

## FCC Test Report

### (PART 24)

**Report No.:** RF171110W003-5

**FCC ID:** 2AJOTTA-1045

**Test Model:** TA-1045

**Received Date:** Nov. 13, 2017

**Test Date:** Nov. 14, 2017 ~ Dec. 28, 2017

**Issued Date:** Dec. 29, 2017

**Applicant:** HMD Global Oy

**Address:** Karaportti 2, 02610 Espoo, Finland

**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. B102, Dazhu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China

**Test Location (2):** 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



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.

# TABLE OF CONTENTS

|                                                                |           |
|----------------------------------------------------------------|-----------|
| <b>RELEASE CONTROL RECORD .....</b>                            | <b>4</b>  |
| <b>1 CERTIFICATION .....</b>                                   | <b>5</b>  |
| <b>2 SUMMARY OF TEST RESULTS .....</b>                         | <b>6</b>  |
| 2.1 MEASUREMENT UNCERTAINTY .....                              | 6         |
| 2.2 TEST SITE AND INSTRUMENTS .....                            | 7         |
| <b>3 GENERAL INFORMATION .....</b>                             | <b>9</b>  |
| 3.1 GENERAL DESCRIPTION OF EUT .....                           | 9         |
| 3.2 CONFIGURATION OF SYSTEM UNDER TEST .....                   | 12        |
| 3.3 DESCRIPTION OF SUPPORT UNITS .....                         | 13        |
| 3.4 TEST ITEM AND TEST CONFIGURATION .....                     | 13        |
| 3.5 EUT OPERATING CONDITIONS .....                             | 16        |
| 3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS .....             | 16        |
| <b>4 TEST TYPES AND RESULTS .....</b>                          | <b>17</b> |
| 4.1 OUTPUT POWER MEASUREMENT .....                             | 17        |
| 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT .....                 | 17        |
| 4.1.2 TEST PROCEDURES .....                                    | 17        |
| 4.1.3 TEST SETUP .....                                         | 18        |
| 4.1.4 TEST RESULTS .....                                       | 19        |
| 4.2 FREQUENCY STABILITY MEASUREMENT .....                      | 33        |
| 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT .....          | 33        |
| 4.2.2 TEST PROCEDURE .....                                     | 33        |
| 4.2.3 TEST SETUP .....                                         | 33        |
| 4.2.4 TEST RESULTS .....                                       | 34        |
| 4.3 OCCUPIED BANDWIDTH MEASUREMENT .....                       | 43        |
| 4.3.1 TEST PROCEDURES .....                                    | 43        |
| 4.3.2 TEST SETUP .....                                         | 43        |
| 4.3.3 TEST RESULTS .....                                       | 44        |
| 4.4 BAND EDGE MEASUREMENT .....                                | 55        |
| 4.4.1 LIMITS OF BAND EDGE MEASUREMENT .....                    | 55        |
| 4.4.2 TEST SETUP .....                                         | 55        |
| 4.4.3 TEST PROCEDURES .....                                    | 55        |
| 4.4.4 TEST RESULTS .....                                       | 57        |
| 4.5 CONDUCTED SPURIOUS EMISSIONS .....                         | 64        |
| 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT ..... | 64        |
| 4.5.2 TEST PROCEDURE .....                                     | 64        |
| 4.5.3 TEST SETUP .....                                         | 64        |
| 4.5.4 TEST RESULTS .....                                       | 65        |
| 4.6 RADIATED EMISSION MEASUREMENT .....                        | 74        |
| 4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....            | 74        |
| 4.6.2 TEST PROCEDURES .....                                    | 74        |
| 4.6.3 DEVIATION FROM TEST STANDARD .....                       | 74        |
| 4.6.4 TEST SETUP .....                                         | 75        |
| 4.6.5 TEST RESULTS .....                                       | 77        |
| 4.7 PEAK TO AVERAGE RATIO .....                                | 113       |
| 4.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT .....        | 113       |
| 4.7.2 TEST SETUP .....                                         | 113       |
| 4.7.3 TEST PROCEDURES .....                                    | 113       |



|                                                                                                       |            |
|-------------------------------------------------------------------------------------------------------|------------|
| 4.7.4 TEST RESULTS .....                                                                              | 114        |
| <b>5 INFORMATION ON THE TESTING LABORATORIES.....</b>                                                 | <b>129</b> |
| <b>6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE<br/>EUT BY THE LAB .....</b> | <b>130</b> |



## RELEASE CONTROL RECORD

| ISSUE NO.      | REASON FOR CHANGE | DATE ISSUED   |
|----------------|-------------------|---------------|
| RF171110W003-5 | Original release  | Dec. 29, 2017 |

# 1 CERTIFICATION

**Product:** Smart Phone

**Brand:** Nokia

**Test Model:** TA-1045

**Sample Status:** Identical Prototype

**Applicant:** HMD Global Oy

**Test Date:** Nov. 14, 2017 ~ Dec. 28, 2017

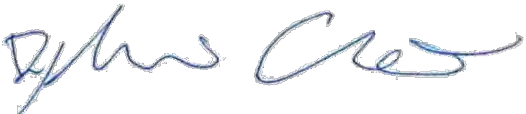
**Standards:** FCC Part 24, Subpart E

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

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

**Prepared by :**  **Date:** Dec. 29, 2017  
Yuqiang Yin / Engineer

**Approved by :**  **Date:** Dec. 29, 2017  
Dylan Chiou / Project Engineer

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 24 & Part 2 |                                     |        |                                                                                   |
|----------------------------------------|-------------------------------------|--------|-----------------------------------------------------------------------------------|
| STANDARD SECTION                       | TEST TYPE                           | RESULT | REMARK                                                                            |
| 2.1046<br>24.232                       | Equivalent Isotropic Radiated Power | PASS   | Meet the requirement of limit.                                                    |
| 2.1055<br>24.235                       | Frequency Stability                 | PASS   | Meet the requirement of limit.                                                    |
| 2.1049<br>24.238(b)                    | Occupied Bandwidth                  | PASS   | Meet the requirement of limit.                                                    |
| 24.232(d)                              | Peak to average ratio               | PASS   | Meet the requirement of limit.                                                    |
| 24.238(b)                              | Band Edge Measurements              | PASS   | Meet the requirement of limit.                                                    |
| 2.1051<br>24.238                       | Conducted Spurious Emissions        | PASS   | Meet the requirement of limit.                                                    |
| 2.1053<br>24.238                       | Radiated Spurious Emissions         | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -16.17dB at 42.61MHz. |

### 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     | UNCERTAINTY |
|---------------------|---------------|-------------|
| Conducted emissions | 9kHz~30MHz    | 2.66dB      |
| Radiated emissions  | 9KHz ~ 30MHz  | 2.68dB      |
|                     | 30MHz ~ 1GHz  | 3.26dB      |
|                     | 1GHz ~ 18GHz  | 4.48dB      |
|                     | 18GHz ~ 40GHz | 4.12dB      |

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

## 2.2 TEST SITE AND INSTRUMENTS

| Equipment                                   | Manufacturer | Model No.                           | Serial No.                      | Last Cal.  | Next Cal.  |
|---------------------------------------------|--------------|-------------------------------------|---------------------------------|------------|------------|
| MXE EMI Receiver                            | KEYSIGHT     | N9038A-544                          | MY54450026                      | Mar. 01,17 | Feb. 28,18 |
| EXA Signal Analyzer                         | KEYSIGHT     | N9010A-544                          | MY54510332                      | Mar. 01,17 | Feb. 28,18 |
| Bilog Antenna 1                             | ETS-LINDGREN | 3143B                               | 00161964                        | Nov. 26,16 | Nov. 25,18 |
| Bilog Antenna 2                             | ETS-LINDGREN | 3143B                               | 00161965                        | Nov. 26,16 | Nov. 25,18 |
| Horn Antenna 1                              | ETS-LINDGREN | 3117                                | 00168728                        | Nov. 26,16 | Nov. 25,18 |
| Horn Antenna 2                              | ETS-LINDGREN | 3117                                | 00168692                        | Nov. 26,16 | Nov. 25,18 |
| Loop antenna                                | Daze         | ZN30900A                            | 0708                            | Nov. 20,17 | Nov. 19,18 |
| Horn Antenna<br>(18GHz-40GHz)               | N/A          | QWH-SL-18-40<br>-K-SG/QMS-00<br>361 | 15433                           | Dec. 16,16 | Dec. 15,18 |
| Radio<br>Communication<br>Analyzer          | ANRITSU      | MT8820C                             | 6201465426                      | Mar. 01,17 | Feb. 28,18 |
| Signal Pre-Amplifier                        | EMSI         | EMC 9135                            | 980249                          | Jul. 24,17 | Jul. 23,18 |
| Signal Pre-Amplifier                        | EMSI         | EMC 012645B                         | 980257                          | Jul. 24,17 | Jul. 23,18 |
| Signal Pre-Amplifier                        | EMSI         | EMC 184045B                         | 980259                          | Jul. 24,17 | Jul. 23,18 |
| 3m Semi-anechoic<br>Chamber                 | ETS-LINDGREN | 9m*6m*6m                            | Euroshieldpn-<br>CT0001143-1216 | May 06,17  | May 05,18  |
| Test Software                               | E3           | V 9.160323                          | N/A                             | N/A        | N/A        |
| Test Software                               | ADT          | ADT_Radiated<br>_V7.6.15.9.2        | N/A                             | N/A        | N/A        |
| 10dB Attenuator                             | JFW/USA      | 50HF-010-SM<br>A                    | 1505                            | Jul. 24,17 | Jul. 23,18 |
| Power Meter                                 | Anritsu      | ML2495A                             | 1506002                         | Mar. 01,17 | Feb. 28,18 |
| Power Sensor                                | Anritsu      | MA2411B                             | 1339352                         | Mar. 01,17 | Feb. 28,18 |
| Humid & Temp<br>Programmable Tester         | Juyi         | ITH-120-45-CP<br>-AR                | IAA1504-001                     | Jul. 18,17 | Jul. 17,18 |
| MXG Analog<br>Microwave<br>Signal Generator | KEYSIGHT     | N5183A                              | MY50143024                      | Mar. 01,17 | Feb. 28,18 |

- NOTE:** 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 525120.

| Description & Manufacturer              | Model No.                  | Serial No.                                                    | Date Of Calibration | Due Date Of Calibration |
|-----------------------------------------|----------------------------|---------------------------------------------------------------|---------------------|-------------------------|
| Spectrum Analyzer<br>Agilent            | N9010A                     | MY52220314                                                    | No. 24, 2017        | Nov. 23, 2018           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ    | FSU43                      | 100115                                                        | Nov. 23, 2017       | Nov. 22, 2018           |
| RF signal cable<br>ETS-LINDGREN         | 5D-FB                      | Cable-CH1-01(RFC-S<br>MS-100-SMS-120+RF<br>C-SMS-100-SMS-400) | Jun. 23, 2017       | Jun. 22, 2018           |
| Power Meter<br>Anritsu                  | ML2495A                    | 1012010                                                       | Aug. 15, 2017       | Aug. 14, 2018           |
| Power Sensor<br>Anritsu                 | MA2411B                    | 1315050                                                       | Aug. 15, 2017       | Aug. 14, 2018           |
| RF Coaxial Cable<br>HUBER+SUHNNER       | EMC104-SM-SM-8000<br>&3000 | 140811+170717                                                 | Oct. 20, 2017       | Oct. 19, 2018           |
| RF Coaxial Cable<br>HUBER+SUHNNER       | SUCOFLEX 104               | EMC104-SM-SM-1000(<br>140807)                                 | Oct. 20, 2017       | Oct. 19, 2018           |
| RF Coaxial Cable<br>Worken              | 8D-FB                      | Cable-Ch10-01                                                 | Oct. 20, 2017       | Oct. 19, 2018           |
| Universal Radio<br>Communication Tester | MT8821C                    | 6201502978                                                    | Jul. 14, 2017       | Jul. 13, 2018           |

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                        |                                                                                                                   |                       |
|------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>PRODUCT</b>         | Smart Phone                                                                                                       |                       |
| <b>BRAND NAME</b>      | Nokia                                                                                                             |                       |
| <b>MODEL NAME</b>      | TA-1045                                                                                                           |                       |
| <b>POWER SUPPLY</b>    | 5/9Vdc (adapter or host equipment)<br>3.85Vdc (Li-ion, battery)                                                   |                       |
| <b>MODULATION TYPE</b> | <b>GSM, GPRS:</b> GMSK<br><b>EDGE:</b> GMSK, 8PSK<br><b>WCDMA :</b> BPSK<br><b>LTE Band 2:</b> QPSK, 16QAM, 64QAM |                       |
| <b>FREQUENCY RANGE</b> | <b>GSM, GPRS, EDGE</b>                                                                                            | 1850.2MHz ~ 1909.8MHz |
|                        | <b>WCDMA</b>                                                                                                      | 1852.4MHz ~ 1907.6MHz |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 1.4MHz</b>                                                                   | 1850.7MHz ~ 1909.3MHz |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 3MHz</b>                                                                     | 1851.5MHz ~ 1908.5MHz |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 5MHz</b>                                                                     | 1852.5MHz ~ 1907.5MHz |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 10MHz</b>                                                                    | 1855.0MHz ~ 1905.0MHz |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 15MHz</b>                                                                    | 1857.5MHz ~ 1902.5MHz |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 20MHz</b>                                                                    | 1860.0MHz ~ 1900.0MHz |
| <b>MAX. EIRP POWER</b> | <b>GSM</b>                                                                                                        | 1338mW                |
|                        | <b>EDGE</b>                                                                                                       | 542mW                 |
|                        | <b>WCDMA</b>                                                                                                      | 404mW                 |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 1.4MHz</b>                                                                   | 258mW                 |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 3MHz</b>                                                                     | 264mW                 |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 5MHz</b>                                                                     | 256mW                 |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 10MHz</b>                                                                    | 264mW                 |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 15MHz</b>                                                                    | 272mW                 |
|                        | <b>LTE Band 2<br/>Channel Bandwidth: 20MHz</b>                                                                    | 227mW                 |

|                            |                                                                                                     |                |
|----------------------------|-----------------------------------------------------------------------------------------------------|----------------|
| <b>EMISSION DESIGNATOR</b> | <b>GSM</b>                                                                                          | 246KGXW        |
|                            | <b>EDGE</b>                                                                                         | 245KG7W        |
|                            | <b>WCDMA</b>                                                                                        | 4M14F9W        |
|                            | <b>LTE Band 2<br/>Channel Bandwidth: 1.4MHz</b>                                                     | QPSK: 1M09G7D  |
|                            |                                                                                                     | 16QAM: 1M08W7D |
|                            |                                                                                                     | 64QAM: 1M08D7W |
|                            | <b>LTE Band 2<br/>Channel Bandwidth: 3MHz</b>                                                       | QPSK: 2M69G7D  |
|                            |                                                                                                     | 16QAM: 2M69W7D |
|                            |                                                                                                     | 64QAM: 2M69D7W |
|                            | <b>LTE Band 2<br/>Channel Bandwidth: 5MHz</b>                                                       | QPSK: 4M49G7D  |
|                            |                                                                                                     | 16QAM: 4M48W7D |
|                            |                                                                                                     | 64QAM: 4M48D7W |
|                            | <b>LTE Band 2<br/>Channel Bandwidth: 10MHz</b>                                                      | QPSK: 8M95G7D  |
|                            |                                                                                                     | 16QAM: 8M96W7D |
|                            |                                                                                                     | 64QAM: 8M95D7W |
|                            | <b>LTE Band 2<br/>Channel Bandwidth: 15MHz</b>                                                      | QPSK: 13M4G7D  |
|                            |                                                                                                     | 16QAM: 13M4W7D |
|                            |                                                                                                     | 64QAM: 13M4D7W |
|                            | <b>LTE Band 2<br/>Channel Bandwidth: 20MHz</b>                                                      | QPSK: 17M9G7D  |
|                            |                                                                                                     | 16QAM: 17M9W7D |
|                            |                                                                                                     | 64QAM: 17M9D7W |
| <b>ANTENNA TYPE</b>        | Fixed Internal antenna with -0.6dBi                                                                 |                |
| <b>HW VERSION</b>          | 5                                                                                                   |                |
| <b>SW VERSION</b>          | 00WW_1_300                                                                                          |                |
| <b>I/O PORTS</b>           | Refer to user's manual                                                                              |                |
| <b>CABLE SUPPLIED</b>      | USB cable: non-shielded, detachable, 1.0meter<br>Earphone cable: non-shielded, detachable, 1.4meter |                |

**NOTE:**

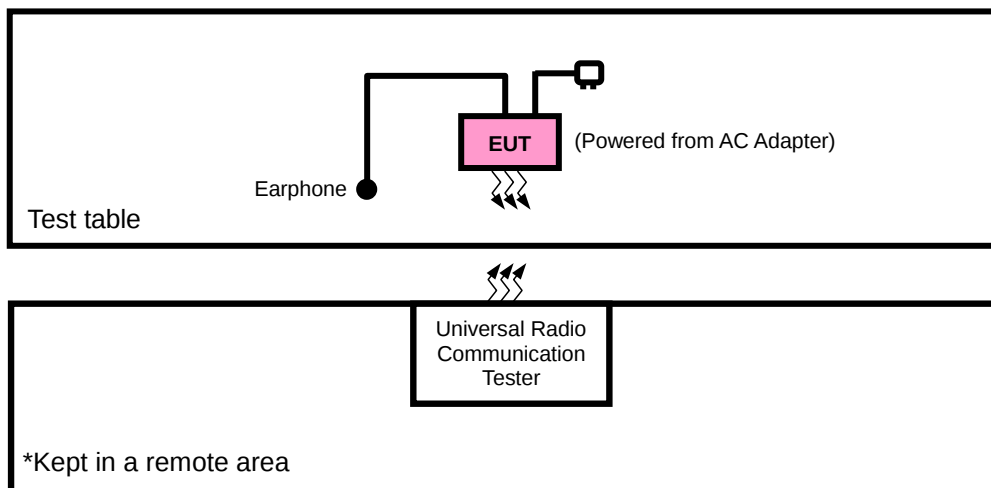
1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

**List of Accessories:**

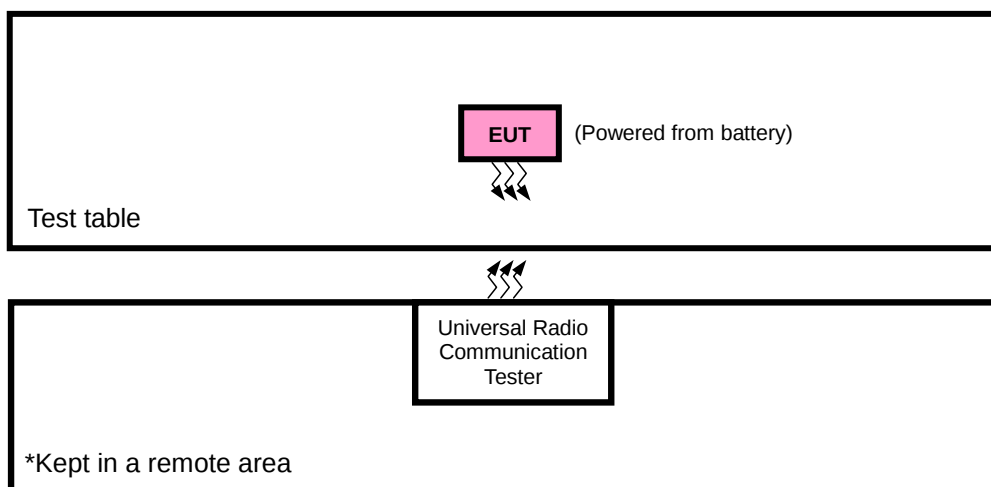
| ACCESSORIES | BRAND    | MODEL            | MANUFACTURER   | SPECIFICATION                                                         |
|-------------|----------|------------------|----------------|-----------------------------------------------------------------------|
| Adapter 1   | Nokia    | FC0302           | Salcomp        | I/P: 100-240Vac, 0.5A<br>O/P: 5Vdc, 2.5A/ 9Vdc, 2.0A /<br>12Vdc, 1.5A |
| Adapter 2   | Nokia    | AD-18WU          | DVE            | I/P: 100-240Vac, 0.5A<br>O/P: 5Vdc, 2.5A/ 9Vdc, 2.0A /<br>12Vdc, 1.5A |
| Adapter 3   | Nokia    | AD-18WU          | Salcomp        | I/P: 100-240Vac, 0.5A<br>O/P: 5Vdc, 3.0A/ 9Vdc, 2.0A /<br>12Vdc, 1.5A |
| Battery     | SCUD     | HE345            | SCUD           | Rating: 3.85Vdc, 3000mAh                                              |
| Earphone 1  | Foxconn  | WH-108           | Foxconn        | 1.4m non-shielded cable w/o core                                      |
| Earphone 2  | Foxconn  | WH-108           | OBO PRO.2 INC. | 1.4m non-shielded cable w/o core                                      |
| USB Cable 1 | FIT      | CUDU01B-FA203-DH | Foxconn        | 1.0m non-shielded cable w/o core                                      |
| USB Cable 2 | Shenglan | JCT024-F001      | Shenglan       | 1.0m non-shielded cable w/o core                                      |
| USB Cable 3 | Yinrun   | YR680004-A       | Yinrun         | 1.0m non-shielded cable w/o core                                      |

## 3.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST



### FOR E.I.R.P. TEST



### 3.3 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   | DC source | LONG WEI | PS-6403D  | 010934269  | N/A    |
| 2   | PC        | HP       | A6608CN   | 3CR83825X3 | N/A    |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|-----------------------------------------------------|
| 1   | DC Line: Unshielded, Detachable 1.0m                |
| 2   | AC Line: Unshielded, Detachable 1.5m                |

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).

### 3.4 TEST ITEM AND TEST CONFIGURATION

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 in EIRP and radiated emission was found when positioned on X-plane for GSM/EDGE/WCDMA /LTE. Following channel(s) was (were) selected for the final test as listed below:

| EUT CONFIGURE MODE | DESCRIPTION                                                      |
|--------------------|------------------------------------------------------------------|
| A                  | EUT + Adapter + USB Cable + Earphone with GSM ,WCDMA or LTE link |
| B                  | EUT + Battery with GSM ,WCDMA or LTE link                        |

#### GSM MODE

| EUT CONFIGURE MODE | TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL | MODE      |
|--------------------|-----------------------|-------------------|----------------|-----------|
| B                  | EIRP                  | 512 to 810        | 512, 661, 810  | GSM, EDGE |
| B                  | FREQUENCY STABILITY   | 512 to 810        | 512, 810       | GSM, EDGE |
| B                  | OCCUPIED BANDWIDTH    | 512 to 810        | 512, 661, 810  | GSM, EDGE |
| B                  | PEAK TO AVERAGE RATIO | 512 to 810        | 512, 661, 810  | GSM, EDGE |
| B                  | BAND EDGE             | 512 to 810        | 512, 810       | GSM, EDGE |
| B                  | CONDCUDED EMISSION    | 512 to 810        | 512, 661, 810  | GSM, EDGE |
| A                  | RADIATED EMISSION     | 512 to 810        | 512, 661, 810  | GSM, EDGE |

## WCDMA MODE

| EUT CONFIGURE MODE | TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL   | MODE  |
|--------------------|-----------------------|-------------------|------------------|-------|
| B                  | EIRP                  | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| B                  | FREQUENCY STABILITY   | 9262 to 9538      | 9262, 9538       | WCDMA |
| B                  | OCCUPIED BANDWIDTH    | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| B                  | PEAK TO AVERAGE RATIO | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| B                  | BAND EDGE             | 9262 to 9538      | 9262, 9538       | WCDMA |
| B                  | CONDCUDED EMISSION    | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |
| A                  | RADIATED EMISSION     | 9262 to 9538      | 9262, 9400, 9538 | WCDMA |

## LTE BAND 2 MODE

| EUT CONFIGURE MODE | TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION        | MODE                 |
|--------------------|-----------------------|-------------------|---------------------|-------------------|-------------------|----------------------|
| B                  | EIRP                  | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
| B                  | FREQUENCY STABILITY   | 18607 to 19193    | 18607, 19193        | 1.4MHz            | QPSK              | 1 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 19185        | 3MHz              | QPSK              | 1 RB / 0 RB Offset   |
|                    |                       | 18625 to 19175    | 18625, 19175        | 5MHz              | QPSK              | 1 RB / 0 RB Offset   |
|                    |                       | 18650 to 19150    | 18650, 19150        | 10MHz             | QPSK              | 1 RB / 0 RB Offset   |
|                    |                       | 18675 to 19125    | 18675, 19125        | 15MHz             | QPSK              | 1 RB / 0 RB Offset   |
|                    |                       | 18700 to 19100    | 18700, 19100        | 20MHz             | QPSK              | 1 RB / 0 RB Offset   |
| B                  | OCCUPIED BANDWIDTH    | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK,16QAM, 64QAM | 6 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK,16QAM, 64QAM | 15 RB / 0 RB Offset  |
|                    |                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK,16QAM, 64QAM | 25 RB / 0 RB Offset  |
|                    |                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK,16QAM, 64QAM | 50 RB / 0 RB Offset  |
|                    |                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK,16QAM, 64QAM | 75 RB / 0 RB Offset  |
|                    |                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK,16QAM, 64QAM | 100 RB / 0 RB Offset |
| B                  | PEAK TO AVERAGE RATIO | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK,16QAM, 64QAM | 1 RB / 0 RB Offset   |

|   |                    |                |                     |        |      |                      |
|---|--------------------|----------------|---------------------|--------|------|----------------------|
| B | BAND EDGE          | 18607 to 19193 | 18607               | 1.4MHz | QPSK | 1 RB / 0 RB Offset   |
|   |                    |                | 19193               | 1.4MHz | QPSK | 6 RB / 0 RB Offset   |
|   |                    | 18615 to 19185 | 18615               | 3MHz   | QPSK | 1 RB / 5 RB Offset   |
|   |                    |                | 19185               | 3MHz   | QPSK | 6 RB / 0 RB Offset   |
|   |                    | 18625 to 19175 | 18625               | 5MHz   | QPSK | 1 RB / 0 RB Offset   |
|   |                    |                | 19175               | 5MHz   | QPSK | 15 RB / 0 RB Offset  |
|   |                    | 18650 to 19150 | 18650               | 10MHz  | QPSK | 1 RB / 14 RB Offset  |
|   |                    |                | 19150               | 10MHz  | QPSK | 15 RB / 0 RB Offset  |
|   |                    | 18675 to 19125 | 18675               | 15MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                    |                | 19125               | 15MHz  | QPSK | 25 RB / 0 RB Offset  |
|   |                    | 18700 to 19100 | 18700               | 20MHz  | QPSK | 1 RB / 24 RB Offset  |
|   |                    |                | 19100               | 20MHz  | QPSK | 25 RB / 0 RB Offset  |
| B | CONDCUDED EMISSION | 18607 to 19193 | 18607, 18900, 19193 | 1.4MHz | QPSK | 1 RB / 0 RB Offset   |
|   |                    | 18615 to 19185 | 18615, 18900, 19185 | 3MHz   | QPSK | 50 RB / 0 RB Offset  |
|   |                    | 18625 to 19175 | 18625, 18900, 19175 | 5MHz   | QPSK | 1 RB / 49 RB Offset  |
|   |                    | 18650 to 19150 | 18650, 18900, 19150 | 10MHz  | QPSK | 50 RB / 0 RB Offset  |
|   |                    | 18675 to 19125 | 18675, 18900, 19125 | 15MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                    | 18700 to 19100 | 18700, 18900, 19100 | 20MHz  | QPSK | 75 RB / 0 RB Offset  |
| A | RADIATED EMISSION  | 18607 to 19193 | 18900               | 1.4MHz | QPSK | 1 RB / 74 RB Offset  |
|   |                    | 18615 to 19185 | 18900               | 3MHz   | QPSK | 75 RB / 0 RB Offset  |
|   |                    | 18625 to 19175 | 18900               | 5MHz   | QPSK | 1 RB / 0 RB Offset   |
|   |                    | 18650 to 19150 | 18650, 18900, 19150 | 10MHz  | QPSK | 1 RB / 99 RB Offset  |
|   |                    | 18675 to 19125 | 18900               | 15MHz  | QPSK | 100 RB / 0 RB Offset |
|   |                    | 18700 to 19100 | 18900               | 20MHz  | QPSK | 1 RB / 0 RB Offset   |

#### TEST CONDITION:

| TEST ITEM             | ENVIRONMENTAL CONDITIONS | INPUT POWER          | TESTED BY   |
|-----------------------|--------------------------|----------------------|-------------|
| EIRP                  | 25deg. C, 57%RH          | 3.85Vdc from Battery | Simon Yang  |
| FREQUENCY STABILITY   | 23deg. C, 61%RH          | DC 3.5V/3.85V/4.4V   | Wenliang Wu |
| OCCUPIED BANDWIDTH    | 23deg. C, 61%RH          | 3.85Vdc from Battery | Wenliang Wu |
| PEAK TO AVERAGE RATIO | 23deg. C, 61%RH          | 3.85Vdc from Battery | Wenliang Wu |
| BAND EDGE             | 23deg. C, 61%RH          | 3.85Vdc from Battery | Wenliang Wu |
| CONDCUDED EMISSION    | 23deg. C, 61%RH          | 3.85Vdc from Battery | Wenliang Wu |
| RADIATED EMISSION     | 23deg. C, 70%RH          | DC 5/9V from adaptor | Simon Yang  |

### **3.5 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

### **3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS**

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

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 24**

**KDB 971168 D01 Power Meas License Digital Systems v03**

**ANSI/TIA/EIA-603-D**

**ANSI/TIA/EIA-603-E**

**ANSI C63.26-2015**

**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 and portable stations are limited to 2 watts EIRP.

#### 4.1.2 TEST PROCEDURES

##### EIRP MEASUREMENT:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM & GPRS, 5MHz for WCDMA mode and 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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 1m to 4m 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

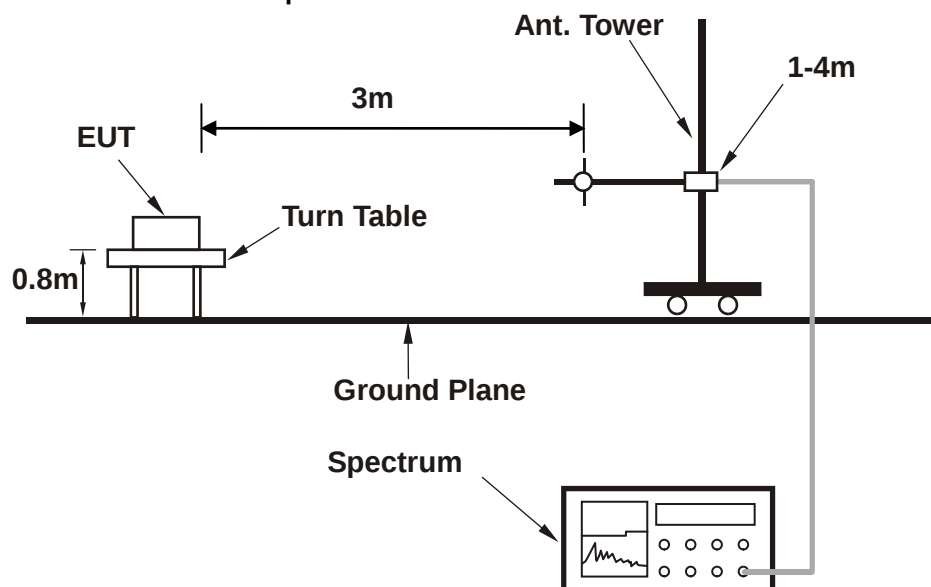
##### CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, GPRS, EDGE & WCDMA 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.

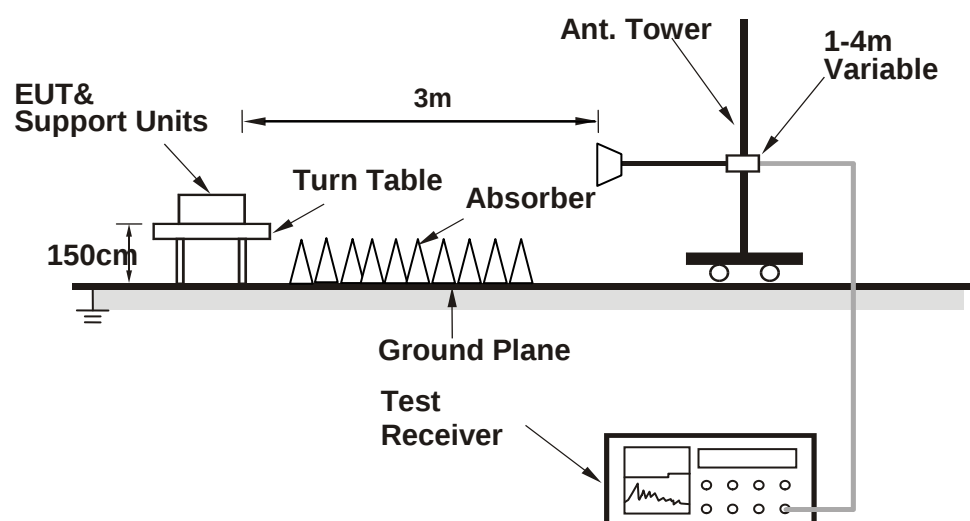
### 4.1.3 TEST SETUP

#### EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

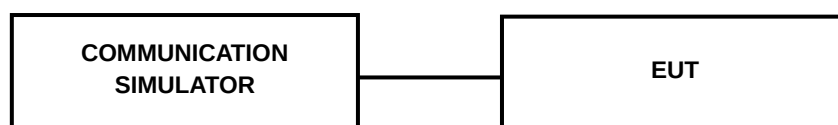


<Radiated Emission above 1 GHz>



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)

| Band            | GSM1900 |        |        |
|-----------------|---------|--------|--------|
| Channel         | 512     | 661    | 810    |
| Frequency (MHz) | 1850.2  | 1880.0 | 1909.8 |
| GSM             | 30.89   | 30.93  | 30.88  |
| GPRS 8          | 30.87   | 30.91  | 30.86  |
| GPRS 10         | 26.49   | 26.53  | 26.48  |
| GPRS 11         | 24.69   | 24.73  | 24.68  |
| GPRS 12         | 23.63   | 23.67  | 23.62  |
| EDGE 8 (MCS9)   | 24.95   | 24.99  | 24.94  |
| EDGE 10 (MCS9)  | 24.21   | 24.25  | 24.20  |
| EDGE 11 (MCS9)  | 23.04   | 23.08  | 23.03  |
| EDGE 12 (MCS9)  | 21.73   | 21.77  | 21.72  |

| Band               | WCDMA II |        |        |
|--------------------|----------|--------|--------|
| Channel            | 9262     | 9400   | 9538   |
| Frequency (MHz)    | 1852.4   | 1880.0 | 1907.6 |
| RMC 12.2K          | 24.89    | 24.98  | 24.93  |
| HSPA               |          |        |        |
| HSDPA Subtest-1    | 23.30    | 23.39  | 23.34  |
| HSDPA Subtest-2    | 23.36    | 23.45  | 23.40  |
| HSDPA Subtest-3    | 22.84    | 22.93  | 22.88  |
| HSDPA Subtest-4    | 22.86    | 22.95  | 22.90  |
| DC-HSDPA Subtest-1 | 23.30    | 23.37  | 23.31  |
| DC-HSDPA Subtest-2 | 23.36    | 23.41  | 23.38  |
| DC-HSDPA Subtest-3 | 22.87    | 22.96  | 22.89  |
| DC-HSDPA Subtest-4 | 22.81    | 22.93  | 22.87  |
| HSUPA Subtest-1    | 23.42    | 23.51  | 23.46  |
| HSUPA Subtest-2    | 21.46    | 21.55  | 21.50  |
| HSUPA Subtest-3    | 22.47    | 22.56  | 22.51  |
| HSUPA Subtest-4    | 21.46    | 21.55  | 21.50  |
| HSUPA Subtest-5    | 23.40    | 23.49  | 23.44  |

| LTE Band 2 |            |         |           |                         |                       |                         |                     |
|------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>18607         | Mid CH<br>18900       | High CH<br>19193        | 3GPP<br>MPR<br>(dB) |
|            |            |         |           | Frequency<br>1850.7 MHz | Frequency<br>1880 MHz | Frequency<br>1909.3 MHz |                     |
| 1.4MHz     | QPSK       | 1       | 0         | 23.66                   | 23.73                 | 23.70                   | 0                   |
|            |            | 1       | 2         | 23.51                   | 23.58                 | 23.55                   | 0                   |
|            |            | 1       | 5         | 23.49                   | 23.56                 | 23.53                   | 0                   |
|            |            | 3       | 0         | 22.61                   | 22.68                 | 22.65                   | 0                   |
|            |            | 3       | 1         | 22.59                   | 22.66                 | 22.63                   | 0                   |
|            |            | 3       | 3         | 22.56                   | 22.63                 | 22.60                   | 0                   |
|            |            | 6       | 0         | 22.57                   | 22.64                 | 22.61                   | 1                   |
|            | 16QAM      | 1       | 0         | 22.64                   | 22.71                 | 22.68                   | 1                   |
|            |            | 1       | 2         | 22.49                   | 22.56                 | 22.53                   | 1                   |
|            |            | 1       | 5         | 22.47                   | 22.54                 | 22.51                   | 1                   |
|            |            | 3       | 0         | 21.59                   | 21.66                 | 21.63                   | 1                   |
|            |            | 3       | 1         | 21.57                   | 21.64                 | 21.61                   | 1                   |
|            |            | 3       | 3         | 21.54                   | 21.61                 | 21.58                   | 1                   |
|            |            | 6       | 0         | 21.55                   | 21.62                 | 21.59                   | 2                   |
|            | 64QAM      | 1       | 0         | 21.65                   | 21.72                 | 21.69                   | 2                   |
|            |            | 1       | 2         | 21.50                   | 21.57                 | 21.54                   | 2                   |
|            |            | 1       | 5         | 21.48                   | 21.55                 | 21.52                   | 2                   |
|            |            | 3       | 0         | 20.60                   | 20.67                 | 20.64                   | 2                   |
|            |            | 3       | 1         | 20.58                   | 20.65                 | 20.62                   | 2                   |
|            |            | 3       | 3         | 20.55                   | 20.62                 | 20.59                   | 2                   |
|            |            | 6       | 0         | 20.56                   | 20.63                 | 20.60                   | 3                   |

| LTE Band 2 |            |         |           |                         |                       |                         |                     |
|------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>18615         | Mid CH<br>18900       | High CH<br>19185        | 3GPP<br>MPR<br>(dB) |
|            |            |         |           | Frequency<br>1851.5 MHz | Frequency<br>1880 MHz | Frequency<br>1908.5 MHz |                     |
| 3MHz       | QPSK       | 1       | 0         | 23.69                   | 23.76                 | 23.73                   | 0                   |
|            |            | 1       | 7         | 23.54                   | 23.61                 | 23.58                   | 0                   |
|            |            | 1       | 14        | 23.52                   | 23.59                 | 23.56                   | 0                   |
|            |            | 8       | 0         | 22.64                   | 22.71                 | 22.68                   | 1                   |
|            |            | 8       | 3         | 22.62                   | 22.69                 | 22.66                   | 1                   |
|            |            | 8       | 7         | 22.59                   | 22.66                 | 22.63                   | 1                   |
|            |            | 15      | 0         | 22.60                   | 22.67                 | 22.64                   | 1                   |
|            | 16QAM      | 1       | 0         | 22.67                   | 22.74                 | 22.71                   | 1                   |
|            |            | 1       | 7         | 22.52                   | 22.59                 | 22.56                   | 1                   |
|            |            | 1       | 14        | 22.50                   | 22.57                 | 22.54                   | 1                   |
|            |            | 8       | 0         | 21.62                   | 21.69                 | 21.66                   | 2                   |
|            |            | 8       | 3         | 21.60                   | 21.67                 | 21.64                   | 2                   |
|            |            | 8       | 7         | 21.57                   | 21.64                 | 21.61                   | 2                   |
|            |            | 15      | 0         | 21.58                   | 21.65                 | 21.62                   | 2                   |
|            | 64QAM      | 1       | 0         | 21.68                   | 21.75                 | 21.72                   | 2                   |
|            |            | 1       | 7         | 21.53                   | 21.60                 | 21.57                   | 2                   |
|            |            | 1       | 14        | 21.51                   | 21.58                 | 21.55                   | 2                   |
|            |            | 8       | 0         | 20.63                   | 20.70                 | 20.67                   | 3                   |
|            |            | 8       | 3         | 20.61                   | 20.68                 | 20.65                   | 3                   |
|            |            | 8       | 7         | 20.58                   | 20.65                 | 20.62                   | 3                   |
|            |            | 15      | 0         | 20.59                   | 20.66                 | 20.63                   | 3                   |

| LTE Band 2 |            |         |           |                         |                       |                         |                     |
|------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>18625         | Mid CH<br>18900       | High CH<br>19175        | 3GPP<br>MPR<br>(dB) |
|            |            |         |           | Frequency<br>1852.5 MHz | Frequency<br>1880 MHz | Frequency<br>1907.5 MHz |                     |
| 5MHz       | QPSK       | 1       | 0         | 23.75                   | 23.82                 | 23.79                   | 0                   |
|            |            | 1       | 12        | 23.60                   | 23.67                 | 23.64                   | 0                   |
|            |            | 1       | 24        | 23.58                   | 23.65                 | 23.62                   | 0                   |
|            |            | 12      | 0         | 22.70                   | 22.77                 | 22.74                   | 1                   |
|            |            | 12      | 6         | 22.68                   | 22.75                 | 22.72                   | 1                   |
|            |            | 12      | 13        | 22.65                   | 22.72                 | 22.69                   | 1                   |
|            |            | 25      | 0         | 22.66                   | 22.73                 | 22.70                   | 1                   |
|            | 16QAM      | 1       | 0         | 22.73                   | 22.80                 | 22.77                   | 1                   |
|            |            | 1       | 12        | 22.58                   | 22.65                 | 22.62                   | 1                   |
|            |            | 1       | 24        | 22.56                   | 22.63                 | 22.60                   | 1                   |
|            |            | 12      | 0         | 21.68                   | 21.75                 | 21.72                   | 2                   |
|            |            | 12      | 6         | 21.66                   | 21.73                 | 21.70                   | 2                   |
|            |            | 12      | 13        | 21.63                   | 21.70                 | 21.67                   | 2                   |
|            |            | 25      | 0         | 21.64                   | 21.71                 | 21.68                   | 2                   |
|            | 64QAM      | 1       | 0         | 21.74                   | 21.81                 | 21.78                   | 2                   |
|            |            | 1       | 12        | 21.59                   | 21.66                 | 21.63                   | 2                   |
|            |            | 1       | 24        | 21.57                   | 21.64                 | 21.61                   | 2                   |
|            |            | 12      | 0         | 20.69                   | 20.76                 | 20.73                   | 3                   |
|            |            | 12      | 6         | 20.67                   | 20.74                 | 20.71                   | 3                   |
|            |            | 12      | 13        | 20.64                   | 20.71                 | 20.68                   | 3                   |
|            |            | 25      | 0         | 20.65                   | 20.72                 | 20.69                   | 3                   |

| LTE Band 2 |            |         |           |                       |                       |                       |                     |
|------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|---------------------|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>18650       | Mid CH<br>18900       | High CH<br>19150      | 3GPP<br>MPR<br>(dB) |
|            |            |         |           | Frequency<br>1855 MHz | Frequency<br>1880 MHz | Frequency<br>1905 MHz |                     |
| 10MHz      | QPSK       | 1       | 0         | 23.80                 | 23.87                 | 23.84                 | 0                   |
|            |            | 1       | 24        | 23.65                 | 23.72                 | 23.69                 | 0                   |
|            |            | 1       | 49        | 23.63                 | 23.70                 | 23.67                 | 0                   |
|            |            | 25      | 0         | 22.75                 | 22.82                 | 22.79                 | 1                   |
|            |            | 25      | 12        | 22.73                 | 22.80                 | 22.77                 | 1                   |
|            |            | 25      | 25        | 22.70                 | 22.77                 | 22.74                 | 1                   |
|            |            | 50      | 0         | 22.71                 | 22.78                 | 22.75                 | 1                   |
|            | 16QAM      | 1       | 0         | 22.78                 | 22.85                 | 22.82                 | 1                   |
|            |            | 1       | 24        | 22.63                 | 22.70                 | 22.67                 | 1                   |
|            |            | 1       | 49        | 22.61                 | 22.68                 | 22.65                 | 1                   |
|            |            | 25      | 0         | 21.73                 | 21.80                 | 21.77                 | 2                   |
|            |            | 25      | 12        | 21.71                 | 21.78                 | 21.75                 | 2                   |
|            |            | 25      | 25        | 21.68                 | 21.75                 | 21.72                 | 2                   |
|            |            | 50      | 0         | 21.69                 | 21.76                 | 21.73                 | 2                   |
|            | 64QAM      | 1       | 0         | 21.79                 | 21.86                 | 21.83                 | 2                   |
|            |            | 1       | 24        | 21.64                 | 21.71                 | 21.68                 | 2                   |
|            |            | 1       | 49        | 21.62                 | 21.69                 | 21.66                 | 2                   |
|            |            | 25      | 0         | 20.74                 | 20.81                 | 20.78                 | 3                   |
|            |            | 25      | 12        | 20.72                 | 20.79                 | 20.76                 | 3                   |
|            |            | 25      | 25        | 20.69                 | 20.76                 | 20.73                 | 3                   |
|            |            | 50      | 0         | 20.70                 | 20.77                 | 20.74                 | 3                   |

| LTE Band 2 |            |         |           |                         |                       |                         |                     |
|------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>18675         | Mid CH<br>18900       | High CH<br>19125        | 3GPP<br>MPR<br>(dB) |
|            |            |         |           | Frequency<br>1857.5 MHz | Frequency<br>1880 MHz | Frequency<br>1902.5 MHz |                     |
| 15MHz      | QPSK       | 1       | 0         | 23.86                   | 23.93                 | 23.90                   | 0                   |
|            |            | 1       | 37        | 23.71                   | 23.78                 | 23.75                   | 0                   |
|            |            | 1       | 74        | 23.69                   | 23.76                 | 23.73                   | 0                   |
|            |            | 36      | 0         | 22.81                   | 22.88                 | 22.85                   | 1                   |
|            |            | 36      | 19        | 22.79                   | 22.86                 | 22.83                   | 1                   |
|            |            | 36      | 39        | 22.76                   | 22.83                 | 22.80                   | 1                   |
|            |            | 75      | 0         | 22.77                   | 22.84                 | 22.81                   | 1                   |
|            | 16QAM      | 1       | 0         | 22.84                   | 22.91                 | 22.88                   | 1                   |
|            |            | 1       | 37        | 22.69                   | 22.76                 | 22.73                   | 1                   |
|            |            | 1       | 74        | 22.67                   | 22.74                 | 22.71                   | 1                   |
|            |            | 36      | 0         | 21.79                   | 21.86                 | 21.83                   | 2                   |
|            |            | 36      | 19        | 21.77                   | 21.84                 | 21.81                   | 2                   |
|            |            | 36      | 39        | 21.74                   | 21.81                 | 21.78                   | 2                   |
|            |            | 75      | 0         | 21.75                   | 21.82                 | 21.79                   | 2                   |
|            | 64QAM      | 1       | 0         | 21.85                   | 21.92                 | 21.89                   | 2                   |
|            |            | 1       | 37        | 21.70                   | 21.77                 | 21.74                   | 2                   |
|            |            | 1       | 74        | 21.68                   | 21.75                 | 21.72                   | 2                   |
|            |            | 36      | 0         | 20.80                   | 20.87                 | 20.84                   | 3                   |
|            |            | 36      | 19        | 20.78                   | 20.85                 | 20.82                   | 3                   |
|            |            | 36      | 39        | 20.75                   | 20.82                 | 20.79                   | 3                   |
|            |            | 75      | 0         | 20.76                   | 20.83                 | 20.80                   | 3                   |

| LTE Band 2 |            |         |           |                    |                    |                    |               |
|------------|------------|---------|-----------|--------------------|--------------------|--------------------|---------------|
| BW         | Modulation | RB Size | RB Offset | Low CH 18700       | Mid CH 18900       | High CH 19100      | 3GPP MPR (dB) |
|            |            |         |           | Frequency 1860 MHz | Frequency 1880 MHz | Frequency 1900 MHz |               |
| 20MHz      | QPSK       | 1       | 0         | 23.91              | 23.98              | 23.95              | 0             |
|            |            | 1       | 50        | 23.76              | 23.83              | 23.80              | 0             |
|            |            | 1       | 99        | 23.74              | 23.81              | 23.78              | 0             |
|            |            | 50      | 0         | 22.86              | 22.93              | 22.90              | 1             |
|            |            | 50      | 25        | 22.84              | 22.91              | 22.88              | 1             |
|            |            | 50      | 50        | 22.81              | 22.88              | 22.85              | 1             |
|            |            | 100     | 0         | 22.82              | 22.89              | 22.86              | 1             |
|            | 16QAM      | 1       | 0         | 22.89              | 22.96              | 22.93              | 1             |
|            |            | 1       | 50        | 22.74              | 22.81              | 22.78              | 1             |
|            |            | 1       | 99        | 22.72              | 22.79              | 22.76              | 1             |
|            |            | 50      | 0         | 21.84              | 21.91              | 21.88              | 2             |
|            |            | 50      | 25        | 21.82              | 21.89              | 21.86              | 2             |
|            |            | 50      | 50        | 21.79              | 21.86              | 21.83              | 2             |
|            |            | 100     | 0         | 21.80              | 21.87              | 21.84              | 2             |
|            | 64QAM      | 1       | 0         | 21.88              | 21.95              | 21.92              | 2             |
|            |            | 1       | 50        | 21.73              | 21.80              | 21.77              | 2             |
|            |            | 1       | 99        | 21.71              | 21.78              | 21.75              | 2             |
|            |            | 50      | 0         | 20.83              | 20.90              | 20.87              | 3             |
|            |            | 50      | 25        | 20.81              | 20.88              | 20.85              | 3             |
|            |            | 50      | 50        | 20.78              | 20.85              | 20.82              | 3             |
|            |            | 100     | 0         | 20.79              | 20.86              | 20.83              | 3             |

Note: Conducted power performed by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch.**

## EIRP POWER (dBm)

### GSM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)       | Polarization (H/V) |
|---------|-----------------|---------------|-----------------------|-----------|----------------|--------------------|
| 512     | 1850.2          | -13.03        | 43.83                 | 30.80     | 1203.10        | H                  |
| 661     | 1880.0          | -12.38        | 43.57                 | 31.20     | 1316.74        | H                  |
| 810     | 1909.8          | -13.30        | 44.57                 | 31.27     | <b>1338.44</b> | H                  |
| 512     | 1850.2          | -26.96        | 46.39                 | 19.43     | 87.66          | V                  |
| 661     | 1880.0          | -26.26        | 47.10                 | 20.84     | 121.23         | V                  |
| 810     | 1909.8          | -25.56        | 45.98                 | 20.42     | 110.08         | V                  |

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

### EDGE

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|
| 512     | 1850.2          | -16.53        | 43.83                 | 27.30     | 537.40        | H                  |
| 661     | 1880.0          | -16.23        | 43.57                 | 27.34     | <b>542.00</b> | H                  |
| 810     | 1909.8          | -17.33        | 44.57                 | 27.24     | 529.42        | H                  |
| 512     | 1850.2          | -28.45        | 46.39                 | 17.94     | 62.20         | V                  |
| 661     | 1880.0          | -27.93        | 47.10                 | 19.17     | 82.53         | V                  |
| 810     | 1909.8          | -27.65        | 45.98                 | 18.32     | 67.97         | V                  |

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

### WCDMA

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|
| 9262    | 1852.4          | -18.47        | 43.83                 | 25.37     | 343.95        | H                  |
| 9400    | 1880.0          | -17.99        | 43.57                 | 25.59     | 361.83        | H                  |
| 9538    | 1907.6          | -18.50        | 44.57                 | 26.07     | <b>404.39</b> | H                  |
| 9262    | 1852.4          | -26.75        | 46.39                 | 19.64     | 91.98         | V                  |
| 9400    | 1880.0          | -26.63        | 47.10                 | 20.47     | 111.33        | V                  |
| 9538    | 1907.6          | -27.53        | 45.98                 | 18.44     | 69.89         | V                  |

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

## LTE BAND 2

### CHANNEL BANDWIDTH: 1.4MHz QPSK

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|-----------|
| 18607   | 1850.7          | -19.79        | 43.83                 | 24.04     | 253.69        | H                  | 2         |
| 18900   | 1880.0          | -19.55        | 43.57                 | 24.03     | 252.64        | H                  | 2         |
| 19193   | 1909.3          | -20.20        | 44.32                 | 24.12     | <b>257.99</b> | H                  | 2         |
| 18607   | 1850.7          | -26.90        | 46.41                 | 19.52     | 89.45         | V                  | 2         |
| 18900   | 1880.0          | -26.74        | 47.07                 | 20.33     | 107.80        | V                  | 2         |
| 19193   | 1909.3          | -26.50        | 45.88                 | 19.38     | 86.70         | V                  | 2         |

### CHANNEL BANDWIDTH: 1.4MHz 16QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18607   | 1850.7          | -20.66        | 43.83                 | 23.17     | 207.63   | H                  | 2         |
| 18900   | 1880.0          | -20.48        | 43.57                 | 23.10     | 203.94   | H                  | 2         |
| 19193   | 1909.3          | -21.16        | 44.32                 | 23.16     | 206.82   | H                  | 2         |
| 18607   | 1850.7          | -27.77        | 46.41                 | 18.65     | 73.21    | V                  | 2         |
| 18900   | 1880.0          | -27.67        | 47.07                 | 19.40     | 87.02    | V                  | 2         |
| 19193   | 1909.3          | -27.46        | 45.88                 | 18.42     | 69.50    | V                  | 2         |

### CHANNEL BANDWIDTH: 1.4MHz 64QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18607   | 1850.7          | -21.54        | 43.83                 | 22.29     | 169.59   | H                  | 2         |
| 18900   | 1880.0          | -21.44        | 43.57                 | 22.13     | 163.31   | H                  | 2         |
| 19193   | 1908.3          | -21.96        | 44.32                 | 22.36     | 172.15   | H                  | 2         |
| 18607   | 1850.7          | -28.64        | 46.41                 | 17.77     | 59.85    | V                  | 2         |
| 18900   | 1880.0          | -28.58        | 47.07                 | 18.49     | 70.63    | V                  | 2         |
| 19193   | 1908.3          | -28.12        | 45.88                 | 17.76     | 59.76    | V                  | 2         |

### CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|-----------|
| 18615   | 1851.5          | -19.77        | 43.82                 | 24.05     | 254.16        | H                  | 2         |
| 18900   | 1880.0          | -19.61        | 43.57                 | 23.97     | 249.17        | H                  | 2         |
| 19185   | 1908.5          | -20.15        | 44.38                 | 24.22     | <b>264.42</b> | H                  | 2         |
| 18615   | 1851.5          | -26.88        | 46.45                 | 19.58     | 90.70         | V                  | 2         |
| 18900   | 1880.0          | -26.80        | 47.07                 | 20.27     | 106.32        | V                  | 2         |
| 19185   | 1908.5          | -26.45        | 45.88                 | 19.43     | 87.62         | V                  | 2         |

### CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18615   | 1851.5          | -20.84        | 43.82                 | 22.98     | 198.66   | H                  | 2         |
| 18900   | 1880.0          | -20.50        | 43.57                 | 23.08     | 203.00   | H                  | 2         |
| 19185   | 1908.5          | -21.14        | 44.38                 | 23.23     | 210.52   | H                  | 2         |
| 18615   | 1851.5          | -27.95        | 46.45                 | 18.51     | 70.89    | V                  | 2         |
| 18900   | 1880.0          | -27.69        | 47.07                 | 19.38     | 86.62    | V                  | 2         |
| 19185   | 1908.5          | -27.44        | 45.88                 | 18.44     | 69.76    | V                  | 2         |

### CHANNEL BANDWIDTH: 3MHZ 64QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18615   | 1851.5          | -21.52        | 43.82                 | 22.30     | 169.90   | H                  | 2         |
| 18900   | 1880.0          | -21.50        | 43.57                 | 22.07     | 161.06   | H                  | 2         |
| 19185   | 1908.5          | -21.91        | 44.38                 | 22.47     | 176.44   | H                  | 2         |
| 18615   | 1851.5          | -28.62        | 46.45                 | 17.83     | 60.69    | V                  | 2         |
| 18900   | 1880.0          | -28.64        | 47.07                 | 18.43     | 69.66    | V                  | 2         |
| 19185   | 1908.5          | -28.07        | 45.88                 | 17.81     | 60.39    | V                  | 2         |

#### CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|-----------|
| 18625   | 1852.5          | -19.83        | 43.83                 | 24.00     | 251.02        | H                  | 2         |
| 18900   | 1880.0          | -19.56        | 43.57                 | 24.02     | 252.06        | H                  | 2         |
| 19175   | 1907.5          | -20.10        | 44.19                 | 24.09     | <b>256.15</b> | H                  | 2         |
| 18625   | 1852.5          | -26.94        | 46.46                 | 19.53     | 89.70         | V                  | 2         |
| 18900   | 1880.0          | -26.75        | 47.07                 | 20.32     | 107.55        | V                  | 2         |
| 19175   | 1907.5          | -26.40        | 45.89                 | 19.49     | 88.86         | V                  | 2         |

#### CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18625   | 1852.5          | -20.66        | 43.83                 | 23.17     | 207.35   | H                  | 2         |
| 18900   | 1880.0          | -20.58        | 43.57                 | 23.00     | 199.30   | H                  | 2         |
| 19175   | 1907.5          | -21.20        | 44.19                 | 22.99     | 198.84   | H                  | 2         |
| 18625   | 1852.5          | -27.77        | 46.46                 | 18.70     | 74.10    | V                  | 2         |
| 18900   | 1880.0          | -27.77        | 47.07                 | 19.30     | 85.04    | V                  | 2         |
| 19175   | 1907.5          | -27.50        | 45.89                 | 18.39     | 68.98    | V                  | 2         |

#### CHANNEL BANDWIDTH: 5MHZ 64QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18625   | 1852.5          | -21.58        | 43.83                 | 22.25     | 167.80   | H                  | 2         |
| 18900   | 1880.0          | -21.45        | 43.57                 | 22.12     | 162.93   | H                  | 2         |
| 19175   | 1907.5          | -21.86        | 44.19                 | 22.33     | 170.92   | H                  | 2         |
| 18625   | 1852.5          | -28.68        | 46.46                 | 17.78     | 60.02    | V                  | 2         |
| 18900   | 1880.0          | -28.59        | 47.07                 | 18.48     | 70.47    | V                  | 2         |
| 19175   | 1907.5          | -28.02        | 45.89                 | 17.87     | 61.25    | V                  | 2         |

### CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|-----------|
| 18650   | 1855.0          | -19.64        | 43.86                 | 24.22     | <b>264.24</b> | H                  | 2         |
| 18900   | 1880.0          | -19.50        | 43.57                 | 24.08     | 255.56        | H                  | 2         |
| 19150   | 1905.0          | -19.97        | 43.99                 | 24.02     | 252.41        | H                  | 2         |
| 18650   | 1855.0          | -26.75        | 46.28                 | 19.53     | 89.80         | V                  | 2         |
| 18900   | 1880.0          | -26.69        | 47.07                 | 20.38     | 109.04        | V                  | 2         |
| 19150   | 1905.0          | -26.27        | 45.92                 | 19.65     | 92.21         | V                  | 2         |

### CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18650   | 1855.0          | -20.79        | 43.86                 | 23.07     | 202.77   | H                  | 2         |
| 18900   | 1880.0          | -20.60        | 43.57                 | 22.98     | 198.38   | H                  | 2         |
| 19150   | 1905.0          | -21.13        | 43.99                 | 22.86     | 193.24   | H                  | 2         |
| 18650   | 1855.0          | -27.90        | 46.28                 | 18.38     | 68.91    | V                  | 2         |
| 18900   | 1880.0          | -27.79        | 47.07                 | 19.28     | 84.64    | V                  | 2         |
| 19150   | 1905.0          | -27.43        | 45.92                 | 18.49     | 70.60    | V                  | 2         |

### CHANNEL BANDWIDTH: 10MHz 64QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18650   | 1855.0          | -21.39        | 43.86                 | 22.47     | 176.64   | H                  | 2         |
| 18900   | 1880.0          | -21.39        | 43.57                 | 22.18     | 165.20   | H                  | 2         |
| 19150   | 1905.0          | -21.73        | 43.99                 | 22.26     | 168.42   | H                  | 2         |
| 18650   | 1855.0          | -28.49        | 46.28                 | 17.79     | 60.09    | V                  | 2         |
| 18900   | 1880.0          | -28.53        | 47.07                 | 18.54     | 71.45    | V                  | 2         |
| 19150   | 1905.0          | -27.89        | 45.92                 | 18.03     | 63.56    | V                  | 2         |

### CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|-----------|
| 18675   | 1857.5          | -19.65        | 43.99                 | 24.34     | <b>271.71</b> | H                  | 2         |
| 18900   | 1880.0          | -19.57        | 43.57                 | 24.01     | 251.48        | H                  | 2         |
| 19125   | 1902.5          | -20.04        | 43.66                 | 23.61     | 229.72        | H                  | 2         |
| 18675   | 1857.5          | -26.76        | 45.93                 | 19.17     | 82.64         | V                  | 2         |
| 18900   | 1880.0          | -26.76        | 47.07                 | 20.31     | 107.30        | V                  | 2         |
| 19125   | 1902.5          | -26.34        | 46.20                 | 19.86     | 96.78         | V                  | 2         |

### CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18675   | 1857.5          | -20.51        | 43.99                 | 23.48     | 222.89   | H                  | 2         |
| 18900   | 1880.0          | -20.44        | 43.57                 | 23.14     | 205.83   | H                  | 2         |
| 19125   | 1902.5          | -20.89        | 43.66                 | 22.76     | 188.89   | H                  | 2         |
| 18675   | 1857.5          | -27.62        | 45.93                 | 18.31     | 67.80    | V                  | 2         |
| 18900   | 1880.0          | -27.63        | 47.07                 | 19.44     | 87.82    | V                  | 2         |
| 19125   | 1902.5          | -27.19        | 46.20                 | 19.01     | 79.58    | V                  | 2         |

### CHANNEL BANDWIDTH: 15MHZ 64QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18675   | 1857.5          | -21.40        | 43.99                 | 22.59     | 181.64   | H                  | 2         |
| 18900   | 1880.0          | -21.46        | 43.57                 | 22.11     | 162.55   | H                  | 2         |
| 19125   | 1902.5          | -21.80        | 43.66                 | 21.86     | 153.29   | H                  | 2         |
| 18675   | 1857.5          | -28.50        | 45.93                 | 17.43     | 55.30    | V                  | 2         |
| 18900   | 1880.0          | -28.60        | 47.07                 | 18.47     | 70.31    | V                  | 2         |
| 19125   | 1902.5          | -27.96        | 46.20                 | 18.24     | 66.71    | V                  | 2         |

### CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|---------------|--------------------|-----------|
| 18700   | 1860.0          | -20.23        | 43.50                 | 23.27     | 212.23        | H                  | 2         |
| 18900   | 1880.0          | -20.02        | 43.57                 | 23.56     | <b>226.73</b> | H                  | 2         |
| 19100   | 1900.0          | -20.62        | 43.62                 | 22.99     | 199.20        | H                  | 2         |
| 18700   | 1860.0          | -27.34        | 45.57                 | 18.24     | 66.60         | V                  | 2         |
| 18900   | 1880.0          | -27.21        | 47.07                 | 19.86     | 96.74         | V                  | 2         |
| 19100   | 1900.0          | -26.92        | 46.26                 | 19.34     | 85.84         | V                  | 2         |

### CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18700   | 1860.0          | -21.16        | 43.50                 | 22.34     | 171.32   | H                  | 2         |
| 18900   | 1880.0          | -21.09        | 43.57                 | 22.49     | 177.21   | H                  | 2         |
| 19100   | 1900.0          | -21.45        | 43.62                 | 22.16     | 164.55   | H                  | 2         |
| 18700   | 1860.0          | -28.27        | 45.57                 | 17.31     | 53.77    | V                  | 2         |
| 18900   | 1880.0          | -28.28        | 47.07                 | 18.79     | 75.61    | V                  | 2         |
| 19100   | 1900.0          | -27.75        | 46.26                 | 18.51     | 70.91    | V                  | 2         |

### CHANNEL BANDWIDTH: 20MHz 64QAM

| Channel | Frequency (MHz) | SPA LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|---------------|-----------------------|-----------|----------|--------------------|-----------|
| 18700   | 1860.0          | -21.98        | 43.50                 | 21.52     | 141.87   | H                  | 2         |
| 18900   | 1880.0          | -21.91        | 43.57                 | 21.66     | 146.55   | H                  | 2         |
| 19100   | 1900.0          | -22.38        | 43.62                 | 21.24     | 132.92   | H                  | 2         |
| 18700   | 1860.0          | -29.08        | 45.57                 | 16.49     | 44.57    | V                  | 2         |
| 18900   | 1880.0          | -29.05        | 47.07                 | 18.02     | 63.39    | V                  | 2         |
| 19100   | 1900.0          | -28.54        | 46.26                 | 17.72     | 59.17    | V                  | 2         |

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).

2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

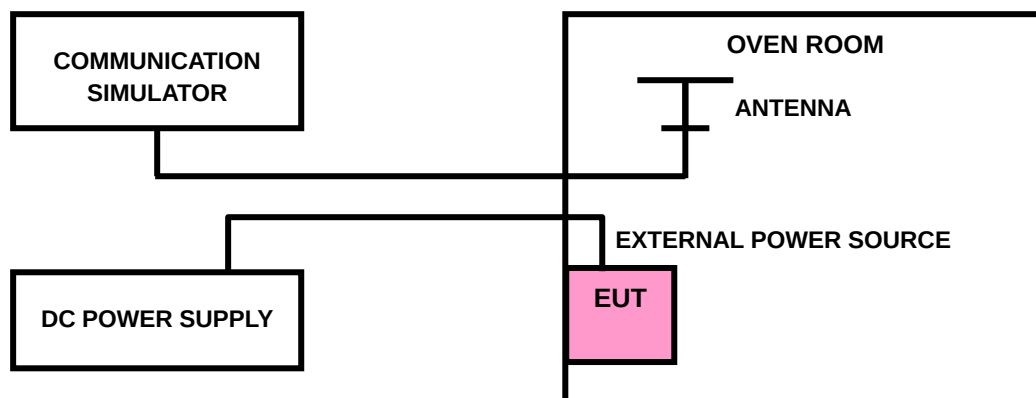
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 4.2.2 TEST PROCEDURE

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  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

### GSM1900

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0010                | 0.0011       | 2.5         |
| 3.5             | -0.0011               | -0.0013      | 2.5         |
| 4.4             | 0.0009                | 0.0011       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | Low Channel           | High Channel |             |
| -30        | -0.0056               | -0.0053      | 2.5         |
| -20        | -0.0050               | -0.0048      | 2.5         |
| -10        | -0.0046               | -0.0044      | 2.5         |
| 0          | -0.0037               | -0.0035      | 2.5         |
| 10         | -0.0030               | -0.0028      | 2.5         |
| 20         | -0.0023               | -0.0021      | 2.5         |
| 30         | -0.0018               | -0.0016      | 2.5         |
| 40         | -0.0013               | -0.0011      | 2.5         |
| 50         | -0.0005               | -0.0003      | 2.5         |

## EDGE 1900

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0011                | 0.0011       | 2.5         |
| 3.5             | -0.0014               | -0.0012      | 2.5         |
| 4.4             | 0.0010                | 0.0010       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | Low Channel           | High Channel |             |
| -30        | -0.0056               | -0.0052      | 2.5         |
| -20        | -0.0050               | -0.0047      | 2.5         |
| -10        | -0.0047               | -0.0044      | 2.5         |
| 0          | -0.0039               | -0.0036      | 2.5         |
| 10         | -0.0028               | -0.0027      | 2.5         |
| 20         | -0.0023               | -0.0022      | 2.5         |
| 30         | -0.0017               | -0.0016      | 2.5         |
| 40         | -0.0012               | -0.0011      | 2.5         |
| 50         | -0.0005               | -0.0004      | 2.5         |

## WCDMA BAND II

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0009                | 0.0009       | 2.5         |
| 3.5             | -0.0010               | -0.0011      | 2.5         |
| 4.4             | 0.0009                | 0.0010       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | Low Channel           | High Channel |             |
| -30        | -0.0055               | -0.0052      | 2.5         |
| -20        | -0.0052               | -0.0049      | 2.5         |
| -10        | -0.0045               | -0.0042      | 2.5         |
| 0          | -0.0039               | -0.0036      | 2.5         |
| 10         | -0.0029               | -0.0027      | 2.5         |
| 20         | -0.0024               | -0.0022      | 2.5         |
| 30         | -0.0019               | -0.0018      | 2.5         |
| 40         | -0.0012               | -0.0011      | 2.5         |
| 50         | -0.0005               | -0.0004      | 2.5         |

## LTE BAND 2

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 1.4MHz                |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | FREQUENCY ERROR (ppm) |              |             |
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0008                | 0.0009       | 2.5         |
| 3.5             | -0.0009               | -0.0010      | 2.5         |
| 4.4             | 0.0007                | 0.0009       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 1.4MHz                |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0055               | -0.0055      | 2.5         |
| -20        | -0.0050               | -0.0050      | 2.5         |
| -10        | -0.0044               | -0.0044      | 2.5         |
| 0          | -0.0039               | -0.0039      | 2.5         |
| 10         | -0.0028               | -0.0030      | 2.5         |
| 20         | -0.0023               | -0.0023      | 2.5         |
| 30         | -0.0018               | -0.0017      | 2.5         |
| 40         | -0.0006               | -0.0006      | 2.5         |
| 50         | -0.0003               | -0.0004      | 2.5         |

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 3MHz                  |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | FREQUENCY ERROR (ppm) |              |             |
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0008                | 0.0010       | 2.5         |
| 3.5             | -0.0010               | -0.0010      | 2.5         |
| 4.4             | 0.0009                | 0.0009       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 3MHz                  |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0055               | -0.0057      | 2.5         |
| -20        | -0.0050               | -0.0048      | 2.5         |
| -10        | -0.0044               | -0.0039      | 2.5         |
| 0          | -0.0034               | -0.0034      | 2.5         |
| 10         | -0.0029               | -0.0027      | 2.5         |
| 20         | -0.0018               | -0.0023      | 2.5         |
| 30         | -0.0015               | -0.0016      | 2.5         |
| 40         | -0.0006               | -0.0008      | 2.5         |
| 50         | -0.0003               | -0.0002      | 2.5         |

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz                  |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | FREQUENCY ERROR (ppm) |              |             |
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0009                | 0.0011       | 2.5         |
| 3.5             | -0.0011               | -0.0012      | 2.5         |
| 4.4             | 0.0010                | 0.0009       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz                  |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0052               | -0.0053      | 2.5         |
| -20        | -0.0046               | -0.0049      | 2.5         |
| -10        | -0.0040               | -0.0040      | 2.5         |
| 0          | -0.0036               | -0.0033      | 2.5         |
| 10         | -0.0030               | -0.0028      | 2.5         |
| 20         | -0.0023               | -0.0020      | 2.5         |
| 30         | -0.0015               | -0.0014      | 2.5         |
| 40         | -0.0009               | -0.0007      | 2.5         |
| 50         | -0.0002               | 0.0002       | 2.5         |

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz                 |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | FREQUENCY ERROR (ppm) |              |             |
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0010                | 0.0008       | 2.5         |
| 3.5             | -0.0012               | -0.0009      | 2.5         |
| 4.4             | 0.0009                | 0.0008       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0050               | -0.0051      | 2.5         |
| -20        | -0.0044               | -0.0047      | 2.5         |
| -10        | -0.0039               | -0.0039      | 2.5         |
| 0          | -0.0034               | -0.0034      | 2.5         |
| 10         | -0.0029               | -0.0022      | 2.5         |
| 20         | -0.0021               | -0.0018      | 2.5         |
| 30         | -0.0015               | -0.0013      | 2.5         |
| 40         | -0.0010               | -0.0008      | 2.5         |
| 50         | 0.0003                | 0.0003       | 2.5         |

# **FREQUENCY ERROR VS. VOLTAGE**

| VOLTAGE (Volts) | 15MHz                 |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | FREQUENCY ERROR (ppm) |              |             |
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0012                | 0.0011       | 2.5         |
| 3.5             | -0.0011               | -0.0012      | 2.5         |
| 4.4             | 0.0009                | 0.0010       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

# **FREQUENCY ERROR vs. TEMPERATURE.**

| TEMP. (°C) | 15MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0050               | -0.0005      | 2.5         |
| -20        | -0.0048               | -0.0043      | 2.5         |
| -10        | -0.0039               | -0.0035      | 2.5         |
| 0          | -0.0030               | -0.0029      | 2.5         |
| 10         | -0.0023               | -0.0026      | 2.5         |
| 20         | -0.0019               | -0.0013      | 2.5         |
| 30         | -0.0012               | -0.0009      | 2.5         |
| 40         | -0.0001               | -0.0004      | 2.5         |
| 50         | 0.0003                | 0.0003       | 2.5         |

# **FREQUENCY ERROR VS. VOLTAGE**

| VOLTAGE (Volts) | 20MHz                 |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | FREQUENCY ERROR (ppm) |              |             |
|                 | Low Channel           | High Channel |             |
| 3.85            | 0.0012                | 0.0011       | 2.5         |
| 3.5             | -0.0012               | -0.0012      | 2.5         |
| 4.4             | 0.0010                | 0.0011       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.4Vdc.

# **FREQUENCY ERROR vs. TEMPERATURE.**

| TEMP. (°C) | 20MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0048               | -0.0050      | 2.5         |
| -20        | -0.0041               | -0.0041      | 2.5         |
| -10        | -0.0037               | -0.0033      | 2.5         |
| 0          | -0.0029               | -0.0029      | 2.5         |
| 10         | -0.0023               | -0.0025      | 2.5         |
| 20         | -0.0018               | -0.0015      | 2.5         |
| 30         | -0.0008               | -0.0009      | 2.5         |
| 40         | -0.0004               | -0.0002      | 2.5         |
| 50         | 0.0003                | 0.0003       | 2.5         |

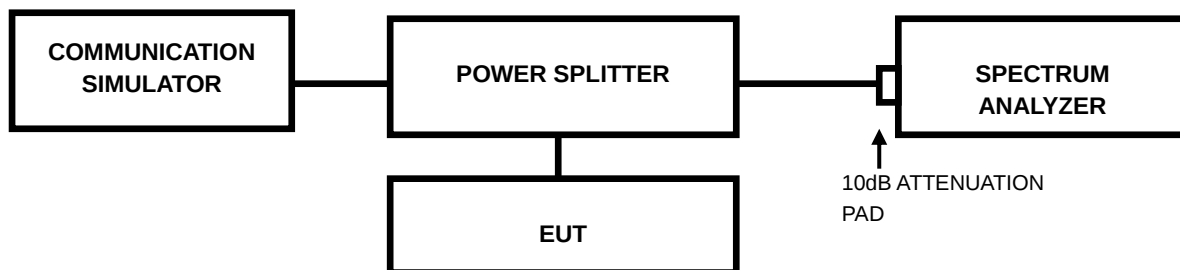
Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 4.3 OCCUPIED BANDWIDTH MEASUREMENT

### 4.3.1 TEST PROCEDURES

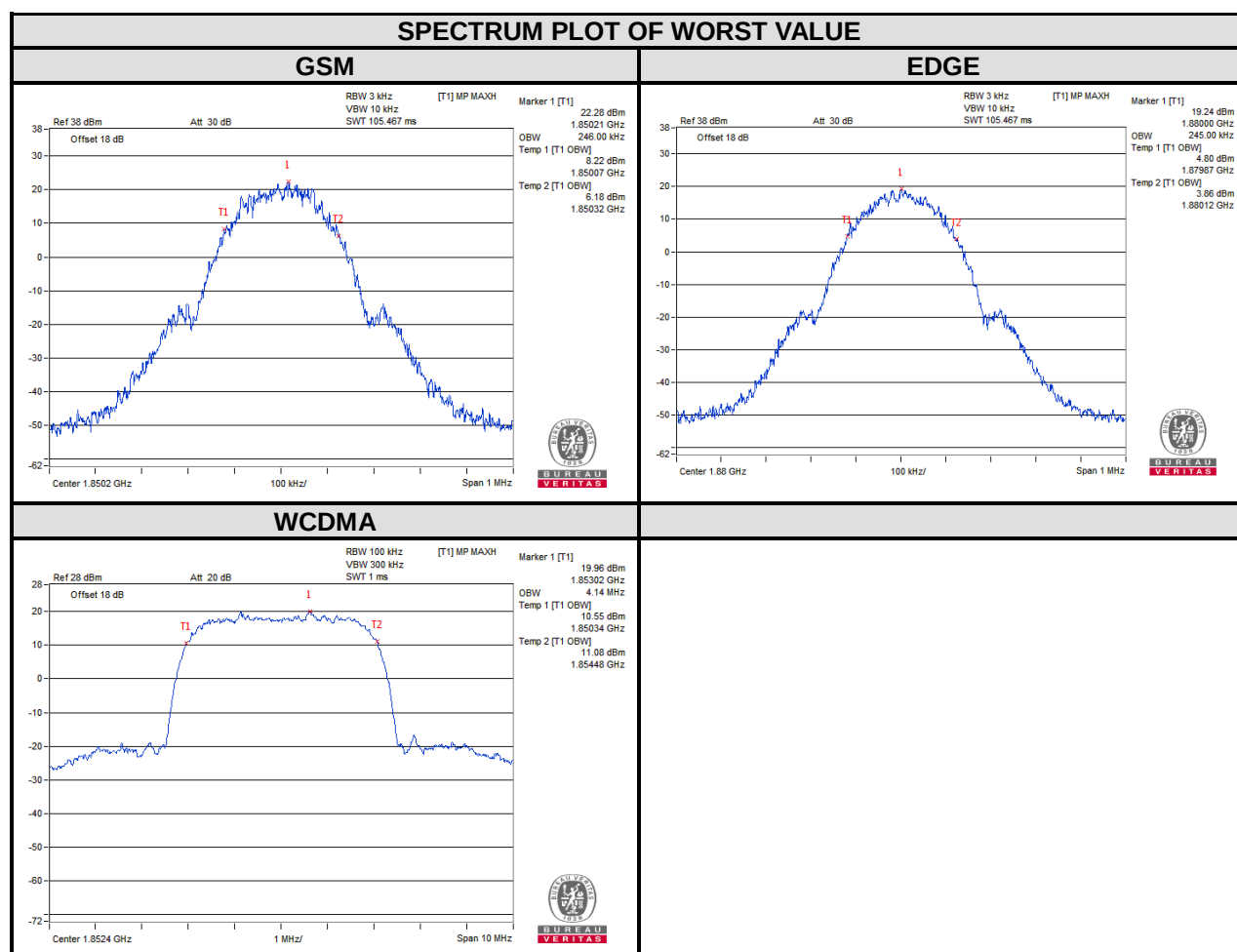
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

### 4.3.2 TEST SETUP

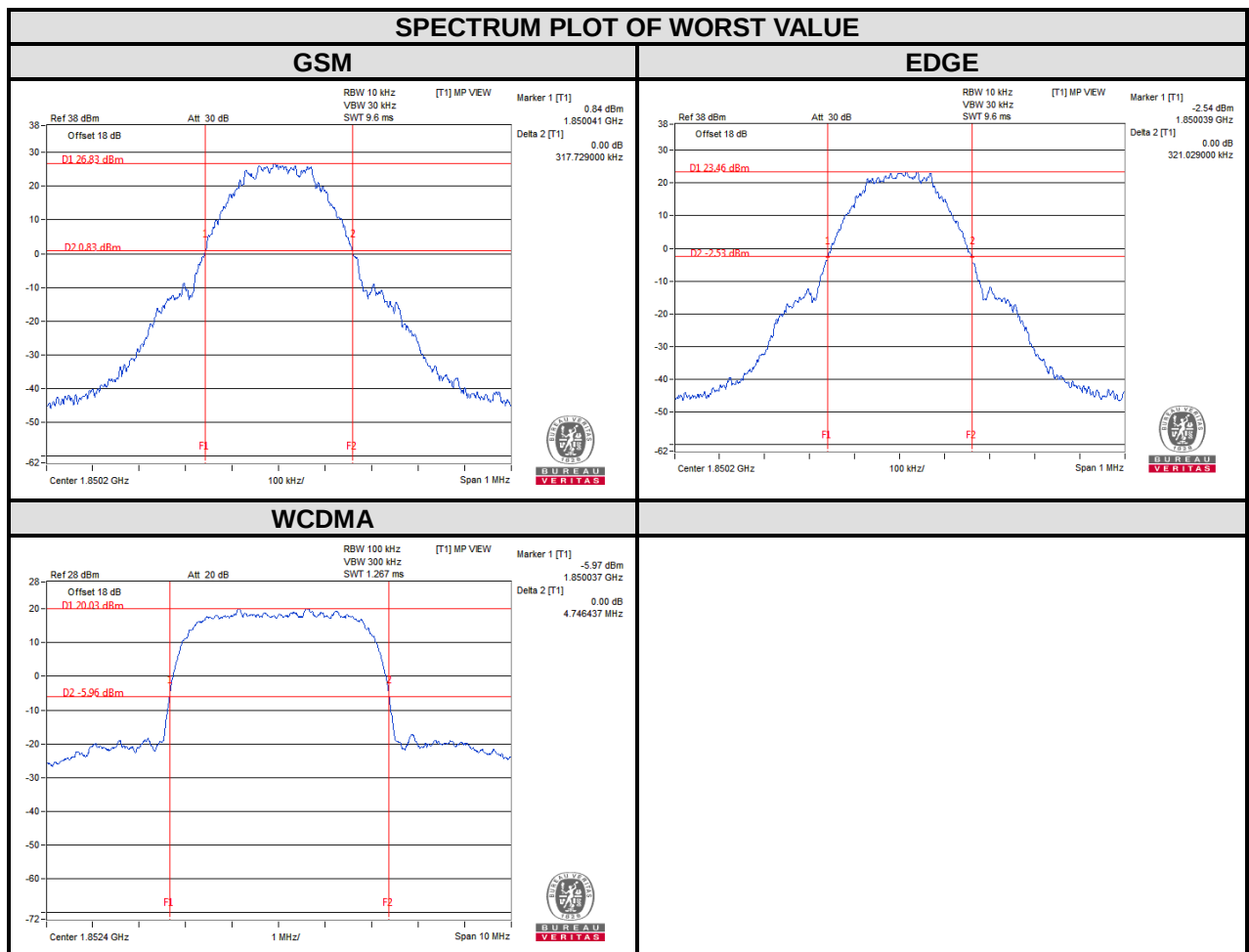


### 4.3.3 TEST RESULTS

| Channel | Frequency (MHz) | 99% Occupied bandwidth (kHz) |        | Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|
|         |                 | GSM                          | EDGE   |         |                 |                              |
| 512     | 1850.2          | 246.00                       | 242.00 | 9262    | 1852.4          | 4.14                         |
| 661     | 1880.0          | 245.00                       | 245.00 | 9400    | 1880.0          | 4.14                         |
| 810     | 1909.8          | 244.00                       | 243.00 | 9538    | 1907.6          | 4.14                         |



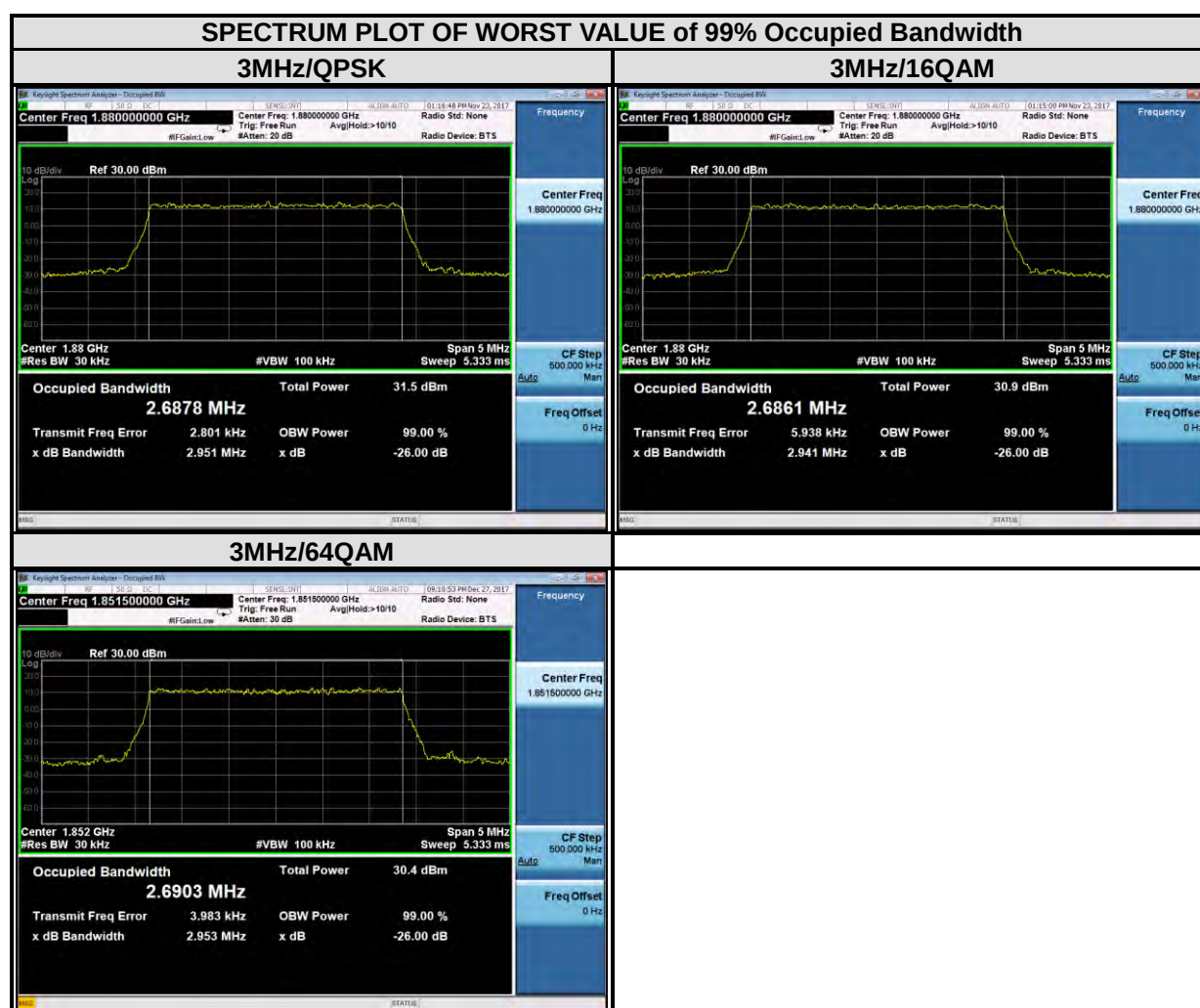
| Channel | Frequency (MHz) | 26dB bandwidth (kHz) |        | CHANNEL | FREQUENCY (MHz) | 26dB bandwidth (MHz) |
|---------|-----------------|----------------------|--------|---------|-----------------|----------------------|
|         |                 | GSM                  | EDGE   |         |                 | WCDMA                |
| 512     | 1850.2          | 317.73               | 321.03 | 9262    | 1852.4          | 4.75                 |
| 661     | 1880.0          | 315.87               | 318.83 | 9400    | 1880.0          | 4.73                 |
| 810     | 1909.8          | 314.41               | 317.48 | 9538    | 1907.6          | 4.72                 |



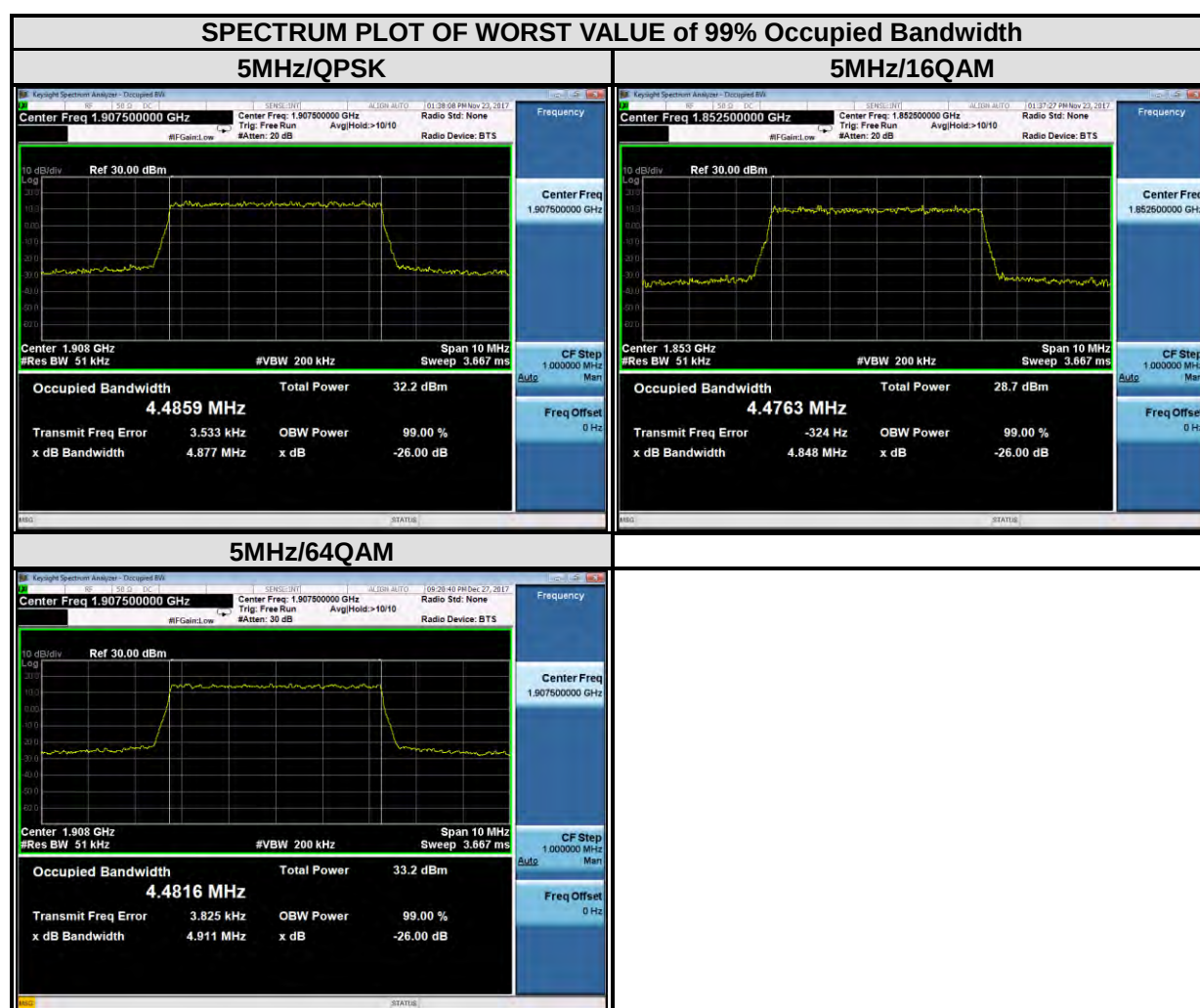
| LTE band 2                 |                 |                              |       |       |
|----------------------------|-----------------|------------------------------|-------|-------|
| Channel Bandwidth : 1.4MHz |                 |                              |       |       |
| Channel                    | Frequency (MHz) | 99% Occupied bandwidth (MHz) |       |       |
|                            |                 | QPSK                         | 16QAM | 64QAM |
| 18607                      | 1850.7          | 1.09                         | 1.08  | 1.08  |
| 18900                      | 1880            | 1.08                         | 1.08  | 1.08  |
| 19193                      | 1909.3          | 1.09                         | 1.08  | 1.08  |



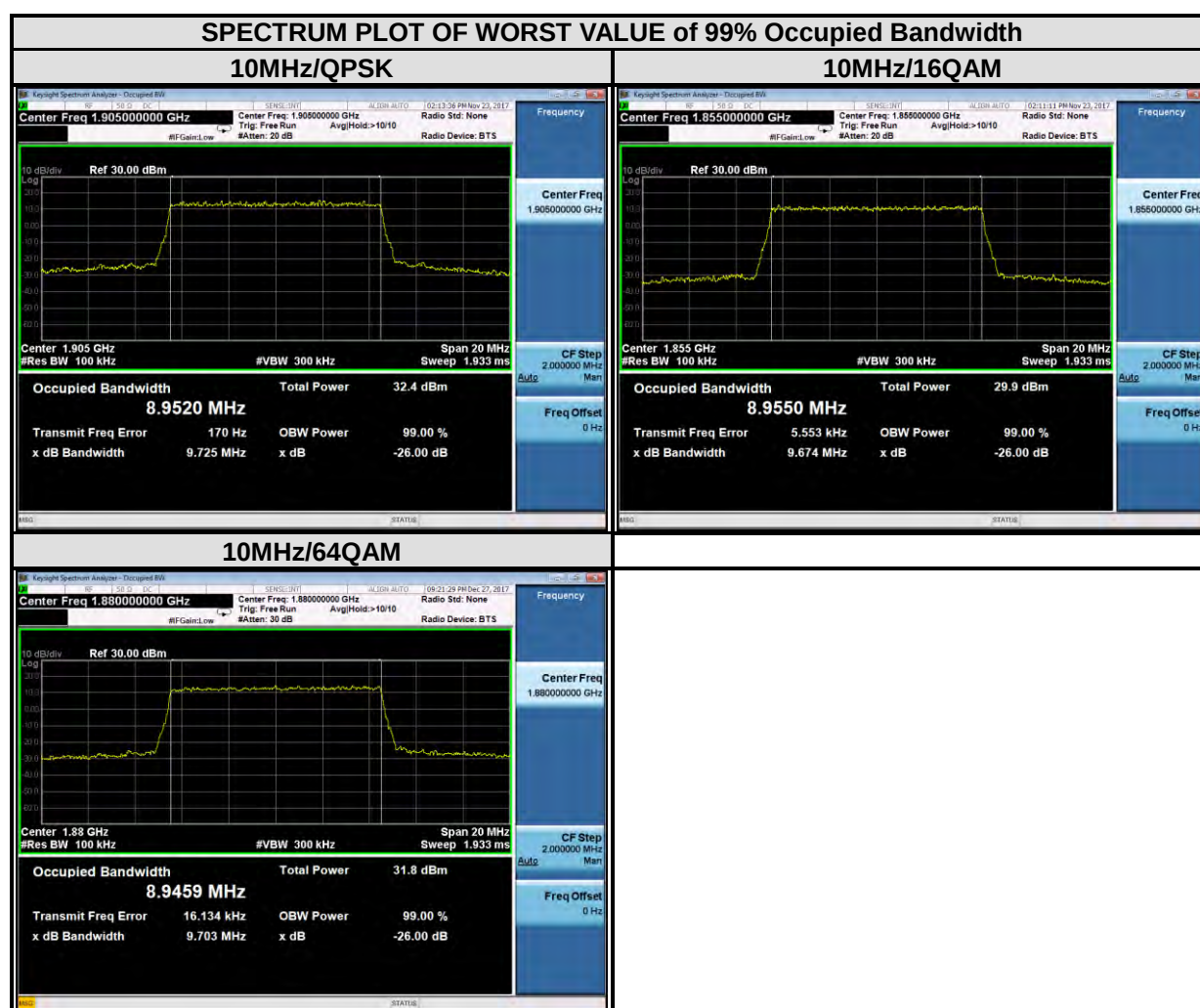
| LTE band 2               |                 |                              |       |       |
|--------------------------|-----------------|------------------------------|-------|-------|
| Channel Bandwidth : 3MHz |                 |                              |       |       |
| Channel                  | Frequency (MHz) | 99% Occupied bandwidth (MHz) |       |       |
|                          |                 | QPSK                         | 16QAM | 64QAM |
| 18615                    | 1851.5          | 2.69                         | 2.68  | 2.69  |
| 18900                    | 1880            | 2.69                         | 2.69  | 2.69  |
| 19185                    | 1908.5          | 2.69                         | 2.68  | 2.69  |



| LTE band 2               |                 |                              |       |       |
|--------------------------|-----------------|------------------------------|-------|-------|
| Channel Bandwidth : 5MHz |                 |                              |       |       |
| Channel                  | Frequency (MHz) | 99% Occupied bandwidth (MHz) |       |       |
|                          |                 | QPSK                         | 16QAM | 64QAM |
| 18625                    | 1852.5          | 4.48                         | 4.48  | 4.47  |
| 18900                    | 1880            | 4.49                         | 4.47  | 4.48  |
| 19175                    | 1907.5          | 4.49                         | 4.47  | 4.48  |



| LTE band 2                |                 |                              |       |       |
|---------------------------|-----------------|------------------------------|-------|-------|
| Channel Bandwidth : 10MHz |                 |                              |       |       |
| Channel                   | Frequency (MHz) | 99% Occupied bandwidth (MHz) |       |       |
|                           |                 | QPSK                         | 16QAM | 64QAM |
| 18650                     | 1855            | 8.94                         | 8.96  | 8.94  |
| 18900                     | 1880            | 8.95                         | 8.92  | 8.95  |
| 19150                     | 1905            | 8.95                         | 8.95  | 8.94  |



| LTE band 2                |                 |                              |       |       |
|---------------------------|-----------------|------------------------------|-------|-------|
| Channel Bandwidth : 15MHz |                 |                              |       |       |
| Channel                   | Frequency (MHz) | 99% Occupied bandwidth (MHz) |       |       |
|                           |                 | QPSK                         | 16QAM | 64QAM |
| 18675                     | 1857.5          | 13.40                        | 13.38 | 13.40 |
| 18900                     | 1880            | 13.43                        | 13.40 | 13.41 |
| 19125                     | 1902.5          | 13.42                        | 13.41 | 13.41 |



| LTE band 2                |                 |                              |       |       |
|---------------------------|-----------------|------------------------------|-------|-------|
| Channel Bandwidth : 20MHz |                 |                              |       |       |
| Channel                   | Frequency (MHz) | 99% Occupied bandwidth (MHz) |       |       |
|                           |                 | QPSK                         | 16QAM | 64QAM |
| 18700                     | 1860            | 17.86                        | 17.85 | 17.85 |
| 18900                     | 1880            | 17.93                        | 17.86 | 17.89 |
| 19100                     | 1900            | 17.90                        | 17.87 | 17.87 |



| LTE band 2                 |                 |                      |       |                          |                 |                      |       |
|----------------------------|-----------------|----------------------|-------|--------------------------|-----------------|----------------------|-------|
| Channel Bandwidth : 1.4MHz |                 |                      |       | Channel Bandwidth : 3MHz |                 |                      |       |
| Channel                    | Frequency (MHz) | 26dB bandwidth (MHz) |       | Channel                  | Frequency (MHz) | 26dB bandwidth (MHz) |       |
|                            |                 | QPSK                 | 16QAM |                          |                 | QPSK                 | 16QAM |
| 18607                      | 1850.7          | 1.22                 | 1.22  | 18615                    | 1851.5          | 2.91                 | 2.94  |
| 18900                      | 1880            | 1.21                 | 1.23  | 18900                    | 1880            | 2.95                 | 2.94  |
| 19193                      | 1909.3          | 1.22                 | 1.22  | 19185                    | 1908.5          | 2.96                 | 2.93  |



| LTE band 2               |                 |                      |       |                           |                 |                      |       |
|--------------------------|-----------------|----------------------|-------|---------------------------|-----------------|----------------------|-------|
| Channel Bandwidth : 5MHz |                 |                      |       | Channel Bandwidth : 10MHz |                 |                      |       |
| Channel                  | Frequency (MHz) | 26dB bandwidth (MHz) |       | Channel                   | Frequency (MHz) | 26dB bandwidth (MHz) |       |
|                          |                 | QPSK                 | 16QAM |                           |                 | QPSK                 | 16QAM |
| 18625                    | 1852.5          | 4.90                 | 4.85  | 18650                     | 1855            | 9.69                 | 9.67  |
| 18900                    | 1880            | 4.88                 | 4.84  | 18900                     | 1880            | 9.69                 | 9.64  |
| 19175                    | 1907.5          | 4.88                 | 4.86  | 19150                     | 1905            | 9.73                 | 9.63  |



| LTE band 2                |                 |                      |       |                           |                 |                      |       |
|---------------------------|-----------------|----------------------|-------|---------------------------|-----------------|----------------------|-------|
| Channel Bandwidth : 15MHz |                 |                      |       | Channel Bandwidth : 20MHz |                 |                      |       |
| Channel                   | Frequency (MHz) | 26dB bandwidth (MHz) |       | Channel                   | Frequency (MHz) | 26dB bandwidth (MHz) |       |
|                           |                 | QPSK                 | 16QAM |                           |                 | QPSK                 | 16QAM |
| 18675                     | 1857.5          | 14.45                | 14.40 | 18700                     | 1860            | 18.98                | 18.90 |
| 18900                     | 1880            | 14.36                | 14.41 | 18900                     | 1880            | 19.10                | 19.24 |
| 19125                     | 1902.5          | 14.39                | 14.38 | 19100                     | 1900            | 18.95                | 19.11 |



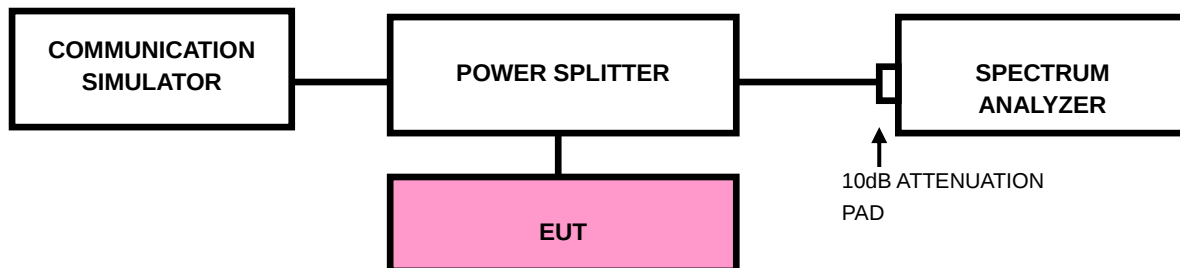
Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 4.4 BAND EDGE MEASUREMENT

### 4.4.1 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.

### 4.4.2 TEST SETUP



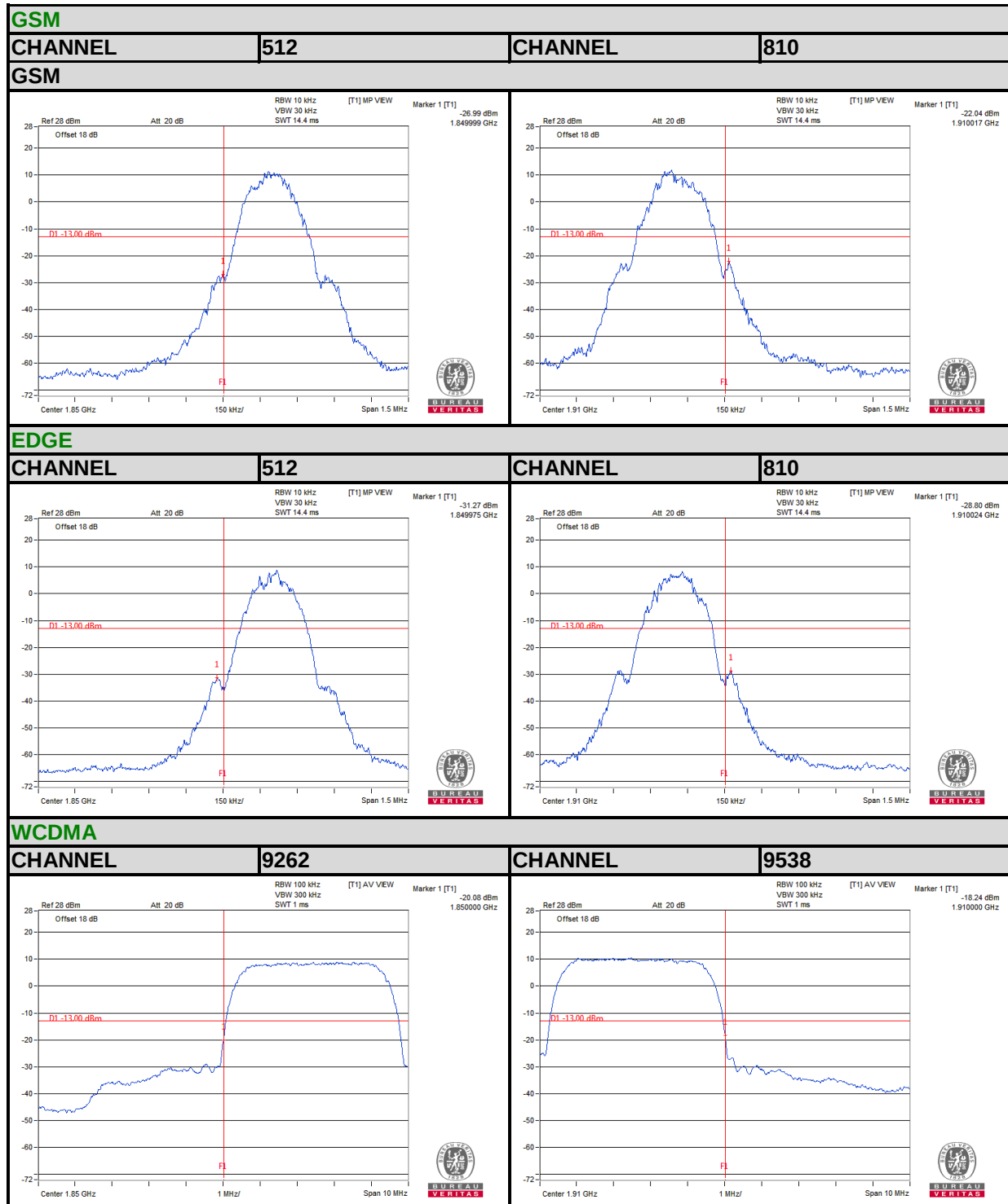
### 4.4.3 TEST PROCEDURES

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/ EDGE).
- The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)
- The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is

200kHz. (LTE bandwidth 5MHz)

- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- i. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- j. Record the max trace plot into the test report.

#### 4.4.4. TEST RESULTS

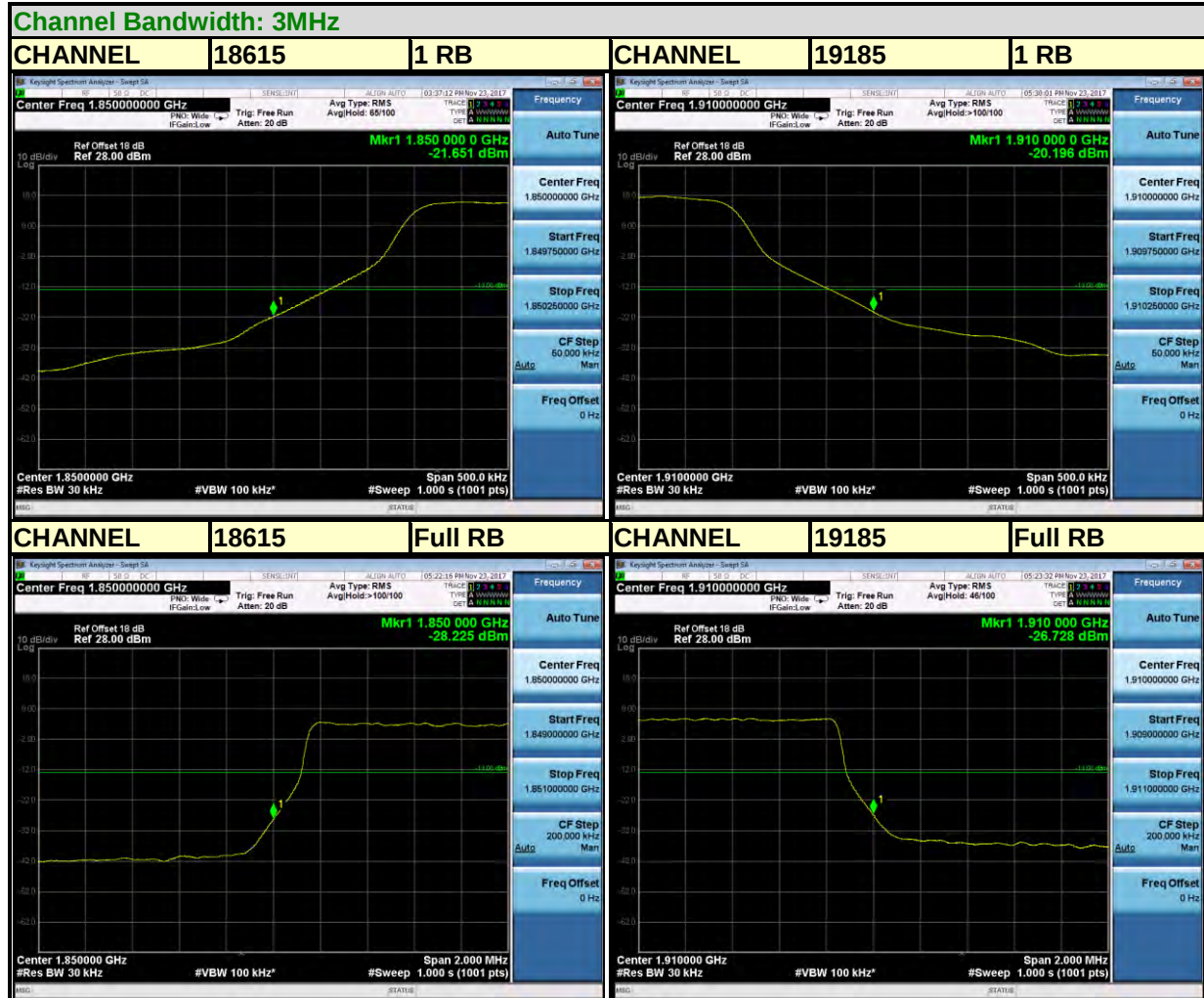


## LTE BAND 2

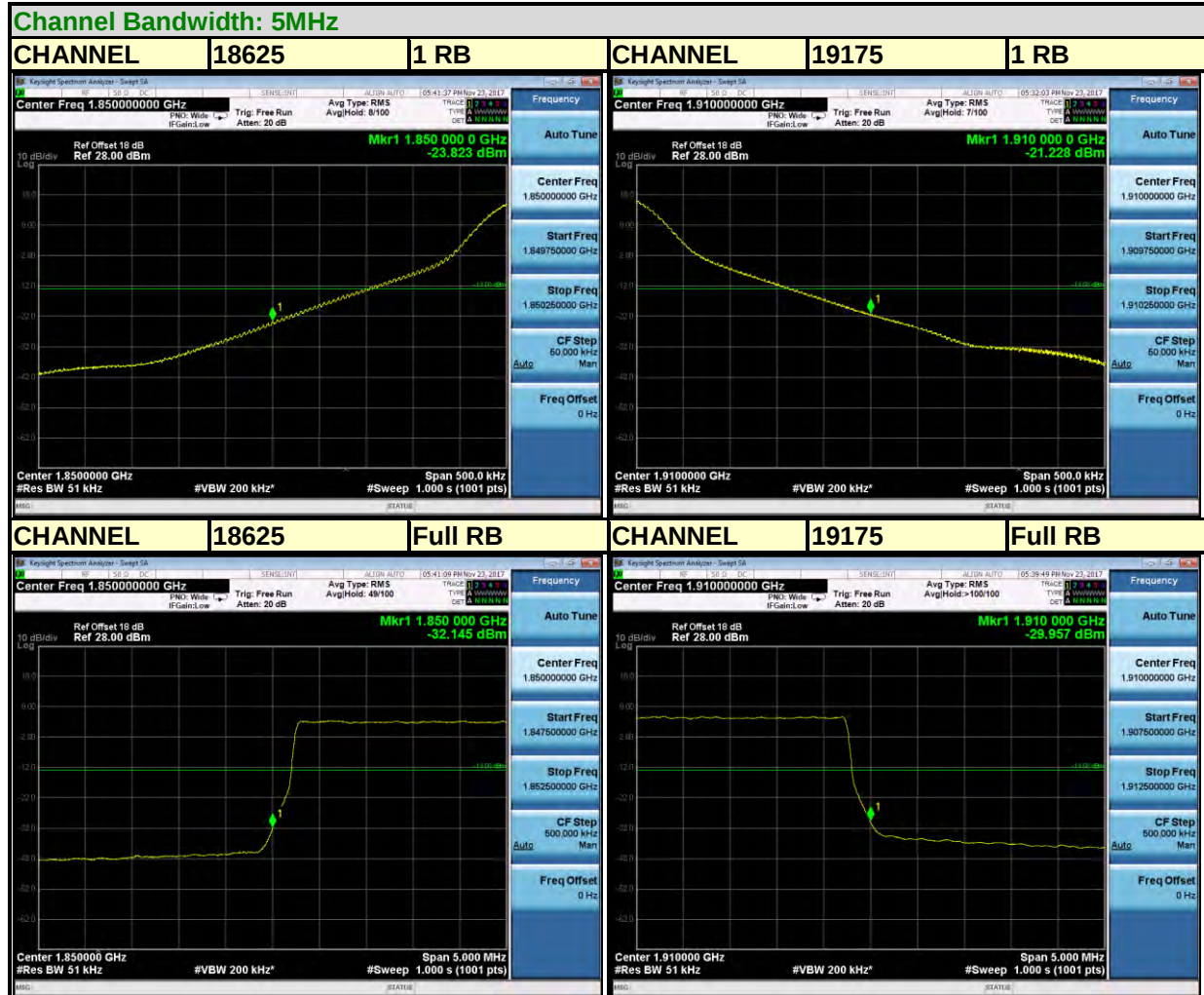
Channel Bandwidth: 1.4MHz



## LTE BAND 2

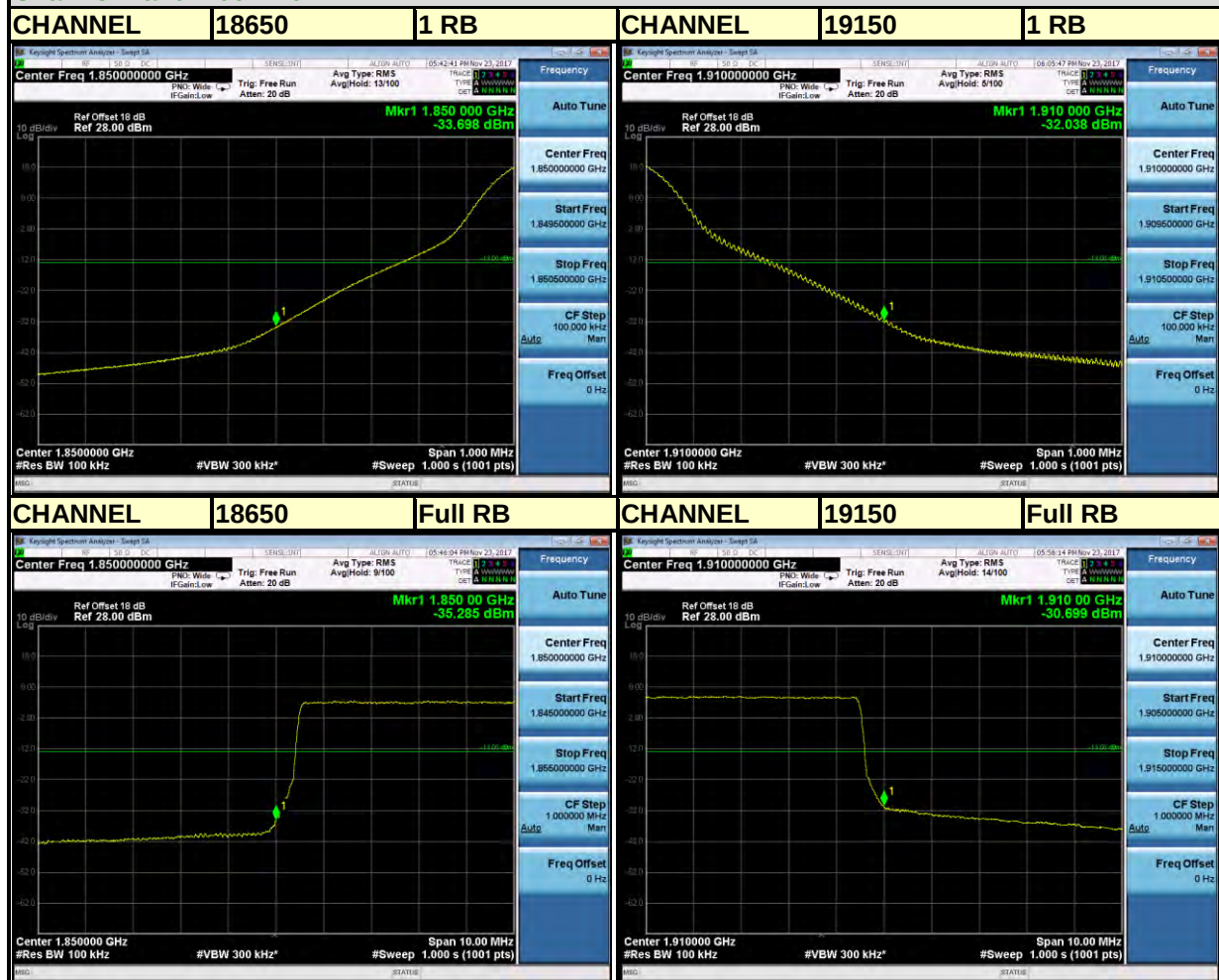


## LTE BAND 2



## LTE BAND 2

Channel Bandwidth: 10MHz



## LTE BAND 2

Channel Bandwidth: 15MHz



## LTE BAND 2

Channel Bandwidth: 20MHz



Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 4.5 CONDUCTED SPURIOUS EMISSIONS

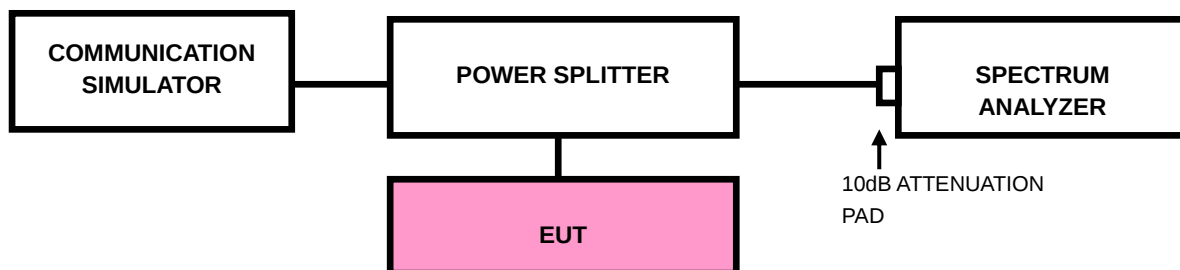
### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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  $-13\text{dBm}$ .

### 4.5.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 9 kHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

### 4.5.3 TEST SETUP



## 4.5.4 TEST RESULTS



# EDGE

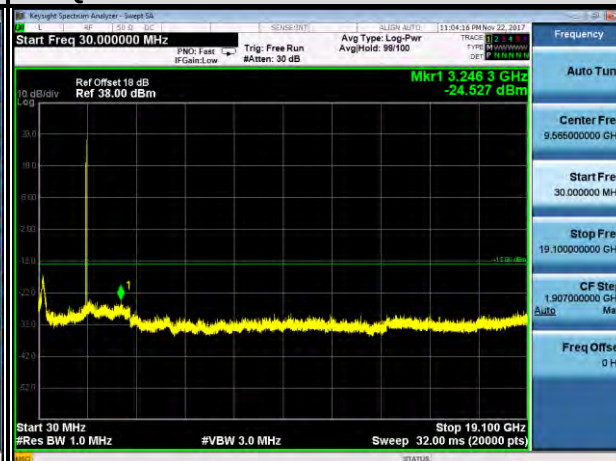
## CHANNEL 512

FREQUENCY RANGE : 30MHz~19.1GHz



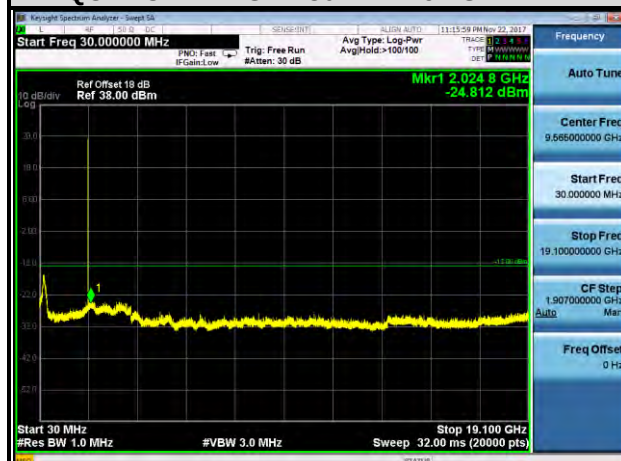
## CHANNEL 661

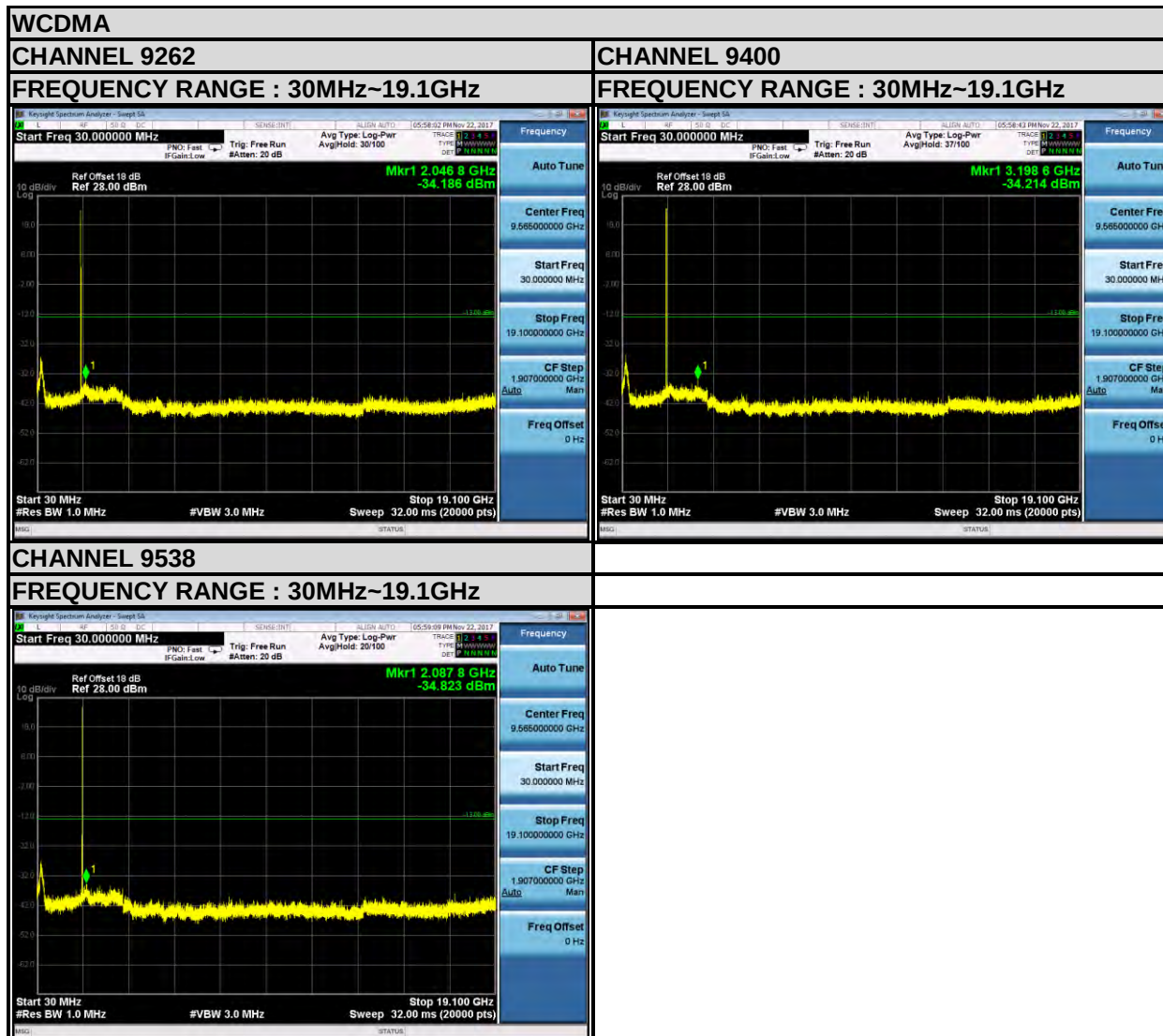
FREQUENCY RANGE : 30MHz~19.1GHz



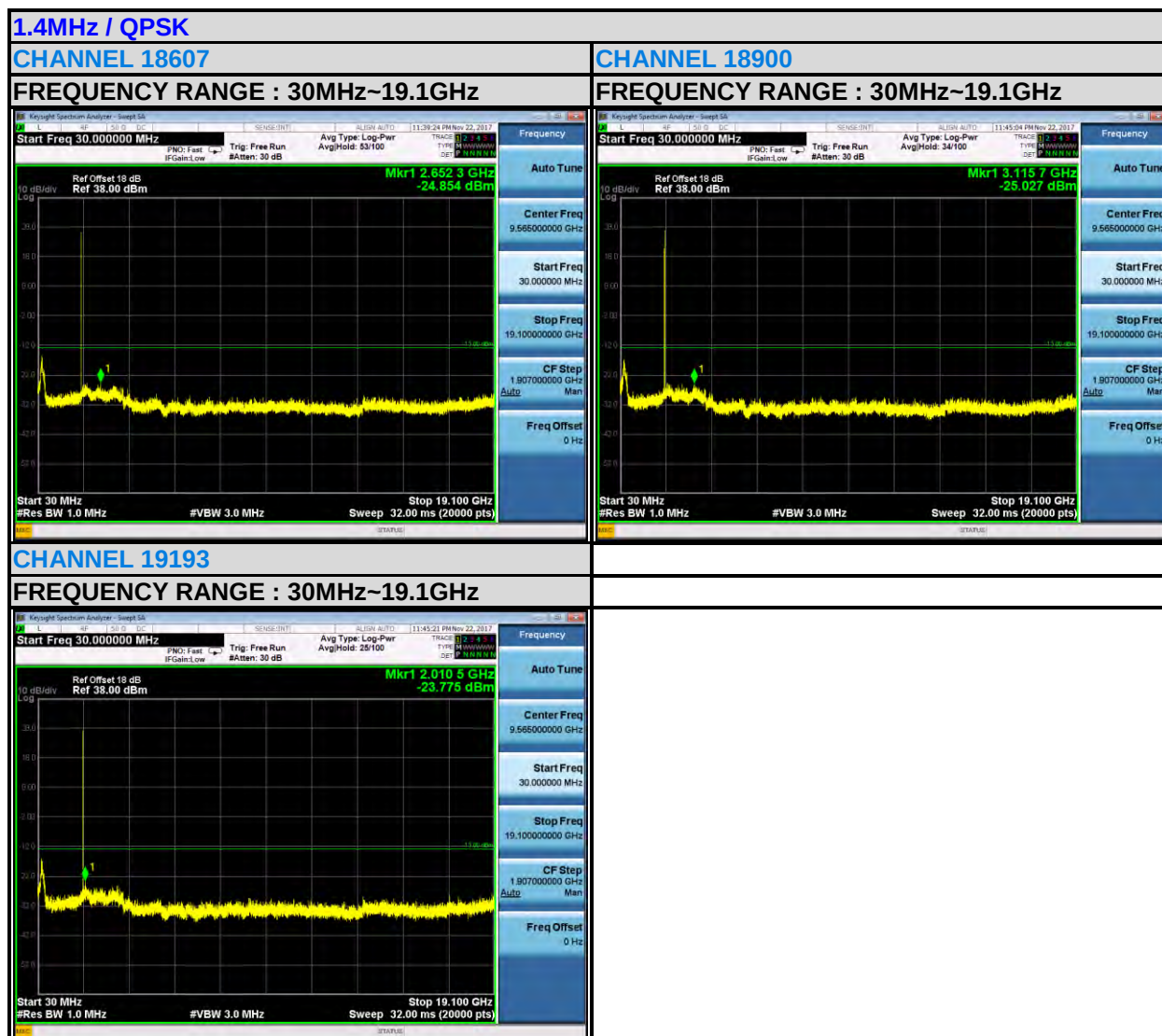
## CHANNEL 810

FREQUENCY RANGE : 30MHz~19.1GHz





## LTE BAND 2



### 3MHz / QPSK

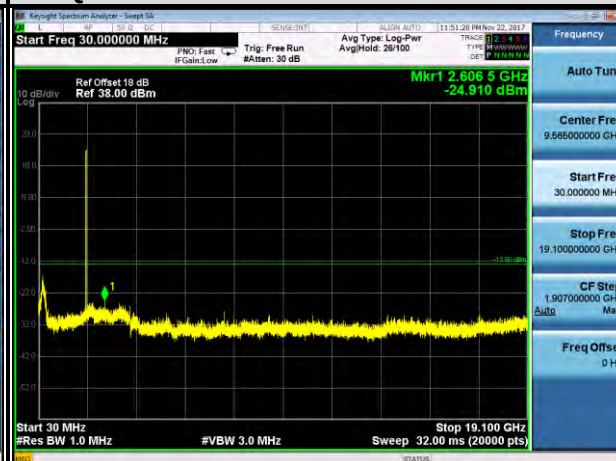
#### CHANNEL 18615

FREQUENCY RANGE : 30MHz~19.1GHz



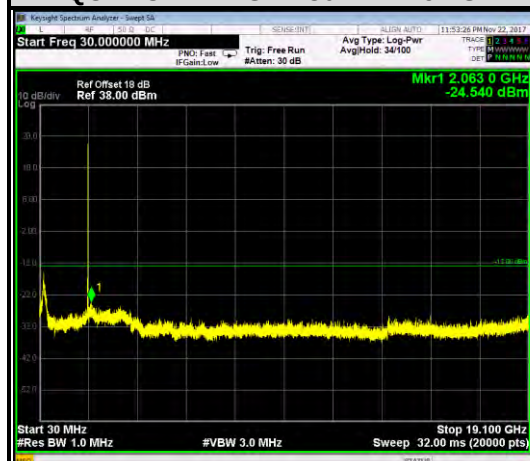
#### CHANNEL 18900

FREQUENCY RANGE : 30MHz~19.1GHz



#### CHANNEL 19185

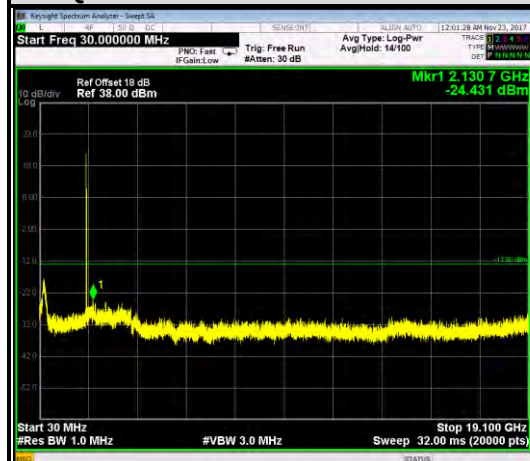
FREQUENCY RANGE : 30MHz~19.1GHz



5MHz / QPSK

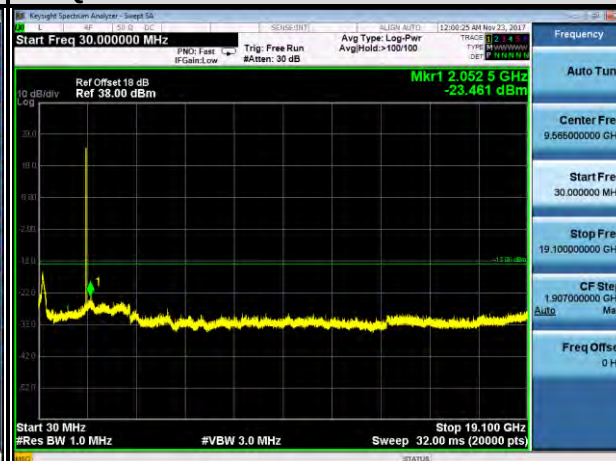
CHANNEL 18625

FREQUENCY RANGE : 30MHz~19.1GHz



CHANNEL 18900

FREQUENCY RANGE : 30MHz~19.1GHz



CHANNEL 19175

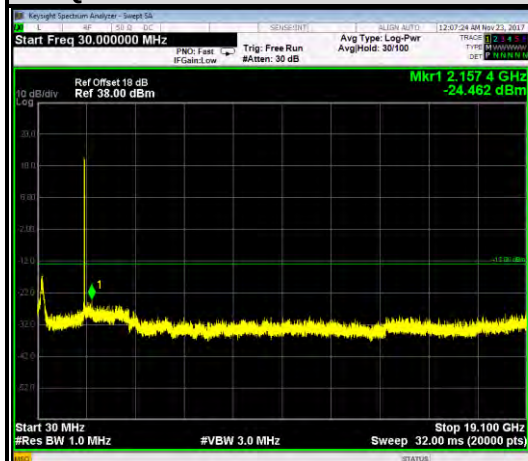
FREQUENCY RANGE : 30MHz~19.1GHz



10MHz / QPSK

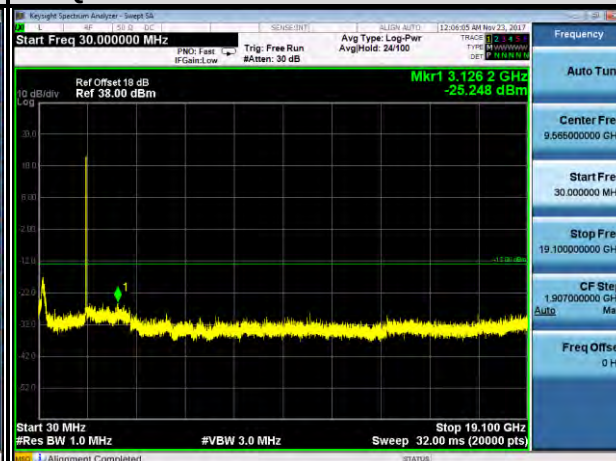
CHANNEL 18650

FREQUENCY RANGE : 30MHz~19.1GHz



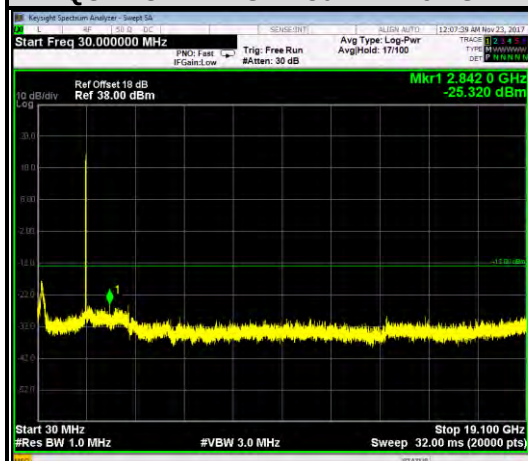
CHANNEL 18900

FREQUENCY RANGE : 30MHz~19.1GHz



CHANNEL 19150

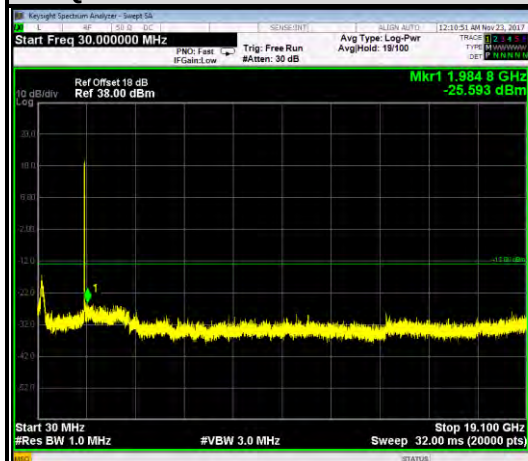
FREQUENCY RANGE : 30MHz~19.1GHz



15MHz / QPSK

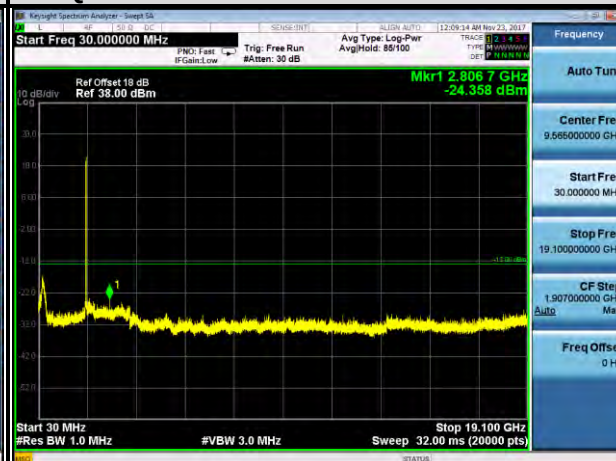
CHANNEL 18675

FREQUENCY RANGE : 30MHz~19.1GHz



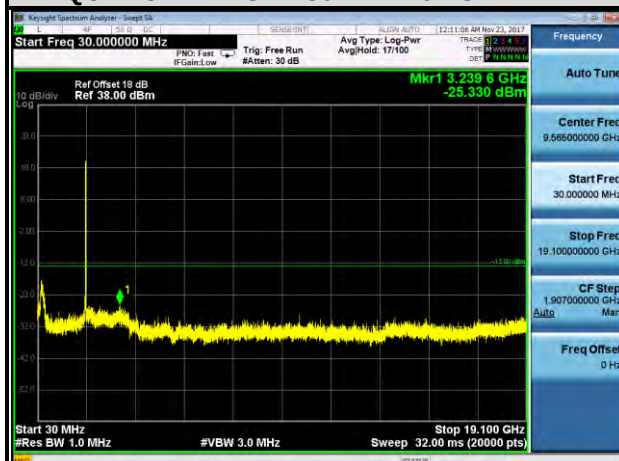
CHANNEL 18900

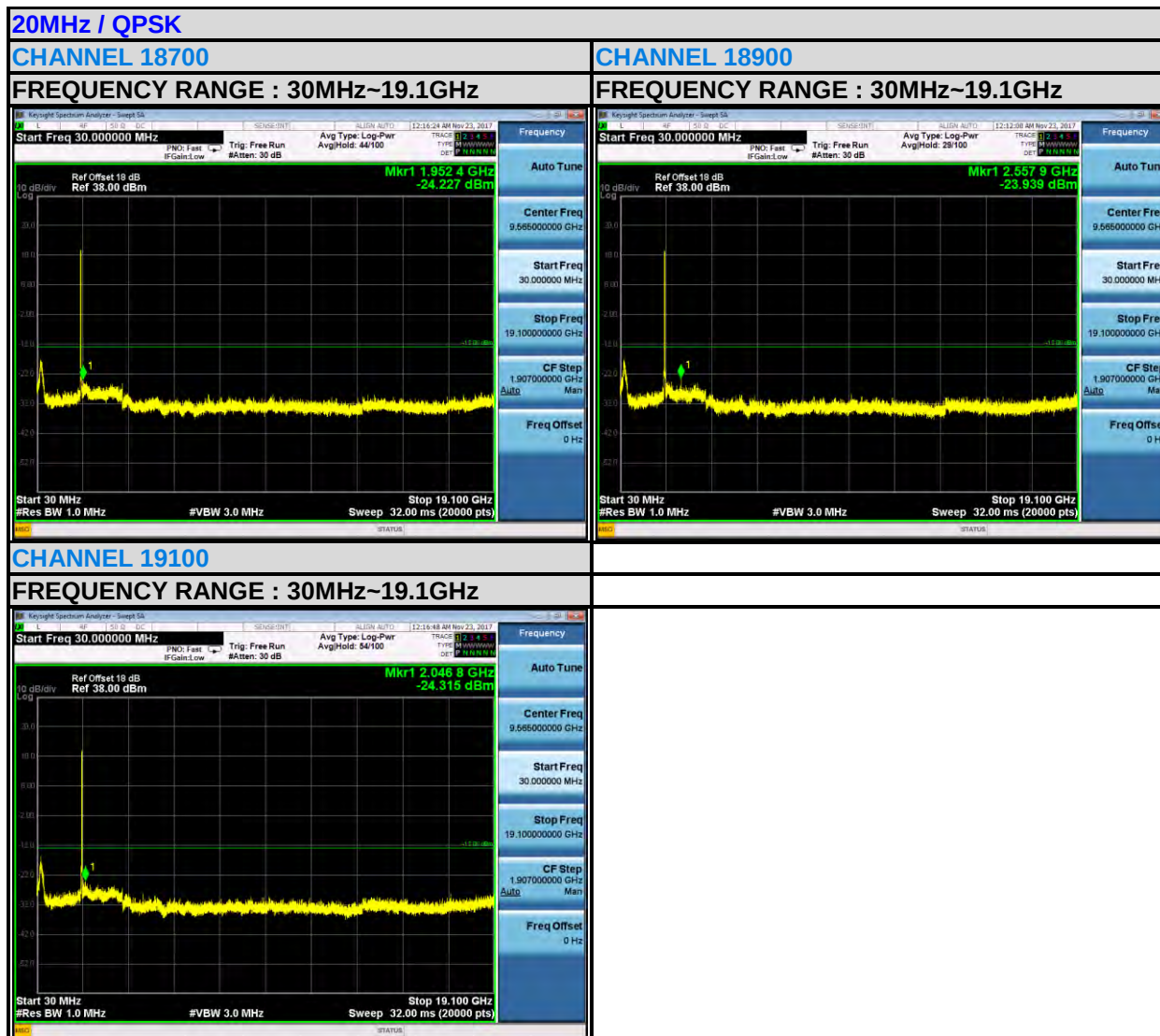
FREQUENCY RANGE : 30MHz~19.1GHz



CHANNEL 19125

FREQUENCY RANGE : 30MHz~19.1GHz





Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 4.6 RADIATED EMISSION MEASUREMENT

### 4.6.1 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 equal to  $-13\text{dBm}$ .

### 4.6.2 TEST PROCEDURES

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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 1m to 4m 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.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

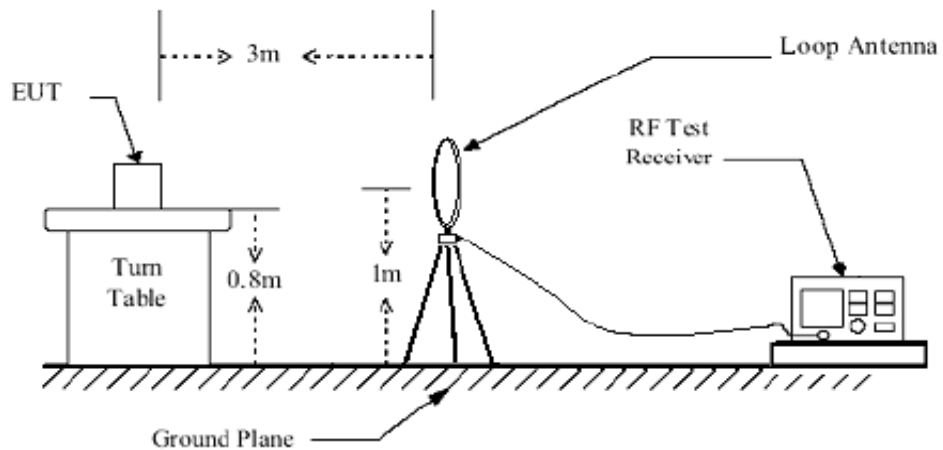
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.6.3 DEVIATION FROM TEST STANDARD

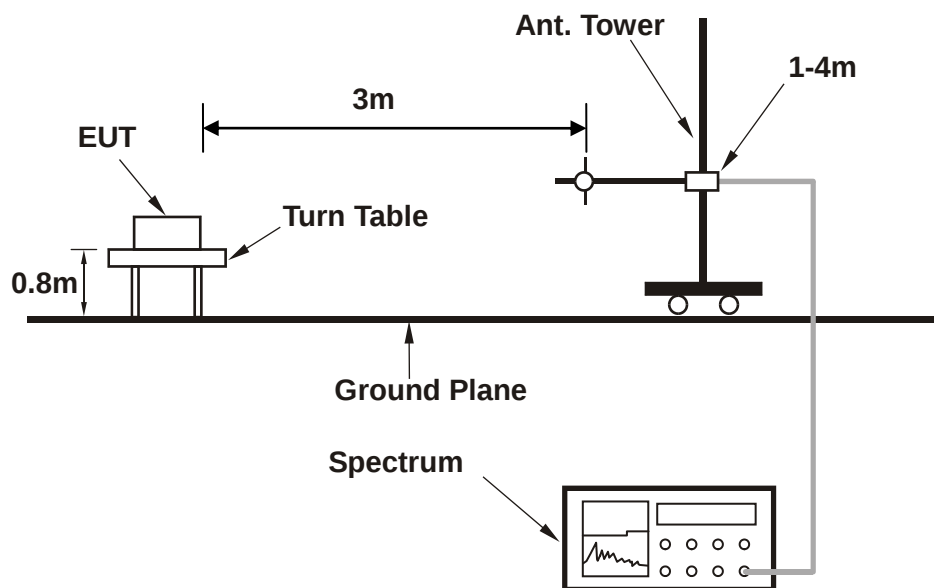
No deviation

#### 4.6.4 TEST SETUP

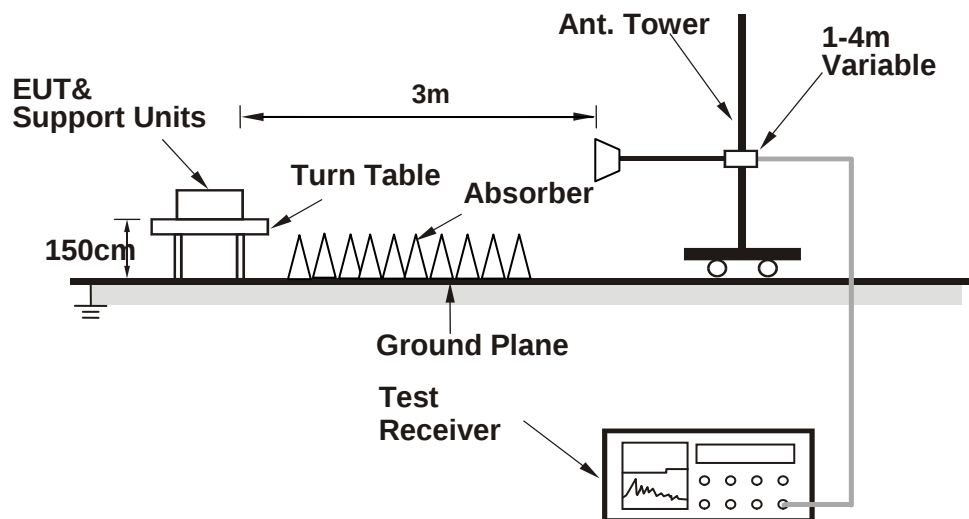
##### <Below 30MHz>



##### < Frequency Range 30MHz~1GHz >



**< Frequency Range above 1GHz >**



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

## 4.6.5 TEST RESULTS

### BELOW 1GHz WORST-CASE DATA

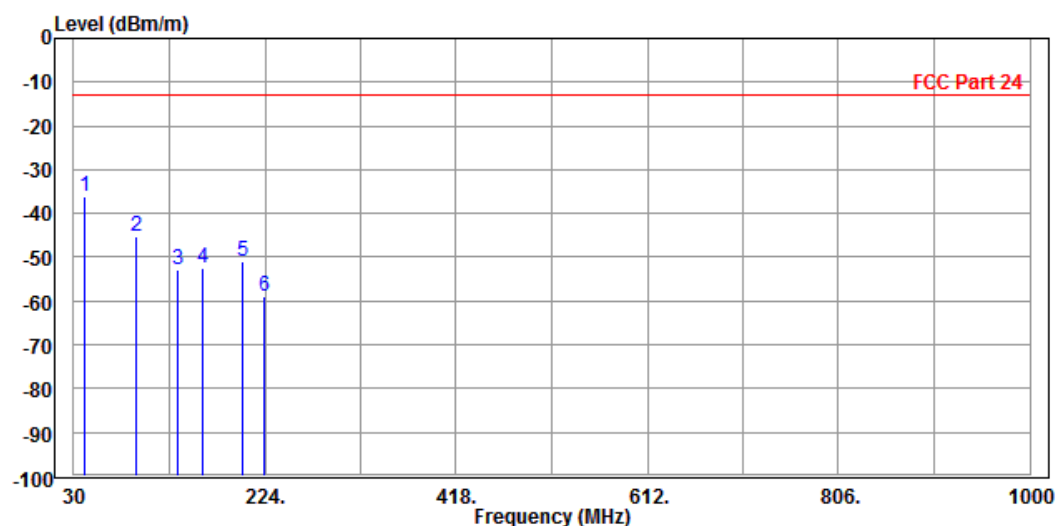
**9 KHz – 30 KHz data:** the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

**30 MHz – 1GHz data:**

**PCS 1900:**

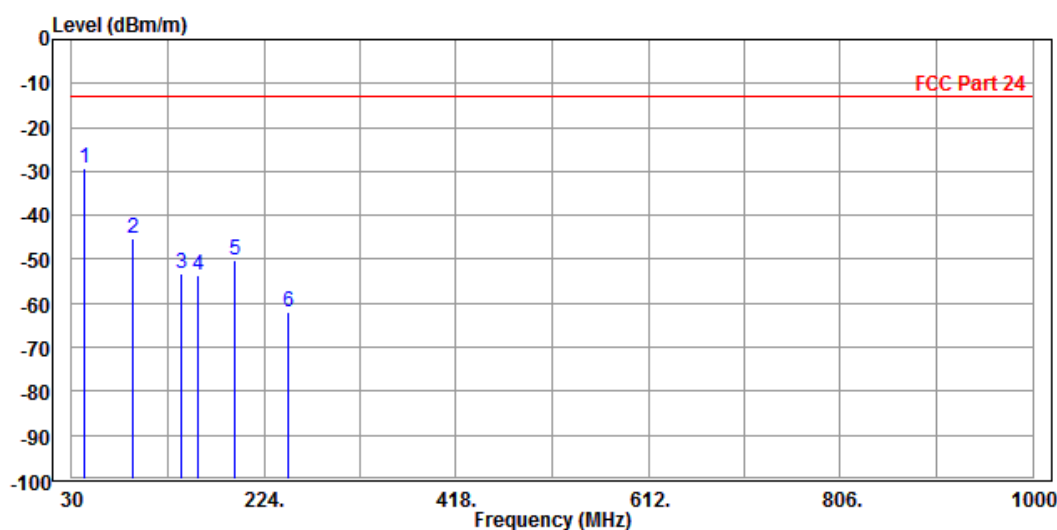
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 661  | FREQUENCY RANGE | Below 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|---------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1 PP | 41.640  | -36.12 | -46.75     | -13.00     | -23.12     | 10.63  | Peak   | Horizontal |
| 2    | 93.050  | -45.19 | -35.50     | -13.00     | -32.19     | -9.69  | Peak   | Horizontal |
| 3    | 135.730 | -52.90 | -34.92     | -13.00     | -39.90     | -17.98 | Peak   | Horizontal |
| 4    | 159.980 | -52.34 | -33.87     | -13.00     | -39.34     | -18.47 | Peak   | Horizontal |
| 5    | 201.690 | -51.08 | -33.88     | -13.00     | -38.08     | -17.20 | Peak   | Horizontal |
| 6    | 224.000 | -58.96 | -42.18     | -13.00     | -45.96     | -16.78 | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 661  | FREQUENCY RANGE | Below 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|---------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1 PP | 42.610  | -29.17 | -26.90     | -13.00     | -16.17     | -2.27  | Peak   | Vertical  |
| 2    | 92.080  | -45.13 | -34.56     | -13.00     | -32.13     | -10.57 | Peak   | Vertical  |
| 3    | 140.580 | -53.27 | -37.33     | -13.00     | -40.27     | -15.94 | Peak   | Vertical  |
| 4    | 158.040 | -53.49 | -38.08     | -13.00     | -40.49     | -15.41 | Peak   | Vertical  |
| 5    | 194.900 | -50.24 | -38.96     | -13.00     | -37.24     | -11.28 | Peak   | Vertical  |
| 6    | 248.250 | -61.79 | -50.30     | -13.00     | -48.79     | -11.49 | Peak   | Vertical  |



## ABOVE 1GHz DATA

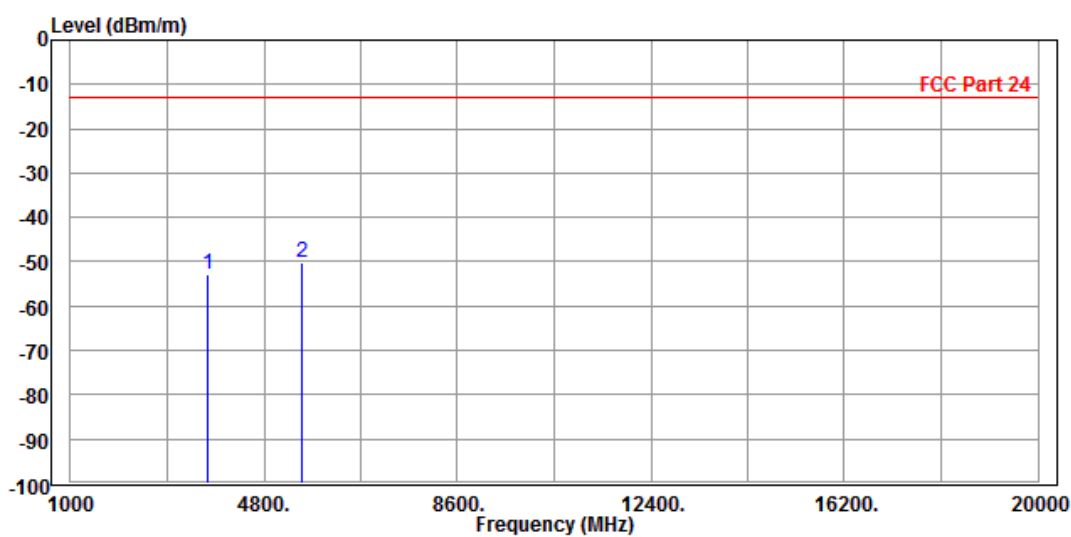
**Note:** For higher frequency, the emission is too low to be detected.

### PCS 1900:

#### CH 512

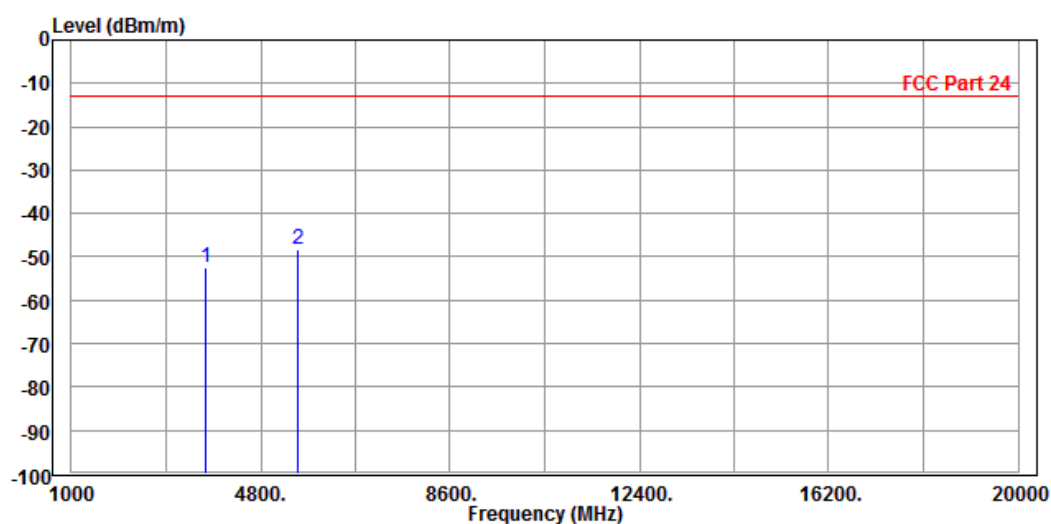
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 512  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3698.000 | -52.73 | -55.84     | -13.00     | -39.73     | 3.11   | Peak   | Horizontal |
| 2 PP | 5550.000 | -50.03 | -59.05     | -13.00     | -37.03     | 9.02   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 512  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

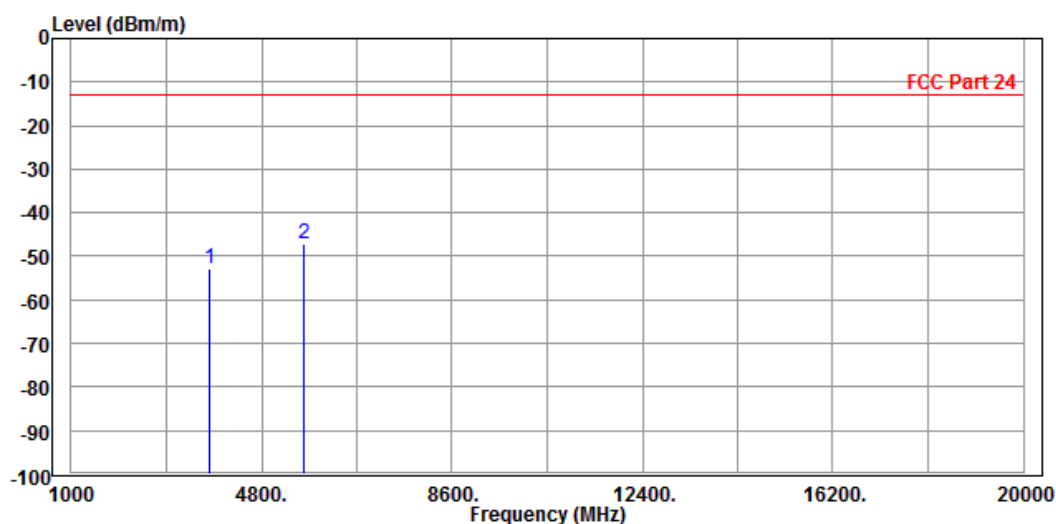
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3698.000 | -52.50 | -56.07     | -13.00     | -39.50     | 3.57   | Peak   | Vertical  |
| 2 PP | 5550.000 | -48.41 | -56.48     | -13.00     | -35.41     | 8.07   | Peak   | Vertical  |



# CH 661

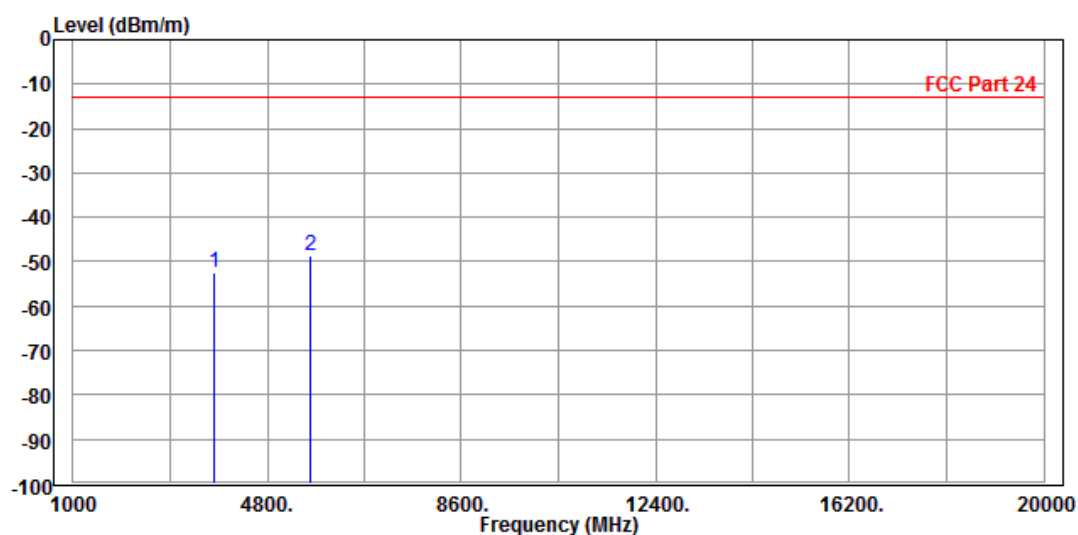
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 661  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -52.87 | -56.26     | -13.00     | -39.87     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -46.98 | -56.10     | -13.00     | -33.98     | 9.12   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 661  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

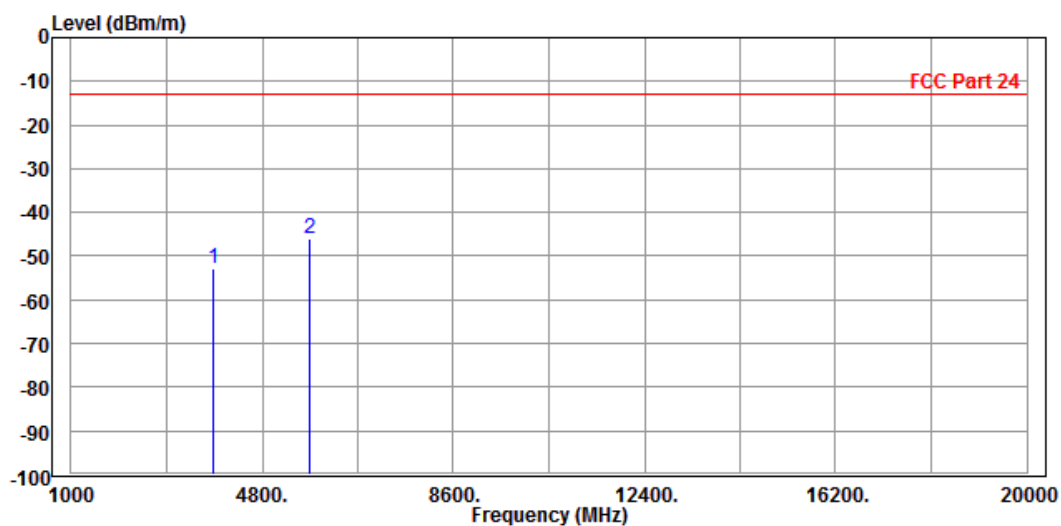
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -52.28 | -56.13     | -13.00     | -39.28     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -48.59 | -56.85     | -13.00     | -35.59     | 8.26   | Peak   | Vertical  |



# CH 810

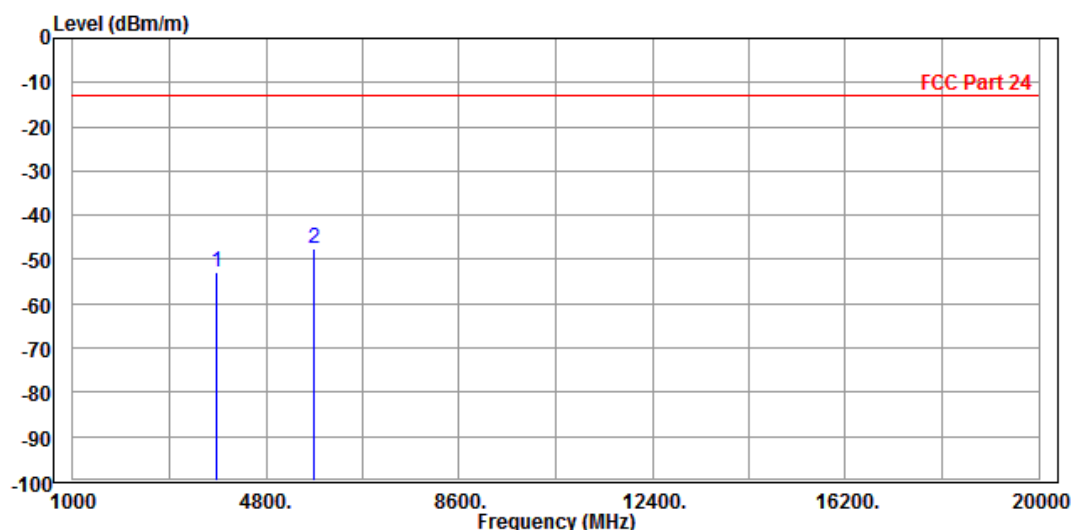
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 810  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3812.000 | -52.81 | -56.47     | -13.00     | -39.81     | 3.66   | Peak   | Horizontal |
| 2 PP | 5730.000 | -45.87 | -55.09     | -13.00     | -32.87     | 9.22   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 810  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3812.000 | -53.03 | -57.17     | -13.00     | -40.03     | 4.14   | Peak   | Vertical  |
| 2 PP | 5730.000 | -47.70 | -56.14     | -13.00     | -34.70     | 8.44   | Peak   | Vertical  |

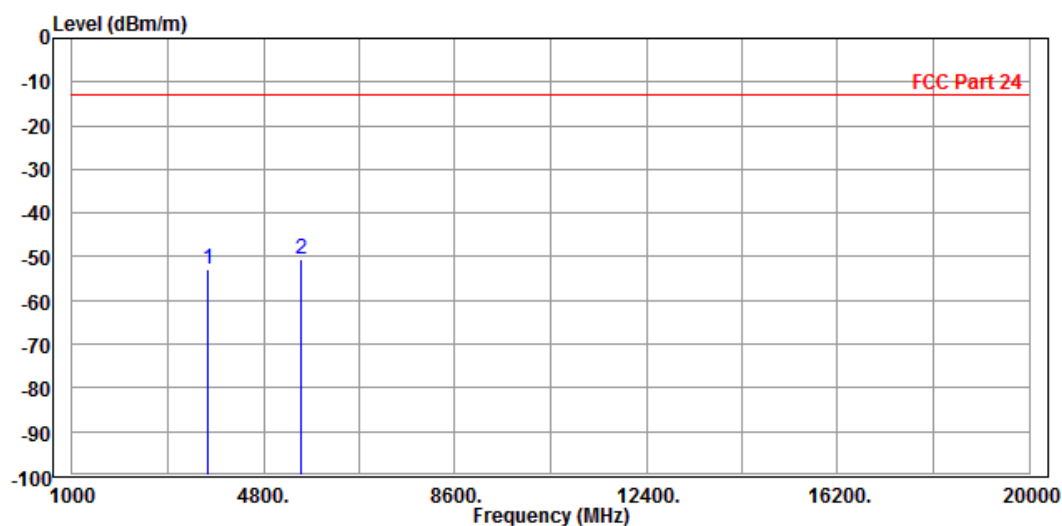


EDGE 1900:

CH 512

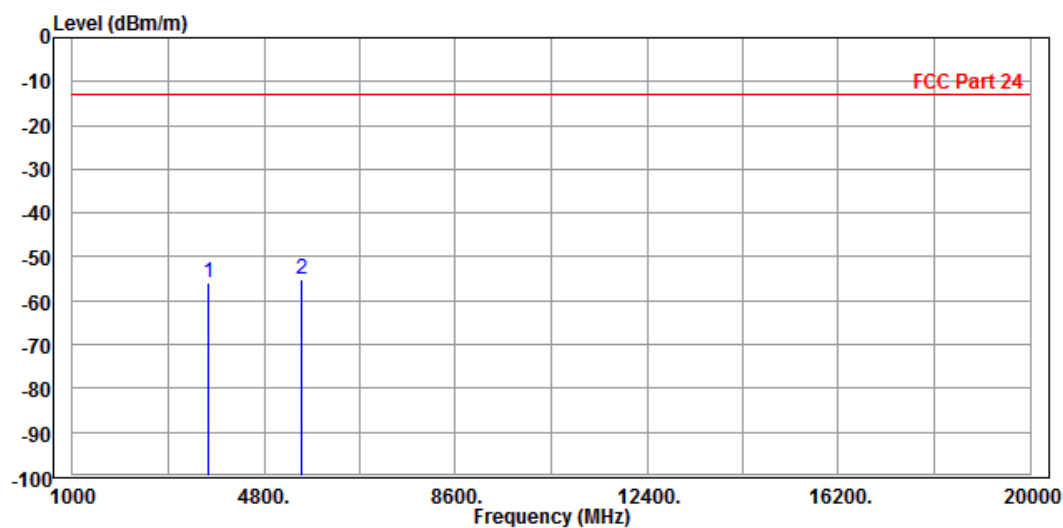
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 512  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3698.000 | -52.97 | -56.08     | -13.00     | -39.97     | 3.11   | Peak   | Horizontal |
| 2 PP | 5550.000 | -50.74 | -59.76     | -13.00     | -37.74     | 9.02   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 512  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

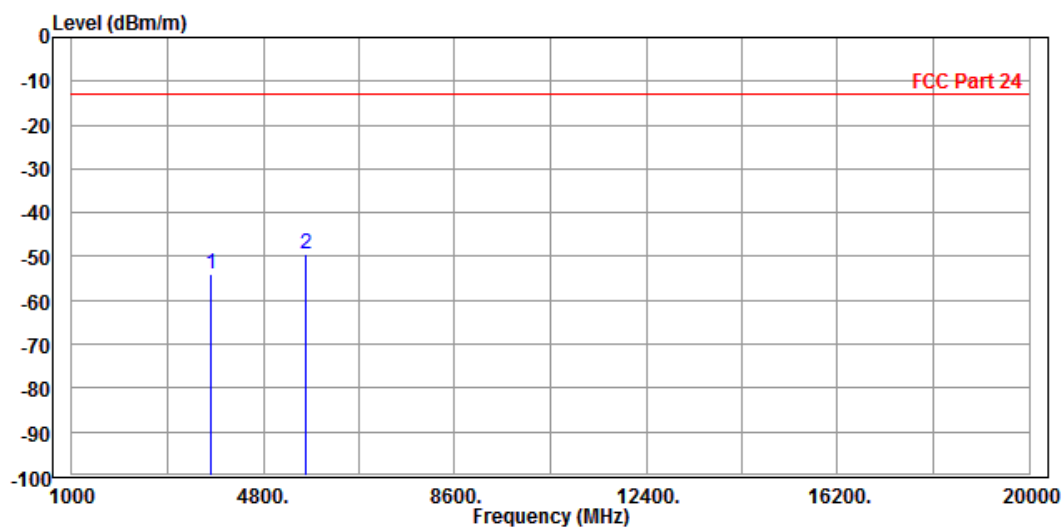
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3698.000 | -55.79 | -59.36     | -13.00     | -42.79     | 3.57   | Peak   | Vertical  |
| 2 PP | 5550.000 | -55.17 | -63.24     | -13.00     | -42.17     | 8.07   | Peak   | Vertical  |



# CH 661

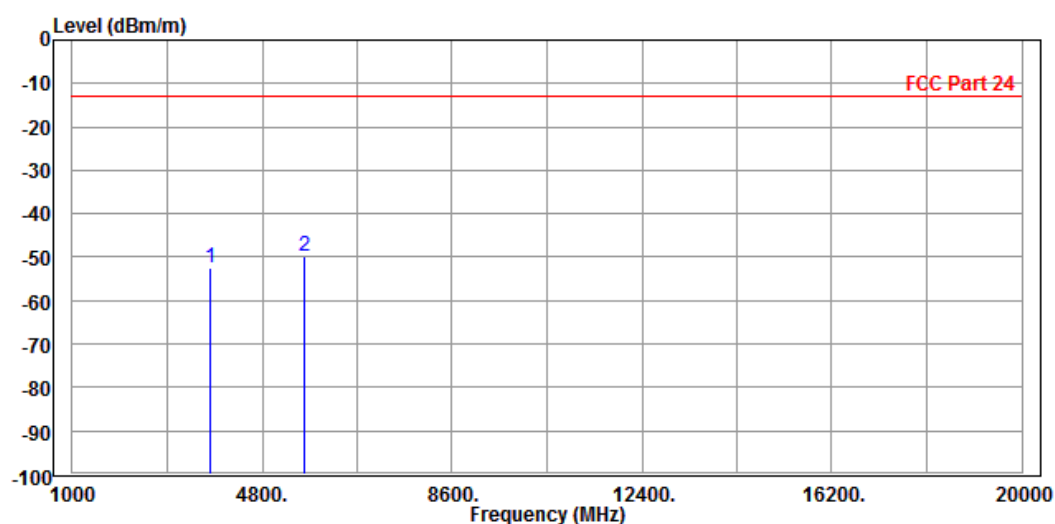
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 661  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -53.90 | -57.29     | -13.00     | -40.90     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -49.42 | -58.54     | -13.00     | -36.42     | 9.12   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 661  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 60%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

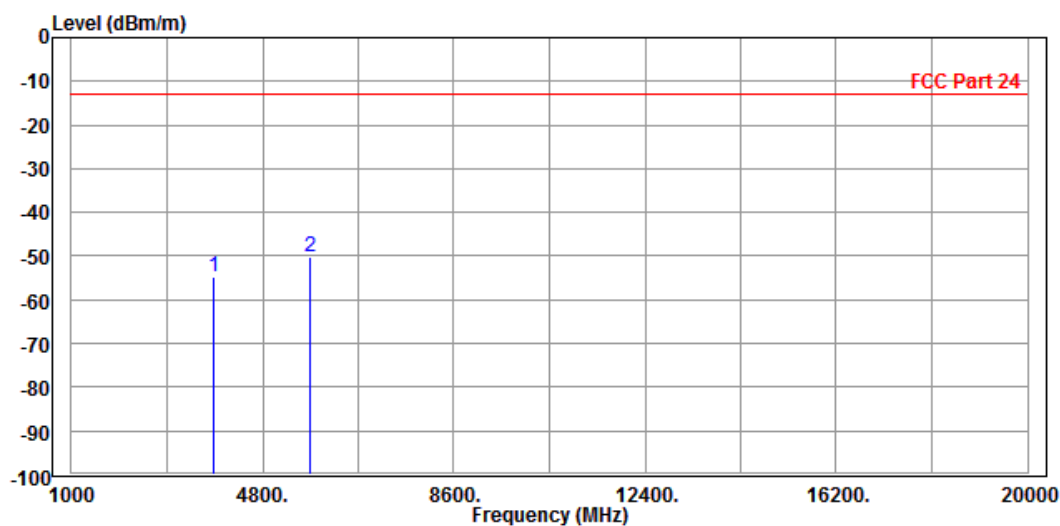
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -52.51 | -56.36     | -13.00     | -39.51     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -49.85 | -58.11     | -13.00     | -36.85     | 8.26   | Peak   | Vertical  |



# CH 810

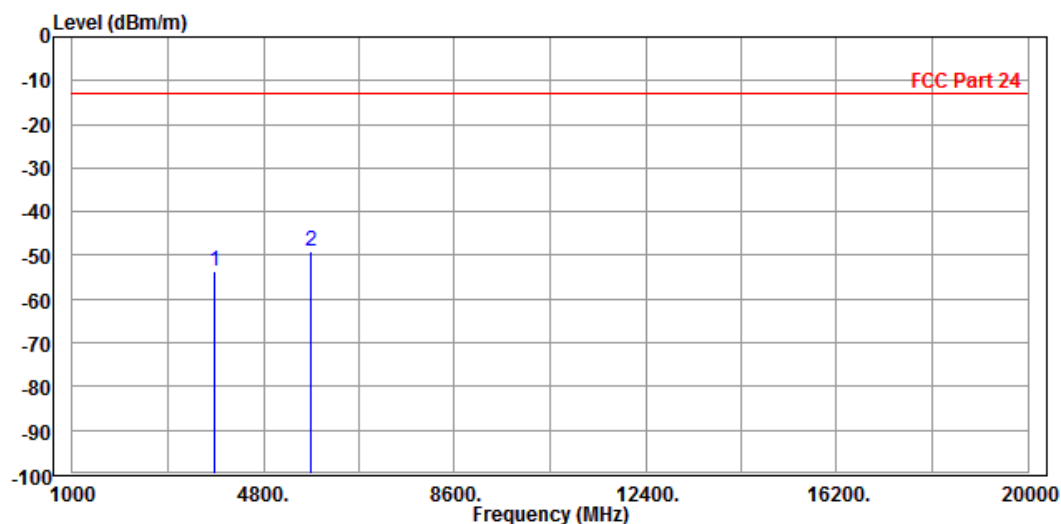
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 810  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3812.000 | -54.70 | -58.36     | -13.00     | -41.70     | 3.66   | Peak   | Horizontal |
| 2 PP | 5730.000 | -50.11 | -59.33     | -13.00     | -37.11     | 9.22   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 810  | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3812.000 | -53.66 | -57.80     | -13.00     | -40.66     | 4.14   | Peak   | Vertical  |
| 2 PP | 5730.000 | -49.05 | -57.49     | -13.00     | -36.05     | 8.44   | Peak   | Vertical  |

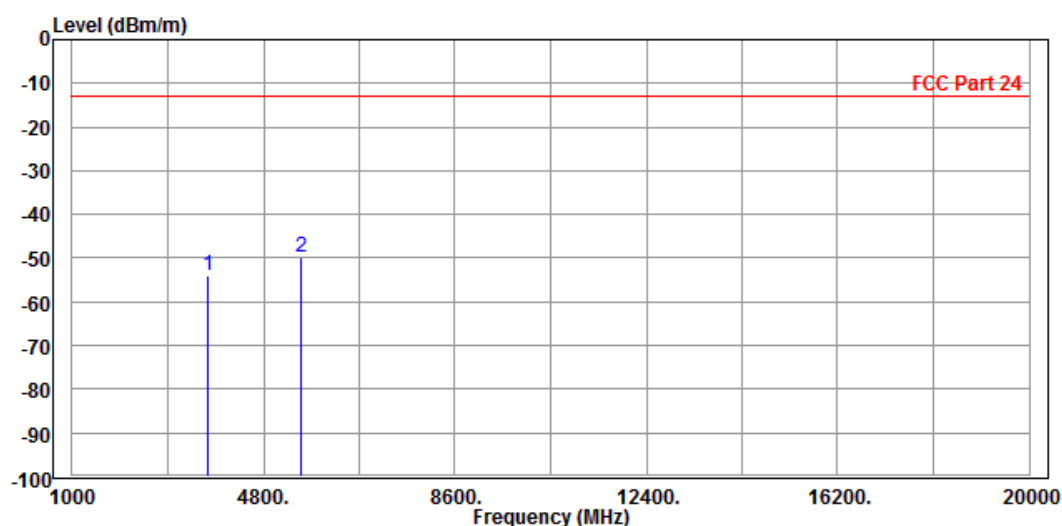


# WCDMA Band II

## CH 9262

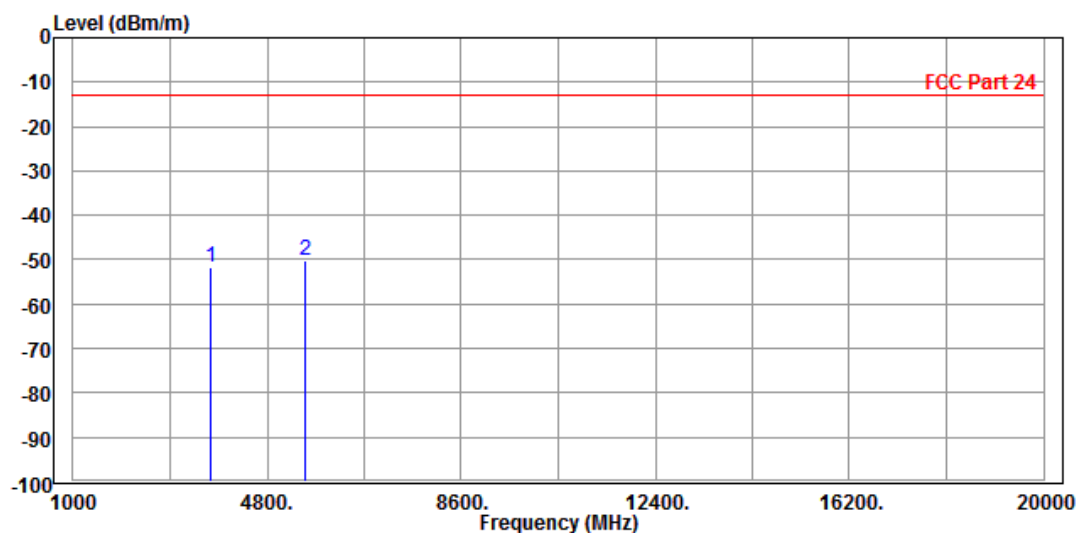
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 9262 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3698.000 | -53.96 | -57.07     | -13.00     | -40.96     | 3.11   | Peak   | Horizontal |
| 2 PP | 5550.000 | -49.89 | -58.91     | -13.00     | -36.89     | 9.02   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 9262 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

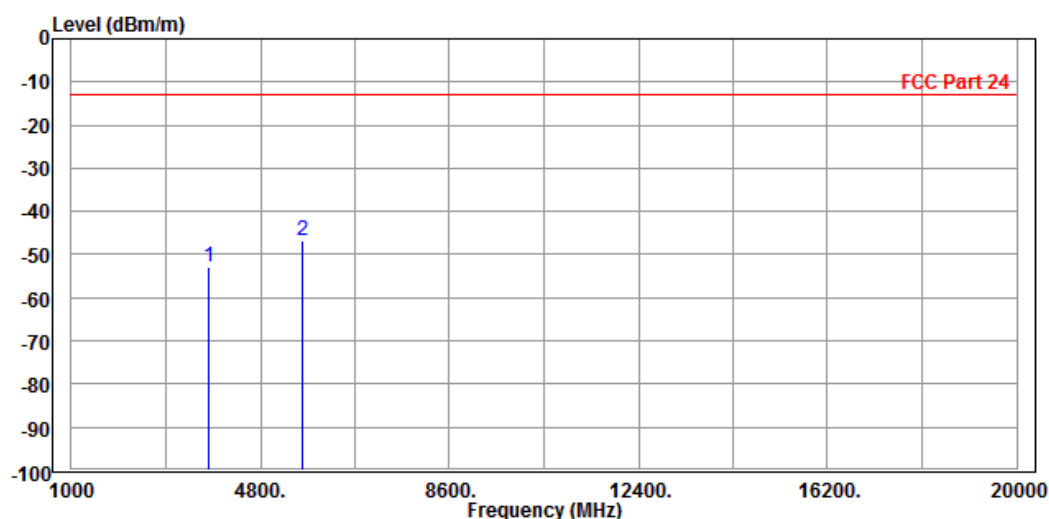
|   | Freq        | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|-------------|--------|------------|------------|------------|--------|--------|-----------|
|   | MHz         | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1 | 3698.000    | -51.71 | -55.28     | -13.00     | -38.71     | 3.57   | Peak   | Vertical  |
| 2 | PP 5550.000 | -50.02 | -58.09     | -13.00     | -37.02     | 8.07   | Peak   | Vertical  |



# CH 9400

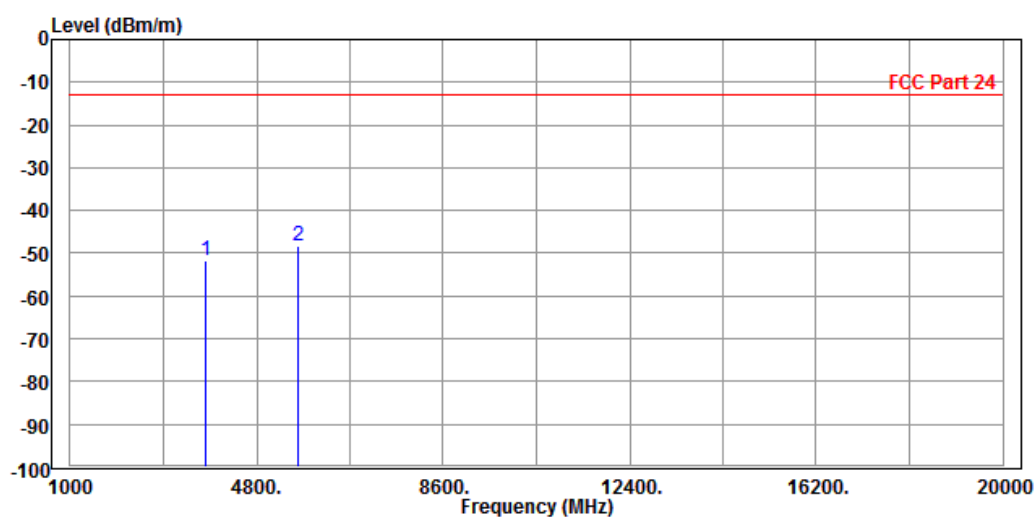
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 9400 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -52.87 | -56.26     | -13.00     | -39.87     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -46.72 | -55.84     | -13.00     | -33.72     | 9.12   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 9400 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

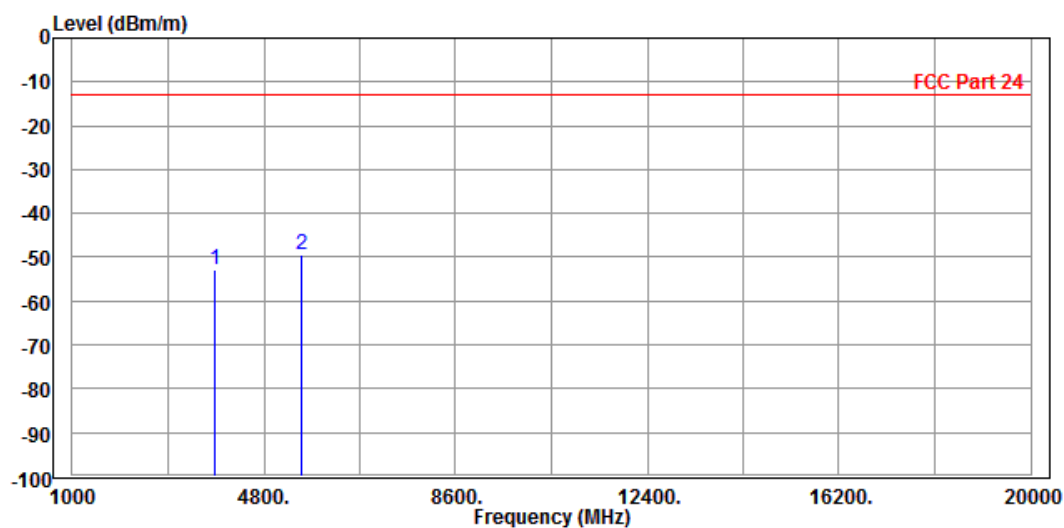
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -51.82 | -55.67     | -13.00     | -38.82     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -48.30 | -56.56     | -13.00     | -35.30     | 8.26   | Peak   | Vertical  |



# CH 9538

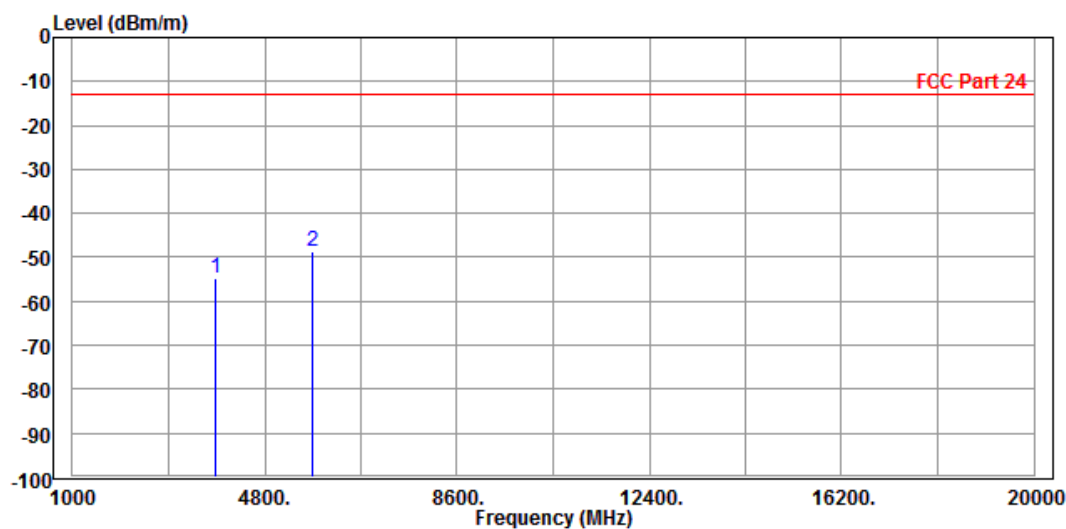
|                                                     |                 |                 |                      |
|-----------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                                | TX channel 9538 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3812.000 | -52.99 | -56.65     | -13.00     | -39.99     | 3.66   | Peak   | Horizontal |
| 2 PP | 5550.000 | -49.25 | -58.27     | -13.00     | -36.25     | 9.02   | Peak   | Horizontal |



|                                                   |                 |                 |                      |
|---------------------------------------------------|-----------------|-----------------|----------------------|
| MODE                                              | TX channel 9538 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang      |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3812.000 | -54.90 | -59.04     | -13.00     | -41.90     | 4.14   | Peak   | Vertical  |
| 2 PP | 5730.000 | -48.83 | -57.27     | -13.00     | -35.83     | 8.44   | Peak   | Vertical  |

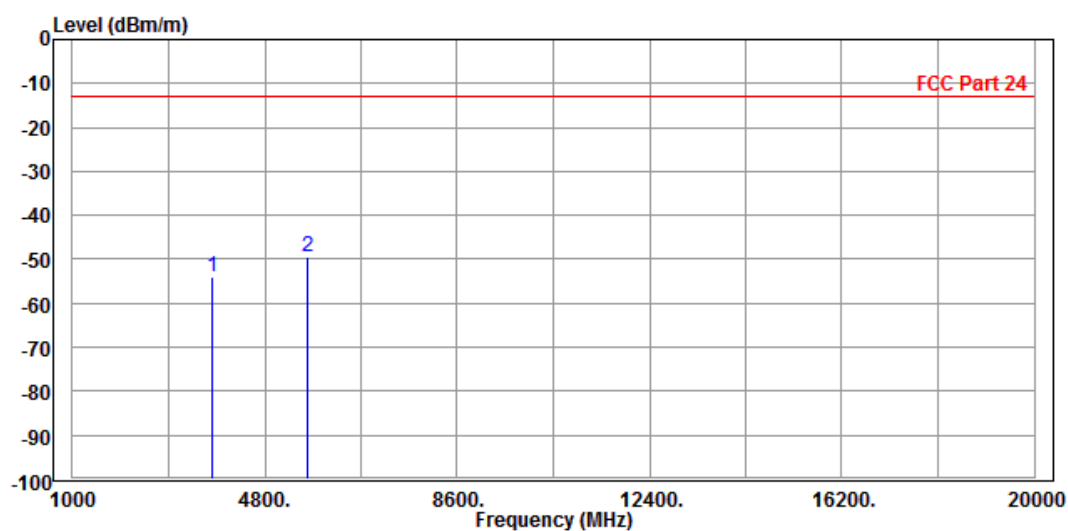


# LTE Band 2

CHANNEL BANDWIDTH: 1.4MHz / QPSK

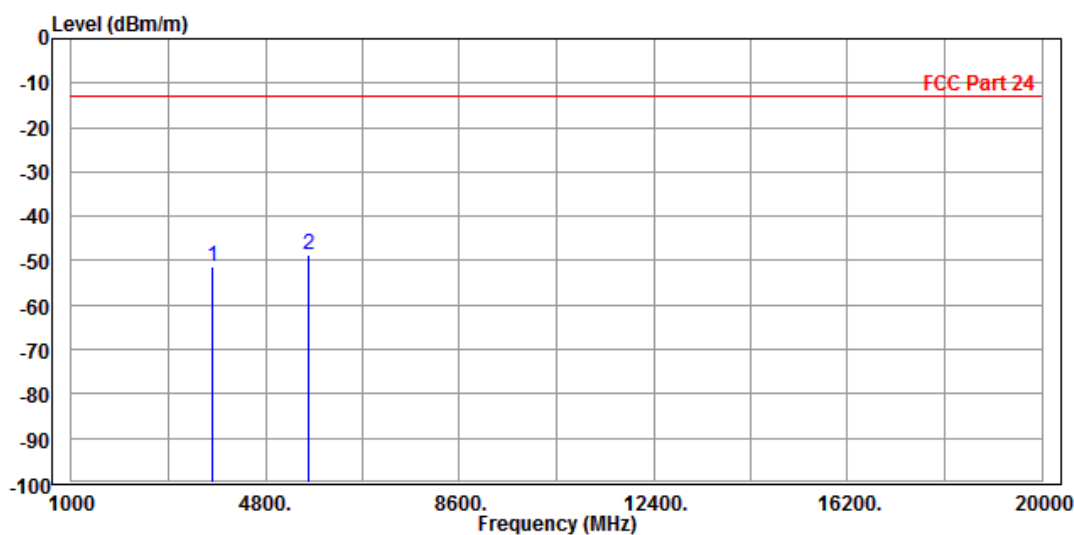
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -53.98 | -57.37     | -13.00     | -40.98     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -49.58 | -58.70     | -13.00     | -36.58     | 9.12   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

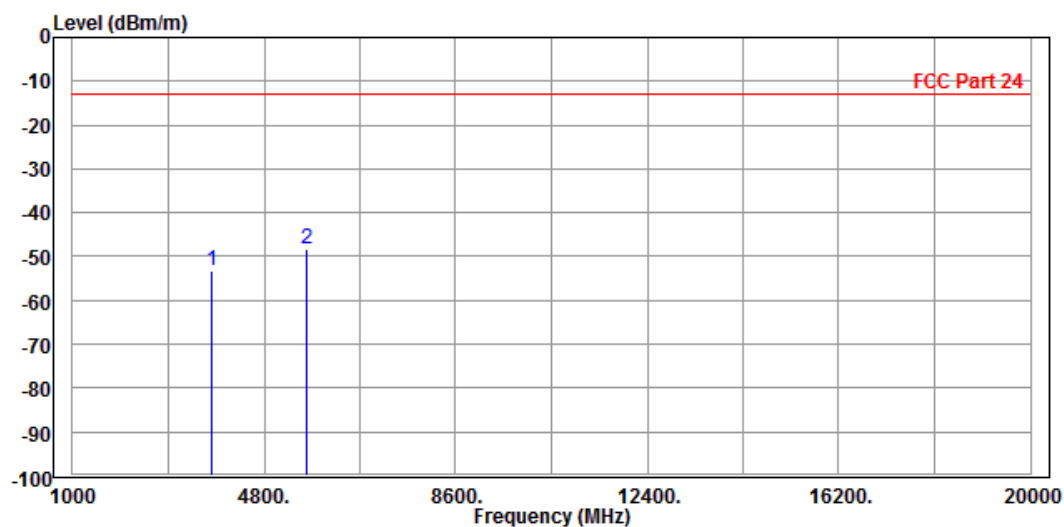
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -51.48 | -55.33     | -13.00     | -38.48     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -48.53 | -56.79     | -13.00     | -35.53     | 8.26   | Peak   | Vertical  |



# CHANNEL BANDWIDTH: 3MHz / QPSK

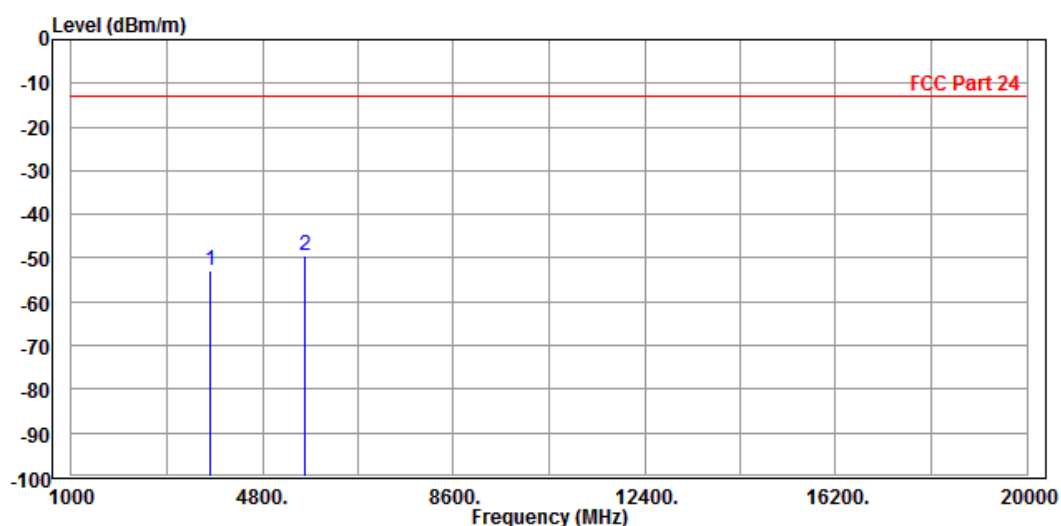
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -53.11 | -56.50     | -13.00     | -40.11     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -48.20 | -57.32     | -13.00     | -35.20     | 9.12   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

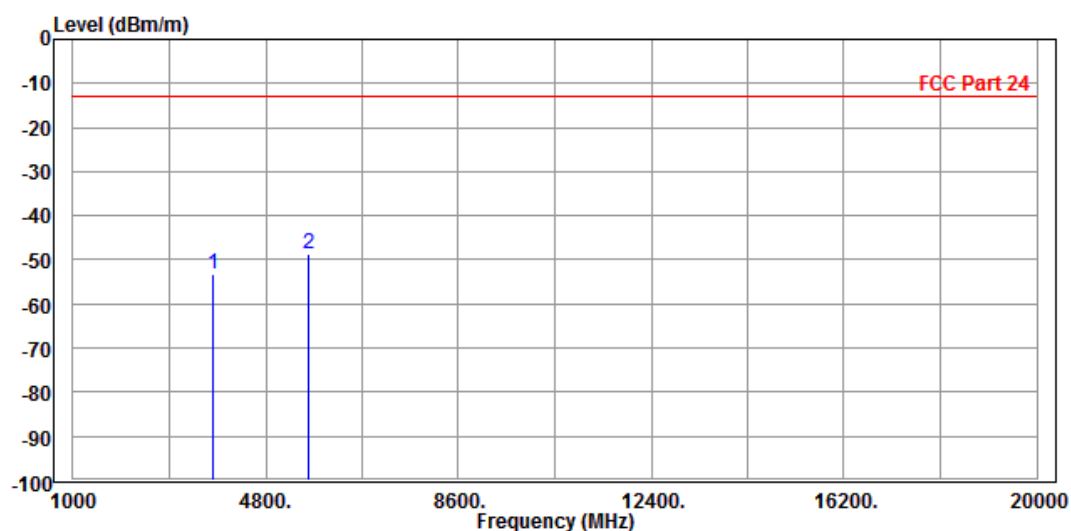
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -52.94 | -56.79     | -13.00     | -39.94     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -49.30 | -57.56     | -13.00     | -36.30     | 8.26   | Peak   | Vertical  |



# CHANNEL BANDWIDTH: 5MHz / QPSK

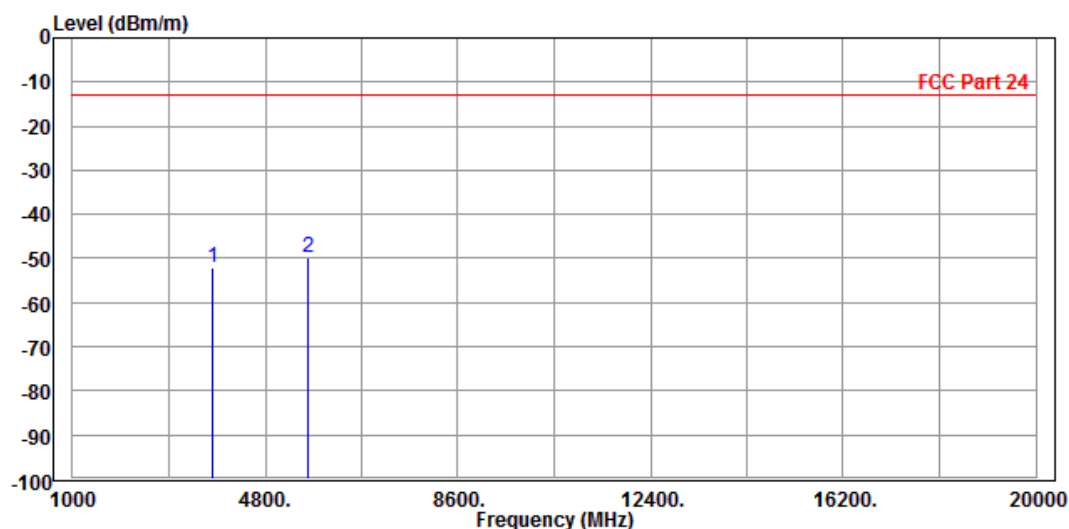
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -53.16 | -56.55     | -13.00     | -40.16     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -48.68 | -57.80     | -13.00     | -35.68     | 9.12   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -51.97 | -55.82     | -13.00     | -38.97     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -49.98 | -58.24     | -13.00     | -36.98     | 8.26   | Peak   | Vertical  |

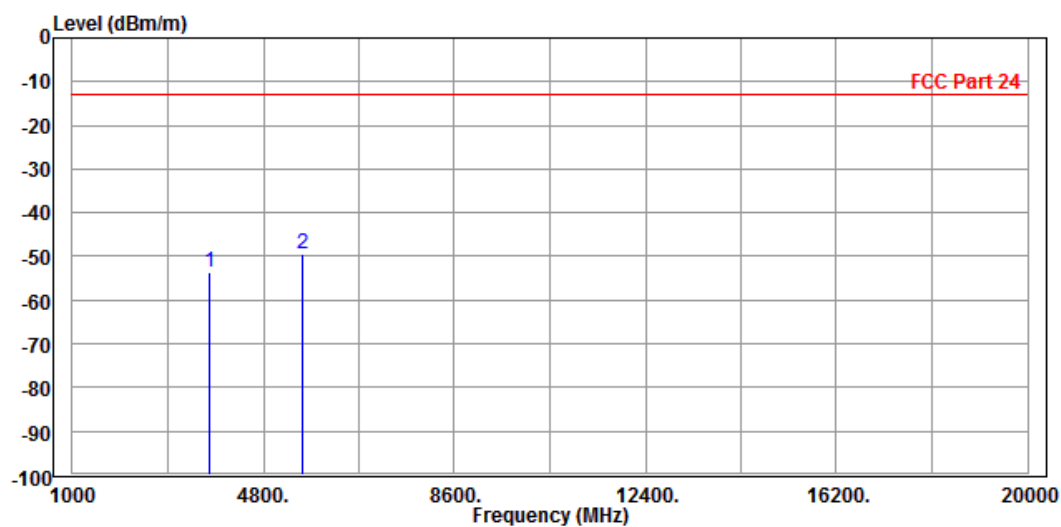


CHANNEL BANDWIDTH: 10MHz / QPSK

CH 18650

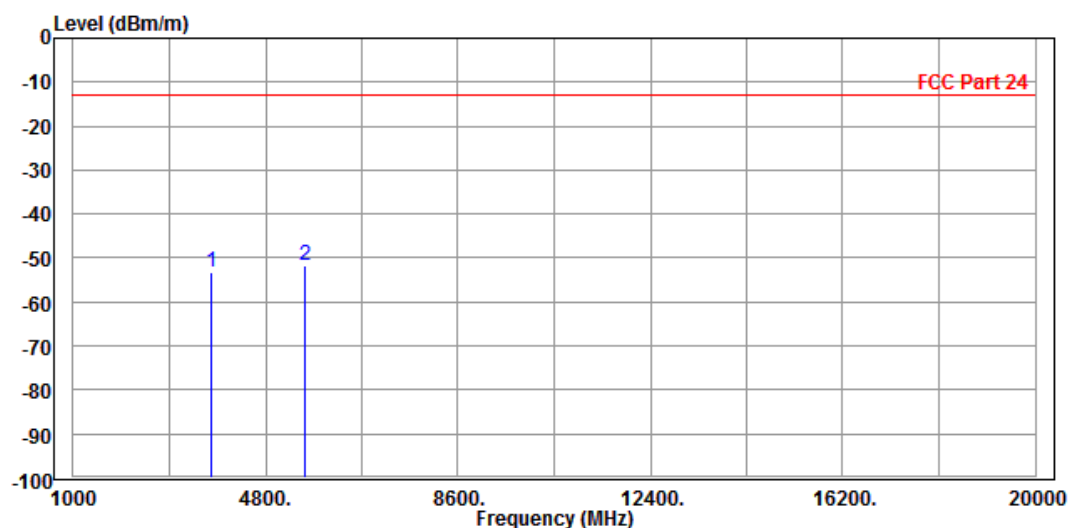
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18650 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3717.000 | -53.46 | -56.67     | -13.00     | -40.46     | 3.21   | Peak   | Horizontal |
| 2 PP | 5565.000 | -49.38 | -58.42     | -13.00     | -36.38     | 9.04   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18650 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

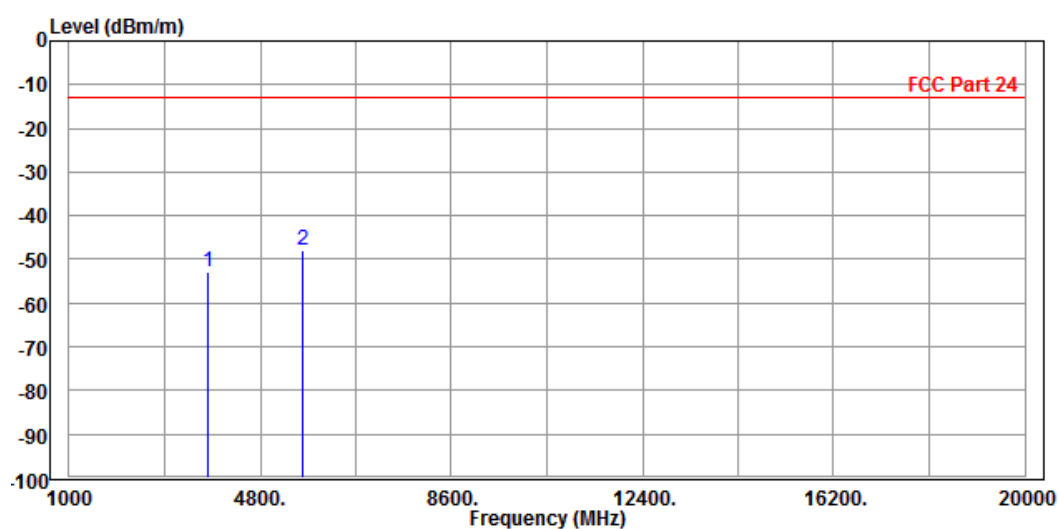
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3717.000 | -53.39 | -57.05     | -13.00     | -40.39     | 3.66   | Peak   | Vertical  |
| 2 PP | 5565.000 | -51.83 | -59.93     | -13.00     | -38.83     | 8.10   | Peak   | Vertical  |



# CH 18900

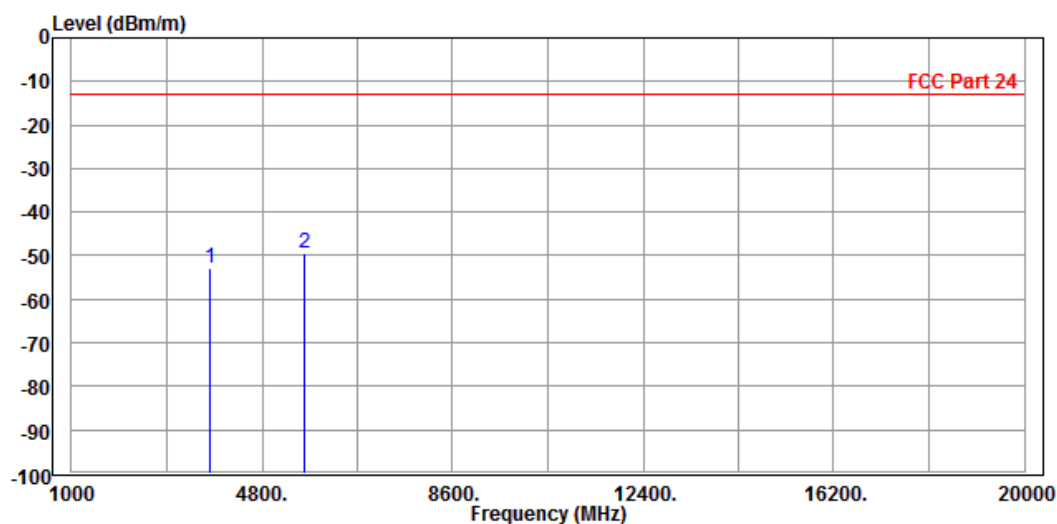
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|   | Freq        | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|---|-------------|--------|------------|------------|------------|--------|--------|------------|
|   | MHz         | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1 | 3755.000    | -52.94 | -56.33     | -13.00     | -39.94     | 3.39   | Peak   | Horizontal |
| 2 | PP 5640.000 | -48.08 | -57.20     | -13.00     | -35.08     | 9.12   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

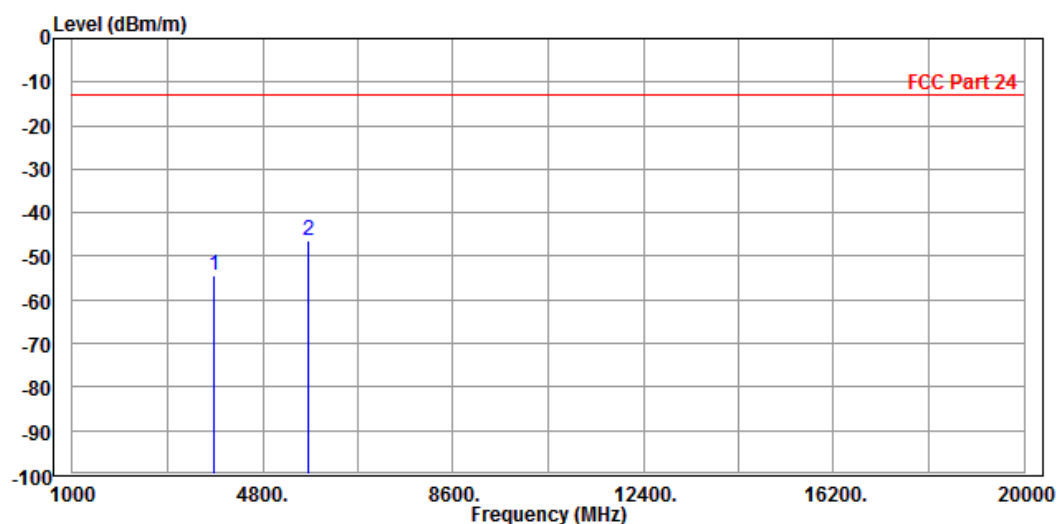
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -52.72 | -56.57     | -13.00     | -39.72     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -49.52 | -57.78     | -13.00     | -36.52     | 8.26   | Peak   | Vertical  |



# CH 19150

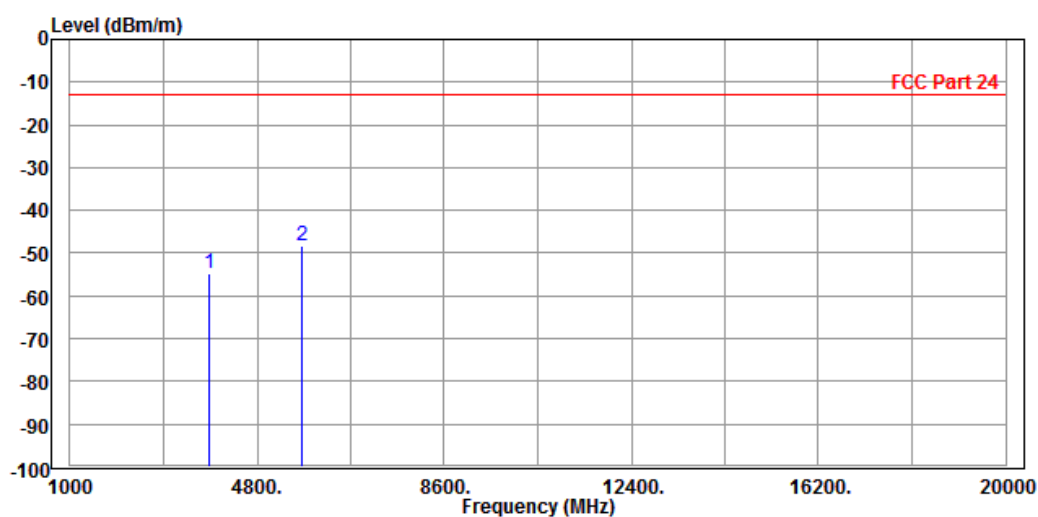
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 19150 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3812.000 | -54.35 | -58.01     | -13.00     | -41.35     | 3.66   | Peak   | Horizontal |
| 2 PP | 5715.000 | -46.38 | -55.59     | -13.00     | -33.38     | 9.21   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 19150 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

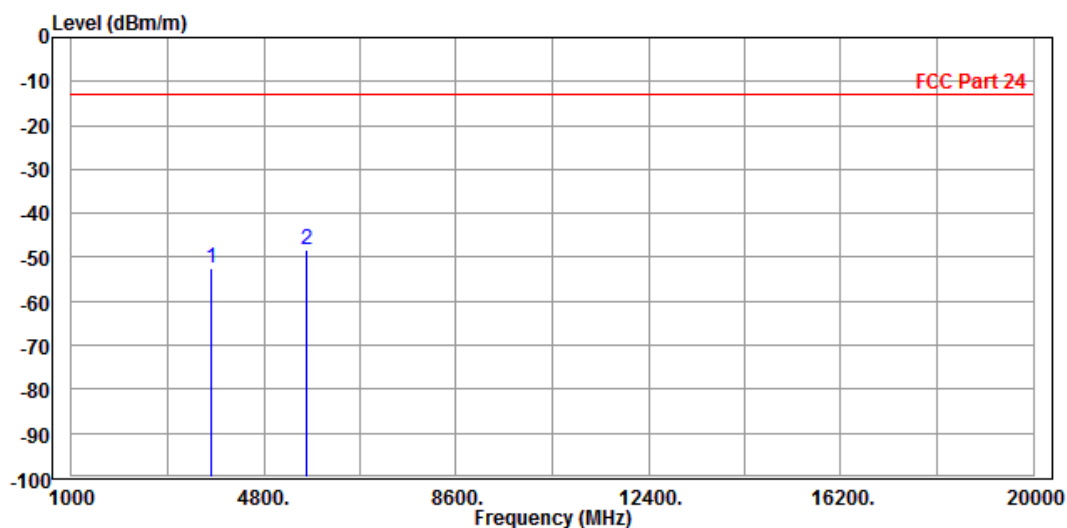
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3812.000 | -54.88 | -59.02     | -13.00     | -41.88     | 4.14   | Peak   | Vertical  |
| 2 PP | 5715.000 | -48.39 | -56.80     | -13.00     | -35.39     | 8.41   | Peak   | Vertical  |



# CHANNEL BANDWIDTH: 15MHz / QPSK

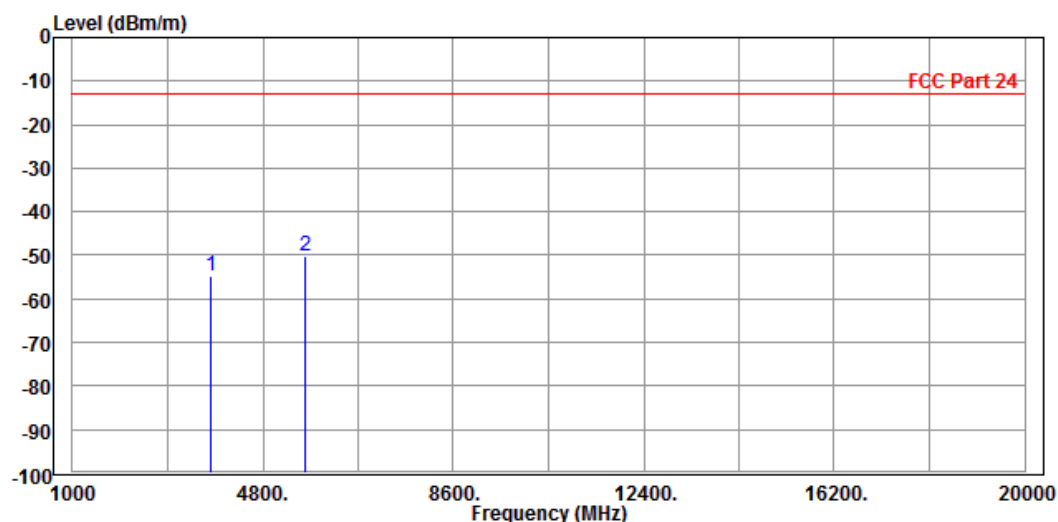
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -52.58 | -55.97     | -13.00     | -39.58     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -48.38 | -57.50     | -13.00     | -35.38     | 9.12   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

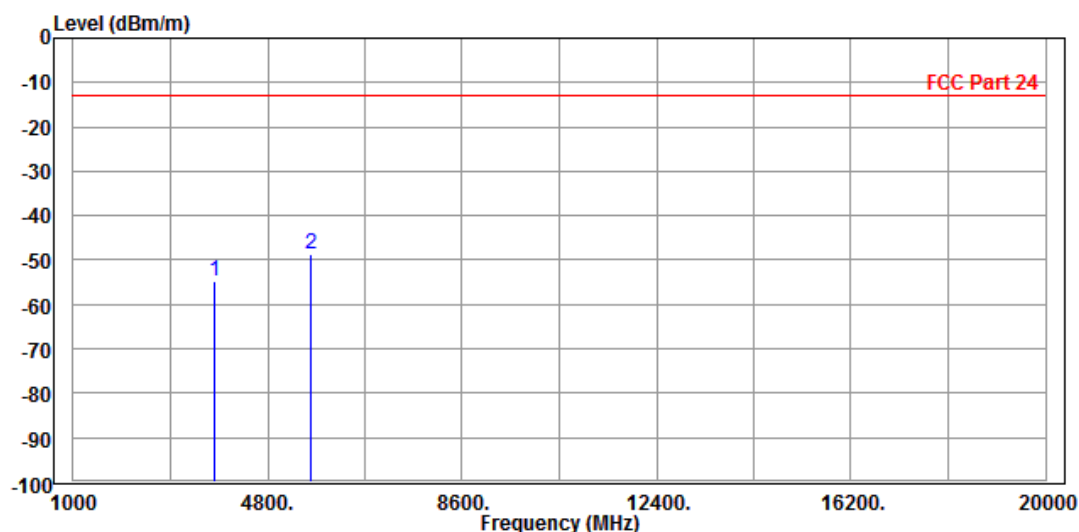
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -54.85 | -58.70     | -13.00     | -41.85     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -50.00 | -58.26     | -13.00     | -37.00     | 8.26   | Peak   | Vertical  |



# CHANNEL BANDWIDTH: 20MHz / QPSK

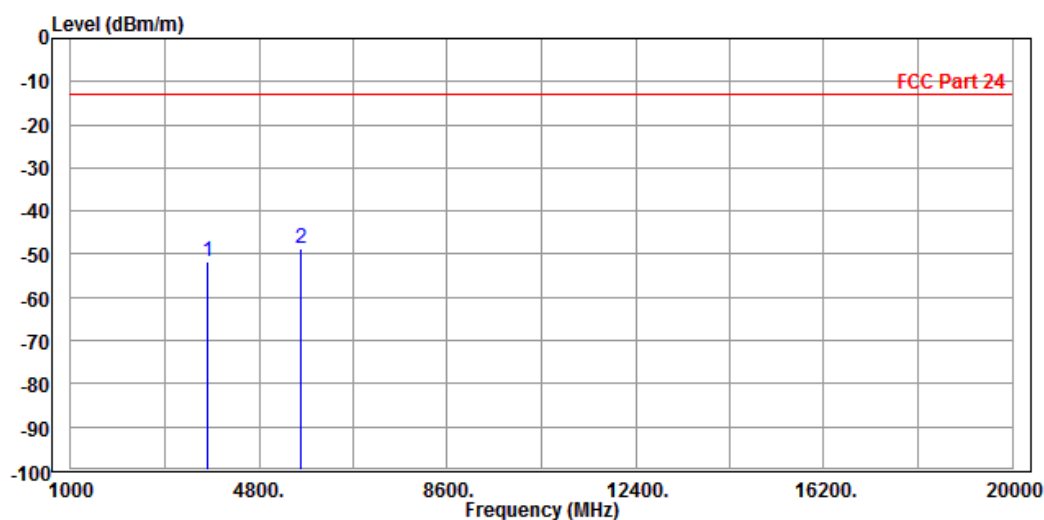
|                                                     |                  |                 |                      |
|-----------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                                | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                            | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                           | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase  |
|------|----------|--------|------------|------------|------------|--------|--------|------------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |            |
| 1    | 3755.000 | -54.75 | -58.14     | -13.00     | -41.75     | 3.39   | Peak   | Horizontal |
| 2 PP | 5640.000 | -48.56 | -57.68     | -13.00     | -35.56     | 9.12   | Peak   | Horizontal |



|                                                   |                  |                 |                      |
|---------------------------------------------------|------------------|-----------------|----------------------|
| MODE                                              | TX channel 18900 | FREQUENCY RANGE | Above 1000MHz        |
| ENVIRONMENTAL CONDITIONS                          | 23deg. C, 70%RH  | INPUT POWER     | DC 5/9V from adapter |
| TESTED BY                                         | Simon Yang       |                 |                      |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                      |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 3755.000 | -51.73 | -55.58     | -13.00     | -38.73     | 3.85   | Peak   | Vertical  |
| 2 PP | 5640.000 | -48.85 | -57.11     | -13.00     | -35.85     | 8.26   | Peak   | Vertical  |



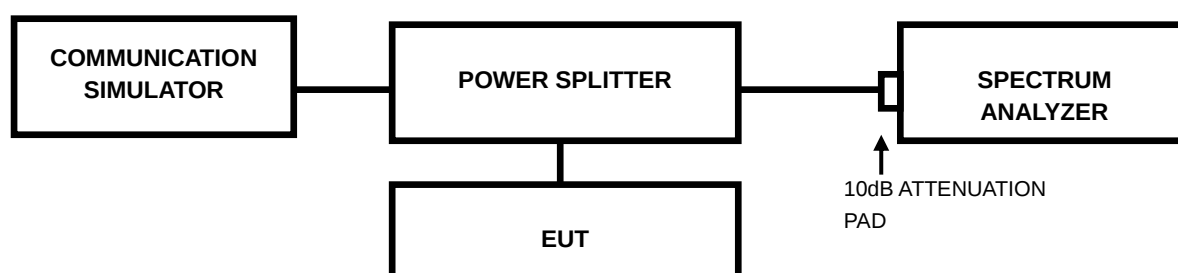
Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 4.7 PEAK TO AVERAGE RATIO

### 4.7.1 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

### 4.7.2 TEST SETUP



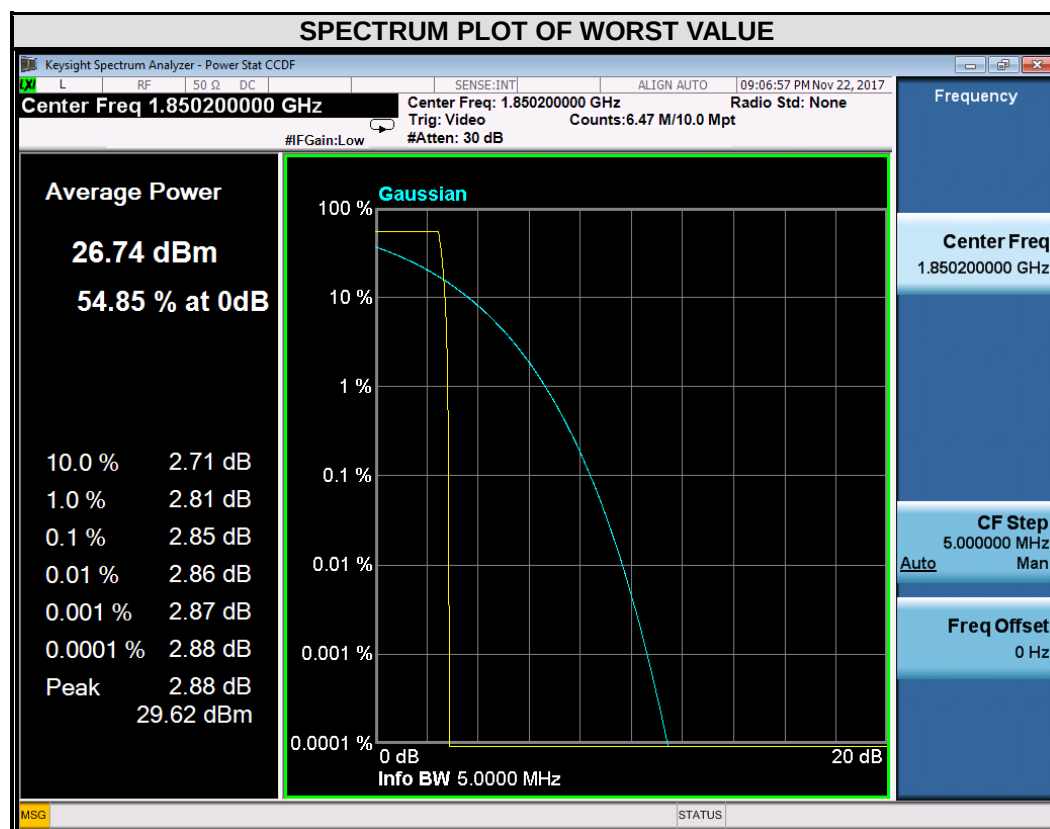
### 4.7.3 TEST PROCEDURES

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%.

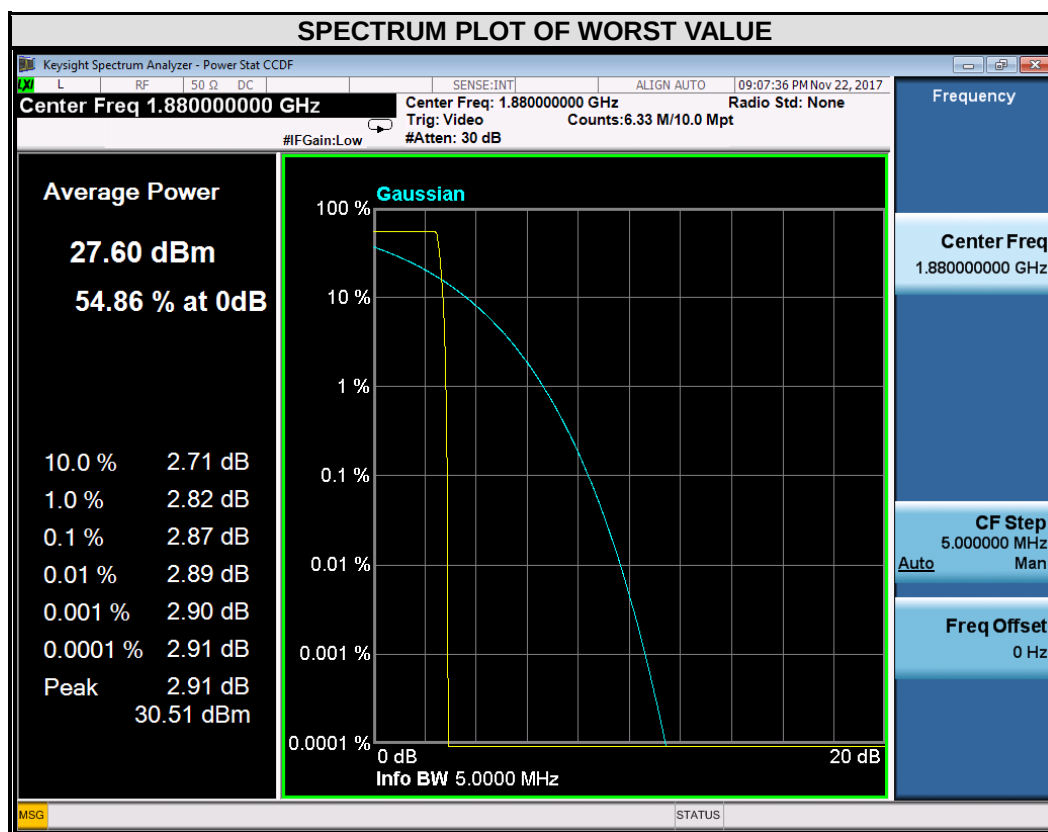
#### 4.7.4 TEST RESULTS

##### GSM

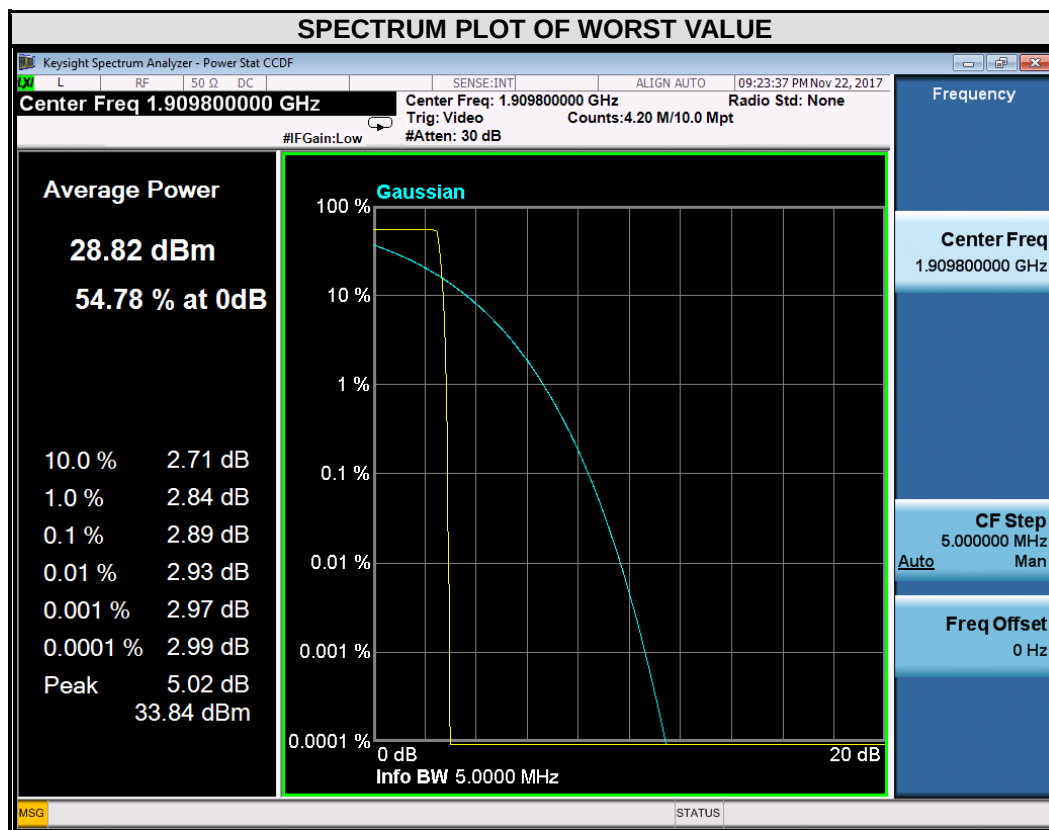
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 512     | 1850.2          | 2.85                       |



| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 661     | 1880            | 2.87                       |

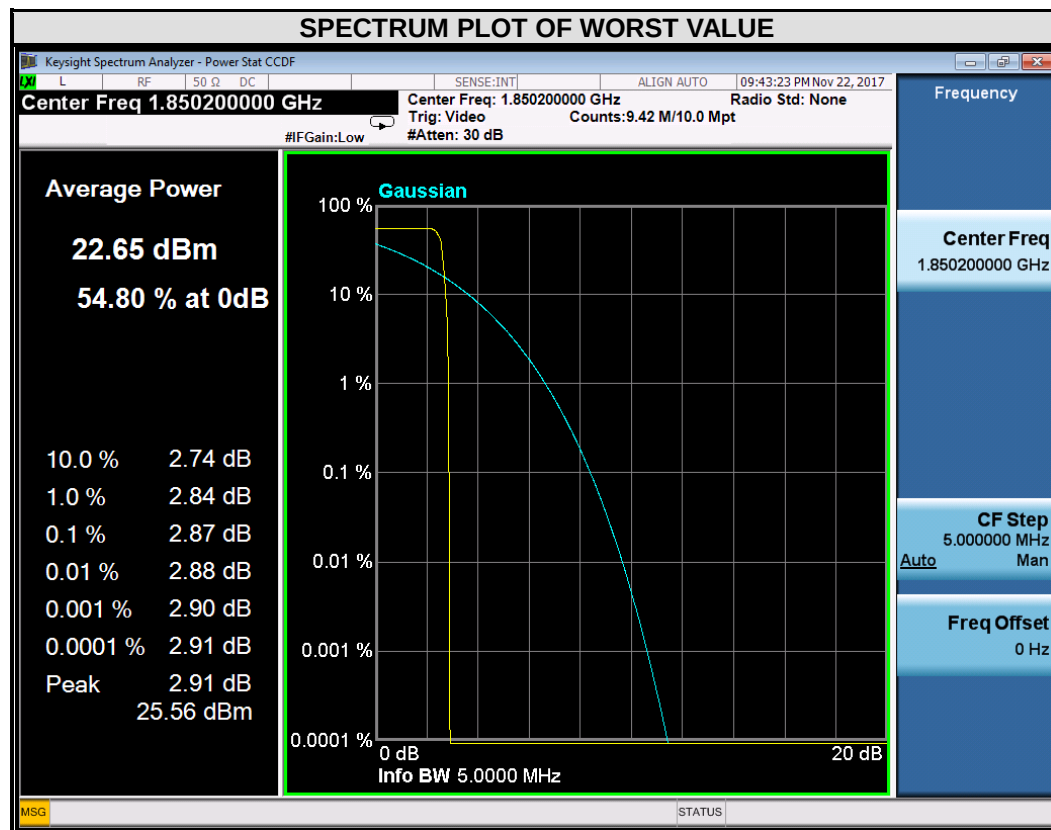


| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 810     | 1909.8          | 2.89                       |

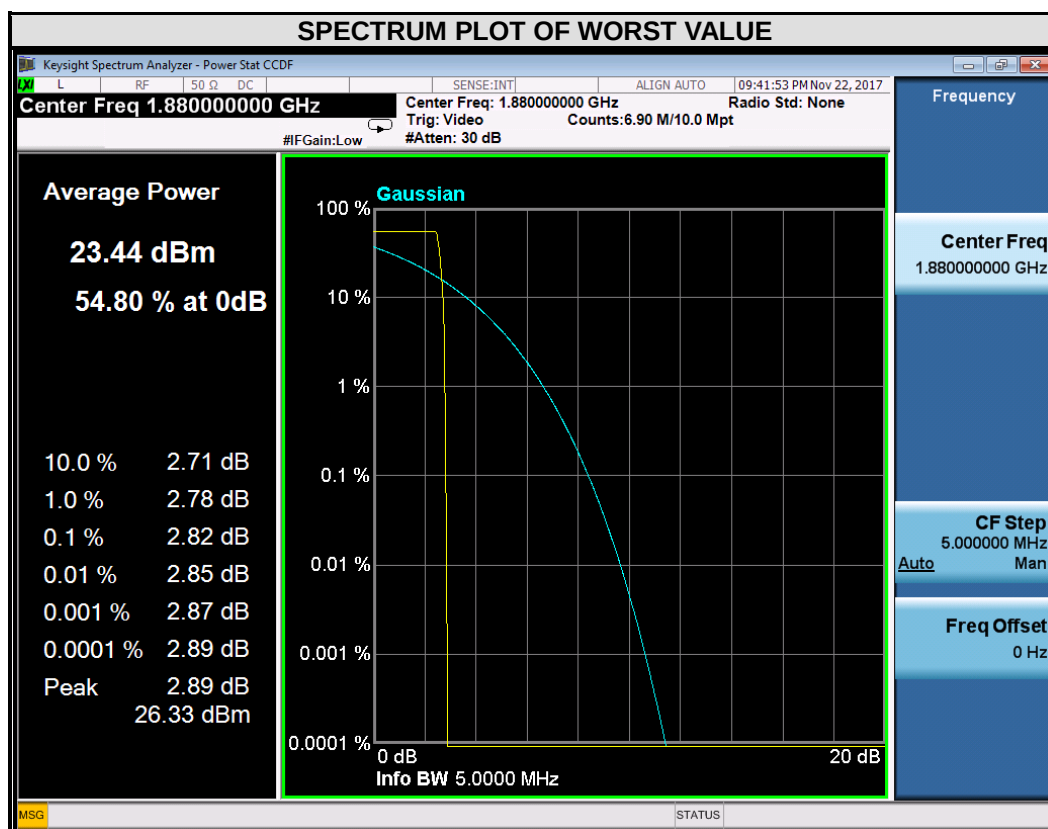


# EDGE

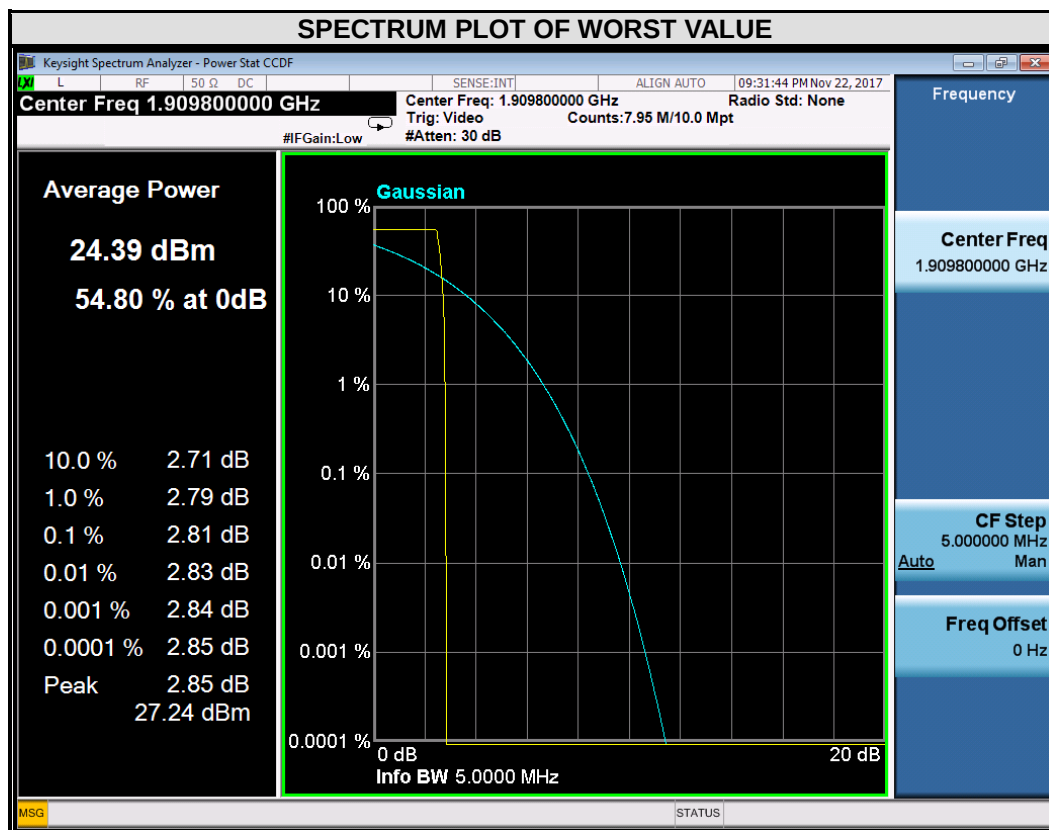
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 512     | 1850.2          | 2.87                       |



| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 661     | 1880            | 2.82                       |

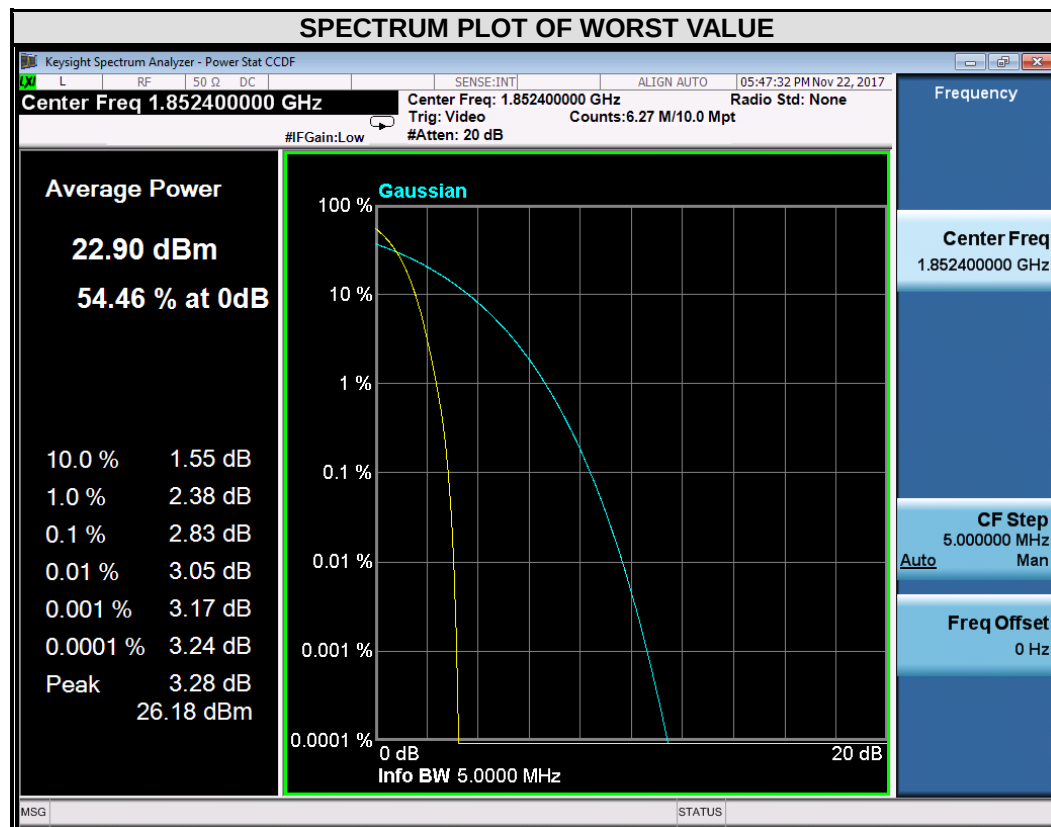


| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 810     | 1909.8          | 2.81                       |

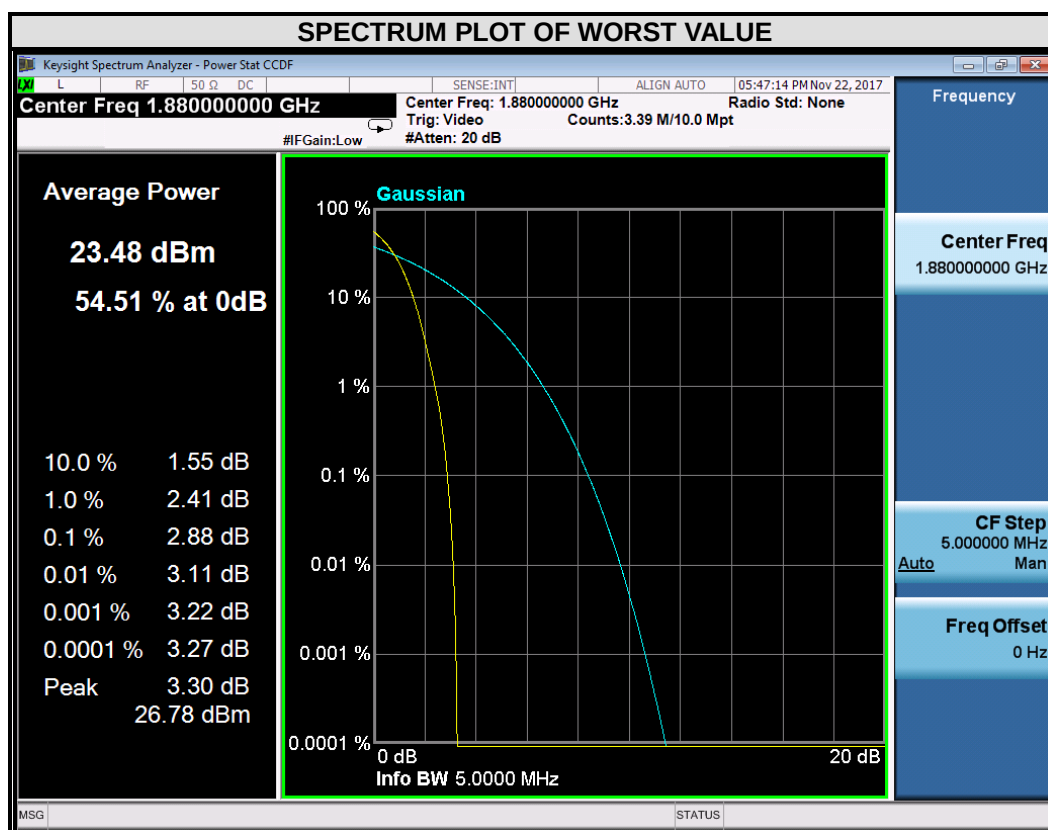


## WCDMA

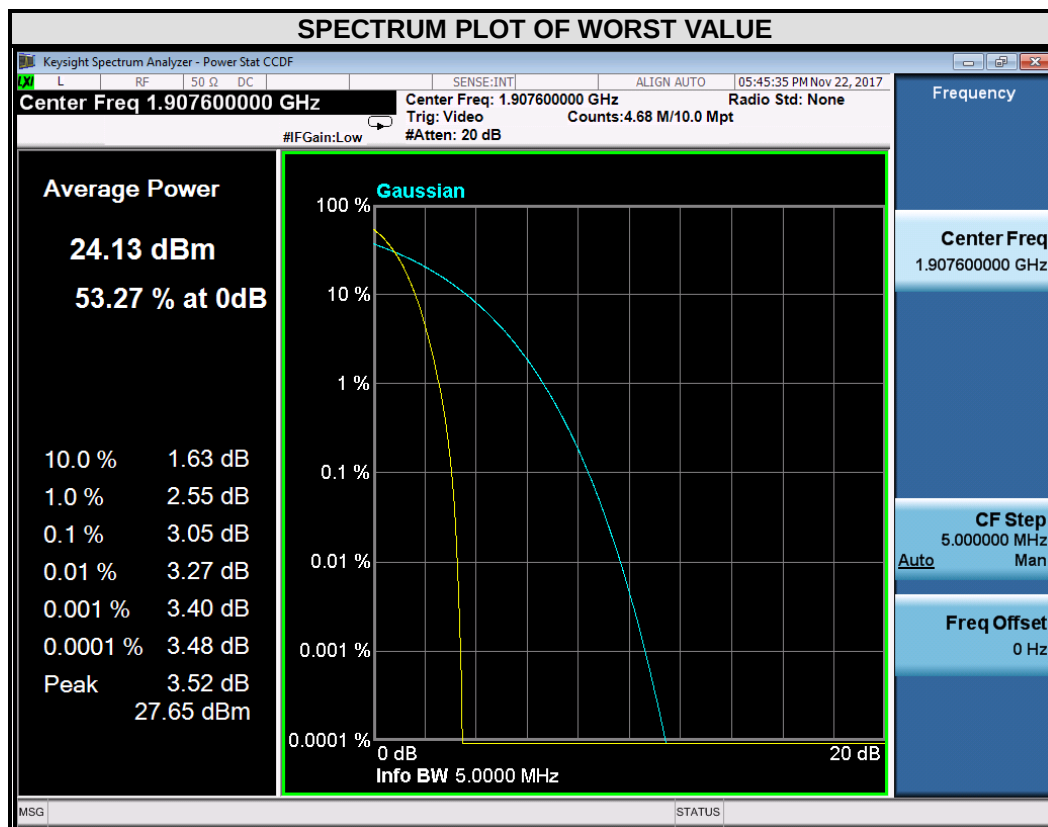
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 9262    | 1852.4          | 2.83                       |



| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 9400    | 1880.0          | 2.88                       |

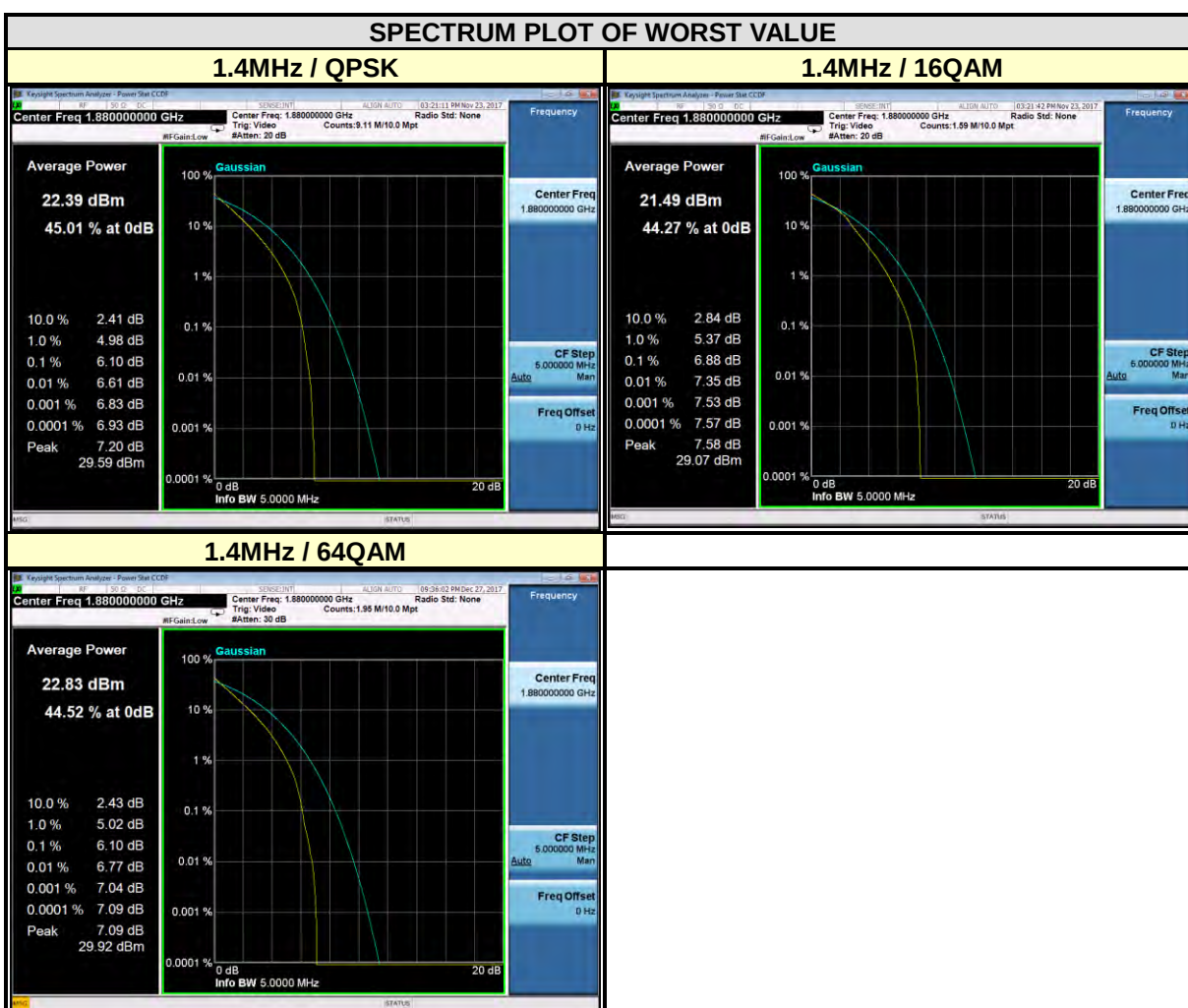


| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 9538    | 1907.6          | 3.05                       |

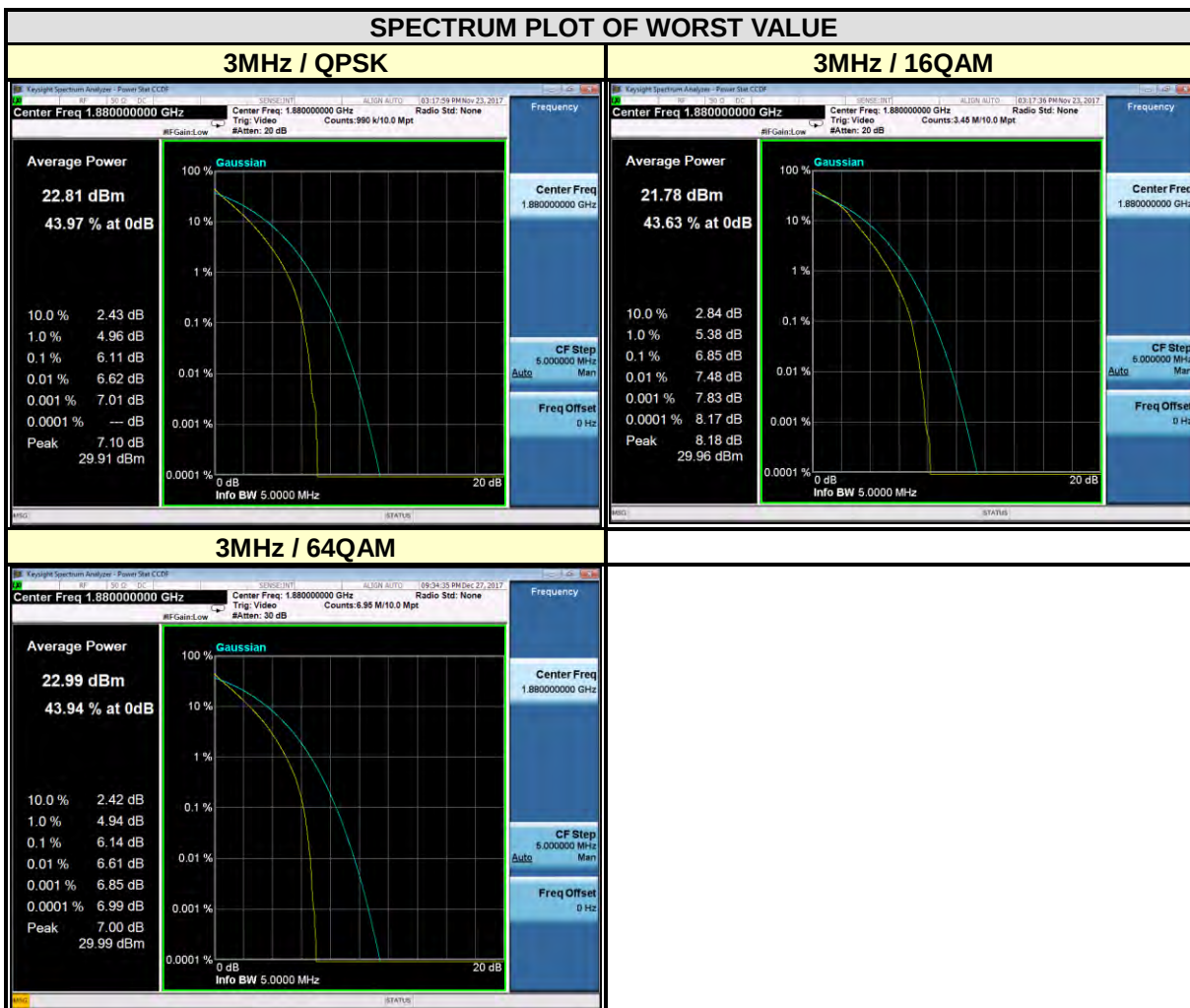


## LTE BAND 2

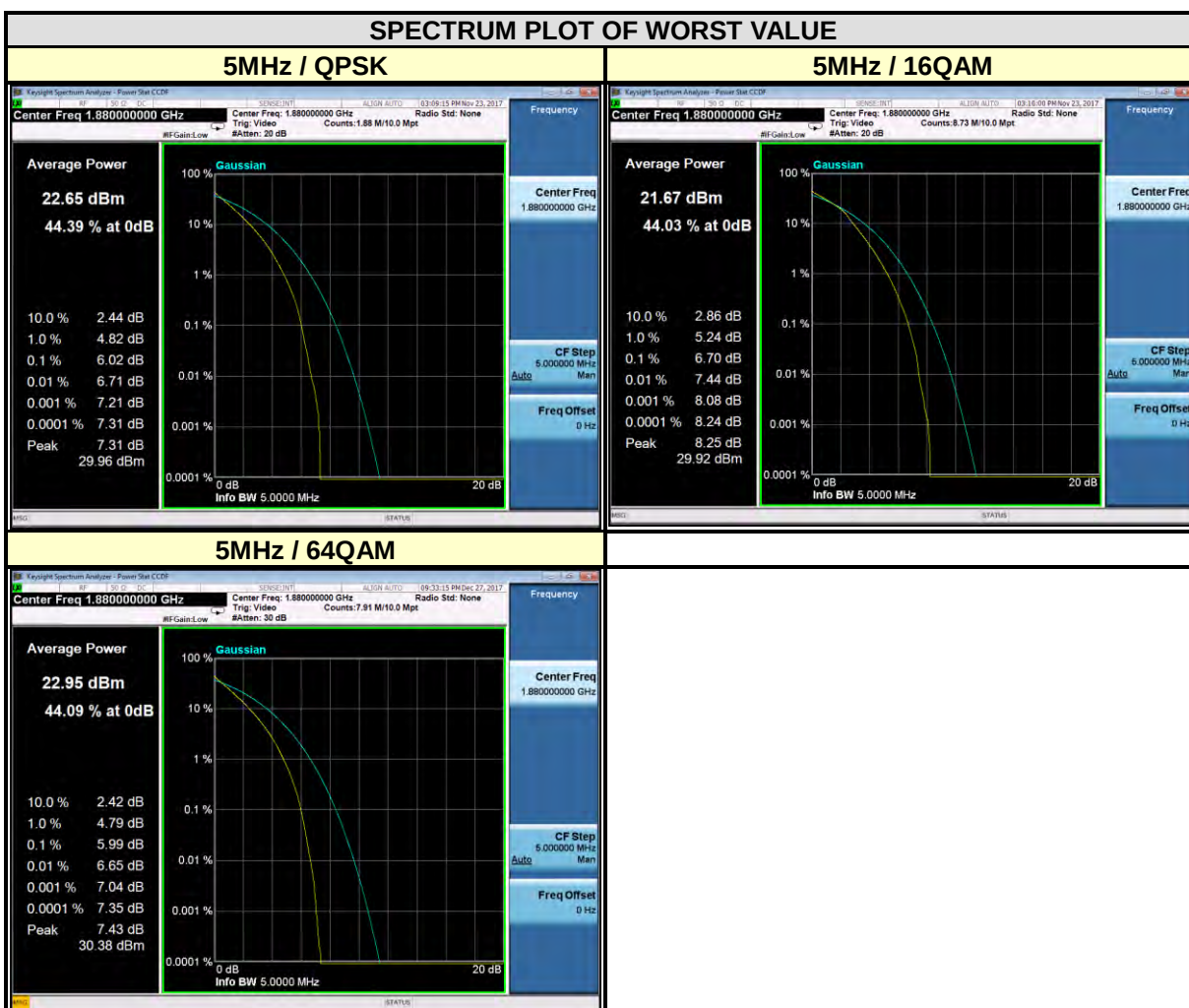
| CHANNEL BANDWIDTH: 1.4MHz |                 |                            |       |       |
|---------------------------|-----------------|----------------------------|-------|-------|
| CHANNEL                   | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |       |
|                           |                 | QPSK                       | 16QAM | 64QAM |
| 18607                     | 1850.7          | 5.82                       | 6.60  | 5.79  |
| 18900                     | 1880            | 6.10                       | 6.88  | 6.10  |
| 19193                     | 1909.3          | 5.62                       | 6.49  | 5.64  |



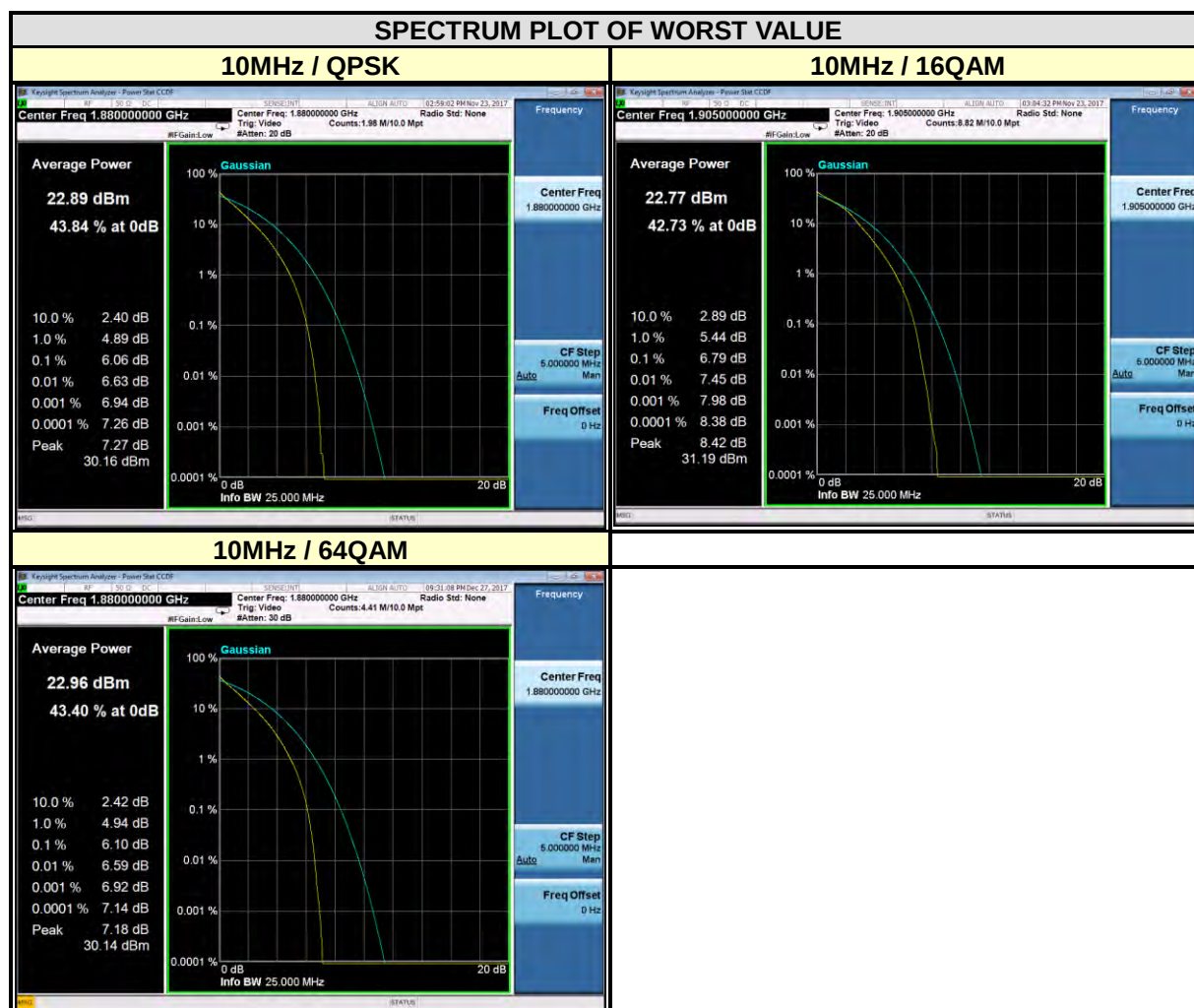
| CHANNEL BANDWIDTH: 3MHz |                 |                            |       |       |
|-------------------------|-----------------|----------------------------|-------|-------|
| CHANNEL                 | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |
| 18615                   | 1851.5          | 5.84                       | 6.56  | 5.90  |
| 18900                   | 1880            | 6.11                       | 6.85  | 6.14  |
| 19185                   | 1908.5          | 5.81                       | 6.55  | 5.84  |



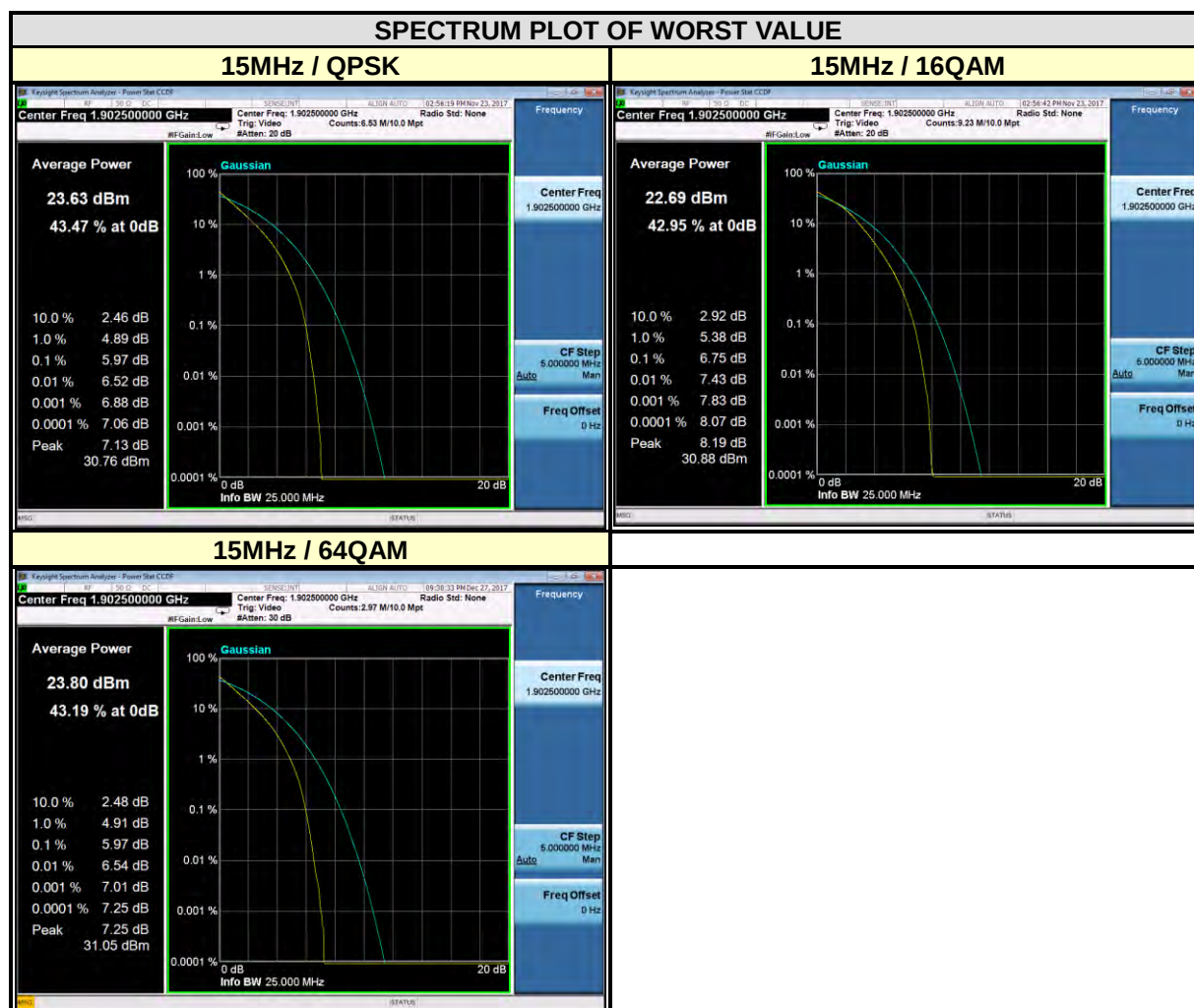
| CHANNEL BANDWIDTH: 5MHz |                 |                            |       |       |
|-------------------------|-----------------|----------------------------|-------|-------|
| CHANNEL                 | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |
| 18625                   | 1852.5          | 5.79                       | 6.51  | 5.81  |
| 18900                   | 1880            | 6.02                       | 6.70  | 5.99  |
| 19175                   | 1907.5          | 5.84                       | 6.62  | 5.88  |



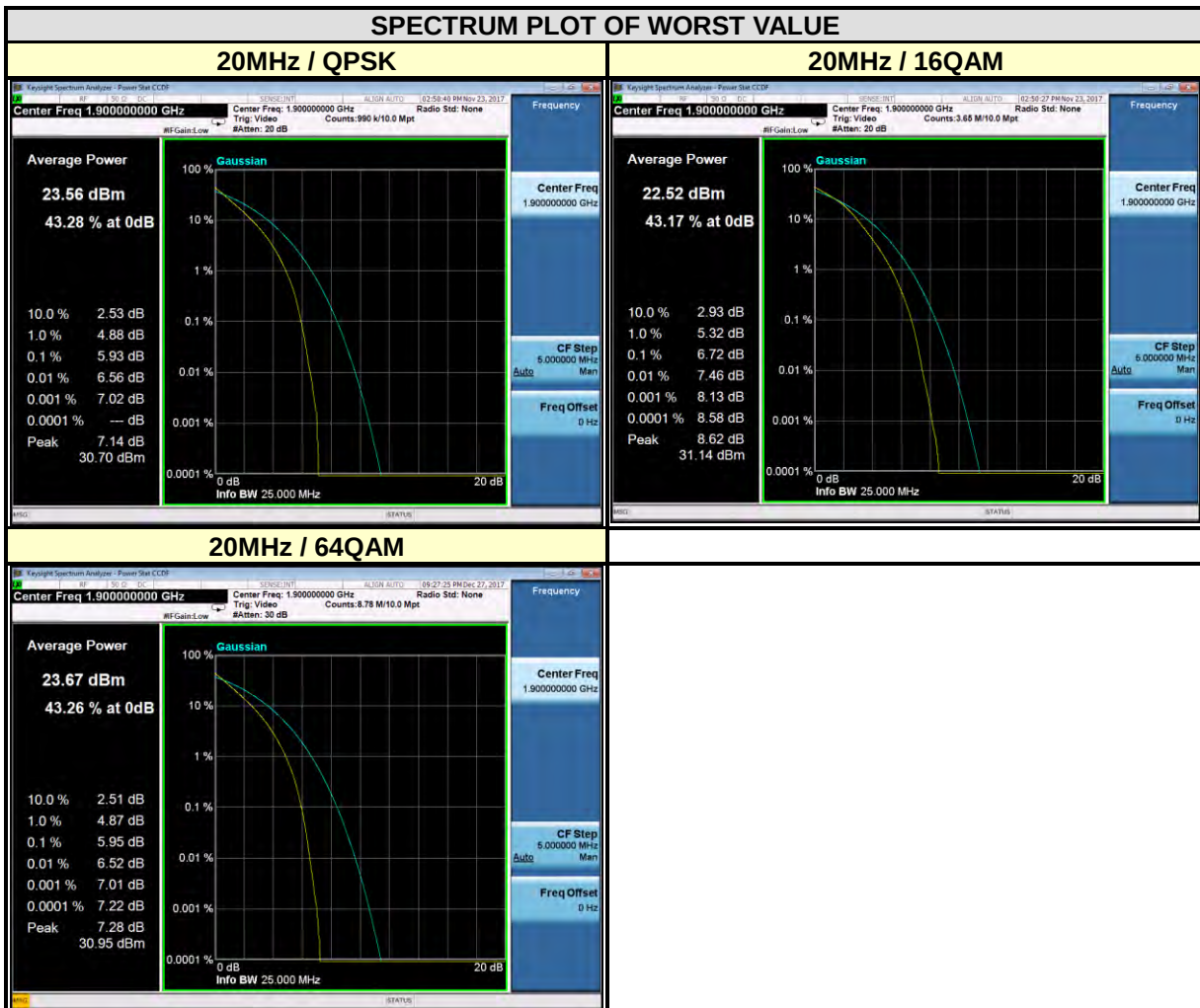
| CHANNEL BANDWIDTH: 10MHz |                 |                            |       |       |
|--------------------------|-----------------|----------------------------|-------|-------|
| CHANNEL                  | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |
| 18650                    | 1855            | 5.83                       | 6.53  | 5.87  |
| 18900                    | 1880            | 6.06                       | 6.73  | 6.10  |
| 19150                    | 1905            | 6.03                       | 6.79  | 6.07  |



| CHANNEL BANDWIDTH: 15MHz |                 |                            |       |       |
|--------------------------|-----------------|----------------------------|-------|-------|
| CHANNEL                  | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |
| 18675                    | 1857.5          | 5.71                       | 6.45  | 5.68  |
| 18900                    | 1880            | 5.89                       | 6.64  | 5.89  |
| 19125                    | 1902.5          | 5.97                       | 6.75  | 5.97  |



| CHANNEL BANDWIDTH: 20MHz |                 |                            |       |       |
|--------------------------|-----------------|----------------------------|-------|-------|
| CHANNEL                  | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |
| 18700                    | 1860            | 5.64                       | 6.42  | 5.64  |
| 18900                    | 1880            | 5.79                       | 6.57  | 5.79  |
| 19100                    | 1900            | 5.93                       | 6.72  | 5.95  |



Note: The test, calibration and test results are compliance with the A2LA (Certificate # 3939.01).

## 5 INFORMATION ON THE TESTING LABORATORIES

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

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

**Linko EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**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.

## **6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**