RF TEST REPORT

Report No.:	SET2019-07539
Product:	Clarion Module
FCC ID:	2ADEK1905R9
Model No.:	Clarion Module R9
Applicant:	Social Bicycles LLC
Address:	55 Prospect St. Suite 410 Brooklyn,New York 11201,United States.
Dates of Testing:	04/20/2019 —06/26/2019
Issued by:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.
Lab Location:	Building 28/29, East of Shigu Xili Industrial Zone, Nanshan District Shenzhen, Guangdong 518055, China.
	Tel：86 755 26627338 **Fax**：86 755 26627238

Test Report

Product .....:	Clarion Module
Brand Name.....:	JUMP Bikes
Trade Name .....:	JUMP Bikes
Applicant .....:	Social Bicycles LLC
Applicant Address .....:	55 Prospect St. Suite 410 Brooklyn,New York 11201, United States
Manufacturer .....:	E-BUSINESS INTERNATIONAL TECHNOLOGY (SHENZHEN) CO.LTD
Manufacturer Address.....:	Floor 13, Tower C, Chuangwei Building, 008 Gaoxin South First Road, Hi-Tech Park, Nanshan District, Shenzhen, China 518057
Test Standards .....:	47 CFR Part 2, 90
Test Result.....:	PASS

Tested by .....: Robin Luo 2019.06.26

Robin Luo, Test Engineer

Reviewed by.....: Chris You 2019.06.26

Chris You, Senior Engineer

Approved by.....: Shuangwen Zhang 2019.06.26

Shuangwen Zhang，Manager

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Change History		
Issue	Date	Reason for change
1.0	2019.06.26	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	Clarion Module
EUT supports Radios application	LTE Band 18/26
Frequency Range(Tx)	LTE Band 18: 817.5MHz~824MHz LTE Band 26: 814.7MHz~824MHz
Maximum Output Power to Antenna	LTE Band 18: 22.86dBm LTE Band 26: 22.88dBm
Support Bandwidth	LTE Band 18: 1.4MHz LTE Band 16: 1.4MHz
Modulation Type	QPSK/16QAM
Antenna Type	Chip Antenna
Power supply	3.8V

1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

Band	Type of Modulation	BW (MHz)	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
LTE Band 18	QPSK	1.4	1M15G7D	-0.091	0.148
LTE Band 18	16QAM	1.4	1M16W7D	—	0.149
LTE Band 26	QPSK	1.4	1M12G7D	0.084	0.148
LTE Band 26	16QAM	1.4	1M11W7D	—	0.149

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, 90，for the EUT FCC ID Certification:

1. 47 CFR Part 2, 90

2. ANSI/TIA/EIA-603-D-2010

3. FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Limit	Result
1	2.1046 90.635	Conducted RF Output Power	<100W	PASS
2	22.913 (a.2)	Effective Radiated Power (Band 18/26)	ERP < 7 Watt	PASS
3	2.1049	Occupied Bandwidth	Reporting Only	PASS
4	2.1051 90.691	Conducted Band Edge Measurement/ Spurious Emission Measurement	＜43+10log10(P[watt])	PASS
5	2.1053 §90.691	Radiated Spurious Emission (Band 18/26)	＜43+10log10(P[watt])	PASS
6	2.1055 90.213	Frequency Stability	＜2.5ppm	PASS

Remark：

1. All test items were verified and recorded according to the standards and without any deviation during the test.

1.4 Test Configuration of Equipment Under Test

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

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

Test Items	Band	Bandwidth(MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	18	√						√	√	√	√	√	√	√	√
	26	√						√	√	√	√	√	√	√	√
26dB and 99% Bandwidth	18	√						√	√			√		√	
	26	√						√	√			√		√	
Conducted Band Edge	18	√						√	√	√		√	√		√
	26	√						√	√	√		√	√		√
Conducted Spurious Emission	18	√						√	√	√			√	√	√
	26	√						√	√	√			√	√	√
Frequency Stability	18	√						√				√		√	
	26	√						√				√		√	
ERP/EIRP	18	√						√	√	√			√	√	√
	26	√						√	√	√			√	√	√
Radiated Spurious Emission	18	Worst case												√	
	26	Worst case												√	
Note:1. The mark “√” means that this configuration is chosen for testing.															

1.5 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 7dB and 10dB attenuator.

Example:

Offset (dB) = RF cable loss(dB) + attenuator factor(dB).
= 7 + 10 = 17 (dB)

1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: CN5031

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until Dec. 31, 2019.

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Dec. 31, 2019.

NVLAP Lab Code: 201008-0

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

1.6.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15℃- 35℃
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2 REQUIREMENTS

2.1 Conducted RF Output Power

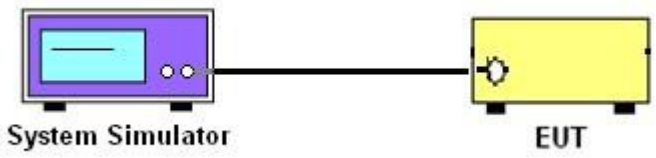
2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.1.3 Test Setup



2.1.4 Test Procedures

1. The transmitter output port was connected to the system simulator.

2. Set EUT at maximum power through system simulator.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Measure and record the power level from the system simulator.

2.1.5 Test Results

Please refer to Appendix A for detail

2.2 99% Occupied Bandwidth and 26dB Bandwidth

2.2.1 Definition

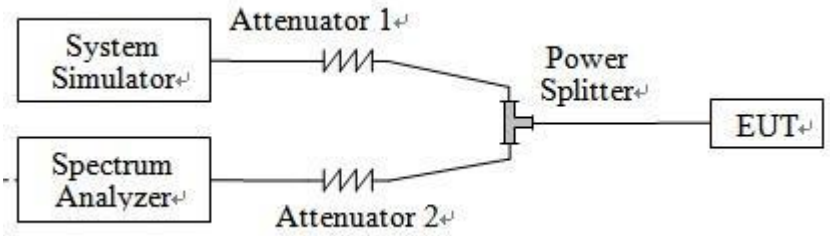
According to FCC section 2.1049, the occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

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.

2.2.2 Measuring Instruments

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

2.2.3 Test Setup



2.2.4 Test Procedures

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

2.2.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Please refer to Appendix A for detail

2.3 Frequency Stability

2.3.1 Requirement

According to FCC requirement, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency. According to FCC section 2.1055, the test conditions are:

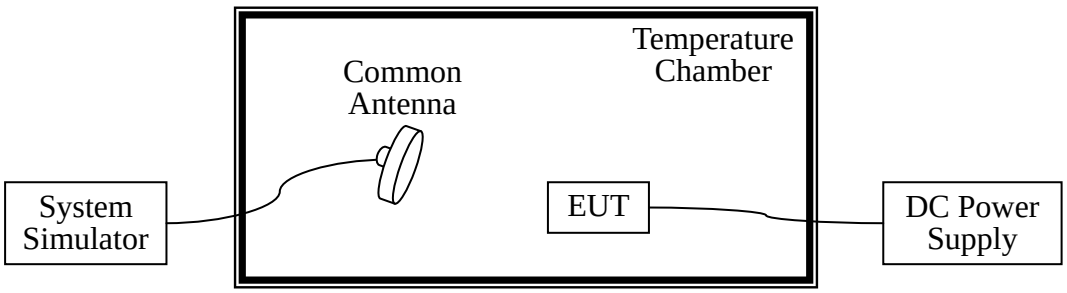
(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.3.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3 Test Setup



2.3.4 Test Procedures

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.
4. The nominal, highest and lowest extreme voltages were tested, which are specified by the applicant; the normal temperature here used is 25°C.
5. The variation in frequency was measured for the worst case.

2.3.5 Test Result of Frequency Stability

Please refer to Appendix A for detail

2.4 Conducted Out of Band Emissions

2.4.1 Requirement

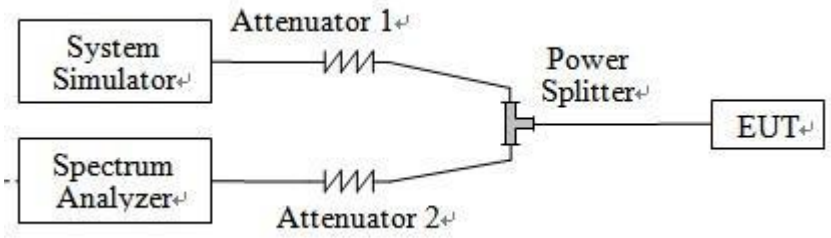
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

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

2.4.2 Measuring Instruments

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

2.4.3 Test Setup



2.4.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating

frequency band.

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

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

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

= -13dBm.

8. For 9KHz to 30MHz: the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

2.4.5 Test Result of Conducted Spurious Emission

Please refer to Appendix A for detail

2.5 Conducted Band Edge

2.5.1 Description of Conducted Band Edge Measurement

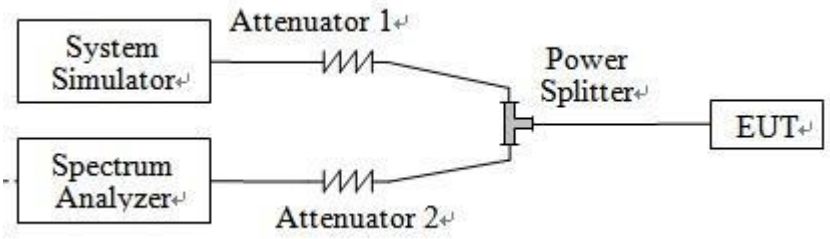
90.691(a)(2)

For any frequency removed from assigned frequency by out of the authorized bandwidth by at least 43 + 10Log(P)dB, it is measured by means of a calibrated spectrum analyzer and scaned from 30MHz up to a frequency including its 10^{th} harmonic.

2.5.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3 Test Setup



2.5.4 Test Procedures

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

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

2.5.5 Test Result of Conducted Band Edge

Please refer to Appendix A for detail

2.6 Transmitter Radiated Power (EIRP/ERP)

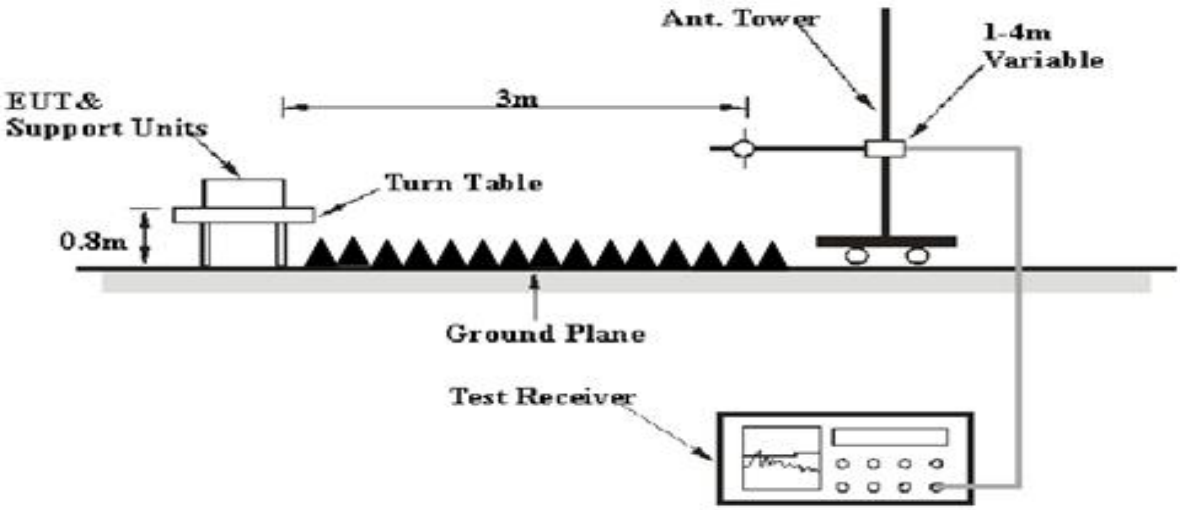
2.6.1 Requirement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 18/26

2.6.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3 Test Setup



2.6.4 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer which used a channel power option across EUT's signal bandwidth per section 4.0 of KDB 971168 D01v03r01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

    Ps (dBm)：Input power to substitution antenna.

    Gs (dBi or dBd)：Substitution antenna Gain.

    Et = Rt + AF

    Es = Rs + AF

    AF (dB/m)：Receive antenna factor

    Rt：The highest received signal in spectrum analyzer for EUT.

    Rs：The highest received signal in spectrum analyzer for substitution antenna.

2.6.5 Test Result of ERP

1. LTE Band 18 Test Verdict:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				23875	23925	23975
Frequency (MHz)				817.5	822.5	827.5
1.4	QPSK	1	0	21.60	21.71	21.64
1.4	QPSK	1	3	21.64	21.70	21.71
1.4	QPSK	1	5	21.60	21.58	21.68
1.4	QPSK	3	0	20.39	20.41	20.29
1.4	QPSK	3	1	20.16	20.16	20.32
1.4	QPSK	3	3	20.32	20.32	20.30
1.4	QPSK	6	0	20.13	20.13	20.29
1.4	16QAM	1	0	20.36	20.27	20.38
1.4	16QAM	1	3	20.09	20.15	20.27
1.4	16QAM	1	5	20.33	20.29	20.35
1.4	16QAM	3	0	19.39	19.18	19.28
1.4	16QAM	3	1	19.07	19.31	19.05
1.4	16QAM	3	3	19.01	19.23	19.37
1.4	QPSK	6	0	18.13	18.74	18.42

2. LTE Band 26 Test Verdict:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				26697	26740	26783
Frequency (MHz)				813.7	819	823.3
1.4	QPSK	1	0	21.60	21.73	21.60
1.4	QPSK	1	3	21.64	21.71	21.69
1.4	QPSK	1	5	19.39	21.58	21.63
1.4	QPSK	3	0	20.30	20.41	20.54
1.4	QPSK	3	1	20.29	20.16	20.03
1.4	QPSK	3	3	20.38	20.32	20.39
1.4	QPSK	6	0	20.27	20.13	20.48
1.4	16QAM	1	0	20.36	20.27	19.97
1.4	16QAM	1	3	20.09	20.15	20.26
1.4	16QAM	1	5	20.33	20.29	20.30
1.4	16QAM	3	0	19.39	19.18	19.39
1.4	16QAM	3	1	19.01	19.31	19.21
1.4	16QAM	3	3	19.13	19.23	19.40
1.4	16QAM	6	0	19.27	18.74	18.14

2.7 Radiated Out of Band Emissions

2.7.1 Requirement

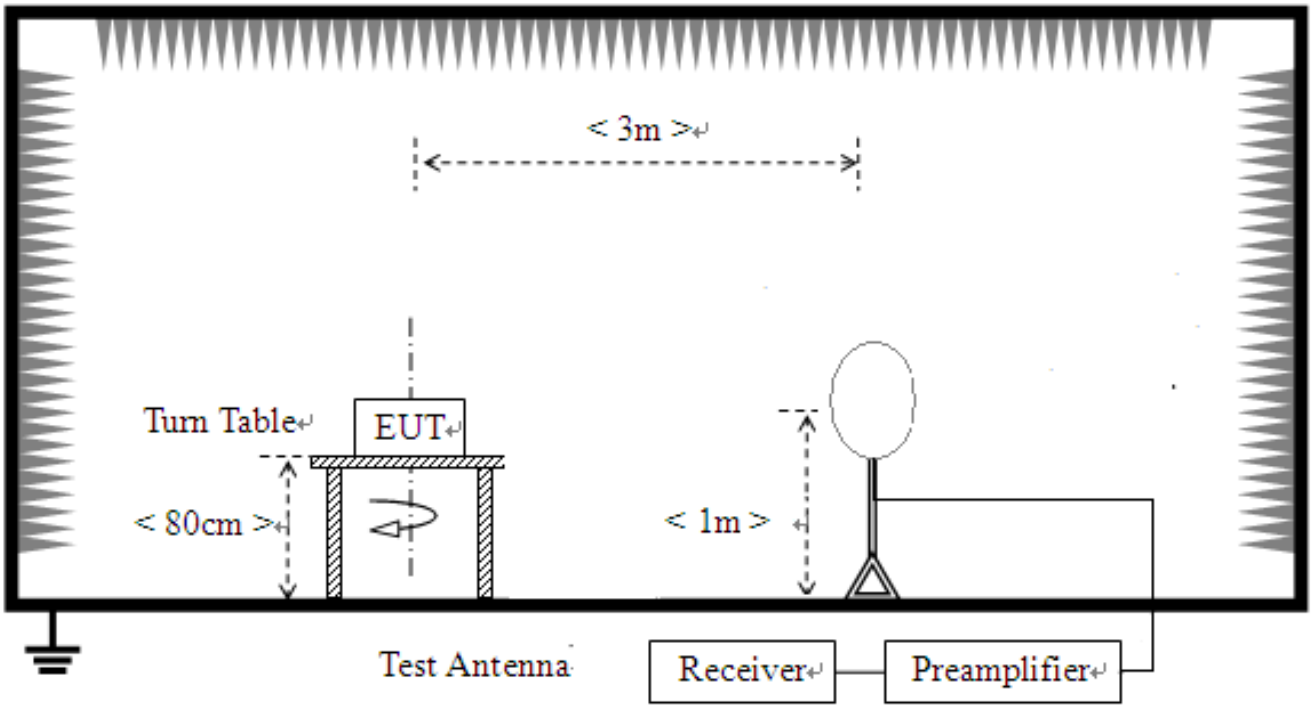
The radiated spurious emission was measured by substitution method according to ANSI / TIA /EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

2.7.2 Measuring Instruments

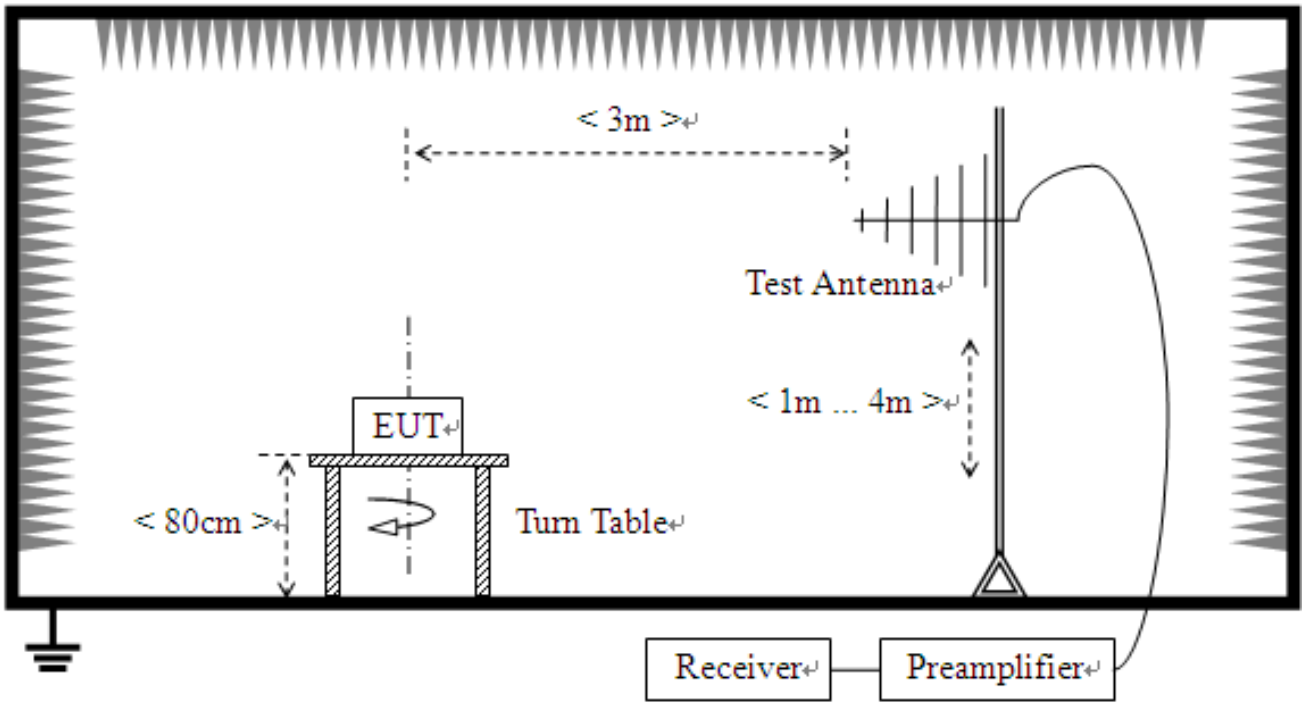
The measuring equipment is listed in the section 3 of this test report.

2.7.3 Test Setup

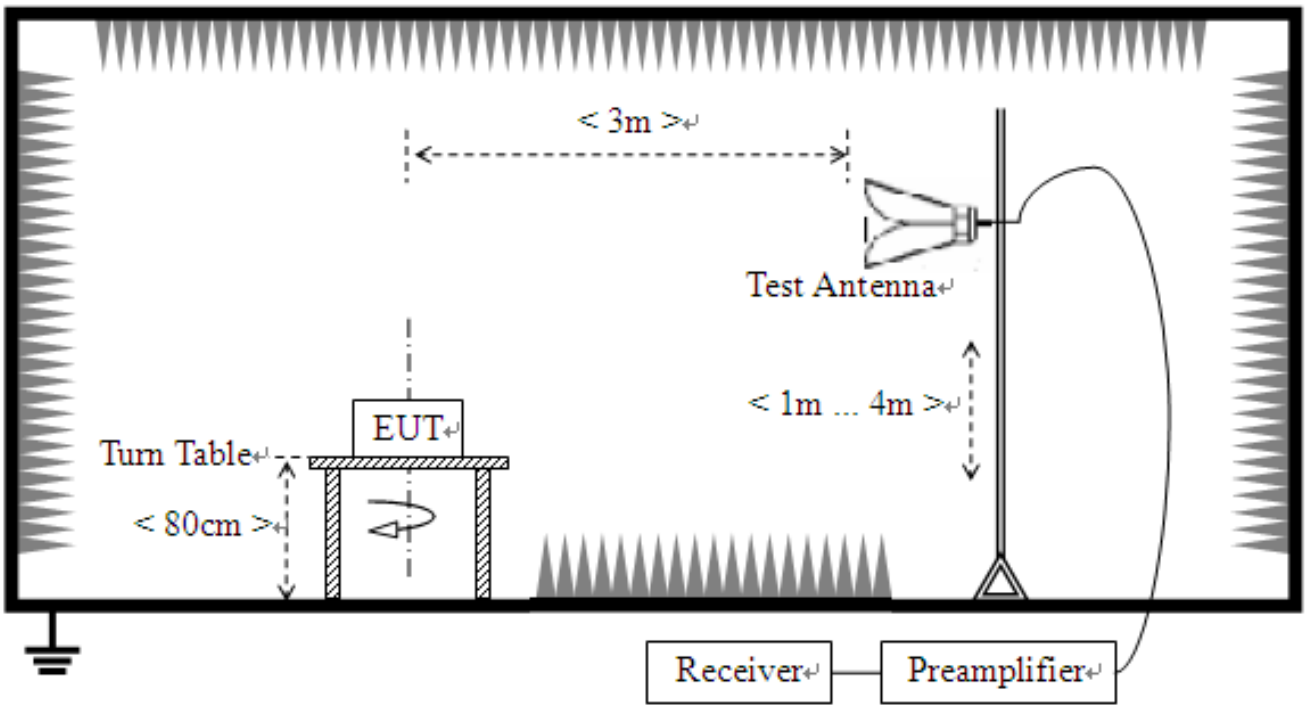
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.7.4 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter 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)

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

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

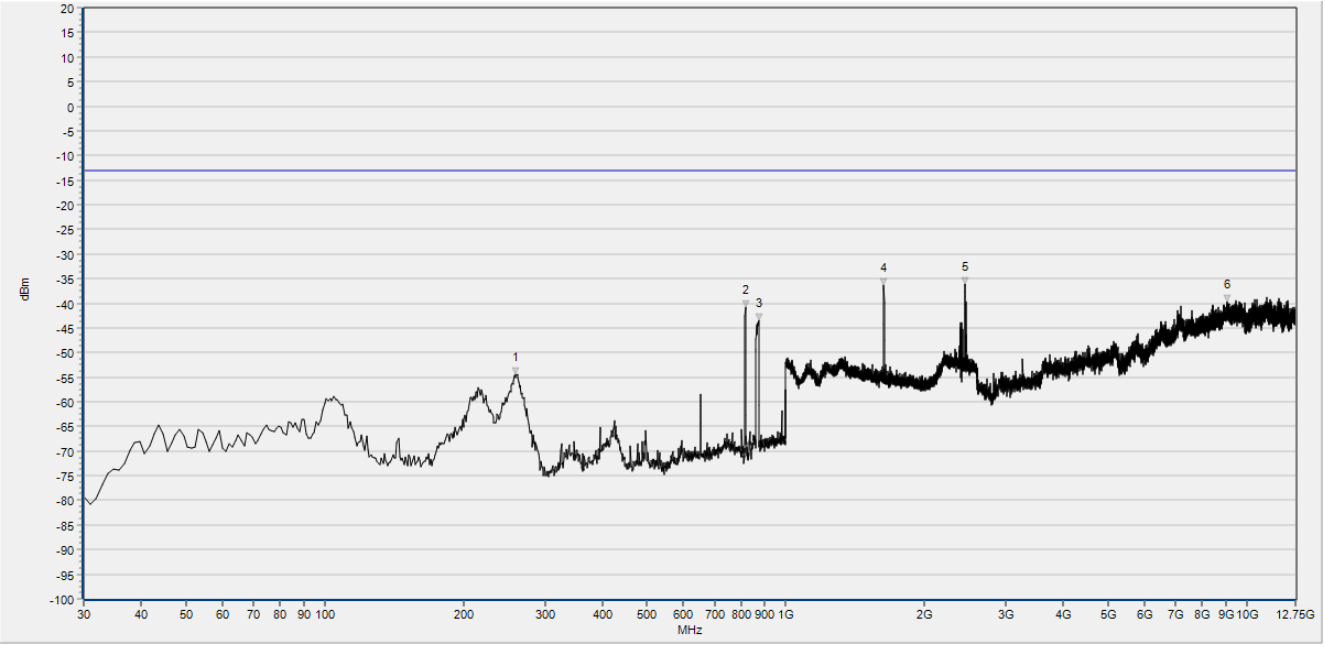
    = -13dBm.
11. All Spurious Emission tests were performed in X, Y, Z axis direction and low, middle, high channel. And only the worst axis test condition was recorded in this test report.
12. The spectrum is measured from 9 KHz to the 10^{th} harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. The worst case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
13. The maximum RB configurations of the Radiated Spurious Emissions as RB Size 1, RB Offset 0

2.7.5 Test Result (Plots) of Radiated Spurious Emission

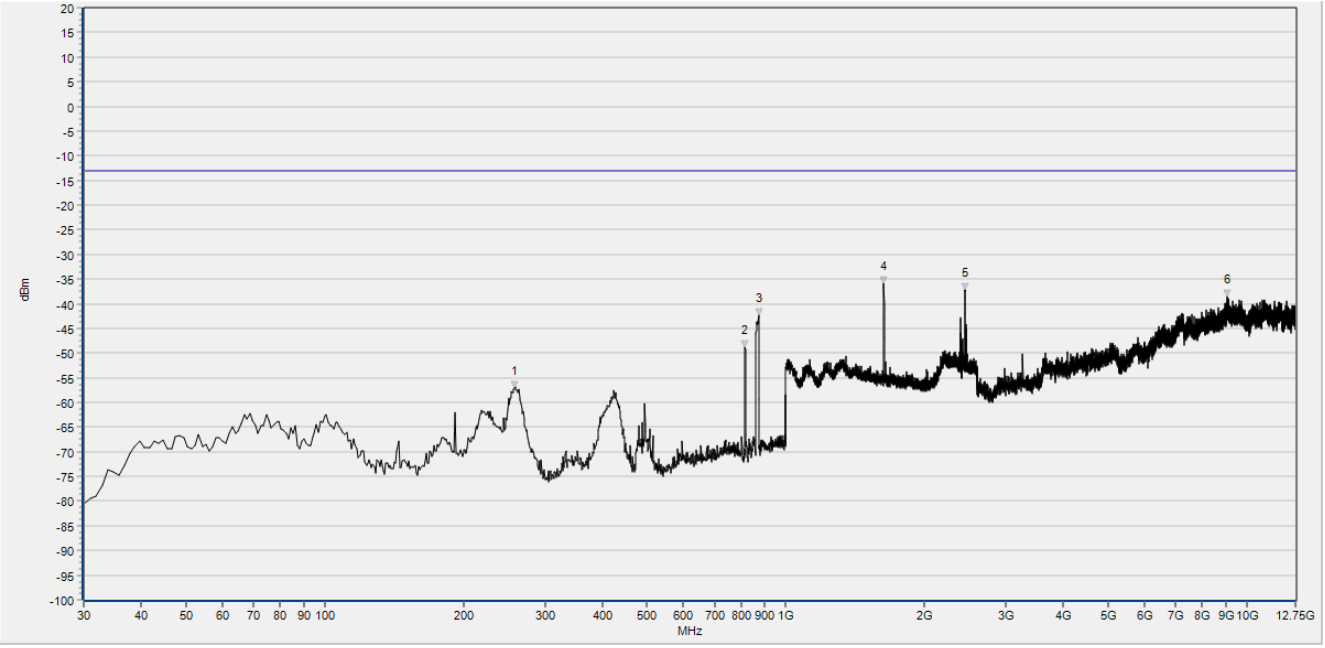
Note: 1. within 30MHz-1GHz were found more than 20dB below limit line

LTE BAND18

LowRang

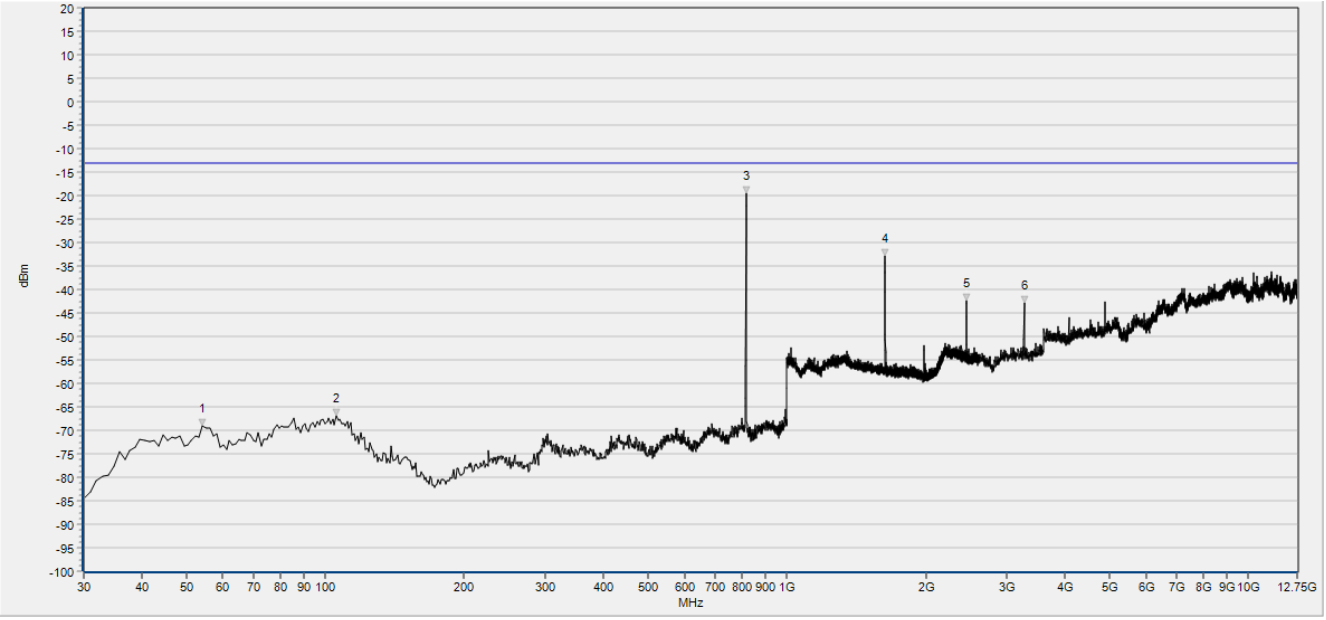


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	259.890	-54.31	-13.00	115.0	H	PASS
2	816.670	-40.80	-13.00	115.0	H	NA
3	862.930	-43.44	-13.00	72.2	H	NA
4	1632.573	-36.37	-13.00	193.4	H	PASS
5	2449.540	-36.18	-13.00	183.3	H	PASS
6	9051.037	-39.63	-13.00	346.3	H	PASS

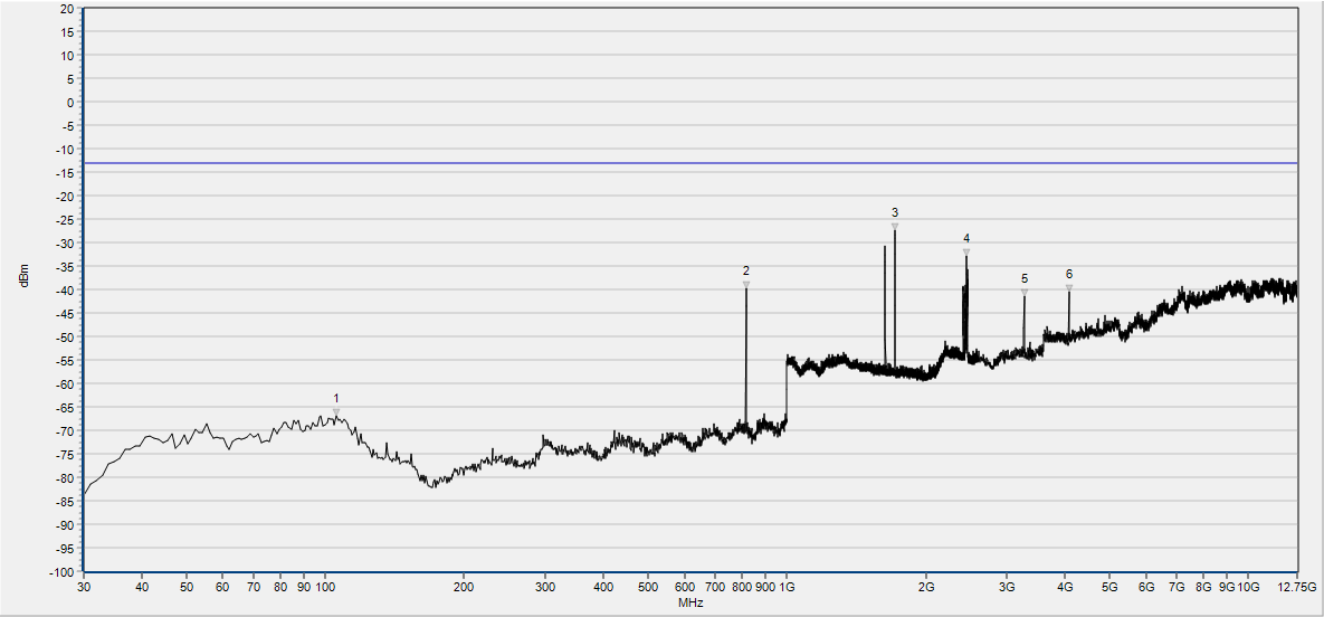


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	257.950	-56.99	-13.00	273.0	V	PASS
2	815.700	-48.73	-13.00	260.7	V	NA
3	862.930	-42.30	-13.00	254.7	V	NA
4	1632.573	-35.86	-13.00	186.3	V	PASS
5	2448.259	-37.23	-13.00	186.3	V	PASS
6	9041.808	-38.52	-13.00	39.2	V	PASS

Middle Rang

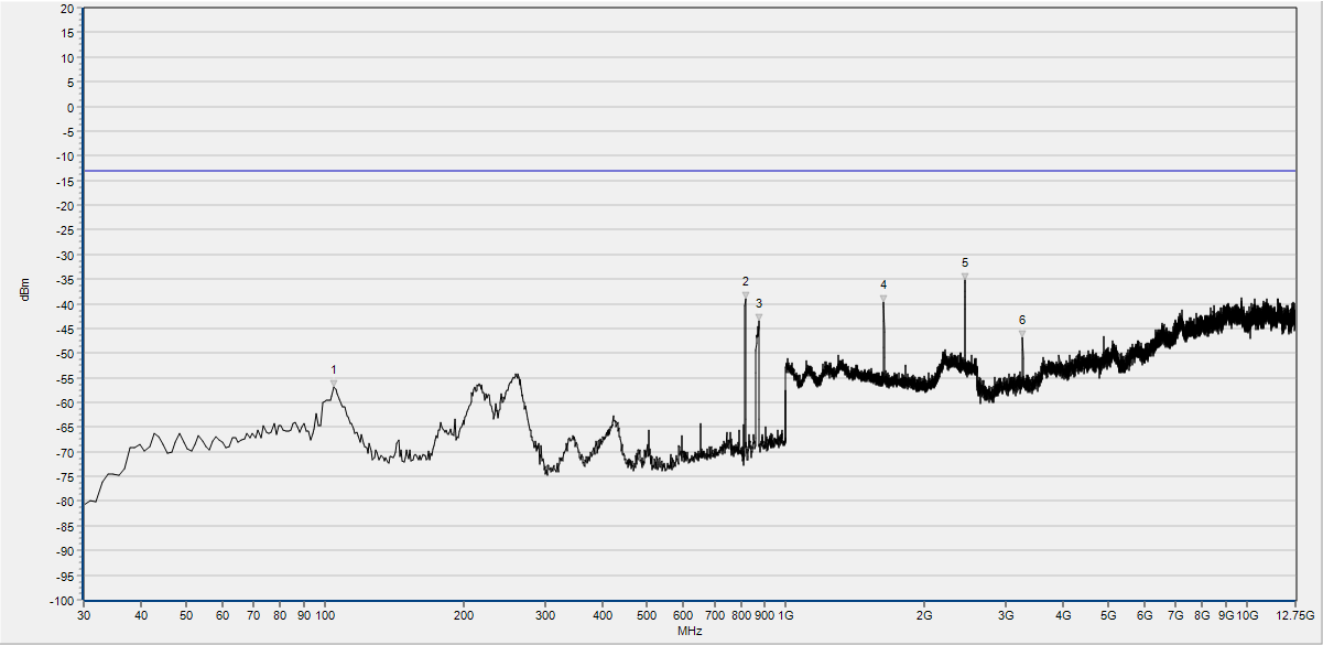


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	54.274	-69.13	-13.00	360.0	H	PASS
2	105.736	-66.82	-13.00	360.0	H	PASS
3	816.486	-19.59	-13.00	360.0	H	N.A
4	1632.744	-32.89	-13.00	25.2	H	PASS
5	2449.550	-42.34	-13.00	25.2	H	PASS
6	3266.739	-42.82	-13.00	22.7	H	PASS

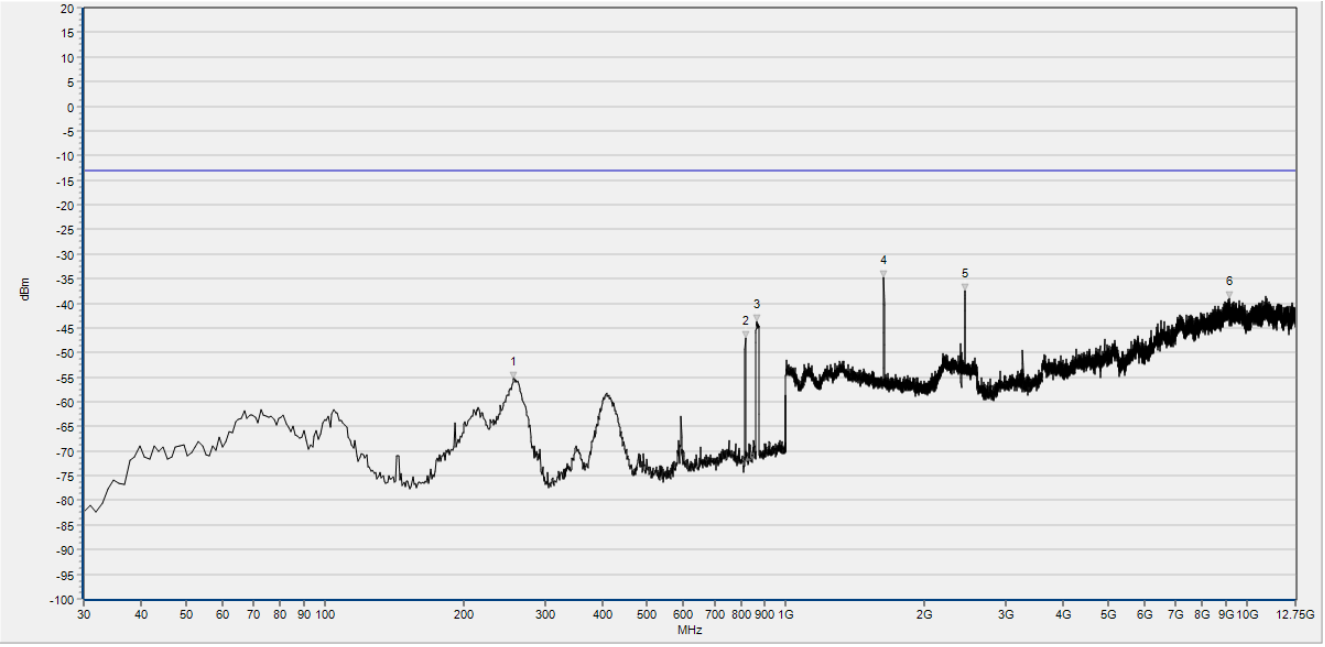


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	105.736	-66.86	-13.00	360.0	V	PASS
2	816.486	-39.87	-13.00	360.0	V	N.A
3	1713.304	-27.34	-13.00	199.3	V	PASS
4	2450.617	-32.91	-13.00	24.1	V	PASS
5	3266.739	-41.38	-13.00	48.1	V	PASS
6	4082.394	-40.57	-13.00	345.1	V	PASS

High Rang



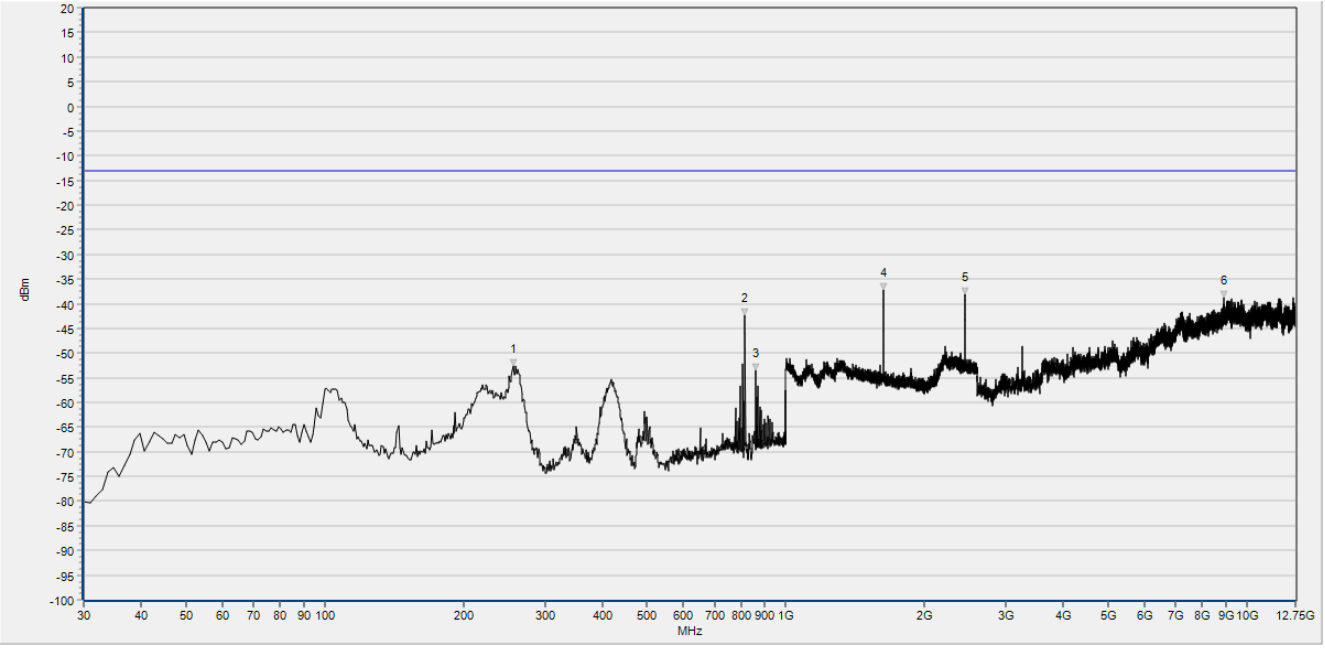
Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	104.690	-56.80	-13.00	66.7	H	PASS
2	826.670	-38.99	-13.00	109.5	H	NA
3	873.900	-43.39	-13.00	72.7	H	NA
4	1632.573	-39.72	-13.00	17.2	H	PASS
5	2449.540	-35.13	-13.00	17.2	H	PASS
6	3266.330	-46.77	-13.00	49.9	H	PASS



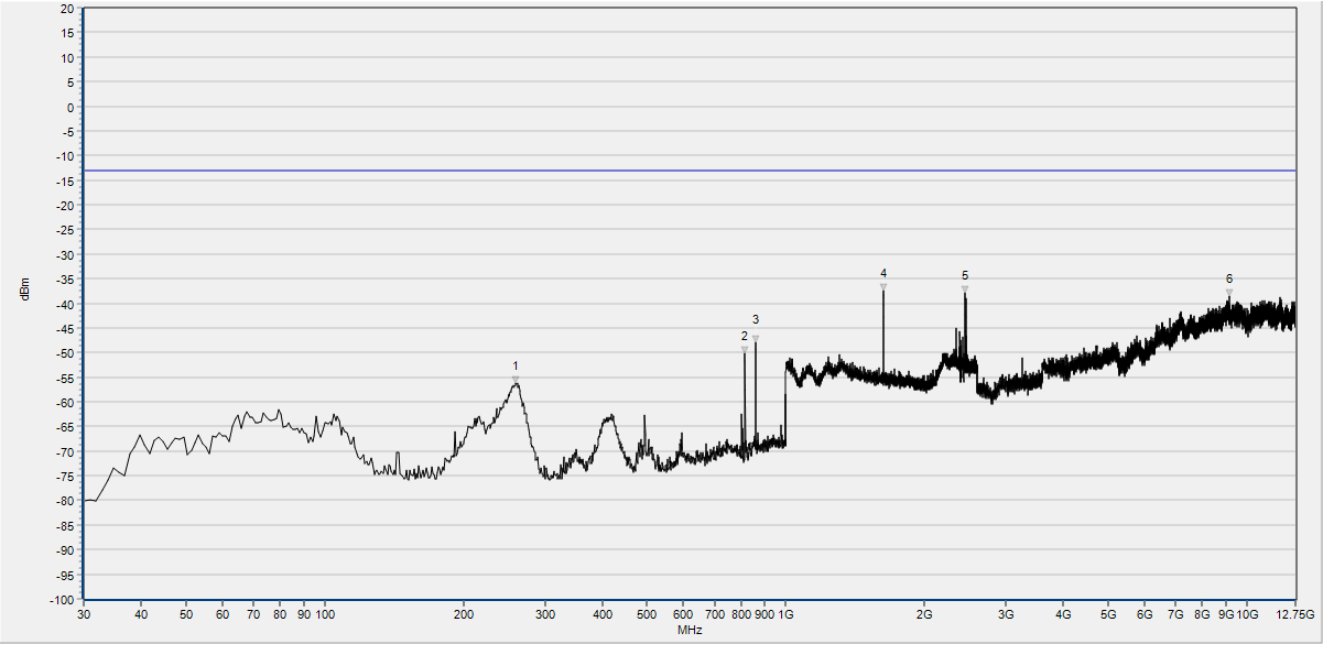
Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	256.980	-55.30	-13.00	75.7	V	PASS
2	826.670	-46.98	-13.00	87.6	V	NA
3	872.200	-43.62	-13.00	56.7	V	NA
4	1632.573	-34.81	-13.00	204.3	V	PASS
5	2449.540	-37.50	-13.00	176.5	V	PASS
6	9148.863	-39.05	-13.00	316.2	V	PASS

LTE BAND26

LowRang

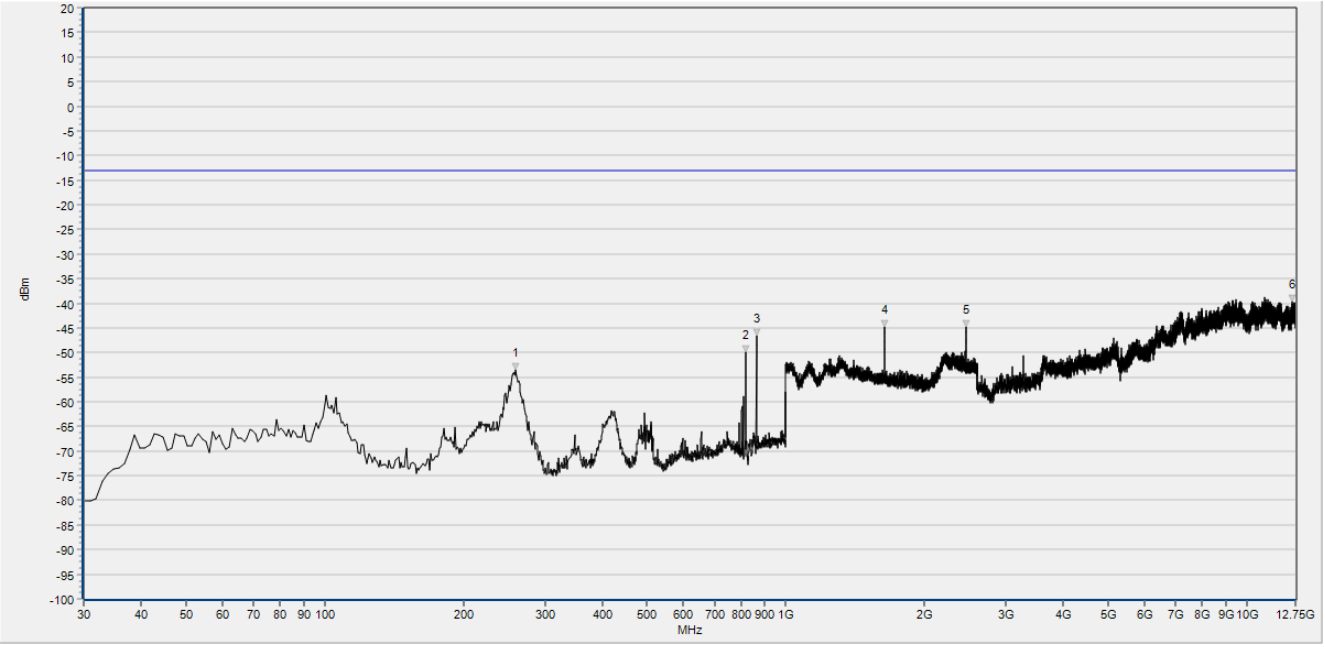


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	256.010	-52.70	-13.00	205.0	H	PASS
2	814.730	-42.45	-13.00	217.2	H	NA
3	860.320	-53.61	-13.00	248.1	H	NA
4	1628.731	-37.14	-13.00	106.4	H	PASS
5	2444.418	-38.03	-13.00	159.6	H	PASS
6	8908.911	-38.79	-13.00	26.7	H	PASS

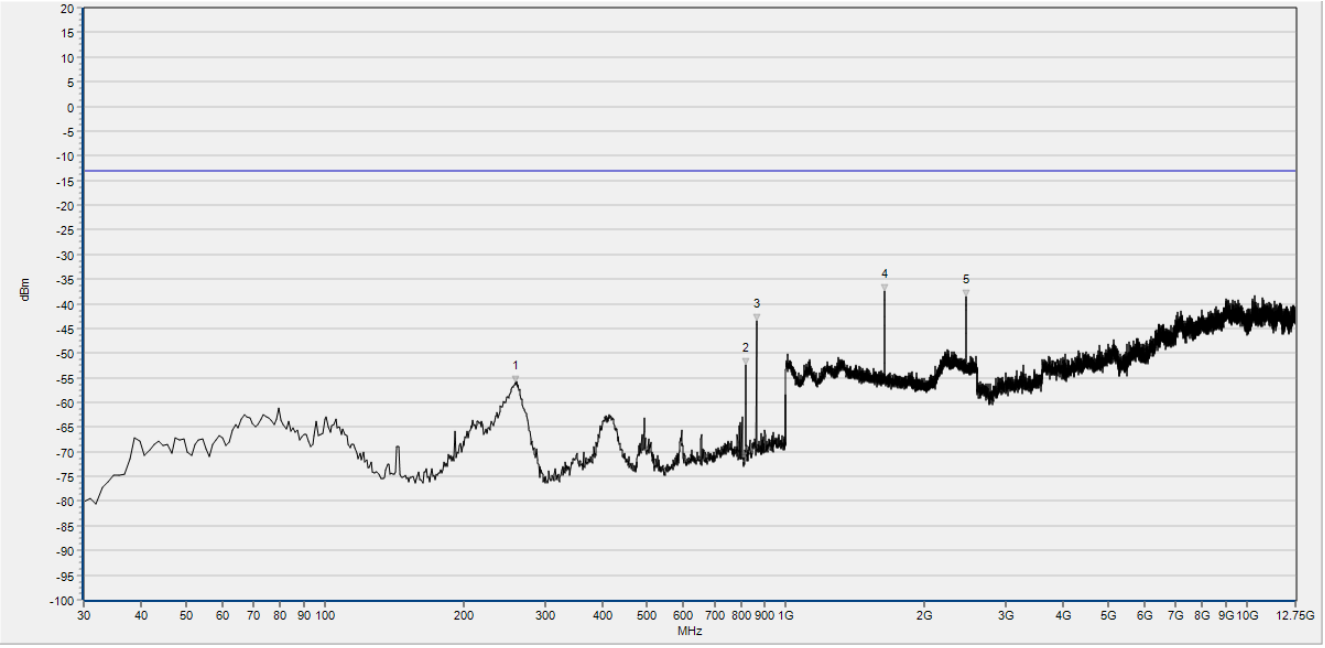


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	259.890	-56.18	-13.00	67.1	V	PASS
2	814.730	-50.13	-13.00	60.8	V	NA
3	860.320	-48.01	-13.00	54.9	V	NA
4	1628.731	-37.45	-13.00	203.6	V	PASS
5	2443.778	-37.78	-13.00	196.1	V	PASS
6	9148.863	-38.59	-13.00	316.4	V	PASS

Middle Rang

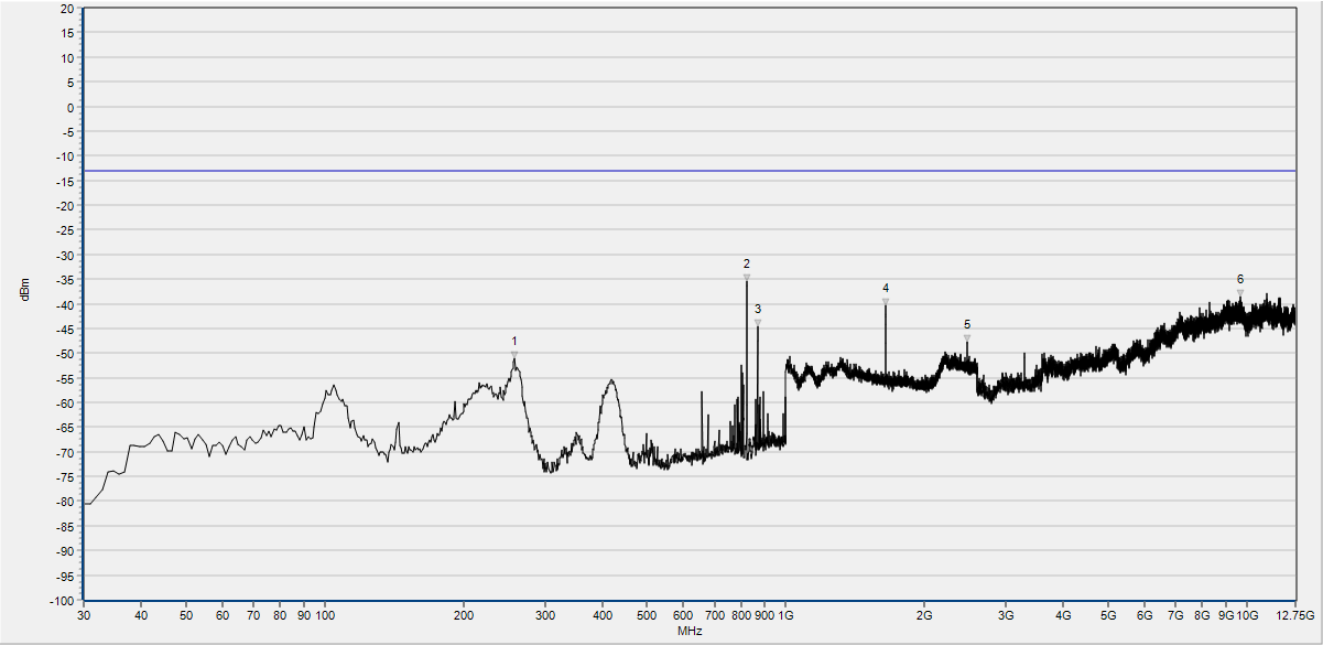


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	259.890	-53.57	-13.00	309.7	H	PASS
2	818.610	-49.87	-13.00	309.7	H	NA
3	864.200	-46.49	-13.00	303.7	H	NA
4	1637.695	-44.78	-13.00	358.1	H	PASS
5	2457.223	-44.71	-13.00	360.0	H	PASS
6	12519.276	-39.61	-13.00	283.1	H	PASS

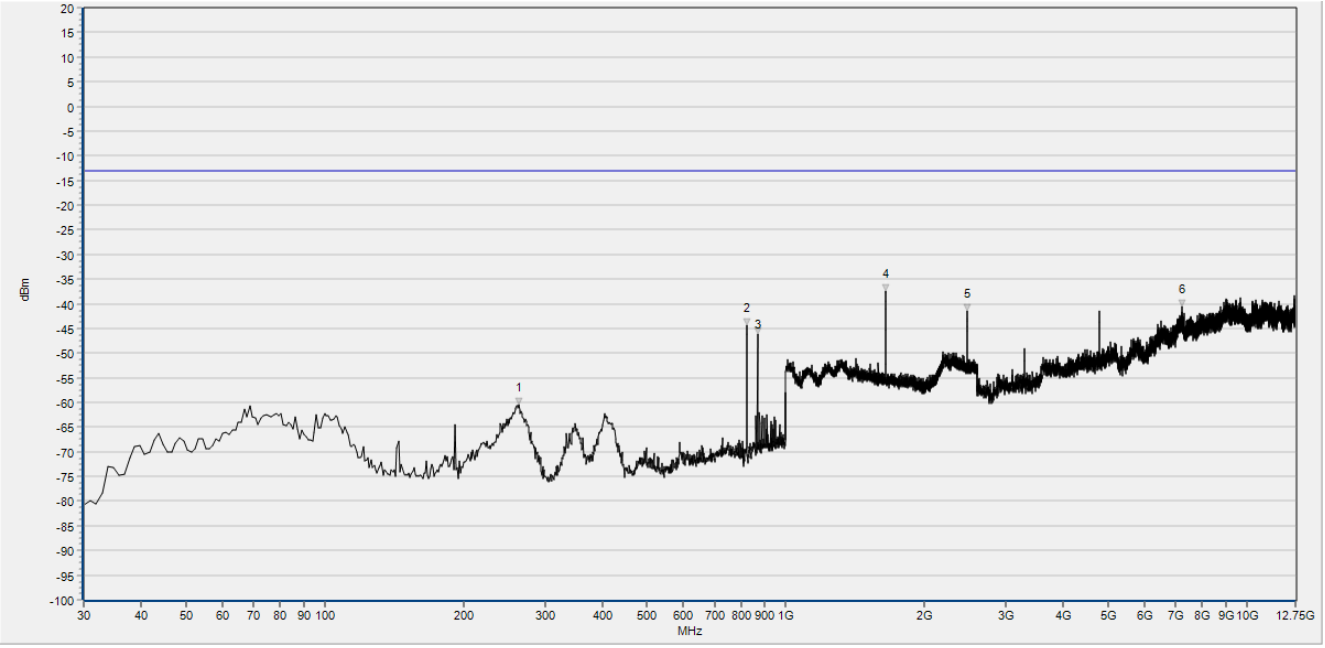


Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	258.920	-55.90	-13.00	72.0	V	PASS
2	818.610	-52.33	-13.00	53.4	V	NA
3	864.200	-43.55	-13.00	59.8	V	NA
4	1637.695	-37.35	-13.00	206.3	V	PASS
5	2457.223	-38.60	-13.00	206.3	V	PASS

High Rang



Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	257.950	-51.07	-13.00	215.7	H	PASS
2	823.460	-35.40	-13.00	221.7	H	NA
3	868.080	-44.67	-13.00	172.6	H	NA
4	1646.659	-40.32	-13.00	300.9	H	PASS
5	2469.388	-47.78	-13.00	300.9	H	PASS
6	9704.446	-38.53	-13.00	360.0	H	PASS



Num	Freq(MHz)	PK	limit PK	Degree	Antenna	Verdict
1	263.770	-60.44	-13.00	203.2	V	PASS
2	822.490	-44.38	-13.00	172.7	V	NA
3	868.080	-46.09	-13.00	160.4	V	NA
4	1646.018	-37.51	-13.00	97.6	V	PASS
5	2469.388	-41.46	-13.00	44.4	V	PASS
6	7251.391	-40.62	-13.00	25.8	V	PASS

3. LIST OF MEASURING EQUIPMENT

Description	Manufacturer	Model	Serial No.	Cal. Date	Due Date	Remark
EMI Test Receiver	R&S	ESIB26	A0304218	2018.09.03	2019.09.20	Radiation
Loop Antenna	Schwarz beck	HFH2-Z2	100047	2019.04.26	2022.04.25	Radiation
Broadband antenna (30MHz~1GHz)	R&S	HL562	101341	2017.07.14	2020.07.13	Radiation
Broadband antenna (30MHz~1GHz)	R&S	HL562	101339	2018.05.25	2019.05.24	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100150	2019.04.27	2022.04.26	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100149	2019.04.17	2022.04.16	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4002A	305753	2017.11.10	2020.11.09	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4003A	0329293	2018.09.17	2020.09.16	Radiation
Amplifier 1GHz-18GHz	AR	25S1G4AM1	22018	2018.09.17	2020.09.16	Radiation
Ampilier 20M~3GHz	MILMEGA	80RF1000-250	1064573	2017.10.09	2020.10.8	Radiation
Ampilier 18G~40GHz	R&S	JS42-18002600-28-5A	12111.0980.00	2018.05.25	2019.05.24	Radiation
Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2018.11.15	2019.11.14	Conducted
LISN	ROHDE&SCHWARZ	ESH2-Z5	A0304221	2019.04.30	2020.04.29	Conducted
Test Receiver	R&S	ESCS30	A0304260	2018.05.25	2019.05.24	Conducted
Temperature chamber	Dongguan gaoda instrument CO.LTD	GD-7005-100	130130101	2019.04.22	2020.04.21	Conducted
Wideband Radio Communication tester	R&S	CMW500	149332	2019.04.01	2020.03.31	Conducted
Power Supply	R&S	NGMO1	101037	2018.08.06	2019.08.05	Conducted

APPENDIX A

Conducted RF (Average) Output Power

Test Result and Data

LTE BAND 18

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				23875	23925	23975
Frequency (MHz)				817.5	822.5	827.5
5	QPSK	1	0	22.75	**22.86**	22.79
5	QPSK	1	3	22.79	22.85	22.86
5	QPSK	1	5	22.75	22.73	22.83
5	QPSK	3	0	21.54	21.56	21.44
5	QPSK	3	1	21.31	21.31	21.47
5	QPSK	3	3	21.47	21.47	21.45
5	QPSK	6	0	21.28	21.28	21.44
5	16QAM	1	0	21.51	21.42	21.53
5	16QAM	1	3	21.24	21.30	21.42
5	16QAM	1	5	21.48	21.44	21.50
5	16QAM	3	0	20.54	20.33	20.43
5	16QAM	3	1	20.22	20.46	20.20
5	16QAM	3	3	20.16	20.38	20.52
5	16QAM	6	0	20.28	20.89	20.57

LTE BAND 26

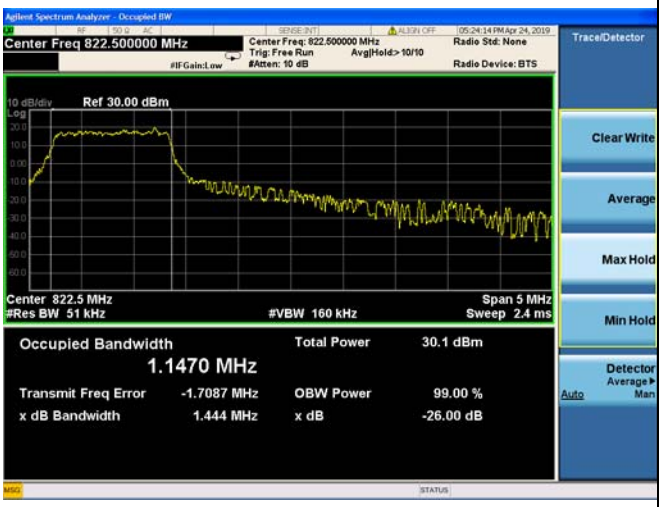
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				26697	26740	26783
Frequency (MHz)				813.7	819	823.3
1.4	QPSK	1	0	22.75	**22.88**	22.75
1.4	QPSK	1	3	22.79	22.86	22.84
1.4	QPSK	1	5	20.54	22.73	22.78
1.4	QPSK	3	0	21.45	21.56	21.69
1.4	QPSK	3	1	21.44	21.31	21.18
1.4	QPSK	3	3	21.53	21.47	21.54
1.4	QPSK	6	0	21.42	21.28	21.63
1.4	16QAM	1	0	21.51	21.42	21.12
1.4	16QAM	1	3	21.24	21.30	21.41
1.4	16QAM	1	5	21.48	21.44	21.45
1.4	16QAM	3	0	20.54	20.33	20.54
1.4	16QAM	3	1	20.16	20.46	20.36
1.4	16QAM	3	3	20.28	20.38	20.55
1.4	16QAM	6	0	21.42	20.89	20.29

99% and 26dB Occupied Bandwidth

Test Result and Data

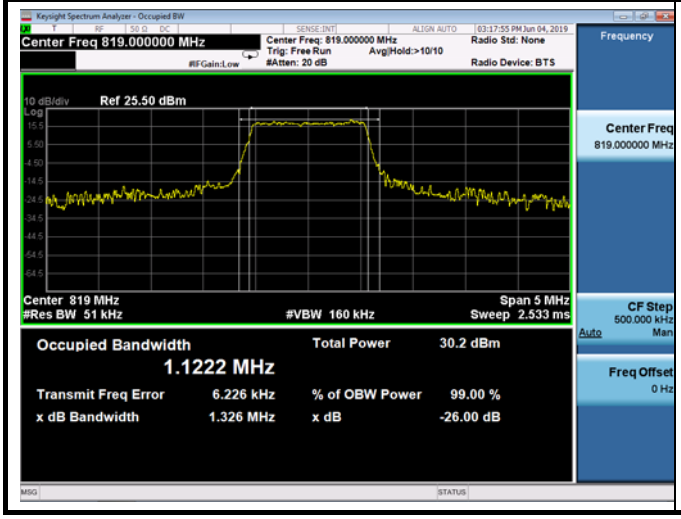
Occupied Bandwidth NormalTC_NormalVol						
Band	Range	BandWidth	Frequency (MHz)	Modulation	Occupied Bandwidth (99%) (MHz)	26dB Bandwidth (MHz)
FDD18	MidRange	1.4	822.5	QPSK	1.1470	1.444
FDD18	MidRange	1.4	822.5	Q16	1.1629	1.463
FDD26	MidRange	1.4	819	QPSK	1.1222	1.326
FDD26	MidRange	1.4	819	Q16	1.1052	1.331

FDD18_MidRange_5M_822.5_QPSK



FDD18_MidRange_5M_822.5_Q16

FDD26_MidRange_1.4M_819_QPSK



FDD02_MidRange_1.4M_819_Q16

Frequency Stability

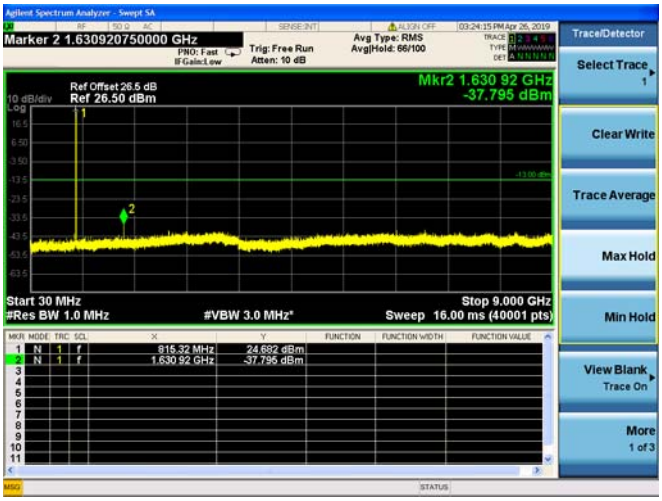
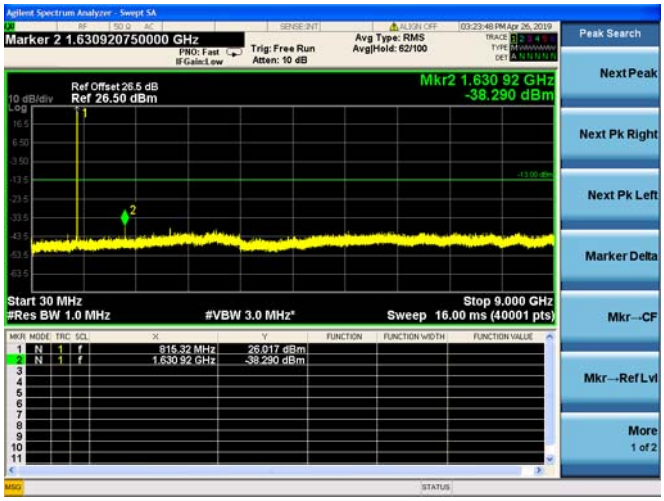
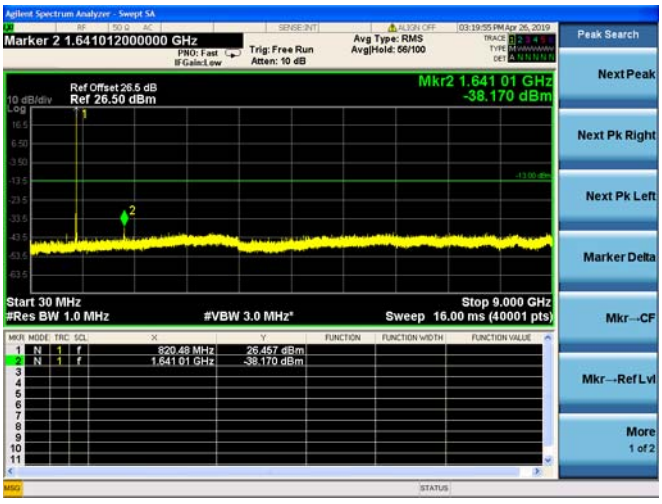
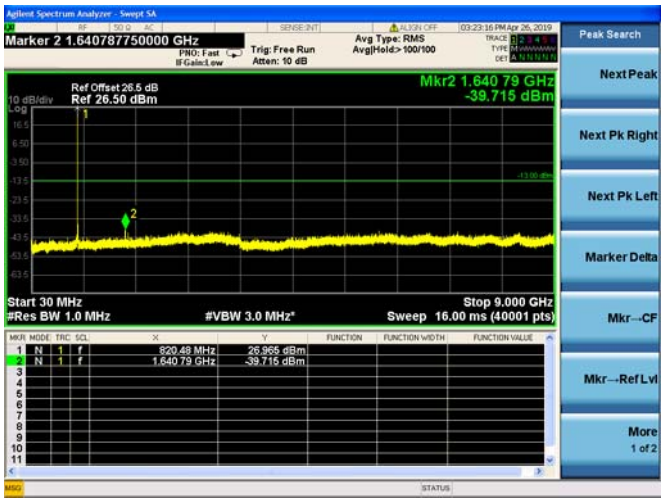
Test Result and Data

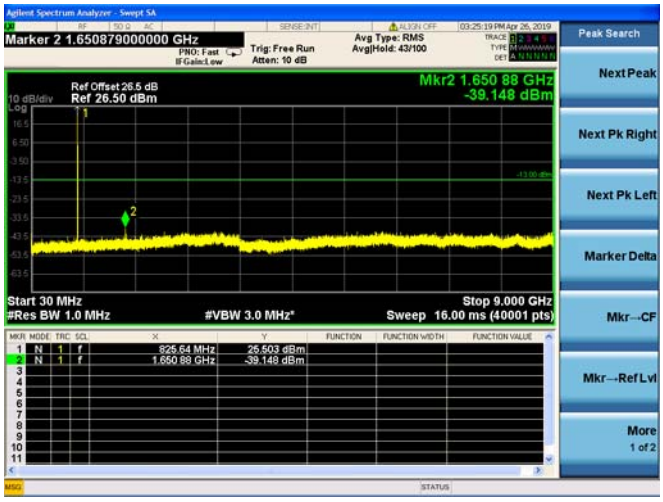
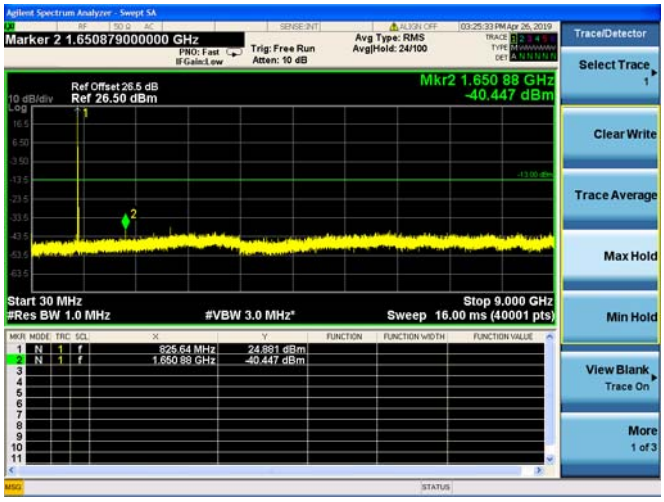
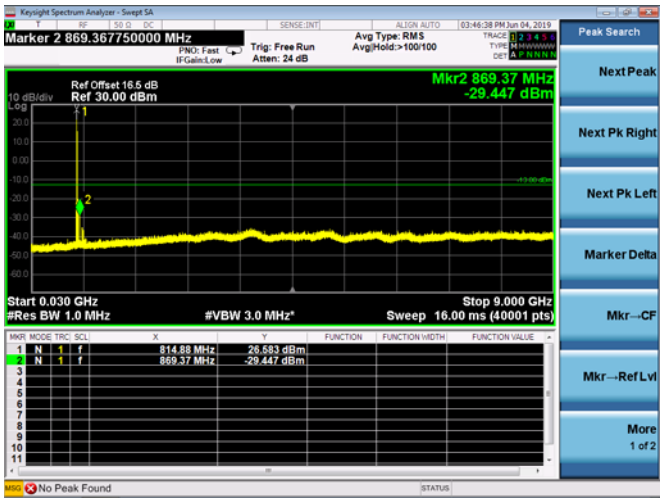
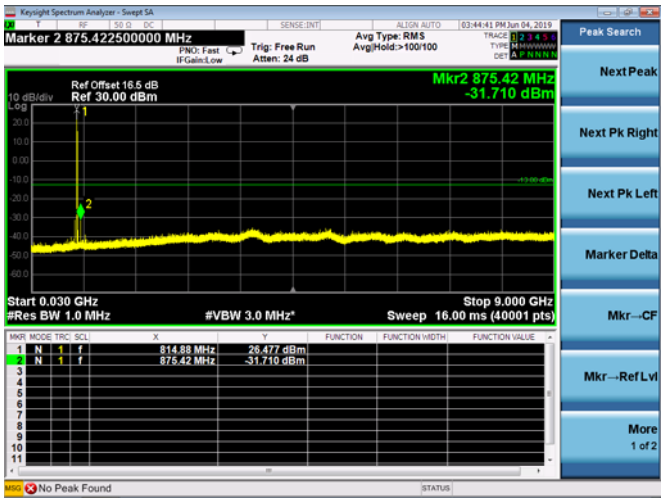
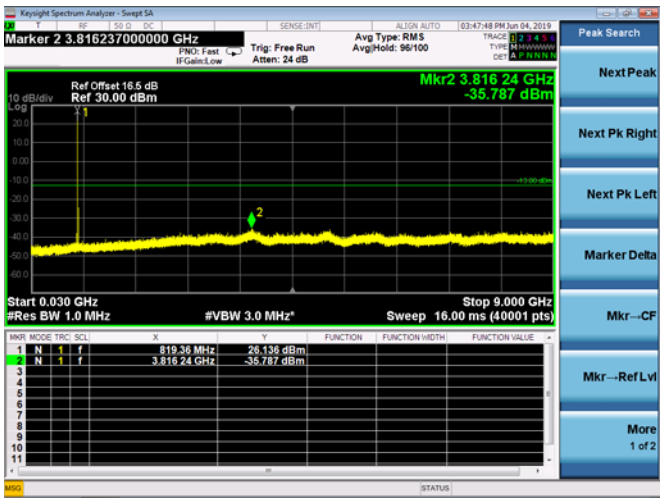
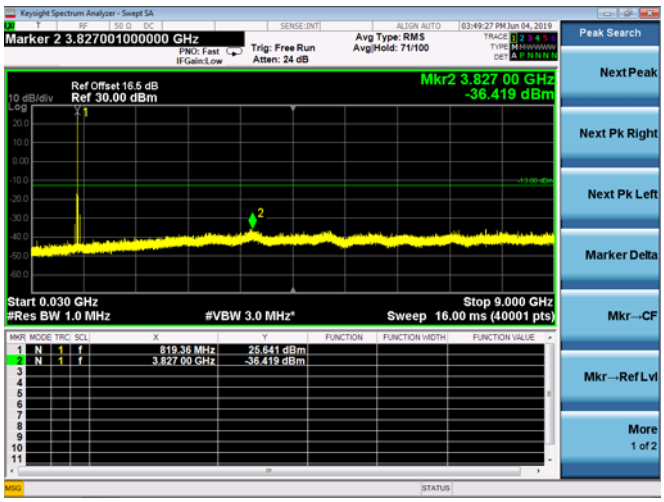
LTE Band 18 – QPSK - Channel 23925 – Frequency 822.5MHz – RB 6/0 Limit:822.5 MHz*2.5ppm=2056.25Hz					
Voltage(%)	**Power(V DC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	5	-30	-16	-0.019	PASS
100		-20	45	0.055	
100		-10	35	0.043	
100		0	-75	-0.091	
100		+10	45	0.055	
100		+20	48	0.058	
100		+30	-48	-0.058	
100		+40	-44	-0.053	
100		+50	-57	-0.069	
115	4.8	+20	35	0.043	
85	5.2	+20	55	0.067	

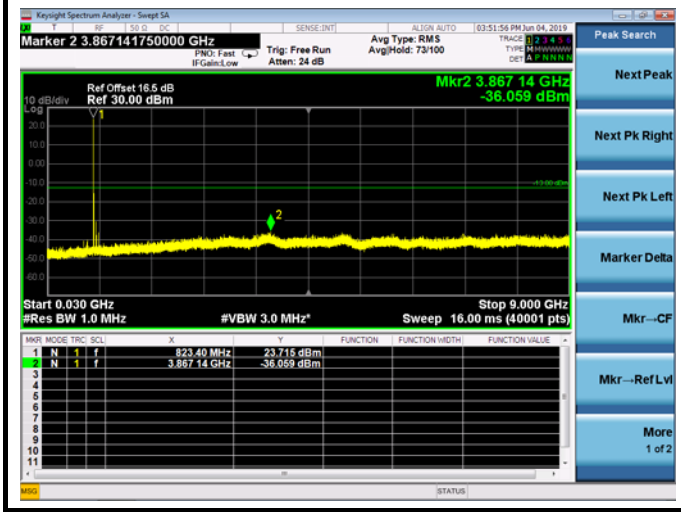
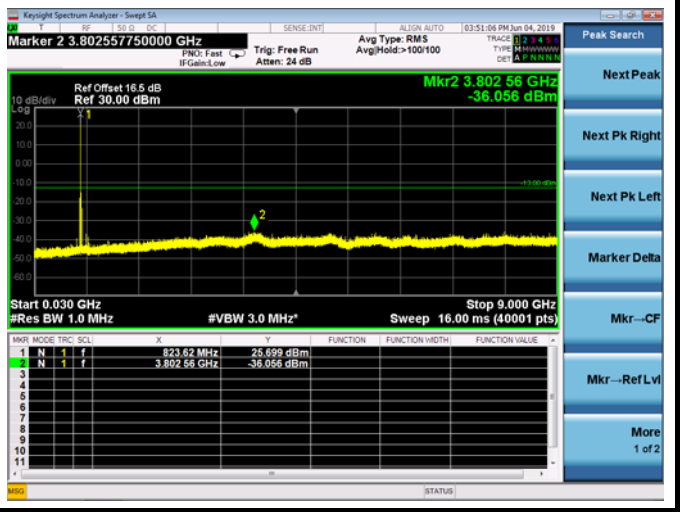
LTE Band 26 – QPSK - Channel 26740 – Frequency 819MHz – RB 6/0 Limit:819MHz*2.5ppm=2047.5Hz					
Voltage(%)	**Power(V DC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	5	-30	43	0.053	PASS
100		-20	37	0.045	
100		-10	69	0.084	
100		0	41	0.050	
100		+10	-38	-0.046	
100		+20	39	0.048	
100		+30	-56	-0.068	
100		+40	59	0.072	
100		+50	-35	-0.043	
115	4.8	+20	51	0.062	
85	5.2	+20	44	0.054	

Note：Normal=5V, Low=4.8V, High=5.2V

Conducted Out of Band Emissions

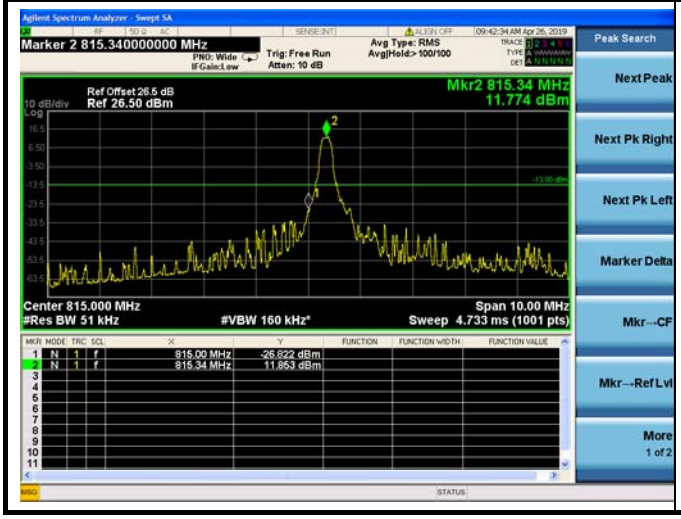
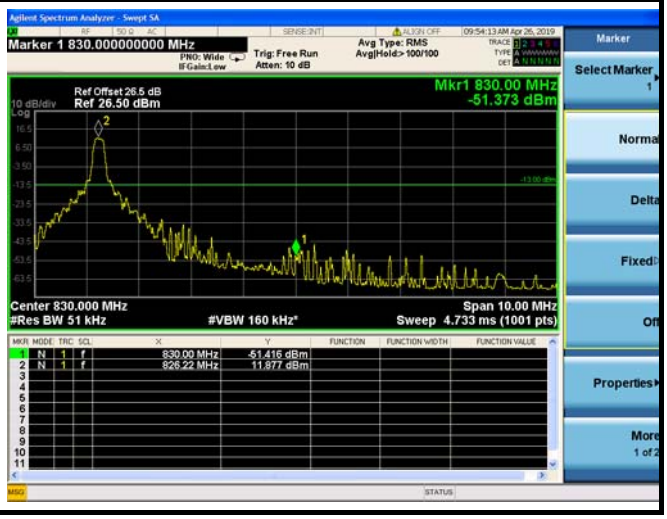
FDD18_LowRange_1.4MHz_30MHz~9GHz QPSK	FDD18_LowRange_1.4MHz_30MHz~9GHz 16QAM
	
FDD18_MiddleRange_1.4MHz_30MHz~9GHz QPSK	FDD18_MiddleRange_1.4MHz_30MHz~9GHz 16QAM
	

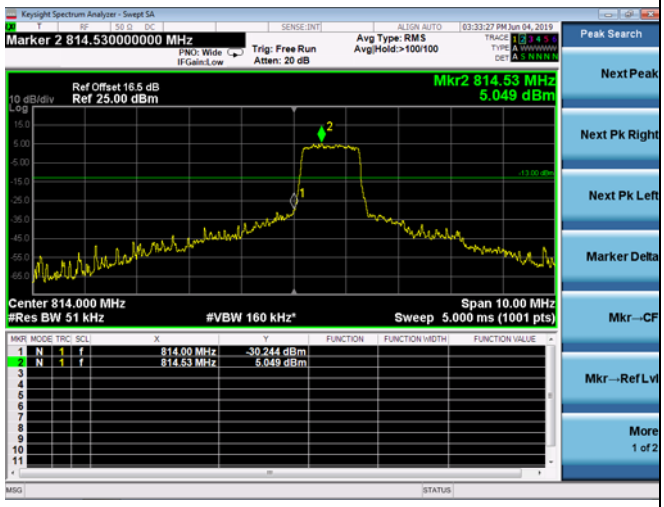
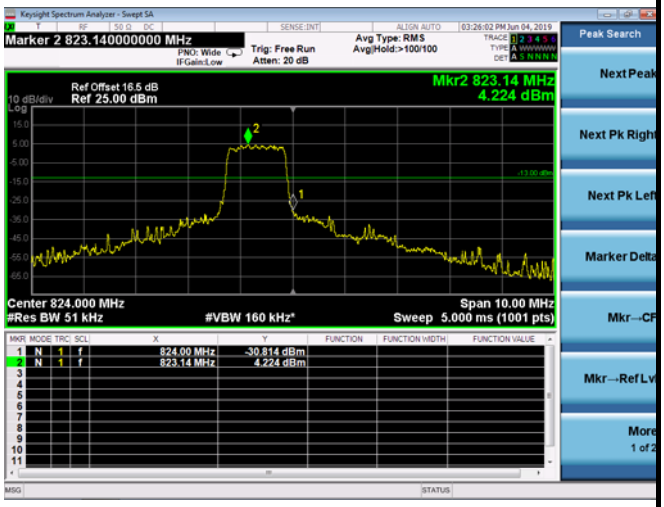
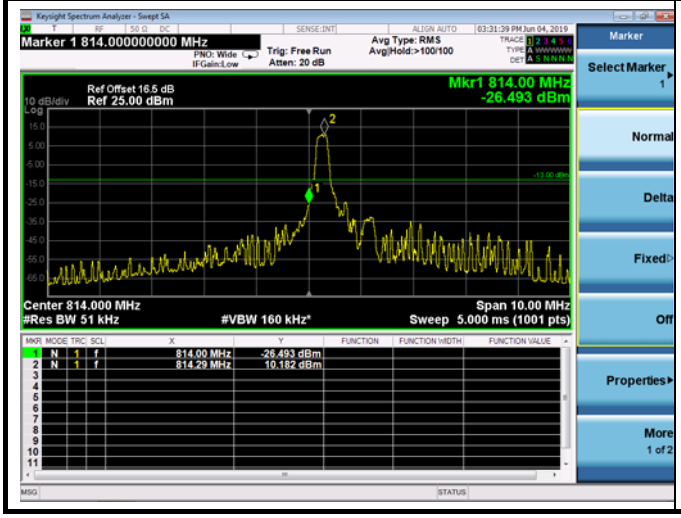
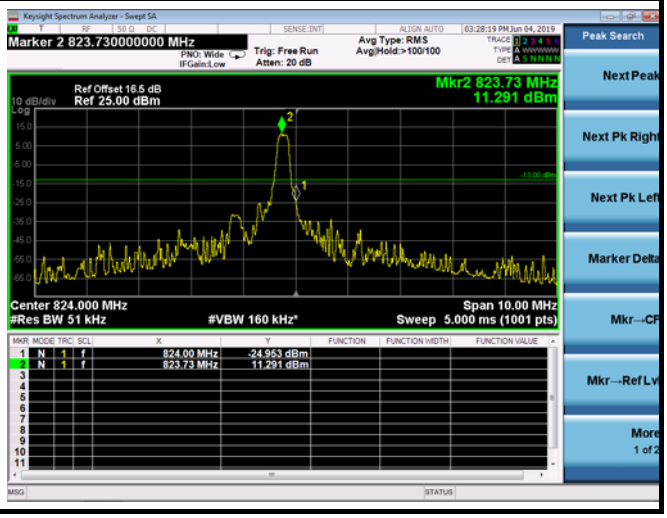
FDD18_HighRange_1.4MHz_30MHz~9GHz QPSK	FDD18_HighRange_1.4MHz_30MHz~9GHz 16QAM
	
FDD26_LowRange_1.4MHz_30MHz~9GHz QPSK	FDD26_LowRange_1.4MHz_30MHz~9GHz 16QAM
	
FDD26_MiddleRange_1.4MHz_30MHz~9GHz QPSK	FDD26_MiddleRange_1.4MHz_30MHz~9GHz 16QAM
	

FDD26_HighRange_1.4MHz_30MHz~9GHz QPSK	FDD26_HighRange_1.4MHz_30MHz~9GHz 16QAM
	

Conducted Band Edge

Test Result and Data

LowRange_ FDD18_1.4MHz_fullRB _Low_QPSK	HighRange_ FDD18_1.4MHz_fullRB _High_Q16
	
LowRange_ FDD18_1.4MHz_OneRB _Low_QPSK	HighRange_ FDD18_1.4MHz_ OneRB _High_Q16
	

LowRange_ FDD26_1.4MHz_fullRB _Low_QPSK	HighRange_ FDD26_1.4MHz_fullRB _High_Q16
	
LowRange_ FDD26_1.4MHz_OneRB _Low_QPSK	HighRange_ FDD26_1.4MHz_ OneRB _High_Q16
	

** END OF REPORT **