

FCC Test Report

(PART 90S)

Report No.: RF160526C21-11

FCC ID: NM8G-2PW2100

Test Model: G-2PW2100

Received Date: May 26, 2016

Test Date: Jun. 18, 2016 ~ Jul. 13, 2016

Issued Date: Aug. 04, 2016

Applicant: HTC Corporation

Address: 1F, 6-3 Baoqiang Road, Xindian District, New Taipei City, Taiwan 231

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 (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan
Hsien 333, Taiwan, R.O.C.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agency.

Table of Contents

| | |
|---|-----------|
| Release Control Record | 3 |
| 1 Certificate of Conformity | 4 |
| 2 Summary of Test Results..... | 5 |
| 2.1 Measurement Uncertainty..... | 5 |
| 2.2 Test Site and Instruments | 6 |
| 3 General Information | 8 |
| 3.1 General Description of EUT | 8 |
| 3.2 Configuration of System under Test..... | 9 |
| 3.2.1 Description of Support Units | 9 |
| 3.3 Test Mode Applicability and Tested Channel Detail | 10 |
| 3.4 EUT Operating Conditions | 12 |
| 3.5 General Description of Applied Standards..... | 12 |
| 4 Test Types and Results | 13 |
| 4.1 Output Power Measurement..... | 13 |
| 4.1.1 Limits of Output Power Measurement | 13 |
| 4.1.2 Test Procedures..... | 13 |
| 4.1.3 Test Setup..... | 14 |
| 4.1.4 Test Results | 15 |
| 4.2 Frequency Stability Measurement | 20 |
| 4.2.1 Limits of Frequency Stability Measurement..... | 20 |
| 4.2.2 Test Procedure | 20 |
| 4.2.3 Test Setup..... | 20 |
| 4.2.4 Test Results | 21 |
| 4.3 Occupied Bandwidth Measurement..... | 22 |
| 4.3.1 Test Procedure | 22 |
| 4.3.2 Test Setup..... | 22 |
| 4.3.3 Test Result | 23 |
| 4.4 Emission Mask Measurement..... | 26 |
| 4.4.1 Limits of Band Edge Measurement | 26 |
| 4.4.2 Test Setup..... | 26 |
| 4.4.3 Test Procedures..... | 26 |
| 4.4.4 Test Results | 27 |
| 4.5 Conducted Spurious Emissions..... | 30 |
| 4.5.1 Limits of Conducted Spurious Emissions Measurement..... | 30 |
| 4.5.2 Test Setup..... | 30 |
| 4.5.3 Test Procedure | 30 |
| 4.5.4 Test Results | 31 |
| 4.6 Radiated Emission Measurement..... | 32 |
| 4.6.1 Limits of Radiated Emission Measurement | 32 |
| 4.6.2 Test Procedure | 32 |
| 4.6.3 Deviation from Test Standard | 32 |
| 4.6.4 Test Setup..... | 32 |
| 4.6.5 Test Results | 33 |
| 5 Pictures of Test Arrangements..... | 37 |
| Appendix – Information on the Testing Laboratories | 38 |

Release Control Record

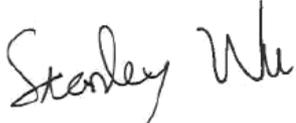
| Issue No. | Description | Date Issued |
|----------------|------------------|---------------|
| RF160526C21-11 | Original Release | Aug. 04, 2016 |

1 Certificate of Conformity

Product: Smartphone
Test Model: G-2PW2100
Sample Status: Production Unit
Applicant: HTC Corporation
Test Date: Jun. 18, 2016 ~ Jul. 13, 2016
Standards: FCC Part 90, Subpart S

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 EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Aug. 04, 2016
Ivonne Wu / Supervisor

Approved by :  , **Date:** Aug. 04, 2016
Stanley Wu / Assistant Manager

2 Summary of Test Results

| Applied Standard: FCC Part 90 & Part 2 | | | |
|--|------------------------------|--------|---|
| FCC Clause | Test Item | Result | Remarks |
| 2.1046 90.635 (b) | Effective Radiated Power | Pass | Meet the requirement of limit. |
| 2.1055 90.213 | Frequency Stability | Pass | Meet the requirement of limit. |
| 2.1049 90.209 | Occupied Bandwidth (*) | Pass | Meet the requirement of limit. |
| 2.1051 90.209 | Emission Masks | Pass | Meet the requirement of limit. |
| 2.1051 90.691 | Conducted Spurious Emissions | Pass | Meet the requirement of limit. |
| 2.1053 90.691 | Radiated Spurious Emissions | Pass | Meet the requirement of limit. Minimum passing margin is -23.84 dB at 2461.50 MHz. |

2.1 Measurement Uncertainty

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

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|------------------------------------|--------------------|--------------------------------|
| Conducted Emissions at mains ports | 150 kHz ~ 30 MHz | 2.44 dB |
| Radiated Emissions up to 1 GHz | 30 MHz ~ 200 MHz | 2.93 dB |
| | 200 MHz ~ 1000 MHz | 2.95 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 2.26 dB |
| | 18 GHz ~ 40 GHz | 1.94 dB |

2.2 Test Site and Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|--|----------------|---------------------|---------------------|-------------------------|
| Test Receiver Agilent | N9038A | MY51210203 | Jan. 21, 2016 | Jan. 20, 2017 |
| Spectrum Analyzer Agilent | N9010A | MY52220314 | Sep. 03, 2015 | Sep. 02, 2016 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSU43 | 101261 | Dec. 17, 2015 | Dec. 16, 2016 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-472 | Jan. 07, 2016 | Jan. 06, 2017 |
| HORN Antenna SCHWARZBECK | BBHA 9120 D | 9120D-969 | Jan. 04, 2016 | Jan. 03, 2017 |
| Double Ridge Guide Horn Antenna EMCO | 3115 | 5619 | Jan. 04, 2016 | Jan. 03, 2017 |
| BILOG Antenna SCHWARZBECK | VULB 9168 | 9168-153 | Jan. 07, 2016 | Jan. 06, 2017 |
| Agilent Communications Tester-Wireless | 8960 Series 10 | MY53201073 | Jul. 03, 2015 | Jul. 02, 2017 |
| Preamplifier EMCI | EMC 012645 | 980115 | Dec. 21, 2015 | Dec. 20, 2016 |
| Preamplifier EMCI | EMC 184045 | 980116 | Dec. 21, 2015 | Dec. 20, 2016 |
| Preamplifier EMCI | EMC 330H | 980112 | Dec. 28, 2015 | Dec. 27, 2016 |
| Power Meter Anritsu | ML2495A | 1232002 | Sep. 21, 2015 | Sep. 20, 2016 |
| Power Sensor Anritsu | MA2411B | 1207325 | Sep. 21, 2015 | Sep. 20, 2016 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 309219/4 2950114 | Oct. 12, 2015 | Oct. 11, 2016 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 250130/4 | Oct. 12, 2015 | Oct. 11, 2016 |
| RF Coaxial Cable Worken | 8D-FB | Cable-Ch10-01 | Oct. 12, 2015 | Oct. 11, 2016 |
| Software BV ADT | E3 6.120103 | NA | NA | NA |
| Antenna Tower MF | MFA-440H | NA | NA | NA |
| Turn Table MF | MFT-201SS | NA | NA | NA |
| Antenna Tower & Turn Table Controller MF | MF-7802 | NA | NA | NA |
| Communications Tester-Wireless Agilent | 8960 Series 10 | MY53201073 | Jul. 03, 2015 | Jul. 02, 2017 |
| Radio Communication Analyzer Anritsu | MT8820C | 6201300640 | Aug. 10, 2015 | Aug. 09, 2017 |

- Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 10.
 3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
 4. The FCC Site Registration No. is 690701.
 5. The IC Site Registration No. is IC7450F-10.

3 General Information

3.1 General Description of EUT

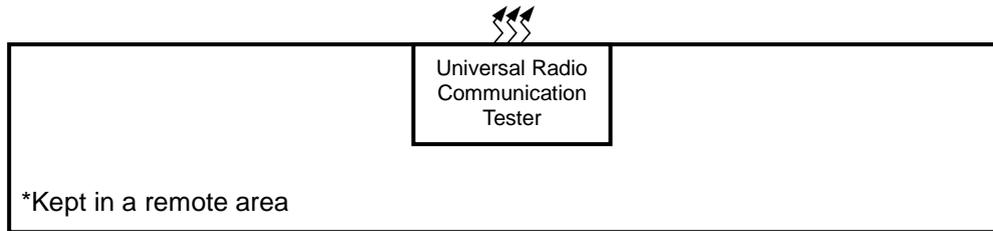
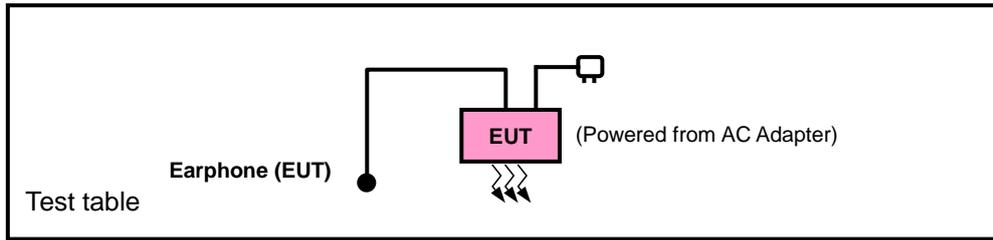
| | | |
|----------------------------|--|-------------------|
| Product | Smartphone | |
| Test Model | G-2PW2100 | |
| Status of EUT | Production Unit | |
| Power Supply Rating | 5.0 Vdc (adapter or host equipment) 3.85 Vdc (Li-ion battery) | |
| Modulation Type | CDMA | QPSK, OQPSK, HPSK |
| | LTE | QPSK, 16QAM |
| Frequency Range | CDMA BC10 | 817.9 ~ 823.1 MHz |
| | LTE Band 26 (Channel Bandwidth: 1.4 MHz) | 814.7 ~ 823.3 MHz |
| | LTE Band 26 (Channel Bandwidth: 3 MHz) | 815.5 ~ 822.5 MHz |
| | LTE Band 26 (Channel Bandwidth: 5 MHz) | 816.5 ~ 821.5 MHz |
| | LTE Band 26 (Channel Bandwidth: 10 MHz) | 819 MHz |
| Emission Designator | CDMA BC10 | 1M28F9W |
| | LTE Band 26 (Channel Bandwidth: 1.4 MHz) | 1M09G7D |
| | LTE Band 26 (Channel Bandwidth: 3 MHz) | 2M73W7D |
| | LTE Band 26 (Channel Bandwidth: 5 MHz) | 4M50G7D |
| | LTE Band 26 (Channel Bandwidth: 10 MHz) | 8M96W7D |
| Max. ERP Power | CDMA BC10 | 38.55 mW |
| | LTE Band 26 (Channel Bandwidth: 1.4 MHz) | 58.48 mW |
| | LTE Band 26 (Channel Bandwidth: 3 MHz) | 59.43 mW |
| | LTE Band 26 (Channel Bandwidth: 5 MHz) | 60.12 mW |
| | LTE Band 26 (Channel Bandwidth: 10 MHz) | 61.24 mW |
| Antenna Type | Fixed Internal Antenna | |
| Accessory Device | Refer to Note as below | |
| Data Cable Supplied | Refer to Note as below | |

Note:

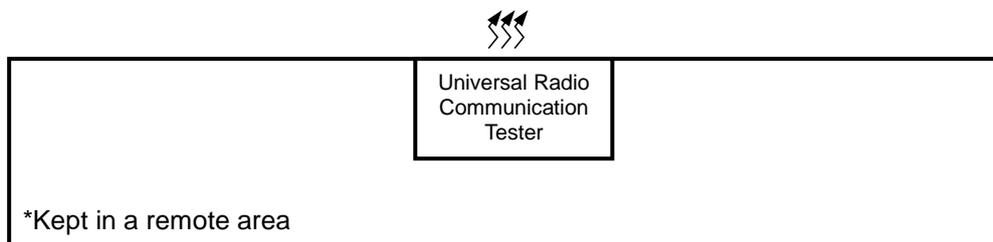
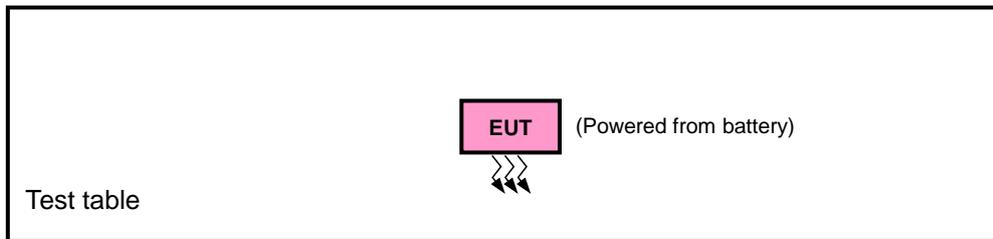
1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.R.P. Test>



3.2.1 Description of Support Units

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

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

| Band | ERP | Radiated Emission |
|-------------|---------|-------------------|
| CDMA | Y-plane | X-axis |
| LTE Band 26 | Y-plane | Y-axis |

CDMA

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Mode |
|--------------------|---------------------|-------------------|----------------|-------|
| - | ERP | 476 to 684 | 476, 580, 684 | 1xRTT |
| - | Frequency Stability | 476 to 684 | 580 | 1xRTT |
| - | Occupied Bandwidth | 476 to 684 | 476, 580, 684 | 1xRTT |
| - | Emission Mask | 476 to 684 | 476, 580, 684 | 1xRTT |
| - | Conducted Emission | 476 to 684 | 580 | 1xRTT |
| - | Radiated Emission | 476 to 684 | 580 | 1xRTT |

LTE Band 26

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode |
|--------------------|---------------------|-------------------|---------------------|-------------------|-------------|---------------------|
| - | ERP | 26697 to 26783 | 26697, 26740, 26783 | 1.4 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 26705 to 26775 | 26705, 26740, 26775 | 3 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 26715 to 26765 | 26715, 26740, 26765 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 26740 | 26740 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| - | Frequency Stability | 26697 to 26783 | 26740 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 26705 to 26775 | 26740 | 3 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 26715 to 26765 | 26740 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 26740 | 26740 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| - | Occupied Bandwidth | 26697 to 26783 | 26697, 26740, 26783 | 1.4 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 26705 to 26775 | 26705, 26740, 26775 | 3 MHz | QPSK, 16QAM | 15 RB / 0 RB Offset |
| | | 26715 to 26765 | 26715, 26740, 26765 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 26740 | 26740 | 10 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| - | Emission Mask | 26697 to 26783 | 26697, 26740, 26783 | 1.4 MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | 26705 to 26775 | 26705, 26740, 26775 | 3 MHz | QPSK, 16QAM | 15 RB / 0 RB Offset |
| | | 26715 to 26765 | 26715, 26740, 26765 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 26740 | 26740 | 10 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| - | Conducted Emission | 26697 to 26783 | 26740 | 1.4 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 26705 to 26775 | 26740 | 3 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 26715 to 26765 | 26740 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 26740 | 26740 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| - | Radiated Emission | 26740 | 26740 | 10 MHz | QPSK | 1 RB / 0 RB Offset |

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

Test Condition:

| Test Item | Environmental Conditions | Input Power | Tested By |
|-----------------------|--------------------------|----------------|----------------------|
| ERP | 25 deg. C, 65 % RH | 3.85 Vdc | Gavin Wu |
| Frequency Stability | 25 deg. C, 65 % RH | 3.85 Vdc | Carlos Chen |
| Occupied Bandwidth | 25 deg. C, 65 % RH | 3.85 Vdc | Carlos Chen |
| Band Edge | 25 deg. C, 65 % RH | 3.85 Vdc | Carlos Chen |
| Peak to Average Ratio | 25 deg. C, 65 % RH | 3.85 Vdc | Carlos Chen |
| Condcudeted Emission | 25 deg. C, 65 % RH | 3.85 Vdc | Carlos Chen |
| Radiated Emission | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Gavin Wu & Toby Tian |

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 90

ANSI/TIA/EIA-603-D 2010

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 100 watts e.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

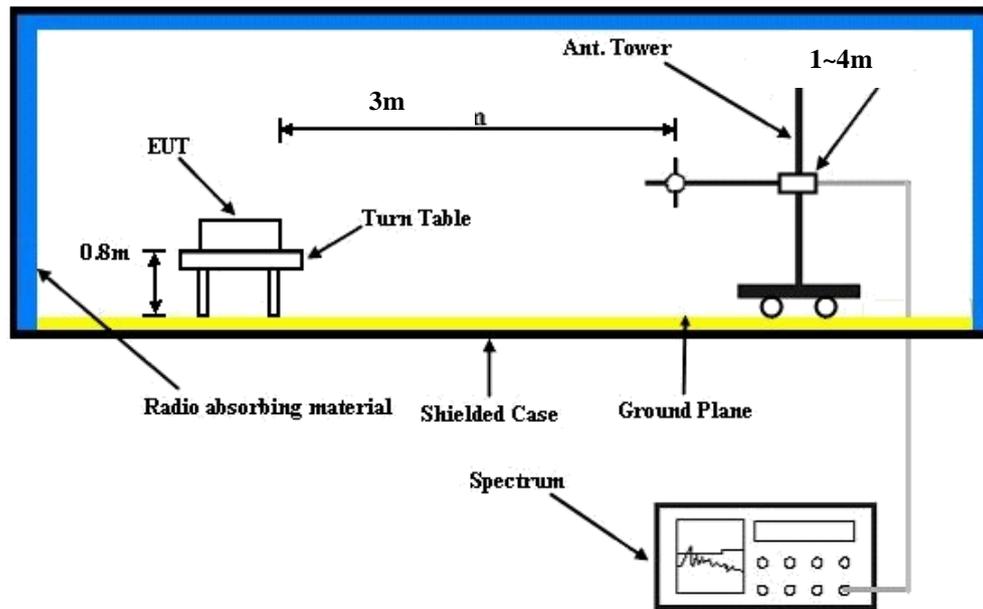
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for CDMA and 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 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, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

Conducted Power Measurement:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. 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:



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)

| Band | CDMA | | |
|-------------------|-------|-------|-------|
| Channel | 476 | 580 | 684 |
| Frequency (MHz) | 817.9 | 820.5 | 823.1 |
| RC1+SO55 | 23.80 | 23.70 | 23.66 |
| RC3+SO55 | 23.87 | 23.80 | 23.77 |
| RC3+SO32(+ F-SCH) | 23.84 | 23.74 | 23.61 |
| RC3+SO32(+SCH) | 23.03 | 22.86 | 22.82 |
| RTAP 153.6 | 23.65 | 23.55 | 23.51 |
| RETAP 4096 | 23.86 | 23.77 | 23.73 |

| Band / BW | RB Size | RB Offset | QPSK | | | 3GPP MPR (dB) | 16QAM | | | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
| | | | Low Ch 26697 | Mid Ch 26740 | High Ch 26783 | | Low Ch 26697 | Mid Ch 26740 | High Ch 26783 | |
| | | | 814.7 MHz | 819.0 MHz | 823.3 MHz | | 814.7 MHz | 819.0 MHz | 823.3 MHz | |
| 26 / 1.4M | 1 | 0 | 22.76 | 22.60 | 22.13 | 0 | 21.73 | 21.63 | 21.15 | 1 |
| | 1 | 2 | 21.83 | 21.84 | 21.36 | 0 | 20.80 | 20.86 | 20.36 | 1 |
| | 1 | 5 | 22.19 | 22.25 | 21.73 | 0 | 21.16 | 21.30 | 20.76 | 1 |
| | 3 | 0 | 22.13 | 21.14 | 20.54 | 0 | 21.05 | 20.14 | 19.52 | 1 |
| | 3 | 1 | 21.83 | 20.77 | 20.29 | 0 | 20.75 | 19.73 | 19.27 | 1 |
| | 3 | 3 | 21.79 | 20.72 | 20.19 | 0 | 20.71 | 19.67 | 19.15 | 1 |
| 6 | 0 | 20.96 | 20.82 | 20.32 | 1 | 19.93 | 19.80 | 19.22 | 2 | |

| Band / BW | RB Size | RB Offset | QPSK | | | 3GPP MPR (dB) | 16QAM | | | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
| | | | Low Ch 26705 | Mid CH 26740 | High CH 26775 | | Low Ch 26705 | Mid CH 26740 | High CH 26775 | |
| | | | 815.5 MHz | 819.0 MHz | 822.5 MHz | | 815.5 MHz | 819.0 MHz | 822.5 MHz | |
| 26 / 3M | 1 | 0 | 22.89 | 22.65 | 22.17 | 0 | 21.86 | 21.69 | 21.21 | 1 |
| | 1 | 7 | 21.96 | 21.91 | 21.48 | 0 | 20.93 | 20.90 | 20.55 | 1 |
| | 1 | 14 | 22.32 | 22.32 | 21.79 | 0 | 21.29 | 21.34 | 20.95 | 1 |
| | 8 | 0 | 21.36 | 21.23 | 20.74 | 1 | 20.33 | 20.24 | 19.66 | 2 |
| | 8 | 3 | 21.06 | 20.85 | 20.38 | 1 | 20.03 | 19.85 | 19.37 | 2 |
| | 8 | 7 | 21.02 | 20.81 | 20.34 | 1 | 19.99 | 19.77 | 19.29 | 2 |
| 15 | 0 | 21.09 | 20.91 | 20.51 | 1 | 20.06 | 19.89 | 19.41 | 2 | |

| Band / BW | RB Size | RB Offset | QPSK | | | 3GPP MPR (dB) | 16QAM | | | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
| | | | Low Ch 26715 | Mid Ch 26740 | High Ch 26765 | | Low Ch 26715 | Mid Ch 26740 | High Ch 26765 | |
| | | | 816.5 MHz | 819.0 MHz | 821.5 MHz | | 816.5 MHz | 819.0 MHz | 821.5 MHz | |
| 26 / 5M | 1 | 0 | 23.00 | 22.69 | 22.26 | 0 | 21.97 | 21.72 | 21.28 | 1 |
| | 1 | 12 | 22.07 | 22.00 | 21.58 | 0 | 21.04 | 21.02 | 20.58 | 1 |
| | 1 | 24 | 22.43 | 22.39 | 22.00 | 0 | 21.40 | 21.40 | 20.87 | 1 |
| | 12 | 0 | 21.47 | 21.35 | 20.89 | 1 | 20.44 | 20.36 | 19.79 | 2 |
| | 12 | 6 | 21.17 | 20.99 | 20.56 | 1 | 20.14 | 19.98 | 19.50 | 2 |
| | 12 | 13 | 21.13 | 20.94 | 20.50 | 1 | 20.10 | 19.93 | 19.45 | 2 |
| 25 | 0 | 21.20 | 21.05 | 20.63 | 1 | 20.17 | 20.04 | 19.52 | 2 | |

| Band / BW | RB Size | RB Offset | QPSK | 3GPP MPR (dB) | 16QAM | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|---------------|--------------|---------------|
| | | | Mid Ch 26740 | | Mid Ch 26740 | |
| | | | 819.0 MHz | | 819.0 MHz | |
| 26 / 10M | 1 | 0 | 23.08 | 0 | 22.05 | 1 |
| | 1 | 24 | 22.15 | 0 | 21.12 | 1 |
| | 1 | 49 | 22.51 | 0 | 21.48 | 1 |
| | 25 | 0 | 21.55 | 1 | 20.52 | 2 |
| | 25 | 12 | 21.25 | 1 | 20.22 | 2 |
| | 25 | 25 | 21.21 | 1 | 20.18 | 2 |
| | 50 | 0 | 21.28 | 1 | 20.25 | 2 |

ERP Power (dBm)

| CDMA | | | | | | | |
|-------|---------|-----------------|-----------|------------------------|-----------|----------|--------------------|
| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y | 476 | 817.9 | -14.25 | 32.01 | 15.61 | 36.39 | H |
| | 580 | 820.5 | -14.10 | 32.11 | 15.86 | 38.55 | |
| | 684 | 823.1 | -14.82 | 32.32 | 15.35 | 34.28 | |
| | 476 | 817.9 | -22.54 | 32.54 | 7.85 | 6.10 | V |
| | 580 | 820.5 | -22.44 | 32.51 | 7.92 | 6.19 | |
| | 684 | 823.1 | -22.68 | 32.51 | 7.68 | 5.86 | |

| LTE Band 26 | | | | | | | |
|------------------------------------|---------|-----------------|-----------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 1.4 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y | 26697 | 814.7 | -12.25 | 32.02 | 17.62 | 57.81 | H |
| | 26740 | 819.0 | -12.29 | 32.11 | 17.67 | 58.48 | |
| | 26783 | 823.3 | -12.39 | 32.18 | 17.64 | 58.08 | |
| | 26697 | 814.7 | -21.41 | 32.5 | 8.94 | 7.83 | V |
| | 26740 | 819.0 | -21.38 | 32.51 | 8.98 | 7.91 | |
| | 26783 | 823.3 | -21.44 | 32.47 | 8.88 | 7.73 | |
| Channel Bandwidth: 1.4 MHz / 16QAM | | | | | | | |
| Y | 26697 | 814.7 | -13.23 | 32.02 | 16.64 | 46.13 | H |
| | 26740 | 819.0 | -13.19 | 32.11 | 16.77 | 47.53 | |
| | 26783 | 823.3 | -13.31 | 32.18 | 16.72 | 46.99 | |
| | 26697 | 814.7 | -22.47 | 32.5 | 7.88 | 6.14 | V |
| | 26740 | 819.0 | -22.36 | 32.51 | 8.00 | 6.31 | |
| | 26783 | 823.3 | -22.41 | 32.47 | 7.91 | 6.18 | |

| LTE Band 26 | | | | | | | |
|----------------------------------|---------|-----------------|-----------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 3 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y | 26705 | 815.5 | -12.20 | 32.02 | 17.67 | 58.48 | H |
| | 26740 | 819.0 | -12.22 | 32.11 | 17.74 | 59.43 | |
| | 26775 | 822.5 | -12.31 | 32.18 | 17.72 | 59.16 | |
| | 26705 | 815.5 | -21.37 | 32.5 | 8.98 | 7.91 | V |
| | 26740 | 819.0 | -21.32 | 32.51 | 9.04 | 8.02 | |
| | 26775 | 822.5 | -21.30 | 32.47 | 9.02 | 7.98 | |
| Channel Bandwidth: 3 MHz / 16QAM | | | | | | | |
| Y | 26705 | 815.5 | -13.15 | 32.02 | 16.72 | 46.99 | H |
| | 26740 | 819.0 | -13.10 | 32.11 | 16.86 | 48.53 | |
| | 26775 | 822.5 | -13.24 | 32.18 | 16.79 | 47.75 | |
| | 26705 | 815.5 | -22.40 | 32.5 | 7.95 | 6.24 | V |
| | 26740 | 819.0 | -22.28 | 32.51 | 8.08 | 6.43 | |
| | 26775 | 822.5 | -22.29 | 32.47 | 8.03 | 6.35 | |

| LTE Band 26 | | | | | | | |
|----------------------------------|---------|-----------------|-----------|------------------------|-----------|----------|--------------------|
| Channel Bandwidth: 5 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
| Y | 26715 | 816.5 | -12.14 | 32.04 | 17.75 | 59.57 | H |
| | 26740 | 819.0 | -12.17 | 32.11 | 17.79 | 60.12 | |
| | 26765 | 821.5 | -11.91 | 31.79 | 17.73 | 59.29 | |
| | 26715 | 816.5 | -21.30 | 32.52 | 9.07 | 8.07 | V |
| | 26740 | 819.0 | -21.25 | 32.51 | 9.11 | 8.15 | |
| | 26765 | 821.5 | -20.94 | 32.17 | 9.08 | 8.09 | |
| Channel Bandwidth: 5 MHz / 16QAM | | | | | | | |
| Y | 26715 | 816.5 | -13.08 | 32.04 | 16.81 | 47.97 | H |
| | 26740 | 819.0 | -13.02 | 32.11 | 16.94 | 49.43 | |
| | 26765 | 821.5 | -12.76 | 31.79 | 16.88 | 48.75 | |
| | 26715 | 816.5 | -22.31 | 32.52 | 8.06 | 6.40 | V |
| | 26740 | 819.0 | -22.20 | 32.51 | 8.16 | 6.55 | |
| | 26765 | 821.5 | -22.01 | 32.17 | 8.01 | 6.32 | |

LTE Band 26

Channel Bandwidth: 10 MHz / QPSK

| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor (dB) | ERP (dBm) | ERP (mW) | Polarization (H/V) |
|-------|---------|-----------------|-----------|------------------------|-----------|----------|--------------------|
| Y | 26740 | 819.0 | -12.09 | 32.11 | 17.87 | 61.24 | H |
| | 26740 | 819.0 | -21.17 | 32.51 | 9.19 | 8.30 | V |

Channel Bandwidth: 10 MHz / 16QAM

| | | | | | | | |
|---|-------|-------|--------|-------|-------|-------|---|
| Y | 26740 | 819.0 | -12.95 | 32.11 | 17.01 | 50.23 | H |
| | 26740 | 819.0 | -22.13 | 32.51 | 8.23 | 6.65 | V |

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

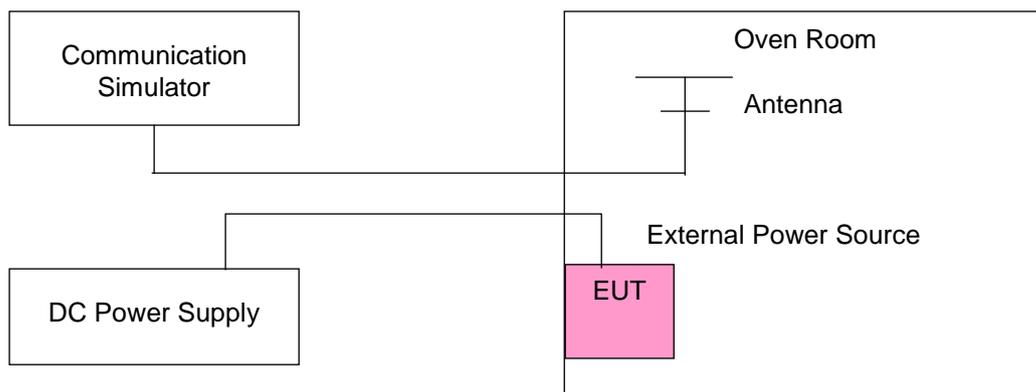
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.2.2 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 ± 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.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

| Voltage (Volts) | Frequency Error (ppm) | | | | | Limit (ppm) |
|-----------------|-----------------------|-------------|-------|-------|--------|-------------|
| | CDMA | LTE Band 26 | | | | |
| | | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | |
| 3.85 | 0.003 | 0.005 | 0.005 | 0.005 | 0.002 | 2.5 |
| 3.6 | 0.004 | 0.001 | 0.002 | 0.003 | 0.004 | 2.5 |
| 4.4 | 0.002 | 0.005 | 0.001 | 0.003 | 0.002 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

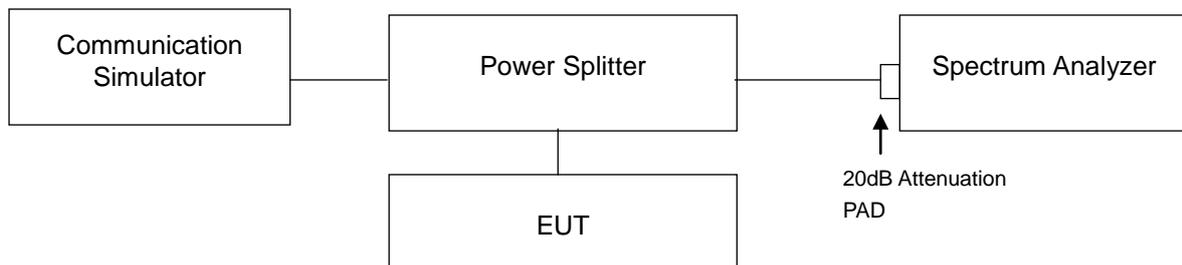
| Temp. (°C) | Frequency Error (ppm) | | | | | Limit (ppm) |
|------------|-----------------------|-------------|--------|--------|--------|-------------|
| | CDMA | LTE Band 26 | | | | |
| | | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | |
| -30 | 0.003 | 0.001 | 0.002 | 0.003 | 0.003 | 2.5 |
| -20 | 0.003 | 0.002 | 0.001 | 0.004 | 0.004 | 2.5 |
| -10 | -0.003 | 0.004 | 0.005 | 0.002 | 0.005 | 2.5 |
| 0 | -0.003 | 0.003 | 0.001 | 0.001 | 0.005 | 2.5 |
| 10 | -0.005 | 0.001 | 0.001 | 0.002 | 0.003 | 2.5 |
| 20 | -0.003 | -0.002 | -0.005 | -0.004 | -0.003 | 2.5 |
| 30 | -0.002 | -0.001 | -0.003 | -0.002 | -0.005 | 2.5 |
| 40 | 0.002 | -0.004 | -0.003 | -0.003 | -0.003 | 2.5 |
| 50 | 0.002 | -0.002 | -0.002 | -0.002 | -0.003 | 2.5 |
| 55 | 0.004 | -0.003 | -0.002 | -0.002 | -0.002 | 2.5 |

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

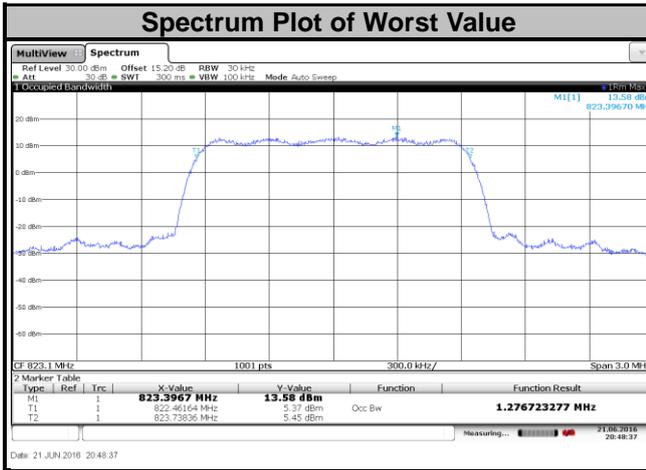
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

4.3.2 Test Setup



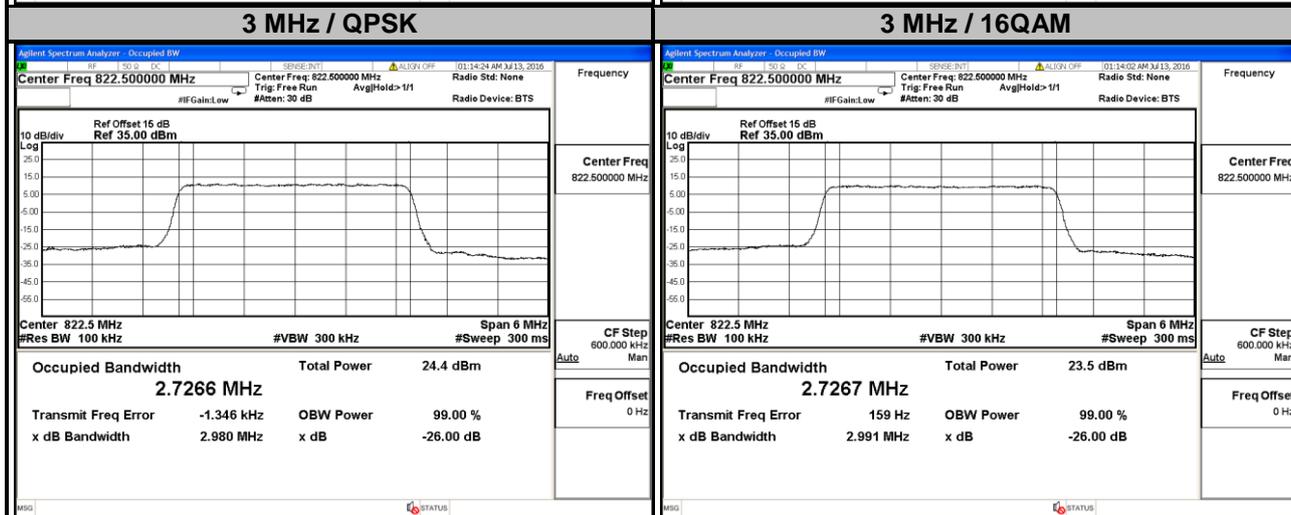
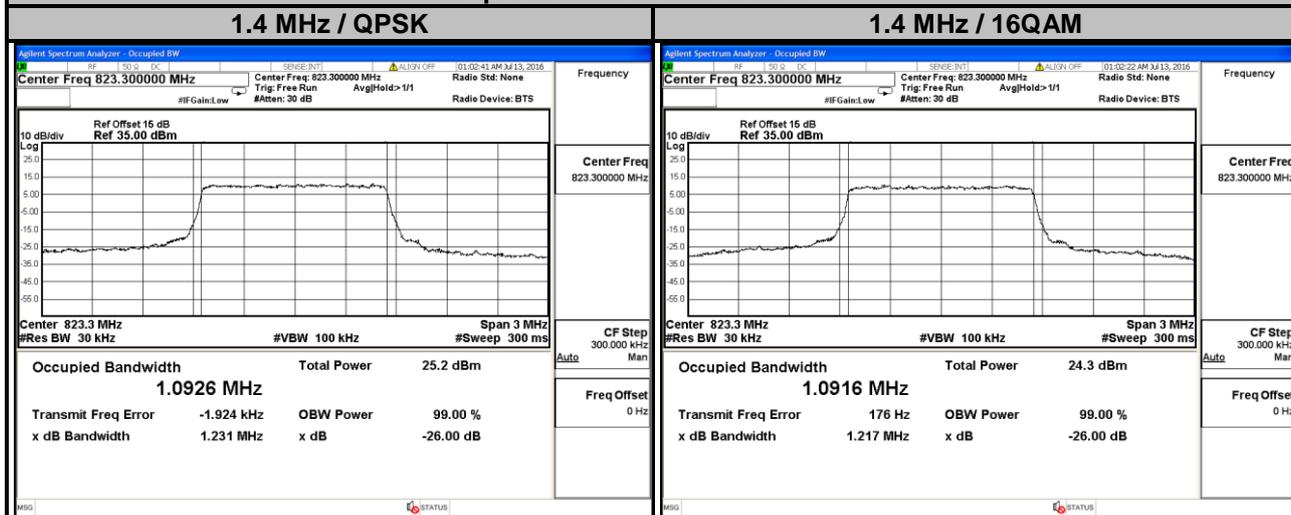
4.3.3 Test Result

| CDMA | | |
|---------|-----------------|-------------------------------|
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) |
| 476 | 817.9 | 1.277 |
| 580 | 820.5 | 1.277 |
| 684 | 823.1 | 1.277 |



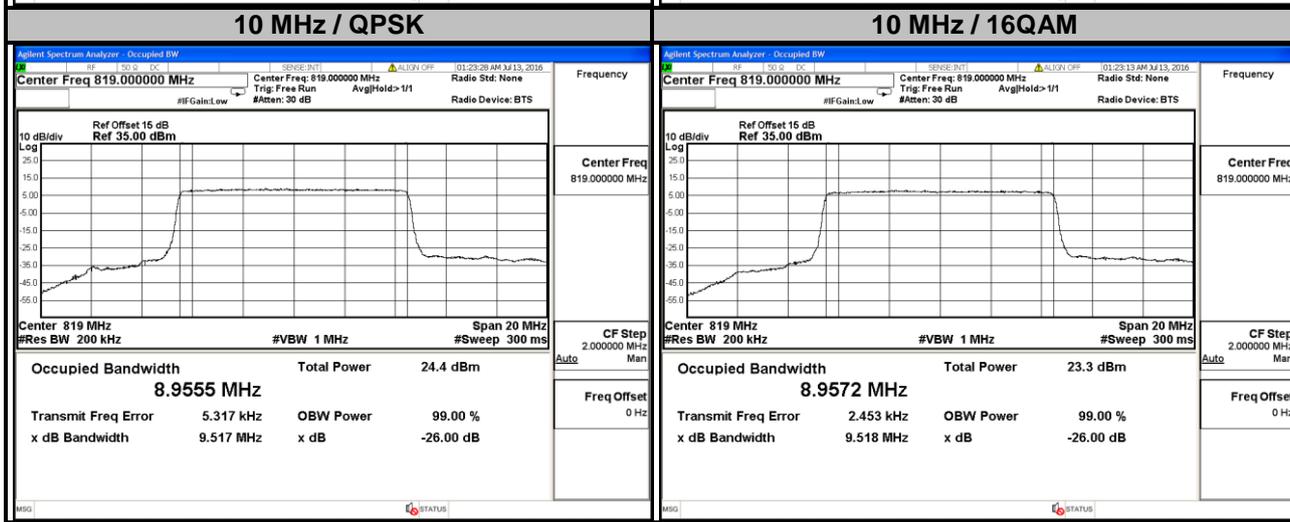
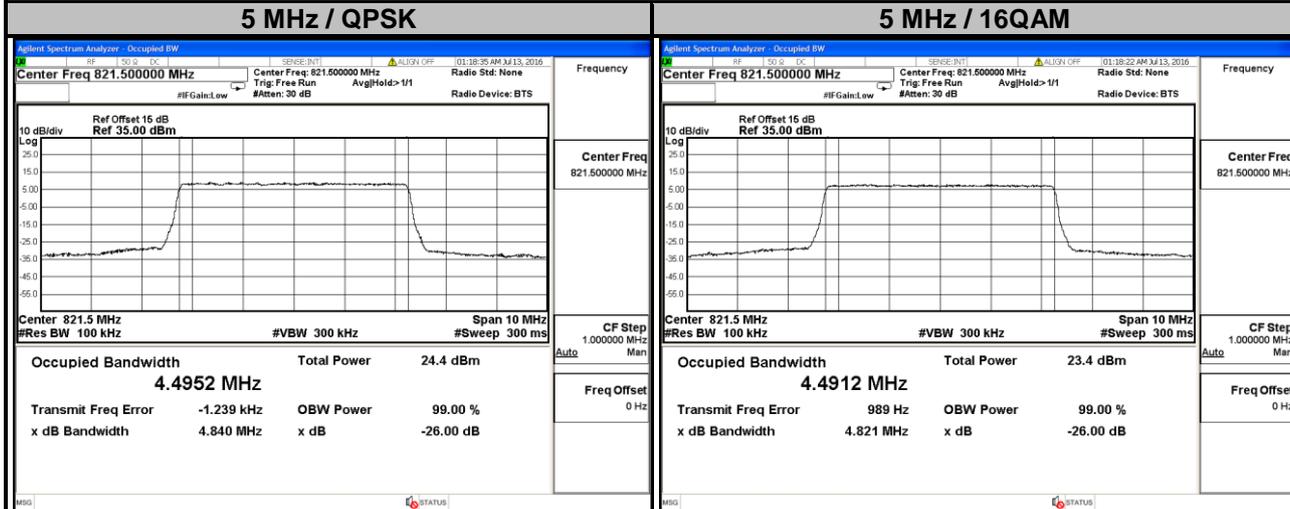
| LTE Band 26 | | | | | | | |
|----------------------------|-----------------|-------------------------------|--------|--------------------------|-----------------|-------------------------------|--------|
| Channel Bandwidth: 1.4 MHz | | | | Channel Bandwidth: 3 MHz | | | |
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 26697 | 814.7 | 1.0918 | 1.0897 | 26705 | 815.5 | 2.7227 | 2.7233 |
| 26740 | 819.0 | 1.0913 | 1.0887 | 26740 | 819.0 | 2.7265 | 2.7246 |
| 26783 | 823.3 | 1.0926 | 1.0916 | 26775 | 822.5 | 2.7266 | 2.7267 |

Spectrum Plot of Worst Value



| LTE Band 26 | | | | | | | |
|--------------------------|-----------------|-------------------------------|--------|---------------------------|-----------------|-------------------------------|--------|
| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 26715 | 816.5 | 4.4914 | 4.4816 | 26740 | 819.0 | 8.9555 | 8.9572 |
| 26740 | 819.0 | 4.4947 | 4.4880 | | | | |
| 26765 | 821.5 | 4.4952 | 4.4912 | | | | |

Spectrum Plot of Worst Value

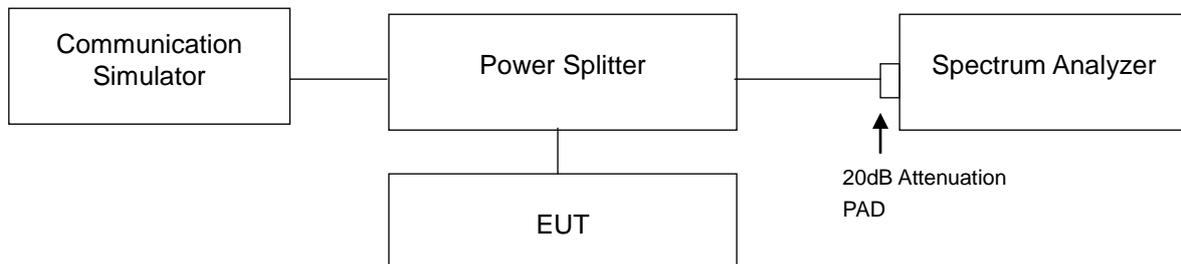


4.4 Emission Mask Measurement

4.4.1 Limits of Band Edge Measurement

According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \text{ Log}_{10}(f/6.1)$ decibels or $50+10\text{Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

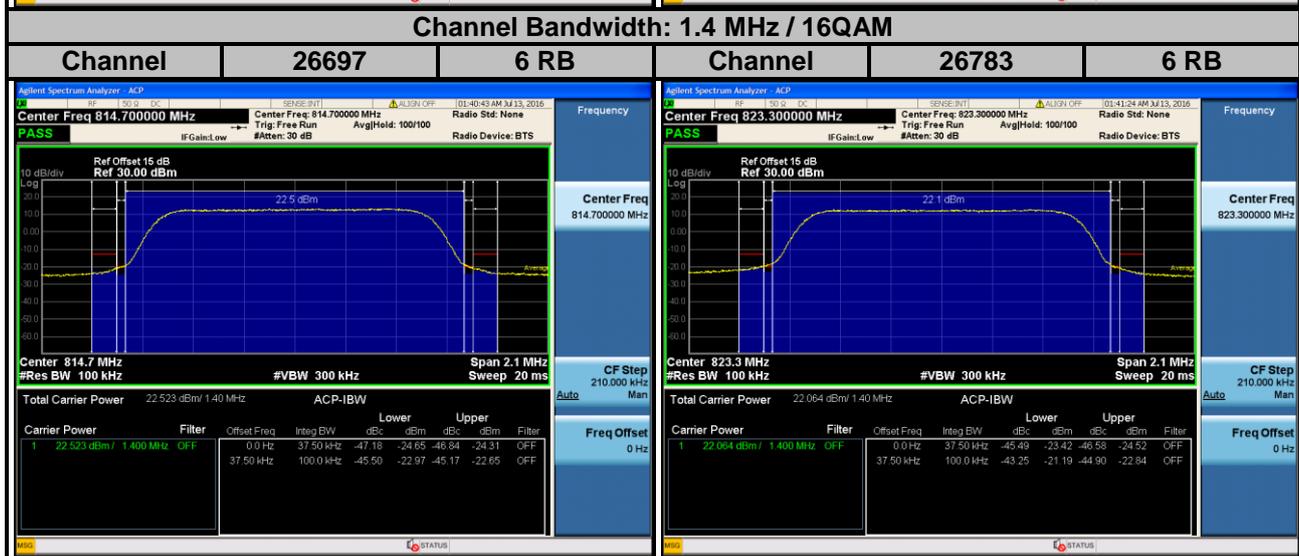
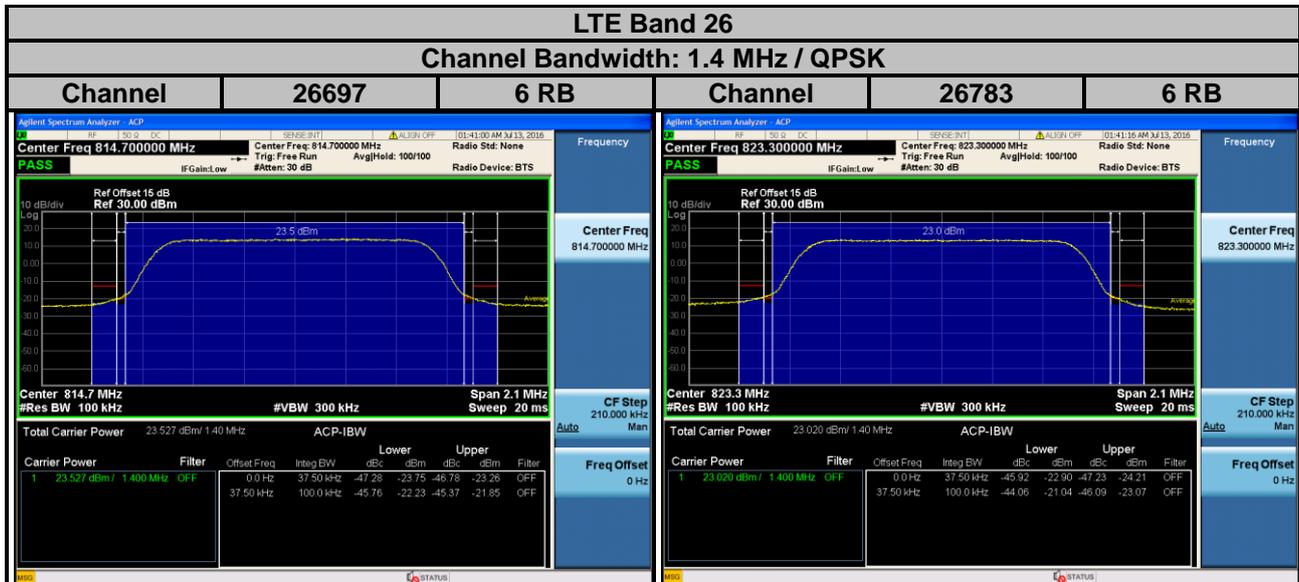
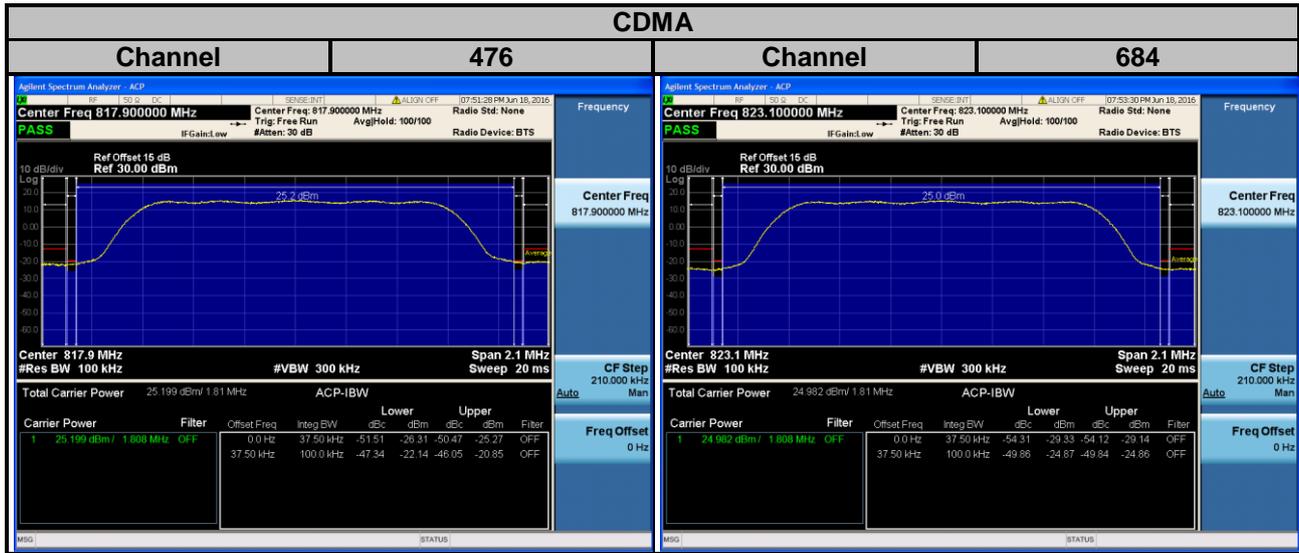
4.4.2 Test Setup



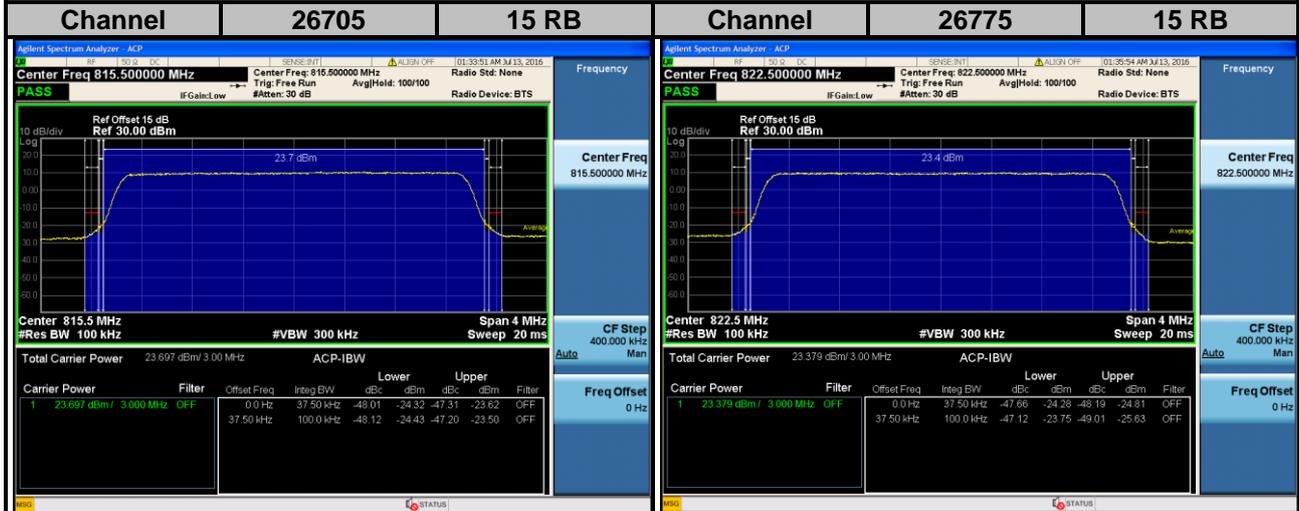
4.4.3 Test Procedures

- a. The measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- b. Record the test plot.

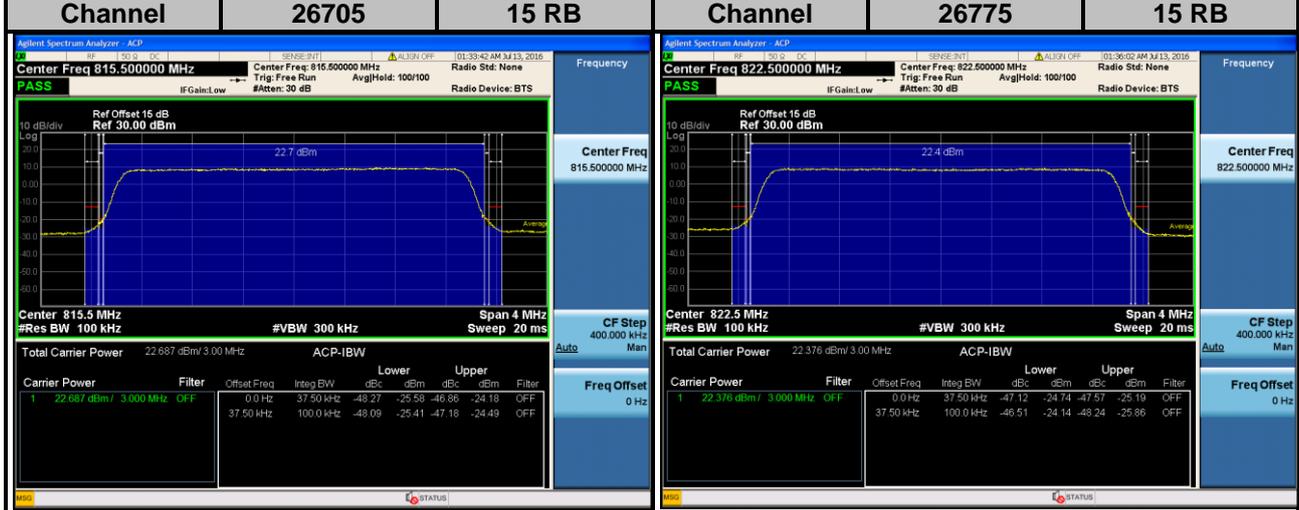
4.4.4 Test Results

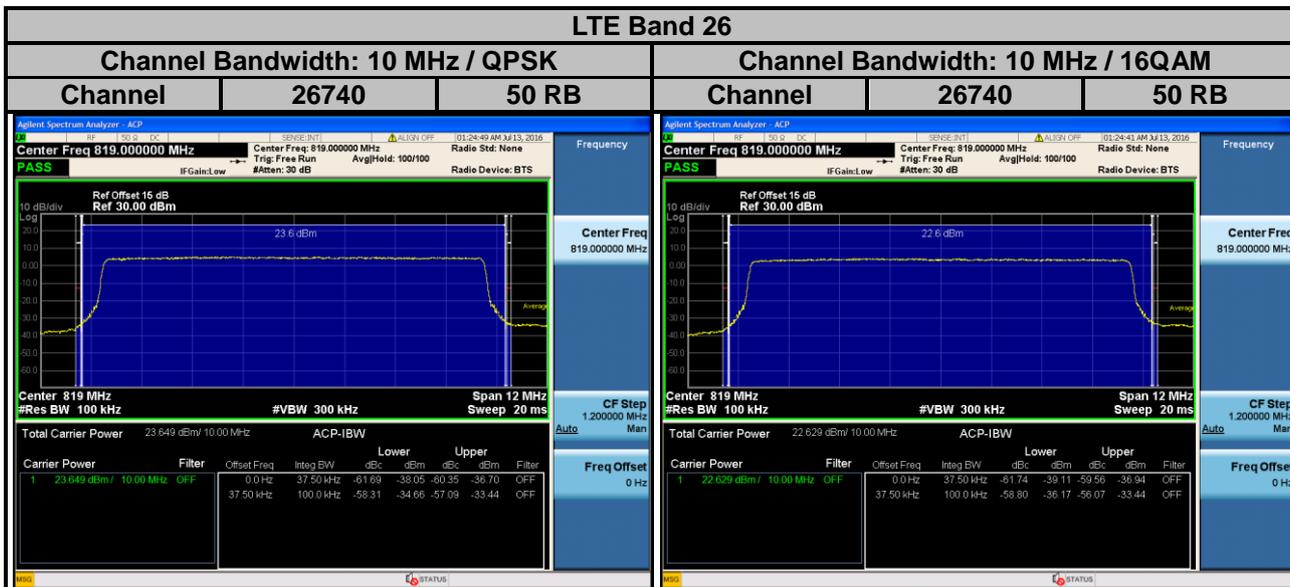
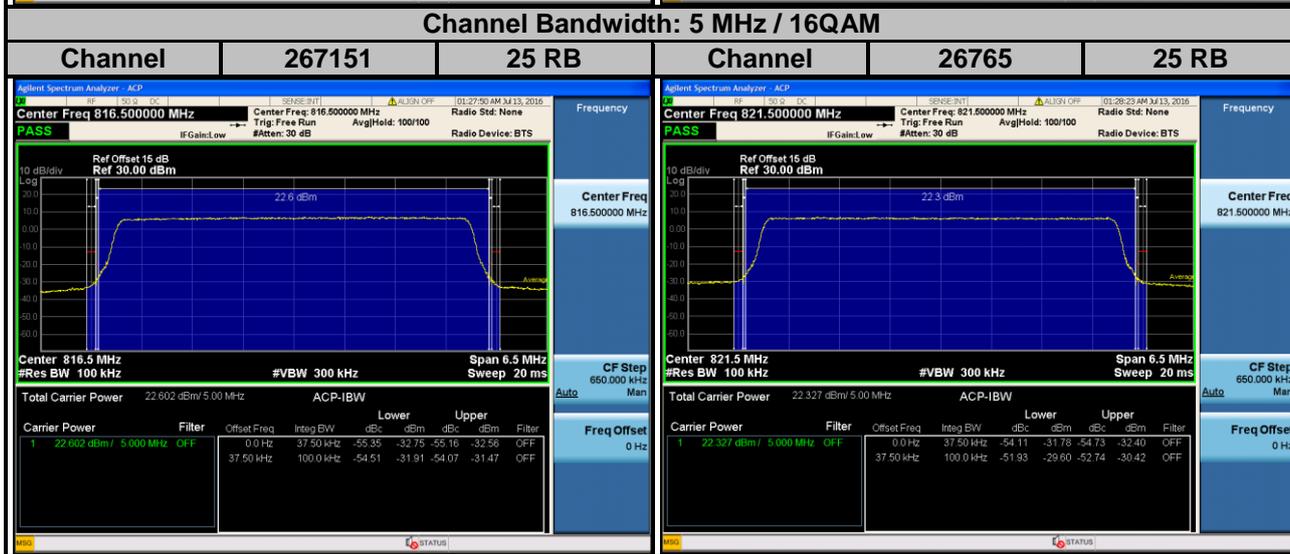
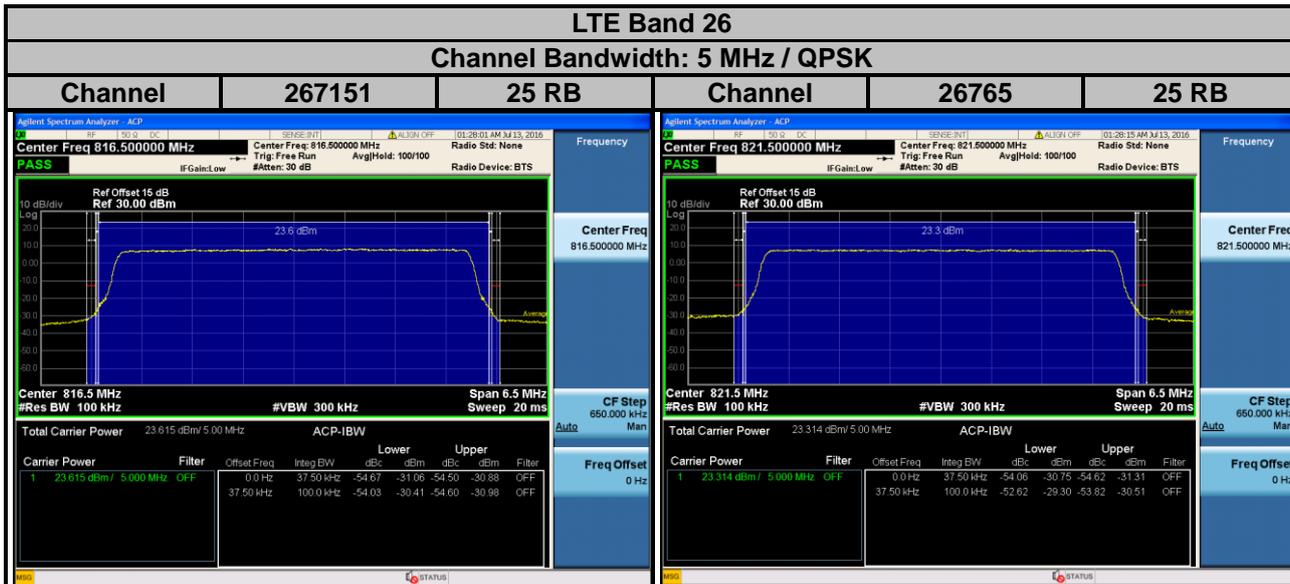


LTE Band 26
Channel Bandwidth: 3 MHz / QPSK



Channel Bandwidth: 3 MHz / 16QAM



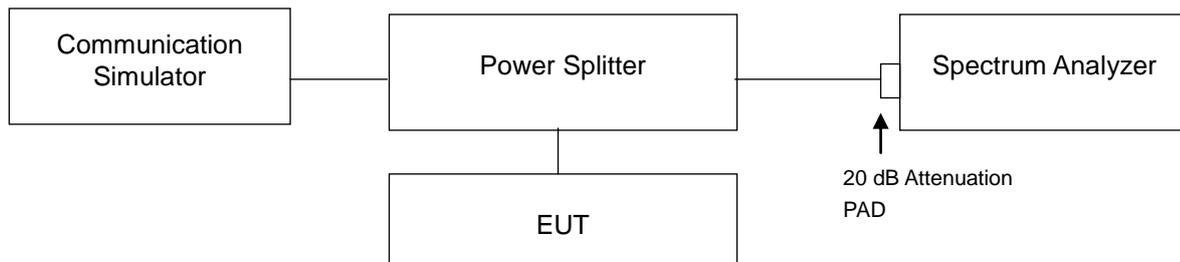


4.5 Conducted Spurious Emissions

4.5.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -13 dBm.

4.5.2 Test Setup

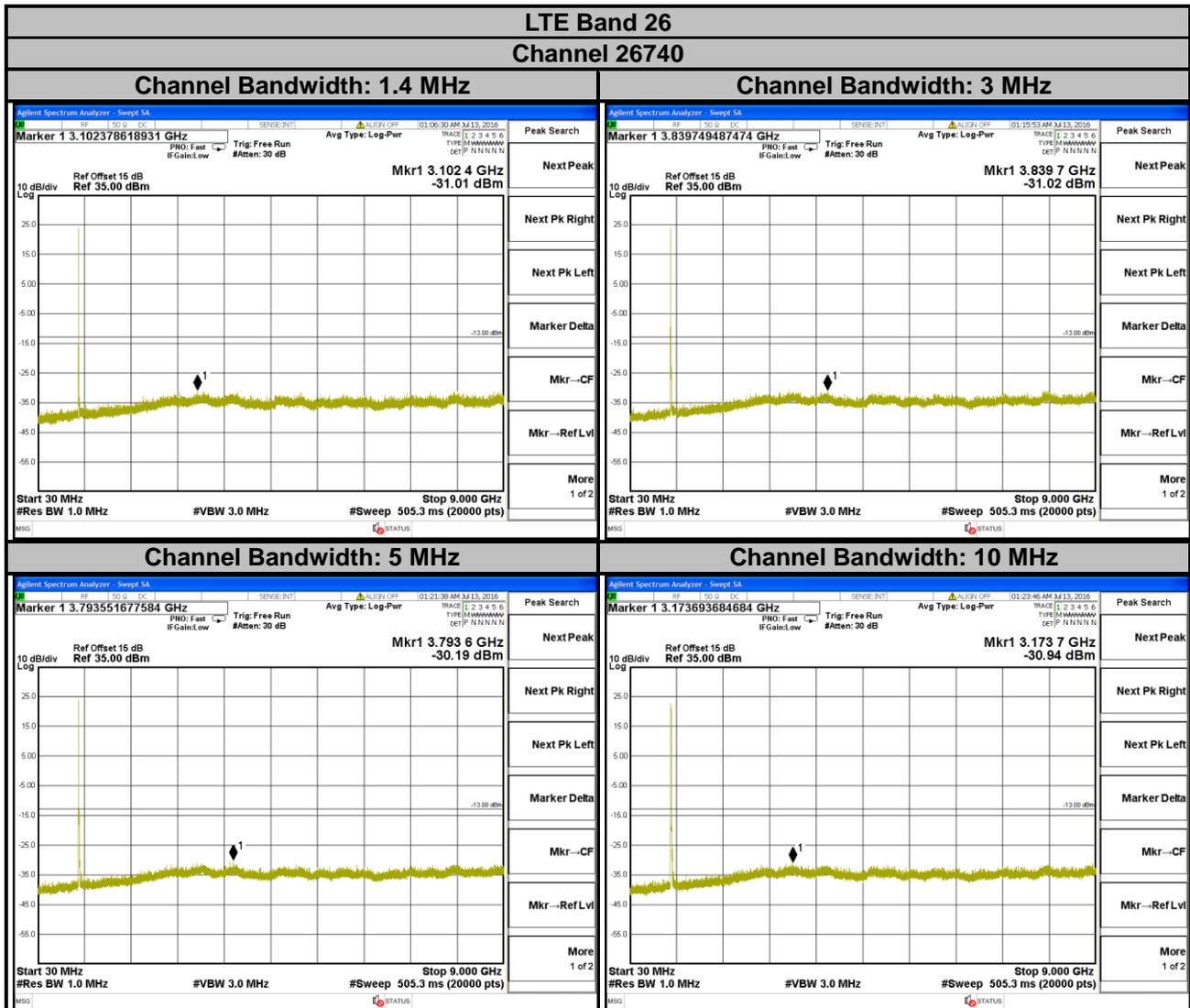
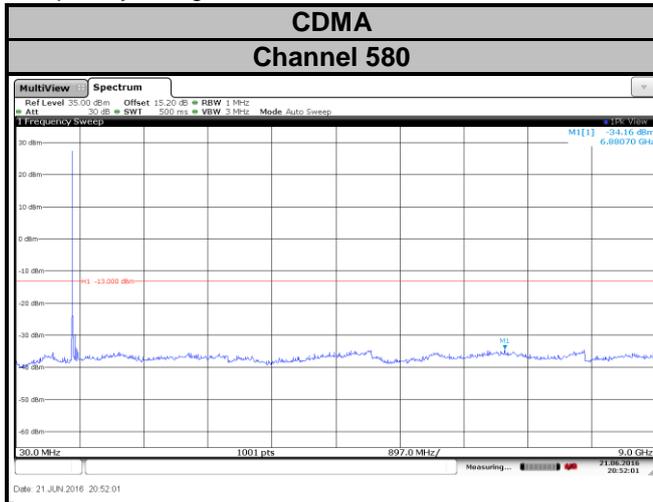


4.5.3 Test Procedure

- 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 30 MHz to 9 GHz. 10 dB attenuation pad is connected with spectrum. RBW=1 MHz and VBW=3 MHz are used for conducted emission measurement.

4.5.4 Test Results

Frequency Range: 30 MHz ~ 8 GHz



4.6 Radiated Emission Measurement

4.6.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -13 dBm.

4.6.2 Test Procedure

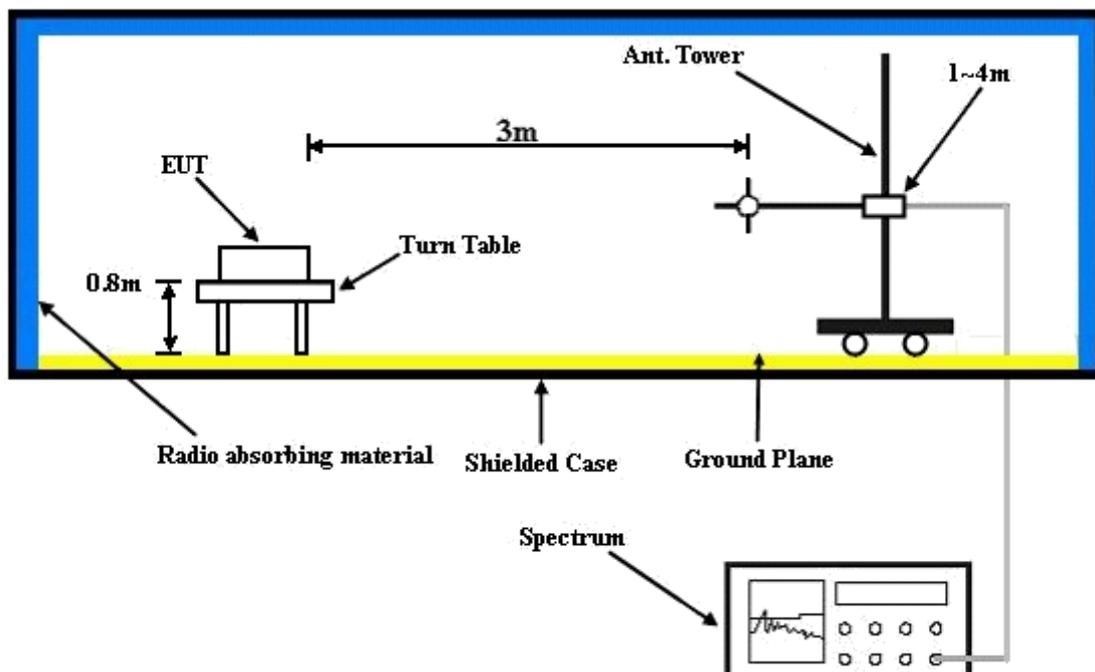
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 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.
- $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi.}$

Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.6.3 Deviation from Test Standard

No deviation.

4.6.4 Test Setup



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

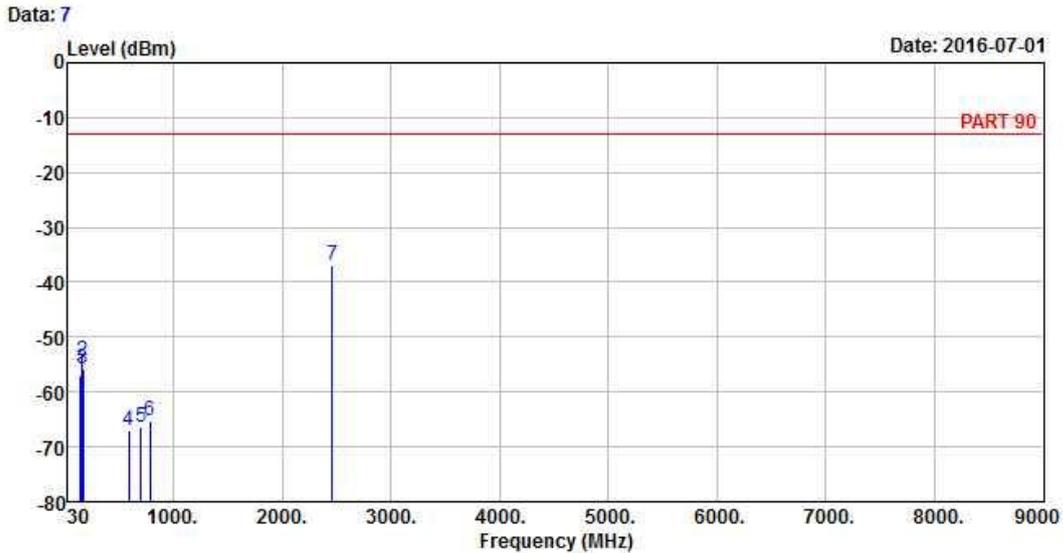
4.6.5 Test Results

CDMA:



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T



Site : 966 Chamber 5
 Condition: PART 90 HORIZONTAL
 Remak : CDMA2000 BC10 Link
 Tested by: Gavin Wu

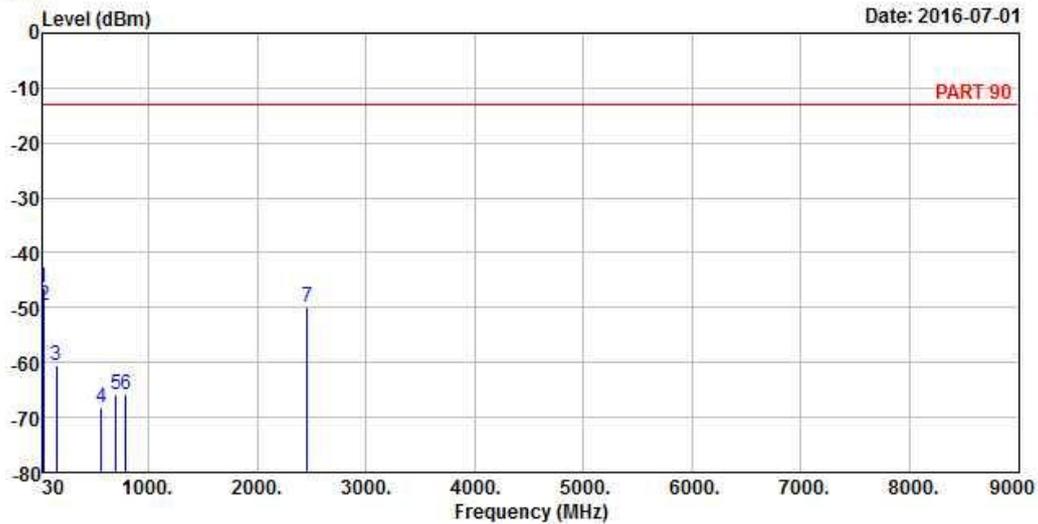
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 143.13 | -56.97 | -48.71 | -13.00 | -43.97 | -8.26 | Peak |
| 2 | 161.76 | -54.32 | -49.34 | -13.00 | -41.32 | -4.98 | Peak |
| 3 | 167.16 | -55.81 | -50.49 | -13.00 | -42.81 | -5.32 | Peak |
| 4 | 588.40 | -67.07 | -65.83 | -13.00 | -54.07 | -1.24 | Peak |
| 5 | 699.00 | -66.47 | -66.36 | -13.00 | -53.47 | -0.11 | Peak |
| 6 | 786.50 | -65.11 | -65.88 | -13.00 | -52.11 | 0.77 | Peak |
| 7 pp | 2461.50 | -36.84 | -26.40 | -13.00 | -23.84 | -10.44 | Peak |



A D T

Data: 8

Date: 2016-07-01



Site : 966 Chamber 5
 Condition: PART 90 VERTICAL
 Remak : CDMA2000 BC10 Link
 Tested by: Gavin Wu

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | pp 30.81 | -46.49 | -46.38 | -13.00 | -33.49 | -0.11 | Peak |
| 2 | 40.53 | -49.65 | -49.77 | -13.00 | -36.65 | 0.12 | Peak |
| 3 | 152.85 | -60.65 | -53.89 | -13.00 | -47.65 | -6.76 | Peak |
| 4 | 565.30 | -68.34 | -66.14 | -13.00 | -55.34 | -2.20 | Peak |
| 5 | 701.10 | -65.93 | -65.85 | -13.00 | -52.93 | -0.08 | Peak |
| 6 | 794.90 | -65.70 | -66.45 | -13.00 | -52.70 | 0.75 | Peak |
| 7 | 2461.50 | -49.76 | -39.32 | -13.00 | -36.76 | -10.44 | Peak |

LTE Band 26
Channel Bandwidth: 10 MHz / QPSK

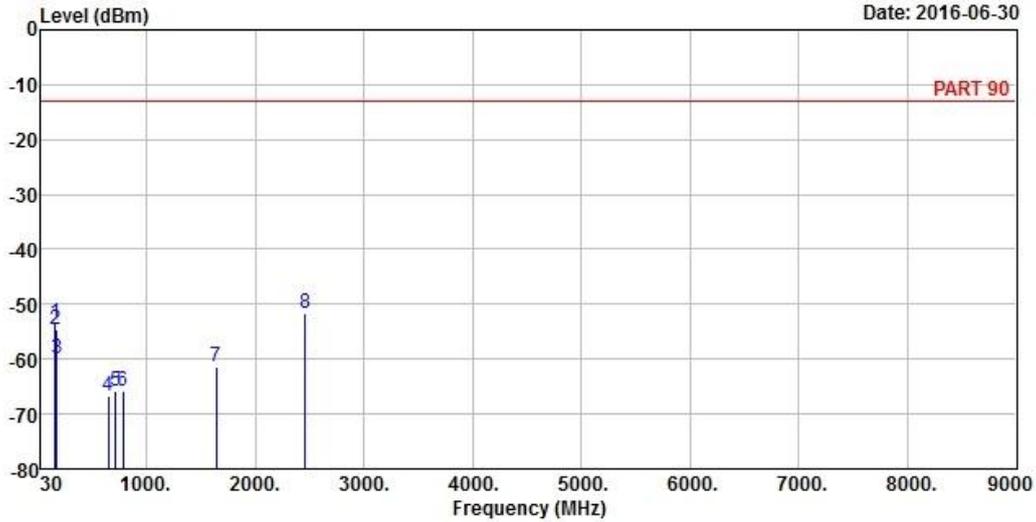


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2016-06-30



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE Band 26_QPSK_10M Link
Tested by: Toby Tian

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 159.87 | -53.41 | -48.57 | -13.00 | -40.41 | -4.84 | Peak |
| 2 | 166.35 | -54.69 | -49.37 | -13.00 | -41.69 | -5.32 | Peak |
| 3 | 176.34 | -59.80 | -53.08 | -13.00 | -46.80 | -6.72 | Peak |
| 4 | 651.40 | -66.79 | -65.94 | -13.00 | -53.79 | -0.85 | Peak |
| 5 | 717.20 | -65.98 | -66.21 | -13.00 | -52.98 | 0.23 | Peak |
| 6 | 782.30 | -65.94 | -66.73 | -13.00 | -52.94 | 0.79 | Peak |
| 7 | 1638.00 | -61.44 | -46.65 | -13.00 | -48.44 | -14.79 | Peak |
| 8 pp | 2457.00 | -51.55 | -41.11 | -13.00 | -38.55 | -10.44 | Peak |

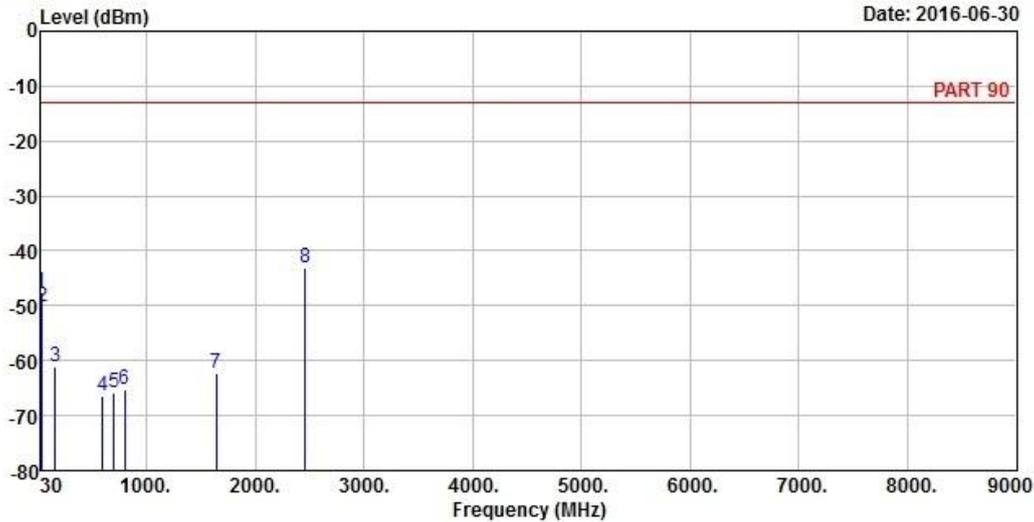


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2016-06-30



Site : 966 Chamber 5
 Condition: PART 90 VERTICAL
 Remak : LTE Band 26_QPSK_10M Link
 Tested by: Toby Tian

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 31.35 | -47.44 | -47.33 | -13.00 | -34.44 | -0.11 | Peak |
| 2 | 40.80 | -50.33 | -50.45 | -13.00 | -37.33 | 0.12 | Peak |
| 3 | 158.52 | -61.21 | -55.82 | -13.00 | -48.21 | -5.39 | Peak |
| 4 | 592.60 | -66.51 | -65.43 | -13.00 | -53.51 | -1.08 | Peak |
| 5 | 697.60 | -65.78 | -65.64 | -13.00 | -52.78 | -0.14 | Peak |
| 6 | 797.00 | -65.14 | -65.88 | -13.00 | -52.14 | 0.74 | Peak |
| 7 | 1638.00 | -62.22 | -47.43 | -13.00 | -49.22 | -14.79 | Peak |
| 8 pp | 2458.00 | -43.06 | -32.62 | -13.00 | -30.06 | -10.44 | Peak |

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---