FCC TEST REPORT

(PART 22)

REPORT NO.:	RF131029C26-1
MODEL NO.:	M5360
FCC ID:	TE7M5360
RECEIVED:	Oct. 29, 2013
TESTED:	Jan. 07 ~ Jan. 28, 2014
ISSUED:	Jan. 29, 2014

APPLICANT:	TP-LINK TECHNOLOGIES CO., LTD.
ADDRESS:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
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.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF131029C26-1	Original release	Jan. 29, 2014

1 CERTIFICATION

PRODUCT:	3G Mobile Wi-Fi, 5200mAh Power Bank
MODEL:	M5360
BRAND:	TP-LINK
APPLICANT:	TP-LINK TECHNOLOGIES CO., LTD.
TESTED:	Jan. 07 ~ Jan. 28, 2014
TEST SAMPLE:	PRODUCTION SAMPLE
STANDARDS:	**FCC PART 22, Subpart H**

The above equipment (model: M5360) 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 :** Jan. 29, 2014

Pettie Chen / Senior Specialist

APPROVED BY : _____ **, DATE :** Jan. 29, 2014

Ivan Tsai / Project Engineer

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 -17.41dB at 1672.80MHz.

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
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 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	100424	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Dec. 18, 2013	Dec. 17, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-405	Feb. 21, 2013	Feb. 20, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 28, 2013	Oct. 27, 2014
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Sep. 09, 2013	Sep. 08, 2014
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 3.

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 988962.

5. The IC Site Registration No. is IC 7450F-3.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	3G Mobile Wi-Fi, 5200mAh Power Bank
MODEL NO.	M5360
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.7Vdc (battery)
MODULATION TYPE	**GPRS, EDGE:** GMSK
FREQUENCY RANGE	**GPRS, EDGE:** 824.2MHz ~ 848.8MHz
MAX. ERP POWER	**GPRS:** 0.899Watts (29.54dBm) **EDGE:** 0.973Watts (29.88dBm)
EMISSION DESIGNATOR	**GPRS:** 255KGXW **EDGE:** 255KG7W
MULTI-SLOTS CLASS	10
ANTENNA TYPE	Fixed Internal antenna with 0.66dBi gain
I/O PORTS	Refer to users' manual
DATA CABLE	NA
ACCESSORY DEVICES	Adapter, Battery

NOTE:

1. The EUT uses following adapter and battery.

Adapter	
Brand	HuntKey
Model	HKA00605010-2B
Input Power	100-240Vac~50/60Hz 0.2A
Output Power	5.0Vdc / 1.0A

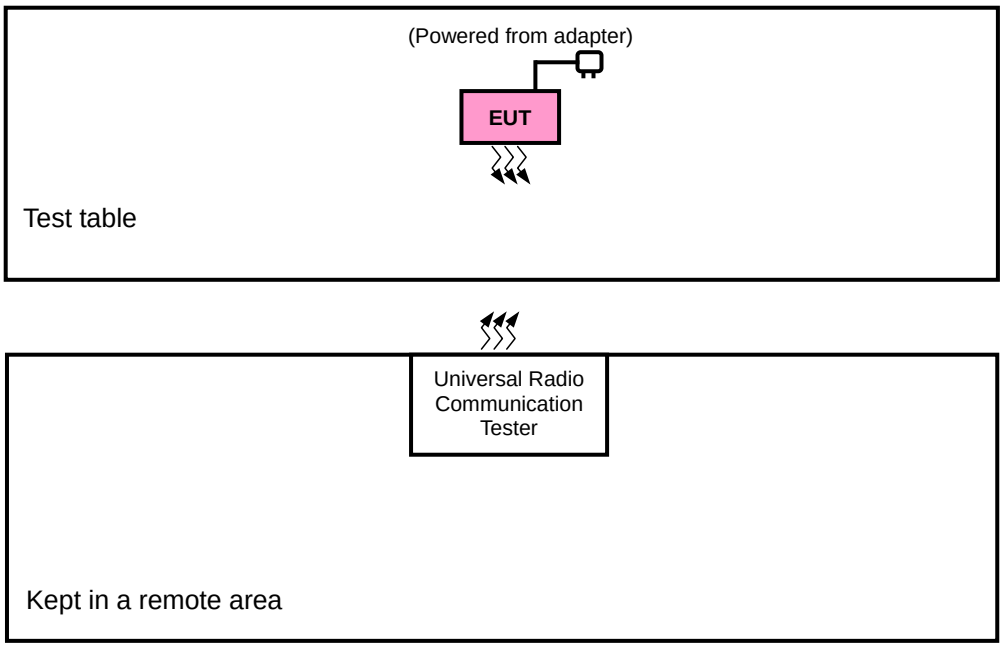
Battery 1	
Brand	HUIZHOU DESAY BATTERY CO., LTD
Model	TBL-18B5200
Power Rating	3.7Vdc, 5200mAh, 19.2 Wh

Battery 2	
Brand	TP-LINK technologies co., LTD
Model	TBL-18B5200
Power Rating	3.7Vdc, 5200mAh, 19.2 Wh

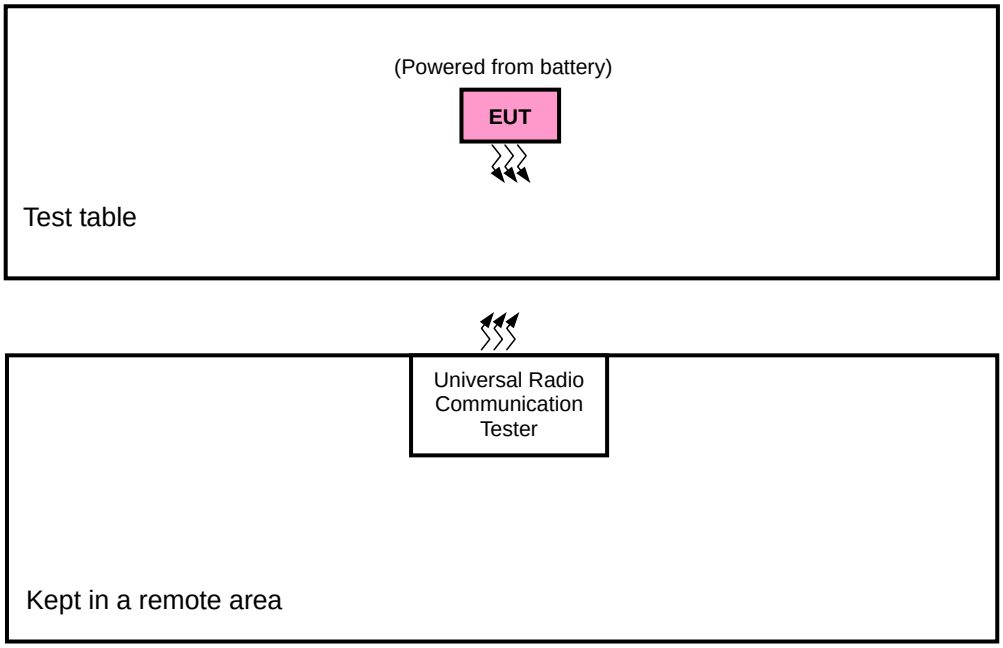
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 CONFIGURATION OF SYSTEM UNDER TEST

Test Mode A, C



Test Mode B, D



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	Universal Radio Communication Tester	R&S	CMU200	104958	NA

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

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

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

EUT CONFIGURE MODE	DESCRIPTION
A	Power from battery 1
B	Power from battery 1 + adapter
C	Power from battery 2
D	Power from battery 2 + adapter

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A, C	ERP	128 to 251	128, 189, 251	GPRS, EDGE
A	FREQUENCY STABILITY	128 to 251	189	GPRS, EDGE
A	OCCUPIED BANDWIDTH	128 to 251	128, 189, 251	GPRS, EDGE
A	BAND EDGE	128 to 251	128, 251	GPRS, EDGE
A	CONDCUDETED EMISSION	128 to 251	128, 189, 251	GPRS, EDGE
A, B	RADIATED EMISSION (30MHz~1GHz)	128 to 251	128	GPRS, EDGE
C, D	RADIATED EMISSION (30MHz~1GHz)	128 to 251	251	GPRS, EDGE
A, C	RADIATED EMISSION (Above 1GHz)	128 to 251	128, 189, 251	GPRS, EDGE

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	25deg. C, 65%RH	3.7Vdc	Match Tsui
FREQUENCY STABILITY	26deg. C, 65%RH	3.7Vdc	Match Tsui
OCCUPIED BANDWIDTH	26deg. C, 65%RH	3.7Vdc	Match Tsui
BAND EDGE	26deg. C, 65%RH	3.7Vdc	Match Tsui
CONDCUDETED EMISSION	26deg. C, 65%RH	3.7Vdc	Match Tsui
RADIATED EMISSION	25deg. C, 65%RH	3.7Vdc 120Vac, 60Hz	Chris Lin

3.5 EUT OPERATING CONDITIONS

The EUT connected with the communication Tester. The communication Tester 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 GPRS & EDGE 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

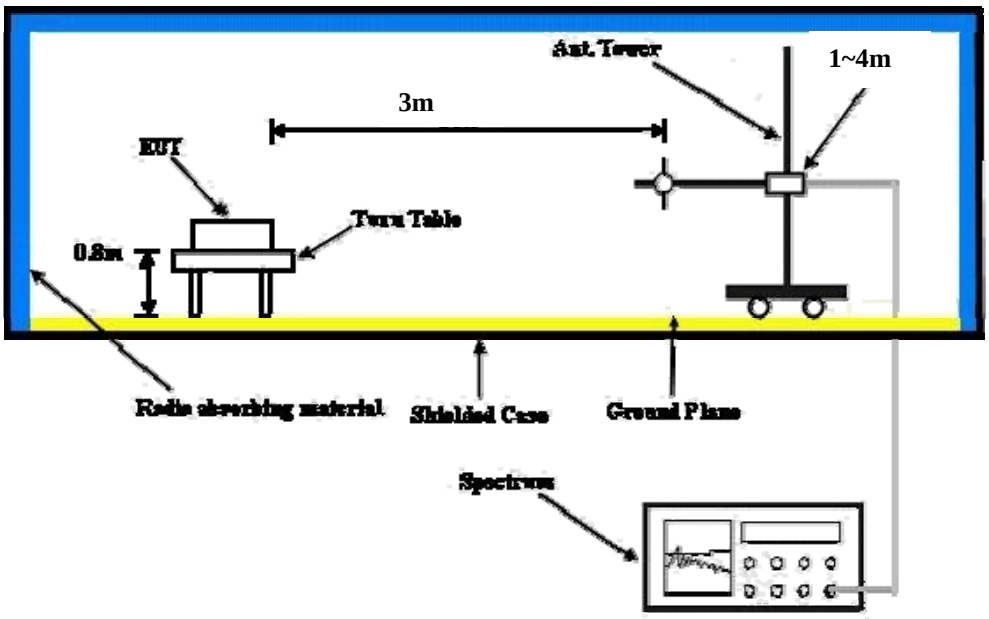
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

CONDUCTED POWER MEASUREMENT:

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

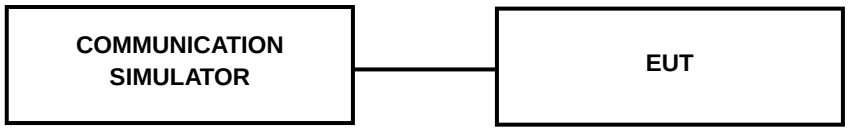
4.1.3 TEST SETUP

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	GPRS850		
Channel	128	189	251
Frequency (MHz)	824.2	836.4	848.8
GPRS 8	31.46	**31.49**	31.48
GPRS 10	28.60	28.65	28.62
GPRS 11	26.53	26.56	26.55
GPRS 12	25.46	25.49	25.48
EDGE 8 (MCS9)	26.09	26.12	26.11
EDGE 10 (MCS9)	25.57	25.60	25.59
EDGE 11 (MCS9)	25.55	25.58	25.57
EDGE 12 (MCS9)	25.00	25.03	25.02

ERP POWER (dBm)

FOR GPRS MODE:

TEST MODE A

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	824.2	-1.81	29.40	0.01	29.41	38.45	-9.04
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	824.2	-12.32	16.99	0.01	17.00	38.45	-21.45

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	836.4	-1.05	29.25	0.29	**29.54**	38.45	-8.91
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	-11.05	18.78	0.29	19.07	38.45	-19.38

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	848.8	-1.50	28.70	0.51	29.21	38.45	-9.24
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	848.8	-9.03	21.73	0.51	22.24	38.45	-16.21

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

TEST MODE C

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	824.2	-1.88	29.33	0.01	29.34	38.45	-9.11
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	824.2	-12.25	17.06	0.01	17.07	38.45	-21.38

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	836.4	-1.18	29.12	0.29	29.41	38.45	-9.04
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	-11.20	18.63	0.29	18.92	38.45	-19.53

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	848.8	-1.57	28.63	0.51	29.14	38.45	-9.31
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	848.8	-9.62	21.14	0.51	21.65	38.45	-16.80

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

FOR EDGE MODE:

TEST MODE A

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	824.2	-1.66	29.55	0.01	29.56	38.45	-8.89
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	824.2	-14.42	14.89	0.01	14.90	38.45	-23.55

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	836.4	-0.95	29.35	0.29	29.64	38.45	-8.81
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	-13.31	16.52	0.29	16.81	38.45	-21.64

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	848.8	-0.83	29.37	0.51	**29.88**	38.45	-8.57
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	848.8	-11.25	19.51	0.51	20.02	38.45	-18.43

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

TEST MODE C

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	824.2	-1.76	29.45	0.01	29.46	38.45	-8.99
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	824.2	-14.32	14.99	0.01	15.00	38.45	-23.45

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	836.4	-0.90	29.40	0.29	29.69	38.45	-8.76
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	-13.37	16.46	0.29	16.75	38.45	-21.70

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	848.8	-0.93	29.27	0.51	29.78	38.45	-8.67
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	848.8	-11.78	18.98	0.51	19.49	38.45	-18.96

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

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

4.2.2 TEST PROCEDURE

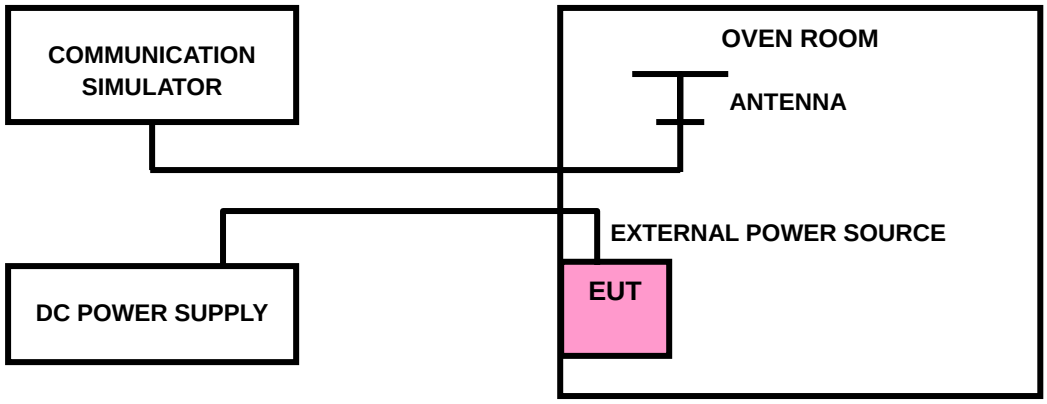
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ 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	EDGE	
5.75	-0.020	-0.016	2.5
5	-0.016	-0.012	2.5
4.25	-0.018	-0.014	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 4.25Vdc to 5.75Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

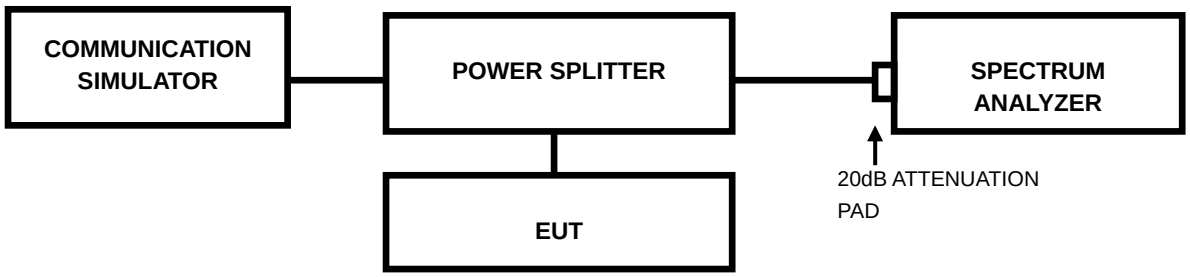
TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	GPRS	EDGE	
50	-0.031	-0.029	2.5
40	-0.025	-0.023	2.5
30	-0.020	-0.018	2.5
20	-0.016	-0.012	2.5
10	-0.024	-0.020	2.5
0	-0.032	-0.026	2.5
-10	-0.037	-0.044	2.5
-20	-0.045	-0.047	2.5
-30	-0.053	-0.049	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 TEST PROCEDURES

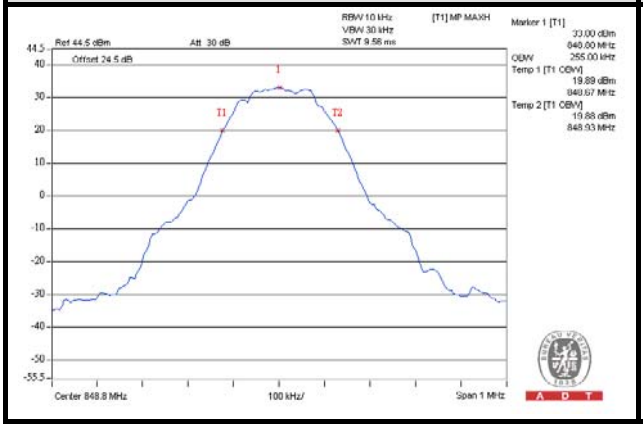
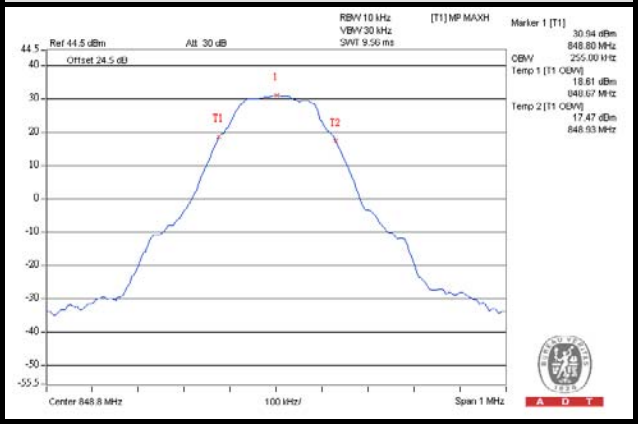
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function 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	EDGE
128	824.2	255.0	250.0
189	836.4	255.0	255.0
251	848.8	255.0	255.0

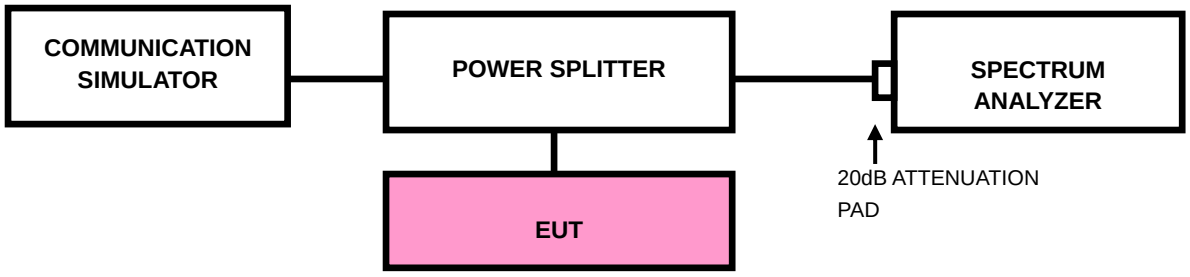
SPECTRUM PLOT OF WORST VALUE	
GPRS	EDGE
	

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



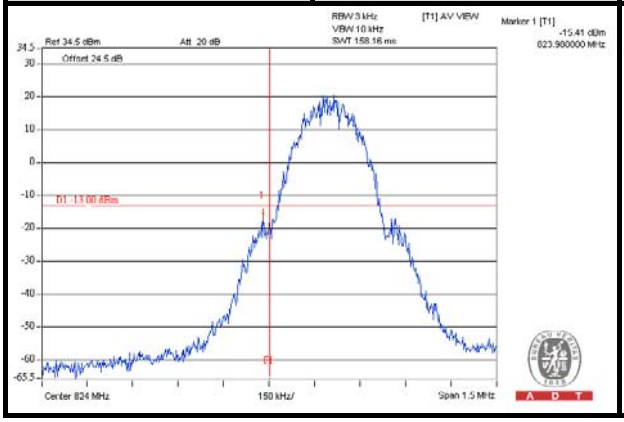
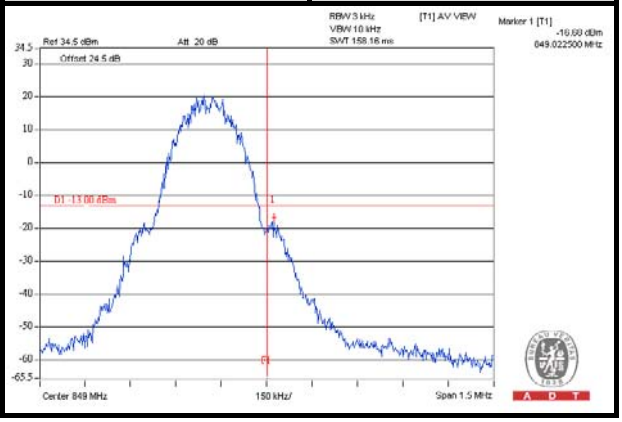
4.4.3 TEST PROCEDURES

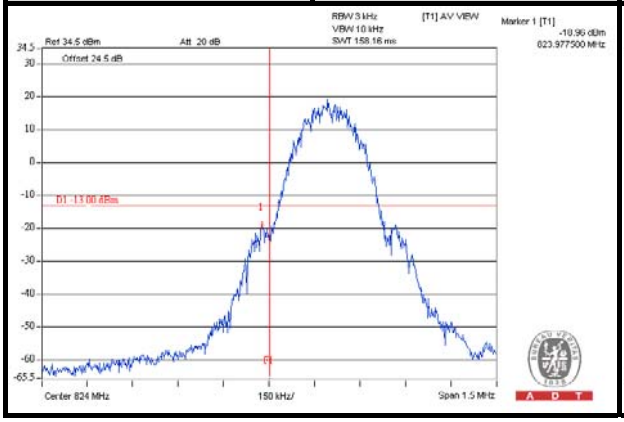
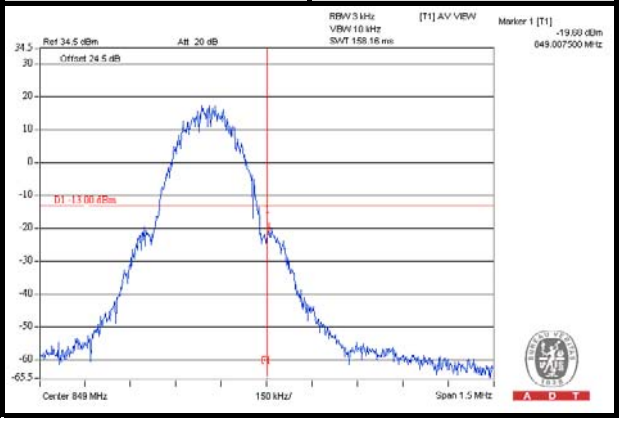
a. All measurements were done at low and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GPRS/EDGE).

c. Record the max trace plot into the test report.

4.4.4 TEST RESULTS

GPRS			
CHANNEL	128	CHANNEL	251
			

EDGE			
CHANNEL	128	CHANNEL	251
			

4.5 CONDUCTED SPURIOUS EMISSIONS

4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

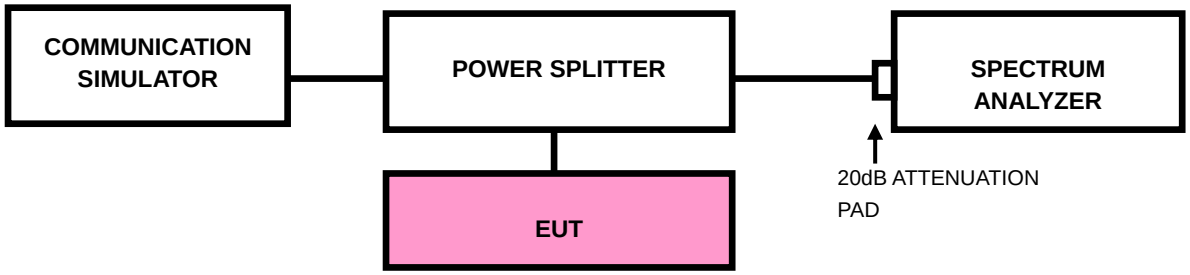
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.5.2 TEST PROCEDURE

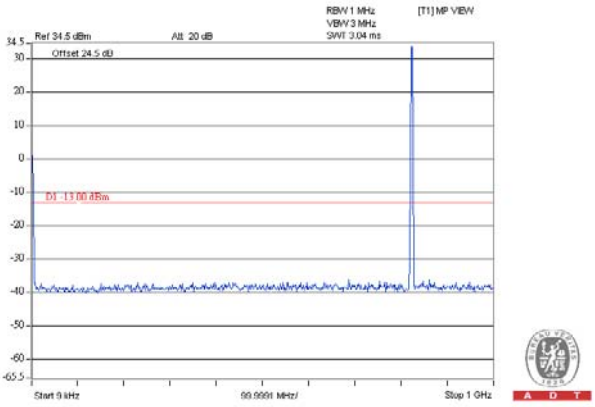
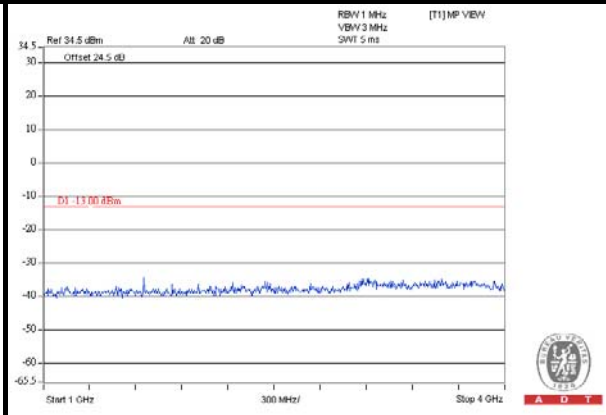
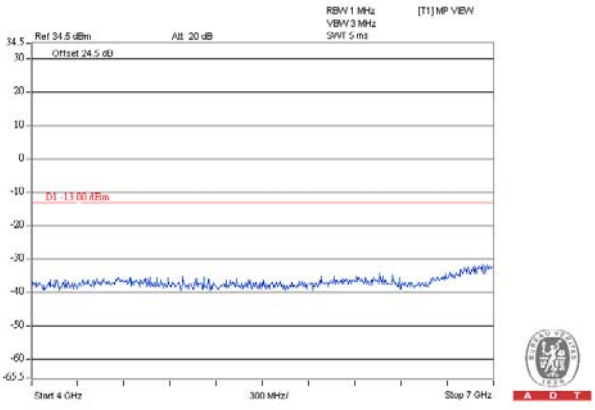
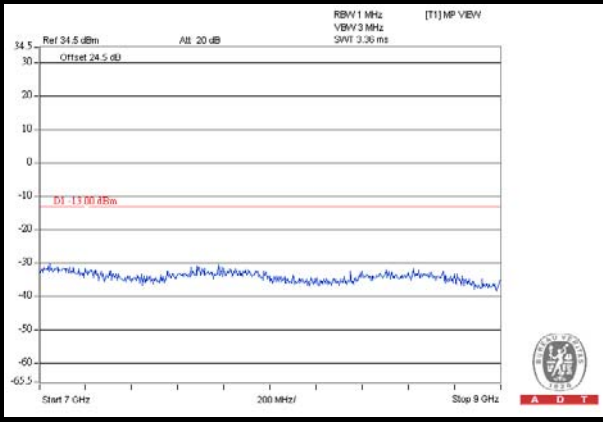
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

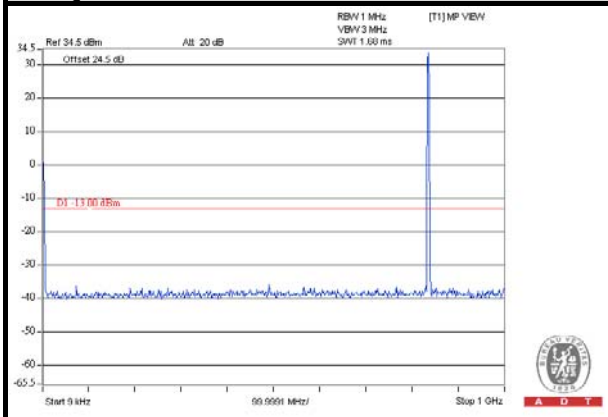
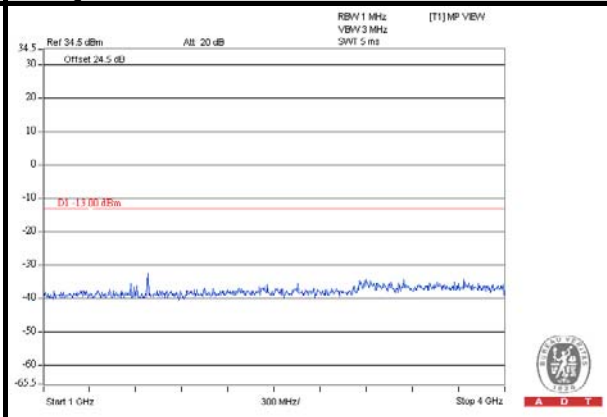
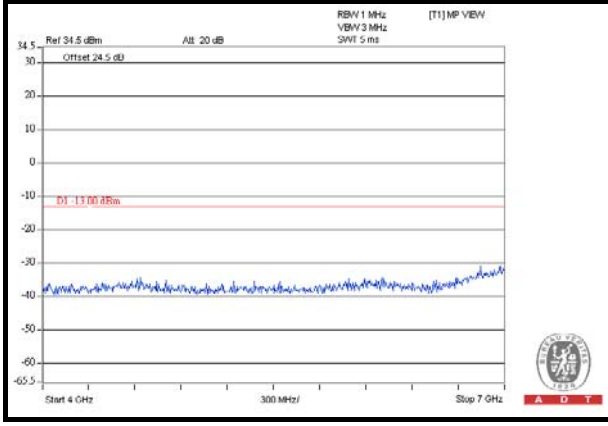
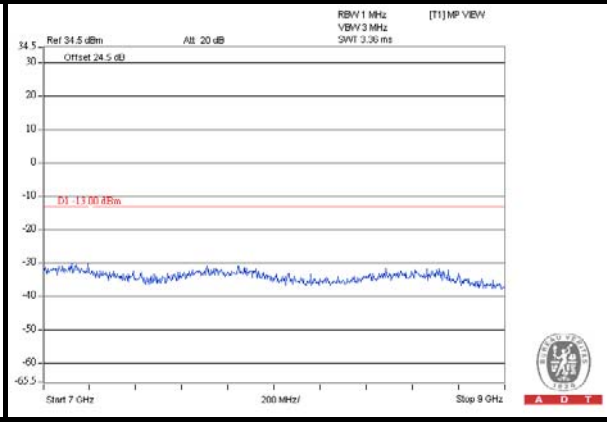
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

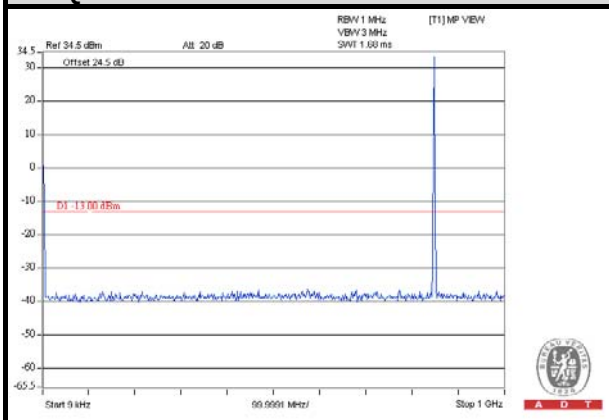
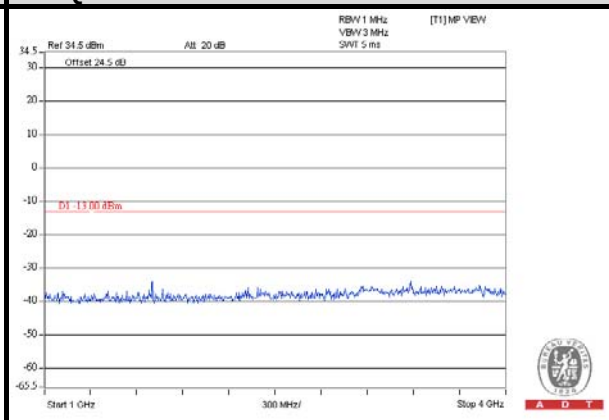
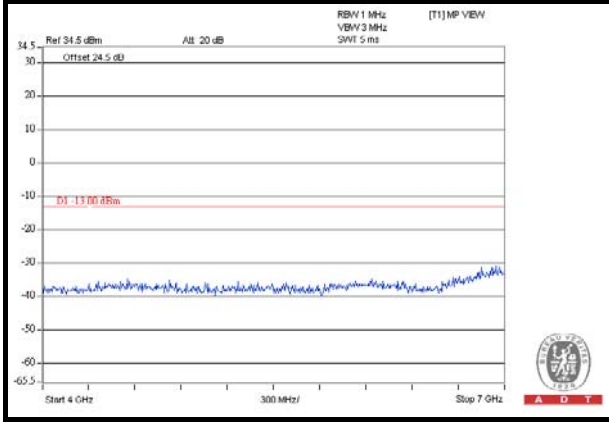
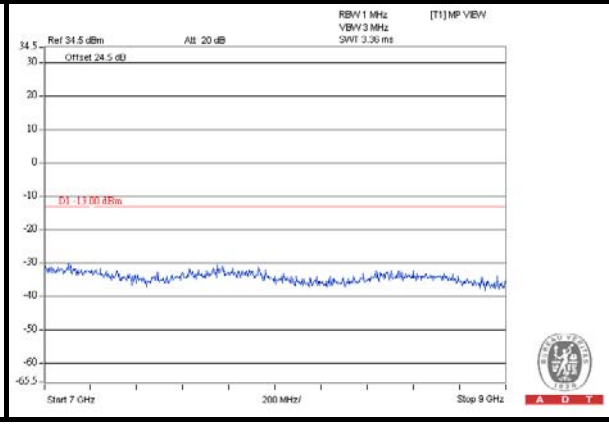
4.5.3 TEST SETUP

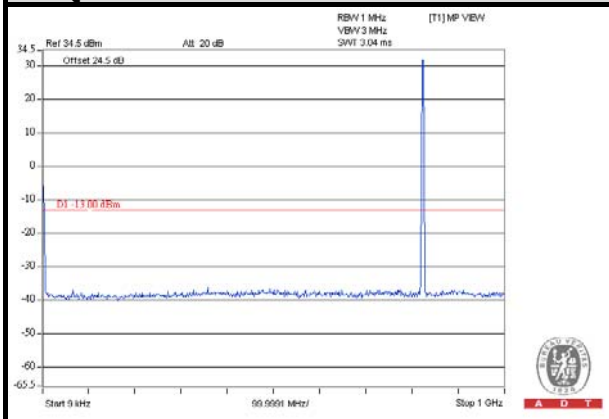
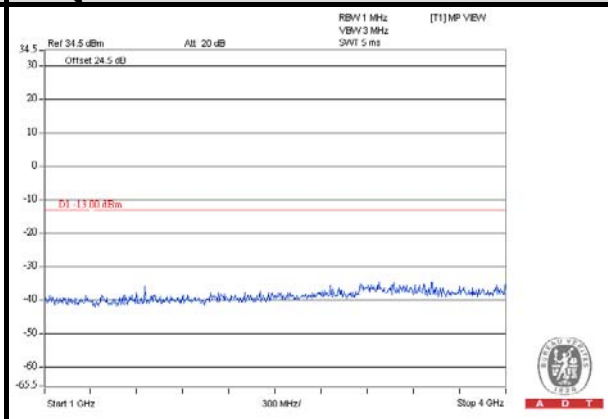
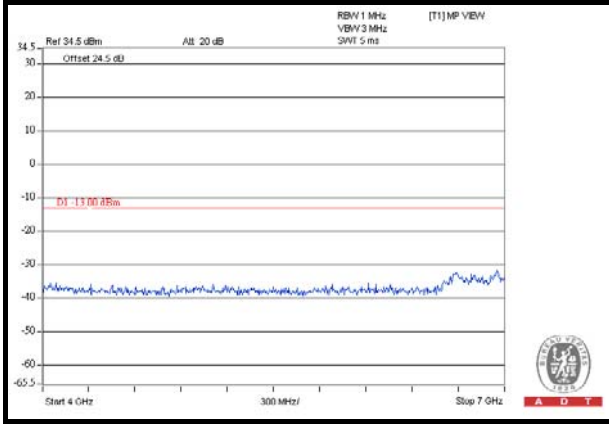
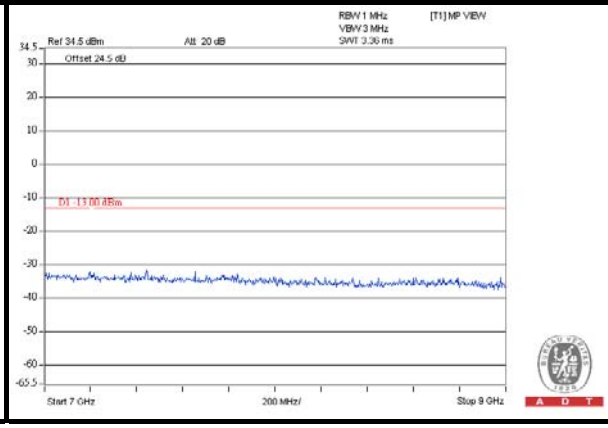


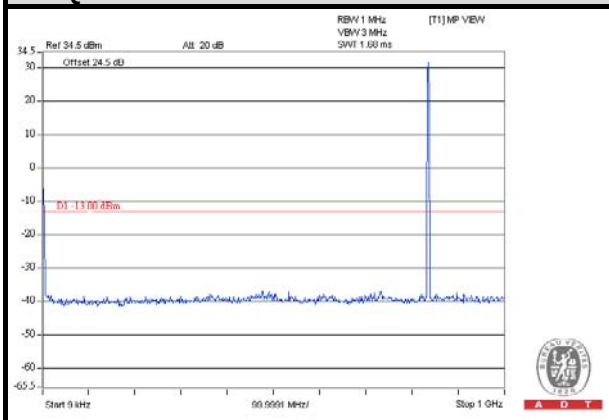
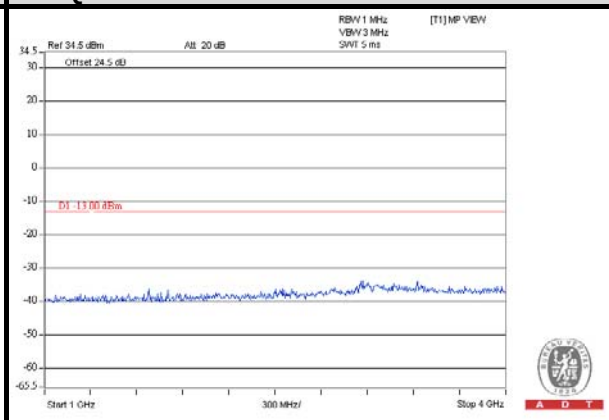
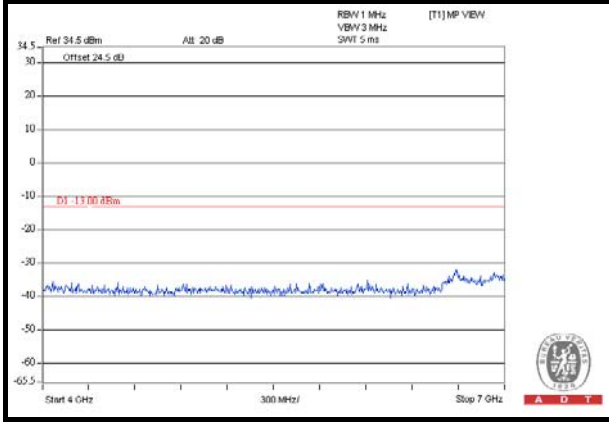
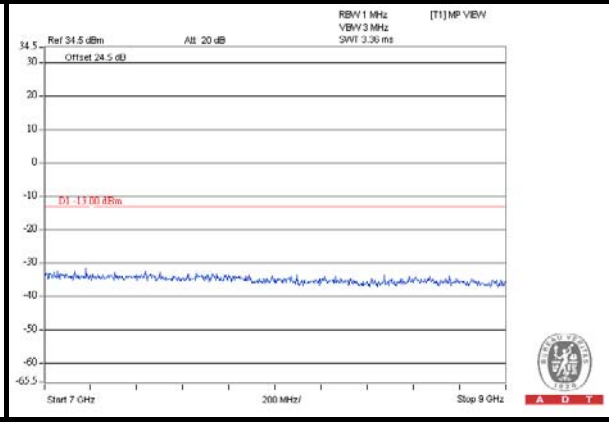
4.5.4 TEST RESULTS

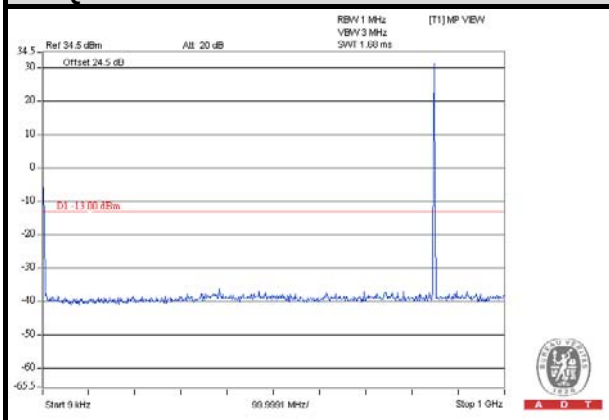
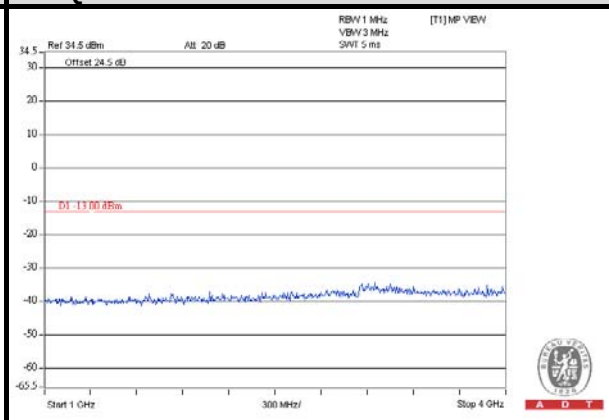
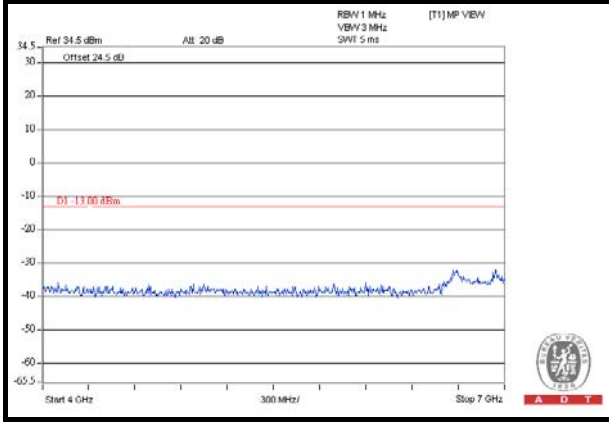
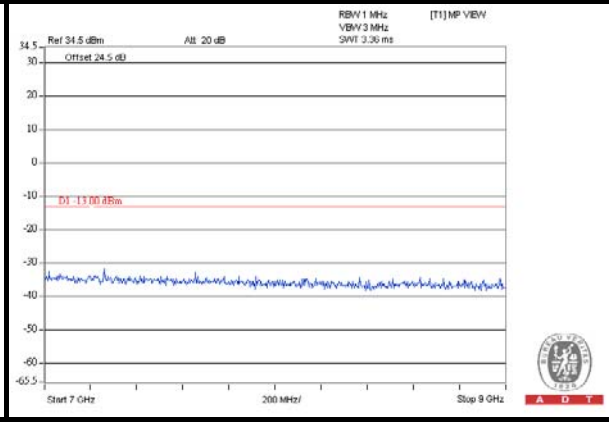
GPRS	
CHANNEL 128	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

GPRS	
CHANNEL 189	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

GPRS	
CHANNEL 251	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

EDGE	
CHANNEL 128	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

EDGE	
CHANNEL 189	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

EDGE	
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. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

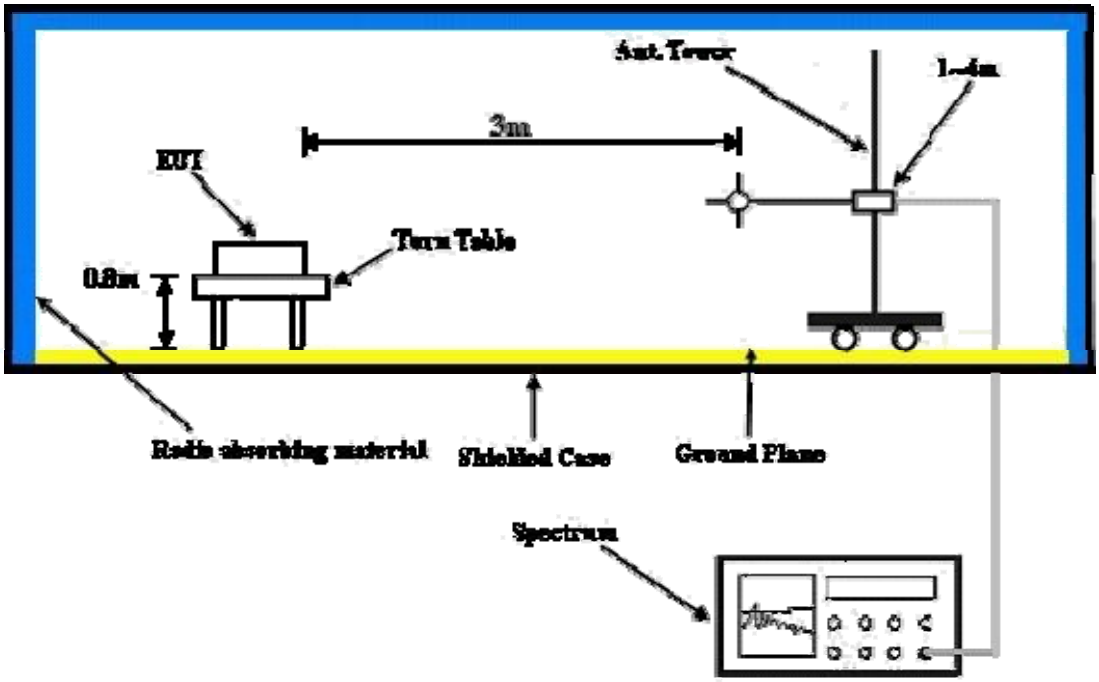
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	86.26	-43.39	-52.80	0.09	-52.71	-13.00	-39.71
2	185.20	-47.13	-58.73	3.58	-55.15	-13.00	-42.15
3	247.28	-54.00	-66.69	5.41	-61.28	-13.00	-48.28
4	458.74	-68.76	-75.78	5.04	-70.74	-13.00	-57.74
5	809.88	-70.41	-71.26	4.02	-67.24	-13.00	-54.24
6	949.56	-70.82	-69.88	3.90	-65.98	-13.00	-52.98
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	88.20	-38.06	-43.61	0.63	-42.98	-13.00	-29.98
2	189.08	-49.52	-57.48	4.08	-53.40	-13.00	-40.40
3	435.46	-68.87	-74.26	5.13	-69.13	-13.00	-56.13
4	602.30	-69.76	-72.23	4.45	-67.78	-13.00	-54.78
5	716.76	-70.03	-70.43	5.04	-65.39	-13.00	-52.39
6	848.68	-70.33	-68.45	3.97	-64.48	-13.00	-51.48

REMARKS:

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

MODE	TX channel 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	B	TESTED BY	Chris 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	86.26	-43.40	-52.81	0.09	-52.72	-13.00	-39.72
2	187.14	-47.72	-59.70	3.84	-55.86	-13.00	-42.86
3	243.40	-54.44	-67.10	5.40	-61.70	-13.00	-48.70
4	511.12	-69.35	-76.10	4.84	-71.26	-13.00	-58.26
5	749.74	-70.49	-71.76	4.62	-67.14	-13.00	-54.14
6	916.58	-69.73	-69.47	3.91	-65.56	-13.00	-52.56
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	90.14	-38.77	-44.50	1.13	-43.37	-13.00	-30.37
2	187.14	-50.08	-57.52	3.84	-53.68	-13.00	-40.68
3	522.76	-62.66	-67.54	4.78	-62.76	-13.00	-49.76
4	635.28	-56.86	-58.87	4.72	-54.15	-13.00	-41.15
5	778.84	-69.16	-68.27	4.29	-63.98	-13.00	-50.98
6	941.80	-70.78	-66.78	3.92	-62.86	-13.00	-49.86

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	84.32	-43.48	-52.66	-0.45	-53.11	-13.00	-40.11
2	187.14	-48.84	-60.82	3.84	-56.98	-13.00	-43.98
3	249.22	-55.47	-68.17	5.40	-62.77	-13.00	-49.77
4	501.42	-69.41	-76.18	4.89	-71.29	-13.00	-58.29
5	712.88	-70.21	-73.42	5.09	-68.33	-13.00	-55.33
6	943.74	-70.52	-69.72	3.92	-65.80	-13.00	-52.80
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	84.32	-37.73	-42.97	-0.45	-43.42	-13.00	-30.42
2	187.14	-50.49	-57.93	3.84	-54.09	-13.00	-41.09
3	291.90	-68.45	-77.36	5.17	-72.19	-13.00	-59.19
4	470.38	-68.93	-74.70	5.00	-69.70	-13.00	-56.70
5	643.04	-63.84	-65.74	4.78	-60.96	-13.00	-47.96
6	957.32	-67.60	-63.32	3.91	-59.41	-13.00	-46.41

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	D	TESTED BY	Chris 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	84.32	-43.97	-53.15	-0.45	-53.60	-13.00	-40.60
2	185.20	-49.48	-61.08	3.58	-57.50	-13.00	-44.50
3	245.34	-55.71	-68.39	5.41	-62.98	-13.00	-49.98
4	443.22	-66.74	-73.58	5.10	-68.48	-13.00	-55.48
5	761.38	-69.55	-70.75	4.51	-66.24	-13.00	-53.24
6	918.52	-70.33	-70.03	3.91	-66.12	-13.00	-53.12
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	88.20	-40.83	-46.38	0.63	-45.75	-13.00	-32.75
2	185.20	-52.14	-59.05	3.58	-55.47	-13.00	-42.47
3	243.40	-58.21	-68.28	5.40	-62.88	-13.00	-49.88
4	435.46	-68.44	-73.83	5.13	-68.70	-13.00	-55.70
5	676.02	-69.99	-71.36	5.05	-66.31	-13.00	-53.31
6	784.66	-63.19	-62.27	4.23	-58.04	-13.00	-45.04

REMARKS:

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

EDGE

MODE	TX channel 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	86.12	-42.87	-52.28	0.06	-52.22	-13.00	-39.22
2	185.80	-47.68	-59.40	3.66	-55.74	-13.00	-42.74
3	247.35	-54.16	-66.85	5.41	-61.44	-13.00	-48.44
4	458.88	-68.63	-75.66	5.04	-70.62	-13.00	-57.62
5	810.25	-70.86	-71.71	4.02	-67.69	-13.00	-54.69
6	949.32	-70.41	-69.47	3.90	-65.57	-13.00	-52.57
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	88.14	-37.95	-43.50	0.62	-42.88	-13.00	-29.88
2	189.24	-49.68	-57.68	4.10	-53.58	-13.00	-40.58
3	435.55	-69.02	-74.41	5.13	-69.28	-13.00	-56.28
4	602.38	-69.96	-72.43	4.45	-67.98	-13.00	-54.98
5	716.88	-70.49	-70.89	5.04	-65.85	-13.00	-52.85
6	848.74	-70.80	-68.92	3.97	-64.95	-13.00	-51.95

REMARKS:

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

MODE	TX channel 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	B	TESTED BY	Chris 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	86.35	-43.23	-52.65	0.11	-52.54	-13.00	-39.54
2	187.51	-47.57	-59.61	3.87	-55.74	-13.00	-42.74
3	243.69	-54.26	-66.92	5.40	-61.52	-13.00	-48.52
4	511.58	-69.09	-75.85	4.84	-71.01	-13.00	-58.01
5	749.41	-70.34	-71.63	4.63	-67.00	-13.00	-54.00
6	916.96	-69.84	-69.57	3.91	-65.66	-13.00	-52.66
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	90.88	-39.08	-44.98	1.11	-43.87	-13.00	-30.87
2	187.88	-50.25	-57.88	3.92	-53.96	-13.00	-40.96
3	522.55	-61.42	-66.30	4.78	-61.52	-13.00	-48.52
4	635.32	-56.71	-58.72	4.72	-54.00	-13.00	-41.00
5	778.77	-69.43	-68.54	4.29	-64.25	-13.00	-51.25
6	941.99	-70.47	-66.47	3.92	-62.55	-13.00	-49.55

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	84.96	-44.01	-53.27	-0.27	-53.54	-13.00	-40.54
2	187.52	-48.71	-60.76	3.88	-56.88	-13.00	-43.88
3	249.30	-55.59	-68.29	5.40	-62.89	-13.00	-49.89
4	501.89	-69.68	-76.44	4.88	-71.56	-13.00	-58.56
5	713.12	-70.35	-73.56	5.09	-68.47	-13.00	-55.47
6	943.52	-70.16	-69.36	3.92	-65.44	-13.00	-52.44
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	84.24	-37.87	-43.11	-0.47	-43.58	-13.00	-30.58
2	187.63	-50.89	-58.45	3.89	-54.56	-13.00	-41.56
3	291.64	-68.99	-77.92	5.18	-72.74	-13.00	-59.74
4	470.78	-69.05	-74.82	5.00	-69.82	-13.00	-56.82
5	643.32	-64.08	-65.99	4.79	-61.20	-13.00	-48.20
6	957.89	-67.86	-63.57	3.91	-59.66	-13.00	-46.66

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	D	TESTED BY	Chris 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	84.45	-44.35	-53.55	-0.41	-53.96	-13.00	-40.96
2	185.58	-49.91	-61.59	3.63	-57.96	-13.00	-44.96
3	245.74	-54.97	-67.65	5.41	-62.24	-13.00	-49.24
4	443.32	-66.46	-73.30	5.10	-68.20	-13.00	-55.20
5	761.88	-69.45	-70.63	4.49	-66.14	-13.00	-53.14
6	918.99	-70.78	-70.47	3.91	-66.56	-13.00	-53.56
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	88.45	-40.39	-45.96	0.70	-45.26	-13.00	-32.26
2	185.44	-52.38	-59.35	3.61	-55.74	-13.00	-42.74
3	243.32	-57.61	-67.68	5.40	-62.28	-13.00	-49.28
4	435.78	-68.71	-74.11	5.13	-68.98	-13.00	-55.98
5	676.57	-69.79	-71.16	5.06	-66.10	-13.00	-53.10
6	784.57	-63.46	-62.54	4.23	-58.31	-13.00	-45.31

REMARKS:

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

ABOVE 1GHz

GPRS

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	1648.40	-35.62	-38.35	5.48	-32.87	-13.00	-19.87
2	2472.60	-51.63	-51.59	6.43	-45.16	-13.00	-32.16
3	3296.80	-57.41	-55.79	6.86	-48.93	-13.00	-35.93
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	-36.74	-41.41	5.48	-35.93	-13.00	-22.93
2	2472.60	-51.30	-51.10	6.43	-44.67	-13.00	-31.67
3	3296.80	-58.17	-56.95	6.86	-50.09	-13.00	-37.09

REMARKS:

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

MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	1672.80	-34.21	-37.04	5.54	-31.50	-13.00	-18.50
2	2509.20	-48.74	-48.54	6.45	-42.09	-13.00	-29.09
3	3345.60	-57.62	-56.10	6.94	-49.16	-13.00	-36.16
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	-34.71	-39.34	5.54	-33.80	-13.00	-20.80
2	2509.20	-51.30	-51.07	6.45	-44.62	-13.00	-31.62
3	3345.60	-57.63	-56.36	6.94	-49.42	-13.00	-36.42

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	1697.60	-35.63	-38.56	5.59	-32.97	-13.00	-19.97
2	2546.40	-47.65	-47.19	6.44	-40.75	-13.00	-27.75
3	3395.20	-57.10	-55.67	7.02	-48.65	-13.00	-35.65
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	-33.52	-38.11	5.59	-32.52	-13.00	-19.52
2	2546.40	-47.62	-47.47	6.44	-41.03	-13.00	-28.03
3	3395.20	-56.41	-55.09	7.02	-48.07	-13.00	-35.07

REMARKS:

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

GPRS

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	1648.40	-36.67	-39.40	5.48	-33.92	-13.00	-20.92
2	2472.60	-52.30	-52.26	6.43	-45.83	-13.00	-32.83
3	3296.80	-58.41	-56.79	6.86	-49.93	-13.00	-36.93
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	-37.40	-42.07	5.48	-36.59	-13.00	-23.59
2	2472.60	-52.70	-52.50	6.43	-46.07	-13.00	-33.07
3	3296.80	-57.90	-56.68	6.86	-49.82	-13.00	-36.82

REMARKS:

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

MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	**1672.80**	**-33.12**	**-35.95**	**5.54**	**-30.41**	**-13.00**	**-17.41**
2	2509.20	-50.96	-50.76	6.45	-44.31	-13.00	-31.31
3	3345.60	-58.21	-56.69	6.94	-49.75	-13.00	-36.75
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	-35.65	-40.28	5.54	-34.74	-13.00	-21.74
2	2509.20	-52.66	-52.43	6.45	-45.98	-13.00	-32.98
3	3345.60	-59.74	-58.47	6.94	-51.53	-13.00	-38.53

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	-36.74	-39.67	5.59	-34.08	-13.00	-21.08
2	2546.4	-48.74	-48.28	6.44	-41.84	-13.00	-28.84
3	3395.2	-58.41	-56.98	7.02	-49.96	-13.00	-36.96
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	-34.01	-38.60	5.59	-33.01	-13.00	-20.01
2	2546.40	-49.52	-49.37	6.44	-42.93	-13.00	-29.93
3	3395.20	-57.41	-56.09	7.02	-49.07	-13.00	-36.07

REMARKS:

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

EDGE

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	1648.40	-36.25	-38.98	5.48	-33.50	-13.00	-20.50
2	2472.60	-51.09	-51.05	6.43	-44.62	-13.00	-31.62
3	3296.80	-56.68	-55.06	6.86	-48.20	-13.00	-35.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1648.40	-37.01	-41.68	5.48	-36.20	-13.00	-23.20
2	2472.60	-51.75	-51.55	6.43	-45.12	-13.00	-32.12
3	3296.80	-59.70	-58.48	6.86	-51.62	-13.00	-38.62

REMARKS:

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

MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	1672.80	-34.91	-37.74	5.54	-32.20	-13.00	-19.20
2	2509.20	-49.54	-49.34	6.45	-42.89	-13.00	-29.89
3	3345.60	-58.35	-56.83	6.94	-49.89	-13.00	-36.89
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	-35.53	-40.16	5.54	-34.62	-13.00	-21.62
2	2509.20	-52.42	-52.19	6.45	-45.74	-13.00	-32.74
3	3345.60	-58.17	-56.90	6.94	-49.96	-13.00	-36.96

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	A	TESTED BY	Chris 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	1697.60	-36.17	-39.10	5.59	-33.51	-13.00	-20.51
2	2546.40	-48.52	-48.06	6.44	-41.62	-13.00	-28.62
3	3395.20	-57.33	-55.90	7.02	-48.88	-13.00	-35.88
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	-34.26	-38.85	5.59	-33.26	-13.00	-20.26
2	2546.40	-48.57	-48.42	6.44	-41.98	-13.00	-28.98
3	3395.20	-57.16	-55.84	7.02	-48.82	-13.00	-35.82

REMARKS:

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

EDGE

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	1648.40	-35.99	-38.72	5.48	-33.24	-13.00	-20.24
2	2472.60	-51.83	-51.79	6.43	-45.36	-13.00	-32.36
3	3296.80	-58.22	-56.60	6.86	-49.74	-13.00	-36.74
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	-37.79	-42.46	5.48	-36.98	-13.00	-23.98
2	2472.60	-53.52	-53.32	6.43	-46.89	-13.00	-33.89
3	3296.80	-58.20	-56.98	6.86	-50.12	-13.00	-37.12

REMARKS:

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

MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	1672.80	-33.68	-36.51	5.54	-30.97	-13.00	-17.97
2	2509.20	-51.54	-51.34	6.45	-44.89	-13.00	-31.89
3	3345.60	-58.78	-57.26	6.94	-50.32	-13.00	-37.32
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	-36.15	-40.78	5.54	-35.24	-13.00	-22.24
2	2509.20	-53.53	-53.30	6.45	-46.85	-13.00	-33.85
3	3345.60	-60.85	-59.58	6.94	-52.64	-13.00	-39.64

REMARKS:

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

MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60Hz
TEST MODE	C	TESTED BY	Chris 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	1697.60	-37.55	-40.48	5.59	-34.89	-13.00	-21.89
2	2546.40	-49.54	-49.08	6.44	-42.64	-13.00	-29.64
3	3395.20	-59.30	-57.87	7.02	-50.85	-13.00	-37.85
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	-34.99	-39.58	5.59	-33.99	-13.00	-20.99
2	2546.40	-50.26	-50.11	6.44	-43.67	-13.00	-30.67
3	3395.20	-58.23	-56.91	7.02	-49.89	-13.00	-36.89

REMARKS:

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

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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.

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.

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