# FCC Test Report

# (PART 24)

| | |
|---|---|
| **Report No.:** | RF180112C19-1 |
| **FCC ID:** | XIA-NTC100 |
| **Test Model:** | NTC-100, NTC-100G |
| **Received Date:** | Jan. 12, 2018 |
| **Test Date:** | Jun. 20, 2018 ~ Jul. 31, 2018 |
| **Issued Date:** | Sep. 20, 2018 |
| **Applicant:** | NetComm Wireless Limited |
| **Address:** | 18-20 Orion Road, Lane Cove, NSW 2066, Sydney Australia |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch |
| **Lab Address:** | No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan ( R.O.C ) |
| **Test Location:** | No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C) |
| **FCC Registration / Designation Number:** | 788550 / TW0003 |

## Table of Contents


**Release Control Record ..... 4**

**1 Certificate of Conformity ..... 5**

**2 Summary of Test Results ..... 6**

2.1 Measurement Uncertainty ..... 6
2.2 Test Site and Instruments ..... 7

**3 General Information ..... 9**

3.1 General Description of EUT ..... 9
3.2 Configuration of System under Test ..... 11
3.2.1 Description of Support Units ..... 11
3.3 Test Mode Applicability and Tested Channel Detail ..... 12
3.4 EUT Operating Conditions ..... 15
3.5 General Description of Applied Standards ..... 15

**4 Test Types and Results ..... 16**

4.1 Output Power Measurement ..... 16
4.1.1 Limits of Output Power Measurement ..... 16
4.1.2 Test Procedures ..... 16
4.1.3 Test Setup ..... 17
4.1.4 Test Results ..... 18
4.2 Modulation Characteristics Measurement ..... 35
4.2.1 Limits of Modulation Characteristics ..... 35
4.2.2 Test Setup ..... 35
4.2.3 Test Procedure ..... 35
4.2.4 Test Results ..... 36
4.3 Frequency Stability Measurement ..... 37
4.3.1 Limits of Frequency Stability Measurement ..... 37
4.3.2 Test Procedure ..... 37
4.3.3 Test Setup ..... 37
4.3.4 Test Results ..... 38
4.4 Occupied Bandwidth Measurement ..... 45
4.4.1 Test Procedure ..... 45
4.4.2 Test Setup ..... 45
4.4.3 Test Result ..... 46
4.5 Band Edge Measurement ..... 50
4.5.1 Limits of Band Edge Measurement ..... 50
4.5.2 Test Setup ..... 50
4.5.3 Test Procedures ..... 50
4.5.4 Test Results ..... 51
4.6 Peak to Average Ratio ..... 58
4.6.1 Limits of Peak to Average Ratio Measurement ..... 58
4.6.2 Test Setup ..... 58
4.6.3 Test Procedures ..... 58
4.6.4 Test Results ..... 59
4.7 Conducted Spurious Emissions ..... 63
4.7.1 Limits of Conducted Spurious Emissions Measurement ..... 63
4.7.2 Test Setup ..... 63
4.7.3 Test Procedure ..... 63
4.7.4 Test Results ..... 64
4.8 Radiated Emission Measurement ..... 85
4.8.1 Limits of Radiated Emission Measurement ..... 85
4.8.2 Test Procedure ..... 85
4.8.3 Deviation from Test Standard ..... 85
4.8.4 Test Setup ..... 86
4.8.5 Test Results ..... 87

**5 Pictures of Test Arrangements..... 129**

**Appendix – Information on the Testing Laboratories ..... 130**

## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF180112C19-1 | Original Release | Sep. 20, 2018 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | 4G LTE Cat M1 / NB1 Industrial IoT Serial Modem |
| **Brand:** | NetCommWireless |
| **Test Model:** | NTC-100, NTC-100G |
| **Applicant:** | NetComm Wireless Limited |
| **Test Date:** | Jun. 20, 2018 ~ Jul. 31, 2018 |
| **Standards:** | FCC Part 24, Subpart E |

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :** Evonne Liu , **Date:** Sep. 20, 2018

Evonne Liu / Specialist

**Approved by :** , **Date:** Sep. 20, 2018

Dylan Chiou / Project Engineer

## 2 Summary of Test Results

| Applied Standard: FCC Part 24 & Part 2 | | | |
|---|---|---|---|
| **FCC Clause** | **Test Item** | **Result** | **Remarks** |
| 2.1046<br>24.232 | Effective Isotropic Radiated Power | Pass | Meet the requirement of limit. |
| 2.1047 | Modulation Characteristics | Pass | Meet the requirement. |
| 2.1046<br>24.232(d) | Peak to Average Ratio | Pass | Meet the requirement of limit. |
| 2.1055<br>24.235 | Frequency Stability | Pass | Meet the requirement of limit. |
| 2.1049<br>24.238(b) | Occupied Bandwidth | Pass | Meet the requirement of limit. |
| 24.238(b) | Band Edge Measurements | Pass | Meet the requirement of limit. |
| 2.1051<br>24.238 | Conducted Spurious Emissions | Pass | Meet the requirement of limit. |
| 2.1053<br>24.238 | Radiated Spurious Emissions | Pass | Meet the requirement of limit.<br>Minimum passing margin is -21.39 dB at 3701.40 MHz. |

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Expended Uncertainty (k=2) (±) |
|---|---|---|
| Radiated Emissions up to 1 GHz | 30 MHz ~ 200 MHz | 2.93 dB |
| | 200 MHz ~ 1000 MHz | 2.95 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 2.26 dB |
| | 18 GHz ~ 40 GHz | 1.94 dB |

## 2.2 Test Site and Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|---|---|---|---|---|
| Test Receiver Agilent | N9038A | MY51210129 | Feb. 06, 2018 | Feb. 05, 2019 |
| Spectrum Analyzer Agilent | N9010A | MY52220314 | Nov. 24, 2017 | Nov. 23, 2018 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSU43 | 100115 | Nov. 23, 2017 | Nov. 22, 2018 |
| Horn Antenna SCHWARZBECK | BBHA 9120D | 9120D-969 | Dec. 12, 2017 | Dec. 11, 2018 |
| BILOG Antenna SCHWARZBECK | VULB 9168 | 9168-472 | Dec. 06, 2017 | Dec. 05, 2018 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | 148 | Dec. 13, 2017 | Dec. 12, 2018 |
| MXG Vector signal generator Agilent | N5182B | MY53050430 | Oct. 24, 2017 | Oct. 23, 2018 |
| Preamplifier EMCI | EMC 012645 | 980115 | Oct. 20, 2017 | Oct. 19, 2018 |
| Preamplifier EMCI | EMC 184045 | 980116 | Oct. 20, 2017 | Oct. 19, 2018 |
| Preamplifier EMCI | EMC 330H | 980112 | Oct. 13, 2017 | Oct. 12, 2018 |
| Power Meter Anritsu | ML2495A | 1012010 | Aug. 15, 2017 | Aug. 14, 2018 |
| Power Sensor Anritsu | MA2411B | 1315050 | Aug. 15, 2017 | Aug. 14, 2018 |
| RF Coaxial Cable HUBER+SUHNNER | EMC104-SM-SM-8000&3000 | 140811+170717 | Oct. 20, 2017 | Oct. 19, 2018 |
| RF Coaxial Cable HUBER+SUHNNER | SUCOFLEX 104 | EMC104-SM-SM-1000(140807) | Oct. 20, 2017 | Oct. 19, 2018 |
| RF Coaxial Cable Worken | 8D-FB | Cable-Ch10-01 | Oct. 20, 2017 | Oct. 19, 2018 |
| Software BV ADT | E3 6.120103 | NA | NA | NA |
| Antenna Tower MF | MFA-440H | NA | NA | NA |
| Turn Table MF | MFT-201SS | NA | NA | NA |
| Antenna Tower &Turn Table Controller MF | MF-7802 | NA | NA | NA |
| Radio Communication Analyzer | MT8821C | 6261786083 | Dec. 21, 2017 | Dec. 20, 2018 |
| Temperature & Humidity Chamber | GTH-120-40-CP-AR | MAA1306-019 | Sep. 08, 2017 | Sep. 07, 2018 |
| DC Power Supply Topward | 33010D | 807748 | Oct. 25, 2016 | Oct. 24, 2018 |
| Digital Multimeter Fluke | 87-III | 70360742 | Jun. 29, 2018 | Jun. 28, 2019 |

Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450F-10.

## 3 General Information

### 3.1 General Description of EUT

| | | | |
|---|---|---|---|
| **Product** | 4G LTE Cat M1 / NB1 Industrial IoT Serial Modem | | |
| **Brand** | NetCommWireless | | |
| **Test Model** | NTC-100, NTC-100G | | |
| **EUT Rating** | Rated Voltage :4.5~36VDC<br>Rated Current :0.23~0.03A | | |
| **Modulation Type** | **Cat-M1** | QPSK, 16QAM | |
| | **NB-IOT** | BPSK, QPSK | |
| **Frequency Range** | **Cat-M1** | LTE Band 2 (Channel Bandwidth: 1.4 MHz) | 1850.7 ~ 1909.3 MHz |
| | | LTE Band 2 (Channel Bandwidth: 3 MHz) | 1851.5 ~ 1908.5 MHz |
| | | LTE Band 2 (Channel Bandwidth: 5 MHz) | 1852.5 ~ 1907.5 MHz |
| | | LTE Band 2 (Channel Bandwidth: 10 MHz) | 1855.0 ~ 1905.0 MHz |
| | | LTE Band 2 (Channel Bandwidth: 15 MHz) | 1857.5 ~ 1902.5 MHz |
| | | LTE Band 2 (Channel Bandwidth: 20 MHz) | 1860.0 ~ 1900.0 MHz |
| | **NB-IOT** | 1850.1 ~ 1909.9 MHz for Stand-alone, In-band and Guard-band | |
| **Max. EIRP Power** | **Cat-M1** | LTE Band 2 (Channel Bandwidth: 1.4 MHz) | 325.09 mW |
| | | LTE Band 2 (Channel Bandwidth: 3 MHz) | 307.61 mW |
| | | LTE Band 2 (Channel Bandwidth: 5 MHz) | 289.73 mW |
| | | LTE Band 2 (Channel Bandwidth: 10 MHz) | 276.06 mW |
| | | LTE Band 2 (Channel Bandwidth: 15 MHz) | 259.42 mW |
| | | LTE Band 2 (Channel Bandwidth: 20 MHz) | 241.55 mW |
| | **NB-IOT** | 373.25 mW for Stand-alone | |
| **Emission Designator** | **Cat-M1** | LTE Band 2 (Channel Bandwidth: 1.4 MHz) | 1M09G7D |
| | | LTE Band 2 (Channel Bandwidth: 3 MHz) | 1M08G7D |
| | | LTE Band 2 (Channel Bandwidth: 5 MHz) | 1M09G7D |
| | | LTE Band 2 (Channel Bandwidth: 10 MHz) | 1M09G7D |
| | | LTE Band 2 (Channel Bandwidth: 15 MHz) | 1M09G7D |
| | | LTE Band 2 (Channel Bandwidth: 20 MHz) | 1M10G7D |
| | **NB-IOT** | 1K86G7D for Stand-alone | |
| **Antenna Type** | Dipole Antenna with 3.42 dBi gain | | |

Note:

1. The models as below are identical to each other except for the following.

| Brand | Model | Difference(s) |
|---|---|---|
| NetCommWireless | NTC-100 | Without GPS |
| | NTC-100G | With GPS |

* The model “NTC-100” was chosen for final test.

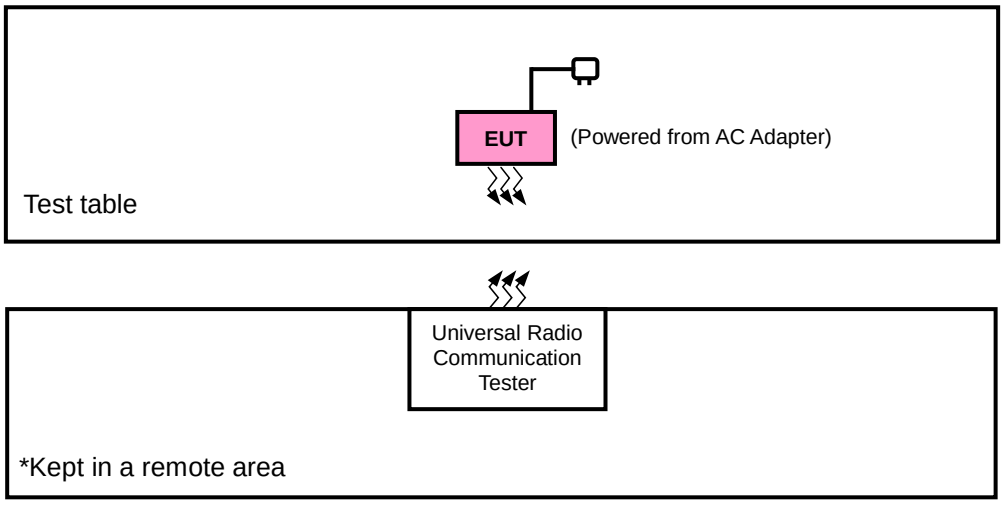
2. The EUT contains following accessory devices.

| | |
|---|---|
| Accessory | Within the box:<br>1.Y-cable(Nano-fit to DE-9 and DC power input) :0.15M ,w/o core<br>2.DIN rail mounting bracket<br><br>Optional Accessory<br>1.GPS Active Patch Antenna : 3M , w/o core<br>2.LTE Tube Antenna :<br>Type:Dipole<br>3.adaptor:<br>Brand: Ten Pao International Inc.<br>Model: S018KM1200150(1.5M/0core)<br>Input: 100-240V~50/60Hz 500mA<br>Output: 12.0V / 1500mA |

3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

## 3.2 Configuration of System under Test

**<Radiated Emission Test / E.I.R.P. Test >**




### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

### 3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports.
The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

| Band | EIRP | Radiated Emission |
|---|---|---|
| LTE Band 2 | Z-plane | X-axis |

**LTE Band 2**

**Cat-M1**

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode |
|---|---|---|---|---|---|---|
| - | EIRP | 18607 to 19193 | 18607, 18900, 19193 | 1.4 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615, 18900, 19185 | 3 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625, 18900, 19175 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650, 18900, 19150 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675, 18900, 19125 | 15 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700, 18900, 19100 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| - | Modulation Characteristics | 18625 to 19175 | 18900 | 5 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset, 5 RB / 0 RB Offset |
| - | Frequency Stability | 18607 to 19193 | 18607, 19193 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615, 19185 | 3 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625, 19175 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650, 19150 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675, 19125 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700, 19100 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| - | Occupied Bandwidth | 18607 to 19193 | 18607, 18900, 19193 | 1.4 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615, 18900, 19185 | 3 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625, 18900, 19175 | 5 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650, 18900, 19150 | 10 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675, 18900, 19125 | 15 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700, 18900, 19100 | 20 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| - | Peak to Average Ratio | 18607 to 19193 | 18607, 18900, 19193 | 1.4 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615, 18900, 19185 | 3 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625, 18900, 19175 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650, 18900, 19150 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675, 18900, 19125 | 15 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700, 18900, 19100 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode |
|---|---|---|---|---|---|---|
| - | Band Edge | 18607 to 19193 | 18607 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 19193 | 1.4 MHz | QPSK | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615 | 3 MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 19185 | 3 MHz | QPSK | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 19175 | 5 MHz | QPSK | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 19150 | 10 MHz | QPSK | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 19125 | 15 MHz | QPSK | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 19100 | 20 MHz | QPSK | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| - | Conducted Emission | 18607 to 19193 | 18607, 18900, 19193 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615, 18900, 19185 | 3 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625, 18900, 19175 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650, 18900, 19150 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675, 18900, 19125 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700, 18900, 19100 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| - | Radiated Emission Above 1 GHz | 18607 to 19193 | 18607, 18900, 19193 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18615 to 19185 | 18615, 18900, 19185 | 3 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18625 to 19175 | 18625, 18900, 19175 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18650 to 19150 | 18650, 18900, 19150 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18675 to 19125 | 18675, 18900, 19125 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 18700 to 19100 | 18700, 18900, 19100 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| - | Radiated Emission Below 1 GHz | 18607 to 19193 | 18607 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**NB-IOT**

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Sub-carrier spacing | Modulation | Mode |
|---|---|---|---|---|---|---|
| - | ERP | 18601 to 19199 | 18601, 18900, 19199 | 3.75 kHz | BPSK | 1 RB / 0 RB Offset |
| | | 18601 to 19199 | 18601, 18900, 19199 | 15 kHz | QPSK | 3 RB / 3 RB Offset |
| - | Frequency Stability | 18601 to 19199 | 18601, 18900, 19199 | 3.75 kHz | BPSK | 1 RB / 0 RB Offset |
| | | 18601 to 19199 | 18601, 18900, 19199 | 15 kHz | QPSK | 3 RB / 3 RB Offset |
| - | Occupied Bandwidth | 18601 to 19199 | 18601, 18900, 19199 | 3.75 kHz | BPSK | 1 RB / 0 RB Offset |
| | | 18601 to 19199 | 18601, 18900, 19199 | 15 kHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 3 RB / 3 RB Offset |
| | | | | | | 12 RB / 0 RB Offset |
| - | Band Edge | 18601 to 19199 | 18601, 19199 | 3.75 kHz | BPSK | 1 RB / 0 RB Offset |
| | | | 18601, 19199 | 15 kHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 3 RB / 3 RB Offset |
| - | Peak to Average Ratio | 18601 to 19199 | 18900 | 3.75 kHz | BPSK | 1 RB / 0 RB Offset |
| | | | 18900 | 15 kHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 3 RB / 3 RB Offset |
| - | Conducted Emission | 18601 to 19199 | 18601, 18900, 19199 | 15 kHz | QPSK | 3 RB / 3 RB Offset |
| - | Radiated Emission | 18601 to 19199 | 18601, 18900, 19199 | 15 kHz | QPSK | 3 RB / 3 RB Offset |

**NOTE:**
Selection is tested with Stand-alone, In-band and Guard-band, The worst case was found in Stand-alone.

**Test Condition:**

| Test Item | Environmental Conditions | Input Power | Tested By |
|---|---|---|---|
| EIRP | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Jisyong Wang |
| Modulation Characteristics | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Getaz Yang |
| Frequency Stability | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Getaz Yang |
| Occupied Bandwidth | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Getaz Yang |
| Band Edge | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Getaz Yang |
| Peak to Average Ratio | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Getaz Yang |
| Conducted Emission | 26 deg. C, 58 % RH | 120 Vac, 60 Hz | Getaz Yang |
| Radiated Emission | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Jisyong Wang |

### 3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

### 3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**
**FCC 47 CFR Part 24**
**KDB 971168 D01 Power Meas License Digital Systems v03r01**
**ANSI/TIA/EIA-603-E 2016**
**ANSI 63.26-2015**

**NOTE:** All test items have been performed and recorded as per the above standards.

# 4 Test Types and Results

## 4.1 Output Power Measurement

### 4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.i.r.p.

### 4.1.2 Test Procedures

**EIRP / ERP Measurement:**

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step b. Record the power level of S.G.

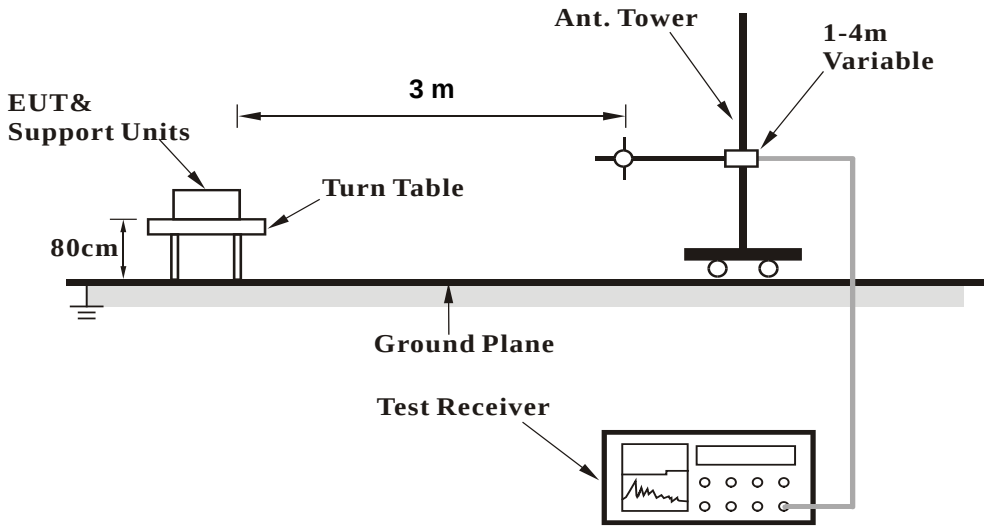
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

**Conducted Power Measurement:**

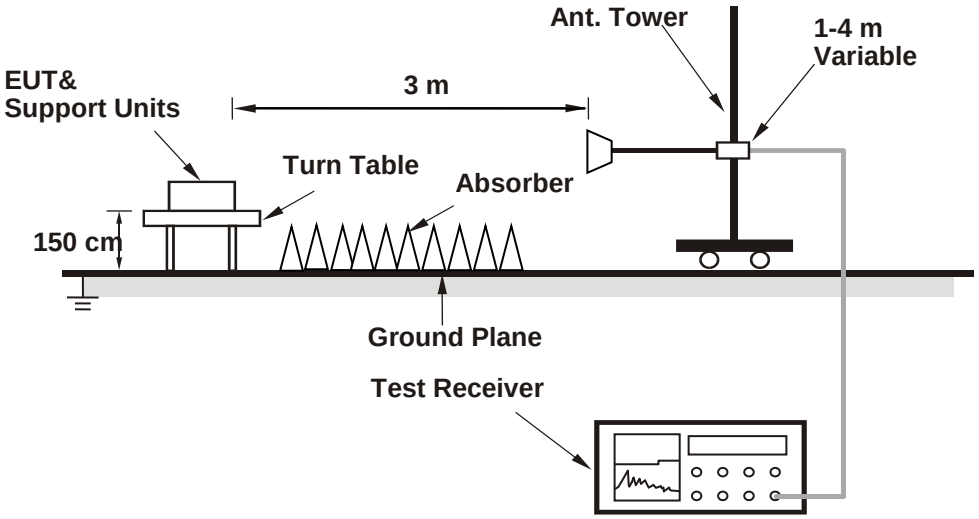
The EUT was set up for the maximum power with LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

**EIRP / ERP Measurement:**
**<Radiated Emission below or equal 1 GHz>**




**<Radiated Emission above 1 GHz>**




For the actual test configuration, please refer to the attached file (Test Setup Photo).

**Conducted Power Measurement:**

### 4.1.4 Test Results

**Conducted Output Power (dBm)**

**Cat-M1**

| eMTC | Band 2 | Region(s): | FCC | Power: | Class 3 | 23 | Tolerance: | 3.2 |
|---|---|---|---|---|---|---|---|---|

| maximum: | 22.44 |
|---|---|

| BW(MHz): | 1.4 |
|---|---|

| Test Frequency ID | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Modulation | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18607 | 1850.7 | 607 | 1930.7 | QPSK | 1 | 0 | 0 | -85 | 22.31 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 22.27 |
| | | | | | QPSK | 3 | 3 | 0 | -85 | 21.59 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.07 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.27 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.37 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 19.88 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 20 |
| Mid Range | 18900 | 1880 | 900 | 1960 | QPSK | 1 | 0 | 0 | -85 | 22.44 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 22.4 |
| | | | | | QPSK | 3 | 3 | 0 | -85 | 21.22 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 19.83 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.14 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.18 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 19.89 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 19.8 |
| High Range | 19193 | 1909.3 | 1193 | 1989.3 | | | | | -85 | |
| | | | | | QPSK | 1 | 0 | 0 | -85 | 21.88 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.83 |
| | | | | | QPSK | 3 | 3 | 0 | -85 | 21.5 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 19.96 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 20.61 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.38 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 19.81 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 19.83 |

| BW(MHz): | 3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Frequency ID | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | | EUT | |
| | | | | | Modulation | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18615 | 1851.5 | 615 | 1931.5 | QPSK | 1 | 0 | 0 | -85 | 21.37 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.36 |
| | | | | | QPSK | 1 | 0 | 1 | -85 | 21.3 |
| | | | | | QPSK | 1 | 5 | 1 | -85 | 21.29 |
| | | | | | QPSK | 3 | 3 | 0 | -85 | 21.58 |
| | | | | | QPSK | 3 | 3 | 1 | -85 | 21.57 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.16 |
| | | | | | QPSK | 6 | 0 | 1 | -85 | 20.52 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.73 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.87 |
| | | | | | 16QAM | 1 | 0 | 1 | -85 | 21.76 |
| | | | | | 16QAM | 1 | 5 | 1 | -85 | 21.72 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 20.46 |
| | | | | | 16QAM | 3 | 3 | 1 | -85 | 20.48 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 20.13 |
| | | | | | 16QAM | 5 | 0 | 1 | -85 | 20.01 |
| Mid Range | 18900 | 1880 | 900 | 1960 | QPSK | 1 | 0 | 0 | -85 | 21.27 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.29 |
| | | | | | QPSK | 1 | 0 | 1 | -85 | 21.28 |
| | | | | | QPSK | 1 | 5 | 1 | -85 | 21.28 |
| | | | | | QPSK | 3 | 3 | 0 | -85 | 21.28 |
| | | | | | QPSK | 3 | 3 | 1 | -85 | 21.27 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 19.84 |
| | | | | | QPSK | 6 | 0 | 1 | -85 | 19.83 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.41 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.49 |
| | | | | | 16QAM | 1 | 0 | 1 | -85 | 21.48 |
| | | | | | 16QAM | 1 | 5 | 1 | -85 | 21.47 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 20.29 |
| | | | | | 16QAM | 3 | 3 | 1 | -85 | 20.31 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 19.98 |
| | | | | | 16QAM | 5 | 0 | 1 | -85 | 19.88 |
| High Range | 19185 | 1908.5 | 1185 | 1988.5 | | | | | -85 | |
| | | | | | QPSK | 1 | 0 | 0 | -85 | 21.68 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.81 |
| | | | | | QPSK | 1 | 0 | 1 | -85 | 21.77 |
| | | | | | QPSK | 1 | 5 | 1 | -85 | 21.72 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | QPSK | 3 | 3 | 0 | -85 | 20.71 |
| | | | | | QPSK | 3 | 3 | 1 | -85 | 20.68 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.03 |
| | | | | | QPSK | 6 | 0 | 1 | -85 | 20.02 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 20.63 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 20.77 |
| | | | | | 16QAM | 1 | 0 | 1 | -85 | 20.74 |
| | | | | | 16QAM | 1 | 5 | 1 | -85 | 20.76 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 19.9 |
| | | | | | 16QAM | 3 | 3 | 1 | -85 | 19.91 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 19.99 |
| | | | | | 16QAM | 5 | 0 | 1 | -85 | 19.87 |

| BW(MHz): | 5 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Frequency ID | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | | EUT | |
| | | | | | Modulation | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 0 | -85 | 21.97 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.94 |
| | | | | | QPSK | 1 | 0 | 1 | -85 | 21.93 |
| | | | | | QPSK | 1 | 5 | 1 | -85 | 21.89 |
| | | | | | QPSK | 1 | 0 | 3 | -85 | 22.07 |
| | | | | | QPSK | 1 | 5 | 3 | -85 | 22.01 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 20.88 |
| | | | | | QPSK | 3 | 3 | 3 | -85 | 20.85 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.92 |
| | | | | | QPSK | 6 | 0 | 1 | -85 | 20.89 |
| | | | | | QPSK | 6 | 0 | 3 | -85 | 20.87 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.76 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.74 |
| | | | | | 16QAM | 1 | 0 | 1 | -85 | 21.75 |
| | | | | | 16QAM | 1 | 5 | 1 | -85 | 21.78 |
| | | | | | 16QAM | 1 | 0 | 3 | -85 | 21.74 |
| | | | | | 16QAM | 1 | 5 | 3 | -85 | 21.77 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 20.7 |
| | | | | | 16QAM | 3 | 3 | 3 | -85 | 20.66 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 19.85 |
| | | | | | 16QAM | 5 | 0 | 1 | -85 | 19.84 |
| | | | | | 16QAM | 5 | 0 | 3 | -85 | 19.8 |
| Mid Range | 18900 | 1880 | 900 | 1960 | QPSK | 1 | 0 | 0 | -85 | 21.68 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.62 |
| | | | | | QPSK | 1 | 0 | 1 | -85 | 21.66 |
| | | | | | QPSK | 1 | 5 | 1 | -85 | 21.67 |
| | | | | | QPSK | 1 | 0 | 3 | -85 | 21.65 |
| | | | | | QPSK | 1 | 5 | 3 | -85 | 21.69 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 20.52 |
| | | | | | QPSK | 3 | 3 | 3 | -85 | 20.47 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.62 |
| | | | | | QPSK | 6 | 0 | 1 | -85 | 20.6 |
| | | | | | QPSK | 6 | 0 | 3 | -85 | 20.61 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.46 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.39 |
| | | | | | 16QAM | 1 | 0 | 1 | -85 | 21.44 |
| | | | | | 16QAM | 1 | 5 | 1 | -85 | 21.36 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 16QAM | 1 | 0 | 3 | -85 | 21.39 |
| | | | | | 16QAM | 1 | 5 | 3 | -85 | 21.45 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 20.29 |
| | | | | | 16QAM | 3 | 3 | 3 | -85 | 20.33 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 19.97 |
| | | | | | 16QAM | 5 | 0 | 1 | -85 | 19.84 |
| | | | | | 16QAM | 5 | 0 | 3 | -85 | 19.83 |
| High Range | 19175 | 1907.5 | 1175 | 1987.5 | | | | | -85 | |
| | | | | | QPSK | 1 | 0 | 0 | -85 | 21.72 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.77 |
| | | | | | QPSK | 1 | 0 | 1 | -85 | 21.66 |
| | | | | | QPSK | 1 | 5 | 1 | -85 | 21.68 |
| | | | | | QPSK | 1 | 0 | 3 | -85 | 21.72 |
| | | | | | QPSK | 1 | 5 | 3 | -85 | 21.68 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 20.69 |
| | | | | | QPSK | 3 | 3 | 3 | -85 | 20.66 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.78 |
| | | | | | QPSK | 6 | 0 | 1 | -85 | 20.73 |
| | | | | | QPSK | 6 | 0 | 3 | -85 | 20.71 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.59 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.63 |
| | | | | | 16QAM | 1 | 0 | 1 | -85 | 21.54 |
| | | | | | 16QAM | 1 | 5 | 1 | -85 | 21.67 |
| | | | | | 16QAM | 1 | 0 | 3 | -85 | 21.47 |
| | | | | | 16QAM | 1 | 5 | 3 | -85 | 21.45 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 20.55 |
| | | | | | 16QAM | 3 | 3 | 3 | -85 | 20.59 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 20.05 |
| | | | | | 16QAM | 5 | 0 | 1 | -85 | 19.95 |
| | | | | | 16QAM | 5 | 0 | 3 | -85 | 19.91 |

| BW(MHz): | 10 |
|---|---|

| Test Frequency ID | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Modulation | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18650 | 1855 | 650 | 1935 | QPSK | 1 | 0 | 0 | -85 | 22.08 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 22.1 |
| | | | | | QPSK | 1 | 0 | 3 | -85 | 22.11 |
| | | | | | QPSK | 1 | 5 | 3 | -85 | 22.03 |
| | | | | | QPSK | 1 | 0 | 7 | -85 | 21.96 |
| | | | | | QPSK | 1 | 5 | 7 | -85 | 21.95 |
| | | | | | QPSK | 4 | 0 | 0 | -85 | 21.97 |
| | | | | | QPSK | 4 | 2 | 7 | -85 | 21.92 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.87 |
| | | | | | QPSK | 6 | 0 | 7 | -85 | 20.88 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.88 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.9 |
| | | | | | 16QAM | 1 | 0 | 3 | -85 | 21.84 |
| | | | | | 16QAM | 1 | 5 | 3 | -85 | 21.88 |
| | | | | | 16QAM | 1 | 0 | 7 | -85 | 21.79 |
| | | | | | 16QAM | 1 | 5 | 7 | -85 | 21.91 |
| | | | | | 16QAM | 4 | 2 | 0 | -85 | 21.17 |
| | | | | | 16QAM | 4 | 2 | 7 | -85 | 21.24 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 20.8 |
| | | | | | 16QAM | 5 | 0 | 7 | -85 | 20.75 |
| Mid Range | 18900 | 1880 | 900 | 1960 | QPSK | 1 | 0 | 0 | -85 | 21.72 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.77 |
| | | | | | QPSK | 1 | 0 | 3 | -85 | 21.7 |
| | | | | | QPSK | 1 | 5 | 3 | -85 | 21.67 |
| | | | | | QPSK | 1 | 0 | 7 | -85 | 21.68 |
| | | | | | QPSK | 1 | 5 | 7 | -85 | 21.78 |
| | | | | | QPSK | 4 | 0 | 0 | -85 | 21.64 |
| | | | | | QPSK | 4 | 2 | 7 | -85 | 21.66 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.57 |
| | | | | | QPSK | 6 | 0 | 7 | -85 | 20.61 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.43 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.51 |
| | | | | | 16QAM | 1 | 0 | 3 | -85 | 21.5 |
| | | | | | 16QAM | 1 | 5 | 3 | -85 | 21.48 |
| | | | | | 16QAM | 1 | 0 | 7 | -85 | 21.46 |
| | | | | | 16QAM | 1 | 5 | 7 | -85 | 21.39 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 16QAM | 4 | 2 | 0 | -85 | 20.81 |
| | | | | | 16QAM | 4 | 2 | 7 | -85 | 20.72 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 20.41 |
| | | | | | 16QAM | 5 | 0 | 7 | -85 | 20.51 |
| High Range | 19150 | 1905 | 1150 | 1985 | | | | | -85 | |
| | | | | | QPSK | 1 | 0 | 0 | -85 | 21.71 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.75 |
| | | | | | QPSK | 1 | 5 | 7 | -85 | 21.66 |
| | | | | | QPSK | 1 | 0 | 3 | -85 | 21.68 |
| | | | | | QPSK | 1 | 5 | 3 | -85 | 21.7 |
| | | | | | QPSK | 1 | 0 | 7 | -85 | 21.67 |
| | | | | | QPSK | 4 | 0 | 0 | -85 | 21.66 |
| | | | | | QPSK | 4 | 2 | 7 | -85 | 21.68 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 20.6 |
| | | | | | QPSK | 6 | 0 | 7 | -85 | 20.55 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.48 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.51 |
| | | | | | 16QAM | 1 | 0 | 3 | -85 | 21.46 |
| | | | | | 16QAM | 1 | 5 | 3 | -85 | 21.49 |
| | | | | | 16QAM | 1 | 0 | 7 | -85 | 21.37 |
| | | | | | 16QAM | 1 | 5 | 7 | -85 | 21.5 |
| | | | | | 16QAM | 4 | 2 | 0 | -85 | 21.46 |
| | | | | | 16QAM | 4 | 2 | 7 | -85 | 21.33 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 20.52 |
| | | | | | 16QAM | 5 | 0 | 7 | -85 | 20.47 |

| BW(MHz): | 15 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Frequency ID | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | | EUT | |
| | | | | | Modulation | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18675 | 1857.5 | 675 | 1937.5 | QPSK | 1 | 0 | 0 | -85 | 22.07 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 22.11 |
| | | | | | QPSK | 1 | 0 | 5 | -85 | 22.03 |
| | | | | | QPSK | 1 | 5 | 5 | -85 | 21.98 |
| | | | | | QPSK | 1 | 0 | 11 | -85 | 21.88 |
| | | | | | QPSK | 1 | 5 | 11 | -85 | 21.9 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 21.94 |
| | | | | | QPSK | 3 | 3 | 11 | -85 | 21.89 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 21.82 |
| | | | | | QPSK | 6 | 0 | 11 | -85 | 21.8 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.95 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 22 |
| | | | | | 16QAM | 1 | 0 | 5 | -85 | 21.88 |
| | | | | | 16QAM | 1 | 5 | 5 | -85 | 21.82 |
| | | | | | 16QAM | 1 | 0 | 11 | -85 | 21.87 |
| | | | | | 16QAM | 1 | 5 | 11 | -85 | 21.79 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 22.23 |
| | | | | | 16QAM | 3 | 3 | 11 | -85 | 22.21 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 22.07 |
| | | | | | 16QAM | 5 | 0 | 11 | -85 | 21.88 |
| Mid Range | 18900 | 1880 | 900 | 1960 | QPSK | 1 | 0 | 0 | -85 | 21.95 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.84 |
| | | | | | QPSK | 1 | 0 | 5 | -85 | 21.76 |
| | | | | | QPSK | 1 | 5 | 5 | -85 | 21.79 |
| | | | | | QPSK | 1 | 0 | 11 | -85 | 21.8 |
| | | | | | QPSK | 1 | 5 | 11 | -85 | 21.86 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 21.64 |
| | | | | | QPSK | 3 | 3 | 11 | -85 | 21.59 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 21.77 |
| | | | | | QPSK | 6 | 0 | 11 | -85 | 21.7 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.73 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.62 |
| | | | | | 16QAM | 1 | 0 | 5 | -85 | 21.68 |
| | | | | | 16QAM | 1 | 5 | 5 | -85 | 21.57 |
| | | | | | 16QAM | 1 | 0 | 11 | -85 | 21.74 |
| | | | | | 16QAM | 1 | 5 | 11 | -85 | 21.63 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 21.87 |
| | | | | | 16QAM | 3 | 3 | 11 | -85 | 21.82 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 21.59 |
| | | | | | 16QAM | 5 | 0 | 11 | -85 | 21.57 |
| High Range | 19125 | 1902.5 | 1125 | 1982.5 | | | | | -85 | |
| | | | | | QPSK | 1 | 0 | 0 | -85 | 21.81 |
| | | | | | QPSK | 1 | 5 | 11 | -85 | 21.71 |
| | | | | | QPSK | 1 | 0 | 5 | -85 | 21.68 |
| | | | | | QPSK | 1 | 5 | 5 | -85 | 21.85 |
| | | | | | QPSK | 1 | 0 | 11 | -85 | 21.82 |
| | | | | | QPSK | 1 | 5 | 11 | -85 | 21.73 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 21.7 |
| | | | | | QPSK | 3 | 3 | 11 | -85 | 21.69 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 21.7 |
| | | | | | QPSK | 6 | 0 | 11 | -85 | 21.69 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.51 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 22.01 |
| | | | | | 16QAM | 1 | 0 | 5 | -85 | 21.52 |
| | | | | | 16QAM | 1 | 5 | 5 | -85 | 21.43 |
| | | | | | 16QAM | 1 | 0 | 11 | -85 | 21.11 |
| | | | | | 16QAM | 1 | 5 | 11 | -85 | 21.53 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 21.52 |
| | | | | | 16QAM | 3 | 3 | 11 | -85 | 21.43 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 21.69 |
| | | | | | 16QAM | 5 | 0 | 11 | -85 | 21.52 |

| BW(MHz): | 20 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Frequency ID | $N_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | | EUT | |
| | | | | | Modulation | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18700 | 1860 | 700 | 1940 | QPSK | 1 | 0 | 0 | -85 | 22.11 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.93 |
| | | | | | QPSK | 1 | 0 | 7 | -85 | 22.1 |
| | | | | | QPSK | 1 | 5 | 7 | -85 | 22.04 |
| | | | | | QPSK | 1 | 0 | 15 | -85 | 21.9 |
| | | | | | QPSK | 1 | 5 | 15 | -85 | 22.03 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 21.89 |
| | | | | | QPSK | 3 | 3 | 15 | -85 | 21.9 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 21.94 |
| | | | | | QPSK | 6 | 0 | 15 | -85 | 21.85 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 22.13 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.77 |
| | | | | | 16QAM | 1 | 0 | 7 | -85 | 21.38 |
| | | | | | 16QAM | 1 | 5 | 7 | -85 | 21.76 |
| | | | | | 16QAM | 1 | 0 | 15 | -85 | 21.8 |
| | | | | | 16QAM | 1 | 5 | 15 | -85 | 21.78 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 21.71 |
| | | | | | 16QAM | 3 | 3 | 15 | -85 | 21.76 |
| | | | | | 16QAM | 5 | 0 | 0 | -85 | 22.01 |
| | | | | | 16QAM | 5 | 0 | 15 | -85 | 21.89 |
| Mid Range | 18900 | 1880 | 900 | 1960 | QPSK | 1 | 0 | 0 | -85 | 21.87 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.76 |
| | | | | | QPSK | 1 | 0 | 7 | -85 | 21.88 |
| | | | | | QPSK | 1 | 5 | 7 | -85 | 21.75 |
| | | | | | QPSK | 1 | 0 | 15 | -85 | 21.77 |
| | | | | | QPSK | 1 | 5 | 15 | -85 | 21.89 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 21.69 |
| | | | | | QPSK | 3 | 3 | 15 | -85 | 21.56 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 21.77 |
| | | | | | QPSK | 6 | 0 | 15 | -85 | 21.66 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 22.07 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.59 |
| | | | | | 16QAM | 1 | 0 | 7 | -85 | 22.01 |
| | | | | | 16QAM | 1 | 5 | 7 | -85 | 21.47 |
| | | | | | 16QAM | 1 | 0 | 15 | -85 | 21.69 |
| | | | | | 16QAM | 1 | 5 | 15 | -85 | 21.81 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 21.56 |
| | | | | | 16QAM | 3 | 3 | 15 | -85 | 21.48 |
| | | | | | 16QAM | 6 | 0 | 0 | -85 | 21.72 |
| | | | | | 16QAM | 6 | 0 | 15 | -85 | 21.55 |
| High Range | 19100 | 1900 | 1100 | 1980 | | | | | -85 | |
| | | | | | QPSK | 1 | 0 | 0 | -85 | 21.61 |
| | | | | | QPSK | 1 | 5 | 0 | -85 | 21.8 |
| | | | | | QPSK | 1 | 0 | 7 | -85 | 21.76 |
| | | | | | QPSK | 1 | 5 | 7 | -85 | 21.63 |
| | | | | | QPSK | 1 | 0 | 15 | -85 | 21.58 |
| | | | | | QPSK | 1 | 5 | 15 | -85 | 21.72 |
| | | | | | QPSK | 3 | 0 | 0 | -85 | 21.6 |
| | | | | | QPSK | 3 | 3 | 15 | -85 | 21.59 |
| | | | | | QPSK | 6 | 0 | 0 | -85 | 21.66 |
| | | | | | QPSK | 6 | 0 | 15 | -85 | 21.59 |
| | | | | | 16QAM | 1 | 0 | 0 | -85 | 21.97 |
| | | | | | 16QAM | 1 | 5 | 0 | -85 | 21.82 |
| | | | | | 16QAM | 1 | 0 | 7 | -85 | 21.36 |
| | | | | | 16QAM | 1 | 5 | 7 | -85 | 21.47 |
| | | | | | 16QAM | 1 | 0 | 15 | -85 | 21.5 |
| | | | | | 16QAM | 1 | 5 | 15 | -85 | 21.59 |
| | | | | | 16QAM | 3 | 0 | 0 | -85 | 21.41 |
| | | | | | 16QAM | 3 | 3 | 15 | -85 | 21.42 |
| | | | | | 16QAM | 6 | 0 | 0 | -85 | 21.57 |
| | | | | | 16QAM | 6 | 0 | 15 | -85 | 21.4 |

## NB-IOT

| NB-IoT | Band 2 | Region(s): | FCC | Power: | Class 3 | 23 | Tolerance: | 3.2 | maximum: | 22.91 |
|---|---|---|---|---|---|---|---|---|---|---|

Stand-alone

| Test Frequency ID | $N_{UL}$ | $M_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | $M_{DL}$ | Frequency of Downlink [MHz] | Test Configuration Initial of Power | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Modulation | Ntones | Sub-carrier spacing (kHz) | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18601 | 0 | 1850.1 | 601 | -0.5 | 1930.1 | BPSK | 1@0 | 3.75 | -110 | 21.94 |
| | | | | | | | QPSK | 1@0 | 15 | -110 | 22.01 |
| | | | | | | | QPSK | 3@3 | 15 | -110 | 22.56 |
| | | | | | | | QPSK | 12@0 | 15 | -110 | 20.86 |
| Mid Range | 18900 | 0 | 1880 | 900 | -0.5 | 1960 | BPSK | 1@0 | 3.75 | -110 | 21.65 |
| | | | | | | | BPSK | 1@47 | 3.75 | -110 | 21.58 |
| | | | | | | | QPSK | 1@0 | 15 | -110 | 21.91 |
| | | | | | | | QPSK | 1@11 | 15 | -110 | 21.83 |
| | | | | | | | QPSK | 3@3 | 15 | -110 | 22.78 |
| | | | | | | | QPSK | 12@0 | 15 | -110 | 20.91 |
| High Range | 19199 | 0 | 1909.9 | 1199 | -0.5 | 1989.9 | BPSK | 1@47 | 3.75 | -110 | 21.74 |
| | | | | | | | QPSK | 1@11 | 15 | -110 | 22.06 |
| | | | | | | | QPSK | 3@3 | 15 | -110 | 22.91 |
| | | | | | | | QPSK | 12@0 | 15 | -110 | 20.93 |

In-band BW(MHz): 3

| Test Frequency ID | $N_{UL}$ | $M_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | $M_{DL}$ | Frequency of Downlink [MHz] | LTE Host Cell | | | Test Configuration Initial of Power | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NDL | Frequency of Downlink [MHz] | DL PRB Location | Modulation | Ntones | Sub-carrier spacing (kHz) | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18606 | 0 | 1850.6 | 606 | -2 | 1930.5925 | 615 | 1931.5 | -5 | BPSK | 1@0 | 3.75 | -110 | 21.7 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.74 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.45 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.51 |
| Mid Range | 18891 | 0 | 1879.1 | 891 | -2 | 1959.0925 | 900 | 1960 | -5 | BPSK | 1@0 | 3.75 | -110 | 21.64 |
| | | | | | | | | | | BPSK | 1@47 | 3.75 | -110 | 21.56 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.73 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.75 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.45 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.67 |
| High Range | 19194 | 0 | 1909.4 | 1194 | 1 | 1989.4075 | 1185 | 1988.5 | 5 | BPSK | 1@47 | 3.75 | -110 | 21.76 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.72 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.71 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.78 |

| In-band | BW(MHz): | 10 | NB-IoT PRB: | 30 |
|---|---|---|---|---|

| Test Frequency ID | $N_{UL}$ | $M_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | $M_{DL}$ | Frequency of Downlink [MHz] | LTE Host Cell | | | Test Configuration Initial of Power | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NDL | Frequency of Downlink [MHz] | DL PRB Location | Modulation | Ntones | Sub-carrier spacing (kHz) | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18660 | -2 | 1855.99 | 660 | -1 | 1935.9975 | 650 | 1935 | 5 | BPSK | 1@0 | 3.75 | -110 | 20.33 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.37 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.63 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.39 |
| Mid Range | 18910 | -2 | 1880.99 | 910 | -1 | 1960.9975 | 900 | 1960 | 5 | BPSK | 1@0 | 3.75 | -110 | 20.32 |
| | | | | | | | | | | BPSK | 1@47 | 3.75 | -110 | 21.45 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.39 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.71 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.61 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.37 |
| High Range | 19160 | -2 | 1905.99 | 1160 | -1 | 1985.9975 | 1150 | 1985 | 5 | BPSK | 1@47 | 3.75 | -110 | 20.61 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.73 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.56 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.73 |

| In-band | BW(MHz): | 10 | NB-IoT PRB: | 35 |
|---|---|---|---|---|

| Test Frequency ID | $N_{UL}$ | $M_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | $M_{DL}$ | Frequency of Downlink [MHz] | LTE Host Cell | | | Test Configuration Initial of Power | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NDL | Frequency of Downlink [MHz] | DL PRB Location | Modulation | Ntones | Sub-carrier spacing (kHz) | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18669 | -2 | 1856.89 | 669 | -1 | 1936.8975 | 650 | 1935 | 10 | BPSK | 1@0 | 3.75 | -110 | 20.35 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.42 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.58 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.59 |
| Mid Range | 18919 | -2 | 1881.89 | 919 | -1 | 1961.8975 | 900 | 1960 | 10 | BPSK | 1@0 | 3.75 | -110 | 20.33 |
| | | | | | | | | | | BPSK | 1@47 | 3.75 | -110 | 21.46 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.36 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.62 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.32 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.35 |
| High Range | 19169 | -2 | 1906.89 | 1169 | -1 | 1986.8975 | 1150 | 1985 | 10 | BPSK | 1@47 | 3.75 | -110 | 20.3 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.83 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.67 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.68 |

| Guard-band | BW(MHz): | 5 |
|---|---|---|

| Test Frequency ID | $N_{UL}$ | $M_{UL}$ | Frequency of Uplink [MHz] | $N_{DL}$ | $M_{DL}$ | Frequency of Downlink [MHz] | LTE Host Cell | | | Test Configuration Initial of Power | | | EUT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NDL | Frequency of Downlink [MHz] | DL PRB Location | Modulation | Ntones | Sub-carrier spacing (kHz) | Cell power (dBm/15kHz) | power (dBm) |
| Low Range | 18601 | 0 | 1850.1 | 601 | 1 | 1930.1075 | 625 | 1932.5 | -24 | BPSK | 1@0 | 3.75 | -110 | 21.61 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.64 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.55 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.49 |
| Mid Range | 18876 | 0 | 1877.6 | 876 | 1 | 1957.6075 | 900 | 1960 | -24 | BPSK | 1@0 | 3.75 | -110 | 21.42 |
| | | | | | | | | | | BPSK | 1@47 | 3.75 | -110 | 22.19 |
| | | | | | | | | | | QPSK | 1@0 | 15 | -110 | 21.68 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 20.17 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.18 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.45 |
| High Range | 19199 | 0 | 1909.9 | 1199 | -2 | 1989.8925 | 1175 | 1987.5 | 24 | BPSK | 1@47 | 3.75 | -110 | 21.44 |
| | | | | | | | | | | QPSK | 1@11 | 15 | -110 | 21.51 |
| | | | | | | | | | | QPSK | 3@3 | 15 | -110 | 22.53 |
| | | | | | | | | | | QPSK | 12@0 | 15 | -110 | 20.47 |

**EIRP Power (dBm)**

**Cat-M1**

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Channel Bandwidth: 1.4 MHz / QPSK** | | | | | | | |
| **Plane** | **Channel** | **Frequency (MHz)** | **Reading (dBm)** | **Correction Factor (dB)** | **EIRP (dBm)** | **EIRP (mW)** | **Polarization (H/V)** |
| Z | 18607 | 1850.7 | -16.54 | 36.57 | 20.03 | 100.69 | H |
| | 18900 | 1880.0 | -16.97 | 37.22 | 20.25 | 105.93 | |
| | 19193 | 1909.3 | -17.33 | 37.18 | 19.85 | 96.61 | |
| | 18607 | 1850.7 | -12.60 | 37.65 | 25.05 | 319.89 | V |
| | 18900 | 1880.0 | -12.46 | 37.58 | 25.12 | 325.09 | |
| | 19193 | 1909.3 | -12.57 | 37.48 | 24.91 | 309.74 | |
| **Channel Bandwidth: 1.4 MHz / 16QAM** | | | | | | | |
| Z | 18607 | 1850.7 | -17.56 | 36.57 | 19.01 | 79.62 | H |
| | 18900 | 1880.0 | -17.99 | 37.22 | 19.23 | 83.75 | |
| | 19193 | 1909.3 | -18.35 | 37.18 | 18.83 | 76.38 | |
| | 18607 | 1850.7 | -13.62 | 37.65 | 24.03 | 252.93 | V |
| | 18900 | 1880.0 | -13.48 | 37.58 | 24.10 | 257.04 | |
| | 19193 | 1909.3 | -13.59 | 37.48 | 23.89 | 244.91 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 3 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 18615 | 1851.5 | -16.78 | 36.57 | 19.79 | 95.28 | H |
| | 18900 | 1880.0 | -17.21 | 37.22 | 20.01 | 100.23 | |
| | 19185 | 1908.5 | -17.57 | 37.18 | 19.61 | 91.41 | |
| | 18615 | 1851.5 | -12.84 | 37.65 | 24.81 | 302.69 | V |
| | 18900 | 1880.0 | -12.70 | 37.58 | 24.88 | 307.61 | |
| | 19185 | 1908.5 | -12.81 | 37.48 | 24.67 | 293.09 | |
| Channel Bandwidth: 3 MHz / 16QAM | | | | | | | |
| Z | 18615 | 1851.5 | -17.76 | 36.57 | 18.81 | 76.03 | H |
| | 18900 | 1880.0 | -18.19 | 37.22 | 19.03 | 79.98 | |
| | 19185 | 1908.5 | -18.55 | 37.18 | 18.63 | 72.95 | |
| | 18615 | 1851.5 | -13.82 | 37.65 | 23.83 | 241.55 | V |
| | 18900 | 1880.0 | -13.68 | 37.58 | 23.90 | 245.47 | |
| | 19185 | 1908.5 | -13.79 | 37.48 | 23.69 | 233.88 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 5 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 18625 | 1852.5 | -17.04 | 36.57 | 19.53 | 89.74 | H |
| | 18900 | 1880.0 | -17.47 | 37.22 | 19.75 | 94.41 | |
| | 19175 | 1907.5 | -17.83 | 37.18 | 19.35 | 86.10 | |
| | 18625 | 1852.5 | -13.10 | 37.65 | 24.55 | 285.10 | V |
| | 18900 | 1880.0 | -12.96 | 37.58 | 24.62 | 289.73 | |
| | 19175 | 1907.5 | -13.07 | 37.48 | 24.41 | 276.06 | |
| Channel Bandwidth: 5 MHz / 16QAM | | | | | | | |
| Z | 18625 | 1852.5 | -18.06 | 36.57 | 18.51 | 70.96 | H |
| | 18900 | 1880.0 | -18.49 | 37.22 | 18.73 | 74.64 | |
| | 19175 | 1907.5 | -18.85 | 37.18 | 18.33 | 68.08 | |
| | 18625 | 1852.5 | -14.12 | 37.65 | 23.53 | 225.42 | V |
| | 18900 | 1880.0 | -13.98 | 37.58 | 23.60 | 229.09 | |
| | 19175 | 1907.5 | -14.09 | 37.48 | 23.39 | 218.27 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 10 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 18650 | 1855.0 | -17.25 | 36.57 | 19.32 | 85.51 | H |
| | 18900 | 1880.0 | -17.68 | 37.22 | 19.54 | 89.95 | |
| | 19150 | 1905.0 | -18.04 | 37.18 | 19.14 | 82.04 | |
| | 18650 | 1855.0 | -13.31 | 37.65 | 24.34 | 271.64 | V |
| | 18900 | 1880.0 | -13.17 | 37.58 | 24.41 | 276.06 | |
| | 19150 | 1905.0 | -13.28 | 37.48 | 24.20 | 263.03 | |
| Channel Bandwidth: 10 MHz / 16QAM | | | | | | | |
| Z | 18650 | 1855.0 | -18.27 | 36.57 | 18.30 | 67.61 | H |
| | 18900 | 1880.0 | -18.70 | 37.22 | 18.52 | 71.12 | |
| | 19150 | 1905.0 | -19.06 | 37.18 | 18.12 | 64.86 | |
| | 18650 | 1855.0 | -14.33 | 37.65 | 23.32 | 214.78 | V |
| | 18900 | 1880.0 | -14.19 | 37.58 | 23.39 | 218.27 | |
| | 19150 | 1905.0 | -14.30 | 37.48 | 23.18 | 207.97 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 15 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 18675 | 1857.5 | -17.52 | 36.57 | 19.05 | 80.35 | H |
| | 18900 | 1880.0 | -17.95 | 37.22 | 19.27 | 84.53 | |
| | 19125 | 1902.5 | -18.31 | 37.18 | 18.87 | 77.09 | |
| | 18675 | 1857.5 | -13.58 | 37.65 | 24.07 | 255.27 | V |
| | 18900 | 1880.0 | -13.44 | 37.58 | 24.14 | 259.42 | |
| | 19125 | 1902.5 | -13.55 | 37.48 | 23.93 | 247.17 | |
| Channel Bandwidth: 15 MHz / 16QAM | | | | | | | |
| Z | 18675 | 1857.5 | -18.54 | 36.57 | 18.03 | 63.53 | H |
| | 18900 | 1880.0 | -18.97 | 37.22 | 18.25 | 66.83 | |
| | 19125 | 1902.5 | -19.33 | 37.18 | 17.85 | 60.95 | |
| | 18675 | 1857.5 | -14.60 | 37.65 | 23.05 | 201.84 | V |
| | 18900 | 1880.0 | -14.46 | 37.58 | 23.12 | 205.12 | |
| | 19125 | 1902.5 | -14.57 | 37.48 | 22.91 | 195.43 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 20 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 18700 | 1860.0 | -17.83 | 36.57 | 18.74 | 74.82 | H |
| | 18900 | 1880.0 | -18.26 | 37.22 | 18.96 | 78.70 | |
| | 19100 | 1900.0 | -18.62 | 37.18 | 18.56 | 71.78 | |
| | 18700 | 1860.0 | -13.89 | 37.65 | 23.76 | 237.68 | V |
| | 18900 | 1880.0 | -13.75 | 37.58 | 23.83 | 241.55 | |
| | 19100 | 1900.0 | -13.86 | 37.48 | 23.62 | 230.14 | |
| Channel Bandwidth: 20 MHz / 16QAM | | | | | | | |
| Z | 18700 | 1860.0 | -18.85 | 36.57 | 17.72 | 59.16 | H |
| | 18900 | 1880.0 | -19.28 | 37.22 | 17.94 | 62.23 | |
| | 19100 | 1900.0 | -19.64 | 37.18 | 17.54 | 56.75 | |
| | 18700 | 1860.0 | -14.91 | 37.65 | 22.74 | 187.93 | V |
| | 18900 | 1880.0 | -14.77 | 37.58 | 22.81 | 190.99 | |
| | 19100 | 1900.0 | -14.88 | 37.48 | 22.60 | 181.97 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

**NB-IOT**

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 18601 | 1850.1 | -16.75 | 36.57 | 19.82 | 95.94 | H |
| | 18900 | 1880.0 | -17.33 | 37.22 | 19.89 | 97.50 | |
| | 19199 | 1909.9 | -17.12 | 37.18 | 20.06 | 101.39 | |
| | 18601 | 1850.1 | -12.23 | 37.65 | 25.42 | 348.34 | V |
| | 18900 | 1880.0 | -12.10 | 37.58 | 25.48 | 353.18 | |
| | 19199 | 1909.9 | -11.76 | 37.48 | 25.72 | 373.25 | |
| Channel Bandwidth: BPSK | | | | | | | |
| Z | 18601 | 1850.1 | -18.01 | 36.57 | 18.56 | 71.78 | H |
| | 18900 | 1880.0 | -18.43 | 37.22 | 18.79 | 75.68 | |
| | 19199 | 1909.9 | -18.14 | 37.18 | 19.04 | 80.17 | |
| | 18601 | 1850.1 | -13.45 | 37.65 | 24.20 | 263.03 | V |
| | 18900 | 1880.0 | -13.43 | 37.58 | 24.15 | 260.02 | |
| | 19199 | 1909.9 | -13.03 | 37.48 | 24.45 | 278.61 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

## 4.2 Modulation Characteristics Measurement

### 4.2.1 Limits of Modulation Characteristics

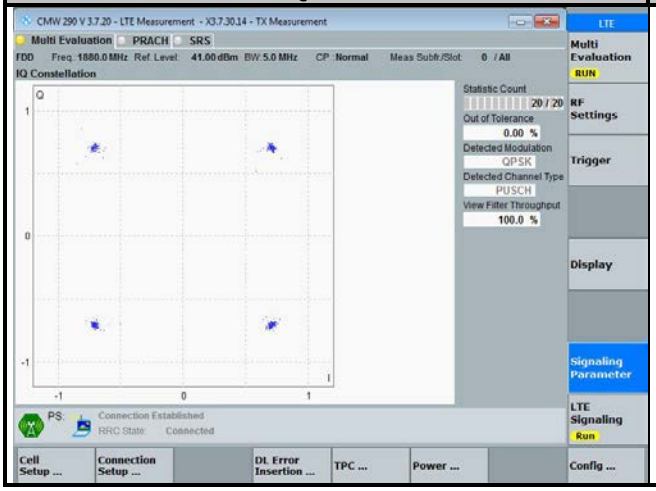
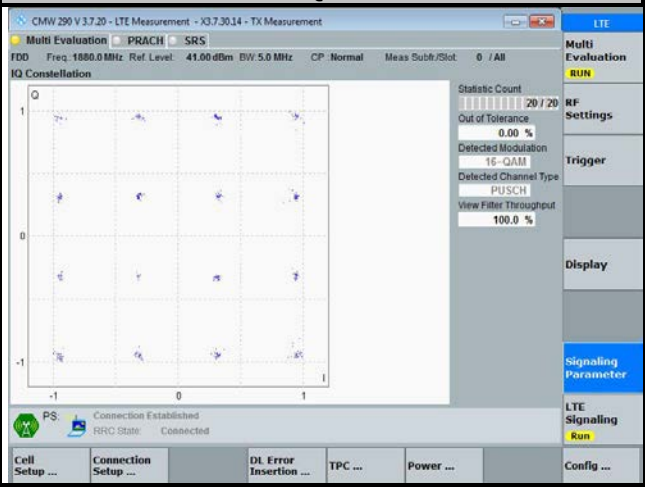
N/A

### 4.2.2 Test Setup


### 4.2.3 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

| Spectrum Plot of Measurement | |
|---|---|
| LTE Band 2 | |
| Channel 18900 | |
| QPSK | 16QAM |
|  |  |

## 4.3 Frequency Stability Measurement

### 4.3.1 Limits of Frequency Stability Measurement

The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±1.0 ppm for base stations.

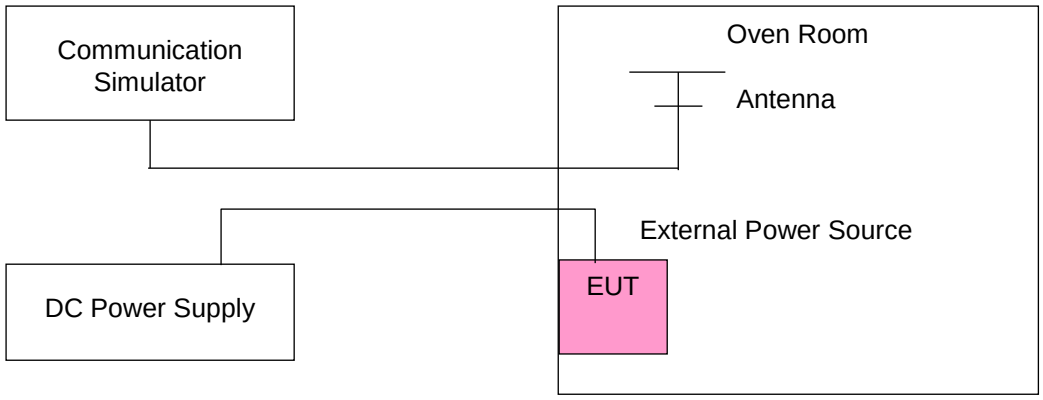
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 4.3.2 Test Procedure

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.3.3 Test Setup



4.3.4 Test Results

**Cat-M1**

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 1.4 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1850.700003 | 0.002 | 1909.300003 | 0.002 | 2.5 |
| 12 | 1850.700002 | 0.001 | 1909.300003 | 0.001 | 2.5 |
| 13.8 | 1850.700003 | 0.002 | 1909.300002 | 0.001 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 1.4 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1850.700001 | 0.001 | 1909.300003 | 0.001 | 2.5 |
| -20 | 1850.700003 | 0.001 | 1909.300002 | 0.001 | 2.5 |
| -10 | 1850.700001 | 0.001 | 1909.300002 | 0.001 | 2.5 |
| 0 | 1850.700001 | 0.001 | 1909.300002 | 0.001 | 2.5 |
| 10 | 1850.700004 | 0.002 | 1909.300003 | 0.002 | 2.5 |
| 20 | 1850.699999 | -0.001 | 1909.299998 | -0.001 | 2.5 |
| 30 | 1850.699999 | -0.001 | 1909.299998 | -0.001 | 2.5 |
| 40 | 1850.699997 | -0.002 | 1909.299996 | -0.002 | 2.5 |
| 50 | 1850.699996 | -0.002 | 1909.299996 | -0.002 | 2.5 |
| 55 | 1850.699997 | -0.002 | 1909.299998 | -0.001 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 3 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1851.500004 | 0.002 | 1908.500002 | 0.001 | 2.5 |
| 12 | 1851.500001 | 0.001 | 1908.500001 | 0.001 | 2.5 |
| 13.8 | 1851.500003 | 0.001 | 1908.500004 | 0.002 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 3 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1851.500003 | 0.001 | 1908.500001 | 0.001 | 2.5 |
| -20 | 1851.500003 | 0.001 | 1908.500004 | 0.002 | 2.5 |
| -10 | 1851.500001 | 0.001 | 1908.500003 | 0.002 | 2.5 |
| 0 | 1851.500003 | 0.001 | 1908.500003 | 0.002 | 2.5 |
| 10 | 1851.500002 | 0.001 | 1908.500003 | 0.002 | 2.5 |
| 20 | 1851.499997 | -0.002 | 1908.499997 | -0.002 | 2.5 |
| 30 | 1851.499997 | -0.001 | 1908.499997 | -0.002 | 2.5 |
| 40 | 1851.499997 | -0.002 | 1908.499996 | -0.002 | 2.5 |
| 50 | 1851.499998 | -0.001 | 1908.499997 | -0.002 | 2.5 |
| 55 | 1851.499997 | -0.001 | 1908.499997 | -0.002 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1852.500004 | 0.002 | 1907.500002 | 0.001 | 2.5 |
| 12 | 1852.500001 | 0.001 | 1907.500003 | 0.002 | 2.5 |
| 13.8 | 1852.500003 | 0.002 | 1907.500003 | 0.001 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1852.500002 | 0.001 | 1907.500003 | 0.002 | 2.5 |
| -20 | 1852.500003 | 0.002 | 1907.500002 | 0.001 | 2.5 |
| -10 | 1852.500002 | 0.001 | 1907.500002 | 0.001 | 2.5 |
| 0 | 1852.500002 | 0.001 | 1907.500004 | 0.002 | 2.5 |
| 10 | 1852.500002 | 0.001 | 1907.500003 | 0.001 | 2.5 |
| 20 | 1852.499996 | -0.002 | 1907.499999 | -0.001 | 2.5 |
| 30 | 1852.499996 | -0.002 | 1907.499998 | -0.001 | 2.5 |
| 40 | 1852.499999 | -0.001 | 1907.499996 | -0.002 | 2.5 |
| 50 | 1852.499999 | -0.001 | 1907.499997 | -0.001 | 2.5 |
| 55 | 1852.499996 | -0.002 | 1907.499997 | -0.001 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 10 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1855.000001 | 0.001 | 1905.000003 | 0.002 | 2.5 |
| 12 | 1855.000002 | 0.001 | 1905.000003 | 0.002 | 2.5 |
| 13.8 | 1855.000002 | 0.001 | 1905.000002 | 0.001 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 10 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1855.000001 | 0.001 | 1905.000004 | 0.002 | 2.5 |
| -20 | 1855.000001 | 0.001 | 1905.000003 | 0.001 | 2.5 |
| -10 | 1855.000004 | 0.002 | 1905.000004 | 0.002 | 2.5 |
| 0 | 1855.000002 | 0.001 | 1905.000003 | 0.002 | 2.5 |
| 10 | 1855.000002 | 0.001 | 1905.000002 | 0.001 | 2.5 |
| 20 | 1854.999996 | -0.002 | 1904.999999 | -0.001 | 2.5 |
| 30 | 1854.999997 | -0.002 | 1904.999997 | -0.001 | 2.5 |
| 40 | 1854.999997 | -0.002 | 1904.999997 | -0.002 | 2.5 |
| 50 | 1854.999997 | -0.002 | 1904.999996 | -0.002 | 2.5 |
| 55 | 1854.999996 | -0.002 | 1904.999999 | -0.001 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 15 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1857.500003 | 0.002 | 1902.500003 | 0.002 | 2.5 |
| 12 | 1857.500001 | 0.001 | 1902.500003 | 0.002 | 2.5 |
| 13.8 | 1857.500002 | 0.001 | 1902.500004 | 0.002 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 15 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1857.500001 | 0.001 | 1902.500001 | 0.001 | 2.5 |
| -20 | 1857.500003 | 0.002 | 1902.500004 | 0.002 | 2.5 |
| -10 | 1857.500003 | 0.001 | 1902.500003 | 0.002 | 2.5 |
| 0 | 1857.500004 | 0.002 | 1902.500002 | 0.001 | 2.5 |
| 10 | 1857.500003 | 0.002 | 1902.500002 | 0.001 | 2.5 |
| 20 | 1857.499998 | -0.001 | 1902.499998 | -0.001 | 2.5 |
| 30 | 1857.499997 | -0.002 | 1902.499996 | -0.002 | 2.5 |
| 40 | 1857.499997 | -0.002 | 1902.499997 | -0.002 | 2.5 |
| 50 | 1857.499998 | -0.001 | 1902.499996 | -0.002 | 2.5 |
| 55 | 1857.499997 | -0.002 | 1902.499997 | -0.001 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1860.000002 | 0.001 | 1900.000004 | 0.002 | 2.5 |
| 12 | 1860.000001 | 0.001 | 1900.000002 | 0.001 | 2.5 |
| 13.8 | 1860.000002 | 0.001 | 1900.000002 | 0.001 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1860.000004 | 0.002 | 1900.000003 | 0.001 | 2.5 |
| -20 | 1860.000004 | 0.002 | 1900.000003 | 0.002 | 2.5 |
| -10 | 1860.000004 | 0.002 | 1900.000002 | 0.001 | 2.5 |
| 0 | 1860.000003 | 0.002 | 1900.000001 | 0.001 | 2.5 |
| 10 | 1860.000003 | 0.002 | 1900.000003 | 0.002 | 2.5 |
| 20 | 1859.999998 | -0.001 | 1899.999998 | -0.001 | 2.5 |
| 30 | 1859.999999 | -0.001 | 1899.999998 | -0.001 | 2.5 |
| 40 | 1859.999997 | -0.002 | 1899.999998 | -0.001 | 2.5 |
| 50 | 1859.999997 | -0.001 | 1899.999999 | -0.001 | 2.5 |
| 55 | 1859.999996 | -0.002 | 1899.999997 | -0.002 | 2.5 |

**NB-IOT**

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 10.2 | 1880.000002 | 0.001 | 1880.000004 | 0.002 | 2.5 |
| 12 | 1880.000004 | 0.002 | 1880.000002 | 0.001 | 2.5 |
| 13.8 | 1880.000004 | 0.002 | 1880.000001 | 0.001 | 2.5 |

**Note:** The applicant defined the normal working voltage of the adapter is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

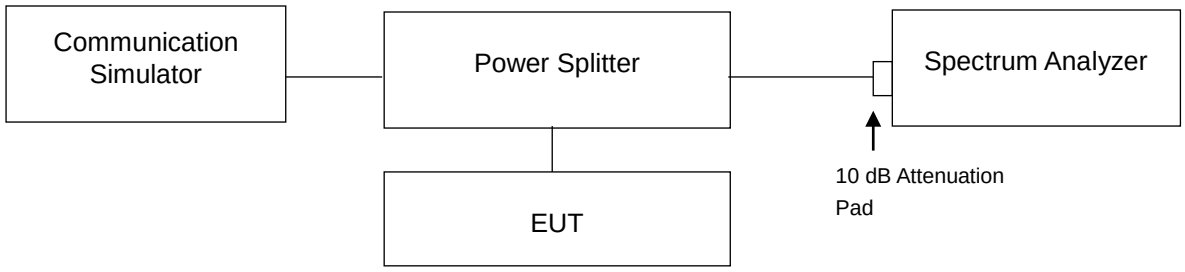
| Temp. (℃) | LTE Band 2 | | | | Limit (ppm) |
|---|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 1880.000001 | 0.001 | 1880.000003 | 0.002 | 2.5 |
| -20 | 1880.000004 | 0.002 | 1880.000002 | 0.001 | 2.5 |
| -10 | 1880.000003 | 0.002 | 1880.000003 | 0.002 | 2.5 |
| 0 | 1880.000003 | 0.001 | 1880.000004 | 0.002 | 2.5 |
| 10 | 1880.000003 | 0.001 | 1880.000001 | 0.001 | 2.5 |
| 20 | 1879.999997 | -0.002 | 1879.999999 | -0.001 | 2.5 |
| 30 | 1879.999999 | -0.001 | 1879.999998 | -0.001 | 2.5 |
| 40 | 1879.999997 | -0.001 | 1879.999998 | -0.001 | 2.5 |
| 50 | 1879.999998 | -0.001 | 1879.999998 | -0.001 | 2.5 |
| 55 | 1879.999996 | -0.002 | 1879.999996 | -0.002 | 2.5 |

## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

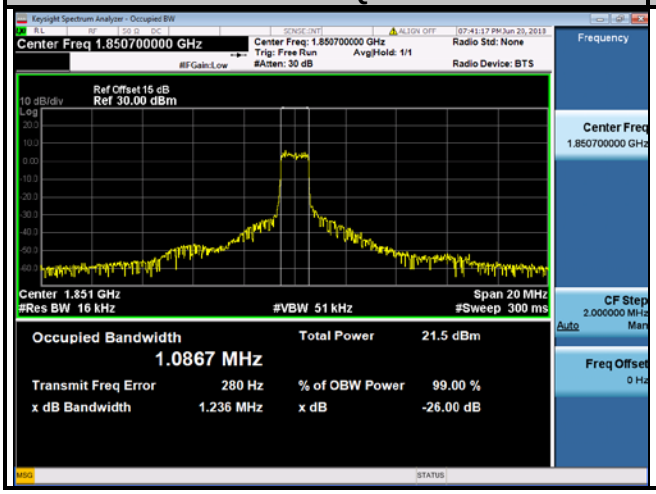
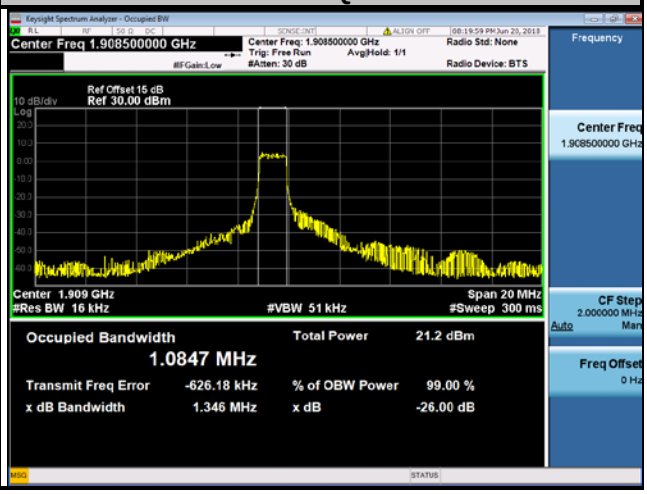
### 4.4.2 Test Setup



4.4.3 Test Result

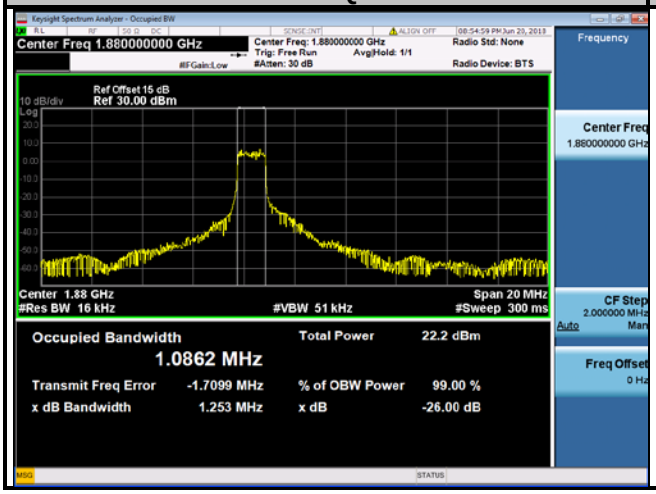
**Cat-M1**

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 1.4 MHz | | | | Channel Bandwidth: 3 MHz | | | |
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 18607 | 1850.7 | 1.0867 | 0.9095 | 18615 | 1851.5 | 1.0807 | 0.9088 |
| 18900 | 1880.0 | 1.0862 | 0.9063 | 18900 | 1880.0 | 1.0804 | 0.9092 |
| 19193 | 1909.3 | 1.0860 | 0.9051 | 19185 | 1908.5 | 1.0847 | 0.9043 |

| Spectrum Plot of Worst Value | |
|---|---|
| 1.4 MHz / QPSK | 3 MHz / QPSK |
|  |  |

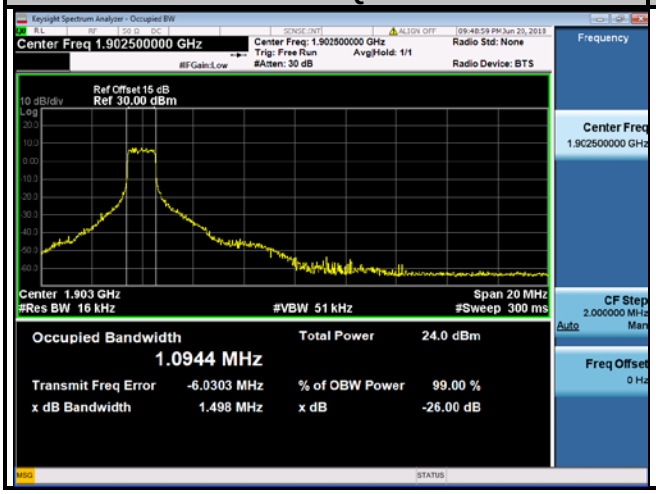
| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 18625 | 1852.5 | 1.0834 | 0.9104 | 18650 | 1855.0 | 1.0876 | 0.9130 |
| 18900 | 1880.0 | 1.0862 | 0.9132 | 18900 | 1880.0 | 1.0927 | 0.9118 |
| 19175 | 1907.5 | 1.0838 | 0.9089 | 19150 | 1905.0 | 1.0898 | 0.9153 |

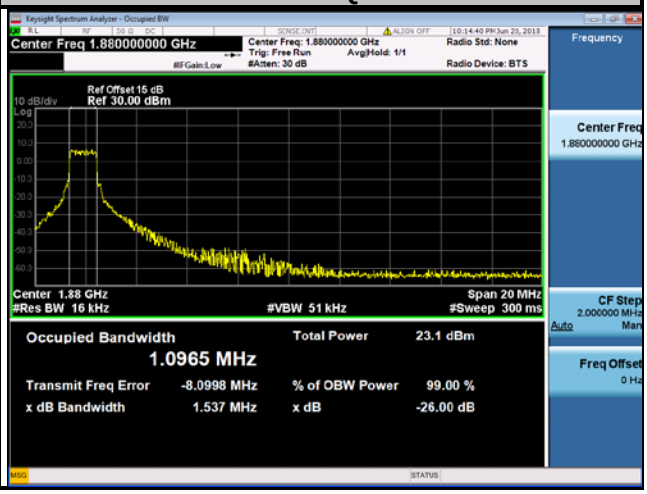
| Spectrum Plot of Worst Value | |
|---|---|
| 5 MHz / QPSK | 10 MHz / QPSK |




| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 15 MHz | | | | Channel Bandwidth: 20 MHz | | | |
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 18675 | 1857.5 | 1.0862 | 0.9213 | 18700 | 1860.0 | 1.0893 | 0.9161 |
| 18900 | 1880.0 | 1.0838 | 0.9182 | 18900 | 1880.0 | 1.0965 | 0.9279 |
| 19125 | 1902.5 | 1.0944 | 0.9247 | 19100 | 1900.0 | 1.0907 | 0.9155 |

| Spectrum Plot of Worst Value | |
|---|---|
| 15 MHz / QPSK | 20 MHz / QPSK |

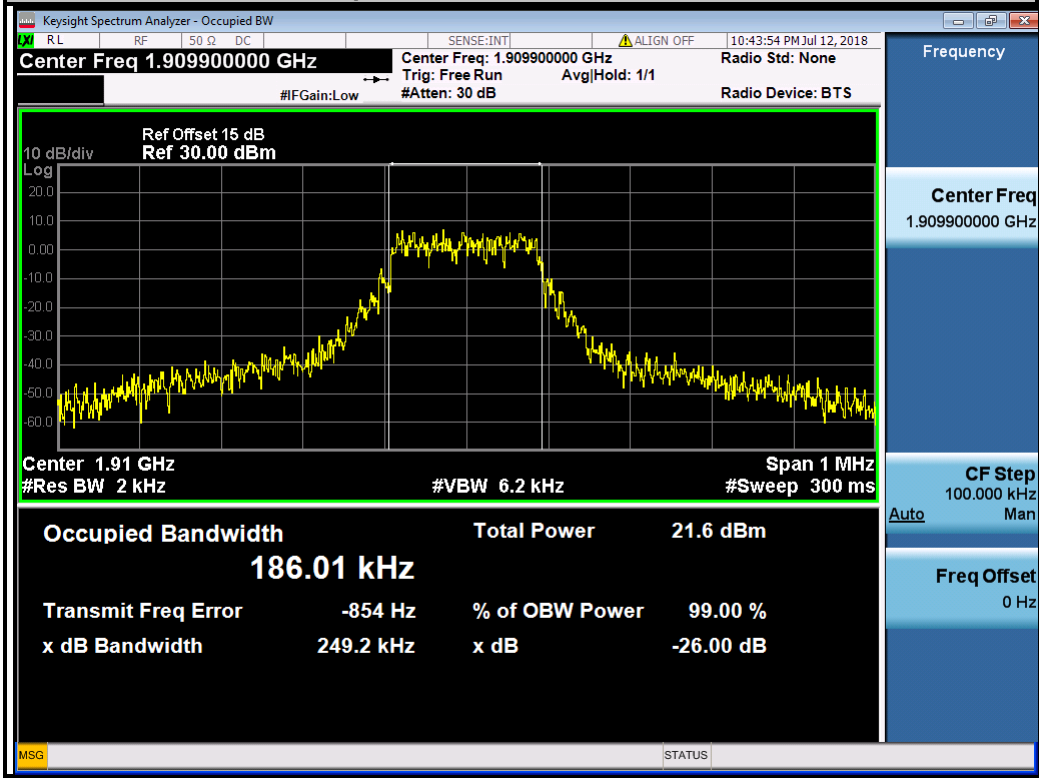


## NB-IOT

| 99 % Occupied Bandwidth (kHz) | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Modulation | Ntones | Sub-carrier spacing (kHz) | 99% |
| 18601 | 1850.1 | BPSK | 1@0 | 3.75 | 56.56 |
| | | QPSK | 1@0 | 15 | 120.26 |
| | | QPSK | 3@3 | 15 | 130.43 |
| | | QPSK | 12@0 | 15 | 183.45 |
| 18900 | 1880 | BPSK | 1@0 | 3.75 | 53.94 |
| | | QPSK | 1@0 | 15 | 119.23 |
| | | QPSK | 3@3 | 15 | 116.11 |
| | | QPSK | 12@0 | 15 | 184.49 |
| 19199 | 1909.9 | BPSK | 1@47 | 3.75 | 52.51 |
| | | QPSK | 1@11 | 15 | 123.75 |
| | | QPSK | 3@3 | 15 | 131.89 |
| | | QPSK | 12@0 | 15 | 186.01 |

**Spectrum Plot of Worst Value**

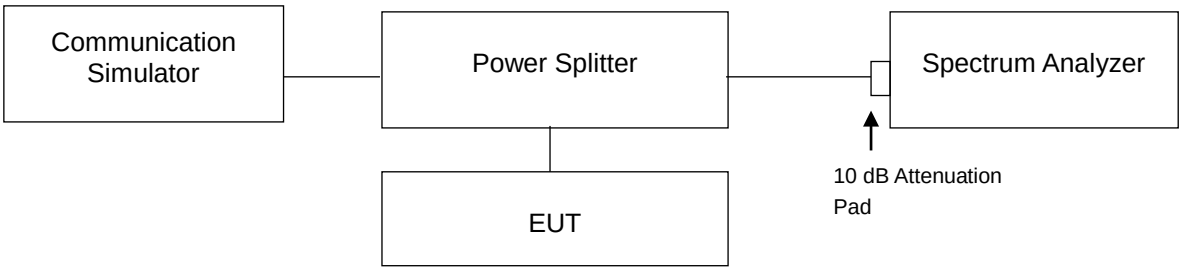


## 4.5 Band Edge Measurement

### 4.5.1 Limits of Band Edge Measurement

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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

### 4.5.2 Test Setup

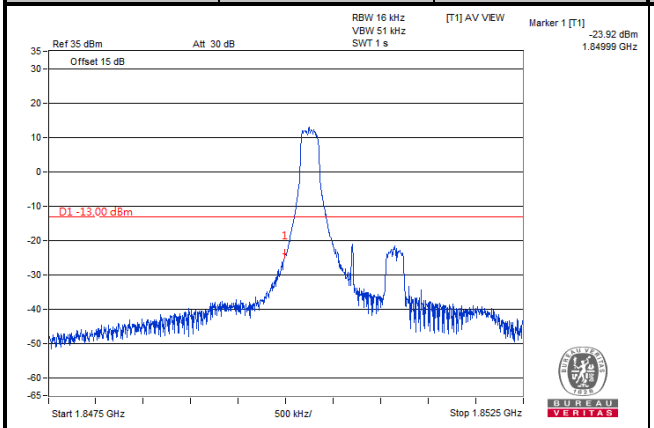
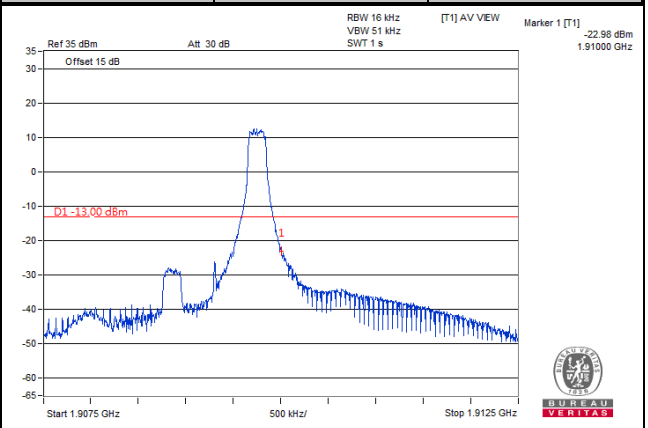
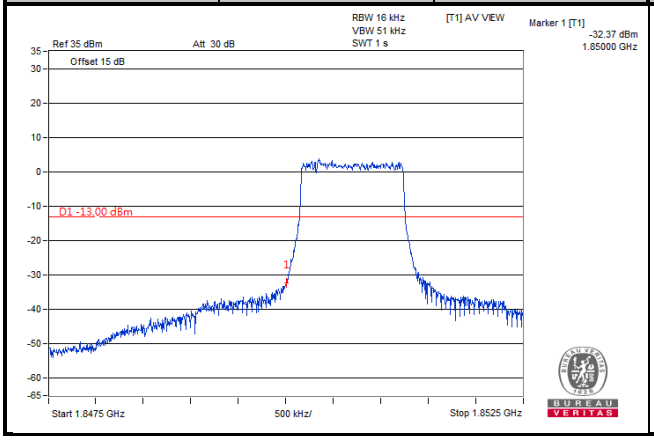
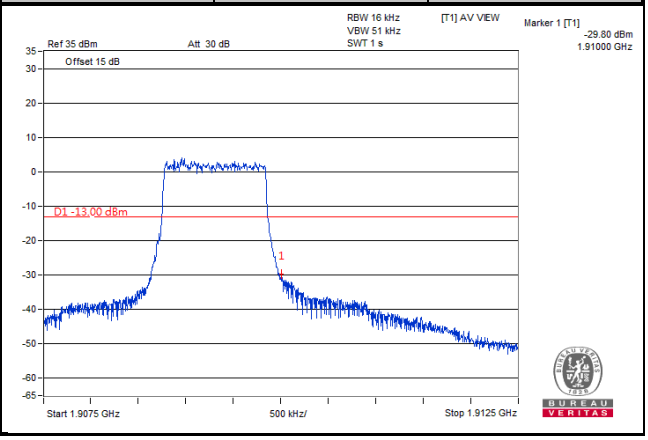


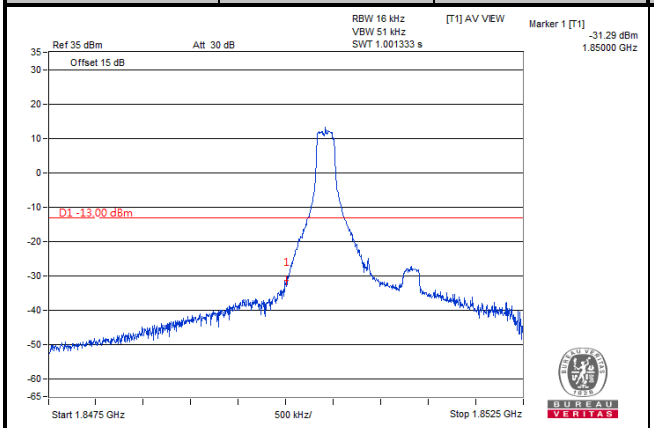
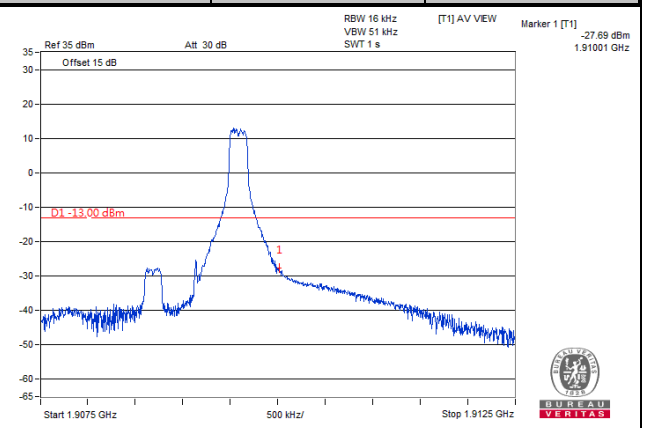
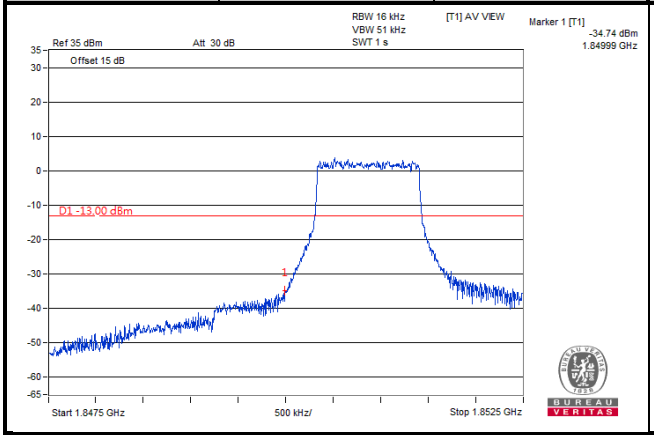
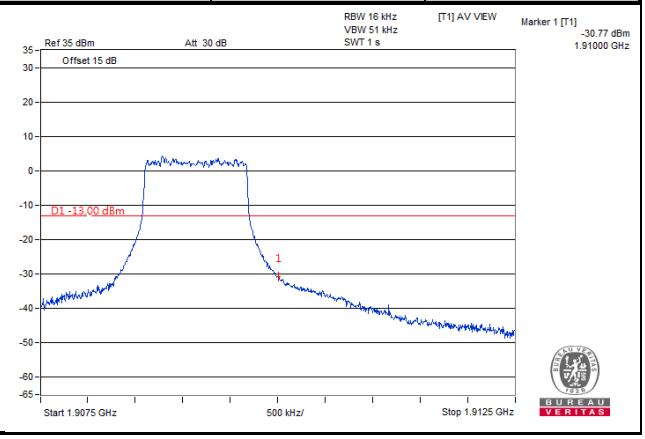

### 4.5.3 Test Procedures

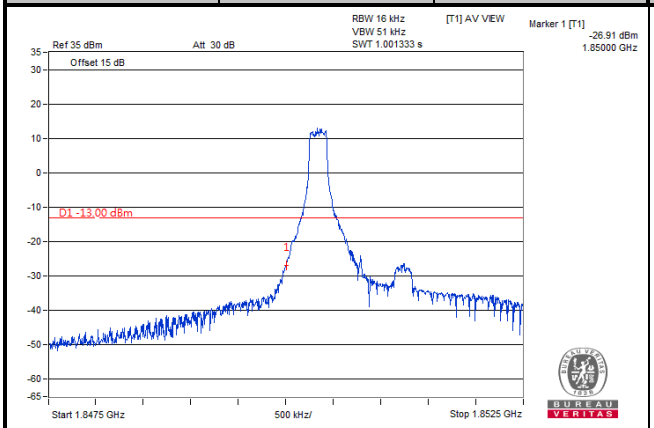
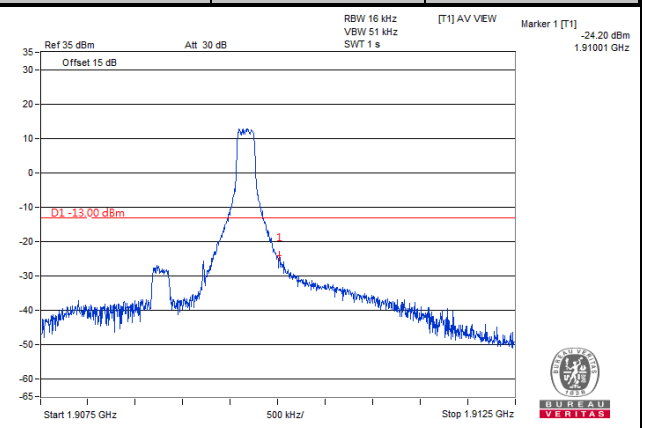
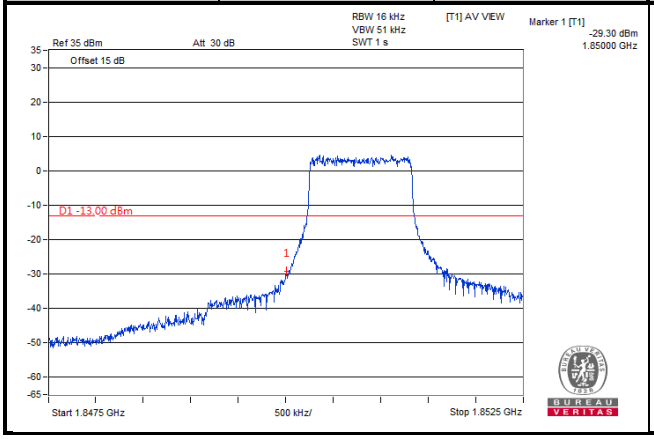
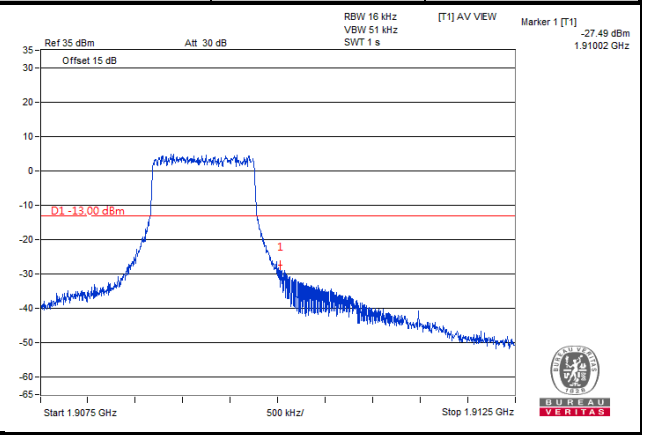
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 16 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 / 3 / 5 / 10 / 15 / 20 MHz) for **Cat-M1**.
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 Hz and VB of the spectrum is 160 Hz (BPSK) for **NB-IOT**.
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 200 Hz and VB of the spectrum is 620 kHz (QPSK) for **NB-IOT**.
e. Record the max trace plot into the test report.

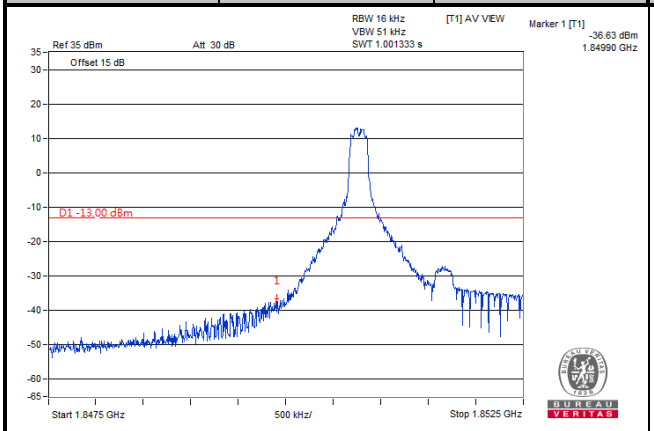
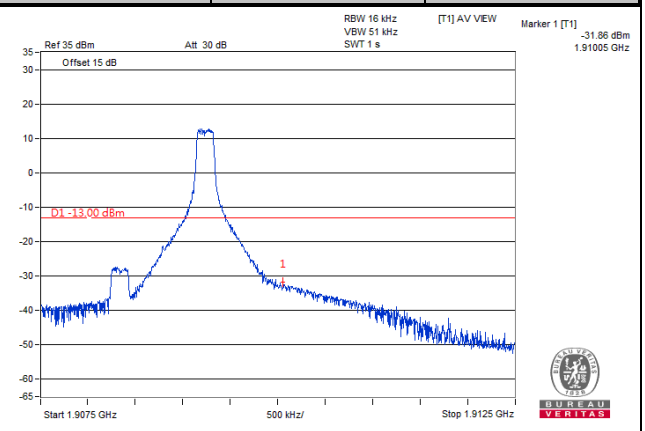
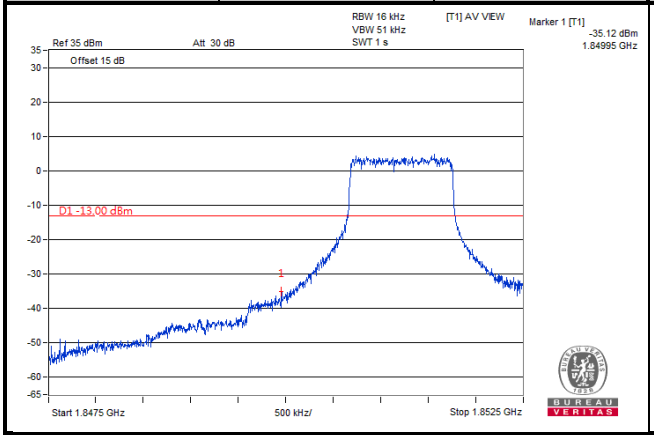
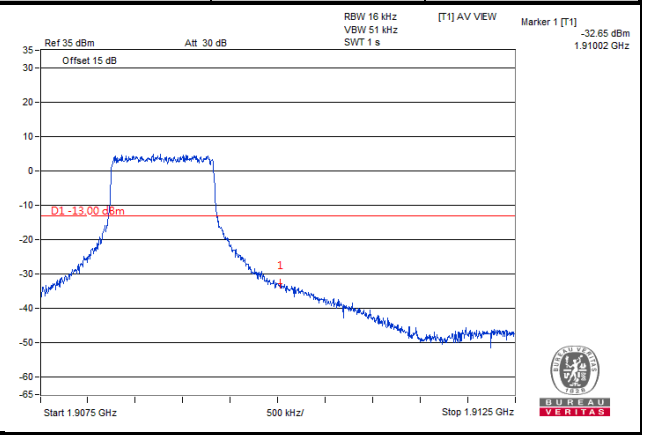
4.5.4 Test Results

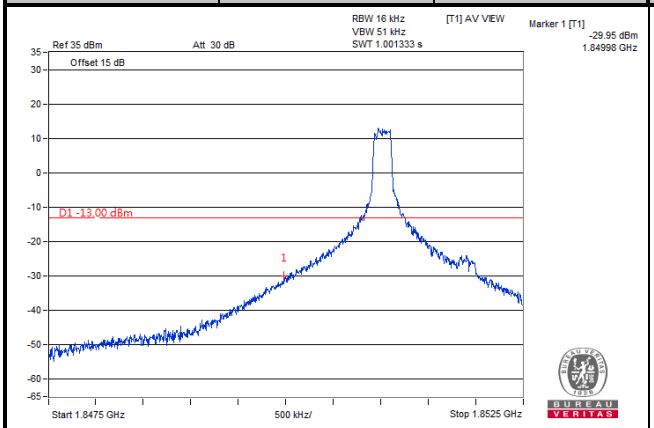
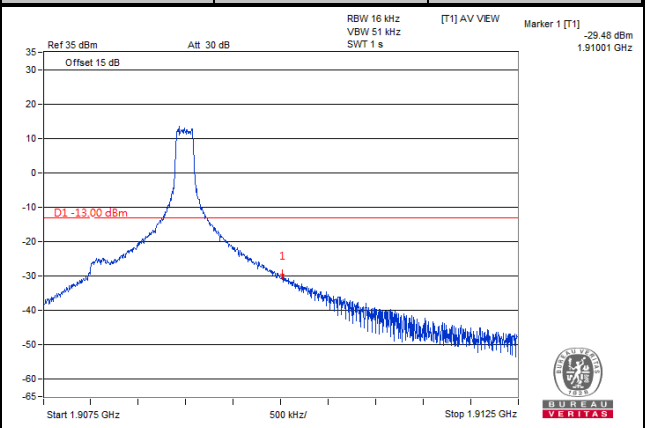
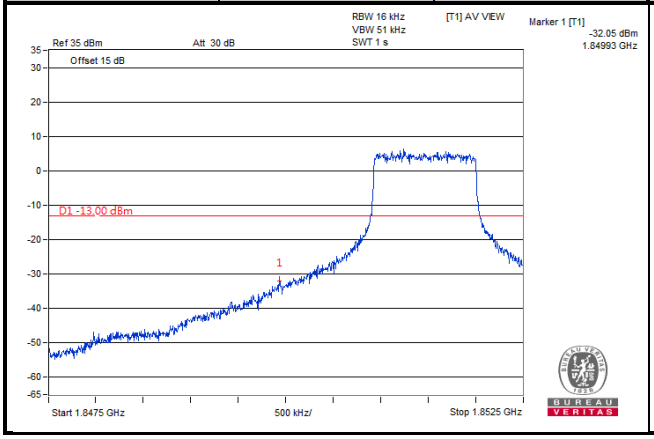
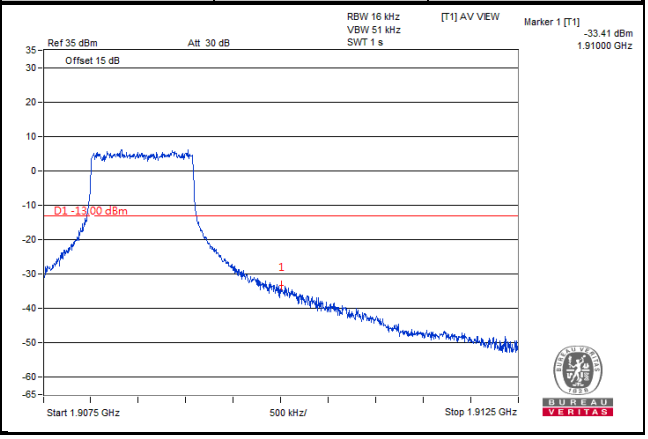
**Cat-M1**

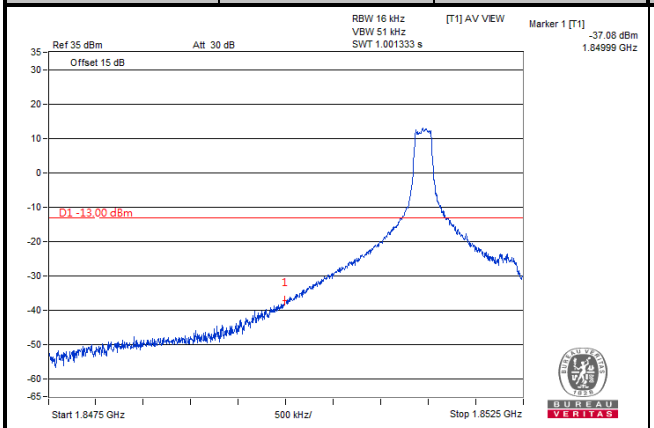
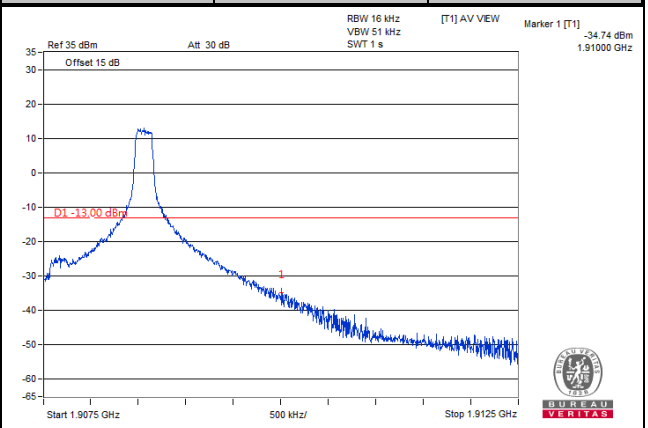
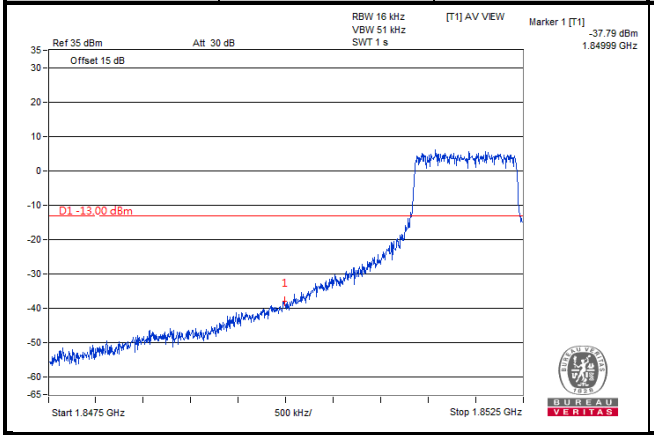
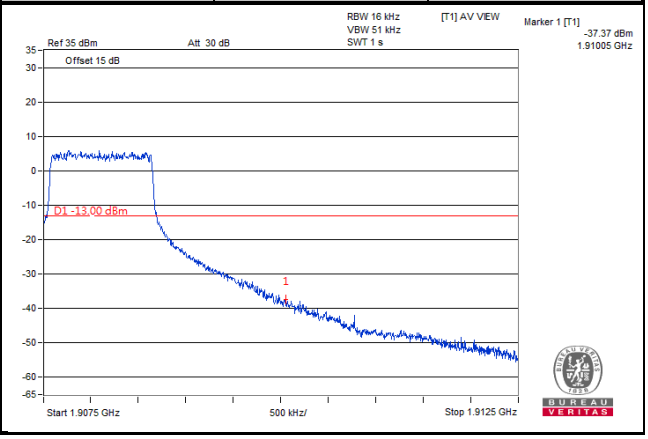
| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel Bandwidth: 1.4 MHz | | | | | |
| Channel | 18607 | 1 RB | Channel | 19193 | 1 RB |
|  | | |  | | |
| Channel | 18607 | 6 RB | Channel | 19193 | 6 RB |
|  | | |  | | |

| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel Bandwidth: 3 MHz | | | | | |
| Channel | 18615 | 1 RB | Channel | 19185 | 1 RB |
|  | | |  | | |
| Channel | 18615 | 6 RB | Channel | 19185 | 6 RB |
|  | | |  | | |

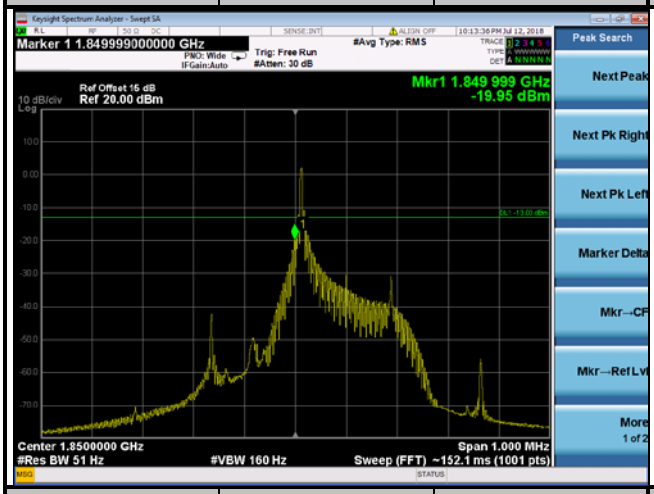
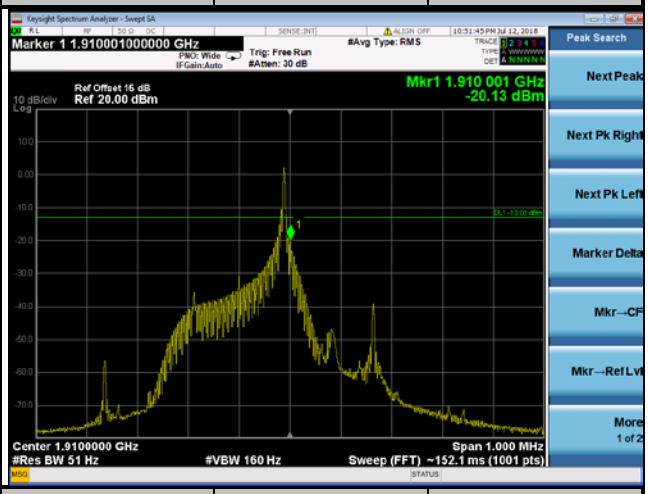
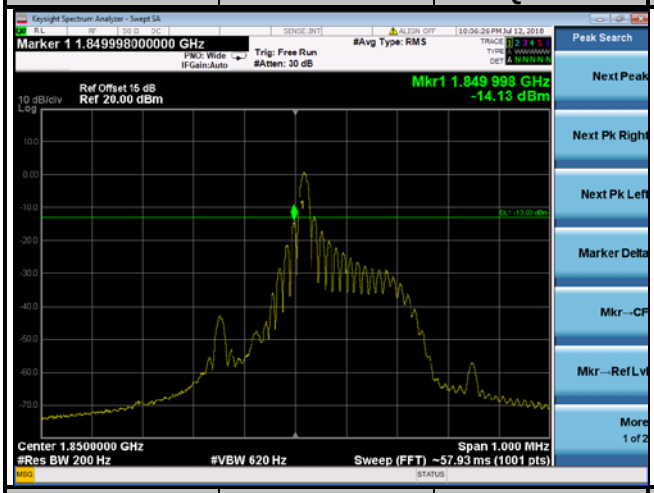
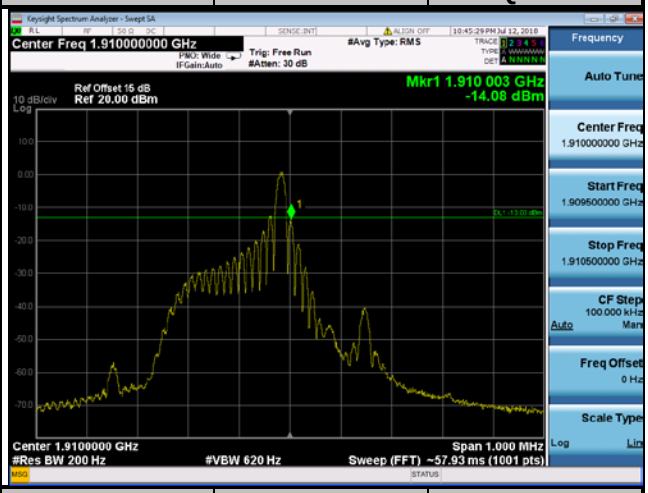
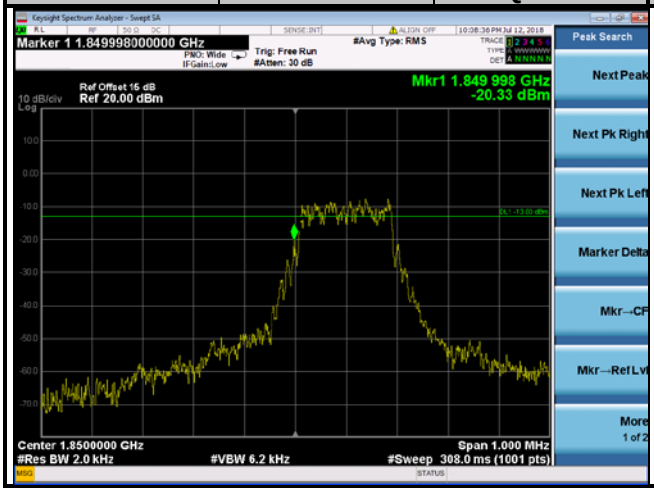
| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel Bandwidth: 5 MHz | | | | | |
| Channel | 18625 | 1 RB | Channel | 19175 | 1 RB |
|  | | |  | | |
| Channel | 18625 | 6 RB | Channel | 19175 | 6 RB |
|  | | |  | | |

| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel Bandwidth: 10 MHz | | | | | |
| Channel | 18650 | 1 RB | Channel | 19150 | 1 RB |
|  | | |  | | |
| Channel | 18650 | 6 RB | Channel | 19150 | 6 RB |
|  | | |  | | |

| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel Bandwidth: 15 MHz | | | | | |
| Channel | 18675 | 1 RB | Channel | 19125 | 1 RB |
|  | | |  | | |
| Channel | 18675 | 6 RB | Channel | 19125 | 6 RB |
|  | | |  | | |

| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel Bandwidth: 20 MHz | | | | | |
| Channel | 18700 | 1 RB | Channel | 19100 | 1 RB |
|  | | |  | | |
| Channel | 18700 | 6 RB | Channel | 19100 | 6 RB |
|  | | |  | | |

## NB-IOT

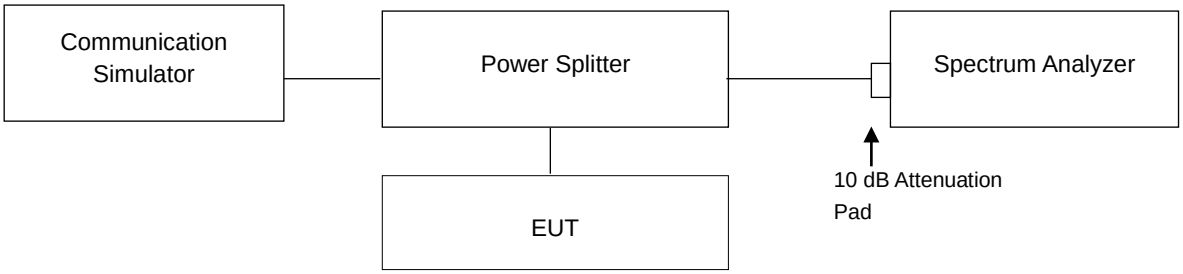
| LTE Band 2 | | | | | |
|---|---|---|---|---|---|
| Channel | 18601 | BPSK | Channel | 19199 | BPSK |
|  | | |  | | |
| Channel | 18601 | QPSK | Channel | 19199 | QPSK |
|  | | |  | | |
| Channel | 18601 | QPSK | Channel | 19199 | QPSK |
|  | | |  | | |

## 4.6 Peak to Average Ratio

### 4.6.1 Limits of Peak to Average Ratio Measurement

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.

### 4.6.2 Test Setup



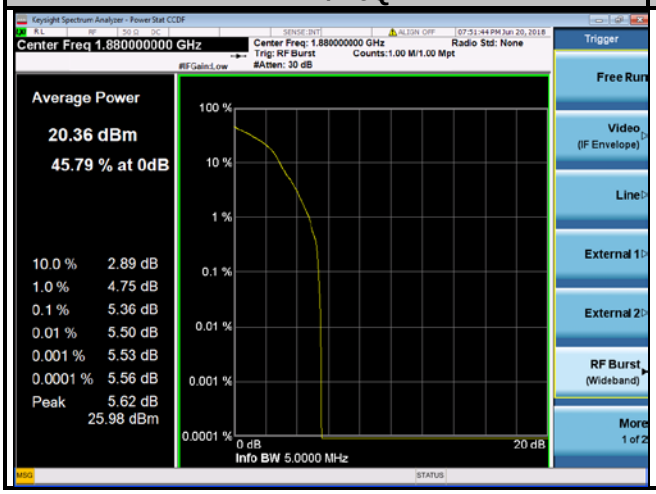
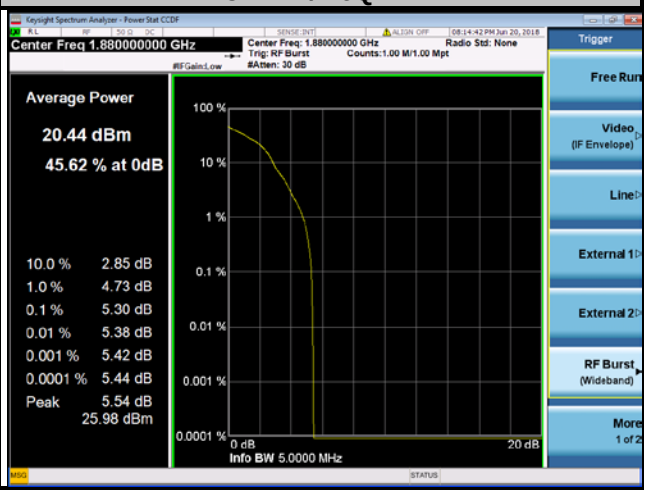

### 4.6.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

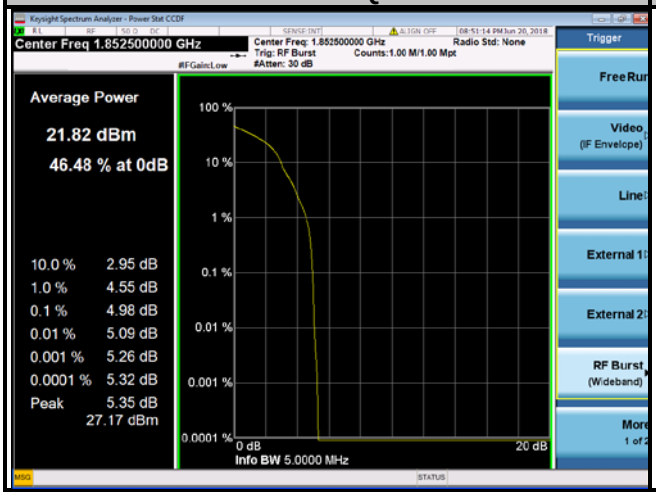
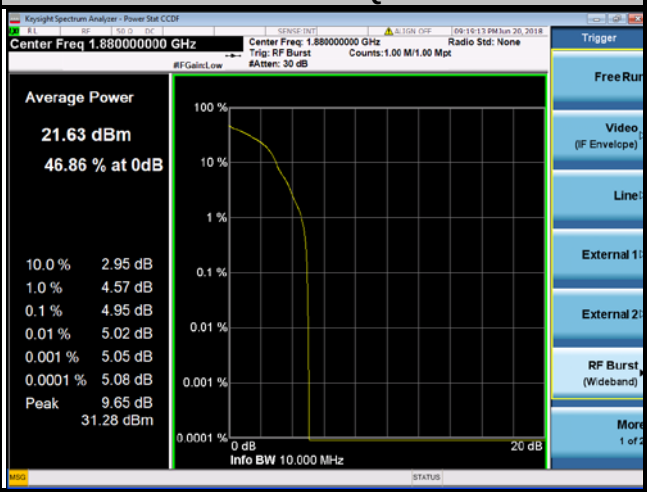
4.6.4 Test Results

**Cat-M1**

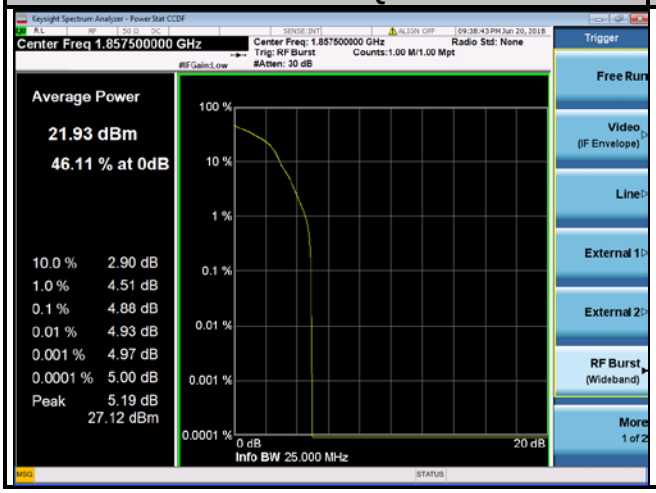
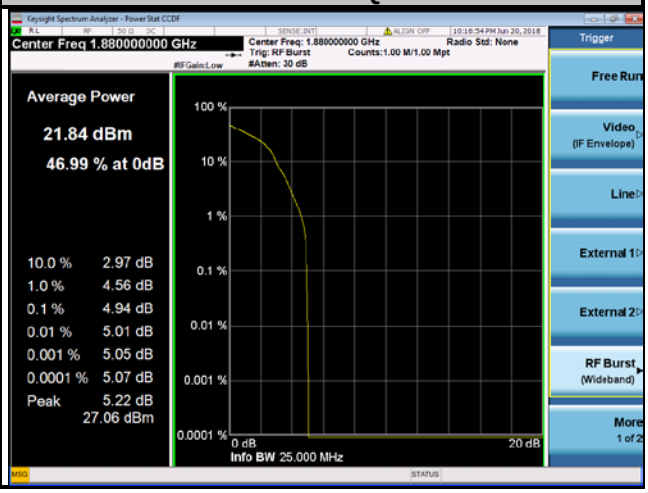
| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 1.4 MHz | | | | Channel Bandwidth: 3 MHz | | | |
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 18607 | 1850.7 | 4.52 | 5.32 | 18615 | 1851.5 | 4.37 | 5.28 |
| 18900 | 1880.0 | 4.52 | 5.36 | 18900 | 1880.0 | 4.46 | 5.30 |
| 19193 | 1909.3 | 4.44 | 5.30 | 19185 | 1908.5 | 4.36 | 5.19 |

| Spectrum Plot of Worst Value | |
|---|---|
| 1.4 MHz / 16QAM | 3 MHz / 16QAM |
|  |  |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 18625 | 1852.5 | 4.43 | 4.98 | 18650 | 1855.0 | 4.36 | 4.92 |
| 18900 | 1880.0 | 4.57 | 4.94 | 18900 | 1880.0 | 4.43 | 4.95 |
| 19175 | 1907.5 | 4.41 | 4.90 | 19150 | 1905.0 | 4.37 | 4.90 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5 MHz / 16QAM | 10 MHz / 16QAM |
|  |  |

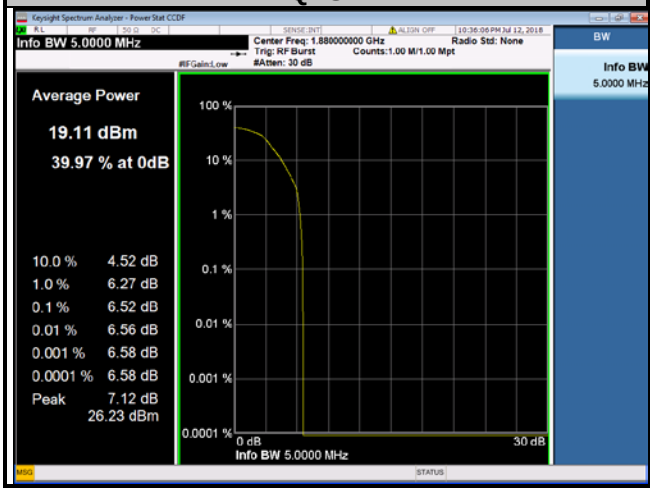
| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Bandwidth: 15 MHz | | | | Channel Bandwidth: 20 MHz | | | |
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 18675 | 1857.5 | 4.34 | 4.88 | 18700 | 1860.0 | 4.38 | 4.88 |
| 18900 | 1880.0 | 4.38 | 4.83 | 18900 | 1880.0 | 4.41 | 4.94 |
| 19125 | 1902.5 | 4.32 | 4.76 | 19100 | 1900.0 | 4.39 | 4.79 |

| Spectrum Plot of Worst Value | |
|---|---|
| 15 MHz / 16QAM | 20 MHz / 16QAM |
|  |  |

## NB-IOT

| Peak to Average Ratio (dB) | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Modulation | Sub-carrier spacing (kHz) | CCDF | Limit |
| 18900 | 1880 | BPSK | 3.75 | 1.77 | 13.00 |
| 18900 | 1880 | QPSK | 15 | 1.59 | |
| 18900 | 1880 | QPSK | 15 | 6.52 | |

| Spectrum Plot of Worst Value |
|---|
| QPSK |

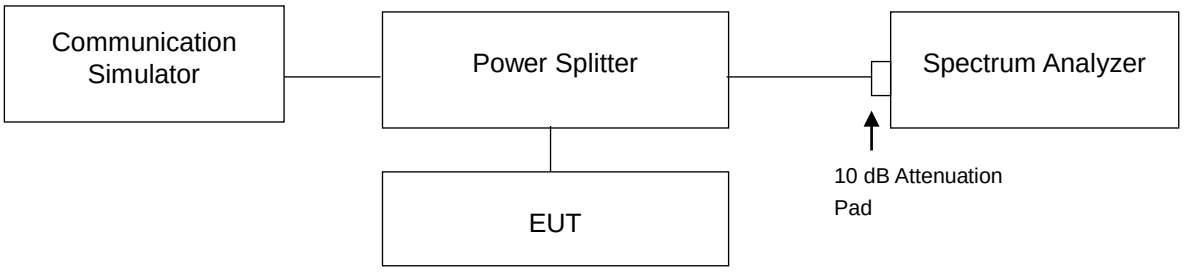


## 4.7 Conducted Spurious Emissions

### 4.7.1 Limits of Conducted Spurious Emissions Measurement

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. The emission limit equal to -13 dBm.

### 4.7.2 Test Setup

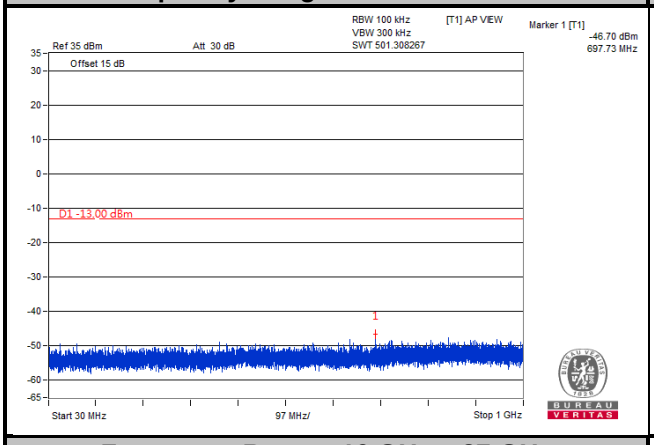
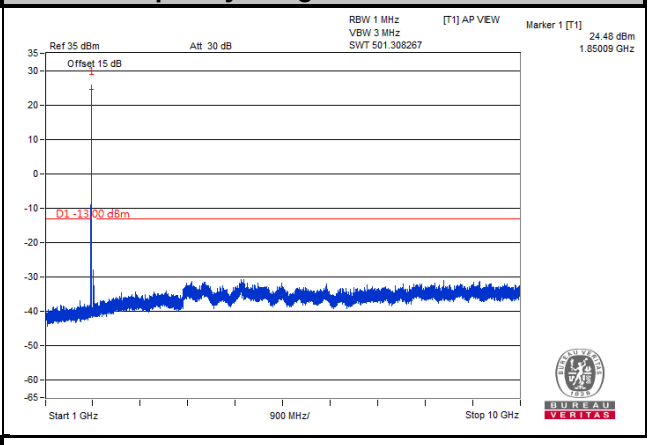
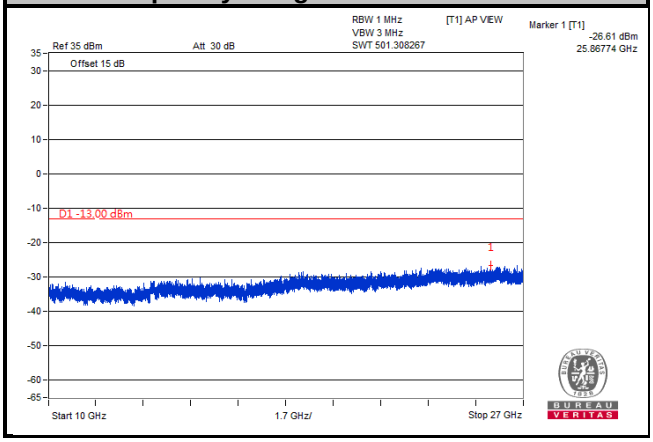


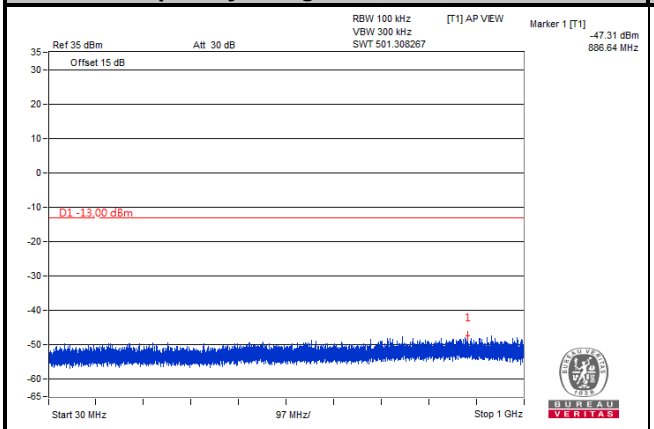
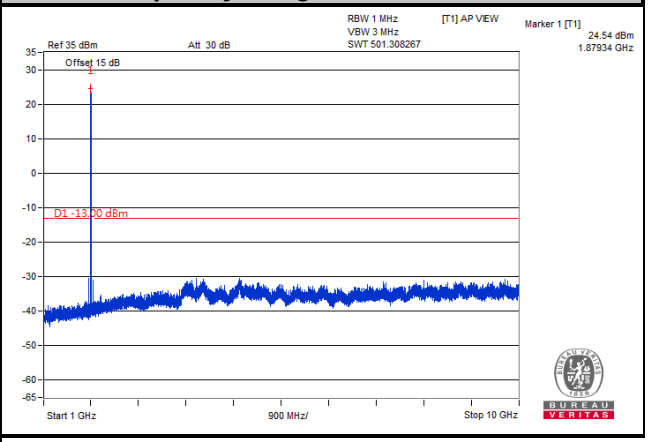
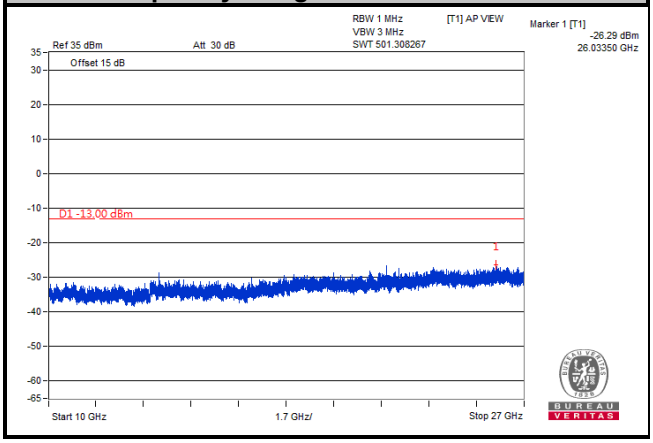

### 4.7.3 Test Procedure

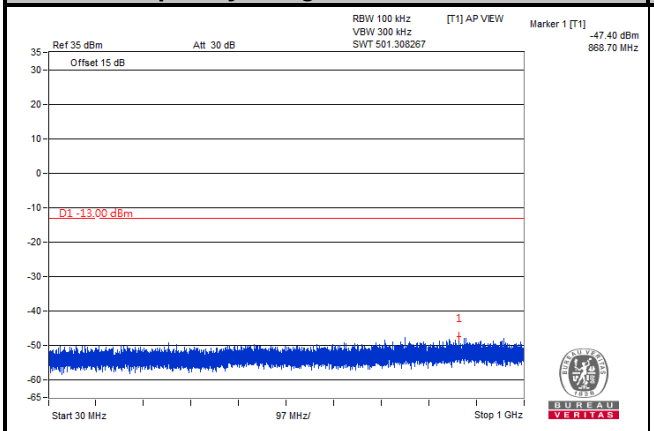
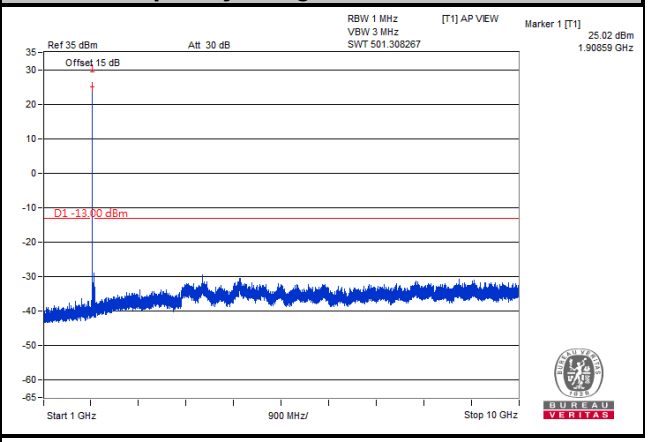
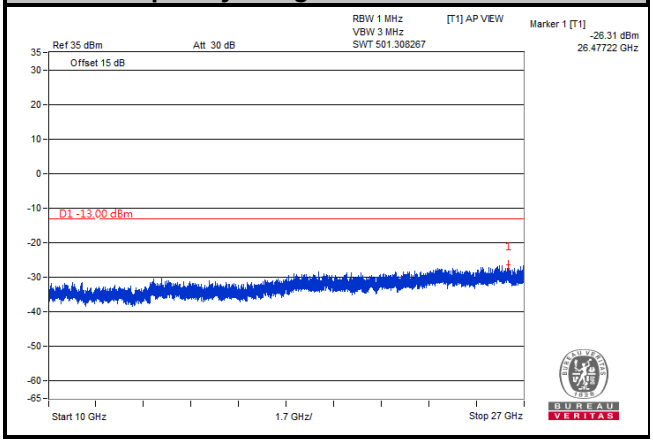
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. For LTE, measuring frequency range is from 30 MHz to 27 GHz. 20 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

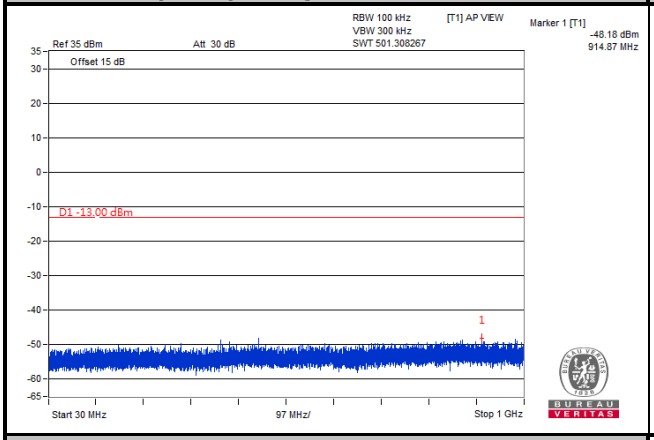
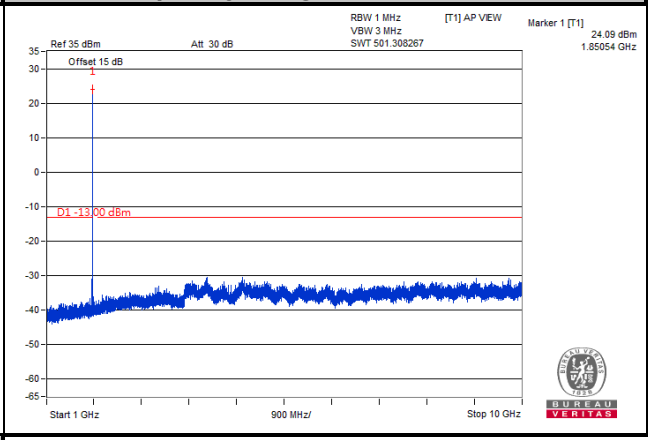
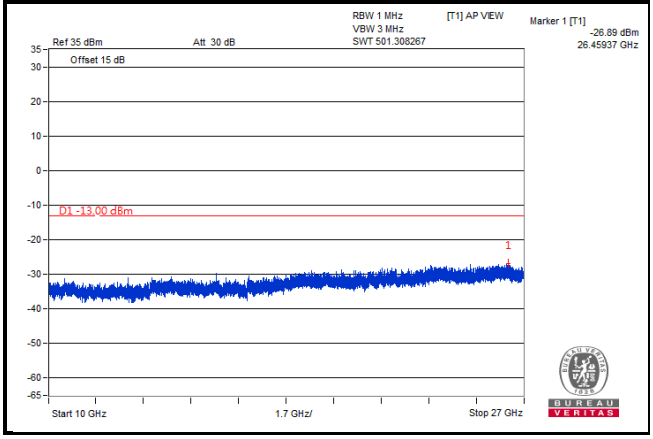
4.7.4 Test Results

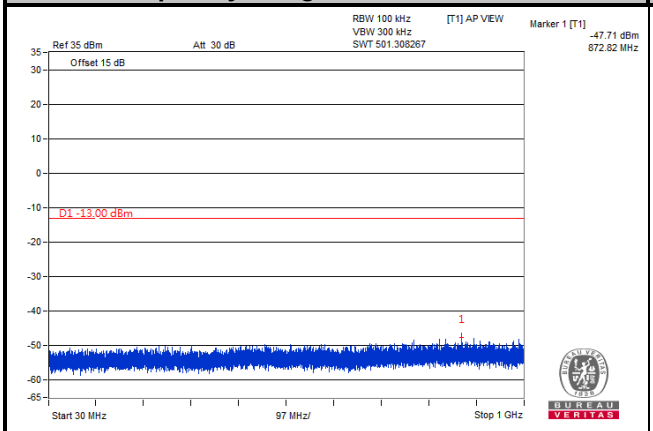
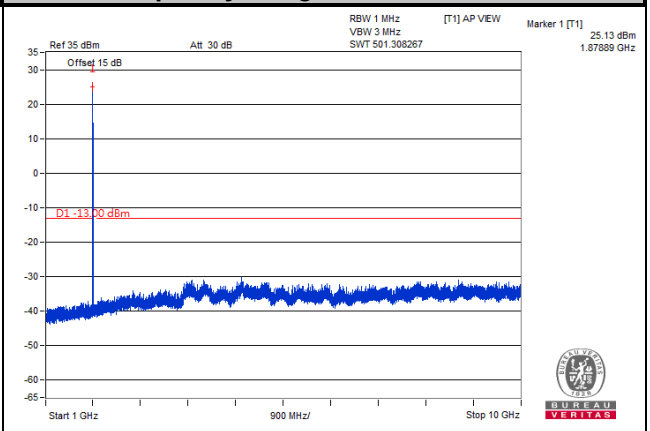
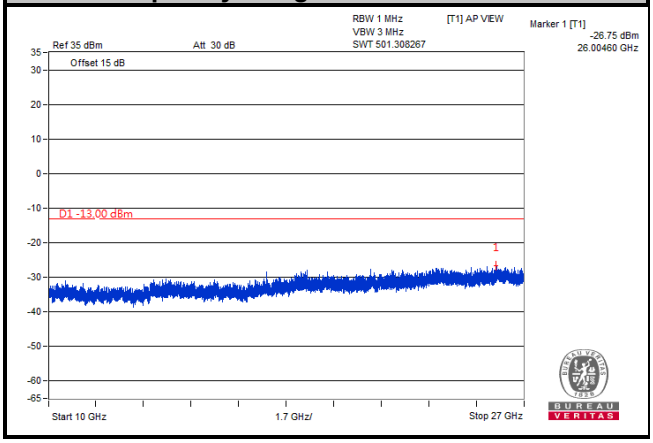
**Cat-M1**

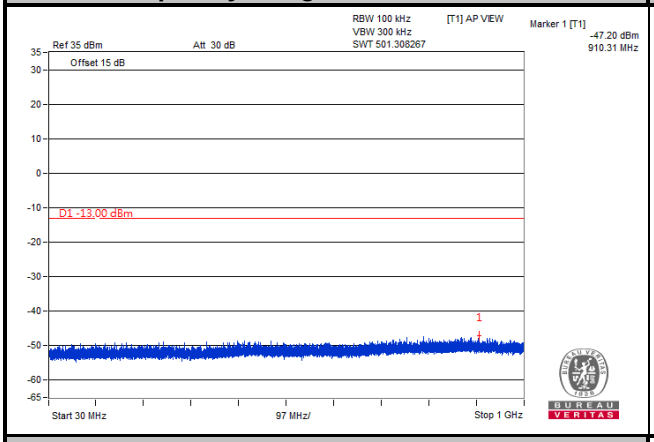
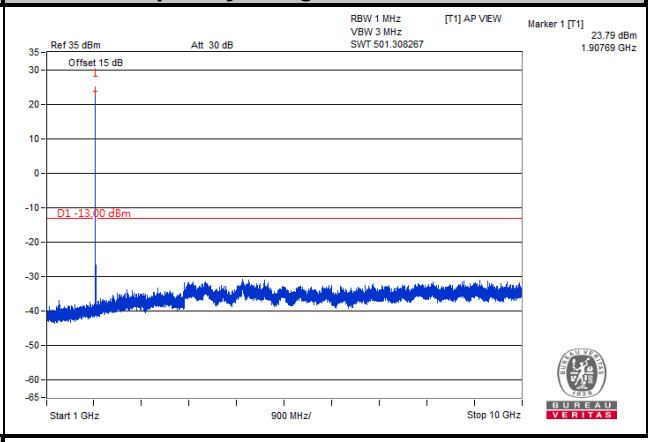
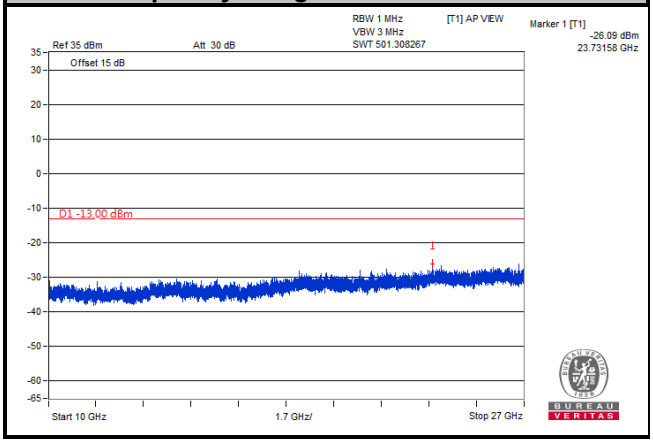
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 1.4 MHz | |
| Channel 18607 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

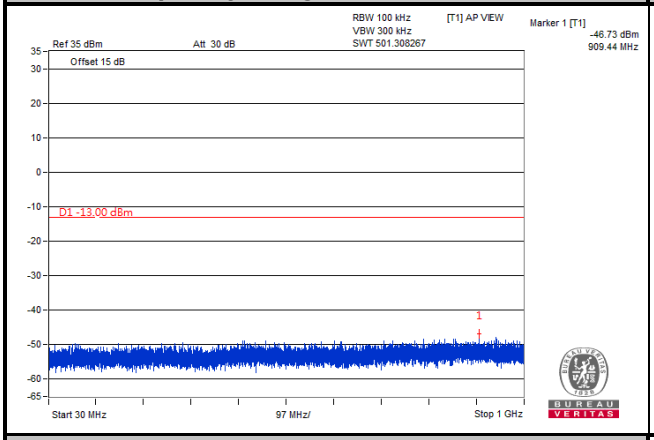
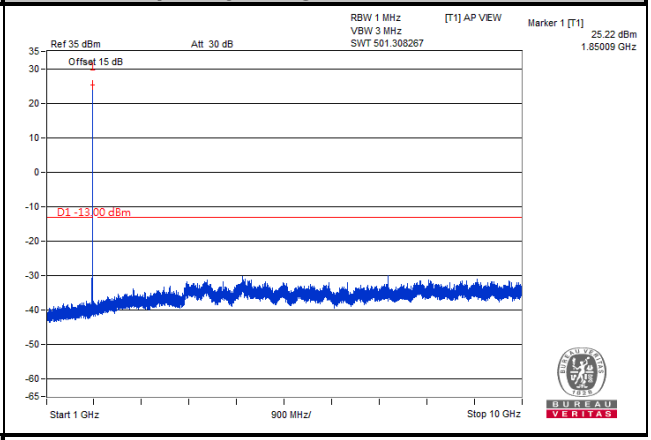
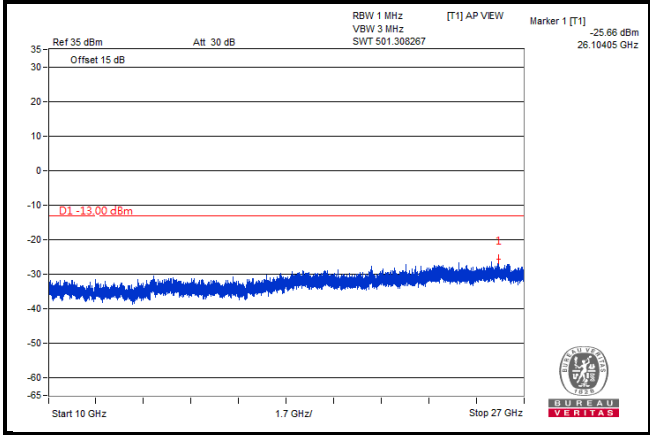
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 1.4 MHz | |
| Channel 18900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

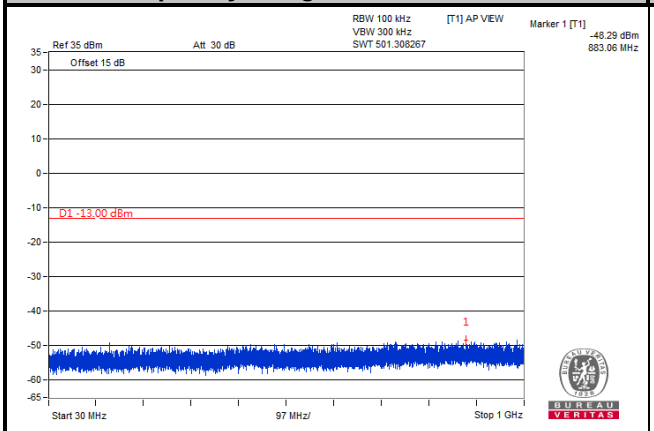
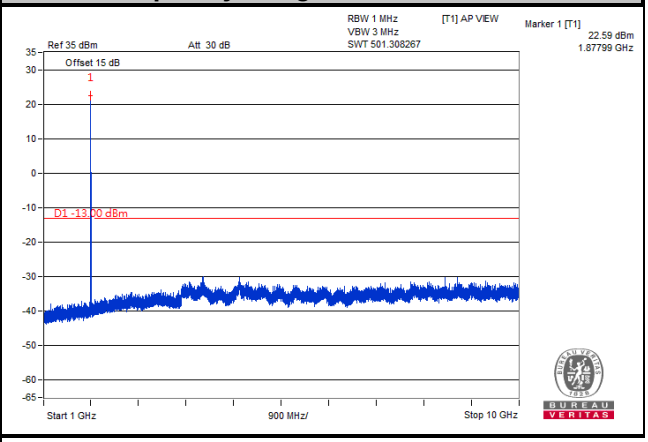
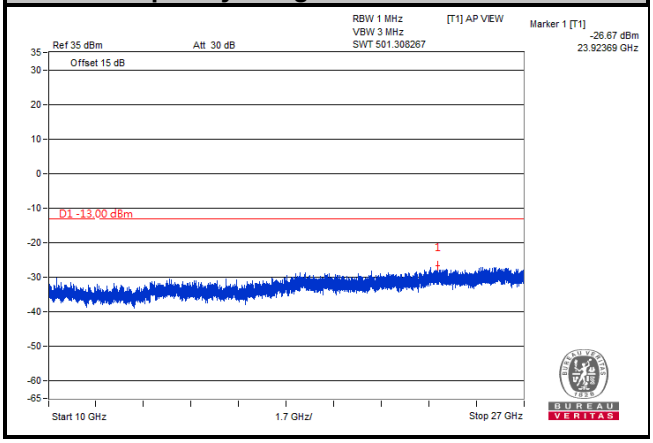
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 1.4 MHz | |
| Channel 19193 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

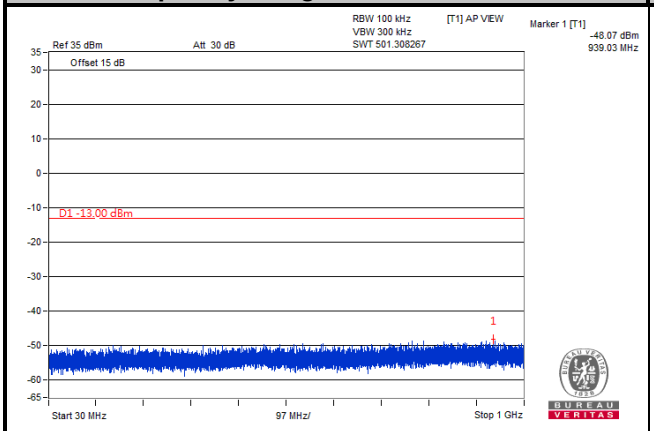
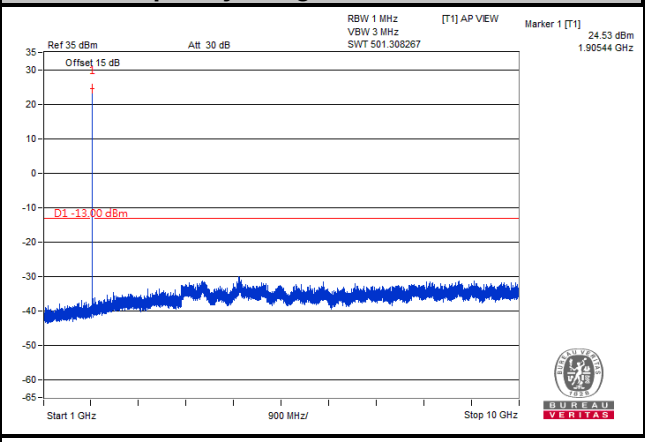
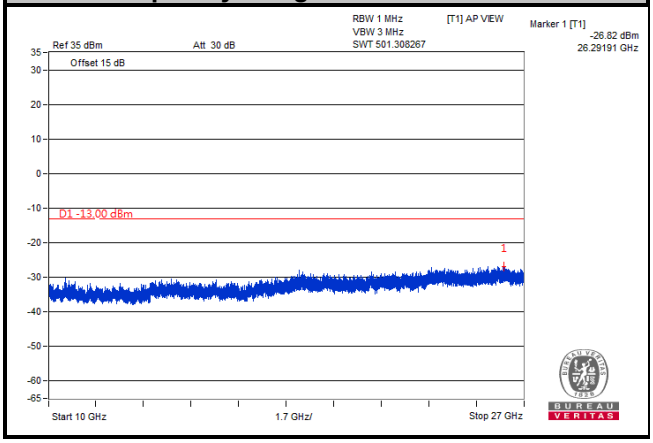
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 3 MHz | |
| Channel 18615 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

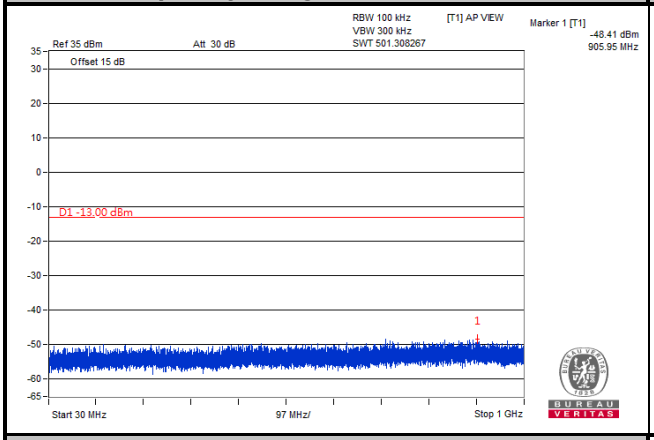
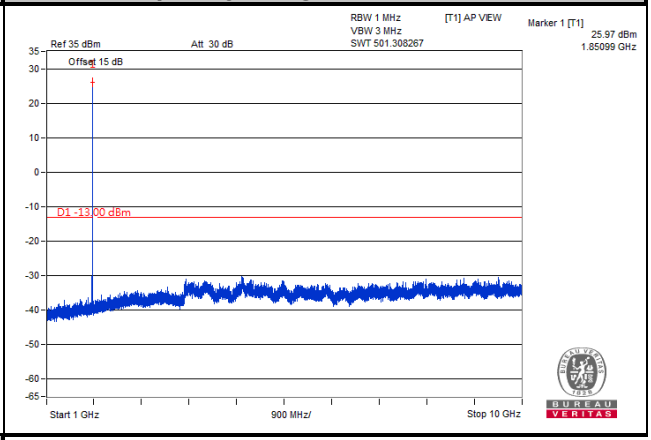
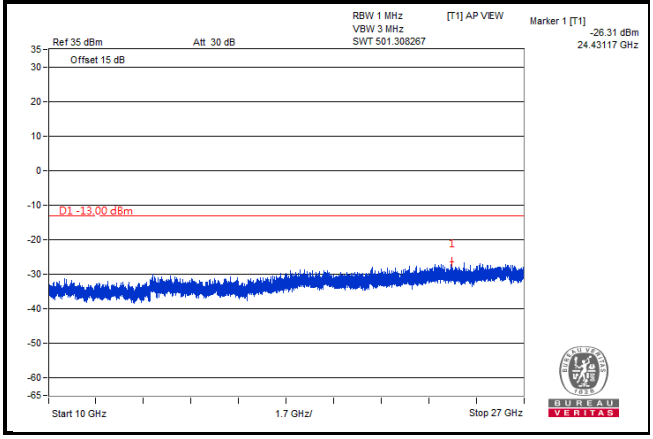
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 3 MHz | |
| Channel 18900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

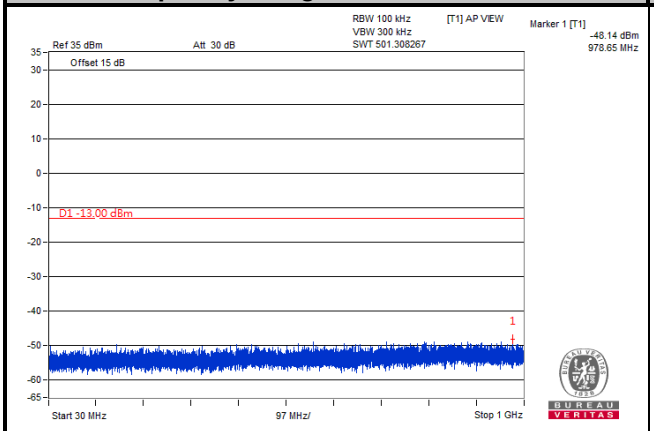
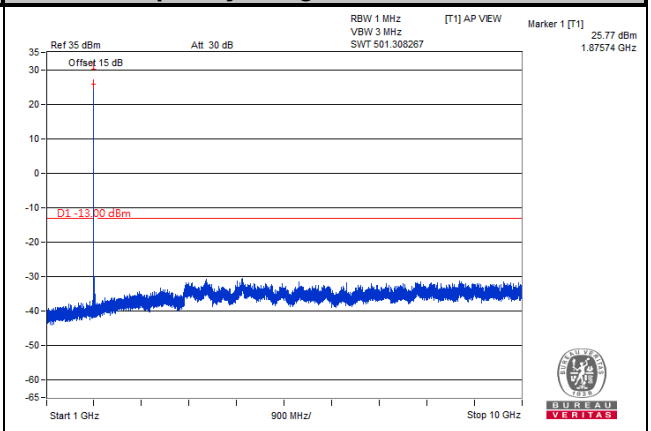
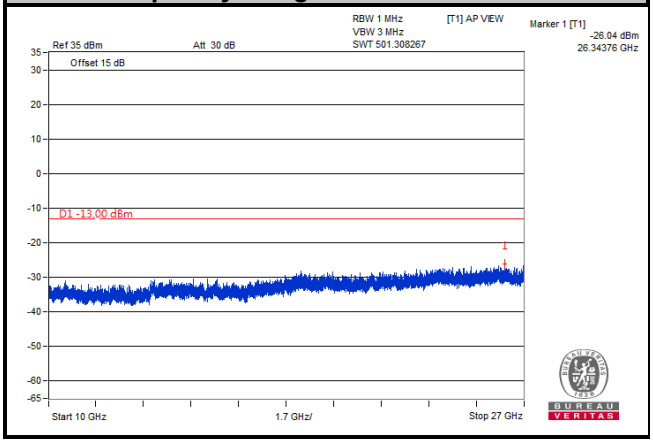
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 3 MHz | |
| Channel 19185 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

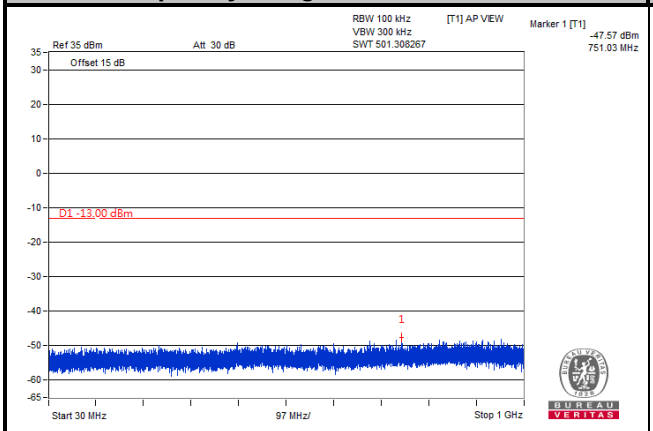
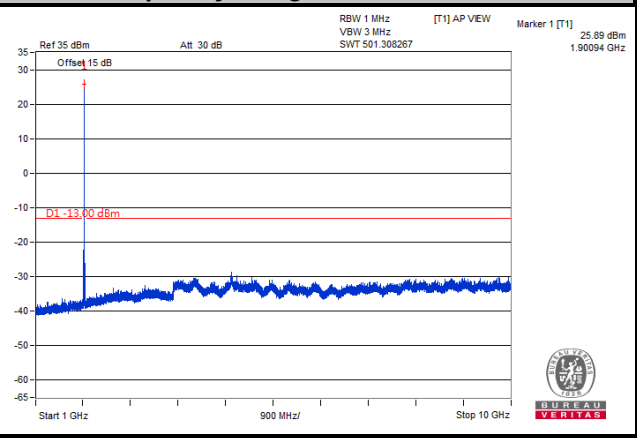
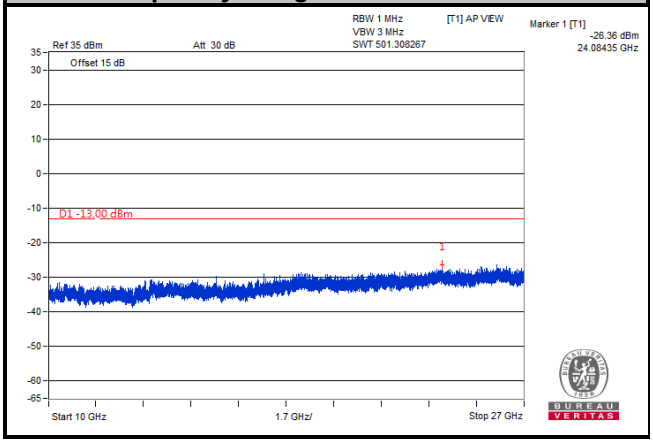
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 5 MHz | |
| Channel 18625 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

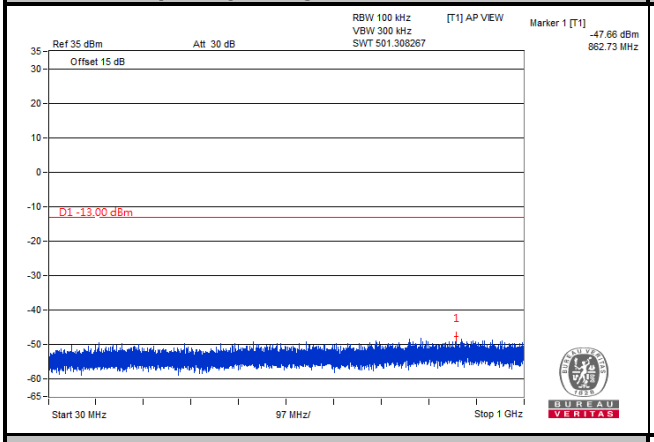
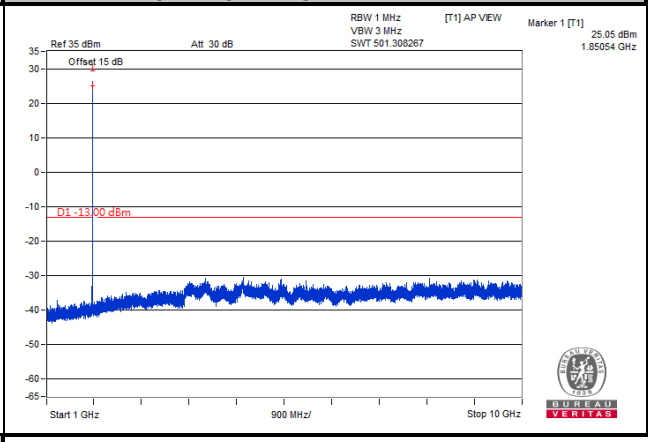
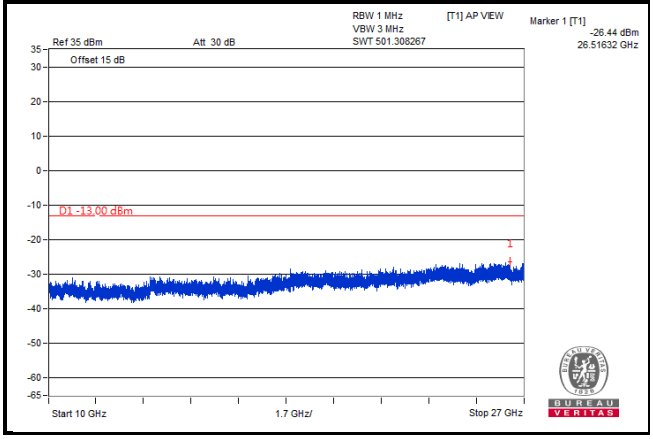
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 5 MHz | |
| Channel 18900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

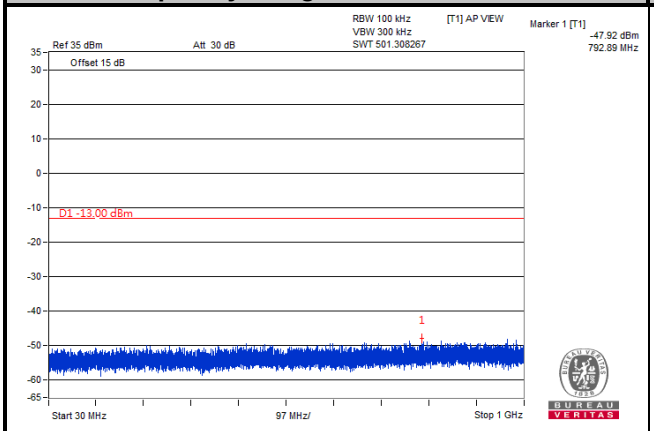
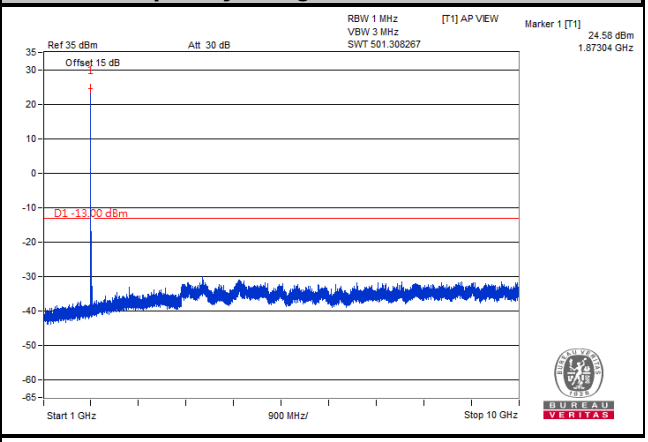
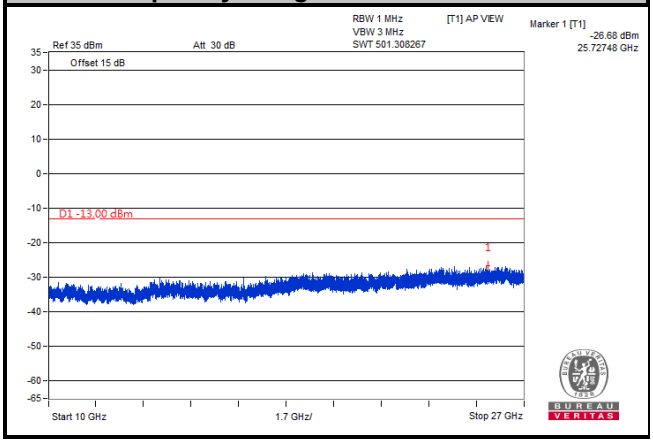
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 5 MHz | |
| Channel 19175 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

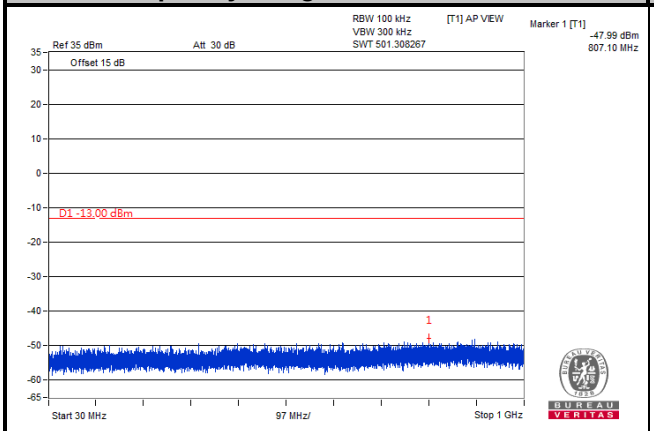
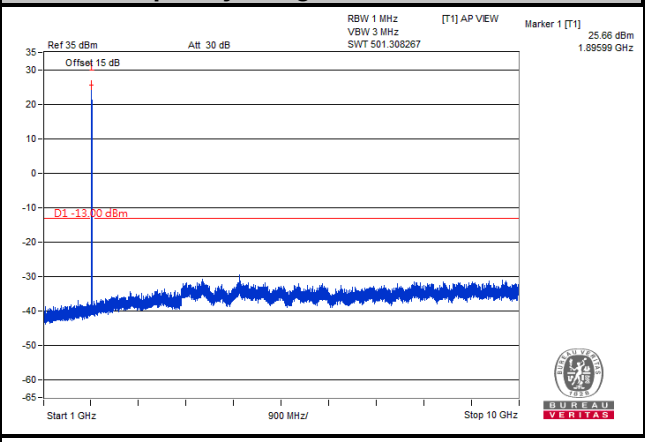
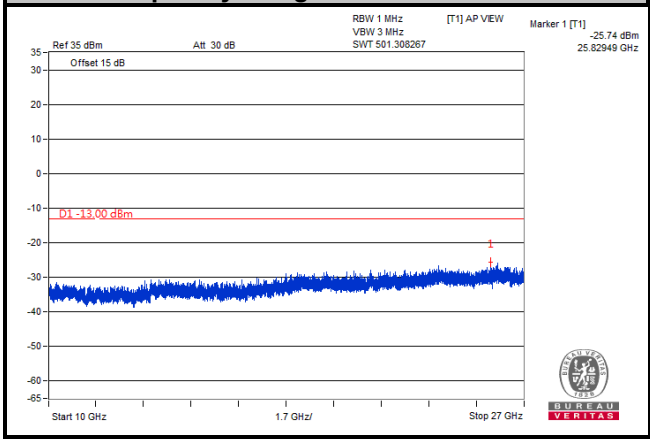
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 10 MHz | |
| Channel 18650 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

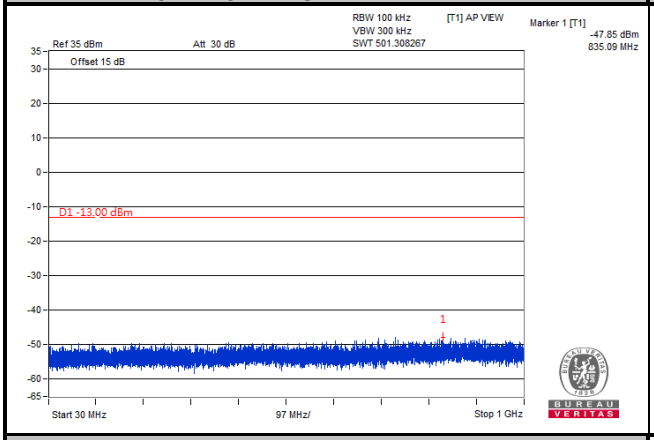
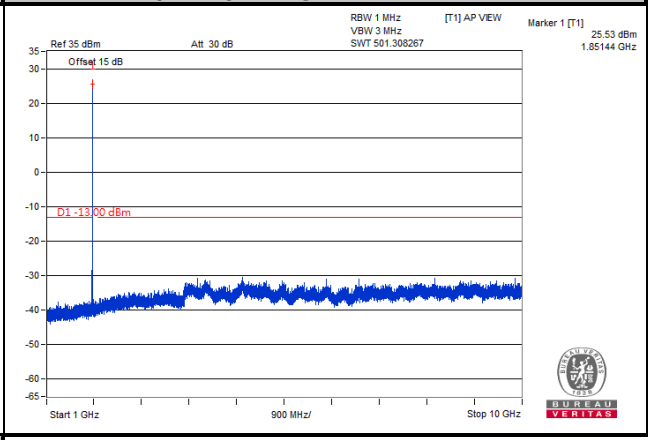
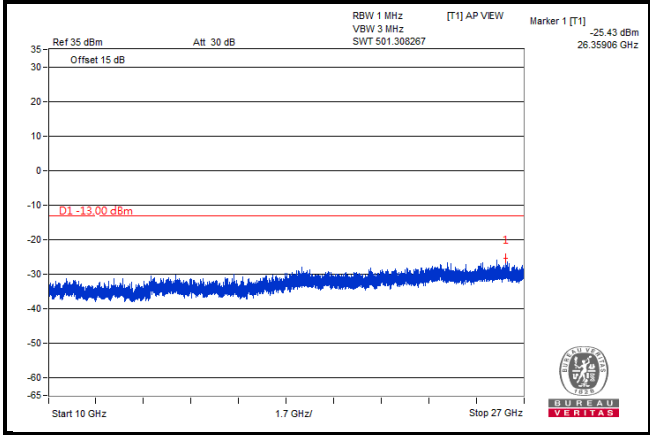
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 10 MHz | |
| Channel 18900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

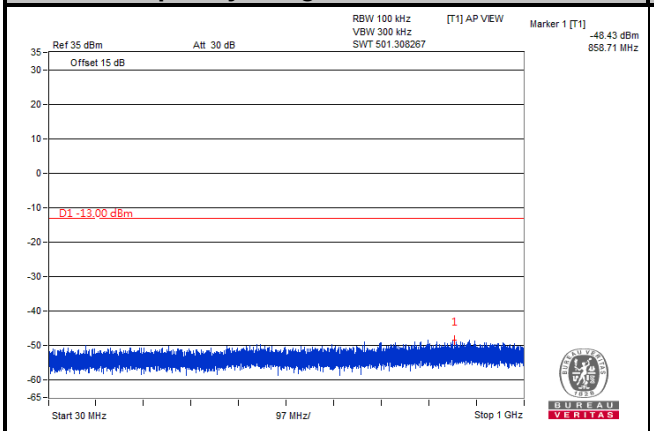
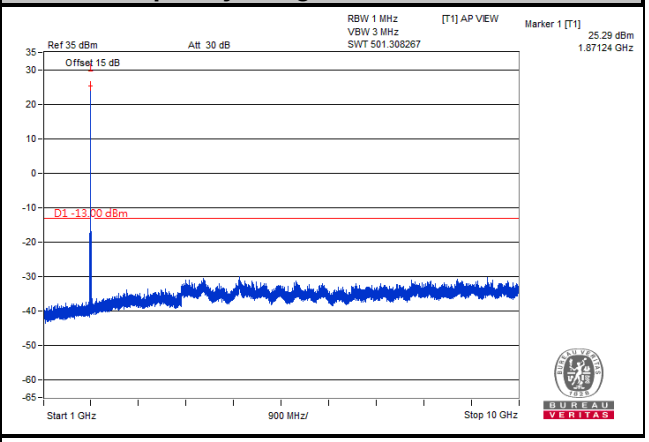
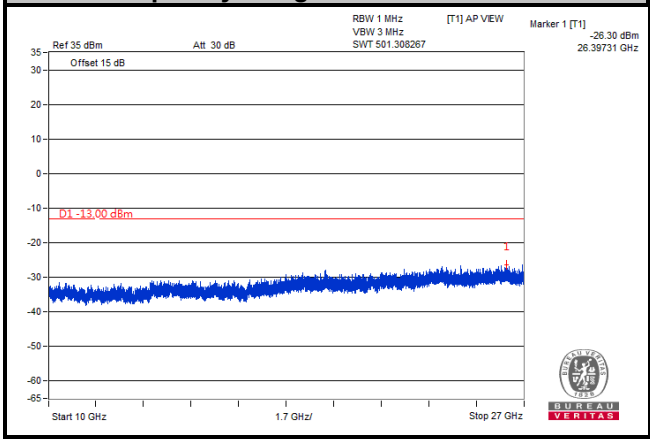
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 10 MHz | |
| Channel 19150 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

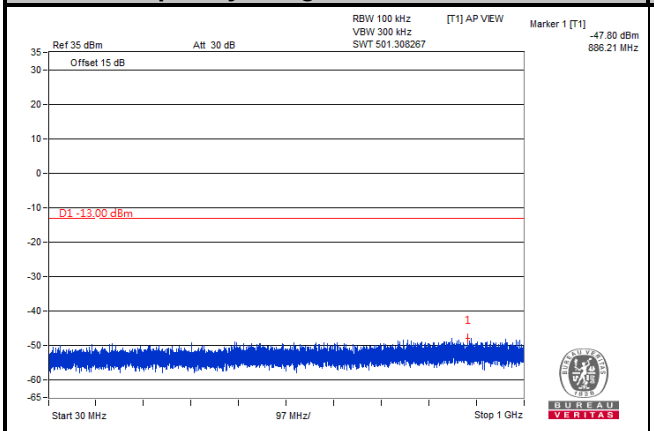
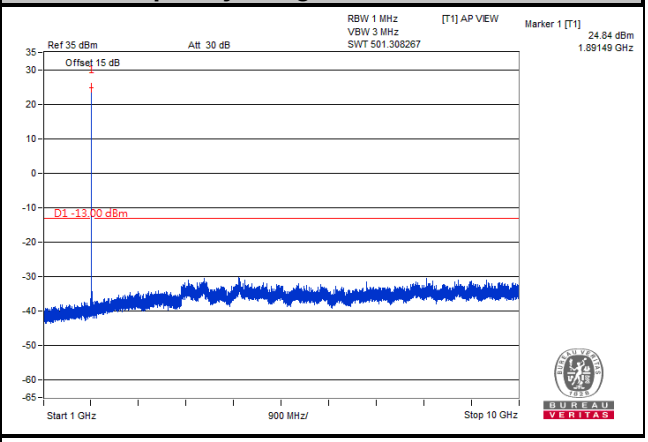
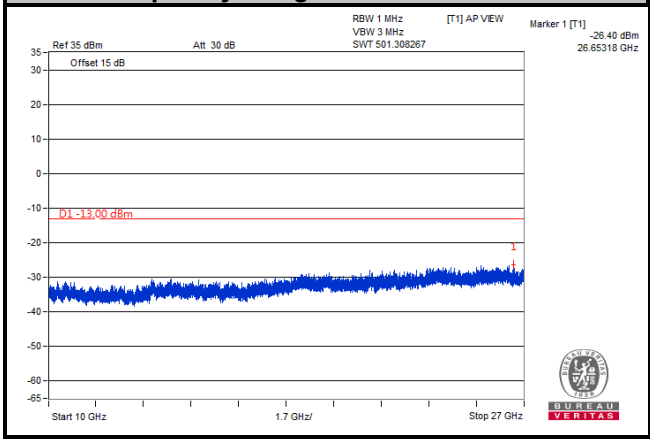
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 15 MHz | |
| Channel 18675 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 15 MHz | |
| Channel 18900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

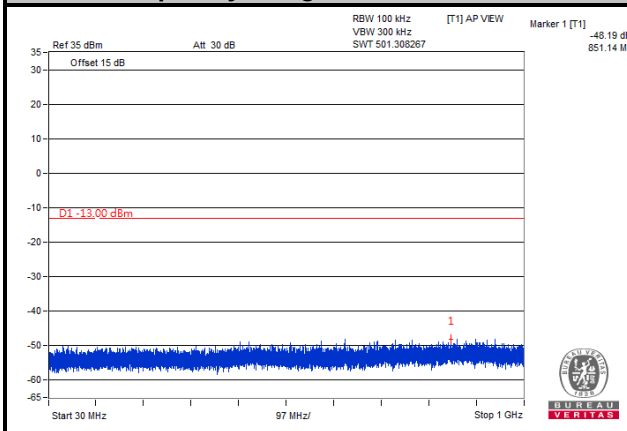
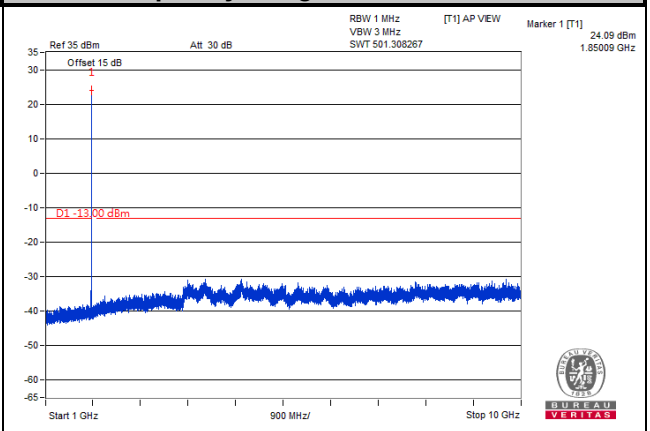
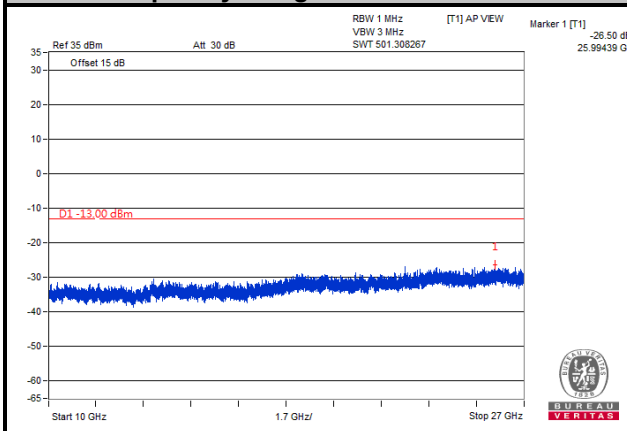
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 15 MHz | |
| Channel 19125 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

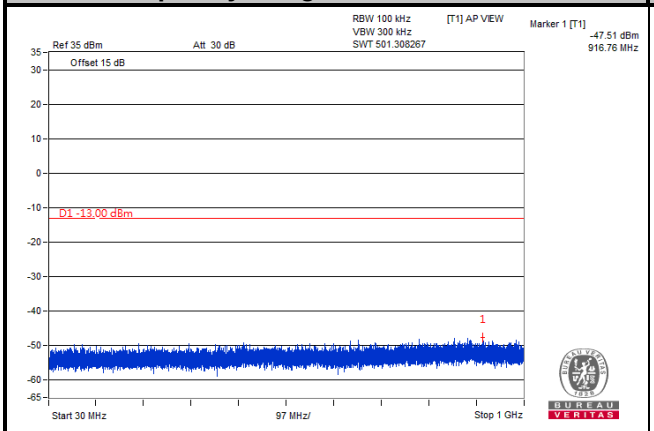
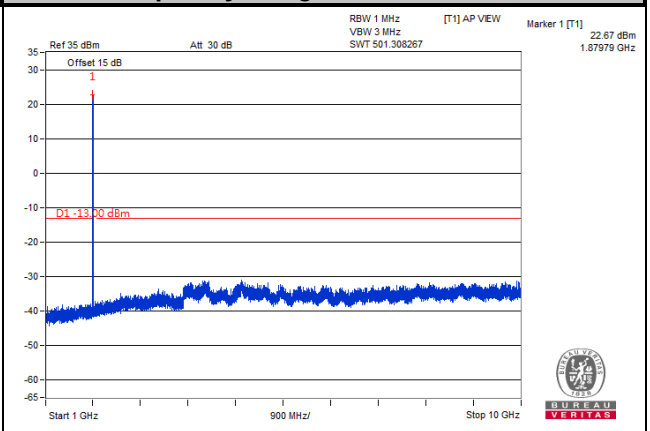
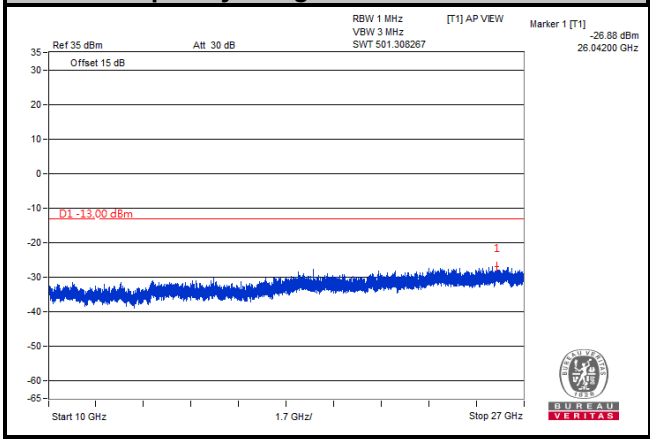
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 20 MHz | |
| Channel 18700 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

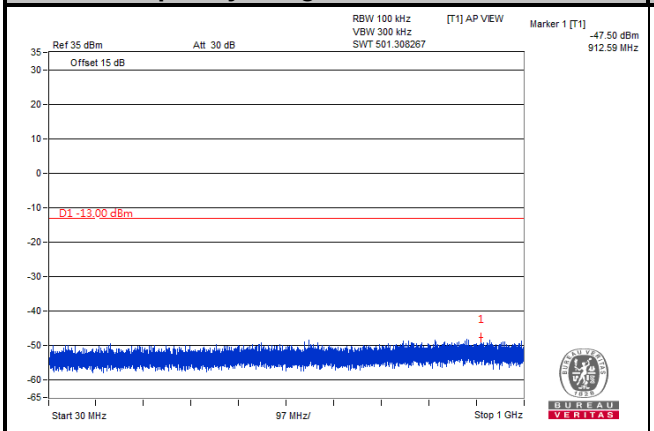
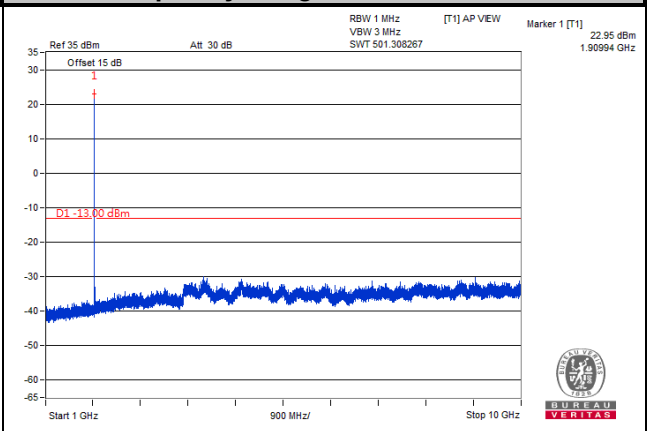
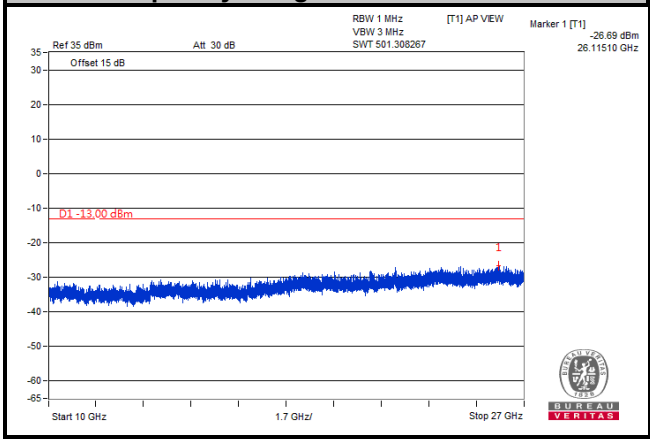
| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 20 MHz | |
| Channel 18900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

| LTE Band 2 | |
|---|---|
| Channel Bandwidth: 20 MHz | |
| Channel 19100 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

## NB-IOT

| LTE Band 2 | |
|---|---|
| QPSK | |
| Channel 601 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

| LTE Band 2 | |
|---|---|
| QPSK | |
| Channel 900 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

| LTE Band 2 | |
|---|---|
| QPSK | |
| Channel 1199 | |
| Frequency Range: 30 MHz ~ 1 GHz | Frequency Range: 1 GHz ~ 10 GHz |
|  |  |
| Frequency Range: 10 GHz ~ 27 GHz | |
|  | |

## 4.8 Radiated Emission Measurement

### 4.8.1 Limits of Radiated Emission Measurement

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. The emission limit is equal to -13 dBm.

### 4.8.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

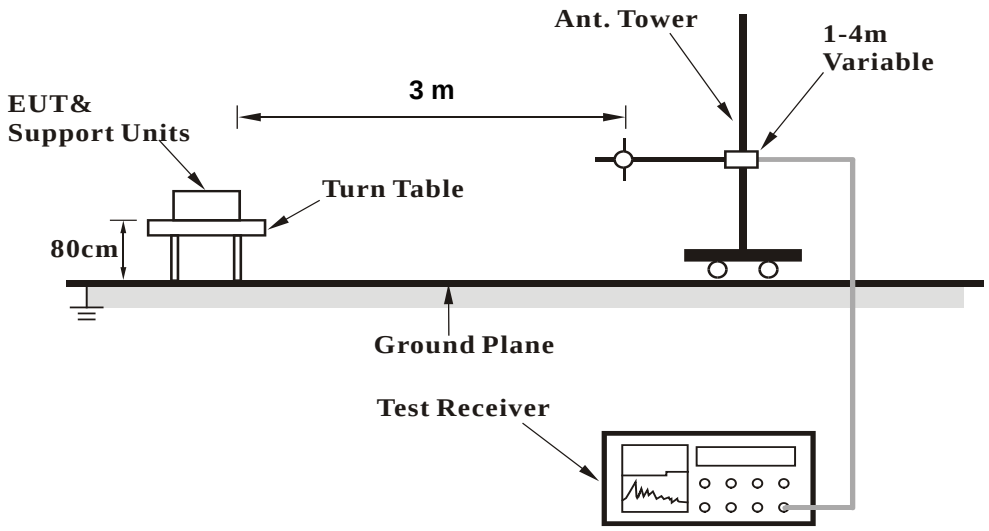
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

### 4.8.3 Deviation from Test Standard

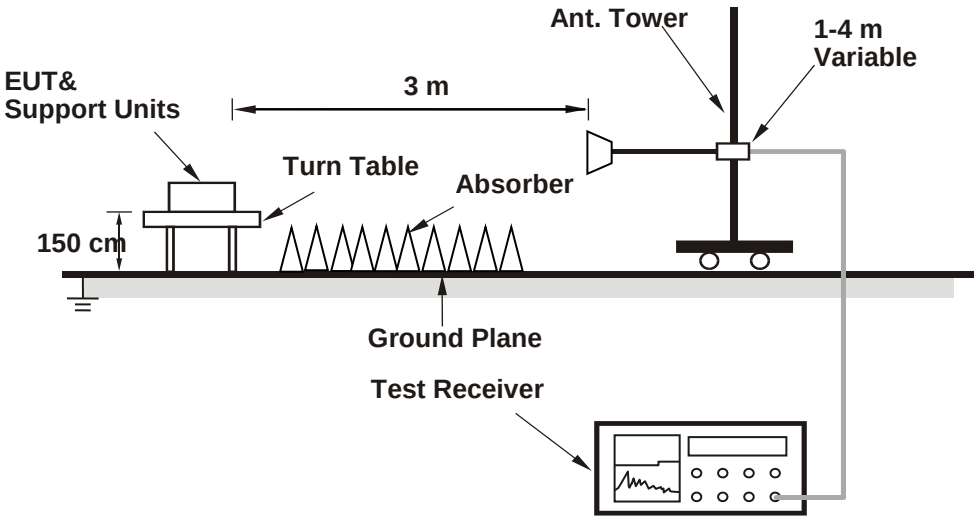
No deviation.

4.8.4 Test Setup

**<Radiated Emission below or equal 1 GHz>**




**<Radiated Emission above 1 GHz>**




For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.8.5 Test Results

**Cat-M1**

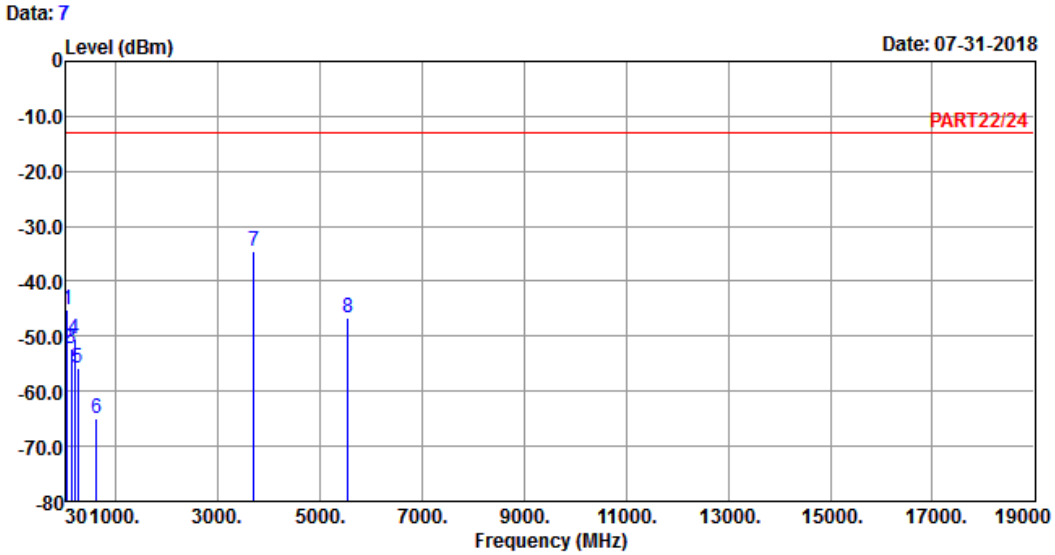
**LTE Band 2**

**Channel Bandwidth: 1.4 MHz / QPSK**

**Low Channel**

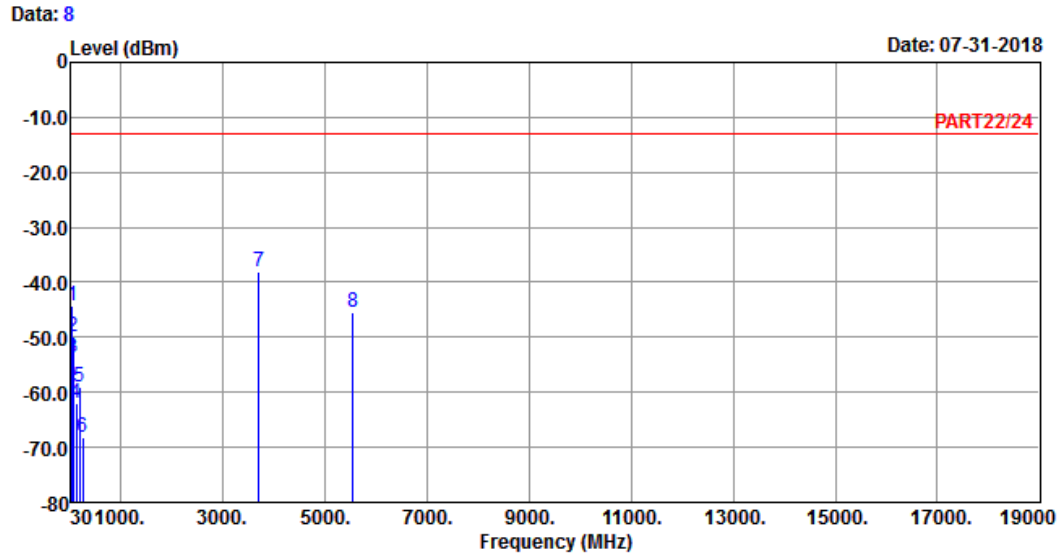
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 44.31 | -45.31 | -43.32 | -13.00 | -32.31 | -1.99 | Peak |
| 2 | 53.49 | -52.27 | -46.46 | -13.00 | -39.27 | -5.81 | Peak |
| 3 | 136.65 | -52.34 | -43.68 | -13.00 | -39.34 | -8.66 | Peak |
| 4 | 190.38 | -50.43 | -43.34 | -13.00 | -37.43 | -7.09 | Peak |
| 5 | 251.94 | -55.88 | -49.85 | -13.00 | -42.88 | -6.03 | Peak |
| 6 | 619.90 | -64.95 | -64.15 | -13.00 | -51.95 | -0.80 | Peak |
| 7 pp | 3701.40 | -34.39 | -27.46 | -13.00 | -21.39 | -6.93 | Peak |
| 8 | 5552.10 | -46.72 | -44.82 | -13.00 | -33.72 | -1.90 | Peak |

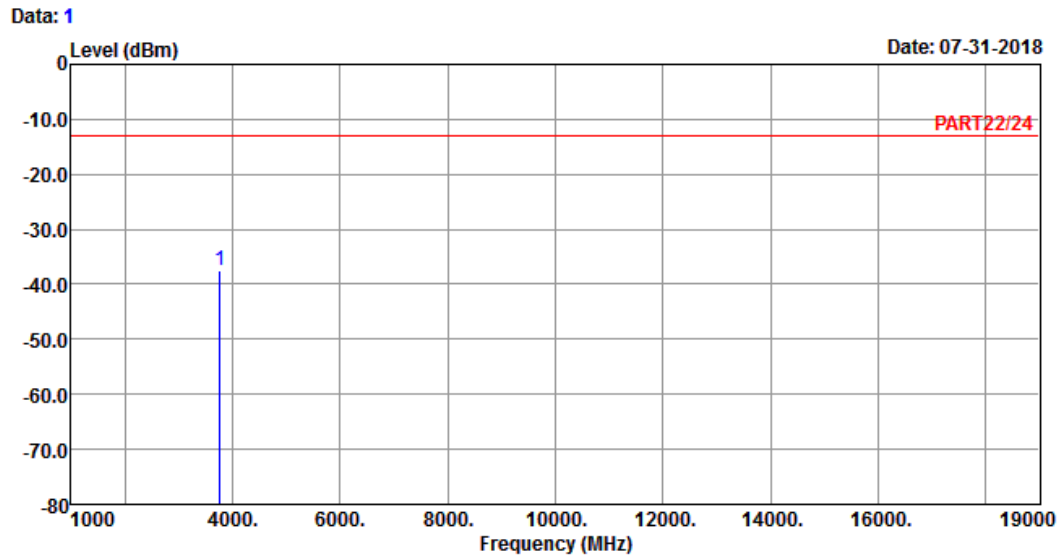



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 44.31 | -44.36 | -42.37 | -13.00 | -31.36 | -1.99 | Peak |
| 2 | 60.78 | -49.94 | -42.20 | -13.00 | -36.94 | -7.74 | Peak |
| 3 | 68.61 | -53.73 | -45.41 | -13.00 | -40.73 | -8.32 | Peak |
| 4 | 123.69 | -61.85 | -52.46 | -13.00 | -48.85 | -9.39 | Peak |
| 5 | 188.76 | -59.02 | -51.90 | -13.00 | -46.02 | -7.12 | Peak |
| 6 | 253.29 | -68.16 | -62.11 | -13.00 | -55.16 | -6.05 | Peak |
| 7 pp | 3701.40 | -38.03 | -31.10 | -13.00 | -25.03 | -6.93 | Peak |
| 8 | 5552.10 | -45.61 | -43.71 | -13.00 | -32.61 | -1.90 | Peak |

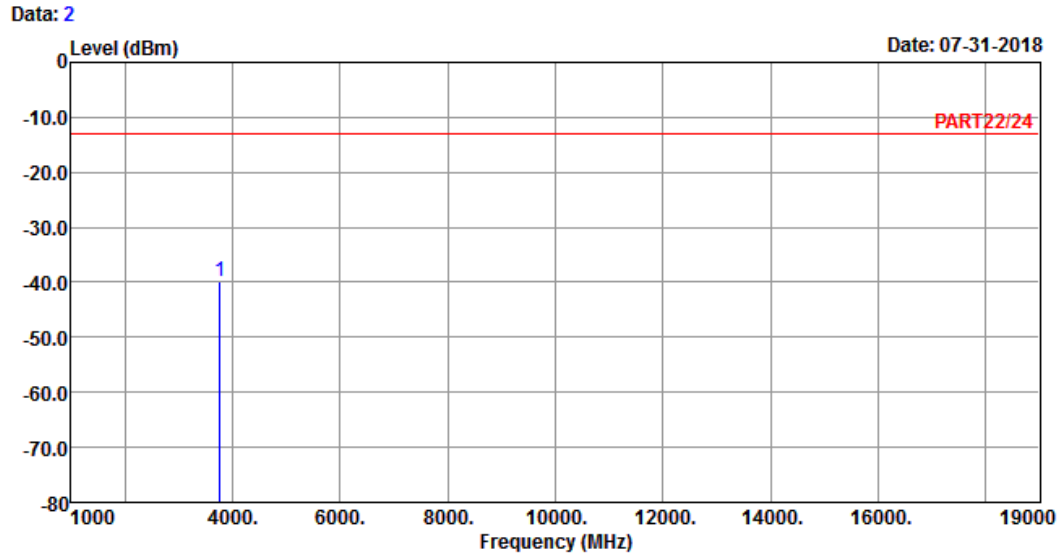
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -37.63 | -30.98 | -13.00 | -24.63 | -6.65 | Peak |

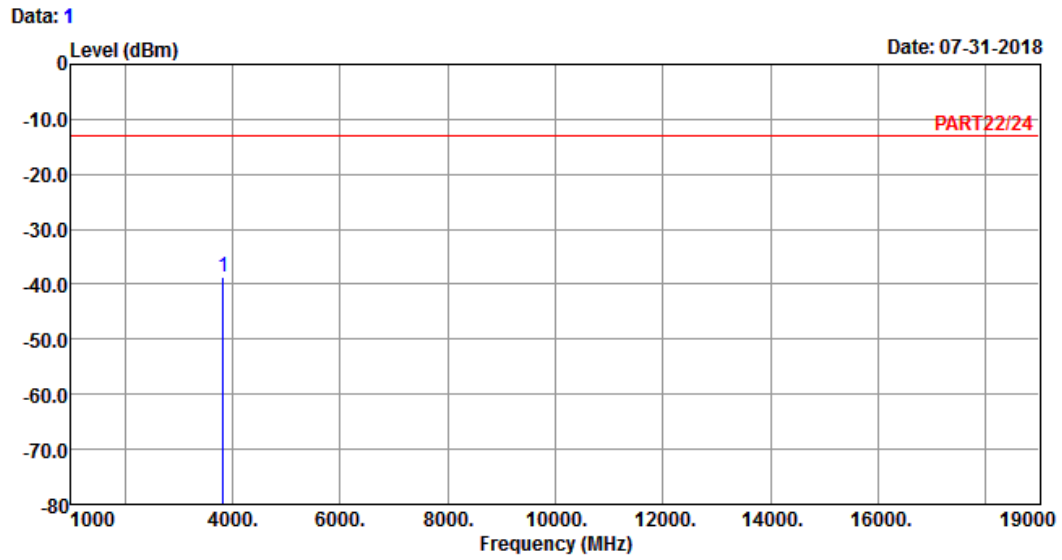



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -39.72 | -33.07 | -13.00 | -26.72 | -6.65 | Peak |

## High Channel

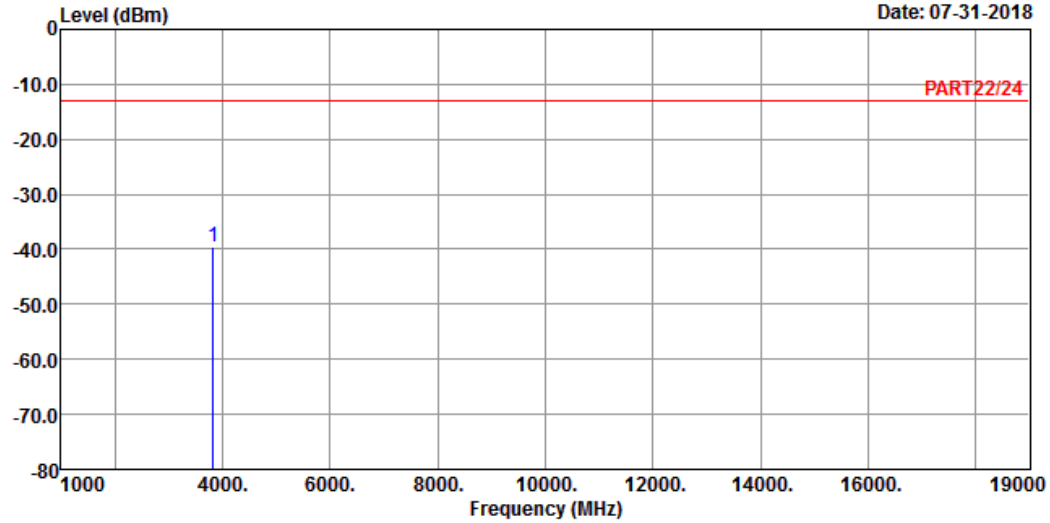
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3818.60 | -38.66 | -32.26 | -13.00 | -25.66 | -6.40 | Peak |

Data: 2

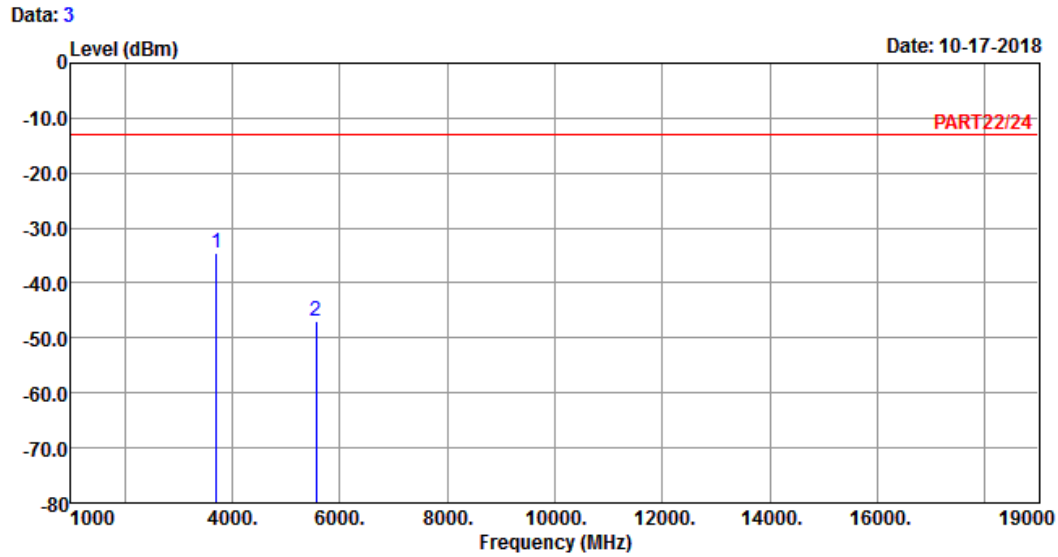



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3818.60 | -39.59 | -33.19 | -13.00 | -26.59 | -6.40 | Peak |

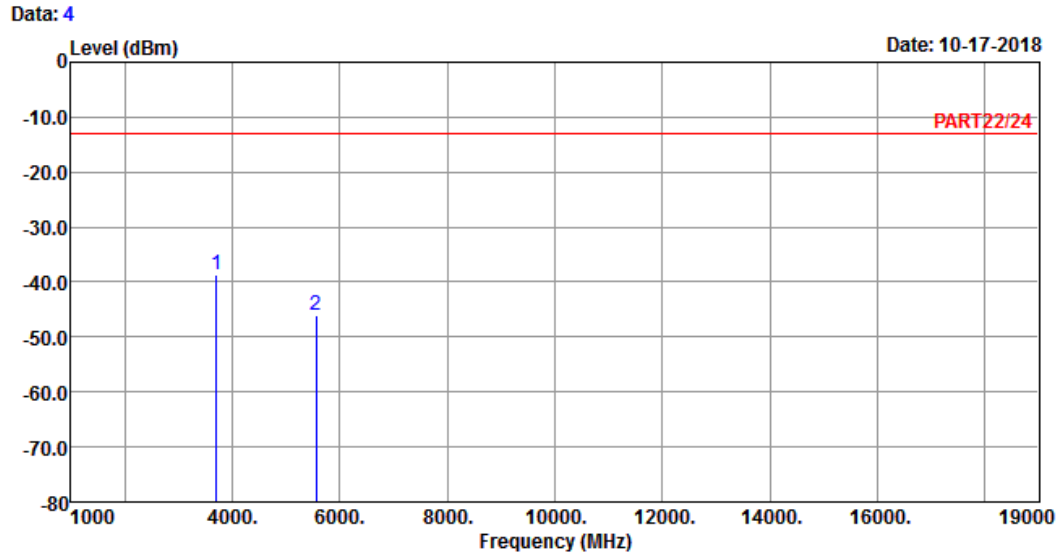
## Channel Bandwidth: 3 MHz / QPSK
## Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_3M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3703.00 | -34.62 | -27.69 | -13.00 | -21.62 | -6.93 | Peak |
| 2 | 5554.50 | -46.99 | -45.09 | -13.00 | -33.99 | -1.90 | Peak |

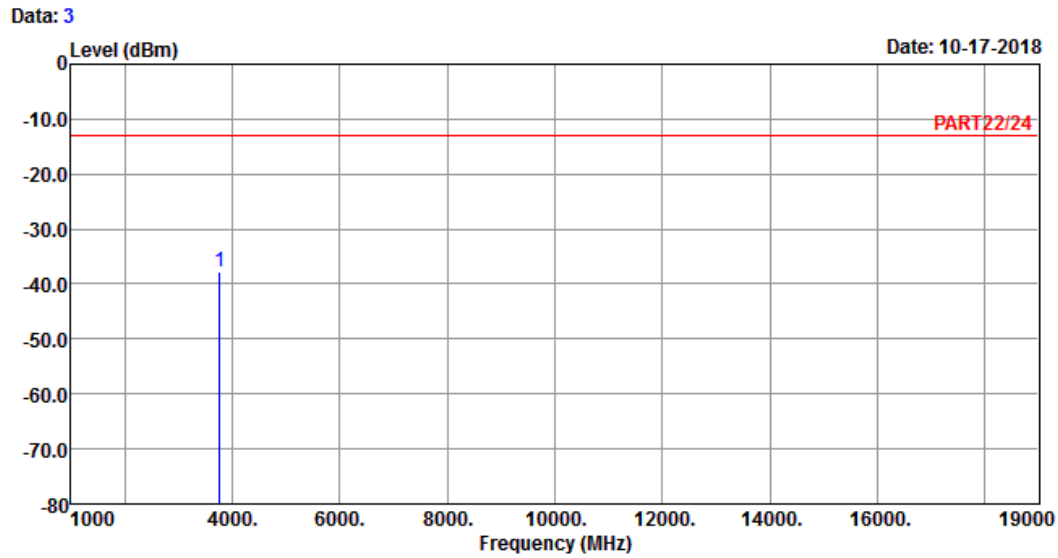



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_3M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3703.00 | -38.62 | -31.69 | -13.00 | -25.62 | -6.93 | Peak |
| 2 | 5554.50 | -45.98 | -44.08 | -13.00 | -32.98 | -1.90 | Peak |

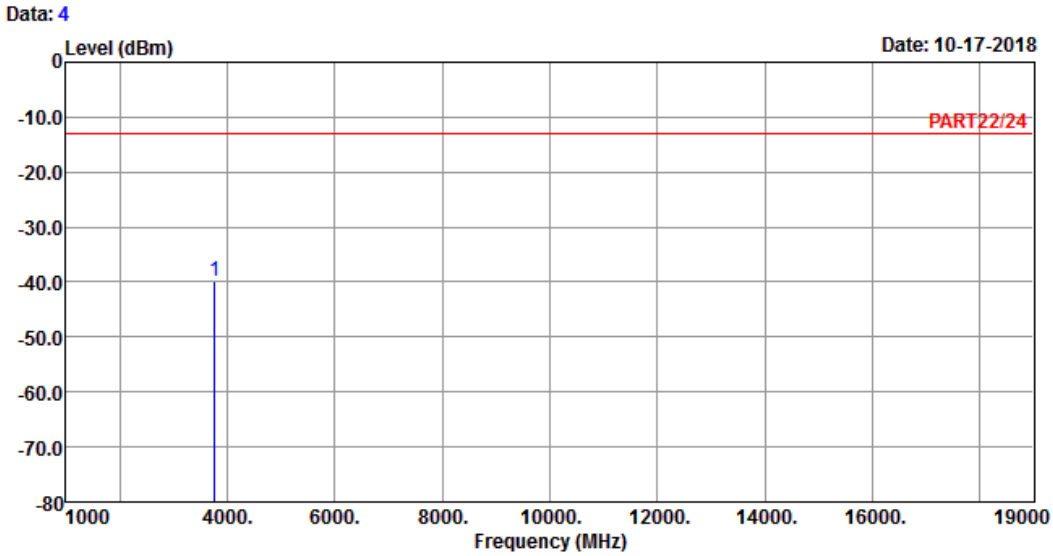
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_3M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -37.85 | -31.20 | -13.00 | -24.85 | -6.65 | Peak |

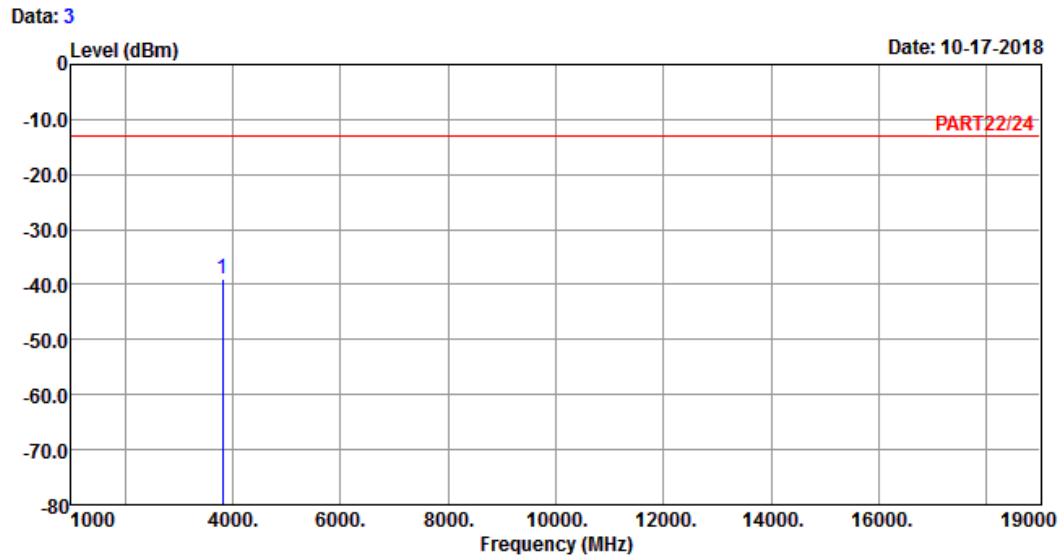



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_3M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -39.99 | -33.34 | -13.00 | -26.99 | -6.65 | Peak |

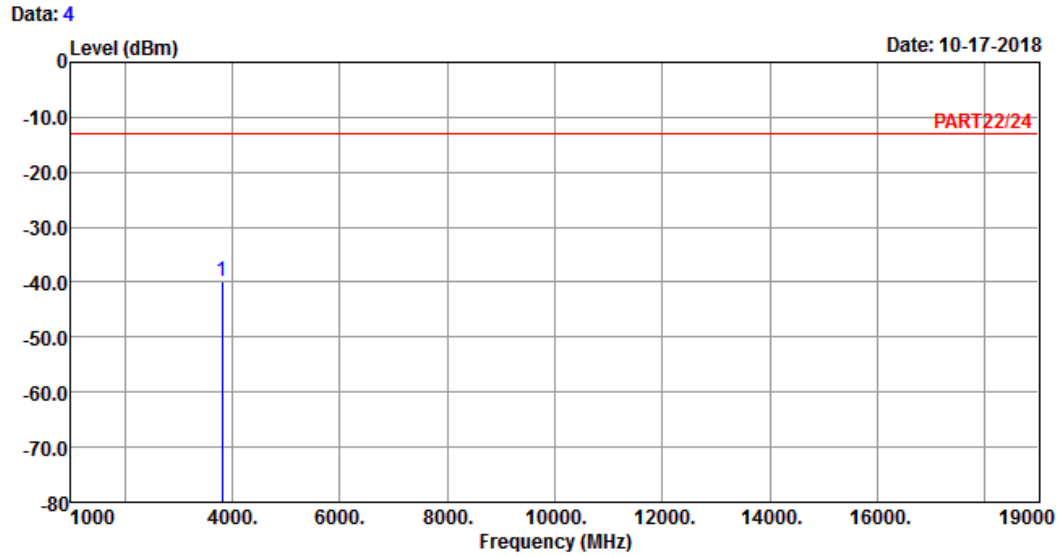
## High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_3M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3817.00 | -38.95 | -32.55 | -13.00 | -25.95 | -6.40 | Peak |

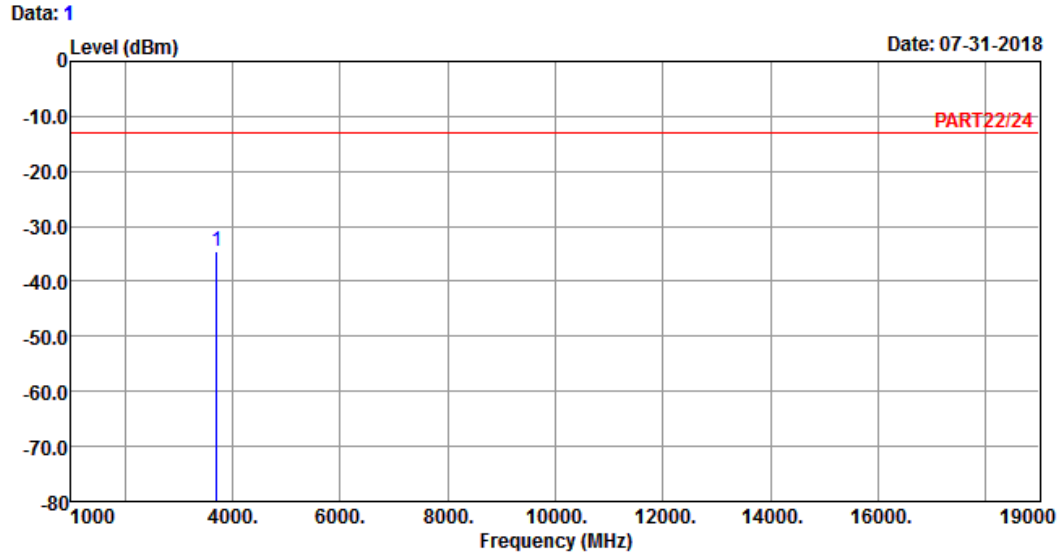



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_3M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3817.00 | -39.78 | -33.38 | -13.00 | -26.78 | -6.40 | Peak |

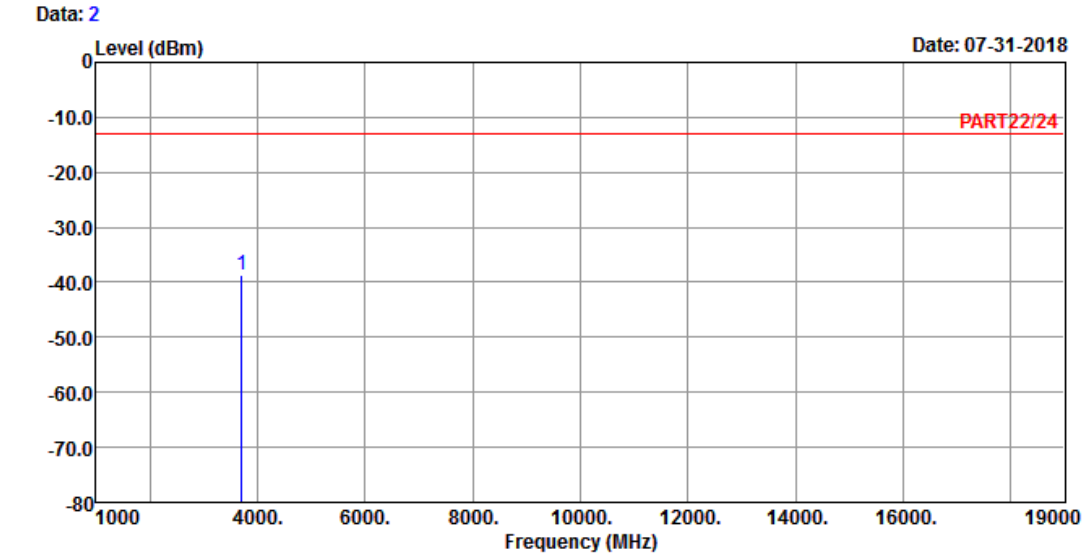
## Channel Bandwidth: 5 MHz / QPSK
## Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_5M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3705.00 | -34.50 | -27.57 | -13.00 | -21.50 | -6.93 | Peak |

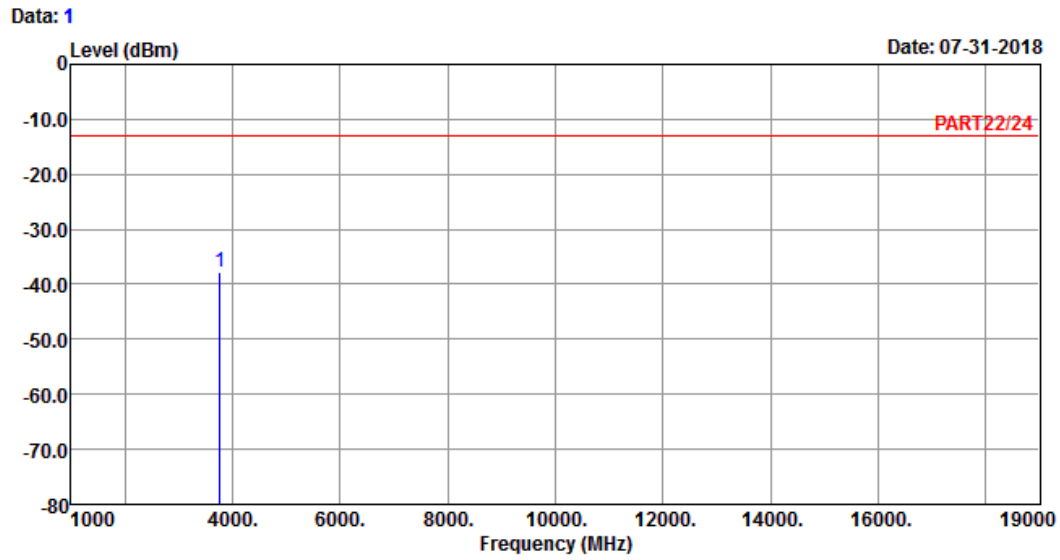



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_5M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3705.00 | -38.72 | -31.79 | -13.00 | -25.72 | -6.93 | Peak |

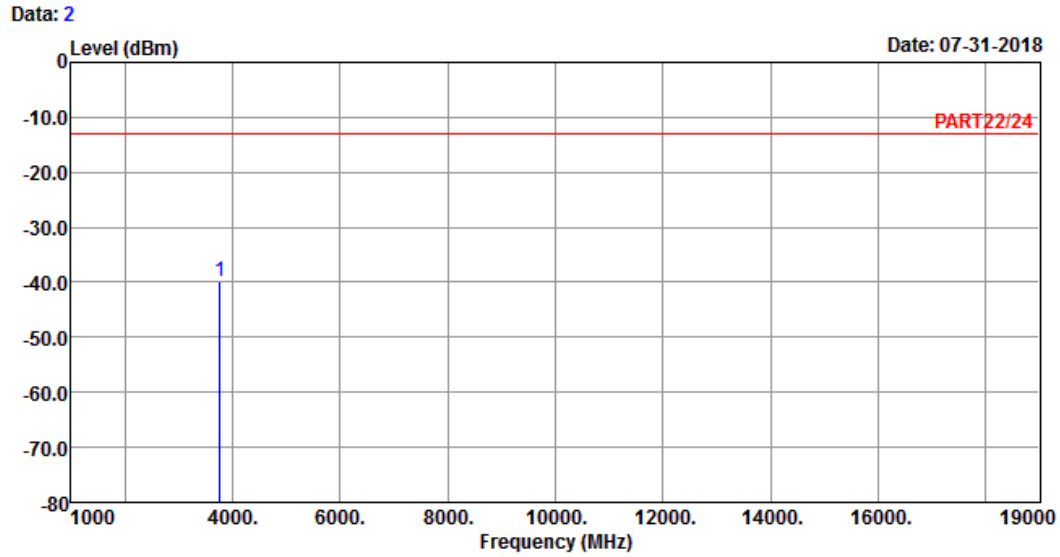
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_5M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -37.81 | -31.16 | -13.00 | -24.81 | -6.65 | Peak |

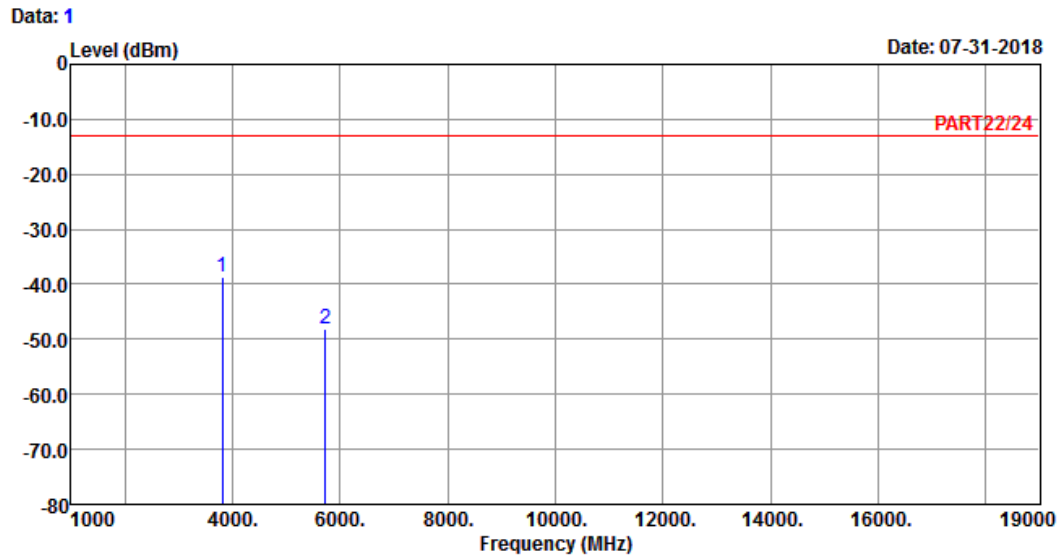



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_5M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -39.86 | -33.21 | -13.00 | -26.86 | -6.65 | Peak |

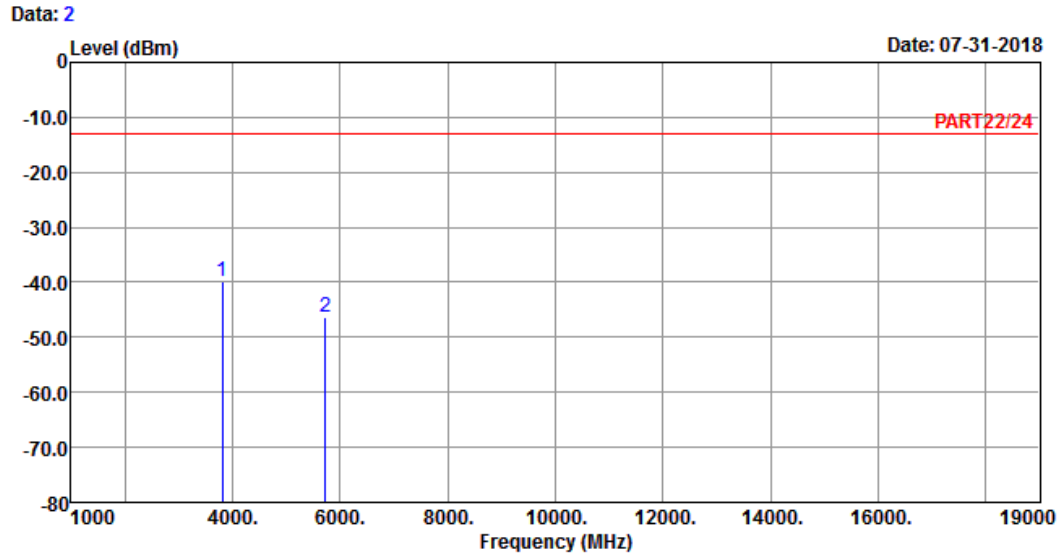
## High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_5M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3815.00 | -38.72 | -32.32 | -13.00 | -25.72 | -6.40 | Peak |
| 2 | 5722.50 | -48.11 | -46.42 | -13.00 | -35.11 | -1.69 | Peak |

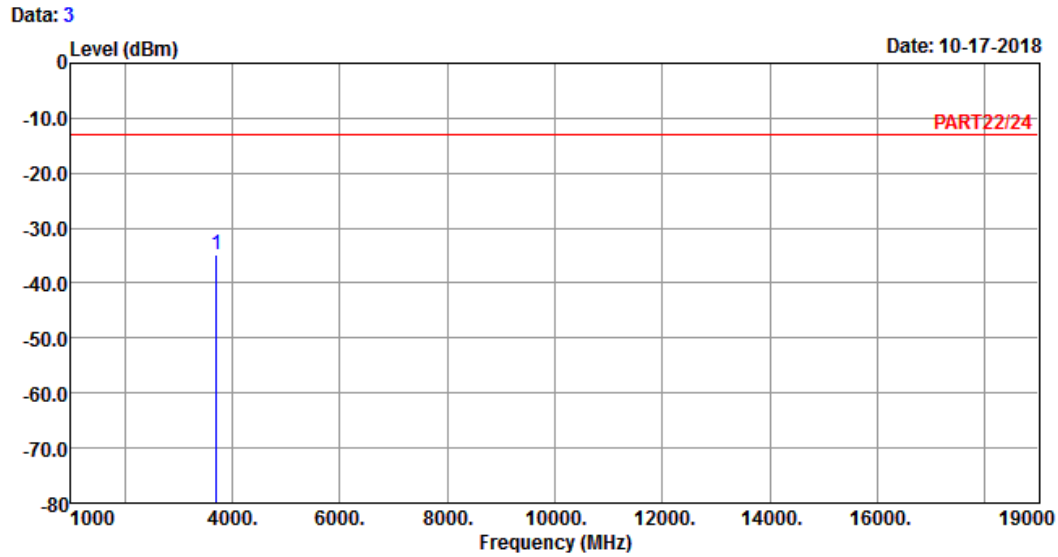



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_5M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3815.00 | -39.79 | -33.39 | -13.00 | -26.79 | -6.40 | Peak |
| 2 | 5722.50 | -46.26 | -44.57 | -13.00 | -33.26 | -1.69 | Peak |

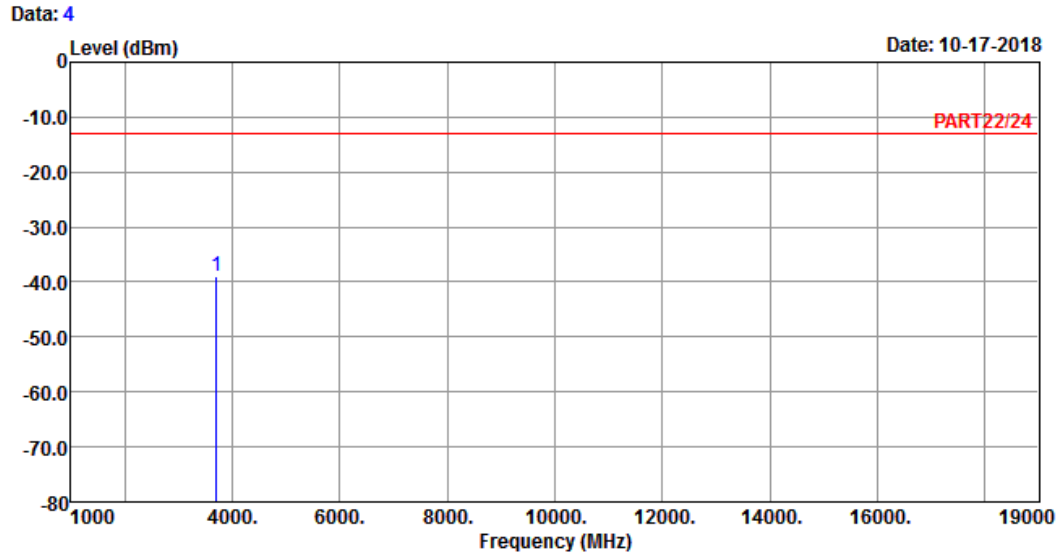
## Channel Bandwidth: 10 MHz / QPSK
## Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_10M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3710.00 | -34.85 | -27.98 | -13.00 | -21.85 | -6.87 | Peak |

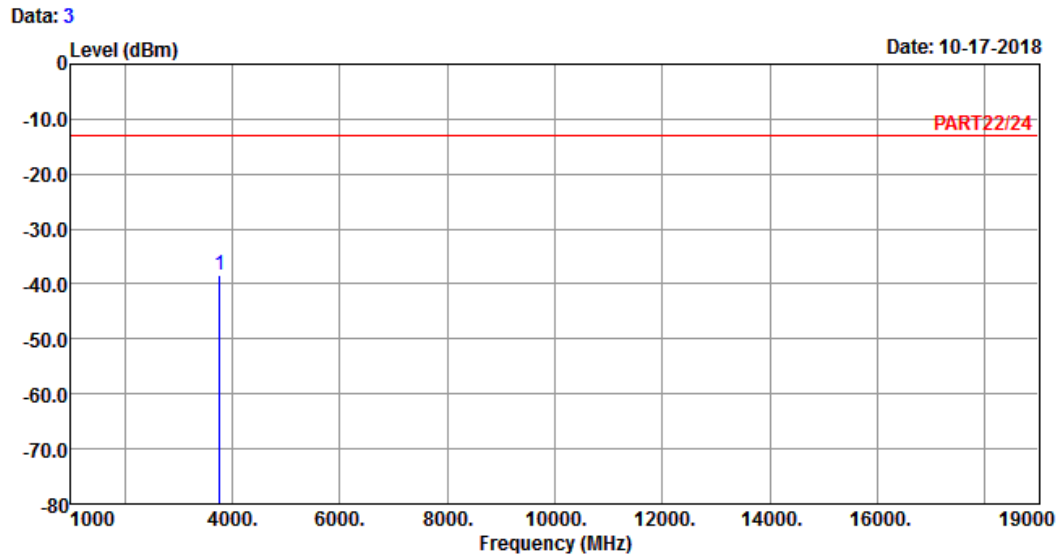



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_10M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3710.00 | -38.99 | -32.12 | -13.00 | -25.99 | -6.87 | Peak |

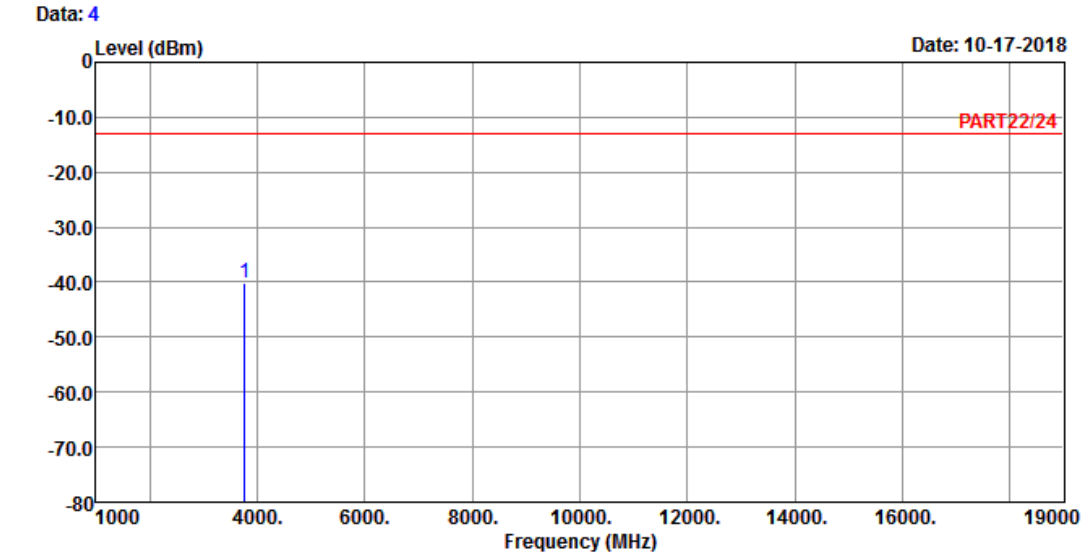
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_10M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -38.25 | -31.60 | -13.00 | -25.25 | -6.65 | Peak |

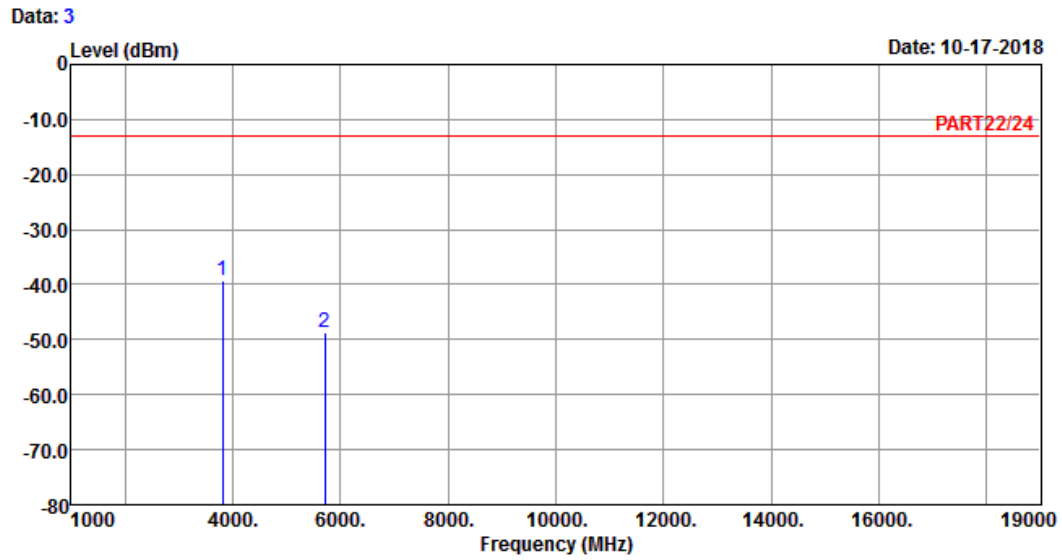



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_10M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -40.23 | -33.58 | -13.00 | -27.23 | -6.65 | Peak |

## High Channel

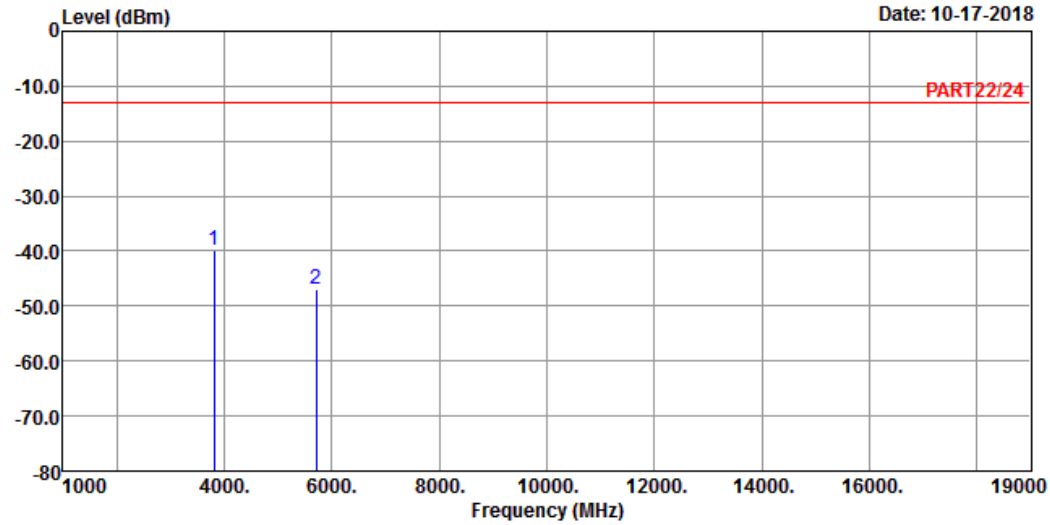
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_10M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3810.00 | -39.23 | -32.83 | -13.00 | -26.23 | -6.40 | Peak |
| 2 | 5715.00 | -48.62 | -46.93 | -13.00 | -35.62 | -1.69 | Peak |

Data: 4

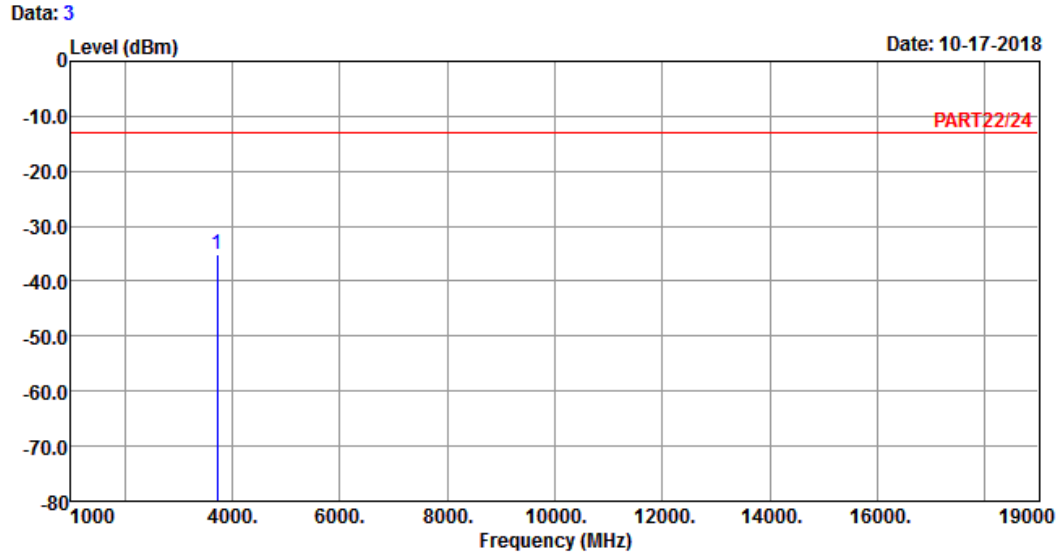



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_10M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3810.00 | -39.98 | -33.58 | -13.00 | -26.98 | -6.40 | Peak |
| 2 | 5715.00 | -46.85 | -45.16 | -13.00 | -33.85 | -1.69 | Peak |

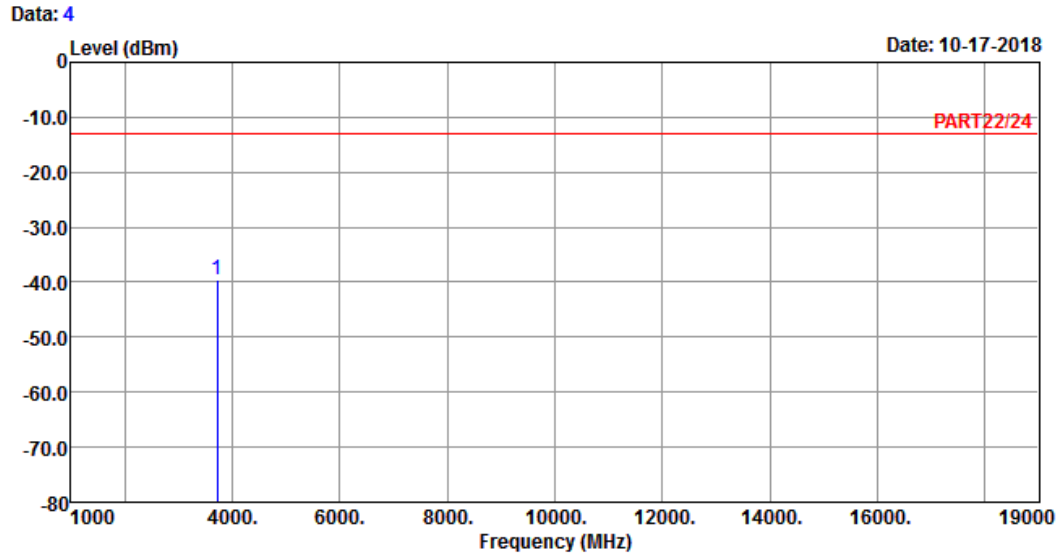
## Channel Bandwidth: 15 MHz / QPSK
## Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_15M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3715.00 | -35.25 | -28.38 | -13.00 | -22.25 | -6.87 | Peak |

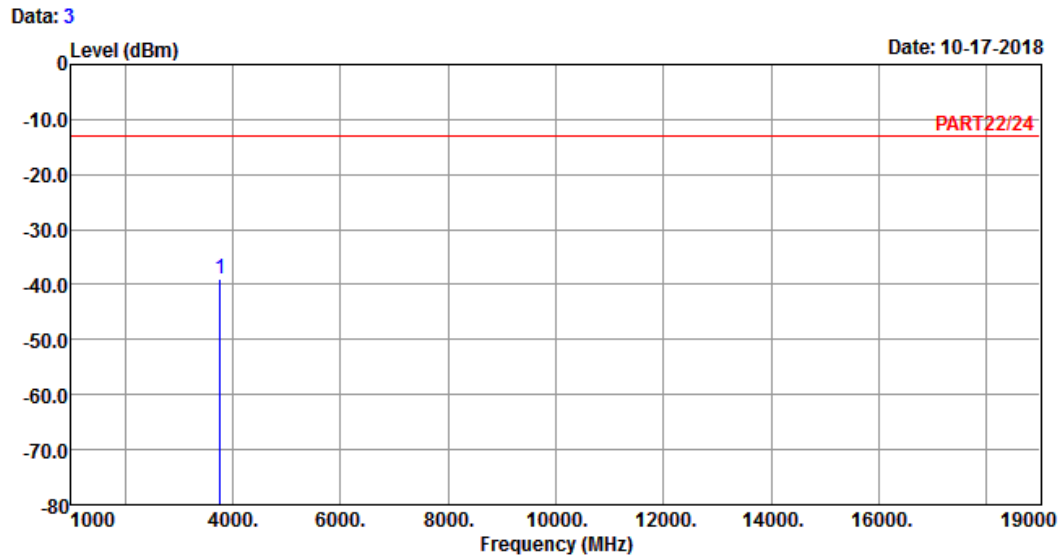



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_15M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3715.00 | -39.53 | -32.66 | -13.00 | -26.53 | -6.87 | Peak |

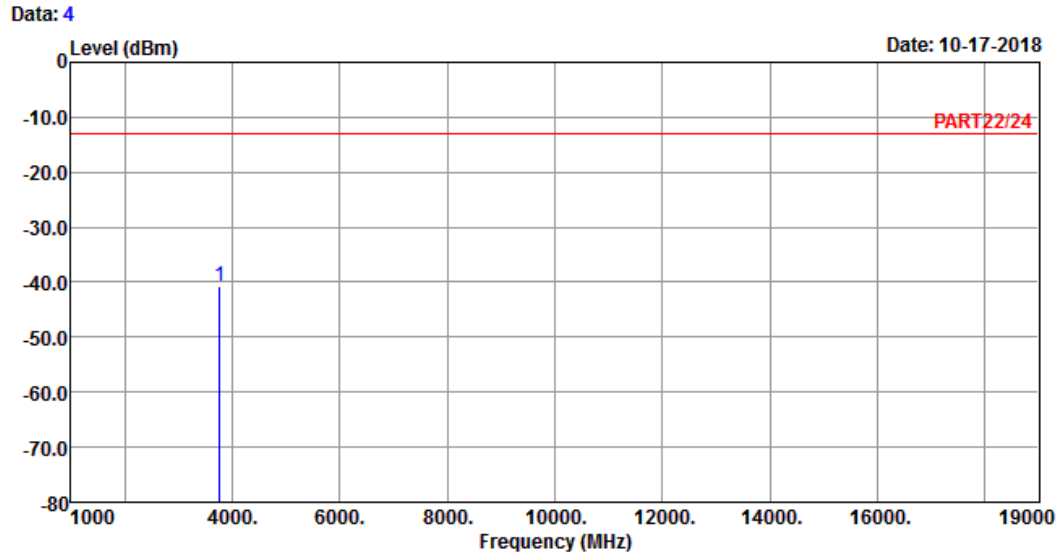
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_15M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -38.96 | -32.31 | -13.00 | -25.96 | -6.65 | Peak |

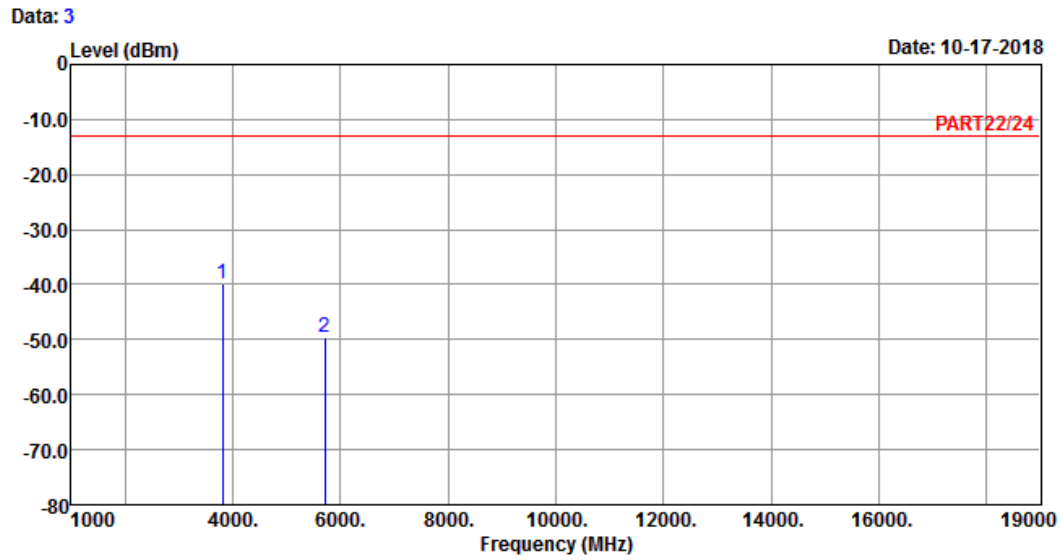



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_15M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -40.85 | -34.20 | -13.00 | -27.85 | -6.65 | Peak |

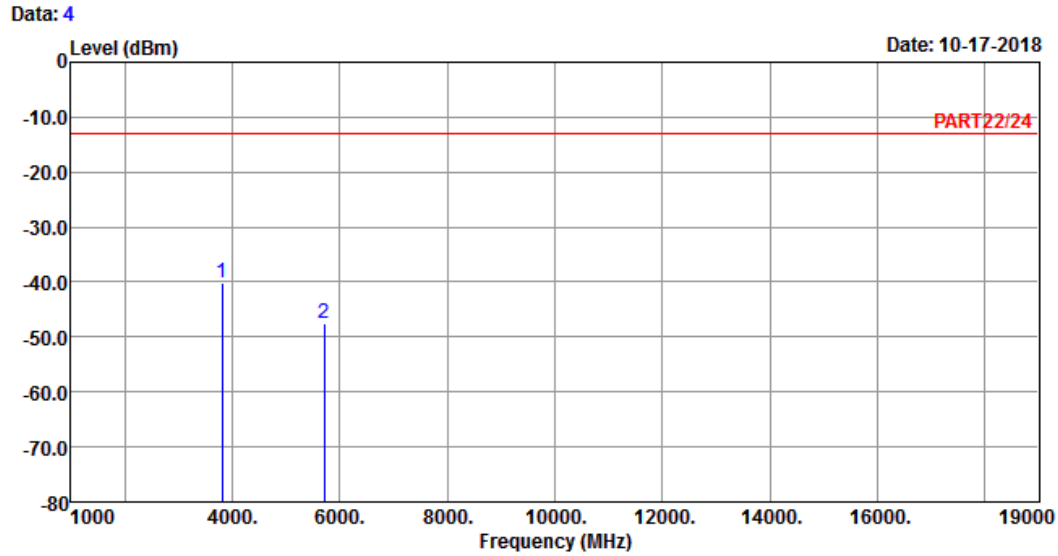
## High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_15M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3805.00 | -39.75 | -33.32 | -13.00 | -26.75 | -6.43 | Peak |
| 2 | 5707.50 | -49.45 | -47.72 | -13.00 | -36.45 | -1.73 | Peak |

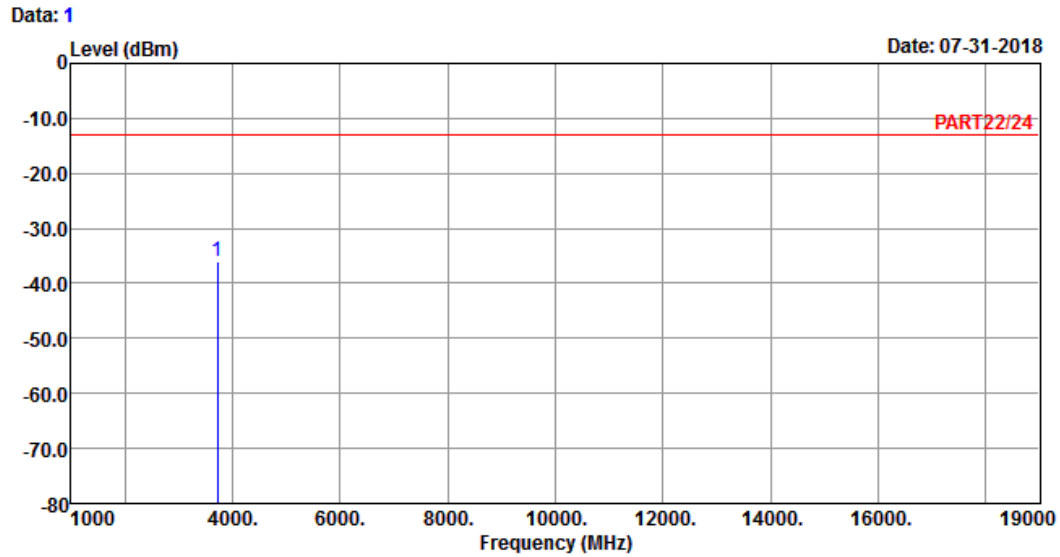



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_15M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3805.00 | -40.25 | -33.82 | -13.00 | -27.25 | -6.43 | Peak |
| 2 | 5707.50 | -47.52 | -45.79 | -13.00 | -34.52 | -1.73 | Peak |

## Channel Bandwidth: 20 MHz / QPSK
## Low Channel

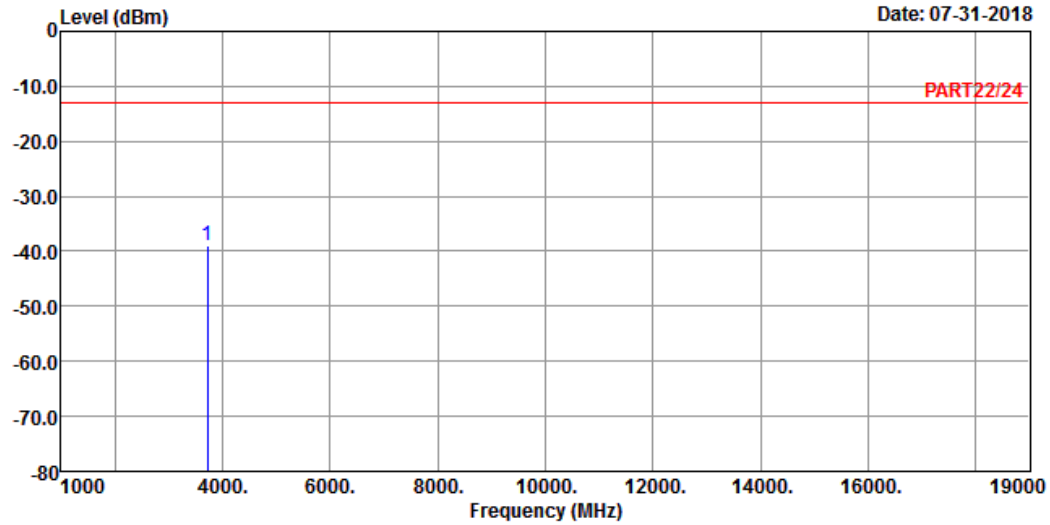
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_20M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3720.00 | -35.87 | -29.05 | -13.00 | -22.87 | -6.82 | Peak |

Data: 2

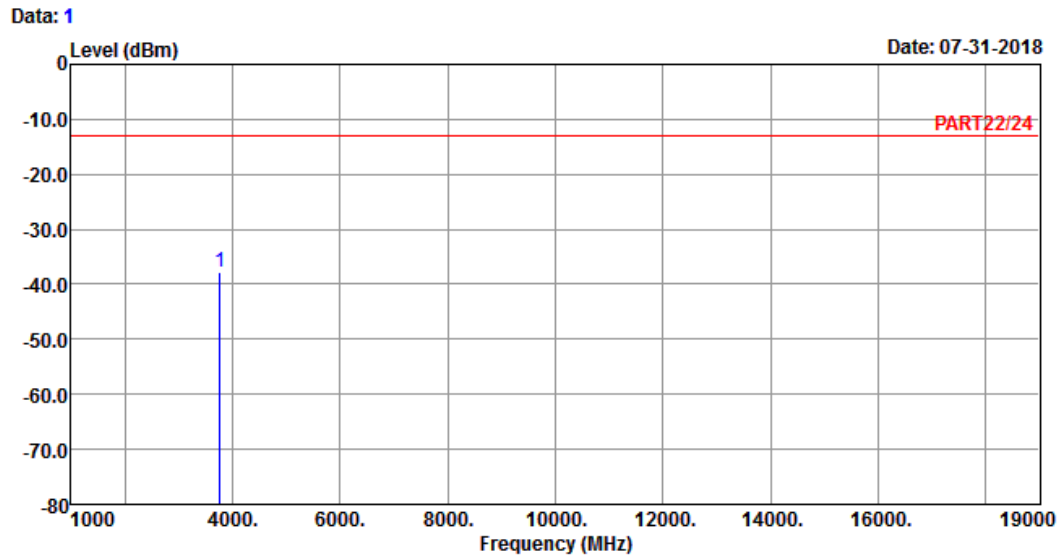



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_20M Link_L-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3720.00 | -38.92 | -32.10 | -13.00 | -25.92 | -6.82 | Peak |

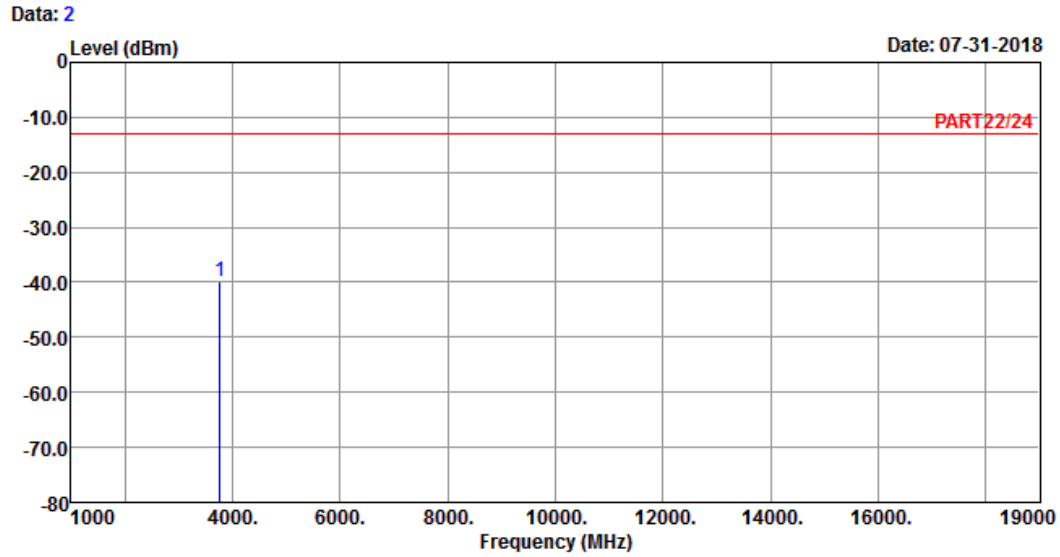
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_20M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -37.81 | -31.16 | -13.00 | -24.81 | -6.65 | Peak |

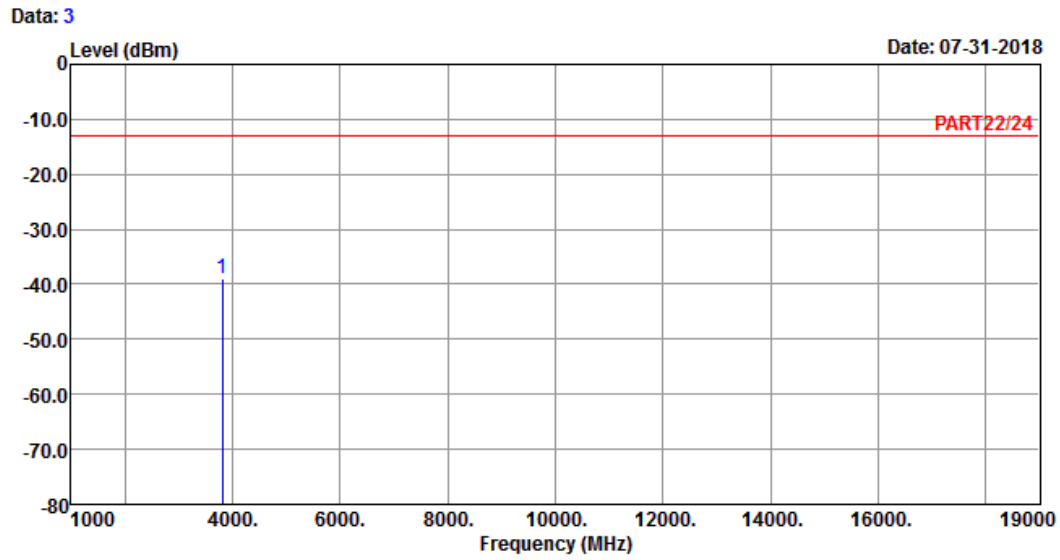



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_20M Link_M-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3760.00 | -39.85 | -33.20 | -13.00 | -26.85 | -6.65 | Peak |

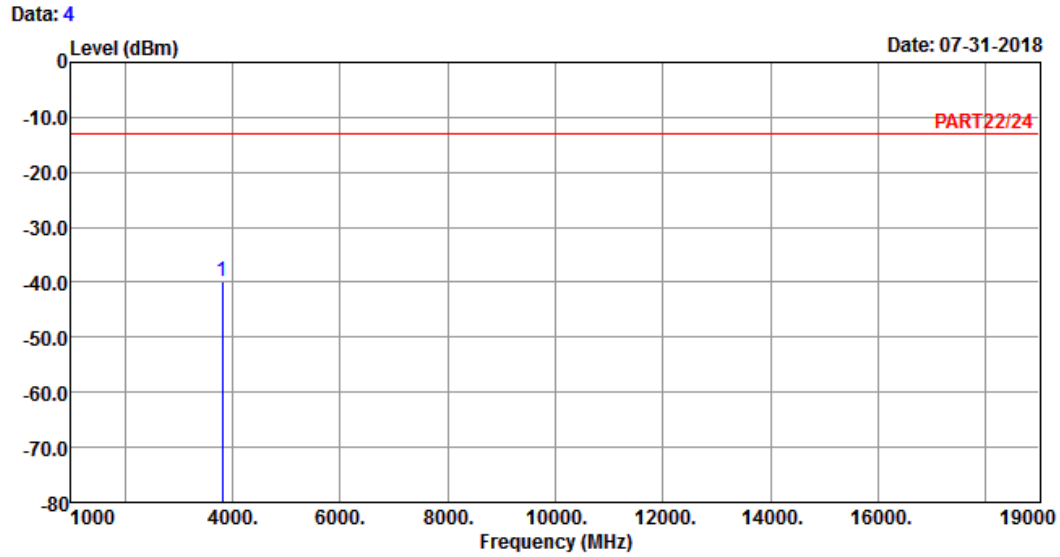
## High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 2 QPSK_20M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3815.00 | -38.96 | -32.56 | -13.00 | -25.96 | -6.40 | Peak |




Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 2 QPSK_20M Link_H-CH
Tested by: Thomas Wei

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3815.00 | -39.92 | -33.52 | -13.00 | -26.92 | -6.40 | Peak |

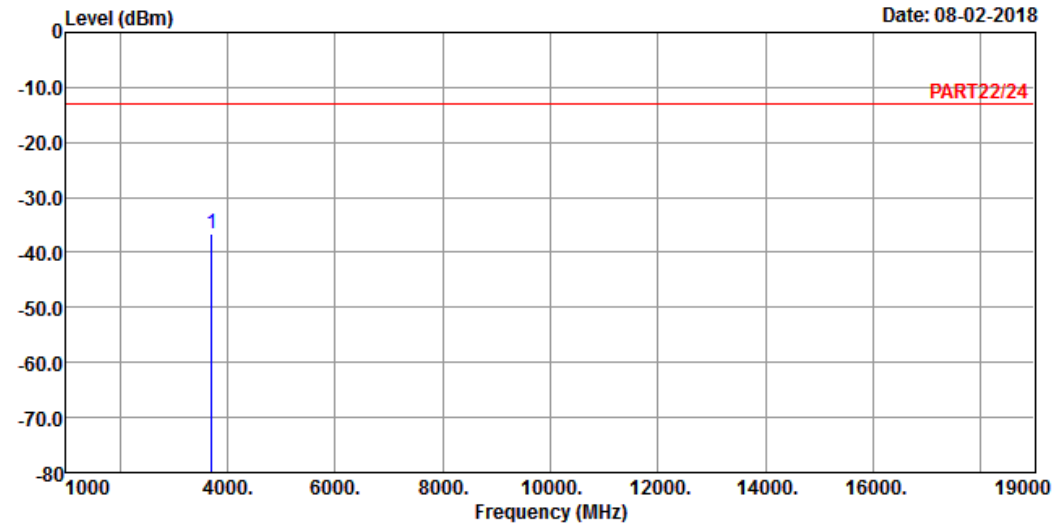
**NB-IOT**

**LTE Band 2**

**Low Channel**

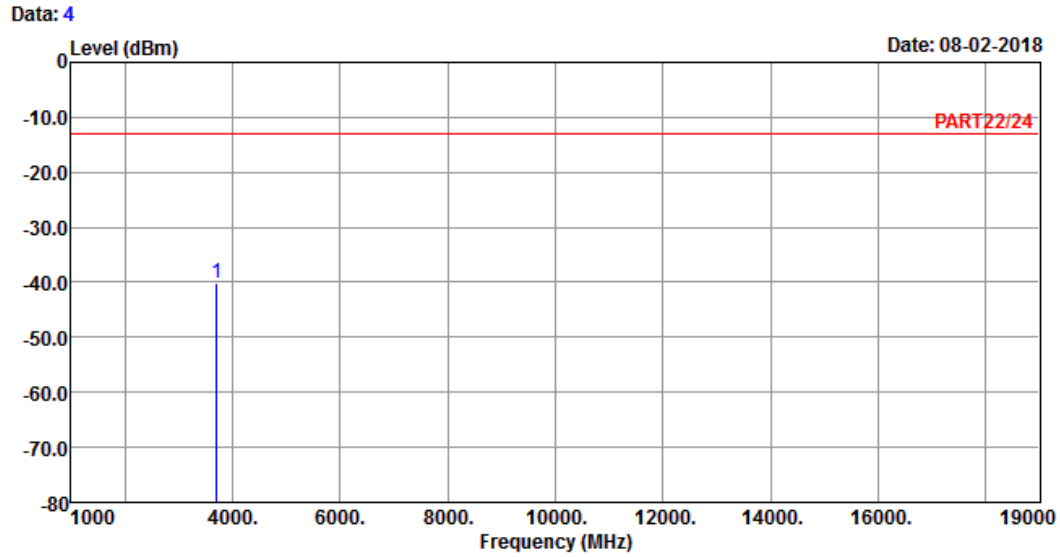
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

Data: 3




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : NB-IOT Band 2 Stand-alone_Link_L-Ch
Tested by: Jisyong Wang

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3700.20 | -36.52 | -29.59 | -13.00 | -23.52 | -6.93 | Peak |

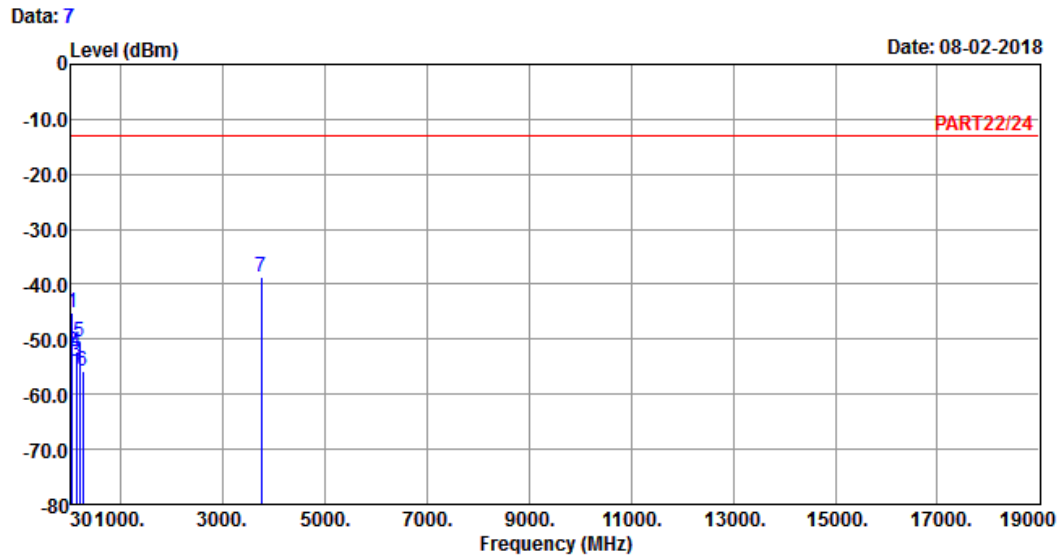



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : NB-IOT Band 2 Stand-alone_Link_L-Ch
Tested by: Jisyong Wang

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3700.20 | -40.12 | -33.19 | -13.00 | -27.12 | -6.93 | Peak |

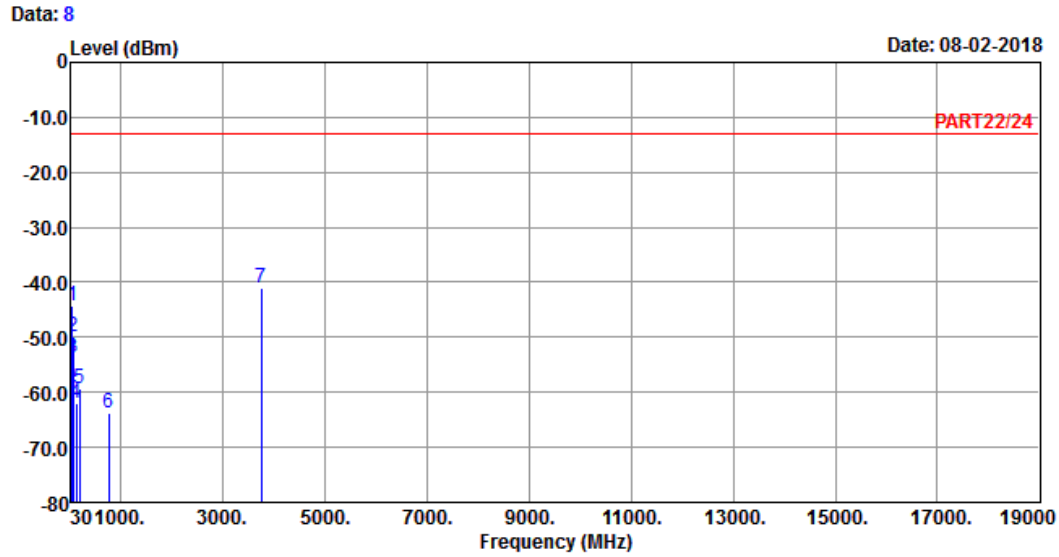
## Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : NB-IOT Band 2 Stand-alone_Link_M-Ch
Tested by: Jisyong Wang

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 44.31 | -45.31 | -43.32 | -13.00 | -32.31 | -1.99 | Peak |
| 2 | 52.41 | -52.27 | -46.73 | -13.00 | -39.27 | -5.54 | Peak |
| 3 | 122.34 | -54.08 | -44.46 | -13.00 | -41.08 | -9.62 | Peak |
| 4 | 136.65 | -52.34 | -43.68 | -13.00 | -39.34 | -8.66 | Peak |
| 5 | 190.38 | -50.43 | -43.34 | -13.00 | -37.43 | -7.09 | Peak |
| 6 | 251.94 | -55.88 | -49.85 | -13.00 | -42.88 | -6.03 | Peak |
| 7 pp | 3760.00 | -38.69 | -32.04 | -13.00 | -25.69 | -6.65 | Peak |

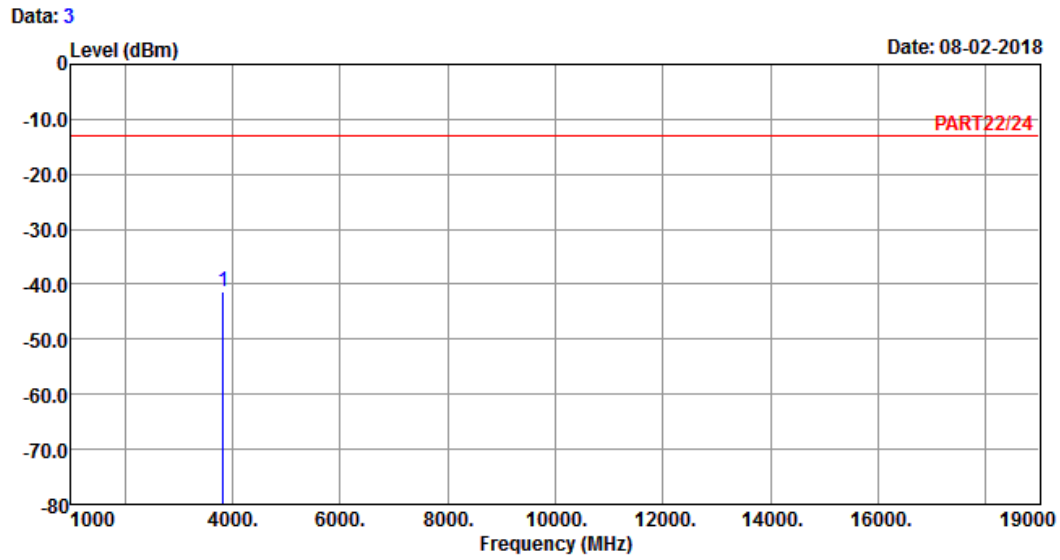



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : NB-IOT Band 2 Stand-alone_Link_M-Ch
Tested by: Jisyong Wang

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 44.31 | -44.36 | -42.37 | -13.00 | -31.36 | -1.99 | Peak |
| 2 | 60.78 | -49.94 | -42.20 | -13.00 | -36.94 | -7.74 | Peak |
| 3 | 68.61 | -53.73 | -45.41 | -13.00 | -40.73 | -8.32 | Peak |
| 4 | 123.69 | -61.85 | -52.46 | -13.00 | -48.85 | -9.39 | Peak |
| 5 | 189.30 | -59.31 | -52.19 | -13.00 | -46.31 | -7.12 | Peak |
| 6 | 767.60 | -63.79 | -64.62 | -13.00 | -50.79 | 0.83 | Peak |
| 7 pp | 3760.00 | -41.02 | -34.37 | -13.00 | -28.02 | -6.65 | Peak |

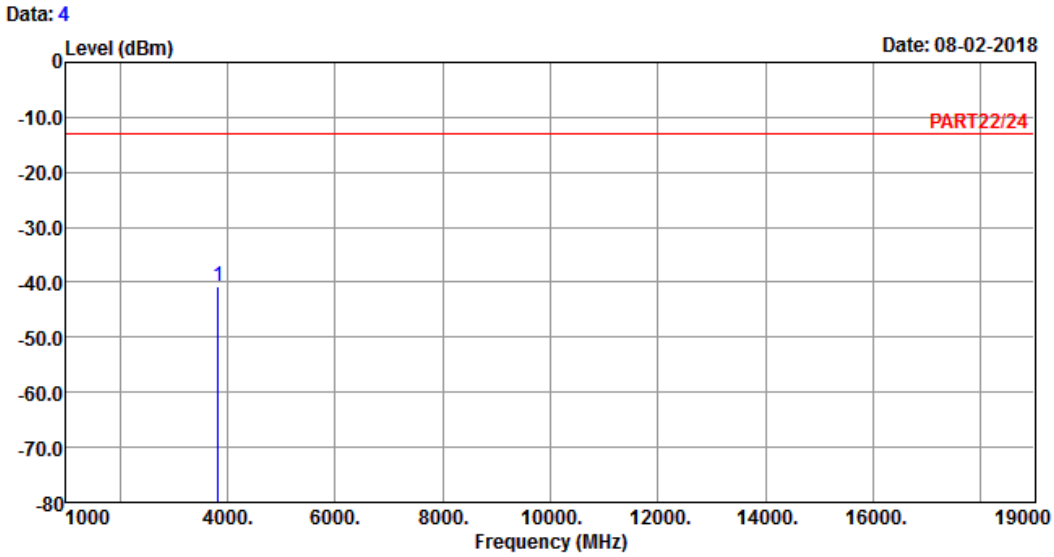
## High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : NB-IOT Band 2 Stand-alone_Link_H-Ch
Tested by: Jisyong Wang

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3819.80 | -41.25 | -34.85 | -13.00 | -28.25 | -6.40 | Peak |




Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : NB-IOT Band 2 Stand-alone_Link_H-Ch
Tested by: Jisyong Wang

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 3819.80 | -40.62 | -34.22 | -13.00 | -27.62 | -6.40 | Peak |

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

**Appendix – Information on the Testing Laboratories**

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:


**Linko EMC/RF Lab**
Tel: 886-2-26052180
Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**
Tel: 886-3-6668565
Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety**
Tel: 886-3-3183232
Fax: 886-3-3270892

**Email:** service.adt@tw.bureauveritas.com
**Web Site:** www.bureauveritas-adt.com


The address and road map of all our labs can be found in our web site also.

**--- END ---**