



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1924-6, XT1924-8
FCC ID : IHDT56XA1
STANDARD : FCC 47 CFR Part 2, 90(R)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Dec. 29, 2017 and completely tested on Feb. 05, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI/TIA-603-E and shown compliance with the applicable technical standards.

This report contains data that were produced under subcontract by Laboratory SPORTON INTERNATIONAL INC.

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.



Approved by: James Huang / Manager

Sporton International (Kunshan) Inc.

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting only	PASS	-
	§90.542 (a)(7)	Effective Radiated Power	ERP < 3Watt	PASS	-
3.5	§2.1049	Occupied Bandwidth	Reporting only	PASS	-
3.6	§2.1053 §90.543 (e)(2)(3)	Conducted Band Edge Measurement	Refer standard	PASS	-
3.7	§2.1051 §90.210(n)	Emission Mask	Mask B	PASS	-
3.8	§2.1053 §90.543 (e)(3)	Conducted Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.9	§2.1055 §90.539 (e)	Frequency Stability Temperature & Voltage	< ±1.25 ppm	PASS	-
4.4	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 21.79 dB at 1576.000 MHz



1 General Description

1.1 Applicant

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1924-6, XT1924-8
FCC ID	IHDT56XA1
Tx Frequency	LTE Band 14: 790.5 MHz ~ 795.5 MHz
Rx Frequency	LTE Band 14: 760.5 MHz ~ 765.5 MHz
Bandwidth	5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 14: 23.83dBm
Type of Modulation	QPSK / 16QAM / 64QAM
IMEI Code	Conducted: 351892090018859 Radiation: 351892090020350
HW Version	DVT 1B
SW Version	hannah-userdebug 8.0.0 OPP27.66 1466 intcfg,test-keys
EUT Stage	Identical Prototype

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

1.4 Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	Motorola (Salom)	Model Name	SPN5970A SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5 Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2	Brand Name	Motorola (Chenyang)	Model Name	SPN5993A SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5 Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
Earphone	Brand Name	Motorola (NEW Leaders)	Model Name	NLD-EM300V-01SF
	Signal Line	1.25 meter, non-shielded cable, without ferrite core		
Battery	Brand Name	Motorola (Amperex)	Model Name	HE50
	Power Rating	3.8Vdc,4850/5000mAh	Type	Li-ion
USB Cable (Black/White)	Brand Name	Motorola (SaiBao)	Model Name	SLQ-A081A
	Signal Line	1.02 meter, shielded cable, without ferrite core		



1.5 Maximum ERP Power, Frequency Tolerance, and Emission Designator

LTE Band 14		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	790.5~795.5	4M50G7D	-	0.0813	4M49W7D	-	0.0676
10	793	9M00G7D	0.0044	0.0847	9M00W7D	-	0.0649
LTE Band 14		64QAM					
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)		Maximum ERP(W)		
5	790.5~795.5	4M49W7D	-		0.0438		
10	793	9M00W7D	-		0.0463		

1.6 Testing Site

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

Test Site	Sporton International (Kunshan) Inc.	
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	Sporton Site No.	FCC Test Firm Registration No.
	TH01-KS	630927

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	03CH12-HY	

Note:

1. The test site complies with ANSI C63.4 2014 requirement.
2. Test data subcontracted: radiated spurious emissions only in section 4.4 of this report.



1.7 Applied Standards

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

- ♦ 47 CFR Part 2, Part 90(R)
- ♦ ANSI/TIA-603-E
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

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



2 Test Configuration of Equipment Under Test

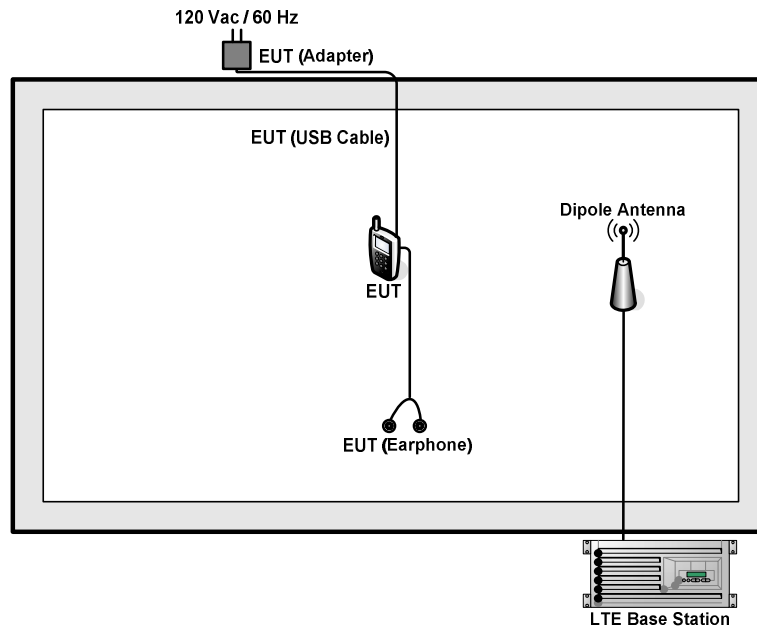
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03 with maximum output power.

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

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	14	-	-	V	-	-	-	V	V	V	V	V	V	V	V	V
	14	-	-		V	-	-	V	V	V	V	V			V	
26dB and 99% Bandwidth	14	-	-	V		-	-	V	V	V			V	V	V	V
	14	-	-		V	-	-	V	V	V			V		V	
Conducted Band Edge	14	-	-	V		-	-	V	V	V	V		V	V		V
	14	-	-		V	-	-	V	V	V	V		V		V	
Emission Mask	14	-	-	V		-	-	V	V	V	V		V	V	V	V
	14	-	-		V	-	-	V	V	V	V		V		V	
Conducted Spurious Emission	14	-	-	V		-	-	V	V	V	V			V	V	V
	14	-	-		V	-	-	V	V	V	V				V	
Frequency Stability	14	-	-		V	-	-	V					V		V	
E.R.P	14	-	-	V		-	-	V	V	V	V			V	V	V
	14	-	-		V	-	-	V	V	V	V				V	
Radiated Spurious Emission	14	-	-		V	-	-	V							V	
Note	<ol style="list-style-type: none"> The mark "v" means that this configuration is chosen for testing The mark "-" means that this bandwidth is not supported. 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



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	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m



2.4 Measurement Results Explanation Example

For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 4.4 dB.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 4.4 \text{ (dB)} \end{aligned}$$

3 Conducted Test Items

3.1 Measuring Instruments

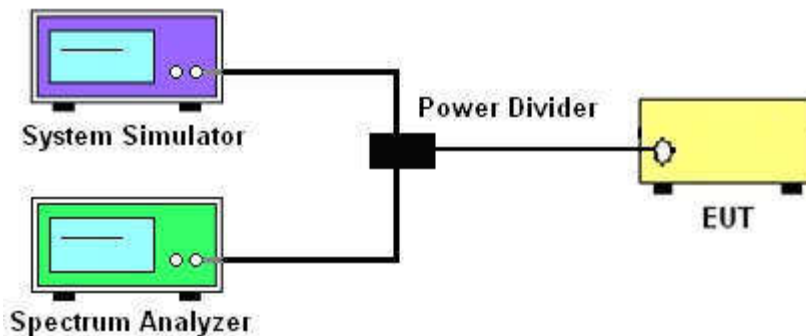
See list of measuring instruments of this test report.

3.2 Test Setup

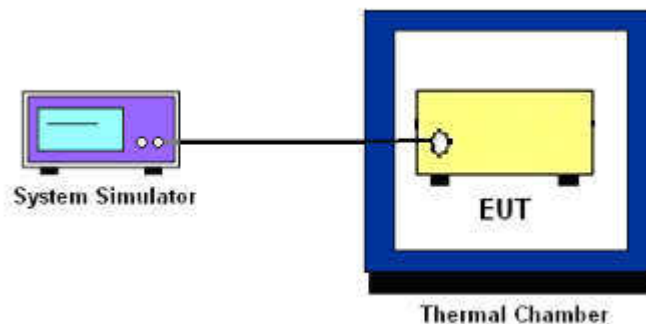
3.2.1 Conducted Output Power



3.2.2 Occupied / 26dB Bandwidth ,Band-Edge and Conducted Spurious Emission



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP

3.4.1 Description of the Conducted Output Power Measurement and ERP Measurement

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

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 14.

According to KDB 412172 D01 Power Approach,

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

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.4.2 Test Procedures

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



3.5 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 v03 Section 4.2.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.

3.6 Conducted Band Edge Measurement

3.6.1 Description of Conducted Band Edge Measurement

For operations in the 758-768 MHz and the 788-798 MHz bands

- (1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log (P)$ dB.

3.6.2 Test Procedures

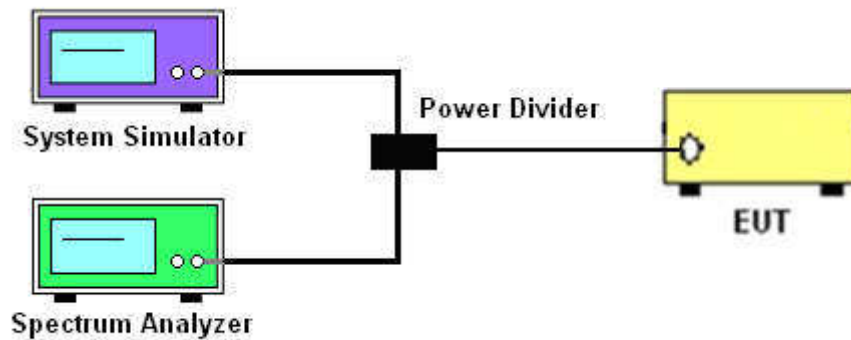
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. Set spectrum analyzer with RMS detector.
3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
4. The limit line is derived from $43 + 10 \log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10 \log(P)]$ (dB)
= $[30 + 10 \log(P)]$ (dBm) - $[43 + 10 \log(P)]$ (dB)
= -13dBm.

3.7 Emission Mask

3.7.1 Test Procedures

1. The testing follows FCC KDB 971168 v03 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The power of the modulated signal was measured on a spectrum analyzer using an RMS and 10 second sweep time in order to maximize the level.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.7.2 Test Setup



3.8 Conducted Spurious Emission Measurement

3.8.1 Description of Conducted Spurious Emission Measurement

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

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

3.8.2 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's, for under 1GHz RBW = 100kHz, VBW = 300kHz and for above 1GHz RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
= -13dBm.

3.9 Frequency Stability Measurement

3.9.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 1.25 ppm of the center frequency.

3.9.2 Test Procedures for Temperature Variation

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

3.9.3 Test Procedures for Voltage Variation

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

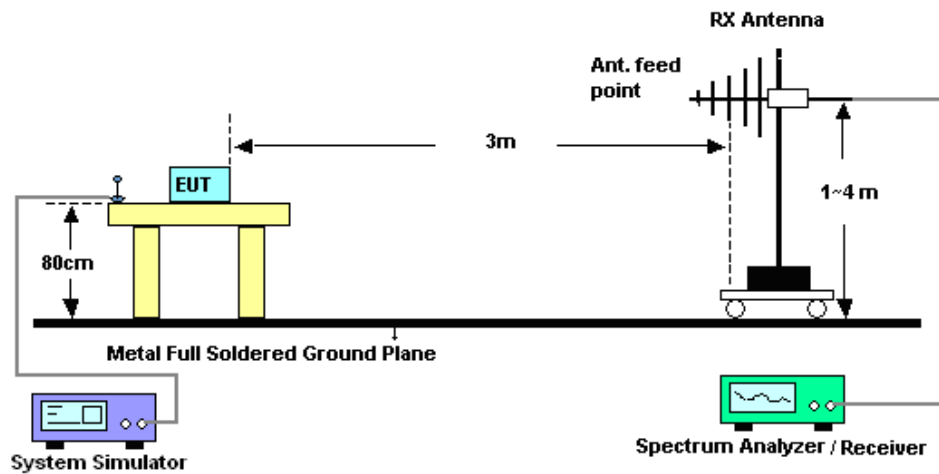
4 Radiated Test Items

4.1 Measuring Instruments

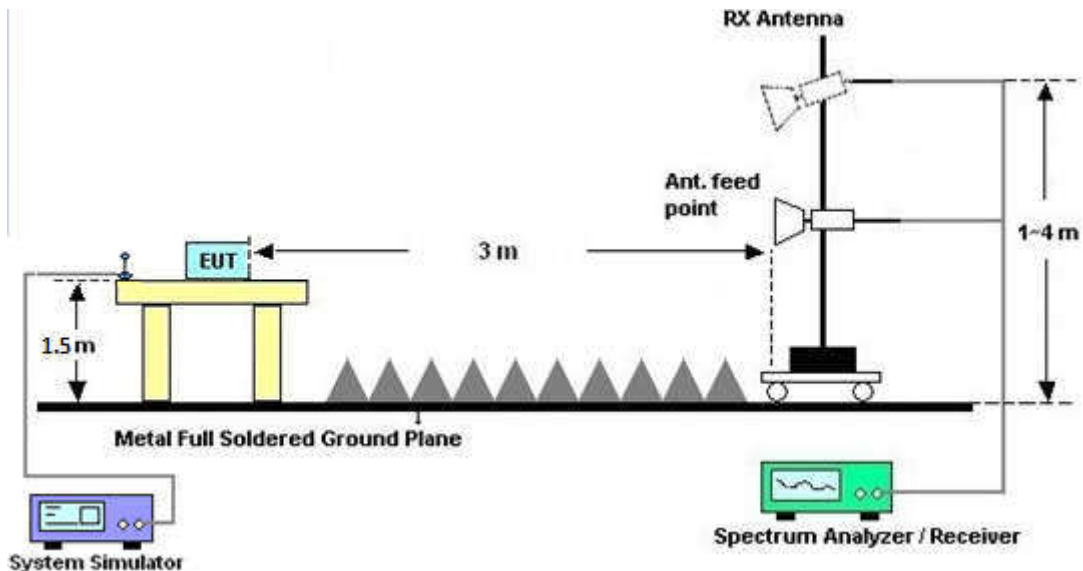
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.



4.4 Radiated Spurious Emission Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E. 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 operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics 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. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

4.4.2 Test Procedures

1. The testing follows FCC KDB 971168 v03 Section 5.8 and ANSI/TIA-603-E Section 2.2.12.
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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

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



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 08, 2017	Feb. 02, 2018	Aug. 07, 2018	Conducted (TH01-KS)
Radio communication analyzer	Anritsu	MT8820C	6201300652	2G/3G/LTE_ full band	Aug. 08, 2017	Feb. 02, 2018	Aug. 07, 2018	Conducted (TH01-KS)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VS WR : 2.5:1 max	Jul. 18, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Jul. 17, 2018	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-	35414&AT-N0602	30MHz~1GHz	Oct. 14, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Oct. 13, 2018	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 25, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Dec. 24, 2018	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1328	1GHz ~ 18GHz	Oct. 20, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Oct. 19, 2018	Radiation (03CH12-HY)
Hygrometer	TECEPEL	DTM-303B	TP140349	N/A	Oct. 12, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Oct. 11, 2018	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 23, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Mar. 22, 2018	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY53270148	1GHz~26.5GHz	Jan. 15, 2018	Jan. 22, 2018 ~ Feb. 05, 2018	Jan. 14, 2019	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jan. 22, 2018 ~ Feb. 05, 2018	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-450 0-B	N/A	1m~4m	N/A	Jan. 22, 2018 ~ Feb. 05, 2018	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jan. 22, 2018 ~ Feb. 05, 2018	N/A	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	Apr. 27, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Apr. 26, 2018	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 15, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Mar. 14, 2018	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May. 22, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	May. 21, 2018	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1212	1GHz ~ 18GHz	Mar. 17, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Mar. 16, 2018	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Jan. 22, 2018 ~ Feb. 05, 2018	Nov. 26, 2018	Radiation (03CH12-HY)

NCR: No Calibration Required



6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.4 dB
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Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.7 dB
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Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.0 dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 14 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.15	23.35	23.15
5	1	12		23.40	23.51	23.15
5	1	24		23.21	23.53	23.65
5	12	0		22.45	22.38	22.34
5	12	7		22.44	22.27	22.25
5	12	13		22.46	22.23	22.44
5	25	0		22.58	22.29	22.40
5	1	0	16-QAM	22.43	22.69	22.50
5	1	12		22.85	22.33	22.78
5	1	24		22.41	22.69	22.84
5	12	0		21.46	21.43	21.32
5	12	7		21.46	21.30	21.27
5	12	13		21.49	21.23	21.30
5	25	0		21.41	21.30	21.46
5	1	0	64QAM	20.29	20.20	20.16
5	1	12		20.57	20.52	20.71
5	1	24		20.91	20.80	20.96
5	12	0		19.79	19.86	19.86
5	12	7		19.99	19.80	19.85
5	12	13		19.83	19.86	19.93
5	25	0		20.04	19.77	19.83



LTE Band 14 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK		23.83	
10	1	25			23.35	
10	1	49			23.50	
10	25	0			22.42	
10	25	12			22.31	
10	25	25			22.77	
10	50	0			22.44	
10	1	0	16-QAM		22.31	
10	1	25			22.49	
10	1	49			22.67	
10	25	0			21.41	
10	25	12			21.37	
10	25	25			21.28	
10	50	0			21.48	
10	1	0	64QAM		20.26	
10	1	25			20.95	
10	1	49			21.21	
10	25	0			20.16	
10	25	12			19.87	
10	25	25			19.79	
10	50	0			19.97	



ERP

LTE Band 14 ($G_T - L_C = -2.4$ dBi) QPSK						
Bandwidth	5M			10M		
Channel	23305	23330	23355		23330	
	(Low)	(Mid)	(High)		(Mid)	
Frequency	790.5	793	795.5		793	
(MHz)						
Conducted Power (dBm)	23.21	23.53	23.65		23.83	
Conducted Power (Watts)	0.2094	0.2254	0.2317		0.2415	
ERP(dBm)	18.66	18.98	19.10		19.28	
ERP(Watts)	0.0735	0.0791	0.0813		0.0847	

LTE Band 14 ($G_T - L_C = -2.4$ dBi) 16QAM						
Bandwidth	5M			10M		
Channel	23305	23330	23355		23330	
	(Low)	(Mid)	(High)		(Mid)	
Frequency	790.5	793	795.5		793	
(MHz)						
Conducted Power (dBm)	22.85	22.33	22.78		22.67	
Conducted Power (Watts)	0.1928	0.1710	0.1897		0.1849	
ERP(dBm)	18.30	17.78	18.23		18.12	
ERP(Watts)	0.0676	0.0600	0.0665		0.0649	



LTE Band 14 (G _T - L _C = -2.4 dBi) 64QAM						
Bandwidth	5M			10M		
Channel	23305	23330	23355		23330	
	(Low)	(Mid)	(High)		(Mid)	
Frequency	790.5	793	795.5		793	
(MHz)						
Conducted Power (dBm)	20.91	20.8	20.96		21.21	
Conducted Power (Watts)	0.1233	0.1202	0.1247		0.1321	
ERP(dBm)	16.36	16.25	16.41		16.66	
ERP(Watts)	0.0433	0.0422	0.0438		0.0463	



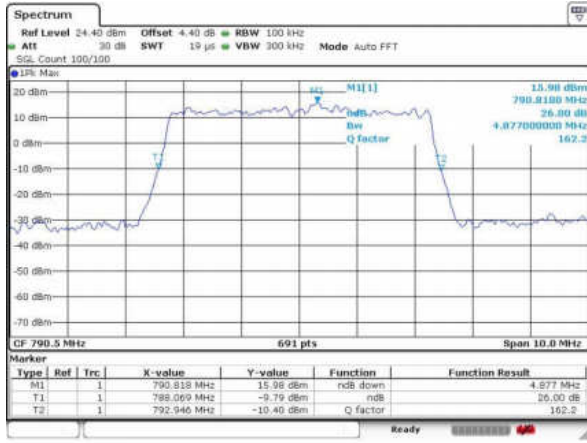
26dB Bandwidth

Mode	LTE Band 14 : 26dB BW(MHz)											
	5MHz		10MHz		5MHz	10MHz						
BW	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM						
Mod.	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM						
Lowest CH	4.877	4.978			4.964							
Middle CH	4.949	4.906	9.812	9.696	4.863	9.812						
Highest CH	4.949	4.949			4.949							



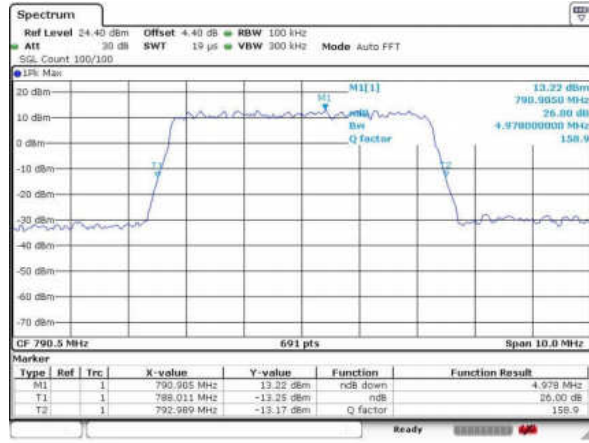
LTE Band 14

Lowest Channel / 5MHz / QPSK



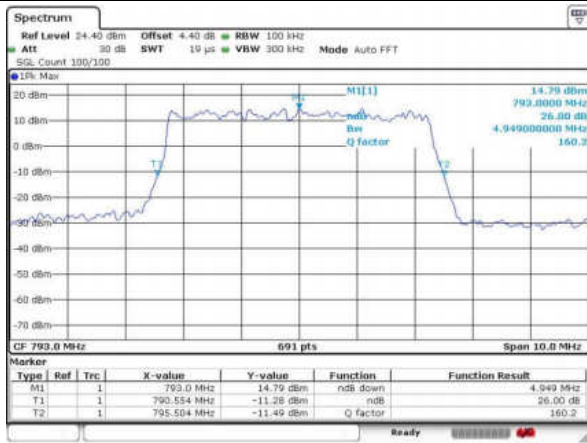
Date: 2 FEB 2018 14:44:24

Lowest Channel / 5MHz / 16QAM



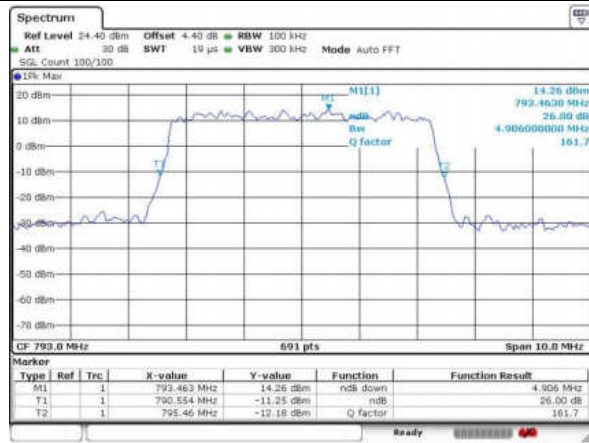
Date: 2 FEB 2018 14:45:08

Middle Channel / 5MHz / QPSK



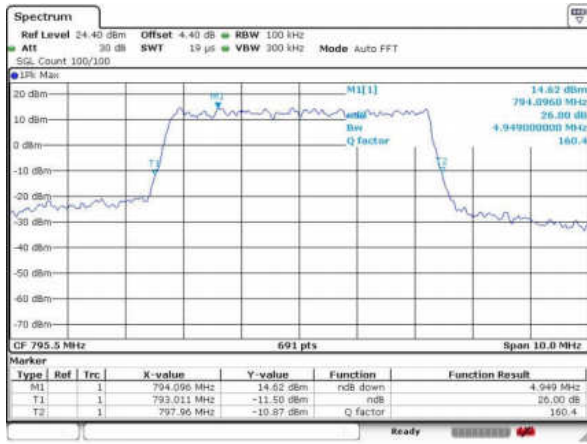
Date: 2 FEB 2018 14:46:59

Middle Channel / 5MHz / 16QAM



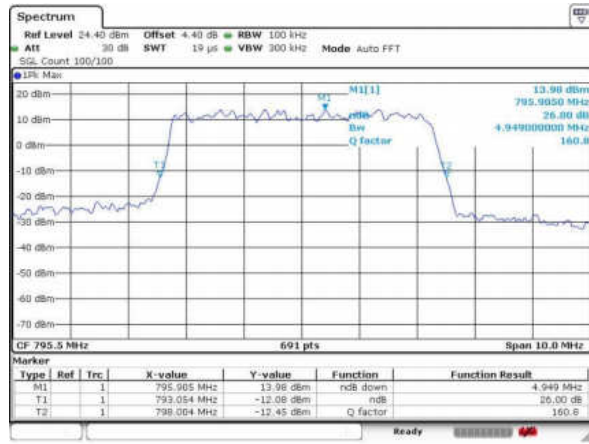
Date: 2 FEB 2018 14:46:35

Highest Channel / 5MHz / QPSK



Date: 2 FEB 2018 15:07:22

Highest Channel / 5MHz / 16QAM



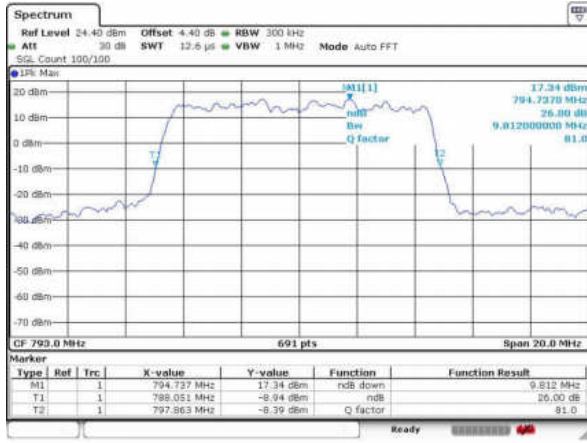
Date: 2 FEB 2018 15:07:38



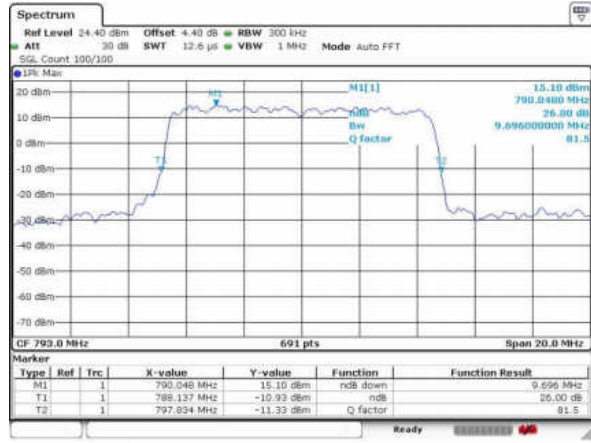
LTE Band 14

Middle Channel / 10MHz / QPSK

Middle Channel / 10MHz / 16QAM



Date: 2 FEB 2018 15:10:52

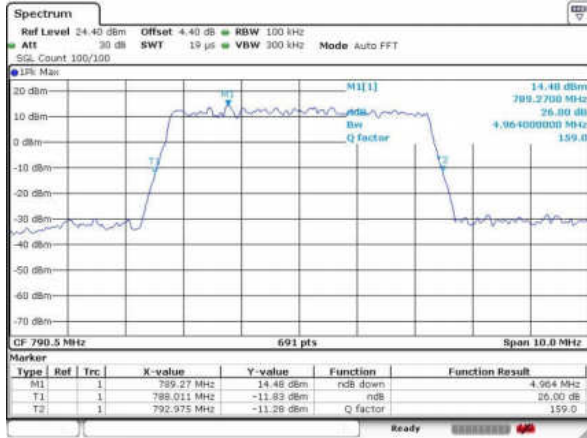


Date: 2 FEB 2018 15:10:38



LTE Band 14

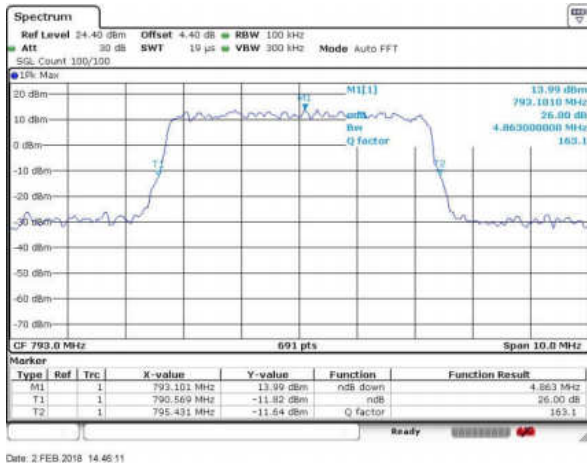
Lowest Channel / 5MHz / 64QAM



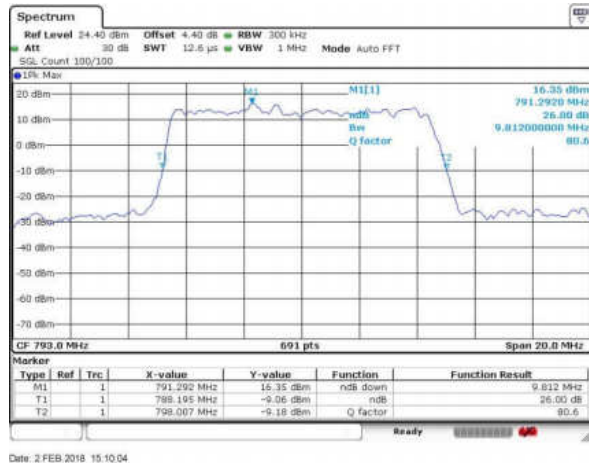
Lowest Channel / 10MHz / 64QAM



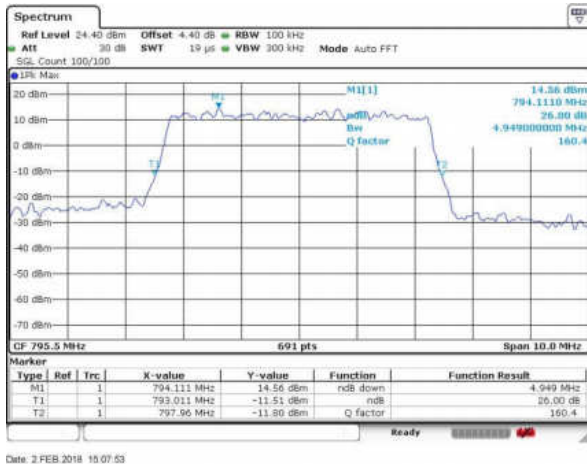
Middle Channel / 5MHz / 64QAM



Middle Channel / 10MHz / 64QAM



Highest Channel / 5MHz / 64QAM



Highest Channel / 10MHz / 64QAM





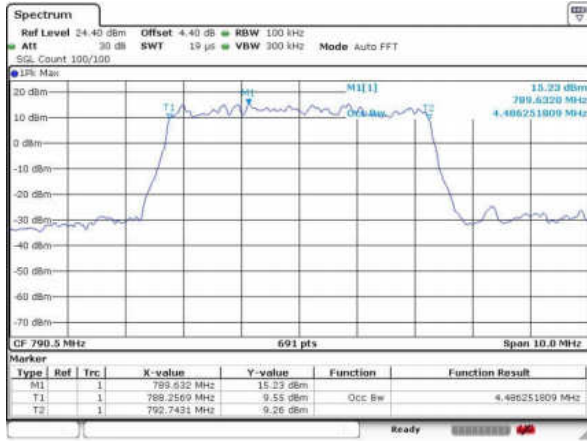
Occupied Bandwidth

Mode	LTE Band 14 : 99%OBW(MHz)										
	5MHz		10MHz		5MHz	10MHz					
BW	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM					
Mod.	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM					
Lowest CH	4.49	4.47			4.49						
Middle CH	4.5	4.49	9.00	9.00	4.47	9.00					
Highest CH	4.49	4.47			4.49						



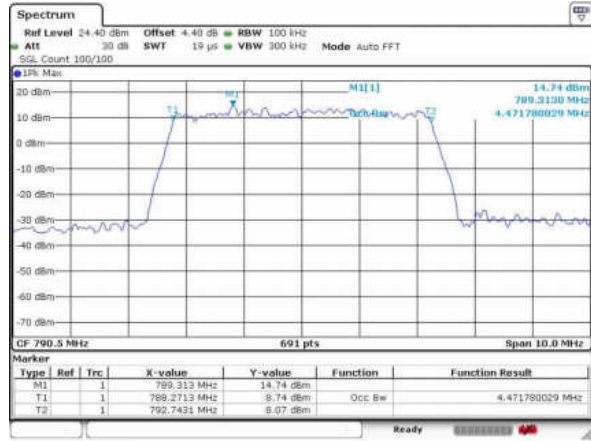
LTE Band 14

Lowest Channel / 5MHz / QPSK



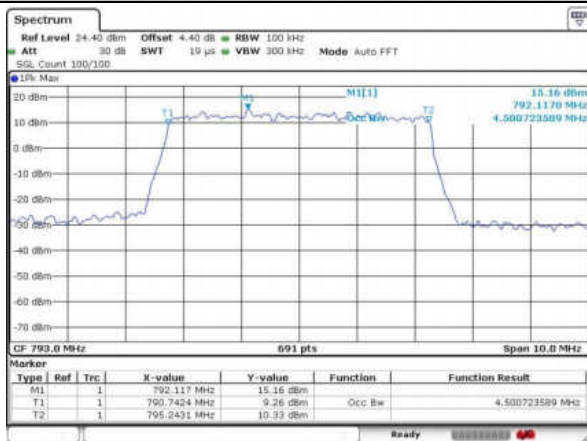
Date: 2 FEB 2018 15:16:07

Lowest Channel / 5MHz / 16QAM



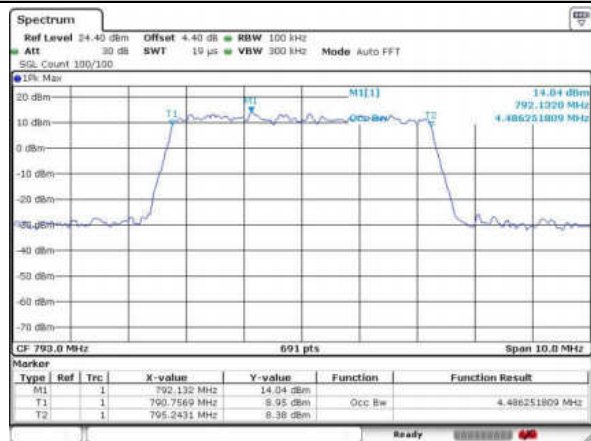
Date: 2 FEB 2018 15:16:27

Middle Channel / 5MHz / QPSK



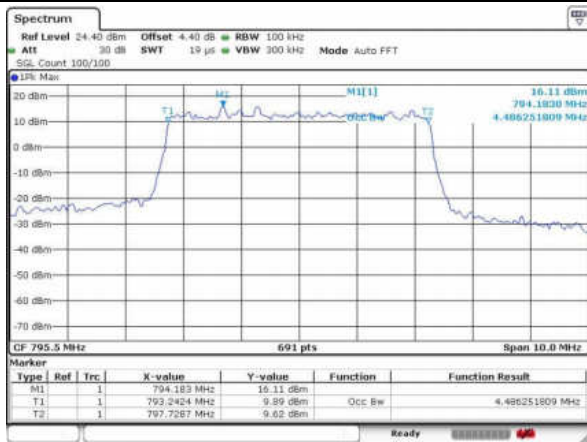
Date: 2 FEB 2018 15:15:38

Middle Channel / 5MHz / 16QAM



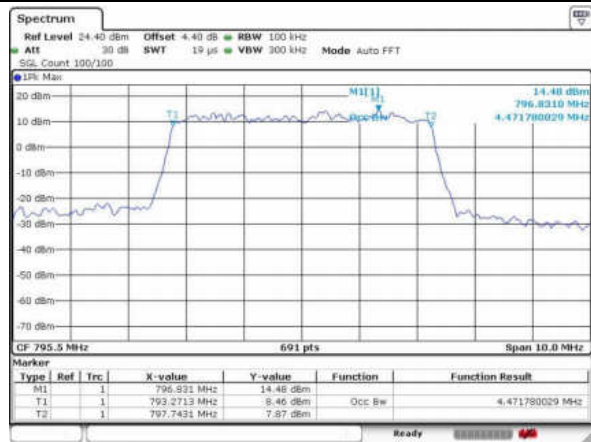
Date: 2 FEB 2018 15:15:24

Highest Channel / 5MHz / QPSK



Date: 2 FEB 2018 15:17:35

Highest Channel / 5MHz / 16QAM



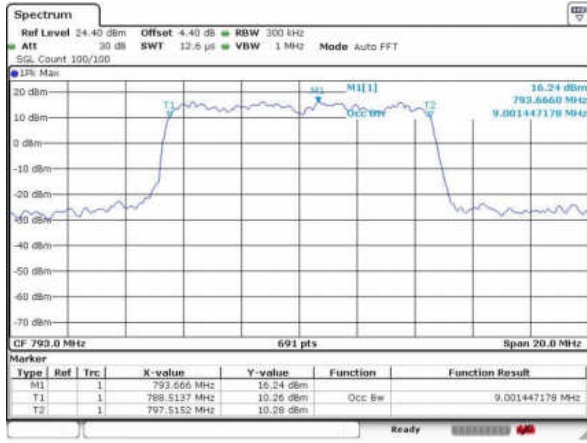
Date: 2 FEB 2018 15:17:21



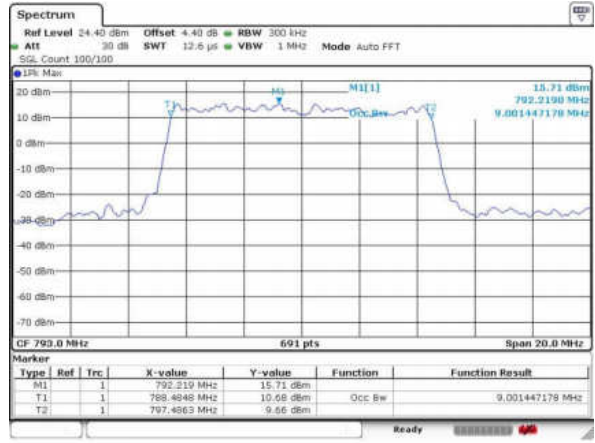
LTE Band 14

Middle Channel / 10MHz / QPSK

Middle Channel / 10MHz / 16QAM



Date: 2 FEB 2018 15:13:31

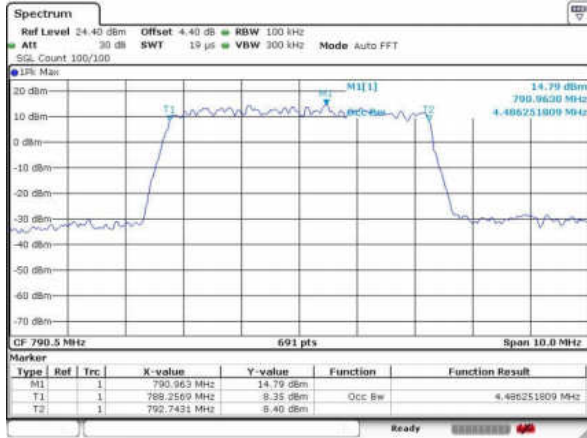


Date: 2 FEB 2018 15:14:04



LTE Band 14

Lowest Channel / 5MHz / 64QAM



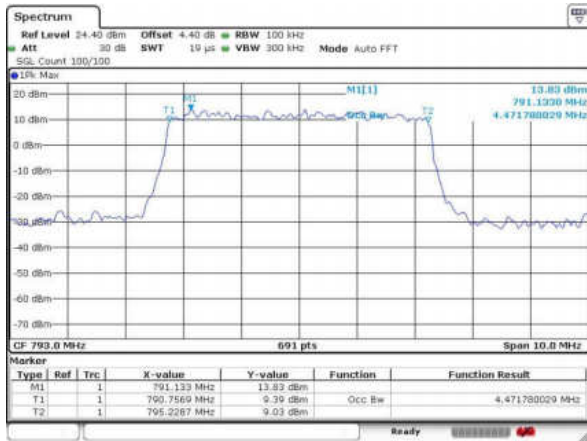
Date: 2 FEB 2018 15:16:38

Lowest Channel / 10MHz / 64QAM



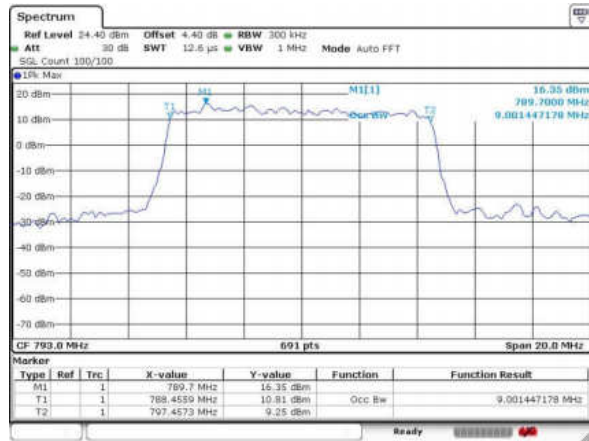
Date: 2 FEB 2018 15:14:16

Middle Channel / 5MHz / 64QAM



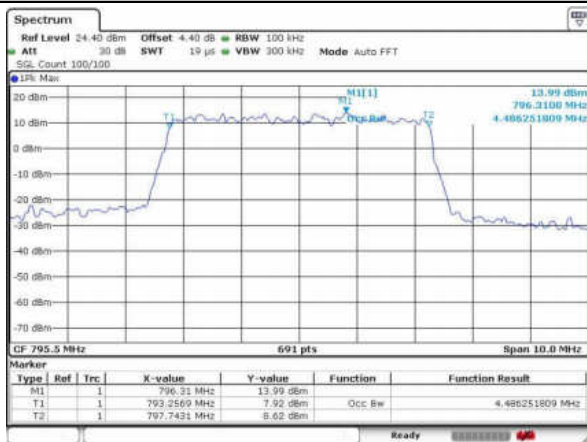
Date: 2 FEB 2018 15:15:01

Middle Channel / 10MHz / 64QAM



Date: 2 FEB 2018 15:14:16

Highest Channel / 5MHz / 64QAM



Date: 2 FEB 2018 15:17:05

Highest Channel / 10MHz / 64QAM





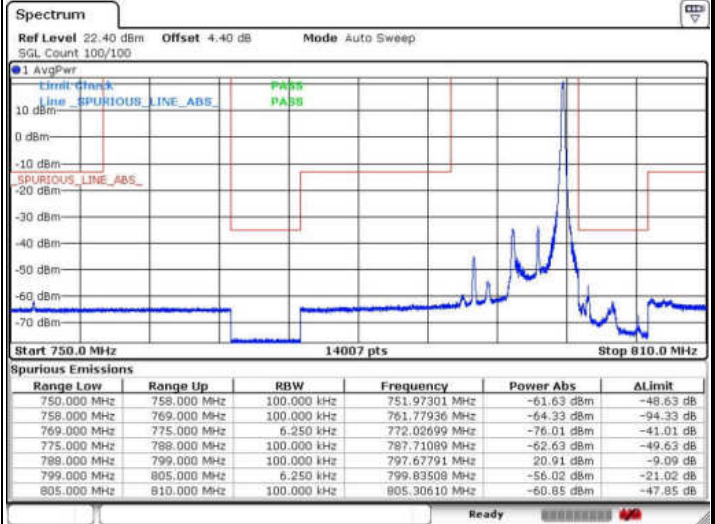
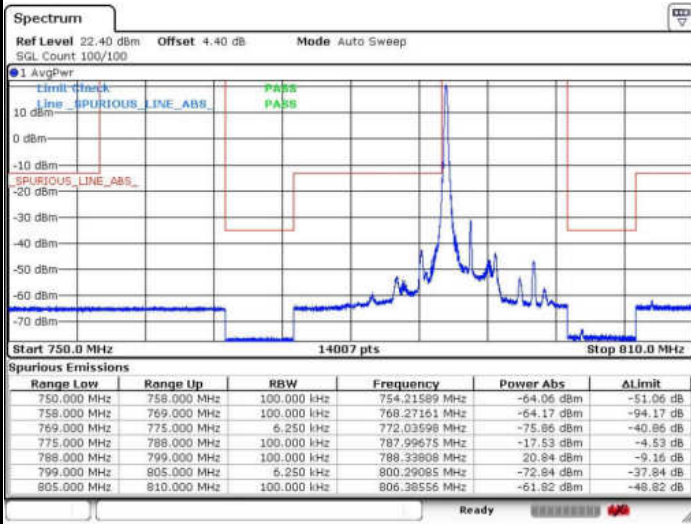
Conducted Band Edge



LTE Band 14 / 5MHz / QPSK

Lowest Band Edge / 1 RB

Highest Band Edge / 1 RB

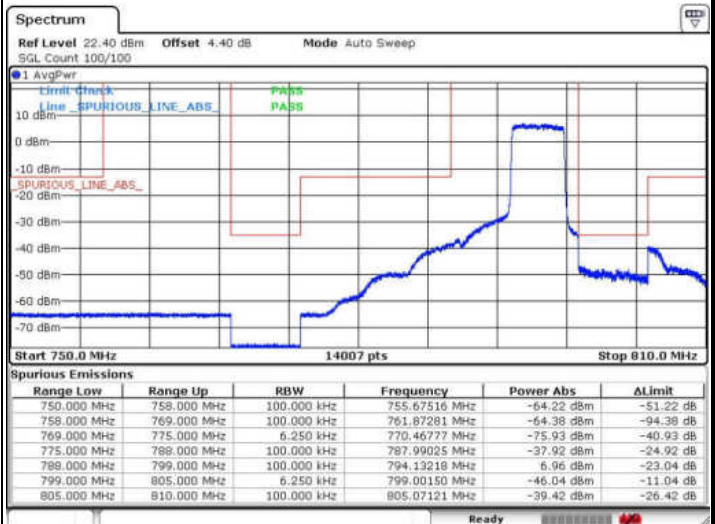
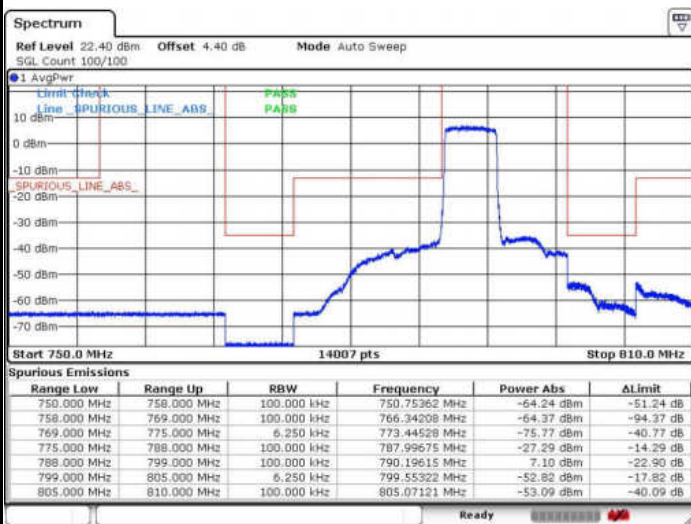


Date: 2 FEB 2018 15:50:37

Date: 2 FEB 2018 15:43:50

Lowest Band Edge / Full RB

Highest Band Edge / Full RB



Date: 2 FEB 2018 15:53:40

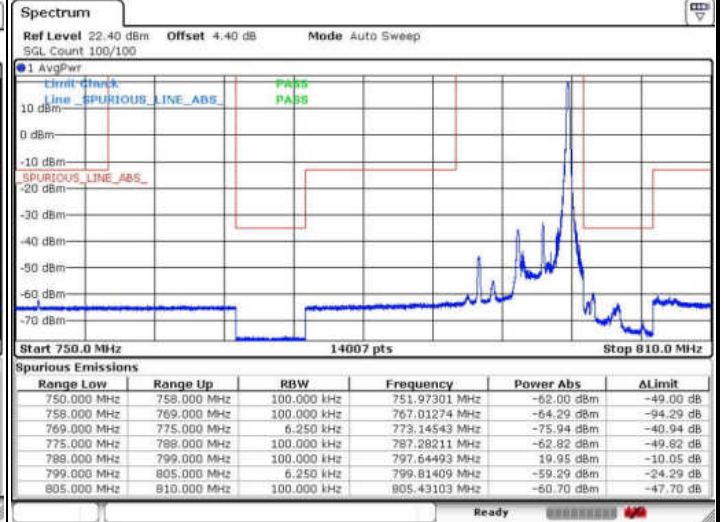
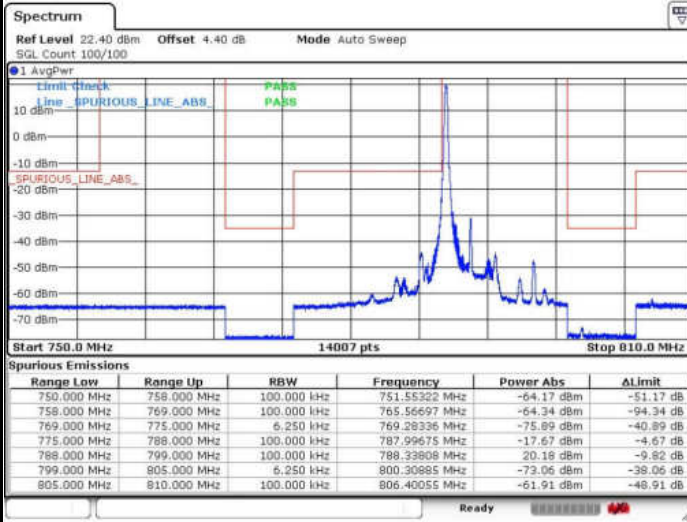
Date: 2 FEB 2018 15:48:49



LTE Band 14 / 5MHz / 16QAM

Lowest Band Edge / 1 RB

Highest Band Edge / 1 RB

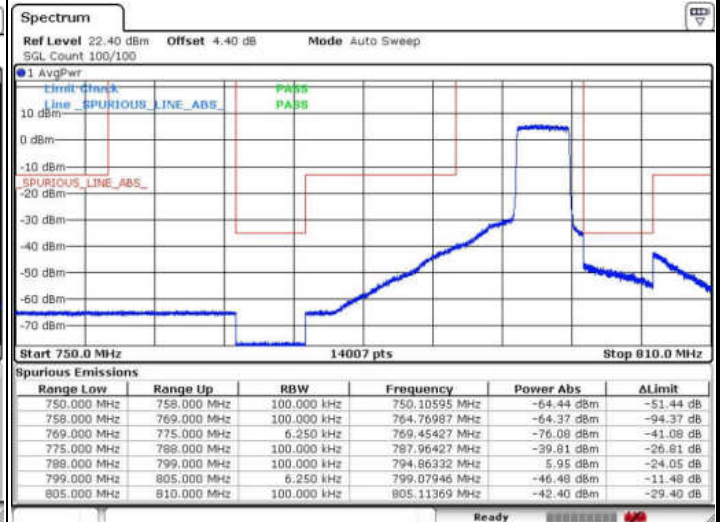
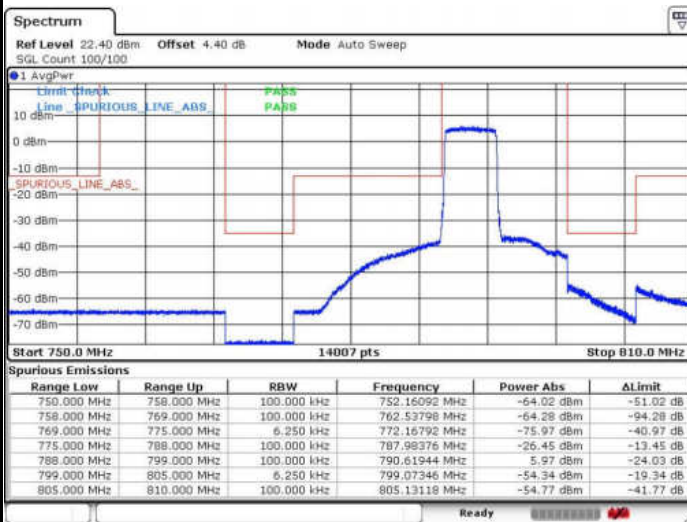


Date: 2 FEB 2018 15:51:21

Date: 2 FEB 2018 15:44:58

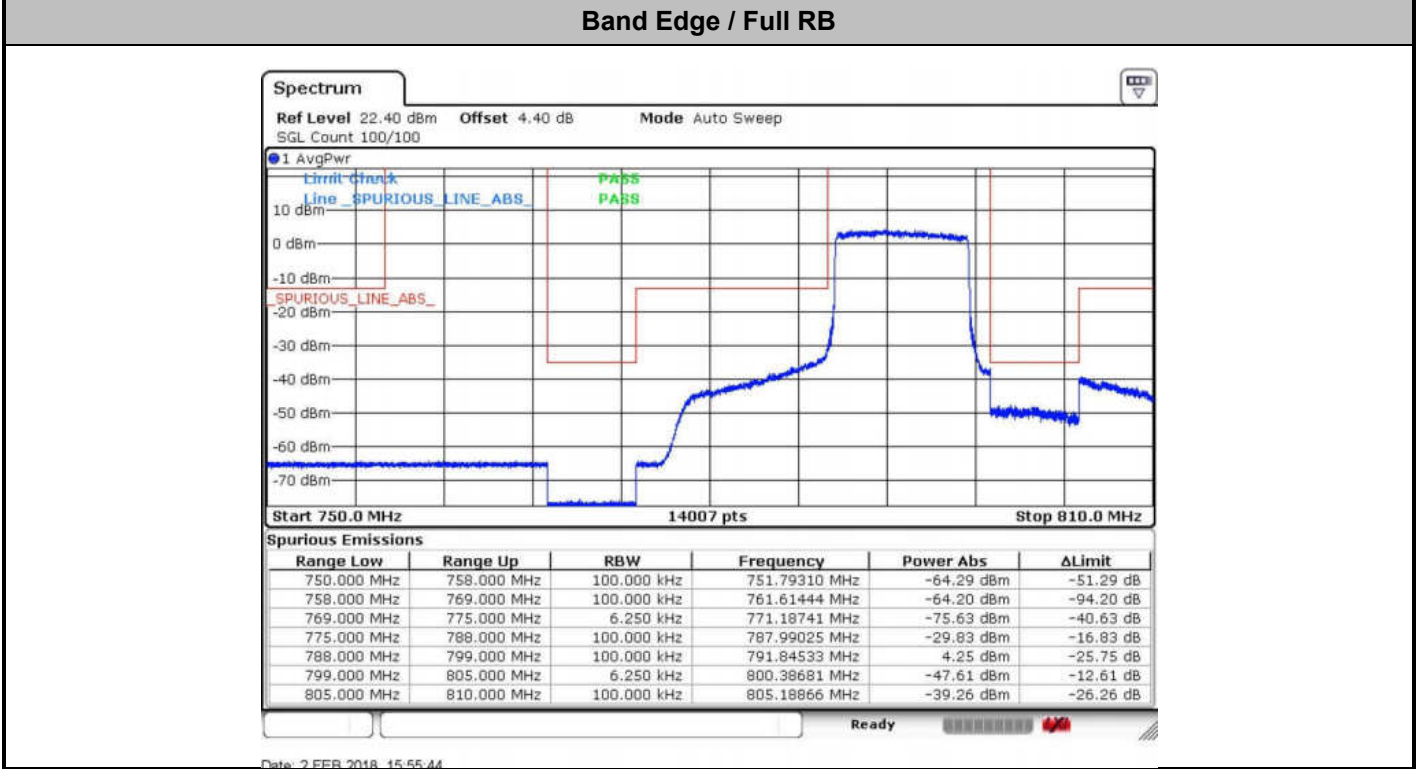
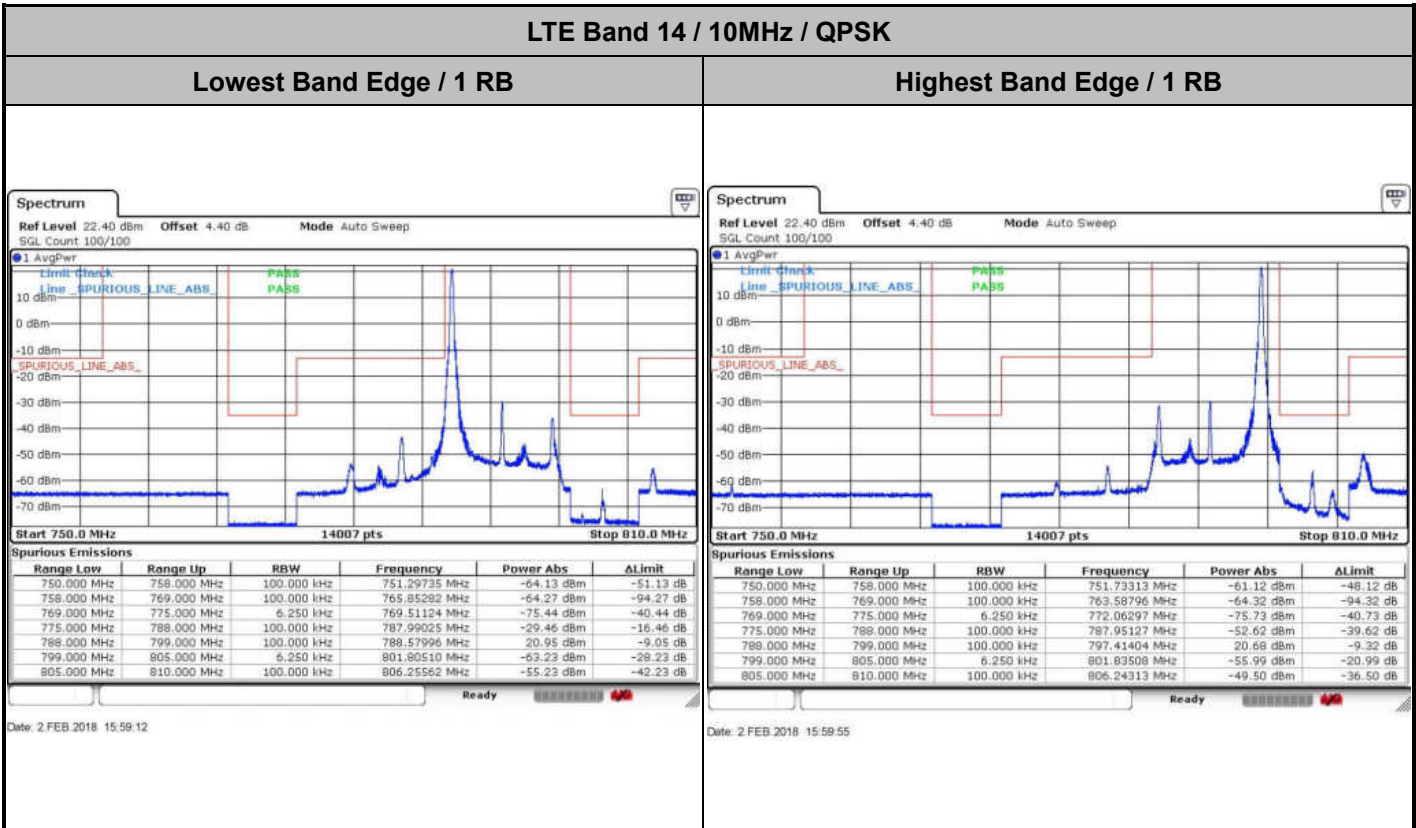
Lowest Band Edge / Full RB

Highest Band Edge / Full RB



Date: 2 FEB 2018 15:53:07

Date: 2 FEB 2018 15:48:13

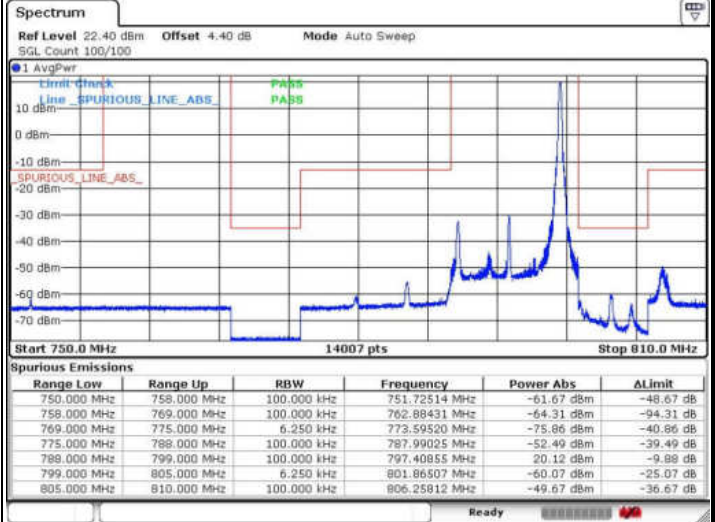
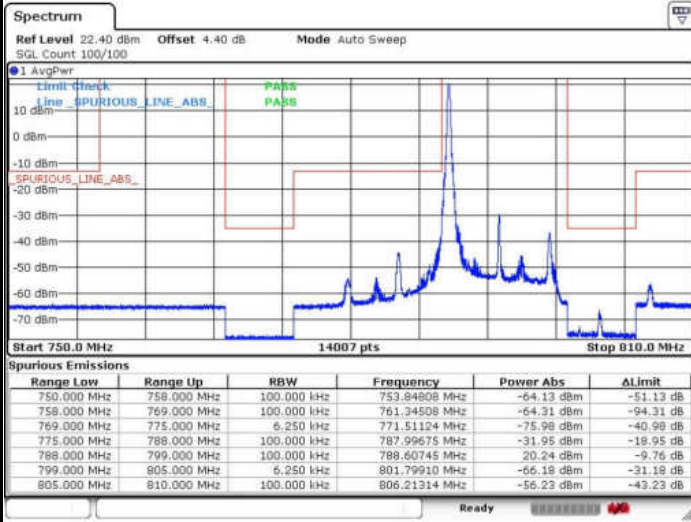




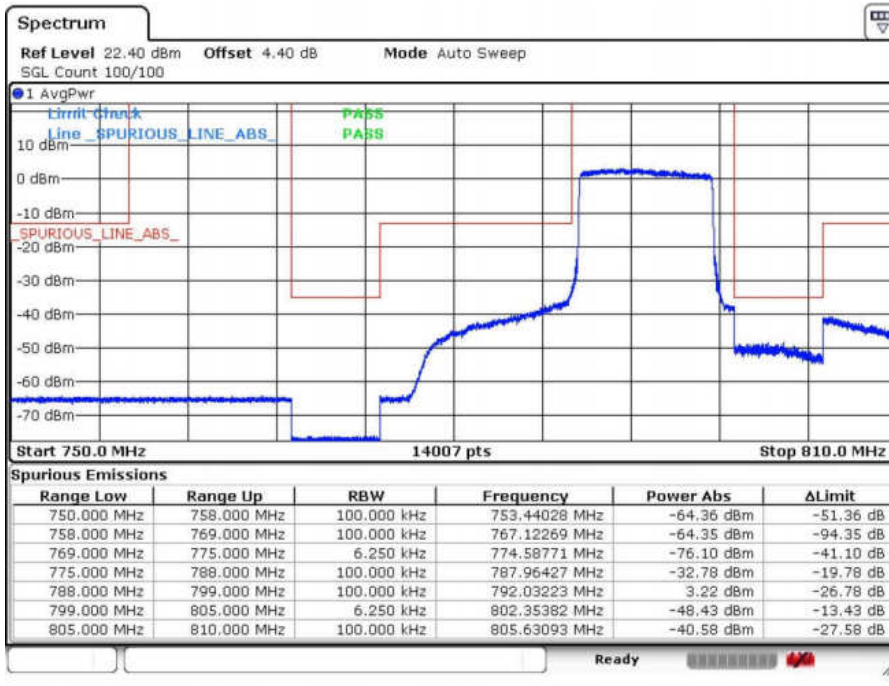
LTE Band 14 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

Highest Band Edge / 1 RB

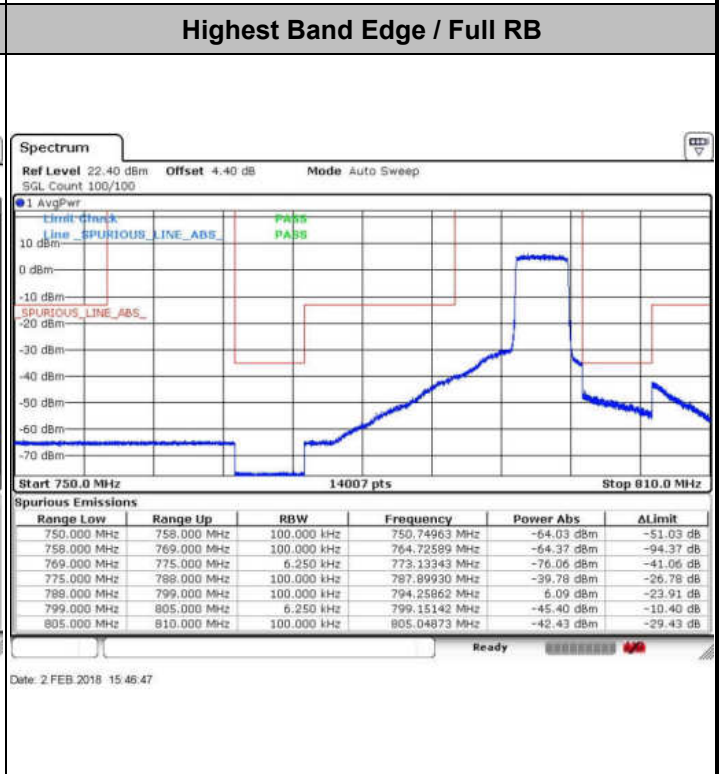
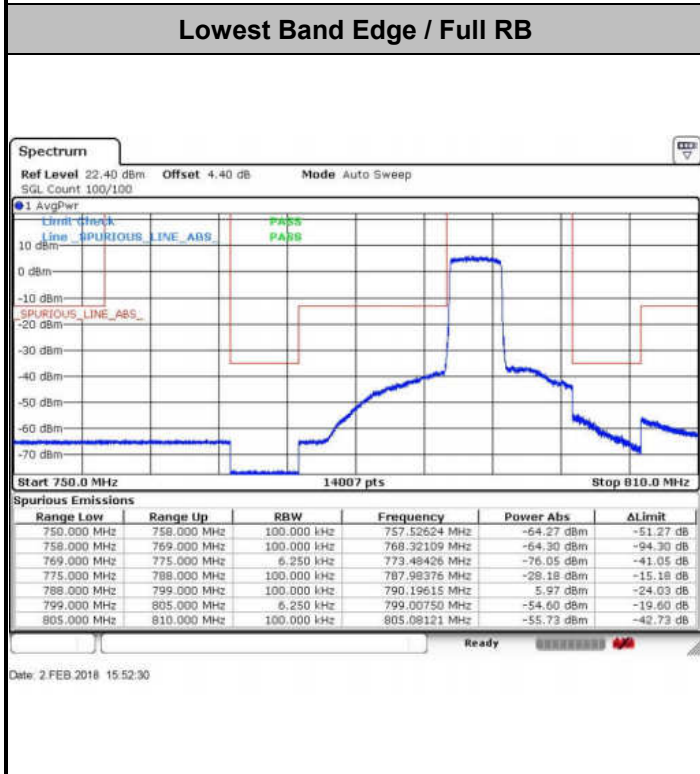
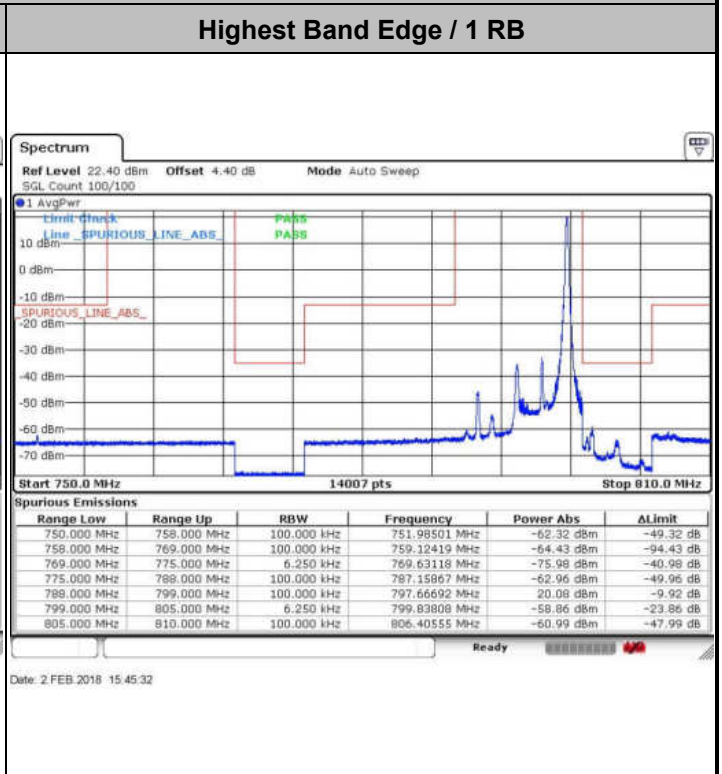
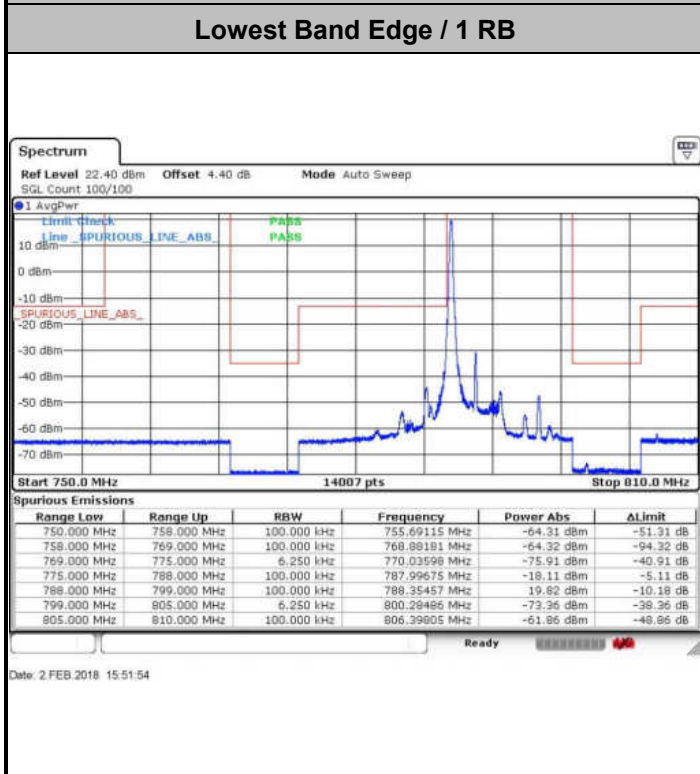


Band Edge / Full RB





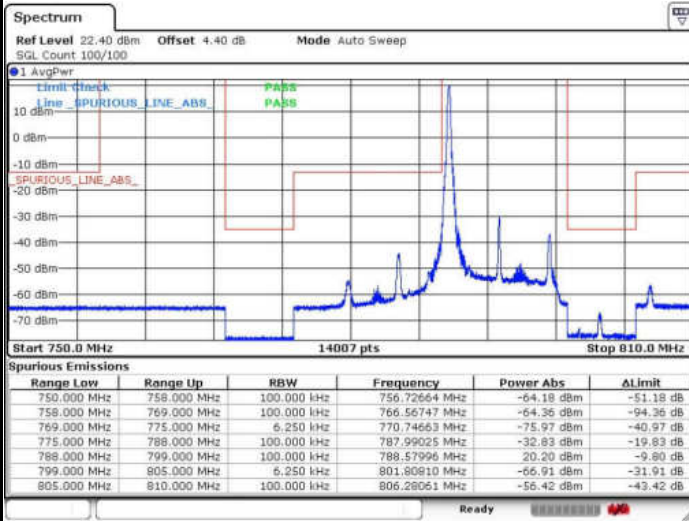
LTE Band 14 / 5MHz / 64QAM





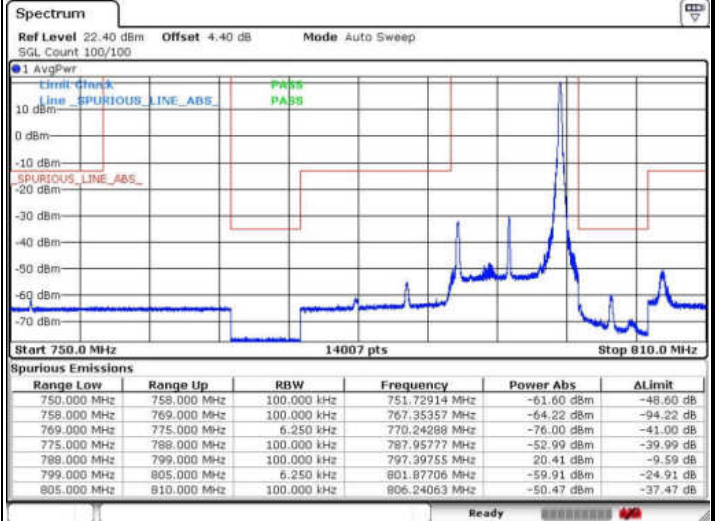
LTE Band 14 / 10MHz / 64QAM

Lowest Band Edge / 1 RB



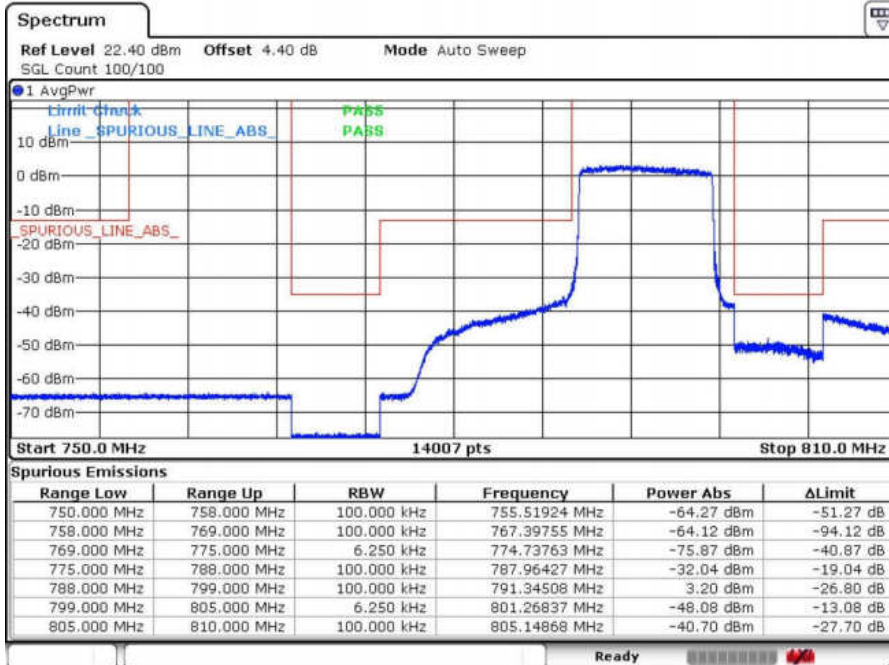
Date: 2 FEB 2018 15:57:46

Highest Band Edge / 1 RB



Date: 2 FEB 2018 16:01:14

Band Edge / Full RB



Date: 2 FEB 2018 15:57:01

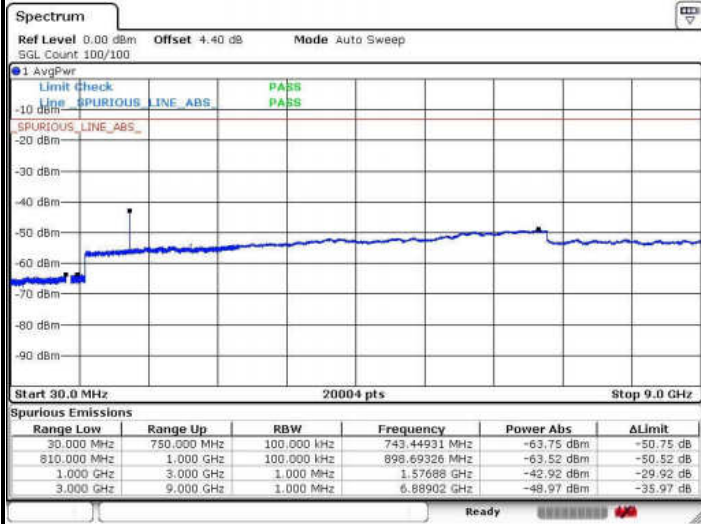


Conducted Spurious Emission



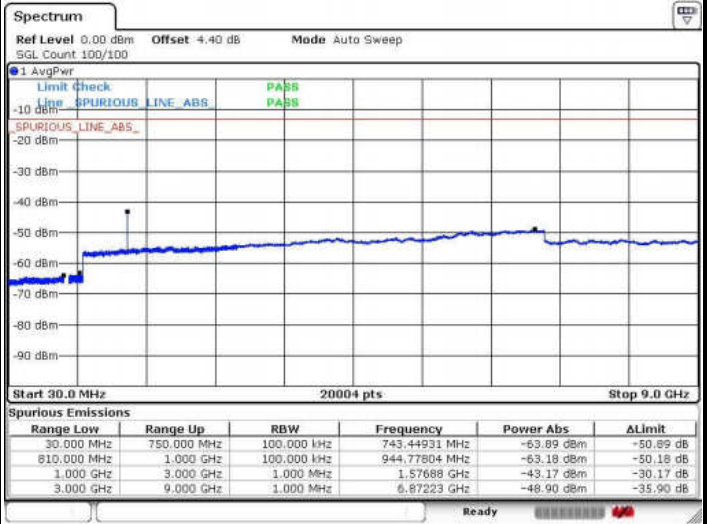
LTE Band 14 / 5MHz

Lowest Channel / QPSK



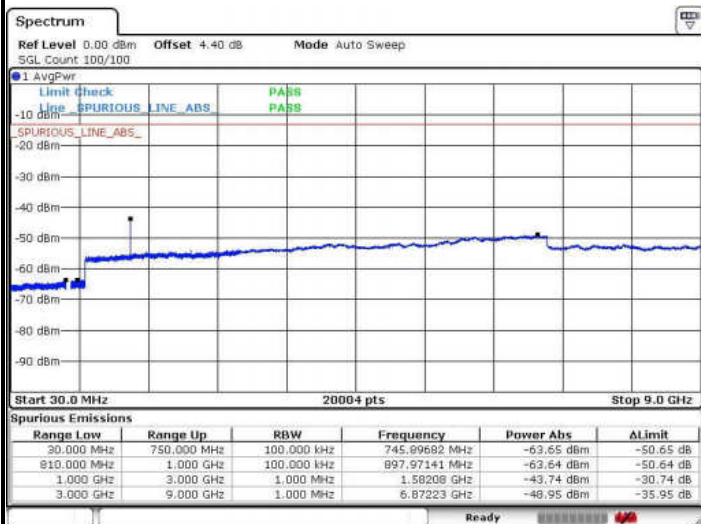
Date: 2 FEB 2018 16:21:41

Lowest Channel / 16QAM



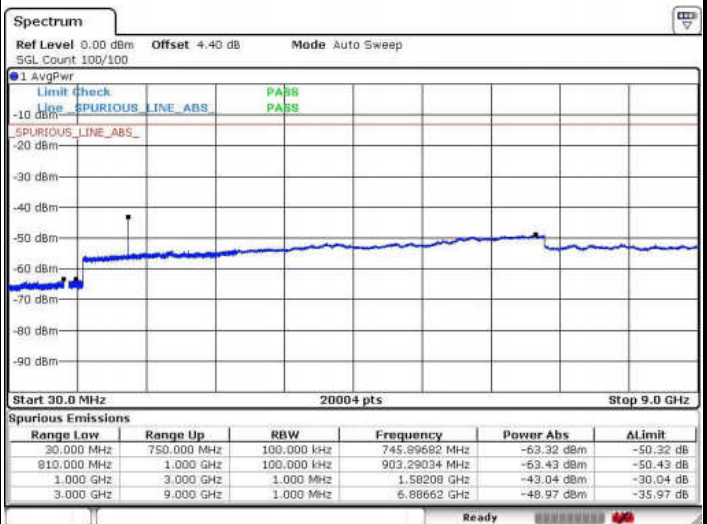
Date: 2 FEB 2018 16:21:15

Middle Channel / QPSK

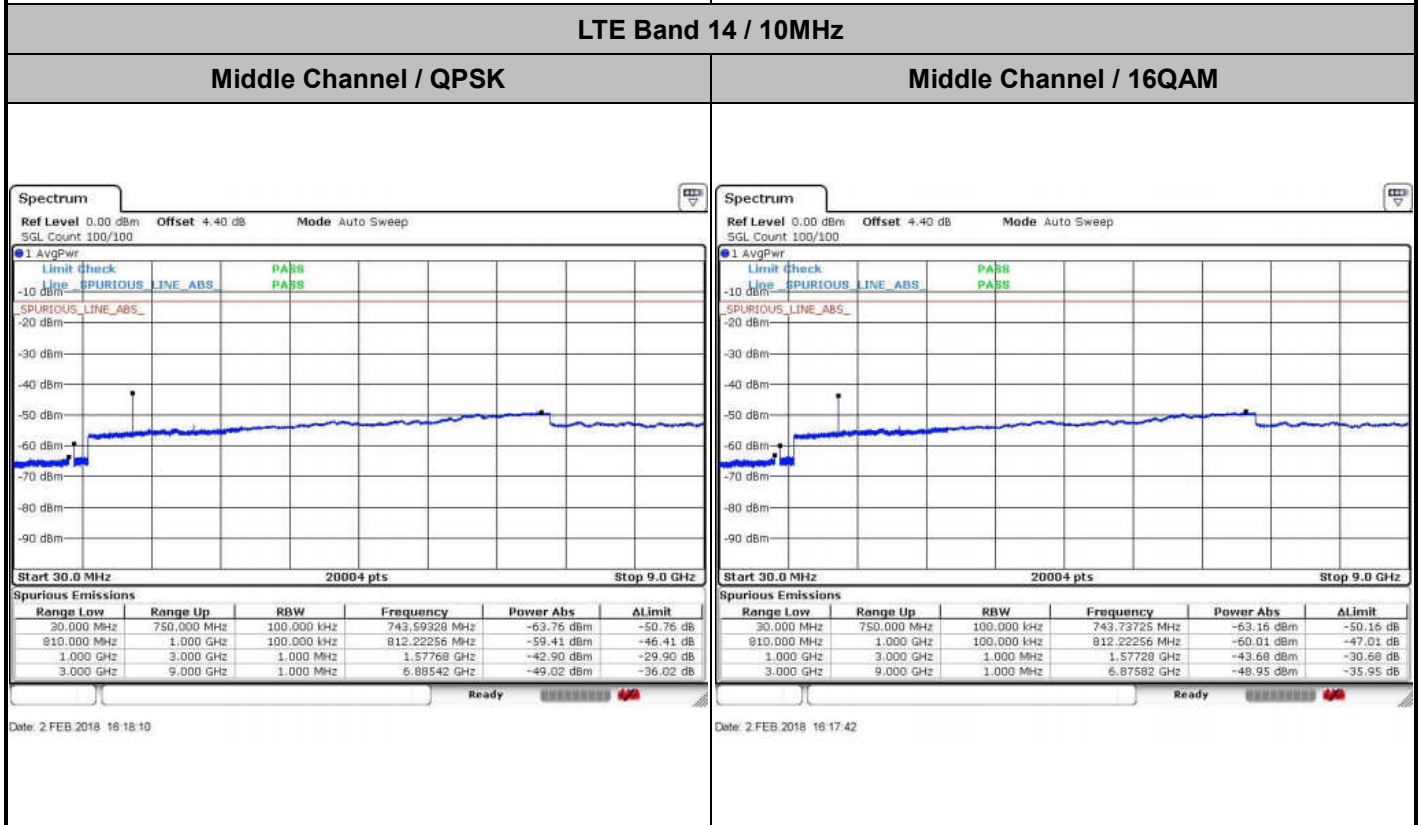
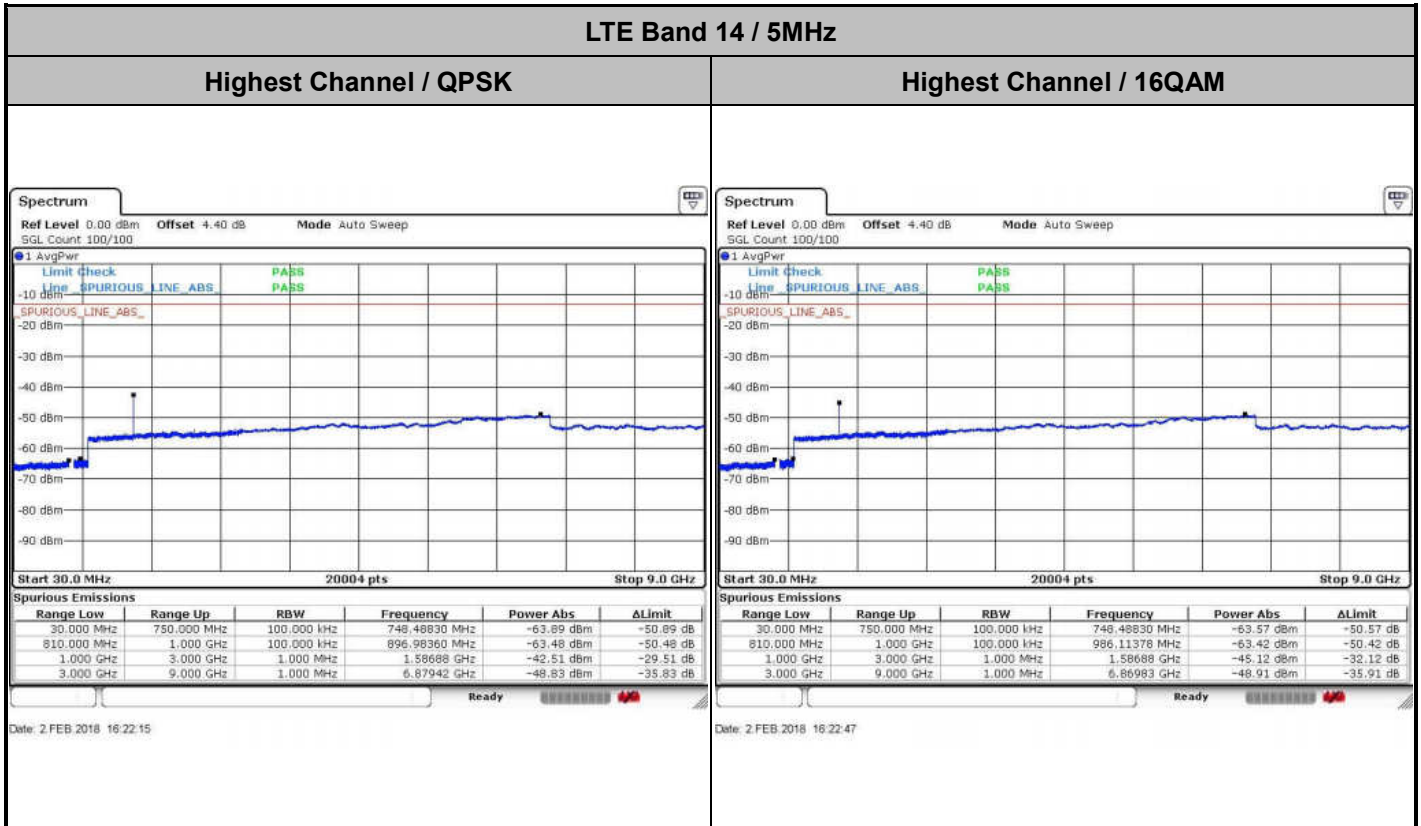


Date: 2 FEB 2018 16:18:52

Middle Channel / 16QAM



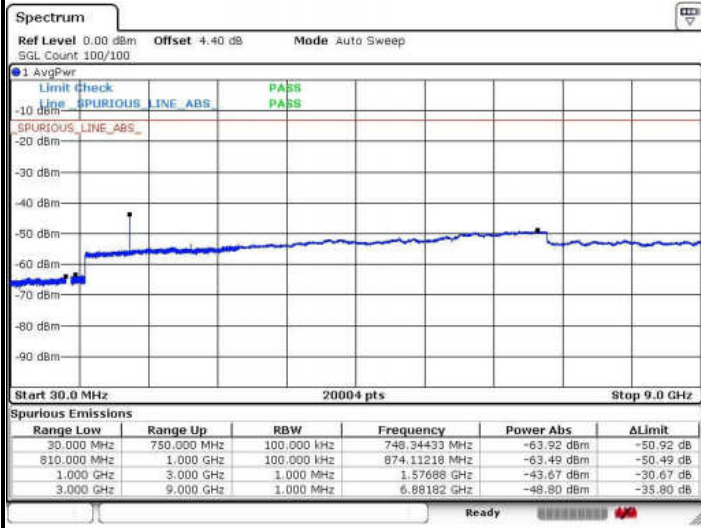
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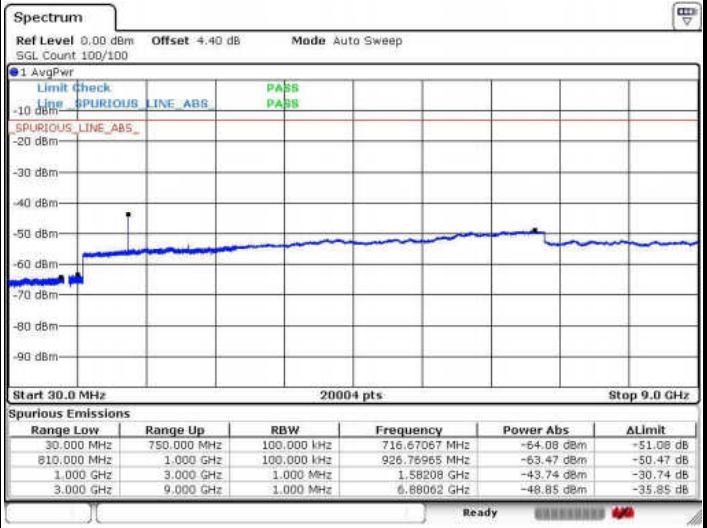
LTE Band 14 / 5MHz

Lowest Channel / 64QAM



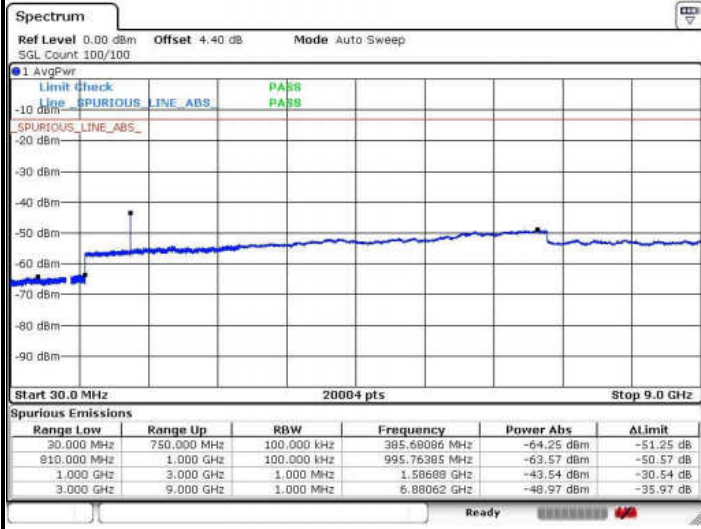
Date: 2 FEB 2018 16:20:49

Middle Channel / 64QAM

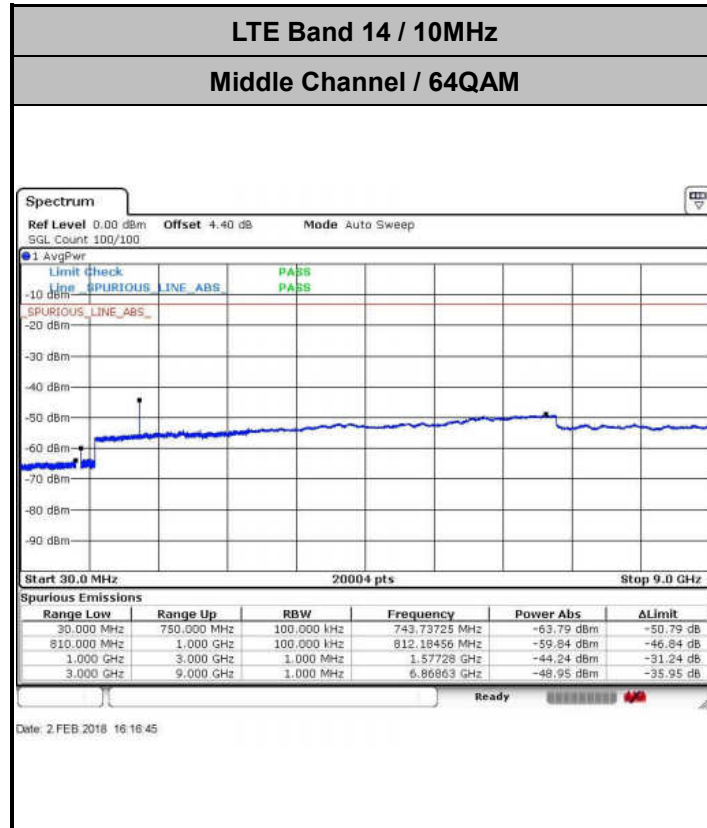


Date: 2 FEB 2018 16:20:08

Highest Channel / 64QAM

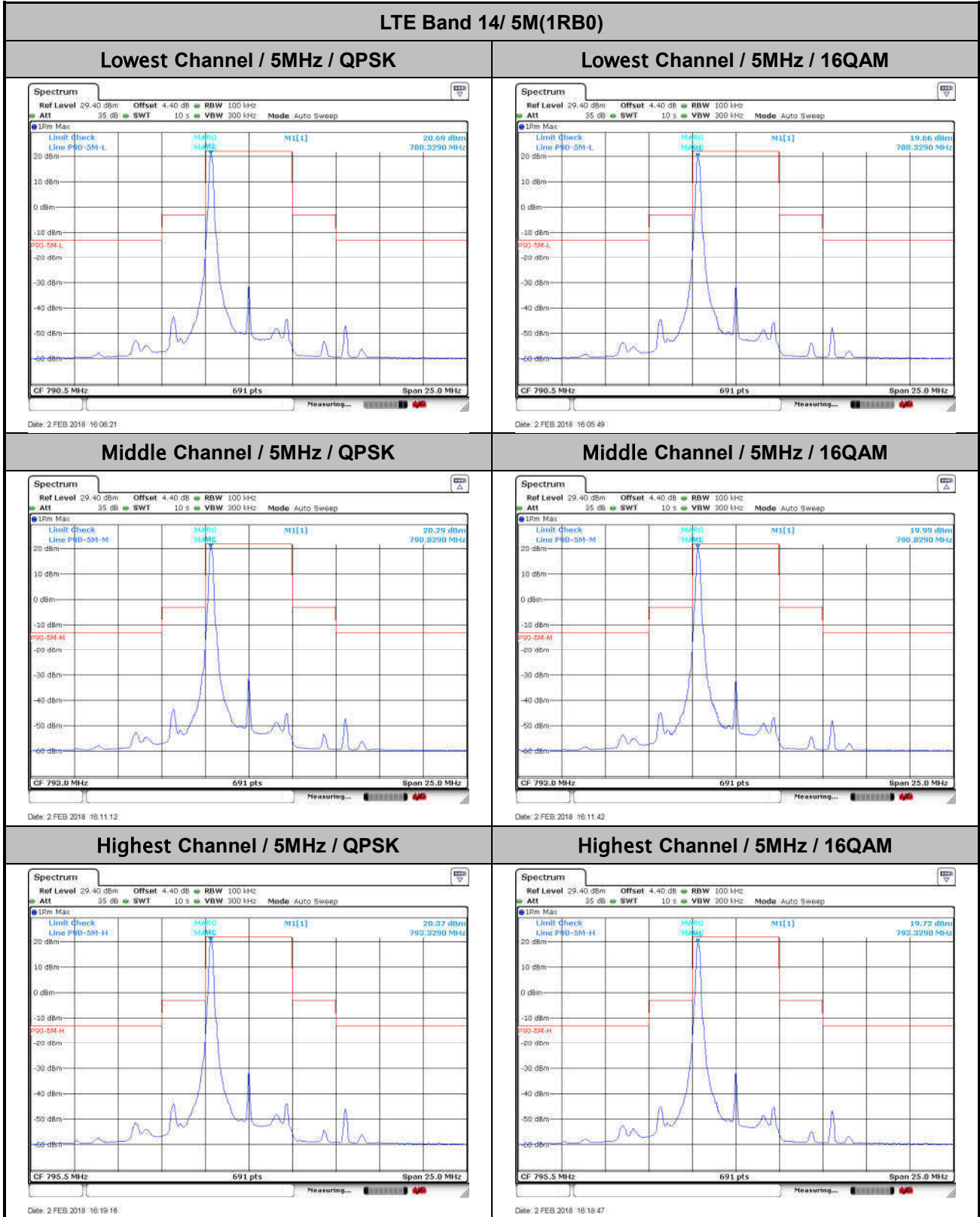


Date: 2 FEB 2018 16:23:16





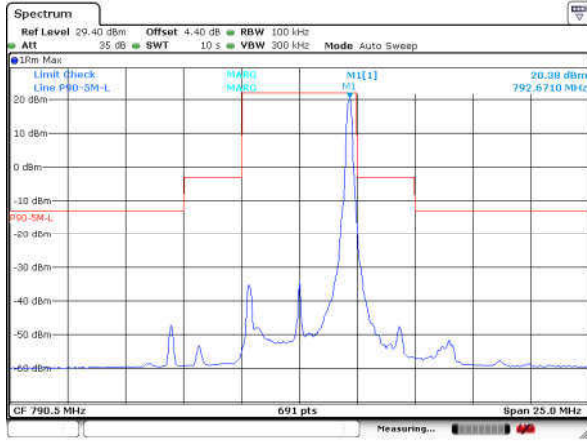
Emission Mask





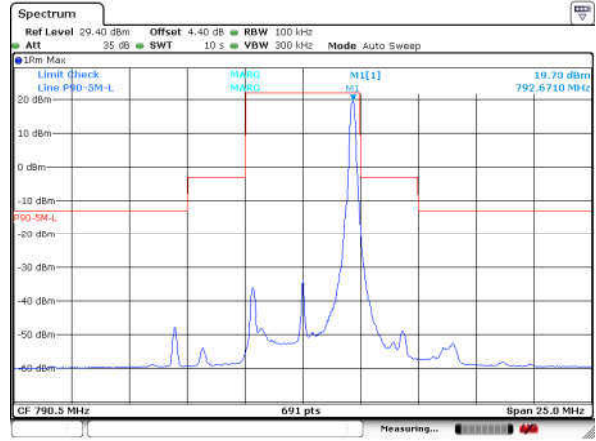
LTE Band 14/ 5M(1RBmax)

Lowest Channel / 5MHz / QPSK



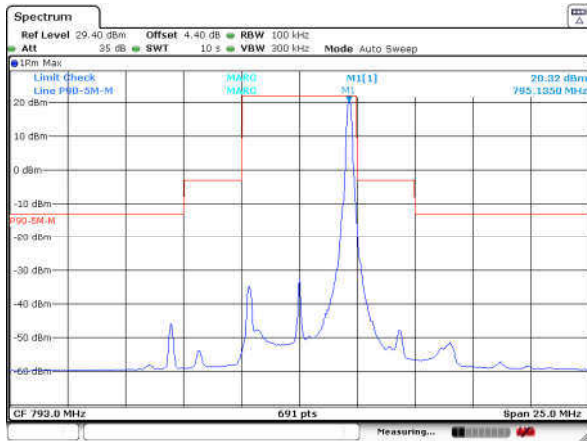
Date: 2 FEB 2018 16:06:49

Lowest Channel / 5MHz / 16QAM



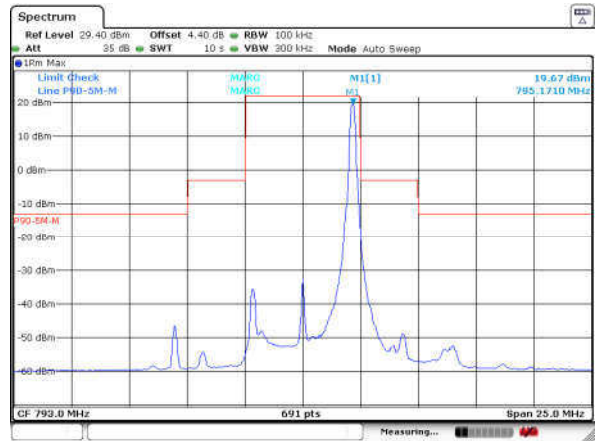
Date: 2 FEB 2018 16:07:23

Middle Channel / 5MHz / QPSK



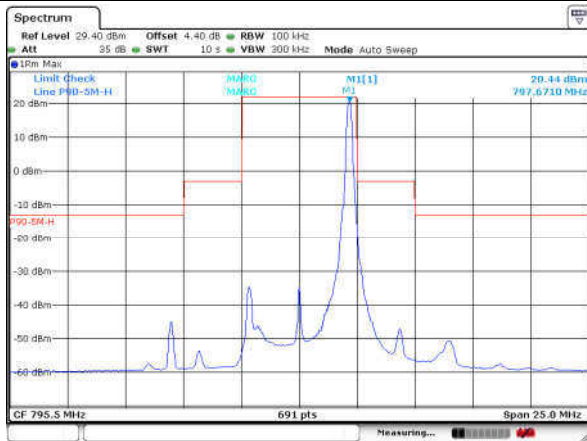
Date: 2 FEB 2018 16:10:26

Middle Channel / 5MHz / 16QAM



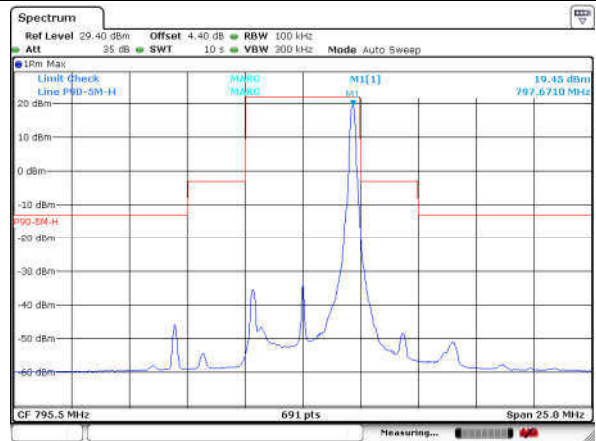
Date: 2 FEB 2018 16:09:45

Highest Channel / 5MHz / QPSK



Date: 2 FEB 2018 16:19:45

Highest Channel / 5MHz / 16QAM

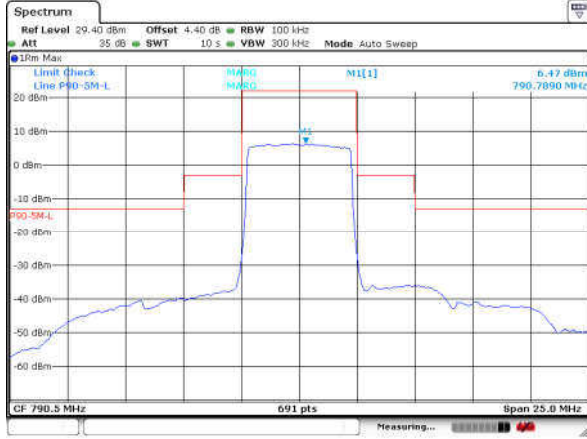


Date: 2 FEB 2018 16:20:14

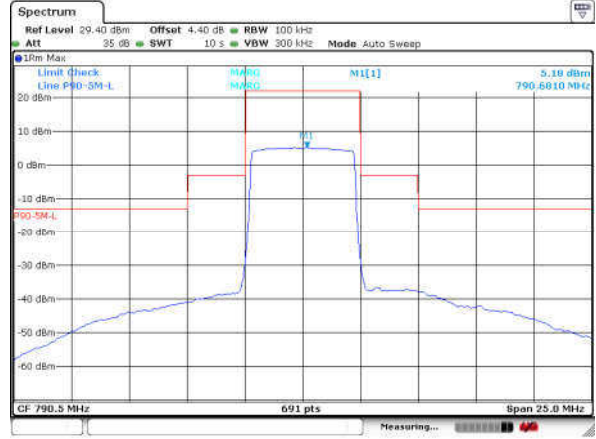


LTE Band 14/ 5M(fullIRB0)

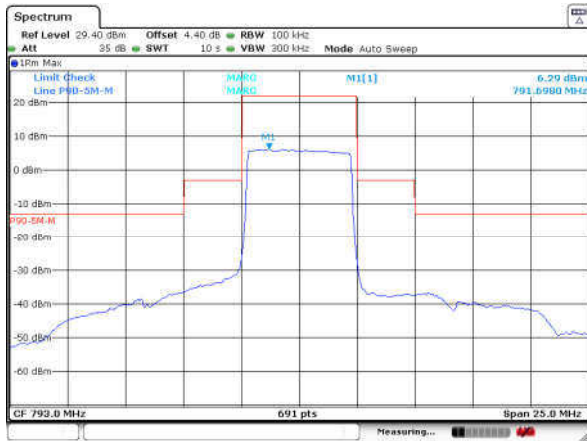
Lowest Channel / 5MHz / QPSK



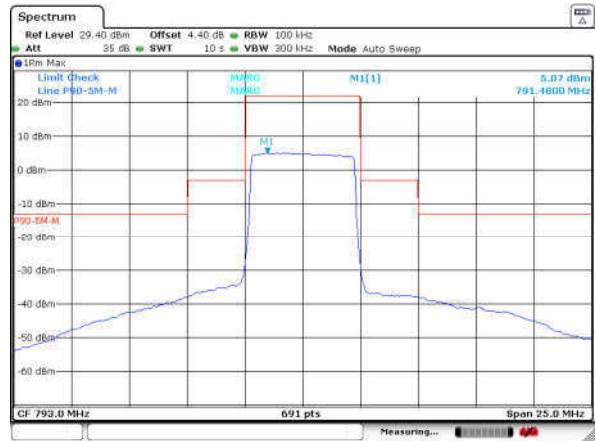
Lowest Channel / 5MHz / 16QAM



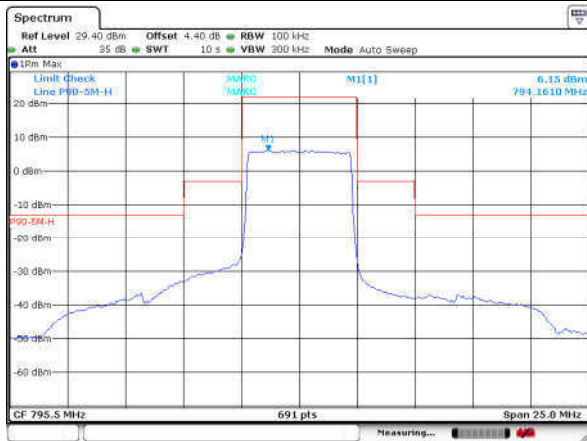
Middle Channel / 5MHz / QPSK



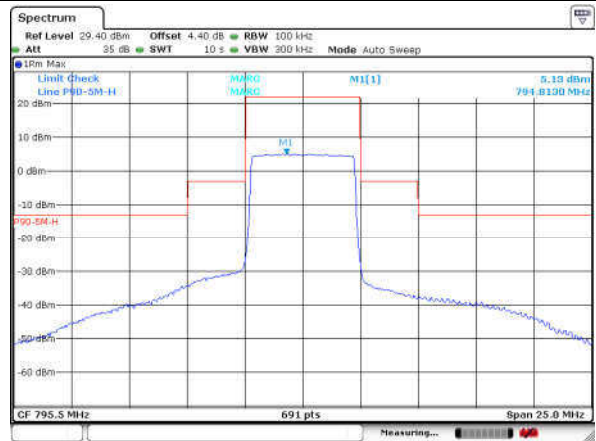
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK



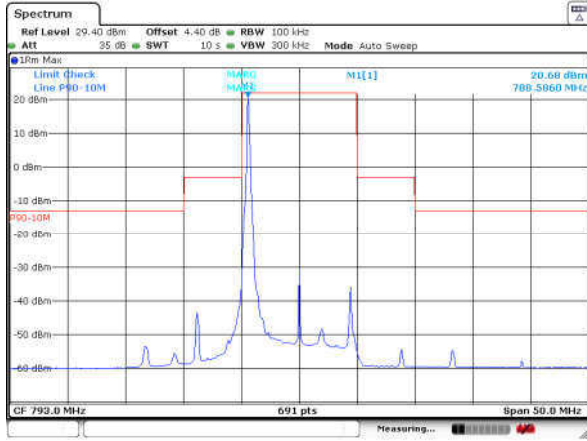
Highest Channel / 5MHz / 16QAM





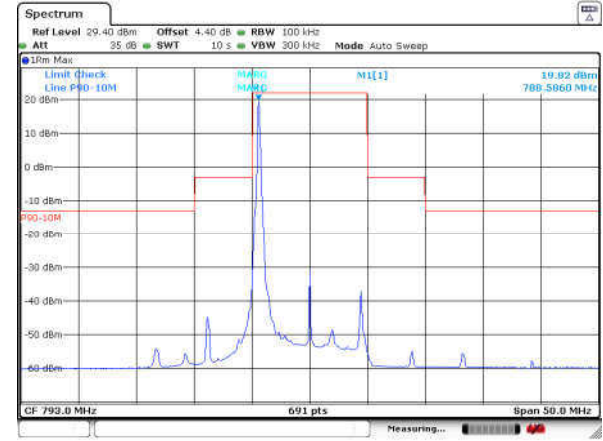
LTE Band 14/ 10MHz

Middle Channel / 1RB0 / QPSK



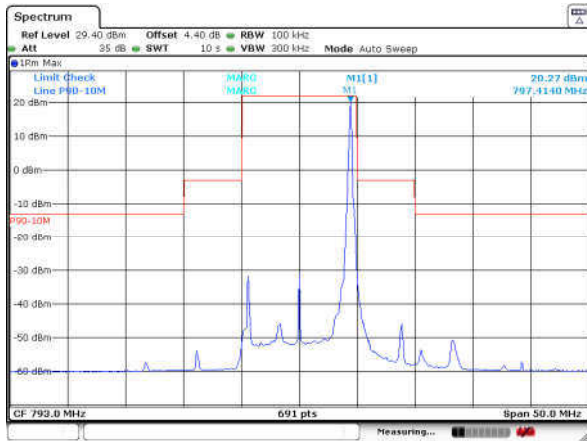
Date: 2 FEB 2018 15:45:59

Middle Channel / 1RB0 / 16QAM



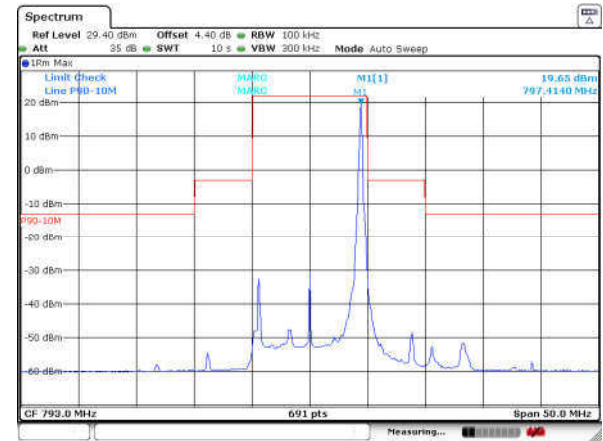
Date: 2 FEB 2018 15:47:15

Middle Channel / 1RBmax / QPSK



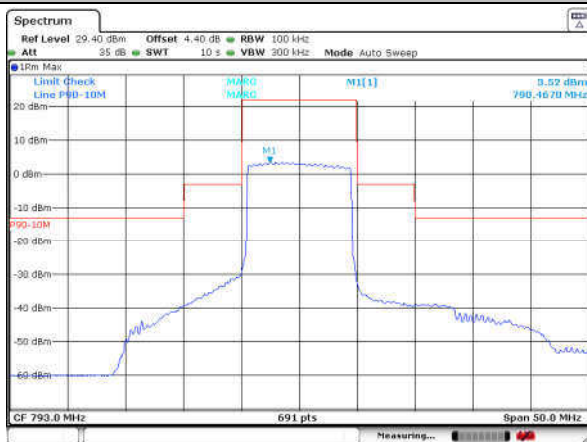
Date: 2 FEB 2018 15:54:49

Middle Channel / 1RBmax / 16QAM



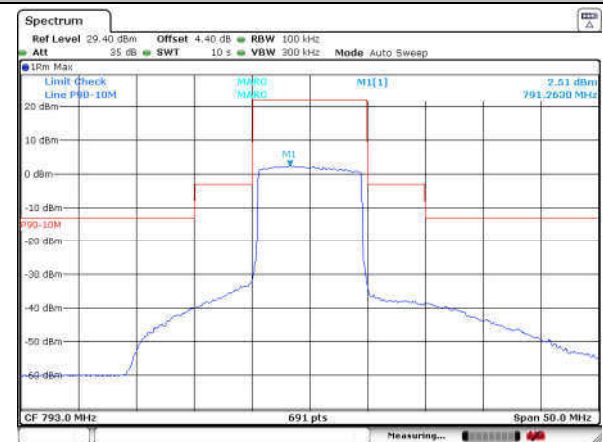
Date: 2 FEB 2018 15:54:22

Middle Channel / fullRB0 / QPSK



Date: 2 FEB 2018 15:55:38

Middle Channel / fullRB0 / 16QAM

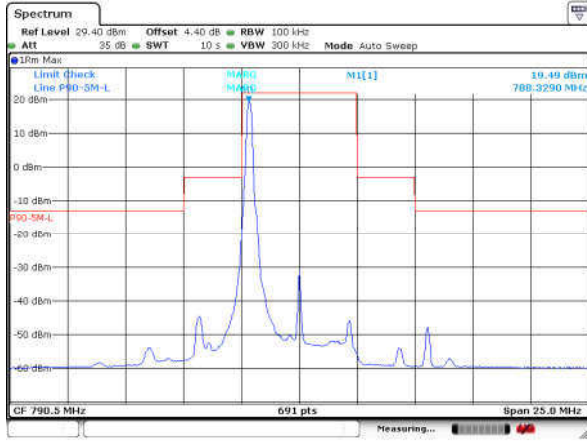


Date: 2 FEB 2018 15:56:17



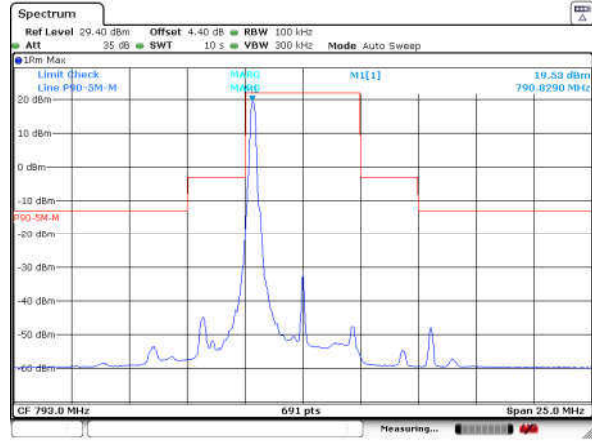
LTE Band 14/ 5MHz

Lowest Channel / 1RB0 / 64QAM



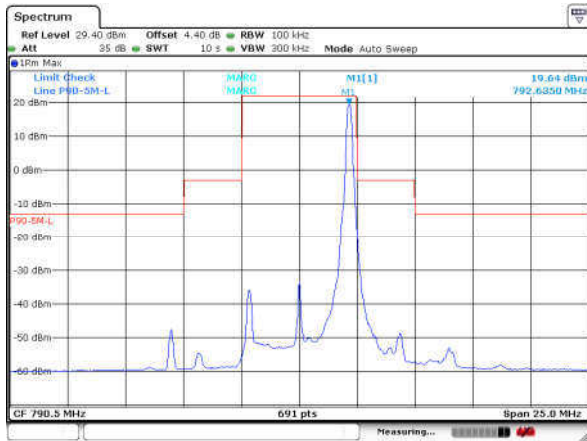
Date: 2 FEB 2018 16:05:13

Middle Channel / 1RB0 / 64QAM



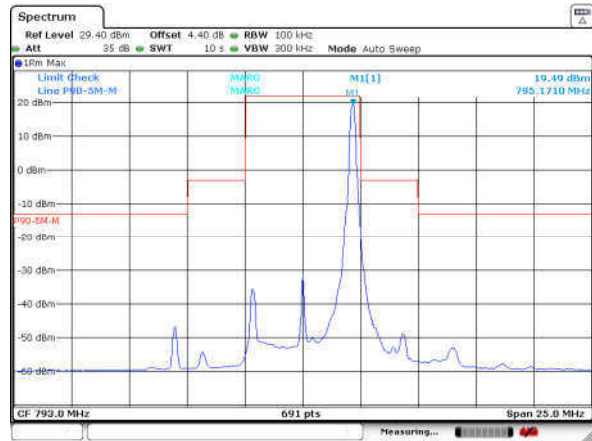
Date: 2 FEB 2018 16:12:25

Lowest Channel / 1RBmax / 64QAM



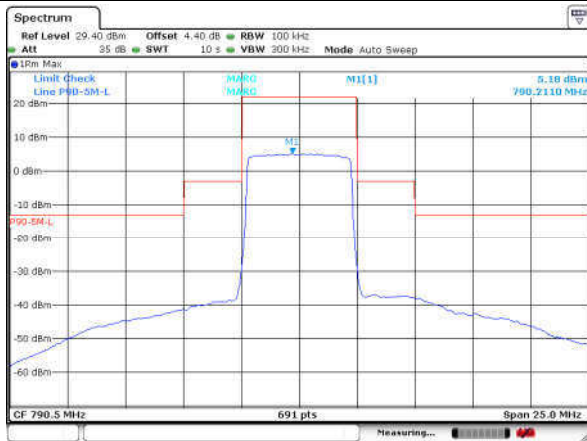
Date: 2 FEB 2018 16:07:48

Middle Channel / 1RBmax / 64QAM



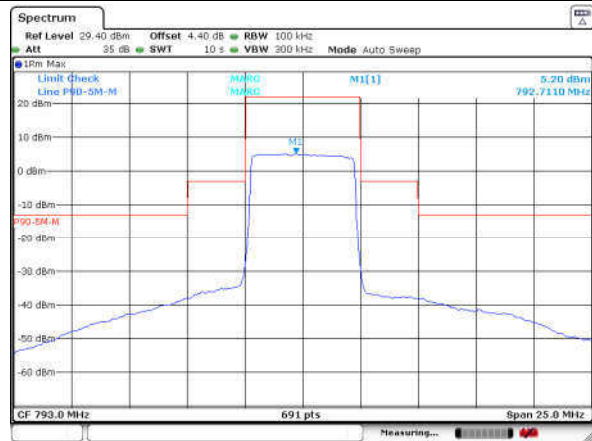
Date: 2 FEB 2018 16:08:53

Lowest Channel / fullRB0 / 64QAM

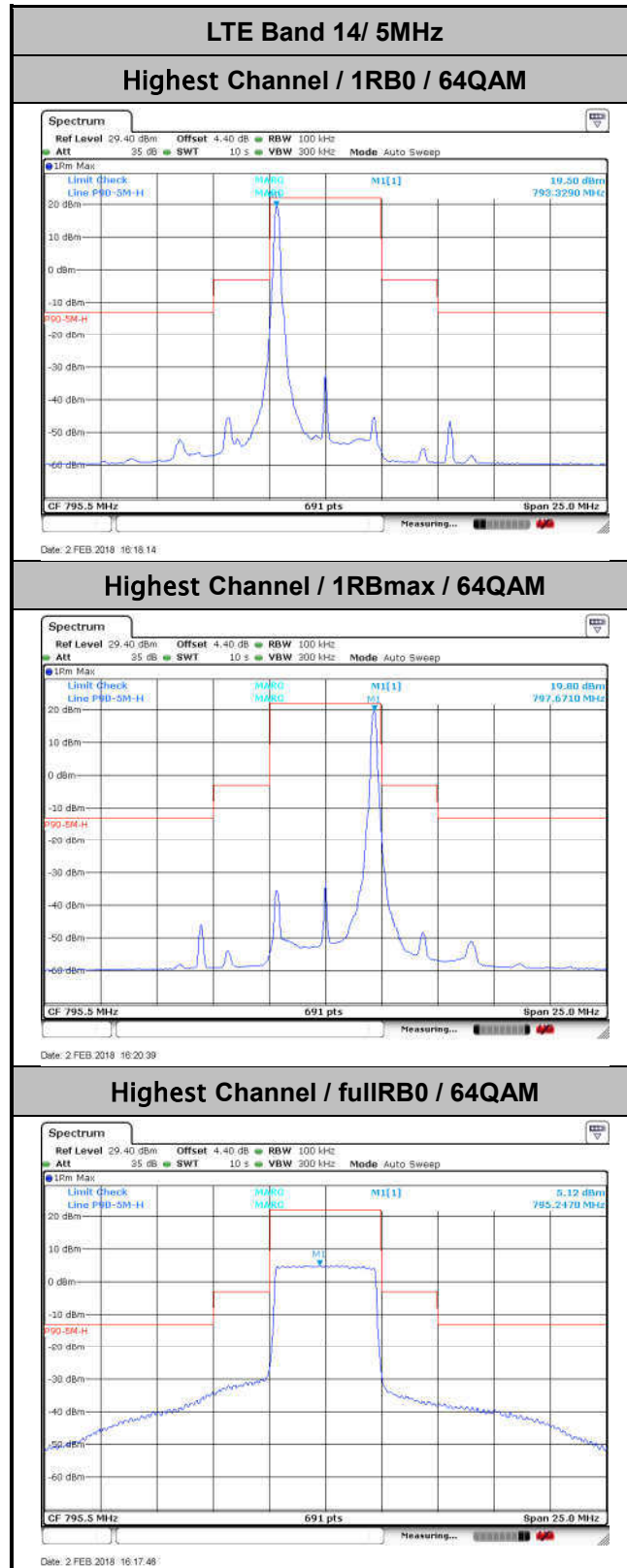


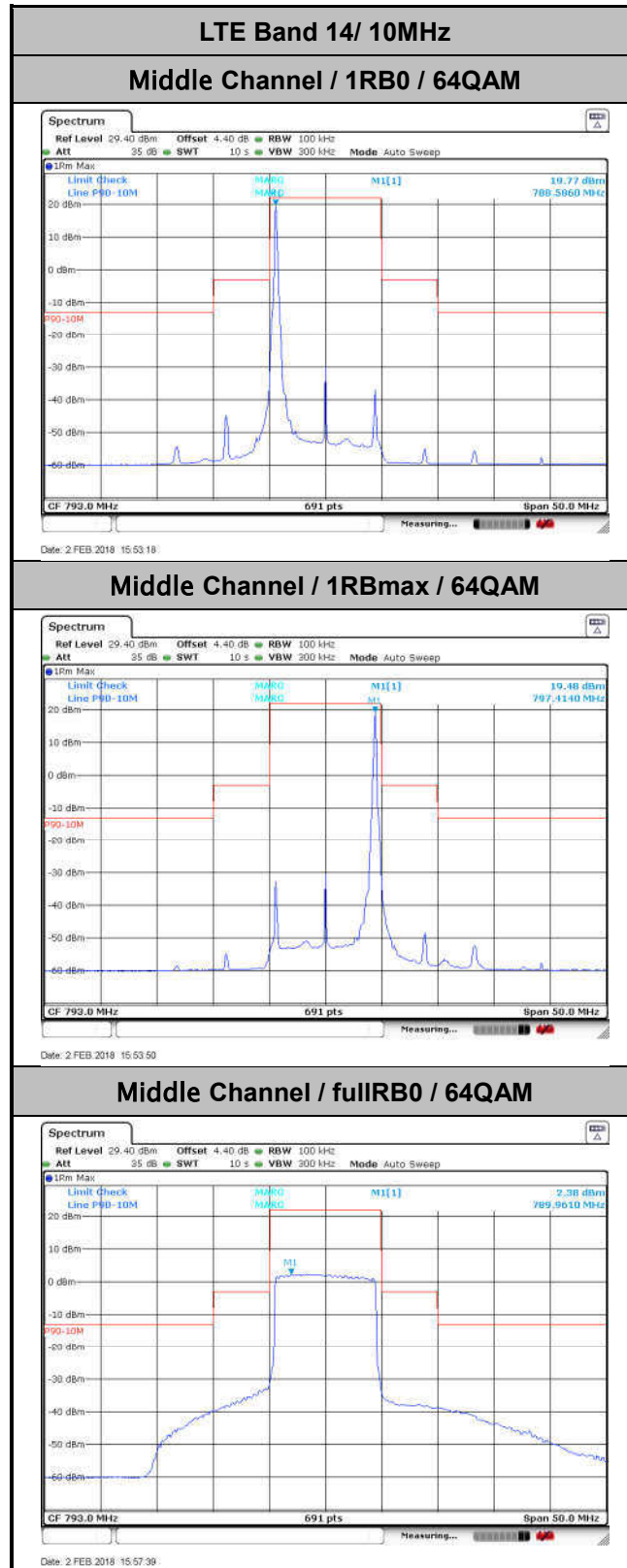
Date: 2 FEB 2018 16:04:43

Middle Channel / fullRB0 / 64QAM



Date: 2 FEB 2018 16:13:02







Frequency Stability

Test Conditions		LTE Band 14 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0044	PASS
40	Normal Voltage	0.0033	
30	Normal Voltage	0.0005	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0024	
0	Normal Voltage	0.0038	
-10	Normal Voltage	0.0011	
-20	Normal Voltage	0.0042	
-30	Normal Voltage	0.0005	
20	Maximum Voltage	0.0034	
20	Normal Voltage	0.0008	
20	Battery End Point	0.0024	

Note:

1. Normal Voltage =3.8 V. ; Battery End Point (BEP) =3.6 V. ; Maximum Voltage =4.4 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.



Appendix B. Test Results of Radiated Test

Field Strength of Spurious Radiated

LTE Band 14 / QPSK / RB Size 1 Offset 0									
Bandwidth	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
10MHz	1576	-63.94	-42.15	-21.79	-73.63	-69.08	1.20	8.49	H
	2365	-61.28	-13	-48.28	-74.31	-68.10	1.42	10.39	H
	3154	-59.99	-13	-46.99	-74.79	-67.62	1.59	11.36	H
	1576	-65.11	-42.15	-22.96	-73.59	-70.25	1.20	8.49	V
	2365	-61.18	-13	-48.18	-74.12	-68.00	1.42	10.39	V
	3154	-60.45	-13	-47.45	-74.93	-68.08	1.59	11.36	V
Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.									
Test Result					PASS				