FCC RADIO TEST REPORT

FCC ID	:	**2ABVH-INARI8B2**
Equipment	:	**Tablet**
Brand Name	:	**AAVA**
Model Name	:	**INARI8B-LTG-1**
Applicant	:	**Aava Mobile Oy** **NAHKATEHTAANKATU 2 90130 OULU FINLAND**
Manufacturer	:	**Aava Mobile Oy** **NAHKATEHTAANKATU 2 90130 OULU FINLAND**
Standard	:	**FCC 47 CFR Part 2, Part 27(D)**

The product was received on Sep. 06, 2018 and testing was started from Oct. 07, 2018 and completed on Dec. 20, 2018. 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.

Jones Tsai

Approved by: Jones Tsai

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

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History of this test report

Report No.	Version	Description	Issued Date
FG890633D	01	Initial issue of report	Jan. 08, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power and Effective Isotropic Radiated Power	Reporting only	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§27.50 (a)(3)	EIRP Power Density	Pass	-
3.5	§2.1049	Occupied Bandwidth	Reporting only	-
3.6	§2.1051 §27.53 (a)(4)	Conducted Band Edge Measurement	Pass	-
3.7	§2.1051 §27.53 (a)(4)	Conducted Spurious Emission	Pass	-
3.8	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Pass	-
4.4	§2.1053 §27.53 (a)(4)	Radiated Spurious Emission	Pass	Under limit 0.34 dB at 13851.000 MHz

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Tablet
Brand Name	AAVA
Model Name	INARI8B-LTG-1
FCC ID	2ABVH-INARI8B2
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	DV1
SW Version	Windows 10
EUT Stage	Identical Prototype

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

Specification of Accessories				
AC Adapter	**Brand Name**	PHIHONG	**Model Name**	AQ18A-59CFA
Battery	**Brand Name**	Aava	**Model Name**	AMME3735
USB Cable	**Brand Name**	PHIHONG	**Model Name**	UES-1001A160-R

1.2 Product Specification of Equipment Under Test

Product Feature	
Tx Frequency	LTE Band 30 : 2305 MHz ~ 2315 MHz
Rx Frequency	LTE Band 30 : 2350 MHz ~ 2360 MHz
Bandwidth	5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 30 : 23.57 dBm
Antenna Type	Flexible Antenna
Antenna Gain	LTE Band 30 : 2.00 dBi
Type of Modulation	QPSK / 16QAM

1.3 Modification of EUT

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

1.4 Maximum Conducted power, Frequency Tolerance and Emission Designator

LTE Band 30		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)
5	**2307.5 ~ 2312.5**	4M49G7D	-	0.3491	4M49W7D	-	0.2931
10	**2310.0**	8M99G7D	0.0075	0.3606	9M05W7D	-	0.3062

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH05-HY
Temperature	24~26℃
Relative Humidity	52~55%
Test Engineer	Aking Chang

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

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH12-HY
Temperature	22~26℃
Relative Humidity	56~67%
Test Engineer	Jack Cheng, Lance Chiang, and Peter Liao

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:

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

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

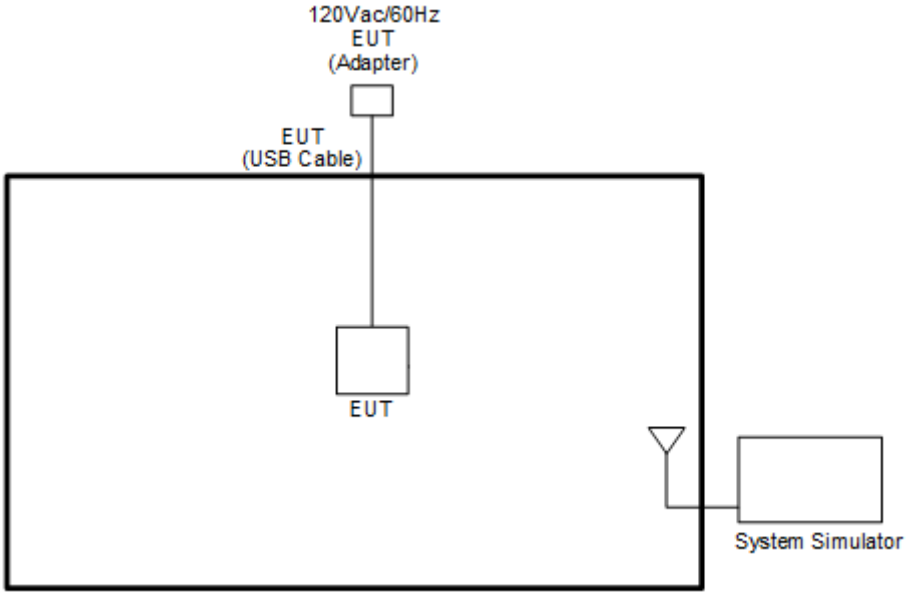
2.1 Test Mode

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

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

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	30	-	-	v	v	-	-	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	30	-	-		v	-	-	v	v	v		v		v	
E.I.R.P PSD	30	-	-	v	v	-	-	v	v	v		v	v	v	v
26dB and 99% Bandwidth	30	-	-	v	v	-	-	v	v			v	v	v	v
Conducted Band Edge	30	-	-	v	v	-	-	v	v	v		v	v		v
Conducted Spurious Emission	30	-	-	v	v	-	-	v	v	v			v	v	v
Frequency Stability	30	-	-		v	-	-	v				v		v	
Radiated Spurious Emission	30	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.														

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	MT8821C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

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

Example :

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

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 30 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	-	27710	-
	Frequency	-	2310	-
5	Channel	27685	27710	27735
	Frequency	2307.5	2310	2312.5

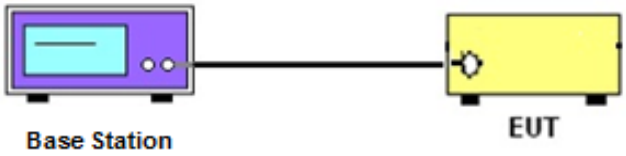
3 Conducted Test Items

3.1 Measuring Instruments

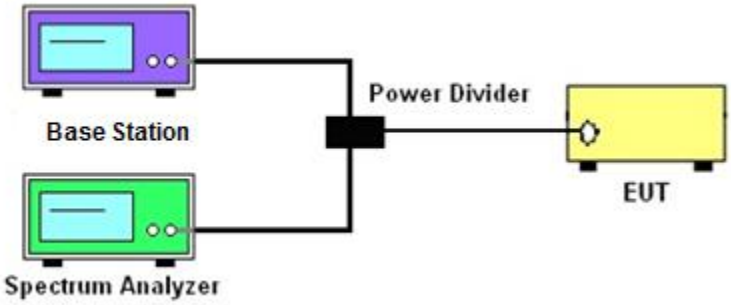
See list of measuring instruments of this test report.

3.1.1 Test Setup

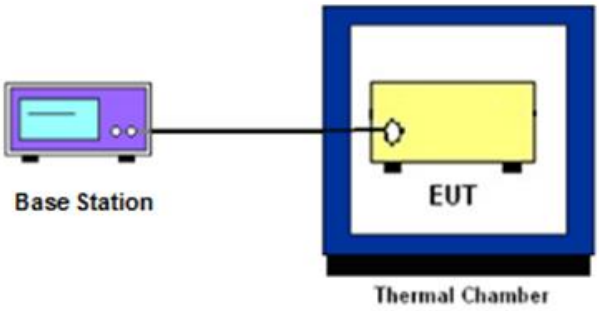
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, 26dB Bandwidth ,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 Measurement and EIRP Measurement

3.2.1 Description of the Conducted Output Power Measurement and EIRP Measurement

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

The EIRP of mobile transmitters must not exceed 0.25 Watts for LTE Band 30.

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 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 FCC KDB 971168 D01 v03r01 Section 5.7.1

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

3.4 EIRP Power Density

3.4.1 Description of EIRP Power Density

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

3.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.4

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 1.5 times the OBW.
3. Set the RBW to the specified reference bandwidth (5MHz).
4. Set VBW ≥ 3 × RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep ≥ 2 × span/RBW.
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

3.5 Occupied Bandwidth

3.5.1 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.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 4.1 and 4.2

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

3.6 Conducted Band Edge Measurement

3.6.1 Description of Conducted Band Edge Measurement

27.53 (a)(4)

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz.

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz.

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0

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

3.7 Conducted Spurious Emission Measurement

3.7.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 70 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10th harmonic.

3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

1. The EUT was connected to spectrum analyzer and 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 70 + 10log(P)dB below the transmitter power P(Watts)

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

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

3.8.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was set up in the thermal chamber and connected with the 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.

3.8.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the 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.

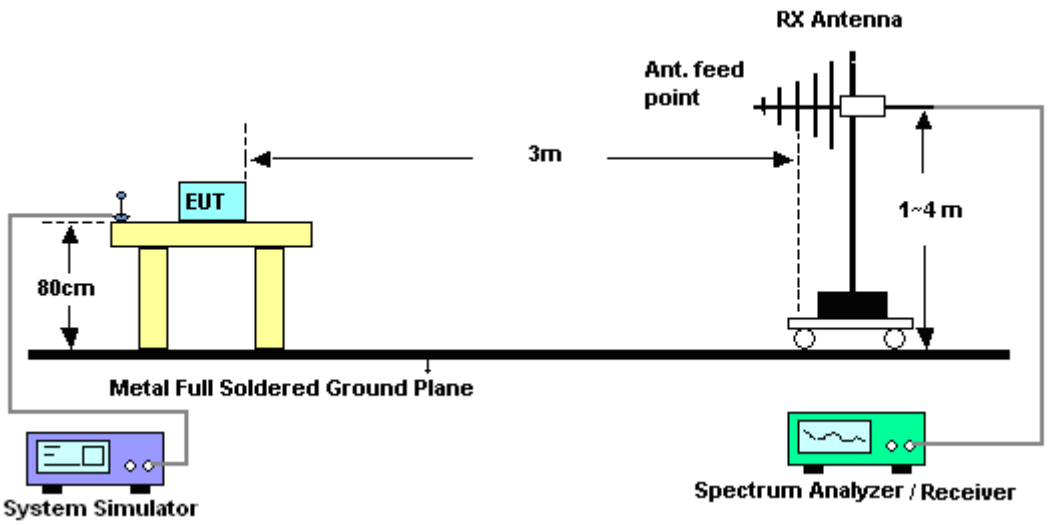
4 Radiated Test Items

4.1 Measuring Instruments

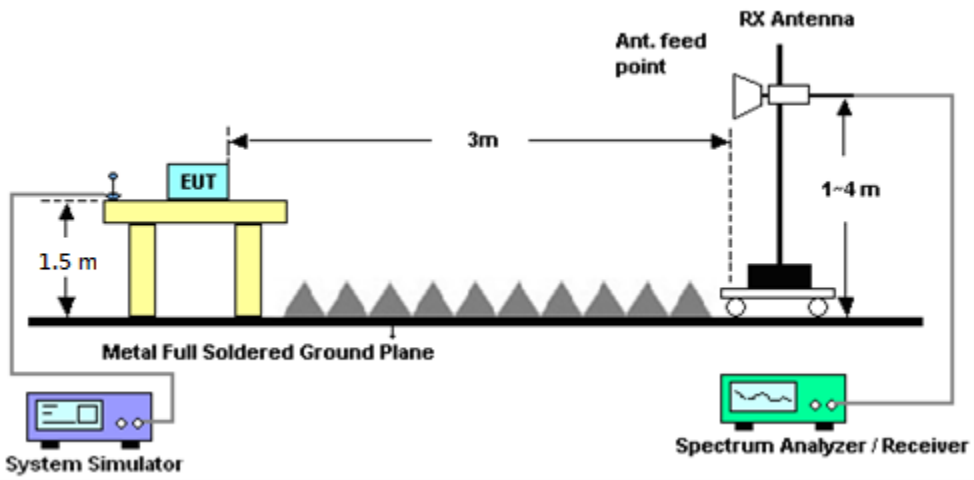
See list of measuring instruments of this test report.

4.2 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Radiated Spurious Emission Measurement

4.4.1 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 70 + 10 log (P) dB.

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

4.4.2 Test Procedures

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

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna 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 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, 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.
   EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
   ERP (dBm) = EIRP - 2.15
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
   The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [70 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [70 + 10log(P)] (dB)
   = -40dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Base Station(Measure)	Anritsu	MT8820C	6201026480	MIMO/LTE (FDD)/ IP Throughput	Dec. 20, 2017	Oct. 07, 2018 ~ Dec. 14, 2018	Dec. 19, 2018	Conducted (TH05-HY)
LTE Base Station	Anritsu	MT8820C	6201432821	GSM/GPRS /WCDMA/LTE	Oct. 14, 2018	Dec. 15, 2018 ~ Dec. 20, 2018	Oct. 13, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101408	10Hz~40GHz	Jul. 30, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Jul. 29, 2019	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃~90℃	Aug. 29, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Aug. 28, 2019	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Oct. 01, 2019	Conducted (TH05-HY)
Coupler	Woken	0.5-18G 10dB 30W	DOM5CIW3A1	0.5-18GHz	Feb. 21, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Feb. 20, 2019	Conducted (TH05-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Mar. 29, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 28, 2019	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	37059&01	30MHz~1GHz	Oct. 13, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1328	1GHz ~ 18GHz	Oct. 19, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 18, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	May 08, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 07, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 26, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 25, 2019	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY53270148	1GHz~26.5GHz	Jan. 15, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Jan. 14, 2019	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-303K	1710001800054002	1GHz~18GHz	Apr. 17, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Apr. 16, 2019	Radiation (03CH12-HY)
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	Aug. 24, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Aug. 23, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 25, 2017	Nov. 21, 2018 ~ Dec. 20, 2018	Dec. 24, 2018	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 15, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 14, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1522	1GHz ~ 18GHz	May 10, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 09, 2019	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May 21, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 20, 2019	Radiation (03CH12-HY)
Base Station	Anritsu	MT8821C	6201432816	GSM / GPRS /WCDMA / LTE FDD/TDD with 44) /LTE-3CC DLCA,2CC ULCA	May 02, 2017	Nov. 21, 2018 ~ Dec. 20, 2018	May 01, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2GHz Low Pass	Mar. 21, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 20, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCT2300/2500-20/40-10SSK	SN1	2300/2500	May 23, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 22, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 14, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 13, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 15, 2019	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Nov. 21, 2018 ~ Dec. 20, 2018	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Nov. 21, 2018 ~ Dec. 20, 2018	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Nov. 21, 2018 ~ Dec. 20, 2018	N/A	Radiation (03CH12-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))	3.36

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 30 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	-	**23.57**	-
10	1	25			23.35	
10	1	49			23.25	
10	25	0			21.52	
10	25	12			21.40	
10	25	25			21.30	
10	50	0			21.42	
10	1	0	16-QAM		22.86	
10	1	25			22.58	
10	1	49			22.55	
10	25	0			20.46	
10	25	12			20.40	
10	25	25			20.28	
10	50	0			20.40	
5	1	0	QPSK	23.34	23.43	23.41
5	1	12		23.32	23.33	23.23
5	1	24		23.30	23.34	23.26
5	12	0		21.38	21.39	21.33
5	12	7		21.43	21.37	21.30
5	12	13		21.38	21.27	21.30
5	25	0		21.32	21.34	21.26
5	1	0	16-QAM	22.62	22.67	22.63
5	1	12		22.57	22.59	22.48
5	1	24		22.49	22.52	22.47
5	12	0		20.40	20.41	20.37
5	12	7		20.44	20.37	20.29
5	12	13		20.39	20.30	20.31
5	25	0		20.32	20.34	20.30

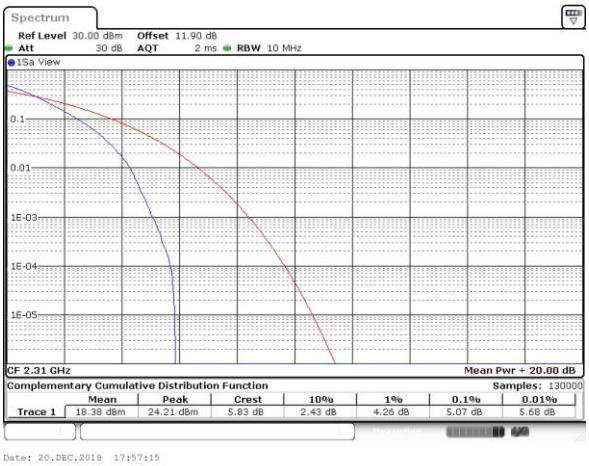
LTE Band 30

Peak-to-Average Ratio

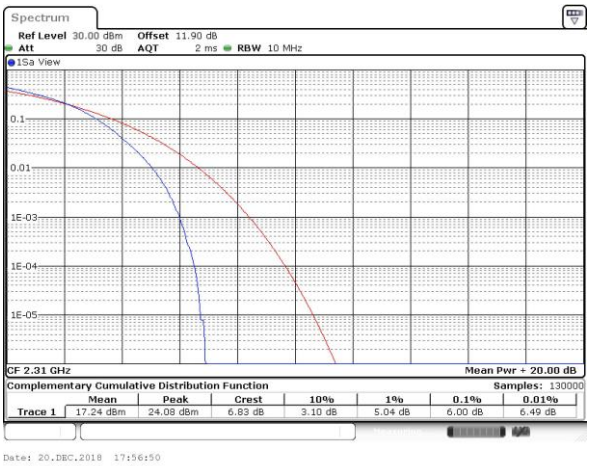
Mode	LTE Band 30 / 10MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	-	-	-	-	PASS
Middle CH	4.84	5.07	6.03	6	
Highest CH	-	-	-	-	

LTE Band 30 / 10MHz / QPSK

Middle Channel / 1RB

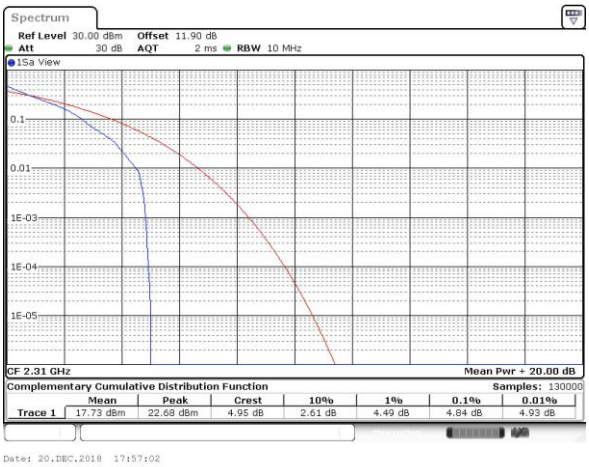


Middle Channel / Full RB

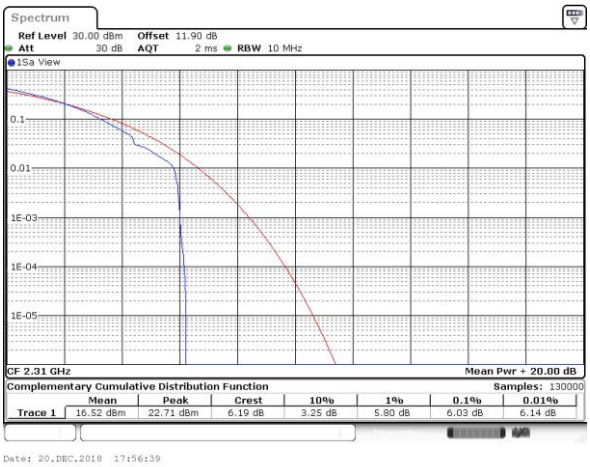


LTE Band 30 / 10MHz / 16QAM

Middle Channel / 1RB



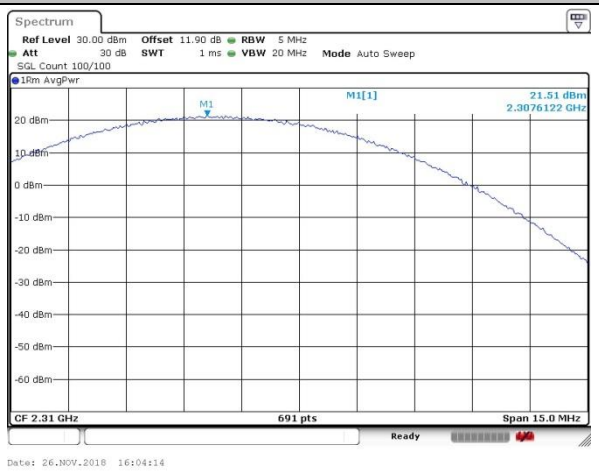
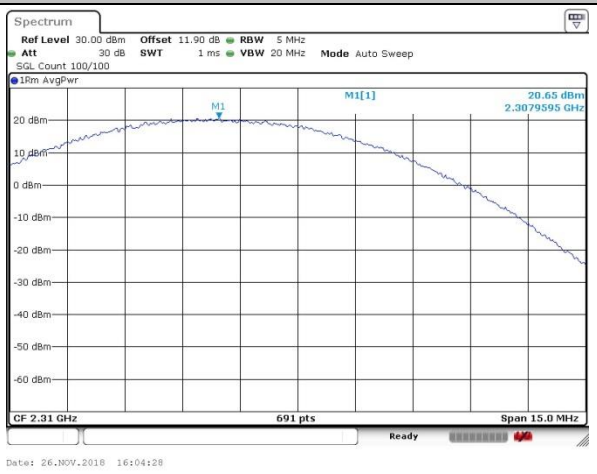
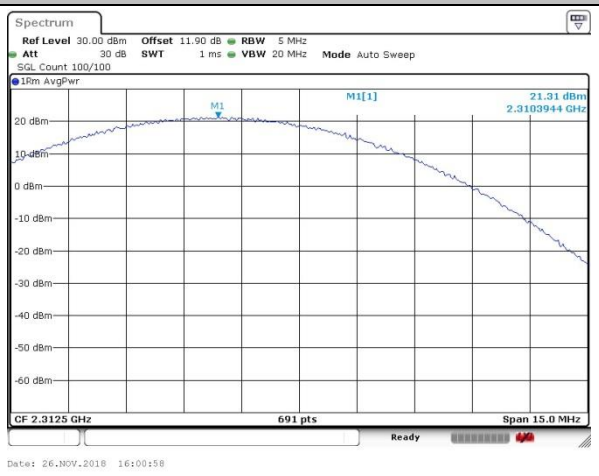
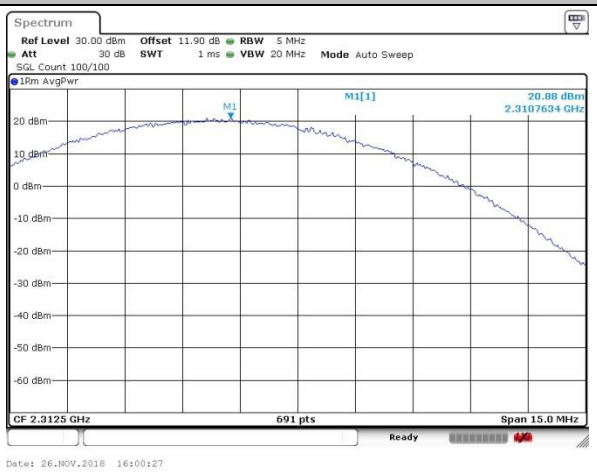
Middle Channel / Full RB



EIRP Power Density

Mode	LTE Band 30 : Conducted Power Density (dBm/5MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	21.32	20.36	-	-	-	-	-	-
Middle CH	-	-	-	-	21.51	20.65	21.48	20.57	-	-	-	-
Highest CH	-	-	-	-	21.32	20.88	-	-	-	-	-	-

Mode	LTE Band 30 : EIRP Power Density (dBm/5MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	23.32	22.36	-	-	-	-	-	-
Middle CH	-	-	-	-	23.51	22.65	23.48	22.57	-	-	-	-
Highest CH	-	-	-	-	23.32	22.88	-	-	-	-	-	-
Antenna Gain	2.0 dBi											
Limit	250mW / 5MHz = 24dBm / 5MHz											
Result	Pass											

LTE Band 30 / 5MHz	
Lowest Channel / 5MHz / 1RB0 / QPSK	**Lowest Channel / 5MHz / 1RB0 / 16QAM**
Middle Channel / 5MHz / 1RB0 / QPSK	**Middle Channel / 5MHz / 1RBmax / 16QAM**
	
Highest Channel / 5MHz / Full RB / QPSK	**Highest Channel / 5MHz / Full RB / 16QAM**
	

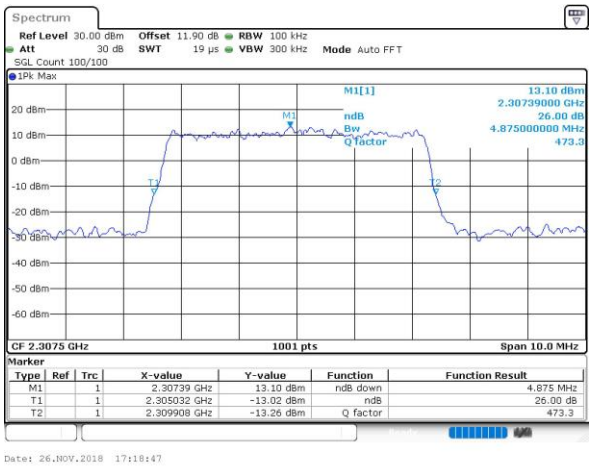
LTE Band 30 / 10MHz	
Lowest Channel / 10MHz / 1RB0 / QPSK	**Lowest Channel / 10MHz / 1RB0 / 16QAM**

26dB Bandwidth

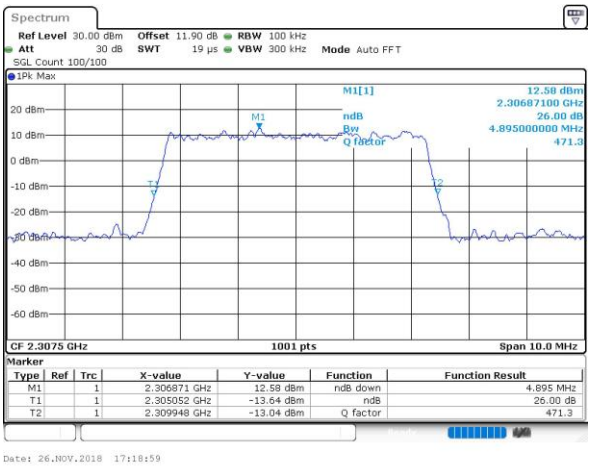
Mode	LTE Band 30 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.88	4.90	-	-	-	-	-	-
Middle CH	-	-	-	-	4.92	4.88	9.75	9.69	-	-	-	-
Highest CH	-	-	-	-	4.94	4.90	-	-	-	-	-	-

LTE Band 30

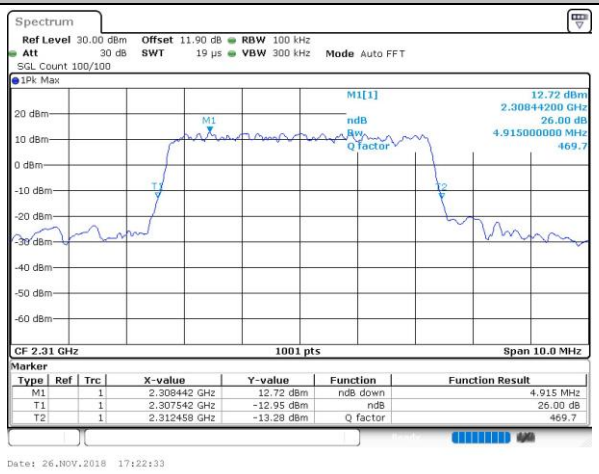
Lowest Channel / 5MHz / QPSK



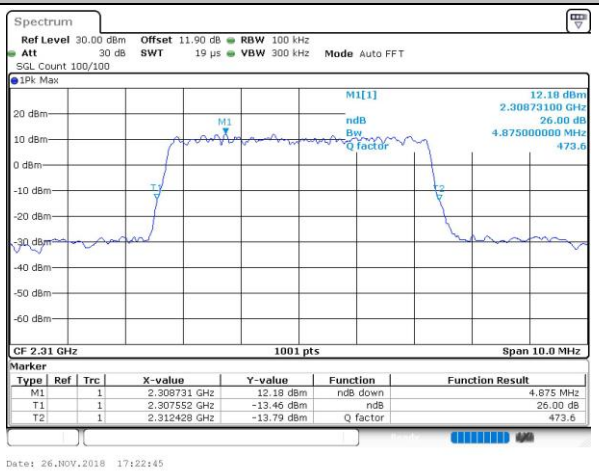
Lowest Channel / 5MHz / 16QAM



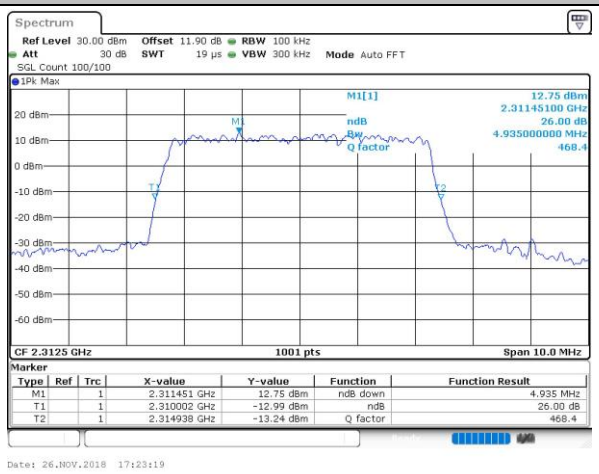
Middle Channel / 5MHz / QPSK



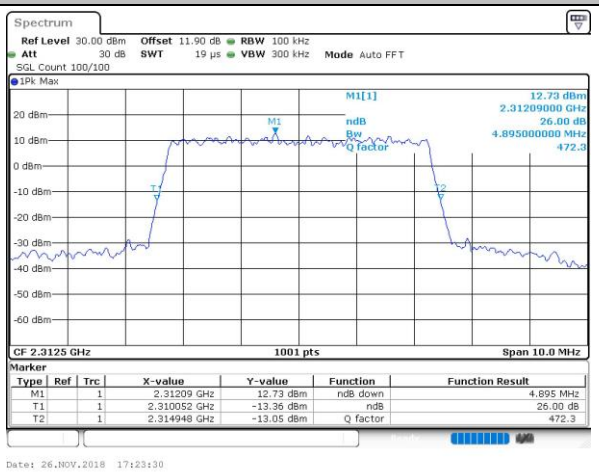
Middle Channel / 5MHz / 16QAM

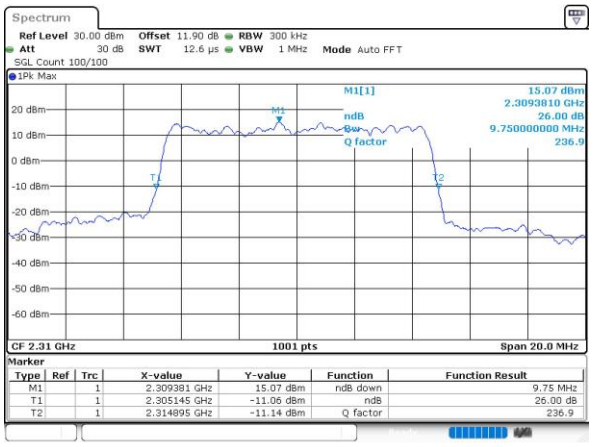
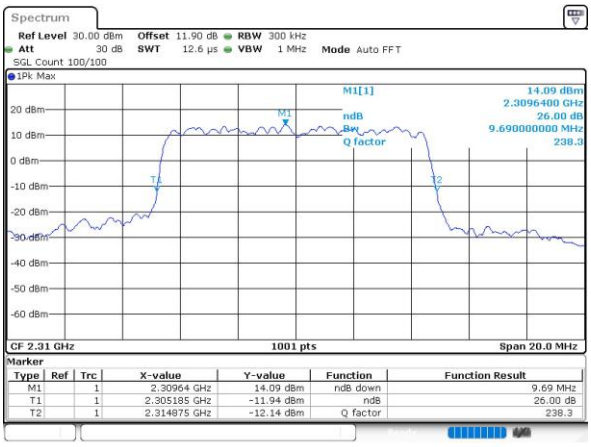


Highest Channel / 5MHz / QPSK



Highest Channel / 5MHz / 16QAM



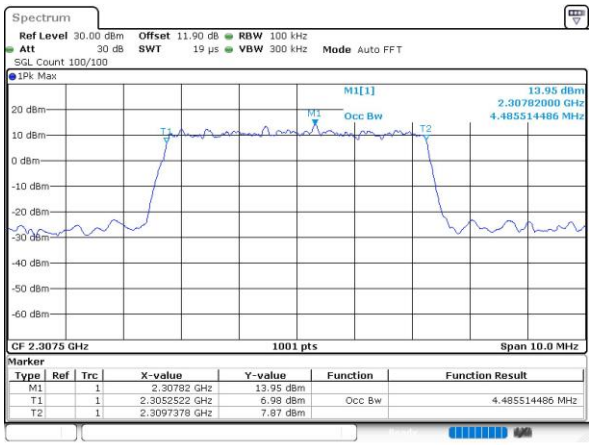
LTE Band 30	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	

Occupied Bandwidth

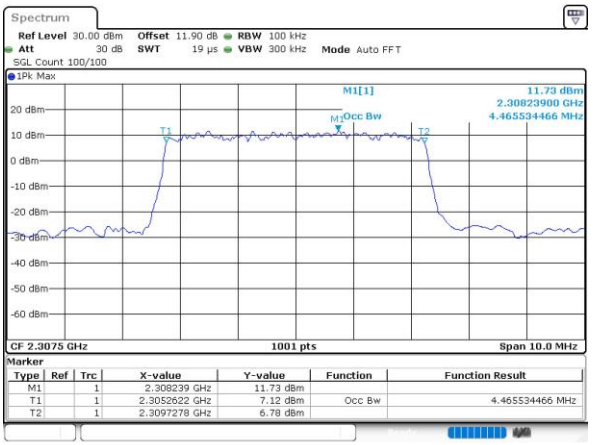
Mode	LTE Band 30 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.49	4.47	-	-	-	-	-	-
Middle CH	-	-	-	-	4.49	4.49	8.99	9.05	-	-	-	-
Highest CH	-	-	-	-	4.48	4.49	-	-	-	-	-	-

LTE Band 30

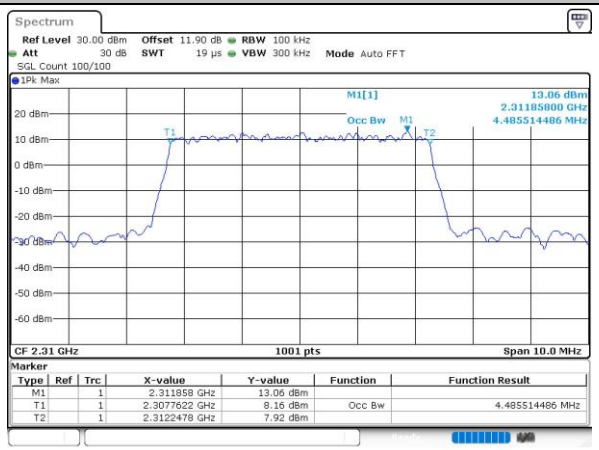
Lowest Channel / 5MHz / QPSK



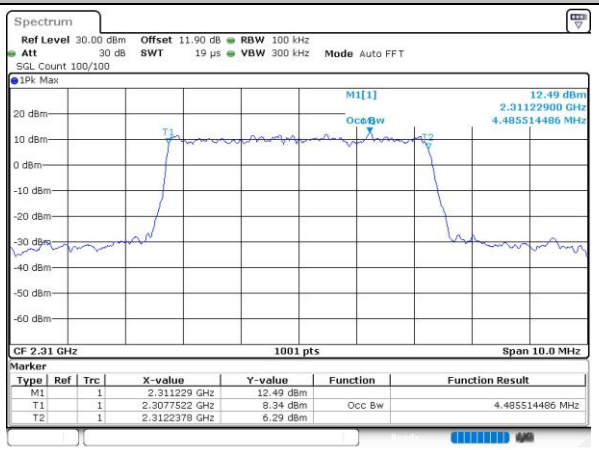
Lowest Channel / 5MHz / 16QAM



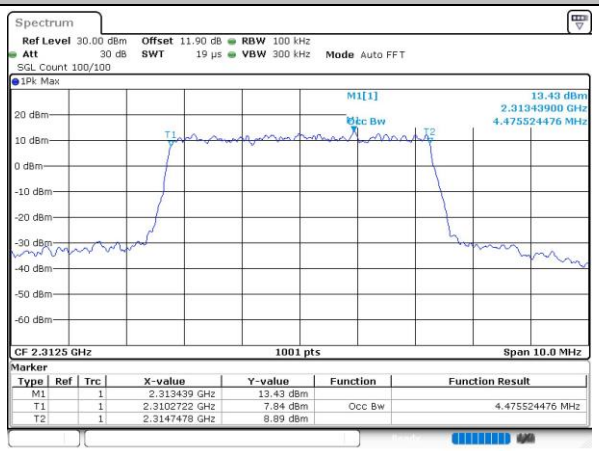
Middle Channel / 5MHz / QPSK



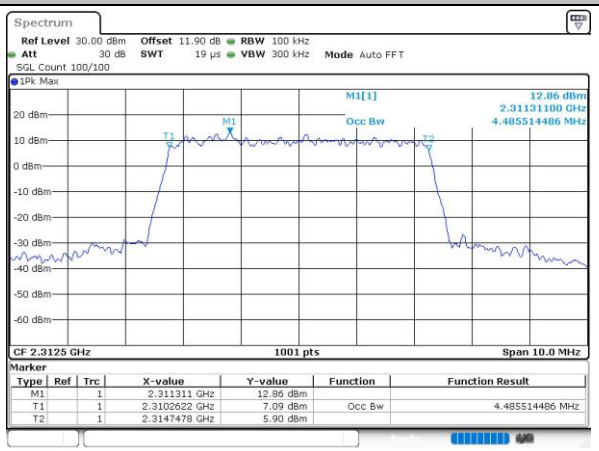
Middle Channel / 5MHz / 16QAM

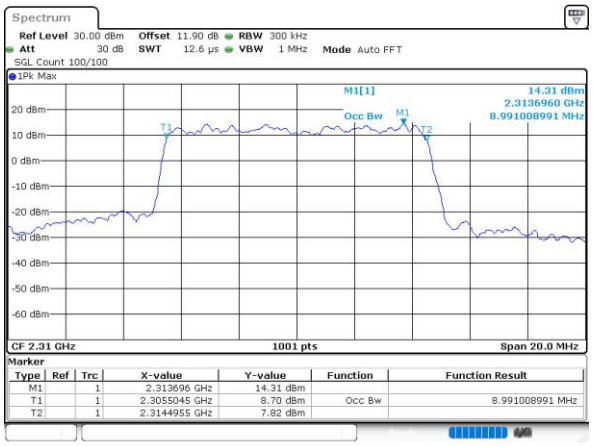
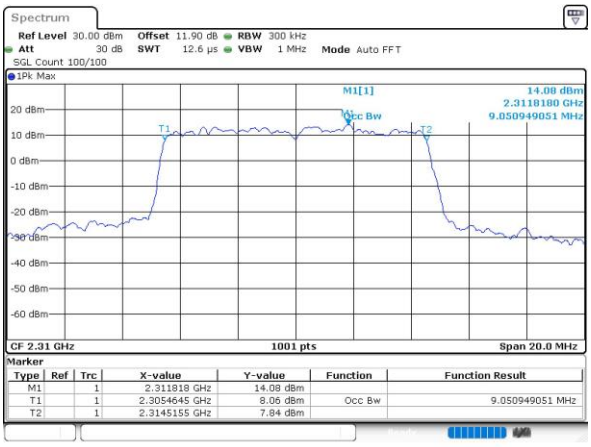


Highest Channel / 5MHz / QPSK



Highest Channel / 5MHz / 16QAM

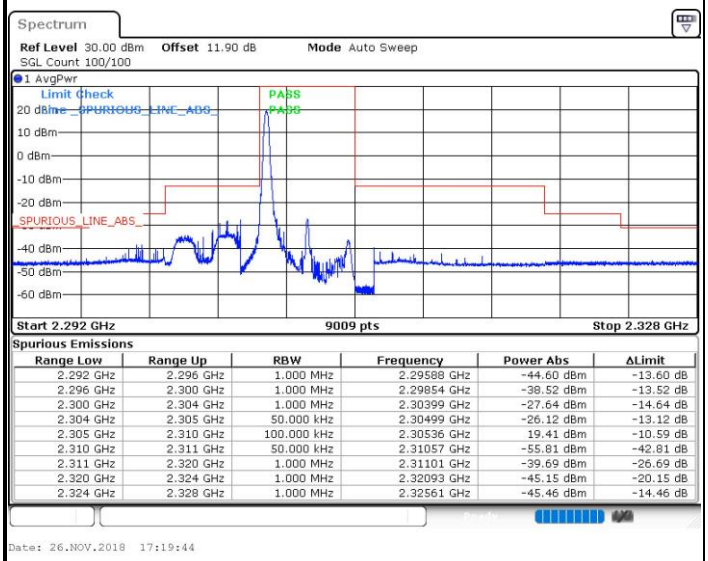


LTE Band 30	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	

Conducted Band Edge

LTE Band 30 / 5MHz / QPSK

Lowest Band Edge / 1 RB

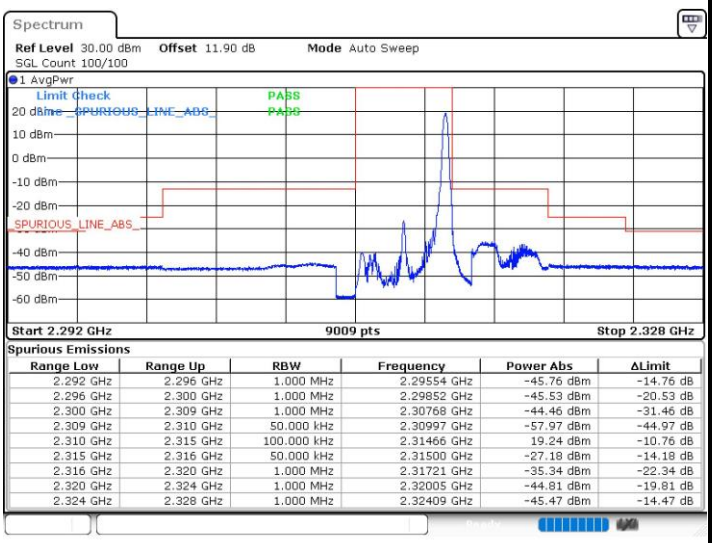


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29588 GHz	-44.60 dBm	-13.60 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29854 GHz	-38.52 dBm	-13.52 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30399 GHz	-27.64 dBm	-14.64 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30499 GHz	-26.12 dBm	-13.12 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30536 GHz	19.41 dBm	-10.59 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31057 GHz	-55.81 dBm	-42.81 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31101 GHz	-39.69 dBm	-26.69 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32093 GHz	-45.15 dBm	-20.15 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32561 GHz	-45.46 dBm	-14.46 dB

Date: 26.NOV.2018 17:19:44

Highest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29554 GHz	-45.76 dBm	-14.76 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29852 GHz	-45.53 dBm	-20.53 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30768 GHz	-44.46 dBm	-31.46 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30997 GHz	-57.97 dBm	-44.97 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31466 GHz	19.24 dBm	-10.76 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-27.18 dBm	-14.18 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31721 GHz	-35.34 dBm	-22.34 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32005 GHz	-44.81 dBm	-19.81 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32409 GHz	-45.47 dBm	-14.47 dB

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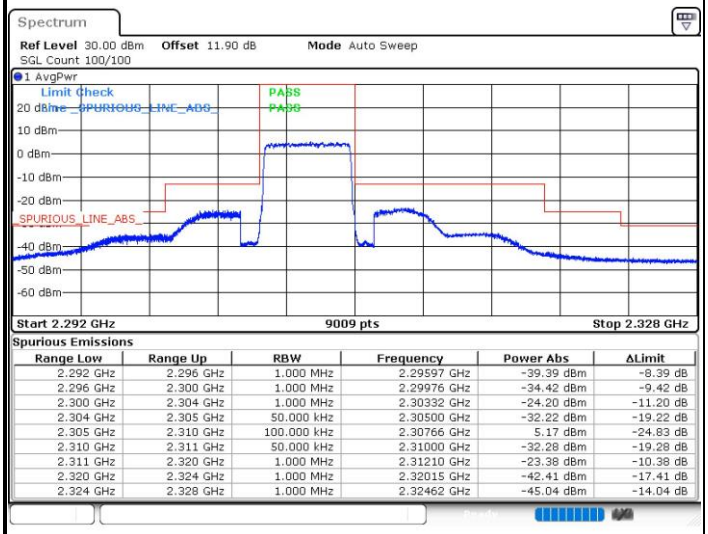
Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29597 GHz	-39.39 dBm	-8.39 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29976 GHz	-34.42 dBm	-9.42 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30332 GHz	-24.20 dBm	-11.20 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30500 GHz	-32.22 dBm	-19.22 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30766 GHz	5.17 dBm	-24.83 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31000 GHz	-32.28 dBm	-19.28 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31210 GHz	-23.38 dBm	-10.38 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32015 GHz	-42.41 dBm	-17.41 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32462 GHz	-45.04 dBm	-14.04 dB

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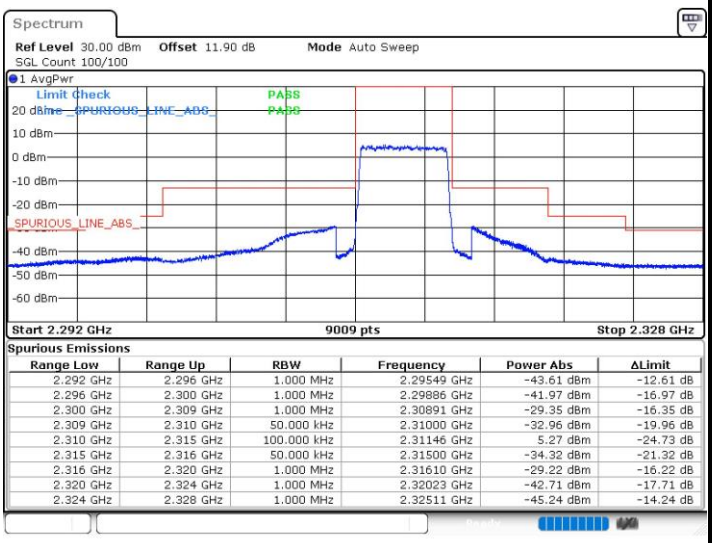
Highest Band Edge / Full RB



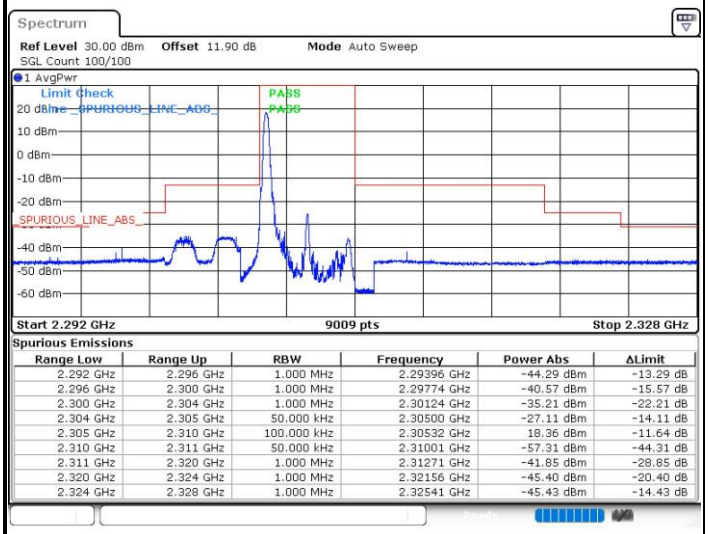
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29549 GHz	-43.61 dBm	-12.61 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29886 GHz	-41.97 dBm	-16.97 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30891 GHz	-29.35 dBm	-16.35 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.31000 GHz	-32.96 dBm	-19.96 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31146 GHz	5.27 dBm	-24.73 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-34.32 dBm	-21.32 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31610 GHz	-29.22 dBm	-16.22 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32023 GHz	-42.71 dBm	-17.71 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32511 GHz	-45.24 dBm	-14.24 dB

Date: 26.NOV.2018 17:25:45

LTE Band 30 / 5MHz / 16QAM

Lowest Band Edge / 1RB

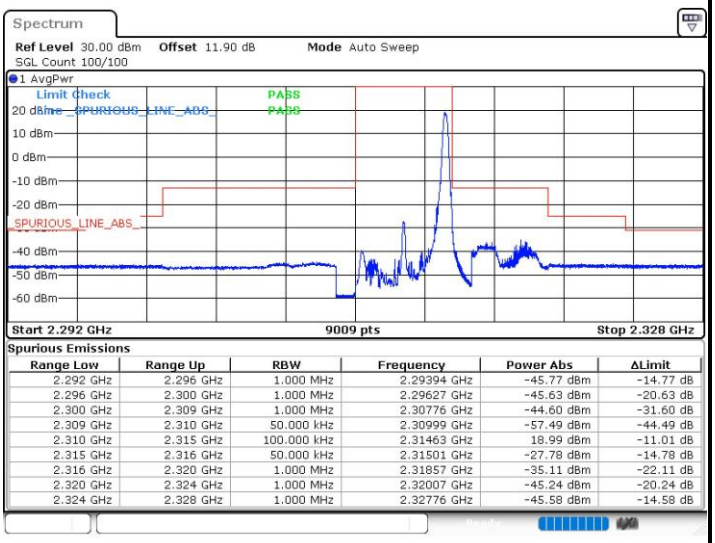


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29396 GHz	-44.29 dBm	-13.29 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29774 GHz	-40.57 dBm	-15.57 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30124 GHz	-35.21 dBm	-22.21 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30500 GHz	-27.11 dBm	-14.11 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30532 GHz	18.36 dBm	-11.64 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31001 GHz	-57.31 dBm	-44.31 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31271 GHz	-41.85 dBm	-28.85 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32156 GHz	-45.40 dBm	-20.40 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32541 GHz	-45.43 dBm	-14.43 dB

Date: 26.NOV.2018 17:20:29

Highest Band Edge / 1 RB

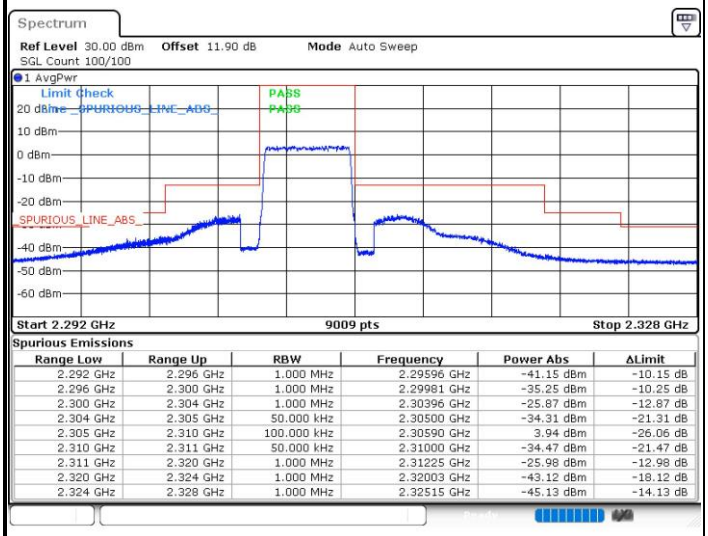


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29394 GHz	-45.77 dBm	-14.77 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29627 GHz	-45.63 dBm	-20.63 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30776 GHz	-44.60 dBm	-31.60 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30999 GHz	-57.49 dBm	-44.49 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31463 GHz	18.99 dBm	-11.01 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31501 GHz	-27.78 dBm	-14.78 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31857 GHz	-35.11 dBm	-22.11 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32007 GHz	-45.24 dBm	-20.24 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32776 GHz	-45.58 dBm	-14.58 dB

Date: 26.NOV.2018 17:25:00

Lowest Band Edge / Full RB

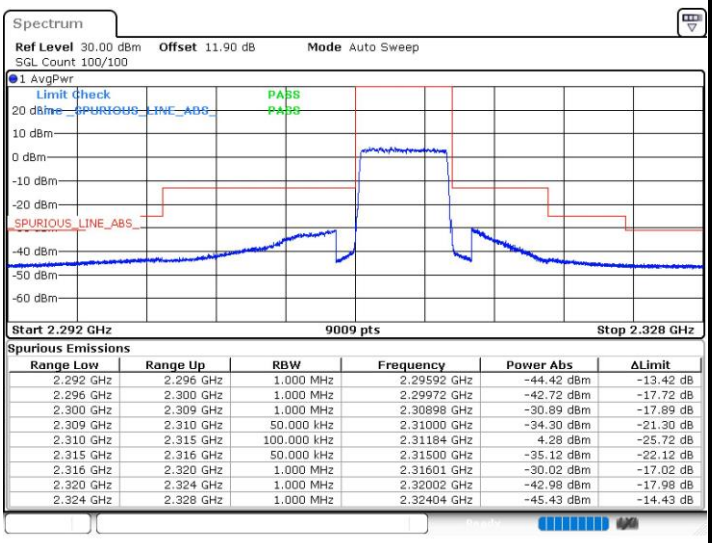


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29596 GHz	-41.15 dBm	-10.15 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29981 GHz	-35.25 dBm	-10.25 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30396 GHz	-25.87 dBm	-12.87 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30500 GHz	-34.31 dBm	-21.31 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30590 GHz	3.94 dBm	-26.06 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31000 GHz	-34.47 dBm	-21.47 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31225 GHz	-25.98 dBm	-12.98 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32003 GHz	-43.12 dBm	-18.12 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32515 GHz	-45.13 dBm	-14.13 dB

Date: 26.NOV.2018 17:21:59

Highest Band Edge / Full RB



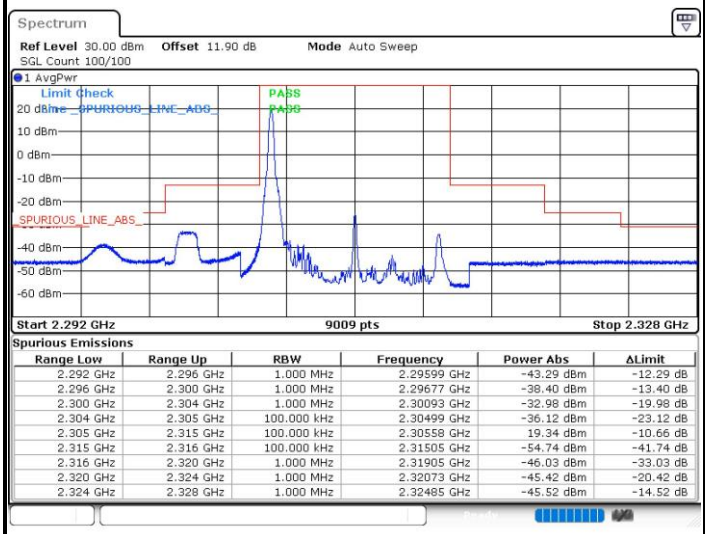
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29592 GHz	-44.42 dBm	-13.42 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29972 GHz	-42.72 dBm	-17.72 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30898 GHz	-30.89 dBm	-17.89 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.31000 GHz	-34.30 dBm	-21.30 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31184 GHz	4.28 dBm	-25.72 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-35.12 dBm	-22.12 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31601 GHz	-30.02 dBm	-17.02 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32002 GHz	-42.98 dBm	-17.98 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32404 GHz	-45.43 dBm	-14.43 dB

Date: 26.NOV.2018 17:26:30

LTE Band 30 / 10MHz / QPSK

Lowest Band Edge / 1 RB

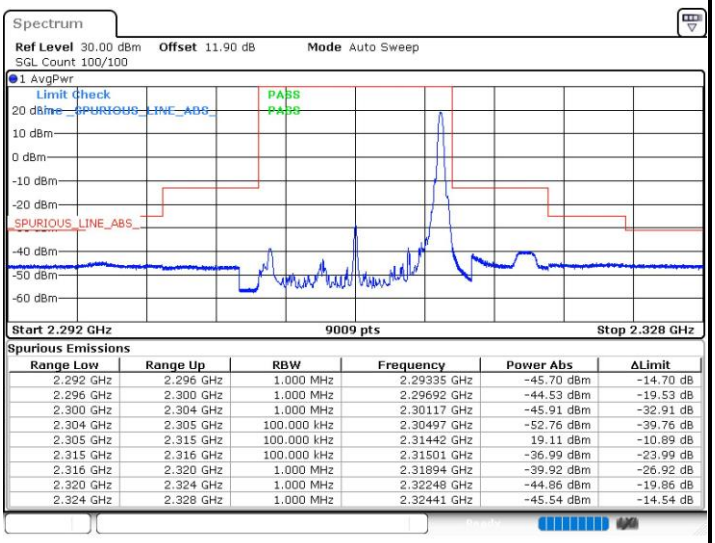


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29599 GHz	-43.29 dBm	-12.29 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29677 GHz	-38.40 dBm	-13.40 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30093 GHz	-32.98 dBm	-19.98 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30499 GHz	-36.12 dBm	-23.12 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30558 GHz	19.34 dBm	-10.66 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31505 GHz	-54.74 dBm	-41.74 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31905 GHz	-46.03 dBm	-33.03 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32073 GHz	-45.42 dBm	-20.42 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32485 GHz	-45.52 dBm	-14.52 dB

Date: 26.NOV.2018 17:28:00

Highest Band Edge / 1 RB

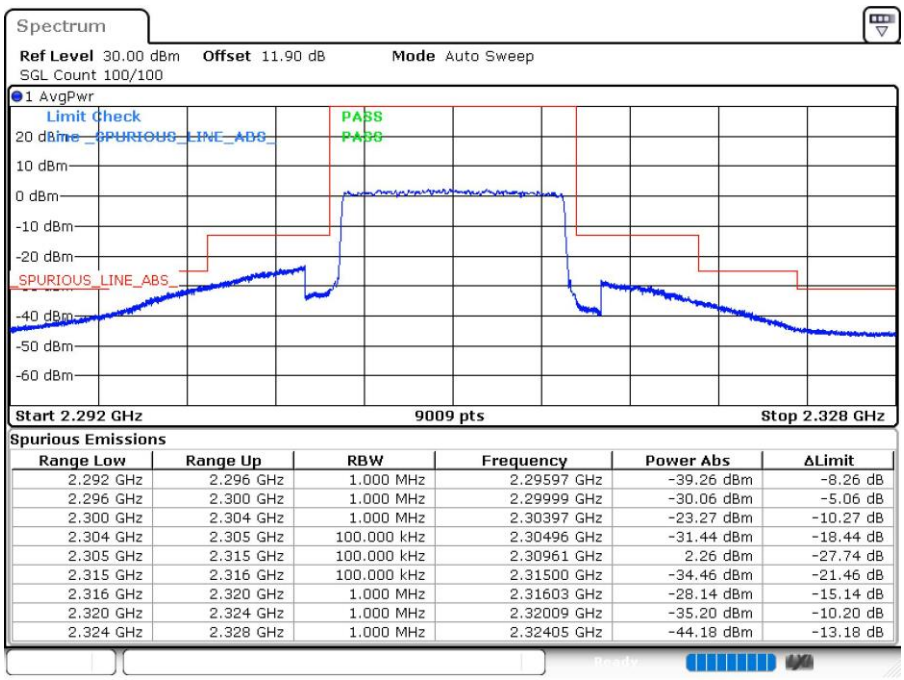


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29335 GHz	-45.70 dBm	-14.70 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29692 GHz	-44.53 dBm	-19.53 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30117 GHz	-45.91 dBm	-32.91 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30497 GHz	-52.76 dBm	-39.76 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31442 GHz	19.11 dBm	-10.89 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31501 GHz	-36.99 dBm	-23.99 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31894 GHz	-39.92 dBm	-26.92 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32248 GHz	-44.86 dBm	-19.86 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32441 GHz	-45.54 dBm	-14.54 dB

Date: 26.NOV.2018 17:29:31

Band Edge / Full RB



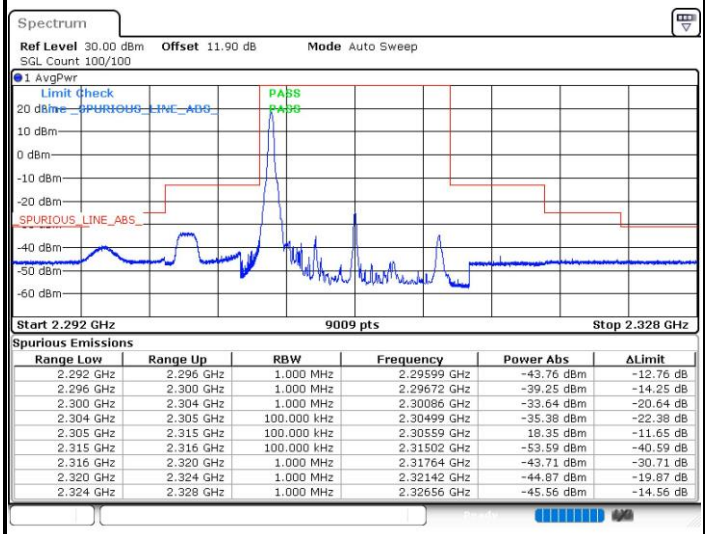
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29597 GHz	-39.26 dBm	-8.26 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29999 GHz	-30.06 dBm	-5.06 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30397 GHz	-23.27 dBm	-10.27 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30496 GHz	-31.44 dBm	-18.44 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30961 GHz	2.26 dBm	-27.74 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31500 GHz	-34.46 dBm	-21.46 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31603 GHz	-28.14 dBm	-15.14 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32009 GHz	-35.20 dBm	-10.20 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32405 GHz	-44.18 dBm	-13.18 dB

Date: 26.NOV.2018 17:31:01

LTE Band 30 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

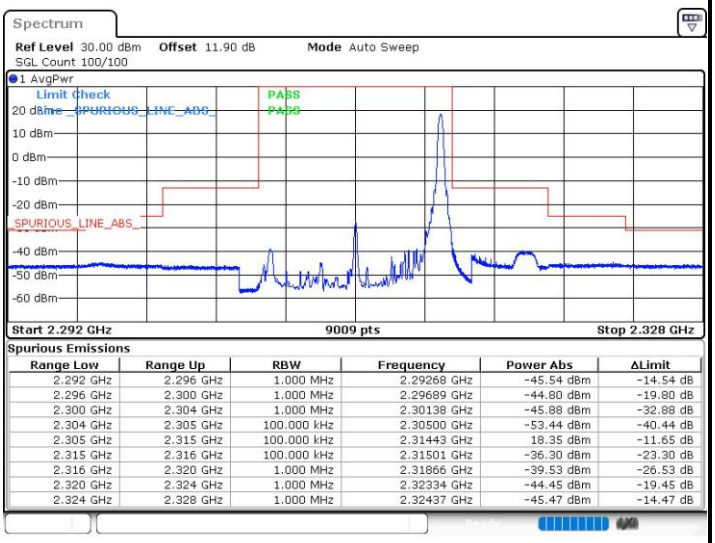


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29599 GHz	-43.76 dBm	-12.76 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29672 GHz	-39.25 dBm	-14.25 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30086 GHz	-33.64 dBm	-20.64 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30499 GHz	-35.38 dBm	-22.38 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30559 GHz	18.35 dBm	-11.65 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31502 GHz	-53.59 dBm	-40.59 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31764 GHz	-43.71 dBm	-30.71 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32142 GHz	-44.87 dBm	-19.87 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32656 GHz	-45.56 dBm	-14.56 dB

Date: 26.NOV.2018 17:28:46

Highest Band Edge / 1 RB

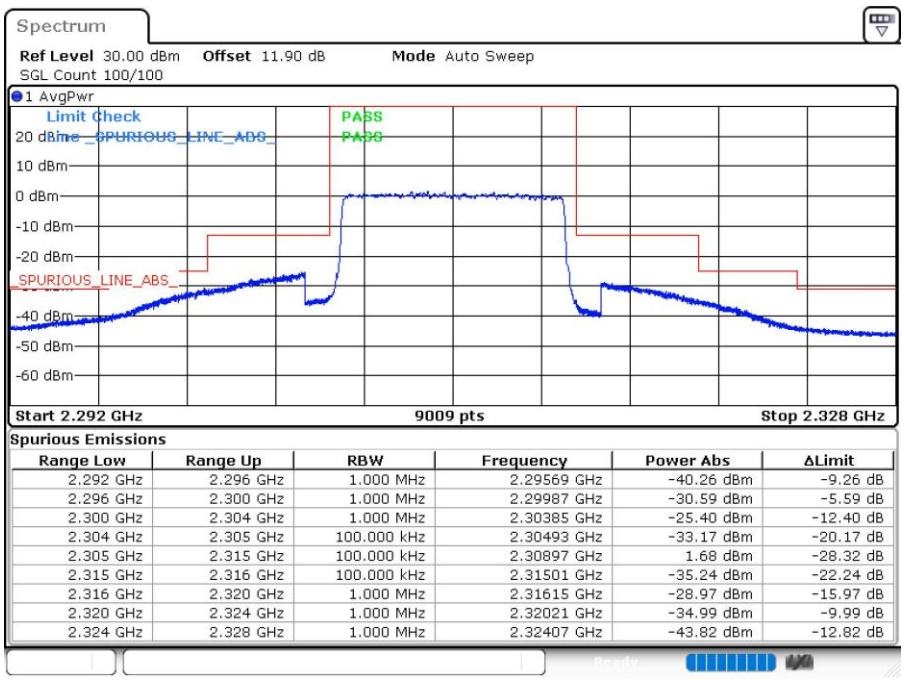


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29268 GHz	-45.54 dBm	-14.54 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29689 GHz	-44.80 dBm	-19.80 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30138 GHz	-45.88 dBm	-32.88 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30500 GHz	-53.44 dBm	-40.44 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31443 GHz	18.35 dBm	-11.65 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31501 GHz	-36.30 dBm	-23.30 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31866 GHz	-39.53 dBm	-26.53 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32334 GHz	-44.45 dBm	-19.45 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32437 GHz	-45.47 dBm	-14.47 dB

Date: 26.NOV.2018 17:30:16

Band Edge / Full RB



Spurious Emissions

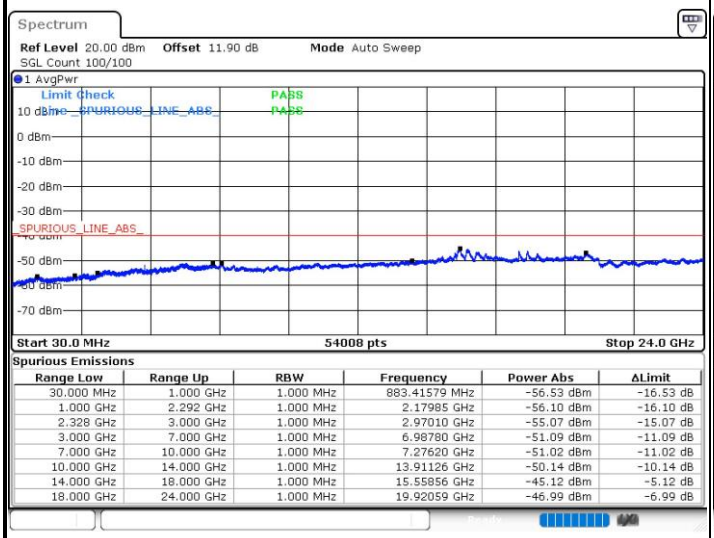
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29569 GHz	-40.26 dBm	-9.26 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29987 GHz	-30.59 dBm	-5.59 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30385 GHz	-25.40 dBm	-12.40 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30493 GHz	-33.17 dBm	-20.17 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30897 GHz	1.68 dBm	-28.32 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31501 GHz	-35.24 dBm	-22.24 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31615 GHz	-28.97 dBm	-15.97 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32021 GHz	-34.99 dBm	-9.99 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32407 GHz	-43.82 dBm	-12.82 dB

Date: 26.NOV.2018 17:31:46

Conducted Spurious Emission

LTE Band 30 / 5MHz

Lowest Channel / QPSK

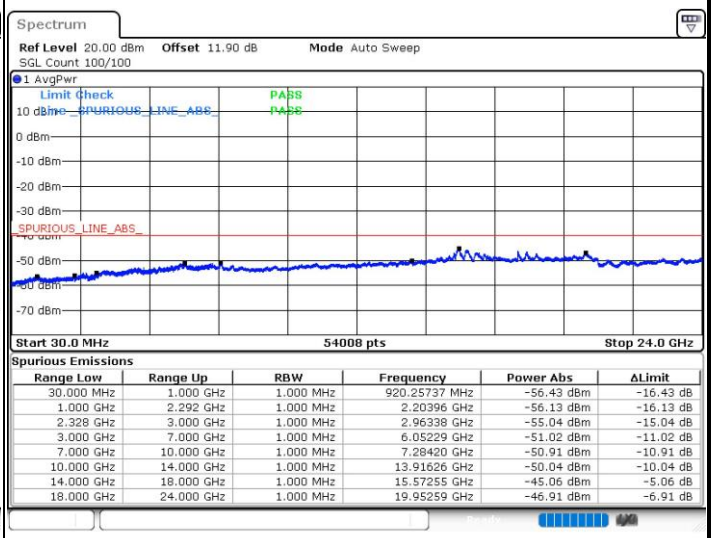


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	883.41579 MHz	-56.53 dBm	-16.53 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.17985 GHz	-56.10 dBm	-16.10 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.97010 GHz	-55.07 dBm	-15.07 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98780 GHz	-51.09 dBm	-11.09 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.27620 GHz	-51.02 dBm	-11.02 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.91126 GHz	-50.14 dBm	-10.14 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.55856 GHz	-45.12 dBm	-5.12 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.92059 GHz	-46.99 dBm	-6.99 dB

Date: 21.NOV.2018 10:59:45

Lowest Channel / 16QAM

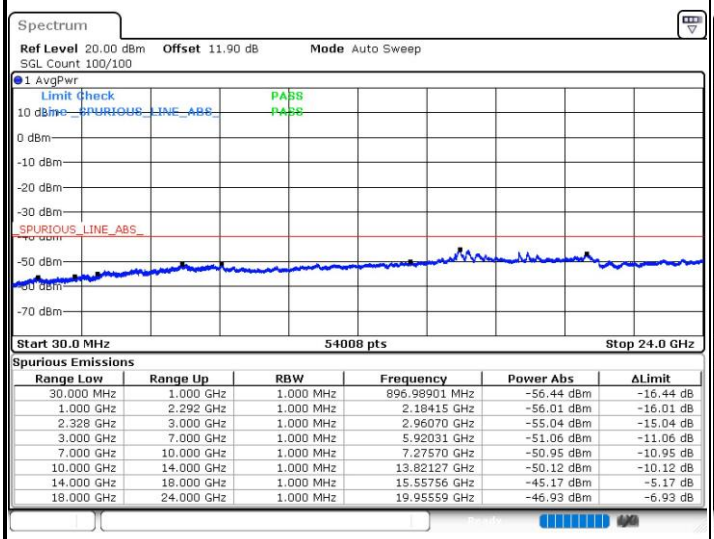


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	920.25737 MHz	-56.43 dBm	-16.43 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.20396 GHz	-56.13 dBm	-16.13 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.96338 GHz	-55.04 dBm	-15.04 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.05229 GHz	-51.02 dBm	-11.02 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.28420 GHz	-50.91 dBm	-10.91 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.91626 GHz	-50.04 dBm	-10.04 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.57255 GHz	-45.06 dBm	-5.06 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.95259 GHz	-46.91 dBm	-6.91 dB

Date: 21.NOV.2018 11:00:30

Middle Channel / QPSK

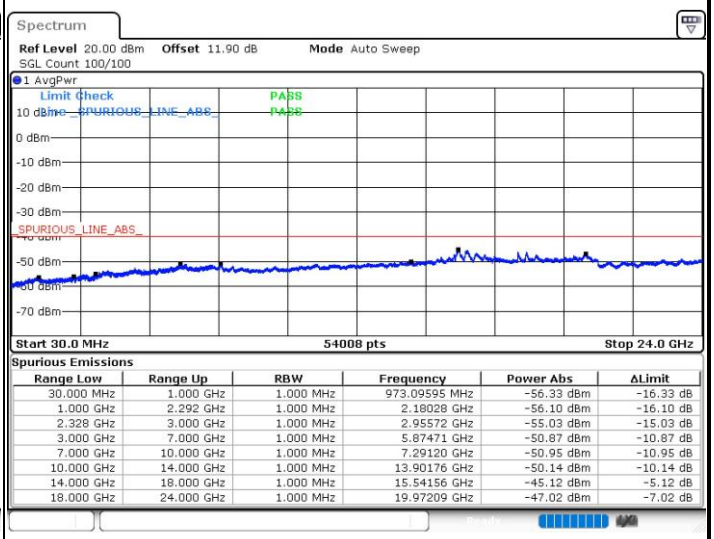


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	896.98901 MHz	-56.44 dBm	-16.44 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.18415 GHz	-56.01 dBm	-16.01 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.96070 GHz	-55.04 dBm	-15.04 dB
3.000 GHz	7.000 GHz	1.000 MHz	5.92031 GHz	-51.06 dBm	-11.06 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.27570 GHz	-50.95 dBm	-10.95 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.82127 GHz	-50.12 dBm	-10.12 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.55756 GHz	-45.17 dBm	-5.17 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.95559 GHz	-46.93 dBm	-6.93 dB

Date: 21.NOV.2018 11:01:16

Middle Channel / 16QAM



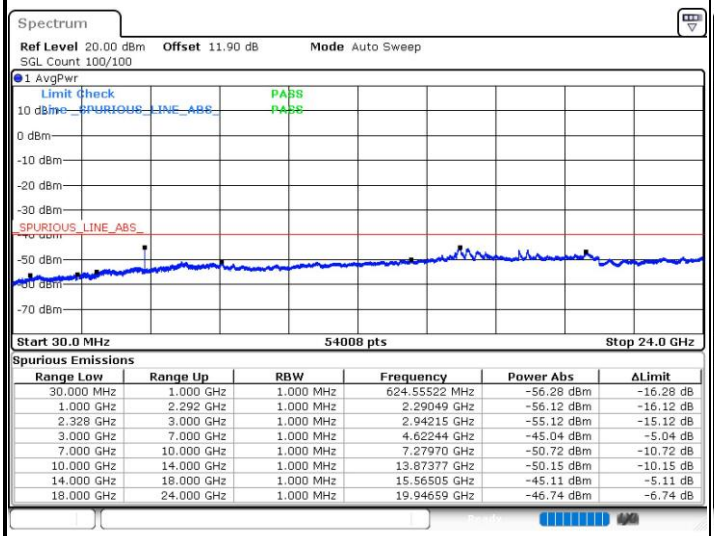
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	973.09595 MHz	-56.33 dBm	-16.33 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.18028 GHz	-56.10 dBm	-16.10 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.95572 GHz	-55.03 dBm	-15.03 dB
3.000 GHz	7.000 GHz	1.000 MHz	5.87471 GHz	-50.87 dBm	-10.87 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.29120 GHz	-50.95 dBm	-10.95 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.90176 GHz	-50.14 dBm	-10.14 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.54156 GHz	-45.12 dBm	-5.12 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.97209 GHz	-47.02 dBm	-7.02 dB

Date: 21.NOV.2018 11:02:01

LTE Band 30 / 5MHz

Highest Channel / QPSK

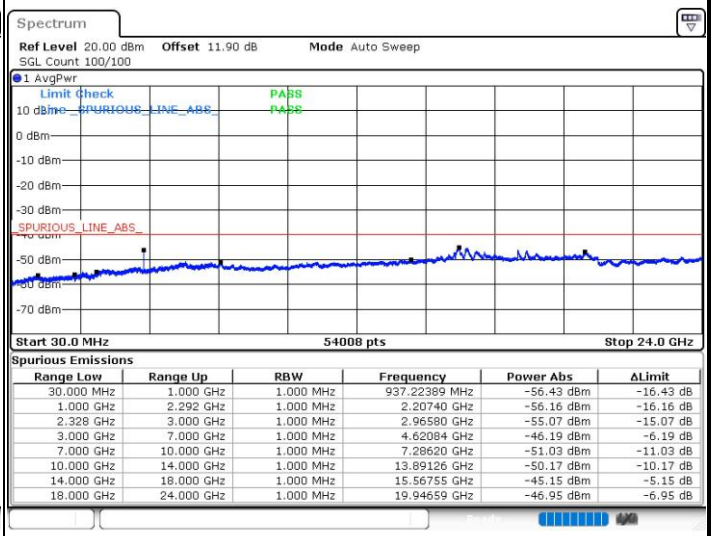


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	624.55522 MHz	-56.28 dBm	-16.28 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.29049 GHz	-56.12 dBm	-16.12 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.94215 GHz	-55.12 dBm	-15.12 dB
3.000 GHz	7.000 GHz	1.000 MHz	4.62244 GHz	-45.04 dBm	-5.04 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.27970 GHz	-50.72 dBm	-10.72 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.87377 GHz	-50.15 dBm	-10.15 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.56505 GHz	-45.11 dBm	-5.11 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.94659 GHz	-46.74 dBm	-6.74 dB

Date: 21.NOV.2018 11:02:46

Highest Channel / 16QAM



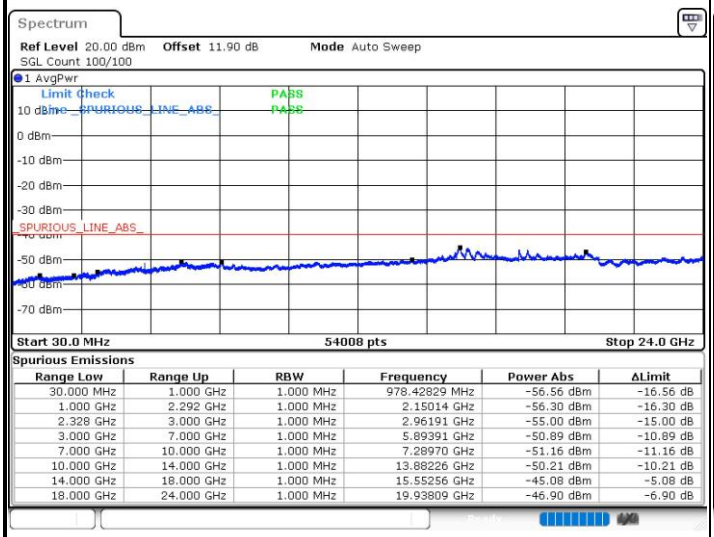
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	937.22389 MHz	-56.43 dBm	-16.43 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.20740 GHz	-56.16 dBm	-16.16 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.96580 GHz	-55.07 dBm	-15.07 dB
3.000 GHz	7.000 GHz	1.000 MHz	4.62084 GHz	-46.19 dBm	-6.19 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.28620 GHz	-51.03 dBm	-11.03 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.89126 GHz	-50.17 dBm	-10.17 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.56755 GHz	-45.15 dBm	-5.15 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.94659 GHz	-46.95 dBm	-6.95 dB

Date: 21.NOV.2018 11:03:31

LTE Band 30 / 10MHz

Middle Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	978.42829 MHz	-56.56 dBm	-16.56 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.15014 GHz	-56.30 dBm	-16.30 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.96191 GHz	-55.00 dBm	-15.00 dB
3.000 GHz	7.000 GHz	1.000 MHz	5.89391 GHz	-50.89 dBm	-10.89 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.28970 GHz	-51.16 dBm	-11.16 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.88226 GHz	-50.21 dBm	-10.21 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.55256 GHz	-45.08 dBm	-5.08 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.93809 GHz	-46.90 dBm	-6.90 dB

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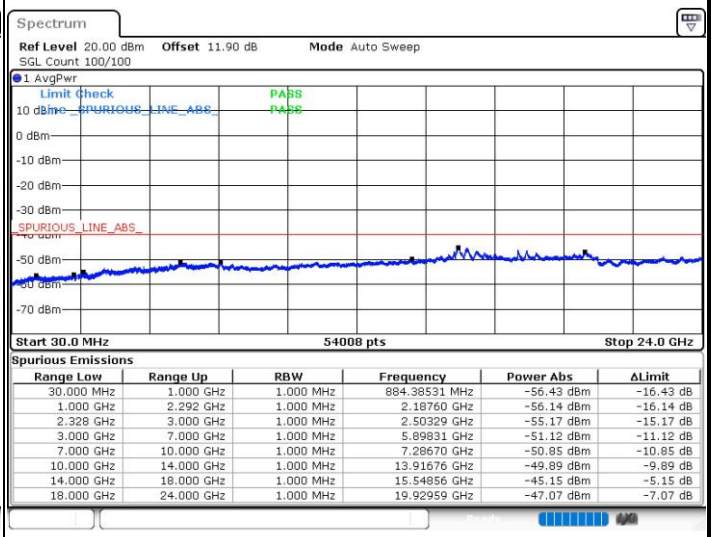
Middle Channel / 16QAM



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	884.38531 MHz	-56.43 dBm	-16.43 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.18760 GHz	-56.14 dBm	-16.14 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.50329 GHz	-55.17 dBm	-15.17 dB
3.000 GHz	7.000 GHz	1.000 MHz	5.89831 GHz	-51.12 dBm	-11.12 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.28670 GHz	-50.85 dBm	-10.85 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.91676 GHz	-49.89 dBm	-9.89 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.54856 GHz	-45.15 dBm	-5.15 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.92959 GHz	-47.07 dBm	-7.07 dB

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Frequency Stability

Test Conditions		LTE Band 30 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0003	PASS
40	Normal Voltage	0.0075	
30	Normal Voltage	0.0003	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0004	
0	Normal Voltage	0.0007	
-10	Normal Voltage	0.0065	
-20	Normal Voltage	0.0001	
-30	Normal Voltage	0.0068	
20	Maximum Voltage	0.0000	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0066	

Note:

1. Normal Voltage =6.8 V.；Battery End Point (BEP) =7.6 V.；Maximum Voltage =8.7 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of EIRP and Radiated Test

EIRP

<Reporting Only>

LTE Band 30 / 5MHz (Average) (GT - LC = 2 dB)							
Channel	Mode	RB		Conducted		EIRP	
		Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	23.34	0.2158	25.34	0.3420
Middle		1	0	23.43	0.2203	25.43	0.3491
Highest		1	0	23.41	0.2193	25.41	0.3475
Lowest	16QAM	1	0	22.62	0.1828	24.62	0.2897
Middle		1	0	22.67	0.1849	24.67	0.2931
Highest		1	0	22.63	0.1832	24.63	0.2904
Limit	EIRP < 0.25W			Result		PASS	

LTE Band 30 / 10MHz (Average) (GT - LC = 2 dB)							
Channel	Mode	RB		Conducted		EIRP	
		Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	-	-	-	-	-	-
Middle		1	0	23.57	0.2275	25.57	0.3606
Highest		-	-	-	-	-	-
Lowest	16QAM	-	-	-	-	-	-
Middle		1	0	22.86	0.1932	24.86	0.3062
Highest		-	-	-	-	-	-
Limit	EIRP < 0.25W			Result		PASS	

Radiated Spurious Emission

LTE Band 30

LTE Band 30 / 5MHz / 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	4608	-45.94	-40	-5.94	-43.29	-57.29	0.85	12.20	H
	6918	-57.02	-40	-17.02	-59.95	-67.52	0.98	11.48	H
	9225	-59.34	-40	-19.34	-64.53	-69.94	1.37	11.97	H
	11529	-50.04	-40	-10.04	-54.04	-60.44	1.52	11.92	H
	13833	-46.62	-40	-6.62	-55.49	-57.28	1.54	12.20	H
	16137	-51.28	-40	-11.28	-66.28	-66.46	1.80	16.98	H
									H
	4608	-50.30	-40	-10.30	-46.86	-61.65	0.85	12.20	V
	6918	-54.21	-40	-14.21	-56.69	-64.71	0.98	11.48	V
	9225	-54.13	-40	-14.13	-60.33	-64.73	1.37	11.97	V
	11529	-43.58	-40	-3.58	-47.46	-53.98	1.52	11.92	V
	13833	-40.54	-40	-0.54	-49.74	-51.20	1.54	12.20	V
	16137	-48.00	-40	-8.00	-63.57	-63.18	1.80	16.98	V
									V

Middle	4614	-44.88	-40	-4.88	-42.3	-56.26	0.82	12.20	H
	6924	-54.81	-40	-14.81	-57.74	-65.28	0.99	11.47	H
	9234	-59.13	-40	-19.13	-64.3	-69.70	1.38	11.94	H
	11538	-50.17	-40	-10.17	-54.18	-60.58	1.52	11.93	H
	13851	-46.88	-40	-6.88	-55.74	-57.52	1.54	12.18	H
	16155	-52.53	-40	-12.53	-67.54	-67.68	1.80	16.95	H
									H
	4614	-50.01	-40	-10.01	-46.66	-61.39	0.82	12.20	V
	6924	-56.32	-40	-16.32	-58.8	-66.79	0.99	11.47	V
	9234	-53.92	-40	-13.92	-60.1	-64.49	1.38	11.94	V
	11538	-44.96	-40	-4.96	-48.87	-55.37	1.52	11.93	V
	13851	-40.34	-40	-0.34	-49.51	-50.98	1.54	12.18	V
	16155	-49.50	-40	-9.50	-65.08	-64.65	1.80	16.95	V
									V
Highest	4620	-48.50	-40	-8.50	-45.92	-59.91	0.79	12.20	H
	6930	-56.77	-40	-16.77	-59.79	-67.22	1.01	11.45	H
	9243	-58.31	-40	-18.31	-63.46	-68.85	1.38	11.92	H
	11556	-49.32	-40	-9.32	-53.31	-59.74	1.52	11.94	H
	13860	-47.01	-40	-7.01	-55.88	-57.63	1.54	12.17	H
	16173	-52.00	-40	-12.00	-67.05	-67.12	1.81	16.92	H
									H
	4620	-51.84	-40	-11.84	-48.49	-63.25	0.79	12.20	V
	6930	-55.03	-40	-15.03	-57.59	-65.48	1.01	11.45	V
	9243	-51.71	-40	-11.71	-57.9	-62.25	1.38	11.92	V
	11556	-43.04	-40	-3.04	-46.97	-53.46	1.52	11.94	V
	13860	-40.50	-40	-0.50	-49.68	-51.12	1.54	12.17	V
	16173	-49.88	-40	-9.88	-65.46	-65.00	1.81	16.92	V
									V

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

LTE Band 30 / 10MHz / 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)
Middle	4620	-57.93	-40	-17.93	-55.35	-69.34	0.79	12.20	H
	6912	-59.72	-40	-19.72	-62.64	-70.25	0.97	11.49	H
	9252	-59.23	-40	-19.23	-64.36	-69.74	1.39	11.89	H
	11556	-56.96	-40	-16.96	-60.95	-67.38	1.52	11.94	H
	13860	-54.71	-40	-14.71	-63.58	-65.33	1.54	12.17	H
	16173	-54.81	-40	-14.81	-69.86	-69.93	1.81	16.92	H
									H
	4620	-60.53	-40	-20.53	-57.18	-71.94	0.79	12.20	V
	6912	-60.63	-40	-20.63	-63.1	-71.16	0.97	11.49	V
	9252	-55.61	-40	-15.61	-61.78	-66.12	1.39	11.89	V
	11556	-53.28	-40	-13.28	-57.21	-63.70	1.52	11.94	V
	13860	-50.15	-40	-10.15	-59.33	-60.77	1.54	12.17	V
	16173	-53.99	-40	-13.99	-69.57	-69.11	1.81	16.92	V
									V

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