FCC RADIO TEST REPORT

FCC ID	:	**AK8XT0011**
Equipment	:	**IoT Network device**
Brand Name	:	**Sony**
Applicant	:	**Sony Corporation** **1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan**
Manufacturer	:	**Sony Corporation** **1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan**
Standard	:	**FCC 47 CFR Part 2, 24(E), 27**

The product was received on Apr. 15, 2021 and testing was started from May 13, 2021 and completed on May 24, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FG971044-04	01	Initial issue of report	Jun. 10, 2021
FG971044-04	02	1. Revise remark description 2. Revise EUT information 3. Revise emission designator 4. Revise measuring instruments 5. Revise test mode	Jun. 18, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§27.50 (b)(10) §27.50 (c)(10)	Effective Radiated Power (Band 12) (Band 13) (Band 17)	Pass	
	§24.232 (c)	Equivalent Isotropic Radiated Power (Band 2)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (Band 4)		
3.3	§24.232 (d) §27.50 (d)(5)	Peak-to-Average Ratio	Pass	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §24.238 (a) §27.53 (c)(2)(4) §27.53 (g) §27.53 (h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 12) (Band 13) (Band 17)	Pass	-
3.6	§2.1051 §24.238 (a) §27.53 (c)(2) §27.53 (g) §27.53 (h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 12) (Band 13) (Band 17)	Pass	-
3.7	§2.1055 §24.235 §27.54	Frequency Stability Temperature & Voltage	Pass	-

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
4.2	§2.1053 §24.238 (a) §27.53 (c)(2) §27.53 (f) §27.53 (g) §27.53 (h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 12) (Band 13) (Band 17)	Pass	Under limit 21.54 dB at 7564.000 MHz
Remark: This variant report includes Full test of new added LTE Band 2 and Power and ERP test of LTE Band 17. Since LTE Band 17 is a subset frequency band of Band 12, both bands share the same RF circuitry and antenna and the same tune-up. Spot check the Band 17 conducted power to verify it does not exceed Band 12, and Band 12 data in the original grant is representative to show compliance of Band 17 operation. For other test results data reuse, please refer to original grant.				

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: Keven Cheng

Report Producer: Cindy Liu

1 General Description

1.1 Product Feature of Equipment Under Test

LTE Cat. M1, Bluetooth-LE, NFC and GNSS.

Product Specification subjective to this standard	
Antenna Type	PIFA Antenna
Antenna Gain	LTE Band 2: -3.10dBi LTE Band 4: -3.40dBi LTE Band 12: -18.00dBi LTE Band 13: -14.70dBi LTE Band 17: -18.00dBi

EUT Information List			
HW Version	**SW Version**	**IMEI**	**Performed Test Item**
A	00.125/0.0.41	351521100104181	Conducted Measurement
	00.125/0.0.41	351521100043363	Radiated Spurious Emission
	00.125/0.0.41	355090110066257	EIRP Test

Accessory List	
Battery	Model Name : AHB482331HPC
	S/N: N/A
USB Cable	Model Name.: W1001-ZZ-0107
	S/N : N/A
Cradle	Model Name.: CB403D-0000-202
	S/N : N/A

Note:

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

1.2 Modification of EUT

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

1.3 Emission Designator

LTE Band 2		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
1.4	1850.7 ~ 1909.3	1M09G7D	-	0.1413	1M10W7D	-	0.0847
3	1851.5 ~ 1908.5	1M09G7D	-	0.1409	1M10W7D	-	0.0809
5	1852.5 ~ 1907.5	1M11G7D	-	0.1409	1M09W7D	-	0.1403
10	1855.0 ~ 1905.0	1M12G7D	0.0118	0.1396	1M14W7D	-	0.1396
15	1857.5 ~ 1902.5	1M11 G7D	-	0.1409	1M14W7D	-	0.1403
20	1860.0 ~ 1900.0	1M12G7D	-	0.1416	1M12W7D	-	0.1374
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	-	-	0.0018	-	-	0.0020
10	709.0~711.0	-	-	0.0019	-	-	0.0020

1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH03-HY
Test Engineer	Benjamin Lin
Temperature	22.5~23.3℃
Relative Humidity	48.6~52.5%

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH12-HY (TAF Code: 3786)
Test Engineer	Jack Cheng
Temperature	22.5~26.8℃
Relative Humidity	54.6~66.8%
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.

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

FCC Designation No.: TW1190 and TW3786

1.5 Applicable Standards

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

- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 24(E), 27
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site v01r01.

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

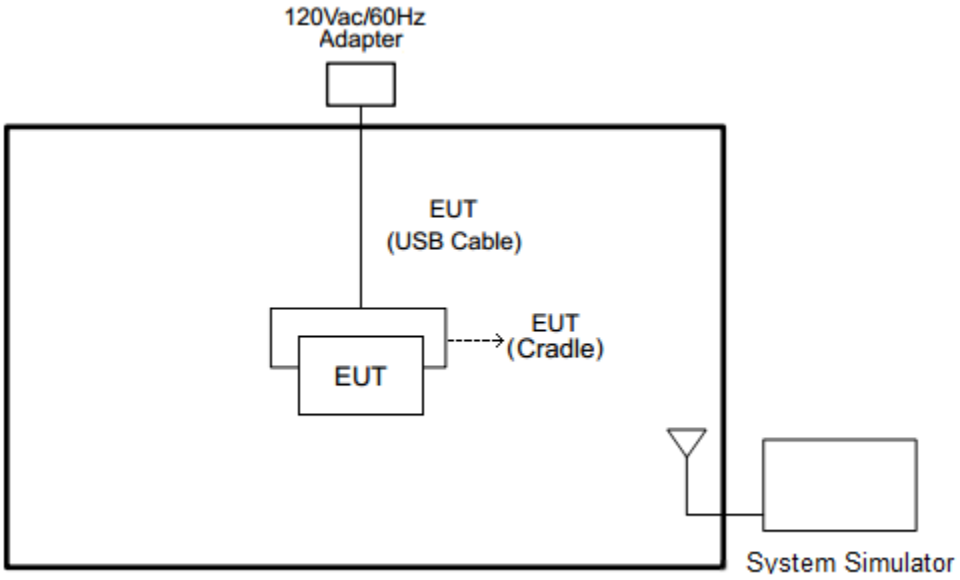
2.1 Test Mode

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

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

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	17	-	-	v	v	-	-	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	2						v	v	v			v		v	
26dB and 99% Bandwidth	2	v	v	v	v	v	v	v	v			v		v	
Conducted Band Edge	2	v	v	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	2	v	v	v	v	v	v	v	v	v			v	v	v
Frequency Stability	2				v			v				v		v	
E.R.P / E.I.R.P	2	v	v	v	v	v	v	v	v	Max Power					
	17	-	-	v	v	-	-	v	v						
Radiated Spurious Emission	2	Worst Case											v	v	v
Remark	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. We have evaluated simultaneous transmissions modes and determined no new significant emissions are observed. 5. Since the maximum RB size is limited to 6RB for LTE Cat M1, the test data of Full RB test items is actual measurement test result record in this report.														

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
2.	Adapter	Sony	UCH20	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

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

Example :

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

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

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

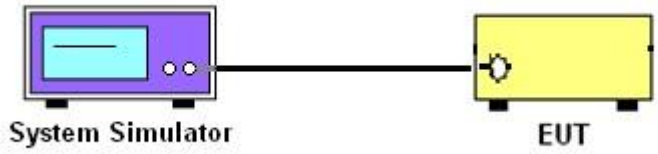
3 Conducted Test Items

3.1 Measuring Instruments

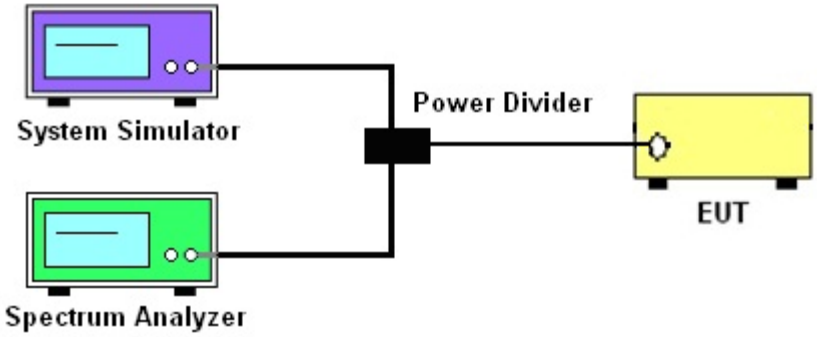
See list of measuring instruments of this test report.

3.1.1 Test Setup

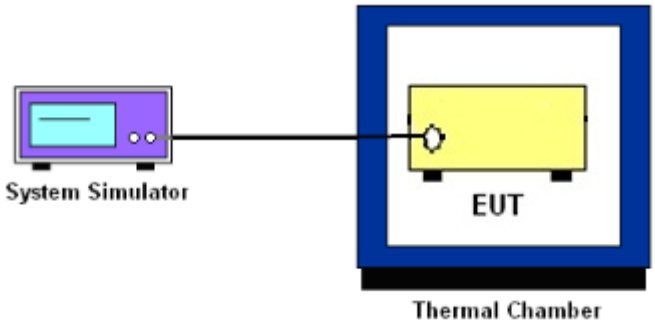
3.1.2 Conducted Output Power



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



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power and ERP/EIRP

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

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

The ERP of mobile transmitters must not exceed 3 Watts for Band 17

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

According to KDB 412172 D01 Power Approach,

EIRP = PT + GT – LC, ERP = EIRP -2.15, where

PT = transmitter output power in dBm

GT = gain of the transmitting antenna in dBi

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

3.2.2 Test Procedures

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

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

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

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

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

3.4 Occupied Bandwidth

3.4.1 Description of Occupied Bandwidth Measurement

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

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

3.4.2 Test Procedures

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

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

3.5 Conducted Band Edge

3.5.1 Description of Conducted Band Edge Measurement

24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

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

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

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

24.235

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

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

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

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

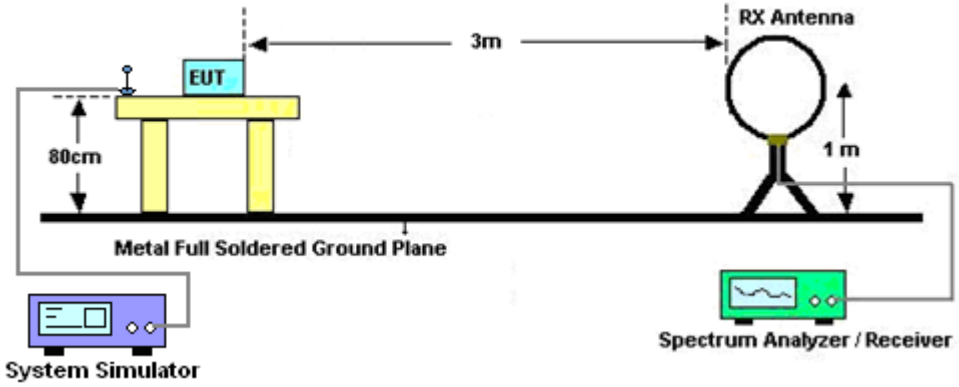
4 Radiated Test Items

4.1 Measuring Instruments

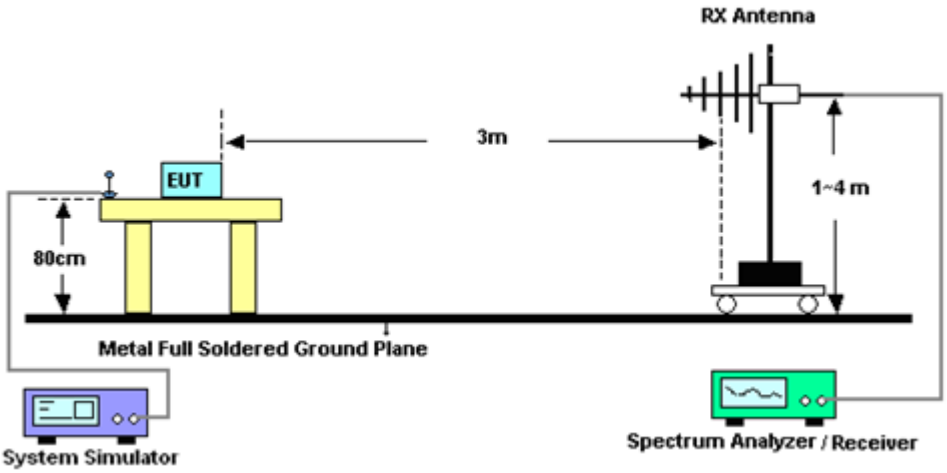
See list of measuring instruments of this test report.

4.1.1 Test Setup

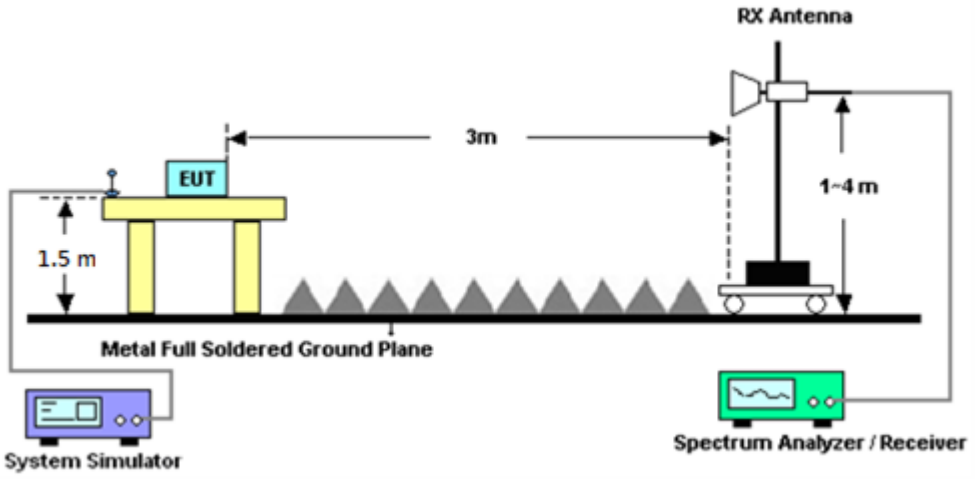
For radiated test below 30MHz



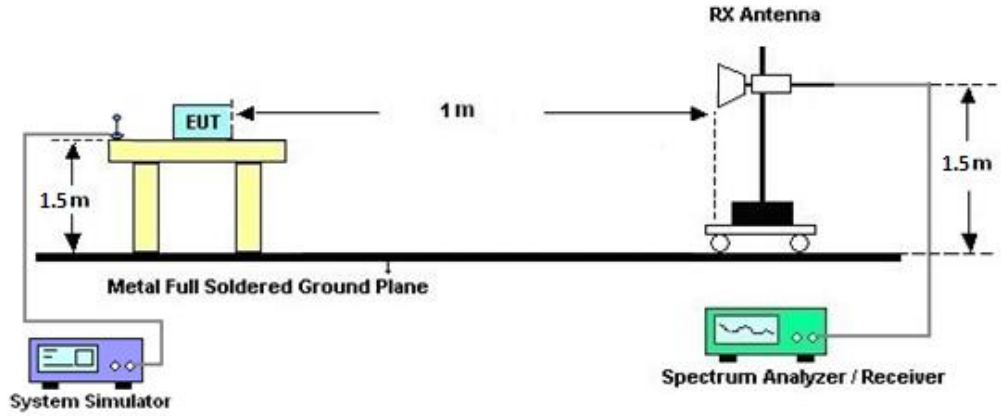
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

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

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

4.2 Radiated Spurious Emission Measurement

4.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

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

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

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

5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	May 24, 2021	Jul. 13, 2021	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	37059 & 01	30MHz~1GHz	Oct. 11, 2020	May 24, 2021	Oct. 10, 2021	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 11, 2020	May 24, 2021	Oct. 10, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 23, 2020	May 24, 2021	Nov. 22, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02037	1GHz~18GHz	Oct. 23, 2020	May 24, 2021	Oct. 22, 2021	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz~40GHz	Dec. 19, 2020	May 24, 2021	Dec. 18, 2021	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz~40GHz	Dec. 11, 2020	May 24, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 24, 2021	May 24, 2021	Mar. 23, 2022	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY57280120	1GHz~26.5GHz	Jul. 20, 2020	May 24, 2021	Jul. 19, 2021	Radiation (03CH12-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-100M-18G-56-01-A70	EC1900249	1GHz~18GHz	Dec. 05, 2020	May 24, 2021	Dec. 04, 2021	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 15, 2020	May 24, 2021	Jun. 14, 2021	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	May 24, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Sep. 14, 2020	May 24, 2021	Sep. 13, 2021	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	101107	100kHz~40GHz	Dec. 04, 2020	May 24, 2021	Dec. 03, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 11, 2020	May 24, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 22, 2021	May 24, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 22, 2021	May 24, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2GHz Low Pass Filter	Mar. 17, 2021	May 24, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-1080-1200-15000-60SS	SN1	1.2GHz High Pass Filter	Mar. 17, 2021	May 24, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3GHz High Pass Filter	Jul. 14, 2020	May 24, 2021	Jul. 13, 2021	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Oct. 02, 2020	May 24, 2021	Oct. 01, 2021	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	May 24, 2021	N/A	Radiation (03CH12-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 24, 2021	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 24, 2021	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	May 24, 2021	N/A	Radiation (03CH12-HY)
Base Station(Measure)	Anritsu	MT8821C	6201107507	FDD/TDD/NB-IoT/Cat-M1/SEQ	Aug. 16, 2020	May 13, 2021~ May 14, 2021	Aug. 15, 2021	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 27, 2020	May 13, 2021~ May 14, 2021	Nov. 26, 2021	Conducted (TH03-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Aug. 05, 2020	May 13, 2021~ May 14, 2021	Aug. 04, 2021	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 05, 2020	May 13, 2021~ May 14, 2021	Oct. 04, 2021	Conducted (TH03-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#B	1-18GHz	Jan. 09, 2021	May 13, 2021~ May 14, 2021	Jan. 08, 2022	Conducted (TH03-HY)

6 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.21**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.80**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power & ERP/EIRP)

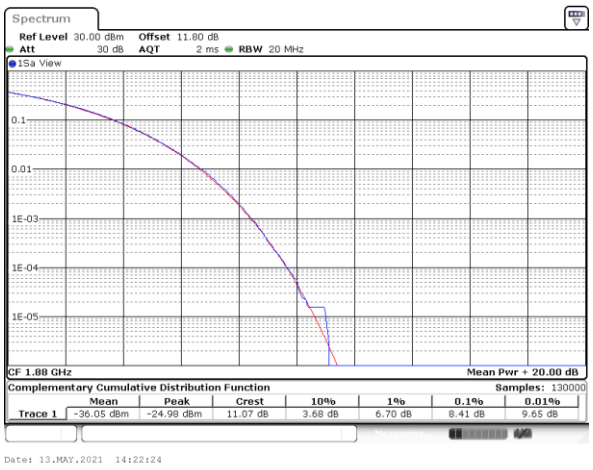
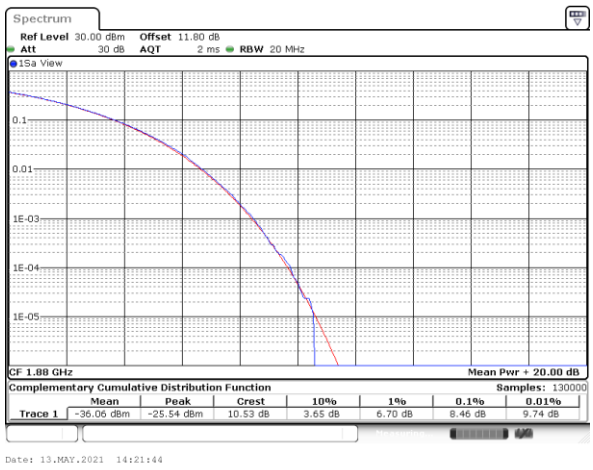
LTE Band 2 Maximum Average Power [dBm] (GT - LC = -3.1 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
20	1	0	QPSK	23.64	23.70	24.61	21.51	0.1416
20	1	5		23.65	23.68	24.52		
20	6	0		23.59	23.60	24.48		
20	1	0	16-QAM	23.59	23.66	24.48	21.38	0.1374
20	1	5		23.59	23.62	24.44		
20	5	0		23.47	23.50	24.35		
15	1	0	QPSK	23.64	23.68	24.59	21.49	0.1409
15	1	5		23.61	23.66	24.58		
15	6	0		23.54	23.56	24.49		
15	1	0	16-QAM	23.69	23.71	24.57	21.47	0.1403
15	1	5		23.67	23.69	24.54		
15	5	0		23.50	23.54	24.43		
10	1	0	QPSK	23.64	23.94	24.53	21.45	0.1396
10	1	5		23.58	23.93	24.55		
10	6	0		22.03	22.09	22.07		
10	1	0	16-QAM	23.69	23.97	24.55	21.45	0.1396
10	1	5		23.66	23.95	24.50		
10	5	0		22.03	22.08	22.24		
5	1	0	QPSK	23.62	23.95	24.59	21.49	0.1409
5	1	5		23.60	23.97	24.52		
5	6	0		22.08	22.09	22.15		
5	1	0	16-QAM	23.64	24.02	24.57	21.47	0.1403
5	1	5		23.60	24.00	24.56		
5	5	0		21.07	21.07	21.30		
3	1	0	QPSK	23.62	23.98	24.59	21.49	0.1409
3	1	5		23.57	23.95	24.55		
3	6	0		21.05	21.00	21.29		
3	1	0	16-QAM	22.02	22.00	22.18	19.08	0.0809
3	1	5		22.05	22.04	22.11		
3	5	0		21.09	21.02	21.36		
1.4	1	0	QPSK	23.66	24.02	24.60	21.50	0.1413
1.4	1	5		23.61	24.01	24.60		
1.4	6	0		21.05	21.40	21.41		
1.4	1	0	16-QAM	22.07	22.14	22.38	19.28	0.0847
1.4	1	5		22.03	22.11	22.30		
1.4	5	0		21.30	21.41	21.69		
Limit	EIRP < 2W			Result			Pass	

LTE Band 17 Maximum Average Power [dBm] (GT - LC = -18 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
10	1	0	QPSK	22.83	22.85	22.79	2.72	0.0019
10	1	5		22.85	22.87	22.75		
10	6	0		22.01	22.06	22.04		
10	1	0	16-QAM	23.17	23.16	23.03	3.02	0.0020
10	1	5		23.08	23.04	23.00		
10	6	0		20.81	21.94	21.88		
5	1	0	QPSK	22.81	22.80	22.80	2.66	0.0018
5	1	5		22.81	22.81	22.79		
5	6	0		21.84	21.83	21.84		
5	1	0	16-QAM	23.14	23.07	23.04	2.99	0.0020
5	1	5		23.02	23.02	22.99		
5	6	0		20.93	20.88	20.88		
Limit	ERP < 3W			Result			Pass	

LTE Band 2

Peak-to-Average Ratio

Mode	LTE Band 2 / 20MHz				
Mod.	QPSK	16QAM	64QAM	256QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	8.41	8.46	-	-	PASS

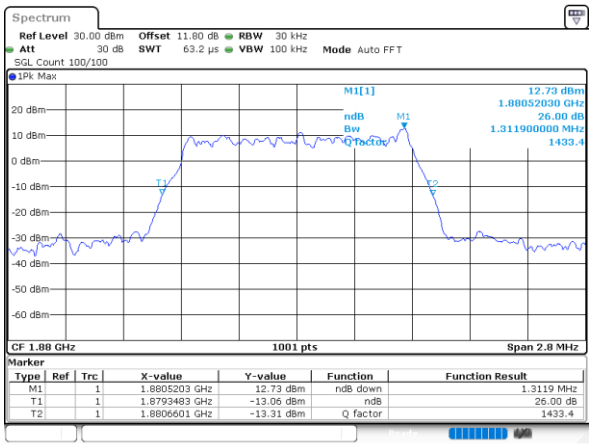
LTE Band 2 / 20MHz / QPSK	LTE Band 2 / 20MHz / 16QAM
Middle Channel / Full RB	Middle Channel / Full RB
	

26dB Bandwidth

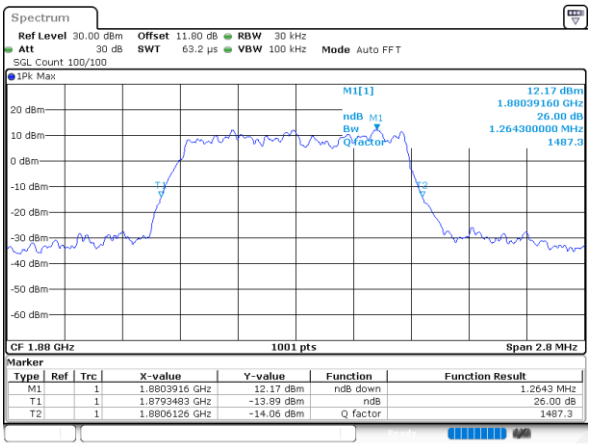
Mode	LTE Band 2 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	1.31	1.26	1.25	1.31	1.29	1.32	1.30	1.30	1.32	1.32	1.32	1.32

LTE Band 2

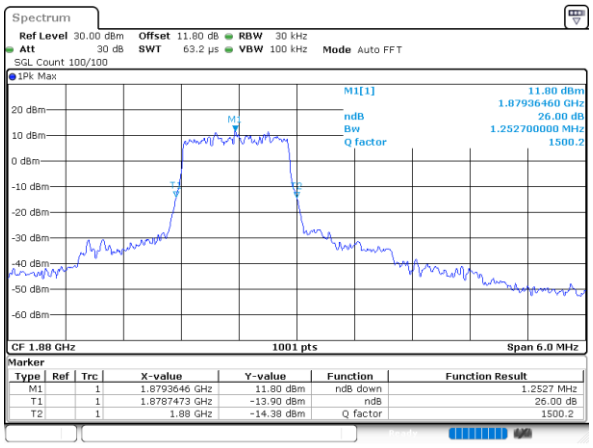
Middle Channel / 1.4MHz / QPSK



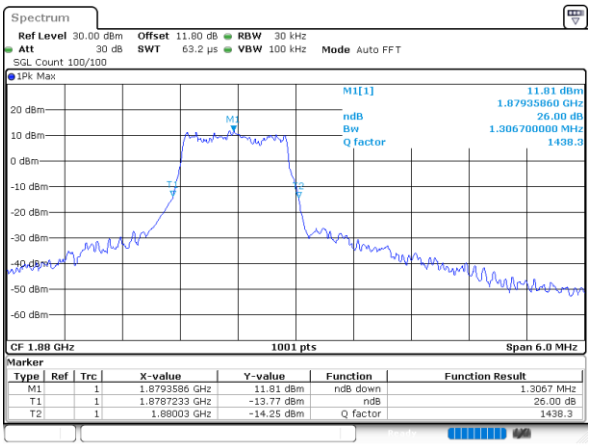
Middle Channel / 1.4MHz / 16QAM



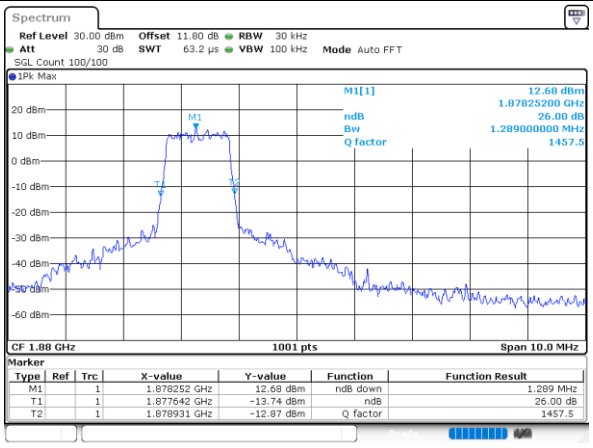
Middle Channel / 3MHz / QPSK



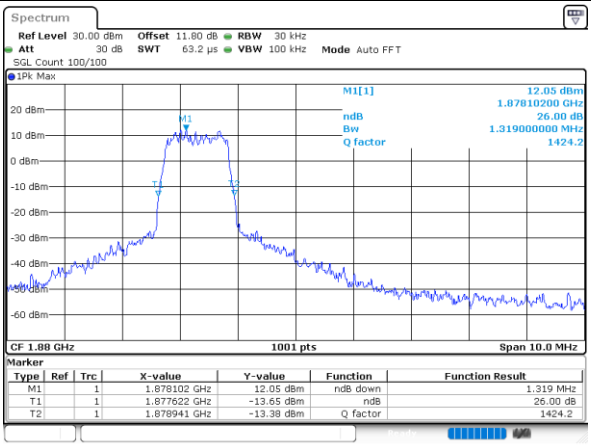
Middle Channel / 3MHz / 16QAM



Middle Channel / 5MHz / QPSK

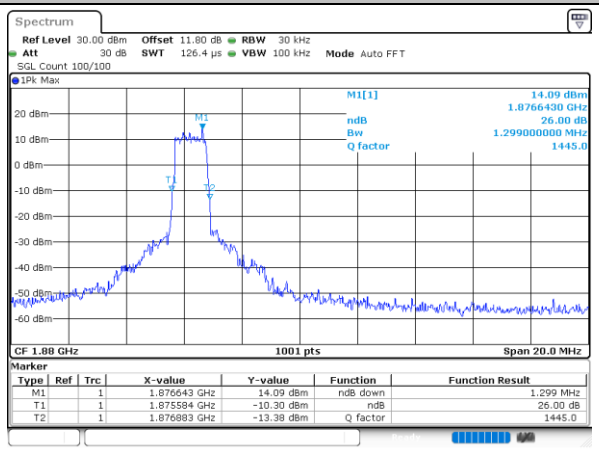


Middle Channel / 5MHz / 16QAM

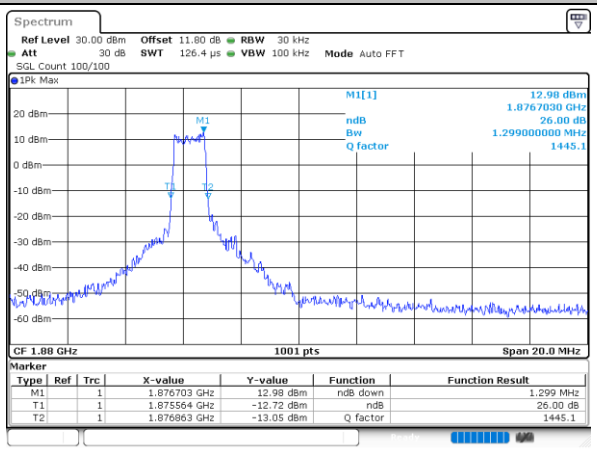


LTE Band 2

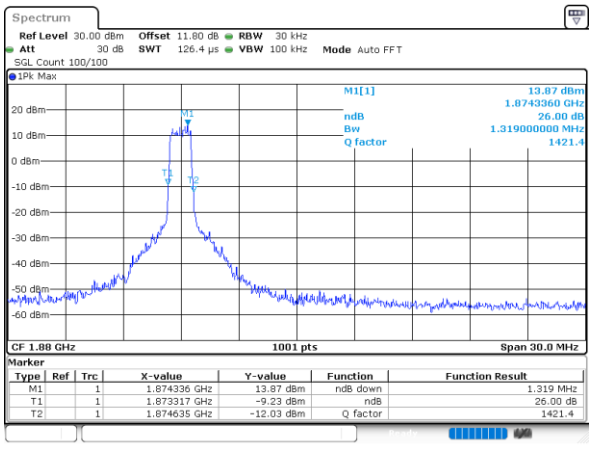
Middle Channel / 10MHz / QPSK



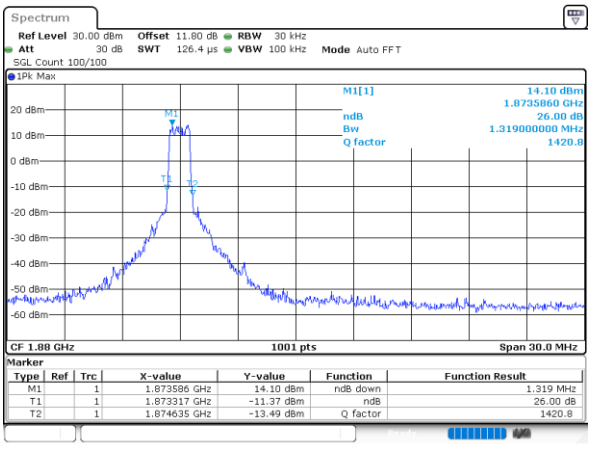
Middle Channel / 10MHz / 16QAM



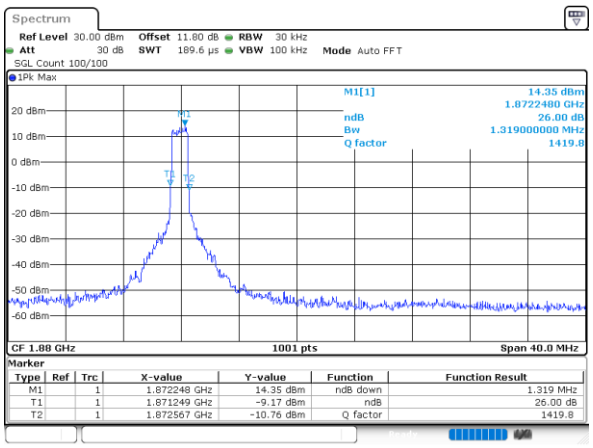
Middle Channel / 15MHz / QPSK



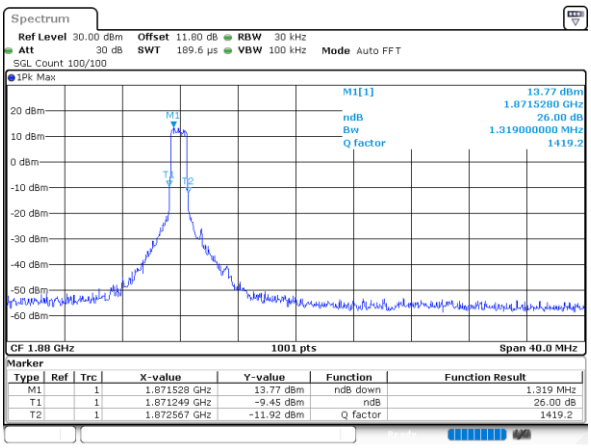
Middle Channel / 15MHz / 16QAM



Middle Channel / 20MHz / QPSK



Middle Channel / 20MHz / 16QAM

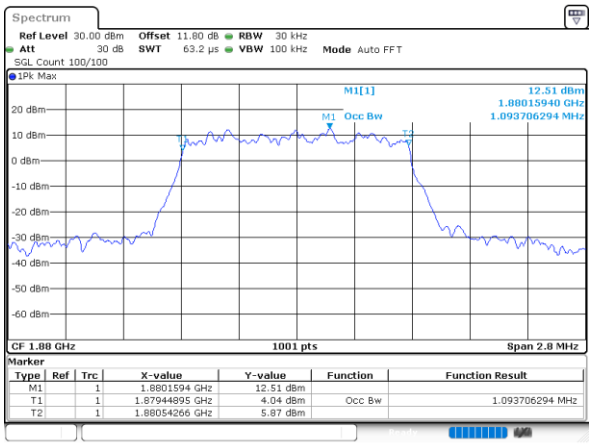


Occupied Bandwidth

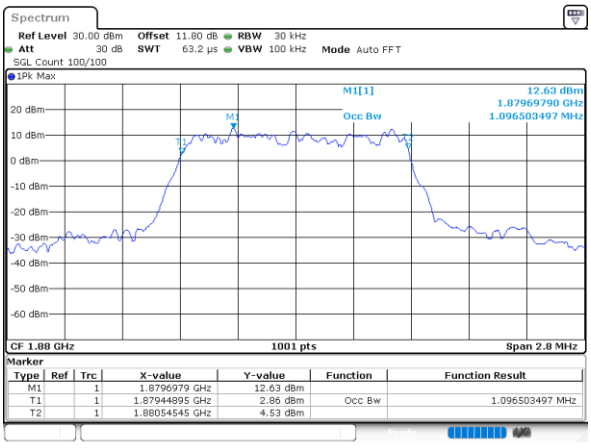
Mode	LTE Band 2 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	1.09	1.10	1.09	1.10	1.11	1.09	1.12	1.14	1.11	1.14	1.12	1.12

LTE Band 2

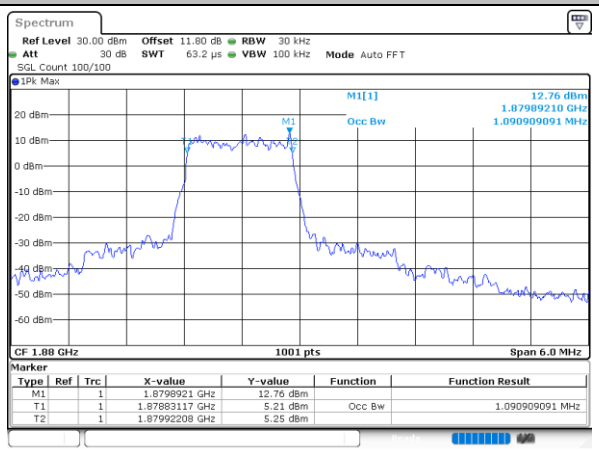
Middle Channel / 1.4MHz / QPSK



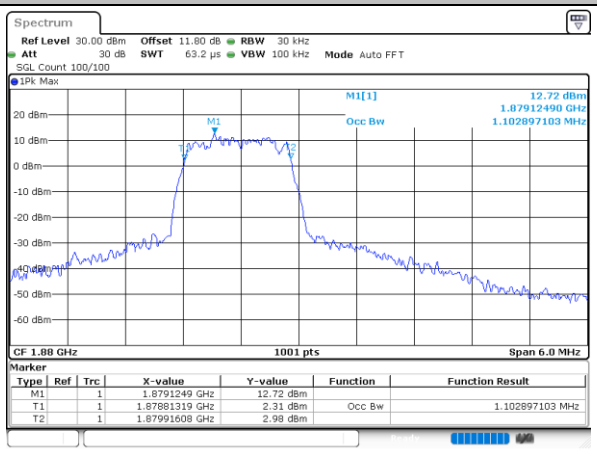
Middle Channel / 1.4MHz / 16QAM



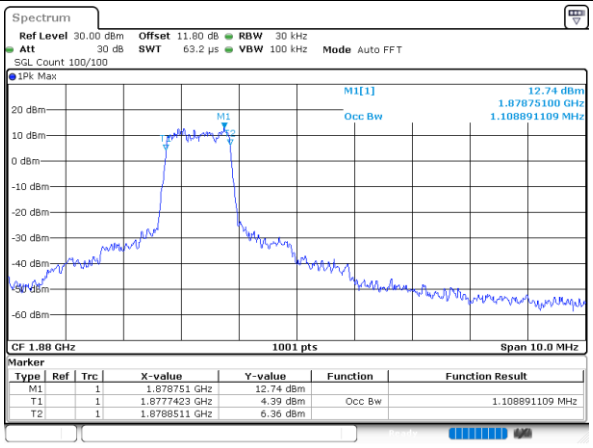
Middle Channel / 3MHz / QPSK



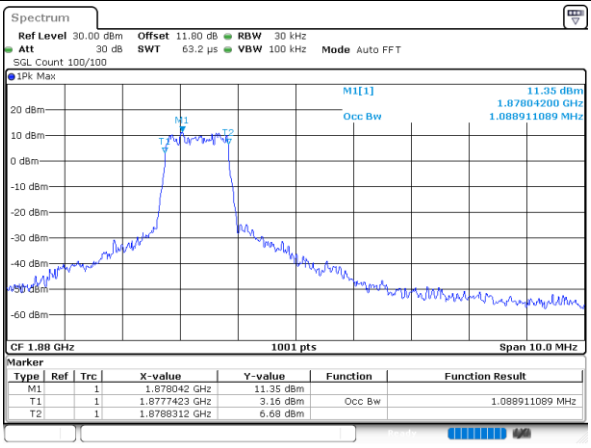
Middle Channel / 3MHz / 16QAM



Middle Channel / 5MHz / QPSK

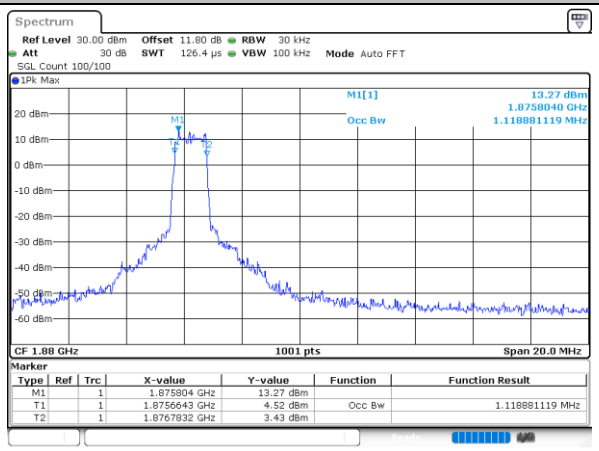


Middle Channel / 5MHz / 16QAM

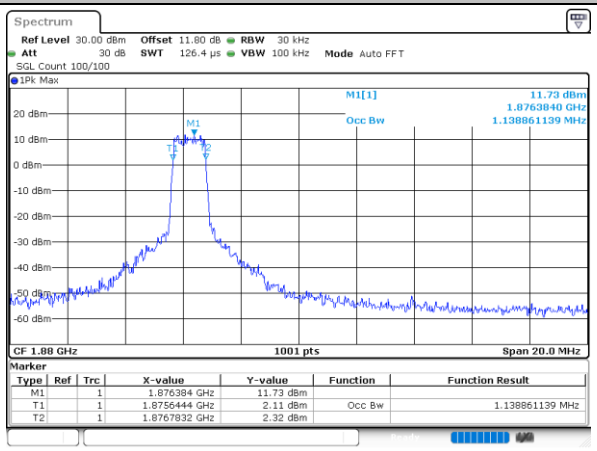


LTE Band 2

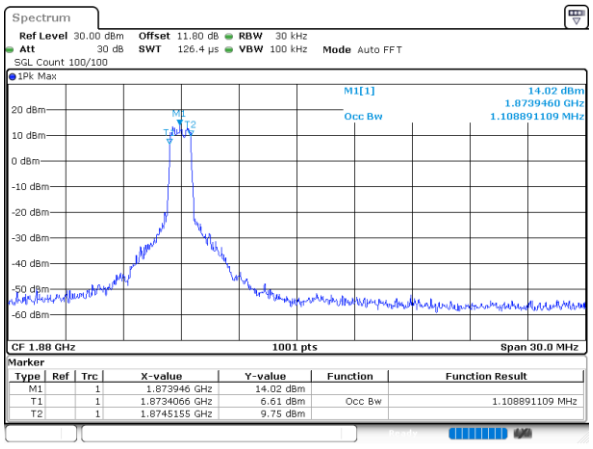
Middle Channel / 10MHz / QPSK



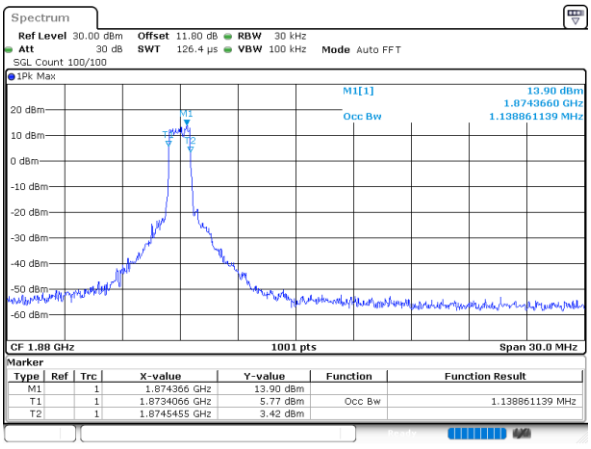
Middle Channel / 10MHz / 16QAM



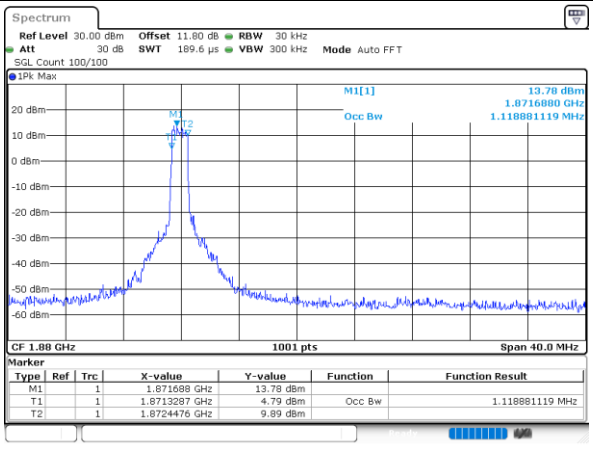
Middle Channel / 15MHz / QPSK



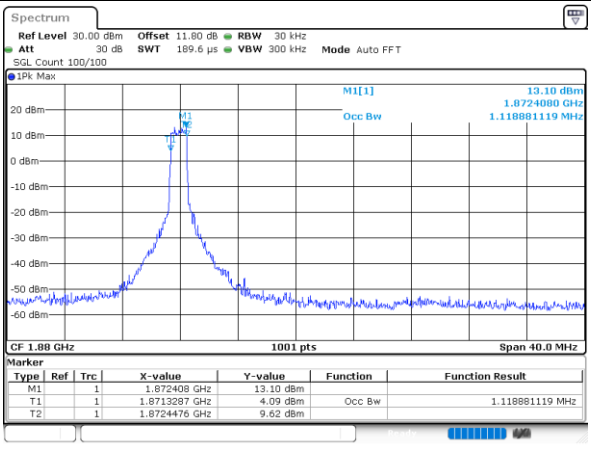
Middle Channel / 15MHz / 16QAM



Middle Channel / 20MHz / QPSK



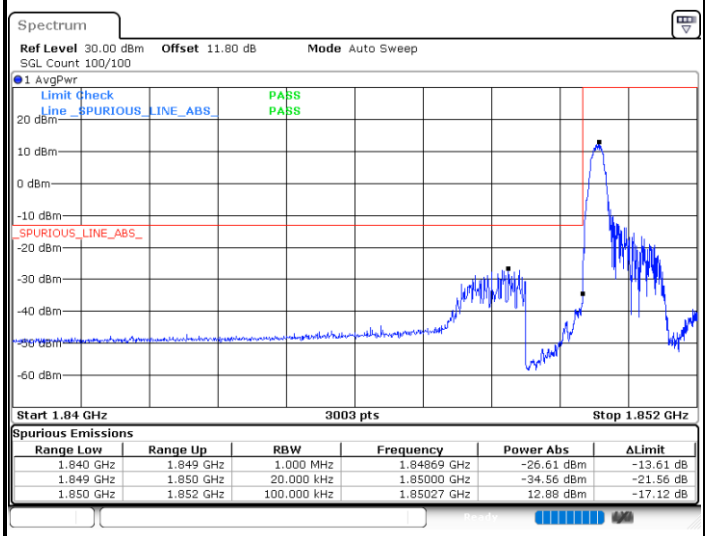
Middle Channel / 20MHz / 16QAM



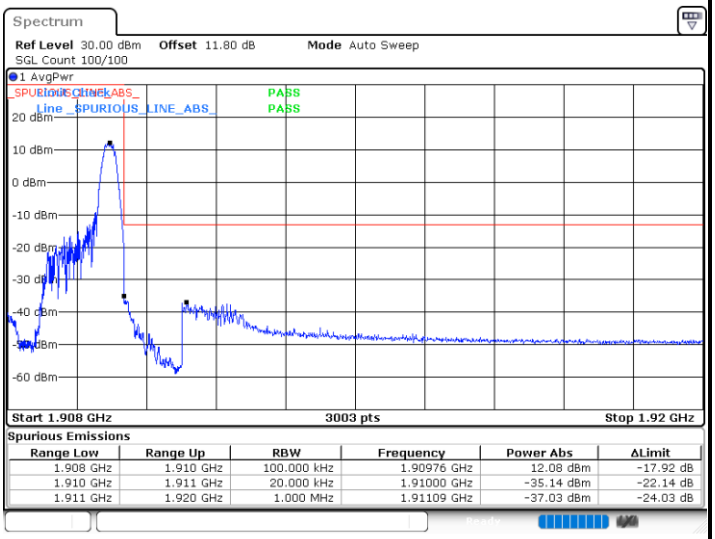
Conducted Band Edge

LTE Band 2 / 1.4MHz / QPSK

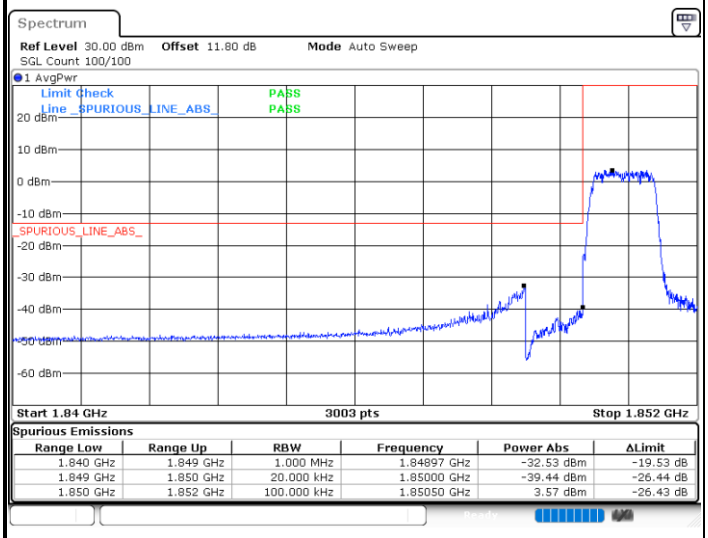
Lowest Band Edge / 1RB



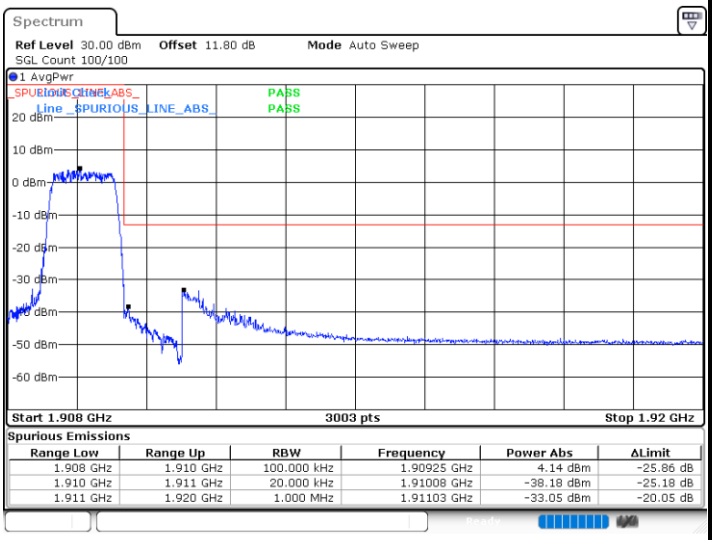
Highest Band Edge / 1RB



Lowest Band Edge / Full RB

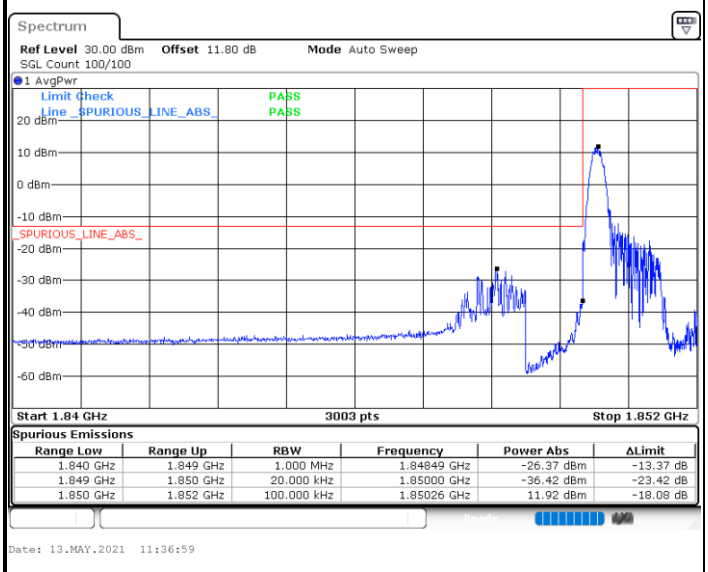


Highest Band Edge / Full RB

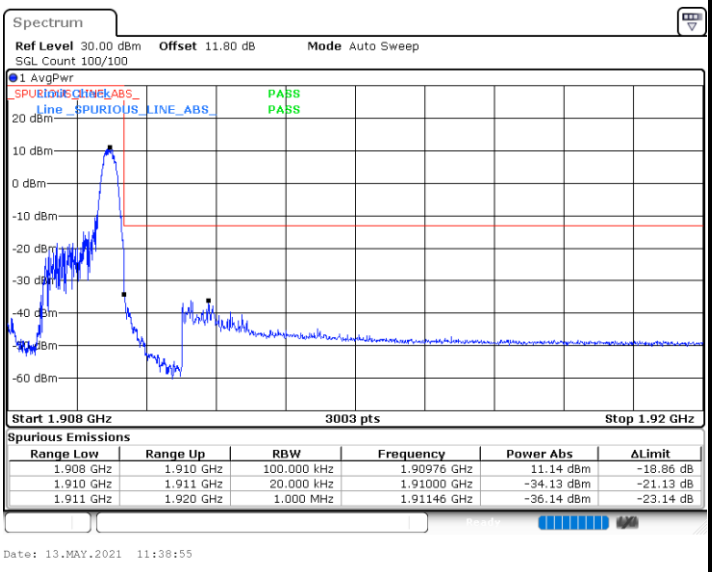


LTE Band 2 / 1.4MHz / 16QAM

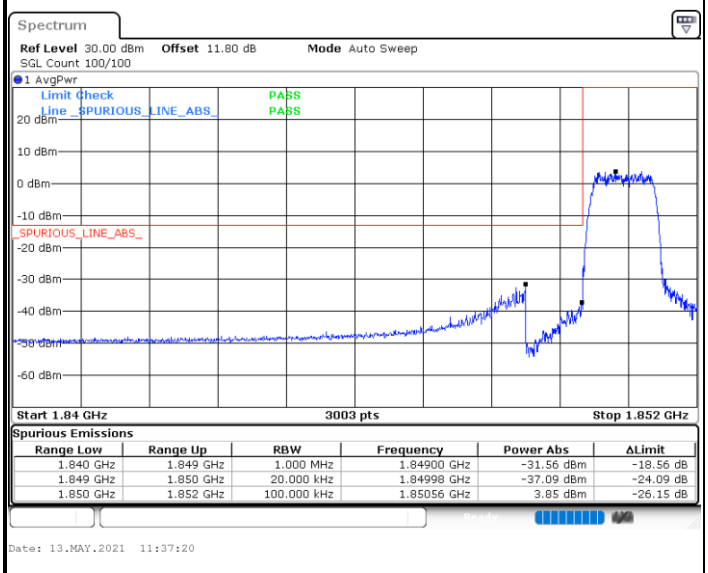
Lowest Band Edge / 1 RB



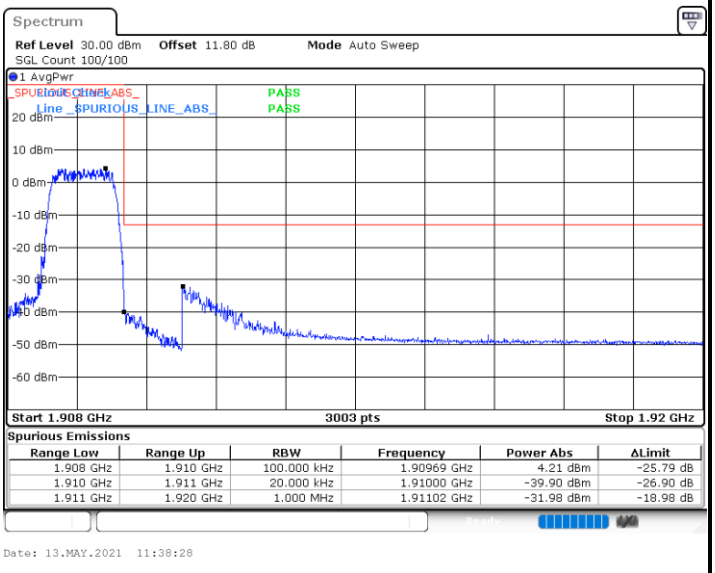
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

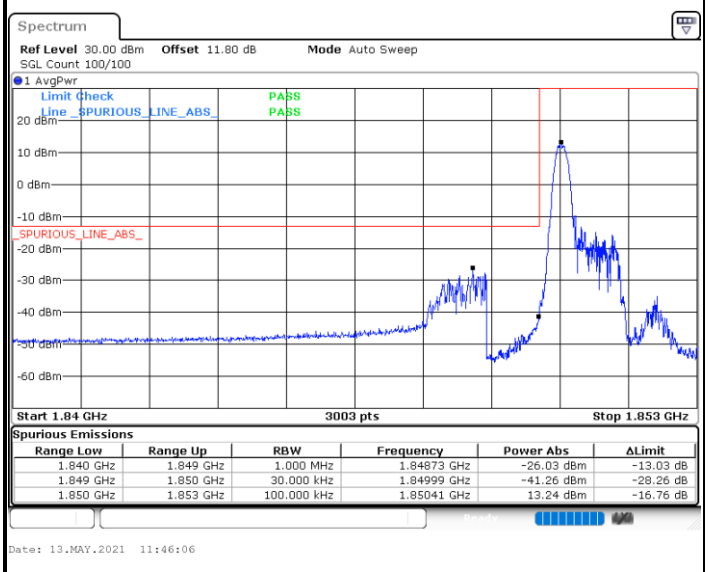


Highest Band Edge / Full RB

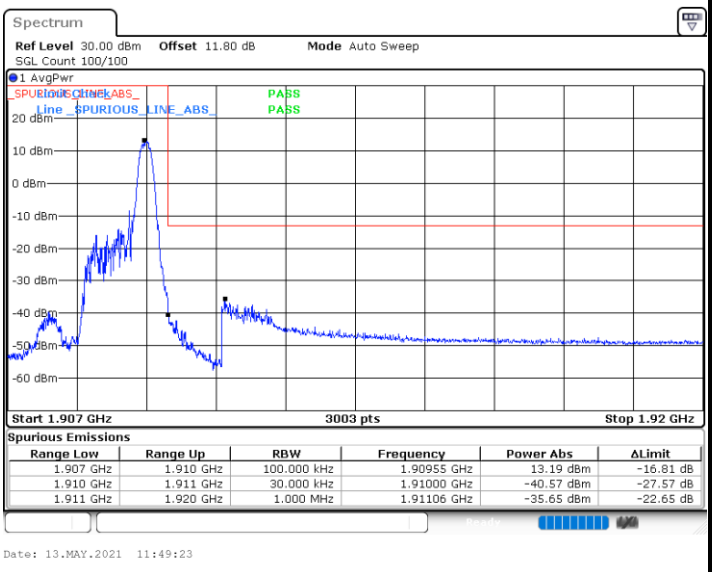


LTE Band 2 / 3MHz / QPSK

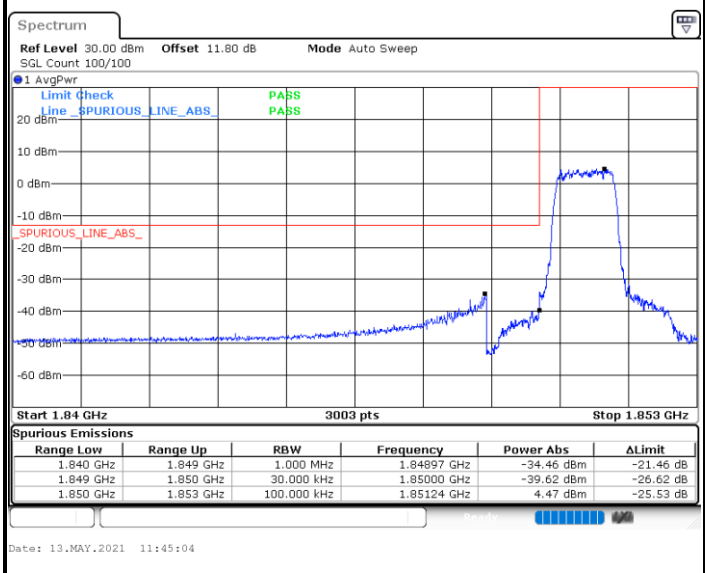
Lowest Band Edge / 1RB



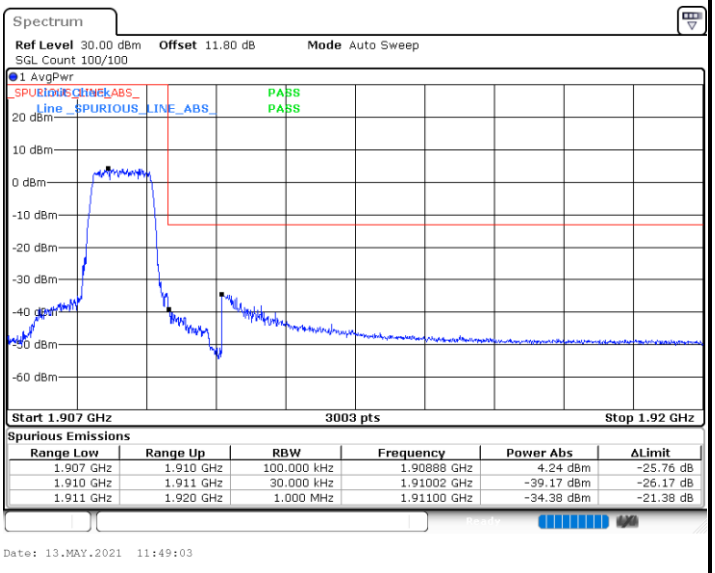
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

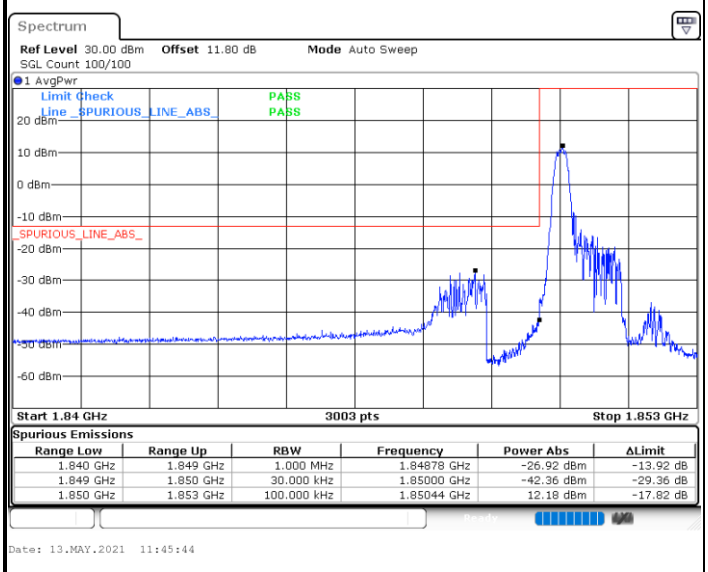


Highest Band Edge / Full RB

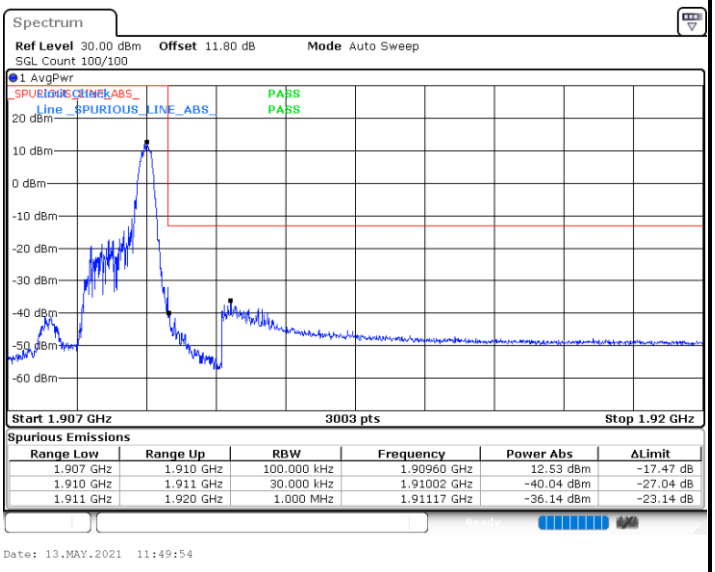


LTE Band 2 / 3MHz / 16QAM

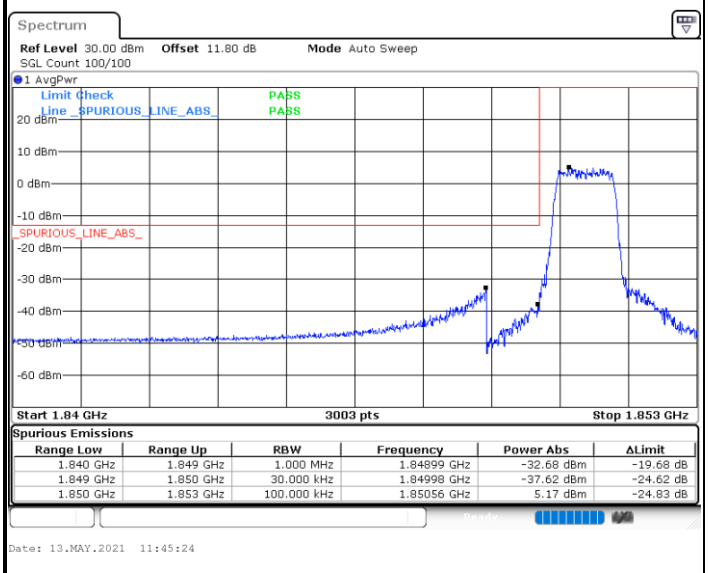
Lowest Band Edge / 1 RB



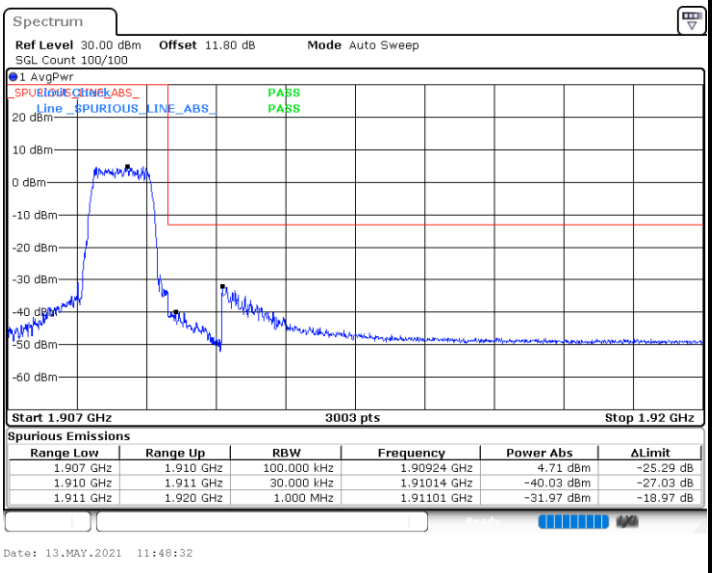
Highest Band Edge /1 RB



Lowest Band Edge / Full RB

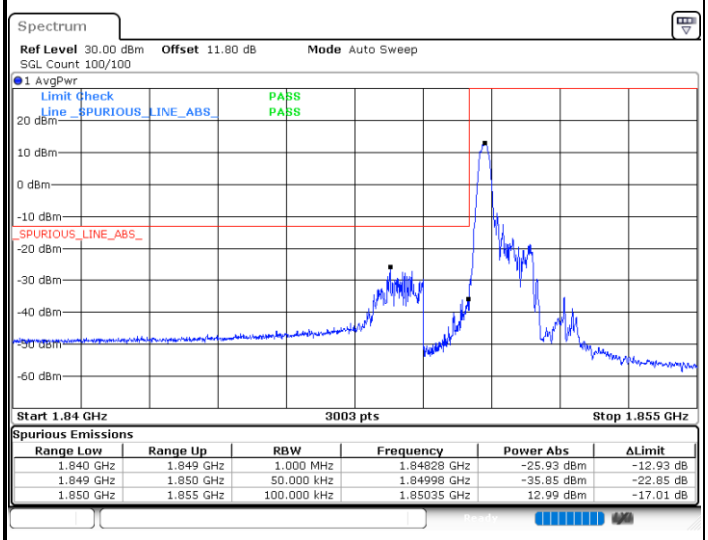


Highest Band Edge / Full RB

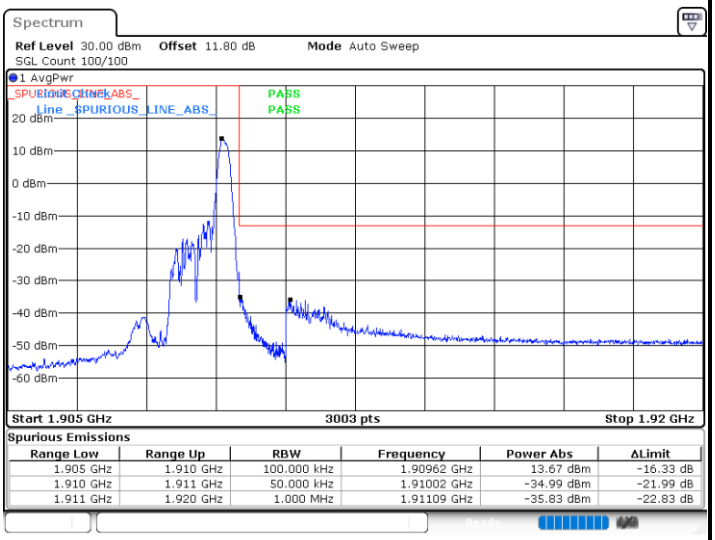


LTE Band 2 / 5MHz / QPSK

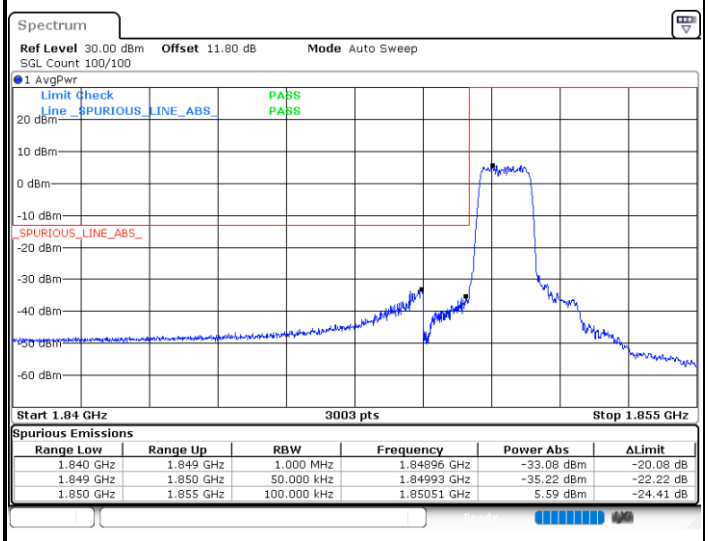
Lowest Band Edge / 1 RB



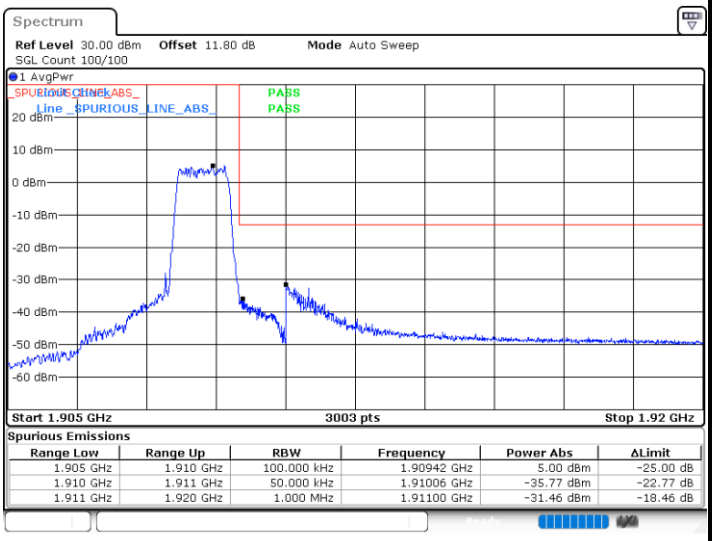
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

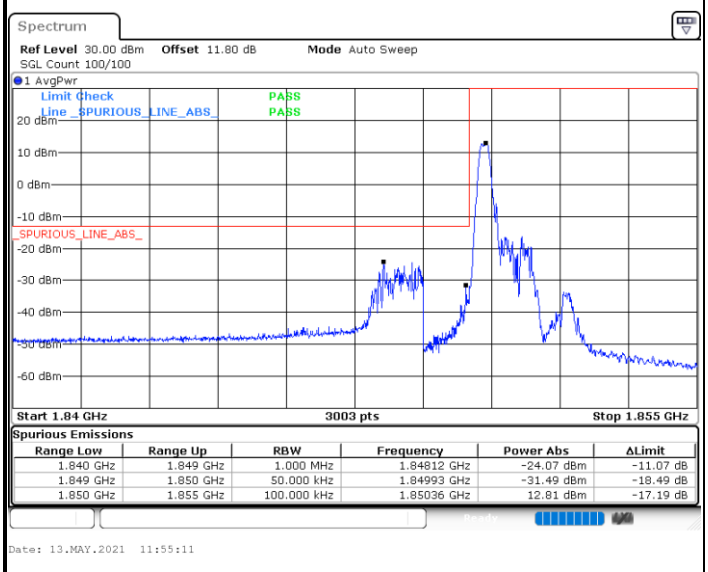


Highest Band Edge / Full RB

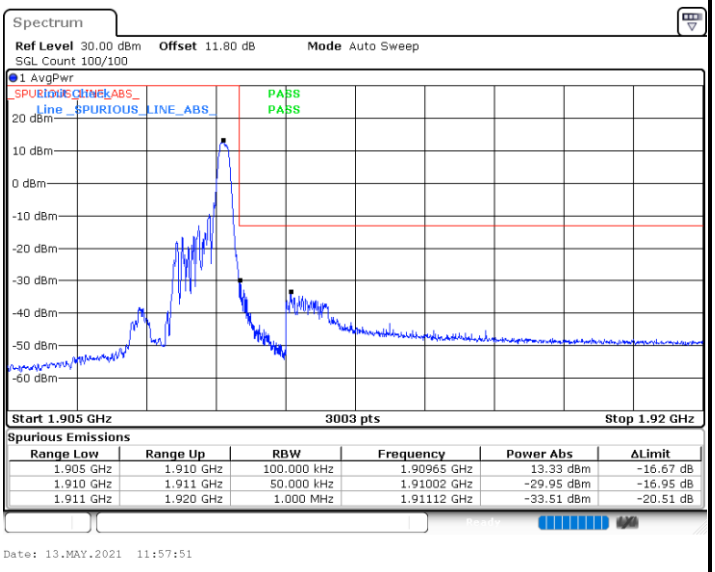


LTE Band 2 / 5MHz / 16QAM

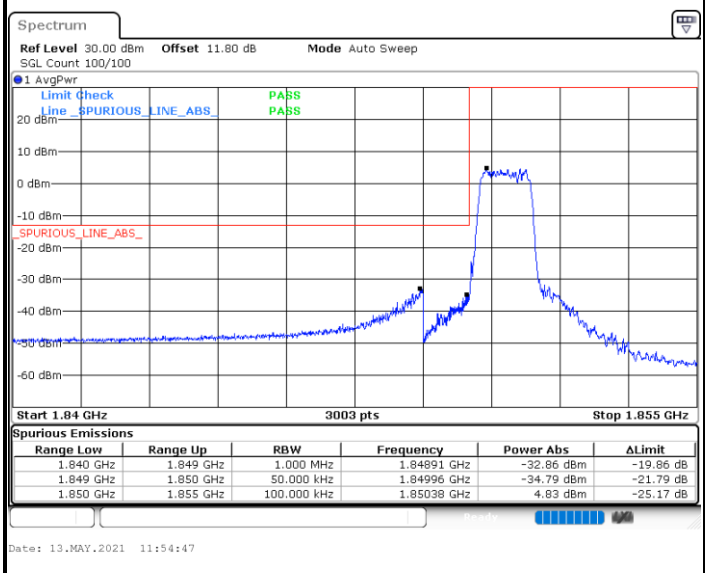
Lowest Band Edge / 1RB



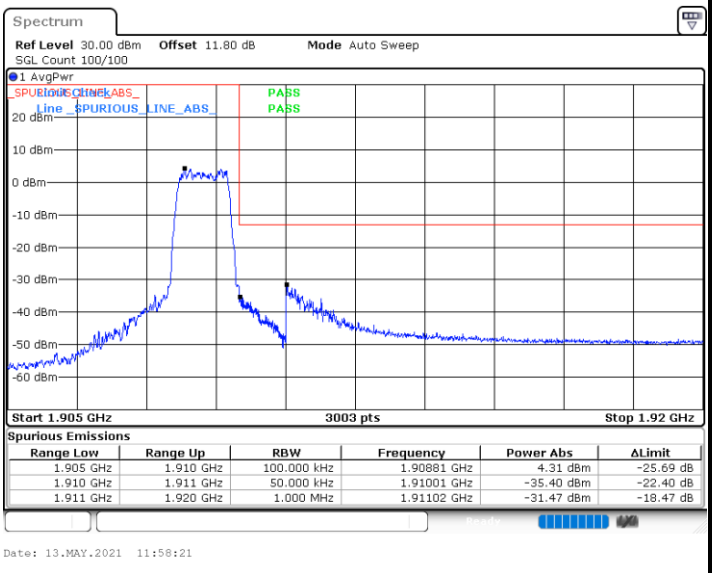
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

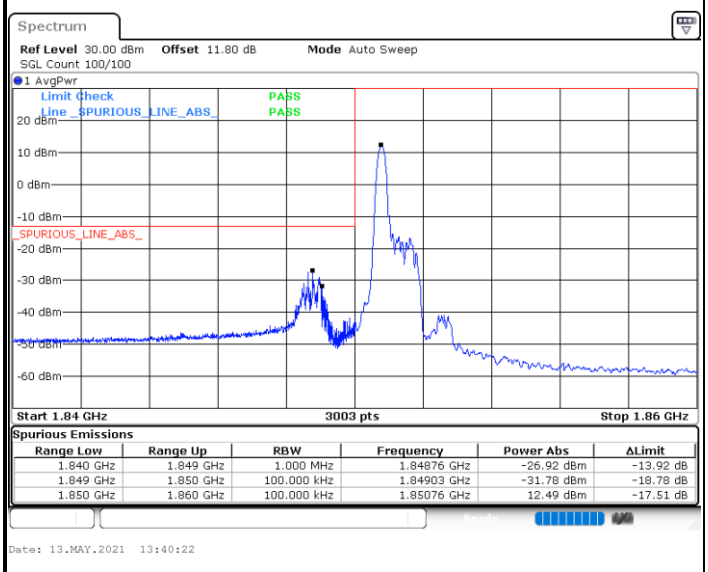


Highest Band Edge / Full RB



LTE Band 2 / 10MHz / QPSK

Lowest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.840 GHz	1.849 GHz	1.000 MHz	1.84876 GHz	-26.92 dBm	-13.92 dB
1.849 GHz	1.850 GHz	100.000 kHz	1.84903 GHz	-31.78 dBm	-18.78 dB
1.850 GHz	1.860 GHz	100.000 kHz	1.85076 GHz	12.49 dBm	-17.51 dB

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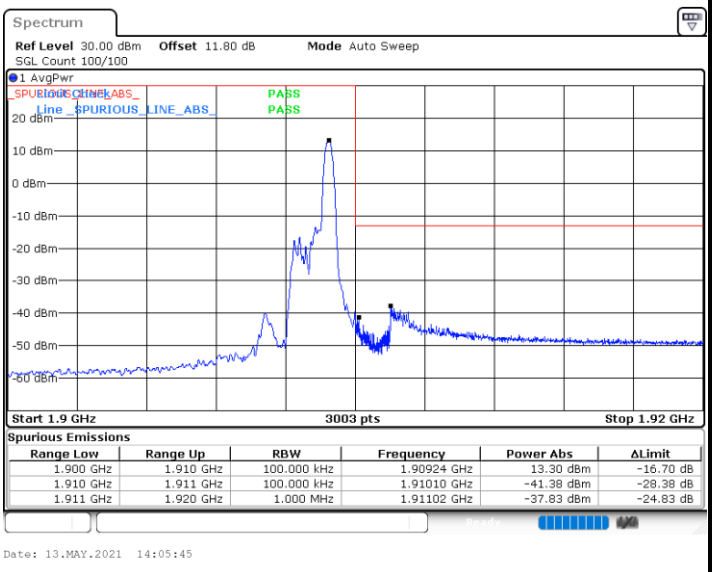
Highest Band Edge / 1 RB

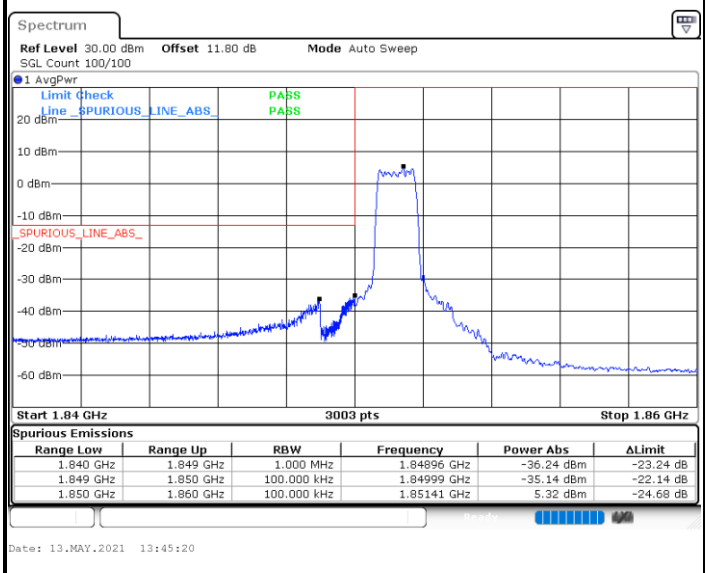


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.900 GHz	1.910 GHz	100.000 kHz	1.90924 GHz	13.30 dBm	-16.70 dB
1.910 GHz	1.911 GHz	100.000 kHz	1.91010 GHz	-41.38 dBm	-28.38 dB
1.911 GHz	1.920 GHz	1.000 MHz	1.91102 GHz	-37.83 dBm	-24.83 dB

Date: 13.MAY.2021 14:05:45

Lowest Band Edge / Full RB

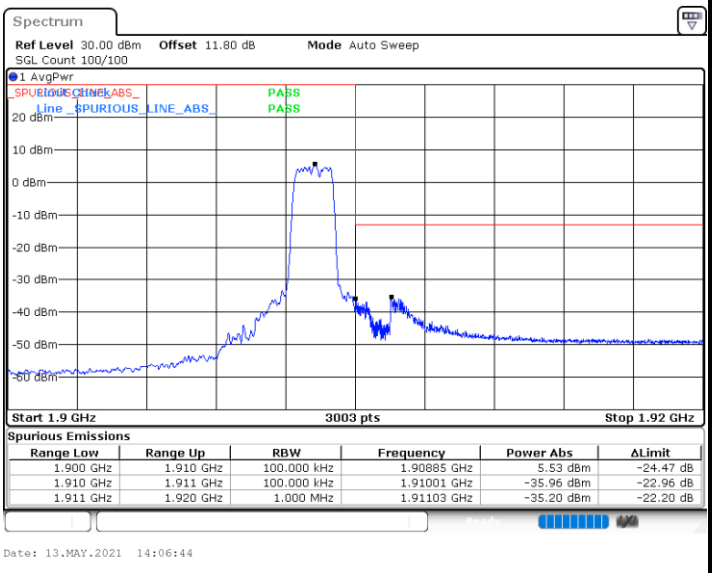


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.840 GHz	1.849 GHz	1.000 MHz	1.84896 GHz	-36.24 dBm	-23.24 dB
1.849 GHz	1.850 GHz	100.000 kHz	1.84999 GHz	-35.14 dBm	-22.14 dB
1.850 GHz	1.860 GHz	100.000 kHz	1.85141 GHz	5.32 dBm	-24.68 dB

Date: 13.MAY.2021 13:45:20

Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.900 GHz	1.910 GHz	100.000 kHz	1.90885 GHz	5.53 dBm	-24.47 dB
1.910 GHz	1.911 GHz	100.000 kHz	1.91001 GHz	-35.96 dBm	-22.96 dB
1.911 GHz	1.920 GHz	1.000 MHz	1.91103 GHz	-35.20 dBm	-22.20 dB

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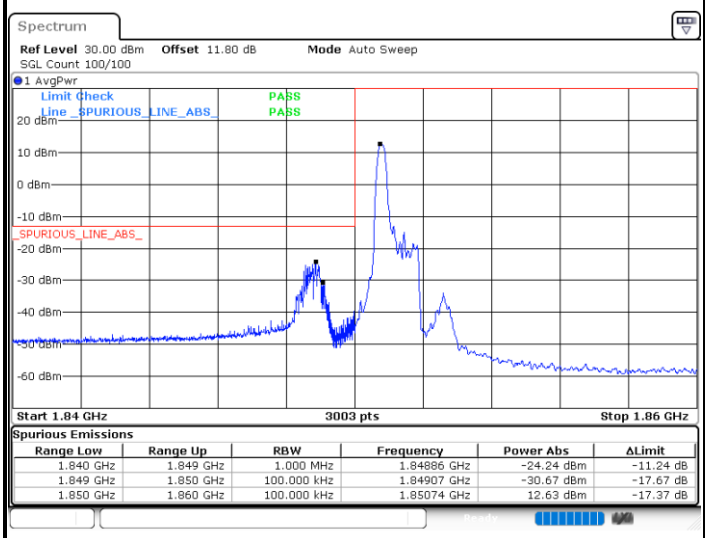
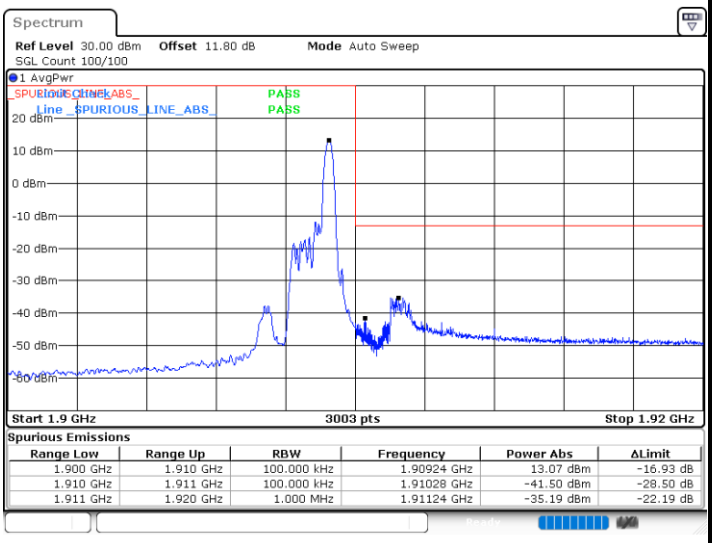
LTE Band 2 / 10MHz / 16QAM

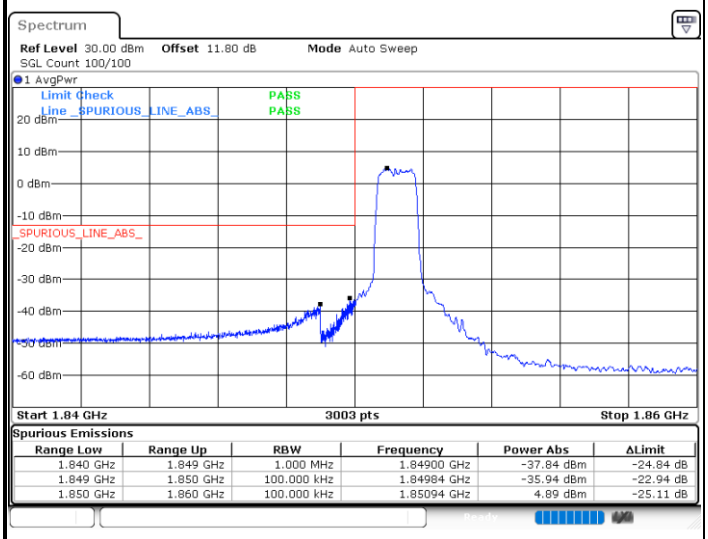
Lowest Band Edge / 1 RB



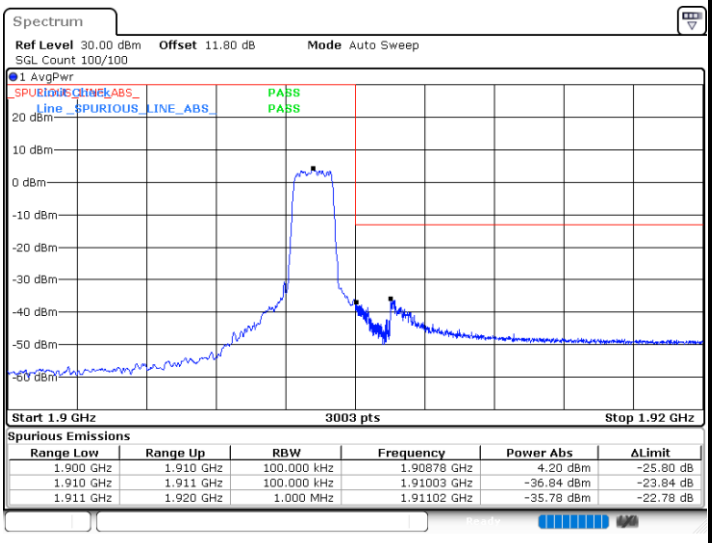
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

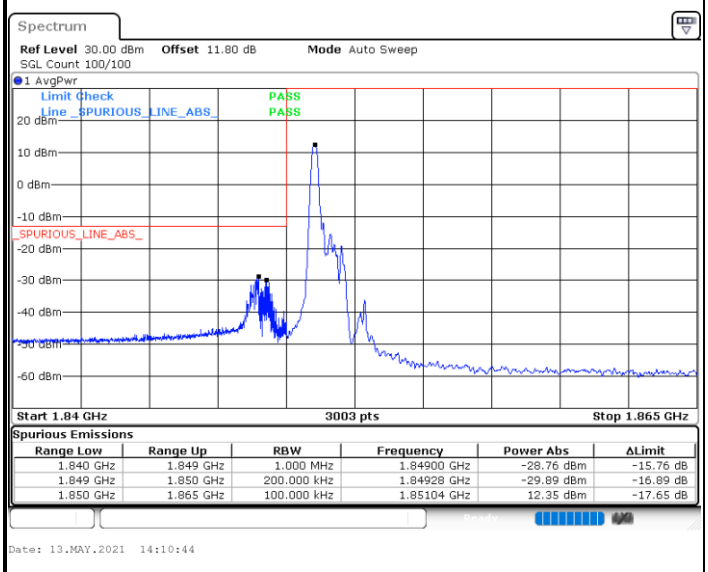


Highest Band Edge / Full RB

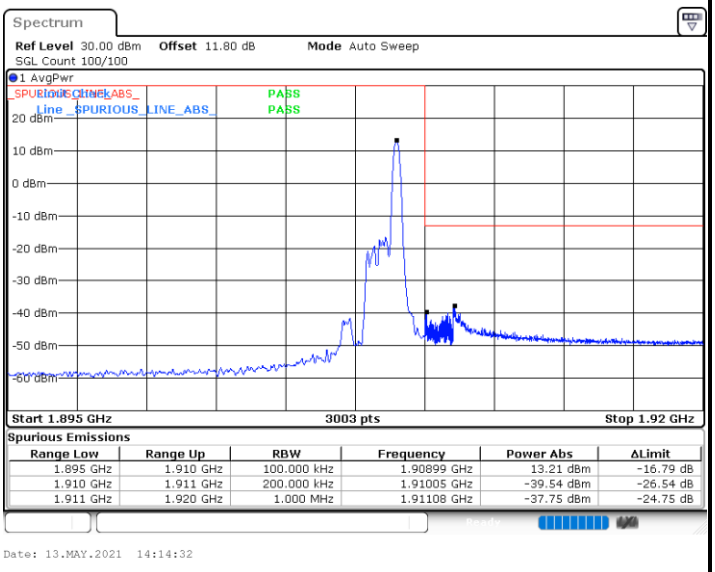


LTE Band 2 / 15MHz / QPSK

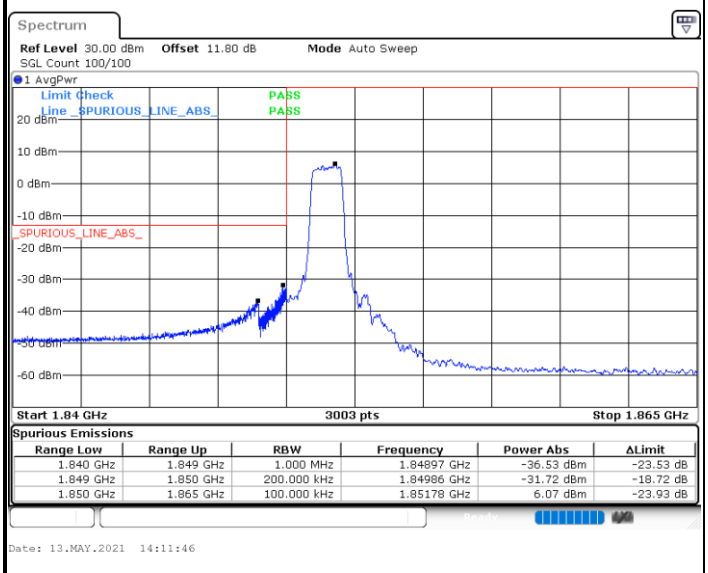
Lowest Band Edge / 1 RB



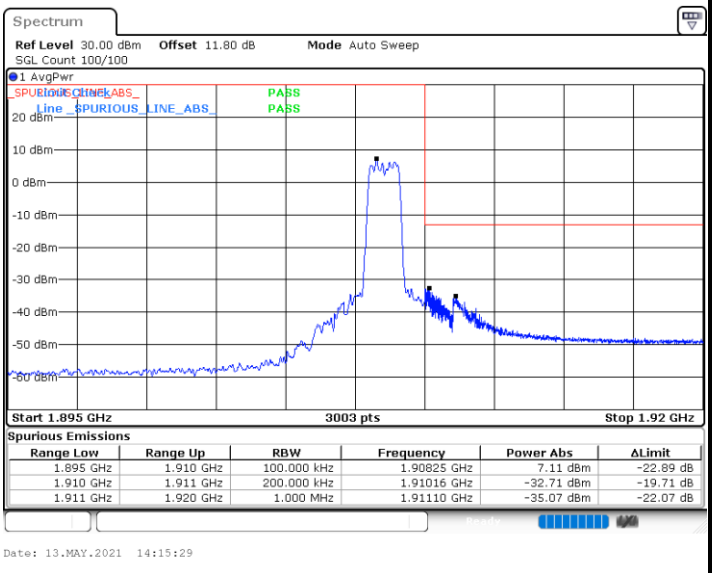
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

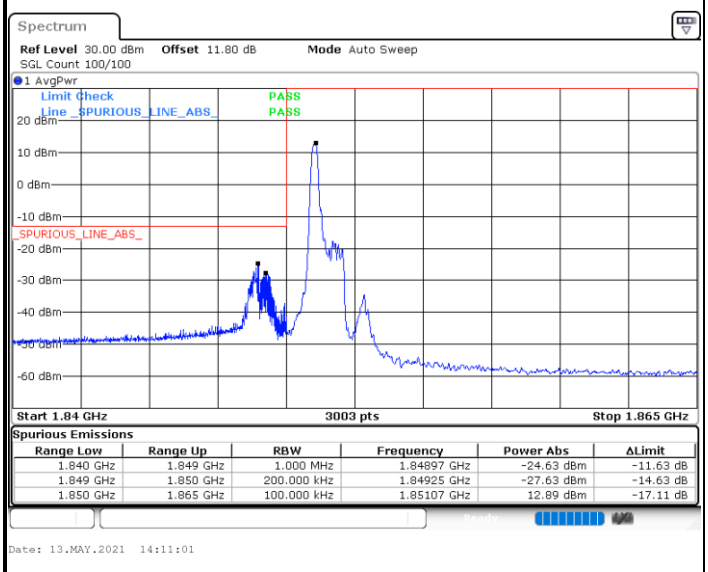


Highest Band Edge / Full RB

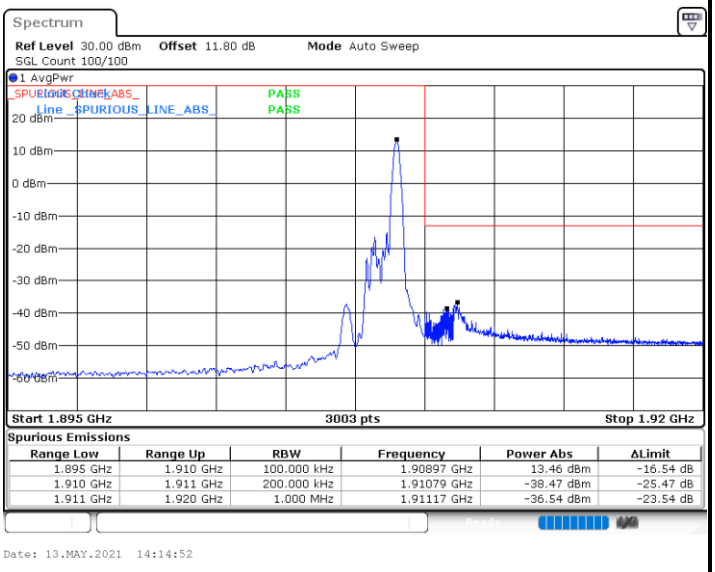


LTE Band 2 / 15MHz / 16QAM

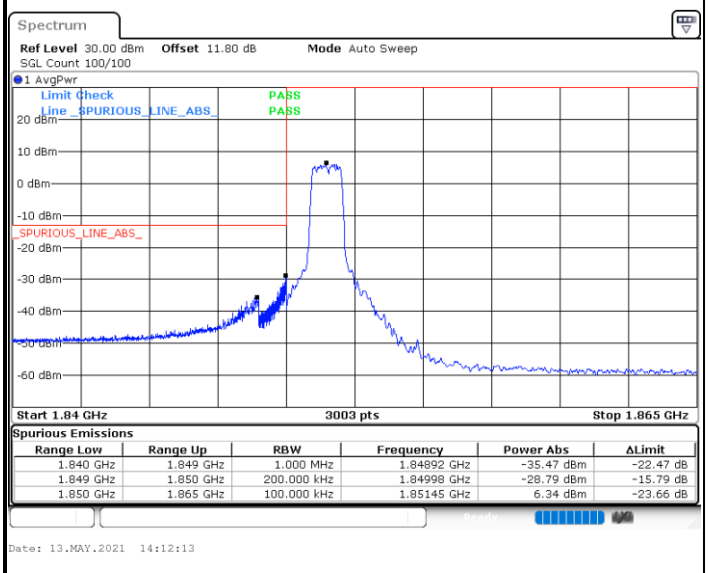
Lowest Band Edge / 1 RB



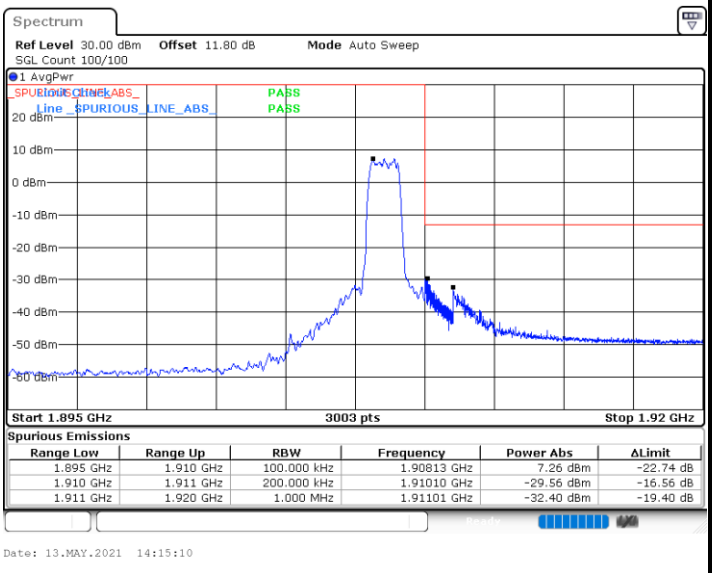
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

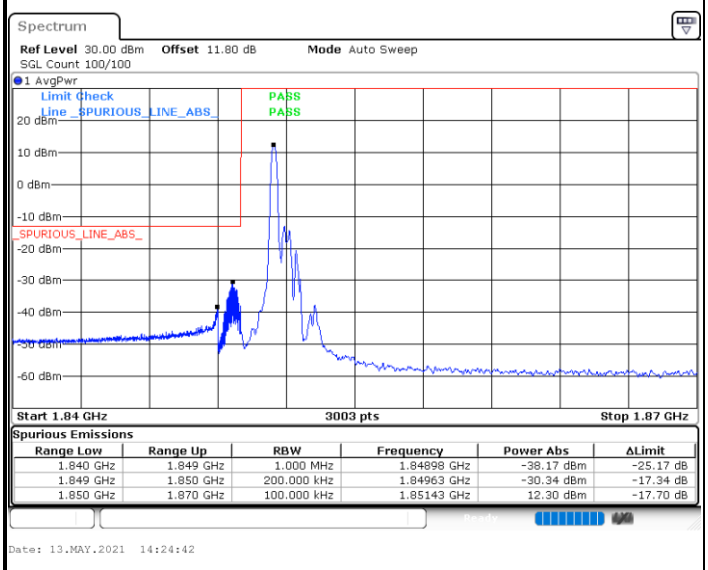


Highest Band Edge / Full RB



LTE Band 2 / 20MHz / QPSK

Lowest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.840 GHz	1.849 GHz	1.000 MHz	1.84898 GHz	-38.17 dBm	-25.17 dB
1.849 GHz	1.850 GHz	200.000 kHz	1.84963 GHz	-30.34 dBm	-17.34 dB
1.850 GHz	1.870 GHz	100.000 kHz	1.85143 GHz	12.30 dBm	-17.70 dB

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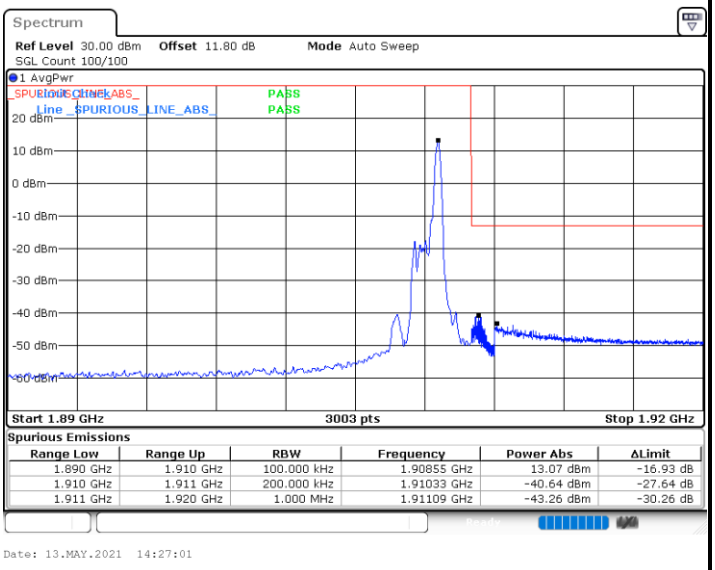
Highest Band Edge / 1 RB

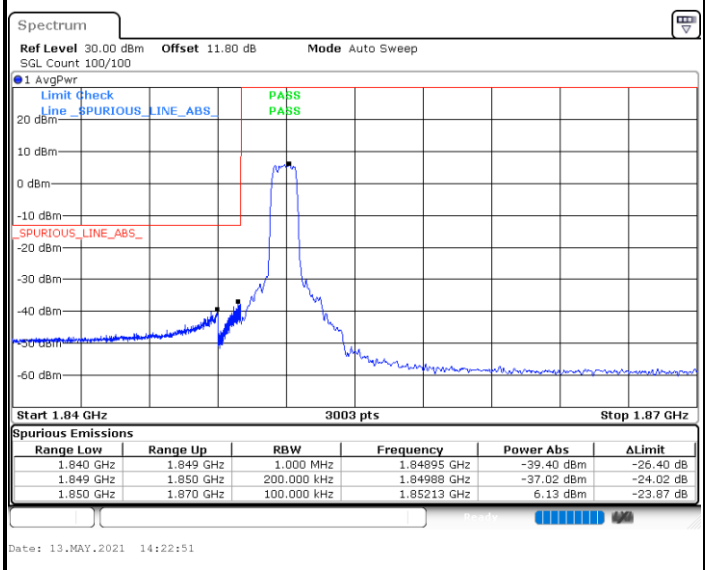


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.890 GHz	1.910 GHz	100.000 kHz	1.90855 GHz	13.07 dBm	-16.93 dB
1.910 GHz	1.911 GHz	200.000 kHz	1.91033 GHz	-40.64 dBm	-27.64 dB
1.911 GHz	1.920 GHz	1.000 MHz	1.91109 GHz	-43.26 dBm	-30.26 dB

Date: 13.MAY.2021 14:27:01

Lowest Band Edge / Full RB

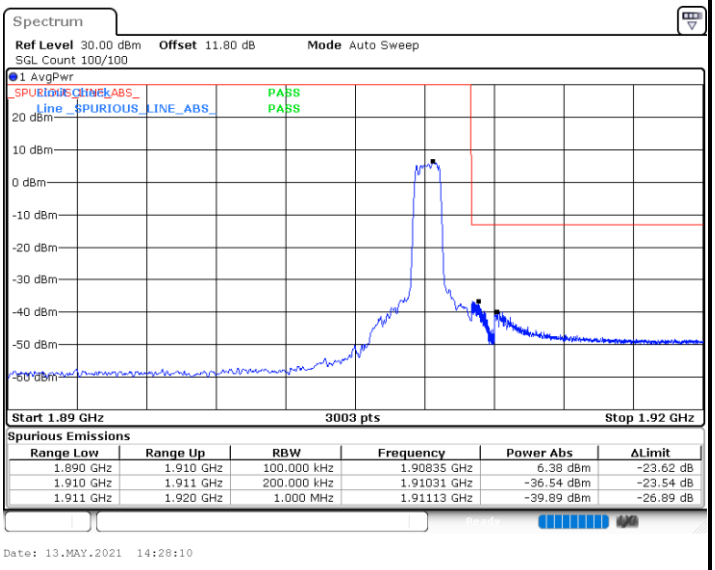


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.840 GHz	1.849 GHz	1.000 MHz	1.84895 GHz	-39.40 dBm	-26.40 dB
1.849 GHz	1.850 GHz	200.000 kHz	1.84988 GHz	-37.02 dBm	-24.02 dB
1.850 GHz	1.870 GHz	100.000 kHz	1.85213 GHz	6.13 dBm	-23.87 dB

Date: 13.MAY.2021 14:22:51

Highest Band Edge / Full RB



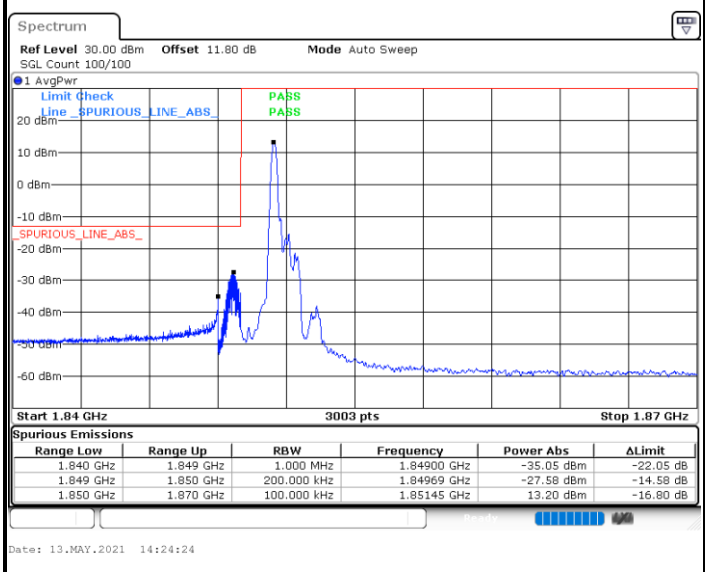
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.890 GHz	1.910 GHz	100.000 kHz	1.90835 GHz	6.38 dBm	-23.62 dB
1.910 GHz	1.911 GHz	200.000 kHz	1.91031 GHz	-36.54 dBm	-23.54 dB
1.911 GHz	1.920 GHz	1.000 MHz	1.91113 GHz	-39.89 dBm	-26.89 dB

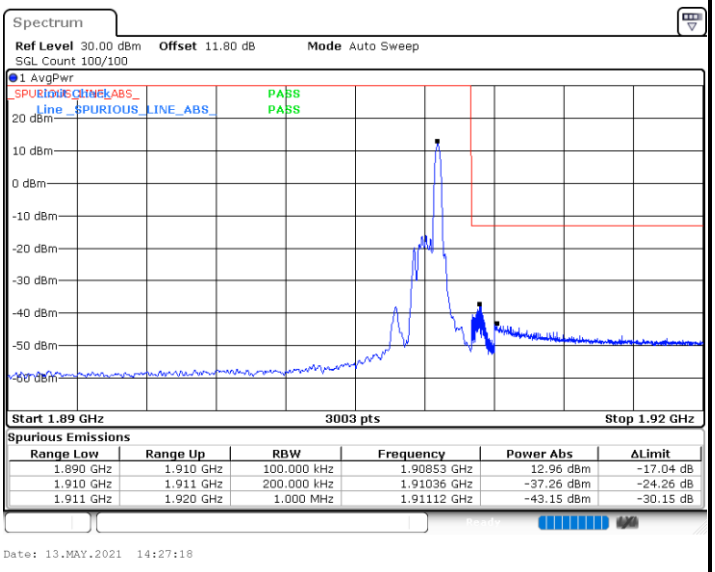
Date: 13.MAY.2021 14:28:10

LTE Band 2 / 20MHz / 16QAM

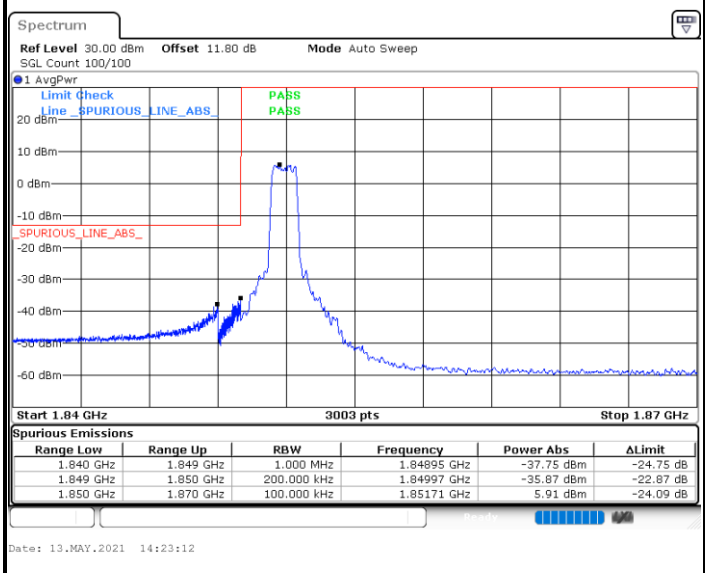
Lowest Band Edge / 1 RB



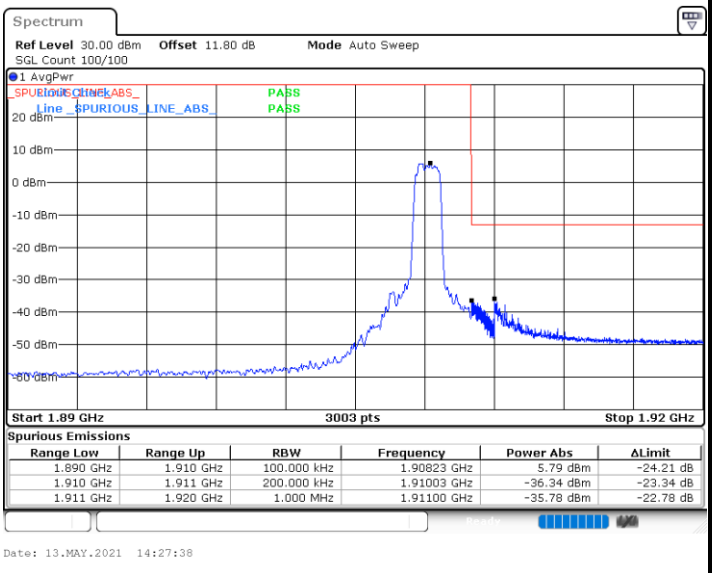
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



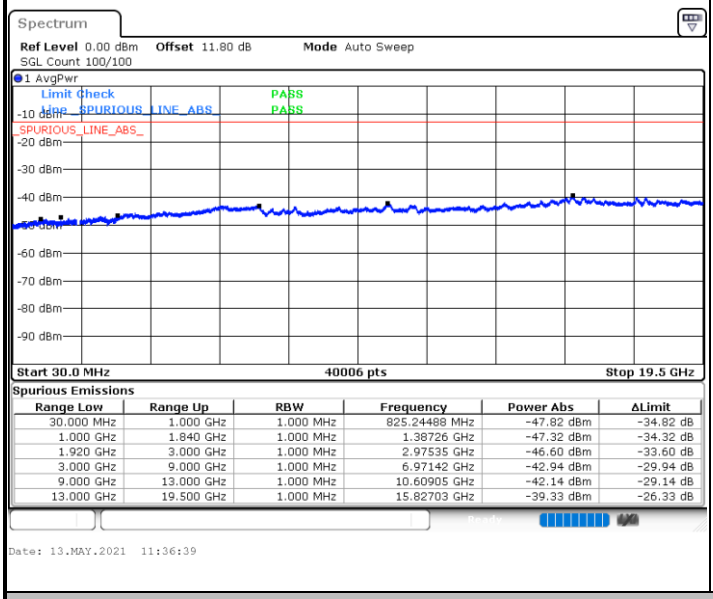
Highest Band Edge / Full RB



Conducted Spurious Emission

LTE Band 2 / 1.4MHz

Lowest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	825.24488 MHz	-47.82 dBm	-34.82 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.38726 GHz	-47.32 dBm	-34.32 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.97535 GHz	-46.60 dBm	-33.60 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.97142 GHz	-42.94 dBm	-29.94 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.60905 GHz	-42.14 dBm	-29.14 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.82703 GHz	-39.33 dBm	-26.33 dB

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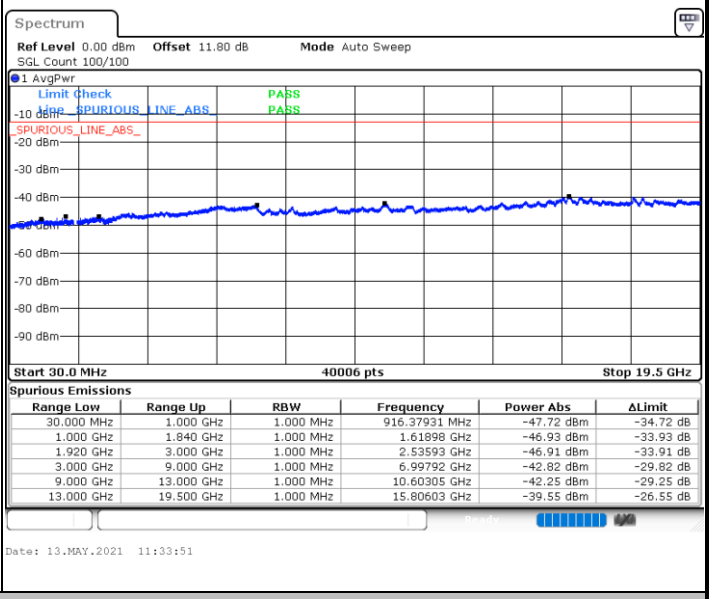
Middle Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	916.37931 MHz	-47.72 dBm	-34.72 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61898 GHz	-46.93 dBm	-33.93 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.53593 GHz	-46.91 dBm	-33.91 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.99792 GHz	-42.82 dBm	-29.82 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.60305 GHz	-42.25 dBm	-29.25 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.80603 GHz	-39.55 dBm	-26.55 dB

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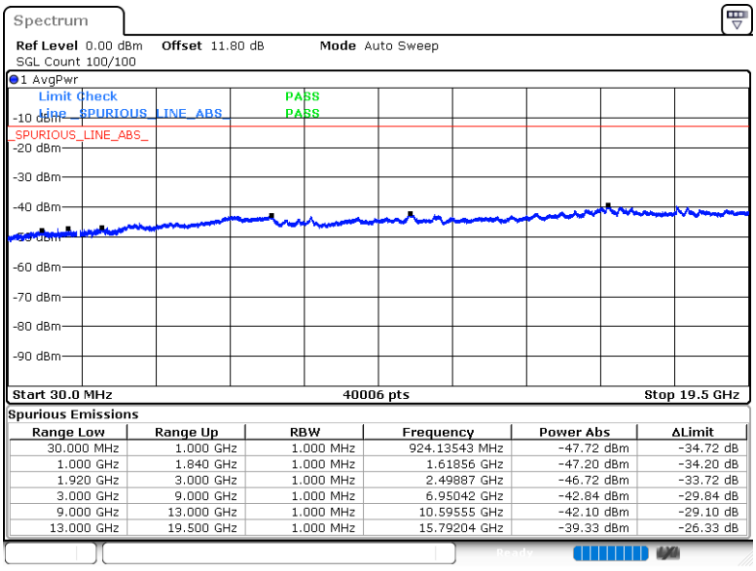
Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	924.13543 MHz	-47.72 dBm	-34.72 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61856 GHz	-47.20 dBm	-34.20 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.49887 GHz	-46.72 dBm	-33.72 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.95042 GHz	-42.84 dBm	-29.84 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.59555 GHz	-42.10 dBm	-29.10 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.79204 GHz	-39.33 dBm	-26.33 dB

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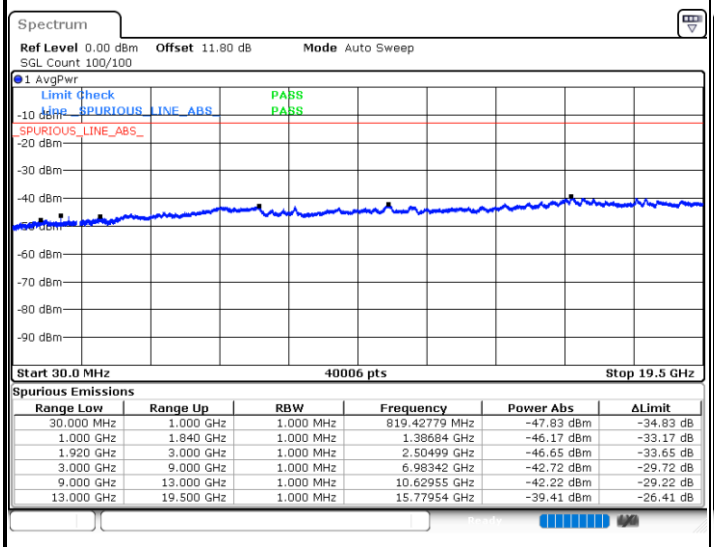
LTE Band 2 / 3MHz

Lowest Channel / QPSK

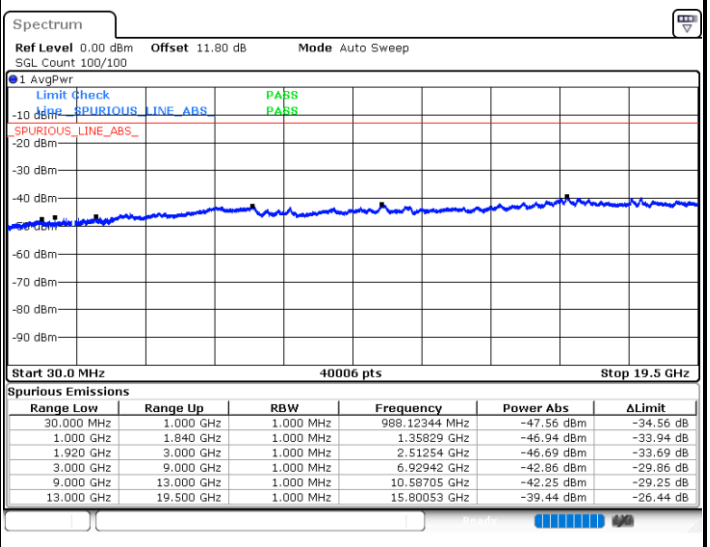


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	819.42779 MHz	-47.83 dBm	-34.83 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.38684 GHz	-46.17 dBm	-33.17 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.50499 GHz	-46.65 dBm	-33.65 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.98342 GHz	-42.72 dBm	-29.72 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.62955 GHz	-42.22 dBm	-29.22 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.77954 GHz	-39.41 dBm	-26.41 dB

Date: 13.MAY.2021 11:46:57

Middle Channel / QPSK

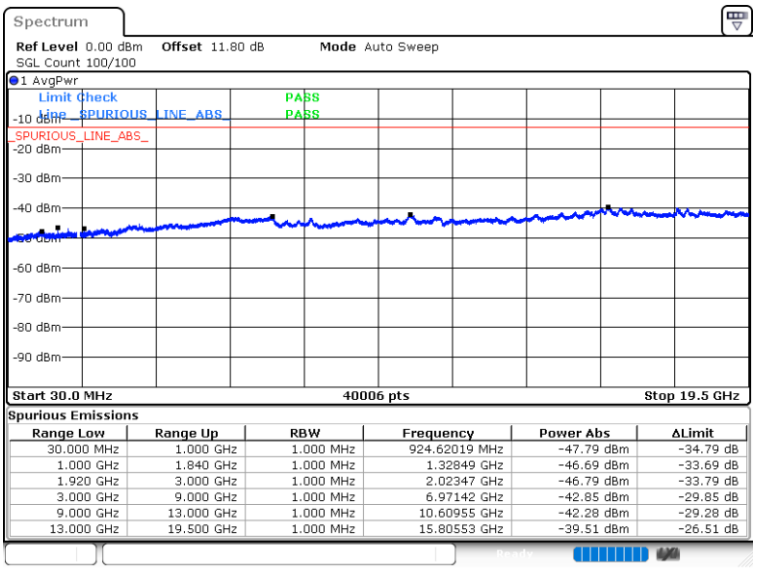


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	988.12344 MHz	-47.56 dBm	-34.56 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.35829 GHz	-46.94 dBm	-33.94 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.51254 GHz	-46.69 dBm	-33.69 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.92942 GHz	-42.86 dBm	-29.86 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.58705 GHz	-42.25 dBm	-29.25 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.80053 GHz	-39.44 dBm	-26.44 dB

Date: 13.MAY.2021 11:44:16

Highest Channel / QPSK



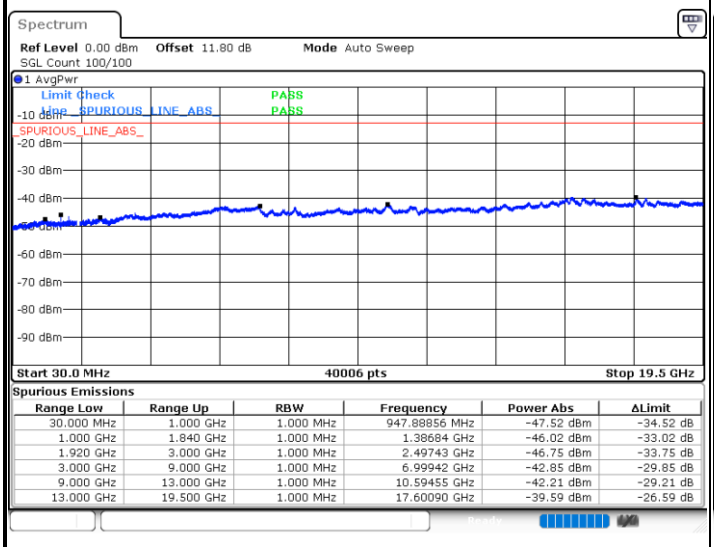
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	924.62019 MHz	-47.79 dBm	-34.79 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.32849 GHz	-46.69 dBm	-33.69 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.02347 GHz	-46.79 dBm	-33.79 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.97142 GHz	-42.85 dBm	-29.85 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.60955 GHz	-42.28 dBm	-29.28 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.80553 GHz	-39.51 dBm	-26.51 dB

Date: 13.MAY.2021 11:51:01

LTE Band 2 / 5MHz

Lowest Channel / QPSK

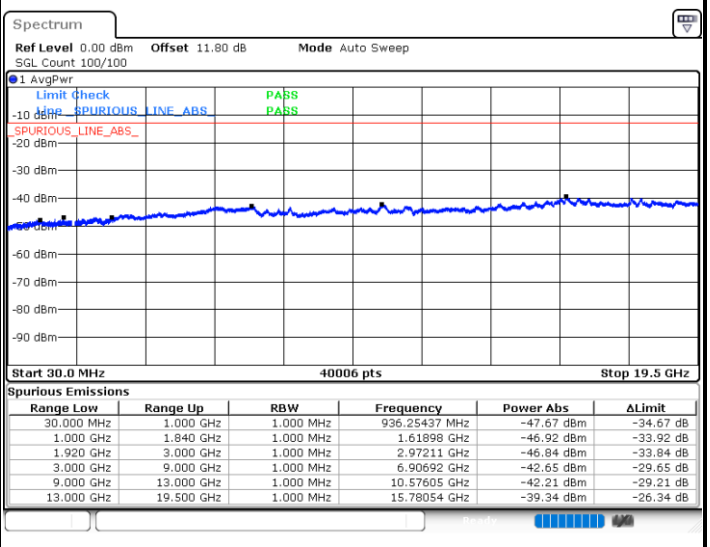


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	947.88856 MHz	-47.52 dBm	-34.52 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.38684 GHz	-46.02 dBm	-33.02 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.49743 GHz	-46.75 dBm	-33.75 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.99942 GHz	-42.85 dBm	-29.85 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.59455 GHz	-42.21 dBm	-29.21 dB
13.000 GHz	19.500 GHz	1.000 MHz	17.60090 GHz	-39.59 dBm	-26.59 dB

Date: 13.MAY.2021 11:56:10

Middle Channel / QPSK

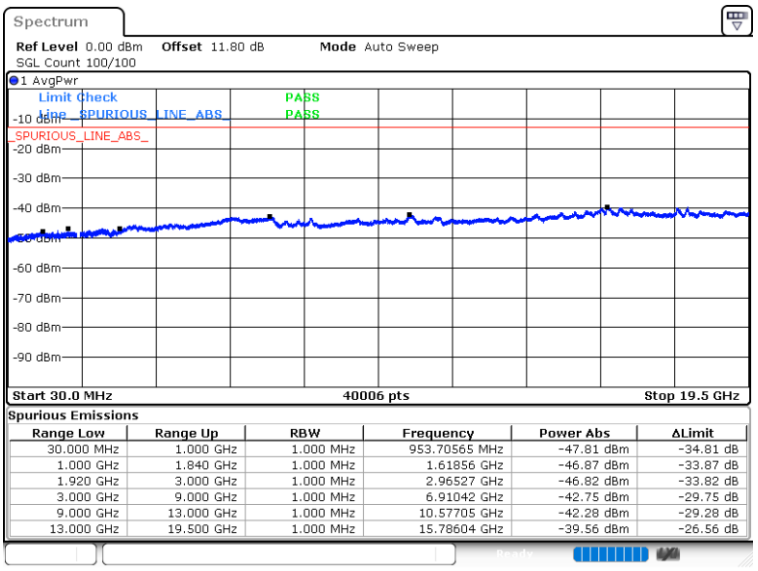


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	936.25437 MHz	-47.67 dBm	-34.67 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61898 GHz	-46.92 dBm	-33.92 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.97211 GHz	-46.84 dBm	-33.84 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.90692 GHz	-42.65 dBm	-29.65 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.57605 GHz	-42.21 dBm	-29.21 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.78054 GHz	-39.34 dBm	-26.34 dB

Date: 13.MAY.2021 11:53:59

Highest Channel / QPSK



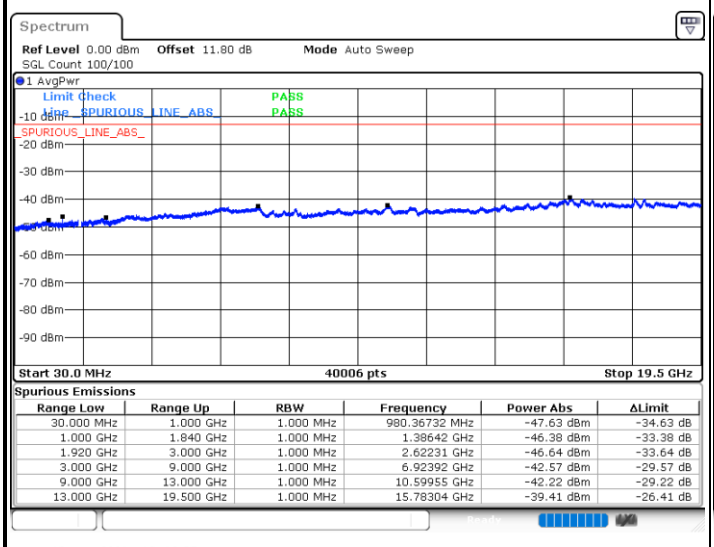
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	953.70565 MHz	-47.81 dBm	-34.81 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61856 GHz	-46.87 dBm	-33.87 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.96527 GHz	-46.82 dBm	-33.82 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.91042 GHz	-42.75 dBm	-29.75 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.57705 GHz	-42.28 dBm	-29.28 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.78604 GHz	-39.56 dBm	-26.56 dB

Date: 13.MAY.2021 11:57:17

LTE Band 2 / 10MHz

Lowest Channel / QPSK

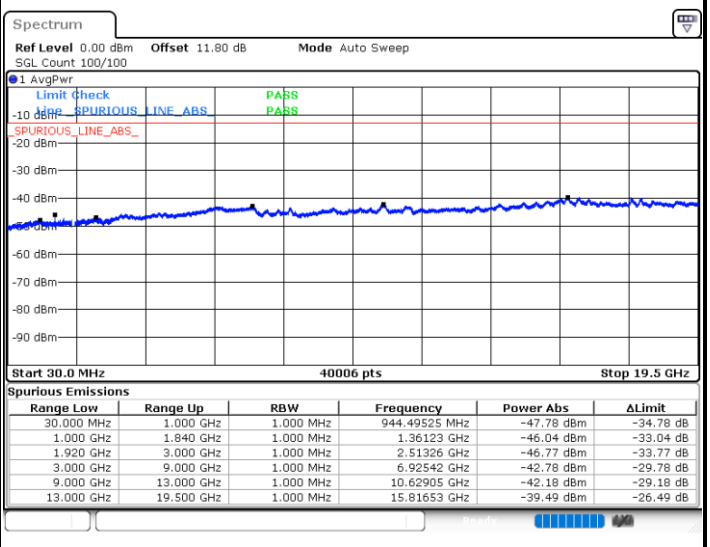


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	980.36732 MHz	-47.63 dBm	-34.63 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.38642 GHz	-46.38 dBm	-33.38 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.62231 GHz	-46.64 dBm	-33.64 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.92392 GHz	-42.57 dBm	-29.57 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.59955 GHz	-42.22 dBm	-29.22 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.78304 GHz	-39.41 dBm	-26.41 dB

Date: 13.MAY.2021 13:46:57

Middle Channel / QPSK

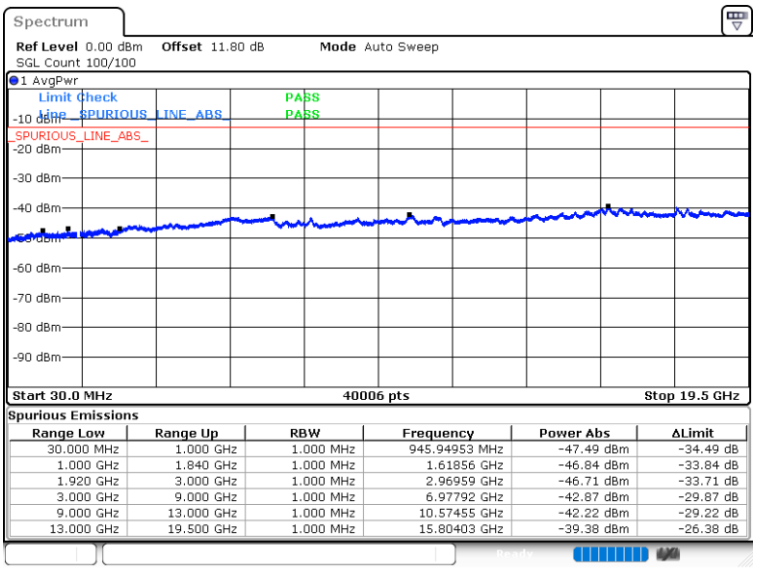


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	944.49525 MHz	-47.78 dBm	-34.78 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.36123 GHz	-46.04 dBm	-33.04 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.51326 GHz	-46.77 dBm	-33.77 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.92542 GHz	-42.78 dBm	-29.78 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.62905 GHz	-42.18 dBm	-29.18 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.81653 GHz	-39.49 dBm	-26.49 dB

Date: 13.MAY.2021 13:38:34

Highest Channel / QPSK



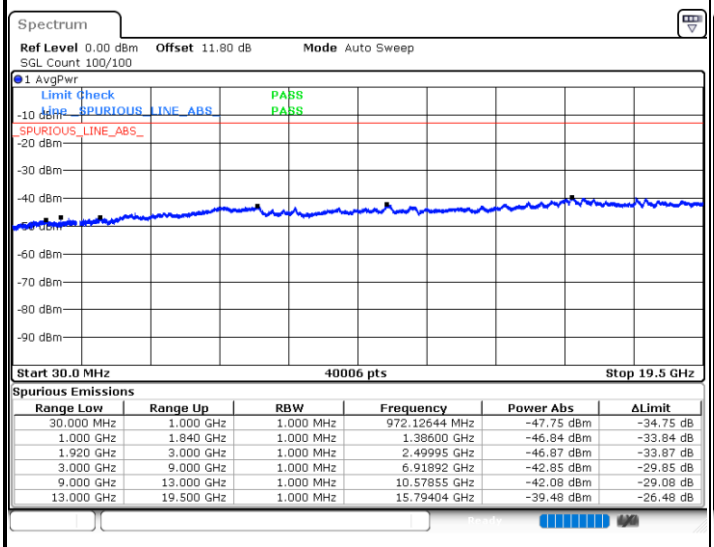
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	945.94953 MHz	-47.49 dBm	-34.49 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61856 GHz	-46.84 dBm	-33.84 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.96959 GHz	-46.71 dBm	-33.71 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.97792 GHz	-42.87 dBm	-29.87 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.57455 GHz	-42.22 dBm	-29.22 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.80403 GHz	-39.38 dBm	-26.38 dB

Date: 13.MAY.2021 14:05:20

LTE Band 2 / 15MHz

Lowest Channel / QPSK

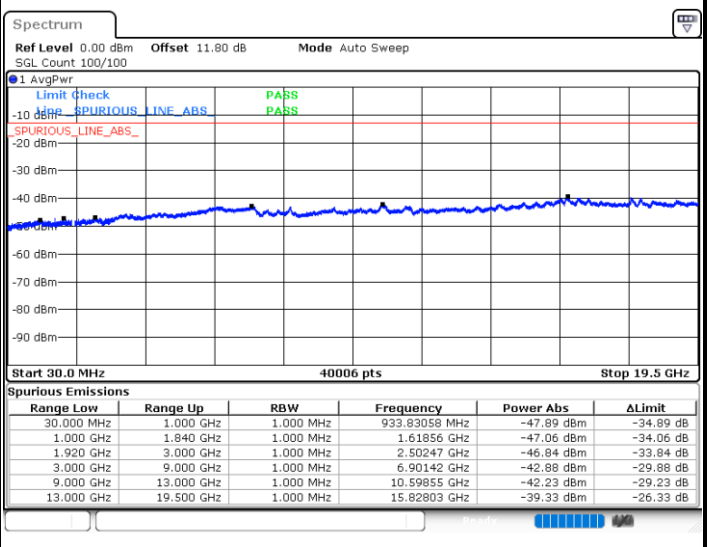


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	972.12644 MHz	-47.75 dBm	-34.75 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.38600 GHz	-46.84 dBm	-33.84 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.49995 GHz	-46.87 dBm	-33.87 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.91892 GHz	-42.85 dBm	-29.85 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.57855 GHz	-42.08 dBm	-29.08 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.79404 GHz	-39.48 dBm	-26.48 dB

Date: 13.MAY.2021 14:13:09

Middle Channel / QPSK

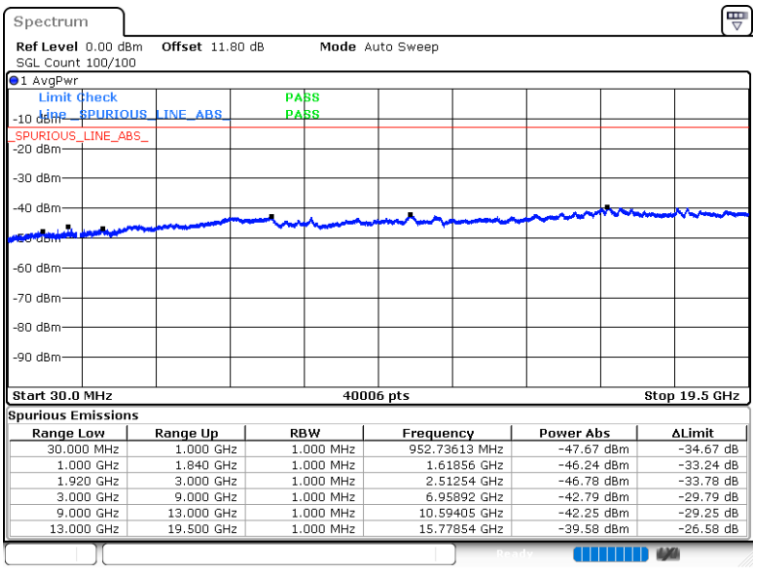


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	933.83058 MHz	-47.89 dBm	-34.89 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61856 GHz	-47.06 dBm	-34.06 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.50247 GHz	-46.84 dBm	-33.84 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.90142 GHz	-42.88 dBm	-29.88 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.59855 GHz	-42.23 dBm	-29.23 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.82803 GHz	-39.33 dBm	-26.33 dB

Date: 13.MAY.2021 14:10:23

Highest Channel / QPSK



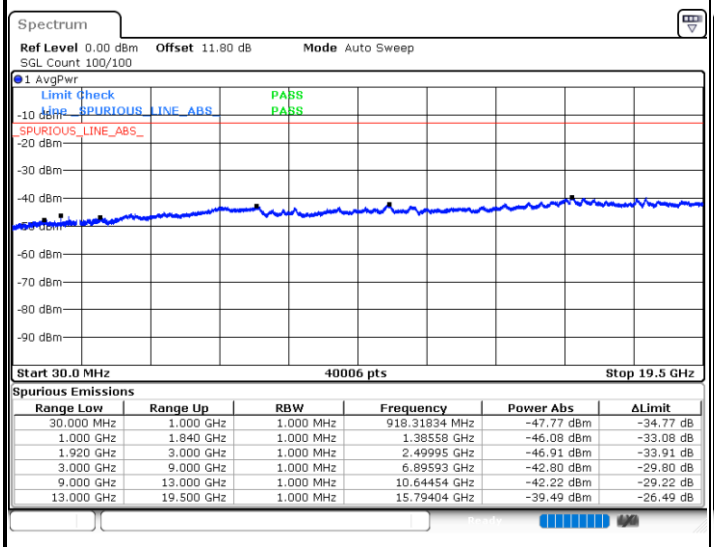
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	952.73613 MHz	-47.67 dBm	-34.67 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61856 GHz	-46.24 dBm	-33.24 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.51254 GHz	-46.78 dBm	-33.78 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.95892 GHz	-42.79 dBm	-29.79 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.59405 GHz	-42.25 dBm	-29.25 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.77854 GHz	-39.58 dBm	-26.58 dB

Date: 13.MAY.2021 14:14:02

LTE Band 2 / 20MHz

Lowest Channel / QPSK

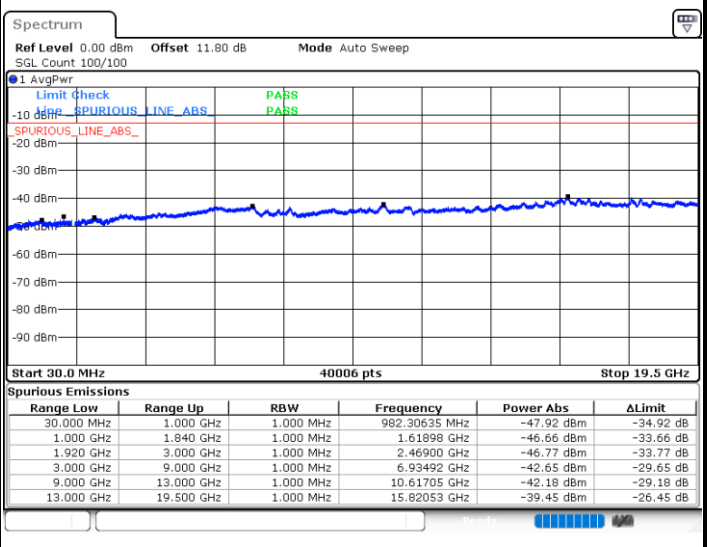


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	918.31834 MHz	-47.77 dBm	-34.77 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.38558 GHz	-46.08 dBm	-33.08 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.49995 GHz	-46.91 dBm	-33.91 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.89593 GHz	-42.80 dBm	-29.80 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.64454 GHz	-42.22 dBm	-29.22 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.79404 GHz	-39.49 dBm	-26.49 dB

Date: 13.MAY.2021 14:25:26

Middle Channel / QPSK

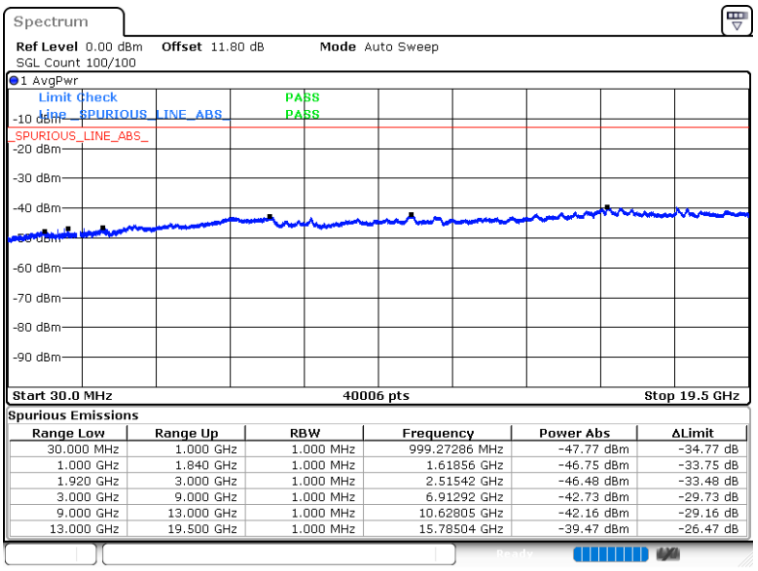


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	982.30635 MHz	-47.92 dBm	-34.92 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61898 GHz	-46.66 dBm	-33.66 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.46900 GHz	-46.77 dBm	-33.77 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.93492 GHz	-42.65 dBm	-29.65 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.61705 GHz	-42.18 dBm	-29.18 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.82053 GHz	-39.45 dBm	-26.45 dB

Date: 13.MAY.2021 14:17:33

Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	999.27286 MHz	-47.77 dBm	-34.77 dB
1.000 GHz	1.840 GHz	1.000 MHz	1.61856 GHz	-46.75 dBm	-33.75 dB
1.920 GHz	3.000 GHz	1.000 MHz	2.51542 GHz	-46.48 dBm	-33.48 dB
3.000 GHz	9.000 GHz	1.000 MHz	6.91292 GHz	-42.73 dBm	-29.73 dB
9.000 GHz	13.000 GHz	1.000 MHz	10.62805 GHz	-42.16 dBm	-29.16 dB
13.000 GHz	19.500 GHz	1.000 MHz	15.78504 GHz	-39.47 dBm	-26.47 dB

Date: 13.MAY.2021 14:26:30

Frequency Stability

Test Conditions		LTE Band 2 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0111	PASS
40	Normal Voltage	0.0117	
30	Normal Voltage	0.0003	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0005	
0	Normal Voltage	0.0009	
-10	Normal Voltage	0.0114	
-20	Normal Voltage	0.0107	
-30	Normal Voltage	0.0118	
20	Maximum Voltage	0.0107	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0110	

Note:

1. Normal Voltage =3.85 V.；Battery End Point (BEP) =3.5 V.；Maximum Voltage =4.35 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of Radiated Test

LTE Band 2

LTE Band 2 / 20MHz / 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	3701	-45.81	-13	-32.81	-63.93	-57.02	1.41	12.62	H
	5553	-49.22	-13	-36.22	-72.31	-60.78	1.74	13.30	H
	7404	-38.55	-13	-25.55	-64.96	-47.87	1.94	11.25	H
									H
									H
									H
									H
	3701	-48.47	-13	-35.47	-66.79	-59.68	1.41	12.62	V
	5553	-45.99	-13	-32.99	-68.74	-57.55	1.74	13.30	V
	7404	-37.23	-13	-24.23	-63.6	-46.55	1.94	11.25	V
									V
									V
									V
									V
Middle	3744	-47.14	-13	-34.14	-65.26	-58.36	1.42	12.65	H
	5616	-48.38	-13	-35.38	-71.47	-59.94	1.74	13.30	H
	7488	-40.16	-13	-27.16	-66.57	-49.30	1.98	11.12	H
									H
									H
									H
	3744	-49.86	-13	-36.86	-68.18	-61.08	1.42	12.65	V
	5616	-46.29	-13	-33.29	-69.04	-57.85	1.74	13.30	V
	7488	-35.59	-13	-22.59	-61.96	-44.73	1.98	11.12	V
									V
									V
									V

Highest	3784	-45.48	-13	-32.48	-63.78	-55.69	2.02	12.23	H
	5674	-48.48	-13	-35.48	-71.89	-58.81	2.11	12.44	H
	7564	-39.34	-13	-26.34	-65.37	-47.46	2.11	10.23	H
									H
									H
									H
									H
	3784	-48.28	-13	-35.28	-66.81	-58.49	2.02	12.23	V
	5674	-44.53	-13	-31.53	-67.44	-54.86	2.11	12.44	V
	7564	-34.54	-13	-21.54	-60.52	-42.66	2.11	10.23	V
									V
									V
									V
									V

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

———THE END———