FCC RF Test Report

APPLICANT	:	SHARP CORPORATION, Mobile Communication B.U.
EQUIPMENT	:	Smart Phone
BRAND NAME	:	SHARP
FCC ID	:	APYHRO00288
STANDARD	:	47 CFR Part 2, 22(H), 27(H)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Aug. 01, 2020 and completely tested on Aug. 20, 2020. We, Sporton International (ShenZhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown 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 (ShenZhen) Inc., the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager

ACCREDITED
Cert #5145.01

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People's Republic of China

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APPENDIX A. TEST RESULTS OF CONDUCTED TEST

APPENDIX B. TEST RESULTS OF RADIATED TEST

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG080101B	Rev. 01	Initial issue of report	Sep. 15, 2020

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(5)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 12) (Band 17)	ERP < 3 Watt	PASS	-
3.5	N/A	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §27.53(g)	Conducted Band Edge Measurement (Band 5) (Band 12) (Band 17)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §27.53(g)	Conducted Spurious Emission (Band 5) (Band 12) (Band 17)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22H	PASS	-
	§2.1055 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §27.53(g)	Radiated Spurious Emission (Band 5) (Band 12) (Band 17)	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 30.90 dB at 1664.180 MHz

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.

1 General Description

1.1 Applicant

SHARP CORPORATION, Mobile Communication B.U.
2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi, Hiroshima 739-0192, Japan

1.2 Manufacturer

SHARP CORPORATION
1 Takumi-cho, Sakai-ku, Sakai-shi, Osaka 590-8522, Japan

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart Phone
Brand Name	SHARP
FCC ID	APYHRO00288
EUT supports Radios application	GSM/WCDMA/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE FM Receiver/GNSS
IMEI Code	Conducted: 004401117330668 Radiation: 004401117330973
HW Version	DVT
SW Version	A804G
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 17 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 5 : 22.98 dBm LTE Band 12 : 23.04 dBm LTE Band 17 : 22.96 dBm
Antenna Gain	LTE Band 5 : -4.80 dBi LTE Band 12 : -4.20 dBi LTE Band 17 : -4.20 dBi
Type of Modulation	QPSK / 16QAM / 64QAM

1.5 Modification of EUT

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

1.6 Maximum ERP Power, Frequency Tolerance, and Emission Designator

LTE Band 5		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	824.7 ~ 848.3	1M09G7D	-	0.0399	1M09W7D	-	0.0343
3	825.5 ~ 847.5	2M72G7D	-	0.0396	2M73W7D	-	0.0341
5	826.5 ~ 846.5	4M49G7D	-	0.0400	4M51W7D	-	0.0343
10	829.0 ~ 844.0	9M03G7D	0.0041	0.0401	9M03W7D	-	0.0344

LTE Band 5		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	824.7 ~ 848.3	1M09W7D	-	0.0267
3	825.5 ~ 847.5	2M75W7D	-	0.0266
5	826.5 ~ 846.5	4M50W7D	-	0.0269
10	829.0 ~ 844.0	9M01W7D	-	0.0266

LTE Band 12		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	699.7 ~ 715.3	1M09G7D	-	0.0460	1M09W7D	-	0.0395
3	700.5 ~ 714.5	2M73G7D	-	0.0459	2M73W7D	-	0.0397
5	701.5 ~ 713.5	4M50G7D	-	0.0459	4M49W7D	-	0.0397
10	704.0 ~ 711.0	9M01G7D	0.0054	0.0467	9M03W7D	-	0.0401

LTE Band 12		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
1.4	699.7 ~ 715.3	1M09W7D	-	0.0309
3	700.5 ~ 714.5	2M75W7D	-	0.0310
5	701.5 ~ 713.5	4M50W7D	-	0.0310
10	704.0 ~ 711.0	9M05W7D	-	0.0315

LTE Band 17		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	706.5 ~ 713.5	4M52G7D	-	0.0457	4M51W7D	-	0.0391
10	709.0 ~ 711.0	9M01G7D	0.0035	0.0458	9M03W7D	-	0.0390

LTE Band 17		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	706.5 ~ 713.5	4M51W7D	-	0.0306
10	709.0 ~ 711.0	9M07W7D	-	0.0305

1.7 Testing Location

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-SZ	CN1256	421272

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-SZ	CN1256	421272

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24

1.9 Applicable Standards

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

- 47 CFR Part 2, 22(H), 27(H)
- ANSI C63.26-2015
- 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

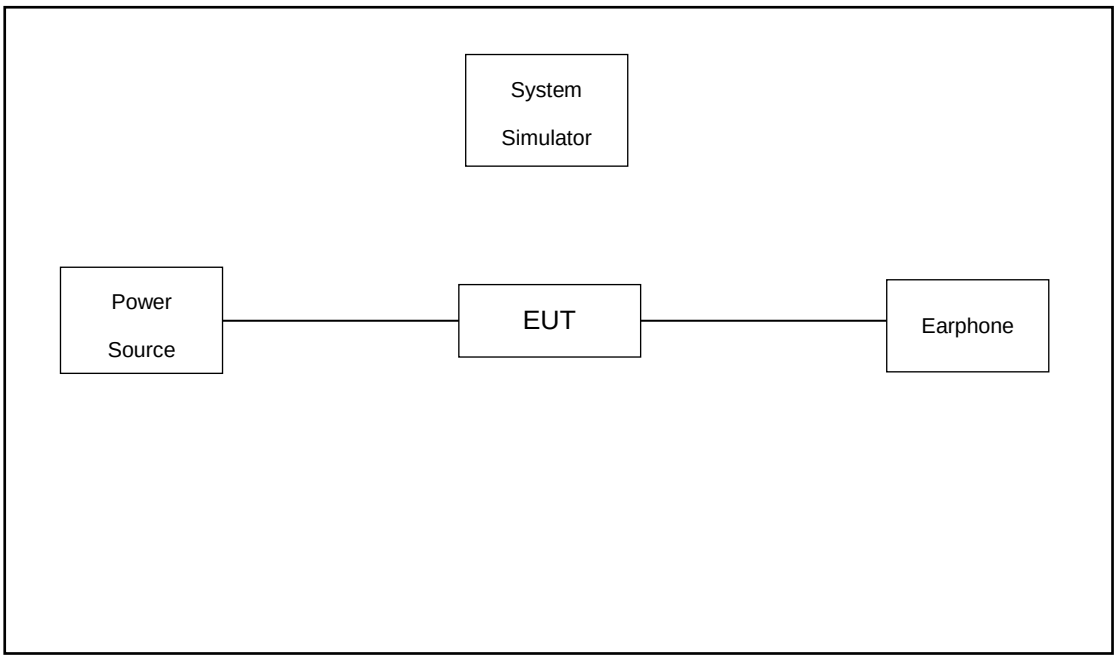
2.1 Test Mode

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.

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

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v
	17	-	-	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
	12				v	-	-	v	v	v	v		v	v	v	v
	17	-	-		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
	12	v	v	v	v	-	-	v	v	v			v	v	v	v
	17	-	-	v	v	-	-	v	v	v			v	v	v	v
Conducted Band Edge	5	v	v	v	v	-	-	v	v	v	v		v	v		v
	12	v	v	v	v	-	-	v	v	v	v		v	v		v
	17	-	-	v	v	-	-	v	v	v	v		v	v		v
Conducted Spurious Emission	5	v	v	v	v	-	-	v	v	v	v			v	v	v
	12	v	v	v	v	-	-	v	v	v	v			v	v	v
	17	-	-	v	v	-	-	v	v	v	v			v	v	v
Frequency Stability	5				v	-	-	v					v		v	
	12				v	-	-	v					v		v	
	17	-	-		v	-	-	v					v		v	
E.R.P.	5	v	v	v	v	-	-	v	v	v	v			v	v	v
	12	v	v	v	v	-	-	v	v	v	v			v	v	v
	17	-	-	v	v	-	-	v	v	v	v			v	v	v
Radiated Spurious Emission	5	Worst Case													v	
	12	Worst Case													v	
	17	Worst Case													v	
Note	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.															

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.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Apple	MC690ZP/A	N/A	Shielded, 1.0m	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 4.0 dB and 10dB attenuator.

Example :

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

= 4.0 + 10 = 14.0 (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 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

LTE Band 17 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23780	23790	23800
	Frequency	709	710	711
5	Channel	23755	23790	23825
	Frequency	706.5	710	713.5

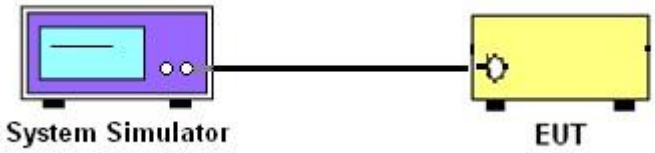
3 Conducted Test Items

3.1 Measuring Instruments

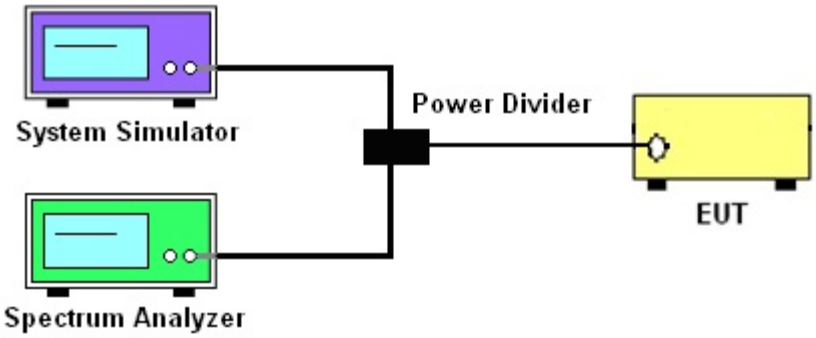
See list of measuring instruments of this test report.

3.2 Test Setup

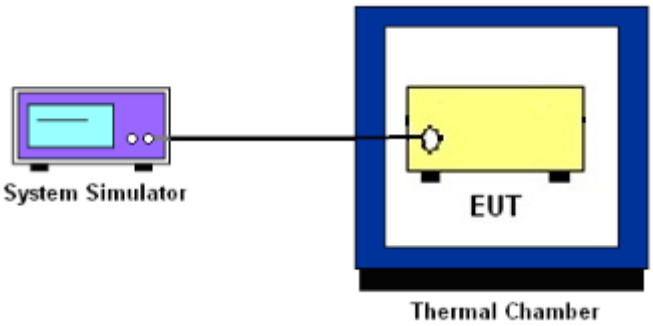
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP

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

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

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

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 12and Band 17.

According to KDB 412172 D01 Power Approach,

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

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
   (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + $10\log_{10}$(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 (g)

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

   Example:

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

   = P(W)- [43 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

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

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

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

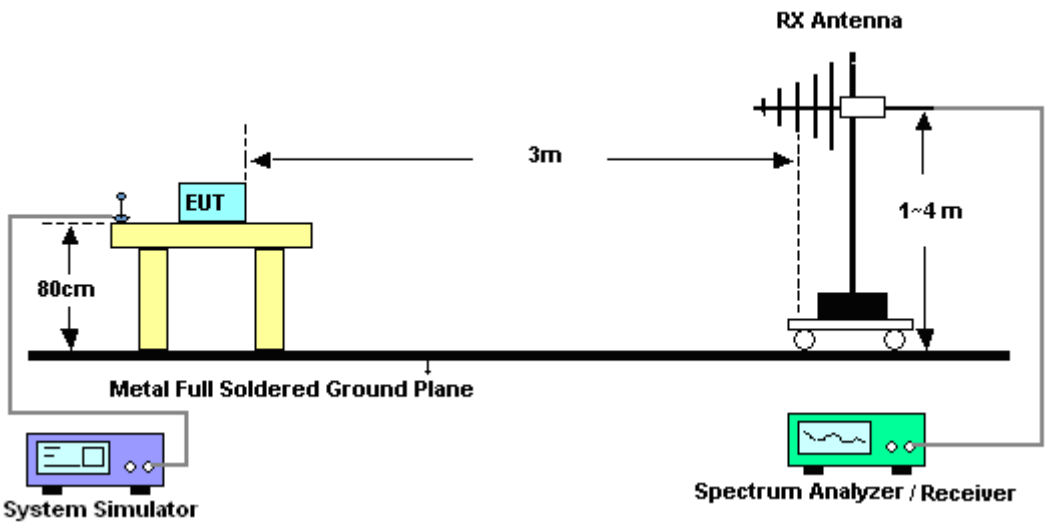
4 Radiated Test Items

4.1 Measuring Instruments

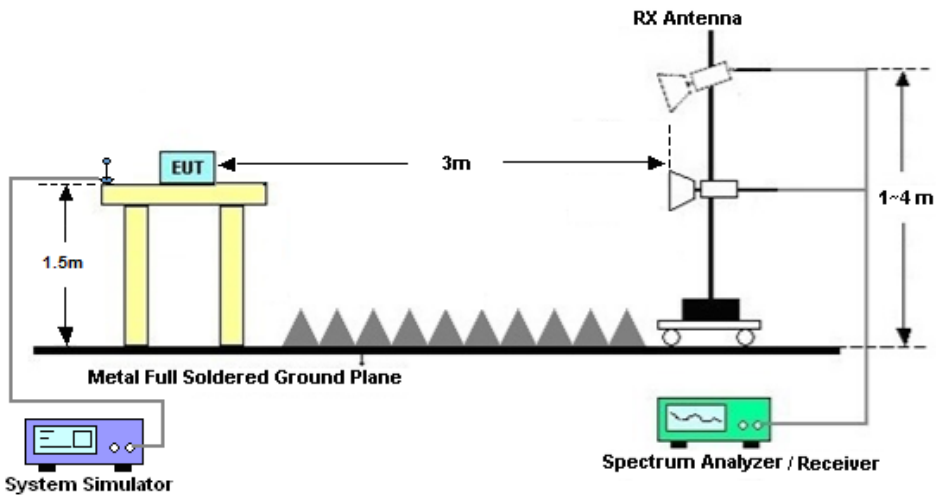
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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.

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

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. 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)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 17, 2020	Aug. 14, 2020~ Aug. 17, 2020	Apr. 16, 2021	Conducted (TH01-SZ)
DC Power Supply	GWINSTEK	AnritsuGPS-3030D	EM882636	Max 30V	Apr. 17, 2020	Aug. 14, 2020~ Aug. 17, 2020	Apr. 16, 2021	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Dec. 22, 2019	Aug. 14, 2020~ Aug. 17, 2020	Dec. 21, 2020	Conducted (TH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 21, 2020	Aug. 20, 2020	Jul. 20, 2021	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Nov. 07, 2019	Aug. 20, 2020	Nov. 06, 2020	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1474	1GHz~18GHz	May 23, 2020	Aug. 20, 2020	May 22, 2021	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 26, 2020	Aug. 20, 2020	Jul. 25, 2021	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 17, 2019	Aug. 20, 2020	Oct. 16, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P-R	1943528	1GHz~18GHz	Oct. 17, 2019	Aug. 20, 2020	Oct. 16, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 21, 2020	Aug. 20, 2020	Jul. 20, 2021	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY53270156	500MHz~26.5GHz	Oct. 17, 2019	Aug. 20, 2020	Oct. 16, 2020	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Aug. 20, 2020	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Aug. 20, 2020	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Aug. 20, 2020	NCR	Radiation (03CH04-SZ)

NCR: No Calibration Required

6 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.8dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.1dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9dB**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 5						
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				20450	20525	20600
Frequency (MHz)				829	836.5	844
10	QPSK	1	0	22.98	22.90	22.74
10	QPSK	1	25	22.91	22.86	22.77
10	QPSK	1	49	22.87	22.83	22.74
10	QPSK	25	0	21.97	21.94	21.73
10	QPSK	25	12	21.96	21.90	21.84
10	QPSK	25	25	21.95	21.90	21.81
10	QPSK	50	0	21.98	21.92	21.73
10	16QAM	1	0	22.31	22.24	22.10
10	16QAM	1	25	22.24	22.17	22.13
10	16QAM	1	49	22.24	22.16	22.05
10	16QAM	25	0	21.04	21.01	20.81
10	16QAM	25	12	21.08	21.00	20.94
10	16QAM	25	25	21.04	20.99	20.91
10	16QAM	50	0	21.03	21.03	20.84
10	64QAM	1	0	21.20	21.18	21.01
10	64QAM	1	25	21.18	21.16	21.02
10	64QAM	1	49	21.15	21.09	21.00
10	64QAM	25	0	20.08	20.04	19.85
10	64QAM	25	12	20.10	20.03	19.97
10	64QAM	25	25	20.05	19.99	19.93
10	64QAM	50	0	20.05	20.03	19.82

Channel				20425	20525	20625
Frequency (MHz)				826.5	836.5	846.5
5	QPSK	1	0	22.97	22.89	22.80
5	QPSK	1	12	22.91	22.83	22.76
5	QPSK	1	24	22.89	22.83	22.75
5	QPSK	12	0	21.97	21.92	21.81
5	QPSK	12	7	21.98	21.93	21.83
5	QPSK	12	13	21.95	21.89	21.81
5	QPSK	25	0	21.96	21.88	21.82
5	16QAM	1	0	22.30	22.25	22.15
5	16QAM	1	12	22.27	22.21	22.09
5	16QAM	1	24	22.24	22.19	22.04
5	16QAM	12	0	21.08	21.02	20.90
5	16QAM	12	7	21.10	21.03	20.93
5	16QAM	12	13	21.07	21.00	20.86
5	16QAM	25	0	21.07	20.98	20.88
5	64QAM	1	0	21.24	21.17	21.04
5	64QAM	1	12	21.23	21.14	21.05
5	64QAM	1	24	21.19	21.12	20.98
5	64QAM	12	0	20.15	20.08	19.97
5	64QAM	12	7	20.16	20.09	19.98
5	64QAM	12	13	20.10	20.06	19.92
5	64QAM	25	0	20.07	20.00	19.92

Channel				20415	20525	20635
Frequency (MHz)				825.5	836.5	847.5
3	QPSK	1	0	22.93	22.85	22.77
3	QPSK	1	8	22.92	22.82	22.74
3	QPSK	1	14	22.90	22.80	22.71
3	QPSK	8	0	21.99	21.91	21.79
3	QPSK	8	4	21.97	21.91	21.84
3	QPSK	8	7	21.94	21.90	21.76
3	QPSK	15	0	21.97	21.90	21.80
3	16QAM	1	0	22.26	22.17	22.08
3	16QAM	1	8	22.28	22.19	22.05
3	16QAM	1	14	22.23	22.16	21.99
3	16QAM	8	0	21.09	21.03	20.91
3	16QAM	8	4	21.12	21.05	20.96
3	16QAM	8	7	21.07	21.03	20.90
3	16QAM	15	0	21.09	20.99	20.89
3	64QAM	1	0	21.20	21.10	20.99
3	64QAM	1	8	21.18	21.10	20.99
3	64QAM	1	14	21.19	21.10	20.98
3	64QAM	8	0	20.08	20.04	19.92
3	64QAM	8	4	20.14	20.07	19.97
3	64QAM	8	7	20.10	20.05	19.92
3	64QAM	15	0	20.08	20.00	19.88

Channel				20407	20525	20643
Frequency (MHz)				824.7	836.5	848.3
1.4	QPSK	1	0	22.85	22.77	22.67
1.4	QPSK	1	3	22.96	22.84	22.73
1.4	QPSK	1	5	22.86	22.77	22.66
1.4	QPSK	3	0	22.94	22.81	22.72
1.4	QPSK	3	1	22.94	22.85	22.75
1.4	QPSK	3	3	22.94	22.80	22.69
1.4	QPSK	6	0	21.92	21.83	21.72
1.4	16QAM	1	0	22.23	22.13	21.98
1.4	16QAM	1	3	22.30	22.23	22.08
1.4	16QAM	1	5	22.20	22.12	21.59
1.4	16QAM	3	0	22.03	21.94	21.80
1.4	16QAM	3	1	22.02	21.94	21.81
1.4	16QAM	3	3	21.97	21.88	21.76
1.4	16QAM	6	0	21.08	20.98	20.85
1.4	64QAM	1	0	21.12	21.05	20.93
1.4	64QAM	1	3	21.21	21.11	20.97
1.4	64QAM	1	5	21.13	21.05	20.90
1.4	64QAM	3	0	21.13	21.06	20.93
1.4	64QAM	3	1	21.18	21.07	20.94
1.4	64QAM	3	3	21.15	21.02	20.90
1.4	64QAM	6	0	20.02	19.93	19.80

LTE Band 12						
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				23060	23095	23130
Frequency (MHz)				704	707.5	711
10	QPSK	1	0	22.82	22.89	22.94
10	QPSK	1	25	22.90	23.00	22.95
10	QPSK	1	49	23.04	22.99	22.96
10	QPSK	25	0	21.94	22.03	21.96
10	QPSK	25	12	22.08	22.03	22.00
10	QPSK	25	25	22.05	22.01	22.01
10	QPSK	50	0	22.05	22.03	22.00
10	16QAM	1	0	22.13	22.19	22.30
10	16QAM	1	25	22.25	22.34	22.25
10	16QAM	1	49	22.38	22.32	22.30
10	16QAM	25	0	20.99	21.10	21.07
10	16QAM	25	12	21.15	21.16	21.11
10	16QAM	25	25	21.17	21.11	21.10
10	16QAM	50	0	21.17	21.11	21.12
10	64QAM	1	0	21.05	21.14	21.22
10	64QAM	1	25	21.18	21.33	21.22
10	64QAM	1	49	21.33	21.27	21.24
10	64QAM	25	0	20.02	20.11	20.09
10	64QAM	25	12	20.20	20.15	20.14
10	64QAM	25	25	20.17	20.15	20.10
10	64QAM	50	0	20.16	20.16	20.09

Channel				23035	23095	23155
Frequency (MHz)				701.5	707.5	713.5
5	QPSK	1	0	22.72	22.87	22.83
5	QPSK	1	12	22.84	22.96	22.85
5	QPSK	1	24	22.84	22.97	22.86
5	QPSK	12	0	21.87	22.04	21.83
5	QPSK	12	7	21.90	22.04	21.86
5	QPSK	12	13	21.86	22.04	21.84
5	QPSK	25	0	21.88	22.01	21.86
5	16QAM	1	0	22.05	22.20	22.14
5	16QAM	1	12	22.15	22.34	22.14
5	16QAM	1	24	22.16	22.33	22.17
5	16QAM	12	0	20.93	21.13	20.89
5	16QAM	12	7	20.96	21.17	20.96
5	16QAM	12	13	20.94	21.14	20.94
5	16QAM	25	0	20.95	21.12	20.93
5	64QAM	1	0	21.00	21.16	21.08
5	64QAM	1	12	21.09	21.25	21.11
5	64QAM	1	24	21.13	21.26	21.12
5	64QAM	12	0	20.01	20.18	19.97
5	64QAM	12	7	20.01	20.24	20.01
5	64QAM	12	13	19.99	20.19	20.02
5	64QAM	25	0	19.95	20.15	19.95

Channel				23025	23095	23165
Frequency (MHz)				700.5	707.5	714.5
3	QPSK	1	0	22.74	22.97	22.82
3	QPSK	1	8	22.74	22.97	22.83
3	QPSK	1	14	22.83	22.95	22.83
3	QPSK	8	0	21.78	22.05	21.81
3	QPSK	8	4	21.80	22.03	21.88
3	QPSK	8	7	21.85	22.01	21.85
3	QPSK	15	0	21.88	22.01	21.84
3	16QAM	1	0	22.06	22.29	22.15
3	16QAM	1	8	22.06	22.34	22.17
3	16QAM	1	14	22.15	22.32	22.15
3	16QAM	8	0	20.87	21.17	20.95
3	16QAM	8	4	20.91	21.17	20.98
3	16QAM	8	7	20.95	21.15	20.97
3	16QAM	15	0	20.97	21.10	20.96
3	64QAM	1	0	21.01	21.23	21.07
3	64QAM	1	8	21.01	21.25	21.10
3	64QAM	1	14	21.09	21.26	21.08
3	64QAM	8	0	19.90	20.20	19.96
3	64QAM	8	4	19.90	20.19	20.02
3	64QAM	8	7	20.00	20.18	20.00
3	64QAM	15	0	19.98	20.12	19.95

Channel				23017	23095	23173
Frequency (MHz)				699.7	707.5	715.3
1.4	QPSK	1	0	22.65	22.88	22.76
1.4	QPSK	1	3	22.73	22.96	22.84
1.4	QPSK	1	5	22.65	22.88	22.73
1.4	QPSK	3	0	22.73	22.95	22.79
1.4	QPSK	3	1	22.76	22.98	22.82
1.4	QPSK	3	3	22.71	22.95	22.80
1.4	QPSK	6	0	21.73	21.93	21.76
1.4	16QAM	1	0	21.97	22.23	22.04
1.4	16QAM	1	3	22.08	22.32	22.16
1.4	16QAM	1	5	21.97	22.24	22.03
1.4	16QAM	3	0	21.80	22.05	21.84
1.4	16QAM	3	1	21.83	22.07	21.88
1.4	16QAM	3	3	21.78	22.00	21.86
1.4	16QAM	6	0	20.86	21.10	20.93
1.4	64QAM	1	0	20.92	21.17	20.99
1.4	64QAM	1	3	21.01	21.25	21.07
1.4	64QAM	1	5	20.92	21.19	21.01
1.4	64QAM	3	0	20.93	21.20	21.01
1.4	64QAM	3	1	20.98	21.20	21.05
1.4	64QAM	3	3	20.94	21.15	21.00
1.4	64QAM	6	0	19.99	20.00	19.97

LTE Band 17						
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				23780	23790	23800
Frequency (MHz)				709	710	711
10	QPSK	1	0	22.91	22.89	22.78
10	QPSK	1	25	22.96	22.91	22.78
10	QPSK	1	49	22.94	22.92	22.81
10	QPSK	25	0	21.99	21.96	21.80
10	QPSK	25	12	22.00	21.95	21.84
10	QPSK	25	25	21.99	21.97	21.82
10	QPSK	50	0	22.00	21.95	21.85
10	16QAM	1	0	22.24	22.24	22.11
10	16QAM	1	25	22.25	22.23	22.12
10	16QAM	1	49	22.26	22.23	22.14
10	16QAM	25	0	21.03	21.02	20.90
10	16QAM	25	12	21.12	21.06	20.92
10	16QAM	25	25	21.05	21.02	20.92
10	16QAM	50	0	21.05	21.07	20.91
10	64QAM	1	0	21.16	21.14	21.04
10	64QAM	1	25	21.16	21.13	21.02
10	64QAM	1	49	21.20	21.20	21.08
10	64QAM	25	0	20.09	20.05	19.93
10	64QAM	25	12	20.09	20.08	19.93
10	64QAM	25	25	20.06	20.04	19.96
10	64QAM	50	0	20.11	20.06	19.96

Channel				23755	23790	23825
Frequency (MHz)				706.5	710	713.5
5	QPSK	1	0	22.95	22.90	22.75
5	QPSK	1	12	22.93	22.88	22.76
5	QPSK	1	24	22.95	22.88	22.77
5	QPSK	12	0	21.95	21.97	21.77
5	QPSK	12	7	21.99	21.98	21.81
5	QPSK	12	13	21.97	21.94	21.79
5	QPSK	25	0	21.96	21.94	21.81
5	16QAM	1	0	22.22	22.22	22.07
5	16QAM	1	12	22.26	22.24	22.08
5	16QAM	1	24	22.27	22.20	22.10
5	16QAM	12	0	21.03	21.03	20.85
5	16QAM	12	7	21.09	21.03	20.90
5	16QAM	12	13	21.09	20.99	20.86
5	16QAM	25	0	21.09	21.02	20.88
5	64QAM	1	0	21.21	21.17	21.01
5	64QAM	1	12	21.18	21.15	21.00
5	64QAM	1	24	21.21	21.14	21.02
5	64QAM	12	0	20.13	20.07	19.92
5	64QAM	12	7	20.17	20.11	19.92
5	64QAM	12	13	20.15	20.09	19.93
5	64QAM	25	0	20.06	20.02	19.89

ERP

LTE Band 5 (GT - LC = -4.80 dB) QPSK									
Bandwidth	1.4M			3M			5M		
Channel	20407	20525	20643	20415	20525	20635	20425	20525	20625
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	824.7	836.5	848.3	825.5	836.5	847.5	826.5	836.5	846.5
Conducted Power (dBm)	22.96	22.84	22.73	22.93	22.85	22.77	22.97	22.89	22.80
Conducted Power (Watts)	0.1977	0.1923	0.1875	0.1963	0.1928	0.1892	0.1982	0.1945	0.1905
ERP(dBm)	16.01	15.89	15.78	15.98	15.90	15.82	16.02	15.94	15.85
ERP(Watts)	0.0399	0.0388	0.0378	0.0396	0.0389	0.0382	0.0400	0.0393	0.0385

LTE Band 5 (GT - LC = -4.80 dB) QPSK			
Bandwidth	10M		
Channel	20450	20525	20600
	(Low)	(Mid)	(High)
Frequency (MHz)	829	836.5	844
Conducted Power (dBm)	22.98	22.90	22.74
Conducted Power (Watts)	0.1986	0.1950	0.1879
ERP(dBm)	16.03	15.95	15.79
ERP(Watts)	0.0401	0.0394	0.0379

LTE Band 5 (GT - LC = -4.80 dB) 16QAM									
Bandwidth	1.4M			3M			5M		
Channel	20407	20525	20643	20415	20525	20635	20425	20525	20625
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	824.7	836.5	848.3	825.5	836.5	847.5	826.5	836.5	846.5
Conducted Power (dBm)	22.30	22.23	22.08	22.28	22.19	22.05	22.30	22.25	22.15
Conducted Power (Watts)	0.1698	0.1671	0.1614	0.1690	0.1656	0.1603	0.1698	0.1679	0.1641
ERP(dBm)	15.35	15.28	15.13	15.33	15.24	15.10	15.35	15.30	15.20
ERP(Watts)	0.0343	0.0337	0.0326	0.0341	0.0334	0.0324	0.0343	0.0339	0.0331

LTE Band 5 (GT - LC = -4.80 dB) 16QAM			
Bandwidth	10M		
Channel	20450	20525	20600
	(Low)	(Mid)	(High)
Frequency (MHz)	829	836.5	844
Conducted Power (dBm)	22.31	22.24	22.10
Conducted Power (Watts)	0.1702	0.1675	0.1622
ERP(dBm)	15.36	15.29	15.15
ERP(Watts)	0.0344	0.0338	0.0327

LTE Band 5 (GT - LC = -4.80 dB) 64QAM									
Bandwidth	1.4M			3M			5M		
Channel	20407	20525	20643	20415	20525	20635	20425	20525	20625
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	824.7	836.5	848.3	825.5	836.5	847.5	826.5	836.5	846.5
Conducted Power (dBm)	21.21	21.11	20.97	21.20	21.10	20.99	21.24	21.17	21.04
Conducted Power (Watts)	0.1321	0.1291	0.1250	0.1318	0.1288	0.1256	0.1330	0.1309	0.1271
ERP(dBm)	14.26	14.16	14.02	14.25	14.15	14.04	14.29	14.22	14.09
ERP(Watts)	0.0267	0.0261	0.0252	0.0266	0.0260	0.0254	0.0269	0.0264	0.0256

LTE Band 5 (GT - LC = -4.80 dB) 64QAM			
Bandwidth	10M		
Channel	20450	20525	20600
	(Low)	(Mid)	(High)
Frequency (MHz)	829	836.5	844
Conducted Power (dBm)	21.20	21.18	21.01
Conducted Power (Watts)	0.1318	0.1312	0.1262
ERP(dBm)	14.25	14.23	14.06
ERP(Watts)	0.0266	0.0265	0.0255

LTE Band 12 (GT - LC = -4.20 dB) QPSK									
Bandwidth	1.4M			3M			5M		
Channel	23017	23095	23173	23025	23095	23165	23035	23095	23155
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	699.7	707.5	715.3	700.5	707.5	714.5	701.5	707.5	713.5
Conducted Power (dBm)	22.76	22.98	22.82	22.74	22.97	22.83	22.84	22.97	22.86
Conducted Power (Watts)	0.1888	0.1986	0.1914	0.1879	0.1982	0.1919	0.1923	0.1982	0.1932
ERP(dBm)	16.41	16.63	16.47	16.39	16.62	16.48	16.49	16.62	16.51
ERP(Watts)	0.0438	0.0460	0.0444	0.0436	0.0459	0.0445	0.0446	0.0459	0.0448

LTE Band 12 (GT - LC = -4.20 dB) QPSK			
Bandwidth	10M		
Channel	23060	23095	23130
	(Low)	(Mid)	(High)
Frequency (MHz)	704	707.5	711
Conducted Power (dBm)	23.04	22.99	22.96
Conducted Power (Watts)	0.2014	0.1991	0.1977
ERP(dBm)	16.69	16.64	16.61
ERP(Watts)	0.0467	0.0461	0.0458

LTE Band 12 (GT - LC = -4.20 dB) 16QAM									
Bandwidth	1.4M			3M			5M		
Channel	23017	23095	23173	23025	23095	23165	23035	23095	23155
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	699.7	707.5	715.3	700.5	707.5	714.5	701.5	707.5	713.5
Conducted Power (dBm)	22.08	22.32	22.16	22.06	22.34	22.17	22.15	22.34	22.14
Conducted Power (Watts)	0.1614	0.1706	0.1644	0.1607	0.1714	0.1648	0.1641	0.1714	0.1637
ERP(dBm)	15.73	15.97	15.81	15.71	15.99	15.82	15.80	15.99	15.79
ERP(Watts)	0.0374	0.0395	0.0381	0.0372	0.0397	0.0382	0.0380	0.0397	0.0379

LTE Band 12 (GT - LC = -4.20 dB) 16QAM			
Bandwidth	10M		
Channel	23060	23095	23130
	(Low)	(Mid)	(High)
Frequency (MHz)	704	707.5	711
Conducted Power (dBm)	22.38	22.32	22.30
Conducted Power (Watts)	0.1730	0.1706	0.1698
ERP(dBm)	16.03	15.97	15.95
ERP(Watts)	0.0401	0.0395	0.0394

LTE Band 12 (GT - LC = -4.20 dB) 64QAM									
Bandwidth	1.4M			3M			5M		
Channel	23017	23095	23173	23025	23095	23165	23035	23095	23155
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	699.7	707.5	715.3	700.5	707.5	714.5	701.5	707.5	713.5
Conducted Power (dBm)	21.01	21.25	21.07	21.09	21.26	21.08	21.13	21.26	21.12
Conducted Power (Watts)	0.1262	0.1334	0.1279	0.1285	0.1337	0.1282	0.1297	0.1337	0.1294
ERP(dBm)	14.66	14.90	14.72	14.74	14.91	14.73	14.78	14.91	14.77
ERP(Watts)	0.0292	0.0309	0.0296	0.0298	0.0310	0.0297	0.0301	0.0310	0.0300

LTE Band 12 (GT - LC = -4.20 dB) 64QAM			
Bandwidth	10M		
Channel	23060	23095	23130
	(Low)	(Mid)	(High)
Frequency (MHz)	704	707.5	711
Conducted Power (dBm)	21.18	21.33	21.22
Conducted Power (Watts)	0.1312	0.1358	0.1324
ERP(dBm)	14.83	14.98	14.87
ERP(Watts)	0.0304	0.0315	0.0307

LTE Band 17 (GT - LC = -4.20 dB) QPSK						
Bandwidth	5M			10M		
Channel	23755	23790	23825	23780	23790	23800
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	706.5	710	713.5	709	710	711
Conducted Power (dBm)	22.95	22.88	22.77	22.96	22.91	22.78
Conducted Power (Watts)	0.1972	0.1941	0.1892	0.1977	0.1954	0.1897
ERP(dBm)	16.60	16.53	16.42	16.61	16.56	16.43
ERP(Watts)	0.0457	0.0450	0.0439	0.0458	0.0453	0.0440

LTE Band 17 (GT - LC = -4.20 dB) 16QAM						
Bandwidth	5M			10M		
Channel	23755	23790	23825	23780	23790	23800
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	706.5	710	713.5	709	710	711
Conducted Power (dBm)	22.27	22.20	22.10	22.26	22.23	22.14
Conducted Power (Watts)	0.1687	0.1660	0.1622	0.1683	0.1671	0.1637
ERP(dBm)	15.92	15.85	15.75	15.91	15.88	15.79
ERP(Watts)	0.0391	0.0385	0.0376	0.0390	0.0387	0.0379

LTE Band 17 (GT - LC = -4.20 dB) 64QAM						
Bandwidth	5M			10M		
Channel	23755	23790	23825	23780	23790	23800
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency (MHz)	706.5	710	713.5	709	710	711
Conducted Power (dBm)	21.21	21.17	21.01	21.20	21.20	21.08
Conducted Power (Watts)	0.1321	0.1309	0.1262	0.1318	0.1318	0.1282
ERP(dBm)	14.86	14.82	14.66	14.85	14.85	14.73
ERP(Watts)	0.0306	0.0303	0.0292	0.0305	0.0305	0.0297

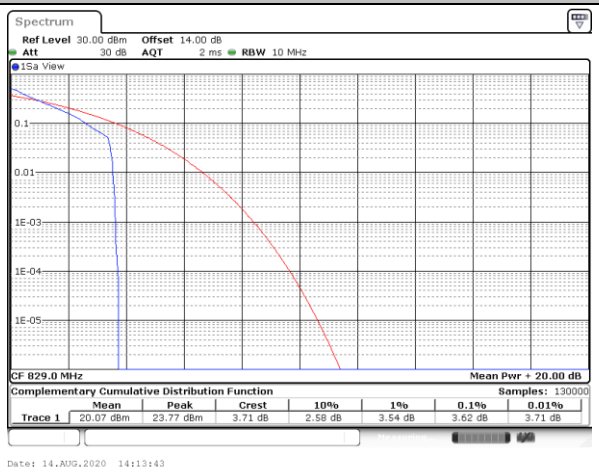
LTE Band 5

Peak-to-Average Ratio

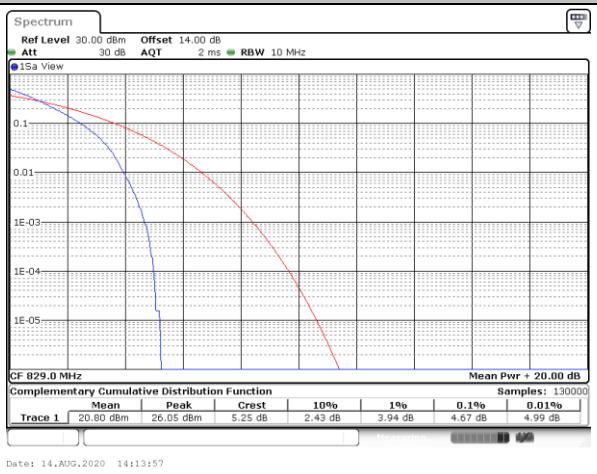
Mode	LTE Band 5 / 10MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	3.62	4.67	5.13	5.88	PASS
Middle CH	3.57	4.43	5.28	5.77	
Highest CH	3.59	4.67	4.90	5.77	
Mode	LTE Band 5 / 10MHz				
Mod.	64QAM				Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	6.41	6.32	-	-	PASS
Middle CH	6.84	6.32	-	-	
Highest CH	6.46	6.41	-	-	

LTE Band 5 / 10MHz / QPSK

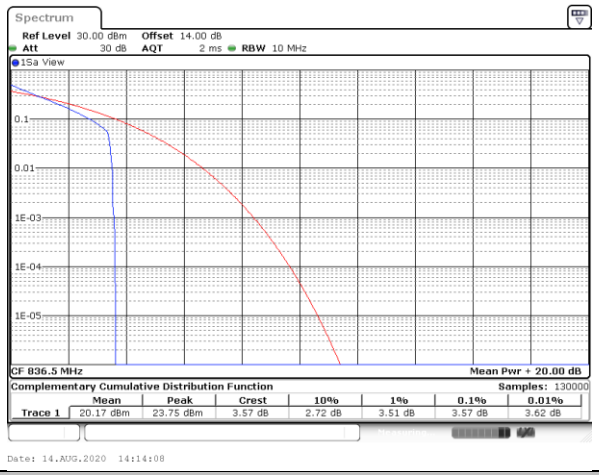
Lowest Channel / 1RB



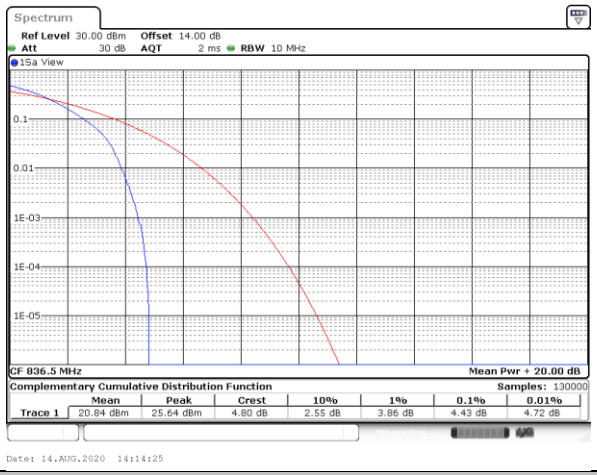
Lowest Channel / Full RB



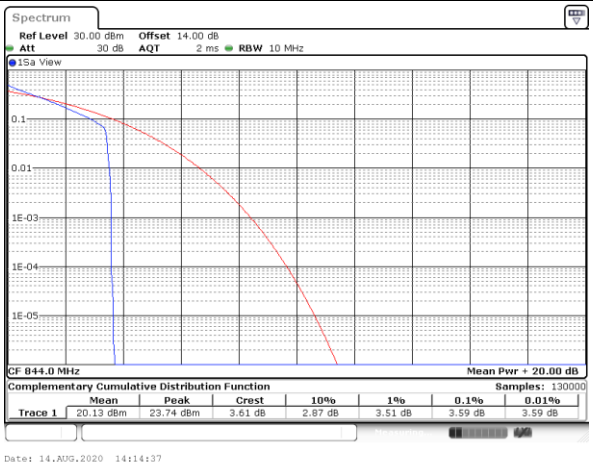
Middle Channel / 1RB



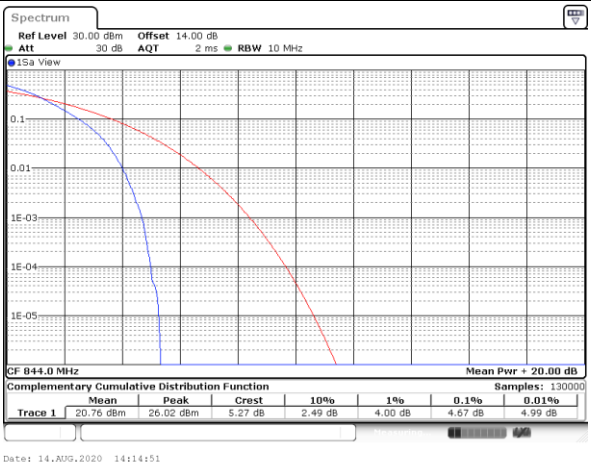
Middle Channel / Full RB



Highest Channel / 1RB

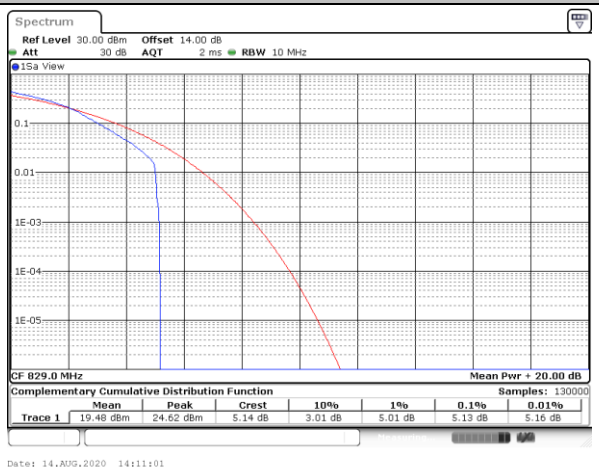


Highest Channel / Full RB

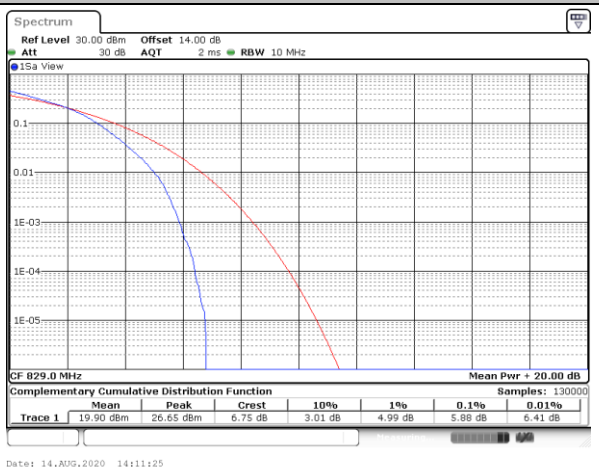


LTE Band 5 / 10MHz / 16QAM

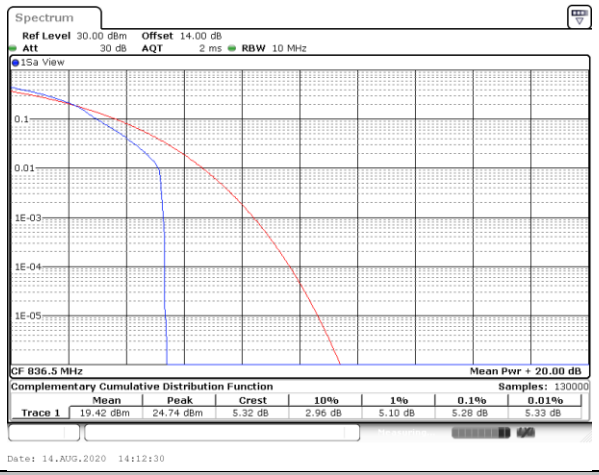
Lowest Channel / 1RB



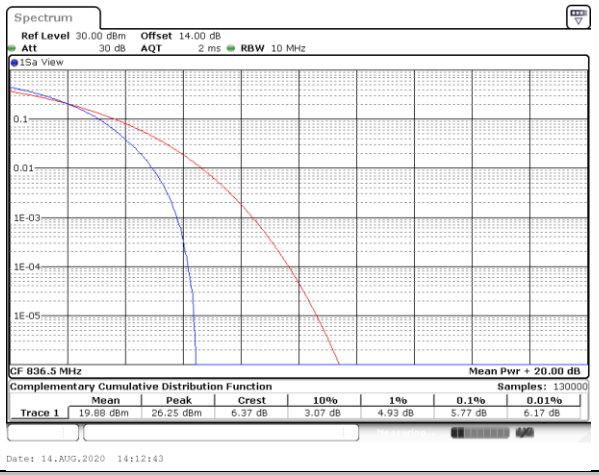
Lowest Channel / Full RB



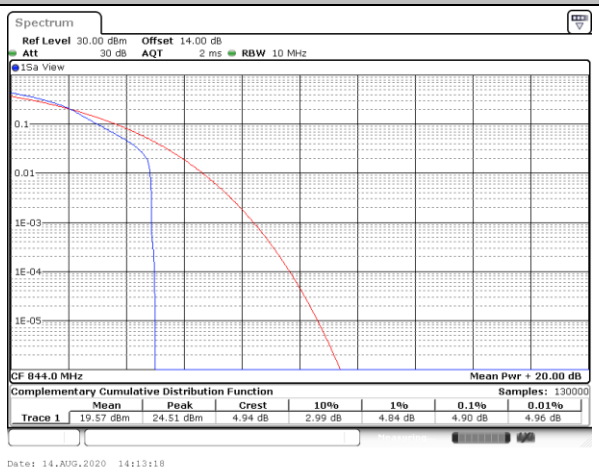
Middle Channel / 1RB



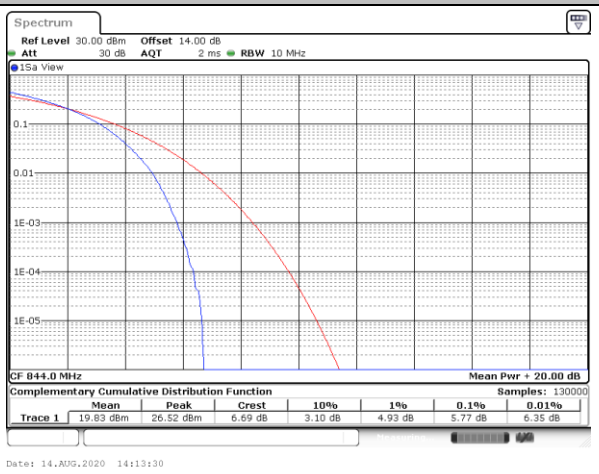
Middle Channel / Full RB



Highest Channel / 1RB

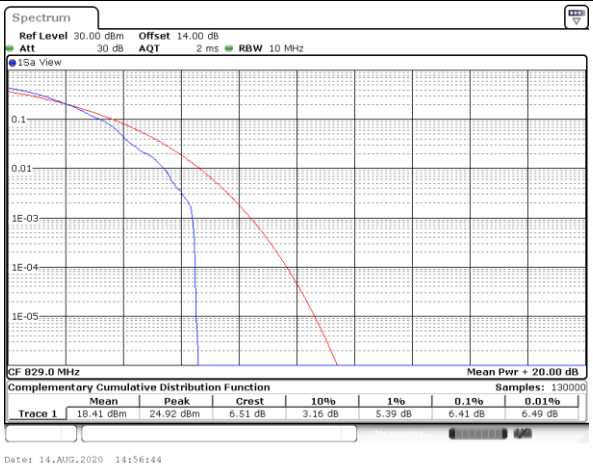


Highest Channel / Full RB

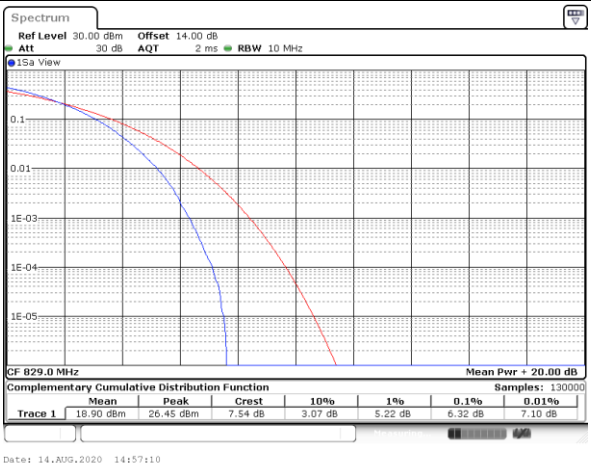


LTE Band 5 / 10MHz / 64QAM

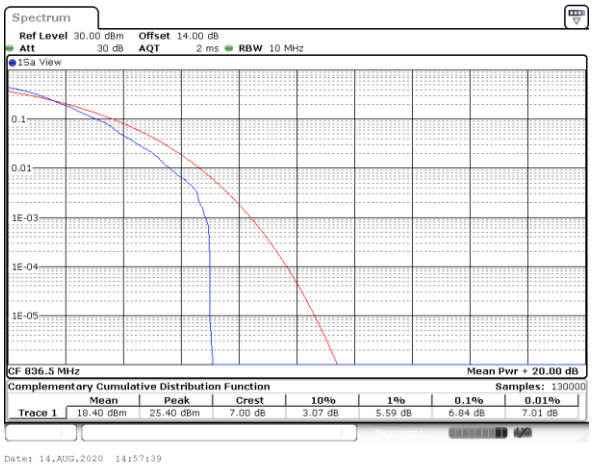
Lowest Channel / 1RB



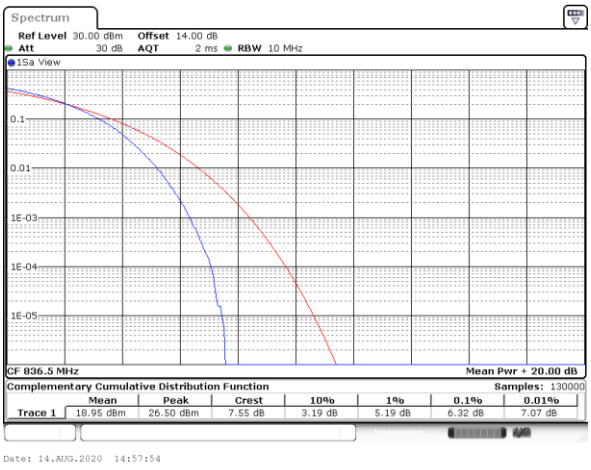
Lowest Channel / Full RB



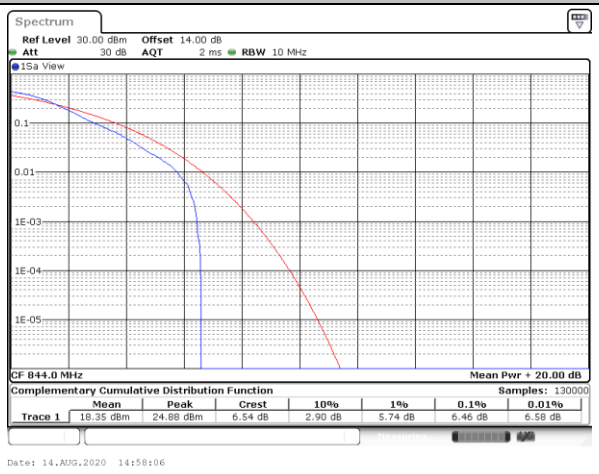
Middle Channel / 1RB



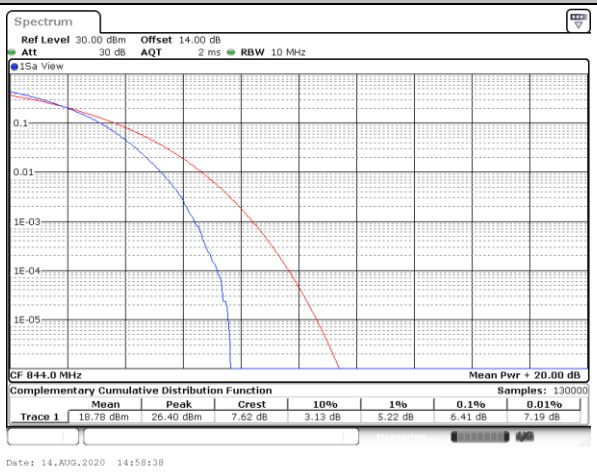
Middle Channel / Full RB



Highest Channel / 1RB



Highest Channel / Full RB

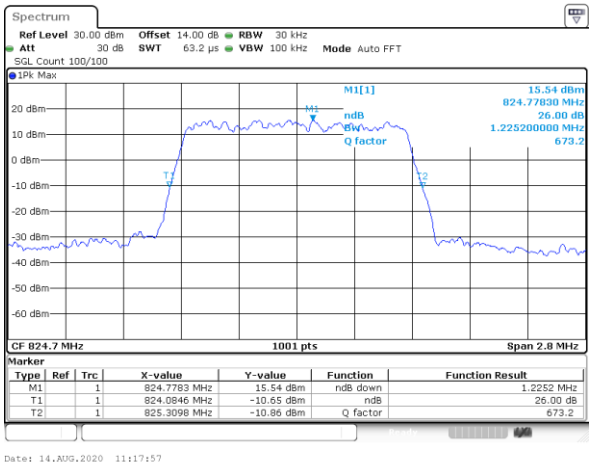


26dB Bandwidth

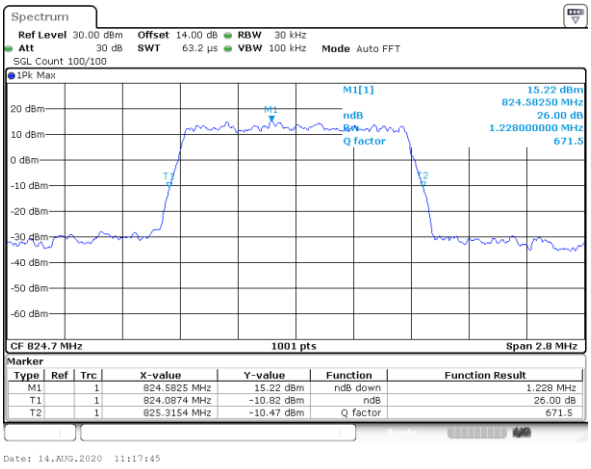
Mode	LTE Band 5 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.23	1.23	2.99	3.03	4.95	4.86	9.67	9.71	-	-	-	-
Middle CH	1.23	1.22	3.03	3.03	4.86	4.90	9.61	9.83	-	-	-	-
Highest CH	1.22	1.22	3.00	2.97	4.85	4.85	9.81	9.83	-	-	-	-
Mode	LTE Band 5 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	1.23	-	2.98	-	4.82	-	9.77	-	-	-	-	-
Middle CH	1.21	-	3.01	-	4.91	-	9.63	-	-	-	-	-
Highest CH	1.22	-	3.00	-	4.77	-	9.77	-	-	-	-	-

LTE Band 5

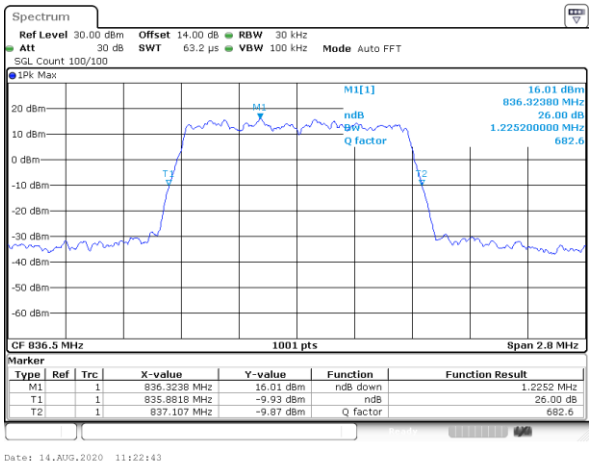
Lowest Channel / 1.4MHz / QPSK



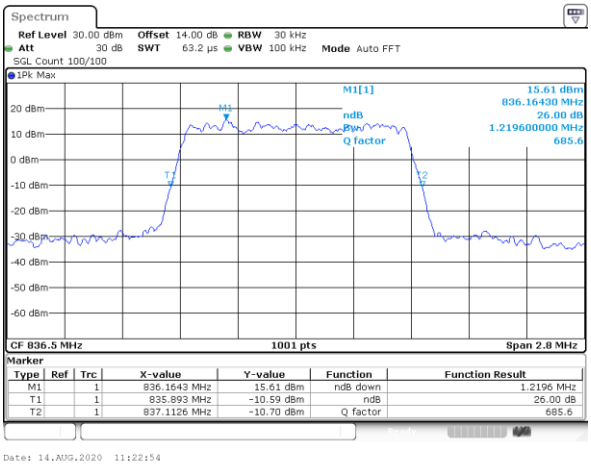
Lowest Channel / 1.4MHz / 16QAM



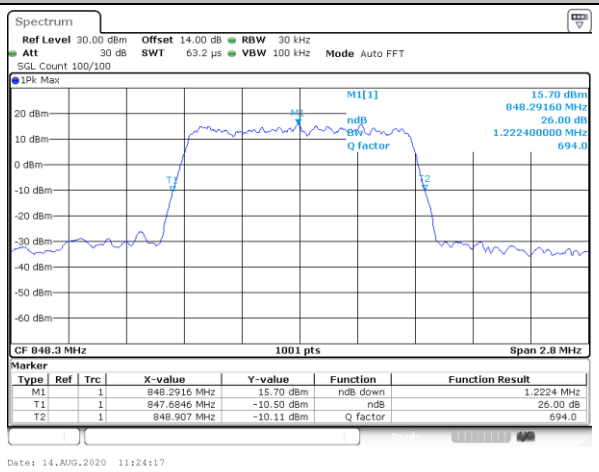
Middle Channel / 1.4MHz / QPSK



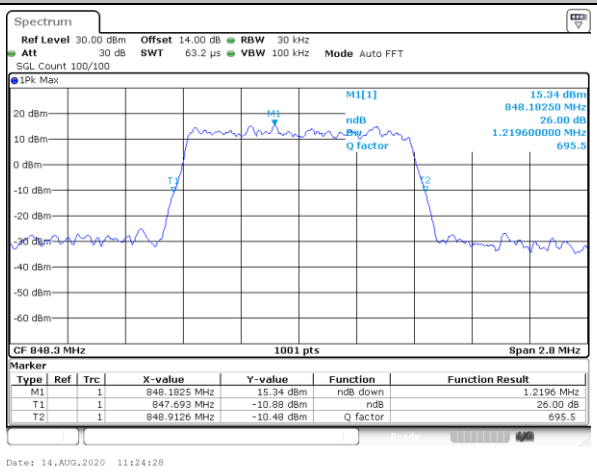
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK

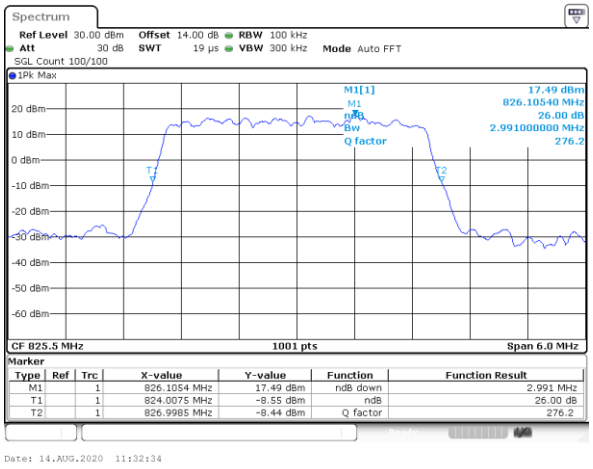


Highest Channel / 1.4MHz / 16QAM

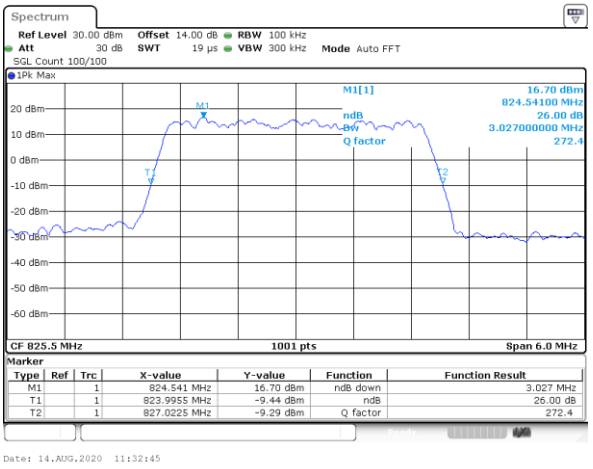


LTE Band 5

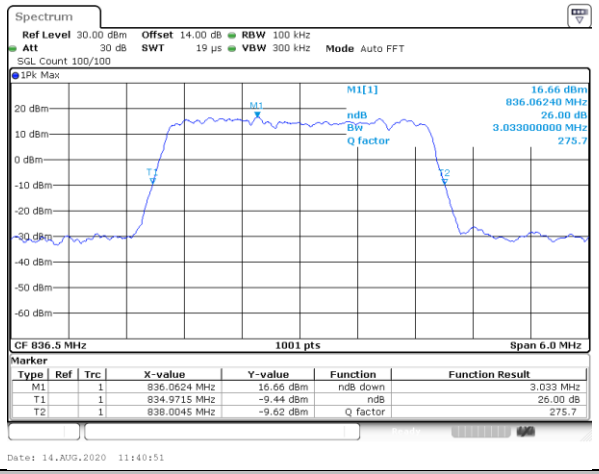
Lowest Channel / 3MHz / QPSK



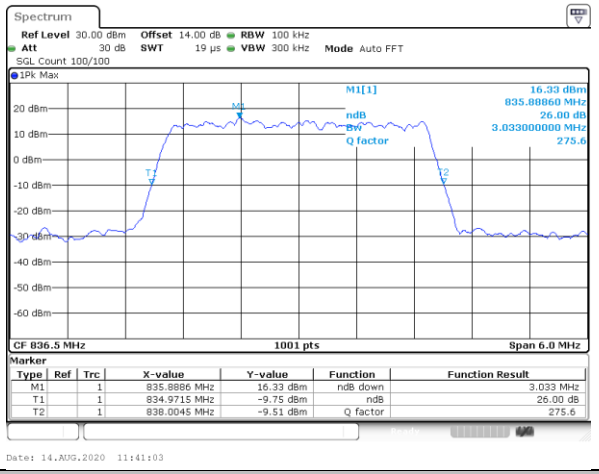
Lowest Channel / 3MHz / 16QAM



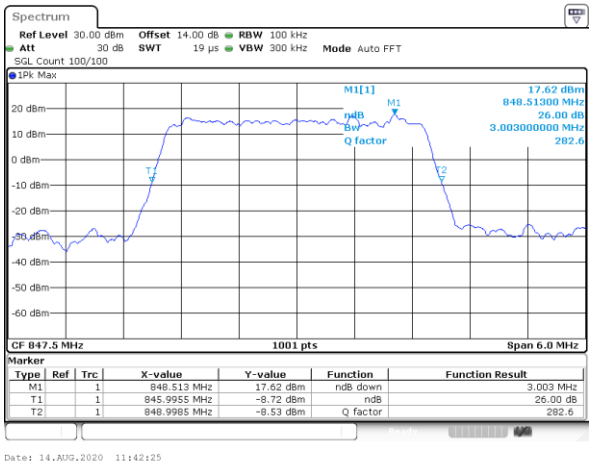
Middle Channel / 3MHz / QPSK



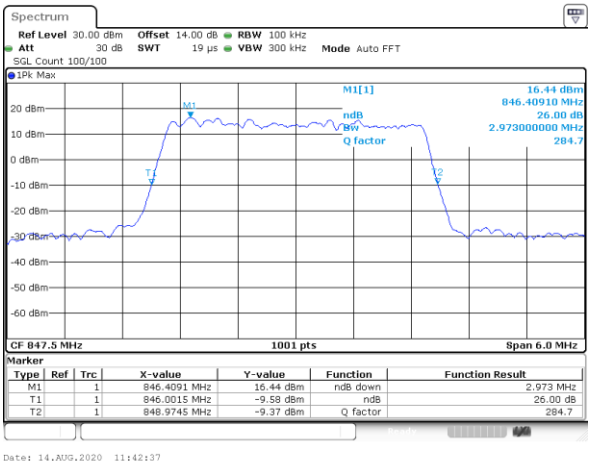
Middle Channel / 3MHz / 16QAM



Highest Channel / 3MHz / QPSK

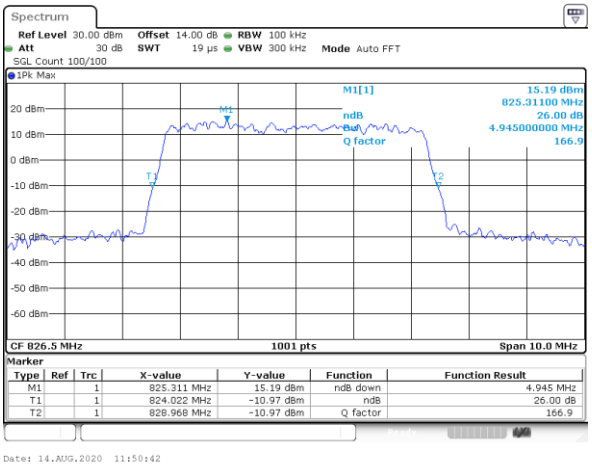


Highest Channel / 3MHz / 16QAM

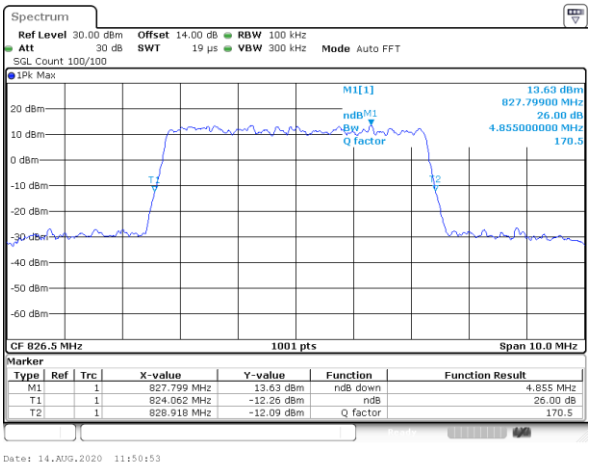


LTE Band 5

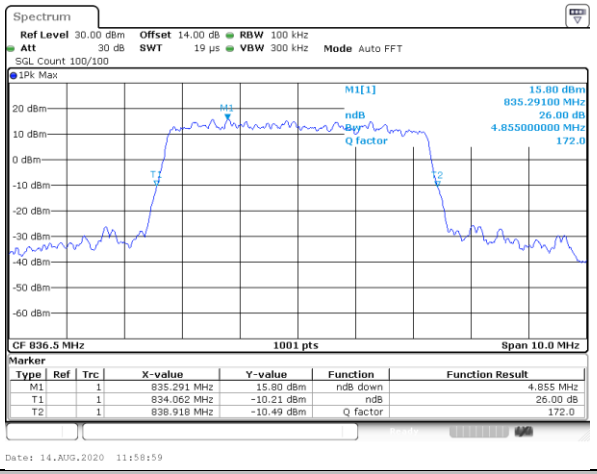
Lowest Channel / 5MHz / QPSK



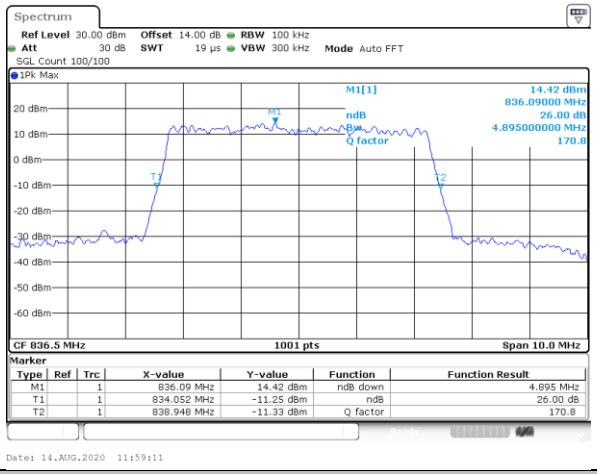
Lowest Channel / 5MHz / 16QAM



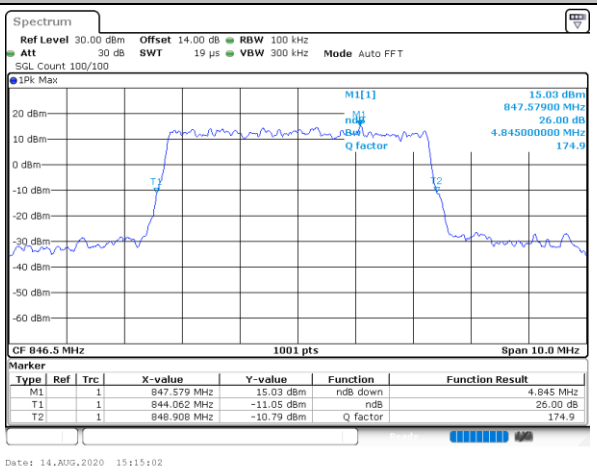
Middle Channel / 5MHz / QPSK



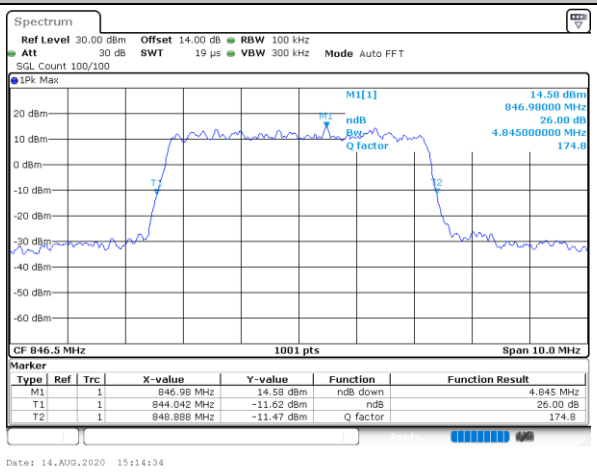
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK

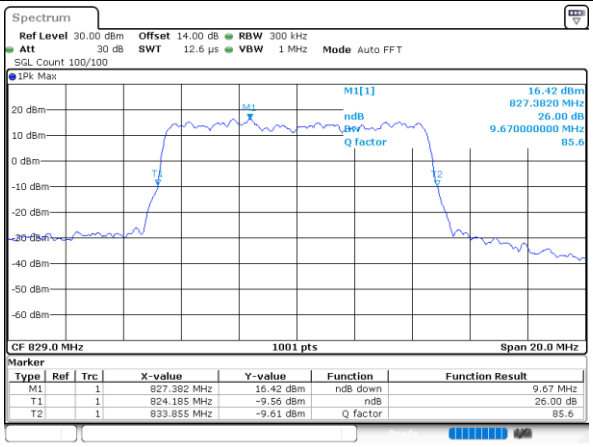


Highest Channel / 5MHz / 16QAM

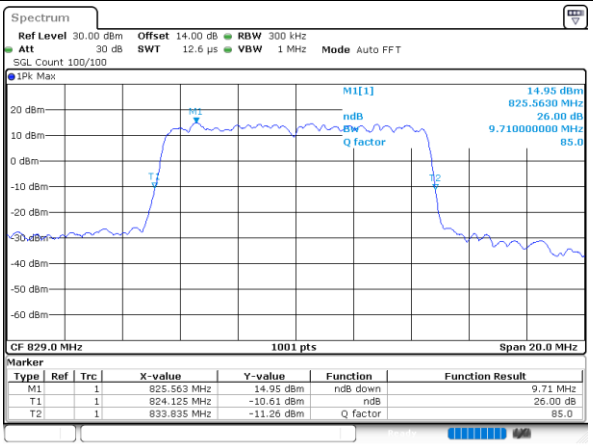


LTE Band 5

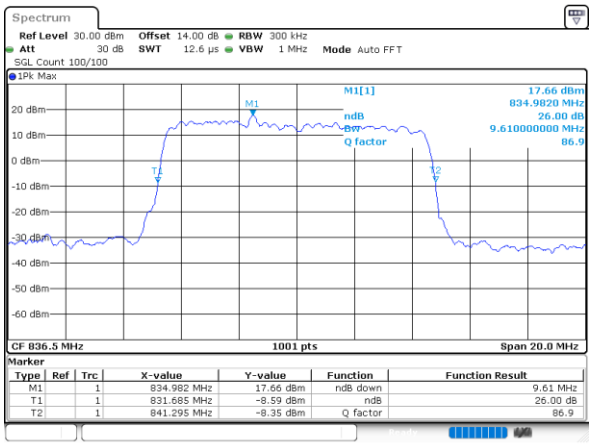
Lowest Channel / 10MHz / QPSK



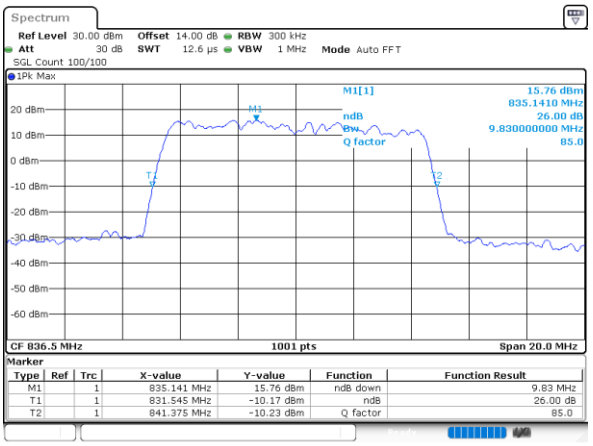
Lowest Channel / 10MHz / 16QAM



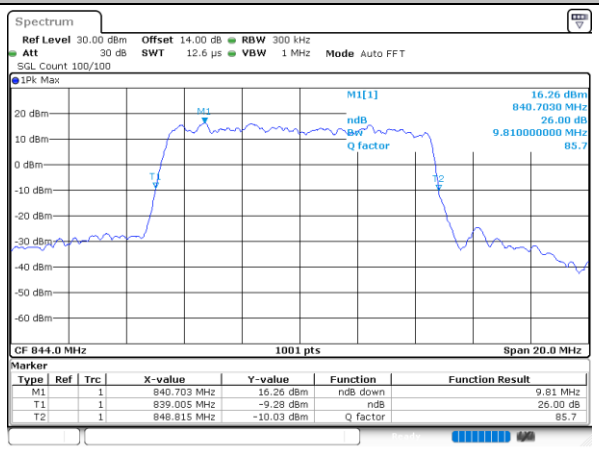
Middle Channel / 10MHz / QPSK



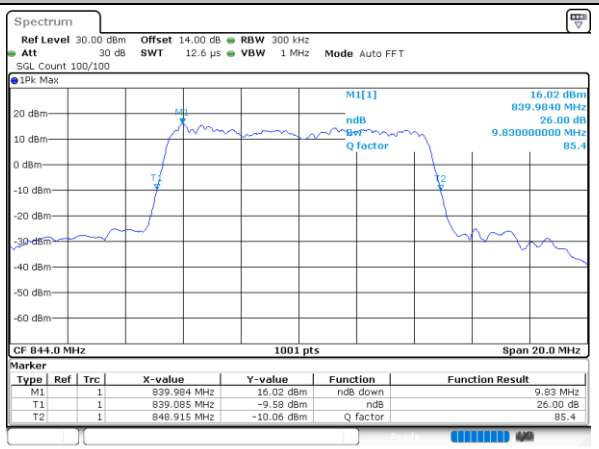
Middle Channel / 10MHz / 16QAM



Highest Channel / 10MHz / QPSK

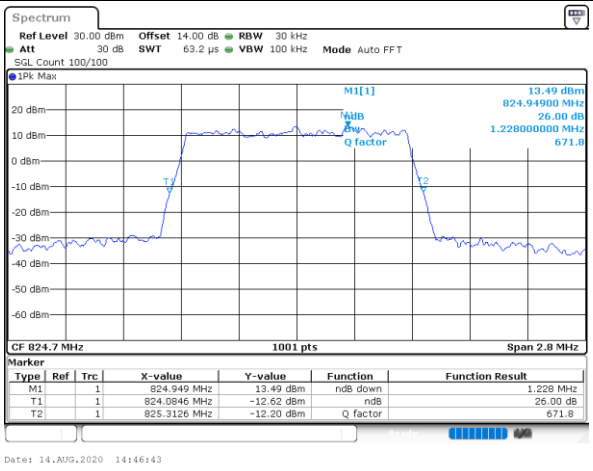


Highest Channel / 10MHz / 16QAM

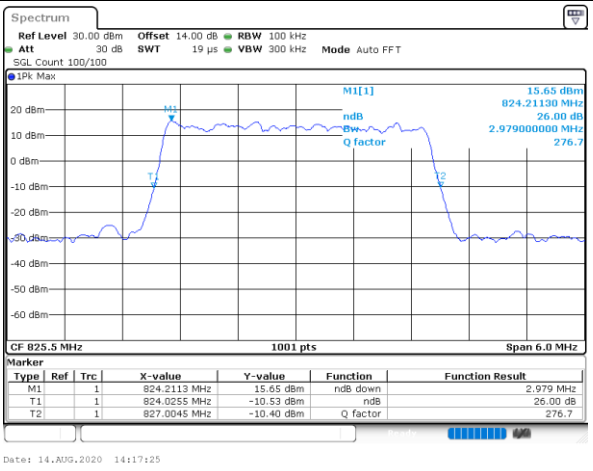


LTE Band 5

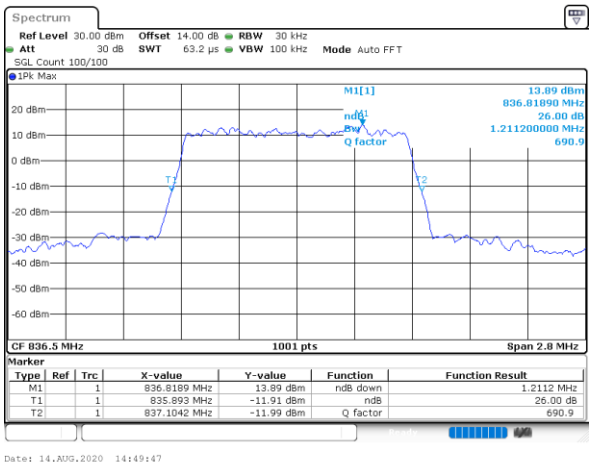
Lowest Channel / 1.4MHz / 64QAM



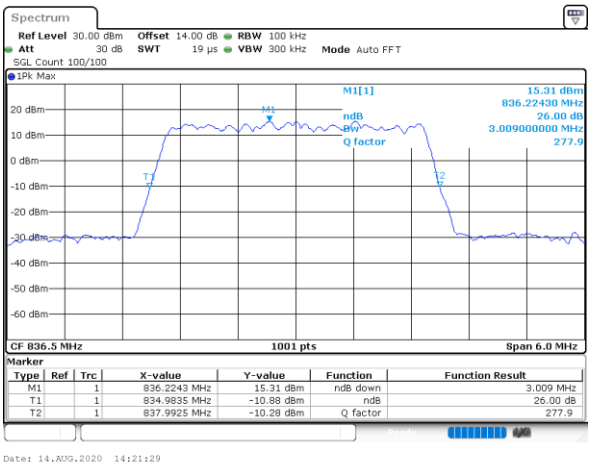
Lowest Channel / 3MHz / 64QAM



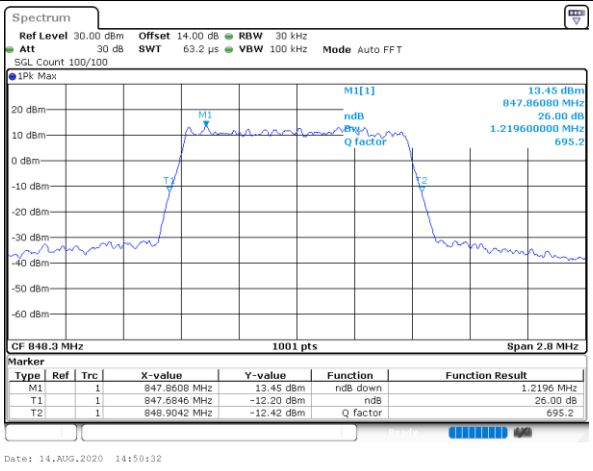
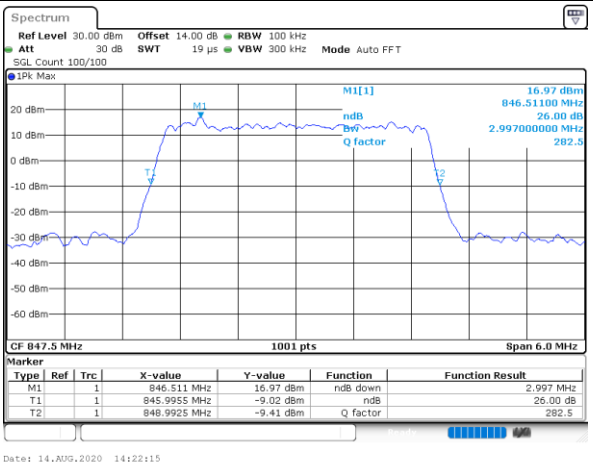
Middle Channel / 1.4MHz / 64QAM



Middle Channel / 3MHz / 64QAM



Highest Channel / 1.4MHz / 64QAM



Highest Channel / 3MHz / 64QAM