

FCC TEST REPORT

(PART 22)

Product: ILIUM PAD L8
Model Name: ILIUM PAD L8
FCC ID: ZC4L8
Applicant: CORPORATIVO LANIX, S.A. DE C.V.
Address: CARRETERA INTERNACIONAL A NOGALES KM.8.5, SAN LUIS. HERMOSILLO, SONORA, MÉXICO. CP. 83160
Manufacturer: Foxda Technology Industrial(Shenzhen) Co., Ltd
Address: 1F of 1st Building&1F-3F of 2nd Building, Foxda Industrial Zone,North of Lanzhu Road,Pingshan New District,Shenzhen City,Guangdong Province,P.R. China
Prepared by: Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch
Lab Location: No. 34, Chenwulu Section, Guantai Rd., Houjie Town, Dongguan City, Guangdong 523942, China
TEL: +86 769 8593 5656
FAX: +86 769 8593 1080
E-MAIL: customerservice.dg@cn.bureauveritas.com
Report No.: RF150512N006-3
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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|----------------|-------------------|---------------|
| RF150512N006-3 | Original release | Jun. 05, 2015 |



Test Report No.: RF150512N006-3

1 CERTIFICATION

PRODUCT: ILIUM PAD L8
BRAND NAME: LANIX
MODEL NAME: ILIUM PAD L8
APPLICANT: CORPORATIVO LANIX, S.A. DE C.V.
TESTED: May 12, 2015 ~ Jun. 04, 2015
TEST SAMPLE: Production unit
STANDARDS: FCC PART 22, Subpart H

The above equipment has been tested by **Bureau Veritas Shenzhen Co., Ltd. Dongguan 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.

TESTED BY

: 

Glyn He/ Project Engineer

DATE : Jun. 05, 2015

APPROVED BY

: 

Sam Tung / Technical Manager

DATE : Jun. 05, 2015

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 22 & Part 2 | | | |
|--|------------------------------|--------|---|
| STANDARD SECTION | 1.1.1.1.1 TEST TYPE | RESULT | REMARK |
| 2.1046 22.913 (a) | Effective Radiated Power | PASS | Meet the requirement of limit. |
| 2.1055 22.355 | Frequency Stability | PASS | Meet the requirement of limit. |
| 2.1049 | Occupied Bandwidth | PASS | Meet the requirement of limit. |
| 22.917 | Band Edge Measurements | PASS | Meet the requirement of limit. |
| 2.1051 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 -50.24dB at 2460.87MHz. |

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 | 2.74dB |
| | 30MHz ~ 1GHz | 3.55dB |
| | 1GHz ~ 18GHz | 4.84dB |
| | 18GHz ~ 40GHz | 1.94dB |

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. |
|-------------------------------------|--------------------|------------------------------|------------|-------------|-------------|
| EMI Test Receiver | Rohde&Schwarz | ESU 26 | 100005 | May 11,15 | May 10,16 |
| GPS Generator+ Antenna | TOJOIN | GNSS-5000A | E1-010119 | Aug. 08, 14 | Aug. 07, 15 |
| Bilog Antenna | Teseq | CBL 6111D | 30643 | Jul. 25, 14 | Jul. 24, 15 |
| Horn Antenna (1GHz -18GHz) | ETS -Lindgren | 3117 | 00062558 | May 30, 14 | May 29, 16 |
| Amplifier (9kHz-1GHz) | SONOMA | 310D | 186955 | Mar. 04,15 | Mar. 03, 16 |
| Pre-Amplifier (18GHz-40GHz) | EMCI | EMC 184045 | 980102 | Nov. 20,14 | Nov. 19,15 |
| Pre-Amplifier (100MHz-26.5GHz) | Agilent | 8449B | 3008A00409 | May 11,15 | May 10,16 |
| GPS Generator+ Antenna | TOJOIN | GNSS-5000A | E1-010119 | Aug. 08, 14 | Aug. 07, 15 |
| 3m Semi-anechoic Chamber | ETS-LINDGREN | 9m*6m*6m | NSEMC003 | Apr. 19,14 | Apr. 18,16 |
| Test Software | ADT | ADT_Radiated _V7.6.15.9.2 | N/A | N/A | N/A |
| Spectrum Analyzer (10Hz-40GHz) | Rohde&Schwarz | FSV40 | 101003 | Apr. 07,15 | Apr. 06,16 |
| Power Meter | Anritsu | ML2495A | 1139001 | Feb. 20,15 | Feb. 19,16 |
| Power Sensor | Anritsu | MA2411B | 1126068 | Feb. 20,15 | Feb. 19,16 |
| Digital Multimeter | FLUKE | 15B | A1220010DG | Oct. 27,14 | Oct. 26,15 |
| Humid & Temp Programmable Tester | Haida | HD-2257 | 110807201 | Sep.04,14 | Sep. 03,15 |
| Oscilloscope | Agilent | DSO9254A | MY51260160 | Oct. 17, 14 | Oct. 16, 15 |
| Signal Analyzer | Rohde & Schwarz | FSV7 | 102331 | Nov. 05,14 | Nov. 04,15 |
| Signal Generator | Agilent | N5183A | MY50140980 | Nov. 05,14 | Nov. 04,15 |
| ESG Vector Signal Generator | Agilent | E4438C | MY49072505 | Mar.13, 15 | Mar.12, 16 |
| BLUETOOTH TESTER | Rohde&Schwarz | CBT32 | 100811 | Sep. 04,14 | Sep. 03,15 |

- 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 Dongguan 966 Chamber
 3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 502831.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | | |
|----------------------------|--|---------------------|
| PRODUCT | ILIUM PAD L8 | |
| MODEL NAME | ILIUM PAD L8 | |
| POWER SUPPLY | 5.0Vdc (adapter or host equipment) 3.7Vdc (battery) | |
| MODULATION TYPE | GSM/GPRS | GMSK |
| | EDGE | GMSK, 8PSK |
| | WCDMA | BPSK |
| FREQUENCY RANGE | GSM/GPRS/EDGE | 824.2MHz ~ 848.8MHz |
| | WCDMA | 826.4MHz ~ 846.6MHz |
| MAX. ERP POWER | GSM | 1038mW |
| | EDGE | 261mW |
| | WCDMA | 247mW |
| EMISSION DESIGNATOR | GSM | 245KGXW |
| | EDGE | 249KG7W |
| | WCDMA | 4M17F9W |
| ANTENNA TYPE | Fixed Internal antenna with -1dBi gain | |
| HW VERSION | V03 | |
| SW VERSION | Android version 4.4.4; ILIUM PAD L8_TELCEL_SW_01 | |
| I/O PORTS | Refer to user's manual | |
| DATA CABLE | USB cable: Unshielded, detachable, 0.8m | |

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapter:

| ADAPTER | |
|----------------|--------------------|
| BRAND: | HJ |
| MODEL: | HJ-0501500-ZT |
| INPUT: | AC 100-240V, 250mA |
| OUTPUT: | DC 5V, 1500mA |

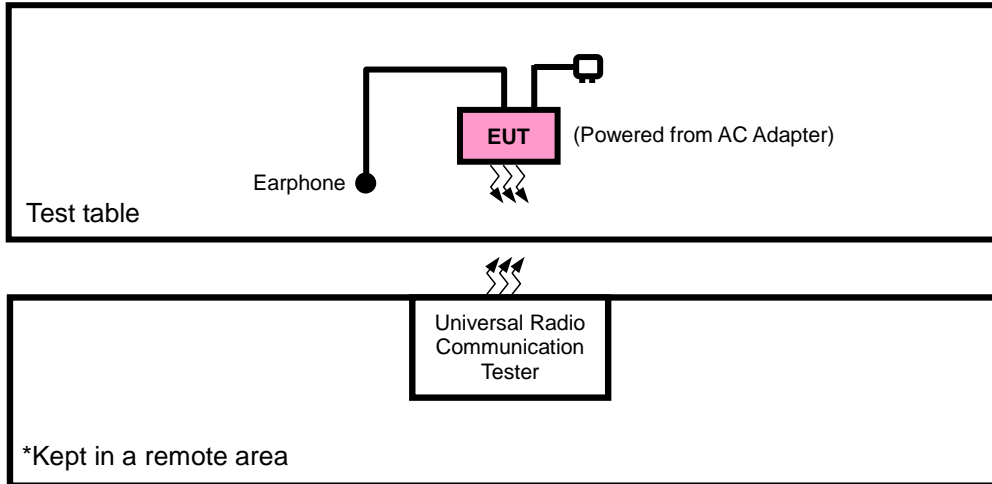
- The EUT matched the following USB cable:

| USB CABLE | |
|---------------------|--------------------------|
| BRAND: | ACH |
| MODEL: | USB 2.0 AM TO Micro B 5P |
| SIGNAL LINE: | 0.8 METER |

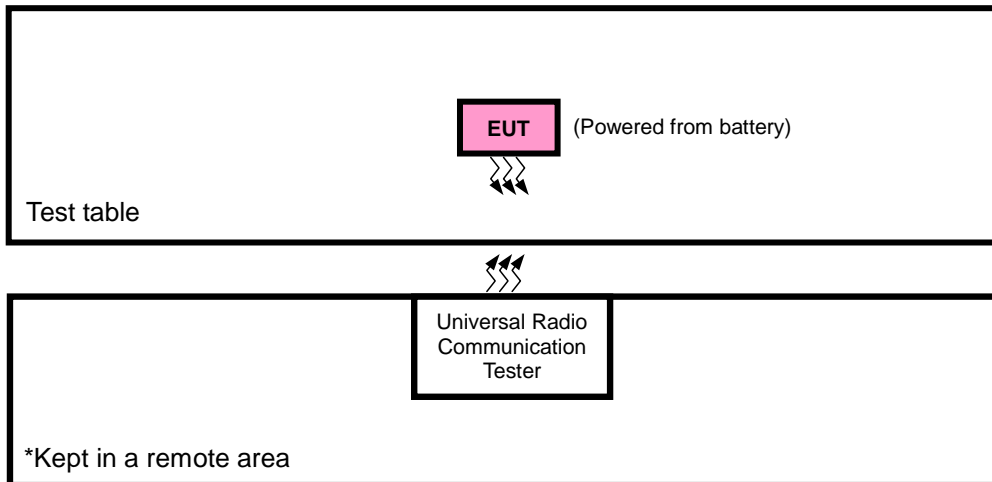
- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR E.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 was found when positioned on Y-plane for ERP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

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

GSM MODE

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | MODE |
|--------------------|---------------------|-------------------|----------------|-----------------|
| B | ERP | 128 to 251 | 128, 190, 251 | GSM, EDGE |
| B | FREQUENCY STABILITY | 128 to 251 | 190 | GSM, EDGE |
| B | OCCUPIED BANDWIDTH | 128 to 251 | 128, 190, 251 | GSM, GPRS, EDGE |
| B | BAND EDGE | 128 to 251 | 128, 251 | GSM, GPRS, EDGE |
| B | CONDUCTED EMISSION | 128 to 251 | 128, 190, 251 | GSM |
| A | RADIATED EMISSION | 128 to 251 | 190 | GSM, EDGE |



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WCDMA MODE

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | MODE |
|--------------------|---------------------|-------------------|------------------|-------|
| B | ERP | 4132 to 4233 | 4132, 4182, 4233 | WCDMA |
| B | FREQUENCY STABILITY | 4132 to 4233 | 4182 | WCDMA |
| B | OCCUPIED BANDWIDTH | 4132 to 4233 | 4132, 4182, 4233 | WCDMA |
| B | BAND EDGE | 4132 to 4233 | 4132, 4233 | WCDMA |
| B | CONDCUDED EMISSION | 4132 to 4233 | 4132, 4182, 4233 | WCDMA |
| A | RADIATED EMISSION | 4132 to 4233 | 4182 | WCDMA |

| TEST ITEM | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---------------------|--------------------------|---------------------|-------------|
| ERP | 23deg. C, 62%RH | 3.7Vdc from Battery | Yuqiang Yin |
| FREQUENCY STABILITY | 23deg. C, 62%RH | 3.7Vdc from Battery | Yuqiang Yin |
| OCCUPIED BANDWIDTH | 23deg. C, 62%RH | 3.7Vdc from Battery | Yuqiang Yin |
| BAND EDGE | 23deg. C, 62%RH | 3.7Vdc from Battery | Yuqiang Yin |
| CONDCUDED EMISSION | 23deg. C, 62%RH | 5Vdc from adapter | Yuqiang Yin |
| RADIATED EMISSION | 25deg. C, 63.6%RH | 5Vdc from adapter | Blue Zheng |



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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 22

ANSI/TIA/EIA-603-C 2004

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



4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

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

4.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

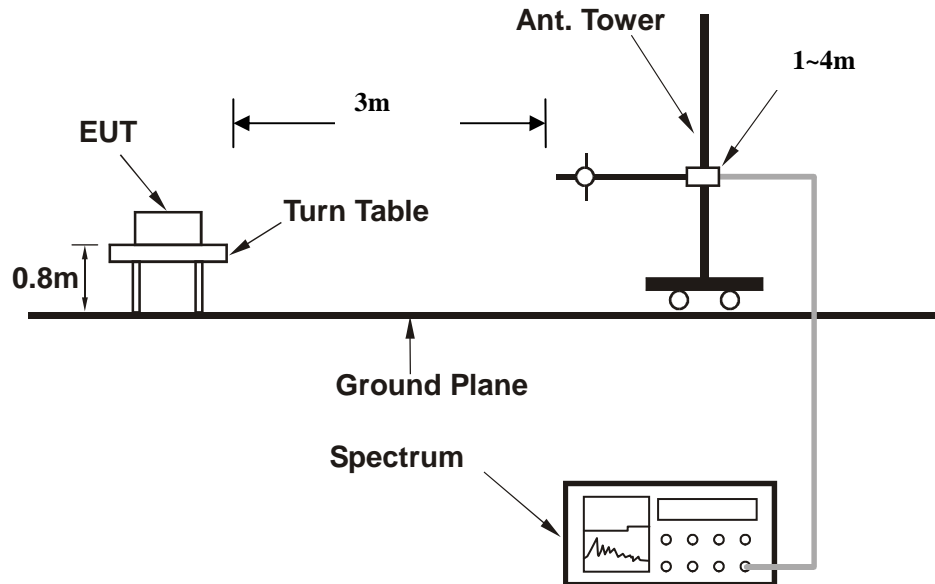
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS & EDGE, 5MHz for WCDMA mode, and 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
 $E.R.P \text{ power can be calculated form E.I.R.P power by subtracting the gain of dipole, } E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15dBi.$

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:



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

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 | 190 | 251 |
| Frequency (MHz) | 824.2 | 836.6 | 848.8 |
| GSM | 33.61 | 33.60 | 33.57 |
| GPRS 8 | 33.47 | 33.47 | 33.48 |
| GPRS 10 | 33.13 | 33.16 | 33.28 |
| EDGE 8 (MCS1) | 33.46 | 33.44 | 33.45 |
| EDGE 10 (MCS1) | 33.10 | 33.15 | 33.27 |
| EDGE 8 (MCS9) | 27.25 | 27.37 | 27.25 |
| EDGE 10 (MCS9) | 27.25 | 27.30 | 27.10 |

| Band | WCDMA V | | |
|-----------------|---------|-------|-------|
| Channel | 4132 | 4182 | 4233 |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| RMC 12.2K | 23.04 | 23.16 | 22.91 |
| HSPA | | | |
| HSDPA Subtest-1 | 22.21 | 22.33 | 22.17 |
| HSDPA Subtest-2 | 22.20 | 22.34 | 22.45 |
| HSDPA Subtest-3 | 21.79 | 21.93 | 21.81 |
| HSDPA Subtest-4 | 21.85 | 21.91 | 21.62 |
| HSUPA Subtest-1 | 21.97 | 22.10 | 22.10 |
| HSUPA Subtest-2 | 20.27 | 20.08 | 20.20 |
| HSUPA Subtest-3 | 20.88 | 21.15 | 20.94 |
| HSUPA Subtest-4 | 19.78 | 19.91 | 20.16 |
| HSUPA Subtest-5 | 22.17 | 22.36 | 22.23 |

ERP POWER (dBm)

GSM

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---------|-----------------|-----------|-----------------------|----------|----------------|--------------------|
| 128 | 824.2 | -4.89 | 35.85 | 28.81 | 760.33 | H |
| 189 | 836.4 | -4.78 | 37.09 | 30.16 | 1037.53 | H |
| 251 | 848.8 | -4.96 | 36.96 | 29.85 | 966.05 | H |
| 128 | 824.2 | -10.54 | 36.88 | 24.19 | 262.42 | V |
| 189 | 836.4 | -10.62 | 37.56 | 24.79 | 301.30 | V |
| 251 | 848.8 | -10.78 | 37.72 | 24.79 | 301.30 | V |

EDGE

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|
| 128 | 824.2 | -10.24 | 35.85 | 23.46 | 221.82 | H |
| 189 | 836.4 | -10.99 | 37.09 | 23.95 | 248.31 | H |
| 251 | 848.8 | -10.64 | 36.96 | 24.17 | 261.22 | H |
| 128 | 824.2 | -21.26 | 36.88 | 13.47 | 22.23 | V |
| 189 | 836.4 | -21.14 | 37.56 | 14.27 | 26.73 | V |
| 251 | 848.8 | -21.43 | 37.72 | 14.14 | 25.94 | V |

WCDMA

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|
| 4132 | 826.4 | -11.48 | 35.85 | 22.22 | 166.72 | H |
| 4182 | 836.4 | -11.02 | 37.09 | 23.92 | 246.60 | H |
| 4233 | 846.6 | -11.77 | 37.00 | 23.08 | 203.24 | H |
| 4132 | 826.4 | -22.65 | 36.85 | 12.05 | 16.03 | V |
| 4182 | 836.4 | -22.88 | 37.56 | 12.53 | 17.91 | V |
| 4233 | 846.6 | -22.19 | 37.77 | 13.43 | 22.03 | V |

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

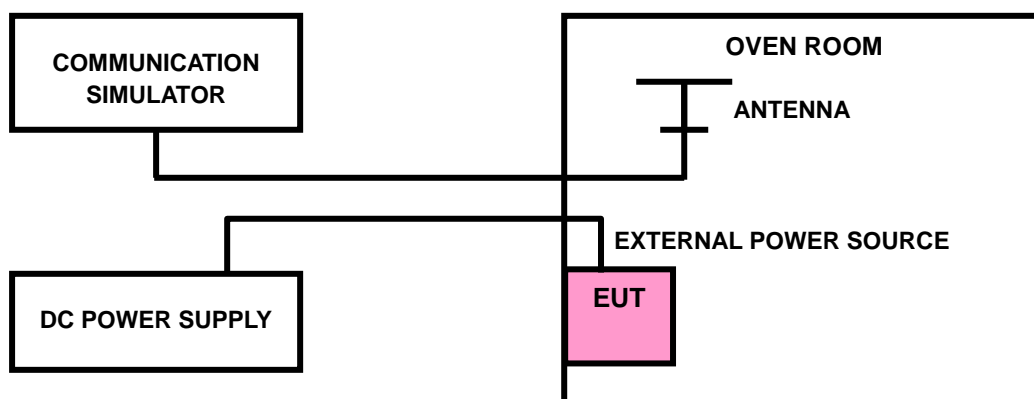
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.2.2 TEST PROCEDURE

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

FREQUENCY ERROR VS. VOLTAGE

| Voltage (Volts) | FREQUENCY ERROR (ppm) | | | Limit (ppm) |
|-----------------|-----------------------|--------|-------|-------------|
| | GSM | EDGE | WCDMA | |
| 3.7 | -0.020 | -0.019 | 0.015 | 2.5 |
| 3.6 | -0.018 | -0.016 | 0.014 | 2.5 |
| 4.2 | -0.017 | -0.017 | 0.012 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

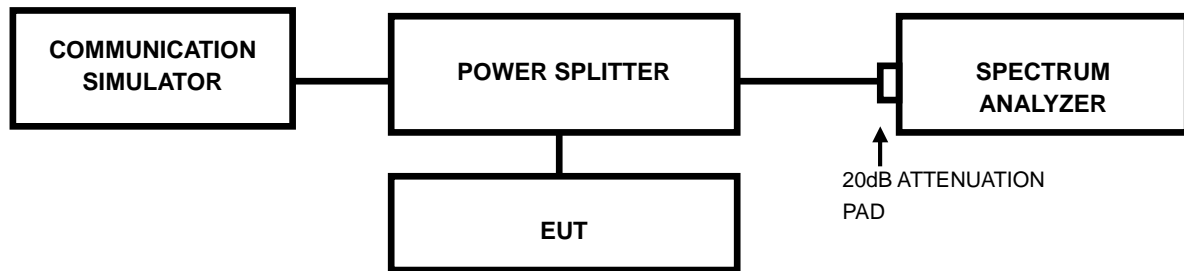
| Voltage (Volts) | FREQUENCY ERROR (ppm) | | | Limit (ppm) |
|-----------------|-----------------------|--------|-------|-------------|
| | GSM | EDGE | WCDMA | |
| -30 | -0.030 | -0.032 | 0.019 | 2.5 |
| -20 | -0.023 | -0.024 | 0.017 | 2.5 |
| -10 | -0.023 | -0.024 | 0.019 | 2.5 |
| 0 | -0.022 | -0.021 | 0.017 | 2.5 |
| 10 | -0.021 | -0.019 | 0.016 | 2.5 |
| 20 | -0.020 | -0.018 | 0.014 | 2.5 |
| 30 | -0.019 | -0.018 | 0.015 | 2.5 |
| 40 | -0.017 | -0.016 | 0.014 | 2.5 |
| 50 | -0.016 | -0.015 | 0.013 | 2.5 |
| 60 | -0.022 | -0.014 | 0.021 | 2.5 |

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 TEST PROCEDURES

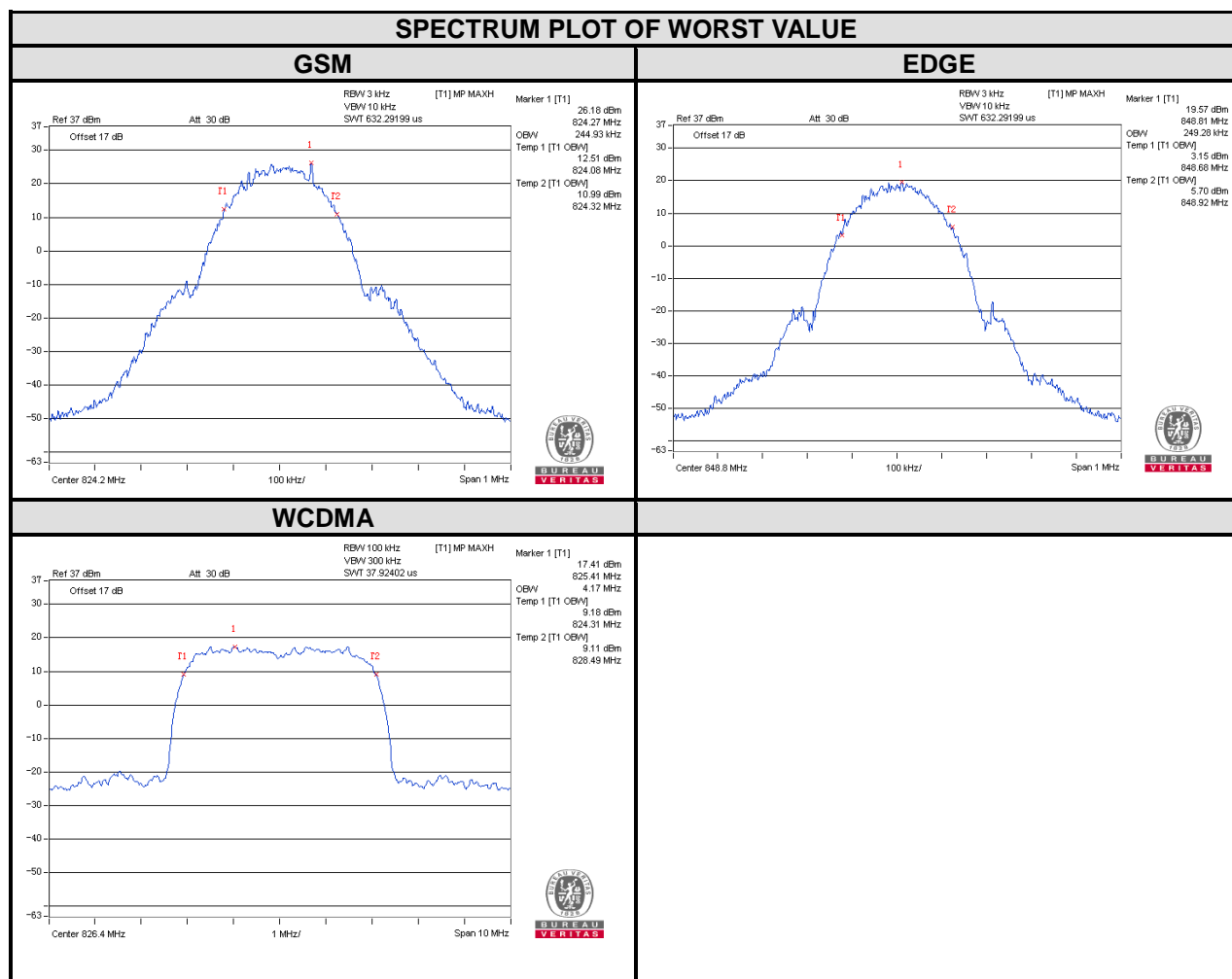
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

4.3.2 TEST SETUP



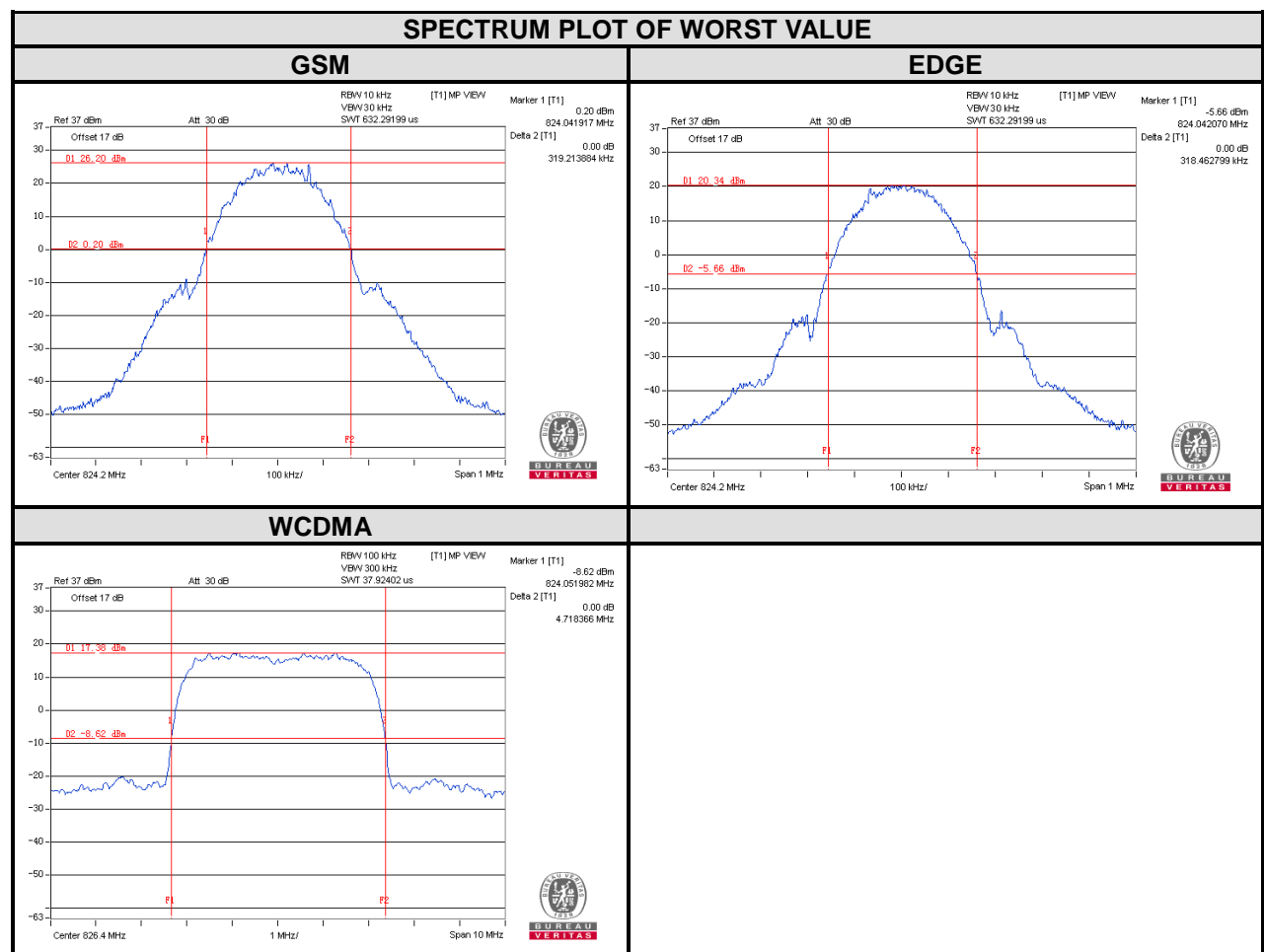
4.3.3 TEST RESULTS

| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|
| | | GSM | EDGE | | | WCDMA |
| 128 | 824.2 | 244.93 | 247.83 | 4132 | 826.4 | 4.17 |
| 190 | 836.6 | 244.93 | 247.83 | 4182 | 836.4 | 4.14 |
| 251 | 848.8 | 243.48 | 249.28 | 4233 | 846.6 | 4.17 |





| CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) |
|---------|-----------------|----------------------|--------|---------|-----------------|----------------------|
| | | GSM | EDGE | | | |
| 128 | 824.2 | 319.21 | 318.46 | 4132 | 826.4 | 4.72 |
| 190 | 836.6 | 316.67 | 313.53 | 4182 | 836.4 | 4.68 |
| 251 | 848.8 | 313.22 | 315.69 | 4233 | 846.6 | 4.71 |

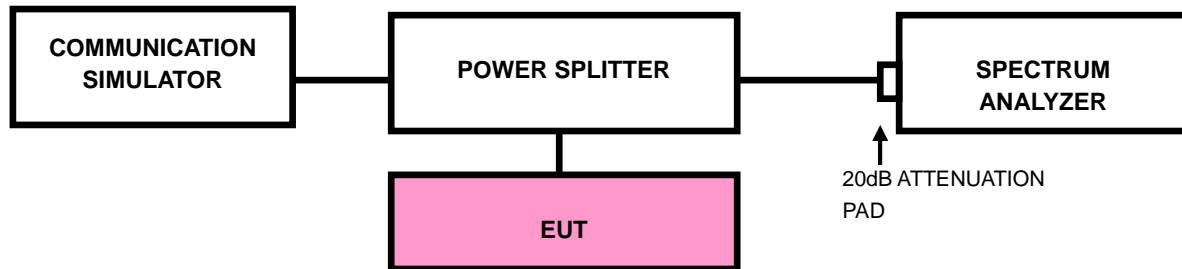


4.4 BAND EDGE MEASUREMENT

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.

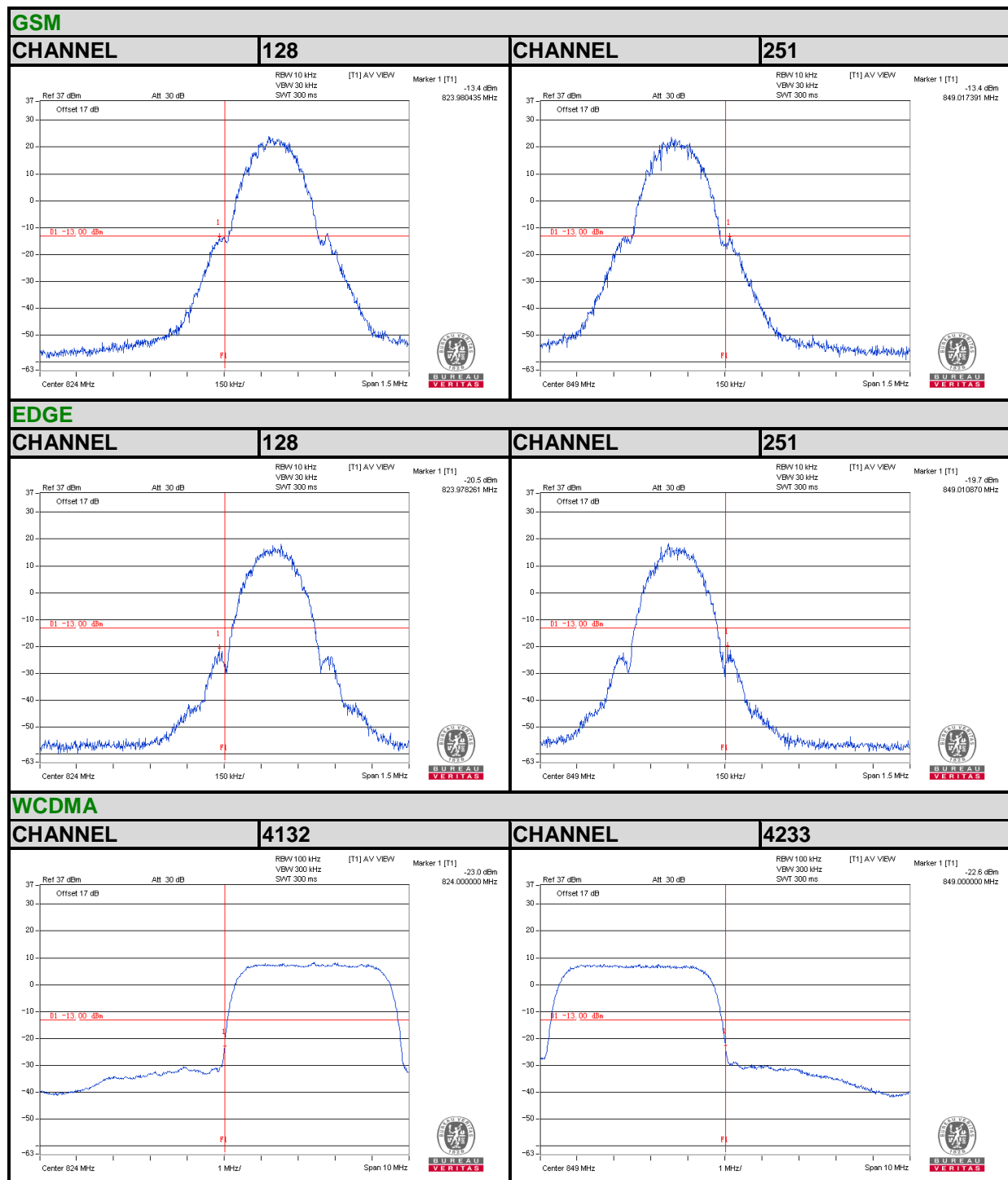
4.4.2 TEST SETUP



4.4.3 TEST PROCEDURES

- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/EDGE).
- c. 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).
- d. Record the max trace plot into the test report.

4.4.4 TEST RESULTS



4.5 CONDUCTED SPURIOUS EMISSIONS

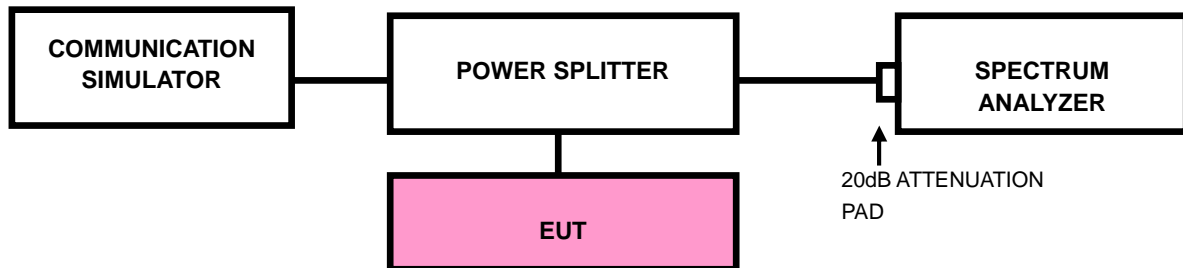
4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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 -13dBm .

4.5.2 TEST PROCEDURE

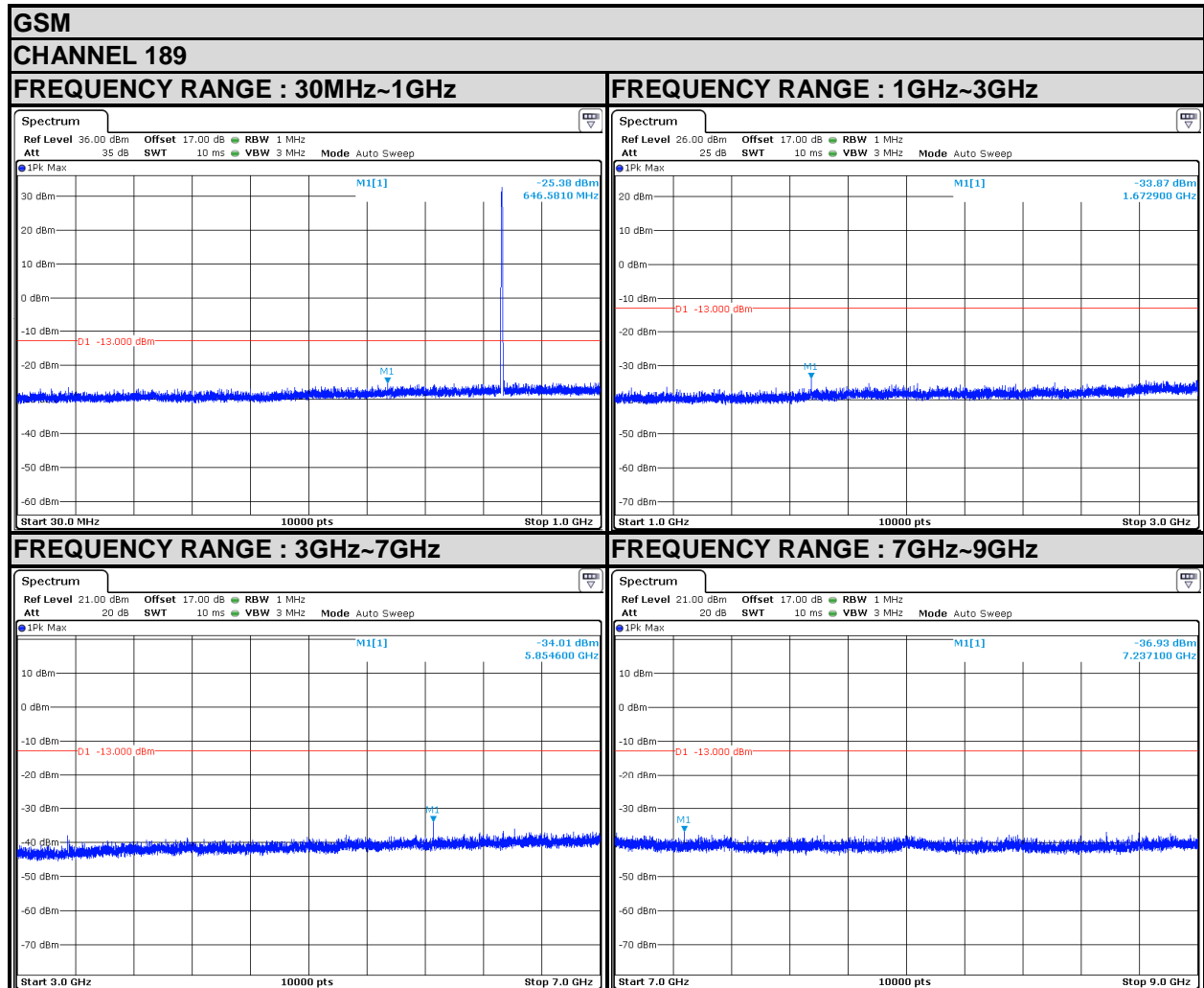
- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

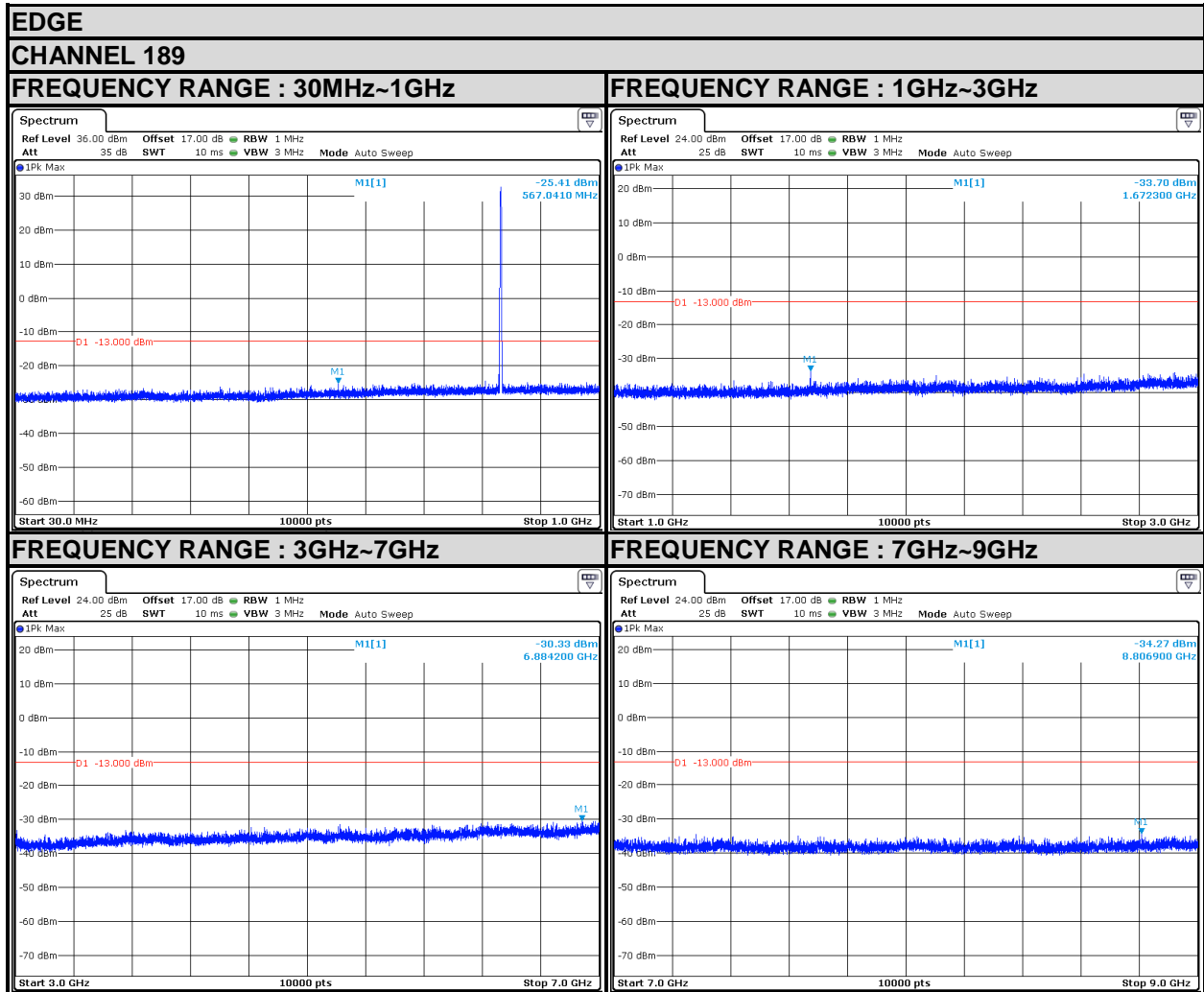
4.5.3 TEST SETUP





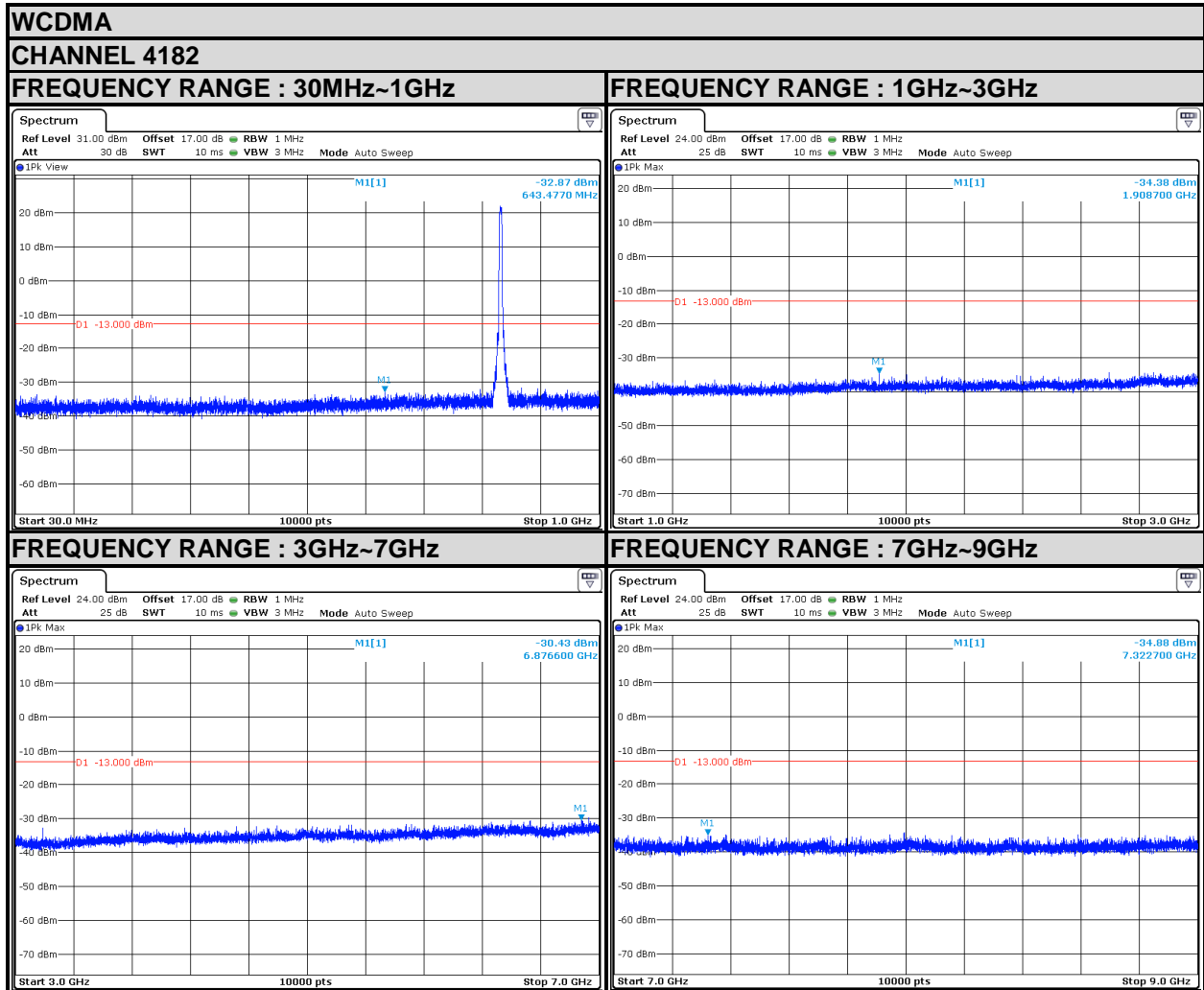
4.5.4 TEST RESULTS







Test Report No.: RF150512N006-3



Bureau Veritas Shenzhen Co., Ltd.
Dongguan Branch

No. 34, Chenwulu Section, Guantai Rd.,
Houjie Town, Dongguan City,
Guangdong 523942, China

Tel: +86 769 8593 5656
Fax: +86 769 8593 1080
Email: customerservice.dg@cn.bureauveritas.com



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 -13dBm .

4.6.2 TEST PROCEDURES

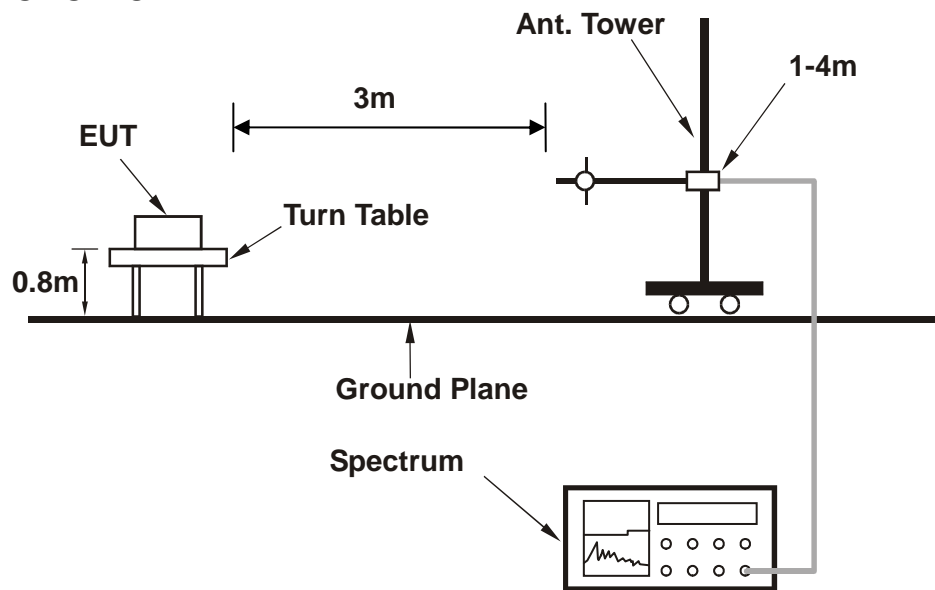
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from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

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



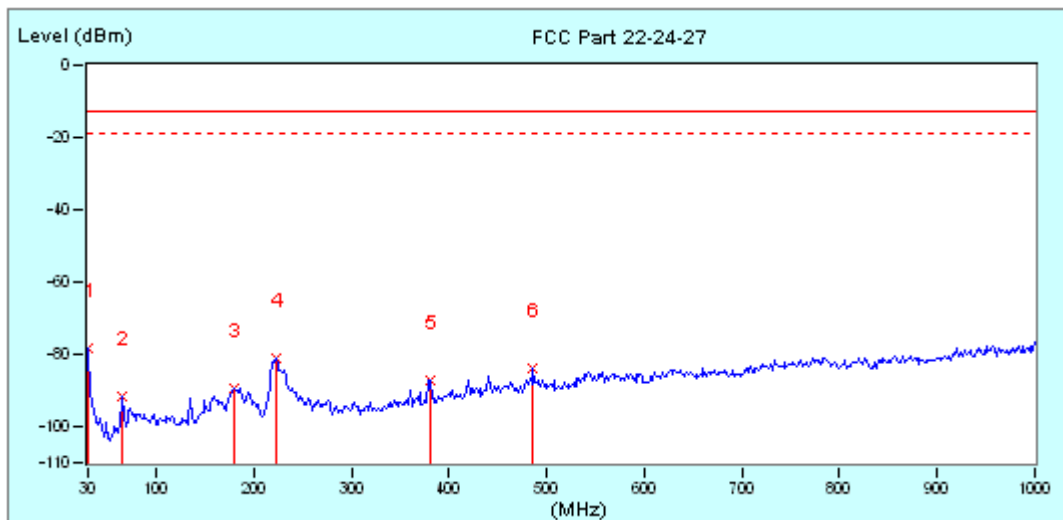
For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.6.5 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

GSM 850:

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 128 | FREQUENCY RANGE | Below 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

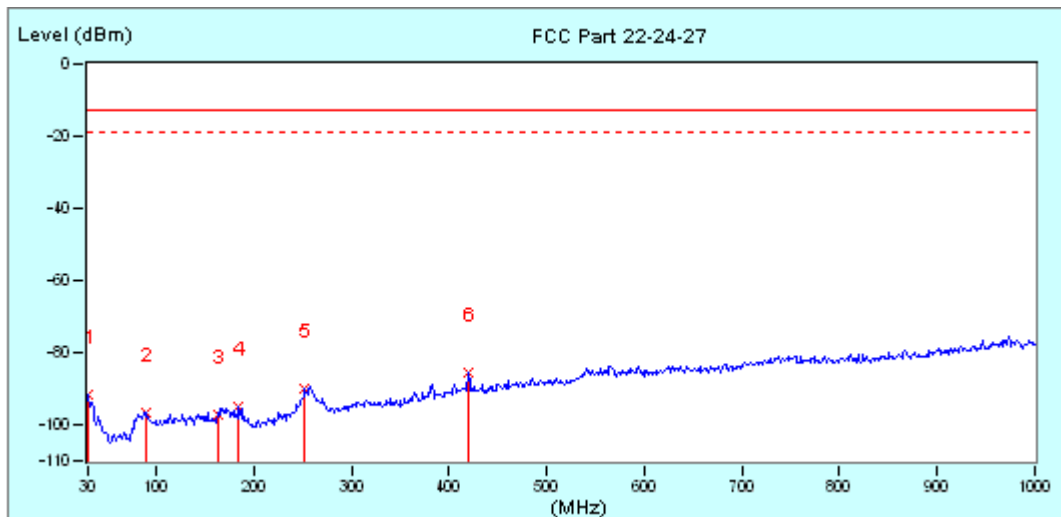


| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table cm deg | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|-------------------------|---|
| * | 1 | -12.55 | -56.66 | -69.21 | -13.00 | -56.21 | 100 | 0 |
| | 2 | -18.01 | -67.33 | -85.34 | -13.00 | -72.34 | 100 | 0 |
| | 3 | -25.35 | -65.88 | -91.23 | -13.00 | -78.23 | 100 | 0 |
| | 4 | -19.01 | -74.87 | -93.88 | -13.00 | -80.88 | 100 | 0 |
| | 5 | -19.95 | -70.97 | -90.92 | -13.00 | -77.92 | 100 | 0 |
| | 6 | -10.87 | -74.74 | -85.61 | -13.00 | -72.61 | 100 | 0 |



Test Report No.: RF150512N006-3

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 128 | FREQUENCY RANGE | Below 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |



| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table cm deg |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|-------------------------|
| 1 | 30.00 | -12.55 | -78.91 | -91.46 | -13.00 | -78.46 | 100 0 |
| 2 | 89.04 | -21.44 | -75.02 | -96.46 | -13.00 | -83.46 | 100 0 |
| 3 | 163.55 | -19.51 | -77.82 | -97.33 | -13.00 | -84.33 | 100 0 |
| 4 | 184.64 | -20.50 | -74.71 | -95.21 | -13.00 | -82.21 | 100 0 |
| 5 | 252.12 | -16.56 | -73.68 | -90.24 | -13.00 | -77.24 | 100 0 |
| * 6 | 419.41 | -10.87 | -74.87 | -85.74 | -13.00 | -72.74 | 100 0 |

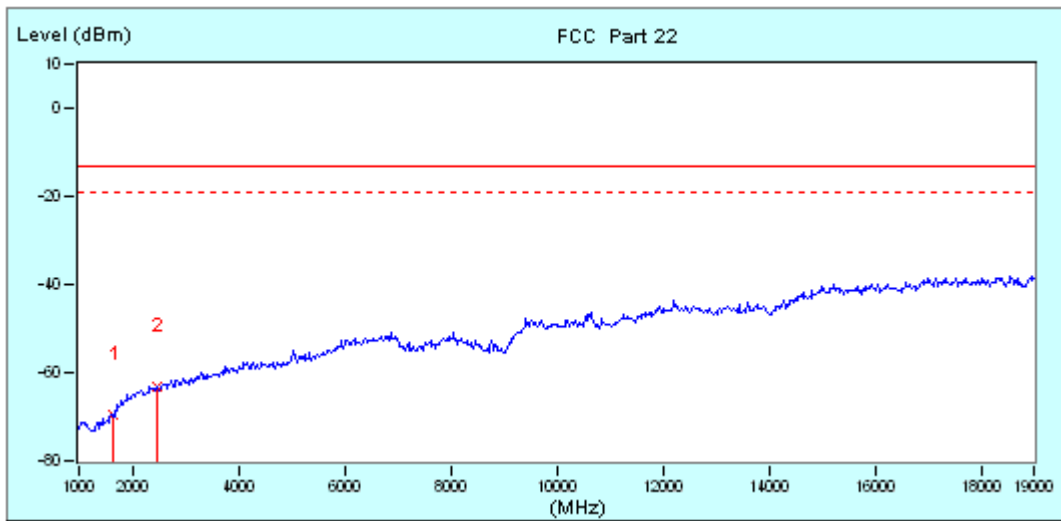


Test Report No.: RF150512N006-3

ABOVE 1GHz DATA

GSM 850:

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 128 | FREQUENCY RANGE | Above 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

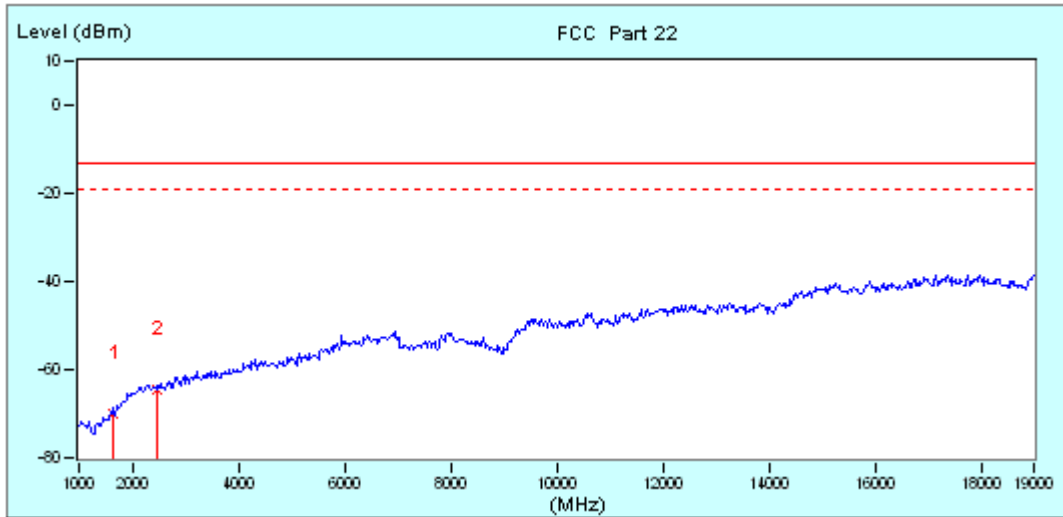


| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table cm deg | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|-------------------------|---|
| 1 | 1652.17 (PK) | -2.08 | -67.63 | -69.71 | -13.00 | -56.71 | 100 | 0 |
| * | 2 | 3.96 | -67.20 | -63.24 | -13.00 | -50.24 | 100 | 0 |



Test Report No.: RF150512N006-3

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 128 | FREQUENCY RANGE | Above 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

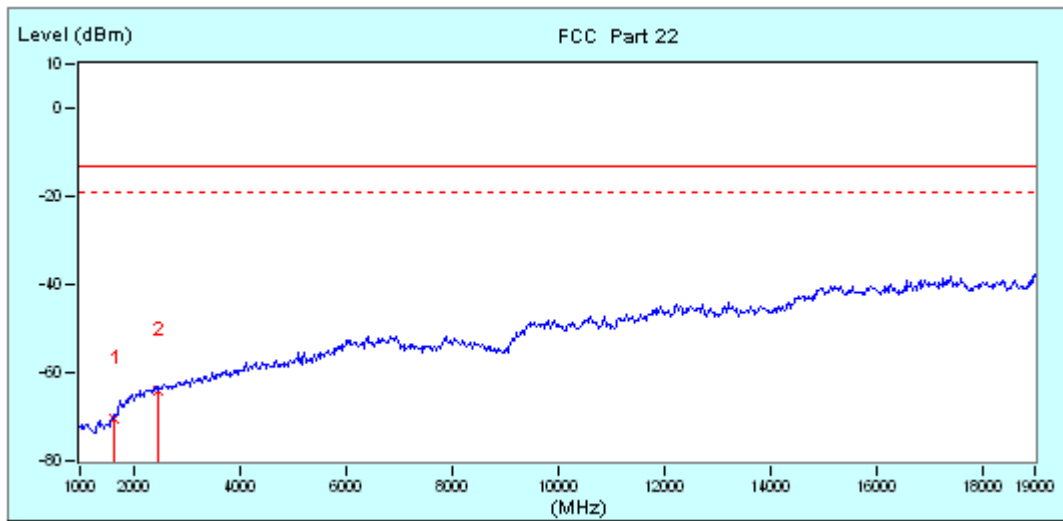


| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table cm deg | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|-------------------------|---|
| 1 | 1626.09 (PK) | -2.39 | -67.42 | -69.81 | -13.00 | -56.81 | 100 | 0 |
| * | 2460.87 (PK) | 3.96 | -68.37 | -64.41 | -13.00 | -51.41 | 100 | 0 |



EDGE 850:

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 128 | FREQUENCY RANGE | Above 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

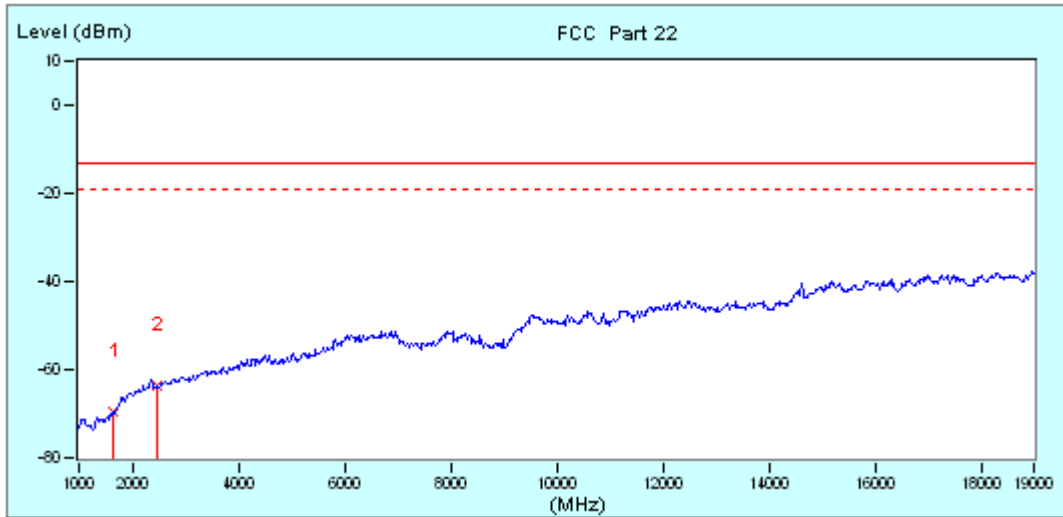


| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|---------------|-----|
| | | | | | | | cm | deg |
| 1 | 1626.09 (PK) | -2.39 | -68.05 | -70.44 | -13.00 | -57.44 | 100 | 0 |
| * | 2460.87 (PK) | 3.96 | -67.87 | -63.91 | -13.00 | -50.91 | 100 | 0 |



Test Report No.: RF150512N006-3

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 128 | FREQUENCY RANGE | Above 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |



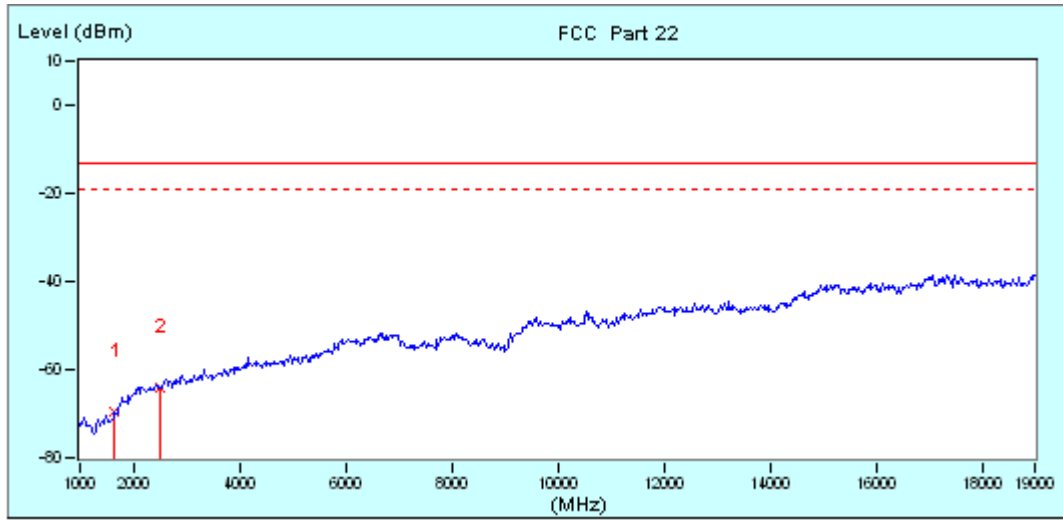
| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|---------------|-----|
| | | | | | | | cm | deg |
| 1 | 1626.09 (PK) | -2.39 | -67.21 | -69.60 | -13.00 | -56.60 | 100 | 0 |
| * | 2 | 3.96 | -67.46 | -63.50 | -13.00 | -50.50 | 100 | 0 |



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WCDMA Band V:

| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 4132 | FREQUENCY RANGE | Above 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

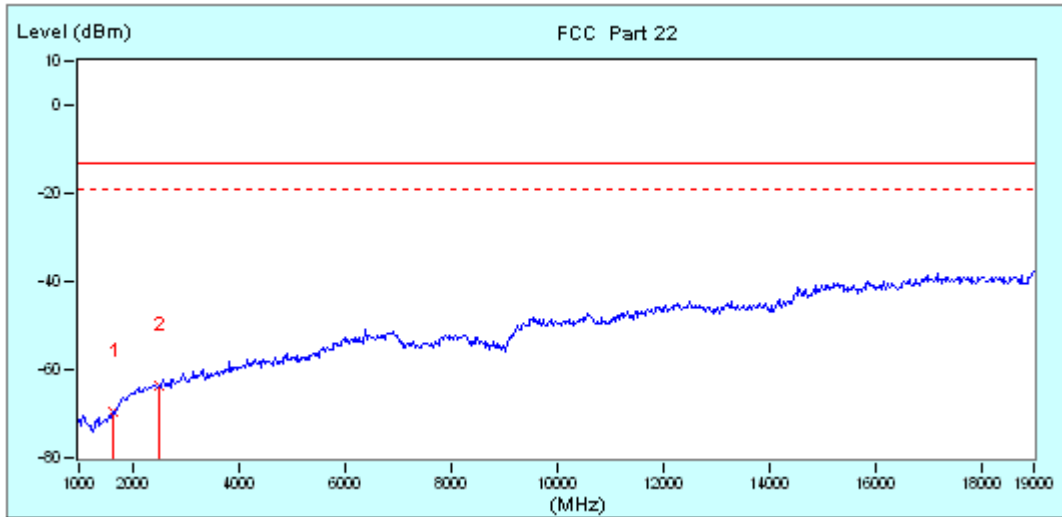


| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|---------------|-----|
| | | | | | | | cm | deg |
| 1 | 1652.17 (PK) | -2.08 | -67.62 | -69.70 | -13.00 | -56.70 | 100 | 0 |
| * | 2513.04 (PK) | 4.14 | -68.26 | -64.12 | -13.00 | -51.12 | 100 | 0 |



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| | | | |
|--|-----------------|------------------------|--------------------|
| MODE | TX channel 4132 | FREQUENCY RANGE | Above 1000MHz |
| ENVIRONMENTAL CONDITIONS | 26deg. C, 56%RH | INPUT POWER | DC 5V from adapter |
| TESTED BY | Bob Chen | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |



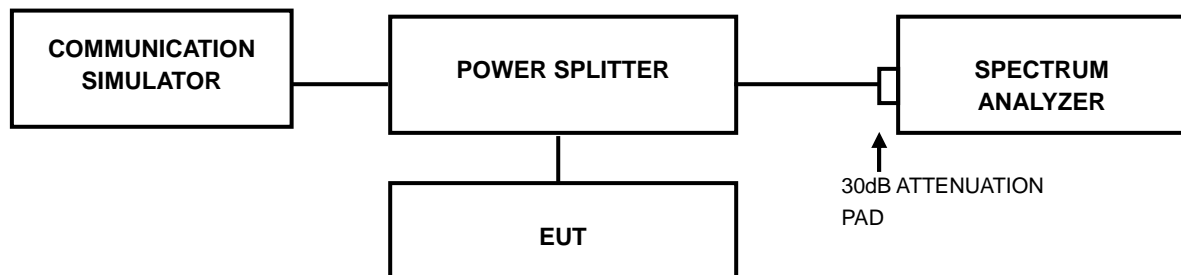
| No. | Frequency MHz | Factor dB | Reading dBm | Emission dBm | Limit dBm | Margin dB | Tower / Table cm deg | |
|-----|------------------|--------------|----------------|-----------------|--------------|--------------|-------------------------|---|
| 1 | 1652.17 (PK) | -2.08 | -67.65 | -69.73 | -13.00 | -56.73 | 100 | 0 |
| * | 2 | 2513.04 (PK) | -67.89 | -63.75 | -13.00 | -50.75 | 100 | 0 |

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



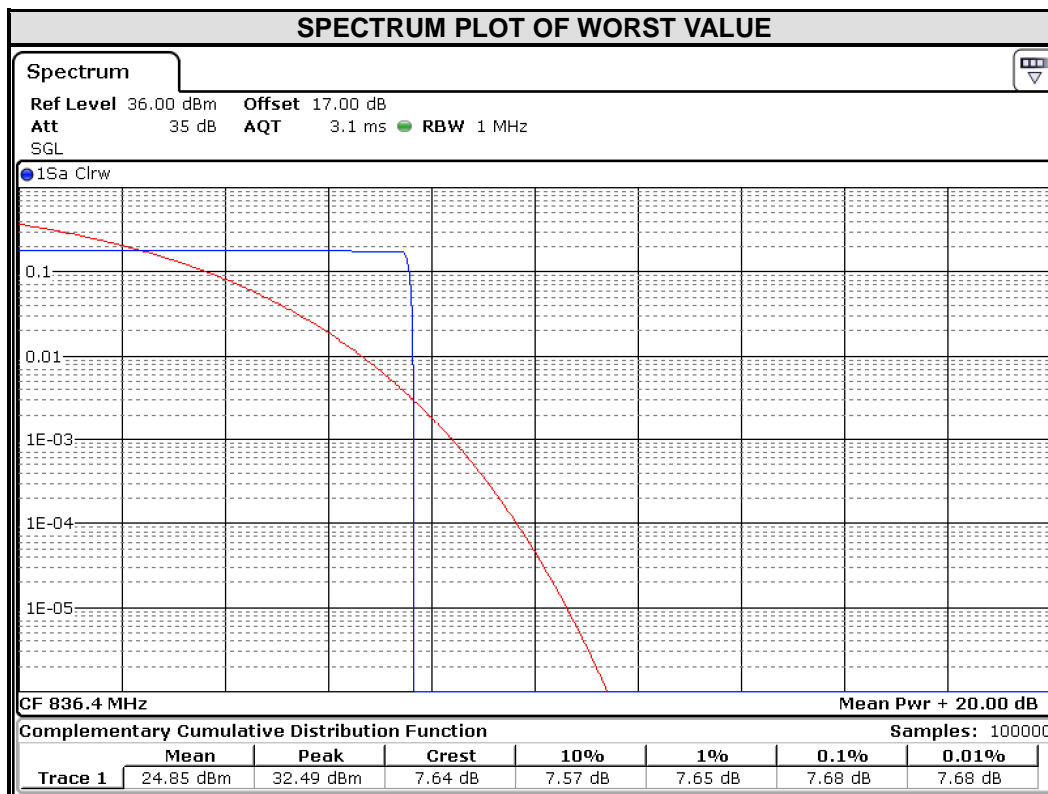
4.7.3 TEST PROCEDURES

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

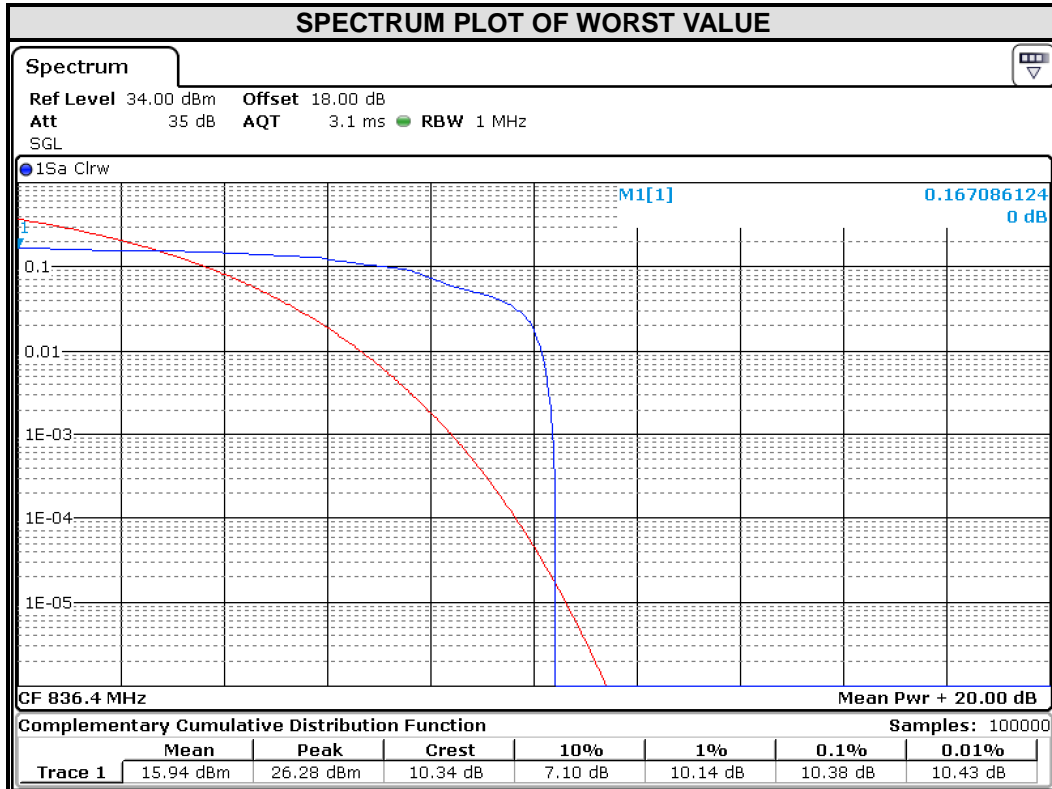
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 128 | 824.2 | 7.68 |





EDGE

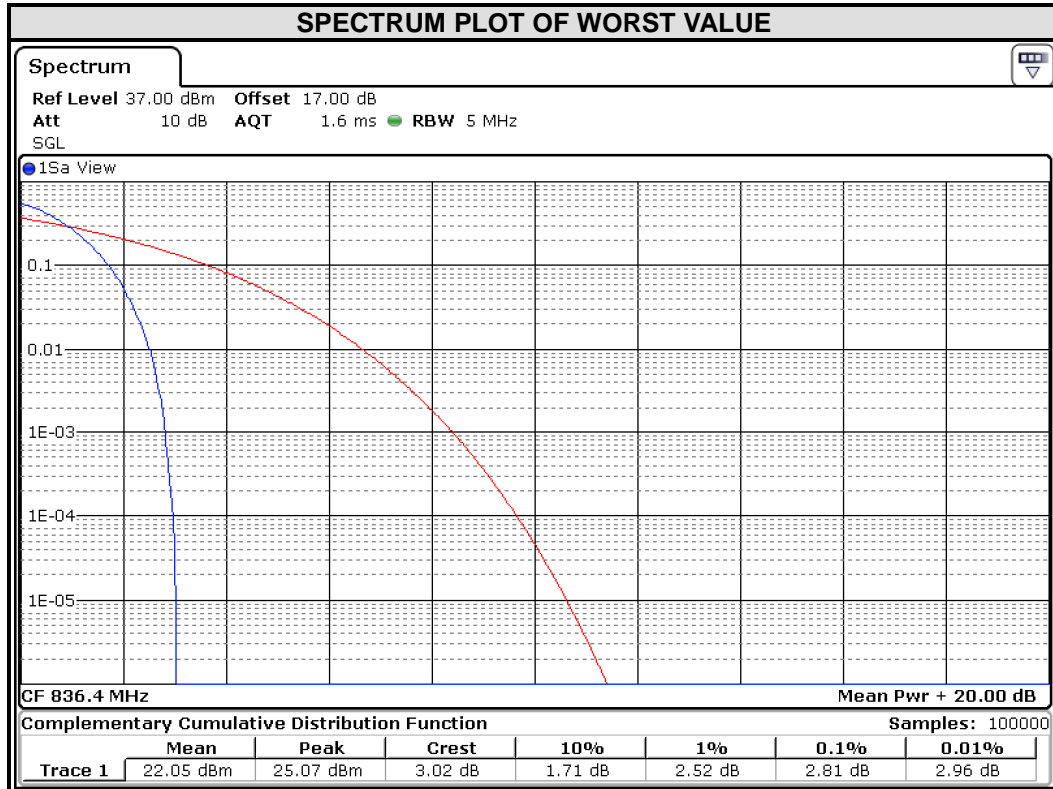
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 128 | 824.2 | 10.38 |





WCDMA

| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 4182 | 836.4 | 2.81 |





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5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch, were founded in 2002 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

Dongguan EMC/RF Lab:

Tel: +86-769-85935656

Fax: +86-769-85931080

Email: customerservice.dg@cn.bureauveritas.com

Web Site: www.adt.com.tw

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



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7 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---