



FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : WCDMA / LTE Multi-Mode Digital Mobile Phone
BRAND NAME : ZTE
MODEL NAME : Z958
MARKETING NAME : Z958
FCC ID : SRQ-Z958
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on May 07, 2015 and completely tested on Jun. 02, 2015. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in compliance with the applicable technical standards.

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

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



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



TABLE OF CONTENTS

REVISION HISTORY.....3
SUMMARY OF TEST RESULT4
1 GENERAL DESCRIPTION6
1.1 Applicant.....6
1.2 Manufacturer.....6
1.3 Product Feature of Equipment Under Test.....6
1.4 Product Specification subjective to this standard7
1.5 Modification of EUT8
1.6 Emission Designator.....8
1.7 Testing Location10
1.8 Applicable Standards.....10
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST11
2.1 Test Mode.....11
2.2 Connection Diagram of Test System.....13
2.3 Support Unit used in test configuration and system.....14
2.4 Measurement Results Explanation Example.....14
3 CONDUCTED TEST ITEMS15
3.1 Measuring Instruments15
3.2 Test Setup15
3.3 Test Result of Conducted Test.....15
3.4 Conducted Output Power16
3.5 Peak-to-Average Ratio16
3.6 Occupied Bandwidth.....17
3.7 Conducted Band Edge17
3.8 Conducted Spurious Emission18
3.9 Frequency Stability19
4 RADIATED TEST ITEMS20
4.1 Measuring Instruments20
4.2 Test Setup20
4.3 Test Result of Radiated Test.....20
4.4 Effective Radiated Power and Effective Isotropic Radiated Power.....21
4.5 Radiated Spurious Emission23
5 LIST OF MEASURING EQUIPMENT24
6 UNCERTAINTY OF EVALUATION25
APPENDIX A. TEST RESULTS OF CONDUCTED TEST
APPENDIX B. TEST RESULTS OF RADIATED TEST
APPENDIX C. TEST SETUP PHOTOGRAPHS



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.5	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(g)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 12) (Band 17)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(g)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 17)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355 §24.235 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22 Within Authorized Band	PASS	-



4.4	§22.913(a)(2)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(c)(10)	Effective Radiated Power (Band 12) (Band 17)	ERP < 3 Watt		
	§24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	EIRP < 2Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt		
4.5	§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 17)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 29.49 dB at 7503.000 MHz



1 General Description

1.1 Applicant

ZTE CORPORATION

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

1.2 Manufacturer

ZTE CORPORATION

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

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	WCDMA / LTE Multi-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z958
Marketing Name	Z958
FCC ID	SRQ-Z958
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/LTE WLAN2.4GHz 802.11b/g/n HT20 Bluetooth v3.0+EDR Bluetooth v4.0 LE
IMEI Number	Conducted: 867420020000883 Radiation: 867428020003925 ERP/EIRP: 867420020001519
HW Version	u02A
SW Version	Z958V1.0.0B01
EUT Stage	Identical Prototype



1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 17 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 12 : 23.81 dBm
Type of Modulation	QPSK / 16QAM



1.5 Modification of EUT

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

1.6 Emission Designator

LTE Band 2	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
1.4	-	-	0.4027	-	-	0.3273
3	-	-	0.3926	-	-	0.3236
5	-	-	0.3516	-	-	0.3020
10	-	-	0.3802	-	-	0.2844
15	-	-	0.4571	-	-	0.3027
20	-	-	0.4018	-	-	0.3573
LTE Band 4	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
1.4	-	-	0.1879	-	-	0.1567
3	-	-	0.1923	-	-	0.1585
5	-	-	0.1892	-	-	0.1722
10	-	-	0.2143	-	-	0.1567
15	-	-	0.2080	-	-	0.1690
20	-	-	0.1995	-	-	0.1578



LTE Band 5	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	-	-	0.0973	-	-	0.0832
3	-	-	0.0979	-	-	0.0897
5	-	-	0.0968	-	-	0.0782
10	-	-	0.0971	-	-	0.0813
LTE Band 12	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	1M10G7D	-	0.1045	1M10W7D	-	0.0889
3	2M73G7D	-	0.1109	2M73W7D	-	0.0881
5	4M51G7D	-	0.1109	4M51W7D	-	0.0895
10	9M11G7D	0.0028	0.1140	9M05W7D	-	0.0910
LTE Band 17	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	-	-	0.1104	-	-	0.0910
10	-	-	0.1102	-	-	0.0927



1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	Sporton Site No.	
	TH01-SZ	

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH02-KS	418269

Note: The test site complies with ANSI C63.4 2009 requirement.

1.8 Applicable Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

Remark:

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



2 Test Configuration of Equipment Under Test

2.1 Test Mode

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.

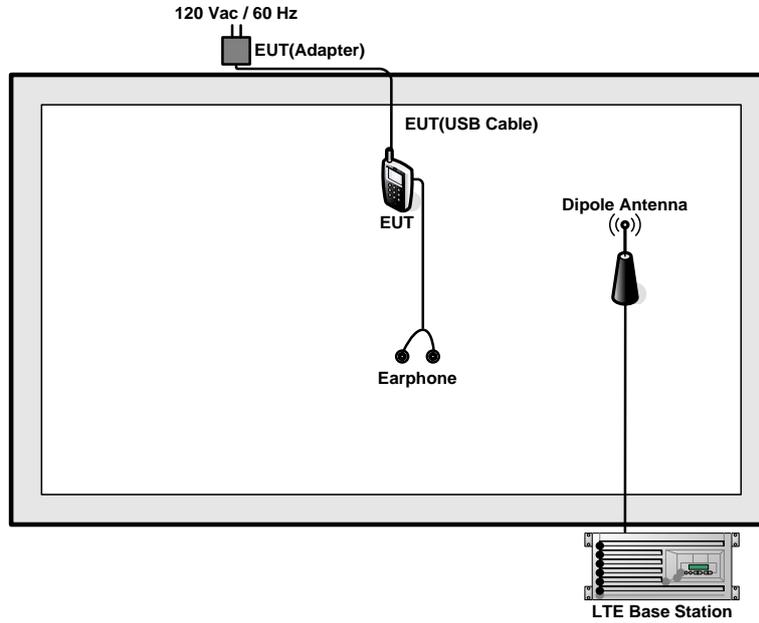
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	12	Y	Y	Y	Y	-	-	Y	Y	Y	Y	Y	Y	Y	Y
Peak-to-Average Ratio	12				Y	-	-	Y	Y	Y		Y	Y	Y	Y
26dB and 99% Bandwidth	12	Y	Y	Y	Y	-	-	Y	Y			Y	Y	Y	Y
Conducted Band Edge	12	Y	Y	Y	Y	-	-	Y	Y	Y		Y	Y		Y



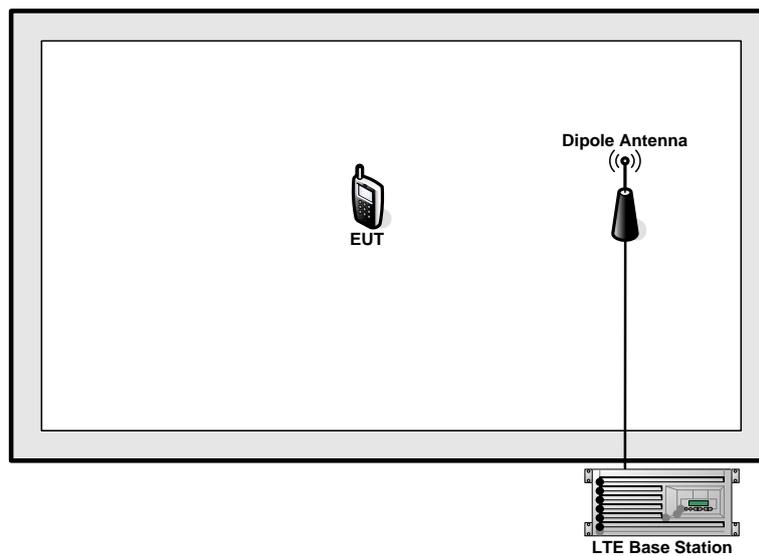
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Conducted Spurious Emission	12	√	√	√	√	-	-	√	√	√			√	√	√
Frequency Stability	12				√	-	-	√				√		√	
E.R.P./ E.I.R.P.	2	√	√	√	√	√	√	√	√	√	√		√	√	√
	4	√	√	√	√	√	√	√	√	√	√		√	√	√
	5	√	√	√	√	-	-	√	√	√			√	√	√
	12	√	√	√	√	-	-	√	√	√			√	√	√
	17	-	-	√	√	-	-	√	√	√			√	√	√
Radiated Spurious Emission	2				√			√		√				√	
	4			√				√		√				√	
	5			√		-	-	√		√				√	
	12	√	√	√	√	-	-	√		√				√	
	17	-	-		√	-	-	√		√				√	
Note	<p>1. The mark “√ “ means that this configuration is chosen for testing</p> <p>2. The mark “-“ means that this bandwidth is not supported.</p> <p>3. 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.</p>														

2.2 Connection Diagram of Test System

For Band 2 / 4 / 5 / 12



For Band 17





2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Lenovo	SH100	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

Following shows an offset computation example with cable loss 4.5 dB and 10dB attenuator.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.5 + 10 = 14.5 \text{ (dB)} \end{aligned}$$

3 Conducted Test Items

3.1 Measuring Instruments

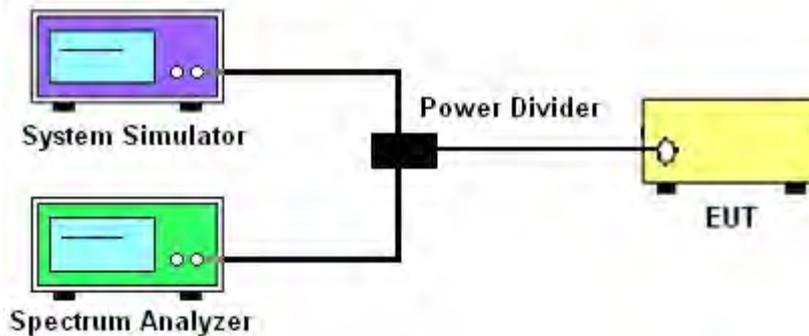
See list of measuring instruments of this test report.

3.2 Test Setup

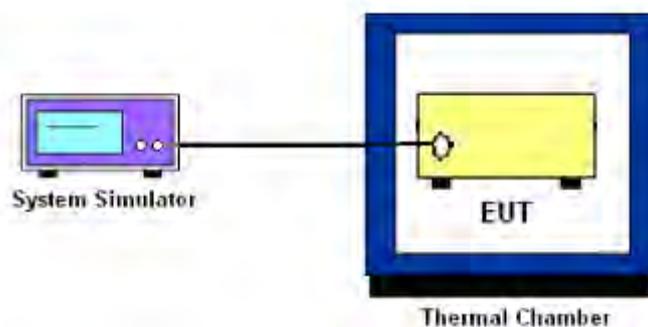
3.2.1 Conducted Output Power



3.2.2 Peak-to-Average Ratio, Occupied Bandwidth ,Conducted Band-Edge and Conducted Spurious Emission



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.



3.4 Conducted Output Power

3.4.1 Description of the Conducted Output Power Measurement

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

3.4.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the 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.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

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

3.5.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.



3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

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

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

3.6.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 4.2.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

27.53 (g) for Band 12

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



3.7.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. 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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

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

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

3.8.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.



3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

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°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

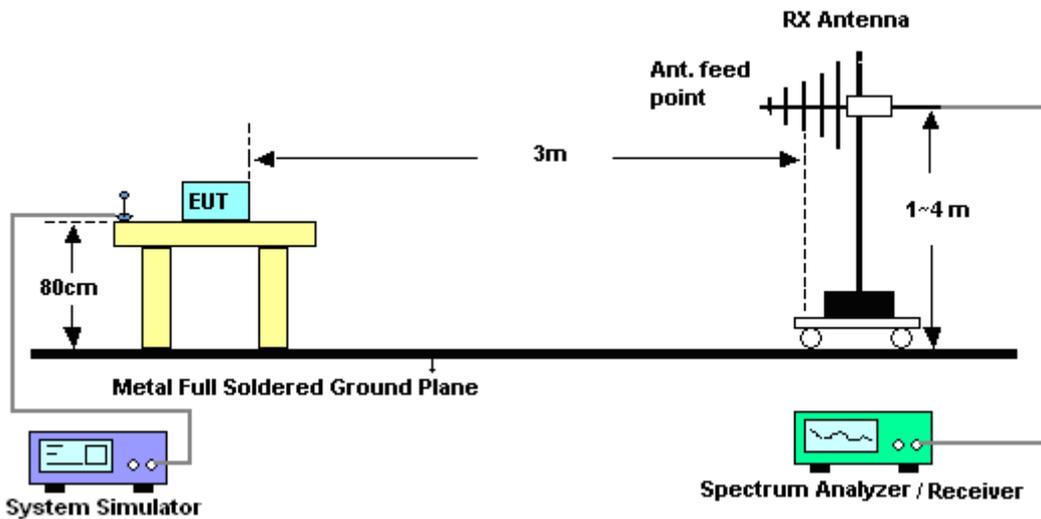
4 Radiated Test Items

4.1 Measuring Instruments

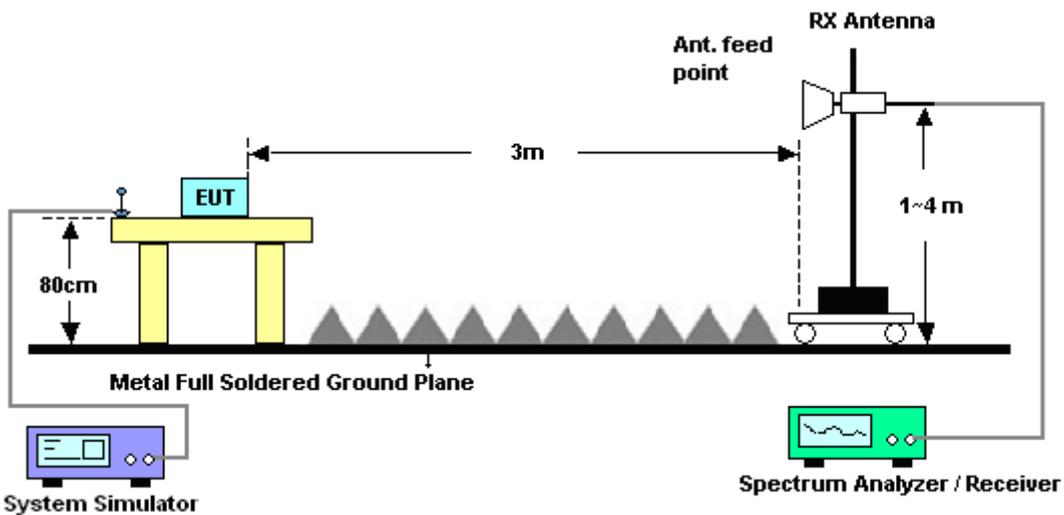
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.



4.4 Effective Radiated Power and Effective Isotropic Radiated Power

4.4.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5 and 3 watts with LTE band 12/17.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 and 1 watt with LTE band 4.

4.4.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.2.1. and ANSI / TIA-603-C-2004 Section 2.2.17.
2. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
3. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
4. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$. Take the record of the output power at substitution antenna.



	LTE					
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1MHz	1MHz	1MHz
Detector	RMS	RMS	RMS	RMS	RMS	RMS
Trace	Average	Average	Average	Average	Average	Average
Average Type	Power	Power	Power	Power	Power	Power
Sweep Count	100	100	100	100	100	100



4.5 Radiated Spurious Emission

4.5.1 Description of Radiated Spurious Emission

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

For LTE Band 12

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.5.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-C-2004 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. 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.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

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

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

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

12. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
13. $\text{ERP (dBm)} = \text{EIRP} - 2.15$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	May 05, 2015	May 18, 2015	May 04, 2016	Conducted (TH01-KS)
Thermal Chamber	Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Sep. 16, 2014	May 18, 2015	Sep. 15, 2015	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 29, 2014	Jun. 01, 2015~ Jun. 02, 2015	Sep. 28, 2015	Radiation (03CH02-KS)
Spectrum Analyzer	R&S	FSV40	101040	10kHz~40GHz;Ma x 30dBm	Sep. 25, 2014	Jun. 01, 2015~ Jun. 02, 2015	Sep. 24, 2015	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 13, 2014	Jun. 01, 2015~ Jun. 02, 2015	Sep. 12, 2015	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 08, 2014	Jun. 01, 2015~ Jun. 02, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Jun. 01, 2015~ Jun. 02, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Sep. 04, 2014	Jun. 01, 2015~ Jun. 02, 2015	Sep. 03, 2015	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	May 04, 2015	Jun. 01, 2015~ Jun. 02, 2015	May 03, 2016	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz Gain 30dB	Oct. 28, 2014	Jun. 01, 2015~ Jun. 02, 2015	Oct. 27, 2015	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Jun. 01, 2015~ Jun. 02, 2015	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 01, 2015~ Jun. 02, 2015	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 01, 2015~ Jun. 02, 2015	NCR	Radiation (03CH02-KS)



6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
---	--------



Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	23.25	23.60	23.43
1.4	1	2		23.44	23.68	23.54
1.4	1	5		23.33	23.52	23.46
1.4	3	0		23.34	23.65	23.50
1.4	3	1		23.51	23.76	23.51
1.4	3	2		23.44	23.66	23.55
1.4	6	0		22.36	22.67	22.51
1.4	1	0	16-QAM	22.54	22.78	22.71
1.4	1	2		22.72	22.91	22.89
1.4	1	5		22.67	22.77	22.80
1.4	3	0		22.49	22.74	22.60
1.4	3	1		22.41	22.76	22.82
1.4	3	2		22.33	22.74	22.83
1.4	6	0		21.33	21.30	21.46
3	1	0	QPSK	23.16	23.53	23.65
3	1	7		23.53	23.63	23.62
3	1	14		23.30	23.45	23.48
3	8	0		22.44	22.59	22.46
3	8	4		22.43	22.66	22.57
3	8	7		22.44	22.64	22.63
3	15	0		22.43	22.67	22.57
3	1	0	16-QAM	22.87	22.96	22.96
3	1	7		22.71	22.86	22.86
3	1	14		22.67	22.98	22.92
3	8	0		21.33	21.58	21.27
3	8	4		21.35	21.63	21.55
3	8	7		21.31	21.71	21.73
3	15	0		21.10	21.53	21.66



LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.19	23.51	23.54
5	1	12		23.34	23.53	23.42
5	1	24		23.56	23.56	23.34
5	12	0		22.33	22.58	22.44
5	12	6		22.38	22.48	22.51
5	12	11		22.40	22.57	22.46
5	25	0		22.47	22.61	22.55
5	1	0	16-QAM	22.63	22.97	22.80
5	1	12		22.67	22.49	22.73
5	1	24		22.90	22.87	22.69
5	12	0		21.38	21.57	21.39
5	12	6		21.44	21.54	21.24
5	12	11		21.34	21.53	21.38
5	25	0		21.29	21.57	21.61
10	1	0	QPSK	23.57	23.66	23.66
10	1	24		23.61	23.66	23.61
10	1	49		23.67	23.81	23.76
10	25	0		22.65	22.68	22.47
10	25	12		22.60	22.61	22.46
10	25	24		22.64	22.56	22.40
10	50	0		22.60	22.64	22.53
10	1	0	16-QAM	22.77	22.98	22.69
10	1	24		22.80	22.88	22.43
10	1	49		22.90	22.91	22.97
10	25	0		21.40	21.59	21.62
10	25	12		21.57	21.54	21.52
10	25	24		21.43	21.53	21.54
10	50	0		21.67	21.58	21.51



Peak-to-Average Ratio

Mode	LTE Band 12 / 10MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	RB Size	Result
Lowest CH	4.00	4.32	4.38	5.22	PASS
Middle CH	2.99	4.38	3.59	5.30	
Highest CH	2.99	4.46	3.83	5.86	



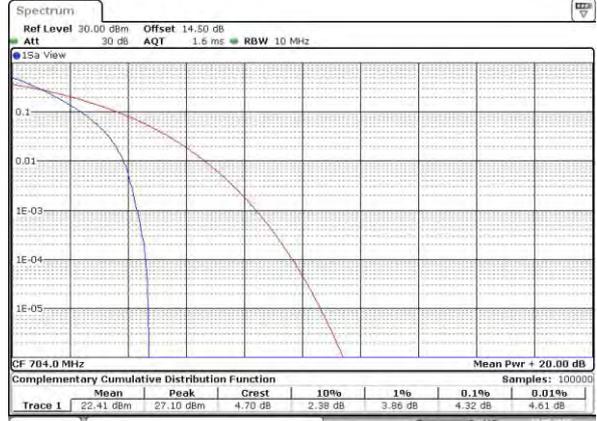
LTE Band 12 / 10MHz / QPSK

Lowest Channel / 1RB



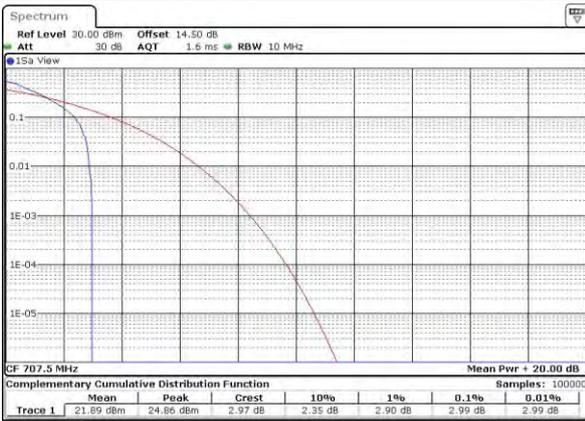
Date: 18 MAY 2015 18:59:07

Lowest Channel / Full RB



Date: 18 MAY 2015 18:59:19

Middle Channel / 1RB



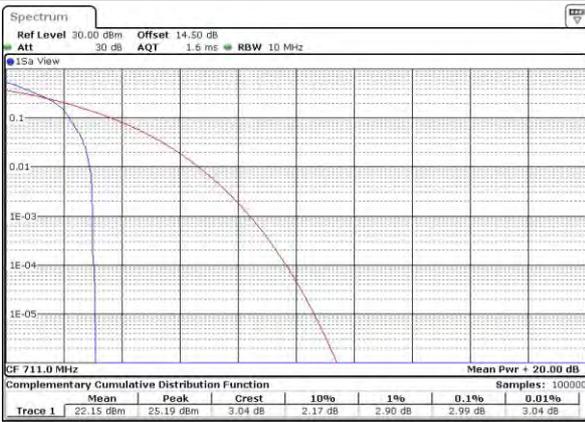
Date: 18 MAY 2015 18:59:37

Middle Channel / Full RB



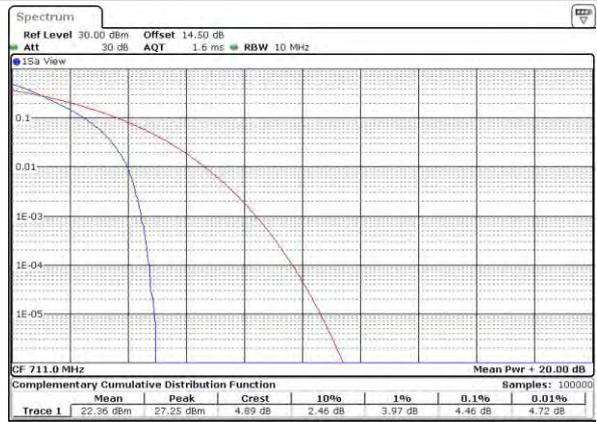
Date: 18 MAY 2015 18:59:51

Highest Channel / 1RB



Date: 18 MAY 2015 19:00:01

Highest Channel / Full RB



Date: 18 MAY 2015 19:18:51



LTE Band 12 / 10MHz / 16QAM

Lowest Channel / 1RB



Date: 18 MAY 2015 18:54:04

Lowest Channel / Full RB



Date: 18 MAY 2015 18:54:16

Middle Channel / 1RB



Date: 18 MAY 2015 18:54:27

Middle Channel / Full RB



Date: 18 MAY 2015 18:56:54

Highest Channel / 1RB



Date: 18 MAY 2015 18:58:36

Highest Channel / Full RB



Date: 18 MAY 2015 18:58:47



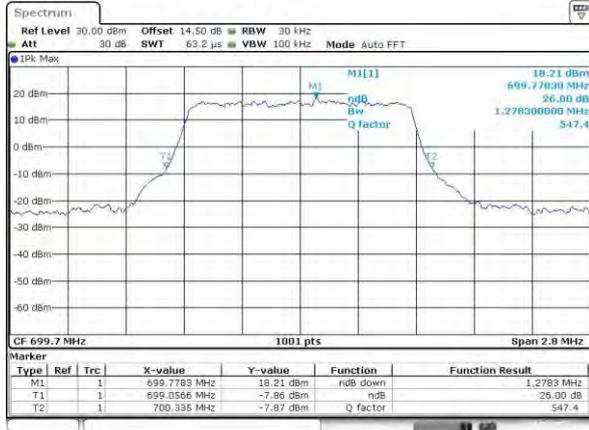
26dB Bandwidth

Mode	LTE Band 12 : 26dB BW(MHz)											
	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
BW	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.278	1.295	3.045	3.057	5.065	5.035	10.150	9.990	-	-	-	-
Middle CH	1.287	1.295	3.051	3.063	5.065	5.065	10.090	10.030	-	-	-	-
Highest CH	1.287	1.298	3.051	3.051	5.065	5.045	9.970	10.010	-	-	-	-



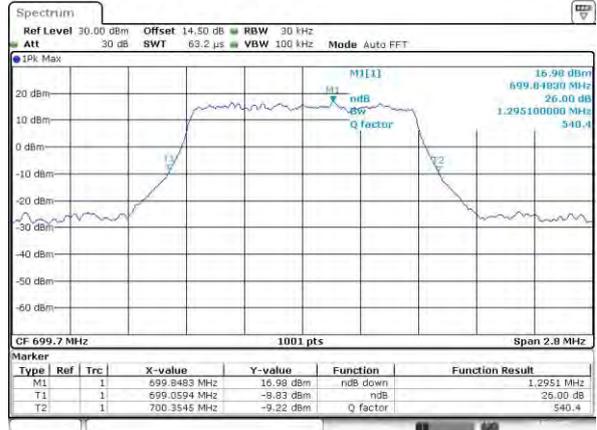
LTE Band 12

Lowest Channel / 1.4MHz / QPSK



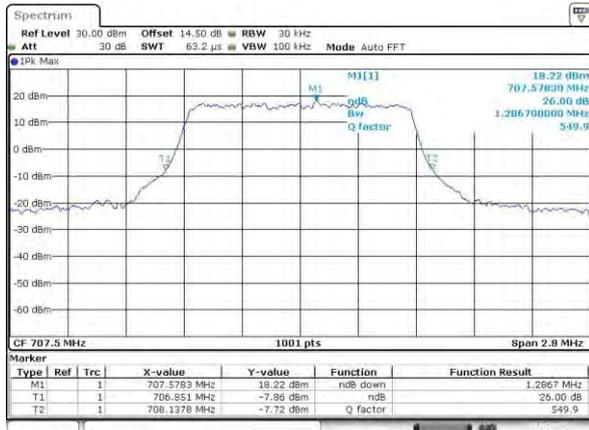
Date: 18 MAY 2015 17:28:34

Lowest Channel / 1.4MHz / 16QAM



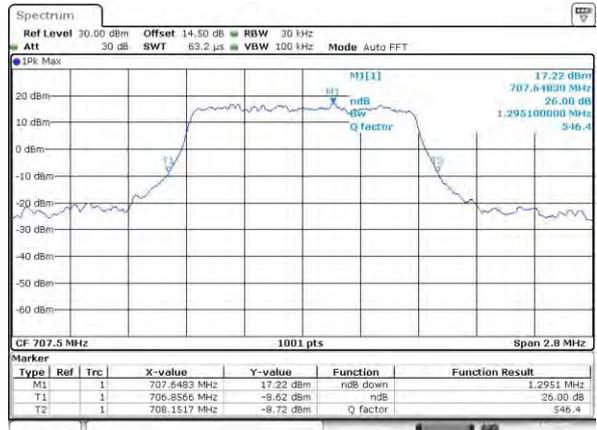
Date: 18 MAY 2015 17:28:22

Middle Channel / 1.4MHz / QPSK



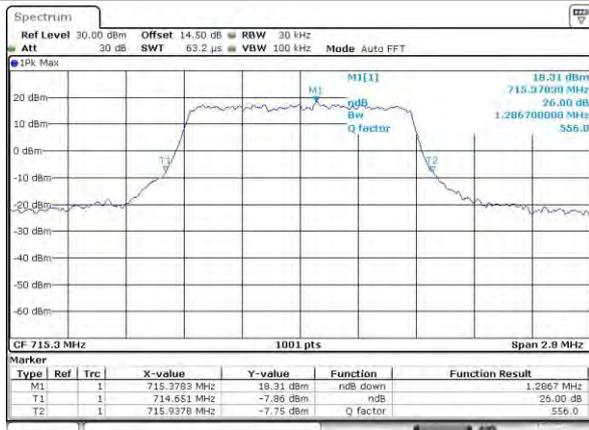
Date: 18 MAY 2015 17:47:07

Middle Channel / 1.4MHz / 16QAM



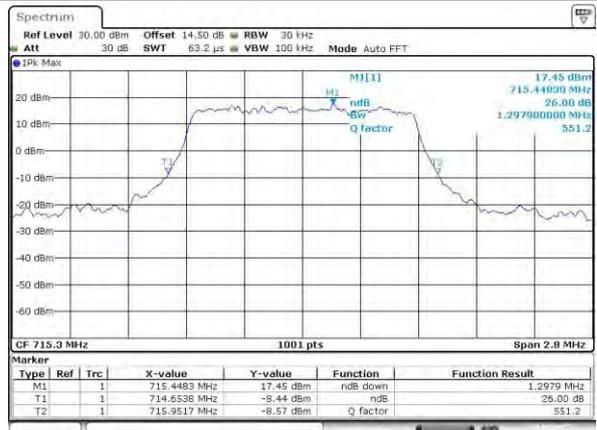
Date: 18 MAY 2015 17:47:20

Highest Channel / 1.4MHz / QPSK



Date: 18 MAY 2015 17:50:12

Highest Channel / 1.4MHz / 16QAM

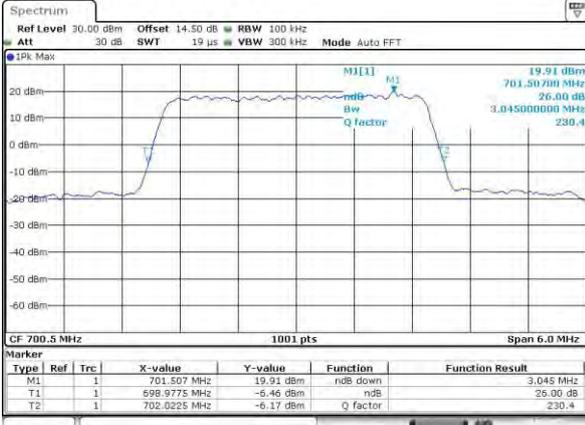


Date: 18 MAY 2015 17:50:24



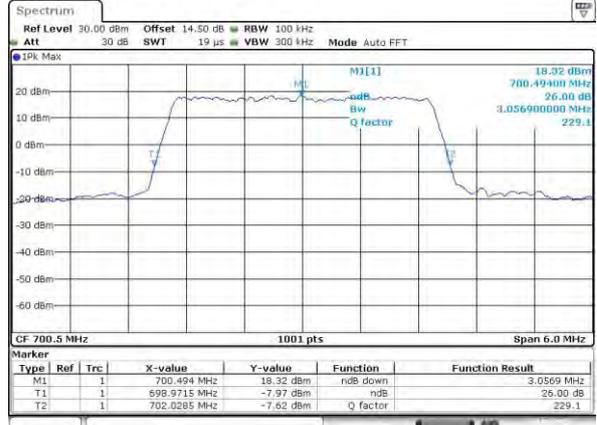
LTE Band 12

Lowest Channel / 3MHz / QPSK



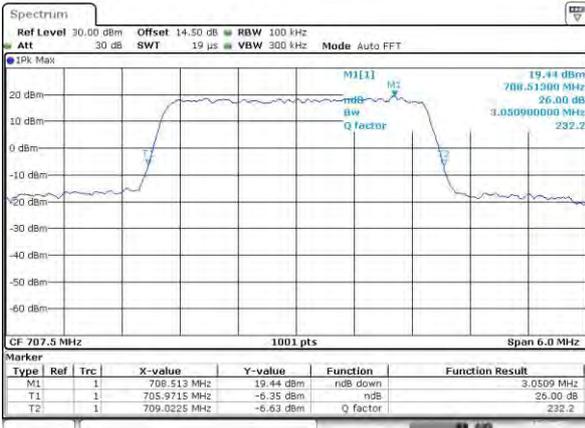
Date: 18 MAY 2015 17:58:00

Lowest Channel / 3MHz / 16QAM



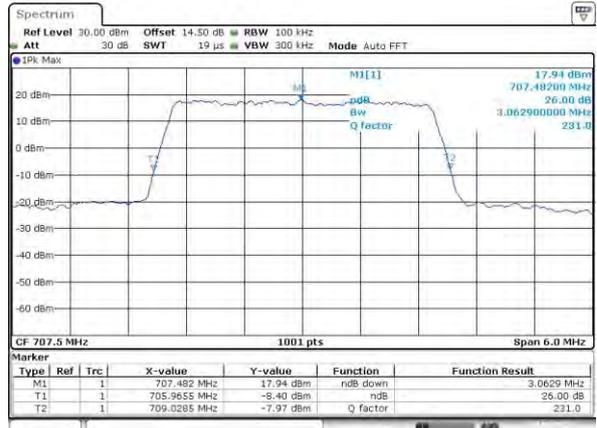
Date: 18 MAY 2015 17:58:13

Middle Channel / 3MHz / QPSK



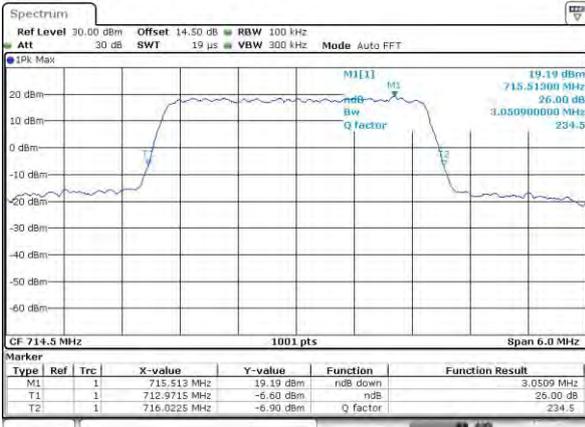
Date: 18 MAY 2015 18:05:44

Middle Channel / 3MHz / 16QAM



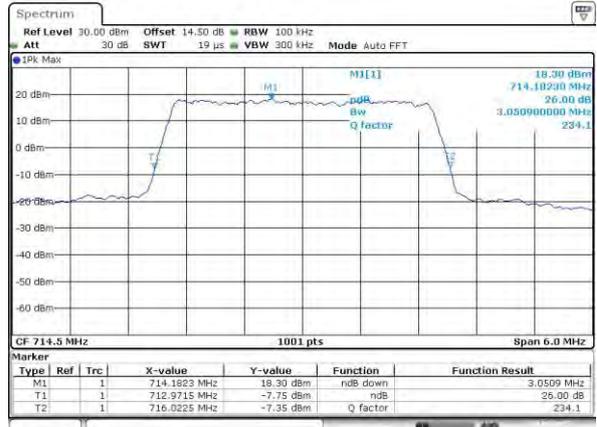
Date: 18 MAY 2015 18:05:56

Highest Channel / 3MHz / QPSK



Date: 18 MAY 2015 18:08:48

Highest Channel / 3MHz / 16QAM

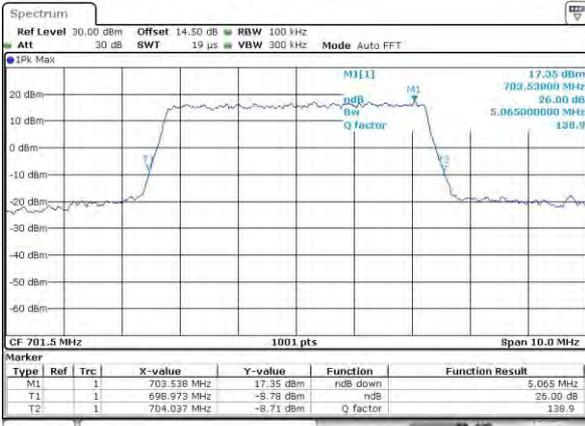


Date: 18 MAY 2015 18:09:01



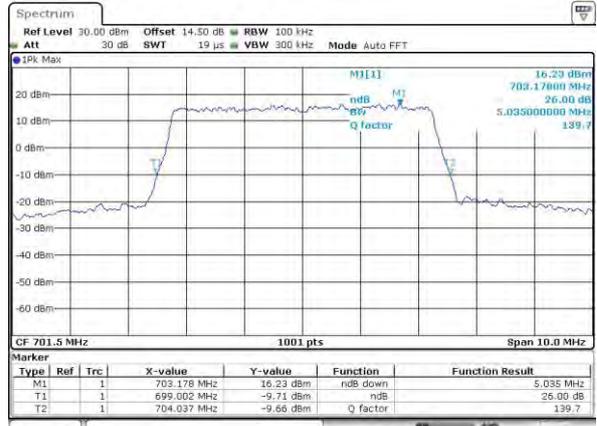
LTE Band 12

Lowest Channel / 5MHz / QPSK



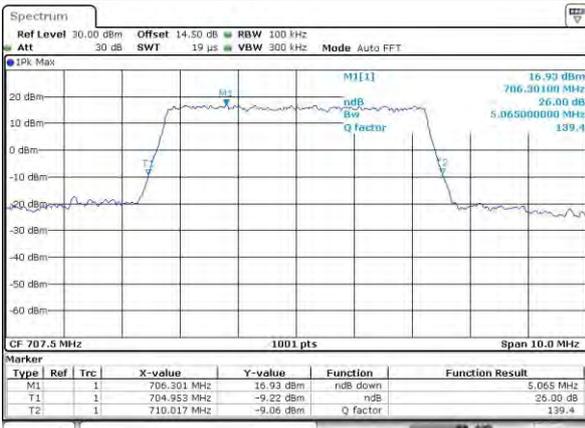
Date: 18 MAY 2015 18:16:31

Lowest Channel / 5MHz / 16QAM



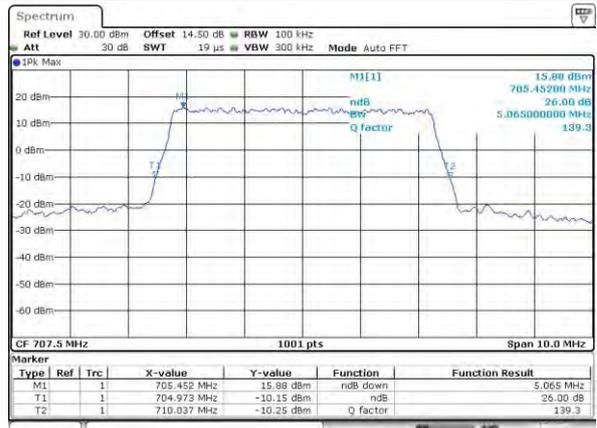
Date: 18 MAY 2015 18:16:43

Middle Channel / 5MHz / QPSK



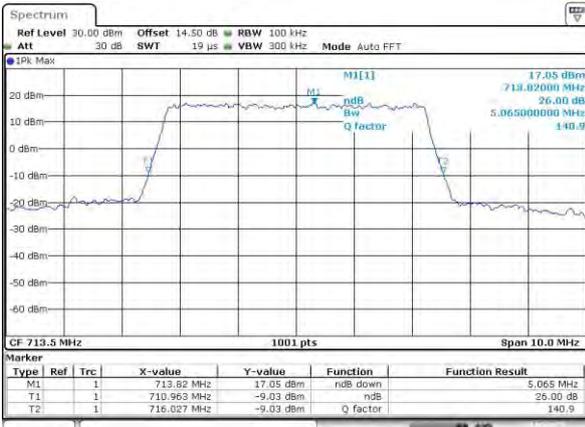
Date: 18 MAY 2015 18:24:15

Middle Channel / 5MHz / 16QAM



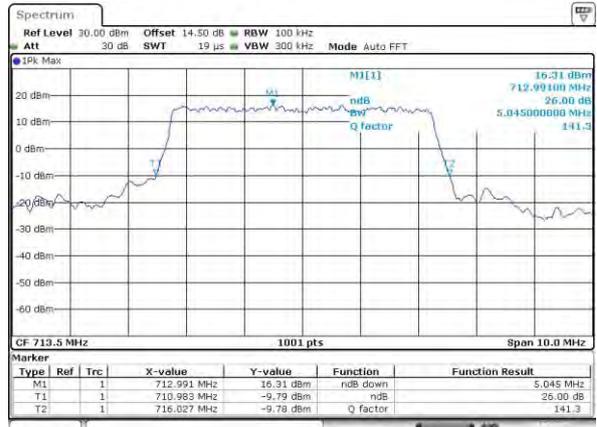
Date: 18 MAY 2015 18:24:28

Highest Channel / 5MHz / QPSK



Date: 18 MAY 2015 18:27:20

Highest Channel / 5MHz / 16QAM

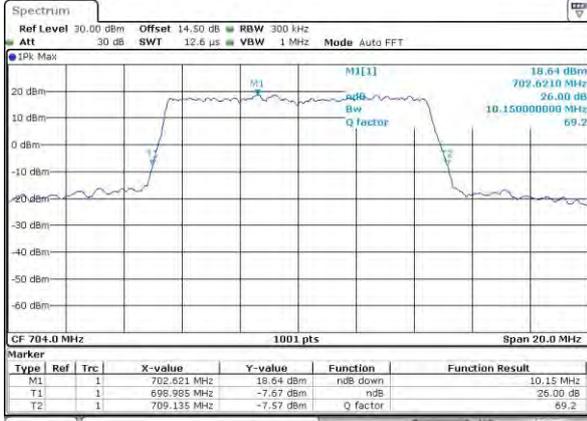


Date: 18 MAY 2015 18:27:33



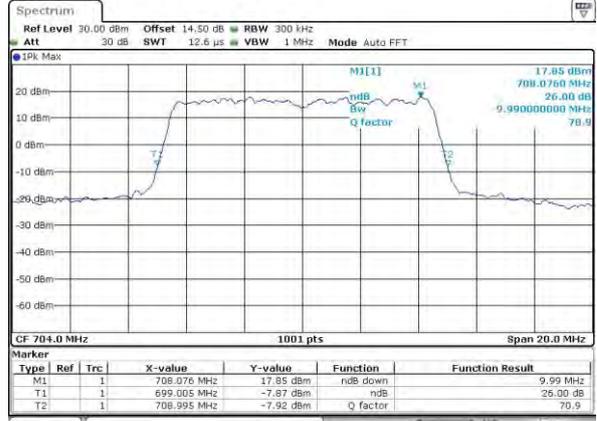
LTE Band 12

Lowest Channel / 10MHz / QPSK



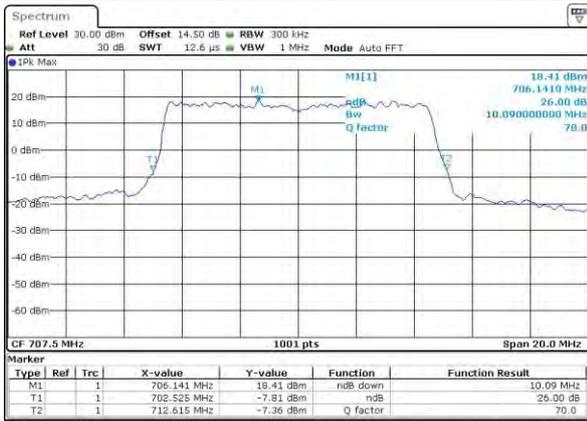
Date: 18 MAY 2015 18:35:04

Lowest Channel / 10MHz / 16QAM



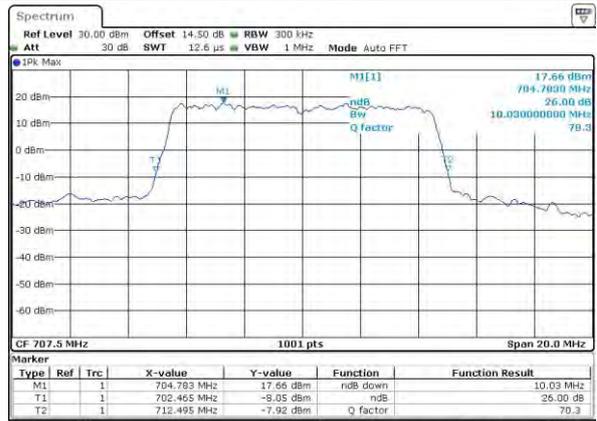
Date: 18 MAY 2015 18:35:16

Middle Channel / 10MHz / QPSK



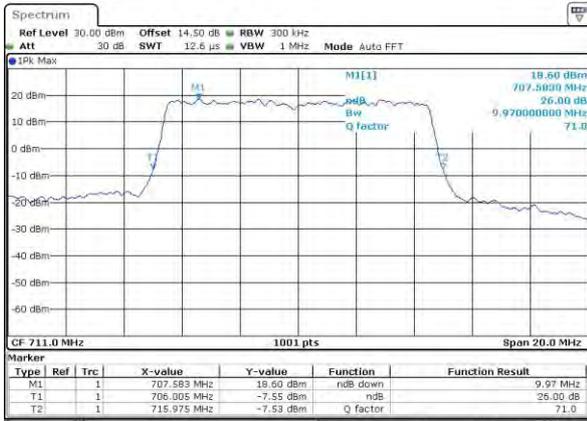
Date: 18 MAY 2015 18:42:47

Middle Channel / 10MHz / 16QAM



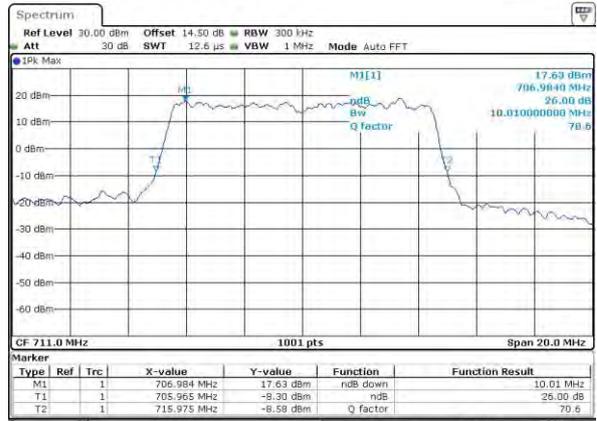
Date: 18 MAY 2015 18:43:00

Highest Channel / 10MHz / QPSK



Date: 18 MAY 2015 18:45:51

Highest Channel / 10MHz / 16QAM



Date: 18 MAY 2015 18:46:04



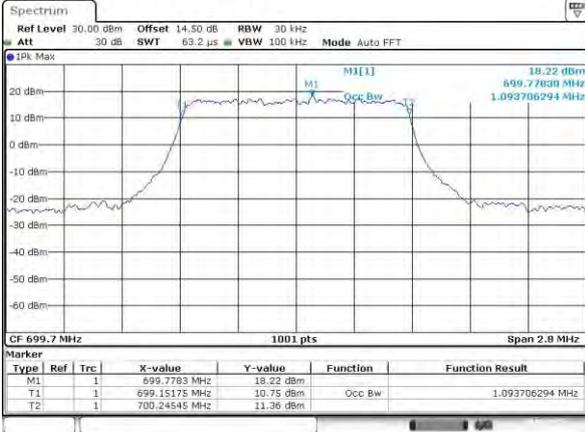
Occupied Bandwidth

Mode	LTE Band 12 : 99%OBW(MHz)											
	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
BW												
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.094	1.097	2.733	2.727	4.505	4.496	9.111	9.031	-	-	-	-
Middle CH	1.097	1.097	2.733	2.727	4.486	4.505	9.051	9.031	-	-	-	-
Highest CH	1.097	1.097	2.727	2.721	4.505	4.496	9.071	9.051	-	-	-	-



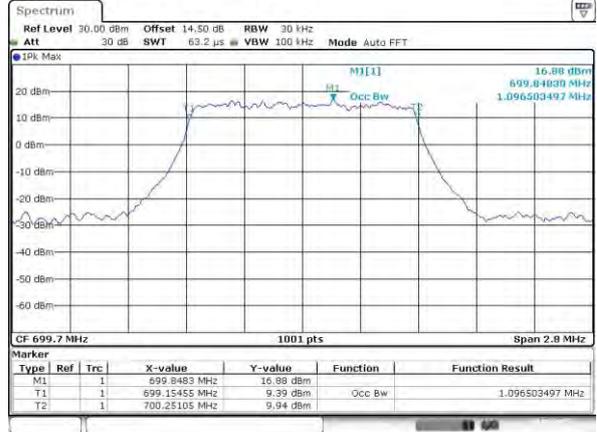
LTE Band 12

Lowest Channel / 1.4MHz / QPSK



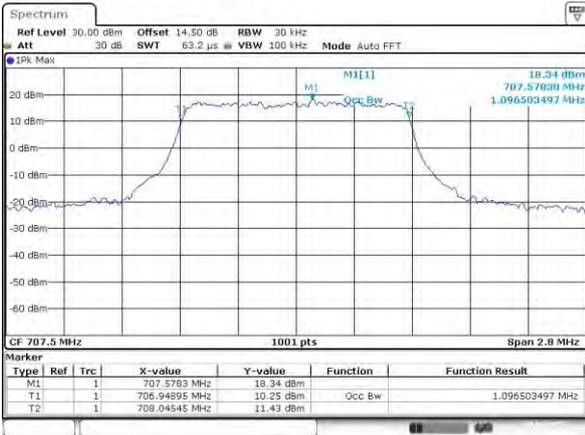
Date: 18 MAY 2015 17:27:58

Lowest Channel / 1.4MHz / 16QAM



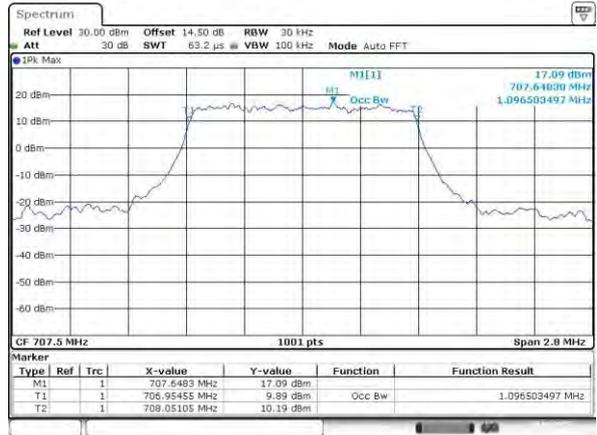
Date: 18 MAY 2015 17:28:09

Middle Channel / 1.4MHz / QPSK



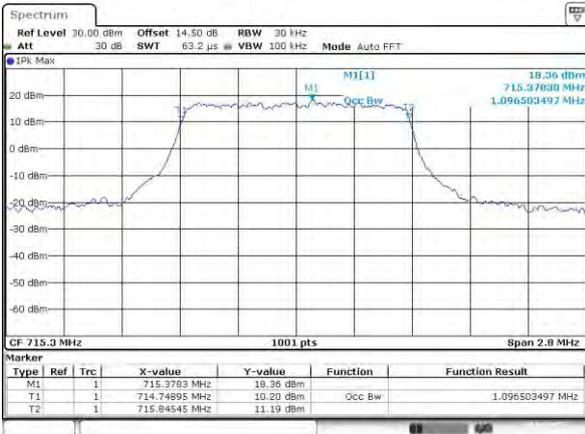
Date: 18 MAY 2015 17:46:44

Middle Channel / 1.4MHz / 16QAM



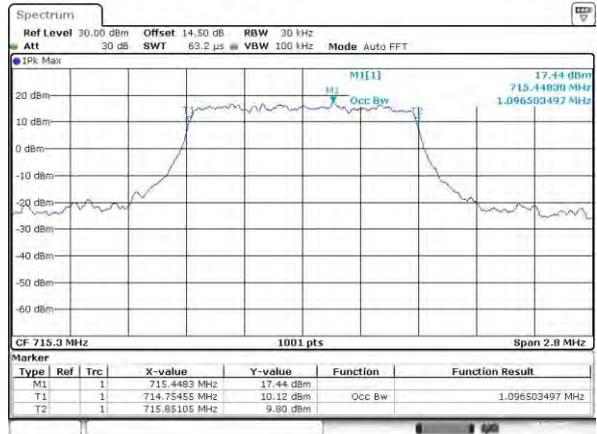
Date: 18 MAY 2015 17:46:55

Highest Channel / 1.4MHz / QPSK



Date: 18 MAY 2015 17:49:48

Highest Channel / 1.4MHz / 16QAM

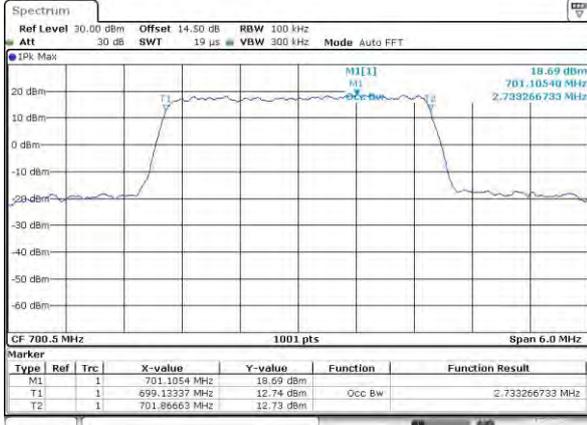


Date: 18 MAY 2015 17:49:59



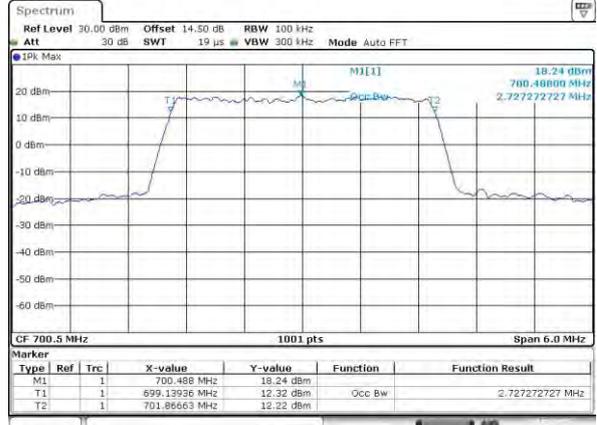
LTE Band 12

Lowest Channel / 3MHz / QPSK



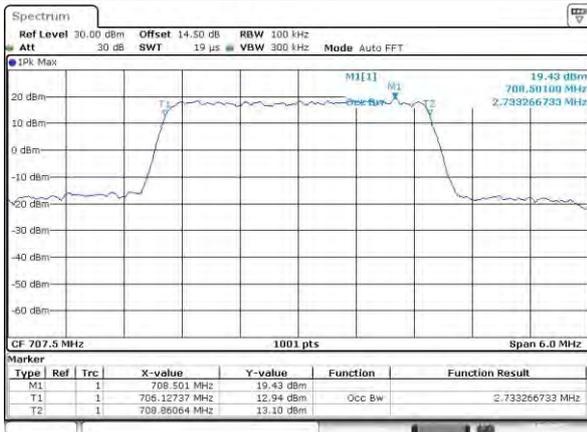
Date: 18 MAY 2015 17:57:37

Lowest Channel / 3MHz / 16QAM



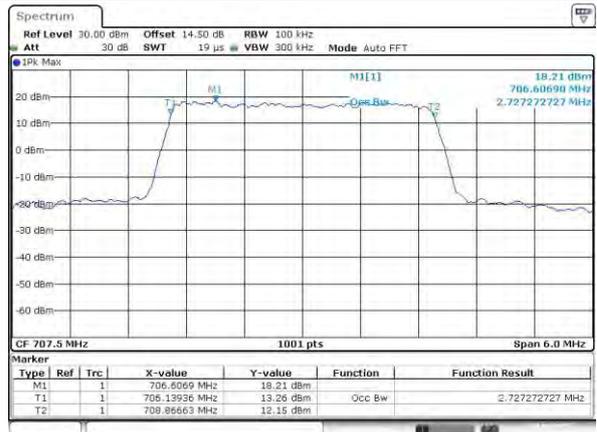
Date: 18 MAY 2015 17:57:48

Middle Channel / 3MHz / QPSK



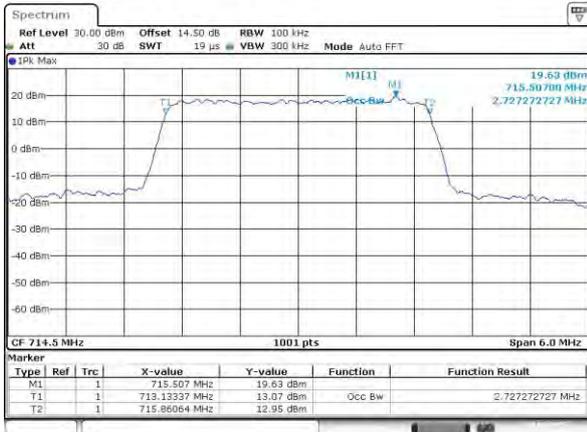
Date: 18 MAY 2015 18:05:20

Middle Channel / 3MHz / 16QAM



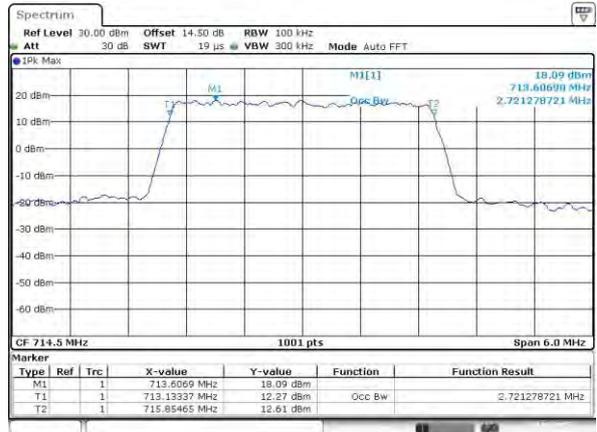
Date: 18 MAY 2015 18:05:31

Highest Channel / 3MHz / QPSK



Date: 18 MAY 2015 18:08:25

Highest Channel / 3MHz / 16QAM

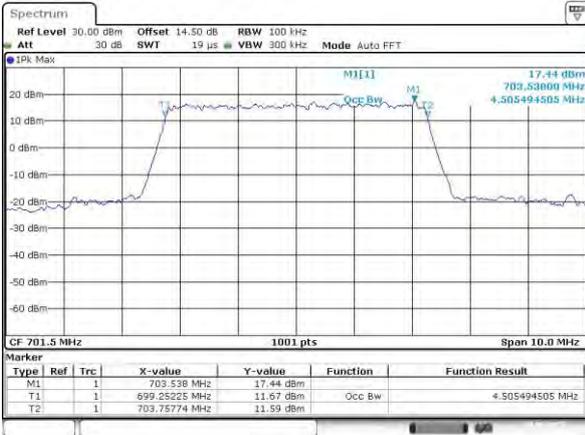


Date: 18 MAY 2015 18:08:35



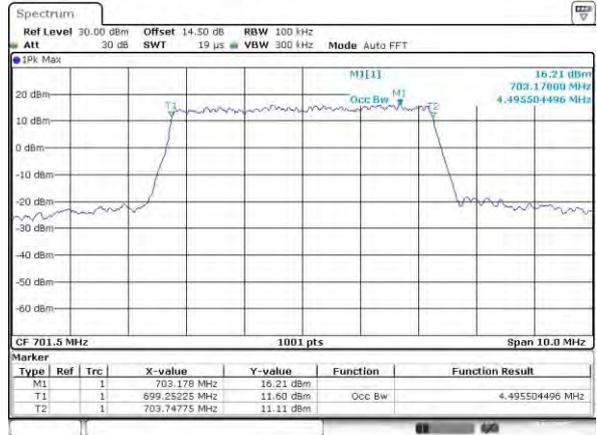
LTE Band 12

Lowest Channel / 5MHz / QPSK



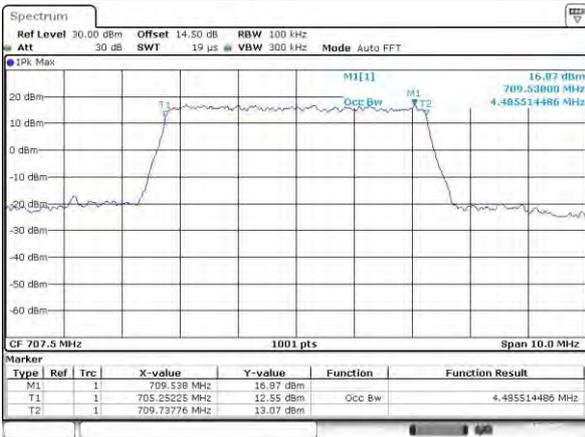
Date: 18 MAY 2015 18:16:07

Lowest Channel / 5MHz / 16QAM



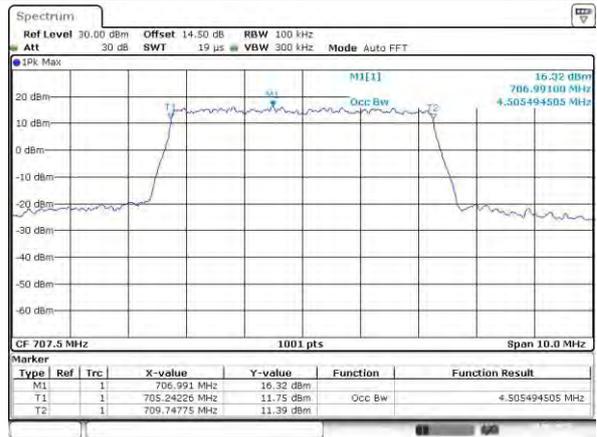
Date: 18 MAY 2015 18:16:18

Middle Channel / 5MHz / QPSK



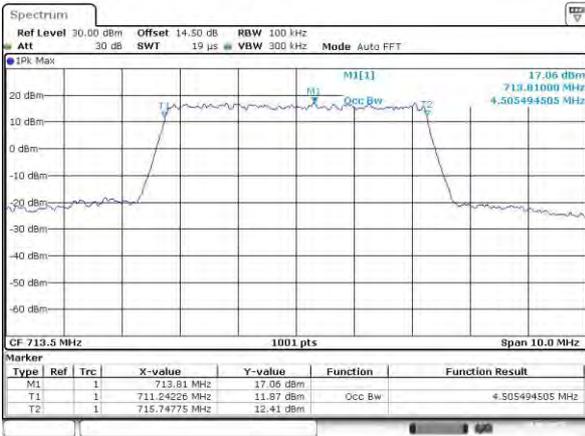
Date: 18 MAY 2015 18:23:51

Middle Channel / 5MHz / 16QAM



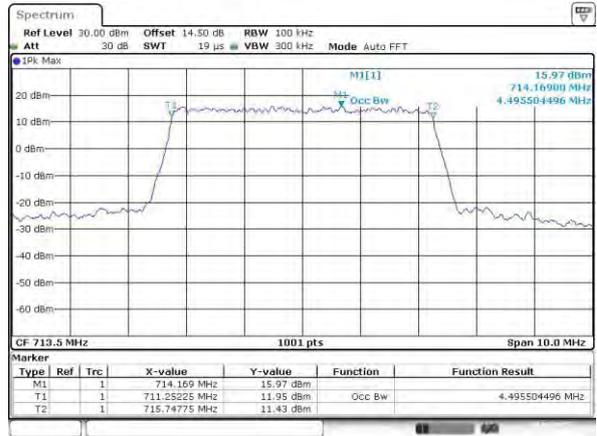
Date: 18 MAY 2015 18:24:02

Highest Channel / 5MHz / QPSK



Date: 18 MAY 2015 18:26:57

Highest Channel / 5MHz / 16QAM

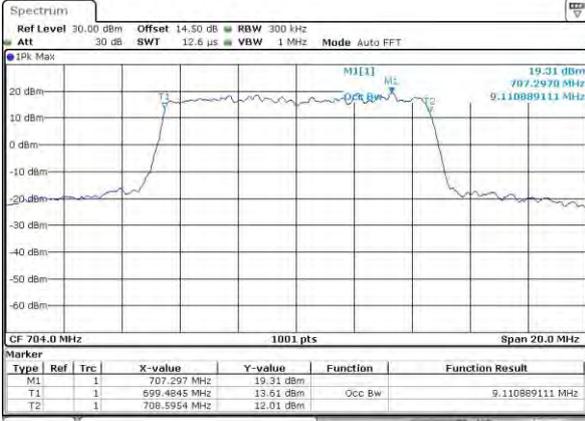


Date: 18 MAY 2015 18:27:07



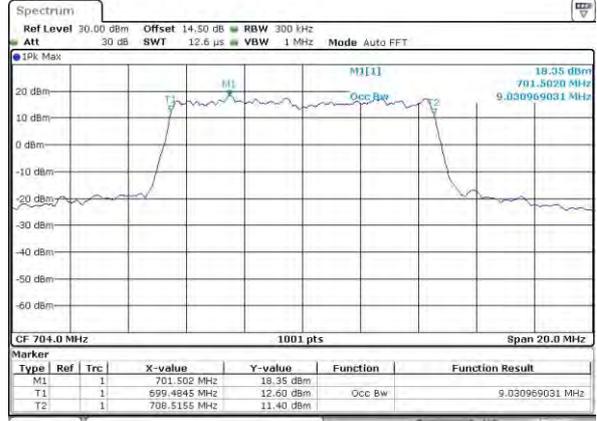
LTE Band 12

Lowest Channel / 10MHz / QPSK



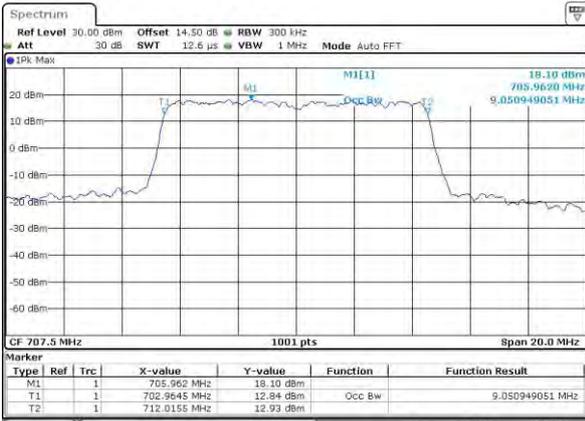
Date: 18 MAY 2015 18:34:40

Lowest Channel / 10MHz / 16QAM



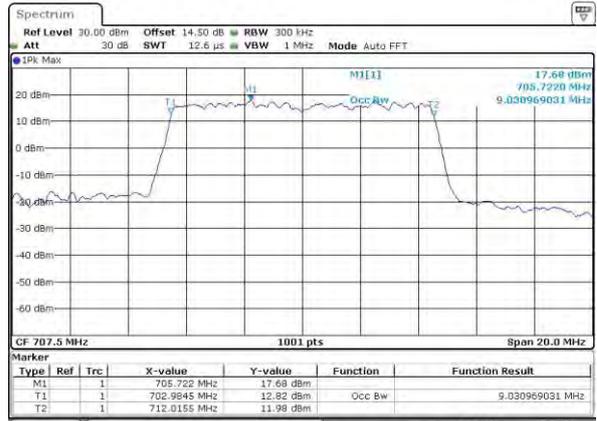
Date: 18 MAY 2015 18:34:51

Middle Channel / 10MHz / QPSK



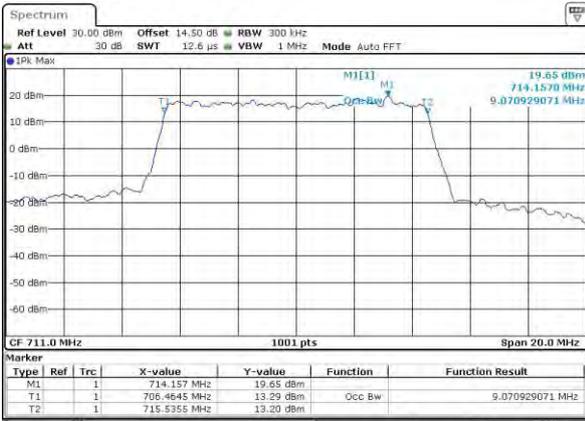
Date: 18 MAY 2015 18:42:24

Middle Channel / 10MHz / 16QAM



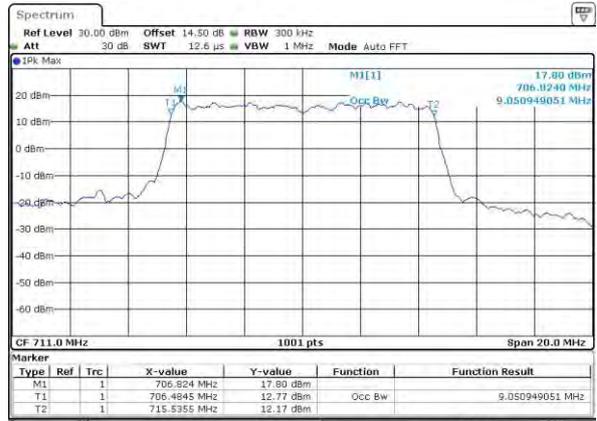
Date: 18 MAY 2015 18:42:34

Highest Channel / 10MHz / QPSK



Date: 18 MAY 2015 18:45:28

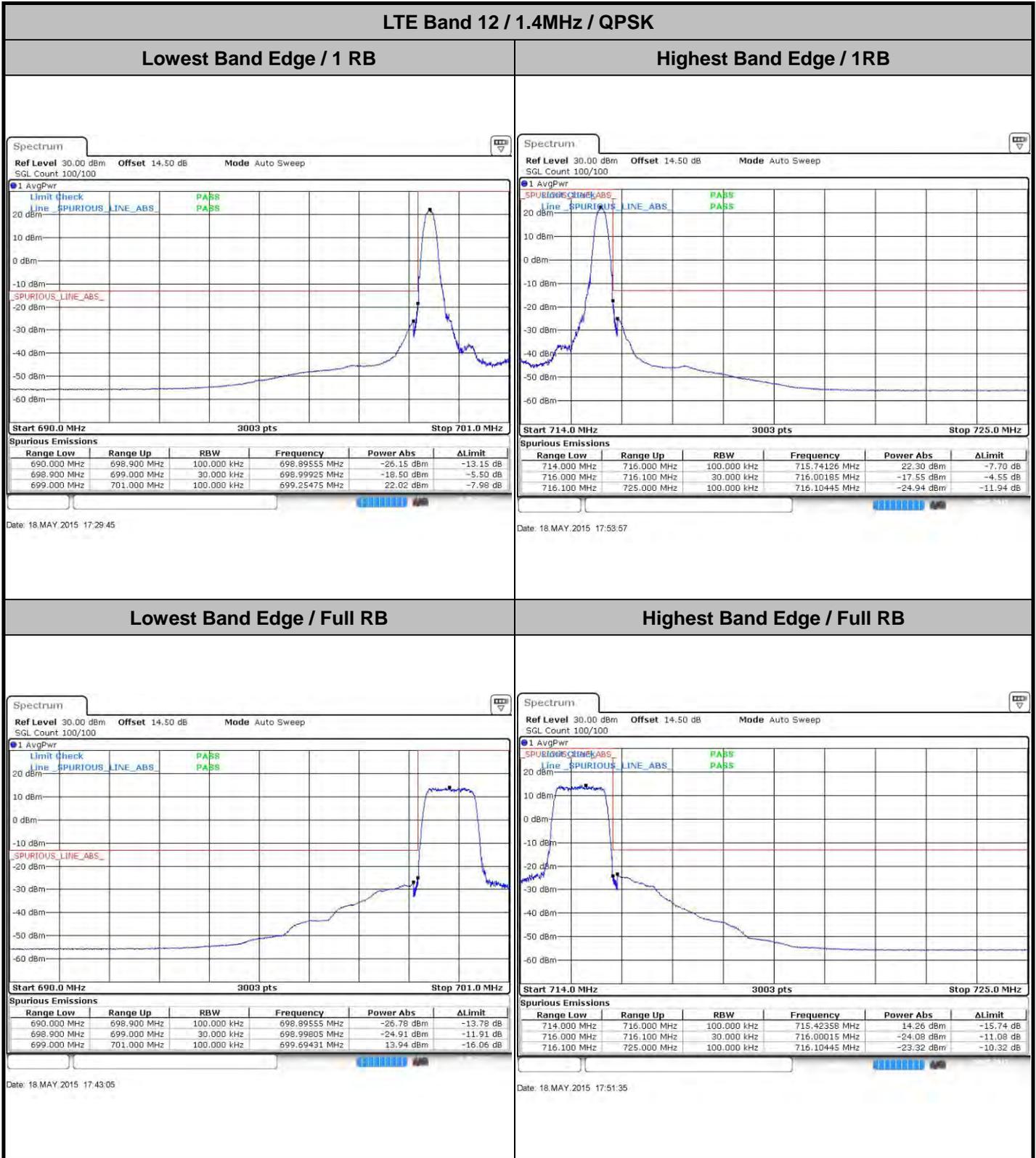
Highest Channel / 10MHz / 16QAM



Date: 18 MAY 2015 18:45:39



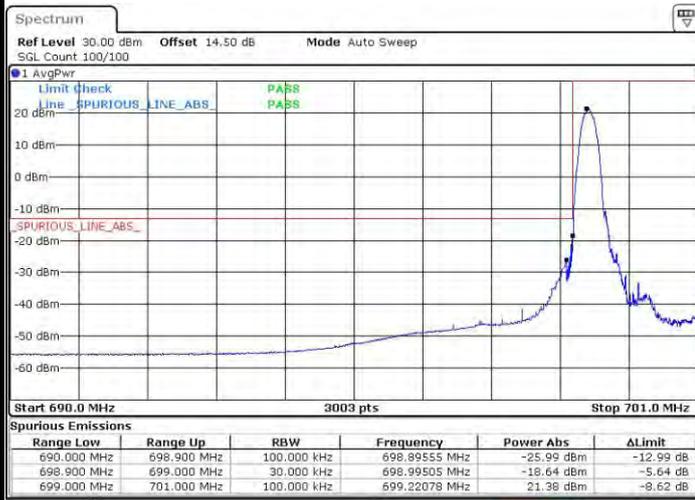
Conducted Band Edge





LTE Band 12 / 1.4MHz / 16QAM

Lowest Band Edge / 1 RB



Date: 18.MAY.2015 17:41:55

Highest Band Edge / 1 RB



Date: 18.MAY.2015 17:55:08

Lowest Band Edge / Full RB



Date: 18.MAY.2015 17:44:15

Highest Band Edge / Full RB



Date: 18.MAY.2015 17:52:46



LTE Band 12 / 3MHz / QPSK

Lowest Band Edge / 1RB



Date: 18.MAY.2015 17:59:23

Highest Band Edge / 1 RB



Date: 18.MAY.2015 18:10:10

Lowest Band Edge / Full RB



Date: 18.MAY.2015 18:01:42

Highest Band Edge / Full RB



Date: 18.MAY.2015 18:12:29



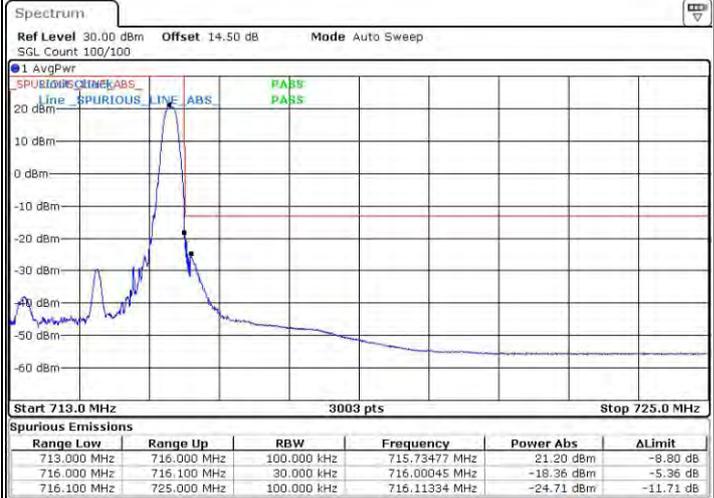
LTE Band 12 / 3MHz / 16QAM

Lowest Band Edge / 1 RB



Date: 18.MAY.2015 19:31:03

Highest Band Edge / 1 RB



Date: 18.MAY.2015 18:11:20

Lowest Band Edge / Full RB



Date: 18.MAY.2015 19:30:21

Highest Band Edge / Full RB

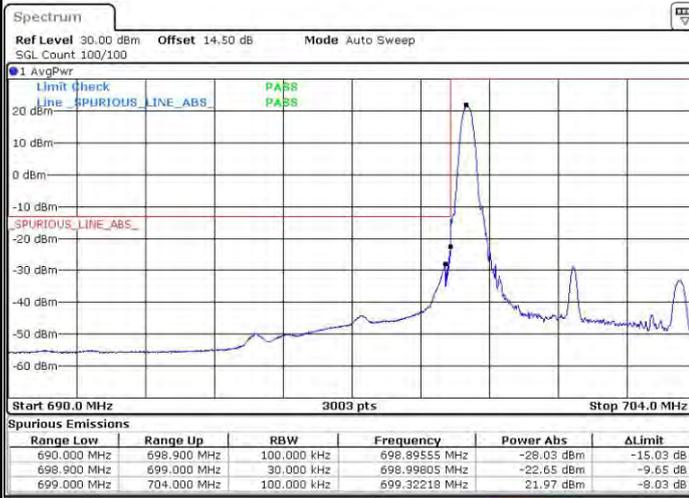


Date: 18.MAY.2015 18:13:39



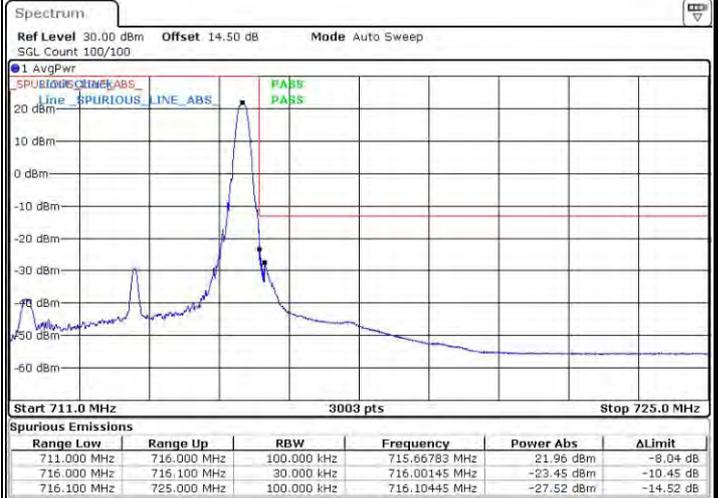
LTE Band 12 / 5MHz / QPSK

Lowest Band Edge / 1 RB



Date: 18.MAY.2015 18:17:53

Highest Band Edge / 1 RB



Date: 18.MAY.2015 18:28:43

Lowest Band Edge / Full RB



Date: 18.MAY.2015 18:20:12

Highest Band Edge / Full RB

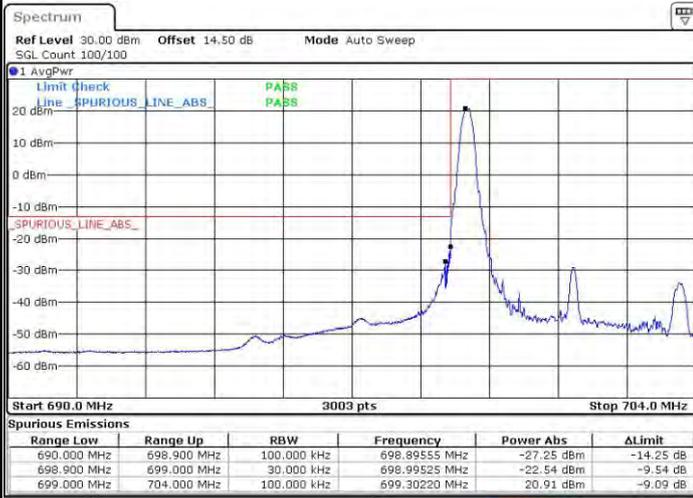


Date: 18.MAY.2015 18:31:02



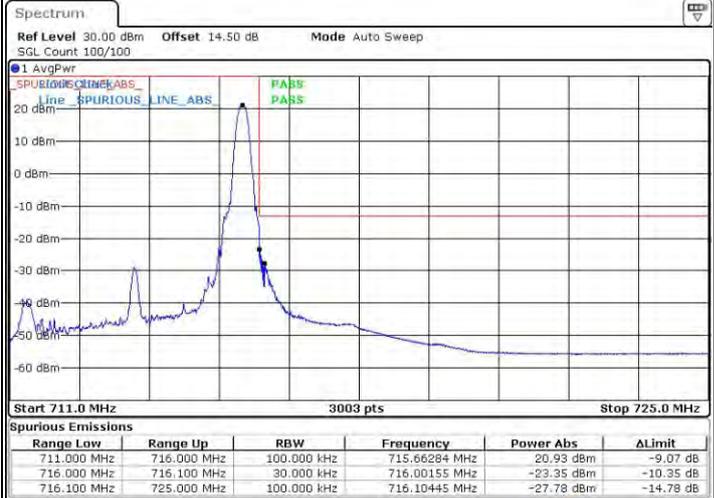
LTE Band 12 / 5MHz / 16QAM

Lowest Band Edge / 1RB



Date: 18.MAY.2015 18:19:03

Highest Band Edge / 1 RB



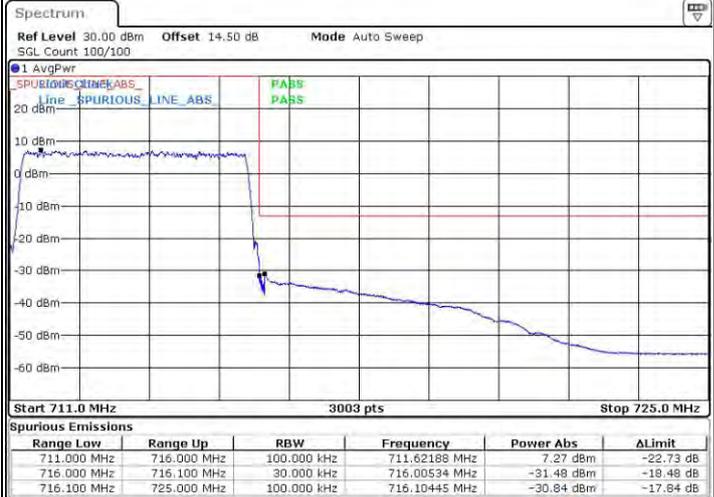
Date: 18.MAY.2015 18:29:52

Lowest Band Edge / Full RB



Date: 18.MAY.2015 18:21:22

Highest Band Edge / Full RB

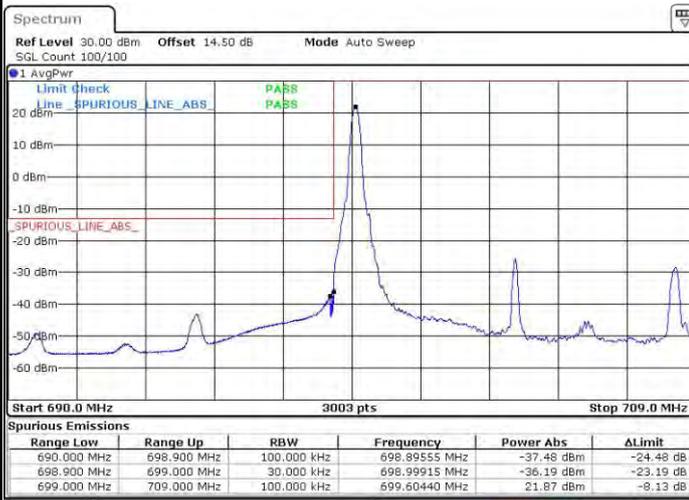


Date: 18.MAY.2015 18:32:11



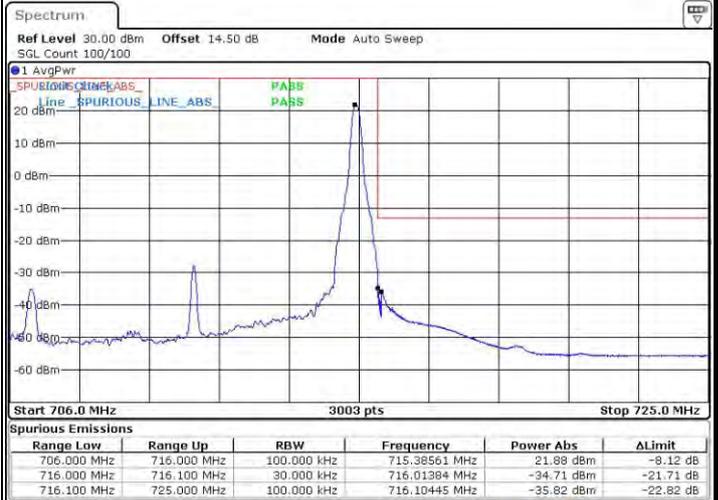
LTE Band 12 / 10MHz / QPSK

Lowest Band Edge / 1 RB



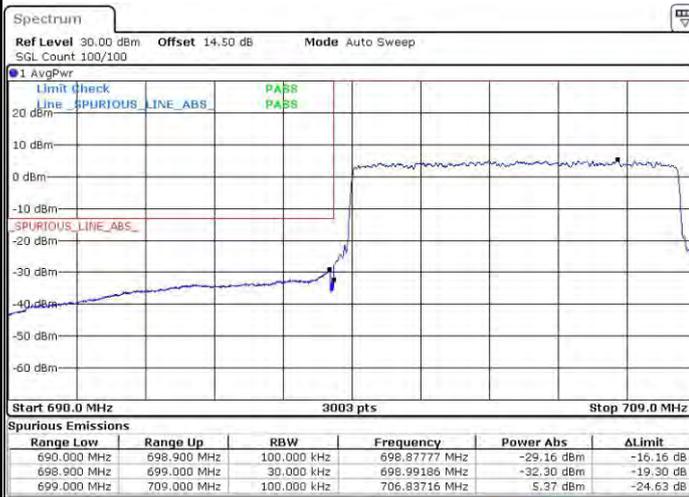
Date: 18.MAY.2015 18:36:26

Highest Band Edge / 1 RB



Date: 18.MAY.2015 18:47:14

Lowest Band Edge / Full RB



Date: 18.MAY.2015 18:38:45

Highest Band Edge / Full RB

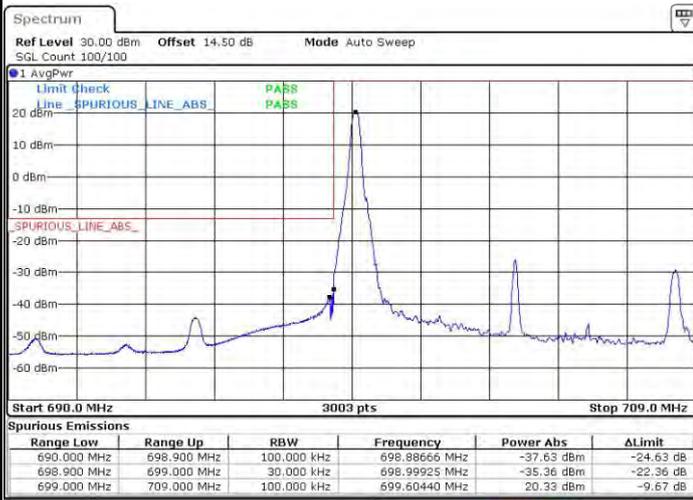


Date: 18.MAY.2015 18:49:33



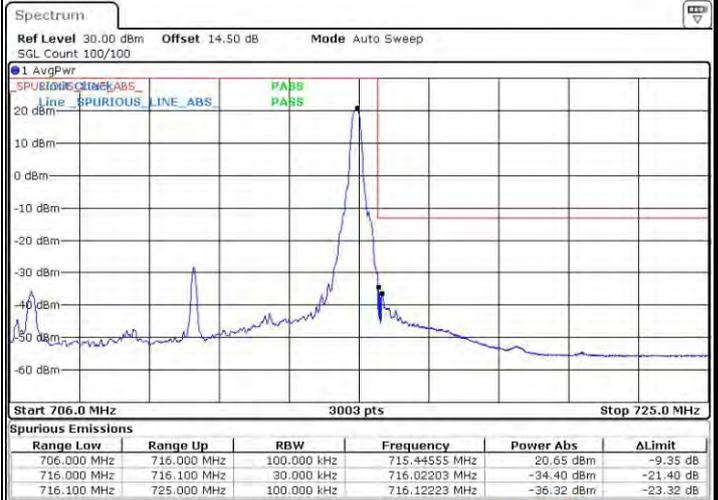
LTE Band 12 / 10MHz / 16QAM

Lowest Band Edge / 1 RB



Date: 18.MAY.2015 18:37:35

Highest Band Edge / 1 RB



Date: 18.MAY.2015 18:48:23

Lowest Band Edge / Full RB



Date: 18.MAY.2015 18:39:55

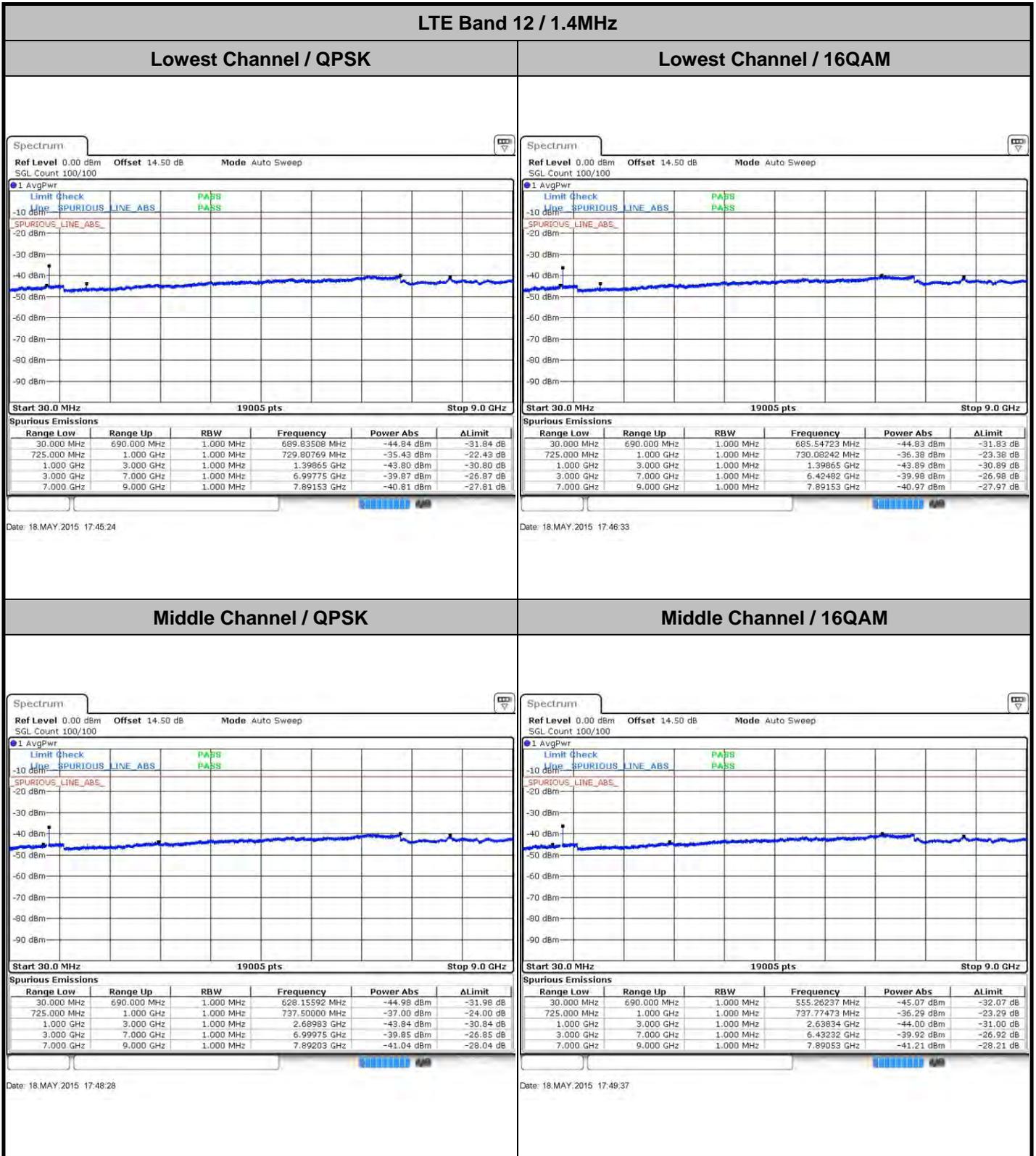
Highest Band Edge / Full RB



Date: 18.MAY.2015 18:50:43



Conducted Spurious Emission





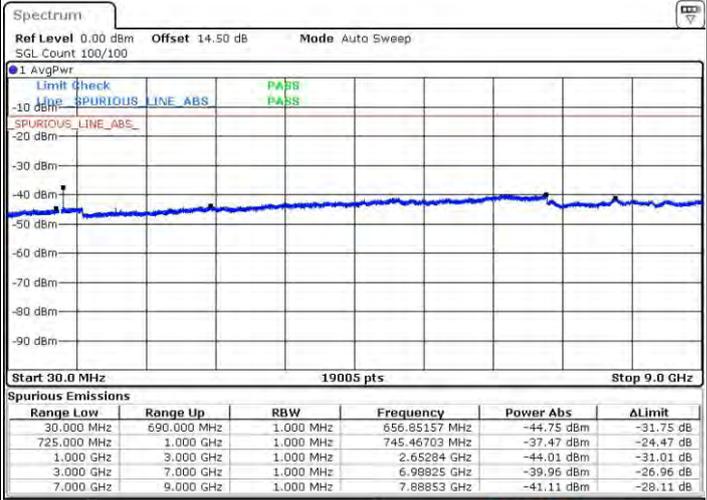
LTE Band 12 / 1.4MHz

Highest Channel / QPSK



Date: 18.MAY.2015 17:56:17

Highest Channel / 16QAM



Date: 18.MAY.2015 17:57:26

LTE Band 12 / 3MHz

Lowest Channel / QPSK



Date: 18.MAY.2015 18:04:00

Lowest Channel / 16QAM



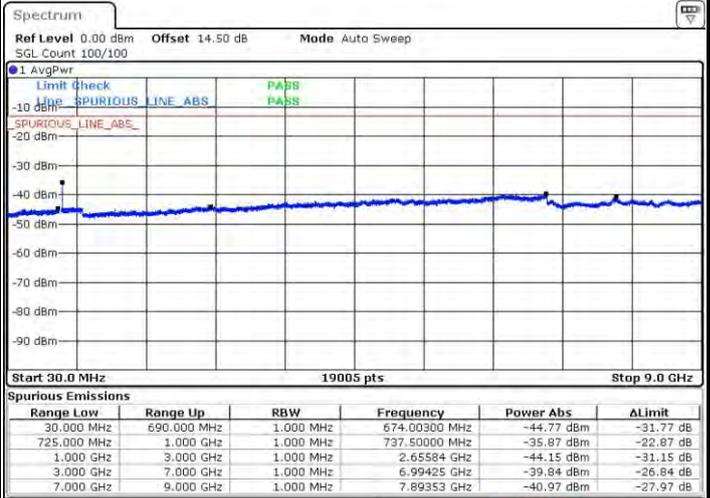
Date: 18.MAY.2015 18:05:09



LTE Band 12 / 3MHz

Middle Channel / QPSK

Middle Channel / 16QAM

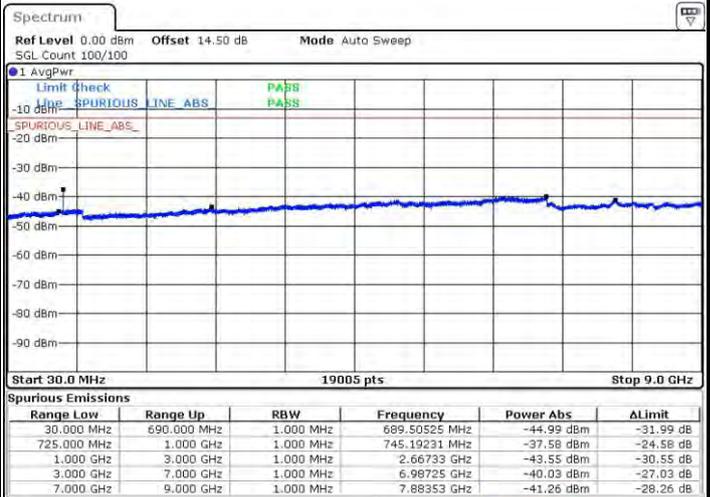


Date: 18.MAY.2015 18:07:05

Date: 18.MAY.2015 18:08:14

Highest Channel / QPSK

Highest Channel / 16QAM



Date: 18.MAY.2015 18:14:48

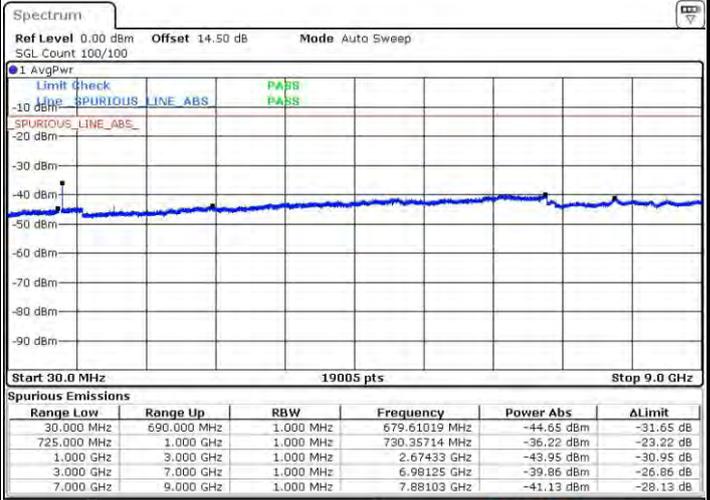
Date: 18.MAY.2015 18:15:57



LTE Band 12 / 5MHz

Lowest Channel / QPSK

Lowest Channel / 16QAM

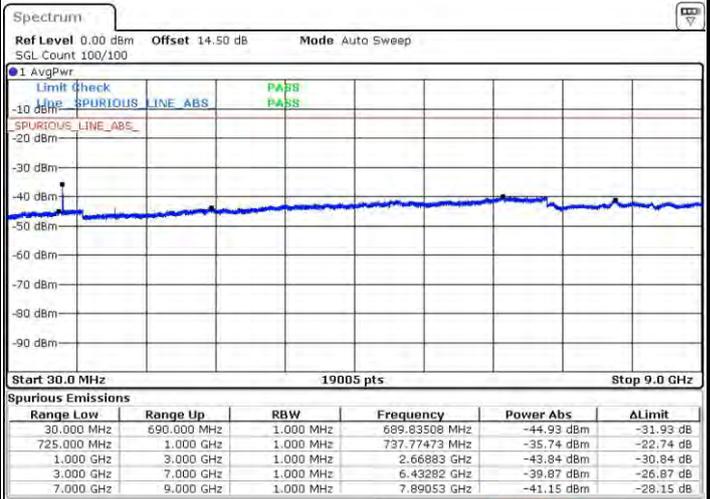


Date: 18.MAY.2015 18:22:31

Date: 18.MAY.2015 18:23:40

Middle Channel / QPSK

Middle Channel / 16QAM



Date: 18.MAY.2015 18:25:36

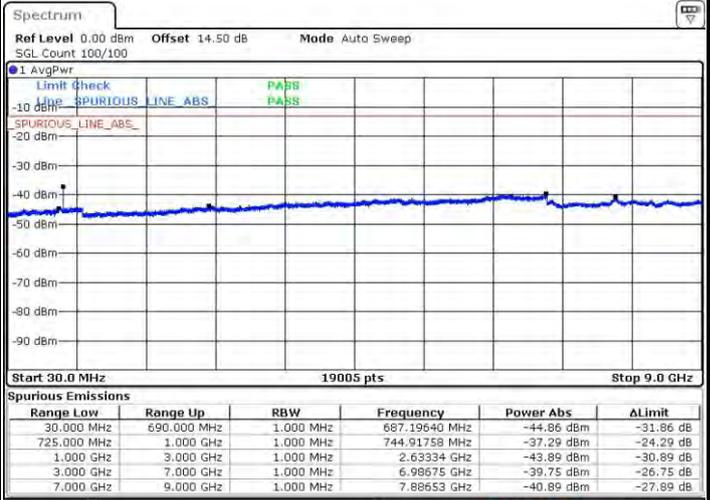
Date: 18.MAY.2015 18:26:45



LTE Band 12 / 5MHz

Highest Channel / QPSK

Highest Channel / 16QAM



Date: 18.MAY.2015 18:33:20

Date: 18.MAY.2015 18:34:29

LTE Band 12 / 10MHz

Lowest Channel / QPSK

Lowest Channel / 16QAM



Date: 18.MAY.2015 18:41:04

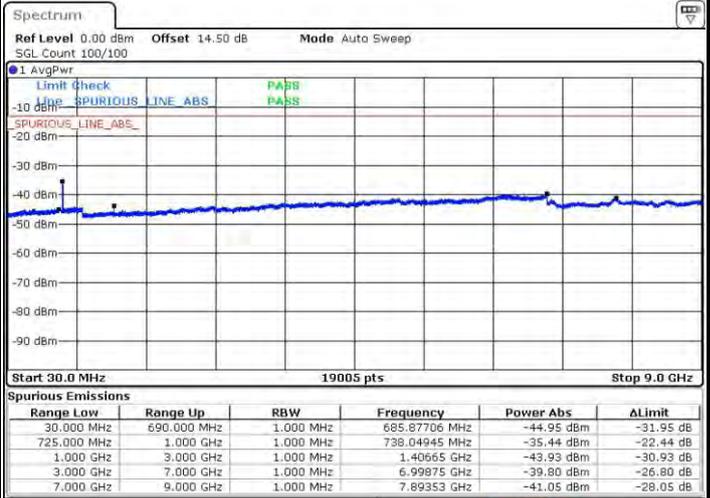
Date: 18.MAY.2015 18:42:13



LTE Band 12 / 10MHz

Middle Channel / QPSK

Middle Channel / 16QAM

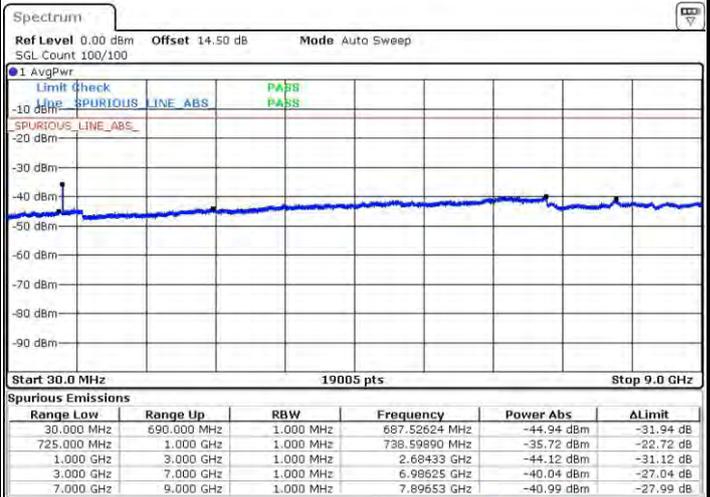
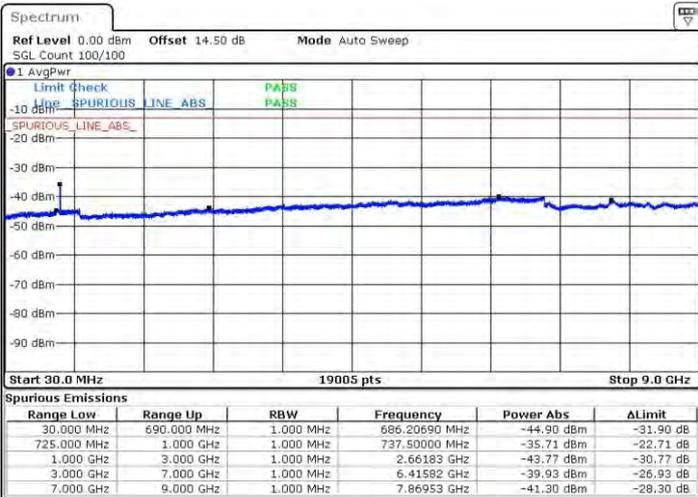


Date: 18.MAY.2015 18:44:08

Date: 18.MAY.2015 18:45:17

Highest Channel / QPSK

Highest Channel / 16QAM



Date: 18.MAY.2015 18:51:51

Date: 18.MAY.2015 18:53:00



Frequency Stability

Test Conditions		LTE Band 12 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0014	PASS
40	Normal Voltage	0.0028	
30	Normal Voltage	0.0014	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0028	
0	Normal Voltage	0.0014	
-10	Normal Voltage	0.0000	
-20	Normal Voltage	0.0028	
-30	Normal Voltage	0.0028	
20	Maximum Voltage	0.0000	
20	Normal Voltage	0.0014	
20	Battery End Point	0.0028	

Note:

1. Normal Voltage = 3.7 V. ; Battery End Point (BEP) = 3.5 V. ; Maximum Voltage =4.2 V
2. Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.



Appendix B. Test Results of Radiated Test

ERP/EIRP

LTE Band 2 / 1.4MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	3	0	25.05	0.3199	24.56	0.2858
Middle		1	2	24.25	0.2661	23.87	0.2438
Highest		1	2	26.05	0.4027	25.22	0.3327
Lowest	16QAM	1	0	24.24	0.2655	23.90	0.2455
Middle		3	1	23.26	0.2118	22.94	0.1968
Highest		3	2	25.15	0.3273	24.32	0.2704
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 3MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	25.13	0.3258	24.90	0.3090
Middle		1	0	23.97	0.2495	23.66	0.2323
Highest		1	0	25.94	0.3926	25.00	0.3162
Lowest	16QAM	1	14	24.25	0.2661	24.00	0.2512
Middle		1	7	23.51	0.2244	23.13	0.2056
Highest		1	0	25.10	0.3236	24.31	0.2698
Limit	EIRP < 2W			Result		PASS	



LTE Band 2 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	12	25.15	0.3273	24.88	0.3076
Middle		1	12	23.81	0.2404	23.54	0.2259
Highest		1	0	25.46	0.3516	24.51	0.2825
Lowest	16QAM	1	24	24.41	0.2761	23.99	0.2506
Middle		1	0	23.31	0.2143	23.11	0.2046
Highest		1	0	24.80	0.3020	23.85	0.2427
Limit	EIRP < 2W			Result		PASS	



LTE Band 2 / 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	49	25.80	0.3802	25.41	0.3475
Middle		1	0	23.93	0.2472	23.79	0.2393
Highest		1	24	25.14	0.3266	24.21	0.2636
Lowest	16QAM	1	0	24.30	0.2692	23.95	0.2483
Middle		1	0	23.40	0.2188	23.20	0.2089
Highest		1	24	24.54	0.2844	23.57	0.2275
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 15MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	25.30	0.3388	25.15	0.3273
Middle		1	0	24.11	0.2576	24.03	0.2529
Highest		1	0	26.60	0.4571	25.32	0.3404
Lowest	16QAM	1	0	24.60	0.2884	24.29	0.2685
Middle		1	74	24.58	0.2871	23.86	0.2432
Highest		1	37	24.81	0.3027	23.62	0.2301
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 20MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	49	26.04	0.4018	25.59	0.3622
Middle		1	49	24.29	0.2685	23.82	0.2410
Highest		1	49	25.64	0.3664	24.45	0.2786
Lowest	16QAM	1	99	24.28	0.2679	24.04	0.2535
Middle		1	49	23.77	0.2382	23.28	0.2128
Highest		1	0	25.53	0.3573	24.48	0.2805
Limit	EIRP < 2W			Result		PASS	



LTE Band 4 / 1.4MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	3	1	22.74	0.1879	22.23	0.1671
Middle		3	1	22.64	0.1837	22.19	0.1656
Highest		1	2	22.34	0.1714	22.69	0.1858
Lowest	16QAM	1	5	21.91	0.1552	21.52	0.1419
Middle		1	5	21.88	0.1542	21.47	0.1403
Highest		1	5	21.55	0.1429	21.95	0.1567
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 3MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	22.84	0.1923	22.64	0.1837
Middle		1	0	22.14	0.1637	22.07	0.1611
Highest		1	0	22.09	0.1618	22.53	0.1791
Lowest	16QAM	1	14	21.97	0.1574	21.70	0.1479
Middle		1	0	21.43	0.1390	21.38	0.1374
Highest		1	14	21.52	0.1419	22.00	0.1585
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	22.77	0.1892	22.64	0.1837
Middle		1	0	22.43	0.1750	22.31	0.1702
Highest		1	0	22.32	0.1706	22.57	0.1807
Lowest	16QAM	1	0	22.36	0.1722	21.58	0.1439
Middle		1	12	21.79	0.1510	21.62	0.1452
Highest		1	0	21.39	0.1377	21.72	0.1486
Limit	EIRP < 1W			Result		PASS	



LTE Band 4/ 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.31	0.2143	22.47	0.1766
Middle		1	49	22.65	0.1841	22.80	0.1905
Highest		1	0	22.30	0.1698	22.78	0.1897
Lowest	16QAM	1	0	21.61	0.1449	21.70	0.1479
Middle		1	0	21.28	0.1343	21.20	0.1318
Highest		1	0	21.41	0.1384	21.95	0.1567
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 15MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.18	0.2080	22.34	0.1714
Middle		1	0	21.70	0.1479	21.53	0.1422
Highest		1	0	22.15	0.1641	22.72	0.1871
Lowest	16QAM	1	0	22.28	0.1690	22.11	0.1626
Middle		1	0	21.07	0.1279	20.91	0.1233
Highest		1	0	21.54	0.1426	21.94	0.1563
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 20MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	22.67	0.1849	22.63	0.1832
Middle		1	0	20.98	0.1253	21.19	0.1315
Highest		1	0	23.00	0.1995	22.78	0.1897
Lowest	16QAM	1	0	21.93	0.1560	21.86	0.1535
Middle		1	0	20.39	0.1094	20.53	0.1130
Highest		1	0	21.72	0.1486	21.98	0.1578
Limit	EIRP < 1W			Result		PASS	



LTE Band 5 / 1.4MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	2	19.88	0.0973	8.23	0.0067
Middle		3	1	19.78	0.0951	7.83	0.0061
Highest		3	0	19.49	0.0889	6.97	0.0050
Lowest	16QAM	1	2	19.17	0.0826	7.60	0.0058
Middle		1	5	19.20	0.0832	7.04	0.0051
Highest		1	5	18.87	0.0771	6.29	0.0043
Limit	ERP < 7W			Result		PASS	

LTE Band 5 / 3MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	19.88	0.0973	8.12	0.0065
Middle		1	0	19.90	0.0977	7.56	0.0057
Highest		1	0	19.91	0.0979	7.13	0.0052
Lowest	16QAM	1	7	19.37	0.0865	7.71	0.0059
Middle		1	0	19.53	0.0897	7.53	0.0057
Highest		1	0	19.33	0.0857	6.81	0.0048
Limit	ERP < 7W			Result		PASS	

LTE Band 5 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	19.73	0.0940	7.96	0.0063
Middle		1	0	19.86	0.0968	7.56	0.0057
Highest		1	0	19.83	0.0962	7.11	0.0051
Lowest	16QAM	1	24	18.90	0.0776	7.18	0.0052
Middle		1	0	18.93	0.0782	7.13	0.0052
Highest		1	24	18.64	0.0731	6.64	0.0046
Limit	ERP < 7W			Result		PASS	



LTE Band 5 / 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	19.81	0.0957	8.42	0.0070
Middle		1	0	19.87	0.0971	8.35	0.0068
Highest		1	0	19.74	0.0942	7.86	0.0061
Lowest	16QAM	1	24	19.10	0.0813	7.22	0.0053
Middle		1	0	18.89	0.0774	7.47	0.0056
Highest		1	0	18.70	0.0741	7.08	0.0051
Limit	ERP < 7W			Result		PASS	



LTE Band 12 / 1.4MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	3	1	20.14	0.1033	5.42	0.0035
Middle		3	1	20.19	0.1045	6.69	0.0047
Highest		3	2	19.80	0.0955	6.08	0.0041
Lowest	16QAM	1	2	19.49	0.0889	5.03	0.0032
Middle		1	2	19.34	0.0859	5.58	0.0036
Highest		1	2	19.14	0.0820	5.81	0.0038
Limit	ERP < 3W			Result		PASS	

LTE Band 12 / 3MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	7	20.45	0.1109	6.14	0.0041
Middle		1	7	20.19	0.1045	6.70	0.0047
Highest		1	0	20.26	0.1062	6.25	0.0042
Lowest	16QAM	1	0	19.30	0.0851	4.83	0.0030
Middle		1	14	19.32	0.0855	5.68	0.0037
Highest		1	0	19.45	0.0881	5.25	0.0033
Limit	ERP < 3W			Result		PASS	



LTE Band 12 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	24	20.19	0.1045	5.61	0.0036
Middle		1	24	19.93	0.0984	6.34	0.0043
Highest		1	0	20.45	0.1109	6.49	0.0045
Lowest	16QAM	1	24	19.52	0.0895	4.94	0.0031
Middle		1	0	19.43	0.0877	5.29	0.0034
Highest		1	0	19.52	0.0895	5.61	0.0036
Limit	ERP < 3W			Result		PASS	

LTE Band 12 / 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	49	20.29	0.1069	7.01	0.0050
Middle		1	49	20.57	0.1140	6.81	0.0048
Highest		1	49	20.16	0.1038	6.94	0.0049
Lowest	16QAM	1	49	19.17	0.0826	6.18	0.0041
Middle		1	0	19.59	0.0910	5.54	0.0036
Highest		1	49	19.30	0.0851	6.14	0.0041
Limit	ERP < 3W			Result		PASS	



LTE Band 17 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	24	20.29	0.1069	7.31	0.0054
Middle		1	0	20.19	0.1045	7.27	0.0053
Highest		1	0	20.43	0.1104	6.96	0.0050
Lowest	16QAM	1	0	19.31	0.0853	5.54	0.0036
Middle		1	0	19.18	0.0828	6.30	0.0043
Highest		1	0	19.59	0.0910	6.06	0.0040
Limit	ERP < 3W			Result		PASS	

LTE Band 17 / 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	49	20.42	0.1102	6.94	0.0049
Middle		1	49	20.15	0.1035	6.88	0.0049
Highest		1	49	19.91	0.0979	6.88	0.0049
Lowest	16QAM	1	49	19.67	0.0927	5.70	0.0037
Middle		1	0	19.43	0.0877	5.81	0.0038
Highest		1	0	18.83	0.0764	5.78	0.0038
Limit	ERP < 3W			Result		PASS	



Radiated Spurious Emission

LTE Band 2 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	3750	-50.83	-13	-37.83	-65.03	-55.43	3	7.60	H
	5628	-46.25	-13	-33.25	-60.04	-52.51	3.84	10.10	H
	7503	-42.49	-13	-29.49	-62.27	-49.99	4.43	11.93	H
	3750	-51.08	-13	-38.08	-63.57	-55.68	3	7.60	V
	5628	-47.61	-13	-34.61	-60.02	-53.87	3.84	10.10	V
	7503	-43.43	-13	-30.43	-61.22	-50.93	4.43	11.93	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 4 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	3459	-49.12	-13	-36.12	-63.25	-53.49	3.12	7.49	H
	5190	-49.38	-13	-36.38	-62.53	-55.18	3.65	9.45	H
	6921	-45.39	-13	-32.39	-62.25	-52.59	4.15	11.35	H
	3459	-51.57	-13	-38.57	-64.39	-55.94	3.12	7.49	V
	5190	-48.26	-13	-35.26	-62.27	-54.06	3.65	9.45	V
	6921	-46.66	-13	-33.66	-61.91	-53.86	4.15	11.35	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 5 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1668	-54.58	-13	-41.58	-56.76	-56.47	1.86	5.90	H
	2504	-52.88	-13	-39.88	-61.91	-55.22	2.31	6.80	H
	3339	-52.66	-13	-39.66	-65.29	-55.06	2.85	7.40	H
	1669	-57.12	-13	-44.12	-55.98	-59.01	1.86	5.90	V
	2504	-45.87	-13	-32.87	-58.41	-48.21	2.31	6.80	V
	3339	-51.55	-13	-38.55	-65.53	-53.95	2.85	7.40	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 12 / 1.4MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1414	-60.77	-13	-47.77	-57.19	-61.75	1.75	4.88	H
	2121	-55.02	-13	-42.02	-61.03	-56.64	2.16	5.93	H
	2829	-53.84	-13	-40.84	-64.26	-55.87	2.48	6.66	H
	1414	-58.46	-13	-45.46	-56.93	-59.44	1.75	4.88	V
	2121	-52.80	-13	-39.80	-60.78	-54.42	2.16	5.93	V
	2828	-52.12	-13	-39.12	-63.63	-54.15	2.48	6.66	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 12 / 3MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1412	-60.55	-13	-47.55	-56.97	-61.53	1.75	4.88	H
	2119	-54.51	-13	-41.51	-60.52	-56.13	2.16	5.93	H
	2825	-54.48	-13	-41.48	-64.90	-56.51	2.48	6.66	H
	1412	-58.41	-13	-45.41	-56.88	-59.39	1.75	4.88	V
	2119	-52.24	-13	-39.24	-60.22	-53.86	2.16	5.93	V
	2825	-52.48	-13	-39.48	-63.99	-54.51	2.48	6.66	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 12 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1412	-60.11	-13	-47.11	-56.53	-61.09	1.75	4.88	H
	2117	-54.59	-13	-41.59	-60.60	-56.21	2.16	5.93	H
	2822	-53.67	-13	-40.67	-64.09	-55.70	2.48	6.66	H
	1412	-58.57	-13	-45.57	-57.04	-59.55	1.75	4.88	V
	2117	-52.18	-13	-39.18	-60.16	-53.80	2.16	5.93	V
	2822	-52.77	-13	-39.77	-64.28	-54.80	2.48	6.66	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 12 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1406	-59.58	-13	-46.58	-56.00	-60.56	1.75	4.88	H
	2110	-53.47	-13	-40.47	-59.48	-55.09	2.16	5.93	H
	2812	-52.96	-13	-39.96	-63.38	-54.99	2.48	6.66	H
	1406	-57.76	-13	-44.76	-56.23	-58.74	1.75	4.88	V
	2110	-50.93	-13	-37.93	-58.91	-52.55	2.16	5.93	V
	2812	-52.01	-13	-39.01	-63.52	-54.04	2.48	6.66	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 17 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1410	-60.79	-13	-47.79	-57.21	-61.77	1.75	4.88	H
	2118	-47.08	-13	-34.08	-55.21	-48.70	2.16	5.93	H
	2820	-53.45	-13	-40.45	-63.87	-55.48	2.48	6.66	H
	1410	-58.81	-13	-45.81	-57.28	-59.79	1.75	4.88	V
	2116	-51.53	-13	-38.53	-59.51	-53.15	2.16	5.93	V
	2820	-52.69	-13	-39.69	-64.2	-54.72	2.48	6.66	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.