FCC TEST REPORT

(PART 22)

REPORT NO.:	RF140326C05A
MODEL NO.:	F-06F
FCC ID:	VQK-F06F2
RECEIVED:	Mar. 26, 2014
TESTED:	Apr. 29 ~ May 08, 2014
ISSUED:	May 21, 2015

APPLICANT:	FUJITSU LIMITED
ADDRESS:	1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47-2, 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 Vil., Kwei Shan Dist., Taoyuan City 33383, 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
RF140326C05A	Original release	May 21, 2015

1 CERTIFICATION

PRODUCT:	Smart Phone
MODEL:	F-06F
BRAND:	FUJITSU
APPLICANT:	FUJITSU LIMITED
TESTED:	Apr. 29 ~ May 08, 2014
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC PART 22, Subpart H**

The above equipment (model: F-06F) 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 : Celine Chou **, DATE :** May 21, 2015

Celine Chou / Specialist

APPROVED BY : Bruce Chen **, DATE :** May 21, 2015

Bruce Chen / 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.
---	Peak To Average Ratio	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 -17.85dB at 1697.60MHz.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Feb. 25, 2014	Feb. 24, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01911	Aug. 22, 2013	Aug. 21, 2014
Preamplifier Agilent	8447D	2944A10638	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable Worken	5D-FB	Cable-HYCH9-01	Aug. 11, 2013	Aug. 10, 2014
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 Table Controller EMCO	2090	NA	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 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 215374.

5. The IC Site Registration No. is IC 7450F-9.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Smart Phone
MODEL NO.	F-06F
POWER SUPPLY	3.8Vdc (Battery) 5.0Vdc (Adapter or cradle or host equipment)
MODULATION TYPE	**GSM, GPRS:** GMSK **WCDMA:** BPSK
FREQUENCY RANGE	**GSM, GPRS:** 824.2MHz ~ 848.8MHz **WCDMA:** 826.4MHz ~ 846.6MHz
MAX. ERP POWER	**GSM:** 990.832 mW (29.96dBm) **WCDMA:** 161.436mW (22.08dBm)
MULTI-SLOTS CLASS	33
WCDMA RELEASE VERSION	6, 10
ANTENNA TYPE	λ/4 Monopole antenna with 0dBi gain
I/O PORTS	Refer to users' manual
DATA CABLE	N/A
ACCESSORY DEVICES	Refer to Note as below

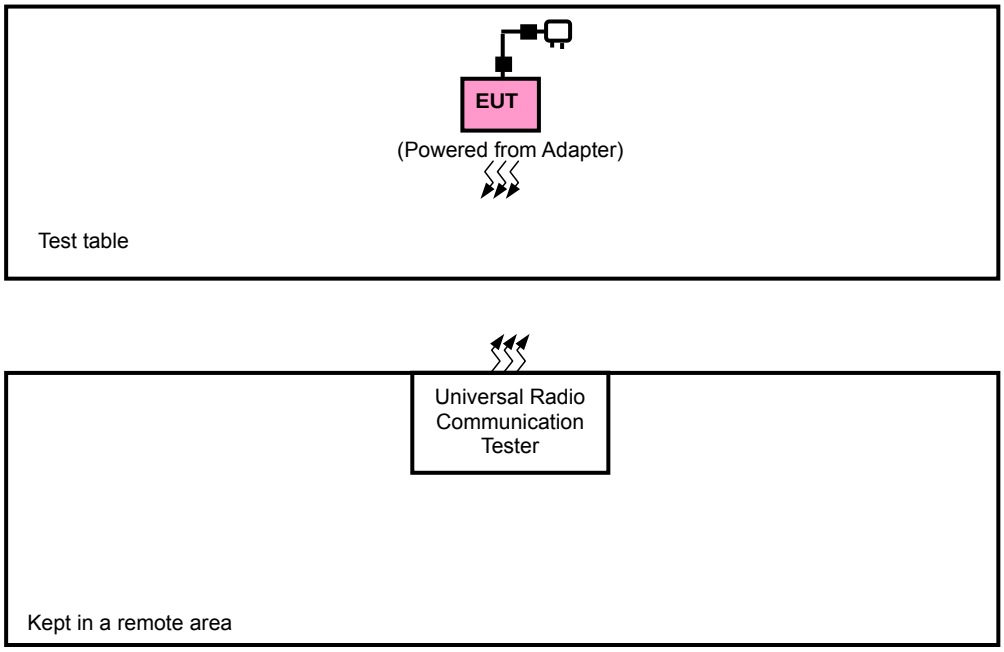
NOTE:

1. The EUT contains the following accessories.

No.	Product	Brand	Model	Description
1	Battery	NTT docomo	F30	3.8Vdc, 2100mA , 8.0Wh Type: Li-on
2	Cradle	NTT docomo	F46	Input : 5.0Vdc, 1.5A Output : 5.0Vdc, 1.5A

2. SW version is R06.2e.
3. HW version is V2.1.0.
4. IMEI Code: 352295060013869.
5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 CONFIGURATION OF SYSTEM UNDER TEST



3.3 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU200	123112	NA
2	ADAPTER	NTT docomo	AC Adapter 04	NA	NA

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

NOTE:
1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 acted as a communication partner to transfer data.
3. Item 2 was provided by the client
4. 1.05m DC cable with 2 cores attached on adapter.

3.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports The worst case was found when positioned on Z-plane. 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, 190, 251	GSM
-	FREQUENCY STABILITY	128 to 251	190	GSM
-	OCCUPIED BANDWIDTH	128 to 251	128, 190, 251	GSM, GPRS
-	PEAK TO AVERAGE RATIO	128 to 251	128, 190, 251	GSM, GPRS
-	BAND EDGE	128 to 251	128, 251	GSM, GPRS
-	CONDCUDETED EMISSION	128 to 251	128, 190, 251	GSM, GPRS
-	RADIATED EMISSION BELOW 1GHz	128 to 251	128	GSM
-	RADIATED EMISSION ABOVE 1GHz	128 to 251	128, 190, 251	GSM

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, HSUPA
-	PEAK TO AVERAGE RATIO	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	BAND EDGE	4132 to 4233	4132, 4233	WCDMA, HSDPA, HSUPA
-	CONDCUDETED EMISSION	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	RADIATED EMISSION BELOW 1GHz	4132 to 4233	4132	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, 68%RH	120Vac, 60Hz	Sun Lin
FREQUENCY STABILITY	24deg. C, 64%RH	3.8Vdc	Match Tsui
OCCUPIED BANDWIDTH	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
PEAK TO AVERAGE RATIO	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
BAND EDGE	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
CONDCUDETED EMISSION	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
RADIATED EMISSION	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin

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

KDB 971168 D01 Power Meas License Digital Systems v02r01

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 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

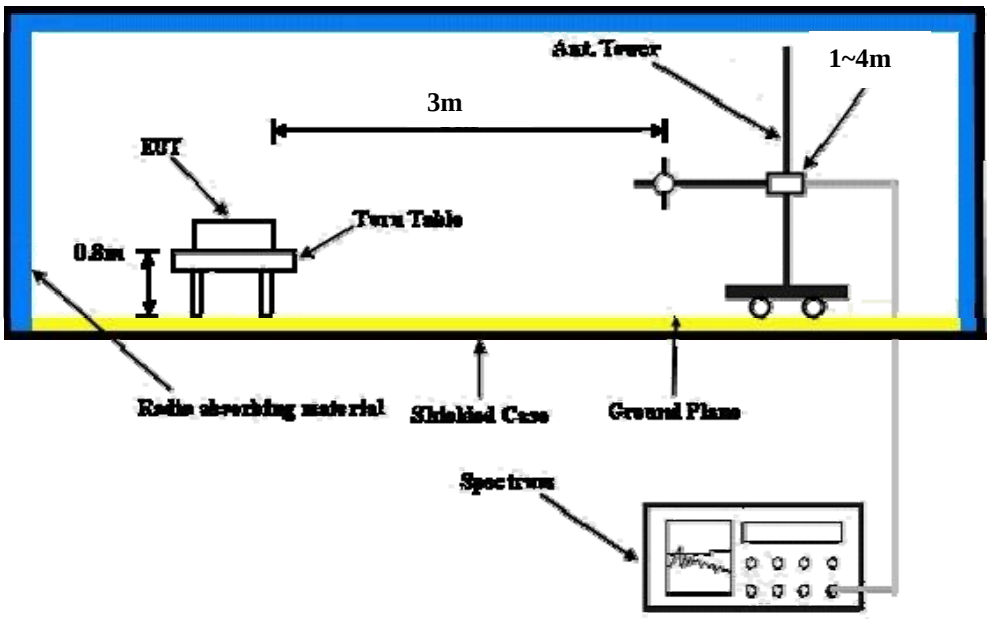
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM & WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

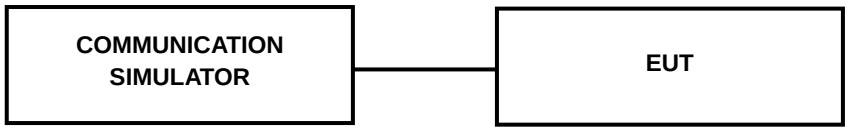
4.1.3 TEST SETUP

EIRP / ERP MEASUREMENT:



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

CONDUCTED POWER MEASUREMENT:



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

4.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GSM850		
Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GSM	32.68	32.55	32.59
GPRS 8	32.64	32.51	32.55
GPRS 10	29.81	29.78	29.82
GPRS 11	28.10	27.94	27.98
GPRS 12	26.61	26.48	26.52
GPRS 30	32.51	32.38	32.42
GPRS 31	29.79	29.66	29.70
GPRS 32	27.97	27.84	27.88
GPRS 33	26.60	26.47	26.51
DTM 9 (GPRS)	29.59	29.46	29.50
DTM 11 (GPRS)	27.79	27.68	27.72

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	24.31	24.20	24.28
HSDPA Subtest-1	23.37	23.26	23.34
HSDPA Subtest-2	23.39	23.28	23.36
HSDPA Subtest-3	22.99	22.88	22.96
HSDPA Subtest-4	22.96	22.85	22.93
HSUPA Subtest-1	23.46	23.35	23.43
HSUPA Subtest-2	22.18	22.07	22.15
HSUPA Subtest-3	21.85	21.74	21.82
HSUPA Subtest-4	22.38	22.27	22.35
HSUPA Subtest-5	24.29	24.18	24.26

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	-17.10	10.44	3.92	14.36	38.45	-24.09
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	-3.26	25.08	3.92	29.00	38.45	-9.45

MODE	TX channel 190						
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	-16.80	10.68	3.79	14.47	38.45	-23.98
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	836.40	-1.98	26.09	3.79	29.88	38.45	-8.57

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	-16.41	11.20	3.42	14.62	38.45	-23.83
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**	**-1.47**	**26.54**	**3.42**	**29.96**	**38.45**	**-8.49**

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	826.40	-23.44	4.10	3.92	8.02	38.45	-30.43
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	826.40	-11.12	17.17	3.92	21.09	38.45	-17.36

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	836.40	-23.62	3.86	3.79	7.65	38.45	-30.80
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	836.40	-9.78	18.29	3.79	**22.08**	38.45	-16.37

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	846.60	-22.40	5.07	3.45	8.52	38.45	-29.93
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	846.60	-10.45	17.62	3.45	21.07	38.45	-17.38

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

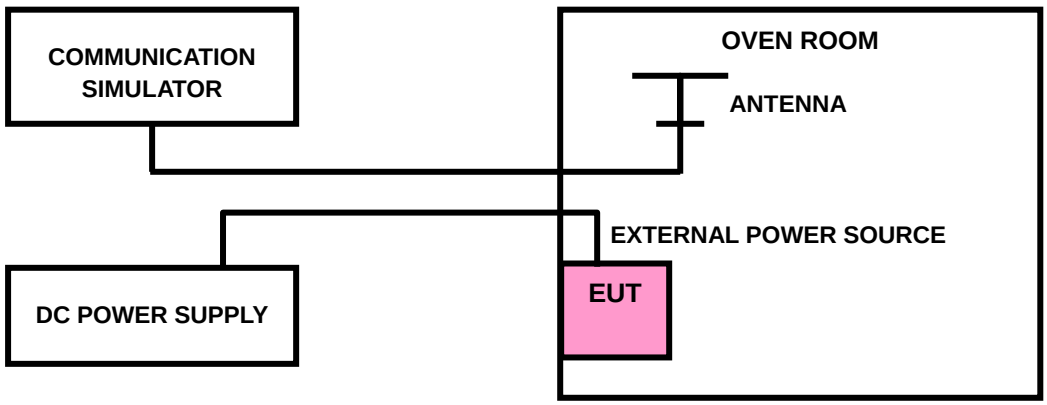
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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)
	GSM	WCDMA	
4.29	-0.022	-0.025	2.5
3.90	-0.014	-0.023	2.5
3.51	-0.020	-0.020	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.51Vdc to 4.29Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

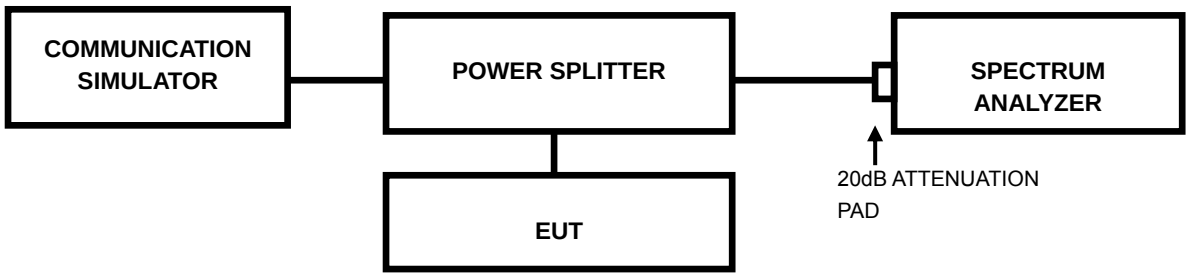
TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	GSM	WCDMA	
55	-0.035	-0.035	2.5
50	-0.035	-0.037	2.5
40	-0.032	-0.037	2.5
30	-0.020	-0.032	2.5
20	-0.014	-0.023	2.5
10	-0.032	-0.029	2.5
0	-0.045	-0.041	2.5
-10	-0.047	-0.049	2.5
-20	-0.044	-0.051	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 TEST PROCEDURES

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

4.3.2 TEST SETUP

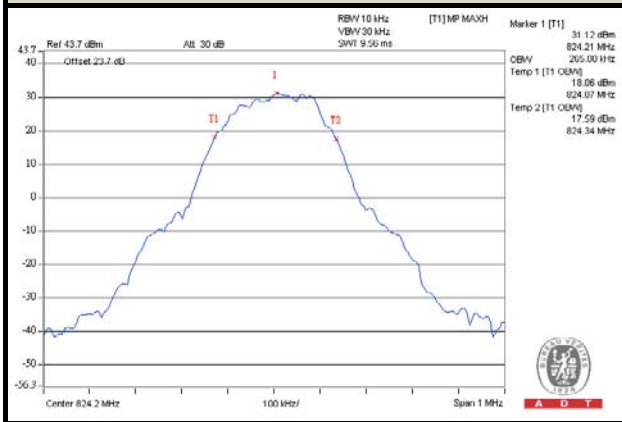


4.3.3 TEST RESULTS

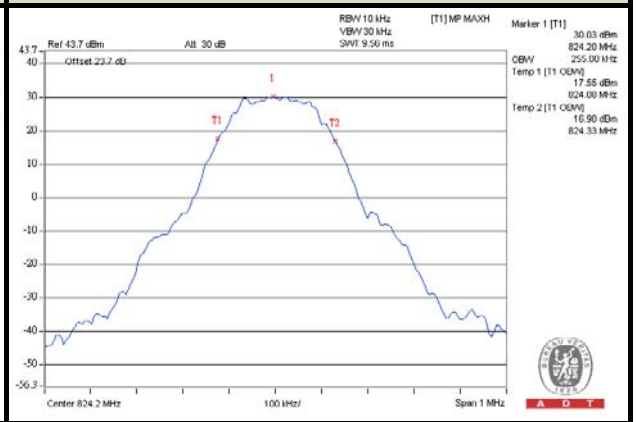
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)		CHANNEL	FREQ. (MHz)	99% OCCUPIED BANDWIDTH (MHz)		
		GSM	GPRS			WCDMA	HSDPA	HSUPA
128	824.2	265.0	255.0	4132	826.4	4.15	4.15	4.15
190	836.6	255.0	250.0	4182	836.4	4.15	4.15	4.15
251	848.8	250.0	255.0	4233	846.6	4.15	4.15	4.15

SPECTRUM PLOT OF WORST VALUE

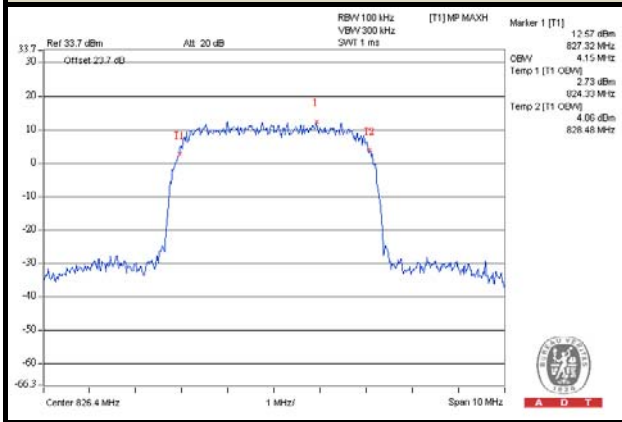
GSM



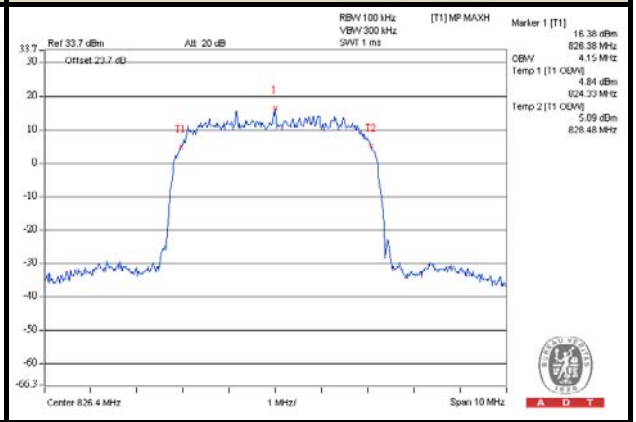
GPRS



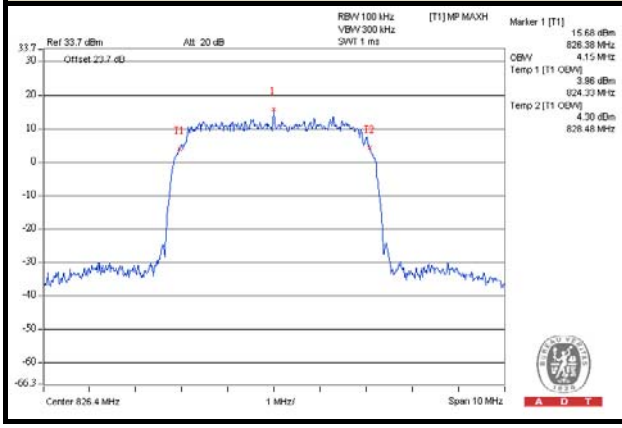
WCDMA



HSDPA



HSUPA

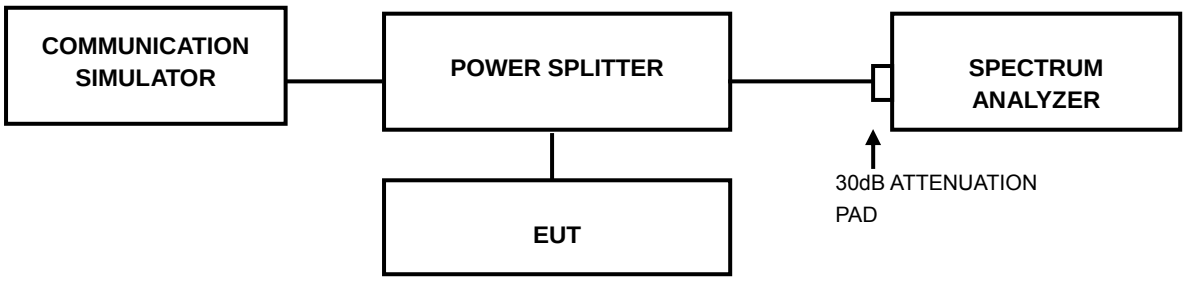


4.4 PEAK TO AVERAGE RATIO

4.4.1 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

4.4.2 TEST SETUP



4.4.3 TEST PROCEDURES

a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

b. Set the number of counts to a value that stabilizes the measured CCDF curve;

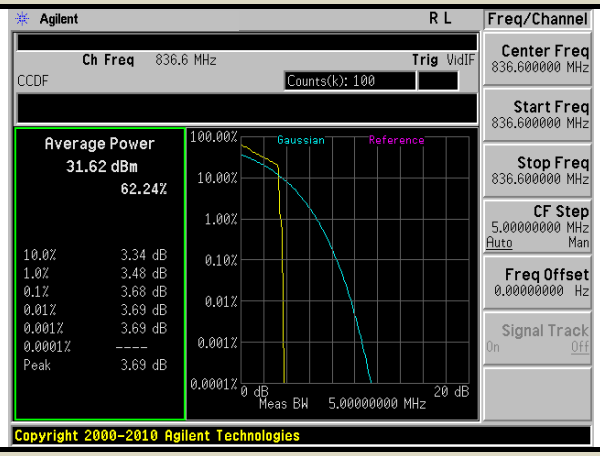
c. Record the maximum PAPR level associated with a probability of 0.1%.

4.4.4 TEST RESULTS

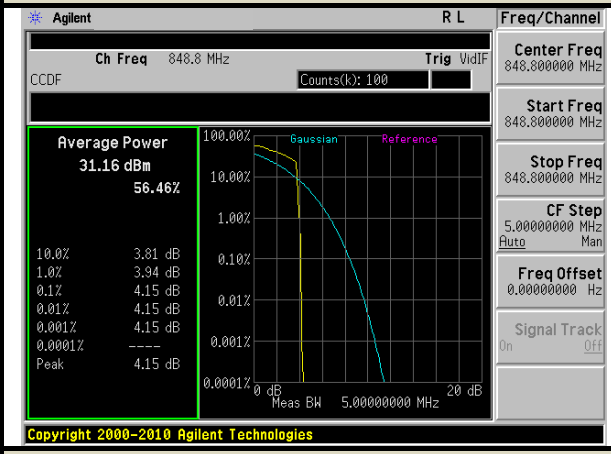
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQ. (MHz)	PEAK TO AVERAGE RATIO (dB)		
		GSM	GPRS			WCDMA	HSDPA	HSUPA
128	824.2	3.43	4.07	4132	826.4	3.35	3.39	3.35
190	836.6	3.68	3.00	4182	836.4	3.36	3.37	3.37
251	848.8	3.32	4.15	4233	846.6	3.39	3.39	3.40

SPECTRUM PLOT OF WORST VALUE

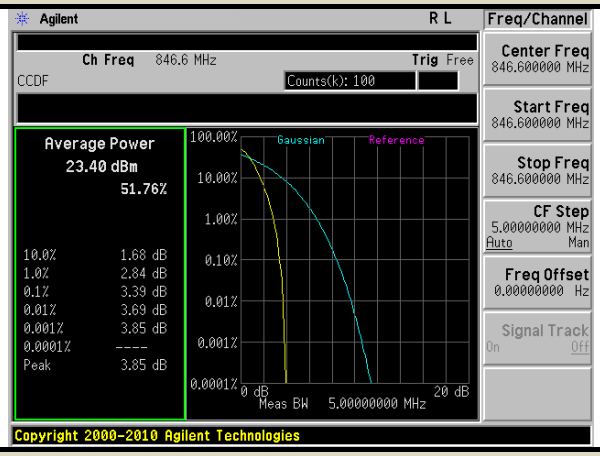
GSM



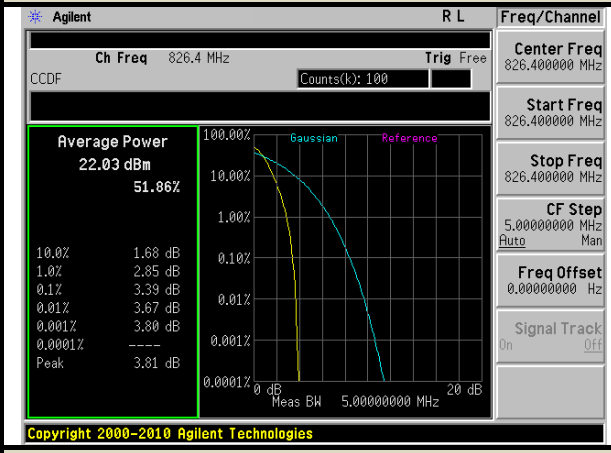
GPRS



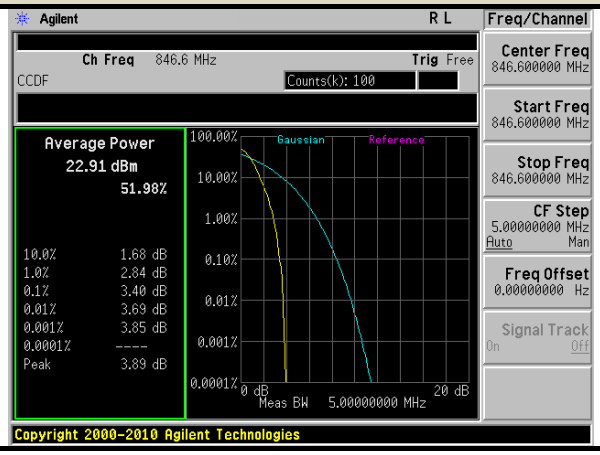
WCDMA



HSDPA



HSUPA

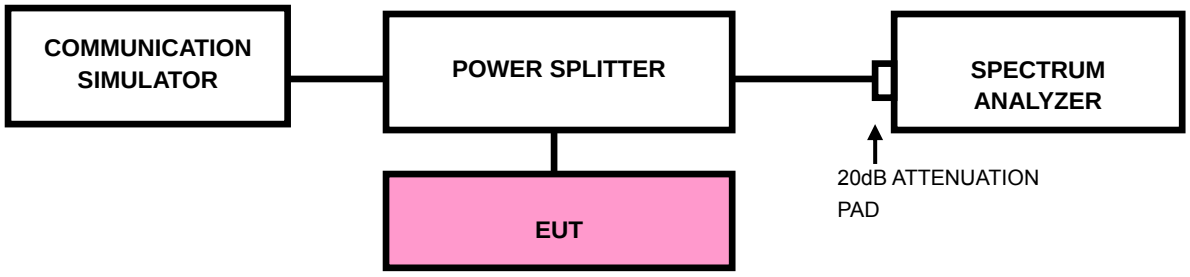


4.5 BAND EDGE MEASUREMENT

4.5.1 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.

4.5.2 TEST SETUP



4.5.3 TEST PROCEDURES

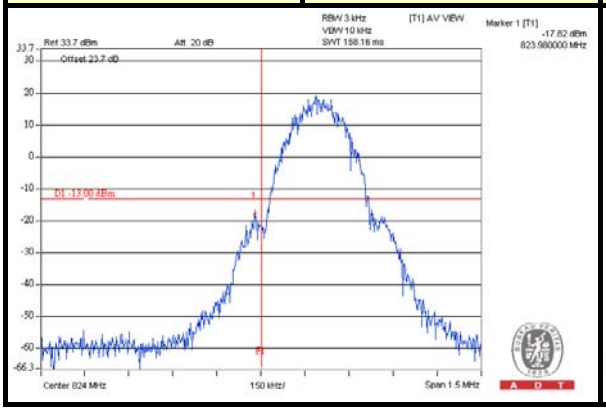
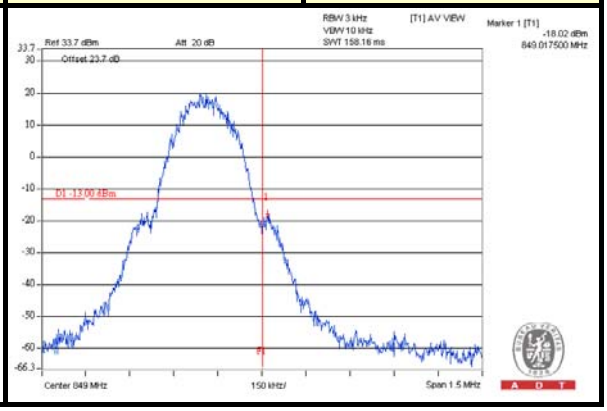
a. All measurements were done at low and high operational frequency range.

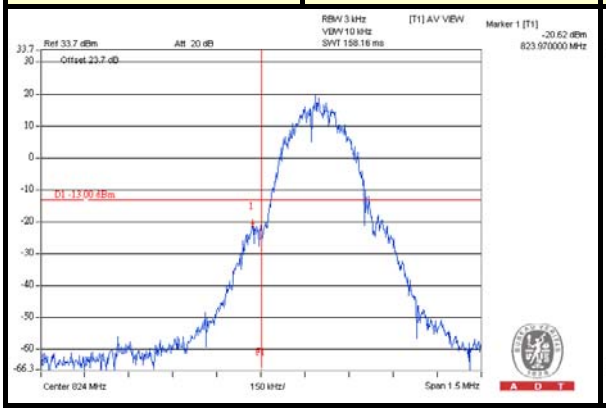
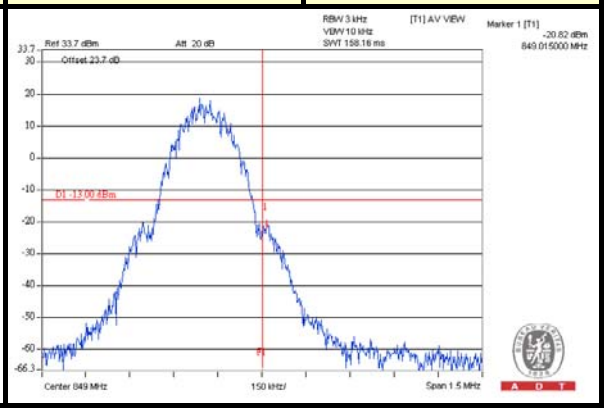
b. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM).

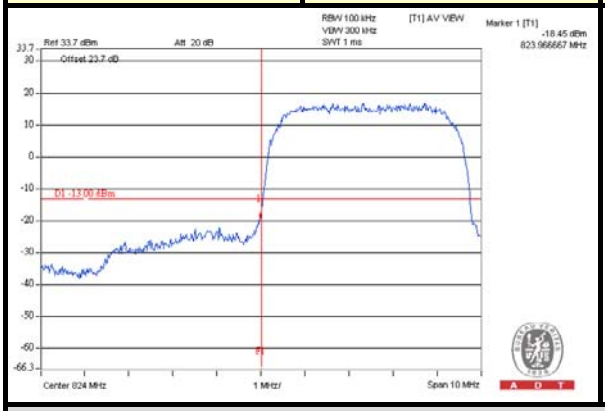
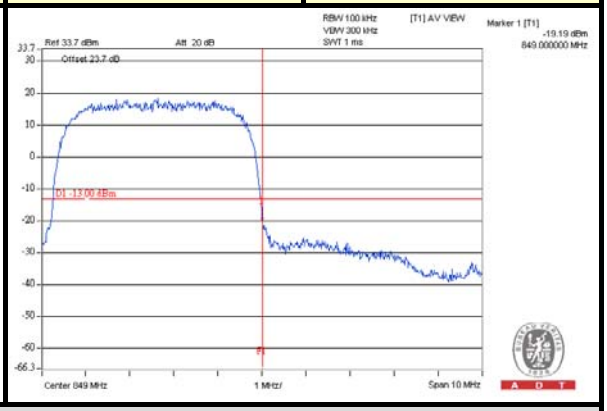
c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA/HSDPA/HSUPA).

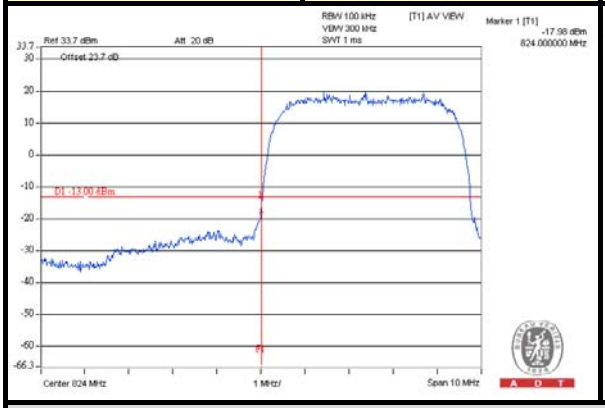
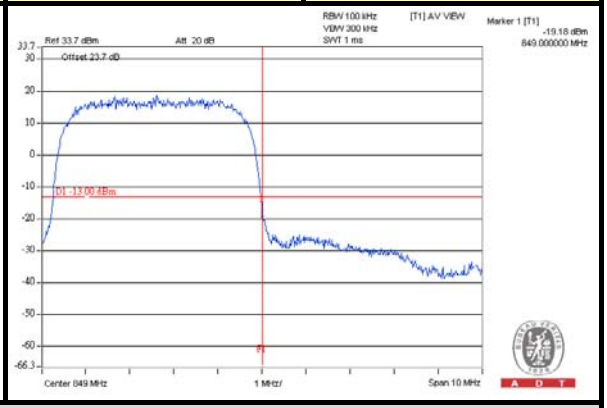
d. Record the max trace plot into the test report.

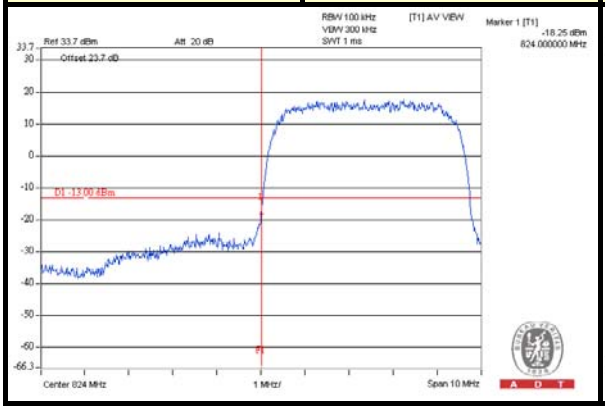
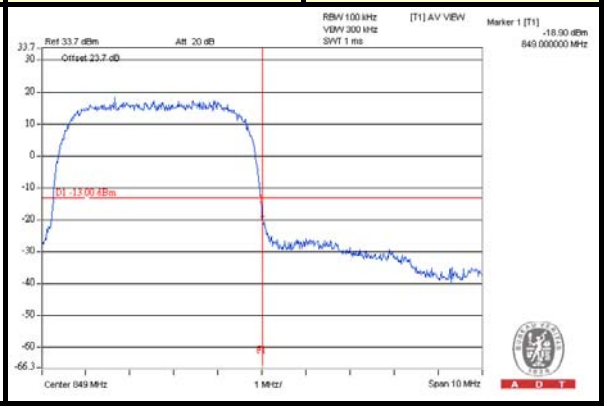
4.5.4 TEST RESULTS

GSM			
CHANNEL	128	CHANNEL	251
			

GPRS			
CHANNEL	128	CHANNEL	251
			

WCDMA			
CHANNEL	4132	CHANNEL	4233
			

HSDPA			
CHANNEL	4132	CHANNEL	4233
			

HSUPA			
CHANNEL	4132	CHANNEL	4233
			

4.6 CONDUCTED SPURIOUS EMISSIONS

4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

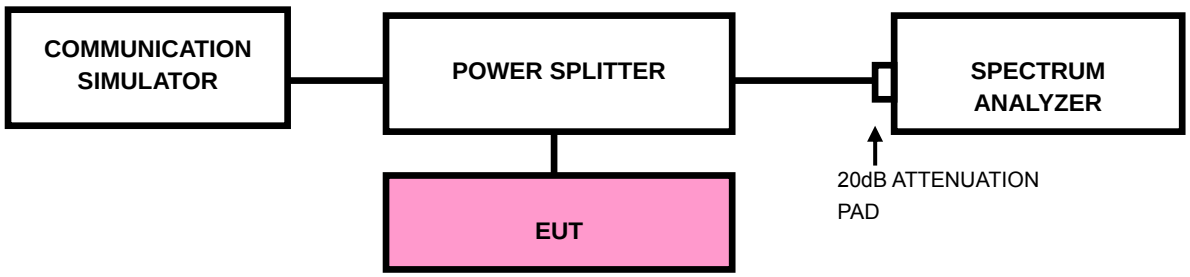
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.6.2 TEST PROCEDURE

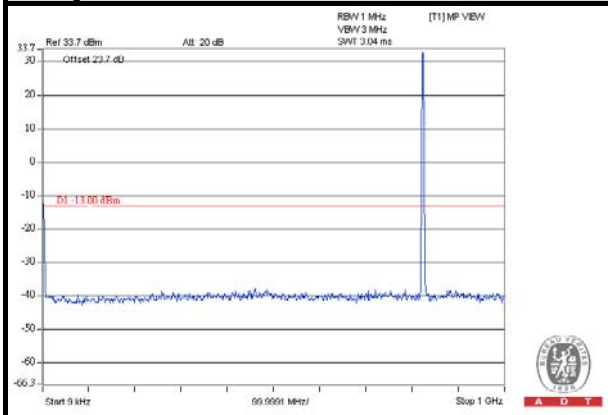
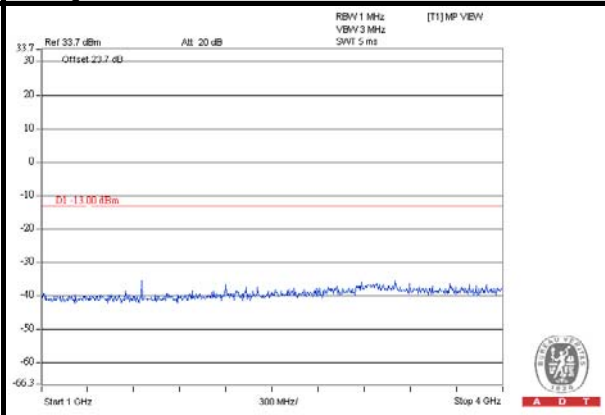
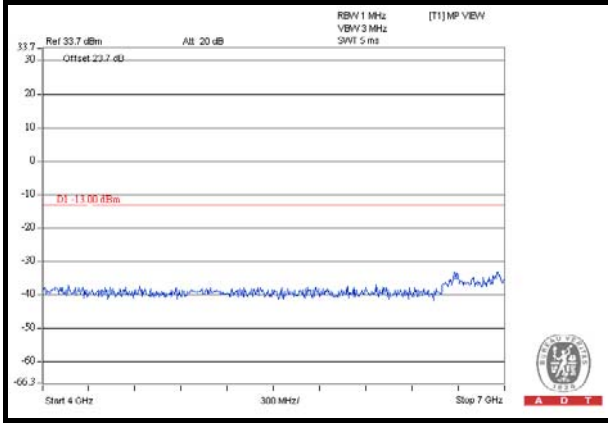
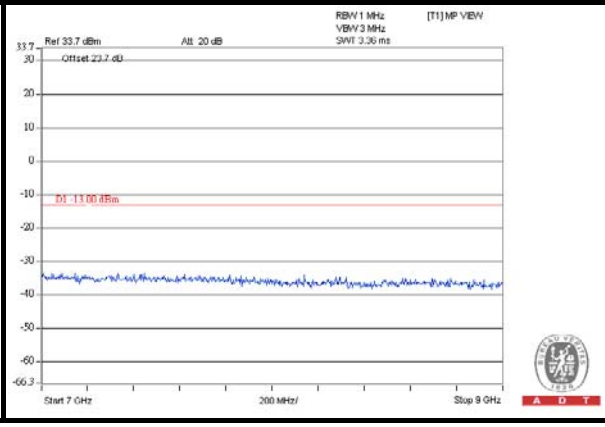
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

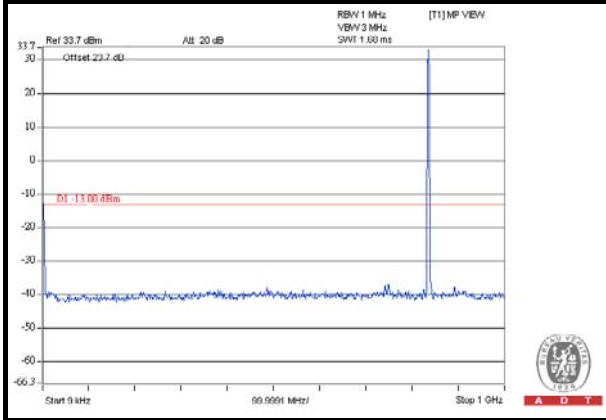
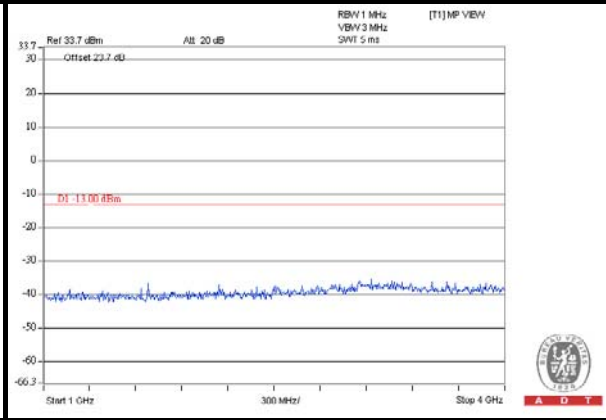
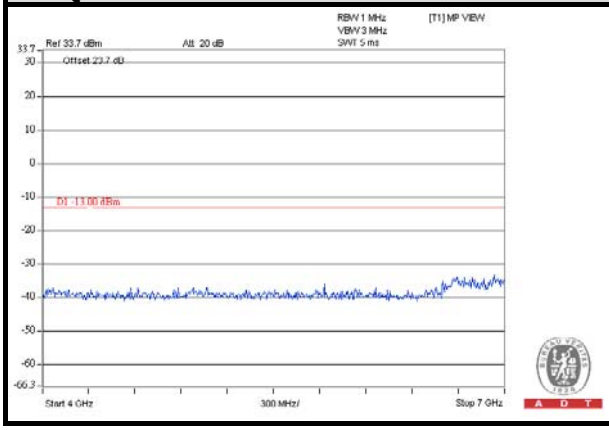
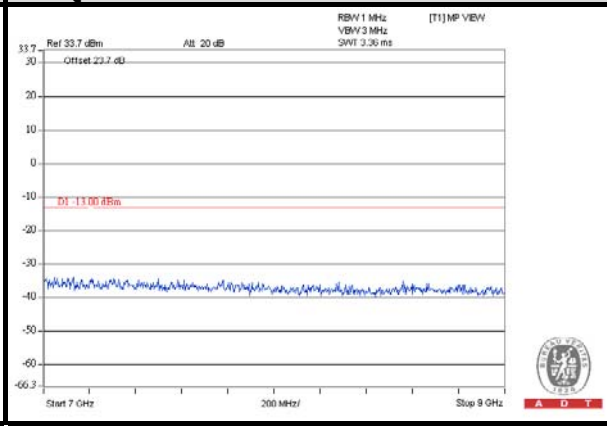
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

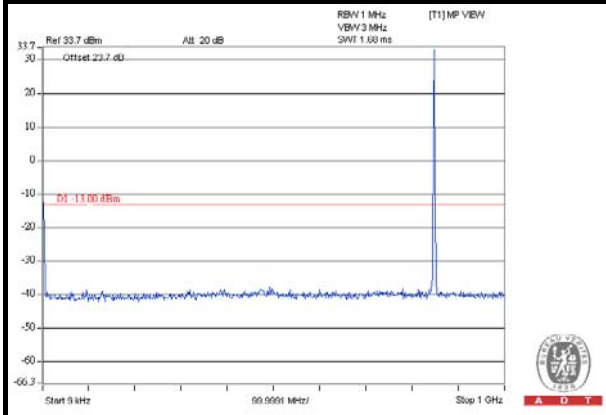
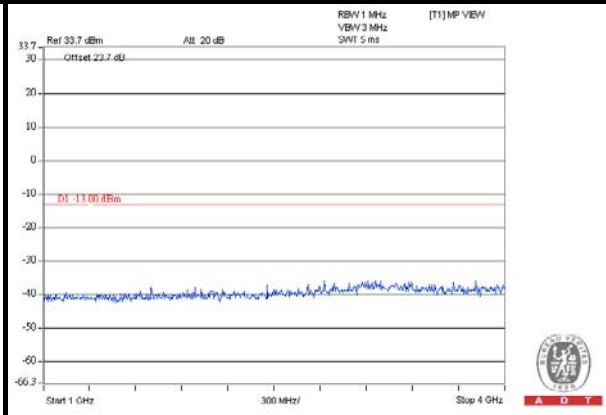
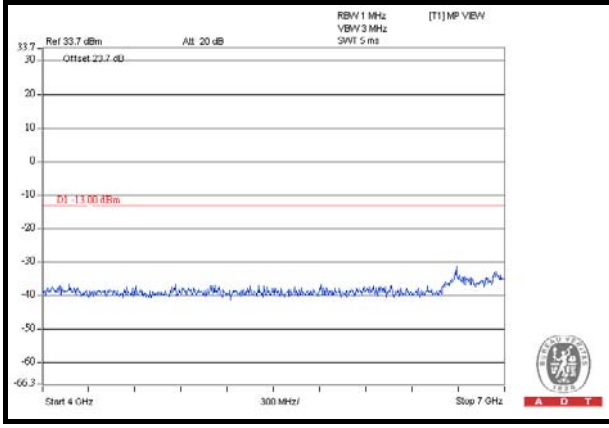
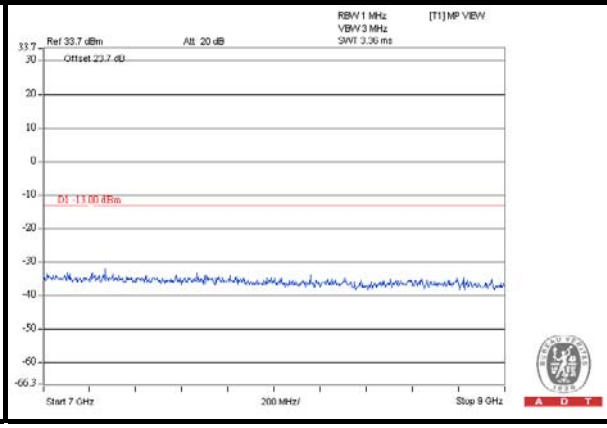
4.6.3 TEST SETUP

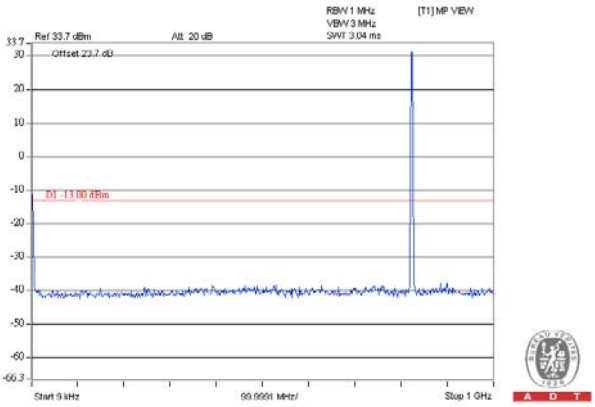
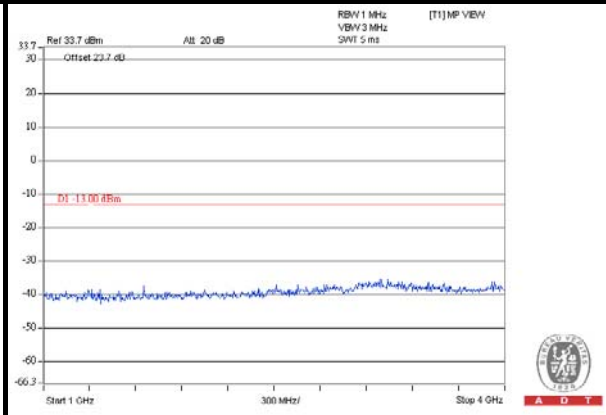
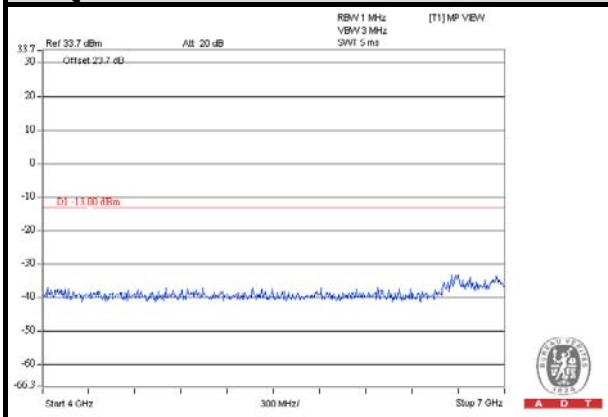
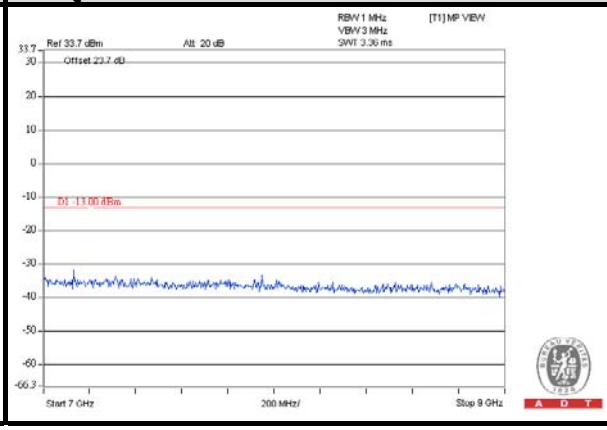


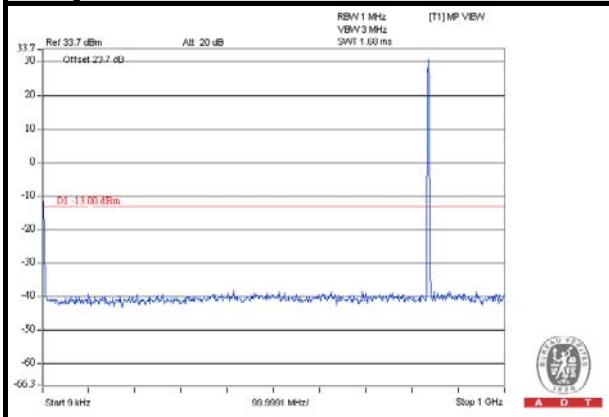
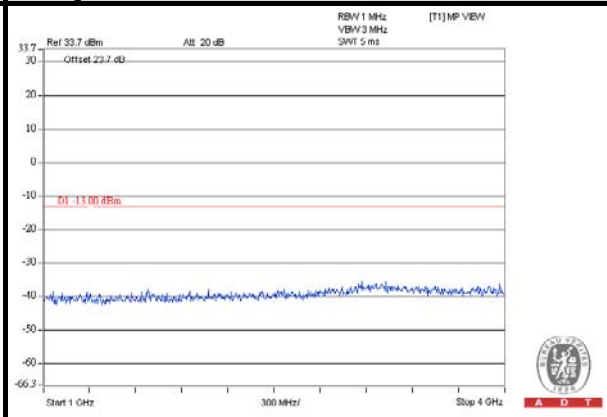
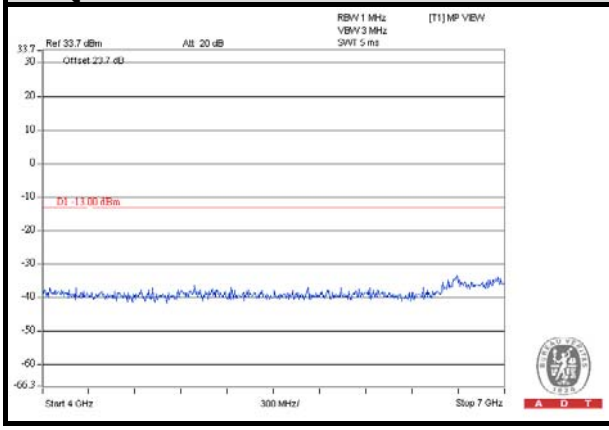
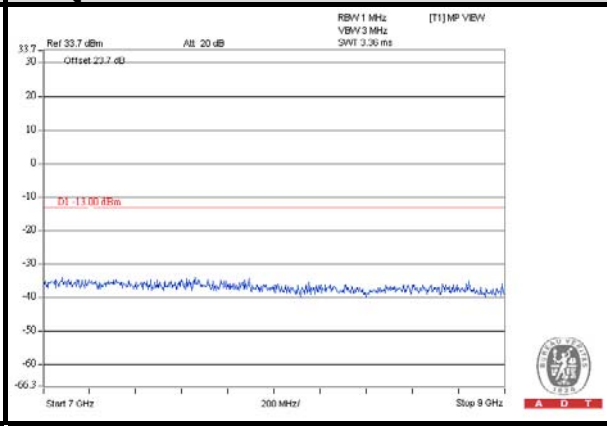
4.6.4 TEST RESULTS

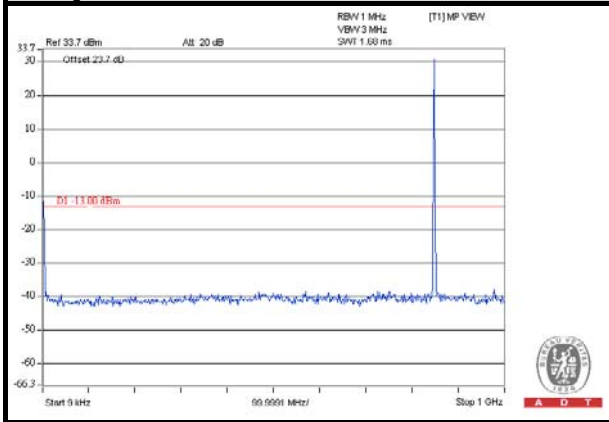
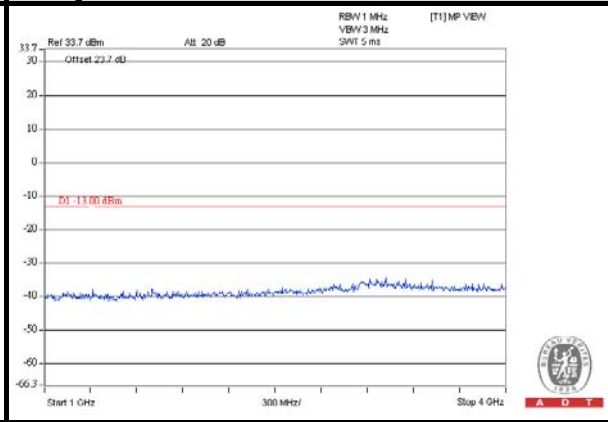
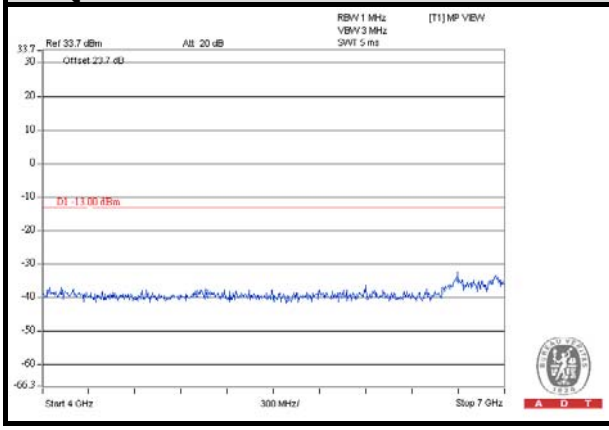
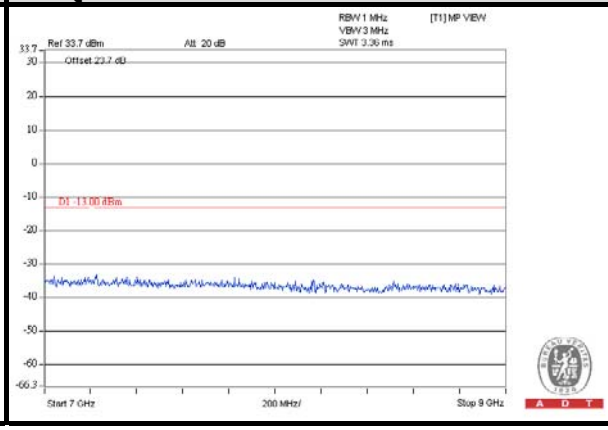
GSM	
CHANNEL 128	
FREQUENCY RANGE : 9kHz~1GHz	**FREQUENCY RANGE : 1GHz~4GHz**
	
FREQUENCY RANGE : 4GHz~7GHz	**FREQUENCY RANGE : 7GHz~9GHz**
	

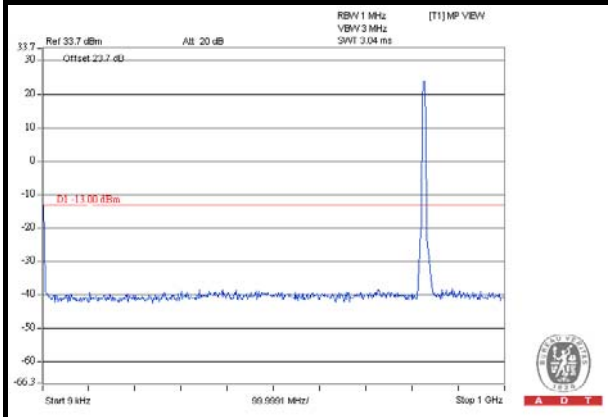
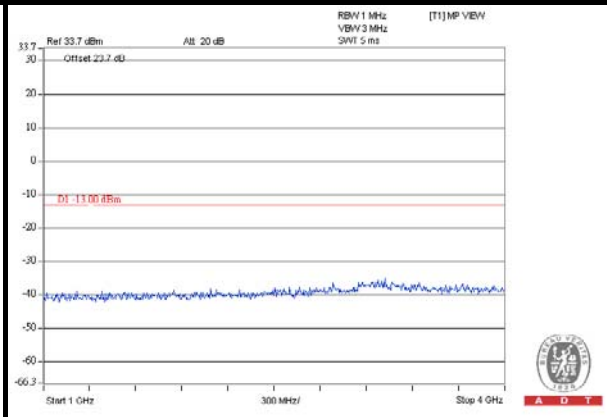
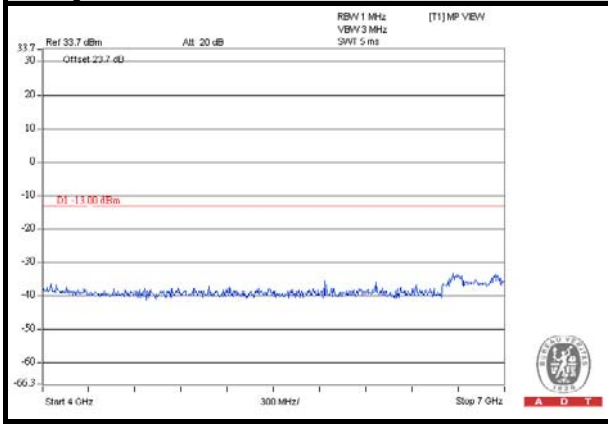
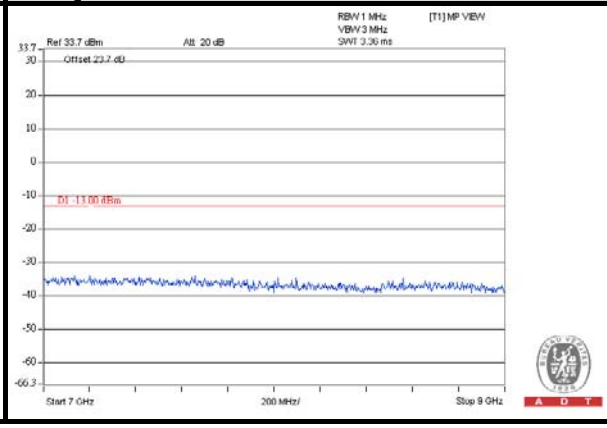
GSM	
CHANNEL 190	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

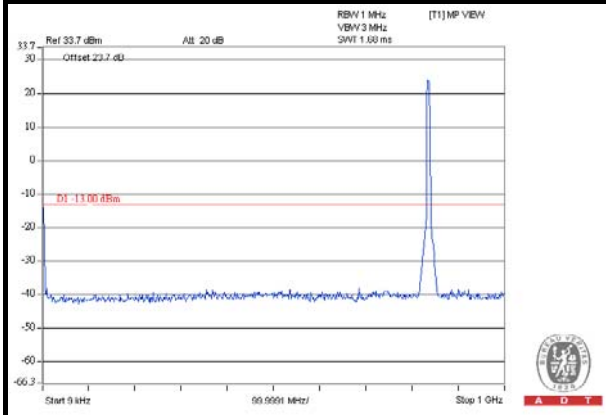
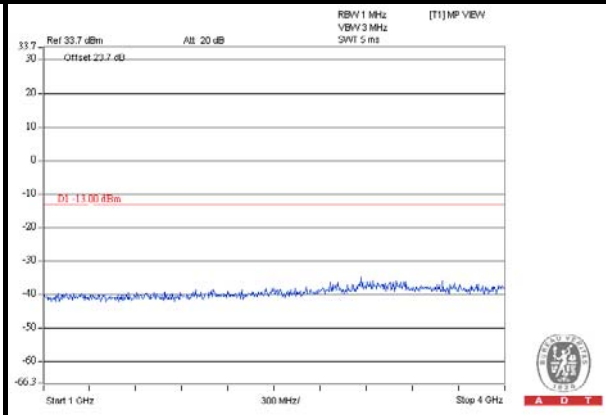
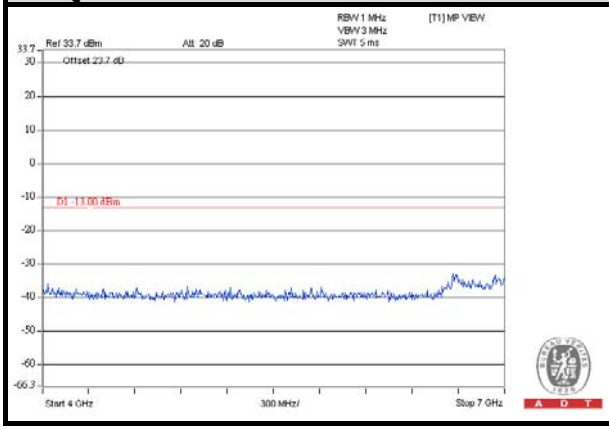
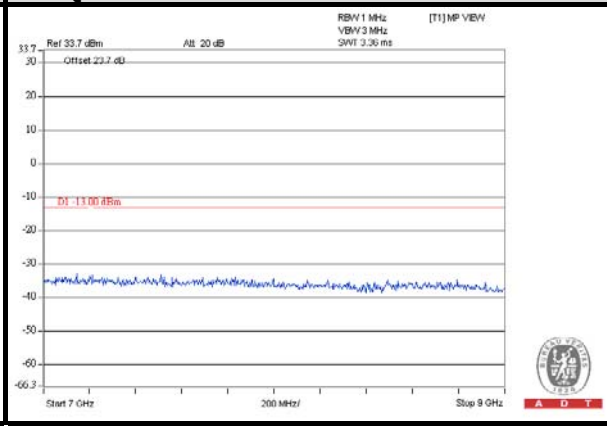
GSM	
CHANNEL 251	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

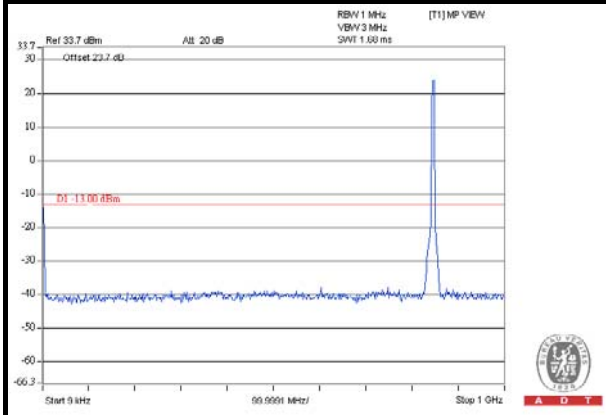
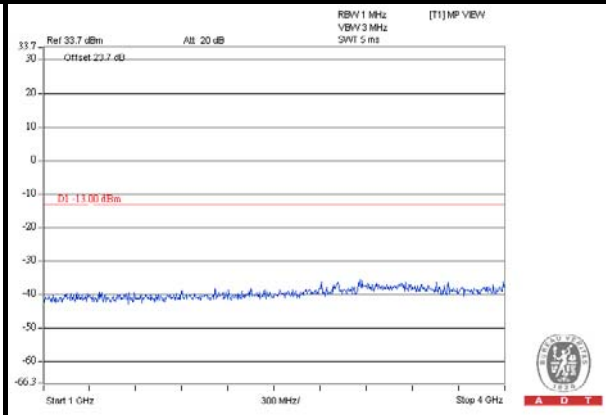
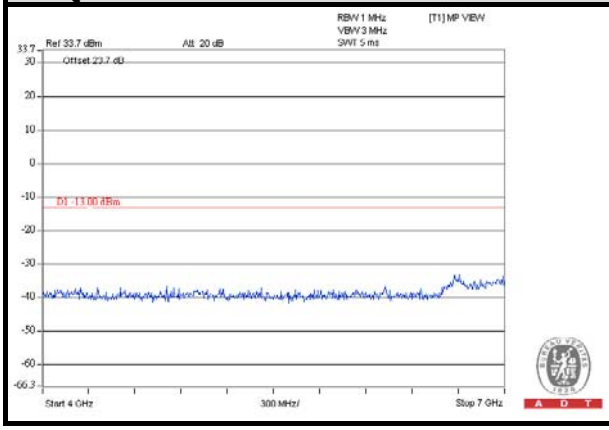
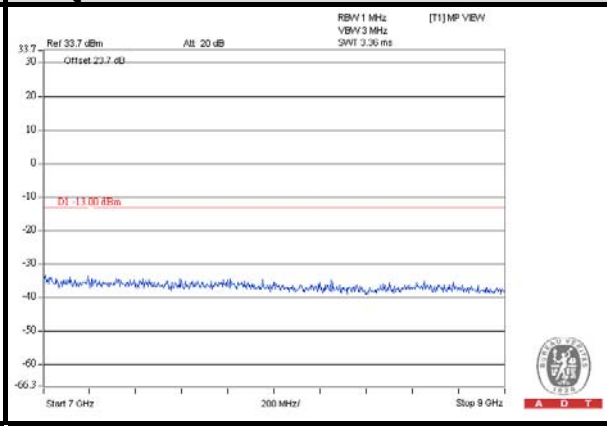
GPRS	
CHANNEL 128	
FREQUENCY RANGE : 9kHz~1GHz	**FREQUENCY RANGE : 1GHz~4GHz**
	
FREQUENCY RANGE : 4GHz~7GHz	**FREQUENCY RANGE : 7GHz~9GHz**
	

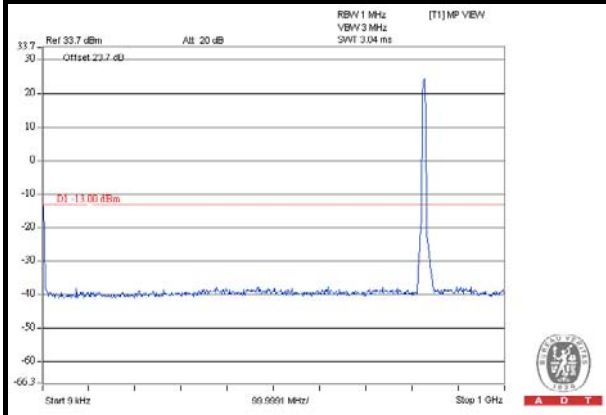
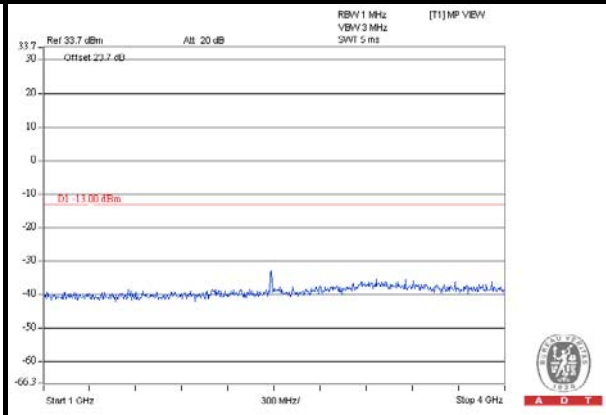
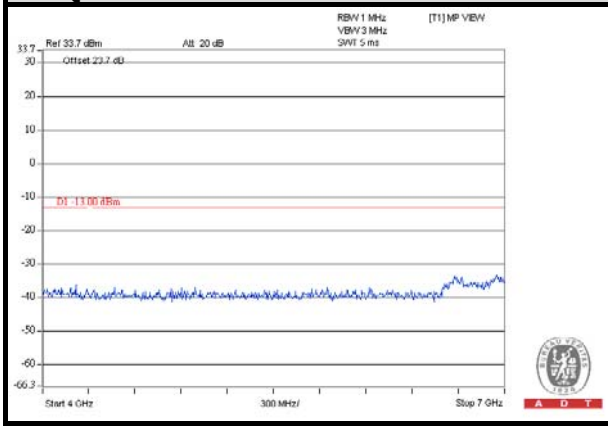
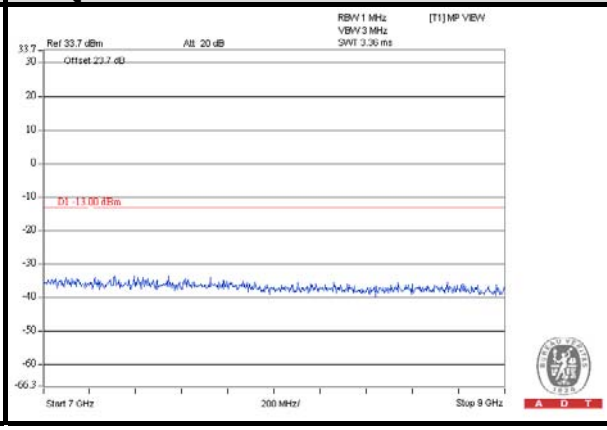
GPRS	
CHANNEL 190	
FREQUENCY RANGE : 9kHz~1GHz	**FREQUENCY RANGE : 1GHz~4GHz**
	
FREQUENCY RANGE : 4GHz~7GHz	**FREQUENCY RANGE : 7GHz~9GHz**
	

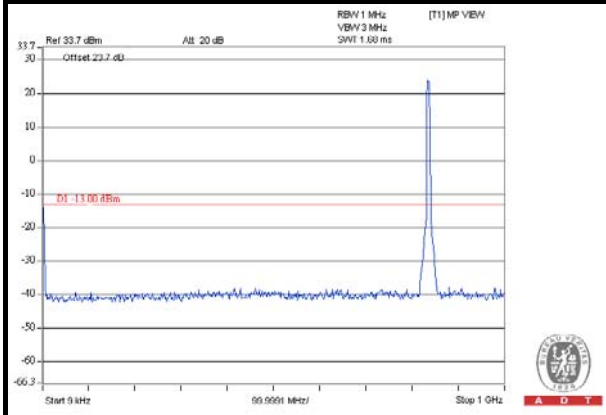
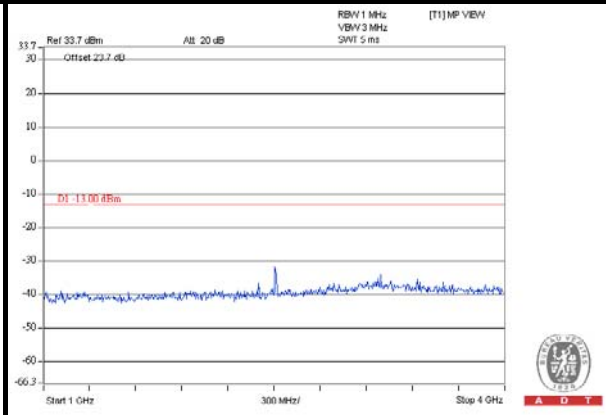
GPRS	
CHANNEL 251	
FREQUENCY RANGE : 9kHz~1GHz	**FREQUENCY RANGE : 1GHz~4GHz**
	
FREQUENCY RANGE : 4GHz~7GHz	**FREQUENCY RANGE : 7GHz~9GHz**
	

WCDMA	
CHANNEL 4132	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

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
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

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
	
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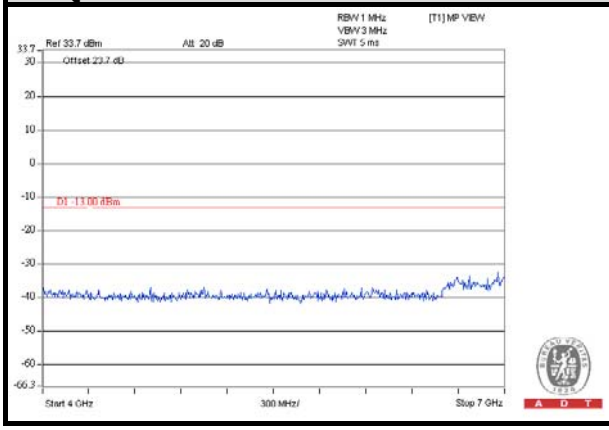
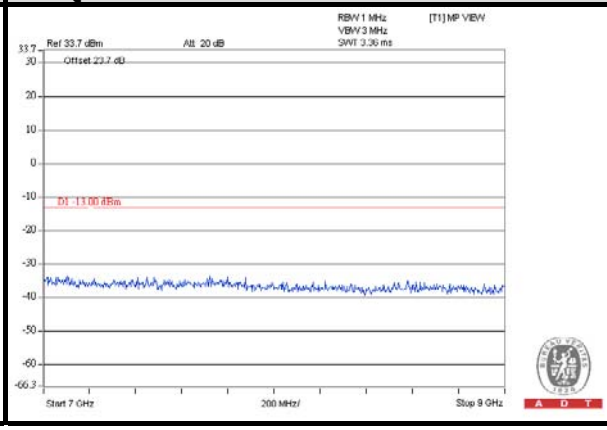
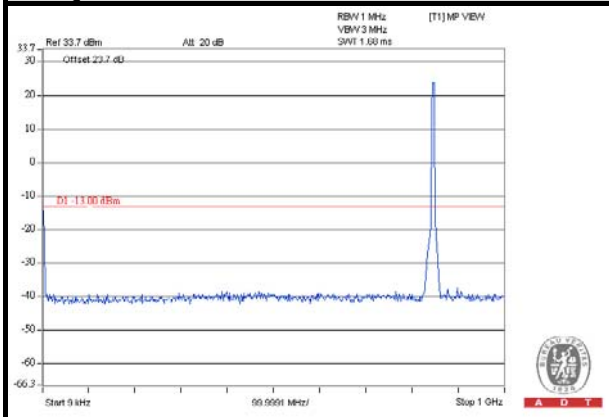
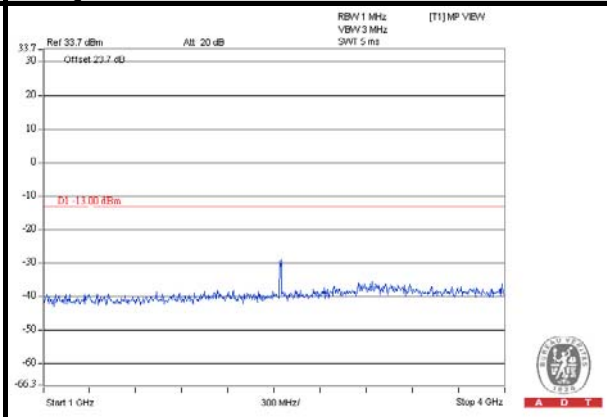
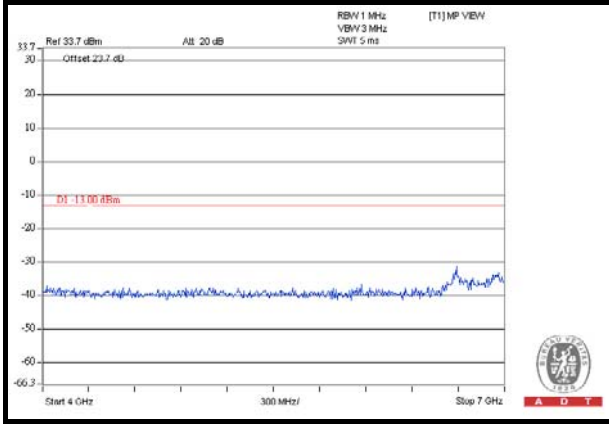
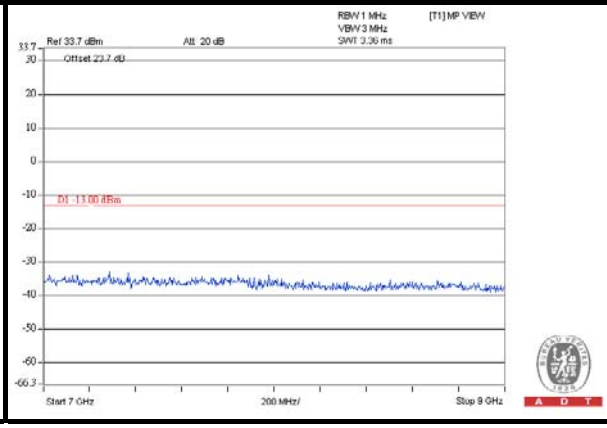
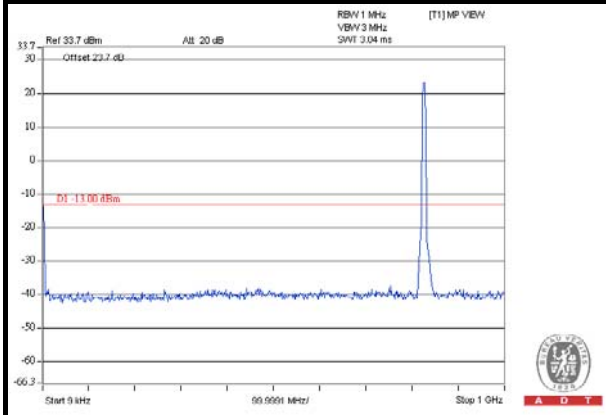
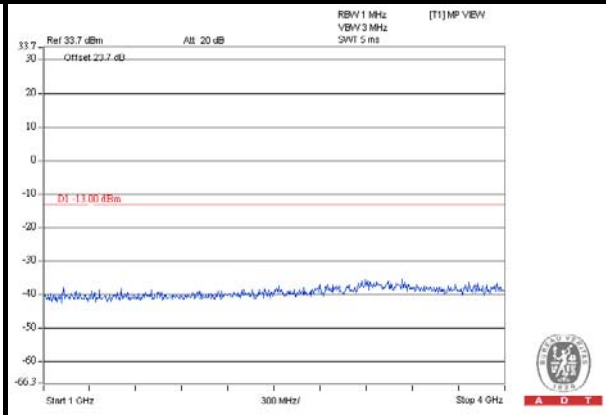
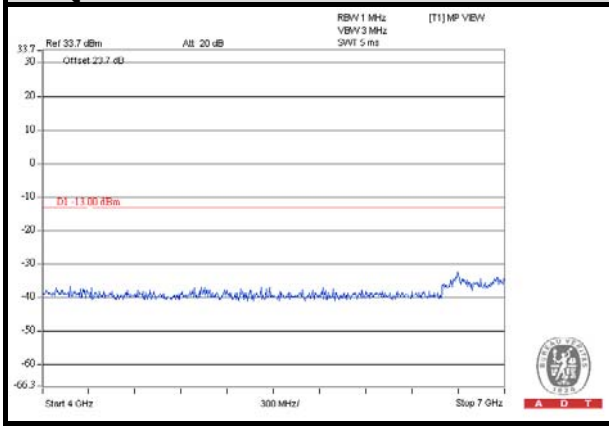
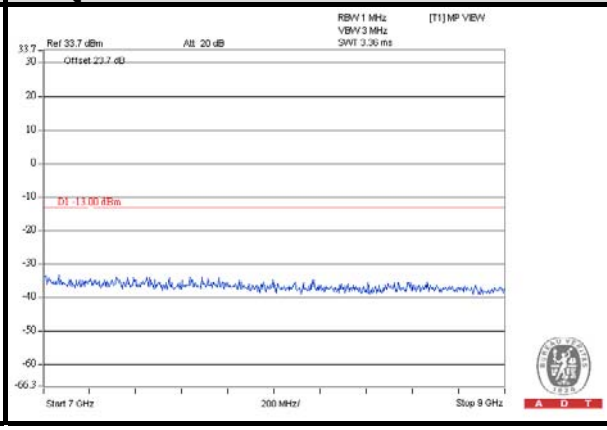
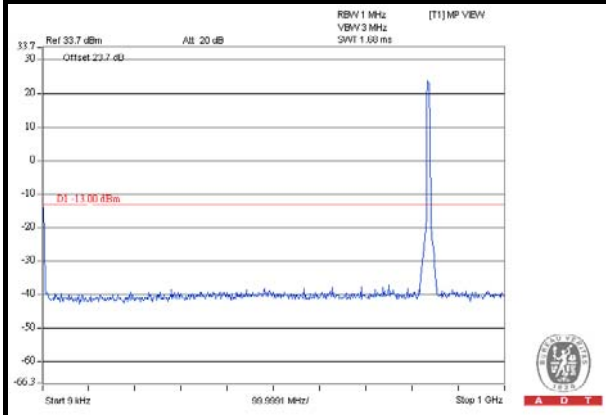
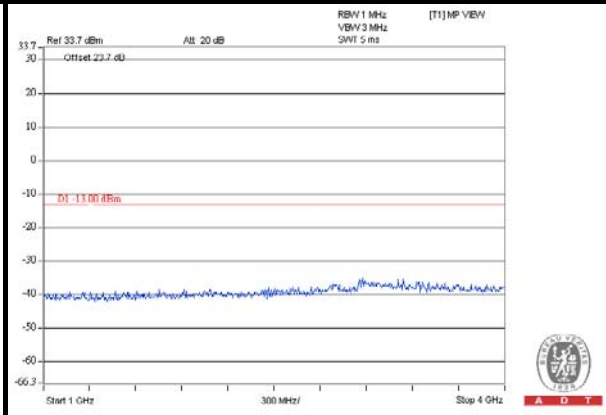
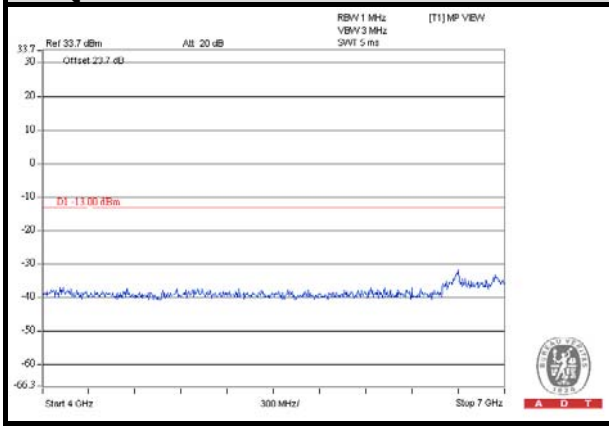
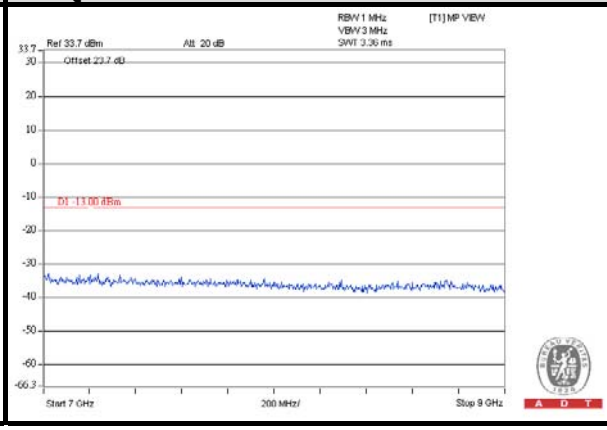
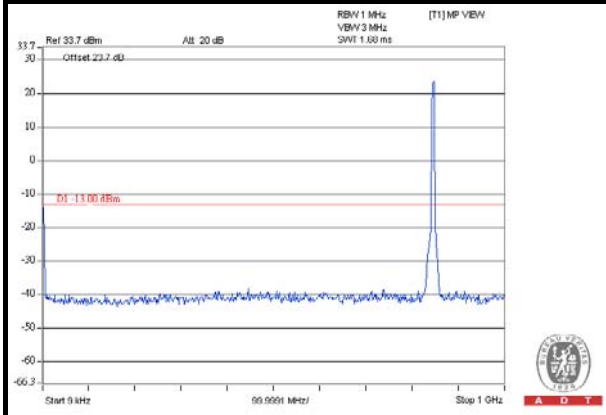
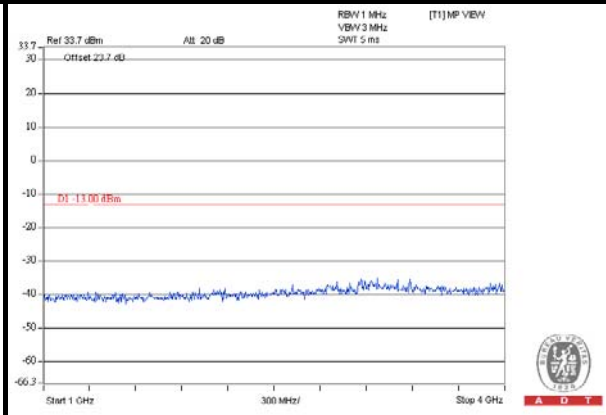
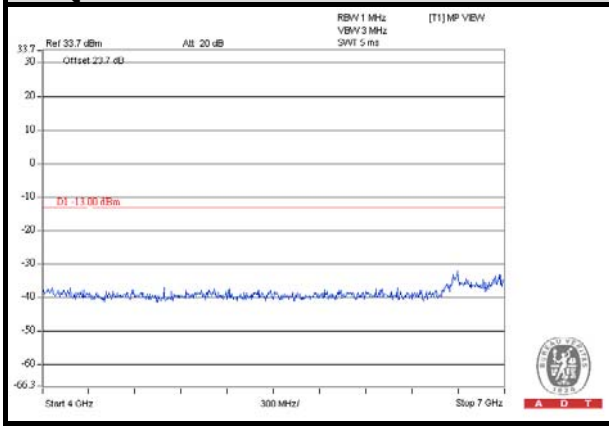
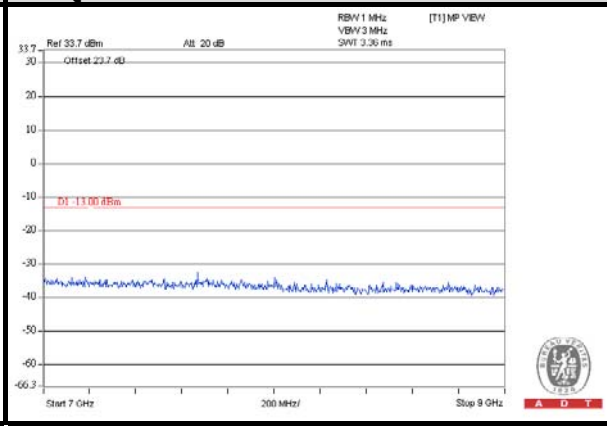
	

HSDPA	
CHANNEL 4233	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

HSUPA	
CHANNEL 4132	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

HSUPA	
CHANNEL 4182	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

HSUPA	
CHANNEL 4233	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

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 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.

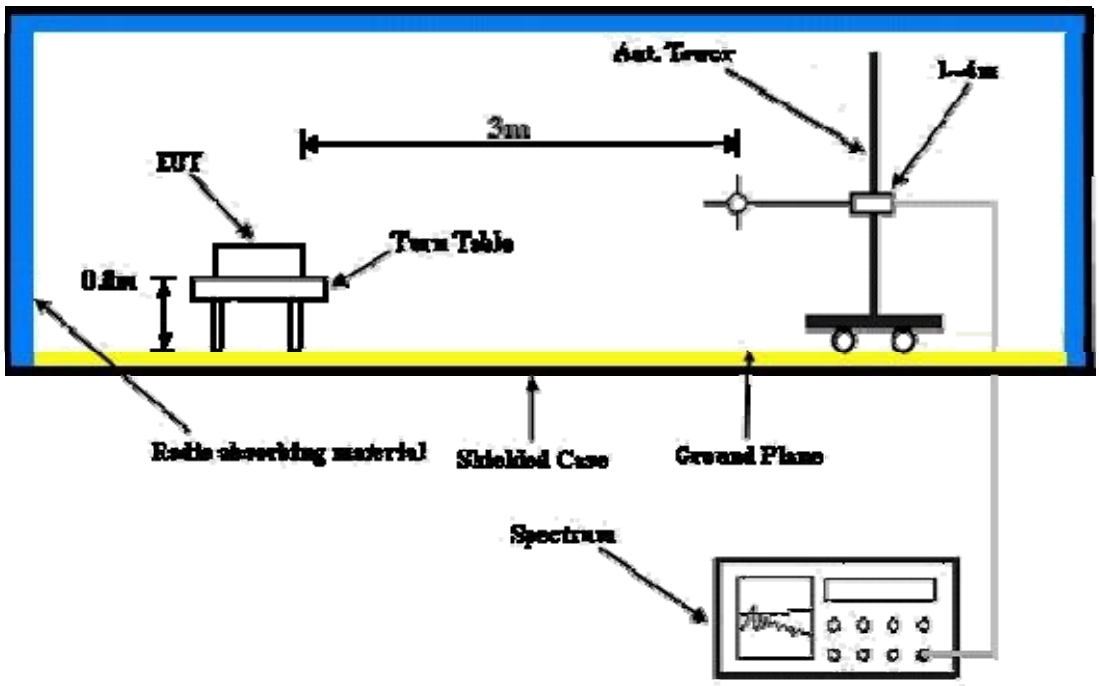
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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

FOR GSM MODE

MODE	TX channel 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.33	-55.89	-41.63	-13.91	-55.54	-13.00	-42.54
2	141.92	-52.03	-56.44	-3.04	-59.48	-13.00	-46.48
3	263.17	-57.57	-62.72	-1.62	-64.34	-13.00	-51.34
4	515.00	-59.11	-64.93	3.86	-61.07	-13.00	-48.07
5	580.29	-61.02	-65.85	3.75	-62.10	-13.00	-49.10
6	872.53	-60.05	-58.28	3.46	-54.82	-13.00	-41.82
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	36.22	-42.68	-38.85	-15.55	-54.40	-13.00	-41.40
2	64.20	-46.56	-53.42	-1.96	-55.38	-13.00	-42.38
3	134.15	-44.80	-47.41	-3.27	-50.68	-13.00	-37.68
4	202.55	-54.31	-55.80	-2.14	-57.94	-13.00	-44.94
5	261.62	-53.33	-52.83	-1.60	-54.43	-13.00	-41.43
6	872.53	-61.88	-59.96	3.46	-56.50	-13.00	-43.50

REMARKS:

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

FOR WCDMA MODE

MODE	TX channel 4132	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-58.58	-37.34	-19.41	-56.75	-13.00	-43.75
2	140.37	-50.95	-55.63	-3.08	-58.71	-13.00	-45.71
3	261.62	-56.85	-62.12	-1.60	-63.72	-13.00	-50.72
4	546.09	-56.86	-62.38	3.90	-58.48	-13.00	-45.48
5	580.29	-61.44	-66.27	3.75	-62.52	-13.00	-49.52
6	872.53	-60.65	-58.88	3.46	-55.42	-13.00	-42.42
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	36.22	-40.00	-36.17	-15.55	-51.72	-13.00	-38.72
2	64.20	-42.52	-49.38	-1.96	-51.34	-13.00	-38.34
3	135.71	-42.07	-44.35	-3.21	-47.56	-13.00	-34.56
4	179.23	-49.82	-52.49	-2.95	-55.44	-13.00	-42.44
5	260.06	-50.62	-50.34	-1.46	-51.80	-13.00	-38.80
6	518.11	-55.89	-61.61	3.84	-57.77	-13.00	-44.77

REMARKS:

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

ABOVE 1GHz

FOR GSM MODE

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1648.40	-52.40	-51.39	7.67	-43.72	-13.00	-30.72
2	2472.60	-49.00	-49.06	6.50	-42.56	-13.00	-29.56
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	1648.40	-43.60	-43.07	7.67	-35.40	-13.00	-22.40
2	2472.60	-48.20	-50.54	6.50	-44.04	-13.00	-31.04

REMARKS:

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

MODE	TX channel 190	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1672.80	-50.60	-49.78	7.64	-42.14	-13.00	-29.14
2	2509.20	-47.40	-47.35	6.45	-40.90	-13.00	-27.90
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	-41.76	-41.26	7.64	-33.62	-13.00	-20.62
2	2509.20	-46.40	-48.71	6.45	-42.26	-13.00	-29.26

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, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1697.60	-50.10	-49.49	7.62	-41.87	-13.00	-28.87
2	2546.40	-47.56	-47.67	6.40	-41.27	-13.00	-28.27
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**	**-38.92**	**-38.47**	**7.62**	**-30.85**	**-13.00**	**-17.85**
2	2546.40	-45.26	-47.39	6.40	-40.99	-13.00	-27.99

REMARKS:

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

FOR WCDMA MODE

MODE	TX channel 4132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1652.80	-57.82	-56.85	7.67	-49.18	-13.00	-36.18
2	2479.20	-56.57	-56.59	6.49	-50.10	-13.00	-37.10
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	1652.80	-52.76	-52.24	7.67	-44.57	-13.00	-31.57
2	2479.20	-60.34	-62.68	6.49	-56.19	-13.00	-43.19

REMARKS:

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

MODE	TX channel 4182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1672.80	-57.80	-56.98	7.64	-49.34	-13.00	-36.34
2	2509.20	-58.60	-58.55	6.45	-52.10	-13.00	-39.10
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	1672.80	-54.10	-53.60	7.64	-45.96	-13.00	-32.96
2	2509.20	-58.90	-61.21	6.45	-54.76	-13.00	-41.76

REMARKS:

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

MODE	TX channel 4233	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.20	-57.82	-57.17	7.62	-49.55	-13.00	-36.55
2	2539.80	-58.20	-58.28	6.41	-51.87	-13.00	-38.87
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	-53.60	-53.14	7.62	-45.52	-13.00	-32.52
2	2539.80	-57.78	-59.95	6.41	-53.54	-13.00	-40.54

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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