FCC RADIO TEST REPORT

FCC ID	:	UZ7ET56DE
Equipment	:	Tablet
Brand Name	:	ZEBRA
Model Name	:	ET56DE
Applicant	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
Manufacturer	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
Standard	:	FCC 47 CFR Part 2, and 90(S)

The product was received on Jan. 16, 2019 and testing was started from Jun. 27, 2019 and completed on Jul. 26, 2019. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Louis Wu

Reviewed by: Louis Wu

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History of this test report

Report No.	Version	Description	Issued Date
FG911635D	01	Initial issue of report	Aug. 08, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046 §90.635	Conducted Output Power and Effective Radiated Power	Pass	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049 §90.209	Occupied Bandwidth and 26dB Bandwidth	Reporting only	-
3.5	§2.1051 §90.691	Emission masks – In-band emissions	Pass	-
3.6	§2.1051 §90.691	Emission masks – Out of band emissions	Pass	-
3.7	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	Pass	-
3.8	§2.1053 §90.691	Field Strength of Spurious Radiation	Pass	Under limit 36.39 dB at 3296.000 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.

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet
Brand Name	ZEBRA
Model Name	ET56DE
FCC ID	UZ7ET56DE
EUT supports Radios application	WCDMA/HSPA/LTE/NFC/GNSS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DV2
SW Version	Android version 8.1.0
FW Version	01-20-03-00-OG-U00-PRD
MFD	19Jun01
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Specification of Accessories				
Spare Standard Battery 24.13Wh	**Brand Name**	Zebra	**Model Name**	BT-000393

Supported Unit Used in Test Configuration and System				
Cradle (Dock) for EMC	**Brand Name**	Zebra	**Part Number**	CRD-ET5X-1SCG1
Cradle (Dock) for RSE	**Brand Name**	Zebra	**Part Number**	CHG-ET5X-CBL1-01
Adapter	**Brand Name**	Zebra	**Part Number**	PWRBGA12V50W0WW
DC Cable	**Brand Name**	Zebra	**Part Number**	CBL-DC-388A1-01

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	LTE Band 26 : 814.7 ~ 823.3 MHz
Rx Frequency	LTE Band 26 : 859.7 ~ 868.3 MHz
Bandwidth	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz
Maximum Output Power to Antenna	24.80 dBm
Antenna Type	PCB Antenna
Antenna Gain	0.31 dBi
Type of Modulation	QPSK / 16QAM / 64QAM

1.3 Modification of EUT

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

1.4 Emission Designator

LTE Band 26		QPSK		16QAM		64QAM	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)
1.4	814.7 ~ 823.3	1M10G7D	-	1M09W7D	-	1M10W7D	-
3	815.5 ~ 822.5	2M72G7D	-	2M73W7D	-	2M73W7D	-
5	816.5 ~ 821.5	4M50G7D	-	4M51W7D	-	4M51W7D	-
10	819.0	9M07G7D	0.0150	8M91W7D	-	9M03W7D	-
15	821.5	13M4G7D	0.0190	13M4W7D	-	13M5W7D	-

1.5 Testing Site

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	Aking Chang
Temperature	24~26℃
Relative Humidity	54~56%

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

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.**
	03CH12-HY
Test Engineer	Jack Cheng, Lance Chiang, and Chuan Chu
Temperature	19.3~26℃
Relative Humidity	57.1~73.1%

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

FCC Designation No.: TW1190 and TW0007

1.6 Applied Standards

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

- FCC 47 CFR Part 2, 90
- ANSI / TIA-603-E
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- Interim Guidance for Equipment Authorization of Devices with Channel Bandwidths Combined Across Two Contiguous Service Rule Allocations OET/Lab/EACB, June 6, 2013

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

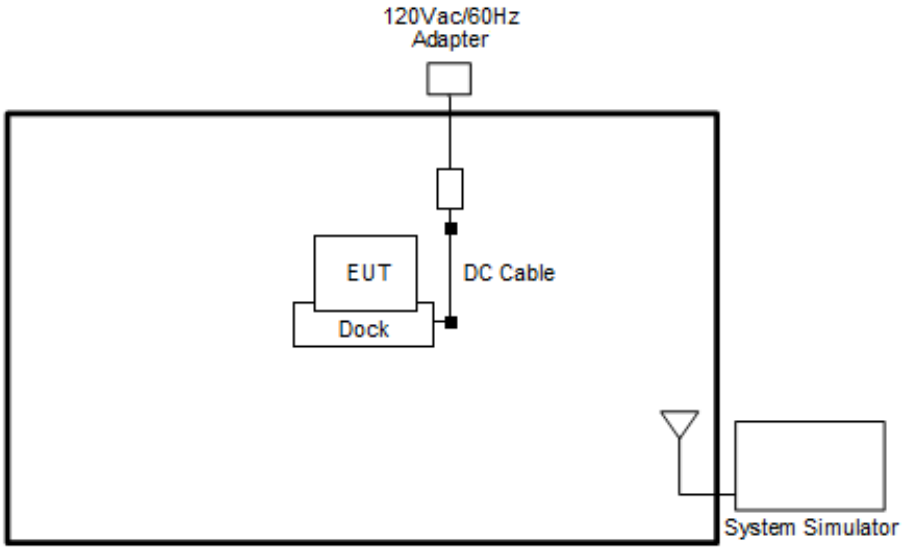
During all testing, EUT is in link mode with base station emulator at maximum power level.

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

Frequency range investigated for radiated emission is 30 MHz to 9000 MHz.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	26					v	-	v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	26	v	v	v	v	v	-	v	v	v			v	v	v	v
Emission masks In-band emissions	26	v	v	v	v	v	-	v	v	v	v		v	v		v
Emission masks – Out of band emissions	26	v	v	v	v	v	-	v	v	v	v			v	v	v
Frequency Stability	26	-	-		v	v	-	v					v		v	
E.R.P.	26					v	-	v	v	v	v			v		
Radiated Spurious Emission	26	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. LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. ERP over 15MHz bandwidth complies the ERP limit line of part22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies.															

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.	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 RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.2 dB and a 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 26 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
15	Channel	26765	-	-
	Frequency	821.5	-	-
10	Channel	-	26740	-
	Frequency	-	819	-
5	Channel	26715	26740	26765
	Frequency	816.5	819	821.5
3	Channel	26705	26740	26775
	Frequency	815.5	819	822.5
1.4	Channel	26697	26740	26783
	Frequency	814.7	819	823.3

3 Conducted Test Items

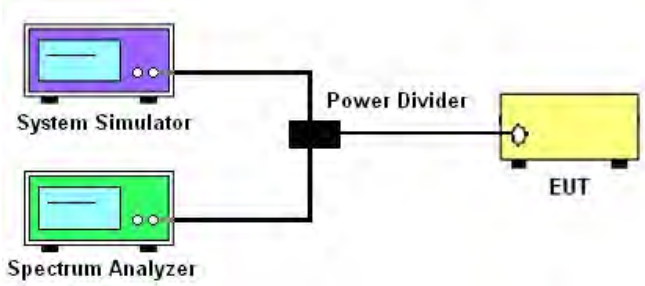
3.1 Measuring Instruments

See list of measuring instruments of this test report.

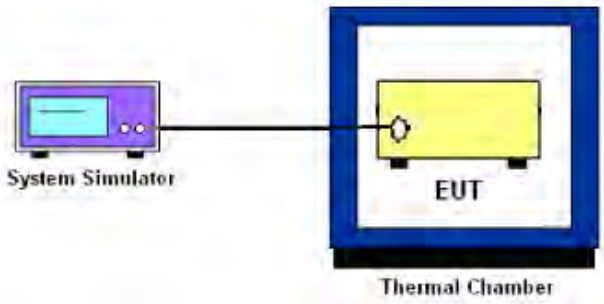
3.1.1 Test Setup

3.1.2 Conducted Output Power

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



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power Measurement and ERP Measurement

3.2.1 Description of the Conducted Output Power Measurement and ERP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum 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 26.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, 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 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

Reporting only

3.3.2 Test Procedures

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 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of (Occupied) Bandwidth Limitations Measurement

The 99% 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 emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

3.4.2 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

3.5 Emissions Mask Measurement

3.5.1 Description of Emissions Mask Measurement

Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of FCC Part 90.691.(a)

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log_{10}(f/6.1) decibels or 50 + 10 Log_{10}(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log_{10}(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

3.5.2 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The emissions mask of low and high channels for the highest RF powers were measured.
3. Set RBW and VBW 3 times of RBW to make the measurement with the spectrum analyzer's, and according to KDB 971168 D02 Misc Rev Approve License Devices v02r01 standards, set RBW = 300 Hz to make offsets less than 37.5 kHz from a channel edge , RBW = 100 kHz to make offsets greater than 37.5 kHz, that is allowed.
4. The test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.

3.6 Emissions Mask – Out Of Band Emissions Measurement

3.6.1 Description of Conducted Emissions Out of band emissions measurement

The power of any emission FCC Part 90.691 (a)(2) on any frequency removed from the assigned frequency by out of the authorized bandwidth 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 10^{th} harmonic.

3.6.2 Test Procedures

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. For testing below 1GHz, make the measurement with the spectrum analyzer's RBW = 100 kHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. For testing above 1GHz, make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

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

3.7.2 Measuring Instruments

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

3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. 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.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.8 Field Strength of Spurious Radiation Measurement

3.8.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

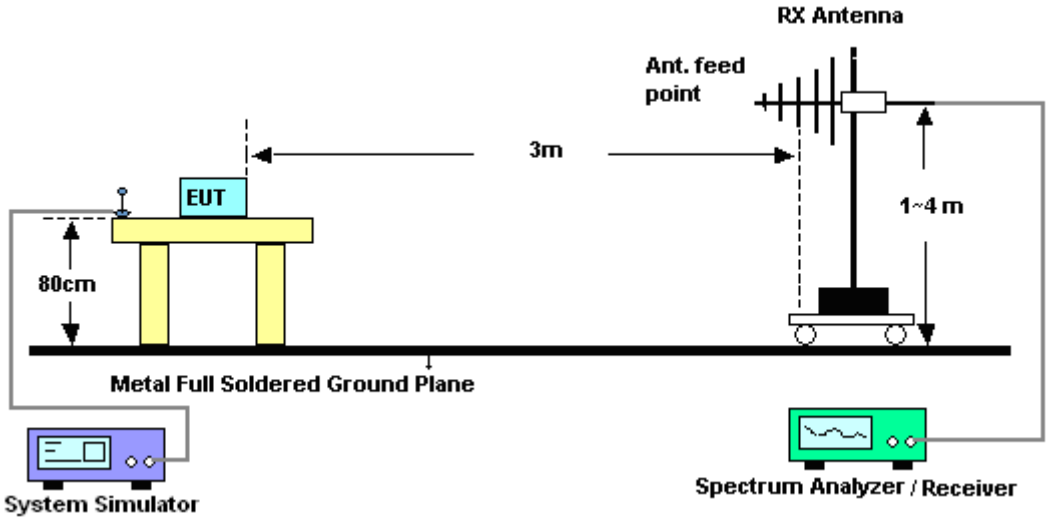
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43+10\log_{10}$(P[Watts]) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.8.2 Test Procedures

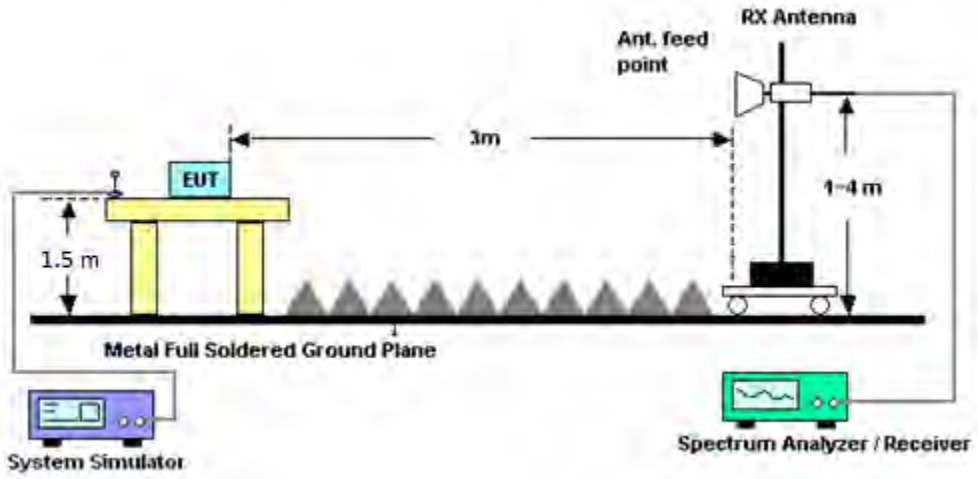
1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position 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. For testing below 1GHz, make the measurement with the spectrum analyzer's RBW = 100 kHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. For testing above 1GHz, make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

3.8.3 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.8.4 Test Result of Field Strength of Spurious Radiated

Please refer to Appendix B.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	Jul. 05, 2019~ Jul. 23, 2019	Jan. 06, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802 N1D01N-06	47020&06	30MHz to 1GHz	Oct. 13, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1212	1GHz ~ 18GHz	Oct. 19, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 18, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1326	1GHz ~ 18GHz	Oct. 30, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 29, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz ~ 40GHz	Dec. 05, 2018	Jul. 05, 2019~ Jul. 23, 2019	Dec. 04, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	Jul. 05, 2019~ Jul. 23, 2019	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5Ghz	May 28, 2018	Jul. 05, 2019~ Jul. 23, 2019	May 26, 2020	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055007	1GHz~18GHz	Apr. 01, 2019	Jul. 05, 2019~ Jul. 23, 2019	Mar. 31, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Jul. 05, 2019~ Jul. 23, 2019	Dec. 05, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 26, 2018	Jul. 05, 2019~ Jul. 23, 2019	Dec. 25, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Dec. 19, 2018	Jul. 05, 2019~ Jul. 23, 2019	Dec. 18, 2019	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	175727	100kHz~40GHz	Dec. 23, 2018	Jul. 05, 2019~ Jul. 23, 2019	Dec. 23, 2019	Radiation (03CH12-HY)
Base Station	Anritsu	MT8821C	6201432816	GSM / GPRS /WCDMA / LTE FDD/TDD with 44) /LTE-3CC DLCA,2CC ULCA	May 05, 2019	Jul. 05, 2019~ Jul. 23, 2019	May 04, 2020	Radiation (03CH12-HY)
Filter	Wainwright	WLK4-1000-1530-6000-40SS	SN11	1 GHz Lowpass	Sep. 16, 2018	Jul. 05, 2019~ Jul. 23, 2019	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-1080-1200-1500-60SS	SN2	1.2G High Pass	Sep. 16, 2018	Jul. 05, 2019~ Jul. 23, 2019	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3GHz High Pass	Mar. 20, 2019	Jul. 05, 2019~ Jul. 23, 2019	Mar. 19, 2020	Radiation (03CH12-HY)
Notch Filter	EWT	EWT-14-0041	D1	DCS 1800	Nov. 01, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 31, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCT698/798-10/40 8SSK	SN1	AWS Band	Nov. 01, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 31, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCG824/849-40/8SS	SN35	CDMA 850	Nov. 07, 2018	Jul. 05, 2019~ Jul. 23, 2019	Nov. 06, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 13, 2019	Jul. 05, 2019~ Jul. 23, 2019	Mar. 12, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	Jul. 05, 2019~ Jul. 23, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jul. 05, 2019~ Jul. 23, 2019	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jul. 05, 2019~ Jul. 23, 2019	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jul. 05, 2019~ Jul. 23, 2019	N/A	Radiation (03CH12-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201432821	GSM/GPRS /WCDMA/LTE	Oct. 14, 2018	Jun. 27, 2019~ Jul. 26, 2019	Oct. 13, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 13, 2018	Jun. 27, 2019~ Jul. 26, 2019	Nov. 12, 2019	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃~90℃	Aug. 29, 2018	Jun. 27, 2019~ Jul. 26, 2019	Aug. 28, 2019	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	Jun. 27, 2019~ Jul. 26, 2019	Oct. 01, 2019	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 14, 2019	Jun. 27, 2019~ Jul. 26, 2019	Jan. 13, 2020	Conducted (TH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.36**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.70**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.98**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	24.66	-	-
15	1	37		24.72	-	-
15	1	74		24.72	-	-
15	36	0		23.84	-	-
15	36	20		23.81	-	-
15	36	39		23.79	-	-
15	75	0		23.83	-	-
15	1	0	16-QAM	23.97	-	-
15	1	37		24.07	-	-
15	1	74		23.99	-	-
15	36	0		22.88	-	-
15	36	20		23.00	-	-
15	36	39		22.90	-	-
15	75	0		22.97	-	-
15	1	0	64-QAM	22.96	-	-
15	1	37		22.98	-	-
15	1	74		22.99	-	-
15	36	0		21.95	-	-
15	36	20		22.06	-	-
15	36	39		21.98	-	-
15	75	0		21.97	-	-
10	1	0	QPSK	-	24.75	-
10	1	25		-	24.67	-
10	1	49		-	24.71	-
10	25	0		-	23.75	-
10	25	12		-	23.81	-
10	25	25		-	23.77	-
10	50	0		-	23.71	-
10	1	0	16-QAM	-	24.13	-
10	1	25		-	23.96	-
10	1	49		-	24.09	-
10	25	0		-	22.88	-
10	25	12		-	22.95	-
10	25	25		-	22.87	-
10	50	0		-	22.89	-
10	1	0	64-QAM	-	22.96	-
10	1	25		-	22.90	-
10	1	49		-	23.04	-
10	25	0		-	22.00	-
10	25	12		-	21.99	-
10	25	25		-	21.94	-
10	50	0		-	21.87	-

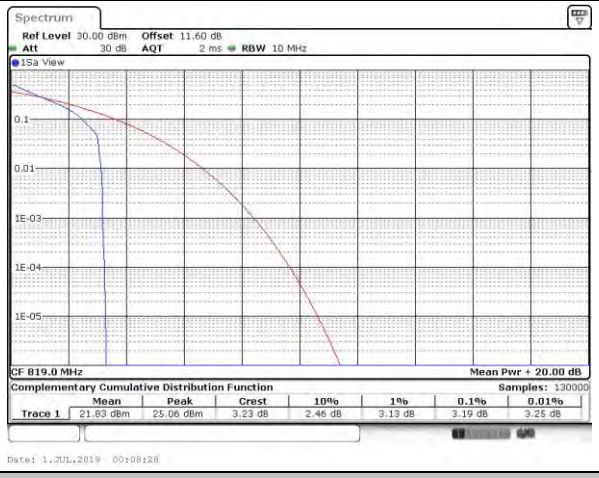
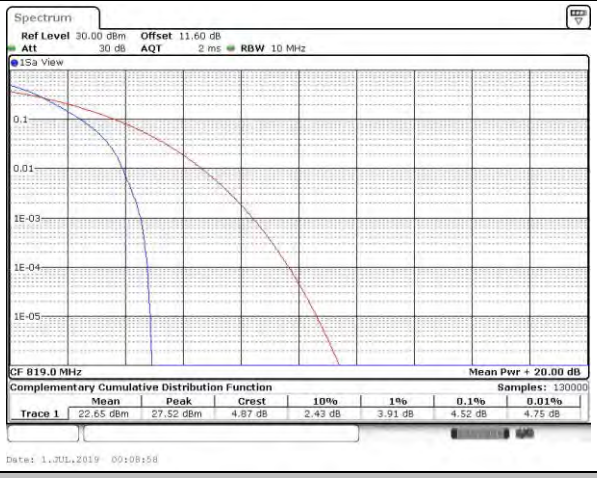
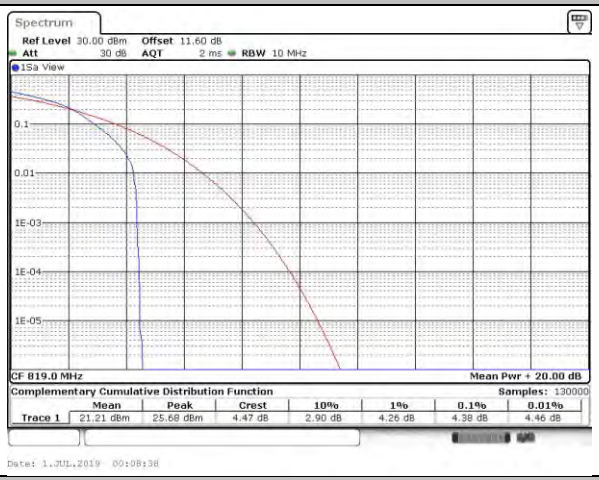
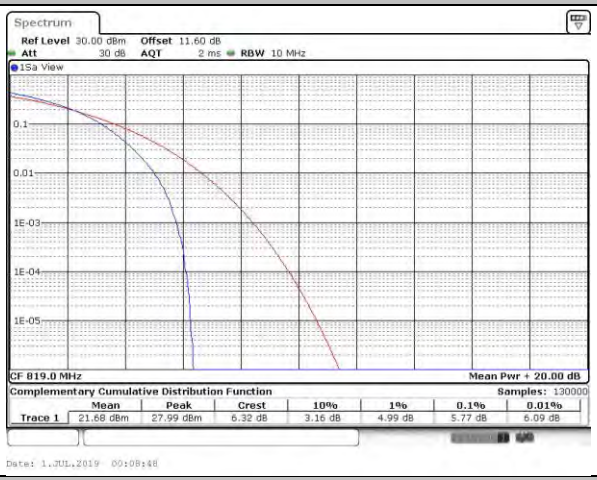
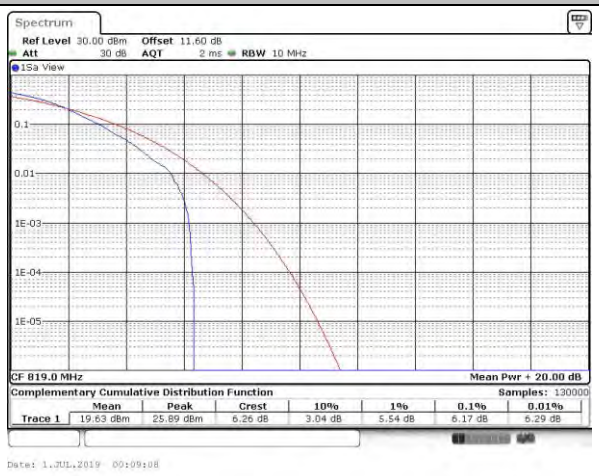
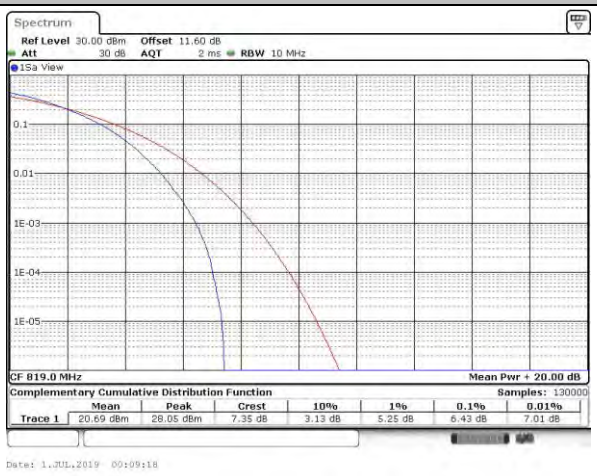
LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	24.56	24.73	24.70
5	1	12		24.69	24.74	24.68
5	1	24		24.66	24.71	24.71
5	12	0		23.78	23.72	23.84
5	12	7		23.82	23.86	23.74
5	12	13		23.70	23.79	23.83
5	25	0		23.80	23.81	23.77
5	1	0	16-QAM	23.89	24.09	24.01
5	1	12		23.99	23.95	23.98
5	1	24		23.90	24.05	24.00
5	12	0		22.85	22.95	22.91
5	12	7		22.96	22.94	22.88
5	12	13		22.90	22.83	22.91
5	25	0		22.95	22.85	22.91
5	1	0	64-QAM	22.91	23.03	23.00
5	1	12		22.91	22.98	23.06
5	1	24		22.89	22.95	23.03
5	12	0		21.91	21.92	21.97
5	12	7		22.01	21.91	21.95
5	12	13		21.91	21.89	21.95
5	25	0		21.89	21.85	21.93
3	1	0	QPSK	24.56	24.78	24.71
3	1	8		24.70	24.67	24.74
3	1	14		24.70	24.69	24.71
3	8	0		23.73	23.81	23.81
3	8	4		23.89	23.83	23.79
3	8	7		23.75	23.79	23.88
3	15	0		23.74	23.76	23.77
3	1	0	16-QAM	23.90	24.08	24.03
3	1	8		24.04	23.94	23.97
3	1	14		23.99	24.01	23.98
3	8	0		22.87	22.94	22.86
3	8	4		22.93	22.92	22.89
3	8	7		22.82	22.81	22.96
3	15	0		22.88	22.84	22.87
3	1	0	64-QAM	22.94	23.05	23.00
3	1	8		22.94	22.93	23.09
3	1	14		22.96	23.01	22.97
3	8	0		21.85	21.94	22.00
3	8	4		21.98	22.01	21.89
3	8	7		21.98	21.94	21.95
3	15	0		21.97	21.92	21.88

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	24.58	24.64	24.71
1.4	1	3		24.66	24.70	24.51
1.4	1	5		24.58	24.62	24.68
1.4	3	0		24.64	24.69	24.64
1.4	3	1		24.43	24.73	**24.80**
1.4	3	3		24.61	24.69	24.76
1.4	6	0		23.59	23.59	23.82
1.4	1	0	16-QAM	23.86	23.87	23.99
1.4	1	3		23.88	23.95	24.02
1.4	1	5		23.72	23.89	23.95
1.4	3	0		23.67	23.71	23.79
1.4	3	1		23.69	23.73	23.80
1.4	3	3		23.64	23.68	23.76
1.4	6	0		22.78	22.85	22.93
1.4	1	0	64-QAM	22.82	22.86	22.97
1.4	1	3		22.83	22.90	22.98
1.4	1	5		22.76	22.86	22.93
1.4	3	0		22.80	22.85	22.96
1.4	3	1		22.84	22.91	22.97
1.4	3	3		22.77	22.84	22.94
1.4	6	0		21.75	21.81	21.90

LTE Band 26_Part 90S

Peak-to-Average Ratio

Mode	LTE Band 26 / 10MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	-	-	-	-	PASS
Middle CH	3.19	4.52	4.38	5.77	
Highest CH	-	-	-	-	
Mode	LTE Band 26 / 10MHz				
Mod.	64QAM				Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	-	-	-	-	PASS
Middle CH	6.17	6.43	-	-	
Highest CH	-	-	-	-	

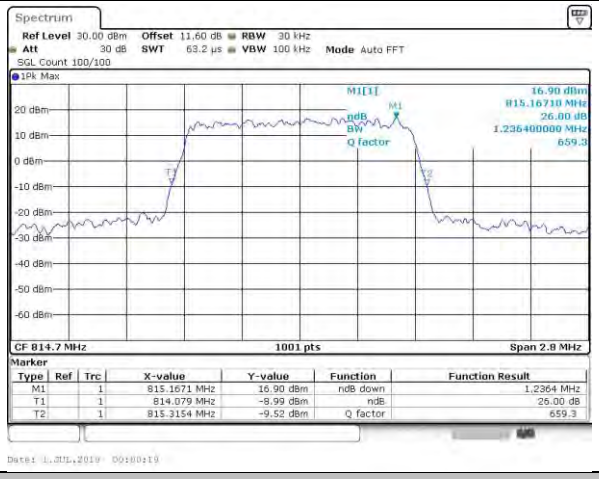
LTE Band 26 / 10MHz / QPSK	
Middle Channel / 1RB	**Middle Channel / Full RB**
	
LTE Band 26 / 10MHz / 16QAM	
Middle Channel / 1RB	**Middle Channel / Full RB**
	
LTE Band 26 / 10MHz / 64QAM	
Middle Channel / 1RB	**Middle Channel / Full RB**
	

26dB Bandwidth

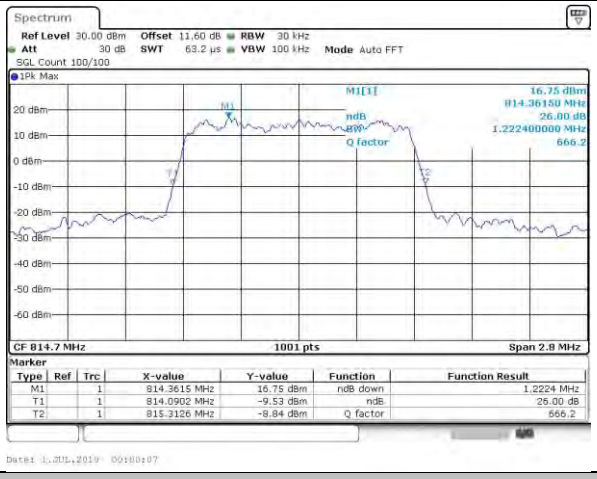
Mode	LTE Band 26 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.24	1.22	2.97	3.00	4.93	4.86	-	-	14.33	14.57	-	-
Middle CH	1.24	1.22	3.02	3.02	4.89	4.91	9.75	9.77	-	-	-	-
Highest CH	1.24	1.22	3.05	3.02	4.97	4.88	-	-	-	-	-	-
Mode	LTE Band 26 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	1.22	-	2.97	-	4.94	-	-	-	14.30	-	-	-
Middle CH	1.23	-	3.03	-	4.91	-	9.87	-	-	-	-	-
Highest CH	1.25	-	3.02	-	4.84	-	-	-	-	-	-	-

LTE Band 26

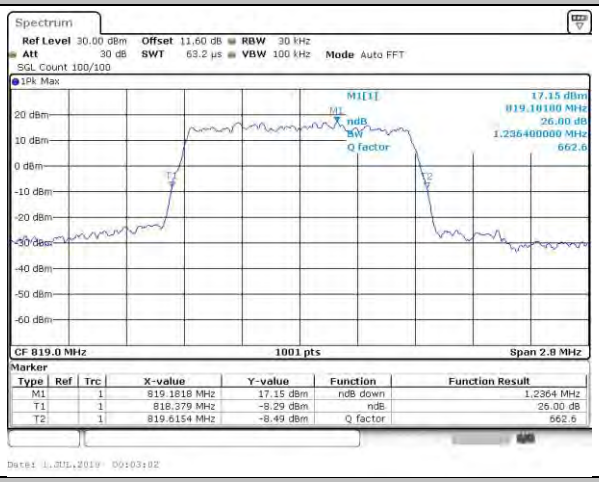
Lowest Channel / 1.4MHz / QPSK



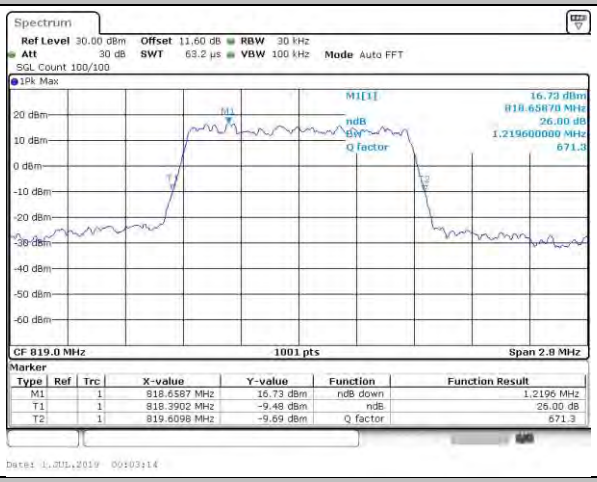
Lowest Channel / 1.4MHz / 16QAM



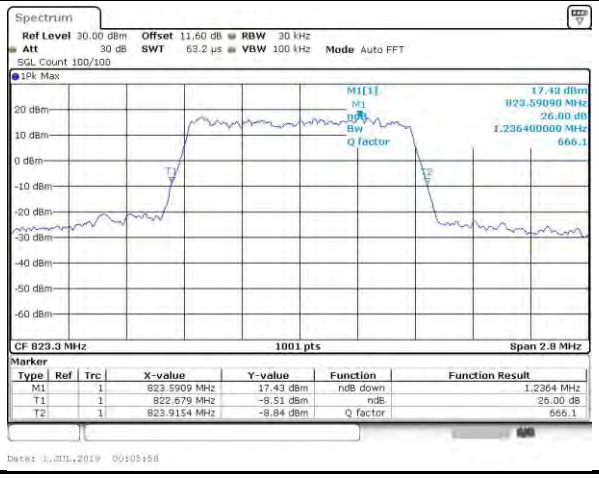
Middle Channel / 1.4MHz / QPSK



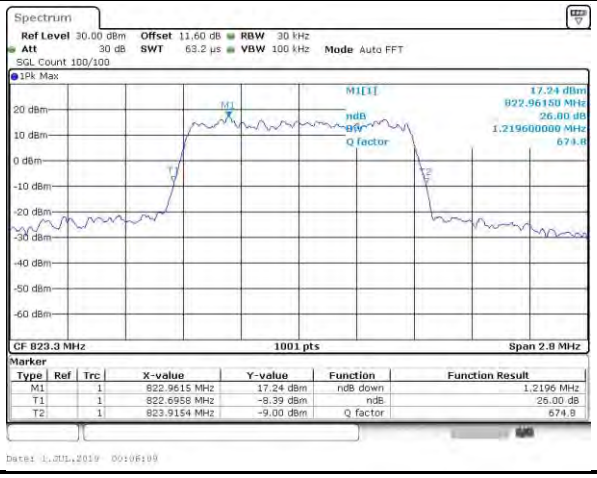
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK

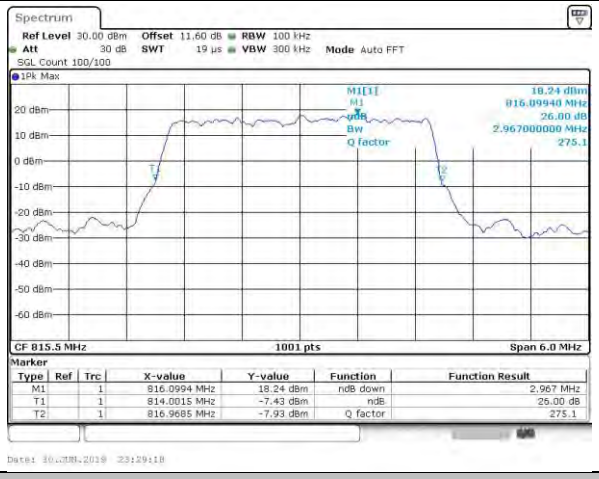


Highest Channel / 1.4MHz / 16QAM

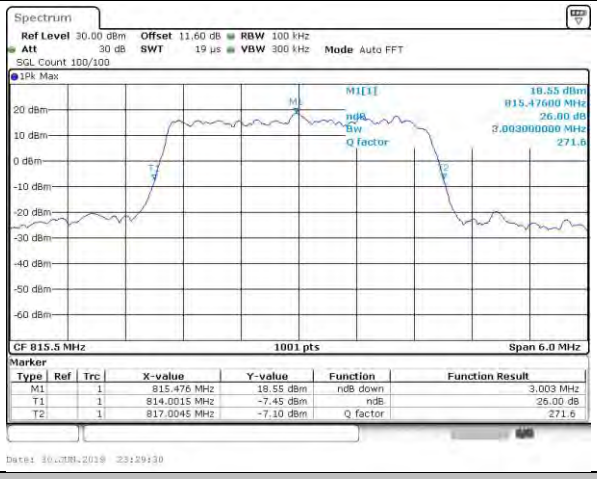


LTE Band 26

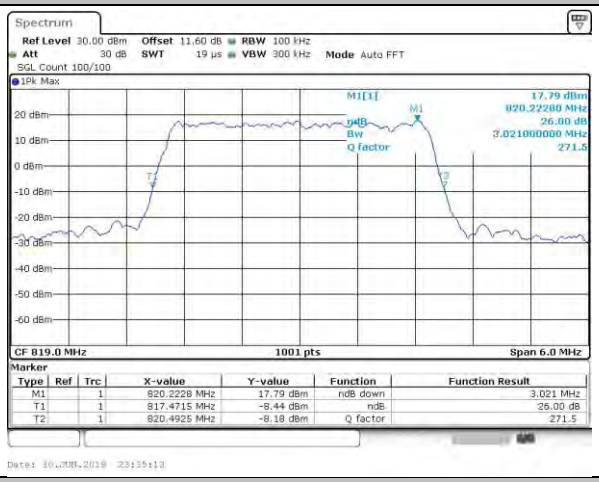
Lowest Channel / 3MHz / QPSK



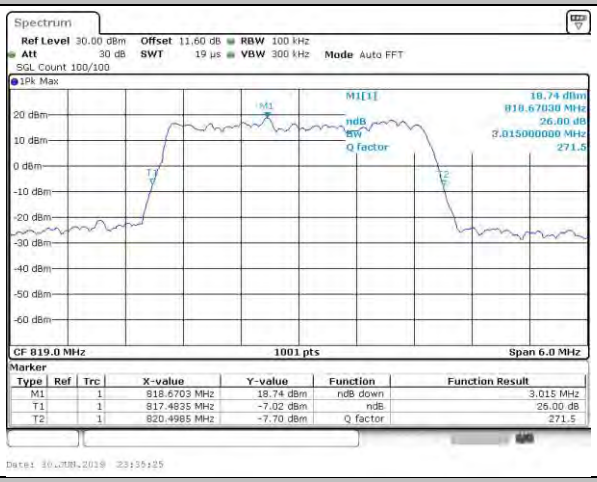
Lowest Channel / 3MHz / 16QAM



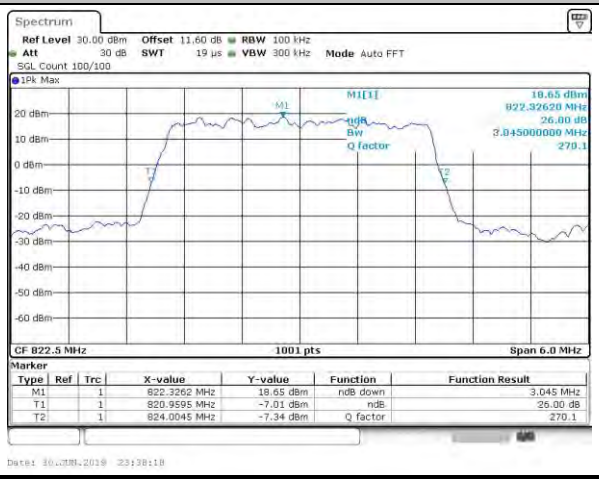
Middle Channel / 3MHz / QPSK



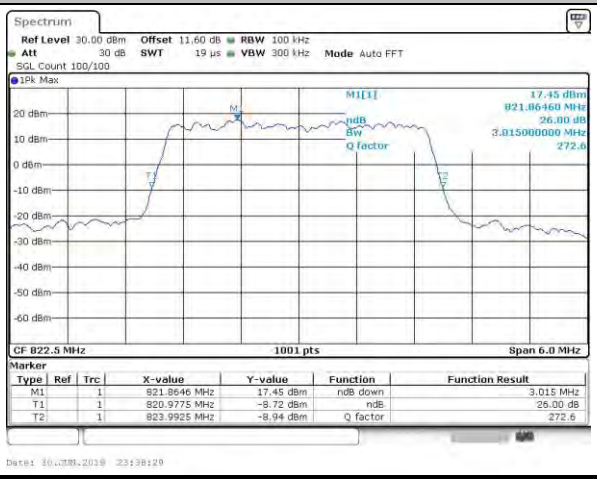
Middle Channel / 3MHz / 16QAM



Highest Channel / 3MHz / QPSK

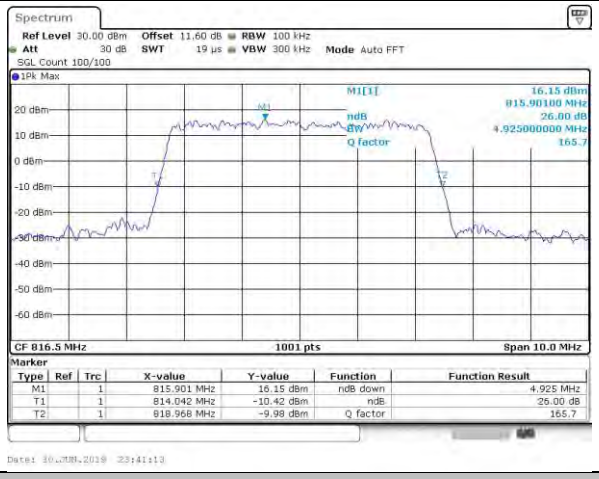


Highest Channel / 3MHz / 16QAM

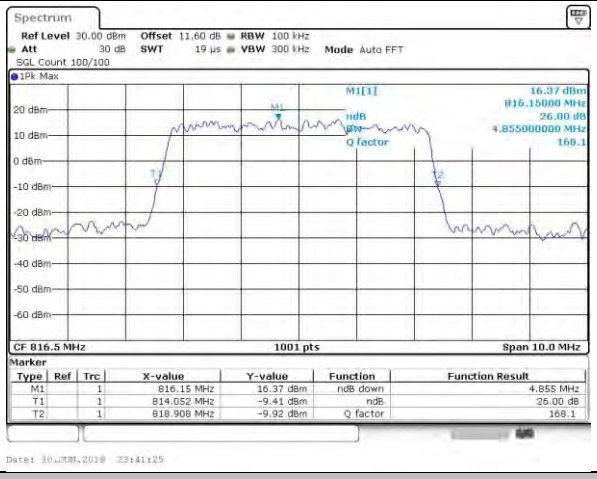


LTE Band 26

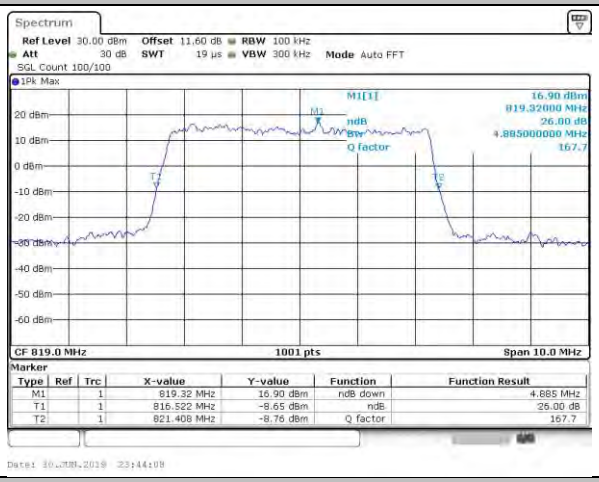
Lowest Channel / 5MHz / QPSK



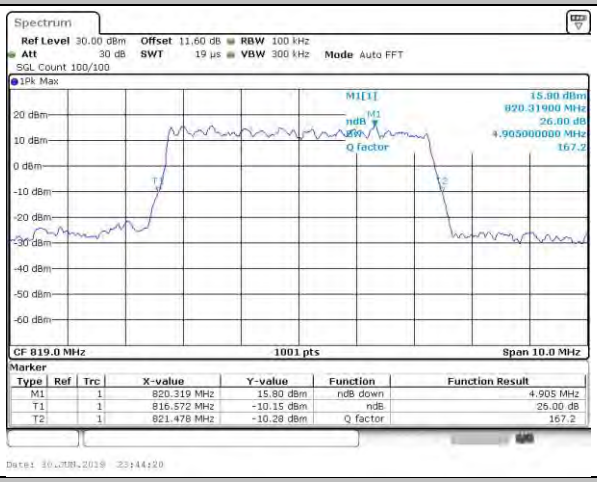
Lowest Channel / 5MHz / 16QAM



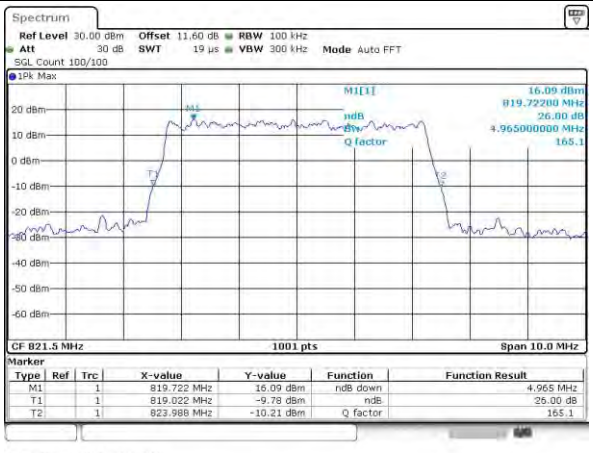
Middle Channel / 5MHz / QPSK



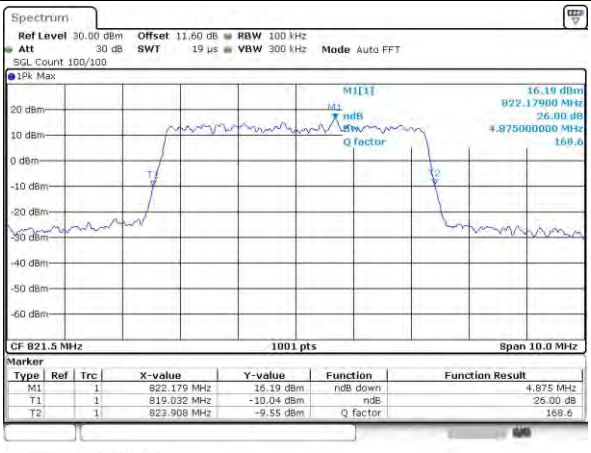
Middle Channel / 5MHz / 16QAM

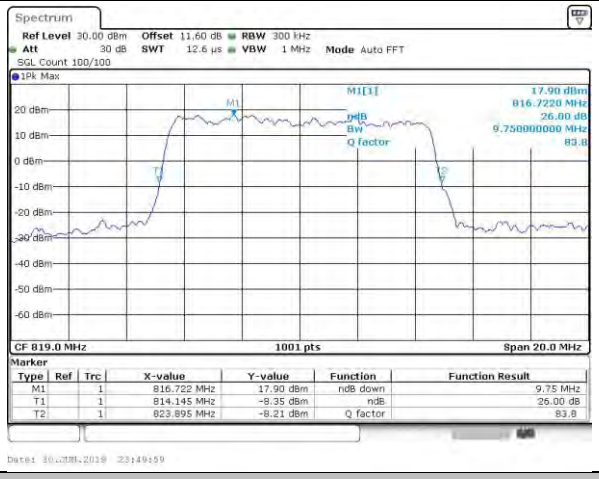
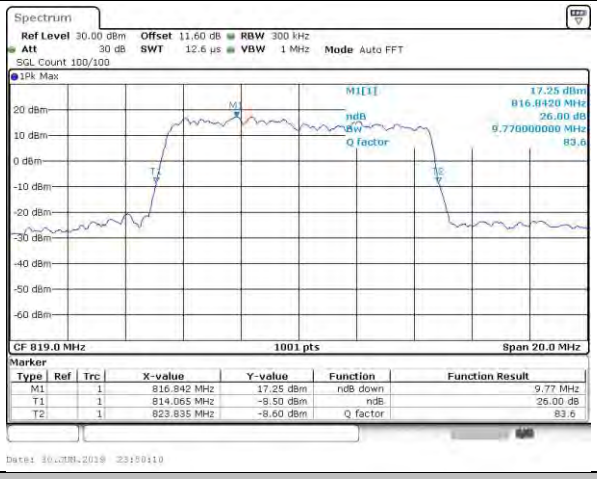
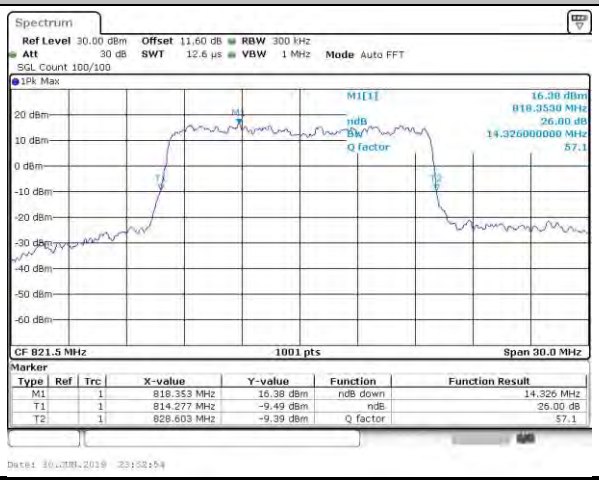
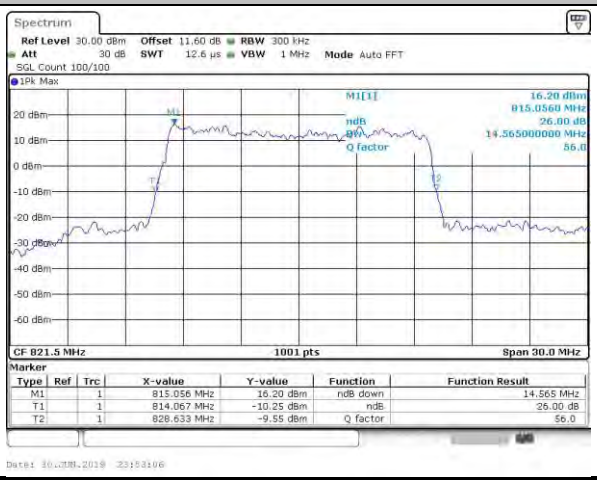


Highest Channel / 5MHz / QPSK



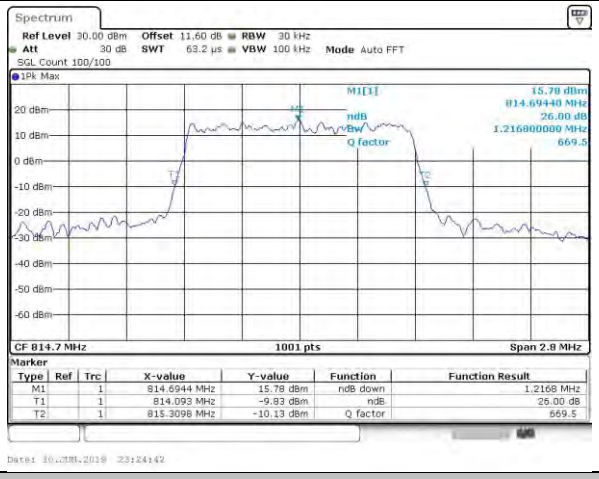
Highest Channel / 5MHz / 16QAM



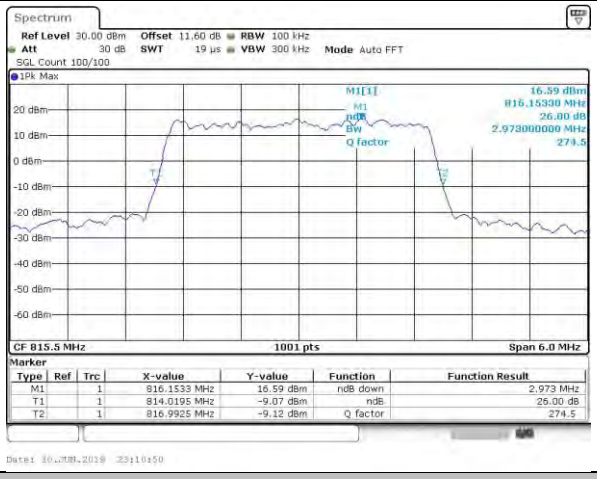
LTE Band 26	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	
Lowest Channel / 15MHz / QPSK	**Lowest Channel / 15MHz / 16QAM**
	

LTE Band 26

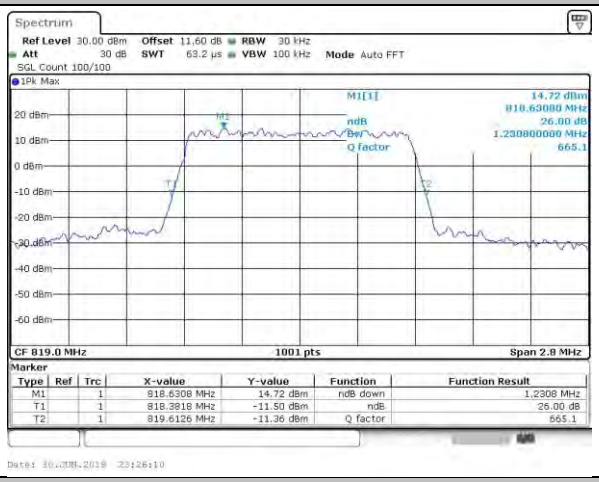
Lowest Channel / 1.4MHz / 64QAM



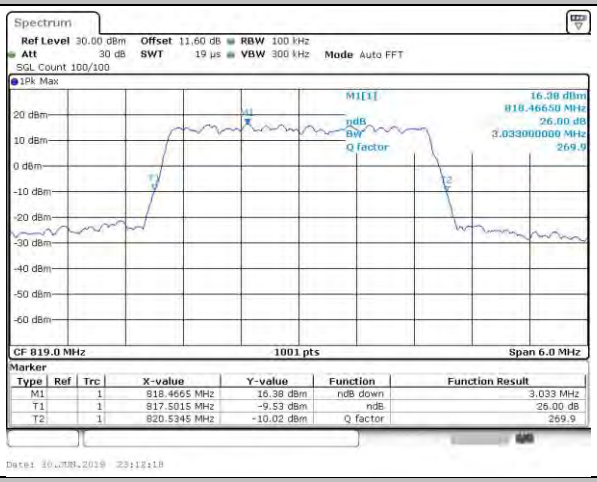
Lowest Channel / 3MHz / 64QAM



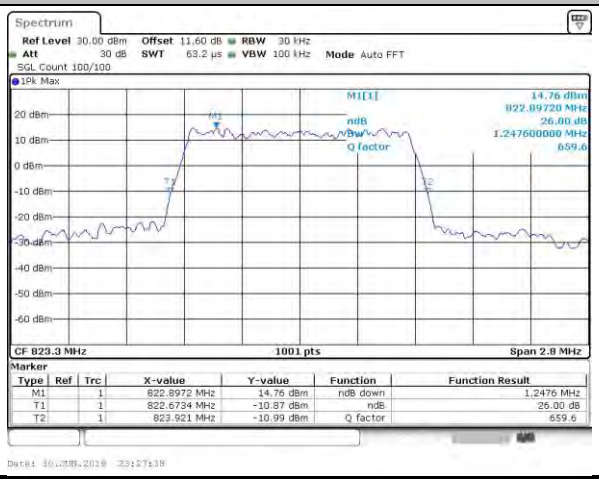
Middle Channel / 1.4MHz / 64QAM



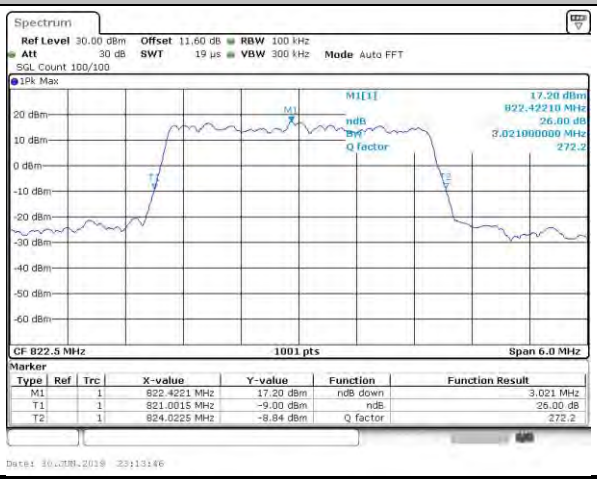
Middle Channel / 3MHz / 64QAM



Highest Channel / 1.4MHz / 64QAM

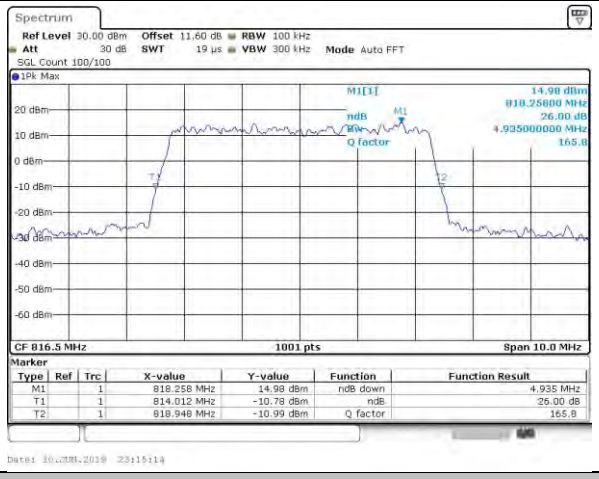


Highest Channel / 3MHz / 64QAM

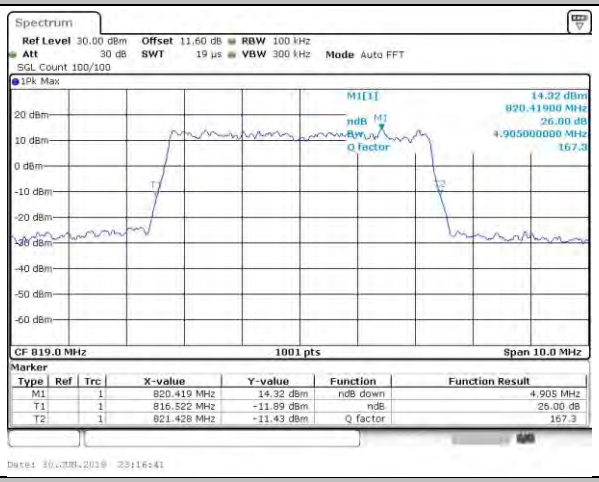


LTE Band 26

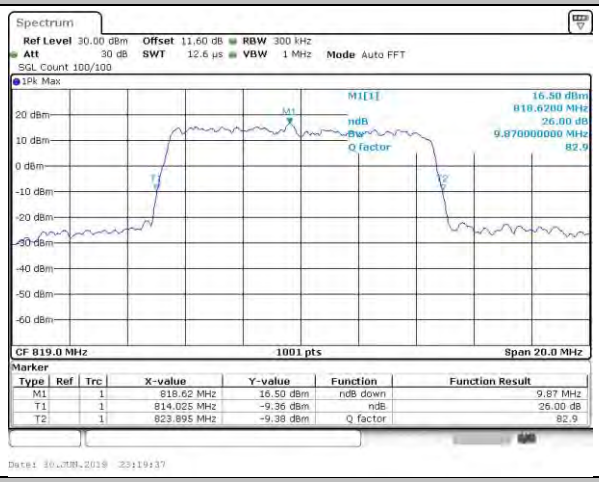
Lowest Channel / 5MHz / 64QAM



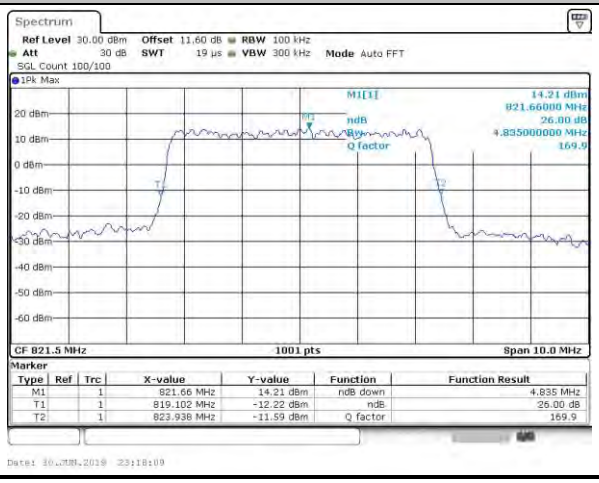
Middle Channel / 5MHz / 64QAM

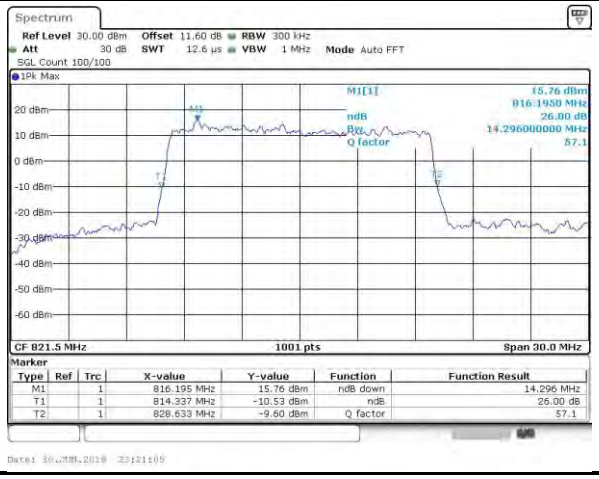


Middle Channel / 10MHz / 64QAM



Highest Channel / 5MHz / 64QAM



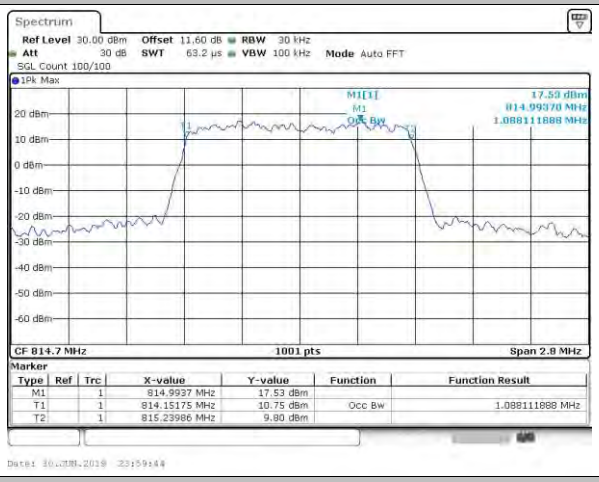
LTE Band 26	
Lowest Channel / 15MHz / 64QAM	
	

Occupied Bandwidth

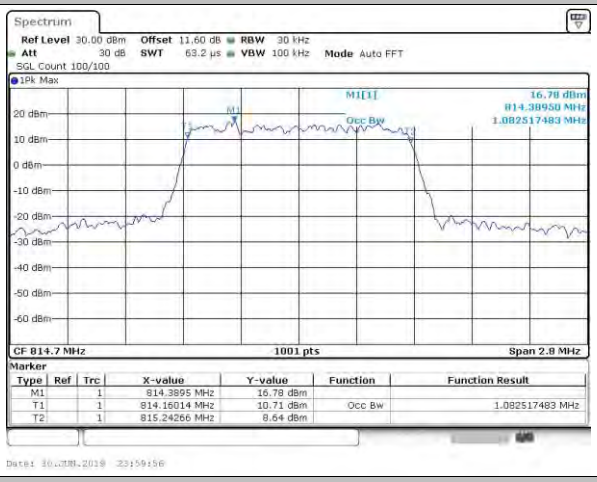
Mode	LTE Band 26 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.09	1.08	2.72	2.71	4.50	4.49	-	-	13.43	13.43	-	-
Middle CH	1.09	1.09	2.71	2.73	4.50	4.50	9.07	8.91	-	-	-	-
Highest CH	1.10	1.09	2.72	2.73	4.50	4.51	-	-	-	-	-	-
Mode	LTE Band 26 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	1.10	-	2.73	-	4.48	-	-	-	13.46	-	-	-
Middle CH	1.09	-	2.72	-	4.51	-	9.03	-	-	-	-	-
Highest CH	1.09	-	2.73	-	4.48	-	-	-	-	-	-	-

LTE Band 26

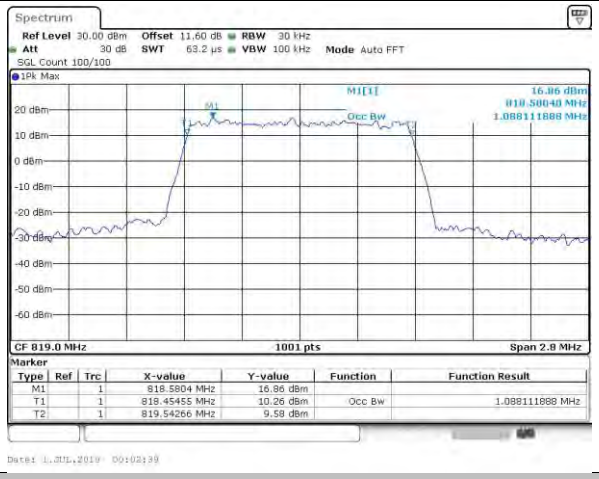
Lowest Channel / 1.4MHz / QPSK



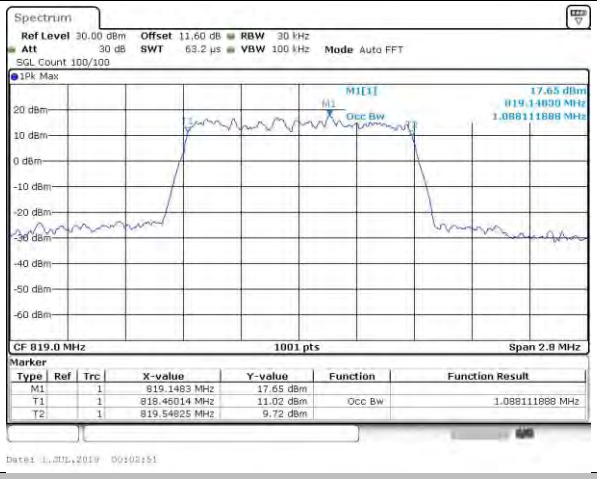
Lowest Channel / 1.4MHz / 16QAM



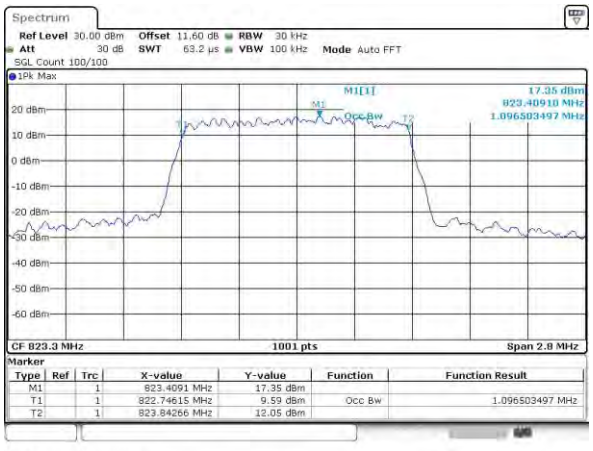
Middle Channel / 1.4MHz / QPSK



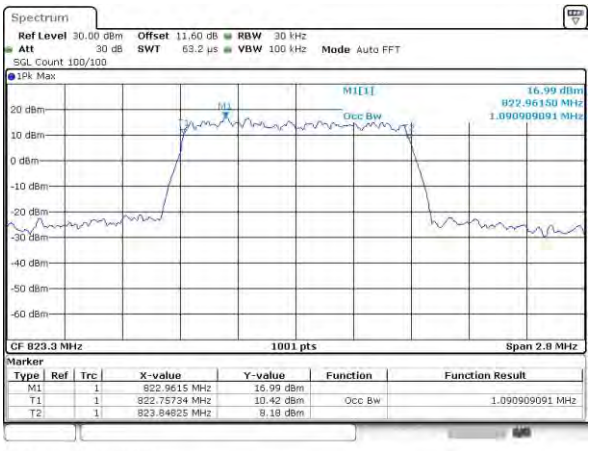
Middle Channel / 1.4MHz / 16QAM



Highest Channel / 1.4MHz / QPSK

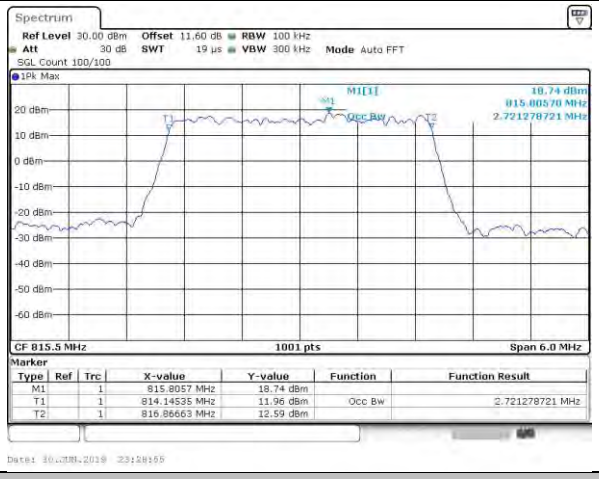


Highest Channel / 1.4MHz / 16QAM

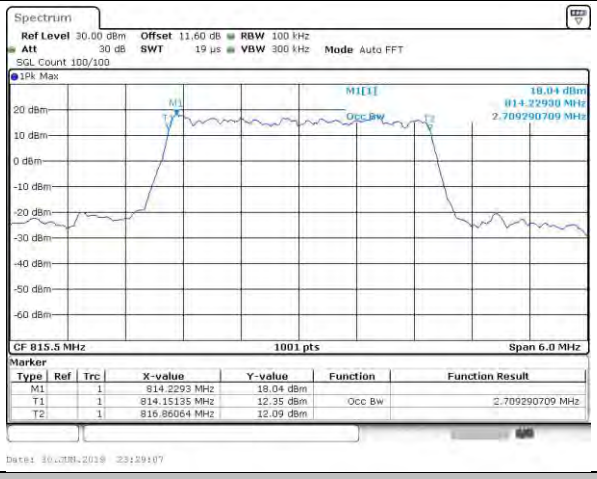


LTE Band 26

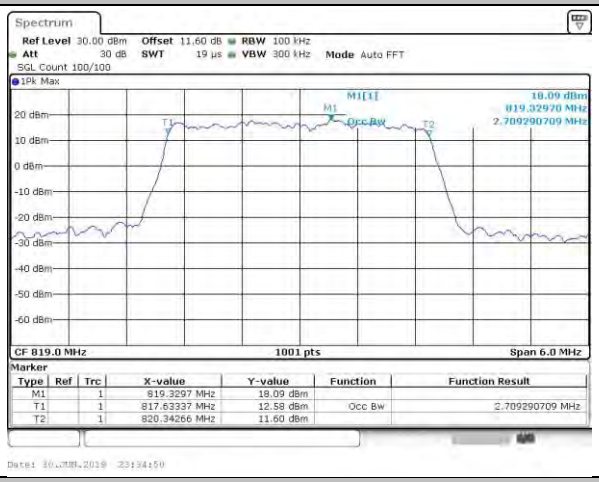
Lowest Channel / 3MHz / QPSK



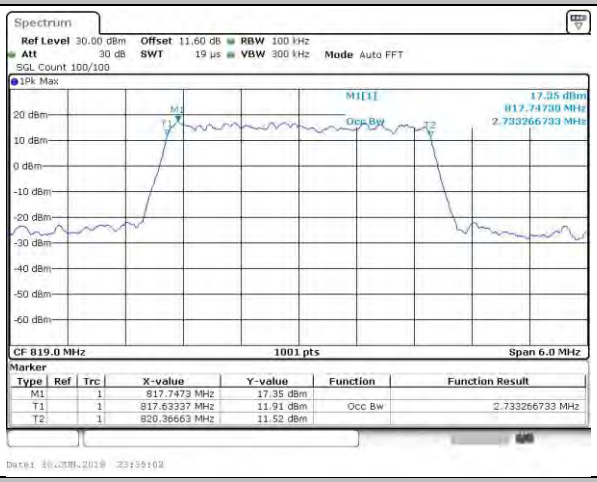
Lowest Channel / 3MHz / 16QAM



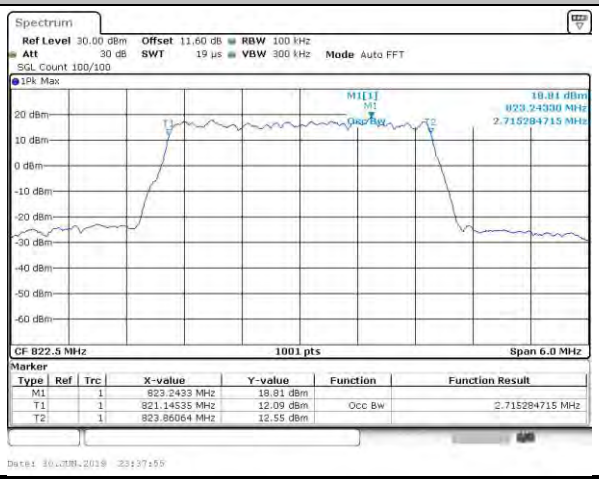
Middle Channel / 3MHz / QPSK



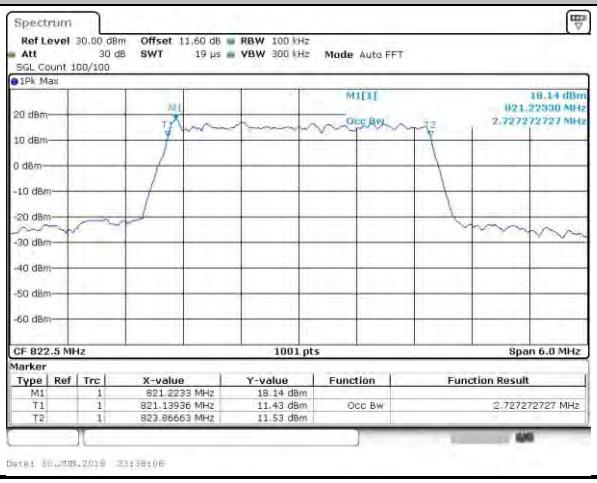
Middle Channel / 3MHz / 16QAM



Highest Channel / 3MHz / QPSK

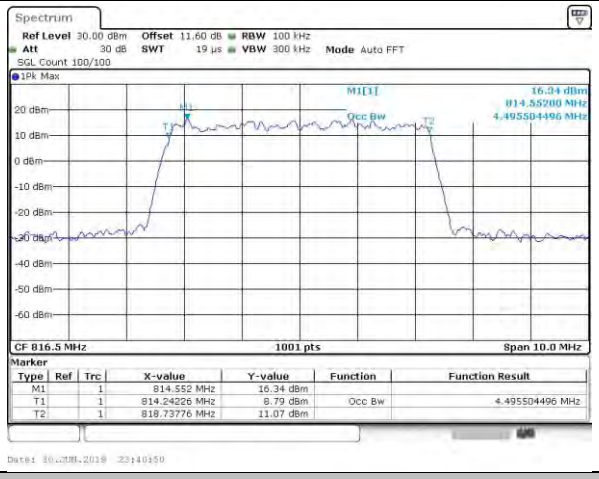


Highest Channel / 3MHz / 16QAM

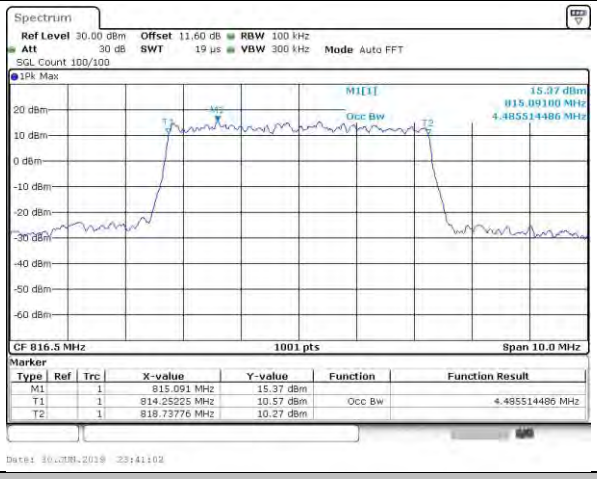


LTE Band 26

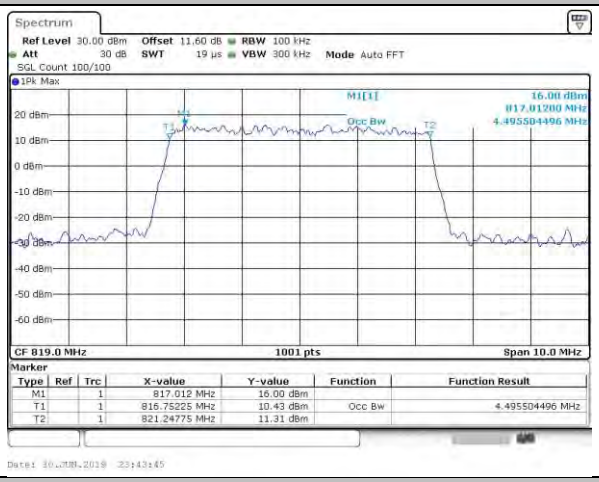
Lowest Channel / 5MHz / QPSK



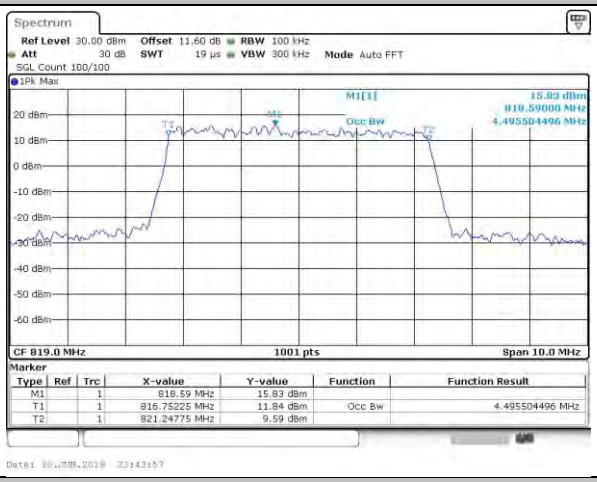
Lowest Channel / 5MHz / 16QAM



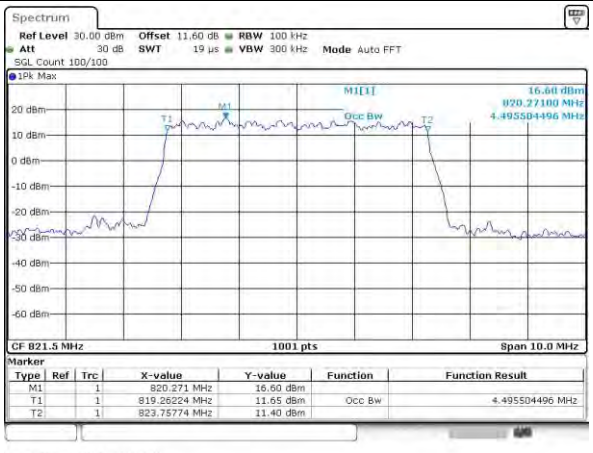
Middle Channel / 5MHz / QPSK



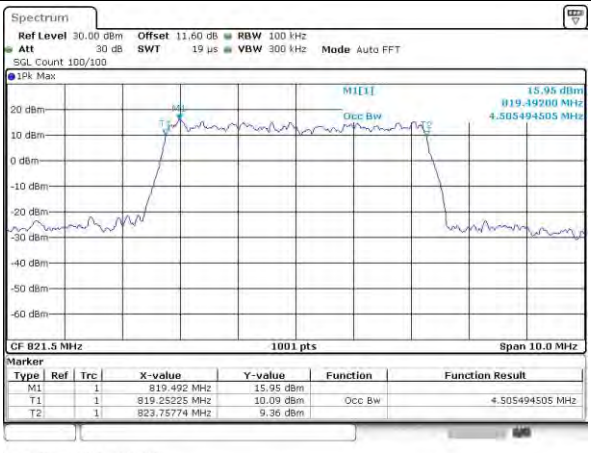
Middle Channel / 5MHz / 16QAM

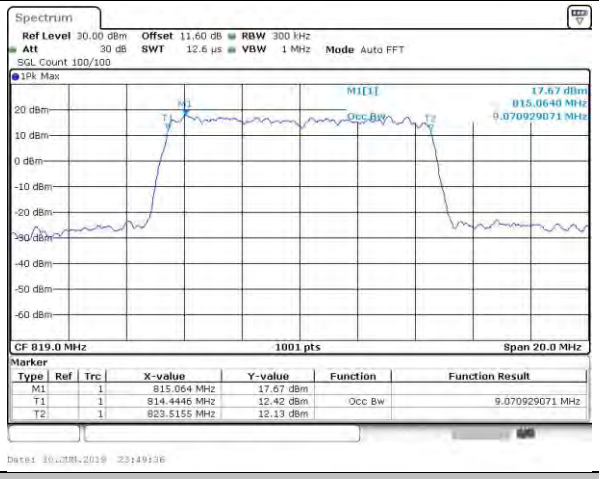
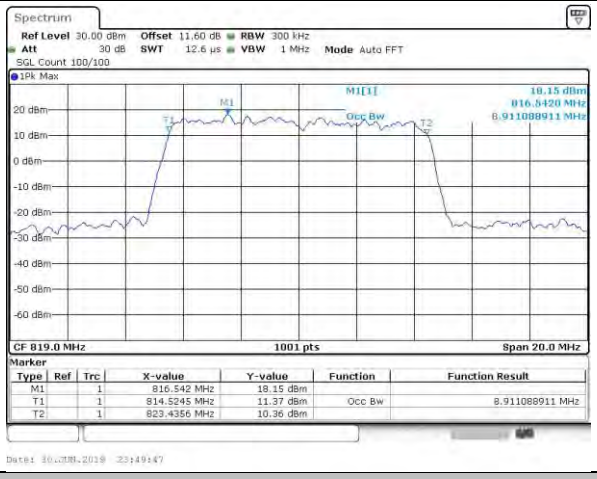
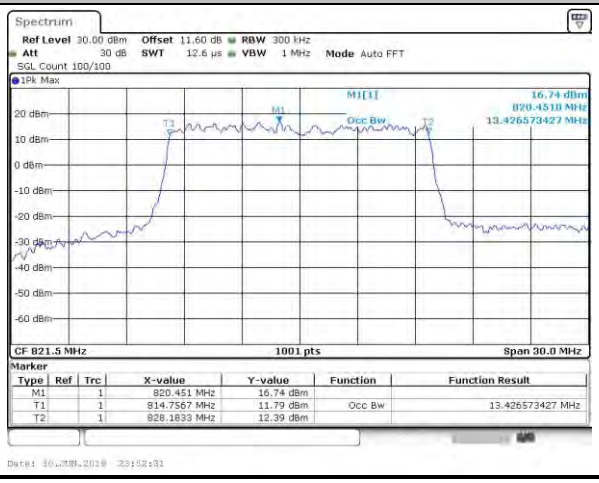
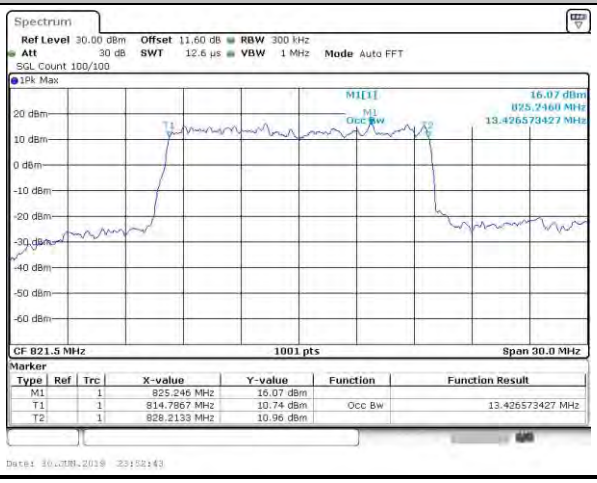


Highest Channel / 5MHz / QPSK



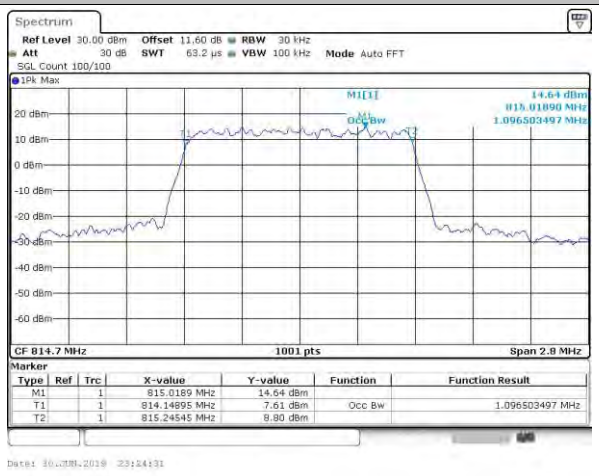
Highest Channel / 5MHz / 16QAM



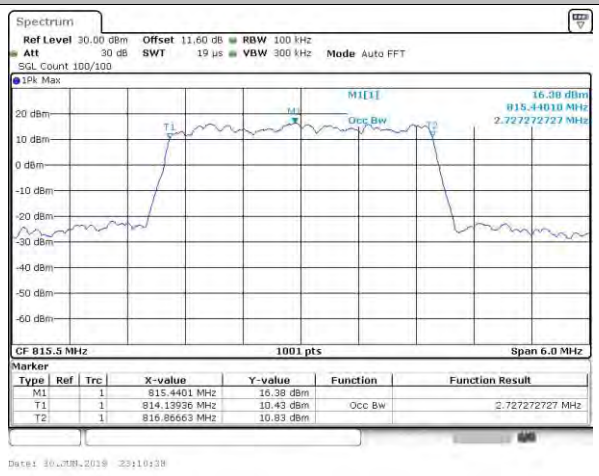
LTE Band 26	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	
LTE Band 26	
Lowest Channel / 15MHz / QPSK	**Lowest Channel / 15MHz / 16QAM**
	

LTE Band 26

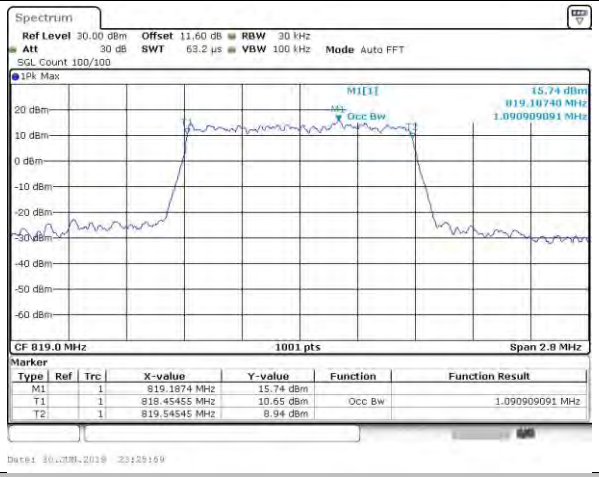
Lowest Channel / 1.4MHz / 64QAM



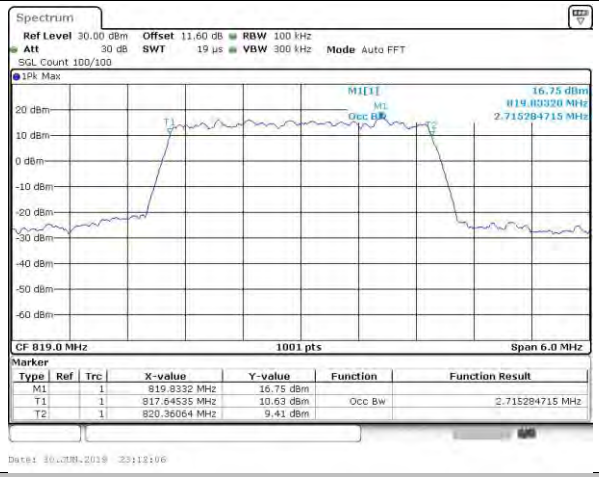
Lowest Channel / 3MHz / 64QAM



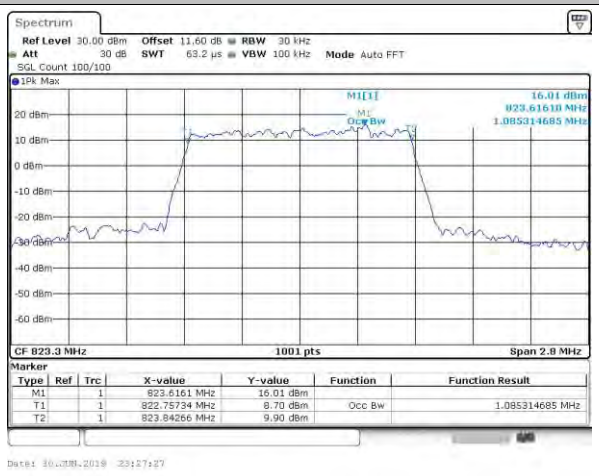
Middle Channel / 1.4MHz / 64QAM



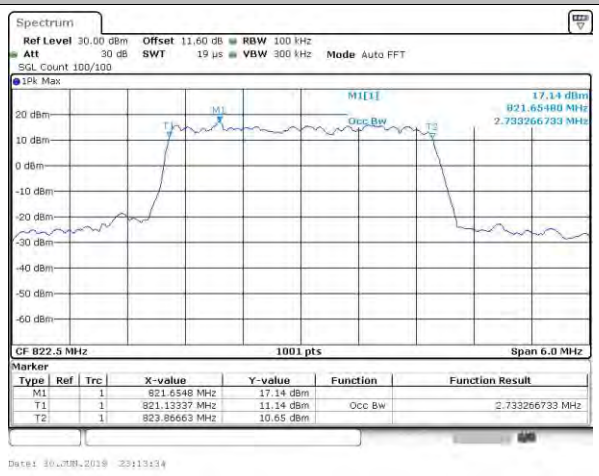
Middle Channel / 3MHz / 64QAM

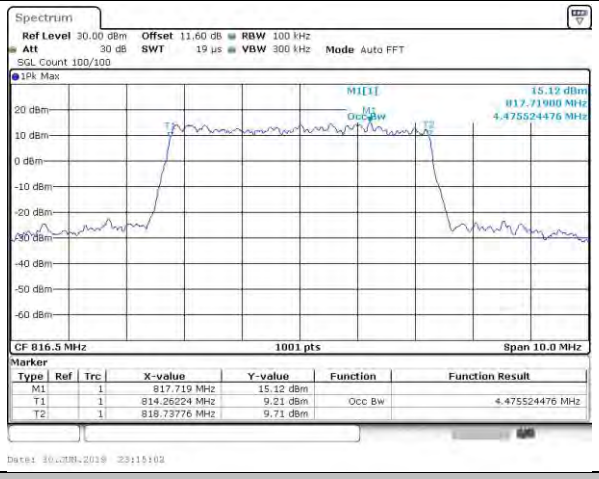
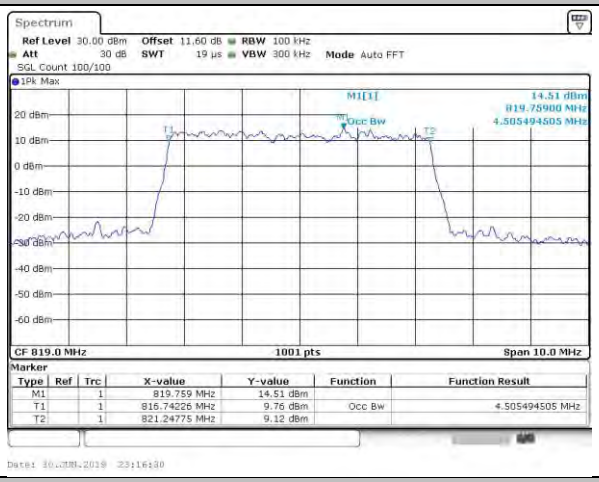
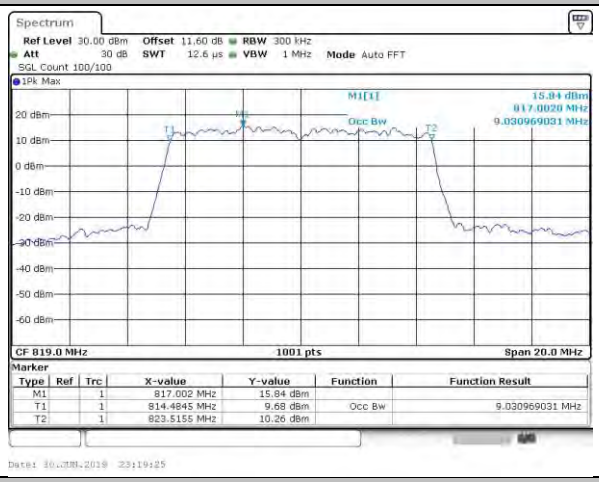
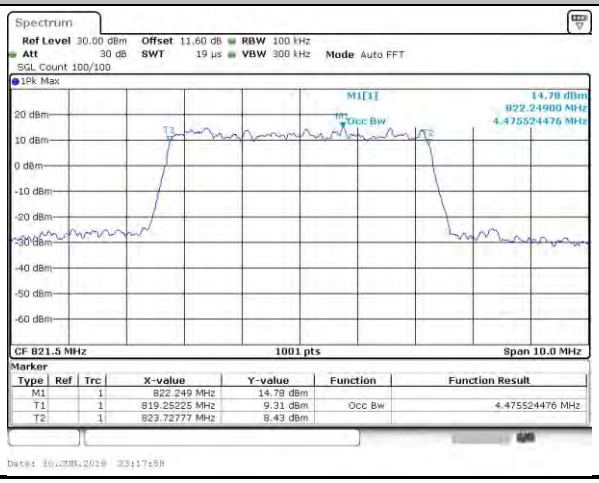


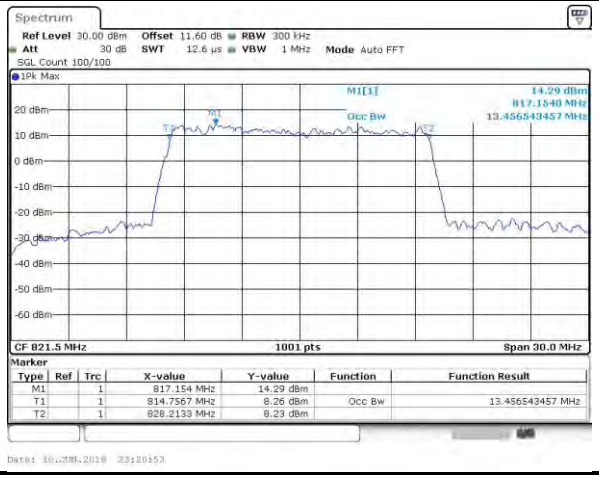
Highest Channel / 1.4MHz / 64QAM



Highest Channel / 3MHz / 64QAM



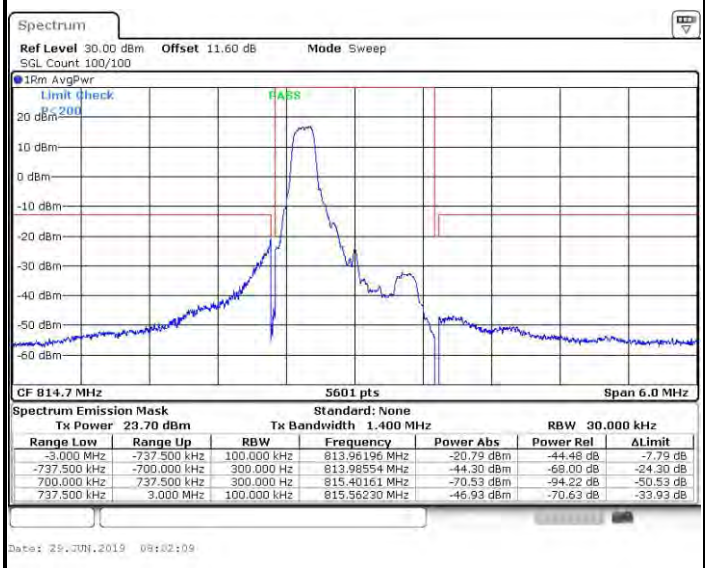
LTE Band 26	
Lowest Channel / 5MHz / 64QAM	
	
Middle Channel / 5MHz / 64QAM	**Middle Channel / 10MHz / 64QAM**
	
Highest Channel / 5MHz / 64QAM	
	

LTE Band 26	
Lowest Channel / 15MHz / 64QAM	
	

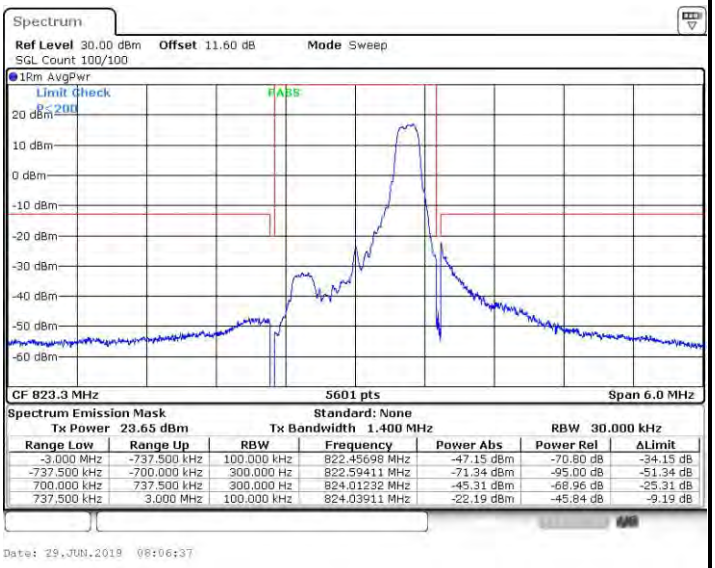
Emission masks – In-band emissions

LTE Band 26 / 1.4MHz / QPSK

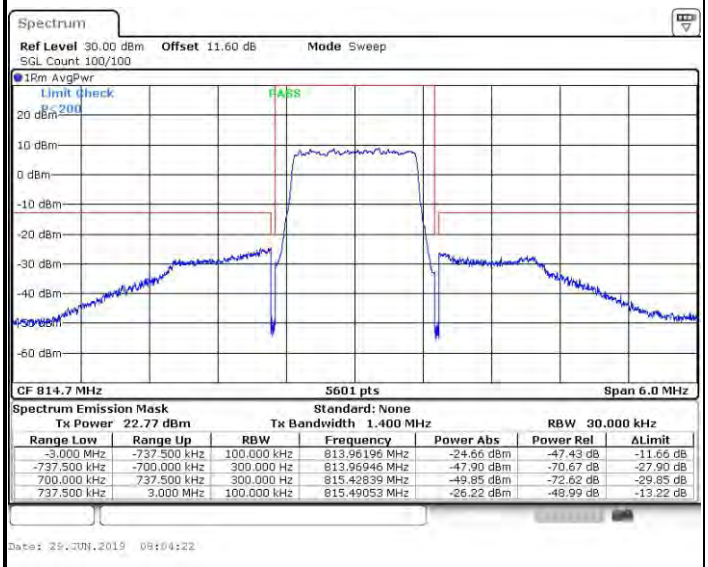
Lowest Band Edge / 1RB



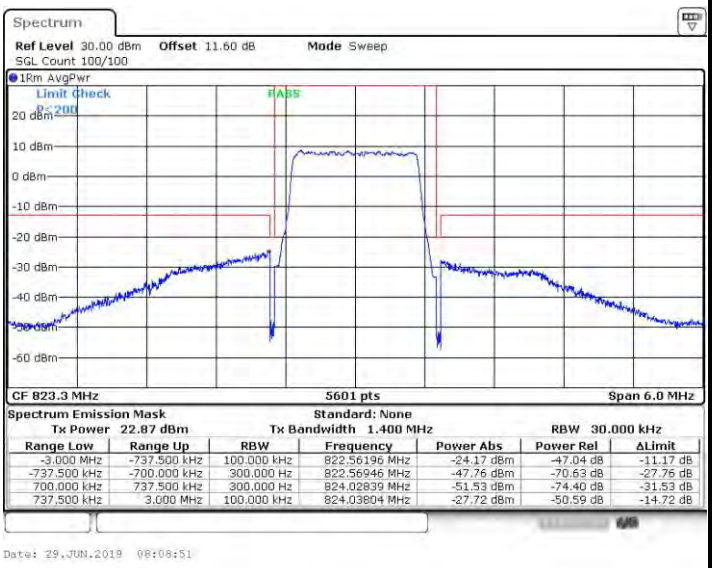
Highest Band Edge / 1RB



Lowest Band Edge / Full RB

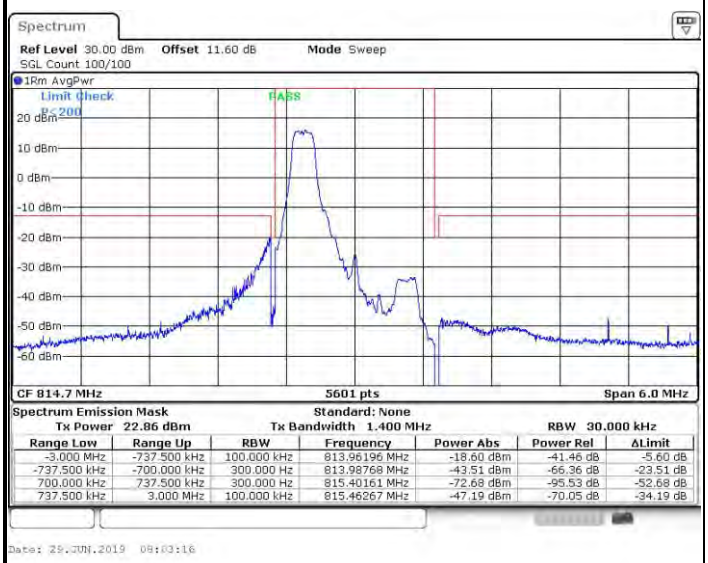


Highest Band Edge / Full RB

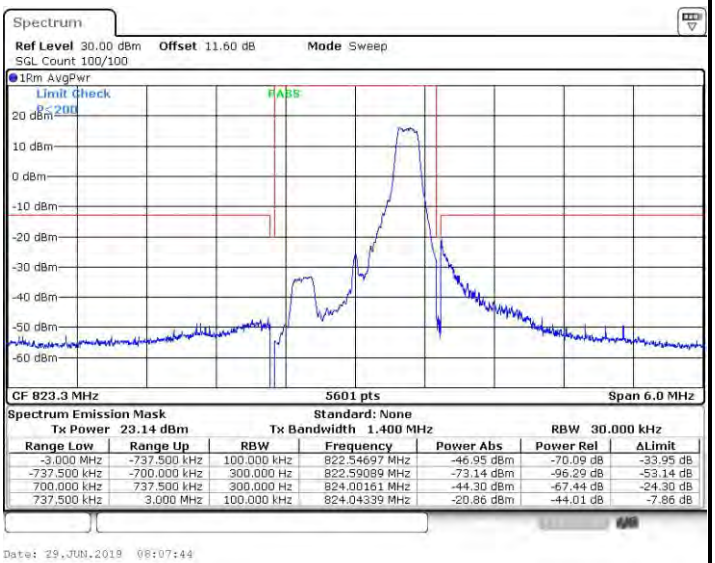


LTE Band 26 / 1.4MHz / 16QAM

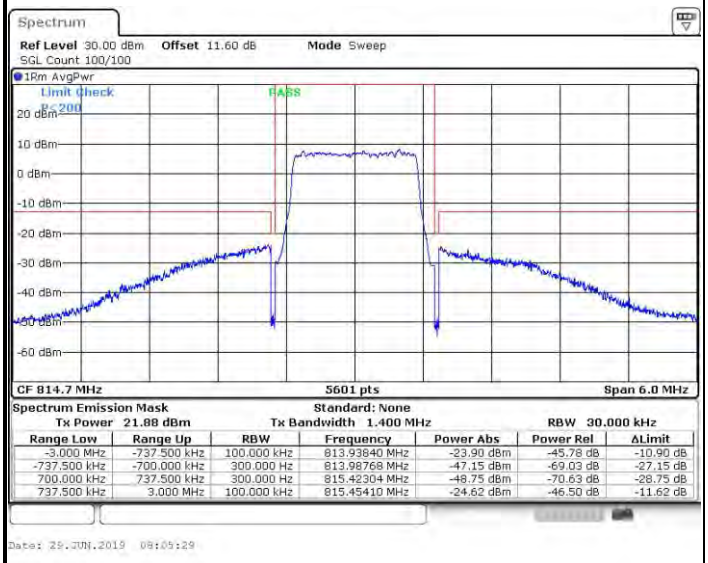
Lowest Band Edge / 1 RB



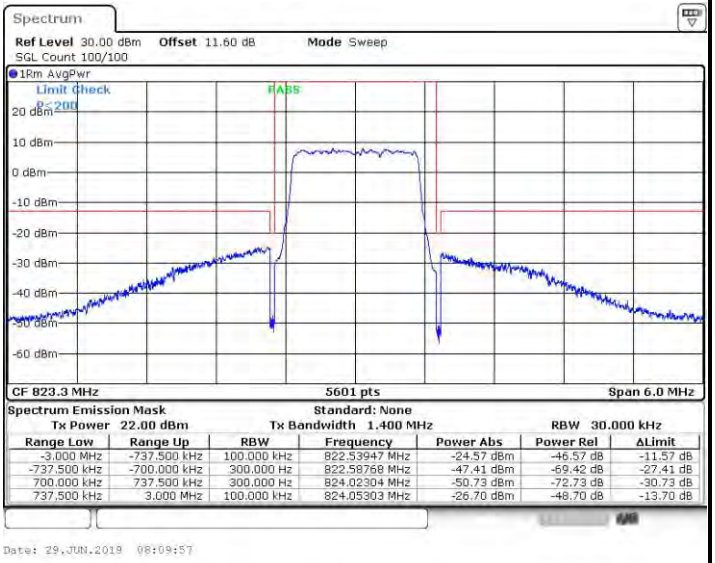
Highest Band Edge / 1 RB

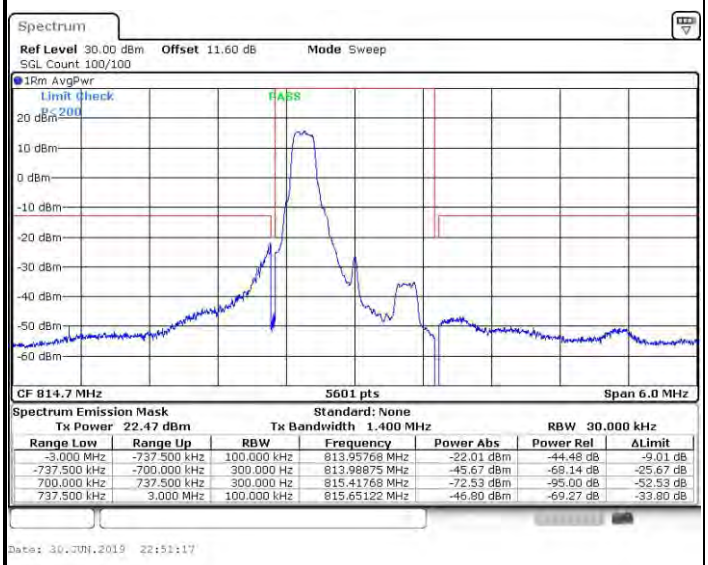
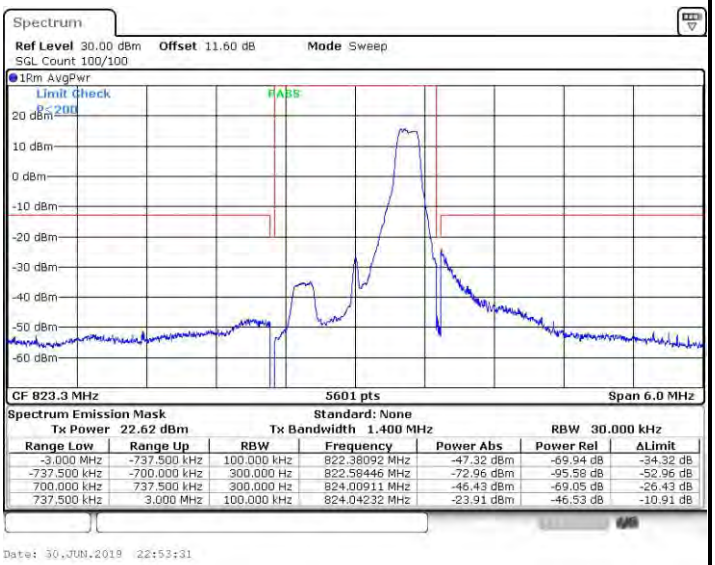
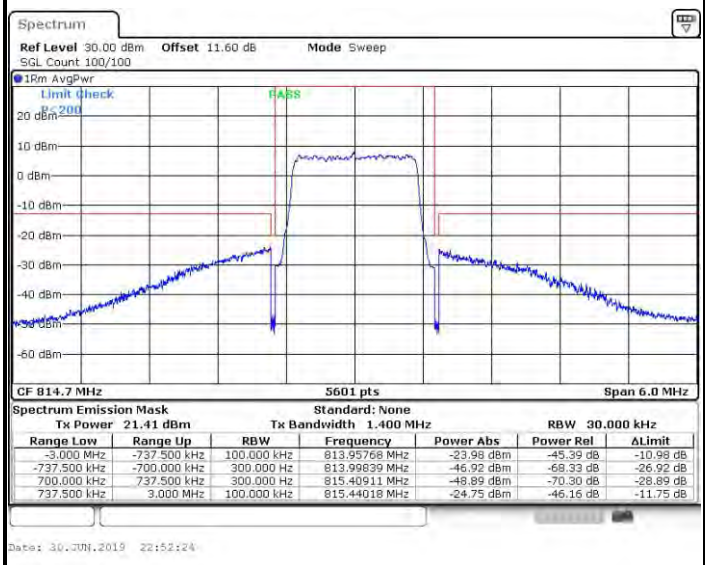
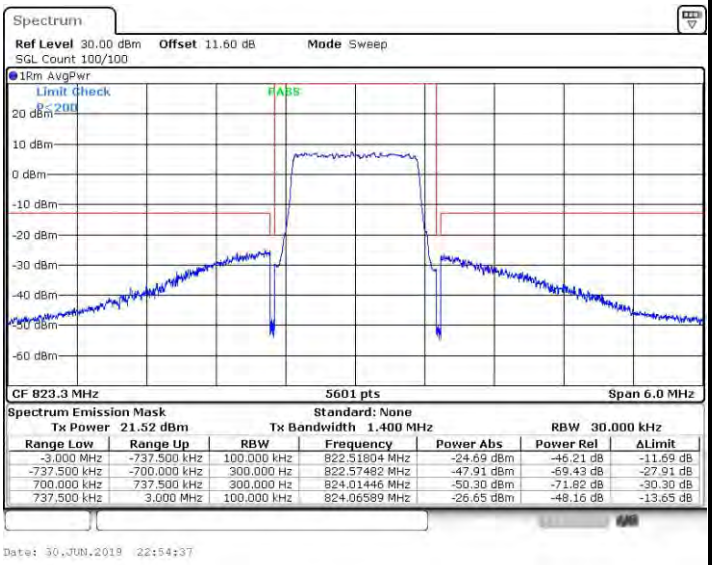


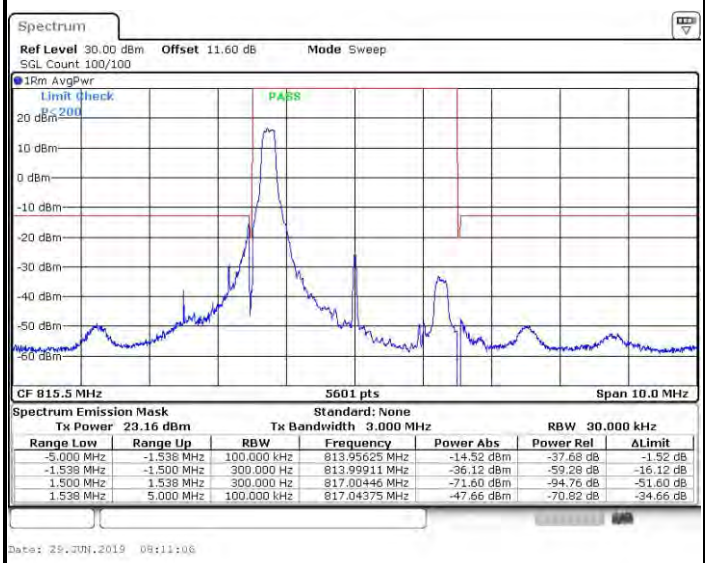
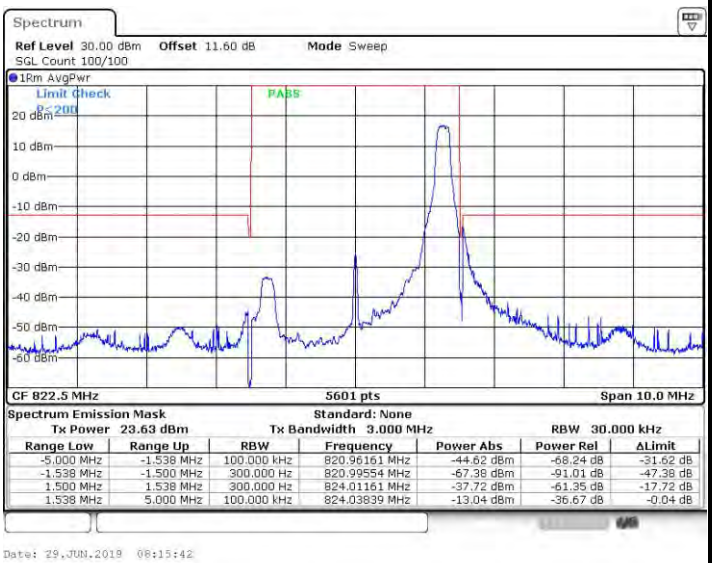
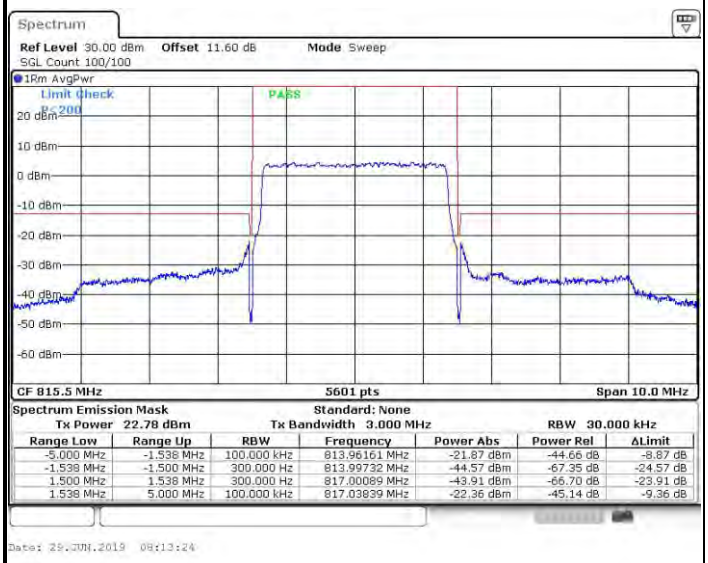
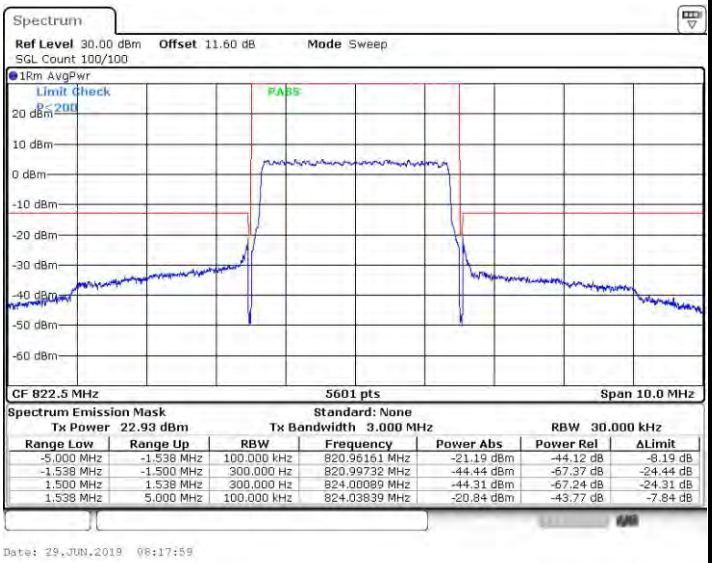
Lowest Band Edge / Full RB

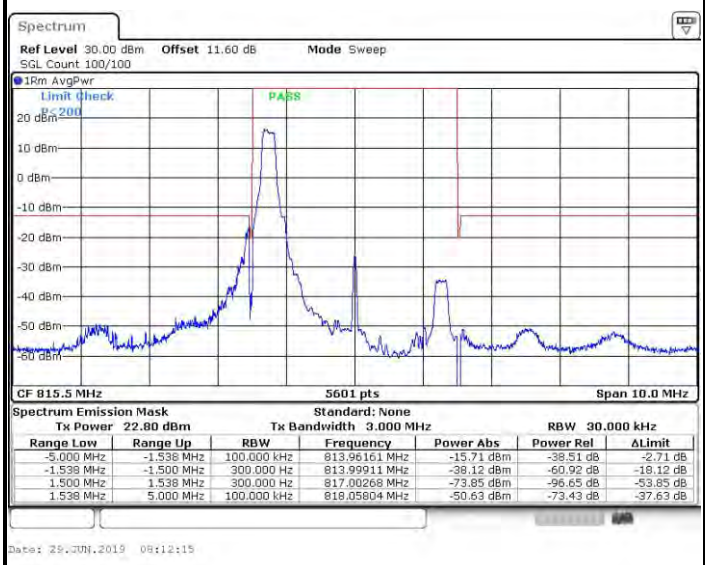
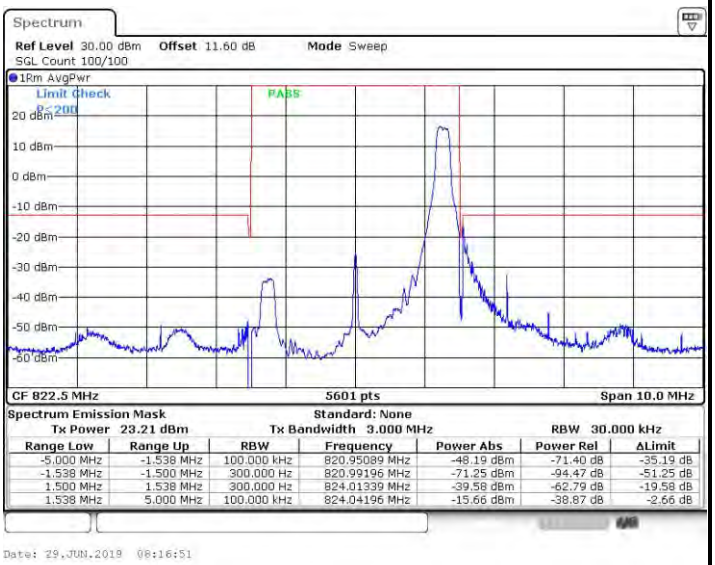
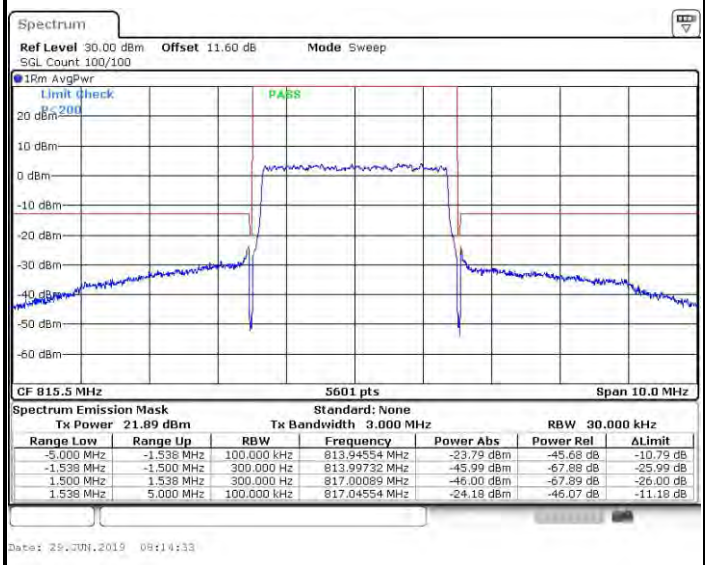
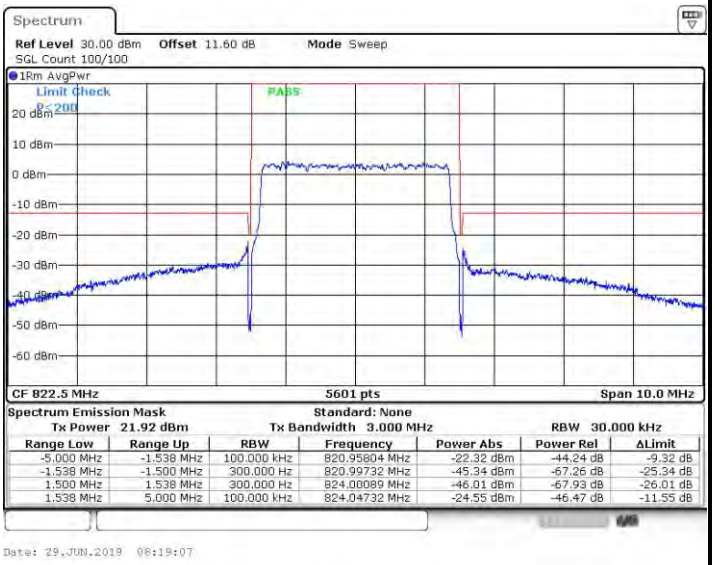


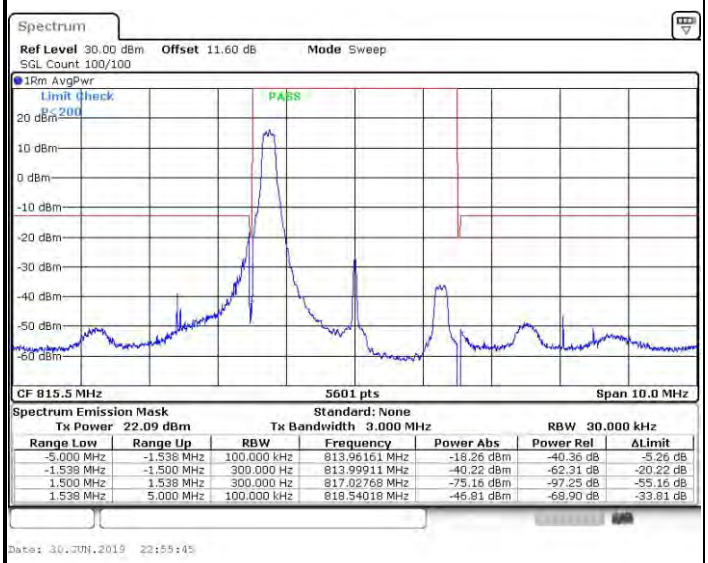
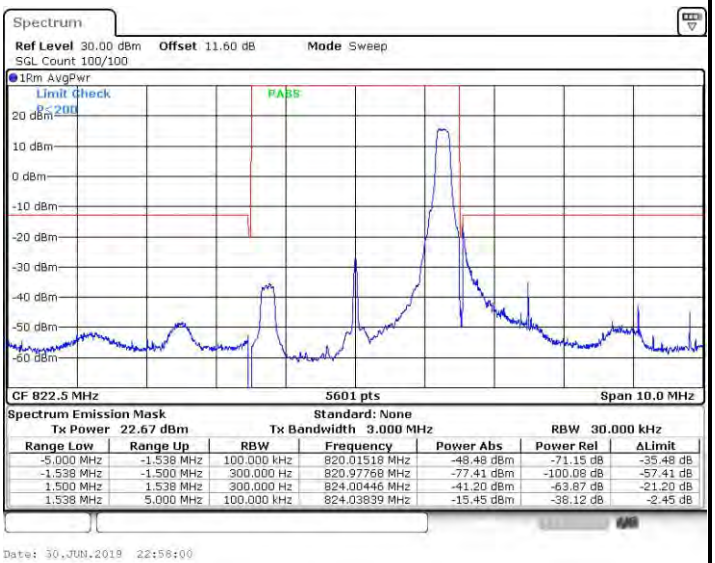
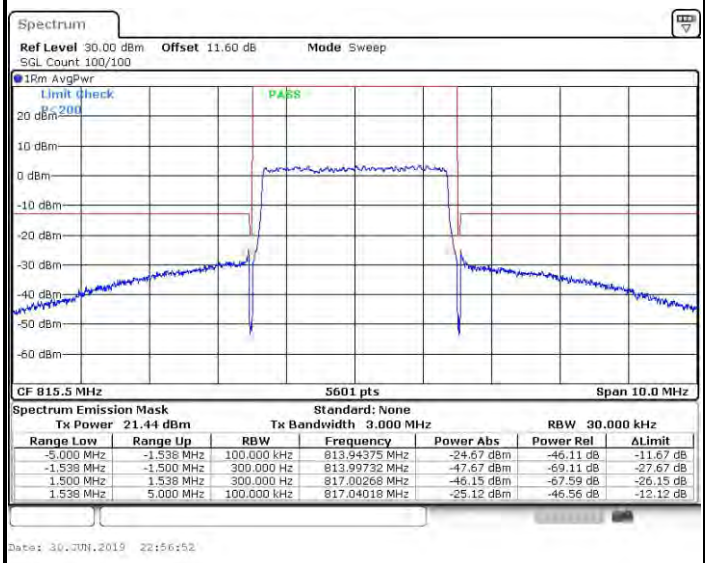
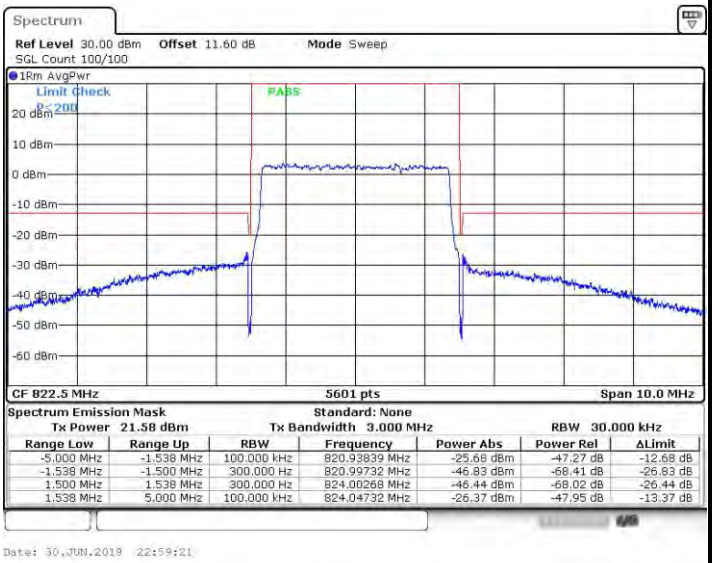
Highest Band Edge / Full RB

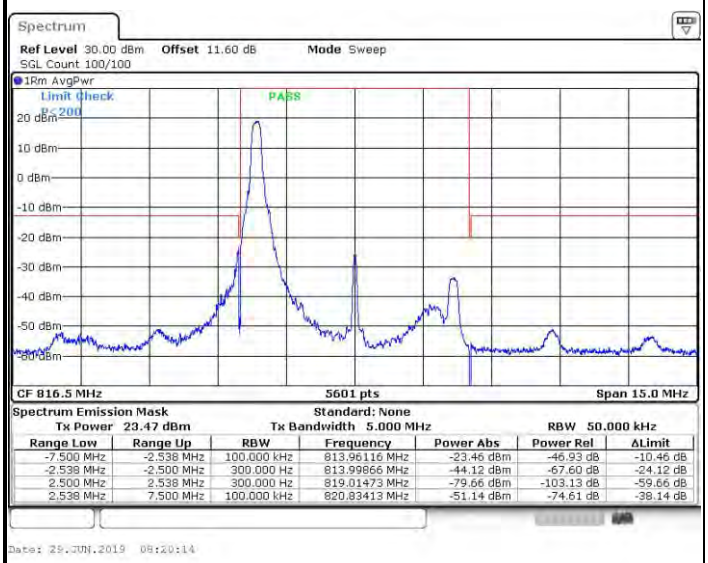
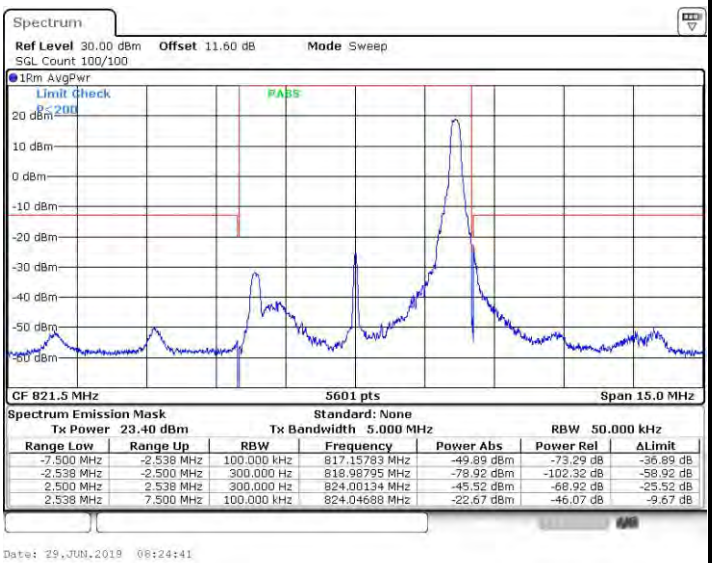
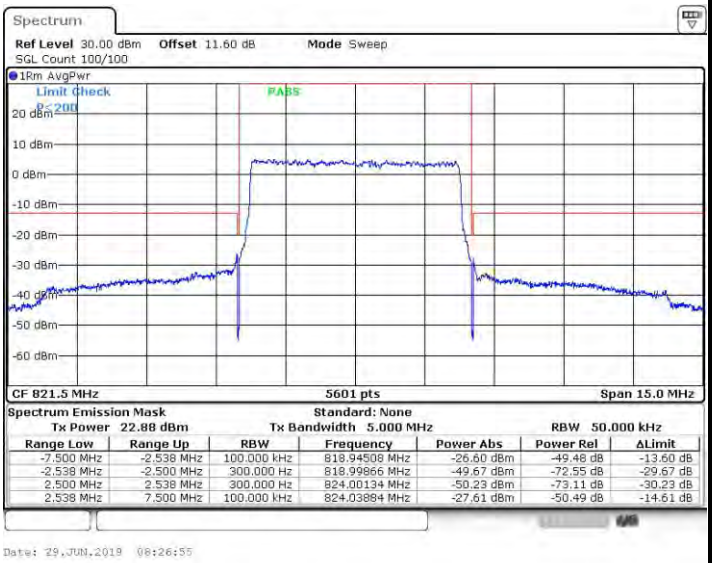


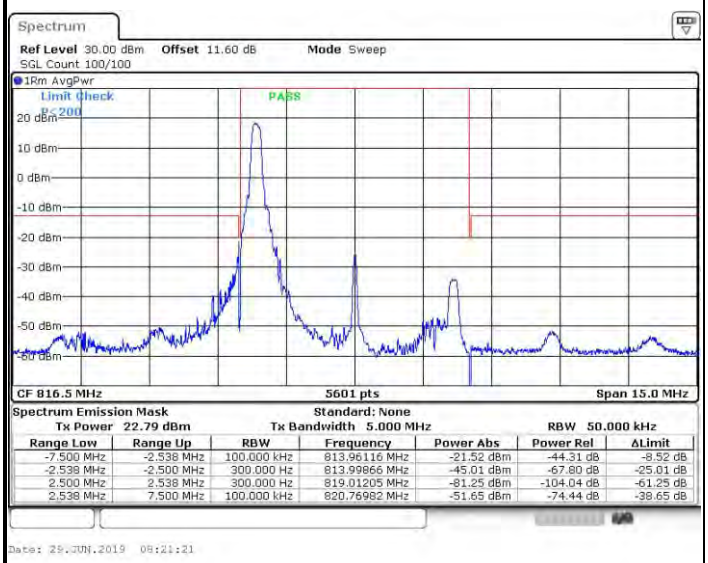
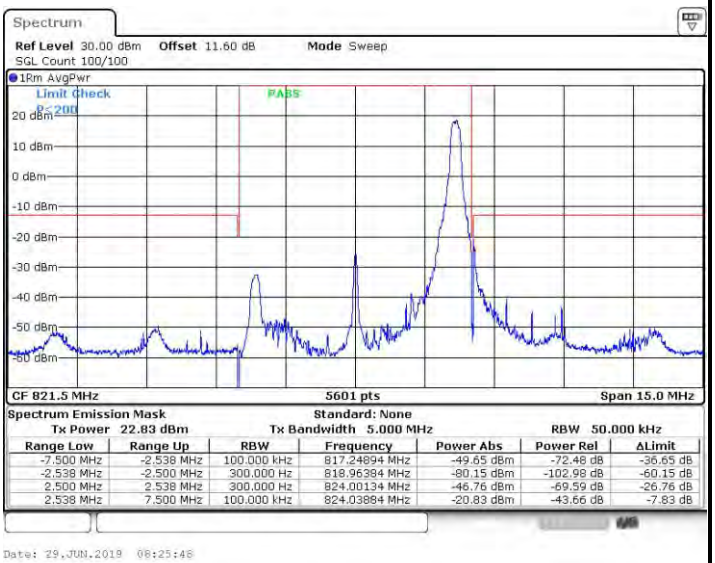
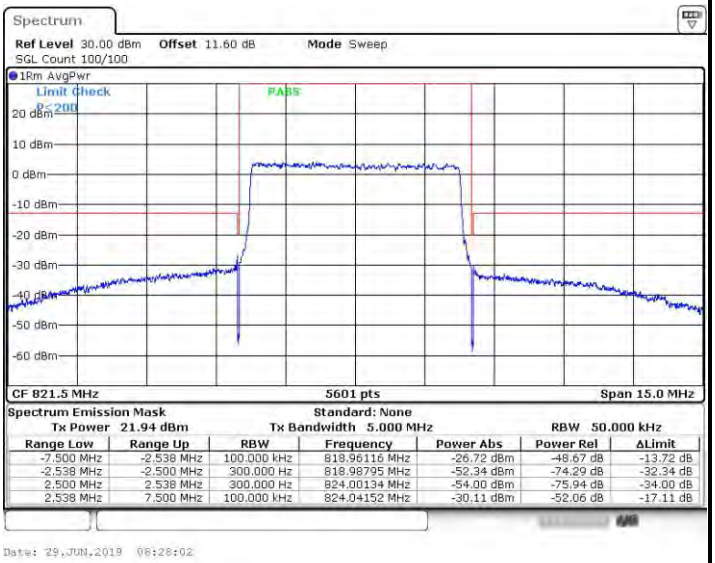
LTE Band 26 / 1.4MHz / 64QAM	
Lowest Band Edge / 1 RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

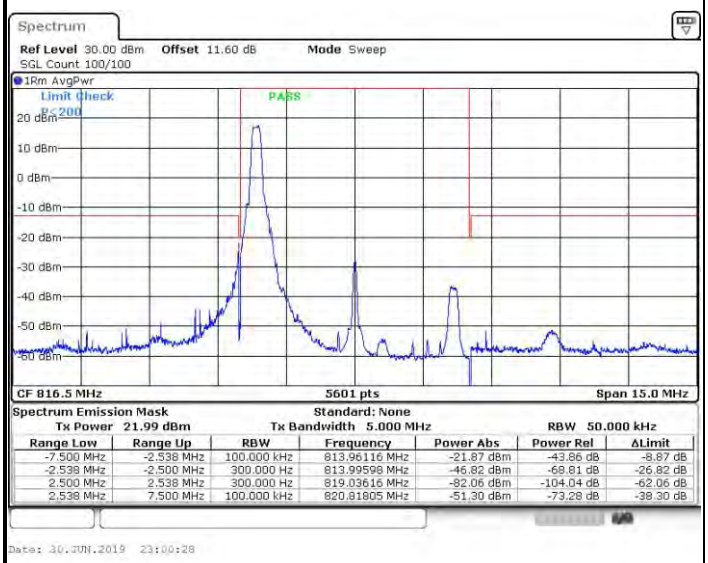
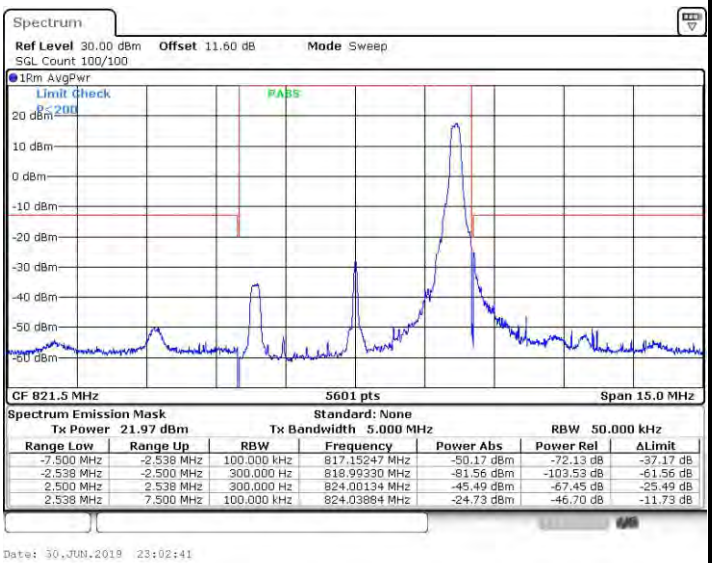
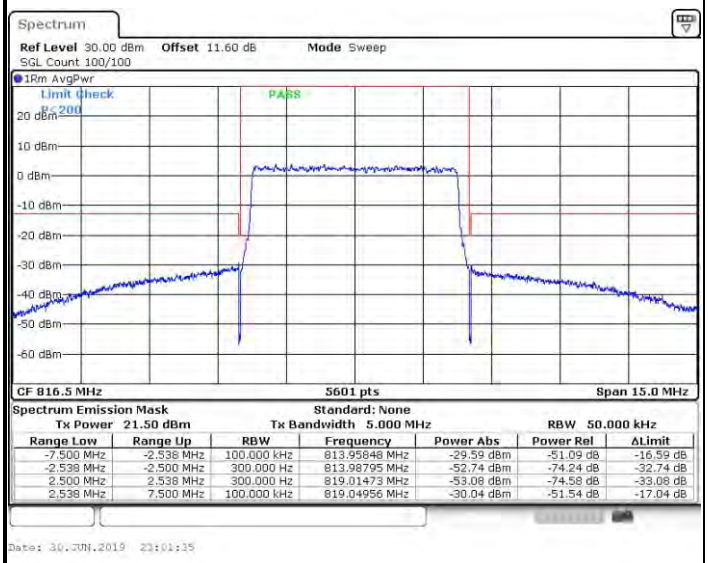
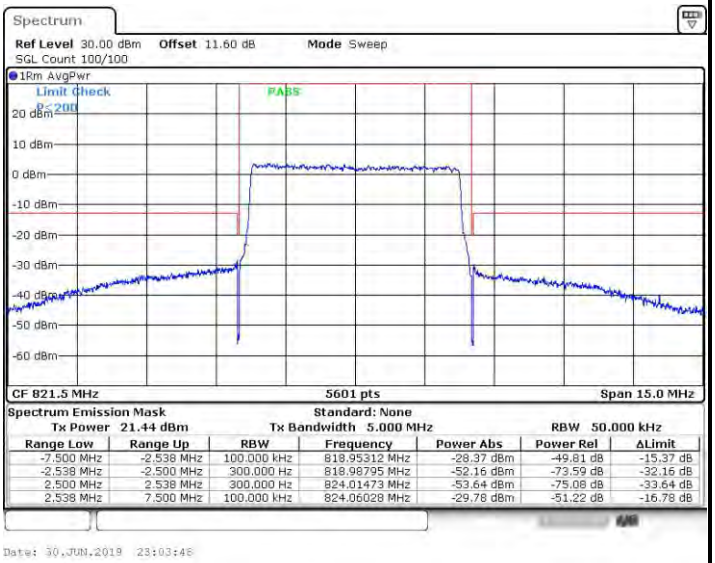
LTE Band 26 / 3MHz / QPSK	
Lowest Band Edge / 1RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

LTE Band 26 / 3MHz / 16QAM	
Lowest Band Edge / 1 RB	**Highest Band Edge /1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

LTE Band 26 / 3MHz / 64QAM	
Lowest Band Edge / 1 RB	**Highest Band Edge /1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

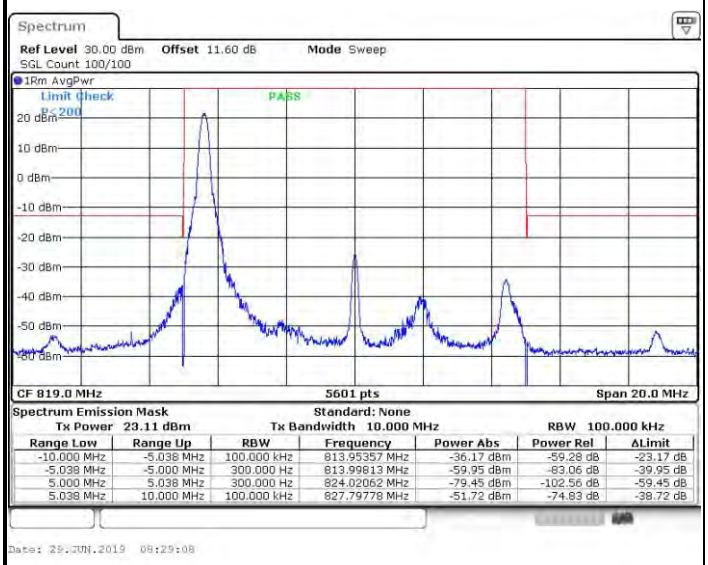
LTE Band 26 / 5MHz / QPSK	
Lowest Band Edge / 1 RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

LTE Band 26 / 5MHz / 16QAM	
Lowest Band Edge / 1RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

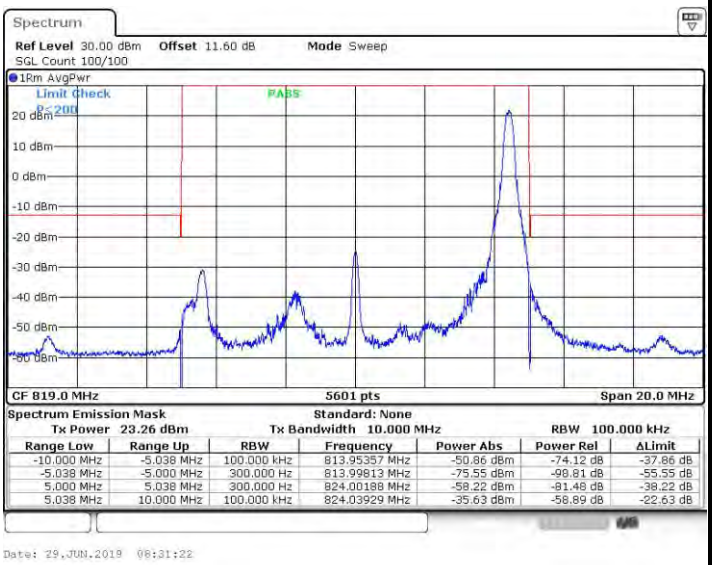
LTE Band 26 / 5MHz / 64QAM	
Lowest Band Edge / 1RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

LTE Band 26 / 10MHz / QPSK

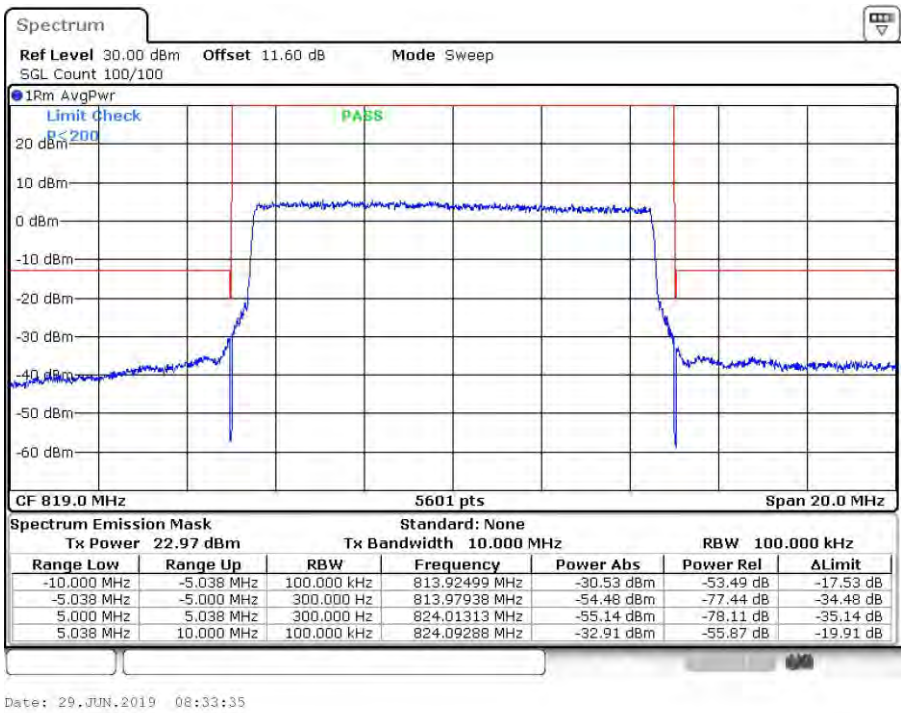
Lowest Band Edge / 1 RB



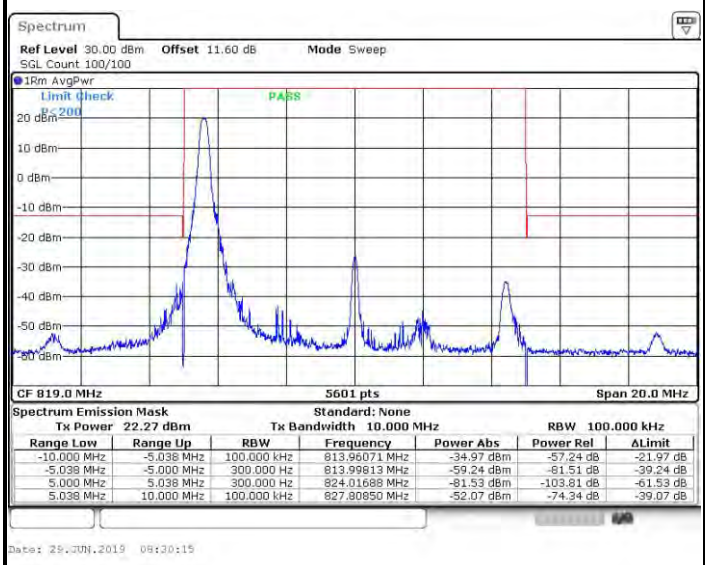
Highest Band Edge / 1 RB

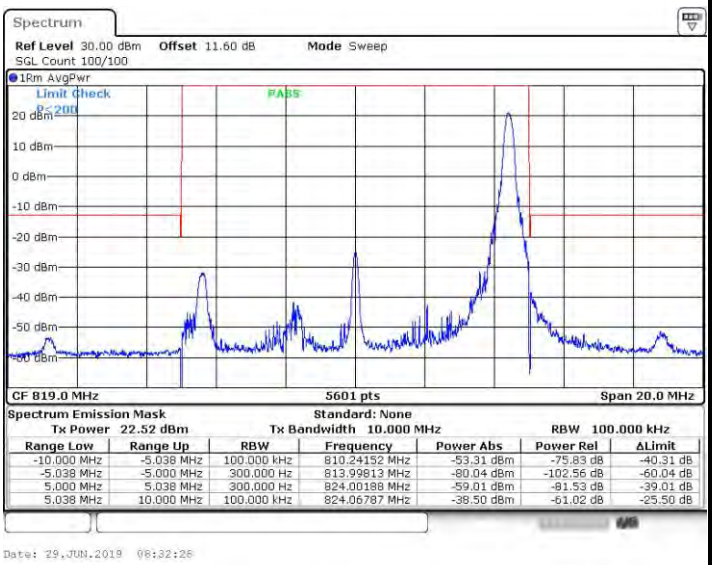


Band Edge / Full RB

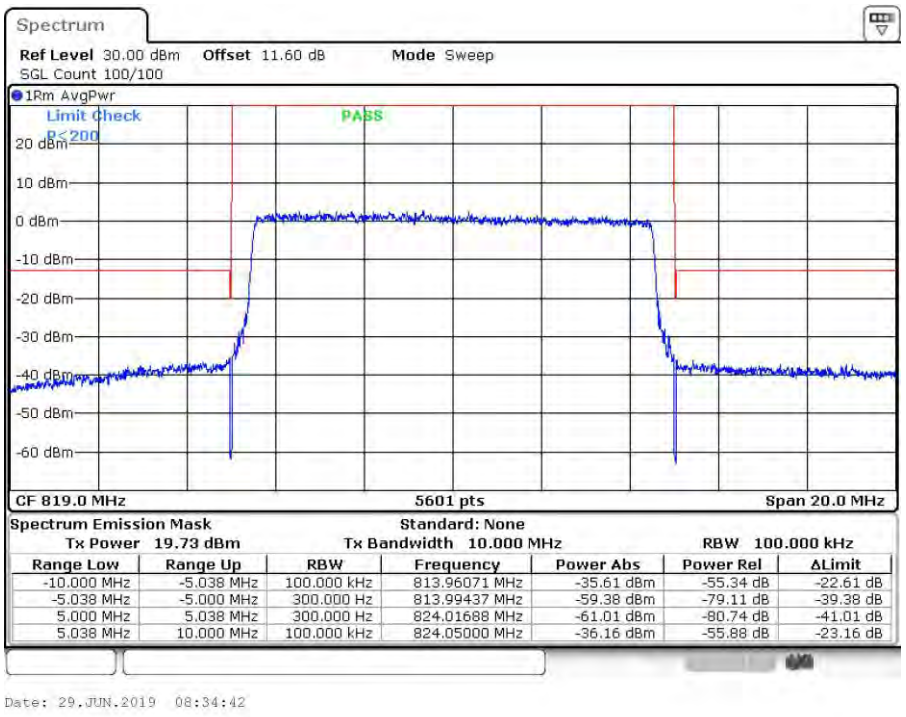


LTE Band 26 / 10MHz / 16QAM	
Lowest Band Edge / 1 RB	**Highest Band Edge / 1 RB**

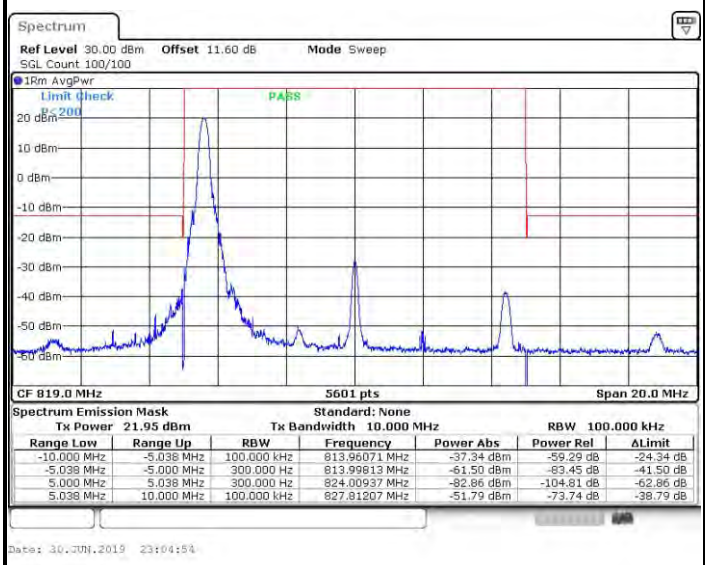


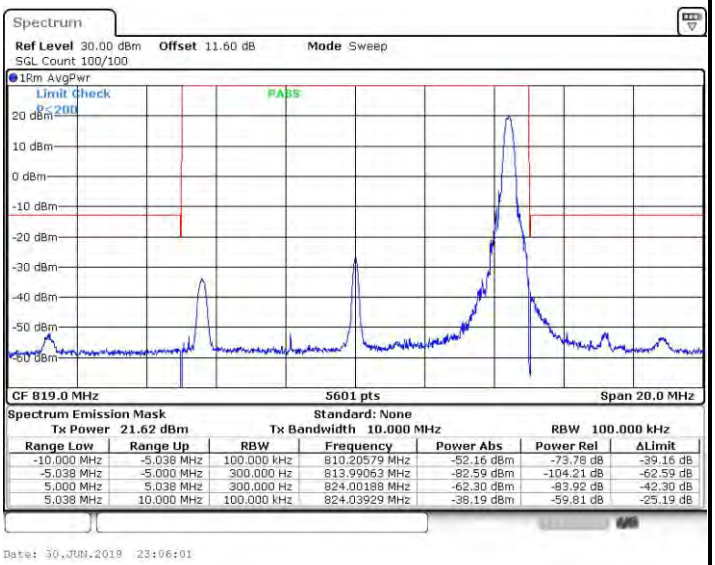


Band Edge / Full RB

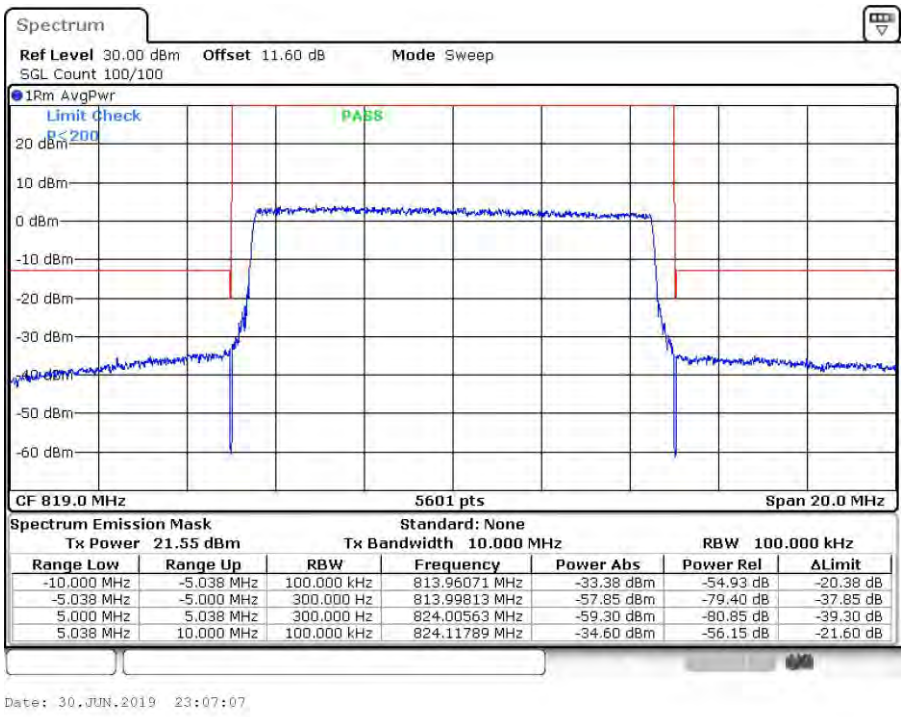


LTE Band 26 / 10MHz / 64QAM	
Lowest Band Edge / 1 RB	**Highest Band Edge / 1 RB**



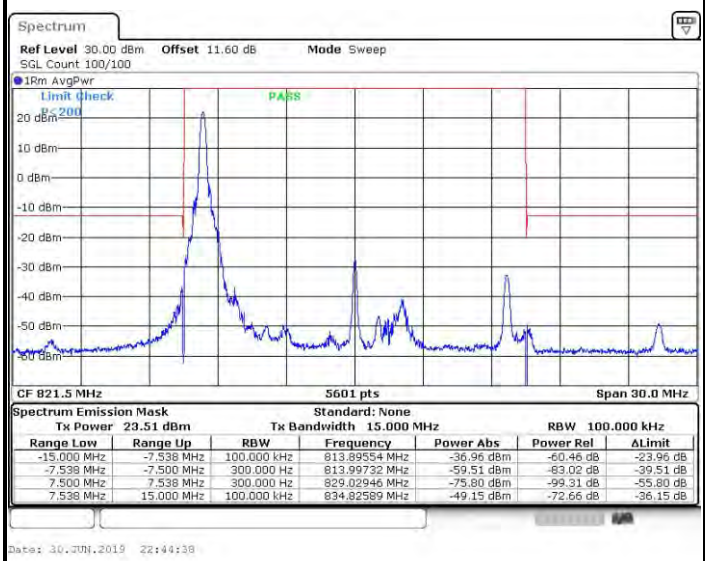


Band Edge / Full RB

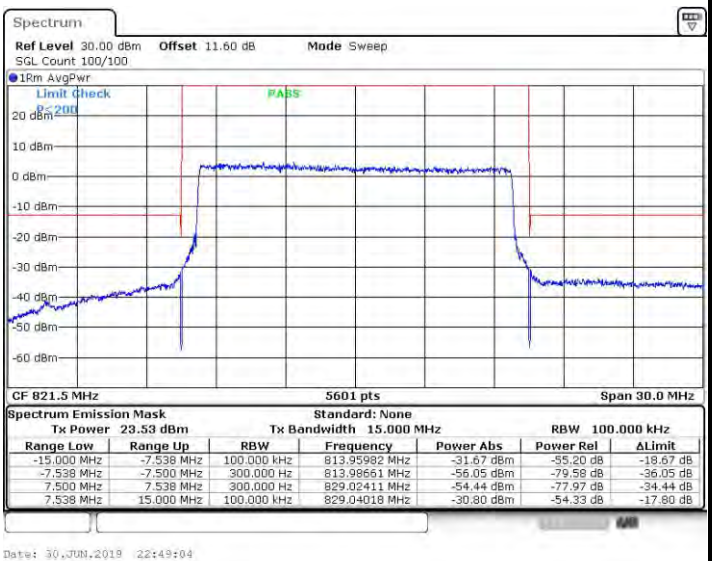


LTE Band 26 / 15MHz QPSK

Lowest Band Edge / 1 RB

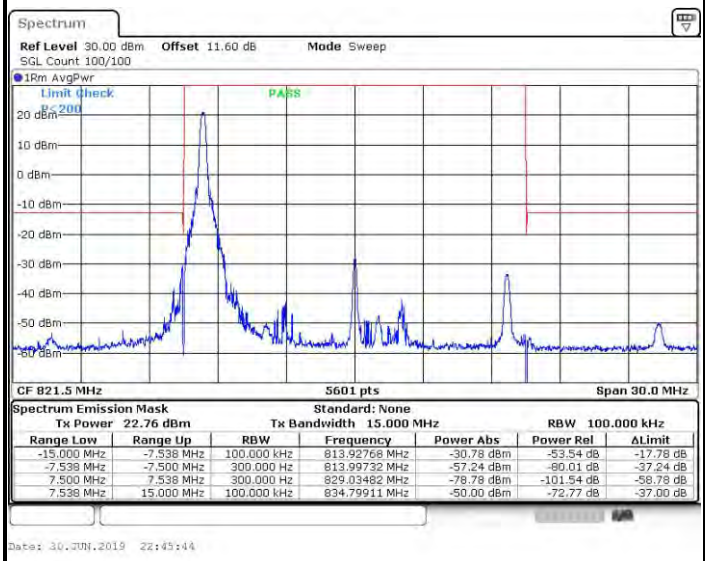


Lowest Band Edge / Full RB

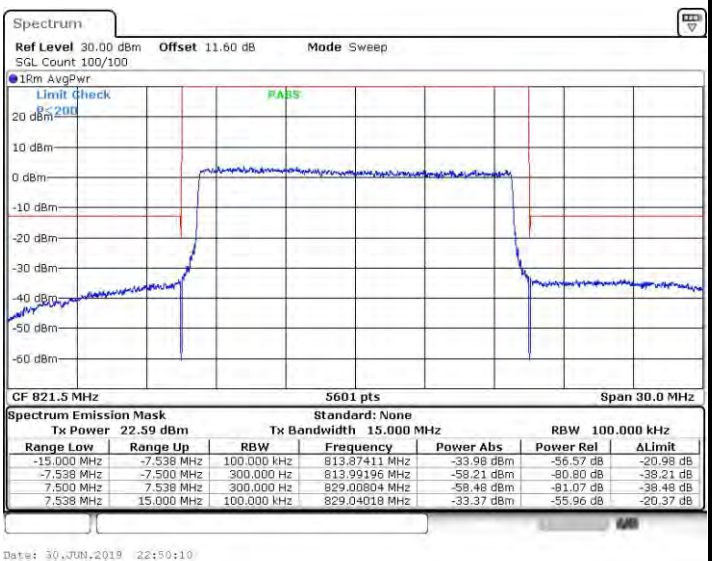


LTE Band 26 / 15MHz 16QAM

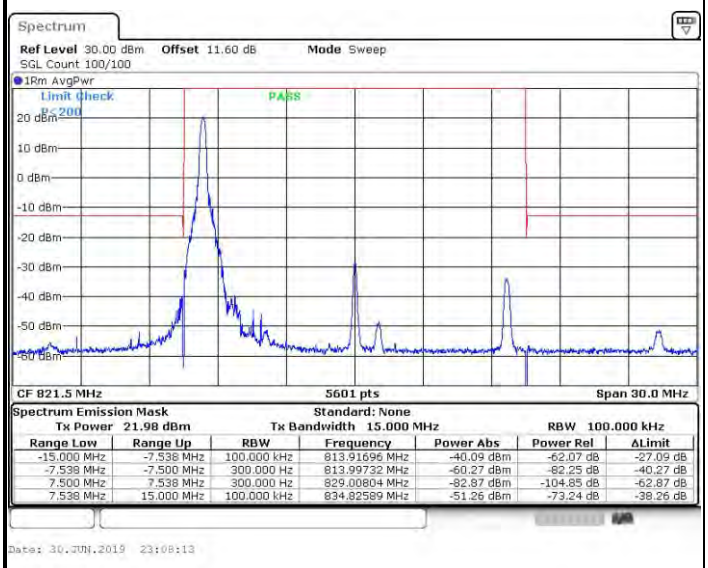
Lowest Band Edge / 1 RB

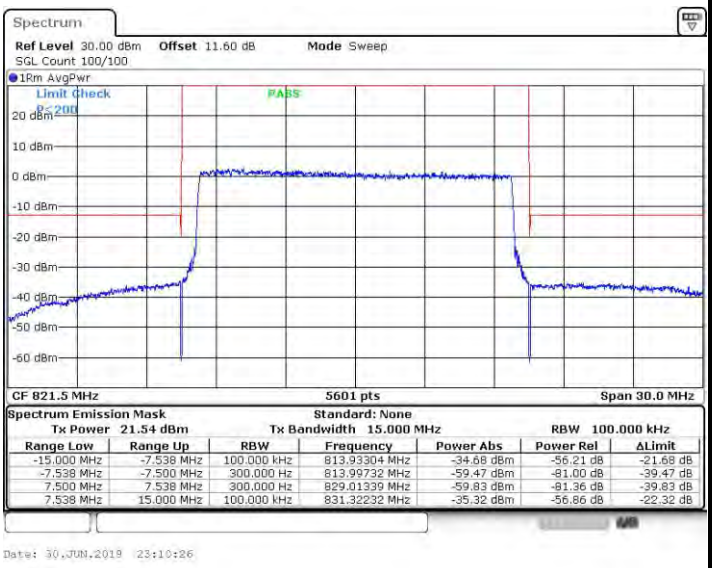


Lowest Band Edge / Full RB



LTE Band 26 / 15MHz / 64QAM	
Lowest Band Edge / 1 RB	**Lowest Band Edge / Full RB**

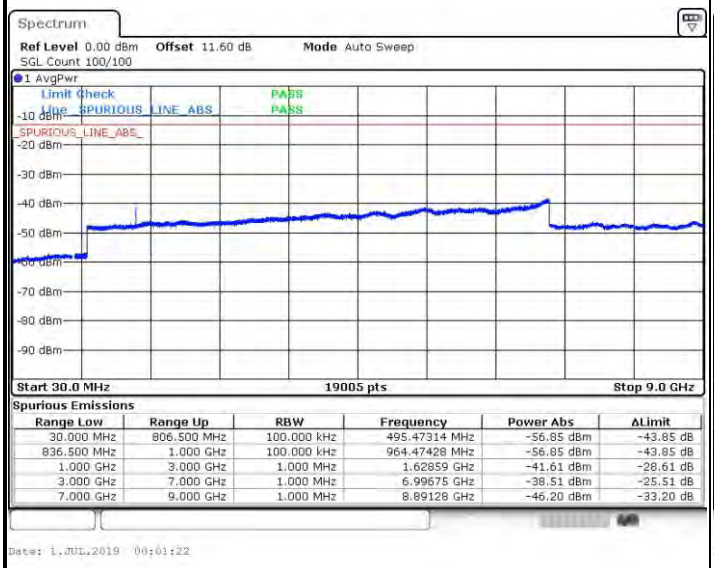




Emission masks – Out of band emissions

LTE Band 26 / 1.4MHz

Lowest Channel / QPSK

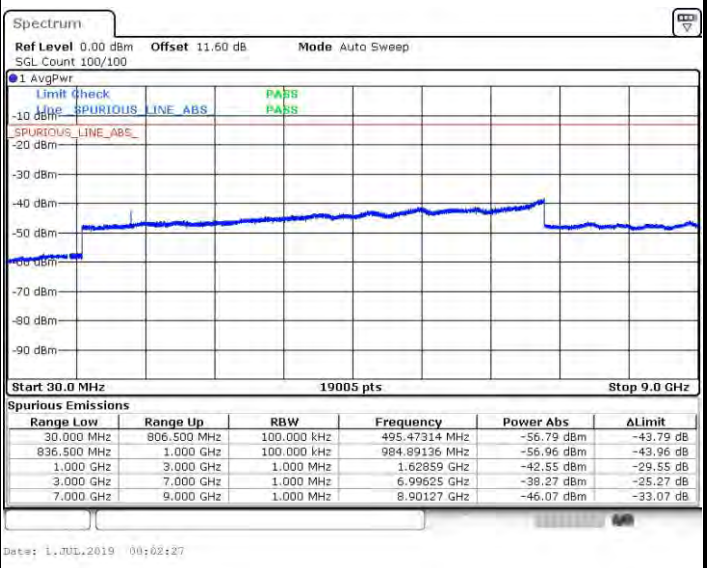


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.47314 MHz	-56.85 dBm	-43.85 dB
836.500 MHz	1.000 GHz	100.000 kHz	964.47428 MHz	-56.85 dBm	-43.85 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62859 GHz	-41.61 dBm	-28.61 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99675 GHz	-38.51 dBm	-25.51 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89128 GHz	-46.20 dBm	-33.20 dB

Date: 1.JUL.2019 00:01:22

Lowest Channel / 16QAM

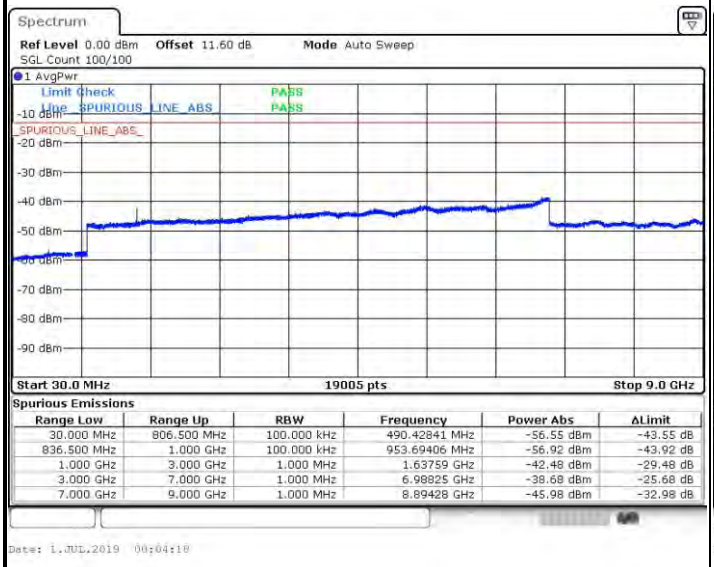


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.47314 MHz	-56.79 dBm	-43.79 dB
836.500 MHz	1.000 GHz	100.000 kHz	984.89136 MHz	-56.96 dBm	-43.96 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62859 GHz	-42.55 dBm	-29.55 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99625 GHz	-38.27 dBm	-25.27 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.90127 GHz	-46.07 dBm	-33.07 dB

Date: 1.JUL.2019 00:02:27

Middle Channel / QPSK

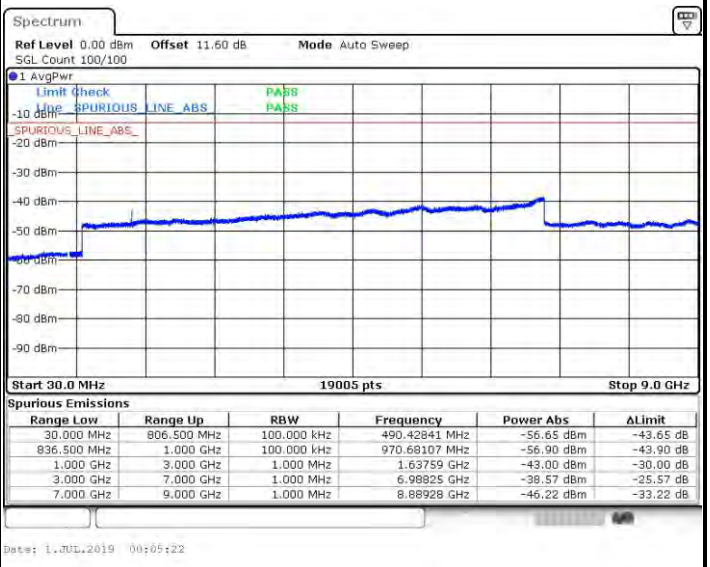


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	490.42841 MHz	-56.55 dBm	-43.55 dB
836.500 MHz	1.000 GHz	100.000 kHz	953.69406 MHz	-56.92 dBm	-43.92 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63759 GHz	-42.48 dBm	-29.48 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98825 GHz	-38.68 dBm	-25.68 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89428 GHz	-45.98 dBm	-32.98 dB

Date: 1.JUL.2019 00:04:18

Middle Channel / 16QAM



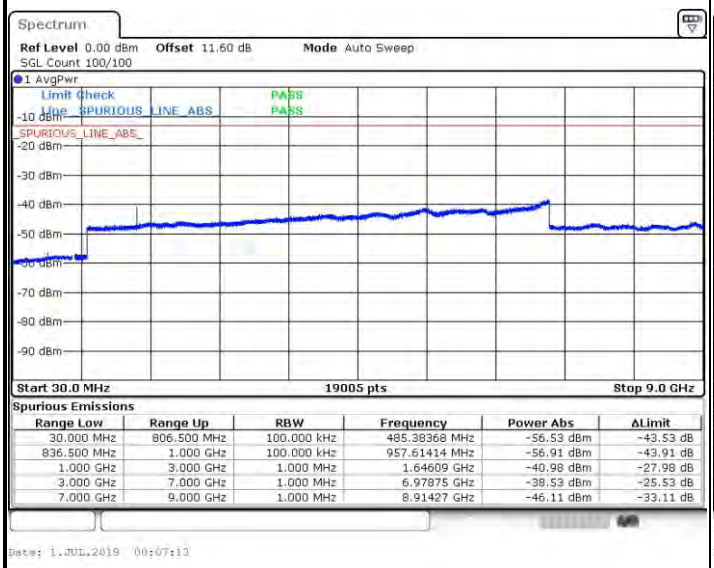
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	490.42841 MHz	-56.65 dBm	-43.65 dB
836.500 MHz	1.000 GHz	100.000 kHz	970.68107 MHz	-56.90 dBm	-43.90 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63759 GHz	-43.00 dBm	-30.00 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98825 GHz	-38.57 dBm	-25.57 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.88928 GHz	-46.22 dBm	-33.22 dB

Date: 1.JUL.2019 00:05:22

LTE Band 26 / 1.4MHz

Highest Channel / QPSK

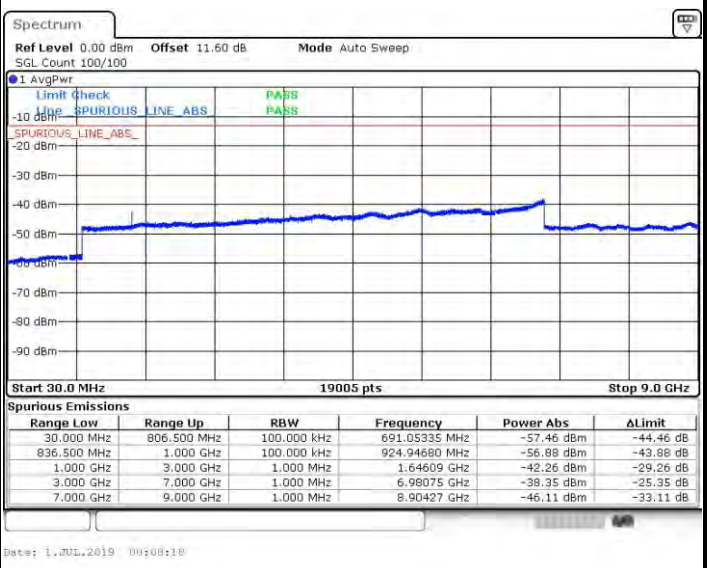


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	485.38368 MHz	-56.53 dBm	-43.53 dB
836.500 MHz	1.000 GHz	100.000 kHz	957.61414 MHz	-56.91 dBm	-43.91 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64609 GHz	-40.98 dBm	-27.98 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.97875 GHz	-38.53 dBm	-25.53 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.91427 GHz	-46.11 dBm	-33.11 dB

Date: 1.JUL.2019 00:07:13

Highest Channel / 16QAM



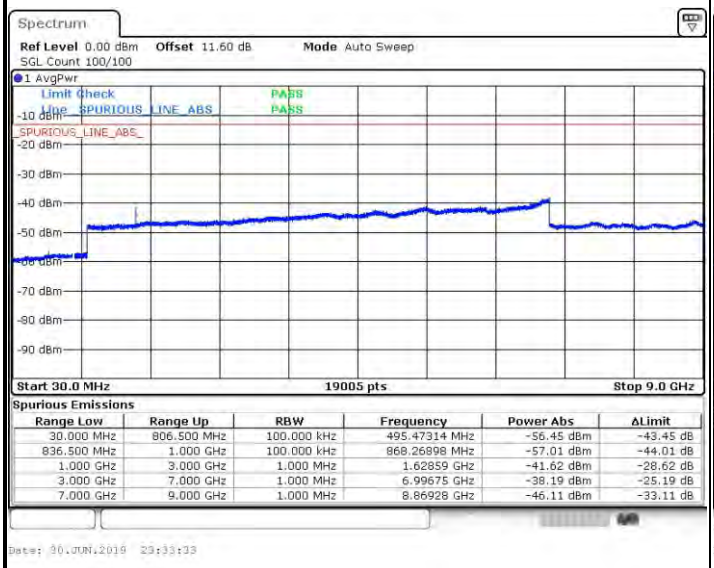
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	691.05335 MHz	-57.46 dBm	-44.46 dB
836.500 MHz	1.000 GHz	100.000 kHz	924.94680 MHz	-56.88 dBm	-43.88 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64609 GHz	-42.26 dBm	-29.26 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98075 GHz	-38.35 dBm	-25.35 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.90427 GHz	-46.11 dBm	-33.11 dB

Date: 1.JUL.2019 00:08:18

LTE Band 26 / 3MHz

Lowest Channel / QPSK

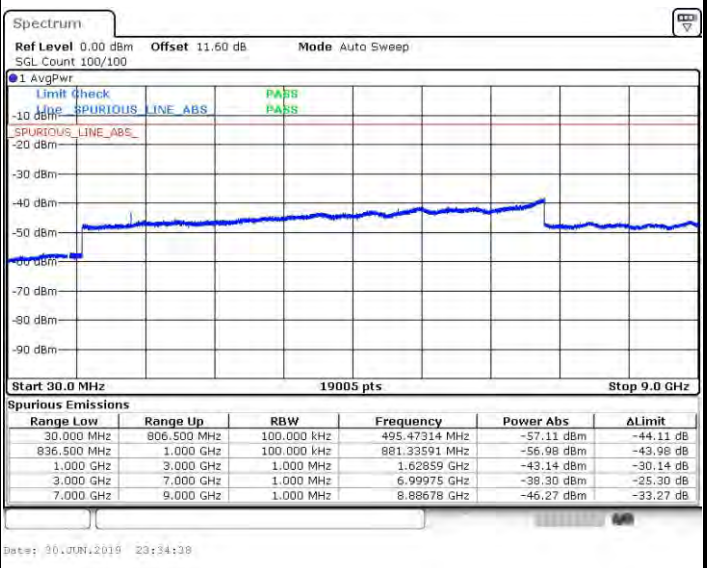


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.47314 MHz	-56.45 dBm	-43.45 dB
836.500 MHz	1.000 GHz	100.000 kHz	868.26898 MHz	-57.01 dBm	-44.01 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62859 GHz	-41.62 dBm	-28.62 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99675 GHz	-38.19 dBm	-25.19 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.86928 GHz	-46.11 dBm	-33.11 dB

Date: 30.JUN.2019 23:33:33

Lowest Channel / 16QAM



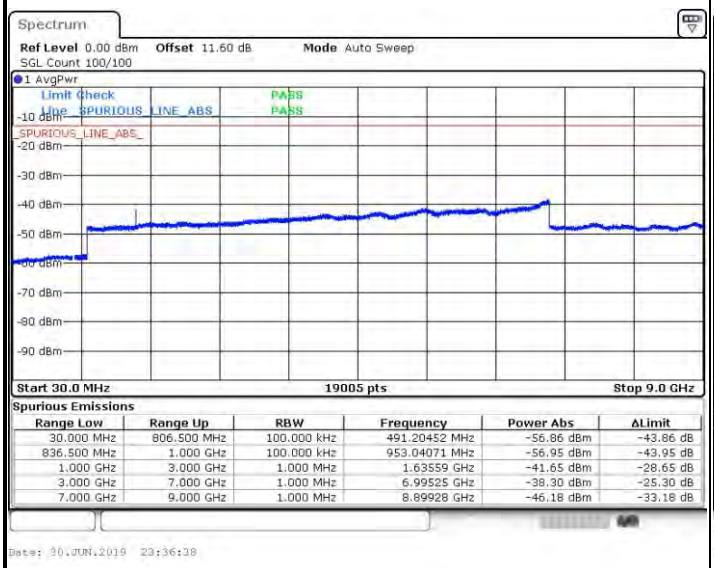
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.47314 MHz	-57.11 dBm	-44.11 dB
836.500 MHz	1.000 GHz	100.000 kHz	881.33591 MHz	-56.98 dBm	-43.98 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62859 GHz	-43.14 dBm	-30.14 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99975 GHz	-38.30 dBm	-25.30 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.88678 GHz	-46.27 dBm	-33.27 dB

Date: 30.JUN.2019 23:34:38

LTE Band 26 / 3MHz

Middle Channel / QPSK

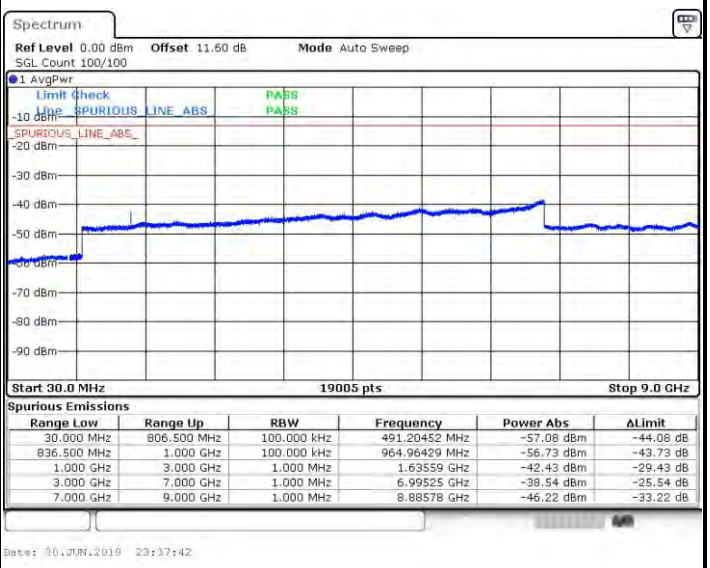


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	491.20452 MHz	-56.86 dBm	-43.86 dB
836.500 MHz	1.000 GHz	100.000 kHz	953.04071 MHz	-56.95 dBm	-43.95 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63559 GHz	-41.65 dBm	-28.65 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99525 GHz	-38.30 dBm	-25.30 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89928 GHz	-46.18 dBm	-33.18 dB

Date: 30.JUN.2019 23:36:38

Middle Channel / 16QAM

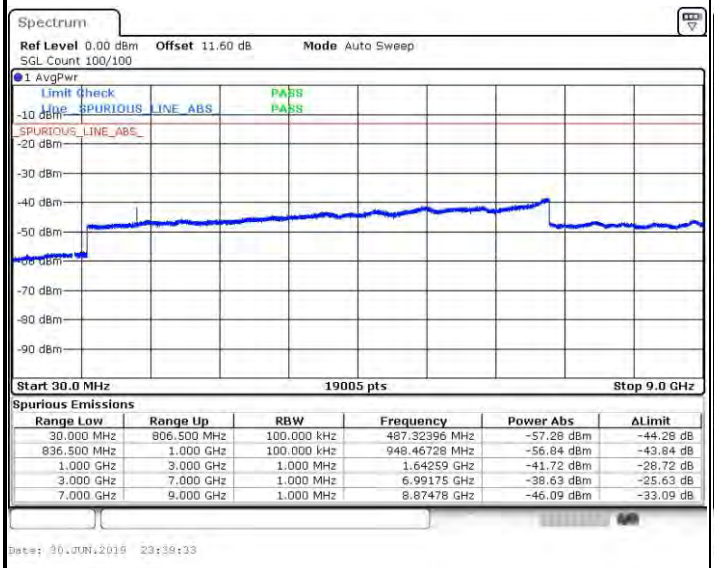


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	491.20452 MHz	-57.08 dBm	-44.08 dB
836.500 MHz	1.000 GHz	100.000 kHz	964.96429 MHz	-56.73 dBm	-43.73 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63559 GHz	-42.43 dBm	-29.43 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99525 GHz	-38.54 dBm	-25.54 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.88578 GHz	-46.22 dBm	-33.22 dB

Date: 30.JUN.2019 23:37:42

Highest Channel / QPSK

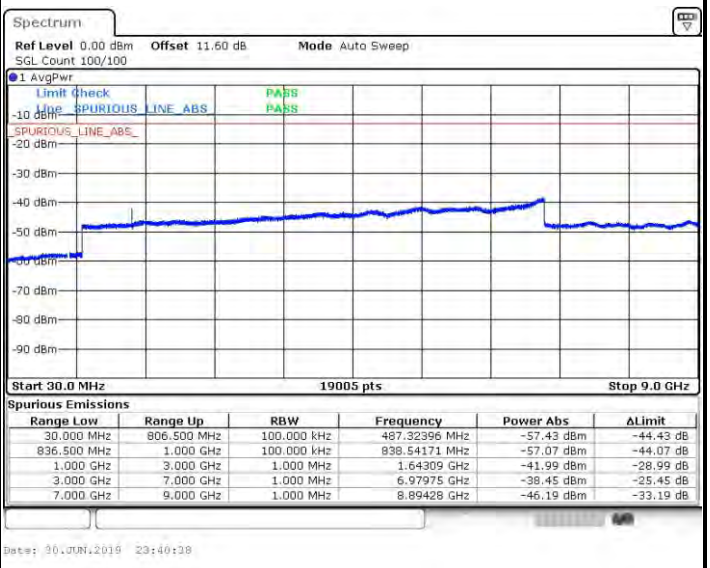


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	487.32396 MHz	-57.28 dBm	-44.28 dB
836.500 MHz	1.000 GHz	100.000 kHz	948.46728 MHz	-56.84 dBm	-43.84 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64259 GHz	-41.72 dBm	-28.72 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99175 GHz	-38.63 dBm	-25.63 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.87478 GHz	-46.09 dBm	-33.09 dB

Date: 30.JUN.2019 23:39:33

Highest Channel / 16QAM



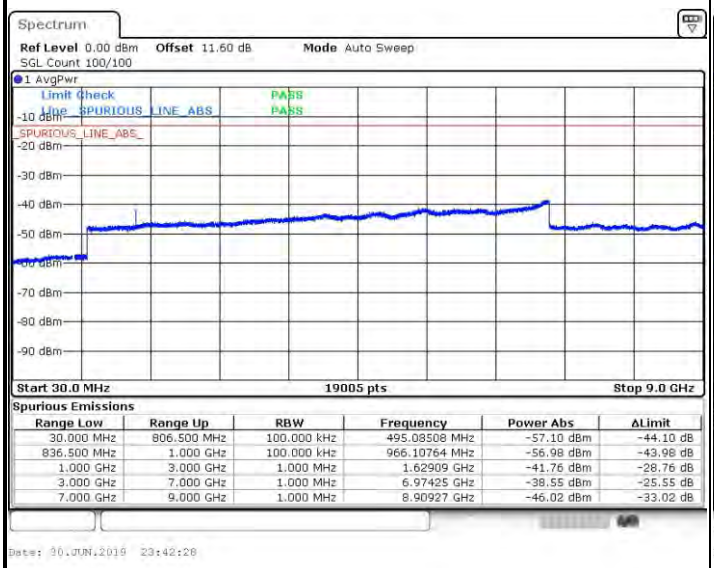
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	487.32396 MHz	-57.43 dBm	-44.43 dB
836.500 MHz	1.000 GHz	100.000 kHz	838.54171 MHz	-57.07 dBm	-44.07 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64309 GHz	-41.99 dBm	-28.99 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.97975 GHz	-38.45 dBm	-25.45 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89428 GHz	-46.19 dBm	-33.19 dB

Date: 30.JUN.2019 23:40:38

LTE Band 26 / 5MHz

Lowest Channel / QPSK

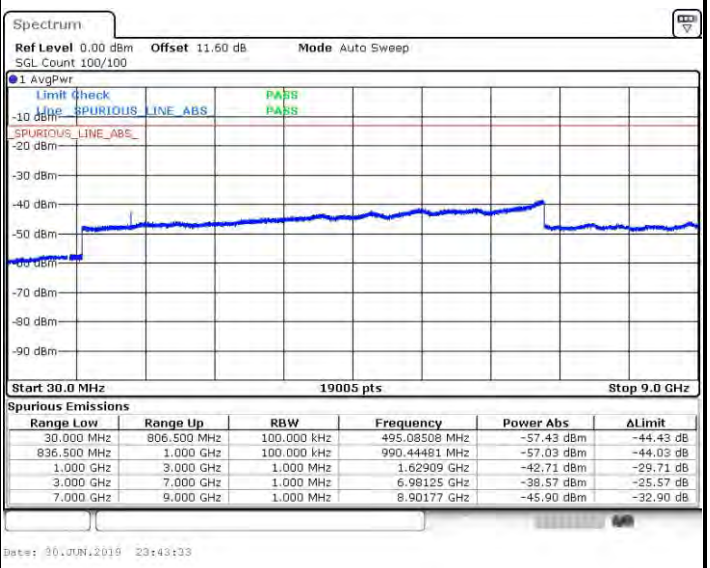


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.08508 MHz	-57.10 dBm	-44.10 dB
836.500 MHz	1.000 GHz	100.000 kHz	966.10764 MHz	-56.98 dBm	-43.98 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62909 GHz	-41.76 dBm	-28.76 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.97425 GHz	-38.55 dBm	-25.55 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.90927 GHz	-46.02 dBm	-33.02 dB

Date: 30.JUN.2019 23:42:28

Lowest Channel / 16QAM

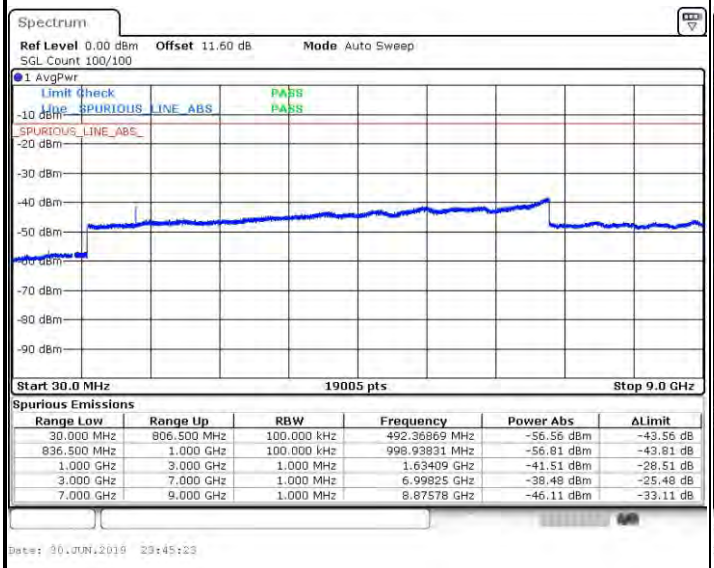


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.08508 MHz	-57.43 dBm	-44.43 dB
836.500 MHz	1.000 GHz	100.000 kHz	990.44481 MHz	-57.03 dBm	-44.03 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62909 GHz	-42.71 dBm	-29.71 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98125 GHz	-38.57 dBm	-25.57 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.90177 GHz	-45.90 dBm	-32.90 dB

Date: 30.JUN.2019 23:43:33

Middle Channel / QPSK

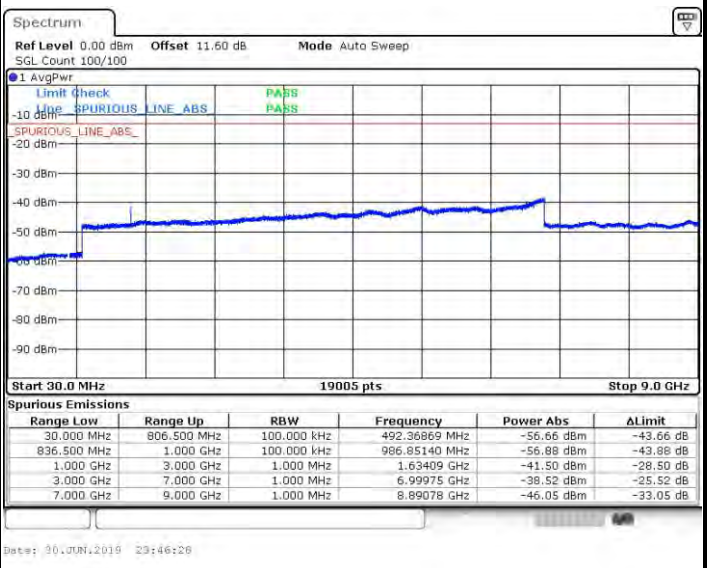


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	492.36869 MHz	-56.56 dBm	-43.56 dB
836.500 MHz	1.000 GHz	100.000 kHz	998.93831 MHz	-56.81 dBm	-43.81 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63409 GHz	-41.51 dBm	-28.51 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99825 GHz	-38.48 dBm	-25.48 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.87578 GHz	-46.11 dBm	-33.11 dB

Date: 30.JUN.2019 23:45:23

Middle Channel / 16QAM



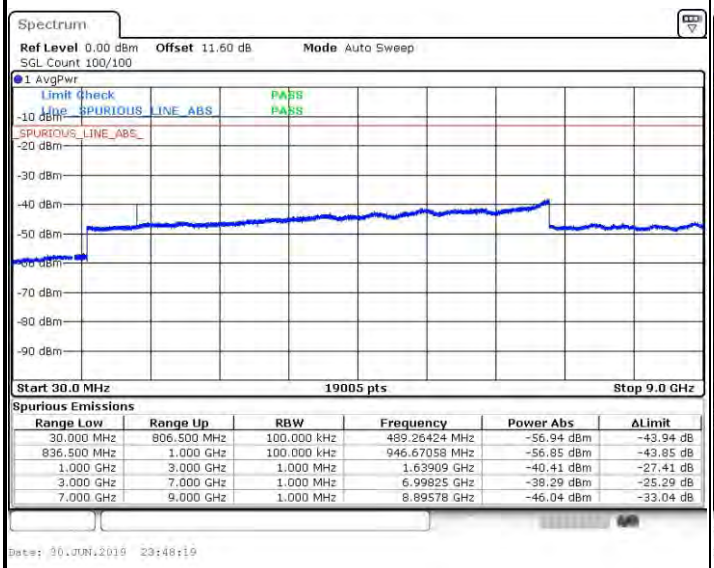
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	492.36869 MHz	-56.66 dBm	-43.66 dB
836.500 MHz	1.000 GHz	100.000 kHz	986.85140 MHz	-56.88 dBm	-43.88 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63409 GHz	-41.50 dBm	-28.50 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99975 GHz	-38.52 dBm	-25.52 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89078 GHz	-46.05 dBm	-33.05 dB

Date: 30.JUN.2019 23:46:28

LTE Band 26 / 5MHz

Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	489.26424 MHz	-56.94 dBm	-43.94 dB
836.500 MHz	1.000 GHz	100.000 kHz	946.67058 MHz	-56.85 dBm	-43.85 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63909 GHz	-40.41 dBm	-27.41 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99825 GHz	-38.29 dBm	-25.29 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89578 GHz	-46.04 dBm	-33.04 dB

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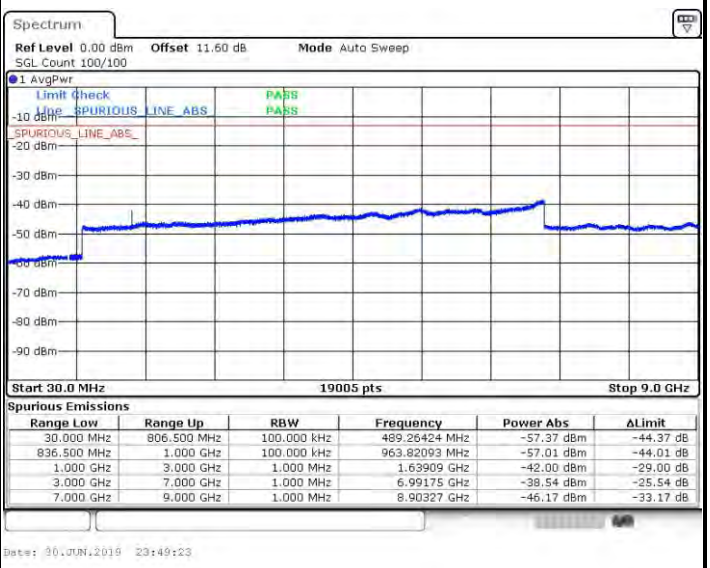
Highest Channel / 16QAM



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	489.26424 MHz	-57.37 dBm	-44.37 dB
836.500 MHz	1.000 GHz	100.000 kHz	963.82093 MHz	-57.01 dBm	-44.01 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.63909 GHz	-42.00 dBm	-29.00 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99175 GHz	-38.54 dBm	-25.54 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.90327 GHz	-46.17 dBm	-33.17 dB

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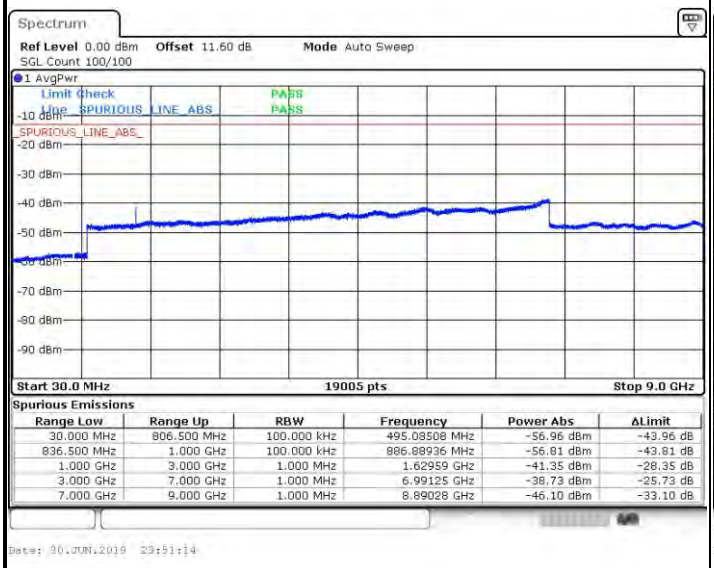
LTE Band 26 / 10MHz

Middle Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.08508 MHz	-56.96 dBm	-43.96 dB
836.500 MHz	1.000 GHz	100.000 kHz	886.88936 MHz	-56.81 dBm	-43.81 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62959 GHz	-41.35 dBm	-28.35 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99125 GHz	-38.73 dBm	-25.73 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89028 GHz	-46.10 dBm	-33.10 dB

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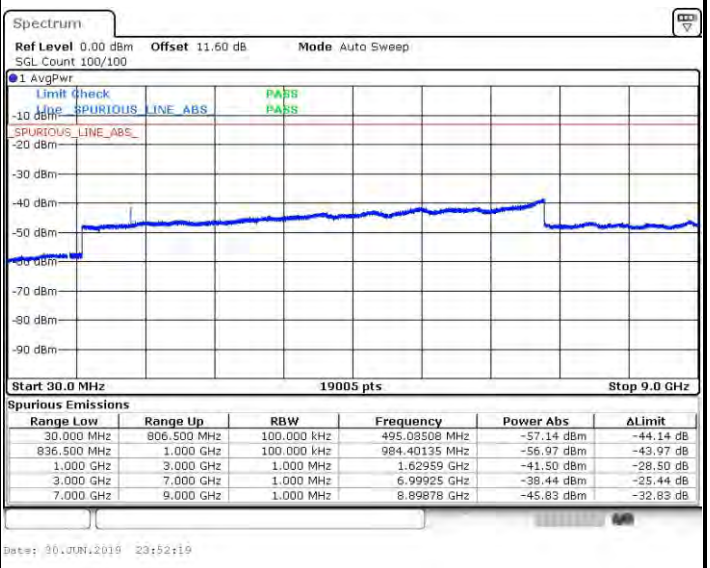
Middle Channel / 16QAM



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	806.500 MHz	100.000 kHz	495.08508 MHz	-57.14 dBm	-44.14 dB
836.500 MHz	1.000 GHz	100.000 kHz	984.40135 MHz	-56.97 dBm	-43.97 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.62959 GHz	-41.50 dBm	-28.50 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99925 GHz	-38.44 dBm	-25.44 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89878 GHz	-45.83 dBm	-32.83 dB

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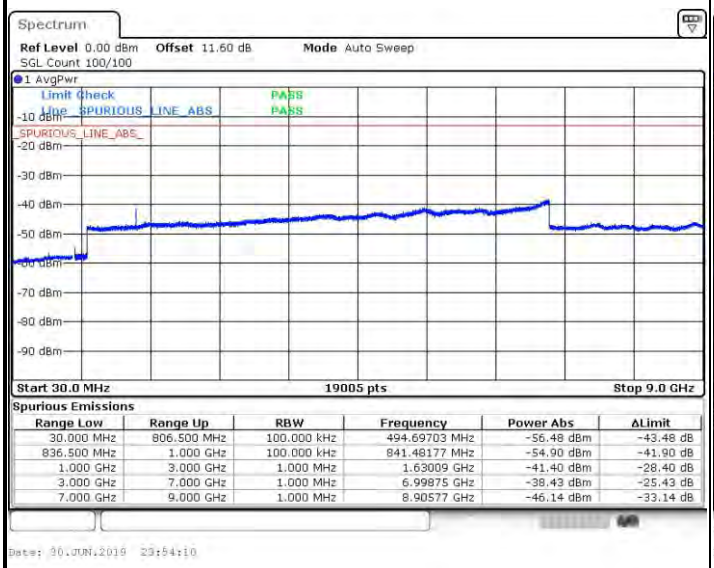
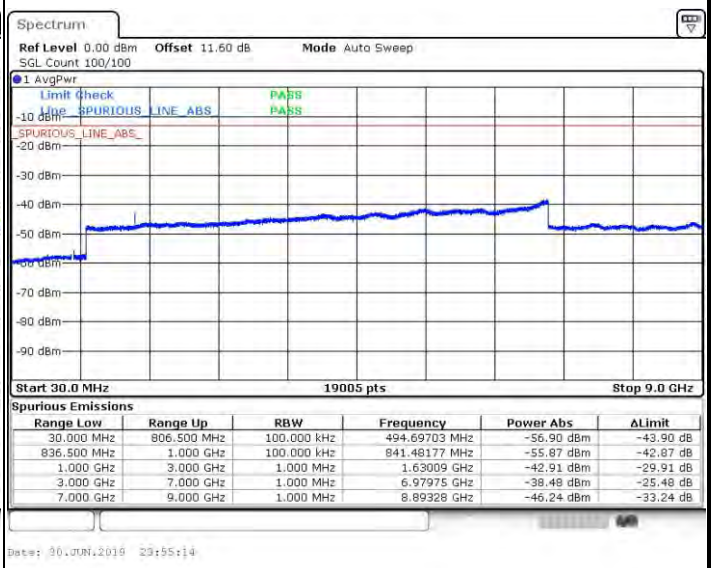
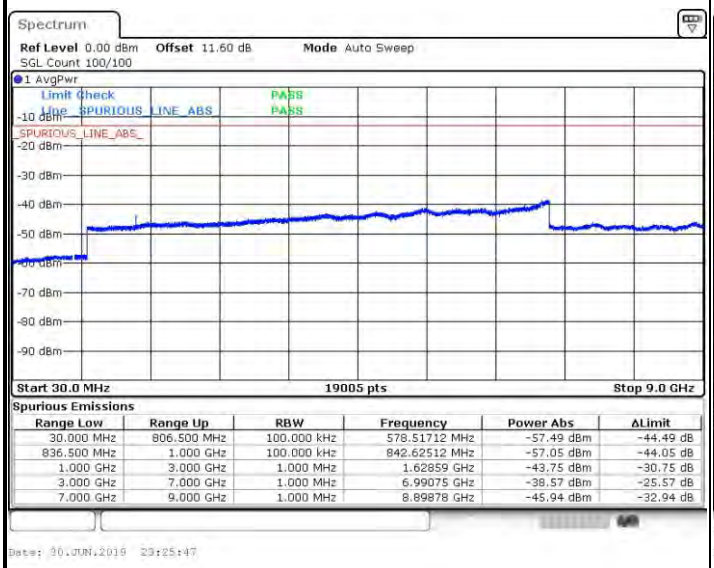
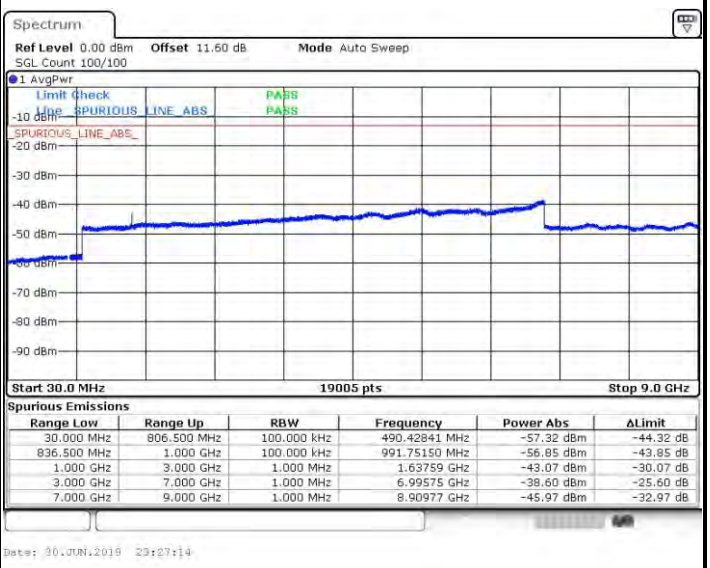
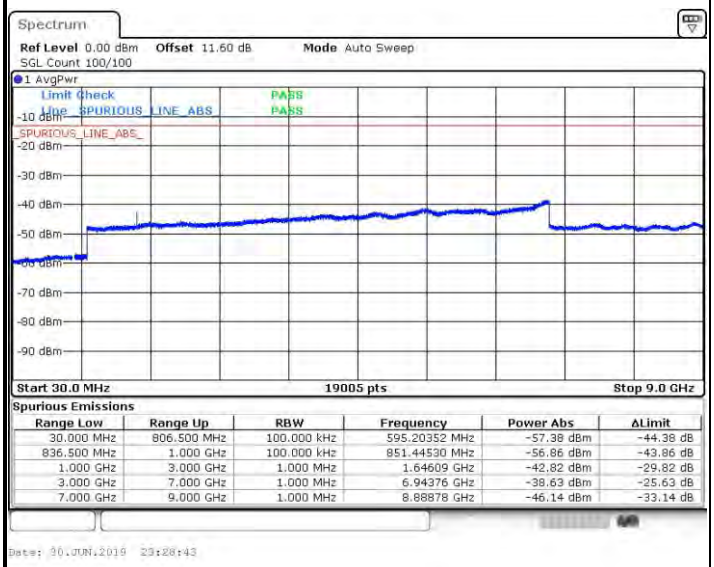
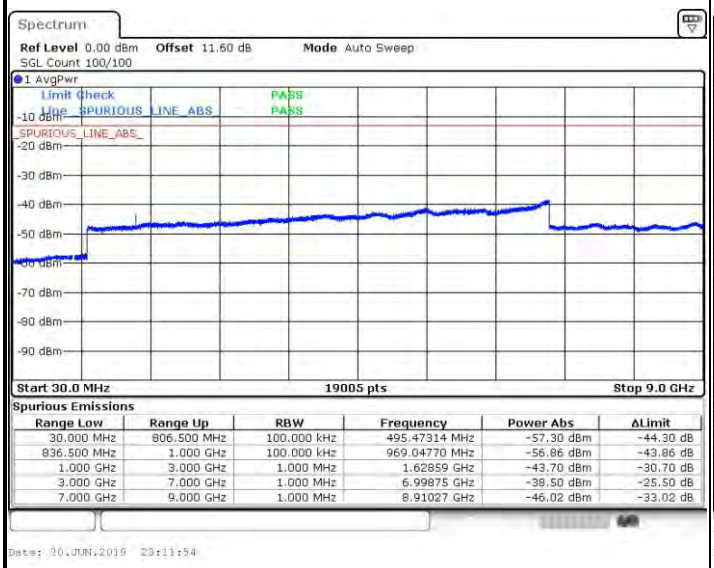
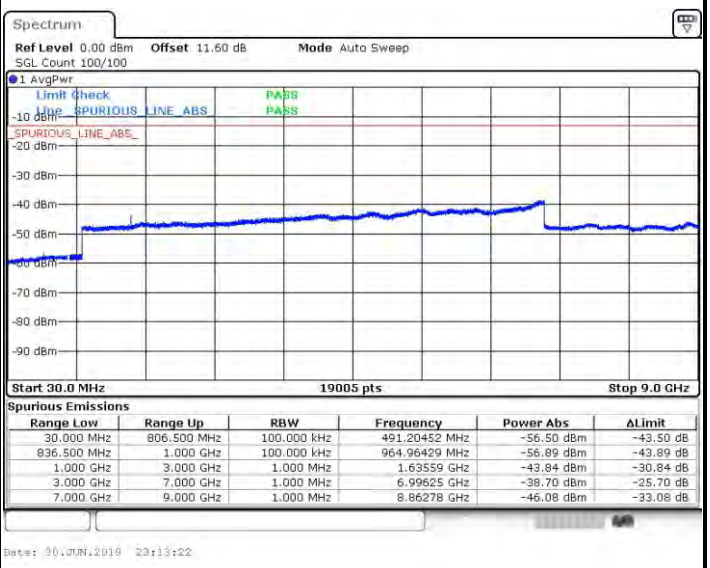
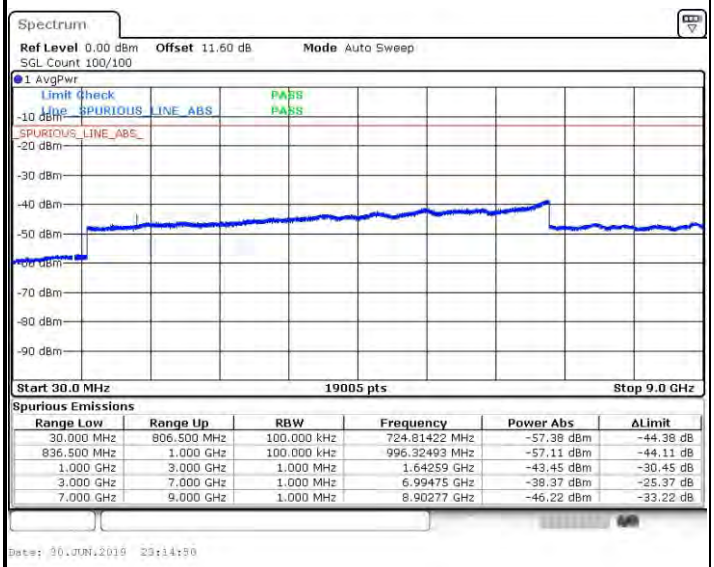
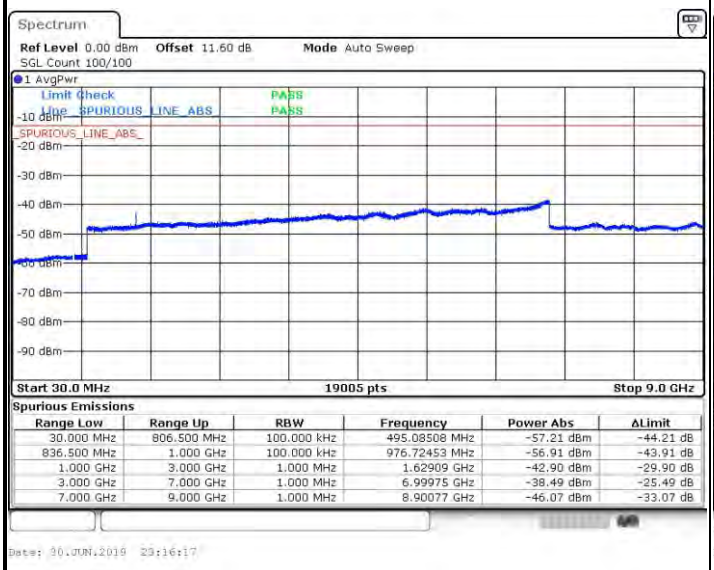
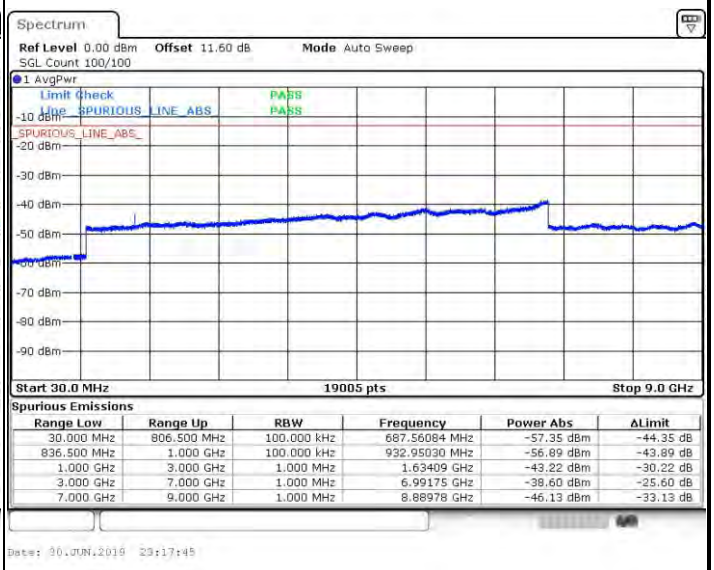
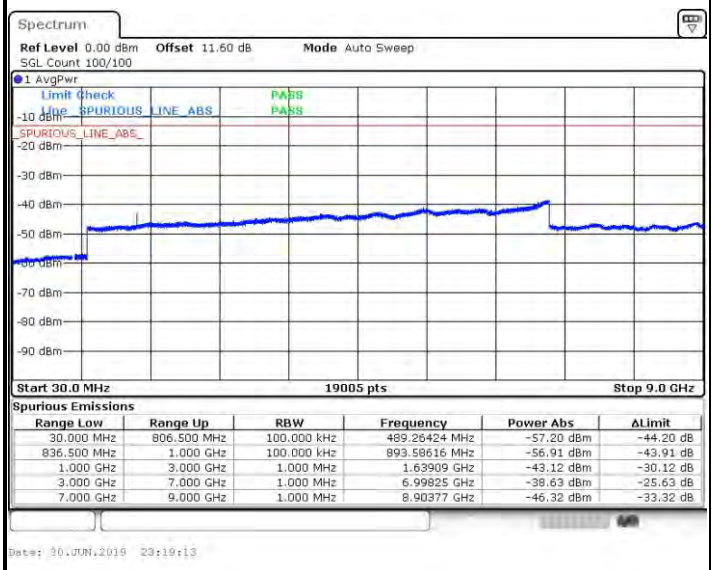
LTE Band 26 / 15MHz	
Lowest Channel / QPSK	**Lowest Channel / 16QAM**

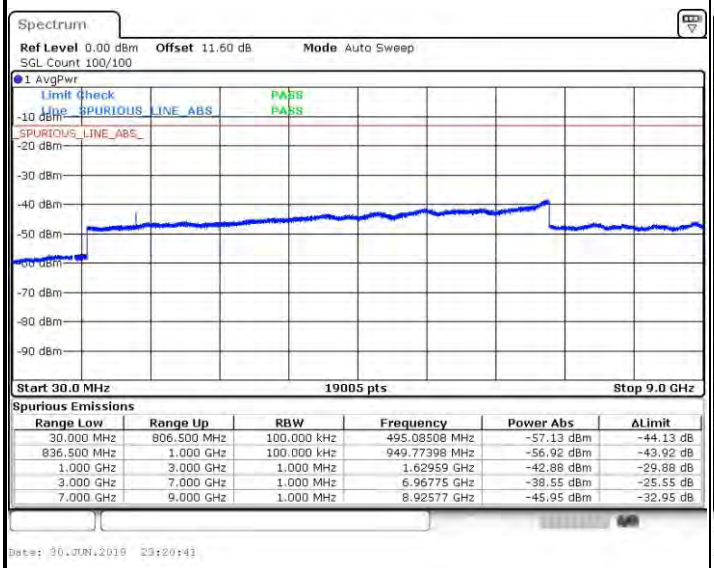
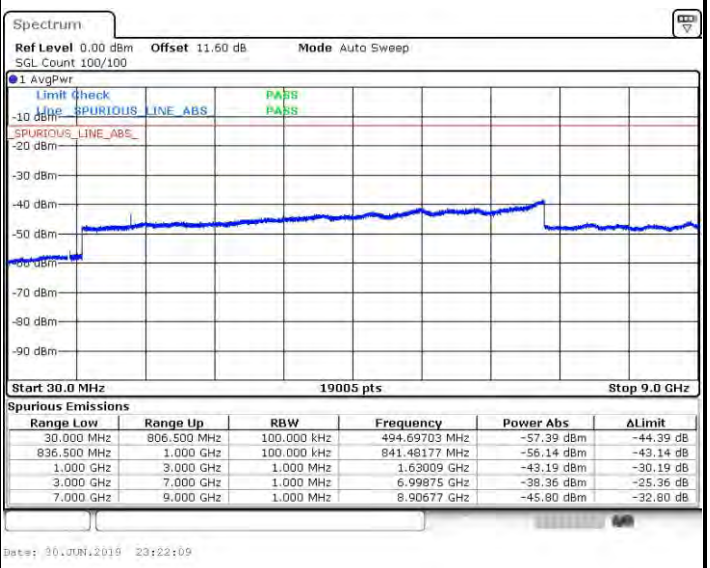




LTE Band 26 / 1.4MHz	
Lowest Channel / 64QAM	**Middle Channel / 64QAM**
	
Highest Channel / 64QAM	
	

LTE Band 26 / 3MHz	
Lowest Channel / 64QAM	**Middle Channel / 64QAM**
	
Highest Channel / 64QAM	
	

LTE Band 26 / 5MHz	
Lowest Channel / 64QAM	**Middle Channel / 64QAM**
	
Highest Channel / 64QAM	
	

LTE Band 26 / 10MHz	LTE Band 26 / 15MHz
Middle Channel / 64QAM	Lowest Channel / 64QAM
	

Frequency Stability

Test Conditions		LTE Band 26 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0050	PASS
40	Normal Voltage	0.0018	
30	Normal Voltage	0.0150	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0050	
0	Normal Voltage	0.0095	
-10	Normal Voltage	0.0114	
-20	Normal Voltage	0.0132	
-30	Normal Voltage	0.0107	
20	Maximum Voltage	0.0033	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0062	

Note:

1. Normal Voltage =3.8 V.；Battery End Point (BEP) =3.5 V.；Maximum Voltage =4.4 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

Test Conditions		LTE Band 26 (QPSK) / Low Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 15MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0022	PASS
40	Normal Voltage	0.0037	
30	Normal Voltage	0.0019	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0026	
0	Normal Voltage	0.0009	
-10	Normal Voltage	0.0030	
-20	Normal Voltage	0.0037	
-30	Normal Voltage	0.0072	
20	Maximum Voltage	0.0010	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0190	

Note:

1. Normal Voltage =3.8 V.；Battery End Point (BEP) =3.5 V.；Maximum Voltage =4.4 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of ERP and Radiated Test

ERP

<Reporting Only>

LTE Band 26 / 15MHz (Channel 26765) (GT - LC = 0.31 dB)							
Channel	Mode	RB		Conducted		ERP	
		Size	Offset	Power (dBm)	Power (Watts)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	37	24.72	0.30	22.88	0.19
Middle		-	-	-	-	-	-
Highest		-	-	-	-	-	-
Lowest	16QAM	1	37	24.07	0.26	22.23	0.17
Middle		-	-	-	-	-	-
Highest		-	-	-	-	-	-
Lowest	64QAM	1	74	22.99	0.20	21.15	0.13
Middle		-	-	-	-	-	-
Highest		-	-	-	-	-	-
Limit	ERP < 7W			Result		PASS	

Radiated Spurious Emission

LTE Band 26 (Part 90S)

LTE Band 26 / 1.4MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1632	-54.29	-13	-41.29	-64.33	-59.83	0.91	8.60	H
	2440	-52.99	-13	-39.99	-67.32	-60.32	1.14	10.62	H
	3256	-49.59	-13	-36.59	-65.33	-58.04	1.32	11.91	H
	4072	-51.12	-13	-38.12	-69.83	-60.28	1.48	12.79	H
									H
									H
	1632	-57.61	-13	-44.61	-67.18	-63.15	0.91	8.60	V
	2440	-53.77	-13	-40.77	-68.2	-61.10	1.14	10.62	V
	3256	-54.62	-13	-41.62	-70.84	-63.07	1.32	11.91	V
	4072	-53.11	-13	-40.11	-71.82	-62.27	1.48	12.79	V
									V
									V
Middle	1640	-55.35	-13	-42.35	-65.44	-60.91	0.92	8.63	H
	2456	-53.28	-13	-40.28	-67.61	-60.63	1.14	10.64	H
	3272	-52.26	-13	-39.26	-67.96	-60.74	1.32	11.95	H
									H
									H
									H
	1640	-57.62	-13	-44.62	-67.17	-63.18	0.92	8.63	V
	2456	-53.41	-13	-40.41	-67.87	-60.76	1.14	10.64	V
	3272	-54.68	-13	-41.68	-70.85	-63.16	1.32	11.95	V
									V
									V
									V
Highest	1648	-51.66	-13	-38.66	-61.76	-57.25	0.92	8.66	H
	2472	-54.16	-13	-41.16	-68.48	-61.53	1.14	10.66	H
	3296	-49.39	-13	-36.39	-65.06	-57.93	1.32	12.01	H
	4120	-50.97	-13	-37.97	-69.71	-60.13	1.47	12.78	H
									H
									H
	1648	-56.06	-13	-43.06	-65.62	-61.65	0.92	8.66	V
	2472	-52.92	-13	-39.92	-67.42	-60.29	1.14	10.66	V
	3296	-54.78	-13	-41.78	-70.91	-63.32	1.32	12.01	V
	4120	-53.21	-13	-40.21	-72.02	-62.37	1.47	12.78	V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.