

## FCC Test Report

### (PART 22)

**Report No.:** RF190415C07

**FCC ID:** O9YJKS3

**Test Model:** JKS3A

**Series Model:** ATS100M-YZ-V, ATS100M-YZ-S, JKS3B, ATS100M-Y-V, ATS100M-Y-S, JKS3C, ATS100M-Z-V, ATS100M-Z-S, JKS3D, ATS100M-V, ATS100M-S  
(Refer to section 3.1 for detail)

**Received Date:** Apr. 15, 2019

**Test Date:** May 10 ~ May 21, 2019

**Issued Date:** Jun. 11, 2019

**Applicant:** Spireon Inc

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**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



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### Release Control Record

| Issue No.   | Description      | Date Issued   |
|-------------|------------------|---------------|
| RF190415C07 | Original Release | Jun. 11, 2019 |

## 1 Certificate of Conformity

**Product:** GPS Tracker

**Brand:** Spireon

**Test Model:** JKS3A

**Series Model:** ATS100M-YZ-V, ATS100M-YZ-S, JKS3B, ATS100M-Y-V, ATS100M-Y-S, JKS3C, ATS100M-Z-V, ATS100M-Z-S, JKS3D, ATS100M-V, ATS100M-S (Refer to section 3.1 for detail)

**Sample Status:** Engineering Sample

**Applicant:** Spireon Inc

**Test Date:** May 10 ~ May 21, 2019

**Standards:** FCC Part 22, Subpart H

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 : Lena Wang , Date: Jun. 11, 2019  
Lena Wang / Specialist

Approved by : Dylan Chiou , Date: Jun. 11, 2019  
Dylan Chiou / Project Engineer

## 2 Summary of Test Results

| Applied Standard: FCC Part 22 & Part 2 |                              |        |                                                                                       |
|----------------------------------------|------------------------------|--------|---------------------------------------------------------------------------------------|
| FCC Clause                             | Test Item                    | Result | Remarks                                                                               |
| 2.1046<br>22.913 (a)                   | Effective Radiated Power     | Pass   | Meet the requirement of limit.                                                        |
| 2.1047                                 | Modulation Characteristics   | Pass   | Meet the requirement.                                                                 |
| 2.1046<br>22.913 (d)                   | Peak to Average Ratio        | Pass   | Meet the requirement of limit.                                                        |
| 2.1055<br>22.355                       | Frequency Stability          | Pass   | Meet the requirement of limit.                                                        |
| 2.1049                                 | Occupied Bandwidth           | Pass   | Meet the requirement of limit.                                                        |
| 22.917                                 | Band Edge Measurements       | Pass   | Meet the requirement of limit.                                                        |
| 2.1051<br>22.917                       | Conducted Spurious Emissions | Pass   | Meet the requirement of limit.                                                        |
| 2.1053<br>22.917                       | Radiated Spurious Emissions  | Pass   | Meet the requirement of limit.<br>Minimum passing margin is -24.47 dB at 1663.00 MHz. |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 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          | Expanded Uncertainty (k=2) (±) |
|--------------------------------|--------------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 9 kHz ~ 30 MHz     | 3.04 dB                        |
|                                | 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<br>Agilent                           | N9038A                     | MY51210203                    | Mar. 18, 2019       | Mar. 17, 2020           |
| Spectrum Analyzer<br>Agilent                       | N9010A                     | MY52220314                    | Dec. 13, 2018       | Dec. 12, 2019           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ               | FSU43                      | 101261                        | Apr. 15, 2019       | Apr. 14, 2020           |
| HORN Antenna<br>SCHWARZBECK                        | BBHA 9120 D                | 9120D-969                     | Nov. 25, 2018       | Nov. 24, 2019           |
| BILOG Antenna<br>SCHWARZBECK                       | VULB9168                   | 9168-472                      | Nov. 23, 2018       | Nov. 22, 2019           |
| Double Ridge Guide Horn<br>Antenna EMCO            | 3115                       | 5619                          | Nov. 25, 2018       | Nov. 24, 2019           |
| BILOG Antenna<br>SCHWARZBECK                       | VULB 9168                  | 9168-153                      | Nov. 23, 2018       | Nov. 22, 2019           |
| Fixed Attenuator<br>WORKEN                         | MDCS18N-10                 | MDCS18N-10-01                 | Apr. 15, 2019       | Apr. 14, 2020           |
| MXG Vector signal<br>generator<br>Agilent          | N5182B                     | MY53050430                    | Nov. 19, 2018       | Nov. 18, 2019           |
| Preamplifier<br>EMCI                               | EMC 012645                 | 980115                        | Oct. 12, 2018       | Oct. 11, 2019           |
| Preamplifier<br>EMCI                               | EMC 330H                   | 980112                        | Oct. 12, 2018       | Oct. 11, 2019           |
| RF Coaxial Cable<br>HUBER+SUHNNER                  | EMC104-SM-SM-<br>8000&3000 | 140811+170717                 | Oct. 12, 2018       | Oct. 11, 2019           |
| RF Coaxial Cable<br>HUBER+SUHNNER                  | SUCOFLEX 104               | EMC104-SM-SM-<br>1000(140807) | Oct. 12, 2018       | Oct. 11, 2019           |
| RF Coaxial Cable<br>WOKEN                          | 8D-FB                      | Cable-Ch10-01                 | Oct. 12, 2018       | Oct. 11, 2019           |
| Boresight Antenna Fixture                          | FBA-01                     | FBA-SIP01                     | NA                  | NA                      |
| Software<br>BV ADT                                 | E3<br>6.120103             | NA                            | NA                  | NA                      |
| Antenna Tower<br>MF                                | MFA-440H                   | NA                            | NA                  | NA                      |
| Turn Table<br>MF                                   | MFT-201SS                  | NA                            | NA                  | NA                      |
| Antenna Tower & Turn<br>Table Controller<br>MF     | MF-7802                    | NA                            | NA                  | NA                      |
| LTE Wireless<br>Communication Test Set<br>Keysight | E7515A                     | MY57270629                    | Feb. 22, 2019       | Feb. 22, 2020           |
| Radio Communication<br>Analyzer<br>Anritsu         | MT8820C                    | 6201300640                    | Aug. 16, 2017       | Aug. 15, 2019           |
| Temperature & Humidity<br>Chamber                  | GTH-120-40-CP-AR           | MAA1306-019                   | Sep. 05, 2018       | Sep. 04, 2019           |
| DC Power Supply<br>Topward                         | 33010D                     | 807748                        | NA                  | NA                      |

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 General Information

#### 3.1 General Description of EUT

|                            |                                                                                                                           |                   |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Product</b>             | GPS Tracker                                                                                                               |                   |
| <b>Brand</b>               | Spireon                                                                                                                   |                   |
| <b>Test Model</b>          | JKS3A                                                                                                                     |                   |
| <b>Series Model</b>        | ATS100M-YZ-V, ATS100M-YZ-S, JKS3B, ATS100M-Y-V, ATS100M-Y-S, JKS3C, ATS100M-Z-V, ATS100M-Z-S, JKS3D, ATS100M-V, ATS100M-S |                   |
| <b>Status of EUT</b>       | Engineering Sample                                                                                                        |                   |
| <b>Power Supply Rating</b> | 12 Vdc (adapter)<br>3.7 Vdc (battery)                                                                                     |                   |
| <b>Modulation Type</b>     | LTE                                                                                                                       | QPSK, 16QAM       |
| <b>Frequency Range</b>     | LTE 26 (Channel Bandwidth: 1.4 MHz)                                                                                       | 824.7 ~ 848.3 MHz |
|                            | LTE 26 (Channel Bandwidth: 3 MHz)                                                                                         | 825.5 ~ 847.5 MHz |
|                            | LTE 26 (Channel Bandwidth: 5 MHz)                                                                                         | 826.5 ~ 846.5 MHz |
|                            | LTE 26 (Channel Bandwidth: 10 MHz)                                                                                        | 829 ~ 844 MHz     |
|                            | LTE 26 (Channel Bandwidth: 15 MHz)                                                                                        | 831.5 ~ 841.5 MHz |
| <b>Max. ERP Power</b>      | LTE 26 (Channel Bandwidth: 1.4 MHz)                                                                                       | 341.19 mW         |
|                            | LTE 26 (Channel Bandwidth: 3 MHz)                                                                                         | 340.41 mW         |
|                            | LTE 26 (Channel Bandwidth: 5 MHz)                                                                                         | 354.81 mW         |
|                            | LTE 26 (Channel Bandwidth: 10 MHz)                                                                                        | 360.58 mW         |
|                            | LTE 26 (Channel Bandwidth: 15 MHz)                                                                                        | 363.08 mW         |
| <b>Emission Designator</b> | LTE 26 (Channel Bandwidth: 1.4 MHz)                                                                                       | 1M09G7D           |
|                            | LTE 26 (Channel Bandwidth: 3 MHz)                                                                                         | 1M10G7D           |
|                            | LTE 26 (Channel Bandwidth: 5 MHz)                                                                                         | 1M10G7D           |
|                            | LTE 26 (Channel Bandwidth: 10 MHz)                                                                                        | 1M09G7D           |
|                            | LTE 26 (Channel Bandwidth: 15 MHz)                                                                                        | 1M11G7D           |
| <b>Antenna Type</b>        | PIFA Antenna with 1.4 dBi gain                                                                                            |                   |
| <b>Accessory Device</b>    | Refer to Note as below                                                                                                    |                   |
| <b>Data Cable Supplied</b> | Refer to Note as below                                                                                                    |                   |

Note:

1. All models are listed as below. Model JKS3A is the representative for final test.

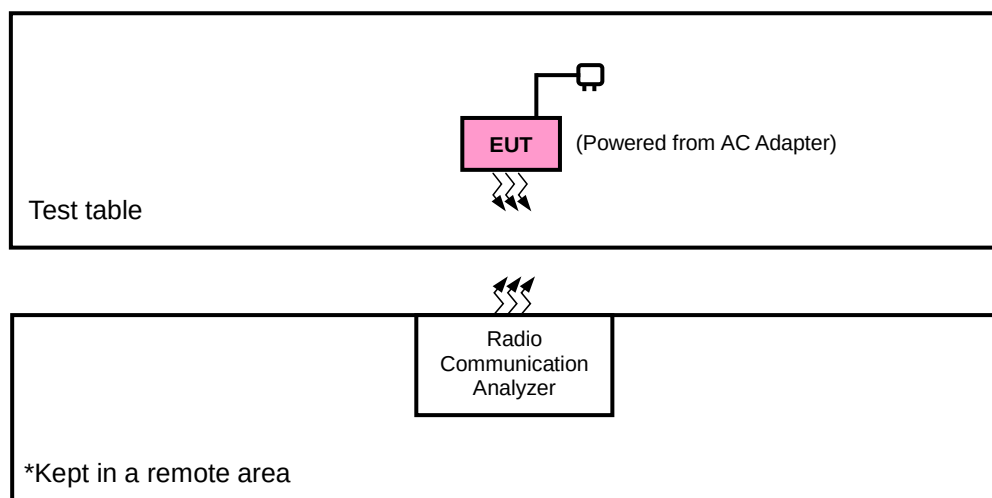
| Brand   | Model        | Difference                      |
|---------|--------------|---------------------------------|
| Spireon | JKS3A        | With Battery; With Buzzer       |
|         | ATS100M-YZ-V |                                 |
|         | ATS100M-YZ-S |                                 |
|         | JKS3B        | With Battery; Without Buzzer    |
|         | ATS100M-Y-V  |                                 |
|         | ATS100M-Y-S  |                                 |
|         | JKS3C        | Without Battery; With Buzzer    |
|         | ATS100M-Z-V  |                                 |
|         | ATS100M-Z-S  |                                 |
|         | JKS3D        | Without Battery; Without Buzzer |
|         | ATS100M-V    |                                 |
|         | ATS100M-S    |                                 |

2. The EUT uses following adapter. (For support unit only)

|              |                                                |
|--------------|------------------------------------------------|
| Brand        | Chanel Well Technology                         |
| Model        | CAP012121                                      |
| Input Power  | 100-240 Vac, 47~63 Hz, 0.35 A                  |
| Output Power | 12 Vdc, 1.0 A                                  |
| Power Line   | 2.25m non-shuelded DC power cable without core |

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



### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Product                      | Brand                  | Model No. | Serial No. | FCC ID |
|-----|------------------------------|------------------------|-----------|------------|--------|
| 1.  | Radio Communication Analyzer | ANRITSU                | MT8821C   | 6201502978 | N/A    |
| 2.  | Adapter                      | Chanel Well Technology | CAP012121 | N/A        | N/A    |

| No. | Signal Cable Description Of The Above Support Units |
|-----|-----------------------------------------------------|
| 1.  | N/A                                                 |
| 2.  | 2.25m                                               |

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1 acted as communication partners to transfer data.
3. Items 2 was provided by client.

### 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        | ERP     | Radiated Emission |
|-------------|---------|-------------------|
| LTE Band 26 | Y-plane | Y-axis            |

#### LTE Band 26

| EUT Configure Mode | Test Item                  | Available Channel | Tested Channel      | Channel Bandwidth | Modulation  | Mode                |
|--------------------|----------------------------|-------------------|---------------------|-------------------|-------------|---------------------|
| -                  | ERP                        | 26797 to 27033    | 26797, 26915, 27033 | 1.4 MHz           | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                            | 26805 to 27025    | 26805, 26915, 27025 | 3 MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                            | 26815 to 27015    | 26815, 26915, 27015 | 5 MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                            | 26840 to 26990    | 26840, 26915, 26990 | 10 MHz            | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                            | 26865 to 26965    | 26865, 26915, 26965 | 15 MHz            | QPSK, 16QAM | 1 RB / 0 RB Offset  |
| -                  | Modulation Characteristics | 26865 to 26965    | 26915               | 15 MHz            | QPSK, 16QAM | 6 RB / 0 RB Offset  |
| -                  | Frequency Stability        | 26797 to 27033    | 26797, 27033        | 1.4 MHz           | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            | 26805 to 27025    | 26805, 27025        | 3 MHz             | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            | 26815 to 27015    | 26815, 27015        | 5 MHz             | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            | 26840 to 26990    | 26840, 26990        | 10 MHz            | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            | 26865 to 26965    | 26865, 26965        | 15 MHz            | QPSK        | 1 RB / 0 RB Offset  |
| -                  | Occupied Bandwidth         | 26797 to 27033    | 26797, 26915, 27033 | 1.4 MHz           | QPSK, 16QAM | 6 RB / 0 RB Offset  |
|                    |                            | 26805 to 27025    | 26805, 26915, 27025 | 3 MHz             | QPSK, 16QAM | 15 RB / 0 RB Offset |
|                    |                            | 26815 to 27015    | 26815, 26915, 27015 | 5 MHz             | QPSK, 16QAM | 25 RB / 0 RB Offset |
|                    |                            | 26840 to 26990    | 26840, 26915, 26990 | 10 MHz            | QPSK, 16QAM | 50 RB / 0 RB Offset |
|                    |                            | 26865 to 26965    | 26865, 26915, 26965 | 15 MHz            | QPSK, 16QAM | 75 RB / 0 RB Offset |
| -                  | Band Edge                  | 26797 to 27033    | 26797               | 1.4 MHz           | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            |                   | 27033               | 1.4 MHz           | QPSK        | 6 RB / 0 RB Offset  |
|                    |                            | 26805 to 27025    | 26805               | 3 MHz             | QPSK        | 1 RB / 5 RB Offset  |
|                    |                            |                   | 27025               | 3 MHz             | QPSK        | 6 RB / 0 RB Offset  |
|                    |                            | 26815 to 27015    | 26815               | 5 MHz             | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            |                   | 27015               | 5 MHz             | QPSK        | 15 RB / 0 RB Offset |
|                    |                            | 26840 to 26990    | 26840               | 10 MHz            | QPSK        | 1 RB / 14 RB Offset |
|                    |                            |                   | 26990               | 10 MHz            | QPSK        | 15 RB / 0 RB Offset |
|                    |                            | 26865 to 26965    | 26865               | 15 MHz            | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            |                   | 26965               | 15 MHz            | QPSK        | 25 RB / 0 RB Offset |
|                    |                            | 26797 to 27033    | 26797, 26915, 27033 | 1.4 MHz           | QPSK, 16QAM | 1 RB / 24 RB Offset |
|                    |                            |                   | 26805, 26915, 27025 | 3 MHz             | QPSK, 16QAM | 25 RB / 0 RB Offset |
|                    |                            | 26805 to 27025    | 26805               | 3 MHz             | QPSK        | 1 RB / 0 RB Offset  |
|                    |                            |                   | 27025               | 3 MHz             | QPSK        | 75 RB / 0 RB Offset |
|                    |                            | 26815 to 27015    | 26815               | 5 MHz             | QPSK        | 1 RB / 74 RB Offset |
|                    |                            |                   | 27015               | 5 MHz             | QPSK        | 75 RB / 0 RB Offset |
| -                  | Peak to Average Ratio      | 26797 to 27033    | 26797, 26915, 27033 | 1.4 MHz           | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                            | 26805 to 27025    | 26805, 26915, 27025 | 3 MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset  |

|   |                    |                |                     |         |             |                    |
|---|--------------------|----------------|---------------------|---------|-------------|--------------------|
|   |                    | 26815 to 27015 | 26815, 26915, 27015 | 5 MHz   | QPSK, 16QAM | 1 RB / 0 RB Offset |
|   |                    | 26840 to 26990 | 26840, 26915, 26990 | 10 MHz  | QPSK, 16QAM | 1 RB / 0 RB Offset |
|   |                    | 26865 to 26965 | 26865, 26915, 26965 | 15 MHz  | QPSK, 16QAM | 1 RB / 0 RB Offset |
| - | Conducted Emission | 26797 to 27033 | 26797, 26915, 27033 | 1.4 MHz | QPSK        | 1 RB / 0 RB Offset |
|   |                    | 26805 to 27025 | 26805, 26915, 27025 | 3 MHz   | QPSK        | 1 RB / 0 RB Offset |
|   |                    | 26815 to 27015 | 26815, 26915, 27015 | 5 MHz   | QPSK        | 1 RB / 0 RB Offset |
|   |                    | 26840 to 26990 | 26840, 26915, 26990 | 10 MHz  | QPSK        | 1 RB / 0 RB Offset |
|   |                    | 26865 to 26965 | 26865, 26915, 26965 | 15 MHz  | QPSK        | 1 RB / 0 RB Offset |
|   |                    |                |                     |         |             |                    |
| - | Radiated Emission  | 26797 to 27033 | 26797, 26915, 27033 | 1.4 MHz | QPSK        | 1 RB / 0 RB Offset |
|   |                    | 26815 to 27015 | 26815, 26915, 27015 | 5 MHz   | QPSK        | 1 RB / 0 RB Offset |
|   |                    | 26865 to 26965 | 26865, 26915, 26965 | 15 MHz  | QPSK        | 1 RB / 0 RB Offset |

**Note:**

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

**Test Condition:**

| Test Item                  | Environmental Conditions | Input Power    | Tested By              |
|----------------------------|--------------------------|----------------|------------------------|
| ERP                        | 25 deg. C, 65 % RH       | 3.7 Vdc        | Thomas Wei             |
| Modulation Characteristics | 25 deg. C, 65 % RH       | 3.7 Vdc        | Getaz Yang             |
| Frequency Stability        | 25 deg. C, 65 % RH       | 3.7 Vdc        | Getaz Yang             |
| Occupied Bandwidth         | 25 deg. C, 65 % RH       | 3.7 Vdc        | Getaz Yang             |
| Band Edge                  | 25 deg. C, 65 % RH       | 3.7 Vdc        | Getaz Yang             |
| Peak to Average Ratio      | 25 deg. C, 65 % RH       | 3.7 Vdc        | Getaz Yang             |
| Conducted Emission         | 25 deg. C, 65 % RH       | 3.7 Vdc        | Getaz Yang             |
| Radiated Emission          | 25 deg. C, 65 % RH       | 120 Vac, 60 Hz | Thomas Wei, Getaz Yang |

### 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 22**

**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 7 watts e.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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ . E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}$ .

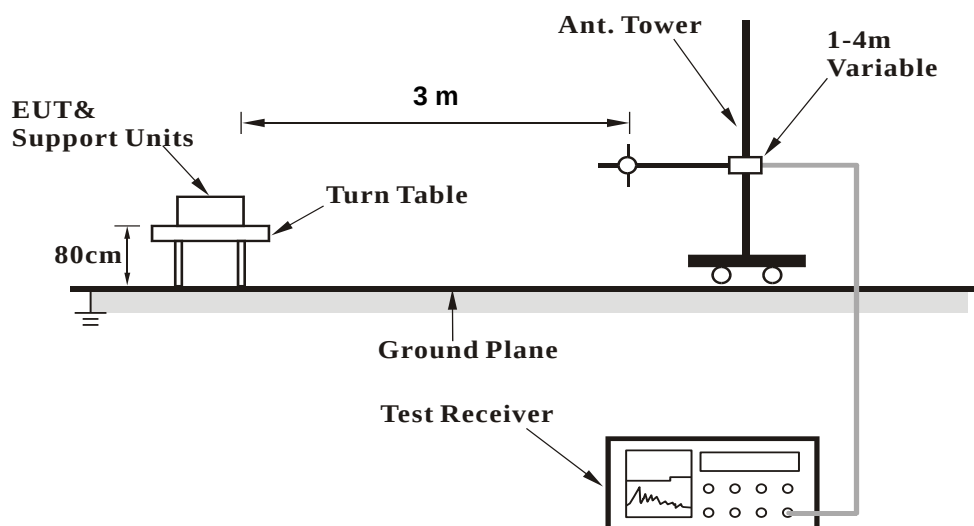
##### **Conducted Power Measurement:**

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.

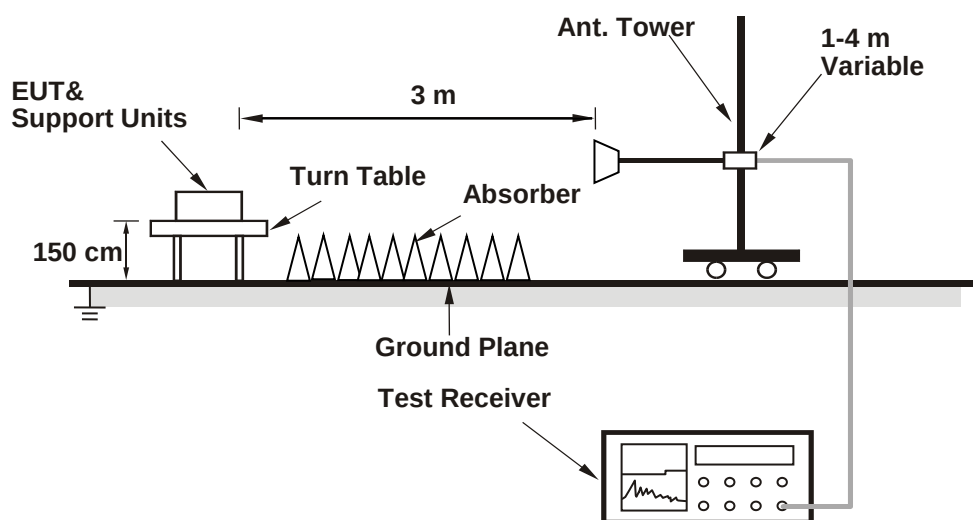
#### 4.1.3 Test Setup

##### EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

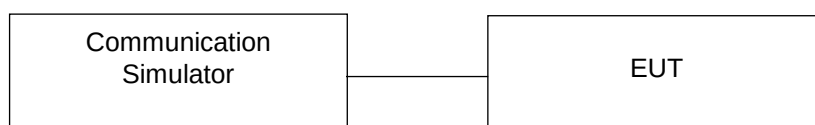


<Radiated Emission above 1 GHz>



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)

|      |         |            |     |        |         |    |            |     |
|------|---------|------------|-----|--------|---------|----|------------|-----|
| eMTC | Band 26 | Region(s): | FCC | Power: | Class 3 | 23 | Tolerance: | 2.7 |
|------|---------|------------|-----|--------|---------|----|------------|-----|

|          |       |
|----------|-------|
| maximum: | 24.72 |
|----------|-------|

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

| Test Frequency ID | N <sub>UL</sub> | Frequency of Uplink [MHz] | N <sub>DL</sub> | Frequency of Downlink [MHz] | Test ConfigurationInitial of Power |         |           |                  | EUT                    |             |
|-------------------|-----------------|---------------------------|-----------------|-----------------------------|------------------------------------|---------|-----------|------------------|------------------------|-------------|
|                   |                 |                           |                 |                             | Modulation                         | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range         | 26797           | 824.7                     | 8797            | 876.5                       | QPSK                               | 1       | 0         | 0                | -85                    | 23.8        |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 23.66       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 3         | 0                | -85                    | 23.32       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 0                | -85                    | 23.23       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 0                | -85                    | 23.46       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 0                | -85                    | 23.42       |
|                   |                 |                           |                 |                             | 16QAM                              | 3       | 0         | 0                | -85                    | 23.42       |
|                   |                 |                           |                 |                             | 16QAM                              | 5       | 0         | 0                | -85                    | 23.42       |
| Mid Range         | 26915           | 836.5                     | 8915            | 888.3                       | QPSK                               | 1       | 0         | 0                | -85                    | 23.66       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 23.4        |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 3         | 0                | -85                    | 23.55       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 0                | -85                    | 23.4        |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 0                | -85                    | 23.36       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 0                | -85                    | 23.38       |
|                   |                 |                           |                 |                             | 16QAM                              | 3       | 0         | 0                | -85                    | 23.6        |
|                   |                 |                           |                 |                             | 16QAM                              | 5       | 0         | 0                | -85                    | 23.55       |
| High Range        | 27033           | 848.3                     | 9033            | 900.1                       | QPSK                               | 1       | 0         | 0                | -85                    | 23.65       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 23.62       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 3         | 0                | -85                    | 23.46       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 0                | -85                    | 23.77       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 0                | -85                    | 23.51       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 0                | -85                    | 23.56       |
|                   |                 |                           |                 |                             | 16QAM                              | 3       | 0         | 0                | -85                    | 23.39       |
|                   |                 |                           |                 |                             | 16QAM                              | 5       | 0         | 0                | -85                    | 23.59       |

|          |   |
|----------|---|
| BW(MHz): | 3 |
|----------|---|

| Test Frequency ID | N <sub>UL</sub> | Frequency of Uplink [MHz] | N <sub>DL</sub> | Frequency of Downlink [MHz] | Test ConfigurationInitial of Power |         |           |                  | EUT                    |             |
|-------------------|-----------------|---------------------------|-----------------|-----------------------------|------------------------------------|---------|-----------|------------------|------------------------|-------------|
|                   |                 |                           |                 |                             | Modulation                         | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range         | 26805           | 825.5                     | 8805            | 876.5                       | QPSK                               | 1       | 0         | 0                | -85                    | 23.96       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 23.85       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 1                | -85                    | 23.44       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 1                | -85                    | 23.44       |

|            |       |      |    |       |           |       |       |      |       |       |
|------------|-------|------|----|-------|-----------|-------|-------|------|-------|-------|
|            |       |      |    |       | QPSK      | 3     | 3     | 0    | -85   | 23.59 |
|            |       |      |    |       | QPSK      | 3     | 3     | 1    | -85   | 23.65 |
|            |       |      |    |       | QPSK      | 6     | 0     | 0    | -85   | 23.53 |
|            |       |      |    |       | QPSK      | 6     | 0     | 1    | -85   | 23.51 |
|            |       |      |    |       | 16QAM     | 1     | 0     | 0    | -85   | 23.55 |
|            |       |      |    |       | 16QAM     | 1     | 5     | 0    | -85   | 23.58 |
|            |       |      |    |       | 16QAM     | 1     | 0     | 1    | -85   | 23.71 |
|            |       |      |    |       | 16QAM     | 1     | 5     | 1    | -85   | 23.58 |
|            |       |      |    |       | 16QAM     | 3     | 0     | 0    | -85   | 23.49 |
|            |       |      |    |       | 16QAM     | 3     | 3     | 1    | -85   | 23.54 |
|            |       |      |    |       | 16QAM     | 5     | 0     | 0    | -85   | 23.69 |
|            |       |      |    |       | 16QAM     | 5     | 0     | 1    | -85   | 23.77 |
|            |       |      |    |       | Mid Range | 26915 | 836.5 | 8915 | 887.5 | QPSK  |
| QPSK       | 1     | 5    | 0  | -85   |           |       |       |      |       | 23.67 |
| QPSK       | 1     | 0    | 1  | -85   |           |       |       |      |       | 23.65 |
| QPSK       | 1     | 5    | 1  | -85   |           |       |       |      |       | 23.65 |
| QPSK       | 3     | 3    | 0  | -85   |           |       |       |      |       | 23.92 |
| QPSK       | 3     | 3    | 1  | -85   |           |       |       |      |       | 23.61 |
| QPSK       | 6     | 0    | 0  | -85   |           |       |       |      |       | 23.62 |
| QPSK       | 6     | 0    | 1  | -85   |           |       |       |      |       | 23.62 |
| 16QAM      | 1     | 0    | 0  | -85   |           |       |       |      |       | 23.66 |
| 16QAM      | 1     | 5    | 0  | -85   |           |       |       |      |       | 23.64 |
| 16QAM      | 1     | 0    | 1  | -85   |           |       |       |      |       | 23.49 |
| 16QAM      | 1     | 5    | 1  | -85   |           |       |       |      |       | 23.61 |
| 16QAM      | 3     | 0    | 0  | -85   |           |       |       |      |       | 23.5  |
| 16QAM      | 3     | 3    | 1  | -85   |           |       |       |      |       | 23.67 |
| 16QAM      | 5     | 0    | 0  | -85   |           |       |       |      |       | 23.69 |
| 16QAM      | 5     | 0    | 1  | -85   |           |       |       |      |       | 23.34 |
| 27025      | 847.5 | 9025 | -4 | QPSK  |           | 1     | 0     | 0    | -85   | 23.48 |
|            |       |      |    | QPSK  |           | 1     | 5     | 0    | -85   | 23.57 |
|            |       |      |    | QPSK  |           | 1     | 0     | 1    | -85   | 23.61 |
|            |       |      |    | QPSK  |           | 1     | 5     | 1    | -85   | 23.51 |
|            |       |      |    | QPSK  |           | 3     | 3     | 0    | -85   | 23.67 |
|            |       |      |    | QPSK  |           | 3     | 3     | 1    | -85   | 23.45 |
|            |       |      |    | QPSK  |           | 6     | 0     | 0    | -85   | 23.73 |
|            |       |      |    | QPSK  |           | 6     | 0     | 1    | -85   | 24.12 |
|            |       |      |    | 16QAM |           | 1     | 0     | 0    | -85   | 24.17 |
|            |       |      |    | 16QAM |           | 1     | 5     | 0    | -85   | 23.77 |
| High Range |       |      |    | 16QAM | 1         | 0     | 1     | -85  | 23.75 |       |
|            |       |      |    | 16QAM | 1         | 5     | 1     | -85  | 23.76 |       |
|            |       |      |    | 16QAM | 3         | 0     | 0     | -85  | 23.95 |       |
|            |       |      |    |       |           |       |       |      |       |       |

|  |  |  |  |  |       |   |   |   |     |       |
|--|--|--|--|--|-------|---|---|---|-----|-------|
|  |  |  |  |  | 16QAM | 3 | 3 | 1 | -85 | 23.92 |
|  |  |  |  |  | 16QAM | 5 | 0 | 0 | -85 | 23.68 |
|  |  |  |  |  | 16QAM | 5 | 0 | 1 | -85 | 23.82 |

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

| Test Frequency ID | N <sub>UL</sub> | Frequency of Uplink [MHz] | N <sub>DL</sub> | Frequency of Downlink [MHz] | Test ConfigurationInitial of Power |         |           |                  | EUT                    |             |
|-------------------|-----------------|---------------------------|-----------------|-----------------------------|------------------------------------|---------|-----------|------------------|------------------------|-------------|
|                   |                 |                           |                 |                             | Modulation                         | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range         | 26815           | 826.5                     | 8815            | 876.5                       | QPSK                               | 1       | 0         | 0                | -85                    | 24.16       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 24.03       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 1                | -85                    | 23.69       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 1                | -85                    | 23.68       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 3                | -85                    | 23.86       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 3                | -85                    | 23.77       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 0         | 0                | -85                    | 23.78       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 3         | 3                | -85                    | 23.71       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 0                | -85                    | 23.75       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 1                | -85                    | 23.8        |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 3                | -85                    | 23.97       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 0                | -85                    | 23.8        |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 0                | -85                    | 23.76       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 1                | -85                    | 23.72       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 1                | -85                    | 23.91       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 3                | -85                    | 23.93       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 3                | -85                    | 23.83       |
|                   |                 |                           |                 |                             | 16QAM                              | 3       | 0         | 0                | -85                    | 24          |
|                   |                 |                           |                 |                             | 16QAM                              | 3       | 3         | 3                | -85                    | 23.95       |
|                   |                 |                           |                 |                             | 16QAM                              | 5       | 0         | 0                | -85                    | 23.85       |
|                   |                 |                           |                 |                             | 16QAM                              | 5       | 0         | 1                | -85                    | 24.15       |
|                   |                 |                           |                 |                             | 16QAM                              | 5       | 0         | 3                | -85                    | 23.79       |
| Mid Range         | 26915           | 836.5                     | 8915            | 886.5                       | QPSK                               | 1       | 0         | 0                | -85                    | 24.21       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 23.77       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 1                | -85                    | 23.94       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 1                | -85                    | 23.91       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 3                | -85                    | 23.76       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 3                | -85                    | 23.86       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 0         | 0                | -85                    | 23.74       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 3         | 3                | -85                    | 23.94       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 0                | -85                    | 23.98       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 1                | -85                    | 23.62       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 3                | -85                    | 23.88       |

|            |       |       |      |       |       |   |   |   |     |       |
|------------|-------|-------|------|-------|-------|---|---|---|-----|-------|
| High Range | 27015 | 846.5 | 9015 | 896.5 | 16QAM | 1 | 0 | 0 | -85 | 23.72 |
|            |       |       |      |       | 16QAM | 1 | 5 | 0 | -85 | 23.95 |
|            |       |       |      |       | 16QAM | 1 | 0 | 1 | -85 | 23.93 |
|            |       |       |      |       | 16QAM | 1 | 5 | 1 | -85 | 23.69 |
|            |       |       |      |       | 16QAM | 1 | 0 | 3 | -85 | 23.99 |
|            |       |       |      |       | 16QAM | 1 | 5 | 3 | -85 | 23.74 |
|            |       |       |      |       | 16QAM | 3 | 0 | 0 | -85 | 23.83 |
|            |       |       |      |       | 16QAM | 3 | 3 | 3 | -85 | 24.11 |
|            |       |       |      |       | 16QAM | 5 | 0 | 0 | -85 | 24.47 |
|            |       |       |      |       | 16QAM | 5 | 0 | 1 | -85 | 24.02 |
|            |       |       |      |       | 16QAM | 5 | 0 | 3 | -85 | 23.96 |
|            | 27015 | 846.5 | 9015 | 896.5 | QPSK  | 1 | 0 | 0 | -85 | 24.24 |
|            |       |       |      |       | QPSK  | 1 | 5 | 0 | -85 | 24.15 |
|            |       |       |      |       | QPSK  | 1 | 0 | 1 | -85 | 23.94 |
|            |       |       |      |       | QPSK  | 1 | 5 | 1 | -85 | 24.08 |
|            |       |       |      |       | QPSK  | 1 | 0 | 3 | -85 | 24.08 |
|            |       |       |      |       | QPSK  | 1 | 5 | 3 | -85 | 24.09 |
|            |       |       |      |       | QPSK  | 3 | 0 | 0 | -85 | 24.11 |
|            |       |       |      |       | QPSK  | 3 | 3 | 3 | -85 | 23.78 |
|            |       |       |      |       | QPSK  | 6 | 0 | 0 | -85 | 23.87 |
|            |       |       |      |       | QPSK  | 6 | 0 | 1 | -85 | 23.92 |
|            |       |       |      |       | QPSK  | 6 | 0 | 3 | -85 | 23.97 |
|            |       |       |      |       | 16QAM | 1 | 0 | 0 | -85 | 24.22 |
|            |       |       |      |       | 16QAM | 1 | 5 | 0 | -85 | 23.93 |
|            |       |       |      |       | 16QAM | 1 | 0 | 1 | -85 | 23.92 |
|            |       |       |      |       | 16QAM | 1 | 5 | 1 | -85 | 23.97 |
|            |       |       |      |       | 16QAM | 1 | 0 | 3 | -85 | 24.02 |
|            |       |       |      |       | 16QAM | 1 | 5 | 3 | -85 | 23.98 |
|            |       |       |      |       | 16QAM | 3 | 0 | 0 | -85 | 24.11 |
|            |       |       |      |       | 16QAM | 3 | 3 | 3 | -85 | 24.12 |
|            |       |       |      |       | 16QAM | 5 | 0 | 0 | -85 | 23.99 |
|            |       |       |      |       | 16QAM | 5 | 0 | 1 | -85 | 24.1  |
|            |       |       |      |       | 16QAM | 5 | 0 | 3 | -85 | 24.16 |

BW(MHz): 10

| Test Frequency ID | N <sub>UL</sub> | Frequency of Uplink [MHz] | N <sub>DL</sub> | Frequency of Downlink [MHz] | Test ConfigurationInitial of Power |         |           |                  | EUT                    |             |
|-------------------|-----------------|---------------------------|-----------------|-----------------------------|------------------------------------|---------|-----------|------------------|------------------------|-------------|
|                   |                 |                           |                 |                             | Modulation                         | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range         | 26840           | 829                       | 8840            | 879                         | QPSK                               | 1       | 0         | 0                | -85                    | 24.25       |

|            |       |       |      |       |       |   |   |   |     |       |
|------------|-------|-------|------|-------|-------|---|---|---|-----|-------|
|            |       |       |      |       | QPSK  | 1 | 5 | 0 | -85 | 24.17 |
|            |       |       |      |       | QPSK  | 1 | 0 | 3 | -85 | 23.83 |
|            |       |       |      |       | QPSK  | 1 | 5 | 3 | -85 | 23.81 |
|            |       |       |      |       | QPSK  | 1 | 0 | 7 | -85 | 23.93 |
|            |       |       |      |       | QPSK  | 1 | 5 | 7 | -85 | 23.93 |
|            |       |       |      |       | QPSK  | 4 | 0 | 0 | -85 | 23.96 |
|            |       |       |      |       | QPSK  | 4 | 2 | 7 | -85 | 23.86 |
|            |       |       |      |       | QPSK  | 6 | 0 | 0 | -85 | 23.88 |
|            |       |       |      |       | QPSK  | 6 | 0 | 7 | -85 | 23.87 |
|            |       |       |      |       | 16QAM | 1 | 0 | 0 | -85 | 24.08 |
|            |       |       |      |       | 16QAM | 1 | 5 | 0 | -85 | 23.9  |
|            |       |       |      |       | 16QAM | 1 | 0 | 3 | -85 | 23.9  |
|            |       |       |      |       | 16QAM | 1 | 5 | 3 | -85 | 23.84 |
|            |       |       |      |       | 16QAM | 1 | 0 | 7 | -85 | 24.07 |
|            |       |       |      |       | 16QAM | 1 | 5 | 7 | -85 | 24.09 |
|            |       |       |      |       | 16QAM | 4 | 2 | 0 | -85 | 23.98 |
|            |       |       |      |       | 16QAM | 4 | 2 | 7 | -85 | 24.08 |
|            |       |       |      |       | 16QAM | 5 | 0 | 0 | -85 | 24.07 |
|            |       |       |      |       | 16QAM | 5 | 0 | 7 | -85 | 23.95 |
| Mid Range  | 26915 | 836.5 | 8915 | 886.5 | QPSK  | 1 | 0 | 0 | -85 | 24.24 |
|            |       |       |      |       | QPSK  | 1 | 5 | 0 | -85 | 23.97 |
|            |       |       |      |       | QPSK  | 1 | 0 | 3 | -85 | 23.98 |
|            |       |       |      |       | QPSK  | 1 | 5 | 3 | -85 | 23.99 |
|            |       |       |      |       | QPSK  | 1 | 0 | 7 | -85 | 24    |
|            |       |       |      |       | QPSK  | 1 | 5 | 7 | -85 | 23.96 |
|            |       |       |      |       | QPSK  | 4 | 0 | 0 | -85 | 23.85 |
|            |       |       |      |       | QPSK  | 4 | 2 | 7 | -85 | 24.03 |
|            |       |       |      |       | QPSK  | 6 | 0 | 0 | -85 | 23.86 |
|            |       |       |      |       | QPSK  | 6 | 0 | 7 | -85 | 23.98 |
|            |       |       |      |       | 16QAM | 1 | 0 | 0 | -85 | 24.07 |
|            |       |       |      |       | 16QAM | 1 | 5 | 0 | -85 | 23.73 |
|            |       |       |      |       | 16QAM | 1 | 0 | 3 | -85 | 24.05 |
|            |       |       |      |       | 16QAM | 1 | 5 | 3 | -85 | 23.86 |
|            |       |       |      |       | 16QAM | 1 | 0 | 7 | -85 | 24.07 |
|            |       |       |      |       | 16QAM | 1 | 5 | 7 | -85 | 24.01 |
|            |       |       |      |       | 16QAM | 4 | 2 | 0 | -85 | 23.85 |
|            |       |       |      |       | 16QAM | 4 | 2 | 7 | -85 | 24.09 |
|            |       |       |      |       | 16QAM | 5 | 0 | 0 | -85 | 23.82 |
|            |       |       |      |       | 16QAM | 5 | 0 | 7 | -85 | 24.01 |
| High Range | 26990 | 844   | 8990 | 894   | QPSK  | 1 | 0 | 0 | -85 | 24.63 |
|            |       |       |      |       | QPSK  | 1 | 5 | 0 | -85 | 24.11 |

|  |  |  |  |  |       |   |   |   |     |       |
|--|--|--|--|--|-------|---|---|---|-----|-------|
|  |  |  |  |  | QPSK  | 1 | 5 | 7 | -85 | 24.05 |
|  |  |  |  |  | QPSK  | 1 | 0 | 3 | -85 | 24.1  |
|  |  |  |  |  | QPSK  | 1 | 5 | 3 | -85 | 24.37 |
|  |  |  |  |  | QPSK  | 1 | 0 | 7 | -85 | 24.3  |
|  |  |  |  |  | QPSK  | 4 | 0 | 0 | -85 | 24.11 |
|  |  |  |  |  | QPSK  | 4 | 2 | 7 | -85 | 24.18 |
|  |  |  |  |  | QPSK  | 6 | 0 | 0 | -85 | 24.24 |
|  |  |  |  |  | QPSK  | 6 | 0 | 7 | -85 | 24.25 |
|  |  |  |  |  | 16QAM | 1 | 0 | 0 | -85 | 24.24 |
|  |  |  |  |  | 16QAM | 1 | 5 | 0 | -85 | 23.92 |
|  |  |  |  |  | 16QAM | 1 | 0 | 3 | -85 | 24.02 |
|  |  |  |  |  | 16QAM | 1 | 5 | 3 | -85 | 24.01 |
|  |  |  |  |  | 16QAM | 1 | 0 | 7 | -85 | 24.14 |
|  |  |  |  |  | 16QAM | 1 | 5 | 7 | -85 | 24.15 |
|  |  |  |  |  | 16QAM | 4 | 2 | 0 | -85 | 24.15 |
|  |  |  |  |  | 16QAM | 4 | 2 | 7 | -85 | 24.09 |
|  |  |  |  |  | 16QAM | 5 | 0 | 0 | -85 | 24.11 |
|  |  |  |  |  | 16QAM | 5 | 0 | 7 | -85 | 24.11 |

BW(MHz): 15

| Test Frequency ID | N <sub>UL</sub> | Frequency of Uplink [MHz] | N <sub>DL</sub> | Frequency of Downlink [MHz] | Test ConfigurationInitial of Power |         |           |                  | EUT                    |             |
|-------------------|-----------------|---------------------------|-----------------|-----------------------------|------------------------------------|---------|-----------|------------------|------------------------|-------------|
|                   |                 |                           |                 |                             | Modulation                         | RB Size | RB Offset | Narrowband Index | Cell power (dBm/15kHz) | power (dBm) |
| Low Range         | 26865           | 831.5                     | 8865            | 881.5                       | QPSK                               | 1       | 0         | 0                | -85                    | 24.41       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 0                | -85                    | 24.33       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 5                | -85                    | 23.95       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 5                | -85                    | 23.94       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 0         | 11               | -85                    | 24.07       |
|                   |                 |                           |                 |                             | QPSK                               | 1       | 5         | 11               | -85                    | 24.04       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 0         | 0                | -85                    | 24.07       |
|                   |                 |                           |                 |                             | QPSK                               | 3       | 3         | 11               | -85                    | 23.97       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 0                | -85                    | 24.03       |
|                   |                 |                           |                 |                             | QPSK                               | 6       | 0         | 11               | -85                    | 24.03       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 0                | -85                    | 24.23       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 0                | -85                    | 24.04       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 5                | -85                    | 23.99       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 5                | -85                    | 24          |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 0         | 11               | -85                    | 24.16       |
|                   |                 |                           |                 |                             | 16QAM                              | 1       | 5         | 11               | -85                    | 24.21       |

|            |       |       |      |       |       |   |   |    |     |       |
|------------|-------|-------|------|-------|-------|---|---|----|-----|-------|
|            |       |       |      |       | 16QAM | 3 | 0 | 0  | -85 | 24.07 |
|            |       |       |      |       | 16QAM | 3 | 3 | 11 | -85 | 24.19 |
|            |       |       |      |       | 16QAM | 5 | 0 | 0  | -85 | 24.21 |
|            |       |       |      |       | 16QAM | 5 | 0 | 11 | -85 | 24.11 |
| Mid Range  | 26915 | 836.5 | 8915 | 886.5 | QPSK  | 1 | 0 | 0  | -85 | 24.38 |
|            |       |       |      |       | QPSK  | 1 | 5 | 0  | -85 | 24.11 |
|            |       |       |      |       | QPSK  | 1 | 0 | 5  | -85 | 24.1  |
|            |       |       |      |       | QPSK  | 1 | 5 | 5  | -85 | 24.09 |
|            |       |       |      |       | QPSK  | 1 | 0 | 11 | -85 | 24.13 |
|            |       |       |      |       | QPSK  | 1 | 5 | 11 | -85 | 24.11 |
|            |       |       |      |       | QPSK  | 3 | 0 | 0  | -85 | 24.01 |
|            |       |       |      |       | QPSK  | 3 | 3 | 11 | -85 | 24.12 |
|            |       |       |      |       | QPSK  | 6 | 0 | 0  | -85 | 23.98 |
|            |       |       |      |       | QPSK  | 6 | 0 | 11 | -85 | 24.13 |
|            |       |       |      |       | 16QAM | 1 | 0 | 0  | -85 | 24.22 |
|            |       |       |      |       | 16QAM | 1 | 5 | 0  | -85 | 23.85 |
|            |       |       |      |       | 16QAM | 1 | 0 | 5  | -85 | 24.14 |
|            |       |       |      |       | 16QAM | 1 | 5 | 5  | -85 | 24.01 |
|            |       |       |      |       | 16QAM | 1 | 0 | 11 | -85 | 24.16 |
|            |       |       |      |       | 16QAM | 1 | 5 | 11 | -85 | 24.15 |
|            |       |       |      |       | 16QAM | 3 | 0 | 0  | -85 | 23.97 |
|            |       |       |      |       | 16QAM | 3 | 3 | 11 | -85 | 24.21 |
|            |       |       |      |       | 16QAM | 5 | 0 | 0  | -85 | 23.98 |
|            |       |       |      |       | 16QAM | 5 | 0 | 11 | -85 | 24.14 |
| High Range | 26965 | 841.5 | 8965 | 891.5 | QPSK  | 1 | 0 | 0  | -85 | 24.72 |
|            |       |       |      |       | QPSK  | 1 | 5 | 11 | -85 | 24.21 |
|            |       |       |      |       | QPSK  | 1 | 0 | 5  | -85 | 24.21 |
|            |       |       |      |       | QPSK  | 1 | 5 | 5  | -85 | 24.22 |
|            |       |       |      |       | QPSK  | 1 | 0 | 11 | -85 | 24.48 |
|            |       |       |      |       | QPSK  | 1 | 5 | 11 | -85 | 24.42 |
|            |       |       |      |       | QPSK  | 3 | 0 | 0  | -85 | 24.2  |
|            |       |       |      |       | QPSK  | 3 | 3 | 11 | -85 | 24.33 |
|            |       |       |      |       | QPSK  | 6 | 0 | 0  | -85 | 24.35 |
|            |       |       |      |       | QPSK  | 6 | 0 | 11 | -85 | 24.35 |
|            |       |       |      |       | 16QAM | 1 | 0 | 0  | -85 | 24.33 |
|            |       |       |      |       | 16QAM | 1 | 5 | 0  | -85 | 24.02 |
|            |       |       |      |       | 16QAM | 1 | 0 | 5  | -85 | 24.16 |
|            |       |       |      |       | 16QAM | 1 | 5 | 5  | -85 | 24.17 |
|            |       |       |      |       | 16QAM | 1 | 0 | 11 | -85 | 24.23 |
|            |       |       |      |       | 16QAM | 1 | 5 | 11 | -85 | 24.24 |
|            |       |       |      |       | 16QAM | 3 | 0 | 0  | -85 | 24.24 |

|  |  |  |  |  |       |   |   |    |     |       |
|--|--|--|--|--|-------|---|---|----|-----|-------|
|  |  |  |  |  | 16QAM | 3 | 3 | 11 | -85 | 24.21 |
|  |  |  |  |  | 16QAM | 5 | 0 | 0  | -85 | 24.25 |
|  |  |  |  |  | 16QAM | 5 | 0 | 11 | -85 | 24.26 |

**ERP Power (dBm)**

| LTE Band 26                        |         |                 |               |                        |           |          |                    |
|------------------------------------|---------|-----------------|---------------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 1.4 MHz / QPSK  |         |                 |               |                        |           |          |                    |
| Plane                              | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y                                  | 26797   | 824.7           | -5.72         | 32.62                  | 24.75     | 298.54   | H                  |
|                                    | 26915   | 836.5           | -5.28         | 32.52                  | 25.09     | 322.85   |                    |
|                                    | 27033   | 848.3           | -5.17         | 32.65                  | 25.33     | 341.19   |                    |
|                                    | 26797   | 824.7           | -12.63        | 32.76                  | 17.98     | 62.81    | V                  |
|                                    | 26915   | 836.5           | -13.10        | 32.39                  | 17.14     | 51.76    |                    |
|                                    | 27033   | 848.3           | -12.91        | 32.54                  | 17.48     | 55.98    |                    |
| Channel Bandwidth: 1.4 MHz / 16QAM |         |                 |               |                        |           |          |                    |
| Y                                  | 26797   | 824.7           | -6.72         | 32.62                  | 23.75     | 237.14   | H                  |
|                                    | 26915   | 836.5           | -6.53         | 32.52                  | 23.84     | 242.10   |                    |
|                                    | 27033   | 848.3           | -6.45         | 32.65                  | 24.05     | 254.10   |                    |
|                                    | 26797   | 824.7           | -14.90        | 32.76                  | 15.71     | 37.24    | V                  |
|                                    | 26915   | 836.5           | -14.47        | 32.39                  | 15.77     | 37.76    |                    |
|                                    | 27033   | 848.3           | -14.17        | 32.54                  | 16.22     | 41.88    |                    |

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

| LTE Band 26                      |         |                 |               |                        |           |          |                    |
|----------------------------------|---------|-----------------|---------------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 3 MHz / QPSK  |         |                 |               |                        |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y                                | 26805   | 825.5           | -5.62         | 32.62                  | 24.85     | 305.49   | H                  |
|                                  | 26915   | 836.5           | -5.28         | 32.52                  | 25.09     | 322.85   |                    |
|                                  | 27025   | 847.5           | -5.18         | 32.65                  | 25.32     | 340.41   |                    |
|                                  | 26805   | 825.5           | -13.55        | 32.76                  | 17.06     | 50.82    | V                  |
|                                  | 26915   | 836.5           | -13.05        | 32.39                  | 17.19     | 52.36    |                    |
|                                  | 27025   | 847.5           | -12.83        | 32.54                  | 17.56     | 57.02    |                    |
| Channel Bandwidth: 3 MHz / 16QAM |         |                 |               |                        |           |          |                    |
| Y                                | 26805   | 825.5           | -6.84         | 32.62                  | 23.63     | 230.67   | H                  |
|                                  | 26915   | 836.5           | -6.39         | 32.52                  | 23.98     | 250.03   |                    |
|                                  | 27025   | 847.5           | -6.31         | 32.65                  | 24.19     | 262.42   |                    |
|                                  | 26805   | 825.5           | -14.83        | 32.76                  | 15.78     | 37.84    | V                  |
|                                  | 26915   | 836.5           | -14.35        | 32.39                  | 15.89     | 38.82    |                    |
|                                  | 27025   | 847.5           | -14.05        | 32.54                  | 16.34     | 43.05    |                    |

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

| LTE Band 26                      |         |                 |               |                        |           |          |                    |
|----------------------------------|---------|-----------------|---------------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 5 MHz / QPSK  |         |                 |               |                        |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y                                | 26815   | 826.5           | -5.51         | 32.62                  | 24.96     | 313.33   | H                  |
|                                  | 26915   | 836.5           | -5.14         | 32.52                  | 25.23     | 333.43   |                    |
|                                  | 27015   | 846.5           | -5.00         | 32.65                  | 25.50     | 354.81   |                    |
|                                  | 26815   | 826.5           | -13.52        | 32.76                  | 17.09     | 51.17    | V                  |
|                                  | 26919   | 836.5           | -13.04        | 32.39                  | 17.20     | 52.48    |                    |
|                                  | 27015   | 846.5           | -12.82        | 32.54                  | 17.57     | 57.15    |                    |
| Channel Bandwidth: 5 MHz / 16QAM |         |                 |               |                        |           |          |                    |
| Y                                | 26815   | 826.5           | -6.71         | 32.62                  | 23.76     | 237.68   | H                  |
|                                  | 26915   | 836.5           | -6.33         | 32.52                  | 24.04     | 253.51   |                    |
|                                  | 27015   | 846.5           | -6.24         | 32.65                  | 24.26     | 266.69   |                    |
|                                  | 26815   | 826.5           | -14.65        | 32.76                  | 15.96     | 39.45    | V                  |
|                                  | 26919   | 836.5           | -14.17        | 32.39                  | 16.07     | 40.46    |                    |
|                                  | 27015   | 846.5           | -13.95        | 32.54                  | 16.44     | 44.06    |                    |

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

| LTE Band 26                       |         |                 |               |                        |           |          |                    |
|-----------------------------------|---------|-----------------|---------------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 10 MHz / QPSK  |         |                 |               |                        |           |          |                    |
| Plane                             | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y                                 | 26840   | 829.0           | -5.43         | 32.62                  | 25.04     | 319.15   | H                  |
|                                   | 26915   | 836.5           | -5.03         | 32.52                  | 25.34     | 341.98   |                    |
|                                   | 26990   | 844.0           | -4.93         | 32.65                  | 25.57     | 360.58   |                    |
|                                   | 26840   | 829.0           | -13.43        | 32.76                  | 17.18     | 52.24    | V                  |
|                                   | 26919   | 836.5           | -12.94        | 32.39                  | 17.30     | 53.70    |                    |
|                                   | 26990   | 844.0           | -12.76        | 32.54                  | 17.63     | 57.94    |                    |
| Channel Bandwidth: 10 MHz / 16QAM |         |                 |               |                        |           |          |                    |
| Y                                 | 26840   | 829.0           | -6.56         | 32.62                  | 23.91     | 246.04   | H                  |
|                                   | 26915   | 836.5           | -6.17         | 32.52                  | 24.20     | 263.03   |                    |
|                                   | 26990   | 844.0           | -6.04         | 32.65                  | 24.46     | 279.25   |                    |
|                                   | 26840   | 829.0           | -14.59        | 32.76                  | 16.02     | 39.99    | V                  |
|                                   | 26919   | 836.5           | -14.07        | 32.39                  | 16.17     | 41.40    |                    |
|                                   | 26990   | 844.0           | -13.81        | 32.54                  | 16.58     | 45.50    |                    |

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

| LTE Band 26                       |         |                 |               |                        |           |          |                    |
|-----------------------------------|---------|-----------------|---------------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 15 MHz / QPSK  |         |                 |               |                        |           |          |                    |
| Plane                             | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y                                 | 26865   | 831.5           | -5.36         | 32.62                  | 25.11     | 324.34   | H                  |
|                                   | 26915   | 836.5           | -5.00         | 32.52                  | 25.37     | 344.35   |                    |
|                                   | 26965   | 841.5           | -4.90         | 32.65                  | 25.60     | 363.08   |                    |
|                                   | 26865   | 831.5           | -13.39        | 32.76                  | 17.22     | 52.72    | V                  |
|                                   | 26915   | 836.5           | -12.89        | 32.39                  | 17.35     | 54.33    |                    |
|                                   | 26965   | 841.5           | -12.68        | 32.54                  | 17.71     | 59.02    |                    |
| Channel Bandwidth: 15 MHz / 16QAM |         |                 |               |                        |           |          |                    |
| Y                                 | 26865   | 831.5           | -6.44         | 32.62                  | 24.03     | 252.93   | H                  |
|                                   | 26915   | 836.5           | -6.07         | 32.52                  | 24.30     | 269.15   |                    |
|                                   | 26965   | 841.5           | -5.97         | 32.65                  | 24.53     | 283.79   |                    |
|                                   | 26865   | 831.5           | -14.48        | 32.76                  | 16.13     | 41.02    | V                  |
|                                   | 26915   | 836.5           | -13.98        | 32.39                  | 16.26     | 42.27    |                    |
|                                   | 26965   | 841.5           | -13.71        | 32.54                  | 16.68     | 46.56    |                    |

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15



### 4.3 Frequency Stability Measurement

#### 4.3.1 Limits of Frequency Stability Measurement

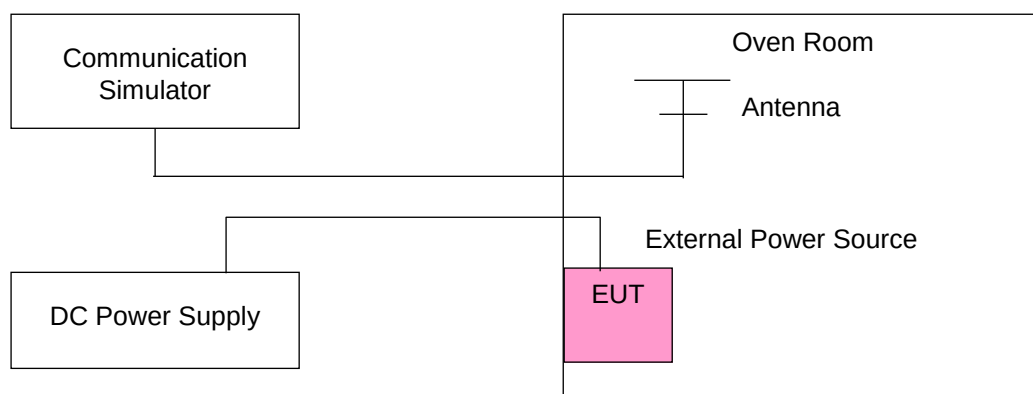
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

#### 4.3.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5$  °C 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

##### Frequency Error vs. Voltage

| Voltage<br>(Volts) | LTE Band 26                |                       |                 |                       | Limit (ppm) |
|--------------------|----------------------------|-----------------------|-----------------|-----------------------|-------------|
|                    | Channel Bandwidth: 1.4 MHz |                       |                 |                       |             |
|                    | Low Channel                |                       | High Channel    |                       |             |
|                    | Frequency (MHz)            | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| 3.145              | 824.700002                 | 0.003                 | 848.300000      | 0.003                 | 2.5         |
| 3.7                | 824.700002                 | 0.002                 | 848.300000      | 0.003                 | 2.5         |
| 4.225              | 824.700003                 | 0.004                 | 848.300000      | 0.002                 | 2.5         |

**Note:** The applicant defined the normal working voltage of the battery is from 3.7 Vdc to 4.225 Vdc.

##### Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 26                |                       |                 |                       | Limit (ppm) |
|------------|----------------------------|-----------------------|-----------------|-----------------------|-------------|
|            | Channel Bandwidth: 1.4 MHz |                       |                 |                       |             |
|            | Low Channel                |                       | High Channel    |                       |             |
|            | Frequency (MHz)            | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| -40        | 824.700004                 | 0.005                 | 848.300000      | 0.002                 | 2.5         |
| -30        | 824.700002                 | 0.002                 | 848.300000      | 0.002                 | 2.5         |
| -20        | 824.700002                 | 0.002                 | 848.300000      | 0.001                 | 2.5         |
| -10        | 824.700002                 | 0.002                 | 848.300000      | 0.001                 | 2.5         |
| 0          | 824.700002                 | 0.002                 | 848.300000      | 0.004                 | 2.5         |
| 10         | 824.699999                 | -0.001                | 848.300000      | -0.003                | 2.5         |
| 20         | 824.699997                 | -0.003                | 848.300000      | -0.002                | 2.5         |
| 30         | 824.699998                 | -0.002                | 848.300000      | -0.003                | 2.5         |
| 40         | 824.699997                 | -0.004                | 848.300000      | -0.001                | 2.5         |
| 50         | 824.699998                 | -0.002                | 848.300000      | -0.003                | 2.5         |
| 60         | 824.699999                 | -0.002                | 848.300000      | -0.001                | 2.5         |
| 70         | 824.699998                 | -0.002                | 848.300000      | -0.005                | 2.5         |
| 75         | 824.699998                 | -0.002                | 848.300000      | -0.003                | 2.5         |

### Frequency Error vs. Voltage

| Voltage<br>(Volts) | LTE Band 26              |                       |                 |                       | Limit (ppm) |
|--------------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
|                    | Channel Bandwidth: 3 MHz |                       |                 |                       |             |
|                    | Low Channel              |                       | High Channel    |                       |             |
|                    | Frequency (MHz)          | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| 3.145              | 824.700001               | 0.001                 | 848.300000      | 0.002                 | 2.5         |
| 3.7                | 824.700002               | 0.003                 | 848.300000      | 0.002                 | 2.5         |
| 4.225              | 824.700002               | 0.003                 | 848.300000      | 0.002                 | 2.5         |

**Note:** The applicant defined the normal working voltage of the battery is from 3.7 Vdc to 4.225 Vdc.

### Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 26              |                       |                 |                       | Limit (ppm) |
|------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
|            | Channel Bandwidth: 3 MHz |                       |                 |                       |             |
|            | Low Channel              |                       | High Channel    |                       |             |
|            | Frequency (MHz)          | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| -40        | 824.700004               | 0.004                 | 848.300000      | 0.004                 | 2.5         |
| -30        | 824.700004               | 0.005                 | 848.300000      | 0.003                 | 2.5         |
| -20        | 824.700004               | 0.004                 | 848.300000      | 0.002                 | 2.5         |
| -10        | 824.700004               | 0.005                 | 848.300000      | 0.002                 | 2.5         |
| 0          | 824.700004               | 0.005                 | 848.300000      | 0.003                 | 2.5         |
| 10         | 824.699998               | -0.003                | 848.300000      | -0.001                | 2.5         |
| 20         | 824.699998               | -0.003                | 848.300000      | -0.005                | 2.5         |
| 30         | 824.699997               | -0.004                | 848.300000      | -0.003                | 2.5         |
| 40         | 824.699998               | -0.003                | 848.300000      | -0.001                | 2.5         |
| 50         | 824.699998               | -0.002                | 848.300000      | -0.003                | 2.5         |
| 60         | 824.699999               | -0.002                | 848.300000      | -0.001                | 2.5         |
| 70         | 824.699999               | -0.002                | 848.300000      | -0.002                | 2.5         |
| 75         | 824.699998               | -0.002                | 848.300000      | -0.002                | 2.5         |

### Frequency Error vs. Voltage

| Voltage<br>(Volts) | LTE Band 26              |                       |                 |                       | Limit (ppm) |
|--------------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
|                    | Channel Bandwidth: 5 MHz |                       |                 |                       |             |
|                    | Low Channel              |                       | High Channel    |                       |             |
|                    | Frequency (MHz)          | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| 3.145              | 824.700001               | 0.001                 | 848.300000      | 0.003                 | 2.5         |
| 3.7                | 824.700003               | 0.003                 | 848.300000      | 0.005                 | 2.5         |
| 4.225              | 824.700001               | 0.001                 | 848.300000      | 0.004                 | 2.5         |

**Note:** The applicant defined the normal working voltage of the battery is from 3.7 Vdc to 4.225 Vdc.

### Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 26              |                       |                 |                       | Limit (ppm) |
|------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
|            | Channel Bandwidth: 5 MHz |                       |                 |                       |             |
|            | Low Channel              |                       | High Channel    |                       |             |
|            | Frequency (MHz)          | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| -40        | 824.700004               | 0.004                 | 848.300000      | 0.003                 | 2.5         |
| -30        | 824.700002               | 0.002                 | 848.300000      | 0.001                 | 2.5         |
| -20        | 824.700002               | 0.003                 | 848.300000      | 0.001                 | 2.5         |
| -10        | 824.700002               | 0.003                 | 848.300000      | 0.001                 | 2.5         |
| 0          | 824.700003               | 0.004                 | 848.300000      | 0.001                 | 2.5         |
| 10         | 824.699998               | -0.002                | 848.300000      | -0.004                | 2.5         |
| 20         | 824.699997               | -0.004                | 848.300000      | -0.003                | 2.5         |
| 30         | 824.699996               | -0.005                | 848.300000      | -0.004                | 2.5         |
| 40         | 824.699997               | -0.004                | 848.300000      | -0.003                | 2.5         |
| 50         | 824.699998               | -0.003                | 848.300000      | -0.001                | 2.5         |
| 60         | 824.699998               | -0.003                | 848.300000      | -0.004                | 2.5         |
| 70         | 824.699997               | -0.004                | 848.300000      | -0.002                | 2.5         |
| 75         | 824.699996               | -0.005                | 848.300000      | -0.004                | 2.5         |

### Frequency Error vs. Voltage

| Voltage<br>(Volts) | LTE Band 26               |                       |                 |                       | Limit (ppm) |
|--------------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
|                    | Channel Bandwidth: 10 MHz |                       |                 |                       |             |
|                    | Low Channel               |                       | High Channel    |                       |             |
|                    | Frequency (MHz)           | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| 3.145              | 824.700002                | 0.003                 | 848.300000      | 0.004                 | 2.5         |
| 3.7                | 824.700003                | 0.003                 | 848.300000      | 0.001                 | 2.5         |
| 4.225              | 824.700003                | 0.004                 | 848.300000      | 0.004                 | 2.5         |

**Note:** The applicant defined the normal working voltage of the battery is from 3.7 Vdc to 4.225 Vdc.

### Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 26               |                       |                 |                       | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
|            | Channel Bandwidth: 10 MHz |                       |                 |                       |             |
|            | Low Channel               |                       | High Channel    |                       |             |
|            | Frequency (MHz)           | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| -40        | 824.700002                | 0.002                 | 848.300000      | 0.005                 | 2.5         |
| -30        | 824.700004                | 0.004                 | 848.300000      | 0.003                 | 2.5         |
| -20        | 824.700003                | 0.003                 | 848.300000      | 0.004                 | 2.5         |
| -10        | 824.700001                | 0.002                 | 848.300000      | 0.001                 | 2.5         |
| 0          | 824.700002                | 0.003                 | 848.300000      | 0.002                 | 2.5         |
| 10         | 824.699999                | -0.001                | 848.300000      | -0.004                | 2.5         |
| 20         | 824.699997                | -0.003                | 848.300000      | -0.001                | 2.5         |
| 30         | 824.699998                | -0.003                | 848.300000      | -0.002                | 2.5         |
| 40         | 824.699997                | -0.004                | 848.300000      | -0.002                | 2.5         |
| 50         | 824.699999                | -0.001                | 848.300000      | -0.001                | 2.5         |
| 60         | 824.699997                | -0.003                | 848.300000      | -0.002                | 2.5         |
| 70         | 824.699997                | -0.003                | 848.300000      | -0.002                | 2.5         |
| 75         | 824.699998                | -0.002                | 848.300000      | -0.003                | 2.5         |

### Frequency Error vs. Voltage

| Voltage<br>(Volts) | LTE Band 26               |                       |                 |                       | Limit (ppm) |
|--------------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
|                    | Channel Bandwidth: 15 MHz |                       |                 |                       |             |
|                    | Low Channel               |                       | High Channel    |                       |             |
|                    | Frequency (MHz)           | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| 3.145              | 824.700003                | 0.003                 | 848.300000      | 0.002                 | 2.5         |
| 3.7                | 824.700002                | 0.002                 | 848.300000      | 0.003                 | 2.5         |
| 4.225              | 824.700001                | 0.001                 | 848.300000      | 0.002                 | 2.5         |

**Note:** The applicant defined the normal working voltage of the battery is from 3.7 Vdc to 4.225 Vdc.

### Frequency Error vs. Temperature

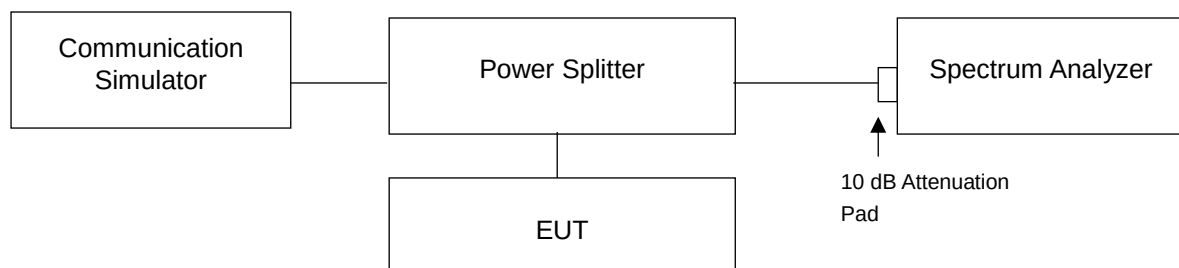
| Temp. (°C) | LTE Band 26               |                       |                 |                       | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
|            | Channel Bandwidth: 15 MHz |                       |                 |                       |             |
|            | Low Channel               |                       | High Channel    |                       |             |
|            | Frequency (MHz)           | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |             |
| -40        | 824.700004                | 0.004                 | 848.300000      | 0.001                 | 2.5         |
| -30        | 824.700004                | 0.004                 | 848.300000      | 0.004                 | 2.5         |
| -20        | 824.700002                | 0.002                 | 848.300000      | 0.004                 | 2.5         |
| -10        | 824.700004                | 0.005                 | 848.300000      | 0.003                 | 2.5         |
| 0          | 824.700002                | 0.003                 | 848.300000      | 0.003                 | 2.5         |
| 10         | 824.699996                | -0.005                | 848.300000      | -0.003                | 2.5         |
| 20         | 824.699998                | -0.003                | 848.300000      | -0.002                | 2.5         |
| 30         | 824.699996                | -0.005                | 848.300000      | -0.005                | 2.5         |
| 40         | 824.699999                | -0.001                | 848.300000      | -0.005                | 2.5         |
| 50         | 824.699998                | -0.002                | 848.300000      | -0.002                | 2.5         |
| 60         | 824.699996                | -0.005                | 848.300000      | -0.004                | 2.5         |
| 70         | 824.699999                | -0.001                | 848.300000      | -0.003                | 2.5         |
| 75         | 824.699997                | -0.003                | 848.300000      | -0.001                | 2.5         |

## 4.4 Occupied Bandwidth Measurement

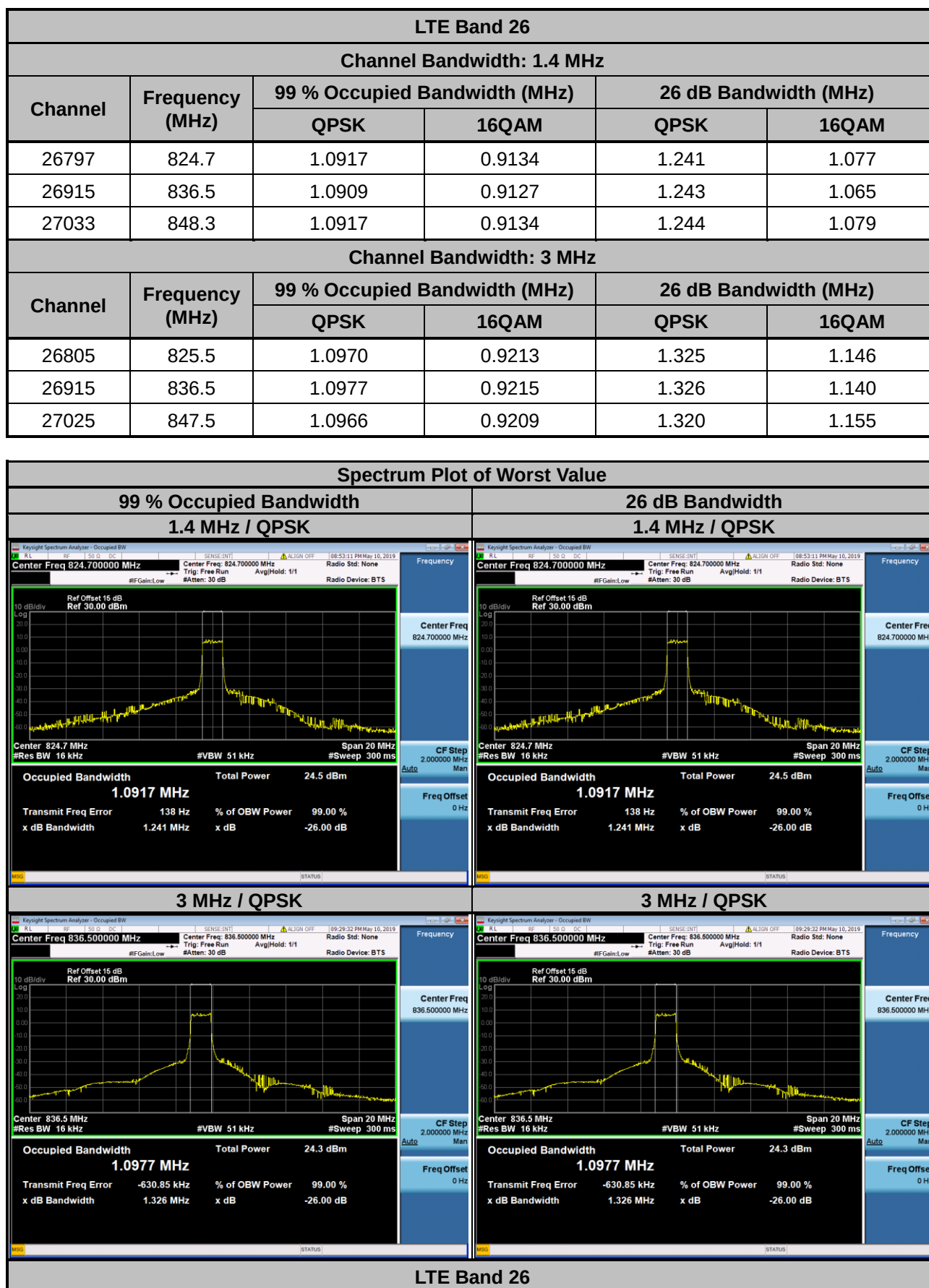
### 4.4.1 Test Procedure

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



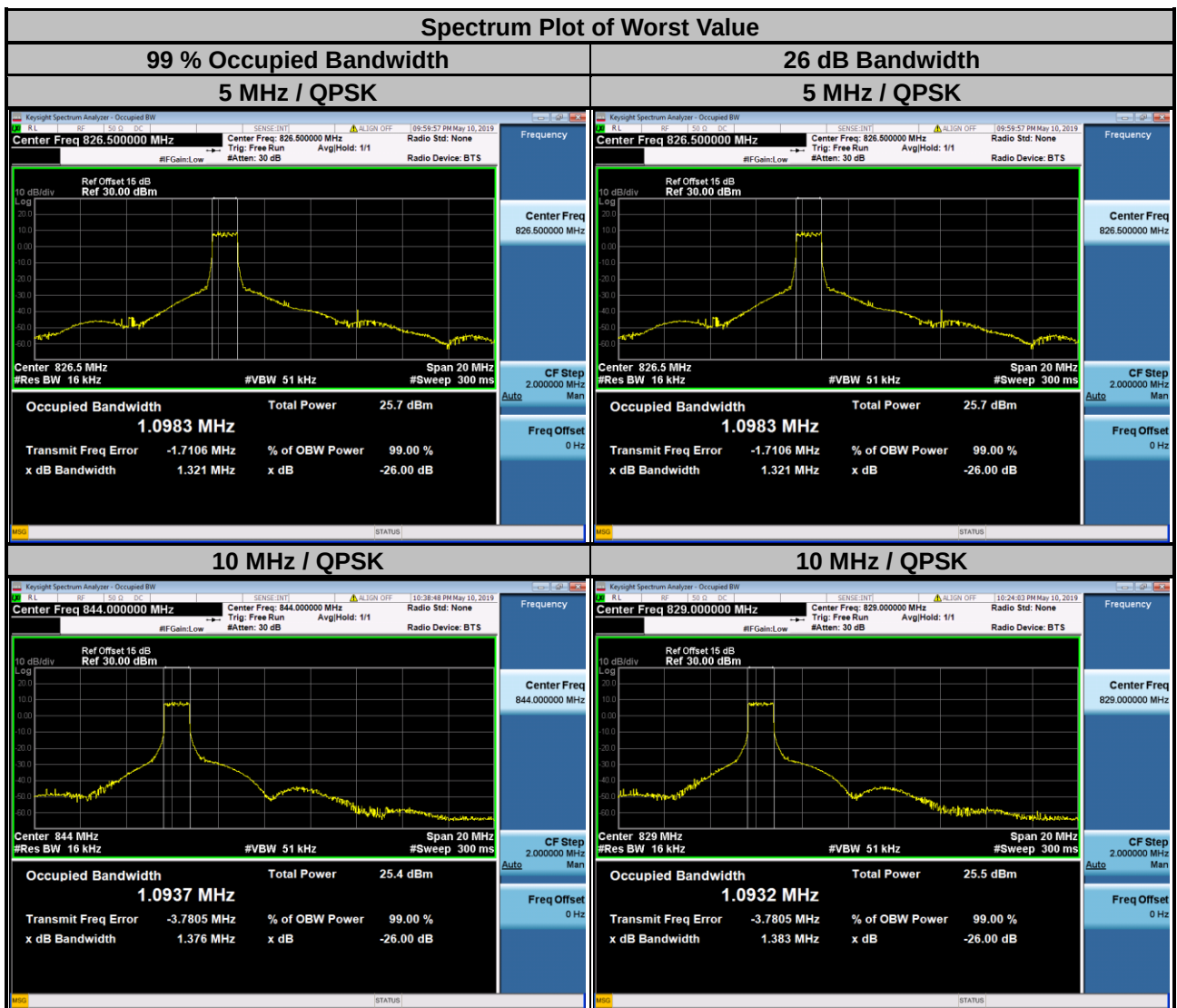
#### 4.4.3 Test Result



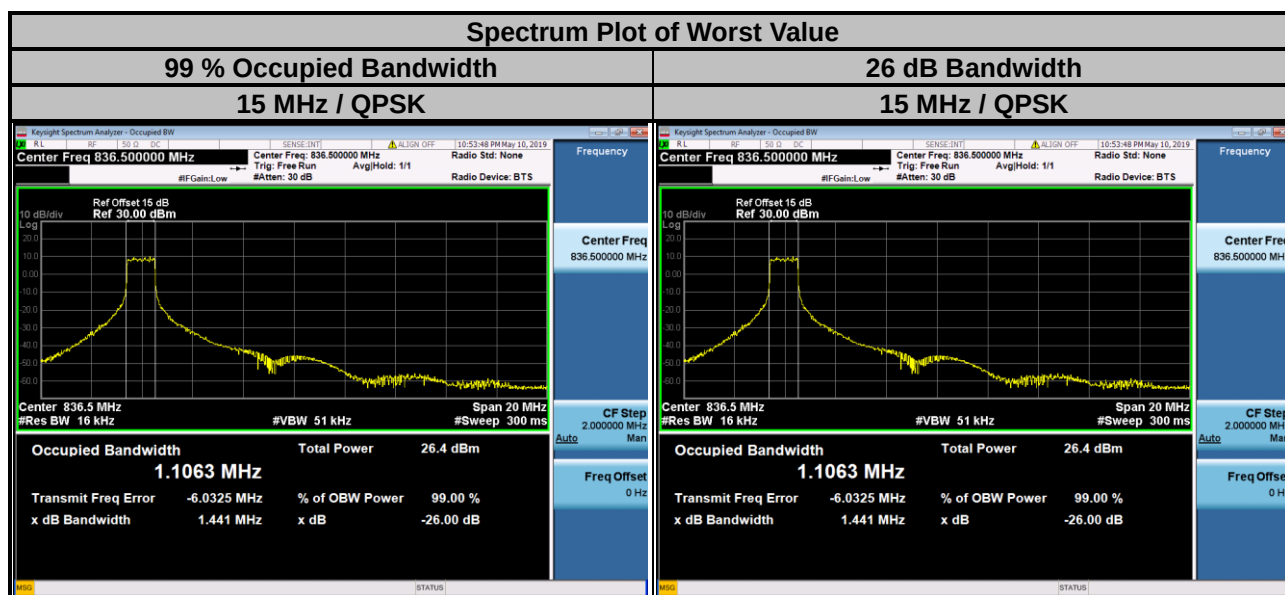
| Channel Bandwidth: 5 MHz |                 |                               |        |                       |       |
|--------------------------|-----------------|-------------------------------|--------|-----------------------|-------|
| Channel                  | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) |        | 26 dB Bandwidth (MHz) |       |
|                          |                 | QPSK                          | 16QAM  | QPSK                  | 16QAM |
| 26815                    | 826.5           | 1.0983                        | 0.9185 | 1.321                 | 1.150 |
| 26915                    | 836.5           | 1.0956                        | 0.9198 | 1.306                 | 1.148 |
| 27015                    | 846.5           | 1.0964                        | 0.9201 | 1.299                 | 1.159 |

| Channel Bandwidth: 10 MHz |                 |                               |        |                       |       |
|---------------------------|-----------------|-------------------------------|--------|-----------------------|-------|
| Channel                   | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) |        | 26 dB Bandwidth (MHz) |       |
|                           |                 | QPSK                          | 16QAM  | QPSK                  | 16QAM |
| 26840                     | 829.0           | 1.0932                        | 0.9159 | 1.383                 | 1.242 |
| 26915                     | 836.5           | 1.0932                        | 0.9161 | 1.371                 | 1.240 |
| 26990                     | 844.0           | 1.0937                        | 0.9164 | 1.376                 | 1.239 |



| LTE Band 26               |                 |                               |        |                       |       |
|---------------------------|-----------------|-------------------------------|--------|-----------------------|-------|
| Channel Bandwidth: 15 MHz |                 |                               |        |                       |       |
| Channel                   | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) |        | 26 dB Bandwidth (MHz) |       |
|                           |                 | QPSK                          | 16QAM  | QPSK                  | 16QAM |
| 26865                     | 831.5           | 1.1059                        | 0.9156 | 1.429                 | 1.216 |
| 26915                     | 836.5           | 1.1063                        | 0.9267 | 1.441                 | 1.286 |
| 26965                     | 841.5           | 1.1054                        | 0.9268 | 1.435                 | 1.288 |

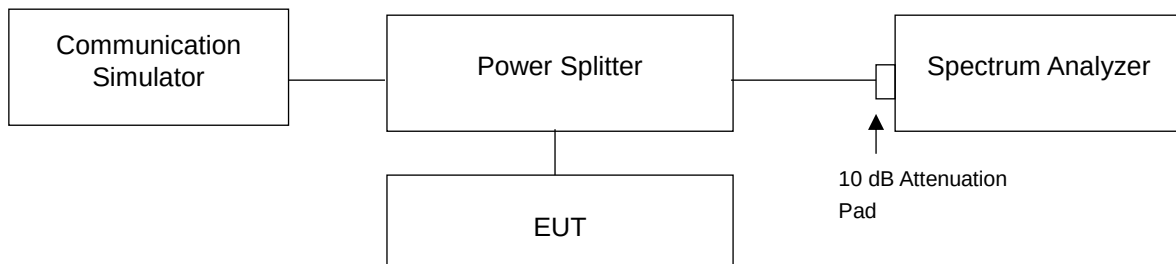


## 4.5 Band Edge Measurement

### 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.

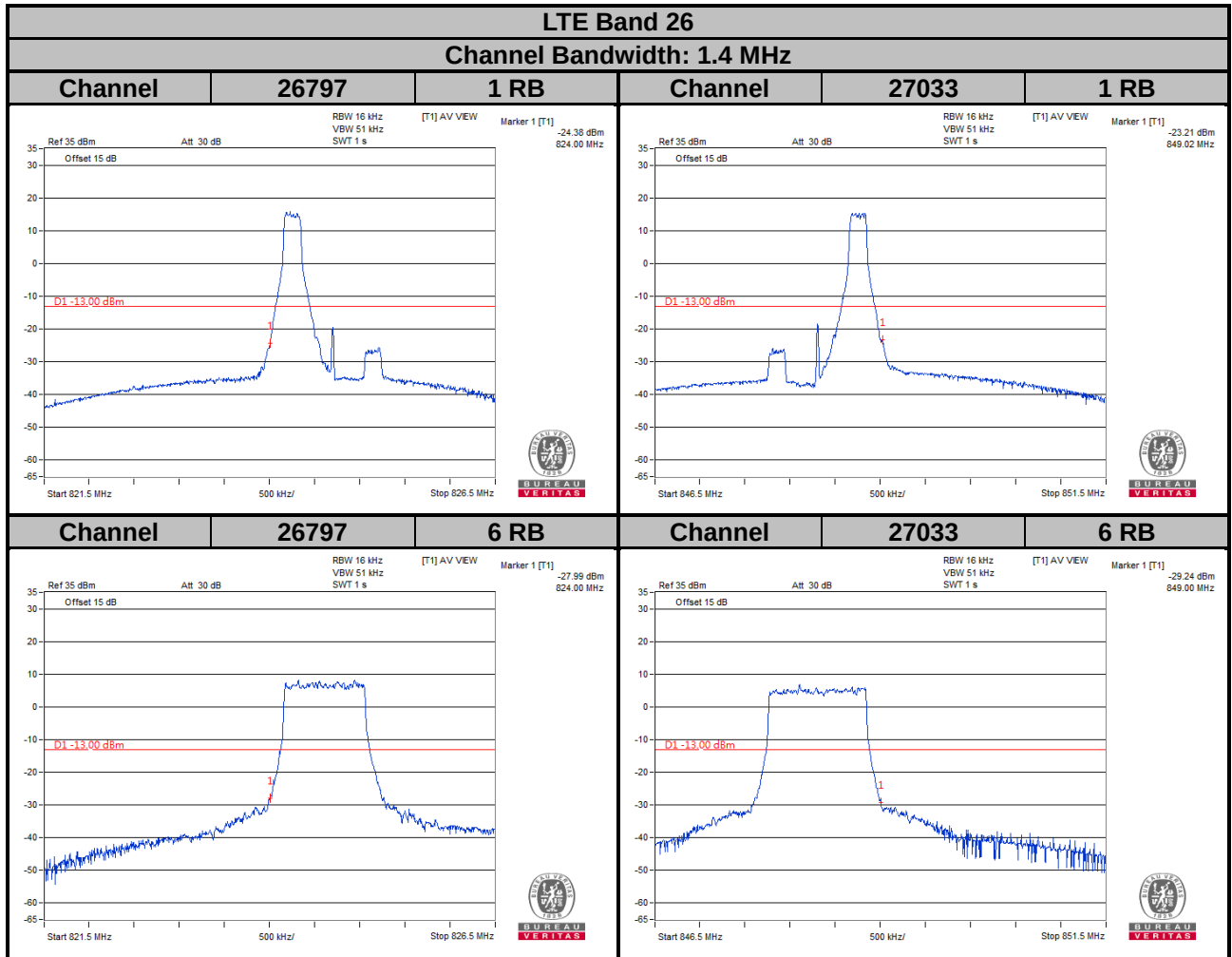
### 4.5.2 Test Setup

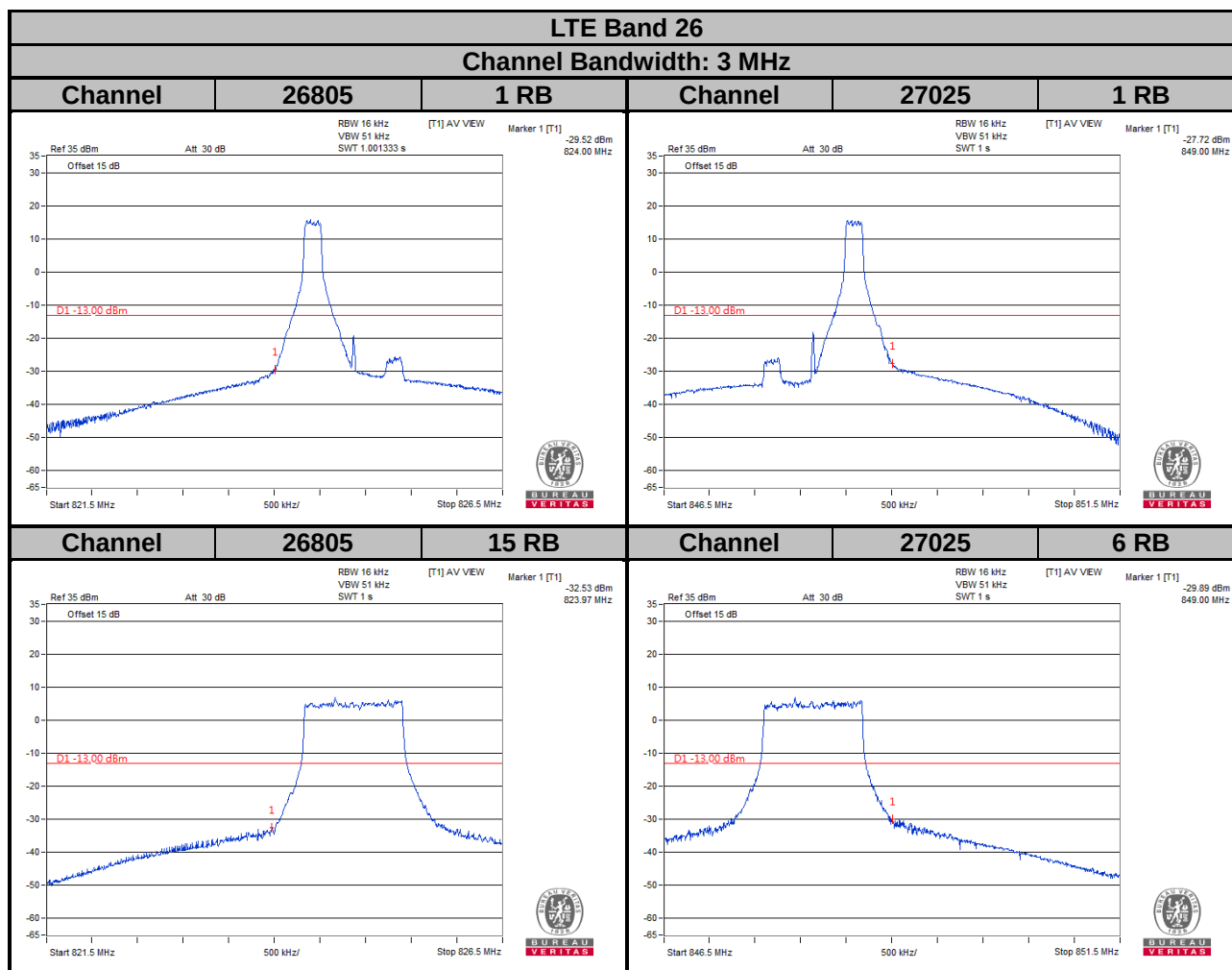


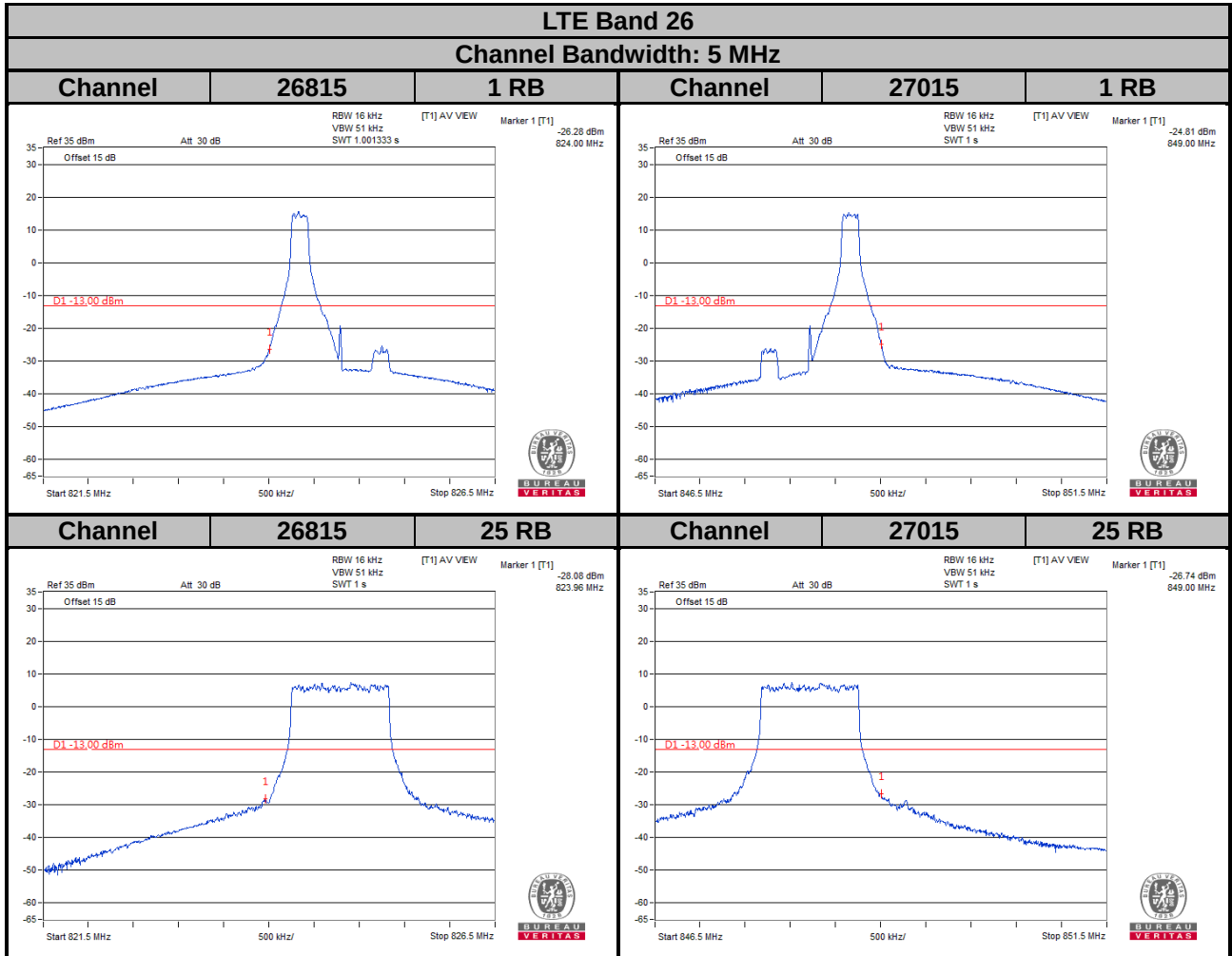
### 4.5.3 Test Procedures

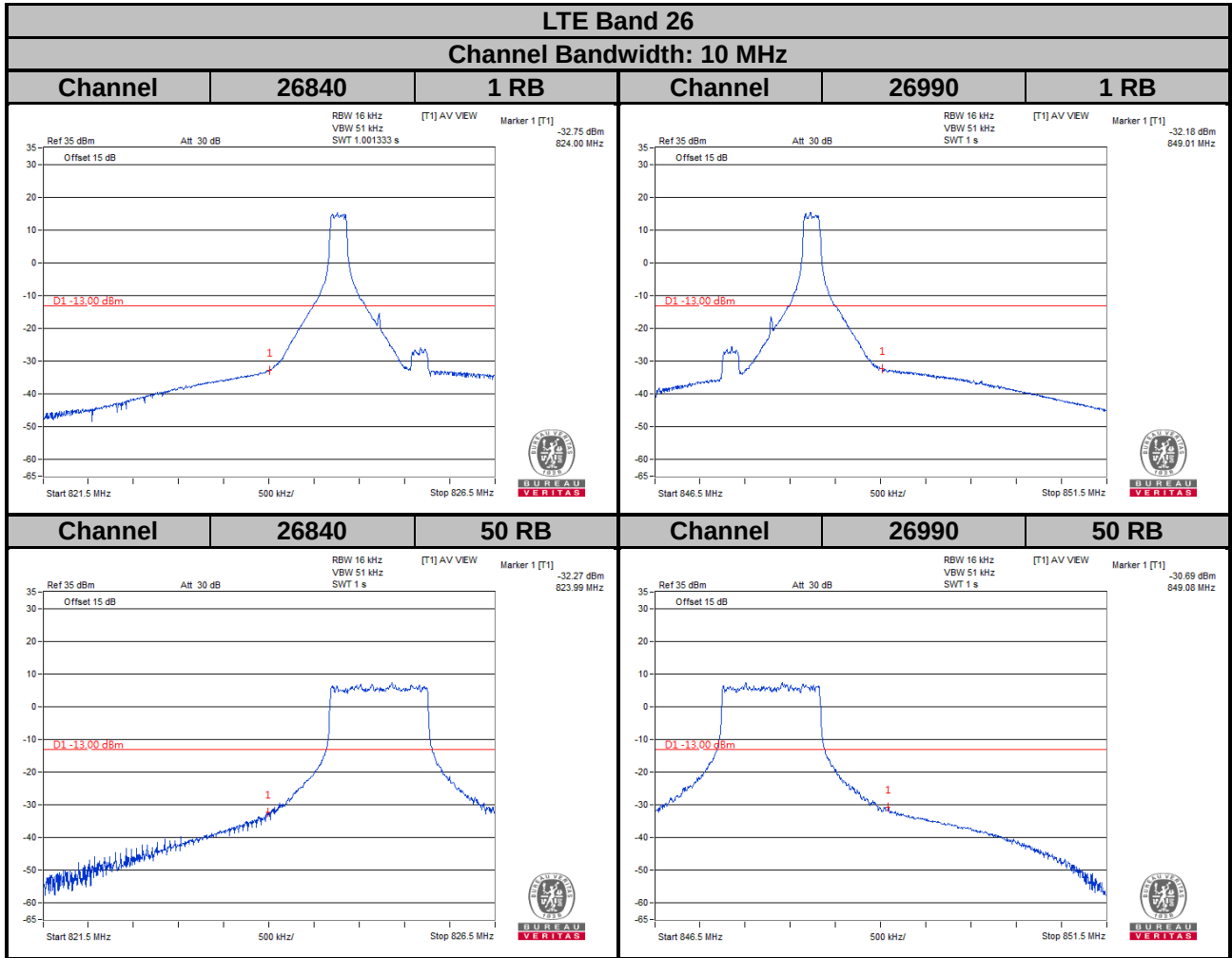
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 16 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 16 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 3 MHz).
- 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 5 MHz).
- 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 10 MHz).
- 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 15 MHz).
- Record the max trace plot into the test report.

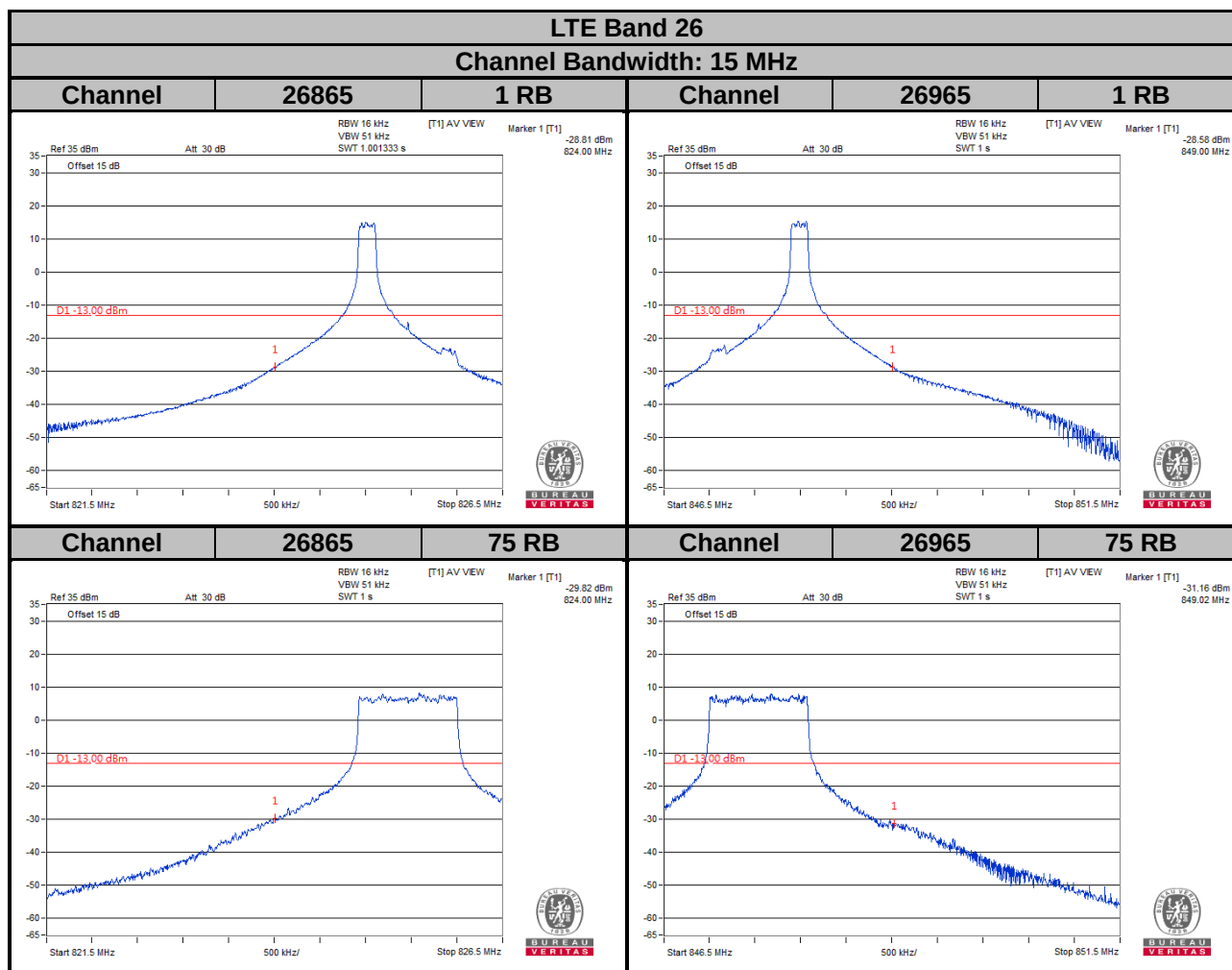
#### 4.5.4 Test Results









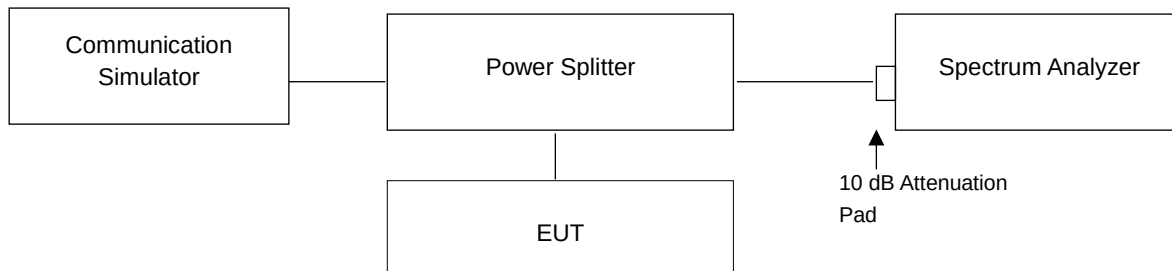


## 4.6 Peak to Average Ratio

### 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

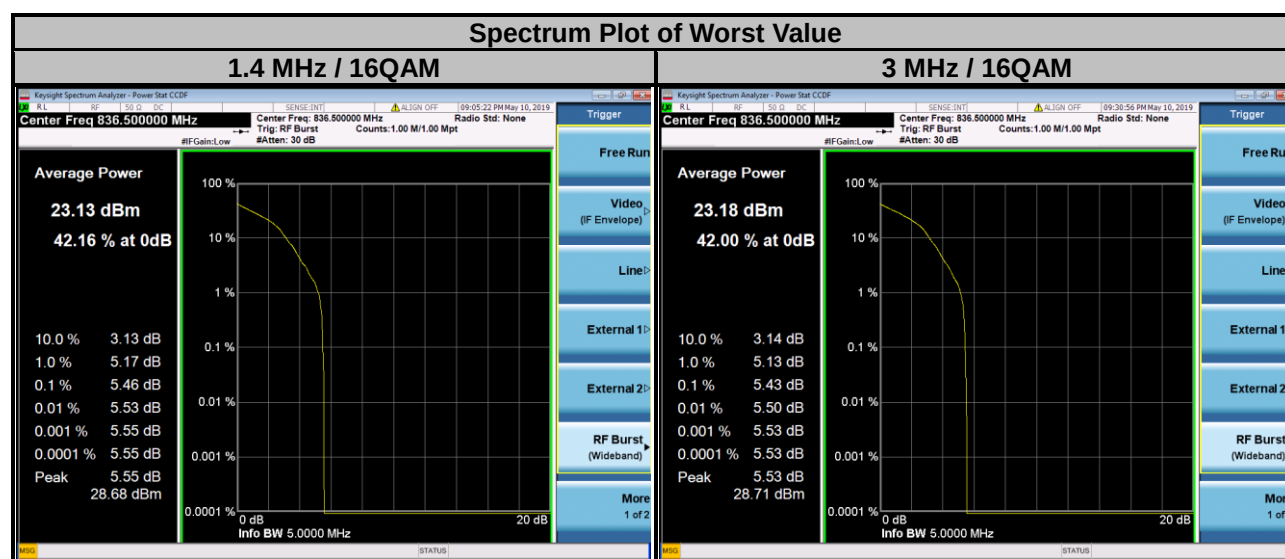


### 4.6.3 Test Procedures

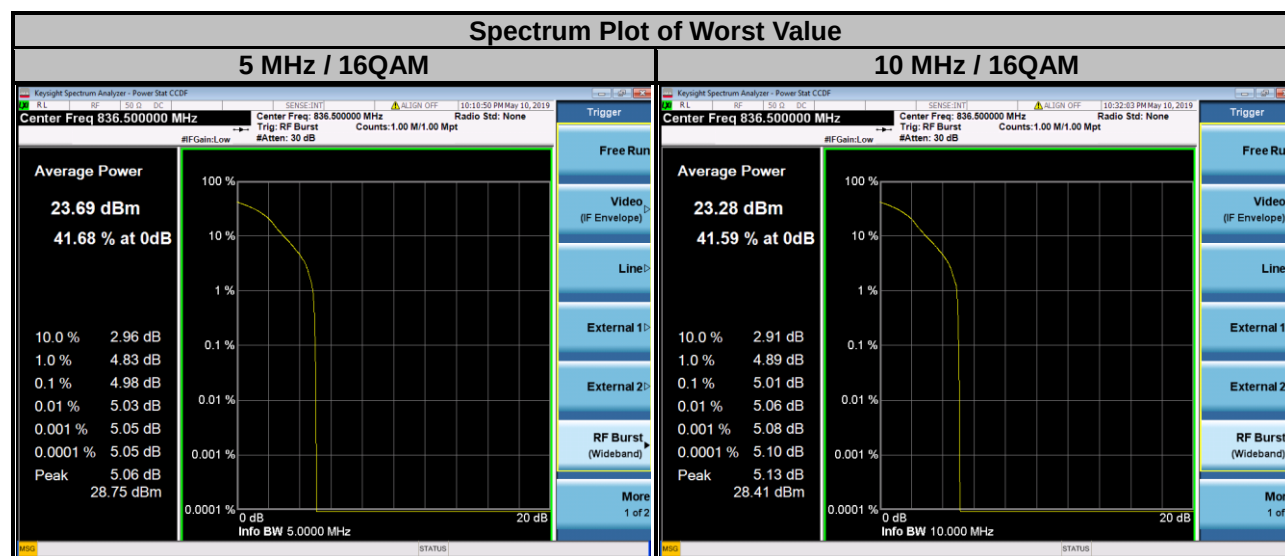
1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

#### 4.6.4 Test Results

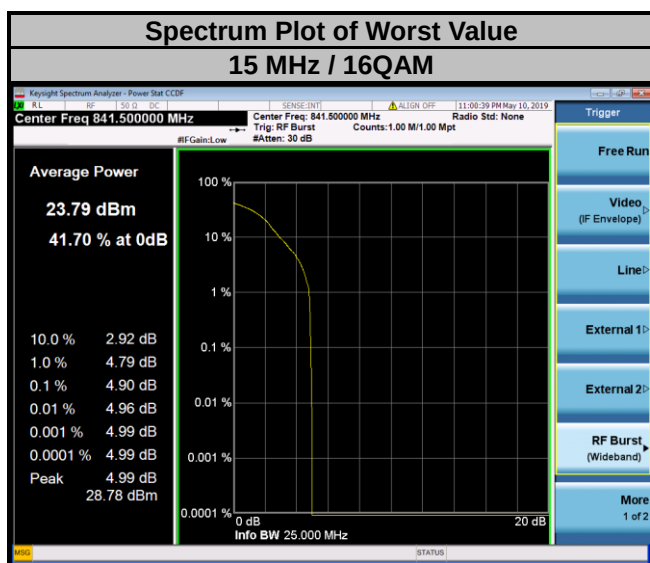
| LTE Band 26                |                 |                            |       |                          |                 |                            |       |
|----------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| 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 |
| 26797                      | 824.7           | 4.33                       | 5.38  | 26805                    | 825.5           | 4.29                       | 5.39  |
| 26915                      | 836.5           | 4.42                       | 5.46  | 26915                    | 836.5           | 4.39                       | 5.43  |
| 27033                      | 848.3           | 4.39                       | 5.44  | 27025                    | 847.5           | 4.33                       | 5.42  |



| LTE Band 26              |                 |                            |       |                           |                 |                            |       |
|--------------------------|-----------------|----------------------------|-------|---------------------------|-----------------|----------------------------|-------|
| 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 |
| 26815                    | 826.5           | 4.44                       | 4.85  | 26840                     | 829.0           | 4.42                       | 4.84  |
| 26915                    | 836.5           | 4.53                       | 4.98  | 26915                     | 836.5           | 4.53                       | 5.01  |
| 27015                    | 846.5           | 4.51                       | 4.93  | 26990                     | 844.0           | 4.50                       | 4.90  |



| LTE Band 26               |                 |                            |       |
|---------------------------|-----------------|----------------------------|-------|
| Channel Bandwidth: 15 MHz |                 |                            |       |
| Channel                   | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|                           |                 | QPSK                       | 16QAM |
| 26865                     | 831.5           | 4.41                       | 4.41  |
| 26915                     | 836.5           | 4.47                       | 4.89  |
| 26965                     | 841.5           | 4.50                       | 4.90  |

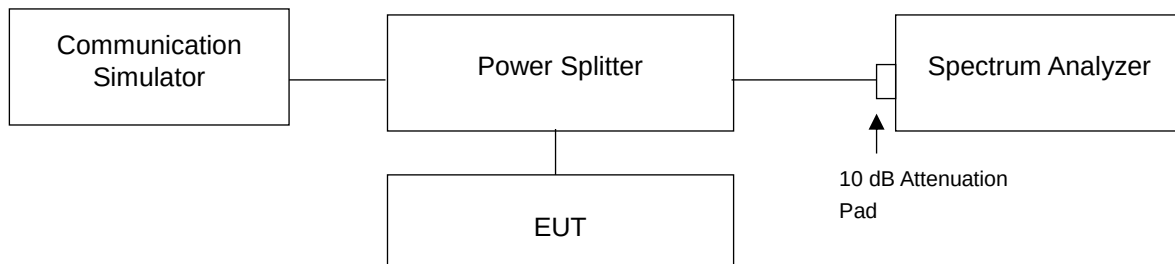


## 4.7 Conducted Spurious Emissions

### 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.

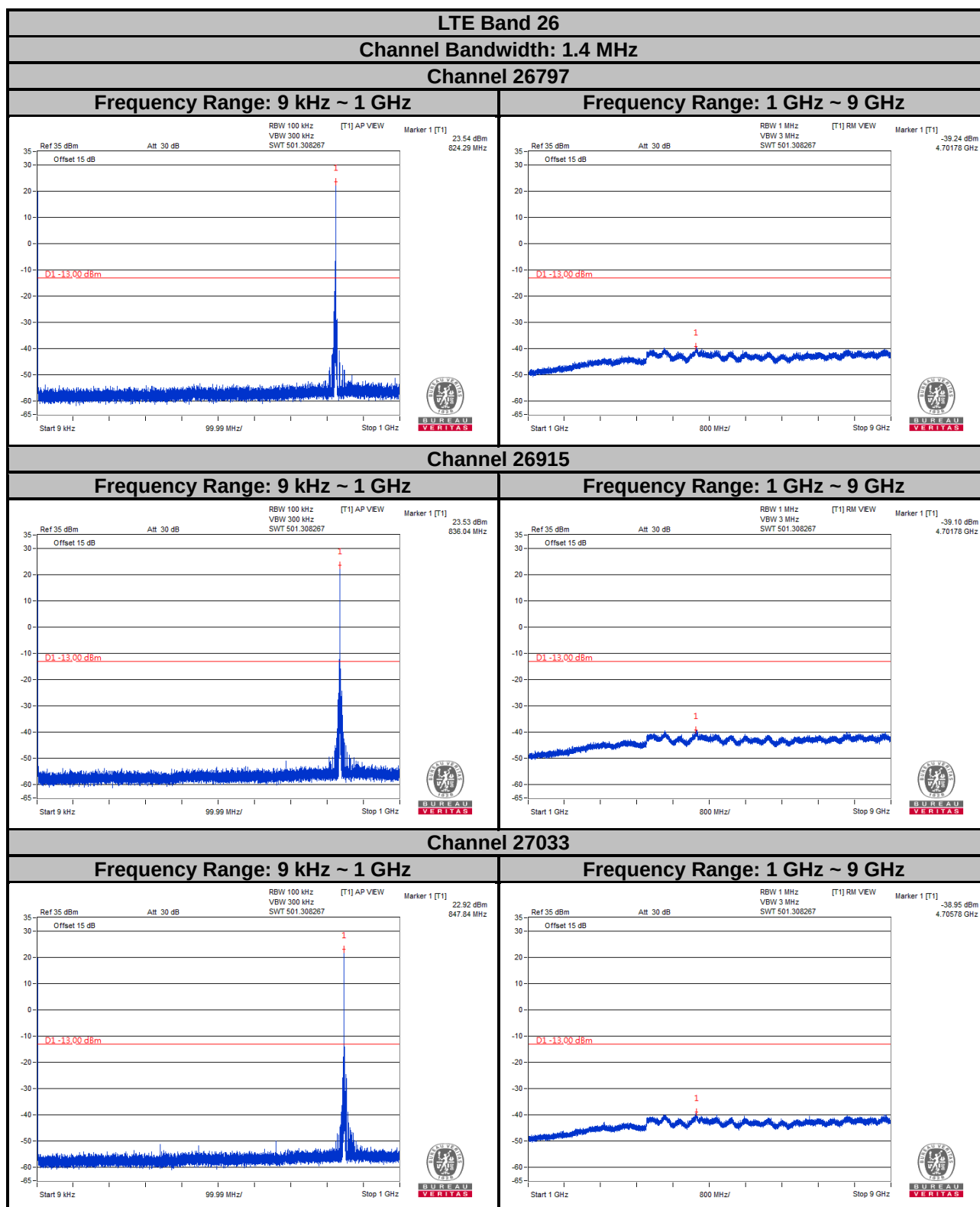
### 4.7.2 Test Setup



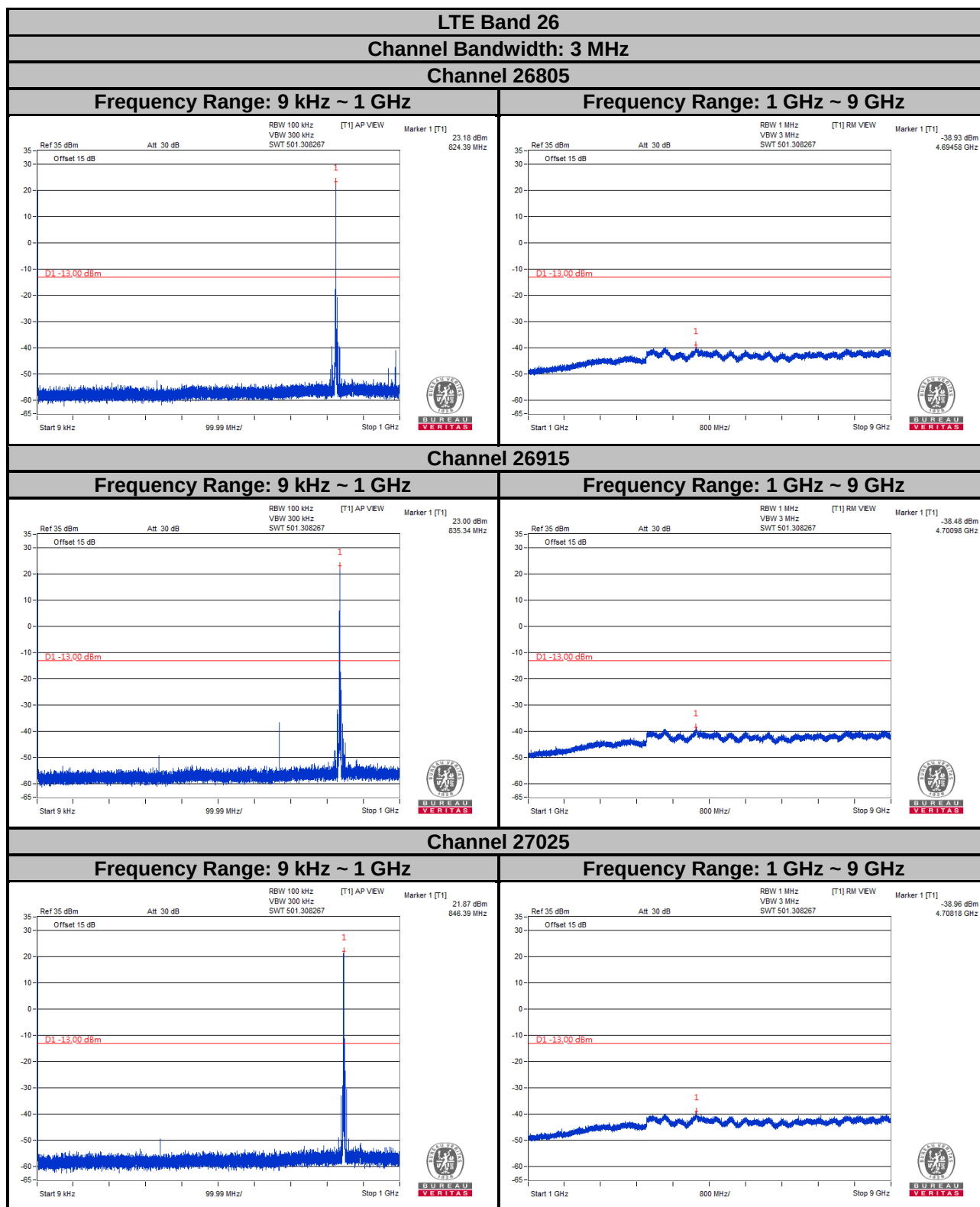
### 4.7.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
- Measuring frequency range is from 1 GHz to 9 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

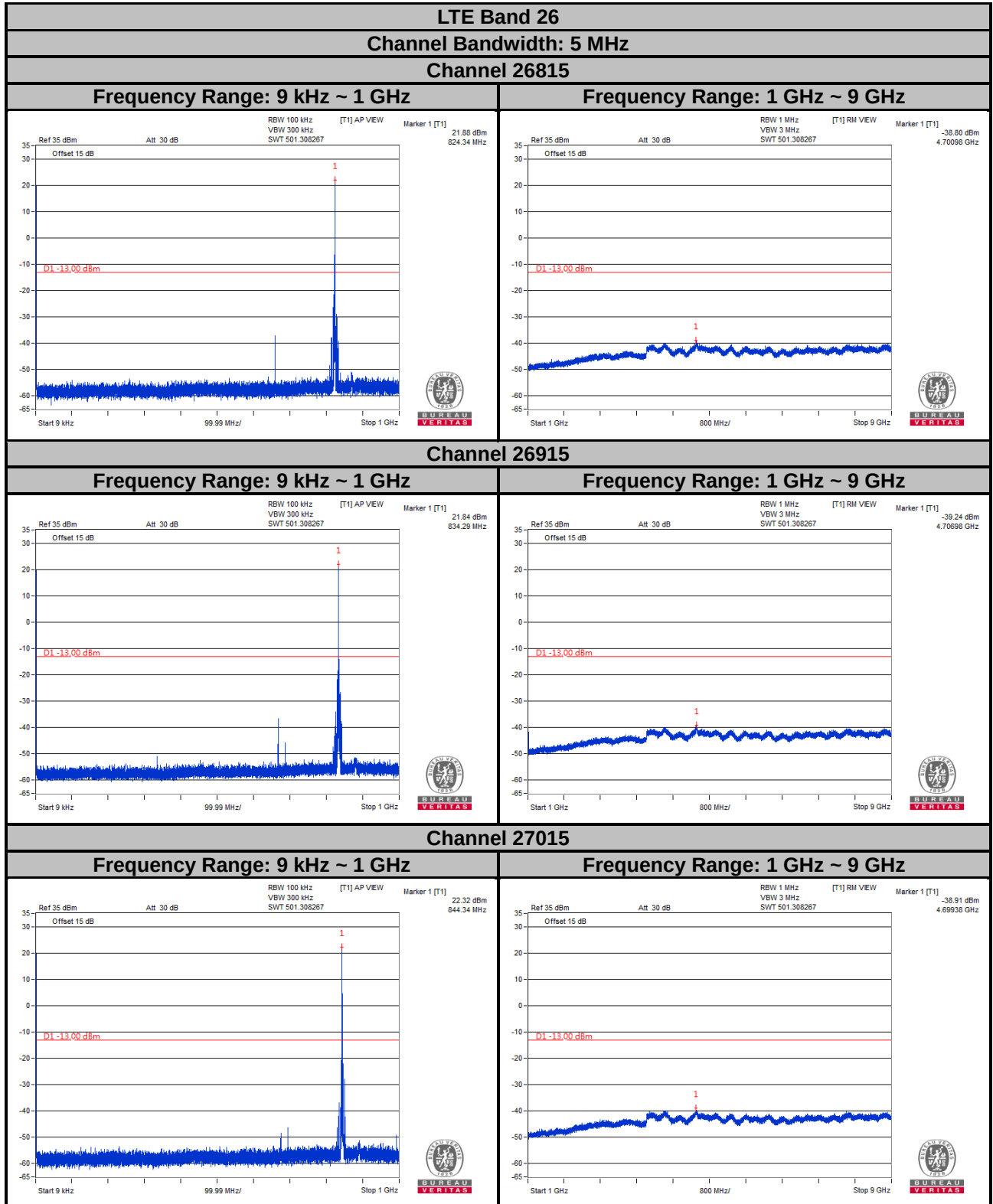
#### 4.7.4 Test Results



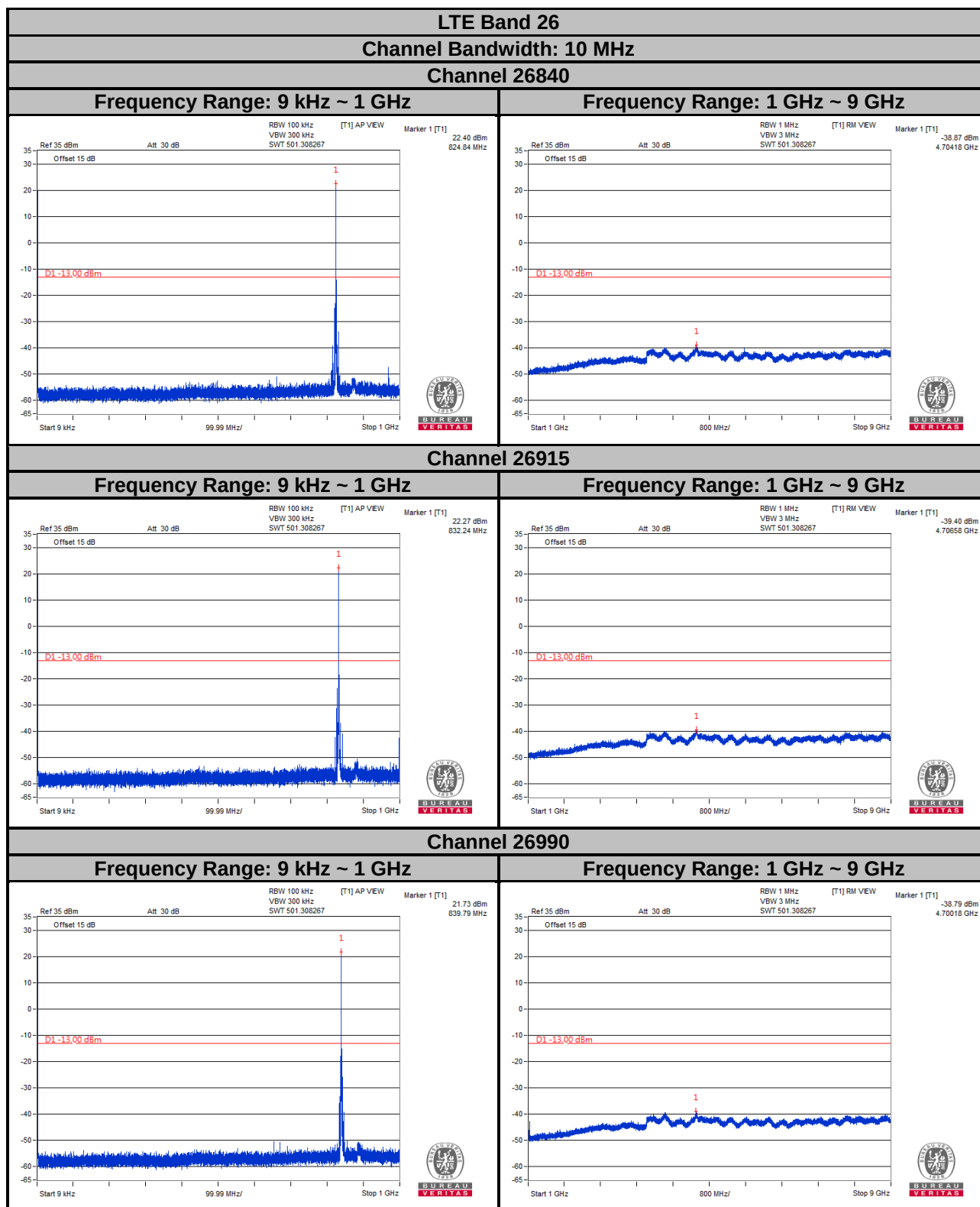
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



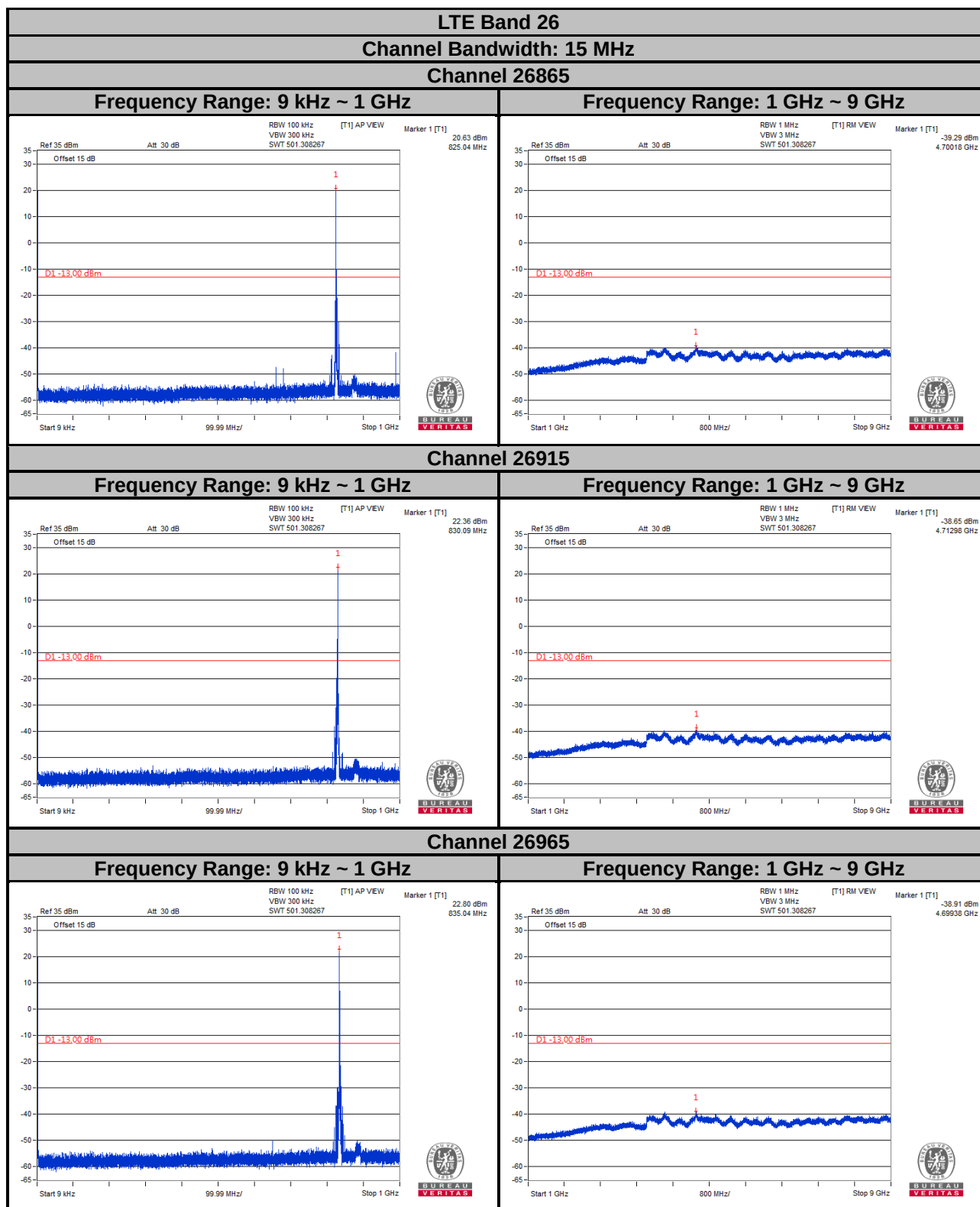
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.

## 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.

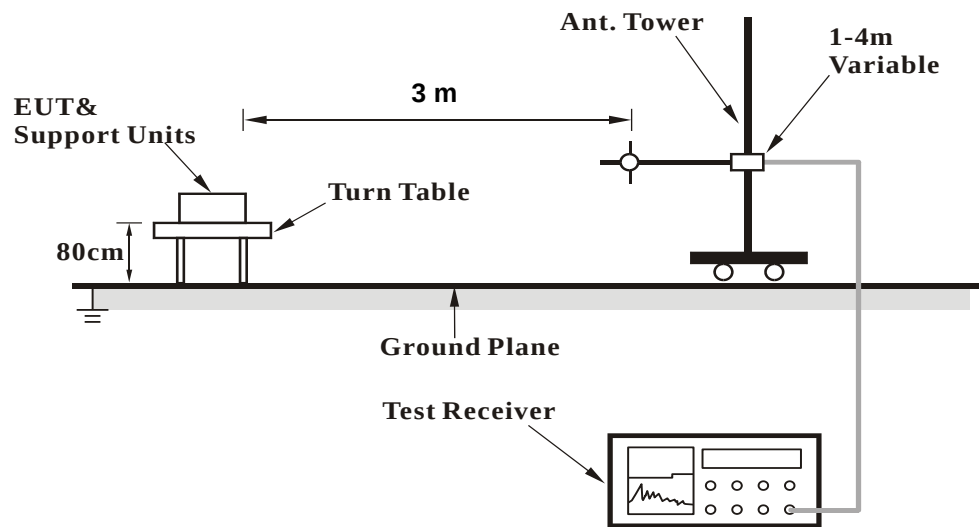
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

### 4.8.3 Deviation from Test Standard

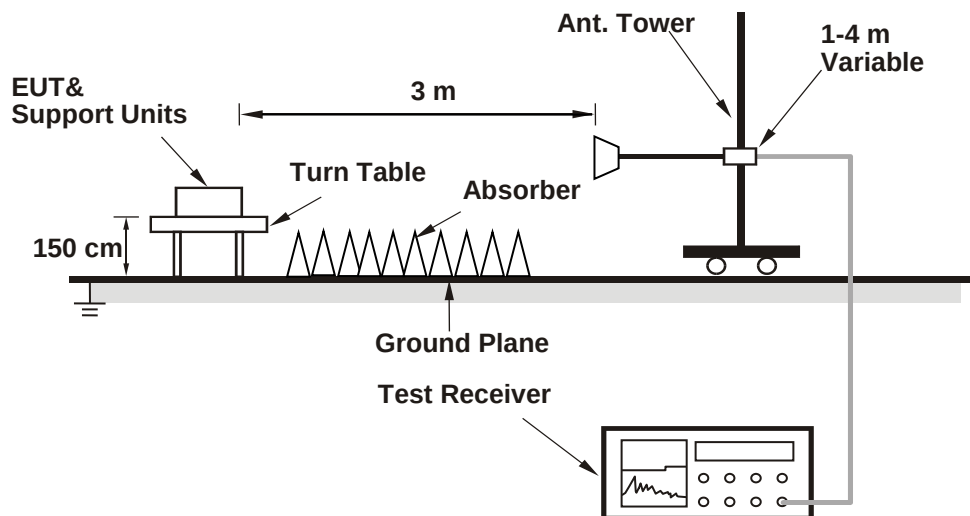
No deviation.

#### 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

LTE Band 26

Channel Bandwidth: 1.4 MHz / QPSK

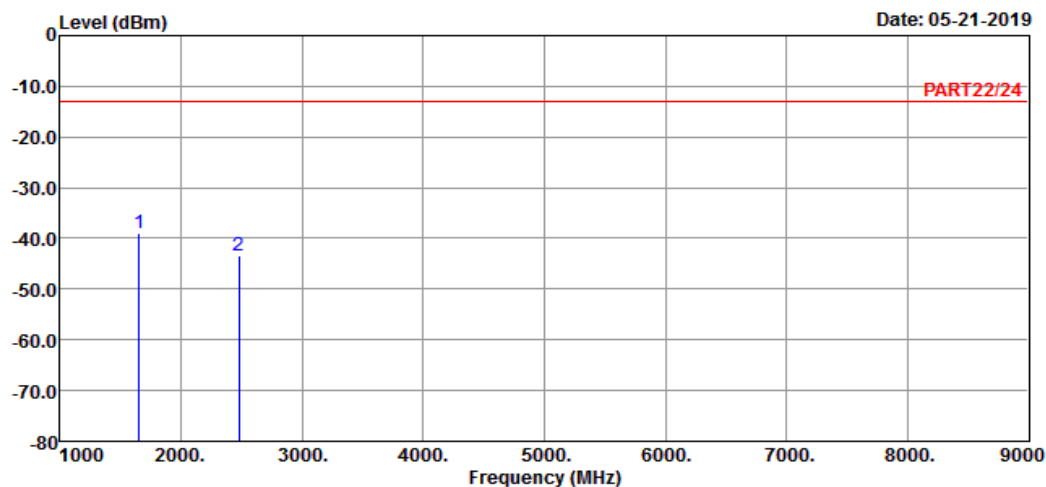
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_L-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1 pp | 1649.40 | -38.92 | -25.18     | -13.00 | -13.74      | -25.92     | Peak   |
| 2    | 2474.10 | -43.33 | -33.31     | -13.00 | -10.02      | -30.33     | Peak   |

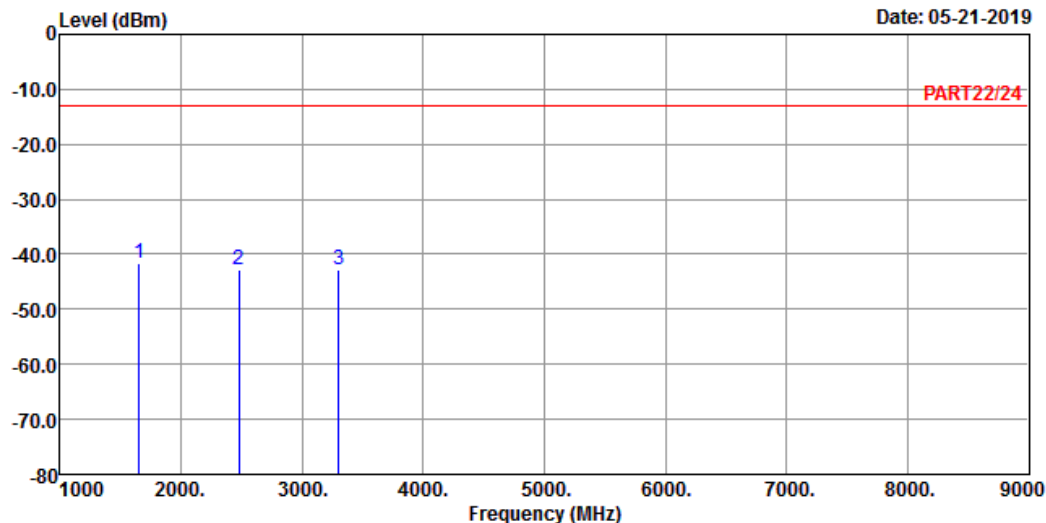


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_L-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1 pp | 1649.40 | -41.58 | -27.84     | -13.00 | -13.74      | -28.58     | Peak   |
| 2    | 2474.10 | -42.88 | -32.86     | -13.00 | -10.02      | -29.88     | Peak   |
| 3    | 3298.80 | -42.76 | -33.90     | -13.00 | -8.86       | -29.76     | Peak   |

# Middle Channel

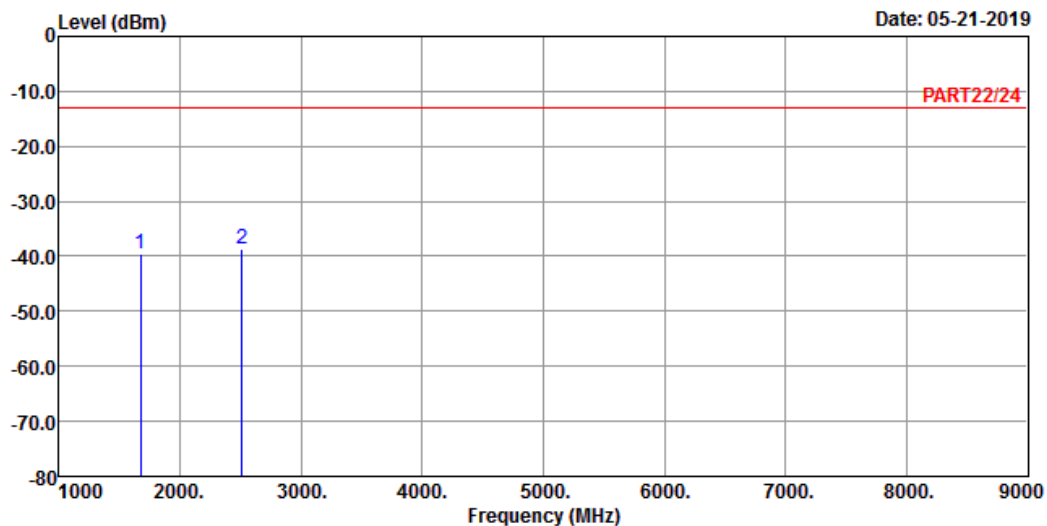


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 05-21-2019



Site : 966 Chamber 5  
Condition: PART22/24 HORIZONTAL  
Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_M-CH  
Tested by: Thomas Wei

|      |         |        | Read   | Limit  |        | Over   |        |
|------|---------|--------|--------|--------|--------|--------|--------|
|      | Freq    | Level  | Level  | Line   | Factor | Limit  | Remark |
|      | MHz     | dBm    | dBm    | dBm    | dB     | dB     |        |
| 1    | 1673.00 | -39.54 | -25.64 | -13.00 | -13.90 | -26.54 | Peak   |
| 2 pp | 2509.50 | -38.58 | -28.50 | -13.00 | -10.08 | -25.58 | Peak   |

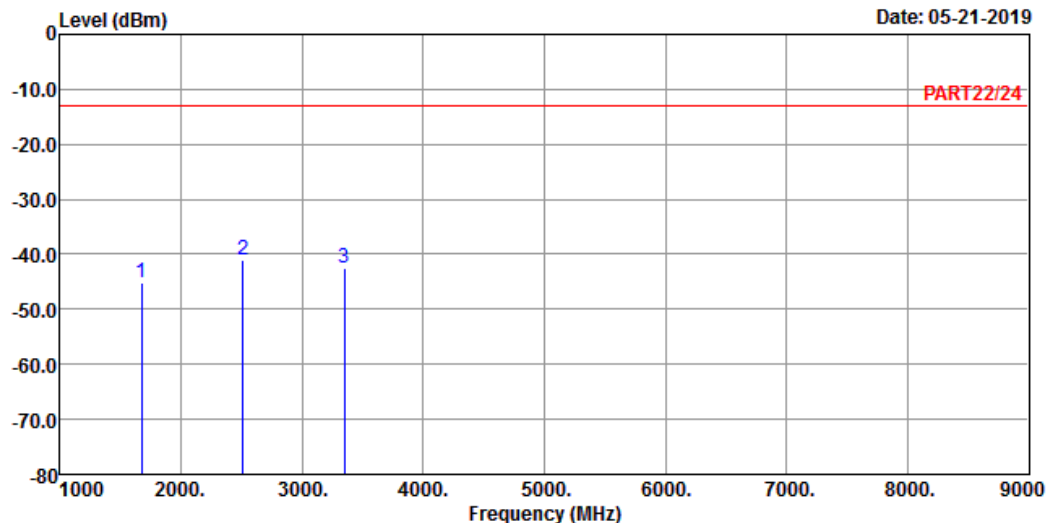


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_M-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1673.00 | -45.02 | -31.12     | -13.00 | -13.90      | -32.02     | Peak   |
| 2 pp | 2509.50 | -40.99 | -30.91     | -13.00 | -10.08      | -27.99     | Peak   |
| 3    | 3346.00 | -42.58 | -33.82     | -13.00 | -8.76       | -29.58     | Peak   |

# High Channel

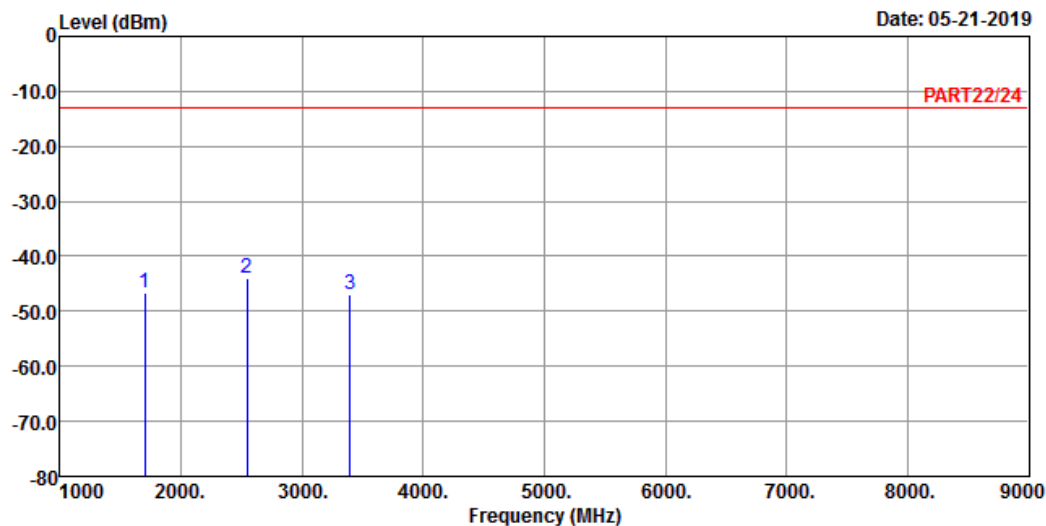


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_H-CH

Tested by: Thomas Wei

|      |         |        | Read   | Limit  |        | Over   |        |
|------|---------|--------|--------|--------|--------|--------|--------|
|      | Freq    | Level  | Level  | Line   | Factor | Limit  | Remark |
|      | MHz     | dBm    | dBm    | dBm    | dB     | dB     |        |
| 1    | 1696.60 | -46.69 | -32.67 | -13.00 | -14.02 | -33.69 | Peak   |
| 2 pp | 2544.90 | -43.95 | -33.89 | -13.00 | -10.06 | -30.95 | Peak   |
| 3    | 3393.20 | -46.92 | -38.32 | -13.00 | -8.60  | -33.92 | Peak   |

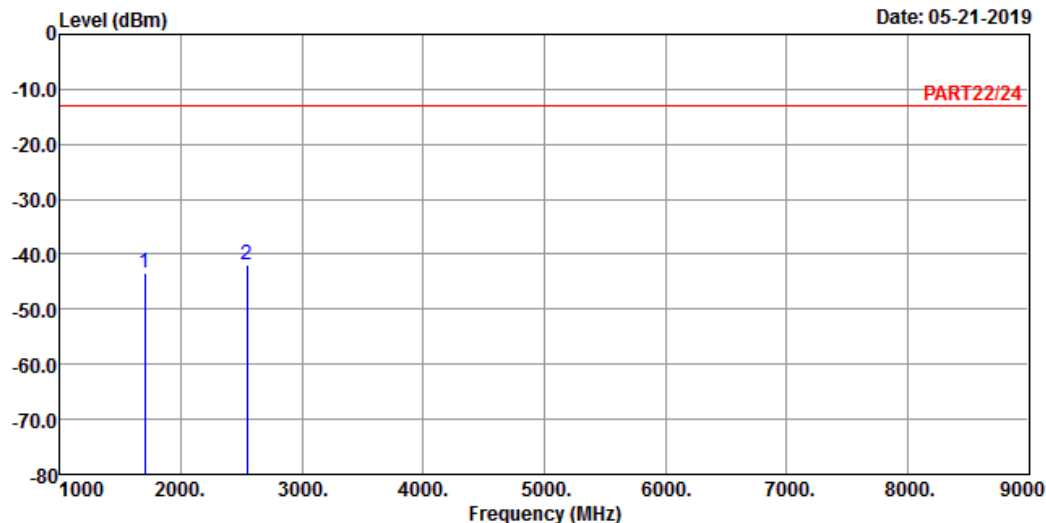


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_H-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1696.60 | -43.43 | -29.41     | -13.00 | -14.02      | -30.43     | Peak   |
| 2 pp | 2544.90 | -41.91 | -31.85     | -13.00 | -10.06      | -28.91     | Peak   |

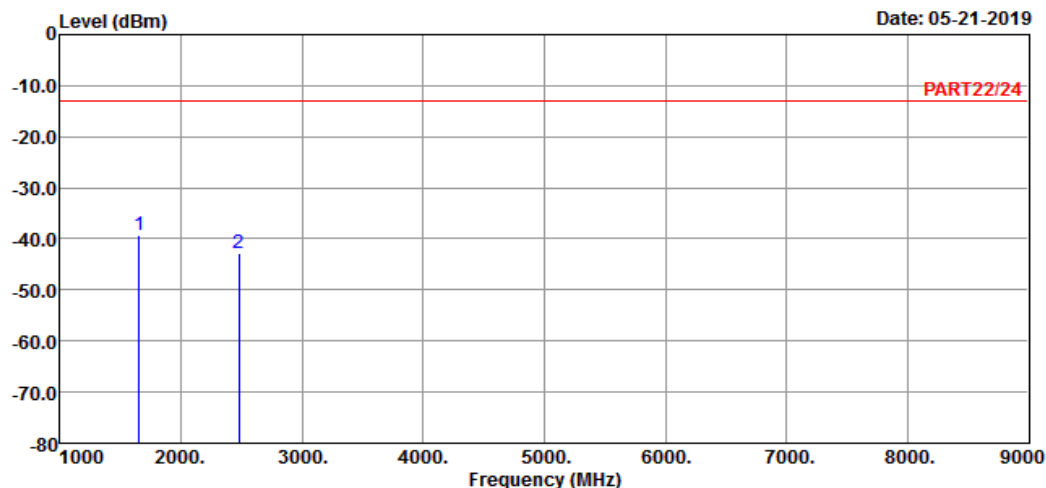
Channel Bandwidth: 5 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5  
Condition: PART22/24 HORIZONTAL  
Remak : Cat-M1 Band 26 QPSK\_5M Link\_L-CH  
Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit Line | Factor | Over Limit | Remark |
|------|---------|--------|------------|------------|--------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm        | dB     | dB         |        |
| 1 pp | 1653.00 | -39.37 | -25.60     | -13.00     | -13.77 | -26.37     | Peak   |
| 2    | 2479.50 | -42.68 | -32.65     | -13.00     | -10.03 | -29.68     | Peak   |

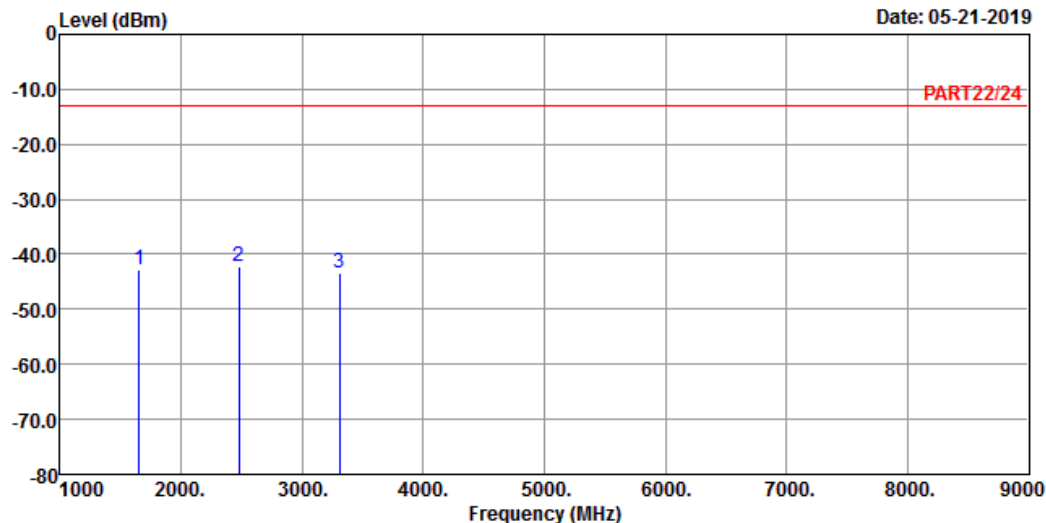


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_5M Link\_L-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1653.00 | -42.93 | -29.16     | -13.00 | -13.77      | -29.93     | Peak   |
| 2 pp | 2479.50 | -42.13 | -32.10     | -13.00 | -10.03      | -29.13     | Peak   |
| 3    | 3306.00 | -43.46 | -34.57     | -13.00 | -8.89       | -30.46     | Peak   |

# Middle Channel

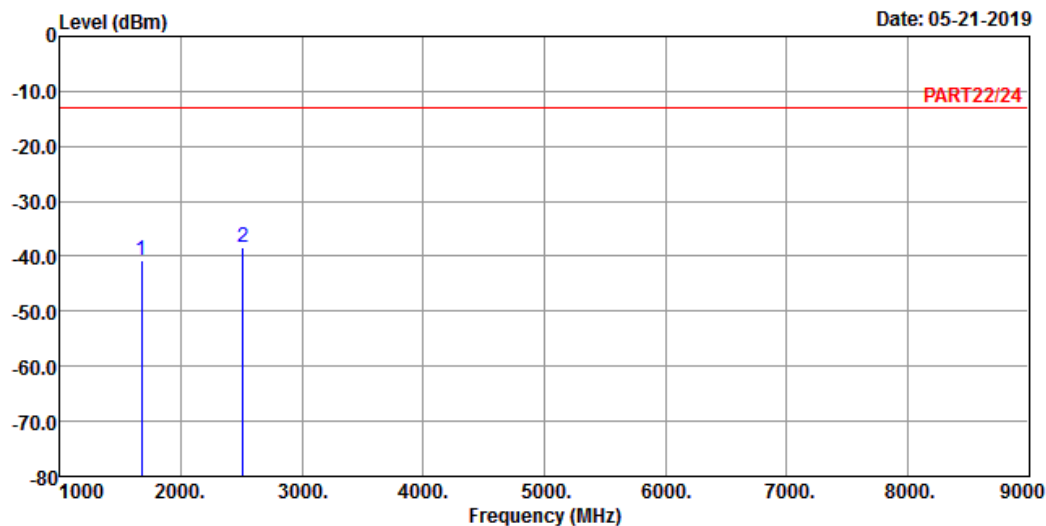


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : Cat-M1 Band 26 QPSK\_5M Link\_M-CH

Tested by: Thomas Wei

|      |         |        | Read   | Limit  |        | Over   |        |
|------|---------|--------|--------|--------|--------|--------|--------|
|      | Freq    | Level  | Level  | Line   | Factor | Limit  | Remark |
|      | MHz     | dBm    | dBm    | dBm    | dB     | dB     |        |
| 1    | 1673.00 | -40.65 | -26.75 | -13.00 | -13.90 | -27.65 | Peak   |
| 2 pp | 2509.50 | -38.24 | -28.16 | -13.00 | -10.08 | -25.24 | Peak   |

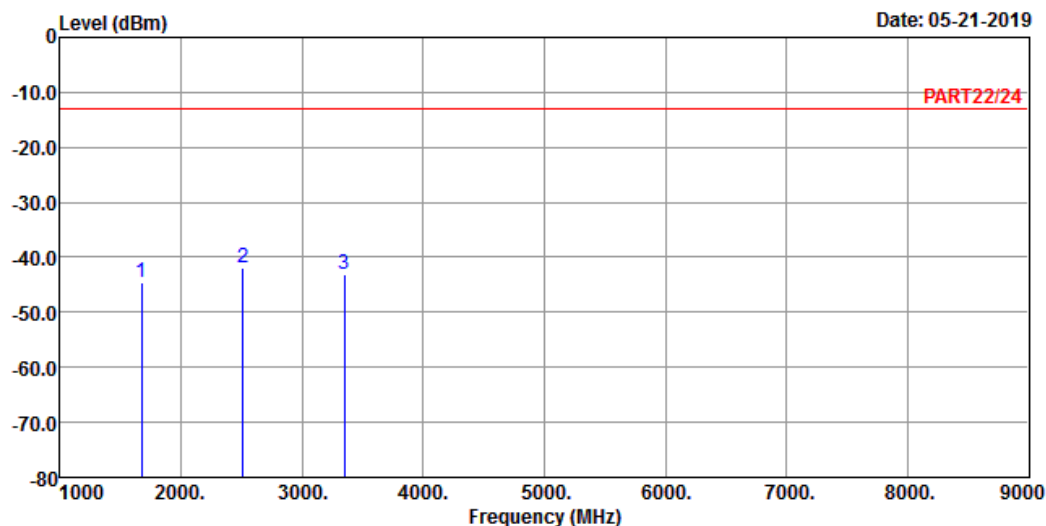


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_5M Link\_M-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1673.00 | -44.49 | -30.59     | -13.00 | -13.90      | -31.49     | Peak   |
| 2 pp | 2509.50 | -41.78 | -31.70     | -13.00 | -10.08      | -28.78     | Peak   |
| 3    | 3346.00 | -43.12 | -34.36     | -13.00 | -8.76       | -30.12     | Peak   |

# High Channel

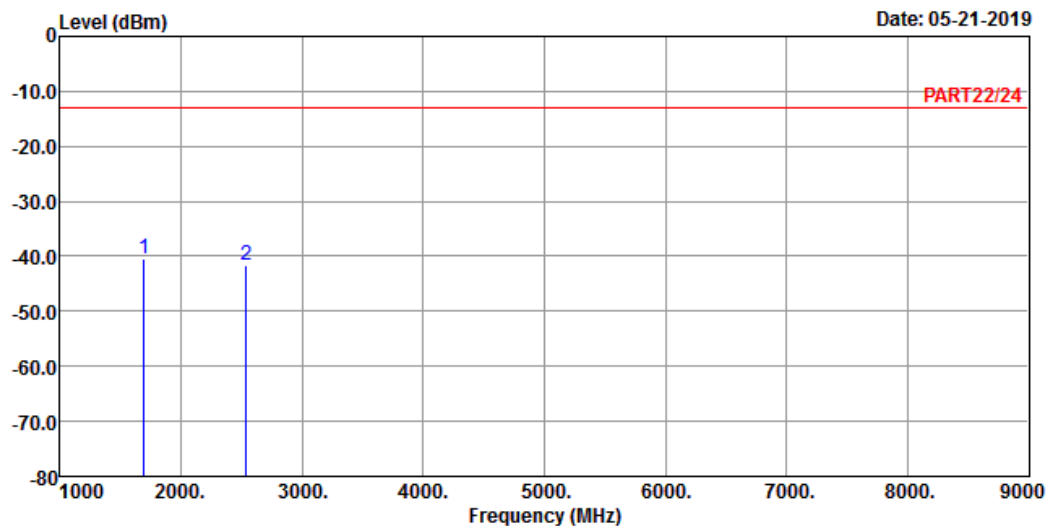


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : Cat-M1 Band 26 QPSK\_5M Link\_H-CH

Tested by: Thomas Wei

|      |       | Read  | Limit | Over   |              |
|------|-------|-------|-------|--------|--------------|
| Freq | Level | Level | Line  | Factor | Limit Remark |
| MHz  | dBm   | dBm   | dBm   | dB     | dB           |

|      |         |        |        |        |        |        |      |
|------|---------|--------|--------|--------|--------|--------|------|
| 1 pp | 1693.00 | -40.40 | -26.38 | -13.00 | -14.02 | -27.40 | Peak |
| 2    | 2539.50 | -41.62 | -31.56 | -13.00 | -10.06 | -28.62 | Peak |

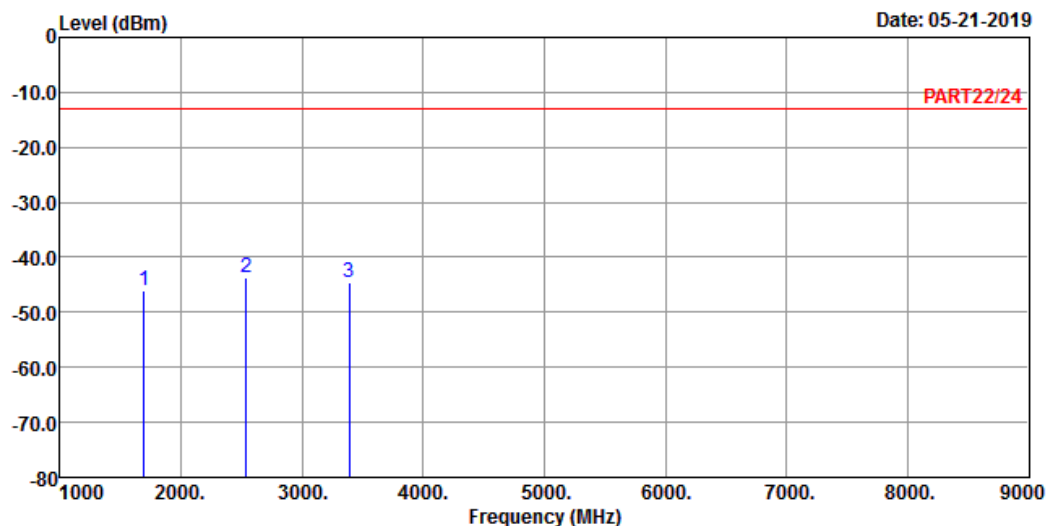


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_5M Link\_H-CH

Tested by: Thomas Wei

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1693.00 | -45.91 | -31.89     | -13.00 | -14.02      | -32.91     | Peak   |
| 2 pp | 2539.50 | -43.84 | -33.78     | -13.00 | -10.06      | -30.84     | Peak   |
| 3    | 3386.00 | -44.55 | -35.92     | -13.00 | -8.63       | -31.55     | Peak   |

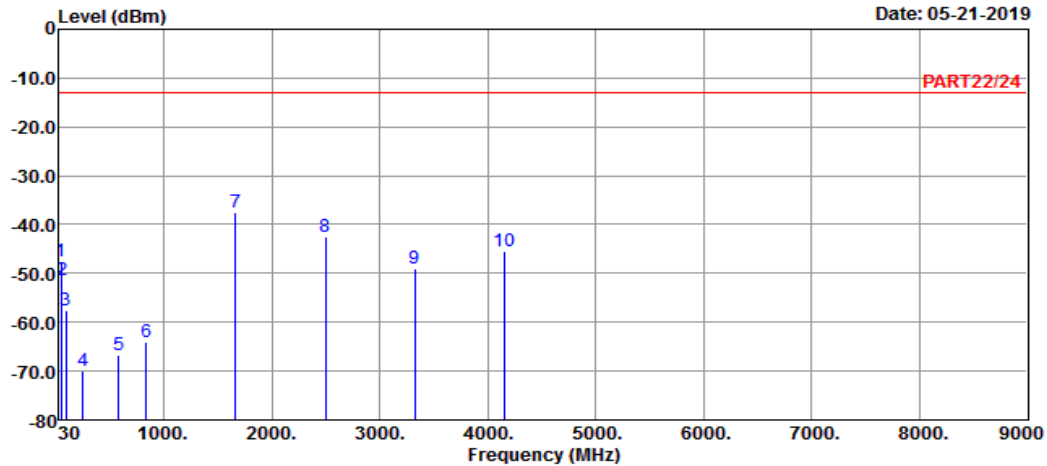
Channel Bandwidth: 15 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5  
Condition: PART22/24 HORIZONTAL  
Remak : Cat-M1 Band 26 QPSK\_15M Link\_L-CH  
Tested by: Getaz Yang

|      | Freq    | Level  | Read Level | Limit Line | Factor | Over Limit | Remark |
|------|---------|--------|------------|------------|--------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm        | dB     | dB         |        |
| 1    | 43.77   | -47.47 | -46.00     | -13.00     | -1.47  | -34.47     | Peak   |
| 2    | 52.95   | -51.48 | -45.67     | -13.00     | -5.81  | -38.48     | Peak   |
| 3    | 95.61   | -57.63 | -46.85     | -13.00     | -10.78 | -44.63     | Peak   |
| 4    | 248.97  | -69.98 | -63.95     | -13.00     | -6.03  | -56.98     | Peak   |
| 5    | 580.70  | -66.63 | -65.07     | -13.00     | -1.56  | -53.63     | Peak   |
| 6    | 836.90  | -63.97 | -64.37     | -13.00     | 0.40   | -50.97     | Peak   |
| 7 pp | 1663.00 | -37.47 | -23.64     | -13.00     | -13.83 | -24.47     | Peak   |
| 8    | 2494.50 | -42.60 | -32.54     | -13.00     | -10.06 | -29.60     | Peak   |
| 9    | 3326.00 | -49.01 | -40.18     | -13.00     | -8.83  | -36.01     | Peak   |
| 10   | 4157.50 | -45.44 | -39.58     | -13.00     | -5.86  | -32.44     | Peak   |

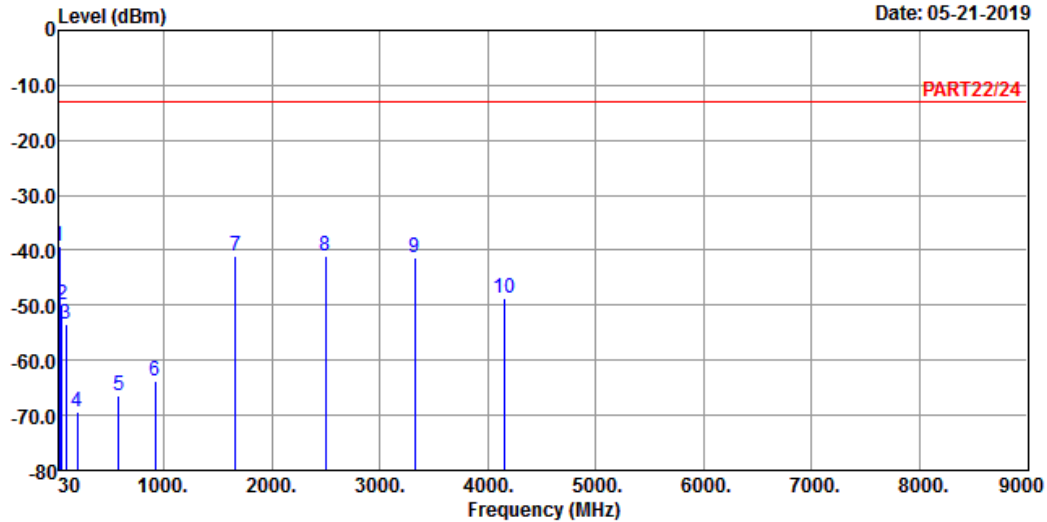


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_15M Link\_L-CH

Tested by: Getaz Yang

|      | Freq    | Level  | Read Level | Limit  | Over   |              |
|------|---------|--------|------------|--------|--------|--------------|
|      | MHz     | dBm    | dBm        | Line   | Factor | Limit Remark |
|      |         |        |            | dBm    | dB     | dB           |
| 1 pp | 31.62   | -39.23 | -38.63     | -13.00 | -0.60  | -26.23 Peak  |
| 2    | 52.95   | -49.87 | -44.06     | -13.00 | -5.81  | -36.87 Peak  |
| 3    | 95.07   | -53.29 | -42.45     | -13.00 | -10.84 | -40.29 Peak  |
| 4    | 198.21  | -69.32 | -61.49     | -13.00 | -7.83  | -56.32 Peak  |
| 5    | 582.80  | -66.49 | -65.01     | -13.00 | -1.48  | -53.49 Peak  |
| 6    | 921.60  | -63.78 | -64.88     | -13.00 | 1.10   | -50.78 Peak  |
| 7    | 1663.00 | -40.99 | -27.16     | -13.00 | -13.83 | -27.99 Peak  |
| 8    | 2494.50 | -40.99 | -30.93     | -13.00 | -10.06 | -27.99 Peak  |
| 9    | 3326.00 | -41.42 | -32.59     | -13.00 | -8.83  | -28.42 Peak  |
| 10   | 4157.50 | -48.65 | -42.79     | -13.00 | -5.86  | -35.65 Peak  |

# Middle Channel

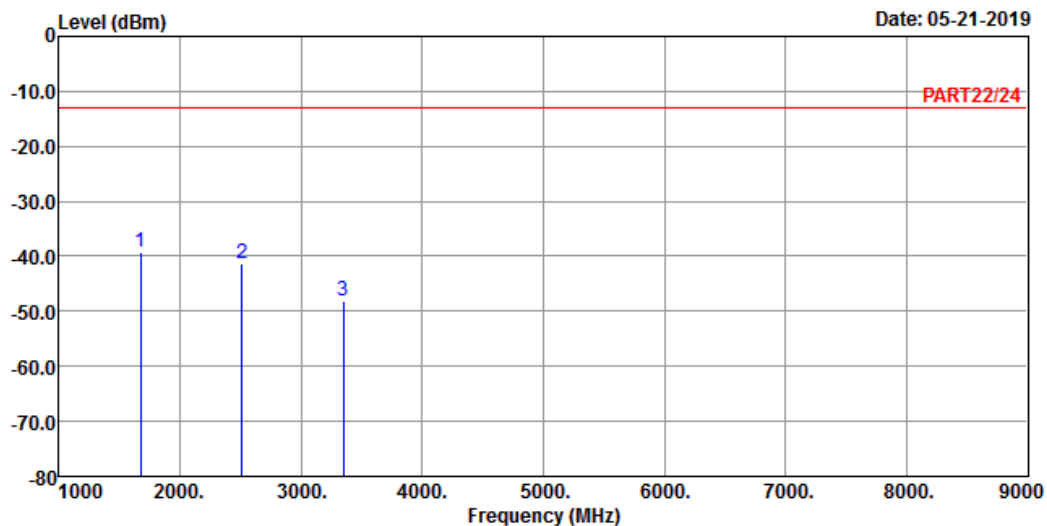


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : Cat-M1 Band 26 QPSK\_15M Link\_M-CH

Tested by: Getaz Yang

|      | Freq    | Level  | Read Level | Limit Line | Over Factor | Limit  | Remark |
|------|---------|--------|------------|------------|-------------|--------|--------|
|      | MHz     | dBm    | dBm        | dBm        | dB          | dB     |        |
| 1 pp | 1673.00 | -39.22 | -25.32     | -13.00     | -13.90      | -26.22 | Peak   |
| 2    | 2509.50 | -41.31 | -31.23     | -13.00     | -10.08      | -28.31 | Peak   |
| 3    | 3346.00 | -48.20 | -39.44     | -13.00     | -8.76       | -35.20 | Peak   |

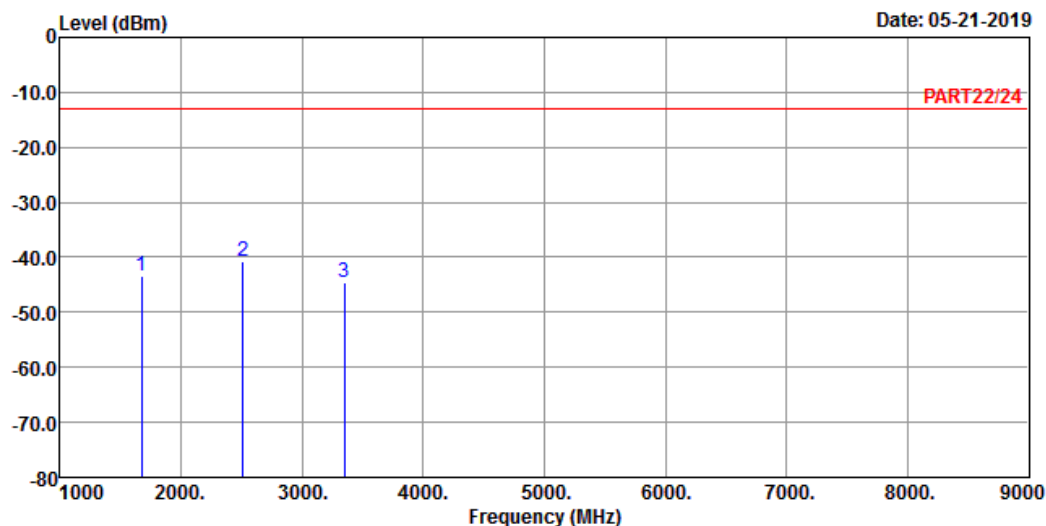


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_15M Link\_M-CH

Tested by: Getaz Yang

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1673.00 | -43.34 | -29.44     | -13.00 | -13.90      | -30.34     | Peak   |
| 2 pp | 2509.50 | -40.62 | -30.54     | -13.00 | -10.08      | -27.62     | Peak   |
| 3    | 3346.00 | -44.45 | -35.69     | -13.00 | -8.76       | -31.45     | Peak   |

# High Channel

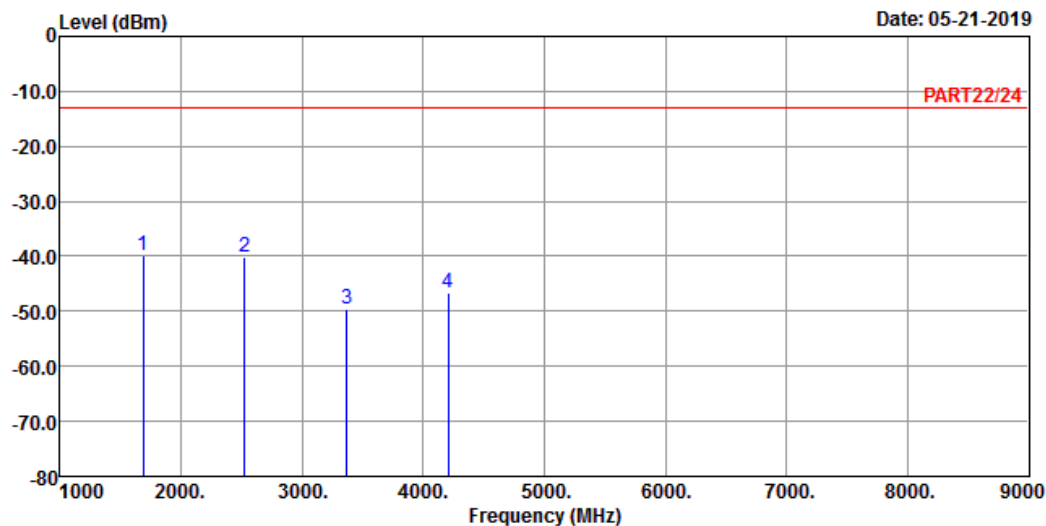


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : Cat-M1 Band 26 QPSK\_15M Link\_H-CH

Tested by: Getaz Yang

|      | Freq    | Level  | Read Level | Limit  | Over   |              |
|------|---------|--------|------------|--------|--------|--------------|
|      | MHz     | dBm    | dBm        | dBm    | dB     | Limit Remark |
| 1 pp | 1683.00 | -39.81 | -25.85     | -13.00 | -13.96 | -26.81 Peak  |
| 2    | 2524.50 | -40.20 | -30.13     | -13.00 | -10.07 | -27.20 Peak  |
| 3    | 3366.00 | -49.73 | -41.03     | -13.00 | -8.70  | -36.73 Peak  |
| 4    | 4207.50 | -46.62 | -41.04     | -13.00 | -5.58  | -33.62 Peak  |

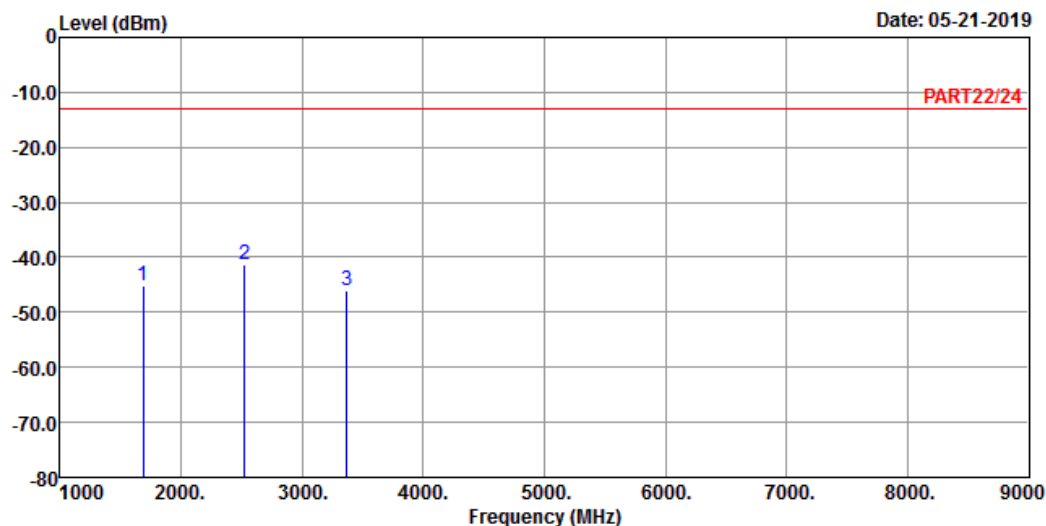


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 05-21-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : Cat-M1 Band 26 QPSK\_15M Link\_H-CH

Tested by: Getaz Yang

|      | Freq    | Level  | Read Level | Limit  | Line Factor | Over Limit | Remark |
|------|---------|--------|------------|--------|-------------|------------|--------|
|      | MHz     | dBm    | dBm        | dBm    | dB          | dB         |        |
| 1    | 1683.00 | -45.22 | -31.26     | -13.00 | -13.96      | -32.22     | Peak   |
| 2 pp | 2524.50 | -41.32 | -31.25     | -13.00 | -10.07      | -28.32     | Peak   |
| 3    | 3366.00 | -46.16 | -37.46     | -13.00 | -8.70       | -33.16     | Peak   |

## 5 Pictures of Test Arrangements

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

## Appendix – Information of 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:

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---