

FCC Test Report

(PART 22)

Report No.: RF200616C19

FCC ID: T8GSAN9000

Test Model: SA-N9000 OEM D1

Received Date: Jun. 16, 2020

Test Date: Jun. 16, 2020 ~ Jun. 22, 2020

Issued Date: Aug. 21, 2020

Applicant: Harman Becker Automotive Systems

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

| Issue No. | Description | Date Issued |
|-------------|------------------|---------------|
| RF200616C19 | Original Release | Aug. 21, 2020 |

1 Certificate of Conformity

Product: Network Accessory Device

Brand: Harman

Test Model: SA-N9000 OEM D1

Sample Status: Standard Sample

Applicant: Harman Becker Automotive Systems

Test Date: Jun. 16, 2020 ~ Jun. 22, 2020

Standards: FCC Part 22, Subpart H

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

Prepared by :



Date:

Aug. 21, 2020

Vera Huang / Specialist

Approved by :



Date:

Aug. 21, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

| Applied Standard: FCC Part 22 & Part 2 | | | |
|--|---|--------|---|
| FCC Clause | Test Item | Result | Remarks |
| 2.1046 22.913 (a) | Effective Radiated Power | Pass | Meet the requirement of limit. |
| 2.1047 22.913 (d) | Modulation Characteristics Peak to Average Ratio | Pass | Meet the requirement. Meet the requirement of limit. |
| 2.1055 22.355 | Frequency Stability | Pass | Meet the requirement of limit. |
| 2.1049 22.917 | Occupied Bandwidth Band Edge Measurements | Pass | Meet the requirement of limit. Meet the requirement of limit. |
| 2.1051 22.917 | Conducted Spurious Emissions | Pass | Meet the requirement of limit. |
| 2.1053 22.917 | Radiated Spurious Emissions | Pass | Meet the requirement of limit. Minimum passing margin is -18.90 dB at 1673.20 MHz. |

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

2.1 Measurement Uncertainty

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

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|--------------------------------|--------------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 9 kHz ~ 30 MHz | 3.04 dB |
| | 30 MHz ~ 200 MHz | 2.93 dB |
| | 200 MHz ~ 1000 MHz | 2.95 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 2.26 dB |
| | 18 GHz ~ 40 GHz | 1.94 dB |

2.2 Test Site and Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|---|--|---------------------------------|---------------------|-------------------------|
| Test Receiver KEYSIGHT | N9038A | MY55420137 | Apr. 16, 2020 | Apr. 15, 2021 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSP40 | 100039 | Jun. 12, 2020 | Jun. 11, 2021 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-160 | Nov. 07, 2019 | Nov. 06, 2020 |
| HORN Antenna SCHWARZBECK | BBHA 9120 D | 9120D-1169 | Nov. 24, 2019 | Nov. 23, 2020 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | BBHA9170241 | Nov. 24, 2019 | Nov. 23, 2020 |
| Preamplifier Agilent (Below 1GHz) | 8447D | 2944A10638 | Jul. 11, 2019 | Jul. 10, 2020 |
| Preamplifier Agilent (Above 1GHz) | 8449B | 3008A02367 | Feb. 18, 2020 | Feb. 17, 2021 |
| RF signal cable HUBER+SUHNER&EMCI | SUCOFLEX 104 & EMC104-SM-SM800 0 | CABLE-CH9-02 (248780+171006) | Jan. 18, 2020 | Jan. 17, 2021 |
| RF signal cable HUBER+SUHNER | SUCOFLEX 104 | CABLE-CH9-(2507 95/4) | Jul. 11, 2019 | Jul. 10, 2020 |
| RF signal cable Woken | 8D-FB | Cable-CH9-01 | Jul. 30, 2019 | Jul. 29, 2020 |
| Software BV ADT | ADT_Radiated_ V7.6.15.9.5 | NA | NA | NA |
| Antenna Tower EMCO | 2070/2080 | 512.835.4684 | NA | NA |
| Turn Table EMCO | 2087-2.03 | NA | NA | NA |
| Antenna Tower & Turn BV ADT | AT100 | AT93021705 | NA | NA |
| Turn Table BV ADT | TT100 | TT93021705 | NA | NA |
| Turn Table Controller BV ADT | SC100 | SC93021705 | NA | NA |
| Boresight Antenna Fixture | FBA-01 | FBA-SIP01 | NA | NA |
| WIT Standard Temperature And Humidity Chamber | TH-4S-C | W981030 | Jun. 01, 2020 | May 31, 2021 |
| JFW 20dB attenuation | 50HF-020-SMA | NA | NA | NA |
| True RMS Clamp Meter Fluke | 325 | 31130711WS | Jun. 06, 2020 | Jun. 05, 2021 |
| Communications Tester-Wireless Agilent | 8960 Series 10 | MY53201073 | Jul. 01, 2019 | Jun. 30, 2021 |
| Temperature & Humidity Chamber | GTH-120-40-CP-AR | MAA1306-019 | Sep. 10, 2019 | Sep. 09, 2020 |
| DC Power Supply Topward | 33010D | 807748 | NA | NA |

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

| | | |
|----------------------------|--------------------------|-------------------------|
| Product | Network Accessory Device | |
| Brand | Harman | |
| Test Model | SA-N9000 OEM D1 | |
| Status of EUT | Standard Sample | |
| Power Supply Rating | 4.2 Vdc | |
| Modulation Type | GSM/GPRS | GMSK |
| | EDGE | GMSK, 8PSK |
| | WCDMA | QPSK |
| Frequency Range | GSM/GPRS/EDGE | 824.2 ~ 848.8 MHz |
| | WCDMA | 826.4 ~ 846.6 MHz |
| Max. ERP Power | GSM/GPRS | 1409.289 mW (31.49 dBm) |
| | EDGE | 1185.769 mW (30.74 dBm) |
| | WCDMA | 222.331 mW (23.47 dBm) |
| Emission Designator | GSM/GPRS | 260KGXW |
| | EDGE | 250KG7W |
| | WCDMA | 4M20F9W |
| Antenna Type | Refer to Note | |
| Accessory Device | N/A | |
| Data Cable Supplied | N/A | |

Note:

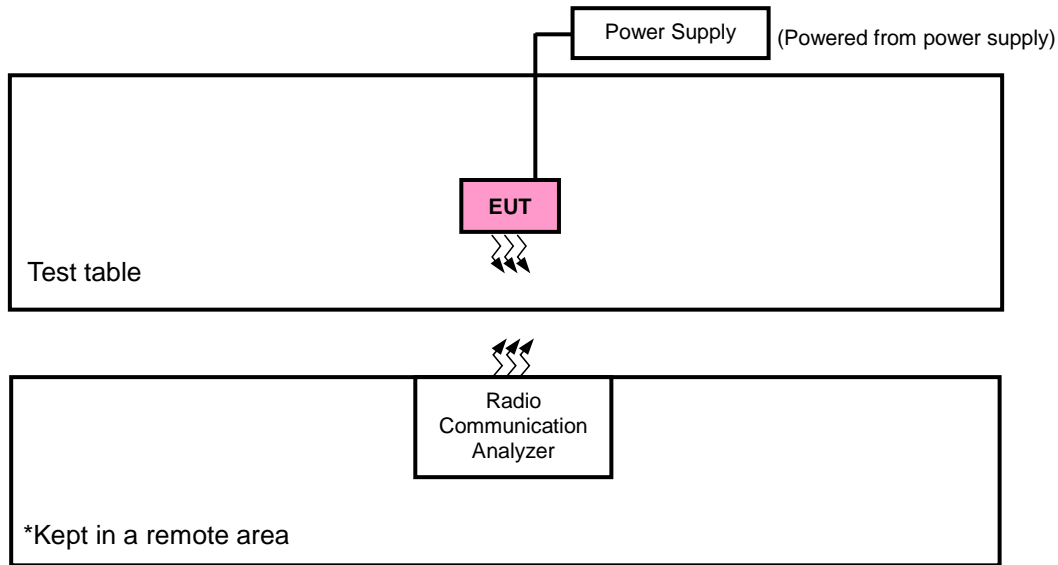
1. The antenna information is listed as below.

| Operating frequency band | Antenna | Gain (dBi) | Connector Type |
|--------------------------|--|------------|----------------|
| GSM/ WCDMA Band 2 | 5G/4G Terminal Mount Monopole Antenna | 2.92 | SMA |
| WCDMA Band 4 | | 3.44 | |
| GSM/ WCDMA Band 5 | | 1.01 | |

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

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

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

| No. | Product | Brand | Model No. | Serial No. | FCC ID |
|-----|------------------------------|---------|-----------|------------|--------|
| 1. | Power Supply | N/A | N/A | N/A | N/A |
| 2. | Radio Communication Analyzer | Anritsu | MT8821C | N/A | N/A |

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 2 acted as a communication partner to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

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

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

| Band | ERP | Radiated Emission |
|-------|---------|-------------------|
| GSM | X-plane | X-axis |
| EDGE | X-plane | X-axis |
| WCDMA | X-plane | X-axis |

GSM

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Mode |
|--------------------|-------------------------------|-------------------|----------------|-----------------|
| - | ERP | 128 to 251 | 128, 189, 251 | GSM, GPRS, EDGE |
| - | Modulation Characteristics | 128 to 251 | 128 | GSM, GPRS, EDGE |
| - | Frequency Stability | 128 to 251 | 128, 251 | GSM, EDGE |
| - | Occupied Bandwidth | 128 to 251 | 128, 189, 251 | GSM, GPRS, EDGE |
| - | Band Edge | 128 to 251 | 128, 251 | GSM, GPRS, EDGE |
| - | Peak to Average Ratio | 128 to 251 | 128, 189, 251 | GSM, GPRS, EDGE |
| - | Conducted Emission | 128 to 251 | 128, 189, 251 | GSM, GPRS, EDGE |
| - | Radiated Emission Below 1 GHz | 128 to 251 | 189 | GSM |
| - | Radiated Emission Above 1 GHz | 128 to 251 | 128, 189, 251 | GSM |

WCDMA

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Mode |
|--------------------|-------------------------------|-------------------|------------------|---------------------|
| - | ERP | 4132 to 4233 | 4132, 4182, 4233 | WCDMA, HSDPA, HSUPA |
| - | Modulation Characteristics | 4132 to 4233 | 4182 | WCDMA, HSDPA, HSUPA |
| - | Frequency Stability | 4132 to 4233 | 4132, 4233 | WCDMA |
| - | Occupied Bandwidth | 4132 to 4233 | 4132, 4182, 4233 | WCDMA, HSDPA, HSUPA |
| - | Band Edge | 4132 to 4233 | 4132, 4233 | WCDMA, HSDPA, HSUPA |
| - | Peak to Average Ratio | 4132 to 4233 | 4132, 4182, 4233 | WCDMA, HSDPA, HSUPA |
| - | Conducted Emission | 4132 to 4233 | 4132, 4182, 4233 | WCDMA, HSDPA, HSUPA |
| - | Radiated Emission Below 1 GHz | 4132 to 4233 | 4182 | WCDMA |
| - | Radiated Emission Above 1 GHz | 4132 to 4233 | 4132, 4182, 4233 | WCDMA |

Test Condition:

| Test Item | Environmental Conditions | Input Power | Tested By |
|----------------------------|--------------------------|----------------|-------------|
| ERP | 25 deg. C, 65 % RH | 4.2 Vdc | Han Wu |
| Modulation Characteristics | 25 deg. C, 65 % RH | 4.2 Vdc | Willy Cheng |
| Frequency Stability | 25 deg. C, 65 % RH | 4.2 Vdc | Willy Cheng |
| Occupied Bandwidth | 25 deg. C, 65 % RH | 4.2 Vdc | Willy Cheng |
| Band Edge | 25 deg. C, 65 % RH | 4.2 Vdc | Willy Cheng |
| Peak to Average Ratio | 25 deg. C, 65 % RH | 4.2 Vdc | Willy Cheng |
| Conducted Emission | 25 deg. C, 65 % RH | 4.2 Vdc | Willy Cheng |
| Radiated Emission | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Han Wu |

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and references

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI 63.26-2015

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

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

Note: All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 Test Procedures

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.

Maximum EIRP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}}$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_{T} gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:



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

4.1.4 Test Results

Conducted Output Power (dBm)

| Band | GSM850 | | |
|-----------------------|--------|-------|--------------|
| Channel | 128 | 189 | 251 |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| GSM (GMSK, 1Tx-slot) | 32.40 | 32.62 | 32.63 |
| GPRS (GMSK, 1Tx-slot) | 32.39 | 32.59 | 32.60 |
| GPRS (GMSK, 2Tx-slot) | 32.36 | 32.55 | 32.58 |
| GPRS (GMSK, 3Tx-slot) | 32.34 | 32.51 | 32.55 |
| GPRS (GMSK, 4Tx-slot) | 32.25 | 32.44 | 32.50 |
| DTM (GMSK, 2Tx-slot) | 31.82 | 31.90 | 32.03 |
| DTM (GMSK, 3Tx-slot) | 31.75 | 31.82 | 31.97 |
| EDGE (8PSK, 1Tx-slot) | 31.68 | 31.74 | 31.88 |
| EDGE (8PSK, 2Tx-slot) | 31.62 | 31.69 | 31.80 |
| EDGE (8PSK, 3Tx-slot) | 31.53 | 31.63 | 31.70 |
| EDGE (8PSK, 4Tx-slot) | 31.47 | 31.57 | 31.63 |
| DTM (8PSK, 2Tx-slot) | 30.93 | 31.08 | 31.14 |
| DTM (8PSK, 3Tx-slot) | 30.88 | 30.99 | 31.04 |

| Band | WCDMA V | | |
|-----------------|--------------|-------|-------|
| Channel | 4132 | 4182 | 4233 |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| RMC 12.2K | 24.61 | 24.46 | 24.35 |
| HSDPA Subtest-1 | 24.38 | 24.41 | 24.31 |
| HSDPA Subtest-2 | 24.34 | 24.38 | 24.25 |
| HSDPA Subtest-3 | 23.84 | 23.92 | 23.88 |
| HSDPA Subtest-4 | 23.81 | 23.85 | 23.67 |
| HSUPA Subtest-1 | 24.35 | 24.21 | 24.27 |
| HSUPA Subtest-2 | 23.38 | 23.25 | 23.39 |
| HSUPA Subtest-3 | 23.34 | 23.19 | 22.92 |
| HSUPA Subtest-4 | 22.36 | 23.03 | 22.61 |
| HSUPA Subtest-5 | 23.33 | 23.18 | 23.42 |

ERP Power (dBm)

| Band | GSM850 | | |
|-----------------------|--------|-------|-------|
| Channel | 128 | 189 | 251 |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| GSM (GMSK, 1Tx-slot) | 31.26 | 31.48 | 31.49 |
| GPRS (GMSK, 1Tx-slot) | 31.25 | 31.45 | 31.46 |
| GPRS (GMSK, 2Tx-slot) | 31.22 | 31.41 | 31.44 |
| GPRS (GMSK, 3Tx-slot) | 31.20 | 31.37 | 31.41 |
| GPRS (GMSK, 4Tx-slot) | 31.11 | 31.30 | 31.36 |
| DTM (GMSK, 2Tx-slot) | 30.68 | 30.76 | 30.89 |
| DTM (GMSK, 3Tx-slot) | 30.61 | 30.68 | 30.83 |
| EDGE (8PSK, 1Tx-slot) | 30.54 | 30.60 | 30.74 |
| EDGE (8PSK, 2Tx-slot) | 30.48 | 30.55 | 30.66 |
| EDGE (8PSK, 3Tx-slot) | 30.39 | 30.49 | 30.56 |
| EDGE (8PSK, 4Tx-slot) | 30.33 | 30.43 | 30.49 |
| DTM (8PSK, 2Tx-slot) | 29.79 | 29.94 | 30.00 |
| DTM (8PSK, 3Tx-slot) | 29.74 | 29.85 | 29.90 |

*ERP = Conducted + antenna gain (0.58dBi)-2.15

| Band | WCDMA V | | |
|-----------------|---------|-------|-------|
| Channel | 4132 | 4182 | 4233 |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| RMC 12.2K | 23.47 | 23.32 | 23.21 |
| HSDPA Subtest-1 | 23.24 | 23.27 | 23.17 |
| HSDPA Subtest-2 | 23.20 | 23.24 | 23.11 |
| HSDPA Subtest-3 | 22.70 | 22.78 | 22.74 |
| HSDPA Subtest-4 | 22.67 | 22.71 | 22.53 |
| HSUPA Subtest-1 | 23.21 | 23.07 | 23.13 |
| HSUPA Subtest-2 | 22.24 | 22.11 | 22.25 |
| HSUPA Subtest-3 | 22.20 | 22.05 | 21.78 |
| HSUPA Subtest-4 | 21.22 | 21.89 | 21.47 |
| HSUPA Subtest-5 | 22.19 | 22.04 | 22.28 |

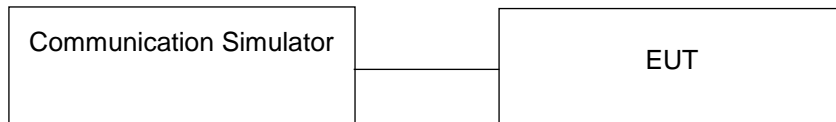
*ERP = Conducted + antenna gain (0.58dBi)-2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

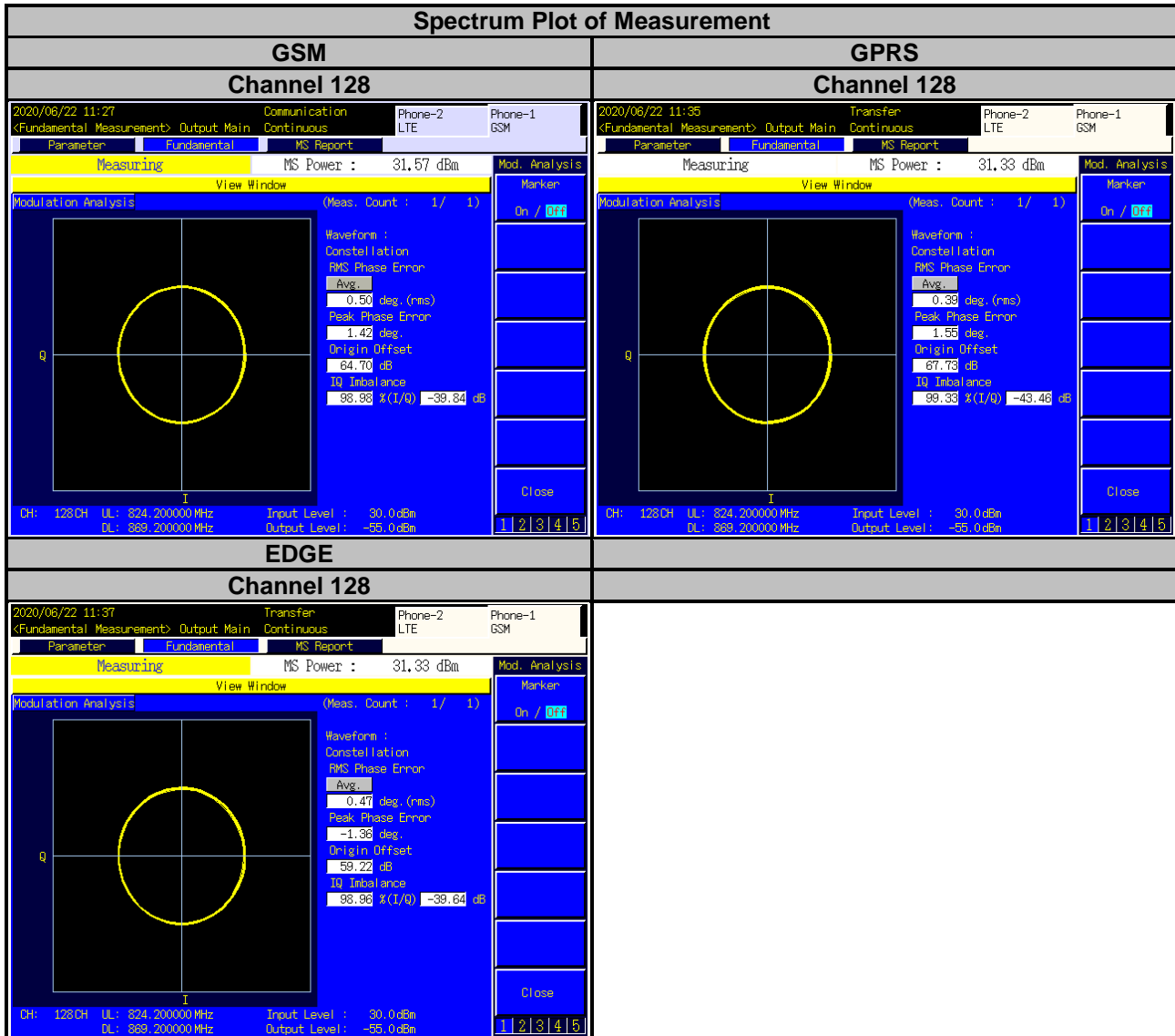
4.2.2 Test Setup

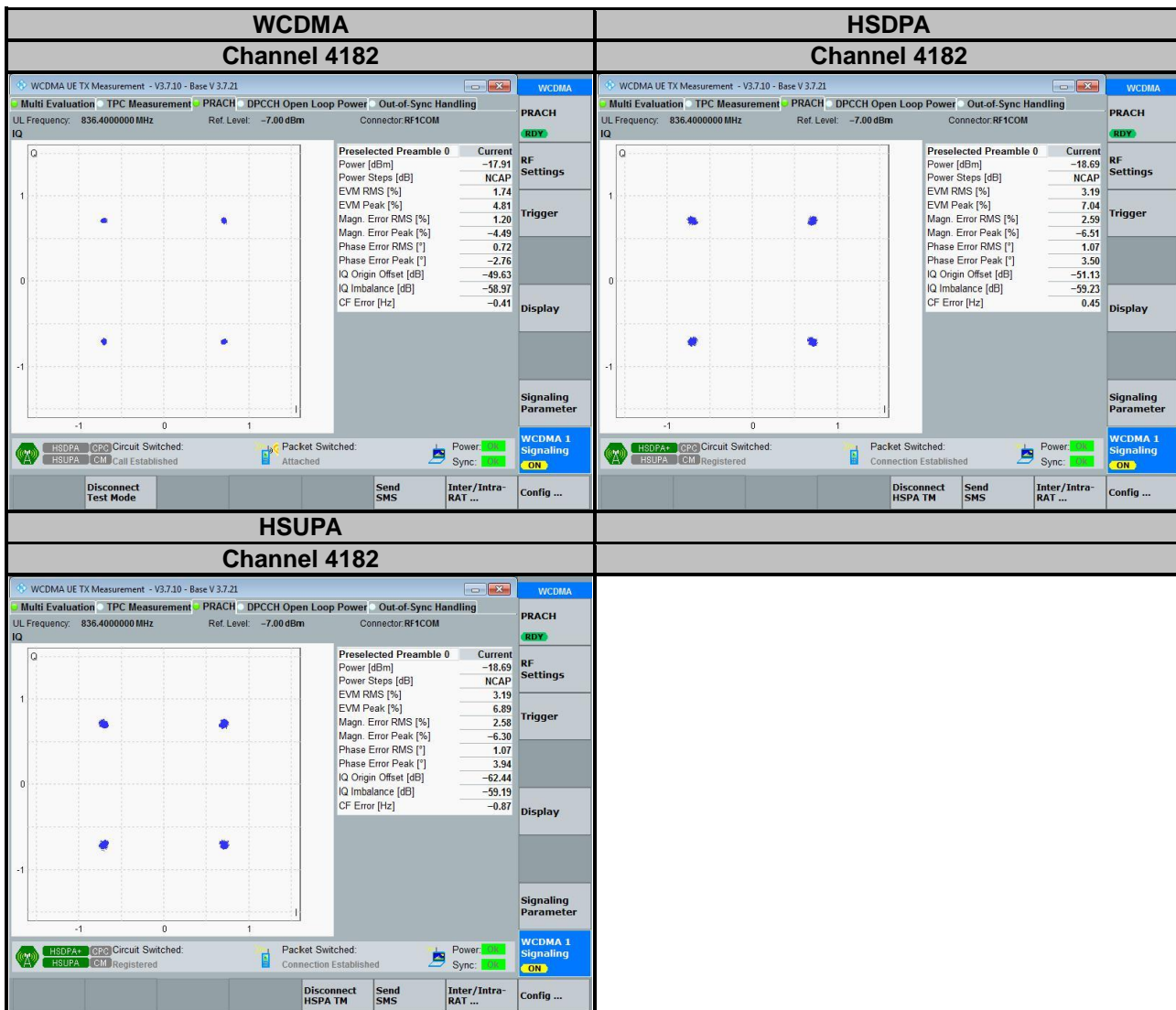


4.2.3 Test Procedure

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

4.2.4 Test Results





4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

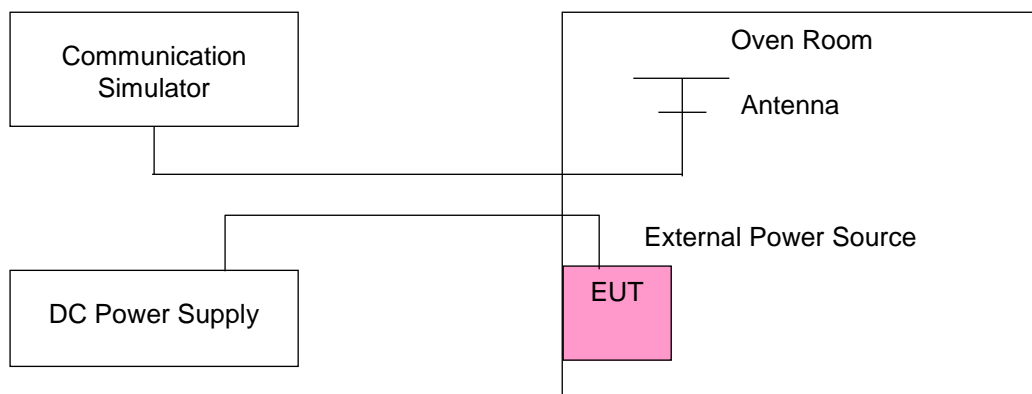
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

| Voltage (Volts) | GSM | | | | Limit (ppm) |
|-----------------|-----------------|-----------------------|-----------------|-----------------------|-------------|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 4.0 | 824.200001 | 0.002 | 848.800002 | 0.002 | 2.5 |
| 4.2 | 824.200004 | 0.005 | 848.800003 | 0.003 | 2.5 |
| 4.4 | 824.200004 | 0.005 | 848.800002 | 0.002 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 4.0 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | GSM | | | | Limit (ppm) |
|------------|-----------------|-----------------------|-----------------|-----------------------|-------------|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -20 | 824.200002 | 0.002 | 848.800003 | 0.004 | 2.5 |
| -10 | 824.200003 | 0.004 | 848.800003 | 0.003 | 2.5 |
| 0 | 824.200004 | 0.004 | 848.800003 | 0.003 | 2.5 |
| 10 | 824.200003 | 0.004 | 848.800002 | 0.003 | 2.5 |
| 20 | 824.199998 | -0.002 | 848.799997 | -0.004 | 2.5 |
| 30 | 824.199998 | -0.002 | 848.799997 | -0.004 | 2.5 |
| 40 | 824.199998 | -0.002 | 848.799998 | -0.002 | 2.5 |
| 50 | 824.199997 | -0.003 | 848.799997 | -0.003 | 2.5 |

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -20°C to 50°C.
2. The EUT would shut down automatically as below -20°C.

Frequency Error vs. Voltage

| Voltage (Volts) | EDGE | | | | Limit (ppm) |
|-----------------|-----------------|-----------------------|-----------------|-----------------------|-------------|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 4.0 | 824.200003 | 0.004 | 848.800003 | 0.004 | 2.5 |
| 4.2 | 824.200003 | 0.004 | 848.800004 | 0.004 | 2.5 |
| 4.4 | 824.200004 | 0.004 | 848.800001 | 0.001 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 4.0 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | EDGE | | | | Limit (ppm) |
|------------|-----------------|-----------------------|-----------------|-----------------------|-------------|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -20 | 824.200004 | 0.005 | 848.800003 | 0.003 | 2.5 |
| -10 | 824.200003 | 0.004 | 848.800003 | 0.003 | 2.5 |
| 0 | 824.200002 | 0.002 | 848.800004 | 0.005 | 2.5 |
| 10 | 824.200002 | 0.002 | 848.800002 | 0.003 | 2.5 |
| 20 | 824.199997 | -0.004 | 848.799998 | -0.003 | 2.5 |
| 30 | 824.199997 | -0.003 | 848.799996 | -0.004 | 2.5 |
| 40 | 824.199997 | -0.004 | 848.799998 | -0.003 | 2.5 |
| 50 | 824.199999 | -0.001 | 848.799997 | -0.004 | 2.5 |

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -20°C to 50°C.
2. The EUT would shut down automatically as below -20°C.

Frequency Error vs. Voltage

| Voltage (Volts) | WCDMA | | | | Limit (ppm) |
|-----------------|-----------------|-----------------------|-----------------|-----------------------|-------------|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 4.0 | 826.400003 | 0.004 | 846.600002 | 0.002 | 2.5 |
| 4.2 | 826.400004 | 0.004 | 846.600004 | 0.004 | 2.5 |
| 4.4 | 826.400002 | 0.002 | 846.600003 | 0.003 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 4.0 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | WCDMA | | | | Limit (ppm) |
|------------|-----------------|-----------------------|-----------------|-----------------------|-------------|
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -20 | 826.400002 | 0.003 | 846.600001 | 0.001 | 2.5 |
| -10 | 826.400003 | 0.004 | 846.600002 | 0.002 | 2.5 |
| 0 | 826.400003 | 0.004 | 846.600002 | 0.002 | 2.5 |
| 10 | 826.400004 | 0.005 | 846.600003 | 0.004 | 2.5 |
| 20 | 826.399997 | -0.004 | 846.599998 | -0.003 | 2.5 |
| 30 | 826.399999 | -0.001 | 846.599997 | -0.004 | 2.5 |
| 40 | 826.399999 | -0.001 | 846.599997 | -0.003 | 2.5 |
| 50 | 826.399998 | -0.002 | 846.599997 | -0.004 | 2.5 |

Note:

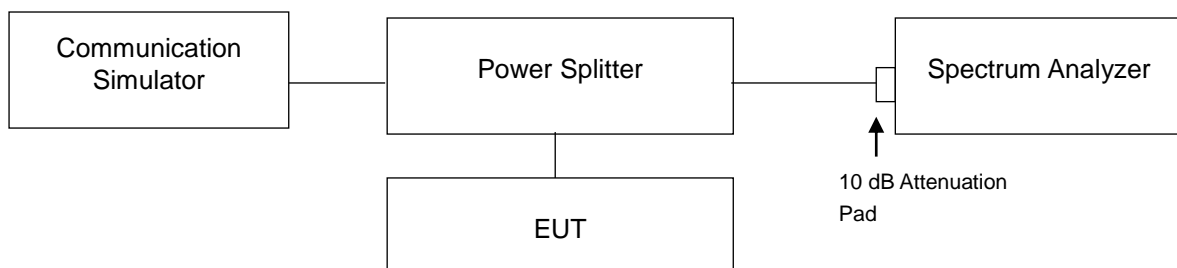
1. The applicant declared that the normal operating temperature of the EUT is from -20°C to 50°C.
2. The EUT would shut down automatically as below -20°C.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

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

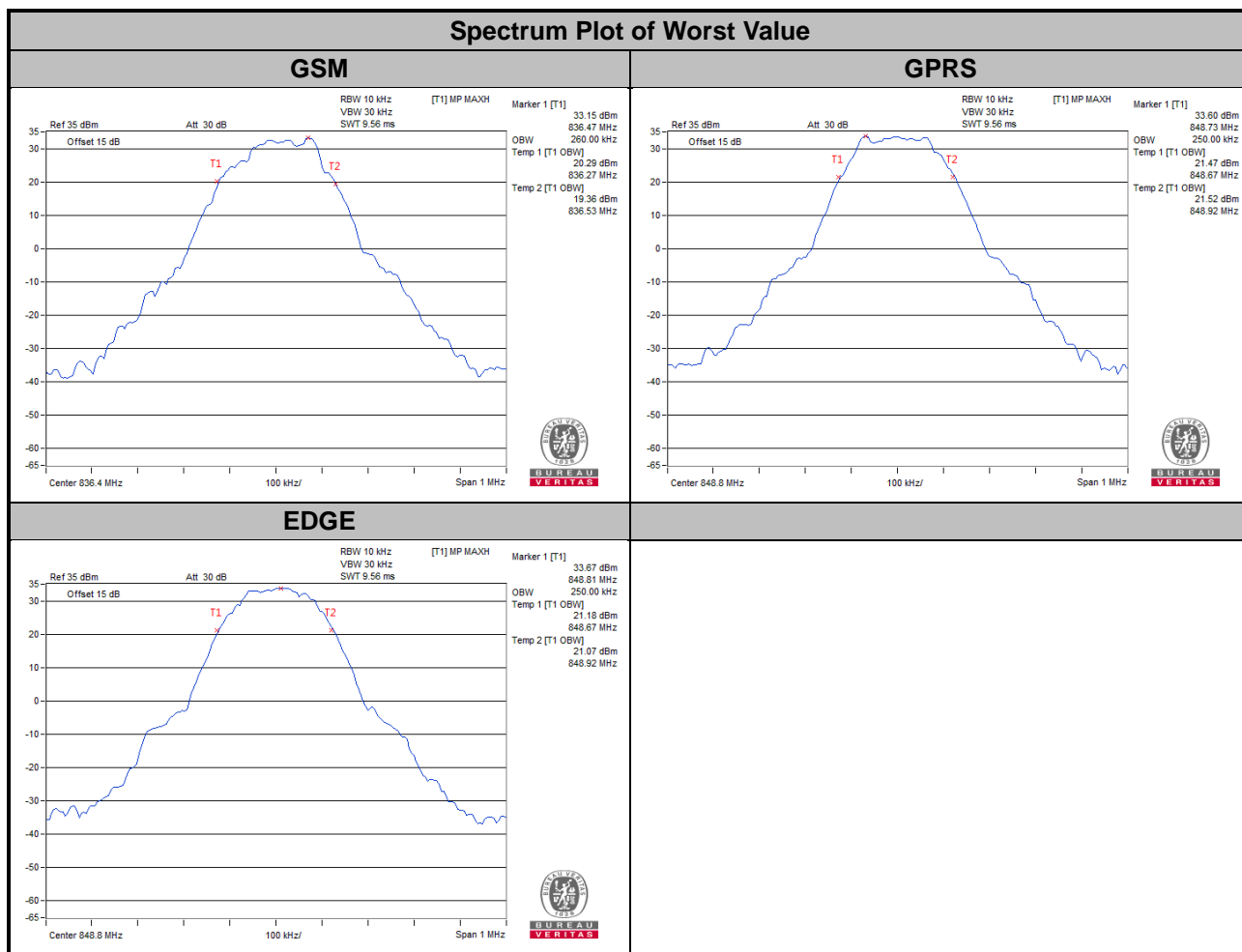
4.4.2 Test Setup



4.4.3 Test Result

Occupied Bandwidth

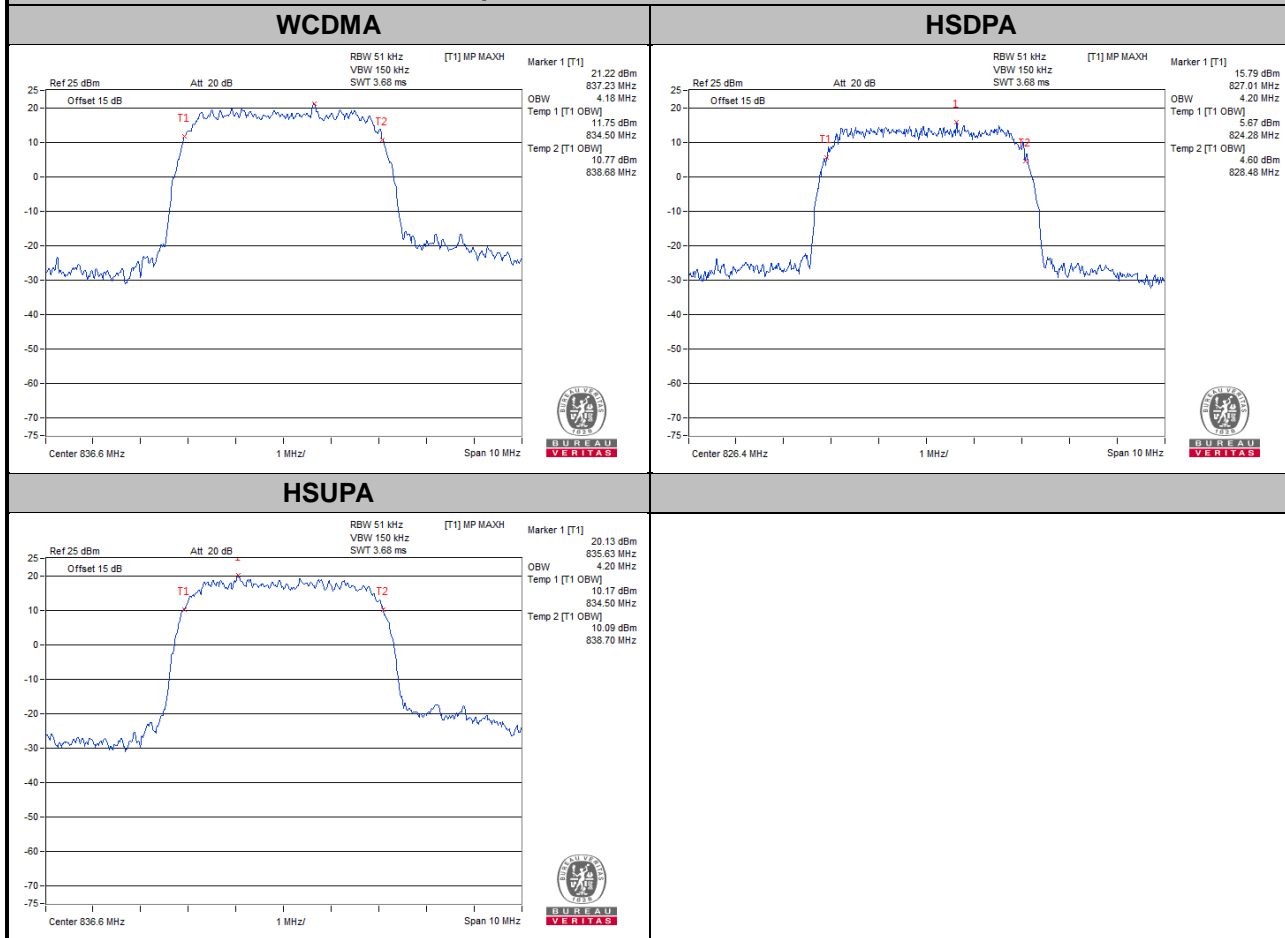
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | | |
|---------|-----------------|------------------------------|-------|-------|
| | | GSM | GPRS | EDGE |
| 128 | 824.2 | 250.0 | 250.0 | 250.0 |
| 189 | 836.4 | 260.0 | 250.0 | 250.0 |
| 251 | 848.8 | 250.0 | 250.0 | 250.0 |



WCDMA Band 5

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
|---------|-----------------|------------------------------|-------|-------|
| | | WCDMA | HSDPA | HSUPA |
| 4132 | 826.4 | 4.17 | 4.20 | 4.18 |
| 4182 | 836.4 | 4.18 | 4.18 | 4.20 |
| 4233 | 846.6 | 4.18 | 4.16 | 4.20 |

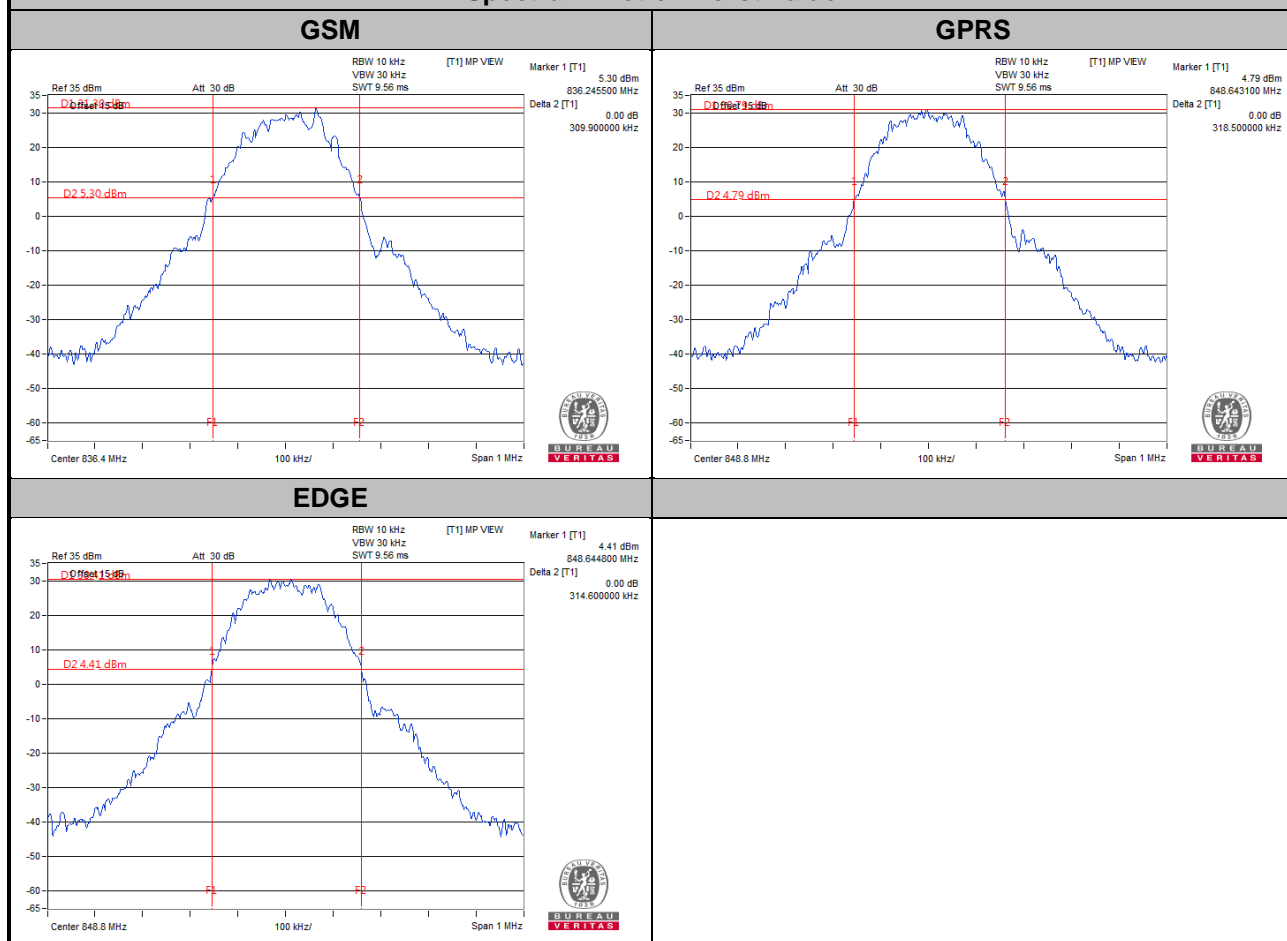
Spectrum Plot of Worst Value



26dB Bandwidth

| Channel | Frequency (MHz) | 26dB Bandwidth (kHz) | | |
|---------|-----------------|----------------------|-------|-------|
| | | GSM | GPRS | EDGE |
| 128 | 824.2 | 303.0 | 314.0 | 313.3 |
| 189 | 836.4 | 309.9 | 314.6 | 307.5 |
| 251 | 848.8 | 305.6 | 318.5 | 314.6 |

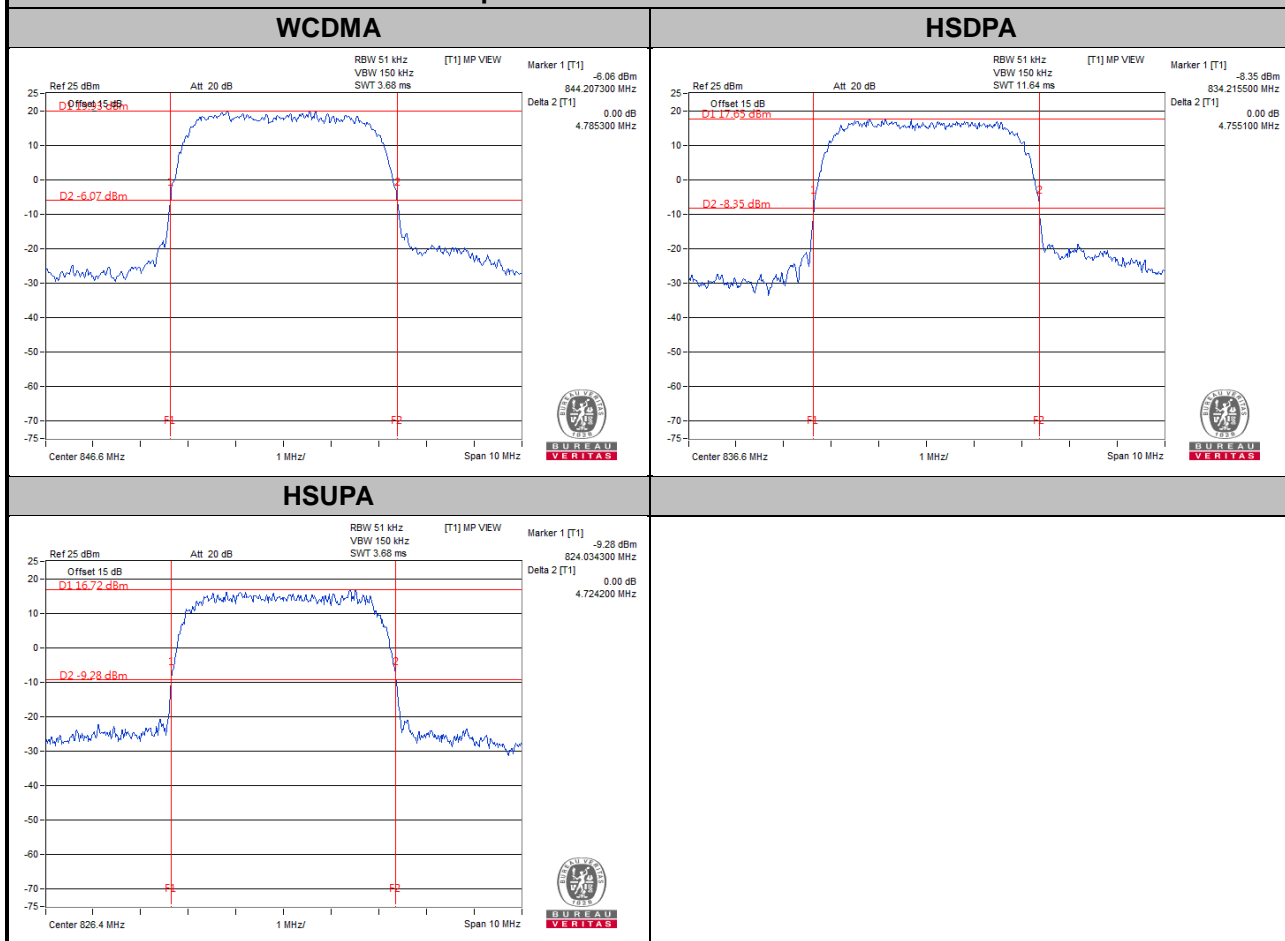
Spectrum Plot of Worst Value



WCDMA Band 5

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
|---------|-----------------|----------------------|-------|-------|
| | | WCDMA | HSDPA | HSUPA |
| 4132 | 826.4 | 4.75 | 4.74 | 4.72 |
| 4182 | 836.4 | 4.76 | 4.76 | 4.69 |
| 4233 | 846.6 | 4.79 | 4.71 | 4.72 |

Spectrum Plot of Worst Value

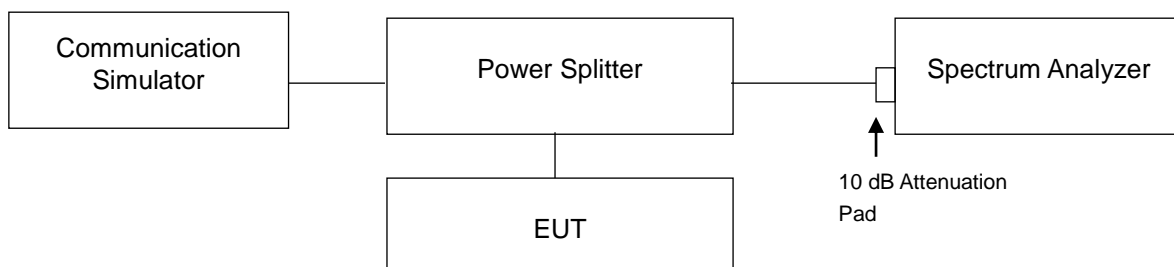


4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

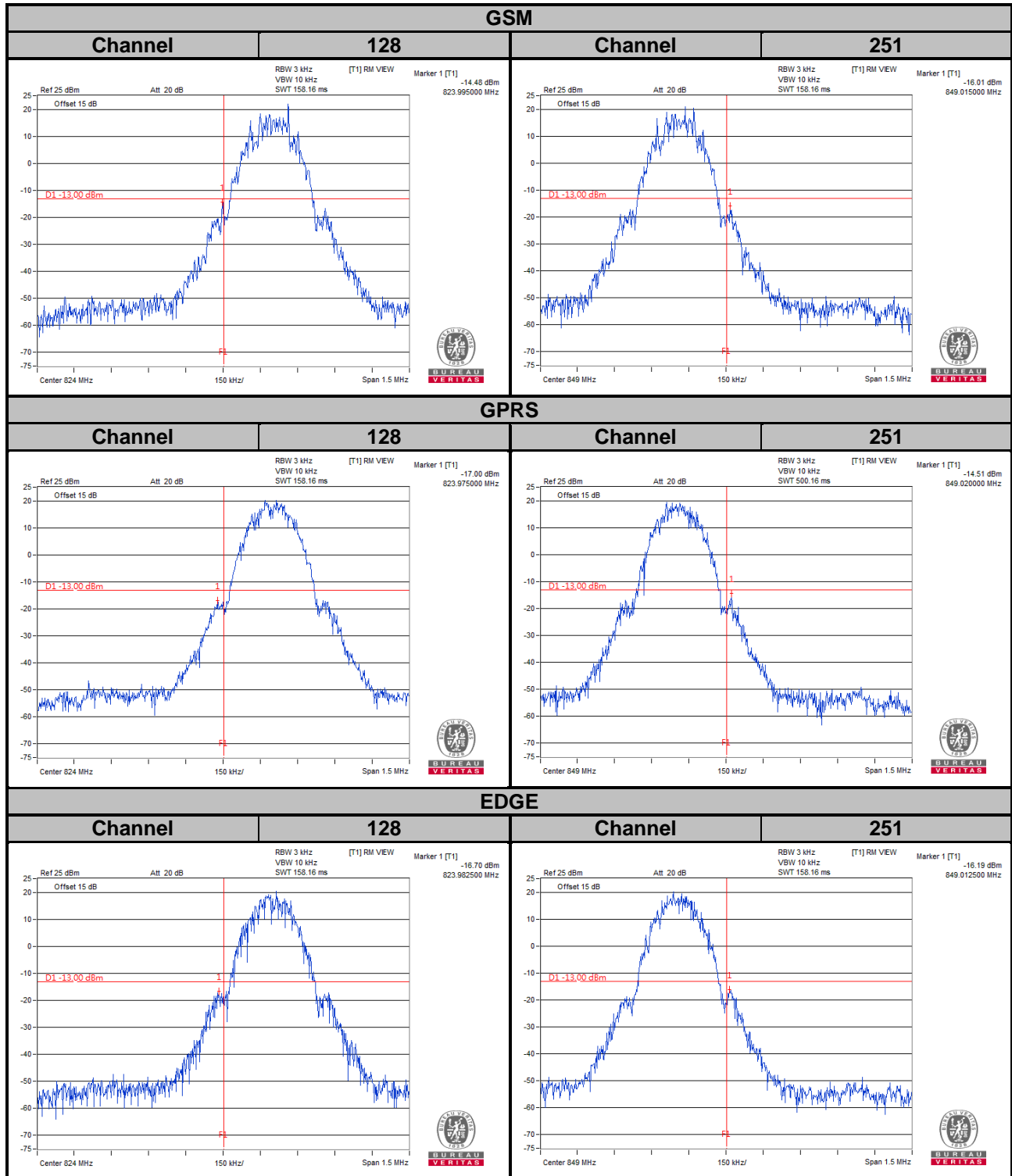
4.5.2 Test Setup



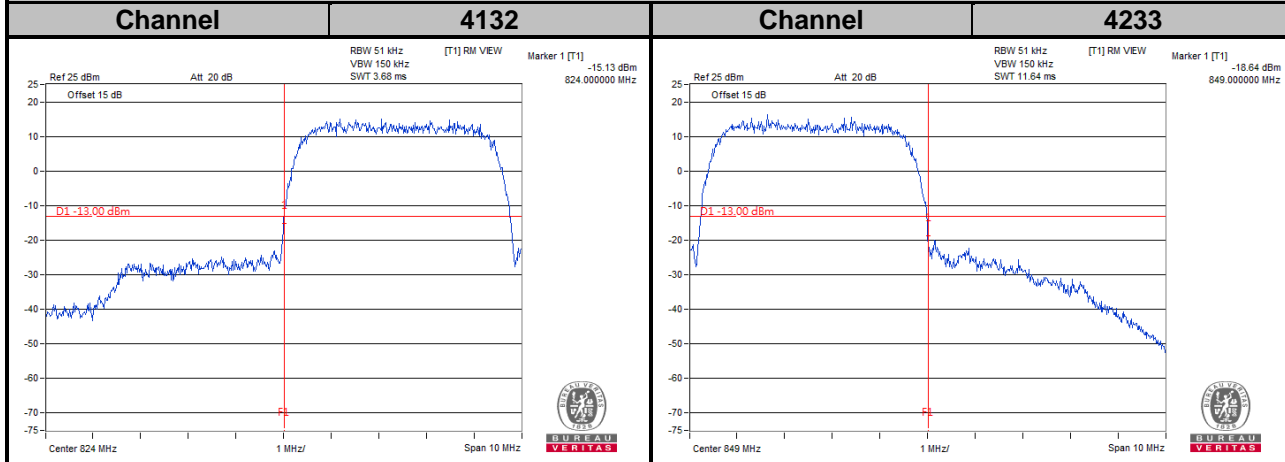
4.5.3 Test Procedures

- 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. RB of the spectrum is 3 kHz and VB of the spectrum is 10 kHz (GSM/GPRS/EDGE).
- The center frequency of spectrum is the band edge frequency and span is 10 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 150 kHz (WCDMA).
- Record the max trace plot into the test report.

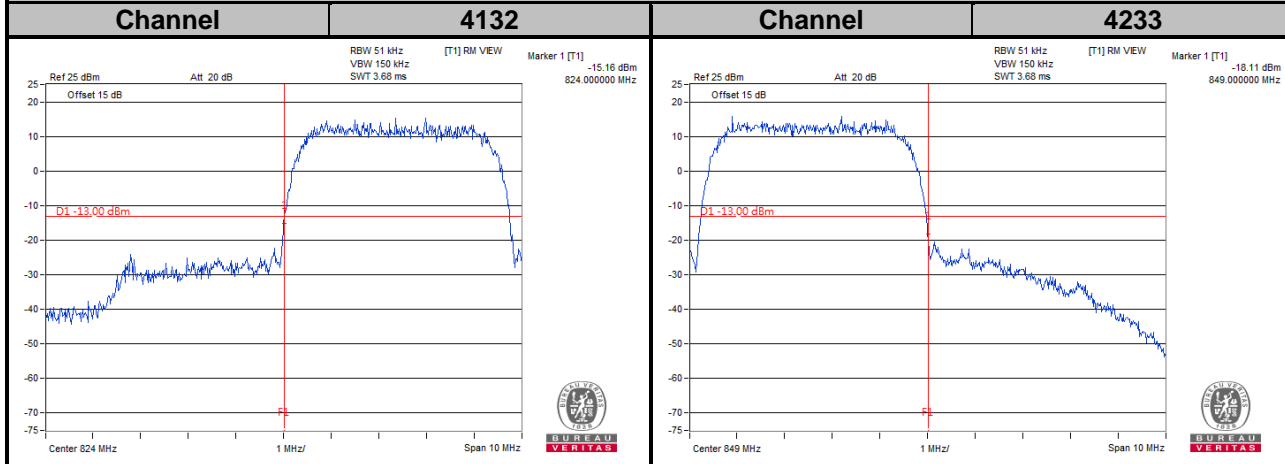
4.5.4 Test Results



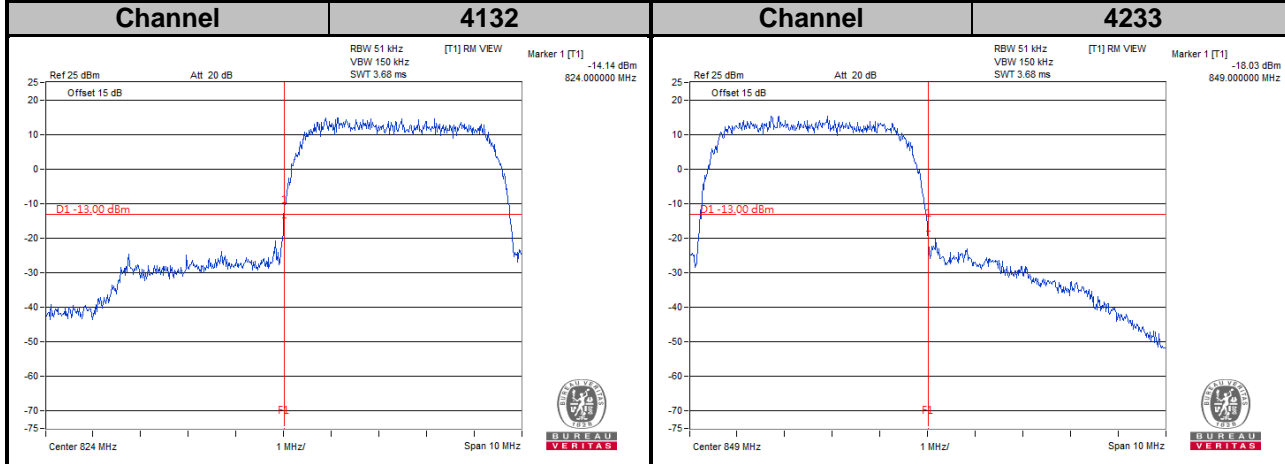
WCDMA



HSDPA



HSUPA

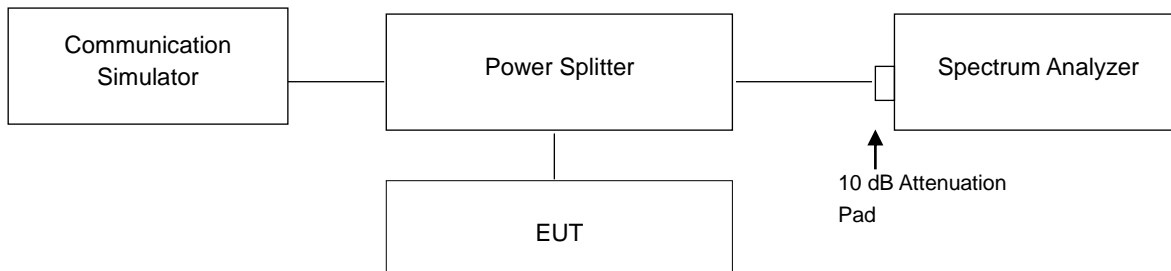


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.6.2 Test Setup

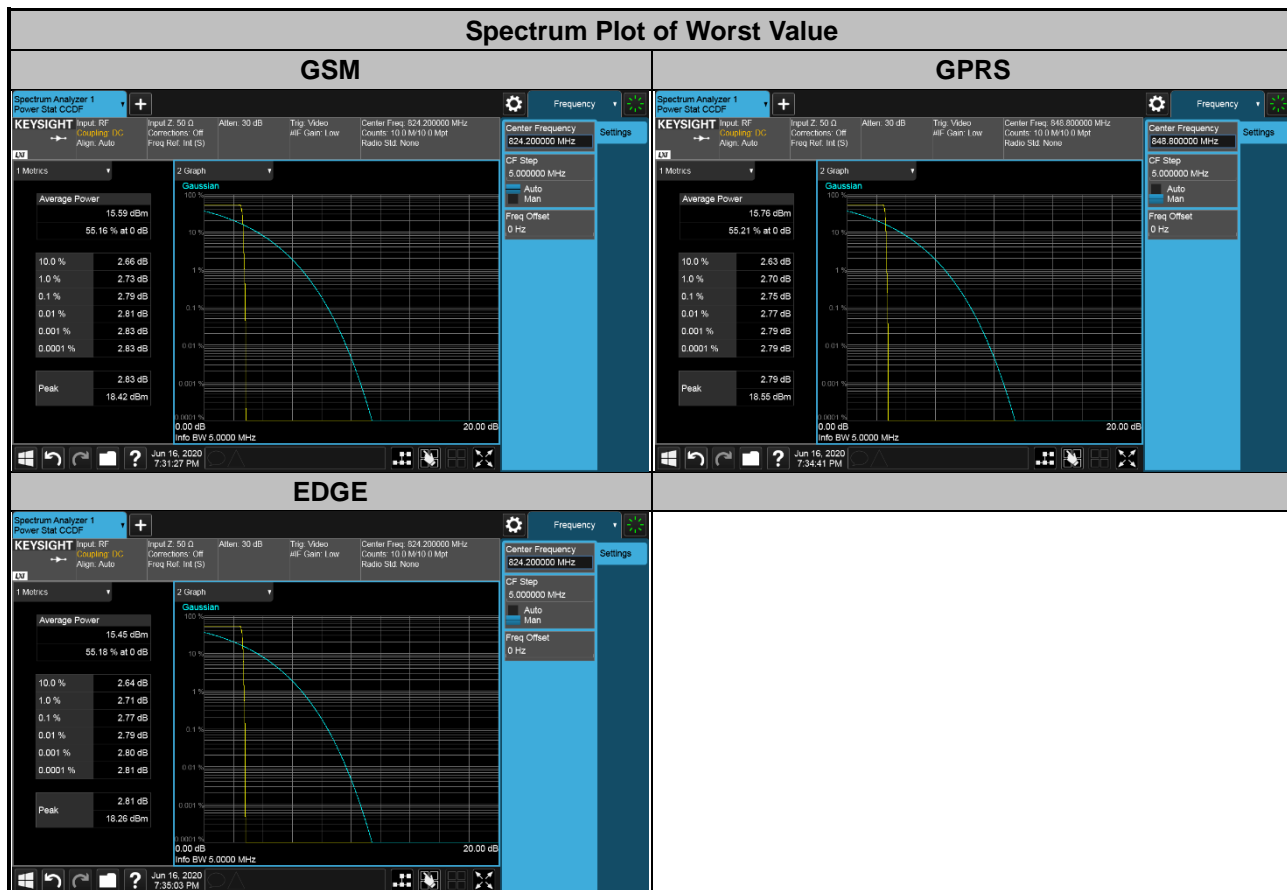


4.6.3 Test Procedures

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

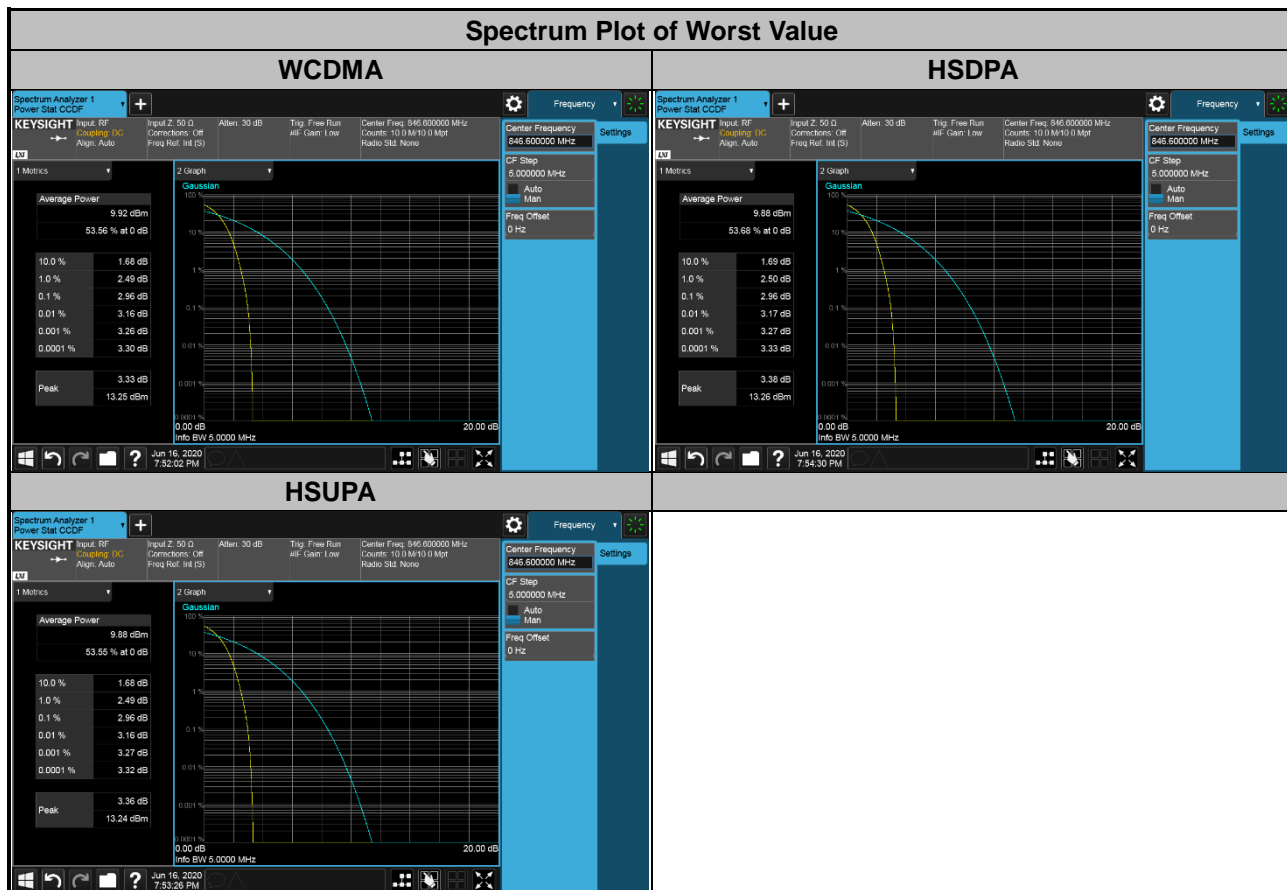
4.6.4 Test Results

| Channel | Frequency (MHz) | Peak To Average Ratio (dB) | | |
|---------|-----------------|----------------------------|------|------|
| | | GSM | GPRS | EDGE |
| 128 | 824.2 | 2.79 | 2.75 | 2.77 |
| 189 | 836.4 | 2.77 | 2.75 | 2.75 |
| 251 | 848.8 | 2.75 | 2.75 | 2.74 |



WCDMA Band 5

| Channel | Frequency (MHz) | Peak To Average Ratio (dB) | | |
|---------|-----------------|----------------------------|-------|-------|
| | | WCDMA | HSDPA | HSUPA |
| 4132 | 826.4 | 2.91 | 2.89 | 2.90 |
| 4182 | 836.4 | 2.93 | 2.91 | 2.92 |
| 4233 | 846.6 | 2.96 | 2.96 | 2.96 |

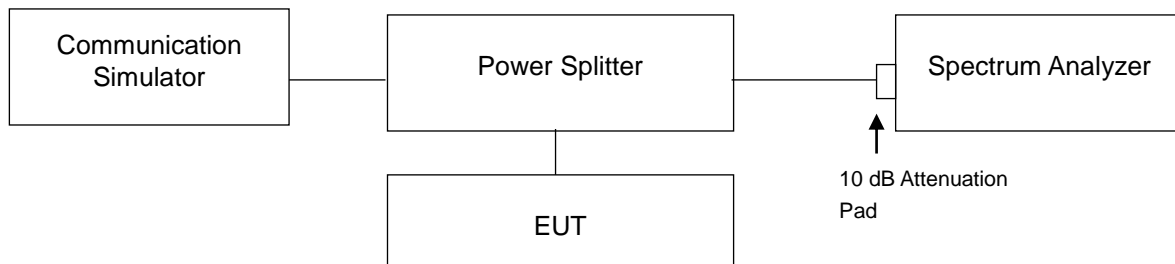


4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

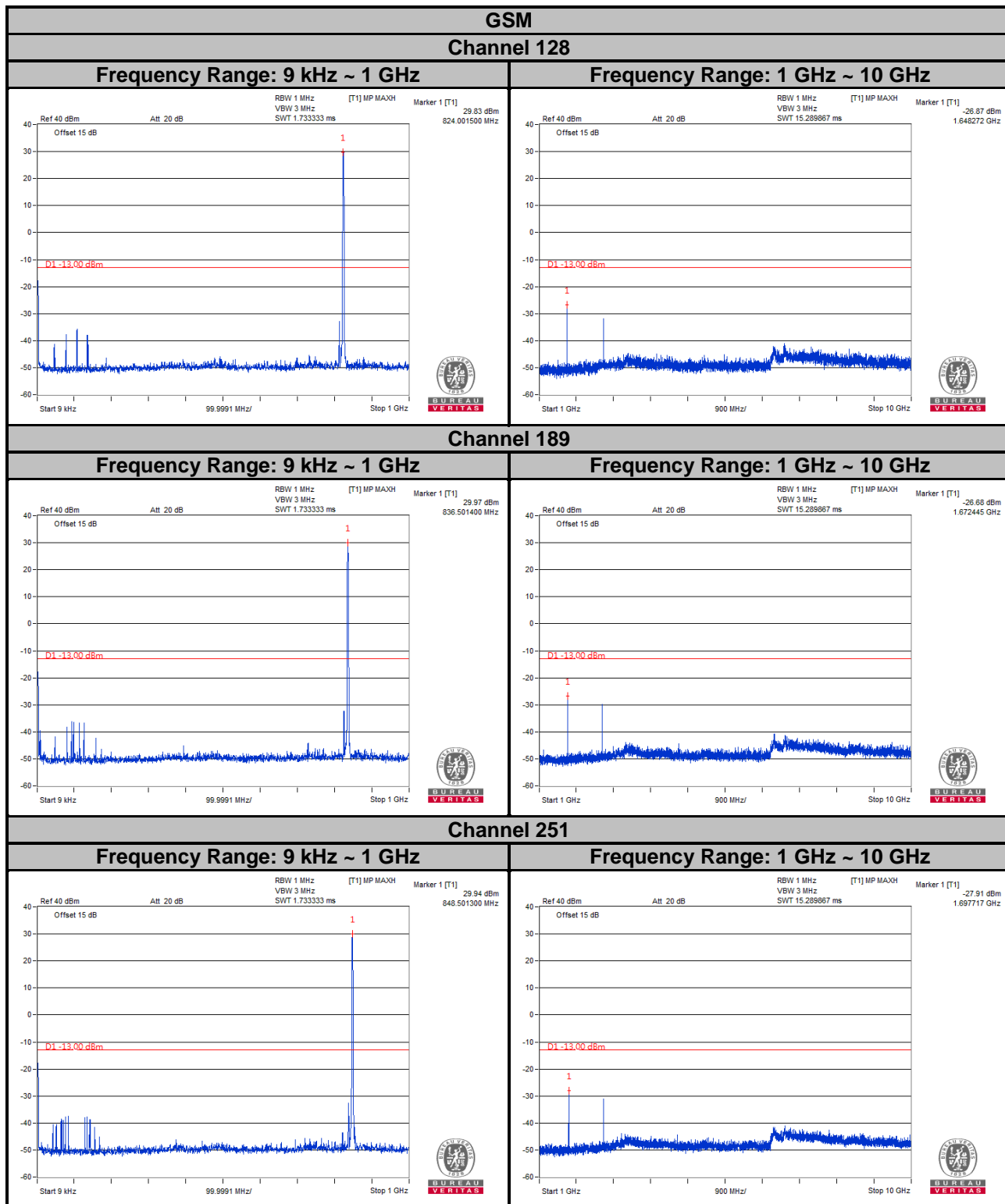
4.7.2 Test Setup



4.7.3 Test Procedure

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

4.7.4 Test Results

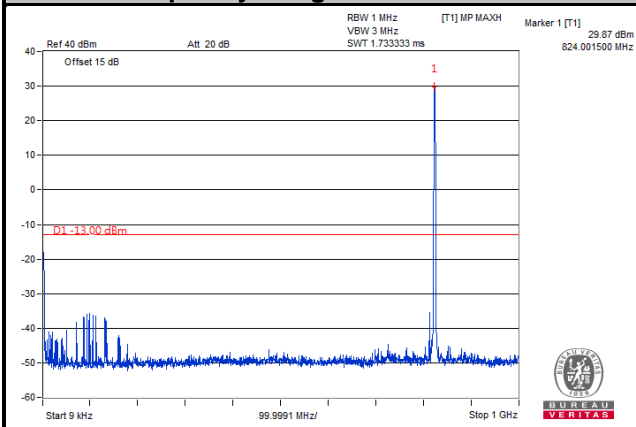


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

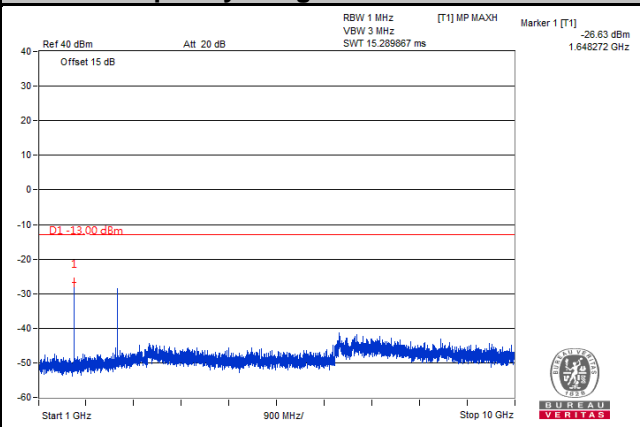
GPRS

Channel 128

Frequency Range: 9 kHz ~ 1 GHz

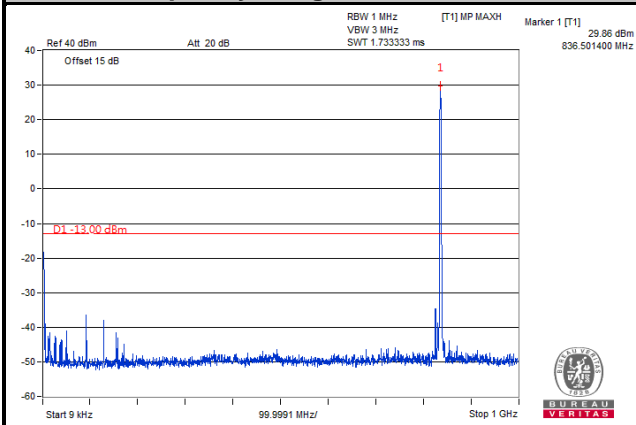


Frequency Range: 1 GHz ~ 10 GHz

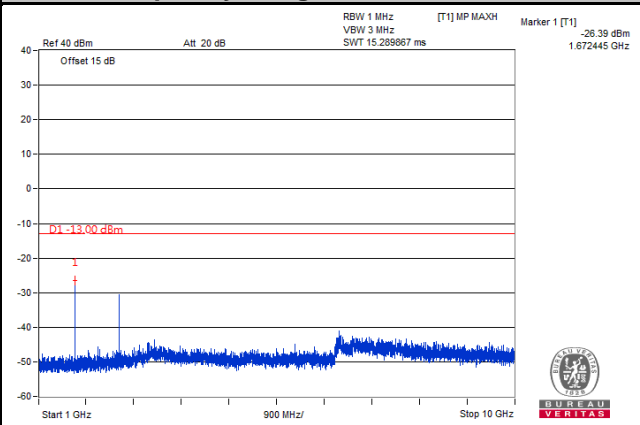


Channel 189

Frequency Range: 9 kHz ~ 1 GHz

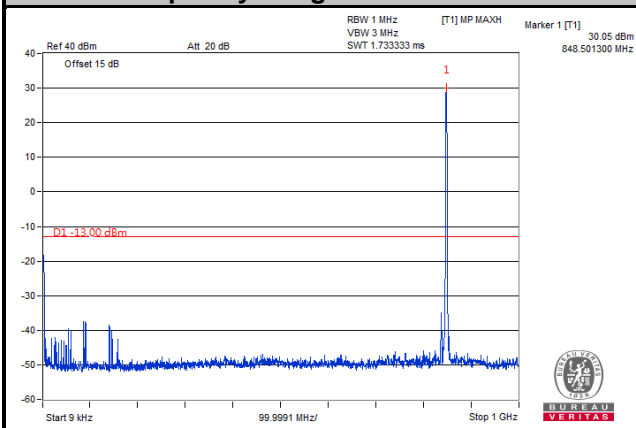


Frequency Range: 1 GHz ~ 10 GHz

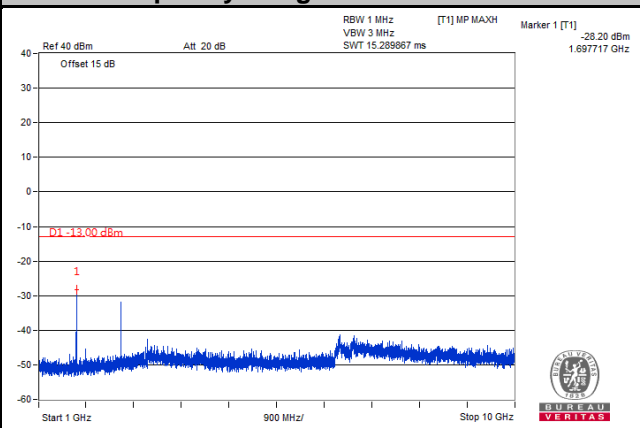


Channel 251

Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

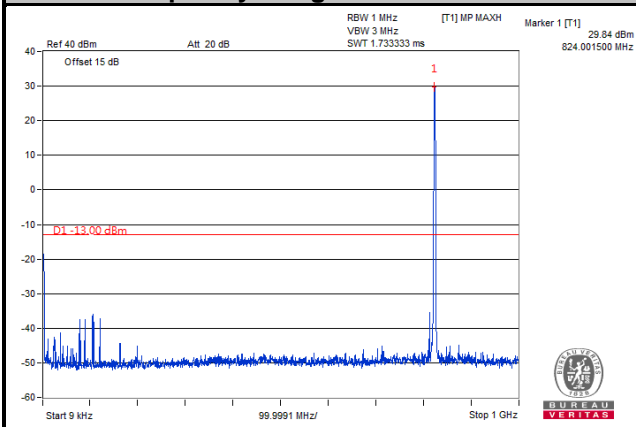


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

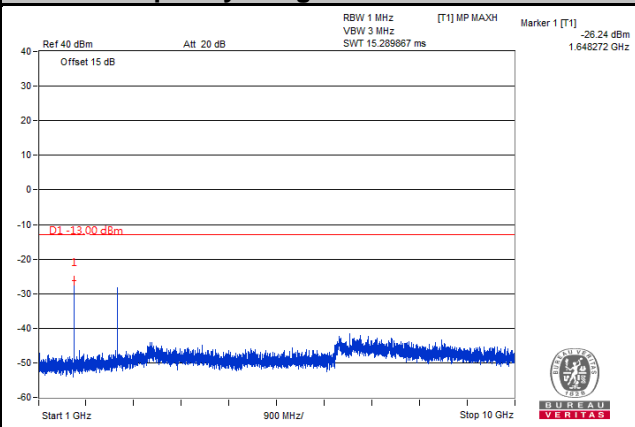
EDGE

Channel 128

Frequency Range: 9 kHz ~ 1 GHz

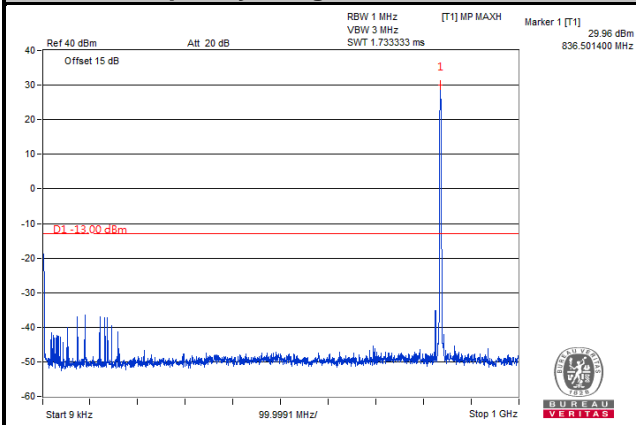


Frequency Range: 1 GHz ~ 10 GHz

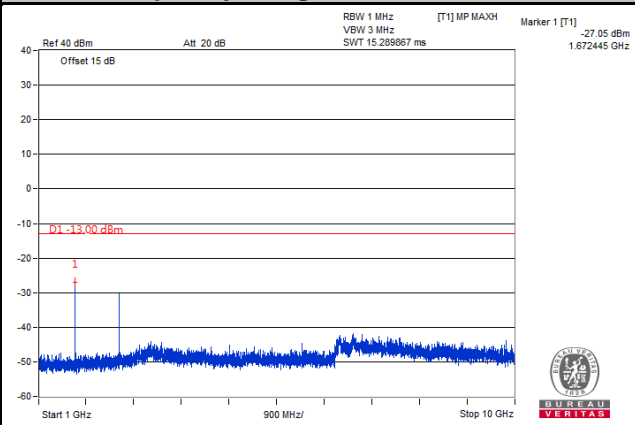


Channel 189

Frequency Range: 9 kHz ~ 1 GHz

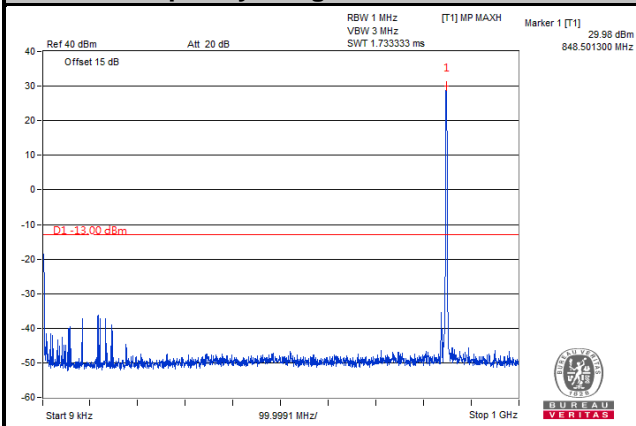


Frequency Range: 1 GHz ~ 10 GHz

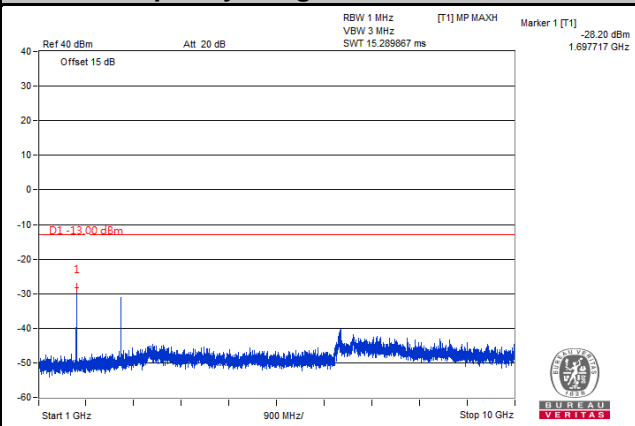


Channel 251

Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

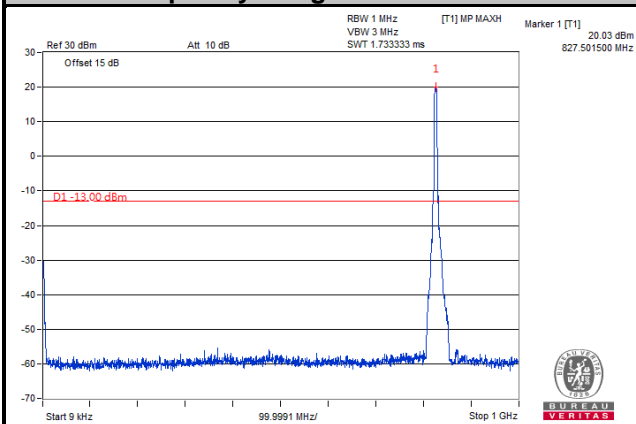


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

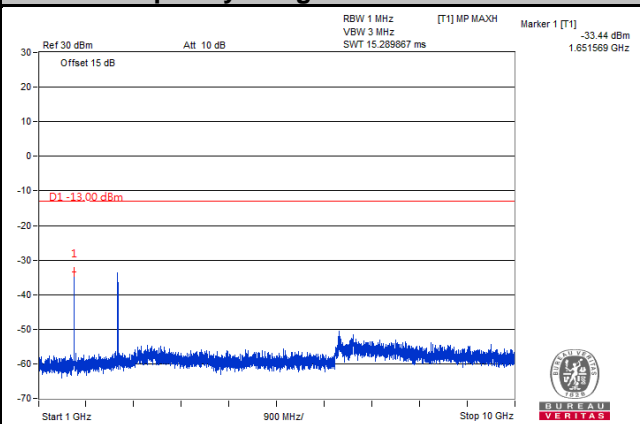
WCDMA

Channel 4132

Frequency Range: 9 kHz ~ 1 GHz

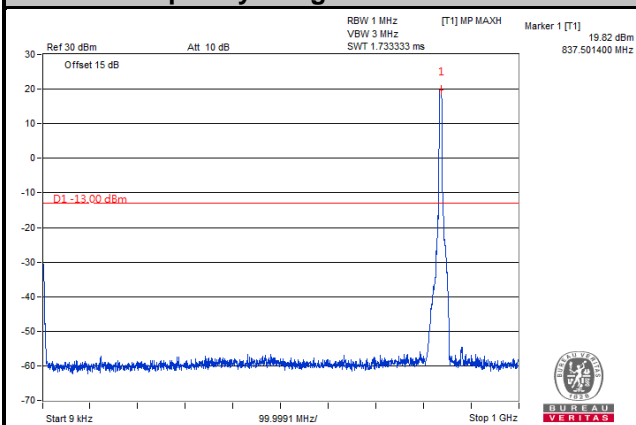


Frequency Range: 1 GHz ~ 10 GHz

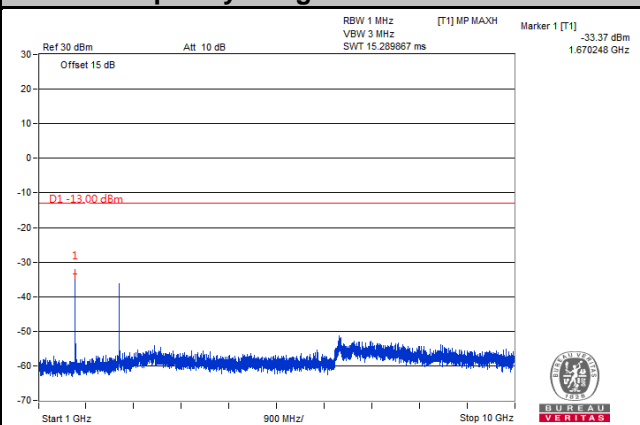


Channel 4182

Frequency Range: 9 kHz ~ 1 GHz

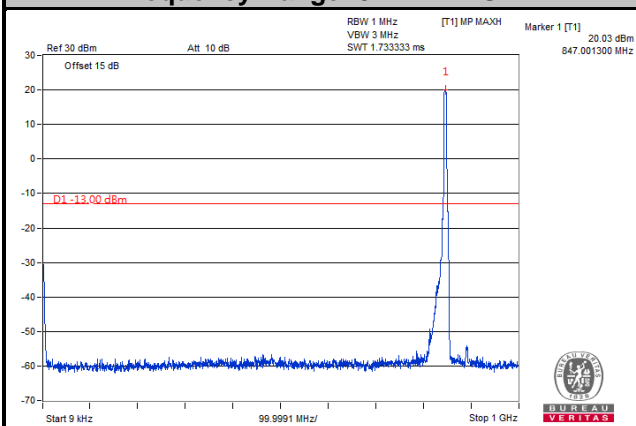


Frequency Range: 1 GHz ~ 10 GHz

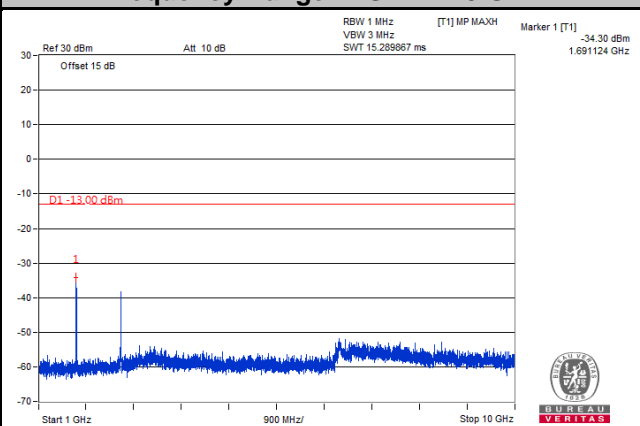


Channel 4233

Frequency Range: 9 kHz ~ 1 GHz

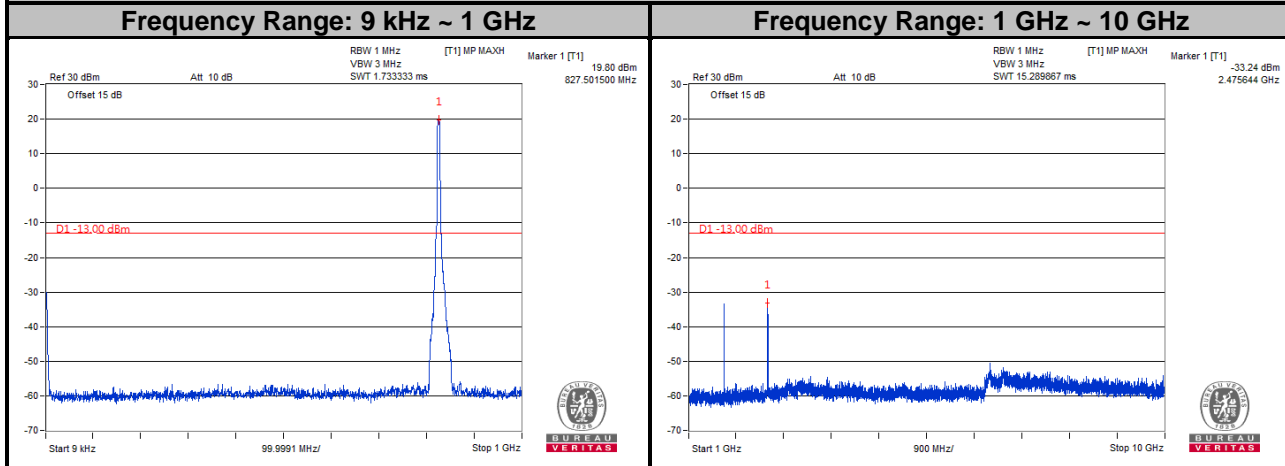


Frequency Range: 1 GHz ~ 10 GHz

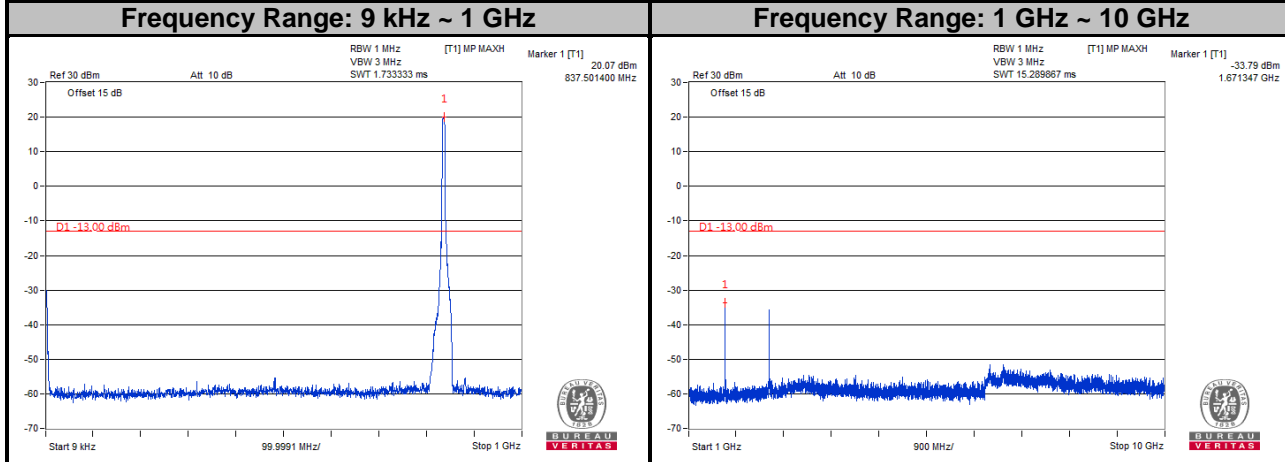


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

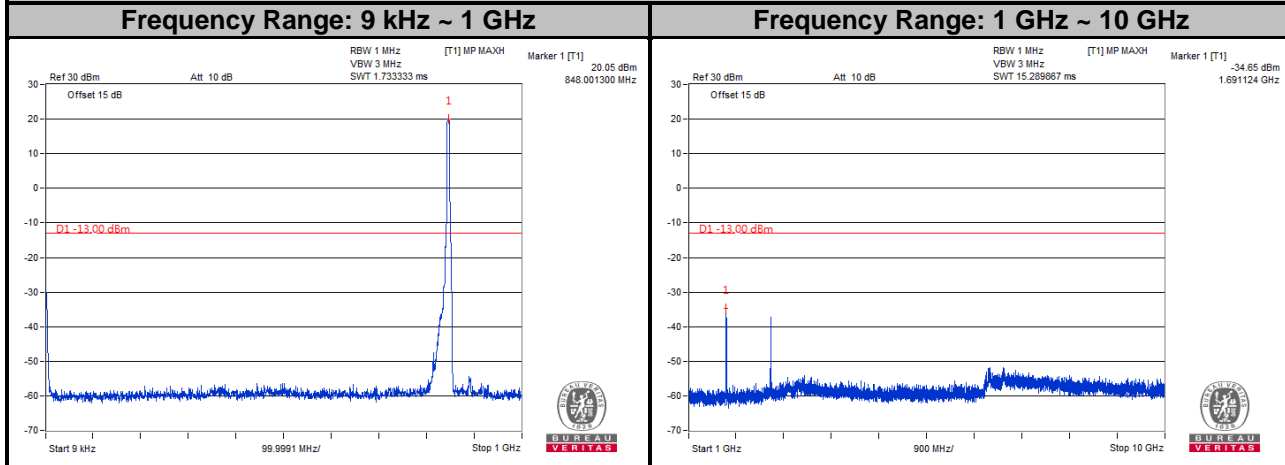
HSDPA Channel 4132



Channel 4182

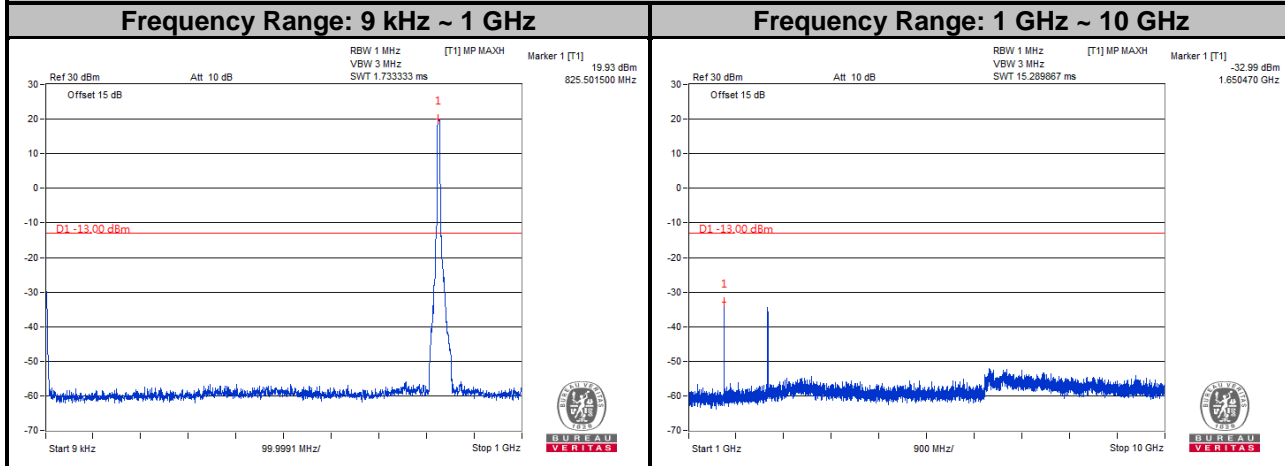


Channel 4233

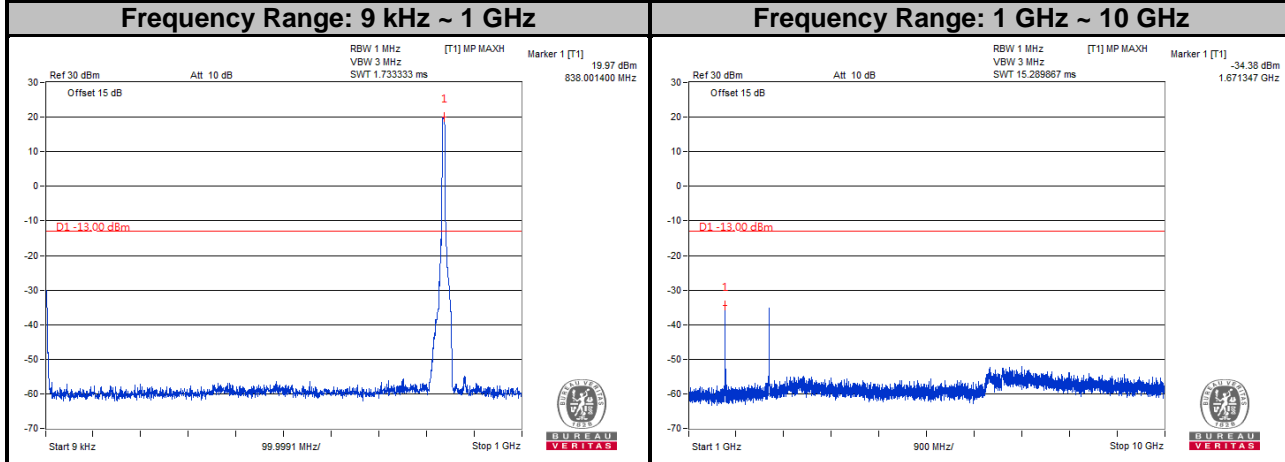


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

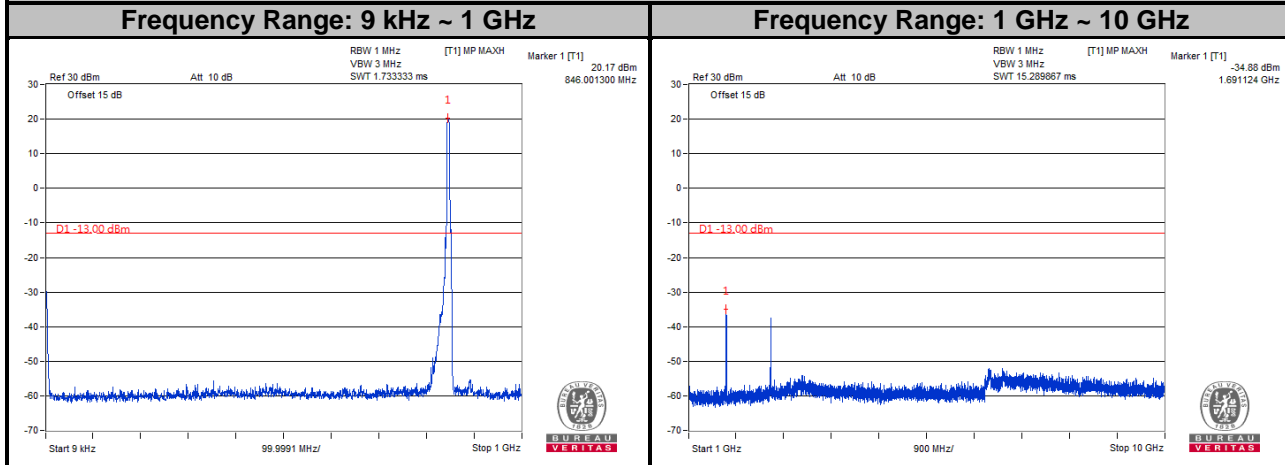
HSUPA Channel 4132



Channel 4182



Channel 4233



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

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit is equal to -13 dBm.

4.8.2 Test Procedure

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

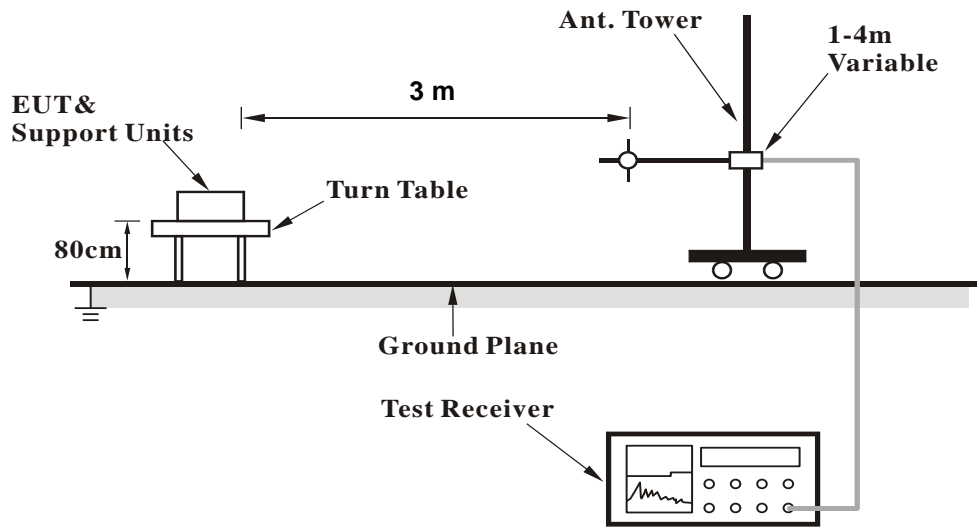
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

4.8.3 Deviation from Test Standard

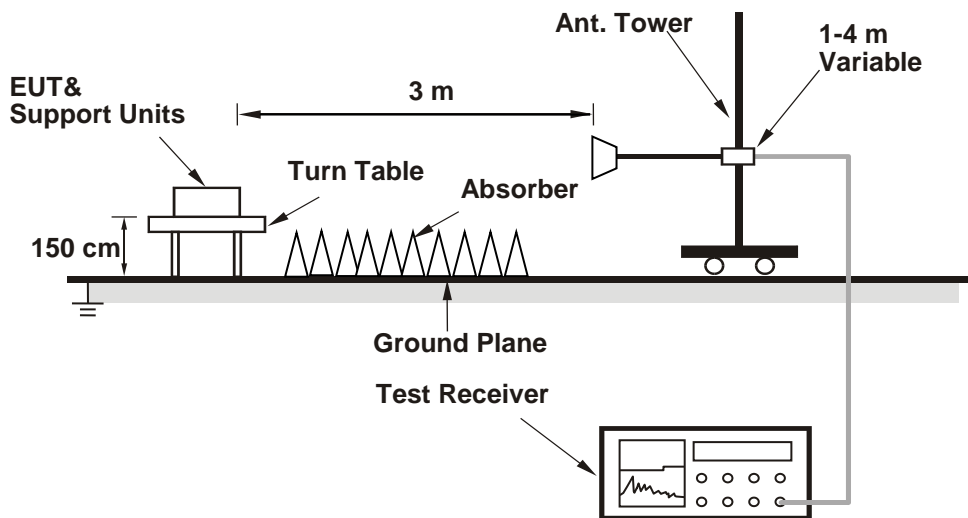
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

<Below 1GHz>

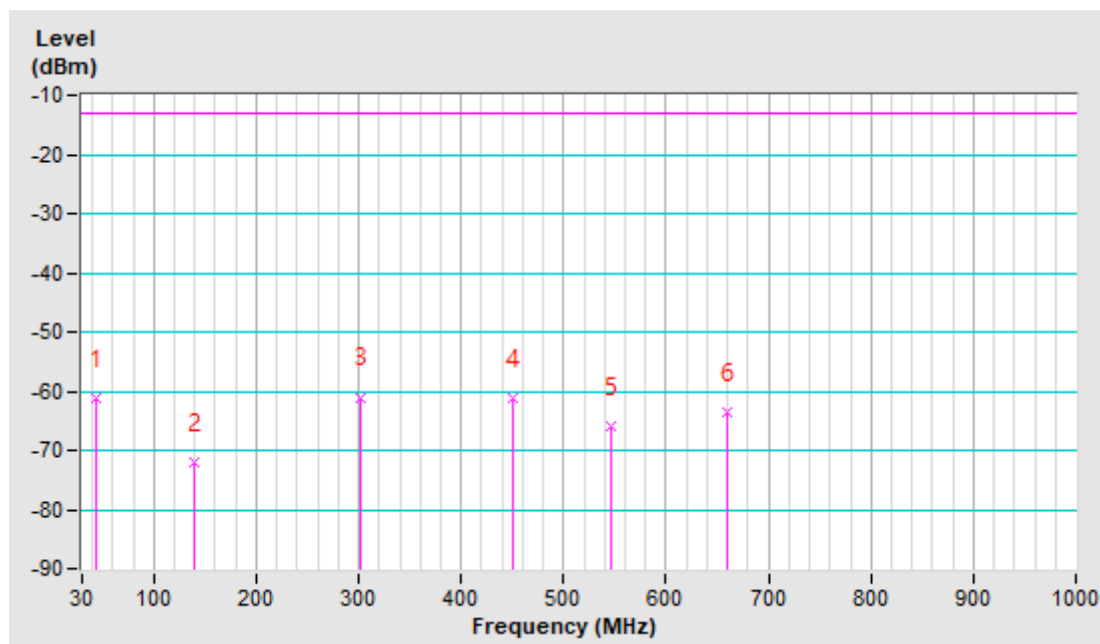
GSM:

| | | | |
|--------------------------|-----------------|-----------------|----------------|
| Mode | TX channel 189 | Frequency Range | Below 1000 MHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|-------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 43.58 | -60.80 | -50.00 | -11.30 | -61.30 | -13.00 | -48.30 |
| 2 | 138.64 | -63.90 | -68.80 | -3.20 | -72.00 | -13.00 | -59.00 |
| 3 | 301.60 | -54.40 | -64.70 | 3.70 | -61.00 | -13.00 | -48.00 |
| 4 | 450.98 | -59.00 | -64.50 | 3.40 | -61.10 | -13.00 | -48.10 |
| 5 | 546.04 | -64.40 | -70.00 | 3.90 | -66.10 | -13.00 | -53.10 |
| 6 | 660.50 | -64.00 | -67.40 | 3.70 | -63.70 | -13.00 | -50.70 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

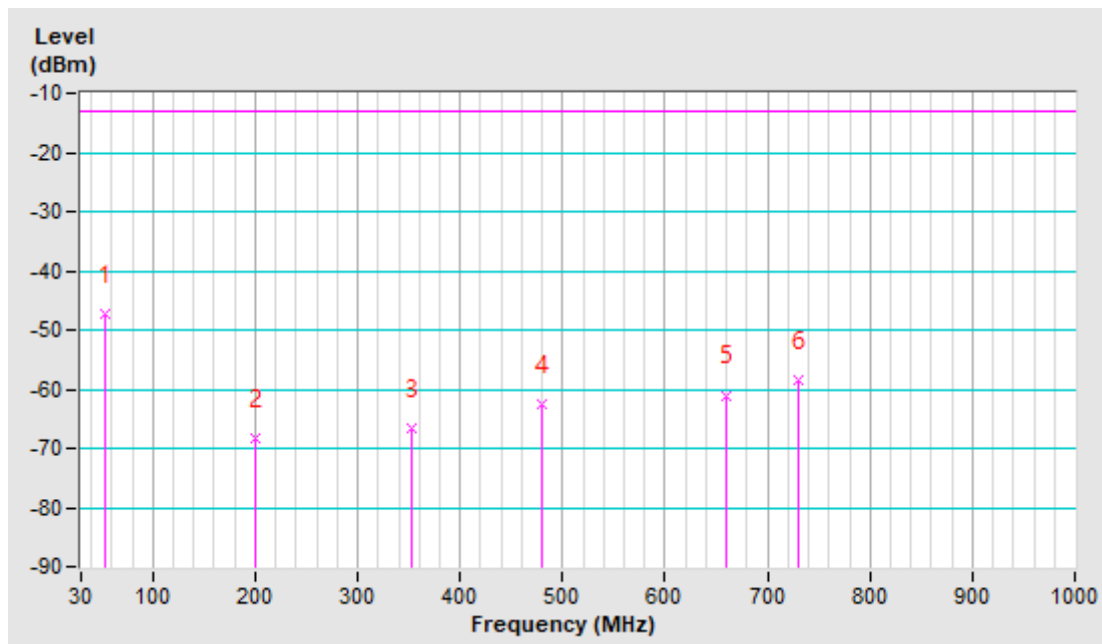


| | | | |
|--------------------------|-----------------|-----------------|----------------|
| Mode | TX channel 189 | Frequency Range | Below 1000 MHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
|---|-------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 53.28 | -38.20 | -41.10 | -6.20 | -47.30 | -13.00 | -34.30 |
| 2 | 200.72 | -65.10 | -66.10 | -2.30 | -68.40 | -13.00 | -55.40 |
| 3 | 352.04 | -64.20 | -70.60 | 3.90 | -66.70 | -13.00 | -53.70 |
| 4 | 480.08 | -60.10 | -66.10 | 3.60 | -62.50 | -13.00 | -49.50 |
| 5 | 660.50 | -64.50 | -64.70 | 3.70 | -61.00 | -13.00 | -48.00 |
| 6 | 730.34 | -62.90 | -62.10 | 3.60 | -58.50 | -13.00 | -45.50 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



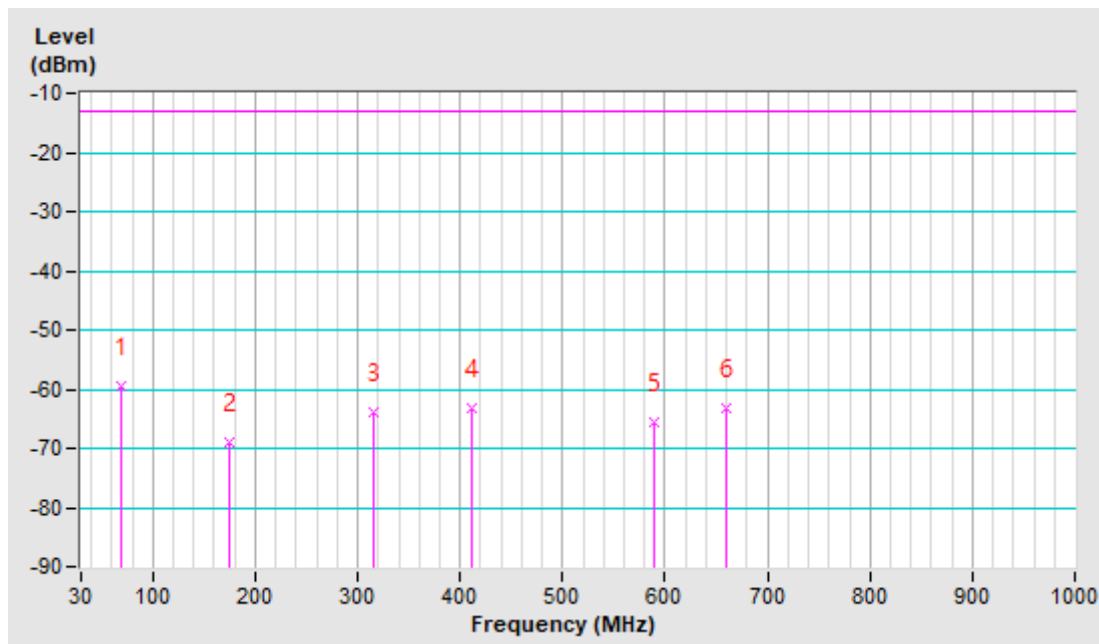
WCDMA Band 5:

| | | | |
|--------------------------|-----------------|-----------------|----------------|
| Mode | TX channel 4182 | Frequency Range | Below 1000 MHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|-------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 68.80 | -50.60 | -58.60 | -0.80 | -59.40 | -13.00 | -46.40 |
| 2 | 175.50 | -59.20 | -66.10 | -2.80 | -68.90 | -13.00 | -55.90 |
| 3 | 315.18 | -57.90 | -68.00 | 4.00 | -64.00 | -13.00 | -51.00 |
| 4 | 412.18 | -61.00 | -66.60 | 3.30 | -63.30 | -13.00 | -50.30 |
| 5 | 588.72 | -64.60 | -69.40 | 3.80 | -65.60 | -13.00 | -52.60 |
| 6 | 660.50 | -63.40 | -66.80 | 3.70 | -63.10 | -13.00 | -50.10 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

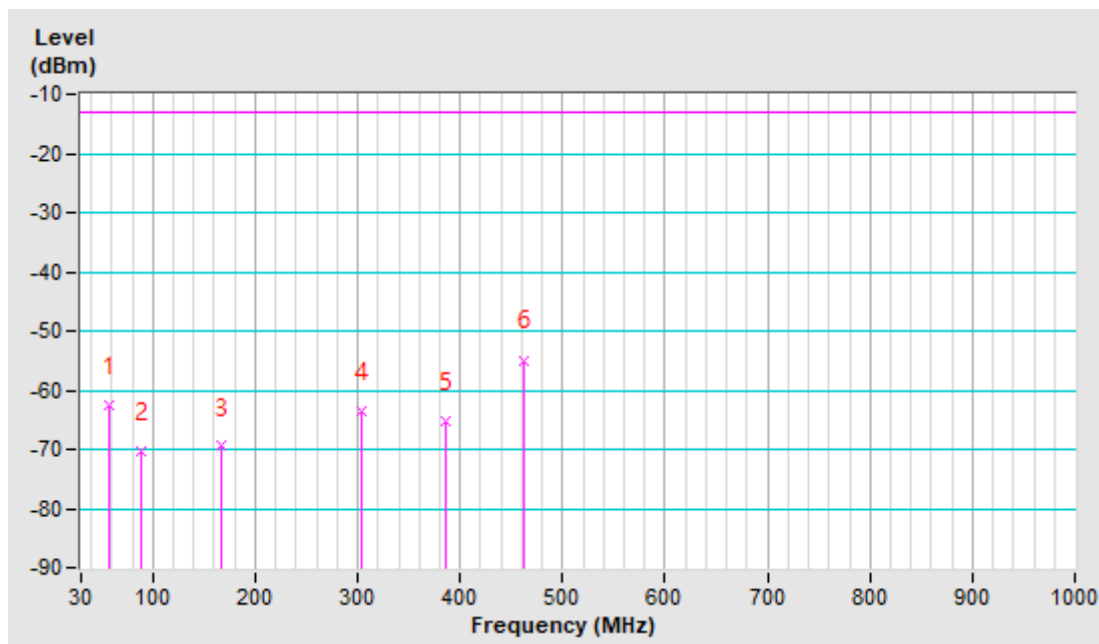


| | | | |
|--------------------------|-----------------|-----------------|----------------|
| Mode | TX channel 4182 | Frequency Range | Below 1000 MHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
|---|-------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 57.16 | -53.30 | -57.70 | -4.70 | -62.40 | -13.00 | -49.40 |
| 2 | 88.20 | -62.00 | -70.30 | -0.20 | -70.50 | -13.00 | -57.50 |
| 3 | 167.74 | -64.20 | -66.60 | -2.90 | -69.50 | -13.00 | -56.50 |
| 4 | 303.54 | -61.50 | -67.20 | 3.70 | -63.50 | -13.00 | -50.50 |
| 5 | 385.02 | -62.80 | -68.80 | 3.50 | -65.30 | -13.00 | -52.30 |
| 6 | 462.62 | -52.60 | -58.30 | 3.40 | -54.90 | -13.00 | -41.90 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



<Above 1GHz>

GSM:

| | | | |
|--------------------------|-----------------|-----------------|--------------|
| Mode | TX channel 128 | Frequency Range | 1GH~18GHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|--------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1648.40 (PK) | -62.90 | -55.10 | 0.90 | -54.20 | -13.00 | -41.20 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1648.40 (PK) | -60.20 | -52.90 | 0.90 | -52.00 | -13.00 | -39.00 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|--------------------------|-----------------|-----------------|--------------|
| Mode | TX channel 189 | Frequency Range | 1GH~18GHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|--------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1672.80 (PK) | -62.80 | -55.10 | 0.80 | -54.30 | -13.00 | -41.30 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1672.80 (PK) | -60.00 | -52.70 | 0.80 | -51.90 | -13.00 | -38.90 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|--------------------------|-----------------|-----------------|--------------|
| Mode | TX channel 251 | Frequency Range | 1GH~18GHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|--------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1697.60 (PK) | -63.40 | -55.80 | 0.70 | -55.10 | -13.00 | -42.10 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1697.60 (PK) | -60.80 | -53.50 | 0.70 | -52.80 | -13.00 | -39.80 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

WCDMA Band 5:

| | | | |
|--------------------------|-----------------|-----------------|--------------|
| Mode | TX channel 4132 | Frequency Range | 1GH~18GHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|--------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1652.80 (PK) | -45.00 | -37.30 | 0.90 | -36.40 | -13.00 | -23.40 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1652.80 (PK) | -40.20 | -33.00 | 0.90 | -32.10 | -13.00 | -19.10 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|--------------------------|-----------------|-----------------|--------------|
| Mode | TX channel 4182 | Frequency Range | 1GH~18GHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|--------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1672.80 (PK) | -45.80 | -38.10 | 0.80 | -37.30 | -13.00 | -24.30 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1673.20 (PK) | -40.00 | -32.70 | 0.80 | -31.90 | -13.00 | -18.90 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|--------------------------|-----------------|-----------------|--------------|
| Mode | TX channel 4233 | Frequency Range | 1GH~18GHz |
| Environmental Conditions | 22deg. C, 66%RH | Input Power | 120Vac, 60Hz |
| Tested By | Han Wu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|--------------|---------------|-----------------------|------------------------|-----------|-------------|-------------|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1693.20 (PK) | -46.10 | -38.60 | 0.70 | -37.90 | -13.00 | -24.90 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1693.20 (PK) | -41.20 | -33.90 | 0.70 | -33.20 | -13.00 | -20.20 |

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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Web Site: www.bureauveritas-adt.com

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

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