

FCC RF Test Report

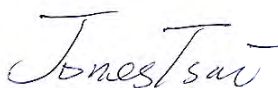
APPLICANT : ZTE CORPORATION
EQUIPMENT : LTE/WCDMA/GSM Tri-Mode Digital Mobile
Phone
BRAND NAME : ZTE
MODEL NAME : Z812
FCC ID : SRQ-Z812
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Jan. 06, 2015 and testing was completed on Jan. 28, 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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG510603B	Rev. 01	Initial issue of report	Feb. 17, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.5	§2.1049 §22.917(b) §24.238(b) §27.53(h)(3)	Occupied Bandwidth & 26dB Bandwidth	Reporting Only	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log ₁₀ (P[Watt])	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log ₁₀ (P[Watts])	PASS	-
3.8	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-
	§2.1055 §24.235 §27.54		within authorized band		
3.9	§2.1046	Conducted Output Power	Reporting Only	PASS	-

Report Section	FCC Rule	Description	Limit	Result	Remark
3.10	§22.913(a)(2)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(c)(10)	Effective Radiated Power (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		
3.11	§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 29.76 dB at 3750.000 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	LTE/WCDMA/GSM Tri-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z812
FCC ID	SRQ-Z812
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/LTE WLAN 2.4GHz 802. 11b/g/n HT20 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
HW Version	wuzA
SW Version	Z812V1.0.0B04
EUT Stage	Production Unit

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

1.4 Product Specification 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 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 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 17 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 2 : 22.86 dBm LTE Band 4 : 23.15 dBm LTE Band 5 : 23.32 dBm LTE Band 17 : 22.93 dBm
Antenna Type	IFA Antenna
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

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

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

FCC Rule	System	Type of Modulation	BW	Emission Designator	Frequency Tolerance (ppm)	Maximum EIRP
Part 24E	LTE Band 2	QPSK	1.4MHz	1M11G7D	-	0.4539 W
Part 24E	LTE Band 2	16QAM	1.4MHz	1M10W7D	-	0.4159 W
Part 24E	LTE Band 2	QPSK	3MHz	2M75G7D	-	0.4667 W
Part 24E	LTE Band 2	16QAM	3MHz	2M73W7D	-	0.3926 W
Part 24E	LTE Band 2	QPSK	5MHz	4M51G7D	-	0.4667 W
Part 24E	LTE Band 2	16QAM	5MHz	4M51W7D	-	0.3767 W
Part 24E	LTE Band 2	QPSK	10MHz	9M07G7D	0.0016 ppm	0.4977 W
Part 24E	LTE Band 2	16QAM	10MHz	9M09W7D	-	0.4385 W
Part 24E	LTE Band 2	QPSK	15MHz	13M5G7D	-	0.4898 W
Part 24E	LTE Band 2	16QAM	15MHz	13M5W7D	-	0.4111 W
Part 24E	LTE Band 2	QPSK	20MHz	18M4G7D	-	0.5140 W
Part 24E	LTE Band 2	16QAM	20MHz	18M4W7D	-	0.4315 W
Part 27L	LTE Band 4	QPSK	1.4MHz	1M10G7D	-	0.4467 W
Part 27L	LTE Band 4	16QAM	1.4MHz	1M10W7D	-	0.3837 W
Part 27L	LTE Band 4	QPSK	3MHz	2M74G7D	-	0.4808 W
Part 27L	LTE Band 4	16QAM	3MHz	2M73W7D	-	0.4093 W
Part 27L	LTE Band 4	QPSK	5MHz	4M52G7D	-	0.4667 W
Part 27L	LTE Band 4	16QAM	5MHz	4M51W7D	-	0.4256 W
Part 27L	LTE Band 4	QPSK	10MHz	9M09G7D	0.0071 ppm	0.4753 W
Part 27L	LTE Band 4	16QAM	10MHz	9M05W7D	-	0.4375 W
Part 27L	LTE Band 4	QPSK	15MHz	13M5G7D	-	0.4550 W
Part 27L	LTE Band 4	16QAM	15MHz	13M5W7D	-	0.4111 W
Part 27L	LTE Band 4	QPSK	20MHz	18M5G7D	-	0.4560 W
Part 27L	LTE Band 4	16QAM	20MHz	18M5W7D	-	0.3681 W

FCC Rule	System	Type of Modulation	BW	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP
Part 22H	LTE Band 5	QPSK	1.4MHz	1M10G7D	-	0.1824 W
Part 22H	LTE Band 5	16QAM	1.4MHz	1M10W7D	-	0.1629 W
Part 22H	LTE Band 5	QPSK	3MHz	2M73G7D	-	0.1849 W
Part 22H	LTE Band 5	16QAM	3MHz	2M73W7D	-	0.1528 W
Part 22H	LTE Band 5	QPSK	5MHz	4M51G7D	-	0.2443 W
Part 22H	LTE Band 5	16QAM	5MHz	4M51W7D	-	0.2104 W
Part 22H	LTE Band 5	QPSK	10MHz	9M09G7D	0.0204 ppm	0.2193 W
Part 22H	LTE Band 5	16QAM	10MHz	9M03W7D	-	0.2138 W
Part 27H	LTE Band 17	QPSK	5MHz	4M50G7D	-	0.0845 W
Part 27H	LTE Band 17	16QAM	5MHz	4M50W7D	-	0.0667 W
Part 27H	LTE Band 17	QPSK	10MHz	9M11G7D	0.0037 ppm	0.0935 W
Part 27H	LTE Band 17	16QAM	10MHz	9M05W7D	-	0.0811 W

1.7 Testing Location

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.
	TH01-KS	03CH01-KS	OTA01-KS
			149928

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.

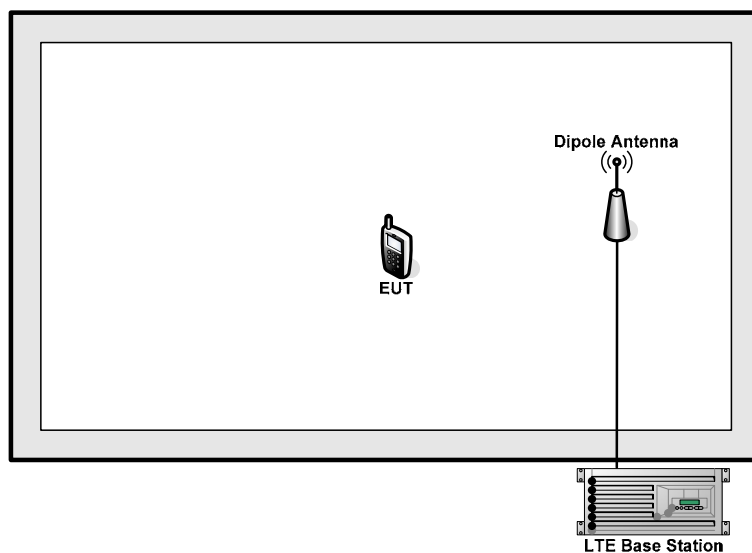
Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

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	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	17	-	-	v	v	-	-	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	2						v	v	v	v		v	v	v	v
	4						v	v	v	v		v	v	v	v
	5				v	-	-	v	v	v		v	v	v	v
	17	-	-		v	-	-	v	v	v		v	v	v	v
26dB and 99% Bandwidth	2	v	v	v	v	v	v	v	v			v	v	v	v
	4	v	v	v	v	v	v	v	v			v	v	v	v
	5	v	v	v	v	-	-	v	v			v	v	v	v
	17	-	-	v	v	-	-	v	v			v	v	v	v
Conducted Band Edge	2	v	v	v	v	v	v	v	v	v		v	v		v
	4	v	v	v	v	v	v	v	v	v		v	v		v
	5	v	v	v	v	-	-	v	v	v		v	v		v
	17	-	-	v	v	-	-	v	v	v		v	v		v

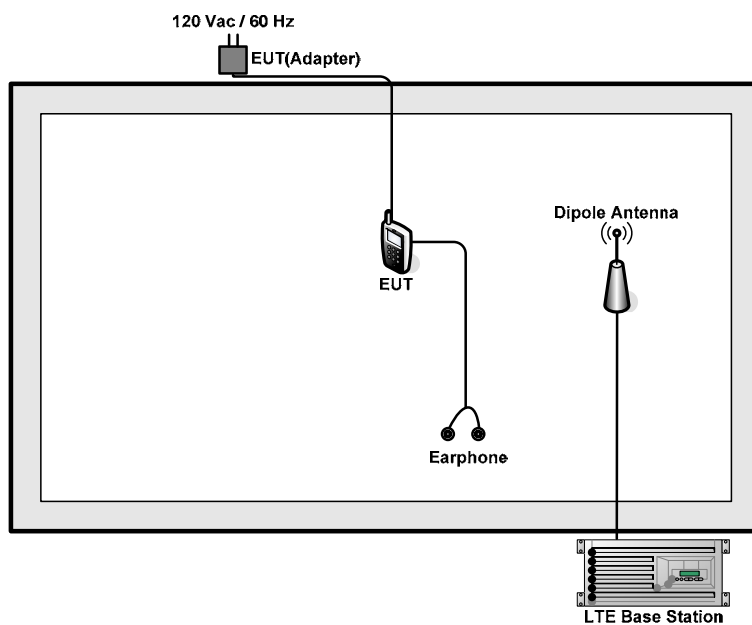
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Conducted Spurious Emission	2	v	v	v	v	v	v	v	v	v			v	v	v
	4	v	v	v	v	v	v	v	v	v			v	v	v
	5	v	v	v	v	-	-	v	v	v			v	v	v
	17	-	-	v	v	-	-	v	v	v			v	v	v
Frequency Stability	2				v			v				v		v	
	4				v			v				v		v	
	5				v	-	-	v				v		v	
	17	-	-		v	-	-	v				v		v	
E.R.P/ E.I.R.P.	2	v					v	v	v	v			v	v	v
	4	v					v	v	v	v			v	v	v
	5	v			v	-	-	v	v	v			v	v	v
	17	-	-	v	v	-	-	v	v	v			v	v	v
Radiated Spurious Emission	2	v	v	v	v	v	v	v		v				v	
	4	v	v	v	v	v	v	v		v				v	
	5	v	v	v	v	-	-	v		v				v	
	17	-	-	v	v	-	-	v		v				v	
Note	- The mark "v" means that this configuration is chosen for testing - The mark "-" means that this bandwidth is not supported. - For E.R.P/E.I.R.P. measurement, the widest bandwidth of each band is chosen for testing due to highest conducted power. Besides, the lowest bandwidth of each band is also measured for reporting only. - 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

For 22(H)/ 24(E)/ 27(L)



For 27(H)



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Lenovo	SH100	N/A	Unshielded, 1.2 m	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 between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.0 dB.

Offset (dB) = RF cable loss = 5.0 (dB)

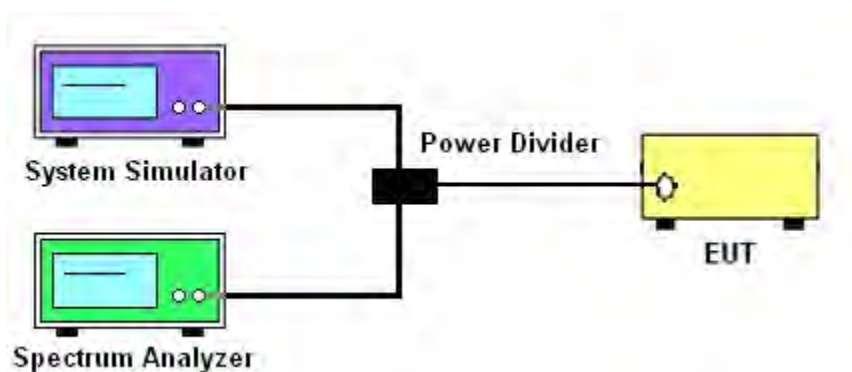
3 Conducted Test Items

3.1 Measuring Instruments

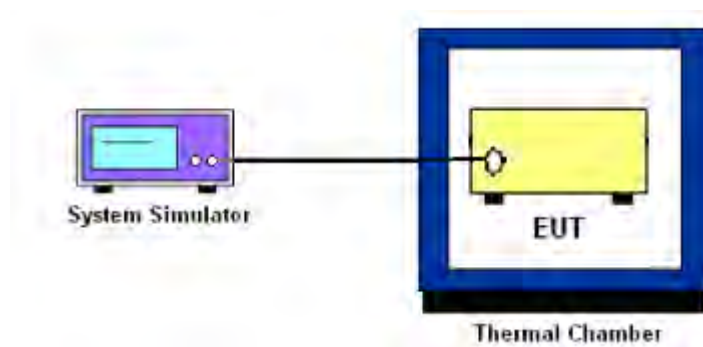
See list of measuring instruments of this test report.

3.2 Test Setup

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



3.2.2 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Peak-to-Average Ratio

3.4.1 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.

3.4.2 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.

3.5 Occupied Bandwidth

3.5.1 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.

3.5.2 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.

3.6 Conducted Band Edge

3.6.1 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 (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.

22.917(a)

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

27.53 (g)

For 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.

3.6.2 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 RBW $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.7 Conducted Spurious Emission

3.7.1 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.

3.7.2 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 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)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.8 Frequency Stability

3.8.1 Description of Frequency Stability Measurement

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

3.8.2 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.

3.8.3 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.

3.9 Conducted Output Power Measurement

3.9.1 Description of the Conducted Output Power Measurement

A LTE base station 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.

3.9.2 Measuring Instruments

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

3.9.3 Test Procedures

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

3.9.4 Test Setup



3.9.5 Test Result of Conducted Output Power

<LTE Band 2 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18700	18900	19100
Frequency (MHz)				1860	1880	1900
20	QPSK	1	0	22.25	22.69	22.86
20	QPSK	1	49	22.21	22.43	22.45
20	QPSK	1	99	21.93	22.50	22.37
20	QPSK	50	0	21.08	21.68	21.78
20	QPSK	50	24	21.05	21.59	21.69
20	QPSK	50	49	21.10	21.52	21.72
20	QPSK	100	0	21.09	21.49	21.69
20	16QAM	1	0	21.85	21.59	22.45
20	16QAM	1	49	21.60	21.55	22.40
20	16QAM	1	99	21.43	21.50	22.39
20	16QAM	50	0	20.09	20.59	20.75
20	16QAM	50	24	20.05	20.52	20.68
20	16QAM	50	49	20.06	20.50	20.67
20	16QAM	100	0	20.08	20.49	20.70
Channel				18675	18900	19125
Frequency (MHz)				1857.5	1880	1902.5
15	QPSK	1	0	22.19	22.65	22.45
15	QPSK	1	37	21.85	22.26	22.34
15	QPSK	1	74	21.99	22.20	22.34
15	QPSK	36	0	22.08	22.36	22.41
15	QPSK	36	18	22.05	22.29	22.42
15	QPSK	36	37	22.02	22.18	22.36
15	QPSK	75	0	21.08	21.56	21.33
15	16QAM	1	0	21.46	21.99	21.87
15	16QAM	1	37	21.38	21.89	21.82
15	16QAM	1	74	21.41	21.86	21.75
15	16QAM	36	0	21.37	21.21	21.26
15	16QAM	36	18	21.26	21.16	21.20
15	16QAM	36	37	21.33	21.07	21.14
15	16QAM	75	0	20.04	20.58	20.35



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18650	18900	19150
Frequency (MHz)				1855	1880	1905
10	QPSK	1	0	22.36	22.65	22.80
10	QPSK	1	24	22.30	22.63	22.59
10	QPSK	1	49	22.03	22.31	22.73
10	QPSK	25	0	21.25	21.60	21.85
10	QPSK	25	12	21.19	21.49	21.77
10	QPSK	25	24	21.16	21.45	21.66
10	QPSK	50	0	21.18	21.45	21.62
10	16QAM	1	0	22.02	22.23	22.39
10	16QAM	1	24	21.79	22.00	22.17
10	16QAM	1	49	21.90	22.19	22.22
10	16QAM	25	0	20.28	20.56	20.84
10	16QAM	25	12	20.21	20.49	20.74
10	16QAM	25	24	20.19	20.45	20.63
10	16QAM	50	0	20.18	20.49	20.65
Channel				18625	18900	19175
Frequency (MHz)				1852.5	1880	1907.5
5	QPSK	1	0	21.96	22.36	22.56
5	QPSK	1	12	21.69	22.23	22.25
5	QPSK	1	24	21.65	22.01	22.24
5	QPSK	12	0	21.06	21.23	21.75
5	QPSK	12	6	20.93	21.25	21.64
5	QPSK	12	11	21.01	21.25	21.57
5	QPSK	25	0	20.98	21.27	21.53
5	16QAM	1	0	20.85	21.44	21.43
5	16QAM	1	12	20.79	21.39	21.40
5	16QAM	1	24	20.77	21.22	21.38
5	16QAM	12	0	20.09	20.26	20.54
5	16QAM	12	6	20.34	20.20	20.45
5	16QAM	12	11	20.03	20.19	20.38
5	16QAM	25	0	20.21	20.35	20.44



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18615	18900	19185
Frequency (MHz)				1851.5	1880	1908.5
3	QPSK	1	0	22.23	22.16	22.60
3	QPSK	1	7	22.21	22.08	22.35
3	QPSK	1	14	21.96	21.98	22.40
3	QPSK	8	0	21.19	21.37	21.50
3	QPSK	8	4	21.15	21.37	21.42
3	QPSK	8	7	21.11	21.34	21.40
3	QPSK	15	0	21.13	21.22	21.45
3	16QAM	1	0	21.39	21.41	21.87
3	16QAM	1	7	21.36	21.40	21.45
3	16QAM	1	14	21.21	21.39	21.70
3	16QAM	8	0	20.03	20.32	20.42
3	16QAM	8	4	20.07	20.33	20.53
3	16QAM	8	7	20.35	20.41	20.51
3	16QAM	15	0	20.11	20.16	20.41
Channel				18607	18900	19193
Frequency (MHz)				1850.7	1880	1909.3
1.4	QPSK	1	0	22.09	22.30	22.55
1.4	QPSK	1	2	22.00	22.25	22.24
1.4	QPSK	1	5	21.74	21.97	22.04
1.4	QPSK	3	0	22.01	22.18	22.47
1.4	QPSK	3	1	22.02	22.28	22.53
1.4	QPSK	3	2	22.00	22.27	22.44
1.4	QPSK	6	0	21.18	21.40	21.47
1.4	16QAM	1	0	21.54	22.20	21.96
1.4	16QAM	1	2	21.47	21.72	21.81
1.4	16QAM	1	5	21.26	21.66	21.77
1.4	16QAM	3	0	20.99	21.84	21.93
1.4	16QAM	3	1	21.12	22.19	21.94
1.4	16QAM	3	2	21.09	21.49	21.61
1.4	16QAM	6	0	20.35	20.25	20.38

<LTE Band 4 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20050	20175	20300
Frequency (MHz)				1720	1732.5	1745
20	QPSK	1	0	23.15	22.93	22.85
20	QPSK	1	49	22.59	22.62	22.78
20	QPSK	1	99	22.46	22.53	22.46
20	QPSK	50	0	22.05	21.82	21.83
20	QPSK	50	24	21.99	21.76	21.82
20	QPSK	50	49	21.98	21.75	21.81
20	QPSK	100	0	21.96	21.75	21.81
20	16QAM	1	0	22.22	22.85	22.51
20	16QAM	1	49	21.99	22.57	22.38
20	16QAM	1	99	21.96	21.99	21.67
20	16QAM	50	0	21.60	20.98	20.89
20	16QAM	50	24	21.59	20.89	20.78
20	16QAM	50	49	21.58	20.88	20.78
20	16QAM	100	0	21.68	20.79	20.76
Channel				20025	20175	20325
Frequency (MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	23.10	22.86	22.86
15	QPSK	1	37	22.72	22.64	22.67
15	QPSK	1	74	22.71	22.72	22.67
15	QPSK	36	0	22.85	22.82	22.76
15	QPSK	36	18	22.76	22.65	22.84
15	QPSK	36	37	22.82	22.57	22.76
15	QPSK	75	0	21.92	21.70	21.78
15	16QAM	1	0	22.21	22.21	22.22
15	16QAM	1	37	21.95	21.76	22.02
15	16QAM	1	74	21.92	21.89	21.92
15	16QAM	36	0	21.96	21.68	21.79
15	16QAM	36	18	21.99	21.61	21.87
15	16QAM	36	37	21.88	21.52	21.79
15	16QAM	75	0	21.86	20.69	20.73



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20000	20175	20350
Frequency (MHz)				1715	1732.5	1750
10	QPSK	1	0	23.04	22.57	22.82
10	QPSK	1	24	22.83	22.50	22.78
10	QPSK	1	49	22.58	22.41	22.57
10	QPSK	25	0	21.94	21.70	21.79
10	QPSK	25	12	21.88	21.66	21.81
10	QPSK	25	24	21.86	21.57	21.69
10	QPSK	50	0	21.86	21.62	21.83
10	16QAM	1	0	21.95	21.88	21.68
10	16QAM	1	24	21.89	21.85	21.62
10	16QAM	1	49	21.86	21.86	21.62
10	16QAM	25	0	20.90	20.71	20.70
10	16QAM	25	12	21.19	20.78	20.73
10	16QAM	25	24	20.93	20.94	20.69
10	16QAM	50	0	20.99	20.63	20.84
Channel				19975	20175	20375
Frequency (MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	22.99	22.62	22.80
5	QPSK	1	12	22.94	22.60	22.74
5	QPSK	1	24	22.78	22.53	22.79
5	QPSK	12	0	21.86	21.62	21.70
5	QPSK	12	6	21.79	21.68	21.65
5	QPSK	12	11	21.90	21.65	21.60
5	QPSK	25	0	21.80	21.62	21.64
5	16QAM	1	0	22.53	22.21	22.30
5	16QAM	1	12	22.32	22.20	21.93
5	16QAM	1	24	22.14	22.16	21.91
5	16QAM	12	0	20.86	20.71	20.78
5	16QAM	12	6	20.89	20.68	20.71
5	16QAM	12	11	20.88	20.66	20.68
5	16QAM	25	0	20.79	21.01	20.63

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				19965	20175	20385
Frequency (MHz)				1711.5	1732.5	1753.5
3	QPSK	1	0	22.82	22.64	22.74
3	QPSK	1	7	22.79	22.51	22.64
3	QPSK	1	14	22.64	22.46	22.52
3	QPSK	8	0	21.86	21.68	21.73
3	QPSK	8	4	21.74	21.62	21.62
3	QPSK	8	7	21.81	21.63	21.72
3	QPSK	15	0	21.72	21.64	21.62
3	16QAM	1	0	22.51	22.08	22.76
3	16QAM	1	7	22.20	21.73	22.75
3	16QAM	1	14	22.45	22.07	22.71
3	16QAM	8	0	20.95	20.69	20.82
3	16QAM	8	4	20.77	20.78	20.83
3	16QAM	8	7	20.84	20.76	20.81
3	16QAM	15	0	20.80	20.52	20.66
Channel				19957	20175	20393
Frequency (MHz)				1710.7	1732.5	1754.3
1.4	QPSK	1	0	22.98	22.89	22.82
1.4	QPSK	1	2	22.87	22.63	22.76
1.4	QPSK	1	5	22.80	22.46	22.73
1.4	QPSK	3	0	22.96	22.69	22.71
1.4	QPSK	3	1	22.91	22.72	22.69
1.4	QPSK	3	2	22.90	22.68	22.66
1.4	QPSK	6	0	21.79	21.69	21.98
1.4	16QAM	1	0	22.16	22.45	22.09
1.4	16QAM	1	2	22.01	22.39	21.99
1.4	16QAM	1	5	22.10	21.94	21.91
1.4	16QAM	3	0	21.88	21.91	22.04
1.4	16QAM	3	1	21.81	21.92	22.01
1.4	16QAM	3	2	21.79	21.89	22.03
1.4	16QAM	6	0	20.99	21.99	20.84

<LTE Band 5 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20450	20525	20600
Frequency (MHz)				829	836.5	844
10	QPSK	1	0	23.32	22.80	23.11
10	QPSK	1	24	22.69	22.79	22.82
10	QPSK	1	49	22.86	22.71	22.68
10	QPSK	25	0	21.92	21.80	21.97
10	QPSK	25	12	21.82	21.87	22.02
10	QPSK	25	24	21.81	21.90	22.09
10	QPSK	50	0	21.85	21.85	22.14
10	16QAM	1	0	22.78	22.33	21.89
10	16QAM	1	24	22.61	22.26	21.65
10	16QAM	1	49	22.39	22.18	21.68
10	16QAM	25	0	20.81	20.71	20.95
10	16QAM	25	12	20.85	20.76	21.01
10	16QAM	25	24	21.06	20.66	21.29
10	16QAM	50	0	20.85	20.88	21.00
Channel				20425	20525	20625
Frequency (MHz)				826.5	836.5	846.5
5	QPSK	1	0	22.97	22.79	23.03
5	QPSK	1	12	22.88	22.65	23.01
5	QPSK	1	24	22.86	22.68	22.92
5	QPSK	12	0	21.95	21.81	22.13
5	QPSK	12	6	21.96	21.86	22.15
5	QPSK	12	11	21.86	21.87	22.27
5	QPSK	25	0	21.95	21.87	22.20
5	16QAM	1	0	22.60	22.48	22.70
5	16QAM	1	12	22.54	22.43	22.65
5	16QAM	1	24	22.30	22.39	22.54
5	16QAM	12	0	21.04	20.82	21.06
5	16QAM	12	6	20.84	20.88	21.07
5	16QAM	12	11	20.74	20.80	21.20
5	16QAM	25	0	20.87	21.07	21.49

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20415	20525	20635
Frequency (MHz)				825.5	836.5	847.5
3	QPSK	1	0	22.91	22.67	23.21
3	QPSK	1	7	22.88	22.65	23.04
3	QPSK	1	14	22.78	22.62	23.03
3	QPSK	8	0	22.16	21.84	22.20
3	QPSK	8	4	22.07	21.87	22.37
3	QPSK	8	7	21.95	21.80	22.30
3	QPSK	15	0	22.09	21.89	22.22
3	16QAM	1	0	21.96	21.66	22.89
3	16QAM	1	7	21.89	21.44	22.84
3	16QAM	1	14	21.88	21.65	22.80
3	16QAM	8	0	21.41	20.77	21.00
3	16QAM	8	4	21.34	20.79	21.19
3	16QAM	8	7	21.23	20.91	21.32
3	16QAM	15	0	21.01	20.73	20.86
Channel				20407	20525	20643
Frequency (MHz)				824.7	836.5	848.3
1.4	QPSK	1	0	22.86	22.89	22.92
1.4	QPSK	1	2	22.85	22.64	22.88
1.4	QPSK	1	5	22.65	22.49	22.91
1.4	QPSK	3	0	22.60	22.84	22.89
1.4	QPSK	3	1	22.59	22.85	22.87
1.4	QPSK	3	2	22.57	22.50	22.78
1.4	QPSK	6	0	22.08	21.77	22.30
1.4	16QAM	1	0	22.30	22.02	21.99
1.4	16QAM	1	2	22.16	21.88	21.97
1.4	16QAM	1	5	22.06	21.95	21.92
1.4	16QAM	3	0	22.26	21.69	21.90
1.4	16QAM	3	1	22.25	21.97	21.90
1.4	16QAM	3	2	22.21	21.94	21.93
1.4	16QAM	6	0	20.56	20.26	20.93

<LTE Band 17 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				23780	23790	23800
Frequency (MHz)				709	710	711
10	QPSK	1	0	22.93	22.92	22.87
10	QPSK	1	24	22.43	22.74	22.75
10	QPSK	1	49	22.80	22.75	22.69
10	QPSK	25	0	21.82	21.79	21.79
10	QPSK	25	12	21.79	21.75	21.68
10	QPSK	25	24	21.68	21.63	21.81
10	QPSK	50	0	21.87	21.80	21.75
10	16QAM	1	0	22.03	22.49	21.49
10	16QAM	1	24	21.68	22.26	21.34
10	16QAM	1	49	21.83	22.37	21.44
10	16QAM	25	0	20.80	21.09	20.73
10	16QAM	25	12	20.64	21.04	20.61
10	16QAM	25	24	20.69	20.93	20.68
10	16QAM	50	0	20.70	20.69	20.77
Channel				23755	23790	23825
Frequency (MHz)				706.5	710	713.5
5	QPSK	1	0	22.84	22.85	22.73
5	QPSK	1	12	22.83	22.83	22.70
5	QPSK	1	24	22.82	22.84	22.51
5	QPSK	12	0	21.70	21.78	21.74
5	QPSK	12	6	21.82	21.66	21.76
5	QPSK	12	11	21.83	21.73	21.78
5	QPSK	25	0	21.72	21.63	21.74
5	16QAM	1	0	21.85	21.88	21.71
5	16QAM	1	12	21.82	21.79	21.62
5	16QAM	1	24	21.80	21.59	21.64
5	16QAM	12	0	20.81	20.72	20.72
5	16QAM	12	6	20.73	20.74	20.72
5	16QAM	12	11	20.76	20.68	20.77
5	16QAM	25	0	20.78	20.66	20.58

Note: Maximum average power for LTE.

3.10 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement

3.10.1 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 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.

3.10.2 Measuring Instruments

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

3.10.3 Test Procedures

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

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

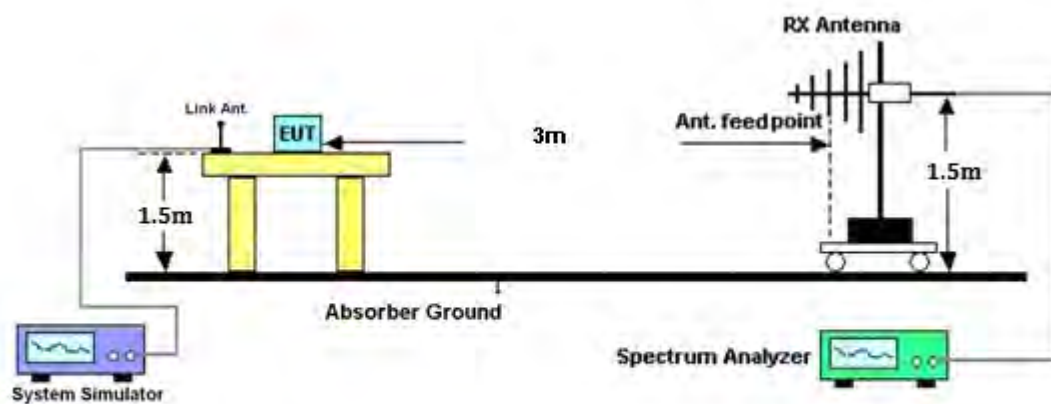
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

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

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

3.10.4 Test Setup



3.10.5 Test Result of ERP/EIRP

LTE Band 2 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
2	1.4	QPSK	1	0	1850.7	26.48	0.4446	H
2	1.4	QPSK	1	0	1880	26.08	0.4055	H
2	1.4	QPSK	1	0	1909.3	25.66	0.3681	H
2	1.4	QPSK	1	0	1850.7	26.57	0.4539	V
2	1.4	QPSK	1	0	1880	26.27	0.4236	V
2	1.4	QPSK	1	0	1909.3	26.47	0.4436	V
2	1.4	16QAM	1	0	1850.7	25.48	0.3532	H
2	1.4	16QAM	1	0	1880	25.28	0.3373	H
2	1.4	16QAM	1	0	1909.3	24.88	0.3076	H
2	1.4	16QAM	1	0	1850.7	26.19	0.4159	V
2	1.4	16QAM	1	0	1880	25.60	0.3631	V
2	1.4	16QAM	1	0	1909.3	26.09	0.4064	V
2	3	QPSK	1	0	1851.5	26.40	0.4365	H
2	3	QPSK	1	0	1880	26.37	0.4335	H
2	3	QPSK	1	0	1908.5	25.81	0.3811	H
2	3	QPSK	1	0	1851.5	26.69	0.4667	V
2	3	QPSK	1	0	1880	26.66	0.4634	V
2	3	QPSK	1	0	1908.5	26.55	0.4519	V
2	3	16QAM	1	0	1851.5	25.94	0.3926	H
2	3	16QAM	1	0	1880	24.93	0.3112	H
2	3	16QAM	1	0	1908.5	25.53	0.3573	H
2	3	16QAM	1	0	1851.5	25.69	0.3707	V
2	3	16QAM	1	0	1880	25.91	0.3899	V
2	3	16QAM	1	0	1908.5	25.59	0.3622	V

LTE Band 2 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
2	5	QPSK	1	0	1852.5	26.59	0.4560	H
2	5	QPSK	1	0	1880	26.38	0.4345	H
2	5	QPSK	1	0	1907.5	26.09	0.4064	H
2	5	QPSK	1	0	1852.5	26.51	0.4477	V
2	5	QPSK	1	0	1880	26.54	0.4508	V
2	5	QPSK	1	0	1907.5	26.69	0.4667	V
2	5	16QAM	1	0	1852.5	25.52	0.3565	H
2	5	16QAM	1	0	1880	25.55	0.3589	H
2	5	16QAM	1	0	1907.5	24.83	0.3041	H
2	5	16QAM	1	0	1852.5	25.16	0.3281	V
2	5	16QAM	1	0	1880	25.76	0.3767	V
2	5	16QAM	1	0	1907.5	25.70	0.3715	V
2	10	QPSK	1	0	1855	26.70	0.4677	H
2	10	QPSK	1	0	1880	26.59	0.4560	H
2	10	QPSK	1	0	1905	26.33	0.4295	H
2	10	QPSK	1	0	1855	26.79	0.4775	V
2	10	QPSK	1	0	1880	26.71	0.4688	V
2	10	QPSK	1	0	1905	26.97	0.4977	V
2	10	16QAM	1	0	1855	26.24	0.4207	H
2	10	16QAM	1	0	1880	25.72	0.3733	H
2	10	16QAM	1	0	1905	25.80	0.3802	H
2	10	16QAM	1	0	1855	26.05	0.4027	V
2	10	16QAM	1	0	1880	25.91	0.3899	V
2	10	16QAM	1	0	1905	26.42	0.4385	V

LTE Band 2 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
2	15	QPSK	1	0	1857.5	26.55	0.4519	H
2	15	QPSK	1	0	1880	26.41	0.4375	H
2	15	QPSK	1	0	1902.5	26.49	0.4457	H
2	15	QPSK	1	0	1857.5	26.83	0.4819	V
2	15	QPSK	1	0	1880	26.45	0.4416	V
2	15	QPSK	1	0	1902.5	26.90	0.4898	V
2	15	16QAM	1	0	1857.5	25.36	0.3436	H
2	15	16QAM	1	0	1880	24.86	0.3062	H
2	15	16QAM	1	0	1902.5	25.72	0.3733	H
2	15	16QAM	1	0	1857.5	25.52	0.3565	V
2	15	16QAM	1	0	1880	25.27	0.3365	V
2	15	16QAM	1	0	1902.5	26.14	0.4111	V
2	20	QPSK	1	0	1860	26.97	0.4977	H
2	20	QPSK	1	0	1880	26.42	0.4385	H
2	20	QPSK	1	0	1900	26.13	0.4102	H
2	20	QPSK	1	0	1860	27.11	0.5140	V
2	20	QPSK	1	0	1880	26.74	0.4721	V
2	20	QPSK	1	0	1900	26.60	0.4571	V
2	20	16QAM	1	0	1860	25.46	0.3516	H
2	20	16QAM	1	0	1880	25.40	0.3467	H
2	20	16QAM	1	0	1900	25.97	0.3954	H
2	20	16QAM	1	0	1860	25.59	0.3622	V
2	20	16QAM	1	0	1880	25.72	0.3733	V
2	20	16QAM	1	0	1900	26.35	0.4315	V

LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	1.4	QPSK	1	0	1710.7	26.05	0.4027	H
4	1.4	QPSK	1	0	1732.5	26.09	0.4064	H
4	1.4	QPSK	1	0	1754.3	26.06	0.4036	H
4	1.4	QPSK	1	0	1710.7	25.62	0.3648	V
4	1.4	QPSK	1	0	1732.5	26.28	0.4246	V
4	1.4	QPSK	1	0	1754.3	26.50	0.4467	V
4	1.4	16QAM	1	0	1710.7	25.21	0.3319	H
4	1.4	16QAM	1	0	1732.5	25.34	0.3420	H
4	1.4	16QAM	1	0	1754.3	25.72	0.3733	H
4	1.4	16QAM	1	0	1710.7	25.46	0.3516	V
4	1.4	16QAM	1	0	1732.5	25.52	0.3565	V
4	1.4	16QAM	1	0	1754.3	25.84	0.3837	V
4	3	QPSK	1	0	1711.5	26.82	0.4808	H
4	3	QPSK	1	0	1732.5	26.15	0.4121	H
4	3	QPSK	1	0	1753.5	26.31	0.4276	H
4	3	QPSK	1	0	1711.5	26.62	0.4592	V
4	3	QPSK	1	0	1732.5	26.33	0.4295	V
4	3	QPSK	1	0	1753.5	26.41	0.4375	V
4	3	16QAM	1	0	1711.5	25.63	0.3656	H
4	3	16QAM	1	0	1732.5	25.52	0.3565	H
4	3	16QAM	1	0	1753.5	25.30	0.3388	H
4	3	16QAM	1	0	1711.5	26.12	0.4093	V
4	3	16QAM	1	0	1732.5	25.54	0.3581	V
4	3	16QAM	1	0	1753.5	25.32	0.3404	V

LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	5	QPSK	1	0	1712.5	26.69	0.4667	H
4	5	QPSK	1	0	1732.5	26.05	0.4027	H
4	5	QPSK	1	0	1752.5	26.27	0.4236	H
4	5	QPSK	1	0	1712.5	26.65	0.4624	V
4	5	QPSK	1	0	1732.5	26.32	0.4285	V
4	5	QPSK	1	0	1752.5	26.52	0.4487	V
4	5	16QAM	1	0	1712.5	26.29	0.4256	H
4	5	16QAM	1	0	1732.5	25.29	0.3381	H
4	5	16QAM	1	0	1752.5	26.01	0.3990	H
4	5	16QAM	1	0	1712.5	24.99	0.3155	V
4	5	16QAM	1	0	1732.5	25.41	0.3475	V
4	5	16QAM	1	0	1752.5	25.27	0.3365	V
4	10	QPSK	1	0	1715	26.77	0.4753	H
4	10	QPSK	1	0	1732.5	26.31	0.4276	H
4	10	QPSK	1	0	1750	26.29	0.4256	H
4	10	QPSK	1	0	1715	26.52	0.4487	V
4	10	QPSK	1	0	1732.5	26.50	0.4467	V
4	10	QPSK	1	0	1750	26.76	0.4742	V
4	10	16QAM	1	0	1715	26.38	0.4345	H
4	10	16QAM	1	0	1732.5	25.37	0.3443	H
4	10	16QAM	1	0	1750	25.61	0.3639	H
4	10	16QAM	1	0	1715	25.98	0.3963	V
4	10	16QAM	1	0	1732.5	25.17	0.3289	V
4	10	16QAM	1	0	1750	26.41	0.4375	V

LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	15	QPSK	1	0	1717.5	26.58	0.4550	H
4	15	QPSK	1	0	1732.5	25.89	0.3882	H
4	15	QPSK	1	0	1747.5	25.90	0.3890	H
4	15	QPSK	1	0	1717.5	26.23	0.4198	V
4	15	QPSK	1	0	1732.5	26.12	0.4093	V
4	15	QPSK	1	0	1747.5	26.40	0.4365	V
4	15	16QAM	1	0	1717.5	26.14	0.4111	H
4	15	16QAM	1	0	1732.5	25.48	0.3532	H
4	15	16QAM	1	0	1747.5	25.52	0.3565	H
4	15	16QAM	1	0	1717.5	26.07	0.4046	V
4	15	16QAM	1	0	1732.5	25.99	0.3972	V
4	15	16QAM	1	0	1747.5	25.67	0.3690	V
4	20	QPSK	1	0	1720	26.35	0.4315	H
4	20	QPSK	1	0	1732.5	26.42	0.4385	H
4	20	QPSK	1	0	1745	25.67	0.3690	H
4	20	QPSK	1	0	1720	26.03	0.4009	V
4	20	QPSK	1	0	1732.5	26.59	0.4560	V
4	20	QPSK	1	0	1745	25.98	0.3963	V
4	20	16QAM	1	0	1720	25.57	0.3606	H
4	20	16QAM	1	0	1732.5	25.66	0.3681	H
4	20	16QAM	1	0	1745	25.13	0.3258	H
4	20	16QAM	1	0	1720	24.85	0.3055	V
4	20	16QAM	1	0	1732.5	25.38	0.3451	V
4	20	16QAM	1	0	1745	25.06	0.3206	V



LTE Band 5 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
5	1.4	QPSK	1	0	824.7	22.32	0.1706	H
5	1.4	QPSK	1	0	836.5	22.35	0.1718	H
5	1.4	QPSK	1	0	848.3	22.61	0.1824	H
5	1.4	QPSK	1	0	824.7	7.03	0.0050	V
5	1.4	QPSK	1	0	836.5	7.06	0.0051	V
5	1.4	QPSK	1	0	848.3	6.58	0.0045	V
5	1.4	16QAM	1	0	824.7	21.82	0.1521	H
5	1.4	16QAM	1	0	836.5	21.98	0.1578	H
5	1.4	16QAM	1	0	848.3	22.12	0.1629	H
5	1.4	16QAM	1	0	824.7	5.28	0.0034	V
5	1.4	16QAM	1	0	836.5	5.24	0.0033	V
5	1.4	16QAM	1	0	848.3	5.97	0.0040	V
5	3	QPSK	1	0	825.5	22.31	0.1702	H
5	3	QPSK	1	0	836.5	22.21	0.1663	H
5	3	QPSK	1	0	847.5	22.67	0.1849	H
5	3	QPSK	1	0	825.5	6.68	0.0047	V
5	3	QPSK	1	0	836.5	6.83	0.0048	V
5	3	QPSK	1	0	847.5	6.47	0.0044	V
5	3	16QAM	1	0	825.5	21.49	0.1409	H
5	3	16QAM	1	0	836.5	21.83	0.1524	H
5	3	16QAM	1	0	847.5	21.84	0.1528	H
5	3	16QAM	1	0	825.5	5.31	0.0034	V
5	3	16QAM	1	0	836.5	6.37	0.0043	V
5	3	16QAM	1	0	847.5	5.71	0.0037	V

LTE Band 5 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
5	5	QPSK	1	0	826.5	22.24	0.1675	H
5	5	QPSK	1	0	836.5	22.55	0.1799	H
5	5	QPSK	1	0	846.5	23.88	0.2443	H
5	5	QPSK	1	0	826.5	6.64	0.0046	V
5	5	QPSK	1	0	836.5	7.27	0.0053	V
5	5	QPSK	1	0	846.5	7.05	0.0051	V
5	5	16QAM	1	0	826.5	22.61	0.1824	H
5	5	16QAM	1	0	836.5	21.79	0.1510	H
5	5	16QAM	1	0	846.5	23.23	0.2104	H
5	5	16QAM	1	0	826.5	6.54	0.0045	V
5	5	16QAM	1	0	836.5	4.98	0.0031	V
5	5	16QAM	1	0	846.5	6.76	0.0047	V
5	10	QPSK	1	0	829	23.40	0.2188	H
5	10	QPSK	1	0	836.5	23.20	0.2089	H
5	10	QPSK	1	0	844	23.41	0.2193	H
5	10	QPSK	1	0	829	7.51	0.0056	V
5	10	QPSK	1	0	836.5	6.69	0.0047	V
5	10	QPSK	1	0	844	7.13	0.0052	V
5	10	16QAM	1	0	829	23.30	0.2138	H
5	10	16QAM	1	0	836.5	22.14	0.1637	H
5	10	16QAM	1	0	844	22.19	0.1656	H
5	10	16QAM	1	0	829	6.49	0.0045	V
5	10	16QAM	1	0	836.5	5.86	0.0039	V
5	10	16QAM	1	0	844	6.74	0.0047	V

LTE Band 17 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
17	5	QPSK	1	0	706.5	18.87	0.0771	H
17	5	QPSK	1	0	710	18.84	0.0766	H
17	5	QPSK	1	0	713.5	19.27	0.0845	H
17	5	QPSK	1	0	706.5	8.01	0.0063	V
17	5	QPSK	1	0	710	8.29	0.0067	V
17	5	QPSK	1	0	713.5	7.40	0.0055	V
17	5	16QAM	1	0	706.5	18.07	0.0641	H
17	5	16QAM	1	0	710	18.24	0.0667	H
17	5	16QAM	1	0	713.5	18.24	0.0667	H
17	5	16QAM	1	0	706.5	6.14	0.0041	V
17	5	16QAM	1	0	710	6.97	0.0050	V
17	5	16QAM	1	0	713.5	6.80	0.0048	V
17	10	QPSK	1	0	709	19.71	0.0935	H
17	10	QPSK	1	0	710	19.71	0.0935	H
17	10	QPSK	1	0	711	19.53	0.0897	H
17	10	QPSK	1	0	709	7.32	0.0054	V
17	10	QPSK	1	0	710	7.43	0.0055	V
17	10	QPSK	1	0	711	7.56	0.0057	V
17	10	16QAM	1	0	709	19.09	0.0811	H
17	10	16QAM	1	0	710	18.99	0.0793	H
17	10	16QAM	1	0	711	18.66	0.0735	H
17	10	16QAM	1	0	709	6.35	0.0043	V
17	10	16QAM	1	0	710	6.59	0.0046	V
17	10	16QAM	1	0	711	6.58	0.0045	V

3.11 Radiated Spurious Emission Measurement

3.11.1 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 17

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.

3.11.2 Measuring Instruments

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

3.11.3 Test Procedures

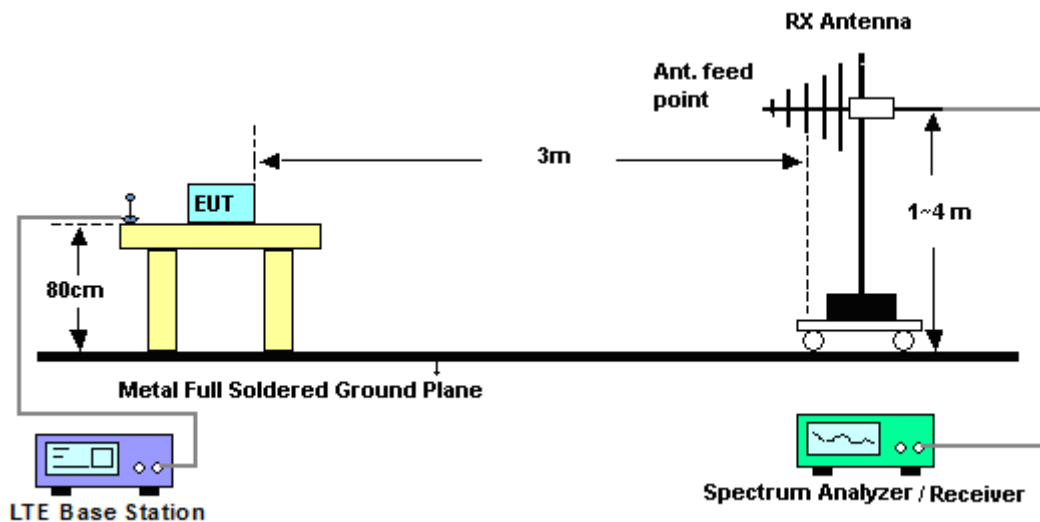
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

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

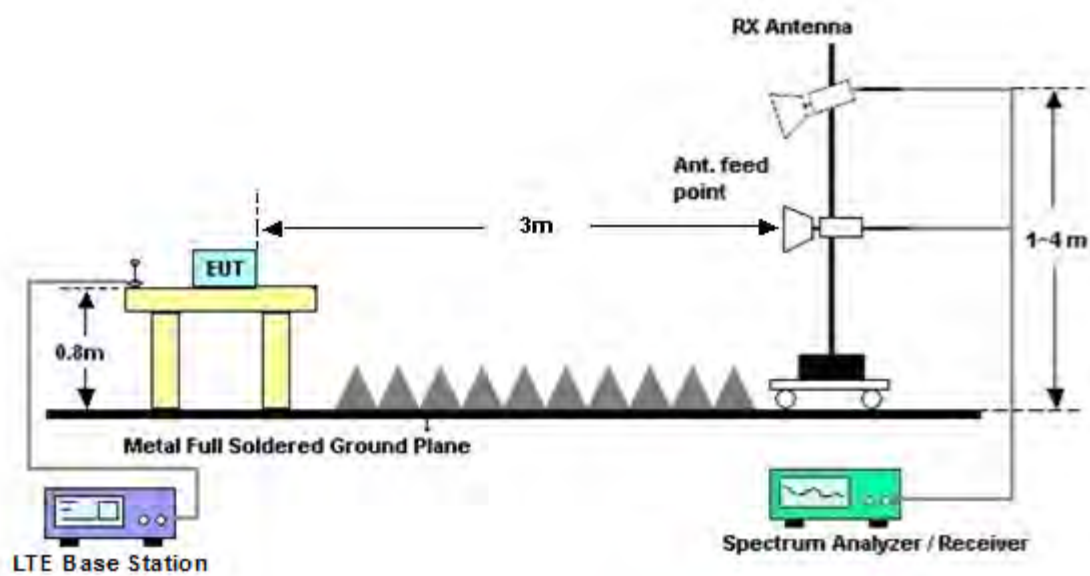
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.11.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.11.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1672	-59.52	-13	-46.52	-52.82	-58.54	1.86	3.03	H	Pass
2510	-53.79	-13	-40.79	-58.08	-54.34	2.31	5.02	H	Pass
3344	-56.86	-13	-43.86	-62.75	-58.31	2.85	6.45	H	Pass

Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1672	-68.25	-13	-55.25	-57.65	-67.27	1.86	3.03	V	Pass
2510	-58.05	-13	-45.05	-60.99	-58.61	2.31	5.02	V	Pass
3344	-55.17	-13	-42.17	-63.01	-56.62	2.85	6.45	V	Pass



Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	3MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Leve Zhao				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1672	-63.08	-13	-50.08	-54.33	-62.11	1.86	3.03	H	Pass
2508	-55.88	-13	-42.88	-59.24	-56.44	2.31	5.02	H	Pass
3340	-61.57	-13	-48.57	-64.48	-63.02	2.85	6.45	H	Pass

Band :	LTE Band 5	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1670	-66.75	-13	-53.75	-57.15	-65.77	1.86	3.03	V	Pass
2505	-60.49	-13	-47.49	-63.43	-61.05	2.31	5.02	V	Pass
3340	-55.66	-13	-42.66	-63.50	-57.11	2.85	6.45	V	Pass



Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Leve Zhao				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1668	-64.60	-13	-51.60	-54.84	-63.62	1.86	3.03	H	Pass
2506	-58.98	-13	-45.98	-60.25	-59.54	2.31	5.02	H	Pass
3336	-58.62	-13	-45.62	-63.46	-60.08	2.85	6.45	H	Pass

Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1668	-68.28	-13	-55.28	-57.68	-67.30	1.86	3.03	V	Pass
2502	-58.49	-13	-45.49	-61.43	-59.05	2.31	5.02	V	Pass
3336	-56.62	-13	-43.62	-64.46	-58.07	2.85	6.45	V	Pass



Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Leve Zhao				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1663	-66.24	-13	-53.24	-55.76	-65.26	1.86	3.03	H	Pass
2498	-53.47	-13	-40.47	-58.02	-54.02	2.31	5.02	H	Pass
3326	-62.21	-13	-49.21	-65.12	-63.66	2.85	6.45	H	Pass

Band :	LTE Band 5				Temperature :	22~23℃			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1664	-66.89	-13	-53.89	-57.20	-65.91	1.86	3.03	V	Pass
2494.5	-58.87	-13	-45.87	-61.81	-59.43	2.31	5.02	V	Pass
3326	-57.09	-13	-44.09	-64.93	-58.54	2.85	6.45	V	Pass



Band :	LTE Band 2				Temperature :	22~23°C			
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3759	-45.90	-13	-32.90	-59.57	-49.48	3	6.58	H	Pass
5646	-55.76	-13	-42.76	-60.15	-61.13	3.84	9.21	H	Pass
7518	-52.10	-13	-39.10	-60.96	-58.77	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23℃						
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3759	-45.55	-13	-32.55	-58.26	-49.13	3	6.58	V	Pass
5646	-51.66	-13	-38.66	-59.23	-57.03	3.84	9.21	V	Pass
7518	-52.75	-13	-39.75	-60.81	-59.42	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3759	-46.36	-13	-33.36	-59.74	-49.94	3	6.58	H	Pass
5634	-51.78	-13	-38.78	-58.66	-57.15	3.84	9.21	H	Pass
7515	-51.95	-13	-38.95	-60.88	-58.62	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3759	-46.72	-13	-33.72	-59.31	-50.29	3	6.58	V	Pass
5634	-52.66	-13	-39.66	-59.86	-58.03	3.84	9.21	V	Pass
7509	-48.05	-13	-35.05	-58.87	-54.72	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3756	-48.53	-13	-35.53	-60.80	-52.11	3	6.58	H	Pass
5631	-54.78	-13	-41.78	-59.72	-60.15	3.84	9.21	H	Pass
7509	-51.55	-13	-38.55	-60.64	-58.22	4.43	11.10	H	Pass

Band :	LTE Band 2				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3762	-50.91	-13	-37.91	-60.94	-54.49	3	6.58	V	Pass
5640	-50.17	-13	-37.17	-58.22	-55.54	3.84	9.21	V	Pass
7509	-50.77	-13	-37.77	-59.98	-57.44	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3750	-44.12	-13	-31.12	-58.63	-47.70	3	6.58	H	Pass
5625	-56.01	-13	-43.01	-60.28	-61.38	3.84	9.21	H	Pass
7500	-51.77	-13	-38.77	-60.77	-58.44	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3750	-42.76	-13	-29.76	-57.27	-46.34	3	6.58	V	Pass
5625	-54.41	-13	-41.41	-60.64	-59.78	3.84	9.21	V	Pass
7500	-49.50	-13	-36.50	-59.61	-56.17	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3744	-58.00	-13	-45.00	-64.99	-61.58	3	6.58	H	Pass
5616	-56.05	-13	-43.05	-60.32	-61.42	3.84	9.21	H	Pass
7491	-50.23	-13	-37.23	-59.91	-56.90	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain	(H/V)	
(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(dBi)		
3744	-60.80	-13	-47.80	-64.88	-64.37	3	6.58	V	Pass
5616	-52.62	-13	-39.62	-59.83	-57.99	3.84	9.21	V	Pass
7491	-54.09	-13	-41.09	-61.25	-60.76	4.43	11.10	V	Pass



Band :	LTE Band 2				Temperature :	22~23°C			
Test Mode :	20MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3741	-58.25	-13	-45.25	-65.24	-61.83	3	6.58	H	Pass
5610	-55.51	-13	-42.51	-60.02	-60.88	3.84	9.21	H	Pass
7479	-49.86	-13	-36.86	-59.67	-56.53	4.43	11.10	H	Pass

Band :	LTE Band 2				Temperature :	22~23°C			
Test Mode :	20MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3741	-60.93	-13	-47.93	-65.01	-64.50	3	6.58	V	Pass
5610	-54.23	-13	-41.23	-60.46	-59.60	3.84	9.21	V	Pass
7479	-51.30	-13	-38.30	-60.24	-57.97	4.43	11.10	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain	(H/V)	
(dB)			(dB)	(dBm)	(dBm)	(dB)	(dBi)		
3462	-45.63	-13	-32.63	-57.70	-49.00	3.12	6.49	H	Pass
5196	-55.95	-13	-42.95	-61.87	-60.93	3.65	8.64	H	Pass
6927	-48.87	-13	-35.87	-60.51	-55.44	4.15	10.72	H	Pass

Band :	LTE Band 4					Temperature :	22~23°C		
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
3462	-45.91	-13	-32.91	-58.2	-49.28	3.12	6.49	V	Pass
5196	-57.46	-13	-44.46	-60.86	-62.44	3.65	8.64	V	Pass
6927	-49.99	-13	-36.99	-59.75	-56.56	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	loss	Gain	(H/V)	
3462	-48.25	-13	-35.25	-59.12	-51.61	3.12	6.49	H	Pass
5193	-55.48	-13	-42.48	-61.40	-60.46	3.65	8.64	H	Pass
6924	-49.06	-13	-36.06	-60.70	-55.63	4.15	10.72	H	Pass

Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3462	-50.46	-13	-37.46	-59.58	-53.83	3.12	6.49	V	Pass
5193	-57.09	-13	-44.09	-60.49	-62.07	3.65	8.64	V	Pass
6924	-49.26	-13	-36.26	-59.02	-55.83	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain	(H/V)	
(dB)			(dB)	(dBm)	(dBm)	(dB)	(dBi)		
3459	-48.12	-13	-35.12	-59.02	-51.49	3.12	6.49	H	Pass
5190	-55.60	-13	-42.60	-61.52	-60.58	3.65	8.64	H	Pass
6921	-48.36	-13	-35.36	-60.00	-54.93	4.15	10.72	H	Pass

Band :	LTE Band 4					Temperature :	22~23°C		
Test Mode :	5MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3459	-45.41	-13	-32.41	-57.97	-48.78	3.12	6.49	V	Pass
5193	-50.21	-13	-37.21	-58.35	-55.19	3.65	8.64	V	Pass
6921	-50.32	-13	-37.32	-60.08	-56.89	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain	(H/V)	
(dB)			(dB)	(dBm)	(dBm)	(dB)	(dBi)		
3456	-47.14	-13	-34.14	-58.40	-50.51	3.12	6.49	H	Pass
5182.5	-55.15	-13	-42.15	-61.07	-60.13	3.65	8.64	H	Pass
6909	-49.58	-13	-36.58	-61.22	-56.15	4.15	10.72	H	Pass

Band :	LTE Band 4	Temperature :	22~23℃						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3456	-45.56	-13	-32.56	-58.04	-48.93	3.12	6.49	V	Pass
5182.5	-51.85	-13	-38.85	-59.17	-56.84	3.65	8.64	V	Pass
6909	-51.33	-13	-38.33	-61.09	-57.90	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain	(H/V)	
		(dB)	(dB)	(dBm)	(dBm)	(dB)	(dBi)		
3450	-44.88	-13	-31.88	-57.47	-48.25	3.12	6.49	H	Pass
5178	-49.25	-13	-36.25	-57.11	-54.23	3.65	8.64	H	Pass
6900	-46.37	-13	-33.37	-59.22	-52.95	4.15	10.72	H	Pass

Band :	LTE Band 4					Temperature :	22~23°C		
Test Mode :	15MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3450	-50.34	-13	-37.34	-59.54	-53.71	3.12	6.49	V	Pass
5178	-51.62	-13	-38.62	-59.03	-56.61	3.65	8.64	V	Pass
6900	-50.29	-13	-37.29	-60.05	-56.86	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	40~41%						
Test Engineer :	Jack Wang	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit	Reading	Power	loss	Gain	(H/V)	
(dB)			(dB)	(dBm)	(dBm)	(dB)	(dBi)		
3447	-48.11	-13	-35.11	-59.01	-51.48	3.12	6.49	H	Pass
5167.5	-54.93	-13	-41.93	-60.85	-59.91	3.65	8.64	H	Pass
6891	-48.28	-13	-35.28	-59.92	-54.85	4.15	10.72	H	Pass

Band :	LTE Band 4				Temperature :	22~23°C			
Test Mode :	20MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
3447	-50.06	-13	-37.06	-59.45	-53.43	3.12	6.49	V	Pass
5167.5	-50.13	-13	-37.13	-58.32	-55.12	3.65	8.64	V	Pass
6891	-50.49	-13	-37.49	-60.25	-57.06	4.15	10.72	V	Pass



Band :	LTE Band 17				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	40~41%			
Test Engineer :	Jack Wang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1416	-69.44	-13	-56.44	-55.82	-68.12	1.75	2.57	H	Pass
2124	-44.95	-13	-31.95	-49.84	-44.62	2.16	3.98	H	Pass
2830	-59.38	-13	-46.38	-63.20	-60.66	2.48	5.91	H	Pass

Band :	LTE Band 17					Temperature :	22~23°C		
Test Mode :	5MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1415	-69.46	-13	-56.46	-56.44	-68.13	1.75	2.57	V	Pass
2124	-58.43	-13	-45.43	-58.03	-58.10	2.16	3.98	V	Pass
2830	-61.62	-13	-48.62	-64.53	-62.90	2.48	5.91	V	Pass



Band :	LTE Band 17					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
1410	-64.08	-13	-51.08	-54.22	-62.76	1.75	2.57	H	Pass
2118	-44.56	-13	-31.56	-49.53	-44.23	2.16	3.98	H	Pass
2820	-59.71	-13	-46.71	-63.53	-60.99	2.48	5.91	H	Pass

Band :	LTE Band 17					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	40~41%		
Test Engineer :	Jack Wang					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1412	-65.03	-13	-52.03	-54.23	-63.71	1.75	2.57	V	Pass
2118	-58.31	-13	-45.31	-57.97	-57.98	2.16	3.98	V	Pass
2820	-59.98	-13	-46.98	-62.99	-61.26	2.48	5.91	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	9kHz~30GHz	May 04, 2014	Jan. 15, 2015~ Jan. 22, 2015	May 03, 2015	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 25, 2014	Jan. 15, 2015~ Jan. 22, 2015	Oct. 24, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 25, 2014	Jan. 26, 2015~ Jan. 28, 2015	Oct. 24, 2015	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Jan. 26, 2015~ Jan. 28, 2015	May 03, 2015	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	Jan. 26, 2015~ Jan. 28, 2015	Nov. 12, 2015	Radiation (03CH01-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	25Mhz-2Ghz	Jan. 17, 2015	Jan. 26, 2015~ Jan. 28, 2015	Jan. 16, 2016	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 17, 2015	Jan. 26, 2015~ Jan. 28, 2015	Jan. 16, 2016	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Jan. 26, 2015~ Jan. 28, 2015	Nov. 07, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz /32dB	May 04, 2014	Jan. 26, 2015~ Jan. 28, 2015	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Oct. 28, 2014	Jan. 26, 2015~ Jan. 28, 2015	Oct. 27, 2015	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 26, 2015~ Jan. 28, 2015	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jan. 26, 2015~ Jan. 28, 2015	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jan. 26, 2015~ Jan. 28, 2015	NCR	Radiation (03CH01-KS)



Spectrum Analyzer	R&S	FSP 7	100819	9kHz~7GHz	May 04, 2014	Jan. 15, 2015~ Jan. 22, 2015	May 03, 2015	ERP/EIRP (OTA01-KS)
Switch Control Manframe	Agilent	3499A	MY4200545 2	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Dual 1-to-6(4) MW MUX	Agilent	N2276A	MY4200084 1	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY4200257 3	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY4200258 6	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-04	00066993	700MHz~6GHz	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Conical Log Spiral (Small)	ETS-Lindgren	3102	00066951	1~10GHz	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Turn Table	ETS-Lindgren	2088	N/A	Resolution : 0.1degree	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Limiting Amplifier	ETS-lindgren	109643	920326	10MHz~2.5GHz	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
EMQuest	ETS-Lindgren	EMQ-100	1125	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)
Medium Duty Holder	ETS-Lindgren	2015	N/A	N/A	N/A	Jan. 15, 2015~ Jan. 22, 2015	N/A	ERP/EIRP (OTA01-KS)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.5
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LTE Band 2

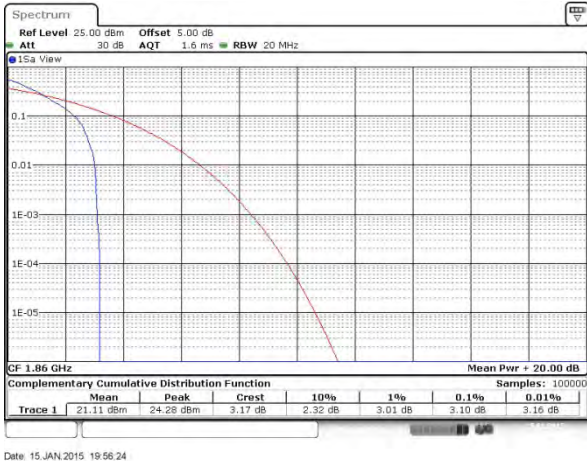
Peak-to-Average Ratio

Mode	LTE Band 2 / 20MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	3.10	4.46	4.41	5.54	PASS
Middle CH	3.19	4.49	4.26	5.57	
Highest CH	3.57	4.49	4.52	5.48	

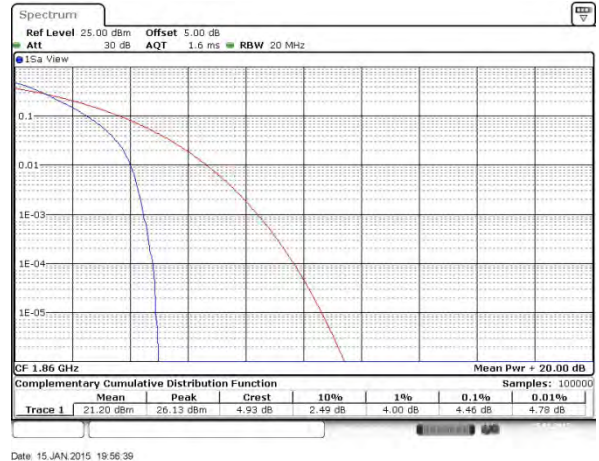


LTE Band 2 / 20MHz / QPSK

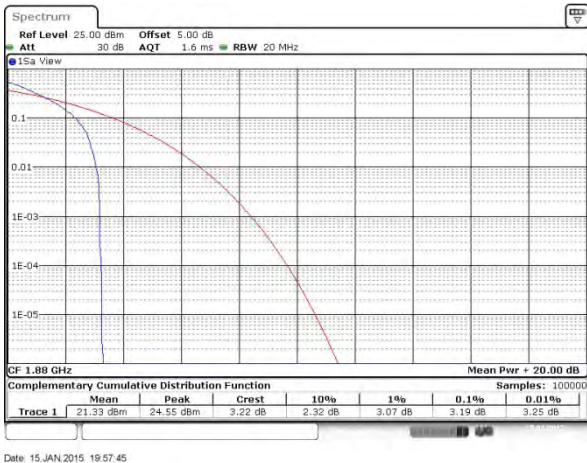
Lowest Channel / 1RB



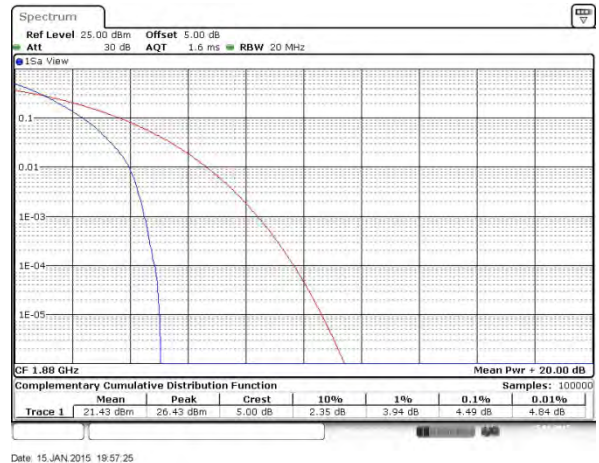
Lowest Channel / Full RB



Middle Channel / 1RB



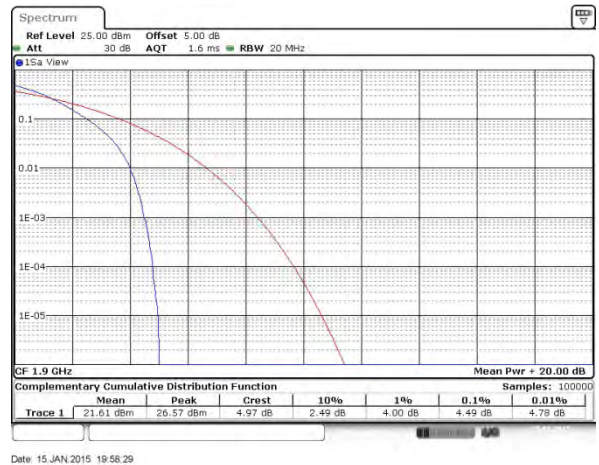
Middle Channel / Full RB



Highest Channel / 1RB



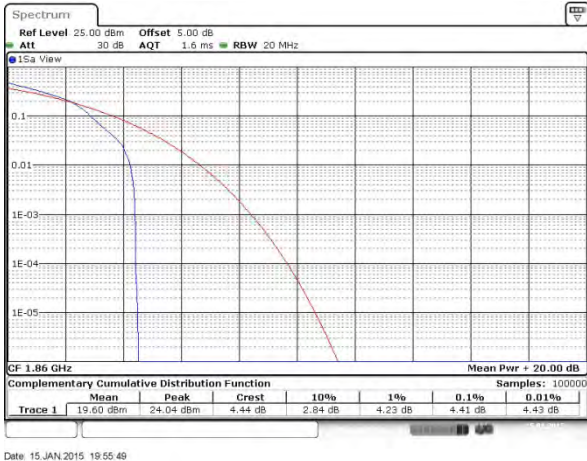
Highest Channel / Full RB



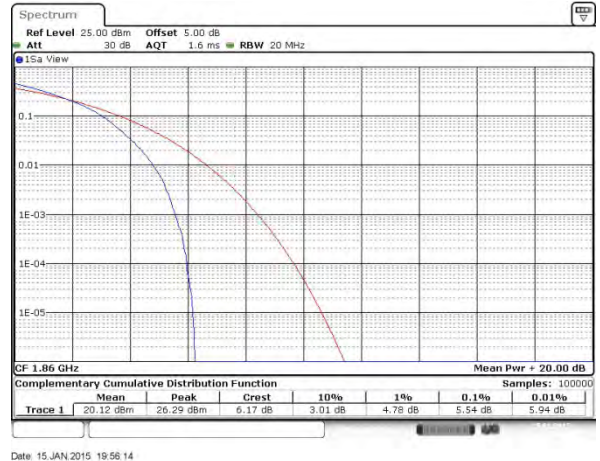


LTE Band 2 / 20MHz / 16QAM

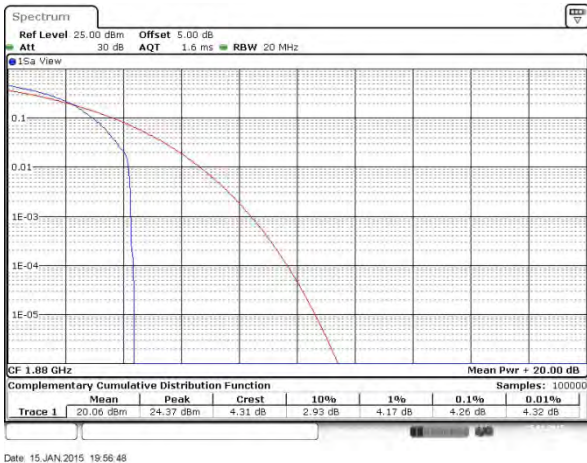
Lowest Channel / 1RB



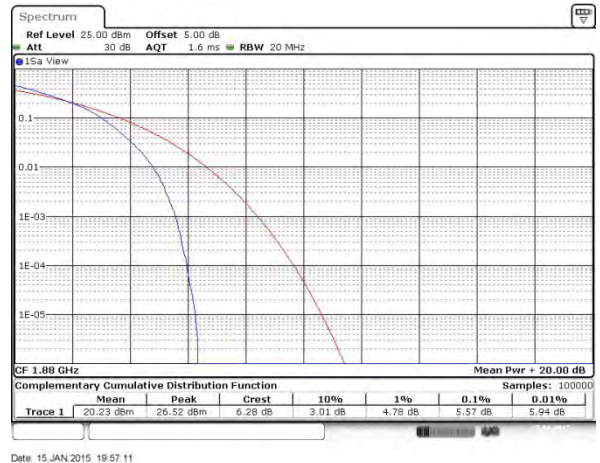
Lowest Channel / Full RB



Middle Channel / 1RB



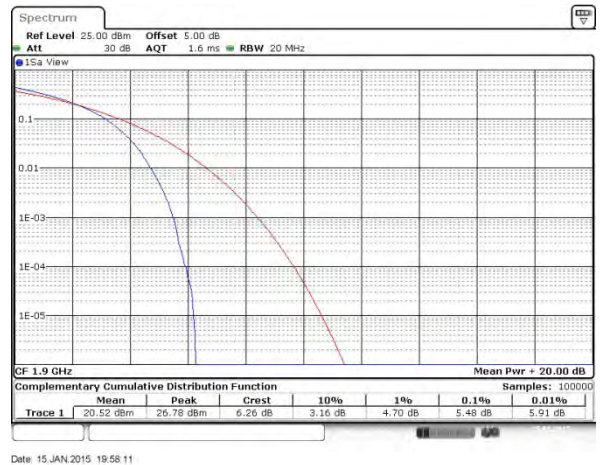
Middle Channel / Full RB



Highest Channel / 1RB



Highest Channel / Full RB



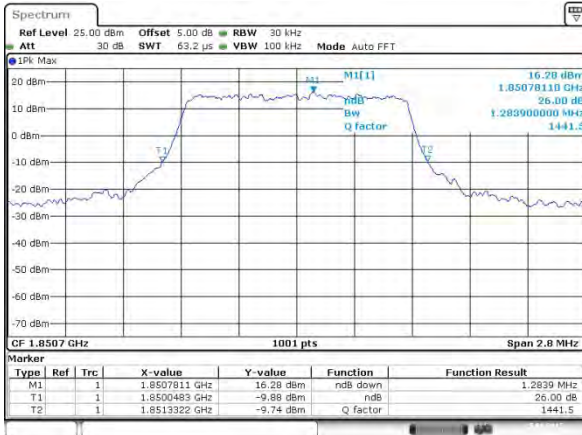
**26dB Bandwidth**

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	1.2839	1.3007	3.039	3.0509	5.055	5.055	10.07	10.01	14.745	14.685	20.42	20.539
Middle CH	1.2951	1.3007	3.045	3.0629	5.055	5.055	10.03	9.97	14.715	14.805	20.42	20.38
Highest CH	1.4238	1.393	3.3267	3.0629	5.155	5.045	10.03	10.05	14.565	14.595	20.34	20.46



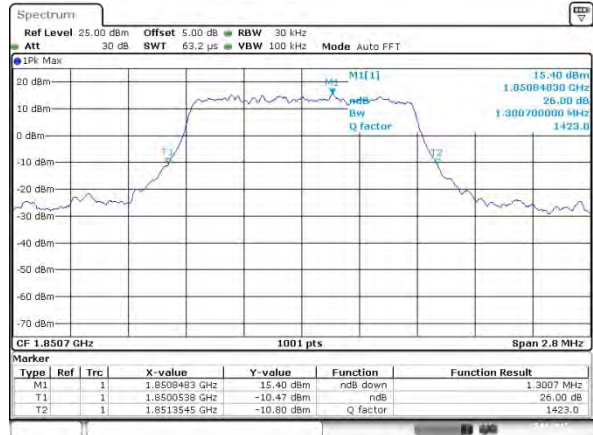
LTE Band 2

Lowest Channel / 1.4MHz / QPSK



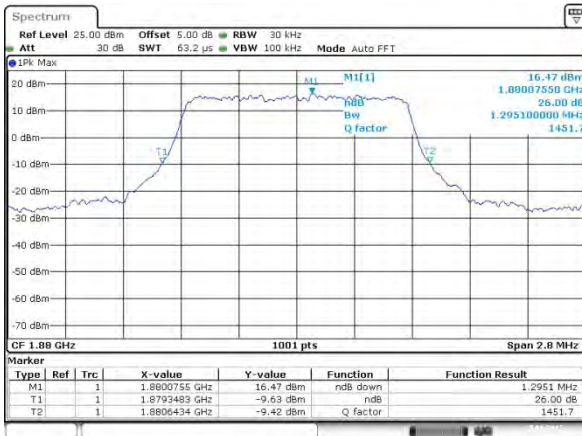
Date: 15 JAN 2015 18:55:56

Lowest Channel / 1.4MHz / 16QAM



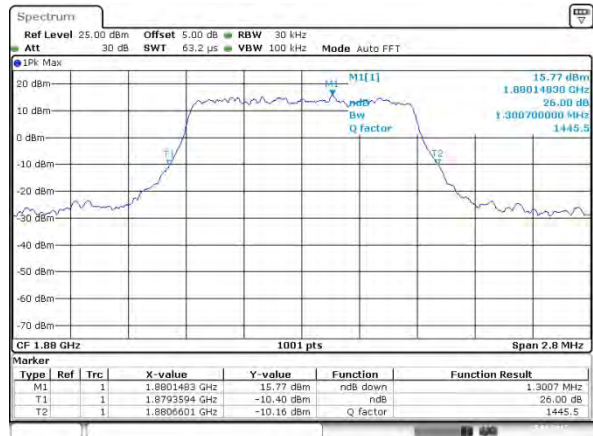
Date: 15 JAN 2015 18:56:06

Middle Channel / 1.4MHz / QPSK



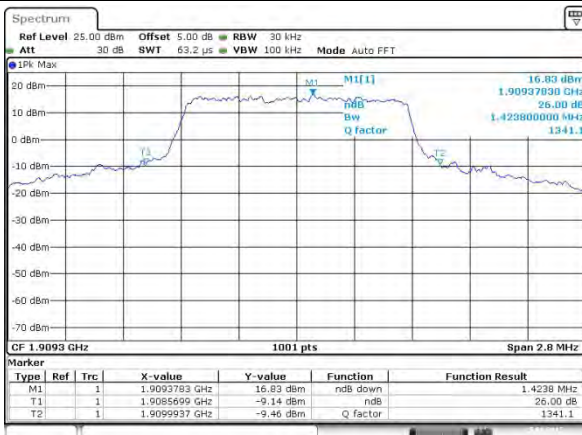
Date: 15 JAN 2015 18:58:18

Middle Channel / 1.4MHz / 16QAM



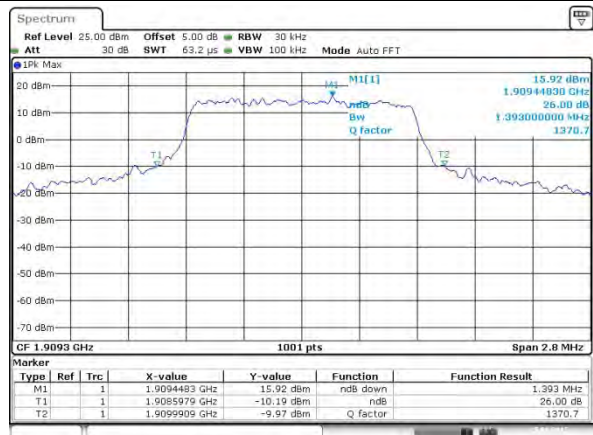
Date: 15 JAN 2015 18:58:26

Highest Channel / 1.4MHz / QPSK



Date: 15 JAN 2015 19:02:37

Highest Channel / 1.4MHz / 16QAM

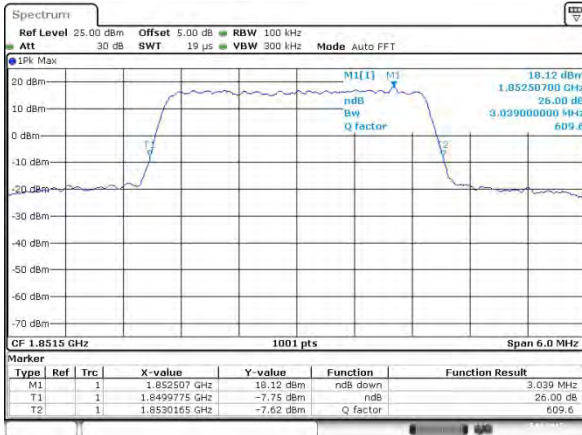


Date: 15 JAN 2015 19:02:48



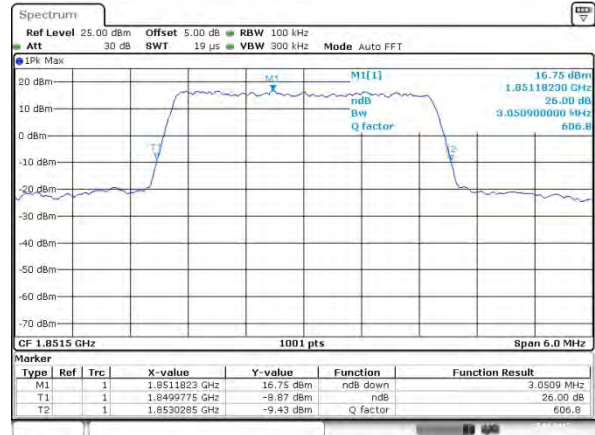
LTE Band 2

Lowest Channel / 3MHz / QPSK



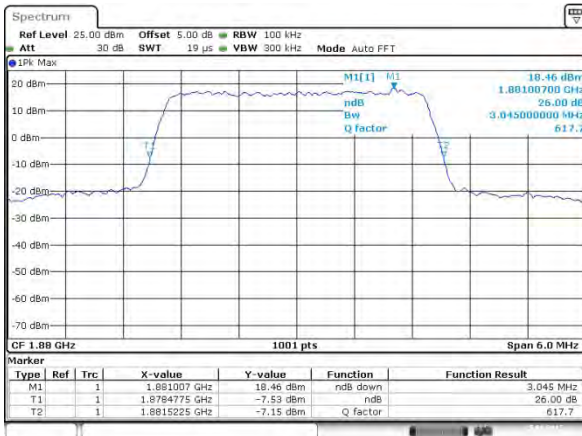
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Lowest Channel / 3MHz / 16QAM



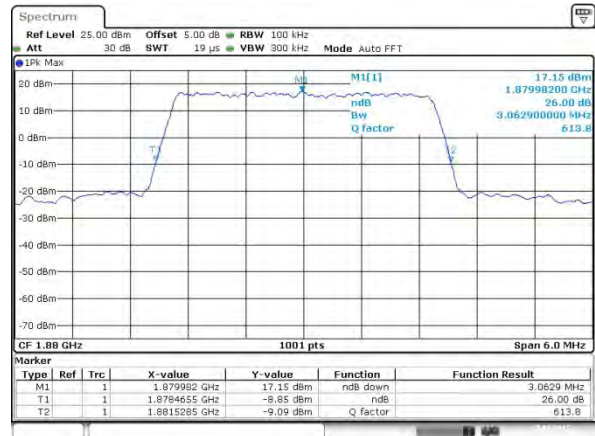
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Middle Channel / 3MHz / QPSK



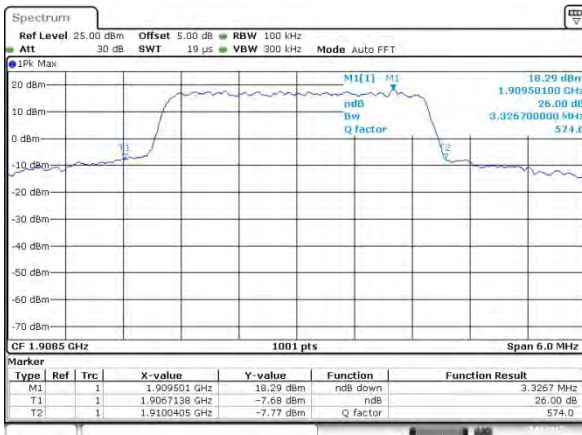
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Middle Channel / 3MHz / 16QAM



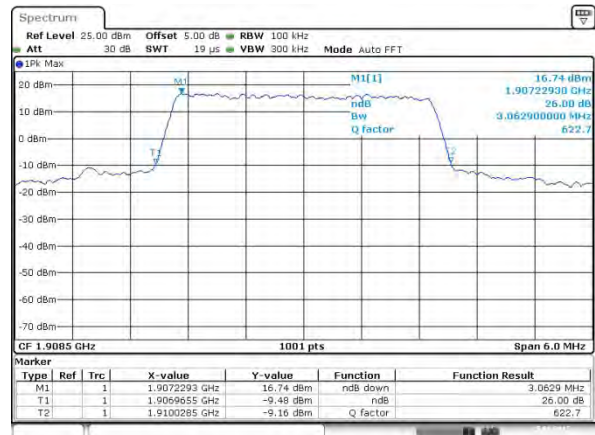
Date: 15 JAN 2015 19:09:29

Highest Channel / 3MHz / QPSK



Date: 15 JAN 2015 19:12:37

Highest Channel / 3MHz / 16QAM

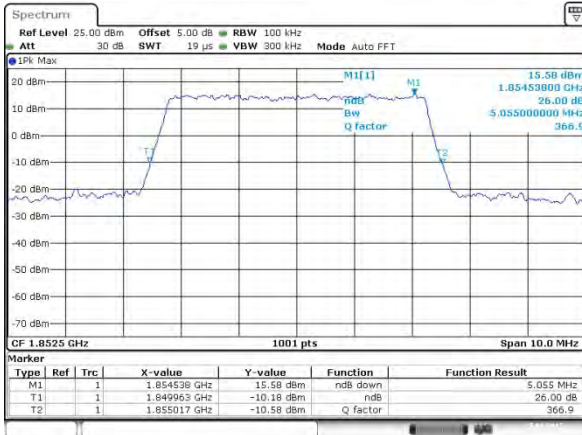


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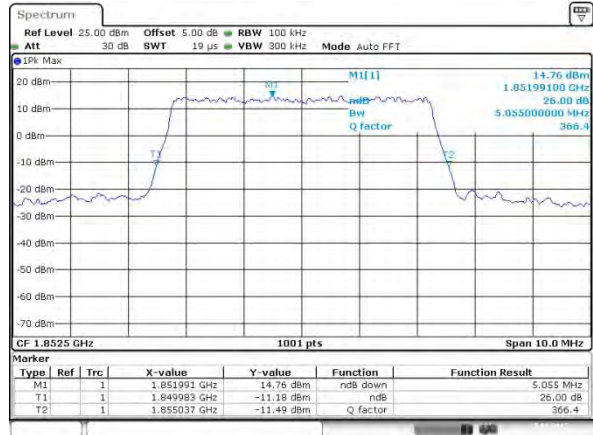
LTE Band 2

Lowest Channel / 5MHz / QPSK



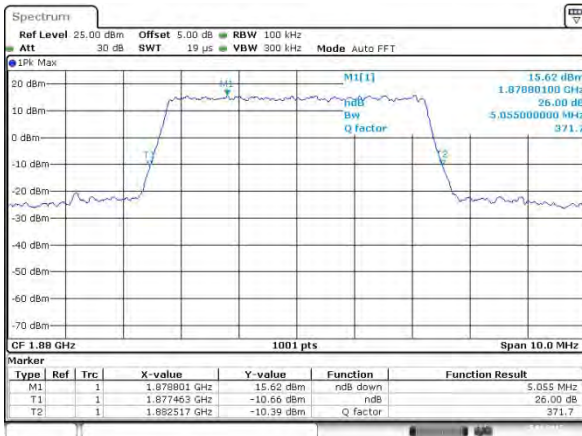
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Lowest Channel / 5MHz / 16QAM



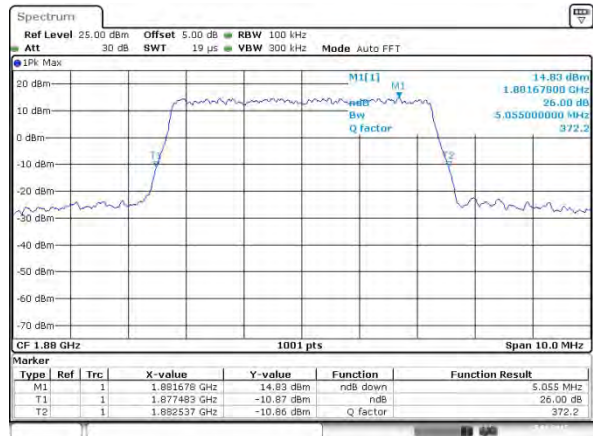
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Middle Channel / 5MHz / QPSK



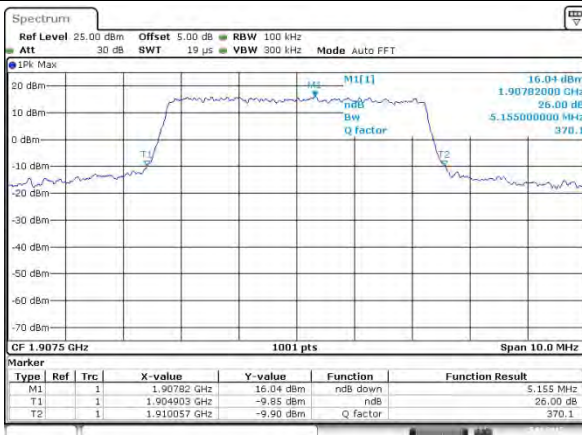
Date: 15 JAN 2015 19:19:18

Middle Channel / 5MHz / 16QAM



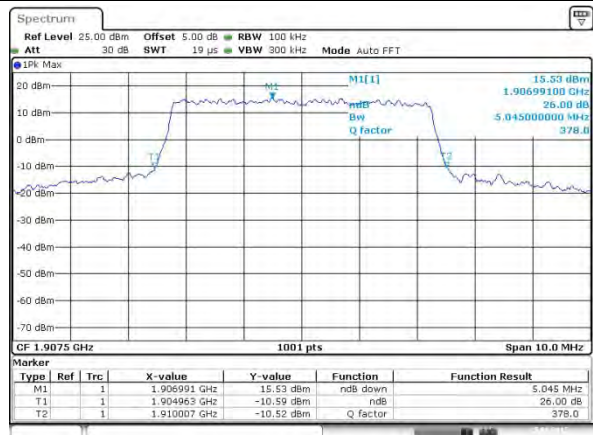
Date: 15 JAN 2015 19:19:30

Highest Channel / 5MHz / QPSK



Date: 15 JAN 2015 19:22:38

Highest Channel / 5MHz / 16QAM

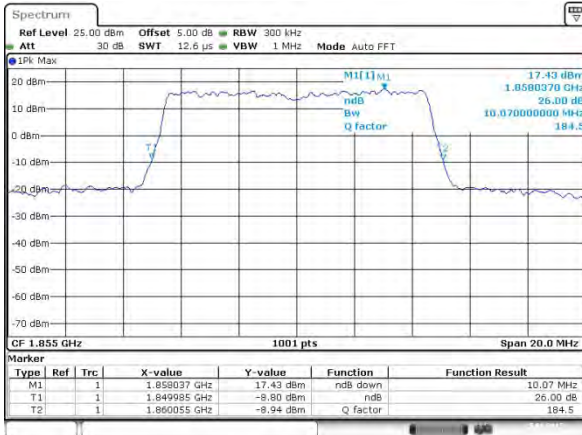


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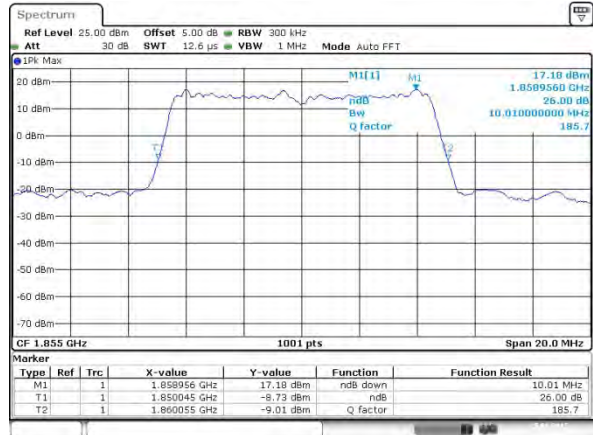
LTE Band 2

Lowest Channel / 10MHz / QPSK



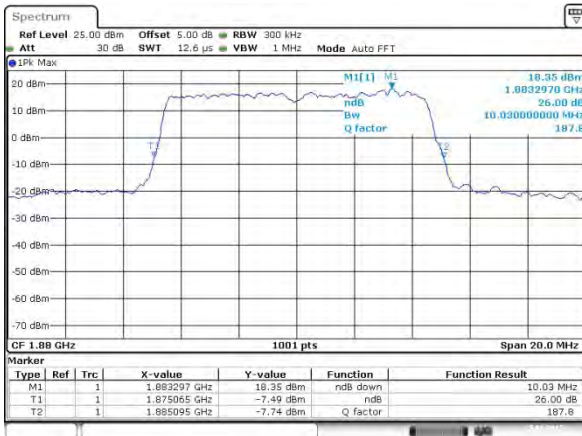
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Lowest Channel / 10MHz / 16QAM



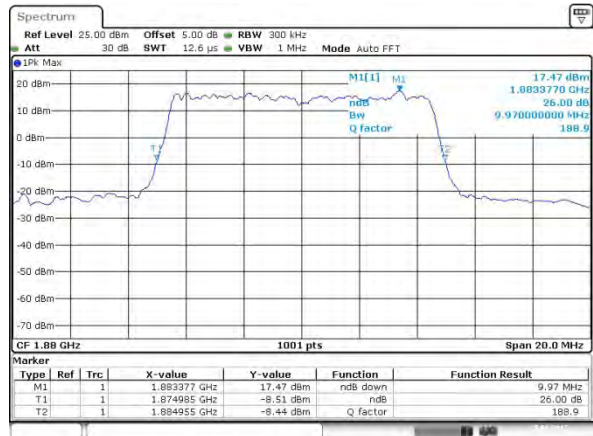
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Middle Channel / 10MHz / QPSK



Date: 15 JAN 2015 19:29:18

Middle Channel / 10MHz / 16QAM



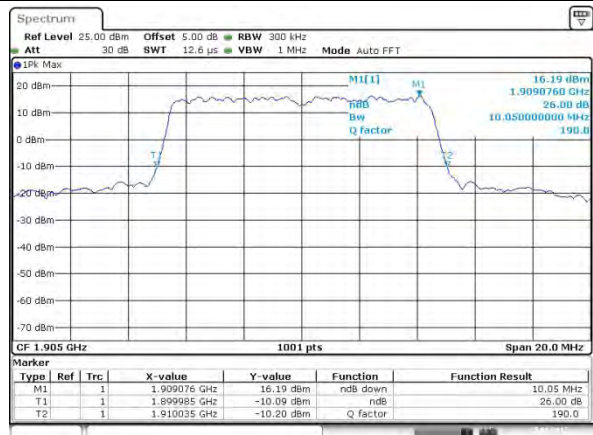
Date: 15 JAN 2015 19:29:30

Highest Channel / 10MHz / QPSK



Date: 15 JAN 2015 19:32:39

Highest Channel / 10MHz / 16QAM

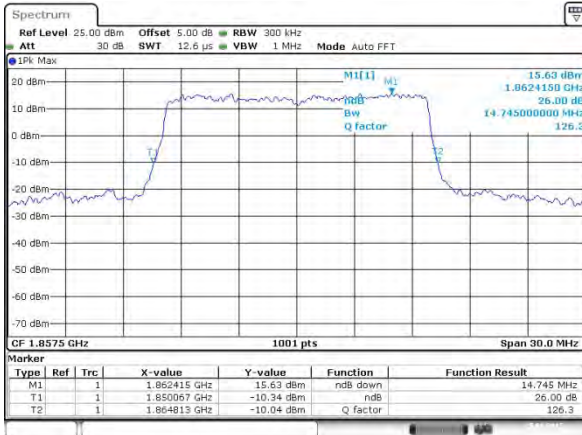


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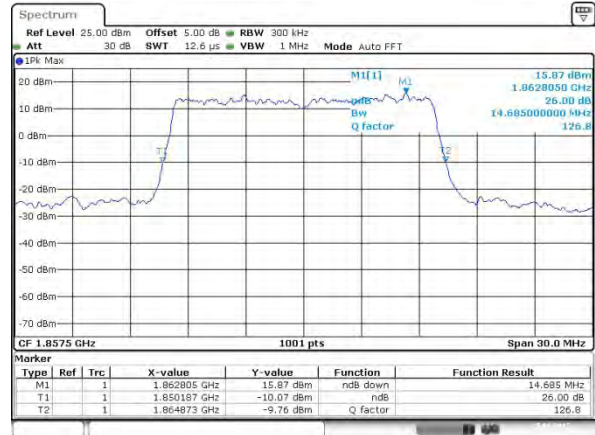


LTE Band 2

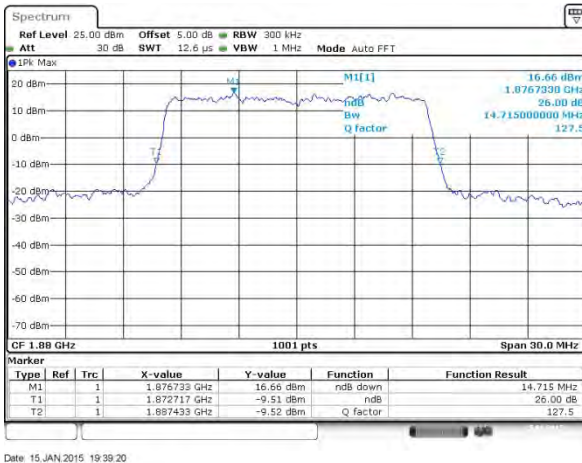
Lowest Channel / 15MHz / QPSK



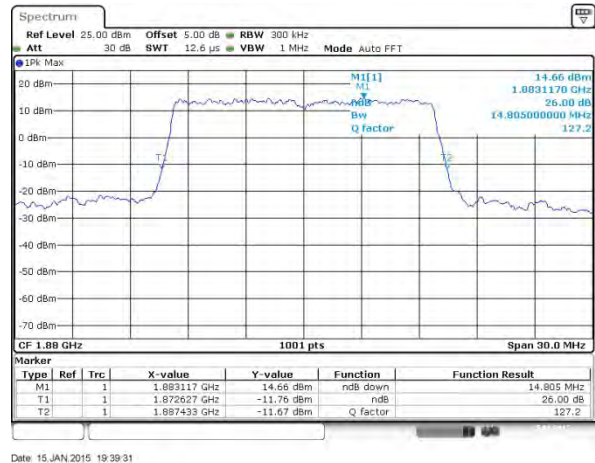
Lowest Channel / 15MHz / 16QAM



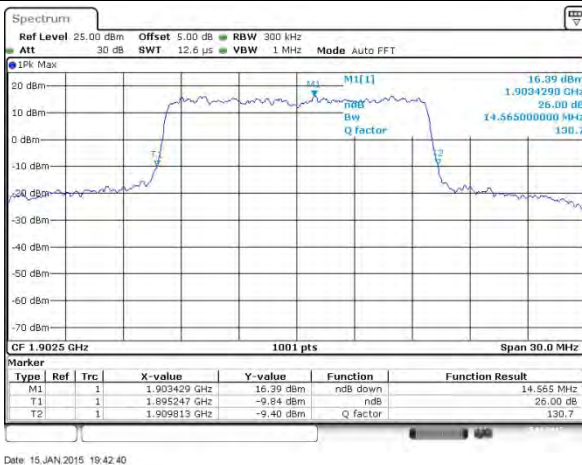
Middle Channel / 15MHz / QPSK



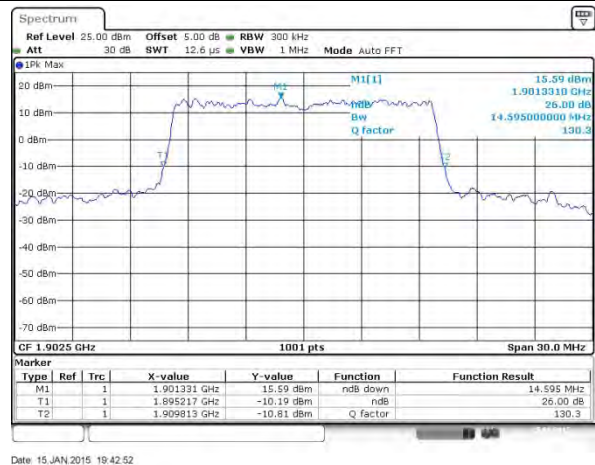
Middle Channel / 15MHz / 16QAM



Highest Channel / 15MHz / QPSK



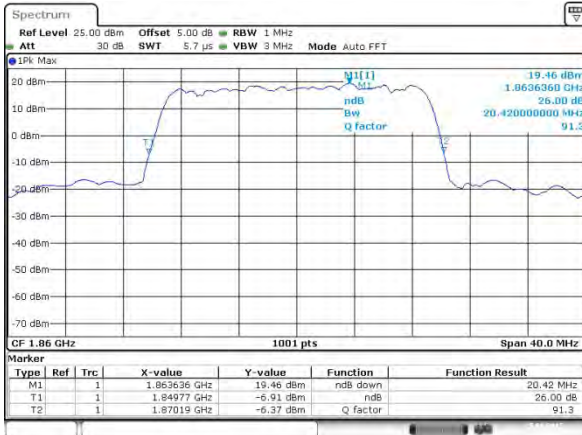
Highest Channel / 15MHz / 16QAM



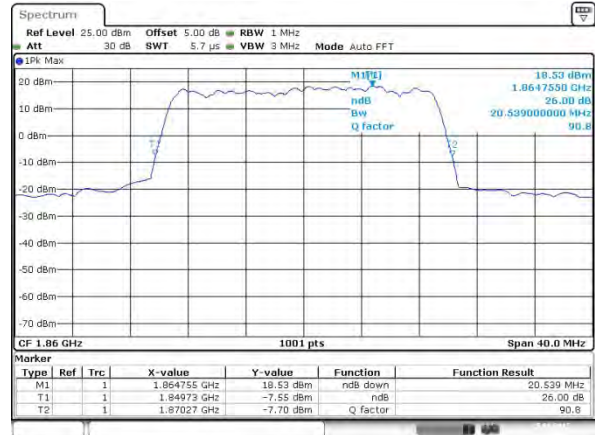


LTE Band 2

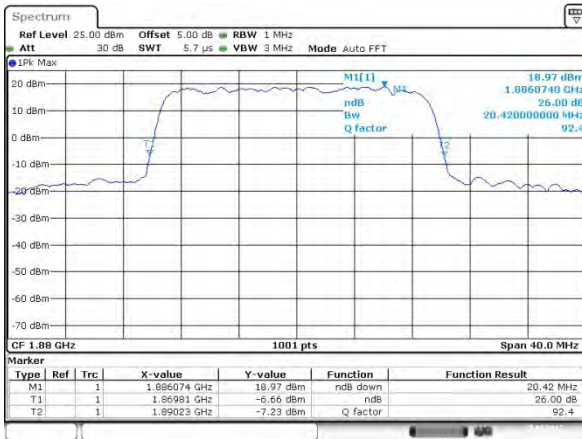
Lowest Channel / 20MHz / QPSK



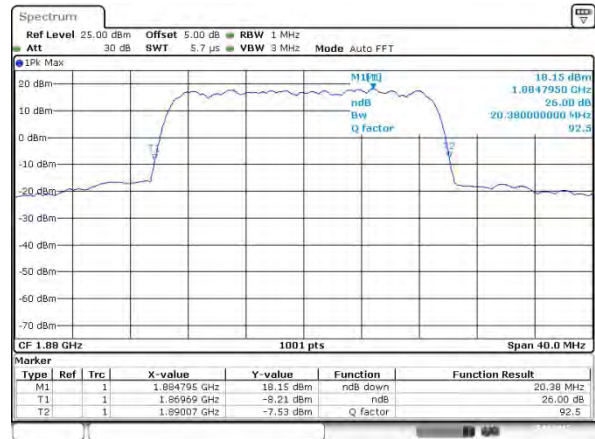
Lowest Channel / 20MHz / 16QAM



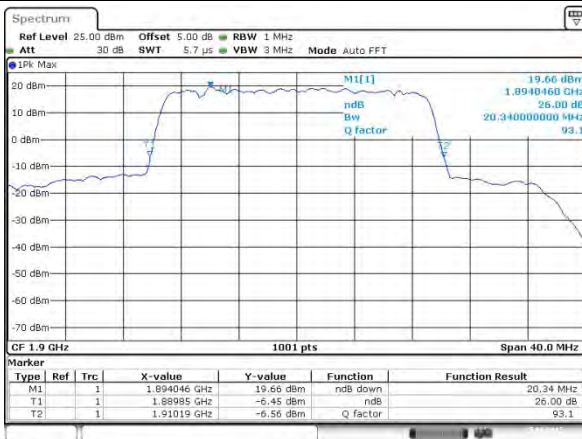
Middle Channel / 20MHz / QPSK



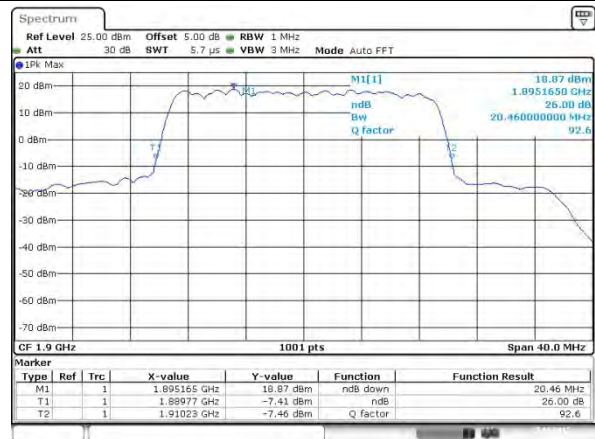
Middle Channel / 20MHz / 16QAM



Highest Channel / 20MHz / QPSK



Highest Channel / 20MHz / 16QAM



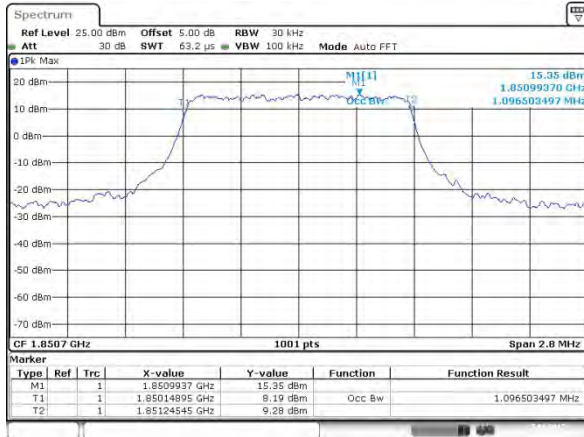
**Occupied Bandwidth**

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	1.1	1.1	2.73	2.72	4.5	4.5	9.05	9.09	13.49	13.46	18.34	18.38
Middle CH	1.1	1.1	2.73	2.72	4.5	4.5	9.07	9.03	13.46	13.49	18.38	18.3
Highest CH	1.11	1.1	2.75	2.73	4.51	4.51	9.05	9.07	13.49	13.46	18.34	18.34

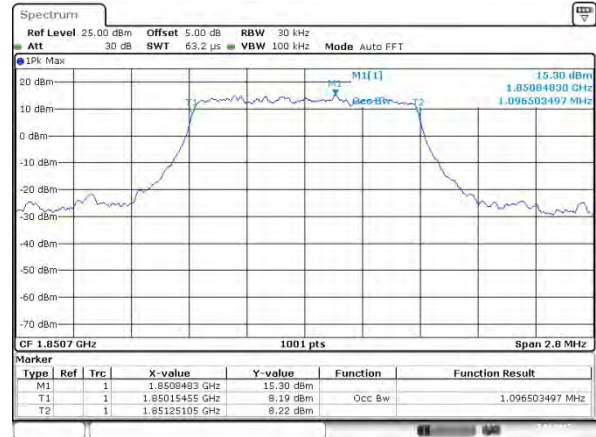


LTE Band 2

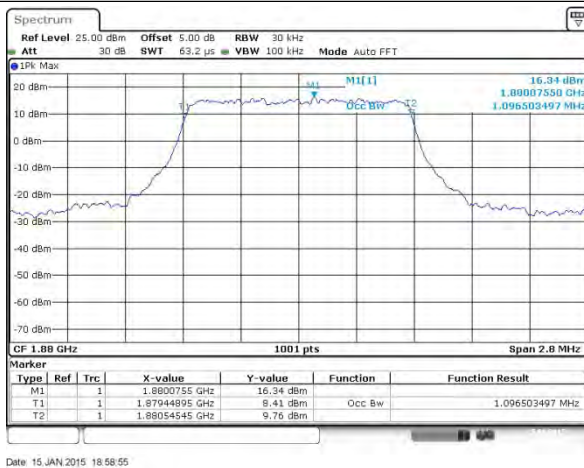
Lowest Channel / 1.4MHz / QPSK



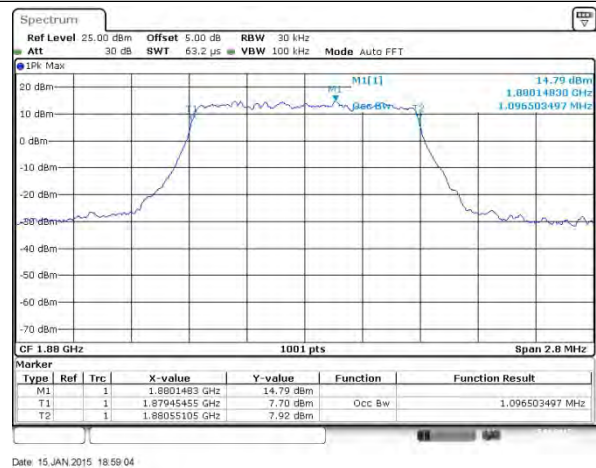
Lowest Channel / 1.4MHz / 16QAM



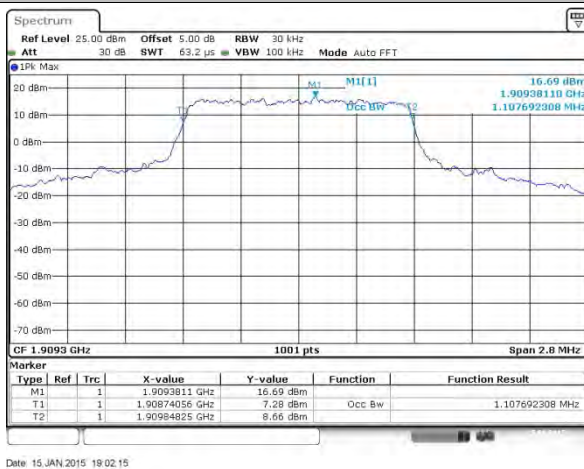
Middle Channel / 1.4MHz / QPSK



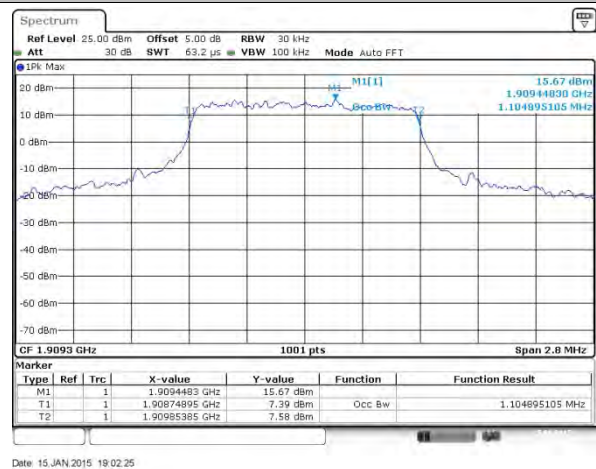
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK



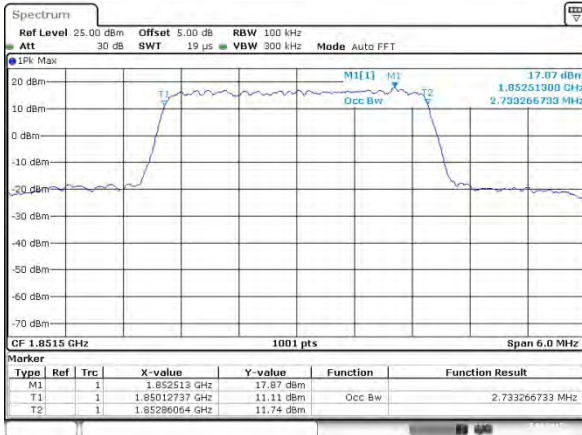
Highest Channel / 1.4MHz / 16QAM



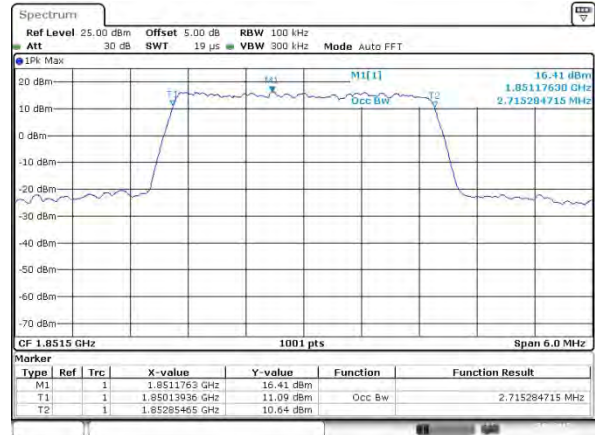


LTE Band 2

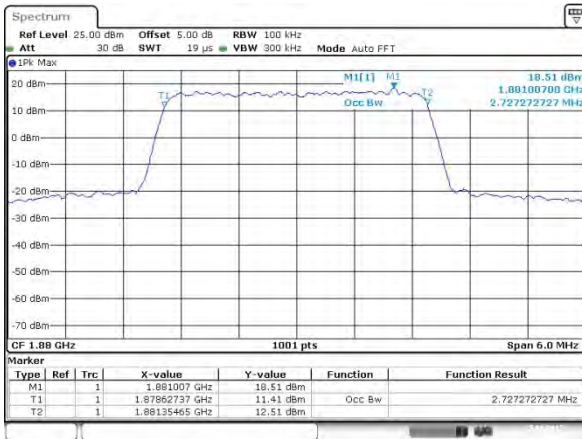
Lowest Channel / 3MHz / QPSK



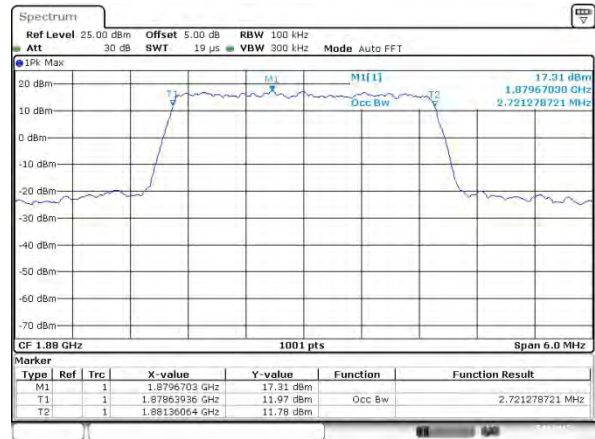
Lowest Channel / 3MHz / 16QAM



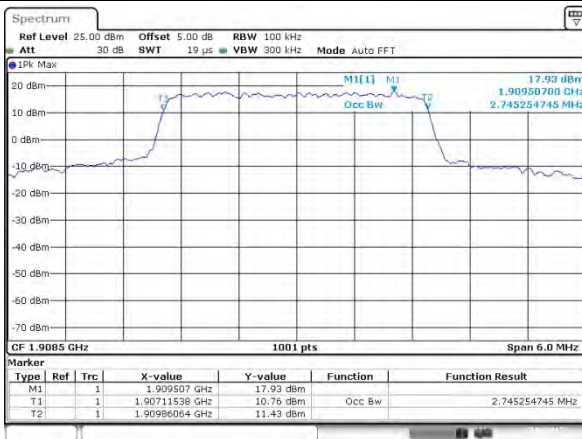
Middle Channel / 3MHz / QPSK



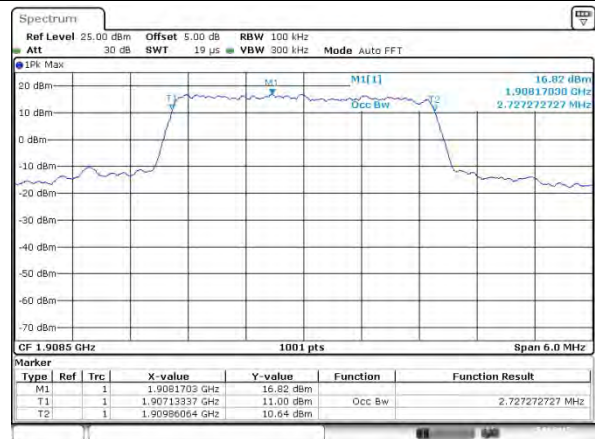
Middle Channel / 3MHz / 16QAM



Highest Channel / 3MHz / QPSK



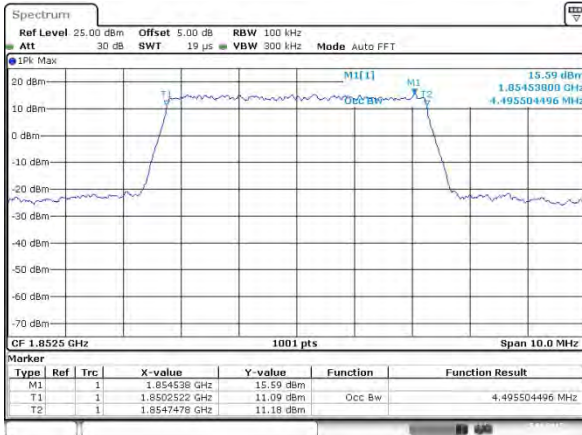
Highest Channel / 3MHz / 16QAM



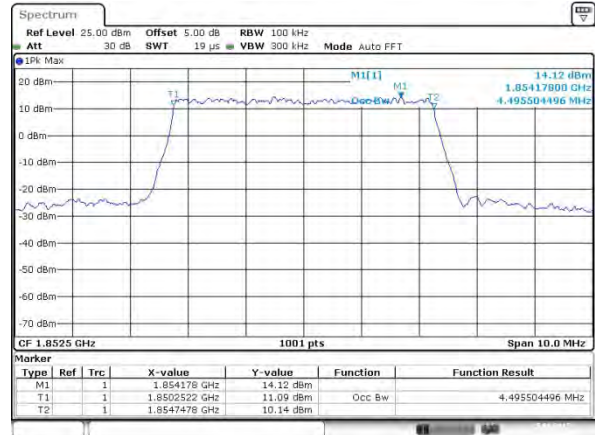


LTE Band 2

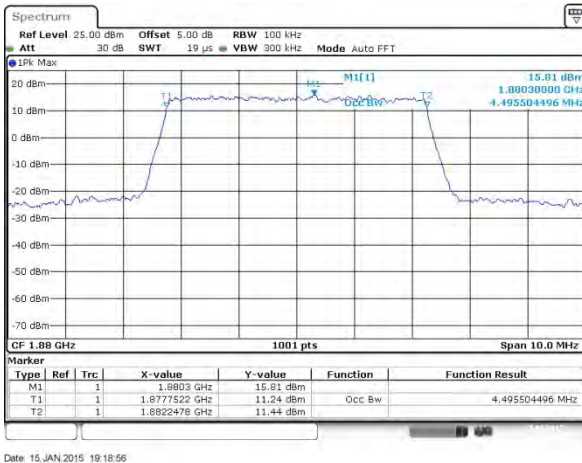
Lowest Channel / 5MHz / QPSK



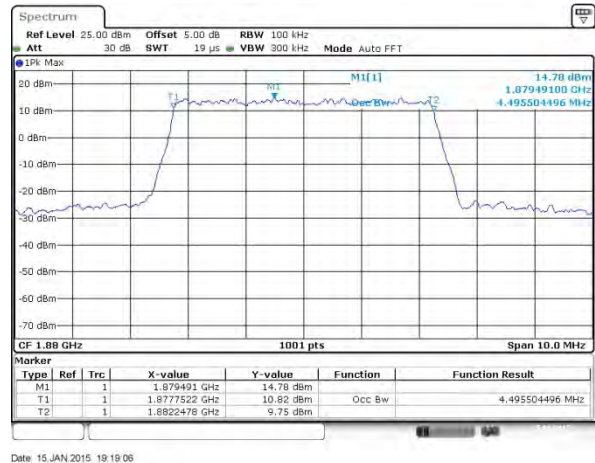
Lowest Channel / 5MHz / 16QAM



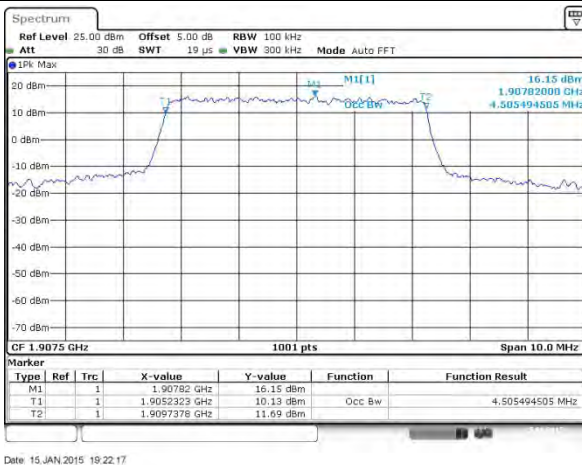
Middle Channel / 5MHz / QPSK



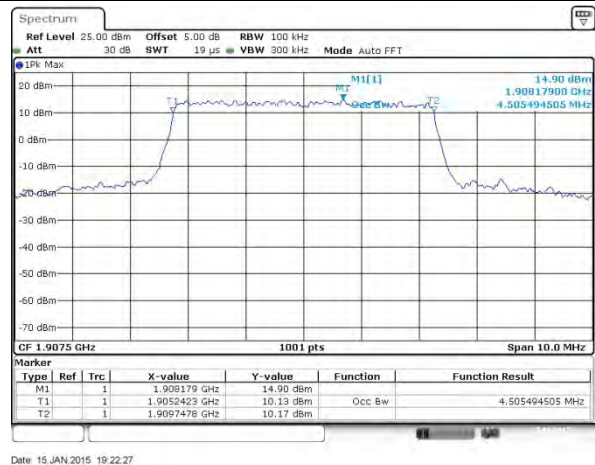
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK



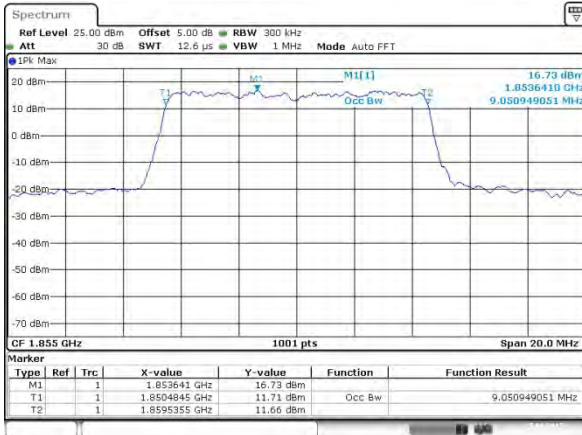
Highest Channel / 5MHz / 16QAM



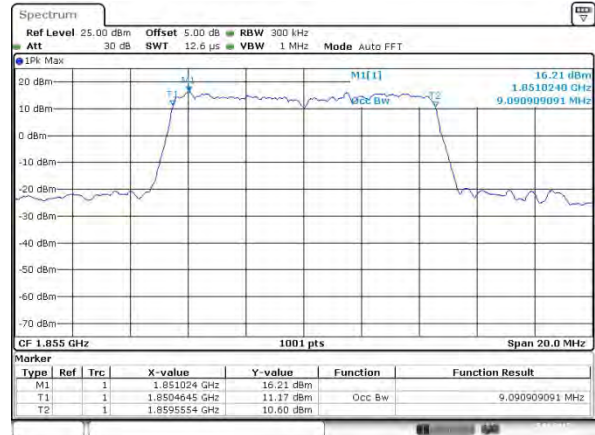


LTE Band 2

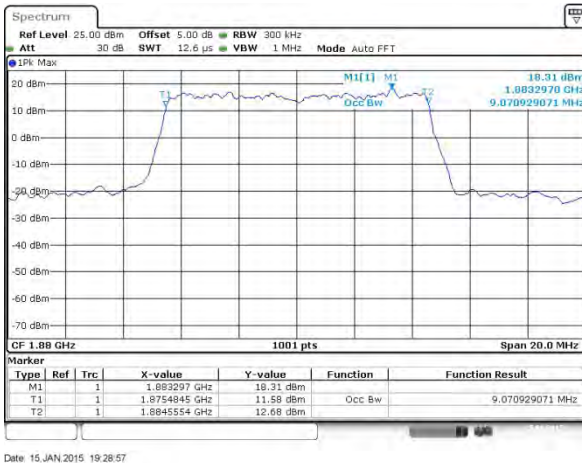
Lowest Channel / 10MHz / QPSK



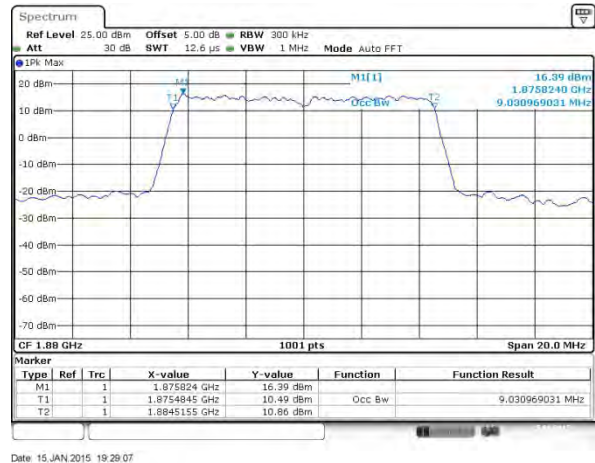
Lowest Channel / 10MHz / 16QAM



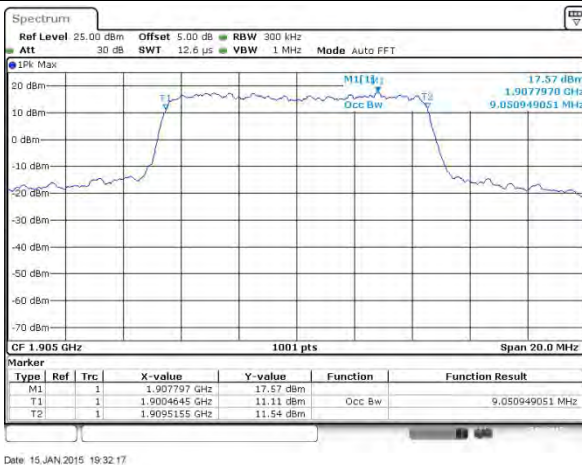
Middle Channel / 10MHz / QPSK



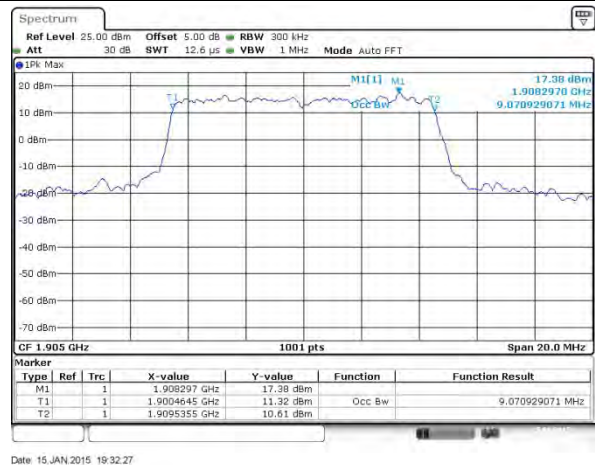
Middle Channel / 10MHz / 16QAM



Highest Channel / 10MHz / QPSK



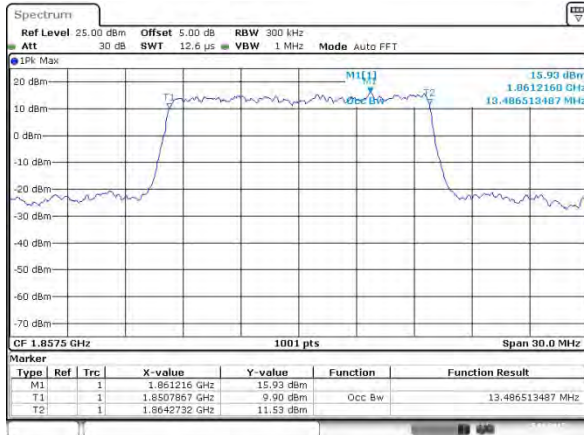
Highest Channel / 10MHz / 16QAM



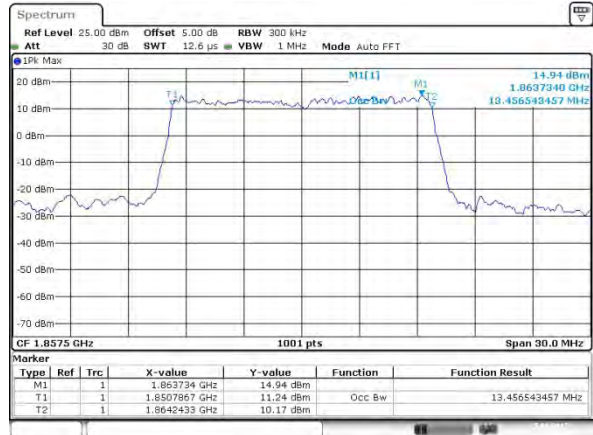


LTE Band 2

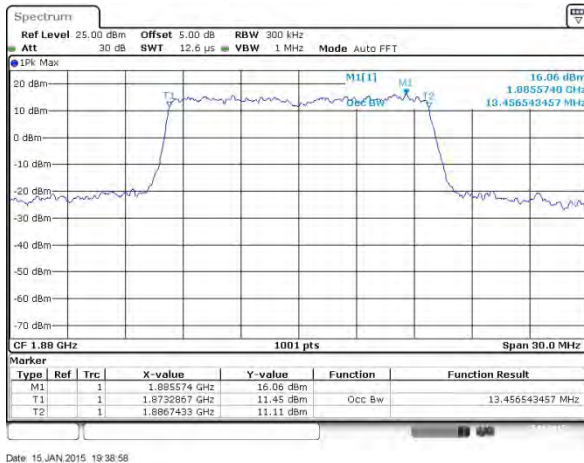
Lowest Channel / 15MHz / QPSK



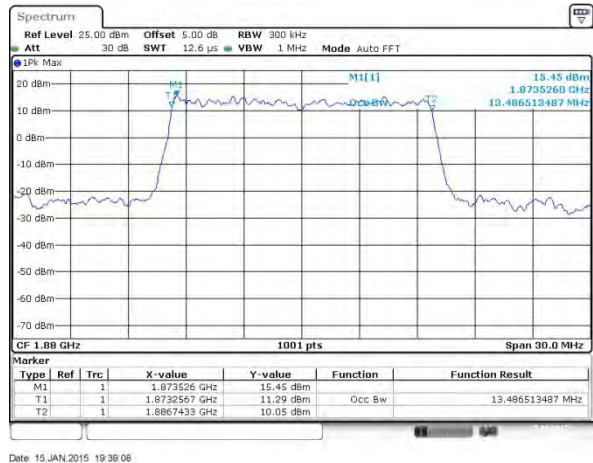
Lowest Channel / 15MHz / 16QAM



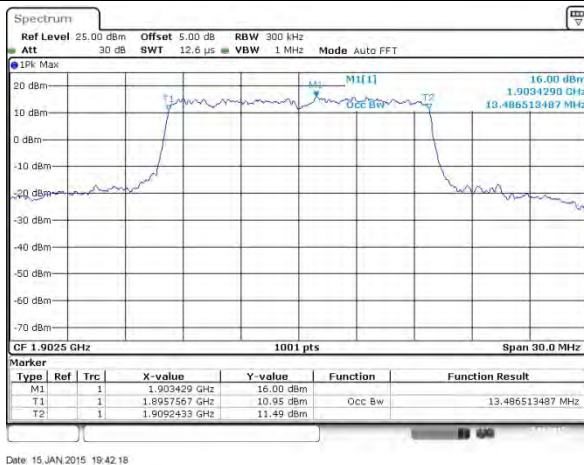
Middle Channel / 15MHz / QPSK



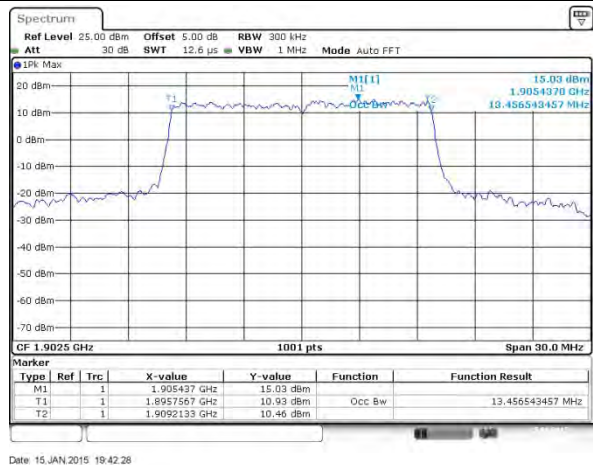
Middle Channel / 15MHz / 16QAM



Highest Channel / 15MHz / QPSK



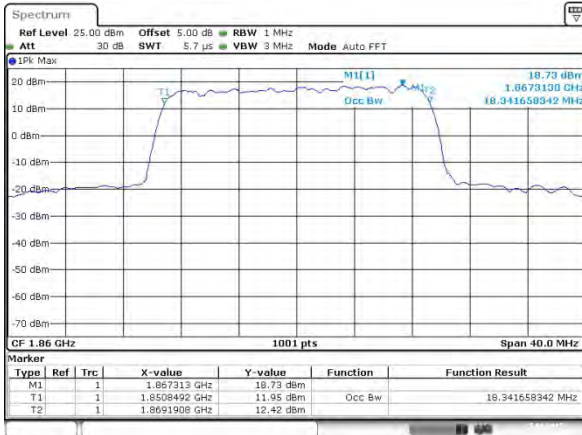
Highest Channel / 15MHz / 16QAM



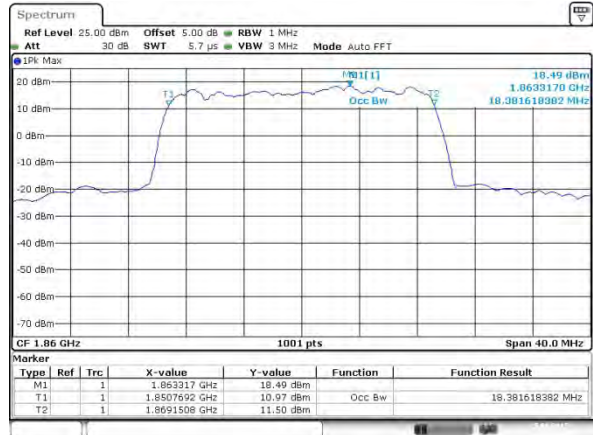


LTE Band 2

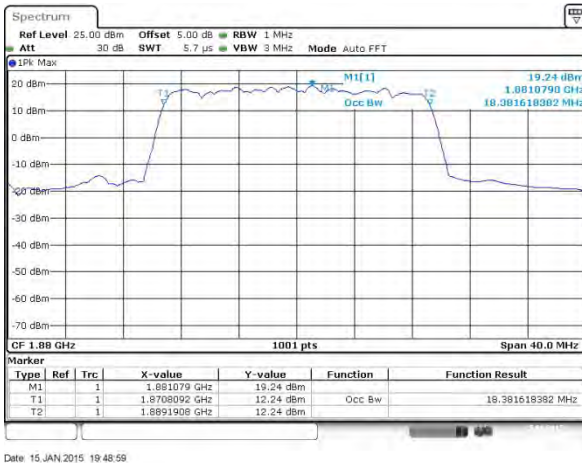
Lowest Channel / 20MHz / QPSK



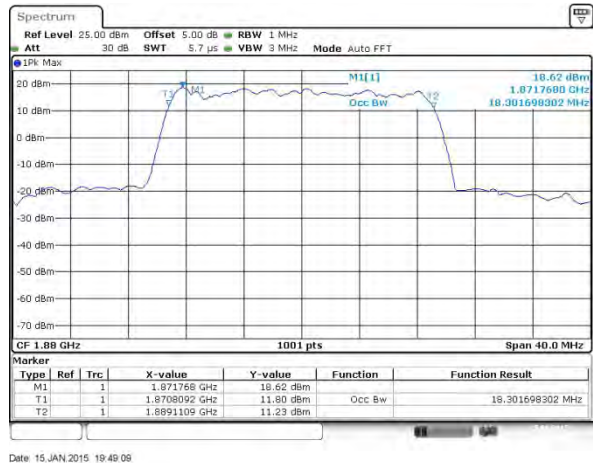
Lowest Channel / 20MHz / 16QAM



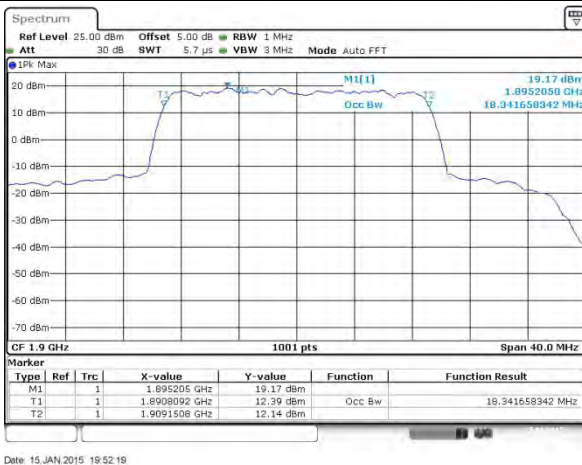
Middle Channel / 20MHz / QPSK



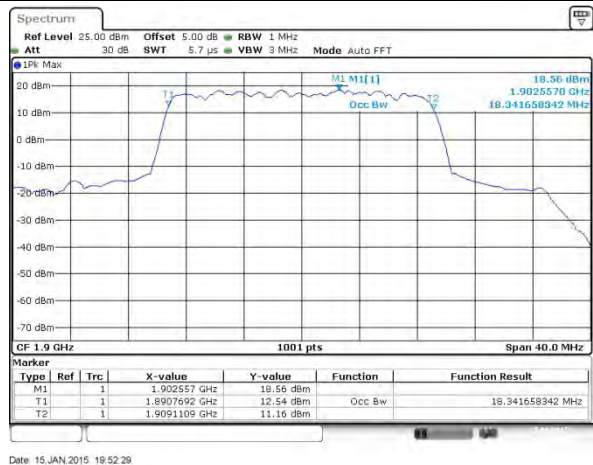
Middle Channel / 20MHz / 16QAM

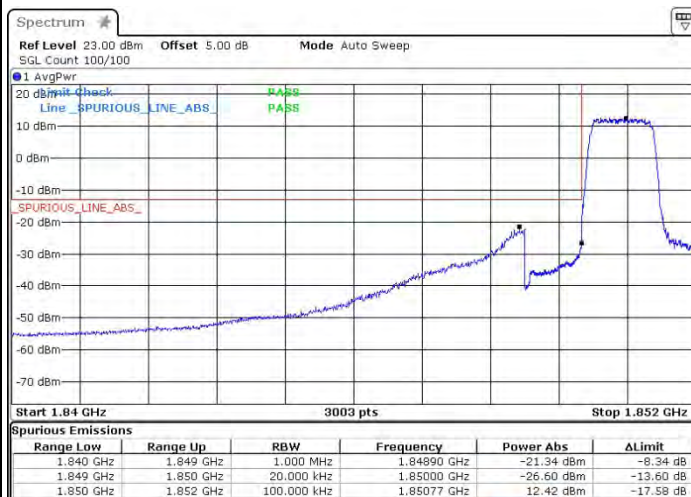


Highest Channel / 20MHz / QPSK



Highest Channel / 20MHz / 16QAM



**Conducted Band Edge****LTE Band 2 / 1.4MHz / QPSK****Lowest Band Edge / 1RB****Highest Band Edge / 1RB****Lowest Band Edge / Full RB****Highest Band Edge / Full RB**



LTE Band 2 / 1.4MHz / 16QAM

Lowest Band Edge / 1 RB

Highest Band Edge / 1 RB



Date: 15 JAN 2015 20:03:09



Date: 15 JAN 2015 20:13:39

Lowest Band Edge / Full RB

Highest Band Edge / Full RB



Date: 15 JAN 2015 20:07:39



Date: 15 JAN 2015 20:17:58



LTE Band 2 / 3MHz / QPSK

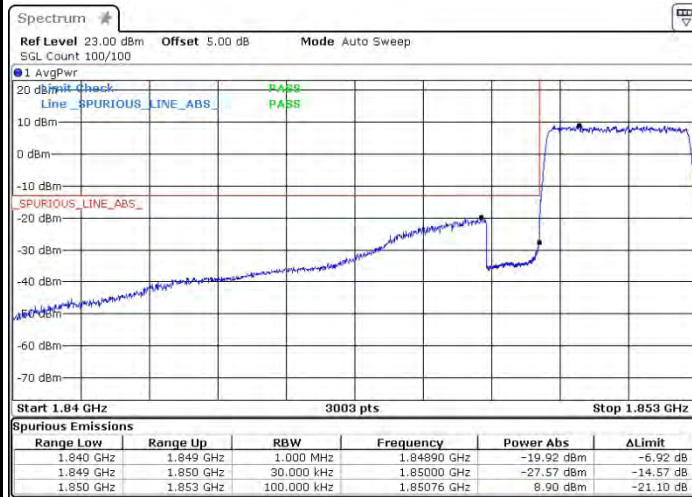
Lowest Band Edge / 1RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



Highest Band Edge / Full RB



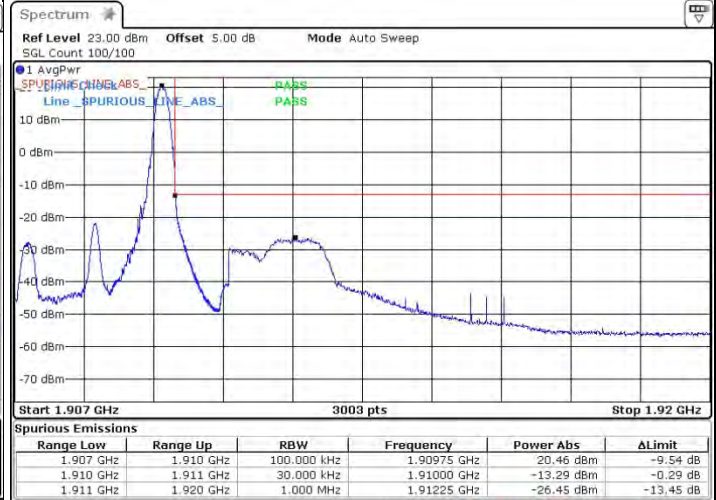


LTE Band 2 / 3MHz / 16QAM

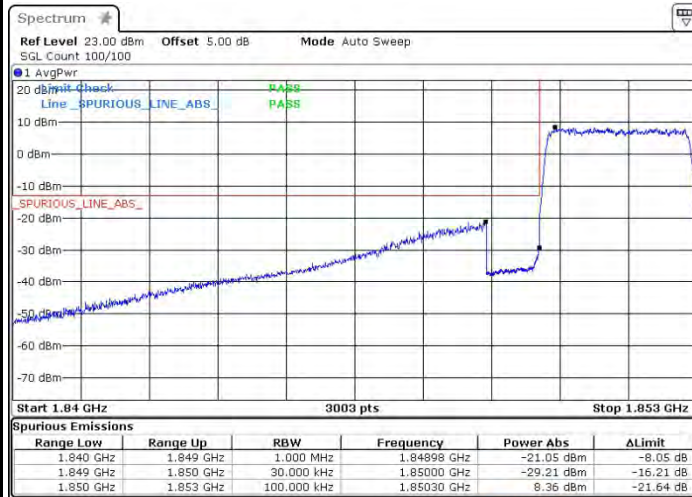
Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



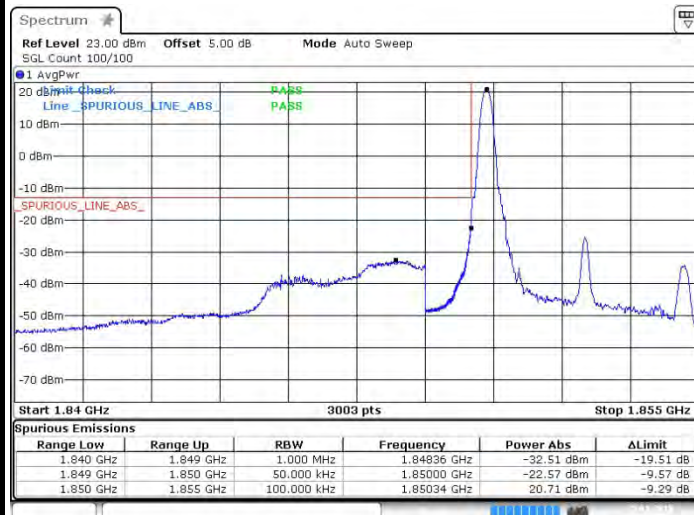
Highest Band Edge / Full RB





LTE Band 2 / 5MHz / QPSK

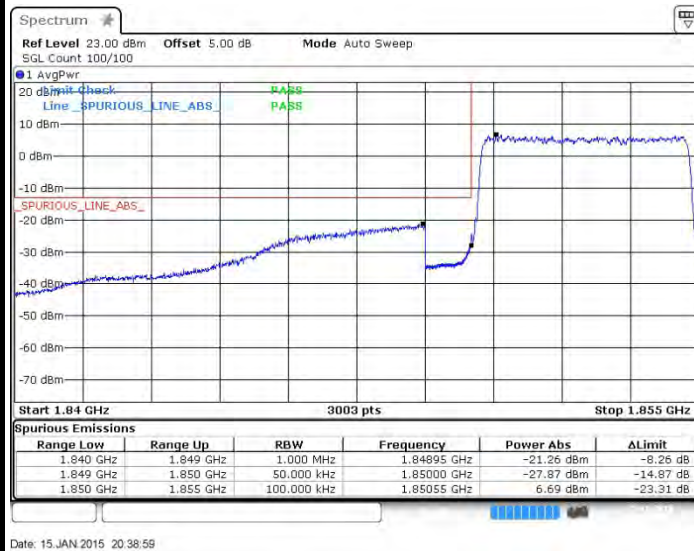
Lowest Band Edge / 1 RB



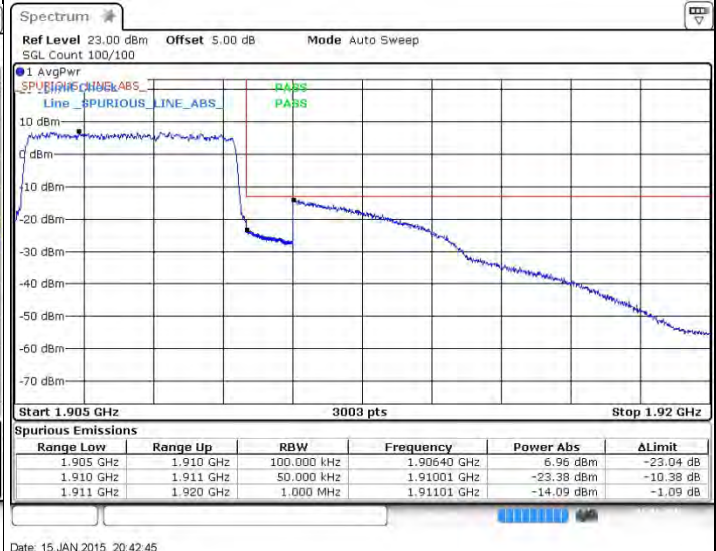
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



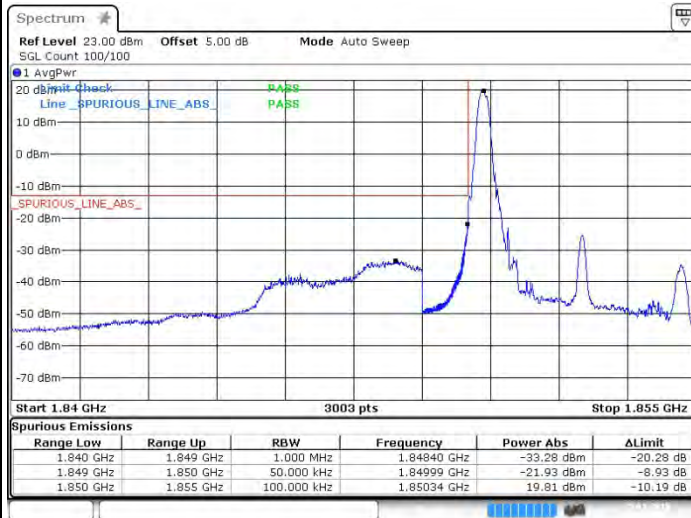
Highest Band Edge / Full RB



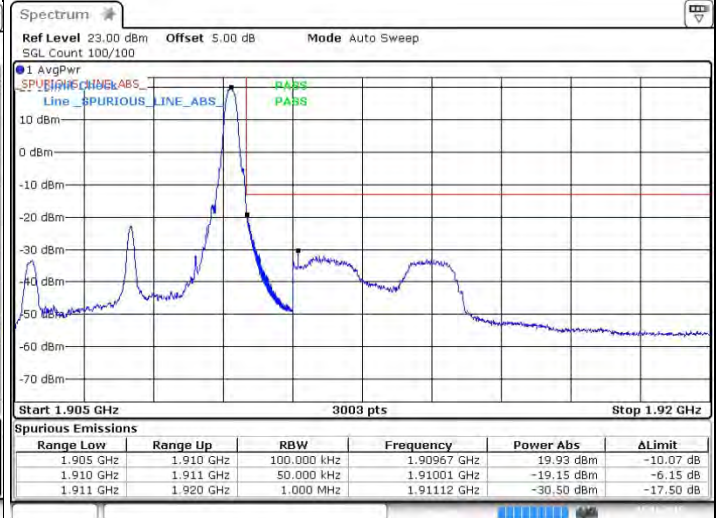


LTE Band 2 / 5MHz / 16QAM

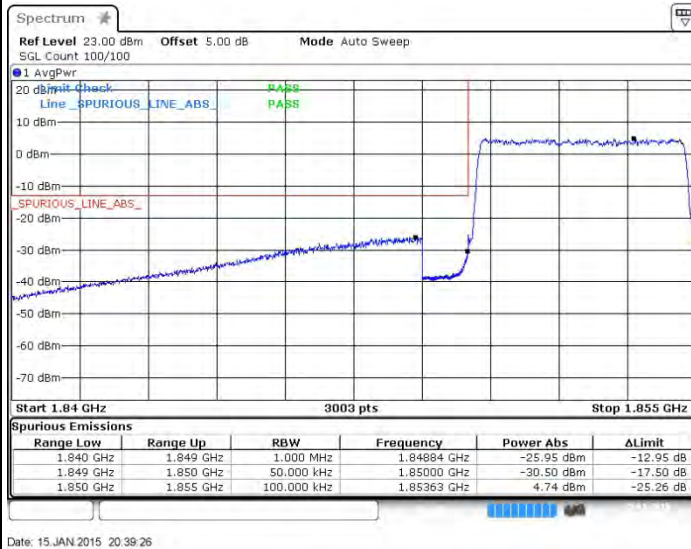
Lowest Band Edge / 1RB



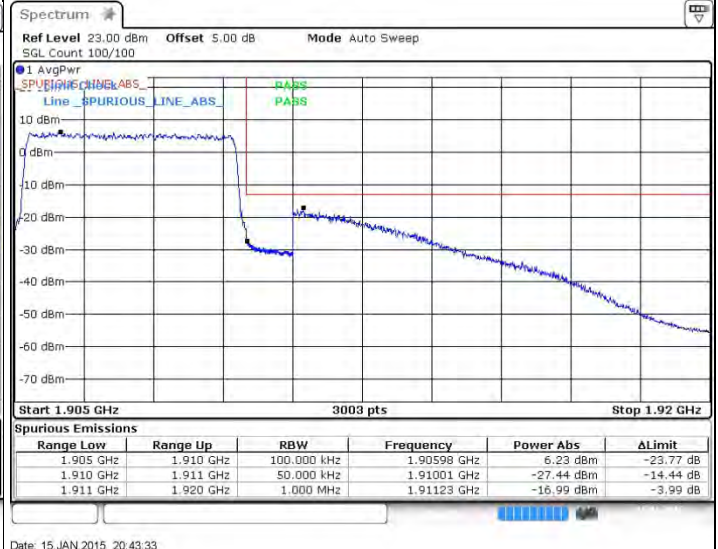
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



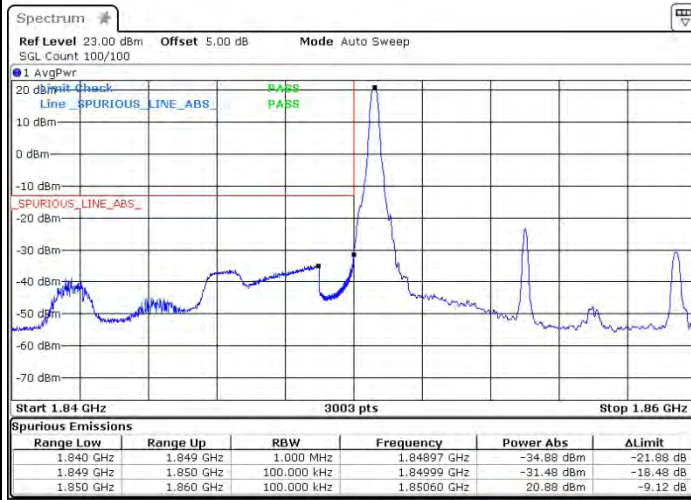
Highest Band Edge / Full RB



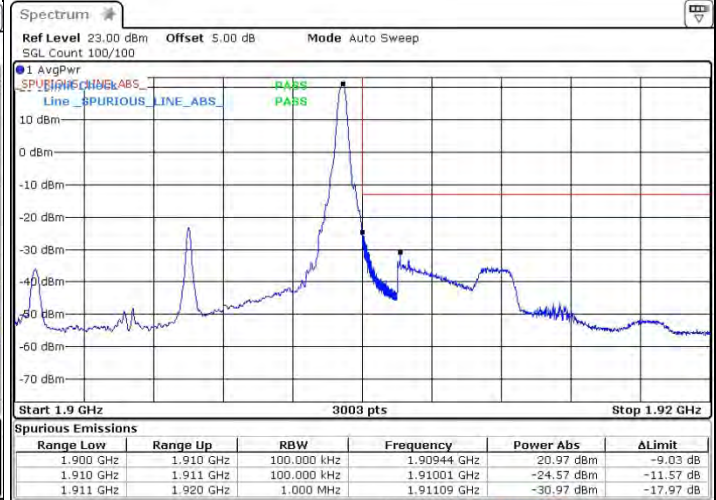


LTE Band 2 / 10MHz / QPSK

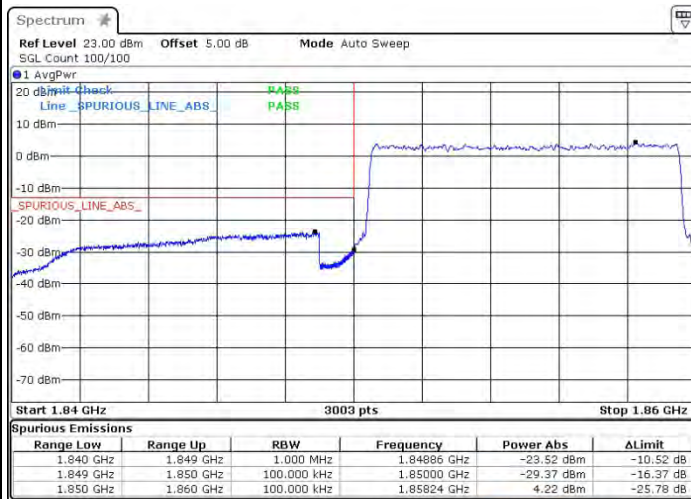
Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



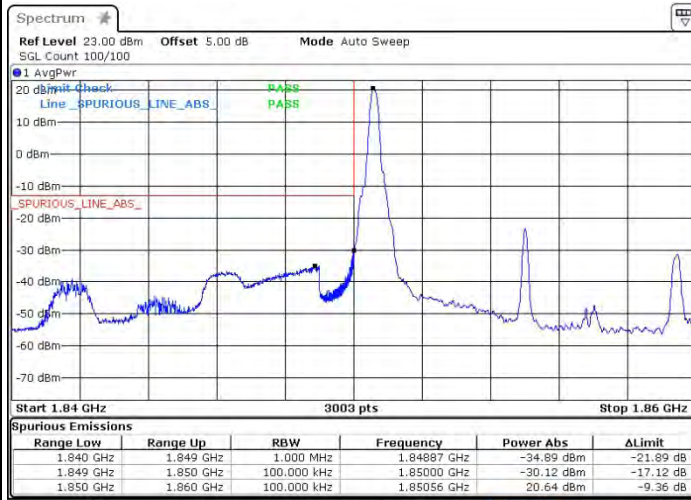
Highest Band Edge / Full RB



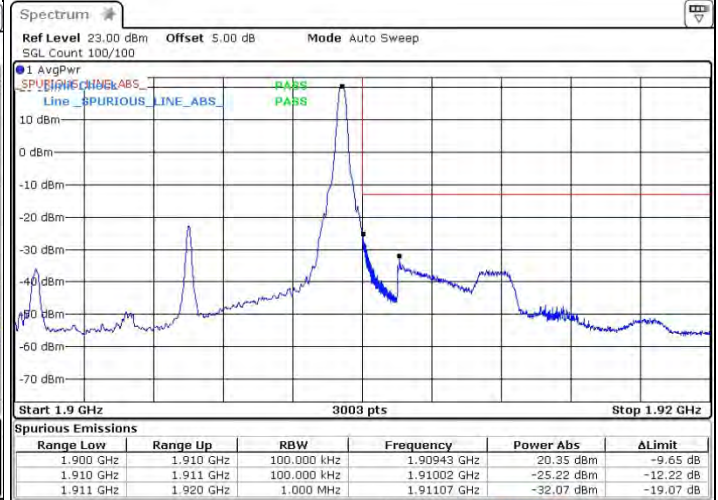


LTE Band 2 / 10MHz / 16QAM

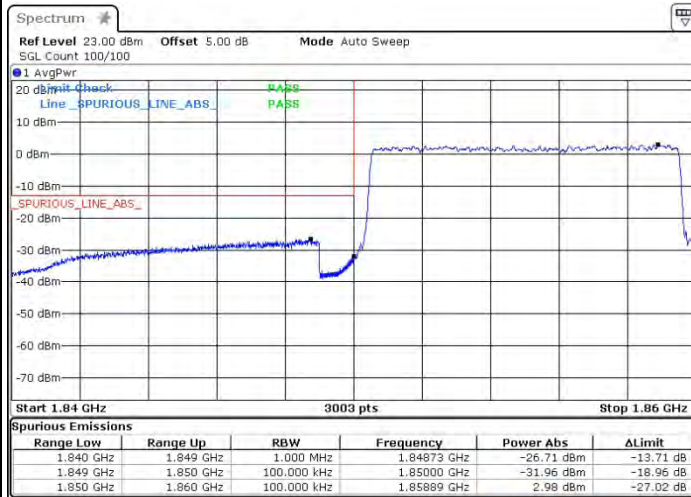
Lowest Band Edge / 1 RB



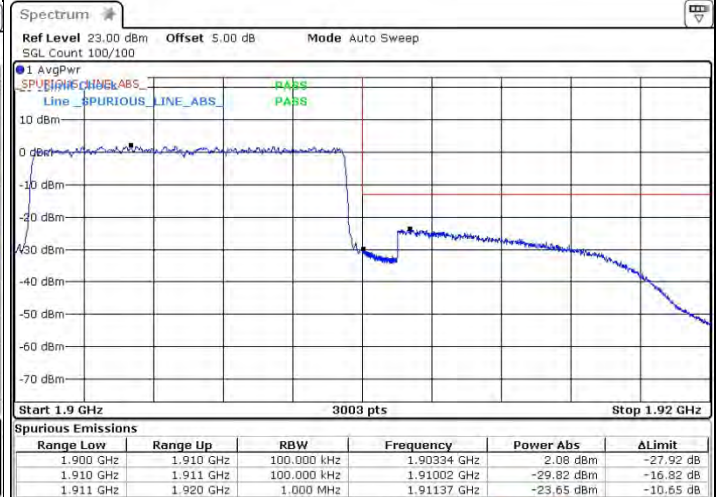
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



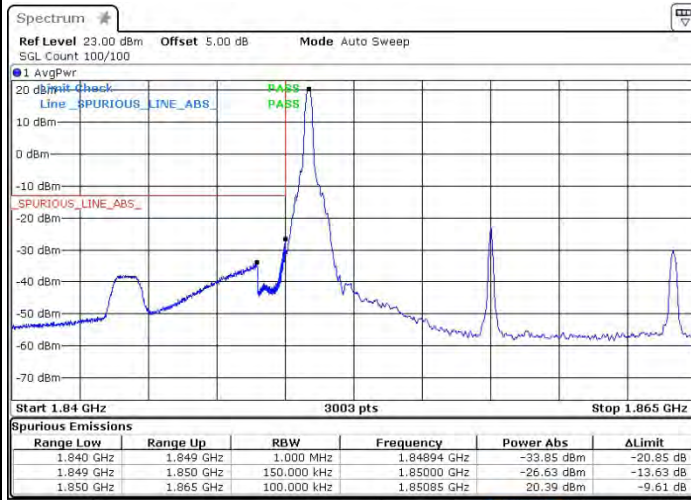
Highest Band Edge / Full RB



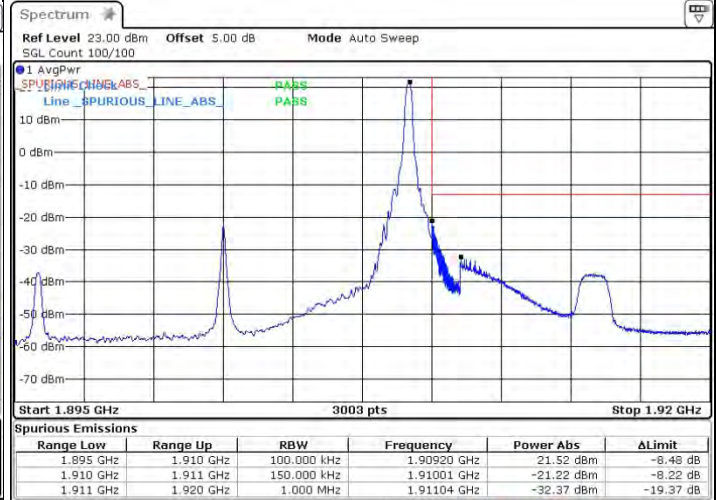


LTE Band 2 / 15MHz / QPSK

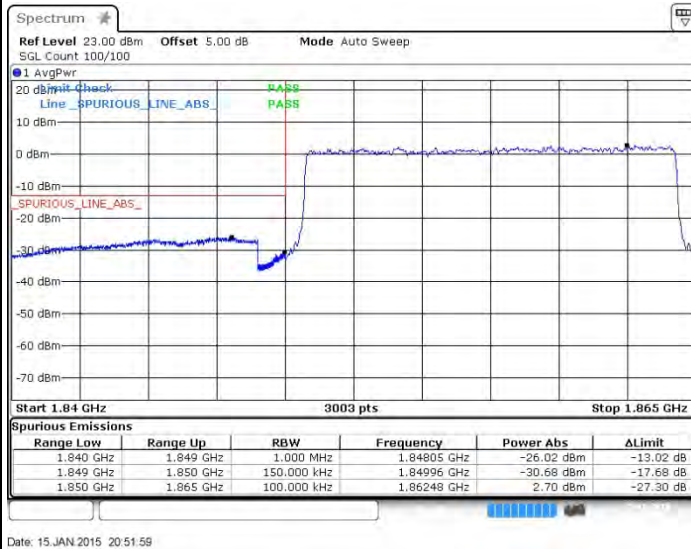
Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



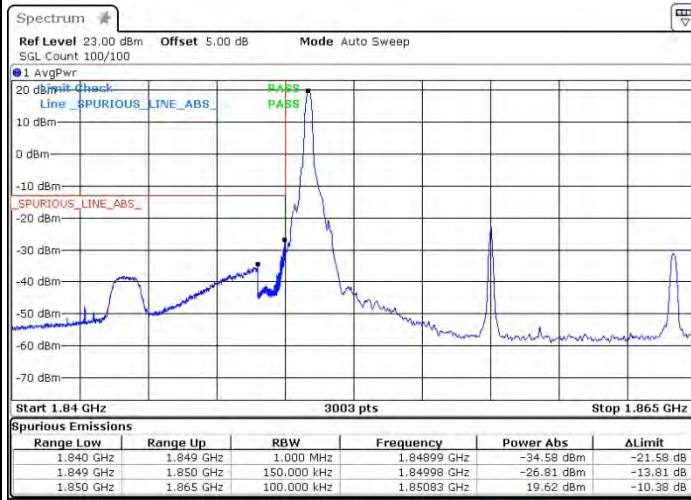
Highest Band Edge / Full RB



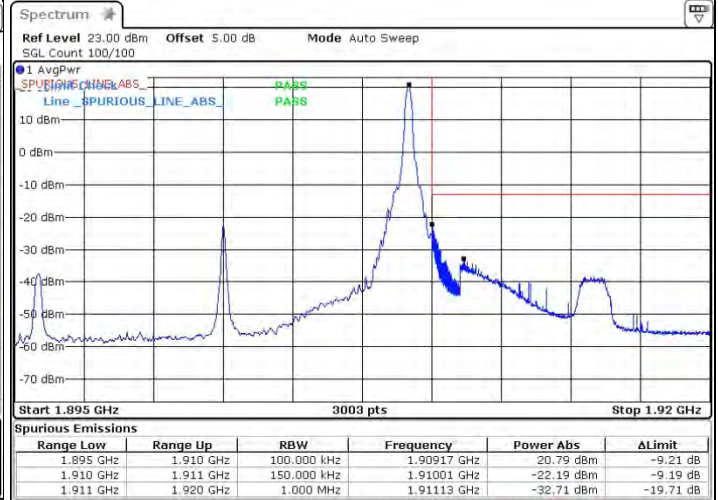


LTE Band 2 / 15MHz / 16QAM

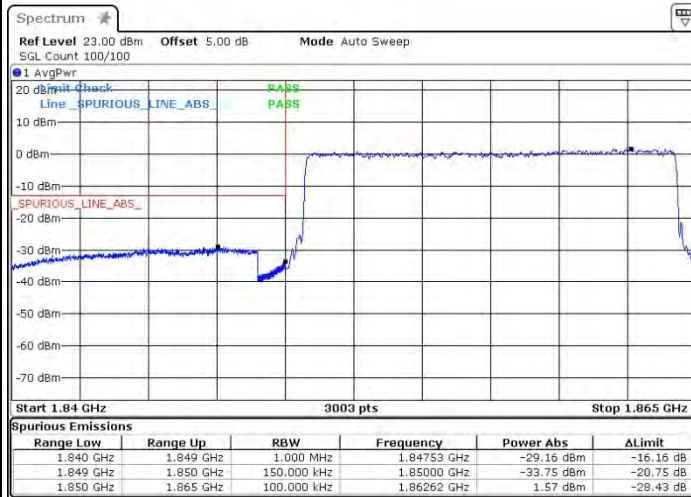
Lowest Band Edge / 1 RB



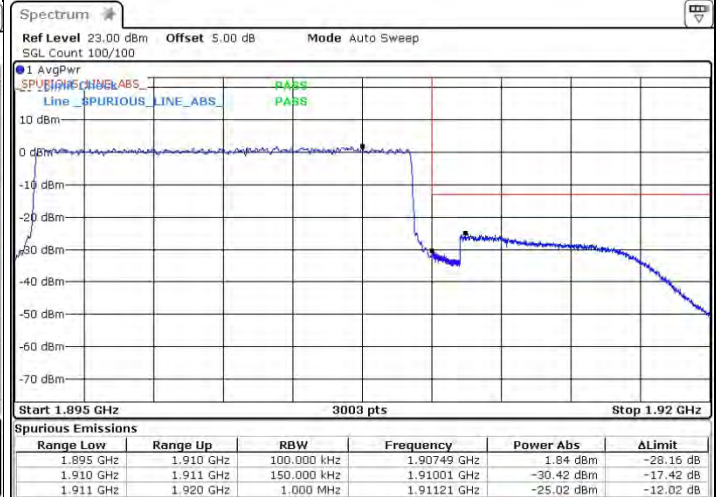
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



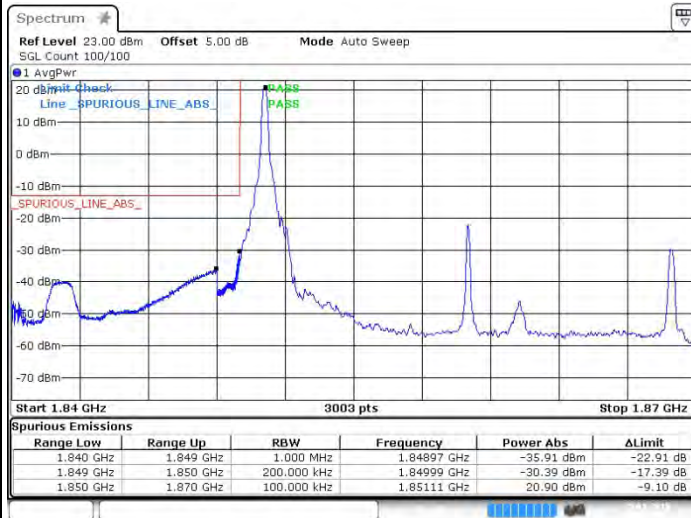
Highest Band Edge / Full RB



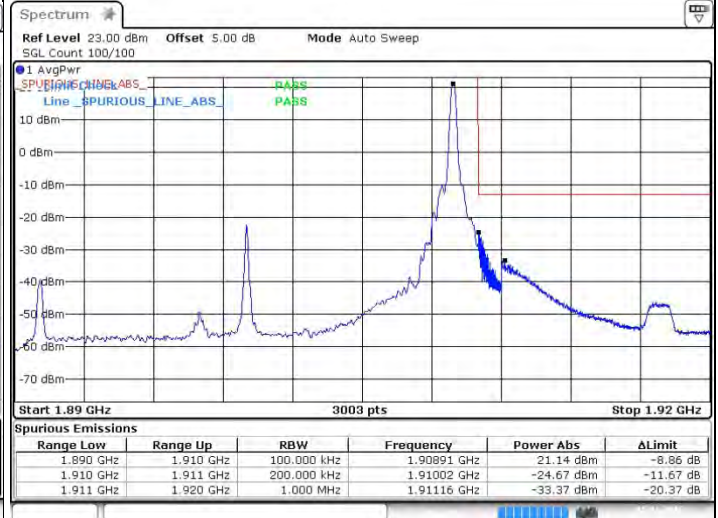


LTE Band 2 / 20MHz / QPSK

Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



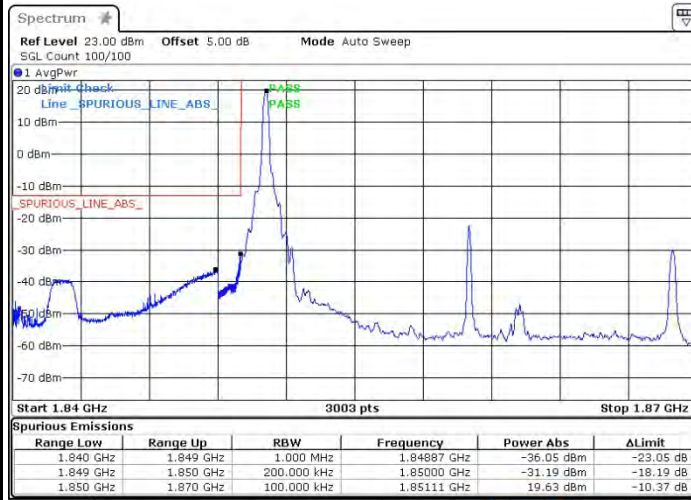
Highest Band Edge / Full RB



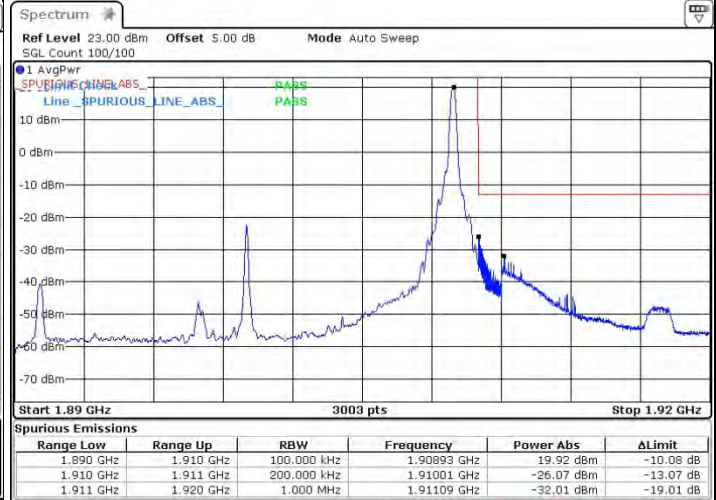


LTE Band 2 / 20MHz / 16QAM

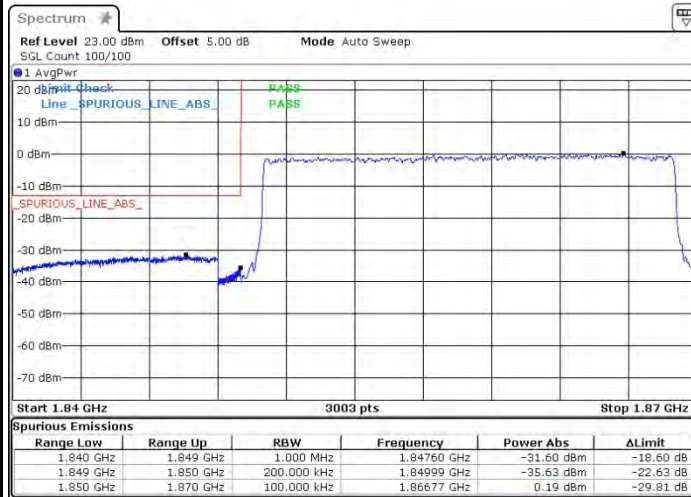
Lowest Band Edge / 1 RB



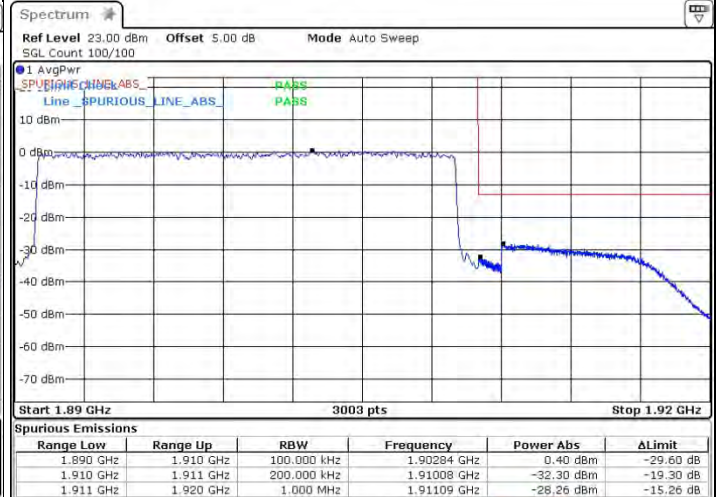
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



Highest Band Edge / Full RB

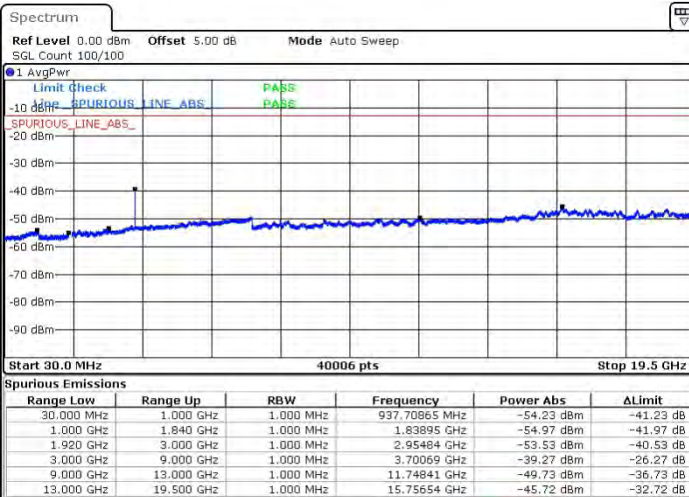




Conducted Spurious Emission

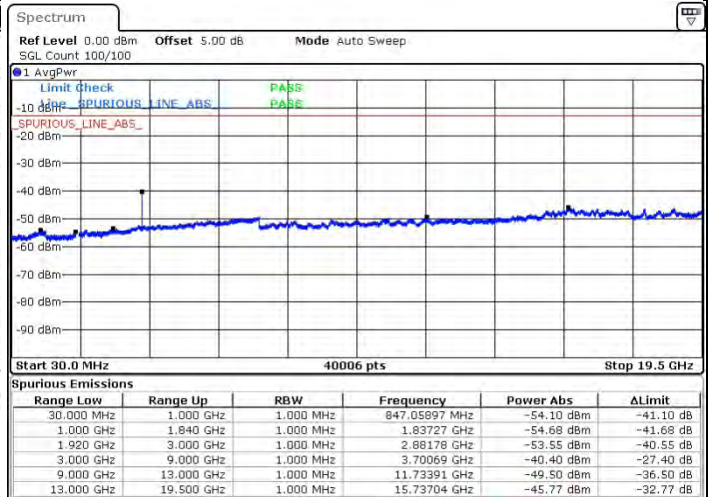
LTE Band 2 / 1.4MHz

Lowest Channel / QPSK



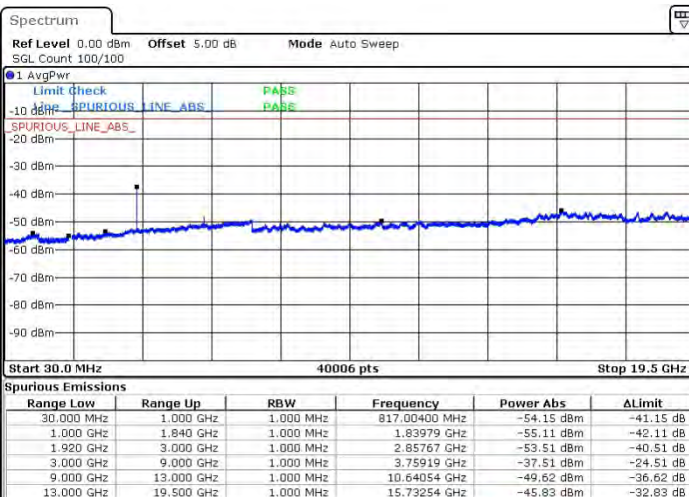
Date: 15 JAN 2015 18:57:16

Lowest Channel / 16QAM



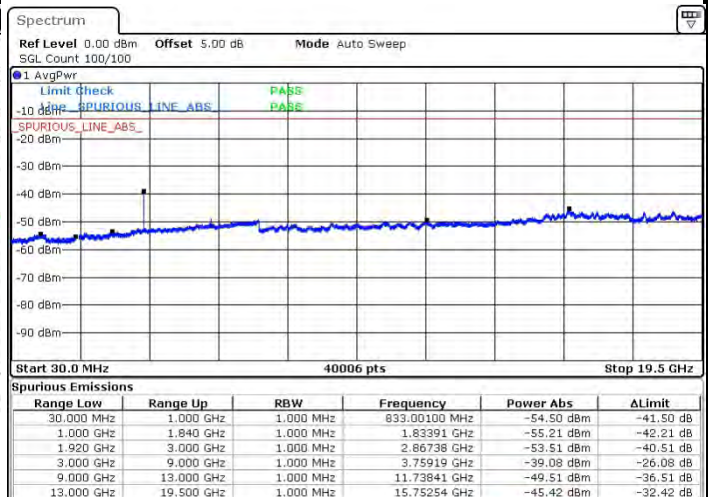
Date: 15 JAN 2015 18:58:34

Middle Channel / QPSK



Date: 15 JAN 2015 19:00:36

Middle Channel / 16QAM

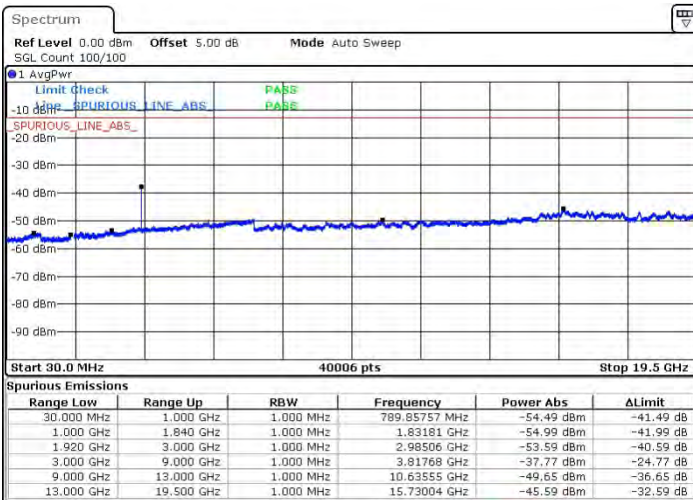


Date: 15 JAN 2015 19:01:54



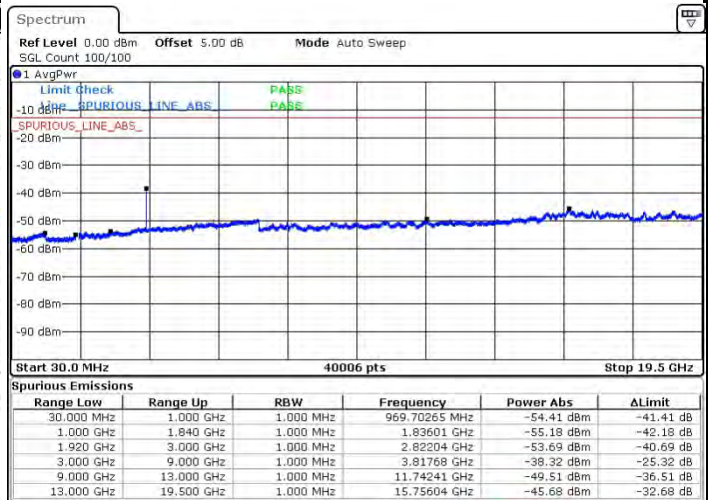
LTE Band 2 / 1.4MHz

Highest Channel / QPSK



Date: 15 JAN 2015 19:03:56

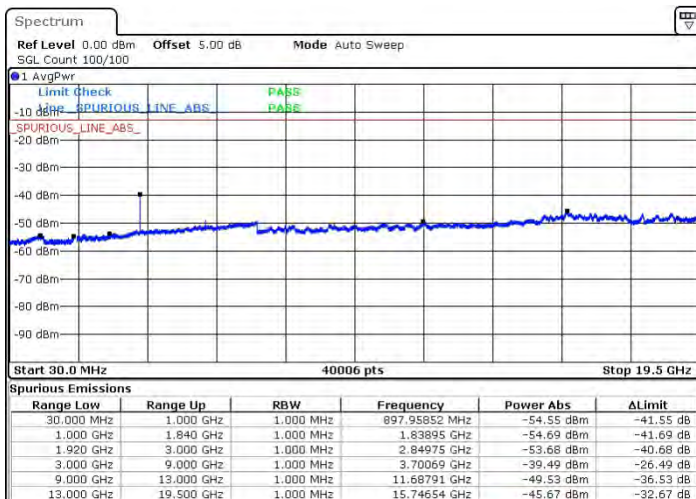
Highest Channel / 16QAM



Date: 15 JAN 2015 19:05:15

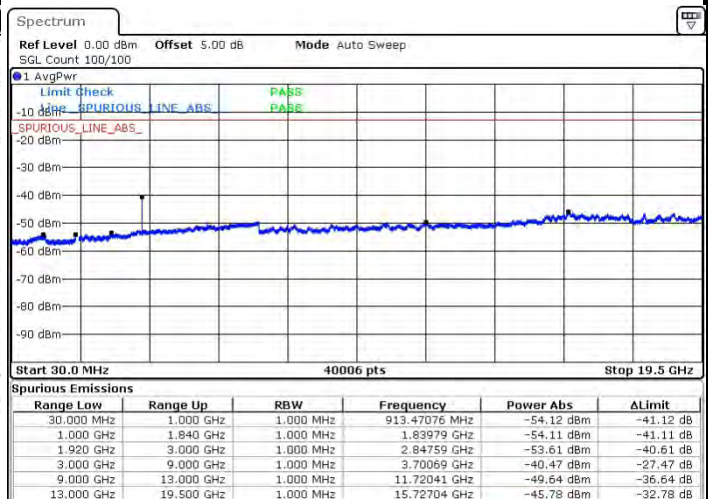
LTE Band 2 / 3MHz

Lowest Channel / QPSK



Date: 15 JAN 2015 19:07:17

Lowest Channel / 16QAM



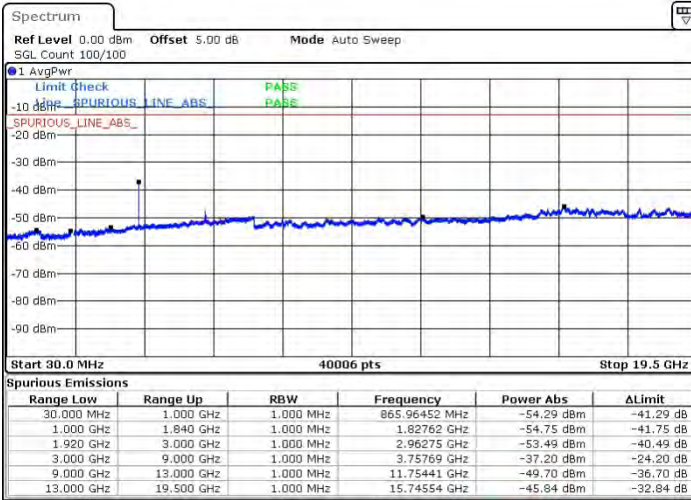
Date: 15 JAN 2015 19:08:35



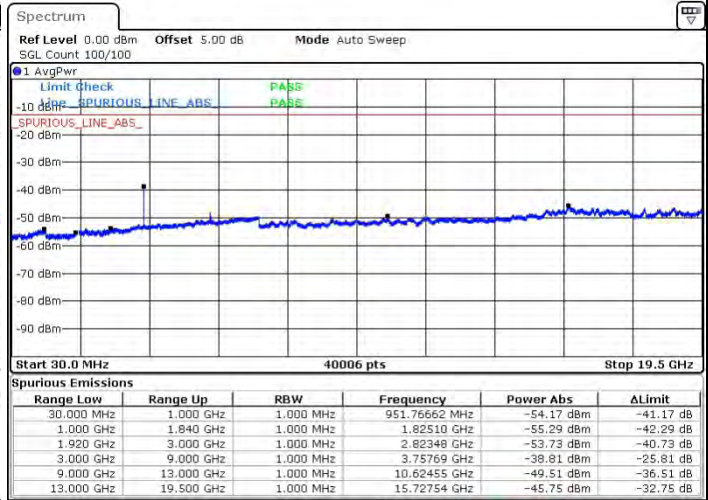
LTE Band 2 / 3MHz

Middle Channel / QPSK

Middle Channel / 16QAM



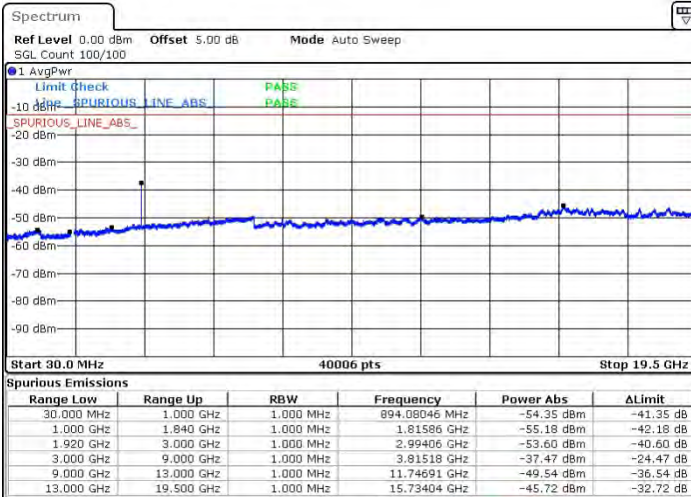
Date: 15 JAN 2015 19:10:37



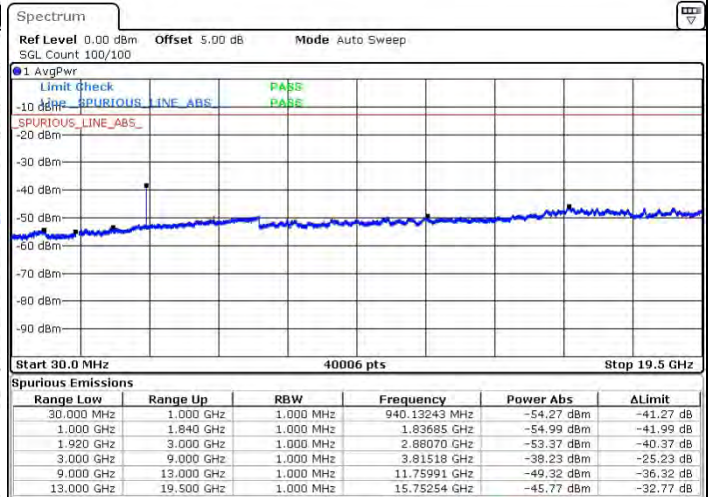
Date: 15 JAN 2015 19:11:55

Highest Channel / QPSK

Highest Channel / 16QAM



Date: 15 JAN 2015 19:13:57



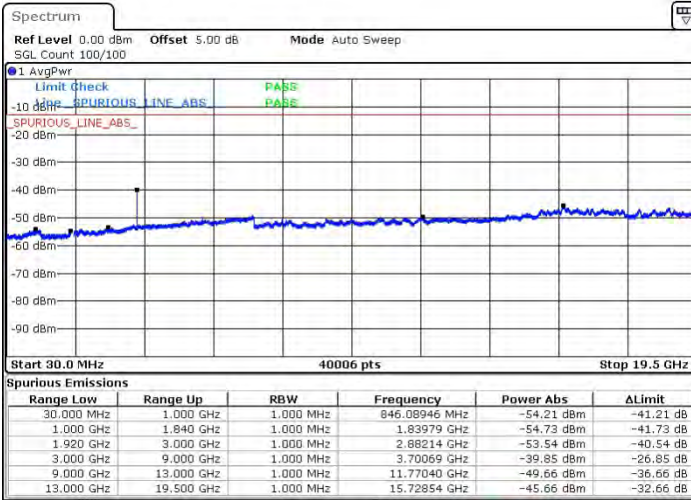
Date: 15 JAN 2015 19:15:16



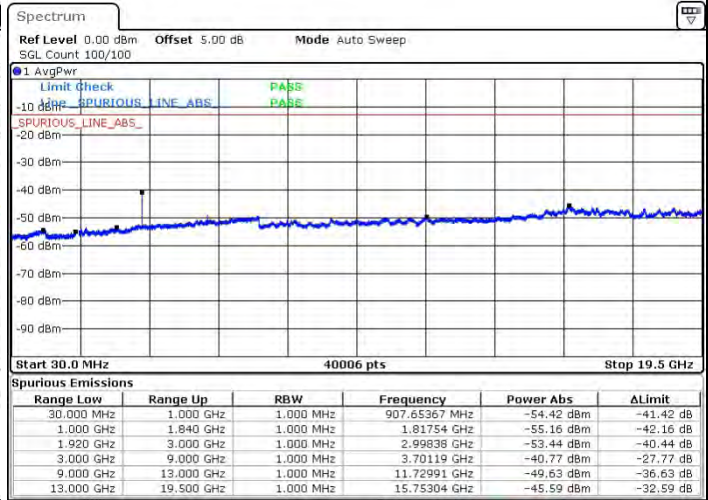
LTE Band 2 / 5MHz

Lowest Channel / QPSK

Lowest Channel / 16QAM



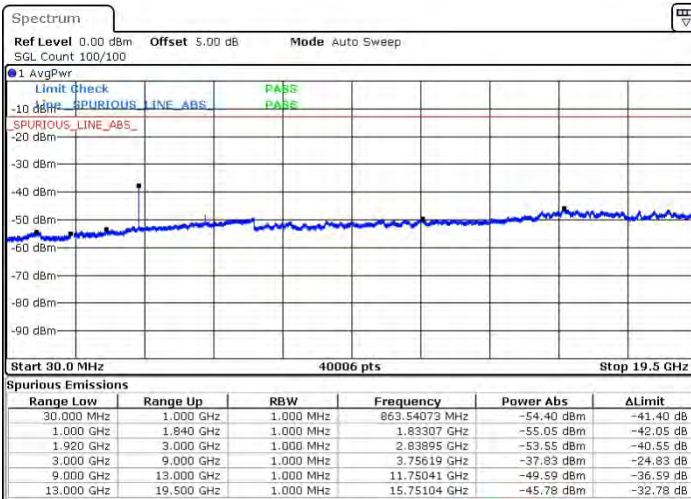
Date: 15 JAN 2015 19:17:18



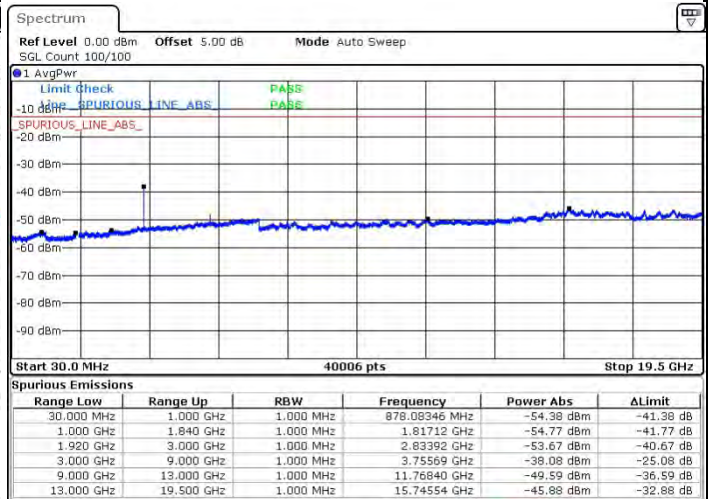
Date: 15 JAN 2015 19:18:36

Middle Channel / QPSK

Middle Channel / 16QAM



Date: 15 JAN 2015 19:20:38

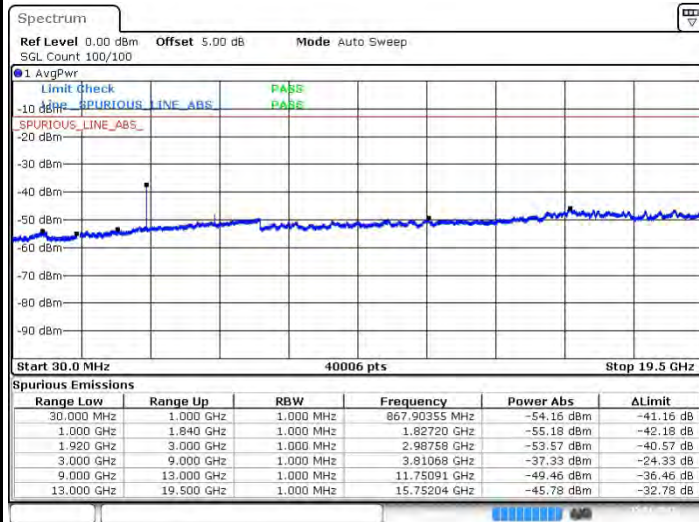


Date: 15 JAN 2015 19:21:56



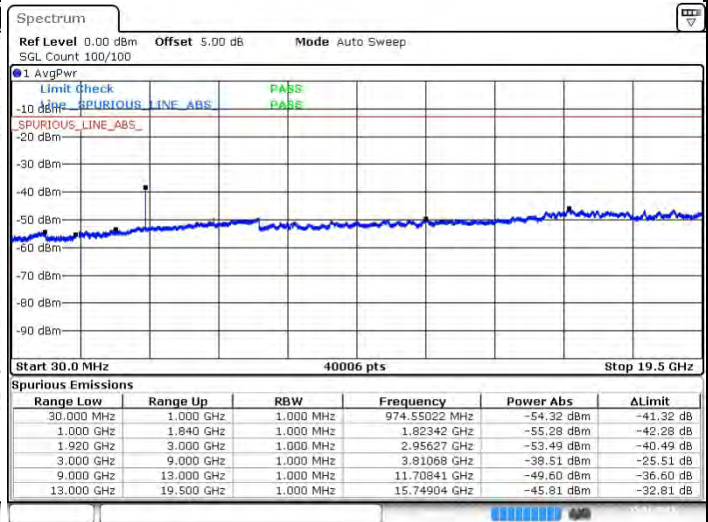
LTE Band 2 / 5MHz

Highest Channel / QPSK



Date: 15 JAN 2015 19:23:58

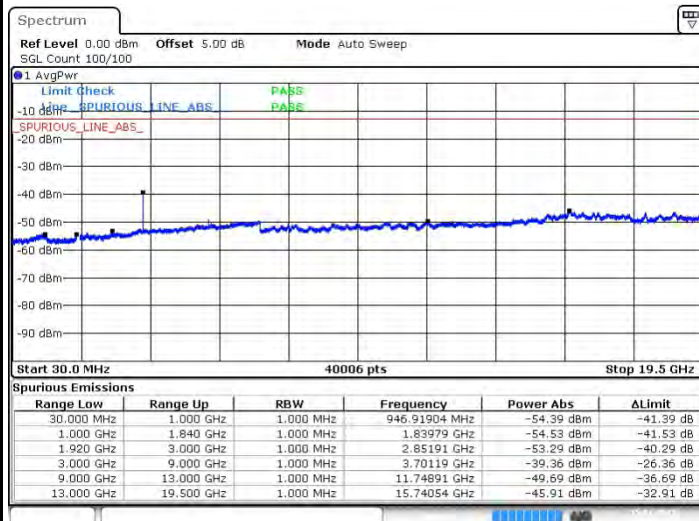
Highest Channel / 16QAM



Date: 15 JAN 2015 19:25:16

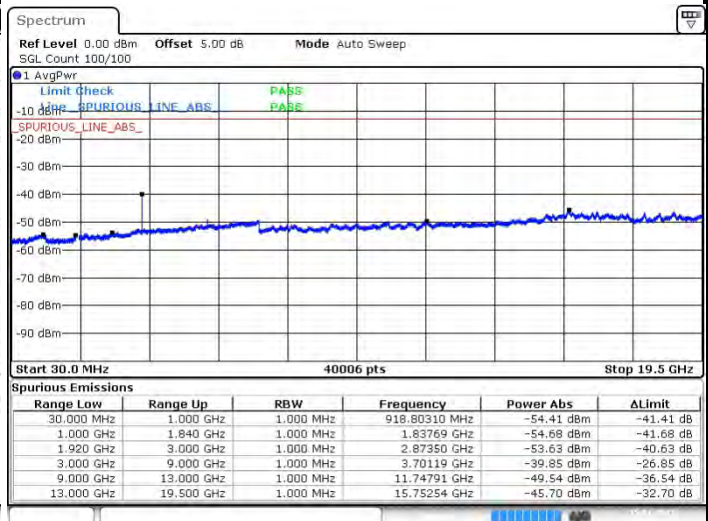
LTE Band 2 / 10MHz

Lowest Channel / QPSK



Date: 15 JAN 2015 19:27:18

Lowest Channel / 16QAM



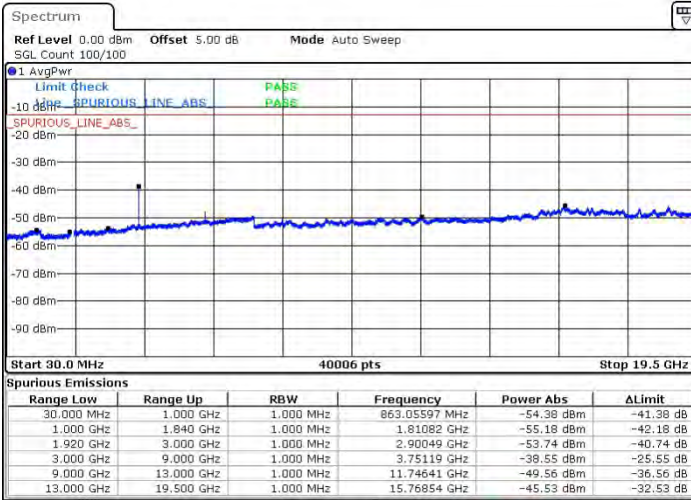
Date: 15 JAN 2015 19:28:36



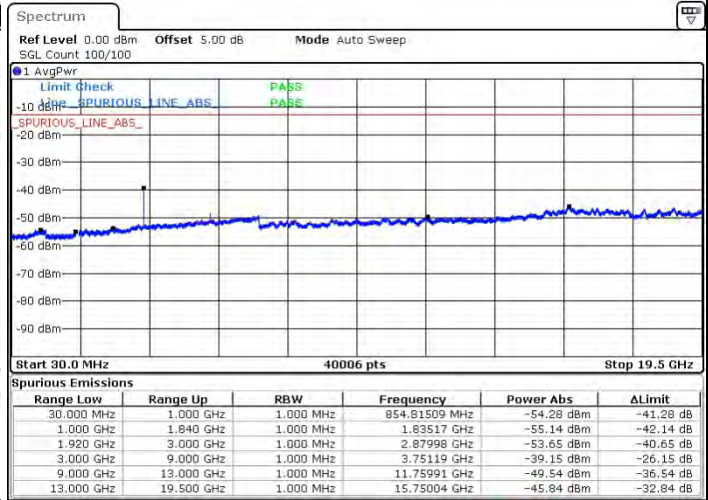
LTE Band 2 / 10MHz

Middle Channel / QPSK

Middle Channel / 16QAM



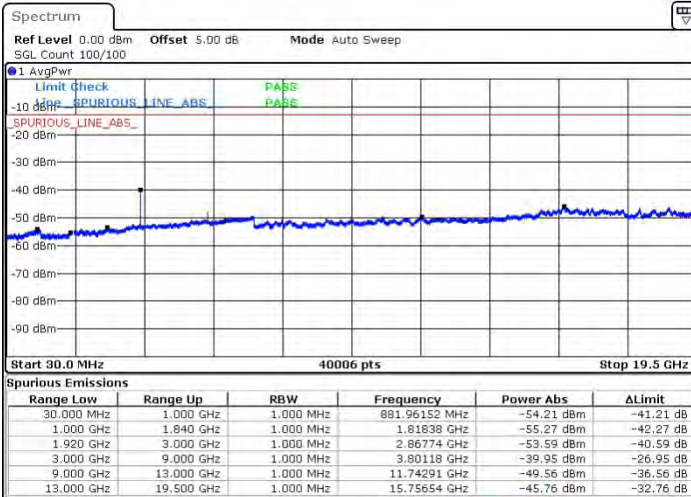
Date: 15 JAN 2015 19:30:38



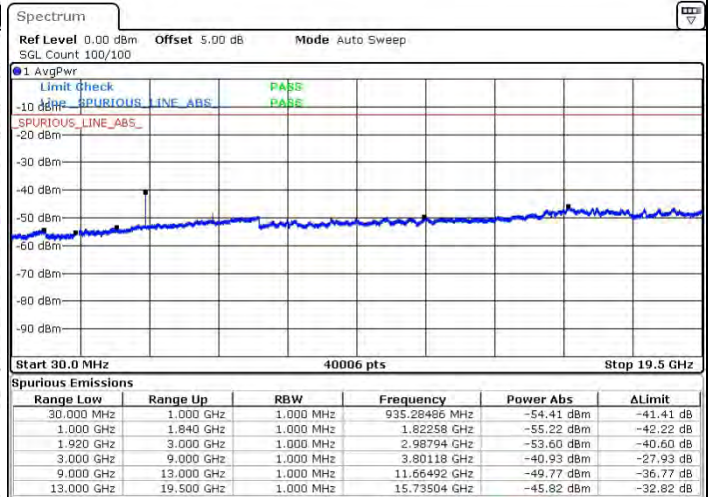
Date: 15 JAN 2015 19:31:57

Highest Channel / QPSK

Highest Channel / 16QAM



Date: 15 JAN 2015 19:33:59



Date: 15 JAN 2015 19:35:17