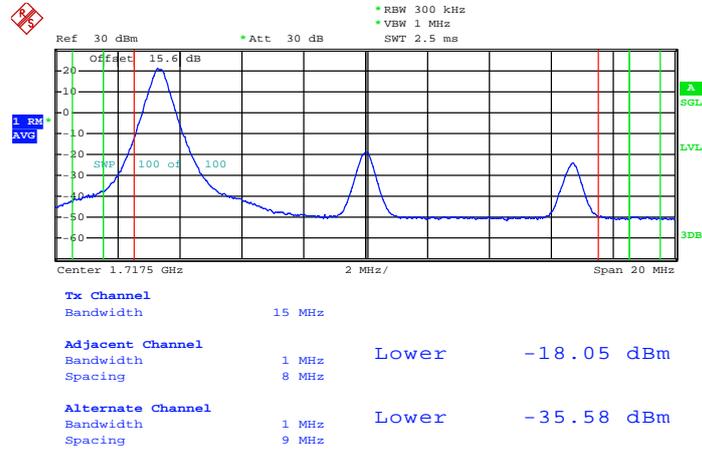
Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0



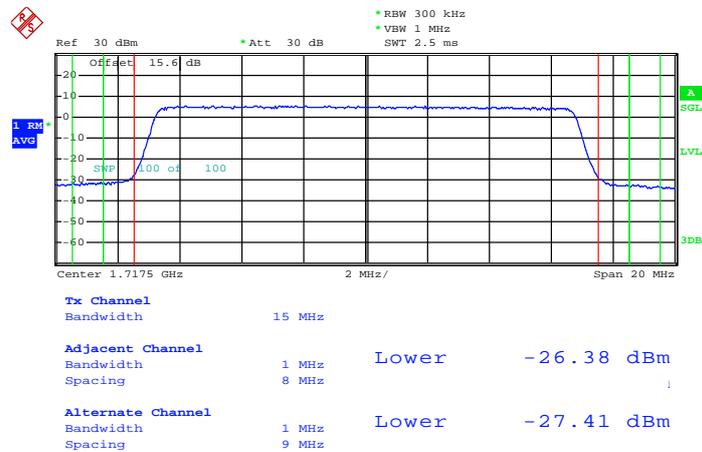


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	15MHz / 16QAM
---------------	------------	---------------------	---------------

**Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0**

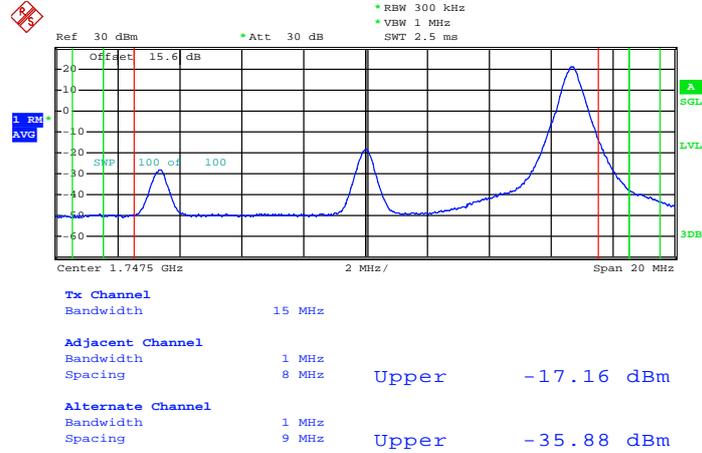


**Lower Band Edge Plot for 16QAM-RB Size 75, RB Offset 0**

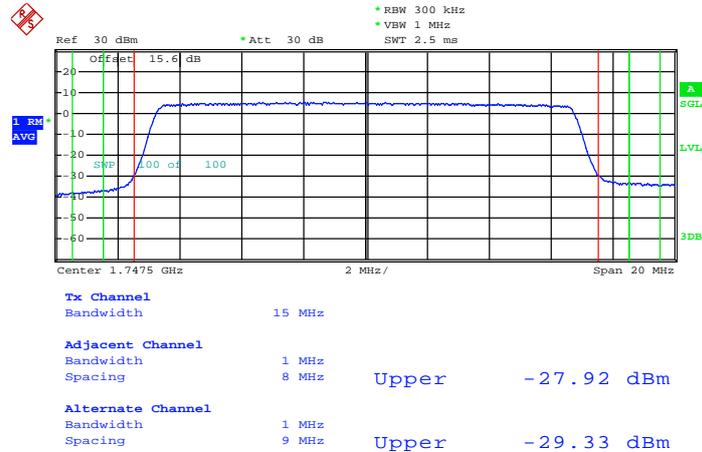




Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 74



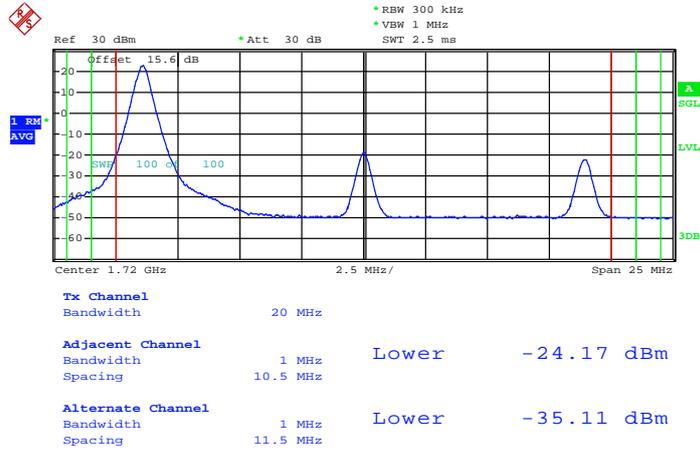
Higher Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



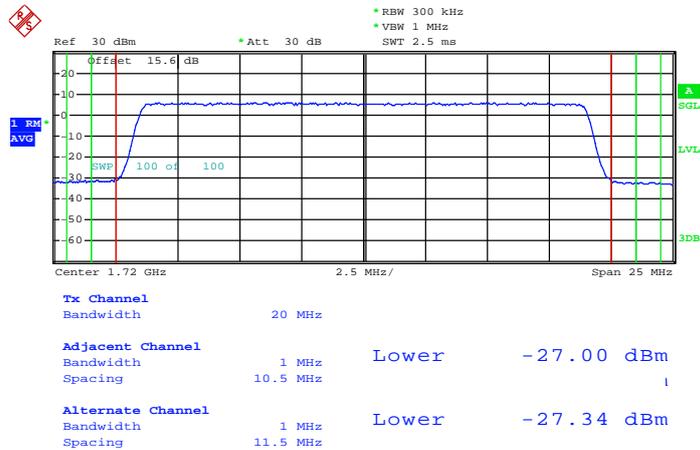


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	20MHz / QPSK
---------------	------------	---------------------	--------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

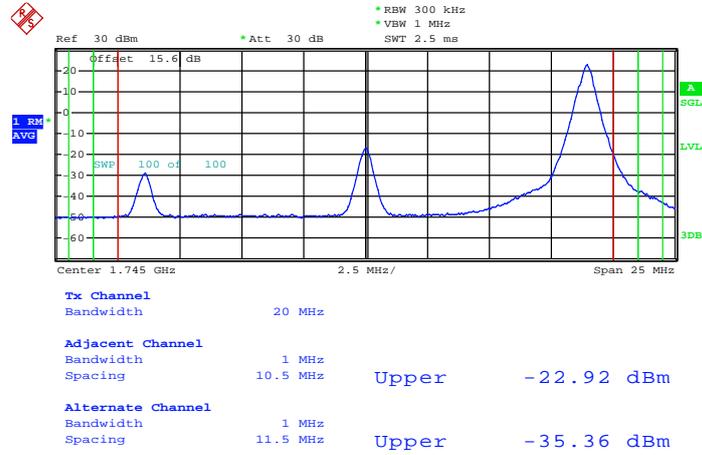


Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0

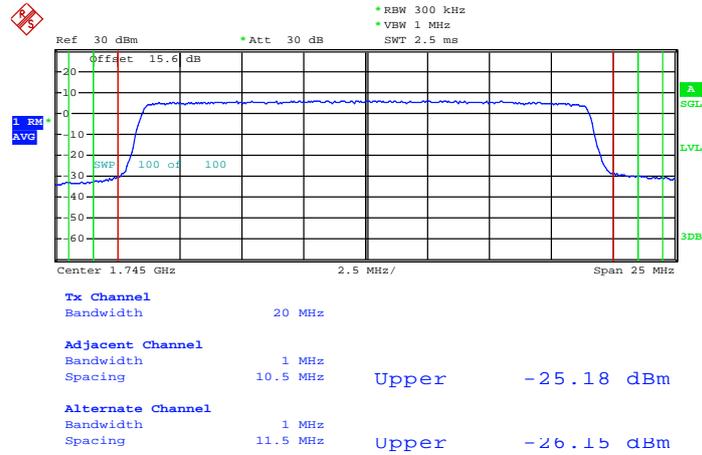




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99



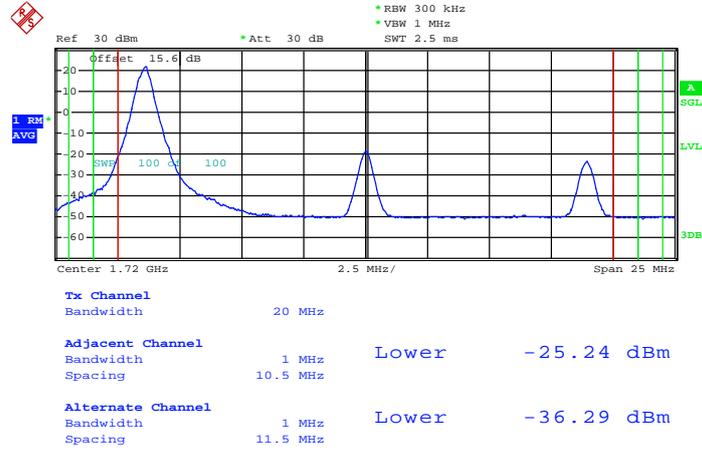
Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0



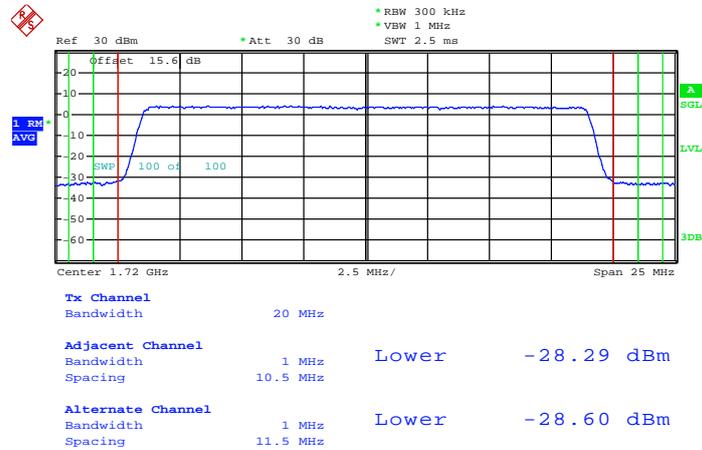


<b>Band :</b>	LTE Band 4	<b>Band Width :</b>	20MHz / 16QAM
---------------	------------	---------------------	---------------

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

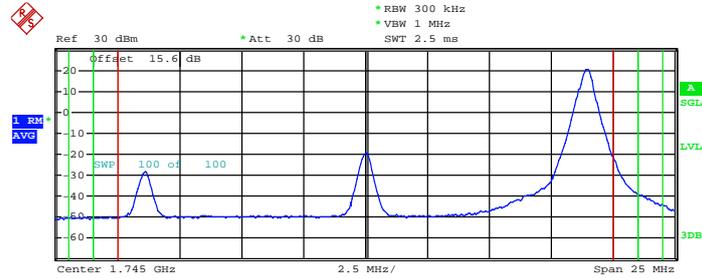


Lower Band Edge Plot for 16QAM-RB Size 100, RB Offset 0



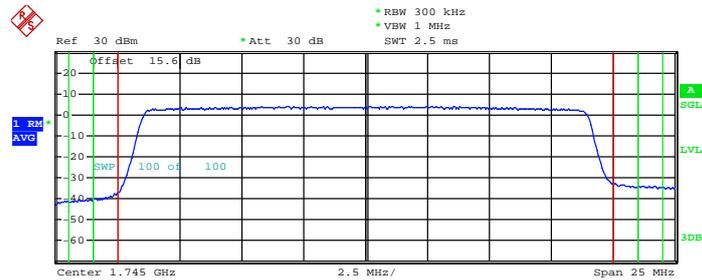


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 99



<b>Tx Channel</b>			
Bandwidth	20 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	10.5 MHz	Upper	-24.53 dBm
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	11.5 MHz	Upper	-37.00 dBm

Higher Band Edge Plot for 16QAM-RB Size 100, RB Offset 0

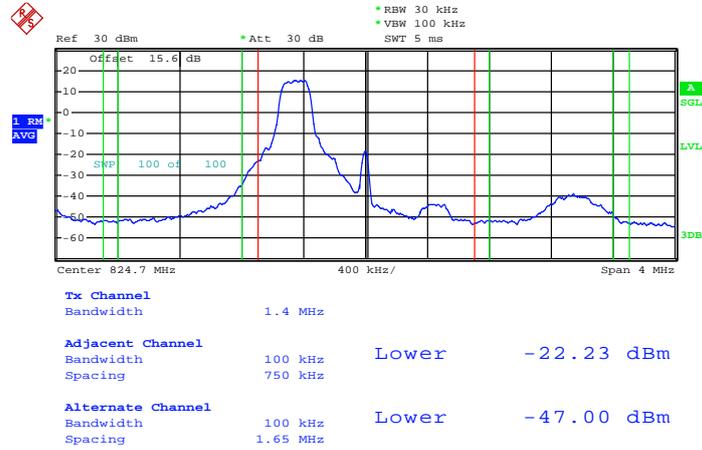


<b>Tx Channel</b>			
Bandwidth	20 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	10.5 MHz	Upper	-29.31 dBm
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	11.5 MHz	Upper	-29.95 dBm

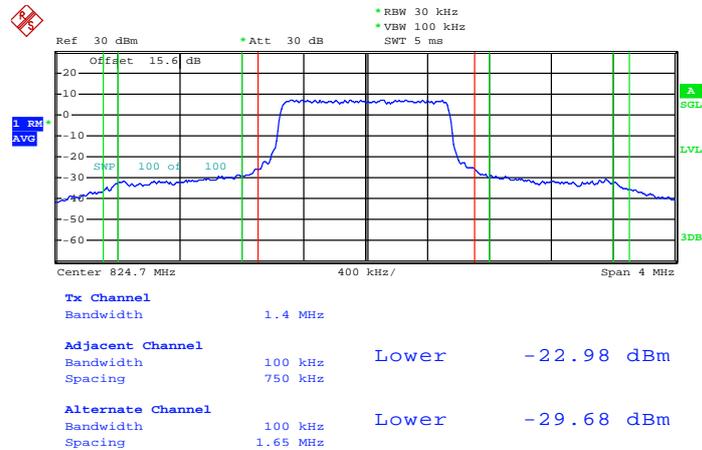


<b>Band :</b>	LTE Band 5	<b>Band Width :</b>	1.4MHz / QPSK
---------------	------------	---------------------	---------------

**Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0**

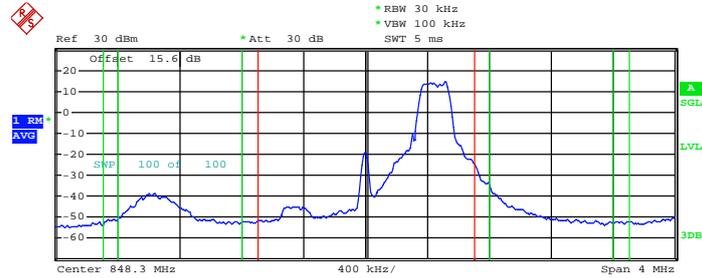


**Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0**



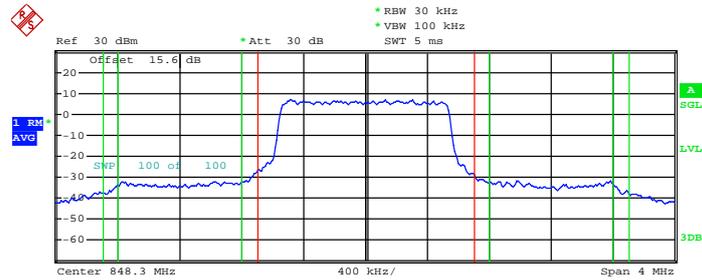


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	750 kHz	Upper	-24.42 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	1.65 MHz	Upper	-47.44 dBm

### Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

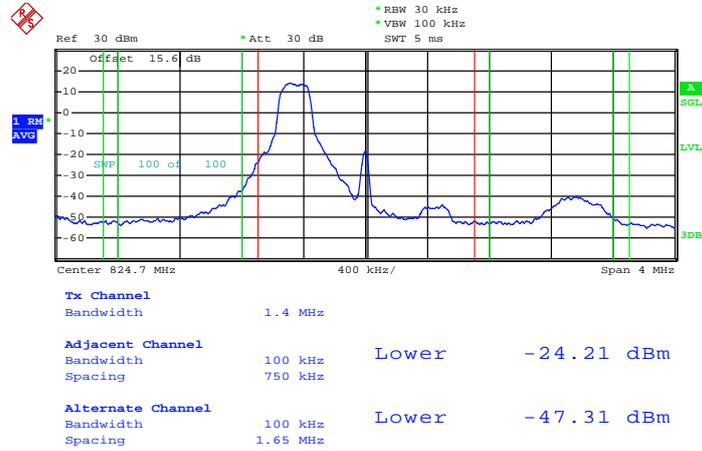


<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	750 kHz	Upper	-26.20 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	1.65 MHz	Upper	-31.12 dBm

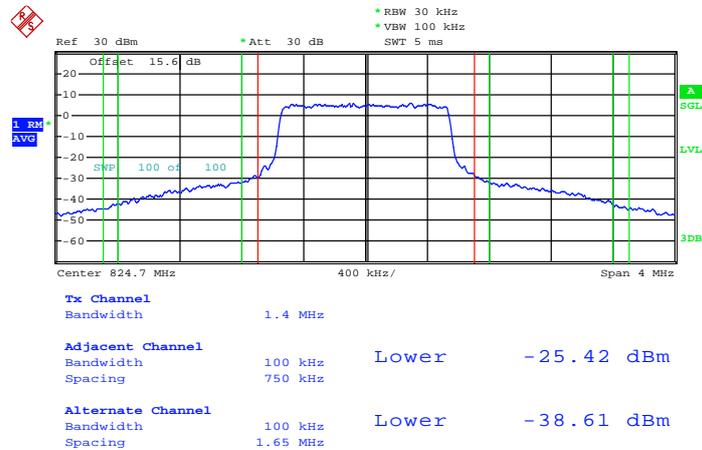


<b>Band :</b>	LTE Band 5	<b>Band Width :</b>	1.4MHz / 16QAM
---------------	------------	---------------------	----------------

**Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0**

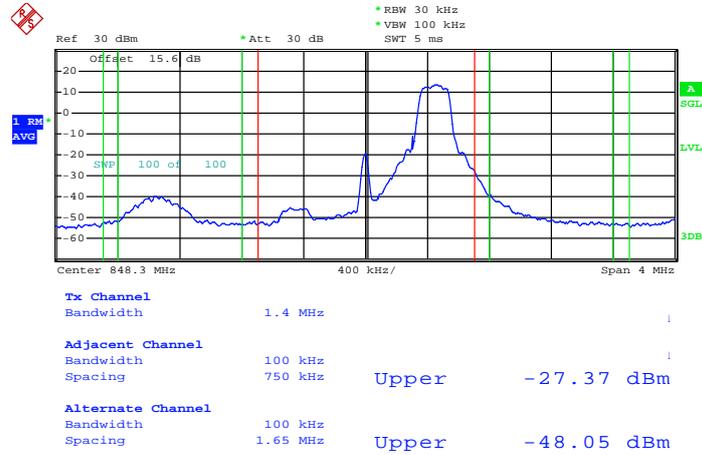


**Lower Band Edge Plot for 16QAM -RB Size 6, RB Offset 0**

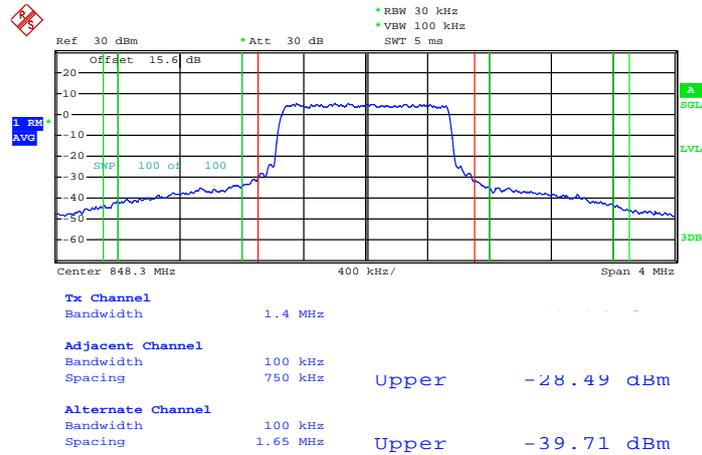




Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 5



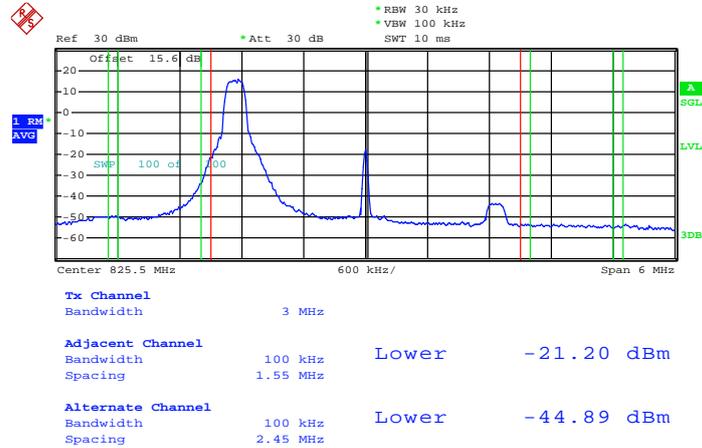
Higher Band Edge Plot for 16QAM -RB Size 6, RB Offset 0



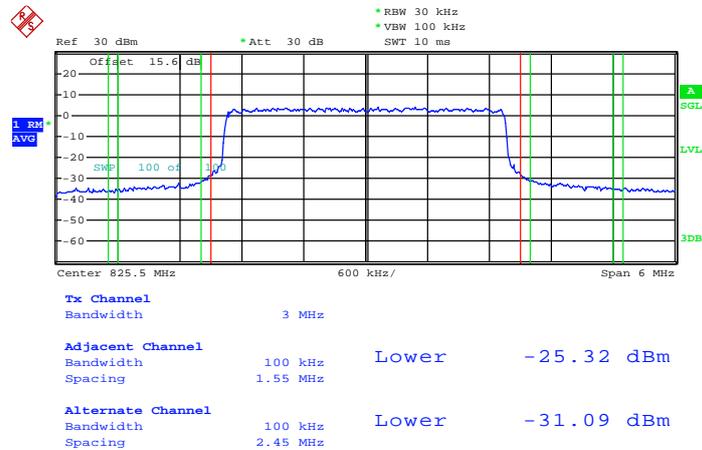


<b>Band :</b>	LTE Band 5	<b>Band Width :</b>	3MHz / QPSK
---------------	------------	---------------------	-------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

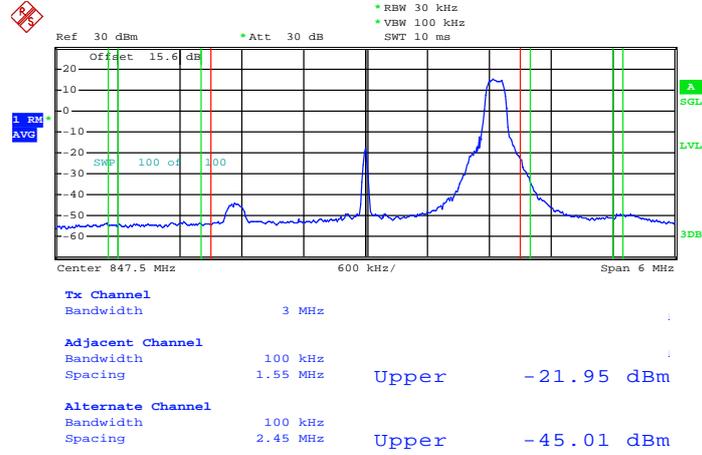


Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0

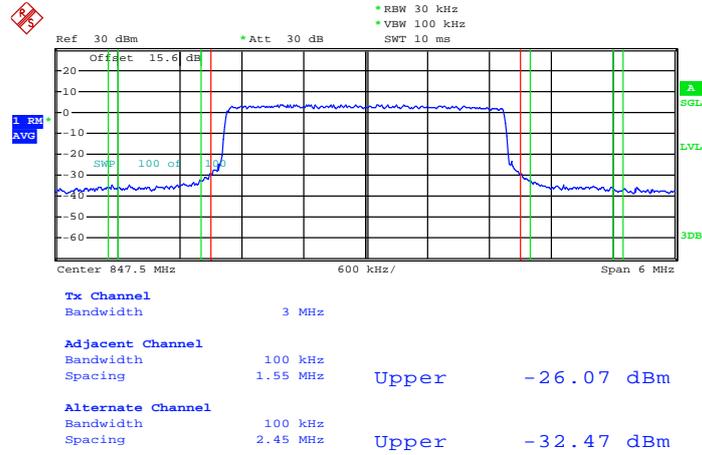




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



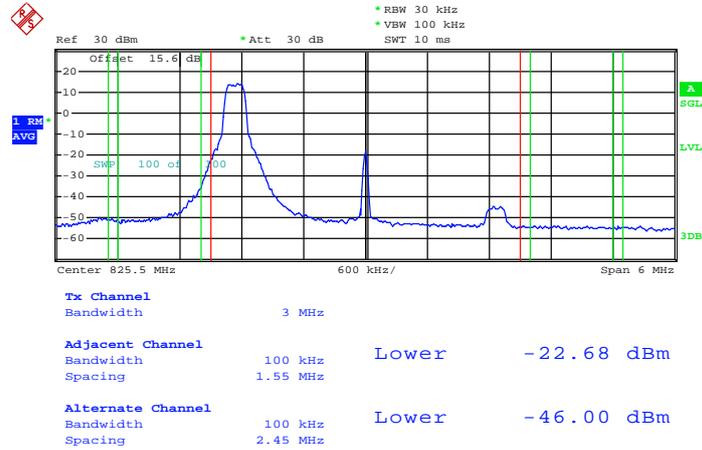
Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0



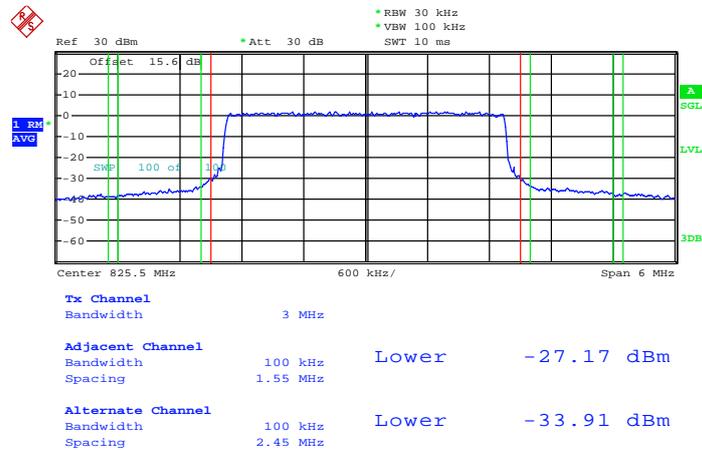


Band :	LTE Band 5	Band Width :	3MHz / 16QAM
--------	------------	--------------	--------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

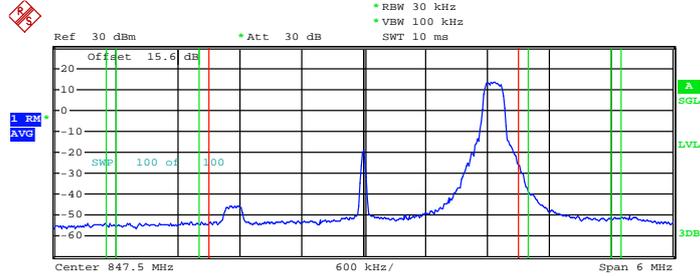


Lower Band Edge Plot for 16QAM -RB Size 15, RB Offset 0



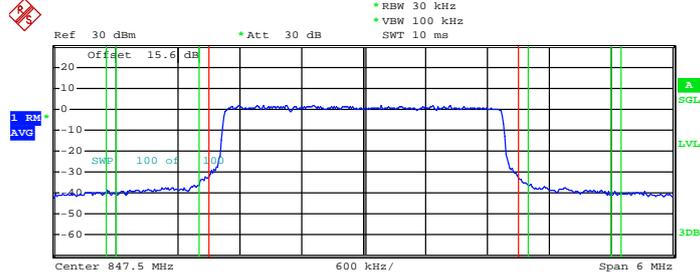


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 14



<b>Tx Channel</b>			
Bandwidth	3 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	1.55 MHz	Upper	-24.79 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	2.45 MHz	Upper	-46.56 dBm

Higher Band Edge Plot for 16QAM -RB Size 15, RB Offset 0

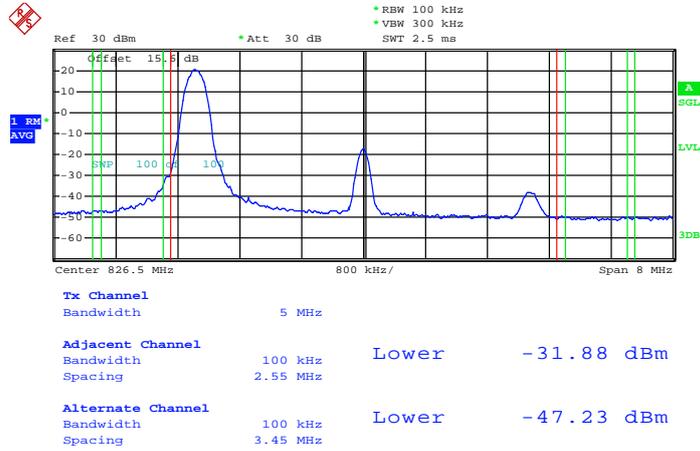


<b>Tx Channel</b>			
Bandwidth	3 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	1.55 MHz	Upper	-29.51 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	2.45 MHz	Upper	-35.36 dBm

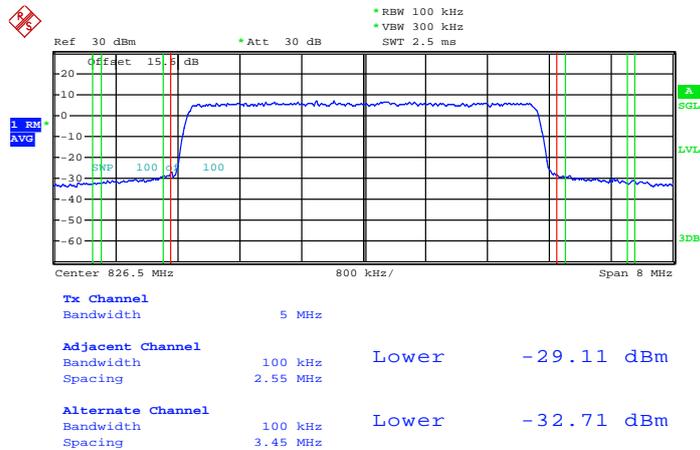


<b>Band :</b>	LTE Band 5	<b>Band Width :</b>	5MHz / QPSK
---------------	------------	---------------------	-------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

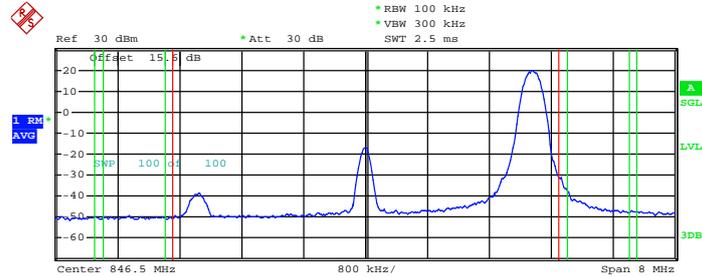


Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



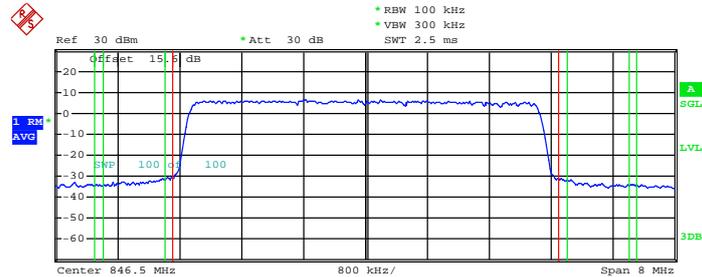


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



<b>Tx Channel</b>	Bandwidth	5 MHz		
<b>Adjacent Channel</b>	Bandwidth	100 kHz		
	Spacing	2.55 MHz	Upper	-33.11 dBm
<b>Alternate Channel</b>	Bandwidth	100 kHz		
	Spacing	3.45 MHz	Upper	-47.68 dBm

Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0

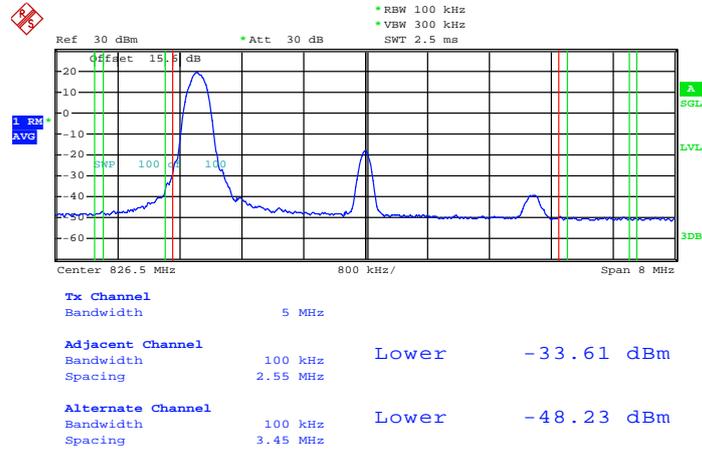


<b>Tx Channel</b>	Bandwidth	5 MHz		
<b>Adjacent Channel</b>	Bandwidth	100 kHz		
	Spacing	2.55 MHz	Upper	-32.03 dBm
<b>Alternate Channel</b>	Bandwidth	100 kHz		
	Spacing	3.45 MHz	Upper	-34.43 dBm

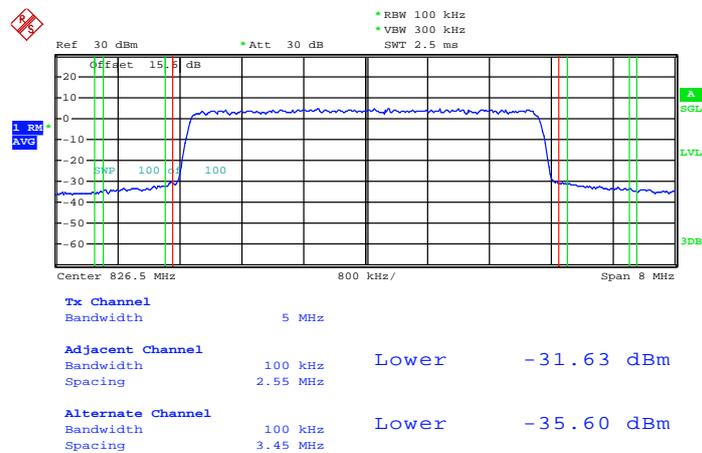


Band :	LTE Band 5	Band Width :	5MHz / 16QAM
--------	------------	--------------	--------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

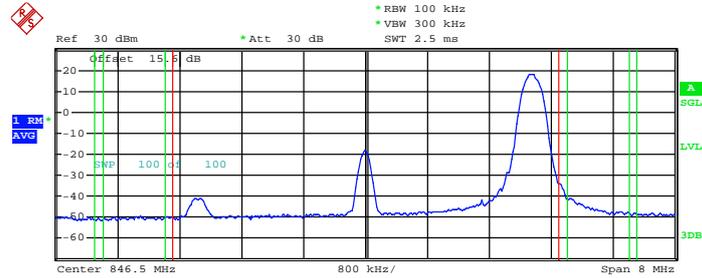


Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



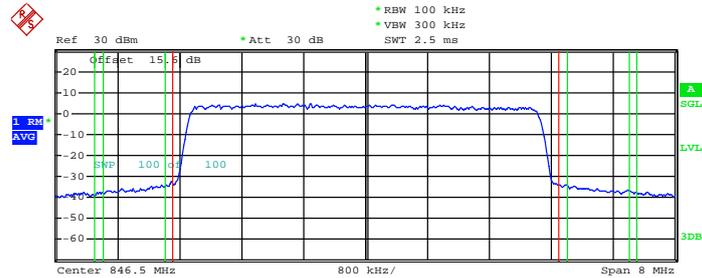


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24



<b>Tx Channel</b>			
Bandwidth	5 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	2.55 MHz	Upper	-36.44 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	3.45 MHz	Upper	-48.64 dBm

Higher Band Edge Plot for 16QAM -RB Size 25, RB Offset 0

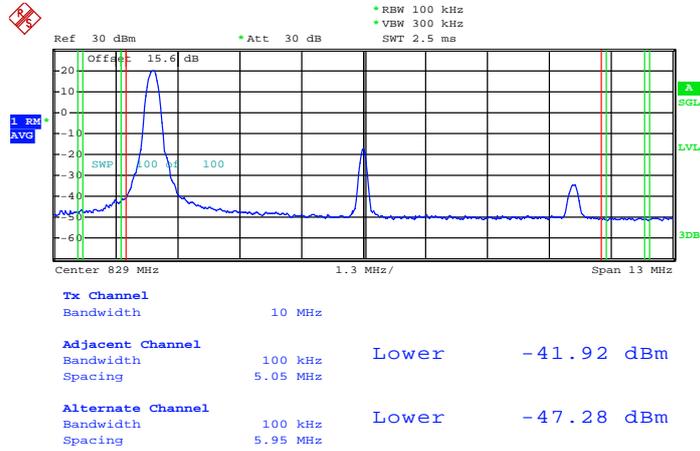


<b>Tx Channel</b>			
Bandwidth	5 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	2.55 MHz	Upper	-34.52 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	3.45 MHz	Upper	-37.71 dBm

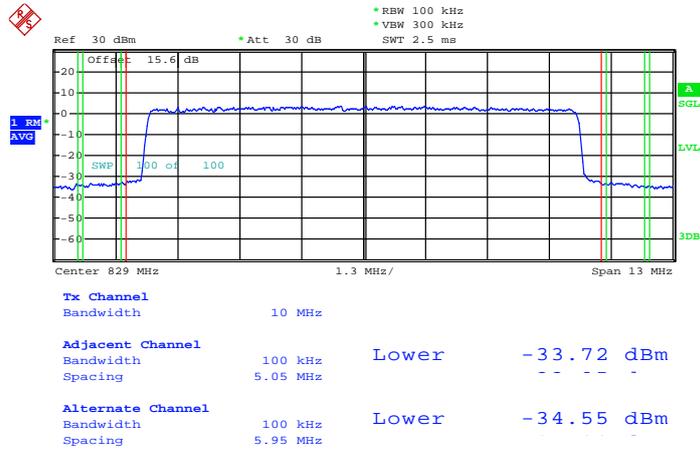


Band :	LTE Band 5	Band Width :	10MHz / QPSK
--------	------------	--------------	--------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

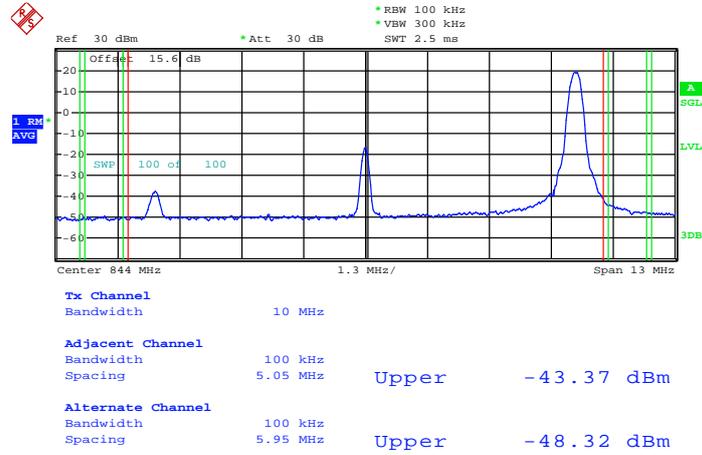


Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0

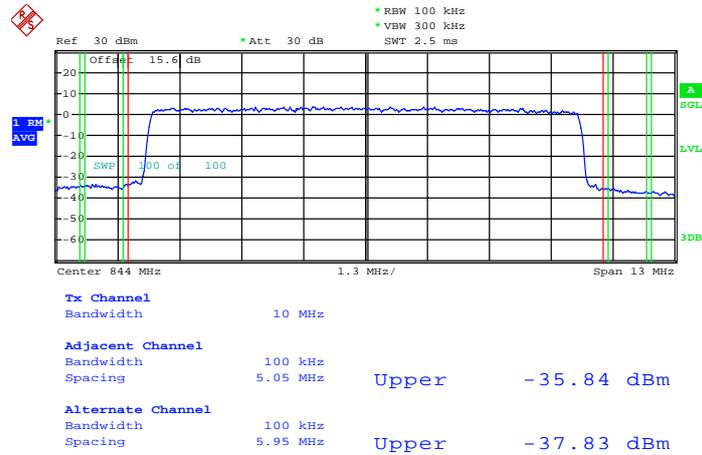




### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



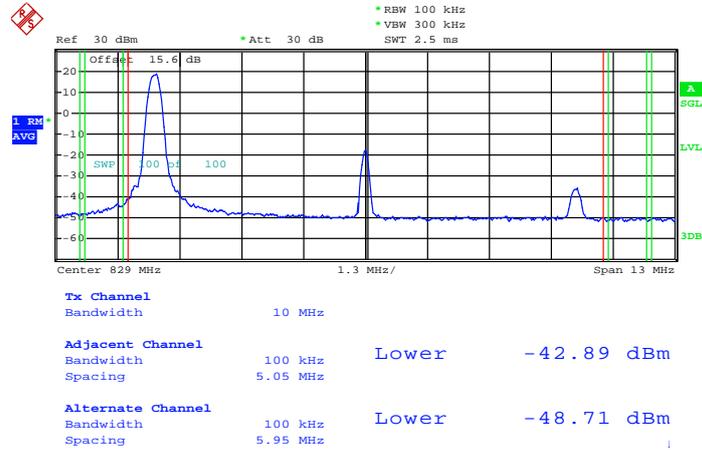
### Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



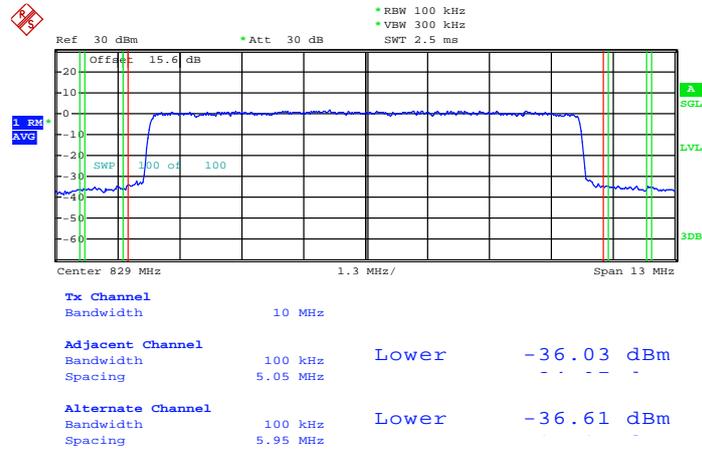


Band :	LTE Band 5	Band Width :	10MHz / 16QAM
--------	------------	--------------	---------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

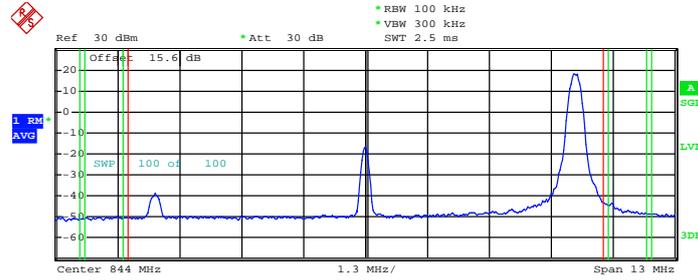


Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



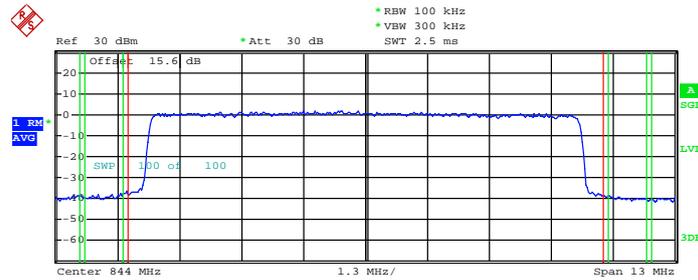


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



<b>Tx Channel</b>	Bandwidth	10 MHz		
<b>Adjacent Channel</b>	Bandwidth	100 kHz	Upper	-44.34 dBm
	Spacing	5.05 MHz		
<b>Alternate Channel</b>	Bandwidth	100 kHz	Upper	-49.03 dBm
	Spacing	5.95 MHz		

Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0

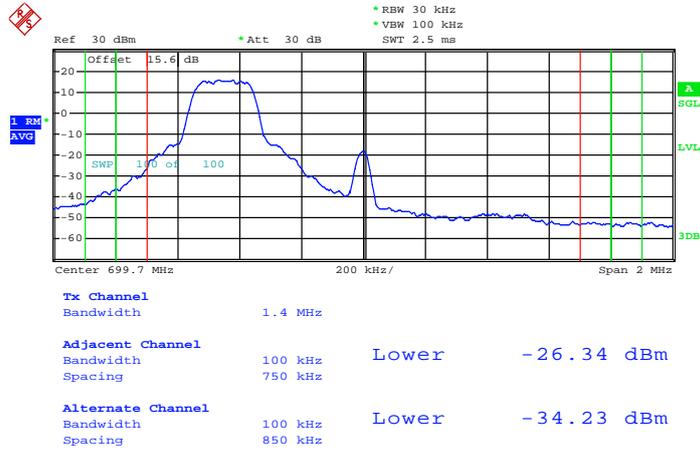


<b>Tx Channel</b>	Bandwidth	10 MHz		
<b>Adjacent Channel</b>	Bandwidth	100 kHz	Upper	-39.31 dBm
	Spacing	5.05 MHz		
<b>Alternate Channel</b>	Bandwidth	100 kHz	Upper	-40.85 dBm
	Spacing	5.95 MHz		

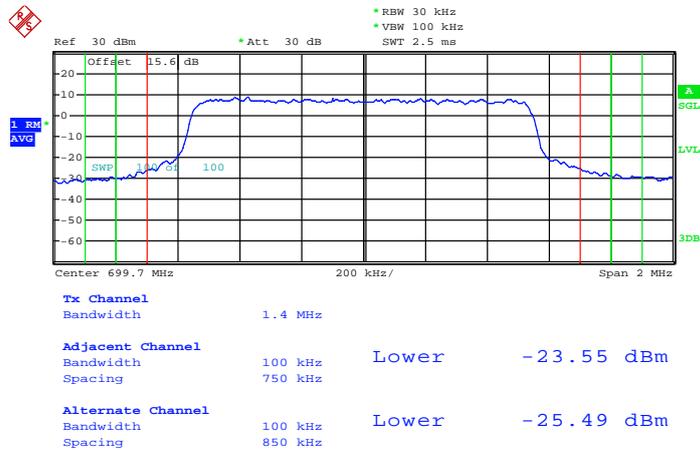


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	1.4MHz / QPSK
---------------	-------------	---------------------	---------------

**Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0**

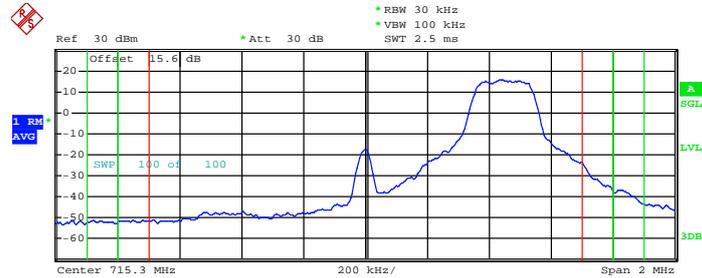


**Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0**



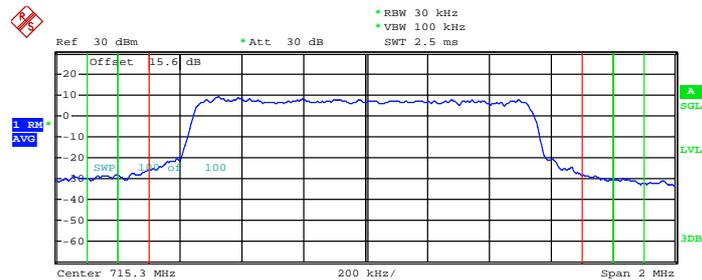


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	750 kHz	Upper	-25.33 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	850 kHz	Upper	-33.95 dBm

### Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

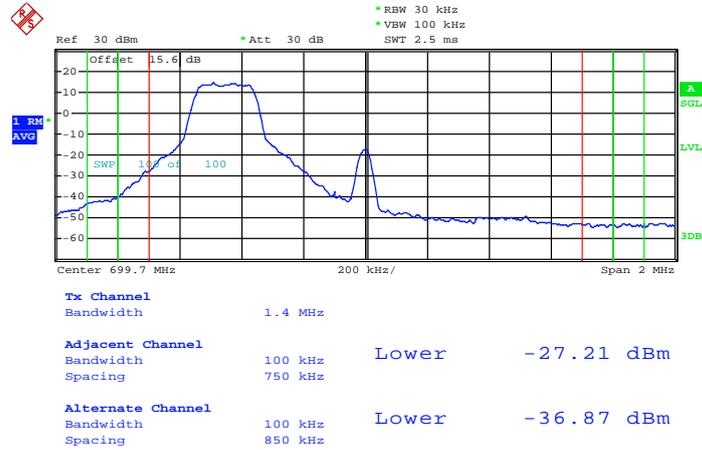


<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	750 kHz	Upper	-24.66 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	850 kHz	Upper	-26.09 dBm

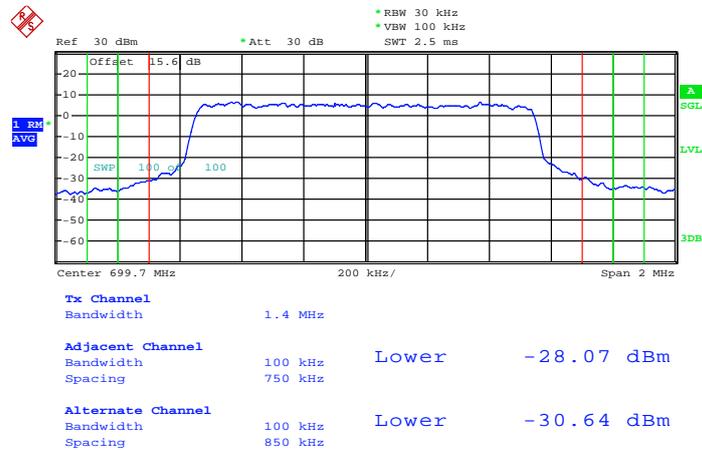


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	1.4MHz / 16QAM
---------------	-------------	---------------------	----------------

**Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0**

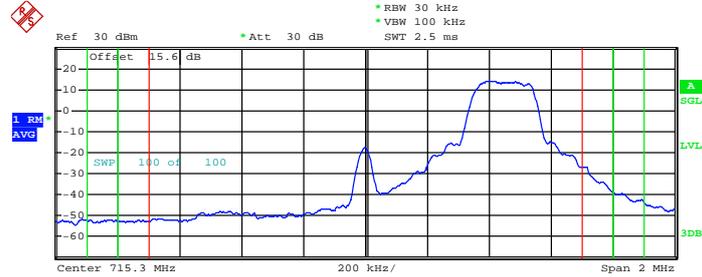


**Lower Band Edge Plot for 16QAM -RB Size 6, RB Offset 0**



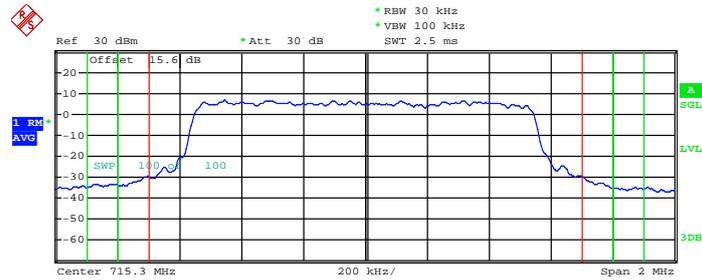


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 5



<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	750 kHz	Upper	-26.56 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	850 kHz	Upper	-36.32 dBm

Higher Band Edge Plot for 16QAM -RB Size 6, RB Offset 0

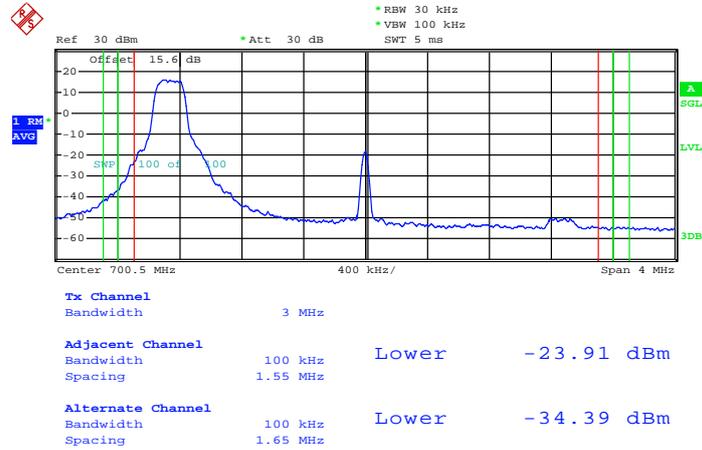


<b>Tx Channel</b>			
Bandwidth	1.4 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	750 kHz	Upper	-27.80 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	850 kHz	Upper	-30.58 dBm

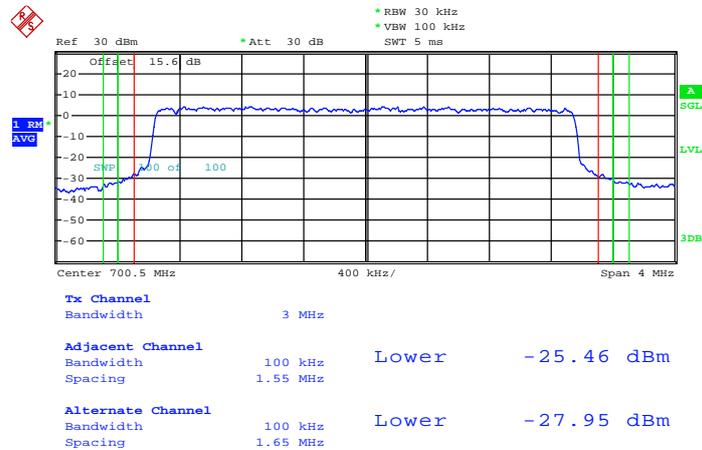


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	3MHz / QPSK
---------------	-------------	---------------------	-------------

**Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0**

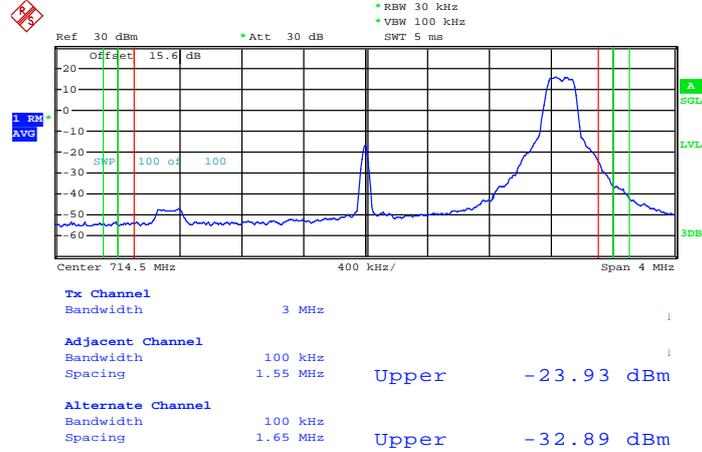


**Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0**

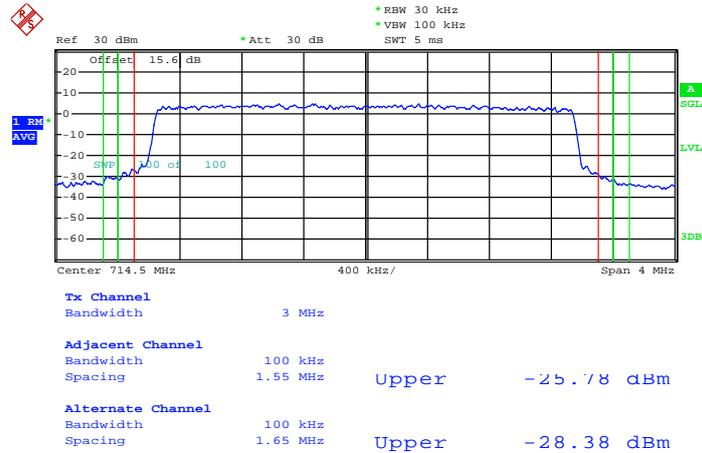




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



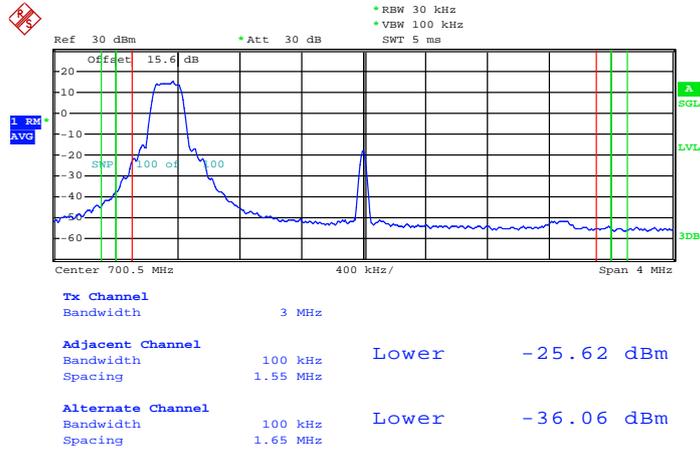
Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0



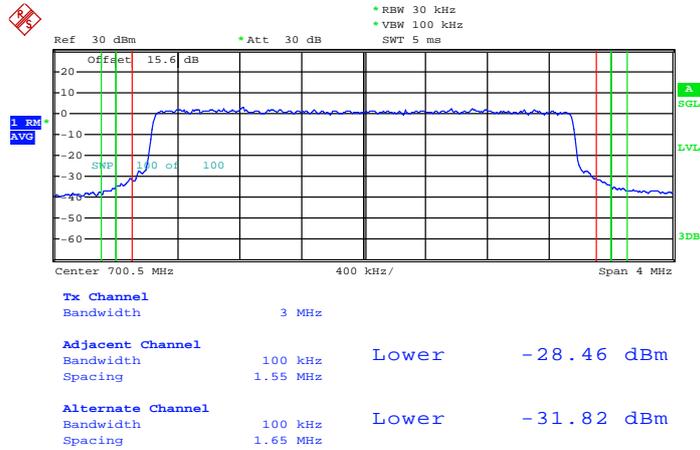


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	3MHz / 16QAM
---------------	-------------	---------------------	--------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

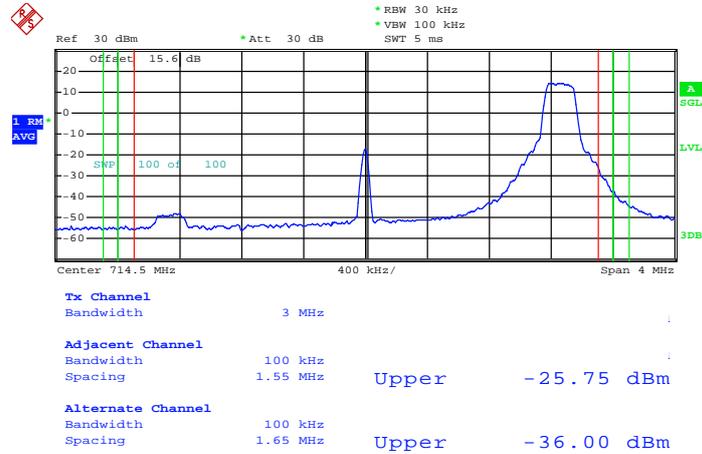


Lower Band Edge Plot for 16QAM -RB Size 15, RB Offset 0

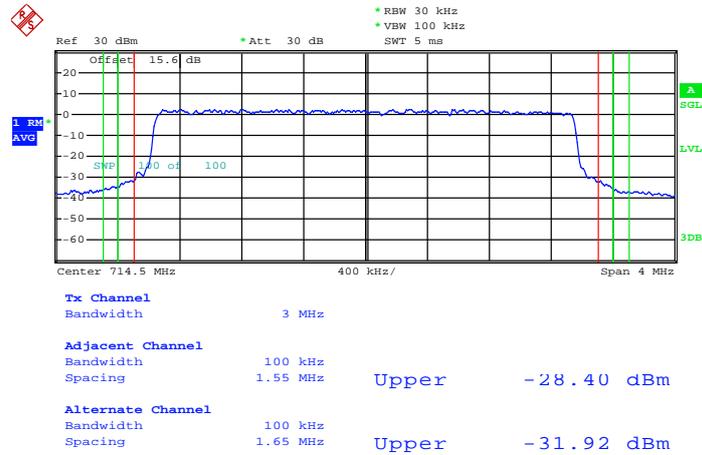




Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 14



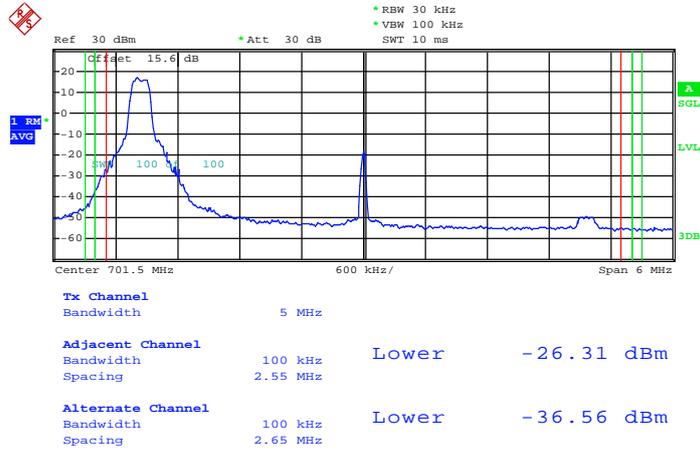
Higher Band Edge Plot for 16QAM -RB Size 15, RB Offset 0



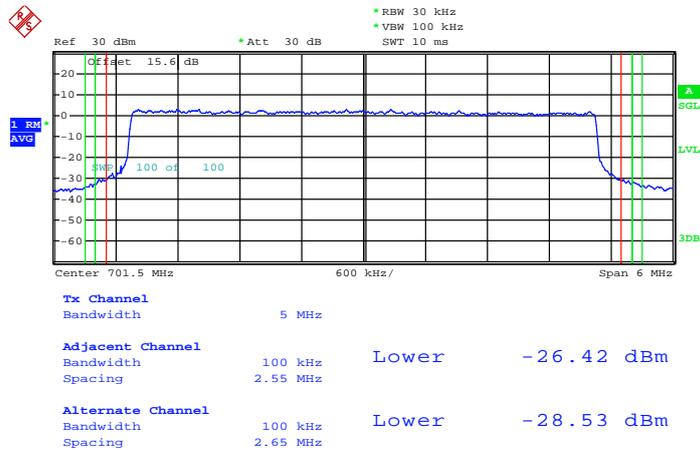


Band :	LTE Band 12	Band Width :	5MHz / QPSK
--------	-------------	--------------	-------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

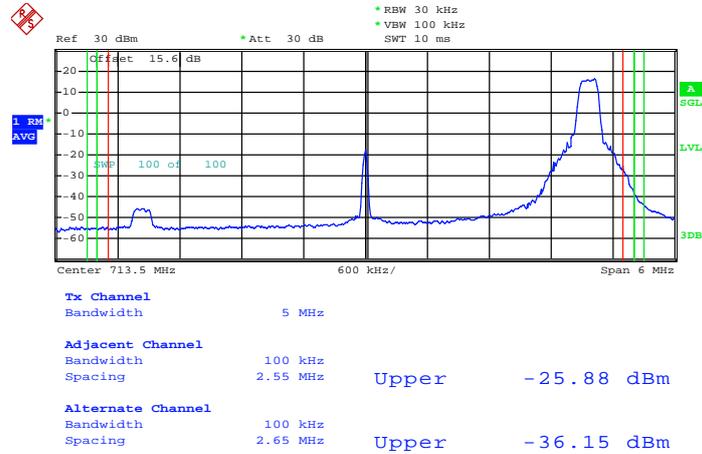


Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0

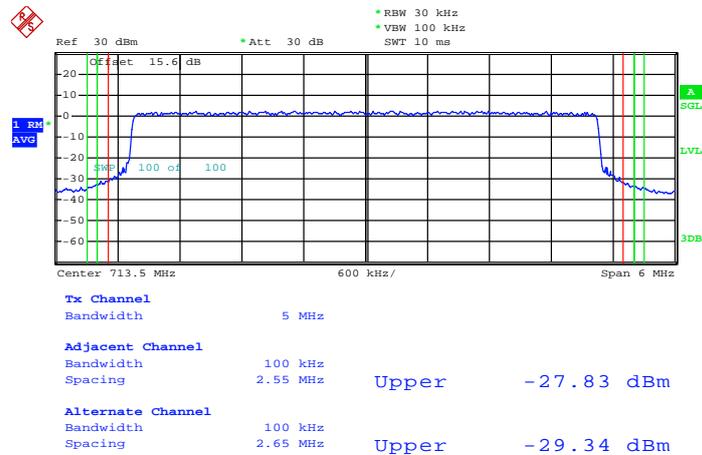




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



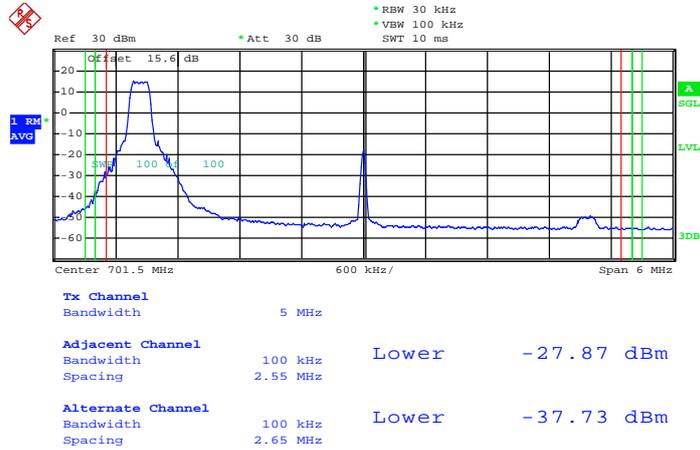
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



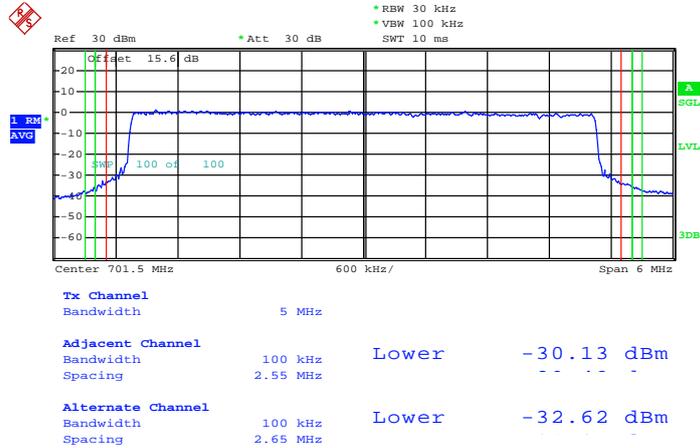


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	5MHz / 16QAM
---------------	-------------	---------------------	--------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

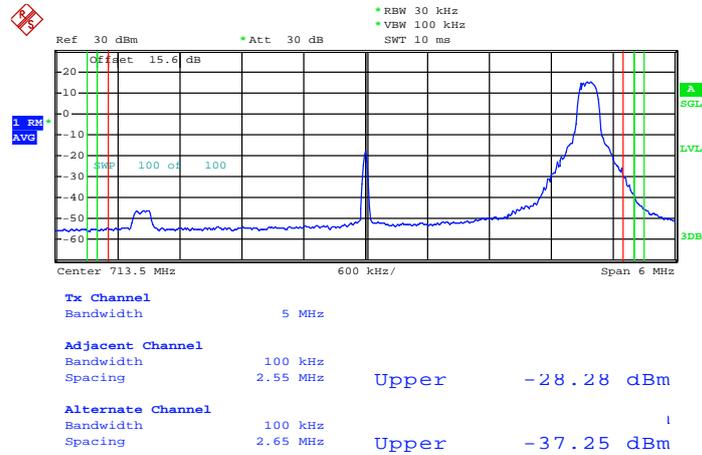


Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0

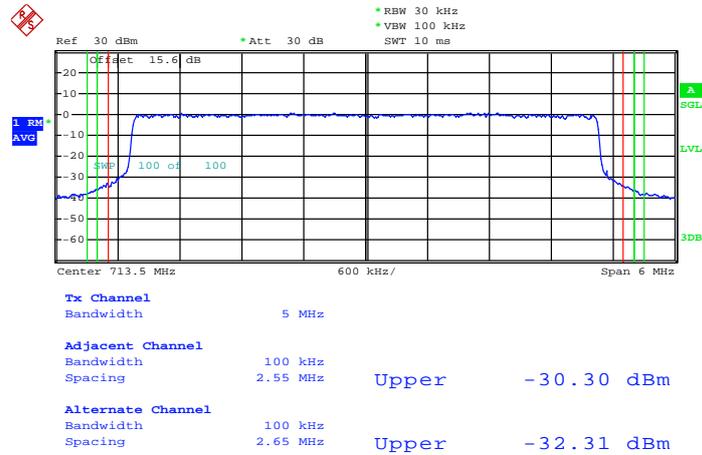




Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24



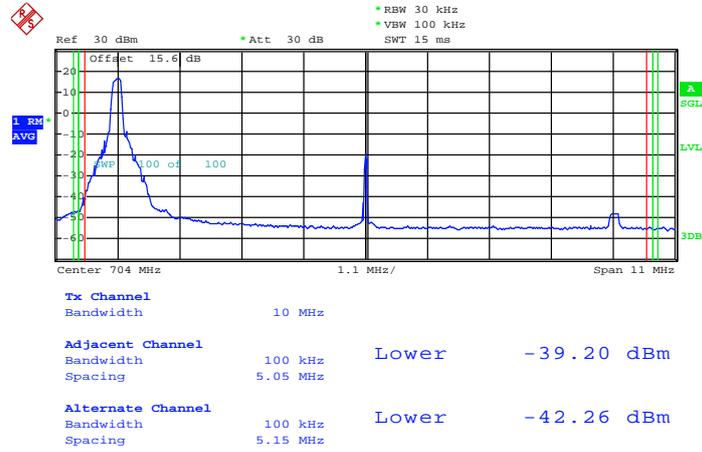
Higher Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



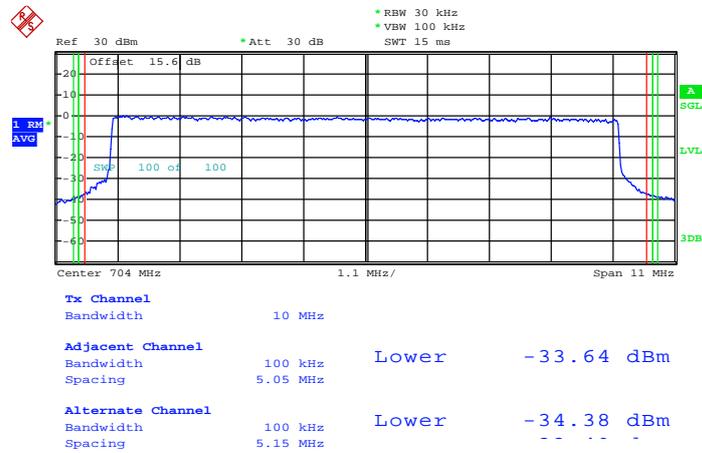


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	10MHz / QPSK
---------------	-------------	---------------------	--------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

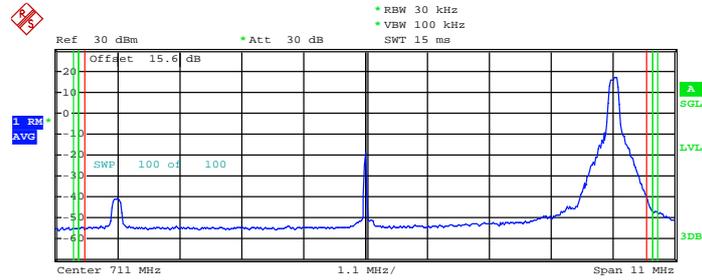


Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



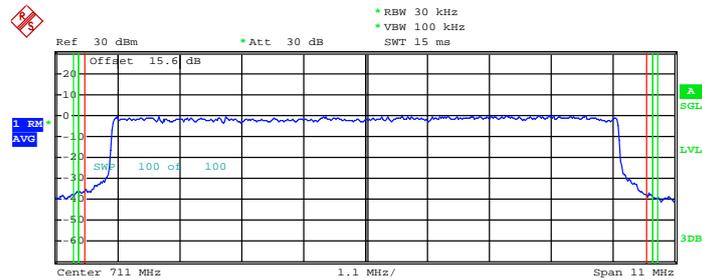


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	5.05 MHz	Upper	-38.33 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	5.15 MHz	Upper	-42.37 dBm

Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0

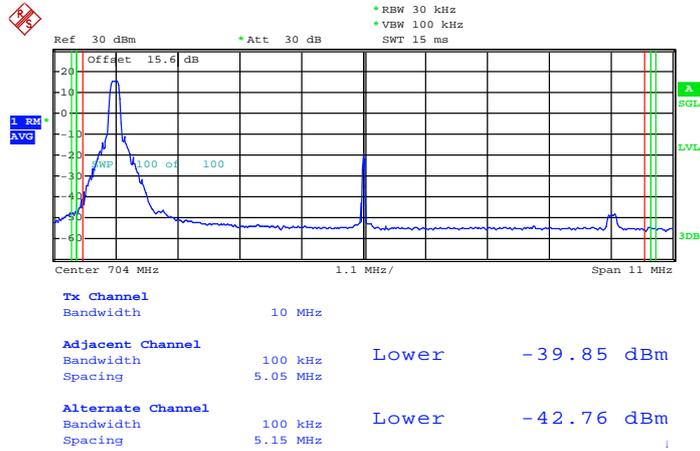


<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	5.05 MHz	Upper	-32.94 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	5.15 MHz	Upper	-34.36 dBm

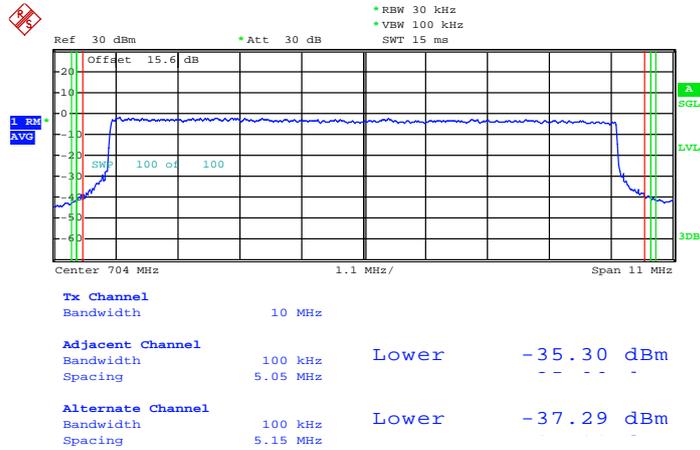


<b>Band :</b>	LTE Band 12	<b>Band Width :</b>	10MHz / 16QAM
---------------	-------------	---------------------	---------------

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0

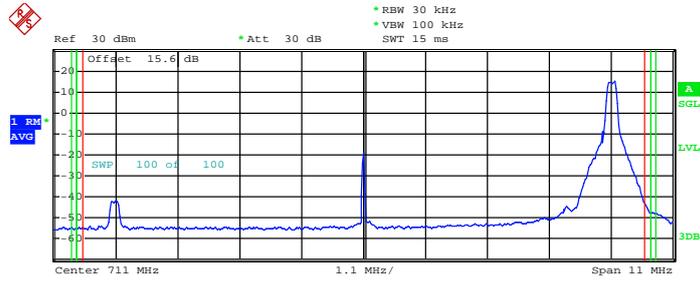


Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



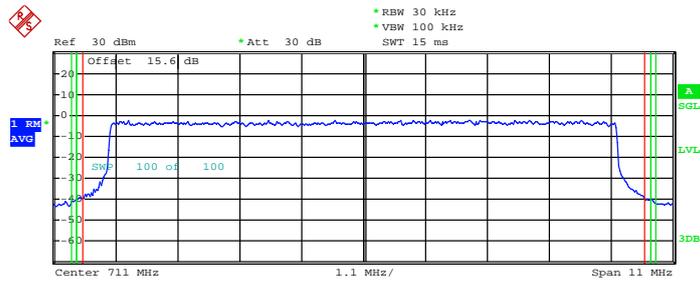


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



<b>Tx Channel</b>	Bandwidth	10 MHz		
<b>Adjacent Channel</b>	Bandwidth	100 kHz		
	Spacing	5.05 MHz	Upper	-40.22 dBm
<b>Alternate Channel</b>	Bandwidth	100 kHz		
	Spacing	5.15 MHz	Upper	-42.53 dBm

Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0

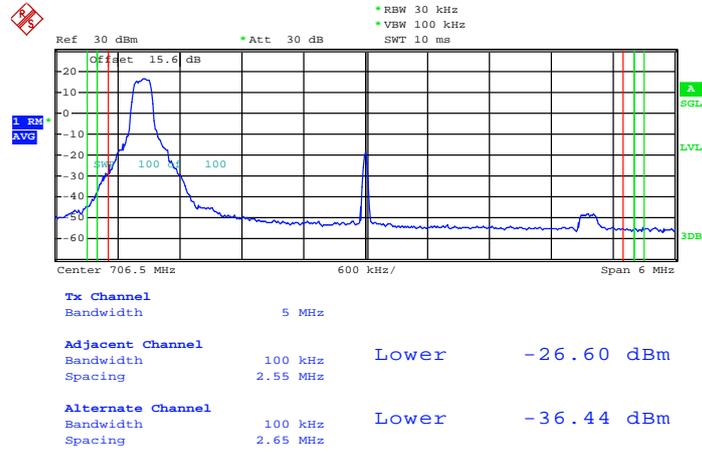


<b>Tx Channel</b>	Bandwidth	10 MHz		
<b>Adjacent Channel</b>	Bandwidth	100 kHz		
	Spacing	5.05 MHz	Upper	-35.26 dBm
<b>Alternate Channel</b>	Bandwidth	100 kHz		
	Spacing	5.15 MHz	Upper	-35.95 dBm

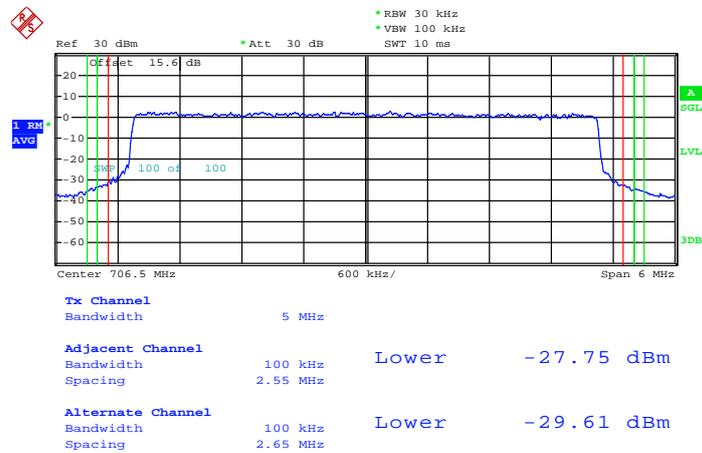


<b>Band :</b>	LTE Band 17	<b>Band Width :</b>	5MHz / QPSK
---------------	-------------	---------------------	-------------

**Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0**

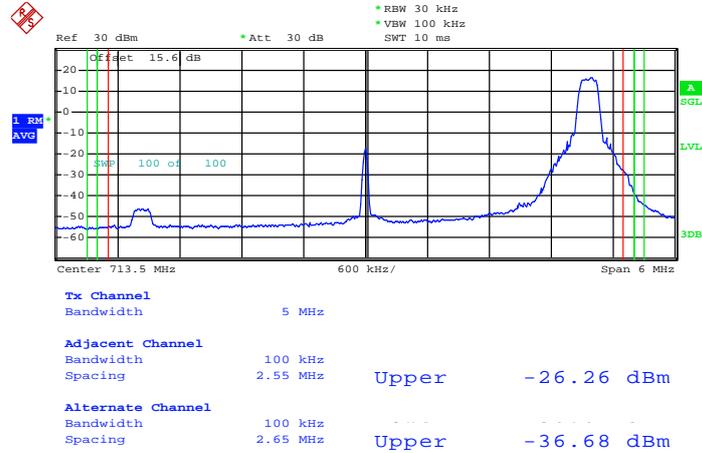


**Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0**

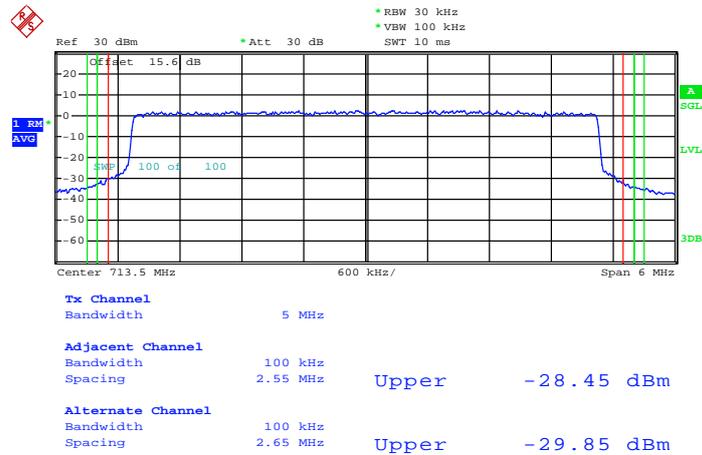




Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



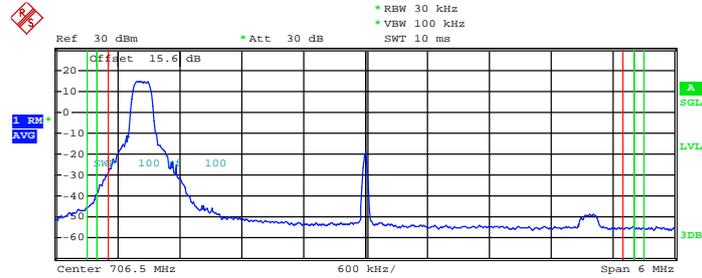
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0





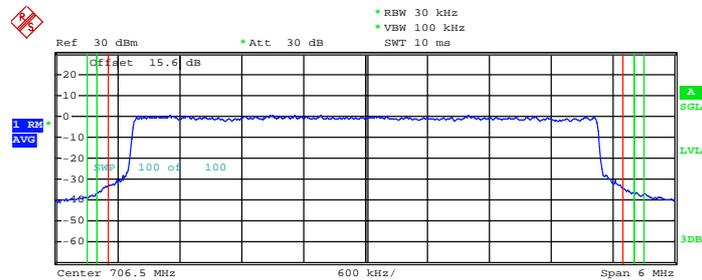
<b>Band :</b>	LTE Band 17	<b>Band Width :</b>	5MHz / 16QAM
---------------	-------------	---------------------	--------------

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



<b>Tx Channel</b>			
Bandwidth	5 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz	Lower	-28.20 dBm
Spacing	2.55 MHz		
<b>Alternate Channel</b>			
Bandwidth	100 kHz	Lower	-37.60 dBm
Spacing	2.65 MHz		

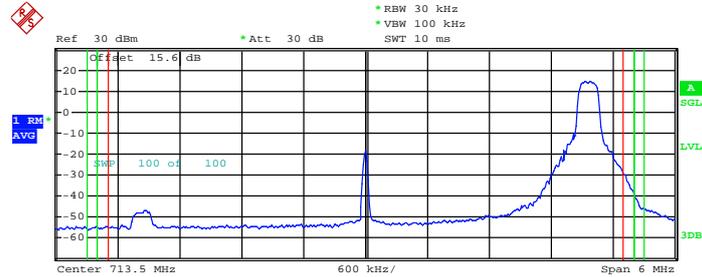
Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



<b>Tx Channel</b>			
Bandwidth	5 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz	Lower	-29.87 dBm
Spacing	2.55 MHz		
<b>Alternate Channel</b>			
Bandwidth	100 kHz	Lower	-33.13 dBm
Spacing	2.65 MHz		

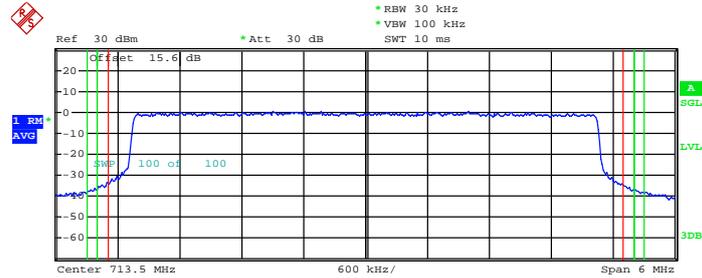


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



**Tx Channel**  
 Bandwidth 5 MHz  
**Adjacent Channel**  
 Bandwidth 100 kHz  
 Spacing 2.55 MHz Upper -27.64 dBm  
**Alternate Channel**  
 Bandwidth 100 kHz  
 Spacing 2.65 MHz Upper -37.69 dBm

Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0

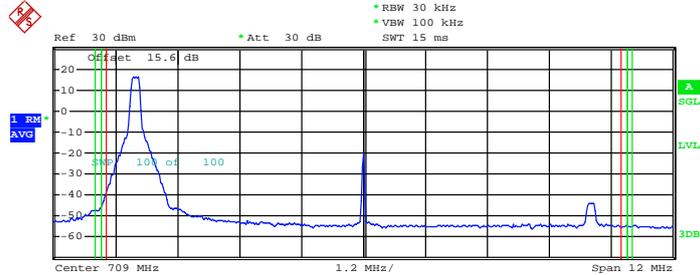


**Tx Channel**  
 Bandwidth 5 MHz  
**Adjacent Channel**  
 Bandwidth 100 kHz  
 Spacing 2.55 MHz Upper -31.10 dBm  
**Alternate Channel**  
 Bandwidth 100 kHz  
 Spacing 2.65 MHz Upper -32.76 dBm



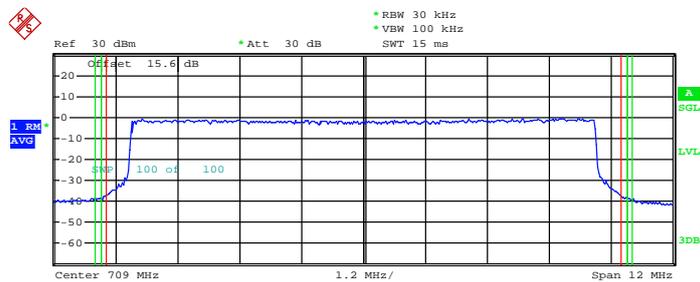
<b>Band :</b>	LTE Band 17	<b>Band Width :</b>	10MHz / QPSK
---------------	-------------	---------------------	--------------

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz	Lower	-38.20 dBm
Spacing	5.05 MHz		
<b>Alternate Channel</b>			
Bandwidth	100 kHz	Lower	-42.27 dBm
Spacing	5.15 MHz		

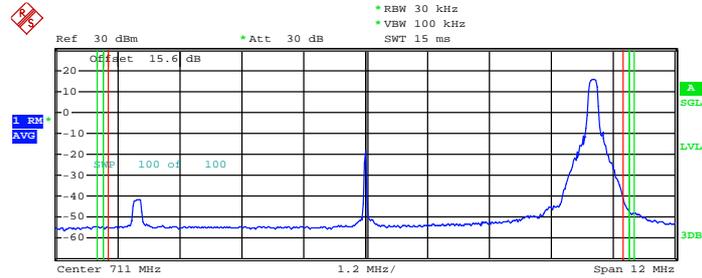
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz	Lower	-33.19 dBm
Spacing	5.05 MHz		
<b>Alternate Channel</b>			
Bandwidth	100 kHz	Lower	-33.74 dBm
Spacing	5.15 MHz		

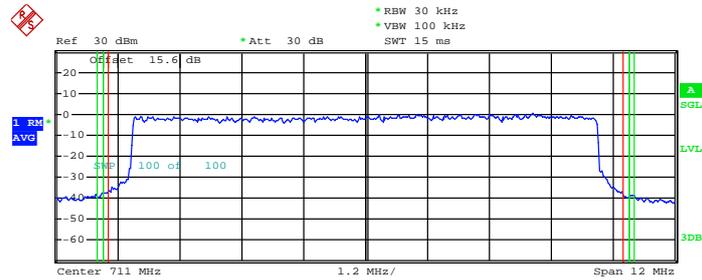


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	5.05 MHz	Upper	-39.46 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	5.15 MHz	Upper	-43.05 dBm

### Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0

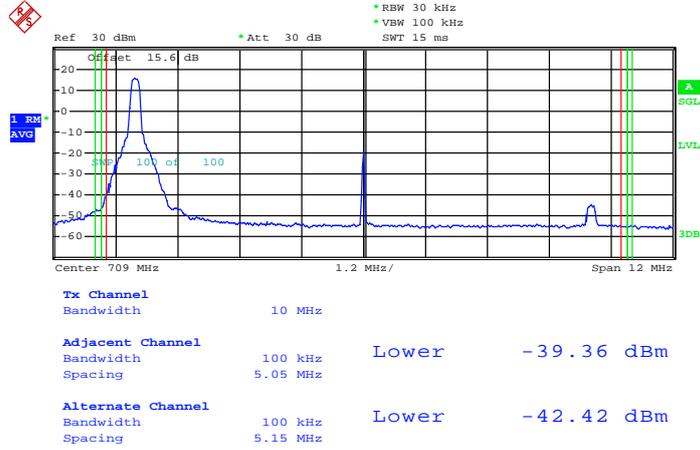


<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	5.05 MHz	Upper	-34.42 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	5.15 MHz	Upper	-33.69 dBm

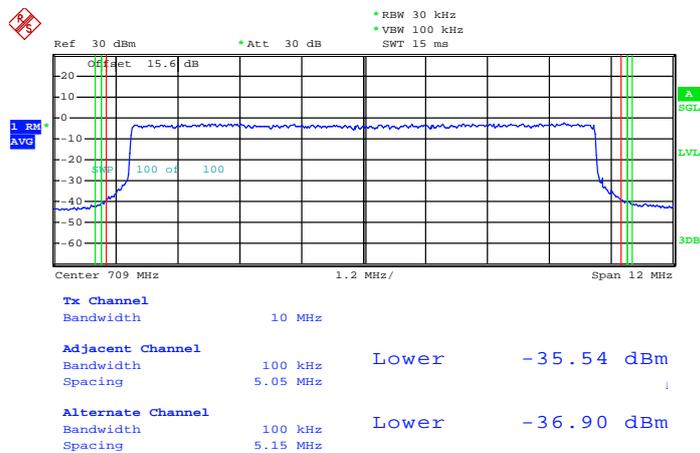


<b>Band :</b>	LTE Band 17	<b>Band Width :</b>	10MHz / 16QAM
---------------	-------------	---------------------	---------------

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

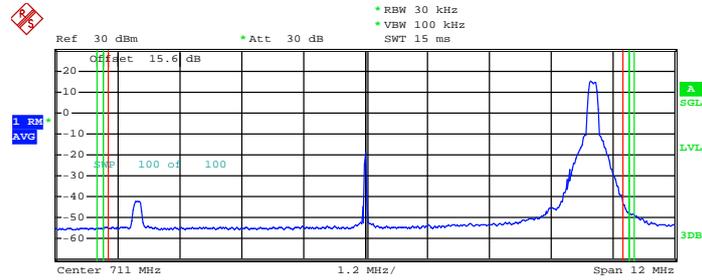


Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



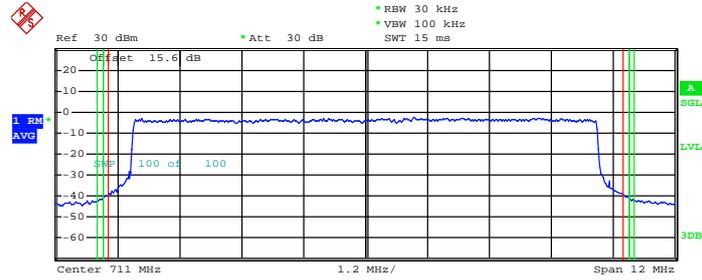


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	5.05 MHz	Upper	-40.30 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	5.15 MHz	Upper	-43.18 dBm

Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	100 kHz		
Spacing	5.05 MHz	Upper	-35.60 dBm
<b>Alternate Channel</b>			
Bandwidth	100 kHz		
Spacing	5.15 MHz	Upper	-36.58 dBm

### 3.6 Conducted Spurious Emission Measurement

#### 3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10<sup>th</sup> harmonic.

#### 3.6.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

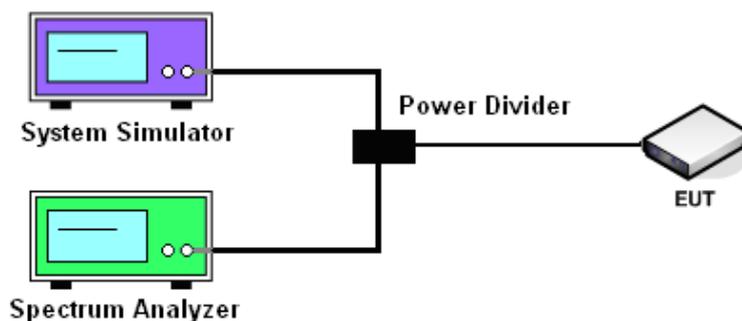
#### 3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 
$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm}.$$

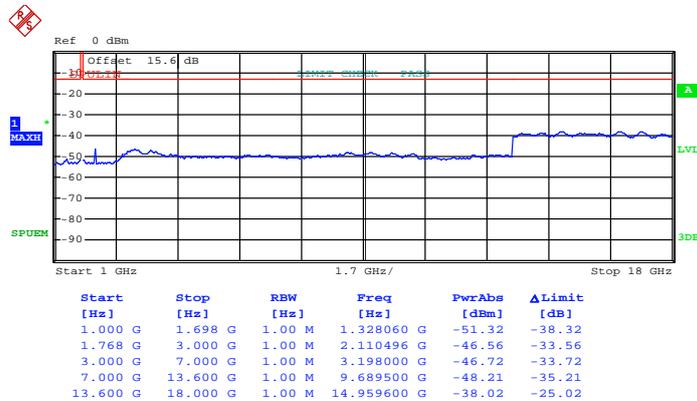
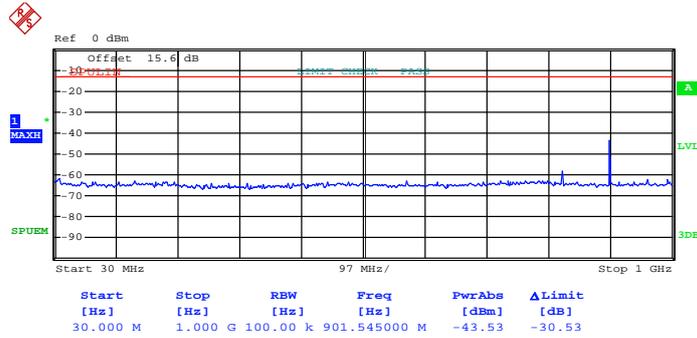
#### 3.6.4 Test Setup



### 3.6.5 Test Result (Plots) of Conducted Spurious Emission

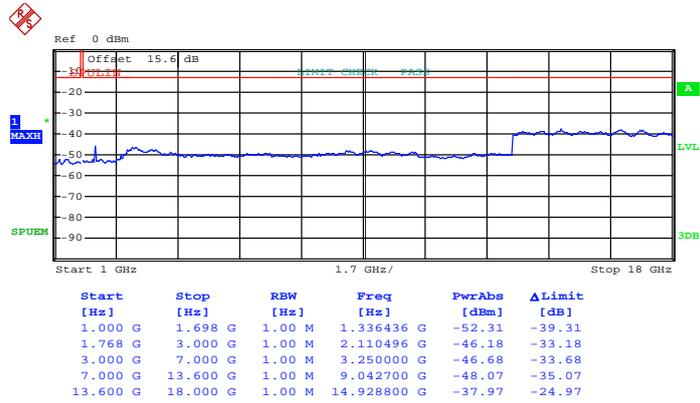
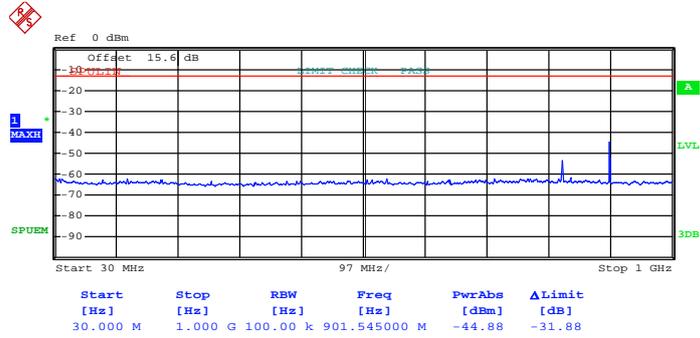
Band :	LTE Band 4	Channel :	CH19957 (Low)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)





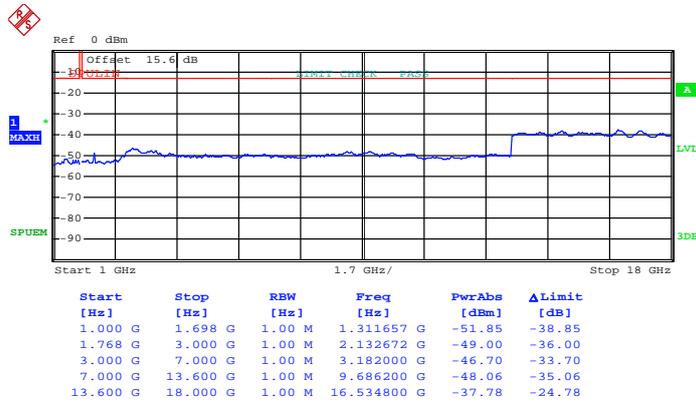
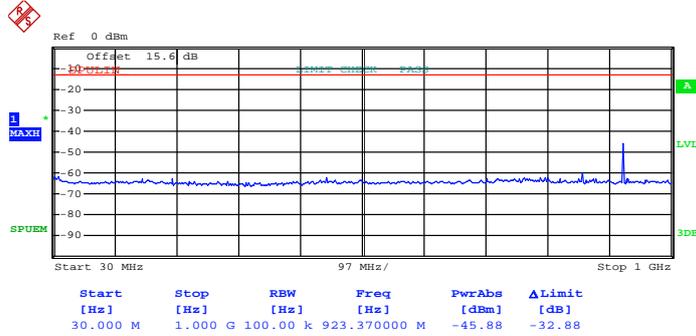
16QAM (RB Size 1, RB Offset 0)





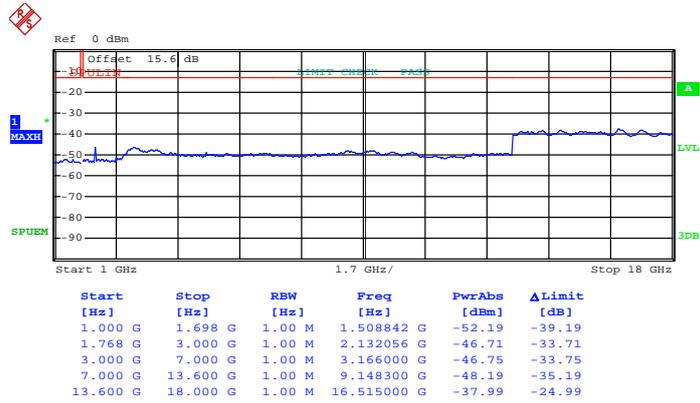
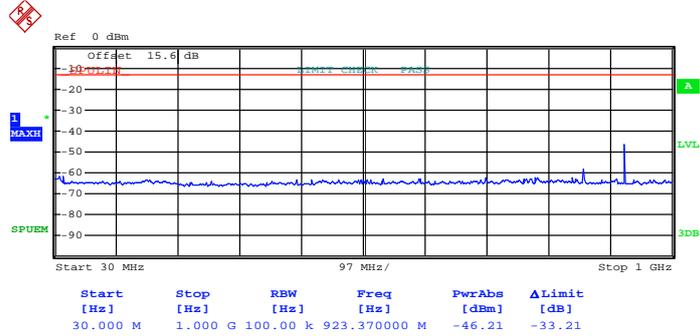
Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)





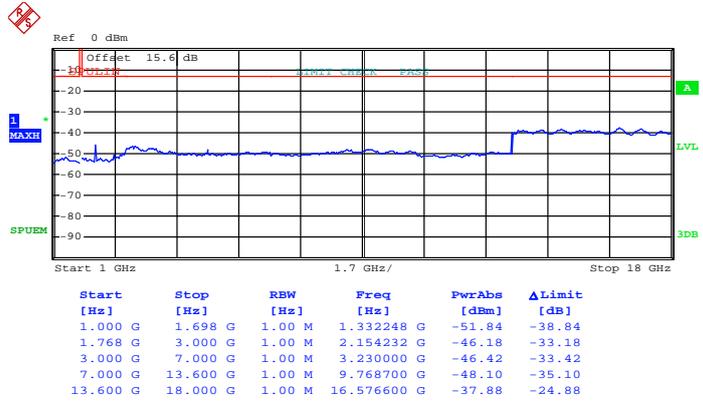
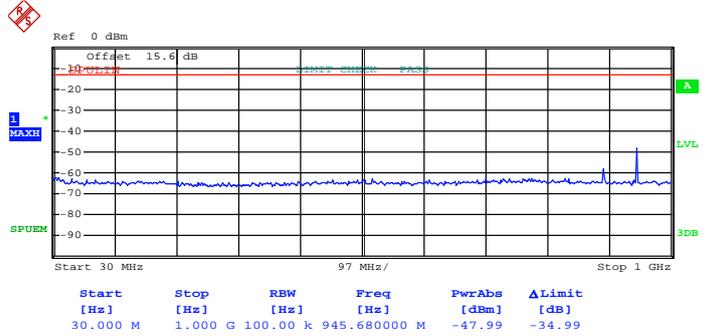
16QAM (RB Size 1, RB Offset 0)





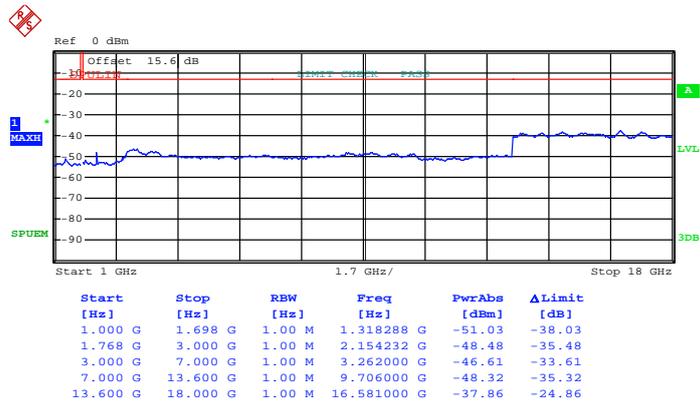
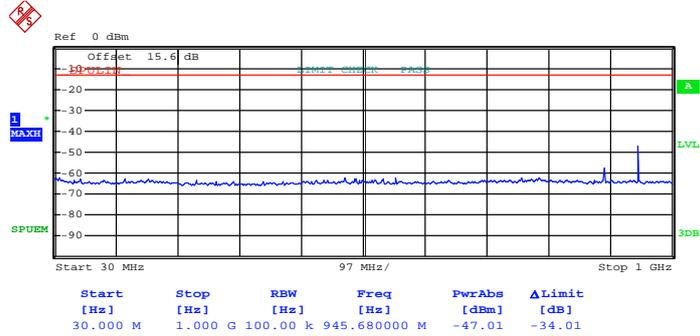
Band :	LTE Band 4	Channel :	CH20393 (High)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)





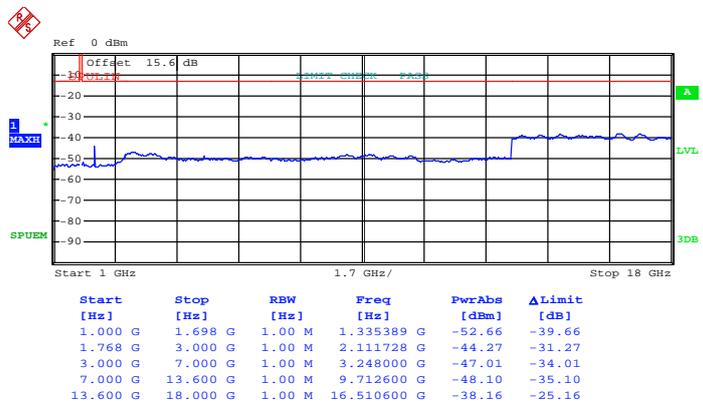
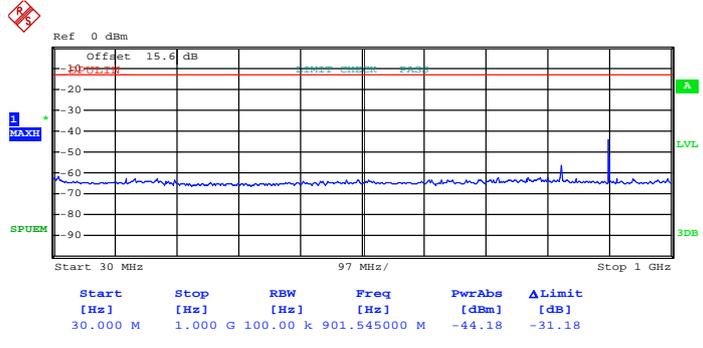
16QAM (RB Size 1, RB Offset 0)





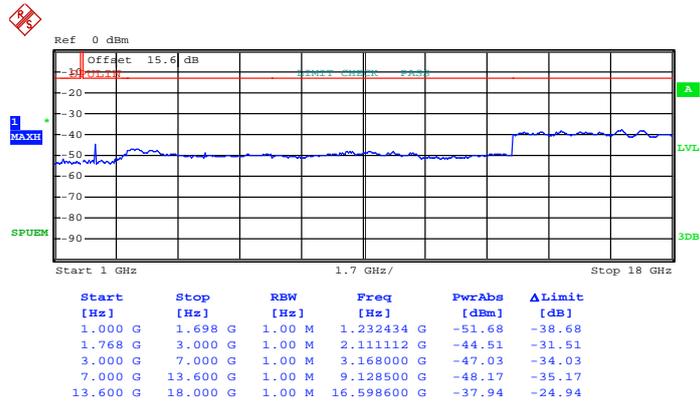
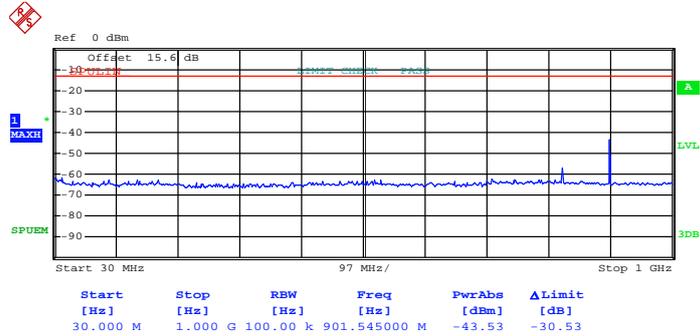
Band :	LTE Band 4	Channel :	CH19965 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





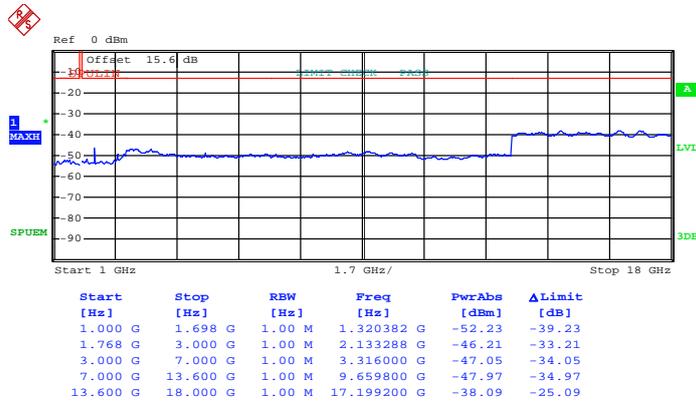
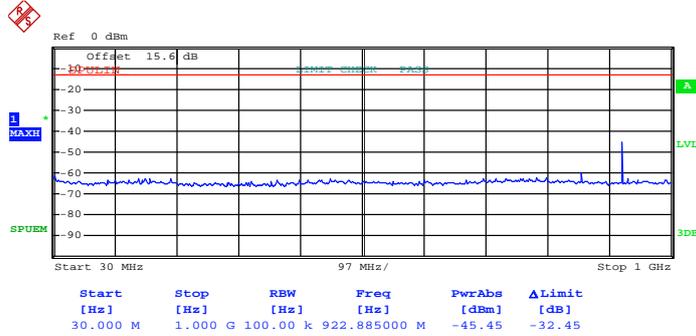
16QAM (RB Size 1, RB Offset 0)





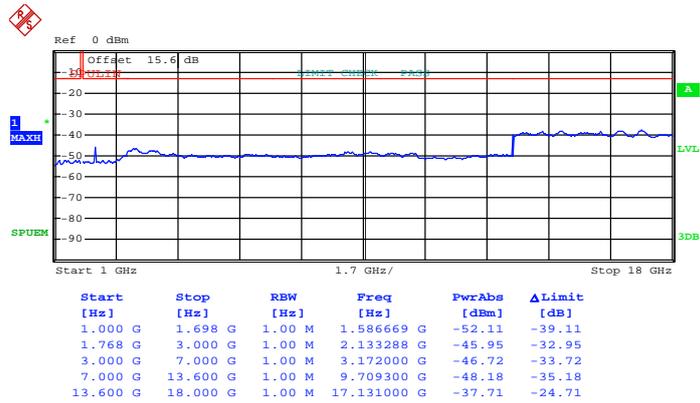
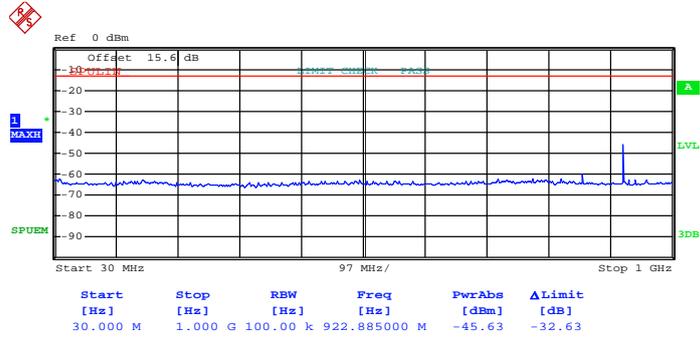
Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





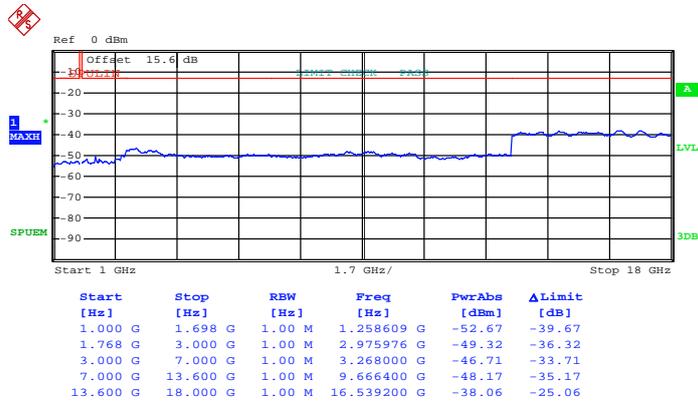
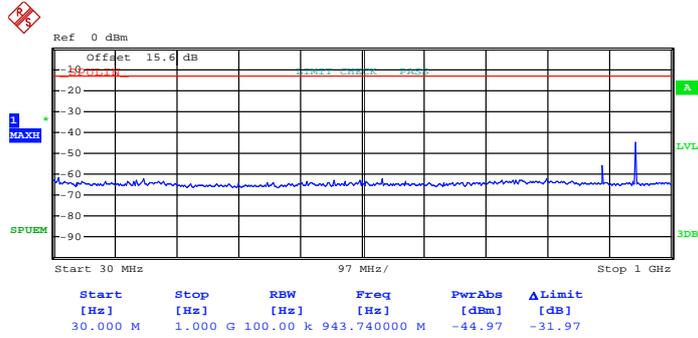
16QAM (RB Size 1, RB Offset 0)





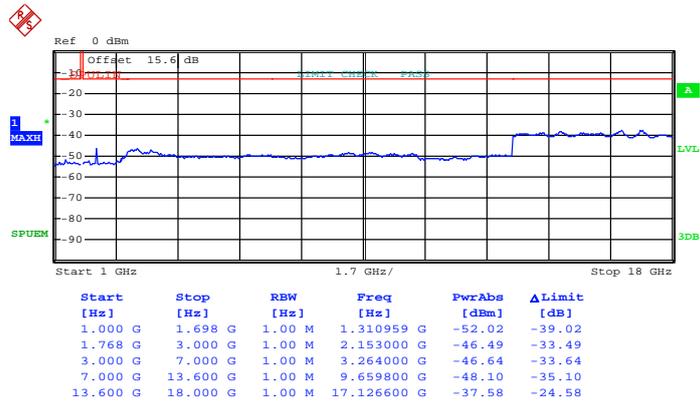
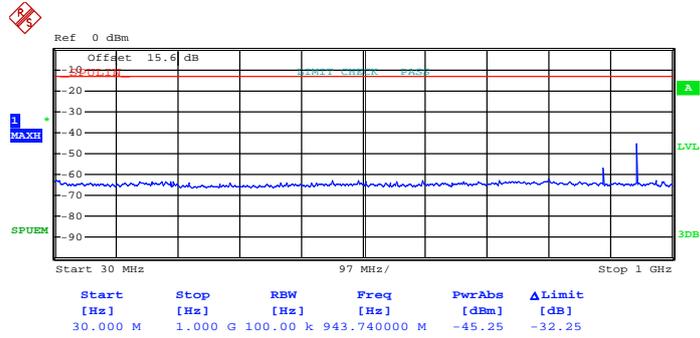
Band :	LTE Band 4	Channel :	CH20385 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





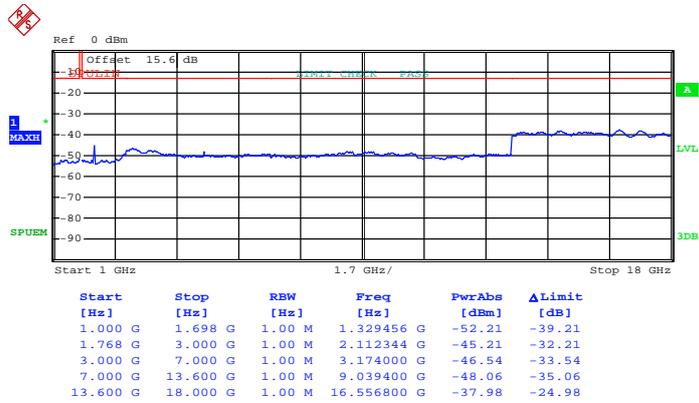
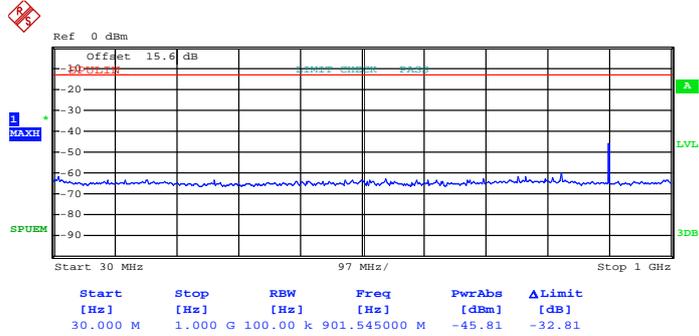
16QAM (RB Size 1, RB Offset 0)





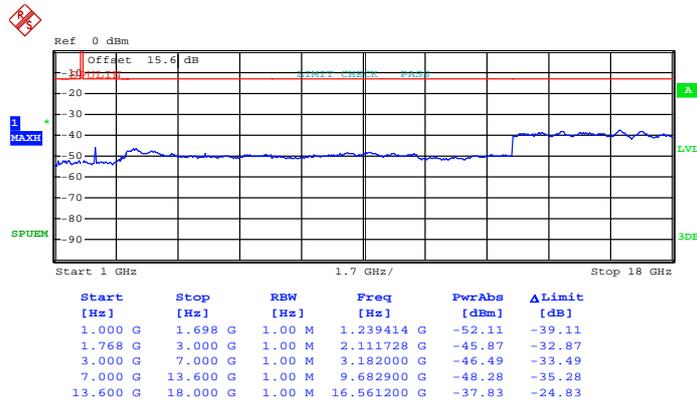
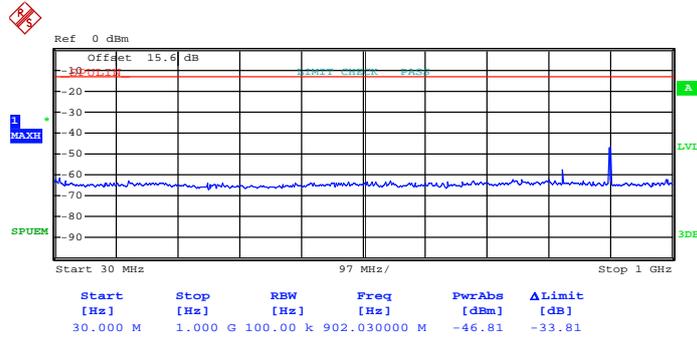
Band :	LTE Band 4	Channel :	CH19975 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





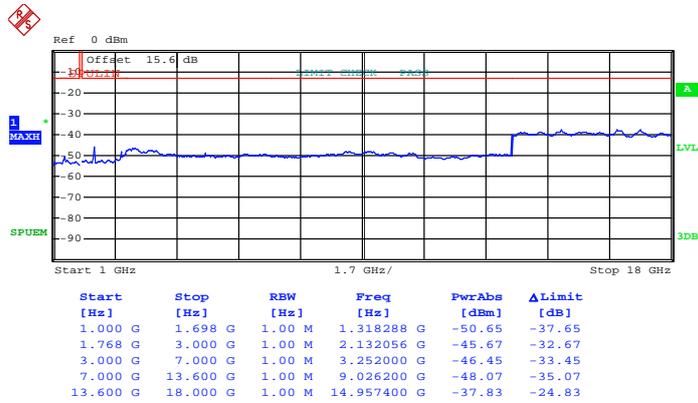
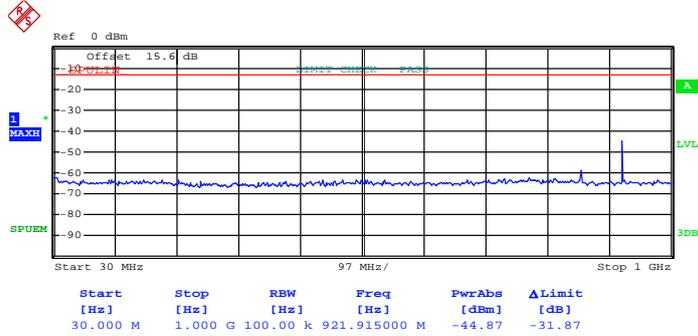
16QAM (RB Size 1, RB Offset 0)





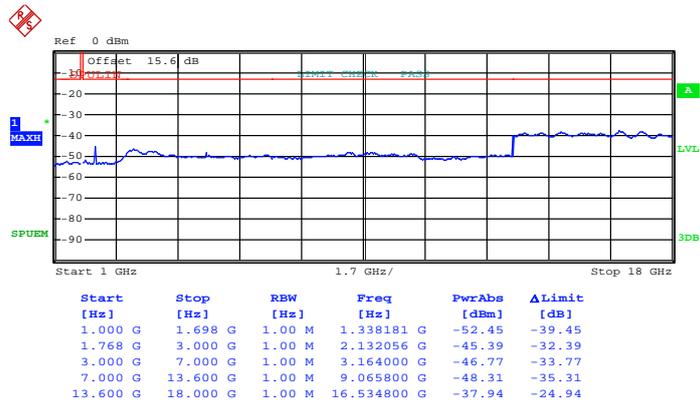
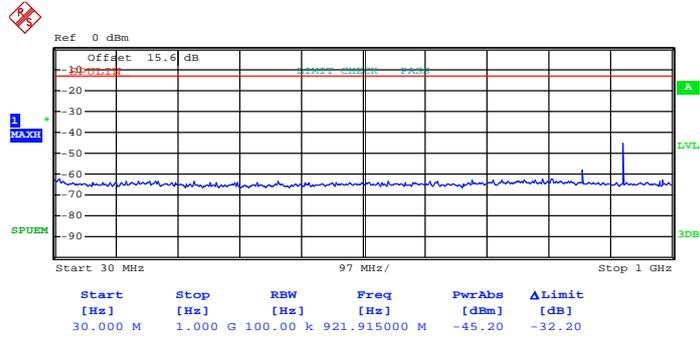
Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





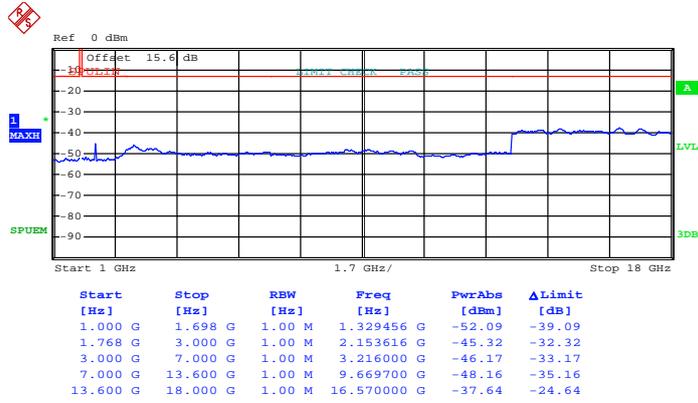
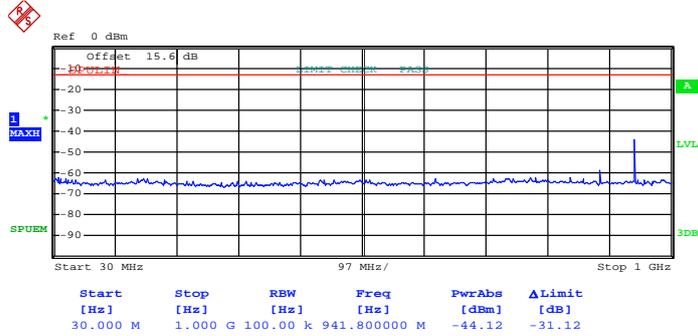
16QAM (RB Size 1, RB Offset 0)





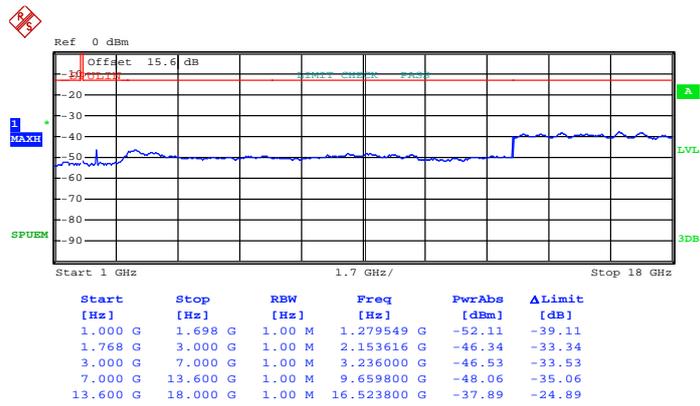
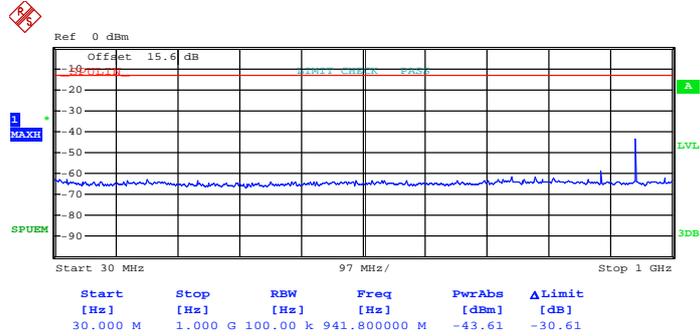
Band :	LTE Band 4	Channel :	CH20375 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





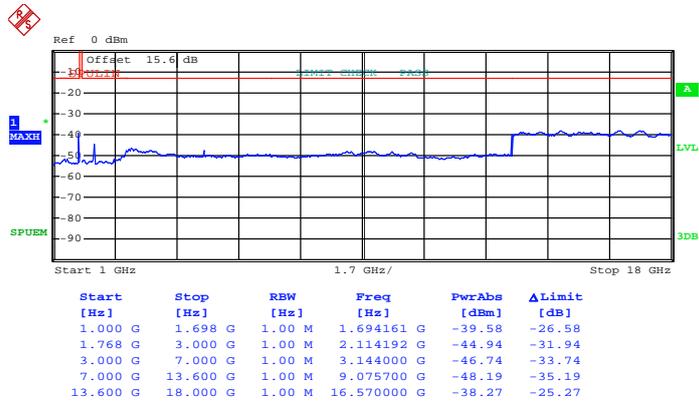
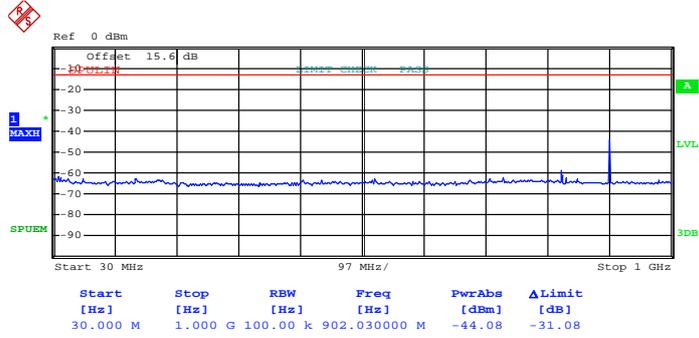
16QAM (RB Size 1, RB Offset 0)





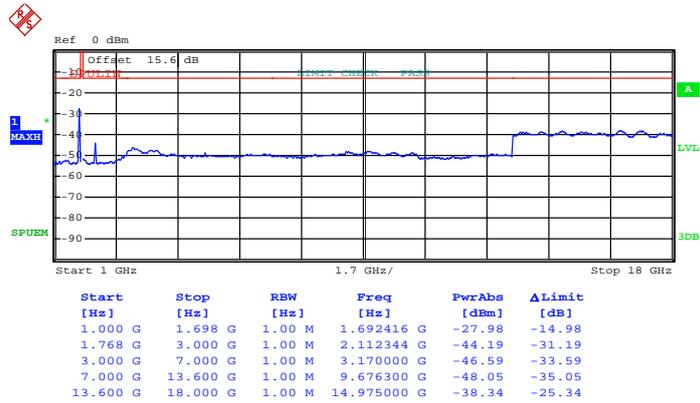
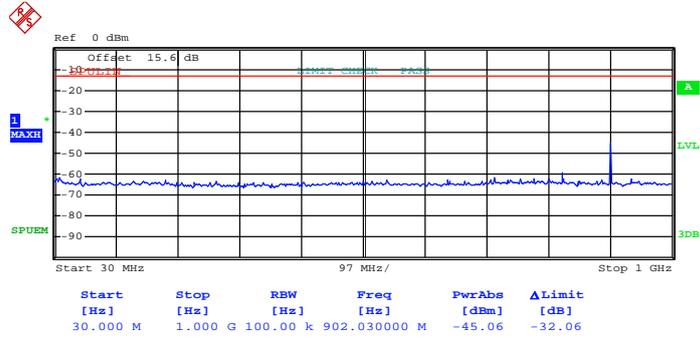
Band :	LTE Band 4	Channel :	CH20000 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)





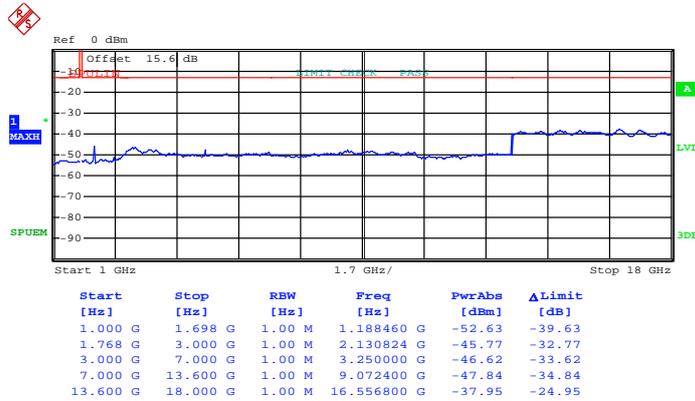
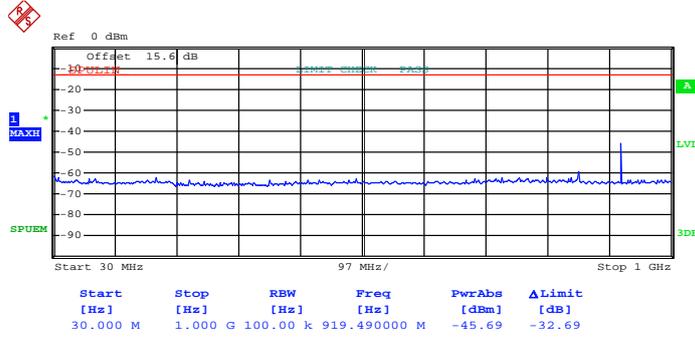
16QAM (RB Size 1, RB Offset 0)





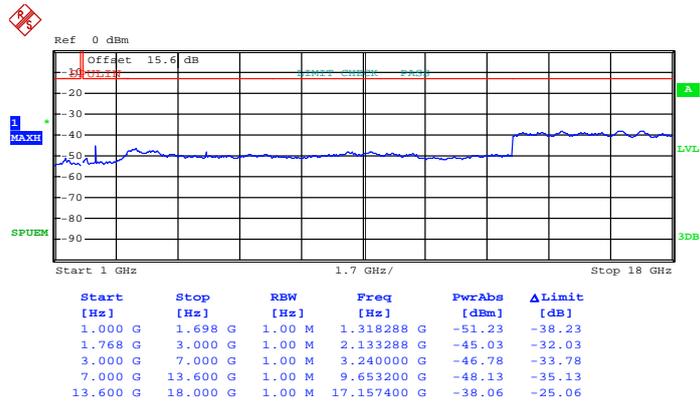
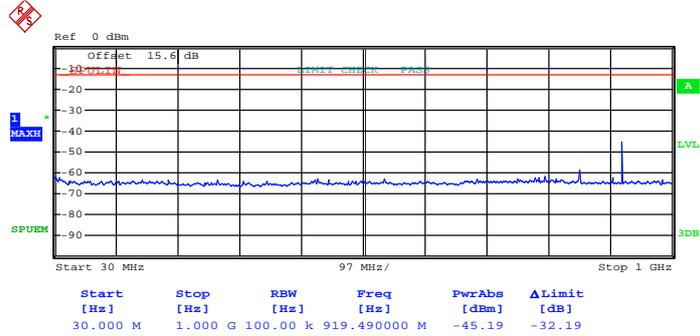
Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)





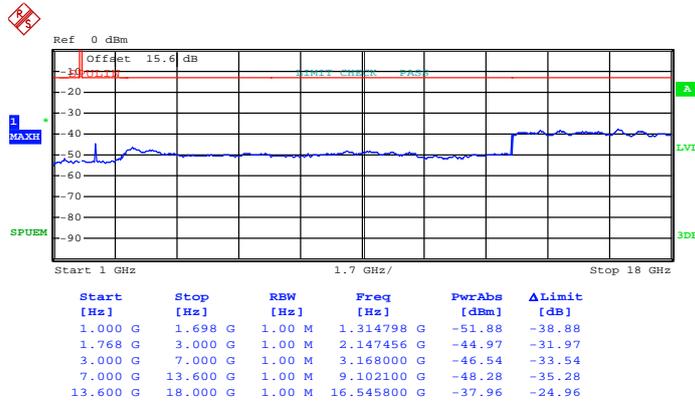
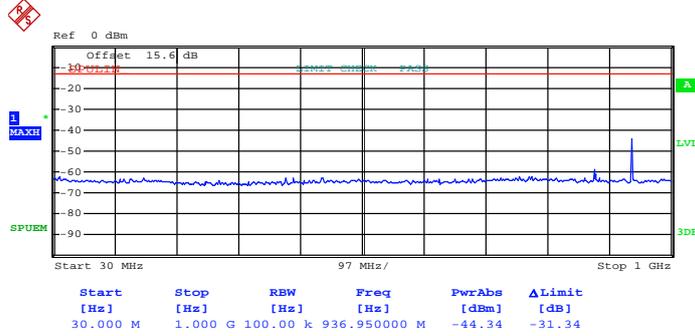
16QAM (RB Size 1, RB Offset 0)





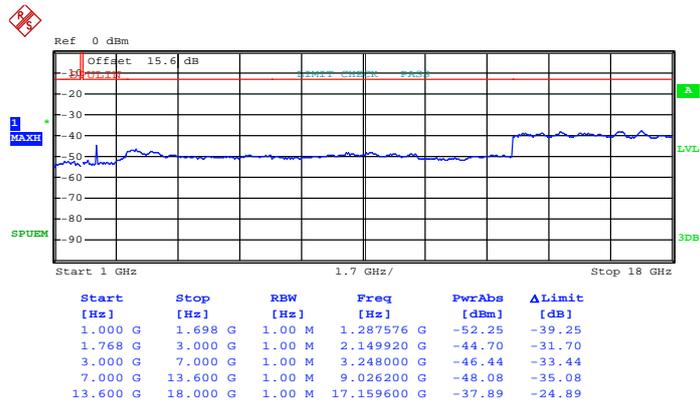
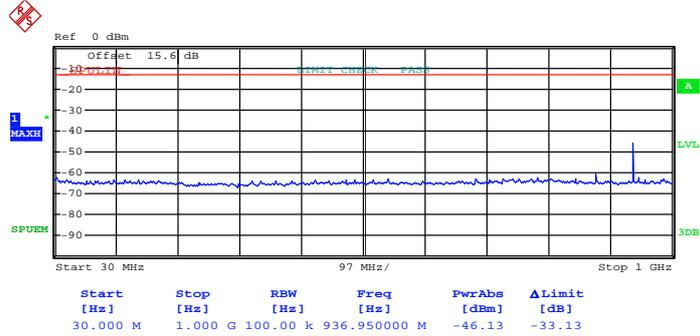
Band :	LTE Band 4	Channel :	CH20350 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)





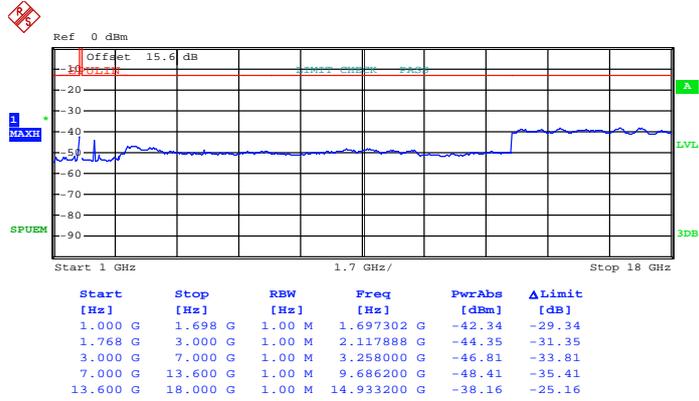
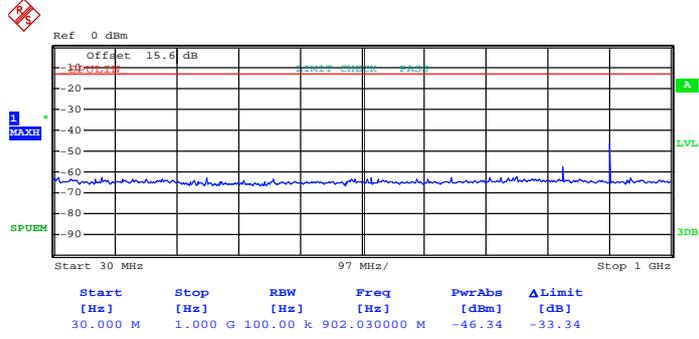
16QAM (RB Size 1, RB Offset 0)





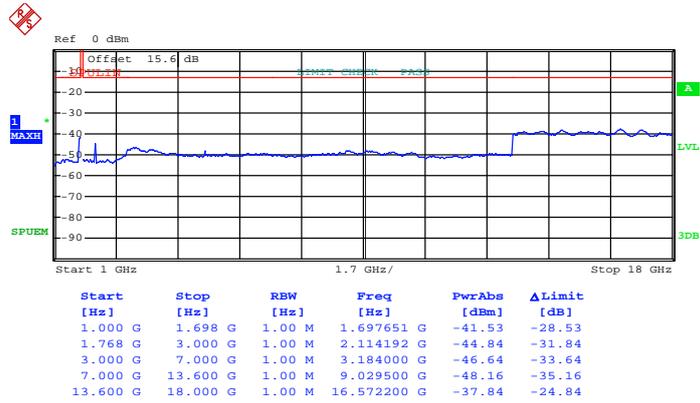
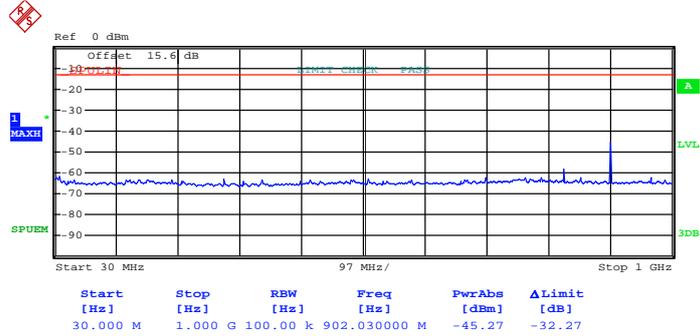
Band :	LTE Band 4	Channel :	CH20025 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 0)





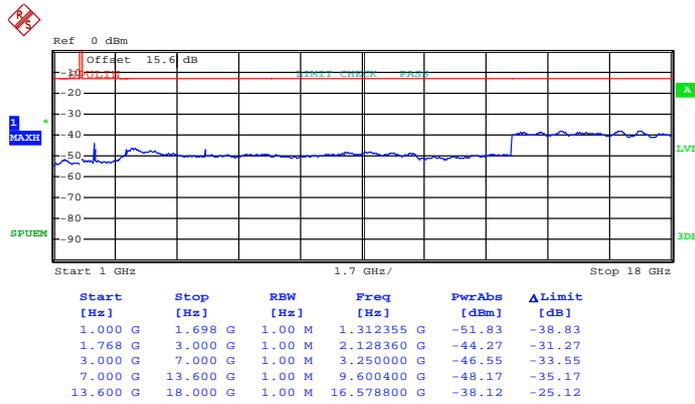
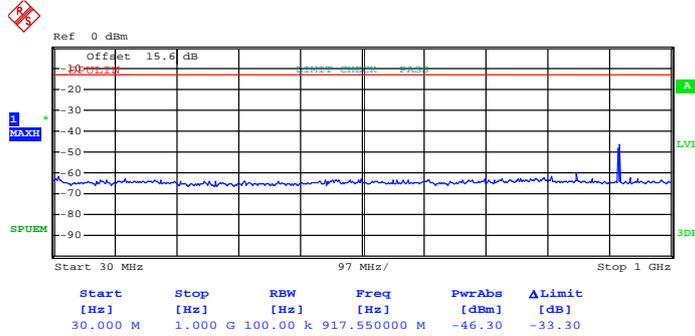
16QAM (RB Size 1, RB Offset 0)





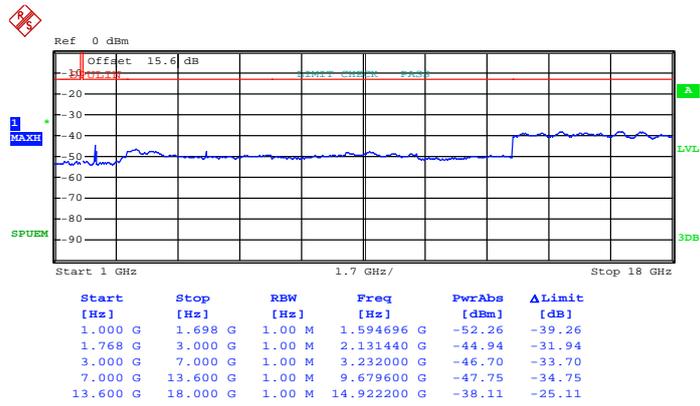
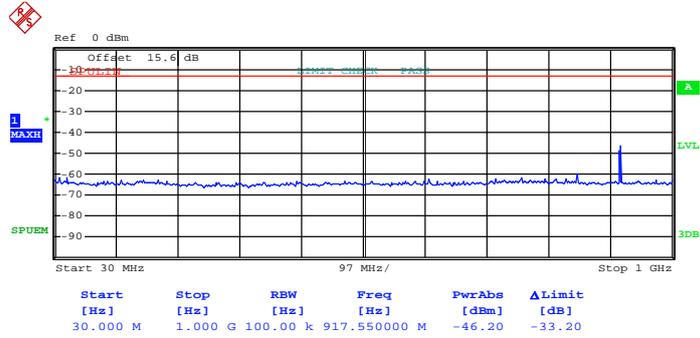
Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 0)





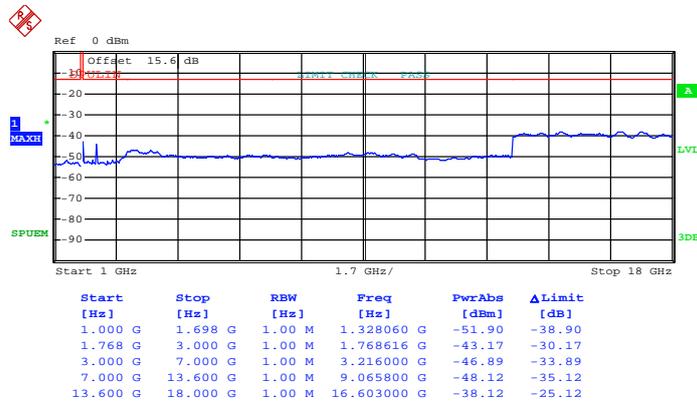
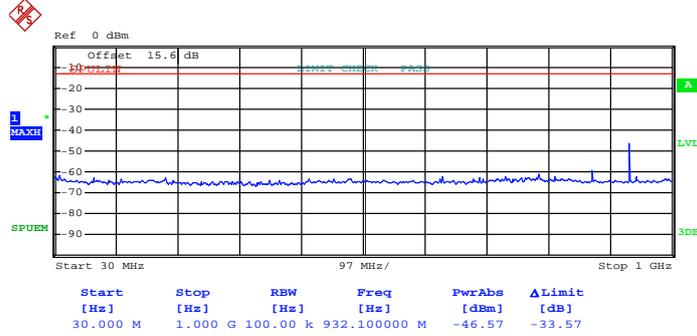
16QAM (RB Size 1, RB Offset 0)





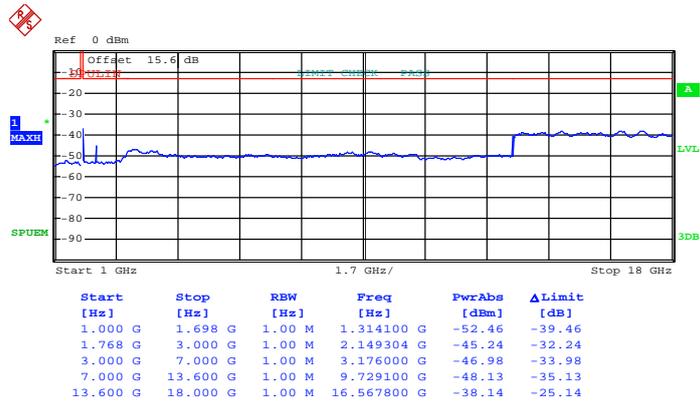
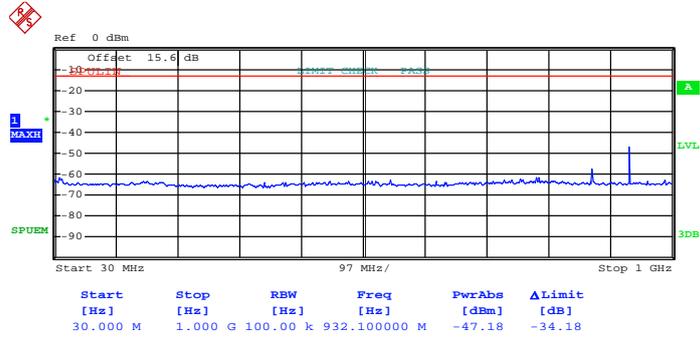
Band :	LTE Band 4	Channel :	CH20325 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 0)





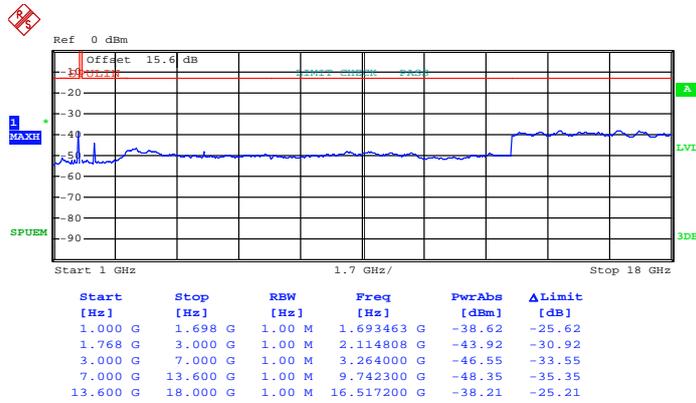
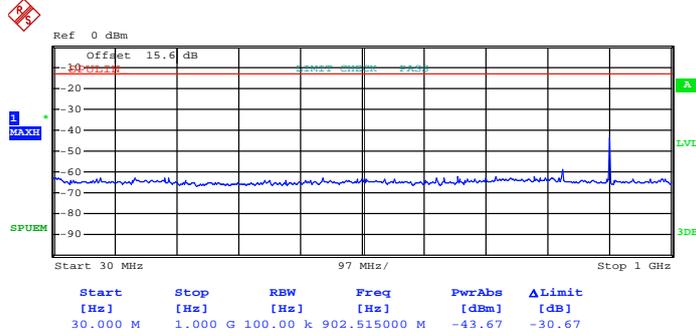
16QAM (RB Size 1, RB Offset 0)





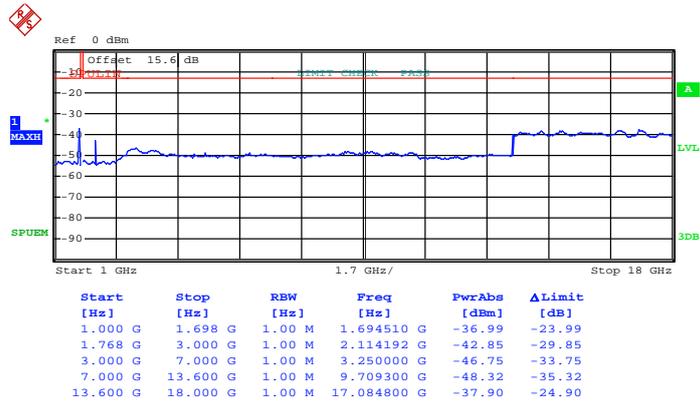
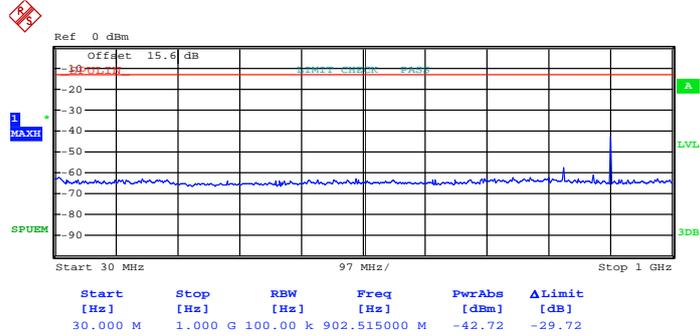
Band :	LTE Band 4	Channel :	CH20050 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)





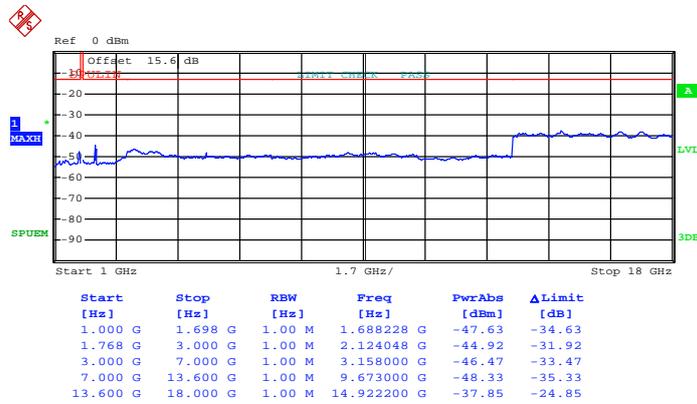
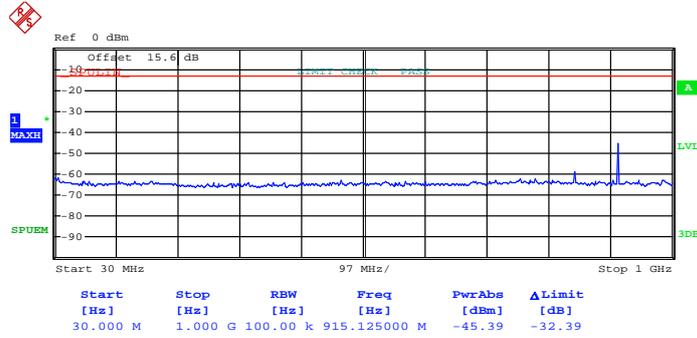
16QAM (RB Size 1, RB Offset 0)





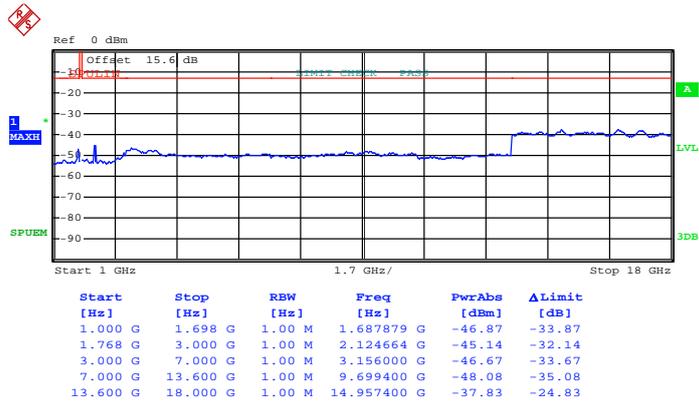
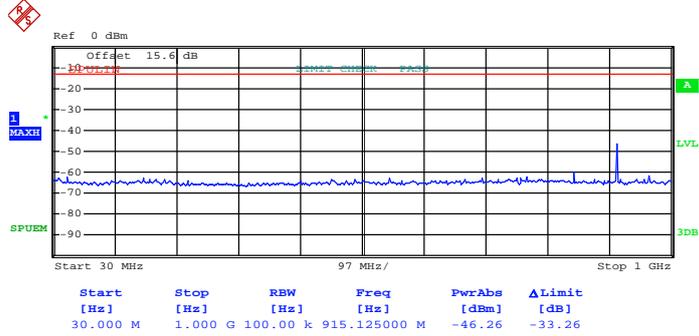
Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)





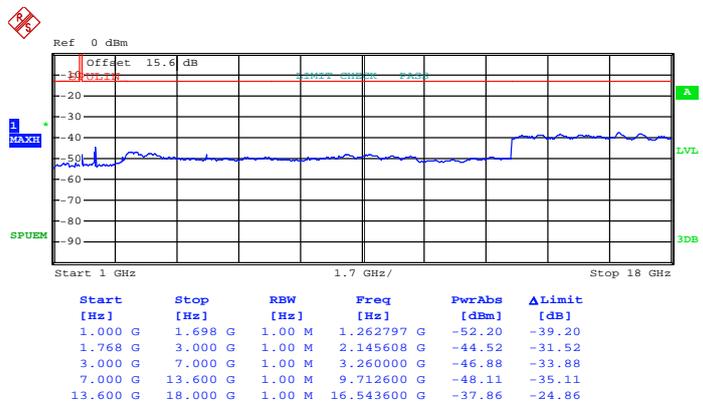
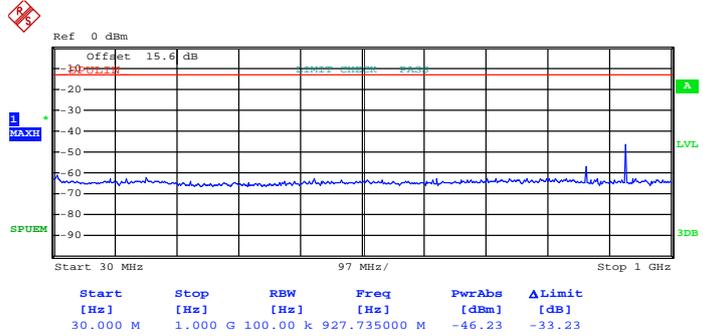
16QAM (RB Size 1, RB Offset 0)





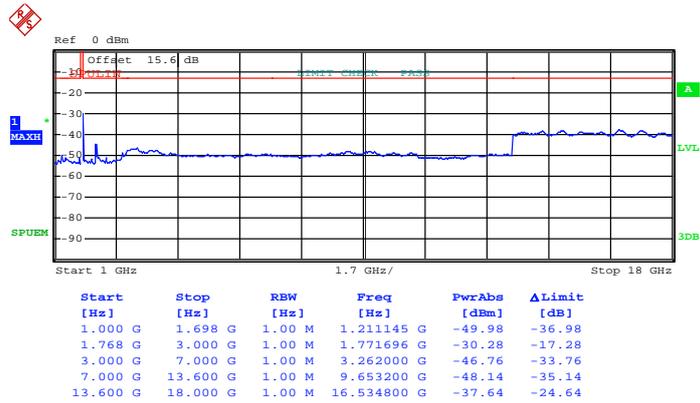
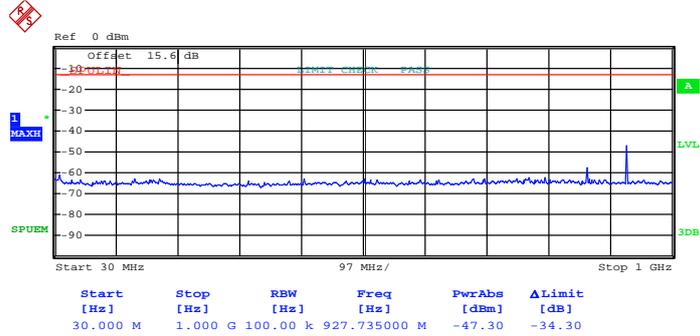
Band :	LTE Band 4	Channel :	CH20300 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)





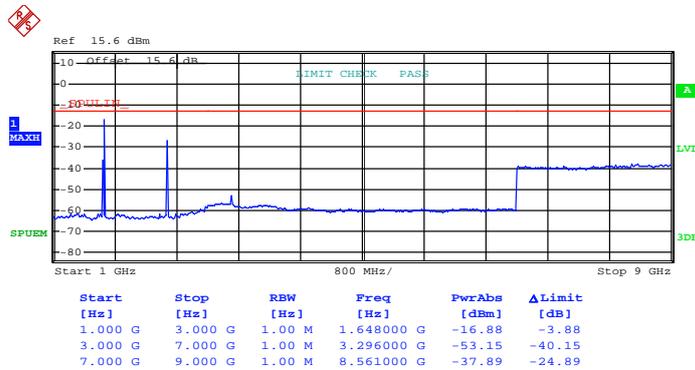
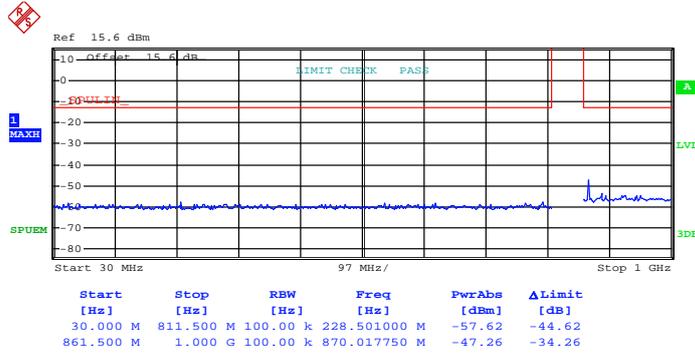
16QAM (RB Size 1, RB Offset 0)





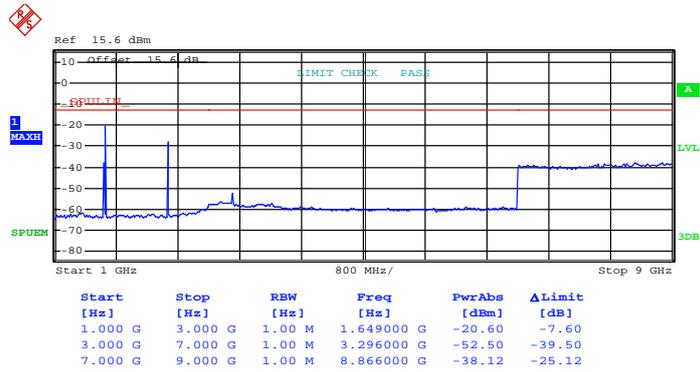
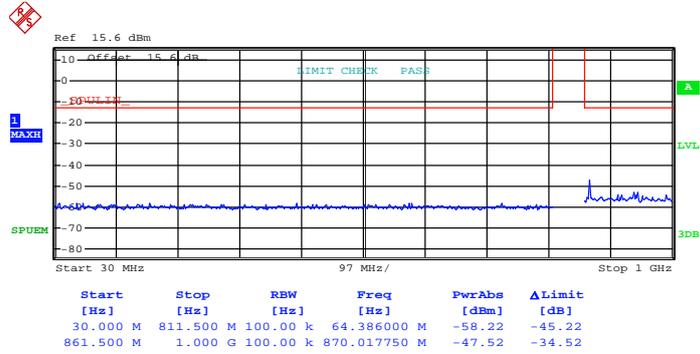
Band :	LTE Band 5	Channel :	CH20407 (Low)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)





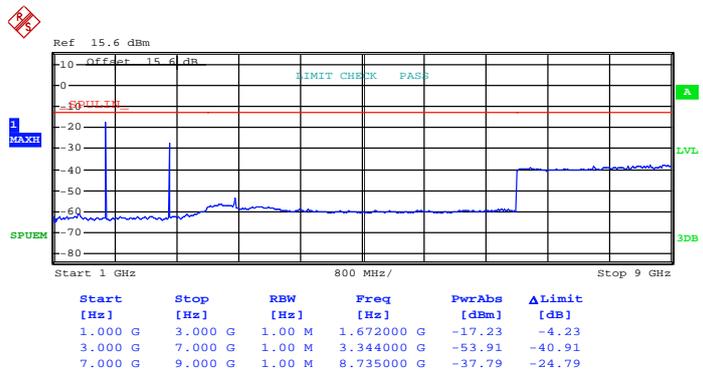
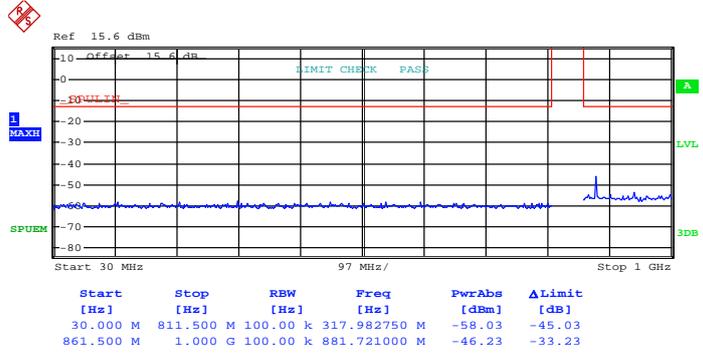
16QAM (RB Size 1, RB Offset 0)





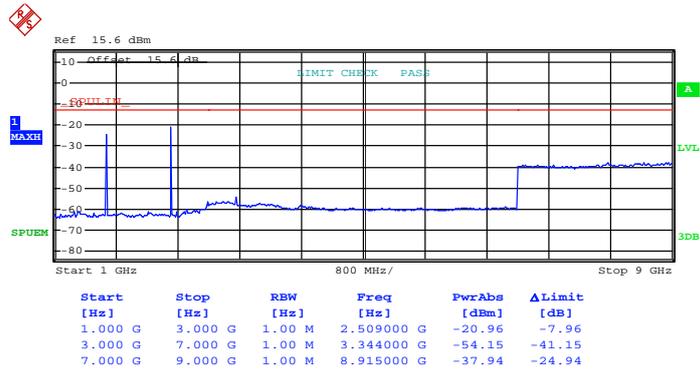
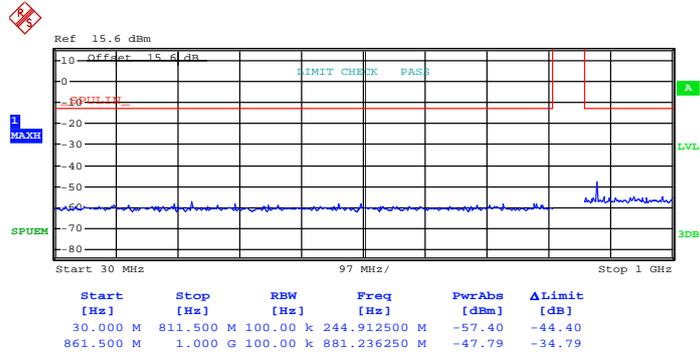
Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)





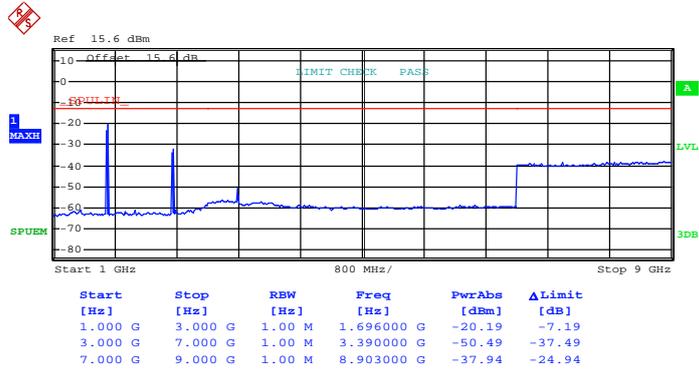
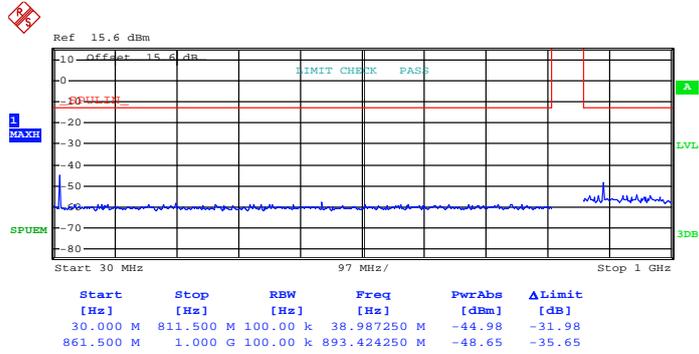
16QAM (RB Size 1, RB Offset 0)





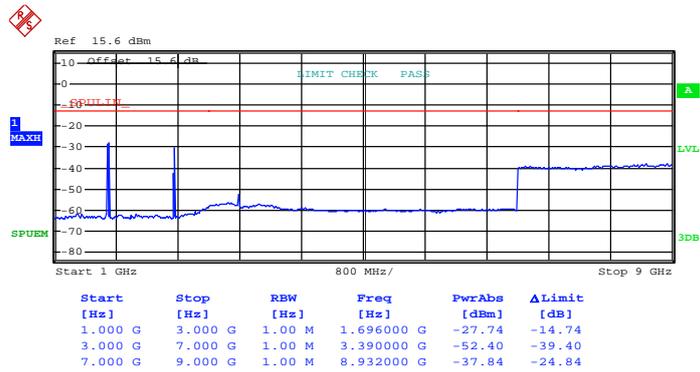
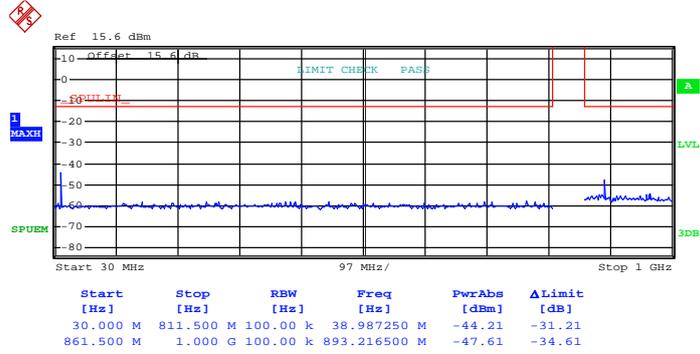
Band :	LTE Band 5	Channel :	CH20643 (High)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)





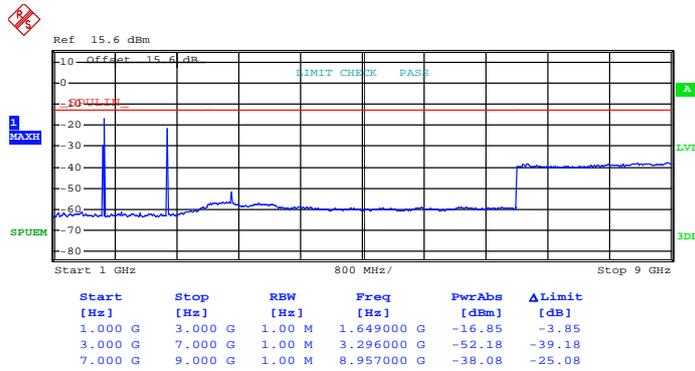
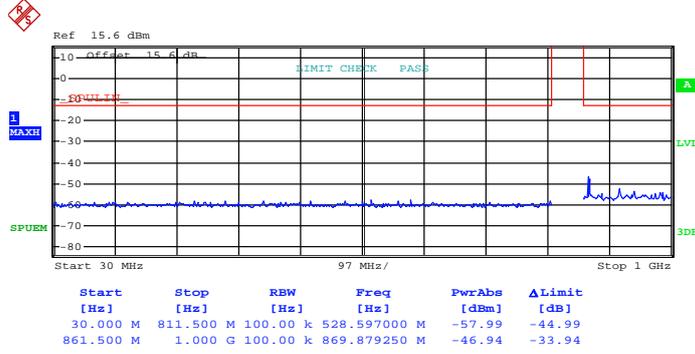
16QAM (RB Size 1, RB Offset 0)





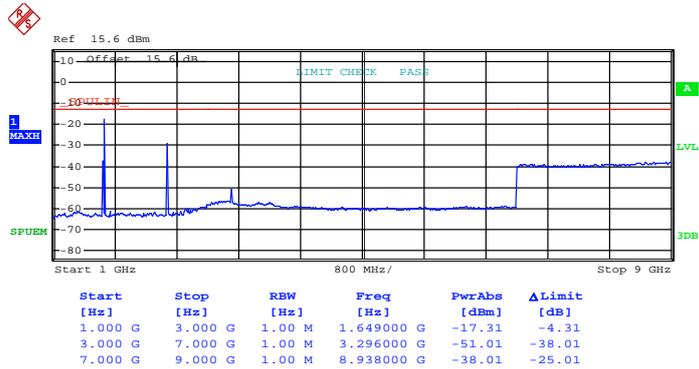
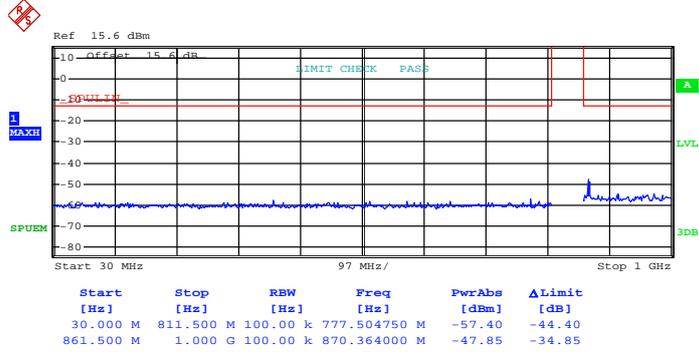
Band :	LTE Band 5	Channel :	CH20415 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





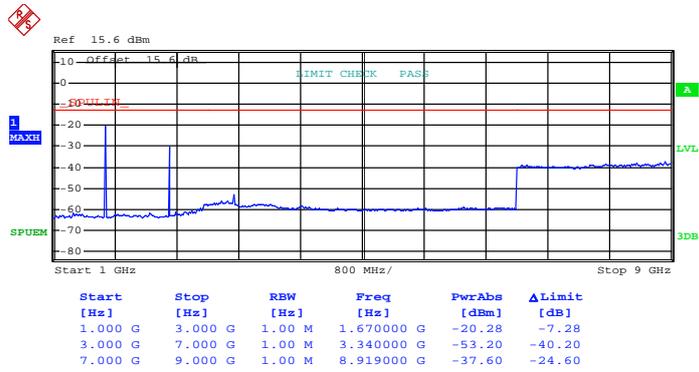
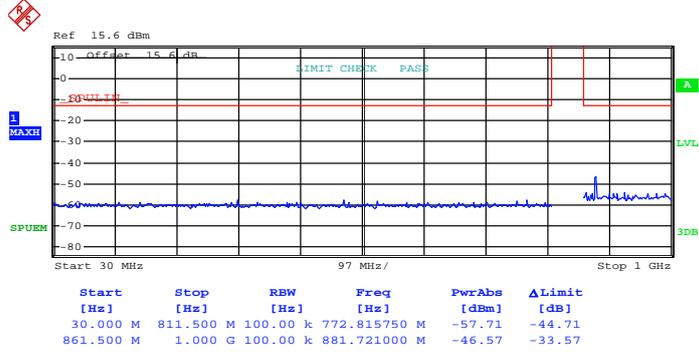
16QAM (RB Size 1, RB Offset 0)





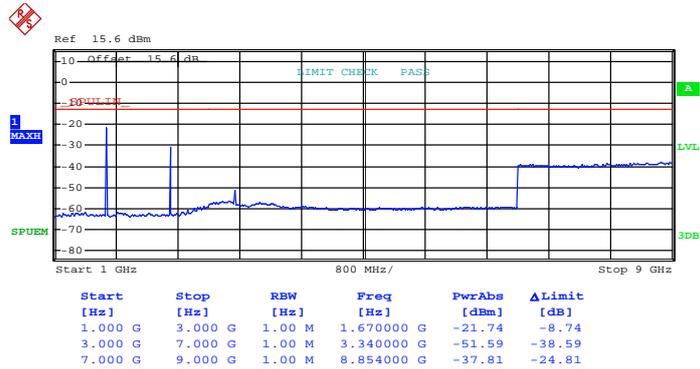
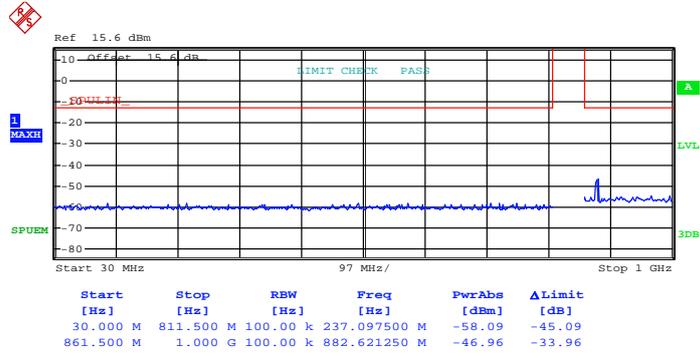
Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





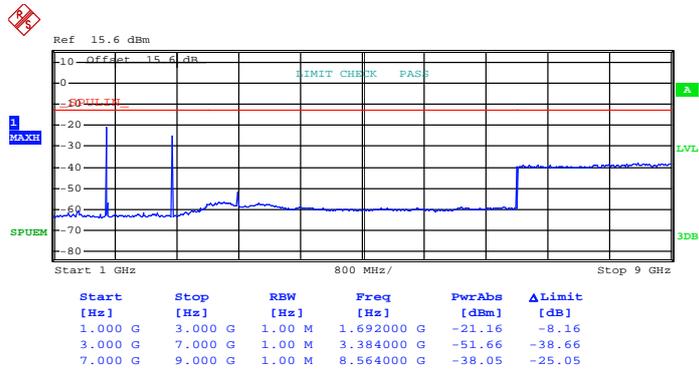
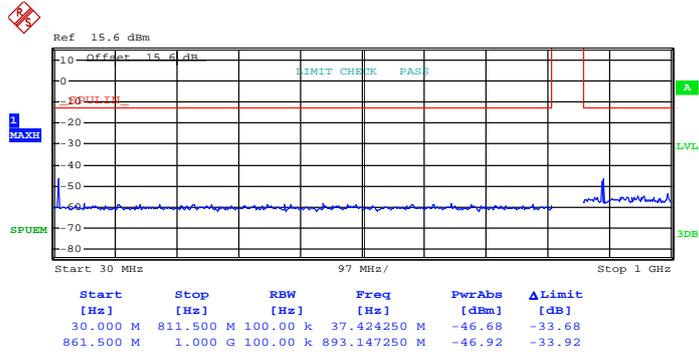
16QAM (RB Size 1, RB Offset 0)





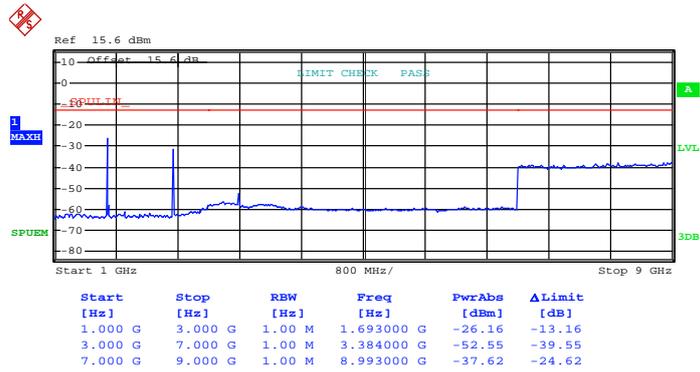
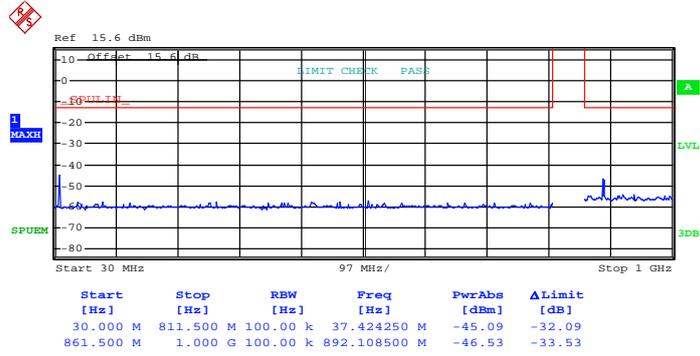
Band :	LTE Band 5	Channel :	CH20635 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





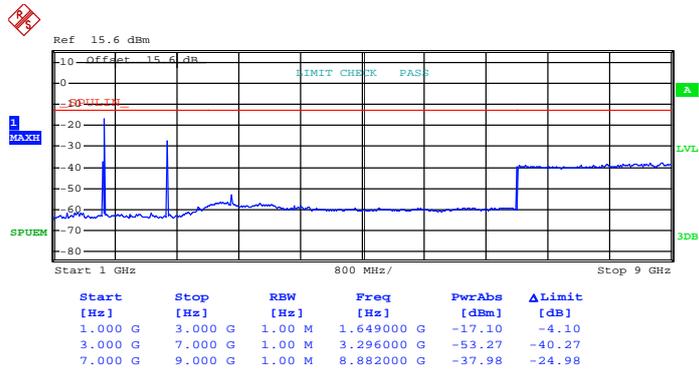
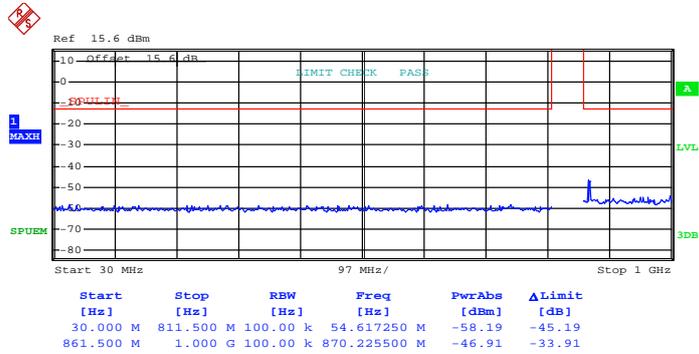
16QAM (RB Size 1, RB Offset 0)





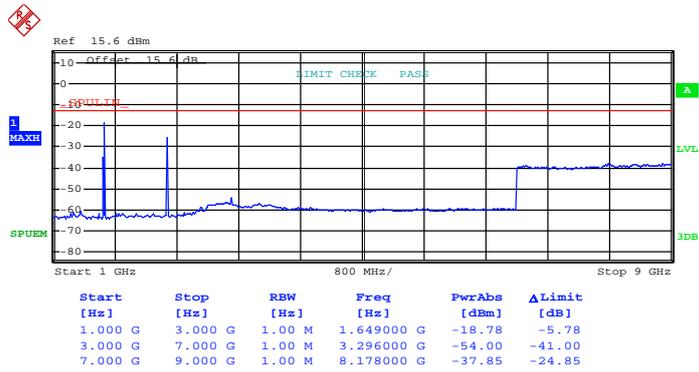
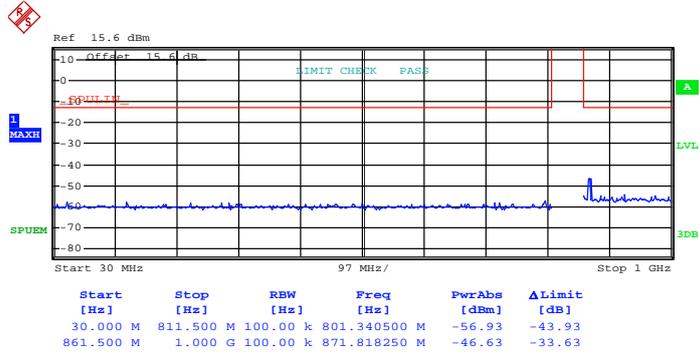
Band :	LTE Band 5	Channel :	CH20425 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





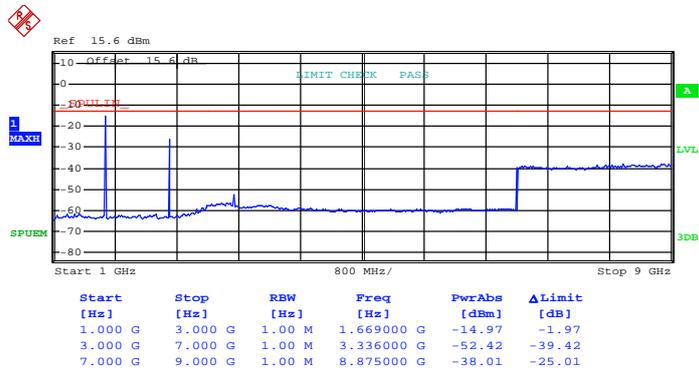
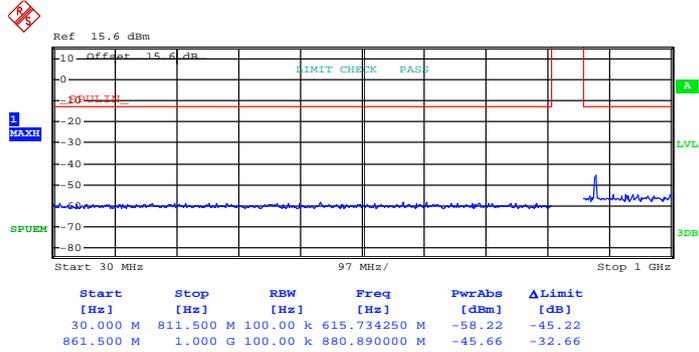
16QAM (RB Size 1, RB Offset 0)





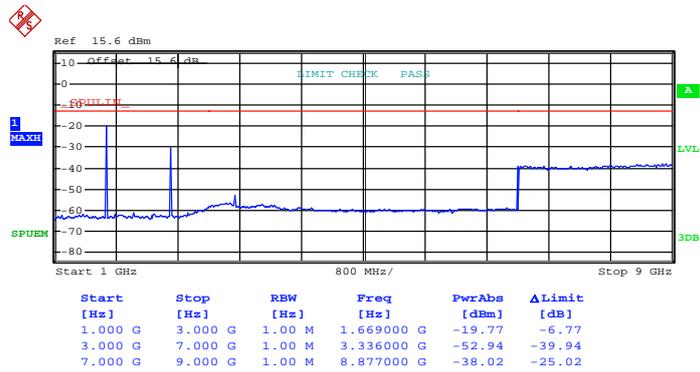
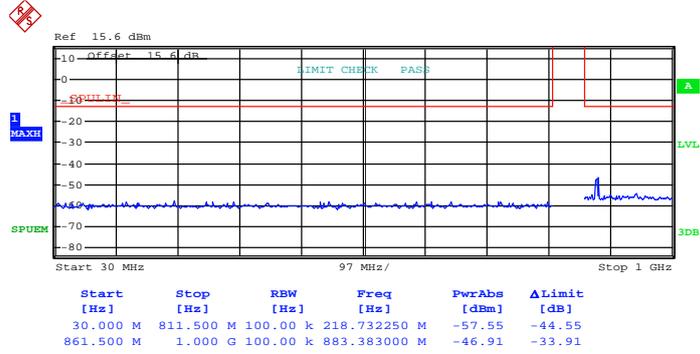
Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





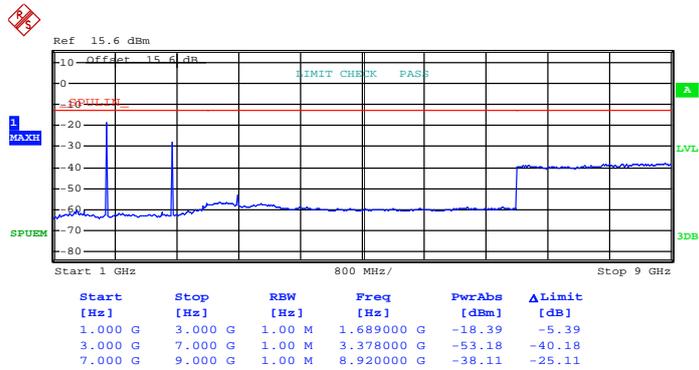
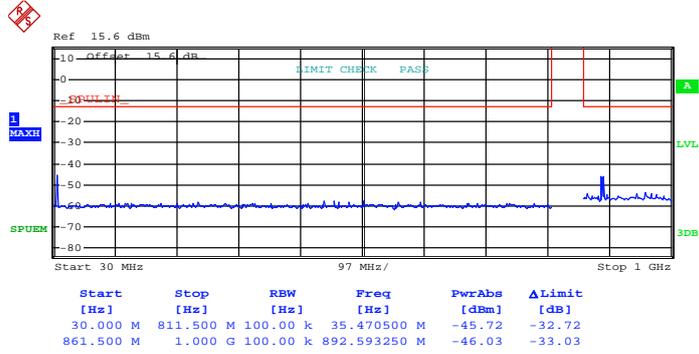
16QAM (RB Size 1, RB Offset 0)





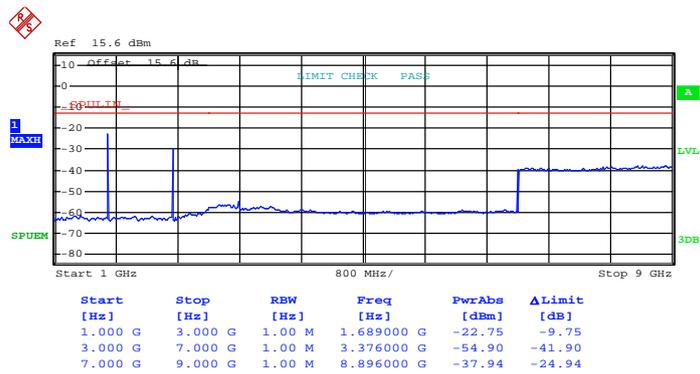
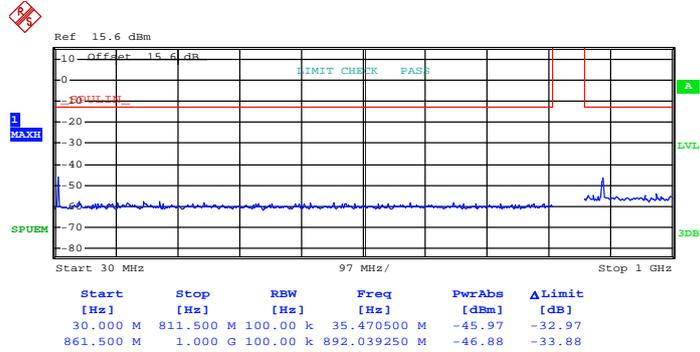
Band :	LTE Band 5	Channel :	CH20625 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





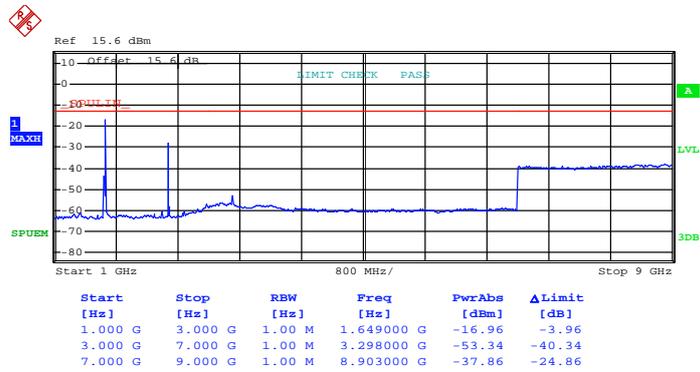
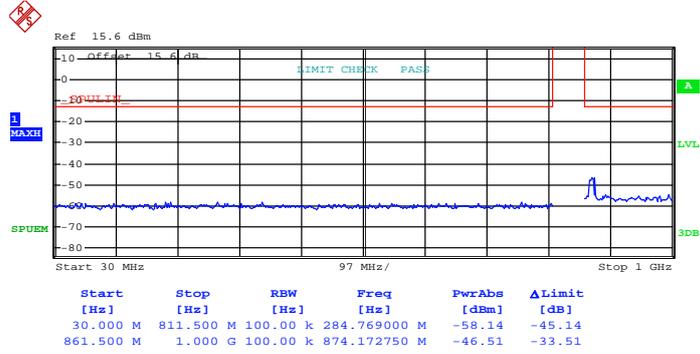
16QAM (RB Size 1, RB Offset 0)





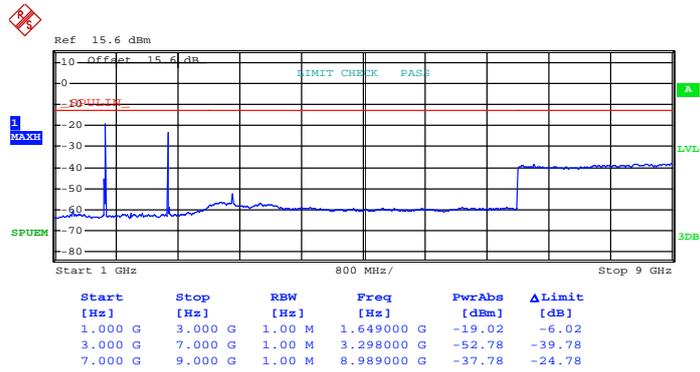
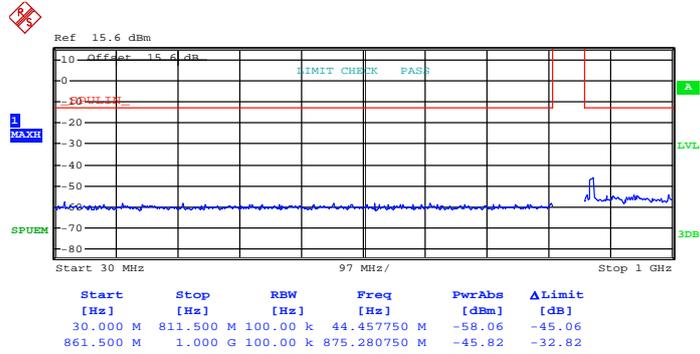
Band :	LTE Band 5	Channel :	CH20450 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)





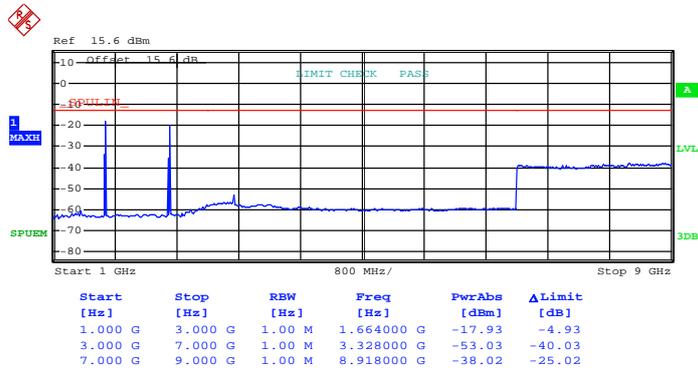
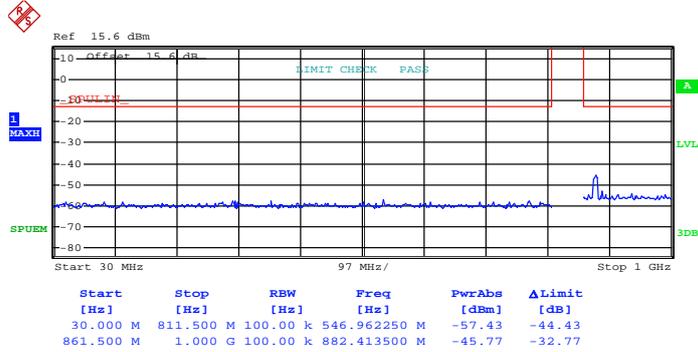
16QAM (RB Size 1, RB Offset 0)





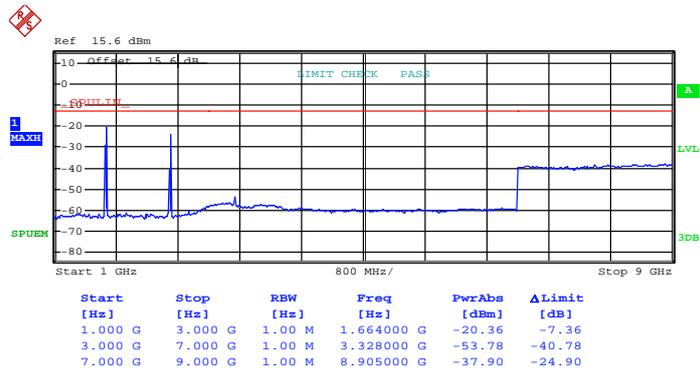
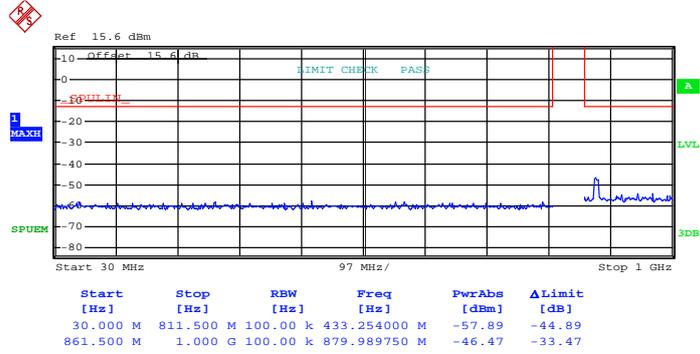
Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)





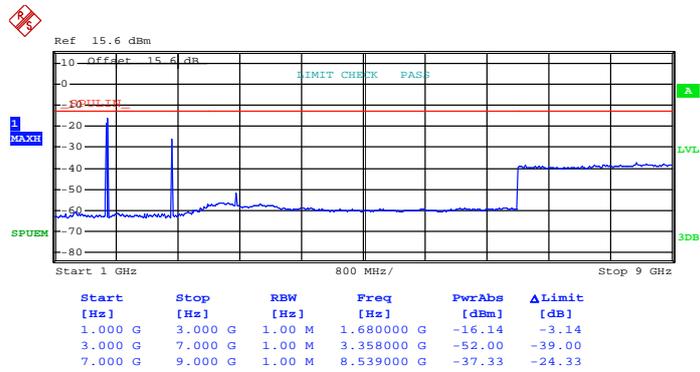
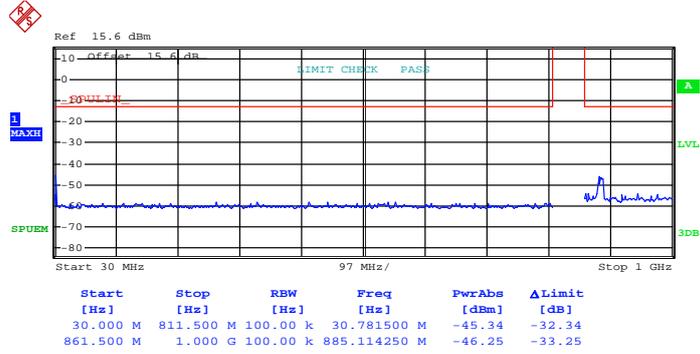
16QAM (RB Size 1, RB Offset 0)





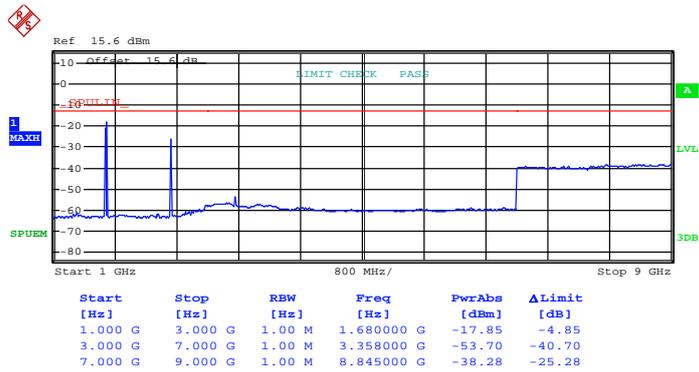
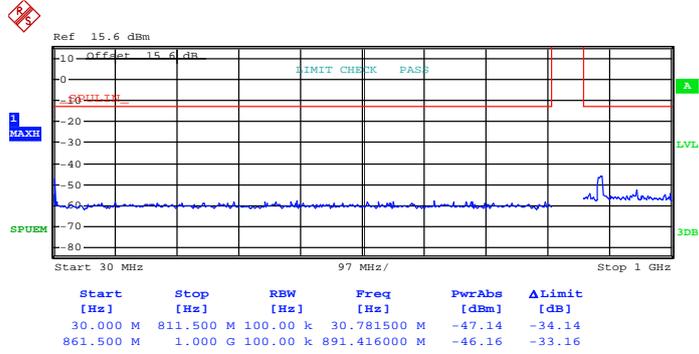
Band :	LTE Band 5	Channel :	CH20600 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)





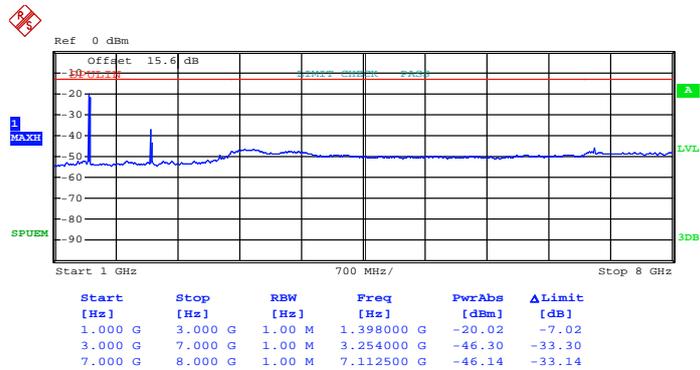
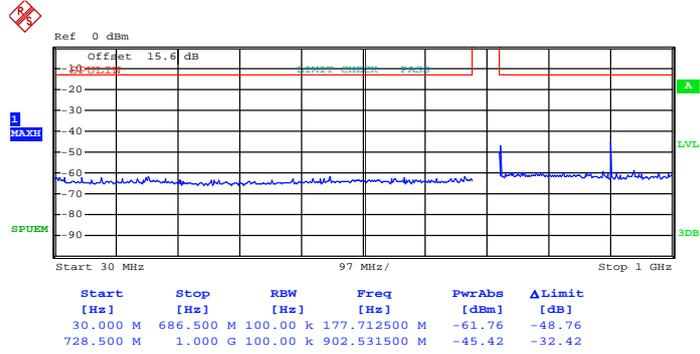
16QAM (RB Size 1, RB Offset 0)





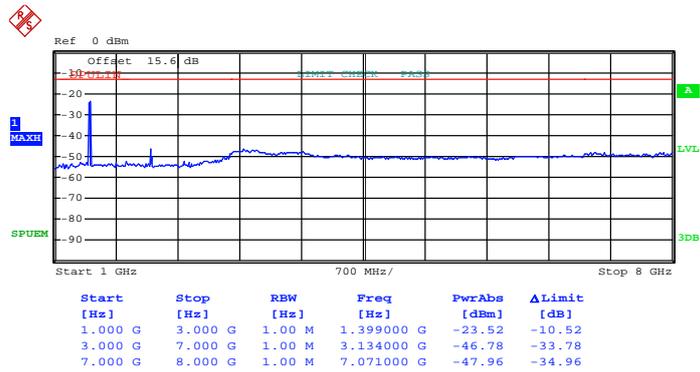
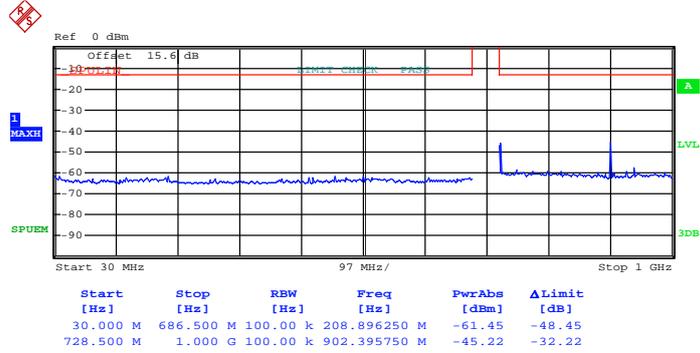
Band :	LTE Band 12	Channel :	CH23017 (Low)
Band Width :	1.4MHz		

QPSK (RB Size 3, RB Offset 0)





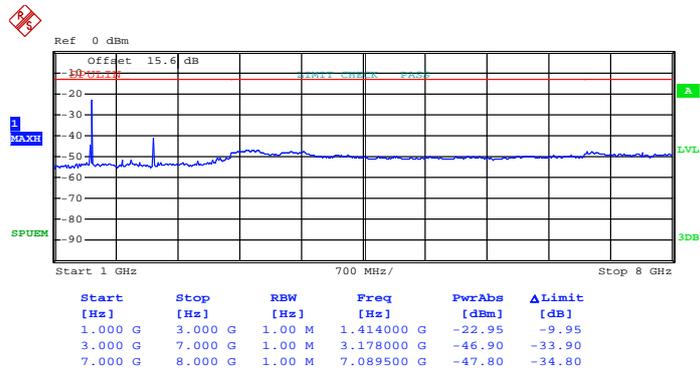
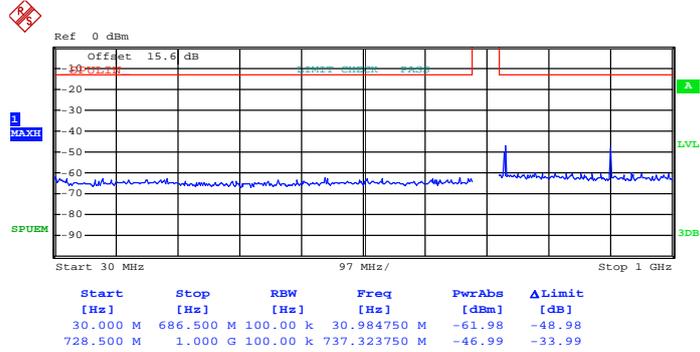
16QAM (RB Size 1, RB Offset 5)





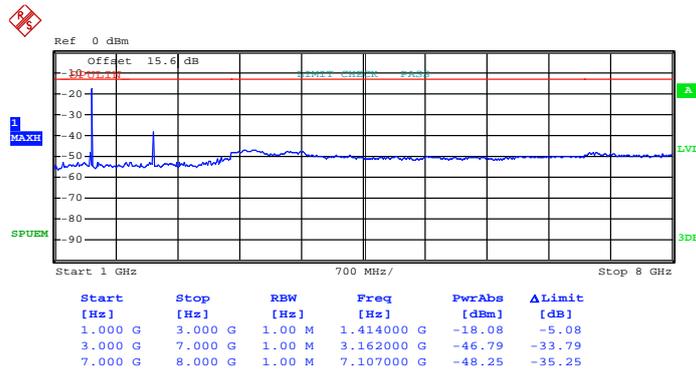
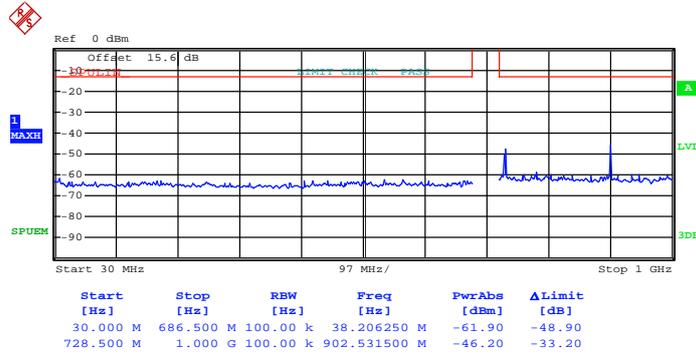
Band :	LTE Band 12	Channel :	CH23095 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)





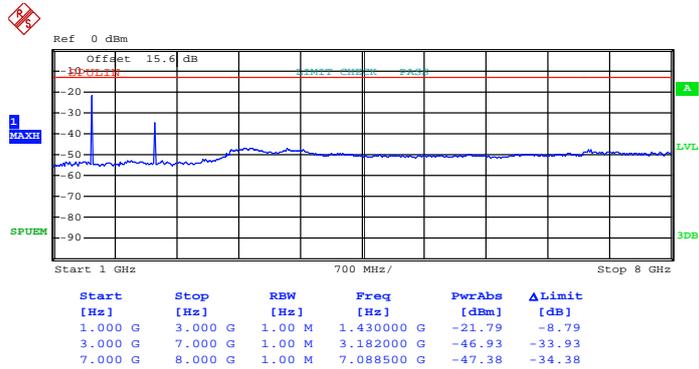
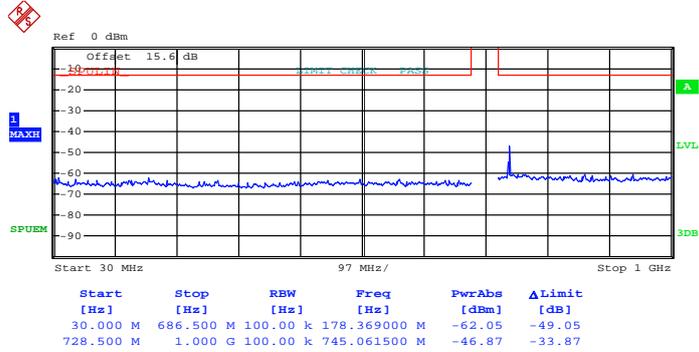
16QAM (RB Size 1, RB Offset 5)





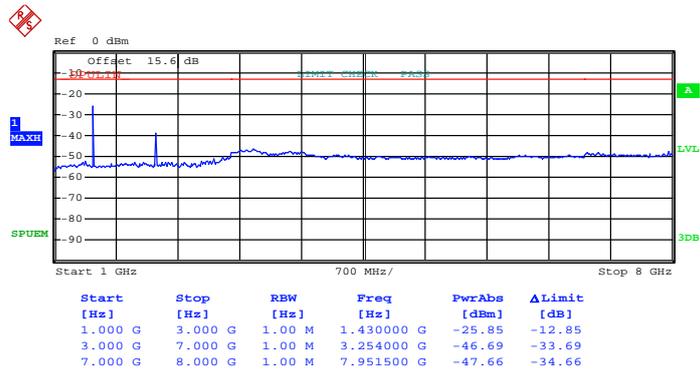
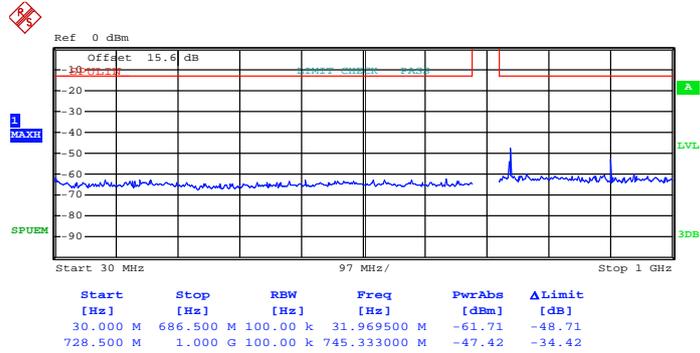
Band :	LTE Band 12	Channel :	CH23173 (High)
Band Width :	1.4MHz		

QPSK (RB Size 3, RB Offset 1)





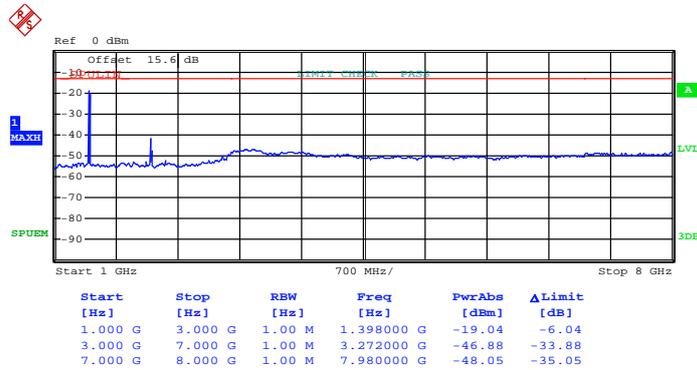
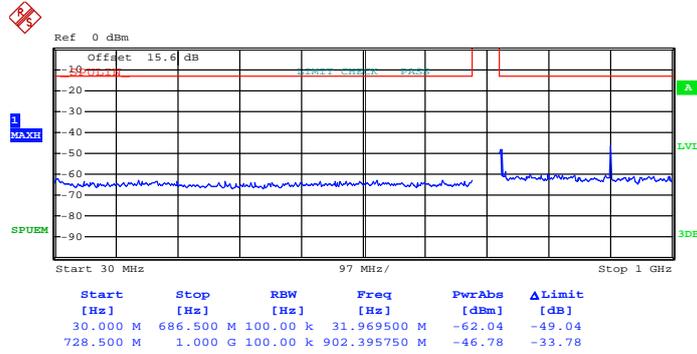
16QAM (RB Size 3, RB Offset 2)





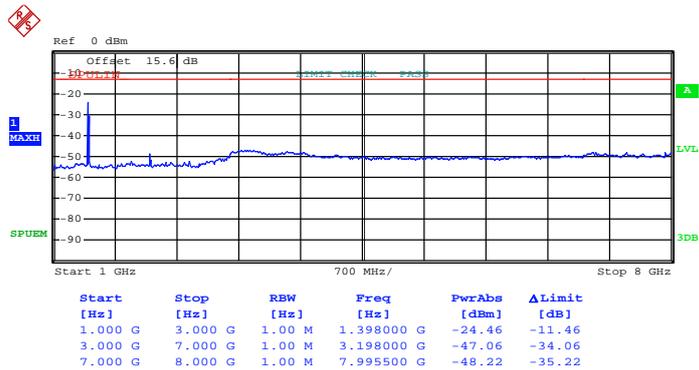
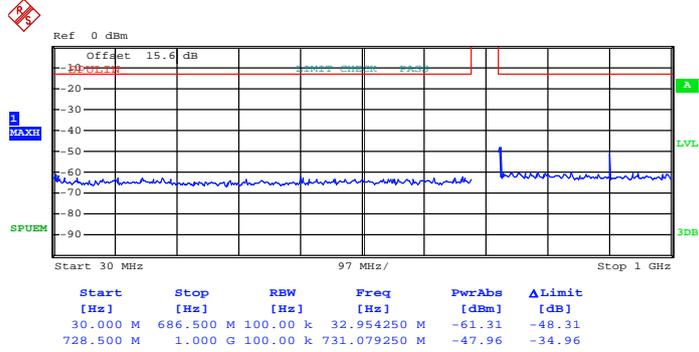
Band :	LTE Band 12	Channel :	CH23025 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)





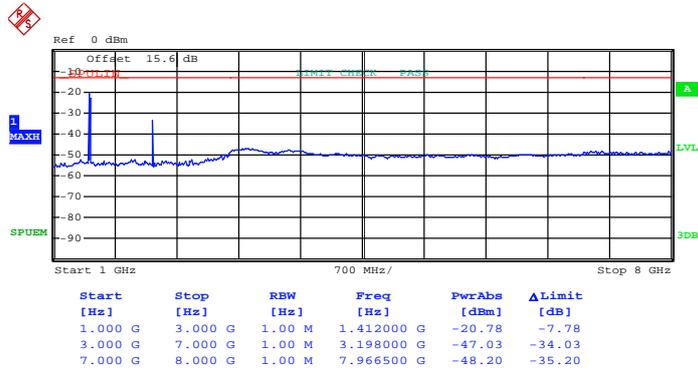
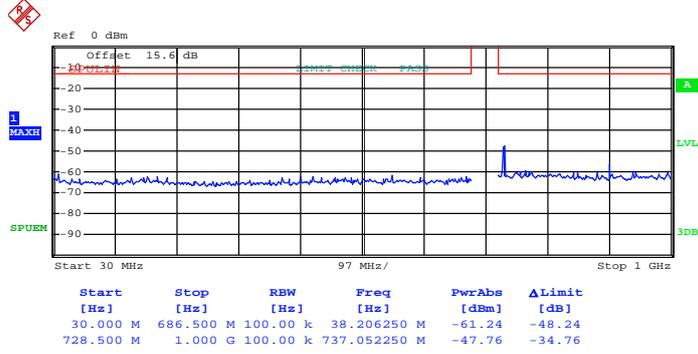
16QAM (RB Size 1, RB Offset 14)





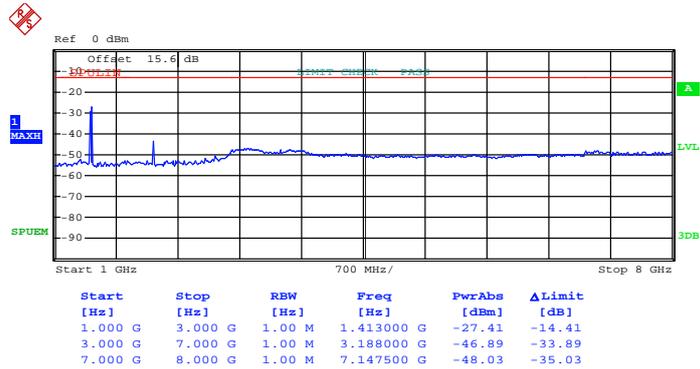
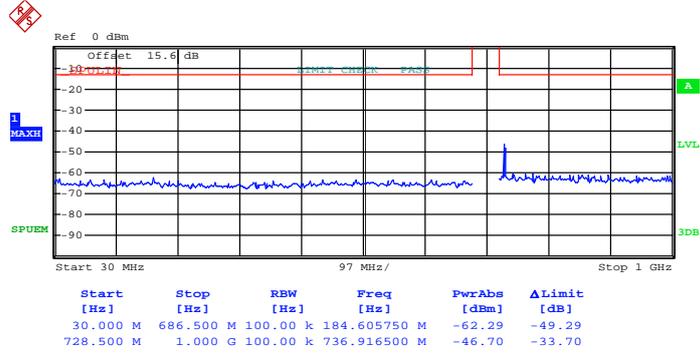
Band :	LTE Band 12	Channel :	CH23095 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)





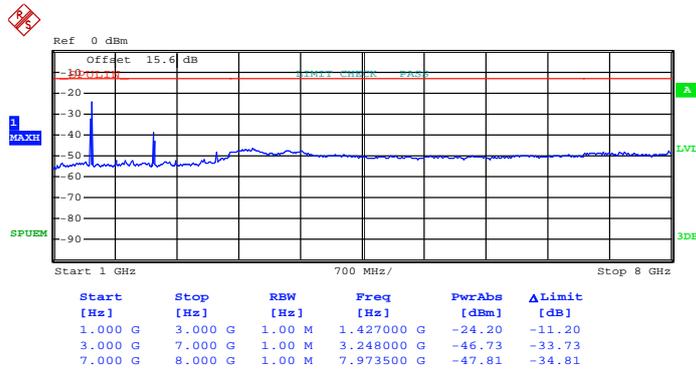
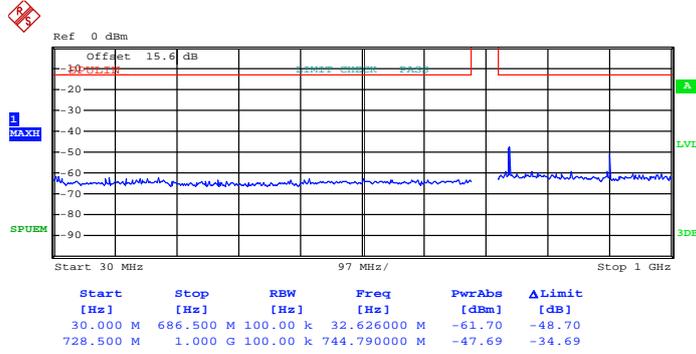
16QAM (RB Size 1, RB Offset 0)





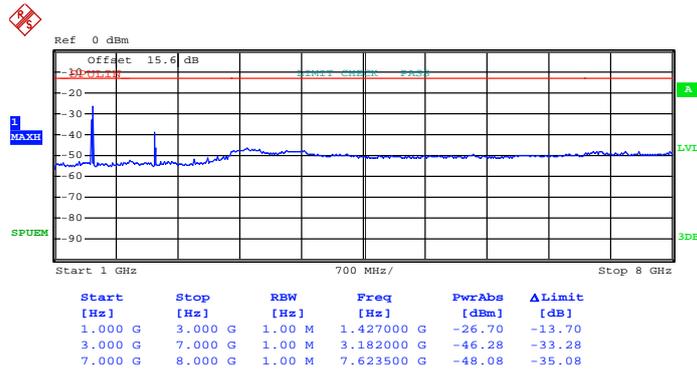
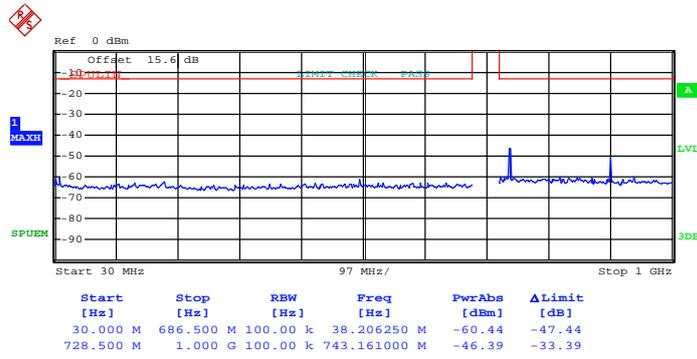
Band :	LTE Band 12	Channel :	CH23165 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 7)





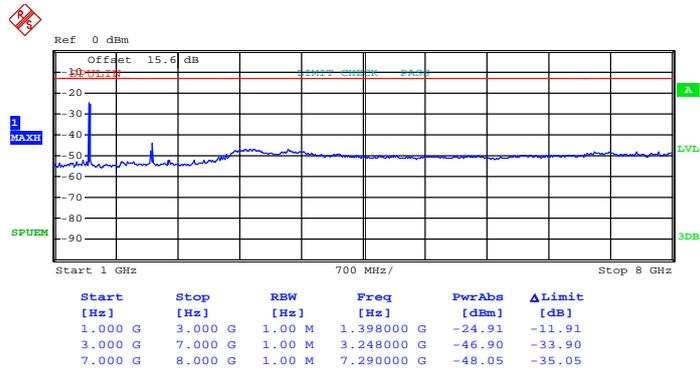
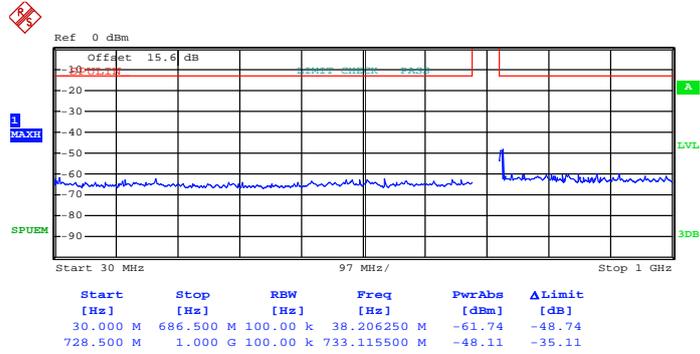
16QAM (RB Size 1, RB Offset 7)





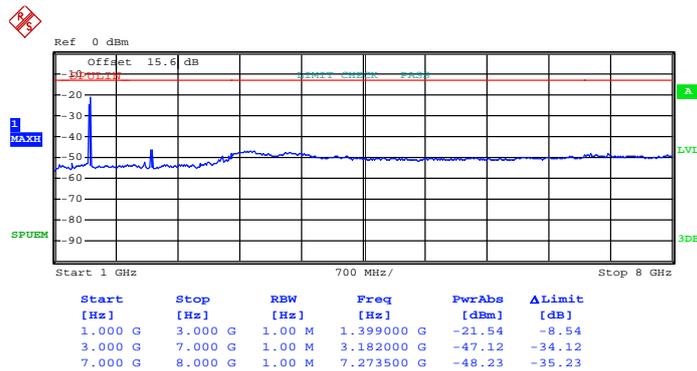
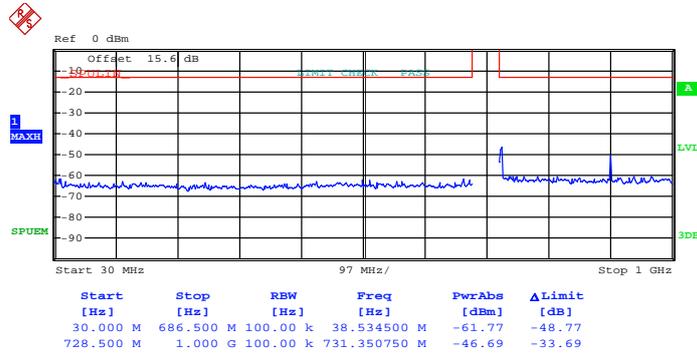
Band :	LTE Band 12	Channel :	CH23035 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)





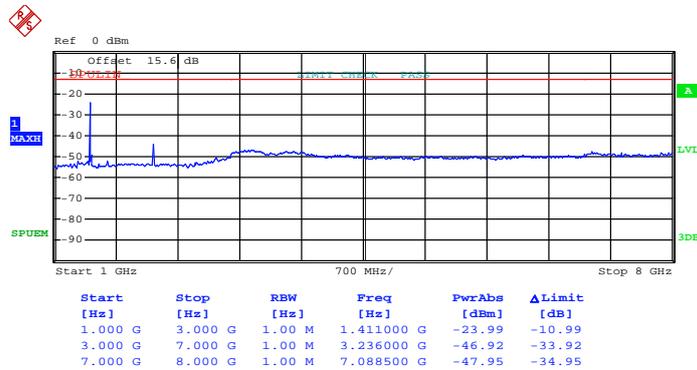
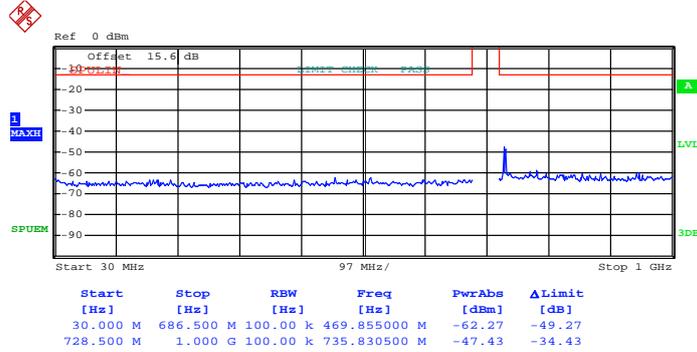
16QAM (RB Size 1, RB Offset 12)





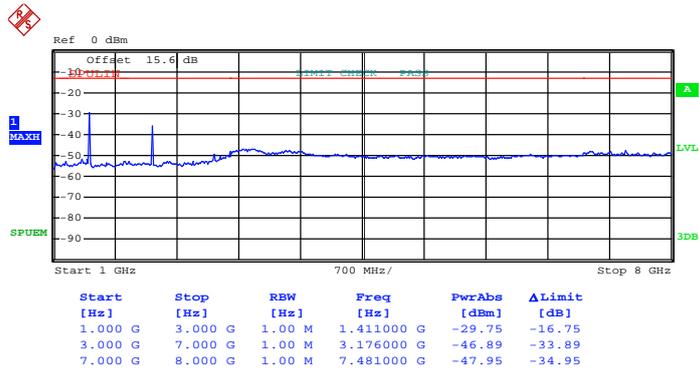
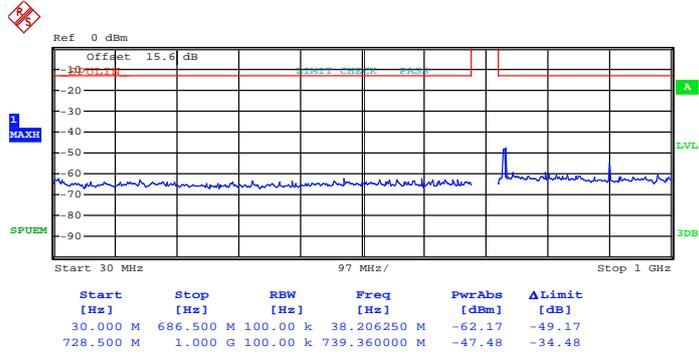
Band :	LTE Band 12	Channel :	CH23095 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)





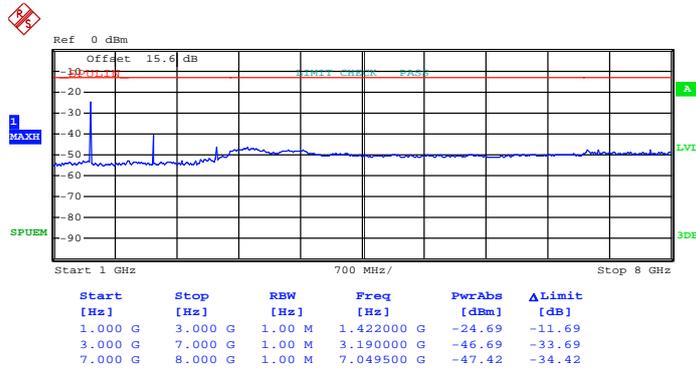
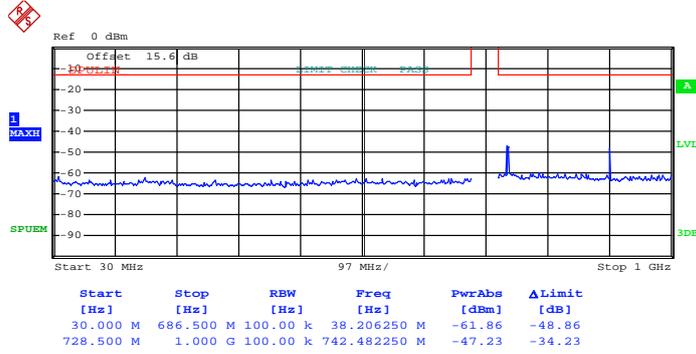
16QAM (RB Size 1, RB Offset 12)





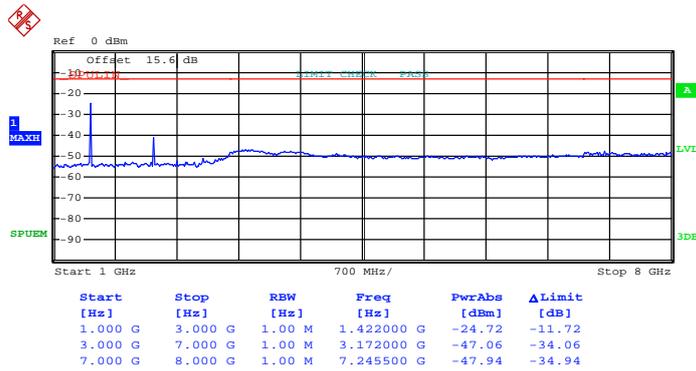
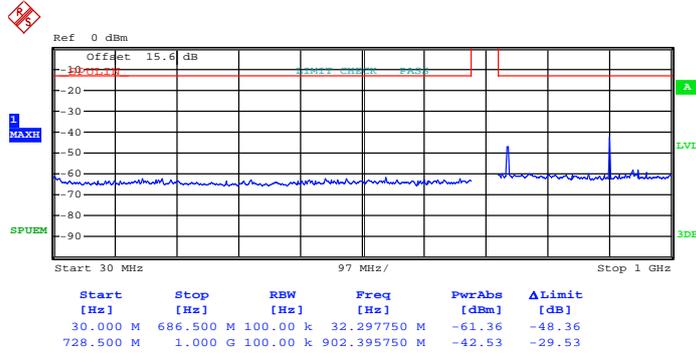
Band :	LTE Band 12	Channel :	CH23155 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)





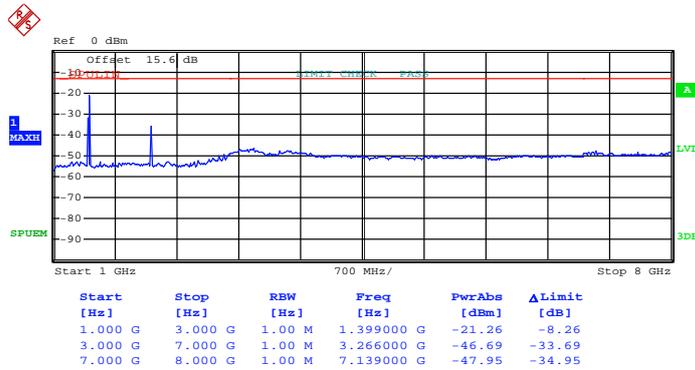
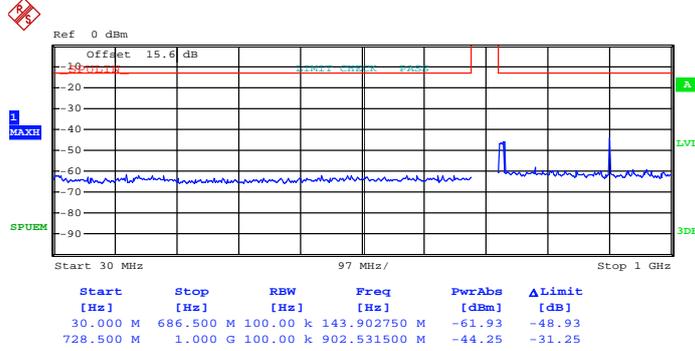
16QAM (RB Size 1, RB Offset 24)





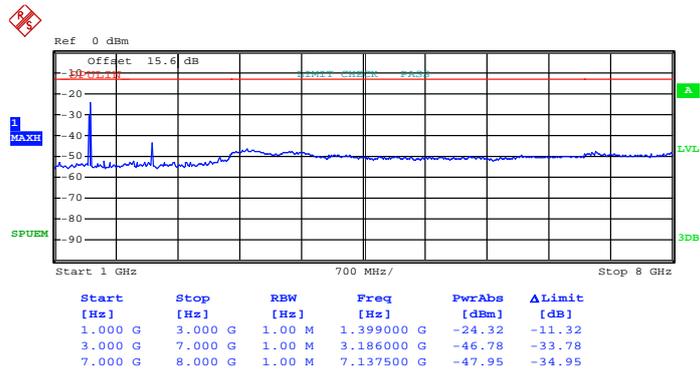
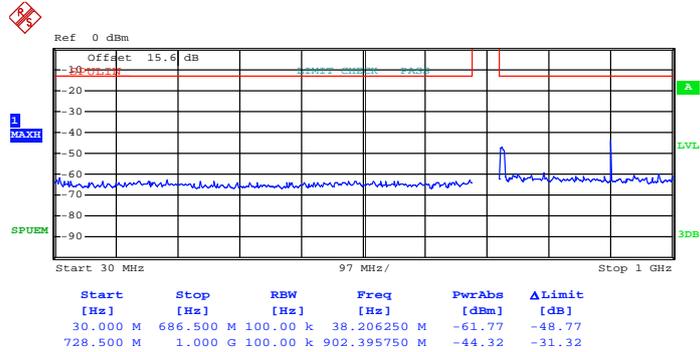
Band :	LTE Band 12	Channel :	CH23060 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)





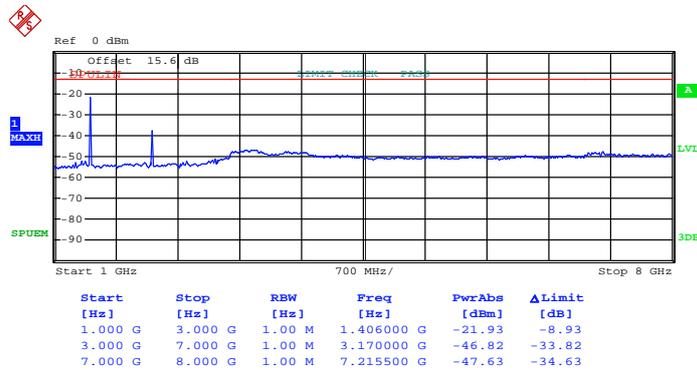
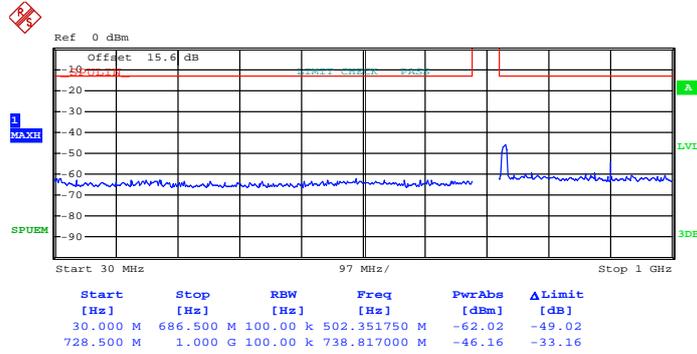
16QAM (RB Size 1, RB Offset 24)





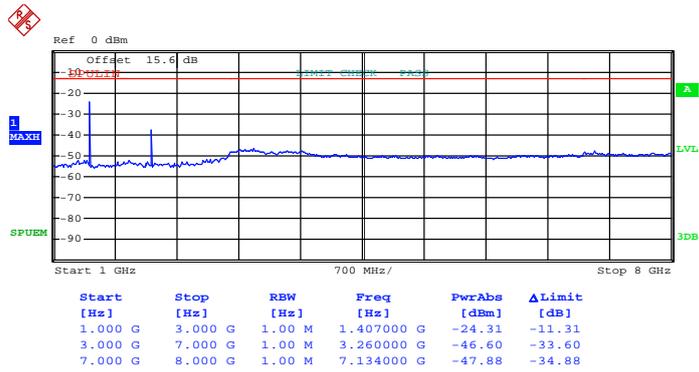
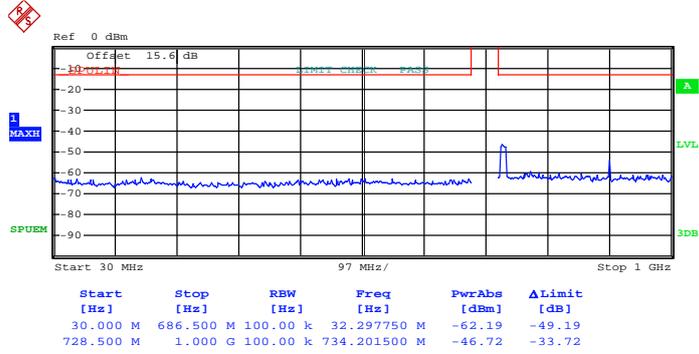
Band :	LTE Band 12	Channel :	CH23095 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)





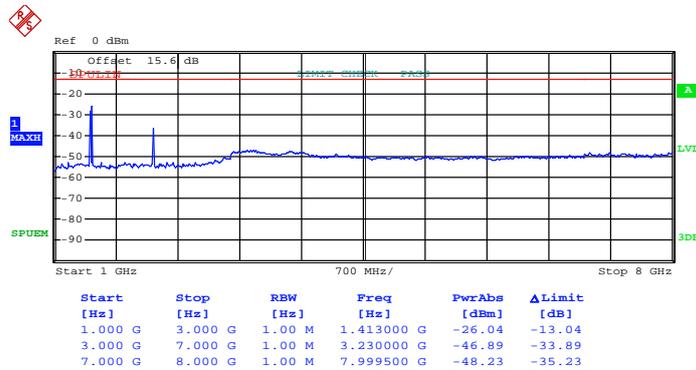
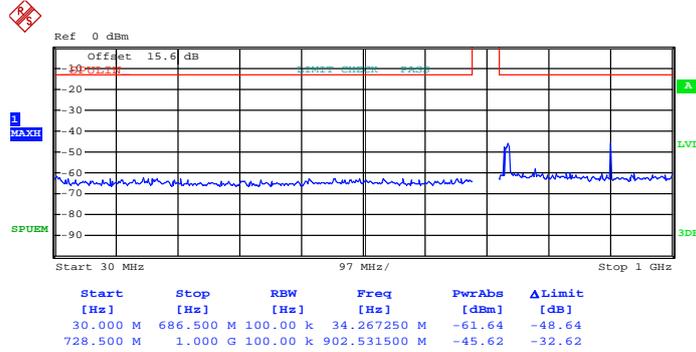
16QAM (RB Size 1, RB Offset 24)





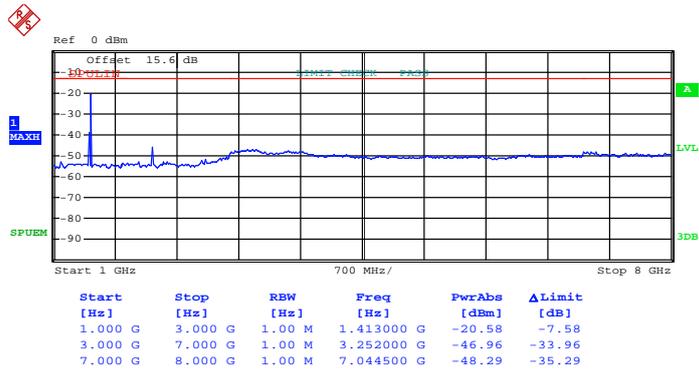
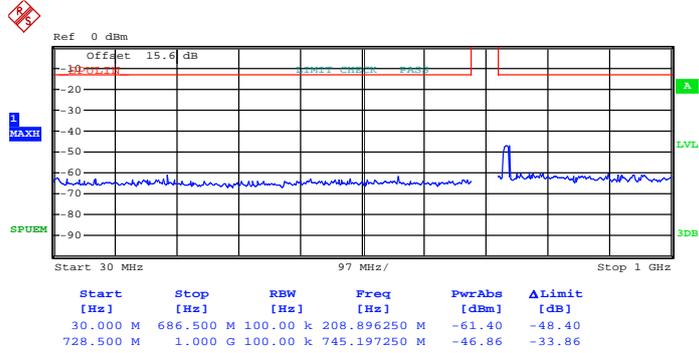
Band :	LTE Band 12	Channel :	CH23130 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)





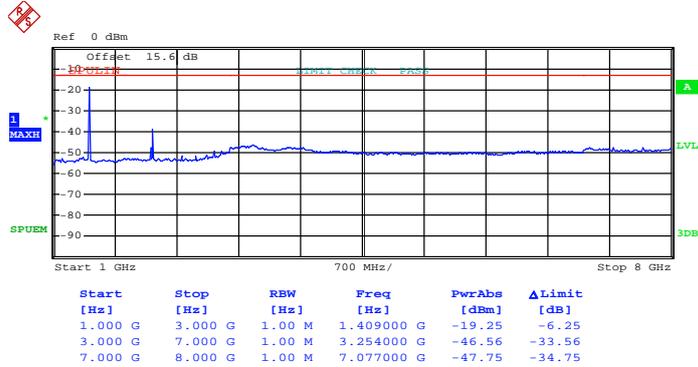
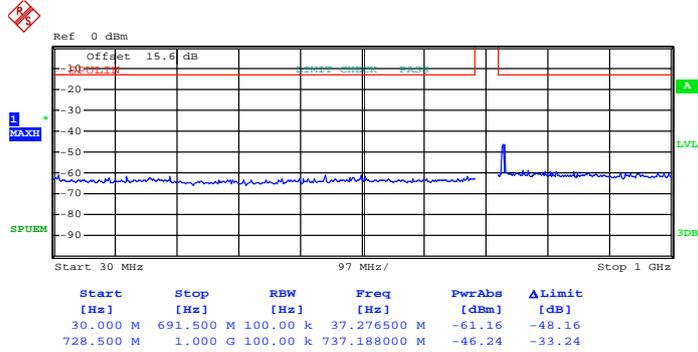
16QAM (RB Size 1, RB Offset 24)





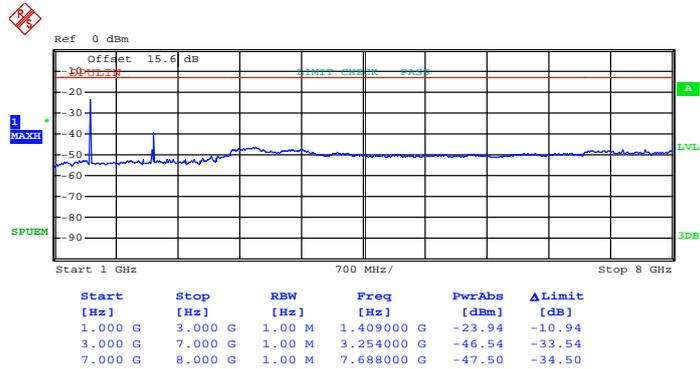
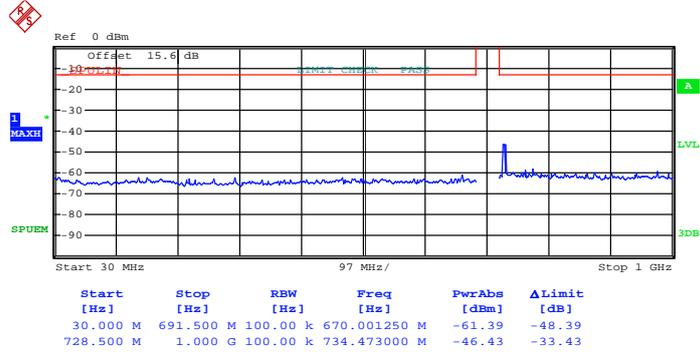
Band :	LTE Band 17	Channel :	CH23755 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)





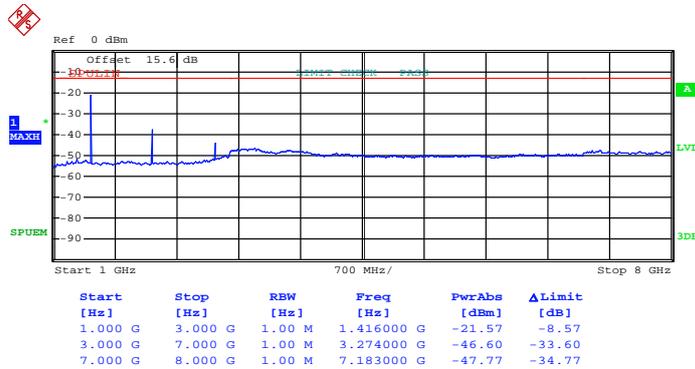
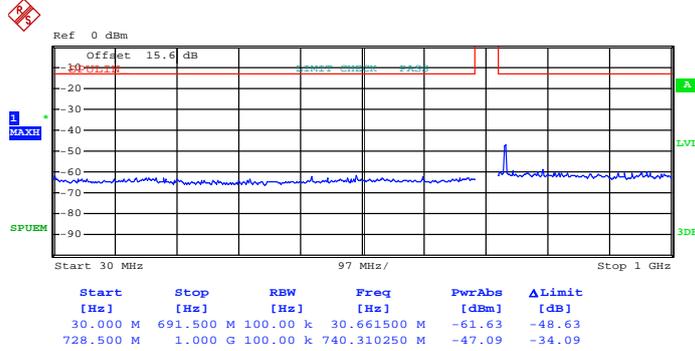
16QAM (RB Size 1, RB Offset 0)





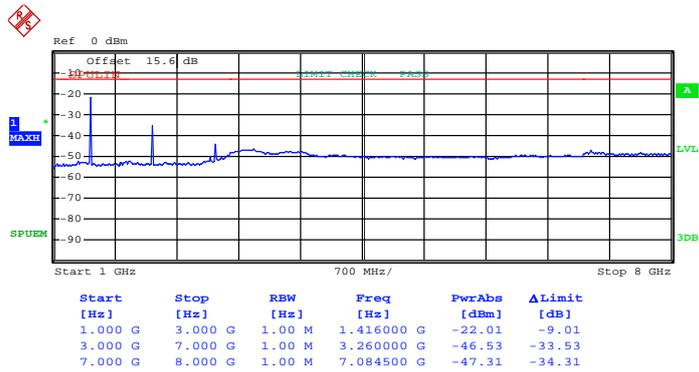
Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)





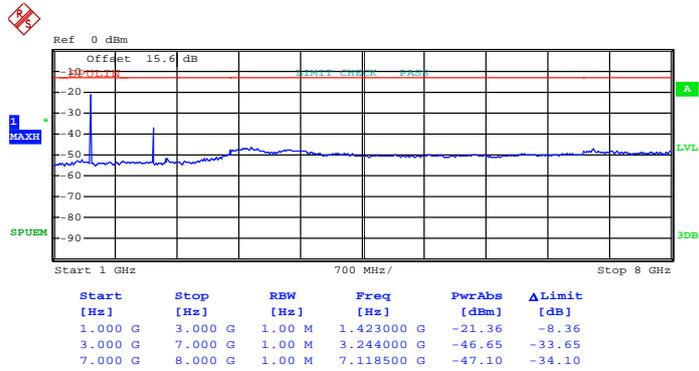
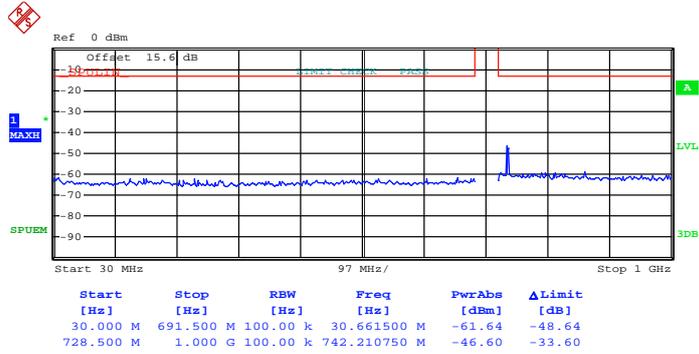
16QAM (RB Size 1, RB Offset 12)





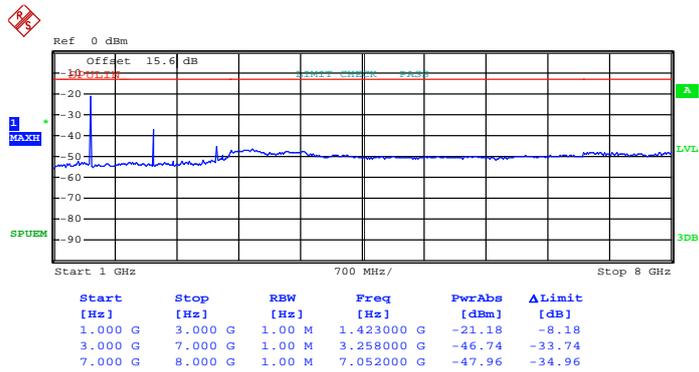
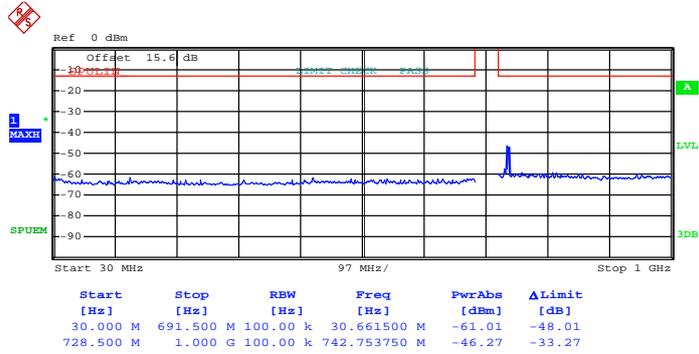
Band :	LTE Band 17	Channel :	CH23825 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)





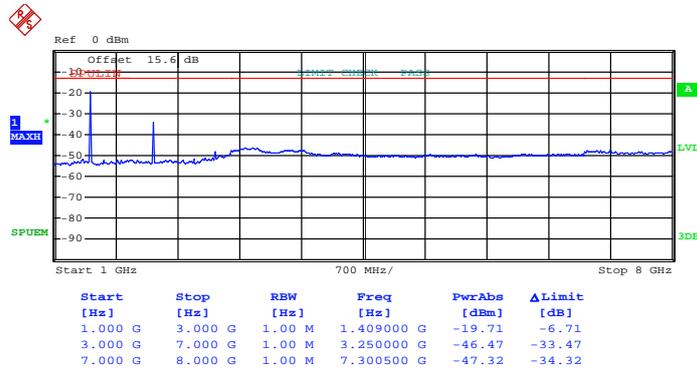
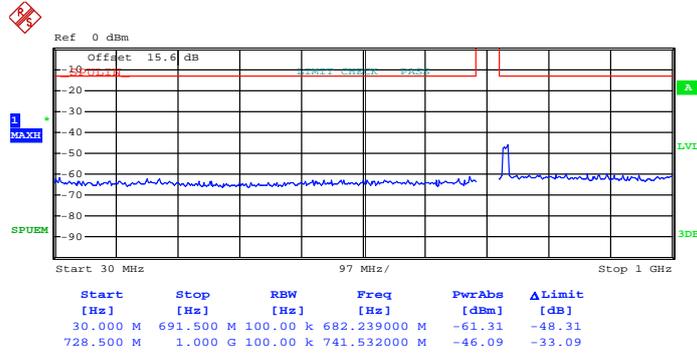
16QAM (RB Size 1, RB Offset 24)





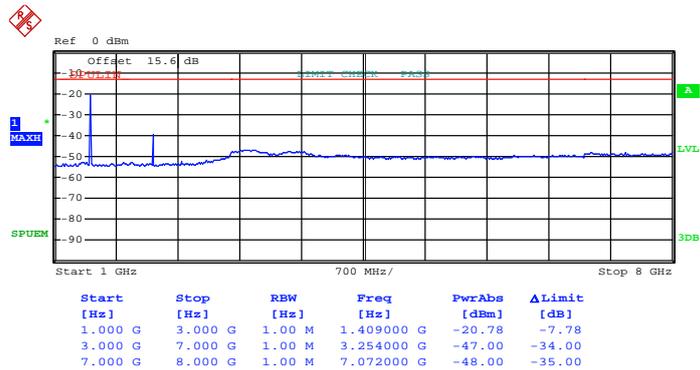
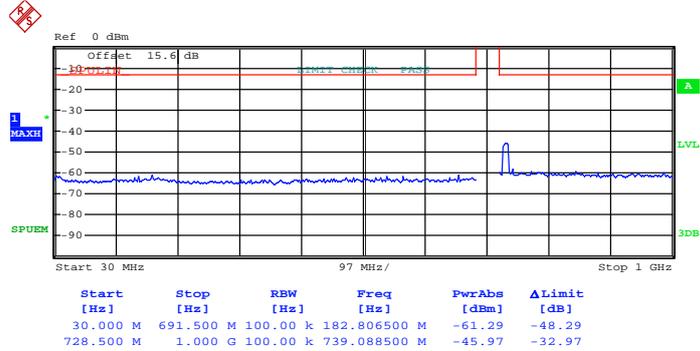
Band :	LTE Band 17	Channel :	CH23780 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)





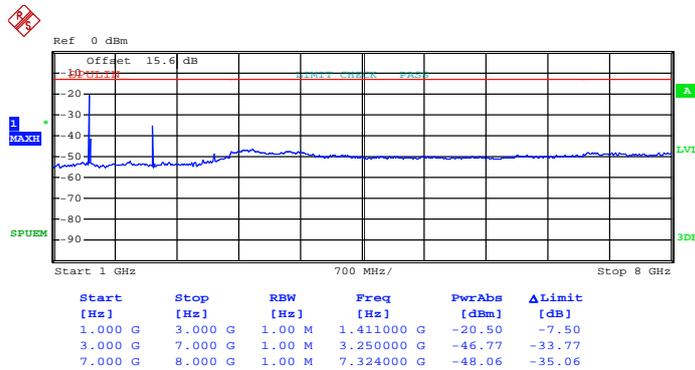
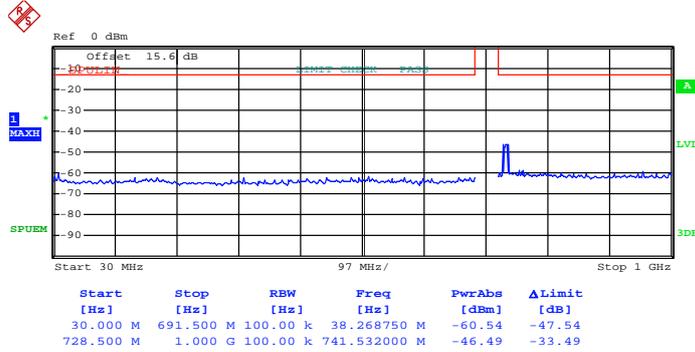
16QAM (RB Size 1, RB Offset 49)





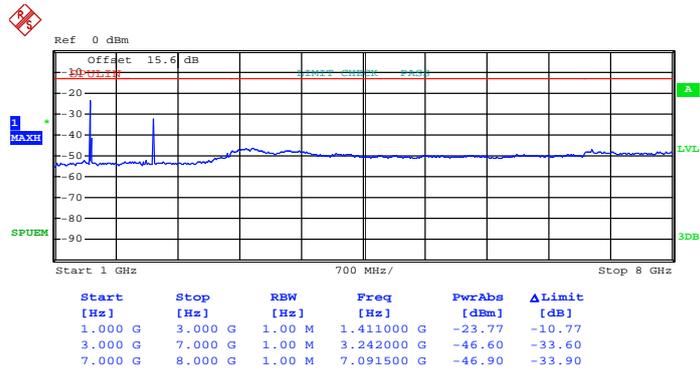
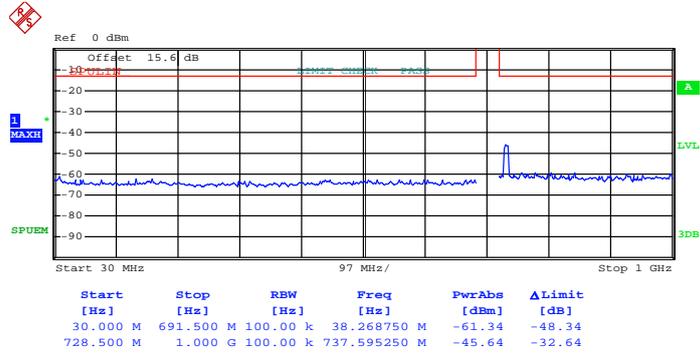
Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)





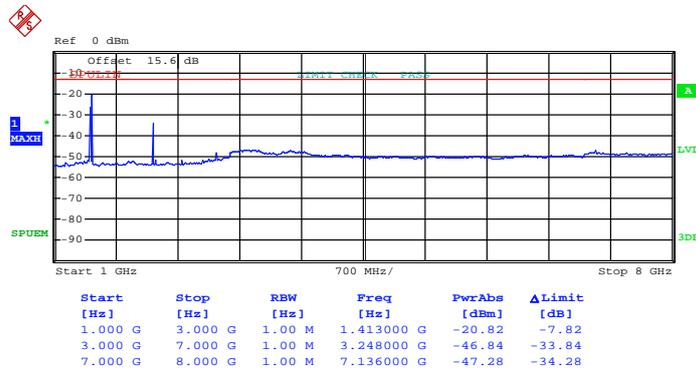
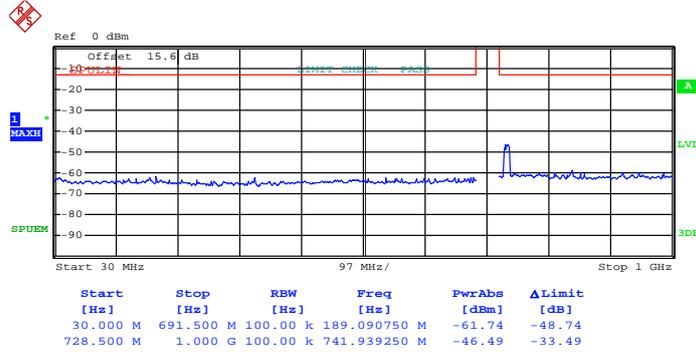
16QAM (RB Size 1, RB Offset 0)





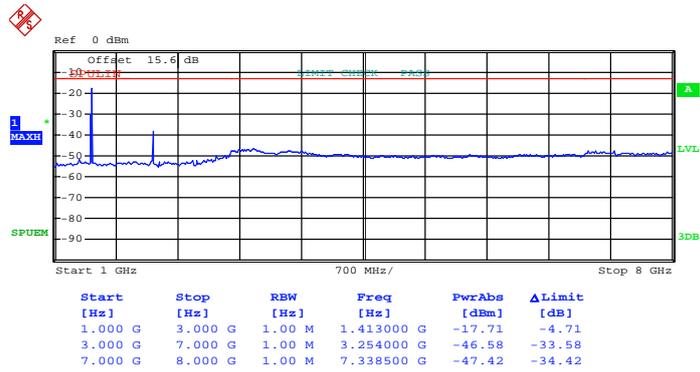
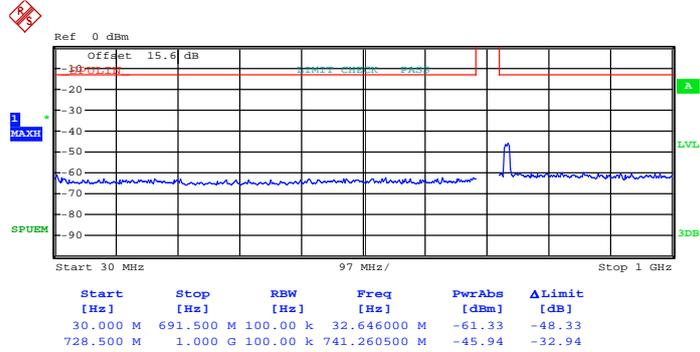
Band :	LTE Band 17	Channel :	CH23800 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)





16QAM (RB Size 1, RB Offset 24)



## 3.7 Radiated Spurious Emission Measurement

### 3.7.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 3.7.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

### 3.7.3 Test Procedures

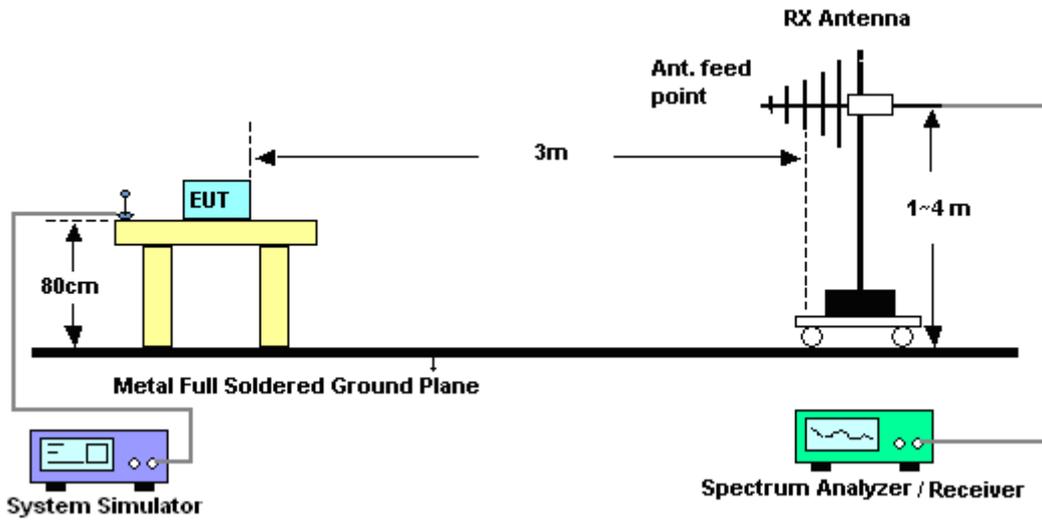
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)  
=  $P(W) - [43 + 10\log(P)]$  (dB)  
=  $[30 + 10\log(P)]$  (dBm) -  $[43 + 10\log(P)]$  (dB)  
= -13dBm.

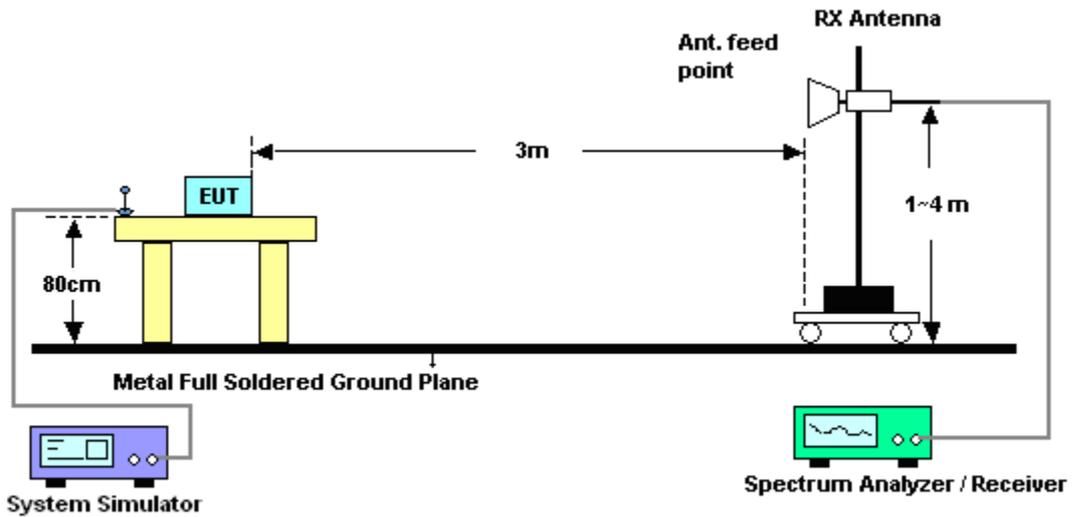
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

### 3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



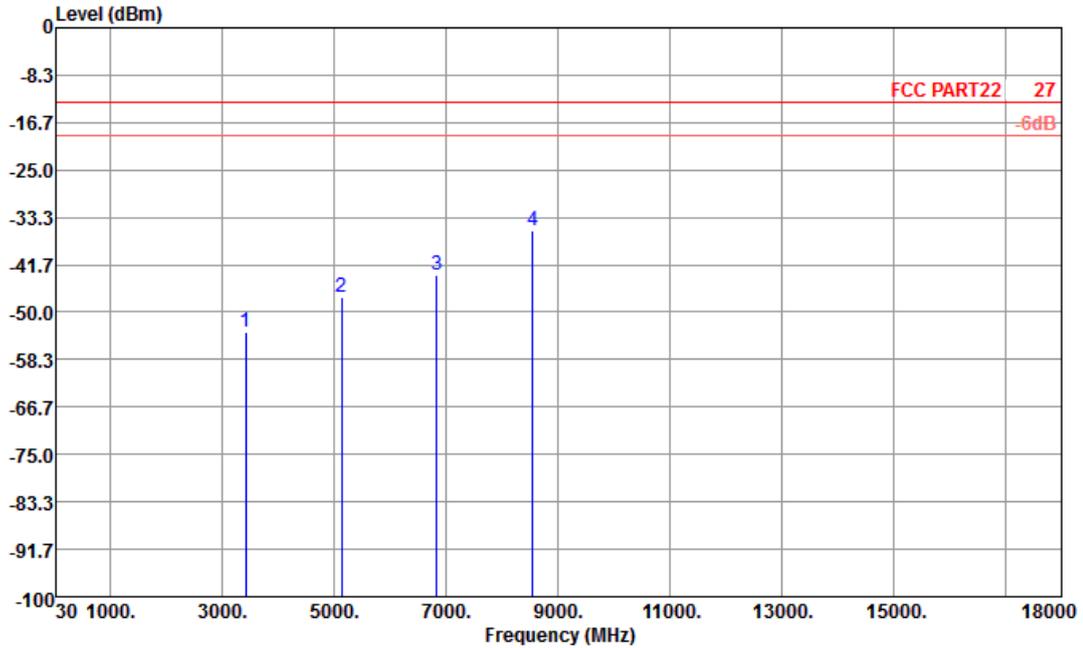
For radiated emissions above 1GHz





3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 4	Temperature :	23~24°C
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



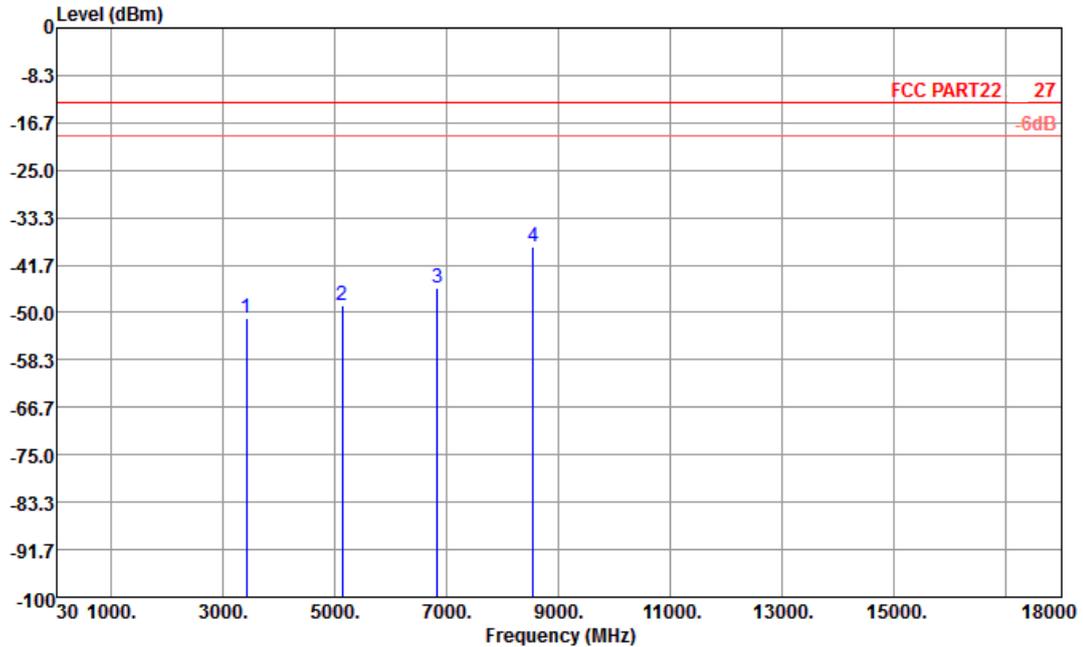
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3422	-53.56	-13	-40.56	-63.22	-58.96	2.2	7.60	H	Pass
5132	-47.32	-13	-34.32	-64.84	-54.10	3.12	9.90	H	Pass
6842	-43.57	-13	-30.57	-64.93	-51.46	2.98	10.87	H	Pass
8552	-35.72	-13	-22.72	-59.79	-8.99	2.88	11.87	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



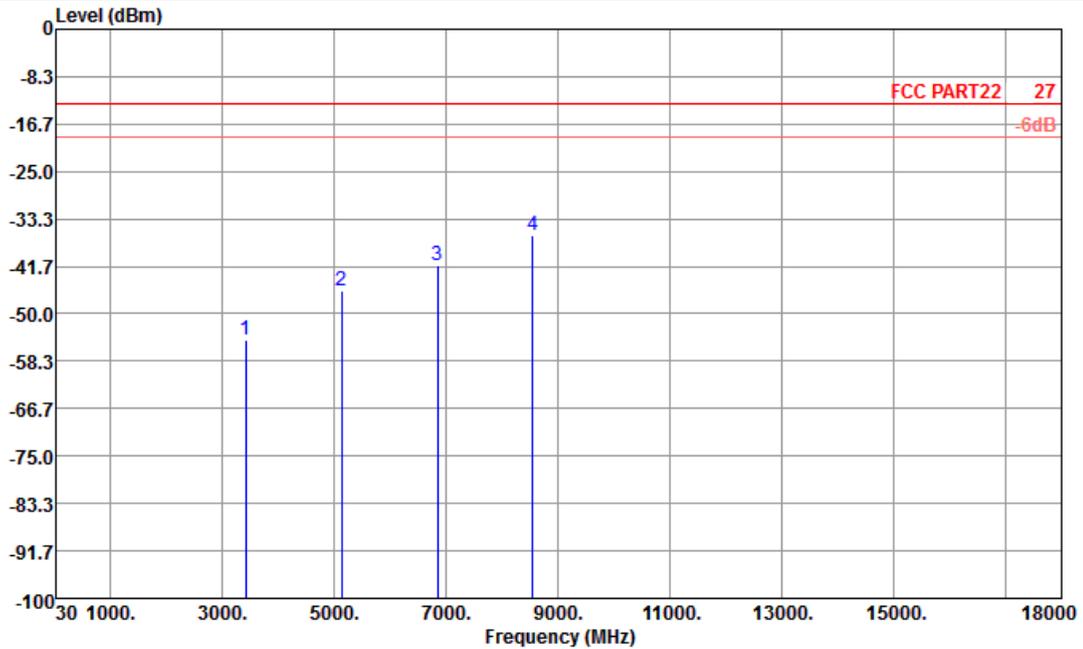
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3422	-50.84	-13	-37.84	-62.13	-56.24	2.2	7.6	V	Pass
5132	-48.69	-13	-35.69	-65.43	-55.47	3.12	9.9	V	Pass
6842	-45.81	-13	-32.81	-65.71	-53.70	2.98	10.87	V	Pass
8552	-38.51	-13	-25.51	-62.06	-47.50	2.88	11.87	V	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



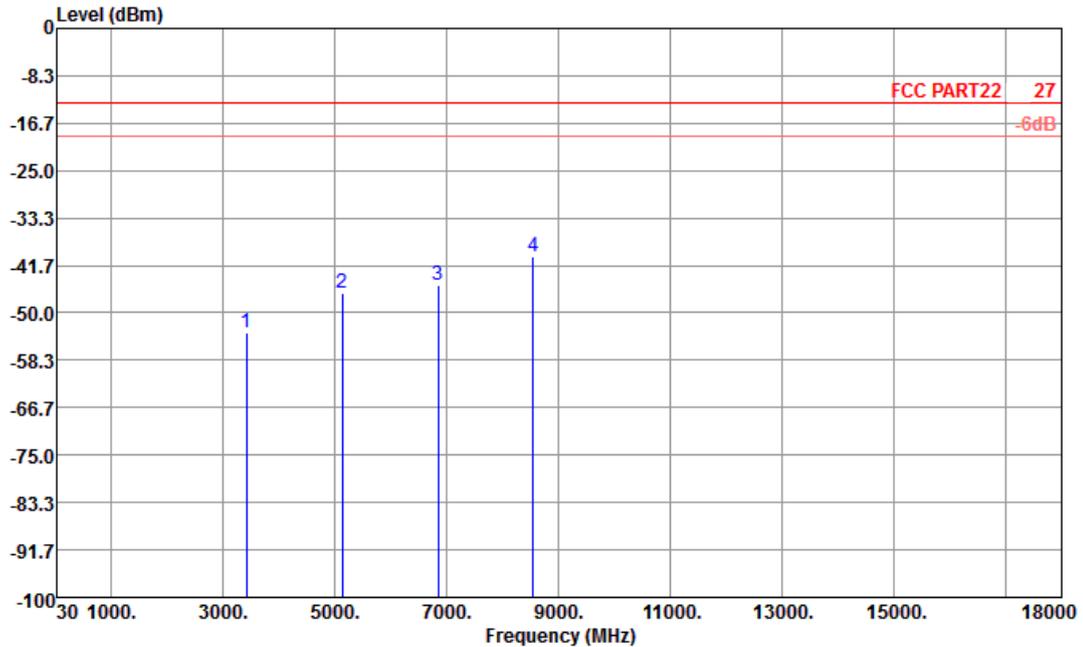
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3424	-54.61	-13	-41.61	-64.46	-60.01	2.2	7.60	H	Pass
5130	-45.86	-13	-32.86	-63.66	-52.64	3.12	9.90	H	Pass
6846	-41.50	-13	-28.50	-63.71	-49.39	2.98	10.87	H	Pass
8552	-36.09	-13	-23.09	-60.10	-45.58	2.97	12.46	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



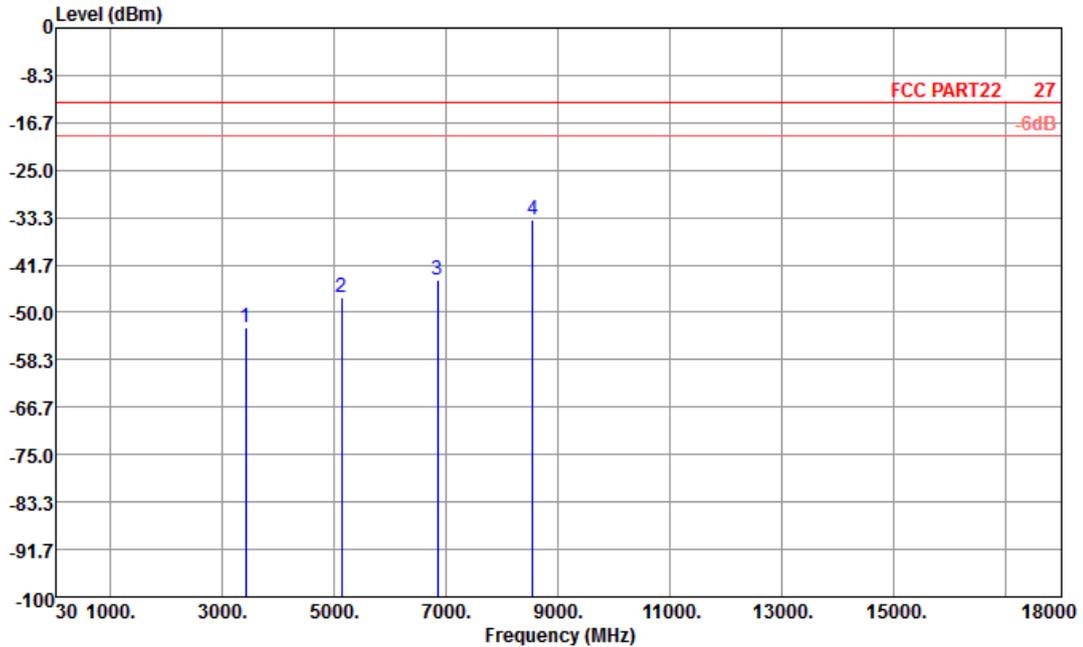
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3424	-53.43	-13	-40.43	-64.06	-58.83	2.2	7.6	V	Pass
5130	-46.60	-13	-33.60	-63.97	-53.38	3.12	9.9	V	Pass
6846	-45.08	-13	-32.08	-65.02	-52.97	2.98	10.87	V	Pass
8552	-40.06	-13	-27.06	-63.16	-49.55	2.97	12.46	V	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



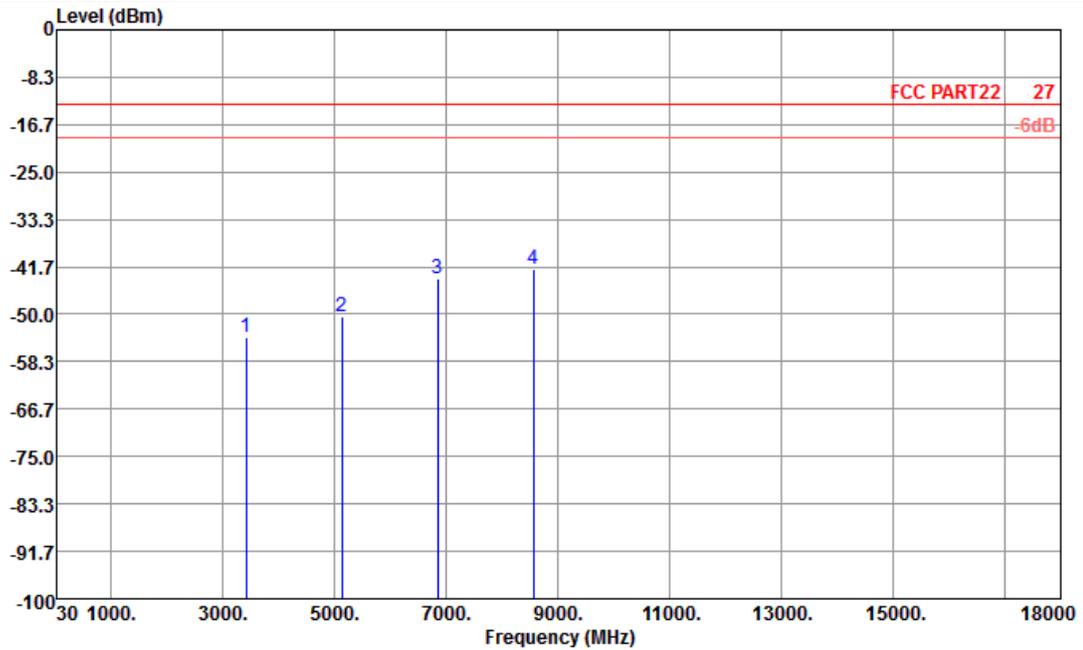
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3420	-52.60	-13	-39.60	-62.28	-58.00	2.2	7.60	H	Pass
5138	-47.39	-13	-34.39	-64.95	-54.17	3.12	9.90	H	Pass
6850	-44.22	-13	-31.22	-65.49	-52.11	2.98	10.87	H	Pass
8552	-33.61	-13	-20.61	-57.93	-43.10	2.97	12.46	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



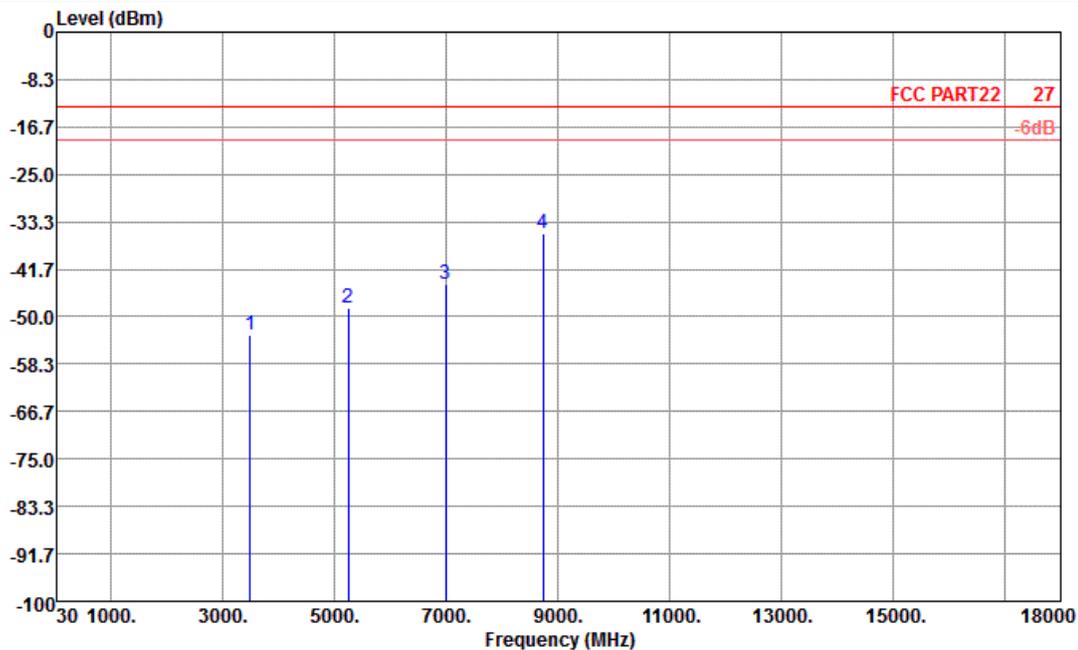
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3424	-53.90	-13	-40.90	-64.44	-59.30	2.2	7.6	V	Pass
5138	-50.41	-13	-37.41	-66.71	-57.19	3.12	9.9	V	Pass
6850	-43.62	-13	-30.62	-64.26	-51.51	2.98	10.87	V	Pass
8562	-42.08	-13	-29.08	-64.8	-51.57	2.97	12.46	V	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



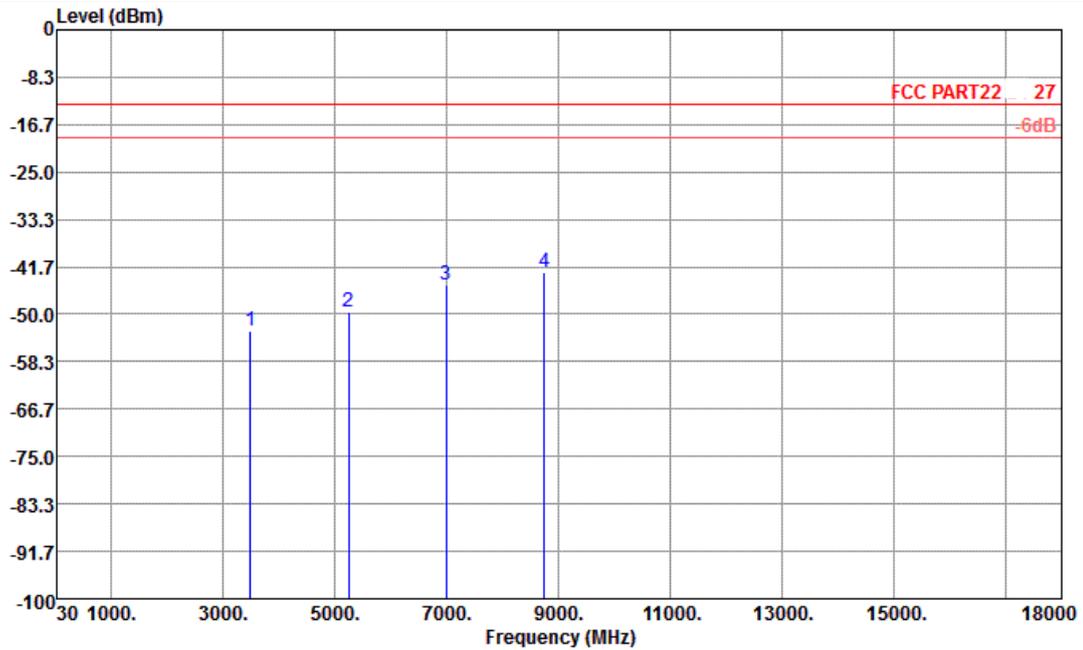
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3491	-53.16	-13	-40.16	-62.66	-58.56	2.2	7.60	H	Pass
5236	-48.50	-13	-35.50	-65.96	-55.28	3.12	9.90	H	Pass
6982	-44.22	-13	-31.22	-65.49	-52.11	2.98	10.87	H	Pass
8730	-35.41	-13	-22.41	-59.50	-44.90	2.97	12.46	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



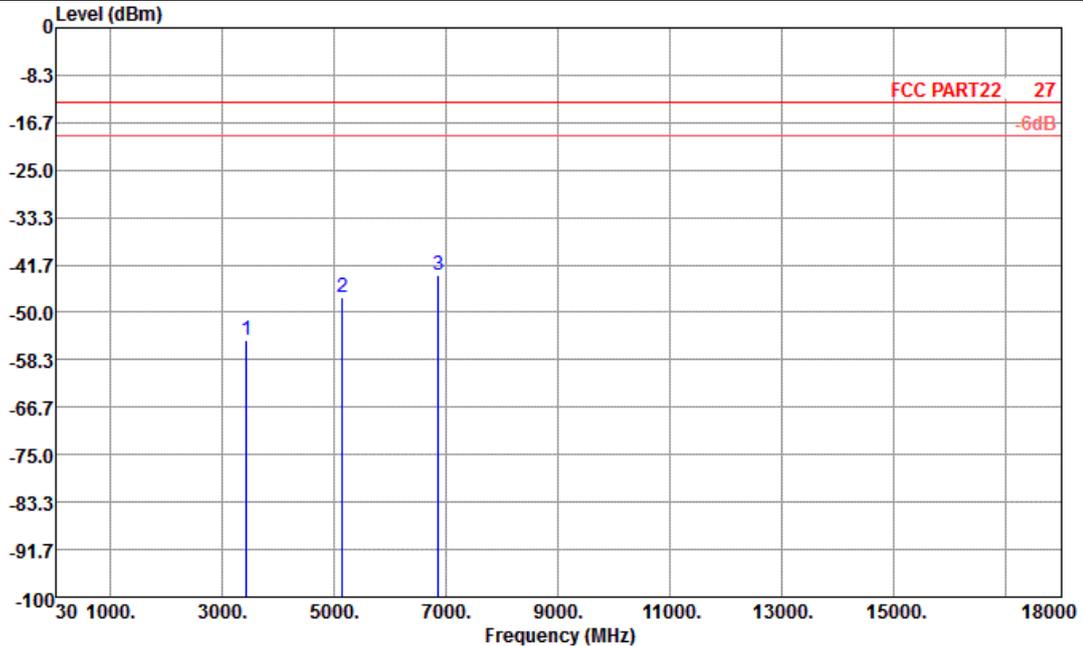
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3491	-53.06	-13	-40.06	-63.76	-58.46	2.2	7.6	V	Pass
5236	-49.56	-13	-36.56	-66.25	-56.34	3.12	9.9	V	Pass
6982	-44.79	-13	-31.79	-64.87	-52.68	2.98	10.87	V	Pass
8750	-42.75	-13	-29.75	-65.3	-52.24	2.97	12.46	V	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	15MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



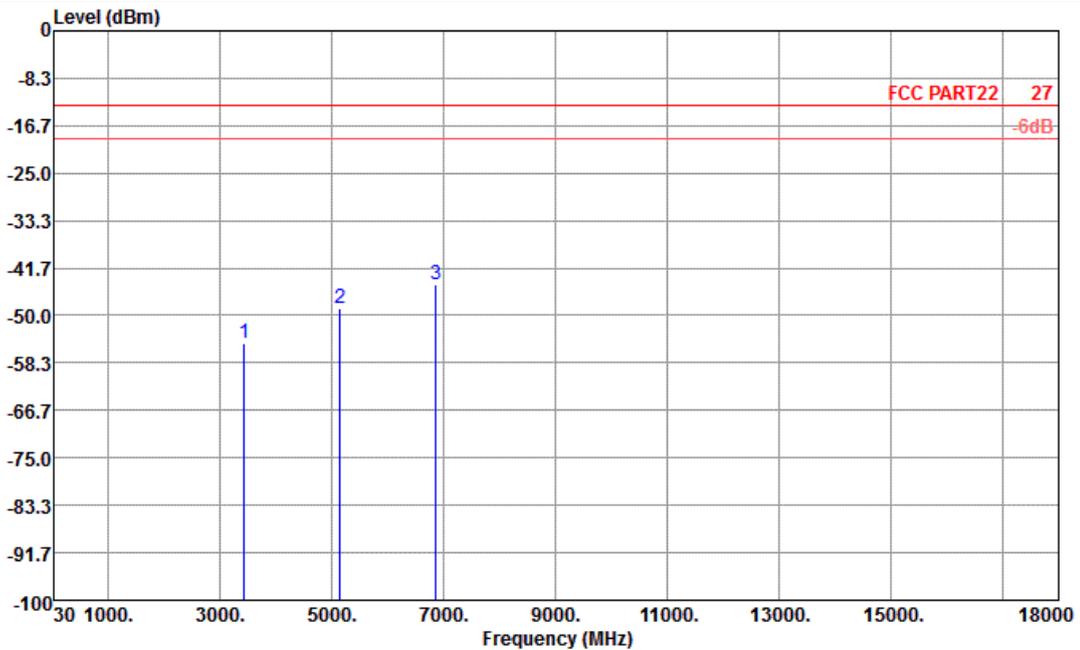
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3421	-54.84	-13	-41.84	-64.69	-60.24	2.2	7.60	H	Pass
5132	-47.45	-13	-34.45	-65.04	-54.23	3.12	9.90	H	Pass
6843	-43.49	-13	-30.49	-64.85	-51.38	2.98	10.87	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	15MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



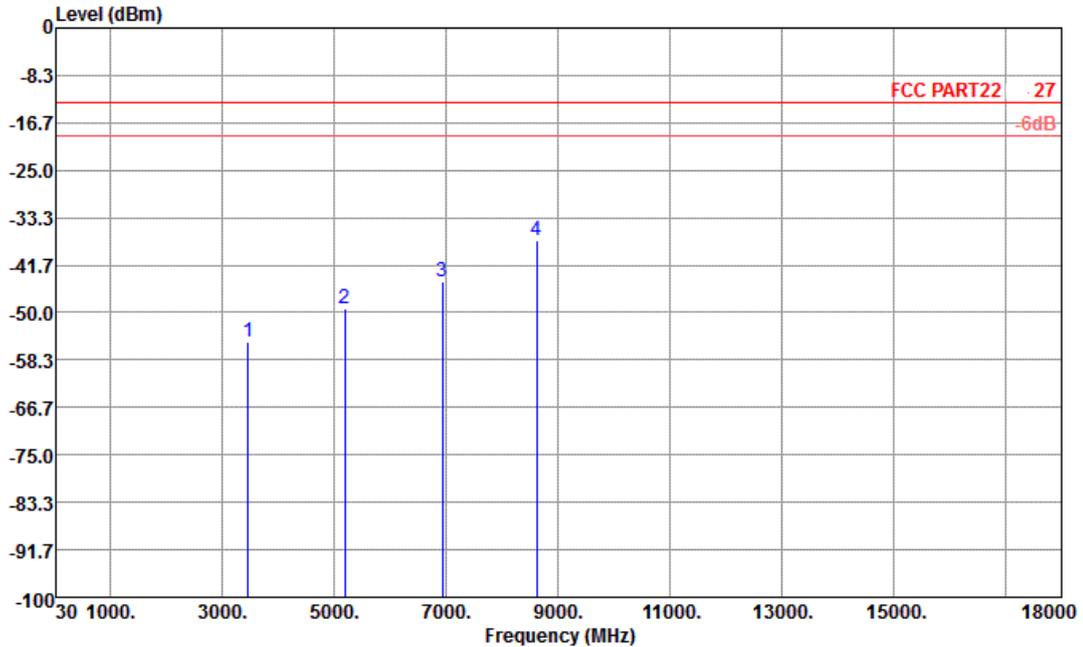
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3421	-54.89	-13	-41.89	-65.33	-60.29	2.2	7.6	V	Pass
5132	-48.70	-13	-35.70	-65.44	-55.48	3.12	9.9	V	Pass
6843	-44.50	-13	-31.50	-64.77	-52.39	2.98	10.87	V	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	20MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



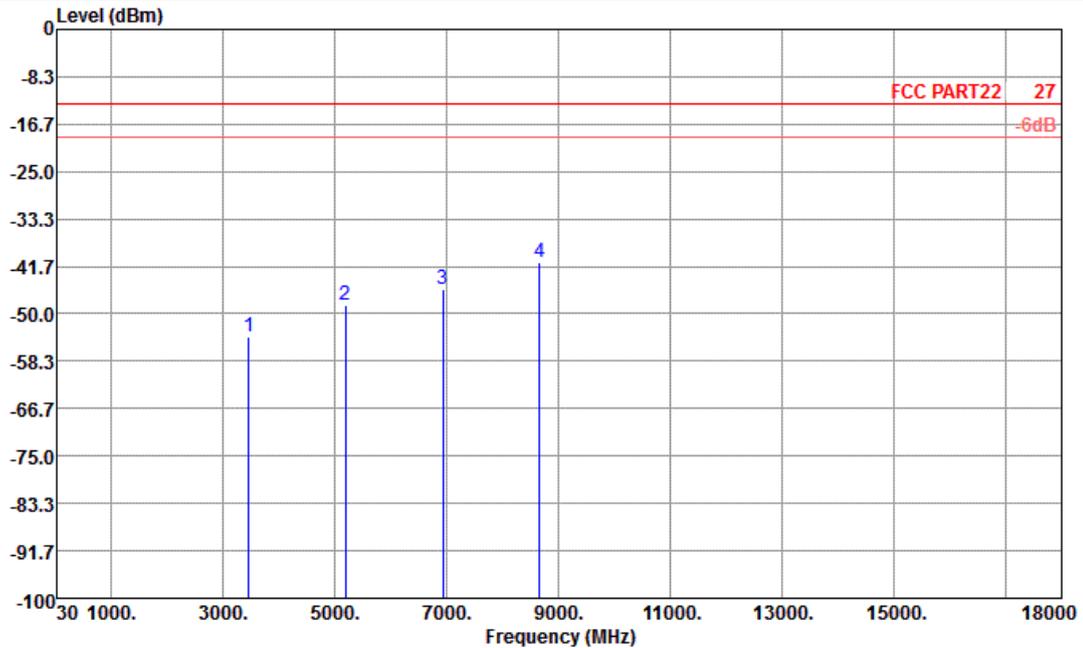
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3447	-55.09	-13	-42.09	-64.94	-60.49	2.2	7.60	H	Pass
5170	-49.20	-13	-36.20	-66.12	-55.98	3.12	9.90	H	Pass
6894	-44.65	-13	-31.65	-65.74	-52.54	2.98	10.87	H	Pass
8620	-37.27	-13	-24.27	-60.83	-46.76	2.97	12.46	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	20MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



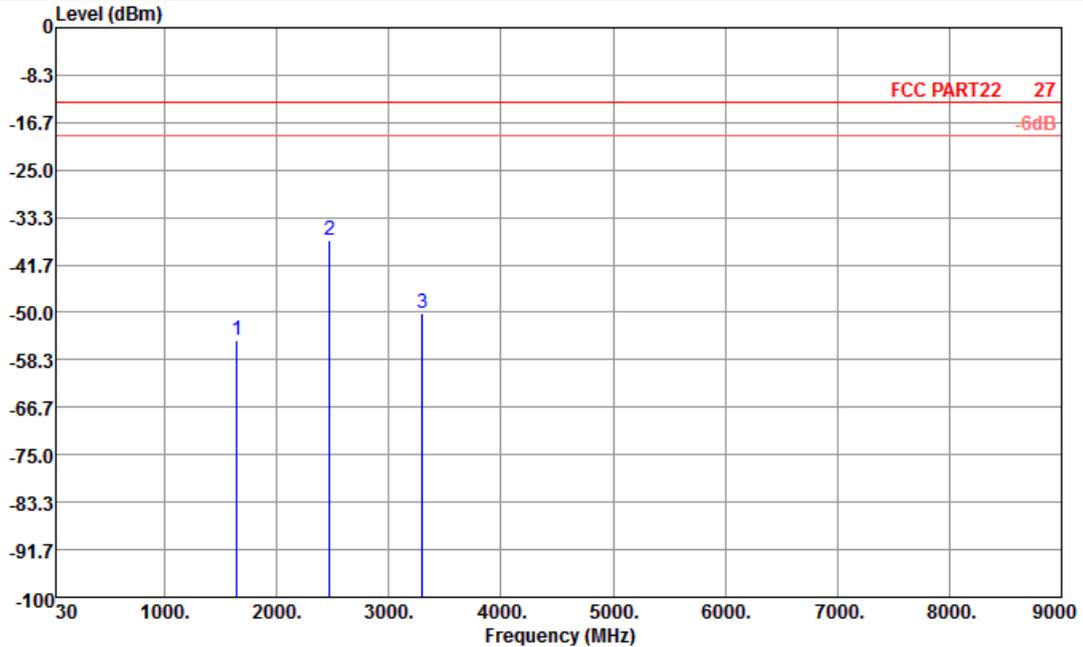
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3447	-54.04	-13	-41.04	-64.56	-59.44	2.2	7.6	V	Pass
5170	-48.57	-13	-35.57	-65.27	-55.35	3.12	9.9	V	Pass
6894	-45.60	-13	-32.60	-65.51	-53.49	2.98	10.87	V	Pass
8620	-40.88	-13	-27.88	-63.89	-50.37	2.97	12.46	V	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



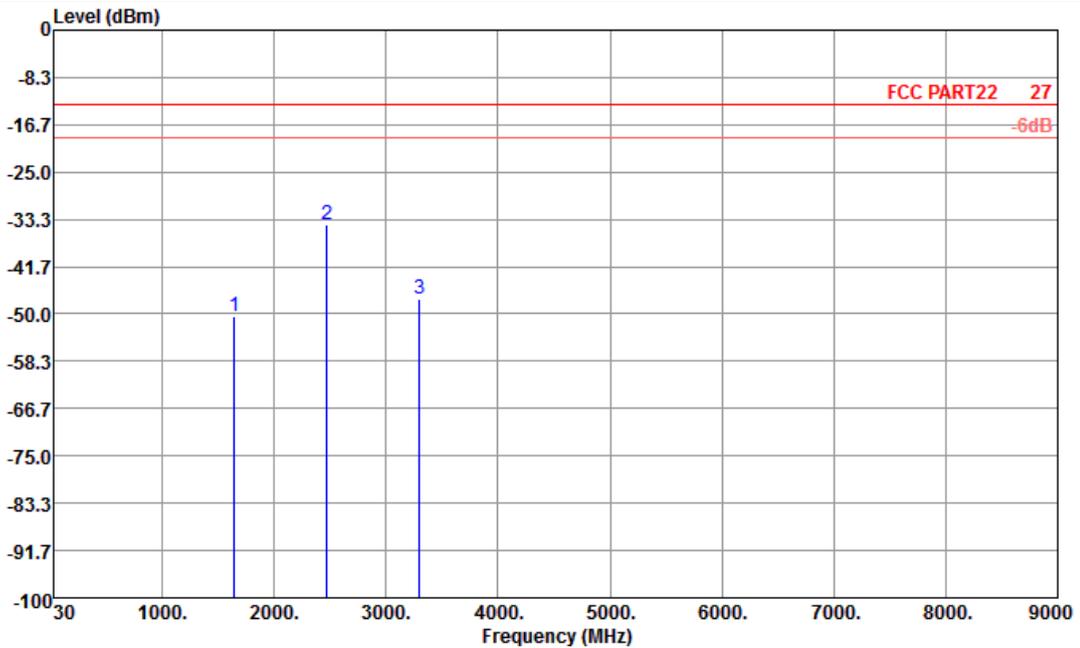
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1648	-54.97	-13	-41.97	-58.17	-55.62	0.57	3.37	H	Pass
2474	-37.31	-13	-24.31	-48.91	-39.54	0.78	5.16	H	Pass
3296	-50.21	-13	-37.21	-63.10	-53.85	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



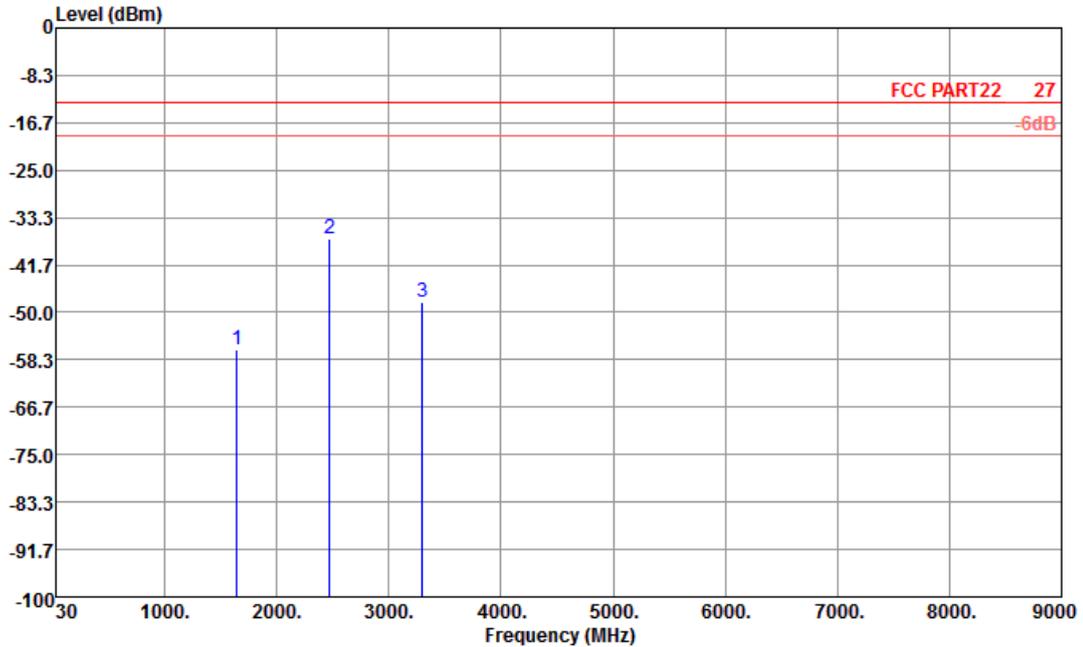
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1648	-50.48	-13	-37.48	-56.57	-51.13	0.57	3.37	V	Pass
2474	-34.19	-13	-21.19	-47.49	-36.42	0.78	5.16	V	Pass
3296	-47.48	-13	-34.48	-61.95	-51.12	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



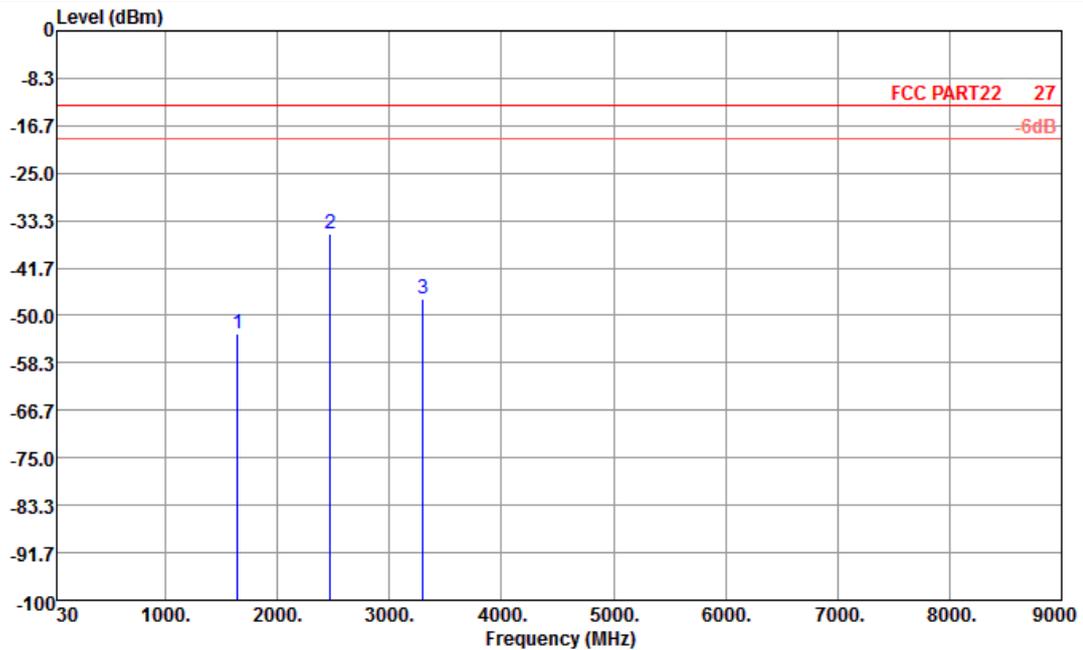
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1648	-56.56	-13	-43.56	-59.76	-57.21	0.57	3.37	H	Pass
2474	-37.02	-13	-24.02	-48.61	-39.25	0.78	5.16	H	Pass
3296	-48.19	-13	-35.19	-61.29	-51.83	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



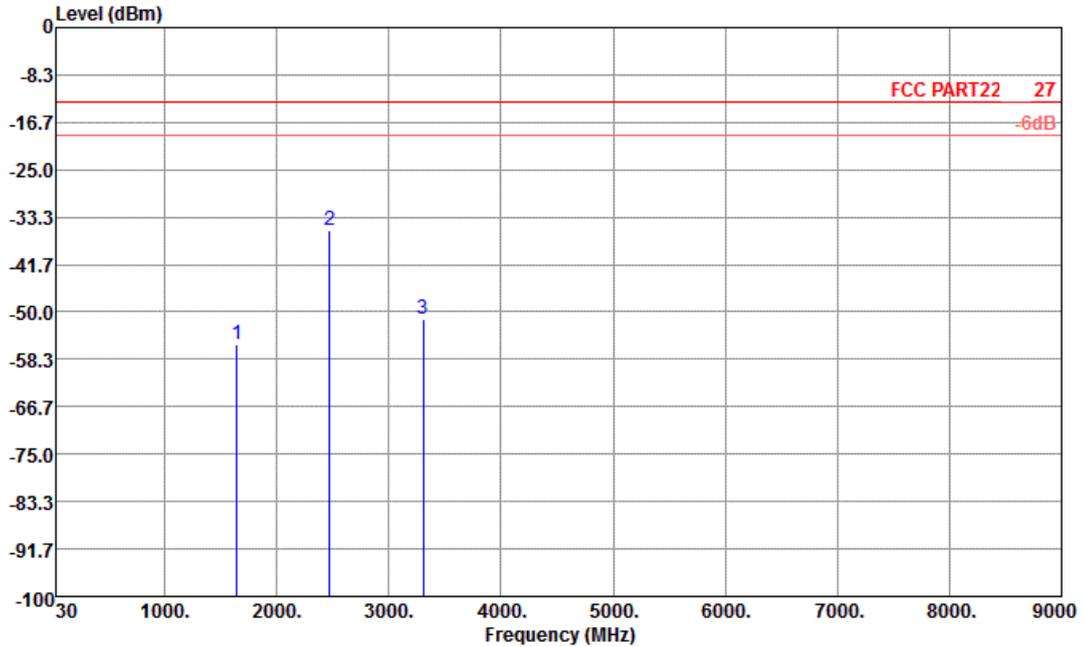
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1648	-53.23	-13	-40.23	-59.19	-53.88	0.57	3.37	V	Pass
2474	-35.67	-13	-22.67	-48.90	-37.90	0.78	5.16	V	Pass
3296	-47.05	-13	-34.05	-61.59	-50.69	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

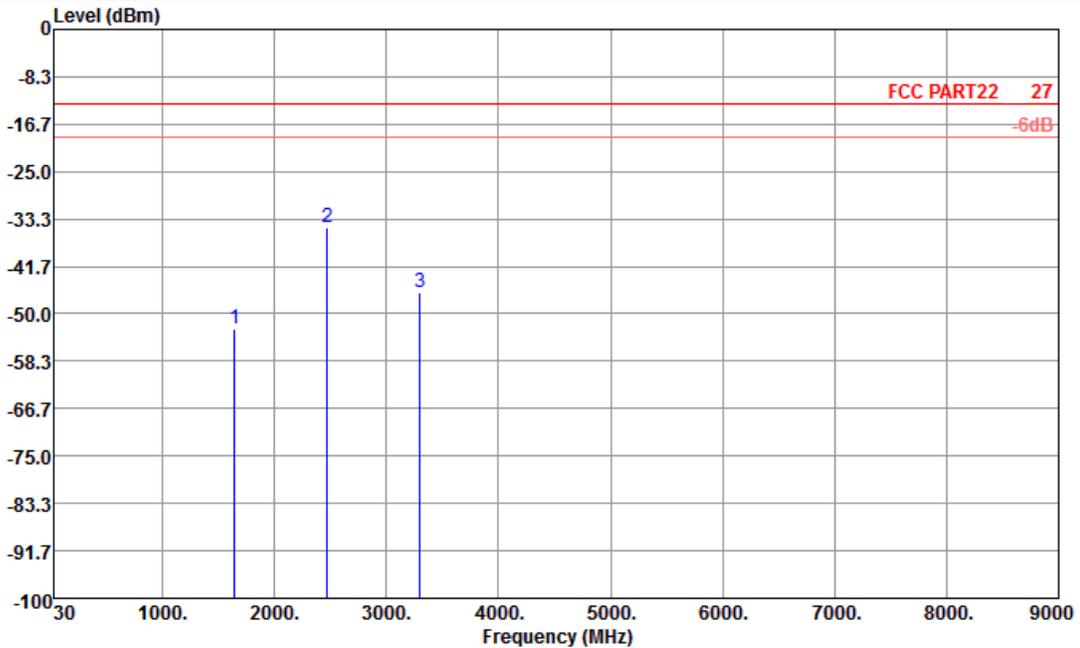


Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL  
 Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1648	-55.81	-13	-42.81	-59.09	-56.46	0.57	3.37	H	Pass
2474	-35.71	-13	-22.71	-47.31	-37.94	0.78	5.16	H	Pass
3296	-51.38	-13	-38.38	-64.27	-55.02	0.87	6.66	H	Pass



Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



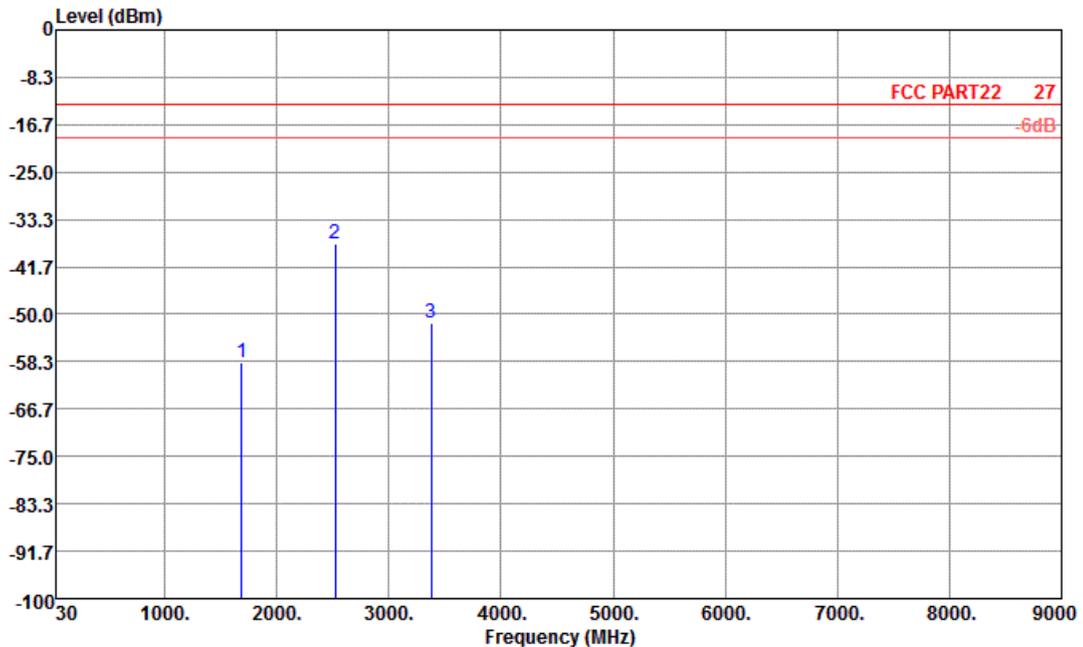
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1648	-52.58	-13	-39.58	-58.52	-53.23	0.57	3.37	V	Pass
2474	-34.84	-13	-21.84	-48.07	-37.07	0.78	5.16	V	Pass
3296	-46.24	-13	-33.24	-60.86	-49.88	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



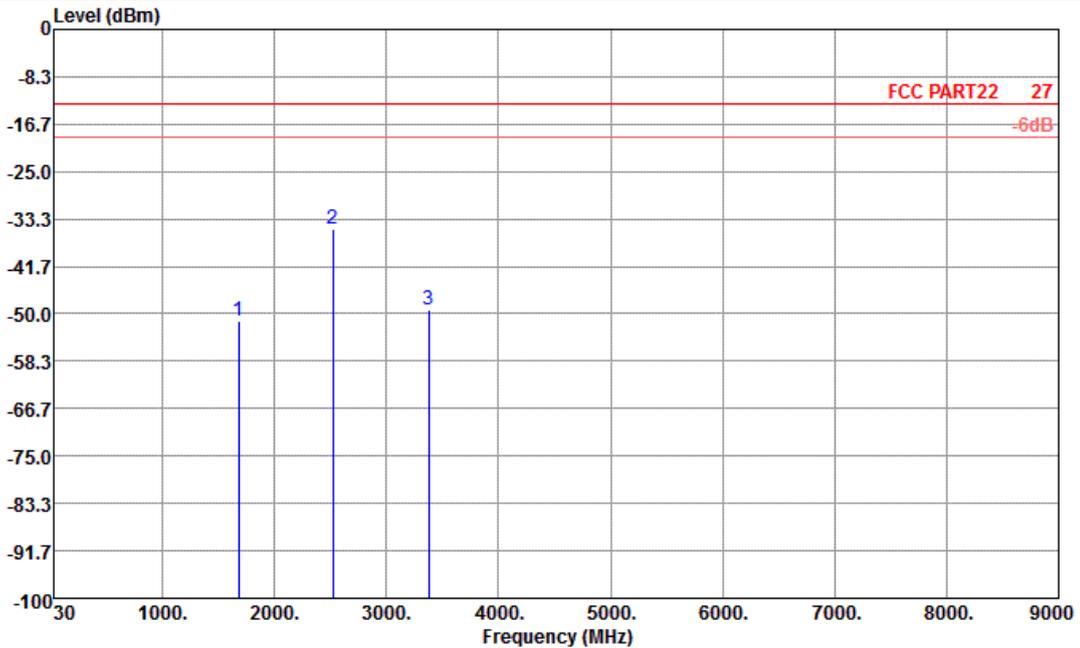
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF EIRP\_FACTOR130726 HORIZONTAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1680	-58.50	-13	-45.50	-61.69	-59.15	0.57	3.37	H	Pass
2520	-37.53	-13	-24.53	-49.14	-39.76	0.78	5.16	H	Pass
3358	-51.41	-13	-38.41	-64.30	-55.05	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 5	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



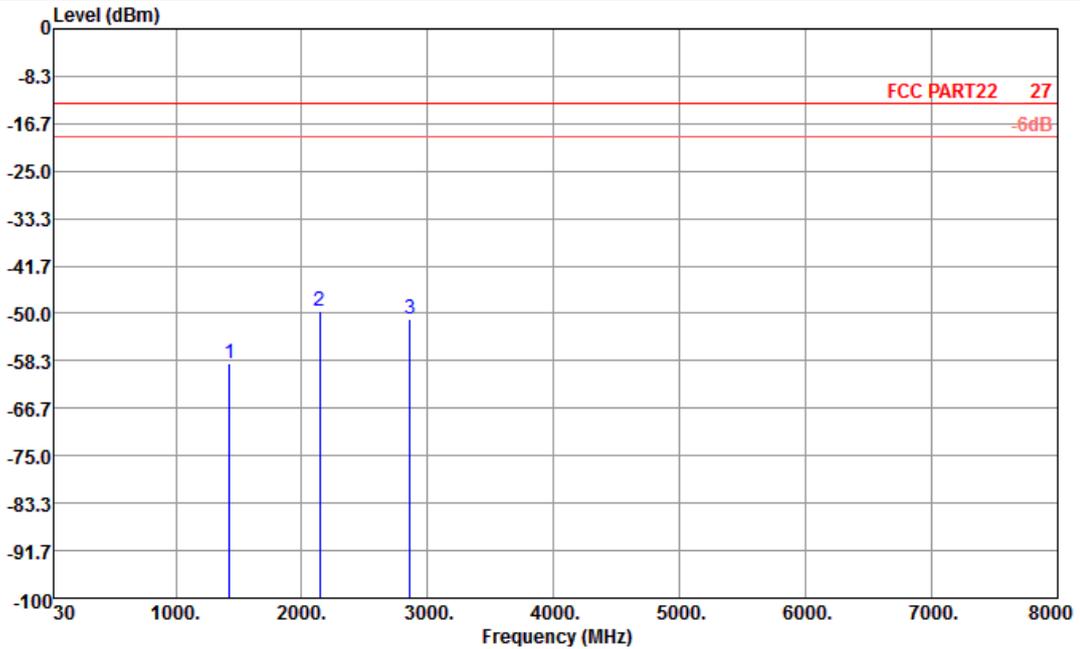
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1680	-51.30	-13	-38.30	-57.29	-51.95	0.57	3.37	V	Pass
2520	-35.05	-13	-22.05	-48.27	-37.28	0.78	5.16	V	Pass
3358	-49.21	-13	-36.21	-63.48	-52.85	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz QPSK RB Size 3 Offset 1	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



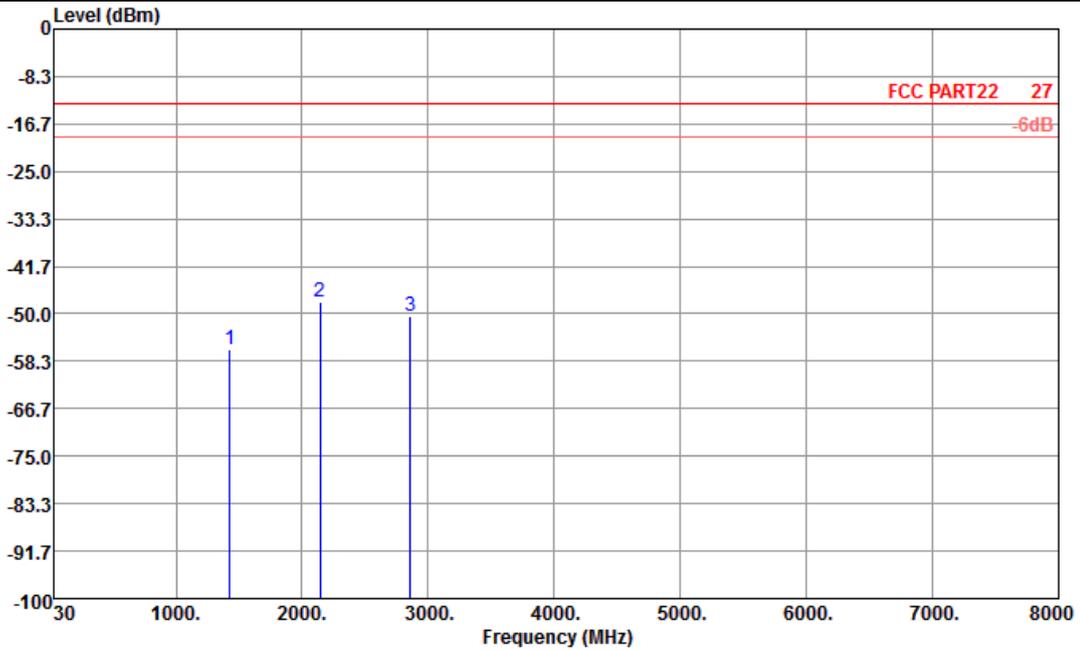
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1430	-58.80	-13	-45.80	-62.01	-59.45	0.57	3.37	H	Pass
2146	-49.58	-13	-36.58	-60.80	-51.81	0.78	5.16	H	Pass
2860	-50.87	-13	-37.87	-63.76	-54.51	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz QPSK RB Size 3 Offset 1	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



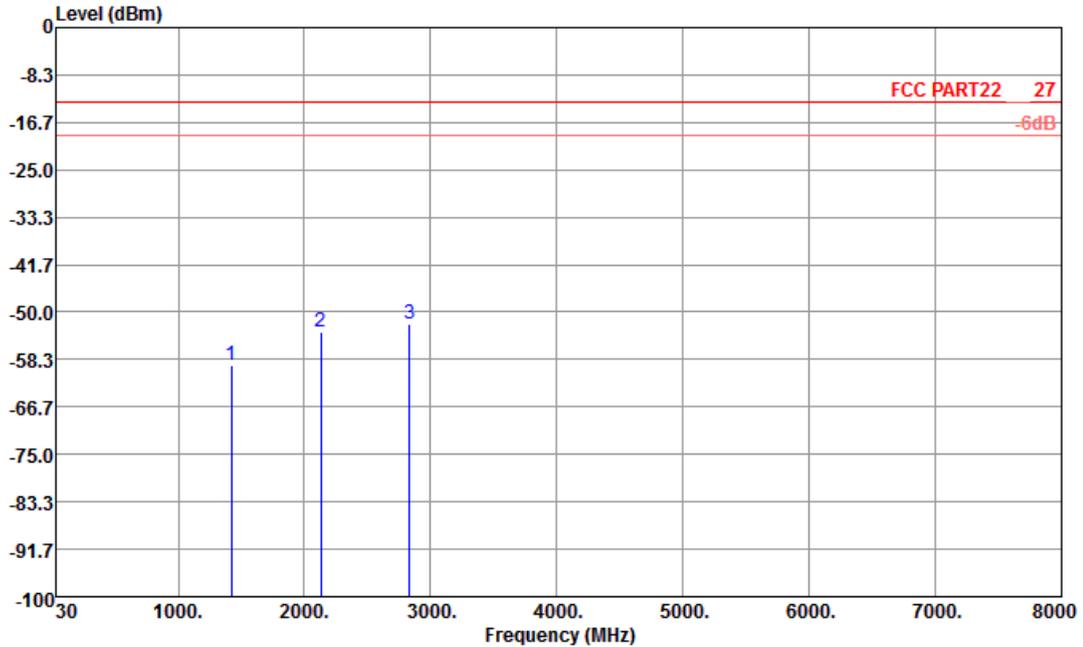
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1430	-56.16	-13	-43.16	-61.87	-56.81	0.57	3.37	V	Pass
2146	-48.05	-13	-35.05	-60.63	-50.28	0.78	5.16	V	Pass
2860	-50.37	-13	-37.37	-64.71	-54.01	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



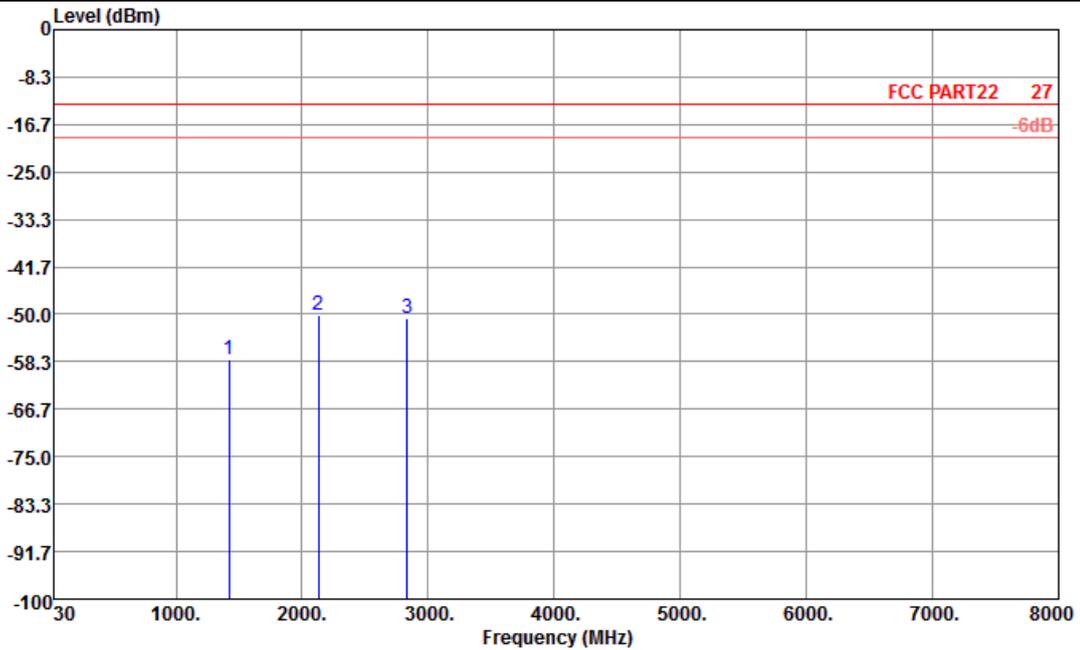
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1418	-59.20	-13	-46.20	-62.36	-59.85	0.57	3.37	H	Pass
2128	-53.59	-13	-40.59	-64.47	-55.82	0.78	5.16	H	Pass
2836	-52.05	-13	-39.05	-64.94	-55.69	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz QPSK RB Size 1 Offset 0	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



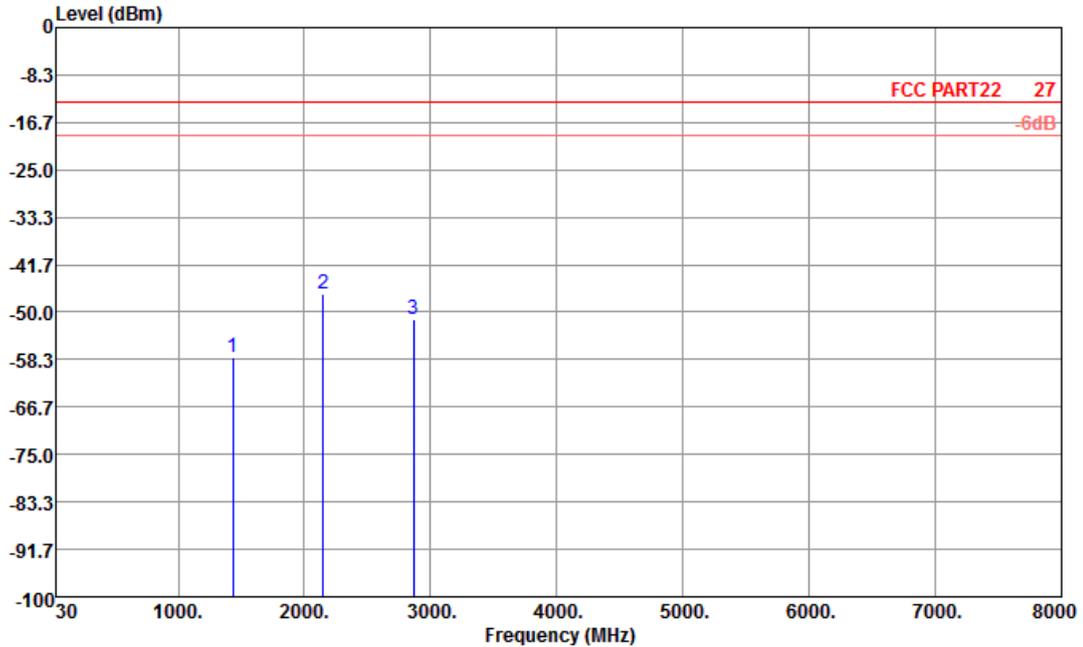
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1418	-57.80	-13	-44.80	-63.30	-58.45	0.57	3.37	V	Pass
2128	-50.11	-13	-37.11	-62.58	-52.34	0.78	5.16	V	Pass
2836	-50.57	-13	-37.57	-64.87	-54.21	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz QPSK RB Size 1 Offset 24	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

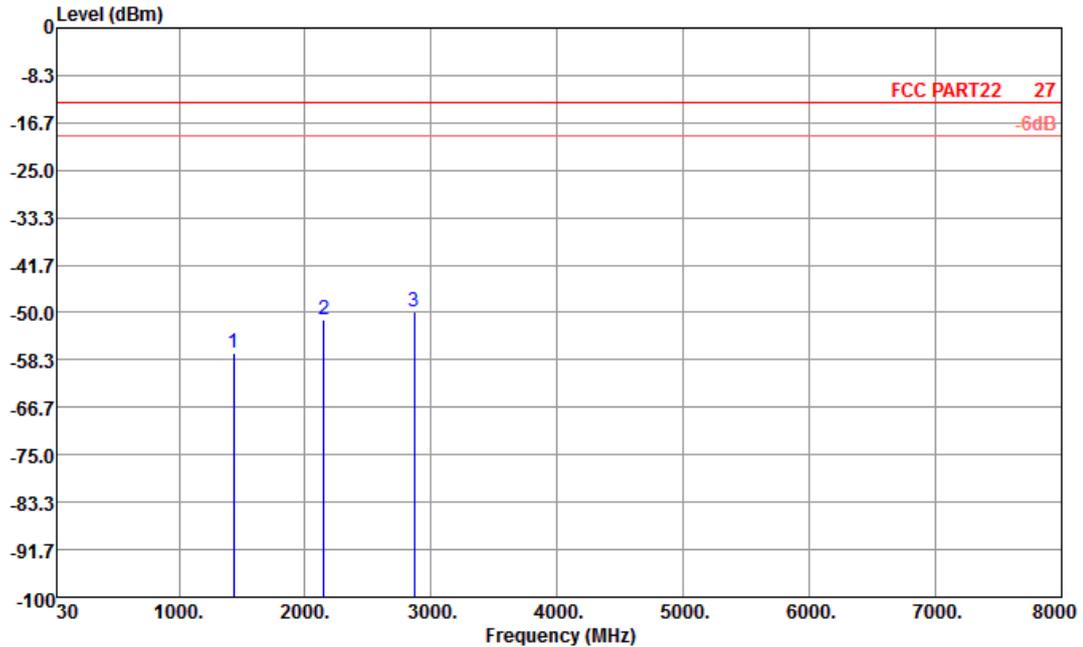


Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL  
 Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1432	-57.83	-13	-44.83	-60.99	-58.48	0.57	3.37	H	Pass
2148	-46.68	-13	-33.68	-57.98	-48.91	0.78	5.16	H	Pass
2864	-51.32	-13	-38.32	-64.21	-54.96	0.87	6.66	H	Pass



Band :	LTE Band 12	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1 Offset 24	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



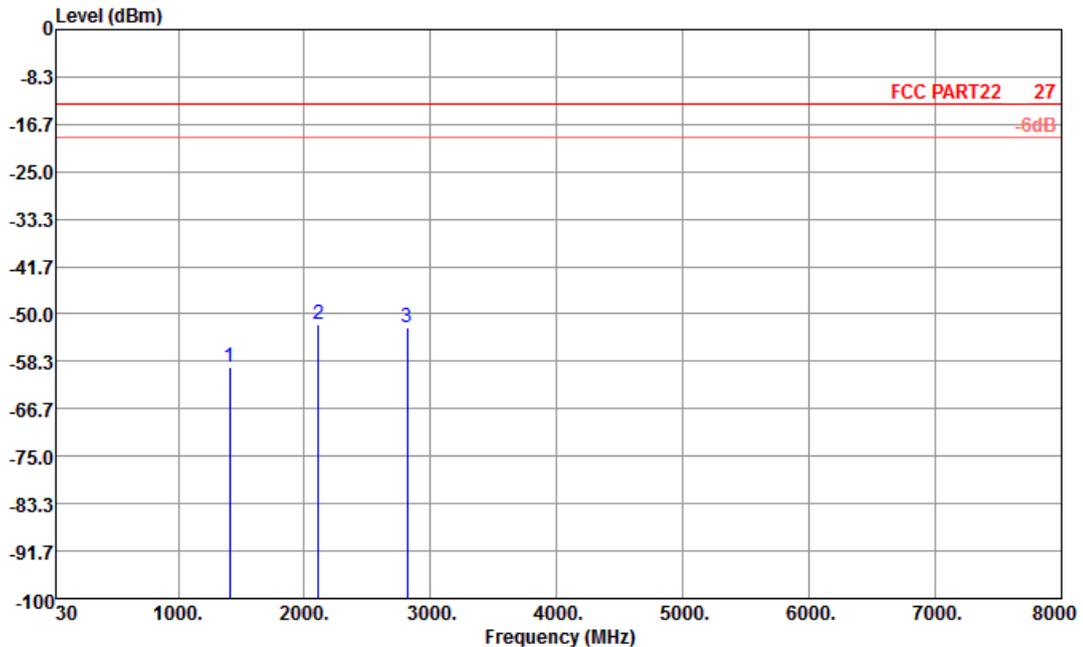
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1432	-56.98	-13	-43.98	-62.62	-57.63	0.57	3.37	V	Pass
2148	-51.21	-13	-38.21	-63.66	-53.44	0.78	5.16	V	Pass
2864	-49.92	-13	-36.92	-64.33	-53.56	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 24	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



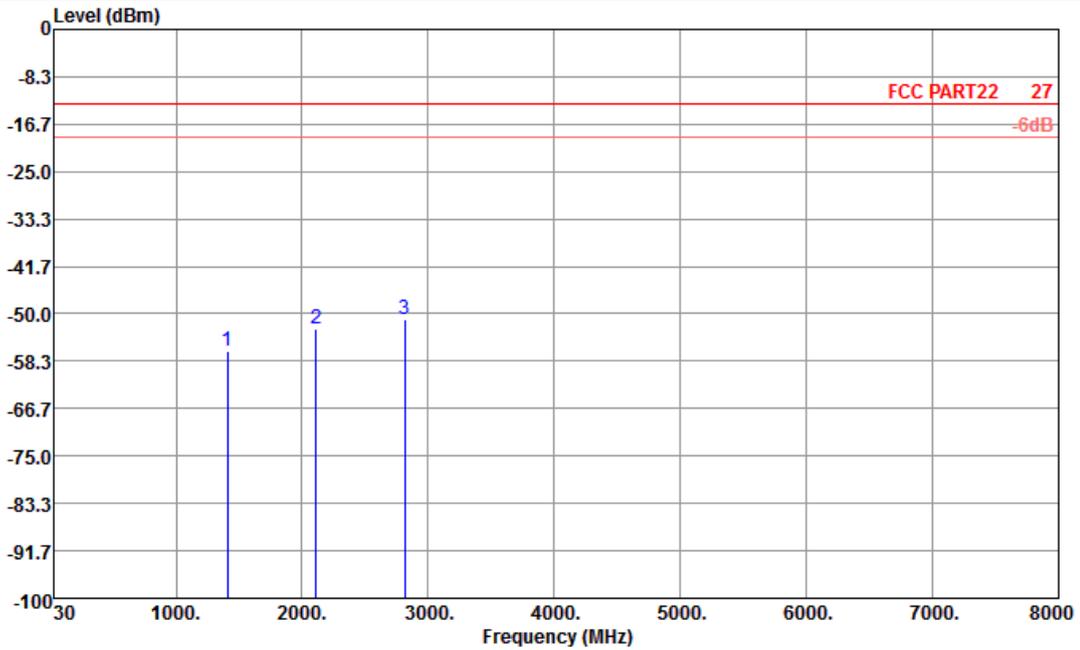
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1408	-59.24	-13	-46.24	-62.39	-59.89	0.57	3.37	H	Pass
2112	-51.68	-13	-38.68	-62.76	-53.91	0.78	5.16	H	Pass
2816	-52.24	-13	-39.24	-65.13	-55.88	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 12	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 24	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



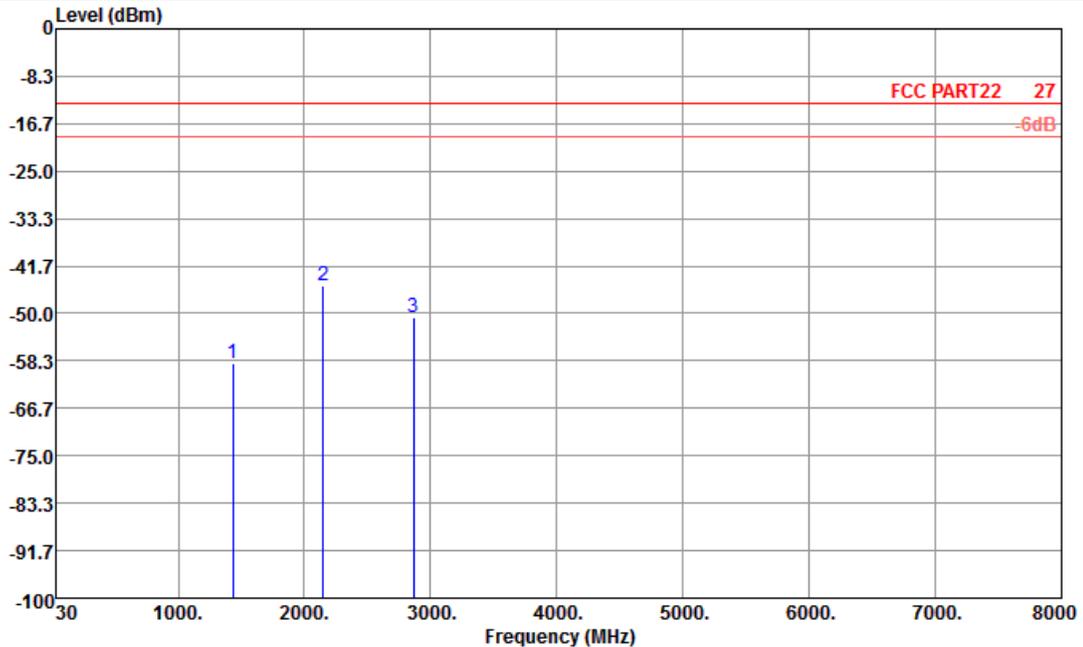
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Z

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1408	-56.66	-13	-43.66	-62.32	-57.31	0.57	3.37	V	Pass
2112	-52.67	-13	-39.67	-64.71	-54.90	0.78	5.16	V	Pass
2816	-50.94	-13	-37.94	-65.16	-54.58	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 17	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz QPSK RB Size 1 Offset 24	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



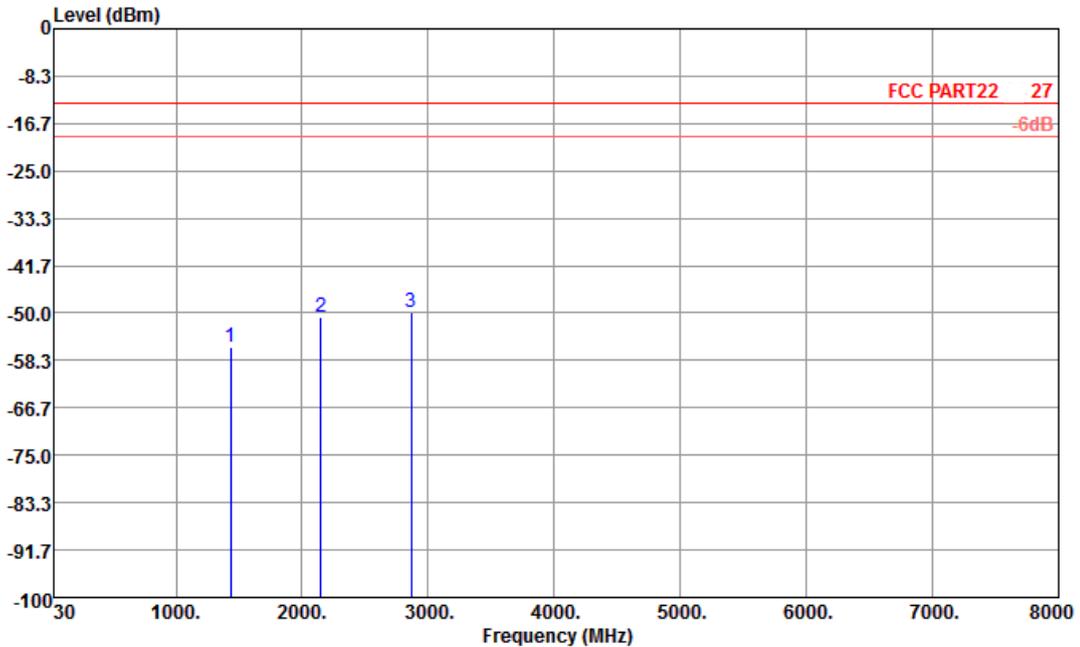
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1432	-58.90	-13	-45.90	-62.11	-59.55	0.57	3.37	H	Pass
2148	-45.15	-13	-32.15	-56.60	-47.38	0.78	5.16	H	Pass
2864	-50.76	-13	-37.76	-63.65	-54.40	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 17	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz QPSK RB Size 1 Offset 24	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



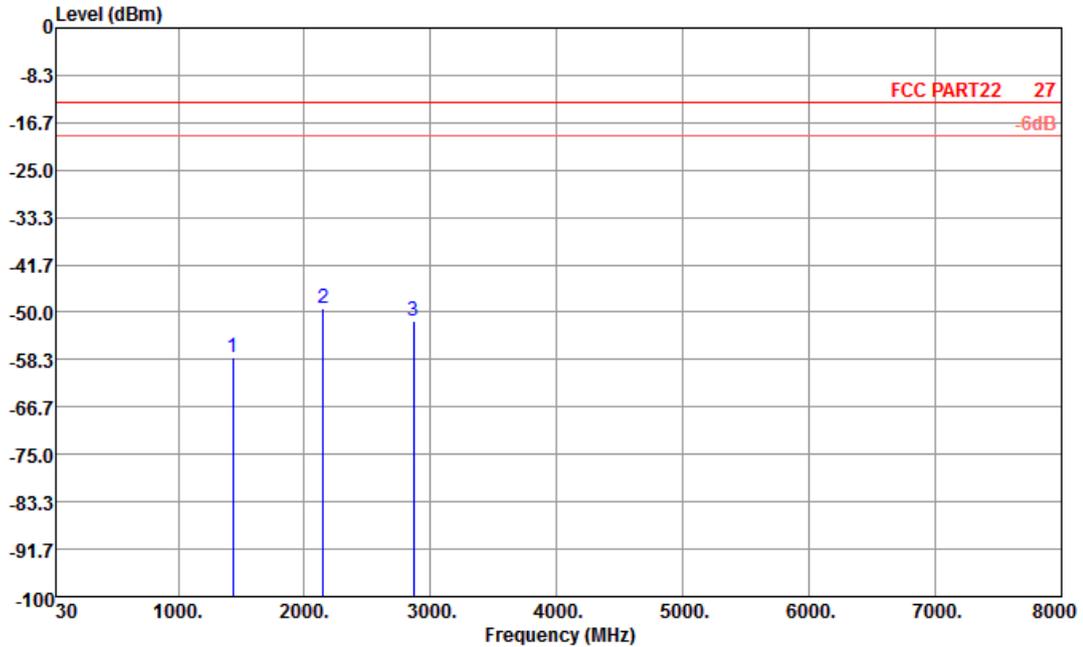
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1432	-56.11	-13	-43.11	-61.82	-56.76	0.57	3.37	V	Pass
2148	-50.67	-13	-37.67	-63.16	-52.90	0.78	5.16	V	Pass
2864	-49.74	-13	-36.74	-64.12	-53.38	0.87	6.66	V	Pass



<b>Band :</b>	LTE Band 17	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 49	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



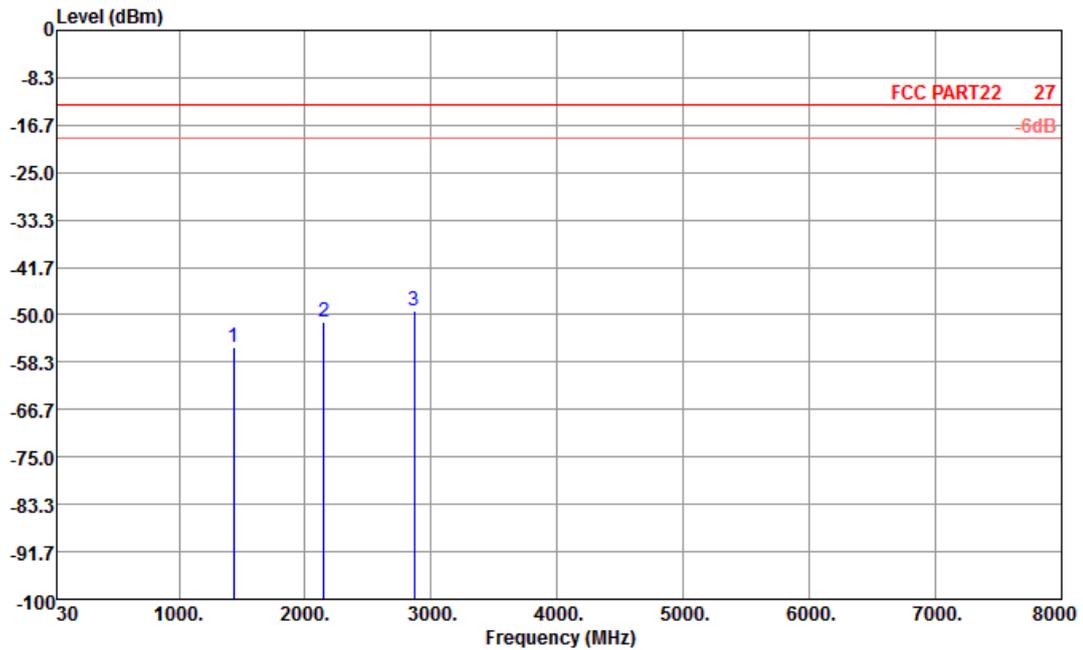
Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 HORIZONTAL

Plane : Y

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1432	-57.94	-13	-44.94	-61.10	-58.59	0.57	3.37	H	Pass
2148	-49.34	-13	-36.34	-60.55	-51.57	0.78	5.16	H	Pass
2864	-51.49	-13	-38.49	-64.38	-55.13	0.87	6.66	H	Pass



<b>Band :</b>	LTE Band 17	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz QPSK RB Size 1 Offset 49	<b>Relative Humidity :</b>	43~44%
<b>Test Engineer :</b>	Stone Gu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS  
 Condition : FCC PART22 27 HF\_EIRP\_FACTOR130726 VERTICAL

Plane : Y

Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
1432	-55.83	-13	-42.83	-61.56	-56.48	0.57	3.37	V	Pass
2148	-51.17	-13	-38.17	-63.63	-53.40	0.78	5.16	V	Pass
2864	-49.36	-13	-36.36	-63.66	-53.00	0.87	6.66	V	Pass

## 3.8 Frequency Stability Measurement

### 3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

### 3.8.2 Measuring Instruments

Measuring equipment is listed in the section 4 of this test report.

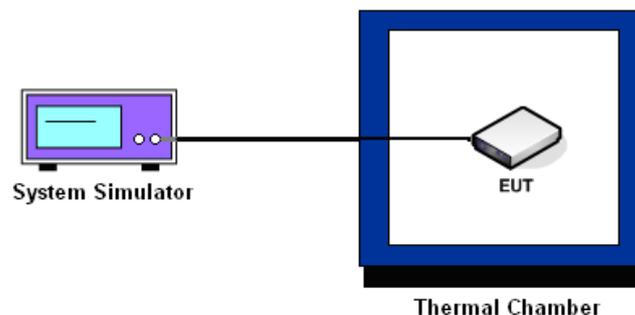
### 3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

### 3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at  $25\pm 5^{\circ}\text{C}$  and connected with the base station.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

### 3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	LTE Band 4 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 1.4MHz		BW 3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	4.9	+0.003	7.5	+0.004	PASS
-20	8.7	+0.005	-9.8	-0.006	
-10	6.5	+0.004	-4.5	-0.003	
0	8.7	+0.005	6.7	+0.004	
10	9.5	+0.005	8.1	+0.005	
20	-4.6	-0.003	5.3	+0.003	
30	-9.0	-0.005	2.3	+0.001	
40	-6.9	-0.004	6.5	+0.004	
50	-7.8	-0.005	4.6	+0.003	

Band :	LTE Band 4 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-7.6	-0.004	8.5	+0.005	PASS
-20	-7.1	-0.004	6.5	+0.004	
-10	-9.5	-0.005	4.6	+0.003	
0	8.6	+0.005	-9.5	-0.005	
10	-6.6	-0.004	-6.4	-0.004	
20	4.9	+0.003	-3.5	-0.002	
30	5.1	+0.003	-7.5	-0.004	
40	1.6	+0.001	-8.1	-0.005	
50	-4.4	-0.003	-7.1	-0.004	



Band :	LTE Band 4 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 15MHz		BW 20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-5.5	-0.003	7.1	+0.004	PASS
-20	-6.1	-0.004	8.0	+0.005	
-10	-3.2	-0.002	-9.0	-0.005	
0	-5.4	-0.003	5.2	+0.003	
10	-6.6	-0.004	4.6	+0.003	
20	-8.7	-0.005	5.3	+0.003	
30	6.4	+0.004	1.8	+0.001	
40	4.5	+0.003	8.2	+0.005	
50	1.2	+0.001	9.3	+0.005	

Band :	LTE Band 4 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 1.4MHz		BW 3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	3.6	+0.002	5.5	+0.003	PASS
-20	6.6	+0.004	3.8	+0.002	
-10	7.2	+0.004	7.2	+0.004	
0	-2.0	-0.001	9.8	+0.006	
10	-9.0	-0.005	1.1	+0.001	
20	9.2	+0.005	9.2	+0.005	
30	6.3	+0.004	3.8	+0.002	
40	5.5	+0.003	7.0	+0.004	
50	7.8	+0.005	6.7	+0.004	



Band :	LTE Band 4 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-3.6	-0.002	-5.8	-0.003	PASS
-20	5.1	+0.003	-6.7	-0.004	
-10	2.6	+0.002	-9.1	-0.005	
0	6.8	+0.004	9.8	+0.006	
10	-9.2	-0.005	5.2	+0.003	
20	3.6	+0.002	6.1	+0.004	
30	4.9	+0.003	7.3	+0.004	
40	8.2	+0.005	5.9	+0.003	
50	11.2	+0.006	-8.5	-0.005	

Band :	LTE Band 4 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 15MHz		BW 20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	8.5	+0.005	5.6	+0.003	PASS
-20	6.9	+0.004	3.6	+0.002	
-10	8.7	+0.005	6.6	+0.004	
0	6.5	+0.004	7.2	+0.004	
10	7.4	+0.004	3.8	+0.002	
20	5.0	+0.003	7.0	+0.004	
30	4.5	+0.003	5.6	+0.003	
40	-7.5	-0.004	3.6	+0.002	
50	-6.5	-0.004	6.6	+0.004	



Band :	LTE Band 5 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 1.4MHz		BW 3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	5.6	+0.007	2.5	+0.003	PASS
-20	6.9	+0.008	6.3	+0.008	
-10	8.7	+0.010	3.5	+0.004	
0	6.5	+0.008	6.4	+0.008	
10	4.0	+0.005	1.5	+0.002	
20	5.0	+0.006	4.5	+0.005	
30	-6.5	-0.008	3.9	+0.005	
40	-4.1	-0.005	1.5	+0.002	
50	-2.6	-0.003	-2.8	-0.003	

Band :	LTE Band 5 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-2.9	-0.003	-4.0	-0.005	PASS
-20	-2.0	-0.002	-3.6	-0.004	
-10	1.3	+0.002	-2.0	-0.002	
0	6.5	+0.008	-3.8	-0.005	
10	4.3	+0.005	4.5	+0.005	
20	2.8	+0.003	6.5	+0.008	
30	2.0	+0.002	-9.7	-0.012	
40	-1.6	-0.002	-8.7	-0.010	
50	-3.3	-0.004	-3.5	-0.004	



Band :	LTE Band 5 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 1.4MHz		BW 3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	3.8	+0.005	4.6	+0.005	PASS
-20	-2.6	-0.003	5.8	+0.007	
-10	-3.5	-0.004	6.3	+0.008	
0	2.6	+0.003	2.5	+0.003	
10	4.6	+0.005	1.3	+0.002	
20	5.9	+0.007	-6.5	-0.008	
30	-6.7	-0.008	-8.1	-0.010	
40	-8.1	-0.010	-7.5	-0.009	
50	11.0	+0.013	-4.4	-0.005	

Band :	LTE Band 5 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	3.1	+0.004	-3.6	-0.004	PASS
-20	2.6	+0.003	-2.9	-0.003	
-10	4.1	+0.005	2.8	+0.003	
0	3.8	+0.005	6.9	+0.008	
10	2.9	+0.003	5.4	+0.006	
20	5.5	+0.007	-6.9	-0.008	
30	-6.1	-0.007	-9.1	-0.011	
40	-3.0	-0.004	-2.5	-0.003	
50	-4.8	-0.006	3.1	+0.004	



Band :	LTE Band 12 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 1.4MHz		BW 3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	6.4	+0.009	4.3	+0.006	PASS
-20	-9.5	-0.013	8.3	+0.012	
-10	-7.1	-0.010	-10.3	-0.015	
0	8.3	+0.012	-7.1	-0.010	
10	-9.5	-0.013	-7.5	-0.011	
20	-5.1	-0.007	-8.3	-0.012	
30	-10.3	-0.015	-5.4	-0.008	
40	-7.1	-0.010	-7.5	-0.011	
50	-11.0	-0.016	6.4	+0.009	

Band :	LTE Band 12 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	7.8	+0.011	-12.3	-0.017	PASS
-20	3.4	+0.005	-5.4	-0.008	
-10	8.3	+0.012	-12.3	-0.017	
0	8.3	+0.012	-10.3	-0.015	
10	-10.3	-0.015	8.3	+0.012	
20	-7.1	-0.010	-10.3	-0.015	
30	-7.5	-0.011	-7.1	-0.010	
40	-9.1	-0.013	-8.3	-0.012	
50	-11.0	-0.016	6.4	+0.009	



Band :	LTE Band 12 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 1.4MHz		BW 3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	6.5	+0.009	5.9	+0.008	PASS
-20	9.7	+0.014	6.5	+0.009	
-10	5.6	+0.008	3.6	+0.005	
0	6.5	+0.009	7.1	+0.010	
10	-5.4	-0.008	6.4	+0.009	
20	-8.7	-0.012	-5.5	-0.008	
30	-7.2	-0.010	-5.4	-0.008	
40	-6.4	-0.009	-6.3	-0.009	
50	5.3	+0.007	3.6	+0.005	

Band :	LTE Band 12 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-5.4	-0.008	9.7	+0.014	PASS
-20	-12.3	-0.017	7.8	+0.011	
-10	-7.5	-0.011	3.4	+0.005	
0	5.2	+0.007	-9.5	-0.013	
10	-7.1	-0.010	-7.5	-0.011	
20	8.3	+0.012	-6.4	-0.009	
30	8.6	+0.012	-7.5	-0.011	
40	-9.1	-0.013	-8.0	-0.011	
50	-5.5	-0.008	-6.8	-0.010	



Band :	LTE Band 17 (QPSK)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-9.8	-0.014	7.6	+0.011	PASS
-20	7.6	+0.011	5.6	+0.008	
-10	-8.5	-0.012	8.1	+0.011	
0	-6.8	-0.010	-6.6	-0.009	
10	-4.6	-0.006	-6.9	-0.010	
20	3.6	+0.005	-7.8	-0.011	
30	5.3	+0.007	-11.2	-0.016	
40	3.1	+0.004	2.6	+0.004	
50	-2.5	-0.004	6.2	+0.009	

Band :	LTE Band 17 (16QAM)		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	5.6	+0.008	-9.8	-0.014	PASS
-20	3.6	+0.005	6.4	+0.009	
-10	9.8	+0.014	1.5	+0.002	
0	-7.8	-0.011	2.5	+0.004	
10	-5.6	-0.008	6.2	+0.009	
20	2.5	+0.004	-4.3	-0.006	
30	6.8	+0.010	-3.5	-0.005	
40	7.4	+0.010	3.8	+0.005	
50	4.9	+0.007	4.8	+0.007	



3.8.7 Test Result of Voltage Variation

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4 (QPSK)	1.4M	Normal	5.6	+0.003	2.5	PASS
		3.5	7.8	+0.005		
		4.2	-9.0	-0.005		
	3M	Normal	-11.2	-0.006		
		3.5	-0.8	+0.001		
		4.2	6.5	+0.004		
	5M	Normal	7.0	+0.004		
		3.5	-4.6	-0.003		
		4.2	-5.0	-0.003		
	10M	Normal	-7.1	-0.004		
		3.5	4.5	+0.003		
		4.2	6.3	+0.004		
	15M	Normal	3.8	+0.002		
		3.5	2.9	+0.002		
		4.2	-5.5	-0.003		
20M	Normal	-11.0	-0.006			
	3.5	-8.4	-0.005			
	4.2	-9.0	-0.005			
LTE Band 5 (QPSK)	1.4M	Normal	5.6	+0.007	2.5	PASS
		3.5	-9.8	-0.012		
		4.2	7.5	+0.009		
	3M	Normal	6.4	+0.008		
		3.5	-5.5	-0.007		
		4.2	-6.5	-0.008		
	5M	Normal	-3.8	-0.005		
		3.5	-8.7	-0.010		
		4.2	-6.9	-0.008		
	10M	Normal	-4.5	-0.005		
		3.5	-6.5	-0.008		
		4.2	-3.2	-0.004		



Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 12 (QPSK)	1.4M	4.2	-10.3	-0.015	2.5	PASS
		Normal	-11.1	-0.016		
		3.5	8.3	+0.012		
	3M	4.2	-10.3	-0.015		
		Normal	7.1	+0.010		
		3.5	9.8	+0.014		
	5M	4.2	-5.1	-0.007		
		Normal	-10.3	-0.015		
		3.5	-8.3	-0.012		
	10M	4.2	4.3	+0.006		
		Normal	6.9	+0.010		
		3.5	7.6	+0.011		
LTE Band 17 (QPSK)	5M	Normal	5.6	+0.008	2.5	PASS
		3.5	3.1	+0.004		
		4.2	5.4	+0.008		
	10M	Normal	-7.8	-0.011		
		3.5	-10.2	-0.014		
		4.2	3.2	+0.005		



Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4 (16QAM)	1.4M	Normal	5.2	+0.003	2.5	PASS
		3.5	6.8	+0.004		
		4.2	-9.2	-0.005		
	3M	Normal	-7.3	-0.004		
		3.5	-8.5	-0.005		
		4.2	6.6	+0.004		
	5M	Normal	7.6	+0.004		
		3.5	9.1	+0.005		
		4.2	8.5	+0.005		
	10M	Normal	2.6	+0.002		
		3.5	1.8	+0.001		
		4.2	-5.5	-0.003		
	15M	Normal	-6.3	-0.004		
		3.5	2.9	+0.002		
		4.2	7.1	+0.004		
20M	Normal	-8.8	-0.005			
	3.5	-1.6	-0.001			
	4.2	5.7	+0.003			
LTE Band 5 (16QAM)	1.4M	Normal	-3.0	-0.004	2.5	PASS
		3.5	-2.8	-0.003		
		4.2	3.6	+0.004		
	3M	Normal	-4.1	-0.005		
		3.5	-6.5	-0.008		
		4.2	5.6	+0.007		
	5M	Normal	3.2	+0.004		
		3.5	3.1	+0.004		
		4.2	-1.8	-0.002		
	10M	Normal	-1.6	-0.002		
		3.5	-0.9	-0.001		
		4.2	2.8	+0.003		



Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 12 (16QAM)	1.4M	4.2	6.9	+0.010	2.5	PASS
		Normal	7.6	+0.011		
		3.5	3.4	+0.005		
	3M	4.2	4.3	+0.006		
		Normal	-9.5	-0.013		
		3.5	-7.1	-0.010		
	5M	4.2	9.7	+0.014		
		Normal	7.8	+0.011		
		3.5	3.4	+0.005		
	10M	4.2	4.3	+0.006		
		Normal	7.8	+0.011		
		3.5	3.4	+0.005		
LTE Band 17 (16QAM)	5M	Normal	5.6	+0.008	2.5	PASS
		3.5	7.8	+0.011		
		4.2	9.6	+0.014		
	10M	Normal	4.5	+0.006		
		3.5	-2.5	-0.004		
		4.2	-3.6	-0.005		

**Remark:**

1. Normal Voltage = 3.7V.
2. The manufacturer declared that the EUT could work properly between voltage 3.5V ~ 4.2V.



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Nov. 11, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Sensor	Anritsu	MA2411B	0917070	N/A	Feb. 28, 2013	Nov. 11, 2013	Feb. 27, 2014	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	N/A	Feb. 28, 2013	Nov. 11, 2013	Feb. 27, 2014	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Nov. 11, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 07, 2013	Nov. 08, 2013~ Nov. 09, 2013	Nov. 06, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 23, 2013	Nov. 08, 2013~ Nov. 09, 2013	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Nov. 08, 2013~ Nov. 09, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2013	Nov. 08, 2013~ Nov. 09, 2013	Jan. 05, 2014	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	N/A	Nov. 08, 2013~ Nov. 09, 2013	N/A	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	N/A	Nov. 08, 2013~ Nov. 09, 2013	N/A	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP 7	100819	9kHz~7GHz	May 23, 2013	Nov. 05, 2013	May 22, 2014	ERP/EIRP (OTA01-KS)
Switch Control Manframe	Agilent	3499A	MY42005452	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Dual 1-to-6(4) MW MUX	Agilent	N2276A	MY42000841	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002573	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002586	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-04	00066993	700MHz~6GHz	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Conical Log Spiral (Small)	ETS-Lindgren	3102	00066951	1~10GHz	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Turn Table	ETS-Lindgren	2088	N/A	Resolution : 0.1degree	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Limiting Amplifier	ETS-lindgren	109643	920326	10MHz~2.5GHz	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
EMQuest	ETS-Lindgren	EMQ-100	1125	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)
Medium Duty Holder	ETS-Lindgren	2015	N/A	N/A	N/A	Nov. 05, 2013	N/A	ERP/EIRP (OTA01-KS)



## 5 Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.54
---	------