FCC RADIO TEST REPORT

FCC ID	:	**PY7-12644I**
Equipment	:	**GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, and NFC**
Brand Name	:	**Sony**
Applicant	:	**Sony Mobile Communications Inc. 4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan**
Manufacturer	:	**Sony Mobile Communications Inc. 4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan**
Standard	:	**FCC 47 CFR Part 2, 22(H), 27**

The product was received on Jul. 20, 2020 and testing was started from Aug. 20, 2020 and completed on Aug. 25, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, 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 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.

Louis Wu

Approved by: Louis Wu

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

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History of this test report

Report No.	Version	Description	Issued Date
FG042243-01B	01	Initial issue of report	Sep. 01, 2020
FG042243-01B	02	Revise list of measuring equipment	Sep. 24, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§22.913 (a)(2)	Effective Radiated Power (Band 5) (Band 26)	Pass	
	§27.50 (b)(10)	Effective Radiated Power (Band 13) (Band 17)		
	§27.50 (h)(2)	Equivalent Isotropic Radiated Power (Band 7) (Band 38) (Band 41)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (Band 4)		
3.3	§24.232 (d) §27.50 (d)(5)	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §22.917 (a) §27.53 (c)(2)(4)	Conducted Band Edge Measurement (Band 4) (Band 5) (Band 13) (Band 17) (Band 26)	Pass	-
	§2.1051 §27.53 (m)(4)	Conducted Band Edge Measurement (Band 7) (Band 38) (Band 41)		
3.6	§2.1051 §22.917 (a) §27.53 (c)(2)	Conducted Spurious Emission (Band 4) (Band 5) (Band 13) (Band 17) (Band 26)	Pass	-
	§2.1051 §27.53 (m)(4)	Conducted Spurious Emission (Band 7) (Band 38) (Band 41)		
3.7	§2.1055 §22.355 §27.54	Frequency Stability Temperature & Voltage	Pass	-

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
4.2	§2.1053 §22.917 (a) §27.53 (c)(2) §27.53 (f)	Radiated Spurious Emission (Band 4) (Band 5) (Band 13) (Band 17) (Band 26)	Pass	Under limit 11.25 dB at 1560.000 MHz
	§2.1051 §27.53 (m)(4)	Radiated Spurious Emission (Band 7) (Band 38) (Band 41)		

Remark: The FCC ID: PY7-12644I and FCC ID: PY7-23855M are HW identical, the difference is only SW, and each supported bands are handled by only SW. Only LTE Band 5, 7, and 13 are added in this report.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang
Report Producer: Cindy Liu

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n/ac/ax, FM Receiver, NFC and GNSS.

Product Specification subjective to this standard	
Antenna Type	Loop Antenna

EUT Information List			
HW Version	SW Version	S/N	Performed Test Item
A	9.60	QV7100D23Z	Conducted Measurement
		QV7100DA3Z	Radiated Spurious Emission
		QV71007J3Z	ERP/EIRP Test

Accessory List	
AC Adapter	Model Name : UCH32
	S/N: 6218W30200215
Earphone	Model Name : STH40D
	S/N : N/A
USB Cable	Model Name.: UCB24
	S/N : N/A

Note:

1. Above EUT list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report. .
3. For other wireless features of this EUT, test report will be issued separately.

1.2 Modification of EUT

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

1.3 Emission Designator

LTE Band 5		QPSK			16QAM			64QAM		
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)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	824.7 ~ 848.3	1M09G7D	-	0.0281	1M09W7D	-	0.0243	1M09W7D	-	0.0189
3	825.5 ~ 847.5	2M72G7D	-	0.0279	2M72W7D	-	0.0245	2M73W7D	-	0.0192
5	826.5 ~ 846.5	4M52G7D	-	0.0281	4M49W7D	-	0.0243	4M51W7D	-	0.0191
10	829.0 ~ 844.0	9M03G7D	0.0149	0.0281	8M99W7D	-	0.0244	9M05W7D	-	0.0187
LTE Band 7		QPSK			16QAM			64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
5	2502.5 ~ 2567.5	4M52G7D	-	0.0244	4M51W7D	-	0.0235	4M52W7D	-	0.0230
10	2505.0 ~ 2565.0	9M01G7D	0.0068	0.0226	9M03W7D	-	0.0234	9M05W7D	-	0.0232
15	2507.5 ~ 2562.5	13M5G7D	-	0.0228	13M5W7D	-	0.0237	13M4W7D	-	0.0232
20	2510.0 ~ 2560.0	18M0G7D	-	0.0226	17M9W7D	-	0.0237	17M9W7D	-	0.0233
LTE Band 13		QPSK			16QAM			64QAM		
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)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
5	779.5 ~ 784.5	4M51G7D	-	0.0391	4M49W7D	-	0.0318	4M49W7D	-	0.0248
10	782.0	8M99G7D	0.0152	0.0391	9M01W7D	-	0.0318	8M97W7D	-	0.0251

1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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
Test Engineer	Sherry Wu
Temperature	23~25℃
Relative Humidity	53~55%

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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.**
	03CH15-HY
Test Engineer	Leo Lee, Mancy Chou and Bigshow Wang
Temperature	23.2~24.9℃
Relative Humidity	44~52%

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

FCC Designation No.: TW1190 and TW0007

1.5 Applicable Standards

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

- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 22(H), 27
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site 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.
3. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

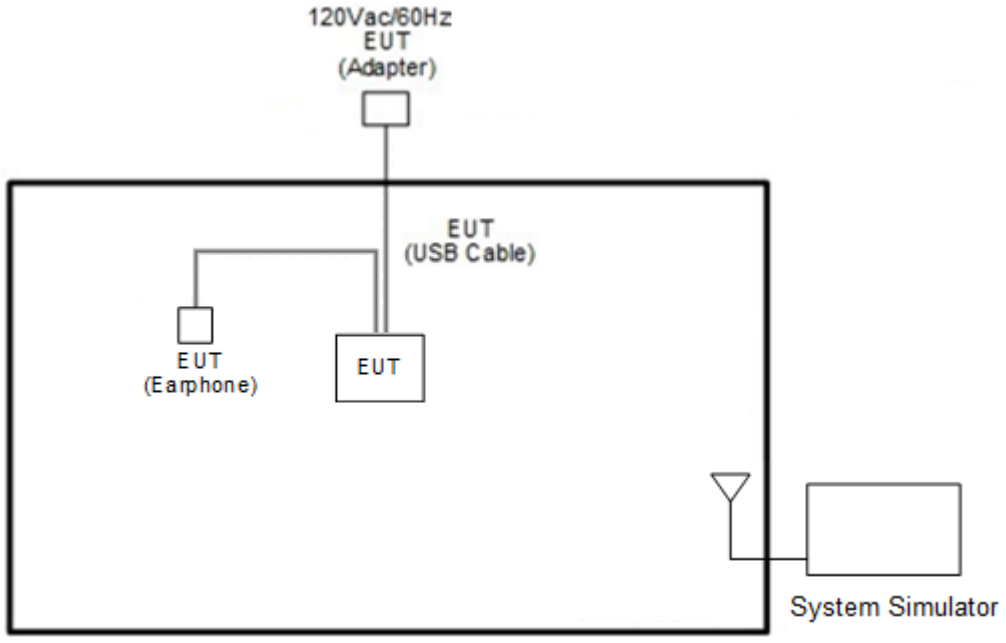
Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X Plane with Accessory for Band 7 and Z Plane with Accessory for Band 5, 13) were recorded in this report.

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Conducted Band Edge	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v
	7	-	-	v	v	v	v	v	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	5				v	-	-	v	v	v	v		v	v	v	v
	7	-	-				v	v	v	v	v		v	v	v	v
	13	-	-		v	-	-	v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	5	v	v	v	v	-	-	v	v	v			v	v	v	v
	7	-	-	v	v	v	v	v	v	v			v	v	v	v
	13	-	-	v	v	-	-	v	v	v			v	v	v	v
Conducted Band Edge	5	v	v	v	v	-	-	v	v	v	v		v	v		v
	7	-	-	v	v	v	v	v	v	v	v		v	v		v
	13	-	-	v	v	-	-	v	v	v	v		v	v		v
Conducted Spurious Emission	5	v	v	v	v	-	-	v	v	v	v			v	v	v
	7	-	-	v	v	v	v	v	v	v	v			v	v	v
	13	-	-	v	v	-	-	v	v	v	v			v	v	v
Frequency Stability	5				v	-	-	v					v		v	
	7	-	-		v			v					v		v	
	13	-	-		v	-	-	v					v		v	

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
E.R.P / E.I.R.P	5	v	v	v	v	-	-	v	v	v	v	v		v	v	v
	7	-	-	v	v	v	v	v	v	v	v	v		v	v	v
	13	-	-	v	v	-	-	v	v	v	v			v	v	v
Radiated Spurious Emission	5	Worst Case												v	v	v
	7	Worst Case												v	v	v
	13	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. Wider operating range bandwidth covers narrower one when the power is higher or the same.															

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

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

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

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

Example :

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

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 5 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

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

LTE Band 13 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	-	23230	-
	Frequency	-	782	-
5	Channel	23205	23230	23255
	Frequency	779.5	782	784.5

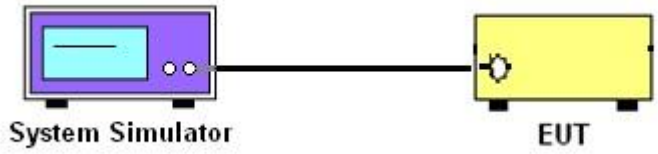
3 Conducted Test Items

3.1 Measuring Instruments

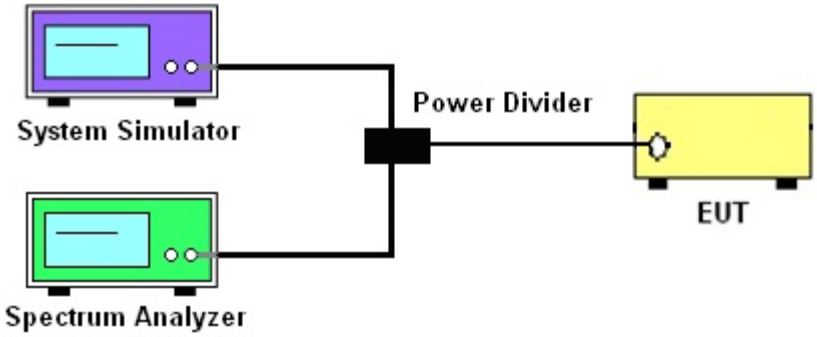
See list of measuring instruments of this test report.

3.1.1 Test Setup

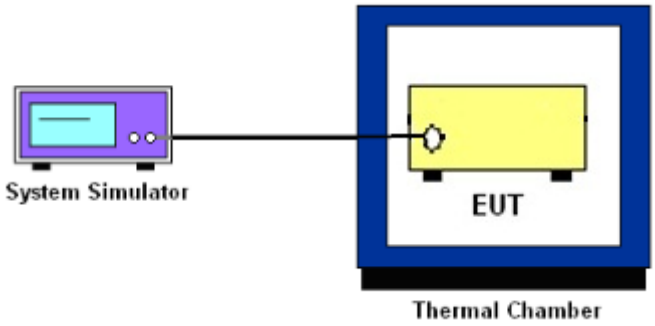
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth ,Conducted Band-Edge 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 and ERP/EIRP

3.2.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

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

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 13

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

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 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.

3.3 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 ANSI C63.26-2015 Section 5.2.6

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 ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

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

3.5.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (c)

For operations in the 776-788 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. In addition, the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least 65 + 10 log10 p(watts), dB, for mobile and portable equipment.

27.53(m)(4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

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

For LTE Band 7

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

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

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a 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)

   For LTE Band 7

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

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

22.355

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 ±0.00025% (±2.5ppm) of the center frequency.

27.54

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

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

3.7.3 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 system simulator.
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.

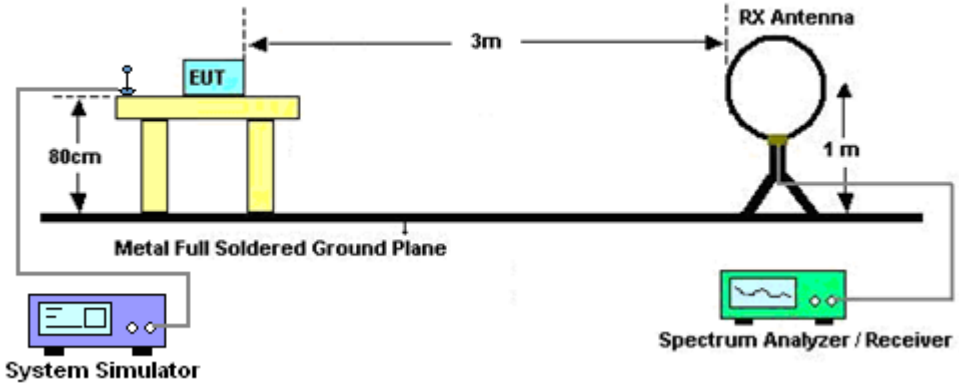
4 Radiated Test Items

4.1 Measuring Instruments

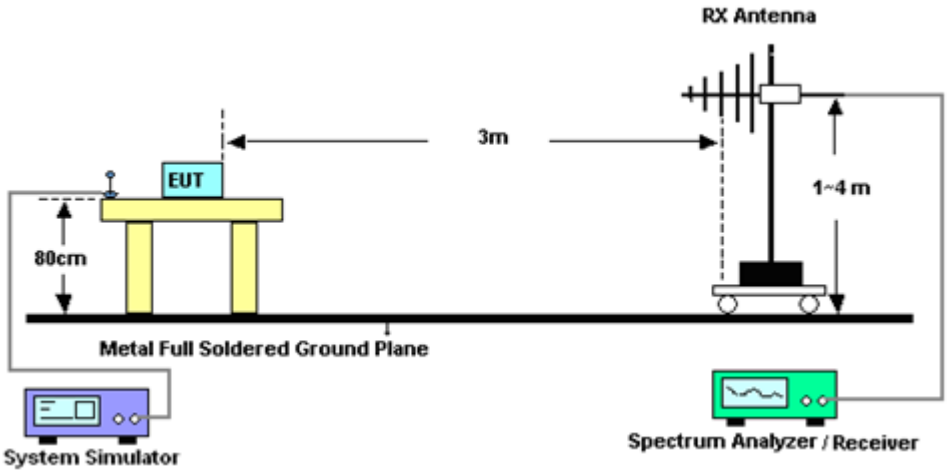
See list of measuring instruments of this test report.

4.1.1 Test Setup

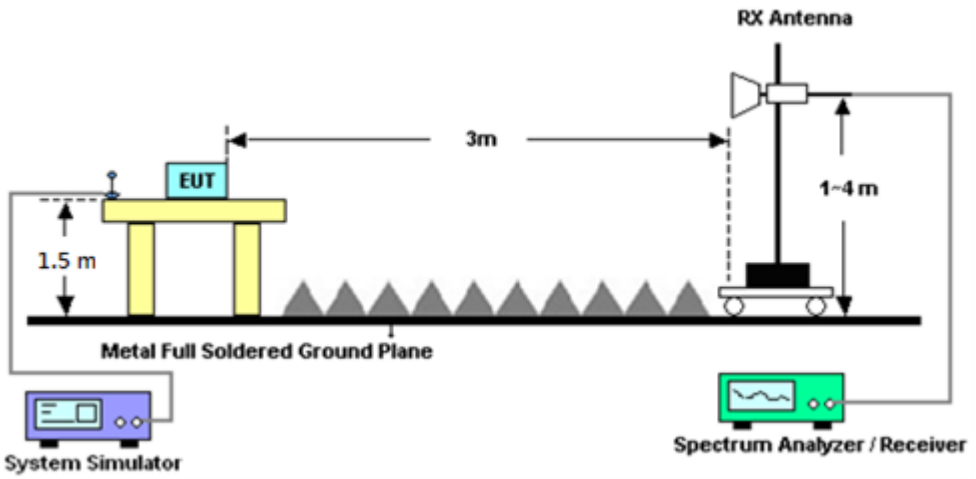
For radiated emissions below 30MHz



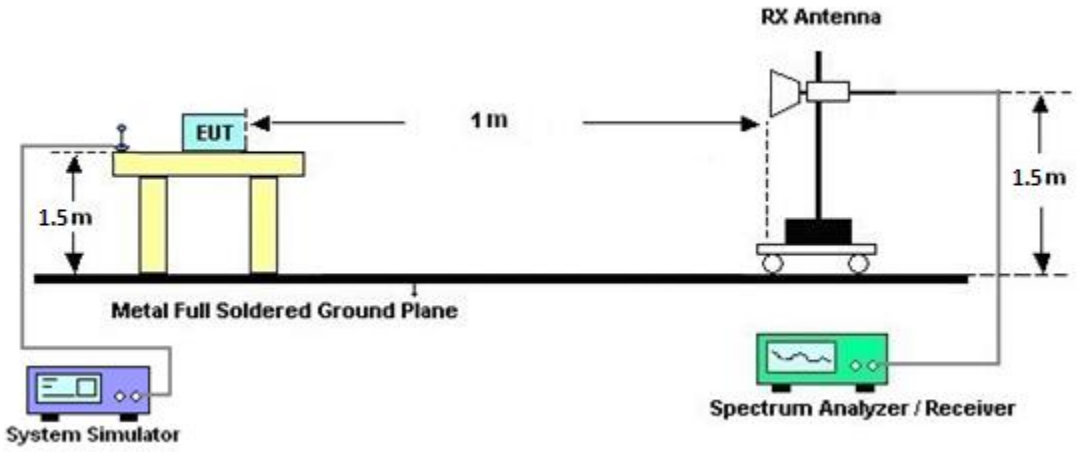
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated emissions above 18GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

4.2 Radiated Spurious Emission Measurement

4.2.1 Description of Radiated Spurious Emission Measurement

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 LTE Band 7

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

For LTE Band 13

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

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

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 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, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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

    For LTE Band 7

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

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

    ERP (dBm) = EIRP - 2.15

5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 09, 2020	Aug. 24, 2020~ Aug. 25, 2020	Jan. 08, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&00800N1D01N-06	41912&05	30MHz to 1GHz	Feb. 09, 2020	Aug. 24, 2020~ Aug. 25, 2020	Feb. 08, 2021	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2019	Aug. 24, 2020~ Aug. 25, 2020	Dec. 26, 2020	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1620	1-18GHz	Oct. 28, 2019	Aug. 24, 2020~ Aug. 25, 2020	Oct. 27, 2020	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Dec. 10, 2019	Aug. 24, 2020~ Aug. 25, 2020	Dec. 09, 2020	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055006	1GHz~18GHz	May 07, 2020	Aug. 24, 2020~ Aug. 25, 2020	May 06, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 21, 2020	Aug. 24, 2020~ Aug. 25, 2020	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Aug. 24, 2020~ Aug. 25, 2020	Dec. 12, 2020	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20MHz~8.4GHz	Nov. 01, 2019	Aug. 24, 2020~ Aug. 25, 2020	Oct. 31, 2020	Radiation (03CH15-HY
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	May 04, 2020	Aug. 24, 2020~ Aug. 25, 2020	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Aug. 24, 2020~ Aug. 25, 2020	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Aug. 24, 2020~ Aug. 25, 2020	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k5)	RK-000451	N/A	N/A	Aug. 24, 2020~ Aug. 25, 2020	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/4	30M-18G	Apr. 14, 2020	Aug. 24, 2020~ Aug. 25, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9838/4PE	30M-18G	Apr. 14, 2020	Aug. 24, 2020~ Aug. 25, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY37710/4	30M-18G	Apr. 17, 2020	Aug. 24, 2020~ Aug. 25, 2020	Apr. 16, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 25, 2020	Aug. 24, 2020~ Aug. 25, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 25, 2020	Aug. 24, 2020~ Aug. 25, 2020	Feb. 24, 2021	Radiation (03CH15-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN4	1.53G Low Pass	Jul. 03, 2020	Aug. 24, 2020~ Aug. 25, 2020	Jul. 02, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-1080-1200-15000-60ST	SN5	1.2GHz High Pass Filter	Jul. 01, 2020	Aug. 24, 2020~ Aug. 25, 2020	Jun. 30, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN4	3GHz High Pass Filter	Sep. 17, 2019	Aug. 24, 2020~ Aug. 25, 2020	Sep. 16, 2020	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN6	6.75GHz High Pass Filter	Jul. 03, 2020	Aug. 24, 2020~ Aug. 25, 2020	Jul. 02, 2021	Radiation (03CH15-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	Aug. 27, 2019	Aug. 24, 2020~ Aug. 25, 2020	Aug. 26, 2020	Radiation (03CH15-HY)
Base Station(Measure)	Anritsu	MT8821C	626200253 41	N/A	Oct. 24, 2019	Aug. 20, 2020~ Aug. 21, 2020	Oct. 23, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 15, 2019	Aug. 20, 2020~ Aug. 21, 2020	Nov. 14, 2020	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SU-241	92003713	-30℃~95℃	May 15, 2020	Aug. 20, 2020~ Aug. 21, 2020	May 14, 2021	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 09, 2019	Aug. 20, 2020~ Aug. 21, 2020	Oct. 08, 2020	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 13, 2020	Aug. 20, 2020~ Aug. 21, 2020	Jan. 12, 2021	Conducted (TH05-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))	**3.06**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.63**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.16**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	**23.54**	23.50	23.49
10	1	25		23.42	23.40	23.42
10	1	49		23.41	23.38	23.32
10	25	0		22.65	22.55	22.55
10	25	12		22.64	22.63	22.54
10	25	25		22.62	22.57	22.57
10	50	0		22.65	22.63	22.54
10	1	0	16-QAM	22.93	22.83	22.88
10	1	25		22.82	22.79	22.80
10	1	49		22.81	22.76	22.70
10	25	0		21.65	21.57	21.51
10	25	12		21.66	21.64	21.54
10	25	25		21.60	21.59	21.55
10	50	0		21.65	21.63	21.52
10	1	0	64-QAM	21.78	21.74	21.73
10	1	25		21.78	21.73	21.72
10	1	49		21.73	21.76	21.64
10	25	0		20.71	20.60	20.59
10	25	12		20.69	20.67	20.59
10	25	25		20.63	20.59	20.60
10	50	0		20.71	20.66	20.59
5	1	0	QPSK	23.50	23.48	23.53
5	1	12		23.41	23.49	23.44
5	1	24		23.34	23.46	23.32
5	12	0		22.60	22.56	22.59
5	12	7		22.57	22.59	22.54
5	12	13		22.57	22.53	22.49
5	25	0		22.60	22.57	22.53
5	1	0	16-QAM	22.86	22.80	22.90
5	1	12		22.74	22.79	22.74
5	1	24		22.80	22.77	22.69
5	12	0		21.62	21.61	21.59
5	12	7		21.66	21.63	21.54
5	12	13		21.56	21.59	21.49
5	25	0		21.65	21.63	21.57
5	1	0	64-QAM	21.69	21.85	21.79
5	1	12		21.70	21.72	21.64
5	1	24		21.65	21.74	21.61
5	12	0		20.68	20.64	20.65
5	12	7		20.68	20.69	20.61
5	12	13		20.55	20.65	20.53
5	25	0		20.67	20.65	20.56

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	23.50	23.44	23.49
3	1	8		23.51	23.48	23.32
3	1	14		23.49	23.42	23.34
3	8	0		22.69	22.53	22.64
3	8	4		22.70	22.61	22.56
3	8	7		22.62	22.54	22.57
3	15	0		22.64	22.58	22.61
3	1	0	16-QAM	22.91	22.79	22.91
3	1	8		22.95	22.85	22.79
3	1	14		22.83	22.75	22.77
3	8	0		21.75	21.63	21.55
3	8	4		21.76	21.63	21.63
3	8	7		21.70	21.63	21.54
3	15	0		21.71	21.57	21.60
3	1	0	64-QAM	21.88	21.69	21.74
3	1	8		21.86	21.79	21.77
3	1	14		21.76	21.69	21.65
3	8	0		20.78	20.64	20.65
3	8	4		20.77	20.63	20.68
3	8	7		20.69	20.59	20.57
3	15	0		20.71	20.59	20.70
1.4	1	0	QPSK	23.51	23.30	23.32
1.4	1	3		23.51	23.42	23.31
1.4	1	5		23.47	23.38	23.22
1.4	3	0		23.53	23.38	23.26
1.4	3	1		23.50	23.48	23.34
1.4	3	3		23.48	23.37	23.30
1.4	6	0		22.60	22.51	22.41
1.4	1	0	16-QAM	22.84	22.67	22.65
1.4	1	3		22.90	22.78	22.68
1.4	1	5		22.79	22.67	22.59
1.4	3	0		22.64	22.45	22.43
1.4	3	1		22.65	22.55	22.28
1.4	3	3		22.57	22.49	22.38
1.4	6	0		21.70	21.61	21.49
1.4	1	0	64-QAM	21.78	21.64	21.54
1.4	1	3		21.81	21.72	21.61
1.4	1	5		21.72	21.62	21.49
1.4	3	0		21.71	21.59	21.46
1.4	3	1		21.79	21.68	21.57
1.4	3	3		21.70	21.62	21.42
1.4	6	0		20.65	20.56	20.41

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	17.81	17.90	18.09
20	1	49		17.85	17.99	18.06
20	1	99		17.94	18.01	18.07
20	50	0		17.90	18.09	18.15
20	50	24		18.03	18.12	18.19
20	50	50		18.06	18.17	18.24
20	100	0		17.99	18.06	18.16
20	1	0	16-QAM	18.14	18.27	18.40
20	1	49		18.18	18.33	**18.45**
20	1	99		18.32	18.38	18.41
20	50	0		17.92	18.09	18.17
20	50	24		18.05	18.12	18.19
20	50	50		18.10	18.23	18.26
20	100	0		18.00	18.08	18.14
20	1	0	64-QAM	18.03	18.12	18.24
20	1	49		18.06	18.23	18.37
20	1	99		18.23	18.31	18.36
20	50	0		17.94	18.13	18.19
20	50	24		18.06	18.18	18.23
20	50	50		18.09	18.23	18.30
20	100	0		18.02	18.13	18.14
15	1	0	QPSK	17.87	17.94	18.11
15	1	37		17.87	18.03	18.09
15	1	74		17.93	18.08	18.13
15	36	0		17.94	18.08	18.16
15	36	20		18.04	18.15	18.28
15	36	39		18.05	18.19	18.25
15	75	0		18.00	18.10	18.15
15	1	0	16-QAM	18.18	18.27	18.41
15	1	37		18.22	18.35	18.41
15	1	74		18.23	18.41	18.44
15	36	0		17.96	18.12	18.18
15	36	20		18.04	18.11	18.26
15	36	39		18.09	18.18	18.27
15	75	0		18.02	18.09	18.15
15	1	0	64-QAM	18.01	18.20	18.29
15	1	37		18.15	18.33	18.36
15	1	74		18.12	18.30	18.34
15	36	0		17.92	18.15	18.20
15	36	20		18.05	18.22	18.32
15	36	39		18.11	18.29	18.29
15	75	0		18.00	18.12	18.18

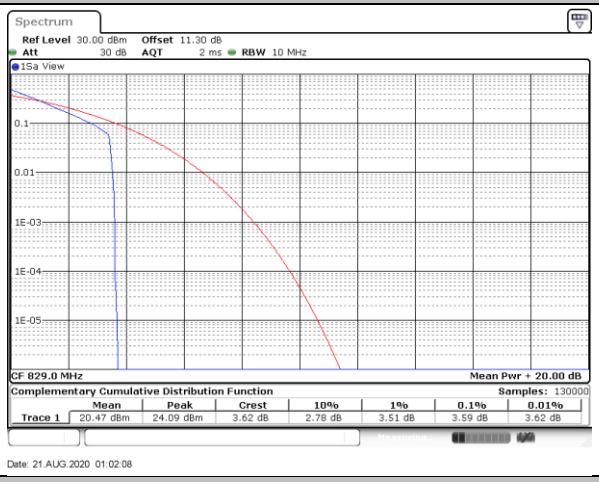
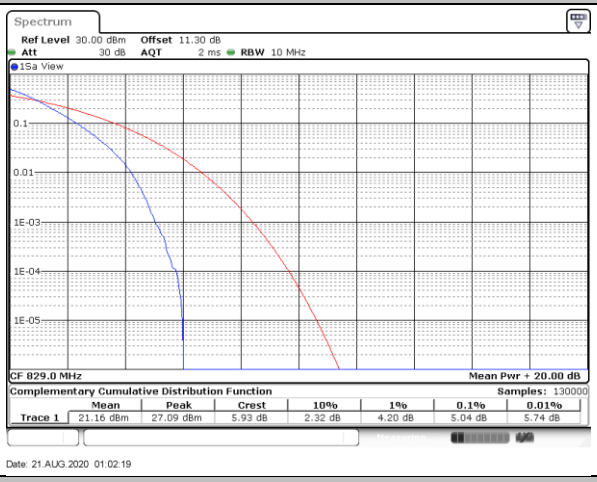
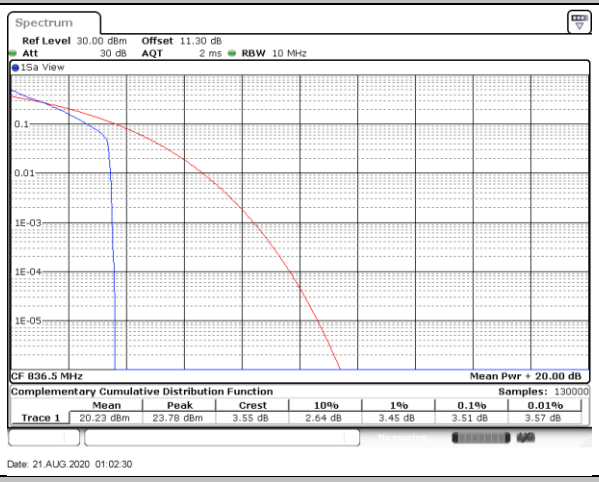
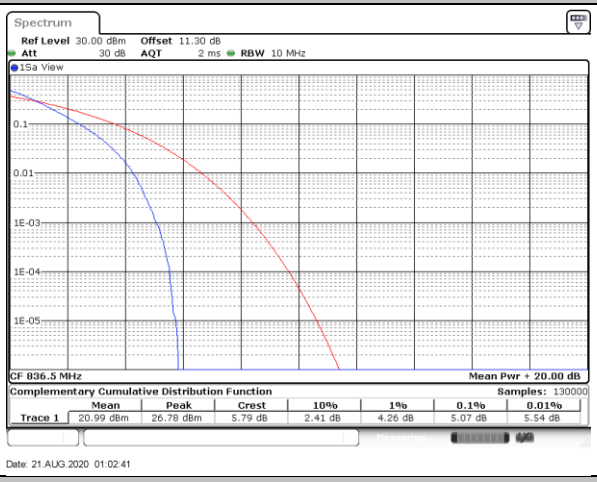
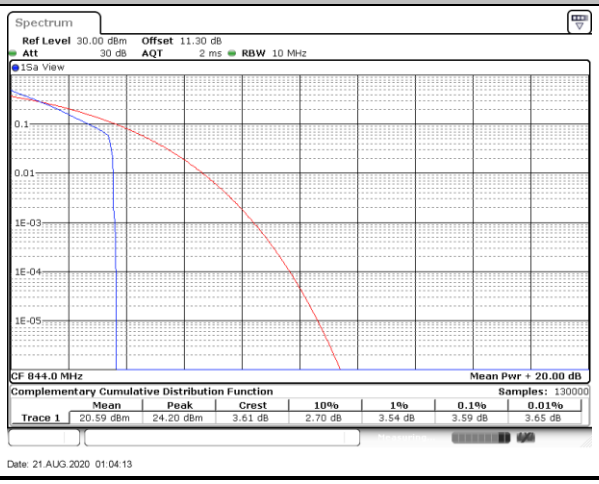
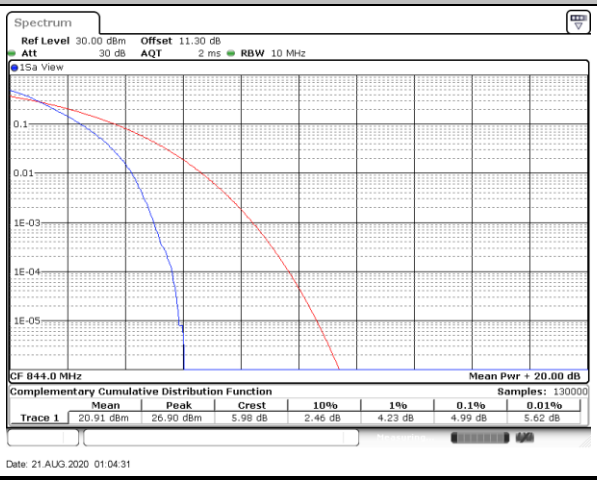
LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	17.77	17.93	18.07
10	1	25		17.77	17.93	18.04
10	1	49		17.88	18.01	18.07
10	25	0		17.91	18.06	18.14
10	25	12		17.96	18.15	18.24
10	25	25		18.00	18.17	18.24
10	50	0		17.91	18.10	18.13
10	1	0	16-QAM	18.11	18.23	18.36
10	1	25		18.21	18.28	18.36
10	1	49		18.15	18.40	18.36
10	25	0		17.87	18.06	18.11
10	25	12		18.00	18.03	18.25
10	25	25		18.01	18.10	18.19
10	50	0		18.01	18.05	18.07
10	1	0	64-QAM	17.96	18.13	18.28
10	1	25		18.11	18.30	18.36
10	1	49		18.10	18.29	18.31
10	25	0		17.85	18.10	18.19
10	25	12		18.05	18.15	18.31
10	25	25		18.10	18.19	18.24
10	50	0		17.97	18.02	18.17
5	1	0	QPSK	17.80	17.92	18.04
5	1	12		17.84	18.03	18.00
5	1	24		17.93	18.03	18.03
5	12	0		17.87	18.05	18.12
5	12	7		18.04	18.06	18.21
5	12	13		17.95	18.16	18.19
5	25	0		17.94	18.01	18.08
5	1	0	16-QAM	18.14	18.25	18.41
5	1	12		18.19	18.32	18.32
5	1	24		18.23	18.34	18.39
5	12	0		17.89	18.04	18.13
5	12	7		18.00	18.03	18.23
5	12	13		18.04	18.14	18.17
5	25	0		17.98	17.99	18.11
5	1	0	64-QAM	17.93	18.11	18.21
5	1	12		18.11	18.23	18.31
5	1	24		18.10	18.26	18.25
5	12	0		17.85	18.09	18.20
5	12	7		18.05	18.21	18.24
5	12	13		18.02	18.25	18.24
5	25	0		17.90	18.03	18.13

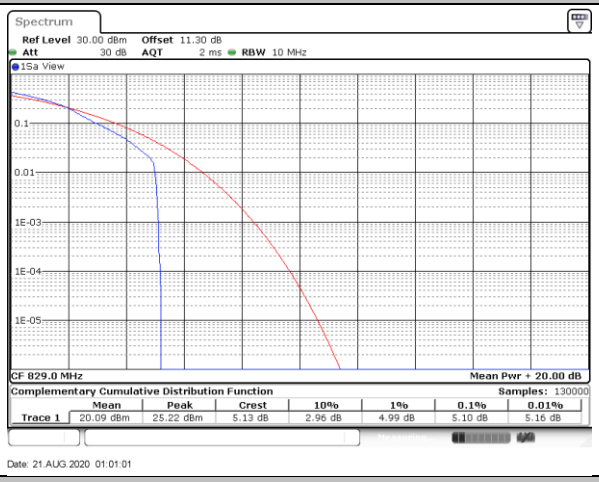
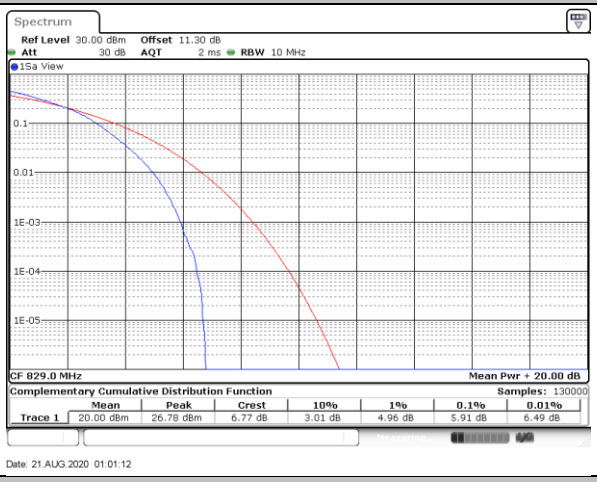
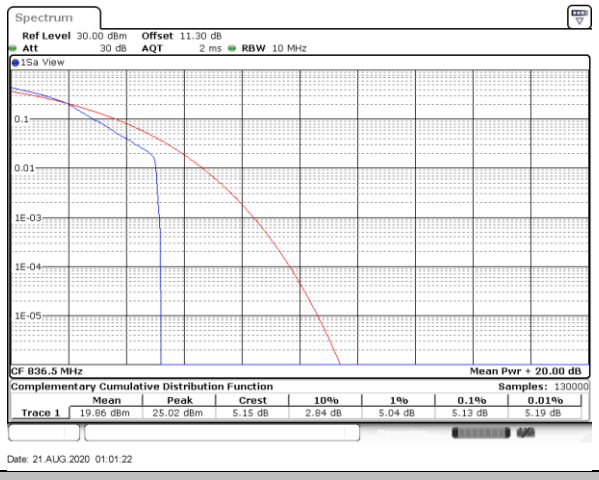
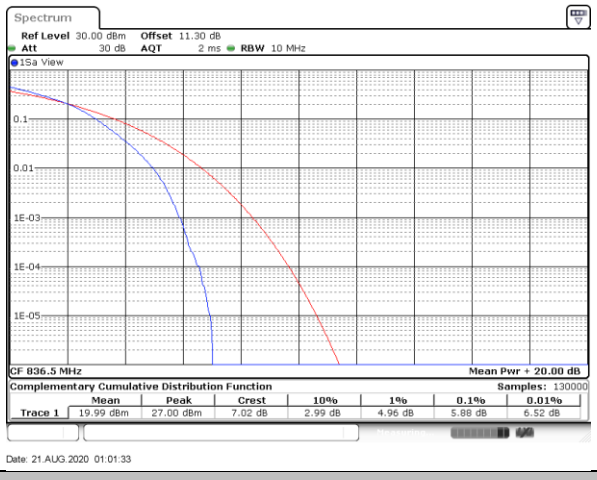
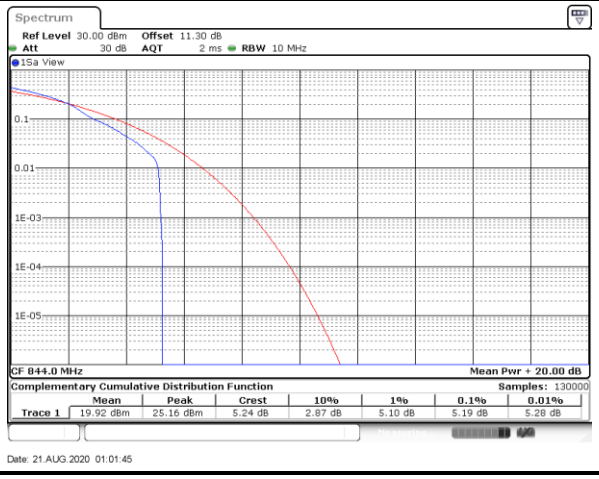
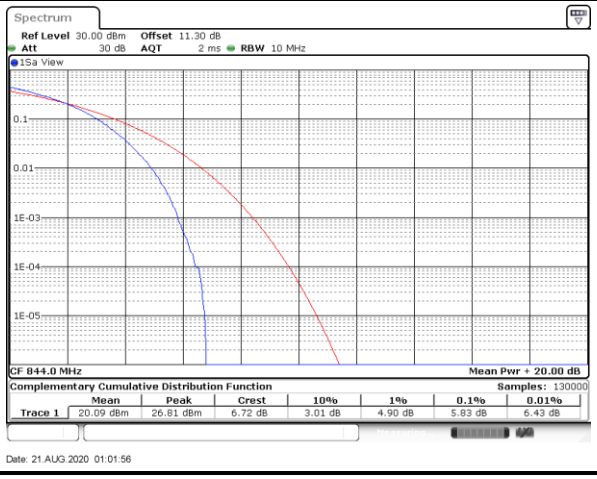
LTE Band 13 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	-	**23.87**	-
10	1	25			23.82	
10	1	49			23.82	
10	25	0			22.93	
10	25	12			22.91	
10	25	25			22.95	
10	50	0			22.92	
10	1	0	16-QAM			
10	1	25			22.97	
	1	49			22.94	
10	25	0			21.93	
10	25	12			21.95	
10	25	25			21.99	
10	50	0			21.97	
10	1	0	64-QAM		21.95	
10	1	25			21.94	
10	1	49			21.91	
10	25	0			21.00	
10	25	12			20.98	
10	25	25			20.92	
10	50	0			20.98	
5	1	0	QPSK	**23.87**	23.86	23.80
5	1	12		23.85	23.86	23.84
5	1	24		23.86	23.82	23.82
5	12	0		22.96	22.95	22.89
5	12	7		22.97	22.92	22.88
5	12	13		22.98	22.97	22.92
5	25	0		22.98	22.89	22.86
5	1	0	16-QAM	22.91	22.94	22.89
5	1	12		22.90	22.93	22.88
5	1	24		22.98	22.94	22.88
5	12	0		21.77	21.74	21.72
5	12	7		21.78	21.75	21.70
5	12	13		21.78	21.78	21.74
5	25	0		21.83	21.75	21.72
5	1	0	64-QAM	21.72	21.78	21.78
5	1	12		21.81	21.86	21.89
5	1	24		21.90	21.86	21.79
5	12	0		20.82	20.84	20.79
5	12	7		20.86	20.80	20.74
5	12	13		20.86	20.87	20.82
5	25	0		20.84	20.75	20.72

LTE Band 5

Peak-to-Average Ratio

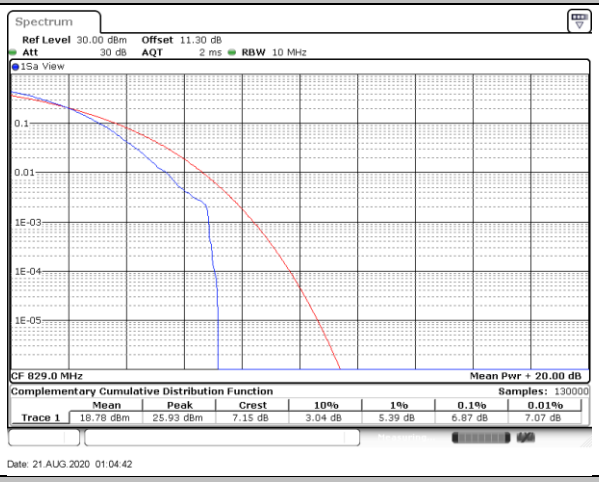
Mode	LTE Band 5 / 10MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	3.59	5.04	5.10	5.91	PASS
Middle CH	3.51	5.07	5.13	5.88	
Highest CH	3.59	4.99	5.19	5.83	
Mode	LTE Band 5 / 10MHz				
Mod.	64QAM				Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	6.87	6.41	-	-	PASS
Middle CH	7.01	6.52	-	-	
Highest CH	6.87	6.35	-	-	

LTE Band 5 / 10MHz / QPSK	
Lowest Channel / 1RB	**Lowest Channel / Full RB**
	
Middle Channel / 1RB	**Middle Channel / Full RB**
	
Highest Channel / 1RB	**Highest Channel / Full RB**
	

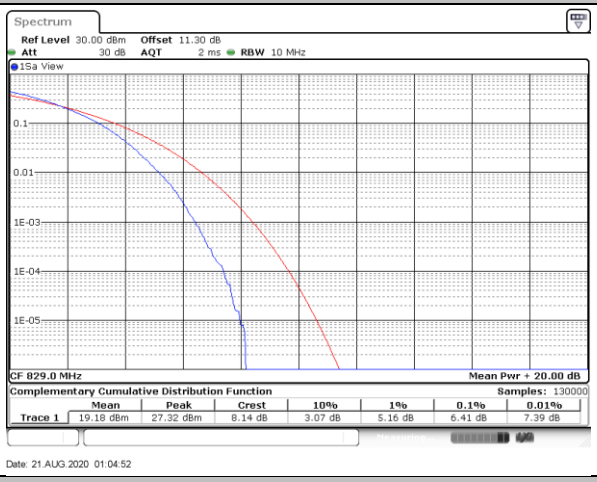
LTE Band 5 / 10MHz / 16QAM	
Lowest Channel / 1RB	**Lowest Channel / Full RB**
	
Middle Channel / 1RB	**Middle Channel / Full RB**
	
Highest Channel / 1RB	**Highest Channel / Full RB**
	

LTE Band 5 / 10MHz / 64QAM

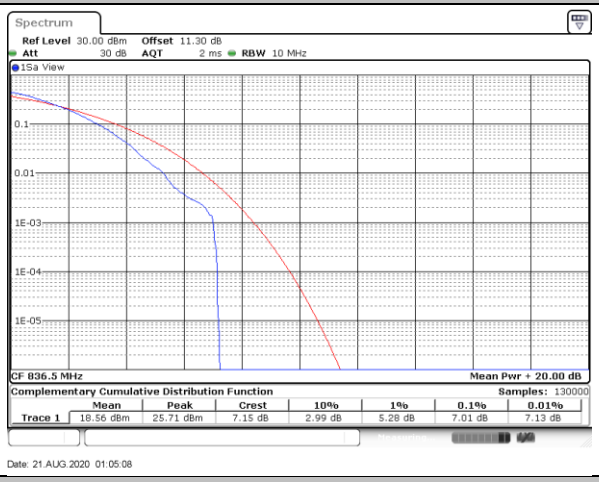
Lowest Channel / 1RB



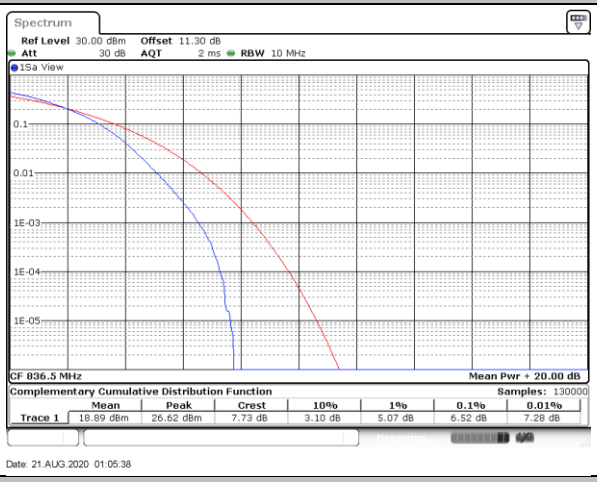
Lowest Channel / Full RB



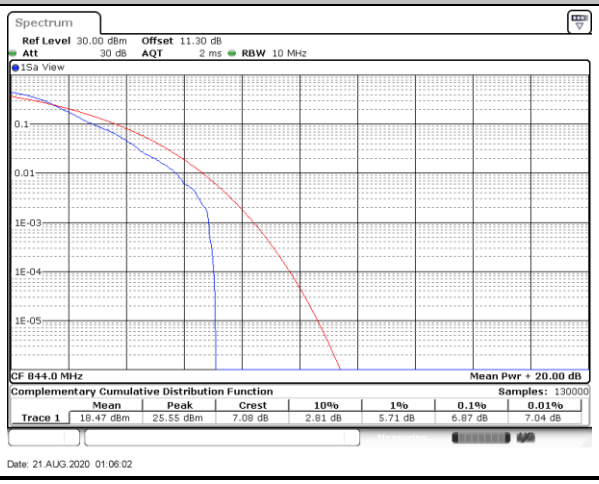
Middle Channel / 1RB



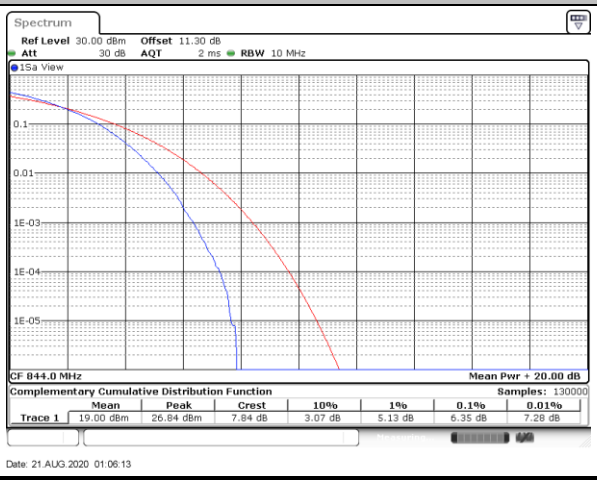
Middle Channel / Full RB



Highest Channel / 1RB



Highest Channel / Full RB

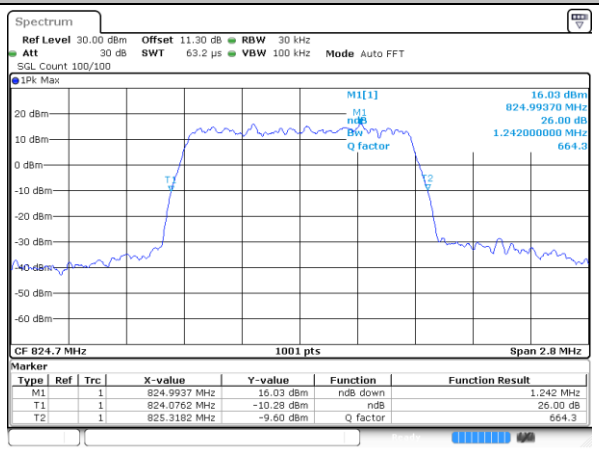


26dB Bandwidth

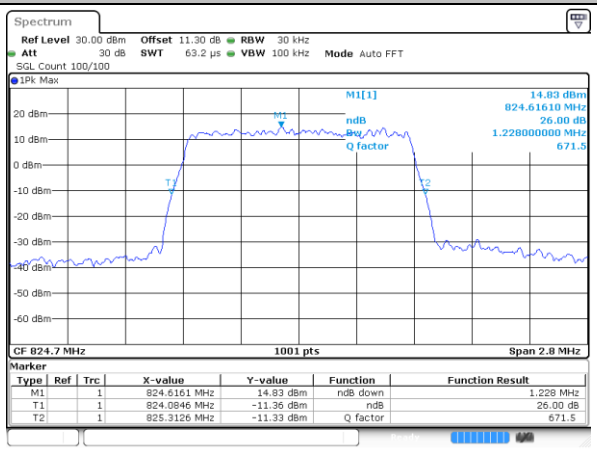
Mode	LTE Band 5 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.24	1.23	3.00	3.04	4.91	4.87	9.65	9.59	-	-	-	-
Middle CH	1.23	1.23	3.01	3.00	4.94	4.93	9.83	9.91	-	-	-	-
Highest CH	1.23	1.21	3.03	2.96	4.96	4.88	9.63	9.65	-	-	-	-
Mode	LTE Band 5 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	1.24	-	3.00	-	4.93	-	9.87	-	-	-	-	-
Middle CH	1.24	-	3.01	-	4.90	-	9.83	-	-	-	-	-
Highest CH	1.22	-	3.04	-	4.90	-	9.91	-	-	-	-	-

LTE Band 5

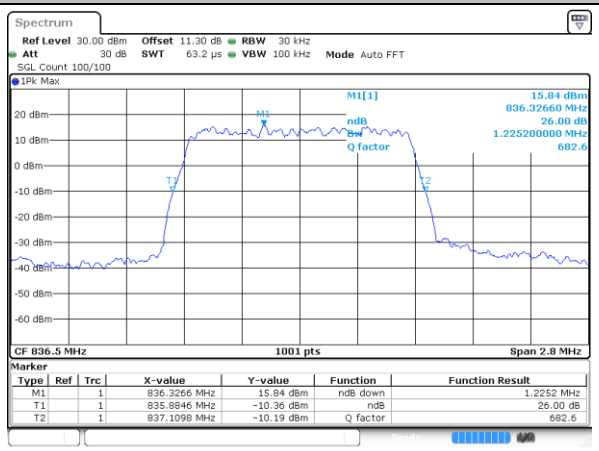
Lowest Channel / 1.4MHz / QPSK



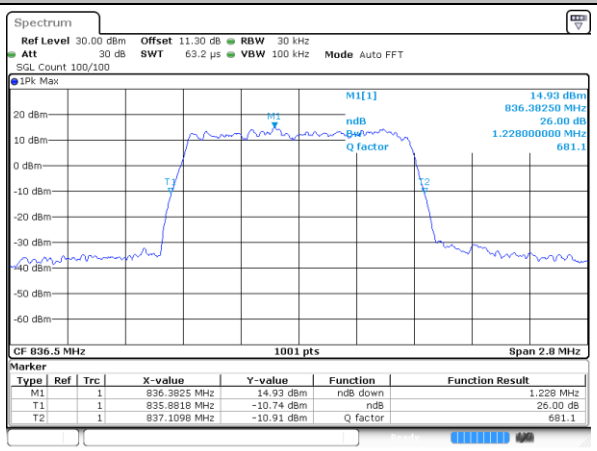
Lowest Channel / 1.4MHz / 16QAM



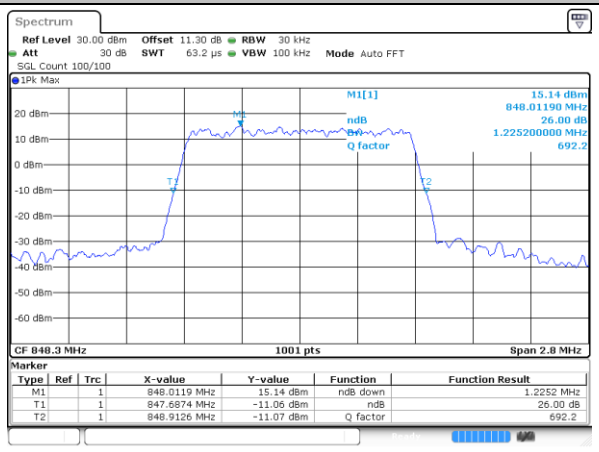
Middle Channel / 1.4MHz / QPSK



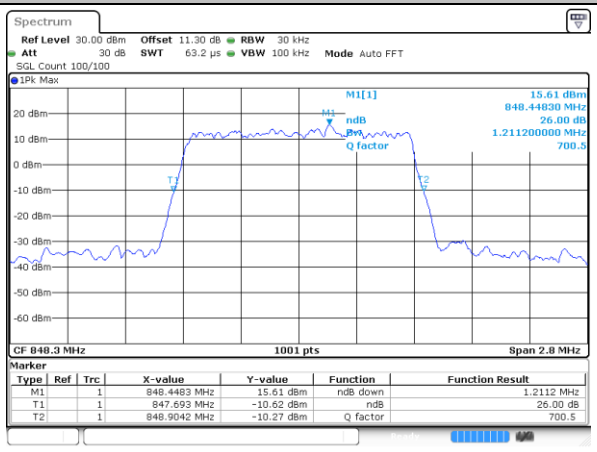
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK

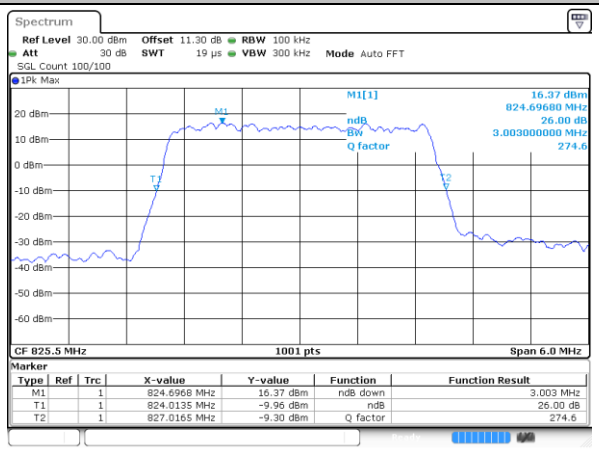


Highest Channel / 1.4MHz / 16QAM

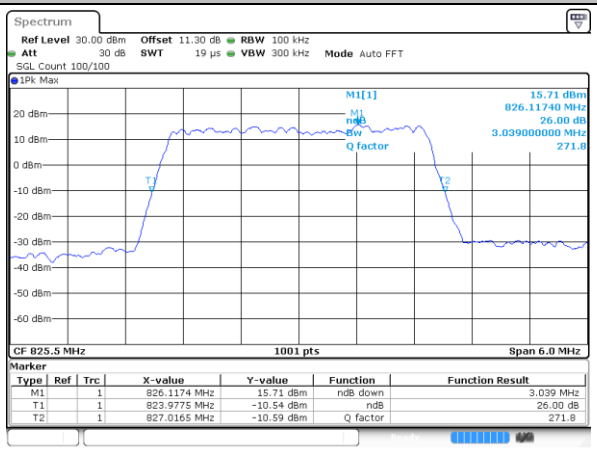


LTE Band 5

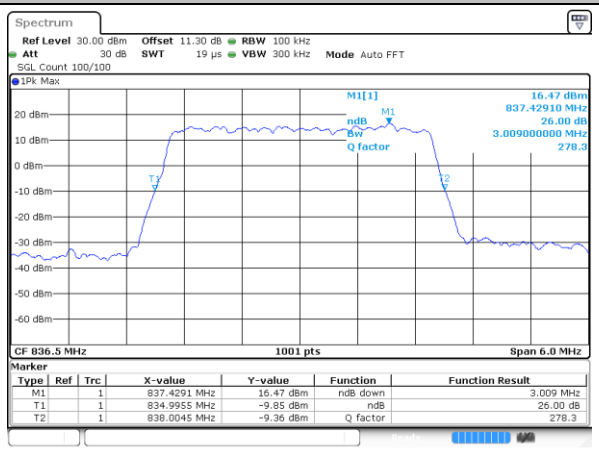
Lowest Channel / 3MHz / QPSK



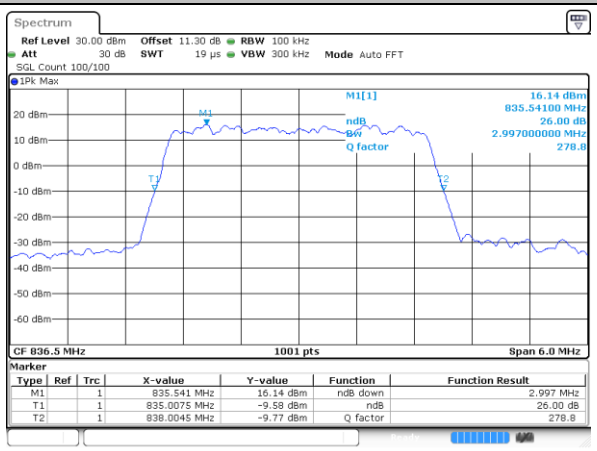
Lowest Channel / 3MHz / 16QAM



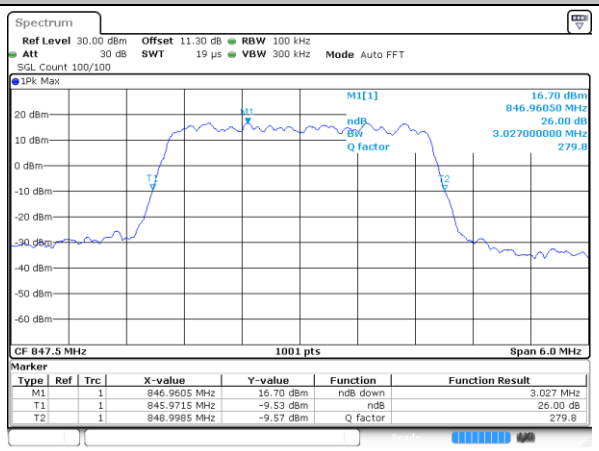
Middle Channel / 3MHz / QPSK



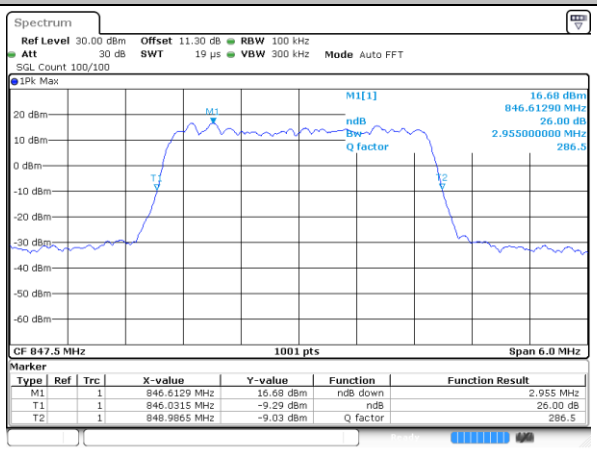
Middle Channel / 3MHz / 16QAM



Highest Channel / 3MHz / QPSK

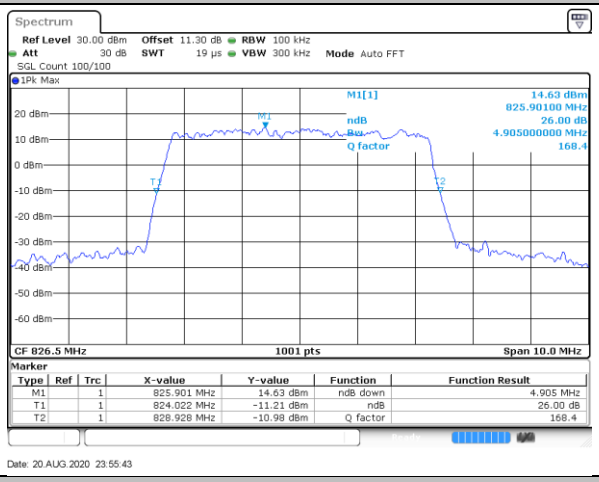


Highest Channel / 3MHz / 16QAM

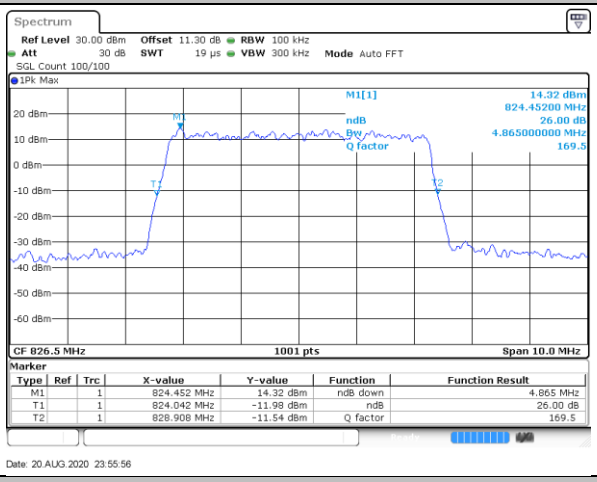


LTE Band 5

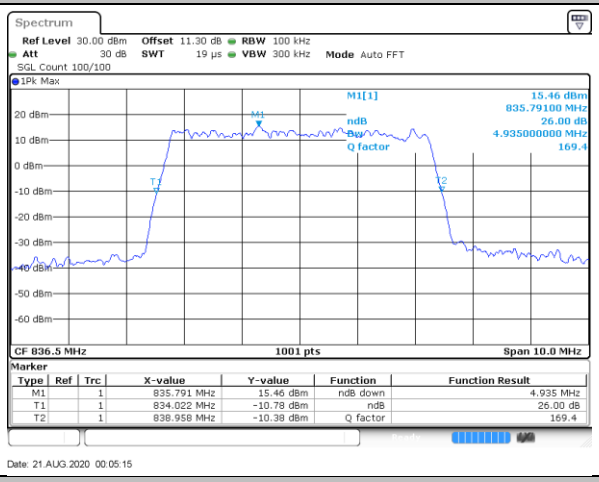
Lowest Channel / 5MHz / QPSK



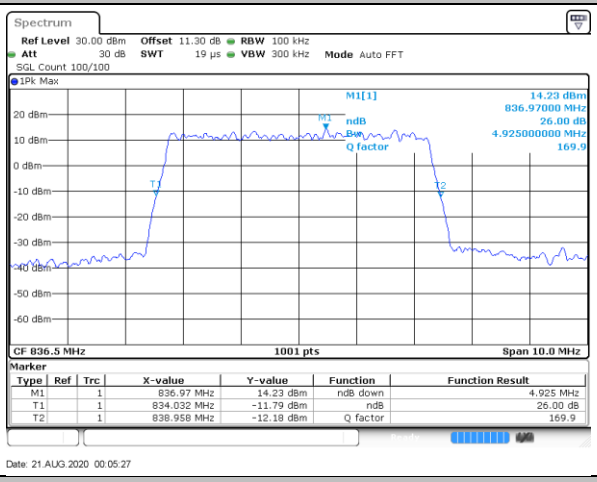
Lowest Channel / 5MHz / 16QAM



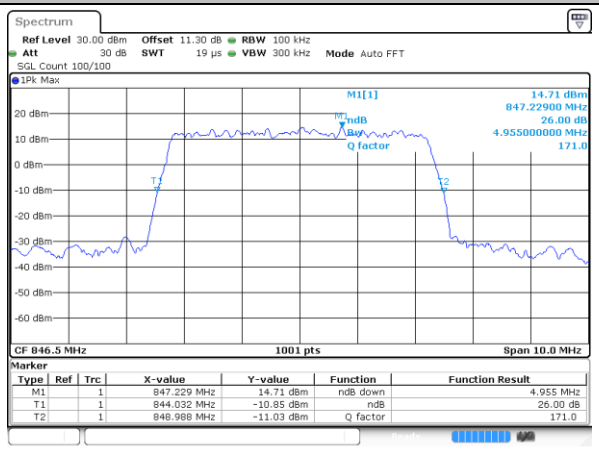
Middle Channel / 5MHz / QPSK



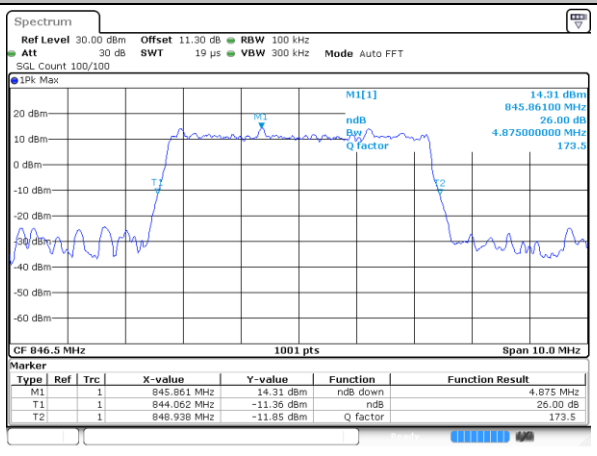
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK

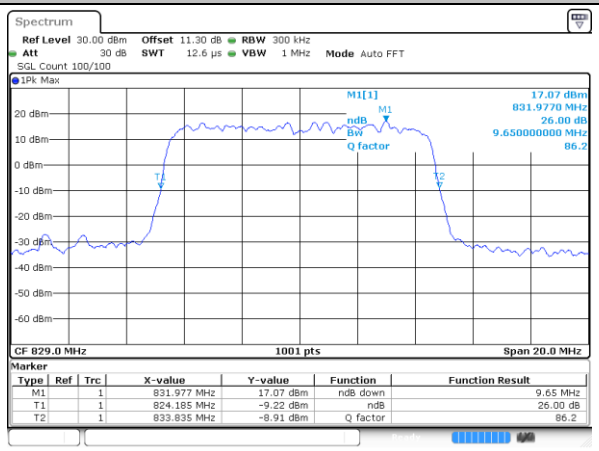


Highest Channel / 5MHz / 16QAM

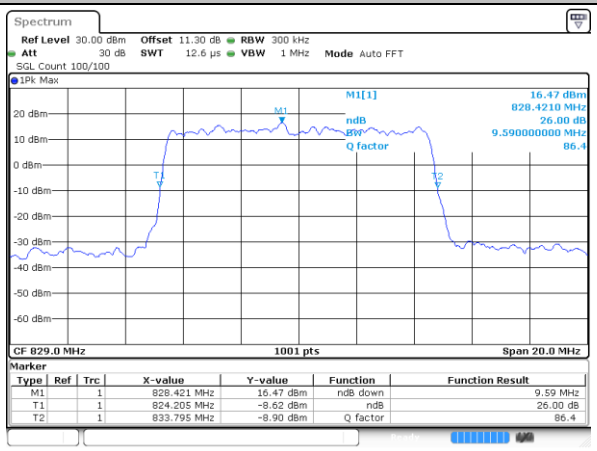


LTE Band 5

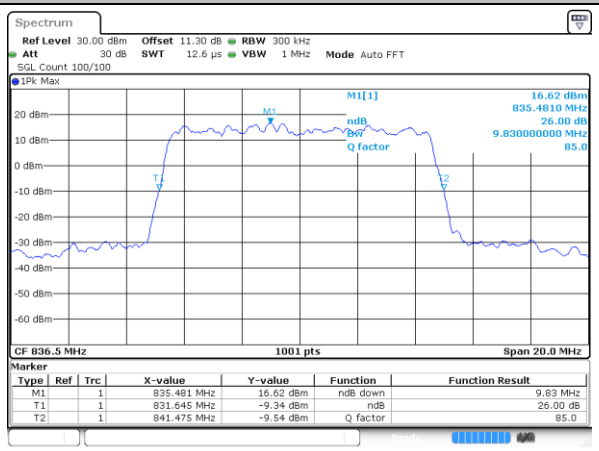
Lowest Channel / 10MHz / QPSK



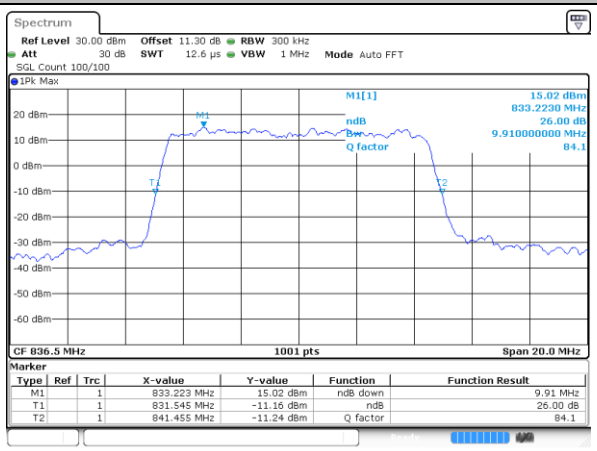
Lowest Channel / 10MHz / 16QAM



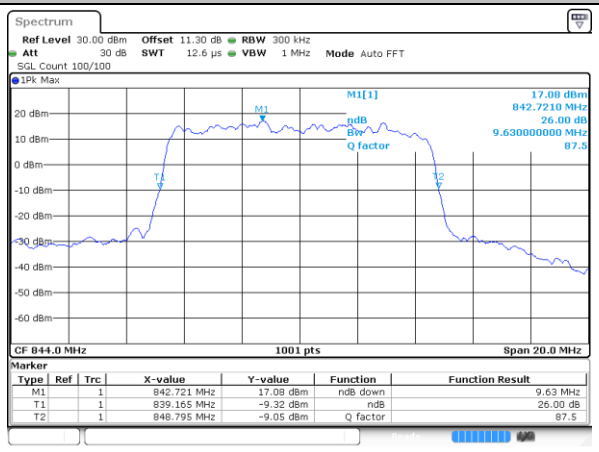
Middle Channel / 10MHz / QPSK



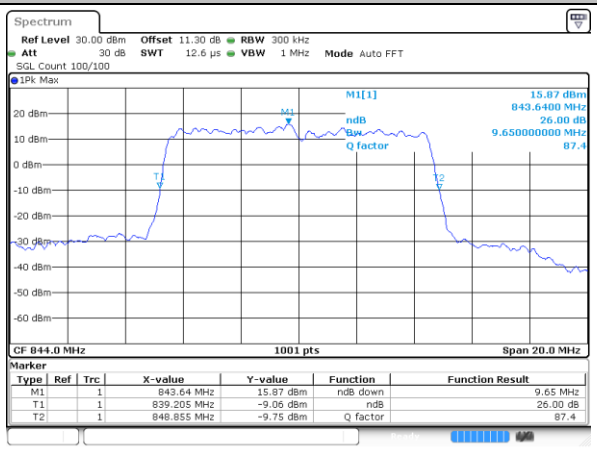
Middle Channel / 10MHz / 16QAM



Highest Channel / 10MHz / QPSK

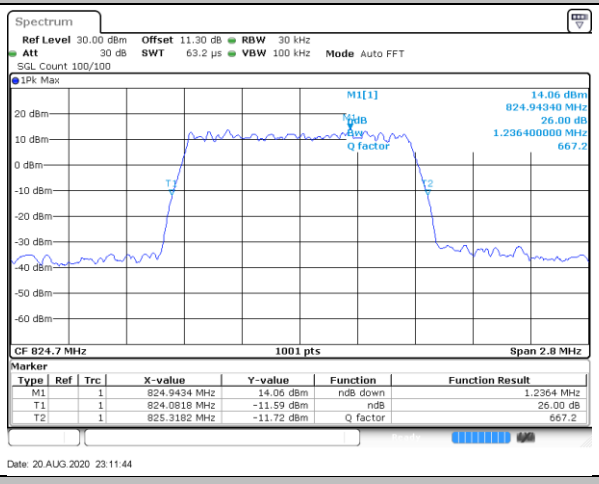


Highest Channel / 10MHz / 16QAM

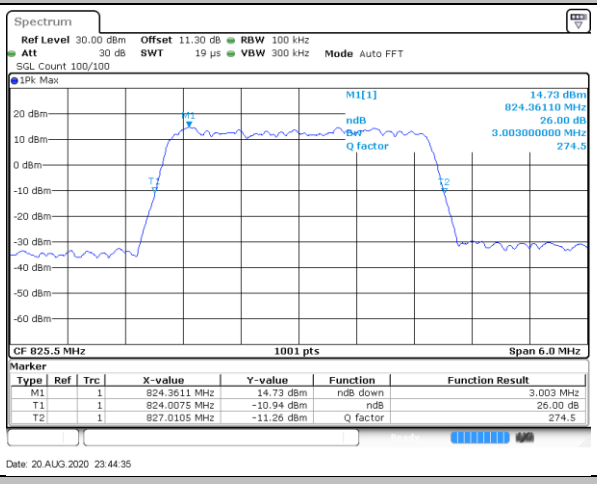


LTE Band 5

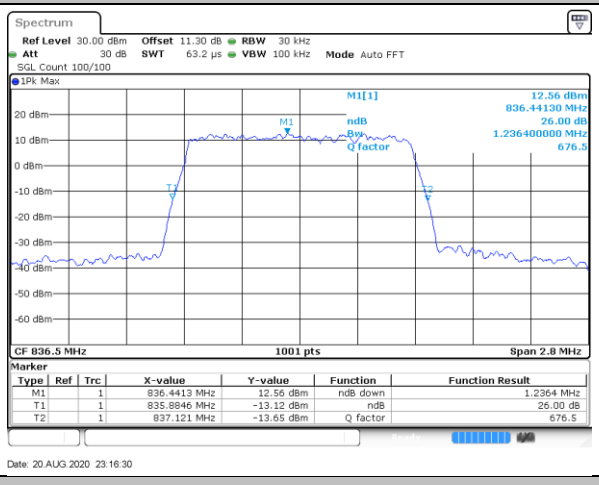
Lowest Channel / 1.4MHz / 64QAM



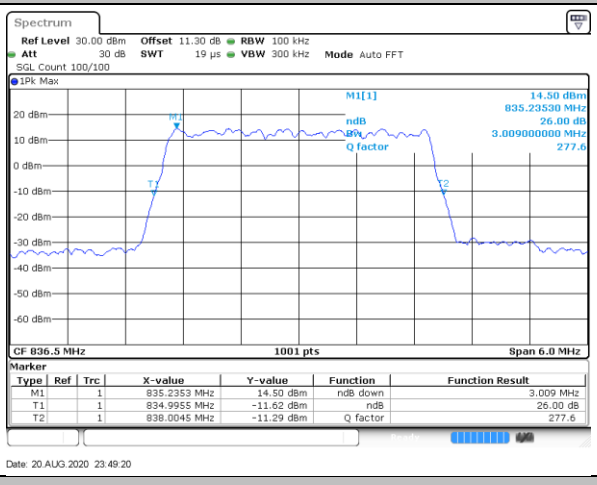
Lowest Channel / 3MHz / 64QAM



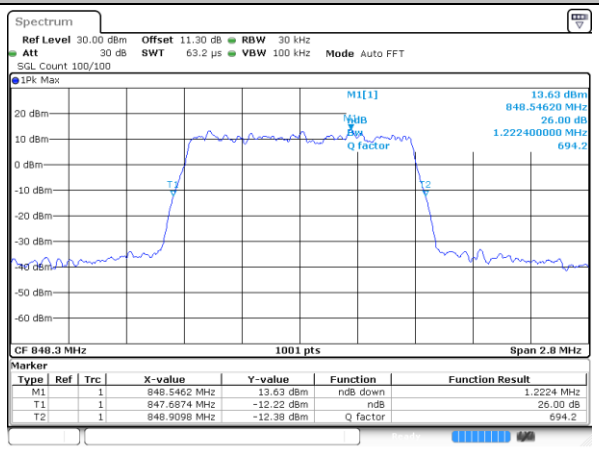
Middle Channel / 1.4MHz / 64QAM



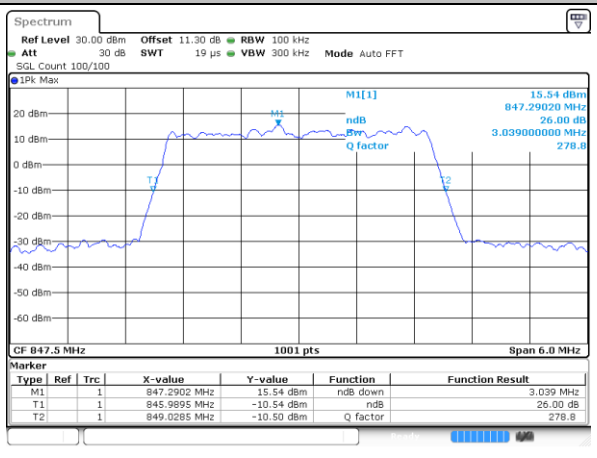
Middle Channel / 3MHz / 64QAM



Highest Channel / 1.4MHz / 64QAM

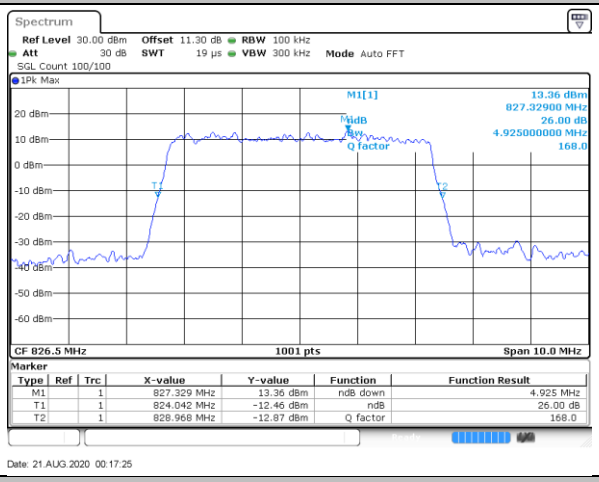


Highest Channel / 3MHz / 64QAM

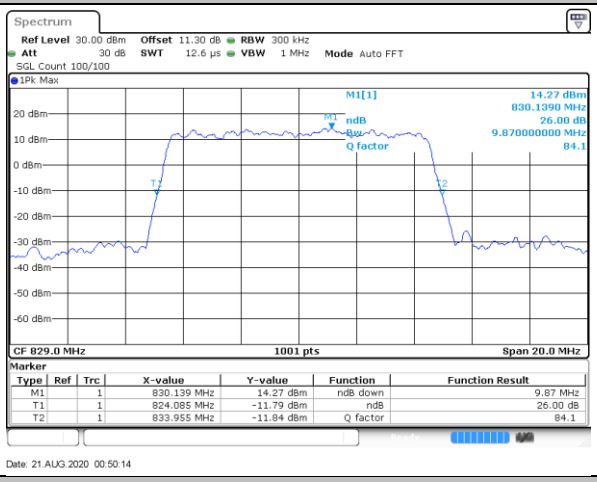


LTE Band 5

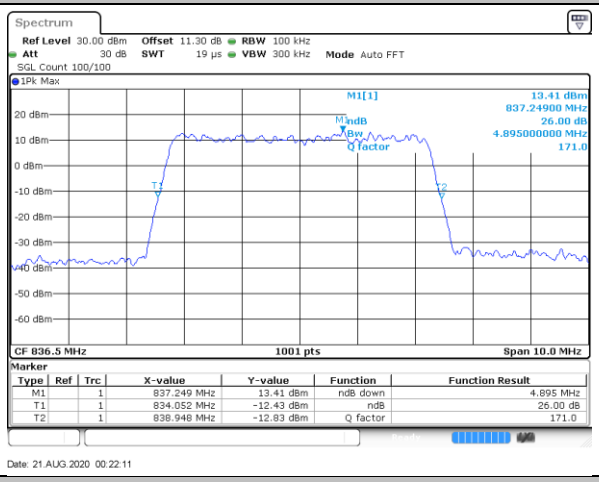
Lowest Channel / 5MHz / 64QAM



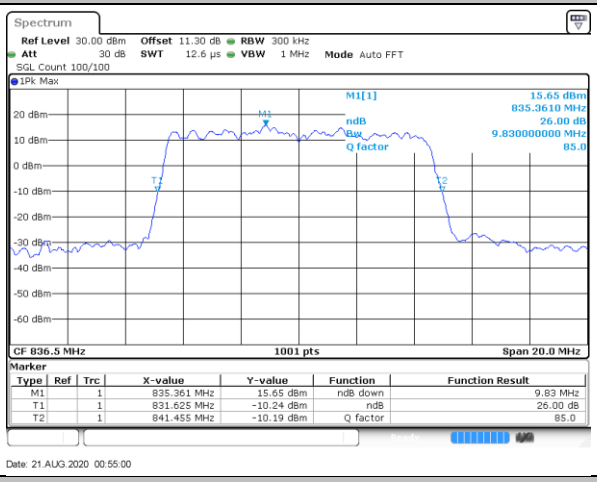
Lowest Channel / 10MHz / 64QAM



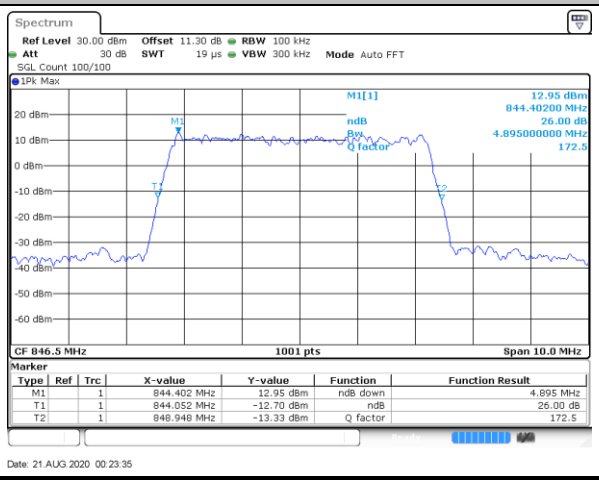
Middle Channel / 5MHz / 64QAM



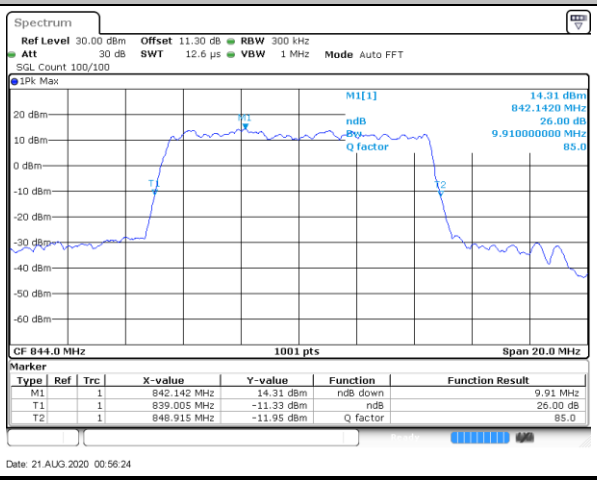
Middle Channel / 10MHz / 64QAM



Highest Channel / 5MHz / 64QAM



Highest Channel / 10MHz / 64QAM

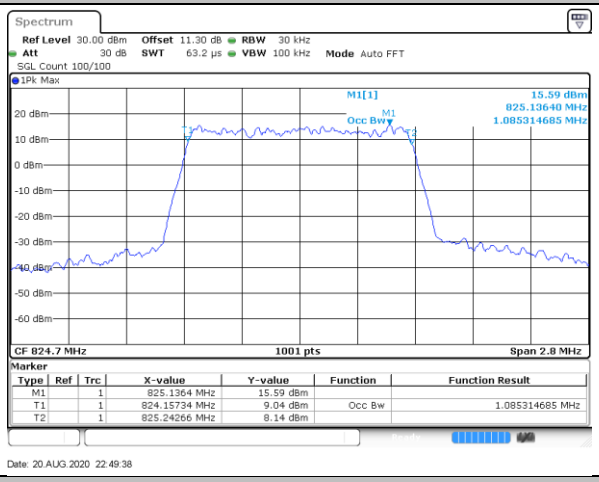


Occupied Bandwidth

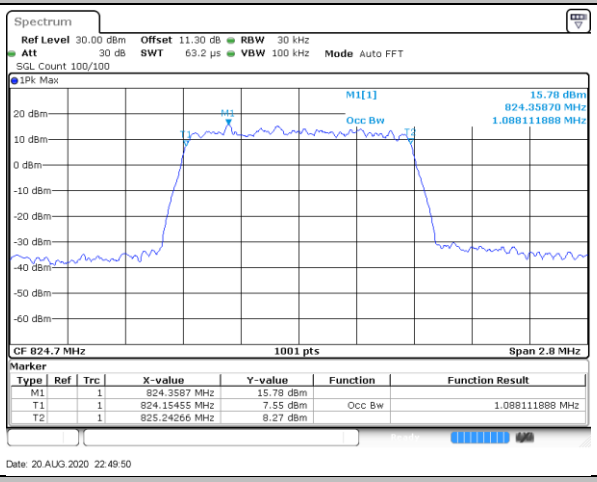
Mode	LTE Band 5 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.09	1.09	2.71	2.70	4.52	4.49	9.03	8.99	-	-	-	-
Middle CH	1.09	1.09	2.70	2.72	4.48	4.49	8.95	8.99	-	-	-	-
Highest CH	1.09	1.09	2.72	2.70	4.49	4.49	9.01	8.97	-	-	-	-
Mode	LTE Band 5 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	1.09	-	2.72	-	4.51	-	9.05	-	-	-	-	-
Middle CH	1.08	-	2.70	-	4.48	-	9.01	-	-	-	-	-
Highest CH	1.09	-	2.73	-	4.50	-	8.99	-	-	-	-	-

LTE Band 5

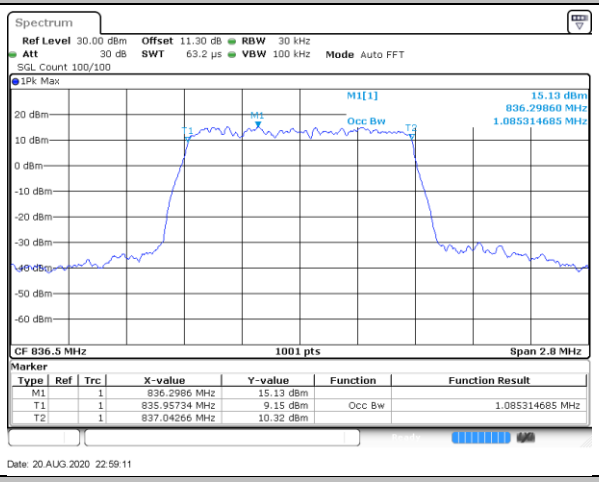
Lowest Channel / 1.4MHz / QPSK



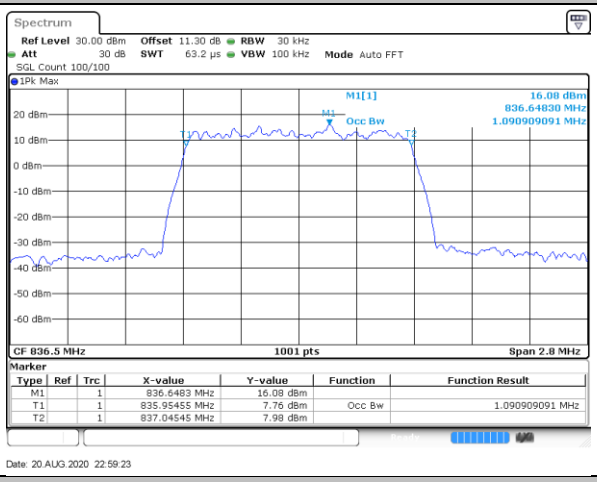
Lowest Channel / 1.4MHz / 16QAM



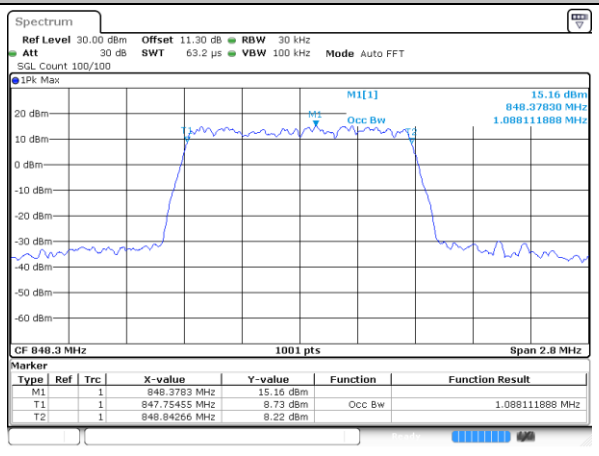
Middle Channel / 1.4MHz / QPSK



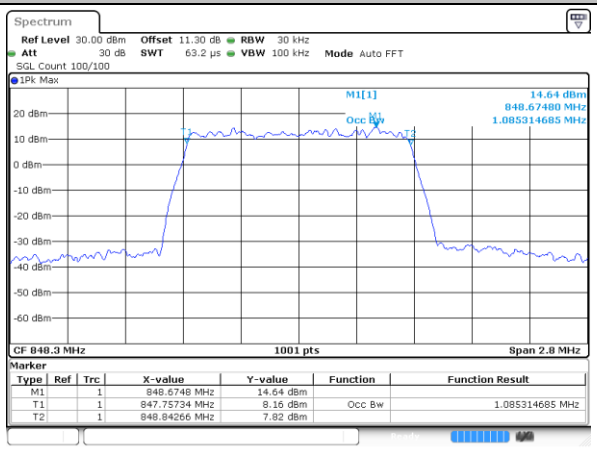
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK

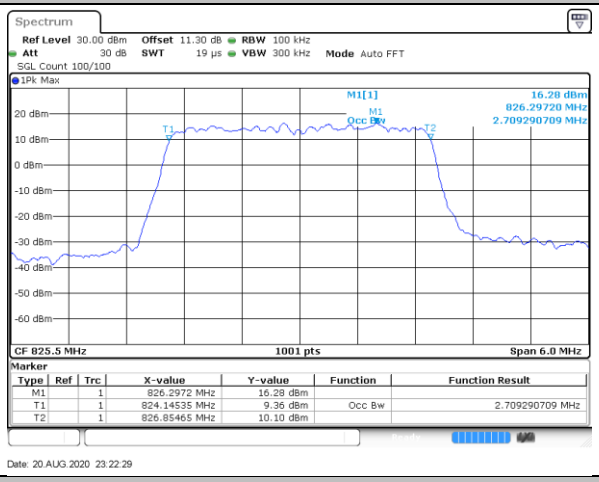


Highest Channel / 1.4MHz / 16QAM

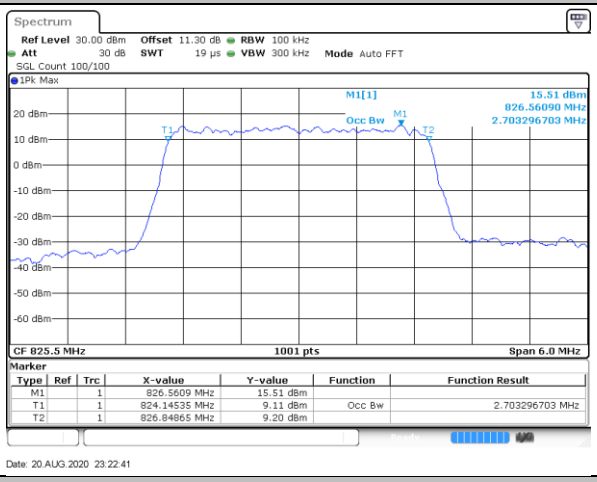


LTE Band 5

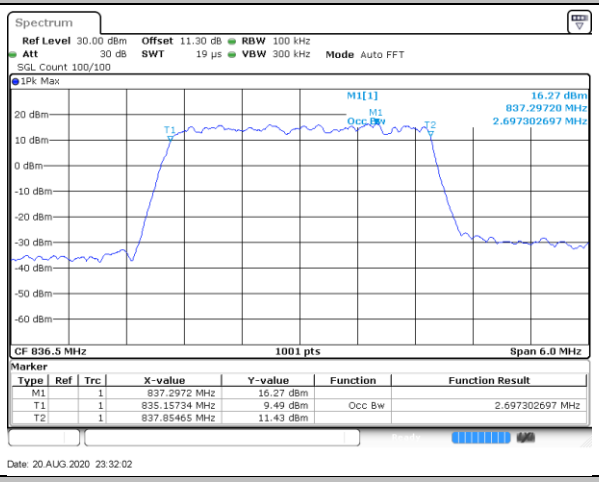
Lowest Channel / 3MHz / QPSK



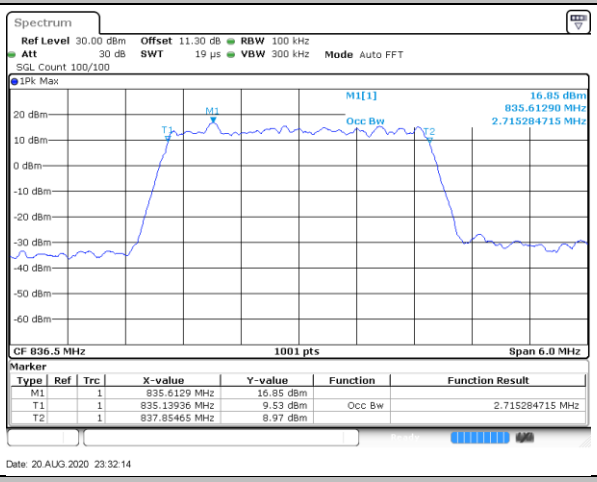
Lowest Channel / 3MHz / 16QAM



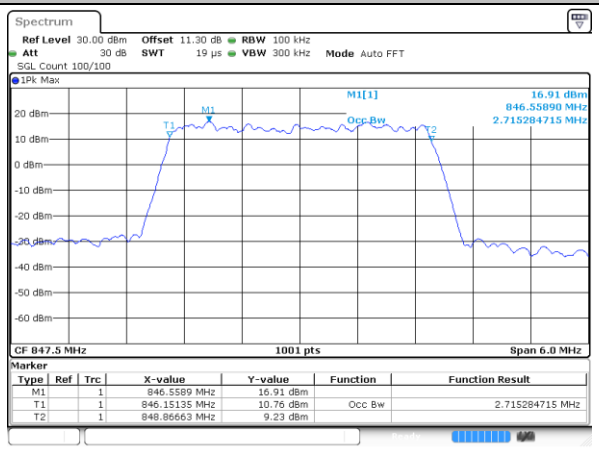
Middle Channel / 3MHz / QPSK



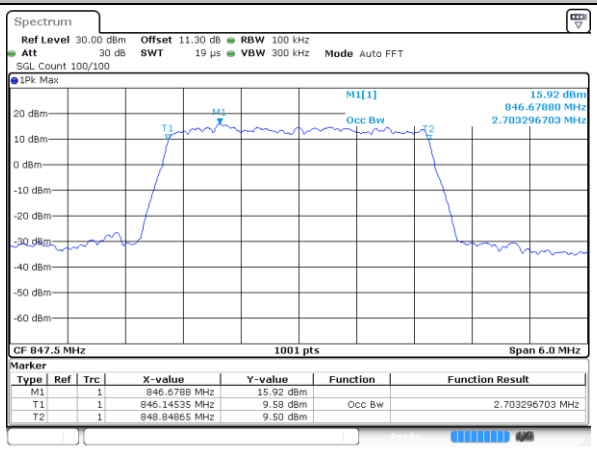
Middle Channel / 3MHz / 16QAM



Highest Channel / 3MHz / QPSK

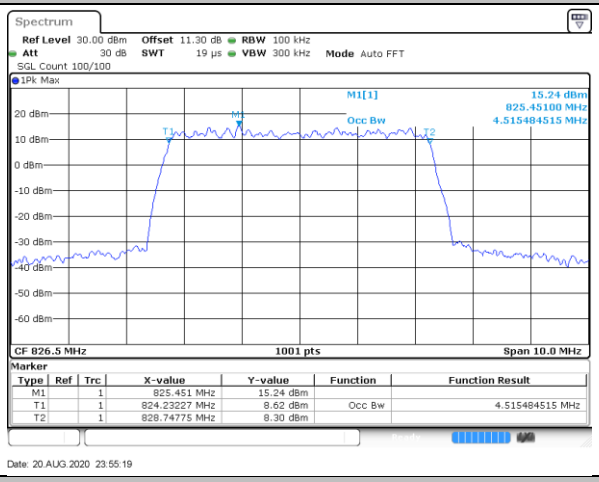


Highest Channel / 3MHz / 16QAM

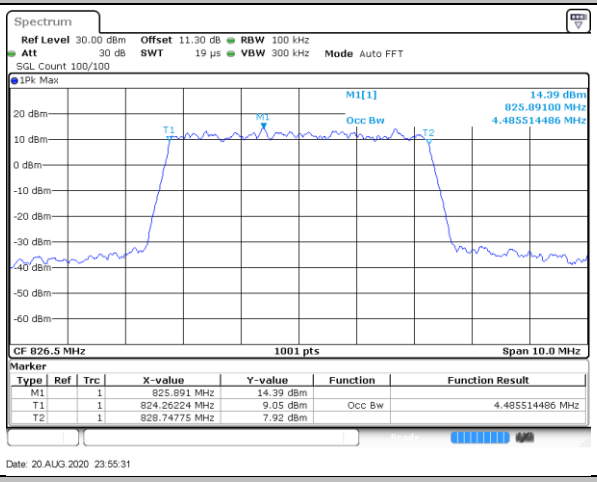


LTE Band 5

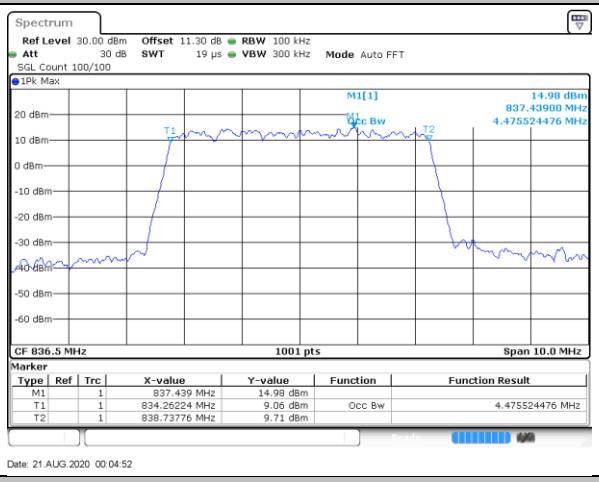
Lowest Channel / 5MHz / QPSK



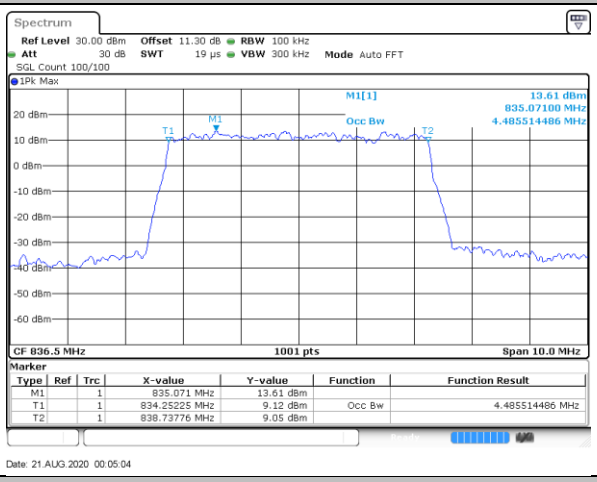
Lowest Channel / 5MHz / 16QAM



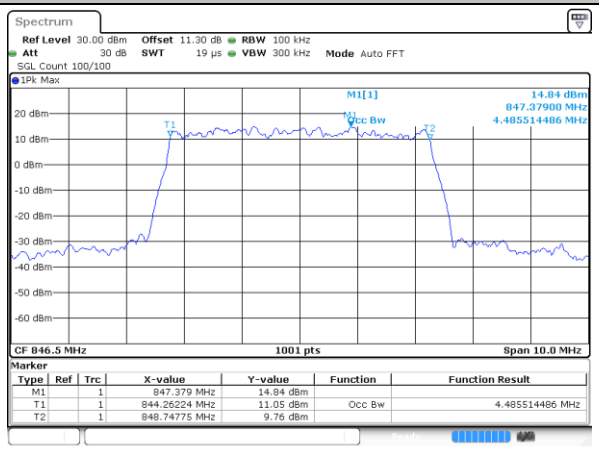
Middle Channel / 5MHz / QPSK



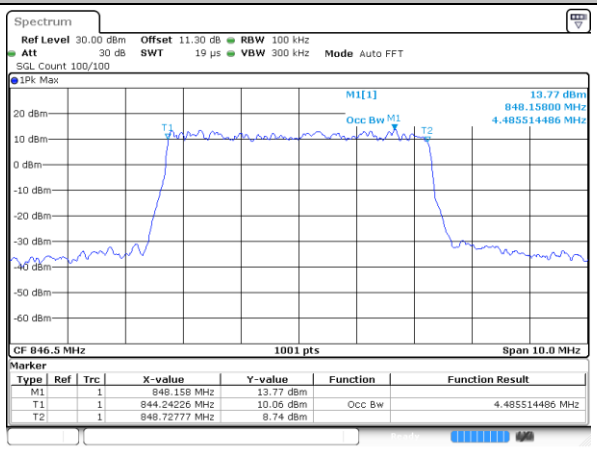
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK

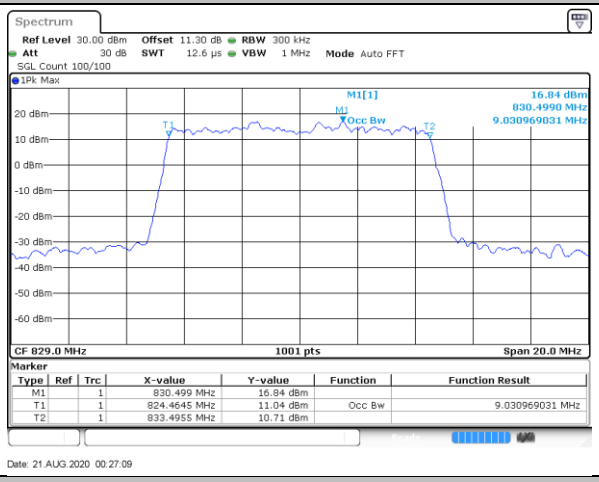


Highest Channel / 5MHz / 16QAM

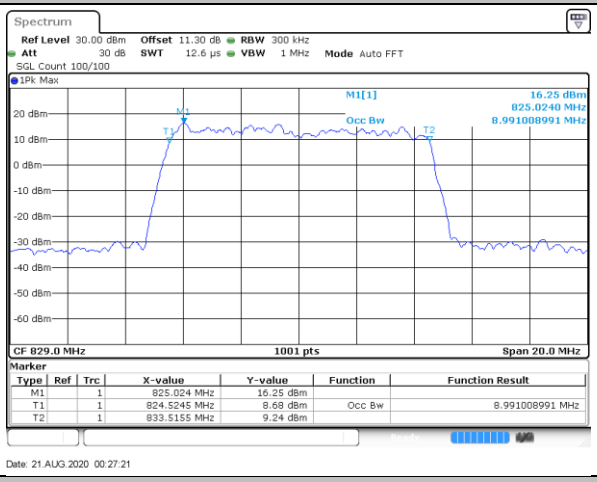


LTE Band 5

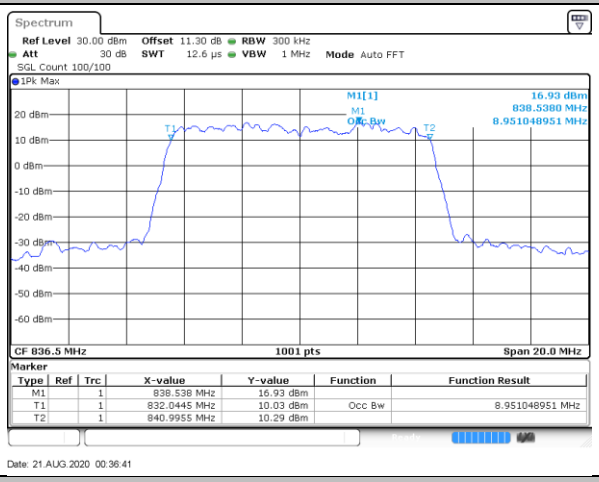
Lowest Channel / 10MHz / QPSK



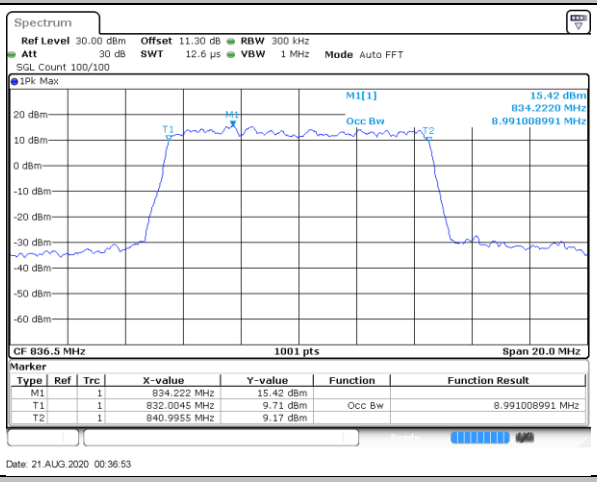
Lowest Channel / 10MHz / 16QAM



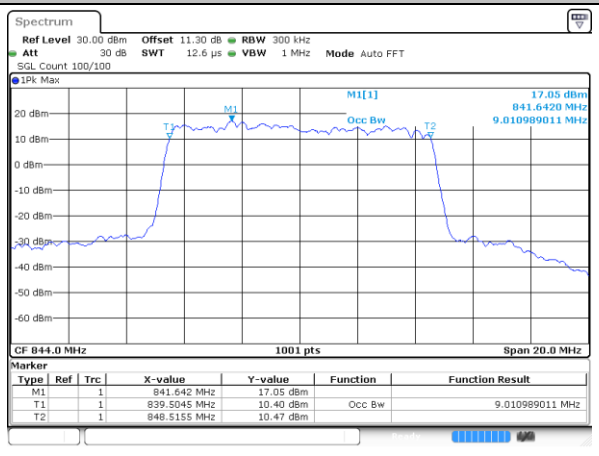
Middle Channel / 10MHz / QPSK



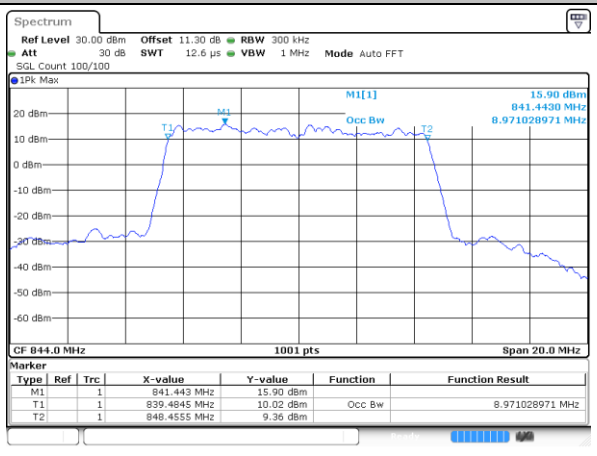
Middle Channel / 10MHz / 16QAM



Highest Channel / 10MHz / QPSK

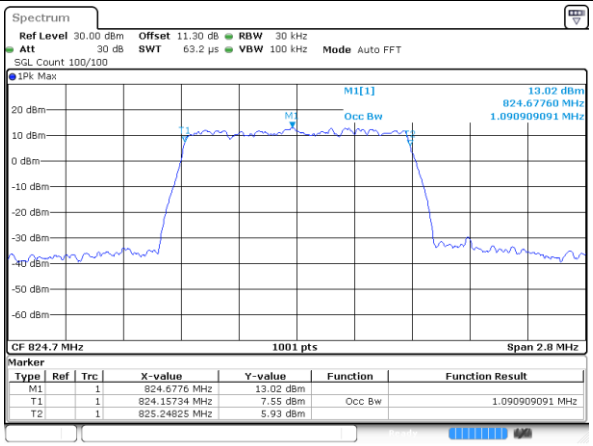


Highest Channel / 10MHz / 16QAM

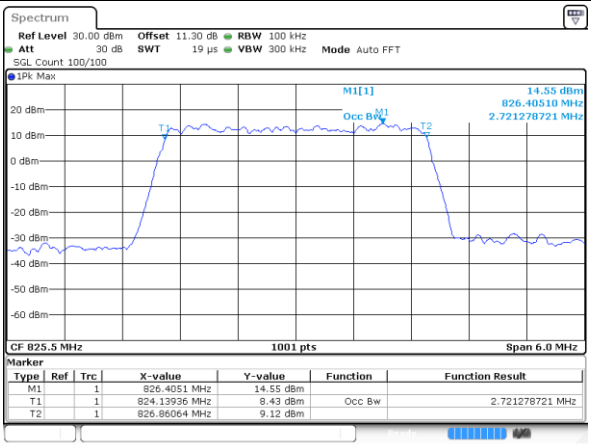


LTE Band 5

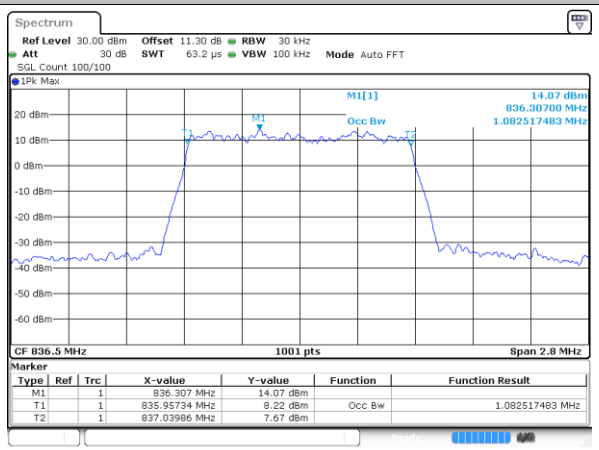
Lowest Channel / 1.4MHz / 64QAM



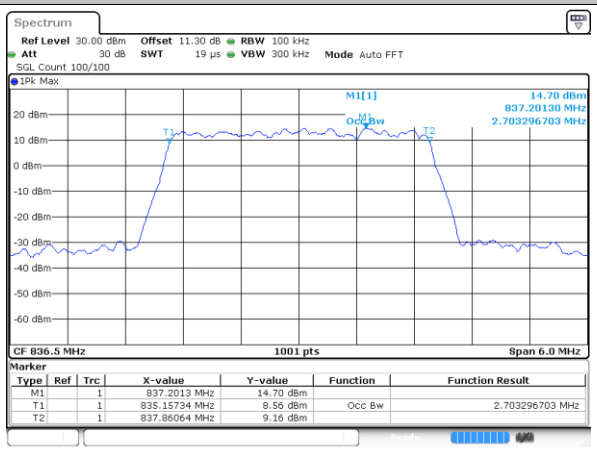
Lowest Channel / 3MHz / 64QAM



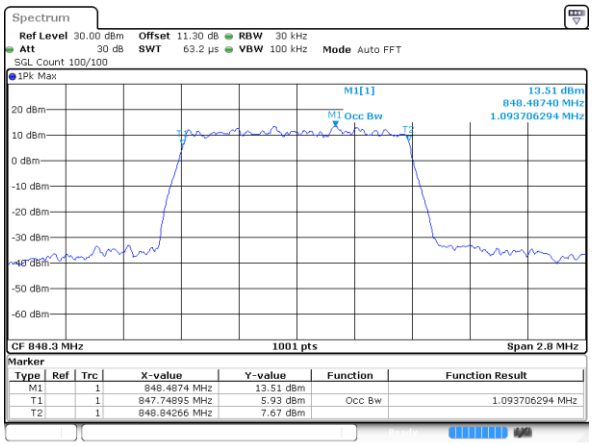
Middle Channel / 1.4MHz / 64QAM



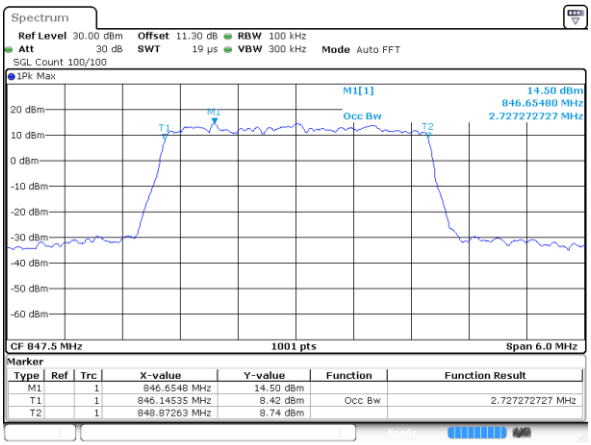
Middle Channel / 3MHz / 64QAM



Highest Channel / 1.4MHz / 64QAM

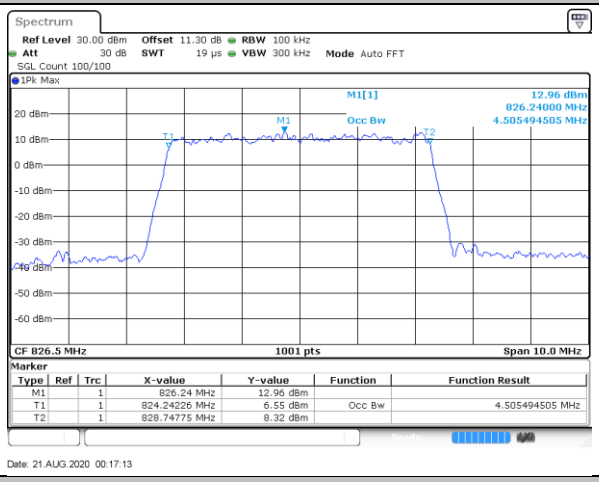


Highest Channel / 3MHz / 64QAM

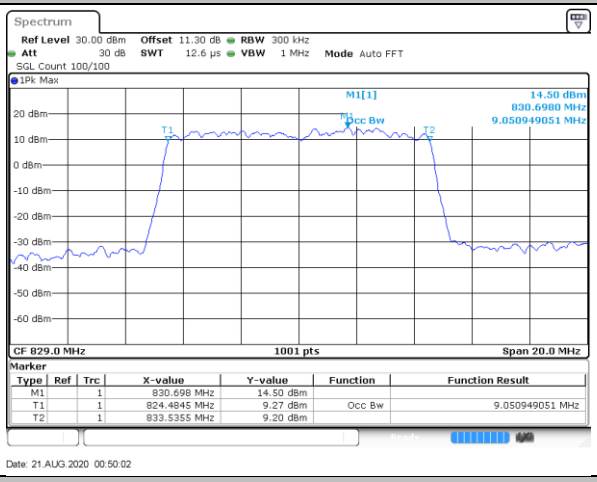


LTE Band 5

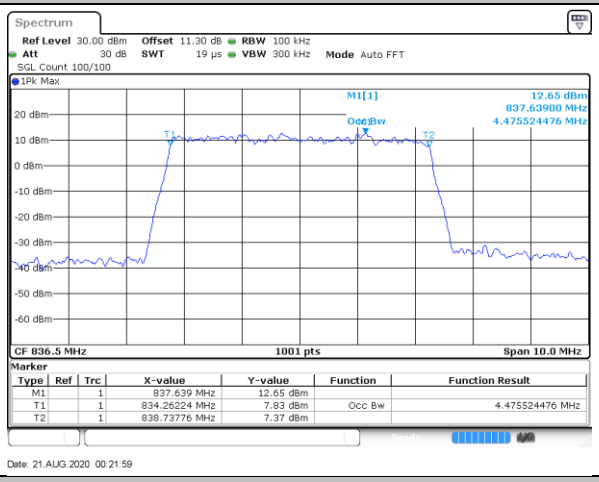
Lowest Channel / 5MHz / 64QAM



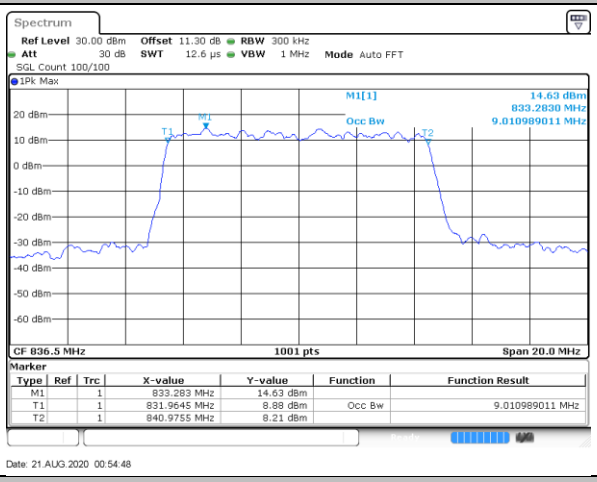
Lowest Channel / 10MHz / 64QAM



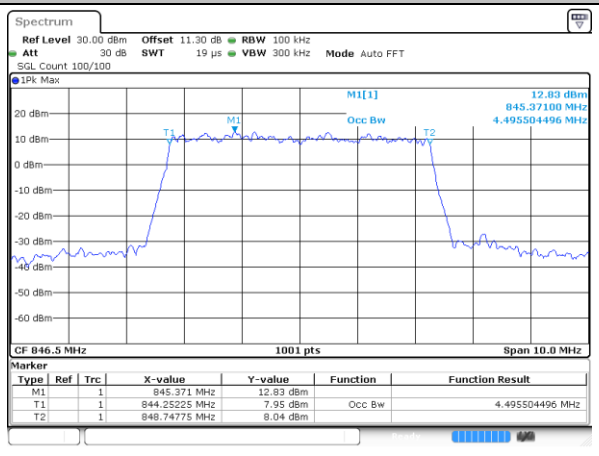
Middle Channel / 5MHz / 64QAM



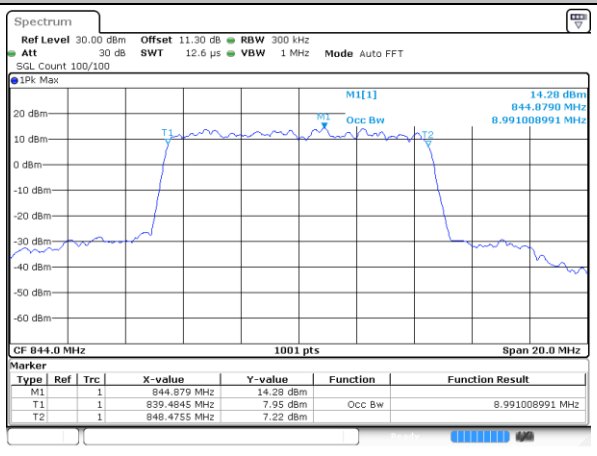
Middle Channel / 10MHz / 64QAM



Highest Channel / 5MHz / 64QAM



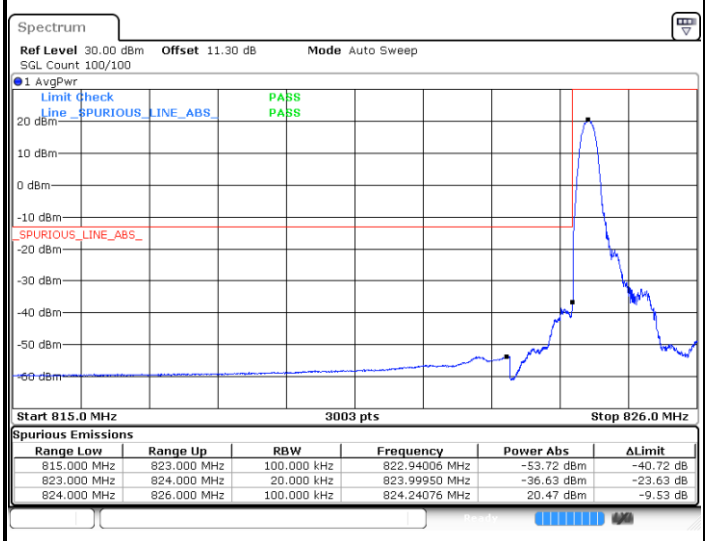
Highest Channel / 10MHz / 64QAM



Conducted Band Edge

LTE Band 5 / 1.4MHz / QPSK

Lowest Band Edge / 1RB

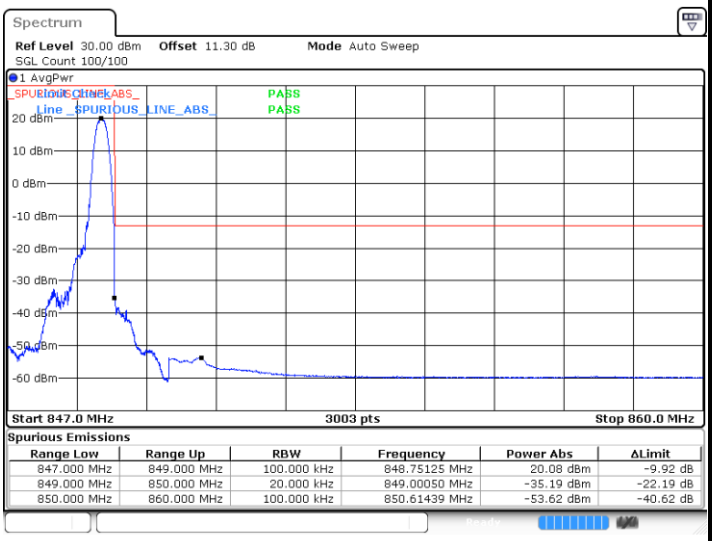


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.94006 MHz	-53.72 dBm	-40.72 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99950 MHz	-36.63 dBm	-23.63 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.24076 MHz	20.47 dBm	-9.53 dB

Date: 20.AUG.2020 22:51:55

Highest Band Edge / 1RB

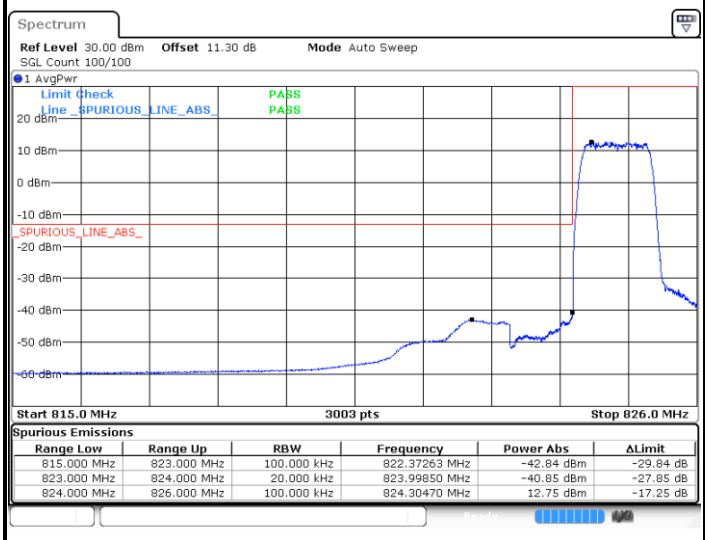


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.75125 MHz	20.08 dBm	-9.92 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00050 MHz	-35.19 dBm	-22.19 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.61439 MHz	-53.62 dBm	-40.62 dB

Date: 20.AUG.2020 23:07:38

Lowest Band Edge / Full RB

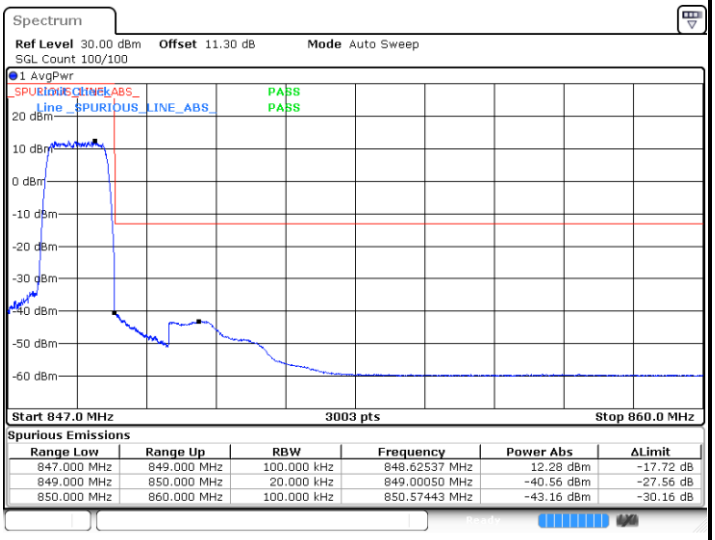


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.37263 MHz	-42.84 dBm	-29.84 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99850 MHz	-40.85 dBm	-27.85 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.30470 MHz	12.75 dBm	-17.25 dB

Date: 20.AUG.2020 22:55:17

Highest Band Edge / Full RB



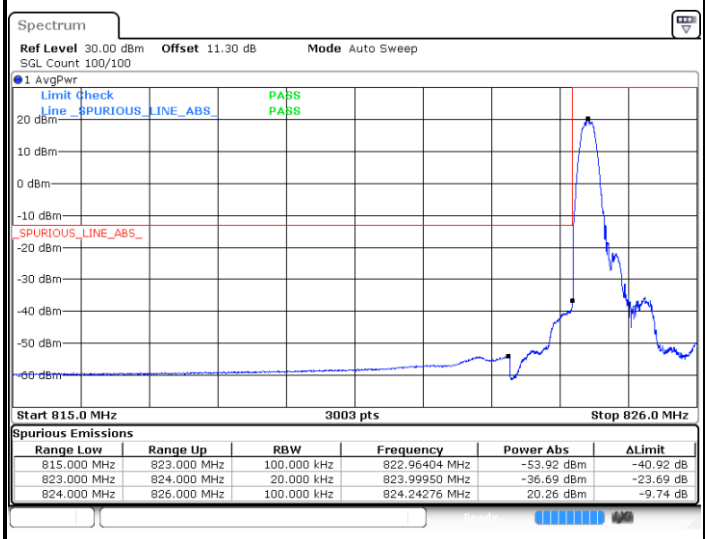
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.62537 MHz	12.28 dBm	-17.72 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00050 MHz	-40.56 dBm	-27.56 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.57443 MHz	-43.16 dBm	-30.16 dB

Date: 20.AUG.2020 23:04:16

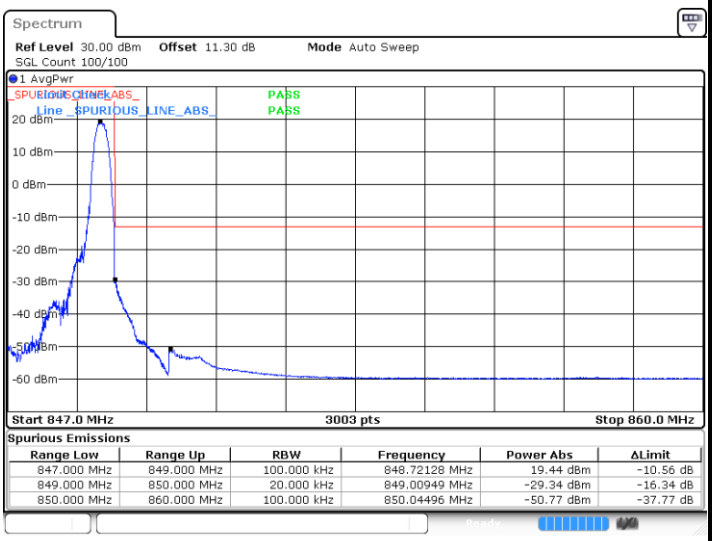
LTE Band 5 / 1.4MHz / 16QAM

Lowest Band Edge / 1 RB



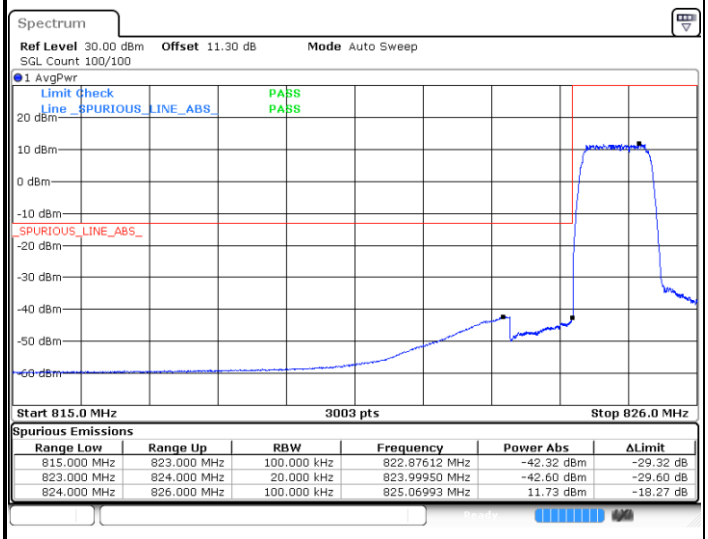
Date: 20.AUG.2020 22:53:36

Highest Band Edge / 1 RB



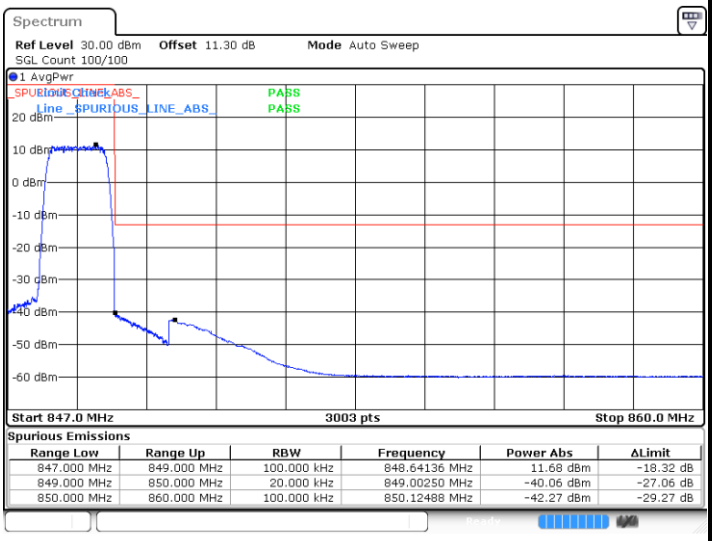
Date: 20.AUG.2020 23:09:18

Lowest Band Edge / Full RB



Date: 20.AUG.2020 22:56:58

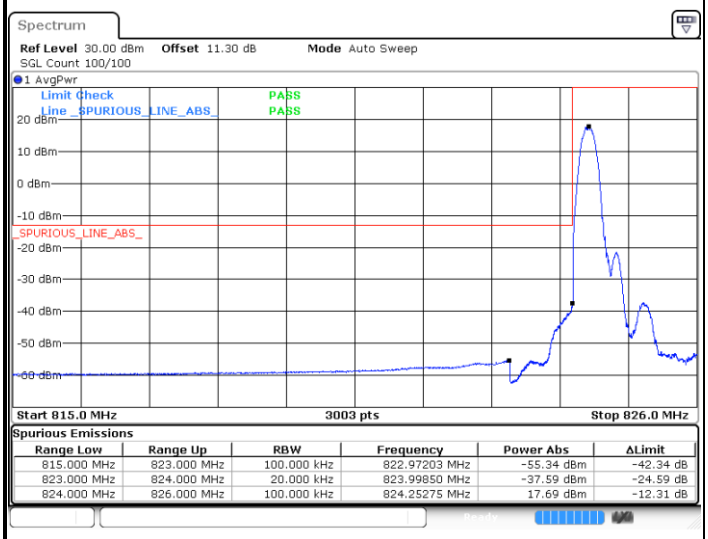
Highest Band Edge / Full RB



Date: 20.AUG.2020 23:05:57

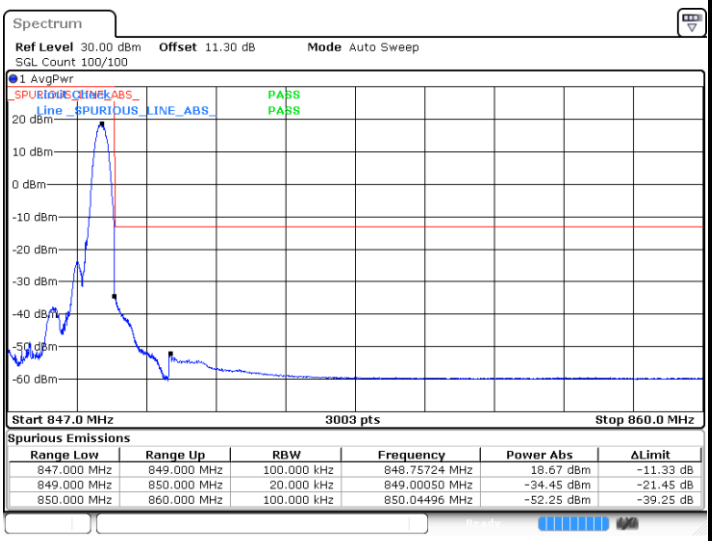
LTE Band 5 / 1.4MHz / 64QAM

Lowest Band Edge / 1 RB



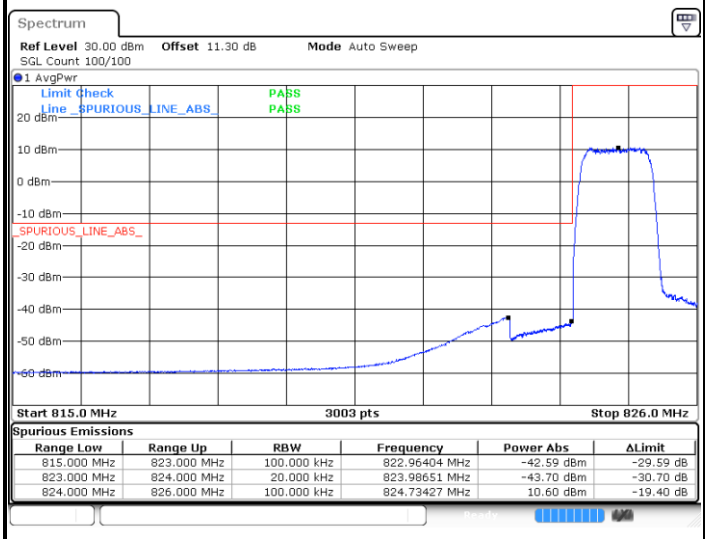
Date: 20.AUG.2020 23:13:25

Highest Band Edge / 1 RB



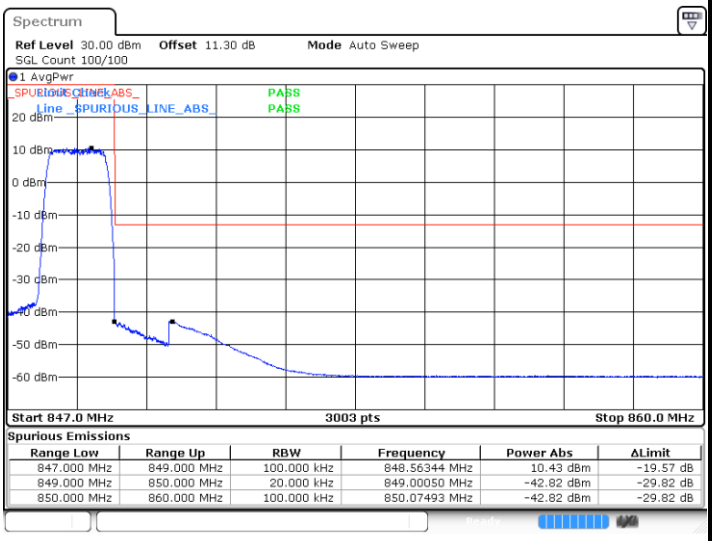
Date: 20.AUG.2020 23:21:15

Lowest Band Edge / Full RB



Date: 20.AUG.2020 23:15:06

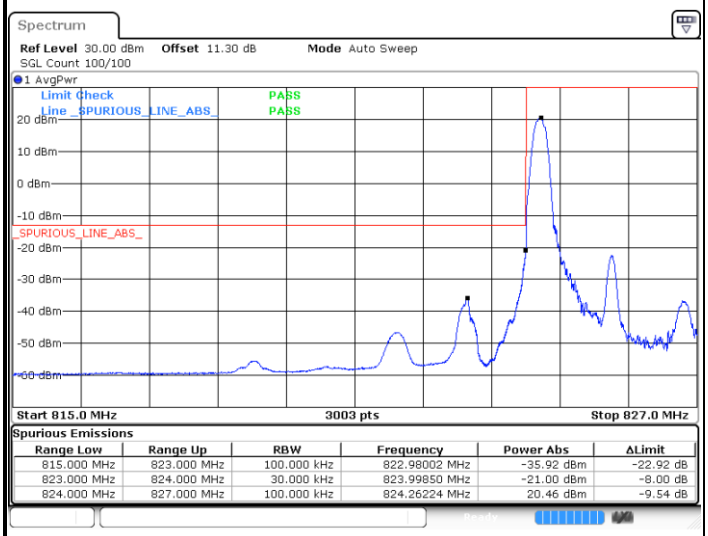
Highest Band Edge / Full RB



Date: 20.AUG.2020 23:19:34

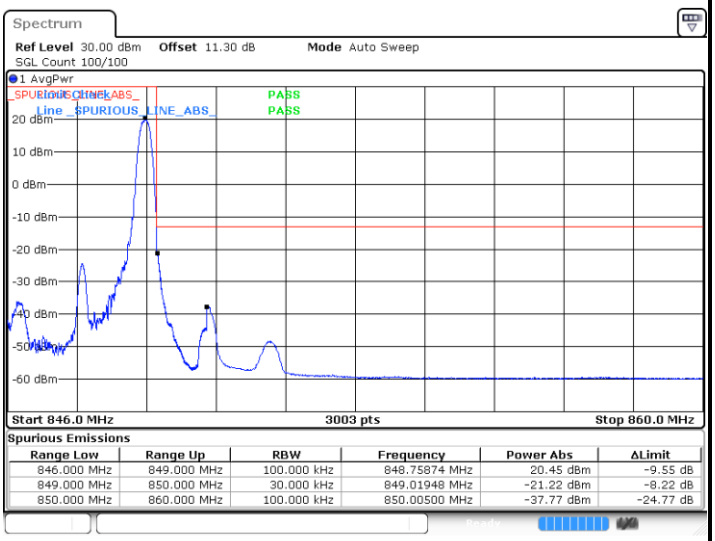
LTE Band 5 / 3MHz / QPSK

Lowest Band Edge / 1RB



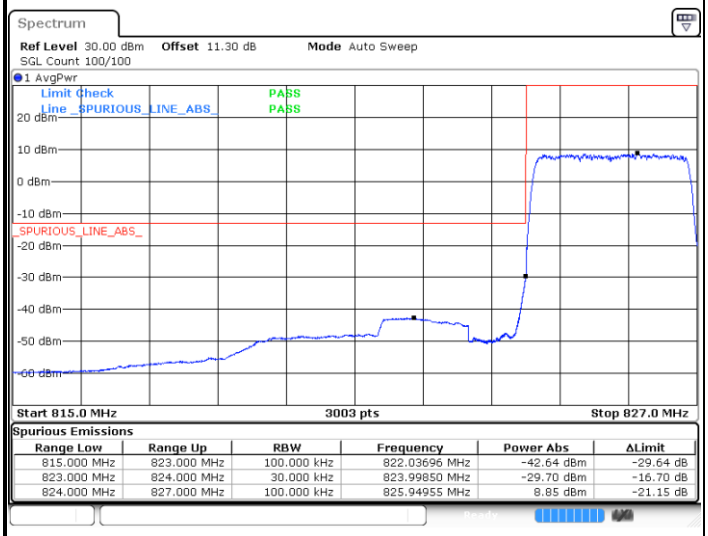
Date: 20.AUG.2020 23:24:46

Highest Band Edge / 1 RB



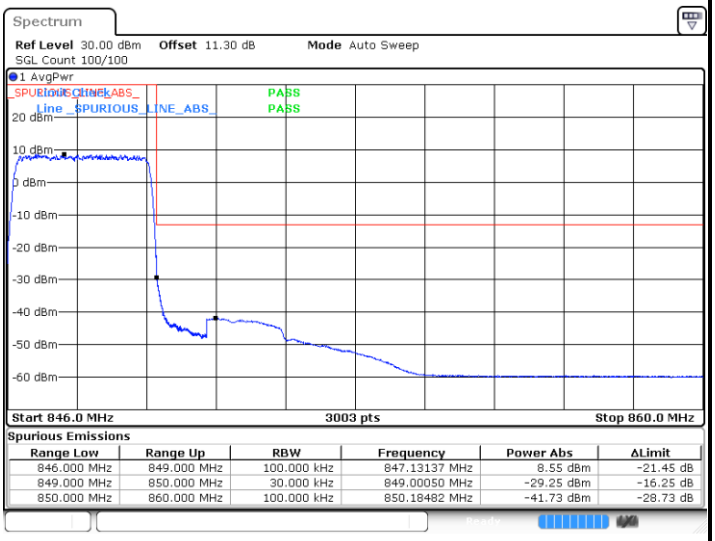
Date: 20.AUG.2020 23:37:07

Lowest Band Edge / Full RB



Date: 20.AUG.2020 23:28:08

Highest Band Edge / Full RB



Date: 20.AUG.2020 23:40:28