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FCC TEST REPORT (PART 22)

REPORT NO.: RF120823C19
MODEL NO.: GTR-129X (X=A~Z or blank)
(refer to item 3.1 for more details)
FCC ID: RID-GTR129
RECEIVED: Aug. 23, 2012
TESTED: Oct. 18 ~ Oct. 25, 2012
ISSUED: Nov. 09, 2012

APPLICANT: GlobalSat WorldCom Corporation

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

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

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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|-------------|-------------------|---------------|
| RF120823C19 | Original release | Nov. 09, 2012 |



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1 CERTIFICATION

PRODUCT: Motorcycle/ Vehicle Tracker

MODEL: GTR-129X (X=A~Z or blank) (refer to item 3.1 for more details)

BRAND: GlobalSat

APPLICANT: GlobalSat WorldCom Corporation

TESTED: Oct. 18 ~ Oct. 25, 2012

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC PART 22, Subpart H


The above equipment (model: GTR-129) 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

: 
Pettie Chen / Senior Specialist

, **DATE** : Nov. 09, 2012

APPROVED BY

: 
Ken Liu / Manager

, **DATE** : Nov. 09, 2012

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 22 & Part 2 | | | |
|--|------------------------------|--------|--|
| STANDARD SECTION | 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 -12.56dB at 2472.6MHz. |

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 | 150kHz~30MHz | 2.44 dB |
| Radiated emissions | 30MHz ~ 200MHz | 2.93 dB |
| | 200MHz ~1000MHz | 2.95 dB |
| | 1GHz ~ 18GHz | 2.26 dB |
| | 18GHz ~ 40GHz | 1.94 dB |

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

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|------------------------------|----------------------|---------------------|-------------------------|
| Test Receiver ROHDE & SCHWARZ | ESCI | 100744 | Apr. 19, 2012 | Apr. 18, 2013 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSP40 | 100269 | Jan. 30, 2012 | Jan. 29, 2013 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-156 | Apr. 03, 2012 | Apr. 02, 2013 |
| HORN Antenna SCHWARZBECK | BBHA 9120 D | 9120D-563 | Sep. 12, 2012 | Sep. 11, 2013 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | 148 | Jul. 11, 2012 | Jul. 10, 2013 |
| Loop Antenna | HFH2-Z2 | 100070 | Jan. 31, 2012 | Jan. 30, 2014 |
| Preamplifier Agilent | 8449B | 3008A01911 | Oct. 25, 2012 | Oct. 24, 2013 |
| Preamplifier Agilent | 8447D | 2944A10638 | Oct. 25, 2012 | Oct. 24, 2013 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 295013/4 283403/4 | Aug. 28, 2012 | Aug. 27, 2013 |
| RF signal cable Worken | 8D-FB | Cable-HYCH9-01 | Aug. 11, 2012 | Aug. 10, 2013 |
| Software | ADT_Radiated_ V7.6.15.9.2 | 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 Table Controller EMCO | 2090 | NA | NA | NA |
| Mini-Circuits Power Splitter | ZN2PD-9G | NA | Jul. 18, 2012 | Jul. 17, 2013 |
| JFW 20dB attenuation | 50HF-020-SMA | NA | NA | NA |

- 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. The test was performed in HwaYa Chamber 9.
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 5. The FCC Site Registration No. is 460141.
 6. The IC Site Registration No. is IC 7450F-4.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|--------------------------|--|
| EUT | Motorcycle/ Vehicle Tracker |
| MODEL NO. | GTR-129X (X=A~Z or blank) (Refer to Note for more details) |
| IMEI CODE | 012896000746864 861785005254820 |
| POWER SUPPLY | 3.7Vdc (battery) 9 ~34Vdc, 1A |
| MODULATION TYPE | GMSK |
| FREQUENCY RANGE | 824.2MHz ~ 848.8MHz |
| MAX. ERP POWER | 1327.39mW (31.23dBm) |
| MULTI-SLOTS CLASS | 12 |
| ANTENNA TYPE | Built-in PIFA antenna with 1 dBi gain |
| I/O PORTS | Refer to users' manual |
| DATA CABLE | Hardwire cable (0.9m) |
| ACCESSORY DEVICES | Battery |

NOTE:

1. All models are listed as below.

| Brand | Model | Difference |
|-----------|---------------------------|---|
| GlobalSat | GTR-129X (X=A~Z or blank) | With internal battery Operating temperature: -10~60°C |
| | GTR-128X (X=A~Z or blank) | Without internal battery Operating temperature: -30~70°C |

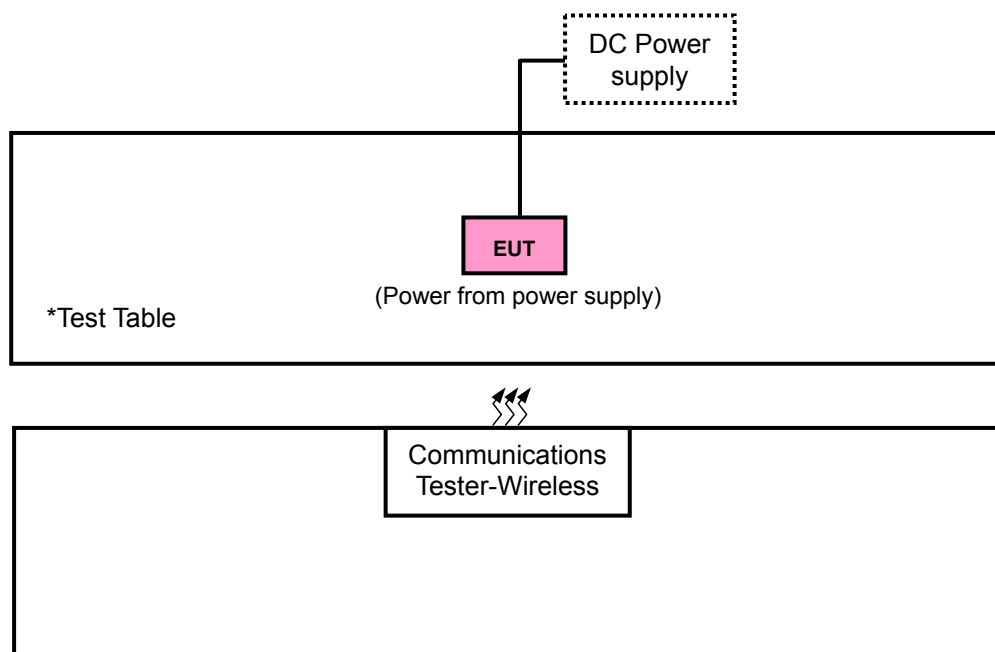
*GTR-129 was chosen for the final test.

2. The EUT uses following battery.

| | |
|---------------|----------------|
| Brand | Li-Polymer |
| Model | H402437 |
| Rating | 3.7Vdc, 320mAh |

3. The module (model no.: 3333 and brand name: MTK) is collocated in this EUT.
4. The above EUT information was 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



3.3 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 Power supply | TOPWARD | TF-6603A | 725942 | NA |
| 2 | Communications Tester-Wireless | Agilent | E5515C | MY50266653 | NA |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1 | NA |
| 2 | NA |

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 2 act as a communication partner to transfer data.
3. Item 1 was placed under the testing table.

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 Z-plane for EUT. Following channel(s) was (were) selected for the final test as listed below:

GPRS MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | MODE |
|----------------------------------|-------------------|----------------|------|
| ERP | 128 to 251 | 128, 189, 251 | GPRS |
| FREQUENCY STABILITY | 128 to 251 | 128 | GPRS |
| OCCUPIED BANDWIDTH | 128 to 251 | 128, 189, 251 | GPRS |
| BAND EDGE | 128 to 251 | 128, 251 | GPRS |
| CONDCUDED EMISSION | 128 to 251 | 128, 189, 251 | GPRS |
| RADIATED EMISSION BELOW 1 GHz | 128 to 251 | 251 | GPRS |
| RADIATED EMISSION ABOVE 1 GHz | 128 to 251 | 128, 189, 251 | GPRS |

TEST CONDITION:

| TEST ITEM | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---------------------|--------------------------|-------------|-----------|
| ERP | 25deg. C, 68%RH | 12Vdc | Sun Lin |
| FREQUENCY STABILITY | 25deg. C, 68%RH | 12Vdc | Sun Lin |
| OCCUPIED BANDWIDTH | 25deg. C, 68%RH | 12Vdc | Sun Lin |
| BAND EDGE | 25deg. C, 68%RH | 12Vdc | Sun Lin |
| CONDCUDED EMISSION | 25deg. C, 68%RH | 12Vdc | Sun Lin |
| RADIATED EMISSION | 25deg. C, 68%RH | 12Vdc | Sun Lin |



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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.

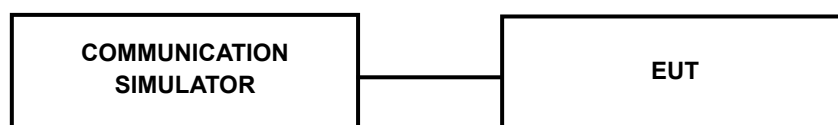
4.1.2 TEST PROCEDURES

CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GPRS 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

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 | GPRS 850 | | |
|--------------------|----------|-------|--------------|
| Channel | 128 | 189 | 251 |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| GPRS 8 (1 Uplink) | 32.27 | 32.34 | 32.38 |
| GPRS 10 (2 Uplink) | 32.18 | 32.27 | 32.33 |

ERP POWER (dBm)

GPRS

| Channel | Frequency (MHz) | Conduction Power (dBm) | Ant Gain (dBi) | EIRP(dBm) | ERP(dBm) | Output Power (mW) |
|---------|-----------------|------------------------|----------------|-----------|----------|-------------------|
| 128 | 824.2 | 32.27 | 1 | 33.27 | 31.12 | 1294.20 |
| 189 | 836.4 | 32.34 | 1 | 33.34 | 31.19 | 1315.22 |
| 251 | 848.8 | 32.38 | 1 | 33.38 | 31.23 | 1327.39 |

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

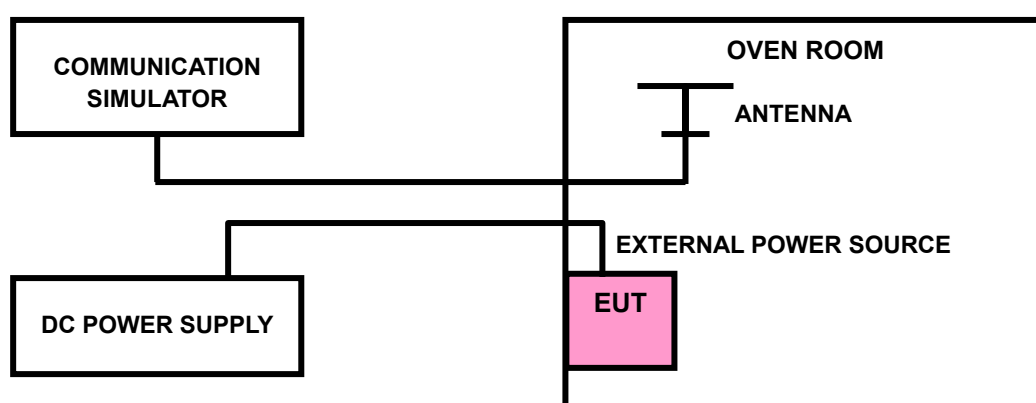
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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) |
|-----------------|-----------------------|-------------|
| | GPRS | |
| 13.8 | -0.019 | 2.5 |
| 10.2 | -0.023 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 10.2Vdc to 13.8Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

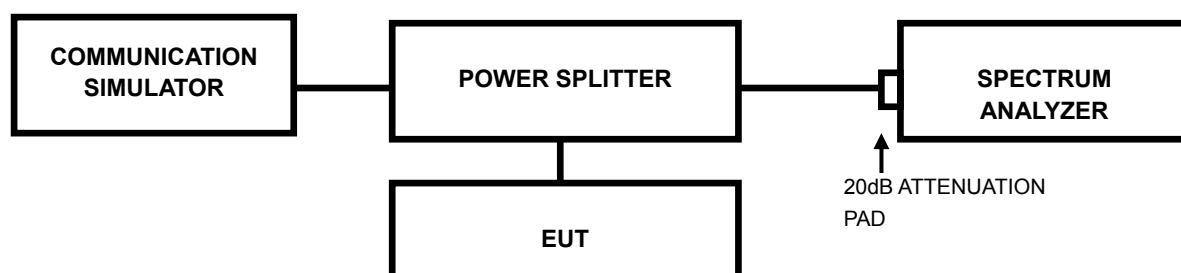
| TEMP. (°C) | FREQUENCY ERROR (ppm) | LIMIT (ppm) |
|------------|-----------------------|-------------|
| | GPRS | |
| 60 | -0.037 | 2.5 |
| 50 | -0.038 | 2.5 |
| 40 | -0.032 | 2.5 |
| 30 | -0.017 | 2.5 |
| 20 | -0.023 | 2.5 |
| 10 | -0.019 | 2.5 |
| 0 | -0.029 | 2.5 |
| -10 | -0.035 | 2.5 |
| -20 | -0.047 | 2.5 |
| -30 | -0.054 | 2.5 |

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 TEST PROCEDURES

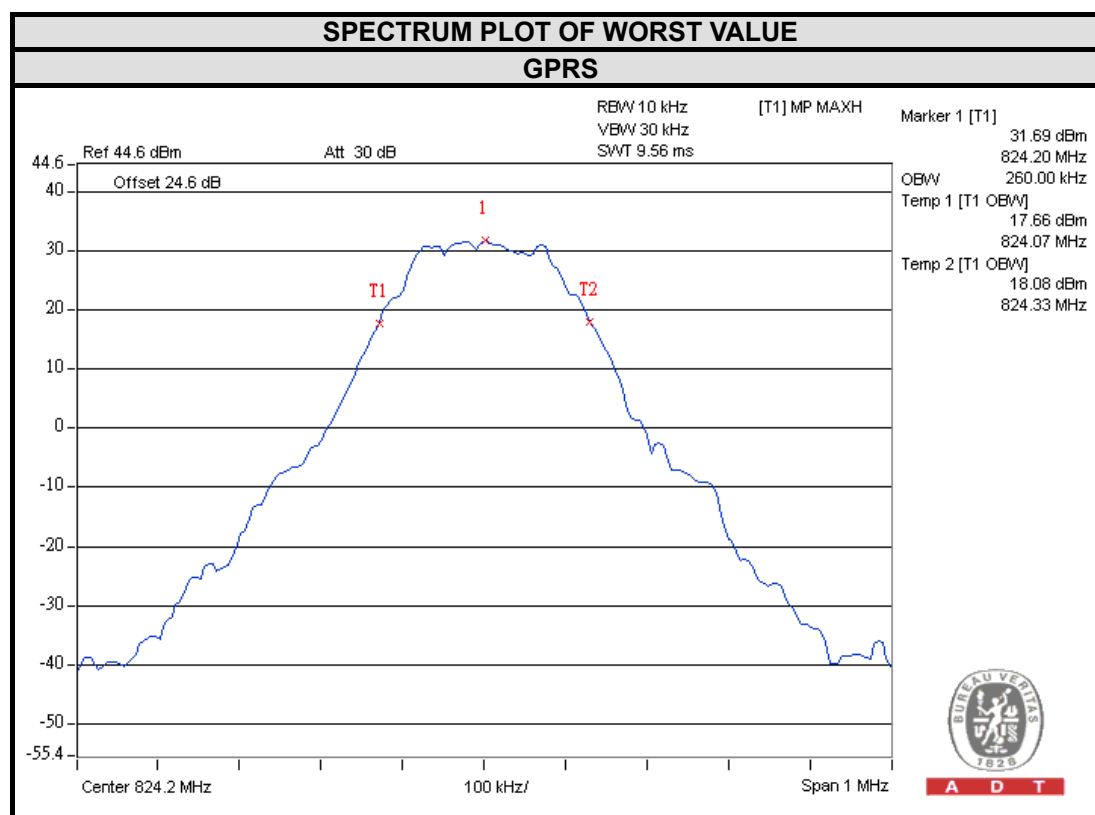
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function 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) |
|---------|--------------------|------------------------------|
| | | GPRS |
| 128 | 824.2 | 260 |
| 189 | 836.4 | 255 |
| 251 | 848.8 | 260 |

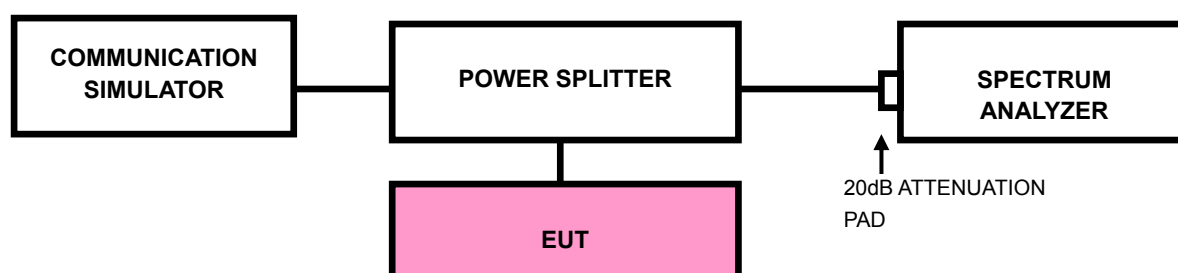


4.4 BAND EDGE MEASUREMENT

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.

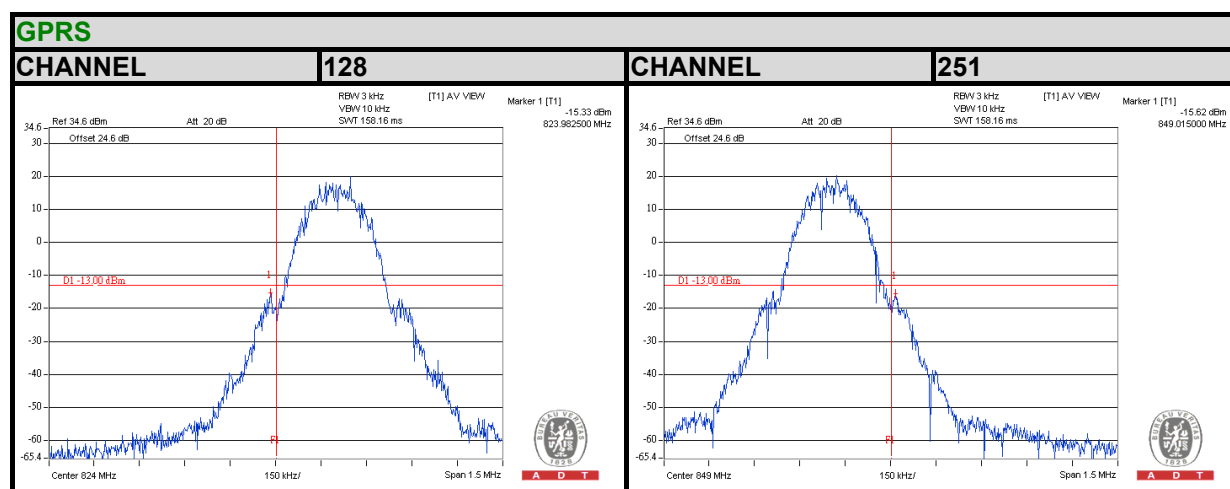
4.4.2 TEST SETUP



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. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GPRS).
- Record the max trace plot into the test report.

4.4.4 TEST RESULTS



4.5 CONDUCTED SPURIOUS EMISSIONS

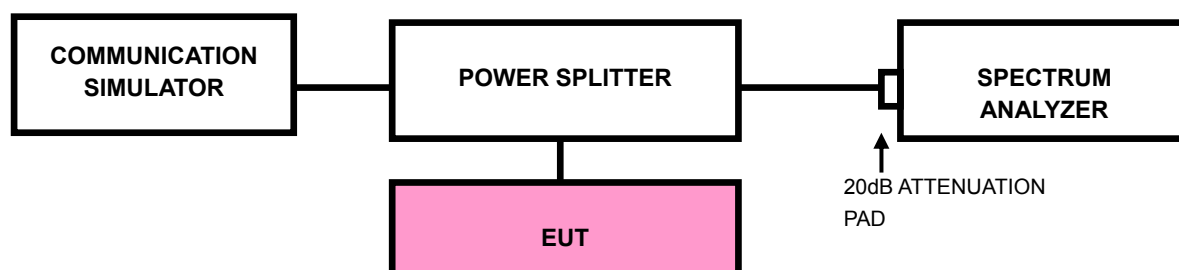
4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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 .

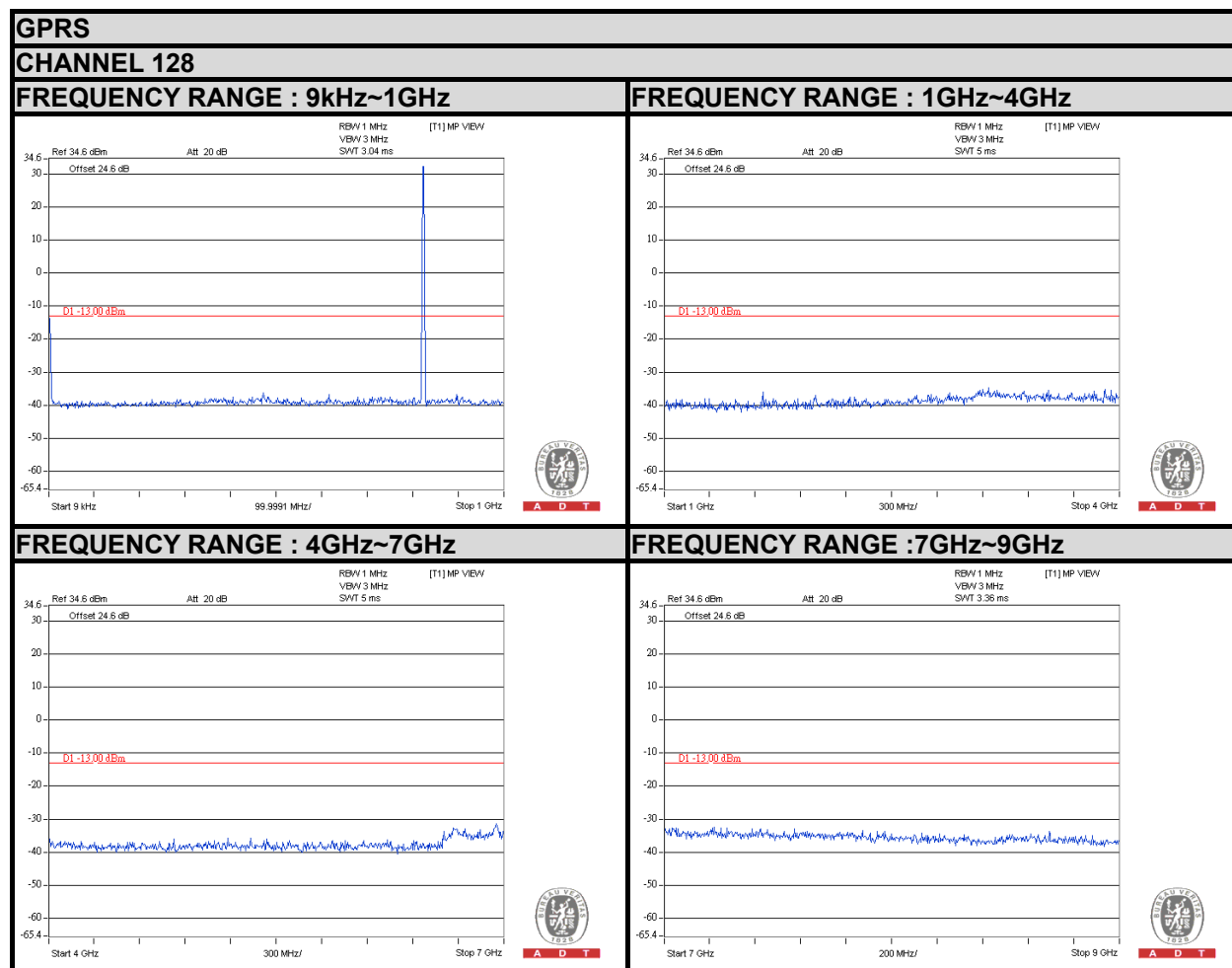
4.5.2 TEST PROCEDURE

- 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 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



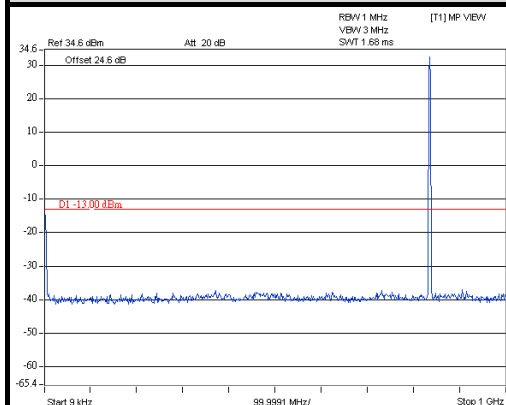


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GPRS

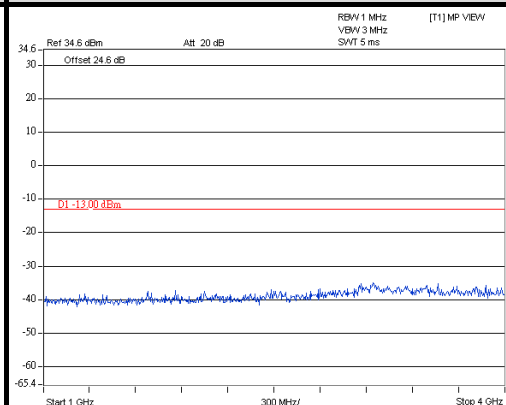
CHANNEL 189

FREQUENCY RANGE : 9kHz~1GHz



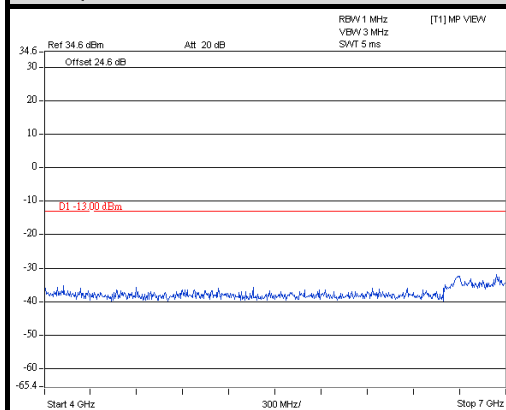
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FREQUENCY RANGE : 1GHz~4GHz



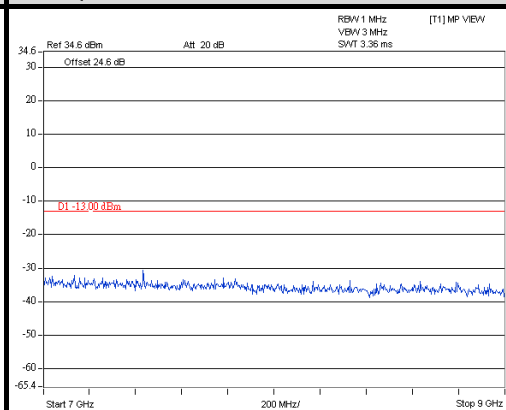
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FREQUENCY RANGE : 4GHz~7GHz



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FREQUENCY RANGE : 7GHz~9GHz

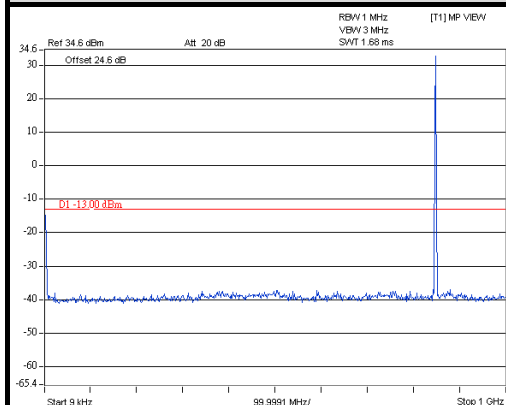


A D T

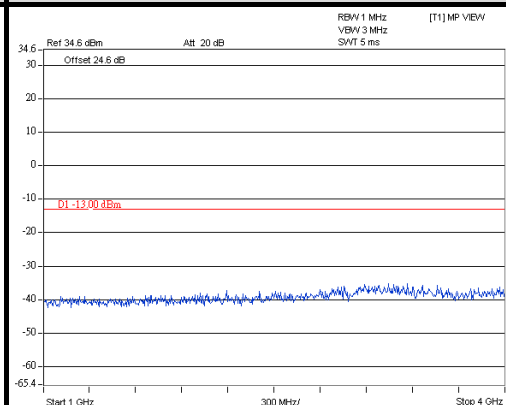
GPRS

CHANNEL 251

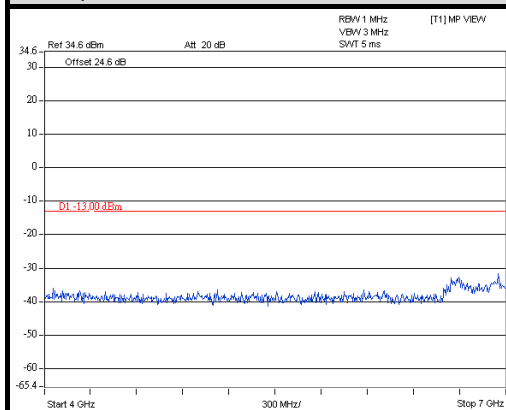
FREQUENCY RANGE : 9kHz~1GHz



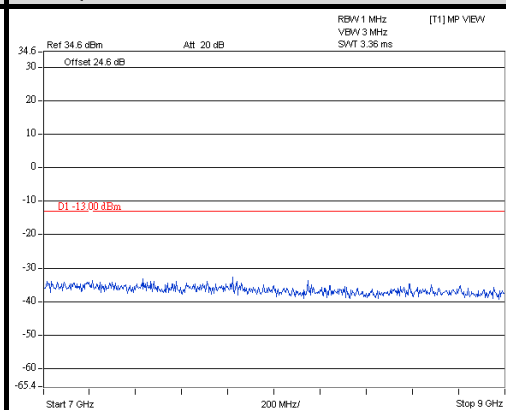
FREQUENCY RANGE : 1GHz~4GHz



FREQUENCY RANGE : 4GHz~7GHz



FREQUENCY RANGE : 7GHz~9GHz



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

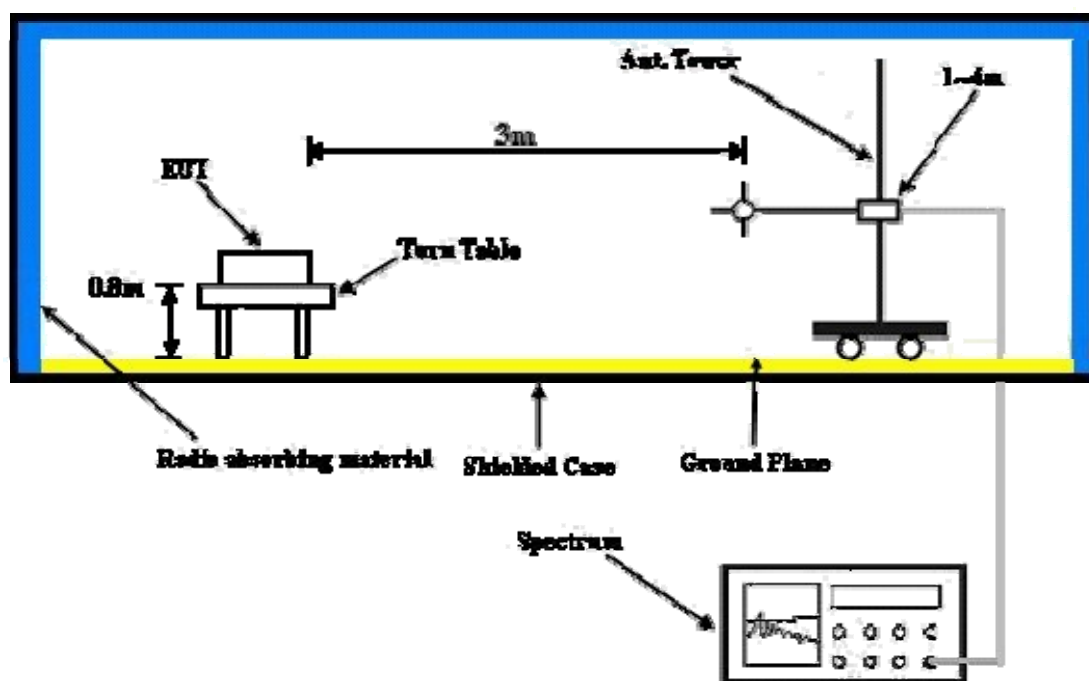
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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

GPRS:

| | | | |
|-------------|----------------|--------------------------|-----------------|
| MODE | TX channel 251 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 12Vdc | ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH |
| TESTED BY | Sun Lin | | |

| 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 | 33.88 | -52.1 | -35.3 | -12.1 | -49.5 | -13.0 | -36.5 |
| 2 | 119.24 | -53.6 | -60.3 | 0.0 | -62.4 | -13.0 | -49.4 |
| 3 | 140.58 | -49.9 | -55.8 | 0.0 | -57.9 | -13.0 | -44.9 |
| 4 | 212.36 | -51.5 | -63.0 | 5.5 | -59.6 | -13.0 | -46.6 |
| 5 | 538.28 | -59.9 | -64.3 | 4.7 | -61.8 | -13.0 | -48.8 |
| 6 | 825.40 | -66.9 | -65.3 | 4.0 | -63.4 | -13.0 | -50.4 |
| 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 | 62.98 | -57.0 | -51.2 | -6.8 | -60.1 | -13.0 | -47.1 |
| 2 | 142.52 | -44.5 | -44.1 | 0.0 | -46.2 | -13.0 | -33.2 |
| 3 | 192.96 | -50.9 | -49.0 | 4.6 | -46.5 | -13.0 | -33.5 |
| 4 | 282.20 | -53.0 | -51.9 | 5.2 | -48.9 | -13.0 | -35.9 |
| 5 | 317.12 | -57.0 | -57.1 | 5.2 | -54.0 | -13.0 | -41.0 |
| 6 | 538.28 | -60.6 | -64.1 | 4.7 | -61.5 | -13.0 | -48.5 |

REMARKS:

- ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15.
- Correction Factor = gain of substitution antenna + cable loss



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Above 1GHz

GPRS:

| | | | |
|-------------|-------------|--------------------------|-----------------|
| MODE | Channel 128 | FREQUENCY RANGE | Above 1000MHz |
| INPUT POWER | 12Vdc | ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH |
| TESTED BY | Sun Lin | | |

| 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 | 1648.4 | -48.11 | -51.07 | 5.48 | -47.74 | -13.0 | -34.74 |
| 2 | 2472.6 | -31.52 | -33.01 | 6.43 | -28.73 | -13.0 | -15.73 |
| 3 | 3296.8 | -43.80 | -43.10 | 6.87 | -38.38 | -13.0 | -25.38 |
| 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 | 1648.4 | -44.20 | -50.19 | 5.48 | -46.86 | -13.0 | -33.86 |
| 2 | 2472.6 | -29.10 | -29.84 | 6.43 | -25.56 | -13.0 | -12.56 |
| 3 | 3296.8 | -44.10 | -43.97 | 6.87 | -39.25 | -13.0 | -26.25 |

REMARKS:

1. $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)} - 2.15$.
2. Correction Factor = gain of substitution antenna + cable loss



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| | | | |
|-------------|-------------|--------------------------|-----------------|
| MODE | Channel 189 | FREQUENCY RANGE | Above 1000MHz |
| INPUT POWER | 12Vdc | ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH |
| TESTED BY | Sun Lin | | |

| 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 | 1672.8 | -46.12 | -49.01 | 5.54 | -45.62 | -13.0 | -32.62 |
| 2 | 2509.2 | -35.35 | -36.89 | 6.45 | -32.59 | -13.0 | -19.59 |
| 3 | 3345.6 | -41.52 | -40.74 | 6.94 | -35.95 | -13.0 | -22.95 |
| 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 | 1672.8 | -42.45 | -48.2 | 5.54 | -44.81 | -13.0 | -31.81 |
| 2 | 2509.2 | -33.44 | -34.45 | 6.45 | -30.15 | -13.0 | -17.15 |
| 3 | 3345.6 | -42.34 | -41.97 | 6.94 | -37.18 | -13.0 | -24.18 |

REMARKS:

1. $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)} - 2.15$.
2. $\text{Correction Factor} = \text{gain of substitution antenna} + \text{cable loss}$



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| | | | |
|-------------|-------------|--------------------------|-----------------|
| MODE | Channel 251 | FREQUENCY RANGE | Above 1000MHz |
| INPUT POWER | 12Vdc | ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH |
| TESTED BY | Sun Lin | | |

| 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 | 1697.6 | -48.20 | -51.01 | 5.59 | -47.57 | -13.0 | -34.57 |
| 2 | 2546.4 | -37.98 | -39.54 | 6.44 | -35.25 | -13.0 | -22.25 |
| 3 | 3395.2 | -41.97 | -41.11 | 7.02 | -36.24 | -13.0 | -23.24 |
| 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 | 1697.6 | -41.20 | -46.69 | 5.59 | -43.25 | -13.0 | -30.25 |
| 2 | 2546.4 | -39.20 | -40.23 | 6.44 | -35.94 | -13.0 | -22.94 |
| 3 | 3395.2 | -43.20 | -42.58 | 7.02 | -37.71 | -13.0 | -24.71 |

REMARKS:

1. $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)} - 2.15$.
2. Correction Factor = gain of substitution antenna + cable loss



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

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

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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---