FCC Test Report
(Part 22)

Report No.:	RF151229C25-3
FCC ID:	M82-TREK733L
Test Model:	TREK-733L
Received Date:	Apr. 14, 2016
Test Date:	Jun. 13 ~ Aug. 05, 2016
Issued Date:	Aug. 10, 2016
Applicant:	ADVANTECH CO., LTD
Address:	No.1, Alley 20, Lane 26, Rueiguang Rd, Neihu District, Taipei, Taiwan 114
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.)

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Release Control Record

Issue No.	Description	Date Issued
RF151229C25-3	Original release.	Aug. 10, 2016

1 Certificate of Conformity

Product: Computer

Brand: Advantech

Test Model: TREK-733L

Sample Status: Engineering sample

Applicant: ADVANTECH CO., LTD

Test Date: Jun. 13 ~ Aug. 05, 2016

Standards: FCC Part 22, Subpart H

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Aug. 10, 2016

Suntee Liu / Specialist

Approved by : _____ , **Date:** Aug. 10, 2016

Bruce Chen / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective radiated power	PASS	Meet the requirement of limit.
---	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	PASS	Meet the requirement of limit.
2.1049	Occupied Bandwidth	PASS	Meet the requirement of limit.
22.917	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -9.5dB at 2546.40MHz.

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	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 18, 2016	Apr. 17, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Sep. 02, 2015	Sep. 01, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	9120D	209	Jan. 20, 2016	Jan. 19, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2015	Oct. 17, 2016
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2015	Aug. 21, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (214378)	Aug. 22, 2015	Aug. 21, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03 (309224+12738)	Aug. 22, 2015	Aug. 21, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2016	Jun. 07, 2017
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 09, 2016	Jun. 08, 2017
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 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

Product	Computer
Brand	Advantech
Test Model	TREK-733L
Sample Status	Engineering sample
Nominal Voltage	12 or 24Vdc (Car power system) 3.6Vdc (Battery)
Modulation Type	GPRS: GMSK EDGE: 8PSK WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK CDMA: QPSK, OQPSK, HPSK
Operating Frequency	GSM: 824.2MHz ~ 848.8MHz WCDMA Band 5: 826.4MHz ~ 846.6MHz CDMA: 824.7MHz ~ 848.31MHz
Max. ERP Power	GPRS: 1071.519mW (30.3dBm) EDGE: 537.032mW (27.3dBm) WCDMA Band 5: 117.490mW (20.7dBm) CDMA: 186.209mW (22.7dBm)
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Stand, GPS + LTE antenna, LTE antenna, Core (For power cable), Battery
Data Cable Supplied	2.1m Display cable with 1 core 5m Coaxial cable without core (For GPS + LTE antenna) 5.1m Coaxial cable without core (For LTE antenna) 0.27m power cable with one external ferrite core

Note:

1. The EUT provides 1 completed transmitter (Fixed on chain 0) and 2 receivers.
2. The EUT uses following antennas.

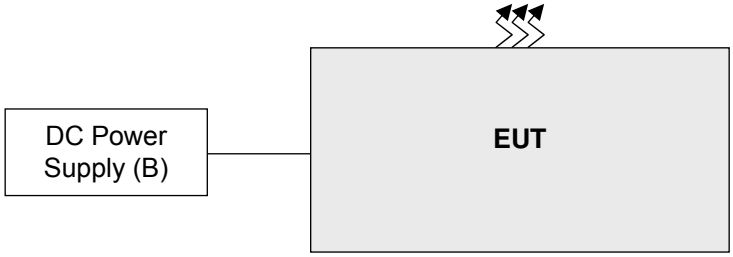
Antenna	Brand	Frequency Range (MHz)	Antenna Gain (dBi)	Antenna Type	Antenna Connector
WWAN (Main) – Chain 0	JEM	1850-1910	0.9	Dipole	SMA
		1710-1755	-0.5		
		824-849	0.5		
		777-787	0.2		
		704-716	0.2		
		1920-1980	-0.4		
WWAN (Aux) – Chain 1	JEM	1850-1910	1.2	Dipole	SMA
		1710-1755	1.8		
		824-849	-0.1		
		777-787	1		
		704-716	1		
		1920-1980	0.7		
WiFi & BT	JEM	2400-2483.5	2.87	PCB	i-pex(MHF)

3. The EUT was operated with following battery:

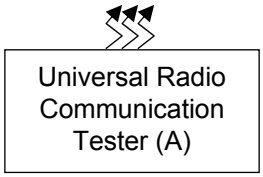
Battery	
Brand:	Formosan
Model:	GP01NCR18650PF
Rating:	3.6Vdc, 2270mA

4. WLAN 2.4GHz, WWAN 2/3G and LTE 4G technologies can transmit at same time.
5. Spurious emission of the simultaneous operation (WLAN 2.4GHz, WWAN 2/3G and LTE 4G) has been evaluated and no non-compliance was found.

3.2 Configuration of System Under Test



Remote site



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Universal Radio Communication Tester	R&S	CMU200	123112	NA	-
B.	DC Power Supply	Topward	6603D	700637	NA	-

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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, 189, 251	GPRS, EDGE
-	Frequency Stability	128 to 251	189	GPRS
-	Occupied Bandwidth	128 to 251	128, 189, 251	GPRS, EDGE
-	Band Edge	128 to 251	128, 251	GPRS, EDGE
-	Peak To Average Ratio	128 to 251	128, 189, 251	GPRS, EDGE
-	Conducted Emission	128 to 251	128, 189, 251	GPRS, EDGE
-	Radiated Emission Below 1GHz	128 to 251	128	GPRS, EDGE
-	Radiated Emission Above 1GHz	128 to 251	128, 189, 251	GPRS, EDGE

WCDMA Mode

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
-	Frequency Stability	4132 to 4233	4182	WCDMA
-	Occupied Bandwidth	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Band Edge	4132 to 4233	4132, 4233	WCDMA, HSDPA, HSUPA
-	Peak To Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Conducted 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

CDMA Mode

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	1013 to 777	1013, 384, 777	CDMA
-	Frequency Stability	1013 to 777	384	CDMA
-	Occupied Bandwidth	1013 to 777	1013, 384, 777	CDMA
-	Band Edge	1013 to 777	1013, 777	CDMA
-	Peak To Average Ratio	1013 to 777	1013, 384, 777	CDMA
-	Conducted Emission	1013 to 777	1013, 384, 777	CDMA
-	Radiated Emission Below 1GHz	1013 to 777	1013	CDMA
-	Radiated Emission Above 1GHz	1013 to 777	1013, 384, 777	CDMA

Test Condition:

Test Item	Environmental Conditions	Input Power (System)	Tested By
ERP	25deg. C, 69%RH 24deg. C, 64%RH	120Vac, 60Hz	Chris Lin Alan Wu
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Conducted Emission	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Radiated Emission	24deg. C, 68%RH 25deg. C, 69%RH 24deg. C, 64%RH	120Vac, 60Hz	Alan Wu Chris Lin

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2
FCC 47 CFR Part 22
KDB 971168 D01 Power Meas License Digital Systems v02r02
ANSI/TIA/EIA-603-C 2004

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

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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:

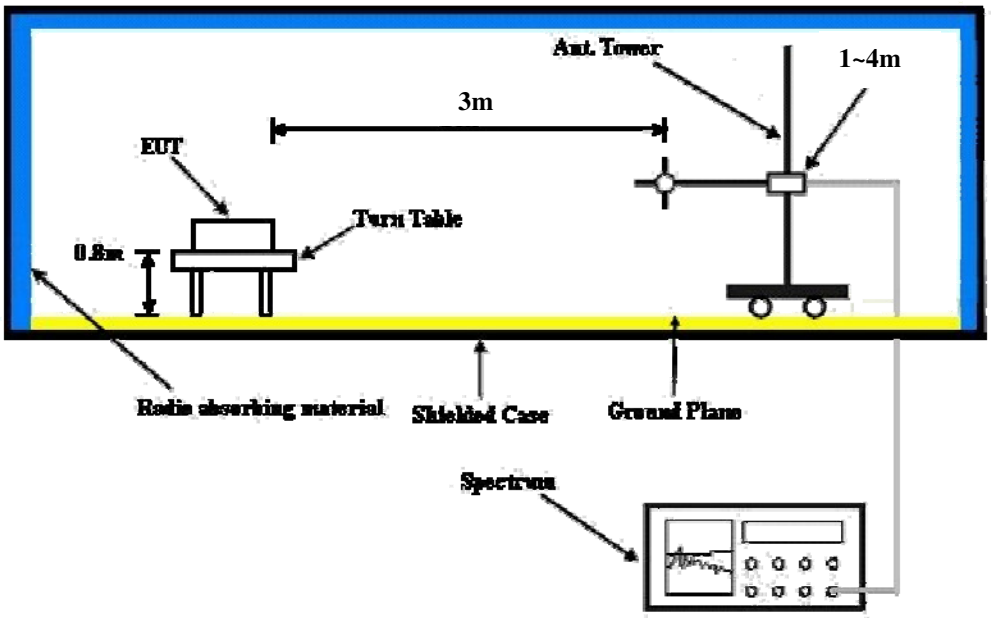
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GPRS, EDGE and 5MHz for WCDMA, HSDPA, HSUPA, CDMA mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated 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, WCDMA, HSDPA, HSUPA, 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:



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

Conducted Power Measurement:

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

4.1.4 Test Results

Conducted Output Power (dBm)

Band	GSM850		
Channel	128	189	251
Frequency (MHz)	824.2	836.4	848.8
GPRS 8	**31.75**	31.68	31.64
GPRS 10	31.16	31.05	31.00
GPRS 11	30.54	30.44	30.31
GPRS 12	29.47	29.32	29.23
EDGE 8 (MCS9)	28.12	28.16	28.22
EDGE 10 (MCS9)	27.95	27.99	28.02
EDGE 11 (MCS9)	27.54	27.61	27.76
EDGE 12 (MCS9)	27.25	27.34	22.51

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	**22.94**	22.88	22.87
HSDPA Subtest-1	22.91	22.86	22.85
HSDPA Subtest-2	22.90	22.86	22.83
HSDPA Subtest-3	22.43	22.39	22.39
HSDPA Subtest-4	22.41	22.38	22.36
HSUPA Subtest-1	22.92	22.85	22.86
HSUPA Subtest-2	20.90	20.84	20.84
HSUPA Subtest-3	21.89	21.81	21.84
HSUPA Subtest-4	20.89	20.82	20.81
HSUPA Subtest-5	22.90	22.84	22.85

Band	CDMA2000 BC0		
Channel	1013	384	777
Frequency (MHz)	824.7	836.52	848.31
RC1+SO55	23.23	**23.40**	23.22

ERP Power (dBm)

GPRS 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	-3.6	27.5	0.0	27.5	38.5	-11.0
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	-2.8	29.2	0.0	29.2	38.5	-9.3

MODE		TX channel 189					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.40	-3.8	27.4	0.2	27.6	38.5	-10.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.40	-1.8	30.0	0.2	30.2	38.5	-8.3

MODE		TX channel 251					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.80	-4.4	26.1	0.5	26.6	38.5	-11.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.80	-1.6	29.8	0.5	**30.3**	38.5	-8.2

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

EDGE Mode

MODE		TX channel 128					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	824.20	-6.6	24.5	0.0	24.5	38.5	-14.0
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	-5.8	26.2	0.0	26.2	38.5	-12.3

MODE		TX channel 189					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.40	-6.8	24.4	0.2	24.6	-13.0	37.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.40	-4.8	27.0	0.2	27.2	38.5	-11.3

MODE		TX channel 251					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.80	-7.4	23.1	0.5	23.6	38.5	-14.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.80	-4.6	26.8	0.5	**27.3**	38.5	-11.2

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

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	-11.5	19.6	0.0	19.6	38.5	-18.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.40	-11.2	20.7	0.0	**20.7**	38.5	-17.8

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	-12.1	19.1	0.2	19.3	38.5	-19.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.40	-11.3	20.5	0.2	**20.7**	38.5	-17.8

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	-12.1	18.4	0.4	18.8	38.5	-19.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	846.60	-11.8	19.5	0.4	19.9	38.5	-18.6

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

CDMA Mode

MODE		TX channel 1013					
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	824.70	-9.5	21.6	0.0	21.6	38.5	-16.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	824.70	-9.2	22.7	0.0	**22.7**	38.5	-15.8

MODE		TX channel 384					
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	836.50	-10.8	20.4	0.2	20.6	38.5	-17.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-10.6	21.2	0.2	21.4	38.5	-17.1

MODE		TX channel 777					
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	848.30	-11.9	18.6	0.5	19.1	38.5	-19.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.30	-10.4	21.0	0.5	21.5	38.5	-17.0

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

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

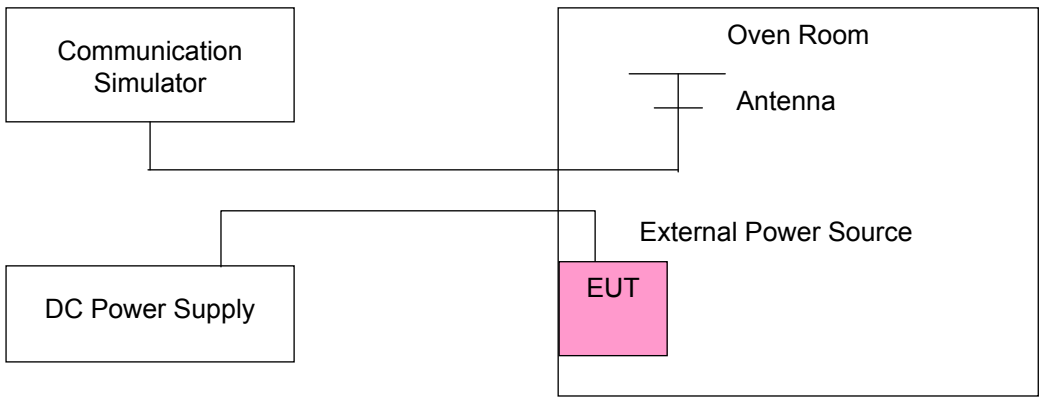
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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	WCDMA	CDMA	
26.4	-0.015	-0.016	-0.015	2.5
24	-0.014	-0.012	-0.013	2.5
21.6	-0.015	-0.014	-0.014	2.5

NOTE: The applicant defined the normal working voltage is from 21.6Vdc to 26.4Vdc.

Frequency Error vs. Temperature.

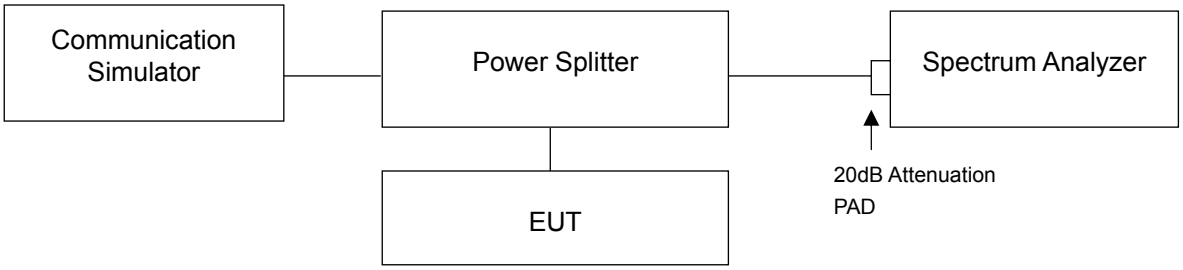
TEMP. (℃)	Frequency Error (ppm)			Limit (ppm)
	GPRS	WCDMA	CDMA	
70	-0.025	-0.026	-0.025	2.5
60	-0.022	-0.026	-0.026	2.5
50	-0.020	-0.019	-0.019	2.5
40	-0.018	-0.018	-0.018	2.5
30	-0.015	-0.016	-0.015	2.5
20	-0.014	-0.012	-0.013	2.5
10	-0.017	-0.017	-0.017	2.5
0	-0.020	-0.021	-0.019	2.5
-10	-0.023	-0.022	-0.022	2.5
-20	-0.025	-0.026	-0.029	2.5

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

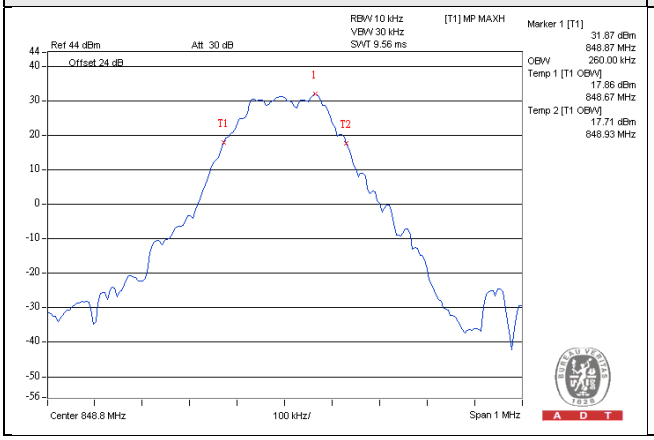
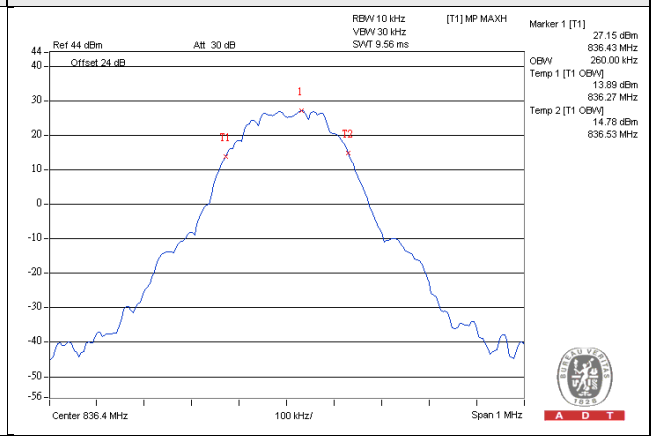
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

4.3.2 Test Setup



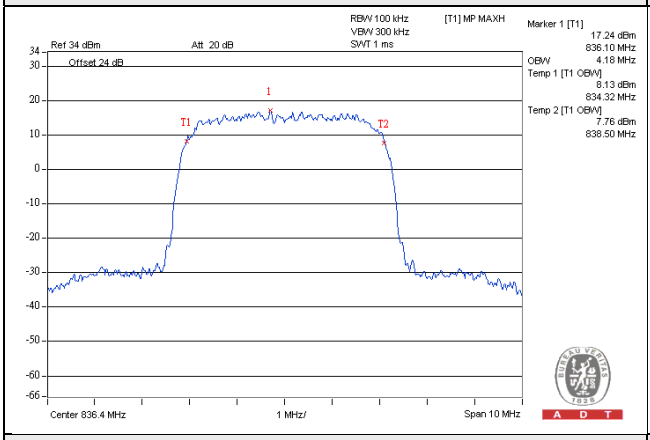
4.3.3 Test Result

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		GPRS	EDGE
128	824.2	0.255	0.255
189	836.4	0.255	0.260
251	848.8	0.260	0.260

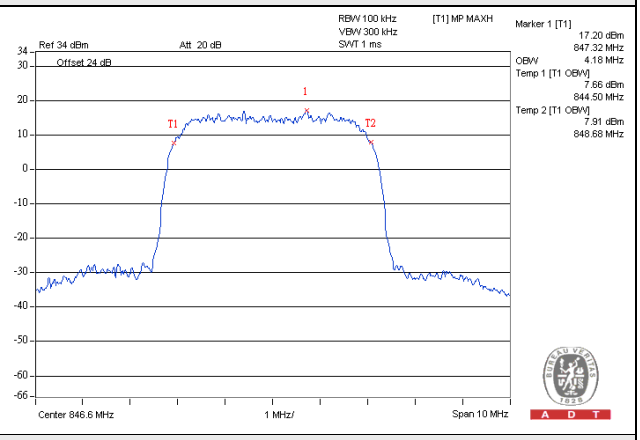
Spectrum Plot Of Worst Value	
GPRS	EDGE
	

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
4132	826.4	4.15	4.17	4.15
4182	836.4	4.18	4.17	4.17
4233	846.6	4.17	4.18	4.17

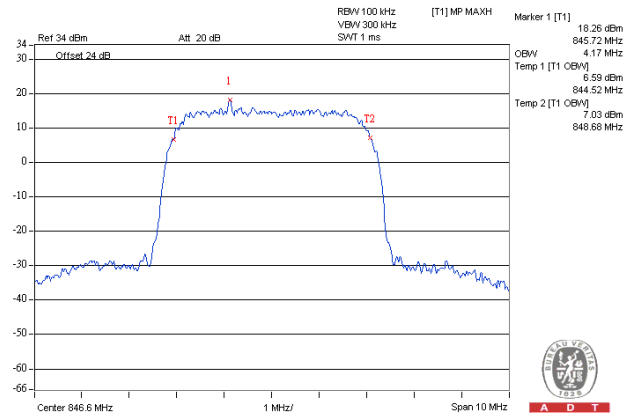
WCDMA



HSDPA

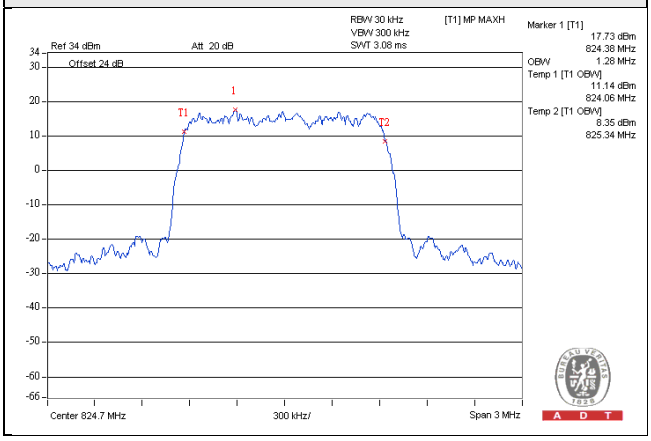


HSUPA



Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		CDMA
1013	824.70	1.28
384	836.52	1.28
777	848.31	1.28

Spectrum Plot Of Worst Value
CDMA

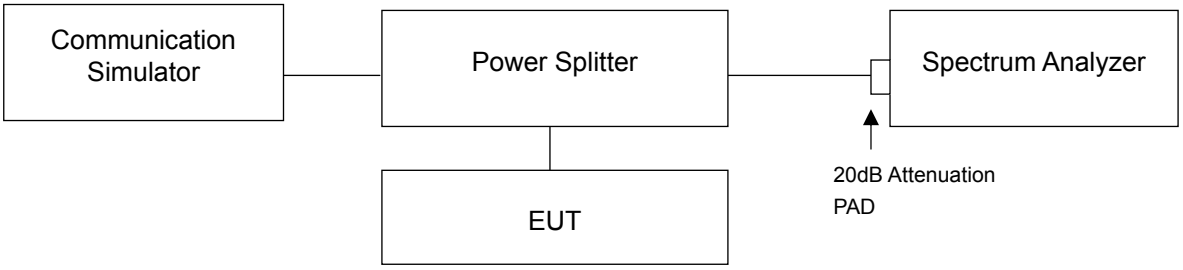


4.4 Band Edge Measurement

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.

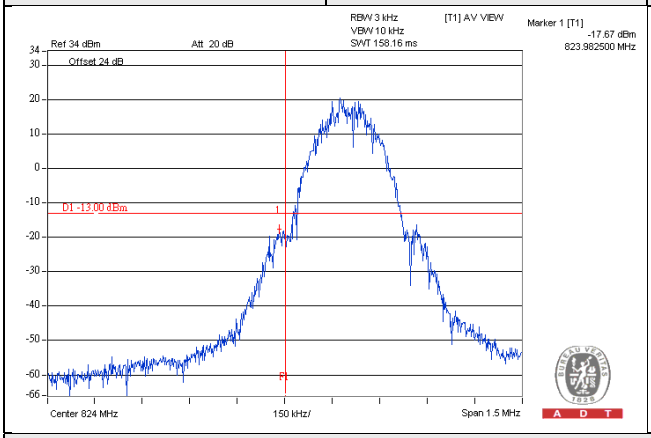
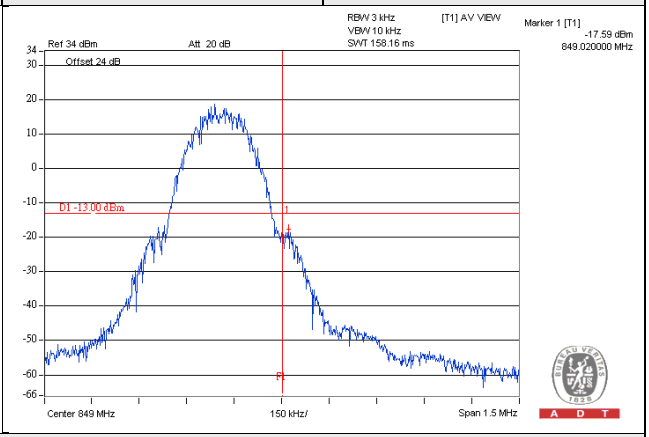
4.4.2 Test Setup

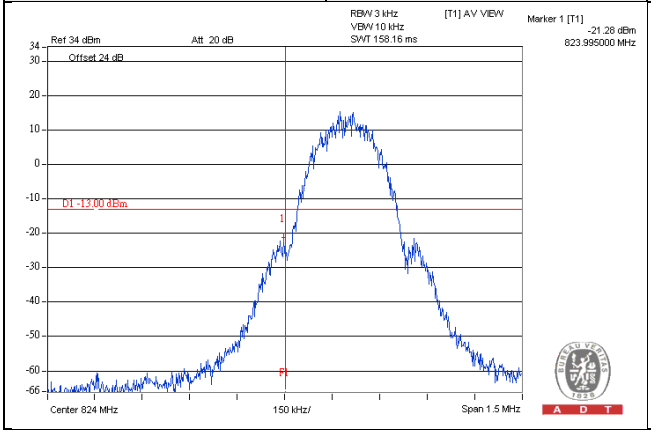
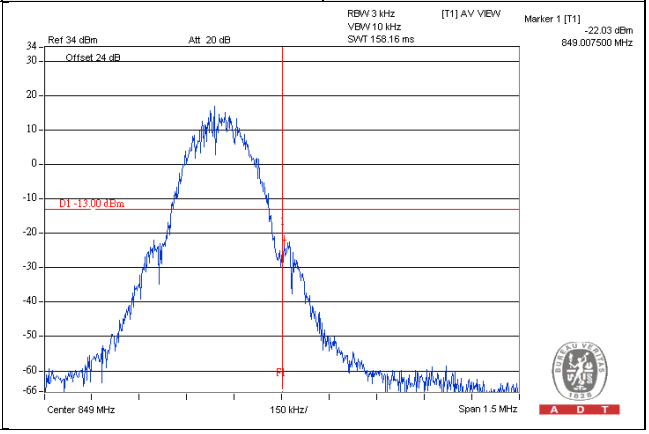


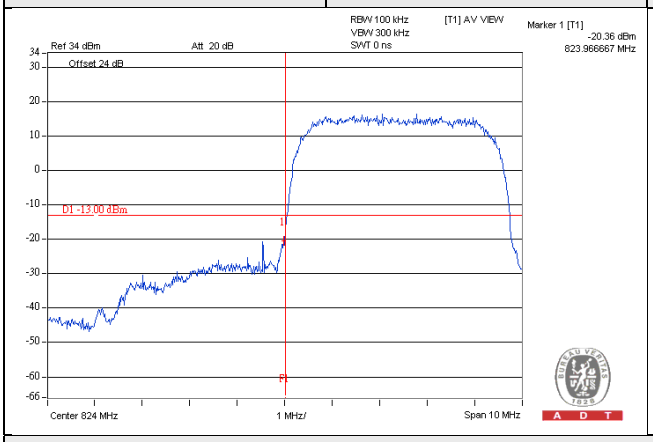
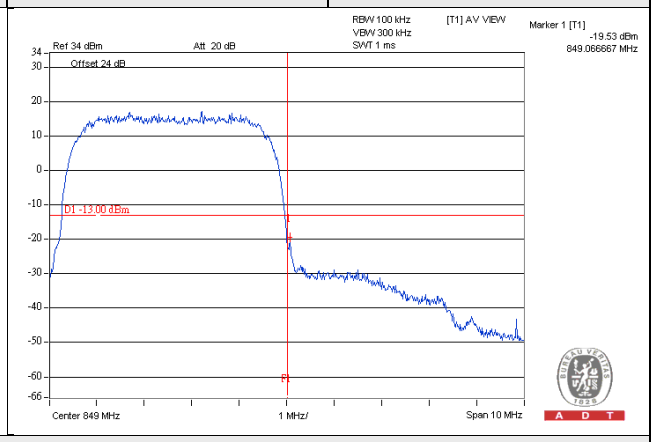
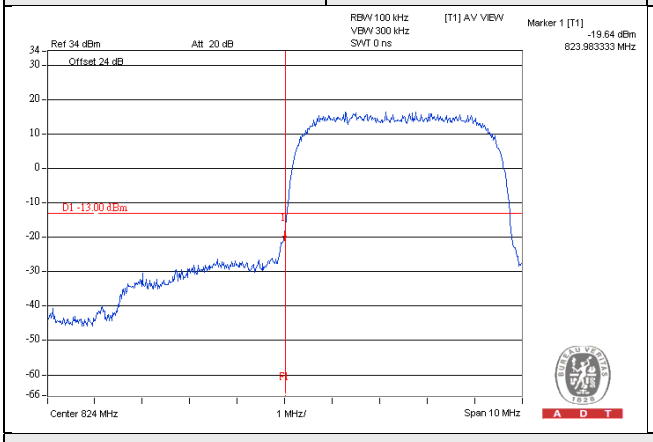
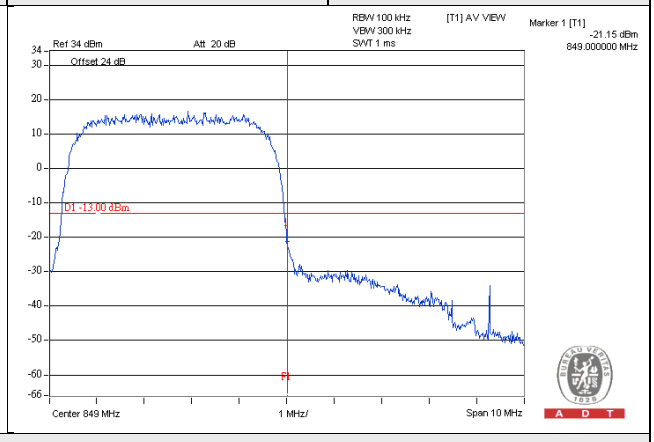
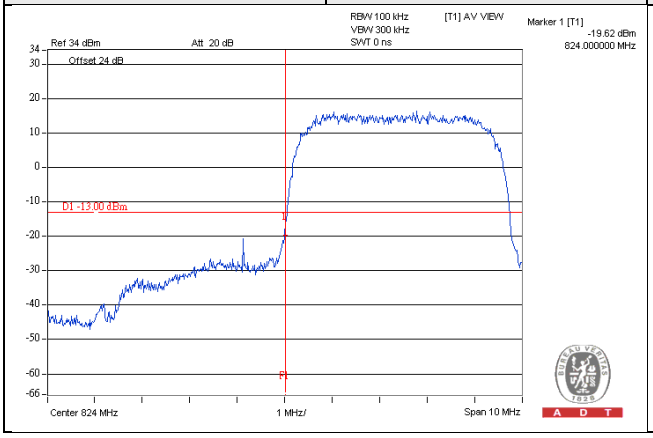
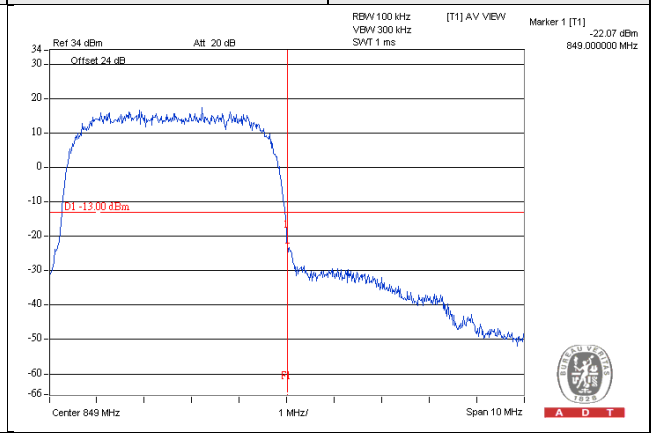
4.4.3 Test Procedures

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 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GPRS / EDGE).
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. The center frequency of spectrum is the band edge frequency and span is 3MHz. RB of the spectrum is 15kHz and VB of the spectrum is 47kHz (CDMA).
e. Record the max trace plot into the test report.

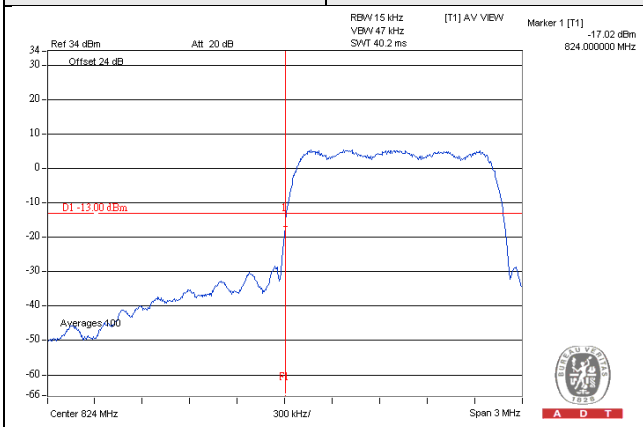
4.4.4 Test Results

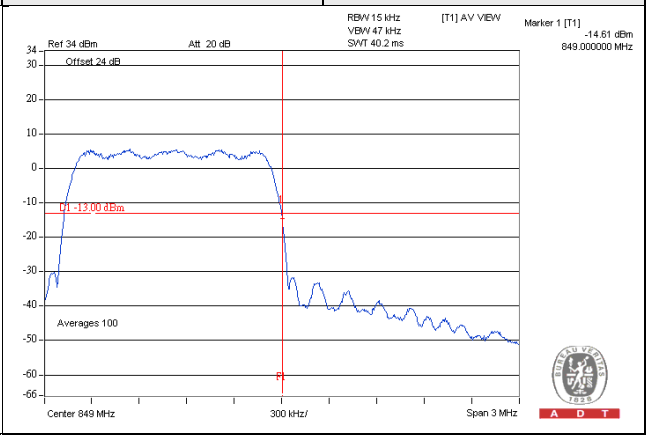
GPRS			
Channel	128	Channel	251
			

EDGE			
Channel	128	Channel	251
			

WCDMA			
Channel	4132	Channel	4233
			
HSDPA			
Channel	4132	Channel	4233
			
HSUPA			
Channel	4132	Channel	4233
			

CDMA			
Channel	1013	Channel	777



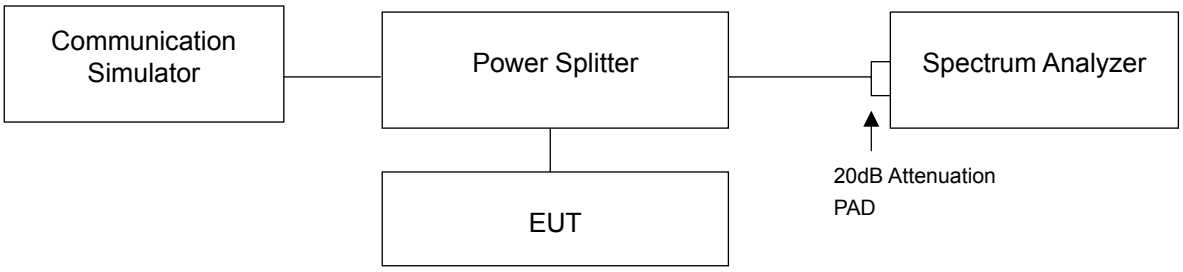


4.5 Peak To Average Ratio

4.5.1 Limits of Peak To Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.5.2 Test Setup



4.5.3 Test Procedures

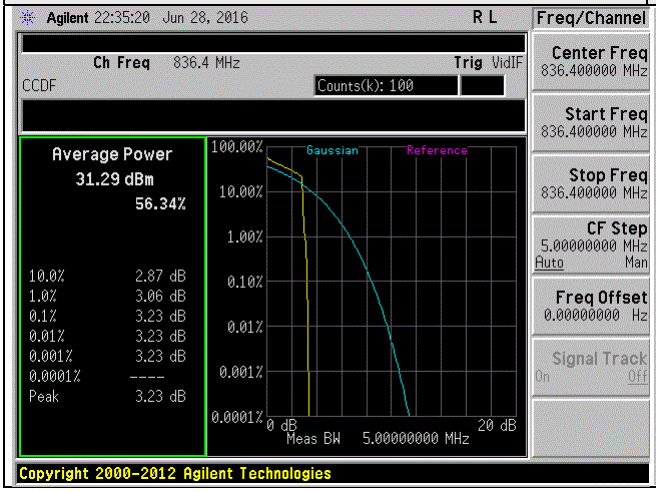
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.5.4 Test Results

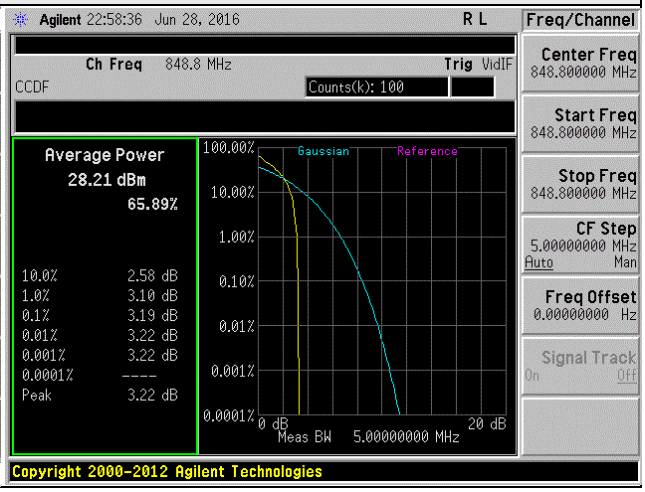
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		GPRS	EDGE
128	824.2	2.59	2.58
189	836.4	3.23	2.82
251	848.8	2.53	3.19

Spectrum Plot Of Worst Value

GPRS

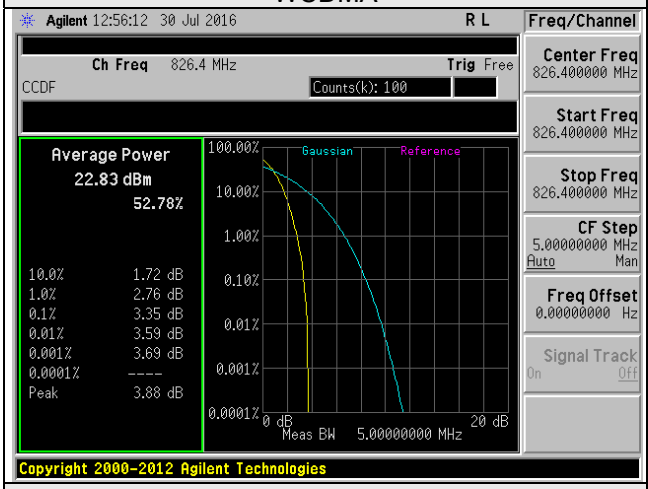


EDGE

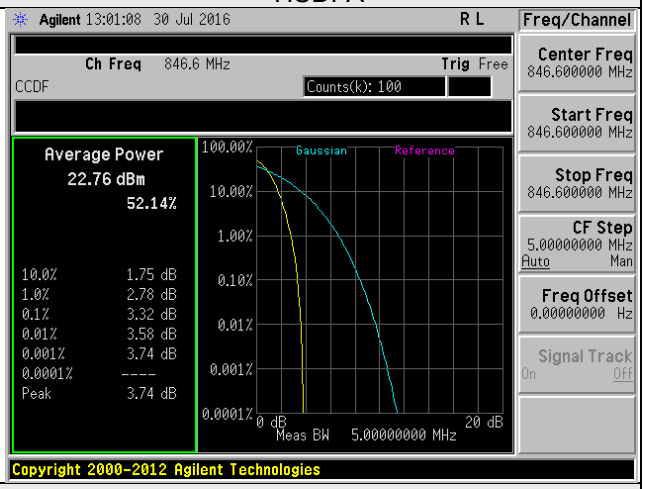


Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		WCDMA	HSDPA	HSUPA
4132	826.4	3.35	3.30	3.32
4182	836.4	3.30	3.30	3.29
4233	846.6	3.35	3.32	3.33

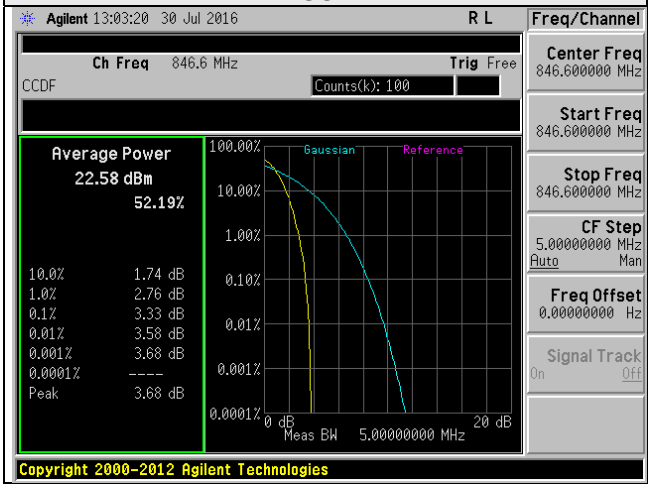
WCDMA



HSDPA

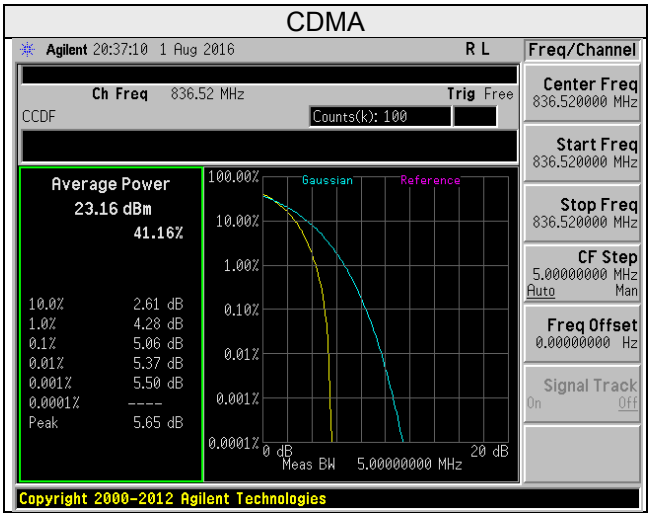


HSUPA



Channel	Frequency (MHz)	Peak To Average Ratio (dB)
		CDMA
1013	824.70	4.90
384	836.52	5.06
777	848.31	4.54

CDMA

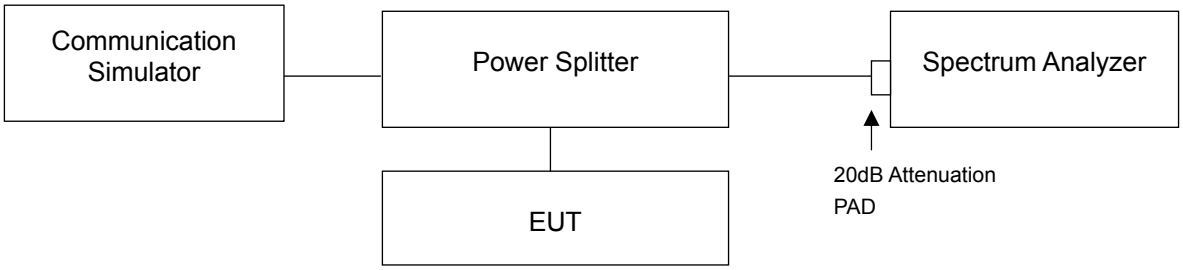


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

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

4.6.2 Test Setup

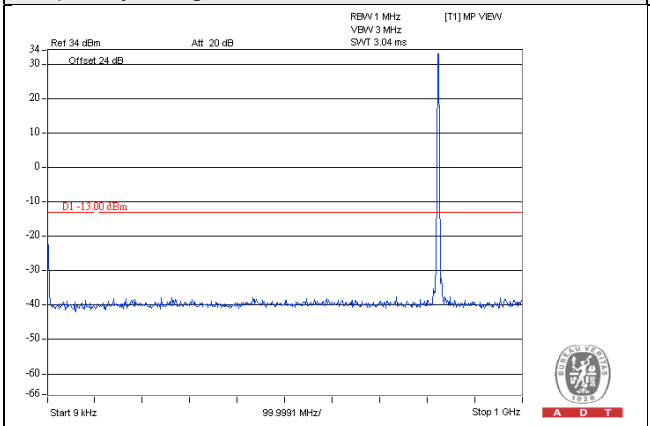
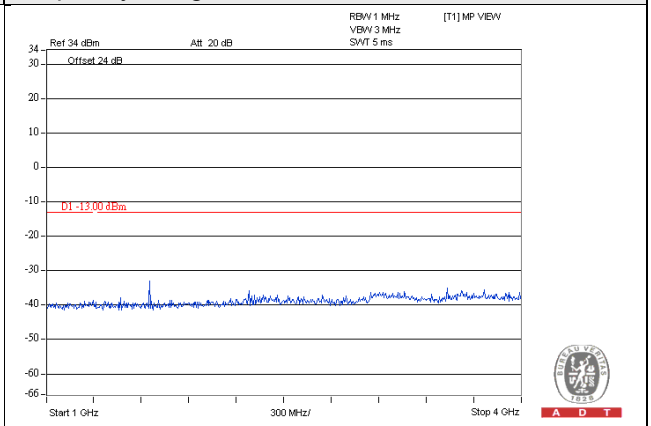
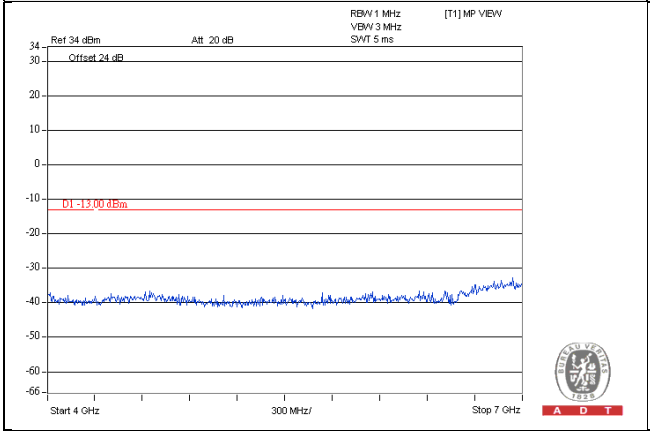
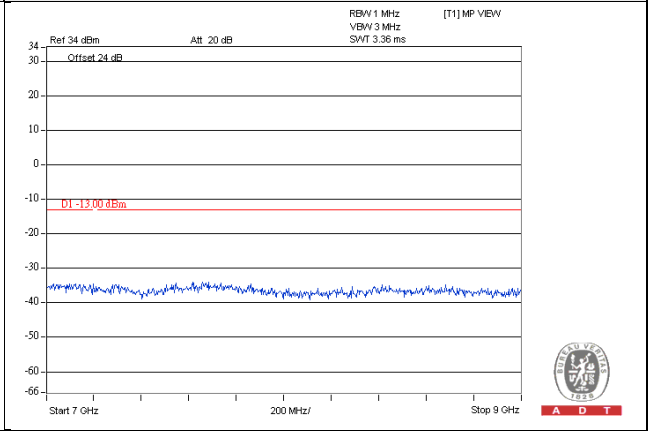


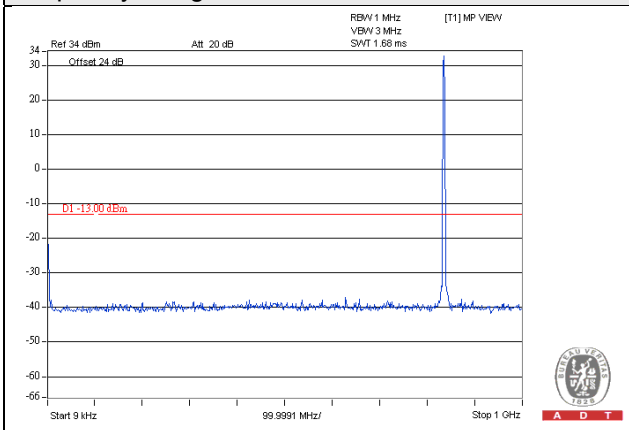
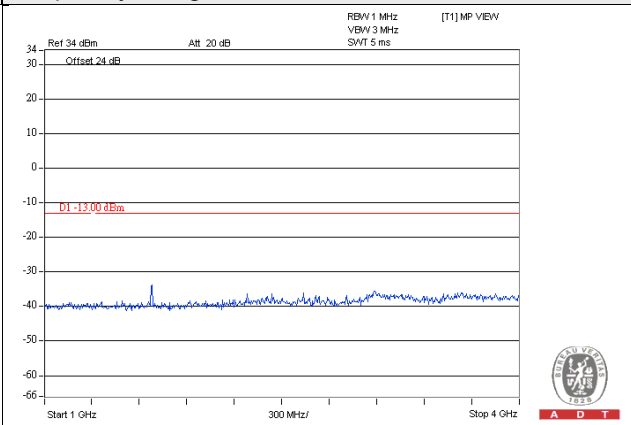
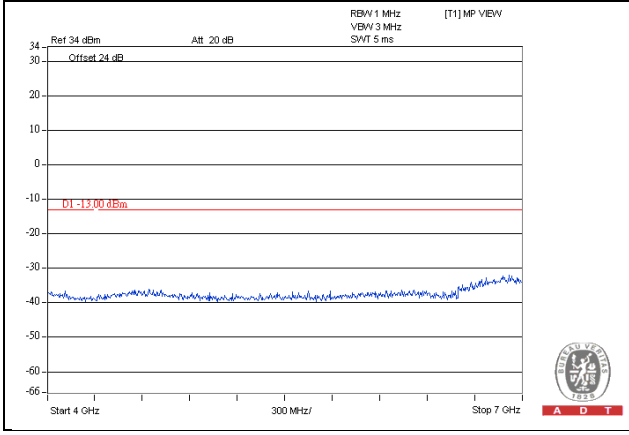
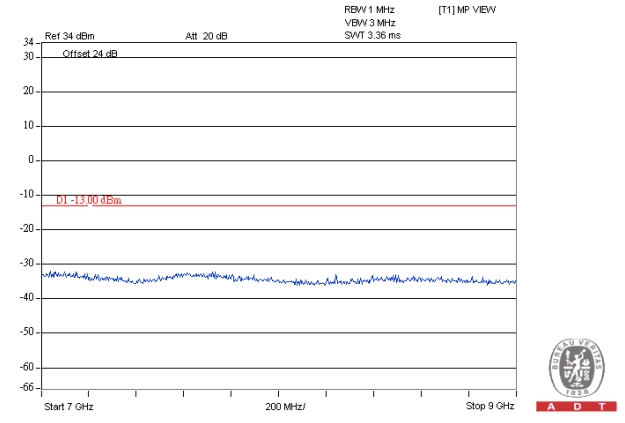
4.6.3 Test Procedure

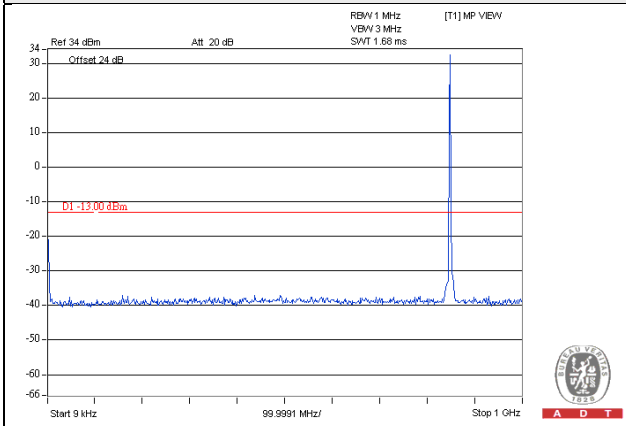
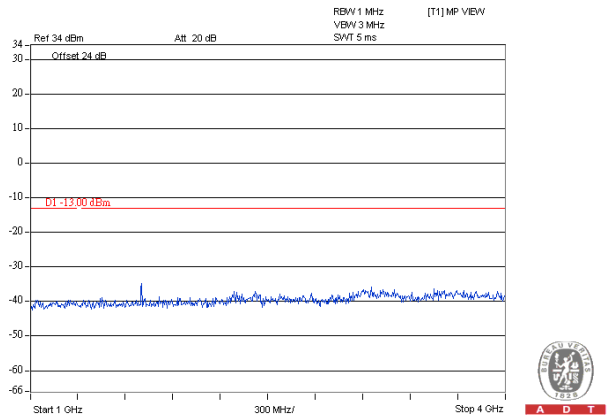
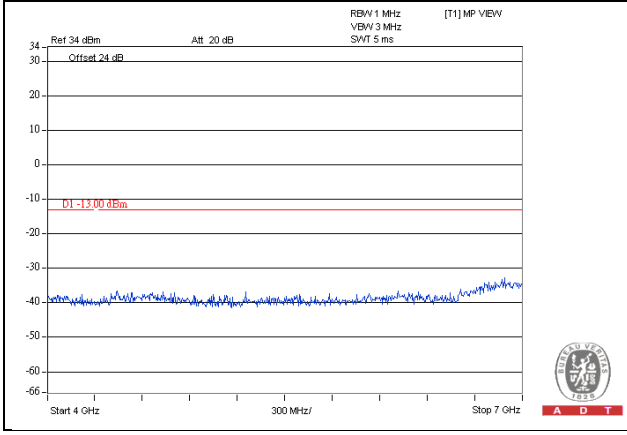
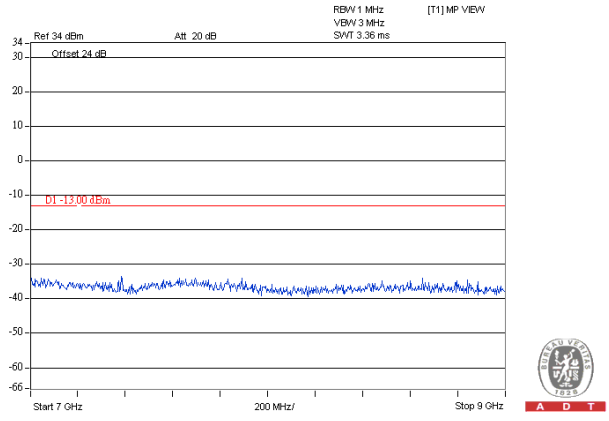
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

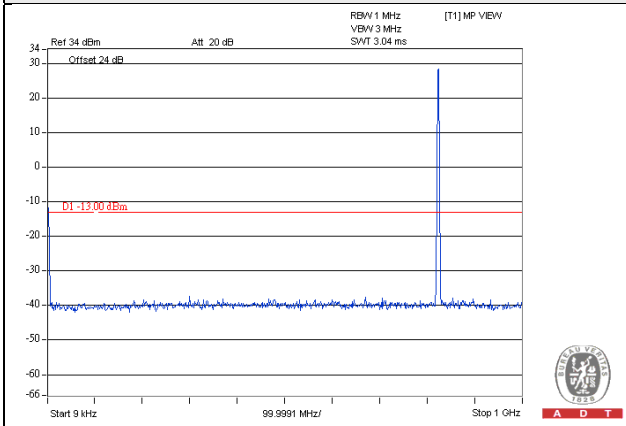
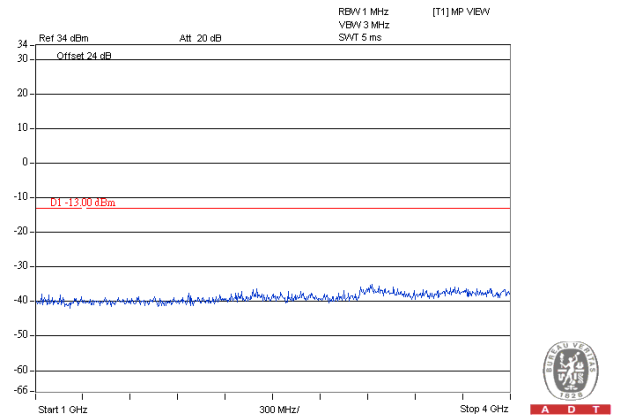
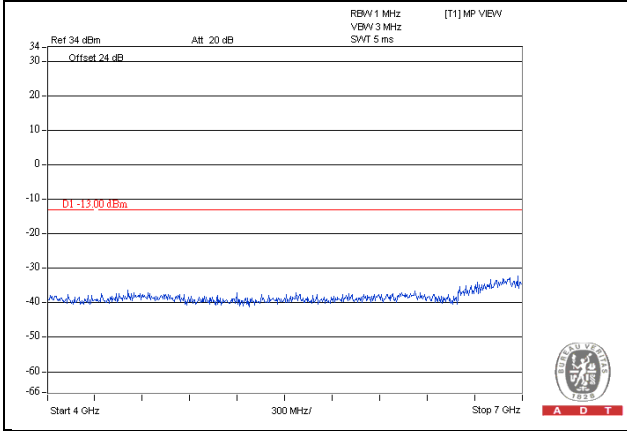
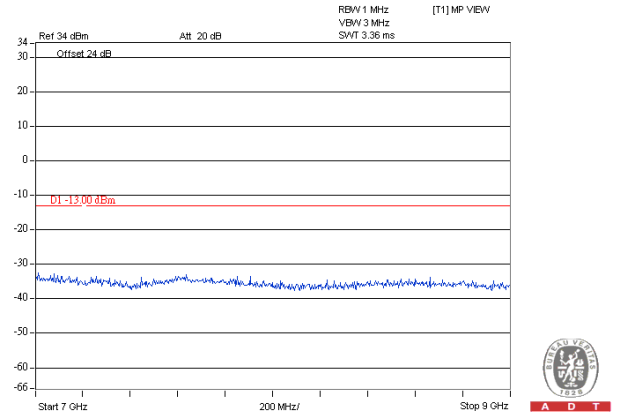
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

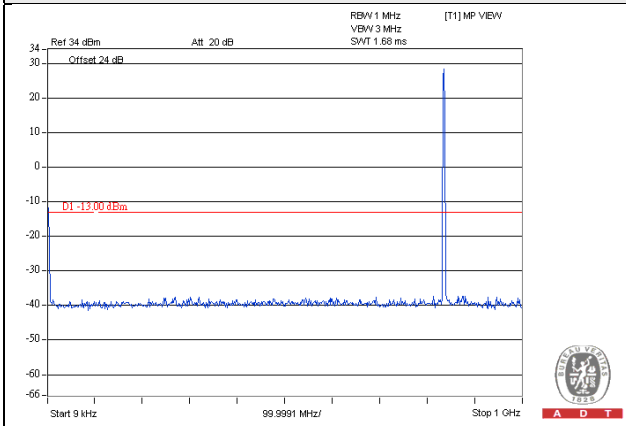
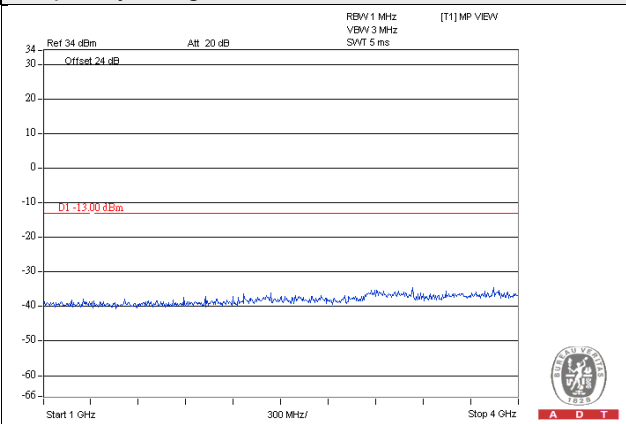
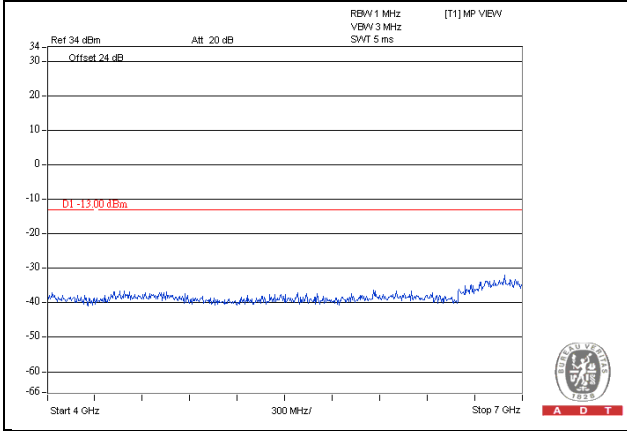
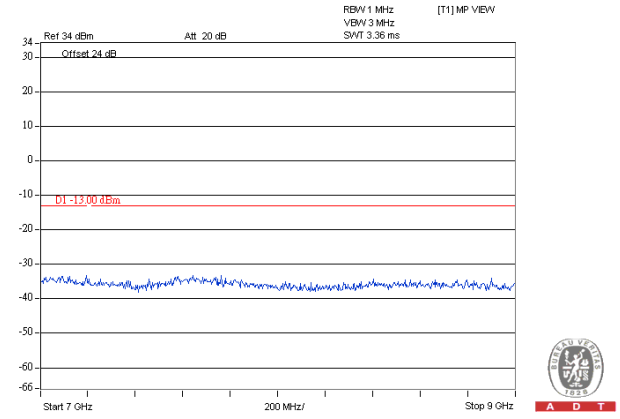
4.6.4 Test Results

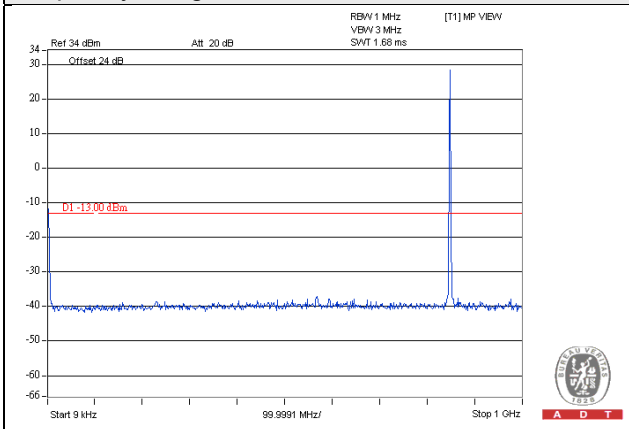
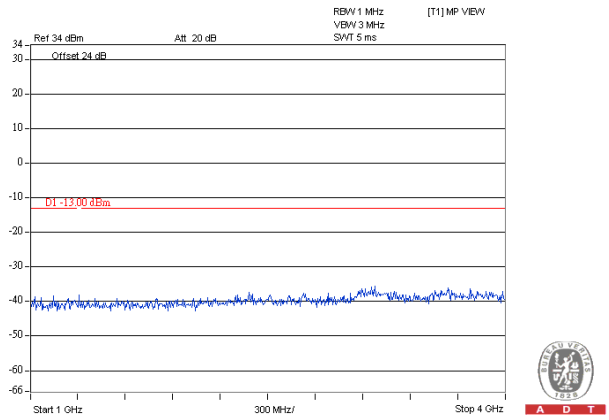
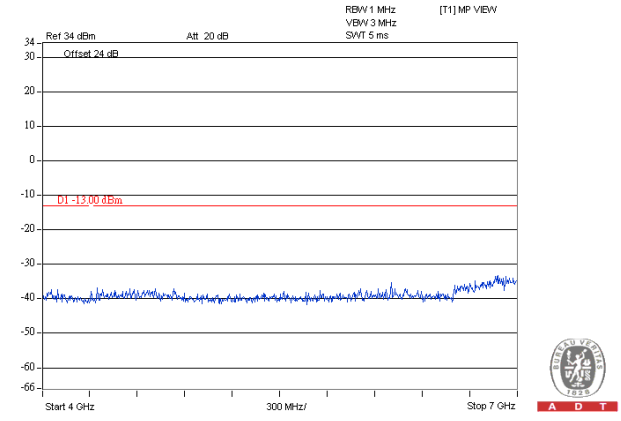
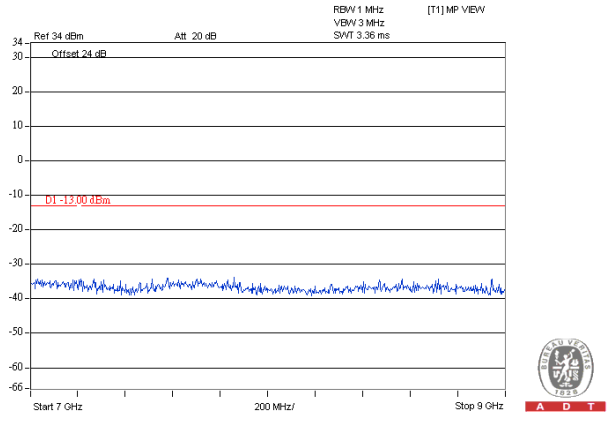
GPRS	
Channel 128	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

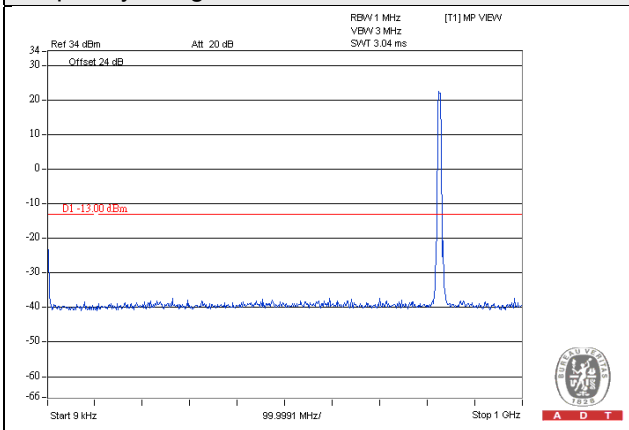
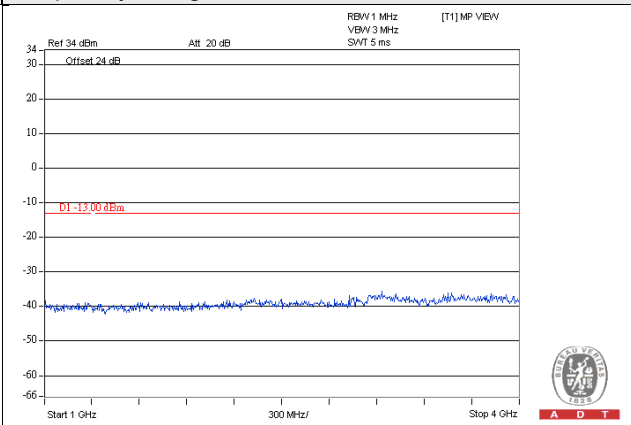
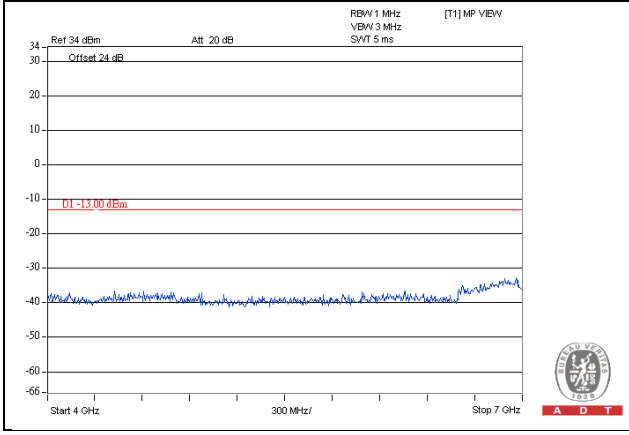
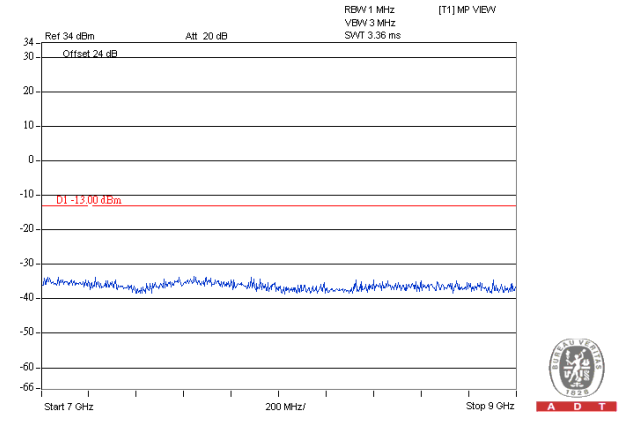
GPRS	
Channel 189	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

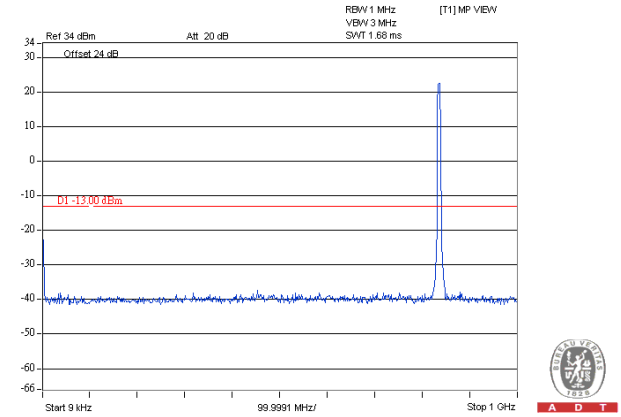
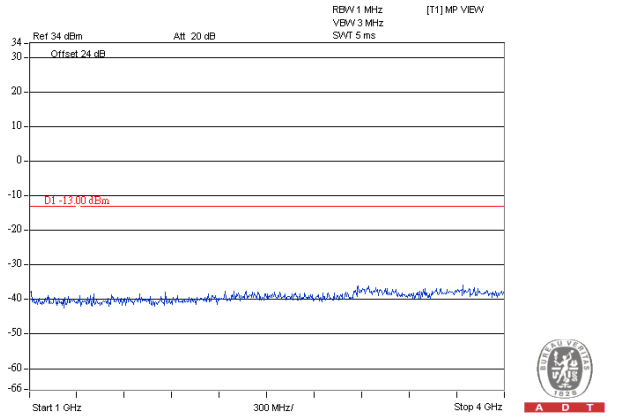
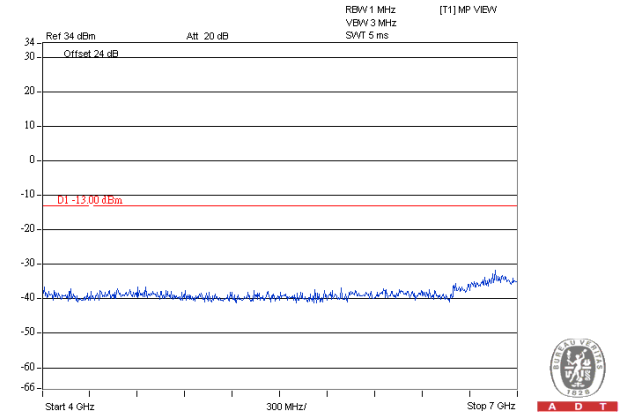
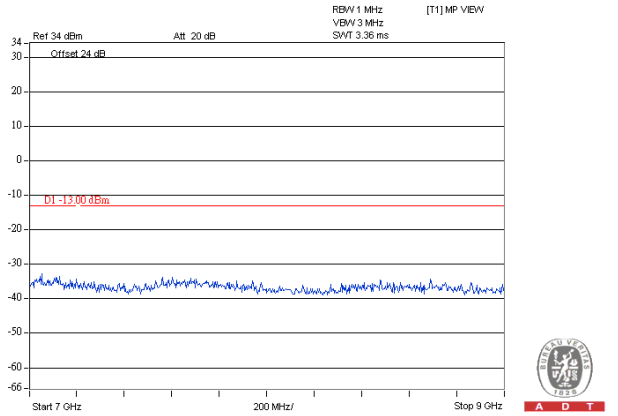
GPRS	
Channel 251	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

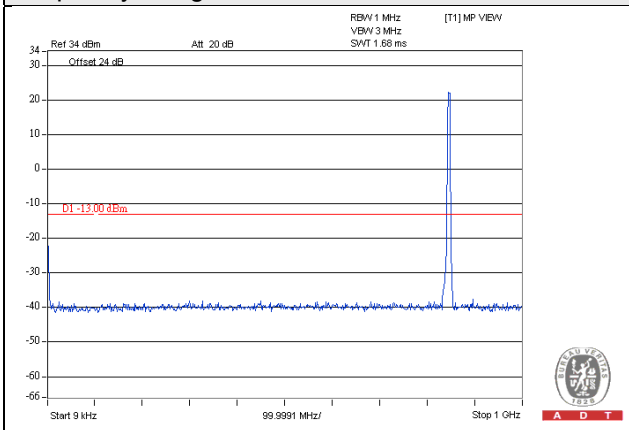
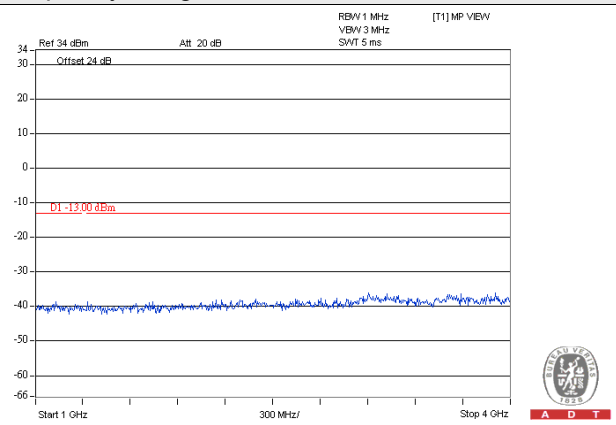
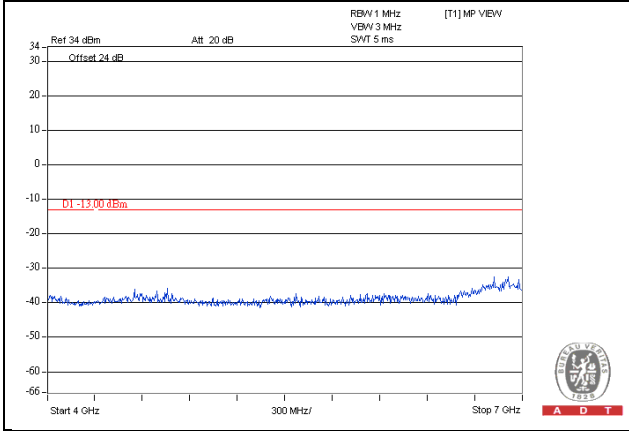
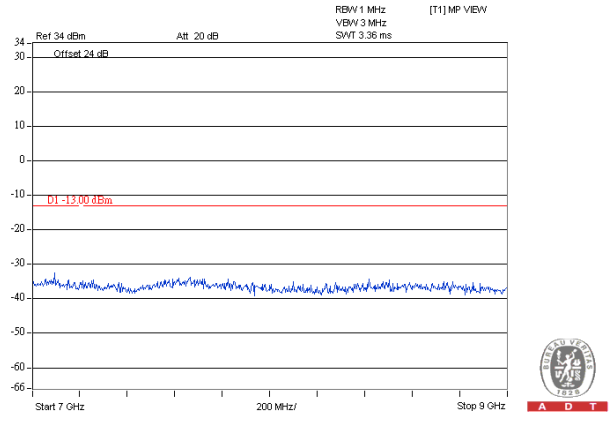
EDGE	
Channel 128	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

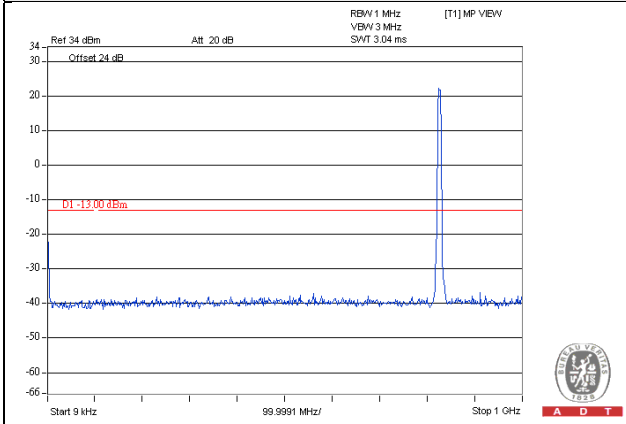
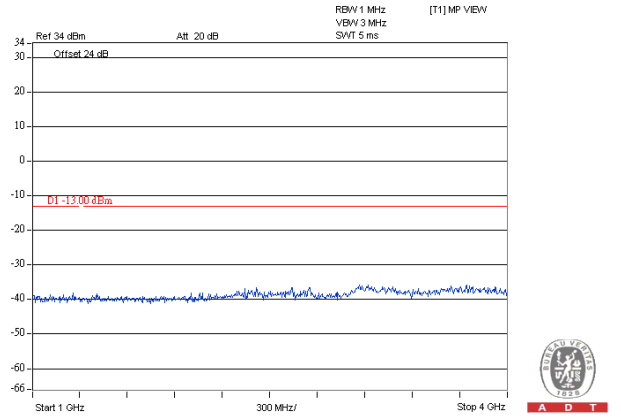
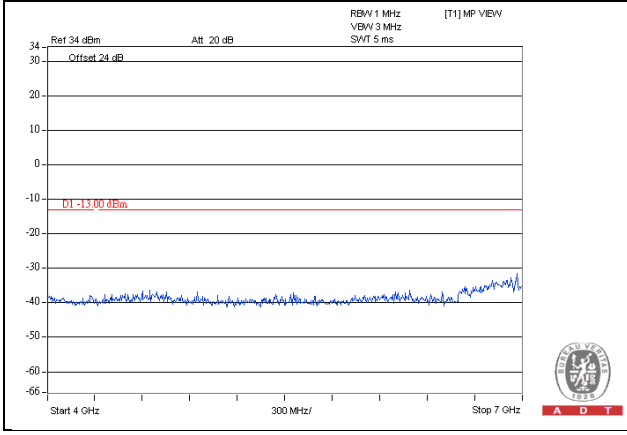
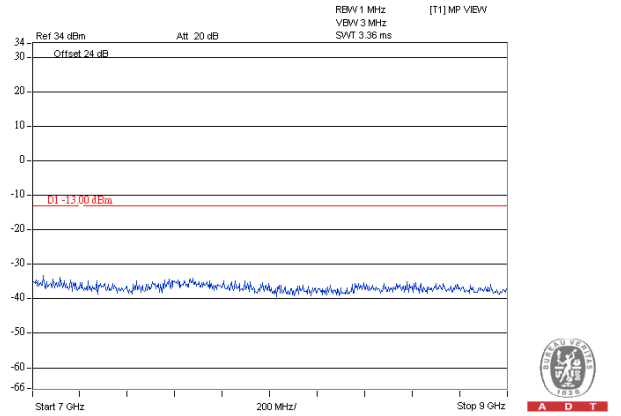
EDGE	
Channel 189	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

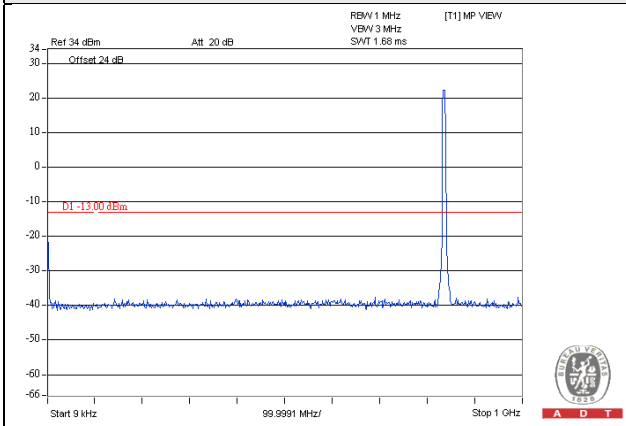
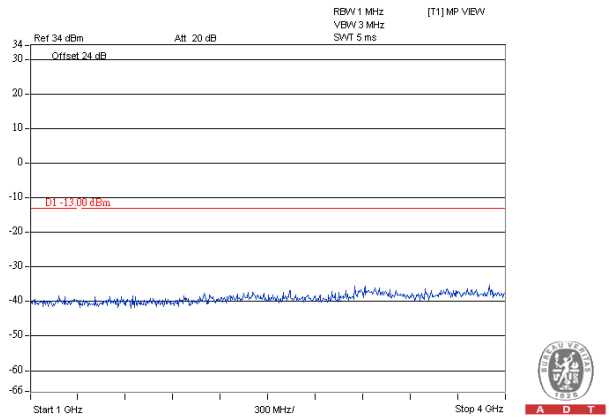
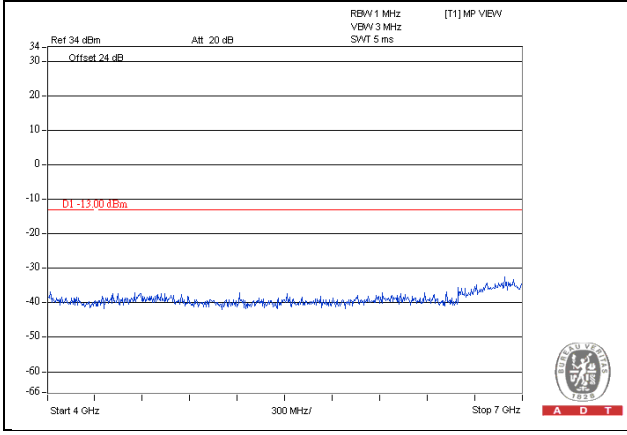
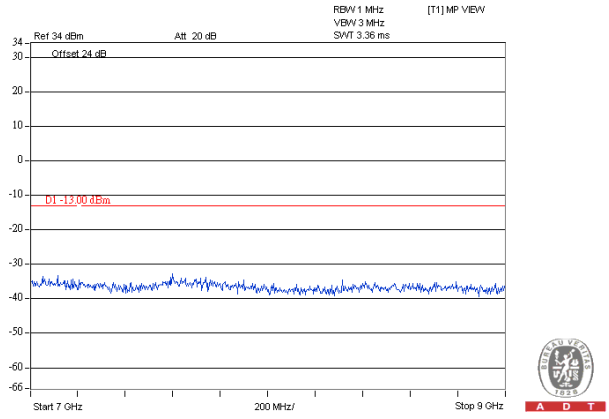
EDGE	
Channel 251	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

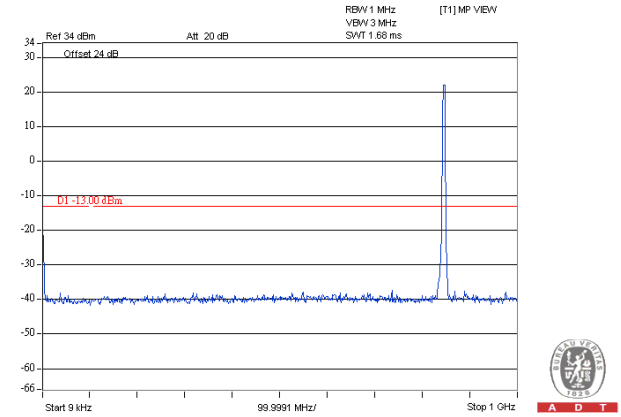
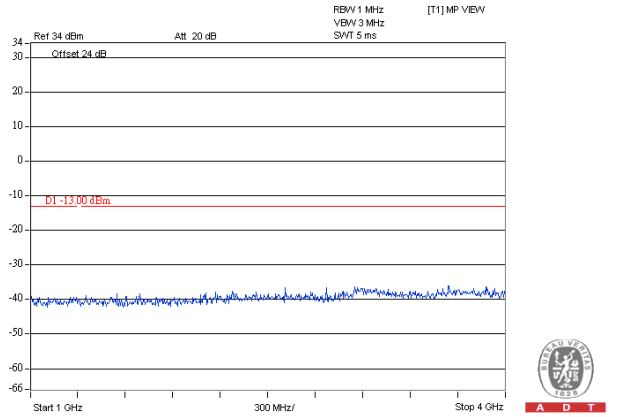
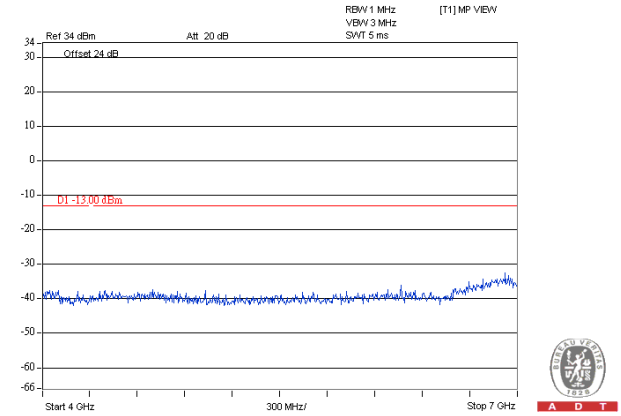
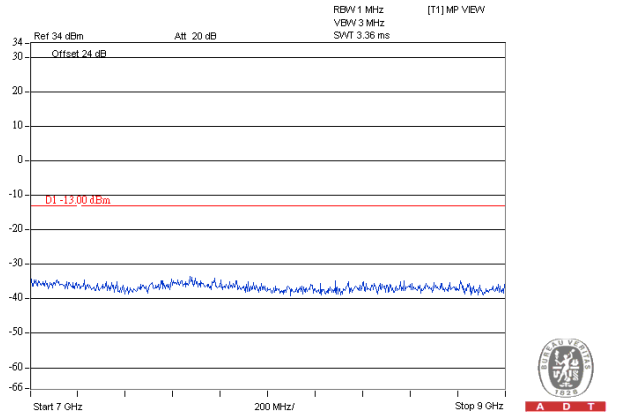
WCDMA	
Channel 4132	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

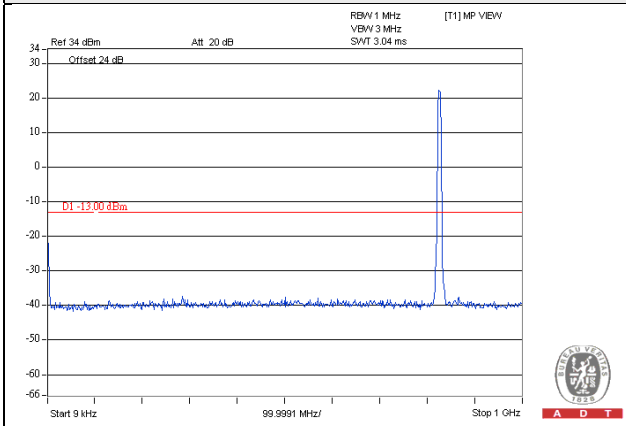
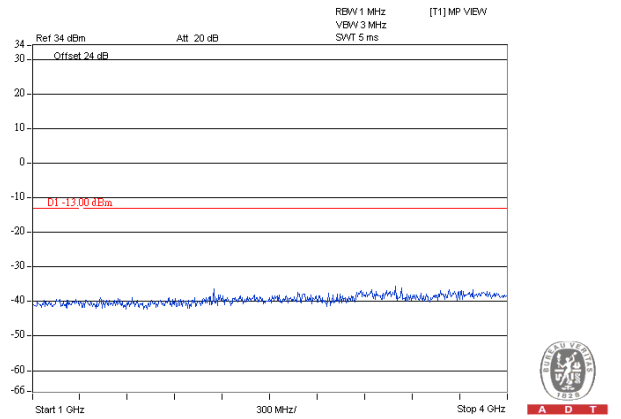
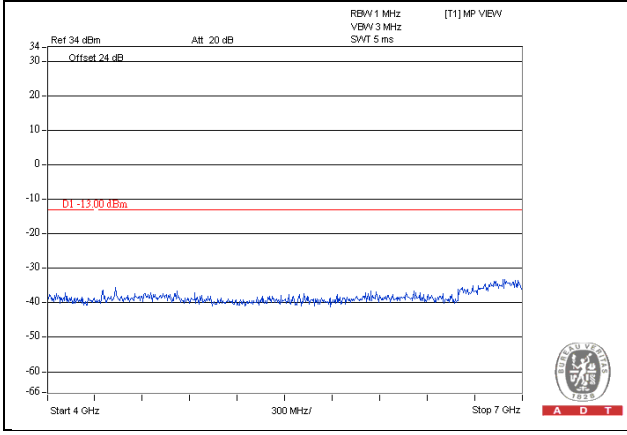
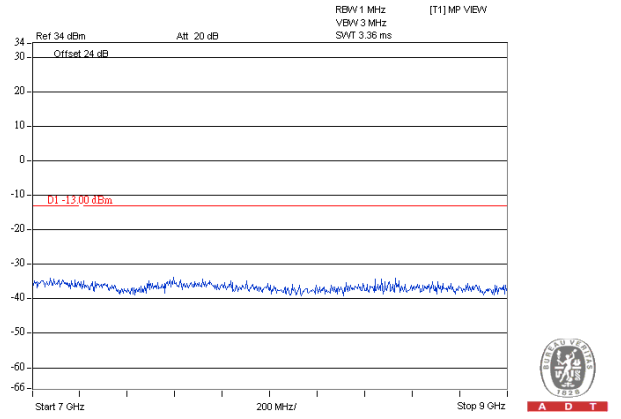
WCDMA	
Channel 4182	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

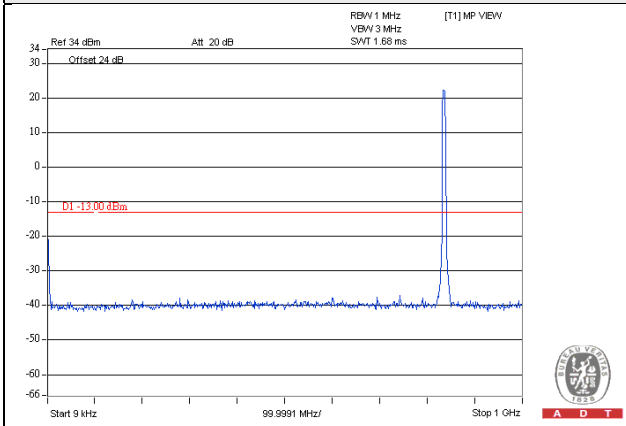
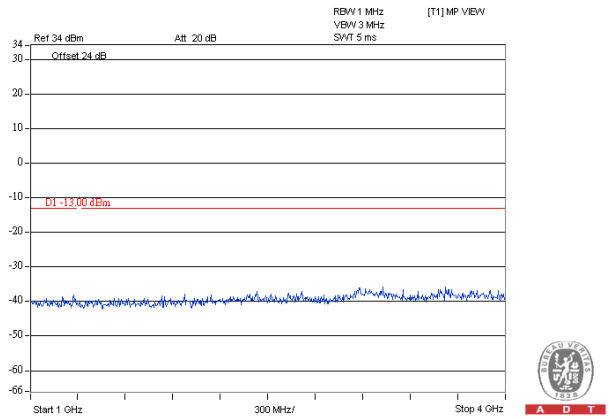
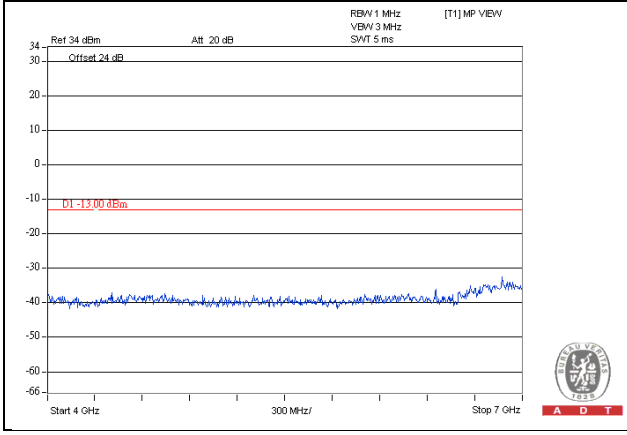
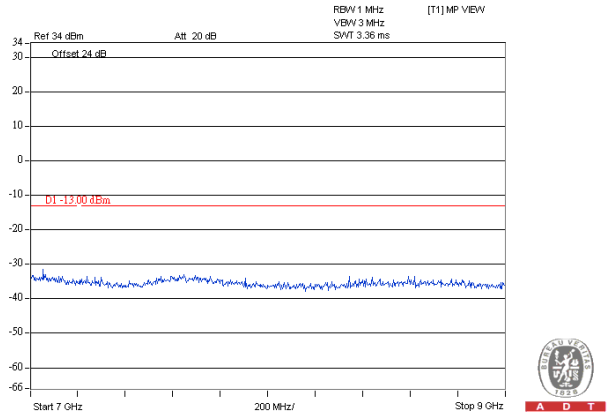
WCDMA	
Channel 4233	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

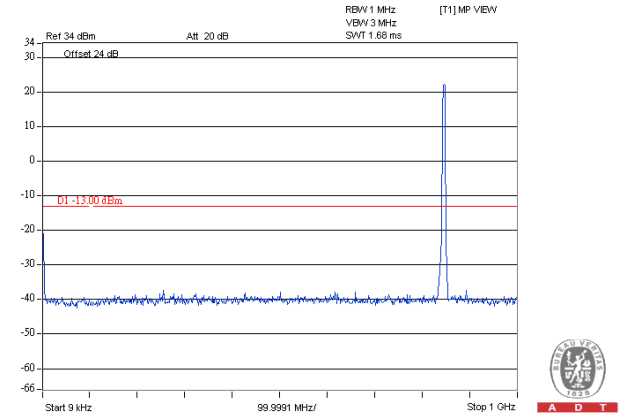
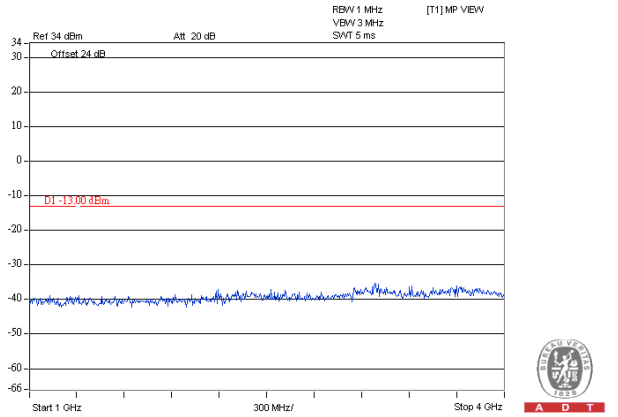
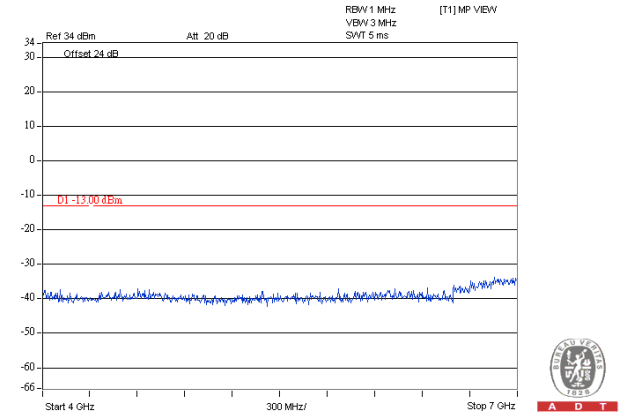
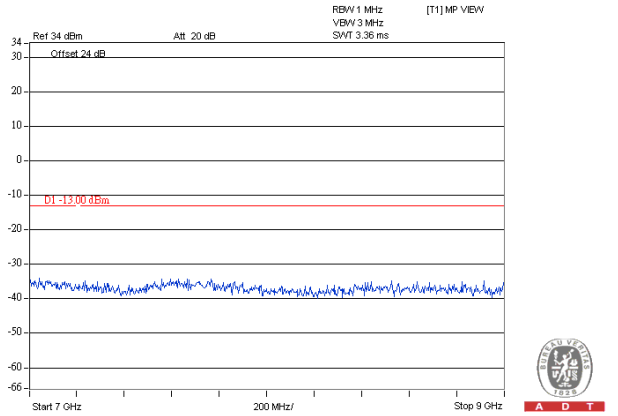
HSDPA	
Channel 4132	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

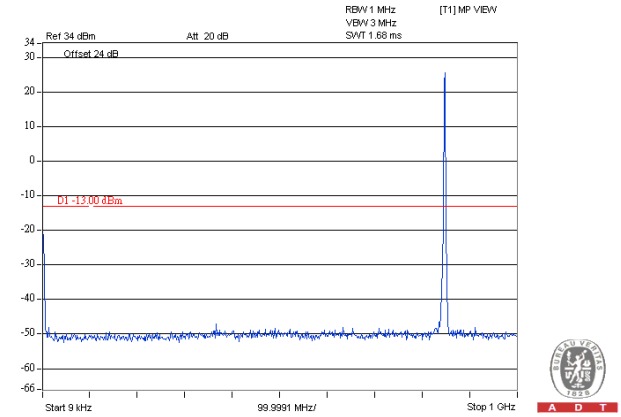
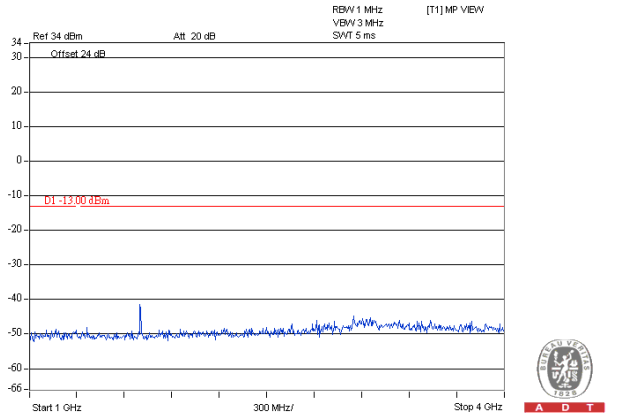
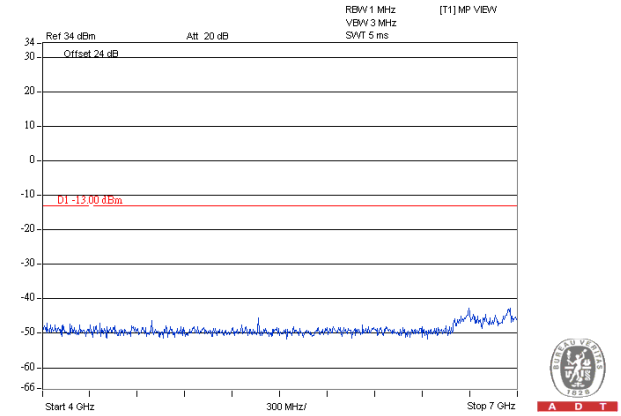
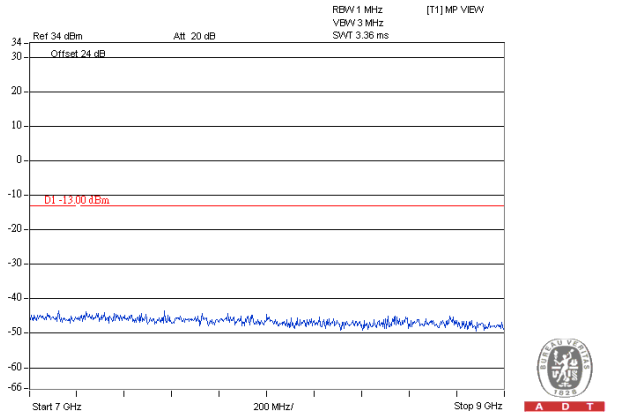
HSDPA	
Channel 4182	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

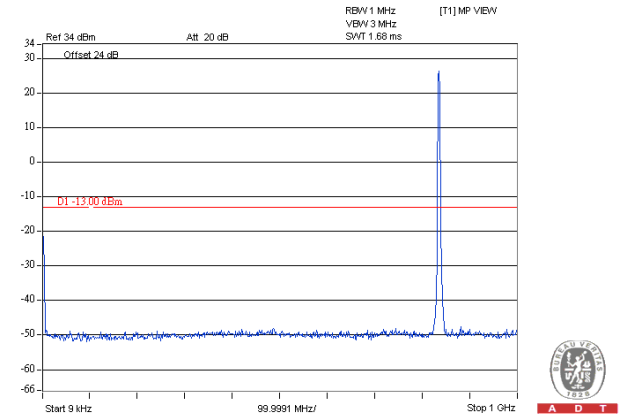
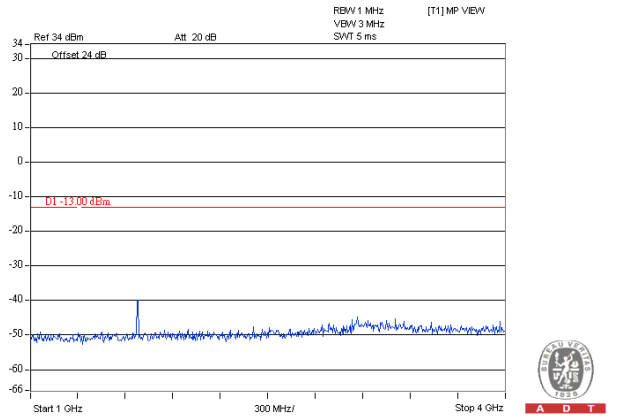
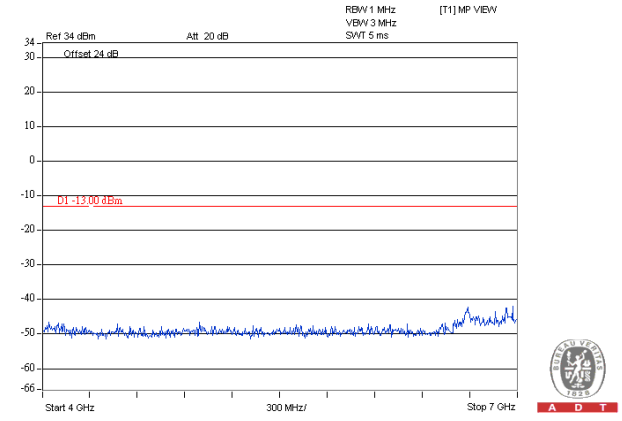
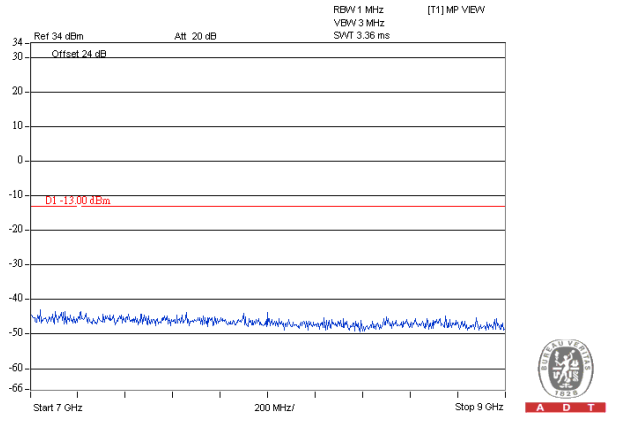
HSDPA	
Channel 4233	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

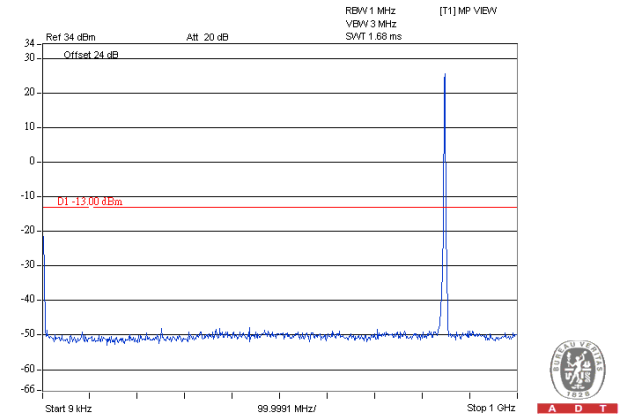
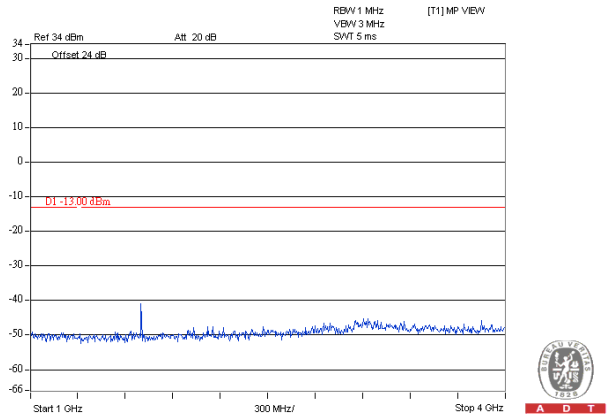
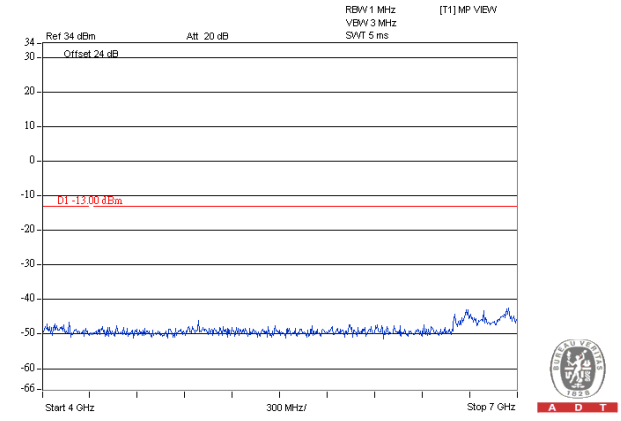
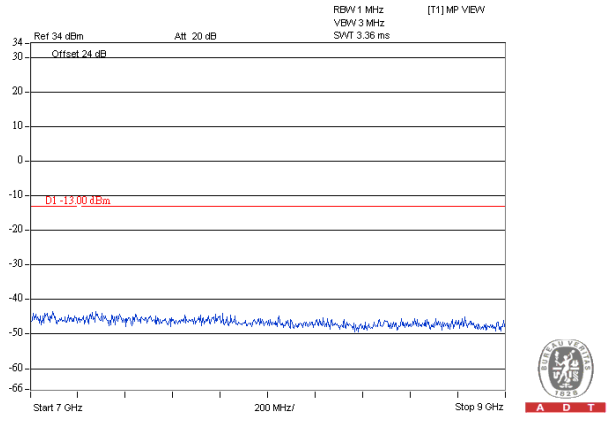
HSUPA	
Channel 4132	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

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
	

CDMA	
Channel 1013	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

CDMA	
Channel 384	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

CDMA	
Channel 777	
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 Procedure

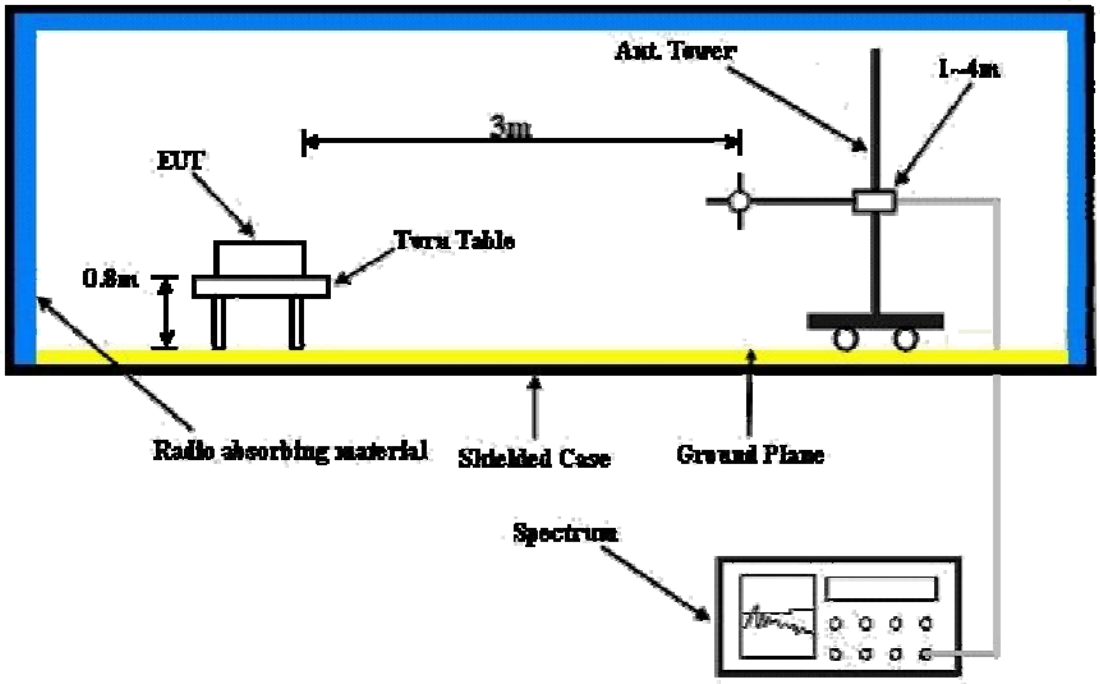
a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
c. 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

Below 1GHz

GPRS Mode

Mode	TX channel 128	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.38	-47.5	-55.1	-1.0	-56.1	-13.0	-43.1
2	224.00	-53.9	-69.7	5.4	-64.3	-13.0	-51.3
3	317.12	-55.2	-66.8	5.2	-61.6	-13.0	-48.6
4	650.80	-54.9	-60.6	4.8	-55.8	-13.0	-42.8
5	786.60	-60.9	-62.0	4.2	-57.8	-13.0	-44.8
6	935.98	-63.0	-62.0	3.9	-58.1	-13.0	-45.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.38	-50.1	-55.3	-1.0	-56.3	-13.0	-43.3
2	130.88	-50.4	-57.7	-0.1	-57.8	-13.0	-44.8
3	241.46	-55.9	-63.8	5.5	-58.3	-13.0	-45.3
4	363.68	-52.4	-61.1	5.2	-55.9	-13.0	-42.9
5	681.84	-60.1	-62.3	5.1	-57.2	-13.0	-44.2
6	935.98	-63.6	-61.0	3.9	-57.1	-13.0	-44.1

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

EDGE Mode

Mode	TX channel 128	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	224.00	-53.9	-69.7	5.4	-64.3	-13.0	-51.3
2	334.58	-56.5	-67.3	5.2	-62.1	-13.0	-49.1
3	586.78	-64.9	-71.4	4.5	-66.9	-13.0	-53.9
4	650.80	-54.9	-60.6	4.8	-55.8	-13.0	-42.8
5	786.60	-60.9	-62.0	4.2	-57.8	-13.0	-44.8
6	860.32	-65.5	-65.7	3.9	-61.8	-13.0	-48.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.38	-50.1	-55.3	-1.0	-56.3	-13.0	-43.3
2	241.46	-55.9	-63.8	5.5	-58.3	-13.0	-45.3
3	390.84	-62.9	-71.2	5.2	-66.0	-13.0	-53.0
4	681.84	-60.1	-62.3	5.1	-57.2	-13.0	-44.2
5	833.16	-66.4	-66.2	4.0	-62.2	-13.0	-49.2
6	935.98	-63.6	-61.0	3.9	-57.1	-13.0	-44.1

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

WCDMA Mode

Mode	TX channel 4132	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	80.44	-48.8	-55.3	-1.6	-56.9	-13.0	-43.9
2	134.76	-51.8	-60.2	-0.3	-60.5	-13.0	-47.5
3	317.12	-55.7	-67.3	5.2	-62.1	-13.0	-49.1
4	654.68	-55.9	-61.4	4.9	-56.5	-13.0	-43.5
5	778.84	-62.1	-63.3	4.2	-59.1	-13.0	-46.1
6	935.98	-65.5	-64.6	3.9	-60.7	-13.0	-47.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	80.44	-53.2	-57.4	-1.6	-59.0	-13.0	-46.0
2	130.88	-52.9	-60.1	-0.1	-60.2	-13.0	-47.2
3	241.46	-58.2	-66.1	5.5	-60.6	-13.0	-47.6
4	274.44	-62.5	-67.3	5.3	-62.0	-13.0	-49.0
5	654.68	-60.8	-63.1	4.9	-58.2	-13.0	-45.2
6	778.84	-64.3	-64.3	4.2	-60.1	-13.0	-47.1

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

CDMA Mode

Mode	TX channel 1013	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	80.44	-48.5	-54.9	-1.6	-56.5	-13.0	-43.5
2	125.06	-54.5	-63.8	0.0	-63.8	-13.0	-50.8
3	317.12	-56.2	-67.8	5.2	-62.6	-13.0	-49.6
4	654.68	-55.9	-61.4	4.9	-56.5	-13.0	-43.5
5	780.78	-61.8	-62.9	4.2	-58.7	-13.0	-45.7
6	972.84	-67.5	-66.0	3.9	-62.1	-13.0	-49.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.38	-52.6	-57.8	-1.0	-58.8	-13.0	-45.8
2	130.88	-52.5	-59.8	-0.1	-59.9	-13.0	-46.9
3	258.92	-60.2	-66.5	5.3	-61.2	-13.0	-48.2
4	392.78	-59.2	-67.4	5.2	-62.2	-13.0	-49.2
5	683.78	-61.4	-63.8	5.1	-58.7	-13.0	-45.7
6	774.96	-63.9	-64.0	4.3	-59.7	-13.0	-46.7

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

Above 1GHz

GPRS Mode

Mode	TX channel 128	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
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	-36.4	-39.6	5.5	-34.1	-13.0	-21.1
2	2472.60	-44.0	-44.1	6.5	-37.6	-13.0	-24.6
3	3296.80	-55.0	-53.2	6.9	-46.3	-13.0	-33.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1648.40	-32.6	-33.8	5.5	-28.3	-13.0	-15.3
2	2472.60	-42.6	-40.3	6.5	-33.8	-13.0	-20.8
3	3296.80	-54.0	-50.5	6.9	-43.6	-13.0	-30.6

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

Mode	TX channel 189	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
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	-34.7	-37.7	5.5	-32.2	-13.0	-19.2
2	2509.20	-36.4	-36.0	6.4	-29.6	-13.0	-16.6
3	3345.60	-55.0	-53.1	6.9	-46.2	-13.0	-33.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1672.80	-30.2	-31.0	5.5	-25.5	-13.0	-12.5
2	2509.20	-38.8	-36.1	6.4	-29.7	-13.0	-16.7
3	3345.60	-54.6	-50.6	6.9	-43.7	-13.0	-30.7

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

Mode	TX channel 251	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
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	-41.5	-44.3	5.6	-38.7	-13.0	-25.7
2	2546.40	-35.0	-34.5	6.4	-28.1	-13.0	-15.1
3	3395.20	-55.0	-53.3	7.0	-46.3	-13.0	-33.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1697.60	-29.9	-30.5	5.6	-24.9	-13.0	-11.9
2	2546.40	-33.5	-30.9	6.4	-24.5	-13.0	-11.5
3	3395.20	-53.0	-48.8	7.0	-41.8	-13.0	-28.8

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

EDGE Mode

Mode	TX channel 128	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
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	-34.4	-37.6	5.5	-32.1	-13.0	-19.1
2	2472.60	-42.0	-42.1	6.5	-35.6	-13.0	-22.6
3	3296.80	-53.0	-51.2	6.9	-44.3	-13.0	-31.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1648.40	-30.6	-31.8	5.5	-26.3	-13.0	-13.3
2	2472.60	-40.6	-38.3	6.5	-31.8	-13.0	-18.8
3	3296.80	-52.0	-48.5	6.9	-41.6	-13.0	-28.6

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

Mode	TX channel 189	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
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	-32.6	-35.7	5.5	-30.2	-13.0	-17.2
2	2509.20	-34.4	-34.0	6.4	-27.6	-13.0	-14.6
3	3345.60	-53.0	-51.1	6.9	-44.2	-13.0	-31.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1672.80	-32.2	-33.0	5.5	-27.5	-13.0	-14.5
2	2509.20	-36.8	-34.1	6.4	-27.7	-13.0	-14.7
3	3345.60	-52.6	-48.6	6.9	-41.7	-13.0	-28.7

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

Mode	TX channel 251	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
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	-39.5	-42.3	5.6	-36.7	-13.0	-23.7
2	2546.40	-33.0	-32.5	6.4	-26.1	-13.0	-13.1
3	3395.20	-53.0	-51.3	7.0	-44.3	-13.0	-31.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1697.60	-27.9	-28.5	5.6	-22.9	-13.0	-9.9
2	**2546.40**	**-31.5**	**-28.9**	**6.4**	**-22.5**	**-13.0**	**-9.5**
3	3395.20	-51.0	-46.8	7.0	-39.8	-13.0	-26.8

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

WCDMA Mode

Mode	TX channel 4132	Frequency Range	Above 1000MHz
Environmental Conditions	24deg. C, 64%RH	Input Power	120Vac, 60 Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1652.80	-43.0	-46.3	5.5	-40.8	-13.0	-27.8
2	2479.20	-53.0	-53.0	6.5	-46.5	-13.0	-33.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1652.80	-39.5	-40.6	5.5	-35.1	-13.0	-22.1
2	2479.20	-54.0	-51.6	6.5	-45.1	-13.0	-32.1

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

Mode	TX channel 4182	Frequency Range	Above 1000MHz
Environmental Conditions	24deg. C, 64%RH	Input Power	120Vac, 60 Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1672.80	-42.7	-45.7	5.5	-40.2	-13.0	-27.2
2	2509.20	-52.8	-52.4	6.4	-46.0	-13.0	-33.0
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	-38.5	-39.3	5.5	-33.8	-13.0	-20.8
2	2509.20	-53.9	-51.3	6.4	-44.9	-13.0	-31.9

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

Mode	TX channel 4233	Frequency Range	Above 1000MHz
Environmental Conditions	24deg. C, 64%RH	Input Power	120Vac, 60 Hz
Tested By	Alan Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.20	-42.0	-44.9	5.6	-39.3	-13.0	-26.3
2	2539.80	-52.6	-52.1	6.4	-45.7	-13.0	-32.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.20	-38.5	-39.1	5.6	-33.5	-13.0	-20.5
2	2539.80	-53.8	-51.2	6.4	-44.8	-13.0	-31.8

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

CDMA Mode

Mode	TX channel 1013	Frequency Range	Above 1000MHz
Environmental Conditions	24deg. C, 64%RH	Input Power	120Vac, 60Hz
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	1649.40	-50.8	-51.0	5.5	-45.5	-13.0	-32.5
2	2474.10	-54.2	-55.5	6.5	-49.0	-13.0	-36.0
3	3298.80	-63.5	-65.1	6.9	-58.2	-13.0	-45.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1649.40	-52.8	-49.9	5.5	-44.4	-13.0	-31.4
2	2474.10	-55.8	-53.9	6.5	-47.4	-13.0	-34.4
3	3298.80	-61.0	-59.5	6.9	-52.6	-13.0	-39.6

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

Mode	TX channel 384	Frequency Range	Above 1000MHz
Environmental Conditions	24deg. C, 64%RH	Input Power	120Vac, 60Hz
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	1673.04	-50.8	-51.0	5.5	-45.5	-13.0	-32.5
2	2509.56	-54.5	-55.6	6.4	-49.2	-13.0	-36.2
3	3346.08	-63.2	-64.9	6.9	-58.0	-13.0	-45.0
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	1673.04	-53.0	-50.0	5.5	-44.5	-13.0	-31.5
2	2509.56	-56.0	-53.9	6.4	-47.5	-13.0	-34.5
3	3346.08	-61.2	-59.6	6.9	-52.7	-13.0	-39.7

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

Mode	TX channel 777	Frequency Range	Above 1000MHz
Environmental Conditions	24deg. C, 64%RH	Input Power	120Vac, 60Hz
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	1696.62	-51.0	-51.3	5.6	-45.7	-13.0	-32.7
2	2544.93	-54.4	-55.5	6.4	-49.1	-13.0	-36.1
3	3393.24	-63.5	-65.3	7.0	-58.3	-13.0	-45.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.62	-52.7	-49.8	5.6	-44.2	-13.0	-31.2
2	2544.93	-55.7	-53.6	6.4	-47.2	-13.0	-34.2
3	3393.24	-60.8	-59.4	7.0	-52.4	-13.0	-39.4

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

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

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

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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