RF TEST REPORT

Report No.: SET2016-19459

Product: LTE Ufi

FCC ID: SRQ-MF920T

Model No.: MF920T

Applicant: ZTE Corporation

Address: ZTE Plaza, Keji Road South, Shenzhen, China

Dates of Testing: 10/10/2016 — 10/26/2016

Issued by: CCIC-SET

Lab Location: Building 28/29, East of Shigu, Xili Industrial Zone, Xili Road, Nanshan District, Shenzhen, Guangdong, China

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Test Report

Product ..... :	LTE Ufi
Brand Name..... :	ZTE
Trade Name ..... :	ZTE
Applicant ..... :	ZTE Corporation
Applicant Address ..... :	ZTE Plaza, Keji Road South, Shenzhen, China
Manufacturer ..... :	ZTE Corporation
Manufacturer Address ..... :	ZTE Plaza, Keji Road South, Shenzhen, China
Test Standards ..... :	47 CFR Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations 47 CFR Part 27(L) 27(M): Miscellaneous wireless communications services
Test Result……..:	PASS

Tested by ……..: Fly Fan 2016.10.27

Fly Fan，Test Engineer

Reviewed by……: Zhu Qi 2016.10.27

Zhu Qi, Senior Egineer

Approved by……..: Wu Lian 2016.10.27

Wu Li'an，Manager

Table of Contents

Change History		
Issue	Date	Reason for change
1.0	2016.10.27	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	LTE Ufi
Hardware Version	dkeB
Software Version	BD_LAMF920TV1.0.0B04
EUT supports Radios application	GSM/GPRS/EDGE/WCDMA/HSPA/LTE WLAN2.4GHz 802.11b/g/n (HT20)
Frequency Range	LTE Band 4 Tx: 1710.7MHz~1754.3MHz Rx: 2110.7MHz~2154.3MHz LTE Band 7 Tx: 2502.5MHz~2567.5MHz Rx: 2622.5MHz~2687.5MHz
Maximum Output Power to Antenna	LTE Band 4：22.76dBm LTE Band 7：22.86dBm
Bandwidth	LTE Band 4：1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 7：5MHz/10MHz/15MHz/20MHz
Modulation Type	QPSK/16QAM
Antenna Type	Internal Antenna

1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW (MHz)	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
Part 27	LTE Band 4	QPSK	1.4	1M11G7D	—	0.133
Part 27	LTE Band 4	16QAM	1.4	1M11W7D	—	0.110
Part 27	LTE Band 4	QPSK	3	2M74G7D	—	0.134
Part 27	LTE Band 4	16QAM	3	2M73W7D	—	0.109
Part 27	LTE Band 4	QPSK	5	4M53G7D	—	0.136
Part 27	LTE Band 4	16QAM	5	4M51W7D	—	0.109
Part 27	LTE Band 4	QPSK	10	8M95G7D	0.03	0.135
Part 27	LTE Band 4	16QAM	10	8M92W7D	0.03	0.109
Part 27	LTE Band 4	QPSK	15	13M6G7D	—	0.137
Part 27	LTE Band 4	16QAM	15	13M5W7D	—	0.109
Part 27	LTE Band 4	QPSK	20	19M7G7D	—	0.139
Part 27	LTE Band 4	16QAM	20	19M7W7D	—	0.110
Part 27	LTE Band 7	QPSK	5	4M55G7D	—	0.131
Part 27	LTE Band 7	16QAM	5	4M53W7D	—	0.106
Part 27	LTE Band 7	QPSK	10	8M94G7D	0.02	0.130
Part 27	LTE Band 7	16QAM	10	8M94W7D	0.02	0.105
Part 27	LTE Band 7	QPSK	15	13M5G7D	—	0.132
Part 27	LTE Band 7	16QAM	15	13M5W7D	—	0.107
Part 27	LTE Band 7	QPSK	20	19M8G7D	—	0.133
Part 27	LTE Band 7	16QAM	20	19M7W7D	—	0.108

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part27 for the EUT FCC ID Certification:

1.47 CFR Part 2, 27(L), 27(M)

2. ANSI/TIA/EIA-603-D-2010

3. FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Limit	Result
1	2.1046	Conducted RF Output Power	Reporting Only	PASS
2	27.50(d)(5)	Peak to Average Radio	＜13dB	PASS
3	27.50(h)(2)	Effective Radiated Power(Band 7)	EIRP＜2Watt	PASS
	27.50(d)(4)	Effective Radiated Power(Band 4)	EIRP＜1Watt	PASS
4	2.1049 27.53(h)(3) 27.53(m)(6)	Occupied Bandwidth	Reporting Only	PASS
5	2.1051 27.53(g)	Conducted Band Edge(Band 4)	＜ 43+10log10(P[watt])	PASS
	2.1051 27.53(m)(4)	Conducted Band Edge(Band 7)	＜5.5MHz: -13dBm ≥5.5MHz: -25dBm	PASS
6	2.1051 27.53(g)	Conducted Spurious Emission (Band 4)	＜ 43+10log10(P[watt])	PASS
	2.1051 27.53(m)(4)	Conducted Spurious Emission (Band 7)	＜ 55+10log10(P[watt])	PASS
7	2.1053 27.53(g)	Radiated Spurious Emission (Band 4)	＜ 43+10log10(P[watt])	PASS
	2.1053 27.53(m)(4)	Radiated Spurious Emission (Band 7)	＜ 55+10log10(P[watt])	PASS

8	2.1055 27.54	Frequency Stability	＜2.5ppm	PASS

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.

1.4 Test Configuration of Equipment Under Test

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth(MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	4	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	7			√	√	√	√	√	√	√	√	√	√	√	√
Peak-to-Average Ratio	4						√		√	√		√	√	√	√
	7						√		√	√		√	√	√	√
26dB and 99% Bandwidth	4	√	√	√	√	√	√	√	√			√		√	
	7			√	√	√	√	√	√			√		√	
Conducted Band Edge	4	√	√	√	√	√	√	√	√	√		√	√		√
	7			√	√	√	√	√	√	√		√	√		√
Conducted Spurious Emission	4	√	√	√	√	√	√	√	√	√			√	√	√
	7			√	√	√	√	√	√	√			√	√	√
Frequency Stability	4	√	√	√	√	√	√	√				√		√	
	7			√	√	√	√	√				√		√	
ERP/EIRP	4	√	√	√	√	√	√	√	√	√			√	√	√
	7			√	√	√	√	√	√	√			√	√	√
Radiated Spurious Emission	4	√	√	√	√	√	√	√		√			√	√	√
	7			√	√	√	√	√		√			√	√	√
Note	**1. The mark “√” means that this configuration is chosen for testing.** **2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.** **3. For E.R.P/E.I.R.P. measurement, the widest bandwidth and the bandwidth with the highest conducted power of each band is chosen for testing. Besides, the lowest bandwidth of each band is also measured for reporting only.**														

1.5 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 7.5dB and 10dB attenuator.

Example:

Offset (dB) = RF cable loss(dB) + attenuator factor(dB).
= 7 + 10 = 17 (dB)

1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories

(identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

FCC-Registration No.: 317478

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

1.6.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (℃):	15℃- 35℃
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2, PART 27H REQUIREMENTS

2.1 Conducted RF Output Power

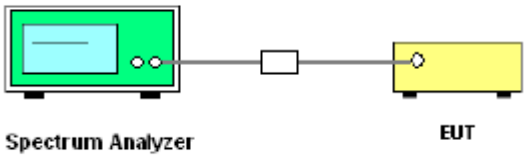
2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.1.3 Test Setup



2.1.4 Test Procedures

1. The transmitter output port was connected to the system simulator.

2. Set EUT at maximum power through system simulator.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Measure and record the power level from the system simulator.

2.1.5 Test Results

1. LTE Band 4 Conducted Power Test Verdict:

BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20050	20175	20300
Frequency(MHz)				1720	1732.5	1745
20	QPSK	1	0	22.71	**22.76**	22.75
20		1	49	22.74	22.72	22.69
20		1	99	22.68	22.70	22.74
20		50	0	22.32	22.34	22.37
20		50	24	22.30	22.25	22.31
20		50	49	22.28	22.22	22.25
20		100	0	22.21	22.26	22.24
20	16QAM	1	0	21.72	21.81	21.74
20		1	49	21.70	21.75	21.73
20		1	99	21.74	21.72	21.67
20		50	0	21.37	21.29	21.32
20		50	24	21.29	21.27	21.30
20		50	49	21.31	21.25	21.26
20		100	0	21.24	21.23	21.21
Channel				20025	20175	20325
Frequency(MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	**22.71**	22.68	22.70
15		1	37	22.66	22.65	22.62
15		1	74	22.64	22.67	22.63
15		36	0	22.33	22.27	22.29
15		36	18	22.28	22.24	22.27
15		36	37	22.26	22.20	22.24
15		75	0	22.21	22.25	22.22
15	16QAM	1	0	21.72	21.77	21.73
15		1	37	21.70	21.75	21.69
15		1	74	21.67	21.62	21.68
15		36	0	21.26	21.33	21.28
15		36	18	21.29	21.23	21.26
15		36	37	21.21	21.25	21.23
15		75	0	21.22	21.24	21.21

BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20000	20175	20350
Frequency(MHz)				1715	1732.5	1750
10	QPSK	1	0	22.65	**22.67**	22.55
10		1	24	22.61	22.59	22.53
10		1	49	22.54	22.56	22.55
10		25	0	22.24	22.26	22.18
10		25	12	22.22	22.25	22.20
10		25	24	22.17	22.20	22.15
10		50	0	22.15	22.12	22.14
10	16QAM	1	0	21.73	21.65	21.64
10		1	24	21.61	21. 62	21.65
10		1	49	21.58	21.59	21.56
10		25	0	21.25	21.23	21.20
10		25	12	21.18	21.20	21.22
10		25	24	21.12	21.18	21.14
10		50	0	21.16	21.14	21.13
Channel				19975	20175	20375
Frequency(MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	**22.63**	22.59	22.57
5		1	12	22.55	22.62	22.56
5		1	24	22.61	22.53	22.55
5		12	0	22.22	22.18	22.24
5		12	6	22.17	22.20	22.18
5		12	11	22.15	22.13	22.17
5		25	0	22.13	22.14	22.16
5	16QAM	1	0	21.59	21.56	21.60
5		1	12	21.55	21.57	21.52
5		1	24	21.59	21.54	21.55
5		12	0	21.15	21.21	21.18
5		12	6	21.16	21.12	21.15
5		12	11	21.15	21.14	21.12
5		25	0	21.13	21.18	21.10

BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				19965	20175	20385
Frequency(MHz)				1711.5	1732.5	1753.5
3	QPSK	1	0	22.56	22.61	**22.65**
3		1	7	22.61	22.60	22.63
3		1	14	22.59	22.55	22.57
3		8	0	22.17	22.21	22.16
3		8	4	22.20	22.15	22.18
3		8	7	22.18	22.12	22.15
3		15	0	22.15	22.14	22.11
3	16QAM	1	0	21.61	21.62	21.55
3		1	7	21.57	21.55	21.53
3		1	14	21.52	21.58	21.56
3		8	0	21.23	21.19	21.22
3		8	4	21.14	21.18	21.15
3		8	7	21.15	21.15	21.14
3		15	0	21.12	21.16	21.13
Channel				19957	20175	20393
Frequency(MHz)				1710.7	1732.5	1754.3
1.4	QPSK	1	0	**22.60**	22.57	22.55
1.4		1	2	22.54	22.55	22.59
1.4		1	5	21.55	22.57	22.53
1.4		3	0	22.21	22.18	22.15
1.4		3	1	22.17	22.13	22.18
1.4		3	2	22.16	22.17	22.11
1.4		6	0	22.15	22.16	22.14
1.4	16QAM	1	0	21.62	21.60	21.59
1.4		1	2	21.53	21.54	21.61
1.4		1	5	21.55	21.52	21.54
1.4		3	0	21.15	21.21	21.17
1.4		3	1	21.19	21.13	21.18
1.4		3	2	21.20	21.18	21.17
1.4		6	0	21.14	21.12	21.13

2. LTE Band 7 Conducted Power Test Verdict:

BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20850	21100	21350
Frequency(MHz)				2510	2535	2560
20	QPSK	1	0	22.82	**22.86**	22.84
20		1	49	22.78	22.77	22.83
20		1	99	22.81	22.82	22.75
20		50	0	22.32	22.34	22.37
20		50	24	22.27	22.25	22.31
20		50	49	22.28	22.29	22.25
20		100	0	22.25	22.30	22.23
20	16QAM	1	0	21.70	21.71	21.65
20		1	49	21.64	21.62	21.63
20		1	99	21.68	21.65	21.61
20		50	0	21.20	21.21	21.15
20		50	24	21.24	21.22	21.23
20		50	49	21.18	21.17	21.18
20		100	0	21.20	21.15	21.11
Channel				20825	21100	21375
Frequency(MHz)				2507.5	2535	2562.5
15	QPSK	1	0	22.80	**22.82**	22.81
15		1	37	22.77	22.75	22.78
15		1	74	22.76	22.78	22.77
15		36	0	22.25	22.32	22.26
15		36	18	22.22	22.31	22.22
15		36	37	22.25	22.27	22.26
15		75	0	22.24	22.23	22.25
15	16QAM	1	0	21.72	21.75	21.69
15		1	37	21.64	21.62	21.65
15		1	74	21.67	21.65	21.64
15		36	0	21.22	21.25	21.19
15		36	18	21.24	21.22	21.15
15		36	37	21.17	21.15	21.14
15		75	0	21.15	21.12	21.13

BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20800	21100	21400
Frequency(MHz)				2505	2535	2565
10	QPSK	1	0	22.77	**22.79**	22.75
10		1	24	22.71	22.75	22.73
10		1	49	22.70	22.73	22.71
10		25	0	22.24	22.20	22.25
10		25	12	22.22	22.24	22.22
10		25	24	22.15	22.17	22.18
10		50	0	22.13	22.12	22.15
10	16QAM	1	0	21.73	21.70	21.65
10		1	24	21.64	21.62	21.61
10		1	49	21.65	21.60	21.63
10		25	0	21.13	21.20	21.15
10		25	12	21.20	21.12	21.21
10		25	24	21.15	21.10	21.15
10		50	0	21.10	21.15	21.13
Channel				20775	21100	21425
Frequency(MHz)				2502.5	2535	2567.5
5	QPSK	1	0	22.69	**22.75**	22.71
5		1	12	22.74	22.72	22.69
5		1	24	22.71	22.68	22.65
5		12	0	22.25	22.25	22.22
5		12	6	22.24	22.22	22.20
5		12	11	22.23	22.24	22.20
5		25	0	22.18	22.20	22.17
5	16QAM	1	0	21.67	21.64	21.63
5		1	12	21.65	21.62	21.60
5		1	24	21.59	21.64	21.58
5		12	0	21.17	21.14	21.19
5		12	6	21.15	21.17	21.18
5		12	11	21.13	21.14	21.15
5		25	0	21.11	21.10	21.13

2.2 Peak to Average Radio

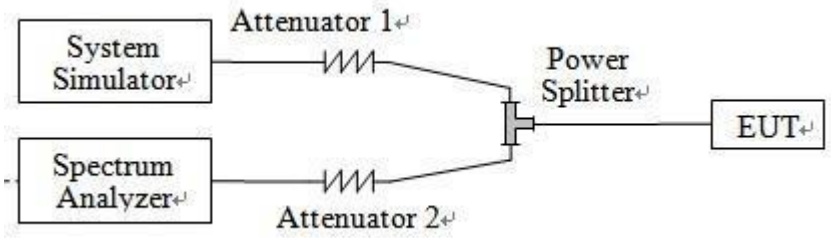
2.2.1 Definition

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.

2.2.2 Measuring Instruments

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

2.2.3 Test Description



2.2.4 Test Procedures

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

2.2.5 Test Results of Peak-to-Average Ratio

1. Test Result of LTE Band 4 Peak-to-Average Ratio:

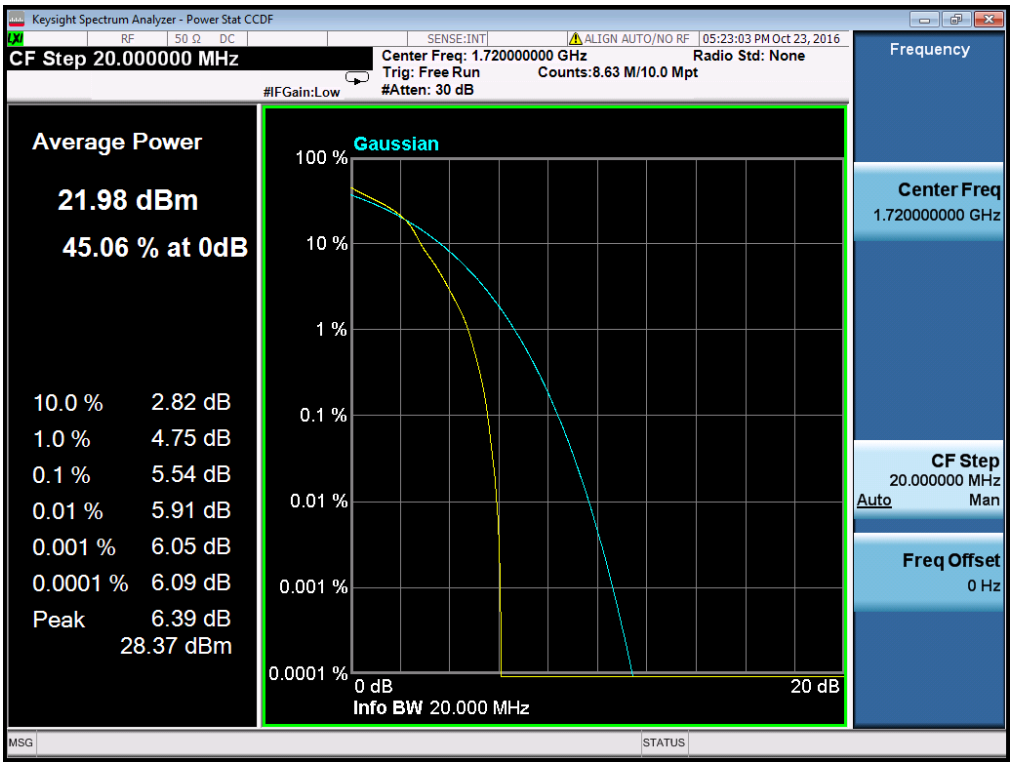
BW (MHz)	Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Peak to Average radio (dB)	Limit (dB)	Verdict
20	16QAM	20050	1720	1	0	5.54	13	PASS
				100	0	6.46		
	16QAM	20175	1732.5	1	0	6.17		PASS
				100	0	6.46		
	16QAM	20300	1745	1	0	5.83		PASS
				100	0	6.42		

2. Test Result of LTE Band 7 Peak-to-Average Ratio:

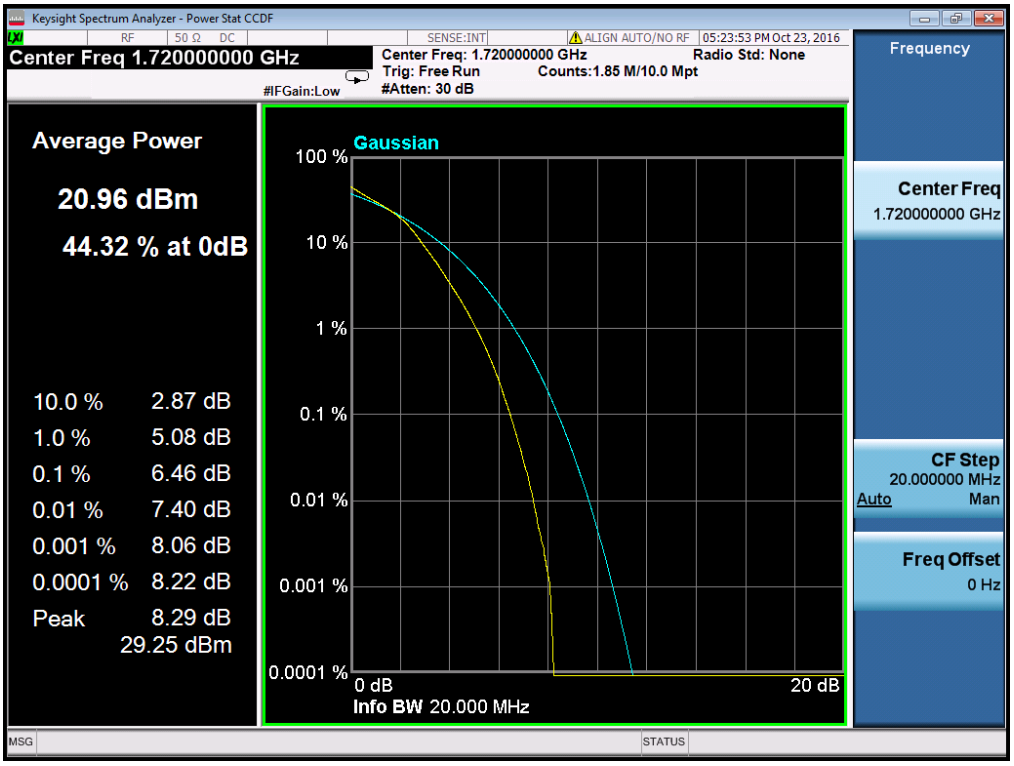
BW (MHz)	Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Peak to Average radio (dB)	Limit (dB)	Verdict
20	16QAM	20850	2510	1	0	4.82	13	PASS
				100	0	6.06		
	16QAM	21100	2535	1	0	5.32		PASS
				100	0	6.24		
	16QAM	21350	2560	1	0	5.34		PASS
				100	0	6.22		

Note: both QPSK/16QAM modulation modes were tested, only provide worst-case mode (16QAM) test plots here.

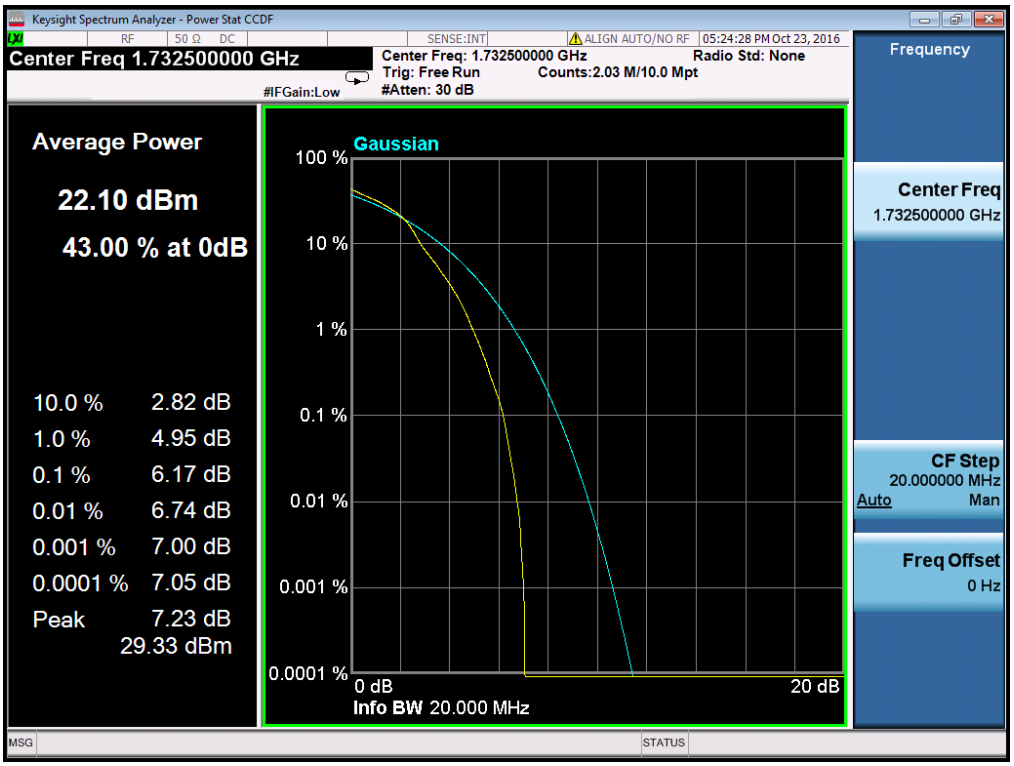
2.2.6 Test Results (Plots) of Peak-to-Average Ratio



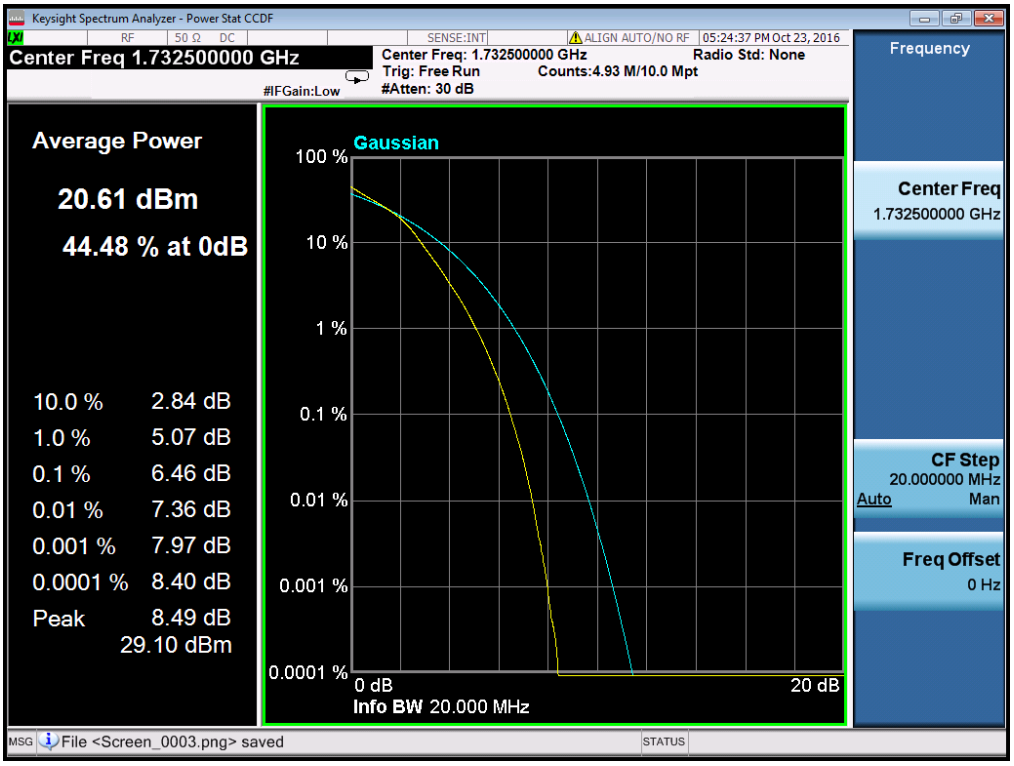
Band 4/20MHz/16QAM in L Ch 1RB Size



Band 4/20MHz/16QAM in L Ch 100RB Size



Band 4/20MHz/16QAM in M Ch 1RB Size



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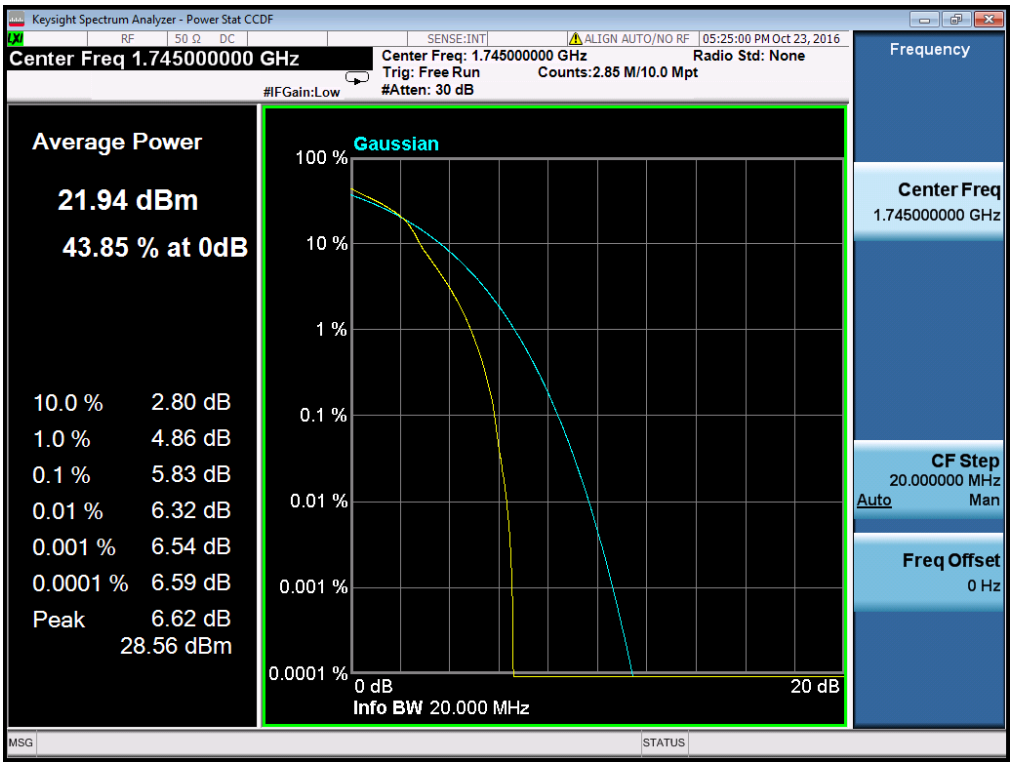
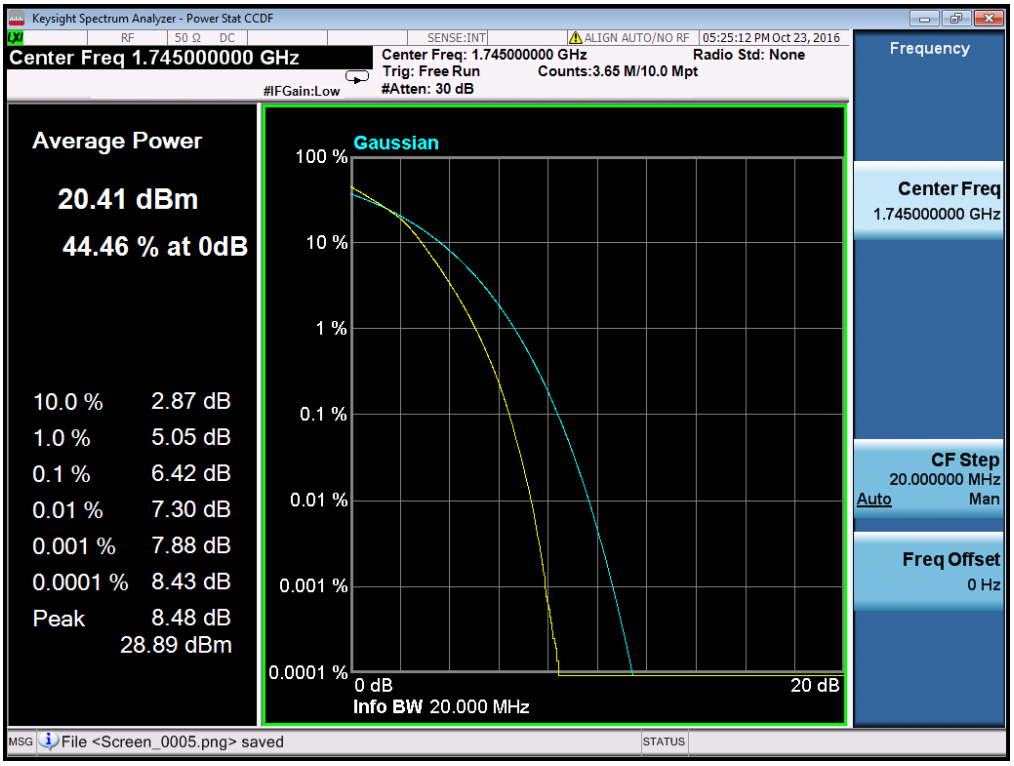
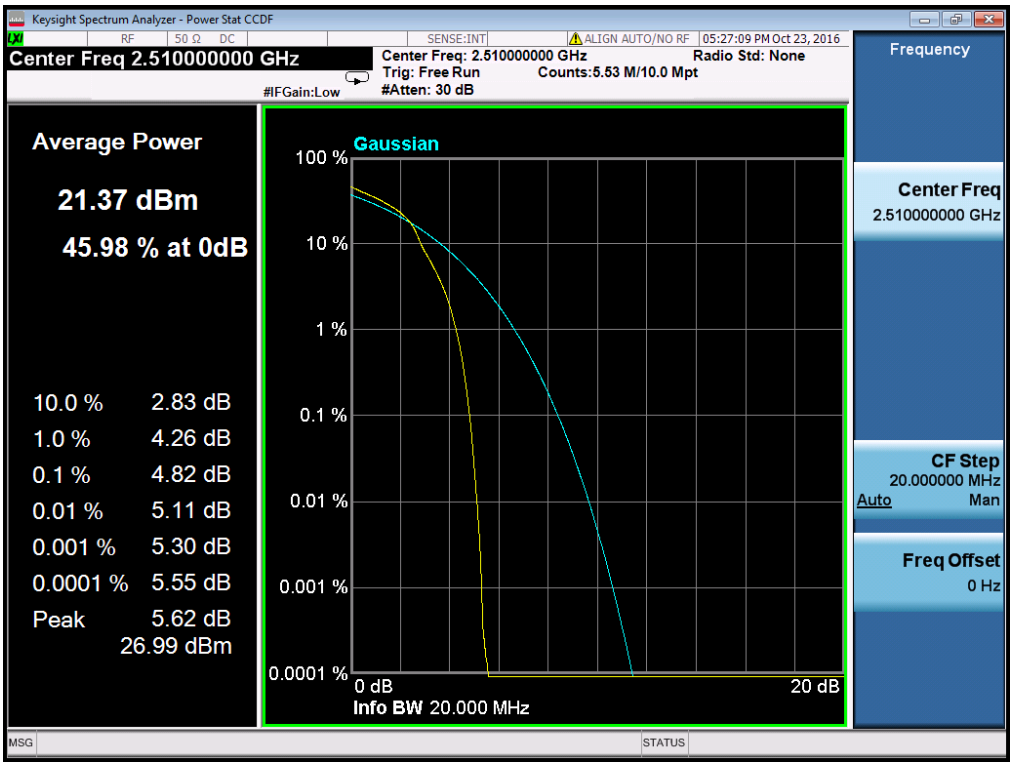


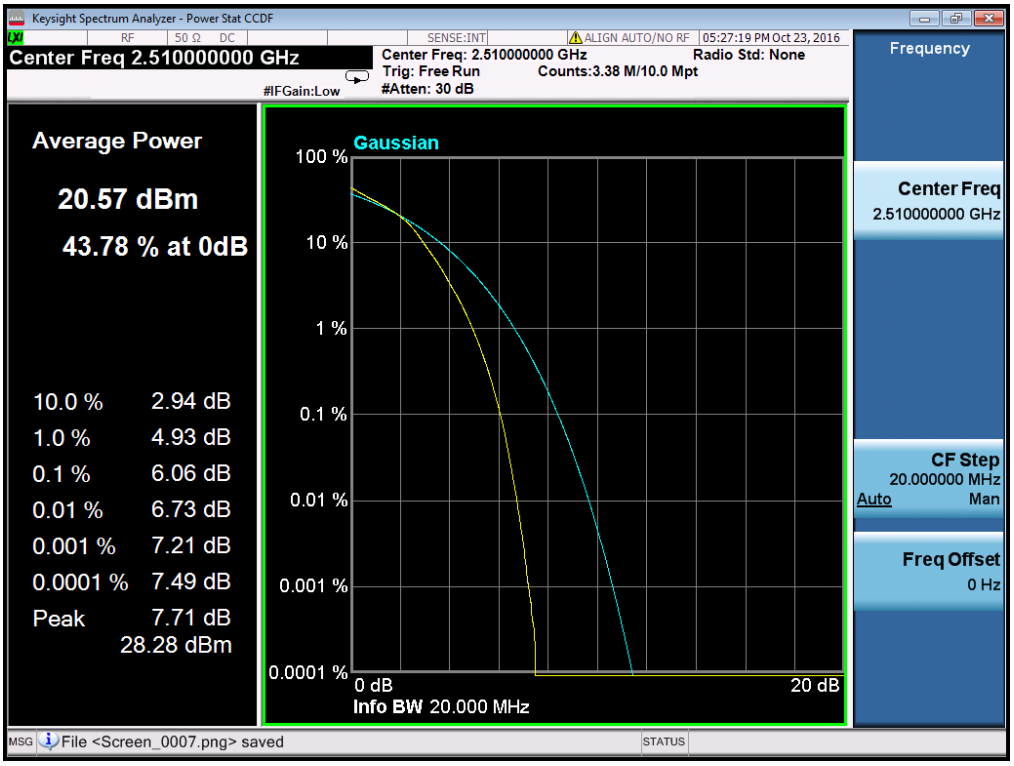
Band 4/20MHz/16QAM in H Ch 1RB Size



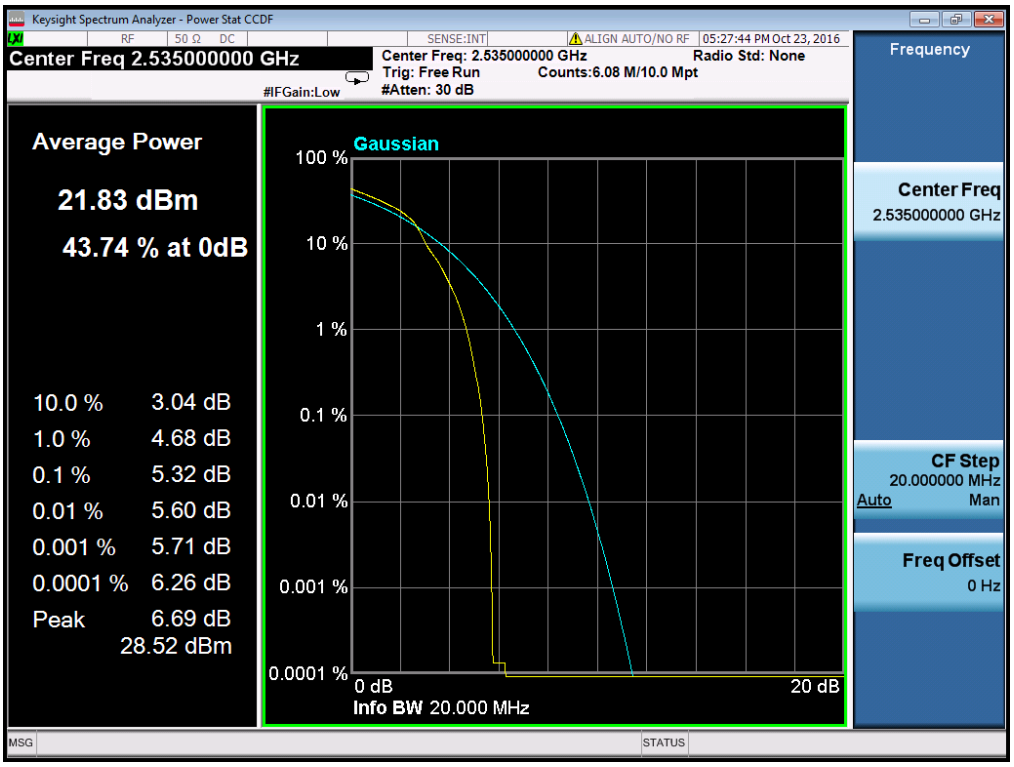
Band 4/20MHz/16QAM in H Ch 100RB Size



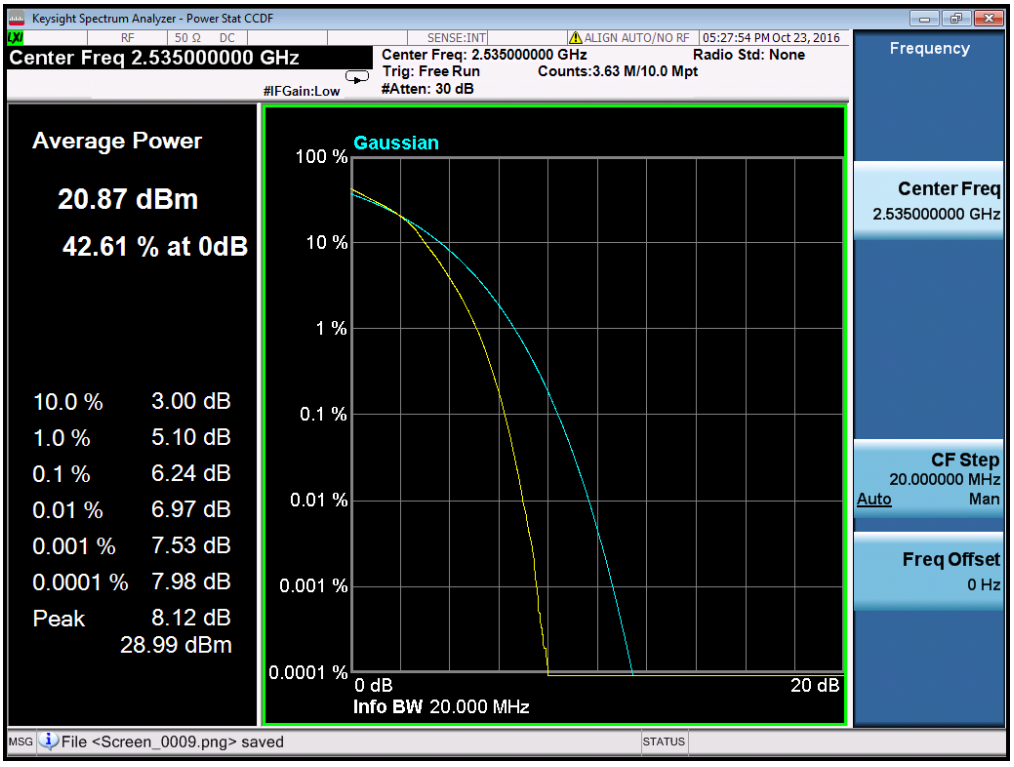
Band 7/20MHz/16QAM in L Ch 1RB Size



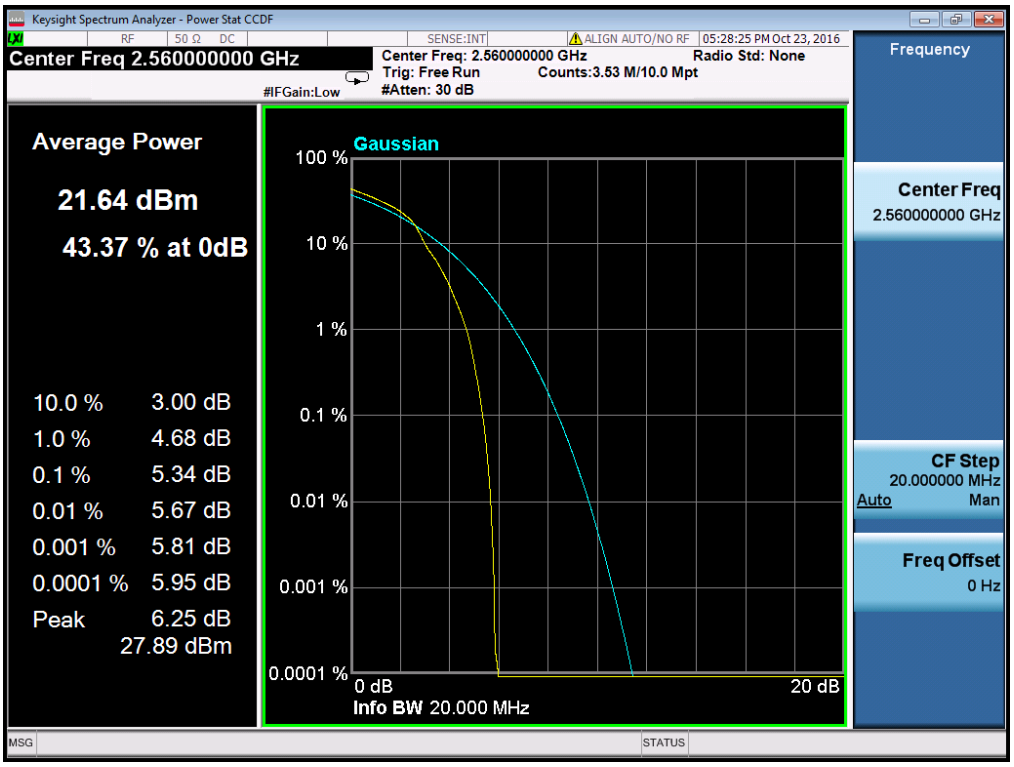
Band 7/20MHz/16QAM in L Ch 100RB Size



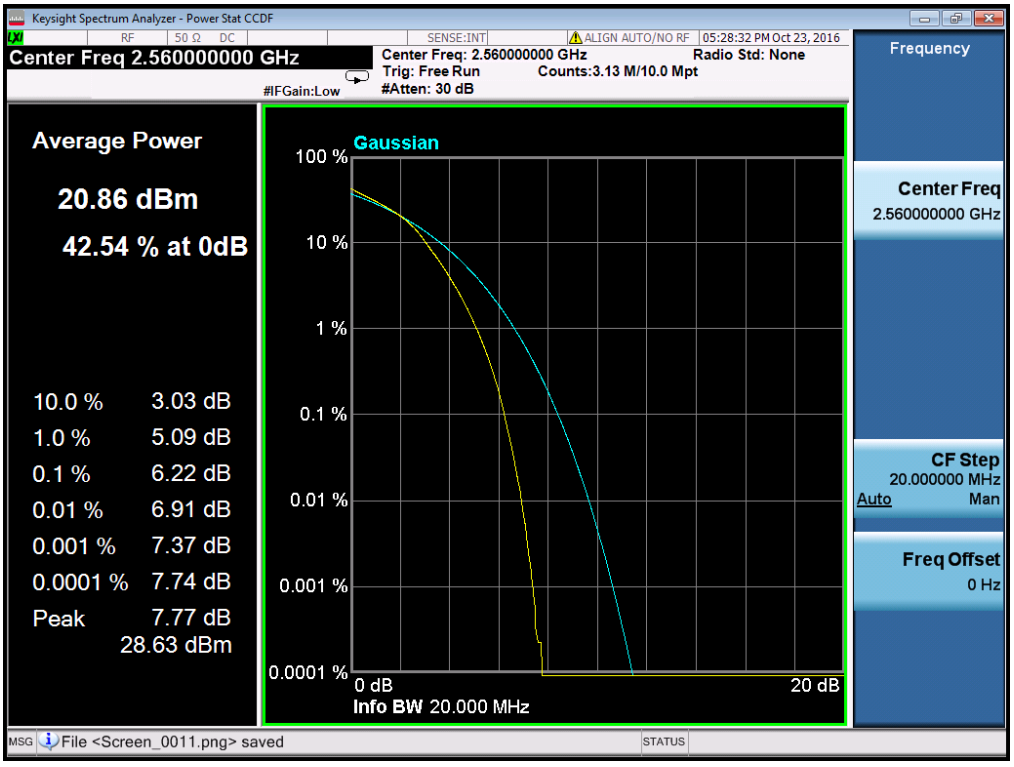
Band 7/20MHz/16QAM in M Ch 1RB Size



Band 7/20MHz/16QAM in M Ch 100RB Size



Band 7/20MHz/16QAM in H Ch 1RB Size



Band 7/20MHz/16QAM in H Ch 100RB Size

2.3 99% Occupied Bandwidth and 26dB Bandwidth

2.3.1 Definition

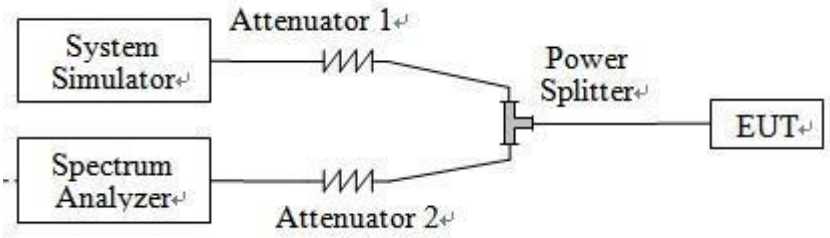
According to FCC section 2.1049, the occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 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.

2.3.2 Measuring Instruments

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

2.3.3 Test Setup



2.3.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

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

LTE Band 4					
BW (MHz)	Channel	Frequency (MHz)	Mode	99% Occupied Bandwidth(MHz)	26dBBandwidth (MHz)
1.4	20175	1732.5	QPSK	1.11	1.41
			16QAM	1.11	1.41
3	20175	1732.5	QPSK	2.74	3.04
			16QAM	2.73	3.05
5	20175	1732.5	QPSK	4.53	5.05
			16QAM	4.51	5.03
10	20175	1732.5	QPSK	8.95	9.79
			16QAM	8.92	9.98
15	20175	1732.5	QPSK	13.55	15.31
			16QAM	13.50	15.41
20	20175	1732.5	QPSK	19.74	25.21
			16QAM	19.70	26.40

LTE Band 7					
BW (MHz)	Channel	Frequency (MHz)	Mode	99% Occupied Bandwidth(MHz)	26dBBandwidth (MHz)
5	21100	2535	QPSK	4.55	5.08
			16QAM	4.53	5.08
10	21100	2535	QPSK	8.94	9.81
			16QAM	8.94	9.96
15	21100	2535	QPSK	13.51	15.23
			16QAM	13.50	15.37
20	21100	2535	QPSK	19.76	26.15
			16QAM	19.67	26.33

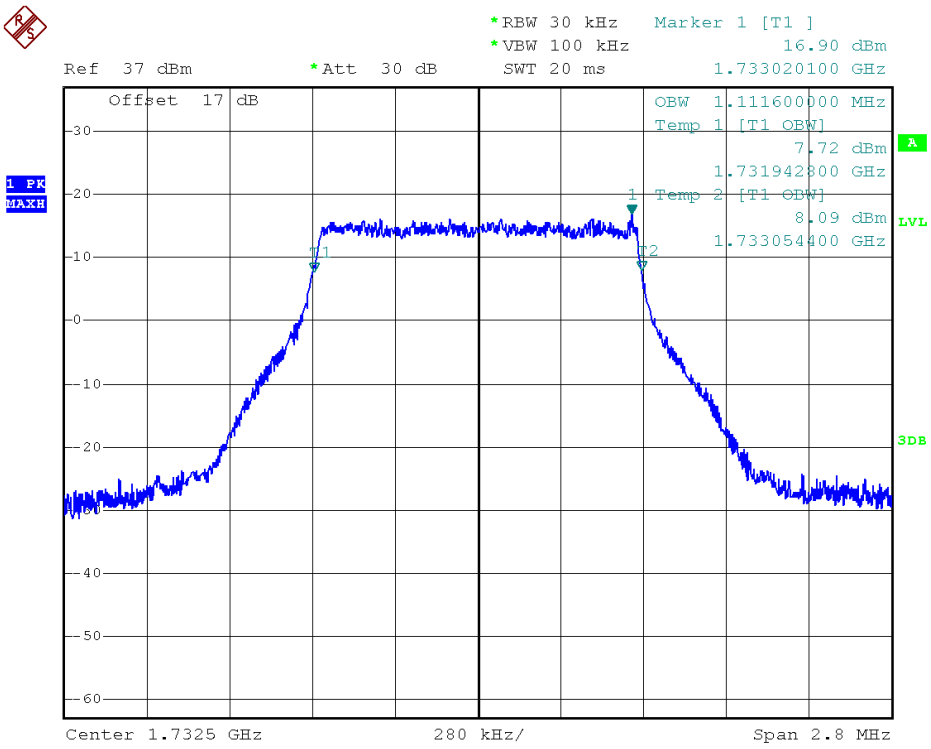
Note: The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

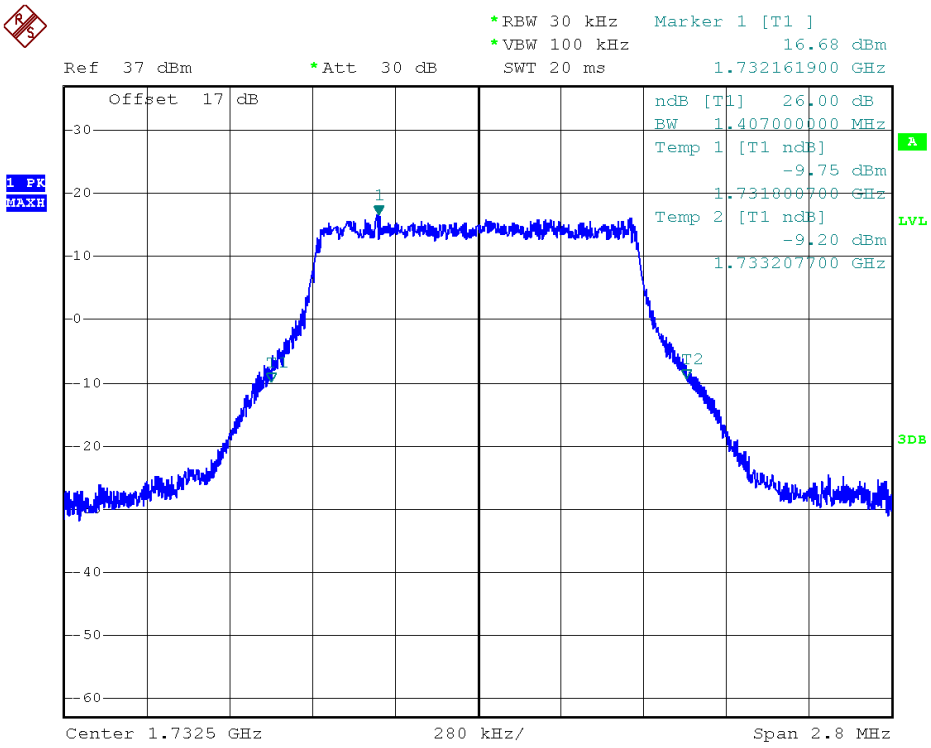
BW1.4MHz RB setting: RB Size 6,RB Offset 0 BW3MHz RB setting: RB Size 15,RB Offset 0

BW5MHz RB setting: RB Size 25,RB Offset 0 BW10MHz RB setting: RB Size 50,RB Offset 0

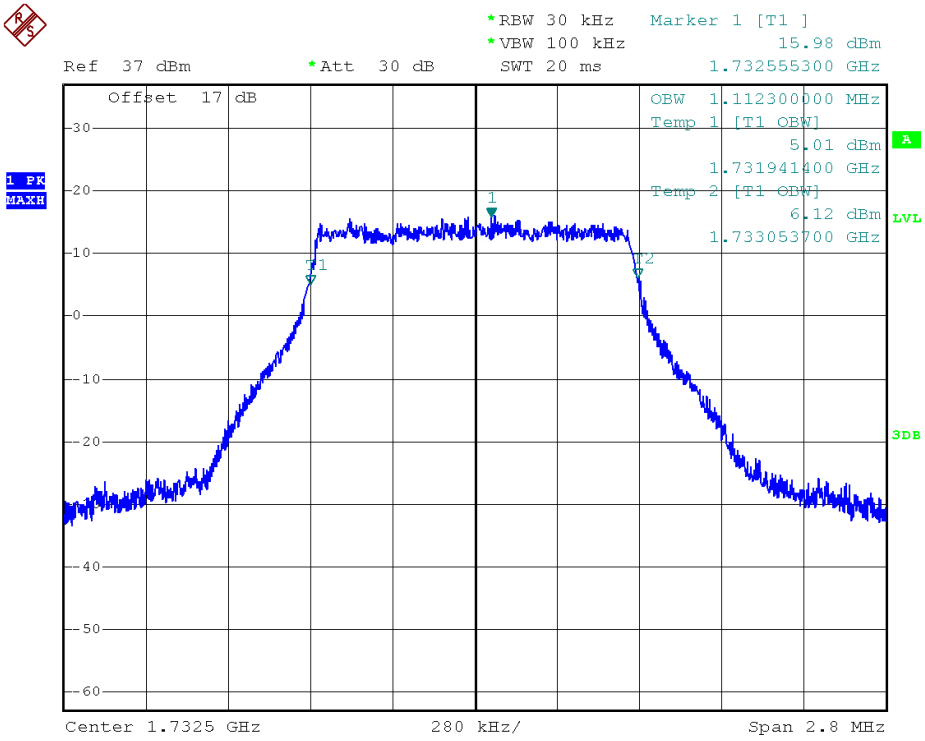
BW15MHz RB setting: RB Size 75,RB Offset 0 BW20MHz RB setting: RB Size 100,RB Offset 0

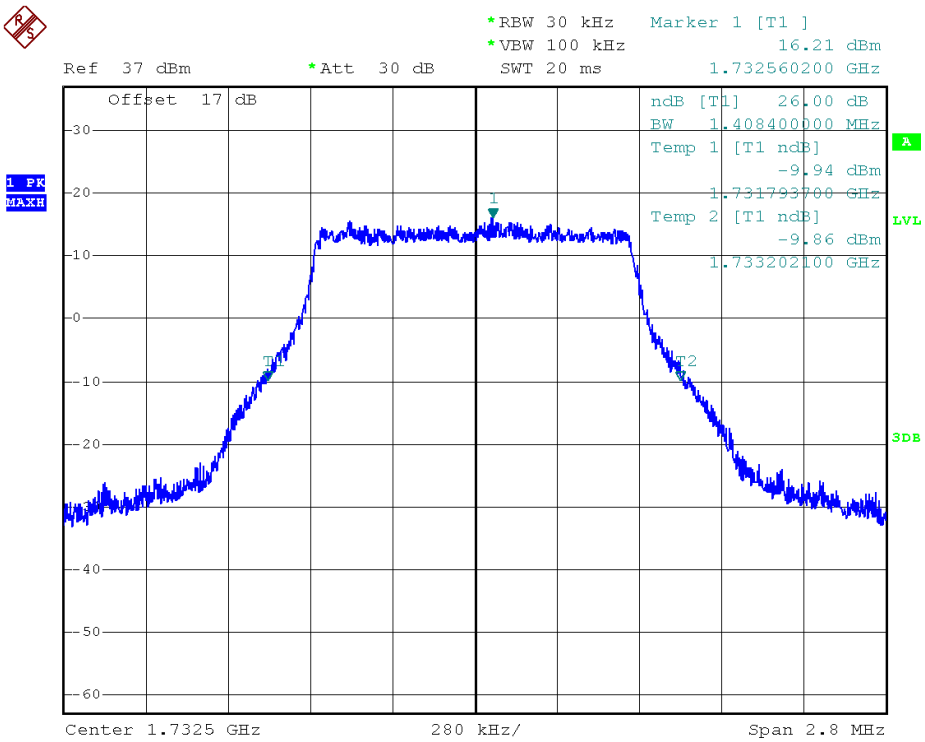
2.3.6 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth





Occupied Bandwidth LTE Band 4/1.4MHz/QPSK





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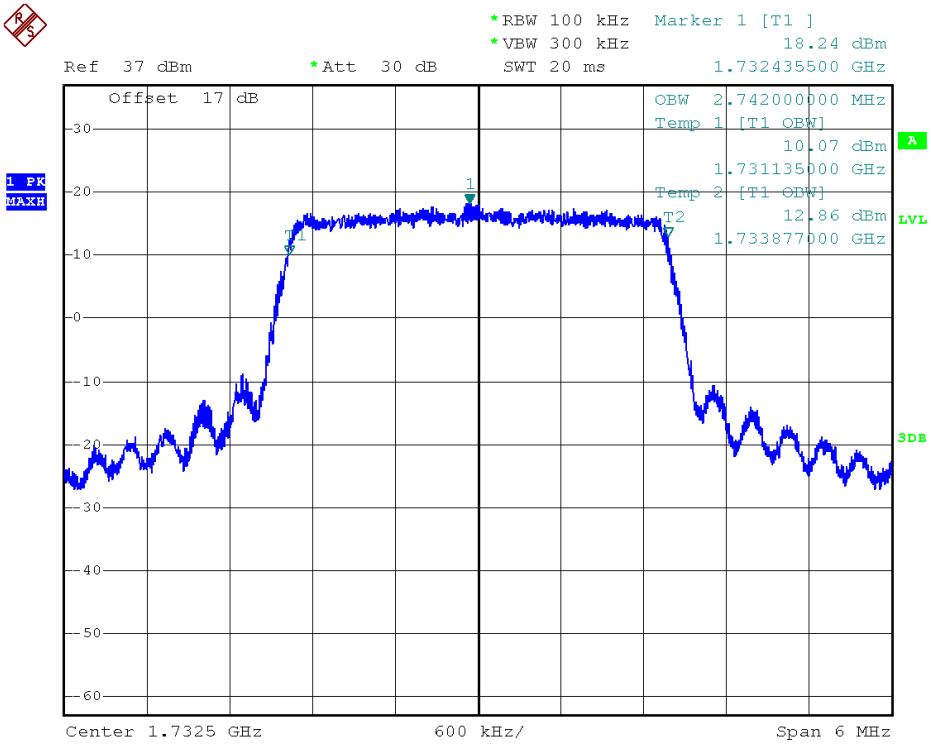
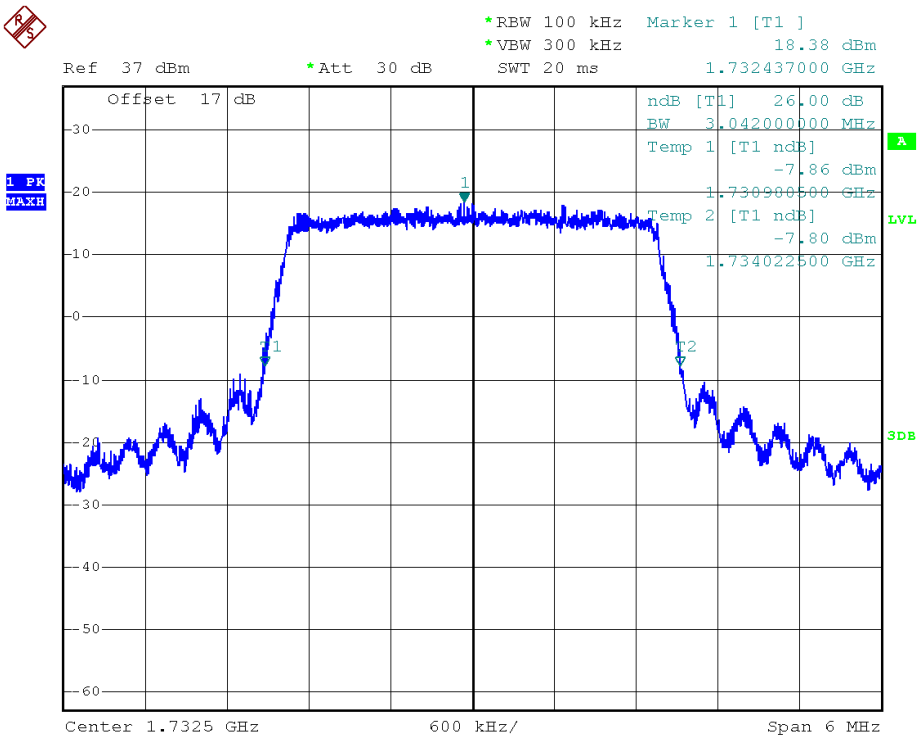
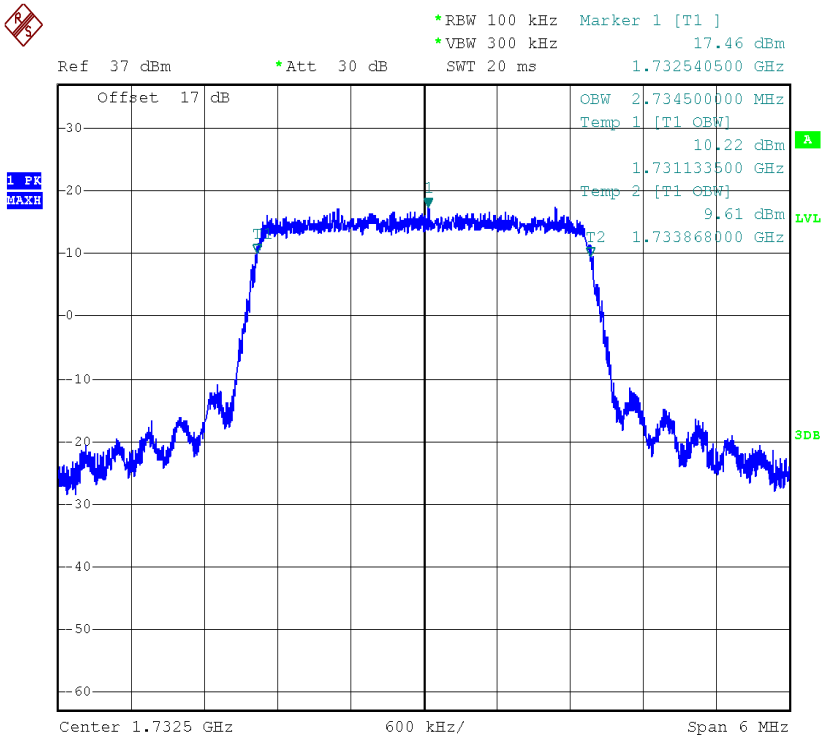
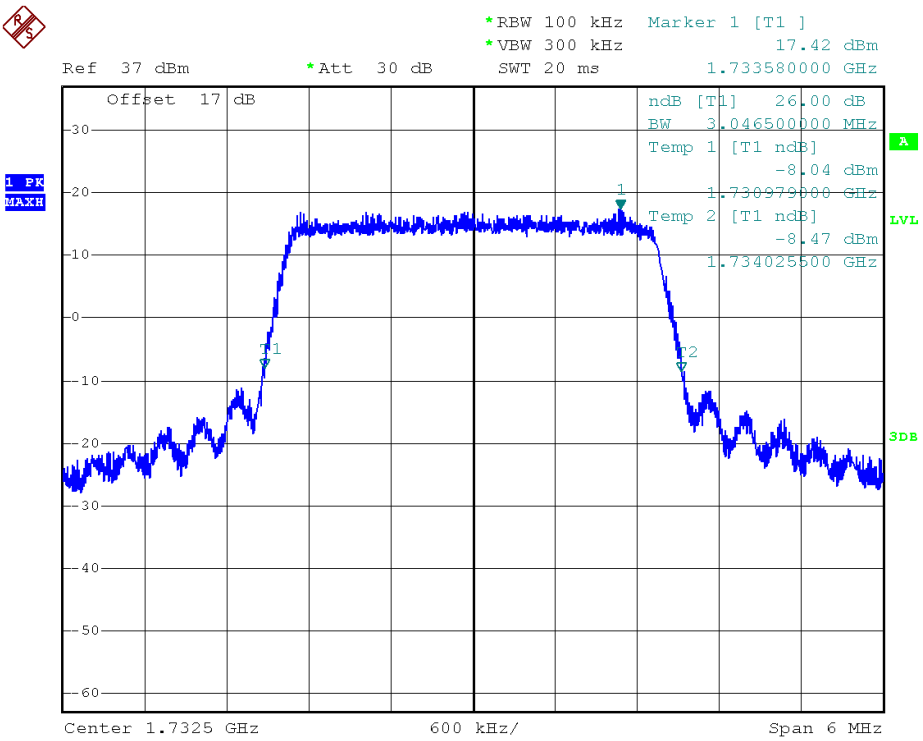


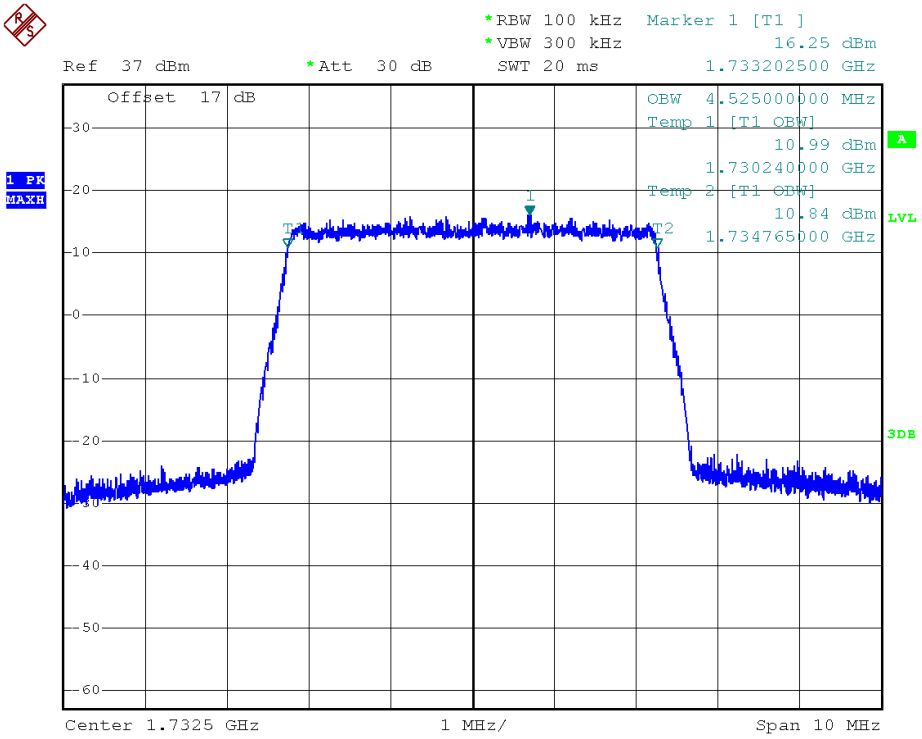


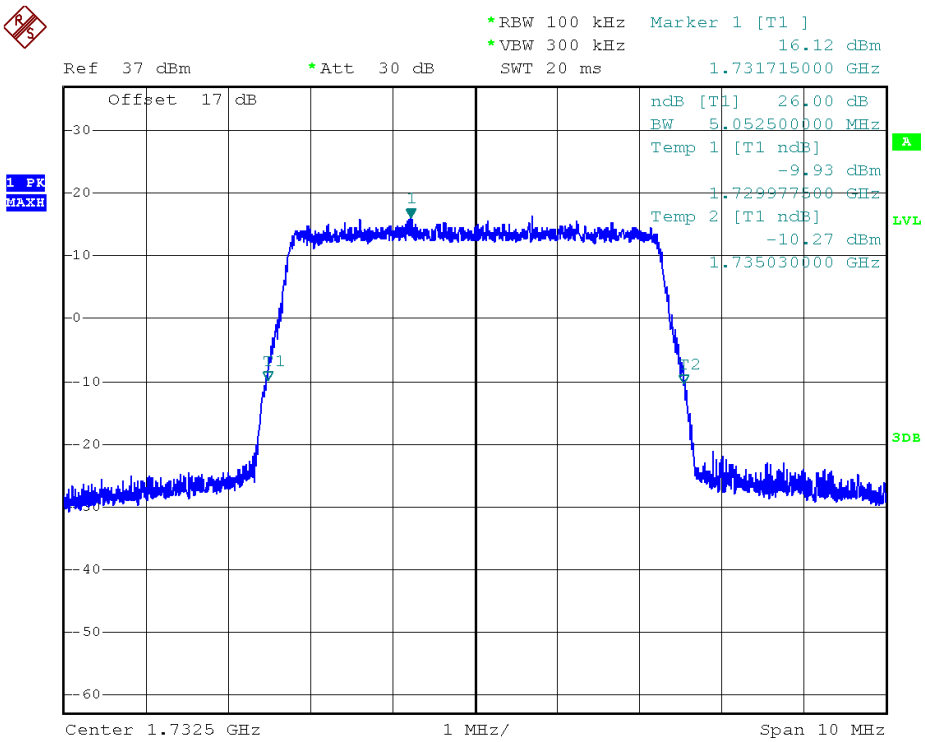
Occupied Bandwidth LTE Band 4/3MHz/QPSK





Occupied Bandwidth LTE Band 4/3MHz/16QAM





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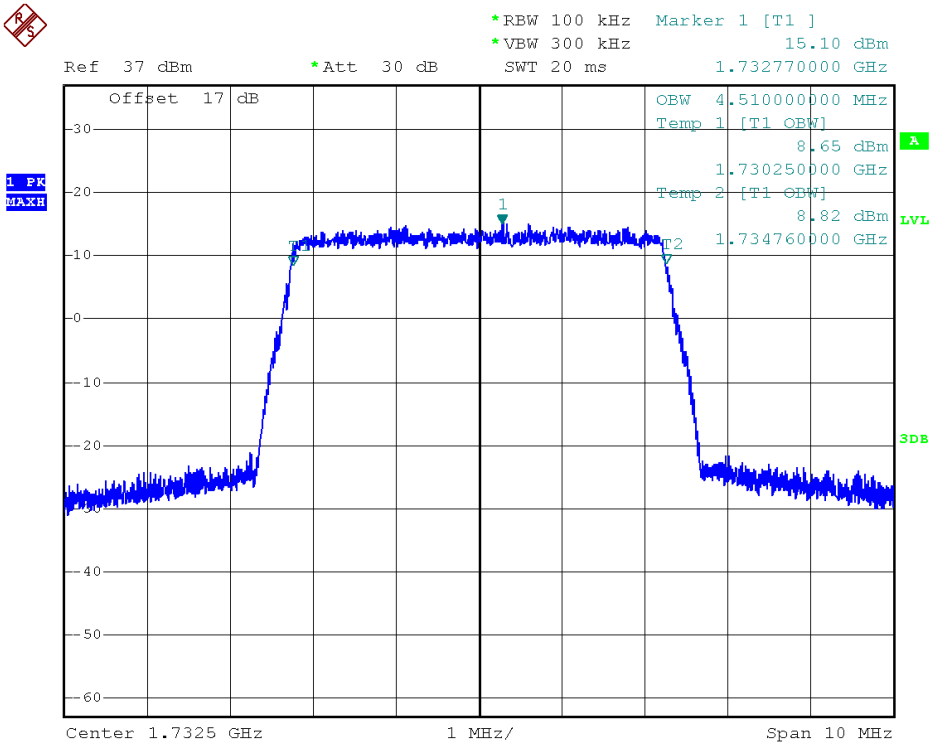

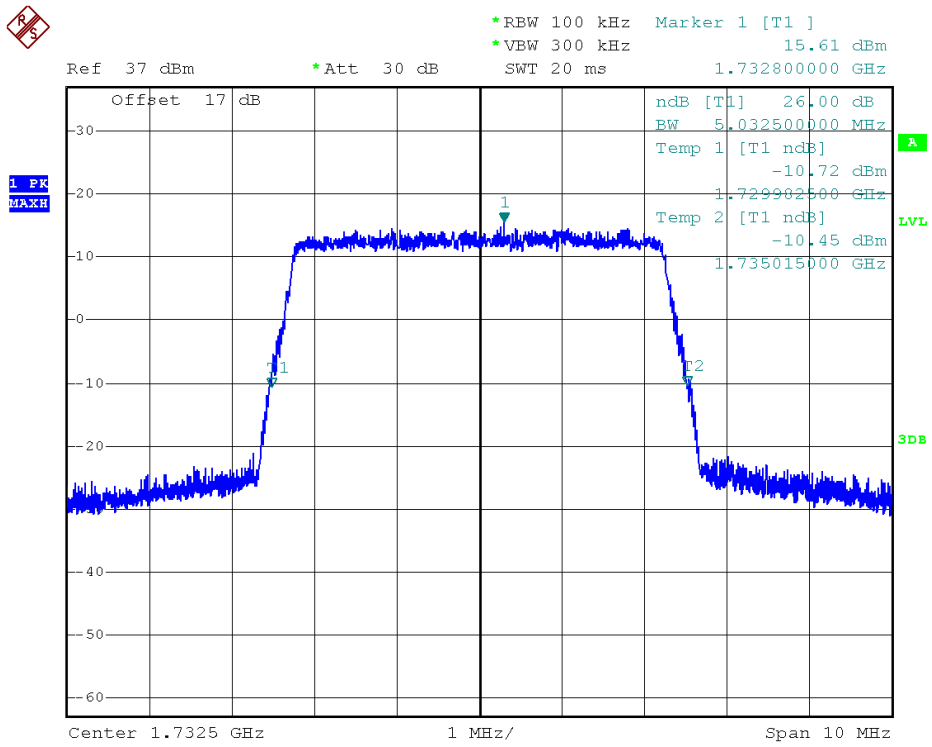

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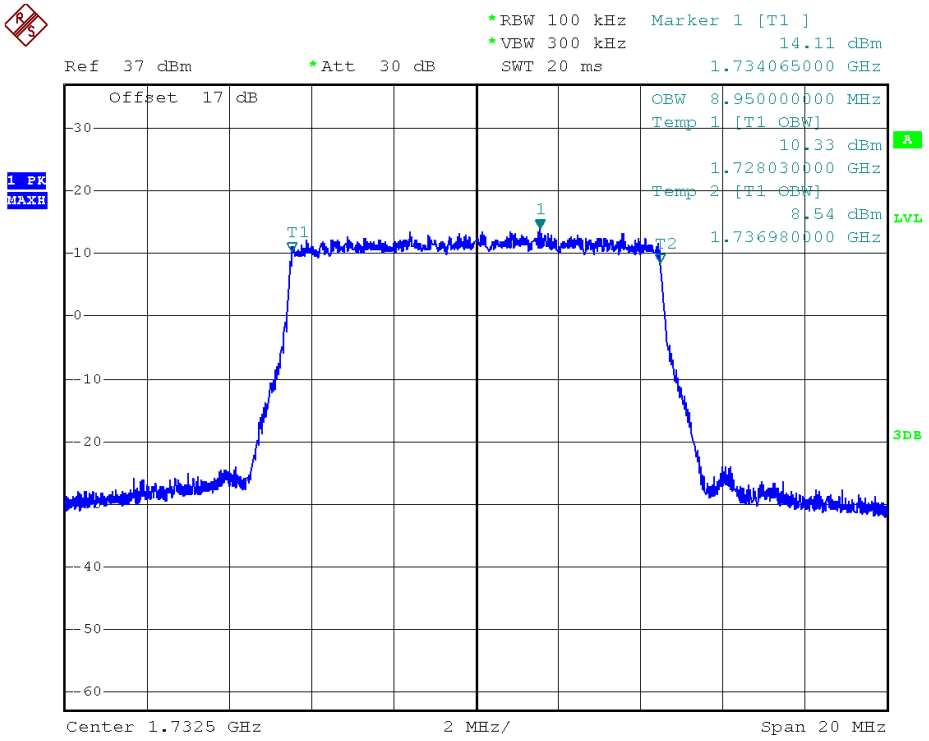

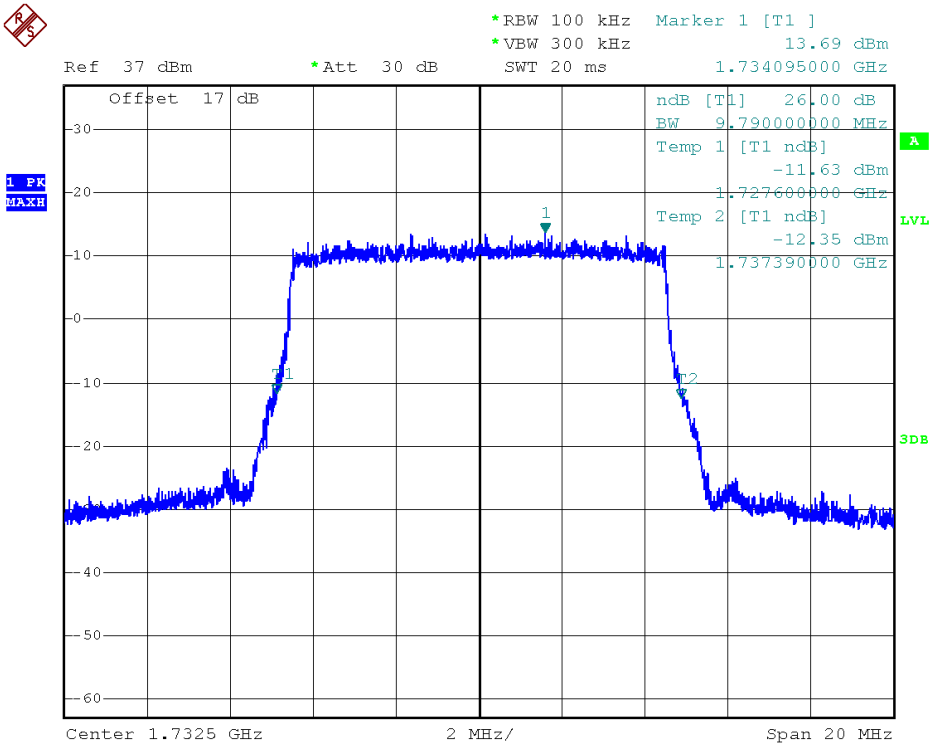

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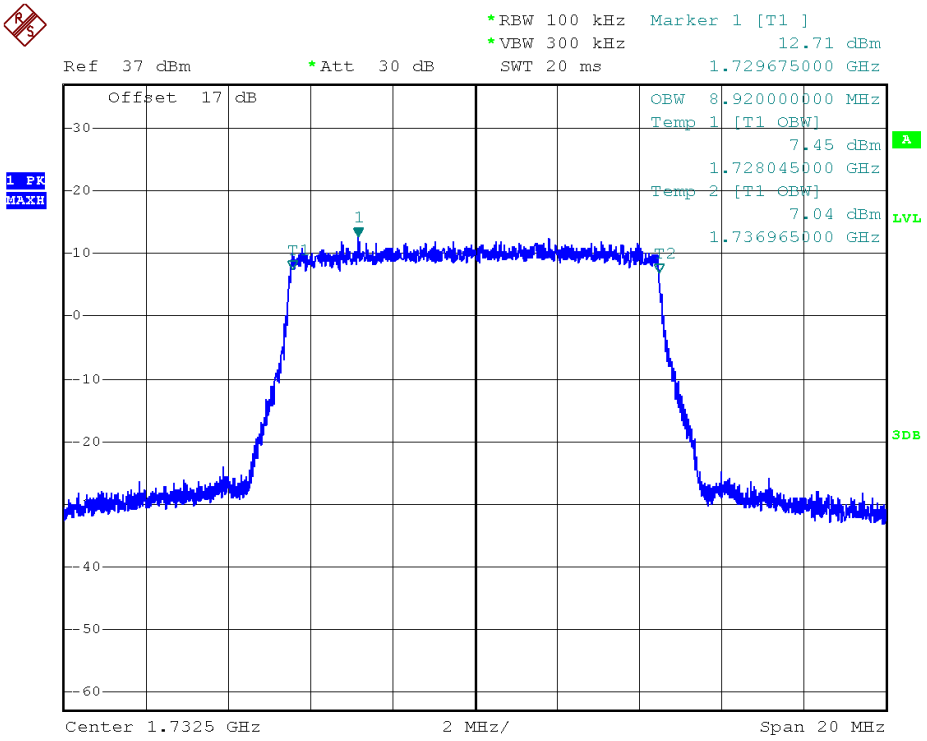
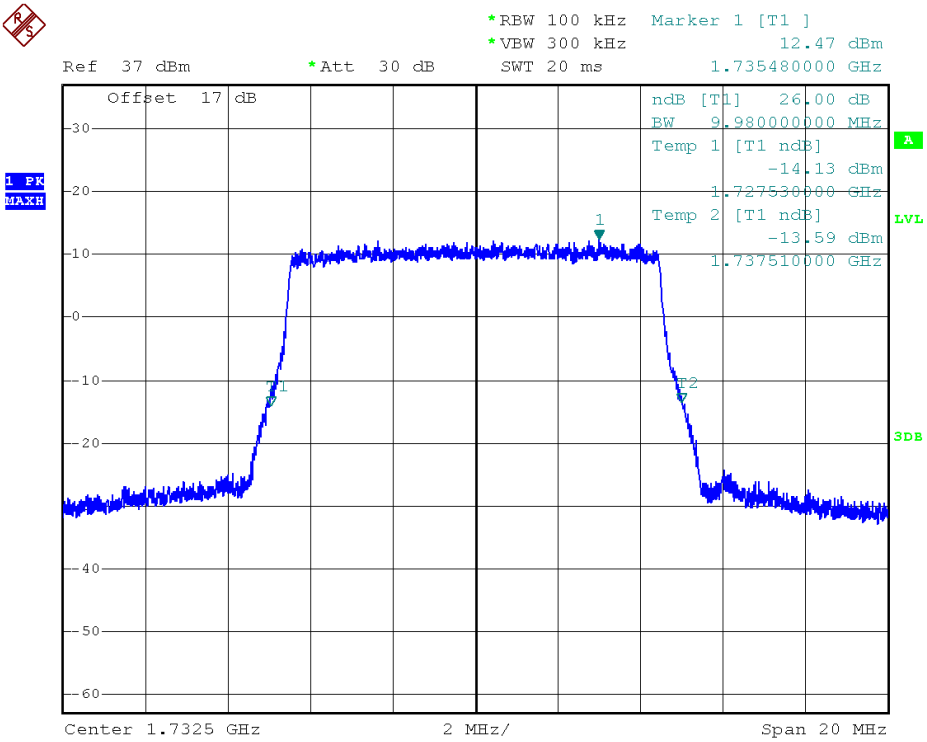
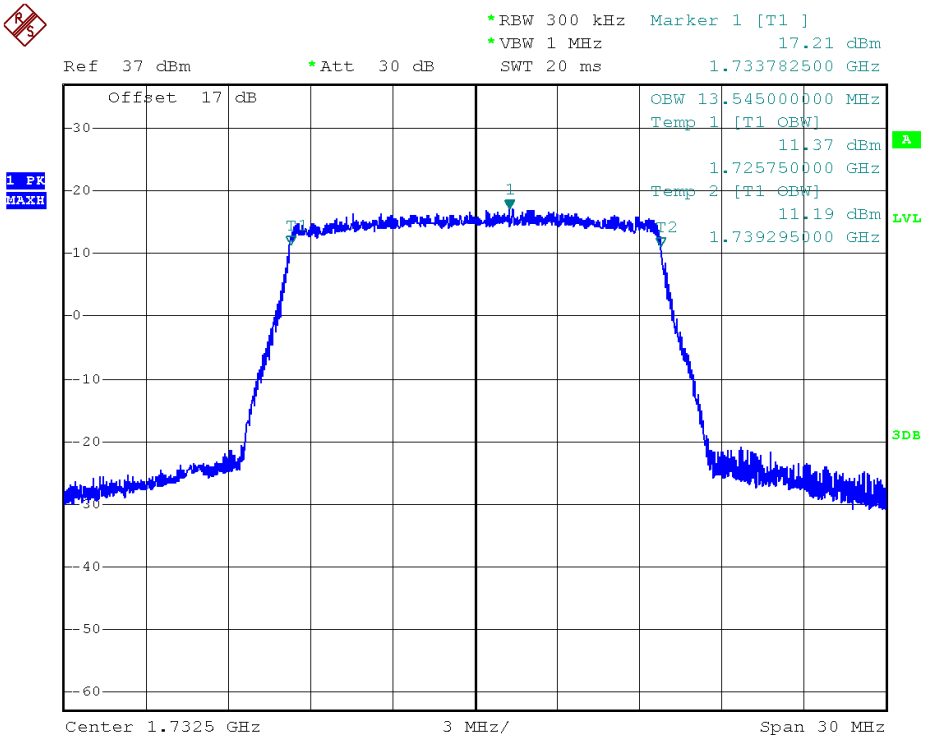
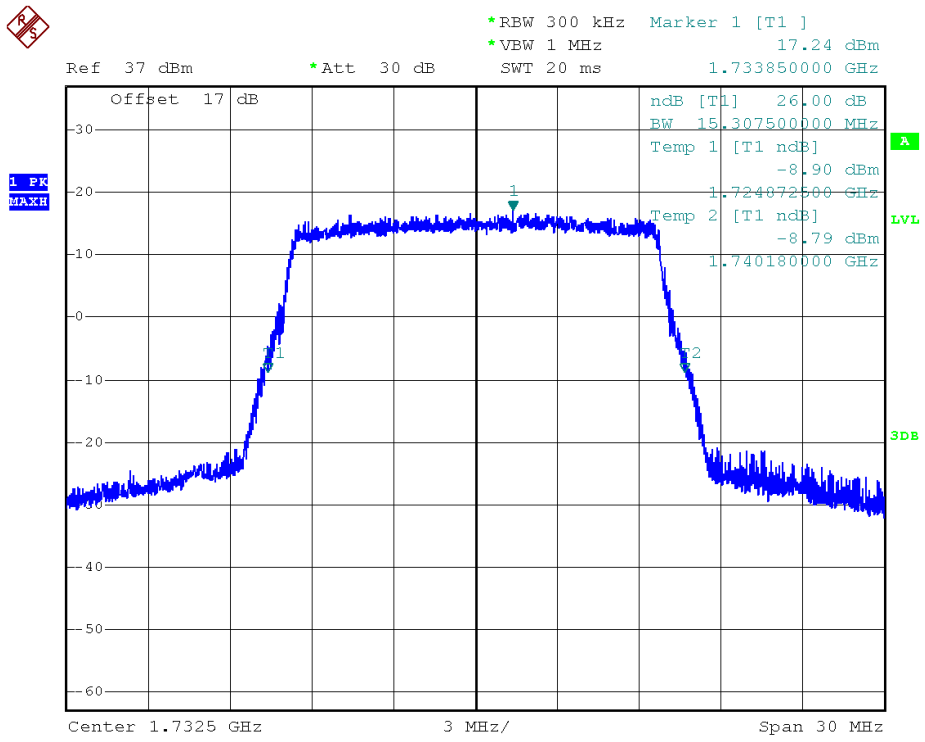




Occupied Bandwidth LTE Band 4/10MHz/16QAM





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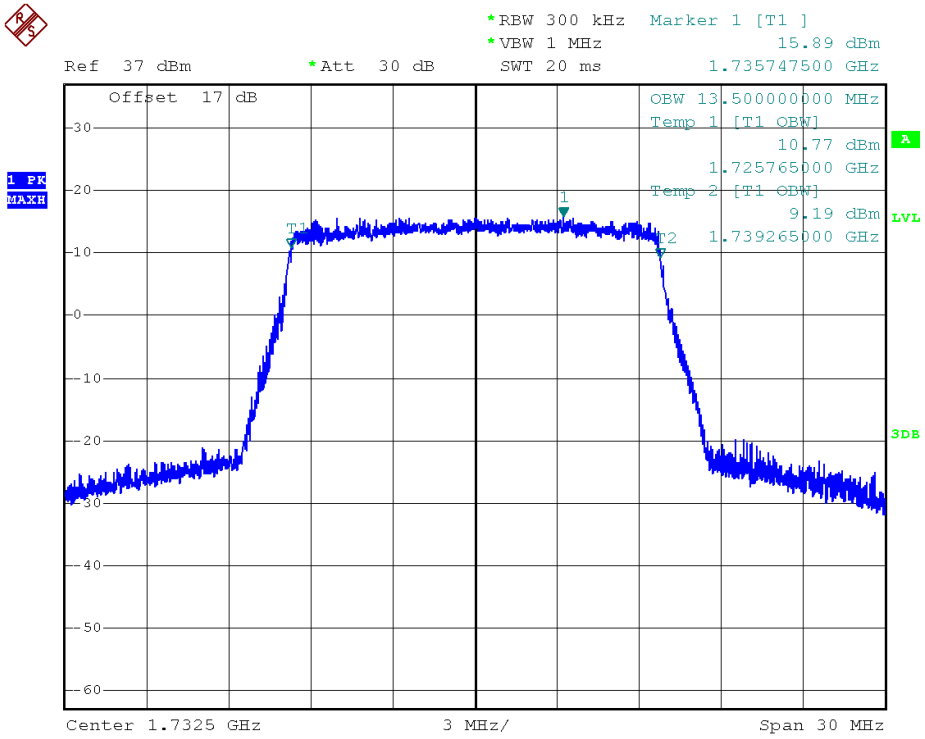

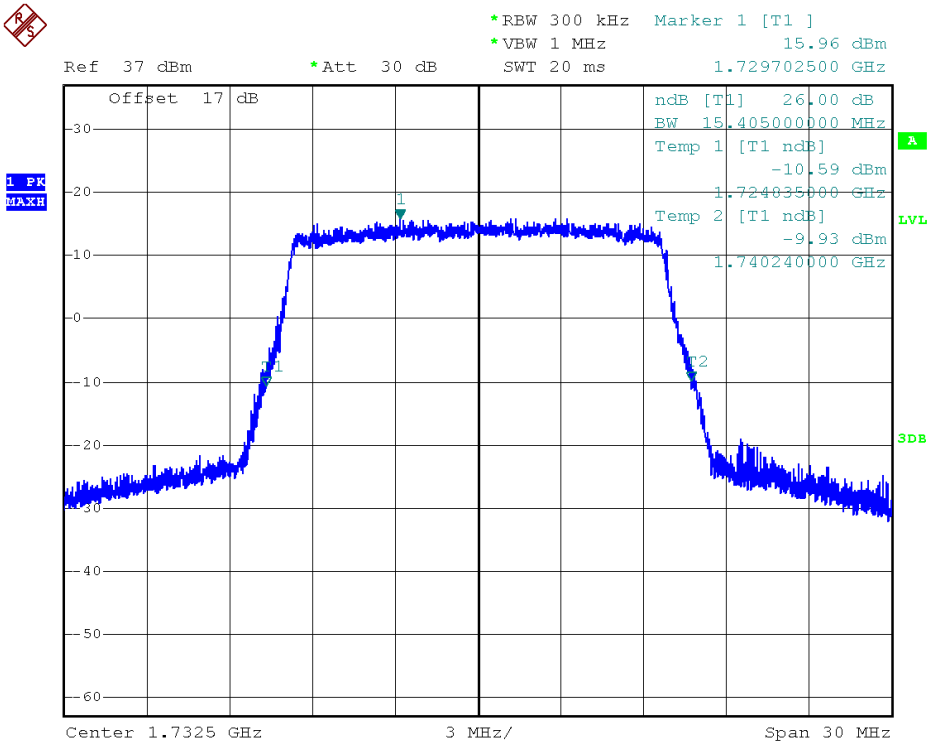

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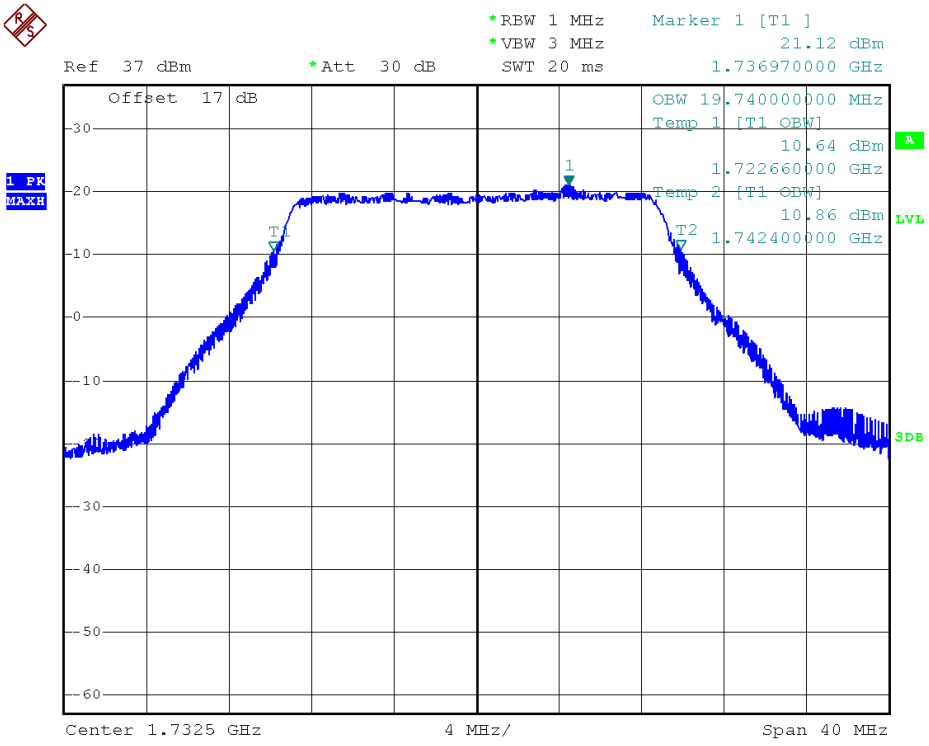

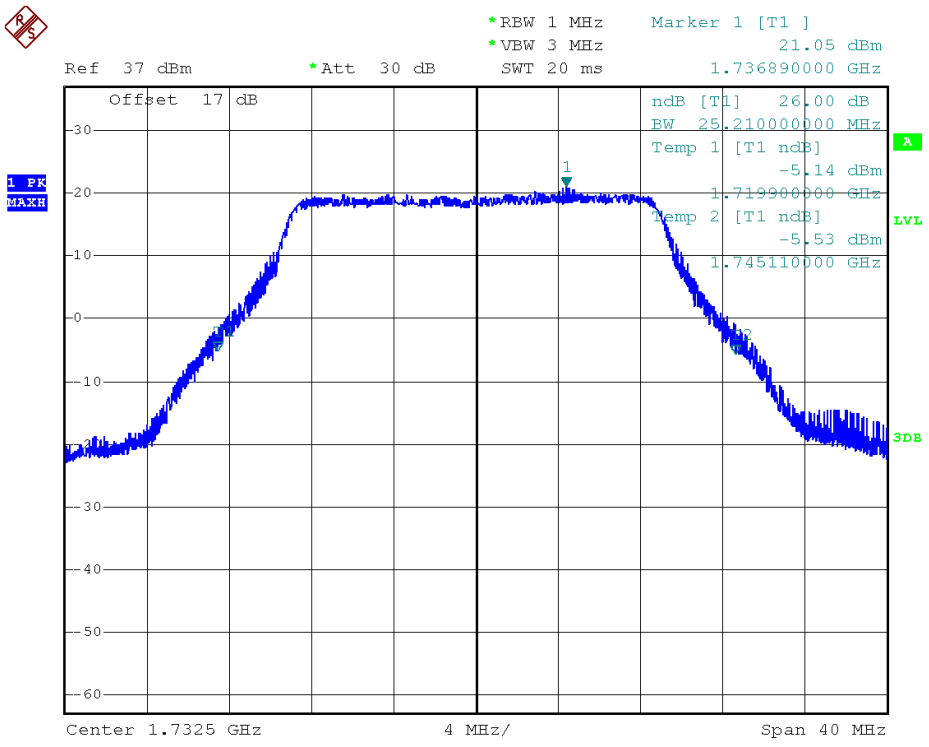

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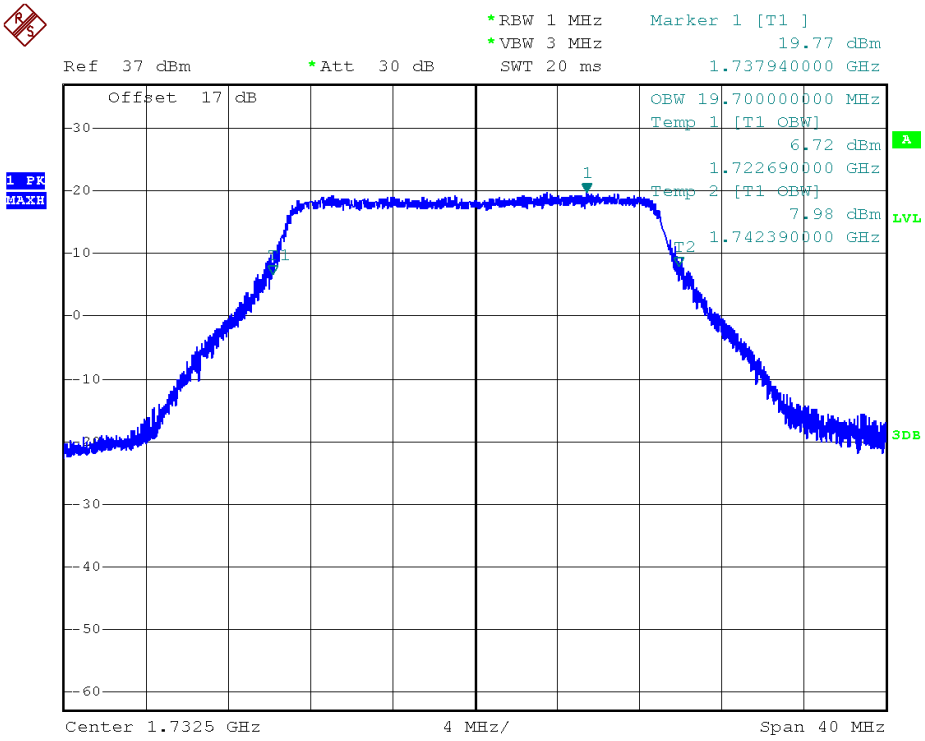

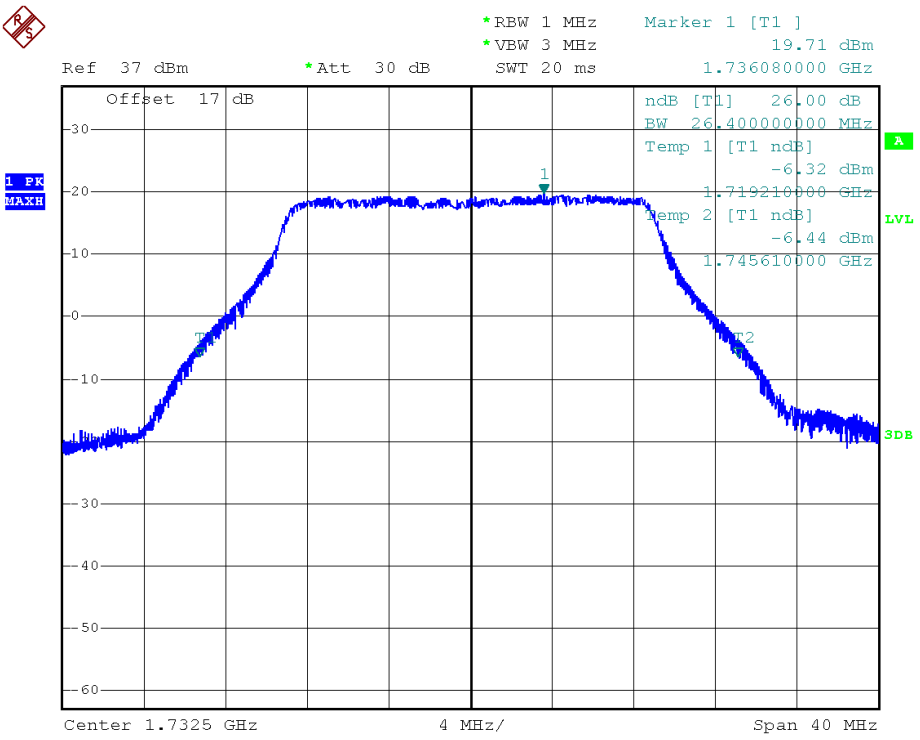

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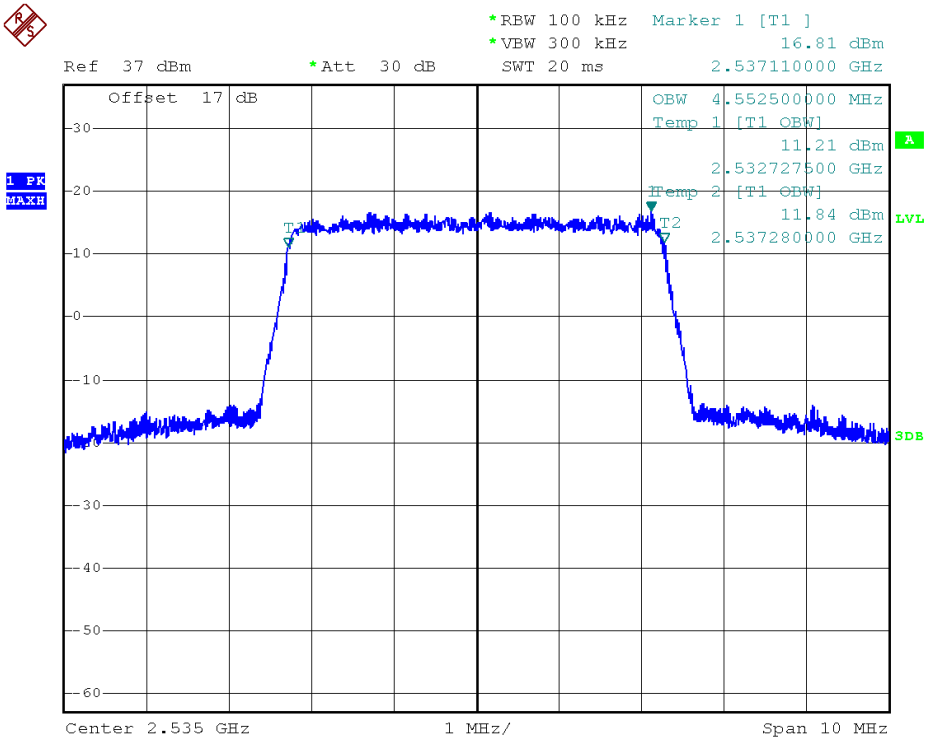
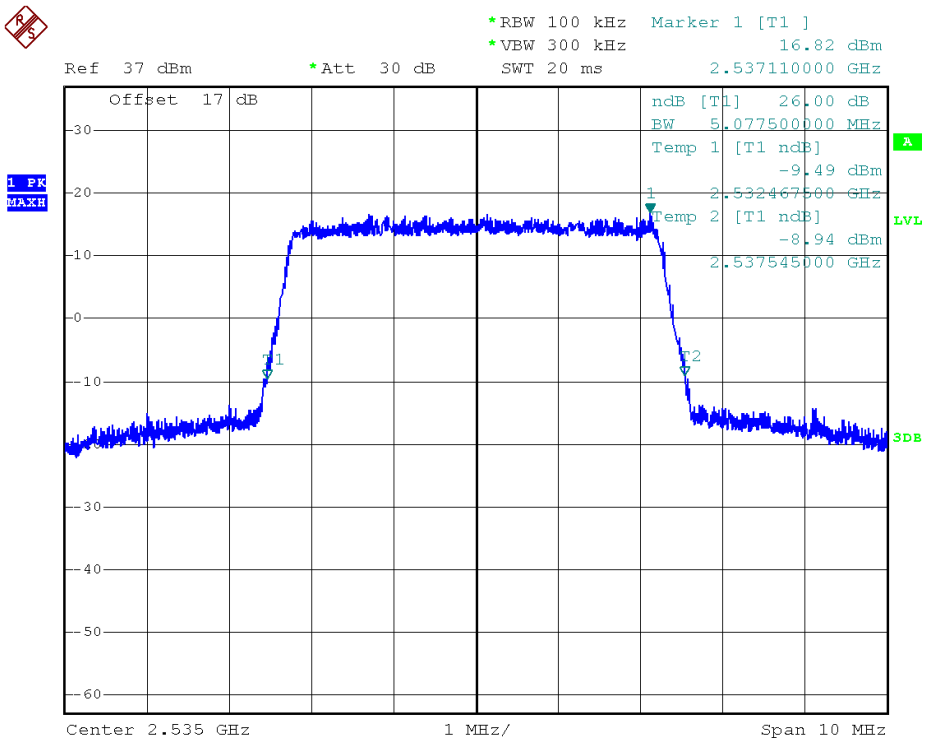
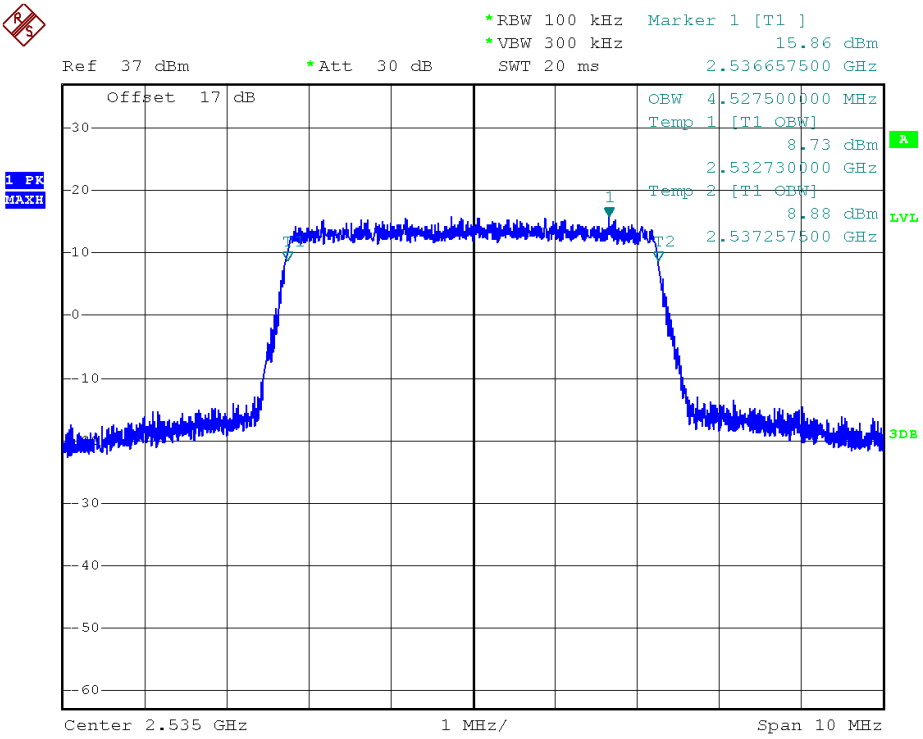
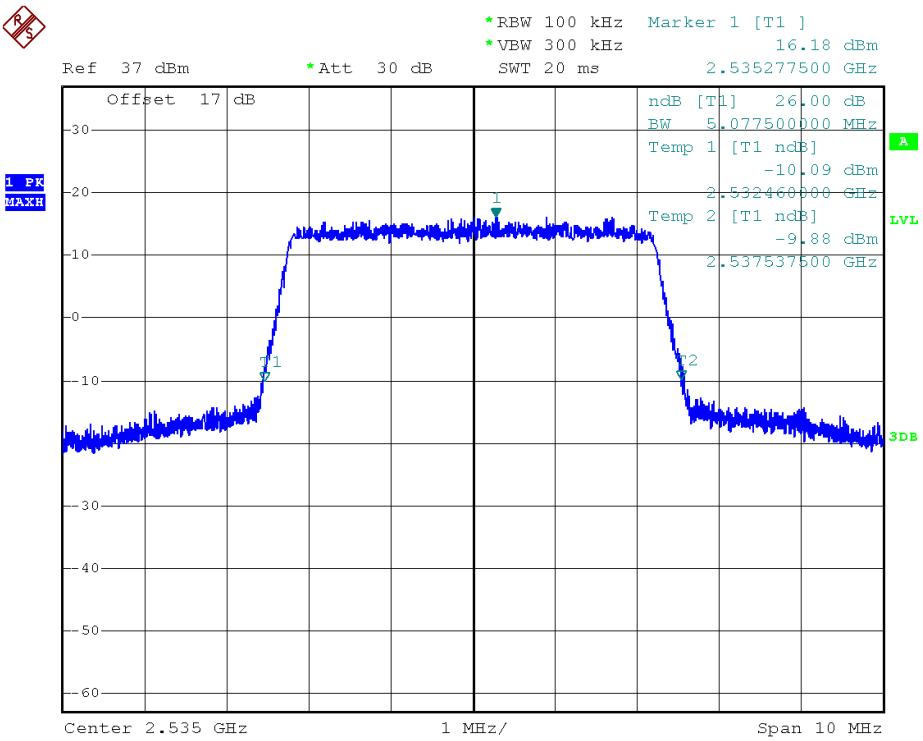




Occupied Bandwidth LTE Band 7/5MHz/QPSK





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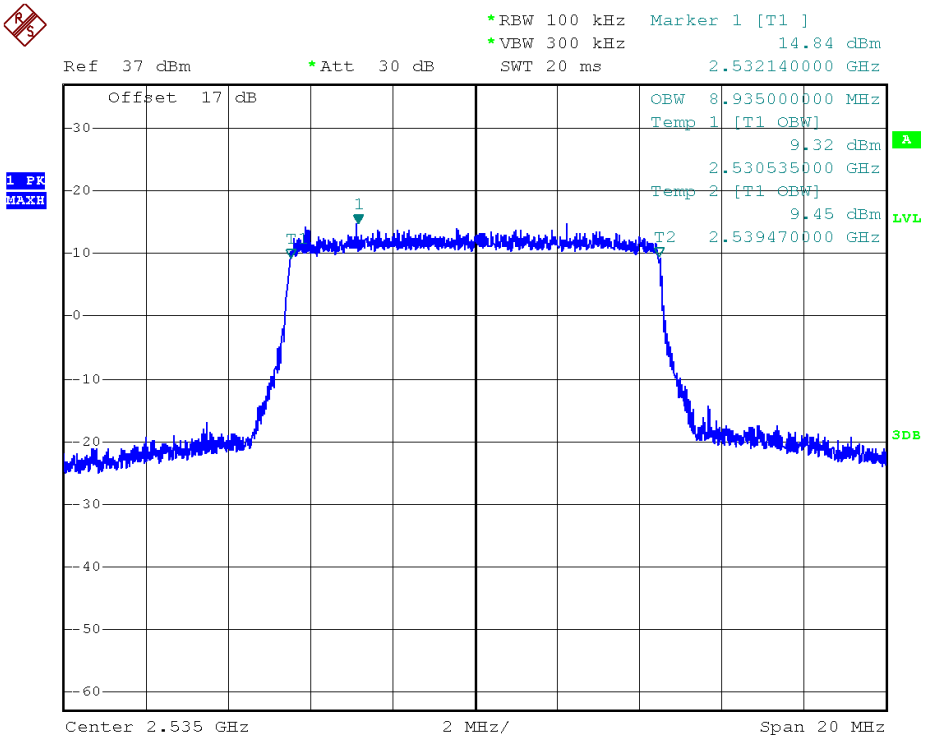

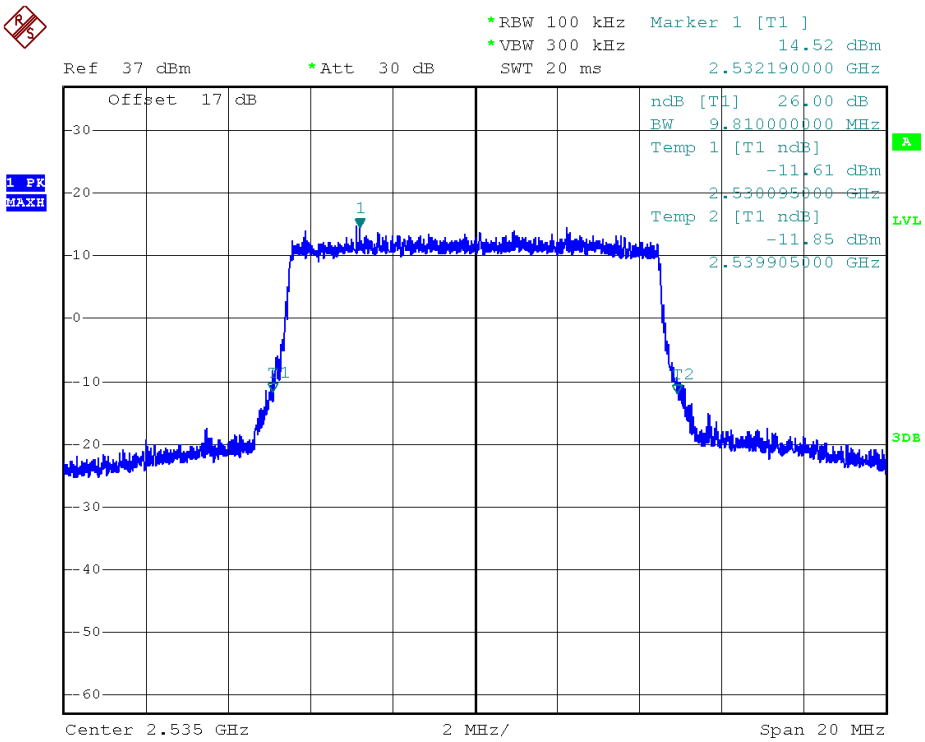

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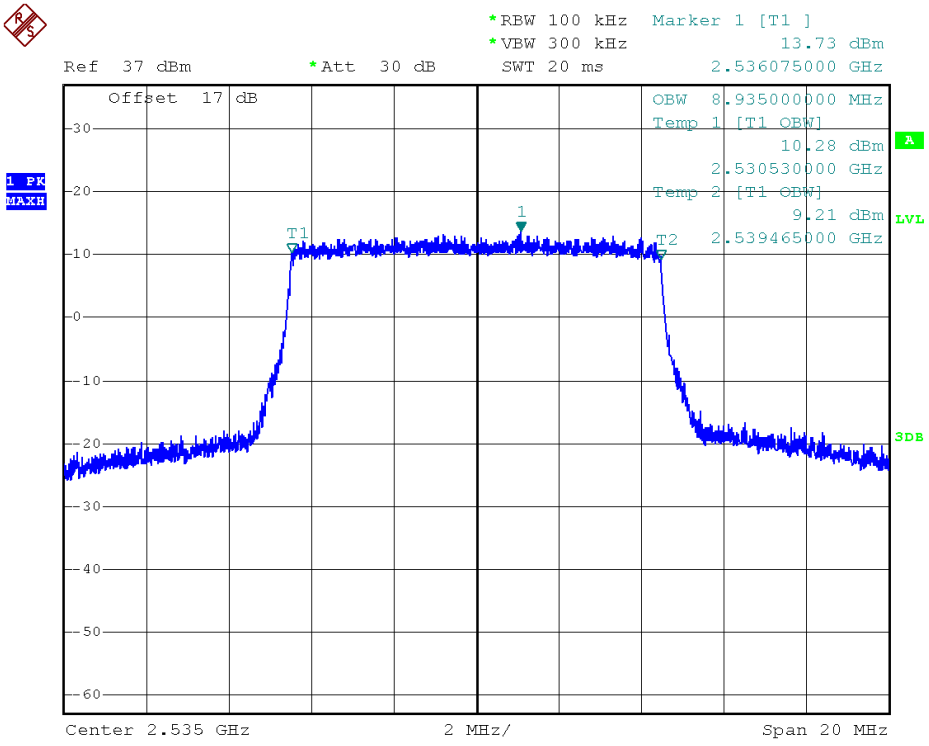

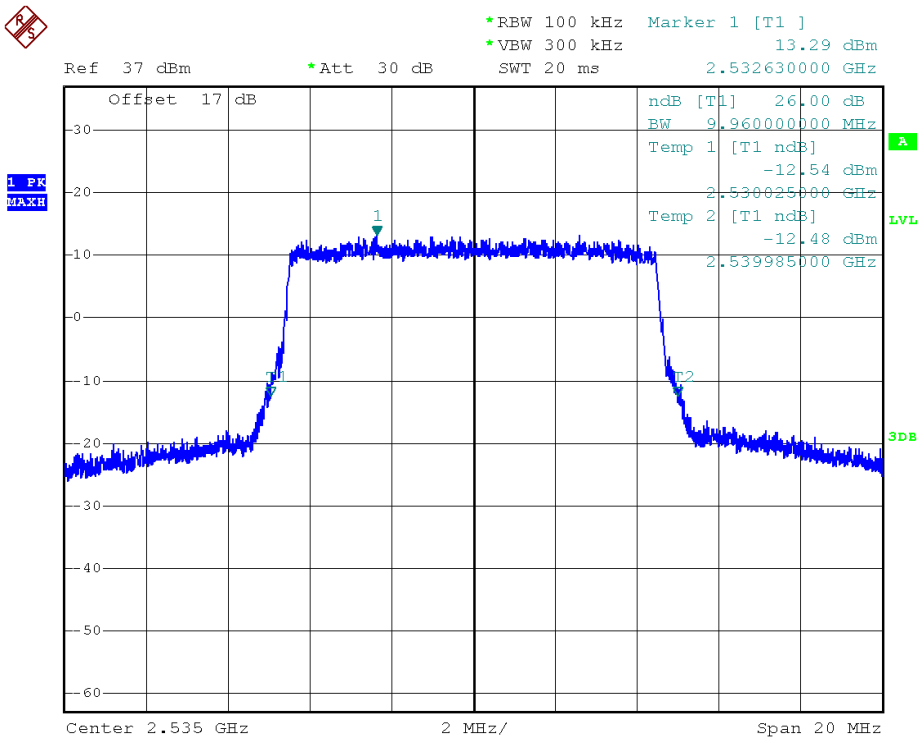

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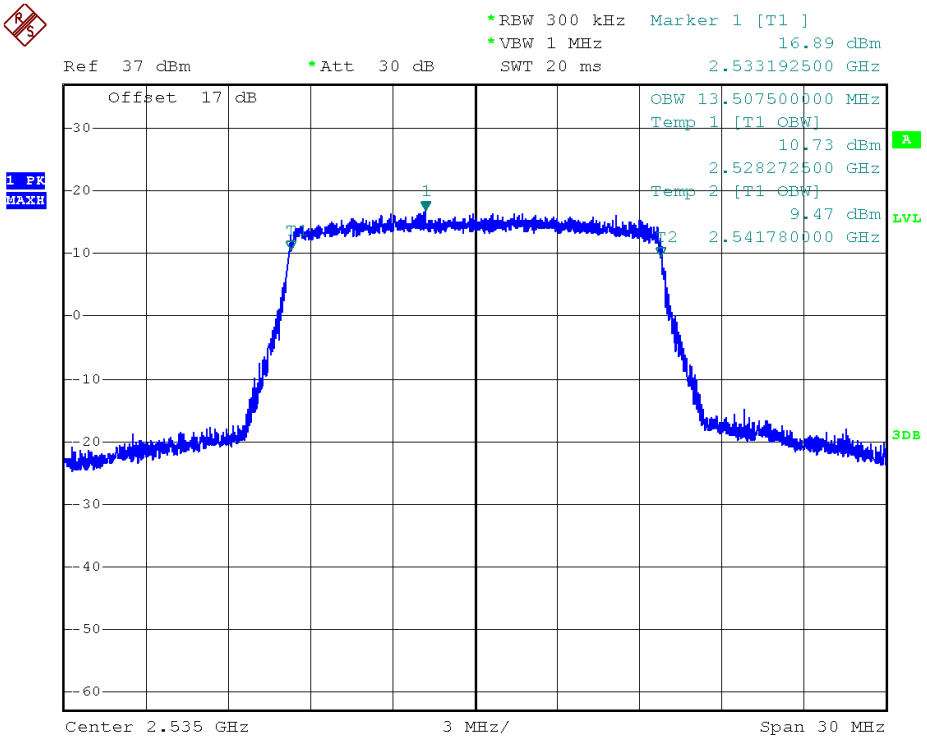
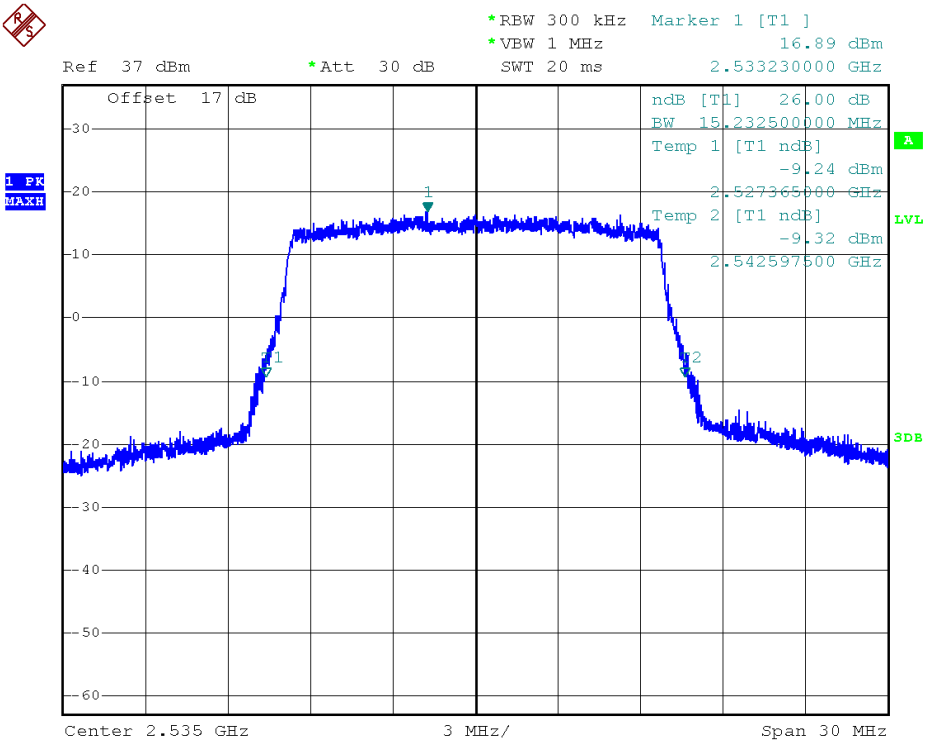
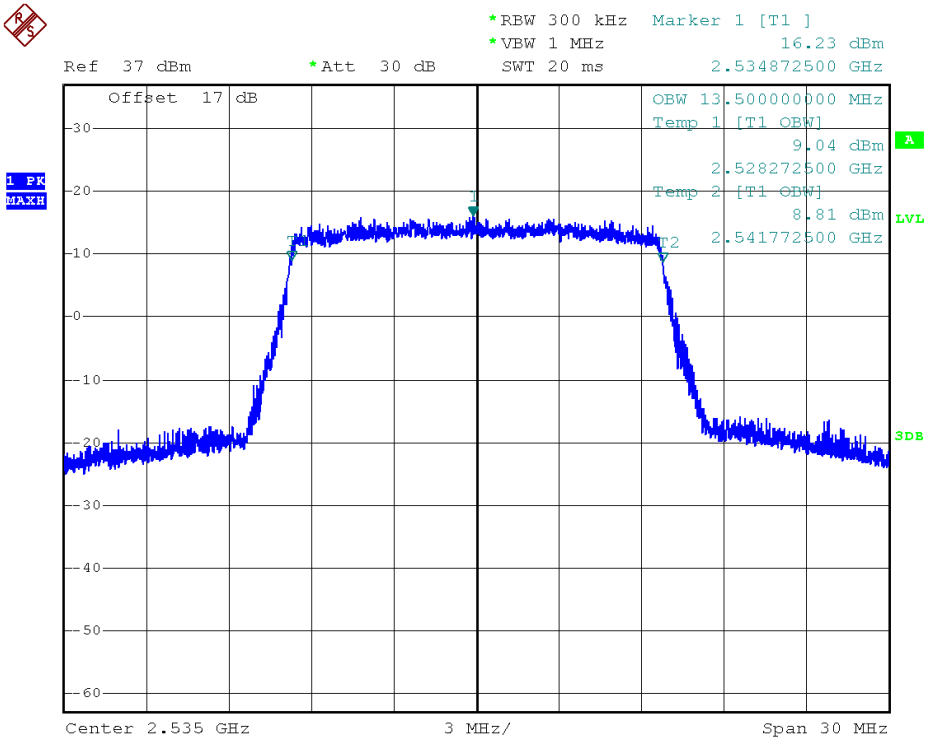
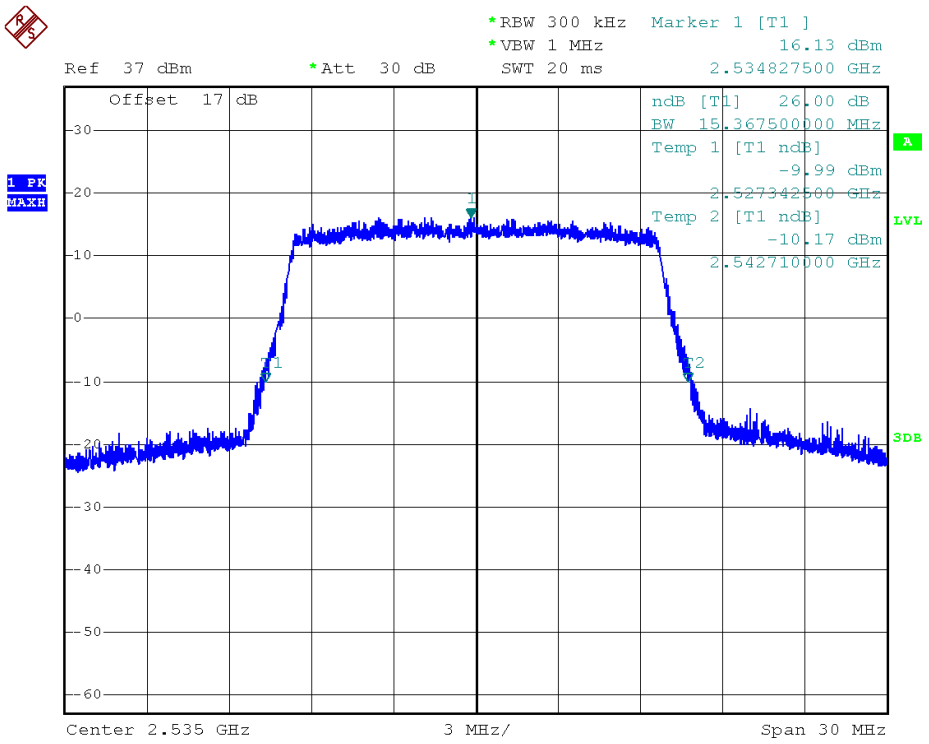


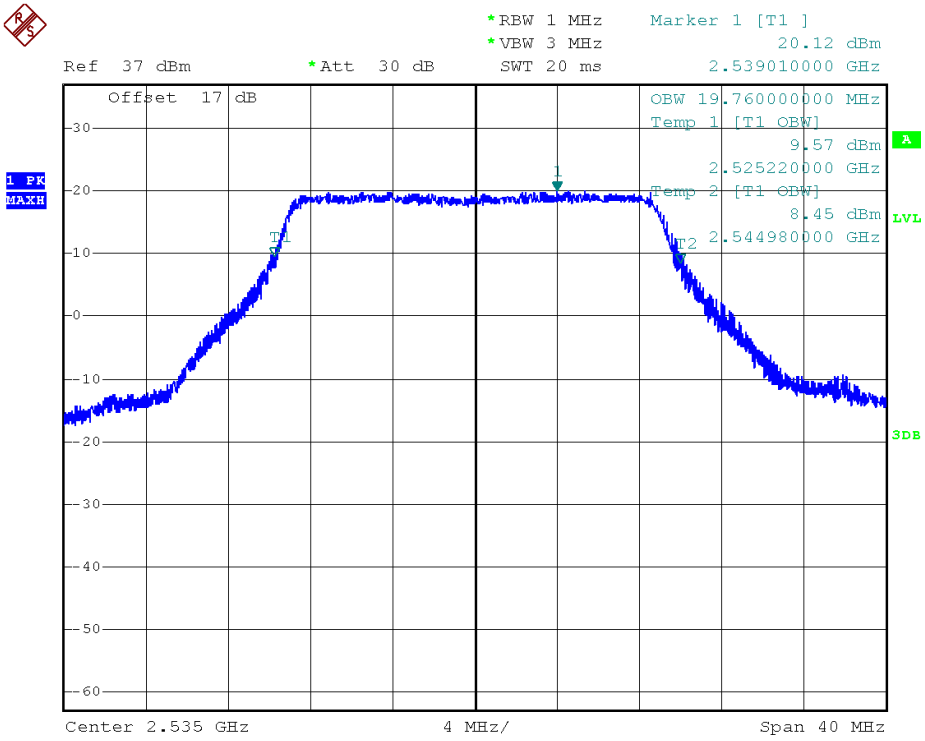


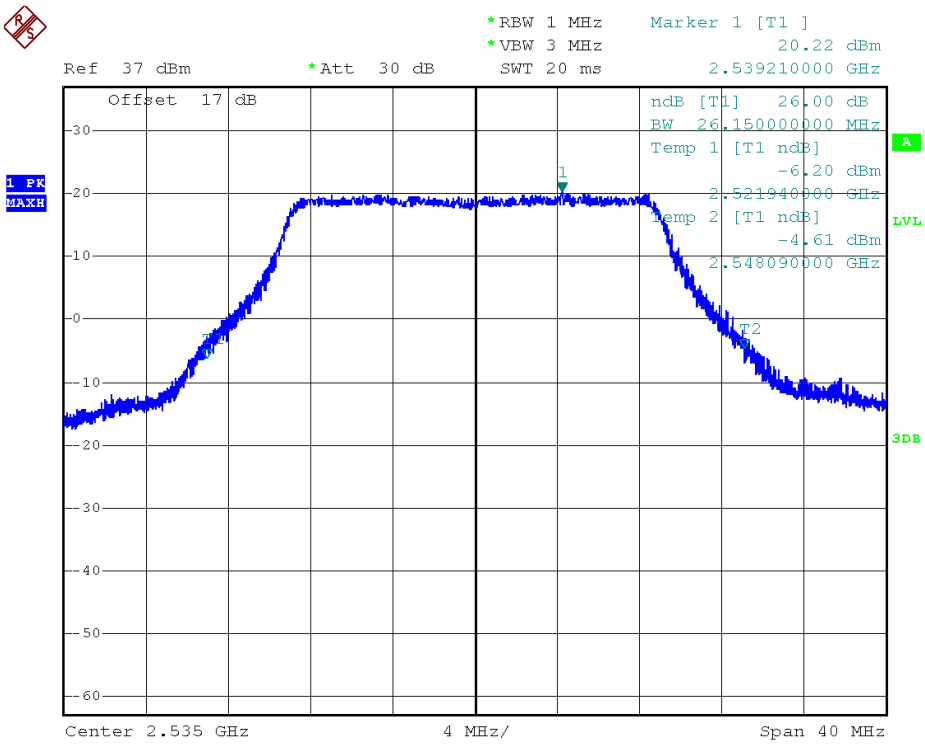
Occupied Bandwidth LTE Band 7/15MHz/QPSK



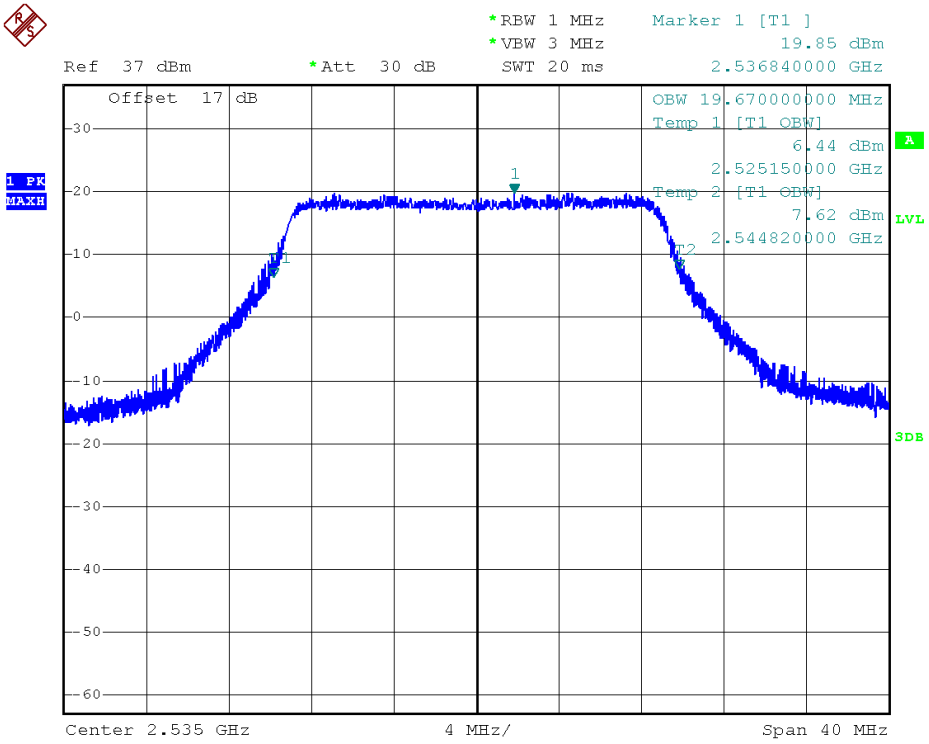


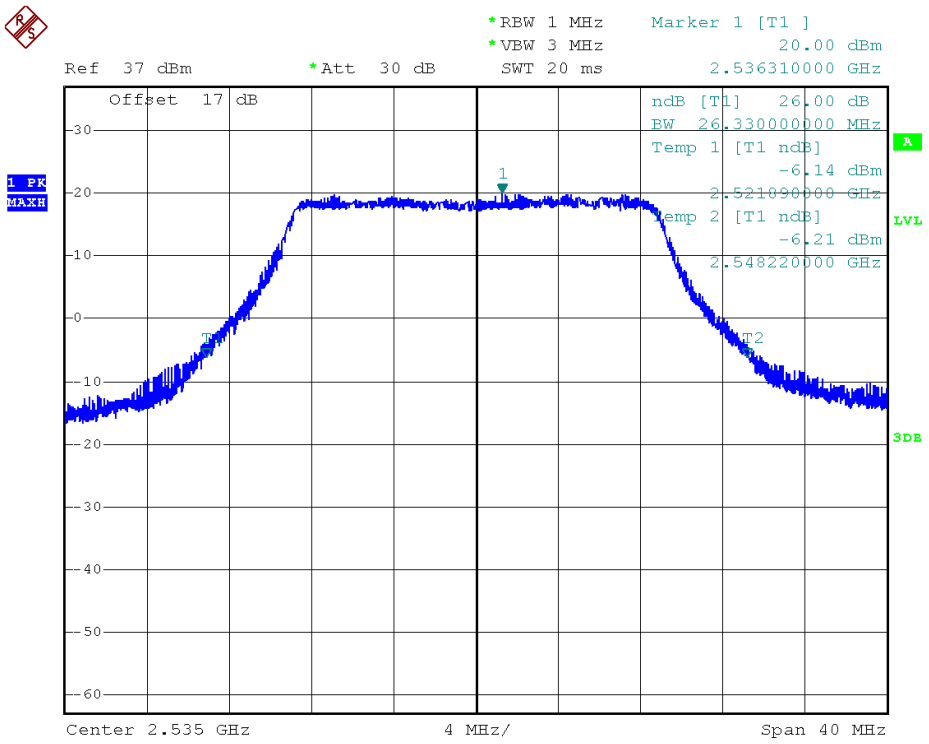
Occupied Bandwidth LTE Band 7/15MHz/16QAM





Occupied Bandwidth LTE Band 7/20MHz/QPSK





Occupied Bandwidth LTE Band 7/20MHz/16QAM

2.4 Frequency Stability

2.4.1 Requirement

According to FCC section 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. 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 ±0.00025% (±2.5ppm) of the center frequency. According to FCC section 2.1055, the test conditions are:

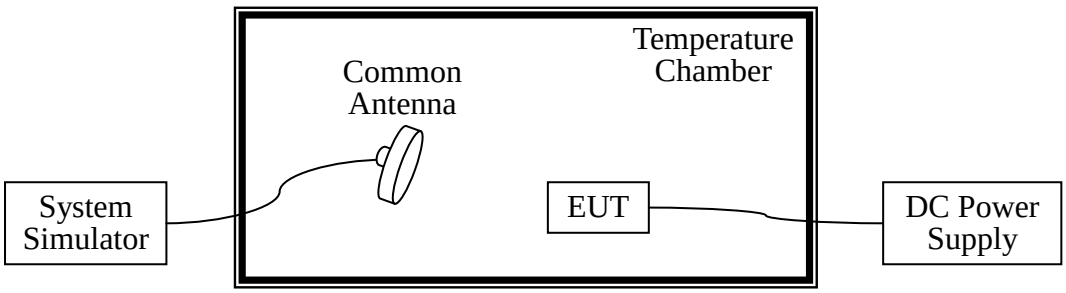
(a) The temperature is varied from -30℃ to +50℃ at intervals of not more than 10℃.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.4.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3 Test Setup



2.4.4 Test Procedures

1. The EUT was set up in the thermal chamber and connected with the system simulator.

2. With power OFF, the temperature was decreased to -30℃ 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℃ step up to 50℃. 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.
4. The nominal, highest and lowest extreme voltages were tested, which are specified by the applicant; the normal temperature here used is 25℃.
5. The variation in frequency was measured for the worst case.

2.4.5 Test Result of Frequency Stability

1. LTE Band 4, QPSK ,BW 10MHz

Test Conditions		Frequency Deviation BW 10MHz Middle Channel 1732.5MHz		
Power (VDC)	Temperature (℃)	Frequency Error	Frequency Error	Limit
		Hz	ppm	ppm
3.7	-30	25	0.02	2.5
	-20	47	0.03	
	-10	17	0.01	
	0	38	0.02	
	+10	17	0.01	
	+20	15	0.01	
	+30	22	0.01	
	+40	56	0.03	
	+55	28	0.02	
4.2	+25	30	0.02	
3.5	+25	22	0.01	

2. LTE Band 4, 16QAM ,BW 10MHz

Test Conditions		Frequency Deviation BW 10MHz Middle Channel 1732.5MHz		
Power (VDC)	Temperature (℃)	Frequency Error	Frequency Error	Limit
		Hz	ppm	ppm
3.7	-30	17	0.01	2.5
	-20	54	0.03	
	-10	35	0.02	
	0	28	0.02	
	+10	38	0.02	
	+20	11	0.01	
	+30	34	0.02	
	+40	27	0.01	
	+55	15	0.01	
4.2	+25	59	0.03	
3.5	+25	35	0.02	

3. LTE Band 7, QPSK ,BW 10MHz

Test Conditions		Frequency Deviation BW 10MHz Middle Channel 2535MHz		
Power (VDC)	Temperature (℃)	Frequency Error	Frequency Error	Limit
		Hz	ppm	ppm
3.7	-30	19	0.01	2.5
	-20	53	0.02	
	-10	41	0.02	
	0	22	0.01	
	+10	23	0.01	
	+20	35	0.01	
	+30	31	0.01	
	+40	23	0.01	
	+55	22	0.01	
4.2	+25	59	0.02	
3.5	+25	50	0.02	

4. LTE Band 7,16QAM ,BW 10MHz

Test Conditions		Frequency Deviation BW 10MHz Middle Channel 2535MHz		
Power (VDC)	Temperature (℃)	Frequency Error	Frequency Error	Limit
		Hz	ppm	ppm
3.7	-30	26	0.01	2.5
	-20	48	0.02	
	-10	25	0.01	
	0	22	0.01	
	+10	23	0.01	
	+20	49	0.02	
	+30	27	0.01	
	+40	23	0.01	
	+55	23	0.01	
4.2	+25	55	0.02	
3.5	+25	24	0.01	

2.5 Conducted Out of Band Emissions

2.5.1 Requirement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

For Band 7:

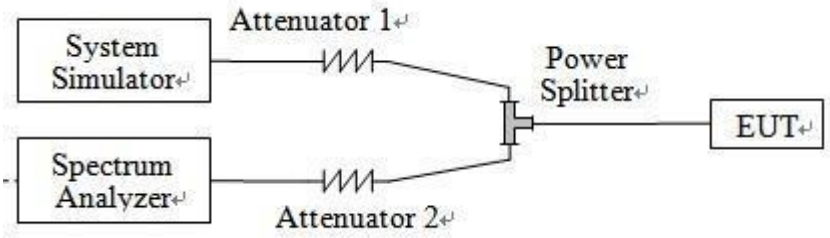
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power(P) by a factor of at least 55+10 log(P) dB. This calculated to be -25dBm.

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10th harmonic.

2.5.2 Measuring Instruments

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

2.5.3 Test Setup



2.5.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a 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 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [43 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

   = -13dBm.
8. For Band 7

   The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [55 + 10log(P)] (dB)

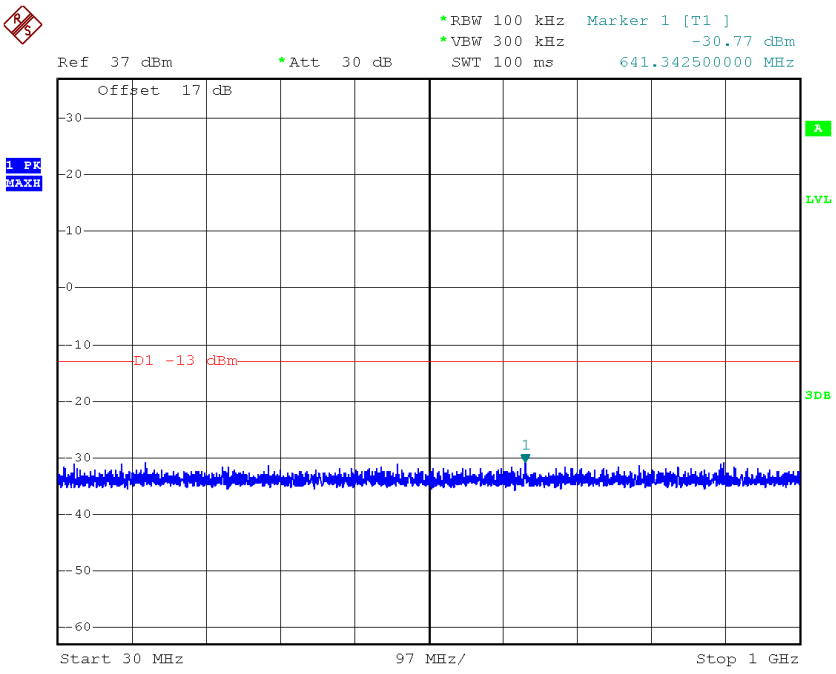
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)

   = -25dBm.
9. For 9KHz to 30MHz: the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

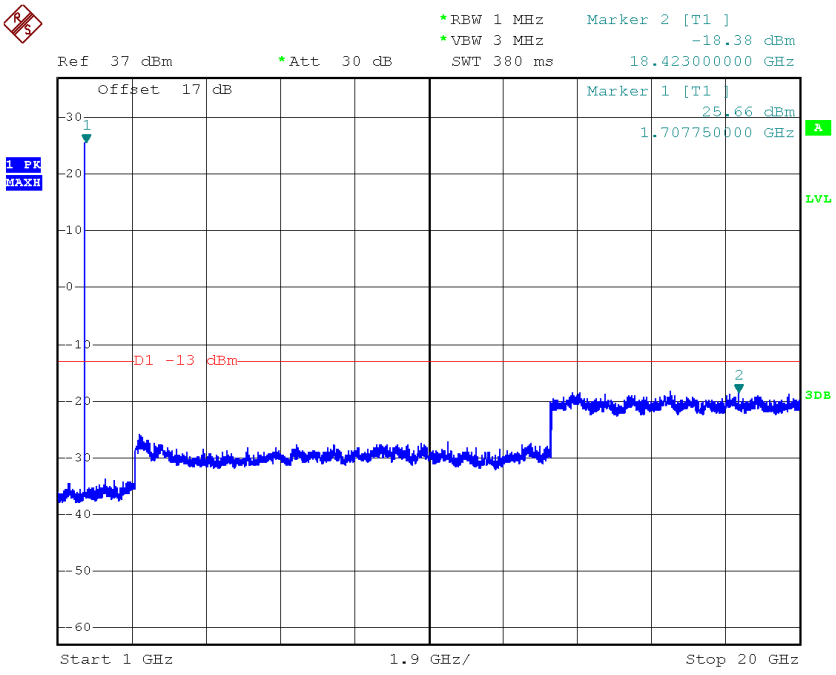
2.5.5 Test Result of Conducted Spurious Emission

Note: For 9 KHz to 30MHz: the amplitude of spurious emissions is attenuated by more than 20dB below the permissible value, so we not provide the test result here

Band	LTE Band 4	Channel	Low
Bandwidth	1.4MHz	Modulation	QPSK

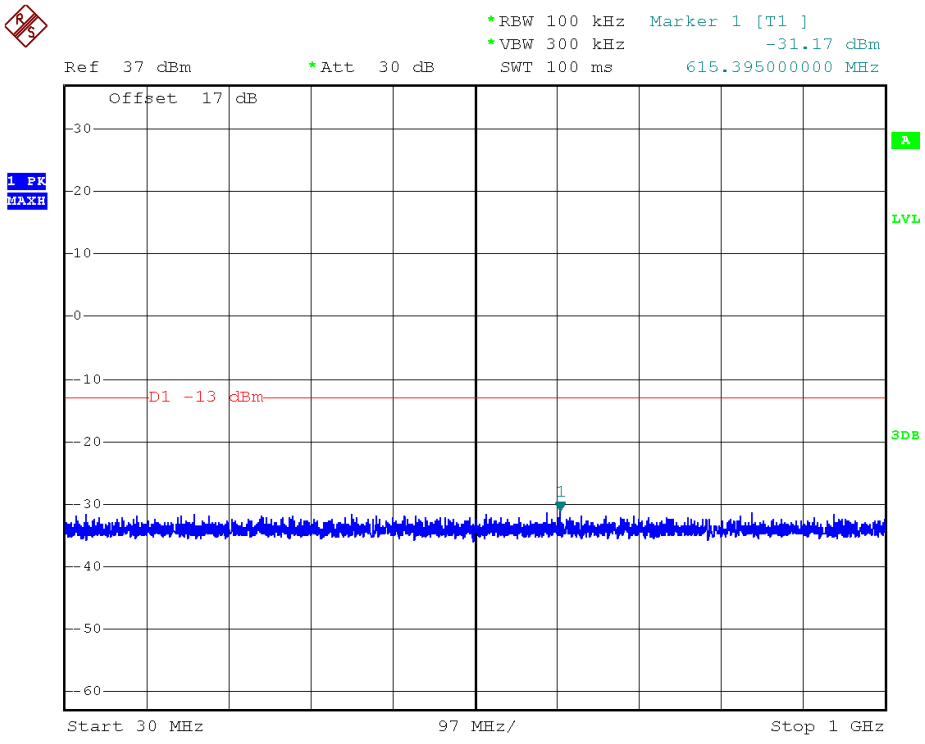


RB Size 1, RB Offset 0 30MHz to 1GHz

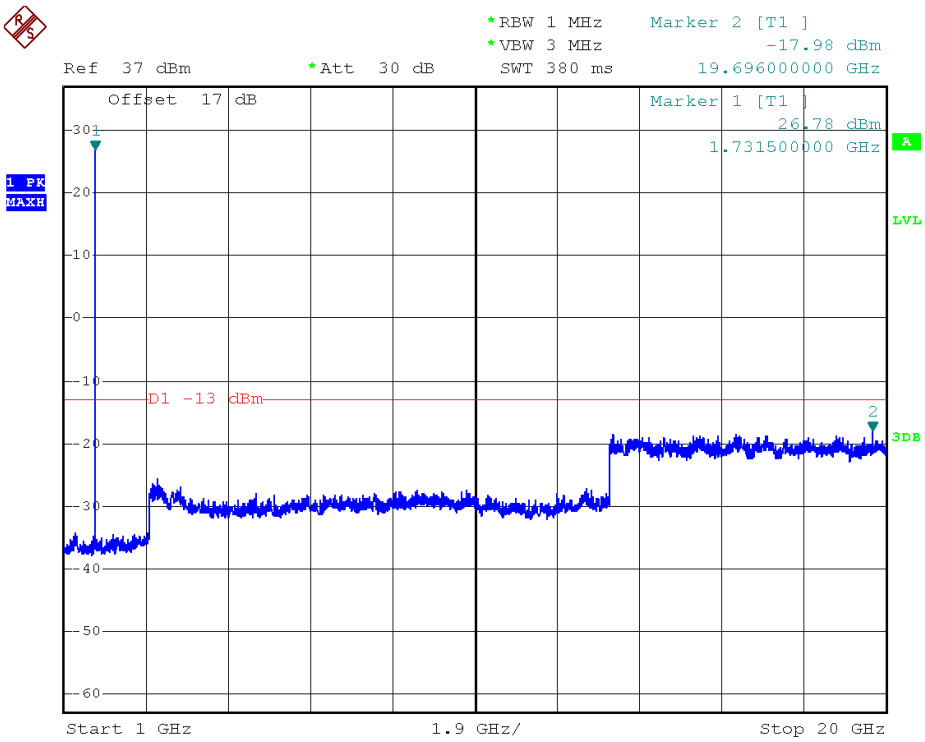


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Middle
Bandwidth	1.4MHz	Modulation	QPSK

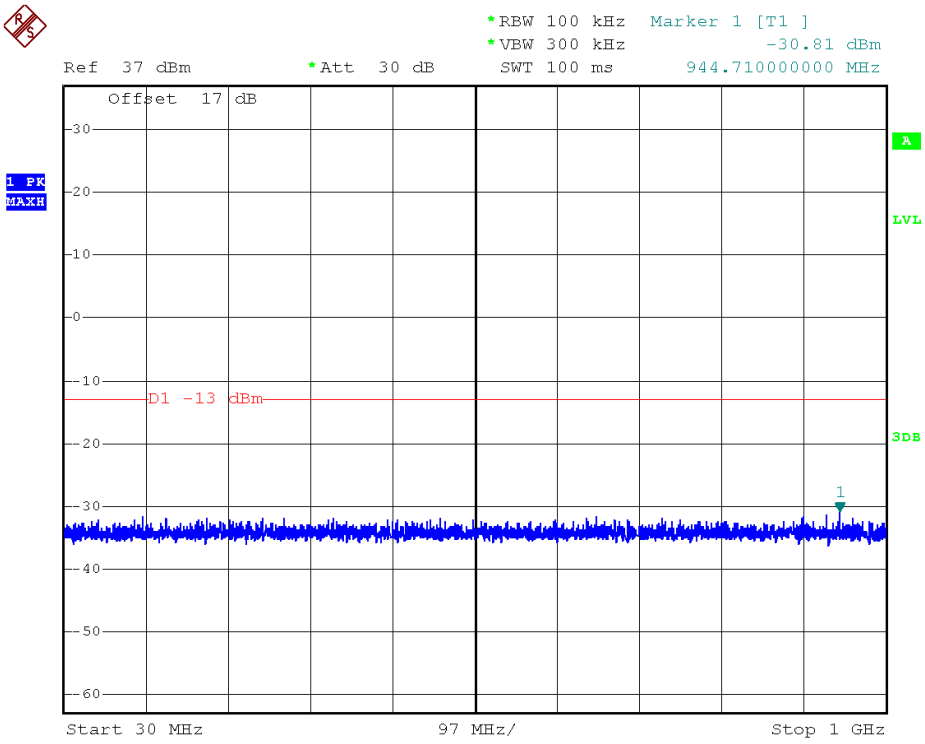


RB Size 1, RB Offset 0 30MHz to 1GHz

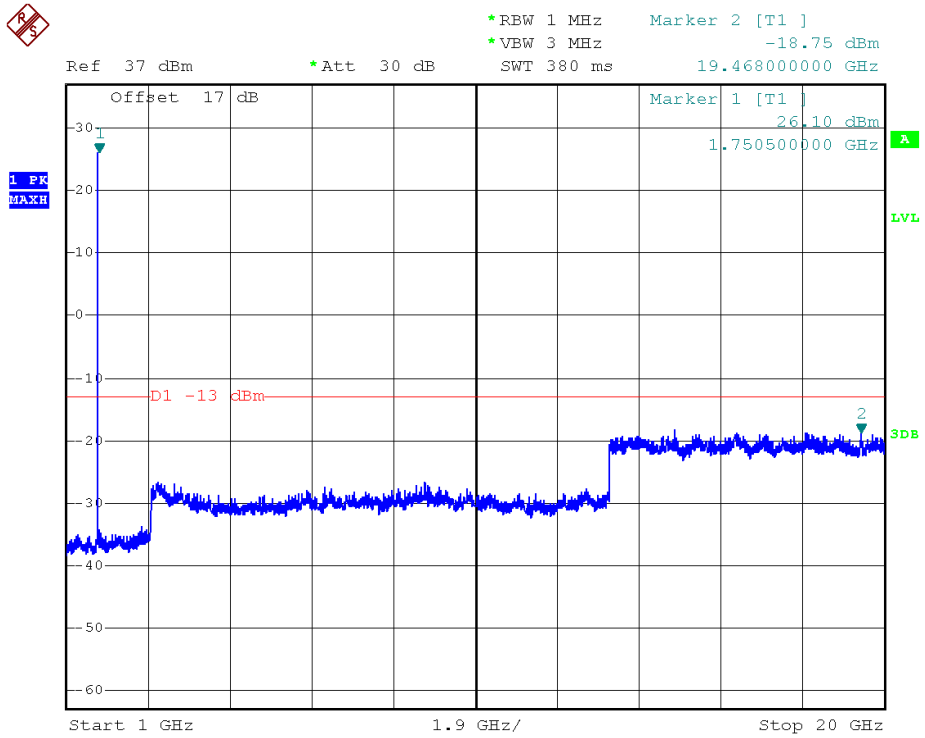


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	High
Bandwidth	1.4MHz	Modulation	QPSK

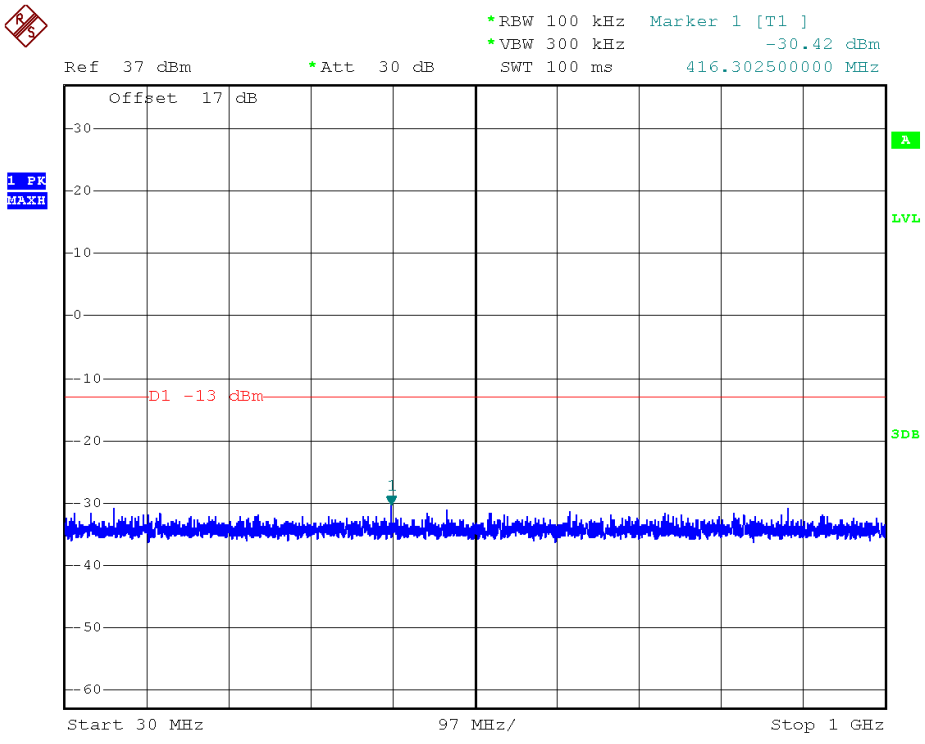


RB Size 1, RB Offset 0 30MHz to 1GHz

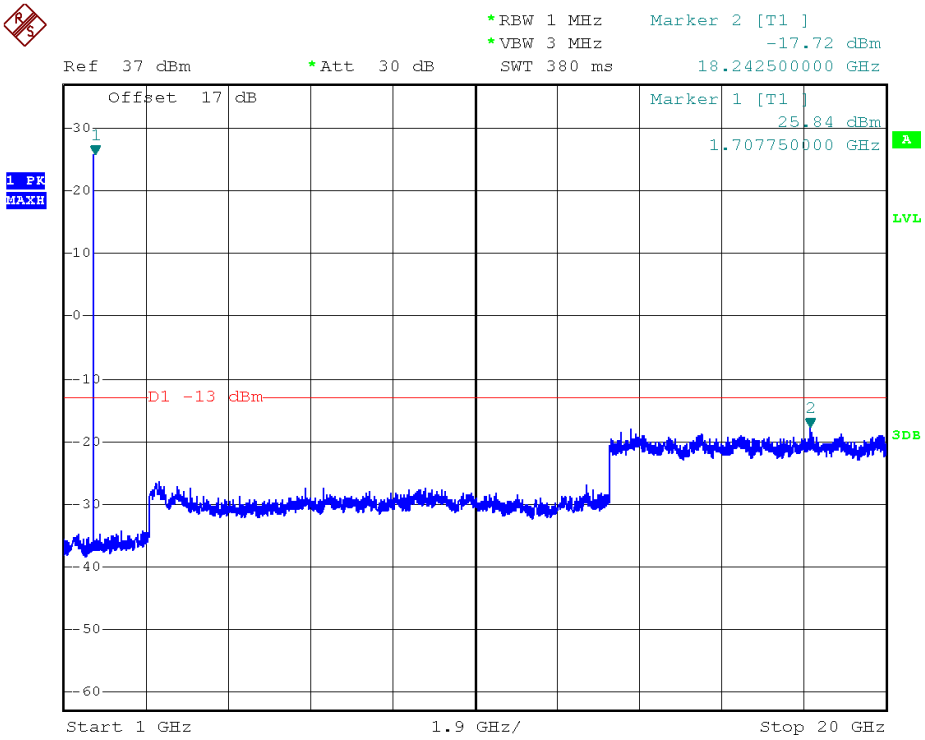


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Low
Bandwidth	3MHz	Modulation	QPSK

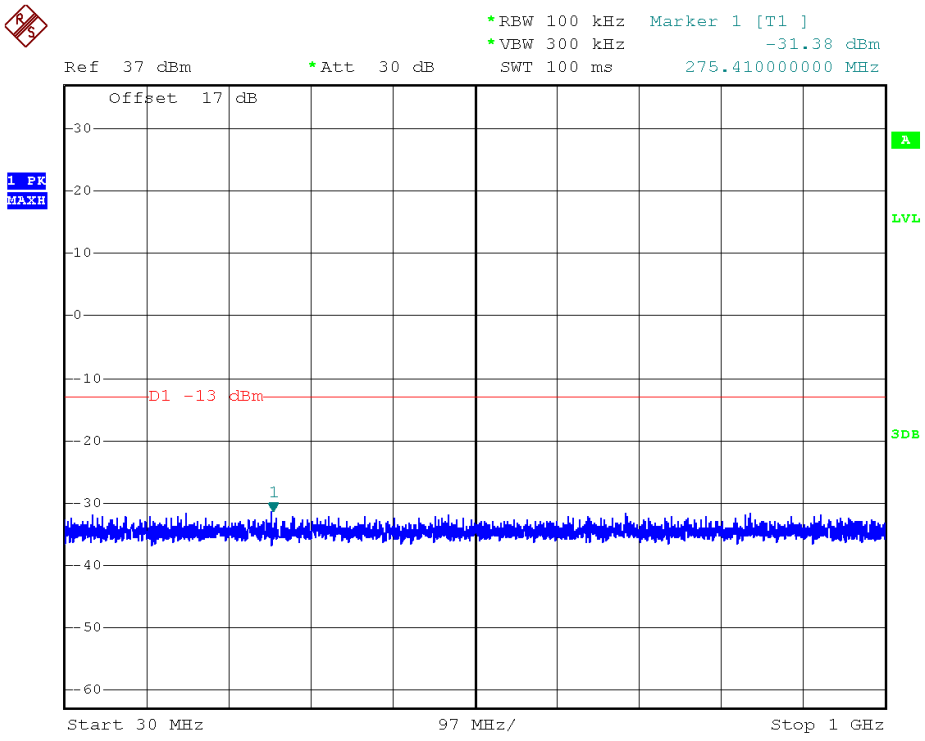


RB Size 1, RB Offset 0 30MHz to 1GHz

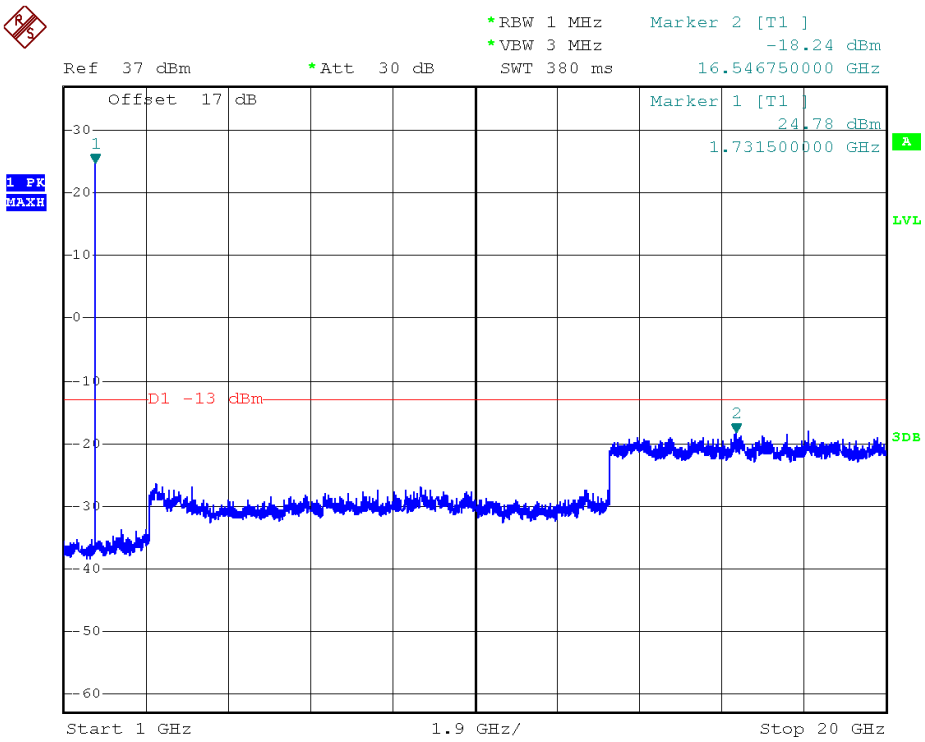


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Middle
Bandwidth	3MHz	Modulation	QPSK

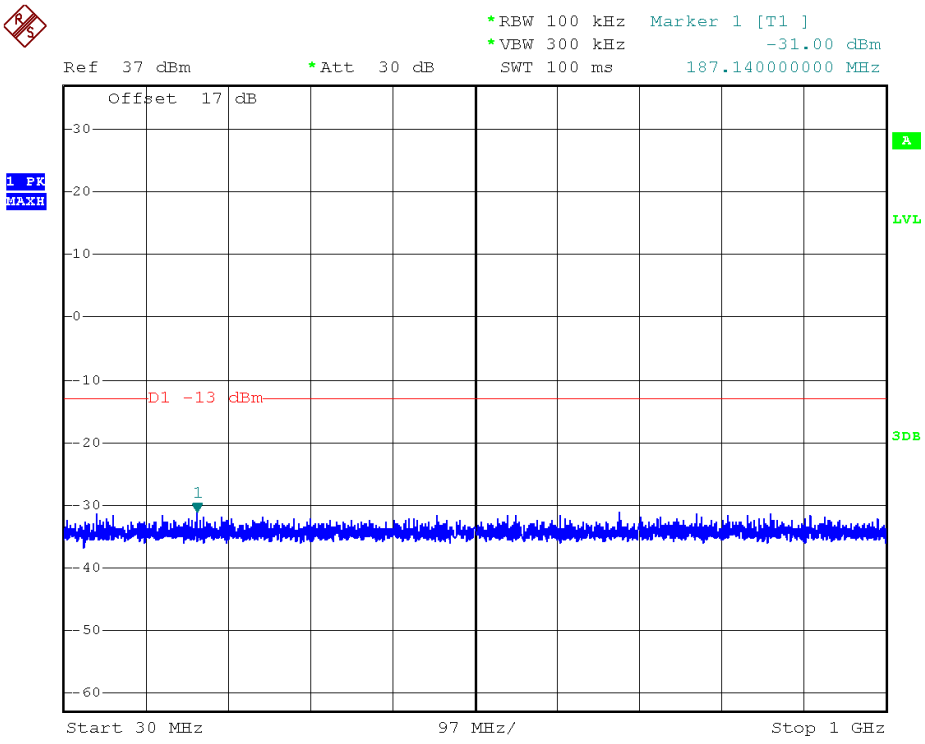


RB Size 1, RB Offset 0 30MHz to 1GHz

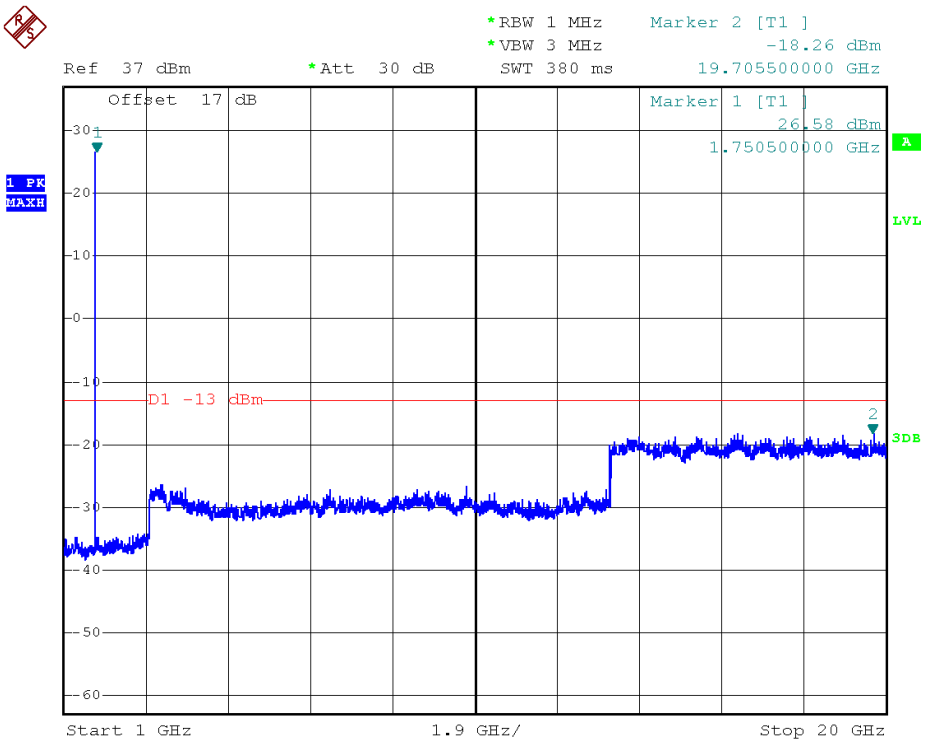


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	High
Bandwidth	3MHz	Modulation	QPSK

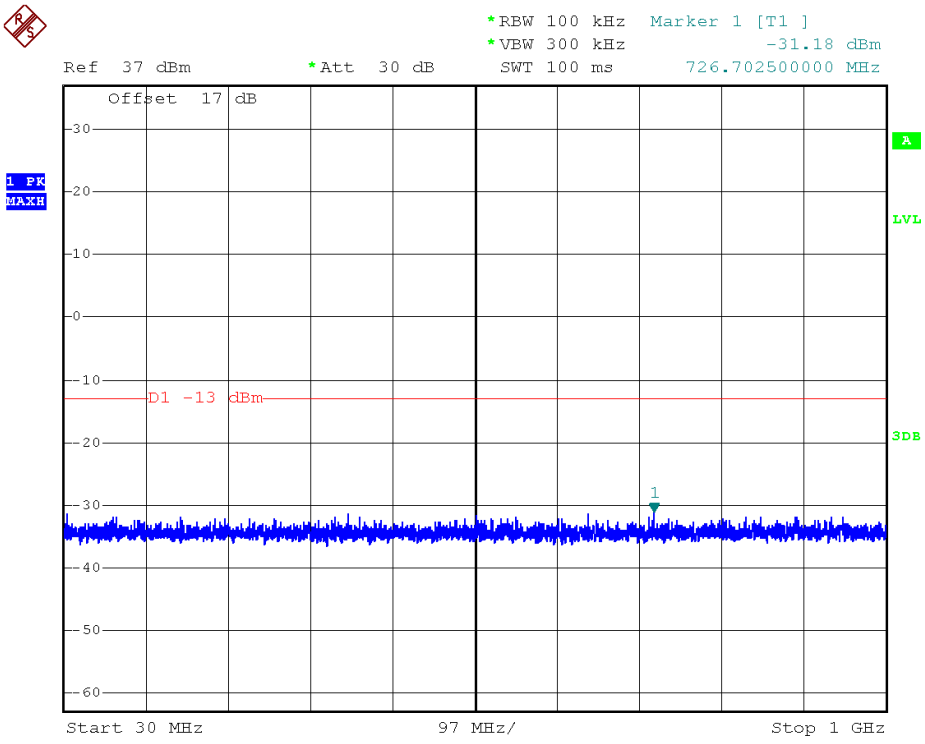


RB Size 1, RB Offset 0 30MHz to 1GHz

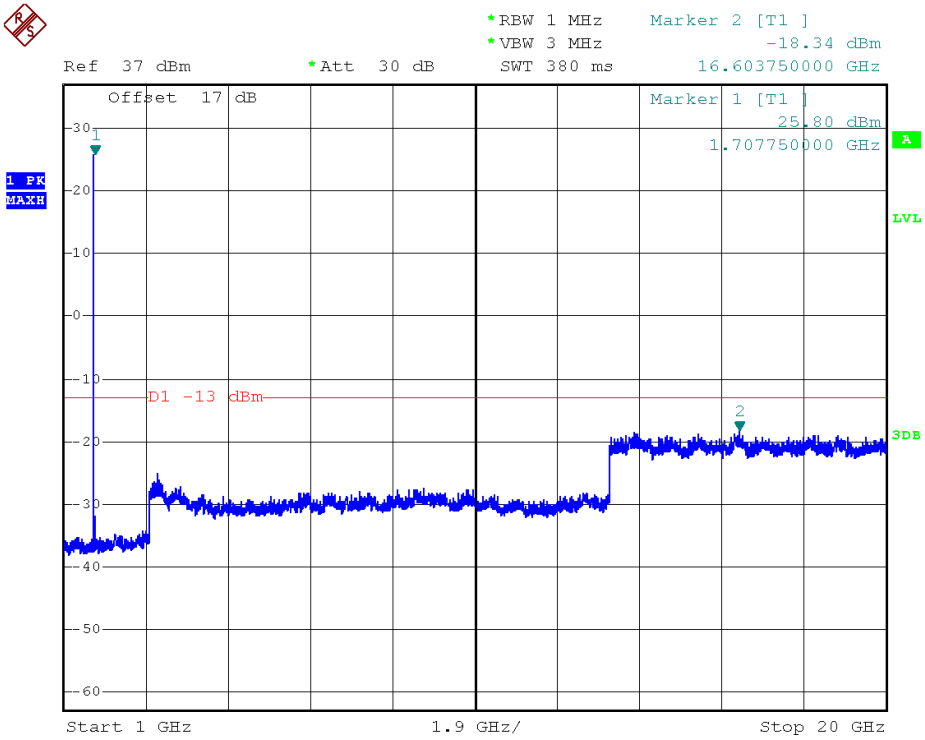


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Low
Bandwidth	5MHz	Modulation	QPSK

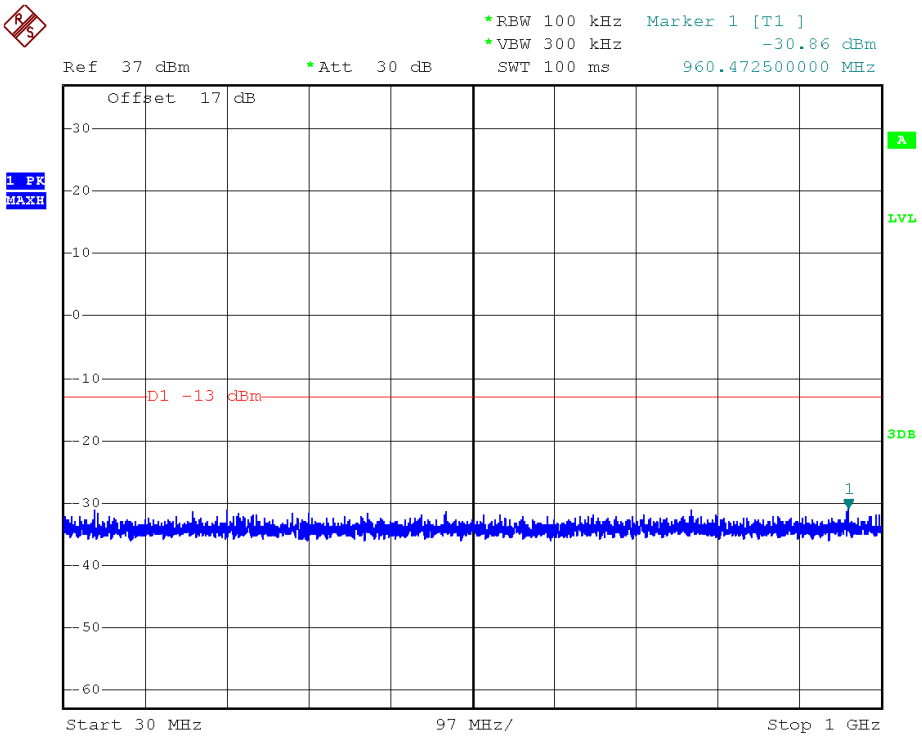


RB Size 1, RB Offset 0 30MHz to 1GHz

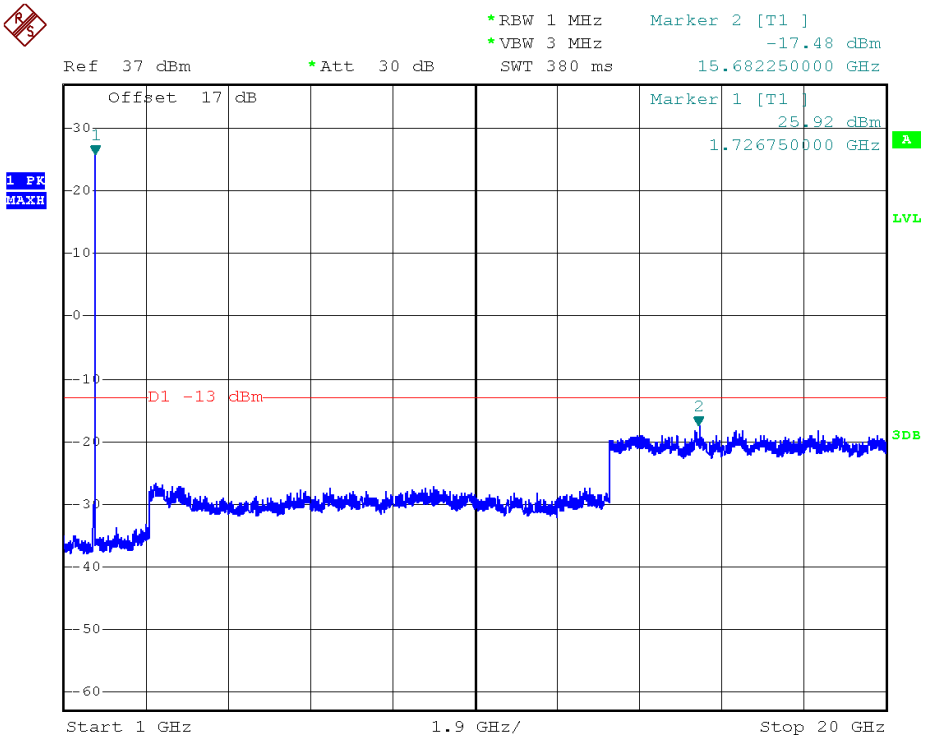


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Middle
Bandwidth	5MHz	Modulation	QPSK

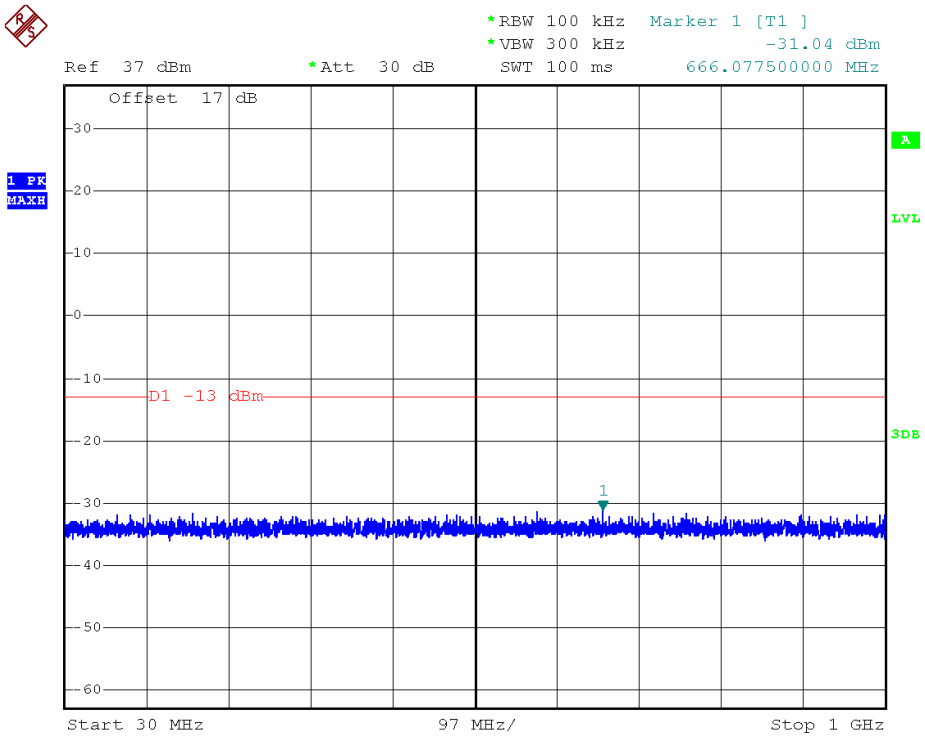


RB Size 1, RB Offset 0 30MHz to 1GHz

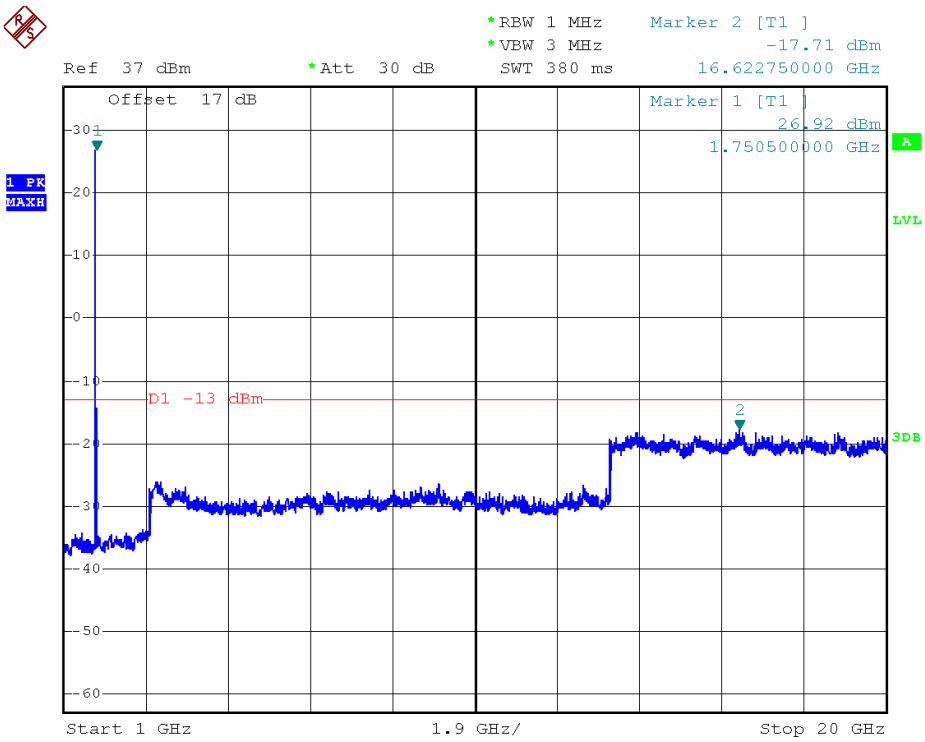


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	High
Bandwidth	5MHz	Modulation	QPSK

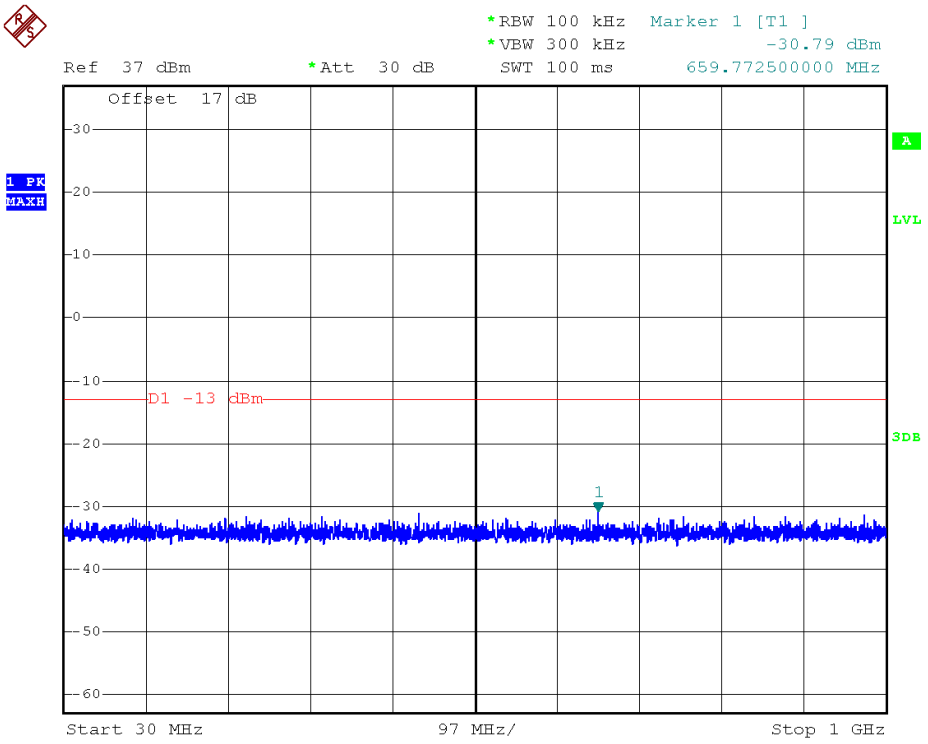


RB Size 1, RB Offset 0 30MHz to 1GHz

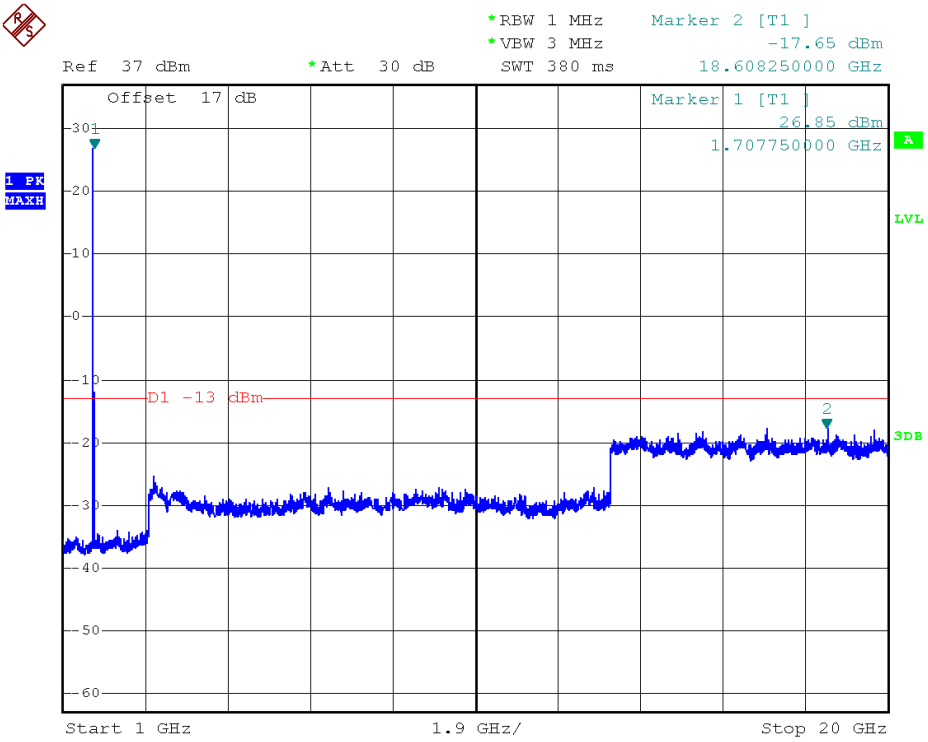


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Low
Bandwidth	10MHz	Modulation	QPSK

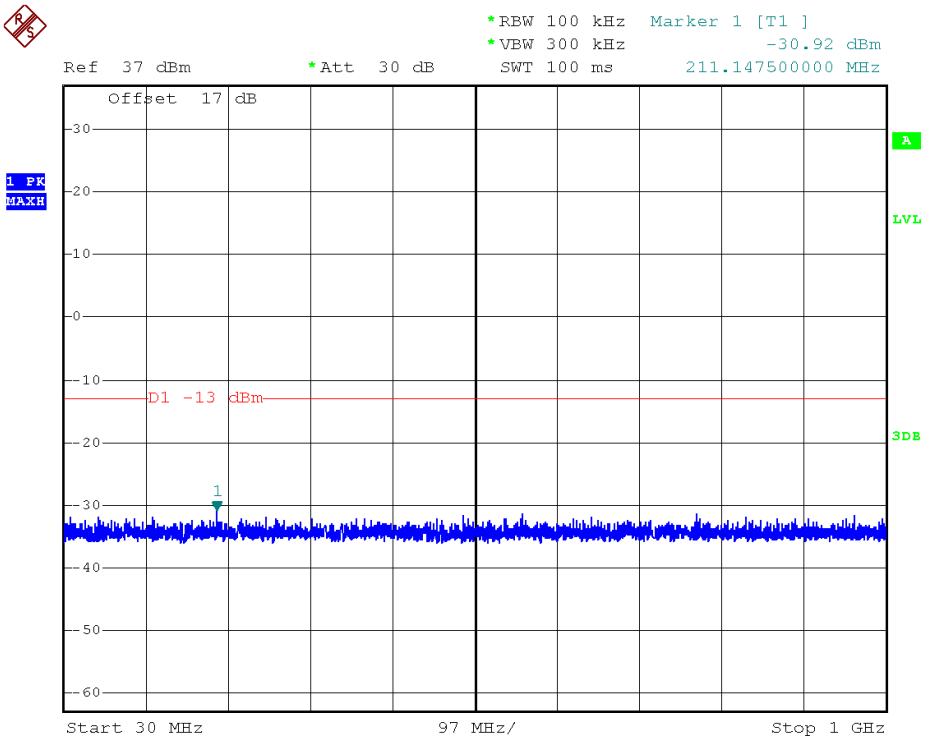


RB Size 1, RB Offset 0 30MHz to 1GHz

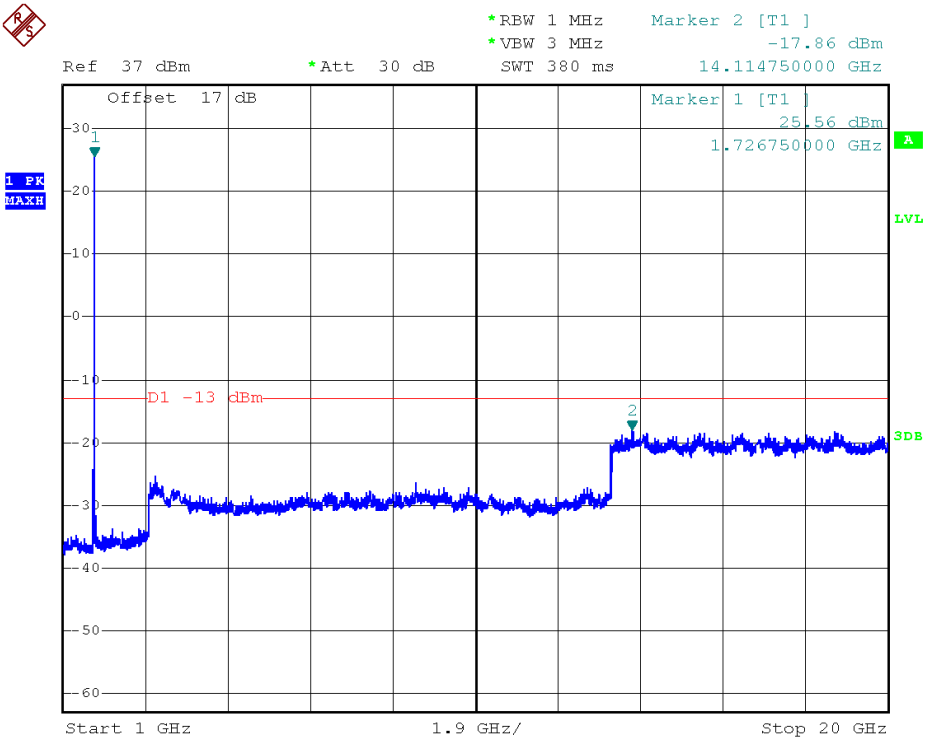


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Middle
Bandwidth	10MHz	Modulation	QPSK

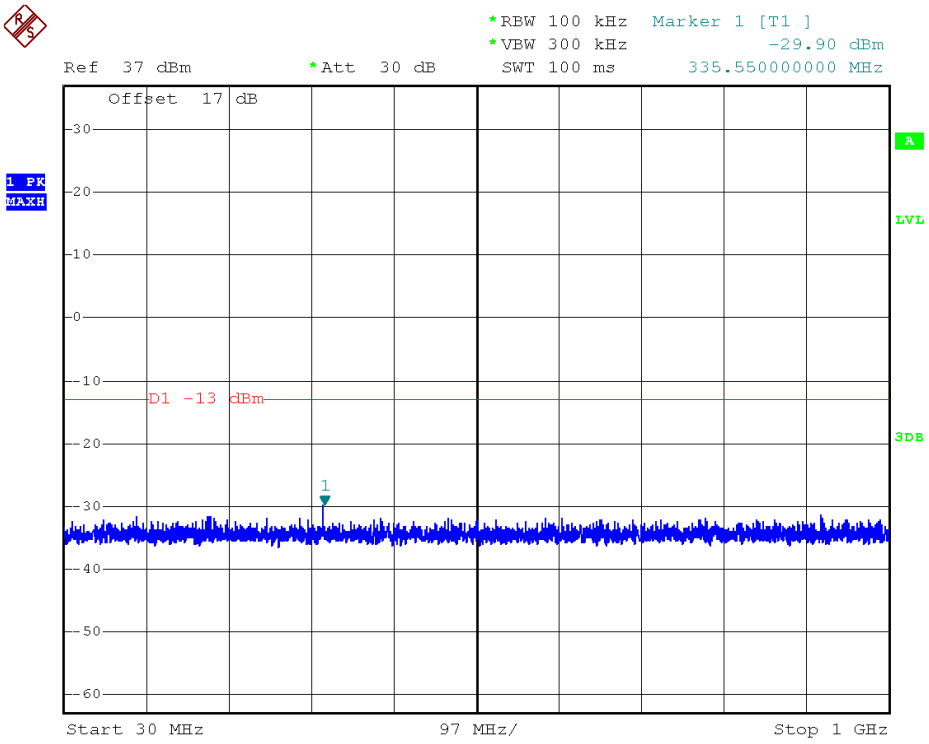


RB Size 1, RB Offset 0 30MHz to 1GHz

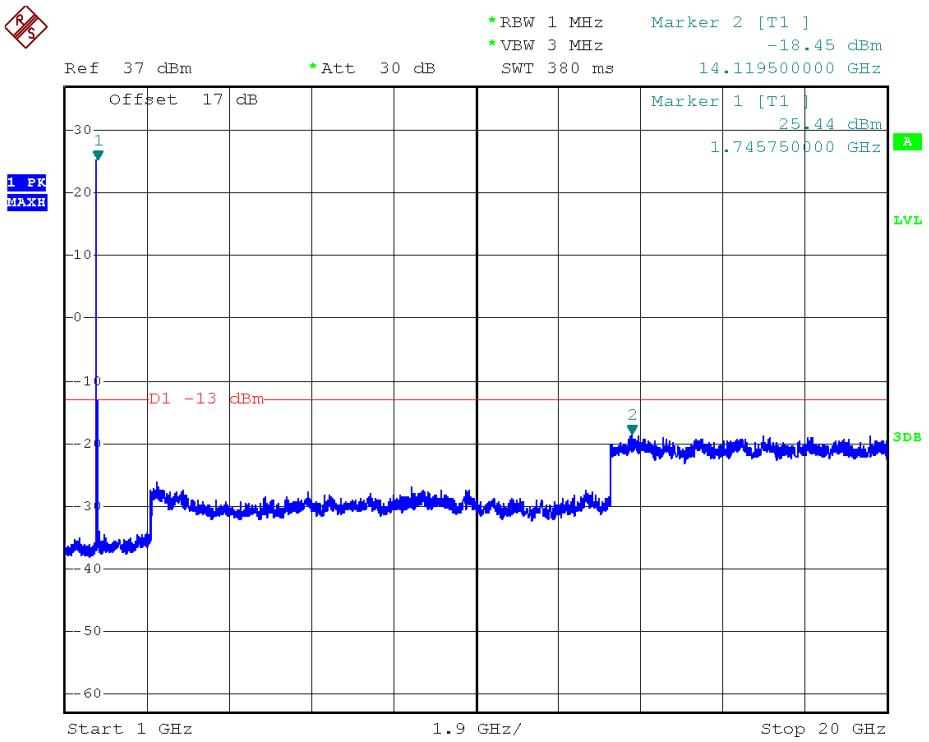


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	High
Bandwidth	10MHz	Modulation	QPSK

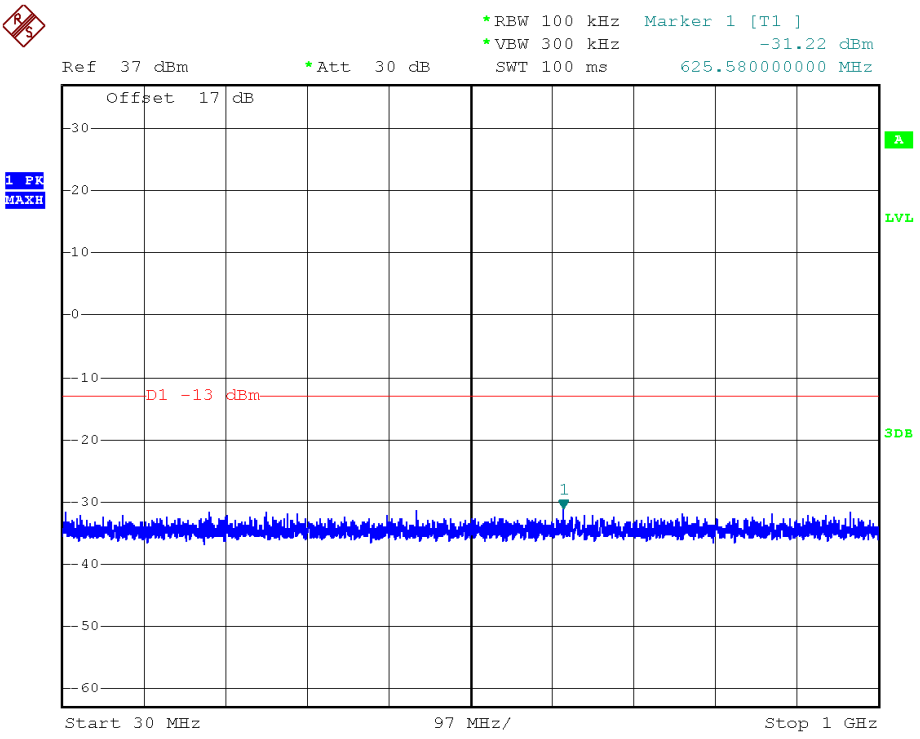


RB Size 1, RB Offset 0 30MHz to 1GHz

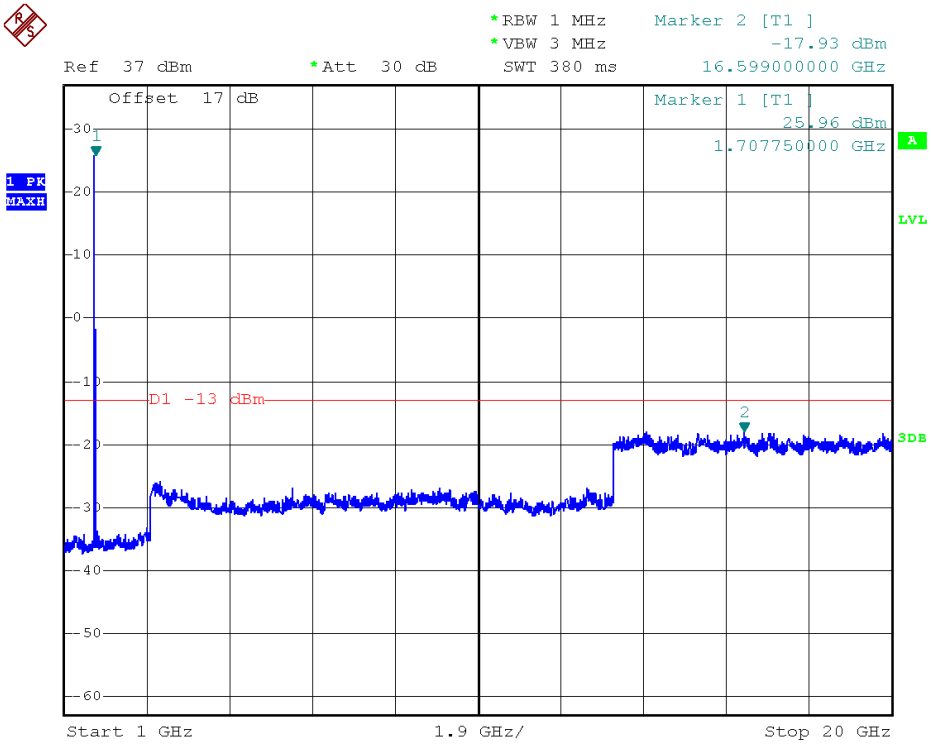


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Low
Bandwidth	15MHz	Modulation	QPSK

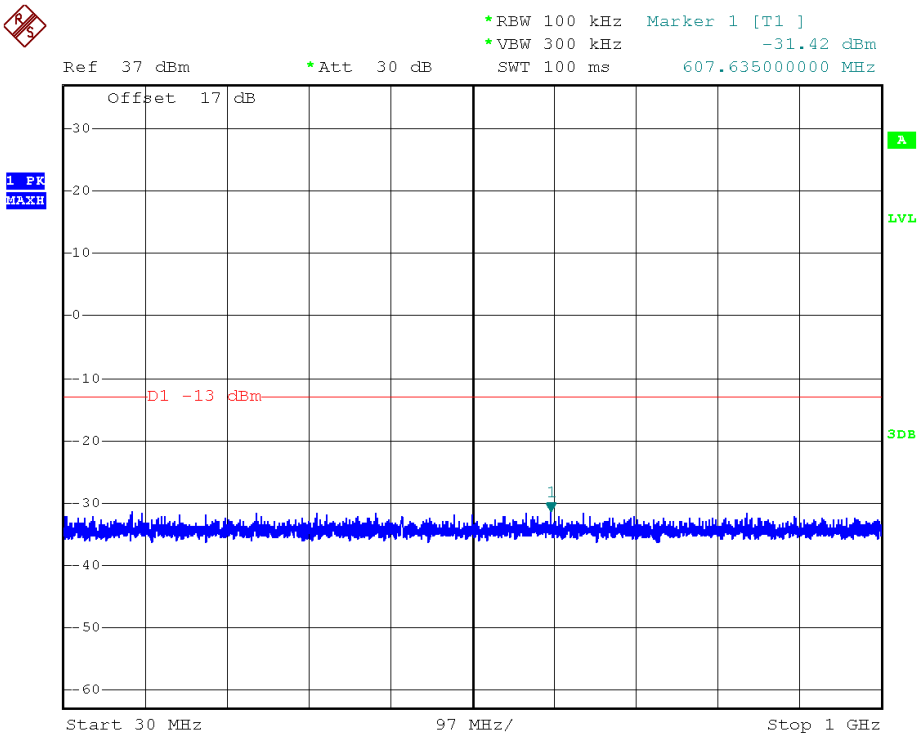


RB Size 1, RB Offset 0 30MHz to 1GHz

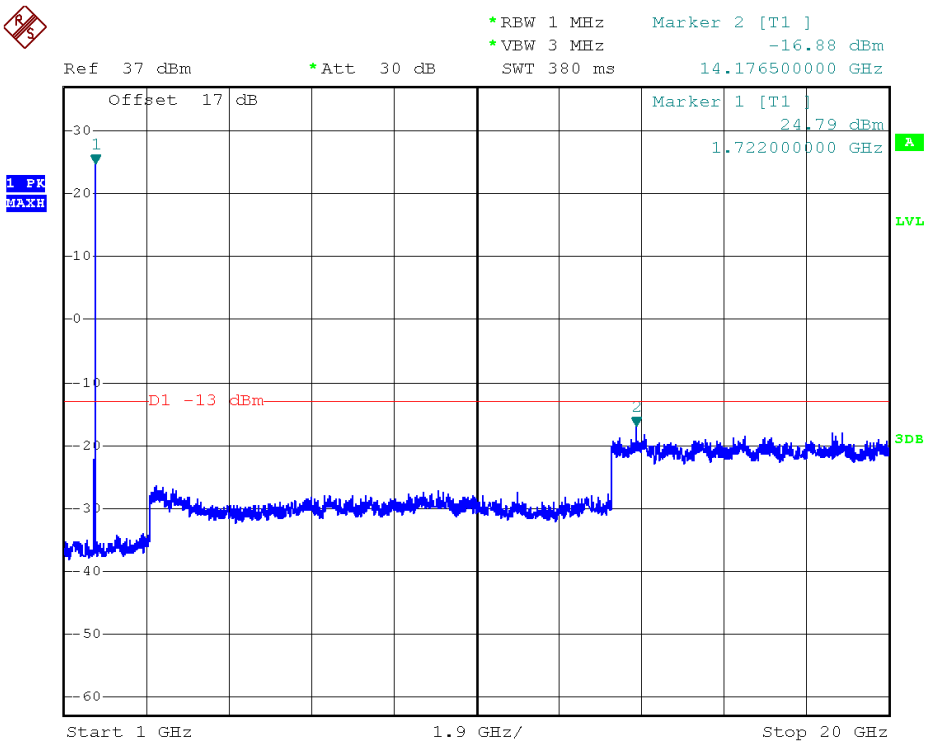


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Middle
Bandwidth	15MHz	Modulation	QPSK

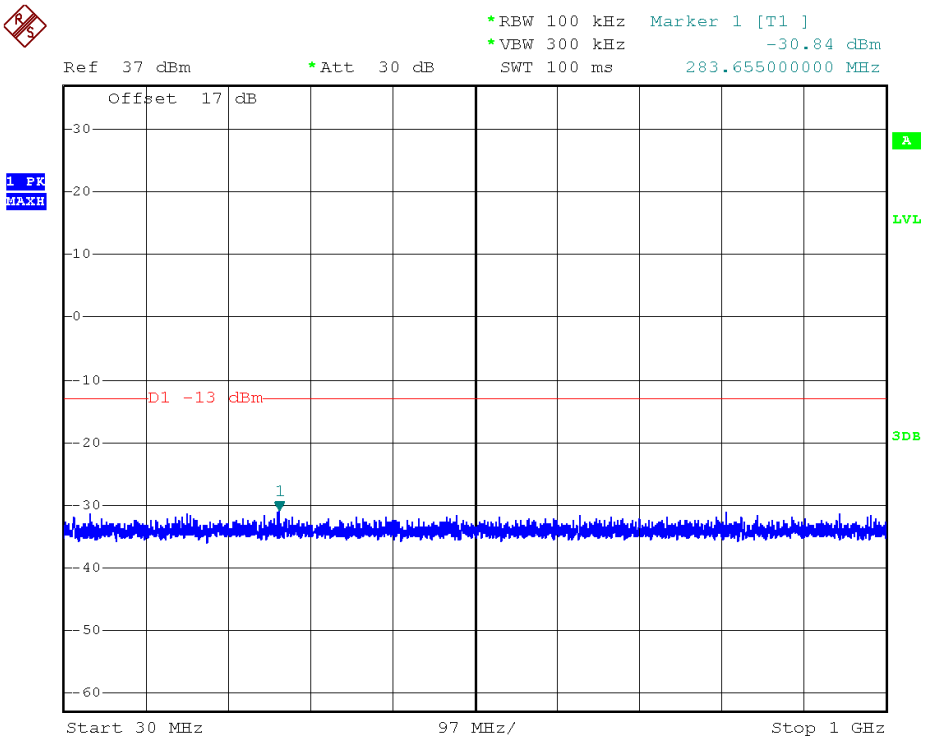


RB Size 1, RB Offset 0 30MHz to 1GHz

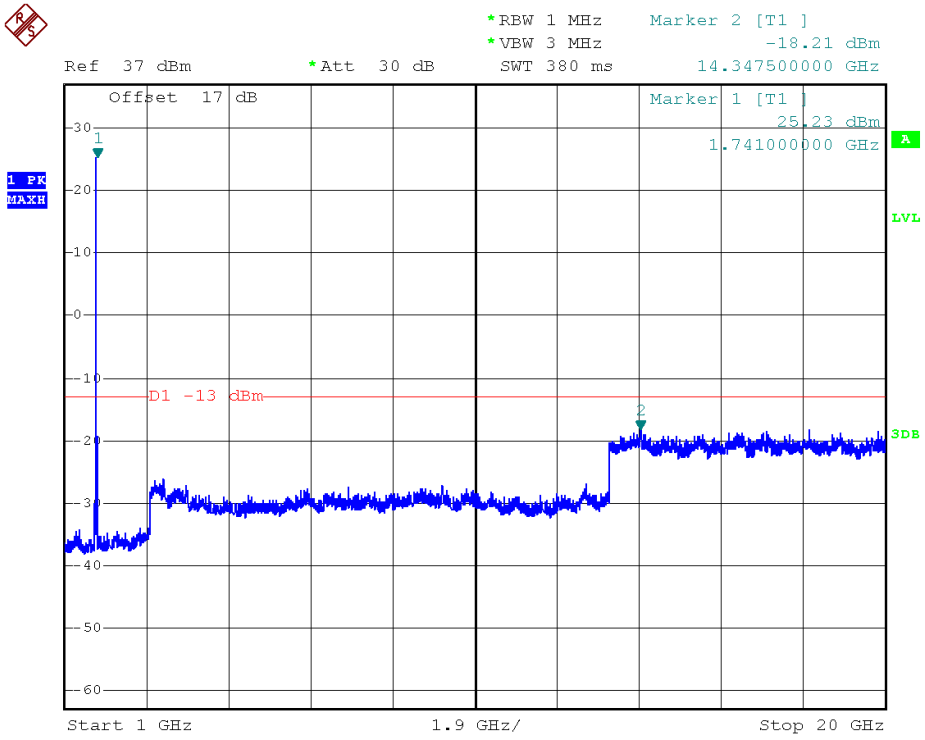


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	High
Bandwidth	15MHz	Modulation	QPSK

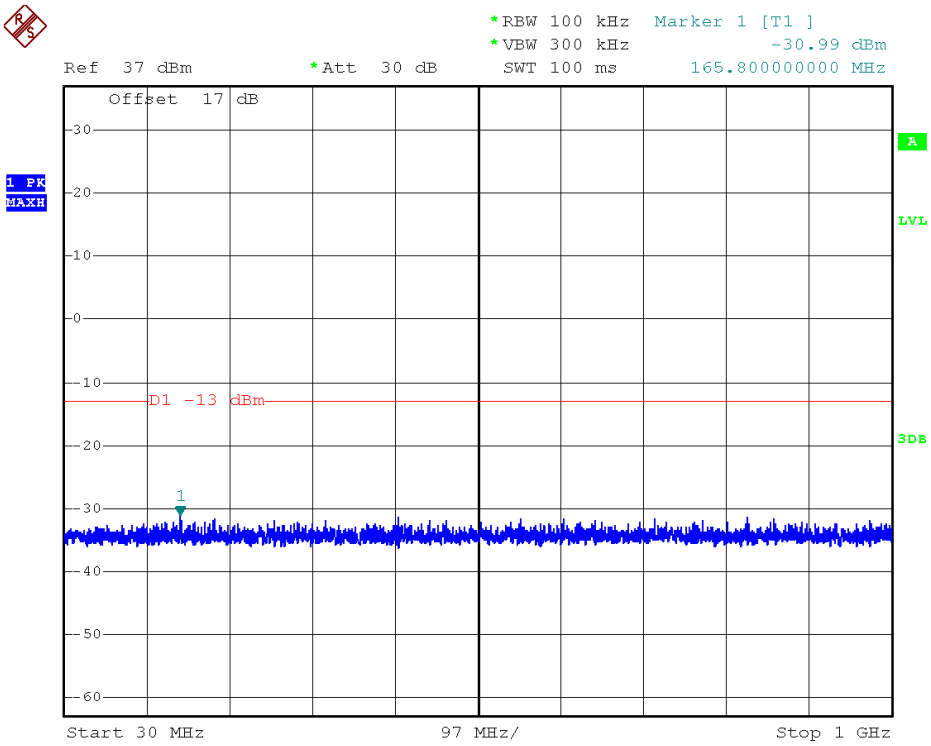


RB Size 1, RB Offset 0 30MHz to 1GHz

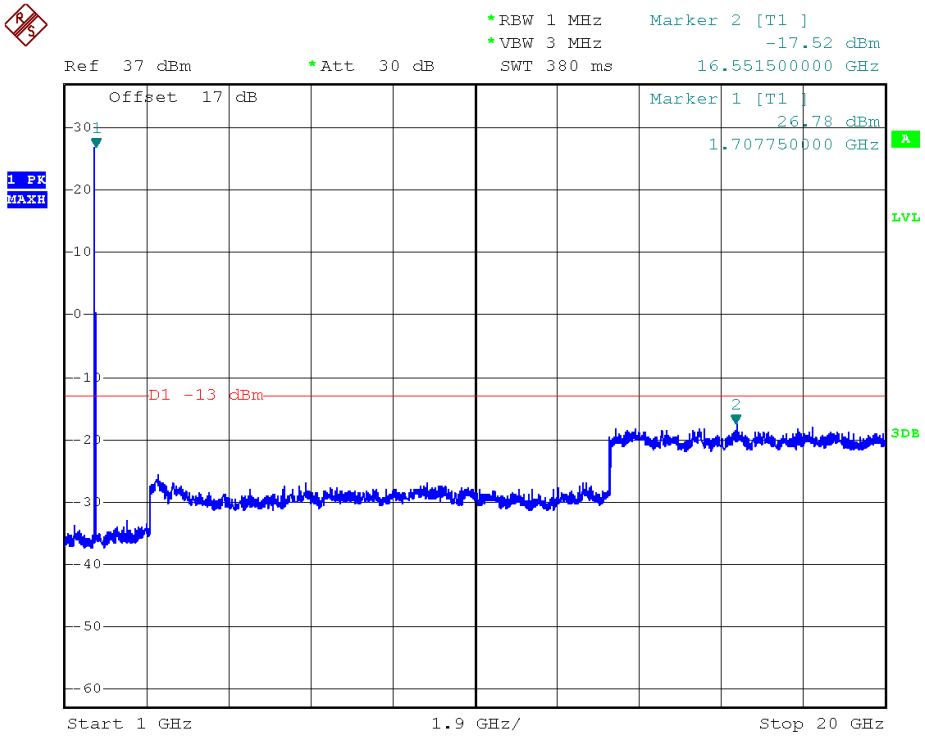


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Low
Bandwidth	20MHz	Modulation	QPSK

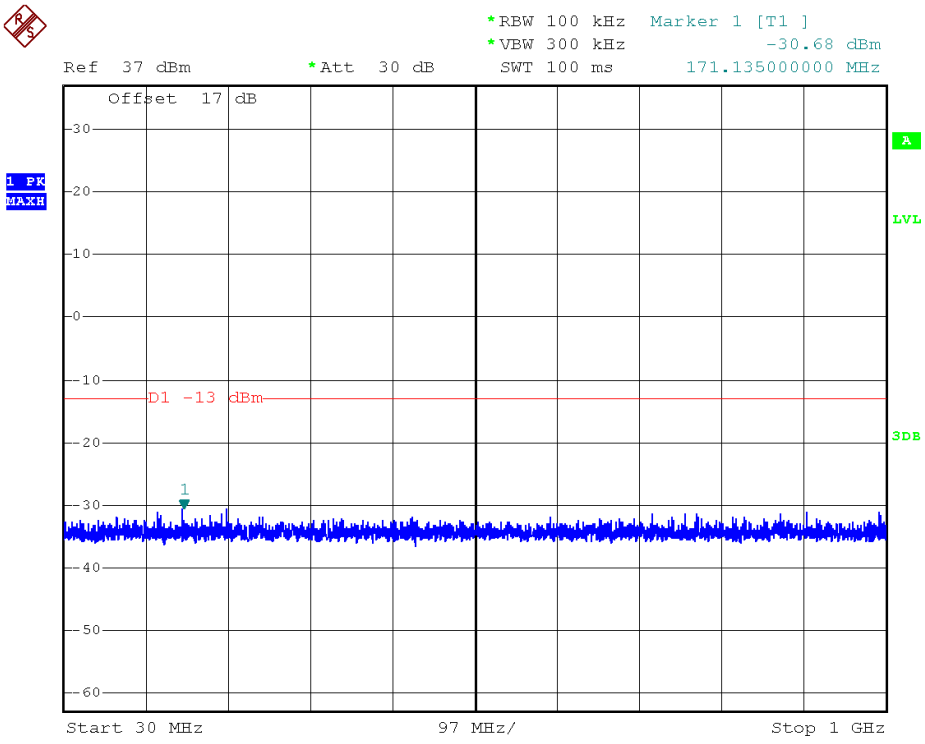


RB Size 1, RB Offset 0 30MHz to 1GHz

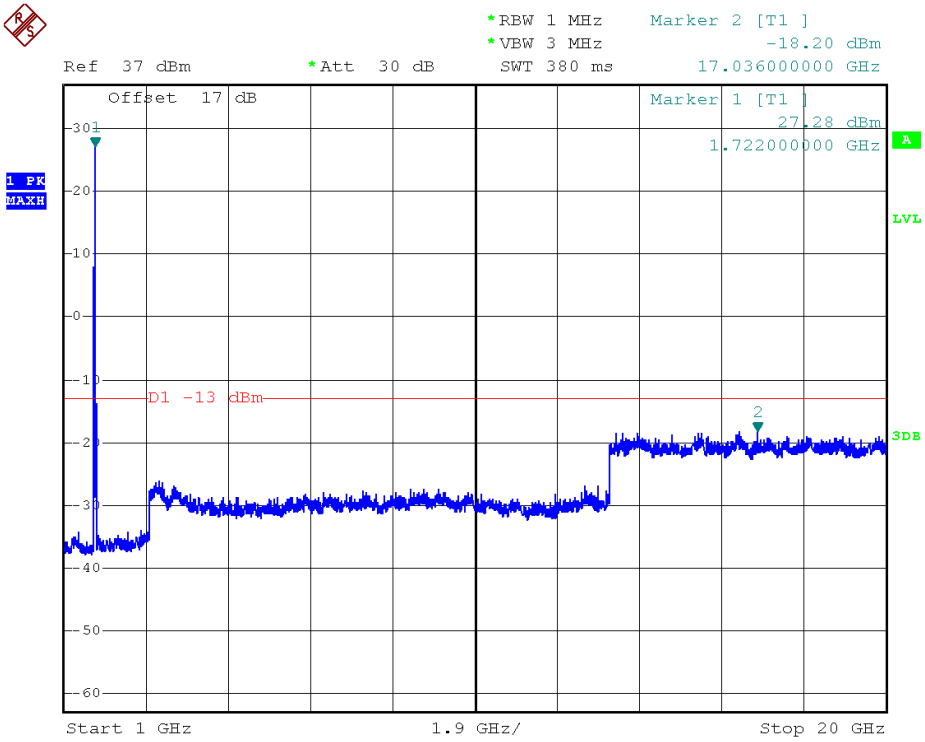


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	Middle
Bandwidth	20MHz	Modulation	QPSK

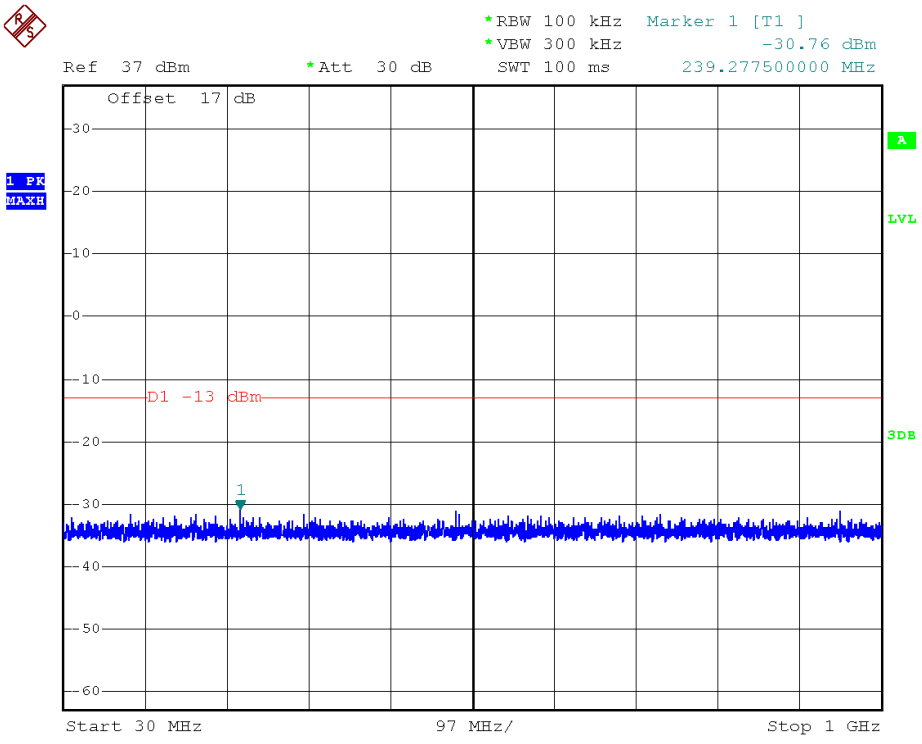


RB Size 1, RB Offset 0 30MHz to 1GHz

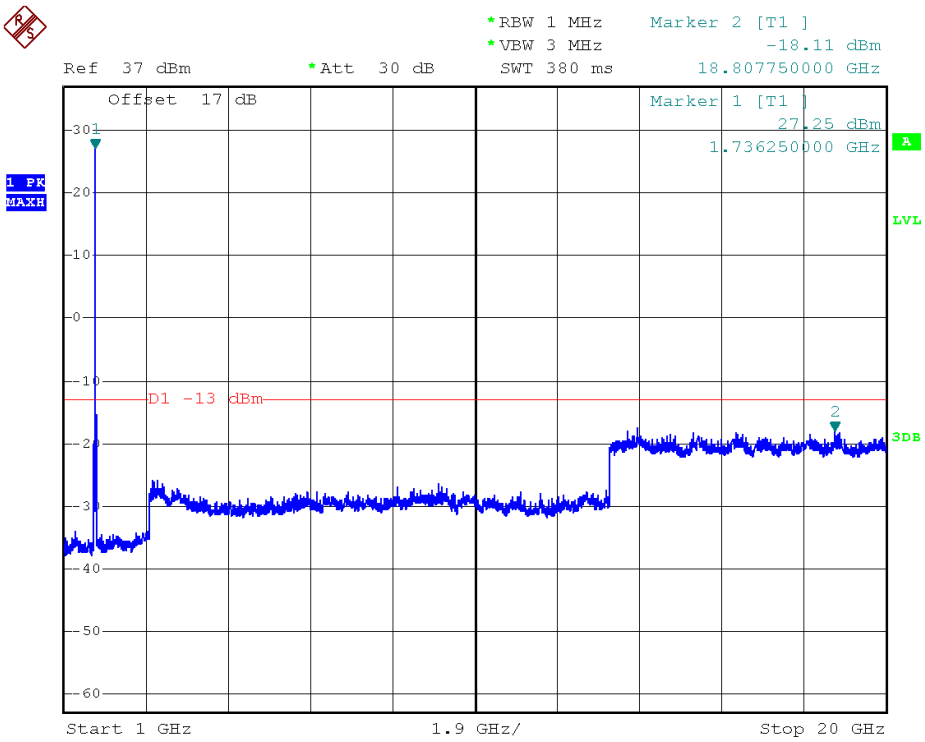


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 4	Channel	High
Bandwidth	20MHz	Modulation	QPSK

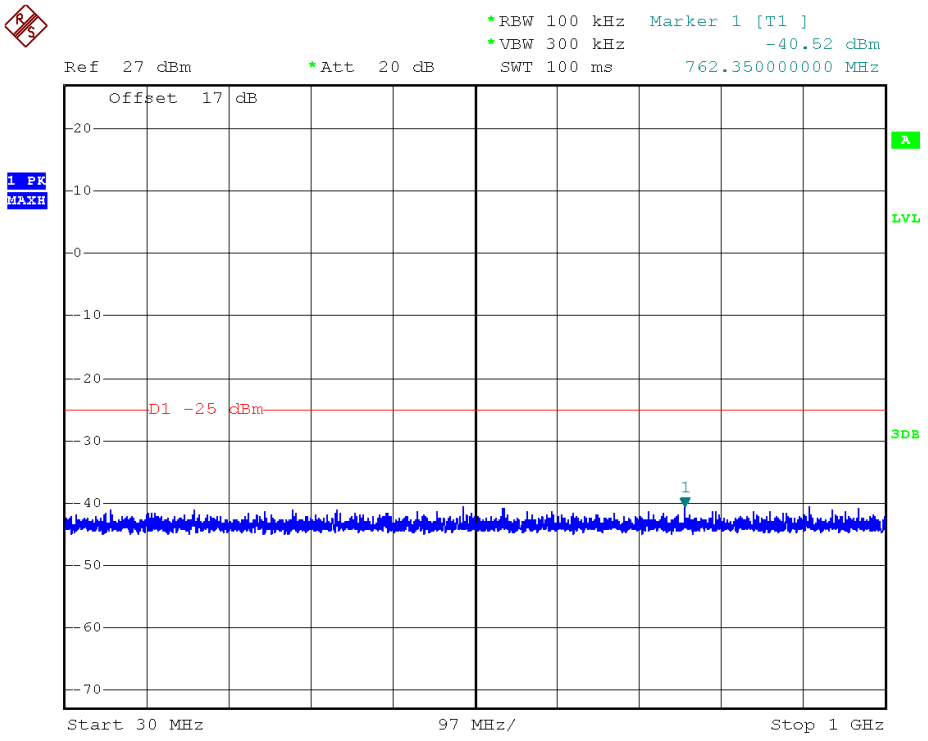


RB Size 1, RB Offset 0 30MHz to 1GHz

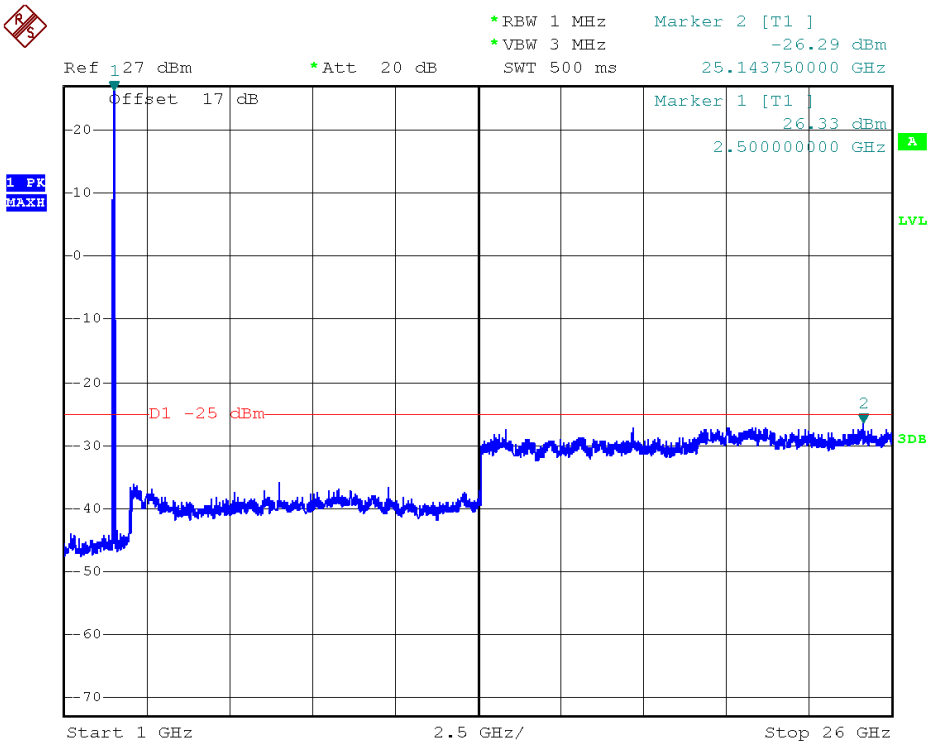


RB Size 1, RB Offset 0 1GHz to 20GHz

Band	LTE Band 7	Channel	Low
Bandwidth	5MHz	Modulation	QPSK

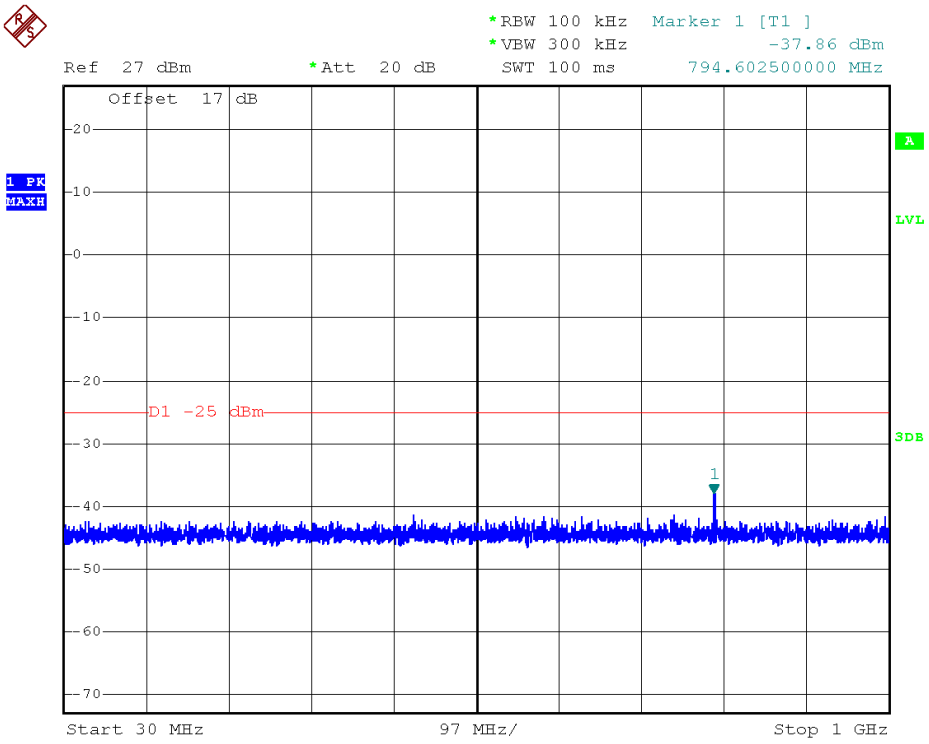


RB Size 1, RB Offset 0 30MHz to 1GHz

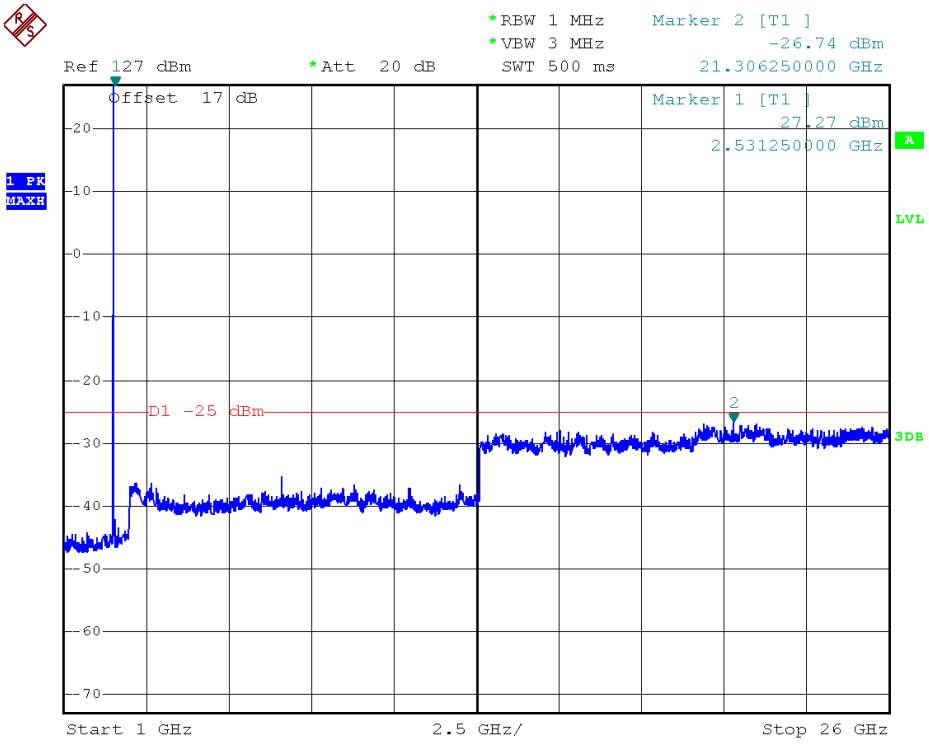


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel:	Middle
Bandwidth	5MHz	Modulation	QPSK

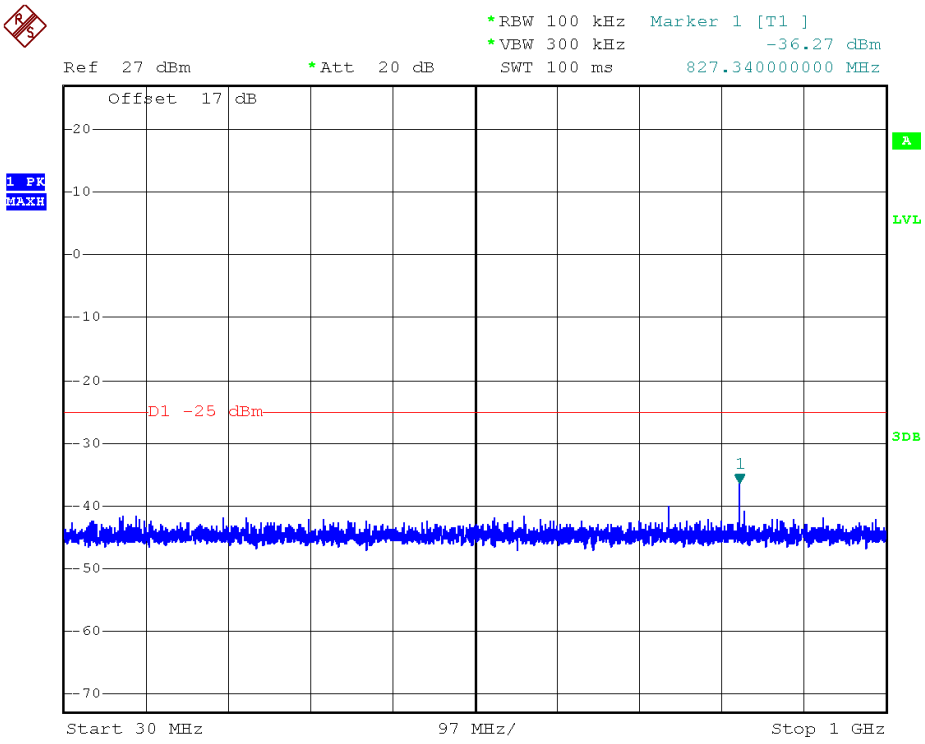


RB Size 1, RB Offset 0 30MHz to 1GHz

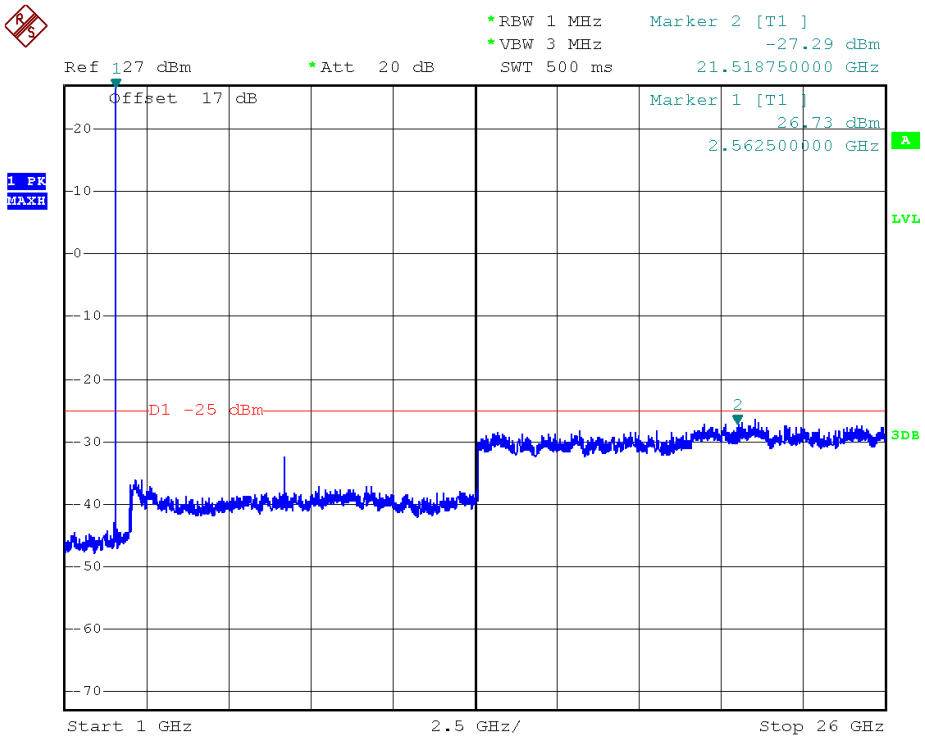


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel:	High
Bandwidth	5MHz	Modulation	QPSK

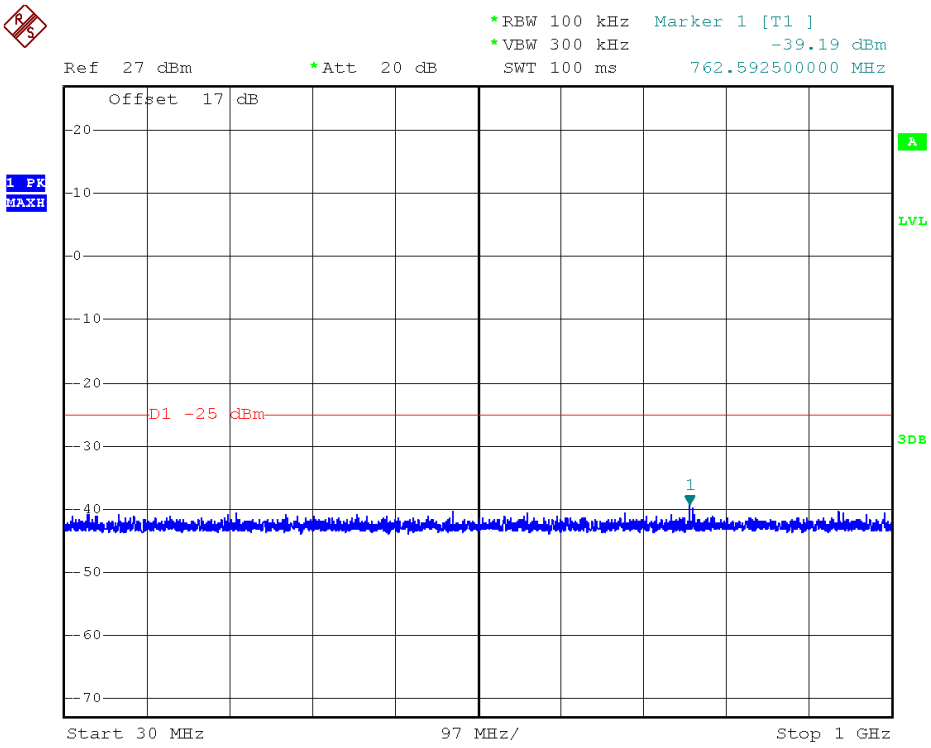


RB Size 1, RB Offset 0 30MHz to 1GHz

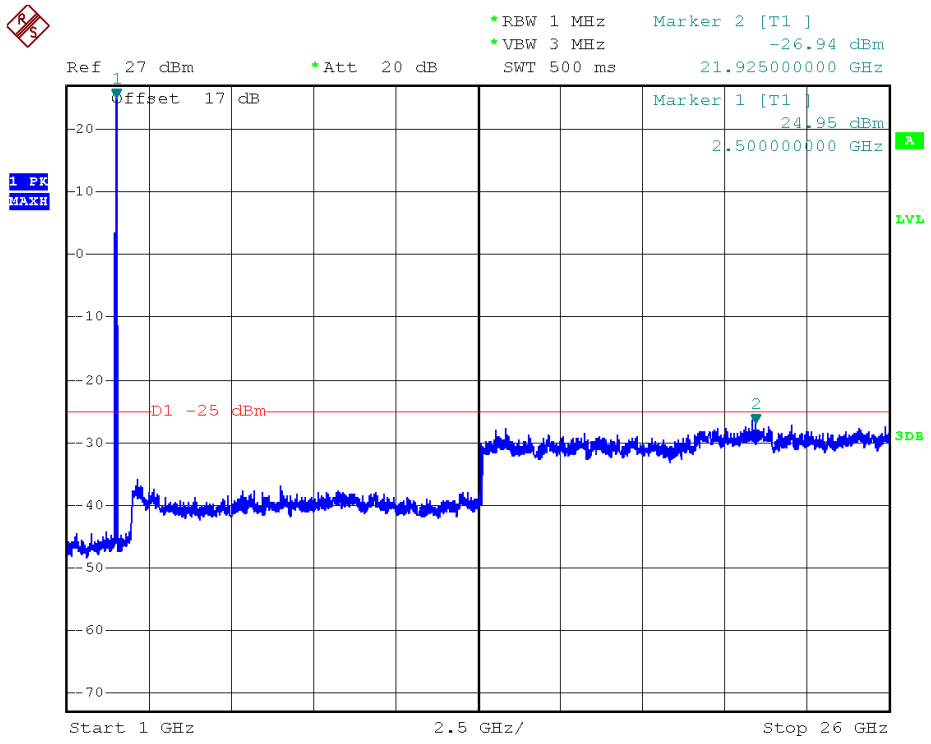


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel:	Low
Bandwidth	10MHz	Modulation	QPSK

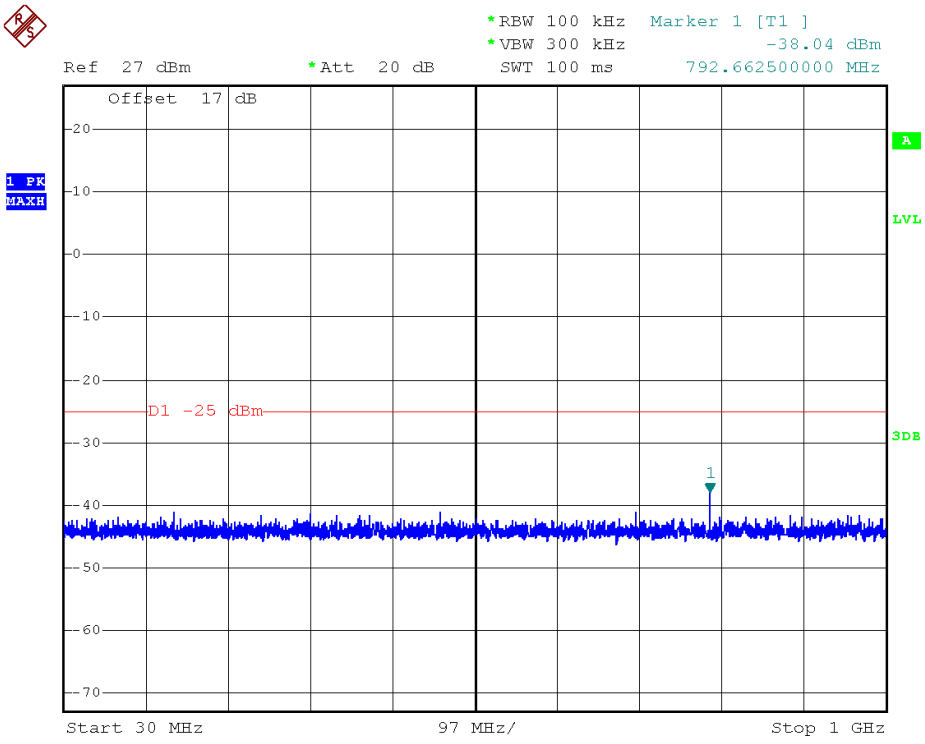


RB Size 1, RB Offset 0 30MHz to 1GHz

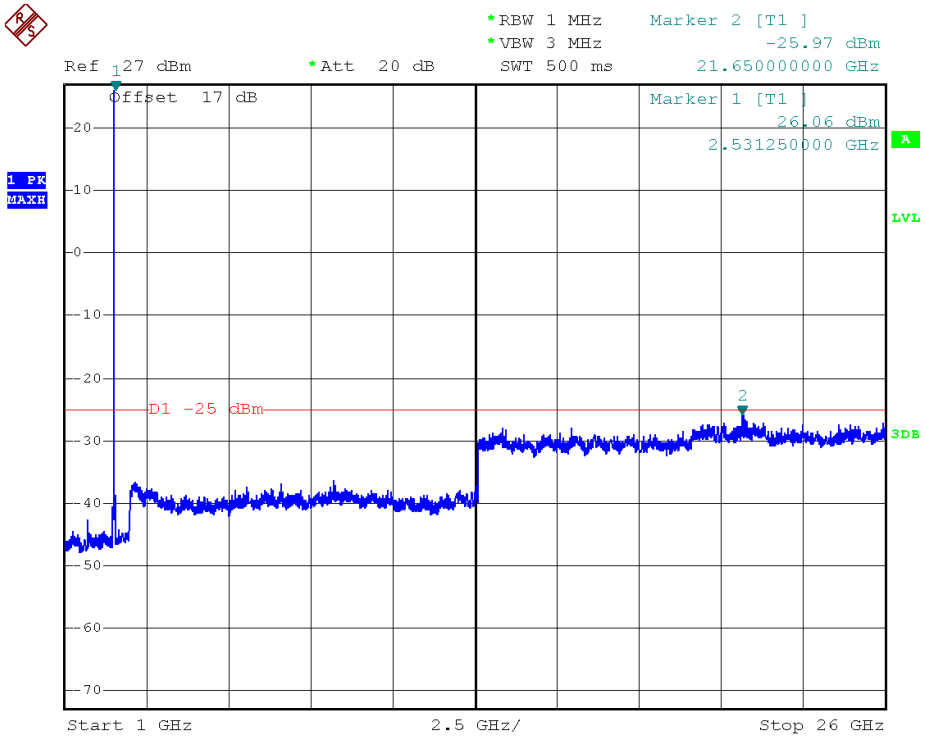


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel	Middle
Bandwidth	10MHz	Modulation	QPSK

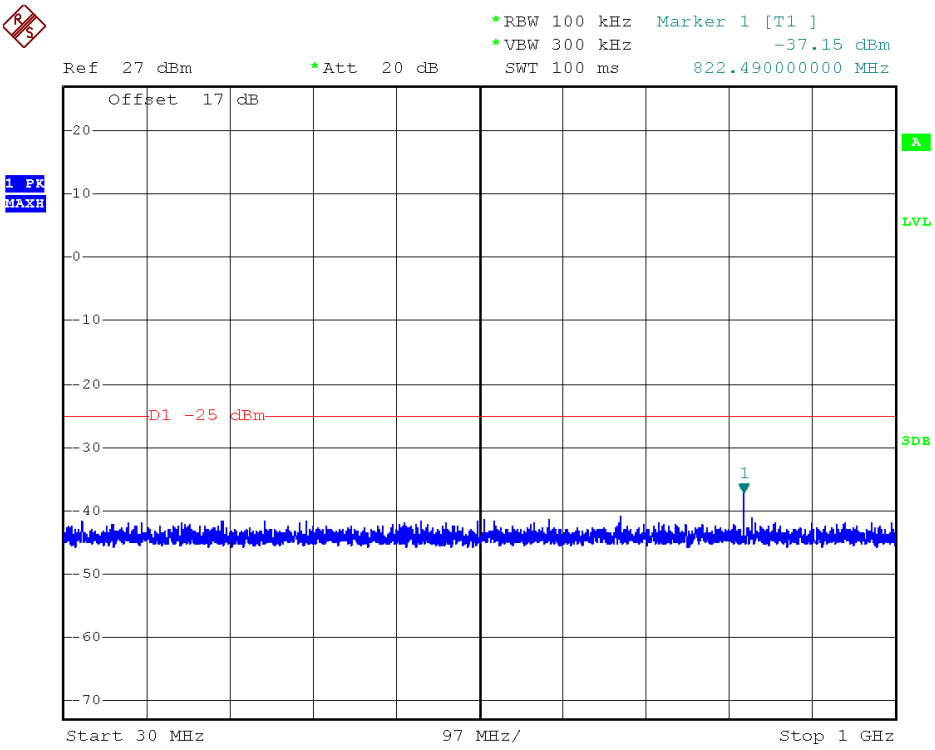


RB Size 1, RB Offset 0 30MHz to 1GHz

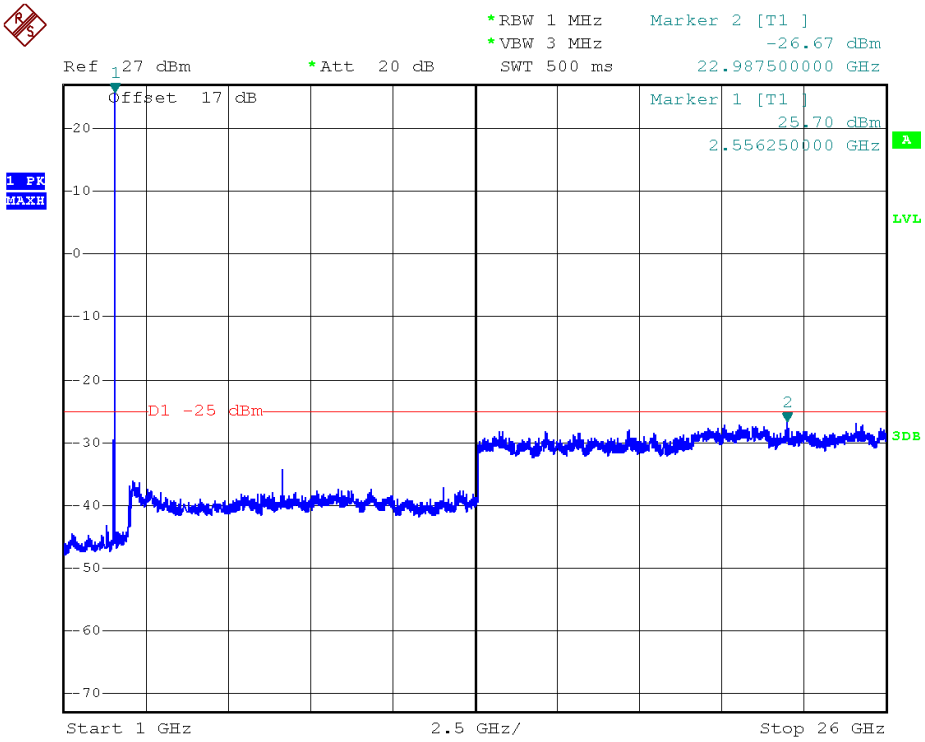


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel	High
Bandwidth	10MHz	Modulation	QPSK

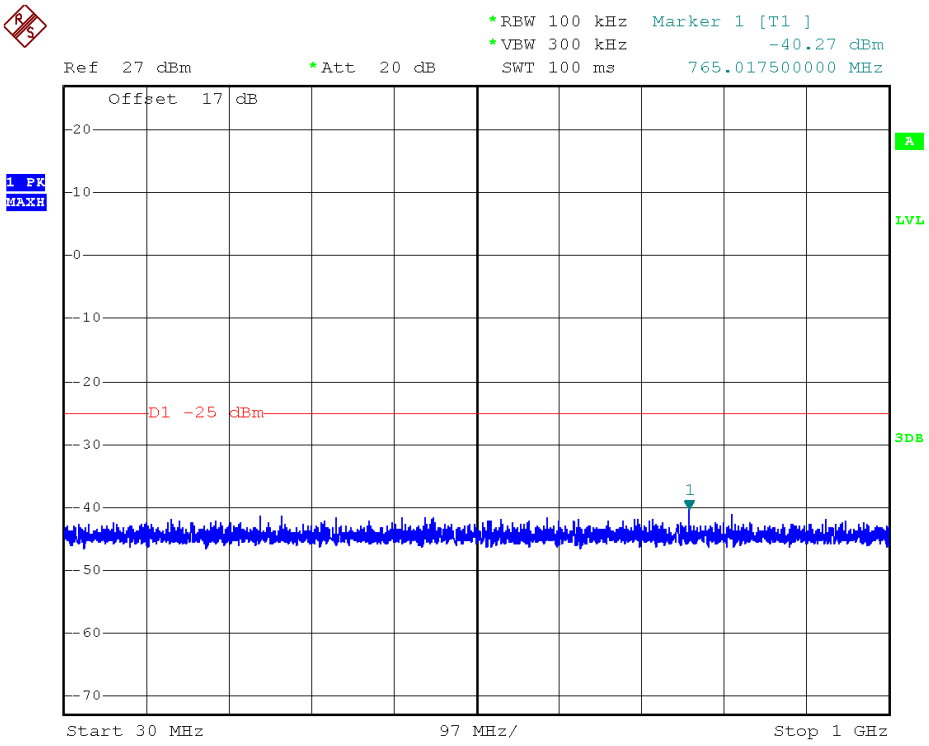


RB Size 1, RB Offset 0 30MHz to 1GHz

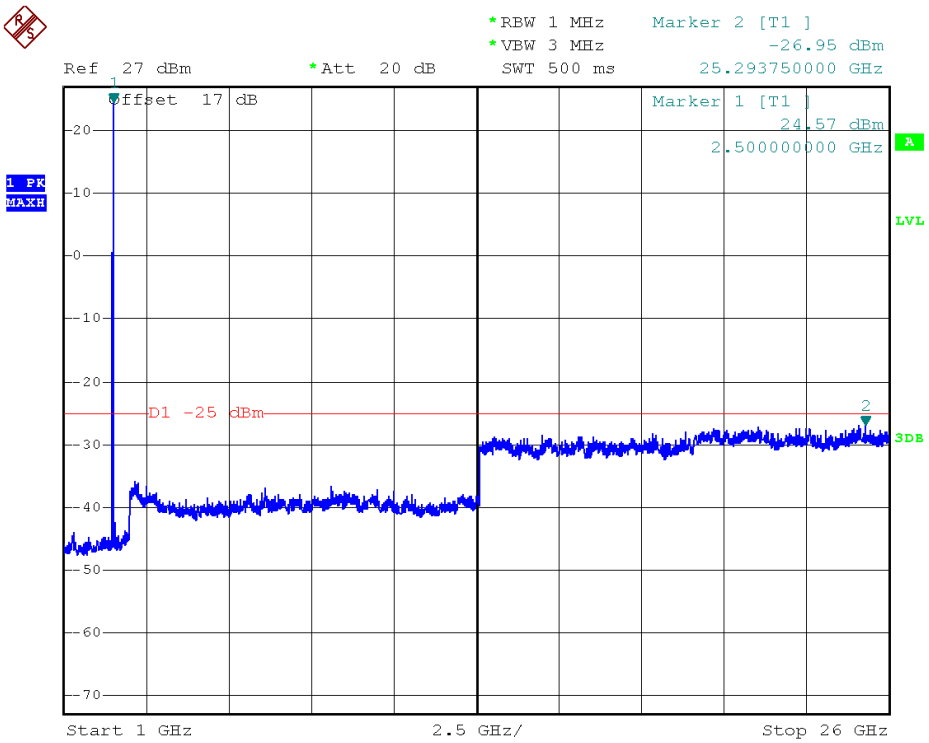


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel	Low
Bandwidth	15MHz	Modulation	QPSK

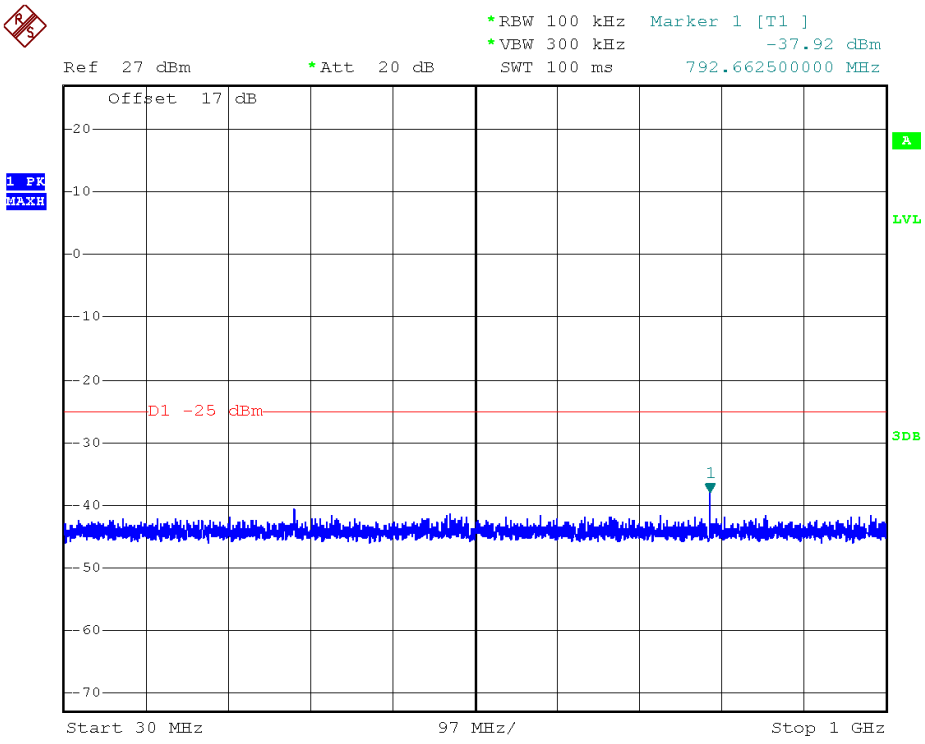


RB Size 1, RB Offset 0 30MHz to 1GHz

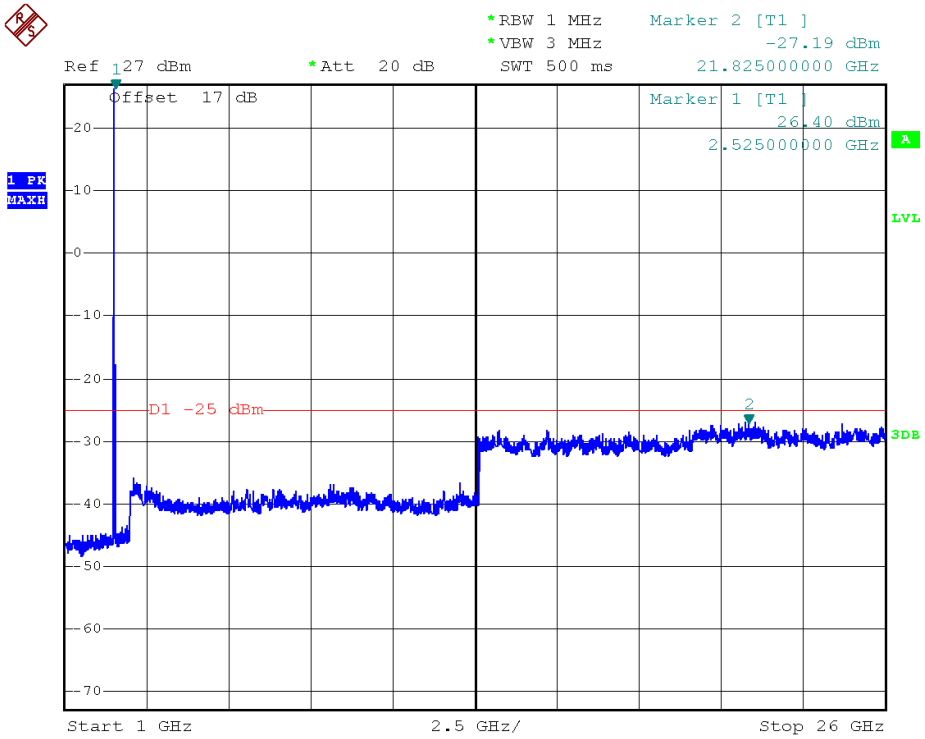


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel:	Middle
Bandwidth	15MHz	Modulation	QPSK

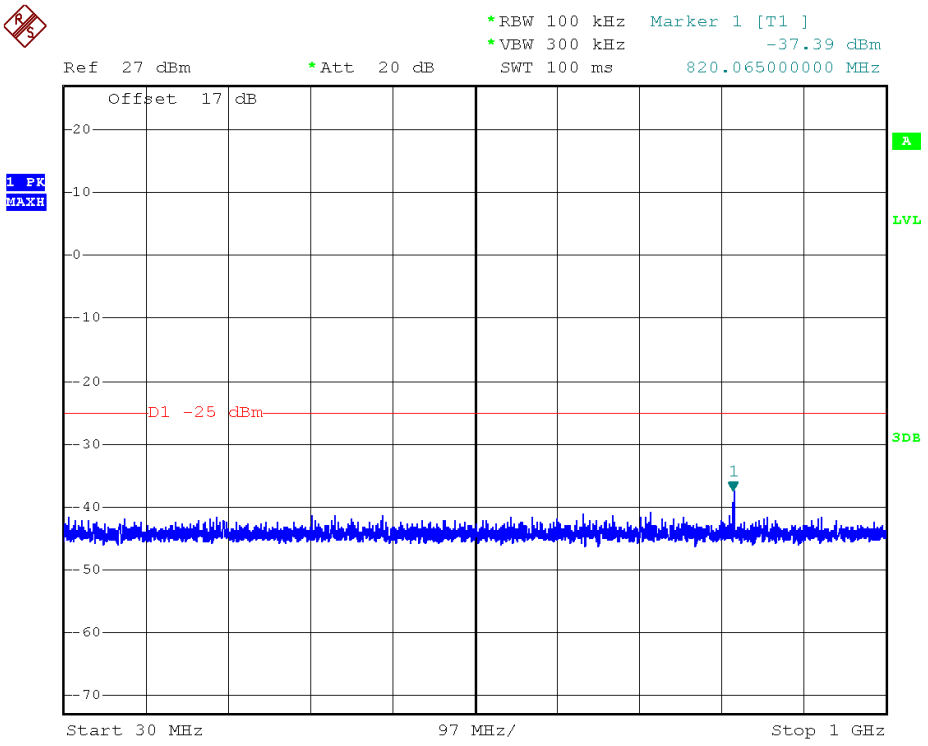


RB Size 1, RB Offset 0 30MHz to 1GHz

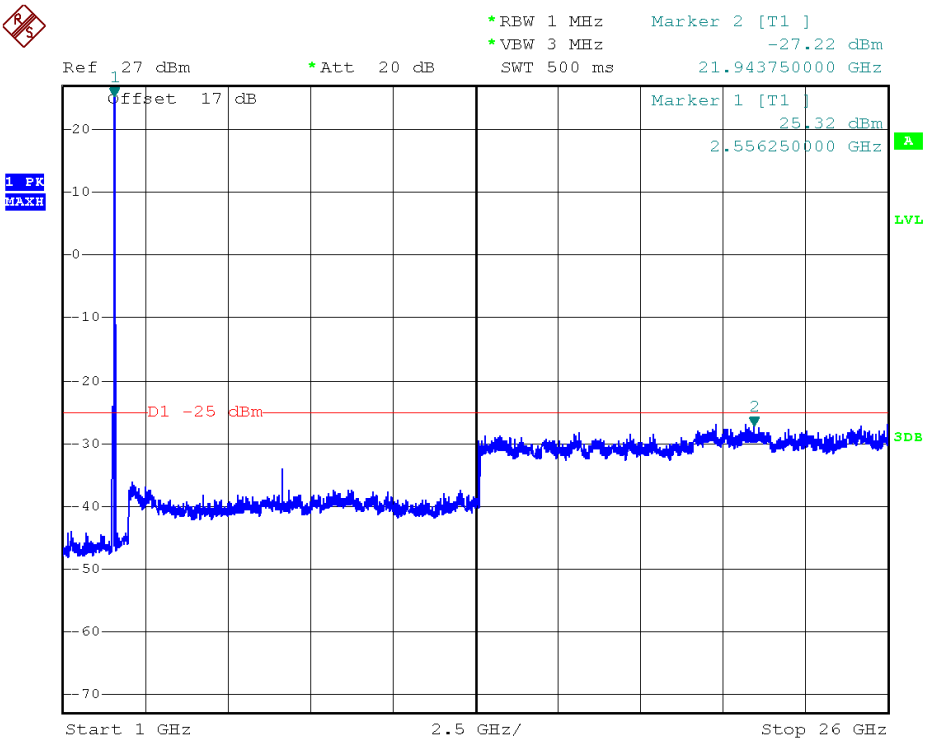


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel:	High
Bandwidth	15MHz	Modulation	QPSK

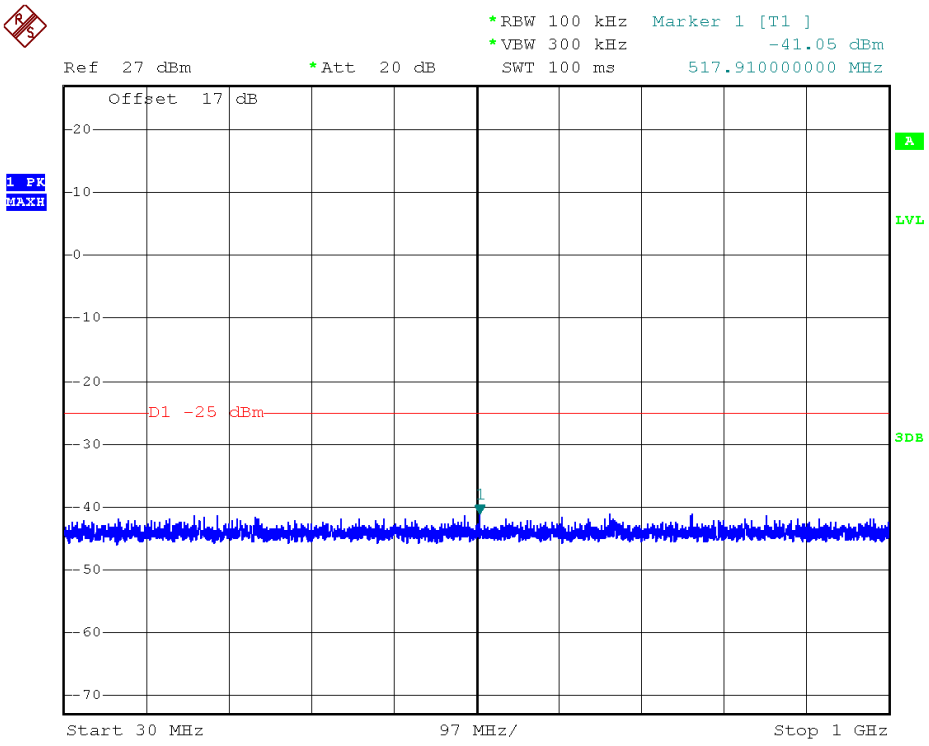


RB Size 1, RB Offset 0 30MHz to 1GHz

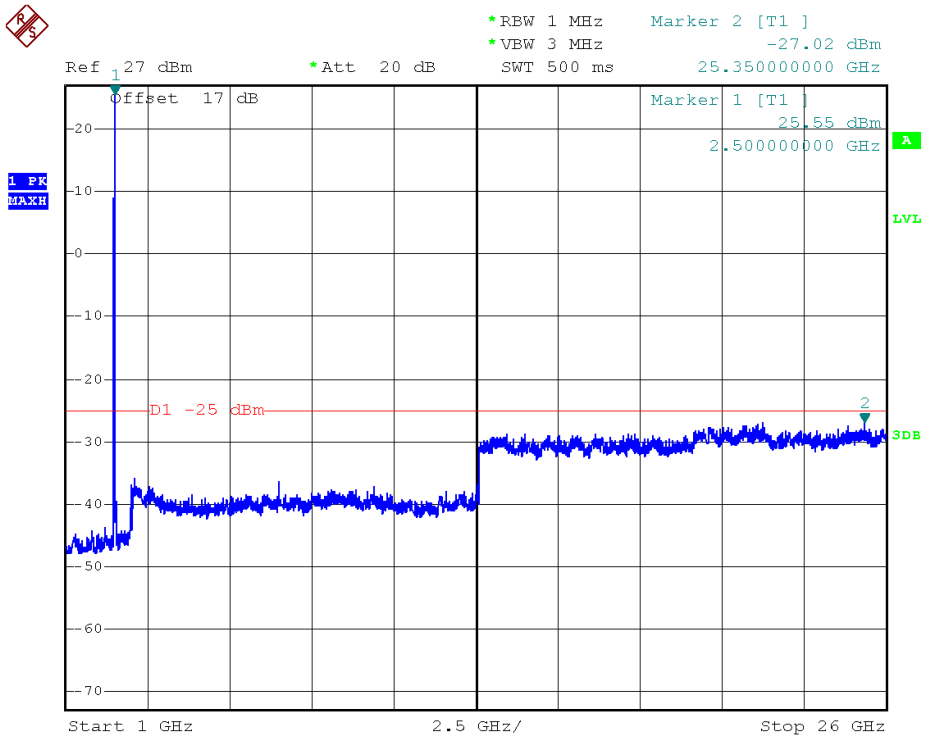


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel:	Low
Bandwidth	20MHz	Modulation	QPSK

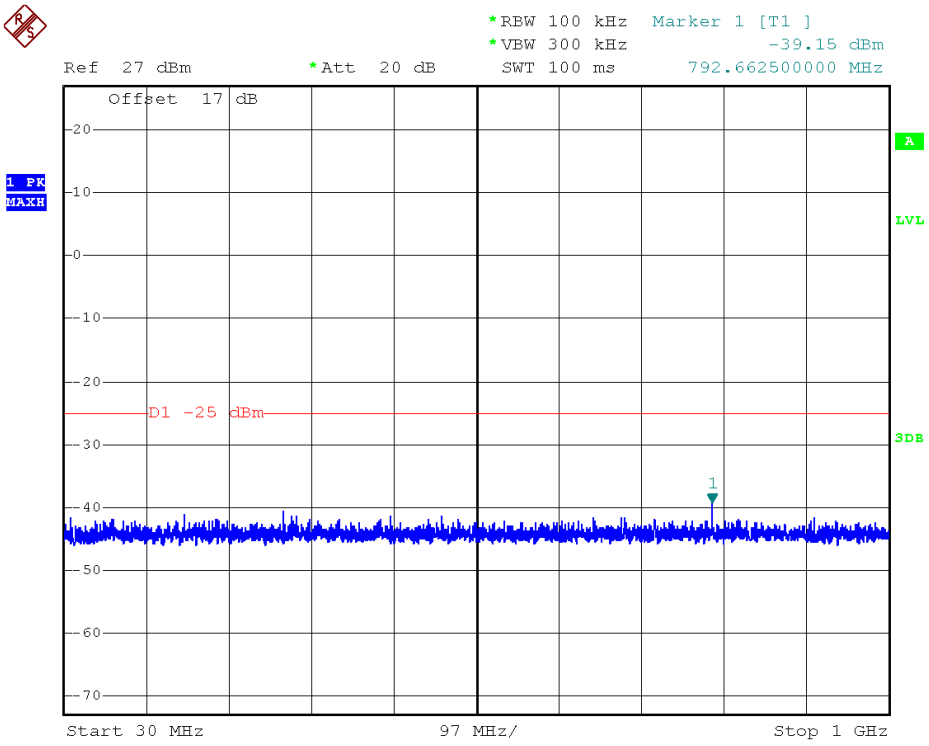


RB Size 1, RB Offset 0 30MHz to 1GHz

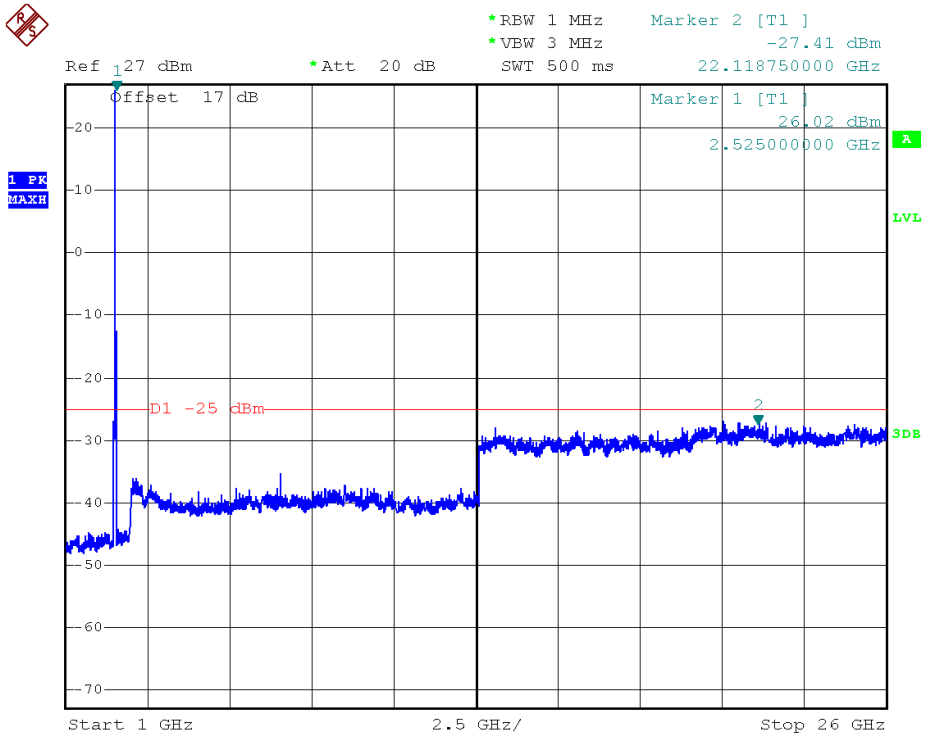


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel	Middle
Bandwidth	20MHz	Modulation	QPSK

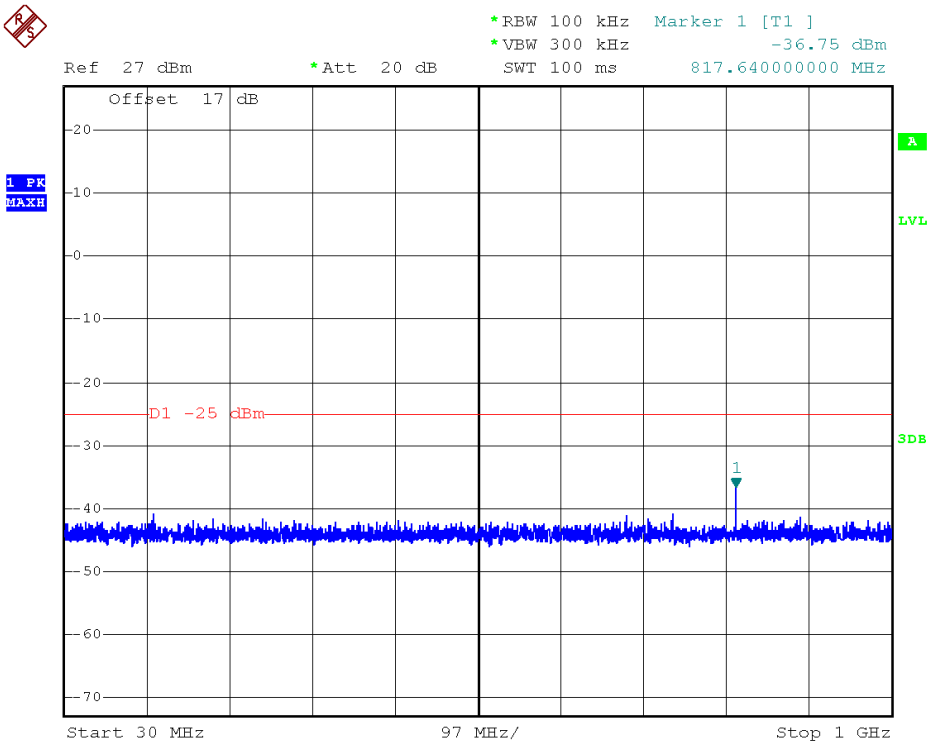


RB Size 1, RB Offset 0 30MHz to 1GHz

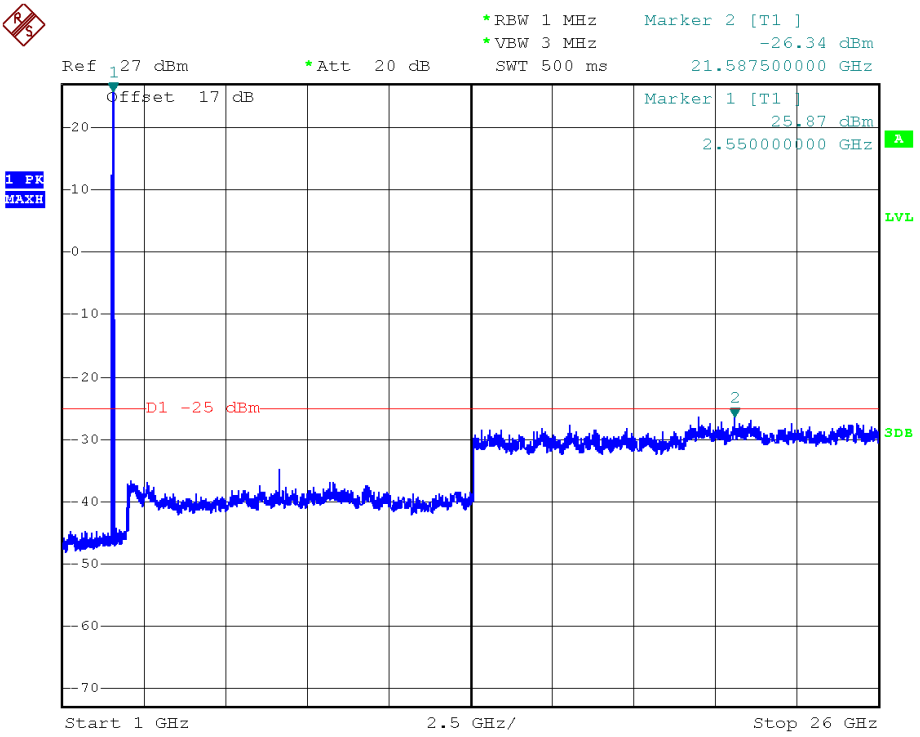


RB Size 1, RB Offset 0 1GHz to 26GHz

Band	LTE Band 7	Channel	High
Bandwidth	20MHz	Modulation	QPSK



RB Size 1, RB Offset 0 30MHz to 1GHz



RB Size 1, RB Offset 0 1GHz to 26GHz

2.6 Conducted Band Edge

2.6.1 Description of Conducted Band Edge Measurement

24.238(a) for Band 2

For operations in the 1850 -1910 MHz band, the FCC limit is 43 + 10log10 (P [Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to a 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(h) for Band 4

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + 10log10(P[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 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz 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.

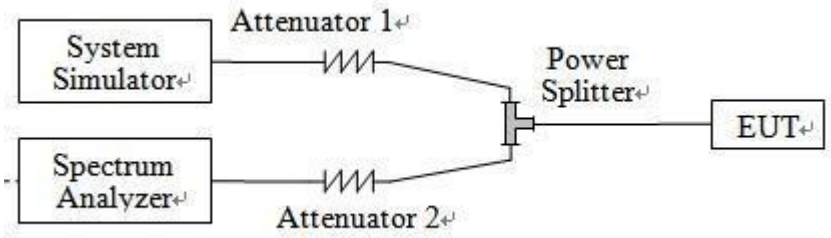
27.53 (m)(4) for Band 7

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

2.6.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3 Test Setup

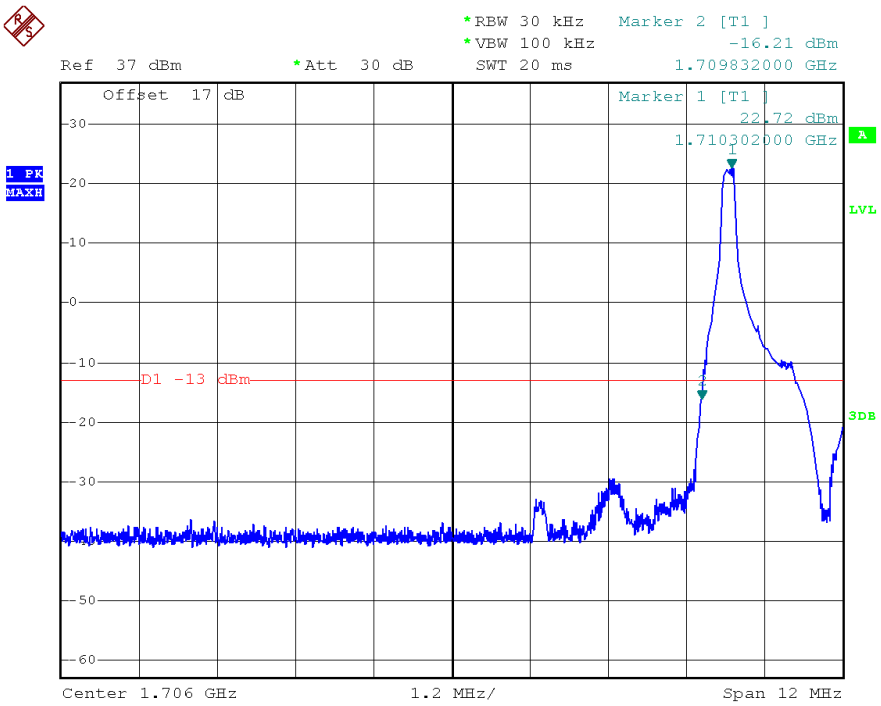


2.6.4 Test Procedures

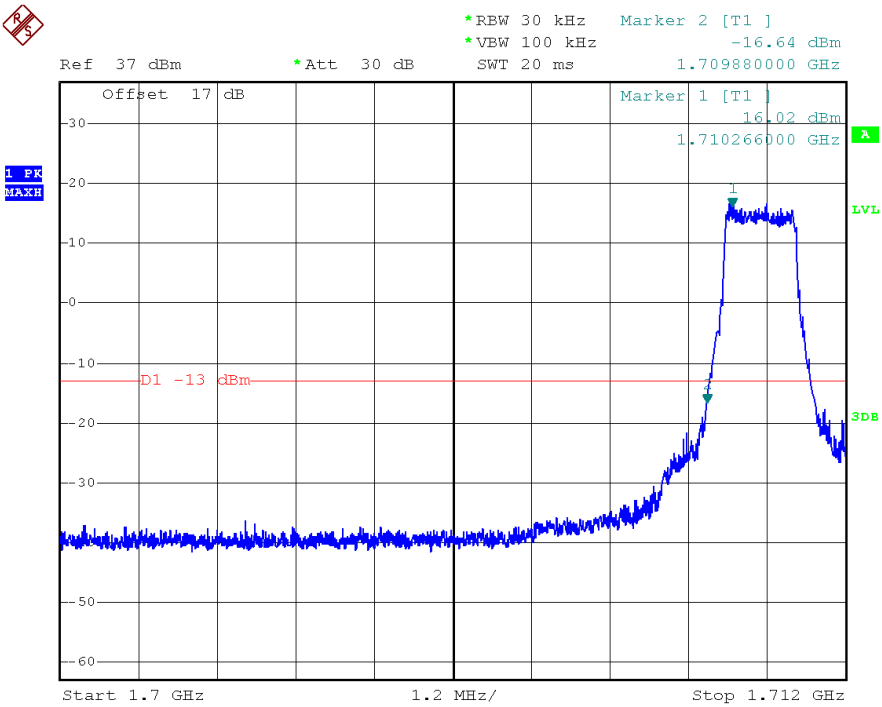
1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW>= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 43 + 10log (P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log (P)] (dBm) - [43 + 10log (P)] (dB)
   = -13dBm.
   <For Band 7>
   The limit line is derived from 55+ 10log (P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log (P)] (dBm) - [55 + 10log (P)] (dB)
   = -25dBm.

2.6.5 Test Result of Conducted Band Edge

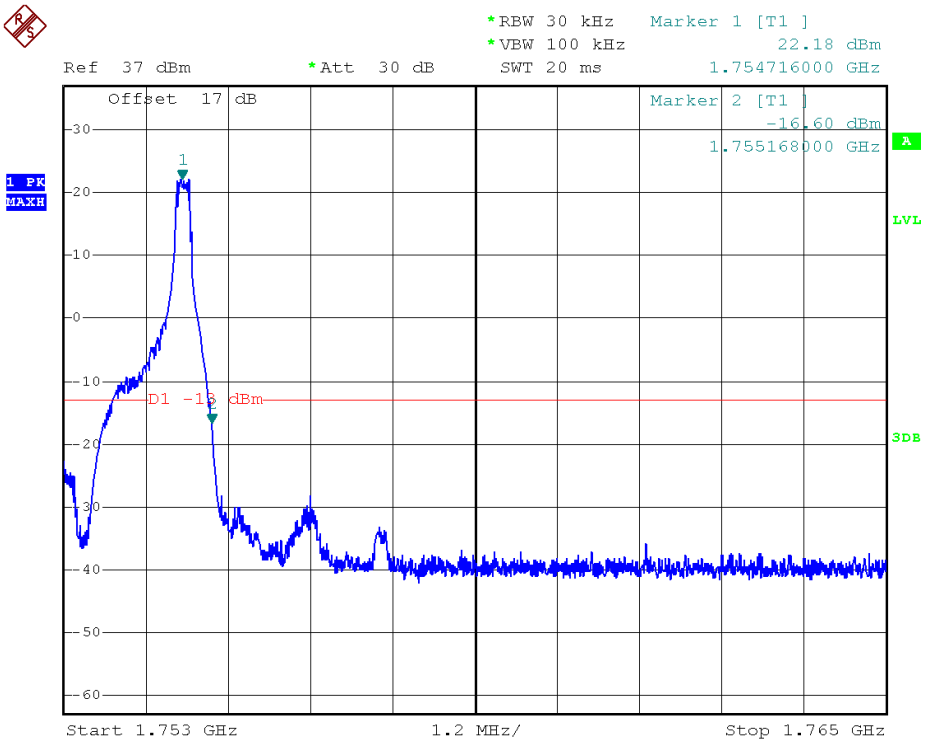
Band	LTE Band 4	Modulation	QPSK
Bandwidth	1.4MHz		



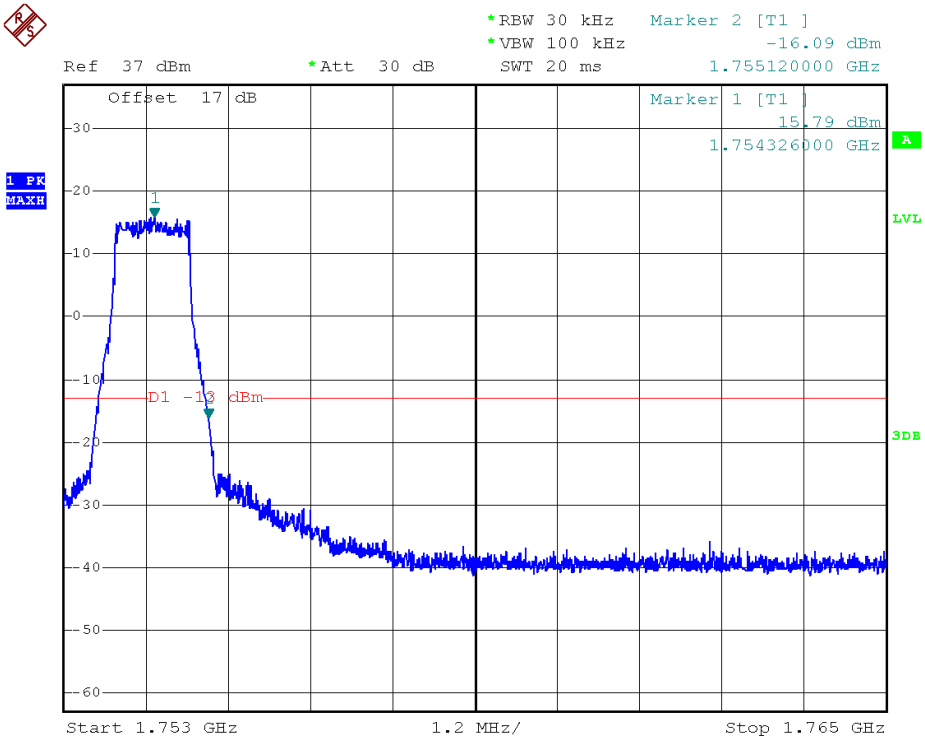
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

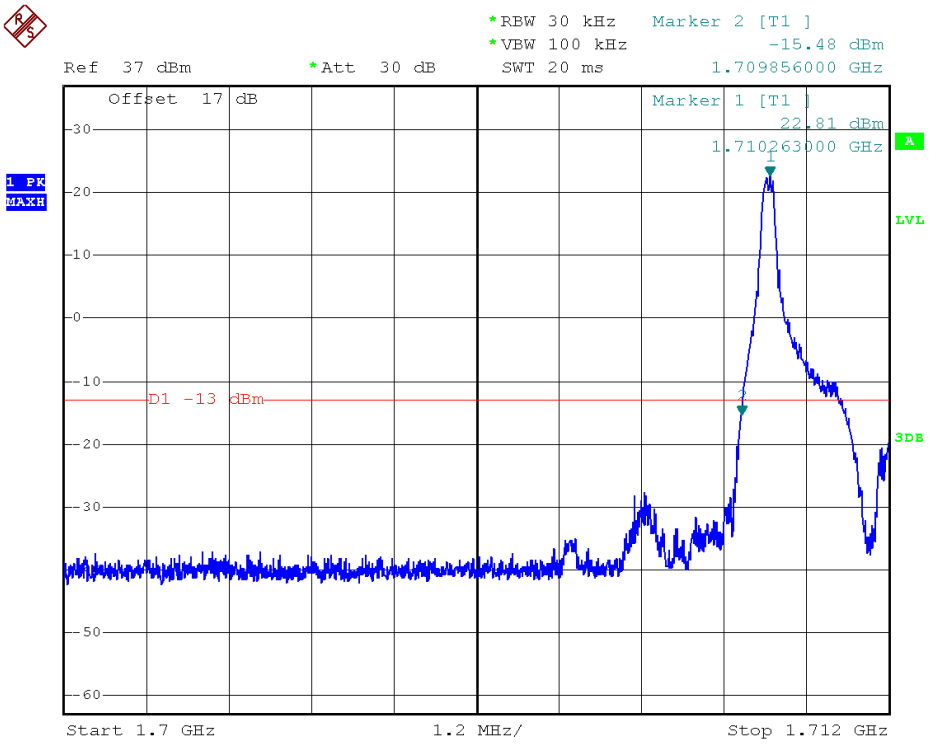


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5

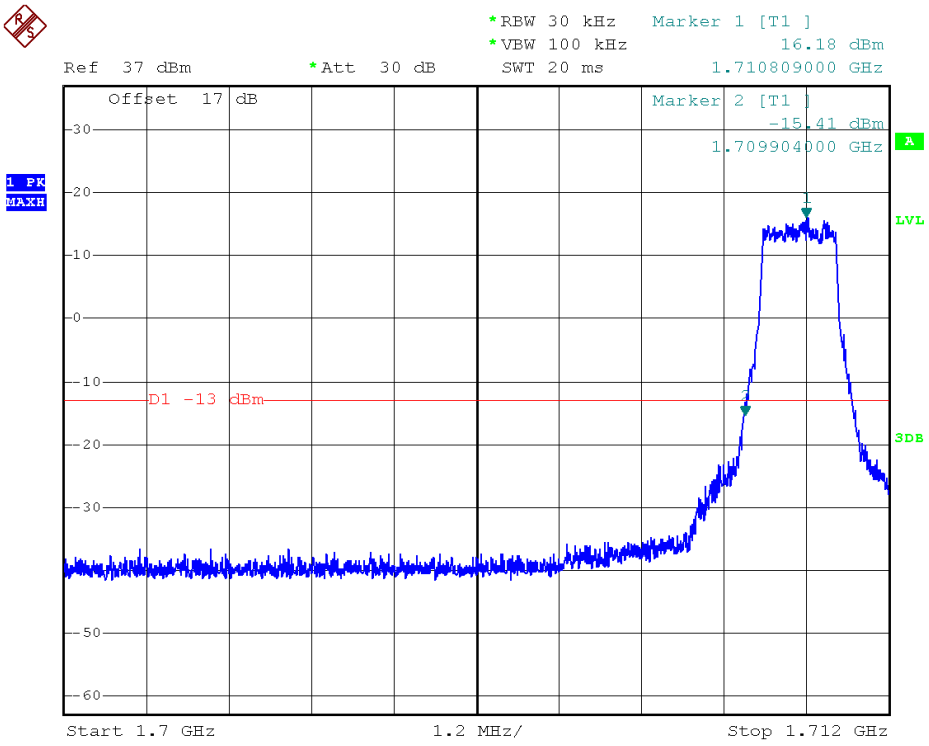


Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

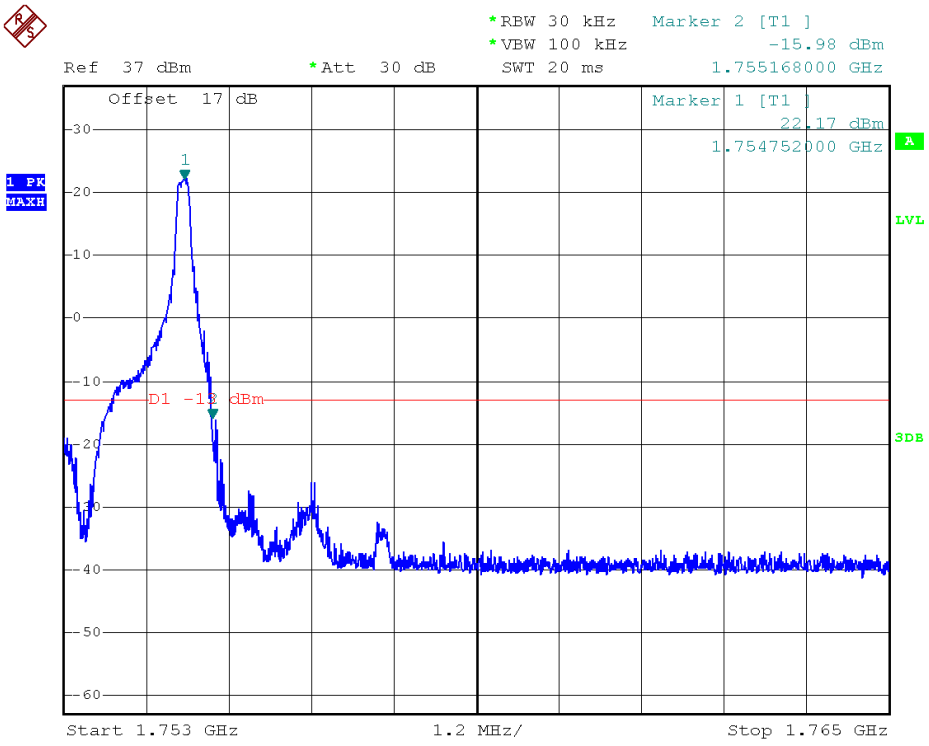
Band	LTE Band 4	Modulation	16QAM
Bandwidth	1.4MHz		



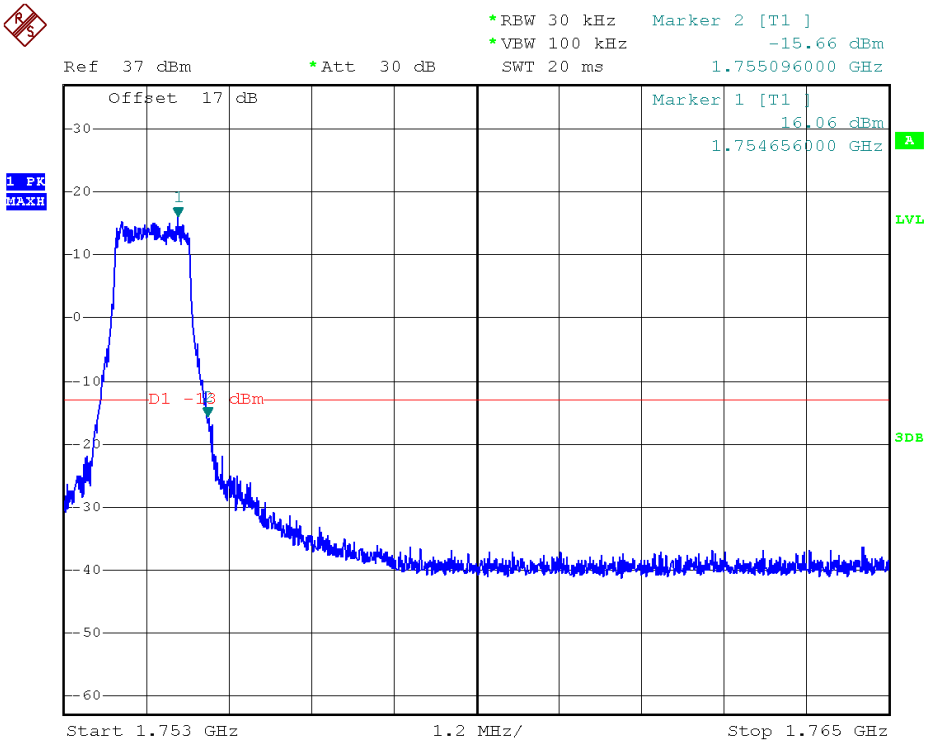
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



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

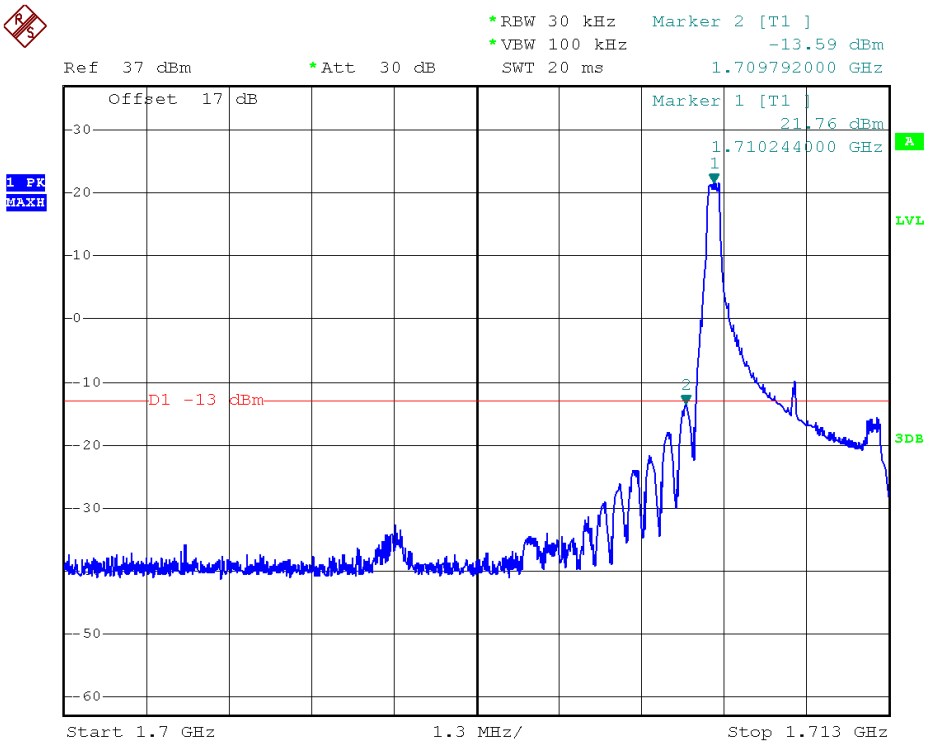


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 5

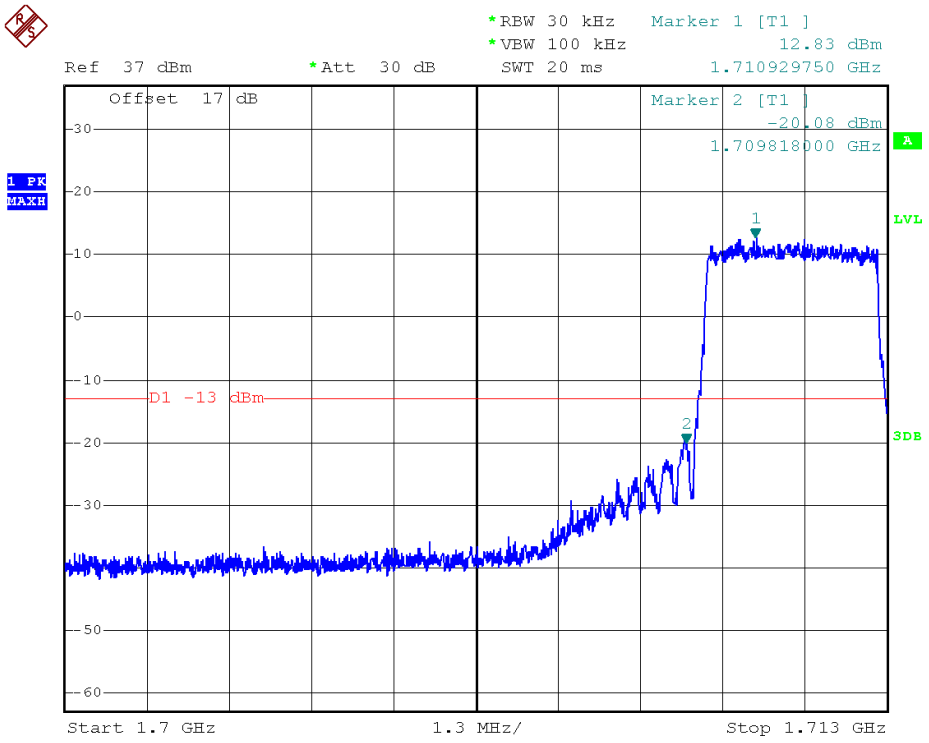


Higher Band Edge Plot for 16QAM -RB Size 6, RB Offset 0

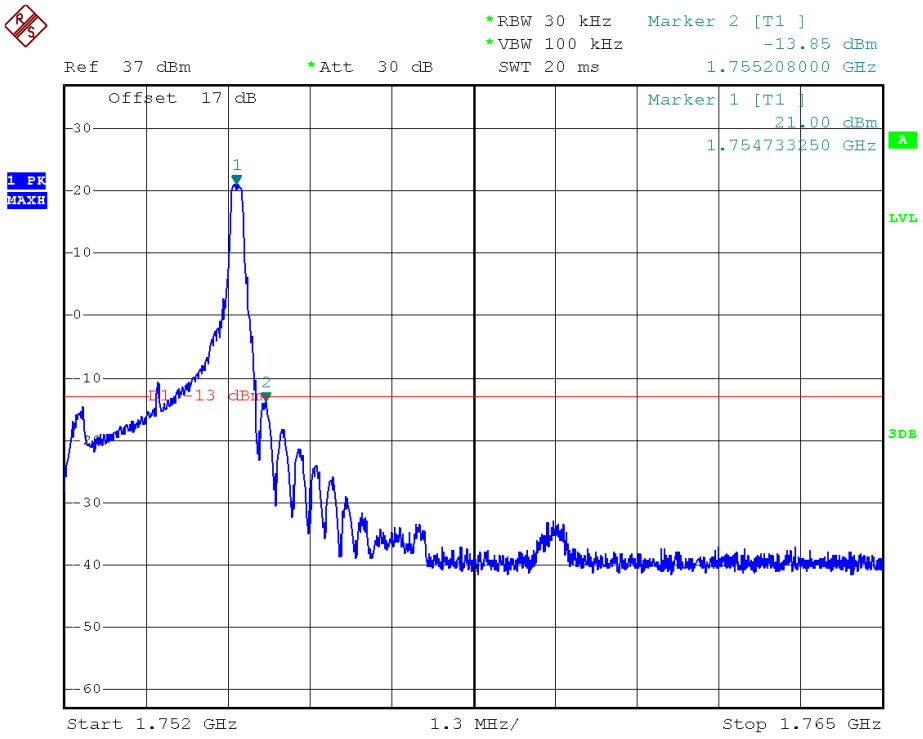
Band	LTE Band 4	Modulation	QPSK
Bandwidth	3MHz		



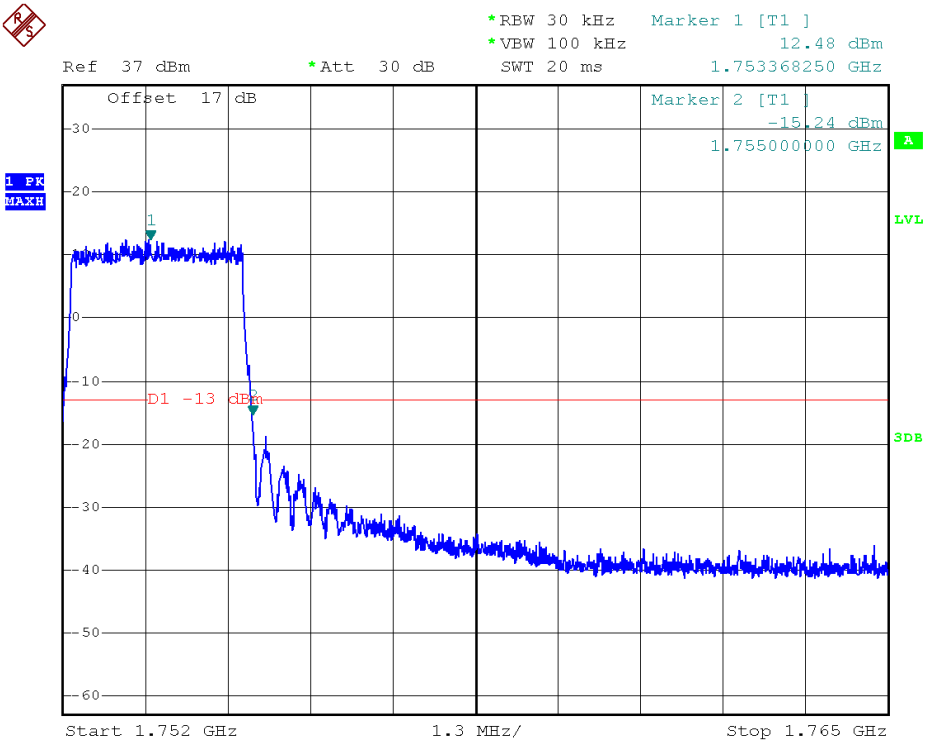
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

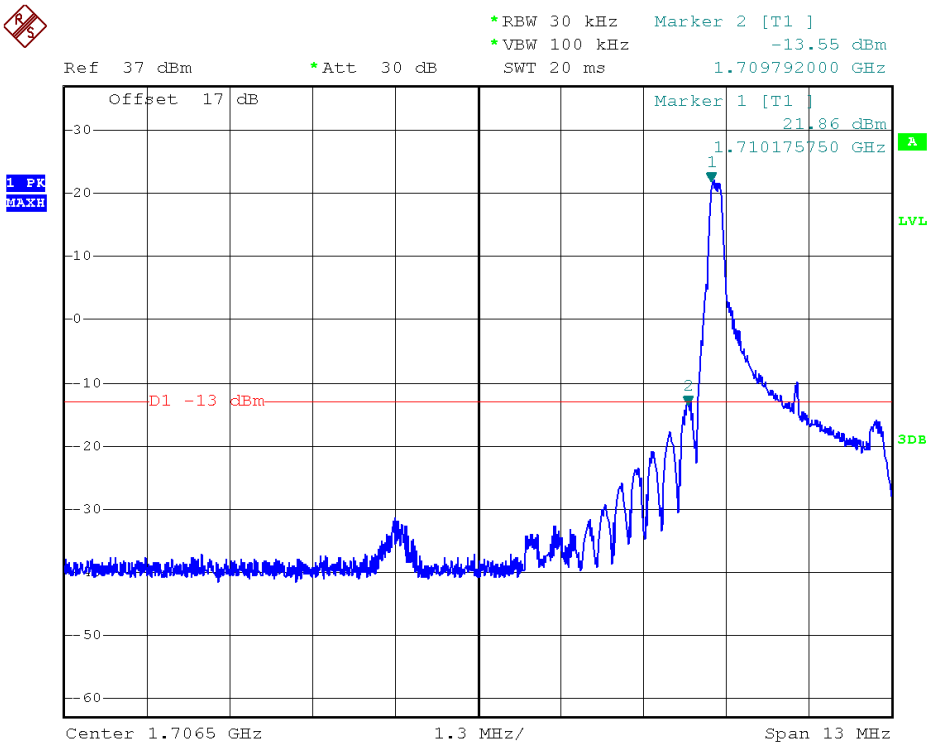


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14

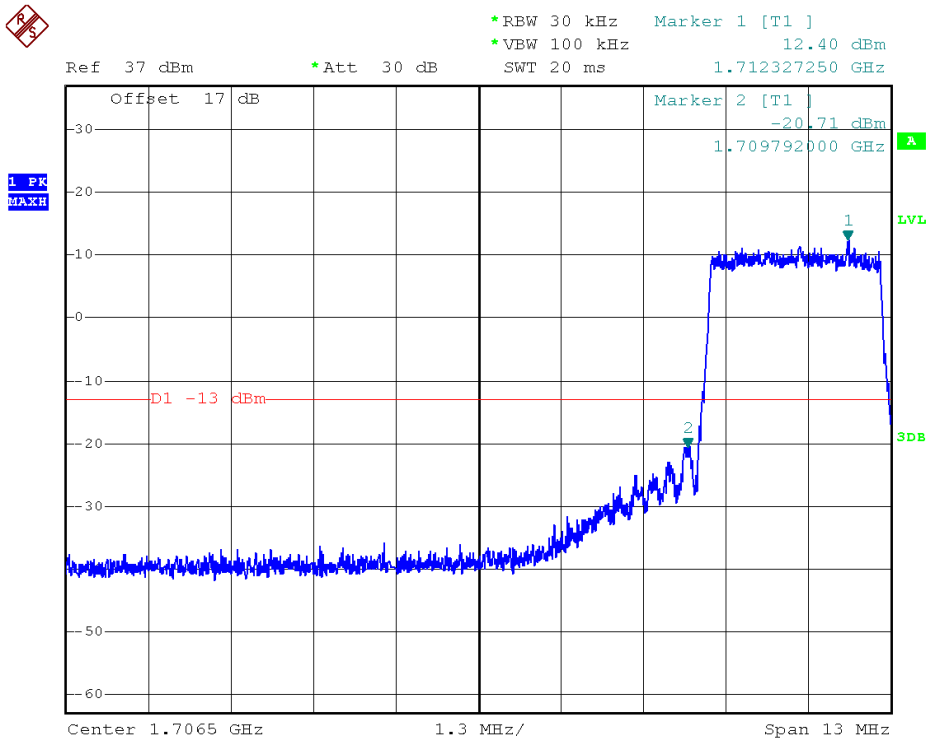


Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0

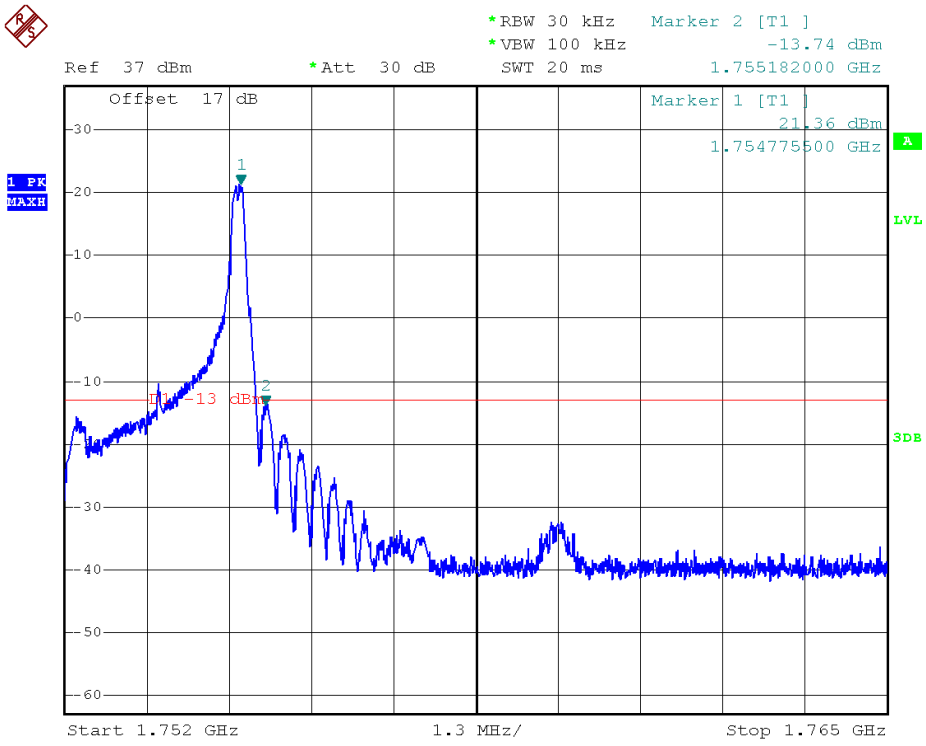
Band	LTE Band 4	Modulation	16QAM
Bandwidth	3MHz		



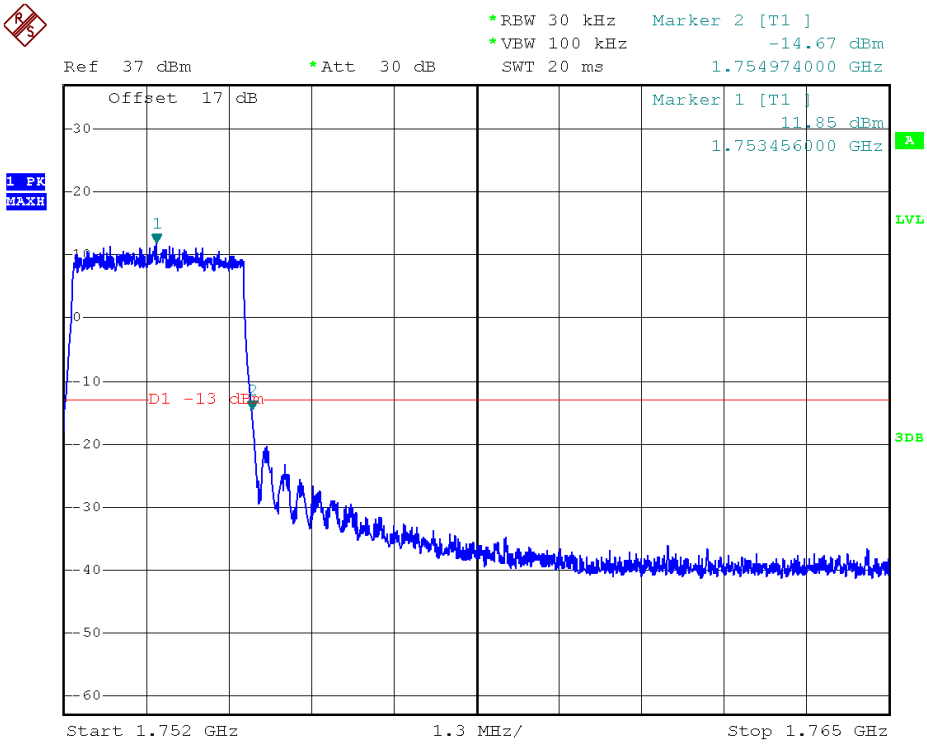
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



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

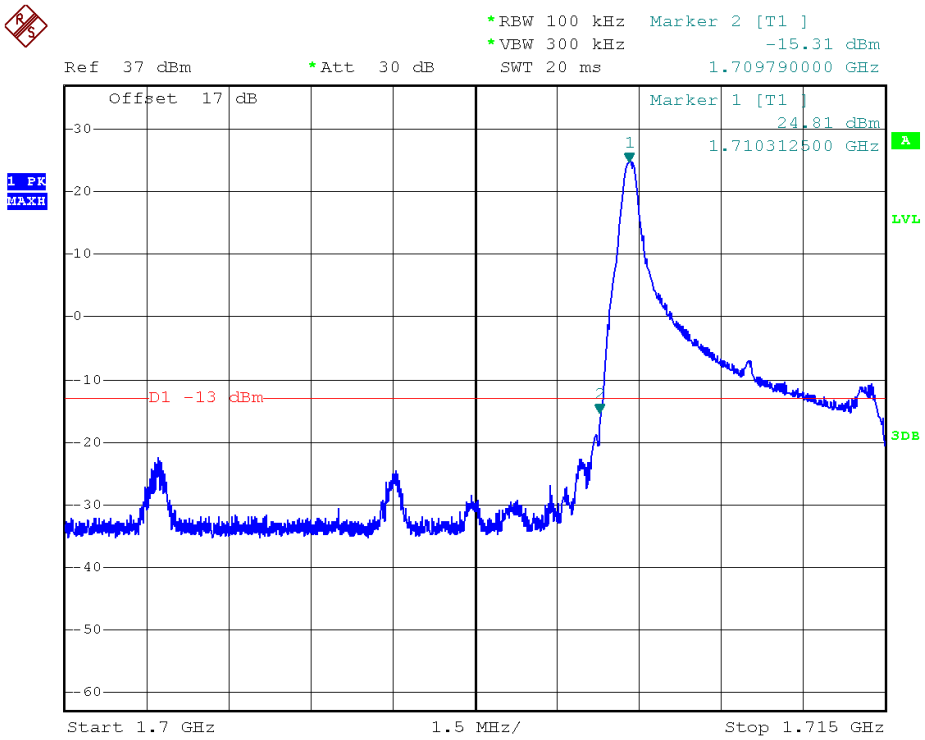


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 14

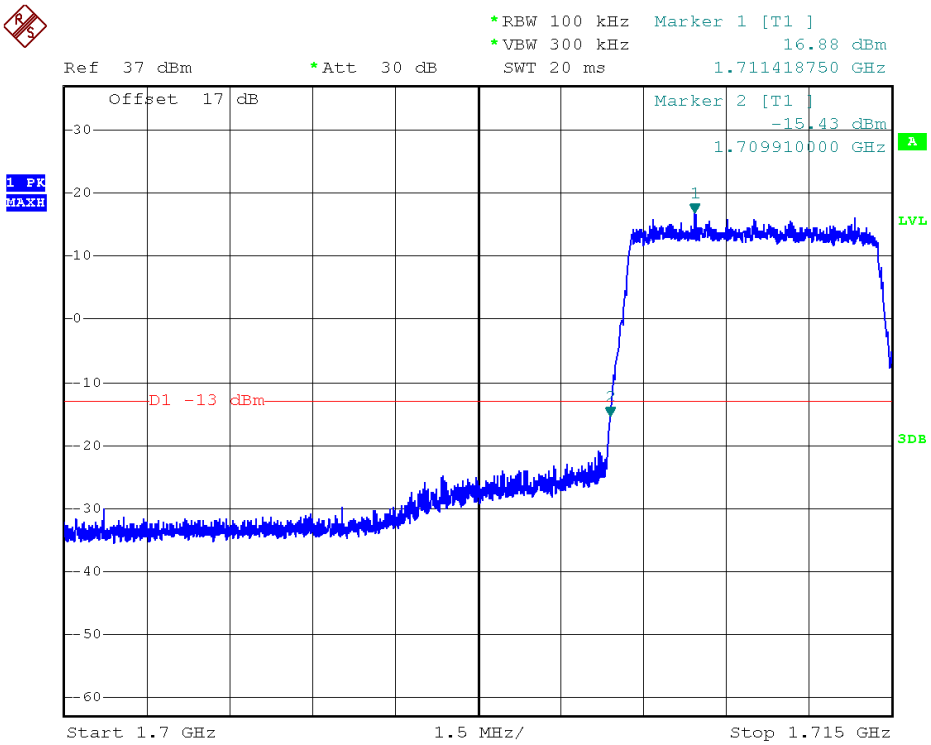


Higher Band Edge Plot for 16QAM -RB Size 15, RB Offset 0

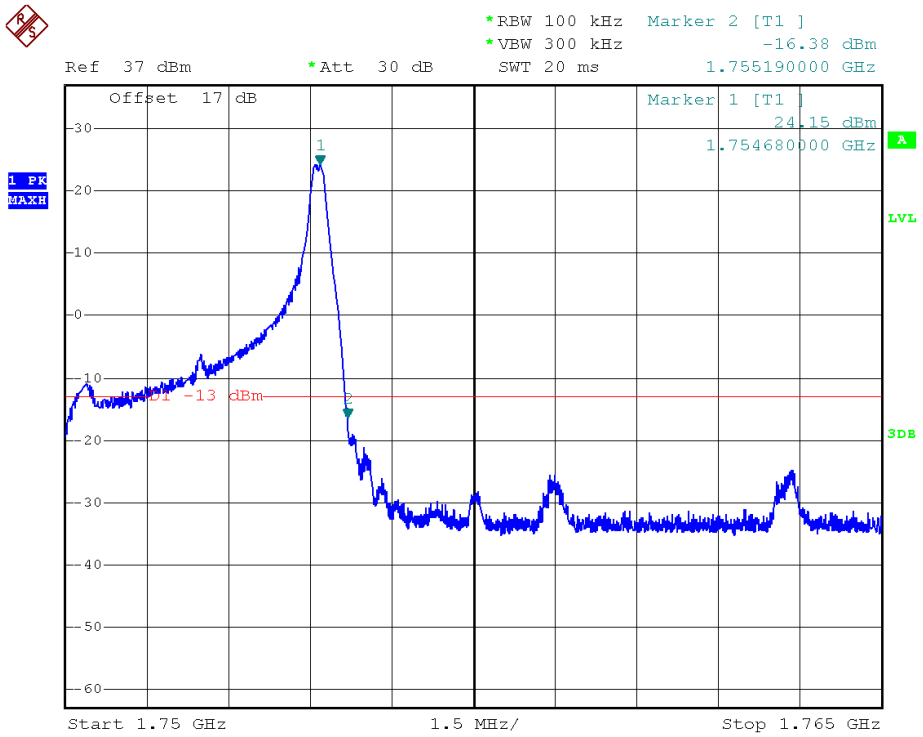
Band	LTE Band 4	Modulation	QPSK
Bandwidth	5MHz		



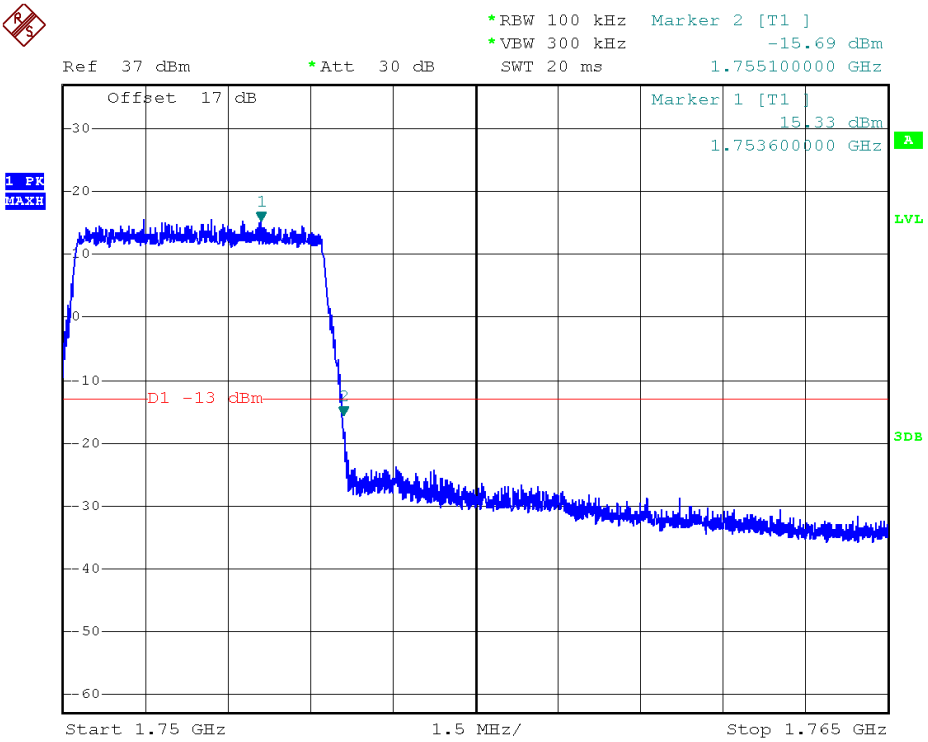
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

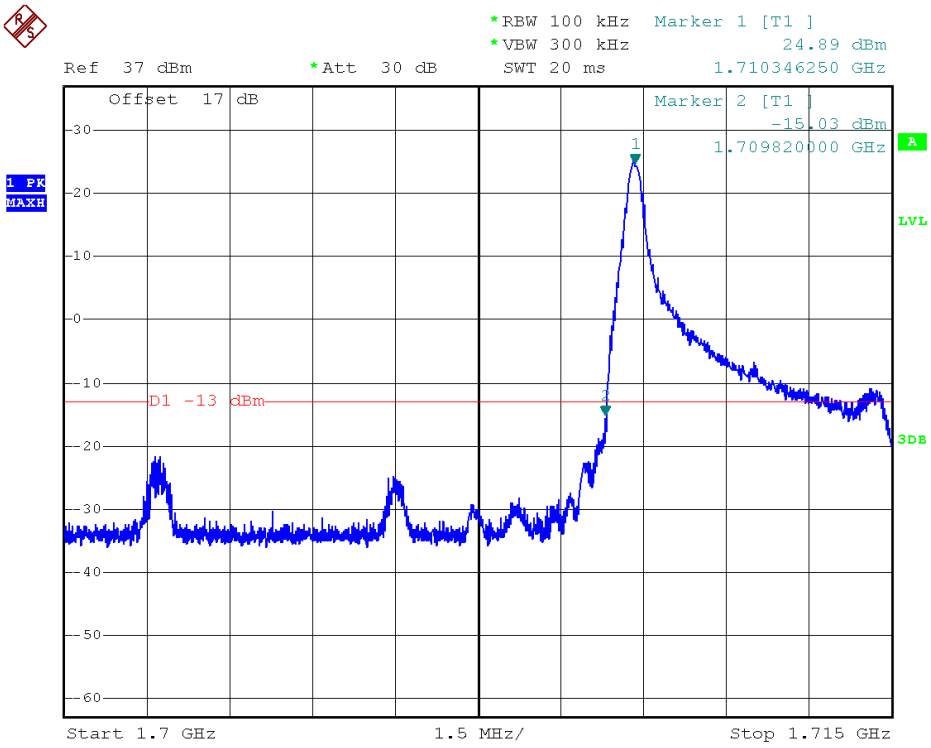


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24

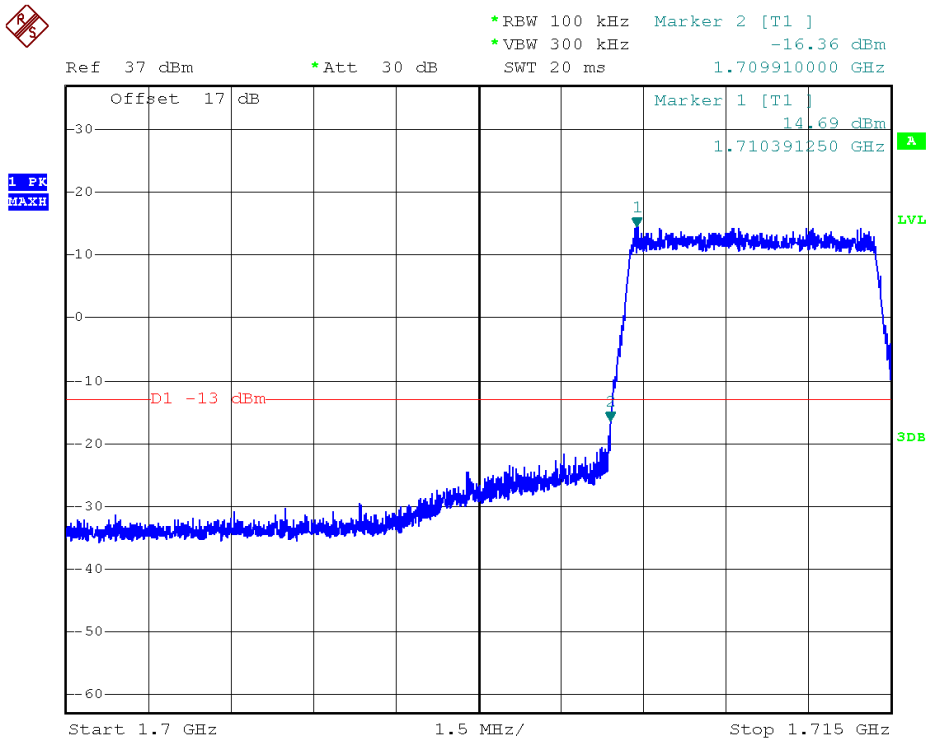


Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0

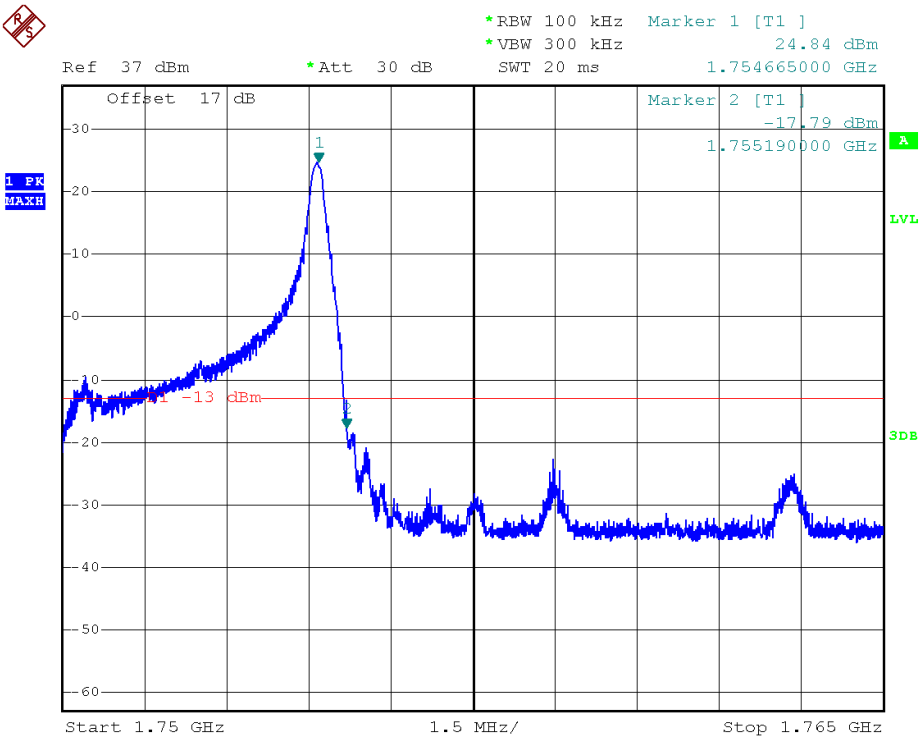
Band	LTE Band 4	Modulation	16QAM
Bandwidth	5MHz		



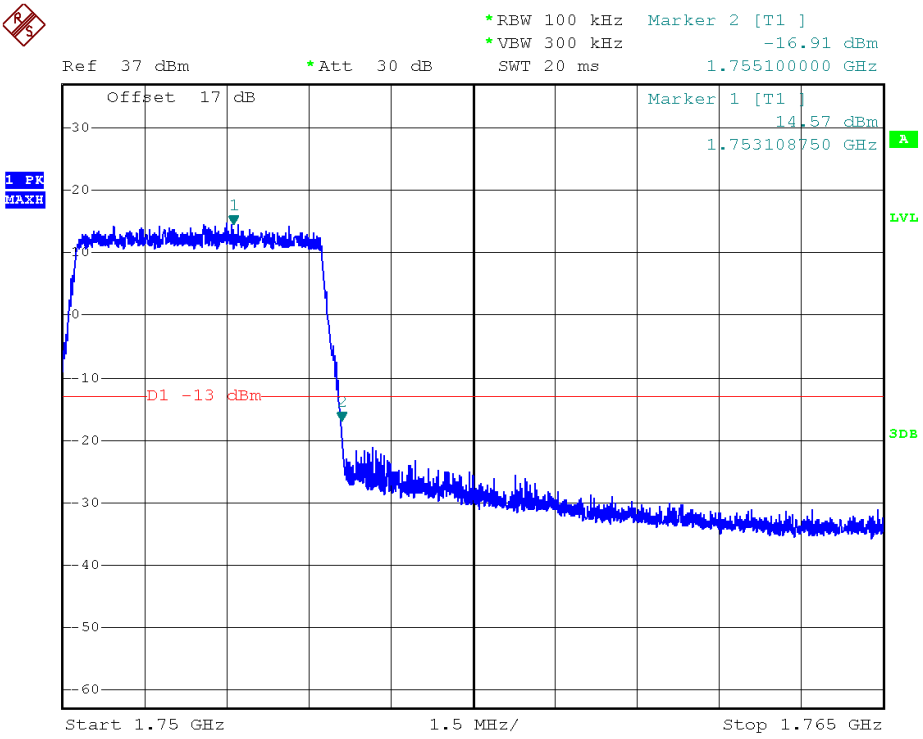
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



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

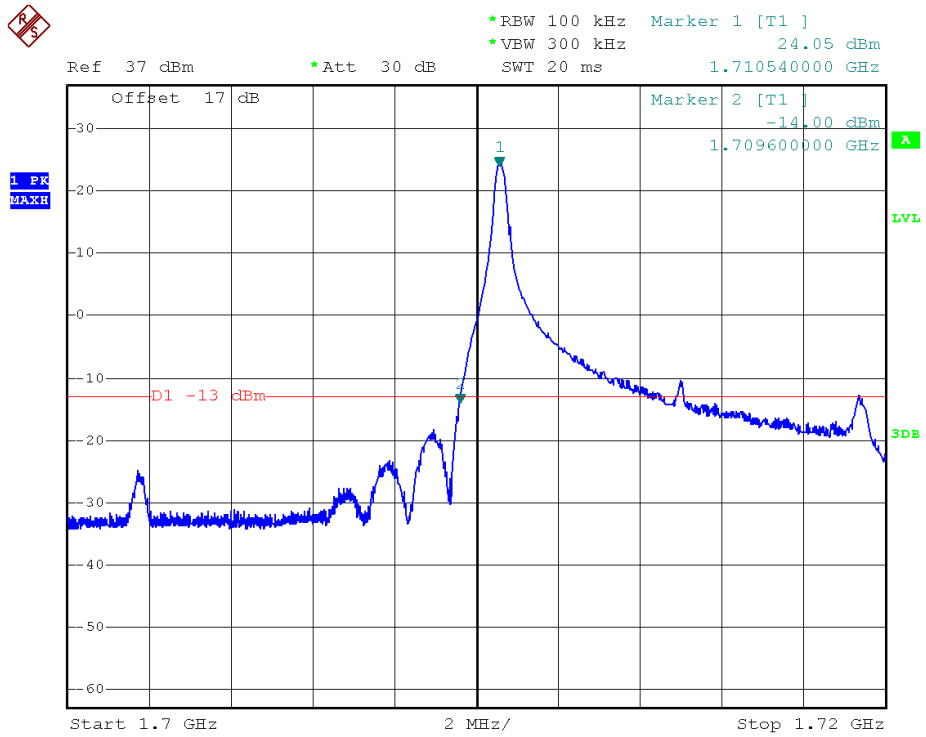


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24

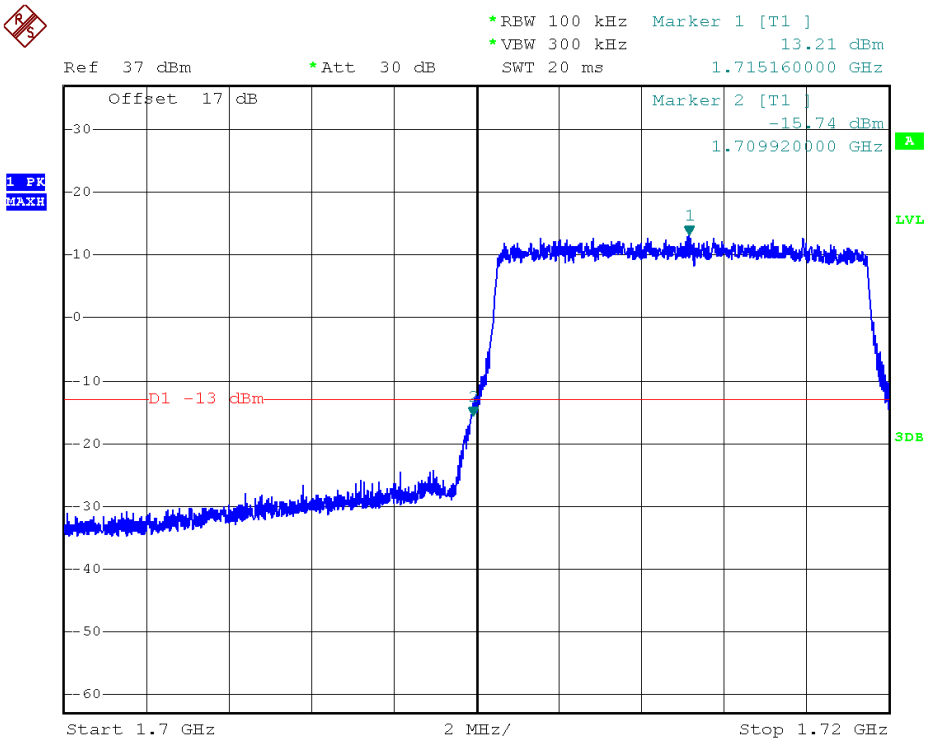


Higher Band Edge Plot for 16QAM -RB Size 25, RB Offset 0

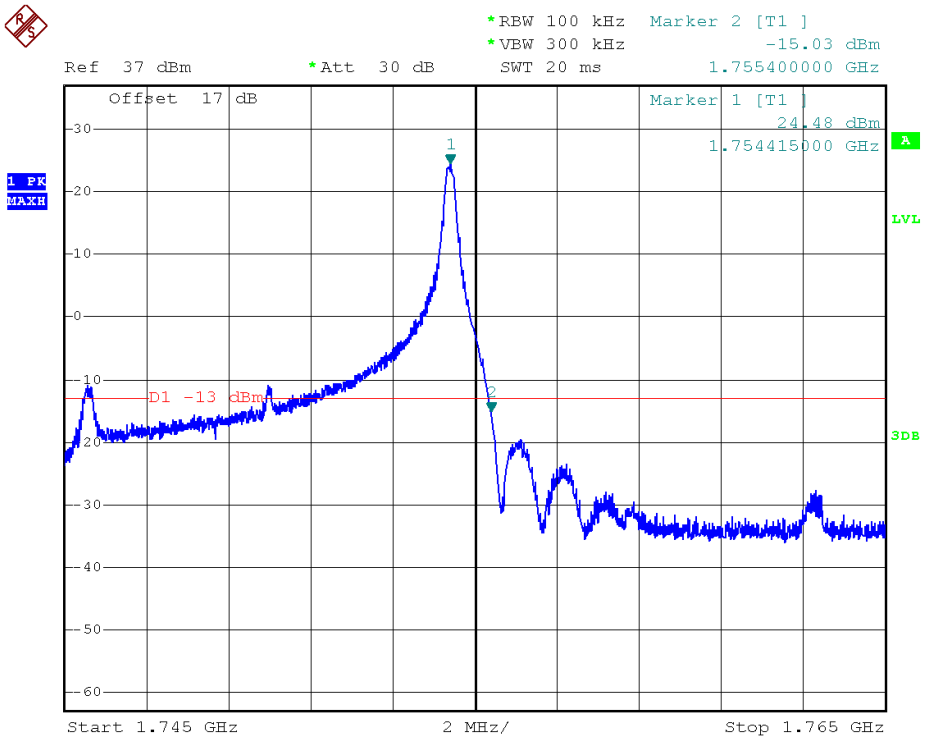
Band	LTE Band 4	Modulation	QPSK
Bandwidth	10MHz		



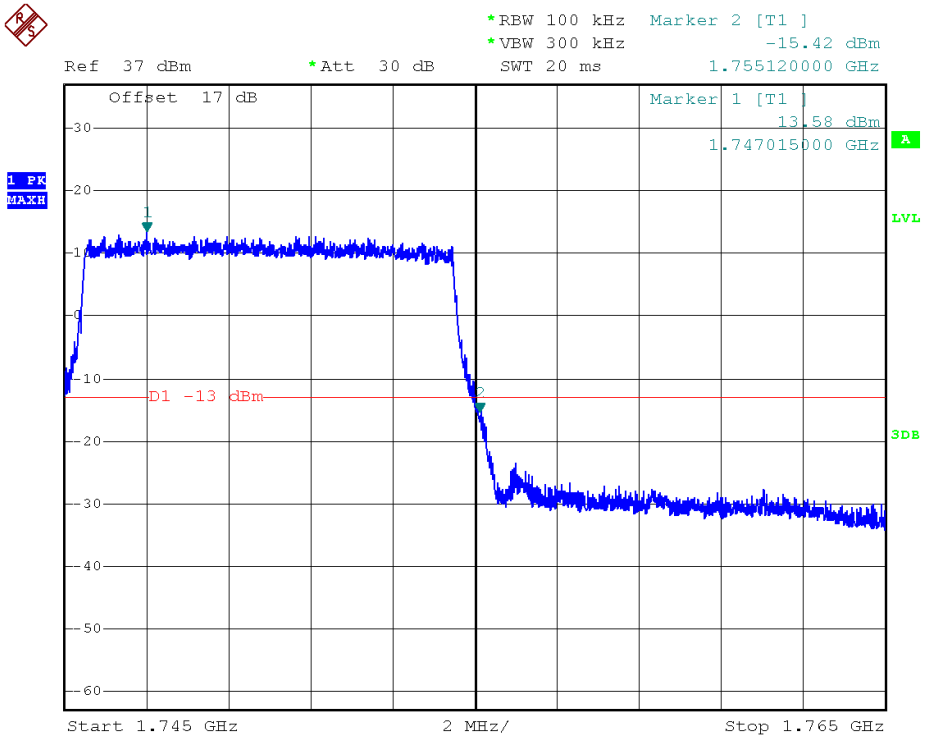
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

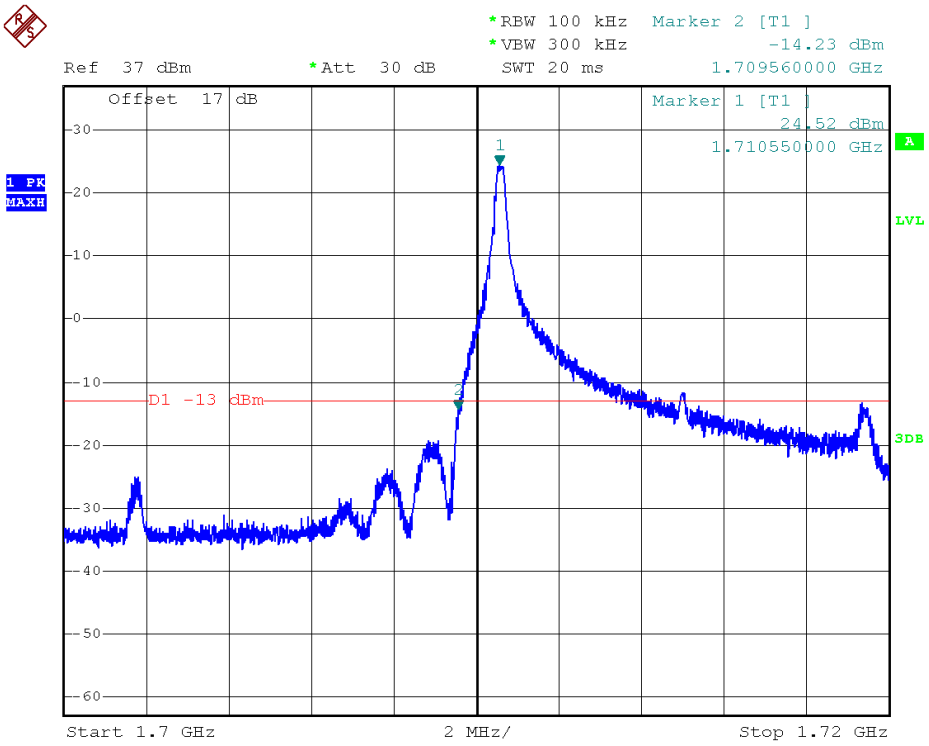


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49

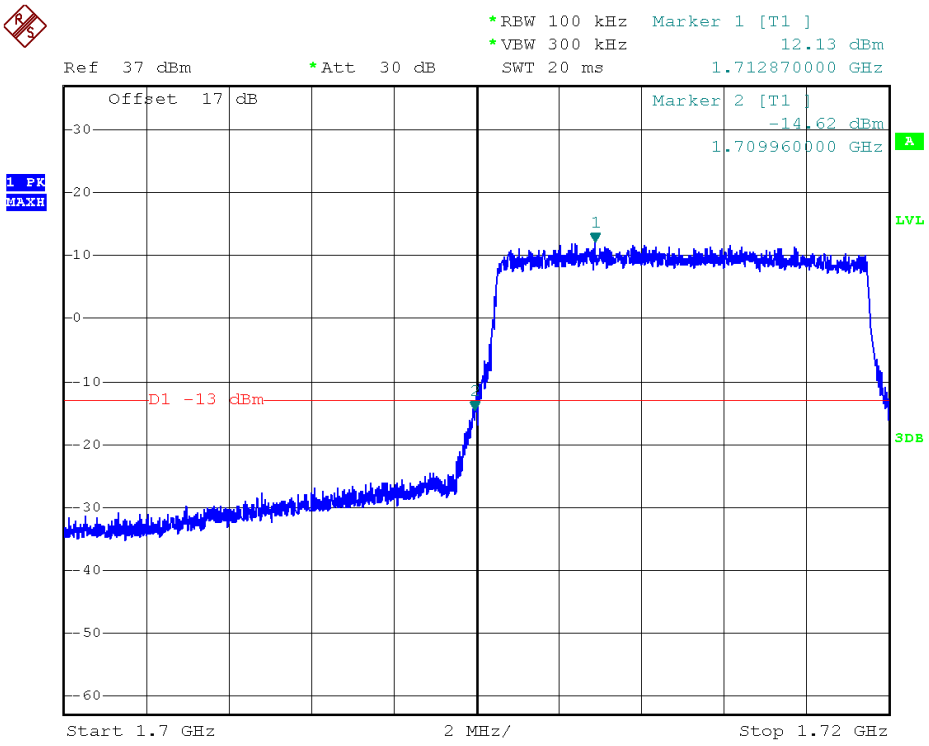


Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0

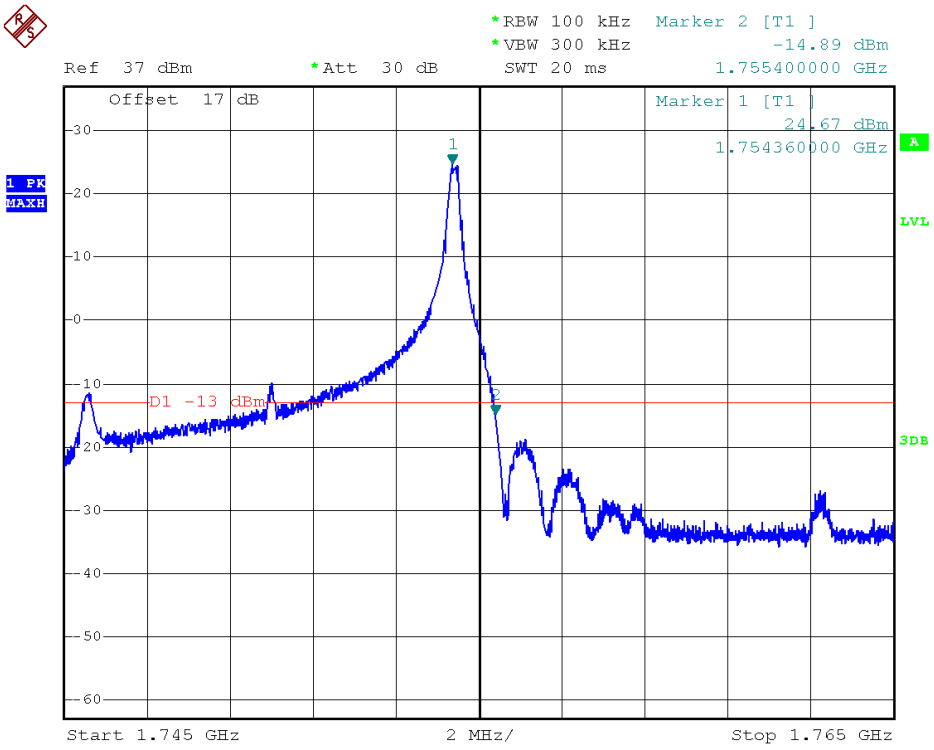
Band	LTE Band 4	Modulation	16QAM
Bandwidth	10MHz		



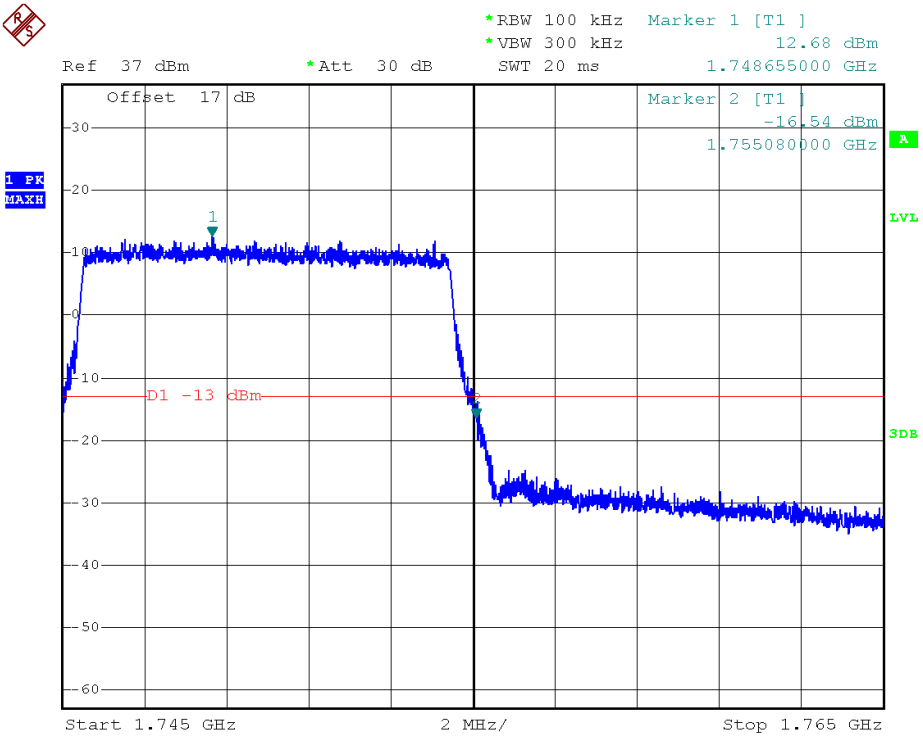
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



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

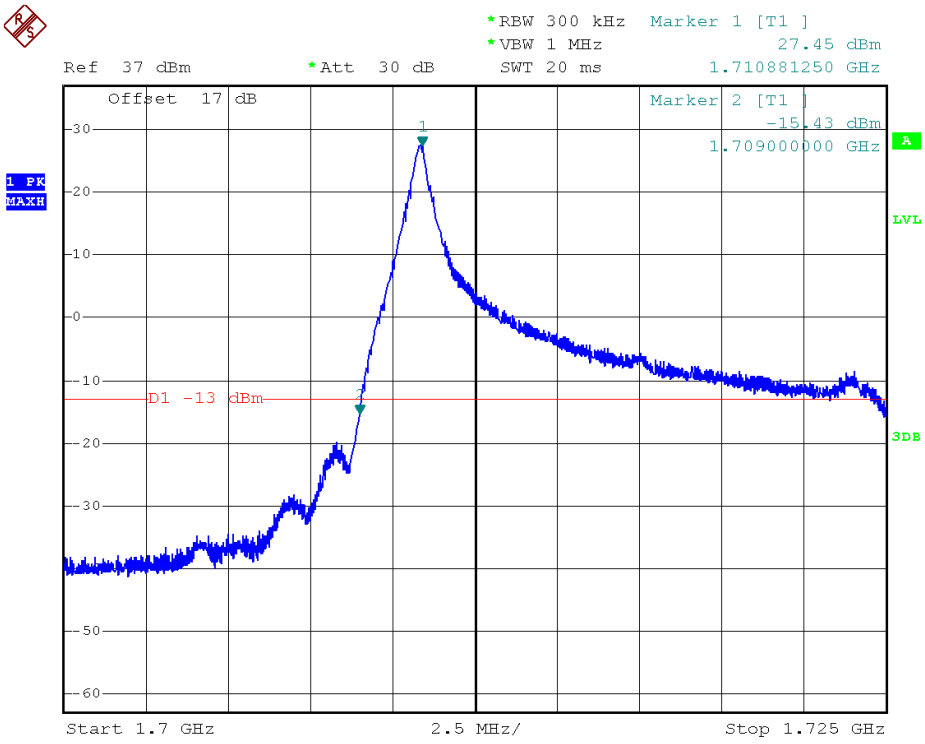


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49

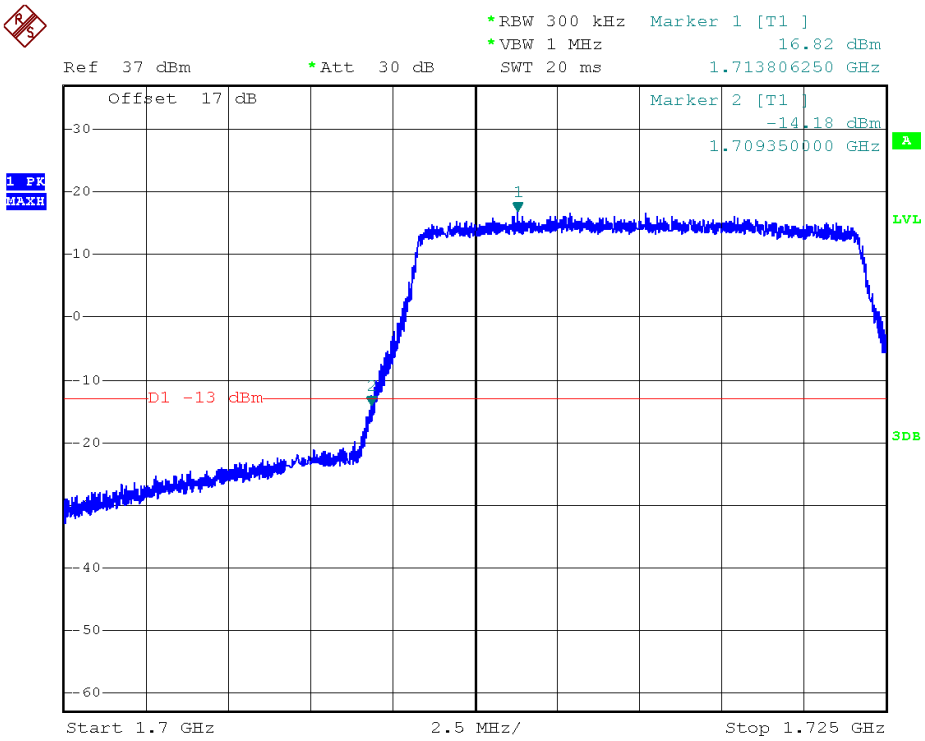


Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0

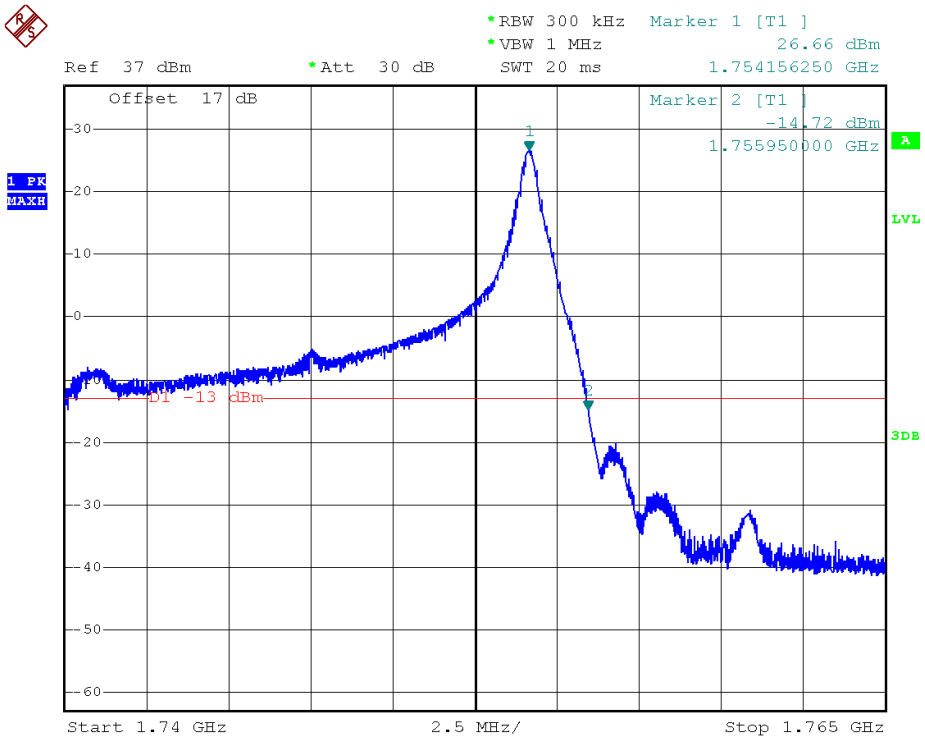
Band	LTE Band 4	Modulation	QPSK
Bandwidth	15MHz		



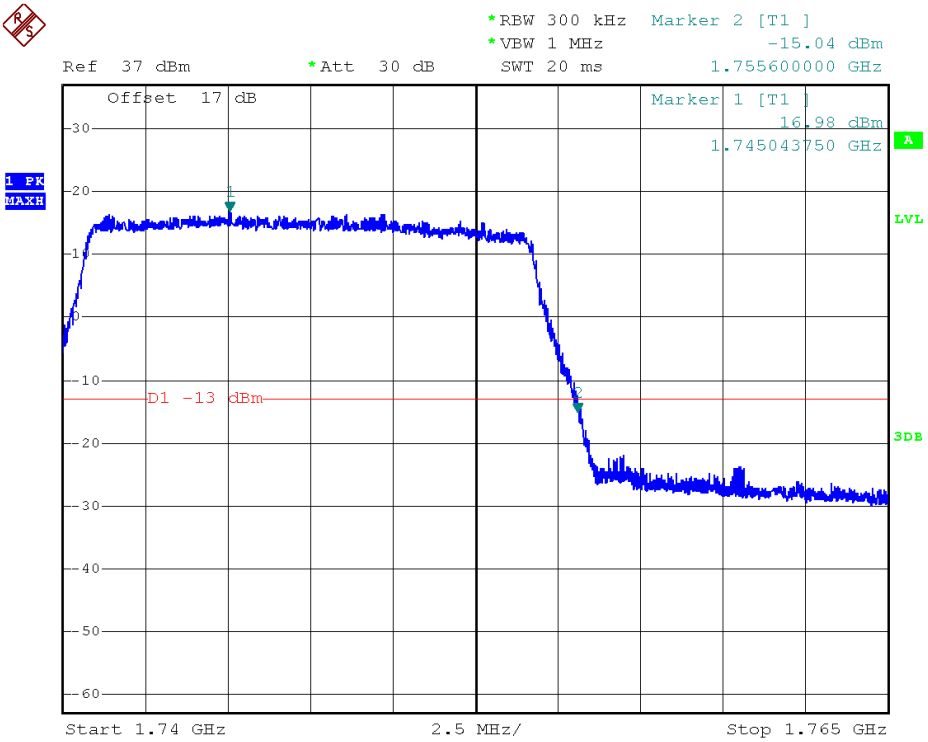
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

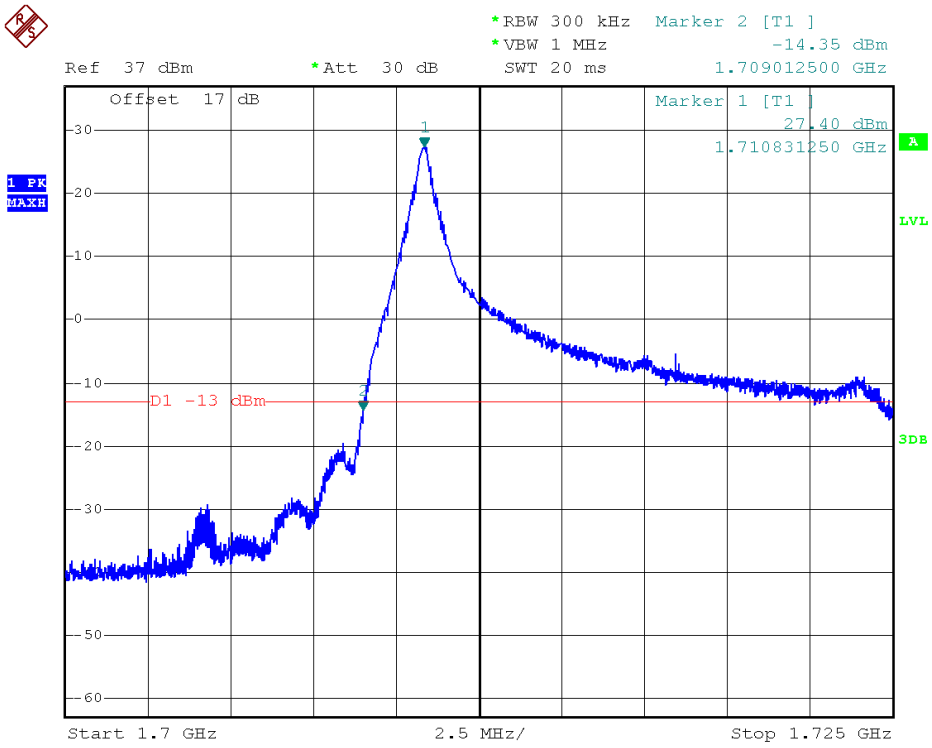


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74

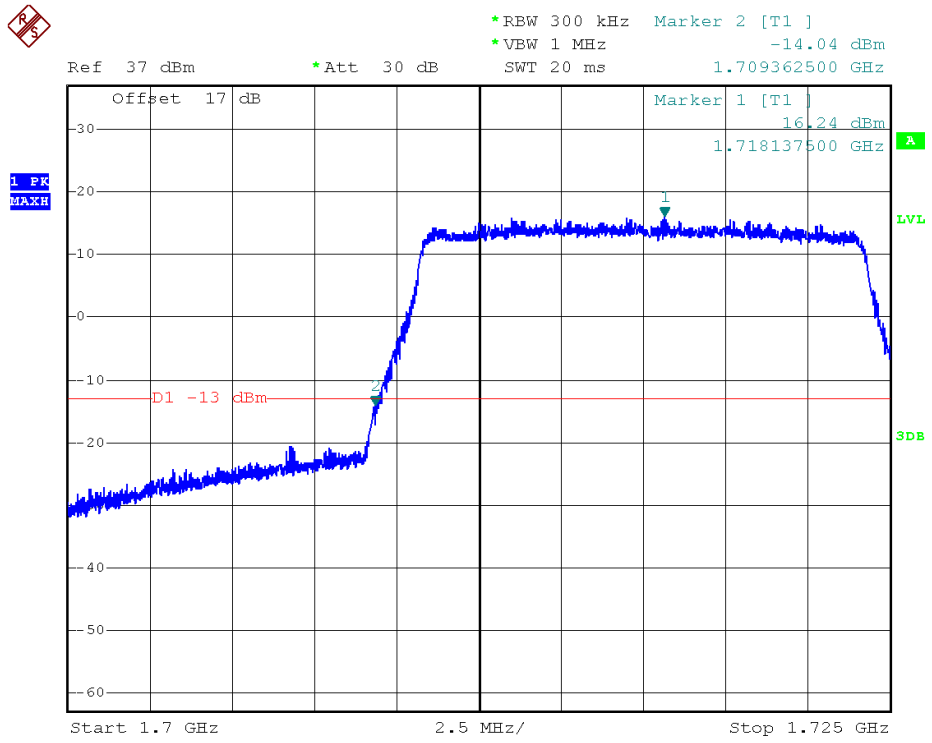


Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0

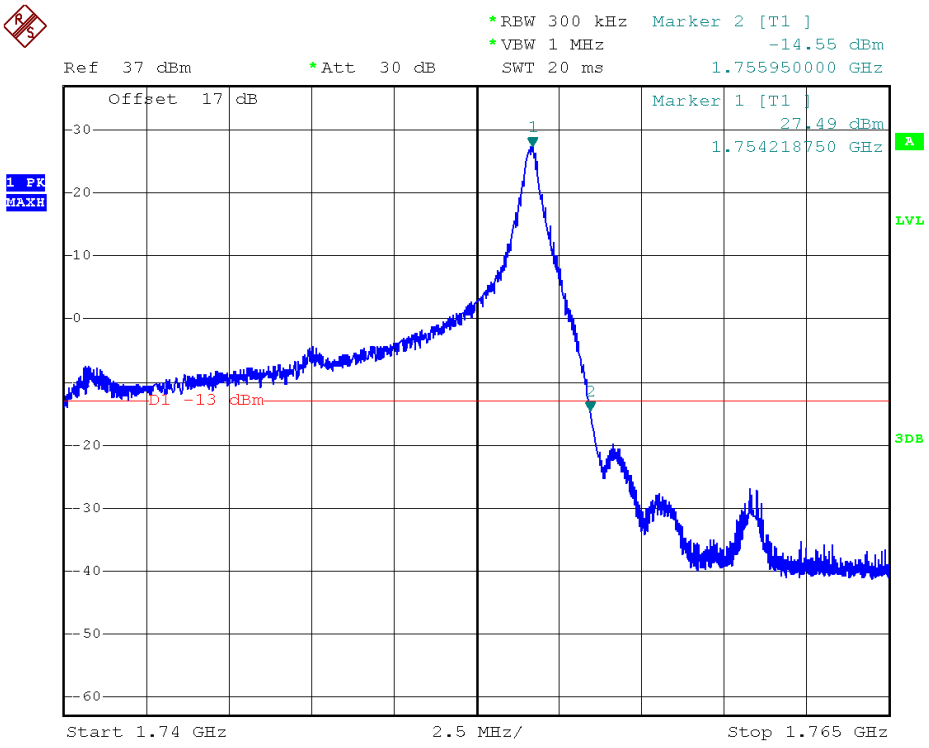
Band	LTE Band 4	Modulation	16QAM
Bandwidth	15MHz		



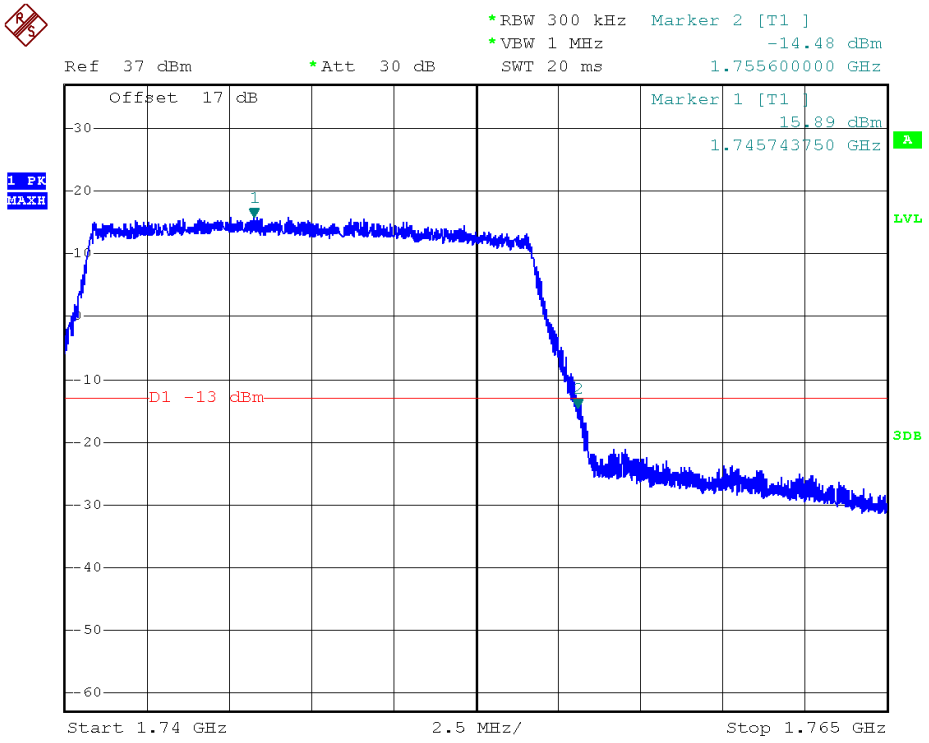
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



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

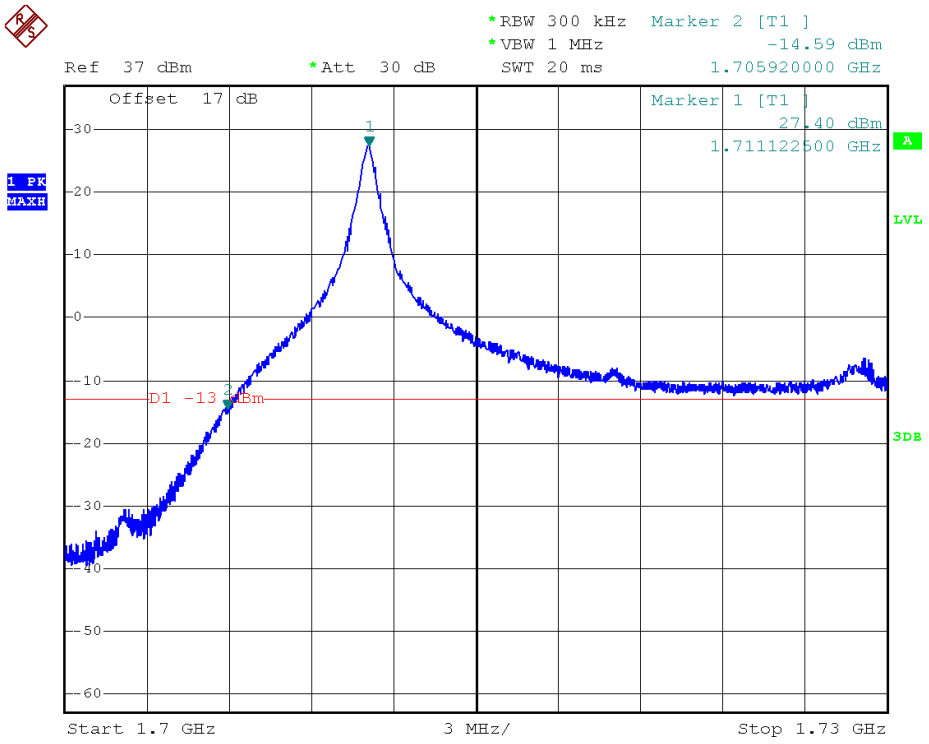


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 74

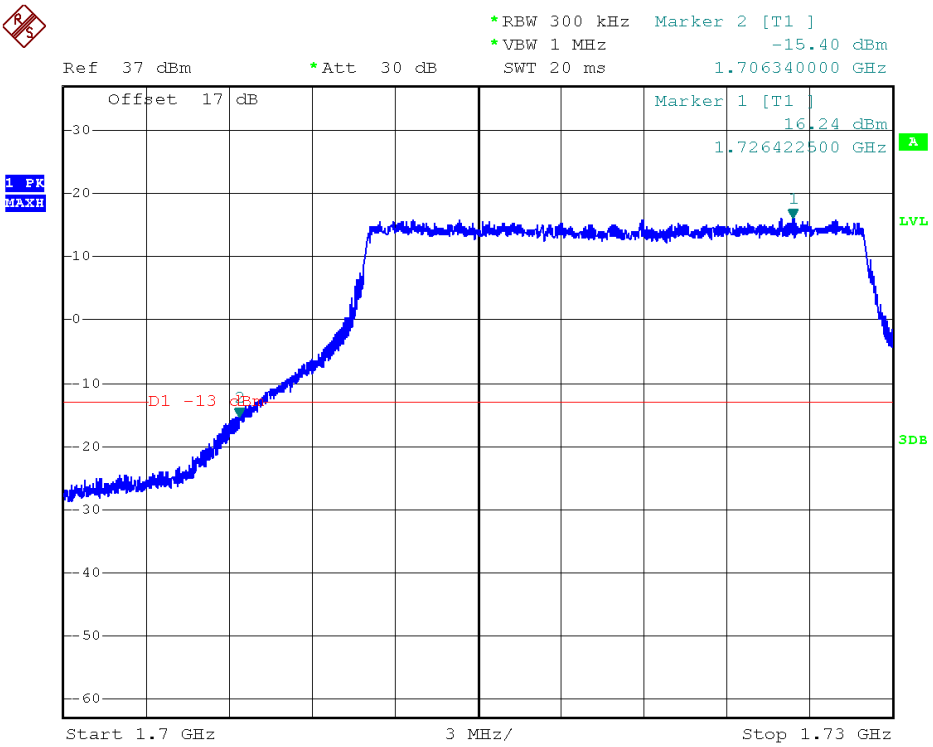


Higher Band Edge Plot for 16QAM -RB Size 75, RB Offset 0

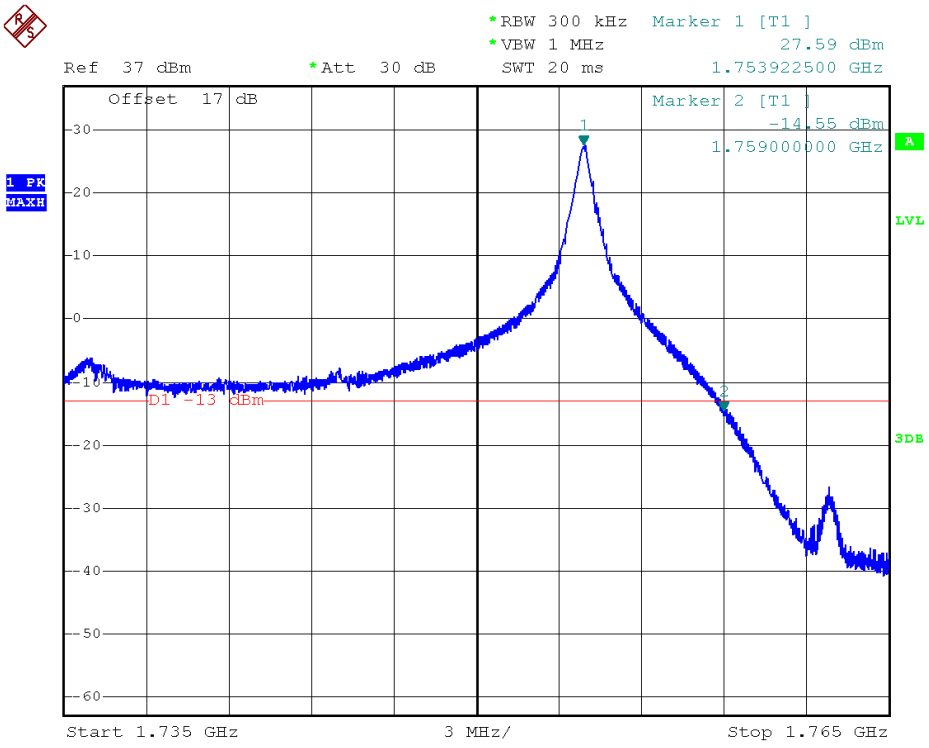
Band	LTE Band 4	Modulation	QPSK
Bandwidth	20MHz		



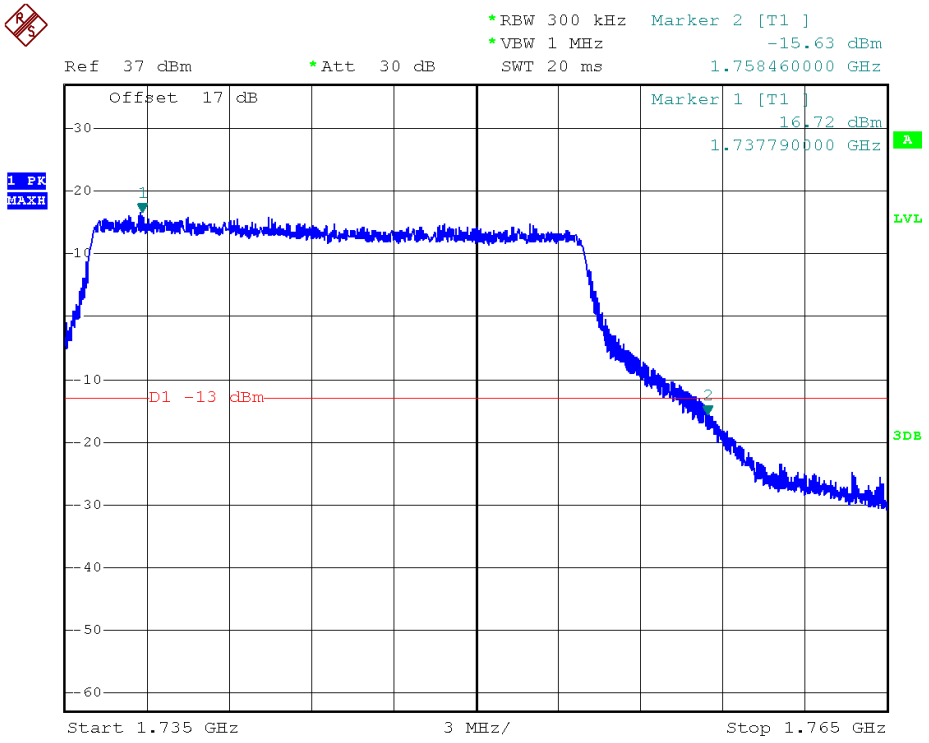
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

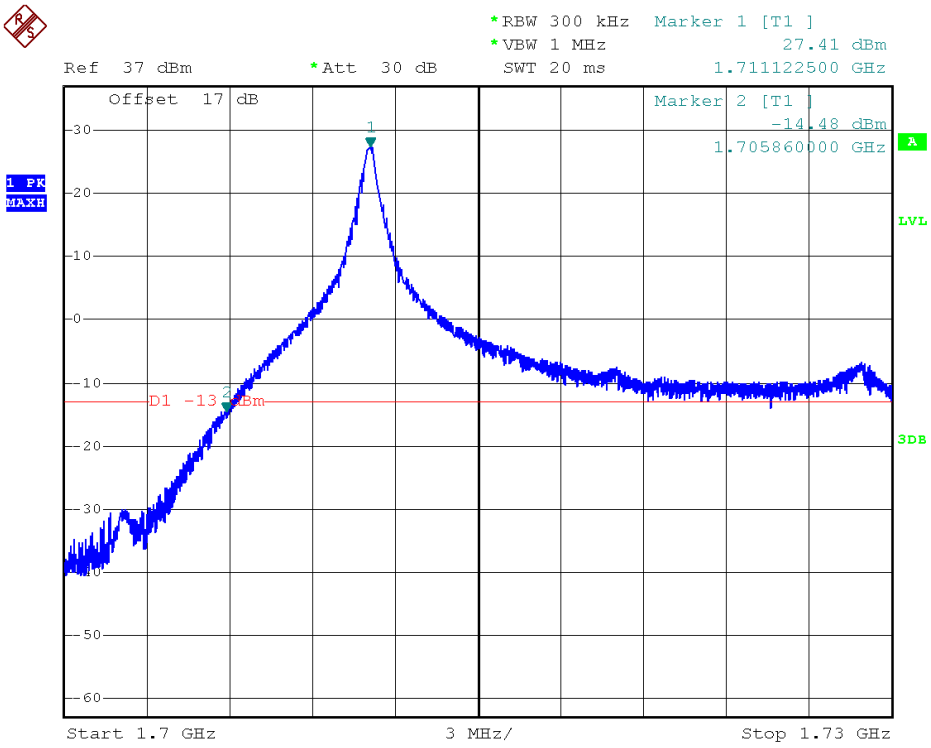


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99

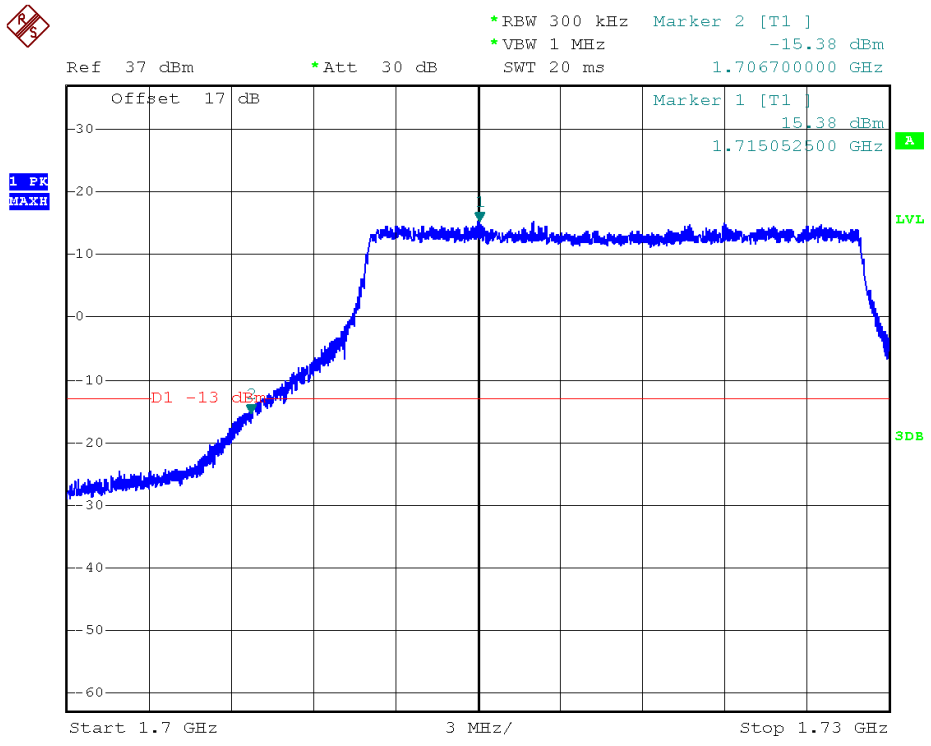


Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0

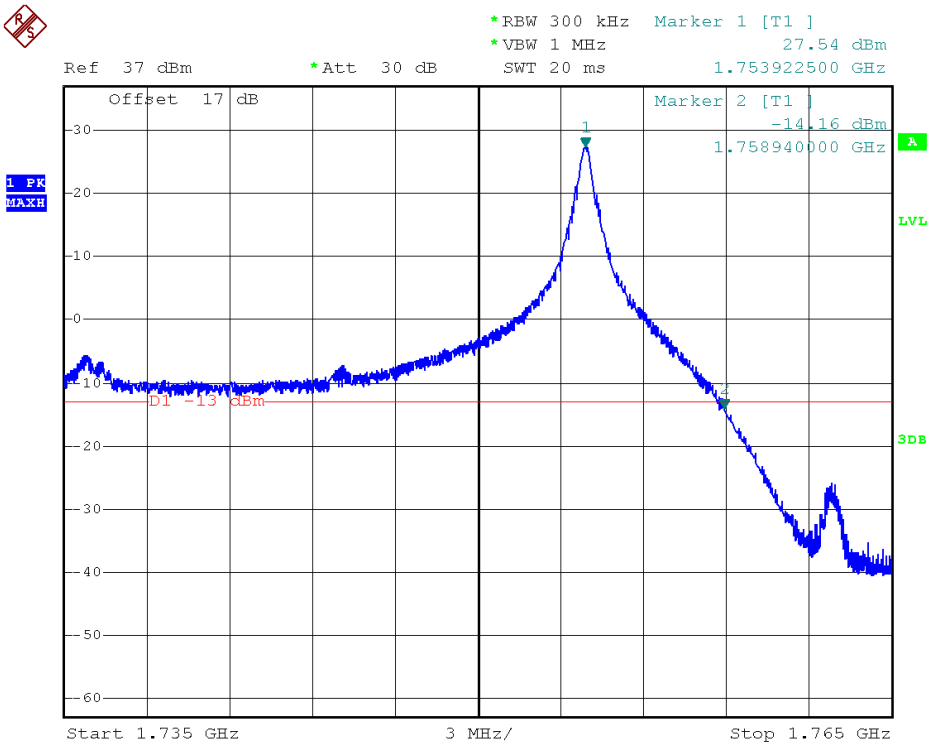
Band	LTE Band 4	Modulation	16QAM
Bandwidth	20MHz		



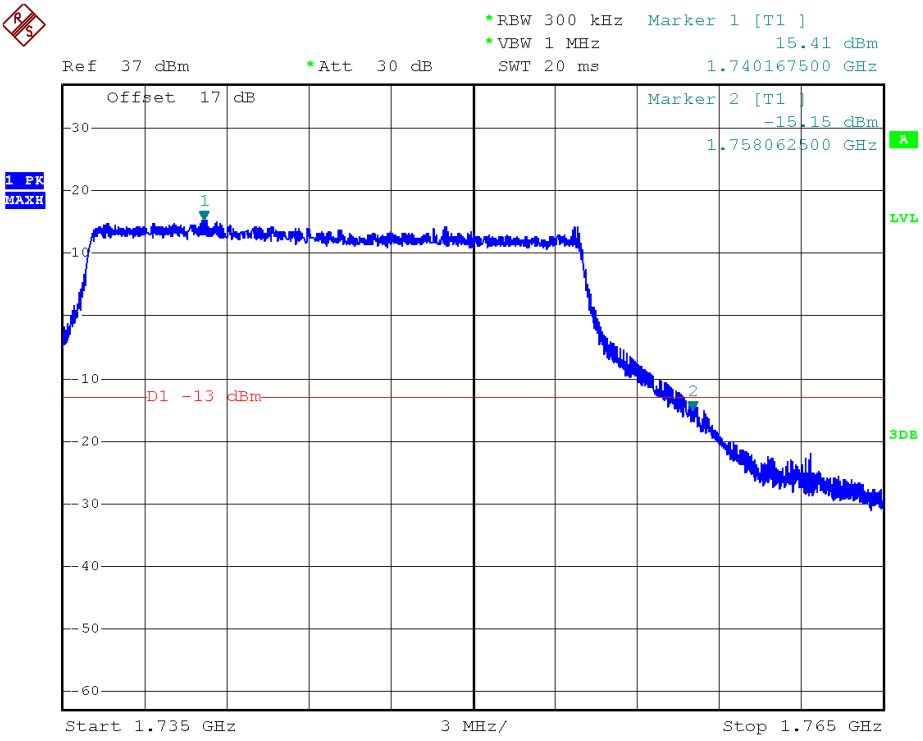
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



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

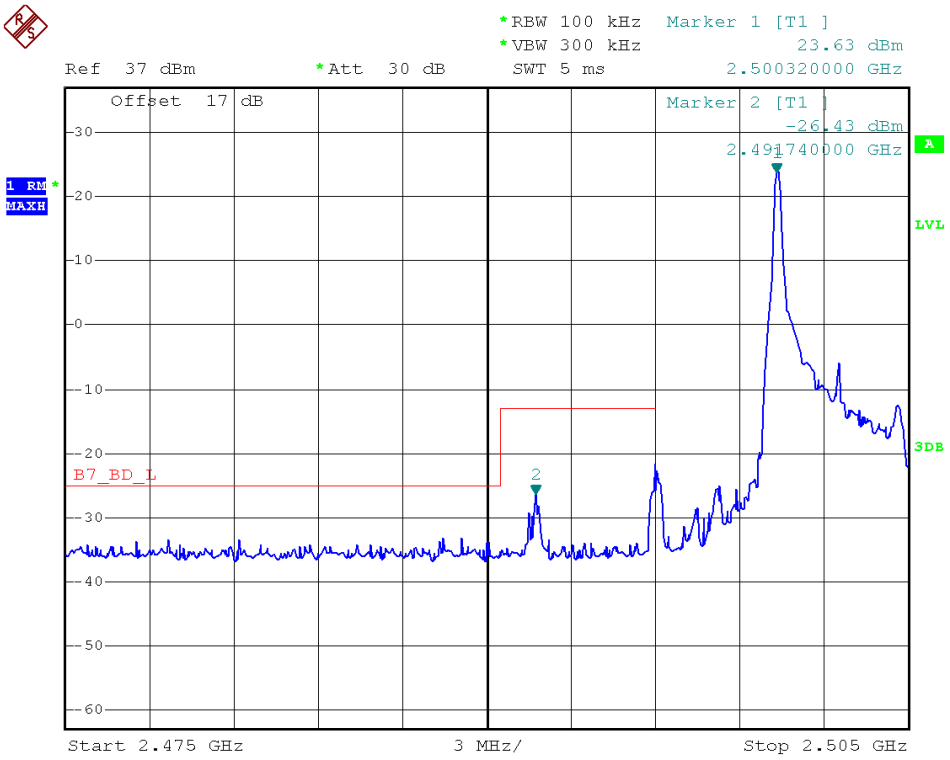


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 99

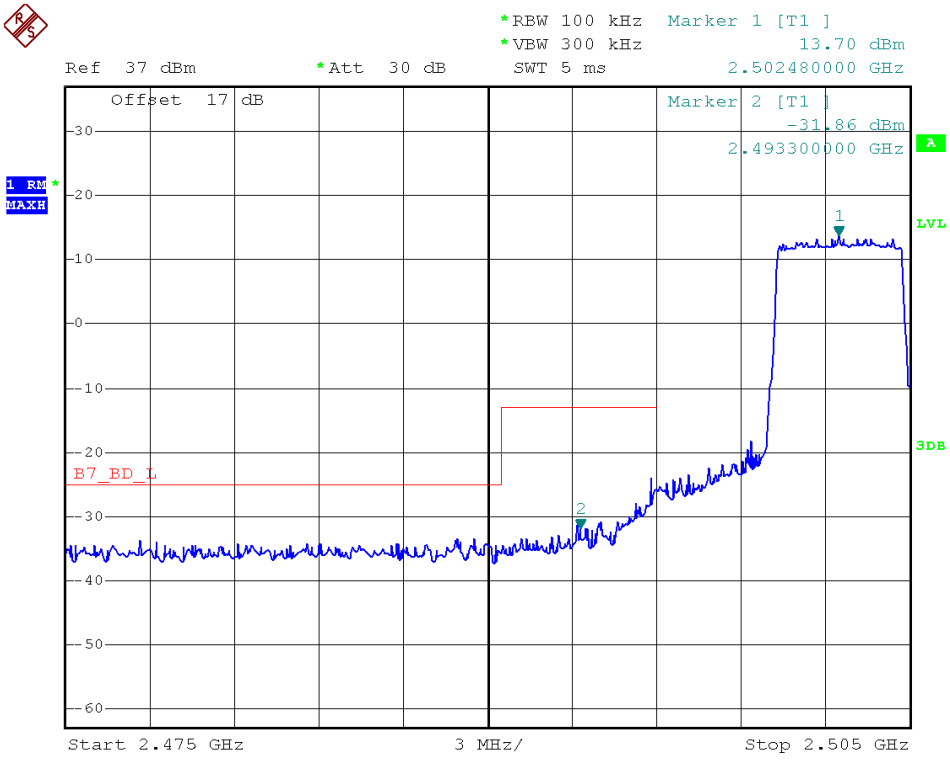


Higher Band Edge Plot for 16QAM -RB Size 100, RB Offset 0

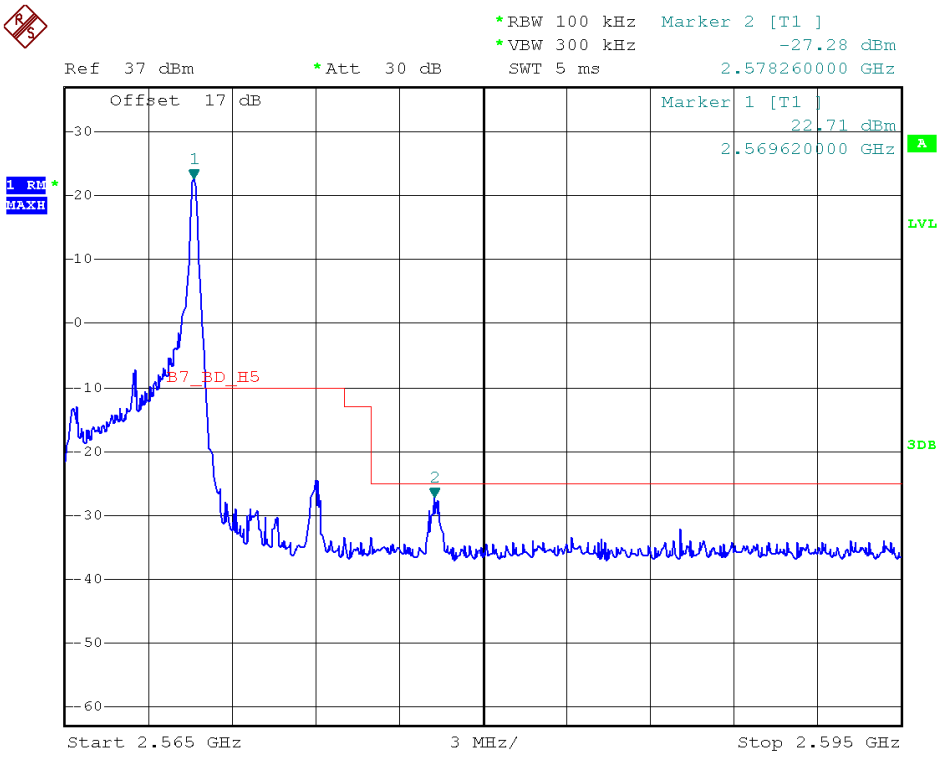
Band	LTE Band 7	Modulation	QPSK
Bandwidth	5MHz		



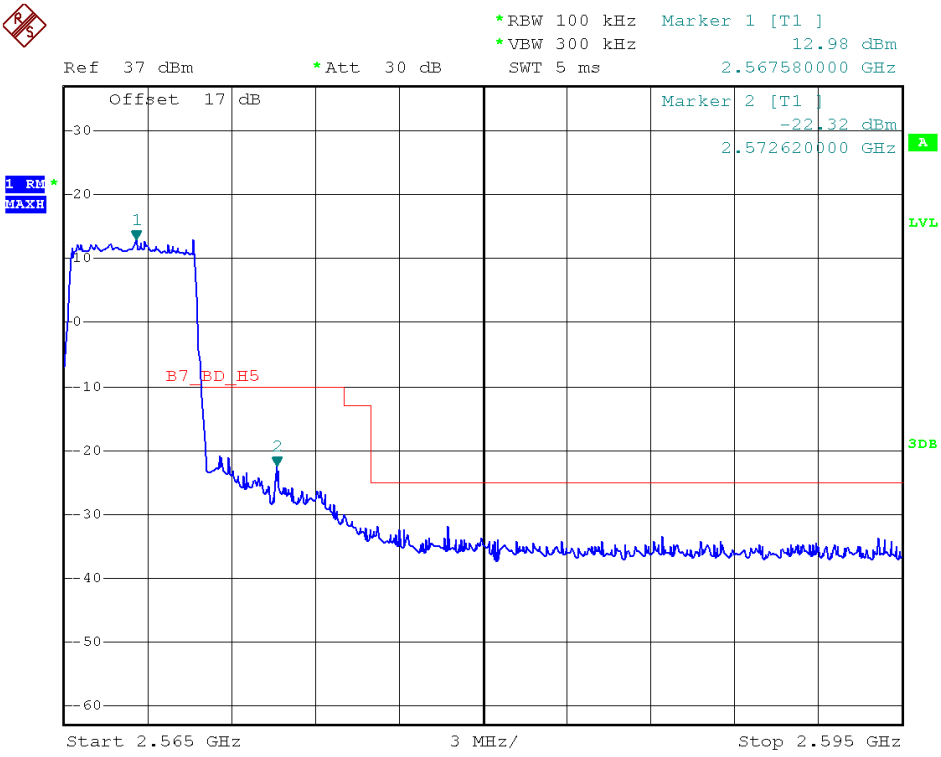
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

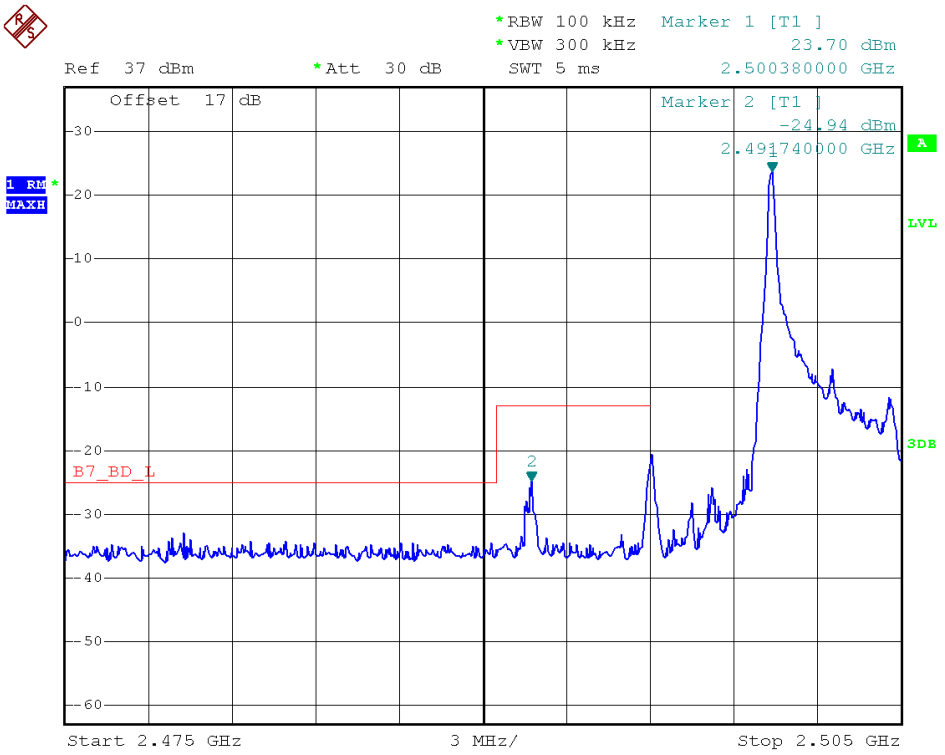


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24

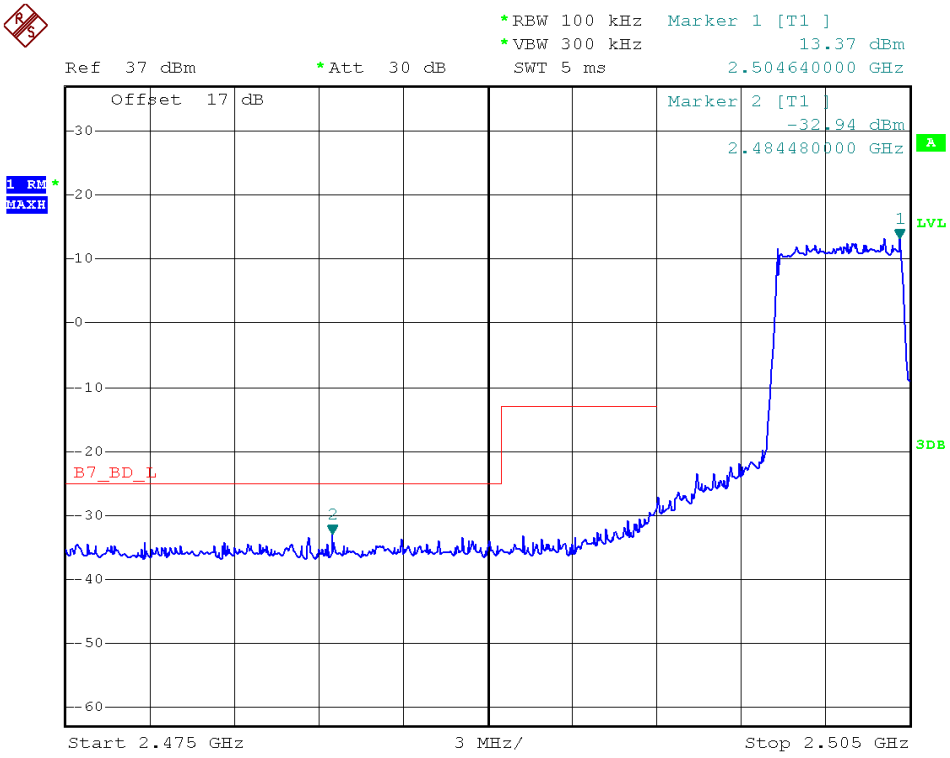


Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0

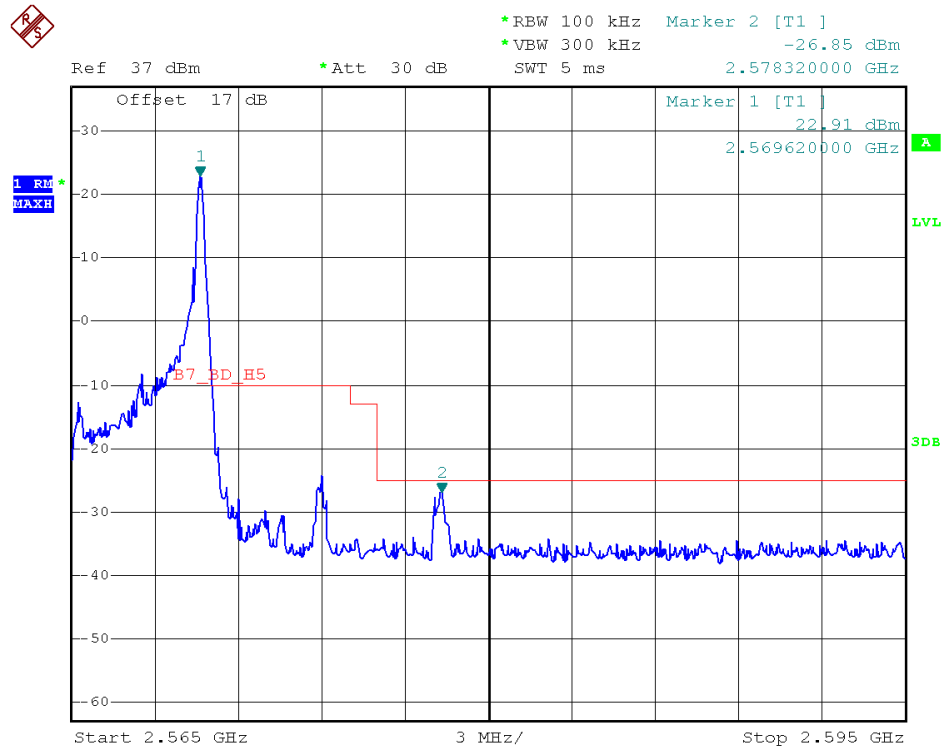
Band	LTE Band 7	Modulation	16QAM
Bandwidth	5MHz		



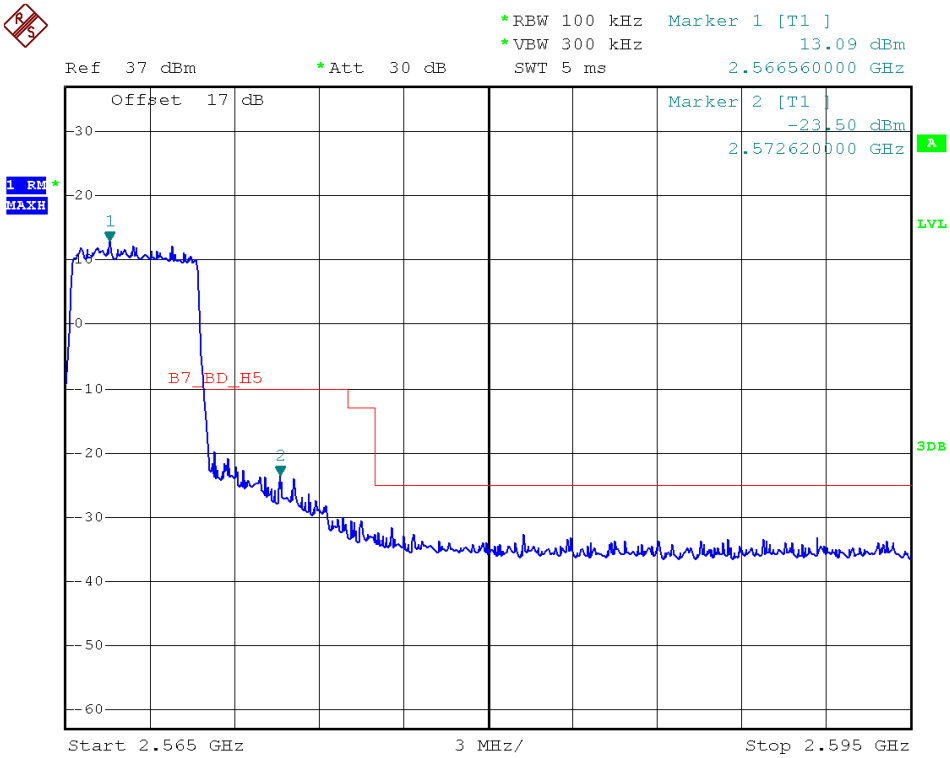
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



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

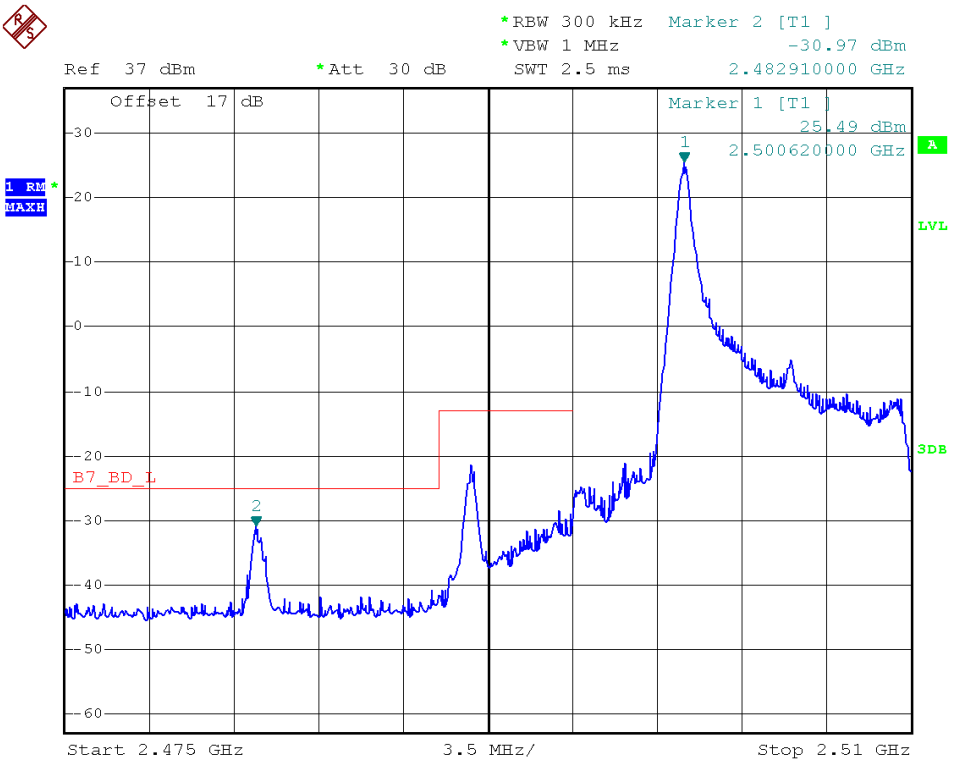


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24

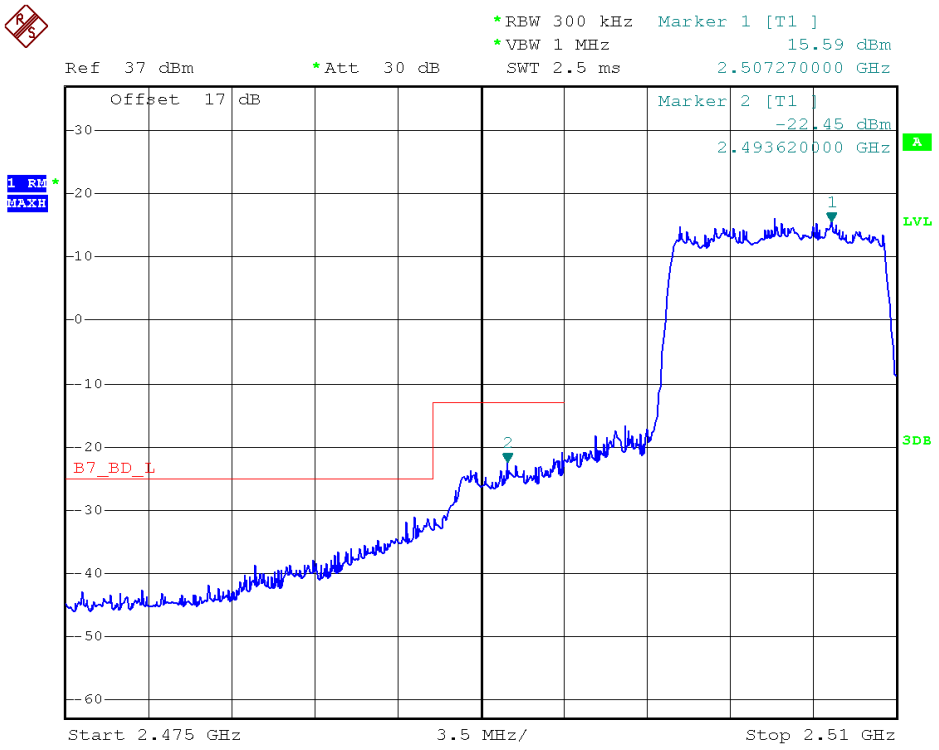


Higher Band Edge Plot for 16QAM -RB Size 25, RB Offset 0

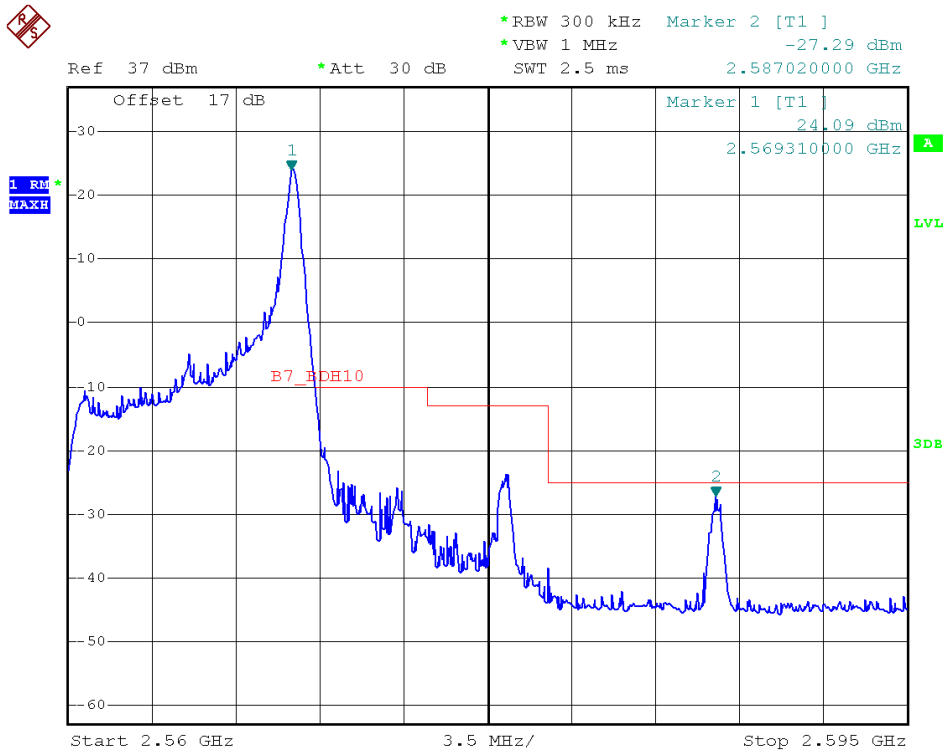
Band	LTE Band 7	Modulation	QPSK
Bandwidth	10MHz		



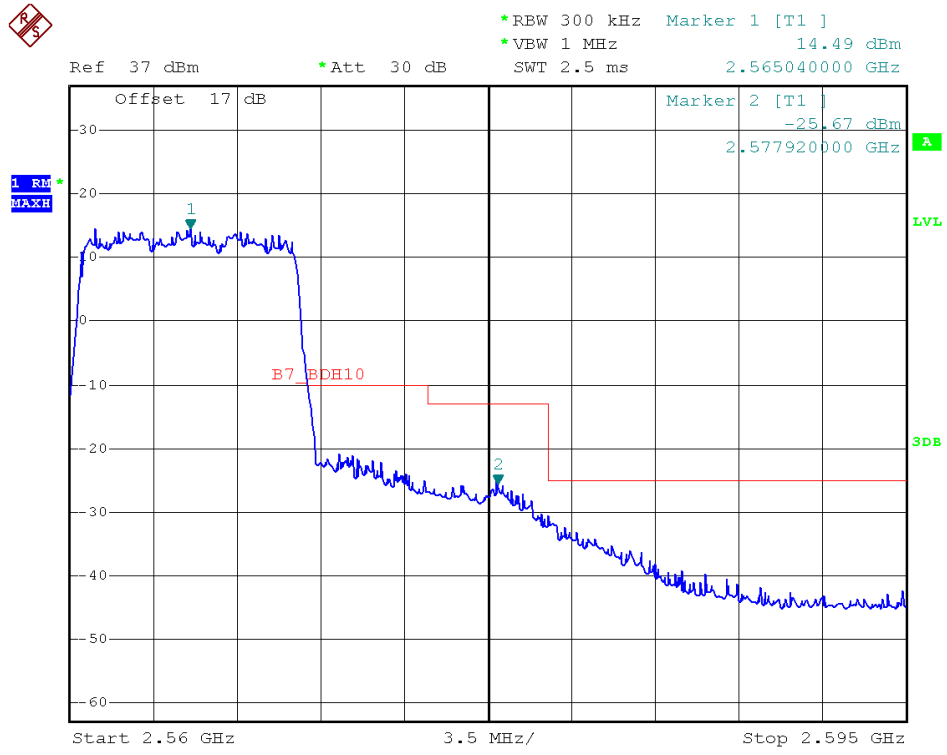
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

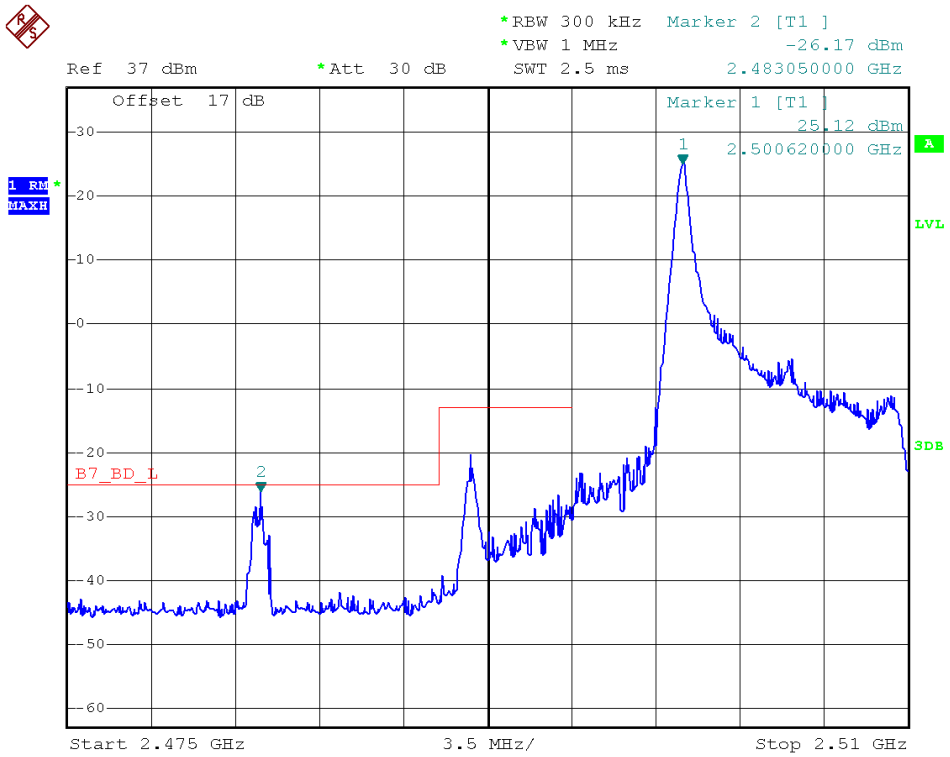


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49

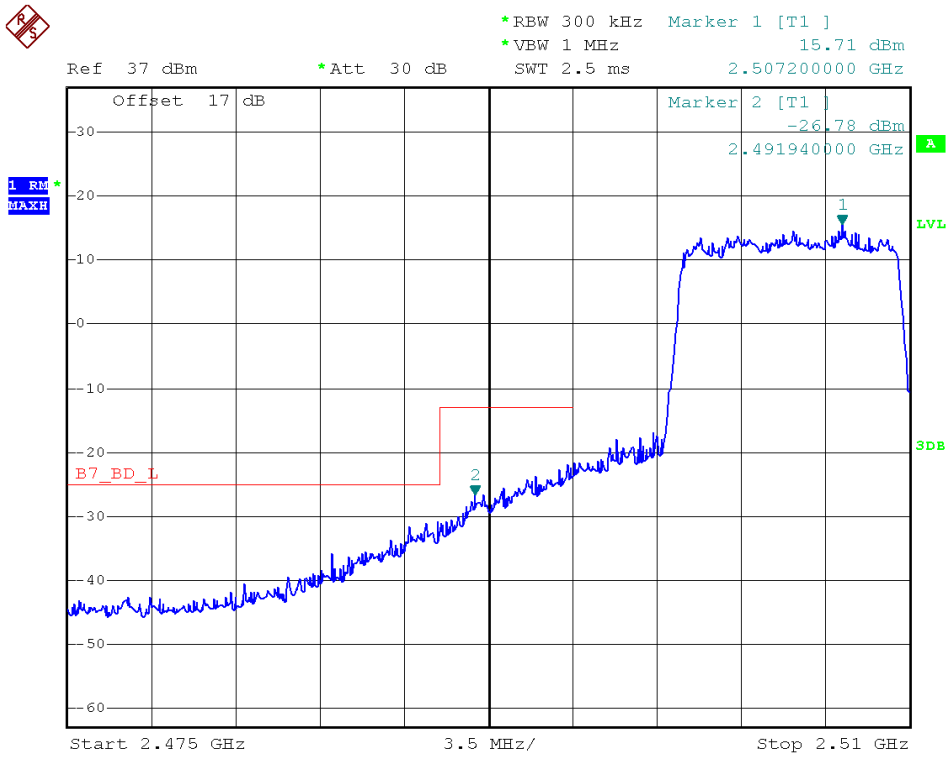


Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0

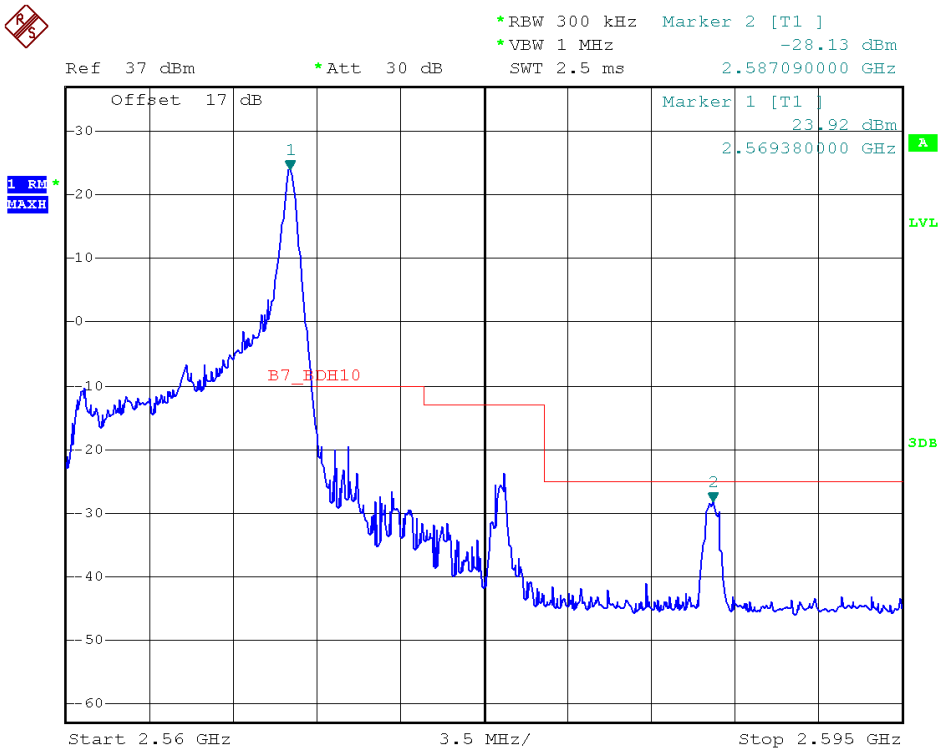
Band	LTE Band 7	Modulation	16QAM
Bandwidth	10MHz		



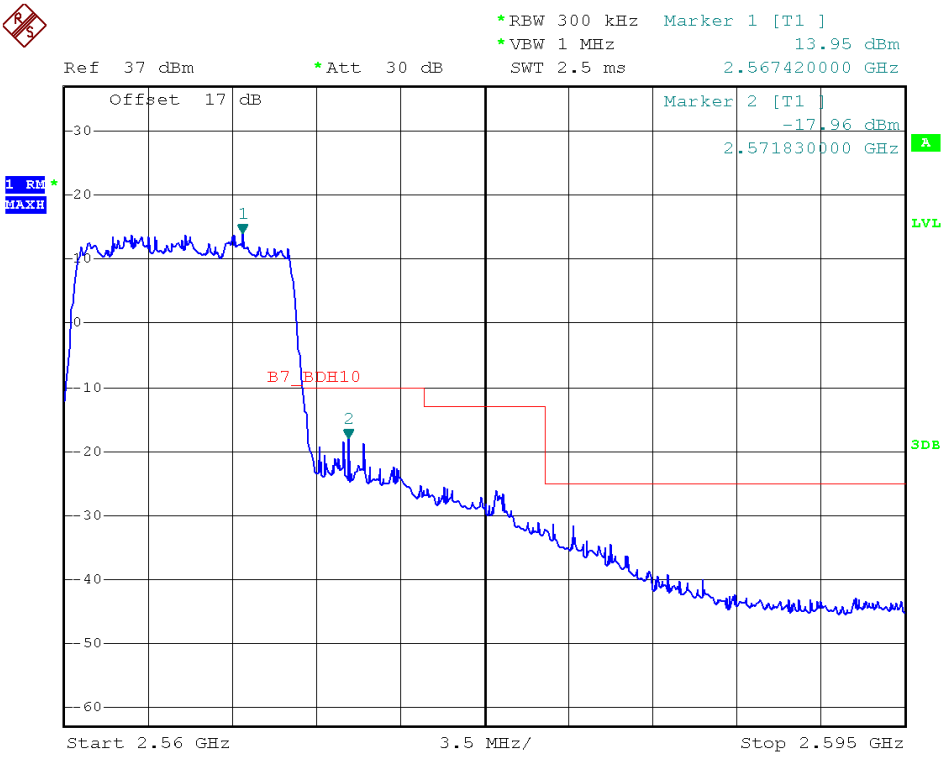
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



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

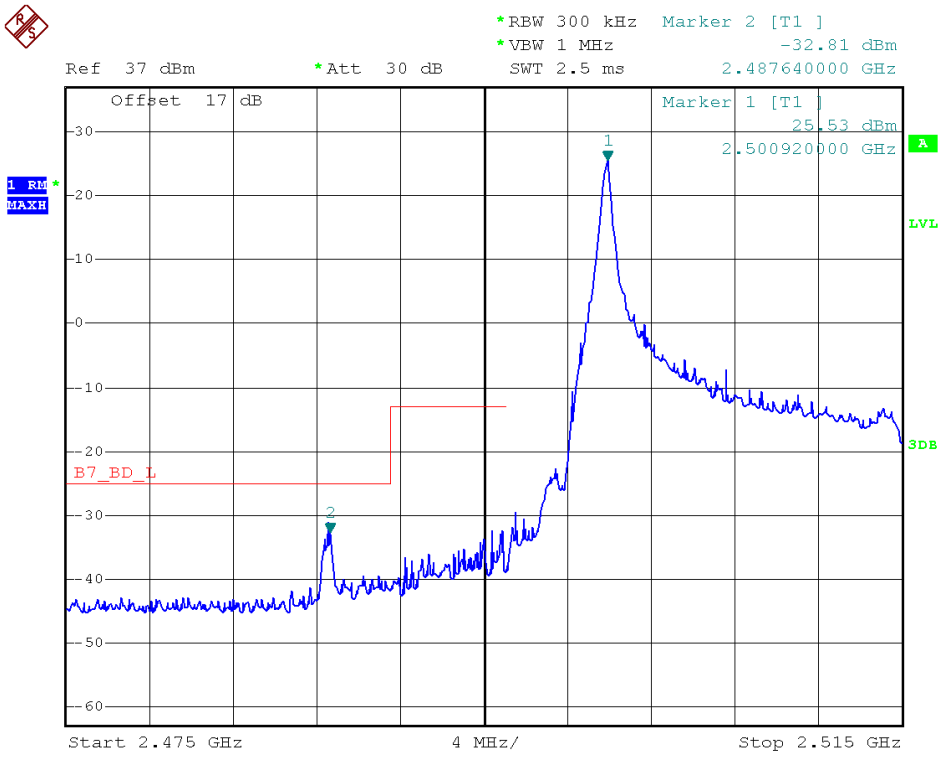


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49

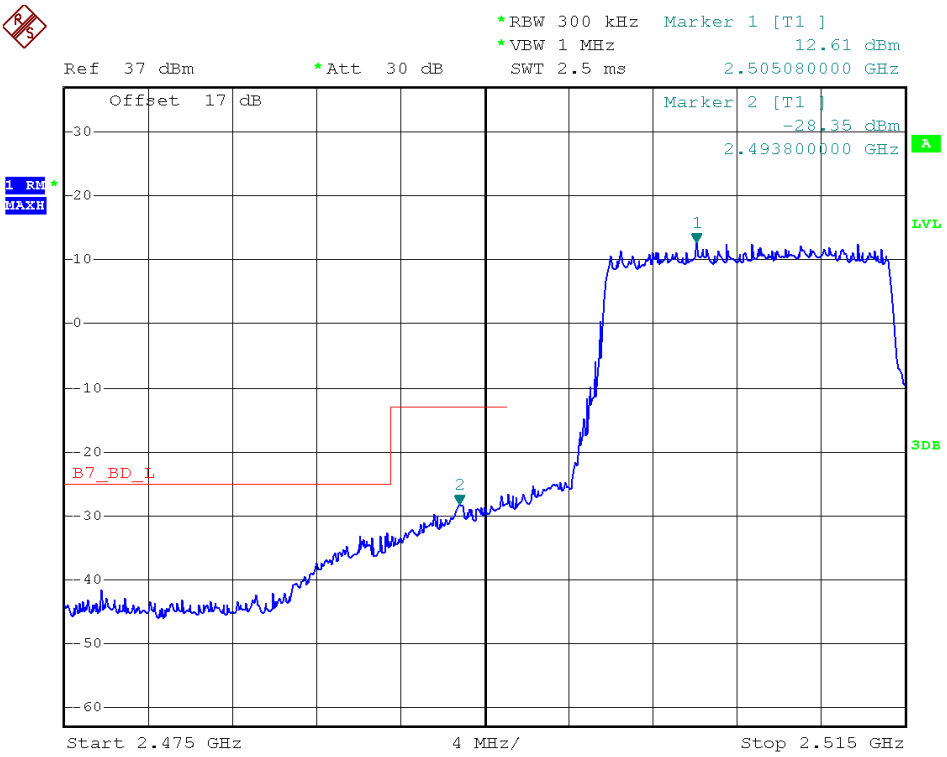


Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0

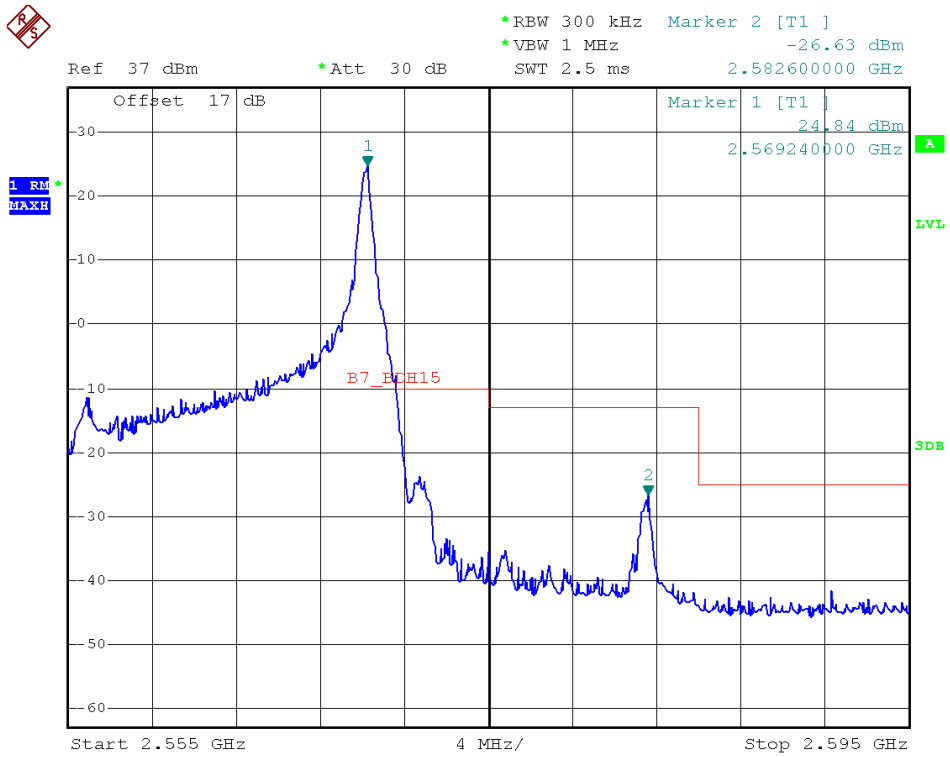
Band	LTE Band 7	Modulation	QPSK
Bandwidth	15MHz		



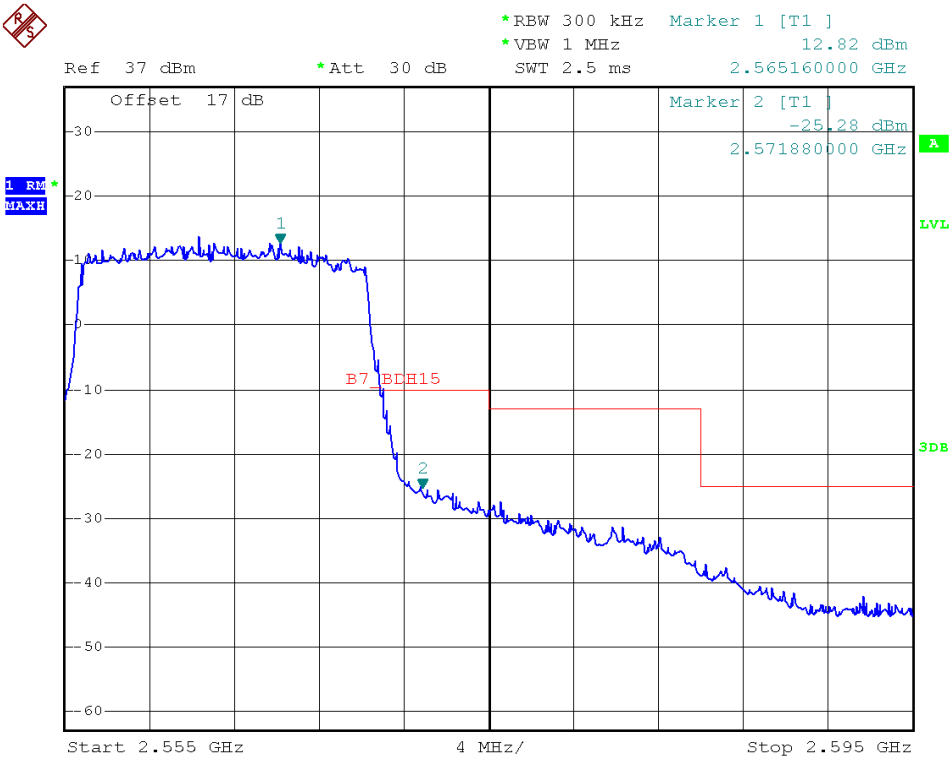
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

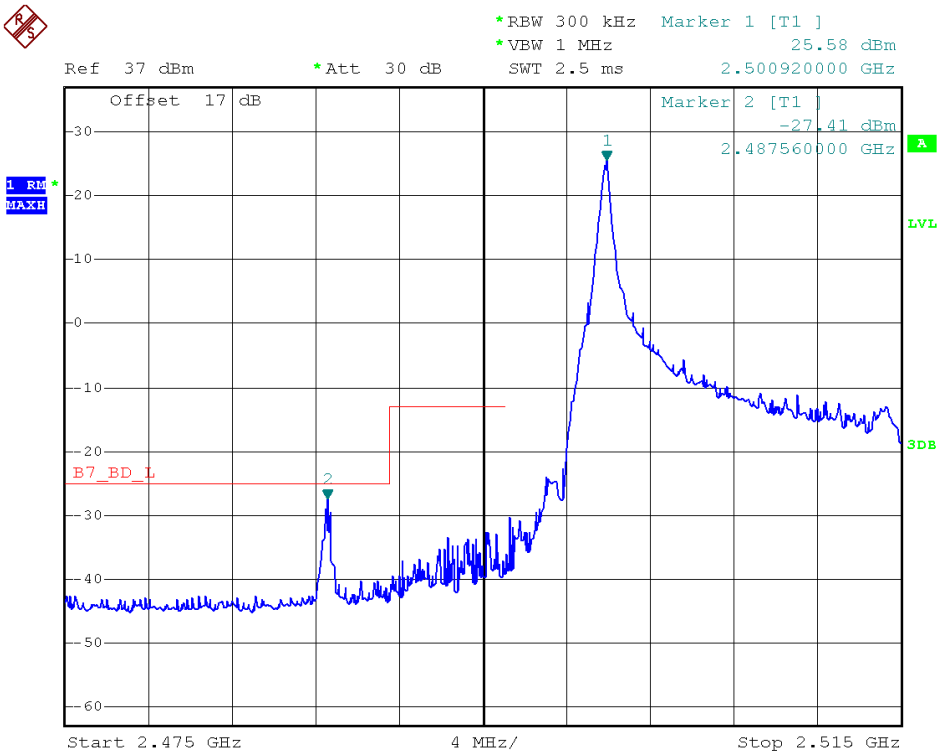


Higher Band Edge Plot for QPSK -RB Size 1, RB Offset 74

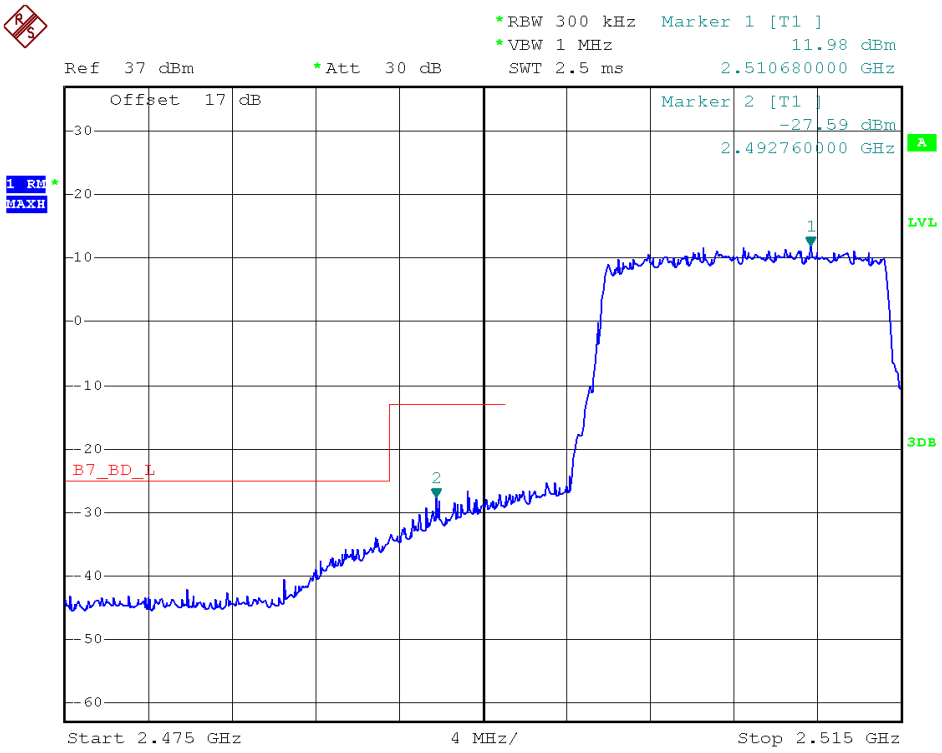


Higher Band Edge Plot for QPSK -RB Size 75, RB Offset 0

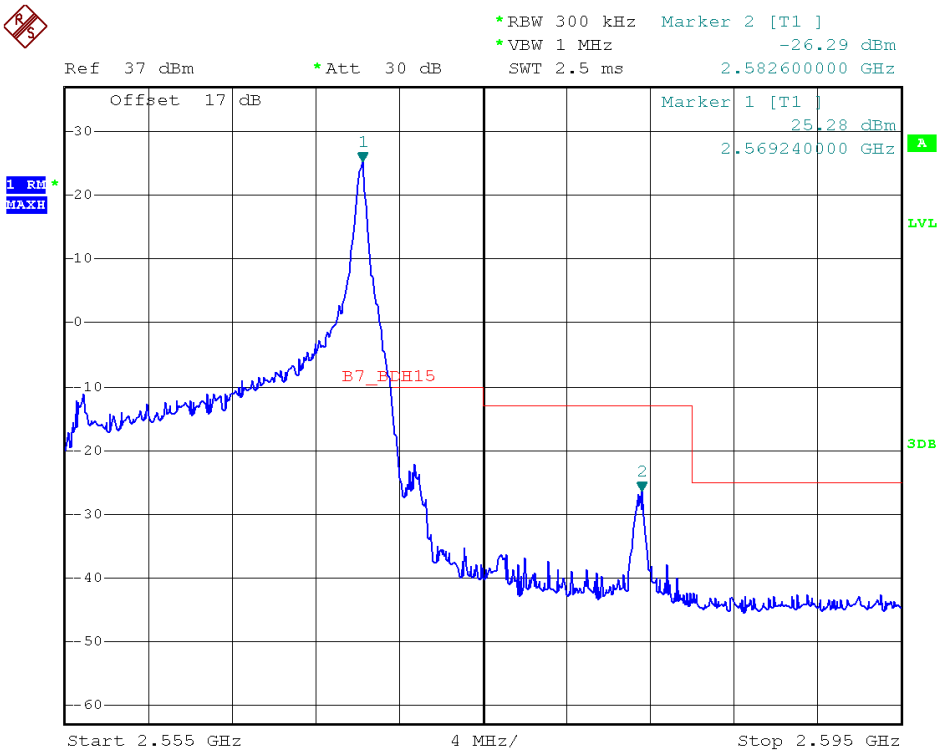
Band	LTE Band 7	Modulation	16QAM
Bandwidth	15MHz		



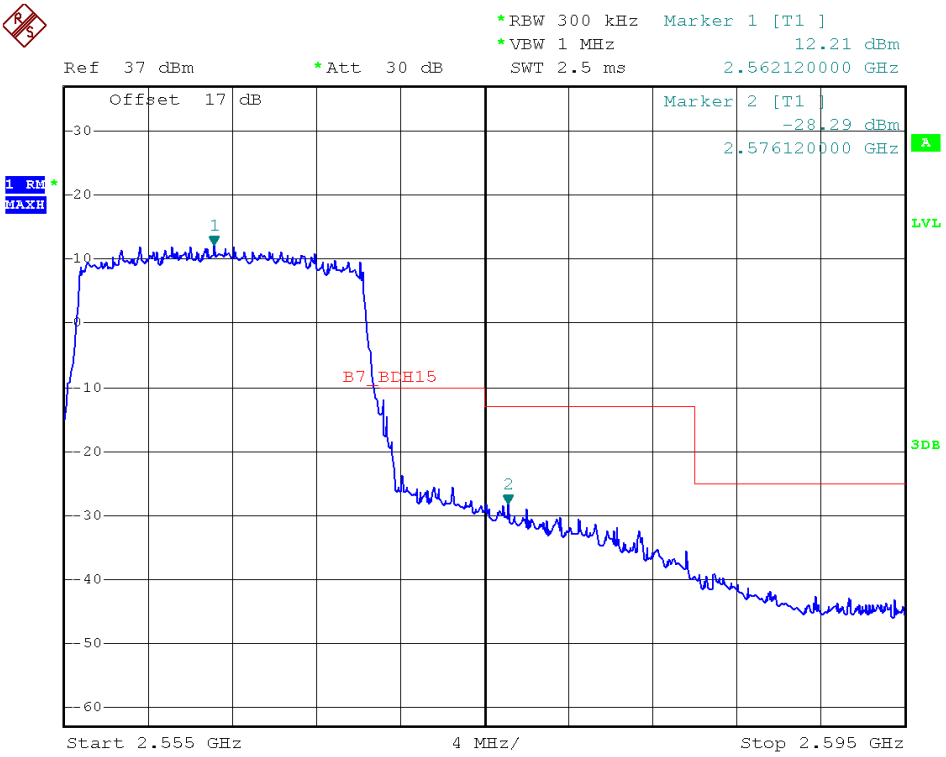
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



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

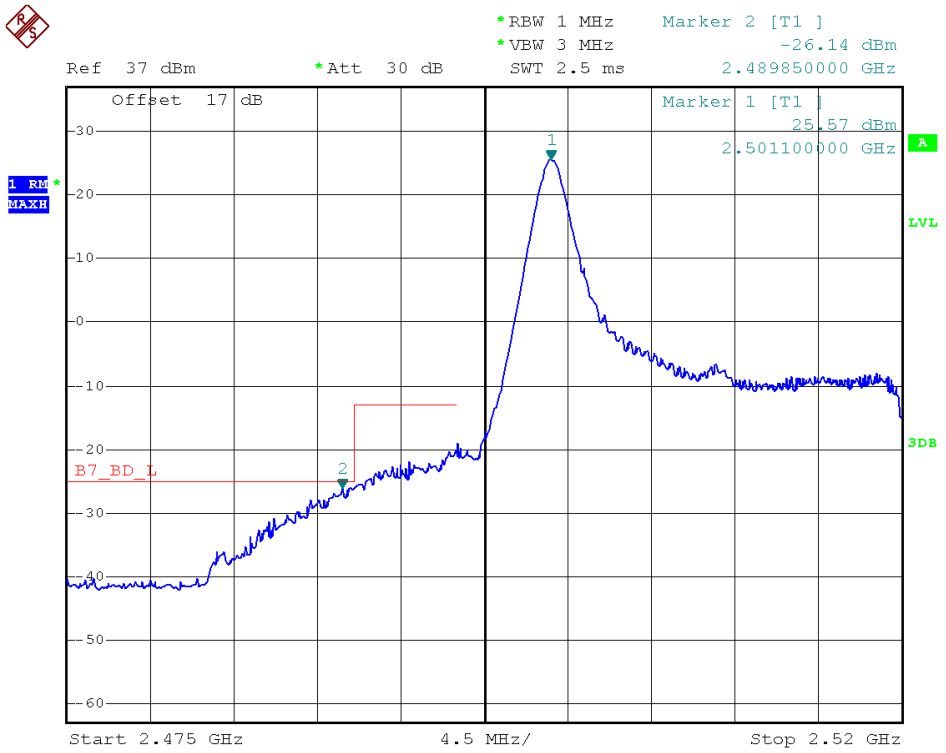


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 74

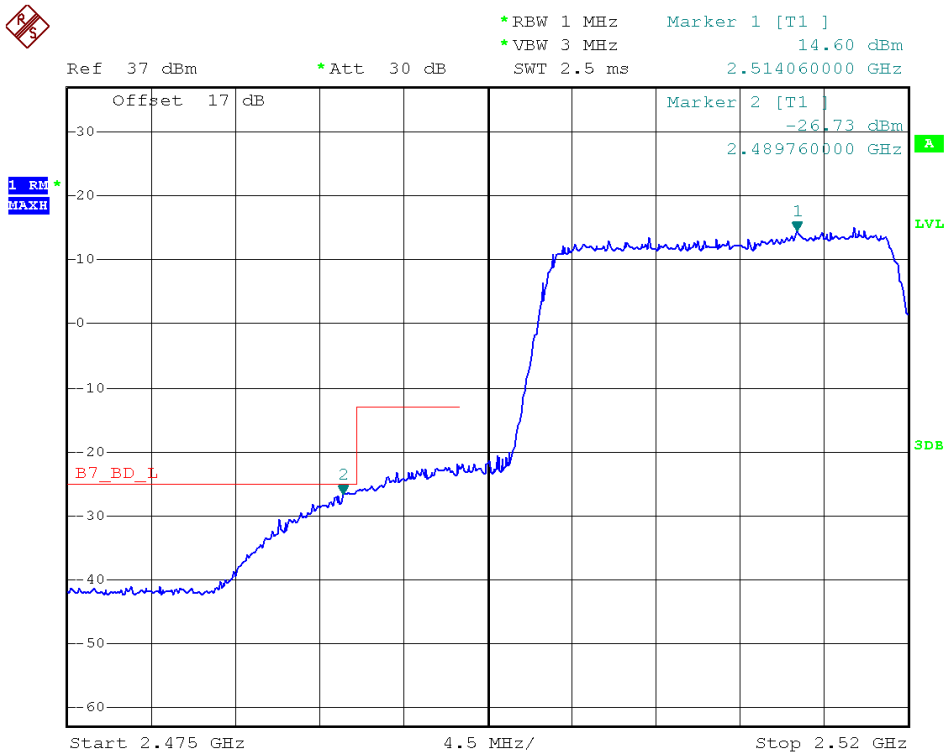


Higher Band Edge Plot for 16QAM -RB Size 75, RB Offset 0

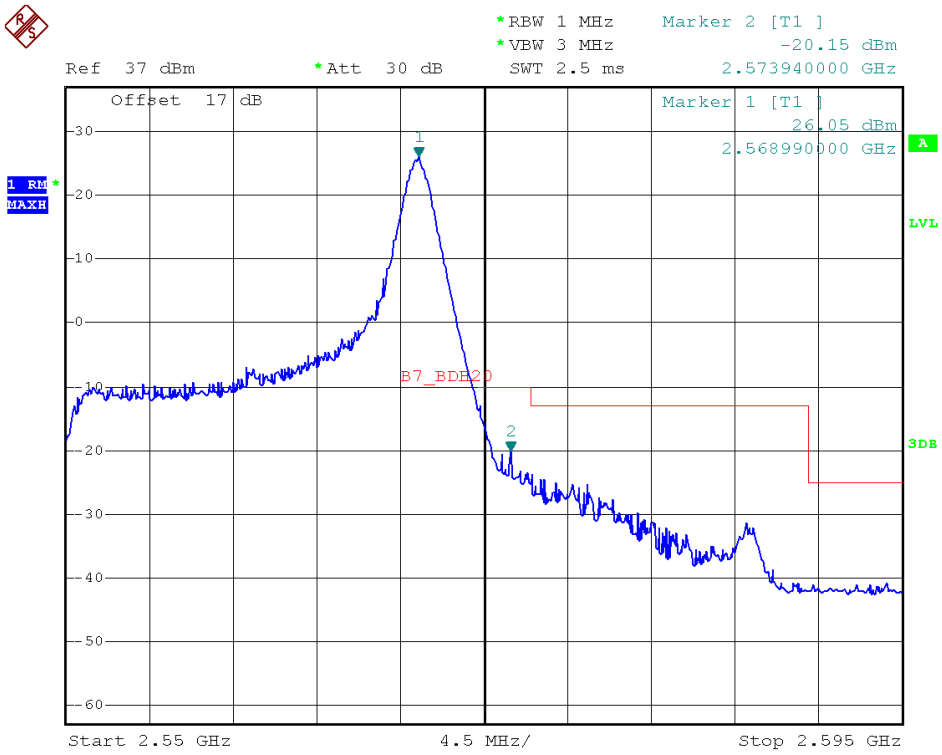
Band	LTE Band 7	Modulation	QPSK
Bandwidth	20MHz		



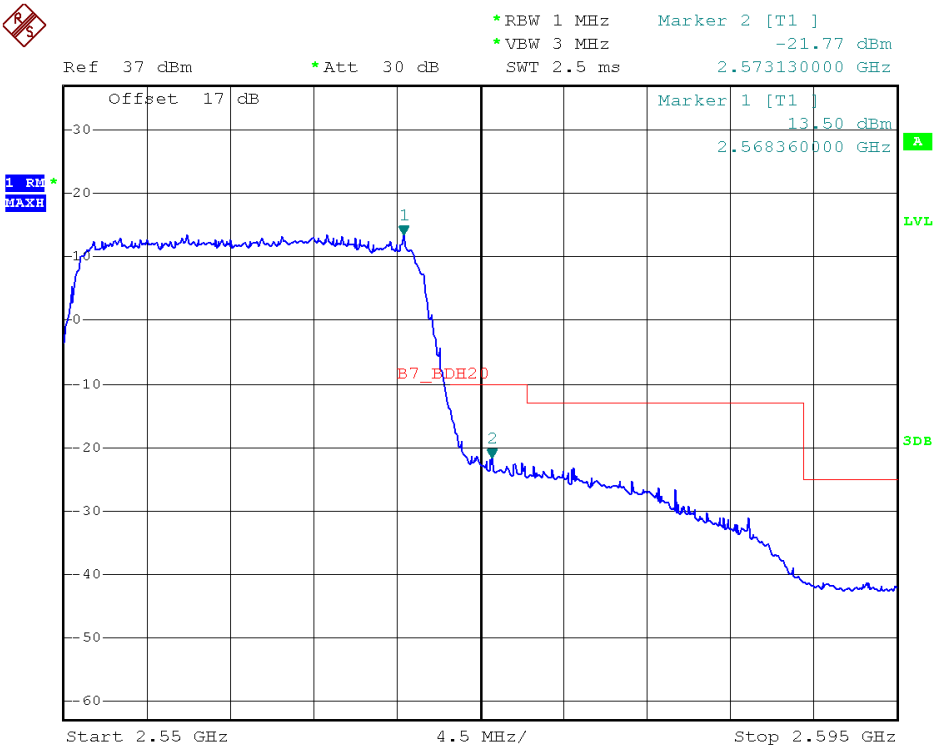
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



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

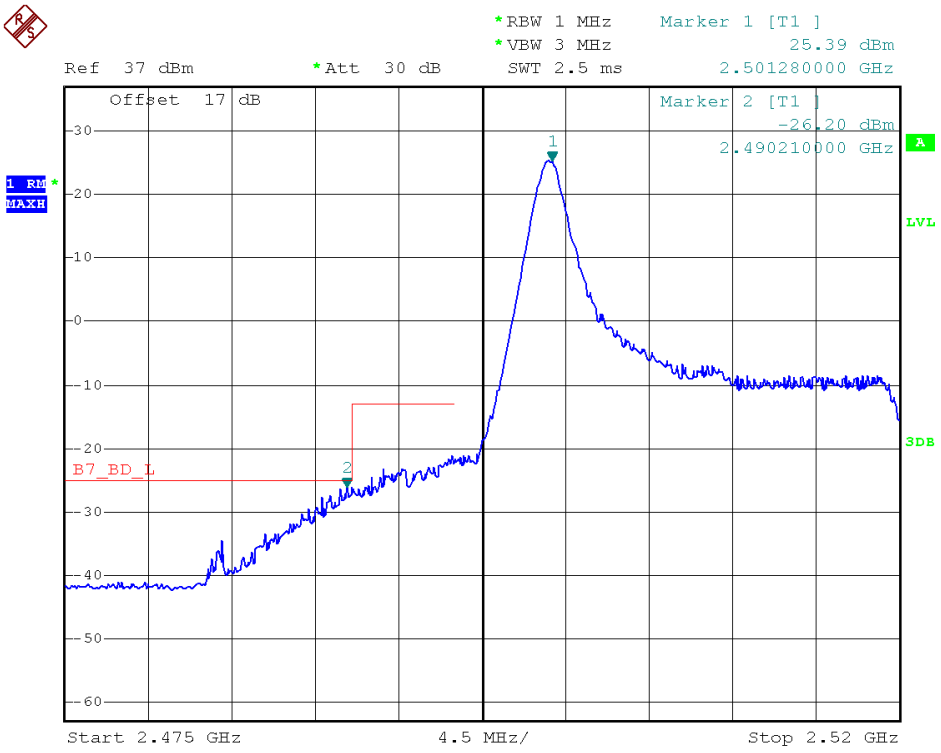


Higher Band Edge Plot for QPSK -RB Size 1, RB Offset 99

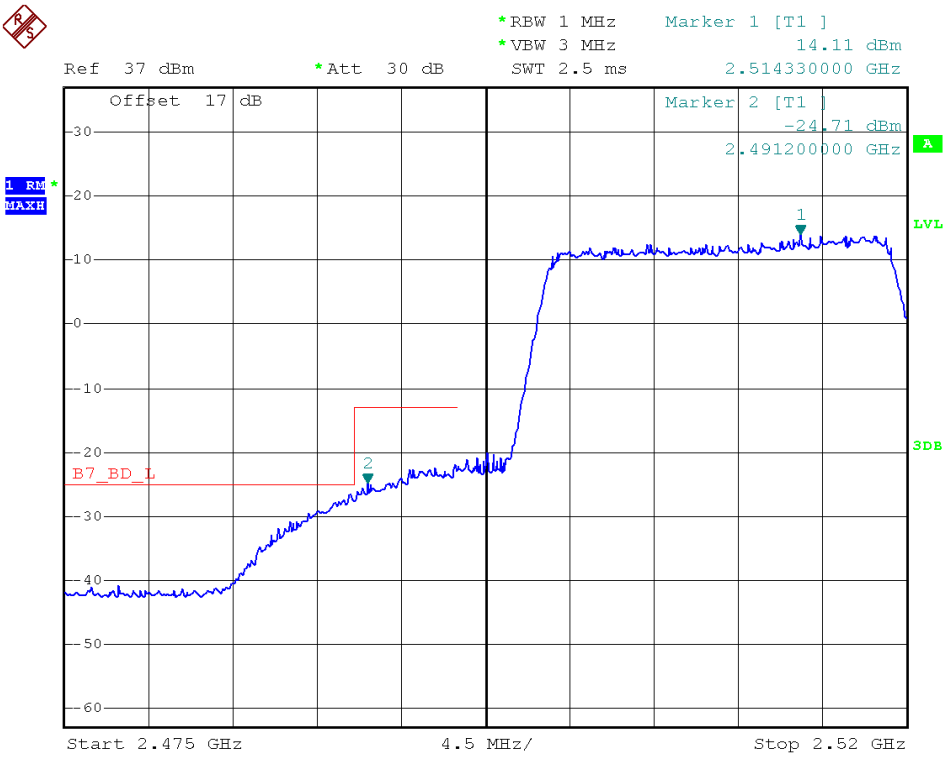


Higher Band Edge Plot for QPSK -RB Size 100, RB Offset 0

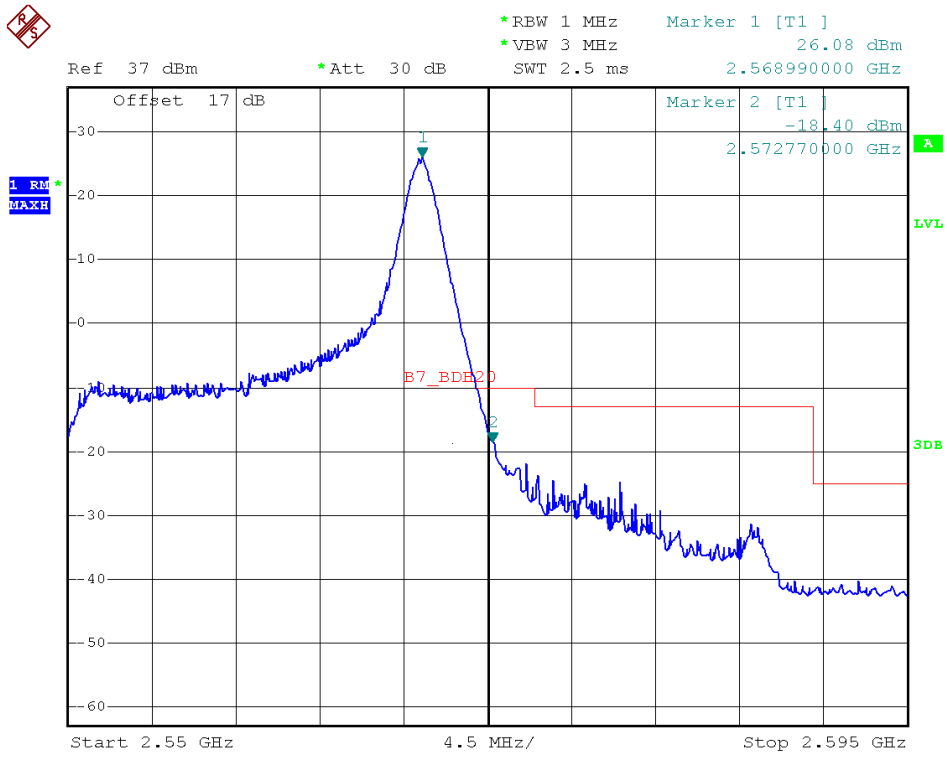
Band	LTE Band 7	Modulation	16QAM
Bandwidth	20MHz		



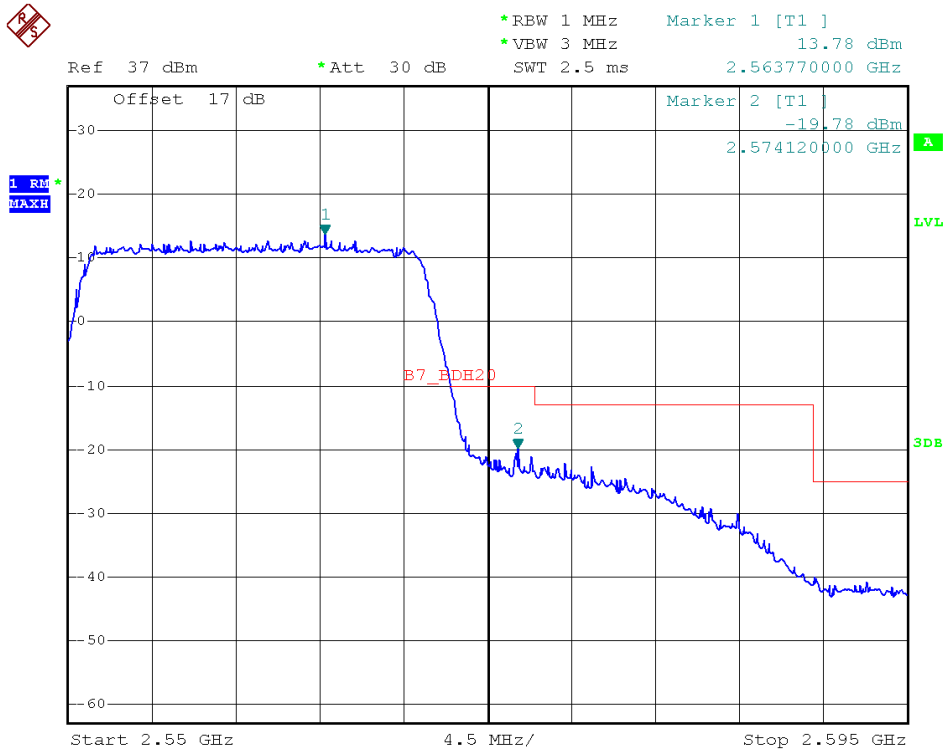
Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



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



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



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

2.7 Transmitter Radiated Power (EIRP/ERP)

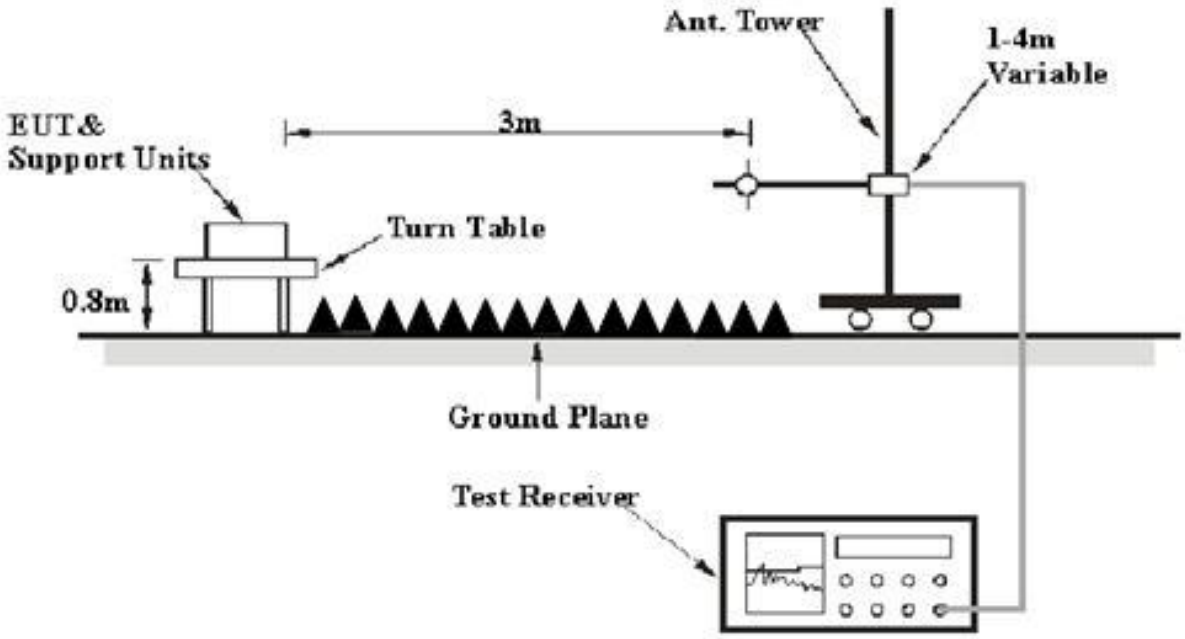
2.7.1 Requirement

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 v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 / 7 and 1 watt with LTE band 4.

2.7.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3 Test Setup



2.7.4 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 D01v02r02.

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 = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

Ps (dBm)：Input power to substitution antenna.

Gs (dBi or dBd)：Substitution antenna Gain.

Et = Rt + AF

Es = Rs + AF

AF (dB/m)：Receive antenna factor

Rt：The highest received signal in spectrum analyzer for EUT.

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

2.7.5 Test Result of ERP/EIRP

1. LTE Band 4 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
4	1.4	QPSK	3	0	1710.7	21.21	H	PASS
4	1.4	QPSK	3	2	1732.5	21.24	H	PASS
4	1.4	QPSK	1	2	1754.3	**21.25**	H	PASS
4	1.4	QPSK	3	0	1710.7	20.86	V	PASS
4	1.4	QPSK	3	2	1732.5	20.84	V	PASS
4	1.4	QPSK	1	2	1754.3	20.87	V	PASS
4	1.4	16QAM	3	2	1710.7	20.39	H	PASS
4	1.4	16QAM	3	2	1732.5	**20.40**	H	PASS
4	1.4	16QAM	3	2	1754.3	20.37	H	PASS
4	1.4	16QAM	3	2	1710.7	19.87	V	PASS
4	1.4	16QAM	3	2	1732.5	19.81	V	PASS
4	1.4	16QAM	3	2	1754.3	19.82	V	PASS
4	3	QPSK	1	0	1711.5	21.21	H	PASS
4	3	QPSK	1	0	1732.5	**21.27**	H	PASS
4	3	QPSK	1	7	1753.5	21.25	H	PASS
4	3	QPSK	1	0	1711.5	20.80	V	PASS
4	3	QPSK	1	0	1732.5	20.84	V	PASS
4	3	QPSK	1	7	1753.5	20.81	V	PASS
4	3	16QAM	1	14	1711.5	20.32	H	PASS
4	3	16QAM	1	14	1732.5	20.34	H	PASS
4	3	16QAM	1	14	1753.5	**20.37**	H	PASS
4	3	16QAM	1	14	1711.5	19.87	V	PASS
4	3	16QAM	1	14	1732.5	19.82	V	PASS
4	3	16QAM	1	14	1753.5	19.90	V	PASS
4	5	QPSK	1	12	1712.5	21.27	H	PASS
4	5	QPSK	1	24	1732.5	**21.32**	H	PASS
4	5	QPSK	1	24	1752.5	21.29	H	PASS
4	5	QPSK	1	12	1712.5	20.76	V	PASS
4	5	QPSK	1	24	1732.5	20.80	V	PASS
4	5	QPSK	1	24	1752.5	20.78	V	PASS
4	5	16QAM	1	24	1712.5	20.35	H	PASS
4	5	16QAM	1	0	1732.5	20.31	H	PASS
4	5	16QAM	1	0	1752.5	**20.39**	H	PASS
4	5	16QAM	1	24	1712.5	19.72	V	PASS
4	5	16QAM	1	0	1732.5	19.85	V	PASS
4	5	16QAM	1	0	1752.5	19.78	V	PASS

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
4	10	QPSK	1	24	1715	**21.29**	H	PASS
4	10	QPSK	1	0	1732.5	21.25	H	PASS
4	10	QPSK	1	24	1750	21.26	H	PASS
4	10	QPSK	1	24	1715	20.77	V	PASS
4	10	QPSK	1	0	1732.5	20.82	V	PASS
4	10	QPSK	1	24	1750	20.76	V	PASS
4	10	16QAM	1	24	1715	20.31	H	PASS
4	10	16QAM	1	0	1732.5	**20.36**	H	PASS
4	10	16QAM	1	24	1750	20.33	H	PASS
4	10	16QAM	1	24	1715	19.82	V	PASS
4	10	16QAM	1	0	1732.5	19.75	V	PASS
4	10	16QAM	1	24	1750	19.83	V	PASS
4	15	QPSK	1	74	1717.5	21.34	H	PASS
4	15	QPSK	1	74	1732.5	**21.38**	H	PASS
4	15	QPSK	1	0	1747.5	21.33	H	PASS
4	15	QPSK	1	74	1717.5	20.83	V	PASS
4	15	QPSK	1	74	1732.5	20.85	V	PASS
4	15	QPSK	1	0	1747.5	20.79	V	PASS
4	15	16QAM	1	74	1717.5	20.34	H	PASS
4	15	16QAM	1	0	1732.5	20.30	H	PASS
4	15	16QAM	1	0	1747.5	**20.39**	H	PASS
4	15	16QAM	1	74	1717.5	19.86	V	PASS
4	15	16QAM	1	0	1732.5	19.81	V	PASS
4	15	16QAM	1	0	1747.5	19.89	V	PASS
4	20	QPSK	1	0	1720	21.37	H	PASS
4	20	QPSK	1	0	1732.5	**21.42**	H	PASS
4	20	QPSK	1	0	1745	21.39	H	PASS
4	20	QPSK	1	0	1720	20.79	V	PASS
4	20	QPSK	1	0	1732.5	20.84	V	PASS
4	20	QPSK	1	0	1745	20.86	V	PASS
4	20	16QAM	1	0	1720	20.37	H	PASS
4	20	16QAM	1	0	1732.5	20.39	H	PASS
4	20	16QAM	1	0	1745	**20.41**	H	PASS
4	20	16QAM	1	0	1720	19.83	V	PASS
4	20	16QAM	1	0	1732.5	19.86	V	PASS
4	20	16QAM	1	0	1745	19.84	V	PASS

2. LTE Band 7 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	H/V	Verdict
			RB Size	RB Offset				
7	5	QPSK	1	12	2502.5	21.16	H	PASS
7	5	QPSK	1	0	2535	21.10	H	PASS
7	5	QPSK	1	24	2567.5	**21.18**	H	PASS
7	5	QPSK	1	12	2502.5	20.76	V	PASS
7	5	QPSK	1	0	2535	20.70	V	PASS
7	5	QPSK	1	24	2567.5	20.75	V	PASS
7	5	16QAM	1	24	2502.5	20.25	H	PASS
7	5	16QAM	1	24	2535	20.22	H	PASS
7	5	16QAM	1	0	2567.5	**20.27**	H	PASS
7	5	16QAM	1	24	2502.5	19.72	V	PASS
7	5	16QAM	1	24	2535	19.75	V	PASS
7	5	16QAM	1	0	2567.5	19.78	V	PASS
7	10	QPSK	1	24	2505	**21.15**	H	PASS
7	10	QPSK	1	49	2535	21.09	H	PASS
7	10	QPSK	1	24	2565	21.11	H	PASS
7	10	QPSK	1	24	2505	20.73	V	PASS
7	10	QPSK	1	49	2535	20.78	V	PASS
7	10	QPSK	1	24	2565	20.75	V	PASS
7	10	16QAM	1	24	2505	20.20	H	PASS
7	10	16QAM	1	49	2535	20.18	H	PASS
7	10	16QAM	1	24	2565	**20.23**	H	PASS
7	10	16QAM	1	24	2505	19.82	V	PASS
7	10	16QAM	1	49	2535	19.75	V	PASS
7	10	16QAM	1	24	2565	19.83	V	PASS
7	15	QPSK	1	37	2507.5	**21.21**	H	PASS
7	15	QPSK	1	74	2535	21.13	H	PASS
7	15	QPSK	1	0	2562.5	21.10	H	PASS
7	15	QPSK	1	37	2507.5	20.75	V	PASS
7	15	QPSK	1	74	2535	20.70	V	PASS
7	15	QPSK	1	0	2562.5	20.79	V	PASS
7	15	16QAM	1	37	2507.5	20.24	H	PASS
7	15	16QAM	1	18	2535	20.20	H	PASS
7	15	16QAM	1	0	2562.5	**20.31**	H	PASS
7	15	16QAM	1	37	2507.5	19.86	V	PASS
7	15	16QAM	1	18	2535	19.81	V	PASS
7	15	16QAM	1	0	2562.5	19.79	V	PASS

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	H/V	Verdict
			RB Size	RB Offset				
7	20	QPSK	1	0	2510	21.19	H	PASS
7	20	QPSK	1	0	2535	21.24	H	PASS
7	20	QPSK	1	0	2560	**21.24**	H	PASS
7	20	QPSK	1	0	2510	20.79	V	PASS
7	20	QPSK	1	0	2535	20.74	V	PASS
7	20	QPSK	1	0	2560	20.75	V	PASS
7	20	16QAM	1	0	2510	20.29	H	PASS
7	20	16QAM	1	0	2535	**20.34**	H	PASS
7	20	16QAM	1	0	2560	20.32	H	PASS
7	20	16QAM	1	0	2510	19.83	V	PASS
7	20	16QAM	1	0	2535	19.86	V	PASS
7	20	16QAM	1	0	2560	19.91	V	PASS

2.8 Radiated Out of Band Emissions

2.8.1 Requirement

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.

For Band 7

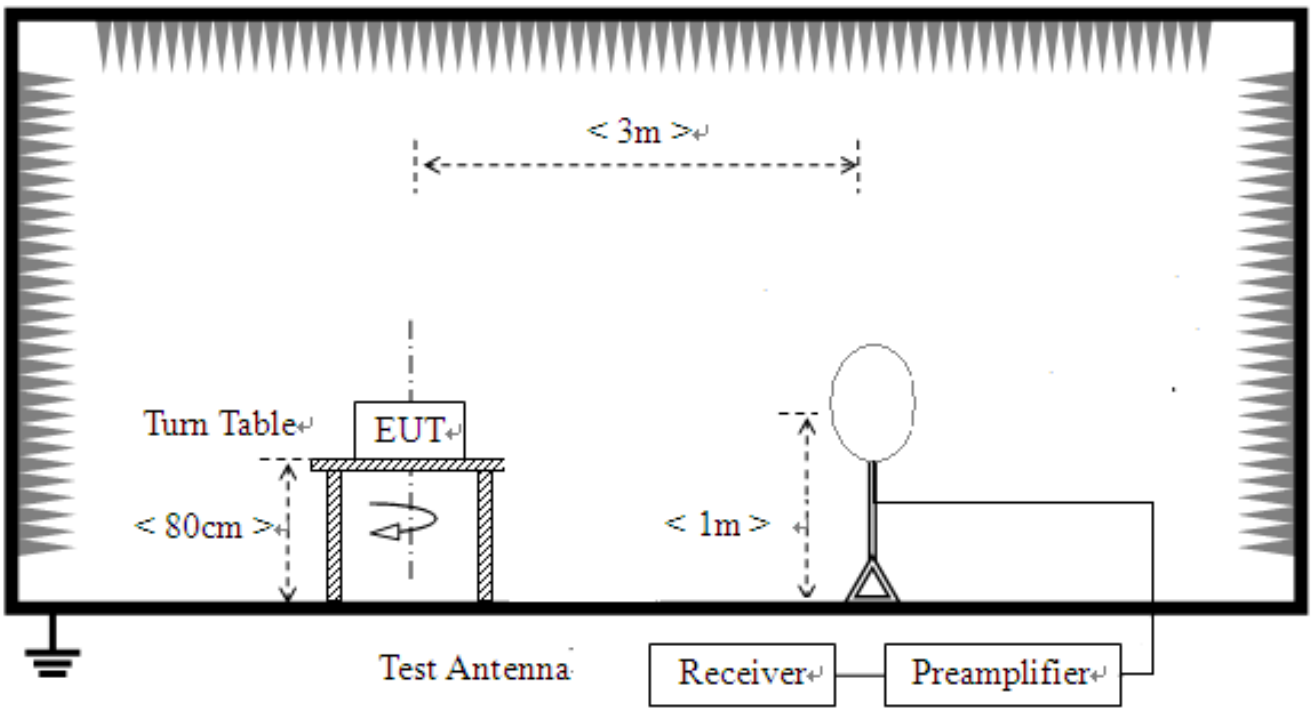
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

2.8.2 Measuring Instruments

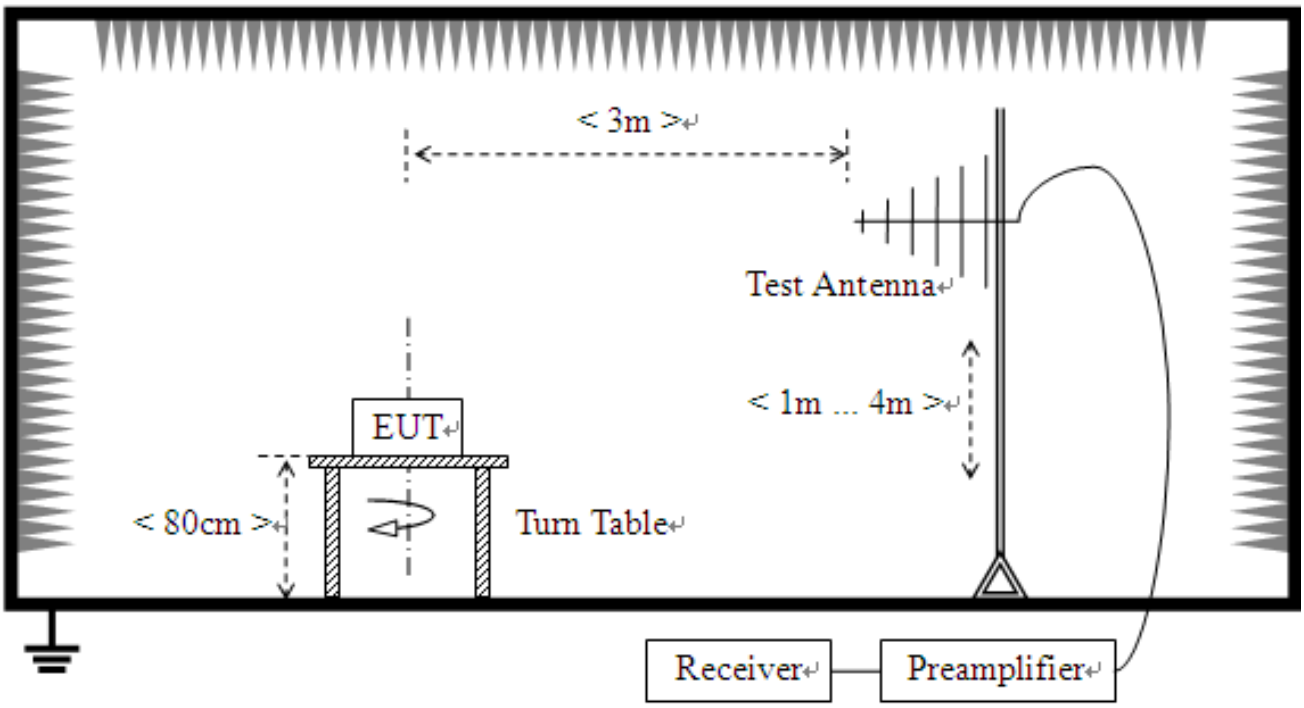
The measuring equipment is listed in the section 3 of this test report.

2.8.3 Test Setup

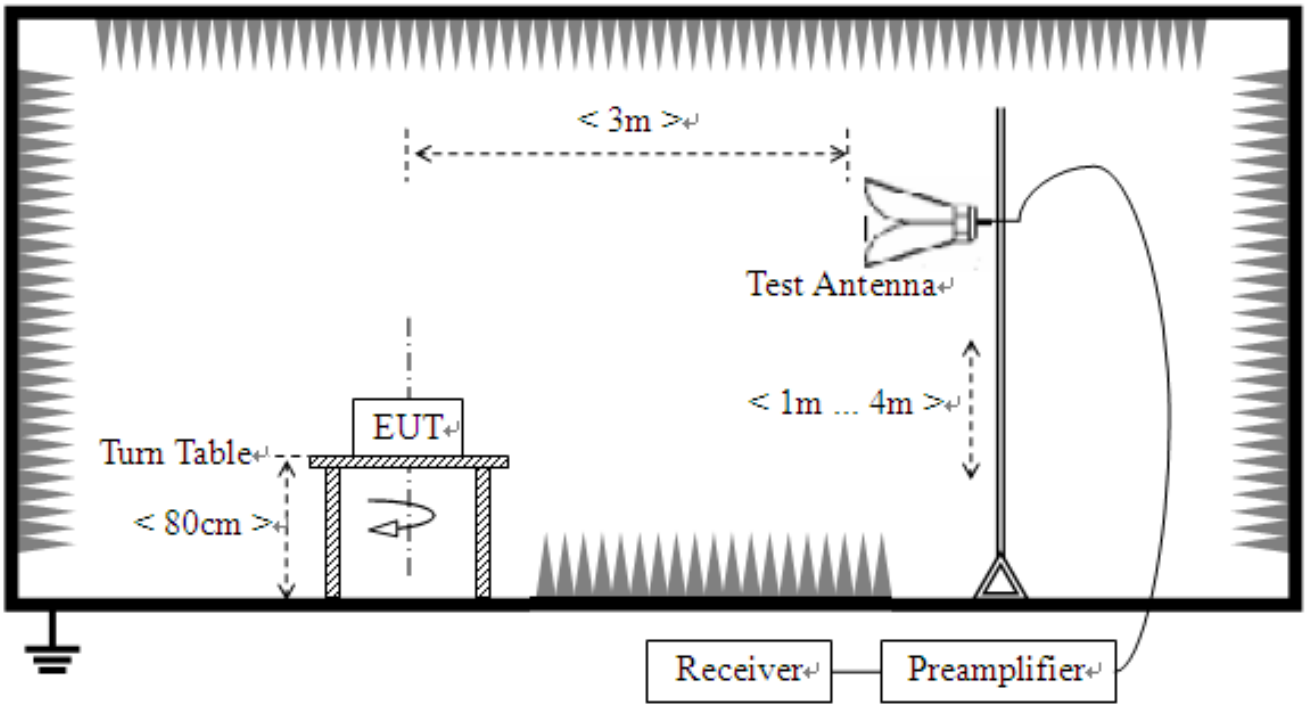
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.8.4 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 + 10log(P)dB below the transmitter power P(Watts)

    = P(W)- [43 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

    = -13dBm.

    <For Band 7>

    The limit line is derived from 55+ 10log(P)dB below the transmitter power P(Watts)

    = P(W)- [55 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)

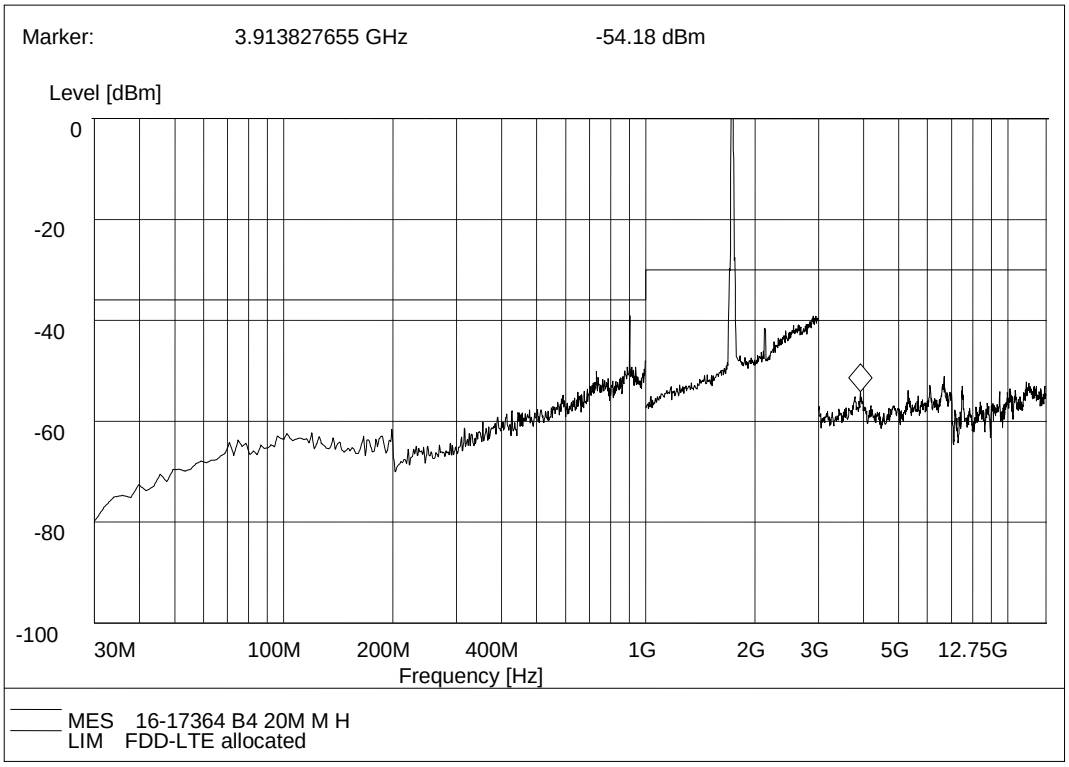
    = -25dBm.
11. All Spurious Emission tests were performed in X, Y, Z axis direction and low, middle, high channel. And only the worst axis test condition was recorded in this test report.
12. The spectrum is measured from 9 KHz to the 10^{th} harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. The worst case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.

13. The maximum RB configurations of the Radiated Spurious Emissions as RB Size 1, RB Offset 0

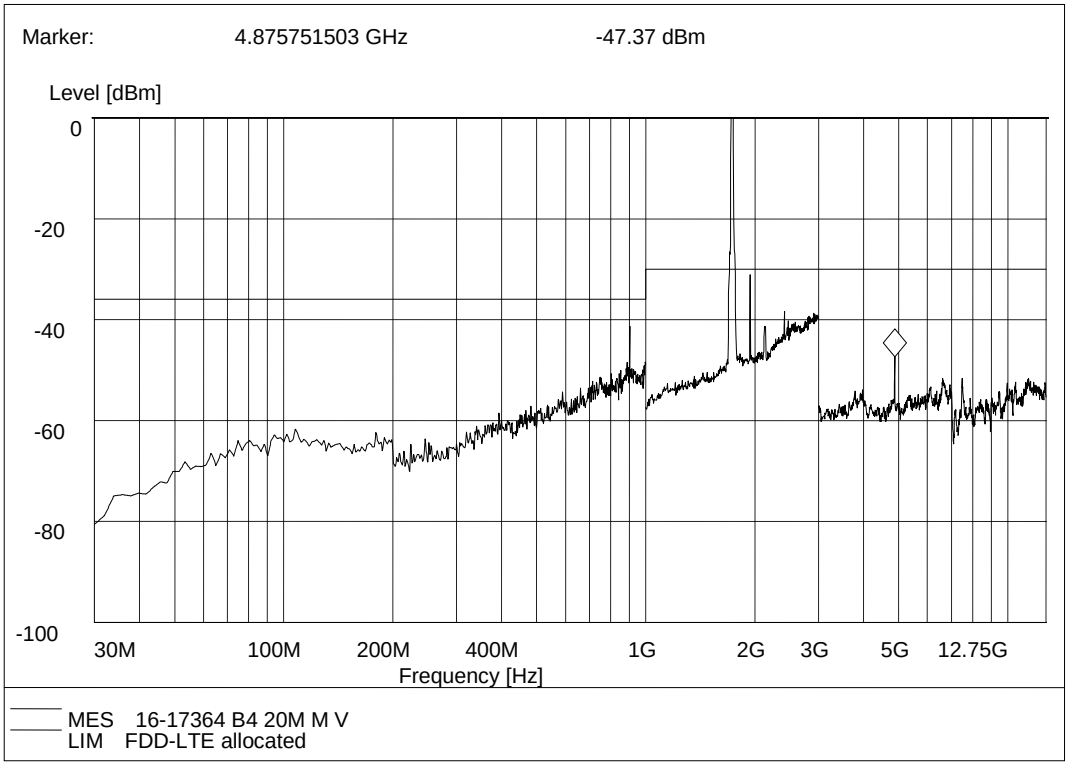
2.8.5 Test Result (Plots) of Radiated Spurious Emission

Note1: For 9 KHz to 30MHz: the amplitude of spurious emissions is attenuated by more than 20dB below the permissible value, so we not provide the test result here.

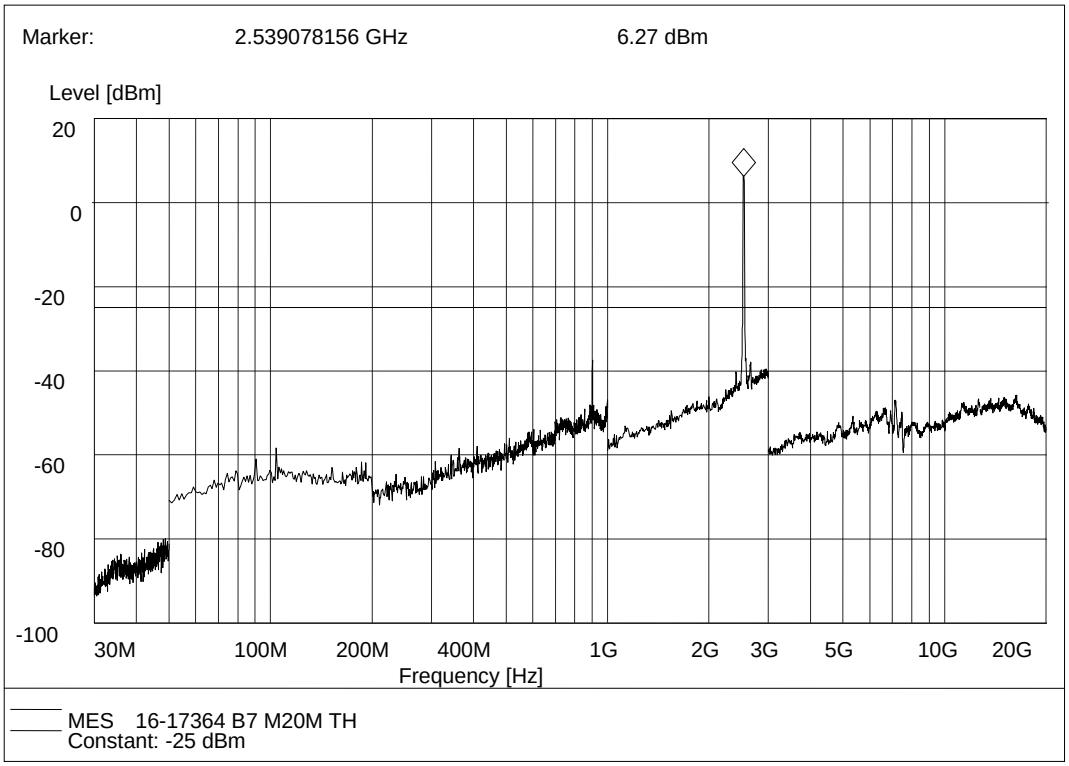
Note2: For band 4,5, all of the bandwidth were tested and found 20MHz bandwidth is the worst bandwidth，the worst case were recorded in this report.



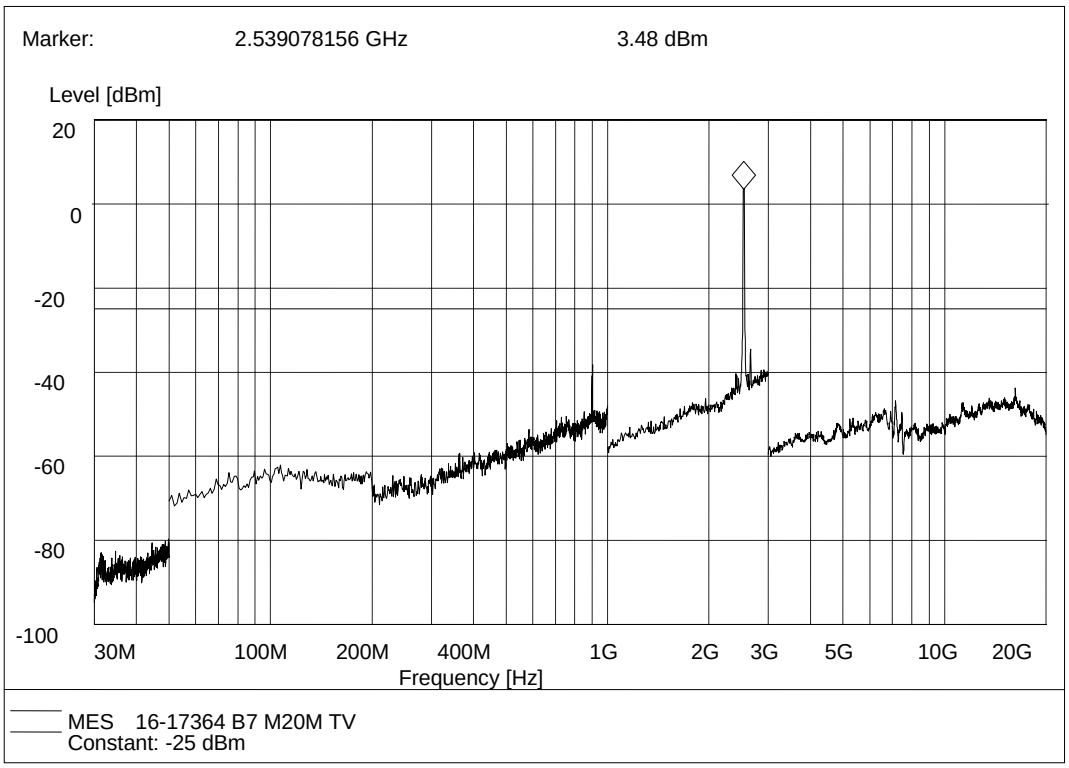
` LTE Band 4 QPSK 15MHz BW Test Antenna Horizontal



LTE Band 4 QPSK 15MHz BW Test Antenna Vertical



LTE Band 7 QPSK 15MHz BW Test Antenna Horizontal



LTE Band 7 QPSK 15MHz BW Test Antenna Vertical

3. LIST OF MEASURING EQUIPMENT

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	2015/11/02
2	RF TEST PANEL	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
3	EMI TEST SOFTWARE	Rohde&Schwarz	ESK1	N/A	N/A
4	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2015/11/08
5	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2015/11/08
6	HORN ANTENNA	ShwarzBeck	9120D	1011	2015/11/08
7	HORN ANTENNA	ShwarzBeck	9120D	1012	2015/11/08
8	Loop Antenna	Rohde&Schwarz	HZ-9	838622\013	2015/11/08
9	HORN ANTENNA	Rohde&Schwarz	HF906	10068	2015/11/02
10	HORN ANTENNA	Rohde&Schwarz	HF906	10039	2015/11/02
11	Pre-amplifer	ShwarzBeck	BBV 9743	9743-0022	2015/11/02
12	Pre-amplifier	ShwarzBeck	BBV 9718	BBV 9718	2015/11/02
13	TURNTABLE	MATURO	TT2.0	N/A	N/A
14	ANTENNA MAST	MATURO	TAM-4.0-P	N/A	N/A
15	EMI TEST SOFTWARE	Audix	E3	N/A	N/A
16	Test cable	Siva Cables Italy	RG 58A/U	W14.02	2015/12/05
17	Climate Chamber	ESPEC	EL-10KA	05107008	2015/11/02
18	Spectrum Analyzer	Kysight	N9030A	ATO-67098	2016/07/19
19	Power Meter	Rohde&Schwarz	NRP2	1020.1809.02	2016.06.02
20	Power Sensor	Rohde&Schwarz	NRP-Z81	823.3618.03	2016.06.02
21	System Simulator	Rohde&Schwarz	CMU200	112012	2015/11/2
22	System Simulator	R&S	CMW500	148888	2016.06.02

4. UNCERTAINTY OF EVALUATION

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2

Measurement	Frequency	Uncertainty
Conducted Emission	9kHz~30MHz	3.39dB
Radiated Emission	30MHz~1000MHz	4.24dB
	1G~18GHz	5.16dB
	18G~40GHz	5.54dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

** END OF REPORT **