



2.7. Radiated Spurious Emissions

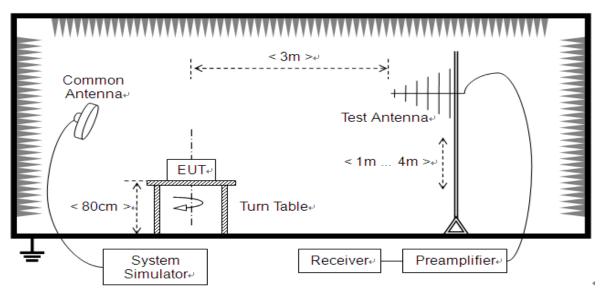
2.7.1. Requirement

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.

Additional requirement for LTE Band 7:

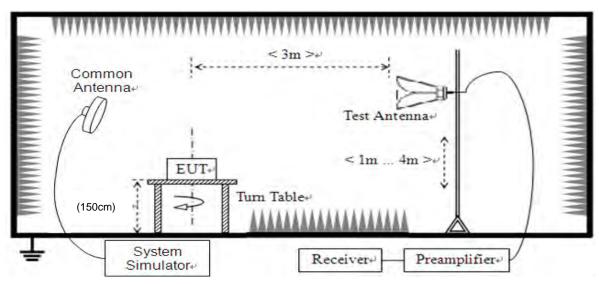
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log(P) dB. This calculated to be -25dBm.

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.





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_{SUBST} is the final substitution correction including receive antenna gain.

P_{SUBST TX} is signal generator level,

P_{SUBST RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

G_{SUBST_TX_ANT} is substitution antenna gain.

A_{TOT} 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} .

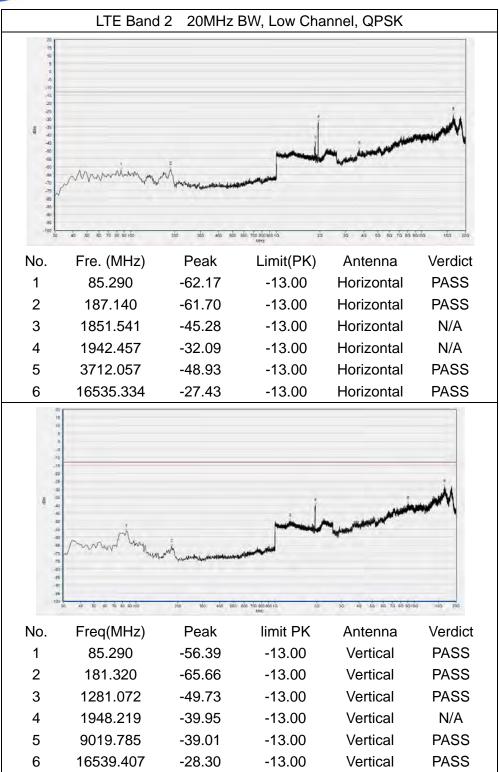
Note1: The power of the EUT transmitting frequency should be ignored.

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.

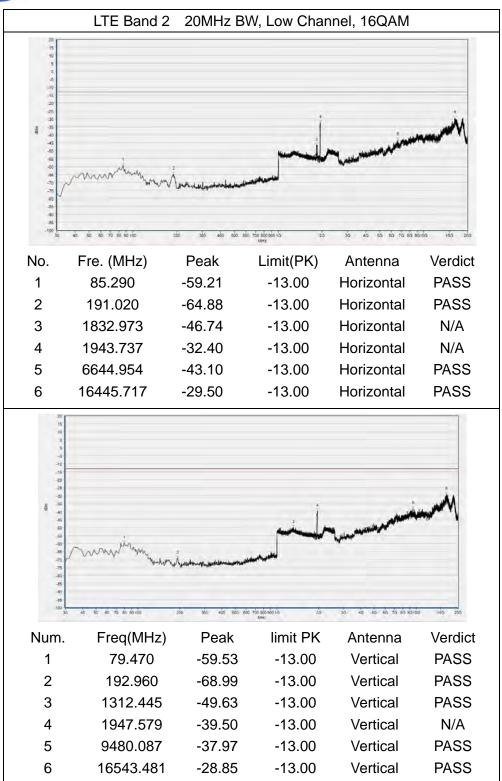
Note3: All bandwidth and test channel were considered and evaluated respectively by performing full test for each band, only the worst cases were recorded in this test report.



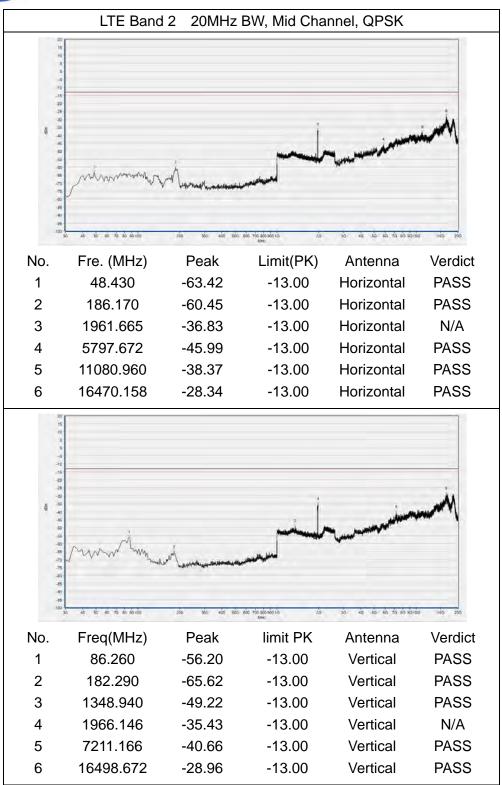




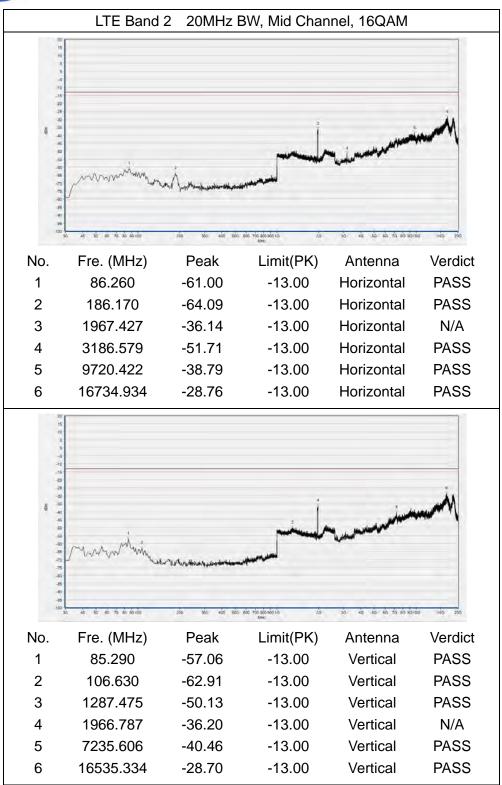




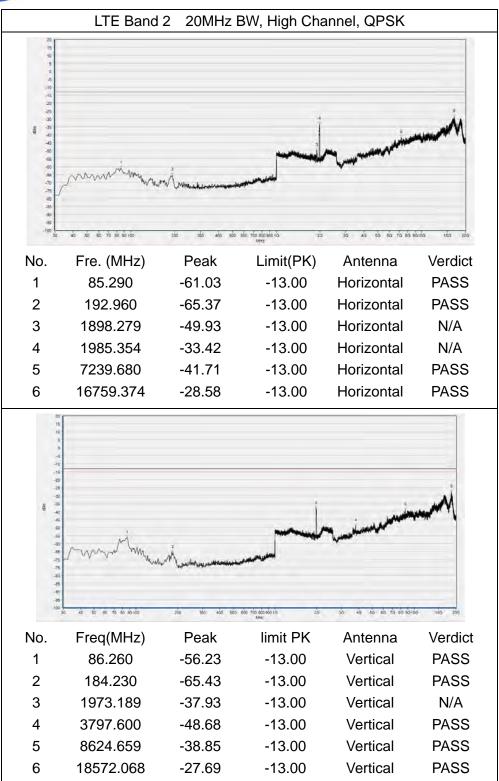




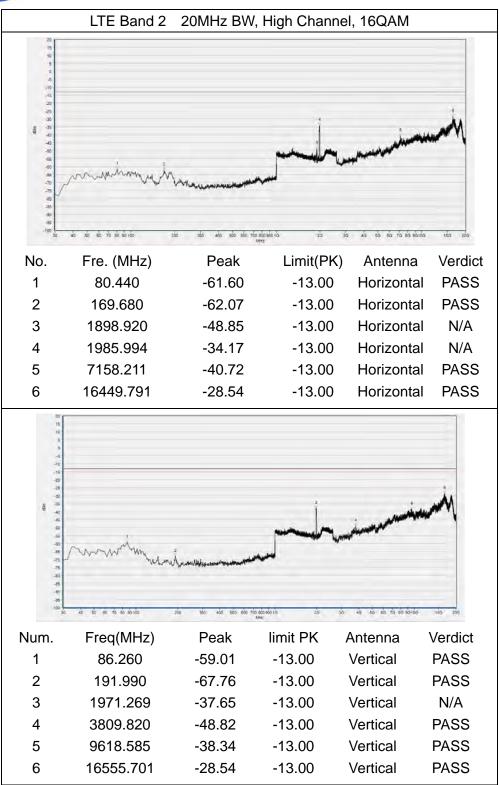






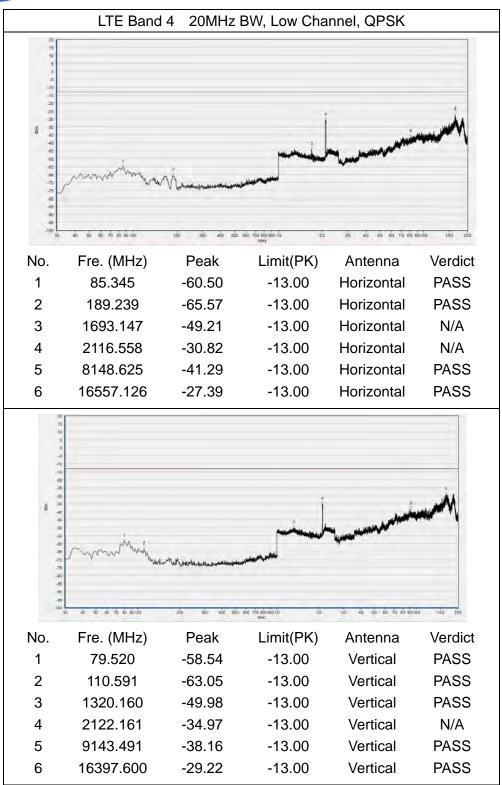




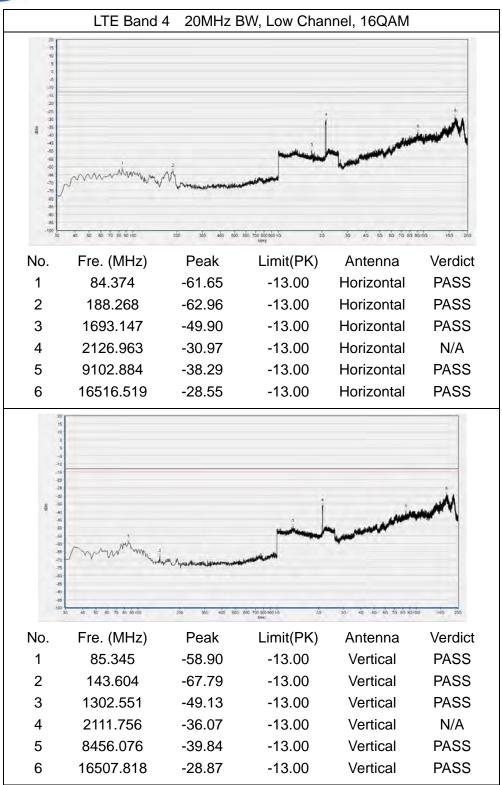




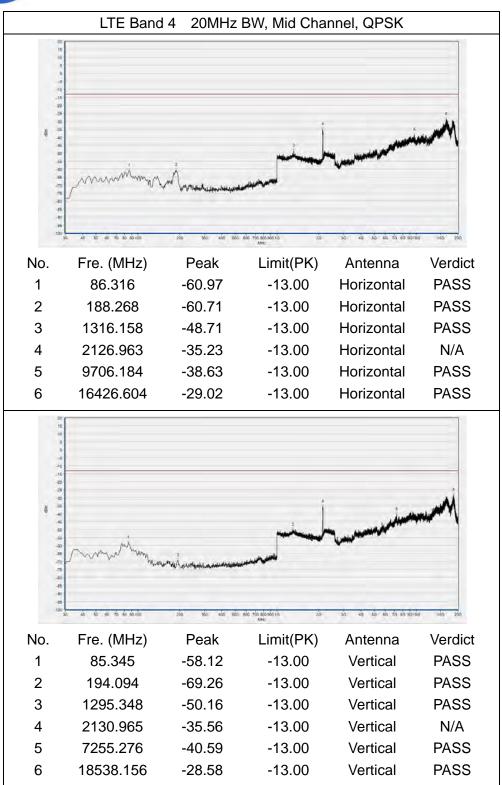




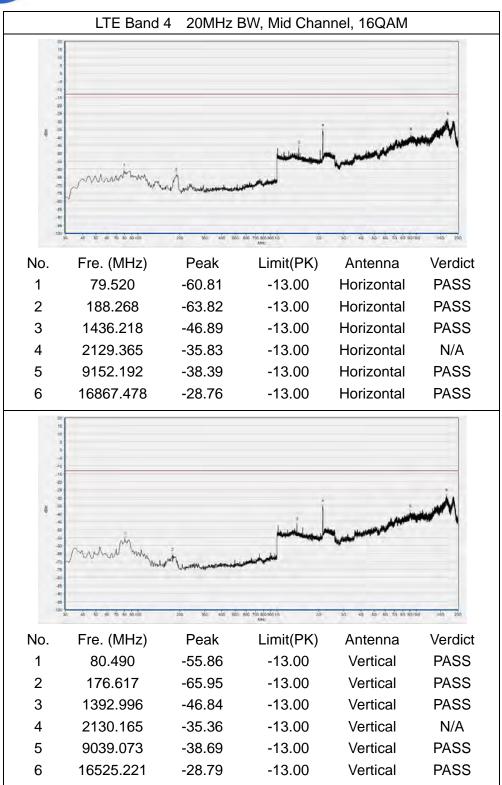




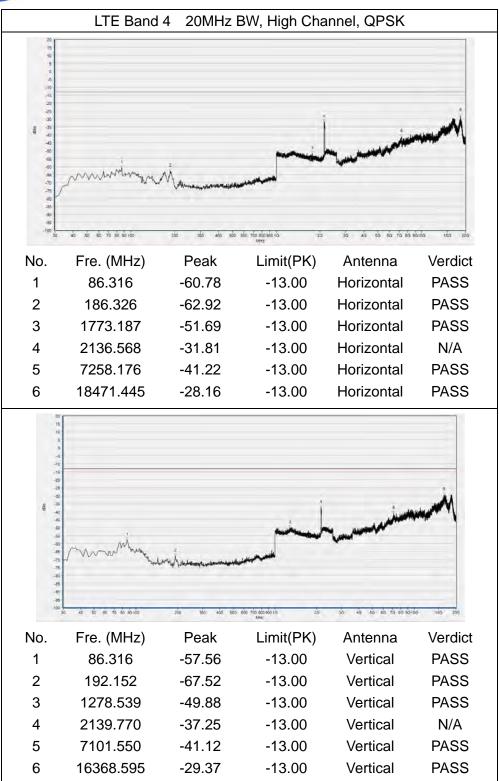




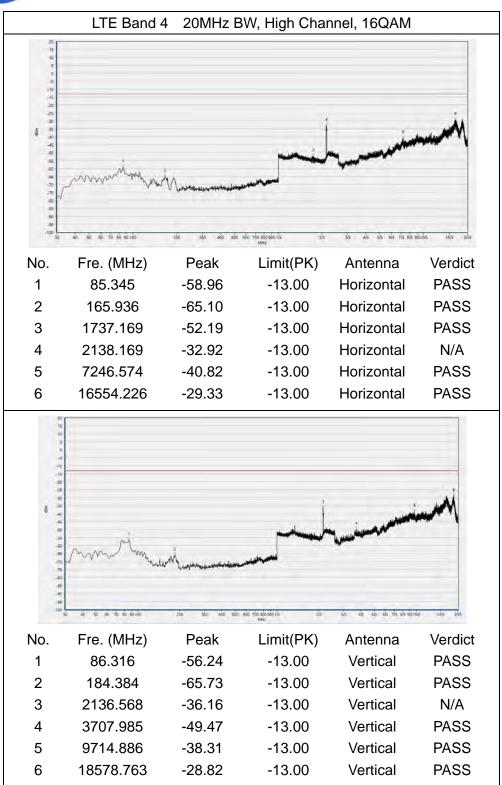




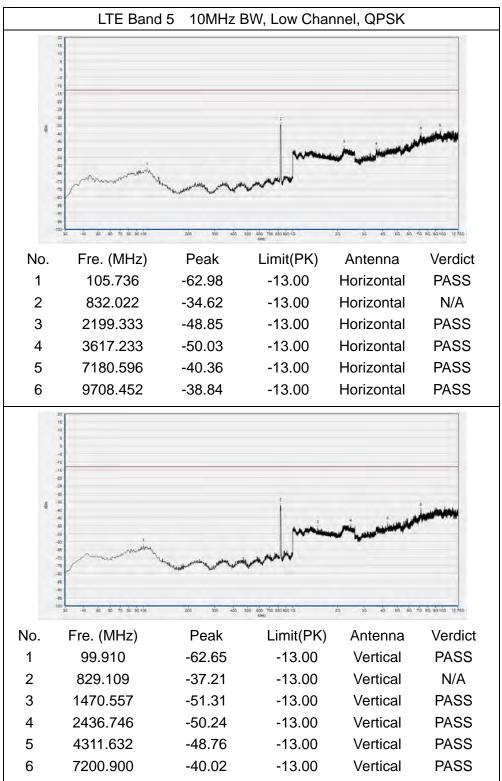






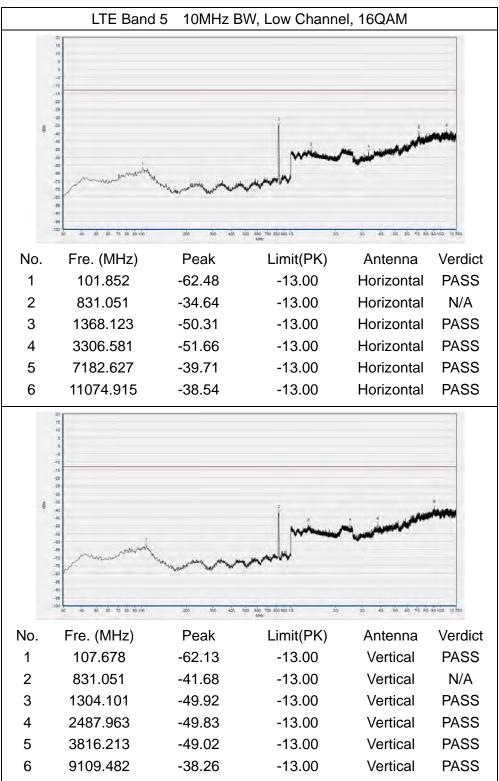






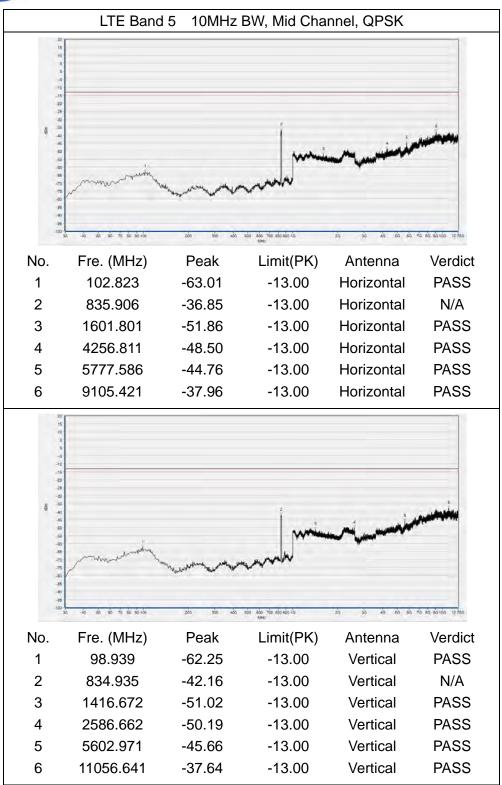




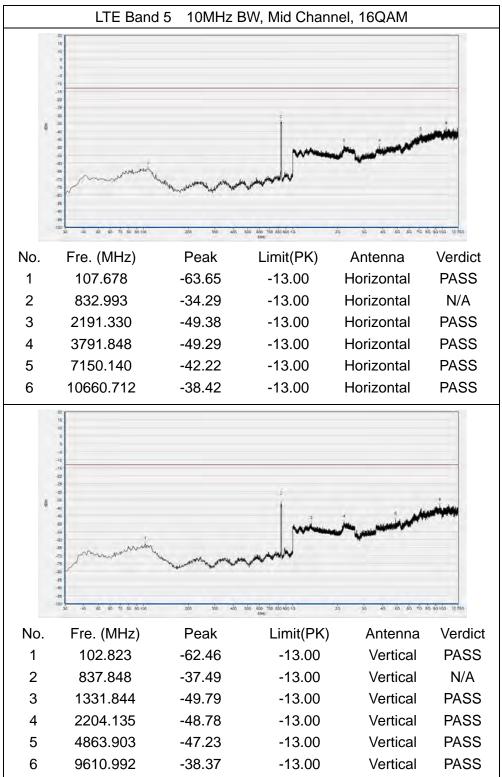




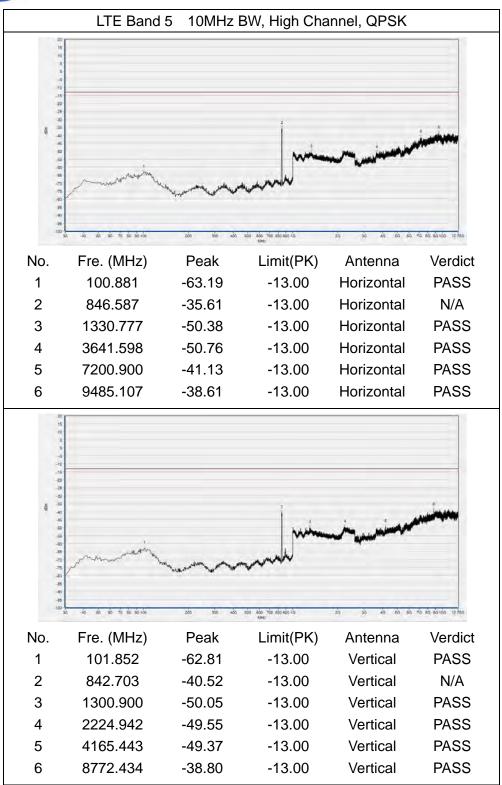




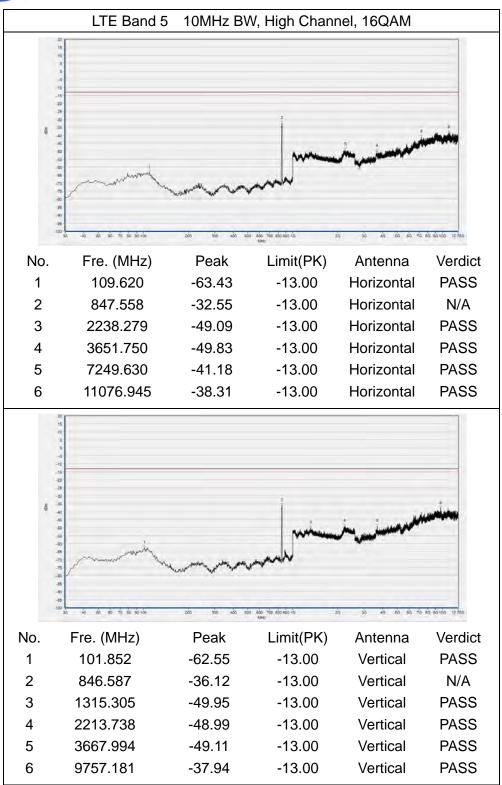




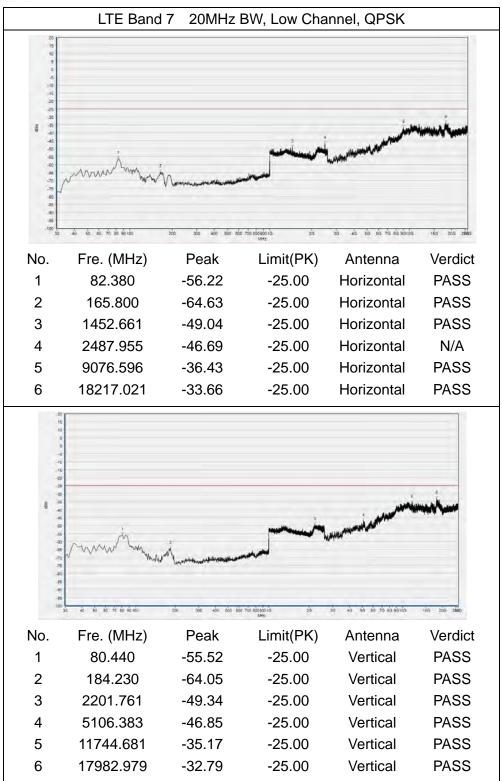




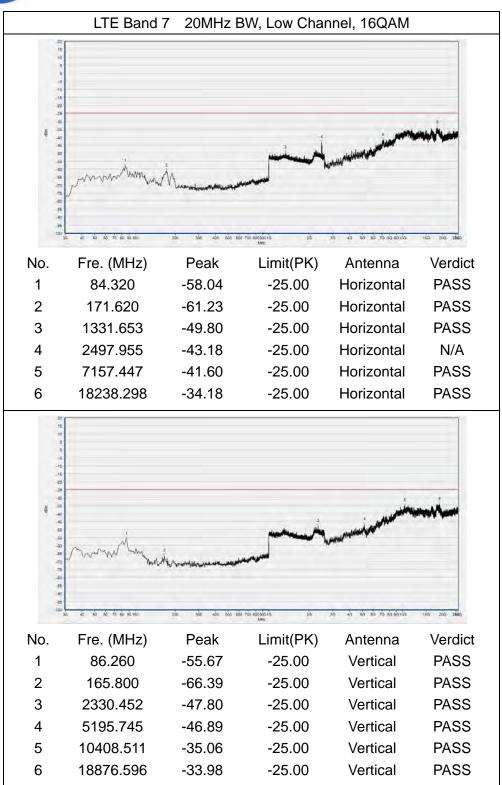




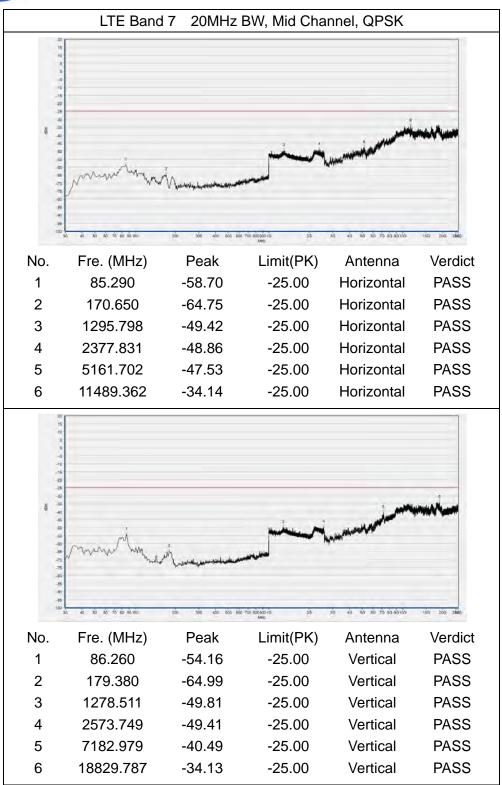




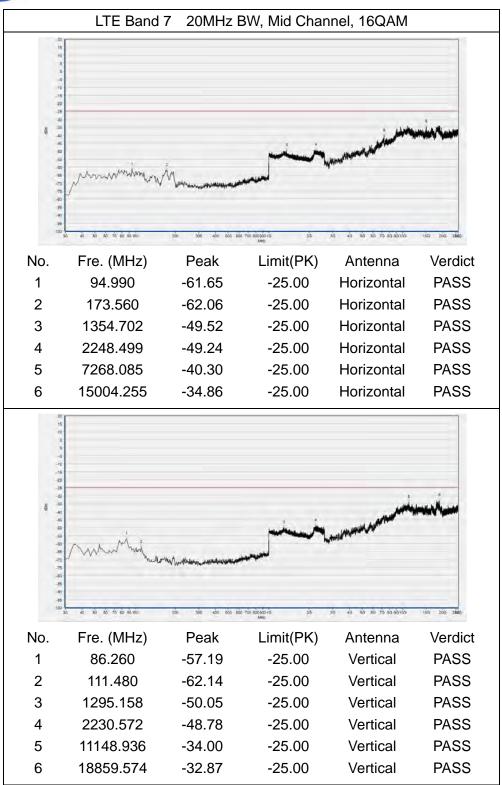






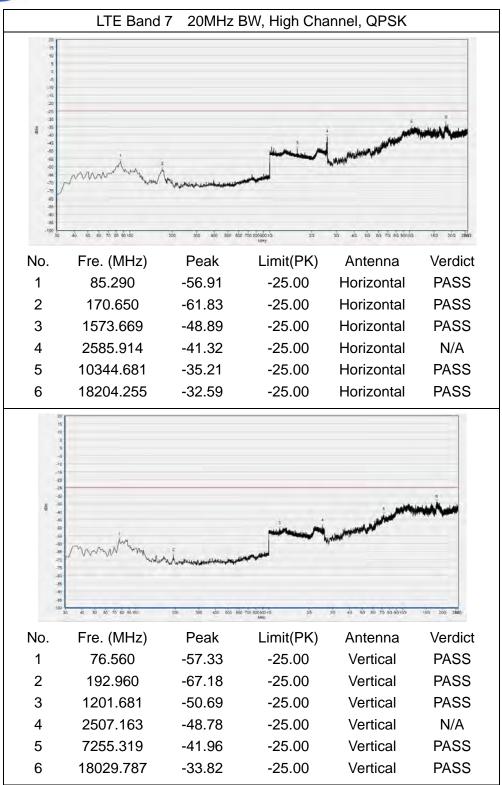




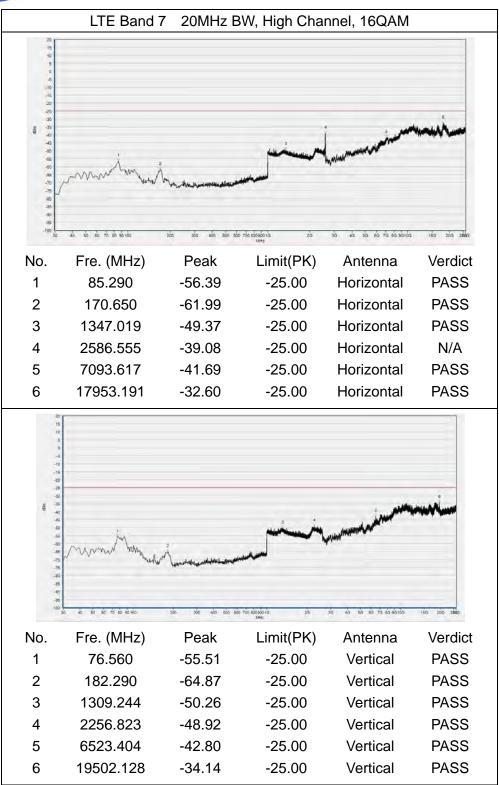






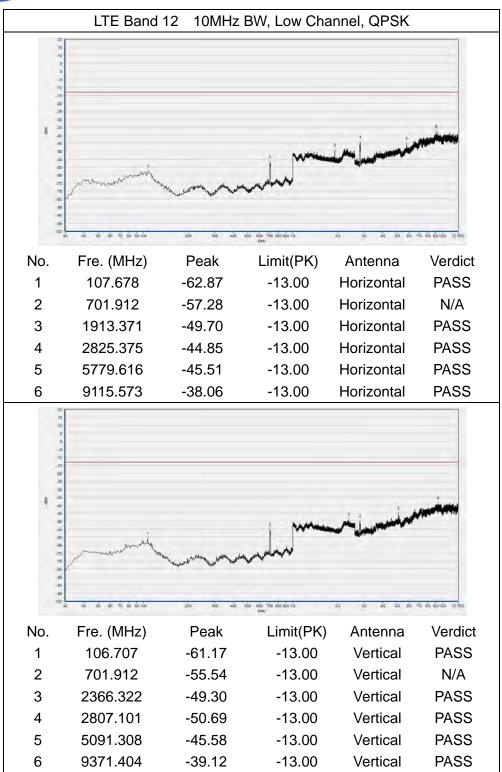




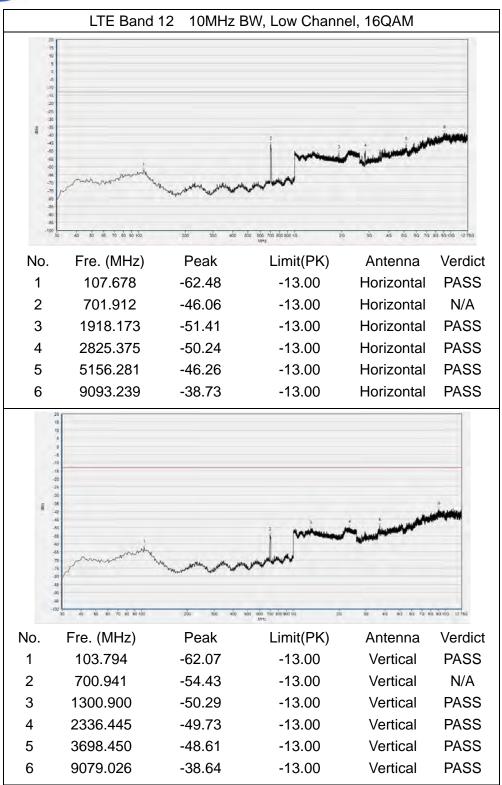




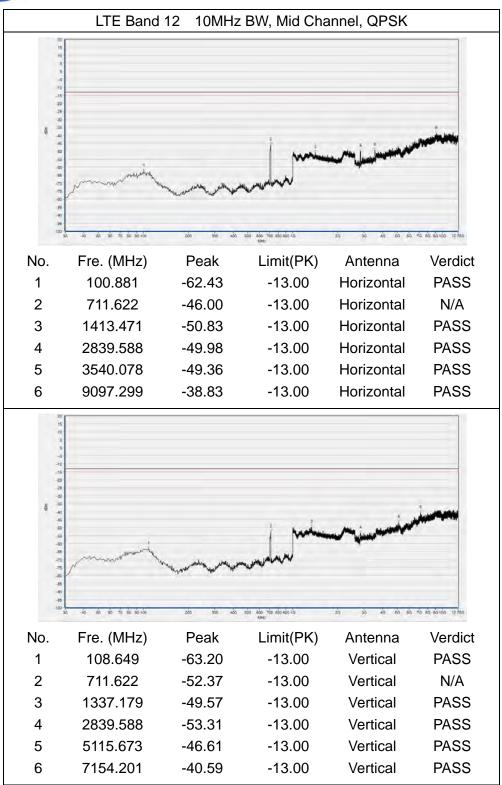






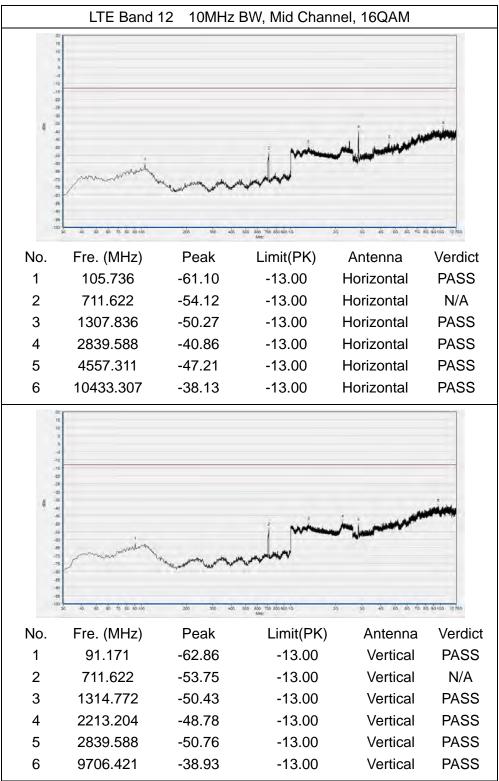






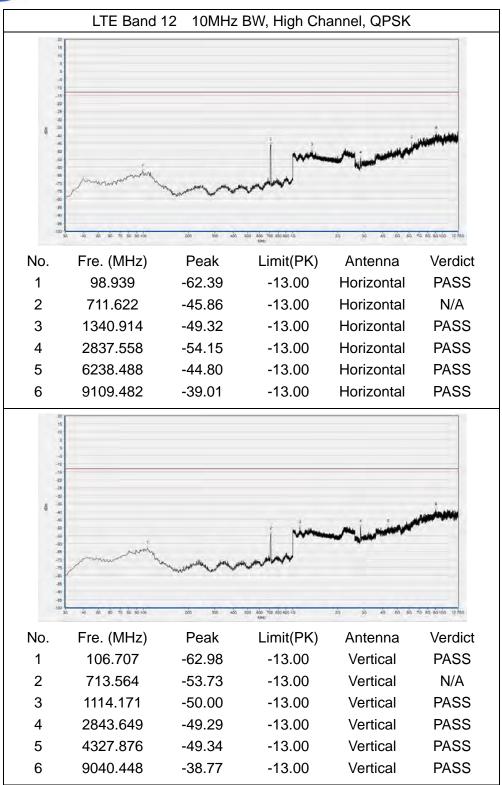




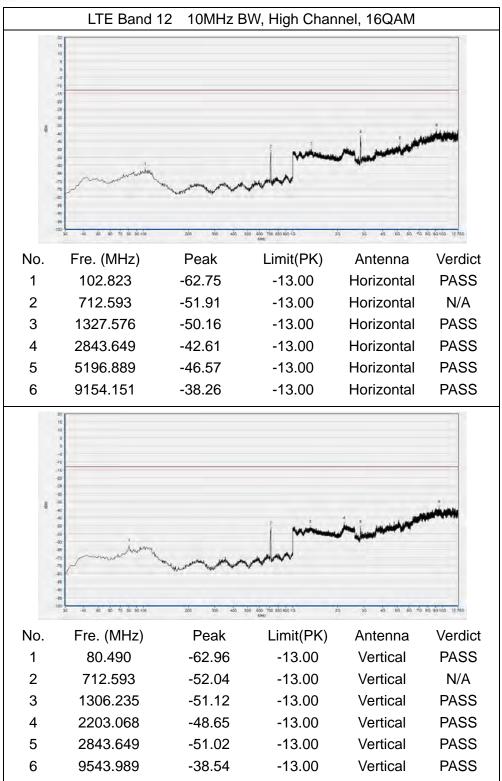






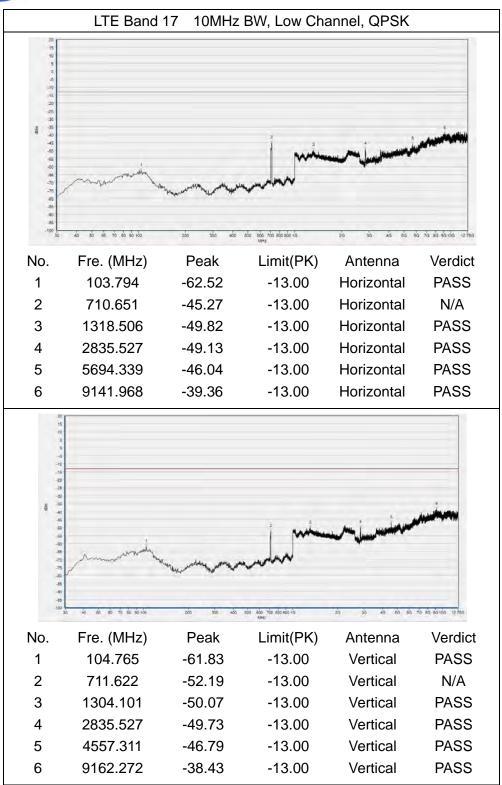




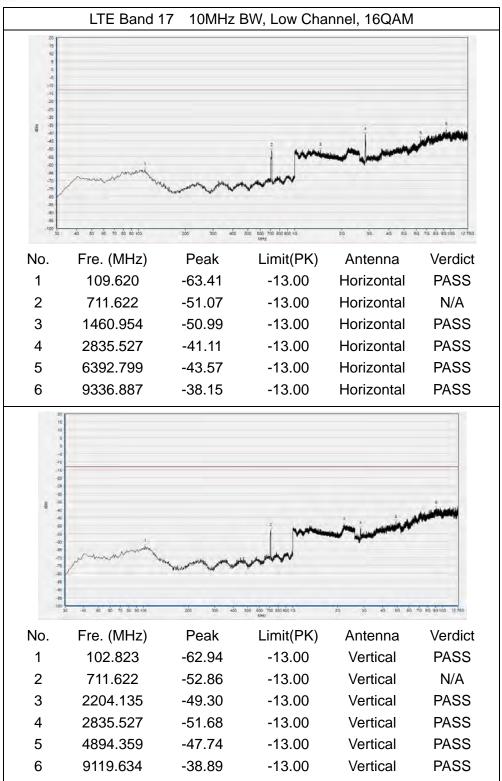






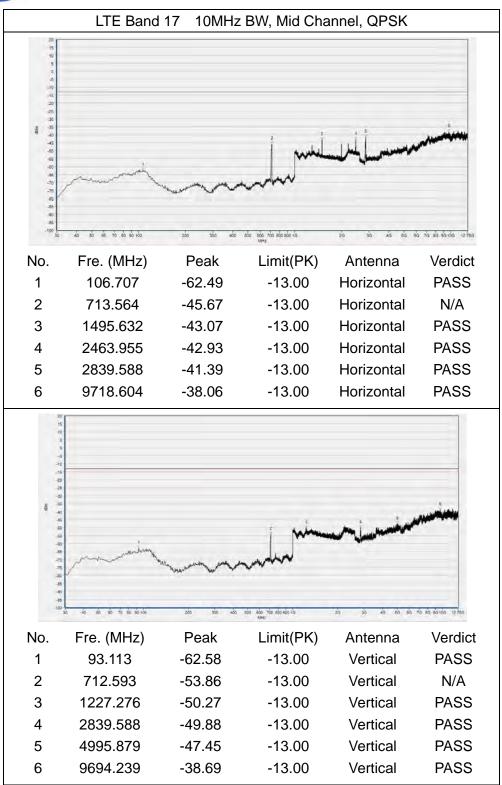




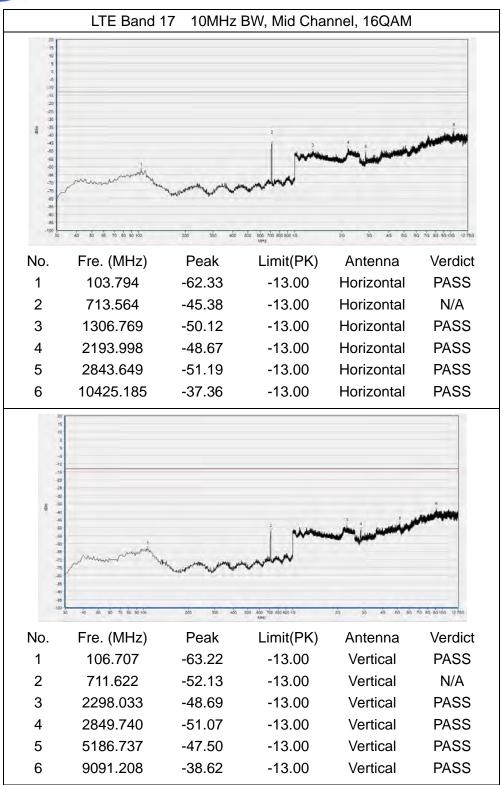




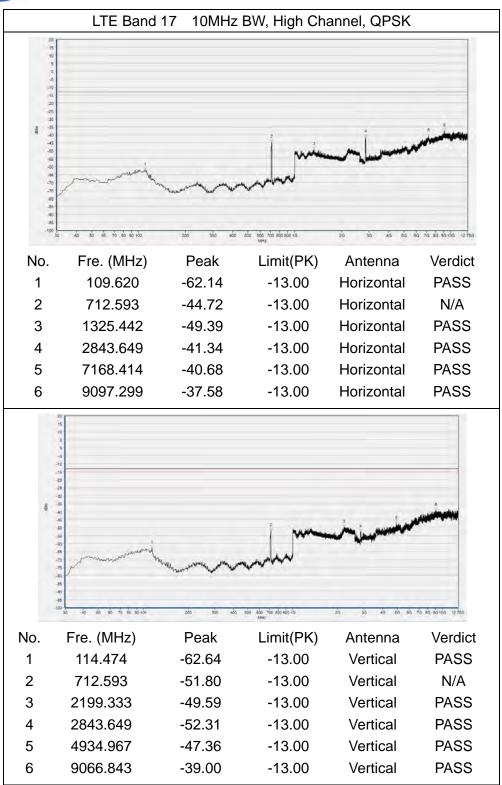




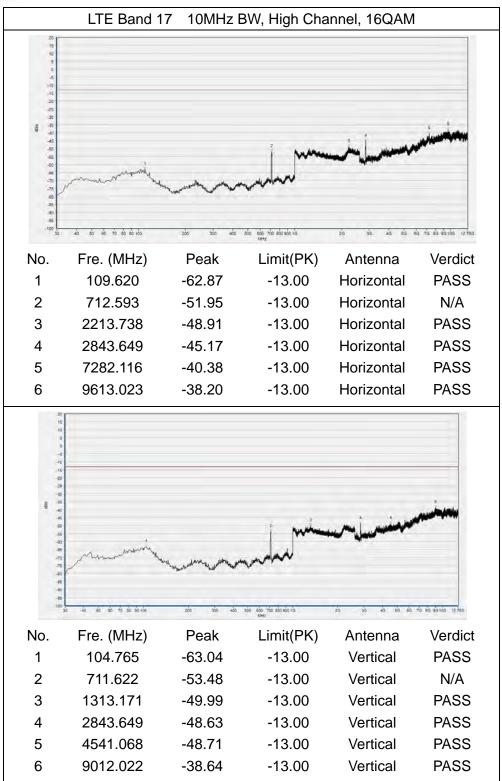
















Annex A Test Uncertainty

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

| <u>'</u> | |
|-------------------------------------|-------------|
| 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

| Company Name: | Shenzhen Morlab Communications Technology Co., Ltd. |
|----------------------|--|
| Department: | Morlab Laboratory |
| Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang |
| | Road, Block 67, BaoAn District, ShenZhen, GuangDong |
| | Province, P. R. China |
| Responsible Test Lab | Mr. Su Fong |
| Manager: | Mr. Su Feng |
| Telephone: | +86 755 36698555 |
| Facsimile: | +86 755 36698525 |

2. Identification of the Responsible Testing Location

| Namai | Shenzhen Morlab Communications Technology Co., Ltd. |
|----------|--|
| Name: | 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 Analzyer | MY53470836 | N9010A | Agilent | 2017.12.03 | 2018.12.02 |
| USB Power Sensor | MY54210011 | U2021XA | Agilent | 2018.04.17 | 2019.04.16 |
| System Simulator | 152038 | CMW500 | R&S | 2018.05.08 | 2019.05.07 |
| RF cable (30MHz-26GHz) | CB01 | RF01 | Morlab | N/A | N/A |
| 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 HANBA EXPERIMENTAL EQUIPMENT CO.,LTD | 2018.04.17 | 2019.04.16 |

4.2Auxiliary Test Equipment

| Equipment Name | Model No. | Brand Name | Manufacturer | Cal.Date | Cal. Due |
|-----------------------|-----------|------------|--------------|----------|----------|
| Computer | T430i | Think Pad | Lenovo | N/A | N/A |



4.3 Radiated Test Equipments

| Equipment | Serial No. | Type | Manufacturer | Cal. Date | Cal. Due |
|------------------|------------|---------------------|--------------|------------|------------|
| Name | | | | | |
| System Simulator | 152038 | CMW500 | R&S | 2018.08.04 | 2019.08.03 |
| Receiver | MY54130016 | N9038A | Agilent | 2018.05.18 | 2019.05.17 |
| Test Antenna - | 9163-519 | VULB 9163 | Schwarzbeck | 2018.03.03 | 2019.03.02 |
| Bi-Log | | | | | |
| Test Antenna - | 9170C-531 | BBHA9170 | Schwarzbeck | 2018.08.06 | 2019.08.05 |
| Horn | 01700 001 | BBH , 1017 0 | Convaizbook | 2010.00.00 | 2013.00.00 |
| Test Antenna - | 01774 | BBHA 9120D | Schwarzbeck | 2018.08.02 | 2019.08.01 |
| Horn | 01774 | BBI IA 9120D | Scriwarzbeck | 2016.06.02 | 2019.06.01 |
| Coaxial cable | | | | | |
| (N male) | CB04 | EMC04 | Morlab | N/A | N/A |
| (9KHz-30MHz) | | | | | |
| Coaxial cable | | | | | |
| (N male) | CB02 | EMC02 | Morlab | N/A | N/A |
| (30MHz-26GHz) | | | | | |
| Coaxial cable | | | | | |
| (N male) | CB03 | EMC03 | Morlab | N/A | N/A |
| (30MHz-26GHz) | | | | | |
| 1-18GHz | MA02 | TS-PR18 | Rohde& | 2018.05.08 | 2019.05.07 |
| pre-Amplifier | IVIAUZ | 13-PK10 | Schwarz | 2016.05.06 | 2019.05.07 |
| 18-26.5GHz | MAGS | TS-PR18 | Rohde& | 2019 05 09 | 2010 05 07 |
| pre-Amplifier | MA03 | 13-4410 | Schwarz | 2018.05.08 | 2019.05.07 |
| Anechoic | N/A | 9m*6m*6m | CRT | 2017.11.19 | 2020.11.18 |
| Chamber | IN/A | 3111 0111 0111 | UNI | 2017.11.19 | 2020.11.10 |

| END OF REPORT |
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