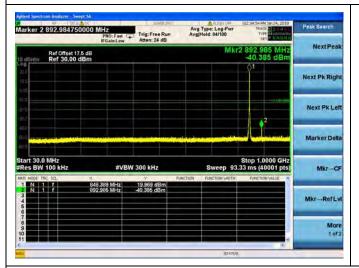
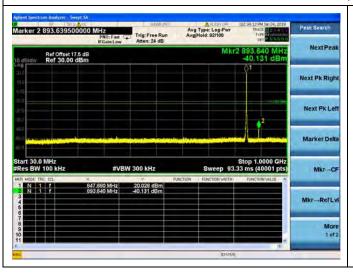


## LTE Band 5 1.4MHz BW High Channel

#### **QPSK**





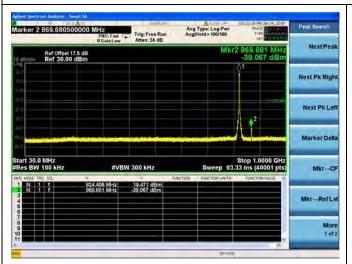




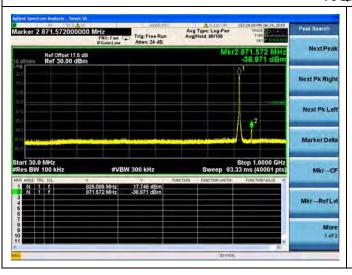


## LTE Band 5 3MHz BW Low Channel

#### **QPSK**







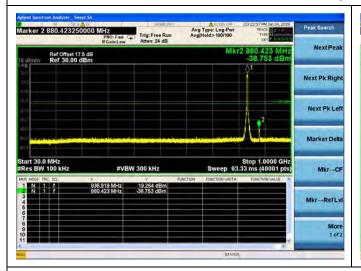




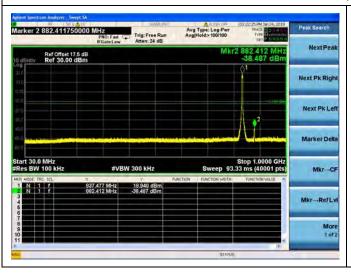


## LTE Band 5 3MHz BW Mid Channel

#### **QPSK**







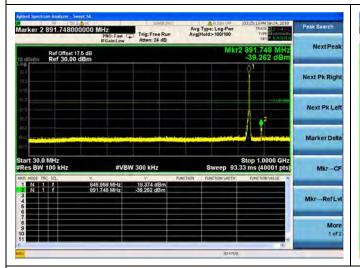




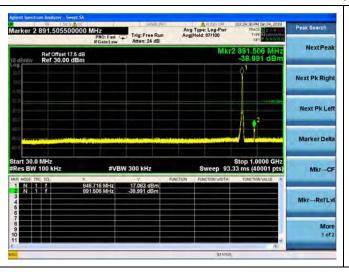


## LTE Band 5 3MHz BW High Channel

#### **QPSK**





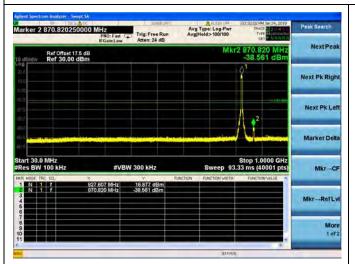




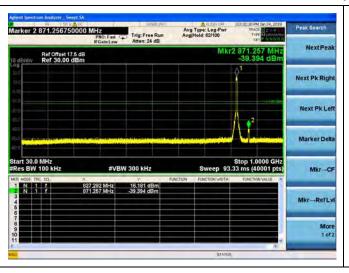


## LTE Band 5 5MHz BW Low Channel

#### **QPSK**







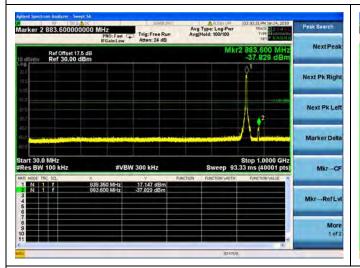




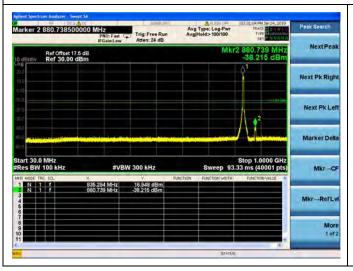


## LTE Band 5 5MHz BW Mid Channel

#### **QPSK**





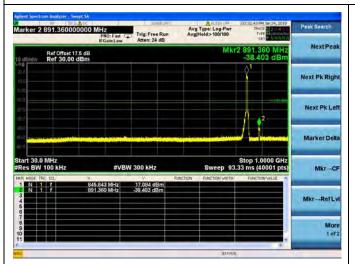




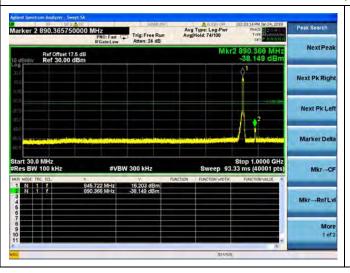


## LTE Band 5 5MHz BW High Channel

#### **QPSK**





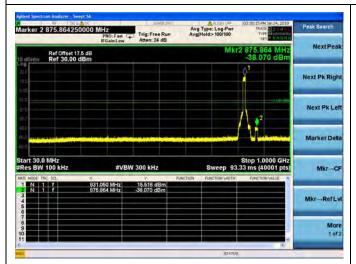


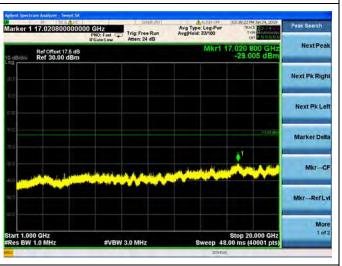


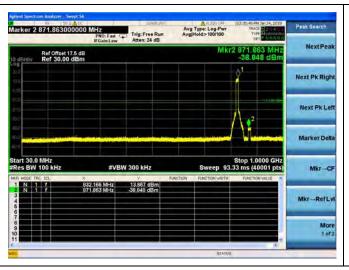


## LTE Band 5 10MHz BW Low Channel

#### **QPSK**







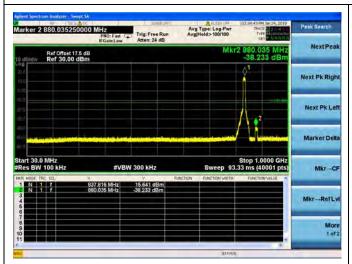


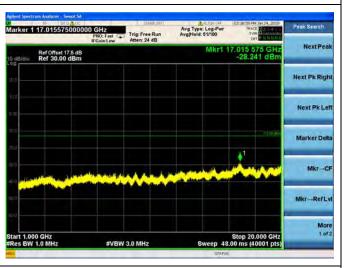


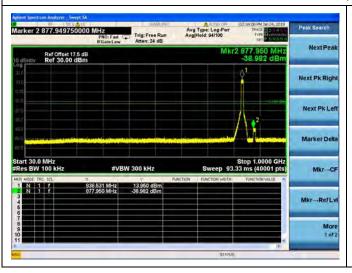


## LTE Band 5 10MHz BW Mid Channel

#### **QPSK**





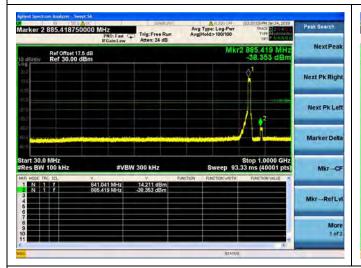




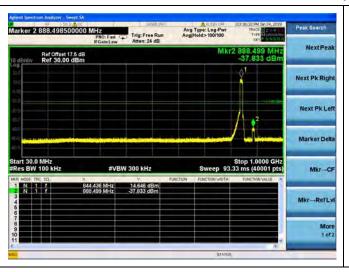


# LTE Band 5 10MHz BW High Channel

#### **QPSK**





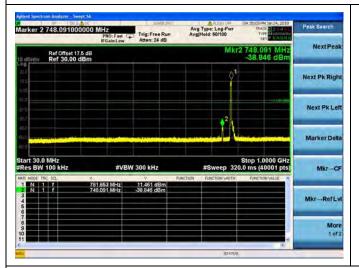




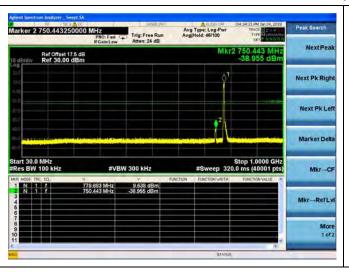


## LTE Band 13 5MHz BW Low Channel

#### **QPSK**







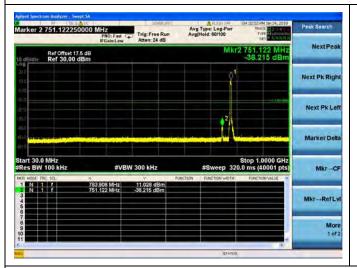




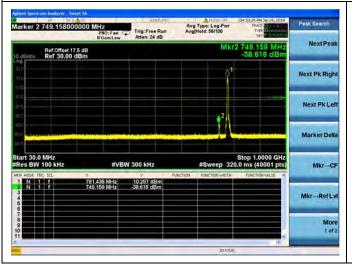


## LTE Band 13 5MHz BW Mid Channel

#### **QPSK**







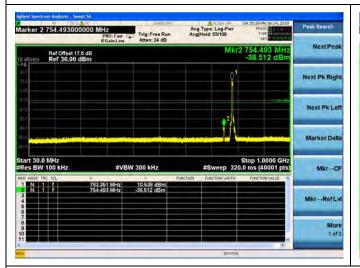




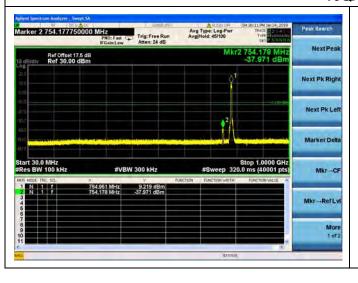


## LTE Band 13 5MHz BW High Channel

#### **QPSK**





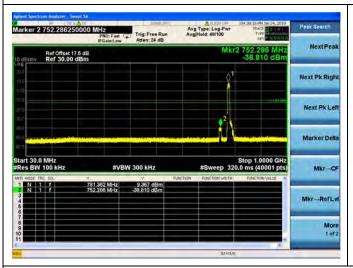




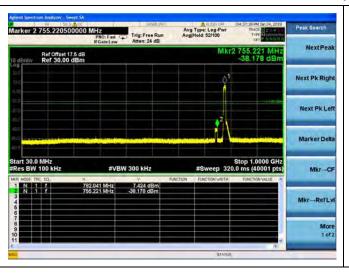


## LTE Band 13 10MHz BW Mid Channel

#### **QPSK**











2.6. Band Edge

# 2.6.1. Requirement

According to FCC section 22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

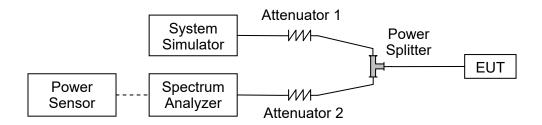
According to FCC section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to FCC section 27.53(h), for operations in the 1710–1755MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

According to FCC section 27.53(c)(2),on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

According to FCC section 27.53(c)(4), on all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

#### 2.6.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

#### 2.6.3. Test procedure

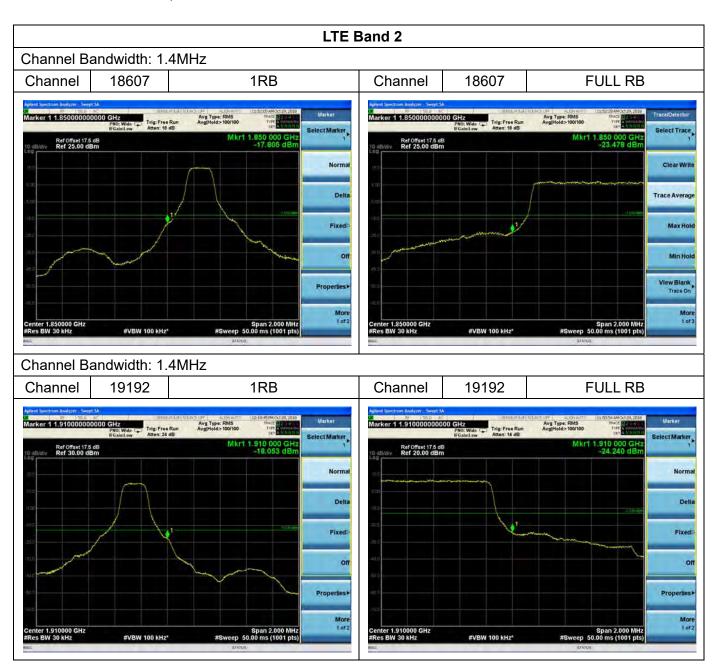
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.





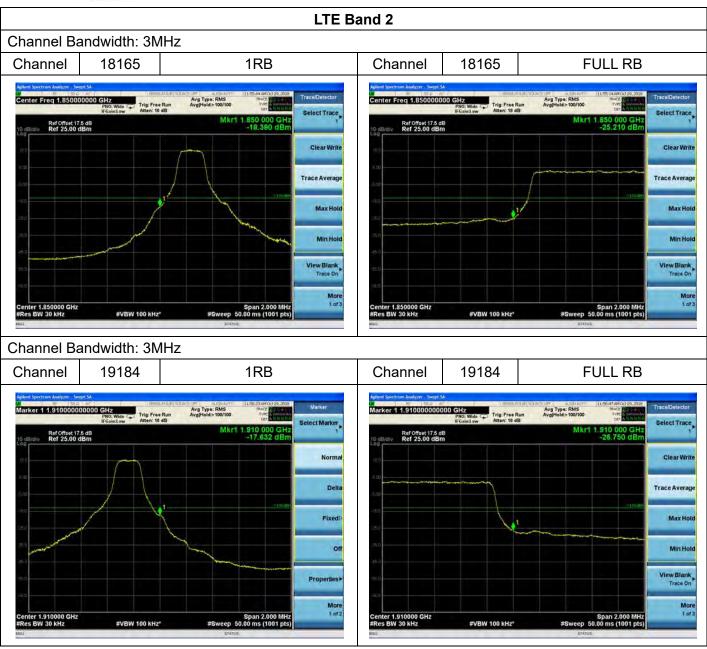
#### 2.6.4. Test Result

The center frequency of spectrum is the band edge frequency and span is 2MHz, Record the max trace into the test report.



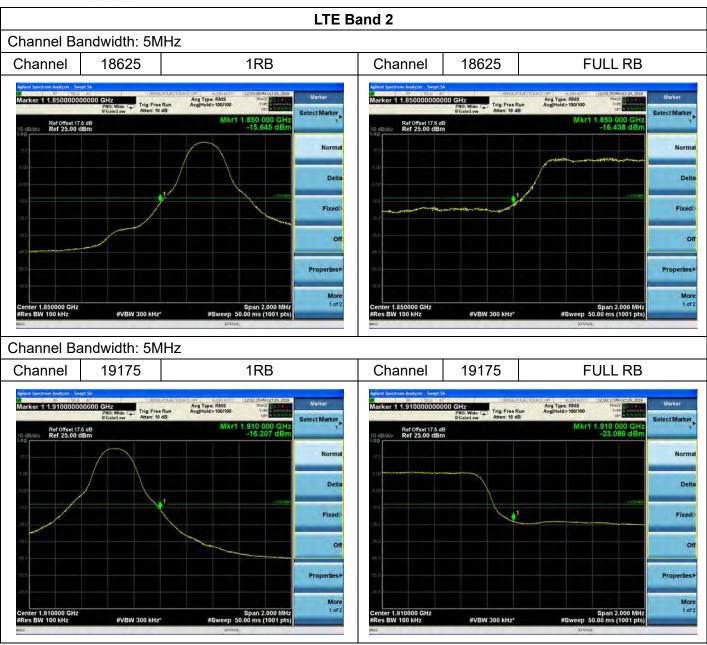






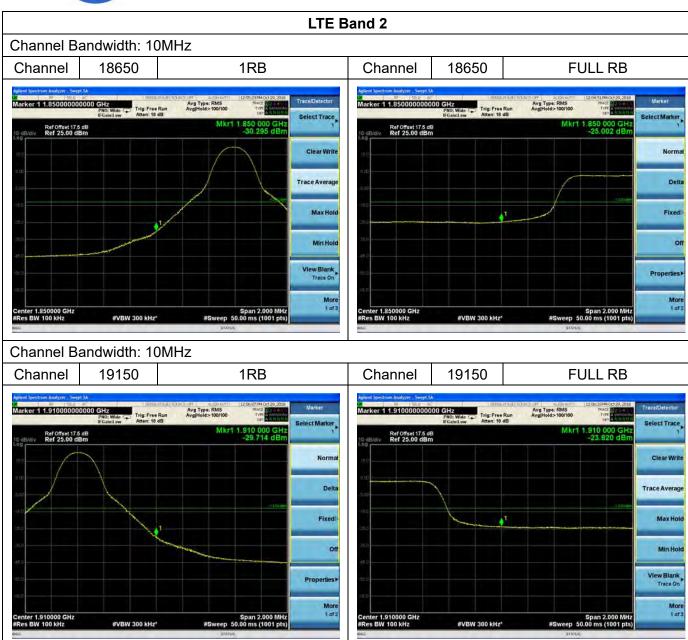




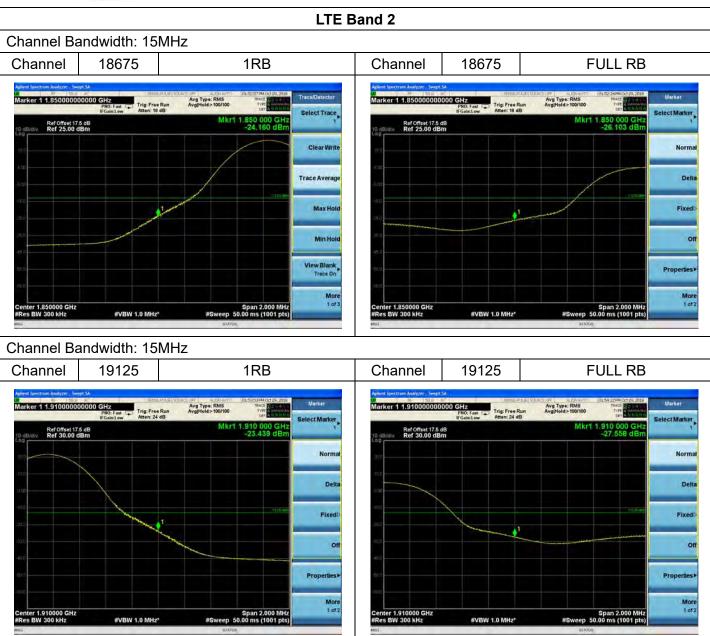




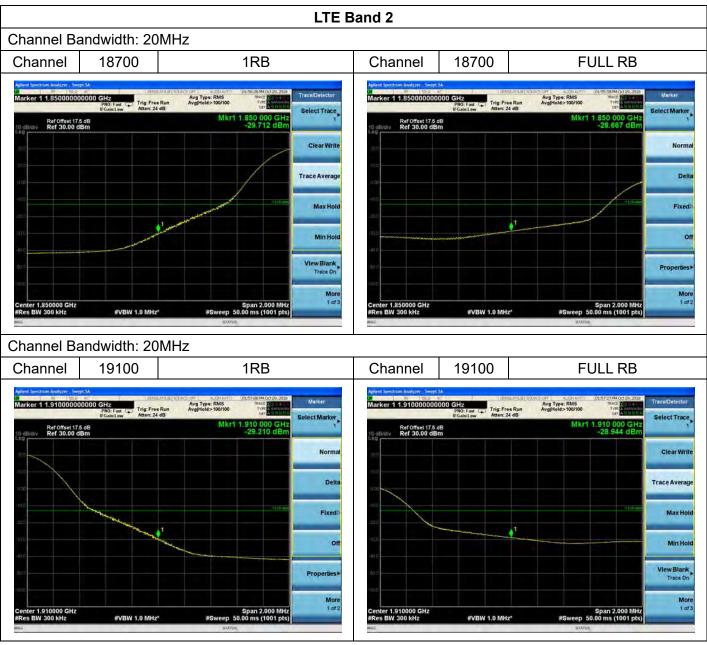






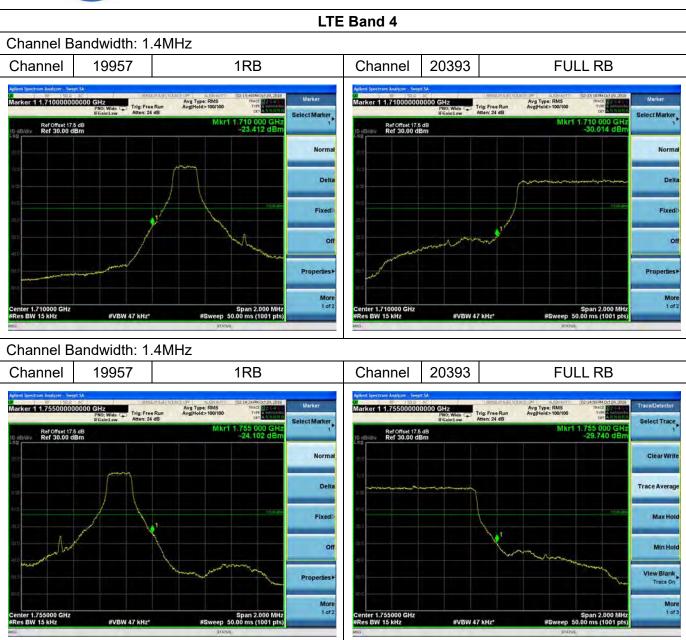




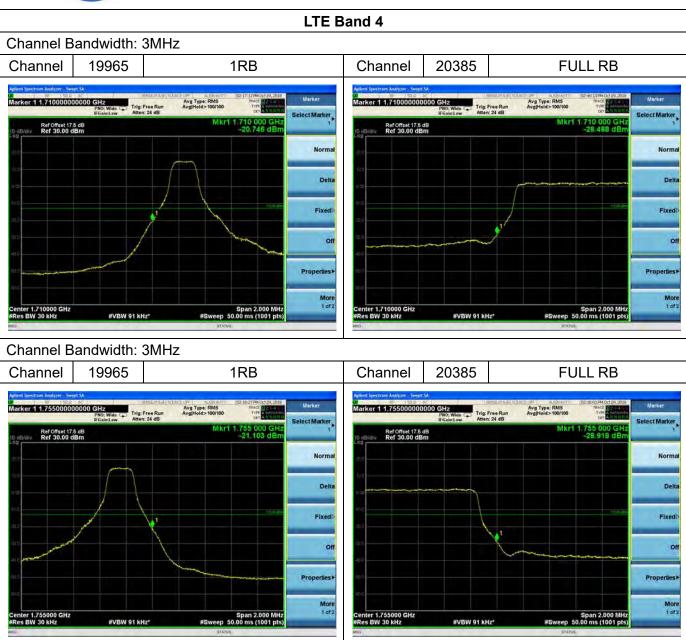




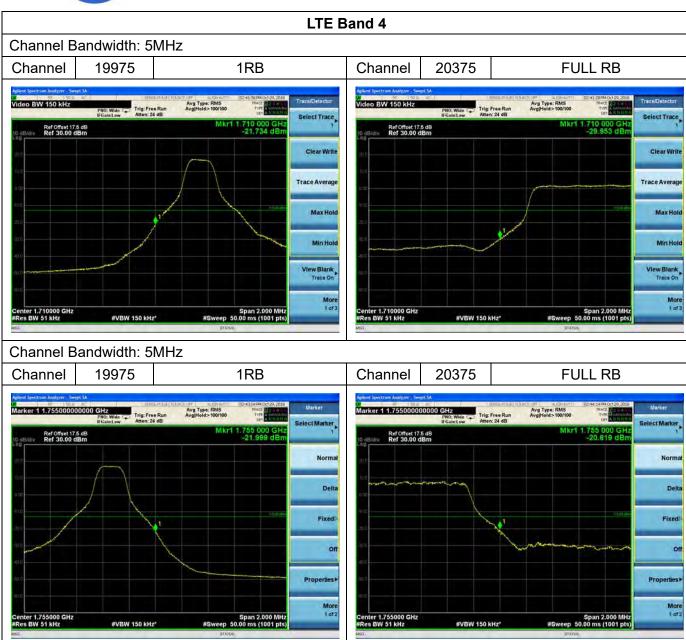




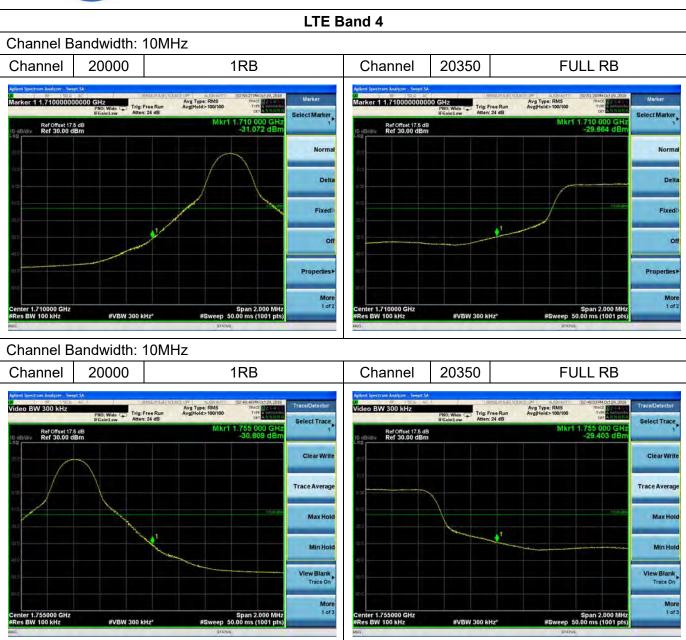




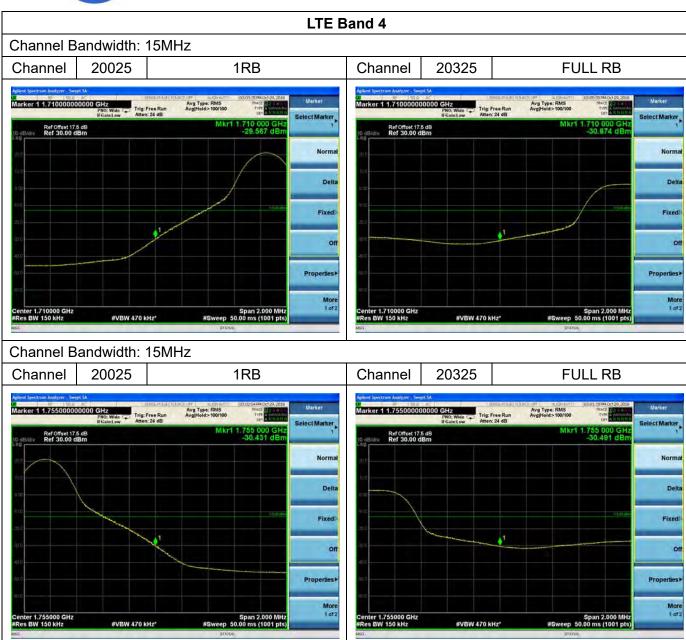




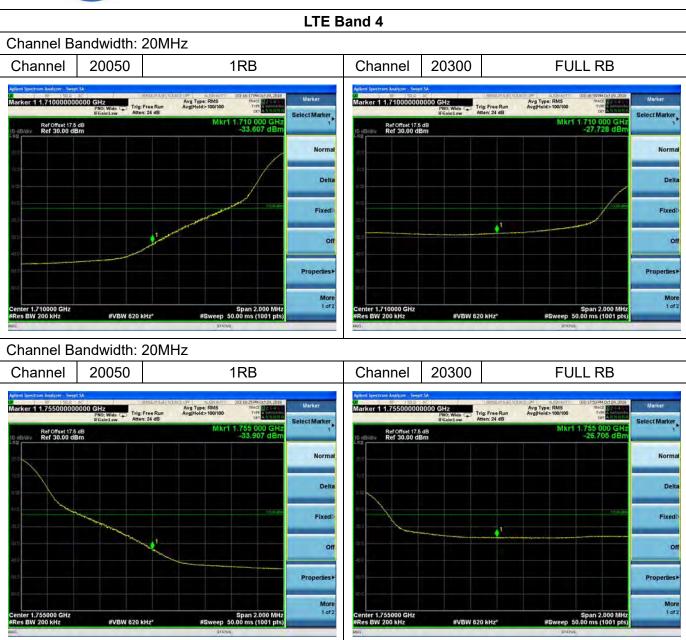




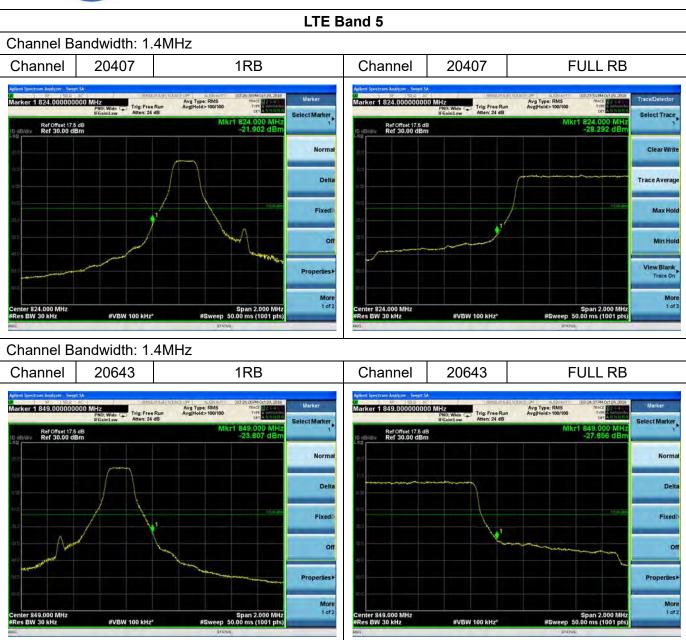




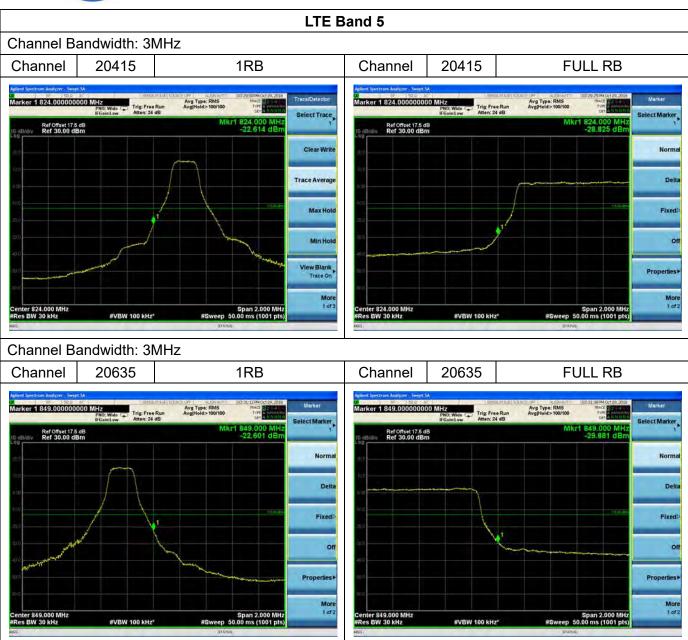




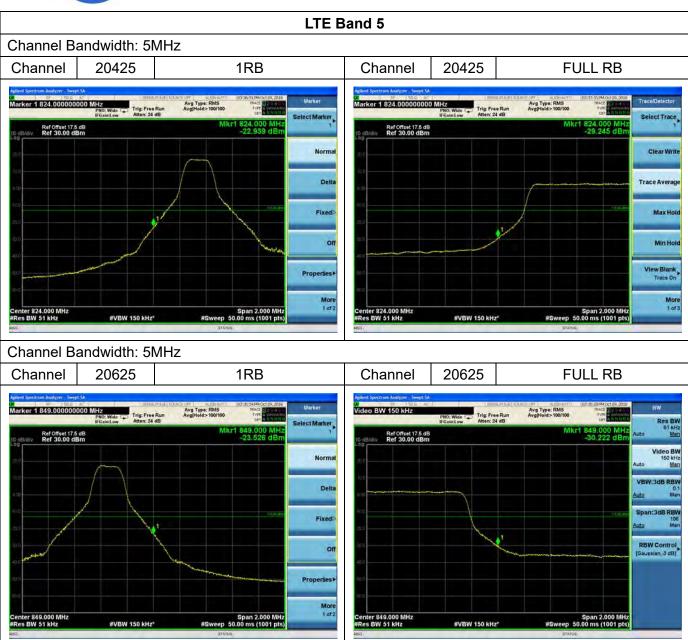




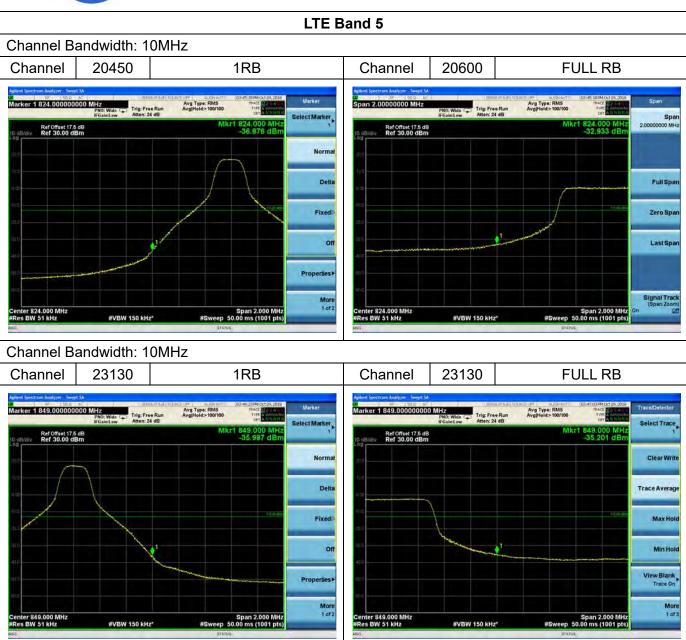














# LTE Band 13 Channel Bandwidth: 5MHz Channel 23205 1RB 1MHz form channel edge 763-775MHz Marker 1 774.810100000 MHz Avg Type: Log-Pw Avg|Hold: 44/100 Avg Type: RMS Avg|Hold>100/100 Select Marker Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm Mkr-RefLv More 1 of 2 More 1 of 2 Channel 23205 Full RB 1MHz form channel edge 763-775MHz arker 1 777.000000000 MHz PNO: Wide Trig: Free Run Atten: 24 dB Trig: Free Run NextPea Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm **Next Pk Righ** Next Pk Lef



# LTE Band 13 Channel Bandwidth: 5MHz Channel 23255 1 RB 1MHz form channel edge 793-805MHz Avg Type: Log-Pv Avg|Hold: 68/100 Avg Type: RMS Avg|Hold>100/100 Select Marker Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm Mkr-RefLv More 1 of 2 More 1 of 2 23255 Channel Full RB 1MHz form channel edge 793-805MHz arker 1 787.000000000 MHz PNO: Wide Place and Attent 24 69 Trig: Free Run NextPea Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm **Next Pk Righ** Next Pk Lef



# LTE Band 13 Channel Bandwidth: 10MHz Channel 23230 1RB 1MHz form channel edge 763-775MHz Avg Type: Log-Pw Avg|Hold: 53/100 Avg Type: RMS Avg|Hold>100/100 Marker 1 774.805900000 MHz Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm View Blank Trace On Mkr-RefLv More 1 of 3 More 1 of 2 Channel 23230 Full RB 1MHz form channel edge 763-775MHz arker 1 777.0000000000 MHz PNO: Wide Trig: Free Run Atten: 24 dB Trig: Free Run NextPea Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm **Next Pk Righ** Trace Averag Next Pk Lef ew Blank Trace On



# LTE Band 13 Channel Bandwidth: 10MHz Channel 23230 1RB 1MHz form channel edge 793-805MHz Avg Type: Log-Pv Avg|Hold: 30/100 Marker 1 795.201100000 MHz Avg Type: RMS Avg|Hold>100/100 Select Marker Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm Mkr-RefLv More 1 of 2 More 1 of 2 Channel 23230 Full RB 1MHz form channel edge MHz arker 1 787.000000000 MHz PNO: Wide Plot Mide W Atten: 24 69 arker 1 793.386700000 MHz PNO: Wide PNO: Mide WAREN: 6 dB NextPea Ref Offset 17.5 dB Ref 30.00 dBm Ref Offset 17.5 dB Ref 5.00 dBm **Next Pk Righ** Trace Averag Next Pk Lef ew Blank Trace On

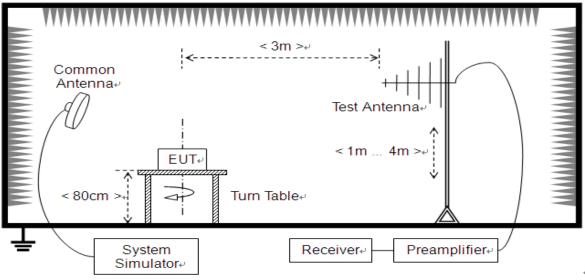


# 2.7. Radiated Spurious Emissions

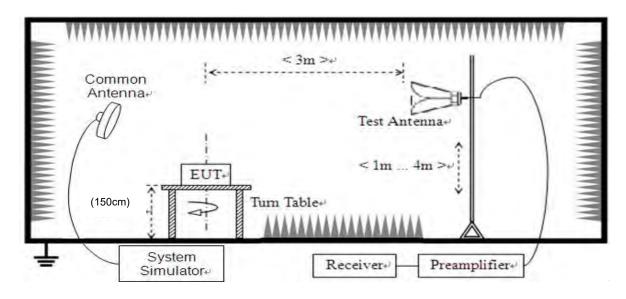
## 2.7.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10\*log(P)dB. This calculated to be -13dBm.

#### 2.7.2. Test Description



(For the test frequency from 30MHz to1GHz)



(For the test frequency above 1GHz)





The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

**Note:** when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

#### 2.7.3. Test procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.

Tel: 86-755-36698555

Http://www.morlab.cn



#### 2.7.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. Test Antenna height is varied from 1m to 4m above the ground, and the Turn Table is actuated to turn from 0° to 360°, both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The substitution corrections are obtained as described below:

 $A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$ 

 $A_{TOT} = L_{CABLES} + A_{SUBST}$ 

Where A<sub>SUBST</sub> is the final substitution correction including receive antenna gain.

P<sub>SUBST TX</sub> is signal generator level,

P<sub>SUBST RX</sub> is receiver level,

L<sub>SUBST CABLES</sub> is cable losses including TX cable,

 $G_{\text{SUBST\_TX\_ANT}}$  is substitution antenna gain.

A<sub>TOT</sub> is total correction factor including cable loss and substitution correction

During the test, the data of  $A_{TOT}$  was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of  $A_{TOT}$ .

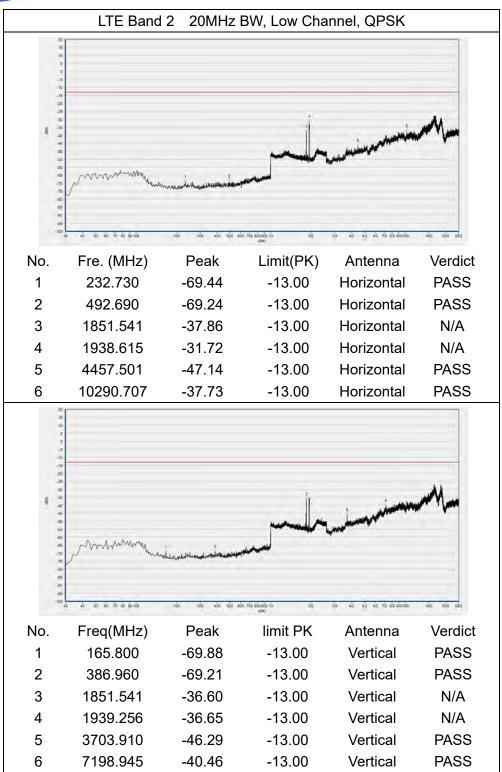
**Note1:** The power of the EUT transmitting frequency should be ignored.

**Note2:** All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

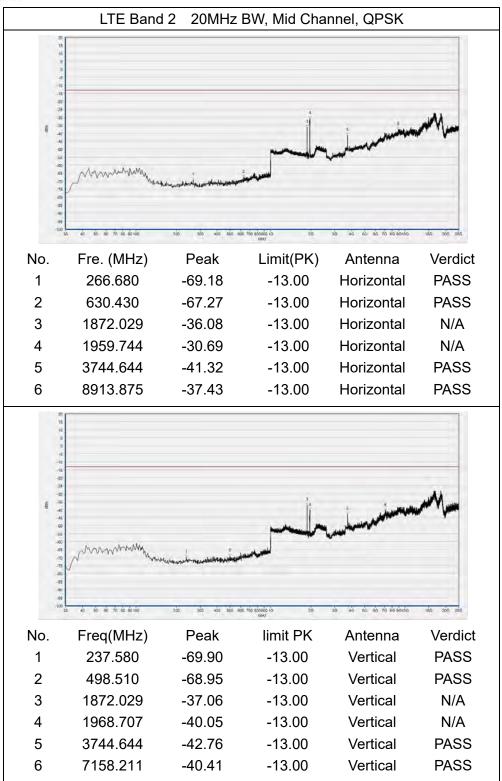
**Note3:** All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and QPSK mode) were recorded in this test report.





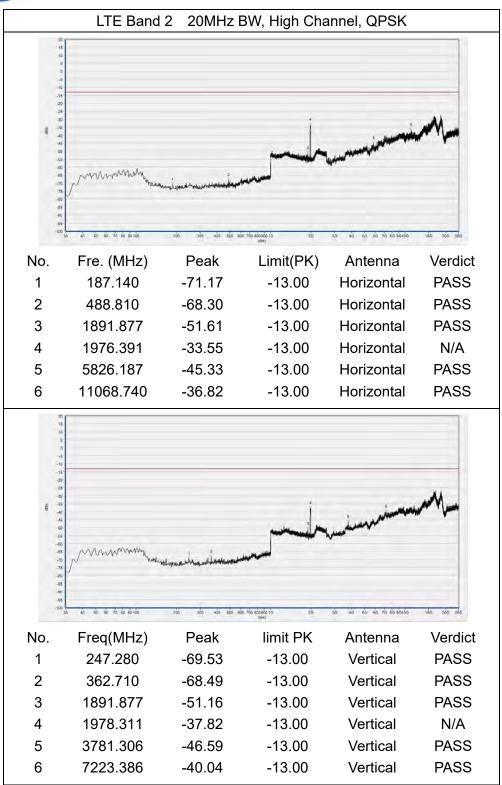




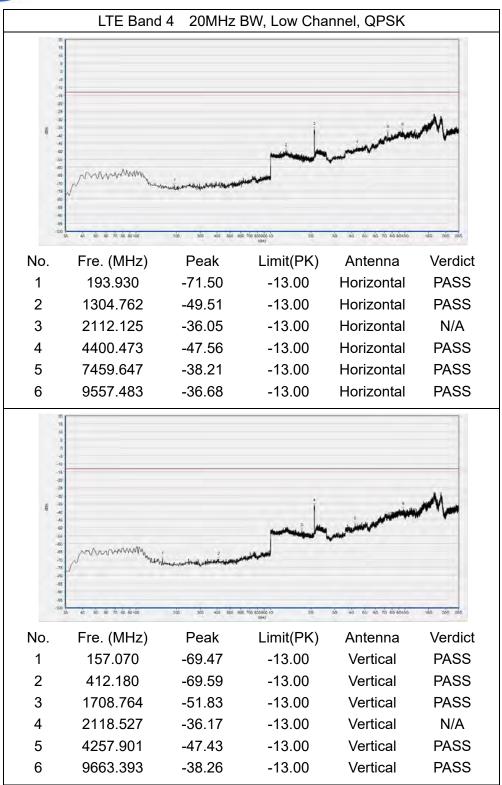




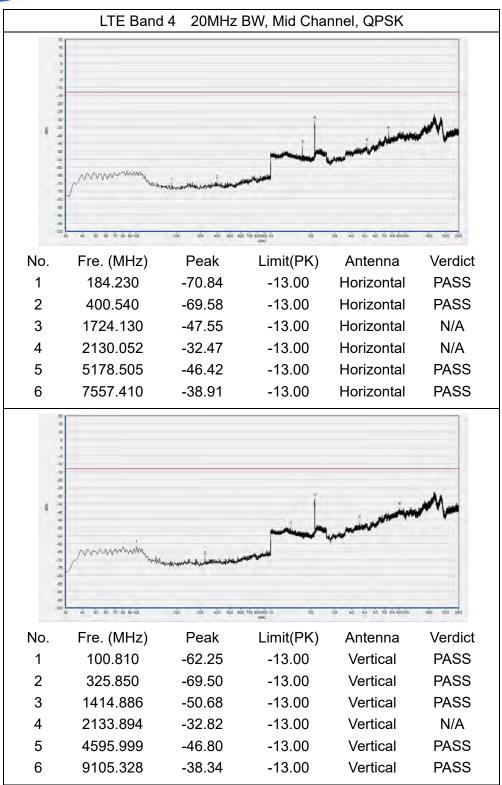




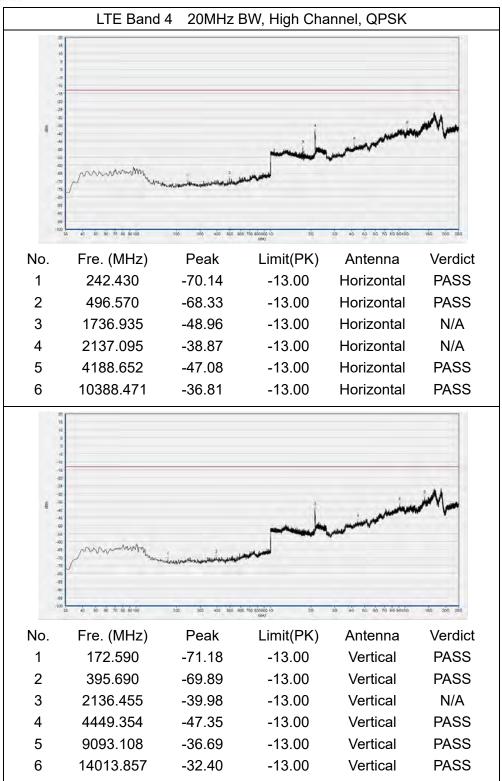






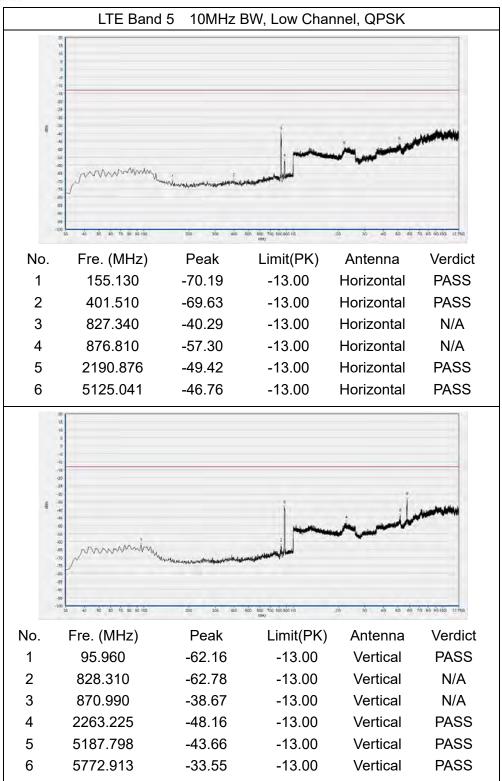




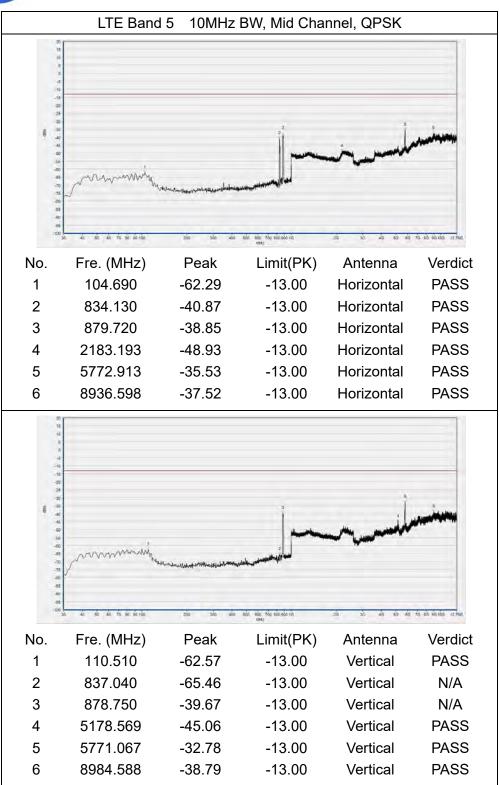




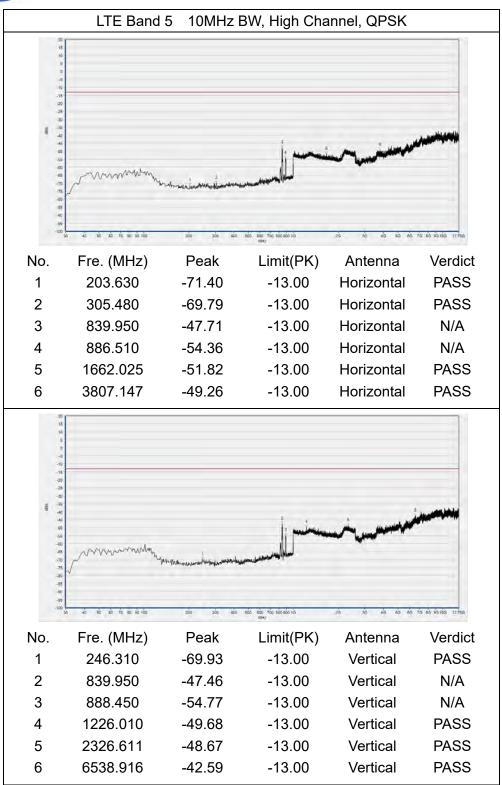




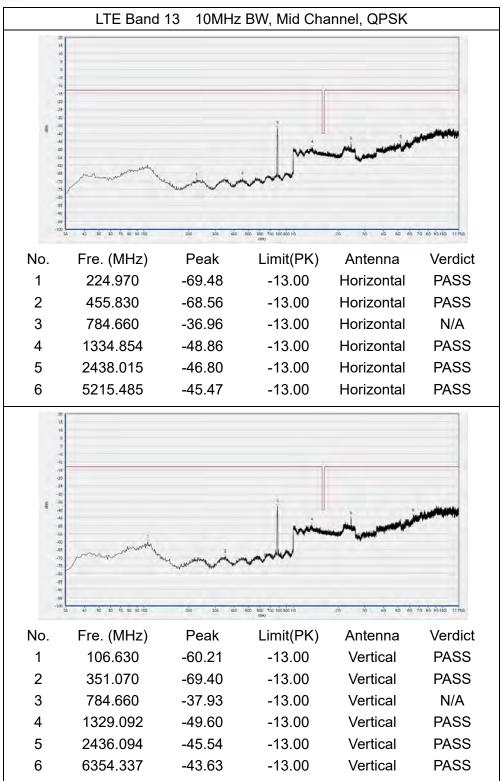
















# **Annex A Test Uncertainty**

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Output Power	±2.22 dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77 dB
Band Edge	±2.77 dB
Equivalent Isotropic Radiated Power	±2.22 dB
Radiated Spurious Emissions	±6 dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2



Tel: 86-755-36698555

Http://www.morlab.cn



# **Annex B Testing Laboratory Information**

## 1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.		
	Morlab Laboratory		
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang		
	Road, Block 67, BaoAn District, ShenZhen, GuangDong		
	Province, P. R. China		
Telephone:	+86 755 36698555		
Facsimile:	+86 755 36698525		

### 2. Identification of the Responsible Testing Location

Name: Shenzhen Morlab Communications Technology Co., Ltd Morlab Laboratory		
	FL.3, Building A, FeiYang Science Park, No.8 LongChang	
Address:	Road, Block 67, BaoAn District, ShenZhen, GuangDong	
	Province, P. R. China	

#### 3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.





## 4. Test Equipments Utilized

## **4.1 Conducted Test Equipments**

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2018.04.17	2019.04.16
Attenuator 1	(N/A.)	10dB	Resnet	2018.04.17	2019.04.16
Attenuator 2	(N/A.)	3dB	Resnet	2018.04.17	2019.04.16
EXA Signal	MY53470836	N9010A	Agilent	2018.11.06	2019.11.05
Analzyer	W1133470636				
USB Power	MY54210011	U2021XA	Agilent	2018.04.17	2019.04.16
Sensor	101134210011				
System Simulator	152038	CMW500	R&S	2018.05.08	2019.05.07
RF cable	0004	RF01	Morlab	N/A	N/A
(30MHz-26GHz)	CB01				
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	(N/A)	HUT705P	CHONGQING	2018.04.17	2019.04.16
			HANBA		
			EXPERIMENTAL		
			EQUIPMENT		
			CO.,LTD		
Computer	T430i	Think Pad	Lenovo	N/A	N/A



### **4.2 Radiated Test Equipments**

Equipment Name	Serial No.	Туре	Manufacturer	Cal. Date	Cal. Due
System Simulator	152038	CMW500	R&S	2018.08.04	2019.08.03
Receiver	MY54130016	N9038A	Agilent	2018.05.18	2019.05.17
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.03.03	2019.03.02
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2018.08.06	2019.08.05
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2018.08.02	2019.08.01
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
Notch Filter	N/A	WRCGV -LTE B2	Wainwright	2018.12.01	2019.11.30
Notch Filter	N/A	WRCGV -LTE B4	Wainwright	2018.12.01	2019.11.30
Notch Filter	N/A	WRCGV -LTE B5	Wainwright	2018.12.01	2019.11.30
Notch Filter	N/A	WRCGV -LTE B13	Wainwright	2018.12.01	2019.11.30
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

FND OF REPORT	

