

FCC Test Report

(PART 22)

Report No.: RF130805C06F

FCC ID: RID-TR300A

Test Model: TR-300A (Refer to item 3.1 for more details)

Received Date: Apr. 29, 2015

Test Date: Jul. 15 ~ Aug. 11, 2015

Issued Date: Aug. 17, 2015

Applicant: GlobalSat WorldCom Corporation

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(R.O.C.)

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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A D T

Release Control Record

Issue No.	Description	Date Issued
RF130805C06F	Original release	Aug. 17, 2015

1 Certificate of Conformity

Product: Personal Tracker

Brand: GlobalSat (Refer to item 3.1 for more details)

Test Model: TR-300A (Refer to item 3.1 for more details)

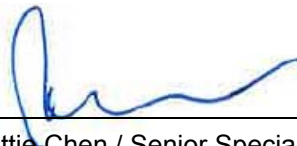
Sample Status: ENGINEERING SAMPLE

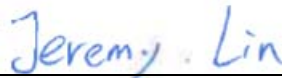
Applicant: GlobalSat WorldCom Corporation

Test Date: Jul. 15 ~ Aug. 11, 2015

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 EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Aug. 17, 2015
Pettie Chen / Senior Specialist

Approved by :  , **Date:** Aug. 17, 2015
Jeremy Lin / 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.
---	Peak To Average Ratio	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 -16.70dB at 881.66MHz.

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	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site And Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 01, 2014	Nov. 30, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Mar. 30, 2015	Mar. 29, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8447D	2944A10629	Oct. 18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01961	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	MWX322+MWX 2211308S0295	Nov. 06, 2014	Nov. 05, 2015
RF signal cable Worken	8D-FB	NA	Mar. 22, 2015	Mar. 21, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	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
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 09, 2015	Jun. 08, 2016
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 test was performed in HwaYa Chamber 4.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 460141.

5. The IC Site Registration No. is IC7450F-4.

3 General Information

3.1 General Description of EUT

Product	Personal Tracker
Brand	GlobalSat (Refer to Note for more details)
Test Model	TR-300A (Refer to Note for more details)
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	3.7Vdc (Battery) 5.0Vdc (Cradle or Charging Clip)
Modulation Type	GSM, GPRS, EDGE: GMSK WCDMA, HSDPA: BPSK
Operating Frequency	GSM, GPRS, EDGE: 824.2MHz ~ 848.8MHz WCDMA, HSDPA: 826.4MHz ~ 846.6MHz
Max. ERP Power	GSM: 0.4266W (16.3dBm) EDGE: 0.01259W (11.0dBm) WCDMA: 0.02399W (13.8dBm)
Emission Designator	GSM: 255KGXW GPRS: 260KG7W EDGE: 255KG7W WCDMA: 4M18F9W
Multi-Slots Class	10
WCDMA Release Version	5
Antenna Type	PIFA antenna with -10dBi gain
Accessory Device	Cradle, Charging Clip, Neck Lanyard, Belt Pouch
Data Cable Supplied	1.05m non-shielded USB cable without core 1.00m non-shielded USB cable without core

Note:

1. The following models are provided to this EUT.

Brand	Model	Description
GlobalSat	TR-300A	Main model
GlobalSat	TR-300AE	The color is different from TR-300A for marketing purpose
SecuraTrac	TR300-MDS	Speaker with black paint, and the appearance's color is different from TR-300A
GlobalSat	TR-300AR	The color is different from TR300-MDS for marketing purpose

2. The EUT is powered by the following battery, adapters, cradle and charging clip.

Battery	
Brand:	Hangzhou Future Power Technology CO., LTD
Model:	FT503548PA
Input:	3.7V, 820mAh

Adapter 1	
Brand:	PHIHONG
Model:	PSAI05R-050Q
Input:	100-240V, 50-60Hz, 0.3A 12-17VA
Output:	5Vdc, 1A

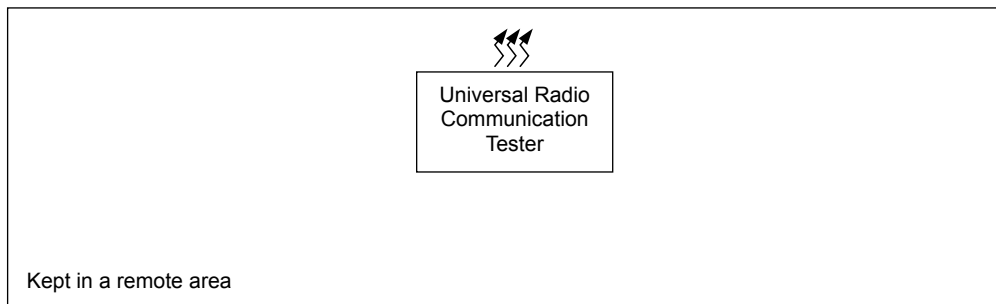
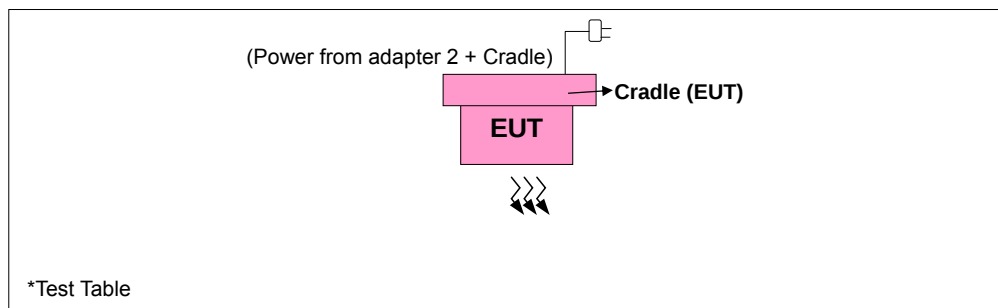
Adapter 2	
Brand:	Powertron Electronics Corp.
Model:	PA 1005-050SUB100
Input:	100-240V, 50-60Hz, 0.3A
Output:	5Vdc, 1A

Cradle	
Brand:	GlobalSat
Model:	TR-313
Rating:	5Vdc, 0.5A

Charging Clip	
Brand:	GlobalSat
Model:	TR-300
Rating:	5Vdc, 0.5A

*After pretesting, "Power from adapter 2 + Cradle" was the worst for the final tests.

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	Universal Radio Communication Tester	R&S	CMU200	117260	NA

NO.	Signal Cable Description Of The Above Support Units
1	NA

NOTE:

1. Item 1 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 and antenna ports

Following channel(s) was (were) selected for the final test as listed below:

GSM MODE

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	128 to 251	128, 189, 251	GSM, EDGE
-	Frequency Stability	128 to 251	189	GPRS
-	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
-	Condcudeted Emission	128 to 251	128, 189, 251	GSM, GPRS, EDGE
-	Radiated Emission Below 1GHz	128 to 251	128, 189, 251	GSM, EDGE
-	Radiated Emission Above 1GHz	128 to 251	128, 189, 251	GSM, EDGE

WCDMA MODE

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

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 65%RH	120Vac, 60Hz	Tank Wu
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Conducuted Emission	25deg. C, 65%RH	120Vac, 60Hz	Tank Wu
Radiated Emission	25deg. C, 65%RH	120Vac, 60Hz	Tank 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

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

KDB 971168 D01 Power Meas License Digital Systems v02r02

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:

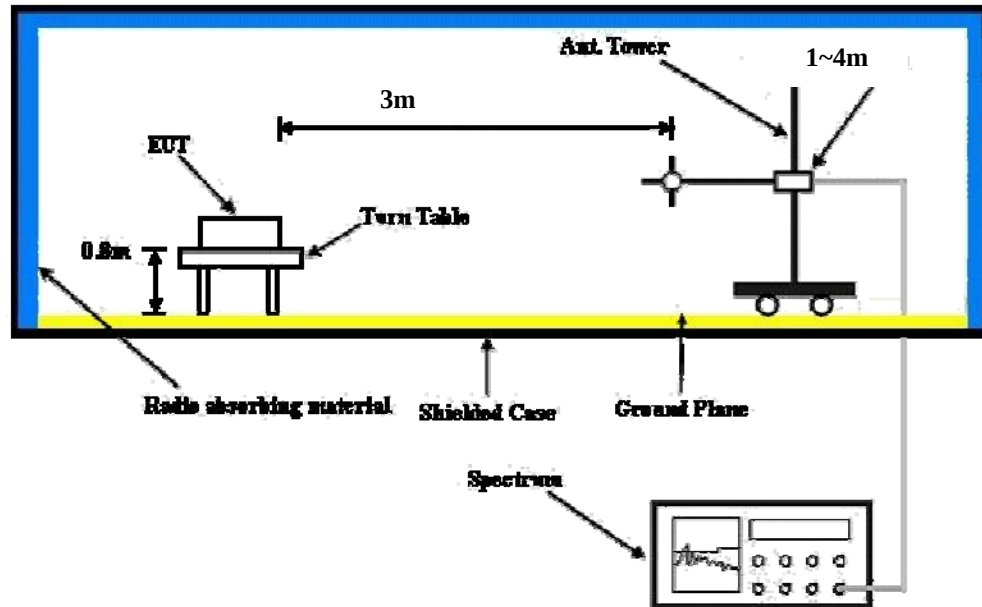
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, EDGE and 5MHz for WCDMA mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 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 power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15\text{dBi}$.

Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, 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	189	251
Frequency (MHz)	824.2	836.4	848.8
GSM	32.25	32.13	31.96
GPRS 8	32.17	32.05	31.88
GPRS 10	29.48	29.36	29.19
GPRS 11	28.47	28.35	28.18
GPRS 12	30.37	30.25	30.08
DTM 9 (GPRS)	29.48	29.36	29.19
DTM 11 (GPRS)	28.47	28.35	28.18
EDGE 8 (MCS9)	26.09	25.97	25.80
EDGE 10 (MCS9)	25.58	25.46	25.29
EDGE 11 (MCS9)	24.54	24.42	24.25
EDGE 12 (MCS9)	23.55	23.43	23.26
DTM 9 (EDGE)	26.02	25.90	25.73
DTM 11 (EDGE)	24.52	24.40	24.23

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	22.24	21.96	22.08
HSDPA Subtest-1	22.22	21.94	22.06
HSDPA Subtest-2	22.23	21.95	22.07
HSDPA Subtest-3	22.13	21.85	21.97
HSDPA Subtest-4	22.22	21.94	22.06

ERP Power (dBm)

For GSM Mode:

MODE		TX channel 128					
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	824.20	-15.8	11.8	3.9	15.7	38.5	-22.8
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	824.20	-22.1	6.2	3.9	10.1	38.5	-28.4

MODE		TX channel 189					
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	836.40	-18.6	8.9	3.8	12.7	38.5	-25.8
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	836.40	-23.7	4.4	3.8	8.2	38.5	-30.3

MODE		TX channel 251					
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	848.80	-14.8	12.9	3.4	16.3	38.5	-22.2
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	848.80	-22.1	6.0	3.4	9.4	38.5	-29.1

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

For EDGE Mode:

MODE		TX channel 128					
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	824.20	-21.3	6.3	3.9	10.2	38.5	-28.3
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	824.20	-28.1	0.3	3.9	4.2	38.5	-34.3

MODE		TX channel 189					
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	836.40	-28.8	-0.7	3.8	3.1	38.5	-35.4
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	836.40	-28.8	-0.7	3.8	3.1	38.5	-35.4

MODE		TX channel 251					
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	848.80	-20.1	7.6	3.4	11.0	38.5	-27.5
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	848.80	-27.3	0.8	3.4	4.2	38.5	-34.3

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

For WCDMA Mode:

MODE		TX channel 4132					
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	826.4	-17.7	9.9	3.9	13.8	38.5	-24.7
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	826.4	-25.4	3.0	3.9	6.9	38.5	-31.6

MODE		TX channel 4182					
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	836.4	-21.6	5.8	3.8	9.6	38.5	-28.9
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	836.4	-23.9	4.2	3.8	8.0	38.5	-30.5

MODE		TX channel 4233					
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	846.6	-23.4	4.2	3.4	7.6	38.5	-30.9
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	846.6	-27.2	1.0	3.4	4.4	38.5	-34.1

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

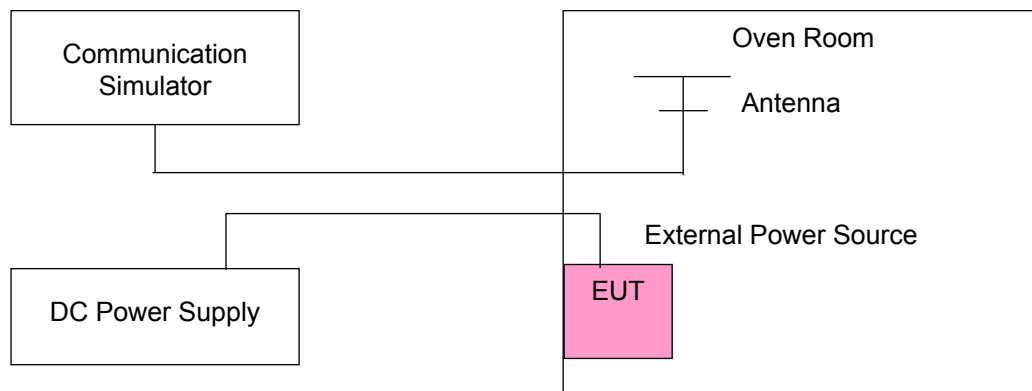
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.2.2 Test Procedure

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

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

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)		Limit (ppm)
	GSM	WCDMA	
4.8	-0.017	-0.024	2.5
4.2	-0.014	-0.019	2.5
3.6	-0.016	-0.023	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.8Vdc.

Frequency Error vs. Temperature.

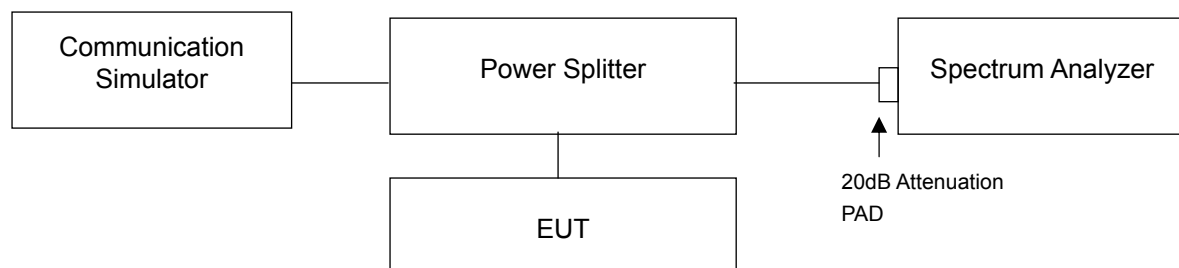
TEMP. (°C)	Frequency Error (ppm)		Limit (ppm)
	GPRS	WCDMA	
60	-0.029	-0.039	2.5
50	-0.026	-0.036	2.5
40	-0.023	-0.031	2.5
30	-0.018	-0.029	2.5
20	-0.014	-0.019	2.5
10	-0.020	-0.023	2.5
0	-0.031	-0.035	2.5
-10	-0.037	-0.039	2.5
-20	-0.038	-0.042	2.5

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

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

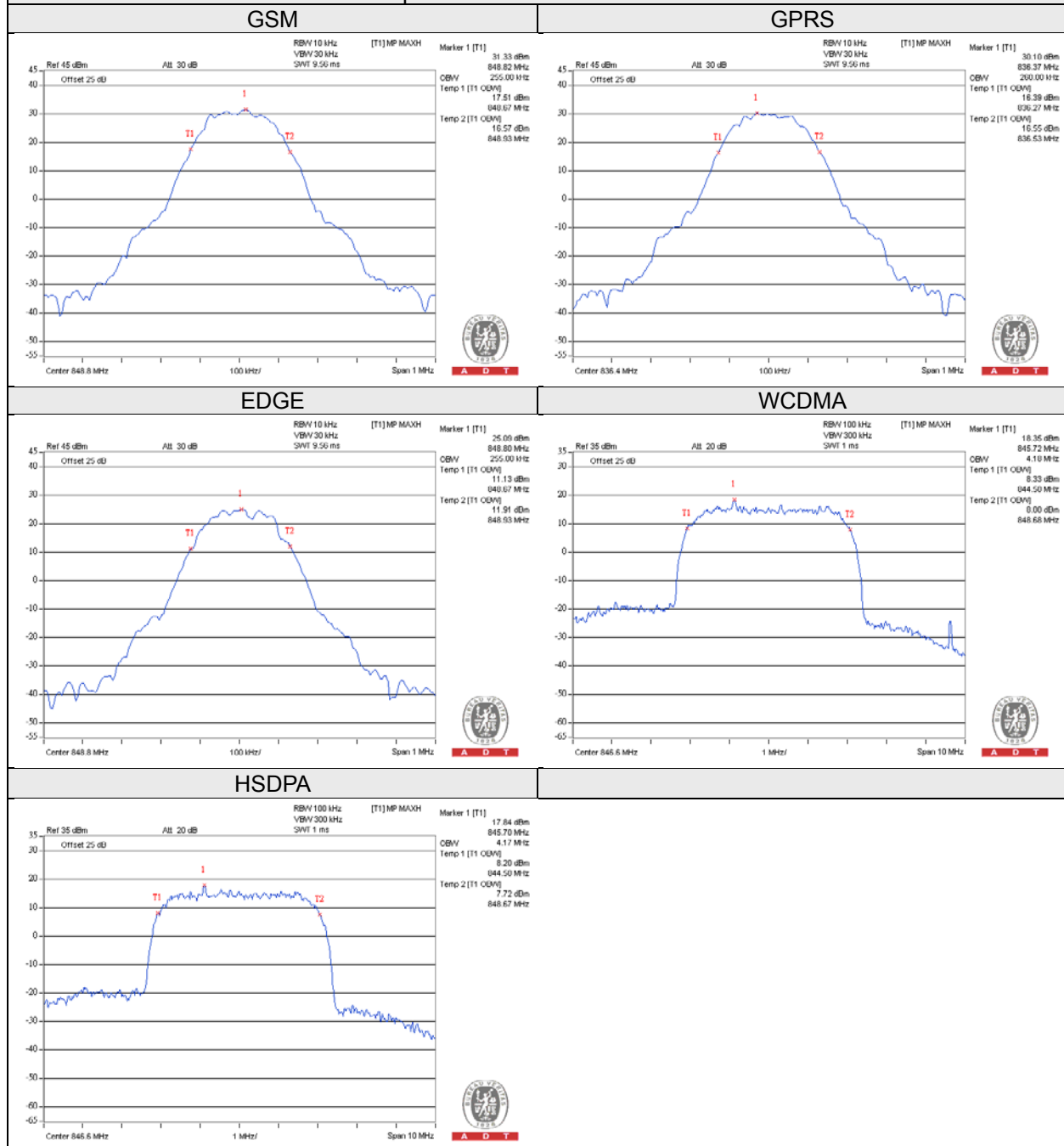
4.3.2 Test Setup



4.3.3 Test Result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)			Channel	FREQ. (MHz)	99% Occupied Bandwidth (MHz)	
		GSM	GPRS	EDGE			WCDMA	HSDPA
128	824.2	255.0	250.0	250.0	4132	826.4	4.15	4.15
190	836.6	255.0	260.0	255.0	4182	836.6	4.17	4.17
251	848.8	255.0	255.0	255.0	4233	846.6	4.18	4.17

Spectrum Plot Of Worst Value

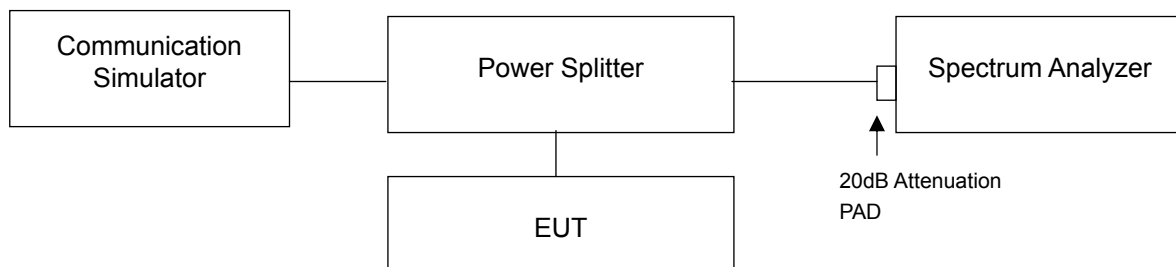


4.4 Band Edge Measurement

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.

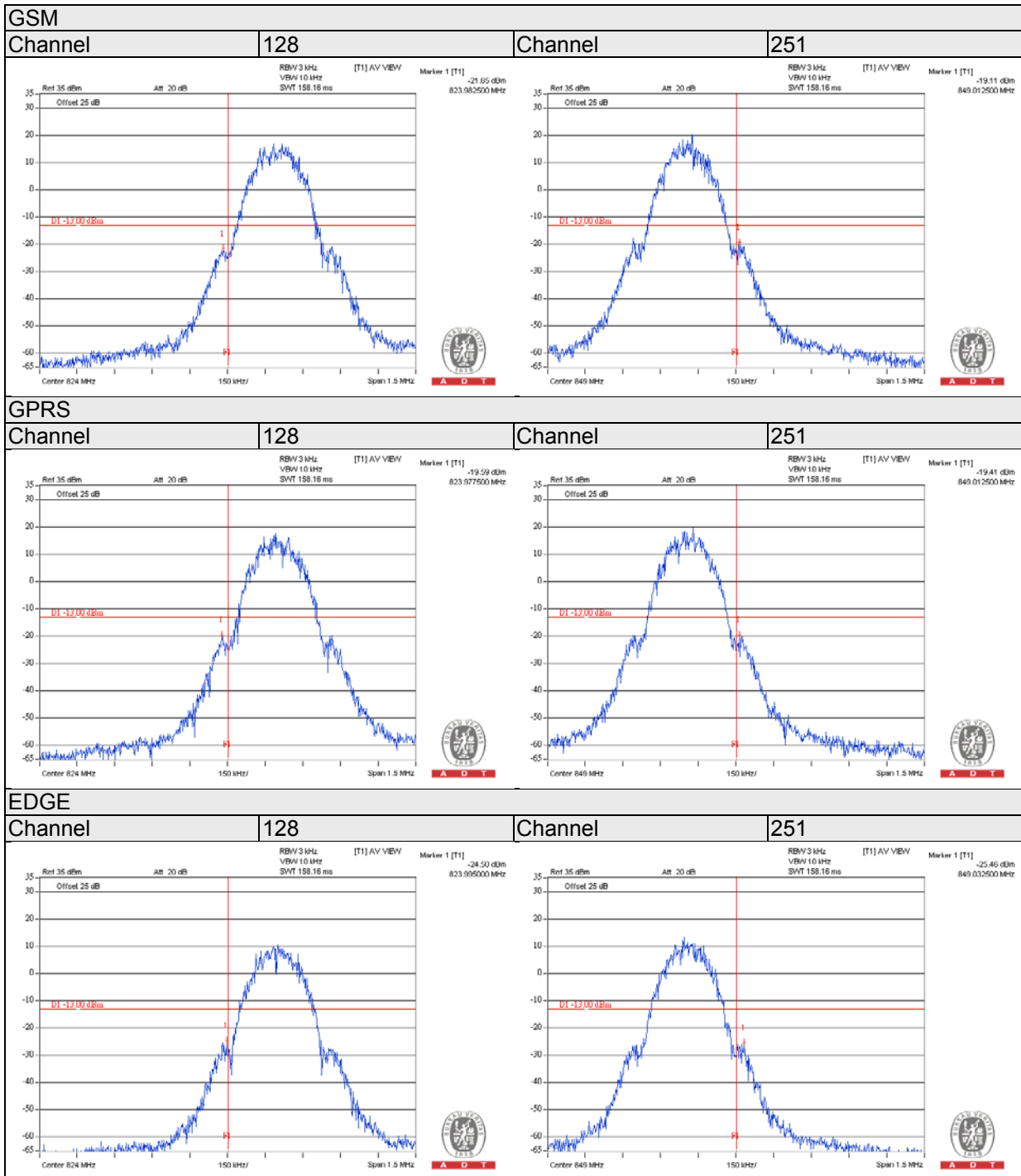
4.4.2 Test Setup



4.4.3 Test Procedures

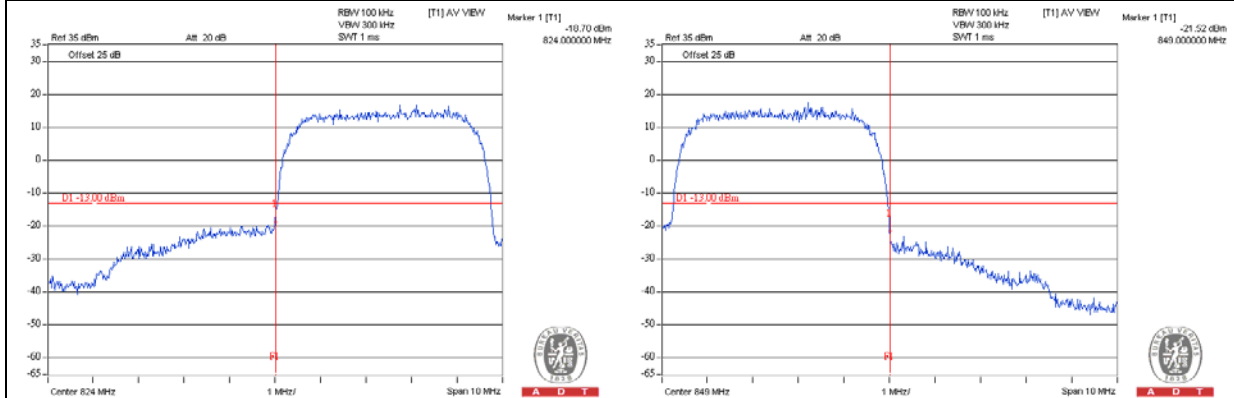
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/GPRS/EDGE).
- The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA/HSDPA).
- Record the max trace plot into the test report.

4.4.4 Test Results



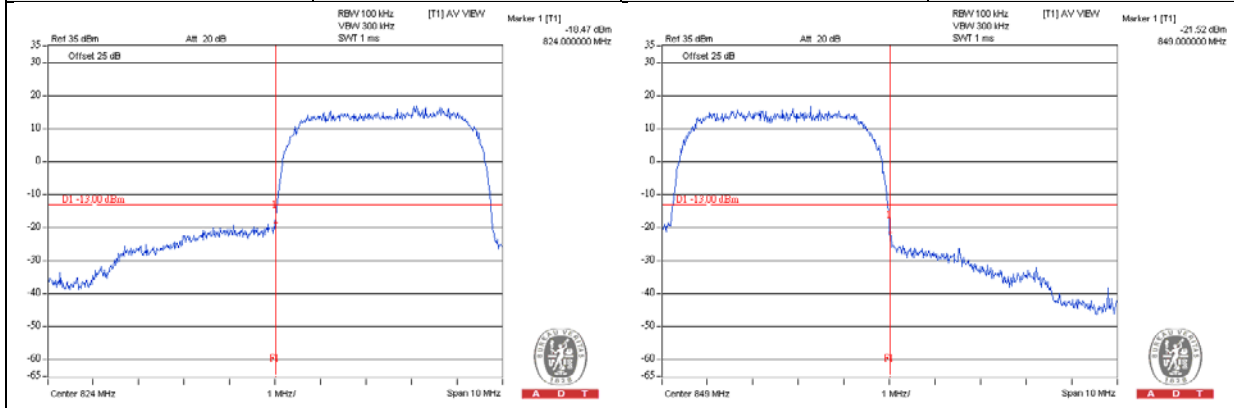
WCDMA

Channel	4132	Channel	4233
---------	------	---------	------



HSDPA

Channel	4132	Channel	4233
---------	------	---------	------

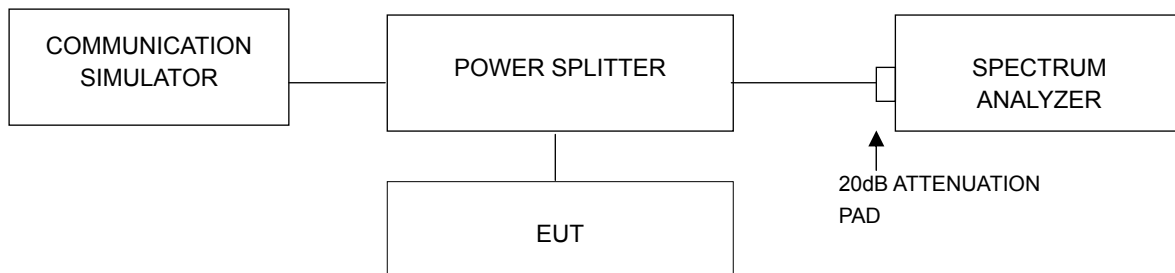


4.5 Peak To Average Ratio

4.5.1 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

4.5.2 Test Setup



4.5.3 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%.

4.5.4 Test Results

Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Freq. (MHz)	Peak To Average Ratio (dB)	
		GSM	GPRS	EDGE			WCDMA	HSDPA
128	824.2	4.35	4.59	3.29	4132	826.4	3.23	3.25
189	836.4	4.93	3.19	2.75	4182	836.4	2.89	2.92
251	848.8	4.06	3.01	2.95	4233	846.6	3.20	3.18

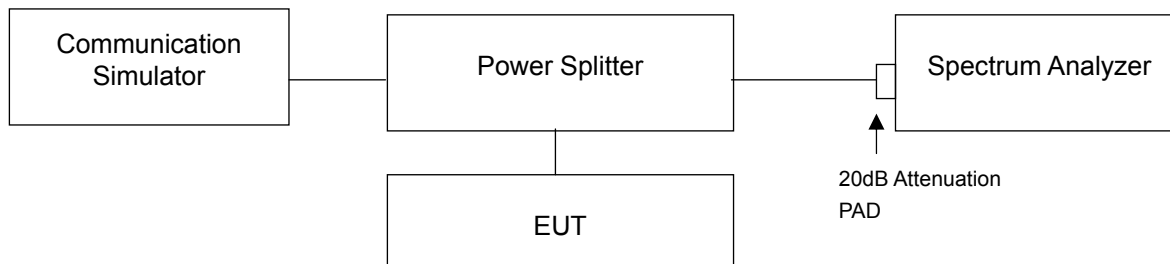


4.6 Conducted Spurious Emissions

4.6.1 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 .

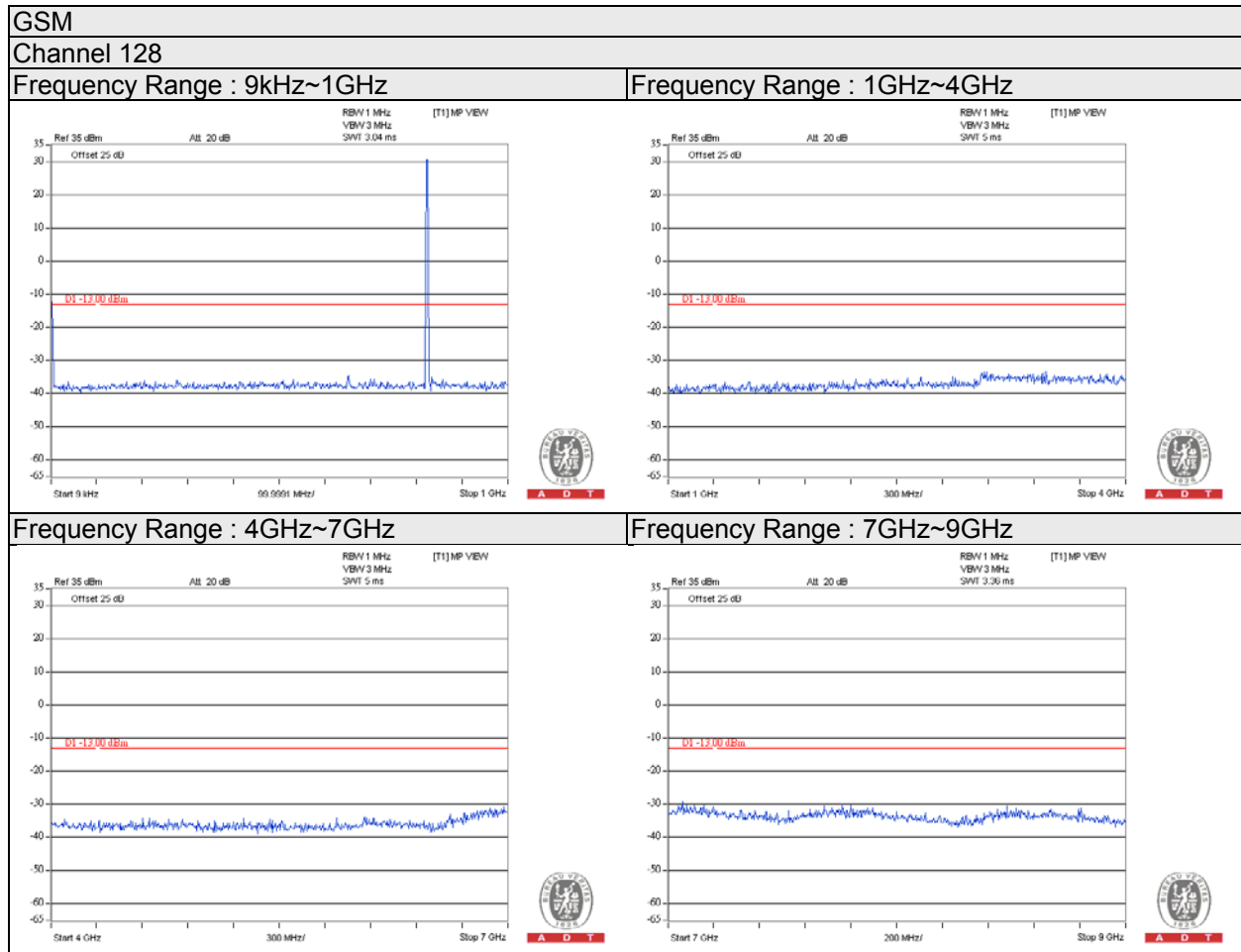
4.6.2 Test Setup



4.6.3 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 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

4.6.4 Test Results

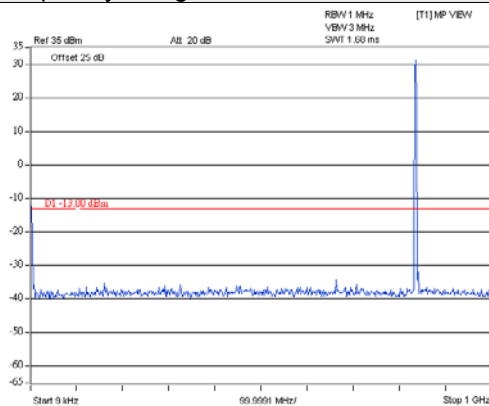


GSM

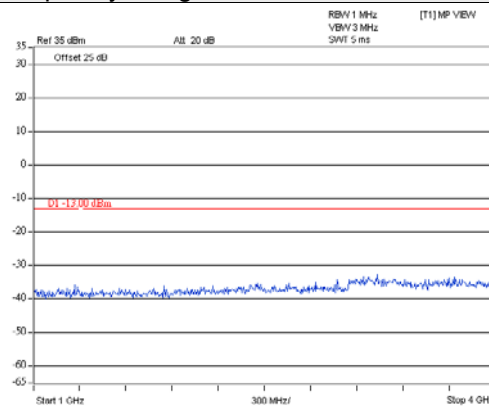
Channel 189

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



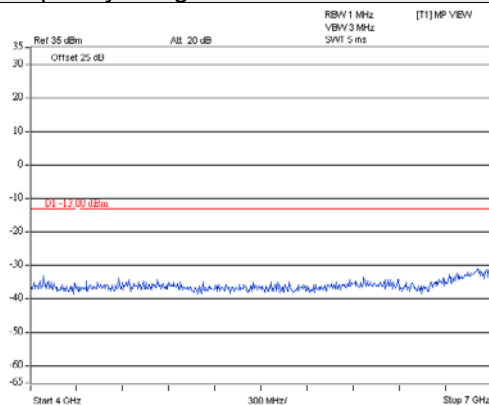
A D T



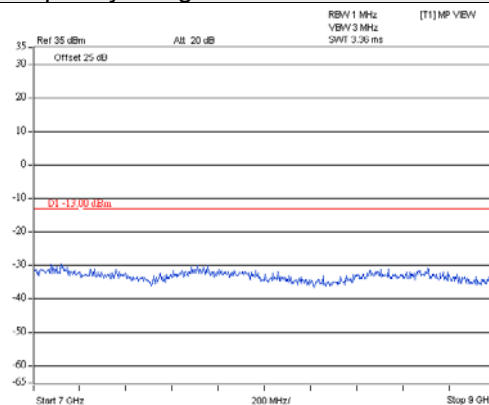
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



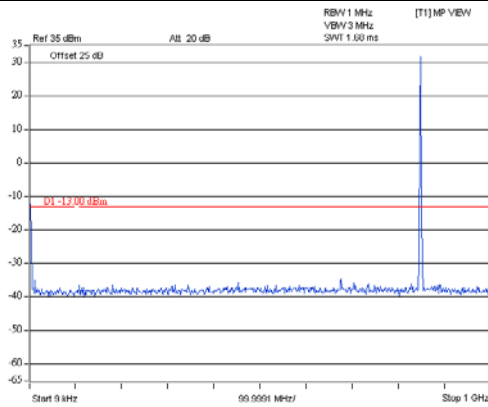
A D T

GSM

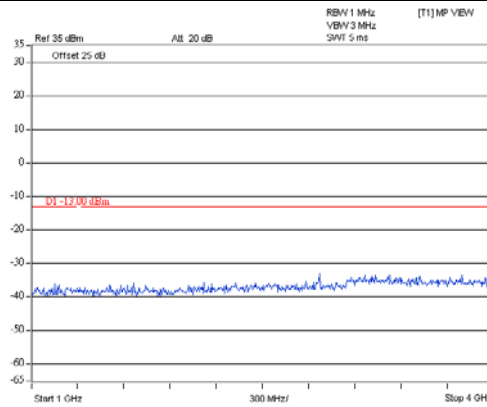
Channel 251

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



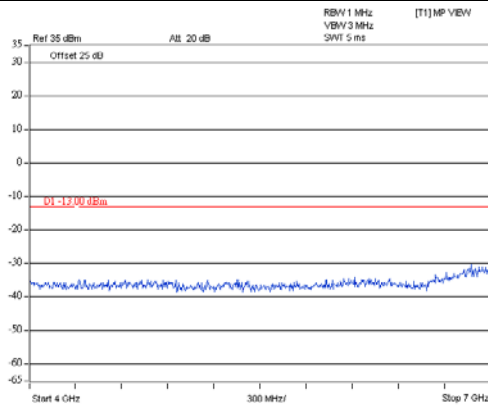
A D T



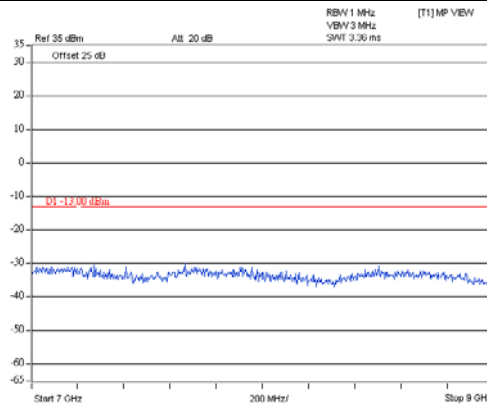
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



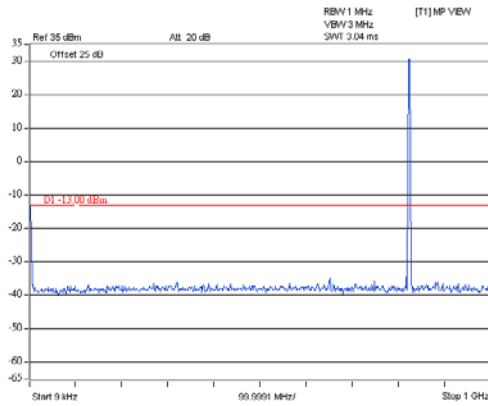
A D T

GPRS

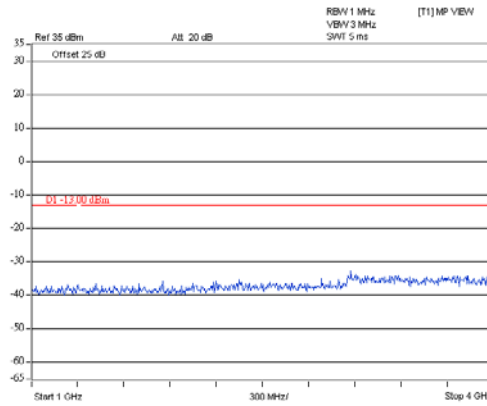
Channel 128

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



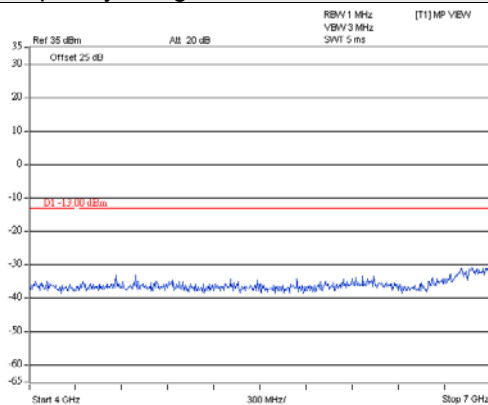
A D T



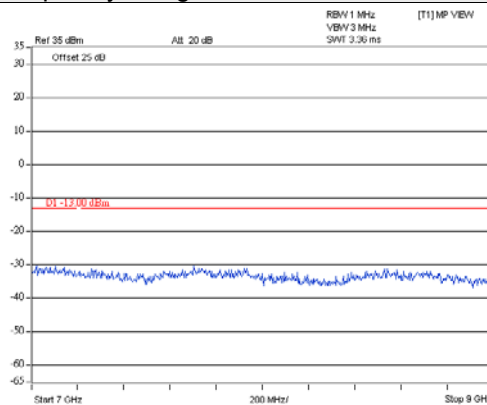
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



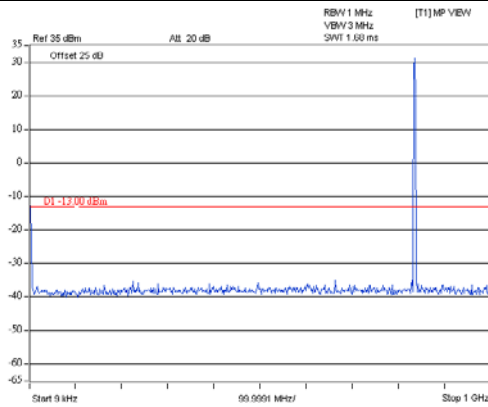
A D T

GPRS

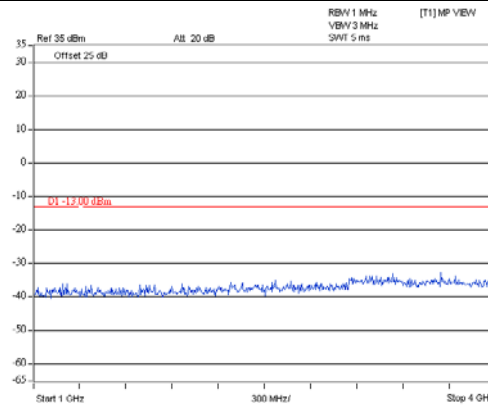
Channel 189

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



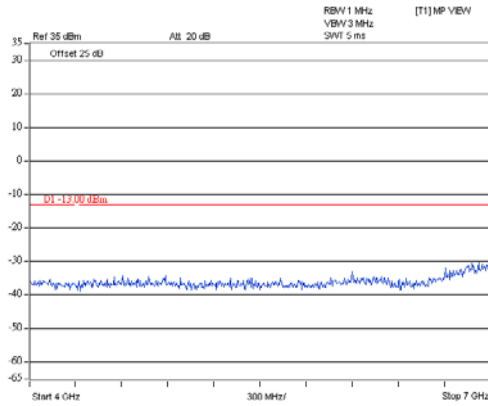
A D T



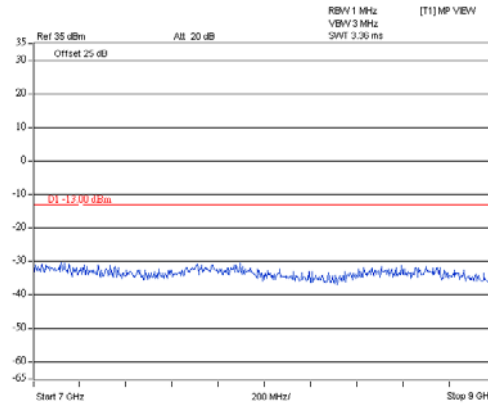
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



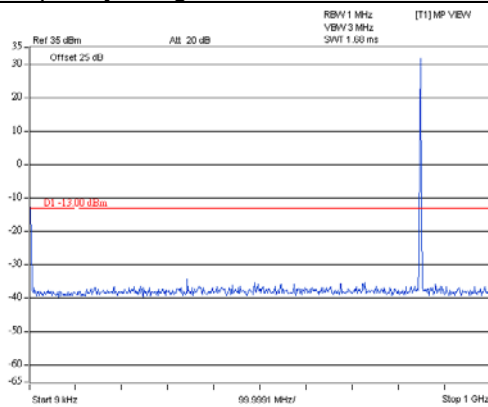
A D T

GPRS

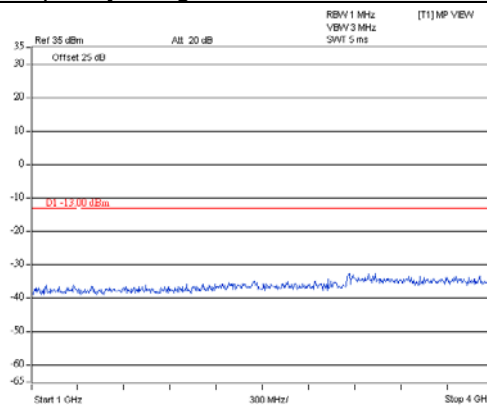
Channel 251

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



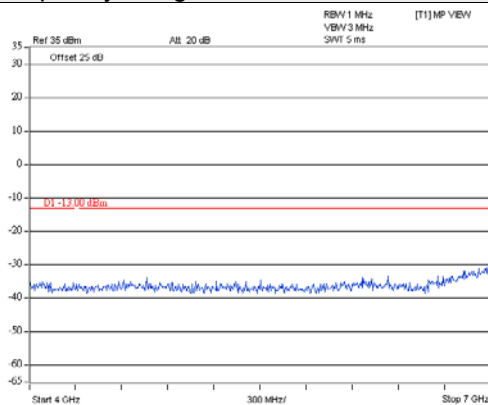
A D T



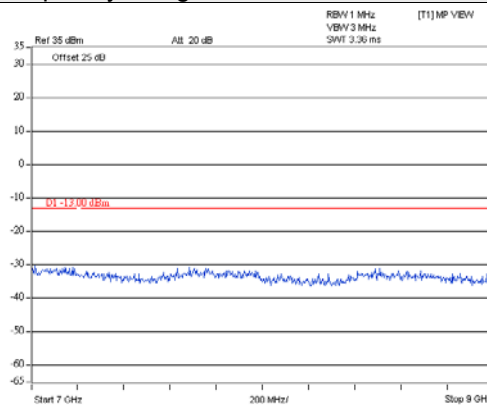
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



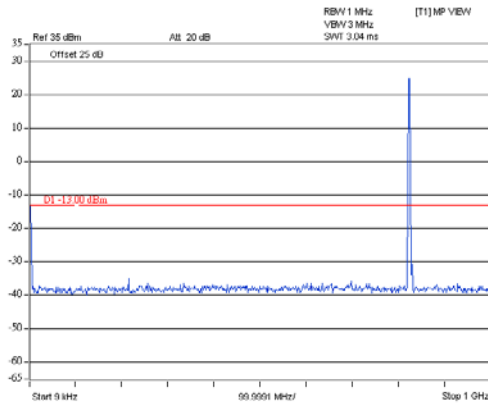
A D T

EDGE

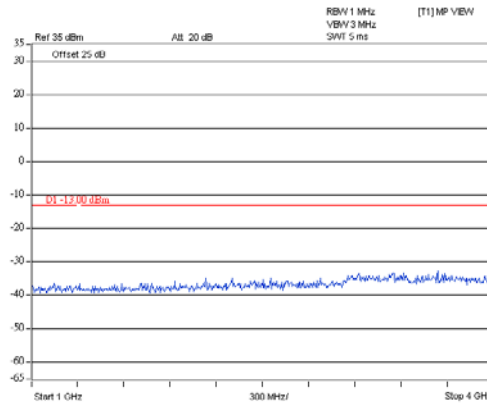
Channel 128

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



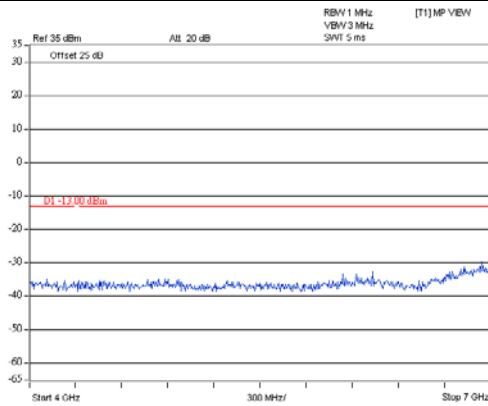
A D T



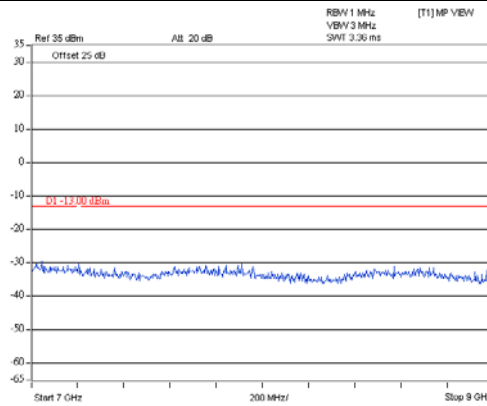
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



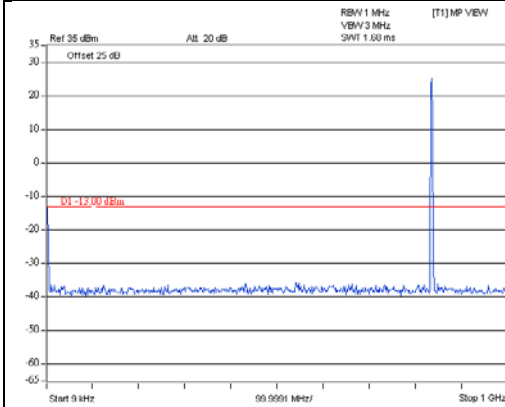
A D T

EDGE

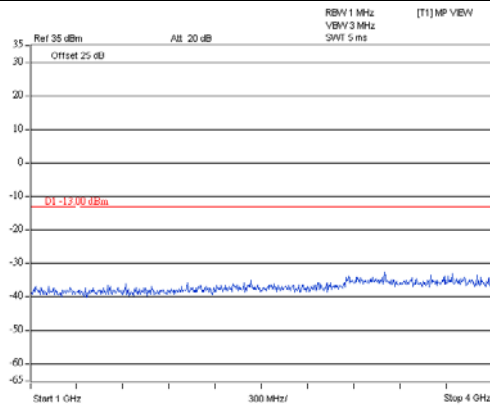
Channel 189

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



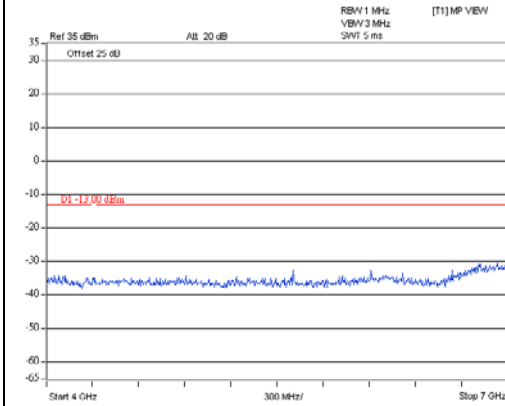
A D T



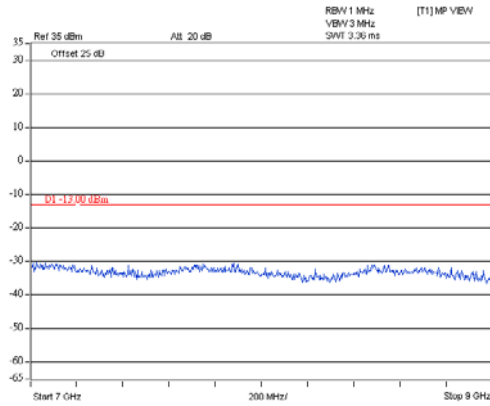
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



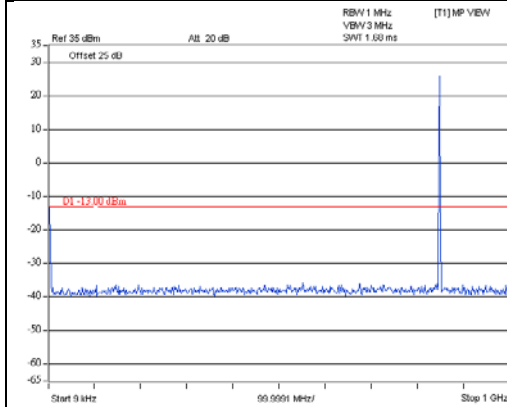
A D T

EDGE

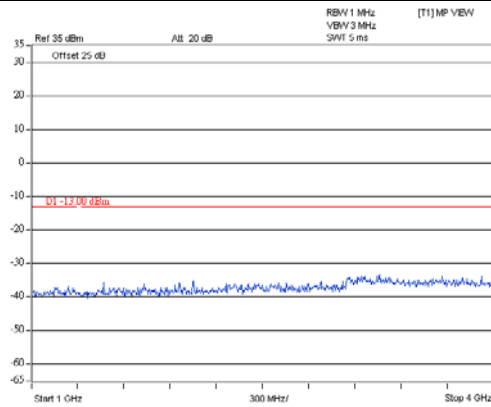
Channel 251

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



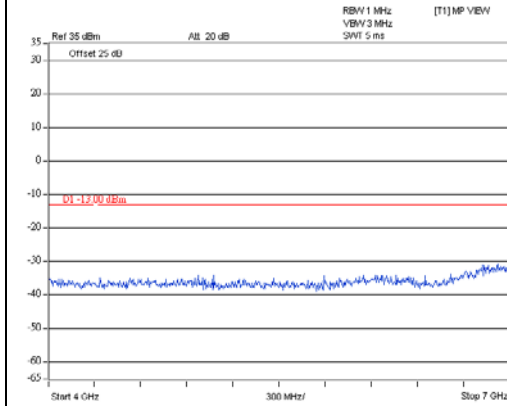
A D T



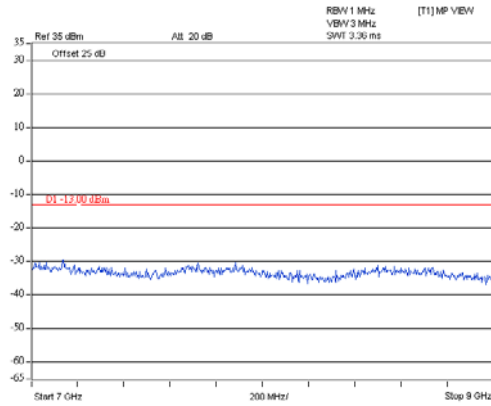
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



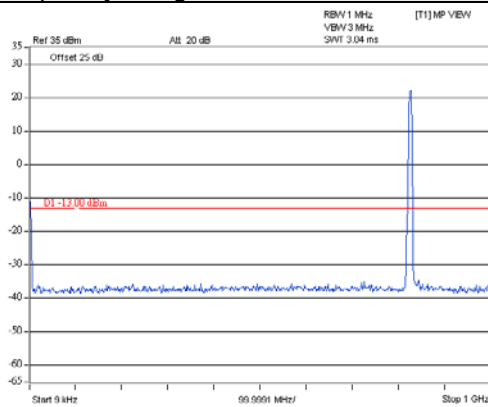
A D T

WCDMA

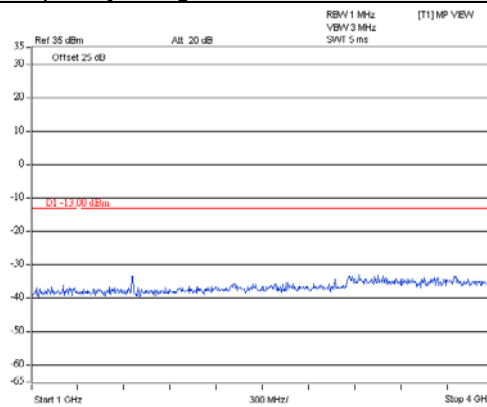
Channel 4132

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



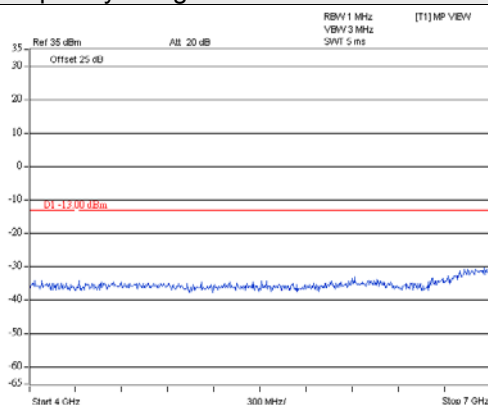
A D T



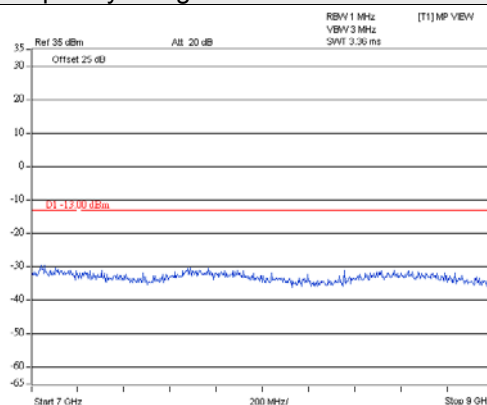
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



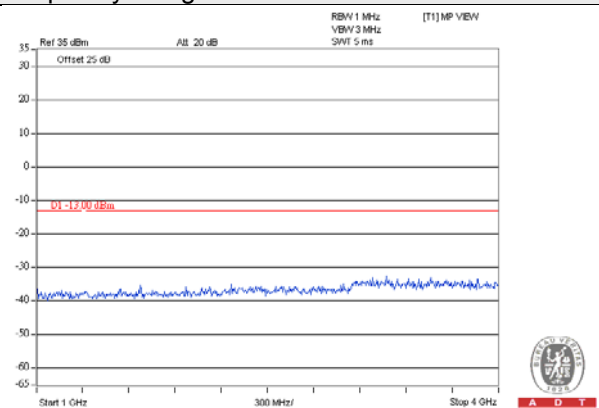
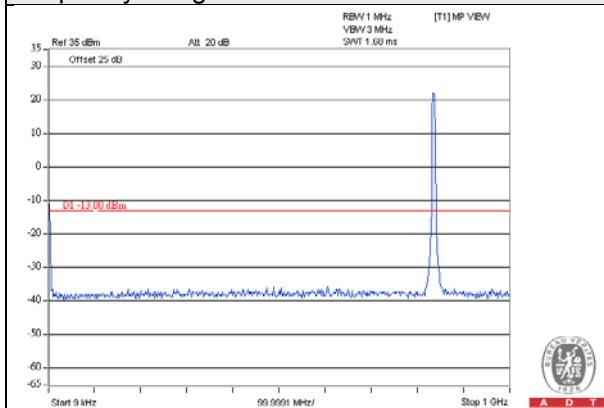
A D T

WCDMA

Channel 4182

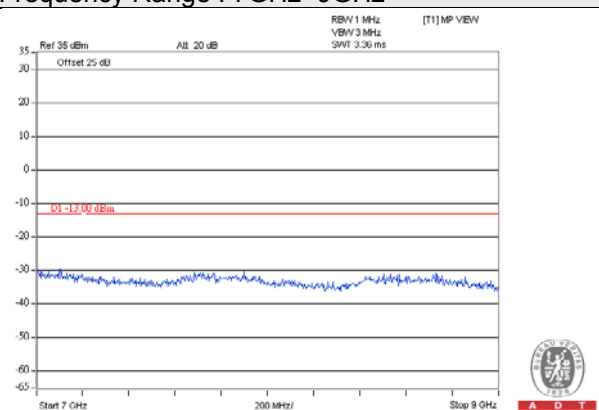
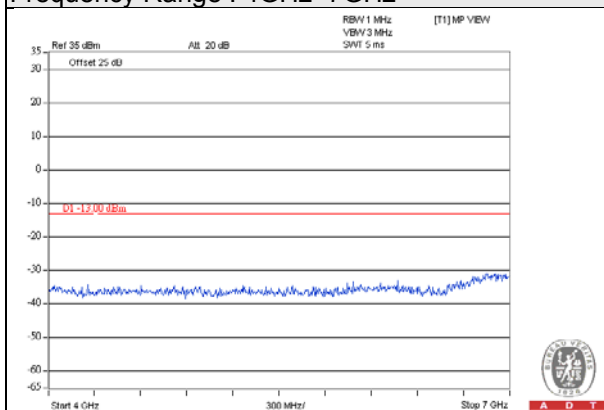
Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz

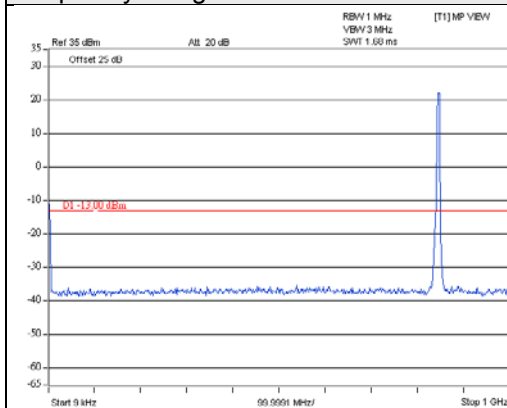


WCDMA

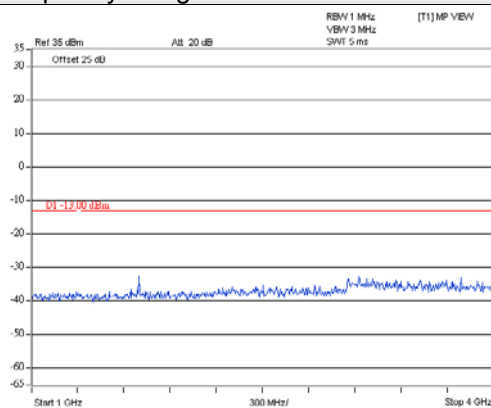
Channel 4233

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



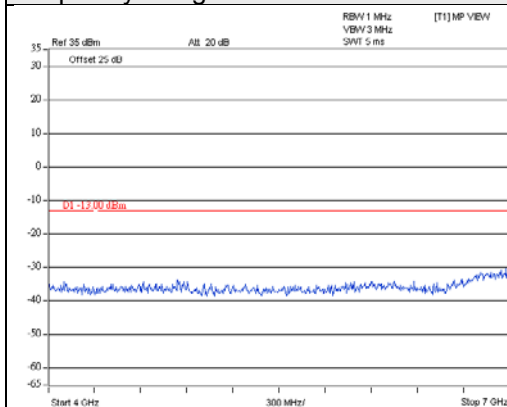
A D T



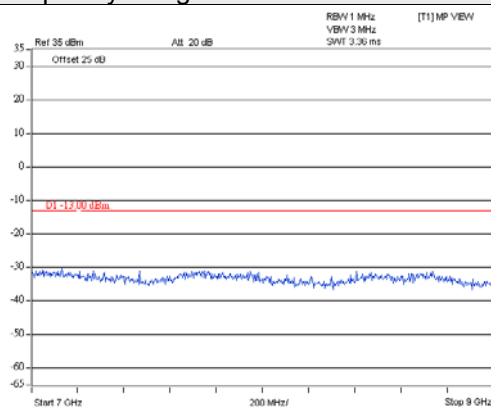
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



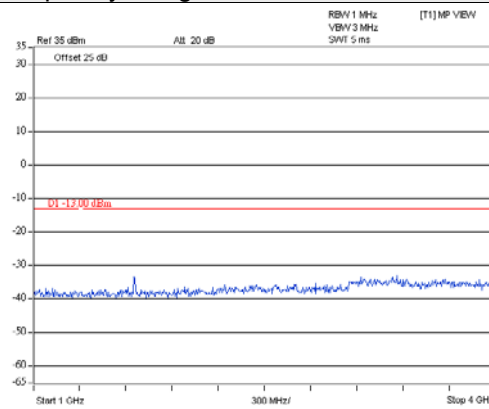
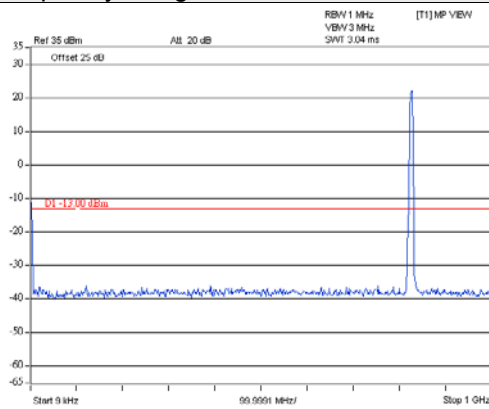
A D T

HSDPA

Channel 4132

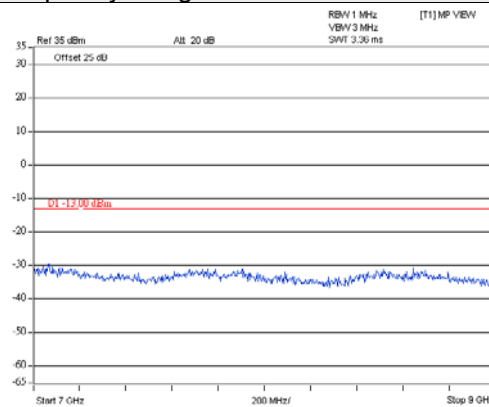
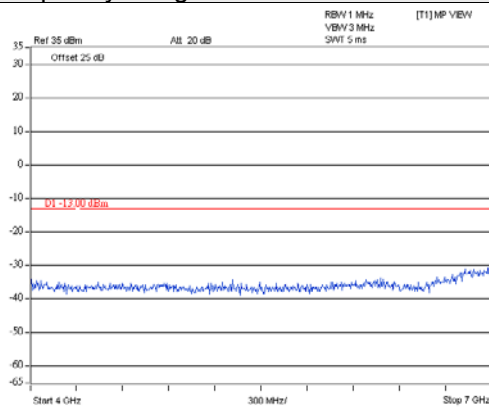
Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz

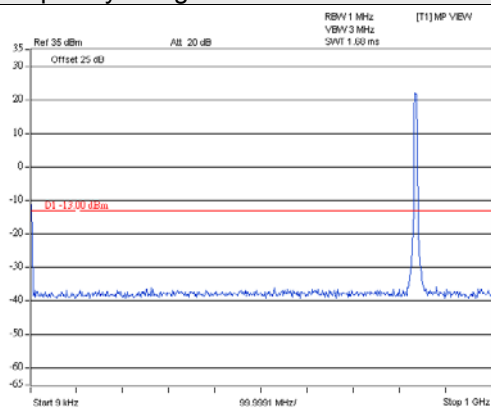


HSDPA

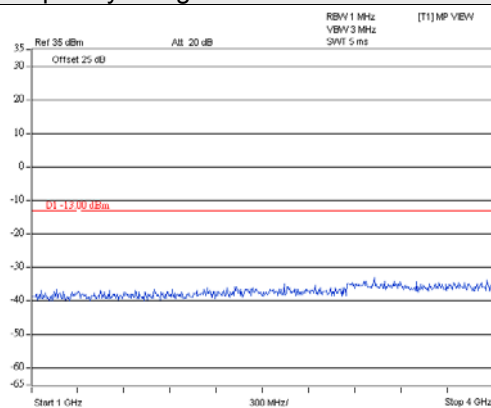
Channel 4182

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



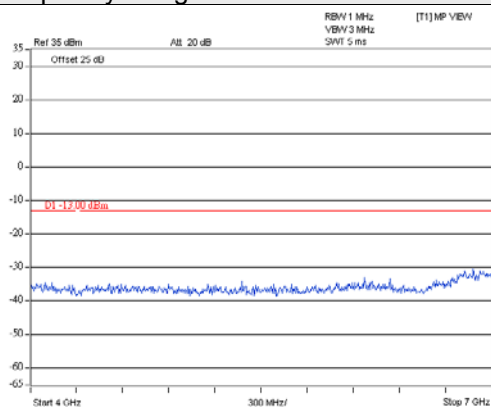
A D T



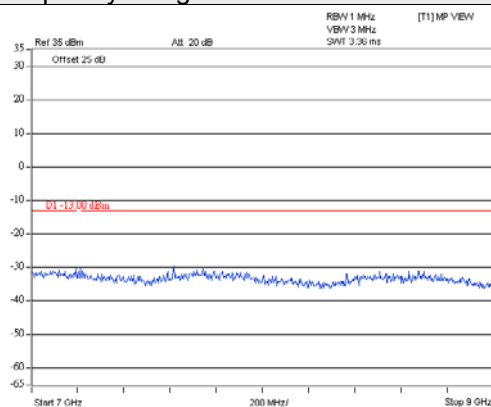
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



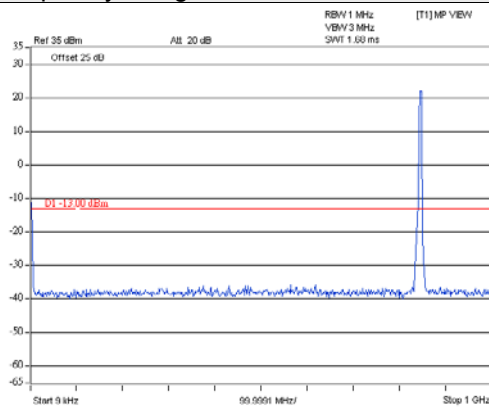
A D T

HSDPA

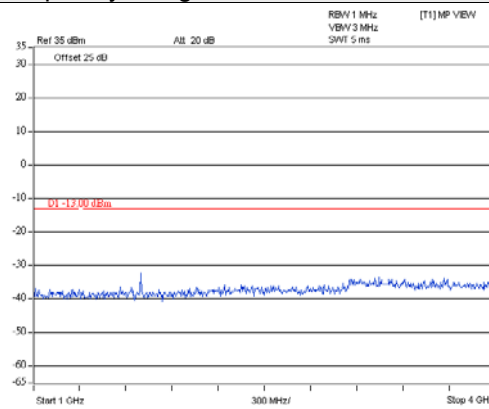
Channel 4233

Frequency Range : 9kHz~1GHz

Frequency Range : 1GHz~4GHz



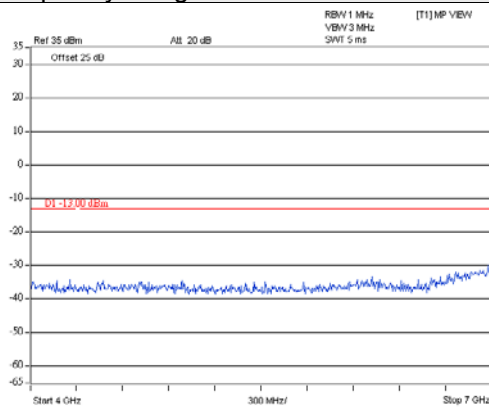
A D T



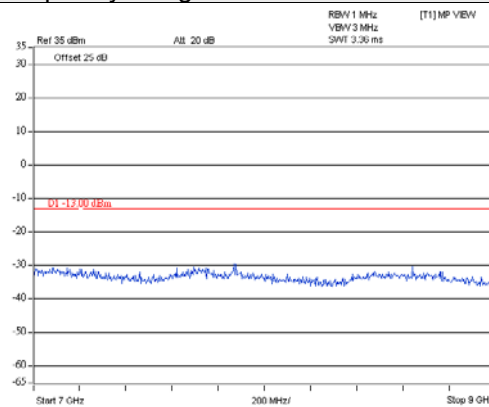
A D T

Frequency Range : 4GHz~7GHz

Frequency Range : 7GHz~9GHz



A D T



A D T

4.7 Radiated Emission Measurement

4.7.1 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 .

4.7.2 Test Procedure

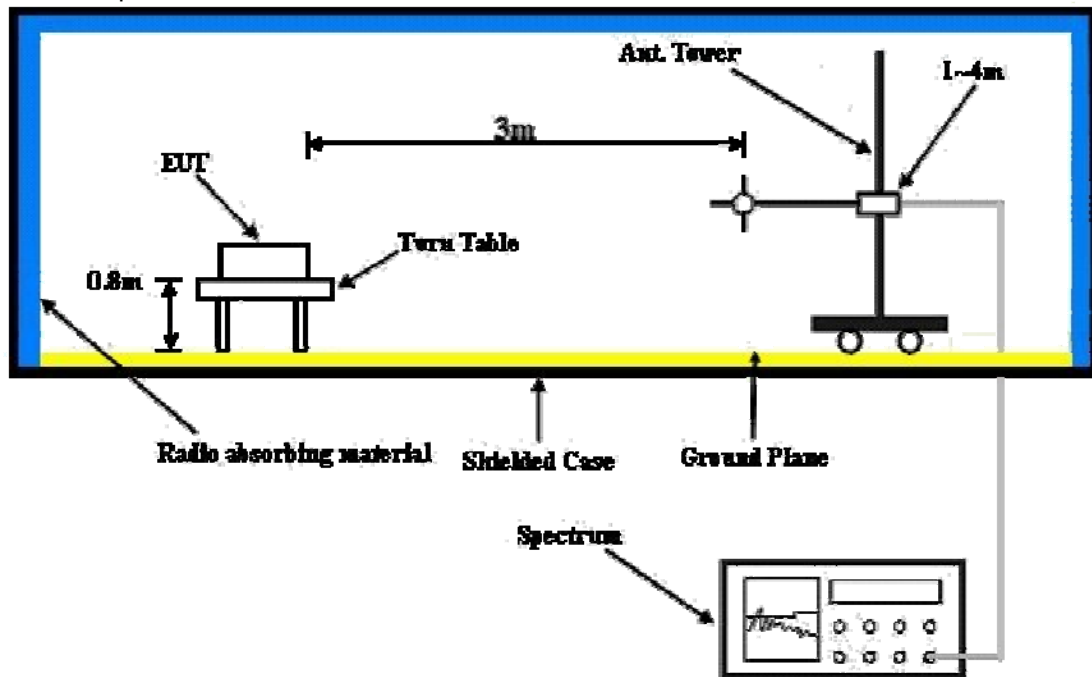
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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, $\text{E.R.P power} = \text{E.I.R.P power} - 2.15\text{dBi}.$

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

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup



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

4.7.5 Test Results

BELOW 1GHz

GSM:

Mode	TX channel 128	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	33.88	-58.60	-38.60	-17.10	-55.70	-13.00	-42.70
2	55.22	-52.80	-50.00	-5.40	-55.40	-13.00	-42.40
3	123.12	-57.30	-61.70	-3.10	-64.80	-13.00	-51.80
4	652.74	-60.00	-61.40	3.60	-57.80	-13.00	-44.80
5	747.80	-50.60	-50.30	3.70	-46.60	-13.00	-33.60
6	870.02	-39.30	-35.40	3.30	-32.10	-13.00	-19.10
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	55.22	-46.10	-47.60	-5.40	-53.00	-13.00	-40.00
2	84.32	-55.60	-61.00	0.40	-60.60	-13.00	-47.60
3	134.76	-60.10	-60.50	-3.20	-63.70	-13.00	-50.70
4	278.32	-64.30	-59.40	-1.60	-61.00	-13.00	-48.00
5	747.80	-49.60	-46.40	3.70	-42.70	-13.00	-29.70
6	870.02	-39.70	-35.60	3.30	-32.30	-13.00	-19.30

Remarks:

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



A D T

Mode	TX channel 189	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	45.52	-53.00	-41.80	-10.40	-52.20	-13.00	-39.20
2	55.22	-51.00	-48.20	-5.40	-53.60	-13.00	-40.60
3	664.38	-60.80	-62.00	3.60	-58.40	-13.00	-45.40
4	745.86	-49.00	-48.80	3.80	-45.00	-13.00	-32.00
5	792.42	-57.50	-56.00	4.00	-52.00	-13.00	-39.00
6	881.66	-36.80	-33.10	3.30	-29.80	-13.00	-16.80

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	30.00	-48.80	-41.50	-19.40	-60.90	-13.00	-47.90
2	55.22	-39.20	-42.90	-5.40	-48.30	-13.00	-35.30
3	148.34	-57.00	-58.30	-3.00	-61.30	-13.00	-48.30
4	282.20	-60.50	-58.20	-1.70	-59.90	-13.00	-46.90
5	745.86	-47.60	-46.60	3.80	-42.80	-13.00	-29.80
6	881.66	-35.20	-33.00	3.30	-29.70	-13.00	-16.70

Remarks:

1. Output Power (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	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	30.00	-47.20	-26.00	-19.40	-45.40	-13.00	-32.40
2	43.58	-55.90	-45.10	-11.30	-56.40	-13.00	-43.40
3	216.24	-51.80	-60.30	-2.00	-62.30	-13.00	-49.30
4	747.80	-50.10	-51.90	3.70	-48.20	-13.00	-35.20
5	806.00	-58.10	-58.50	3.90	-54.60	-13.00	-41.60
6	895.24	-37.00	-35.30	3.50	-31.80	-13.00	-18.80

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	51.34	-39.00	-41.10	-7.30	-48.40	-13.00	-35.40
2	82.38	-58.40	-65.40	0.40	-65.00	-13.00	-52.00
3	138.64	-55.10	-57.00	-3.20	-60.20	-13.00	-47.20
4	278.32	-62.90	-60.20	-1.60	-61.80	-13.00	-48.80
5	747.80	-54.10	-53.10	3.70	-49.40	-13.00	-36.40
6	895.24	-38.20	-35.60	3.50	-32.10	-13.00	-19.10

Remarks:

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

EDGE:

Mode	TX channel 128	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	33.88	-56.80	-38.90	-17.10	-56.00	-13.00	-43.00
2	51.34	-49.90	-45.90	-7.30	-53.20	-13.00	-40.20
3	86.26	-37.20	-46.20	0.10	-46.10	-13.00	-33.10
4	144.46	-40.60	-44.70	-3.20	-47.90	-13.00	-34.90
5	163.86	-40.50	-45.80	-2.90	-48.70	-13.00	-35.70
6	268.62	-49.50	-54.30	-1.50	-55.80	-13.00	-42.80

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	33.88	-44.10	-39.80	-17.10	-56.90	-13.00	-43.90
2	51.34	-40.40	-42.40	-7.30	-49.70	-13.00	-36.70
3	80.44	-33.20	-40.60	0.50	-40.10	-13.00	-27.10
4	140.58	-48.90	-50.60	-3.00	-53.60	-13.00	-40.60
5	191.02	-51.10	-52.40	-2.70	-55.10	-13.00	-42.10
6	262.80	-55.50	-55.00	-1.60	-56.60	-13.00	-43.60

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Mode	TX channel 189	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	35.82	-54.90	-37.60	-15.90	-53.50	-13.00	-40.50
2	51.34	-49.80	-45.80	-7.30	-53.10	-13.00	-40.10
3	86.26	-37.70	-46.70	0.10	-46.60	-13.00	-33.60
4	146.40	-42.50	-46.40	-3.00	-49.40	-13.00	-36.40
5	241.46	-48.70	-56.30	-1.40	-57.70	-13.00	-44.70
6	266.68	-49.20	-54.10	-1.60	-55.70	-13.00	-42.70

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	30.00	-45.20	-37.90	-19.40	-57.30	-13.00	-44.30
2	51.34	-38.90	-41.00	-7.30	-48.30	-13.00	-35.30
3	78.50	-32.10	-40.10	0.60	-39.50	-13.00	-26.50
4	142.52	-50.50	-51.80	-3.10	-54.90	-13.00	-41.90
5	272.50	-56.80	-55.00	-1.50	-56.50	-13.00	-43.50
6	322.94	-50.20	-56.70	4.10	-52.60	-13.00	-39.60

Remarks:

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



A D T

Mode	TX channel 251	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	37.76	-49.20	-33.40	-14.70	-48.10	-13.00	-35.10
2	51.34	-50.60	-46.70	-7.30	-54.00	-13.00	-41.00
3	80.44	-40.20	-47.70	0.50	-47.20	-13.00	-34.20
4	130.88	-33.30	-38.50	-3.30	-41.80	-13.00	-28.80
5	163.86	-41.20	-46.60	-2.90	-49.50	-13.00	-36.50
6	260.86	-48.60	-54.00	-1.50	-55.50	-13.00	-42.50

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	30.00	-45.50	-38.20	-19.40	-57.60	-13.00	-44.60
2	51.34	-38.60	-40.70	-7.30	-48.00	-13.00	-35.00
3	80.44	-32.20	-39.60	0.50	-39.10	-13.00	-26.10
4	148.34	-49.40	-50.60	-3.00	-53.60	-13.00	-40.60
5	194.90	-51.50	-52.20	-2.60	-54.80	-13.00	-41.80
6	249.22	-46.00	-47.00	-1.40	-48.40	-13.00	-35.40

Remarks:

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

WCDMA:

Mode	TX channel 4132	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	35.82	-53.60	-36.40	-15.90	-52.30	-13.00	-39.30
2	78.50	-50.60	-58.50	0.60	-57.90	-13.00	-44.90
3	156.10	-50.40	-54.30	-2.90	-57.20	-13.00	-44.20
4	262.80	-54.60	-59.90	-1.60	-61.50	-13.00	-48.50
5	730.34	-44.80	-46.70	3.60	-43.10	-13.00	-30.10
6	873.90	-54.50	-52.80	3.50	-49.30	-13.00	-36.30

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	31.94	-44.10	-38.40	-18.30	-56.70	-13.00	-43.70
2	57.16	-39.80	-44.10	-4.70	-48.80	-13.00	-35.80
3	78.50	-42.00	-50.00	0.60	-49.40	-13.00	-36.40
4	138.64	-49.40	-51.30	-3.20	-54.50	-13.00	-41.50
5	730.34	-45.80	-45.00	3.60	-41.40	-13.00	-28.40
6	873.90	-56.80	-54.90	3.50	-51.40	-13.00	-38.40

Mode	TX channel 4182	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	33.88	-55.40	-37.50	-17.10	-54.60	-13.00	-41.60
2	53.28	-47.90	-45.50	-6.20	-51.70	-13.00	-38.70
3	76.56	-50.50	-58.60	0.30	-58.30	-13.00	-45.30
4	142.52	-49.00	-53.30	-3.10	-56.40	-13.00	-43.40
5	745.86	-51.60	-53.50	3.80	-49.70	-13.00	-36.70
6	881.66	-53.90	-52.30	3.30	-49.00	-13.00	-36.00

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	31.94	-46.90	-41.20	-18.30	-59.50	-13.00	-46.50
2	57.16	-41.50	-45.80	-4.70	-50.50	-13.00	-37.50
3	142.52	-49.90	-51.10	-3.10	-54.20	-13.00	-41.20
4	276.38	-62.90	-60.10	-1.60	-61.70	-13.00	-48.70
5	732.28	-49.70	-48.70	3.60	-45.10	-13.00	-32.10
6	881.66	-54.50	-52.30	3.30	-49.00	-13.00	-36.00



Mode	TX channel 4233	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	37.76	-55.50	-39.70	-14.70	-54.40	-13.00	-41.40
2	53.28	-47.60	-45.30	-6.20	-51.50	-13.00	-38.50
3	72.68	-49.00	-57.00	-0.10	-57.10	-13.00	-44.10
4	142.52	-43.60	-47.90	-3.10	-51.00	-13.00	-38.00
5	747.80	-49.20	-51.10	3.70	-47.40	-13.00	-34.40
6	895.24	-56.50	-54.70	3.50	-51.20	-13.00	-38.20

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	30.00	-32.20	-24.90	-19.40	-44.30	-13.00	-31.30
2	47.46	-30.70	-31.60	-9.20	-40.80	-13.00	-27.80
3	130.88	-38.90	-42.70	-3.30	-46.00	-13.00	-33.00
4	196.84	-48.70	-49.20	-2.50	-51.70	-13.00	-38.70
5	747.80	-55.00	-53.90	3.70	-50.20	-13.00	-37.20
6	891.36	-64.00	-61.40	3.50	-57.90	-13.00	-44.90

ABOVE 1GHz

GSM:

Mode	TX channel 128	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-50.0	-42.3	0.9	-41.4	-13.0	-28.4
2	2472.60	-55.2	-48.8	0.1	-48.7	-13.0	-35.7
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	-49.6	-42.3	0.9	-41.4	-13.0	-28.4
2	2472.60	-55.4	-51.3	0.1	-51.2	-13.0	-38.2

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 189	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-50.3	-42.7	0.8	-41.9	-13.0	-28.9
2	2509.20	-53.0	-46.7	0.2	-46.5	-13.0	-33.5
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	-48.4	-41.1	0.8	-40.3	-13.0	-27.3
2	2509.20	-55.5	-51.6	0.2	-51.4	-13.0	-38.4

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 251	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-59.90	-52.3	0.7	-51.6	-13.0	-38.6
2	2546.40	-55.90	-49.8	0.2	-49.6	-13.0	-36.6
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	-51.0	-43.7	0.7	-43.0	-13.0	-30.0
2	2546.40	-57.5	-53.5	0.2	-53.3	-13.0	-40.3

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

EDGE:

Mode	TX channel 128	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-51.8	-44.0	0.9	-43.1	-13.0	-30.1
2	2472.60	-56.0	-49.7	0.1	-49.6	-13.0	-36.6
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	-50.4	-43.0	0.9	-42.1	-13.0	-29.1
2	2472.60	-56.0	-52.0	0.1	-51.9	-13.0	-38.9

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 189	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-51.2	-43.5	0.8	-42.7	-13.0	-29.7
2	2509.20	-56.1	-49.8	0.2	-49.6	-13.0	-36.6
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	-49.0	-41.7	0.8	-40.9	-13.0	-27.9
2	2509.20	-56.2	-52.3	0.2	-52.1	-13.0	-39.1

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 251	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-60.5	-52.9	0.7	-52.2	-13.0	-39.2
2	2546.40	-56.4	-50.3	0.2	-50.1	-13.0	-37.1

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	-51.8	-44.5	0.7	-43.8	-13.0	-30.8
2	2546.40	-58.1	-54.1	0.2	-53.9	-13.0	-40.9

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

WCDMA:

Mode	TX channel 4132	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-48.2	-40.5	0.9	-39.6	-13.0	-26.6
2	2479.20	-55.0	-48.6	0.1	-48.5	-13.0	-35.5
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	-47.4	-40.2	0.9	-39.3	-13.0	-26.3
2	2479.20	-52.9	-48.9	0.1	-48.8	-13.0	-35.8

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 4182	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-49.3	-41.7	0.8	-40.9	-13.0	-27.9
2	2509.20	-55.4	-49.1	0.2	-48.9	-13.0	-35.9
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	-47.6	-40.3	0.8	-39.5	-13.0	-26.5
2	2509.20	-52.1	-48.2	0.2	-48.0	-13.0	-35.0

Remarks:

- Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 4233	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Tank 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	-50.8	-43.2	0.7	-42.5	-13.0	-29.5
2	2539.80	-52.1	-46.0	0.2	-45.8	-13.0	-32.8
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	-50.5	-43.2	0.7	-42.5	-13.0	-29.5
2	2539.80	-51.4	-47.3	0.2	-47.1	-13.0	-34.1

Remarks:

1. Output Power (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 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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