

FCC RF Test Report

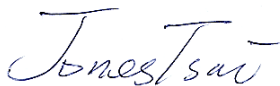
APPLICANT : Acer Incorporated
EQUIPMENT : Smart HandHeld
BRAND NAME : Acer
MODEL NAME : S58, S58A
MARKETING NAME : Liquid Jade Primo, Liquid Jade 2
FCC ID : HLZEMS58
STANDARD : 47 CFR Part 2, 24(E), 27
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Nov. 03, 2015 and completely tested on Feb. 03, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 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 INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG5N0311B	Rev. 01	Initial issue of report	Mar. 09, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§27.50(c)(10)	Effective Radiated Power (Band 12)	ERP < 3 Watt		
	§24.232(c) §27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2) (Band 7)	EIRP < 2Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt		
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 §24.238(a) §27.53(g) §27.53(h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 12)	< 43+10log ₁₀ (P[Watts])	PASS	-
	§27.53(m)(4)	Conducted Band Edge Measurement (Band 7)	§27.53(m)(4)		
3.8	§2.1051 §24.238(a) §27.53(g) §27.53(h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 12)	< 43+10log ₁₀ (P[Watts])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 7)	< 55+10log ₁₀ (P[Watts])		
3.9	§2.1055 §24.235 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-



Report Section	FCC Rule	Description	Limit	Result	Remark
4.4	§2.1053 §24.238(a) §27.53(g) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 12)	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Under limit 18.50 dB at 10206.000 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 7)	$< 55+10\log_{10}(P[\text{Watts}])$		



1 General Description

1.1 Applicant

Acer Incorporated

8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)

1.2 Manufacturer

Shanghai Sunrise Simcom Limited

No. 888, Shengli Rd., Qingpu, Shanghai, P.R.China 201700

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart HandHeld
Brand Name	Acer
Model Name	S58, S58A
Marketing Name	Liquid Jade Primo, Liquid Jade 2
FCC ID	HLZEMS58
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v4.1 EDR/LE
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 12 : 699 MHz ~ 716 MHz
Rx Frequency	LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 7 : 2622.5MHz ~ 2687.5 MHz LTE Band 12 : 729 MHz ~ 746 MHz
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 7 : 5MHz / 10MHz / 15MHz / 20MHz LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 2 : 22.49 dBm LTE Band 4 : 23.25 dBm LTE Band 7 : 21.24 dBm LTE Band 12 : 22.49 dBm
Antenna Type	IFA Antenna
Antenna Gain	LTE Band 2 : 0.79 dBi LTE Band 4 : 0.14 dBi LTE Band 7 : 0.73 dBi LTE Band 12 : -4.69 dBi
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				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	1M10G7D	-	0.2096	1M09W7D	-	0.1746
3	2M72G7D	-	0.2120	2M74W7D	-	0.1766
5	4M50G7D	-	0.2204	4M50W7D	-	0.1828
10	9M09G7D	0.0076	0.2227	9M05W7D	-	0.1931
15	13M5G7D	-	0.2535	13M5W7D	-	0.2084
20	18M5G7D	-	0.2675	18M5W7D	-	0.2280
LTE Band 4				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	1M09G7D	-	0.2103	1M10W7D	-	0.1732
3	2M73G7D	-	0.2126	2M73W7D	-	0.1740
5	4M50G7D	-	0.2212	4M49W7D	-	0.1826
10	9M03G7D	0.0090	0.2078	9M05W7D	-	0.1729
15	13M5G7D	-	0.2140	13M6W7D	-	0.1748
20	18M5G7D	-	0.2345	18M5W7D	-	0.1909
LTE Band 7				16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
			AVG.			AVG.
5	4M50G7D	-	0.1866	4M51W7D	-	0.1499
10	9M13G7D	0.0092	0.1819	9M03W7D	-	0.1522
15	13M6G7D	-	0.1794	13M5W7D	-	0.1439
20	18M4G7D	-	0.1702	18M5W7D	-	0.1424
LTE Band 12				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	1M09G7D	-	0.0413	1M09W7D	-	0.0328
3	2M73G7D	-	0.0391	2M73W7D	-	0.0330
5	4M52G7D	-	0.0391	4M51W7D	-	0.0334
10	9M09G7D	0.0158	0.0409	9M05W7D	-	0.0343

1.7 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	TH05-HY

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
	03CH11-HY

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, 24(E), 27
- ♦ ANSI / TIA / EIA-603-D-2010
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

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.

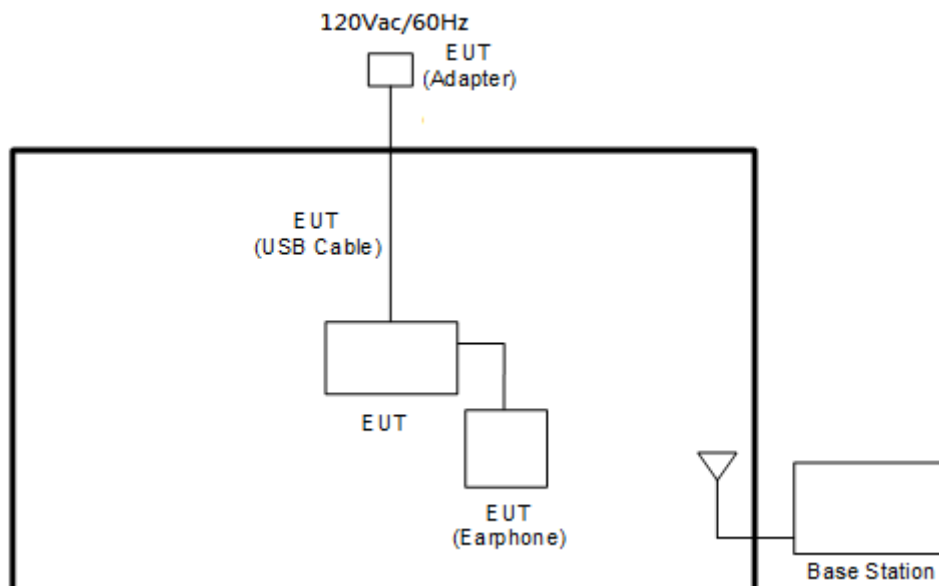
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	7	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	12	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
Peak-to-Average Ratio	2						✓	✓	✓	✓		✓	✓	✓	✓
	4						✓	✓	✓	✓		✓	✓	✓	✓
	7	-	-				✓	✓	✓	✓		✓	✓	✓	✓
	12				✓	-	-	✓	✓	✓		✓	✓	✓	✓
26dB and 99% Bandwidth	2	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
	7	-	-	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
	12	✓	✓	✓	✓	-	-	✓	✓			✓	✓	✓	✓
Conducted Band Edge	2	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
	7	-	-	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
	12	✓	✓	✓	✓	-	-	✓	✓	✓		✓	✓		✓



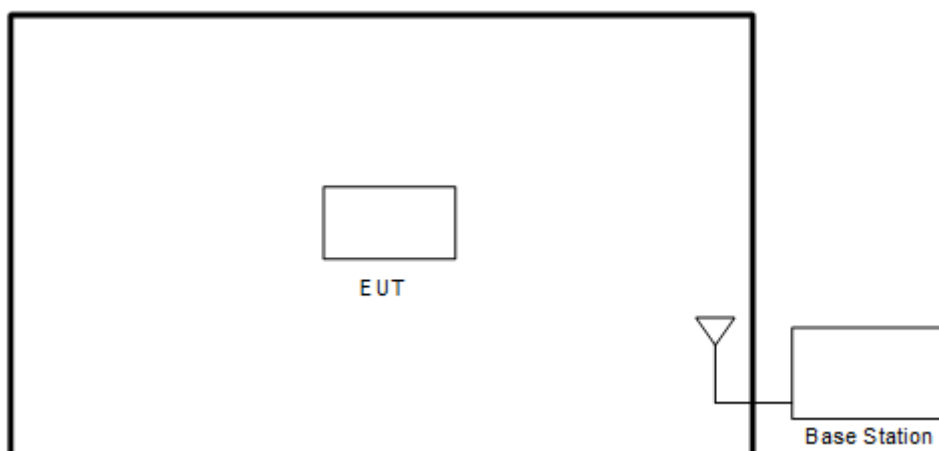
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Conducted Spurious Emission	2	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	7	-	-	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	12	✓	✓	✓	✓	-	-	✓	✓	✓			✓	✓	✓
Frequency Stability	2				✓			✓				✓		✓	
	4				✓			✓				✓		✓	
	7	-	-		✓			✓				✓		✓	
	12				✓	-	-	✓				✓		✓	
E.R.P./ E.I.R.P.	2	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	7	-	-	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	12	✓	✓	✓	✓	-	-	✓	✓	✓			✓	✓	✓
Radiated Spurious Emission	2	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓
	7	-	-	✓	✓	✓	✓	✓		✓			✓	✓	✓
	12	✓	✓	✓	✓	-	-	✓		✓			✓	✓	✓
Note	1. The mark "✓" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 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.														

2.2 Connection Diagram of Test System

<Radiated Spurious Emission for LTE Band 2/4/7>



<Radiated Spurious Emission for LTE Band 12>



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m



2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$



2.5 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3



LTE Band 7 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20850	21100	21350
	Frequency	2510	2535	2560
15	Channel	20825	21100	21375
	Frequency	2507.5	2535	2562.5
10	Channel	20800	21100	21400
	Frequency	2505	2535	2565
5	Channel	20775	21100	21425
	Frequency	2502.5	2535	2567.5

LTE Band 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

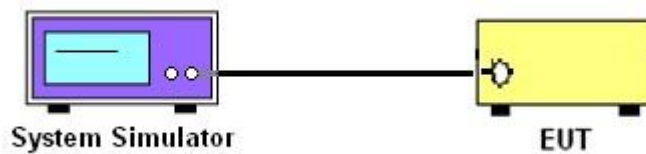
3 Conducted Test Items

3.1 Measuring Instruments

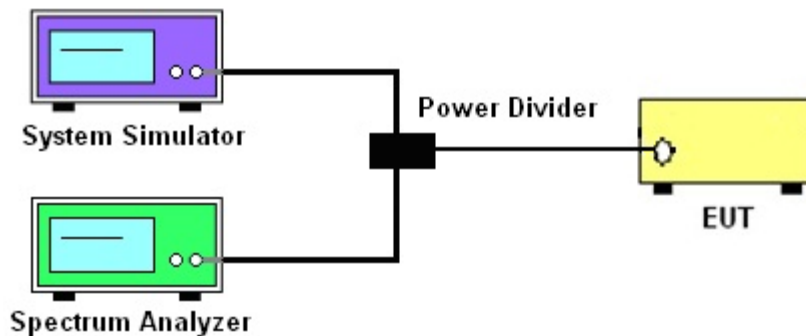
See list of measuring instruments of this test report.

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 and ERP/EIRP

3.4.1 Description of the Conducted Output Power Measurement and ERP/EIRP 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.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 12.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2 and Band 7.

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

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. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
(this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.



3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (g)

For 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.

27.53 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ 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.

27.53(m)(4):

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.

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.
4. Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used and the measured power was integrated over the full required measurement bandwidth of 1 MHz.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

Example:

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

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

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} = -13\text{dBm}.$$

9. For LTE Band 7, the other 40 dB, and 55 dB have additionally applied same calculation above.

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.

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.

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.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. 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.
11. For Band 7
The limit line is derived from $55 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [55 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[55 + 10\log(P)]$ (dB)
 $= -25$ 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 testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. 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.
4. 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.

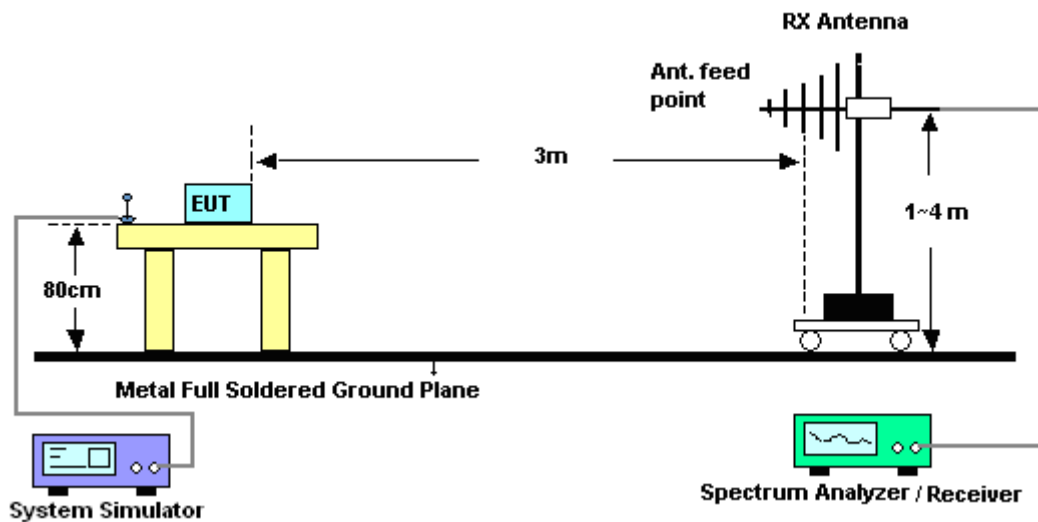
4 Radiated Test Items

4.1 Measuring Instruments

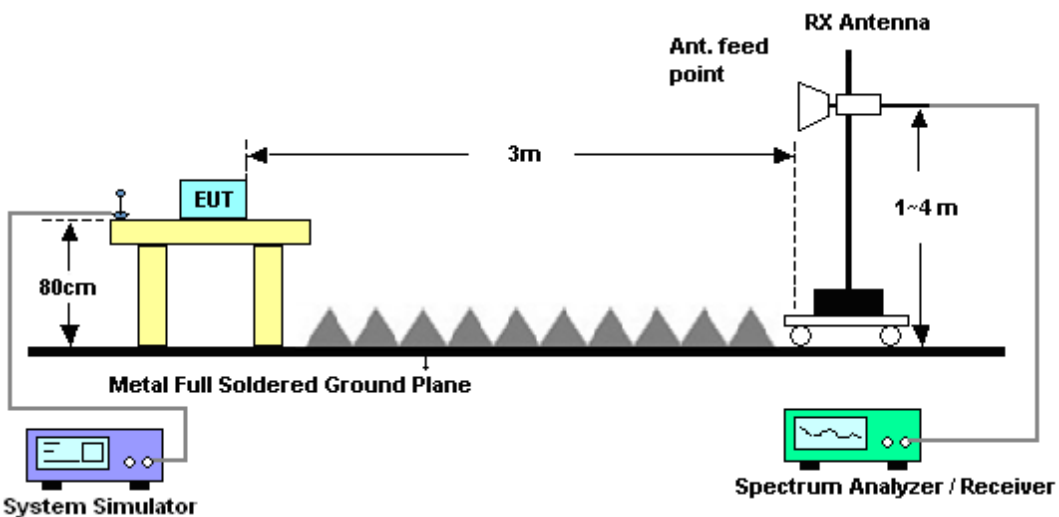
See list of measuring instruments of this test report.

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 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-D-2010. 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.

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.

4.4.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 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)

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

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

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

For Band 7:

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

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

$$13. \text{ ERP (dBm)} = \text{EIRP} - 2.15$$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201432821	GSM/GPRS /WCDMA/LTE	Oct. 16, 2015	Jan. 30, 2016 ~ Feb. 03, 2016	Oct. 15, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Sep. 11, 2015	Jan. 30, 2016 ~ Feb. 03, 2016	Sep. 10, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Mar. 18, 2015	Jan. 30, 2016 ~ Feb. 03, 2016	Mar. 17, 2016	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-30℃ ~70℃	Sep. 08, 2015	Jan. 30, 2016 ~ Feb. 03, 2016	Sep. 07, 2016	Conducted (TH05-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 20, 2015	Jan. 29, 2016 ~ Feb. 02, 2016	Nov. 19, 2016	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D	35414	30MHz~1GHz	Nov. 17, 2015	Jan. 29, 2016 ~ Feb. 02, 2016	Nov. 16, 2016	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 08, 2015	Jan. 29, 2016 ~ Feb. 02, 2016	Oct. 07, 2016	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 19, 2015	Jan. 29, 2016 ~ Feb. 02, 2016	Nov. 18, 2016	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHZ	Sep. 24, 2015	Jan. 29, 2016 ~ Feb. 02, 2016	Sep. 23, 2016	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jan. 29, 2016 ~ Feb. 02, 2016	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0-360 degree	N/A	Jan. 29, 2016 ~ Feb. 02, 2016	N/A	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 02, 2015	Jan. 29, 2016 ~ Feb. 02, 2016	Nov. 01, 2016	Radiation (03CH11-HY)



6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.9
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	22.46	22.49	22.47
20	1	49		21.62	21.56	21.49
20	1	99		21.74	21.73	21.53
20	50	0		21.05	21.17	21.06
20	50	24		20.78	20.69	20.65
20	50	50		20.73	20.54	20.45
20	100	0		20.88	20.91	20.90
20	1	0	16-QAM	21.67	21.75	21.74
20	1	49		20.83	20.76	20.68
20	1	99		20.95	21.00	20.77
20	50	0		20.01	19.82	19.81
20	50	24		19.74	19.65	19.58
20	50	50		19.69	19.54	19.44
20	100	0		19.77	19.68	19.69
15	1	0	QPSK	22.17	22.18	22.14
15	1	37		21.78	21.71	21.56
15	1	74		21.65	21.61	21.43
15	36	0		20.89	20.81	20.84
15	36	20		20.75	20.64	20.58
15	36	39		20.68	20.53	20.40
15	75	0		20.84	20.71	20.62
15	1	0	16-QAM	21.42	21.43	21.39
15	1	37		20.86	20.77	20.68
15	1	74		20.88	20.88	20.71
15	36	0		19.89	19.81	19.78
15	36	20		19.74	19.64	19.53
15	36	39		19.63	19.54	19.35
15	75	0		19.82	19.75	19.55



LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	21.68	21.80	21.64
10	1	25		21.53	21.53	21.27
10	1	49		21.40	21.41	21.13
10	25	0		20.65	20.68	20.45
10	25	12		20.53	20.56	20.33
10	25	25		20.51	20.47	20.15
10	50	0		20.53	20.61	20.38
10	1	0	16-QAM	20.91	21.03	20.93
10	1	25		20.76	20.77	20.57
10	1	49		20.71	20.62	20.41
10	25	0		19.57	19.60	19.40
10	25	12		19.53	19.56	19.28
10	25	25		19.43	19.40	19.07
10	50	0		19.45	19.54	19.29
5	1	0	QPSK	21.51	21.56	21.30
5	1	12		21.50	21.44	21.16
5	1	24		21.46	21.35	21.15
5	12	0		20.47	20.55	20.26
5	12	7		20.52	20.53	20.23
5	12	13		20.46	20.41	20.21
5	25	0		20.50	20.46	20.23
5	1	0	16-QAM	20.73	20.77	20.54
5	1	12		20.74	20.68	20.42
5	1	24		20.67	20.56	20.30
5	12	0		19.47	19.51	19.21
5	12	7		19.48	19.51	19.20
5	12	13		19.46	19.37	19.13
5	25	0		19.46	19.43	19.18



LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	21.46	21.65	21.25
3	1	8		21.58	21.64	21.31
3	1	14		21.46	21.45	21.19
3	8	0		21.37	20.41	20.21
3	8	4		21.47	20.47	20.21
3	8	7		20.42	20.39	20.15
3	15	0		20.42	20.47	20.21
3	1	0	16-QAM	20.77	20.91	20.46
3	1	8		20.90	20.86	20.55
3	1	14		20.67	20.64	20.38
3	8	0		19.48	19.48	19.23
3	8	4		19.48	19.52	19.27
3	8	7		19.48	19.46	19.23
3	15	0		19.44	19.50	19.23
1.4	1	0	QPSK	21.44	21.55	21.10
1.4	1	3		21.53	21.54	21.23
1.4	1	5		21.44	21.39	21.11
1.4	3	0		21.43	21.44	21.13
1.4	3	1		21.49	21.48	21.19
1.4	3	3		21.50	21.45	21.19
1.4	6	0		20.40	20.39	20.11
1.4	1	0	16-QAM	20.78	20.85	20.34
1.4	1	3		20.83	20.84	20.44
1.4	1	5		20.76	20.57	20.34
1.4	3	0		20.53	20.44	20.15
1.4	3	1		20.56	20.47	20.19
1.4	3	3		20.60	20.45	20.18
1.4	6	0		19.45	19.44	19.19



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	21.58	23.12	22.51
20	1	49		22.54	22.49	22.49
20	1	99		22.78	22.27	22.34
20	50	0		20.75	22.08	21.47
20	50	24		21.48	21.66	21.63
20	50	50		21.66	21.48	21.65
20	100	0		21.39	21.71	21.58
20	1	0	16-QAM	20.54	22.36	21.78
20	1	49		21.77	21.75	21.76
20	1	99		22.03	21.51	21.68
20	50	0		19.72	21.07	20.47
20	50	24		20.41	20.63	20.64
20	50	50		20.63	20.49	20.62
20	100	0		20.34	20.71	20.58
15	1	0	QPSK	21.53	23.25	22.38
15	1	37		22.05	22.39	22.57
15	1	74		22.73	22.35	22.35
15	36	0		20.51	21.86	21.61
15	36	20		21.06	21.62	21.57
15	36	39		21.65	21.49	21.51
15	75	0		21.04	21.69	21.63
15	1	0	16-QAM	20.54	22.49	21.62
15	1	37		21.28	21.85	21.65
15	1	74		22.00	21.61	21.64
15	36	0		19.51	20.82	20.60
15	36	20		20.01	20.62	20.54
15	36	39		20.62	20.51	20.46
15	75	0		20.01	20.70	20.62



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	21.55	23.00	22.58
10	1	25		21.52	22.60	22.63
10	1	49		22.27	22.35	22.25
10	25	0		20.54	21.82	21.72
10	25	12		20.54	21.65	21.55
10	25	25		20.91	21.49	21.59
10	50	0		20.56	21.64	21.70
10	1	0	16-QAM	20.53	22.30	21.83
10	1	25		20.71	21.90	21.88
10	1	49		21.50	21.63	21.56
10	25	0		19.54	20.81	20.68
10	25	12		19.51	20.67	20.56
10	25	25		19.87	20.51	20.55
10	50	0		19.53	20.65	20.64
5	1	0	QPSK	21.51	22.65	22.51
5	1	12		21.51	22.57	22.40
5	1	24		21.72	22.34	22.30
5	12	0		20.55	21.71	21.52
5	12	7		20.60	21.63	21.47
5	12	13		20.60	21.62	21.38
5	25	0		20.56	21.59	21.44
5	1	0	16-QAM	20.78	21.91	21.72
5	1	12		20.77	21.78	21.62
5	1	24		20.95	21.62	21.52
5	12	0		19.55	20.73	20.53
5	12	7		19.57	20.64	20.47
5	12	13		19.58	20.65	20.38
5	25	0		19.53	20.62	20.43



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	21.65	22.65	22.48
3	1	8		21.66	22.61	22.53
3	1	14		21.56	22.52	22.29
3	8	0		20.60	21.63	21.42
3	8	4		20.56	21.57	21.48
3	8	7		20.57	21.63	21.39
3	15	0		20.56	21.58	21.47
3	1	0	16-QAM	20.86	21.83	21.65
3	1	8		20.93	21.85	21.75
3	1	14		20.82	21.68	21.49
3	8	0		19.66	20.68	20.45
3	8	4		19.61	20.67	20.52
3	8	7		19.61	20.70	20.42
3	15	0		19.59	20.58	20.47
1.4	1	0	QPSK	21.52	22.51	22.33
1.4	1	3		21.56	22.62	22.41
1.4	1	5		21.52	22.52	22.28
1.4	3	0		21.53	22.54	22.35
1.4	3	1		21.57	22.59	22.40
1.4	3	3		21.56	22.52	22.38
1.4	6	0		20.53	21.48	21.30
1.4	1	0	16-QAM	20.78	21.70	21.53
1.4	1	3		20.82	21.85	21.60
1.4	1	5		20.64	21.67	21.43
1.4	3	0		20.55	21.56	21.35
1.4	3	1		20.59	21.61	21.36
1.4	3	3		20.58	21.53	21.34
1.4	6	0		19.60	20.56	20.39



LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	21.24	21.16	21.10
20	1	49		21.21	21.14	21.09
20	1	99		20.72	20.51	20.80
20	50	0		20.64	20.17	20.26
20	50	24		20.24	20.10	20.25
20	50	50		19.83	19.97	20.13
20	100	0		20.31	20.05	20.21
20	1	0	16-QAM	20.49	20.08	20.03
20	1	49		20.28	20.22	20.29
20	1	99		19.74	19.60	19.85
20	50	0		19.57	19.04	19.07
20	50	24		19.34	19.13	19.20
20	50	50		18.99	18.92	19.13
20	100	0		19.26	18.99	19.25
15	1	0	QPSK	21.23	20.87	21.03
15	1	37		21.21	21.14	21.22
15	1	74		20.85	20.66	20.91
15	36	0		20.45	20.06	20.01
15	36	20		20.40	19.98	20.12
15	36	39		20.08	19.81	20.02
15	75	0		20.32	19.87	20.10
15	1	0	16-QAM	20.46	20.25	20.30
15	1	37		20.36	20.34	20.24
15	1	74		20.05	19.89	19.96
15	36	0		19.36	18.91	18.97
15	36	20		19.41	18.98	19.20
15	36	39		19.10	18.84	18.94
15	75	0		19.28	18.93	19.03



LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	21.22	21.21	20.99
10	1	25		21.21	21.20	21.15
10	1	49		21.14	20.96	20.97
10	25	0		20.33	20.18	19.96
10	25	12		20.44	20.20	20.07
10	25	25		20.27	20.10	20.13
10	50	0		20.27	20.16	20.18
10	1	0	16-QAM	20.85	20.62	20.69
10	1	25		20.65	20.72	20.72
10	1	49		20.64	20.62	20.45
10	25	0		19.30	19.09	18.93
10	25	12		19.31	19.09	19.06
10	25	25		19.26	19.06	19.03
10	50	0		19.28	19.09	19.19
5	1	0	QPSK	21.23	21.13	21.17
5	1	12		21.21	21.20	21.22
5	1	24		21.22	21.14	21.21
5	12	0		20.29	20.16	20.24
5	12	7		20.42	20.13	20.16
5	12	13		20.30	20.11	20.14
5	25	0		20.30	20.05	20.08
5	1	0	16-QAM	20.73	20.21	20.16
5	1	12		20.66	20.30	20.25
5	1	24		20.35	20.11	20.17
5	12	0		19.40	19.26	19.20
5	12	7		19.46	19.24	19.26
5	12	13		19.42	19.20	19.13
5	25	0		19.41	19.17	19.31



LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	22.30	22.32	22.20
10	1	25		22.22	22.18	22.13
10	1	49		22.09	22.16	22.09
10	25	0		21.29	21.36	21.19
10	25	12		21.25	21.24	21.13
10	25	25		21.14	21.16	21.08
10	50	0		21.23	21.27	21.20
10	1	0	16-QAM	21.41	21.46	21.35
10	1	25		21.43	21.39	21.39
10	1	49		21.43	21.40	21.29
10	25	0		20.37	20.22	20.12
10	25	12		20.31	20.22	20.18
10	25	25		20.20	20.09	20.01
10	50	0		20.28	20.18	20.13
5	1	0	QPSK	22.35	22.37	22.17
5	1	12		22.36	22.23	22.14
5	1	24		22.26	22.20	22.14
5	12	0		21.42	21.11	21.17
5	12	7		21.41	21.18	21.15
5	12	13		21.30	21.13	21.13
5	25	0		21.38	21.16	21.18
5	1	0	16-QAM	21.39	21.47	21.40
5	1	12		21.43	21.34	21.35
5	1	24		21.44	21.39	21.29
5	12	0		20.40	20.05	20.15
5	12	7		20.40	20.11	20.16
5	12	13		20.28	20.05	20.12
5	25	0		20.36	20.11	20.13



LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.44	22.25	22.12
3	1	8		22.44	22.49	22.12
3	1	14		22.46	22.17	22.17
3	8	0		21.47	21.13	21.06
3	8	4		21.41	21.12	21.15
3	8	7		21.45	21.07	21.05
3	15	0		21.46	21.07	21.07
3	1	0	16-QAM	21.43	21.07	21.03
3	1	8		21.49	21.10	21.01
3	1	14		21.44	21.09	21.01
3	8	0		20.46	20.19	20.09
3	8	4		20.46	20.24	20.19
3	8	7		20.49	20.20	20.12
3	15	0		20.45	20.19	20.10
1.4	1	0	QPSK	22.39	22.21	21.94
1.4	1	3		22.48	22.30	22.20
1.4	1	5		22.46	22.20	22.06
1.4	3	0		22.39	22.20	22.01
1.4	3	1		22.44	22.23	22.14
1.4	3	3		22.44	22.23	22.14
1.4	6	0		21.42	21.14	21.00
1.4	1	0	16-QAM	21.42	21.36	21.08
1.4	1	3		21.41	21.22	21.16
1.4	1	5		21.36	21.03	21.05
1.4	3	0		21.50	21.15	20.97
1.4	3	1		21.00	21.01	21.08
1.4	3	3		21.43	21.21	21.14
1.4	6	0		20.42	20.14	20.06

**ERP/EIRP**

LTE Band 2 / 1.4MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.14	0.2062	23.21	0.2096
Middle		1	0	22.78	0.1895	22.96	0.1979
Highest		1	0	22.37	0.1728	23.01	0.2000
Lowest	16QAM	1	0	22.35	0.1717	22.42	0.1746
Middle		1	0	22.01	0.1589	22.20	0.1660
Highest		1	0	21.61	0.1450	22.25	0.1678
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 3MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.26	0.2120	23.22	0.2097
Middle		1	0	22.80	0.1907	23.01	0.2001
Highest		1	0	22.39	0.1735	23.15	0.2063
Lowest	16QAM	1	0	22.47	0.1764	22.47	0.1766
Middle		1	0	22.00	0.1586	22.24	0.1674
Highest		1	0	21.99	0.1580	22.20	0.1661
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 5MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.40	0.2187	23.43	0.2204
Middle		1	0	22.73	0.1877	23.13	0.2055
Highest		1	0	22.37	0.1726	23.22	0.2101
Lowest	16QAM	1	0	22.62	0.1828	22.58	0.1812
Middle		1	0	21.97	0.1576	22.33	0.1710
Highest		1	0	21.54	0.1427	22.46	0.1762
Limit	EIRP < 2W			Result		PASS	



LTE Band 2 / 10MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.48	0.2227	23.44	0.2208
Middle		1	0	22.80	0.1906	23.18	0.2080
Highest		1	0	22.49	0.1773	23.16	0.2069
Lowest	16QAM	1	0	22.86	0.1931	22.69	0.1860
Middle		1	0	22.16	0.1644	22.45	0.1756
Highest		1	0	21.87	0.1537	22.58	0.1812
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 15MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.88	0.2441	24.04	0.2535
Middle		1	0	23.38	0.2176	23.77	0.2381
Highest		1	0	23.28	0.2128	23.94	0.2479
Lowest	16QAM	1	0	23.06	0.2021	23.19	0.2084
Middle		1	0	22.58	0.1810	22.93	0.1963
Highest		1	0	22.45	0.1756	23.11	0.2046
Limit	EIRP < 2W			Result		PASS	

LTE Band 2 / 20MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	24.03	0.2527	24.27	0.2675
Middle		1	0	23.55	0.2264	24.02	0.2522
Highest		1	0	23.60	0.2293	24.03	0.2532
Lowest	16QAM	1	0	23.32	0.2150	23.58	0.2280
Middle		1	0	22.67	0.1848	23.22	0.2097
Highest		1	0	22.85	0.1926	23.29	0.2135
Limit	EIRP < 2W			Result		PASS	



LTE Band 4 / 1.4MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	3	23.23	0.2103	22.09	0.1618
Middle		1	3	22.50	0.1777	21.91	0.1554
Highest		1	3	22.40	0.1739	21.93	0.1559
Lowest	16QAM	1	3	22.39	0.1732	21.22	0.1324
Middle		1	3	21.72	0.1485	21.12	0.1294
Highest		1	3	21.63	0.1456	21.18	0.1311
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 3MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.28	0.2126	22.10	0.1620
Middle		1	0	22.69	0.1858	21.87	0.1537
Highest		1	0	22.48	0.1769	21.69	0.1476
Lowest	16QAM	1	8	22.41	0.1740	21.17	0.1311
Middle		1	8	21.83	0.1523	21.07	0.1280
Highest		1	8	21.69	0.1477	20.91	0.1232
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 5MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.45	0.2212	22.03	0.1596
Middle		1	0	22.67	0.1851	21.78	0.1505
Highest		1	0	22.36	0.1723	21.83	0.1523
Lowest	16QAM	1	0	22.61	0.1826	21.22	0.1324
Middle		1	0	21.91	0.1552	21.02	0.1265
Highest		1	0	21.61	0.1449	21.07	0.1281
Limit	EIRP < 1W			Result		PASS	



LTE Band 4 / 10MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.18	0.2078	22.35	0.1716
Middle		1	0	22.72	0.1870	21.90	0.1547
Highest		1	0	22.18	0.1651	22.40	0.1737
Lowest	16QAM	1	0	22.38	0.1729	21.56	0.1432
Middle		1	0	22.00	0.1583	21.16	0.1307
Highest		1	0	21.47	0.1402	21.68	0.1473
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 15MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.30	0.2140	22.86	0.1932
Middle		1	0	23.05	0.2017	22.47	0.1766
Highest		1	0	22.83	0.1919	22.22	0.1667
Lowest	16QAM	1	0	22.43	0.1748	22.09	0.1619
Middle		1	0	22.27	0.1686	21.69	0.1477
Highest		1	0	22.03	0.1596	21.37	0.1370
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 20MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.70	0.2345	23.01	0.1998
Middle		1	0	23.13	0.2055	22.72	0.1869
Highest		1	0	23.15	0.2065	22.60	0.1820
Lowest	16QAM	1	0	22.81	0.1909	22.26	0.1681
Middle		1	0	22.36	0.1723	21.95	0.1566
Highest		1	0	22.23	0.1672	21.79	0.1509
Limit	EIRP < 1W			Result		PASS	



LTE Band 7 / 5MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	21.17	0.1309	21.31	0.1353
Middle		1	0	21.23	0.1327	21.63	0.1454
Highest		1	0	21.84	0.1529	22.71	0.1866
Lowest	16QAM	1	0	20.40	0.1097	20.59	0.1145
Middle		1	0	20.48	0.1116	20.87	0.1223
Highest		1	0	20.91	0.1232	21.76	0.1499
Limit	EIRP < 2W			Result		PASS	

LTE Band 7 / 10MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	21.21	0.1323	21.27	0.1338
Middle		1	0	21.15	0.1304	21.59	0.1442
Highest		1	0	21.85	0.1531	22.60	0.1819
Lowest	16QAM	1	0	20.50	0.1122	20.57	0.1141
Middle		1	0	20.39	0.1093	20.93	0.1239
Highest		1	0	21.07	0.1279	21.83	0.1522
Limit	EIRP < 2W			Result		PASS	

LTE Band 7 / 15MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	21.42	0.1388	21.45	0.1397
Middle		1	0	21.19	0.1315	21.59	0.1441
Highest		1	0	22.23	0.1669	22.54	0.1794
Lowest	16QAM	1	0	20.64	0.1159	20.69	0.1172
Middle		1	0	20.46	0.1111	20.84	0.1212
Highest		1	0	21.38	0.1375	21.58	0.1439
Limit	EIRP < 2W			Result		PASS	



LTE Band 7 / 20MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	21.69	0.1476	21.27	0.1341
Middle		1	0	21.00	0.1258	21.22	0.1323
Highest		1	0	21.37	0.1369	22.31	0.1702
Lowest	16QAM	1	0	20.88	0.1225	20.55	0.1136
Middle		1	0	20.26	0.1062	20.42	0.1101
Highest		1	0	20.61	0.1150	21.53	0.1424
Limit	EIRP < 2W			Result		PASS	



LTE Band 12 / 1.4MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	3	4.19	0.0026	16.16	0.0413
Middle		1	3	5.27	0.0034	15.47	0.0352
Highest		1	3	6.08	0.0041	14.83	0.0304
Lowest	16QAM	3	0	3.09	0.0020	15.15	0.0328
Middle		3	0	3.82	0.0024	14.50	0.0282
Highest		3	0	4.70	0.0030	13.71	0.0235
Limit	ERP < 3W			Result		PASS	

LTE Band 12 / 3MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	8	4.28	0.0027	15.92	0.0391
Middle		1	8	5.20	0.0033	15.33	0.0341
Highest		1	8	6.27	0.0042	14.69	0.0294
Lowest	16QAM	1	8	3.53	0.0023	15.19	0.0330
Middle		1	8	4.35	0.0027	14.53	0.0284
Highest		1	8	5.57	0.0036	14.01	0.0252
Limit	ERP < 3W			Result		PASS	

LTE Band 12 / 5MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	3.97	0.0025	15.93	0.0391
Middle		1	0	4.90	0.0031	15.87	0.0387
Highest		1	0	5.51	0.0036	14.72	0.0296
Lowest	16QAM	1	0	3.34	0.0022	15.24	0.0334
Middle		1	0	4.17	0.0026	15.17	0.0328
Highest		1	0	4.44	0.0028	14.28	0.0268
Limit	ERP < 3W			Result		PASS	



LTE Band 12 / 10MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	0	3.62	0.0023	16.11	0.0409
Middle		1	0	3.96	0.0025	15.97	0.0395
Highest		1	0	5.09	0.0032	15.90	0.0389
Lowest	16QAM	1	0	2.89	0.0019	15.35	0.0343
Middle		1	0	3.27	0.0021	15.33	0.0341
Highest		1	0	4.36	0.0027	15.14	0.0327
Limit	ERP < 3W			Result		PASS	



LTE Band 2

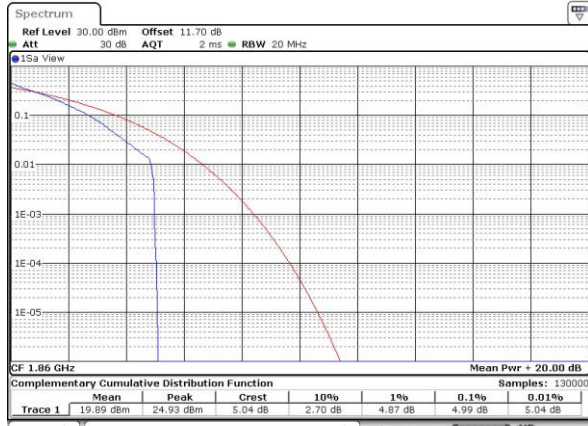
Peak-to-Average Ratio

Mode	LTE Band 2 / 20MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	4.99	5.57	5.62	6.46	PASS
Middle CH	4.70	5.45	5.48	6.41	
Highest CH	4.90	5.51	5.36	6.43	

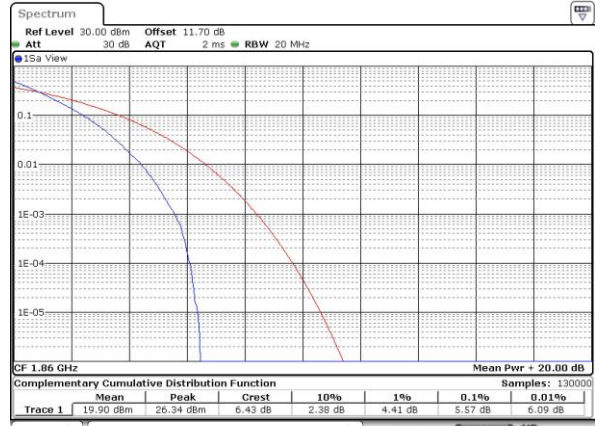


LTE Band 2 / 20MHz / QPSK

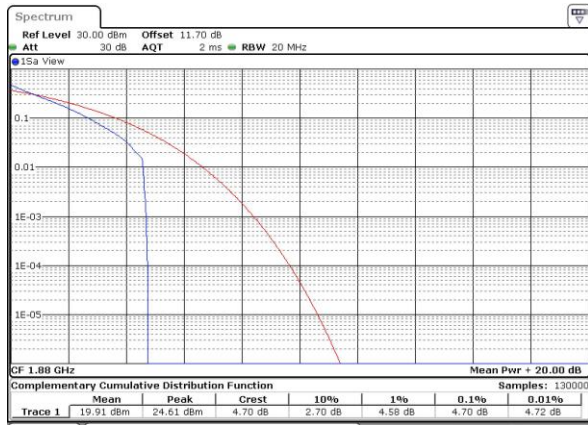
Lowest Channel / 1RB



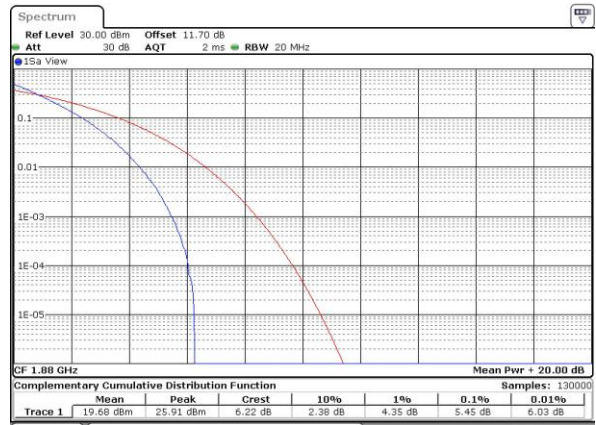
Lowest Channel / Full RB



Middle Channel / 1RB



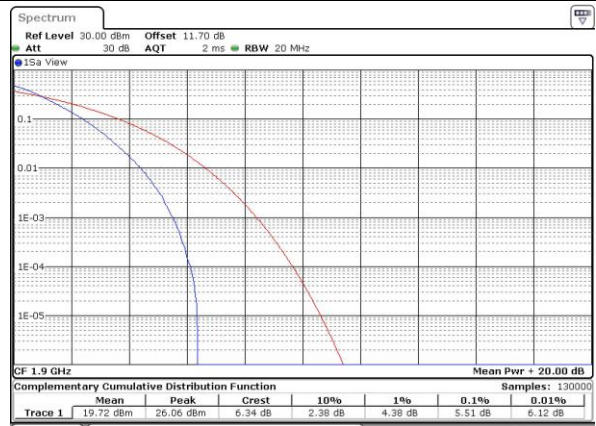
Middle Channel / Full RB



Highest Channel / 1RB



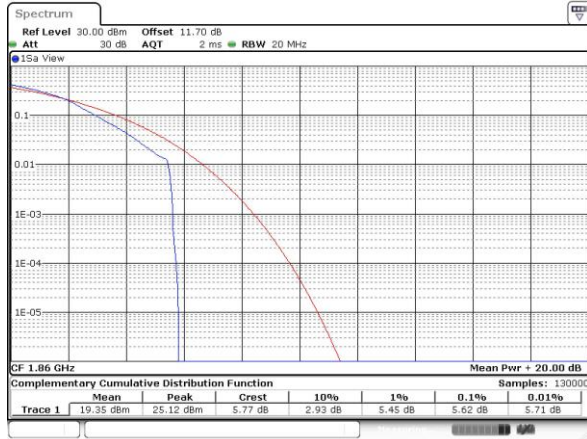
Highest Channel / Full RB



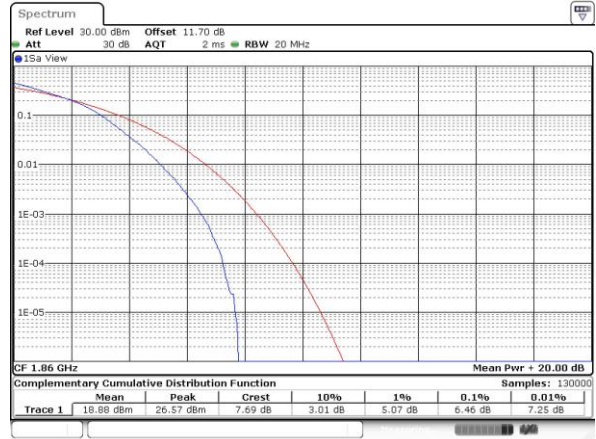


LTE Band 2 / 20MHz / 16QAM

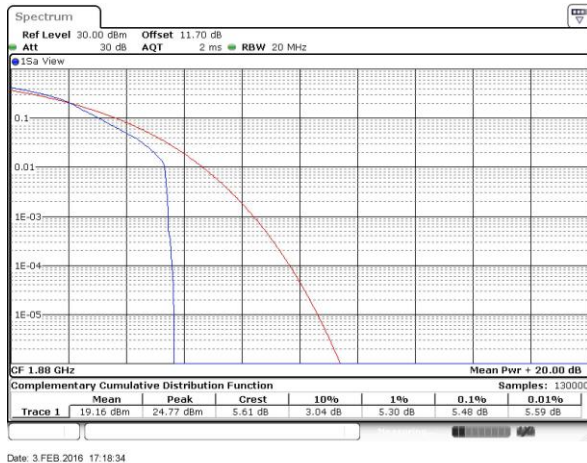
Lowest Channel / 1RB



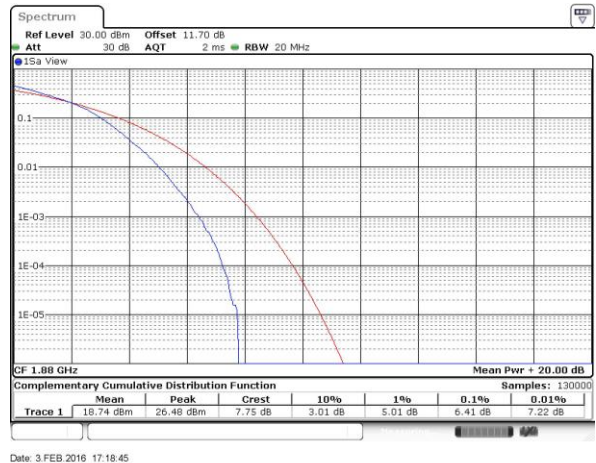
Lowest Channel / Full RB



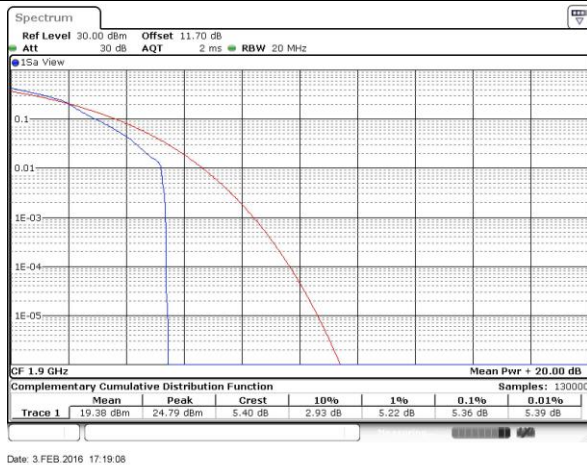
Middle Channel / 1RB



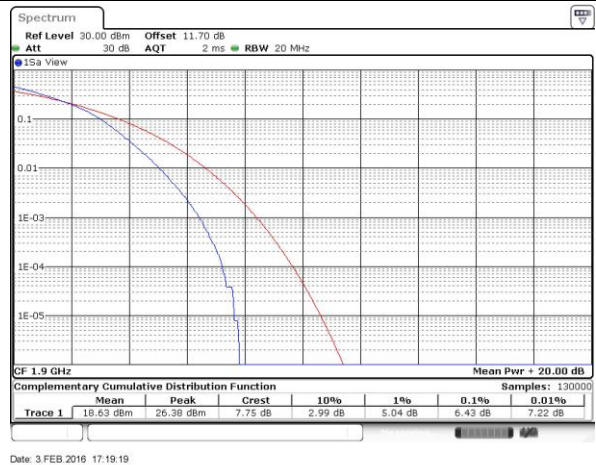
Middle Channel / Full RB



Highest Channel / 1RB



Highest Channel / Full RB





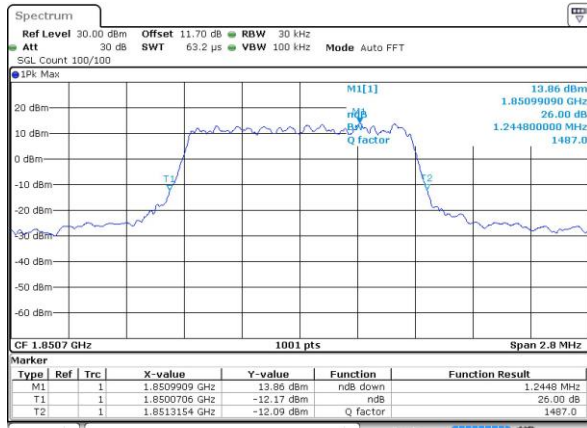
26dB Bandwidth

Mode	LTE Band 2 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.24	1.24	2.97	3.03	4.94	4.83	9.75	9.85	14.30	14.39	20.10	20.14
Middle CH	1.23	1.22	3.01	3.00	4.93	4.91	9.87	9.77	14.21	14.39	20.58	20.10
Highest CH	1.23	1.24	3.00	3.06	4.98	4.92	9.67	9.95	14.15	14.30	20.14	20.10

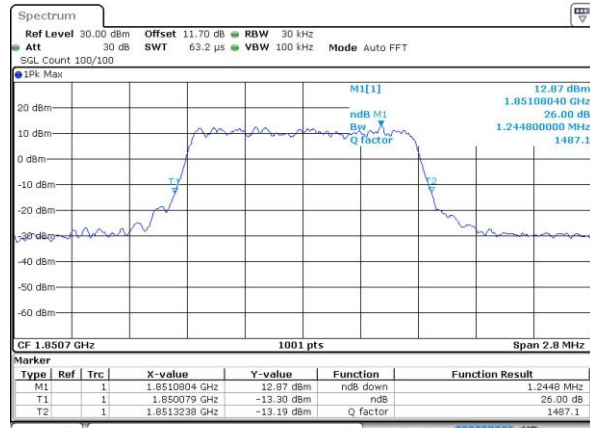


LTE Band 2

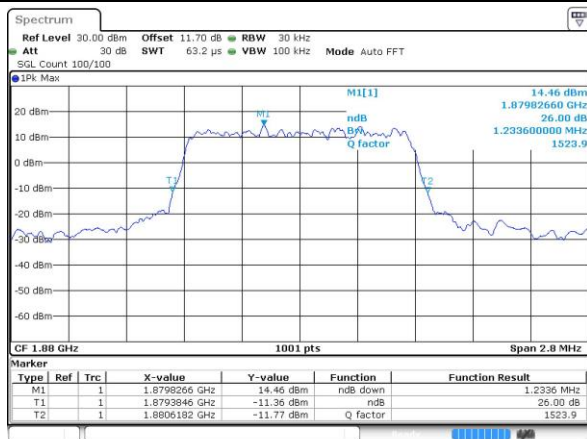
Lowest Channel / 1.4MHz / QPSK



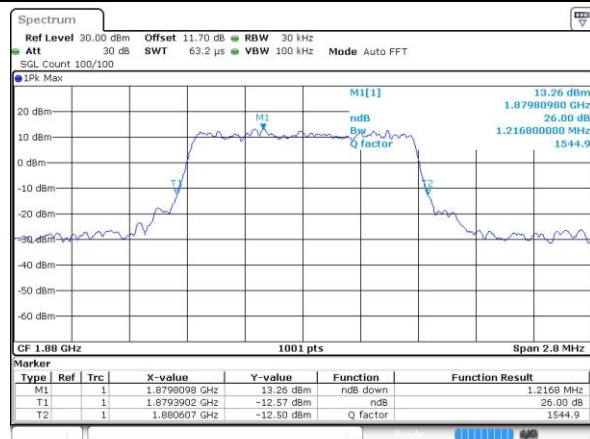
Lowest Channel / 1.4MHz / 16QAM



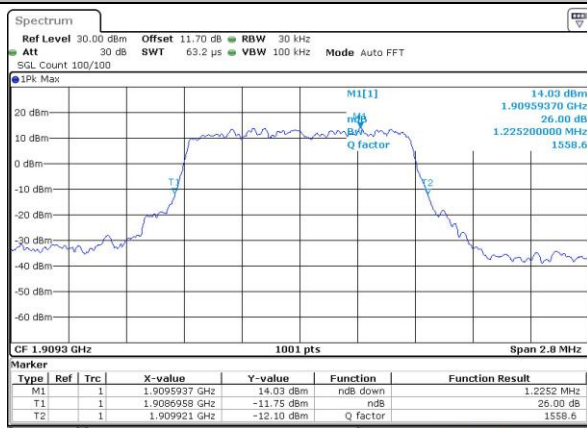
Middle Channel / 1.4MHz / QPSK



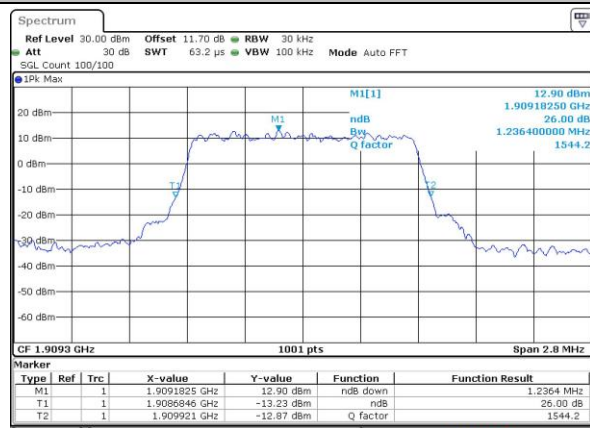
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK



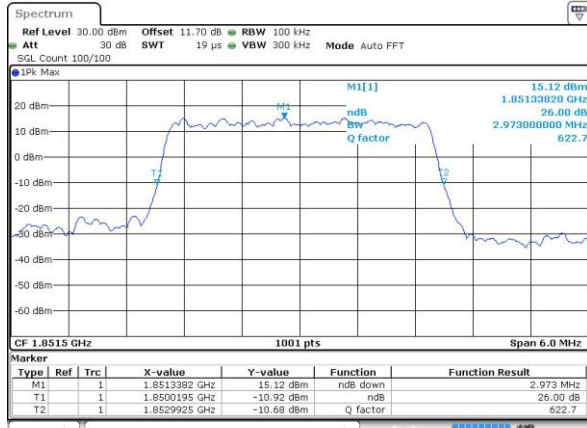
Highest Channel / 1.4MHz / 16QAM





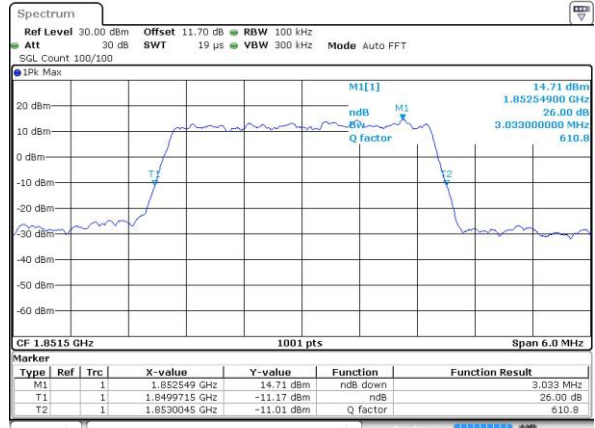
LTE Band 2

Lowest Channel / 3MHz / QPSK



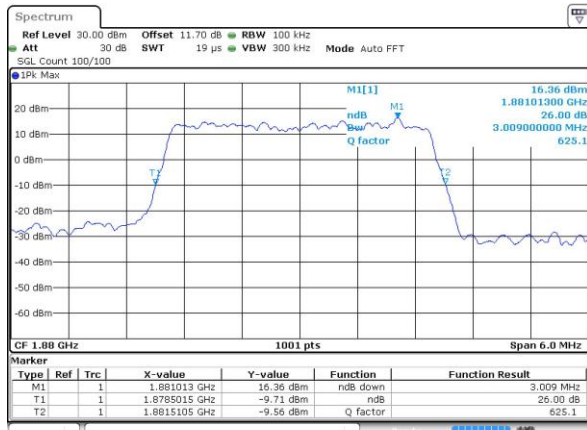
Date: 3 FEB 2016 15:12:58

Lowest Channel / 3MHz / 16QAM



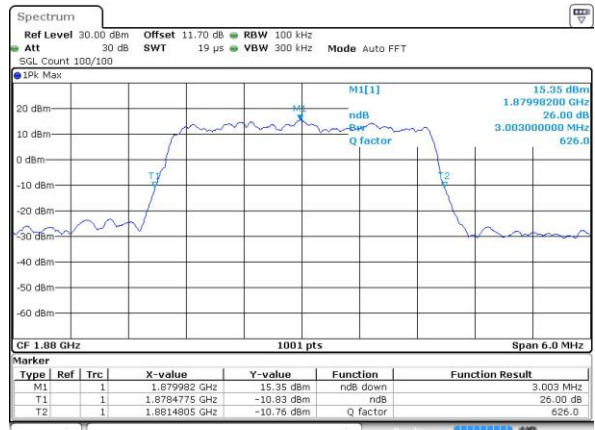
Date: 3 FEB 2016 15:13:08

Middle Channel / 3MHz / QPSK



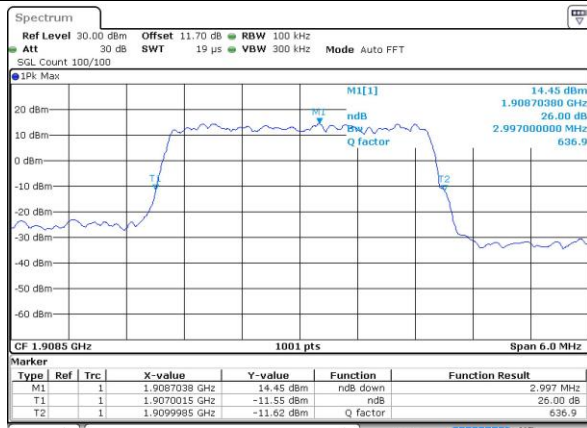
Date: 3 FEB 2016 15:20:07

Middle Channel / 3MHz / 16QAM



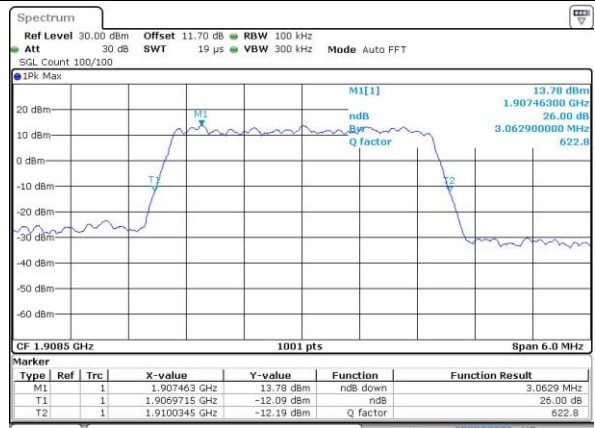
Date: 3 FEB 2016 15:20:17

Highest Channel / 3MHz / QPSK



Date: 3 FEB 2016 15:22:39

Highest Channel / 3MHz / 16QAM

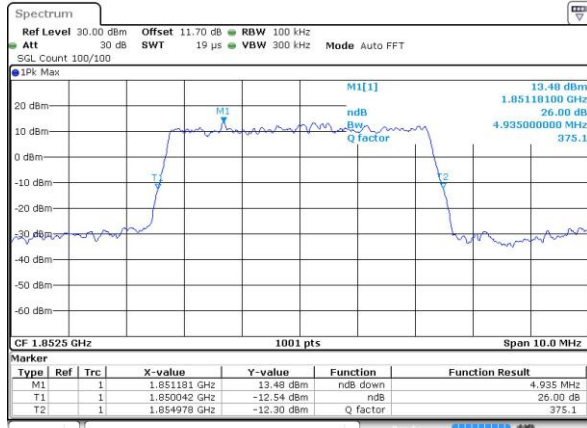


Date: 3 FEB 2016 15:22:49



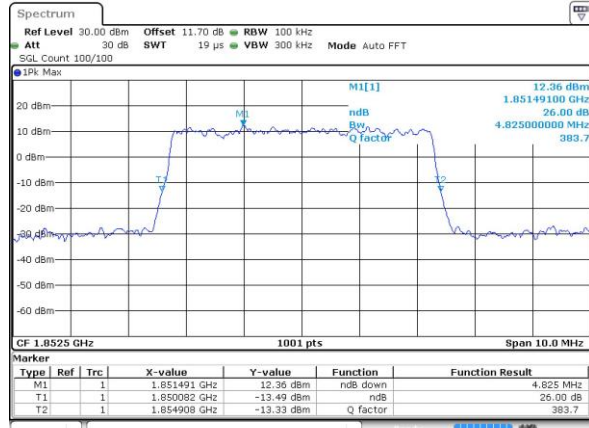
LTE Band 2

Lowest Channel / 5MHz / QPSK



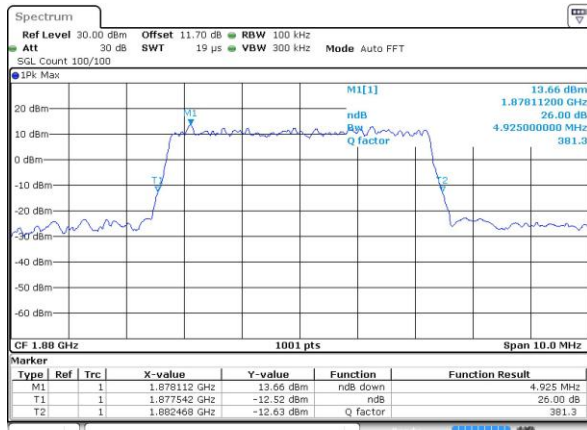
Date: 3.FEB.2016 15:37:47

Lowest Channel / 5MHz / 16QAM



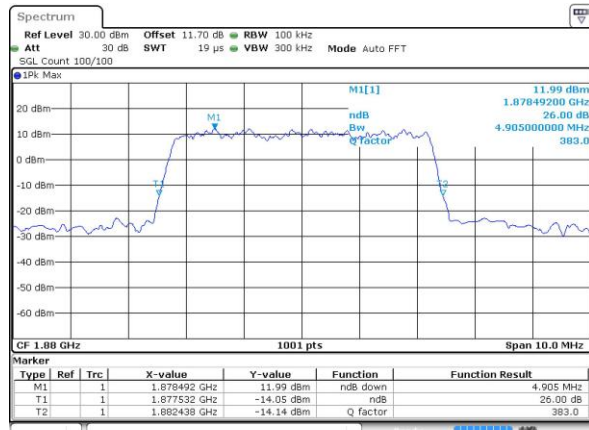
Date: 3.FEB.2016 15:37:58

Middle Channel / 5MHz / QPSK



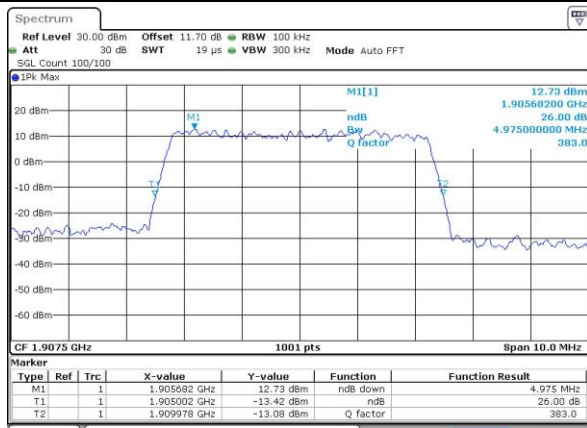
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Middle Channel / 5MHz / 16QAM



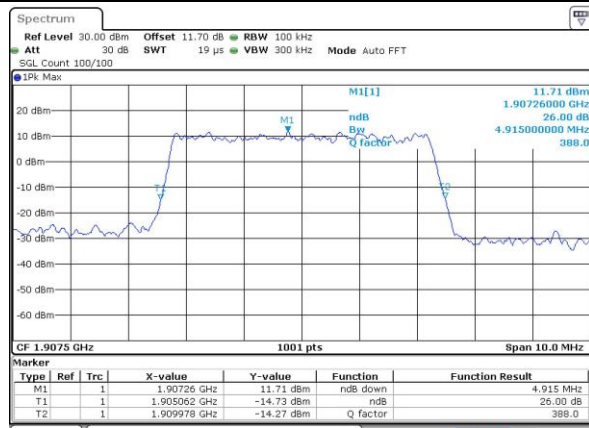
Date: 3.FEB.2016 15:45:07

Highest Channel / 5MHz / QPSK



Date: 3.FEB.2016 15:47:28

Highest Channel / 5MHz / 16QAM

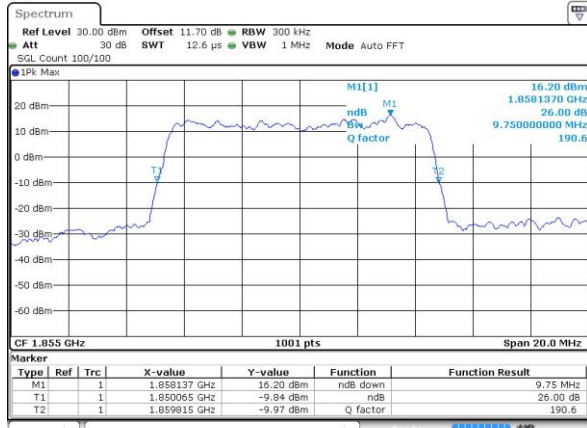


Date: 3.FEB.2016 15:47:39

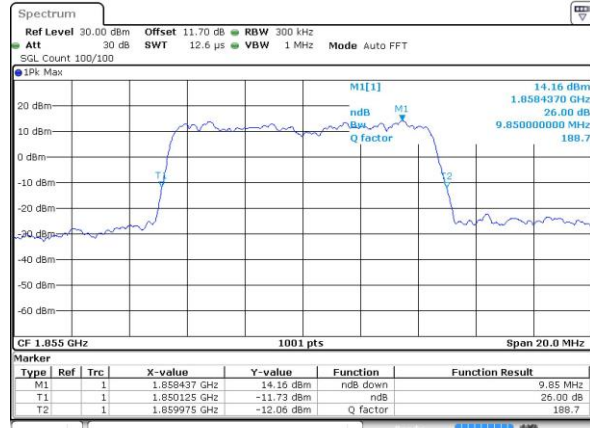


LTE Band 2

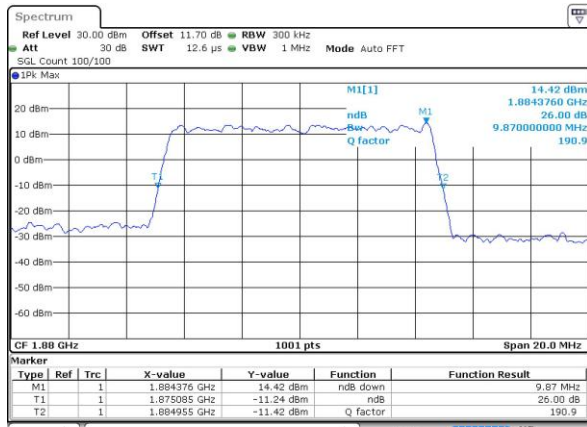
Lowest Channel / 10MHz / QPSK



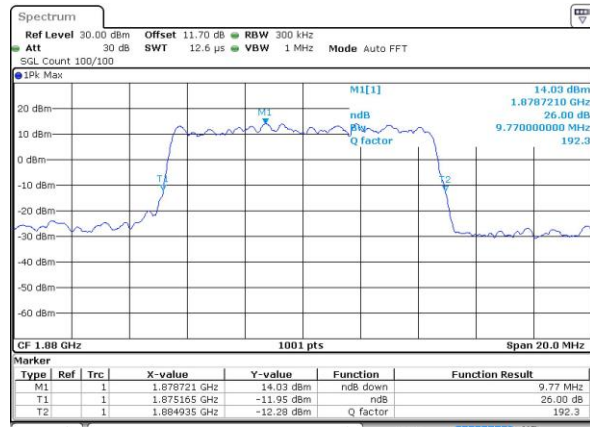
Lowest Channel / 10MHz / 16QAM



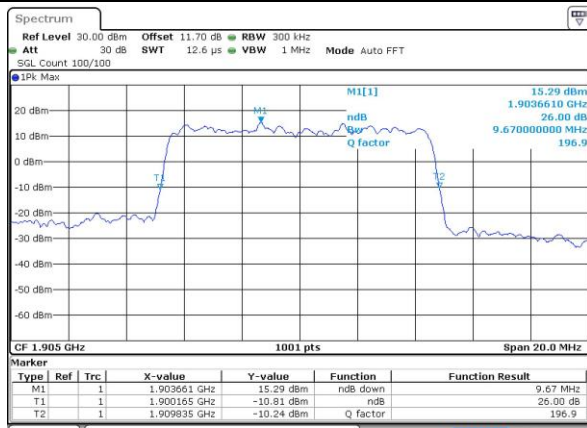
Middle Channel / 10MHz / QPSK



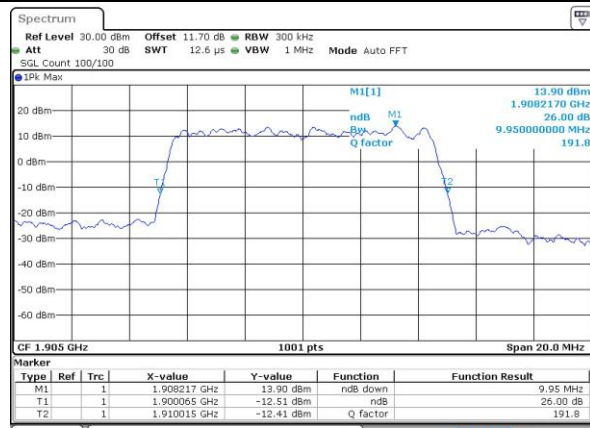
Middle Channel / 10MHz / 16QAM



Highest Channel / 10MHz / QPSK



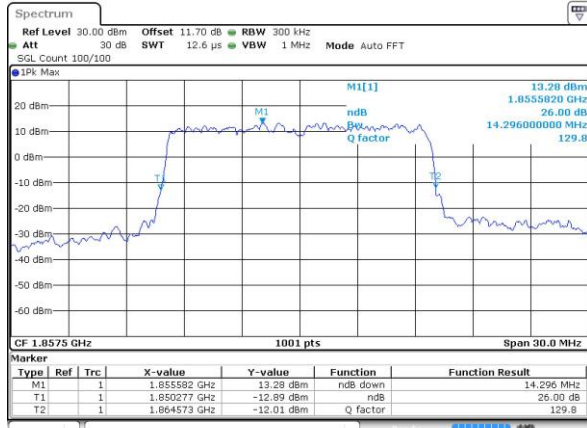
Highest Channel / 10MHz / 16QAM



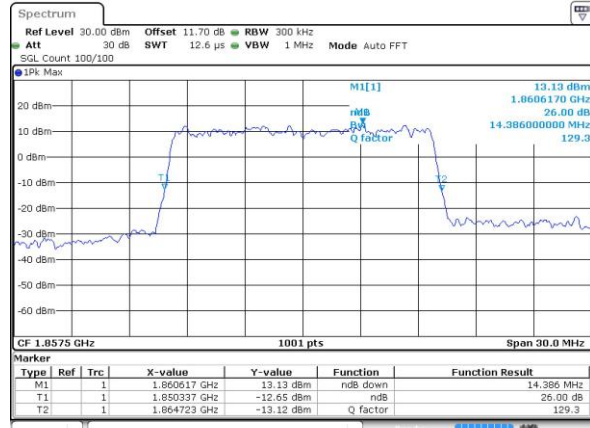


LTE Band 2

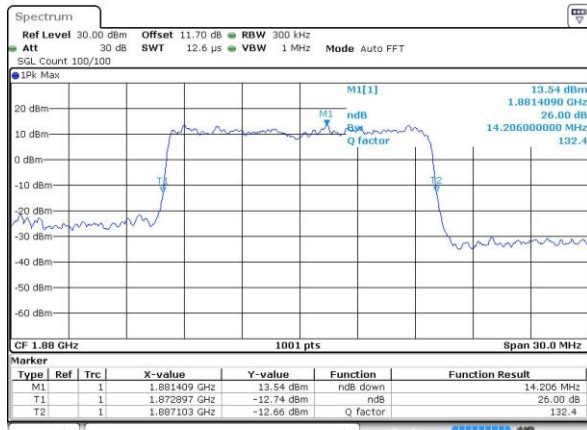
Lowest Channel / 15MHz / QPSK



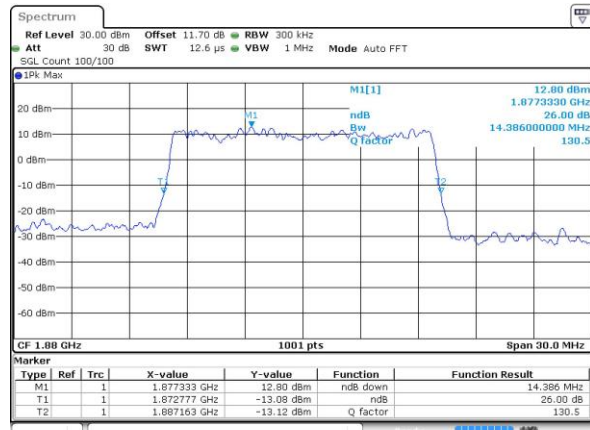
Lowest Channel / 15MHz / 16QAM



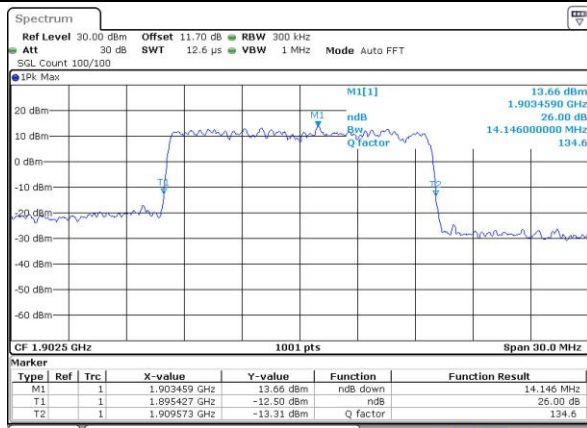
Middle Channel / 15MHz / QPSK



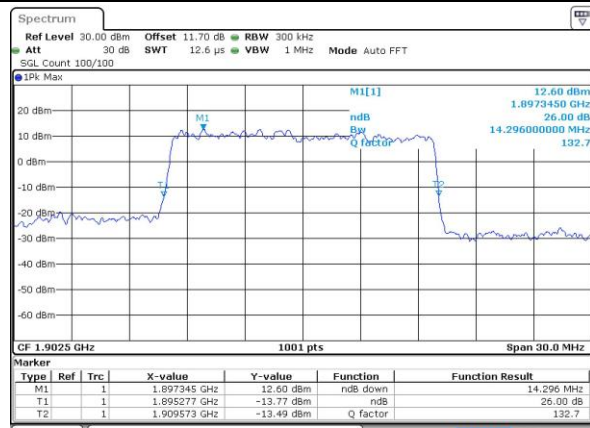
Middle Channel / 15MHz / 16QAM



Highest Channel / 15MHz / QPSK



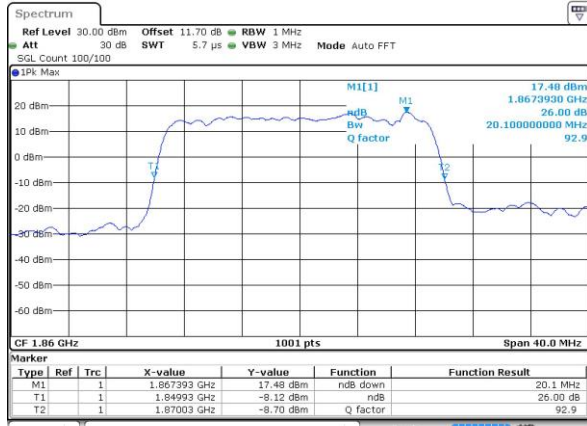
Highest Channel / 15MHz / 16QAM





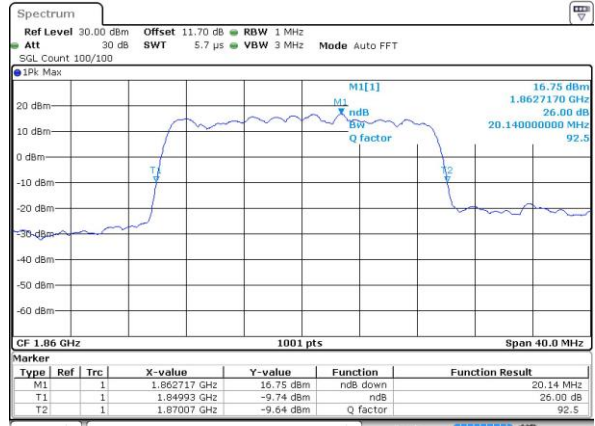
LTE Band 2

Lowest Channel / 20MHz / QPSK



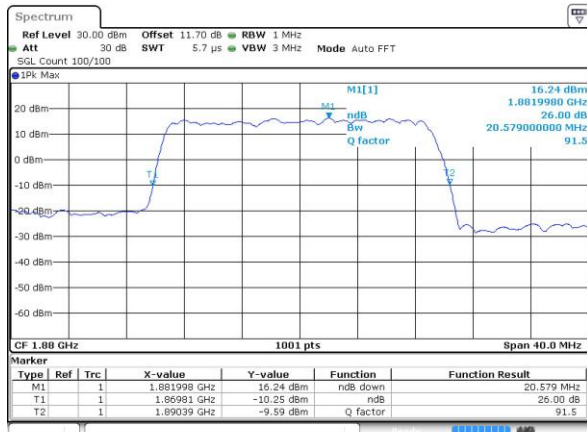
Date: 3 FEB 2016 16:28:19

Lowest Channel / 20MHz / 16QAM



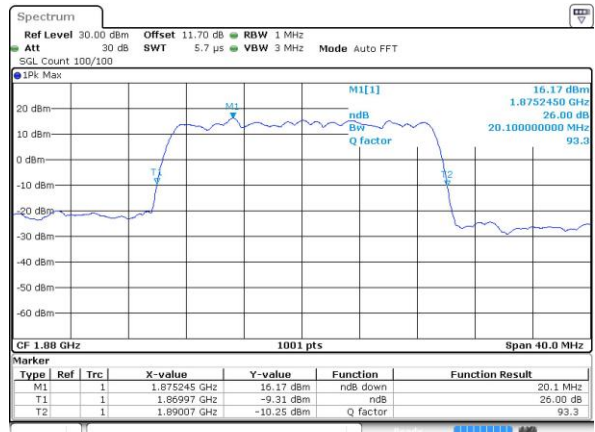
Date: 3 FEB 2016 16:28:30

Middle Channel / 20MHz / QPSK



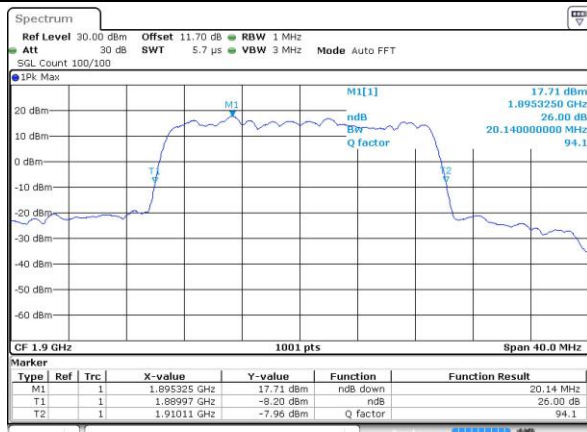
Date: 3 FEB 2016 16:35:28

Middle Channel / 20MHz / 16QAM



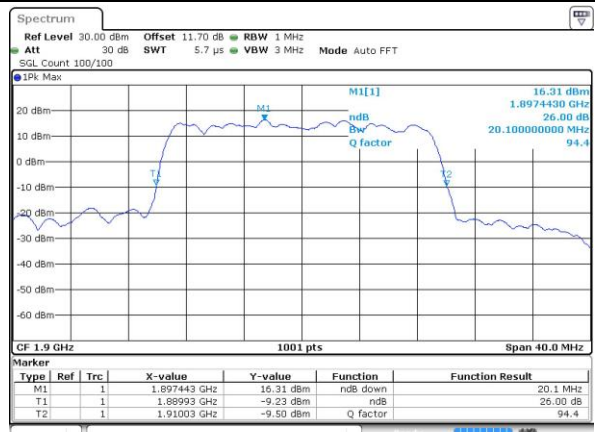
Date: 3 FEB 2016 16:35:38

Highest Channel / 20MHz / QPSK



Date: 3 FEB 2016 16:37:59

Highest Channel / 20MHz / 16QAM



Date: 3 FEB 2016 16:38:10



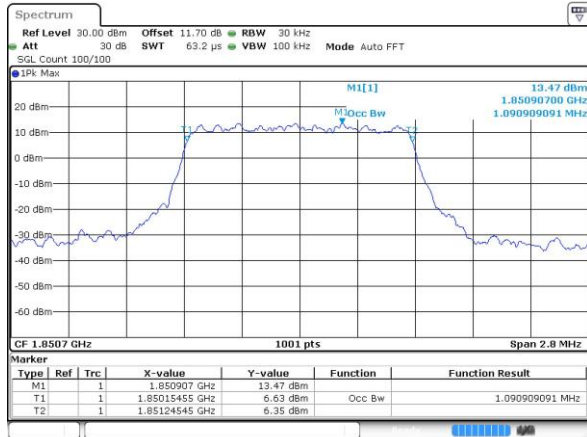
Occupied Bandwidth

Mode	LTE Band 2 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.09	1.09	2.72	2.72	4.50	4.50	9.05	9.01	13.46	13.43	18.46	18.38
Middle CH	1.10	1.09	2.72	2.73	4.48	4.49	9.01	9.05	13.46	13.49	18.38	18.42
Highest CH	1.09	1.09	2.71	2.74	4.49	4.50	9.09	9.03	13.46	13.46	18.34	18.50

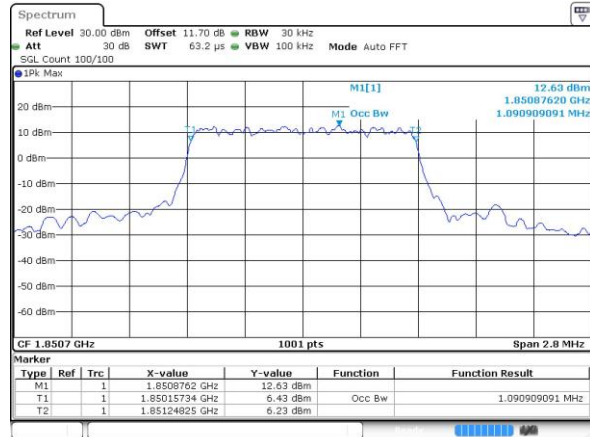


LTE Band 2

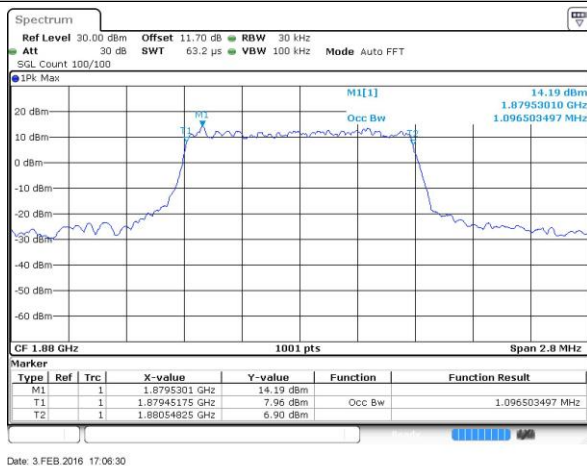
Lowest Channel / 1.4MHz / QPSK



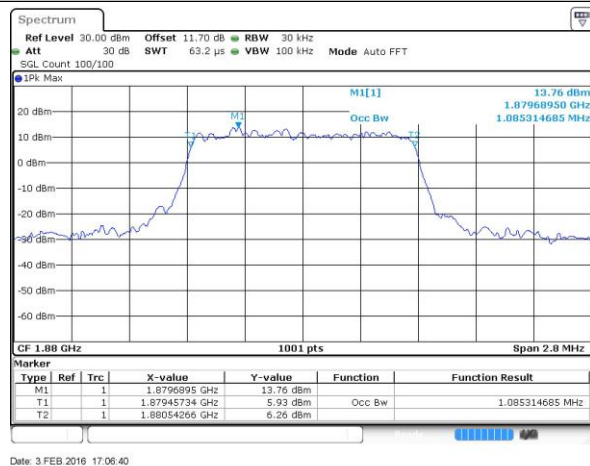
Lowest Channel / 1.4MHz / 16QAM



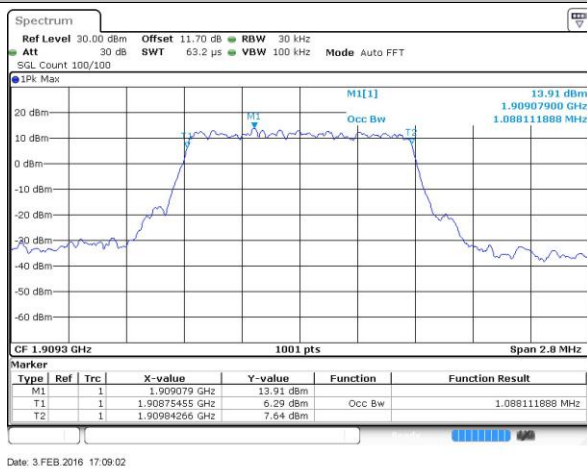
Middle Channel / 1.4MHz / QPSK



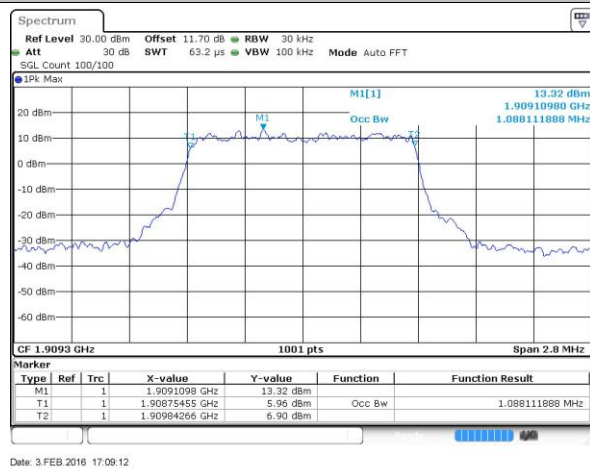
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK



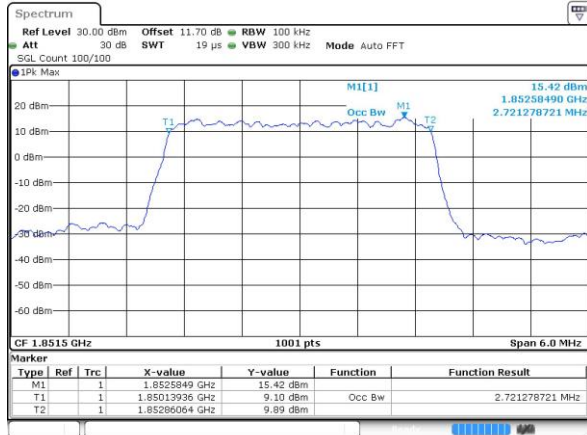
Highest Channel / 1.4MHz / 16QAM





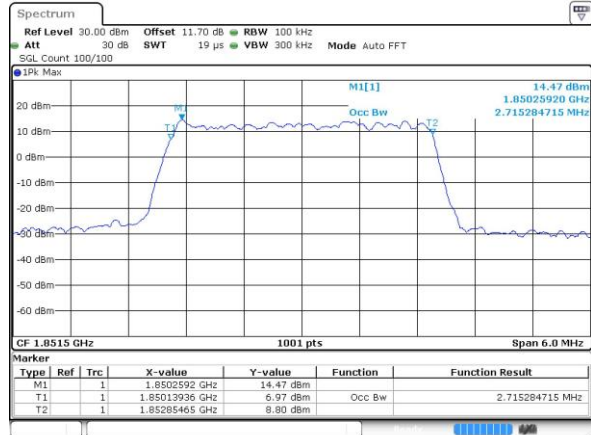
LTE Band 2

Lowest Channel / 3MHz / QPSK



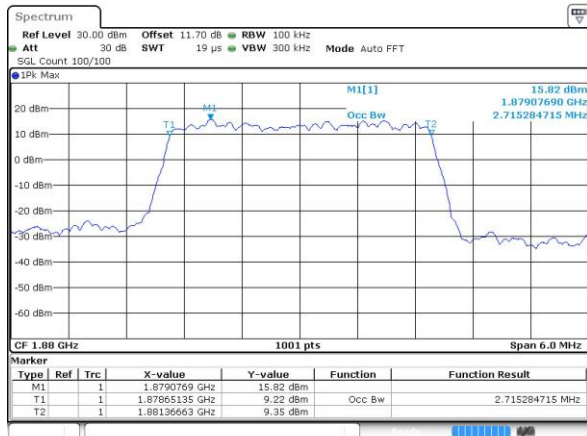
Date: 3 FEB 2016 15:12:37

Lowest Channel / 3MHz / 16QAM



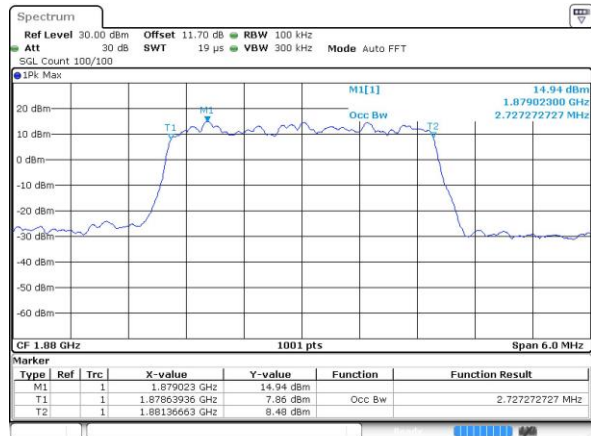
Date: 3 FEB 2016 15:12:47

Middle Channel / 3MHz / QPSK



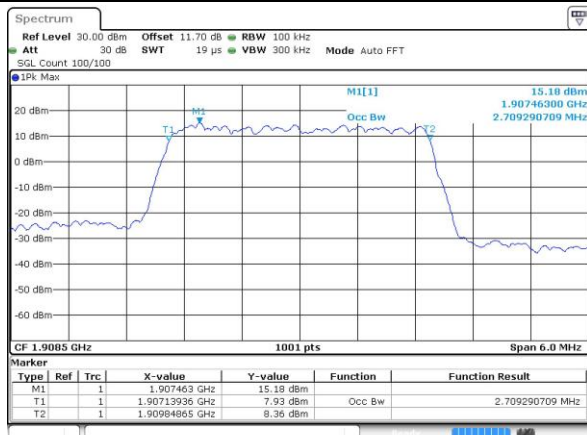
Date: 3 FEB 2016 15:19:46

Middle Channel / 3MHz / 16QAM



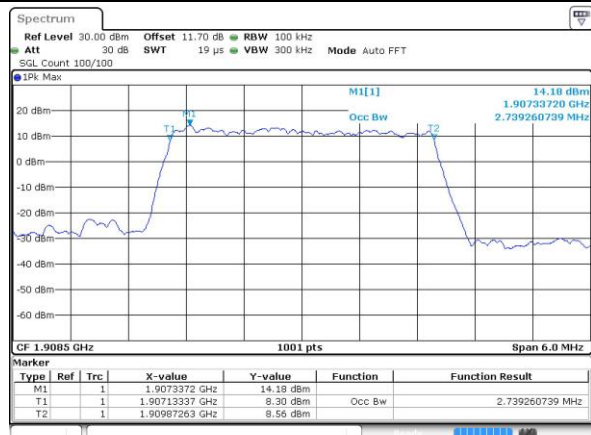
Date: 3 FEB 2016 15:19:56

Highest Channel / 3MHz / QPSK



Date: 3 FEB 2016 15:22:18

Highest Channel / 3MHz / 16QAM

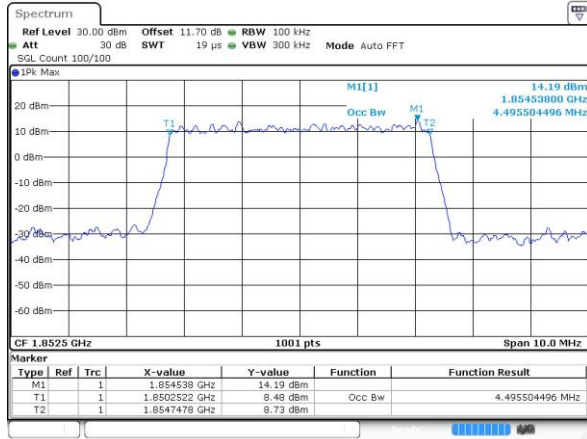


Date: 3 FEB 2016 15:22:28

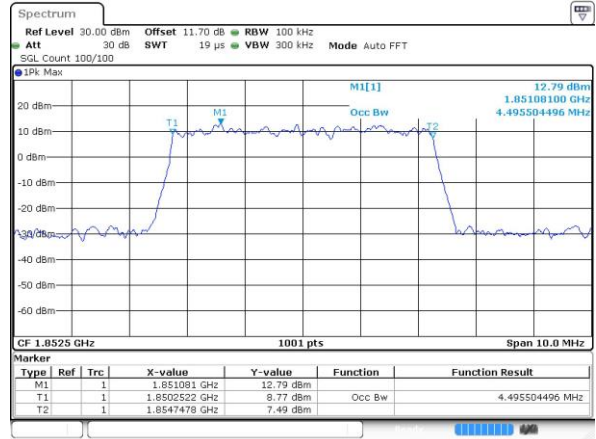


LTE Band 2

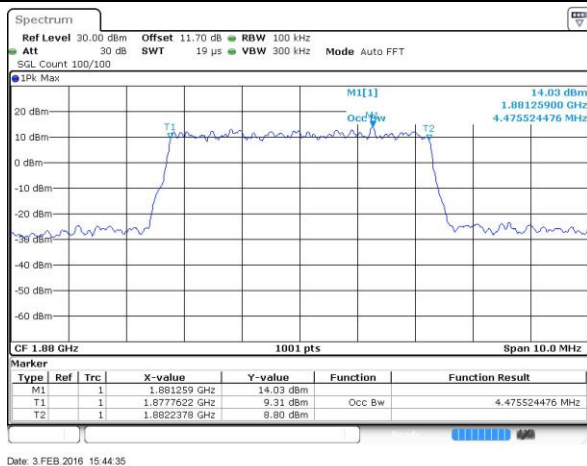
Lowest Channel / 5MHz / QPSK



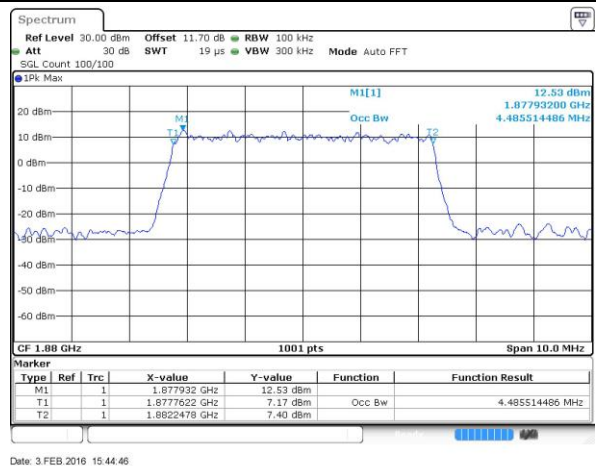
Lowest Channel / 5MHz / 16QAM



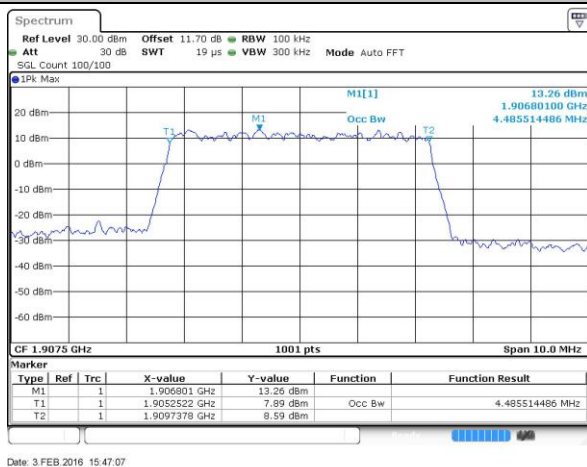
Middle Channel / 5MHz / QPSK



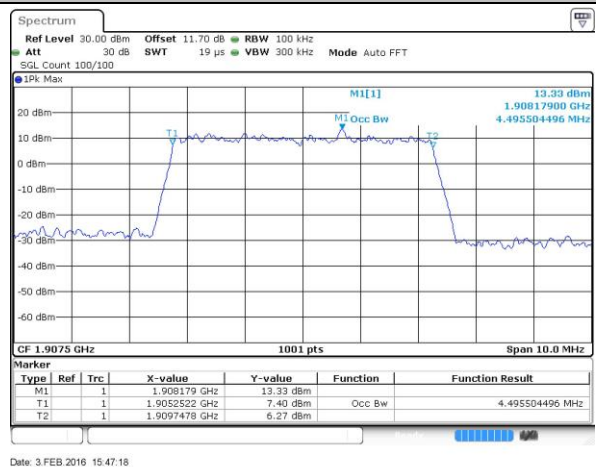
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK



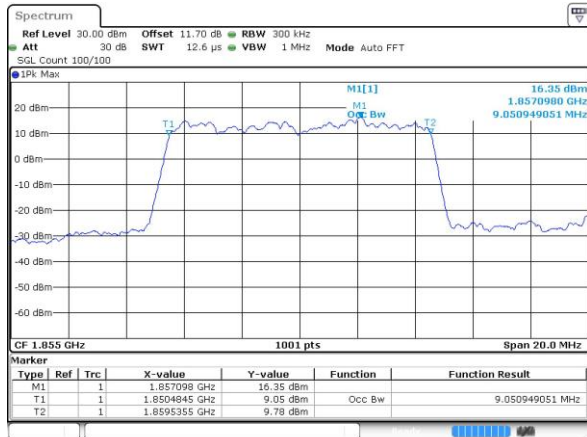
Highest Channel / 5MHz / 16QAM





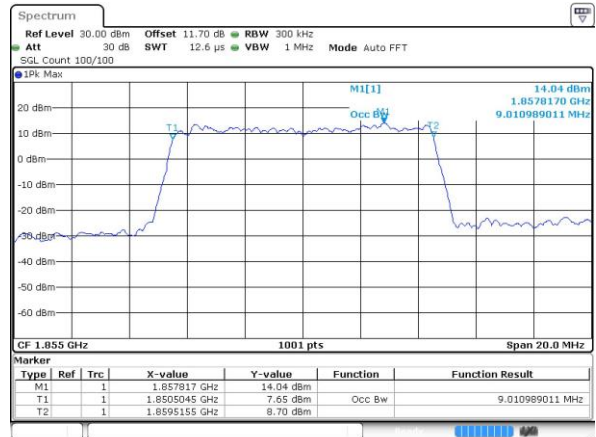
LTE Band 2

Lowest Channel / 10MHz / QPSK



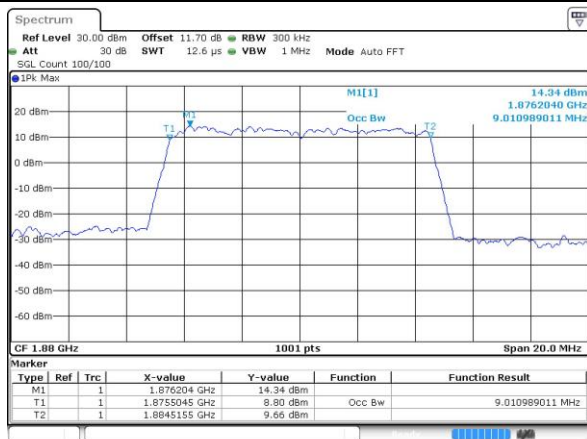
Date: 3 FEB 2016 15:54:16

Lowest Channel / 10MHz / 16QAM



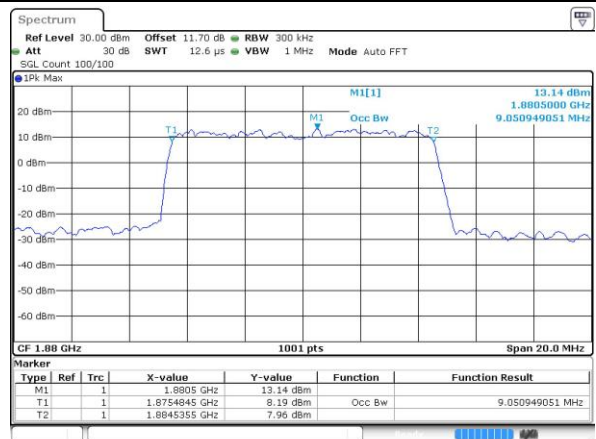
Date: 3 FEB 2016 15:54:27

Middle Channel / 10MHz / QPSK



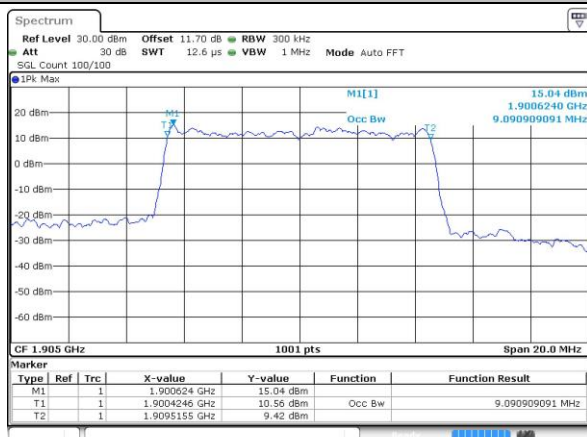
Date: 3 FEB 2016 16:01:26

Middle Channel / 10MHz / 16QAM



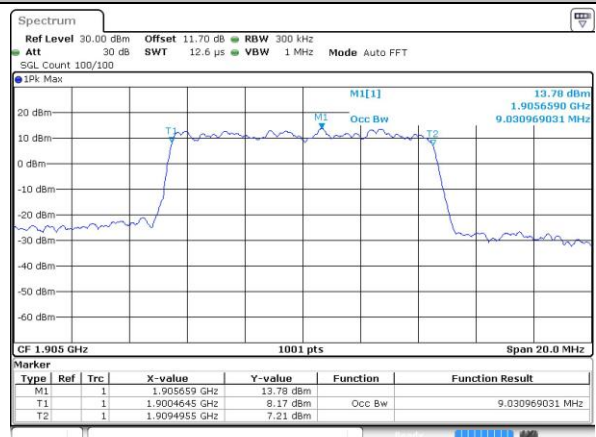
Date: 3 FEB 2016 16:01:36

Highest Channel / 10MHz / QPSK



Date: 3 FEB 2016 16:03:58

Highest Channel / 10MHz / 16QAM

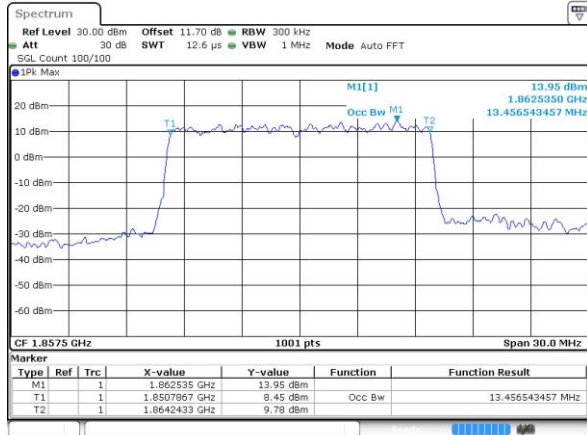


Date: 3 FEB 2016 16:04:08



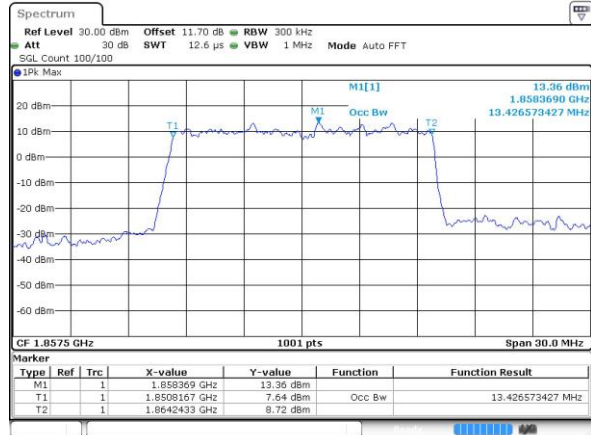
LTE Band 2

Lowest Channel / 15MHz / QPSK



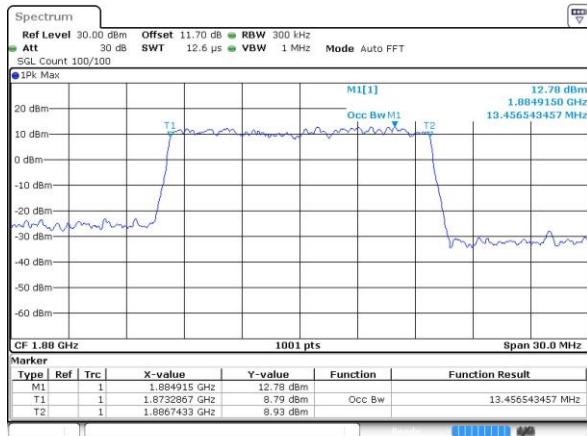
Date: 3 FEB 2016 16:11:08

Lowest Channel / 15MHz / 16QAM



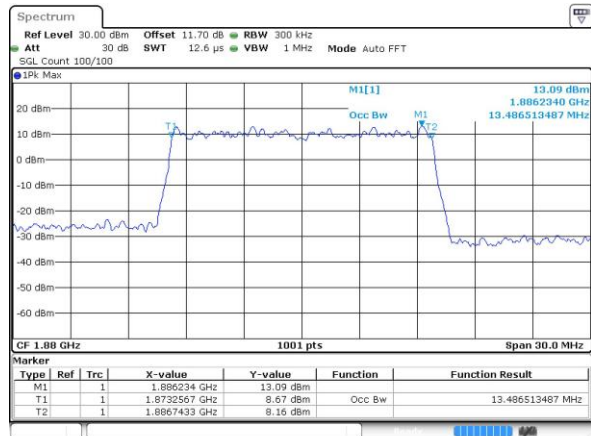
Date: 3 FEB 2016 16:11:18

Middle Channel / 15MHz / QPSK



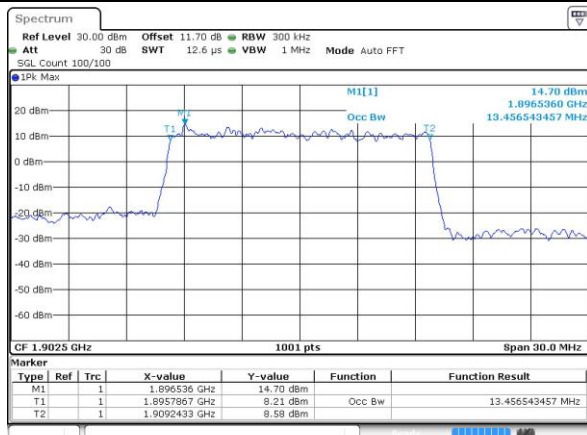
Date: 3 FEB 2016 16:18:17

Middle Channel / 15MHz / 16QAM



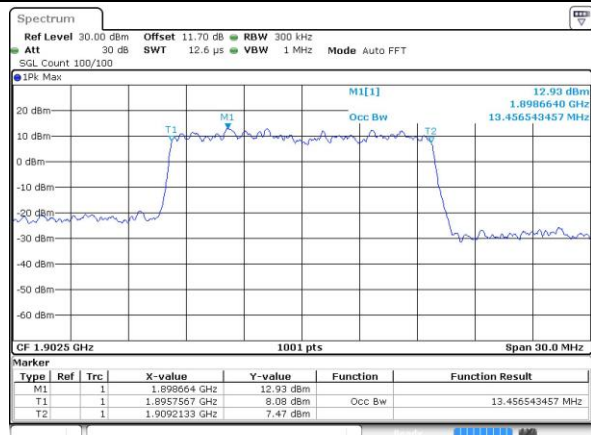
Date: 3 FEB 2016 16:18:28

Highest Channel / 15MHz / QPSK



Date: 3 FEB 2016 16:20:49

Highest Channel / 15MHz / 16QAM

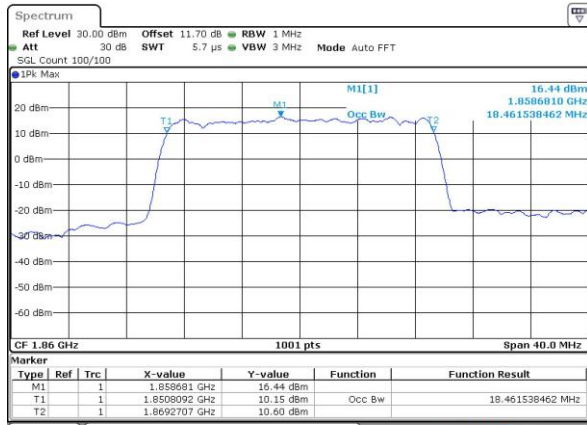


Date: 3 FEB 2016 16:21:00



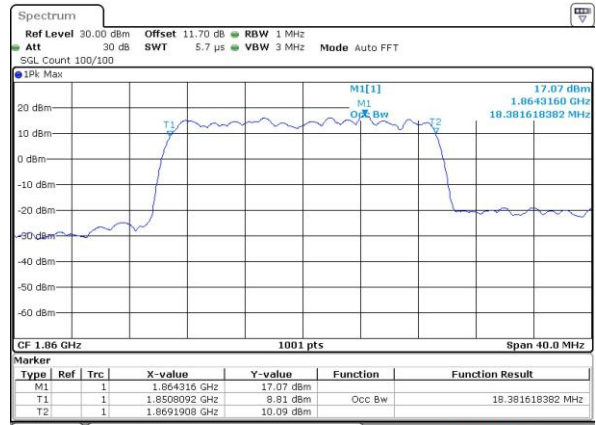
LTE Band 2

Lowest Channel / 20MHz / QPSK



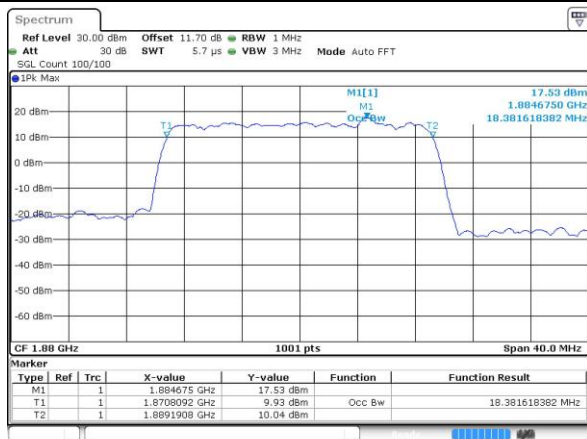
Date: 3 FEB 2016 16:27:58

Lowest Channel / 20MHz / 16QAM



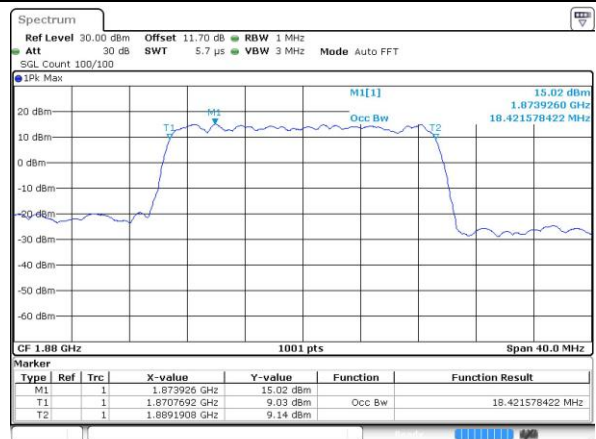
Date: 3 FEB 2016 16:28:09

Middle Channel / 20MHz / QPSK



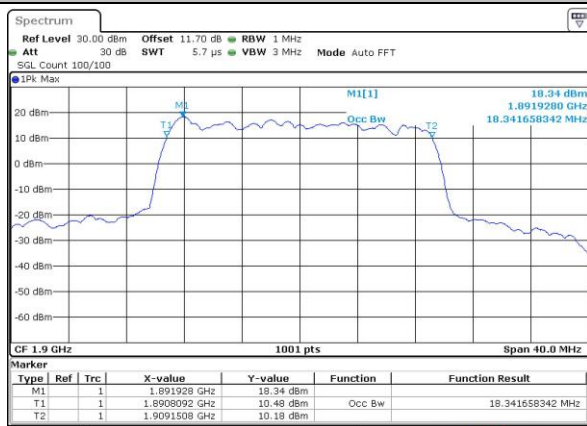
Date: 3 FEB 2016 16:35:07

Middle Channel / 20MHz / 16QAM



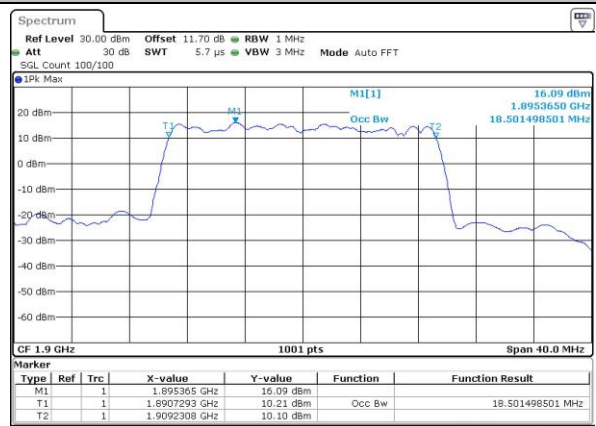
Date: 3 FEB 2016 16:35:17

Highest Channel / 20MHz / QPSK



Date: 3 FEB 2016 16:37:38

Highest Channel / 20MHz / 16QAM



Date: 3 FEB 2016 16:37:49