FCC RADIO TEST REPORT

FCC ID	:	**RWO-RZ350259**
Equipment	:	**Smartphone**
Brand Name	:	**RAZER**
Model Name	:	**RZ35-0259**
Applicant	:	**Razer Inc.** **201 3rd Street, Suite 900, San Francisco, CA 94103, USA**
Manufacturer	:	**Razer Inc.** **201 3rd Street, Suite 900, San Francisco, CA 94103, USA**
Standard	:	**FCC 47 CFR Part 2, 90(R)**

The product was received on Jul. 17, 2018 and testing was started from Aug. 08, 2018 and completed on Sep. 28, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FG871722D	01	Initial issue of report	Sep. 27, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§90.542 (a)(7)	Effective Radiated Power	Pass	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1053 §90.543 (e)(2)	Conducted Band Edge Measurement	Pass	-
3.6	§2.1051 §90.210 (n)	Emission Mask	Pass	-
3.7	§2.1053 §90.543 (e)(3)	Conducted Spurious Emission	Pass	-
3.8	§2.1055 §90.539 (e)	Frequency Stability Temperature & Voltage	Pass	-
4.2	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	Pass	Under limit 18.54 dB at 1576.000 MHz

Reviewed by: Wii Chang

Report Producer: Fish Liu

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, NFC, WPC, and GNSS

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN <Ant. 1>: PIFA Antenna <Ant. 2>: PIFA Antenna Bluetooth: PIFA Antenna GPS/Glonass/BDS: PIFA Antenna NFC: Loop Antenna WPC: Loop antenna

1.2 Modification of EUT

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

1.3 Testing Site

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 and TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH05-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH13-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

1.4 Applied Standards

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

- ANSI C63.26-2015
- 47 CFR Part 2, Part 90(R)
- ANSI / TIA-603-E
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- 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

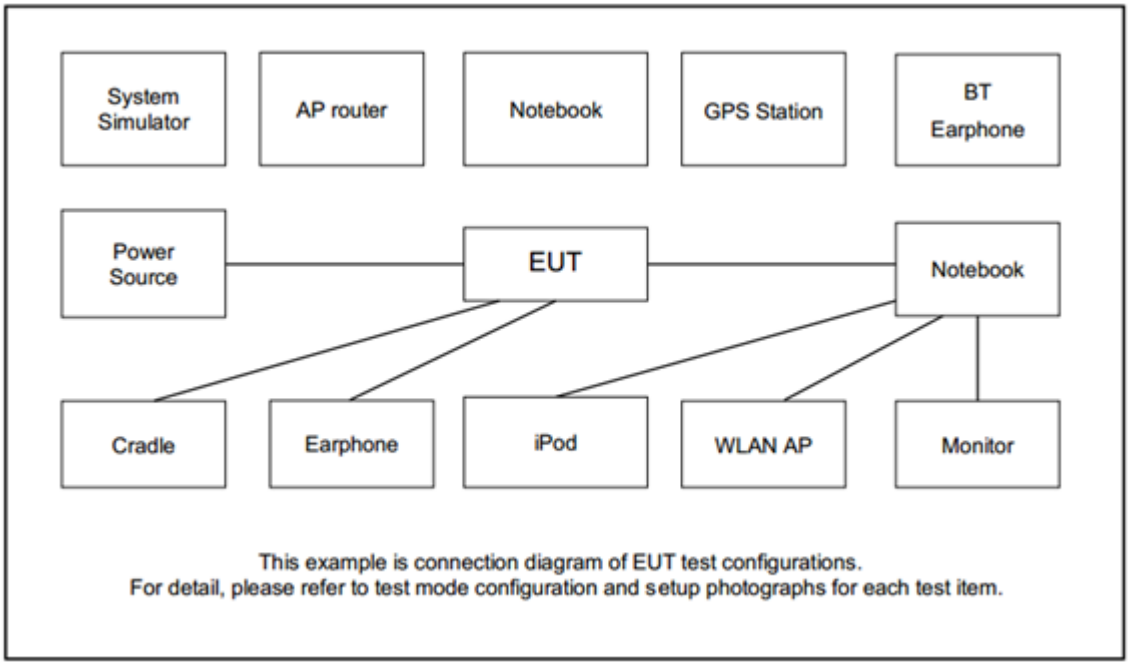
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

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	v
Peak-to-Average Ratio	14	-	-		v	-	-	v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	14	-	-	v	v	-	-	v	v	v			v	v	v	v
Conducted Band Edge	14	-	-	v	v	-	-	v	v	v	v		v	v		v
Emission Mask	14	-	-	v	v	-	-	v	v	v	v		v	v	v	v
Conducted Spurious Emission	14	-	-	v	v	-	-	v	v	v	v			v	v	v
Frequency Stability	14	-	-		v	-	-	v	v	v			v		v	
E.R.P	14	-	-	v	v	-	-	v	v	v	v			v	v	v
Radiated Spurious Emission	14	Worst Case												v	v	v
Remark	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. **3.** The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. **4.** All the radiated test cases were performed with Adapter 1.															

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.	Base Station	Anritsu	MT8821C	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

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

Example :

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

= 4.5 + 10 = 14.5 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 14 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	-	23330	-
	Frequency	-	793	-
5	Channel	23305	23330	23355
	Frequency	790.5	793	795.5

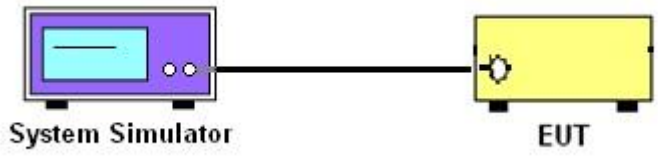
3 Conducted Test Items

3.1 Measuring Instruments

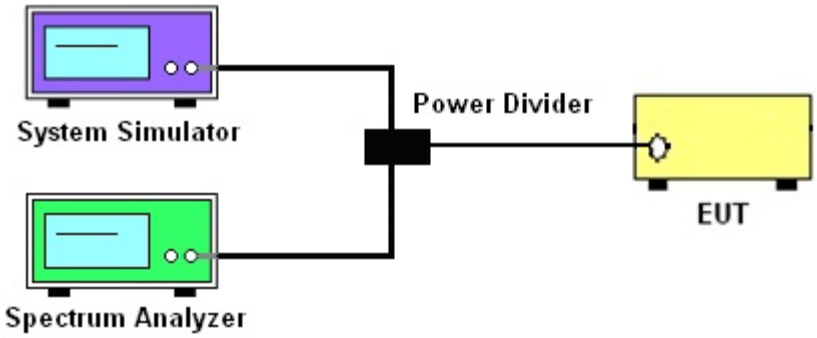
See list of measuring instruments of this test report.

3.1.1 Test Setup

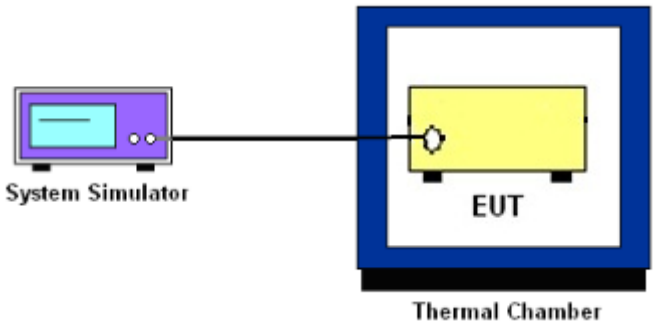
3.1.2 Conducted Output Power



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



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power Measurement and ERP

3.2.1 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

3.2.2 Test Procedures

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

3.3 Peak-to-Average Ratio

3.3.1 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.

3.3.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.7.1

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

3.4 Occupied Bandwidth

3.4.1 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.

3.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 4.2

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

3.5 Conducted Band Edge Measurement

3.5.1 Description of Conducted Band Edge Measurement

90.543(e)

(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.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Checked that all the results comply with the emission limit line.
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

3.6 Emission Mask

3.6.1 Description of Emissions Mask Measurement

Transmitters designed must meet the emission mask comply with the emission mask provisions of FCC Part 90.210(n).

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. 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.
3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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 30MHz up to a frequency including its 10^{th} harmonic.

3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

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 RBW = 1MHz, VBW = 3MHz.
6. Set spectrum analyzer with RMS detector.
7. Taking the record of maximum spurious emission.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.8.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

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.

3.8.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at 20±5° 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.

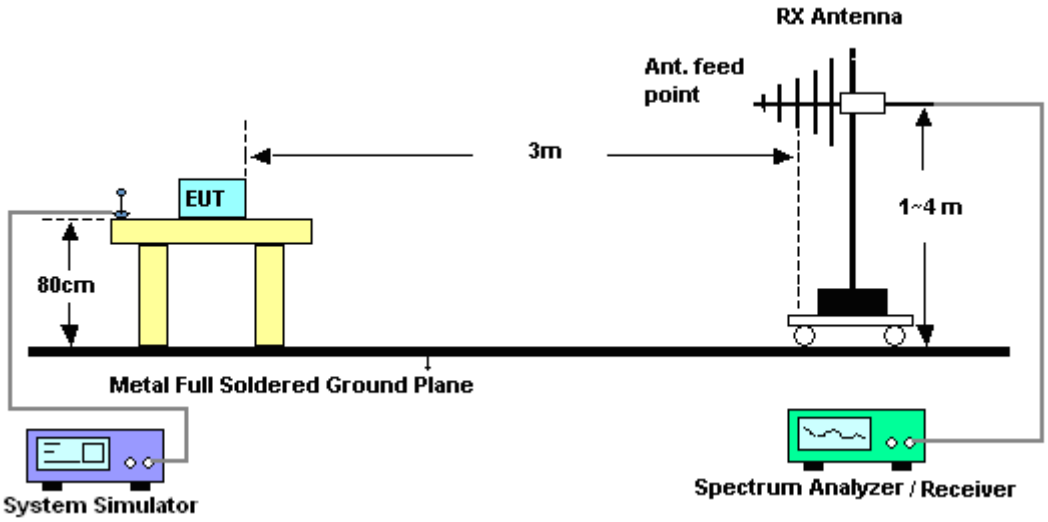
4 Radiated Test Items

4.1 Measuring Instruments

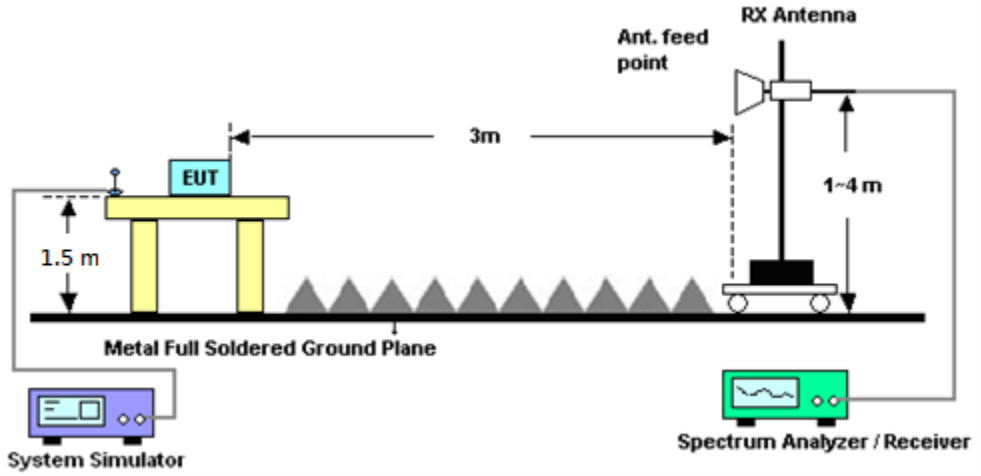
See list of measuring instruments of this test report.

4.1.1 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

4.2 Radiated Spurious Emission Measurement

4.2.1 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.

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

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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, Sweep = 500ms, 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.
11. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201432821	GSM/GPRS /WCDMA/LTE	Oct. 13, 2017	Aug. 08, 2018 ~ Sep. 28, 2018	Oct. 12, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 07, 2017	Aug. 08, 2018 ~ Sep. 28, 2018	Nov. 06, 2018	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890001	1V~20V 0.5A~5A	Oct. 06, 2017	Aug. 08, 2018 ~ Sep. 28, 2018	Oct. 05, 2018	Conducted (TH05-HY)
Coupler	Warison	1-18GHz 20dB 25WSMA Directional Coupler	#B	1G~18GHz	Dec. 04, 2017	Aug. 08, 2018 ~ Sep. 28, 2018	Dec. 03, 2018	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Sep. 10, 2018~ Sep. 19, 2018	Nov. 22, 2018	Radiation (03CH13-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jul. 15, 2019	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 21, 2016	Sep. 10, 2018~ Sep. 19, 2018	Dec. 20, 2018	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	40103&07	30MHz to 1GHz	Jan. 10, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jan. 09, 2019	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Jun. 29, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jun. 28, 2019	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	Sep. 07, 2018	Sep. 10, 2018~ Sep. 19, 2018	Sep. 06, 2019	Radiation (03CH13-HY)
Filter	Wainwright	WLKS1200-8SS	SN3	1.2G Low Pass	Nov. 21, 2017	Sep. 10, 2018~ Sep. 19, 2018	Nov. 20, 2018	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN477220	3G High Pass	Nov. 21, 2017	Sep. 10, 2018~ Sep. 19, 2018	Nov. 20, 2018	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-1080-1200-15000-60ST	SN3	1.2 GHz High pass	Jul. 05, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jul. 04, 2019	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 10, 2017	Sep. 10, 2018~ Sep. 19, 2018	Nov. 09, 2018	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 05, 2017	Sep. 10, 2018~ Sep. 19, 2018	Dec. 04, 2018	Radiation (03CH13-HY)
Preamplifier	Jet-Power	JPA0118-55-303	17100018000054001	1GHz~18GHz	Apr. 16, 2018	Sep. 10, 2018~ Sep. 19, 2018	Apr. 15, 2019	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Feb. 02, 2018	Sep. 10, 2018~ Sep. 19, 2018	Feb. 01, 2019	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 15, 2018	Sep. 10, 2018~ Sep. 19, 2018	Mar. 14, 2019	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Sep. 10, 2018~ Sep. 19, 2018	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Sep. 10, 2018~ Sep. 19, 2018	N/A	Radiation (03CH13-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 15, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jan. 14, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Jan. 22, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jan. 21, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	335041/4	30M-18G	Jan. 22, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jan. 21, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/ 4	30M~18GHz	Jan. 22, 2018	Sep. 10, 2018~ Sep. 19, 2018	Jan. 21, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 17, 2017	Sep. 10, 2018~ Sep. 19, 2018	Oct. 16, 2018	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 17, 2017	Sep. 10, 2018~ Sep. 19, 2018	Oct. 16, 2018	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	Sep. 10, 2018~ Sep. 19, 2018	N/A	Radiation (03CH13-HY)

6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.07**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.48**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.92**

Appendix A. Test Results of Conducted Test

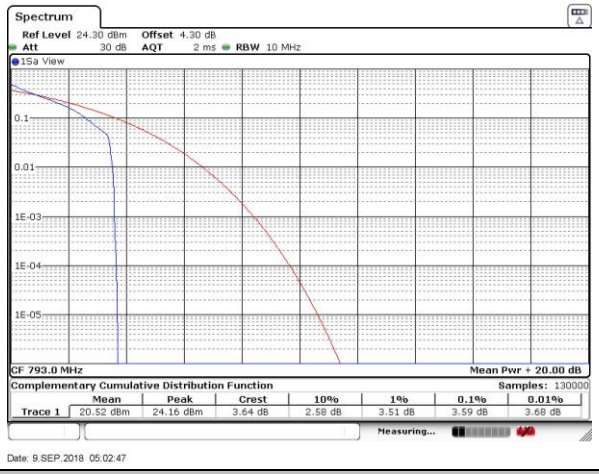
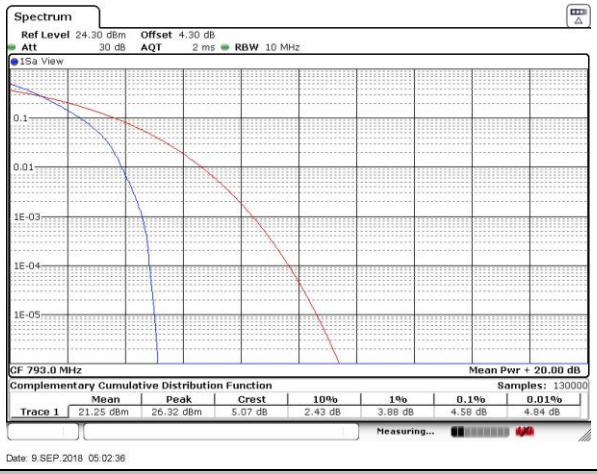
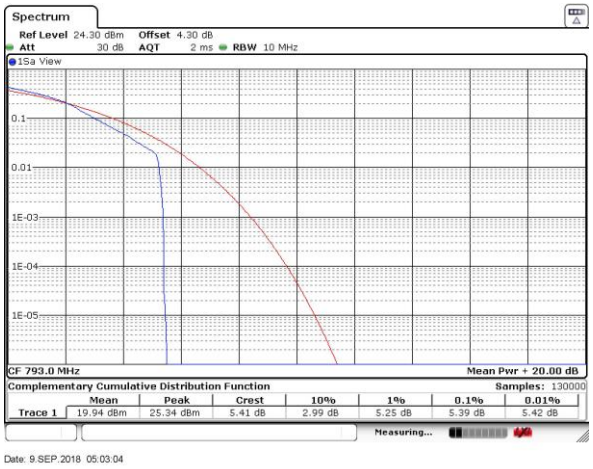
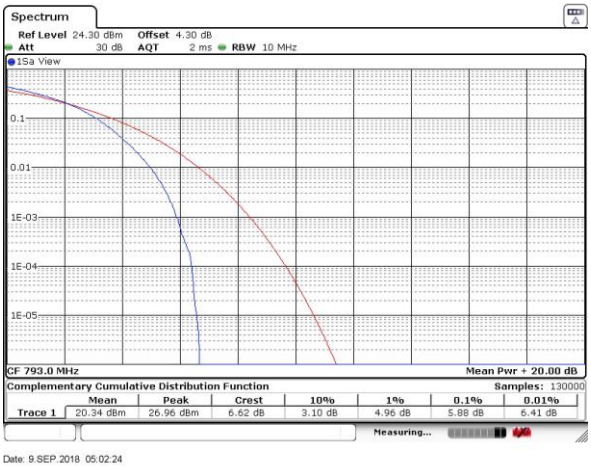
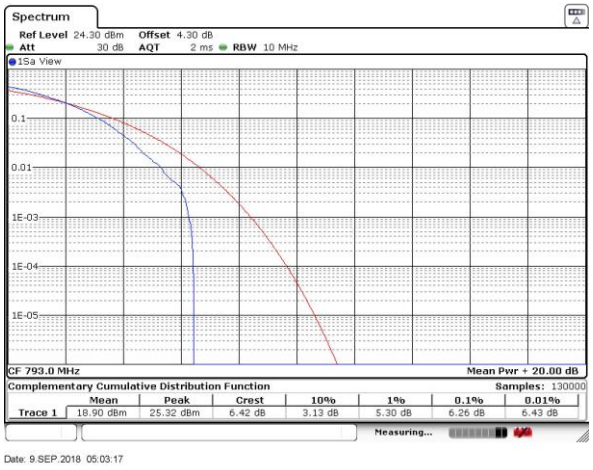
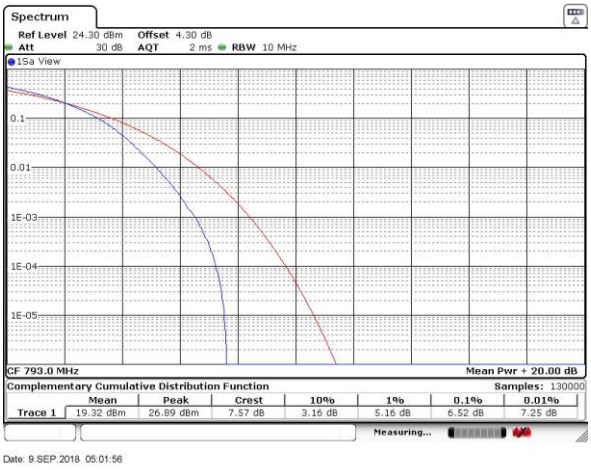
Conducted Output Power(Average power)

LTE Band 14 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	-	**23.34**	-
10	1	25			23.33	
10	1	49			23.30	
10	25	0			22.44	
10	25	12			22.39	
10	25	25			22.28	
10	50	0			22.39	
10	1	0	16-QAM		22.55	
10	1	25			22.71	
10	1	49			22.58	
10	25	0			21.52	
10	25	12			21.48	
10	25	25			21.41	
10	50	0			21.46	
10	1	0	64-QAM		21.51	
10	1	25			21.58	
10	1	49			21.51	
10	25	0			20.51	
10	25	12			20.49	
10	25	25			20.38	
10	50	0			20.44	
5	1	0	QPSK	23.26	23.31	23.33
5	1	12		23.28	23.31	23.31
5	1	24		23.31	23.26	23.29
5	12	0		22.36	22.43	22.34
5	12	7		22.34	22.40	22.32
5	12	13		22.38	22.34	22.36
5	25	0		22.32	22.34	22.31
5	1	0	16-QAM	22.57	22.68	22.77
5	1	12		22.60	22.61	22.60
5	1	24		22.67	22.57	22.57
5	12	0		21.43	21.51	21.45
5	12	7		21.43	21.51	21.43
5	12	13		21.49	21.42	21.47
5	25	0		21.40	21.46	21.43
5	1	0	64-QAM	21.55	21.53	21.60
5	1	12		21.55	21.63	21.56
5	1	24		21.60	21.54	21.48
5	12	0		20.47	20.52	20.49
5	12	7		20.45	20.50	20.48
5	12	13		20.54	20.44	20.49
5	25	0		20.39	20.43	20.41

LTE Band 14

Peak-to-Average Ratio

Mode	LTE Band 14 / 10MHz						
Mod.	QPSK		16QAM		64QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	1RB	Full RB	Result
Lowest CH							PASS
Middle CH	3.59	4.58	5.39	5.88	6.26	6.52	
Highest CH							

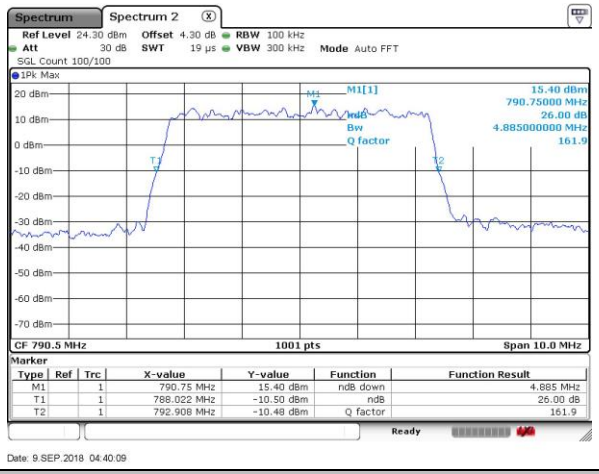
LTE Band 14 / 10MHz / QPSK	
Middle Channel/ 1RB	**Middle Channel / Full RB**
	
LTE Band 14 / 10MHz / 16QAM	
Middle Channel/ 1RB	**Middle Channel / Full RB**
	
LTE Band 14 / 10MHz / 64QAM	
Middle Channel/ 1RB	**Middle Channel / Full RB**
	

26dB Bandwidth

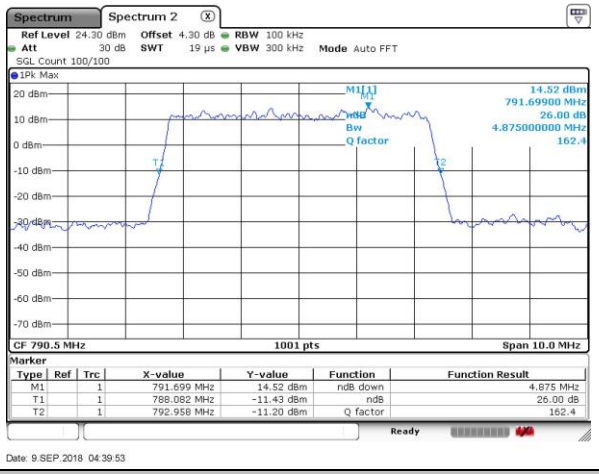
Mode	LTE Band 14 : 26dB BW(MHz)					
BW	5MHz			10MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	4.885	4.875	4.835			
Middle CH	4.805	4.825	4.905	9.89	9.69	9.83
Highest CH	4.965	4.885	4.865			

LTE Band 14

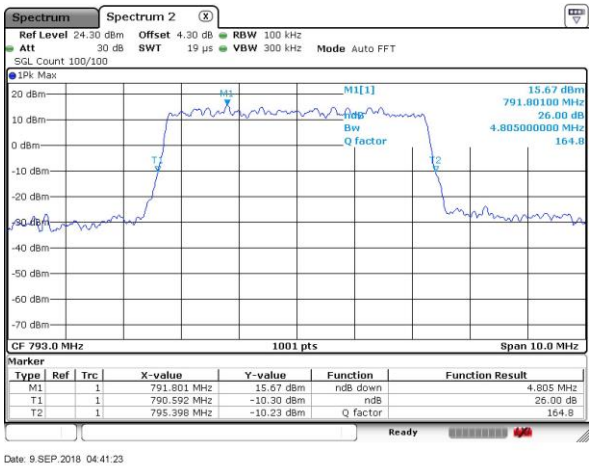
Lowest Channel / 5MHz / QPSK



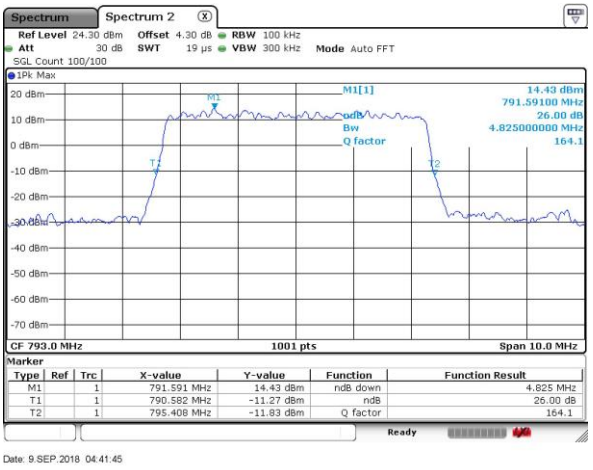
Lowest Channel / 5MHz / 16QAM



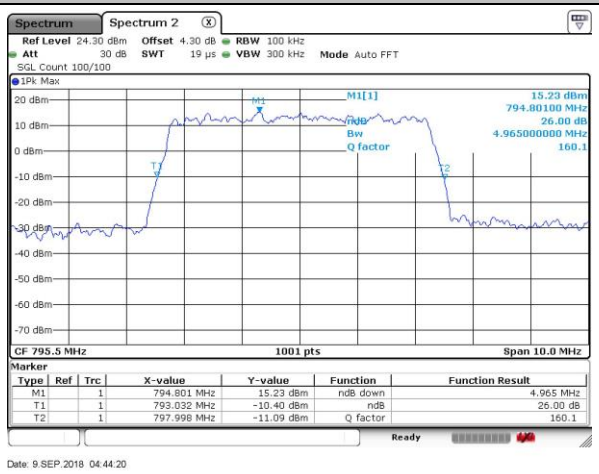
Middle Channel / 5MHz / QPSK



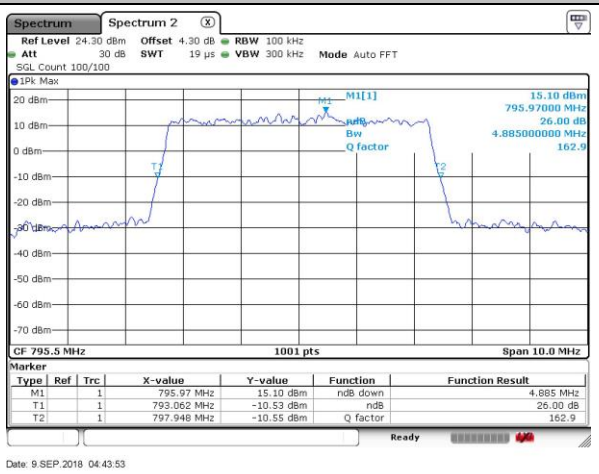
Middle Channel / 5MHz / 16QAM



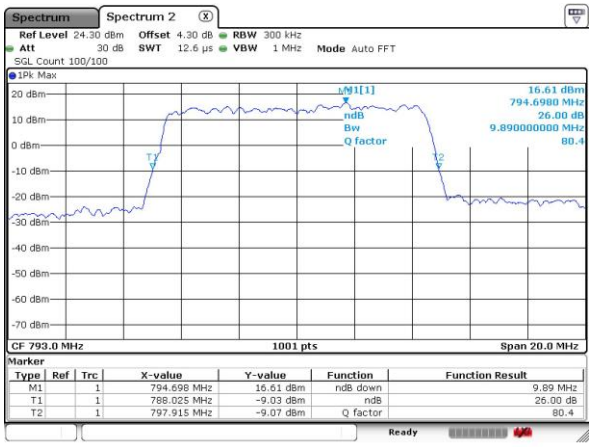
Highest Channel / 5MHz / QPSK

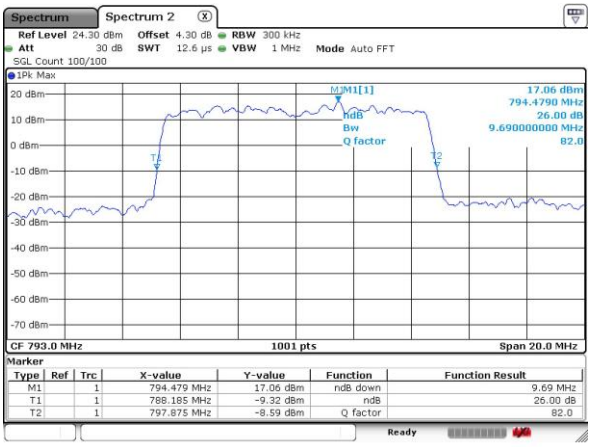


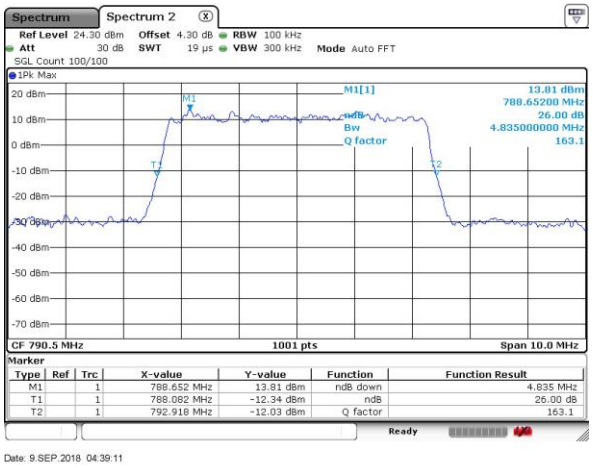
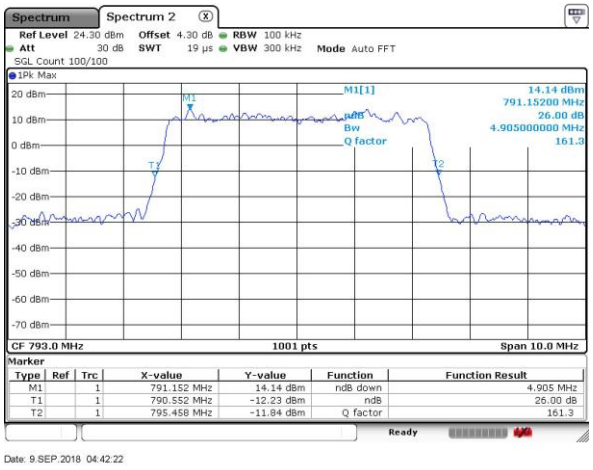
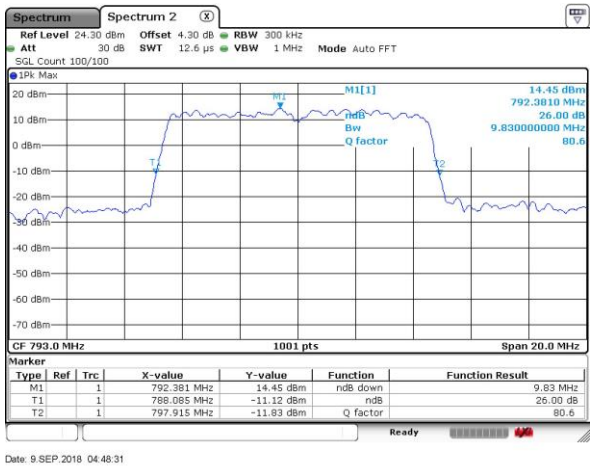
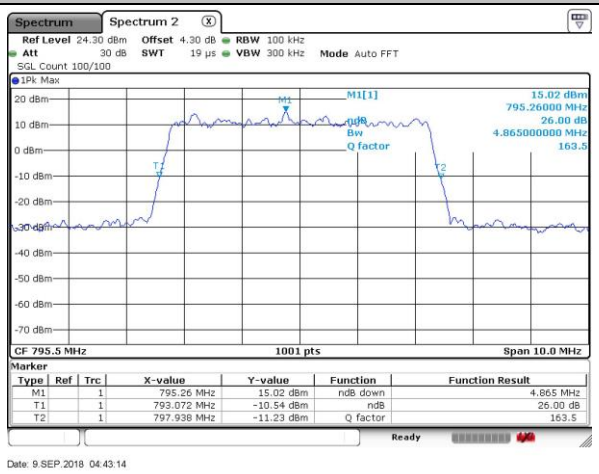
Highest Channel / 5MHz / 16QAM



LTE Band 14	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**





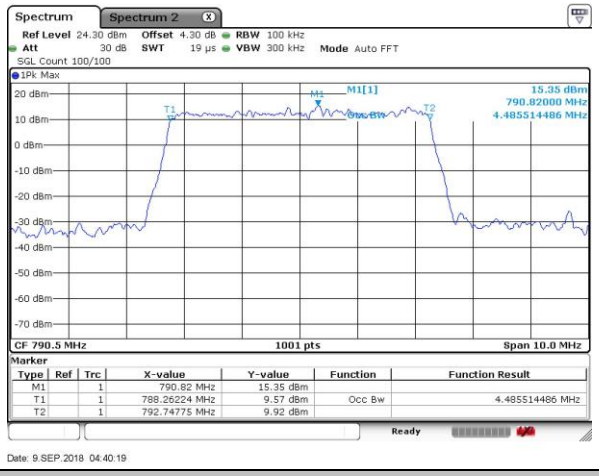
LTE Band 14	
Lowest Channel / 5MHz / 64QAM	**Lowest Channel / 10MHz / 64QAM**
	
Middle Channel / 5MHz / 64QAM	**Middle Channel /10MHz / 64QAM**
	
Highest Channel /5MHz / 64QAM	**Highest Channel /10MHz / 64QAM**
	

Occupied Bandwidth

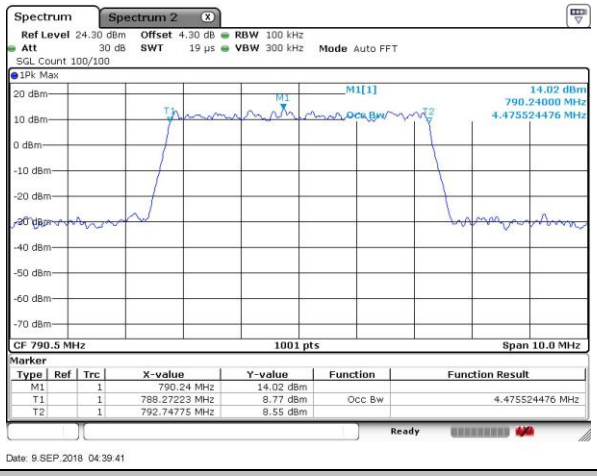
Mode	LTE Band 14 : 99%OBW(MHz)					
BW	5MHz			10MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	4.49	4.48	4.52			
Middle CH	4.49	4.48	4.50	9.03	9.01	9.01
Highest CH	4.48	4.52	4.50			

LTE Band 14

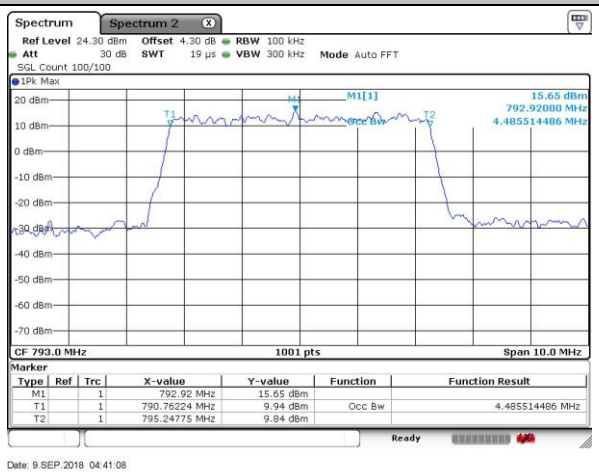
Lowest Channel / 5MHz / QPSK



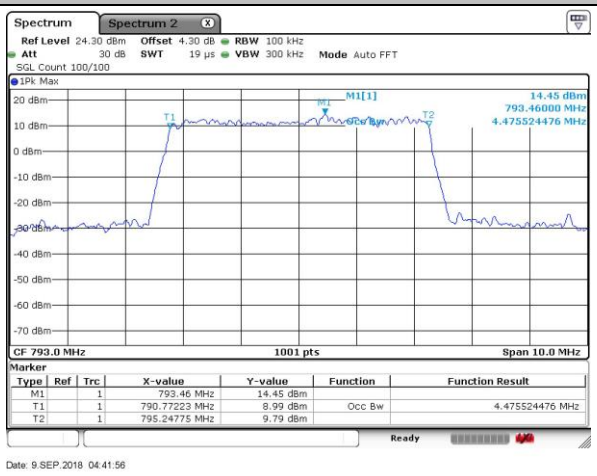
Lowest Channel / 5MHz / 16QAM



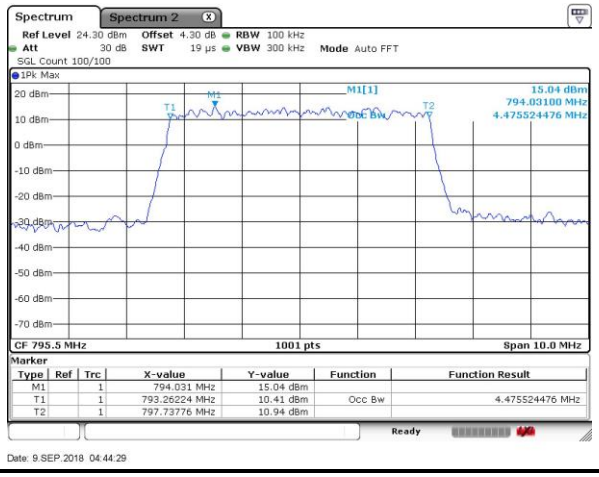
Middle Channel / 5MHz / QPSK



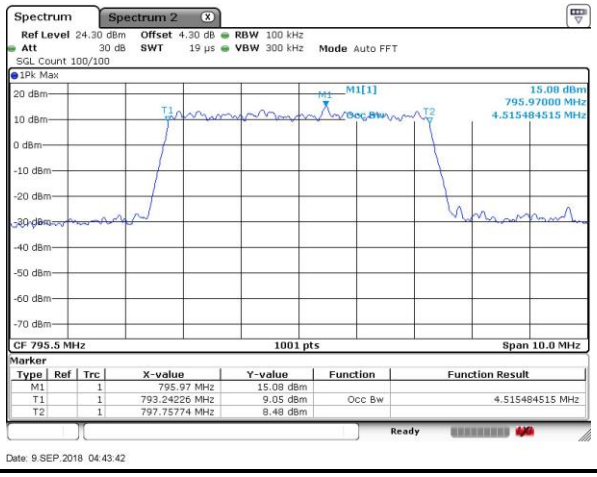
Middle Channel / 5MHz / 16QAM

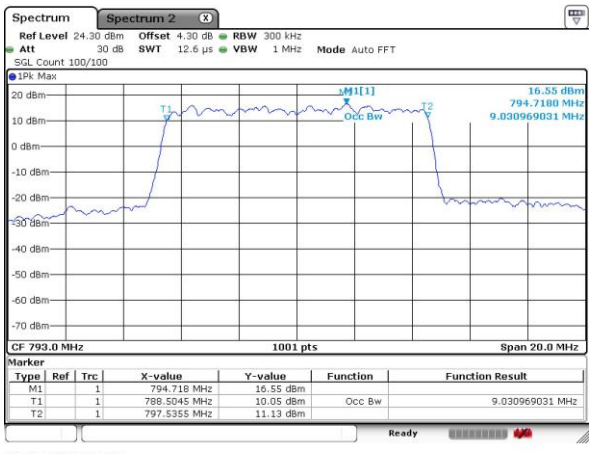
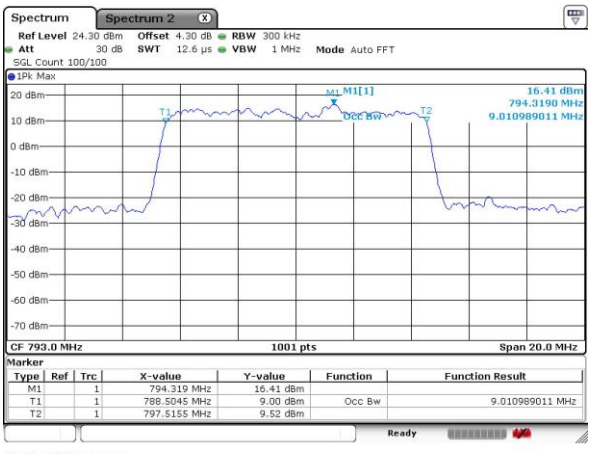


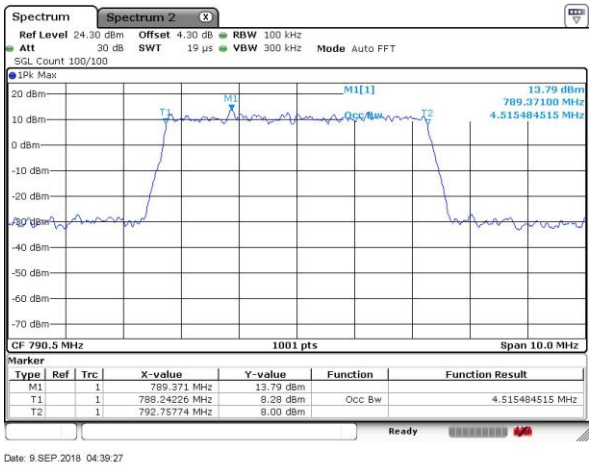
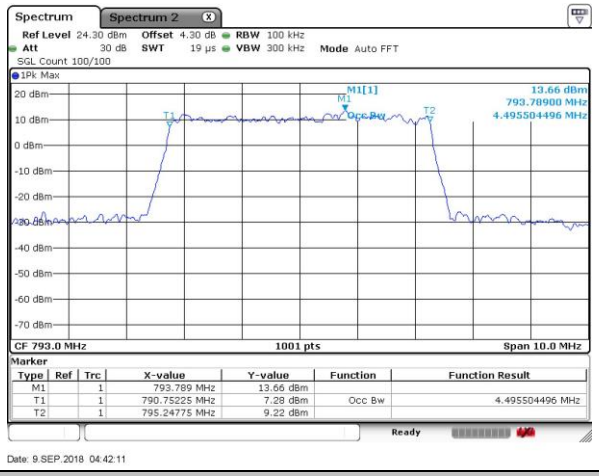
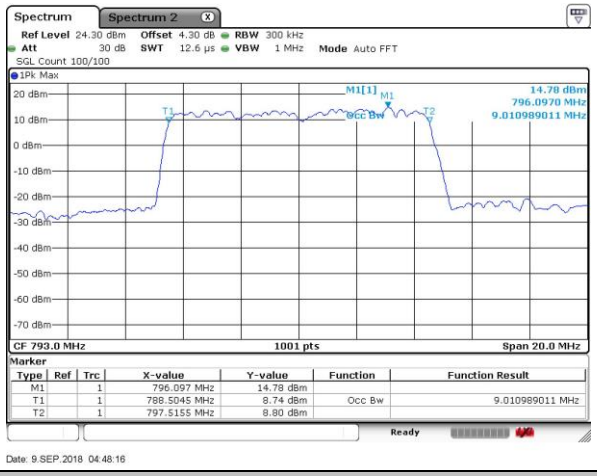
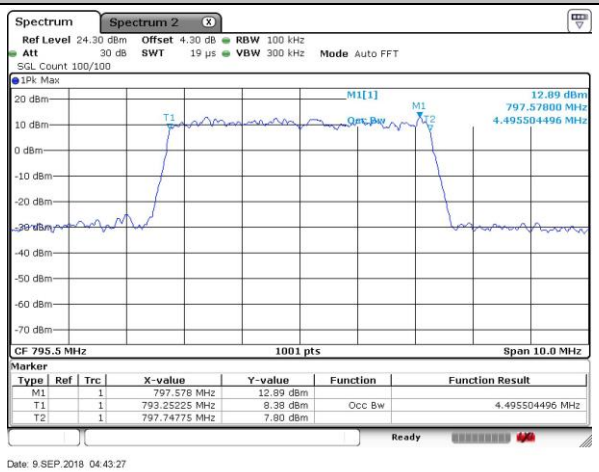
Highest Channel / 5MHz / QPSK



Highest Channel / 5MHz / 16QAM



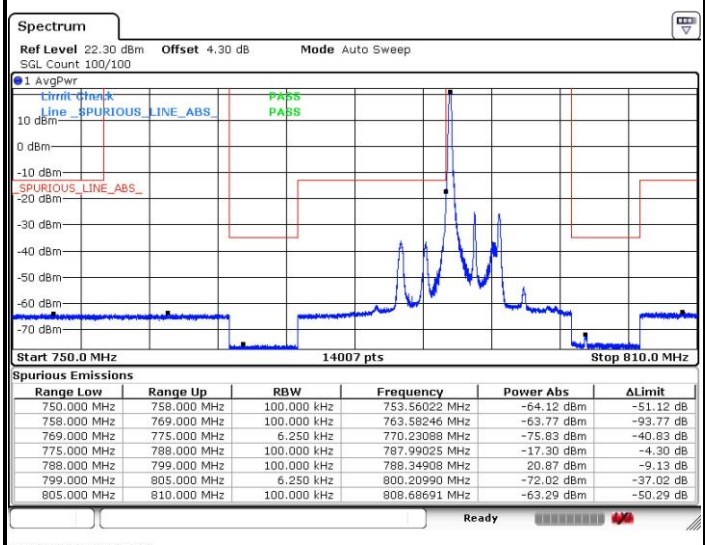
LTE Band 14	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	

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**
	

Conducted Band Edge

LTE Band 14 / 5MHz / QPSK

Lowest Band Edge / 1 RB

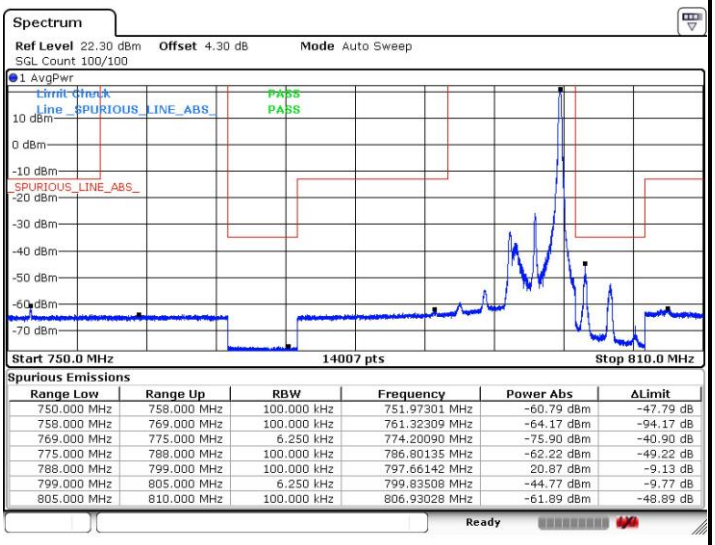


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	753.56022 MHz	-64.12 dBm	-51.12 dB
758.000 MHz	769.000 MHz	100.000 kHz	763.58246 MHz	-63.77 dBm	-93.77 dB
769.000 MHz	775.000 MHz	6.250 kHz	770.23088 MHz	-75.83 dBm	-40.83 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99025 MHz	-17.30 dBm	-4.30 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.34908 MHz	20.87 dBm	-9.13 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.20990 MHz	-72.02 dBm	-37.02 dB
805.000 MHz	810.000 MHz	100.000 kHz	808.68691 MHz	-63.29 dBm	-50.29 dB

Date: 9.SEP.2018 01:41:37

Highest Band Edge / 1 RB

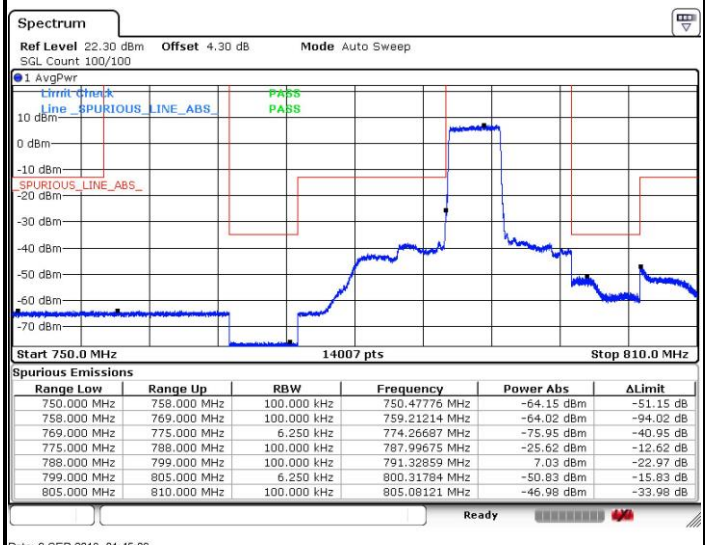


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	751.97301 MHz	-60.79 dBm	-47.79 dB
758.000 MHz	769.000 MHz	100.000 kHz	761.32309 MHz	-64.17 dBm	-94.17 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.20090 MHz	-75.90 dBm	-40.90 dB
775.000 MHz	788.000 MHz	100.000 kHz	786.80135 MHz	-62.22 dBm	-49.22 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.66142 MHz	20.87 dBm	-9.13 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.83508 MHz	-44.77 dBm	-9.77 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.93028 MHz	-61.89 dBm	-48.89 dB

Date: 9.SEP.2018 01:40:47

Lowest Band Edge / Full RB

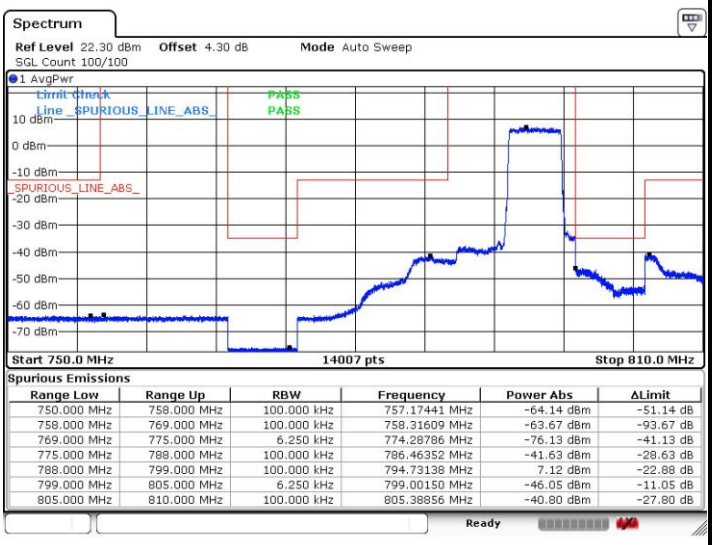


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	750.47776 MHz	-64.15 dBm	-51.15 dB
758.000 MHz	769.000 MHz	100.000 kHz	759.21214 MHz	-64.02 dBm	-94.02 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.26687 MHz	-75.95 dBm	-40.95 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99675 MHz	-25.62 dBm	-12.62 dB
788.000 MHz	799.000 MHz	100.000 kHz	791.32859 MHz	7.03 dBm	-22.97 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.31784 MHz	-50.83 dBm	-15.83 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.08121 MHz	-46.98 dBm	-33.98 dB

Date: 9.SEP.2018 01:45:03

Highest Band Edge / Full RB



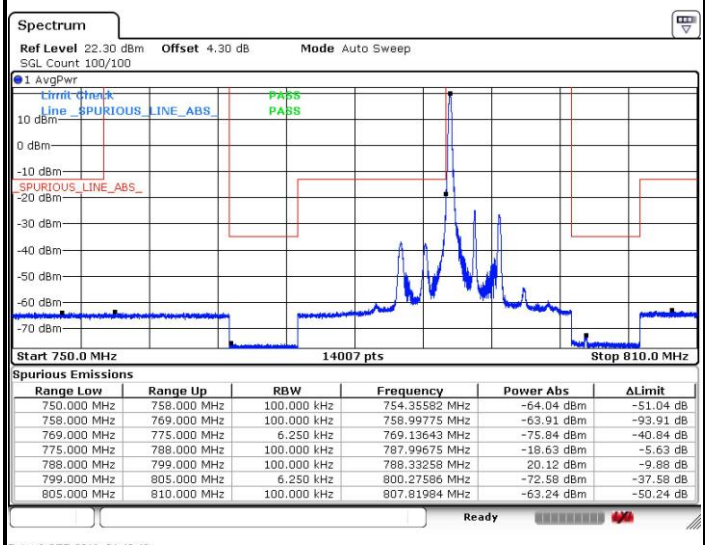
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	757.17441 MHz	-64.14 dBm	-51.14 dB
758.000 MHz	769.000 MHz	100.000 kHz	758.31609 MHz	-63.67 dBm	-93.67 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.28786 MHz	-76.13 dBm	-41.13 dB
775.000 MHz	788.000 MHz	100.000 kHz	786.46352 MHz	-41.63 dBm	-28.63 dB
788.000 MHz	799.000 MHz	100.000 kHz	794.73138 MHz	7.12 dBm	-22.88 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.00150 MHz	-46.05 dBm	-11.05 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.38856 MHz	-40.80 dBm	-27.80 dB

Date: 9.SEP.2018 01:38:04

LTE Band 14 / 5MHz / 16QAM

Lowest Band Edge /1 RB

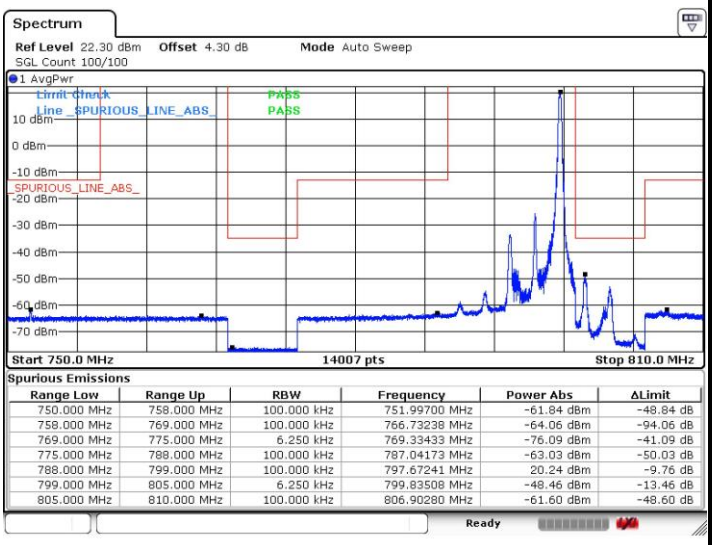


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	754.35582 MHz	-64.04 dBm	-51.04 dB
758.000 MHz	769.000 MHz	100.000 kHz	758.99775 MHz	-63.91 dBm	-93.91 dB
769.000 MHz	775.000 MHz	6.250 kHz	769.13643 MHz	-75.84 dBm	-40.84 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99675 MHz	-18.63 dBm	-5.63 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.33258 MHz	20.12 dBm	-9.88 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.27586 MHz	-72.58 dBm	-37.58 dB
805.000 MHz	810.000 MHz	100.000 kHz	807.81984 MHz	-63.24 dBm	-50.24 dB

Date: 9.SEP.2018 01:42:42

Highest Band Edge / 1 RB

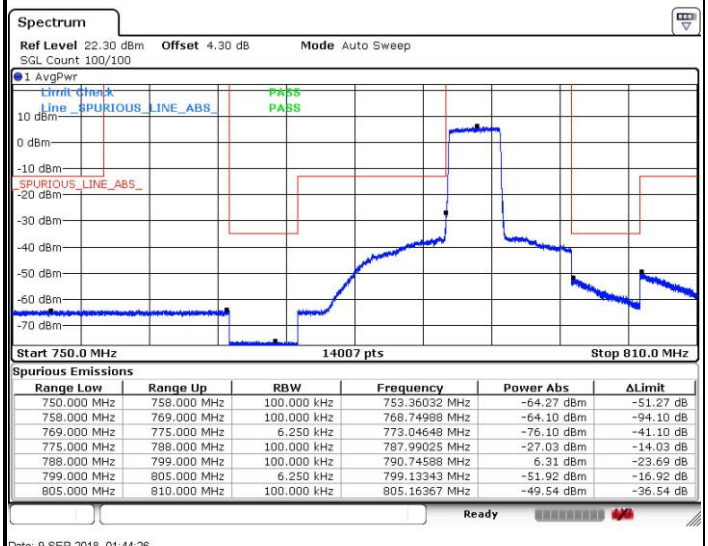


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	751.99700 MHz	-61.84 dBm	-48.84 dB
758.000 MHz	769.000 MHz	100.000 kHz	766.73238 MHz	-64.06 dBm	-94.06 dB
769.000 MHz	775.000 MHz	6.250 kHz	769.33433 MHz	-76.09 dBm	-41.09 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.04173 MHz	-63.03 dBm	-50.03 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.67241 MHz	20.24 dBm	-9.76 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.83508 MHz	-48.46 dBm	-13.46 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.90280 MHz	-61.60 dBm	-48.60 dB

Date: 9.SEP.2018 01:40:17

Lowest Band Edge / Full RB

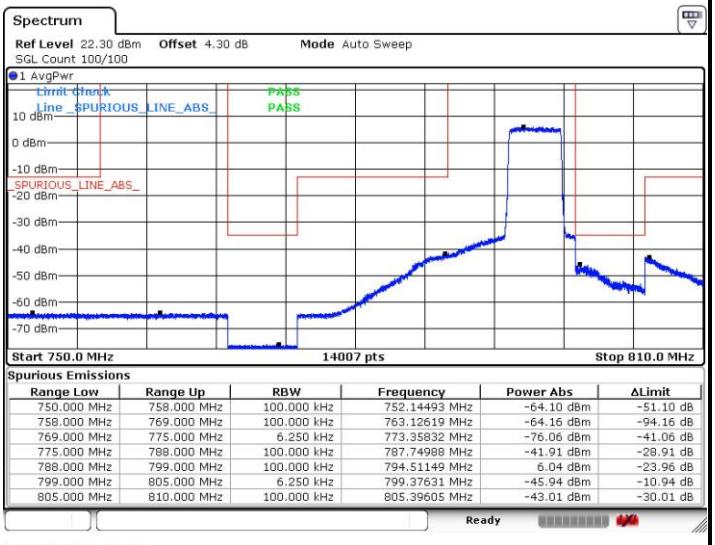


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	753.36032 MHz	-64.27 dBm	-51.27 dB
758.000 MHz	769.000 MHz	100.000 kHz	768.74988 MHz	-64.10 dBm	-94.10 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.04648 MHz	-76.10 dBm	-41.10 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99025 MHz	-27.03 dBm	-14.03 dB
788.000 MHz	799.000 MHz	100.000 kHz	790.74588 MHz	6.31 dBm	-23.69 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.13343 MHz	-51.92 dBm	-16.92 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.16367 MHz	-49.54 dBm	-36.54 dB

Date: 9.SEP.2018 01:44:26

Highest Band Edge / Full RB



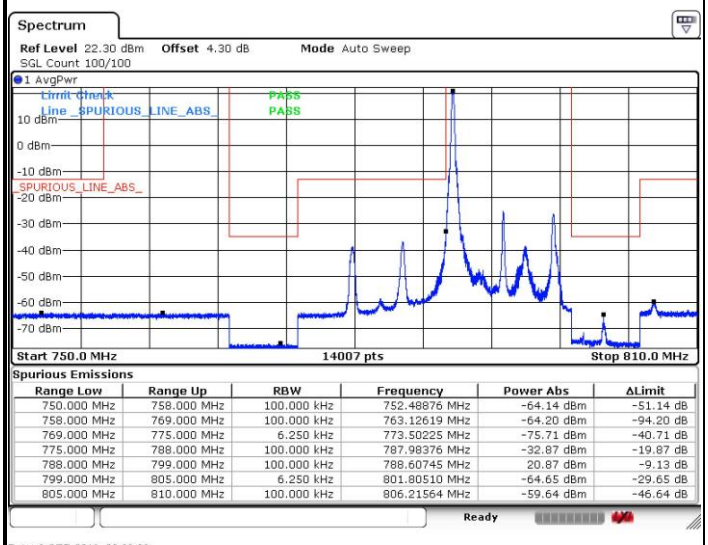
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	752.14493 MHz	-64.10 dBm	-51.10 dB
758.000 MHz	769.000 MHz	100.000 kHz	763.12619 MHz	-64.16 dBm	-94.16 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.35832 MHz	-76.06 dBm	-41.06 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.74988 MHz	-41.91 dBm	-28.91 dB
788.000 MHz	799.000 MHz	100.000 kHz	794.51149 MHz	6.04 dBm	-23.96 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.37631 MHz	-45.94 dBm	-10.94 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.39605 MHz	-43.01 dBm	-30.01 dB

Date: 9.SEP.2018 01:38:37

LTE Band 14 / 10MHz / QPSK

Lowest Band Edge / 1 RB

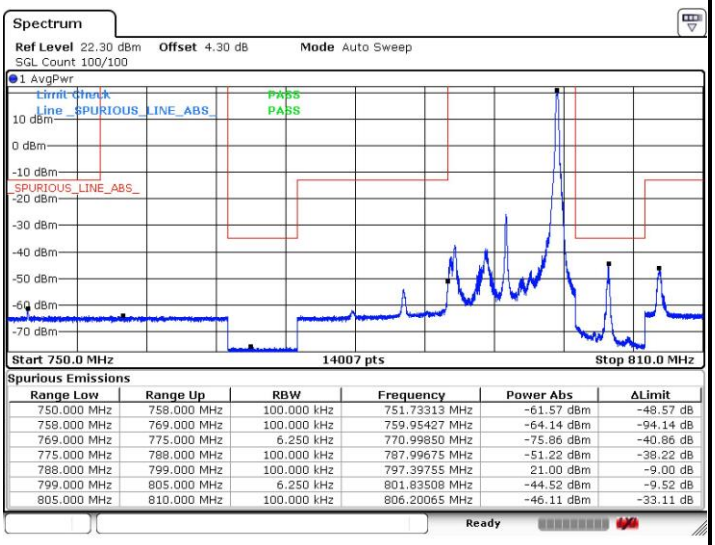


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	752.48876 MHz	-64.14 dBm	-51.14 dB
758.000 MHz	769.000 MHz	100.000 kHz	763.12619 MHz	-64.20 dBm	-94.20 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.50225 MHz	-75.71 dBm	-40.71 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.98376 MHz	-32.87 dBm	-19.87 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.60745 MHz	20.87 dBm	-9.13 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.80510 MHz	-64.65 dBm	-29.65 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.21564 MHz	-59.64 dBm	-46.64 dB

Date: 9.SEP.2018 02:33:39

Highest Band Edge / 1 RB

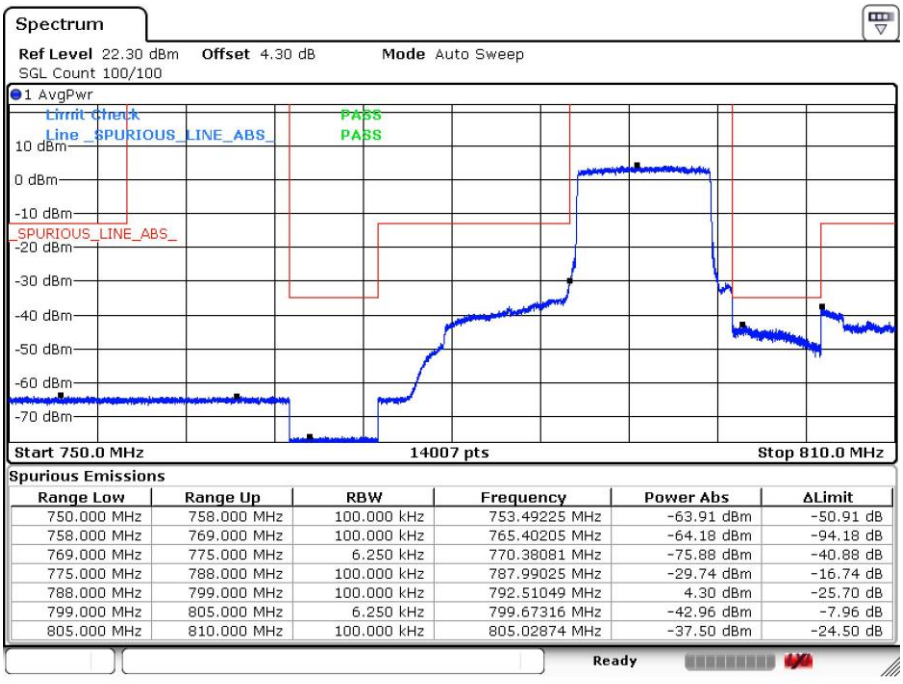


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	751.73313 MHz	-61.57 dBm	-48.57 dB
758.000 MHz	769.000 MHz	100.000 kHz	759.95427 MHz	-64.14 dBm	-94.14 dB
769.000 MHz	775.000 MHz	6.250 kHz	770.99850 MHz	-75.86 dBm	-40.86 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99675 MHz	-51.22 dBm	-38.22 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.39755 MHz	21.00 dBm	-9.00 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.83508 MHz	-44.52 dBm	-9.52 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.20065 MHz	-46.11 dBm	-33.11 dB

Date: 9.SEP.2018 02:34:08

Band Edge / Full RB



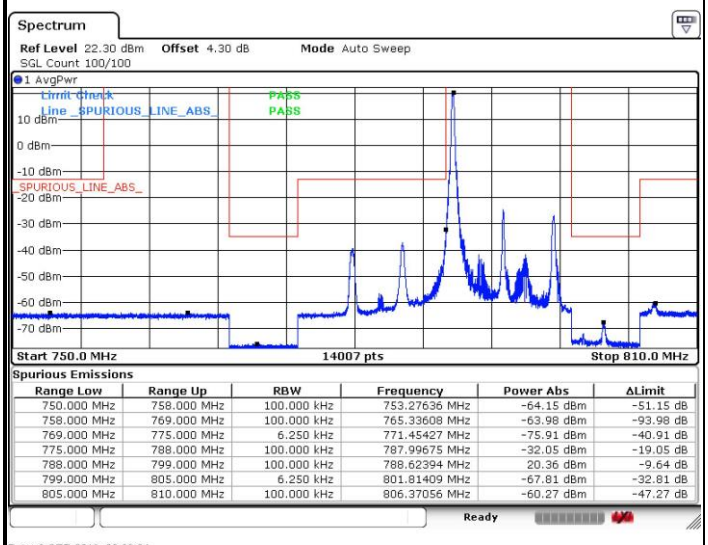
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	753.49225 MHz	-63.91 dBm	-50.91 dB
758.000 MHz	769.000 MHz	100.000 kHz	765.40205 MHz	-64.18 dBm	-94.18 dB
769.000 MHz	775.000 MHz	6.250 kHz	770.38081 MHz	-75.88 dBm	-40.88 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99025 MHz	-29.74 dBm	-16.74 dB
788.000 MHz	799.000 MHz	100.000 kHz	792.51049 MHz	4.30 dBm	-25.70 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.67316 MHz	-42.96 dBm	-7.96 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.02874 MHz	-37.50 dBm	-24.50 dB

Date: 9.SEP.2018 02:30:56

LTE Band 14 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

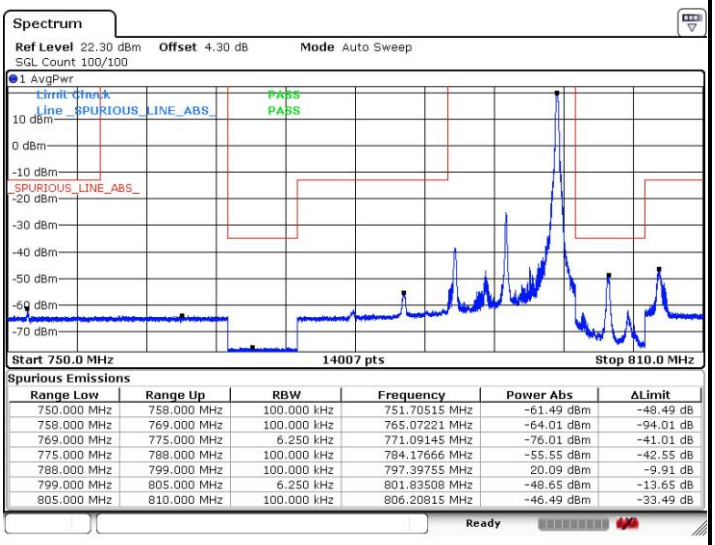


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	753.27636 MHz	-64.15 dBm	-51.15 dB
758.000 MHz	769.000 MHz	100.000 kHz	765.33608 MHz	-63.98 dBm	-93.98 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.45427 MHz	-75.91 dBm	-40.91 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99675 MHz	-32.05 dBm	-19.05 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.62394 MHz	20.36 dBm	-9.64 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.81409 MHz	-67.81 dBm	-32.81 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.37056 MHz	-60.27 dBm	-47.27 dB

Date: 9.SEP.2018 02:33:04

Highest Band Edge / 1 RB

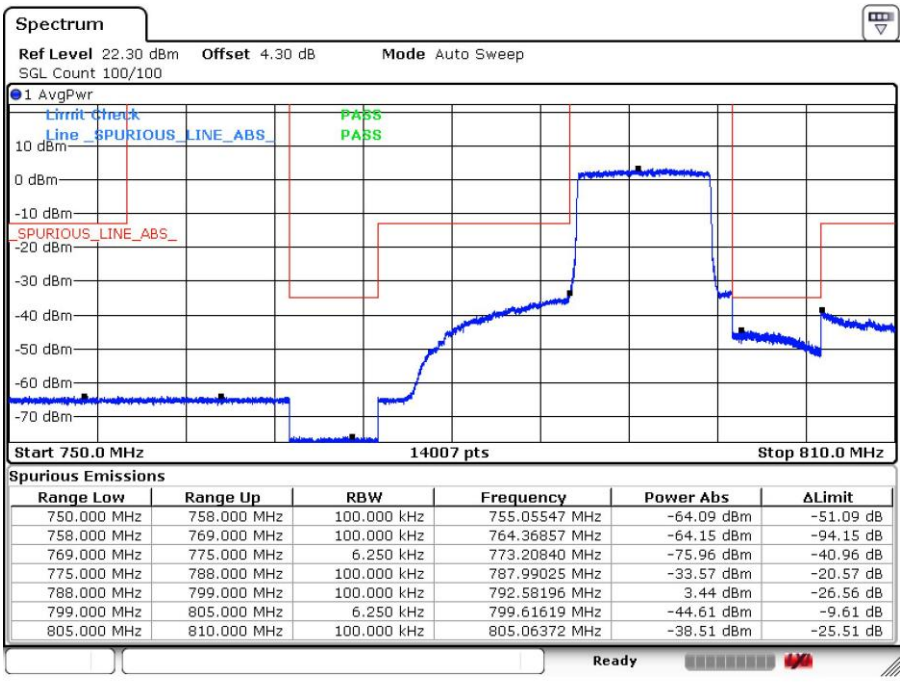


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	751.70515 MHz	-61.49 dBm	-48.49 dB
758.000 MHz	769.000 MHz	100.000 kHz	765.07221 MHz	-64.01 dBm	-94.01 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.09145 MHz	-76.01 dBm	-41.01 dB
775.000 MHz	788.000 MHz	100.000 kHz	784.17666 MHz	-55.55 dBm	-42.55 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.39755 MHz	20.09 dBm	-9.91 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.83508 MHz	-48.65 dBm	-13.65 dB
805.000 MHz	810.000 MHz	100.000 kHz	806.20815 MHz	-46.49 dBm	-33.49 dB

Date: 9.SEP.2018 02:35:08

Band Edge / Full RB



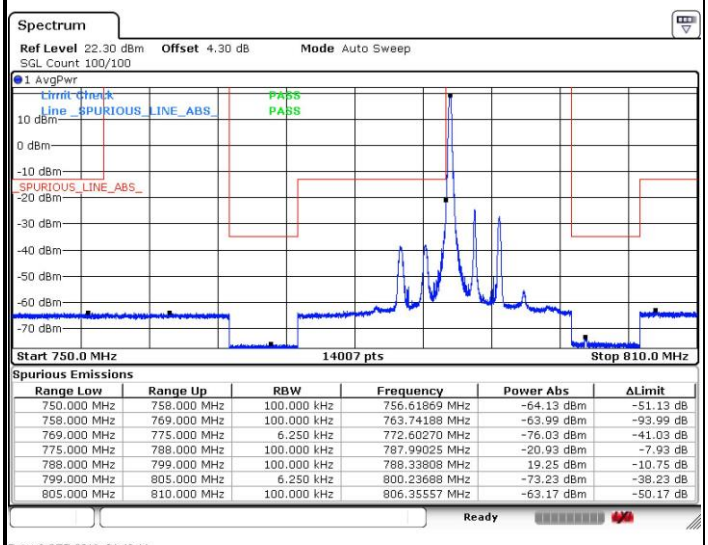
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
750.000 MHz	758.000 MHz	100.000 kHz	755.05547 MHz	-64.09 dBm	-51.09 dB
758.000 MHz	769.000 MHz	100.000 kHz	764.36857 MHz	-64.15 dBm	-94.15 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.20840 MHz	-75.96 dBm	-40.96 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99025 MHz	-33.57 dBm	-20.57 dB
788.000 MHz	799.000 MHz	100.000 kHz	792.58196 MHz	3.44 dBm	-26.56 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.61619 MHz	-44.61 dBm	-9.61 dB
805.000 MHz	810.000 MHz	100.000 kHz	805.06372 MHz	-38.51 dBm	-25.51 dB

Date: 9.SEP.2018 02:31:36

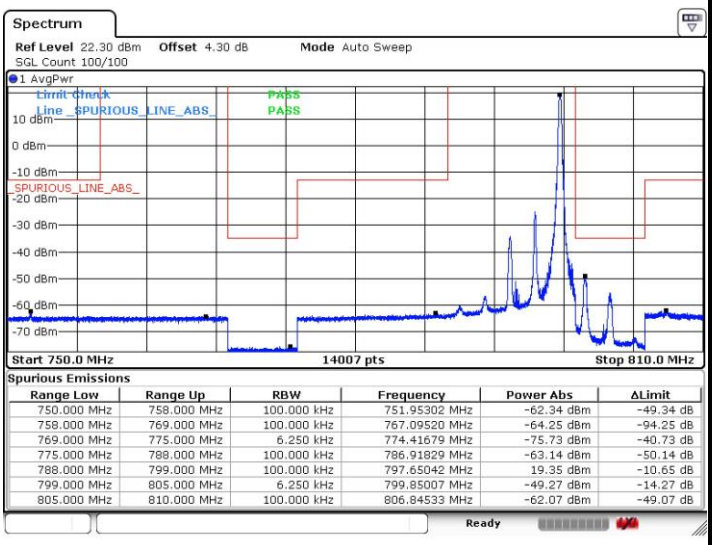
LTE Band 14 / 5MHz / 64QAM

Lowest Band Edge / 1 RB



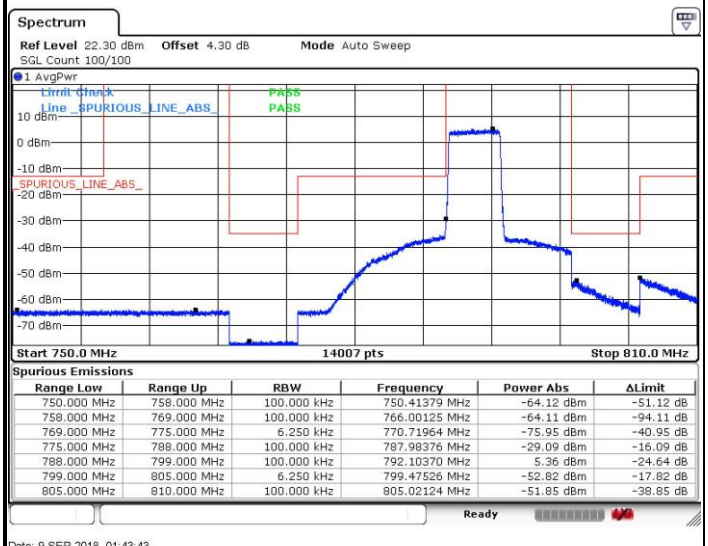
Date: 9.SEP.2018 01:43:11

Highest Band Edge / 1 RB



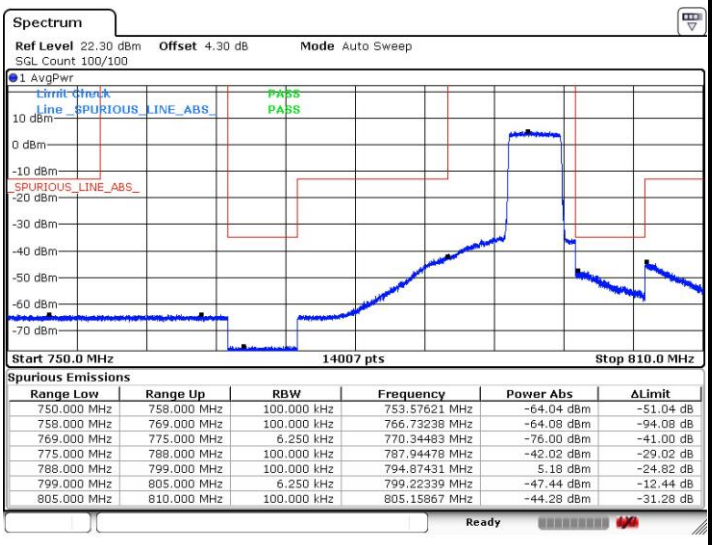
Date: 9.SEP.2018 01:39:42

Lowest Band Edge / Full RB



Date: 9.SEP.2018 01:43:43

Highest Band Edge / Full RB



Date: 9.SEP.2018 01:39:05