

FCC TEST REPORT (PART 22)

REPORT NO.: RF130109C20
 MODEL NO.: PN07110
 FCC ID: NM8PN07110
 RECEIVED: Jan. 09, 2013
 TESTED: Jan. 13, 2013 ~ Jan. 25, 2013
 ISSUED: Feb. 07, 2013

APPLICANT: HTC Corporation

ADDRESS: 23, Xinghua Rd., Taoyuan 330, Taiwan, R.O.C.

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

- LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
- **TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130109C20	Original release	Feb. 07, 2013



CERTIFICATION 1

PRODUCT: Smartphone **MODEL:** PN07110 BRAND: HTC **APPLICANT: HTC Corporation TESTED:** Jan. 13, 2013 ~ Jan. 25, 2013 **TEST SAMPLE:** Production Unit STANDARDS: FCC PART 22, Subpart H

The above equipment (model: PN07110) 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.

Vera Huang, DATE: Feb. 07, 2013 Vera Huang / Specialist

PREPARED BY

APPROVED BY

DATE : Feb. 07, 2013

Anderson Chiu / Senior 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		Meet the requirement of limit. Minimum passing margin is -5.99dB 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
Conducted emissions	150kHz~30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
Radiated emissions	200MHz ~1000MHz	2.95 dB
Raulaleu emissions	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100744	Apr. 19, 2012	Apr. 18, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2012	Dec. 16, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Apr. 03, 2012	Apr. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9120 D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 25, 2012	Dec. 24, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable Worken	RG-213	NA	Dec. 29, 2012	Dec. 28, 2013
Software	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Mar. 23, 2012	Mar. 22, 2013
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Communications Tester-Wireless	E5515C	MY52102049	Jun. 11, 2012	Jun. 10, 2013
Radio Communication Analyzer	MT8820C	6201168830	Jul. 17, 2012	Jul. 16, 2013

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 9.

- 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 IC 7450F-4.



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Smartphone			
MODEL NO.	PN07110			
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (battery)			
	GSM/GPRS	GMSK		
MODULATION TYPE	EDGE	8PSK		
	WCDMA	BPSK		
FREQUENCY RANGE	GSM/GPRS/EDGE	824.2MHz ~ 848.8MHz		
	WCDMA	826.4MHz ~ 846.6MHz		
	GSM	648.63mW		
MAX. ERP POWER	EDGE	233.35mW		
	WCDMA	136.46mW		
	GSM	246KGXW		
EMISSION DESIGNATOR	EDGE	247KG7W		
DECICITATION	WCDMA	4M18F9W		
MULTI-SLOTS CLASS	12			
WCDMA RELEASE VERSION	6			
ANTENNA TYPE	Fixed Internal antenna			
I/O PORTS	Refer to users' manual			
DATA CABLE	Refer to NOTE as below			
ACCESSORY DEVICES	Refer to NOTE as below			

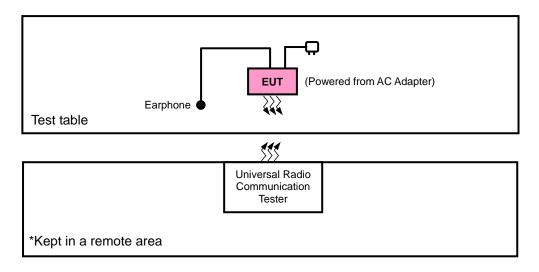
NOTE:

- 1. The EUT's accessories list refers to Ext Pho.
- The device has 2 configurations as below.
 Main Sample (A): Battery 1 + LCD Panel 1 + Front Camera 1
 2nd Sample (B): Battery 2 + LCD Panel 2 + Front Camera 2
- 3. 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.

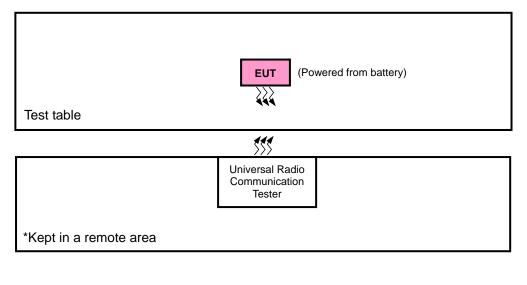


3.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR E.R.P. TEST





3.3 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Earphone	Merry	Max 300	NA	NA
2	Earphone	Cotron	Max 300	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS				
1	1.1m audio cable				
2	1.1m audio cable				
NOT					

NOTE:

1. All power cords of the above support units are non shielded (1.8m).

2. Item 1 and 2 was provided by client.



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

EUT CONFIGURE MODE	TX ANTENNA STATUS	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
А, В	0, 1	ERP	128 to 251	128, 189, 251	GSM, EDGE
А	0, 1	FREQUENCY STABILITY	128 to 251	251	GSM, EDGE
A	0, 1	OCCUPIED BANDWIDTH	128 to 251	128, 189, 251	GSM, EDGE
A	0, 1	BAND EDGE	128 to 251	128, 251	GSM, EDGE
A	0, 1	CONDCUDETED EMISSION	128 to 251	251	GSM
А	0, 1	RADIATED EMISSION	128 to 251	251	GSM, EDGE
В	0	RADIATED EMISSION	128 to 251	251	GSM

GSM MODE

WCDMA MODE

EUT CONFIGURE MODE	TX ANTENNA STATUS	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
А, В	0, 1	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
А	0, 1	FREQUENCY STABILITY	4132 to 4233	4182	WCDMA
А	0, 1	OCCUPIED BANDWIDTH	4132 to 4233	4132, 4182, 4233	WCDMA
А	0, 1	BAND EDGE	4132 to 4233	4132, 4233	WCDMA
А	0, 1	CONDCUDETED EMISSION	4132 to 4233	4182	WCDMA
А	0, 1	RADIATED EMISSION	4132 to 4233	4182	WCDMA



TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	25deg. C, 59%RH	3.8Vdc	Howard Kao
FREQUENCY STABILITY	25deg. C, 59%RH	3.8Vdc	Howard Kao
OCCUPIED BANDWIDTH	25deg. C, 59%RH	3.8Vdc	Howard Kao
BAND EDGE	25deg. C, 59%RH	3.8Vdc	Howard Kao
CONDCUDETED EMISSION	25deg. C, 59%RH	3.8Vdc	Howard Kao
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu

3.5 EUT OPERATING CONDITIONS

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

3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2 FCC 47 CFR Part 22 ANSI/TIA/EIA-603-C 2004

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



4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

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

4.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

The EUT was place on a turntable with 1.727 meter height in a fully anechoic chamber.

- b. The EUT was set at 4.858 meters from the receiving antenna, which was mounted on the antenna tower.
- c. The EUT was rotated along 2 axis: Theta-axis: 180 degree and Phi-axis: 360 degree, Step Size: 15 degree.
- d. The height of the receiving antenna is fixed.
- e. Taking the record of received power.
- f. A dipole antenna was used in place of the EUT for pathloss calibration with a network analyzer.
- g. The gain of the dipole antenna and the insertion loss of the connected RF cable were applied into the pathloss calibration.
- h. The maximum ERP/EIRP was calculated with received power and pathloss.

Gs (dBi or dBd) : Substitution antenna Gain.

Et = Rt + AF

Es = Rs + AF

AF (dB/m) : Receiver antenna factor

Rt: The highest received signal in spectrum analyzer for EUT.

Rs: The highest received signal in spectrum analyzer for substitution antenna.

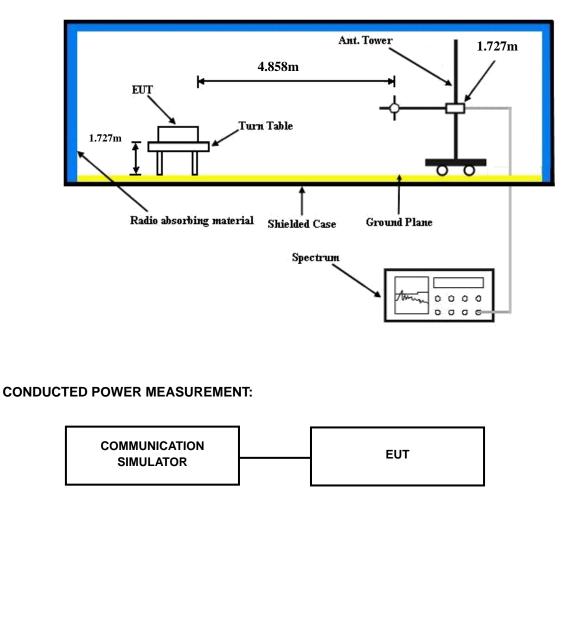


CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA & CDMA 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:





4.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band			GPR	S850			
Antenna		Antenna 0		Antenna 1			
Channel	128	189	251	128	189	251	
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	
GSM (1 Uplink)	33.47	33.52	33.58	33.23	33.17	33.06	
GPRS 8 (GMSK, 1 slot)	33.46	33.51	33.57	33.21	33.15	33.01	
GPRS 10 (GMSK, 2 slot)	31.47	31.52	31.58	31.47	31.42	31.28	
GPRS 11 (GMSK, 3 Uplink)	29.39	29.44	29.50	29.72	29.66	29.52	
GPRS 12 (GMSK, 4 Uplink)	28.16	28.21	28.27	28.03	27.97	27.83	
EDGE 8 (GMSK, 1 Uplink)	33.42	33.47	33.53	33.20	33.14	33.00	
EDGE 10 (GMSK, 2 Uplink)	31.45	31.50	31.56	31.28	31.22	31.08	
EDGE 11 (GMSK, 3 Uplink)	29.36	29.41	29.47	29.70	29.64	29.50	
EDGE 12 (GMSK, 4 Uplink)	28.11	28.16	28.22	27.98	27.92	27.78	
EDGE 8 (8PSK, 1 Uplink)	27.25	27.30	27.36	27.40	27.34	27.20	
EDGE 10 (8PSK, 2 Uplink)	26.98	27.03	27.09	27.14	27.08	26.94	
EDGE 11 (8PSK, 3 Uplink)	26.48	26.53	26.59	26.40	26.34	26.20	
EDGE 12 (8PSK, 4 Uplink)	25.49	25.54	25.60	25.67	25.61	25.47	
DTM 9 (GMSK, 2 Uplink)	31.32	31.37	31.43	31.23	31.17	31.03	
DTM 11 (GMSK, 3 Uplink)	29.33	29.38	29.44	29.64	29.58	29.44	
DTM 9 (8PSK, 2 Uplink)	26.96	27.01	27.07	27.26	27.20	27.06	
DTM 11 (8PSK, 3 Uplink)	26.45	26.50	26.56	26.68	26.62	26.48	

Band	WCDMA V							
Antenna		Antenna 0		Antenna 1				
Channel	4132	4182	4233	4132	4182	4233		
Frequency (MHz)	826.4	836.4	846.6	826.4	836.4	846.6		
RMC 12.2K	23.63	23.65	23.59	23.76	23.52	23.47		
HSDPA Subtest-1	22.40	22.42	22.36	22.76	22.52	22.47		
HSDPA Subtest-2	20.86	20.88	20.82	22.74	22.50	22.45		
HSDPA Subtest-3	19.25	19.27	19.21	22.23	21.99	21.94		
HSDPA Subtest-4	18.75	18.77	18.71	22.24	22.00	21.95		
HSUPA Subtest-1	22.29	22.31	22.25	22.55	22.31	22.26		
HSUPA Subtest-2	21.66	21.68	21.62	21.22	20.98	20.93		
HSUPA Subtest-3	21.18	21.20	21.14	20.89	20.65	20.60		
HSUPA Subtest-4	22.15	22.17	22.11	21.54	21.30	21.25		
HSUPA Subtest-5	22.57	22.59	22.53	22.80	22.56	22.51		



ERP POWER (dBm)

Main Sample (A)

<Antenna 0>

	GSM Radiated Power ERP							
		Horiz	zontal Polariza	ition				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-19.02	-48.12	0.00	-1.08	28.02	633.87		
836.40	-19.23	-48.28	0.00	-0.93	28.12	648.63		
848.80	-19.69	-48.35	0.00	-0.76	27.90	616.60		
		Ver	tical Polarizati	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-27.70	-47.97	0.00	-1.08	19.19	82.99		
836.40	-27.20	-48.01	0.00	-0.93	19.88	97.27		
848.80	-27.04	-48.05	0.00	-0.76	20.25	105.93		

	EDGE Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-24.12	-48.12	0.00	-1.08	22.92	195.88		
836.40	-23.81	-48.28	0.00	-0.93	23.54	225.94		
848.80	-23.91	-48.35	0.00	-0.76	23.68	233.35		
		Ver	tical Polarizati	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-32.81	-47.97	0.00	-1.08	14.08	25.59		
836.40	-31.96	-48.01	0.00	-0.93	15.12	32.51		
848.80	-31.38	-48.05	0.00	-0.76	15.91	38.99		



	WCDMA Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-27.06	-48.12	0.00	-1.08	19.98	99.54		
836.40	-27.38	-48.28	0.00	-0.93	19.97	99.31		
848.80	-27.77	-48.35	0.00	-0.76	19.82	95.94		
		Ver	tical Polarizat	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-35.55	-47.97	0.00	-1.08	11.34	13.61		
836.40	-35.22	-48.01	0.00	-0.93	11.86	15.35		
848.80	-34.96	-48.05	0.00	-0.76	12.33	17.10		

<Antenna 1>

	GSM Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-30.04	-48.12	0.00	-1.08	17.00	50.12		
836.40	-29.69	-48.28	0.00	-0.93	17.66	58.34		
848.80	-29.16	-48.35	0.00	-0.76	18.43	69.66		
		Ver	tical Polarizat	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-41.86	-47.97	0.00	-1.08	5.03	3.18		
836.40	-40.52	-48.01	0.00	-0.93	6.56	4.53		
848.80	-39.26	-48.05	0.00	-0.76	8.03	6.35		



	EDGE Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-37.34	-48.12	0.00	-1.08	9.70	9.33		
836.40	-37.45	-48.28	0.00	-0.93	9.90	9.77		
848.80	-37.19	-48.35	0.00	-0.76	10.40	10.96		
		Ver	tical Polarizat	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-48.13	-47.97	0.00	-1.08	-1.24	0.75		
836.40	-46.66	-48.01	0.00	-0.93	0.42	1.10		
848.80	-44.91	-48.05	0.00	-0.76	2.38	1.73		

WCDMA Radiated Power ERP

	Horizontal Polarization								
Frequency	Rt	Rs	Ps	Gs	ERP	ERP			
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)			
824.20	-39.16	-48.12	0.00	-1.08	7.88	6.14			
836.40	-38.97	-48.28	0.00	-0.93	8.38	6.89			
848.80	-40.25	-48.35	0.00	-0.76	7.34	5.42			
	•	Ver	tical Polarizati	ion	•				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP			
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)			
824.20	-48.94	-47.97	0.00	-1.08	-2.05	0.62			
836.40	-48.71	-48.01	0.00	-0.93	-1.63	0.69			
848.80	-48.39	-48.05	0.00	-0.76	-1.10	0.78			



2nd Sample (B)

<Antenna 0>

	GSM Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-19.03	-48.12	0.00	-1.08	28.01	632.41		
836.40	-19.52	-48.28	0.00	-0.93	27.83	606.74		
848.80	-20.53	-48.35	0.00	-0.76	27.06	508.16		
		Ver	tical Polarizati	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-27.59	-47.97	0.00	-1.08	19.30	85.11		
836.40	-26.92	-48.01	0.00	-0.93	20.16	103.75		
848.80	-27.70	-48.05	0.00	-0.76	19.59	90.99		

	EDGE Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-24.10	-48.12	0.00	-1.08	22.94	196.79		
836.40	-24.73	-48.28	0.00	-0.93	22.62	182.81		
848.80	-25.38	-48.35	0.00	-0.76	22.21	166.34		
		Ver	tical Polarizat	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-33.07	-47.97	0.00	-1.08	13.82	24.10		
836.40	-32.96	-48.01	0.00	-0.93	14.12	25.82		
848.80	-32.53	-48.05	0.00	-0.76	14.76	29.92		



	WCDMA Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-25.69	-48.12	0.00	-1.08	21.35	136.46		
836.40	-26.20	-48.28	0.00	-0.93	21.15	130.32		
848.80	-26.95	-48.35	0.00	-0.76	20.64	115.88		
		Ver	tical Polarizat	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-31.04	-47.97	0.00	-1.08	15.85	38.46		
836.40	-30.92	-48.01	0.00	-0.93	16.16	41.30		
848.80	-31.46	-48.05	0.00	-0.76	15.83	38.28		

<Antenna 1>

	GSM Radiated Power ERP							
		Horiz	zontal Polariza	ation				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-25.75	-48.12	0.00	-1.08	21.29	134.59		
836.40	-25.65	-48.28	0.00	-0.93	21.70	147.91		
848.80	-24.77	-48.35	0.00	-0.76	22.82	191.43		
		Ver	tical Polarizat	ion				
Frequency	Rt	Rs	Ps	Gs	ERP	ERP		
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)		
824.20	-37.21	-47.97	0.00	-1.08	9.68	9.29		
836.40	-36.55	-48.01	0.00	-0.93	10.53	11.30		
848.80	-34.87	-48.05	0.00	-0.76	12.42	17.46		



		EDGE	Radiated Powe	EDGE Radiated Power ERP														
		Horiz	zontal Polariza	ation														
Frequency	Rt	Rs	Ps	Gs	ERP	ERP												
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)												
824.20	-31.40	-48.12	0.00	-1.08	15.64	36.64												
836.40	-32.01	-48.28	0.00	-0.93	15.34	34.20												
848.80	-32.23	-48.35	0.00	-0.76	15.36	34.36												
		Ver	tical Polarizat	ion														
Frequency	Rt	Rs	Ps	Gs	ERP	ERP												
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)												
824.20	-44.11	-47.97	0.00	-1.08	2.78	1.90												
836.40	-43.85	-48.01	0.00	-0.93	3.23	2.10												
848.80	-43.08	-48.05	0.00	-0.76	4.21	2.64												

WCDMA Radiated Power ERP

		Horiz	zontal Polariza	ation									
Frequency	Rt	Rs	Ps	Gs	ERP	ERP							
(MHz)	(MHz) (dBm) (dBm) (dBm) (dBd) (dBm) (
824.20	-35.43	-48.12	0.00	-1.08	11.61	14.49							
836.40	-36.82	-48.28	0.00	-0.93	10.53	11.30							
848.80	-37.26	-48.35	0.00	-0.76	10.33	10.79							
	•	Ver	tical Polarizati	ion	•								
Frequency	Rt	Rs	Ps	Gs	ERP	ERP							
(MHz)	(dBm)	(dBm)	(dBm)	(dBd)	(dBm)	(mW)							
824.20	-45.61	-47.97	0.00	-1.08	1.28	1.34							
836.40	-44.82	-48.01	0.00	-0.93	2.26	1.68							
848.80	-43.73	-48.05	0.00	-0.76	3.56	2.27							



4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

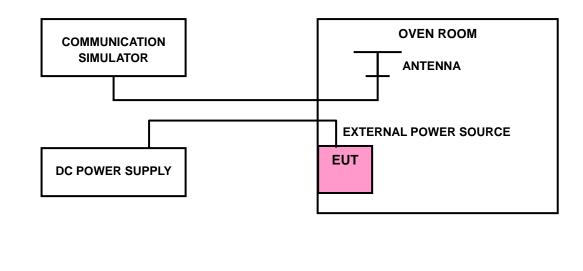
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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 $\pm 0.5^{\circ}$ 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

<Antenna 0>

FREQUENCY ERROR V.S VOLTAGE

	FRE			
VOLTAGE (Volts)	GPRS	EDGE	WCDMA	LIMIT (ppm)
3.8	-0.02	0.03	-0.002	2.5
3.6	-0.02	0.03	-0.002	2.5
4.35	-0.03	0.03	-0.002	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.35Vdc.

FREQUENCY ERROR V.S TEMPERATURE

	FRE	EQUENCY ERROR (p	pm)	
ТЕМР. (°С)	GPRS	EDGE	WCDMA	LIMIT (ppm)
-30	-0.01	0.03	-0.002	2.5
-20	-0.01	0.03	-0.002	2.5
-10	-0.02	0.03	-0.001	2.5
0	-0.02	0.03	0.002	2.5
10	-0.02	0.03	-0.002	2.5
20	-0.01	0.03	-0.003	2.5
30	-0.01	0.04	-0.002	2.5
40	-0.02	0.03	-0.002	2.5
50	-0.01	0.03	-0.001	2.5
55	-0.01	0.03	0.002	2.5



<Antenna 1>

FREQUENCY ERROR V.S VOLTAGE

	FRE	EQUENCY ERROR (p	pm)	
VOLTAGE (Volts)	GPRS	EDGE	WCDMA	LIMIT (ppm)
3.8	-0.02	0.01	-0.002	2.5
3.6	-0.03	0.01	-0.002	2.5
4.35	-0.02	0.01	-0.002	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.35Vdc.

	FRE	QUENCY ERROR (p	pm)	
TEMP. (℃)	GPRS	EDGE	WCDMA	LIMIT (ppm)
-30	-0.02	0.01	0.002	2.5
-20	-0.02	0.01	0.003	2.5
-10	-0.02	0.01	0.002	2.5
0	-0.02	0.01	0.002	2.5
10	-0.03	0.01	0.002	2.5
20	-0.03	0.01	0.002	2.5
30	-0.03	0.01	-0.002	2.5
40	-0.03	0.01	0.003	2.5
50	-0.02	0.01	-0.002	2.5
55	-0.02	0.01	-0.002	2.5

FREQUENCY ERROR V.S TEMPERATURE

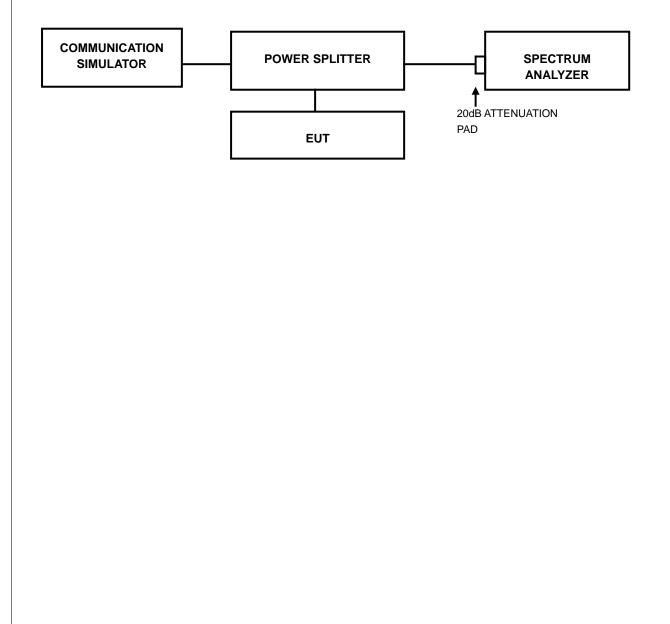


4.3 OCCUPIED BANDWIDTH MEASUREMENT

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

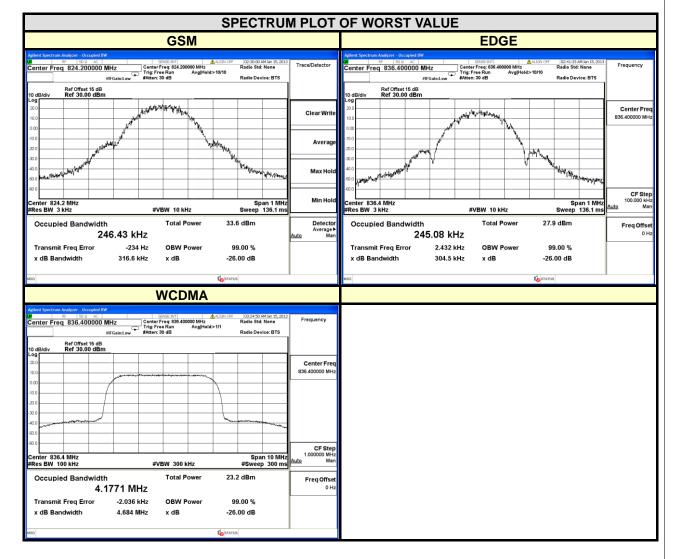




4.3.3 TEST RESULTS

<Antenna 0>

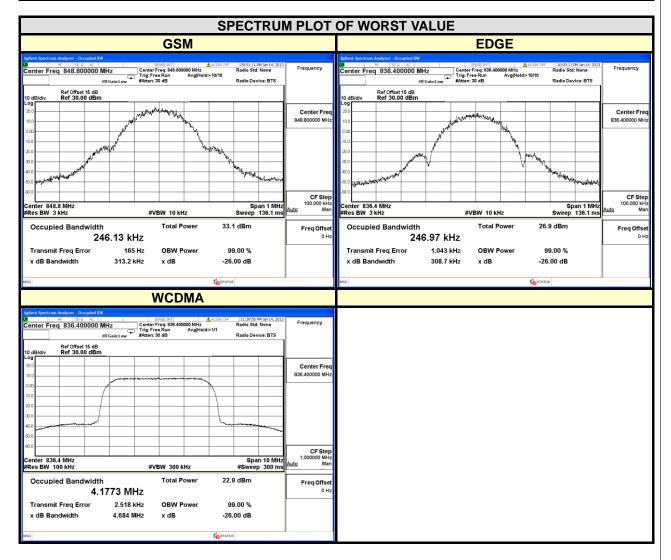
CHANNEL	FREQUENCY		CUPIED DTH (kHz)	CHANNEL		99% OCCUPIED BANDWIDTH (MHz)
	(MHz)	GPRS	EDGE		(MHz)	WCDMA
128	824.2	246.43	242.15	4132	826.4	4.1691
189	836.4	244.90	245.08	4182	836.4	4.1771
251	848.8	243.54	242.93	4233	846.6	4.1717





<Antenna 1>

CHANNEL	FREQUENCY	99% OC BANDWII	CUPIED DTH (kHz)	CHANNEL		99% OCCUPIED BANDWIDTH (MHz)
	(MHz)	GPRS	EDGE		(MHz)	WCDMA
128	824.2	245.14	246.95	4132	826.4	4.1722
189	836.4	244.38	246.97	4182	836.4	4.1773
251	848.8	246.13	244.70	4233	846.6	4.1758



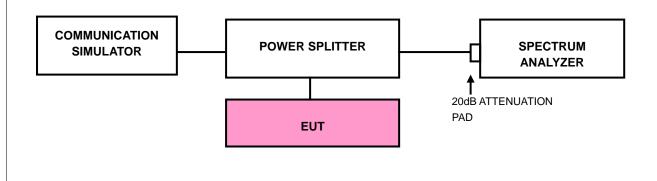


4.4 BAND EDGE MEASUREMENT

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



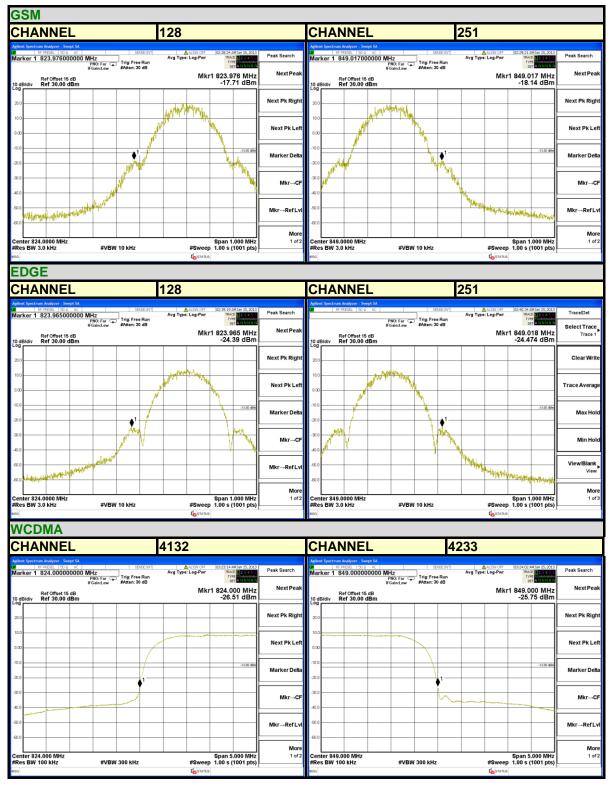
4.4.3 TEST PROCEDURES

- 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 1MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/GPRS/EDGE).
- c. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
- d. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (WCDMA).
- e. Record the max trace plot into the test report.



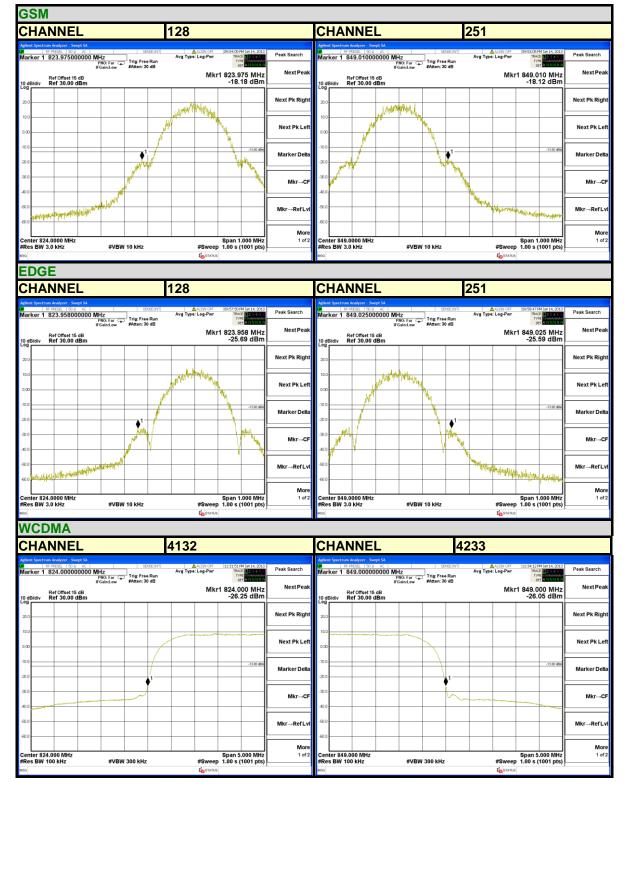
4.4.4 TEST RESULTS

<Antenna 0>





<Antenna 1>





4.5 CONDUCTED SPURIOUS EMISSIONS

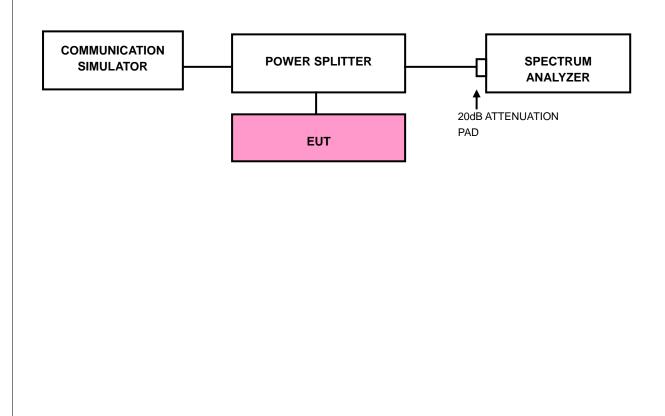
4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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.
- Measuring frequency range is from 30 MHz to 9GHz. 10dB 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

<Antenna 0>

GSN	GSM									W	CD	AN										
СНА	IANNEL 189										CHANNEL 4182											
FRE	EQUENCY RANGE : 30MHz~9GHz									FREQUENCY RANGE : 30MHz~9GHz												
100	RF PRESEL	er - Swept SA 50 g AC 248912445	DHO: Fred /	Trig: Fre	NSE:INT		ALIGN OFF	02:32:18 AM TRACE TYPE	123456	Peak Search	1,00	RF F	Analyzer - Sv RESEL 50 s .171617	2 AC	GHz PNO: Fast ⊊		NSE:INT		ALIGN OFF	TRA		Peak Search
10 dB/div	Ref Off Ref 3	fset 15 dB 5.00 dBm	IFGain:Low	#Atten: 3	0 dB		Mk	r1 1.672 -28.93	5 GHz 3 dBm	NextPeak	10 d	R B/div R	ef Offset 1 ef 35.00	li 5 dB	Gain:Low	#Atten: 3	0 dB		М	(r1 6.17 -31.	1 6 GHz 71 dBm	NextPeak
25.0										Next Pk Right	25.0											Next Pk Right
15.0 5.00										Next Pk Left	15.0 5.00											Next Pk Left
-5.00									-13.00 dBm	Marker Delta	-5.00										-13.00 dBm	Marker Delta
-25.0		1								Mkr→CF	-25.0							•	1			Mkr→CF
-35.0 -45.0										Mkr→RefLvl	-35.0 -45.0											Mkr→RefLvl
-65.0										More	-55.0											More
	ant 30 MHz Stop 9.000 GHz 1 o Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 501 ms (20000 pts)									1 of 2		t 30 MHz s BW 1.0			#VBV	/ 3.0 MHz		;	Sweep	501 ms (2	.000 GHz 20000 pts)	1 of 2

<Antenna 1>

GS	SN	1										W	CDI	AN									
Cł	ΗA	NNI	EL 18	39								CHANNEL 4182											
FF	RE	QUE	ENC	(RA	NGE	: 30	ОМН	z~90	GHz			FREQUENCY RANGE : 30MHz~9GHz											
x			50 Q AC		S	INSE:INT		ALIGN OFF	09:55:59 PM 3	lan 14, 2013	Peak Search	1,00	RF F	Analyzer - Sv PRESEL 50 i	Q AC		SE	NSE:INT		ALIGN OFF	11:44:34 P	M Jan 14, 2013	Peak Search
Marl	ker 1	1.6729	37646882	PNO: Fast C IFGain:Low	Trig: Fre	e Run 0 dB	Avg Type	e: Log-Pwr	TRACE TYPE DET	23456 NNNNN		Mar	ker 16	.082361	618081	GHz PNO: Fast G FGain:Low	Trig: Free #Atten: 30	Run dB	Avg Type	:: Log-Pwr	TRACI	23456 MMMNNNN PNNNNN	
	3/div	Ref Offse Ref 35.	et 15 dB 00 dBm					Mk	r1 1.672 9 -28.62		NextPeak		R B/div R	ef Offset 1 lef 35.00	5 dB dBm					Mk	r1 6.082 -31.7	2 4 GHz 78 dBm	NextPeak
25.0											Next Pk Right	25.0											Next Pk Right
15.0				_								15.0										i	
5.00			_	-	-					_	Next Pk Left	5.00				-							Next Pk Left
-5.00										-13.00 dBm	Marker Delta	-5.00										-13.00 dBm	Marker Delta
-15.0			A1									-15.0											
-35.0						and the second second	- June 1 - Marco	la de la del	0.000-0.00	History	Mkr→CF	-35.0					and the second second	L. Land Mar	lete state	Marcard Lat			Mkr→CF
-45.0											Mkr→RefLvl	-45.0				-							Mkr→RefLvl
-65.0	<u> </u>	_		-								-65.0											
	t 30 M s BW	/Hz 1.0 MHz		#VB	W 3.0 MH;		#	≠Sweep 5	Stop 9.00 501 ms (200		More 1 of 2								More 1 of 2				
DSN									1			MSG											



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.

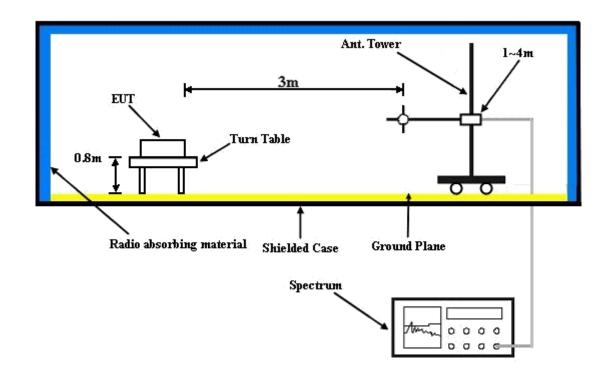
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

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).

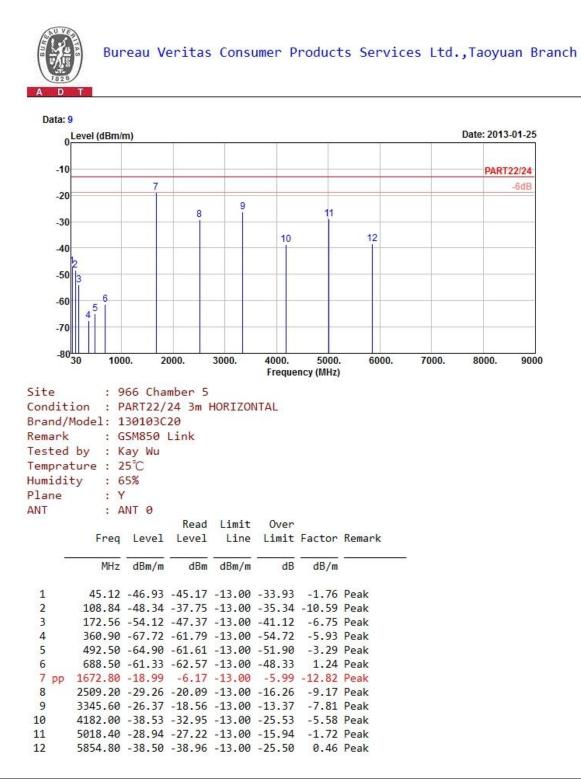


4.6.5 TEST RESULTS

Main Sample (A)

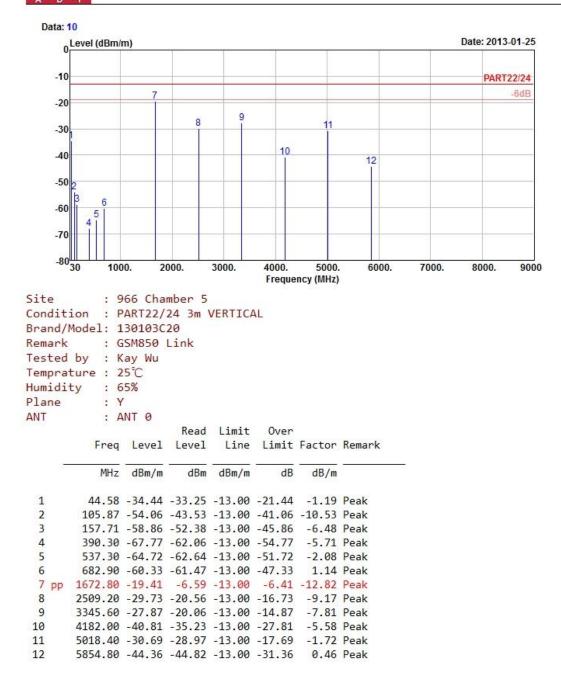
<Antenna 0>

GSM:





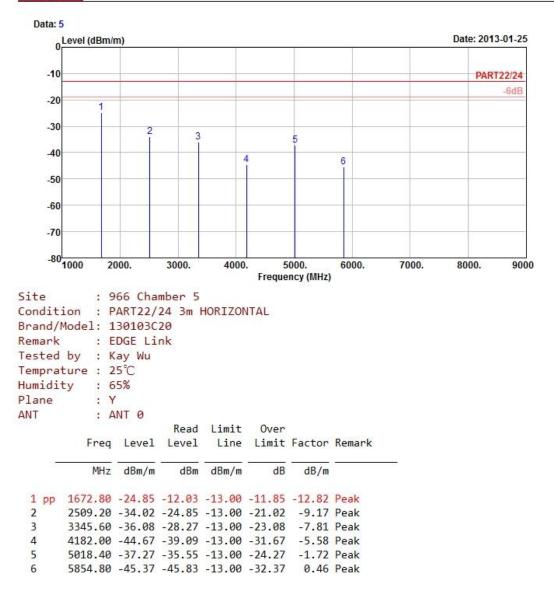
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch





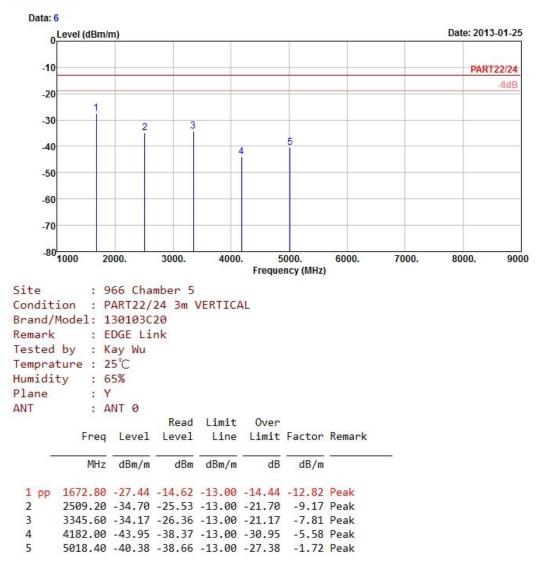
EDGE:







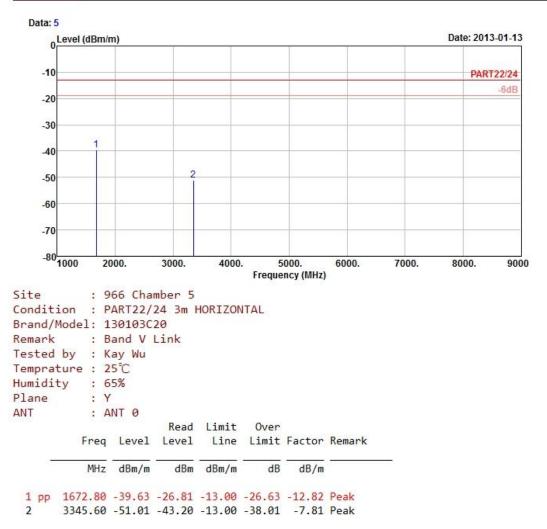






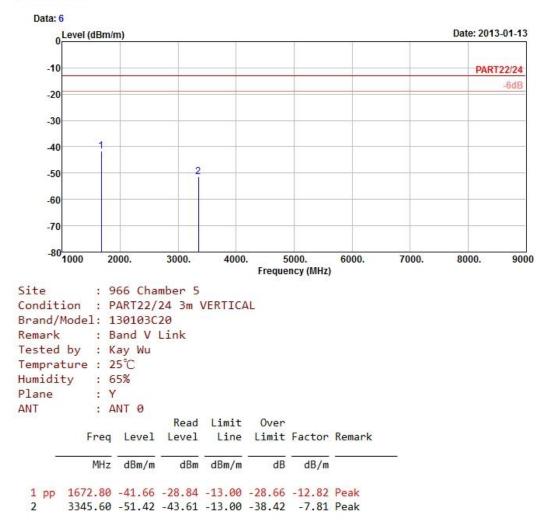
WCDMA:







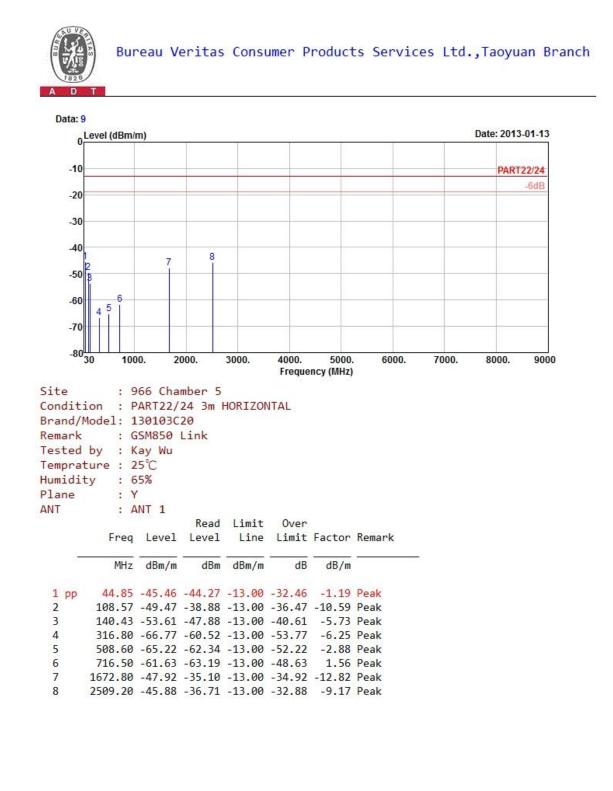




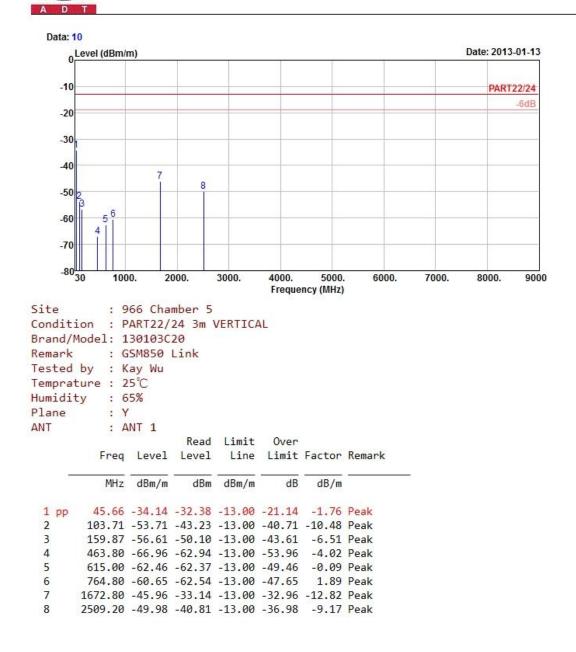


<Antenna 1>

GSM:

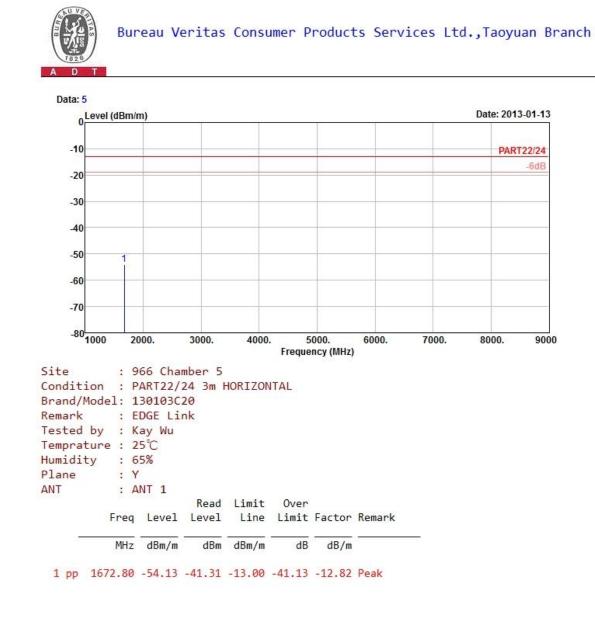






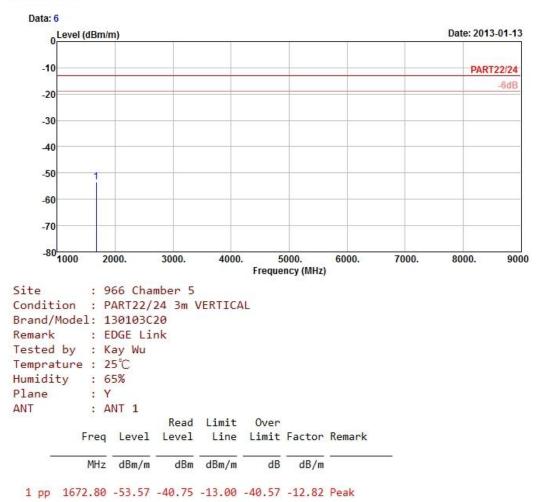


EDGE:





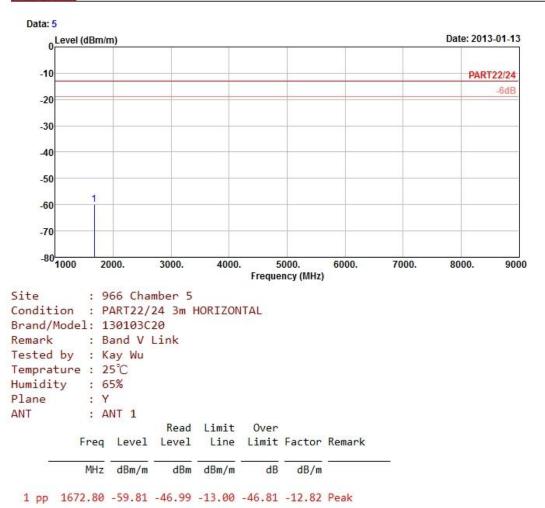






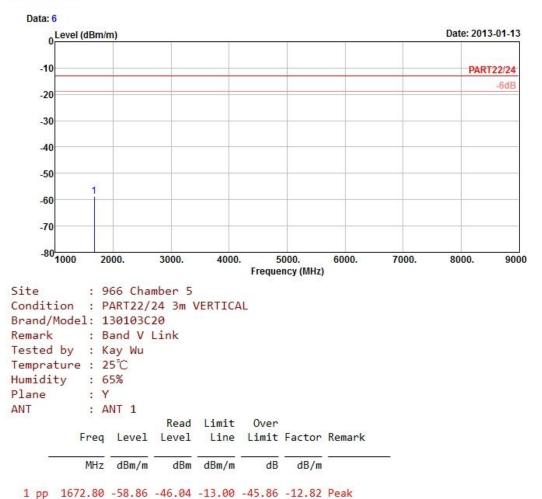
WCDMA:









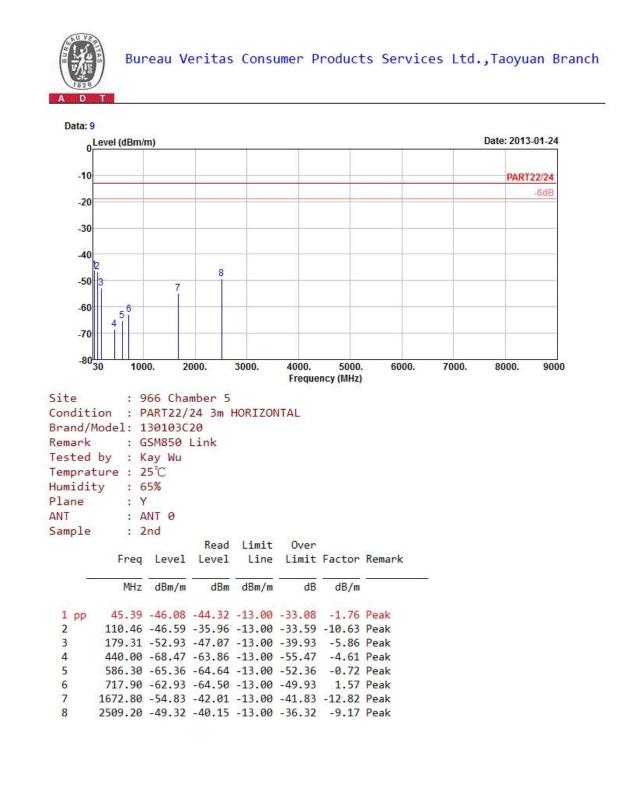




2nd Sample (B)

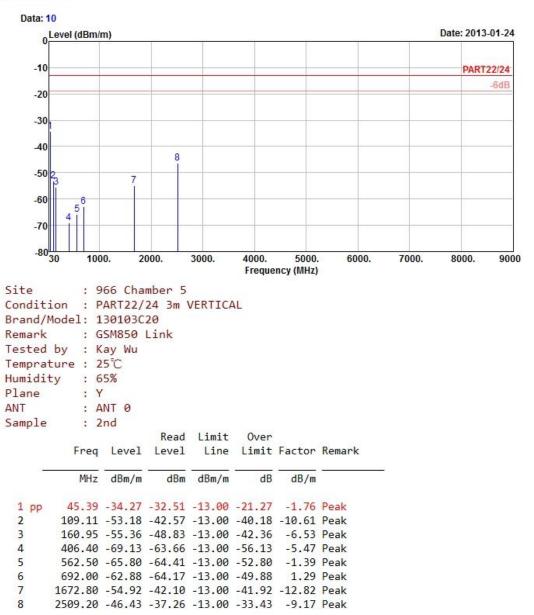
<Antenna 0>

GSM:











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:

Linko EMC/RF Lab: Tel: 886-2-26052180 Fax: 886-2-26051924 Hsin Chu EMC/RF Lab: Tel: 886-3-5935343 Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab: Tel: 886-3-3183232 Fax: 886-3-3270892

Email: <u>service.adt@tw.bureauveritas.com</u> Web Site: <u>www.bureauveritas-adt.com</u>

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 were made to the EUT by the lab during the test.

---END----