



FCC TEST REPORT (PART 22)

REPORT NO.: RF110617D07-3

MODEL NO.: PCG-4121DL, PCG-4121EL

FCC ID: AK8PCG4121DL

RECEIVED: Jun. 17, 2011

TESTED: Jul. 13 ~ Jul. 17, 2011

ISSUED: Jul. 20, 2011

APPLICANT: Sony Corporation

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Jul. 20, 2011



1 CERTIFICATION

PRODUCT: Personal Computer

Model No.: PCG-4121DL, PCG-4121EL

BRAND: SONY

APPLICANT: Sony Corporation

TEST SAMPLE: ENGINEERING SAMPLE

TESTED: Jul. 13 ~ Jul. 17, 2011

STANDARDS: FCC Part 22, Subpart H
ANSI C63.4-2003

The above equipment (model: PCG-4121DL) 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 : Andrea Hsia , DATE : Jul. 20, 2011
Andrea Hsia / Specialist

APPROVED BY : Gary Chang , DATE : Jul. 20, 2011
Gary Chang / Assistant Manager

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 AND LIMIT	RESULT	REMARK
2.1046 22.913 (a)	Maximum Peak Output Power Limit: max. 7 watts e.i.r.p peak power	PASS	Meet the requirement of limit. Minimum passing margin is 29.2dBm at 848.8MHz.
2.1055	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. ± 2.5 ppm	PASS	Meet the requirement of limit.
2.1049 (h)	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 -25.1dB at 1697.6MHz.

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	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 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 $k=2$.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Personal Computer
MODEL NO.	PCG-4121DL, PCG-4121EL
FCC ID	AK8PCG4121DL
NOMINAL VOLTAGE	11.1Vdc (Li-Lon battery) 19.5Vdc (Adapter) 5Vdc (Adapter)
OPERATION TEMPERATURE RANGE	-20°C ~ 60°C
MODULATION TYPE	GMSK, 8PSK (for GPRS, E-GPRS) QPSK, OQPSK, HPSK (for CDMA) BPSK (for WCDMA)
MULTI-SLOTS CLASS	10
WCDMA RELEASE VERSION	99
FREQUENCY RANGE	824.2MHz ~ 848.8MHz (for GPRS, E-GPRS) 824.7MHz ~ 848.31MHz (for CDMA) 826.4MHz ~ 846.6MHz (for WCDMA)
NUMBER OF CHANNEL	124 (for GPRS, E-GPRS) 788 (for CDMA) 102 (for WCDMA)
MAX. ERP POWER	GPRS Mode: 29.2dBm (0.8318Watts) E-GPRS Mode: 23.0dBm (0.1995Watts) CDMA Mode: 22.4dBm (0.1738Watts) WCDMA Mode: 21.0dBm (0.1259Watts)
ANTENNA TYPE	Refer to note as below
MAX. ANTENNA GAIN	Refer to note as below
I/O PORTS	Refer to user's manual
DATA CABLE	NA
ACCESSORY DEVICES	Adapter, Battery

NOTE:

1. All models are electrically identical, which are identical to each other except for the Top cover less of ODD differences only, as the following:

BRAND	MODELNAME	TOPCOVER LESS OF ODD
SONY	PCG-4121DL	Without
SONY	PCG-4121EL	With

**During the test, the model no.: PCG-4121DL was the worst case and only its test data was recorded in this report.

2. The case of EUT has two kinds of material: MG & CFRP. During the test, the MG material case was the worst case and only its test data was recorded in this report.
3. The following antennas are used in this EUT.

Type	Connector	Manufacture	Gain	
			MG material case	CFRP material case
PIFA	Hirose U.FL	ACON	0.23dBi	-0.27dBi



4. The EUT is a Personal Computer. The test data are separated into following test reports:

Function	Test Standard	Reference Report
802.11abgn Mini-PCI Card+ Bluetooth module (Brand: Intel, Model: 62230ANHMW)	802.11a/n (5180~5320MHz, 5500~5700MHz)	FCC Part 15, Subpart E (Section 15.407)
	802.11a/n (For DFS report) (5260~5320MHz, 5500~5700MHz)	
	802.11a/n (5745~5825 MHz)	FCC Part 15, Subpart C (Section 15.247)
	802.11b/g/n Bluetooth	
GSM 850 / CDMA 850 / WCDMA 850 (Brand: Huawei, Model: Gobi3000)	FCC Part 22	RF110617D07-3
PCS 1900 / CDMA 1900 / WCDMA 1900 (Brand: Huawei, Model: Gobi3000)	FCC Part 24	RF110617D07-4

5. The EUT were powered by the following adapters & battery:

Power Source	Brand	Model No.	Spec.
AC adapter 1	NJRC	VGP-AC19V31	AC Input: 100-240V, 1.5A, 50-60Hz DC Output: 19.5V, 4.7A Non-shielded AC 2Pin (0.8m) Non-shielded DC (1.8m)
AC adapter 2	NJRC	VGP-AC19V32	AC Input: 100-240V, 1.5A, 50-60Hz DC Output: 19.5V, 4.7A Non-shielded AC 3Pin (0.8m) Non-shielded DC (1.8m)
AC adapter 3	Liteon	VGP-AC19V36	AC Input: 100-240V, 1.5A, 50/60Hz DC Output: 19.5V, 4.7A Non-shielded AC 3Pin (0.8m) Non-shielded DC (1.8m)
AC adapter 4	Delta	VGP-AC19V42	AC Input: 100-240V, 1.5A 50-60Hz DC Output: 19.5V, 4.7A Non-shielded AC 3Pin (0.8m) Non-shielded DC (1.8m)
AC adapter 5	Delta	VGP-AC19V51	AC Input: 100-240V, 1.5A, 50/60Hz DC Output 1: 19.5Vdc 4.7A DC Output 2: 5Vdc 1.5A DC Output 3: 5Vdc 1.5A Non-shielded AC 3Pin (0.8m) Non-shielded DC (1.8m)
Battery	Sony	VGP-BPS24	11.1V, 4400mAh

6. The communicated functions of EUT listed as below:

		GSM (850&1900MHz)	CDMA (850&1900MHz)	WCDMA (850&1900MHz)	With 802.11a/b/g/n + Bluetooth + GPS functions
2G	GPRS	√			
	EDGE	√			
3G	CDMA		√		
	1*EVDO		√		
	WCDMA			√	
	Release 5 HSDPA			√	
	Release 6 HSUPA			√	



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7. The EUT has no voice function.
8. Hardware version: P4.
9. Software version: D3200-STSUVN-1576 (for CDMA)
D3200-STSUGN-1575 (for GPRS & WCDMA)
- 10.IMEI Code: 867548000021394
- 11.The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

FOR GPRS & E-GPRS:

124 channels are provided to this EUT. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
LOW	128	824.2 MHz	GPRS, E-GPRS
MIDDLE	190	836.6 MHz	GPRS, E-GPRS
HIGH	251	848.8 MHz	GPRS, E-GPRS

NOTE:

1. Below 1 GHz, the channel 128, 190, and 251 were pre-tested in chamber. The channel 251 was chosen for final test.
2. Above 1 GHz, the channel 128, 190, and 251 were tested individually.
3. The worst case for final test is chosen when the power control level set 5.
4. The channel space is 0.2MHz.
5. The EUT is a GPRS class 10 device (Multislot class: 10, Mobile Terminal B), which provide 2 up-link. After pre-tested both functions, found up-link with 1 time slot is worse, therefore, test results of output power, frequency stability, occupied bandwidth and band edge tests came out from this.
6. The EUT is an E-GPRS class 10 device (Multislot class: 10, Mobile Terminal B), which provide 2 up-link. After pre-tested both functions, found up-link with 1 time slot is worse, therefore, test results of output power, frequency stability, occupied bandwidth and band edge tests came out from this.
7. After pretest of output power and spurious emission under GPRS & E-GPRS mode, find the worst mode is GPRS. Therefore, select GPRS mode to do final test

FOR CDMA:

788 channels are provided to this EUT in the CDMA850 band. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
LOW	1013	824.70 MHz	SO55
MIDDLE	384	836.52 MHz	SO55
HIGH	777	848.31 MHz	SO55

NOTE:

1. Below 1 GHz, the channel 1013, 384 and 777 were pre-tested in chamber. The channel 777 was the worst case and chosen for final test.
2. Above 1 GHz, the channel 1013, 384 and 777 were tested individually.
3. The channel space is 0.03MHz.
4. After pretest of output power and spurious emission under 1xEVDO, CDMA2000(SO32), CDMA2000(SO2) & CDMA2000(SO55) mode, find the worst mode is CDMA2000(SO55). Therefore, select CDMA2000(SO55) mode to do final test

FOR WCDMA:

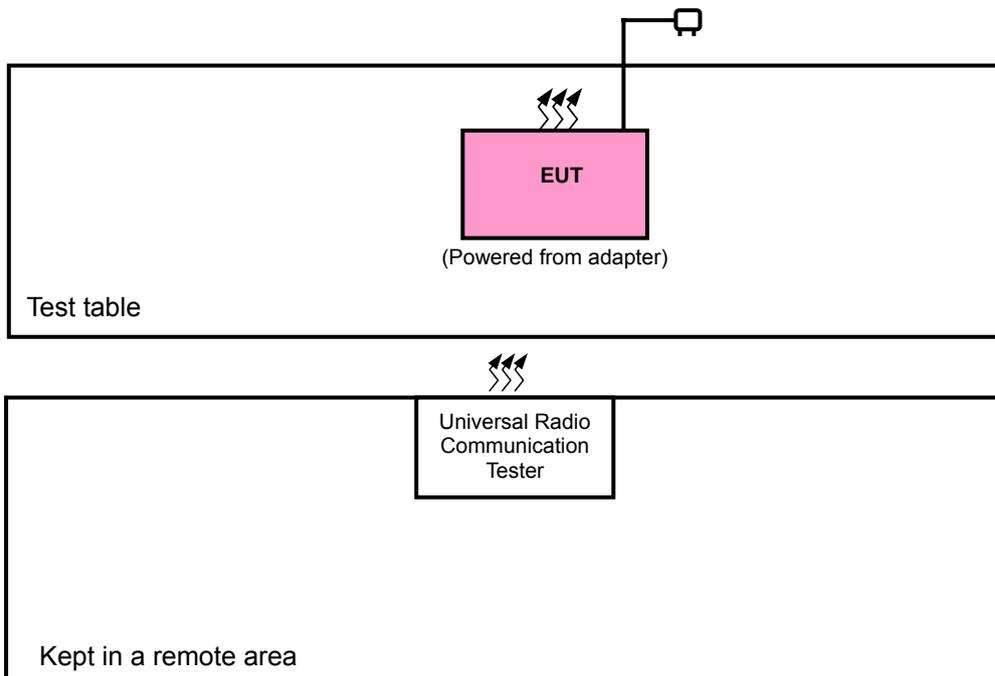
102 channels are provided to this EUT. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
LOW	4132	826.4 MHz	WCDMA, HSDPA, HSUPA
MIDDLE	4182	836.4 MHz	WCDMA, HSDPA, HSUPA
HIGH	4233	846.6 MHz	WCDMA, HSDPA, HSUPA

NOTE:

1. Below 1 GHz, the channel 4132, 4182 and 4233 were pre-tested in chamber. The channel 4233 was chosen for final test.
2. Above 1 GHz, the channel 4132, 4182 and 4233 were tested individually.
3. The channel space is 0.2MHz.
5. After pretest of output power and spurious emission under WCDMA-RMC & HSDPA mode, find the worst mode is WCDMA-RMC. Therefore, select WCDMA-RMC mode to do final test

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR GPRS & E-GPRS:

EUT CONFIGURE MODE	APPLICABLE TO							DESCRIPTION
	OP	FS	OB	BE	CE	RE<1G	RE≥1G	
-	√	√	√	√	√	√	√	-

Where **OP**: Output power **FS**: Frequency stability
OB: Occupied bandwidth **BE**: Band edge
CE: Conducted spurious emissions **RE<1G**: Radiated emission below 1GHz
RE≥1G: Radiated emission above 1GHz

NOTE: Speed mode worst enable during the test

OUTPUT POWER MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	128, 190, 251	GPRS, EGPRS

FREQUENCY STABILITY MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	190	GPRS

OCCUPIED BANDWIDTH MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	128, 190, 251	GPRS, EGPRS

BAND EDGE MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	128, 251	GPRS, EGPRS



CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	128, 190, 251	GPRS

RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	251	GPRS

RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
128 to 251	128, 190, 251	GPRS

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
OP	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
FS	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
OB	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
EM	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
BE	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
CE	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
RE < 1G	25deg. C, 65%RH, 991 hPa	120Vac, 60Hz	David Huang
RE ≥ 1G	27deg. C, 65%RH, 991 hPa	120Vac, 60Hz	Mark Liao



FOR CDMA:

EUT CONFIGURE MODE	APPLICABLE TO							DESCRIPTION
	OP	FS	OB	BE	CE	RE<1G	RE≥1G	
-	√	√	√	√	√	√	√	-

Where **OP**: Output power
OB: Occupied bandwidth
CE: Conducted spurious emissions
RE≥1G: Radiated emission above 1GHz
FS: Frequency stability
BE: Band edge
RE<1G: Radiated emission below 1GHz
NOTE: Speed mode worst enable during the test

OUTPUT POWER MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	1013, 384, 777	CDMA

FREQUENCY STABILITY MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	384	CDMA

OCCUPIED BANDWIDTH MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	1013, 384, 777	CDMA

BAND EDGE MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	1013, 777	CDMA



CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	1013, 384, 777	CDMA

RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	777	CDMA

RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
1013 to 777	1013, 384, 777	CDMA

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
OP	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
FS	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
OB	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
EM	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
BE	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
CE	23deg. C, 63%RH	120Vac, 60Hz	Mark Liao
RE < 1G	25deg. C, 65%RH	120Vac, 60Hz	David Huang
RE ≥ 1G	27deg. C, 65%RH	120Vac, 60Hz	Mark Liao



FOR WCDMA:

EUT CONFIGURE MODE	APPLICABLE TO							DESCRIPTION
	OP	FS	OB	BE	CE	RE<1G	RE≥1G	
-	√	√	√	√	√	√	√	-

Where **OP**: Output power **FS**: Frequency stability
OB: Occupied bandwidth **BE**: Band edge
CE: Conducted spurious emissions **RE<1G**: Radiated emission below 1GHz
RE≥1G: Radiated emission above 1GHz

NOTE: Speed mode worst enable during the test

OUTPUT POWER MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4132, 4182, 4233	WCDMA

FREQUENCY STABILITY MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4182	WCDMA

OCCUPIED BANDWIDTH MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4132, 4182, 4233	WCDMA

BAND EDGE MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4132, 4233	WCDMA



CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4132, 4182, 4233	WCDMA

RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4233	WCDMA

RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
4132 to 4233	4132, 4182, 4233	WCDMA

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
OP	23deg. C, 63%RH, 1008 hPa	120Vac, 60Hz	Mark Liao
FS	23deg. C, 63%RH, 1008 hPa	120Vac, 60Hz	Mark Liao
OB	23deg. C, 63%RH, 1008 hPa	120Vac, 60Hz	Mark Liao
EM	23deg. C, 63%RH, 1008 hPa	120Vac, 60Hz	Mark Liao
BE	23deg. C, 63%RH, 1008 hPa	120Vac, 60Hz	Mark Liao
CE	23deg. C, 63%RH, 1008 hPa	120Vac, 60Hz	Mark Liao
RE < 1G	25deg. C, 65%RH, 991 hPa	120Vac, 60Hz	David Huang
RE ≥ 1G	27deg. C, 65%RH, 991 hPa	120Vac, 60Hz	Mark Liao



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI C63.4-2003

ANSI/TIA/EIA-603-C 2004

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

3.4 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	104484	NA
2	NJZ-2000 (GPRS+WCDMA SIMULATOR)	JRC	NJZ-2000	ET00054	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).

NOTE 2: Item 1-2 acted as a communication partners to transfer data.

4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 22.913 (a) that “Mobile / Portable station are limited to 7 watts e.r.p”.



4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Jul. 22, 2010	Jul. 21, 2011
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 13, 2011	Apr. 12, 2012
HORN Antenna SCHWARZBECK	9120D	9120D-405	Feb. 08, 2011	Feb. 07, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295014/4	Sep. 03, 2010	Sep. 02, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	Sep. 03, 2010	Sep. 02, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA

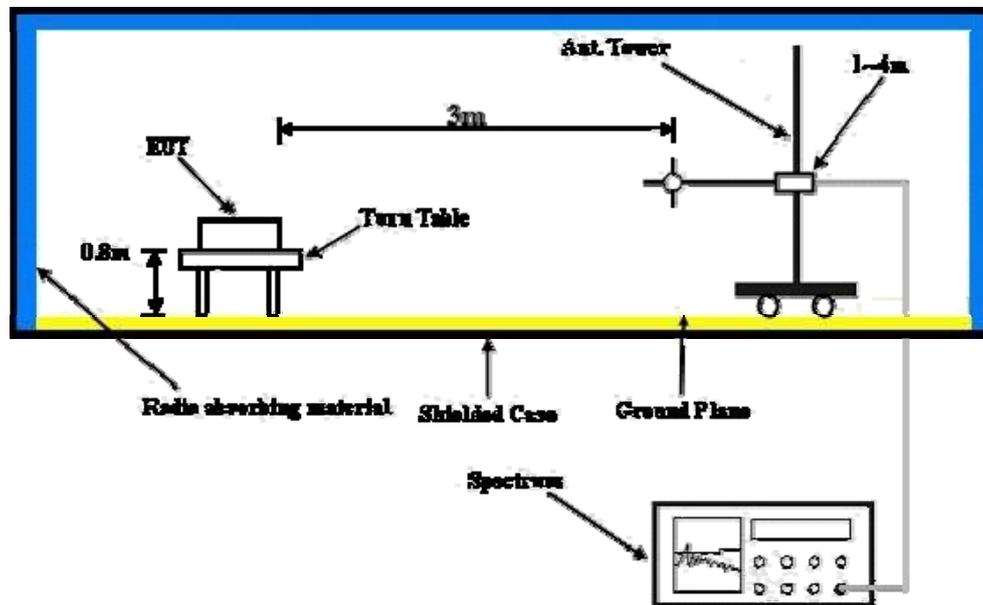
- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

- a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 128, 190 and 251 (GPRS & E-GPRS) / 1013, 384 and 777 (CDMA) / 4132, 4182 and 4233 (WCDMA) (low, middle and high operational frequency range.)
- b. The conducted output power used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. The path loss included the splitter loss, cable loss and 20dB pad loss. The spectrum set RB/VB 1MHz (GPRS & E-GPRS), 3MHz (CDMA) and 5MHz (WCDMA), then read peak power value and record to the test. (All transmitted path loss shall be considered in the test report data.)
- c. 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.
- d. 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 c. Record the power level of S.G
- e. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
- f. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi.}$

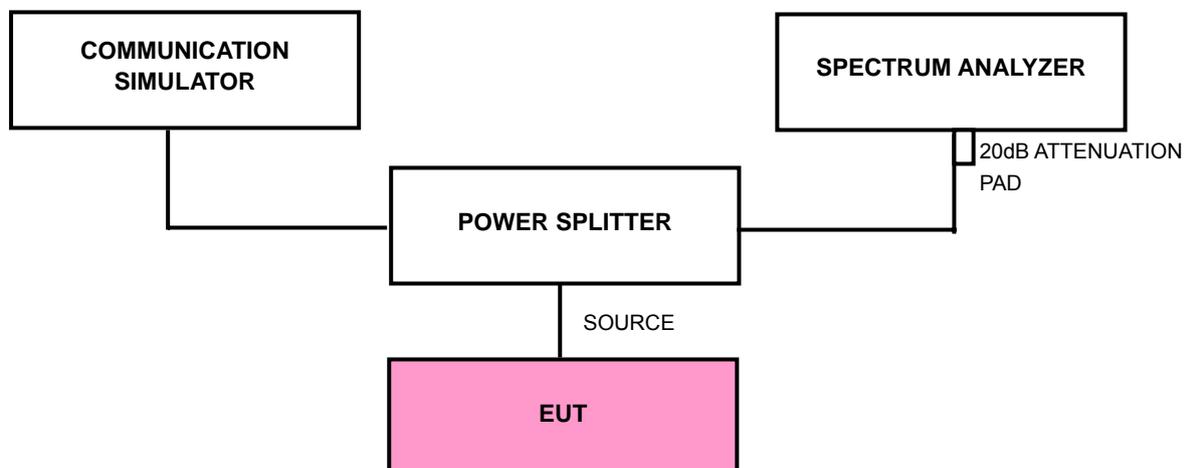
4.1.4 TEST SETUP

EIRP POWER 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 related item – Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITIONS

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



4.1.6 TEST RESULTS

FOR GPRS & E-GPRS:

FOR GPRS MODE (UP-LINK WITH 1 TIME SLOT)

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	7.13	24.50	31.63	1.4555
190	836.6	7.23	24.50	31.73	1.4894
251	848.8	7.60	24.50	32.10	1.6218

FOR E-GPRS MODE (UP-LINK WITH 1 TIME SLOT)

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	1.14	24.50	25.64	0.3664
190	836.6	1.22	24.50	25.72	0.3733
251	848.8	1.71	24.50	26.21	0.4178

- REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB)+ 20dB Pad.



FOR GPRS MODE (UP-LINK WITH 1 TIME SLOT)

ERP POWER					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	37.0	-8.6	28.4	0.6918
190	836.6	37.0	-8.6	28.4	0.6918
251	848.8	37.9	-8.7	29.2	0.8318

FOR E-GPRS MODE (UP-LINK WITH 1 TIME SLOT)

ERP POWER					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	30.7	-8.6	22.1	0.1622
190	836.6	30.6	-8.6	22.0	0.1585
251	848.8	31.7	-8.7	23.0	0.1995

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

FOR CDMA:

WORST CASE CONDUCTED POWER OF 1x EV-DO								
CHANNEL	FREQ. (MHz)	Rev. A	Rev. 0	CORR. FACTOR (dB)	Rev. A		Rev. 0	
					OUTPUT POWER			
		RAW VALUE (dBm)			dBm	Watt	dBm	Watt
1013	824.70	-1.2	-1.1	24.50	23.35	0.2163	23.44	0.2208
384	836.52	-1.3	-1.2	24.50	23.22	0.2099	23.31	0.2143
777	848.31	-1.3	-1.4	24.50	23.20	0.2089	23.12	0.2051

CDMA 2000 CONDUCTED POWER											
CHAN.	FREQ. (MHz)	CDMA 2000	RAW VALUE (dBm)				CORR. FACTOR (dB)	OUTPUT POWER (dBm)			
			RC	SO2	SO55	TDSO SO32 (FCH)		TDSO SO32 (FCH+S CH)	SO2	SO55	TDSO SO32 (FCH)
		1013	824.70	RC1	-1.08	-1.04		-	-	24.50	23.42
RC3	-0.99			-0.96	-1.08	-1.04	24.50	23.51	23.54	23.42	23.46
384	836.52	RC1	-1.31	-1.22	-	-	24.50	23.19	23.28	-	-
		RC3	-1.29	-1.14	-1.25	-1.22	24.50	23.21	23.36	23.25	23.28
777	848.31	RC1	-1.44	-1.35	-	-	24.50	23.06	23.15	-	-
		RC3	-1.35	-1.31	-1.38	-1.36	24.50	23.15	23.19	23.12	23.14

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB)+ 20dB Pad.



1xEV-DO MODE

ERP POWER (1x EV-DO)								
CHANNEL	FREQ. (MHz)	S.G. VALUE (dBm)		CORR. FACTOR (dB)	OUTPUT POWER			
		Rev. A	Rev. 0		Rev. A		Rev. 0	
					dBm	Watt	dBm	Watt
1013	824.70	29.6	29.9	-8.6	21.0	0.1259	21.3	0.1349
384	836.52	29.3	29.4	-8.6	20.7	0.1175	20.8	0.1202
777	848.31	30.2	30.5	-8.7	21.5	0.1413	21.8	0.1514

CDMA MODE

ERP POWER (SO55)					
CHANNEL NO.	FREQUENCY (MHz)	S.G. VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
1013	824.70	30.6	-8.6	22.0	0.1585
384	836.52	30.1	-8.6	21.5	0.1413
777	848.31	31.1	-8.7	22.4	0.1738

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



FOR WCDMA:
WCDMA-RMC MODE

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-0.68	24.50	23.82	0.2410
4182	836.4	-0.74	24.50	23.76	0.2377
4233	846.6	-0.81	24.50	23.69	0.2339

HSDPA MODE-R5 Subtest 1

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.42	24.50	22.08	0.1614
4182	836.4	-2.44	24.50	22.06	0.1607
4233	846.6	-2.47	24.50	22.03	0.1596

HSDPA MODE-R5 Subtest 2

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.45	24.50	22.05	0.1603
4182	836.4	-2.48	24.50	22.02	0.1592
4233	846.6	-2.49	24.50	22.01	0.1589

HSDPA MODE-R5 Subtest 3

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.54	24.50	21.96	0.1570
4182	836.4	-2.66	24.50	21.84	0.1528
4233	846.6	-2.57	24.50	21.93	0.1560

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

**HSDPA MODE-R5 Subtest 4**

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.48	24.50	22.02	0.1592
4182	836.4	-2.48	24.50	22.02	0.1592
4233	846.6	-2.49	24.50	22.01	0.1589

HSUPA MODE-R6 Subtest 1

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-0.84	24.50	23.66	0.2323
4182	836.4	-0.93	24.50	23.57	0.2275
4233	846.6	-0.97	24.50	23.53	0.2254

HSUPA MODE-R6 Subtest 2

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.22	24.50	22.28	0.1690
4182	836.4	-2.32	24.50	22.18	0.1652
4233	846.6	-2.34	24.50	22.16	0.1644

HSUPA MODE-R6 Subtest 3

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.25	24.50	22.25	0.1679
4182	836.4	-2.35	24.50	22.15	0.1641
4233	846.6	-2.44	24.50	22.06	0.1607

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).

2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.



HSUPA MODE-R6 Subtest 4

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-2.12	24.50	22.38	0.1730
4182	836.4	-2.24	24.50	22.26	0.1683
4233	846.6	-2.29	24.50	22.21	0.1663

HSUPA MODE-R6 Subtest 5

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	-0.94	24.50	23.56	0.2270
4182	836.4	-0.99	24.50	23.51	0.2244
4233	846.6	-1.03	24.50	23.47	0.2223

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB)+ 20dB Pad.



WCDMA-RMC MODE

ERP POWER					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	29.5	-8.6	20.9	0.1230
4182	836.4	29.4	-8.6	20.8	0.1202
4233	846.6	29.7	-8.7	21.0	0.1259

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



4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

According to the FCC part 22.863 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The frequency error rate is according to the JTC standard that the frequency error rate shall be accurate to within 2.5ppm of the received frequency from the base station. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 2.1055(a)(1) $-30 \sim 60$.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
Hewlett Packard RF cable	8120-6192	01428251	NA	NA
RF cable	SUCOFLEX 104	257029	Sep. 11, 2010	Sep. 10, 2011
WIT Standard Temperature & Humidity Chamber	MHU-225AU	920842	Jun. 15, 2011	Jun. 14, 2012

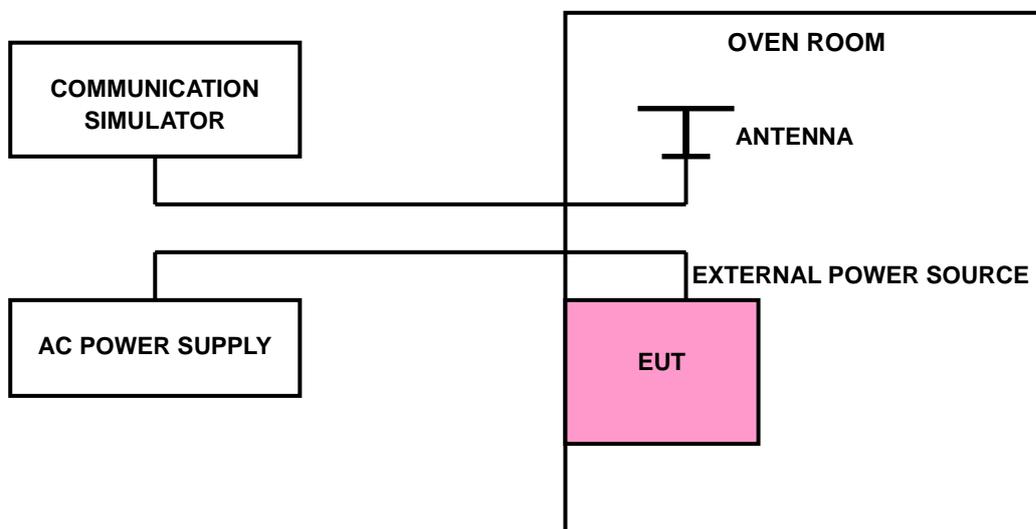
NOTE: The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST PROCEDURE

- a. Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the GPRS / CDMA / WCDMA link mode. This is accomplished with the use of the R&S CMU200 / JRC NJZ-2000 simulator station. The oven room could control the temperatures and humidity. The GPRS link channel is the 190, the CDMA link channel is the 384 and the WCDMA link channel is the 4182.
- b. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- c. EUT is connected the external power supply to control the AC input power. The various Volts from the minimum 93.5 Volts to 126.5 Volts. Each step shall be record the frequency error rate.
- d. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 during the measurement testing.
- e. 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.

4.2.4 TEST SETUP





A D T

4.2.5 TEST RESULTS

FOR GPRS:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
126.5	-8	-0.010	2.5
93.5	-7	-0.008	2.5

NOTE: The applicant defined the normal working voltage of the AC adapter is from 93.5Vac to 126.5Vac.

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. ()	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
60	-8	-0.010	2.5
50	-7	-0.008	2.5
40	-8	-0.010	2.5
30	-8	-0.010	2.5
20	-6	-0.007	2.5
10	-5	-0.006	2.5
0	-8	-0.010	2.5
-10	-7	-0.008	2.5
-20	-9	-0.011	2.5
-30	-8	-0.010	2.5



A D T

FOR CDMA:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
126.5	-6	-0.007	2.5
93.5	-4	-0.005	2.5

NOTE: The applicant defined the normal working voltage of the AC adapter is from 93.5Vac to 126.5Vac.

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. ()	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
60	-7	-0.008	2.5
50	-6	-0.007	2.5
40	-5	-0.006	2.5
30	-6	-0.007	2.5
20	-4	-0.005	2.5
10	-7	-0.008	2.5
0	-8	-0.010	2.5
-10	-6	-0.007	2.5
-20	-5	-0.006	2.5
-30	-9	-0.011	2.5

**FOR WCDMA:**

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
126.5	11	0.013	2.5
93.5	12	0.014	2.5

NOTE: The applicant defined the normal working voltage of the AC adapter is from 93.5Vac to 126.5Vac.

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. ()	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
60	12	0.014	2.5
50	12	0.014	2.5
40	11	0.013	2.5
30	11	0.013	2.5
20	12	0.014	2.5
10	10	0.012	2.5
0	11	0.013	2.5
-10	12	0.014	2.5
-20	11	0.013	2.5
-30	12	0.014	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

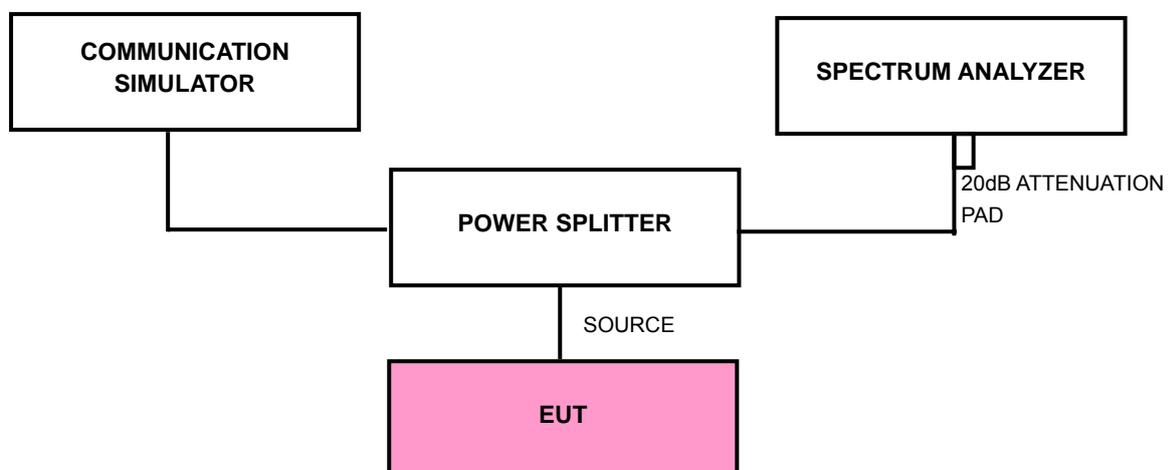
According to FCC 2.1049 (h) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 26, 2011	May 25, 2012
RF cable	SUCOFLEX 104	274403/4	Aug. 20, 2010	Aug. 19, 2011
RF cable	SUCOFLEX 104	250729/4	Aug. 19, 2010	Aug. 18, 2011
RF cable	SUCOFLEX 104	214377/4	Aug. 19, 2010	Aug. 18, 2011
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST SETUP



4.3.4 TEST PROCEDURES

- a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 128, 190 and 251 (GPRS / E-GPRS) / 1013, 384 and 777 (CDMA) / 4132, 4182 and 4233 (WCDMA) (low, middle and high operational frequency range.)
- b. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. 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.

4.3.5 EUT OPERATING CONDITION

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



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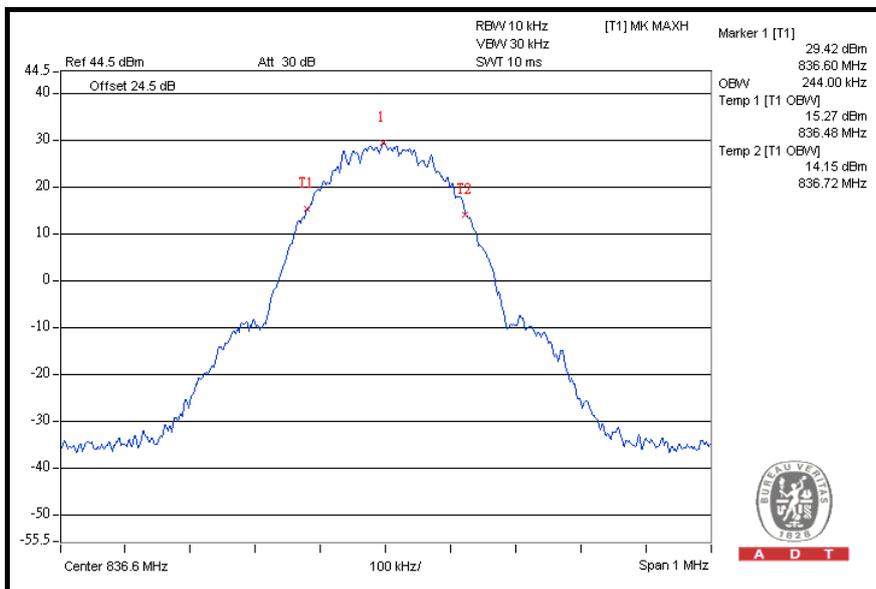
4.3.6 TEST RESULTS

FOR GPRS & E-GPRS:

FOR GPRS MODE (UP-LINK WITH 1 TIME SLOT)

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)
128	824.2	242
190	836.6	244
251	848.8	242

CH 190





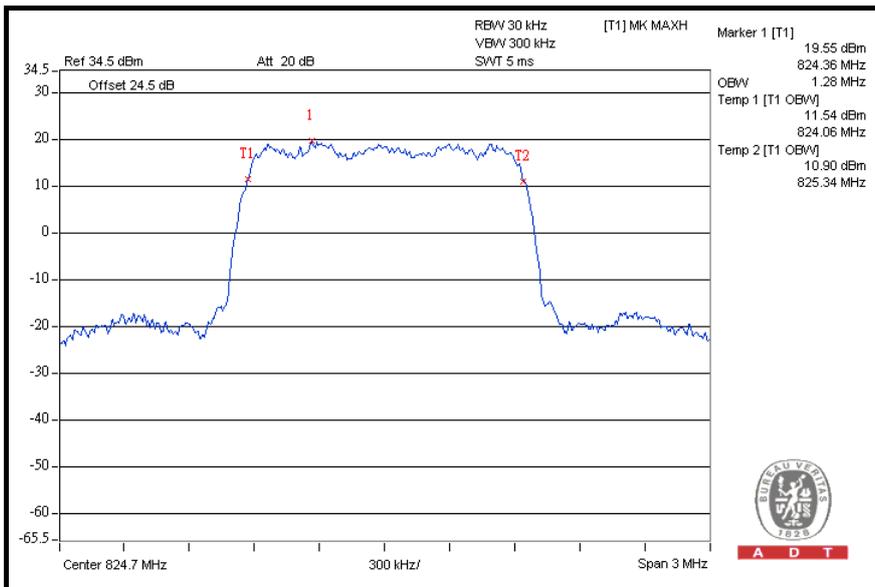
A D T

FOR CDMA

FOR SO55:

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
1013	824.70	1.28
384	836.52	1.27
777	848.31	1.27

CH 1013



A D T

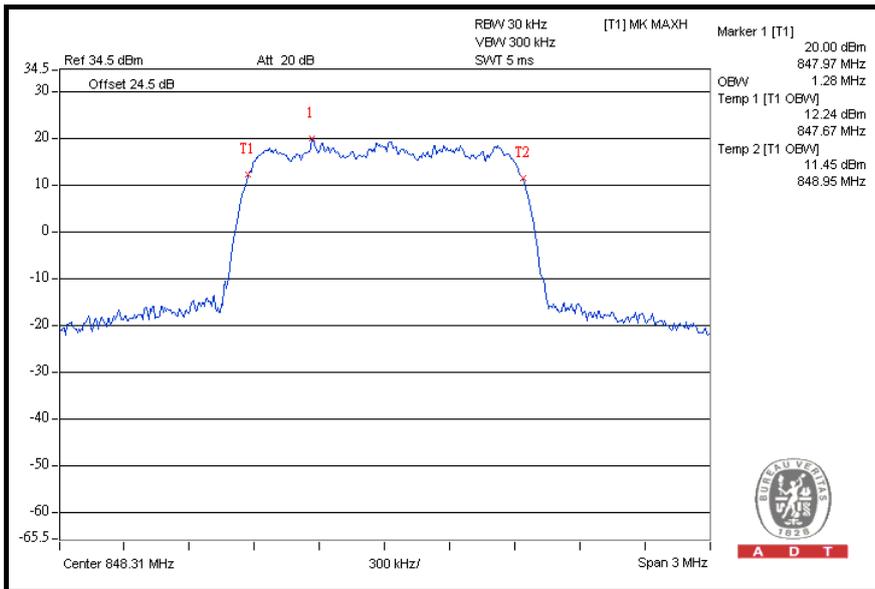


A D T

FOR EV-DO Rev. A:

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
1013	824.70	1.27
384	836.52	1.27
777	848.31	1.28

CH 777



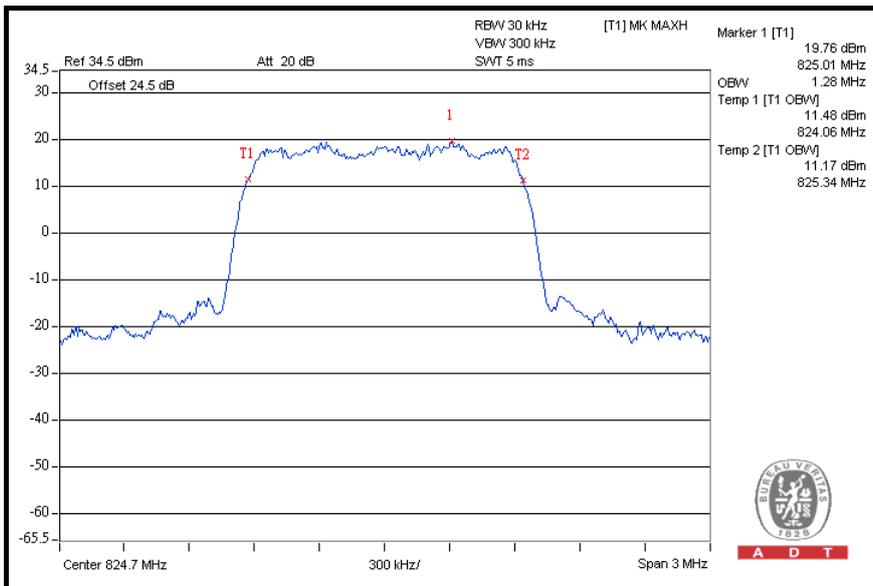


A D T

FOR EV-DO Rev. 0

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
1013	824.70	1.28
384	836.52	1.27
777	848.31	1.27

CH 1013

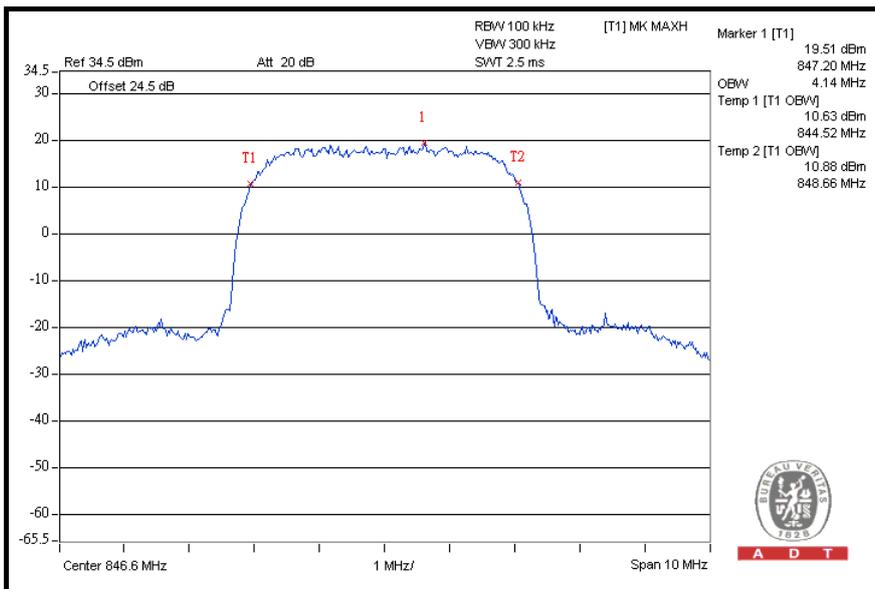


FOR WCDMA:

FOR WCDMA:

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
4132	826.4	4.14
4182	836.4	4.14
4233	846.6	4.14

CH 4233



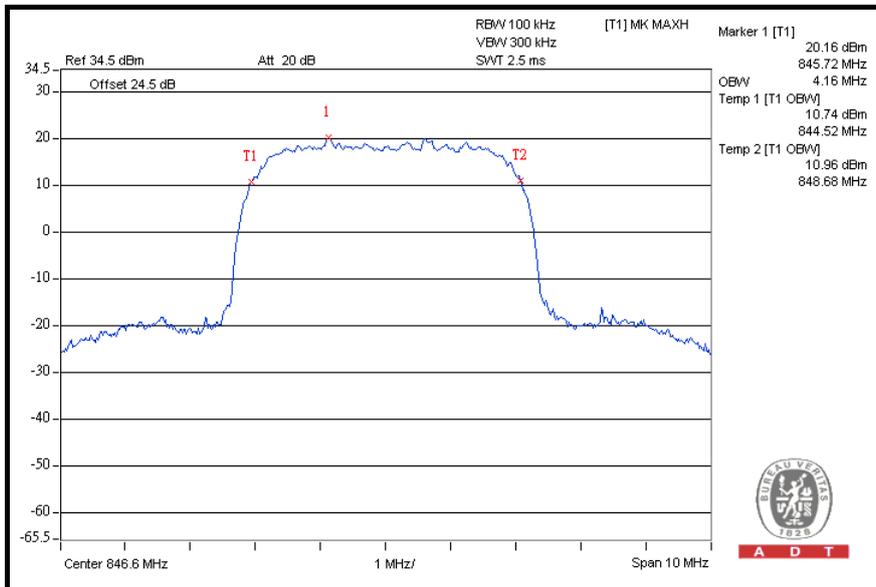


A D T

FOR HSDPA:

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
4132	826.4	4.14
4182	836.4	4.16
4233	846.6	4.16

CH 4233



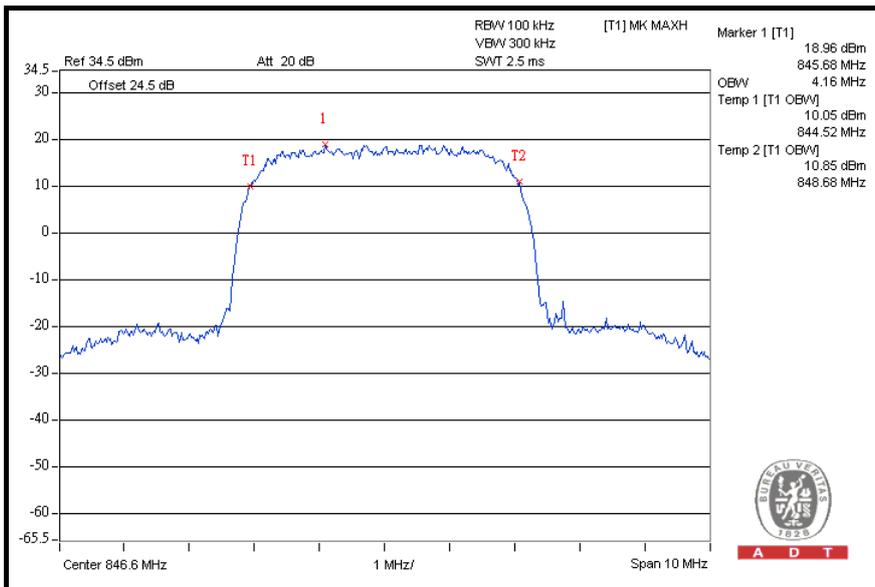


A D T

FOR HSUPA:

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
4132	826.4	4.14
4182	836.4	4.14
4233	846.6	4.16

CH 4233



A D T

4.4 BAND EDGE MEASUREMENT

4.4.1 LIMITS OF BAND EDGE MEASUREMENT

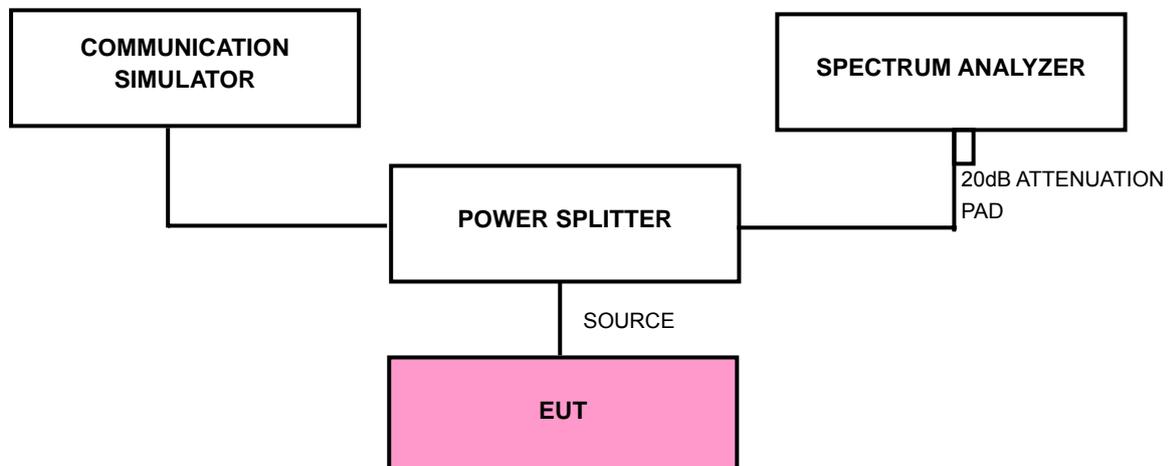
According to FCC 22.917 specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 26, 2011	May 25, 2012
RF cable	SUCOFLEX 104	274403/4	Aug. 20, 2010	Aug. 19, 2011
RF cable	SUCOFLEX 104	250729/4	Aug. 19, 2010	Aug. 18, 2011
RF cable	SUCOFLEX 104	214377/4	Aug. 19, 2010	Aug. 18, 2011
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SETUP



4.4.4 TEST PROCEDURES

- a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels, 128 and 251 (GPRS/ E-GPRS) / 1013 and 777 (CDMA) / 4132 and 4233 (WCDMA) (low and high operational frequency range.)
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss is the worst loss 24.5dB in the transmitted path track.
- c. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GPRS/ E-GPRS).
- 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 15kHz (CDMA).
- e. 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).
- f. Record the max trace plot into the test report.

4.4.5 EUT OPERATING CONDITION

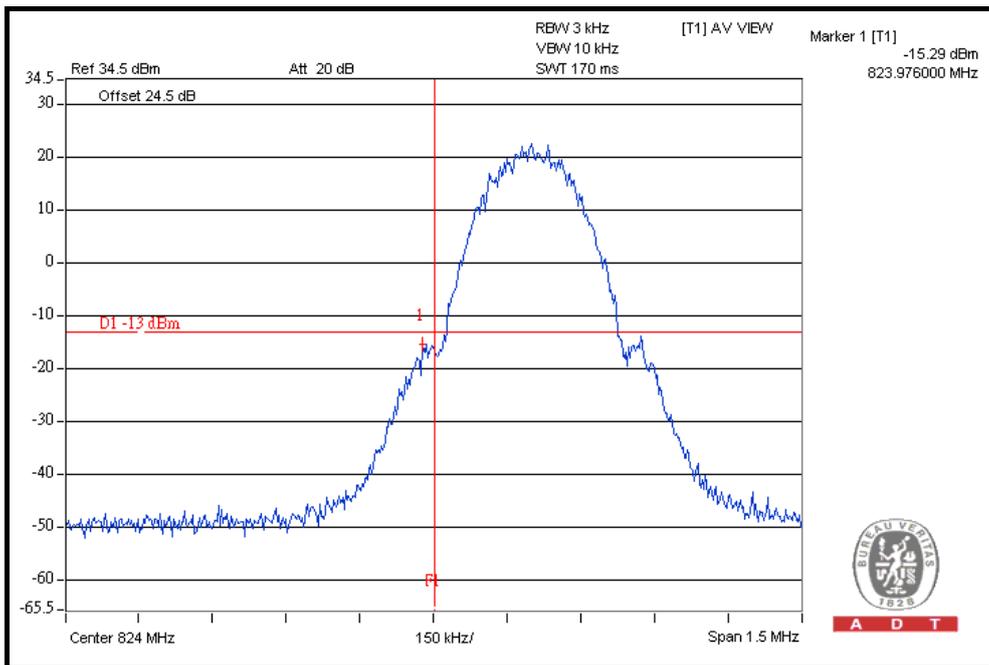
- a. The EUT makes a call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

4.4.6 TEST RESULTS

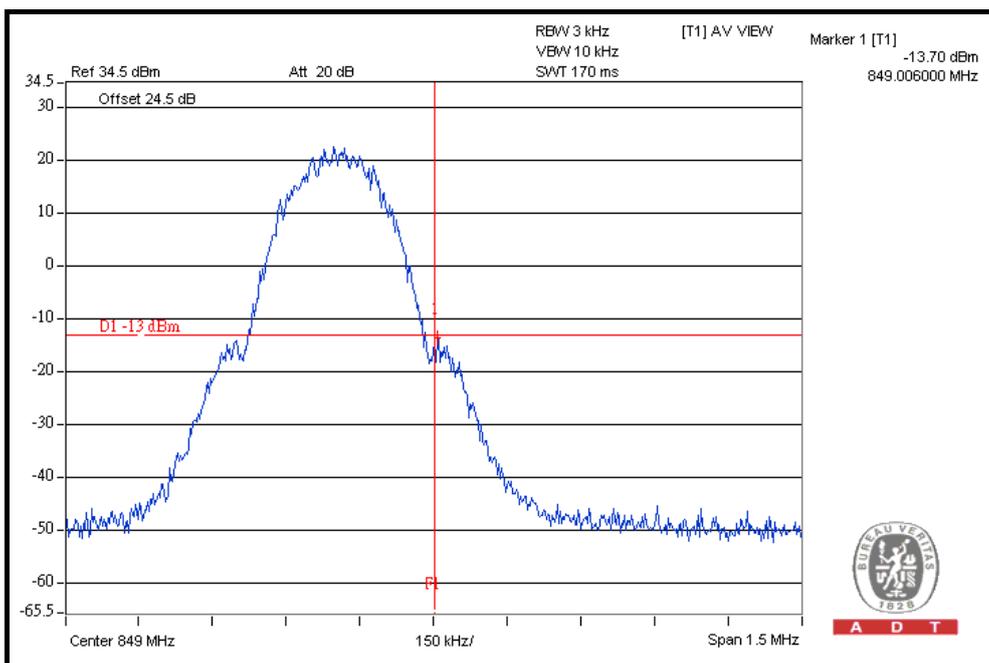
FOR GPRS / E-GPRS:

FOR GPRS MODE (UP-LINK WITH 1 TIME SLOT)

LOWER BAND EDGE



HIGHER BAND EDGE

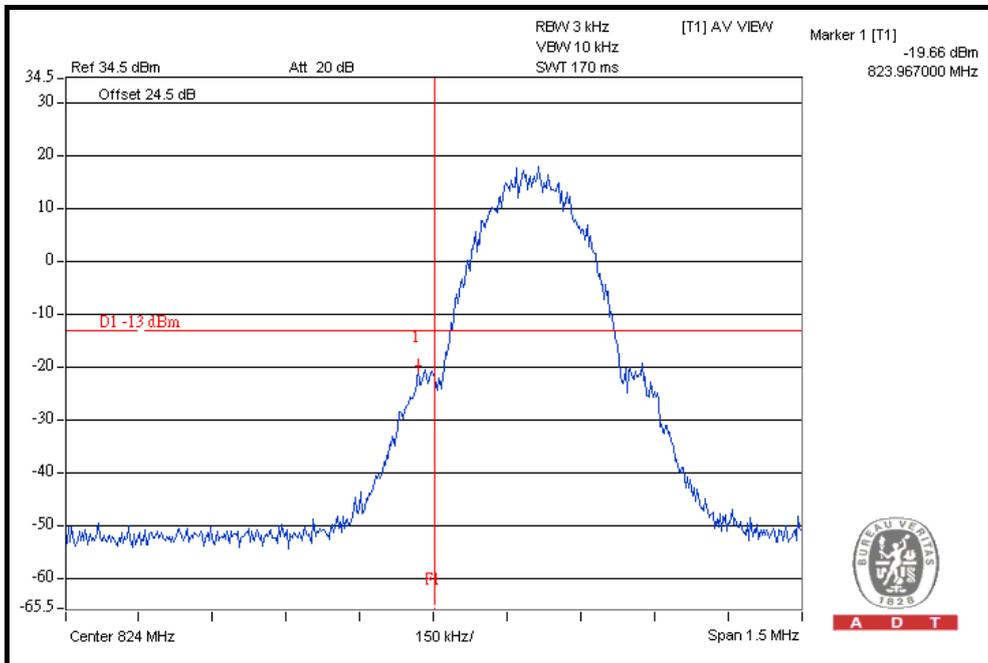




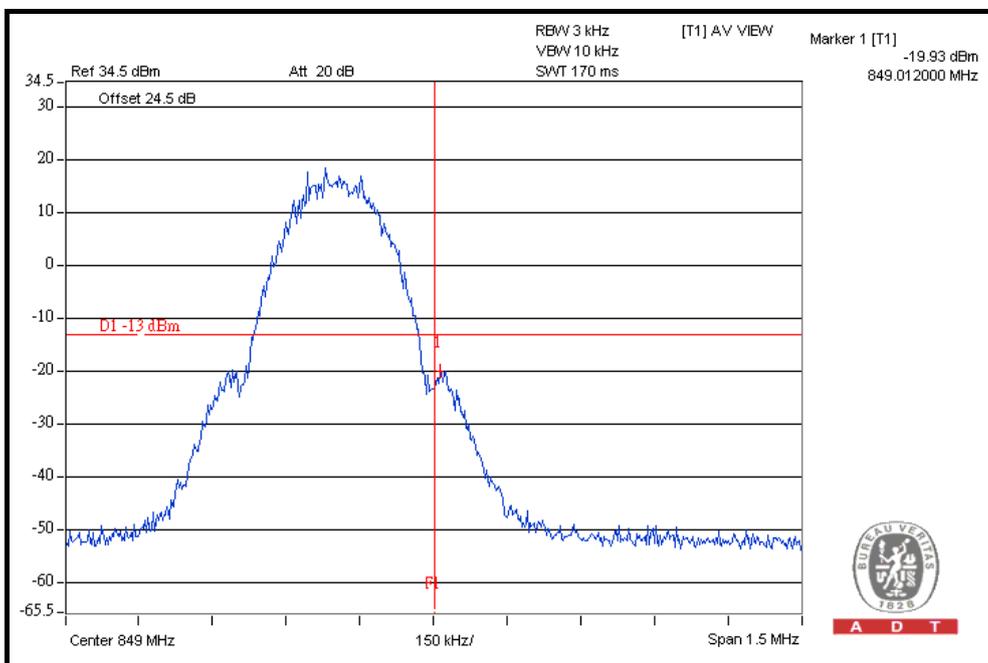
A D T

FOR E-GPRS MODE (UP-LINK WITH 1 TIME SLOT)

LOWER BAND EDGE



HIGHER BAND EDGE



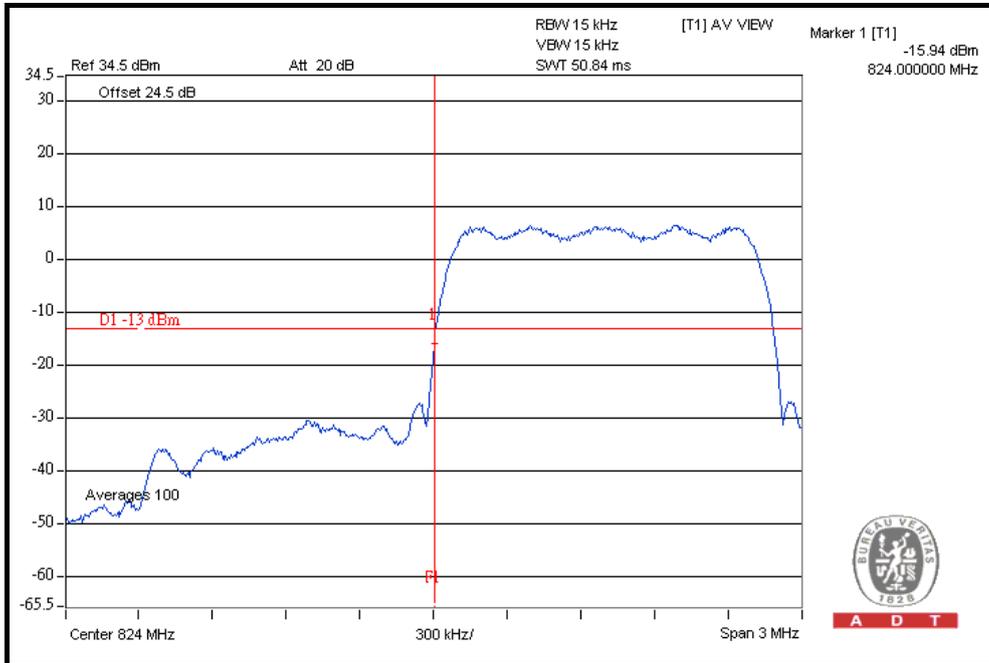


A D T

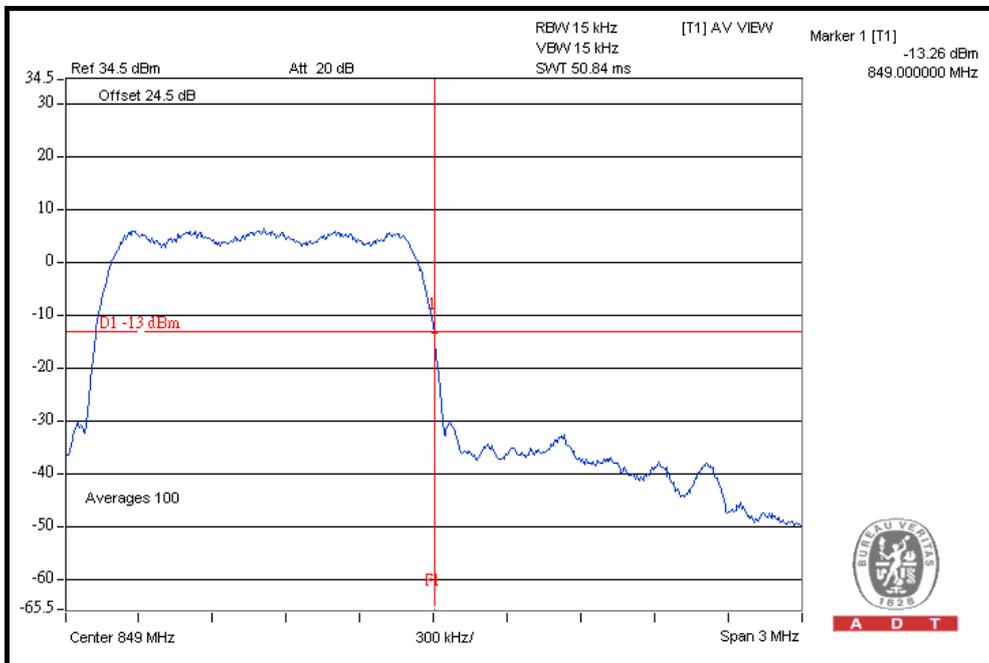
FOR CDMA:

FOR SO55:

LOWER BAND EDGE



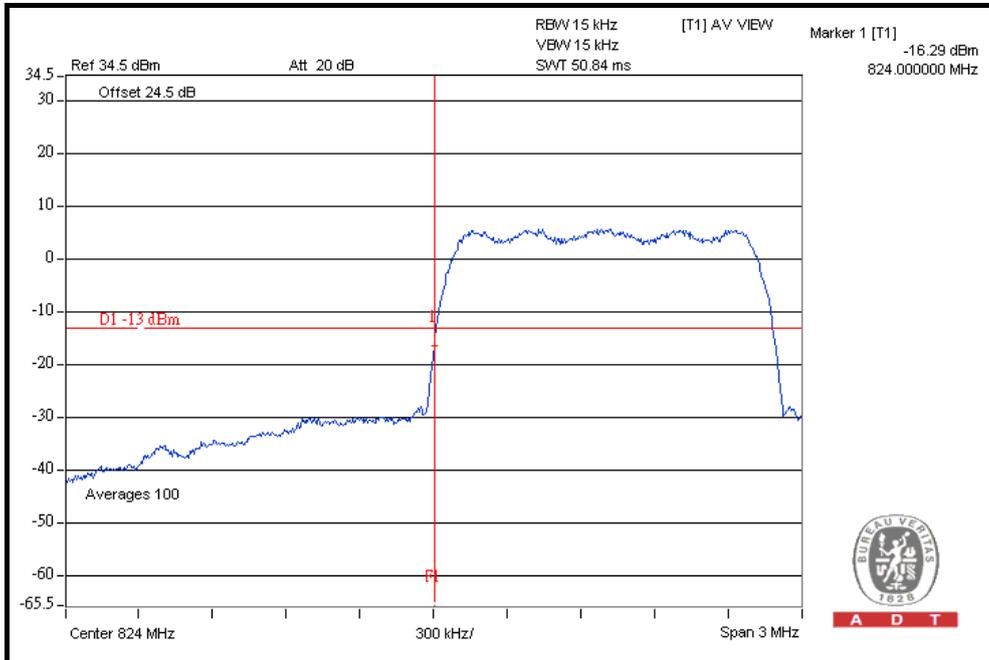
HIGHER BAND EDGE



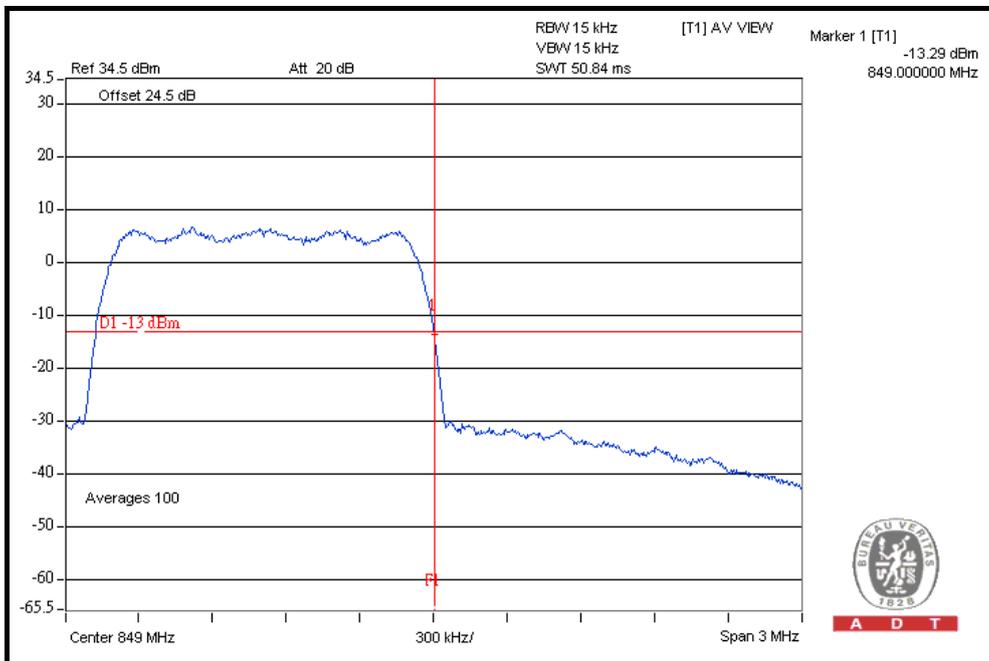


A D T

FOR EV-DO Rev. A: LOWER BAND EDGE



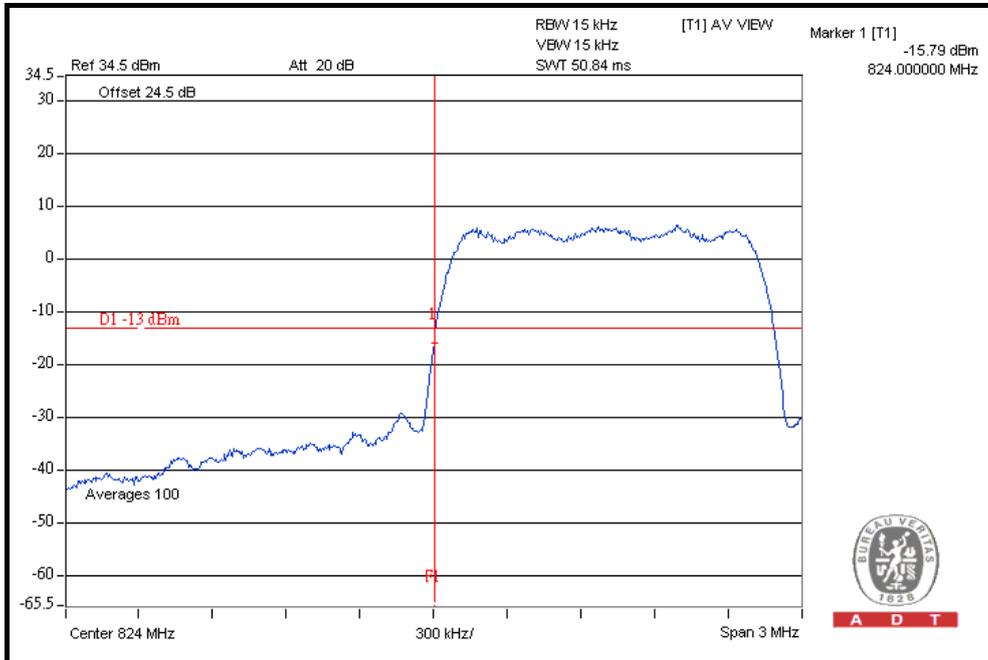
HIGHER BAND EDGE



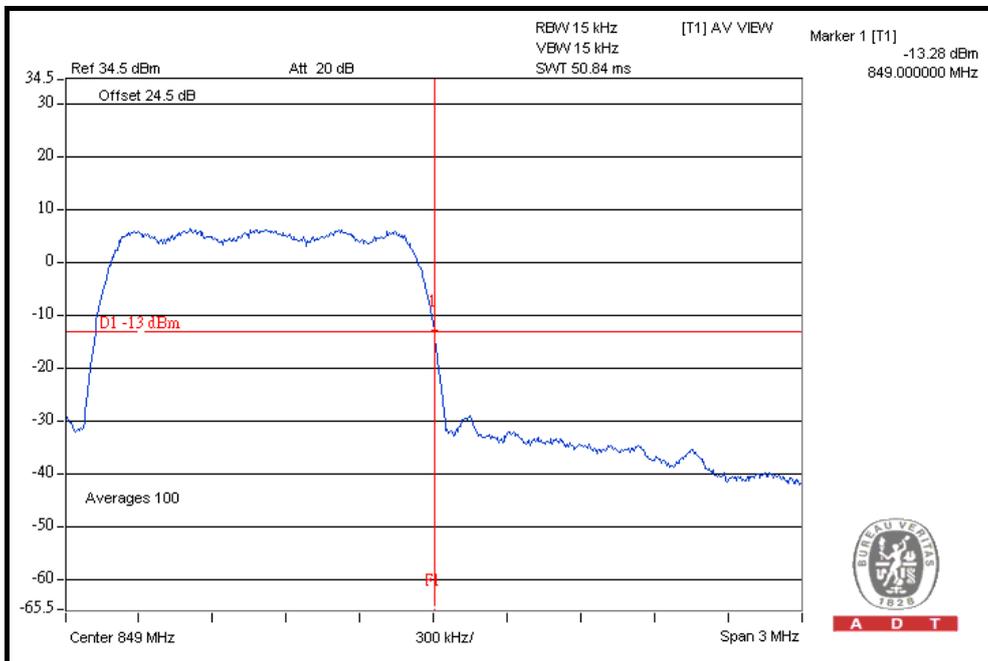


A D T

FOR EV-DO Rev. 0: LOWER BAND EDGE



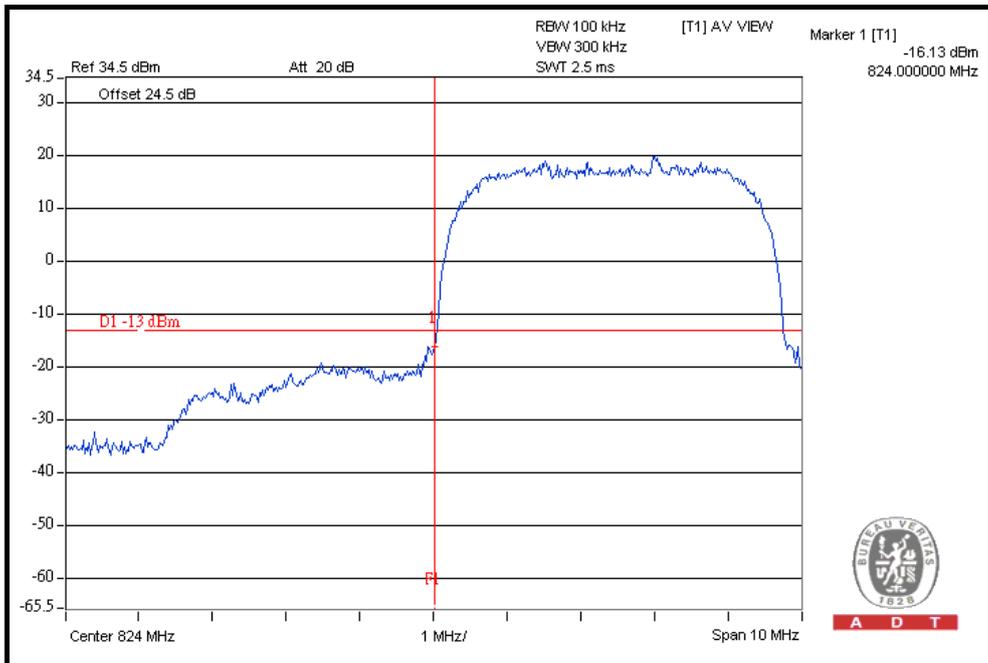
HIGHER BAND EDGE



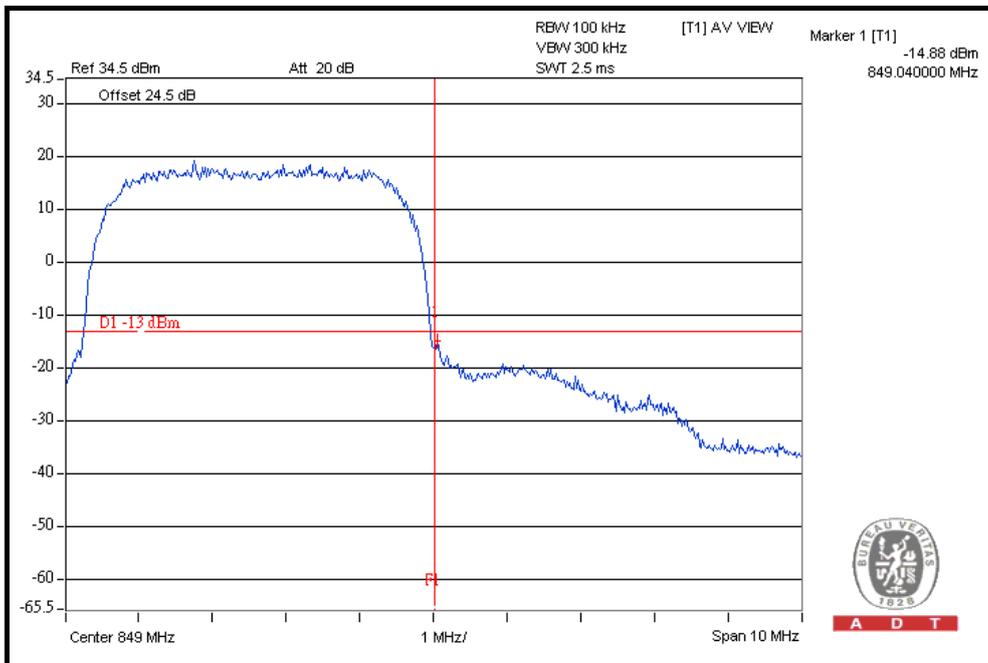
FOR WCDMA:

WCDMA-RMC MODE

LOWER BAND EDGE

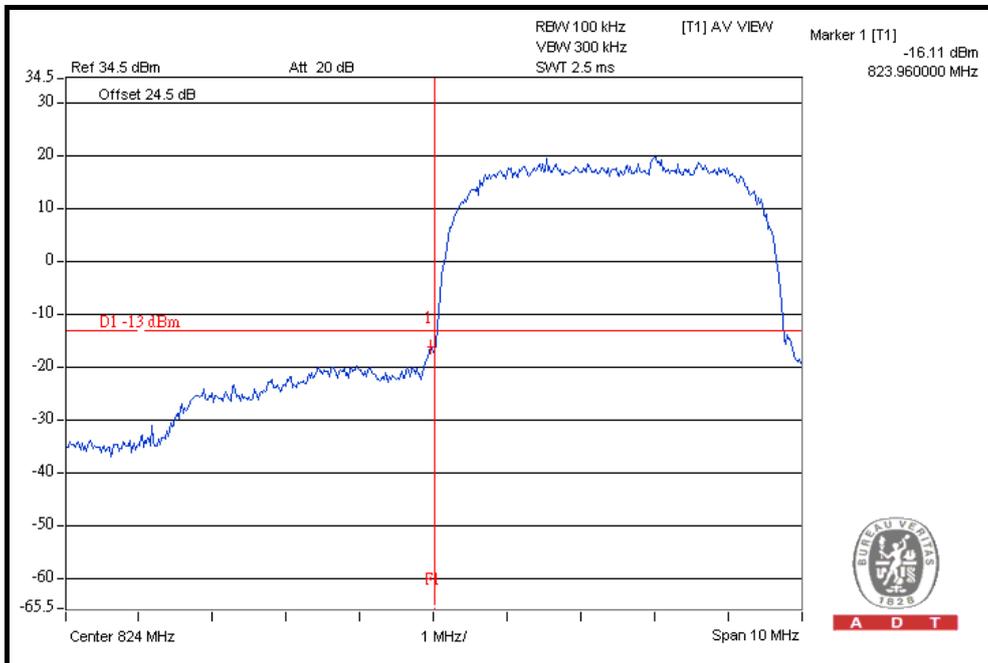


HIGHER BAND EDGE

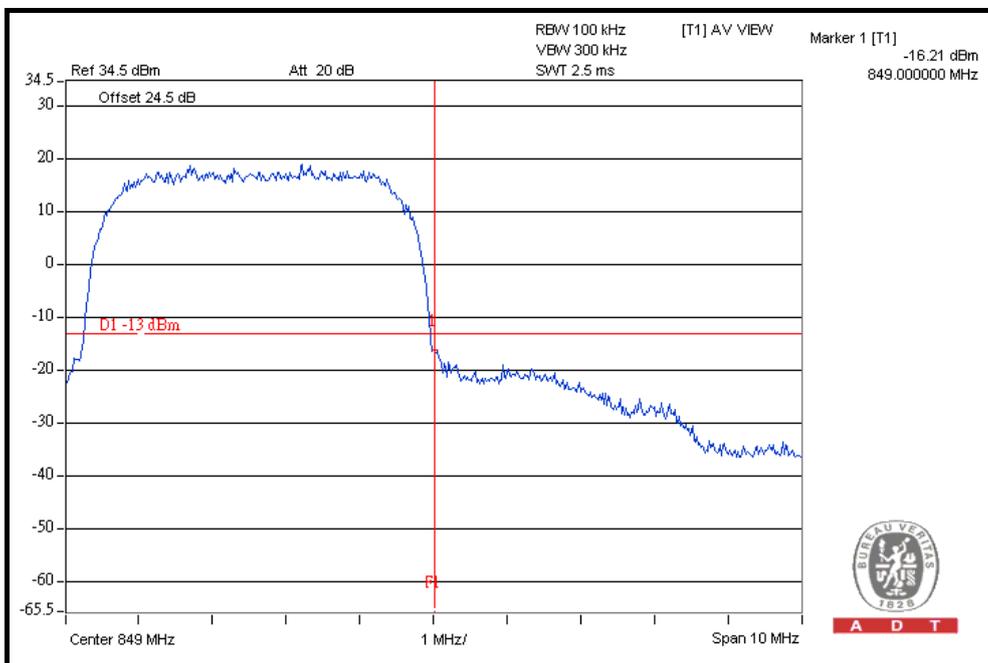


HSDPA MODE

LOWER BAND EDGE



HIGHER BAND EDGE

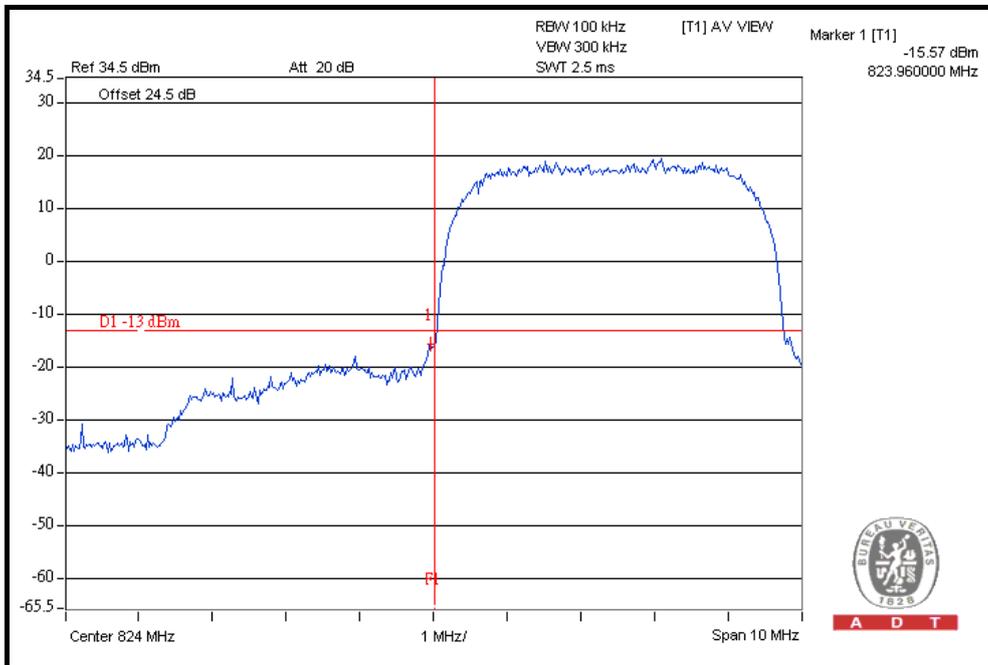




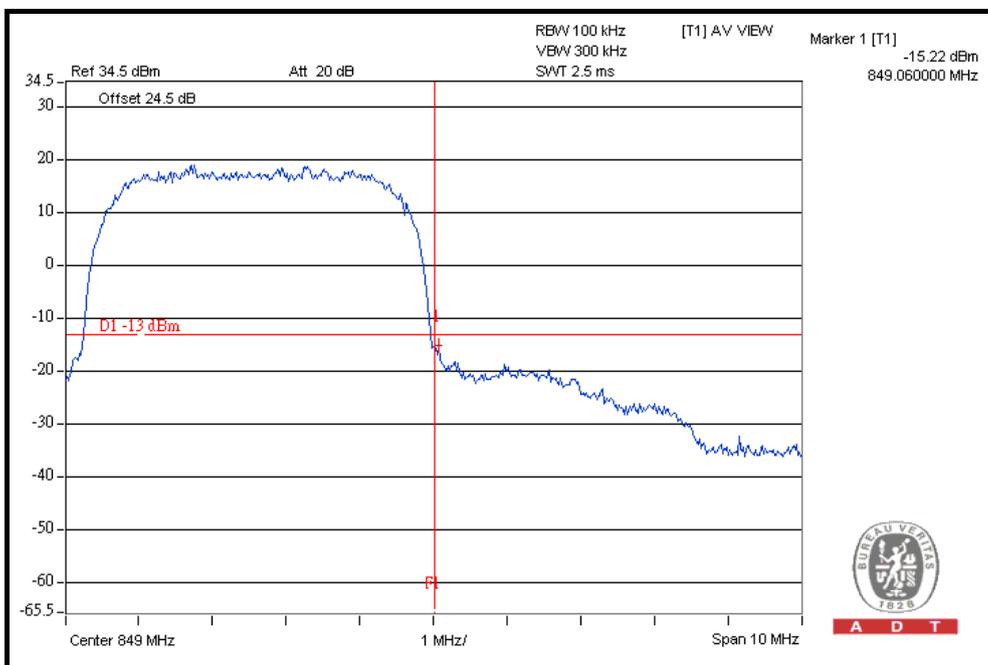
A D T

HSUPA MODE

LOWER BAND EDGE



HIGHER BAND EDGE





4.5 CONDUCTED SPURIOUS EMISSIONS

4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

In the FCC 22.917, On any frequency outside a licensee's frequency block within GPRS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The emission limit equal to -13dBm .

4.5.2 TEST INSTRUMENTS

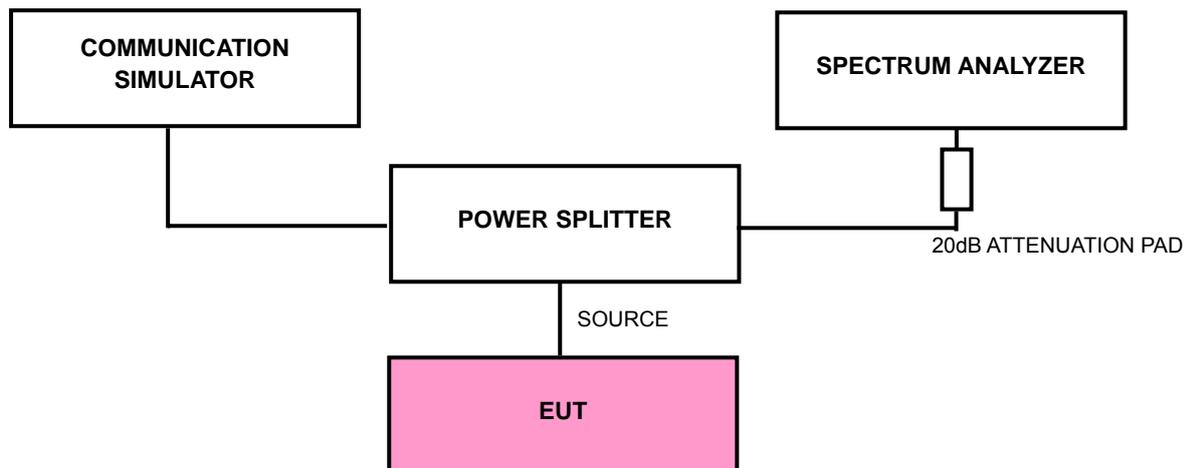
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
Wainwright Instruments Band Reject Filter	WRCG 824/849-810/ 863-60/9SS	SN1	Mar. 24, 2011	Mar. 23, 2012
WI Highpass filter	WHK1.5/15G-10ST	SN1	Mar. 29, 2011	Mar. 28, 2012
Mini-Circuits Power Splitter	ZN2PD-9G	NA	May 26, 2011	May 25, 2012
RF cable	SUCOFLEX 104	274403/4	Aug. 20, 2010	Aug. 19, 2011
RF cable	SUCOFLEX 104	250729/4	Aug. 19, 2010	Aug. 18, 2011
RF cable	SUCOFLEX 104	214377/4	Aug. 19, 2010	Aug. 18, 2011
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 128, 190 and 251 (GPRS) / 1013, 384 and 777 (CDMA) / 4132, 4182 and 4233 (WCDMA) (low, middle and high operational frequency range.)
- b. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. From 1GHz to 9GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

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

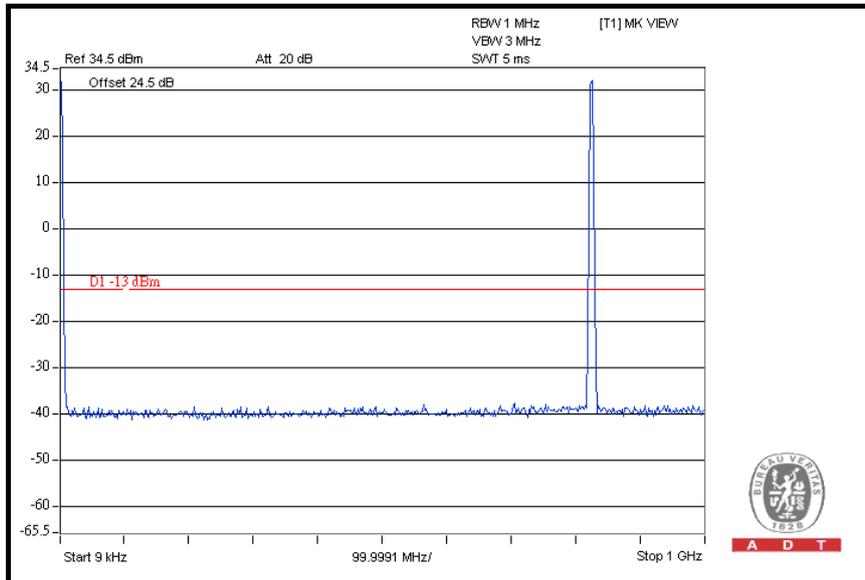


A D T

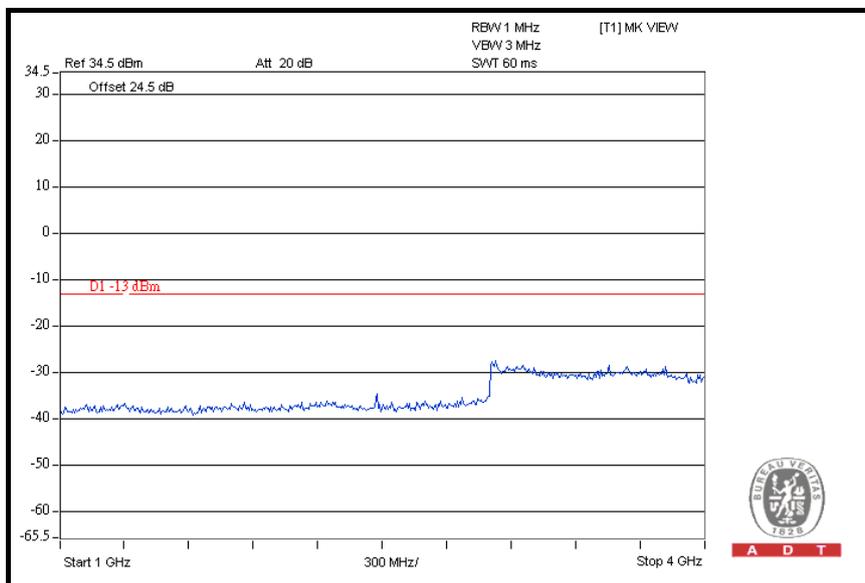
4.5.6 TEST RESULTS

FOR GPRS:

CH 128: 9kHz ~ 1GHz



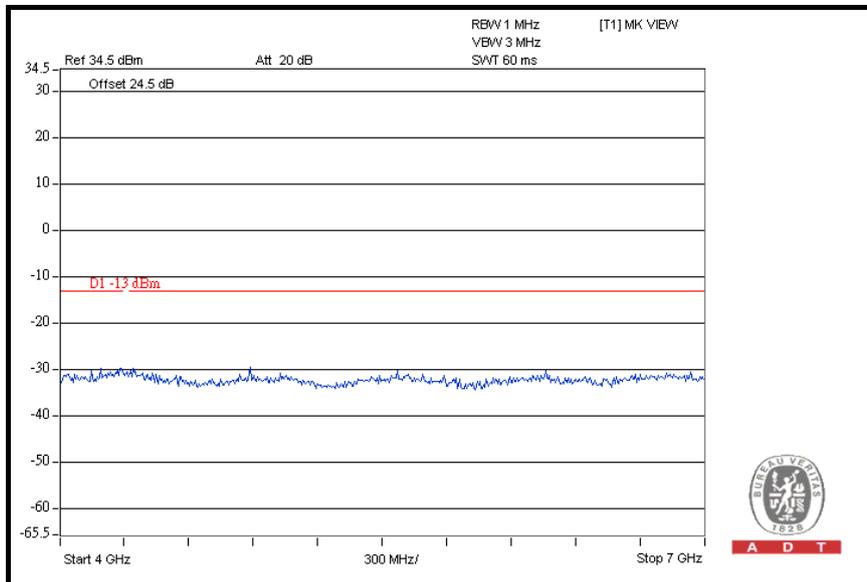
1GHz ~ 4GHz



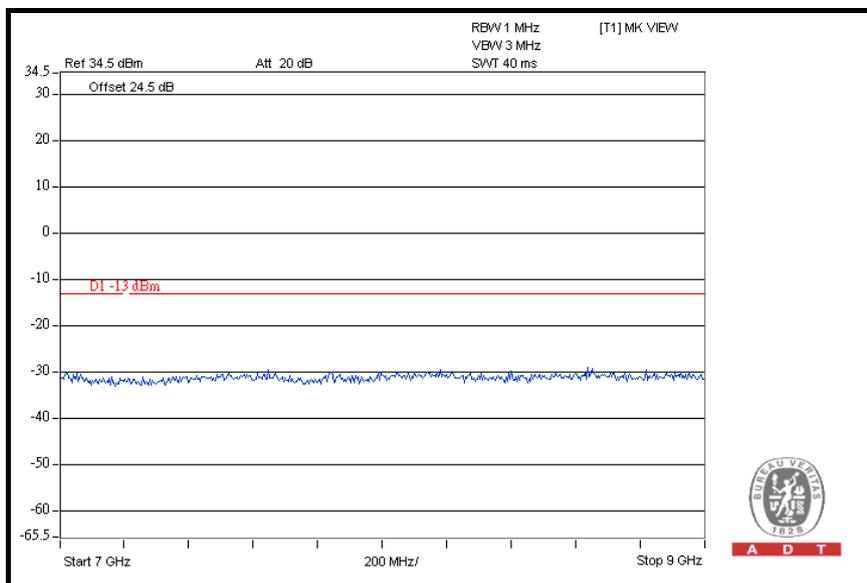


A D T

4GHz ~ 7GHz



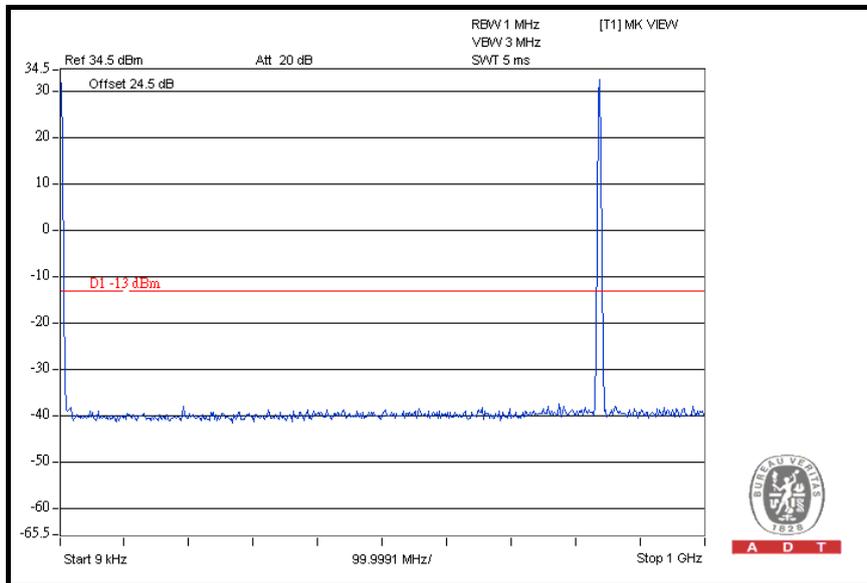
7GHz ~ 9GHz



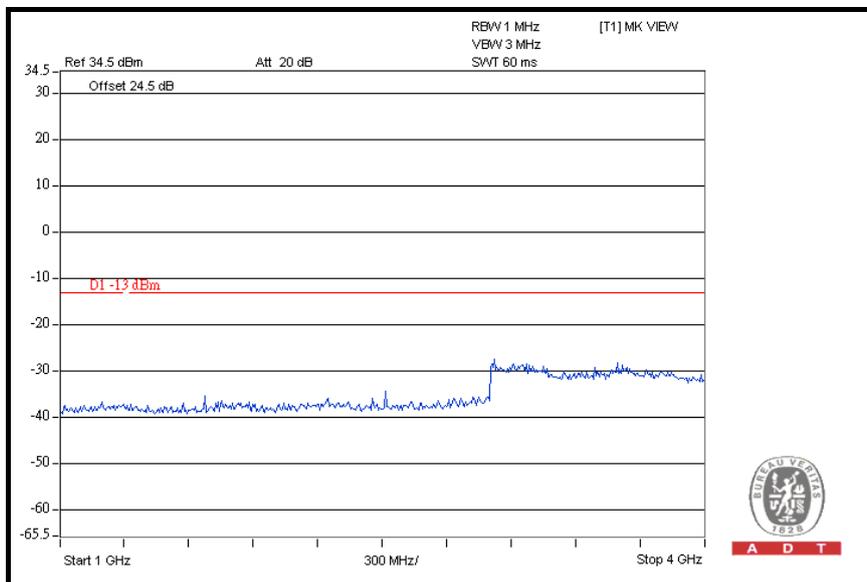


A D T

CH 190: 9kHz ~ 1GHz



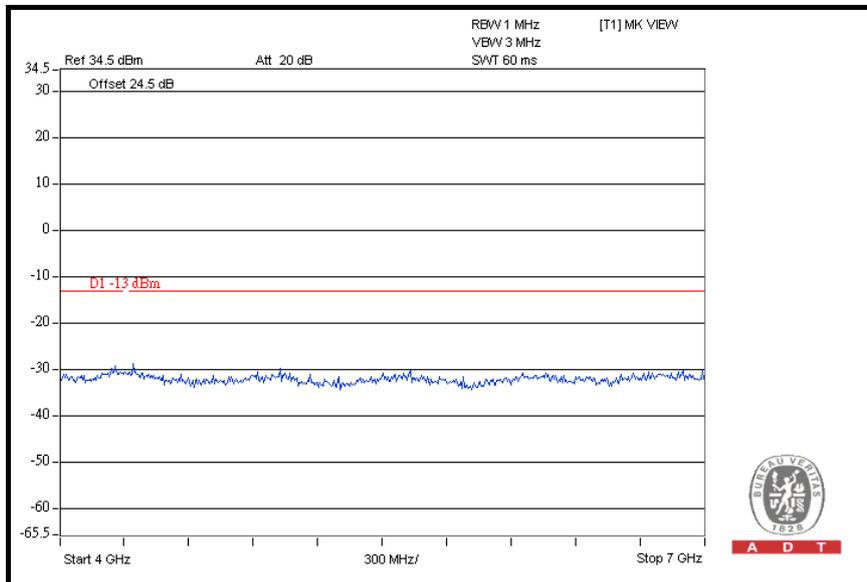
1GHz ~ 4GHz





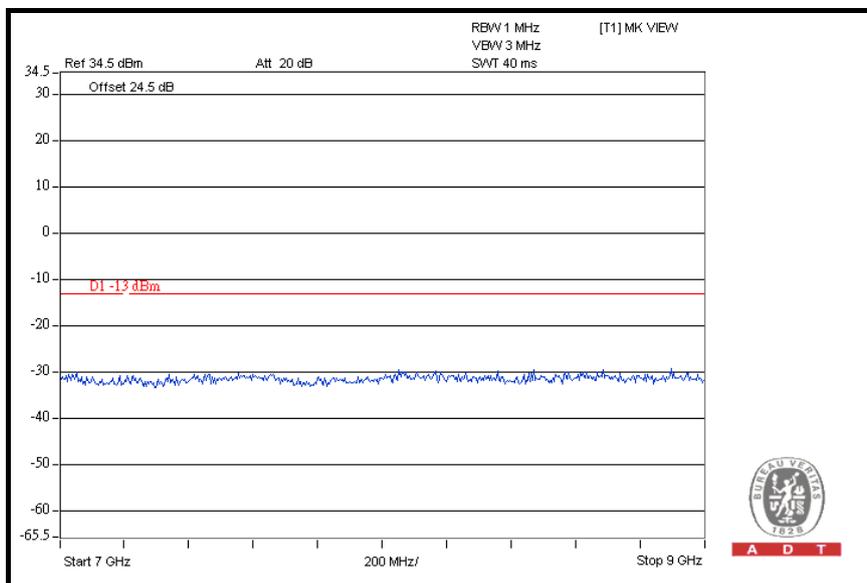
A D T

4GHz ~ 7GHz



A D T

7GHz ~ 9GHz

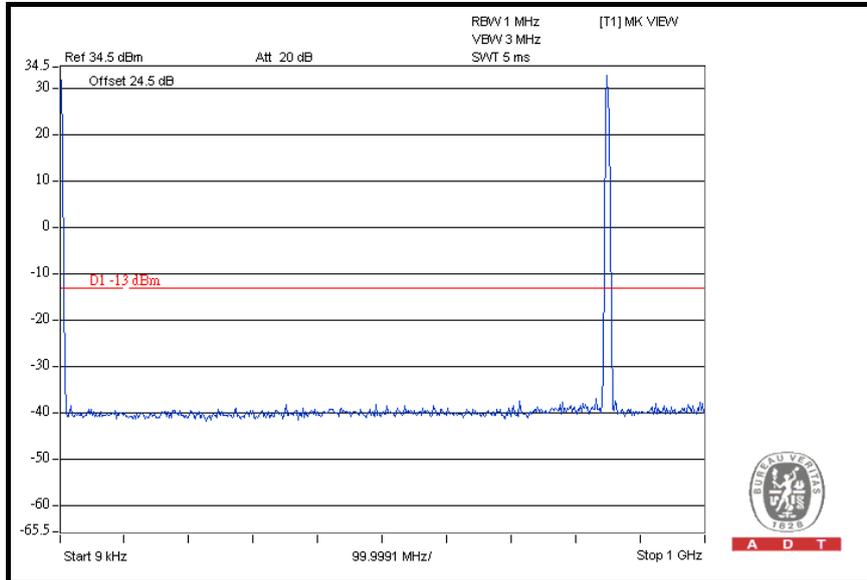


A D T

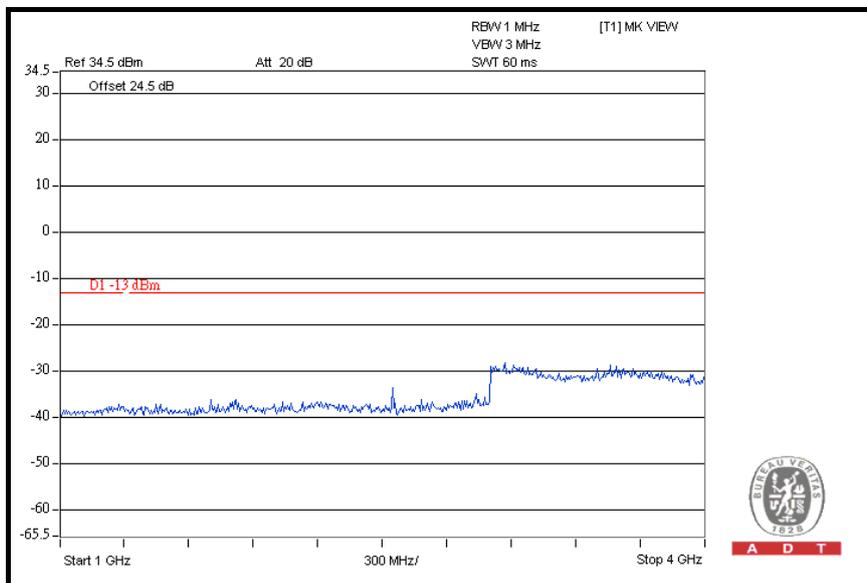


A D T

CH 251: 9kHz ~ 1GHz



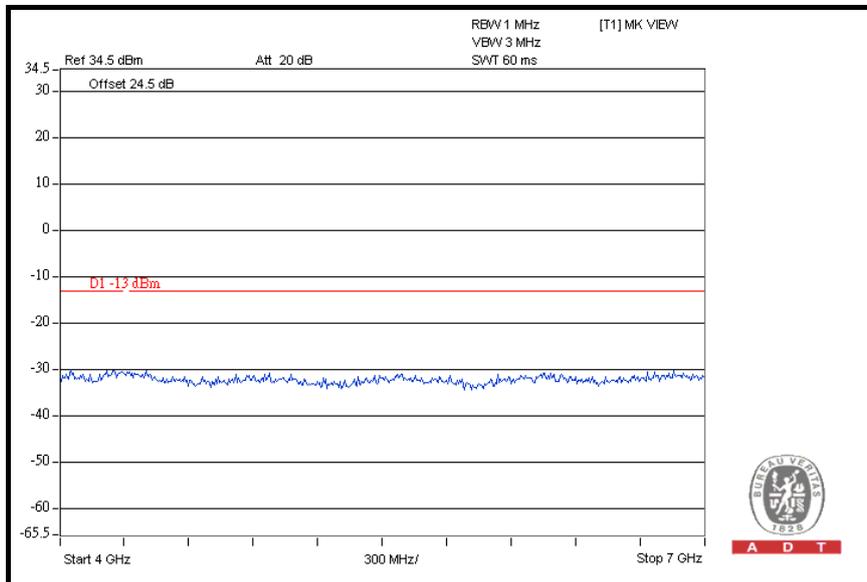
1GHz ~ 4GHz



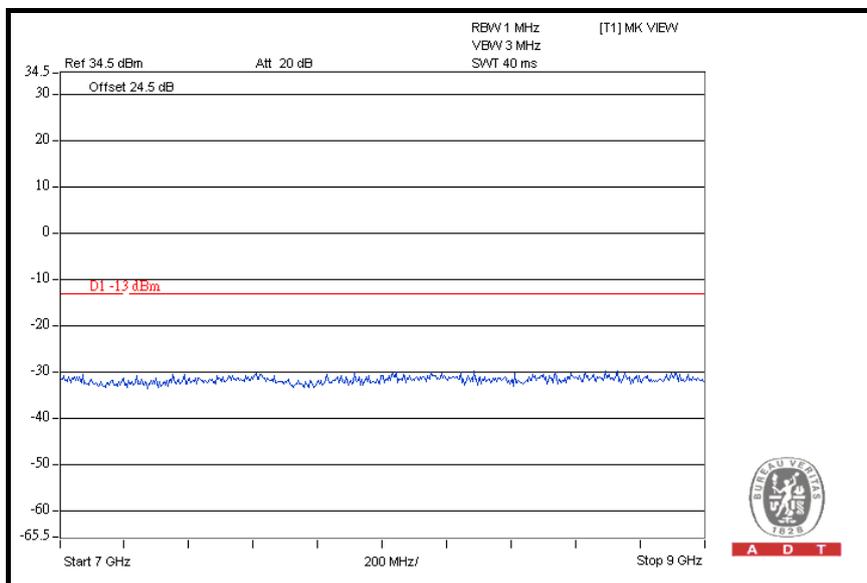


A D T

4GHz ~ 7GHz



7GHz ~ 9GHz

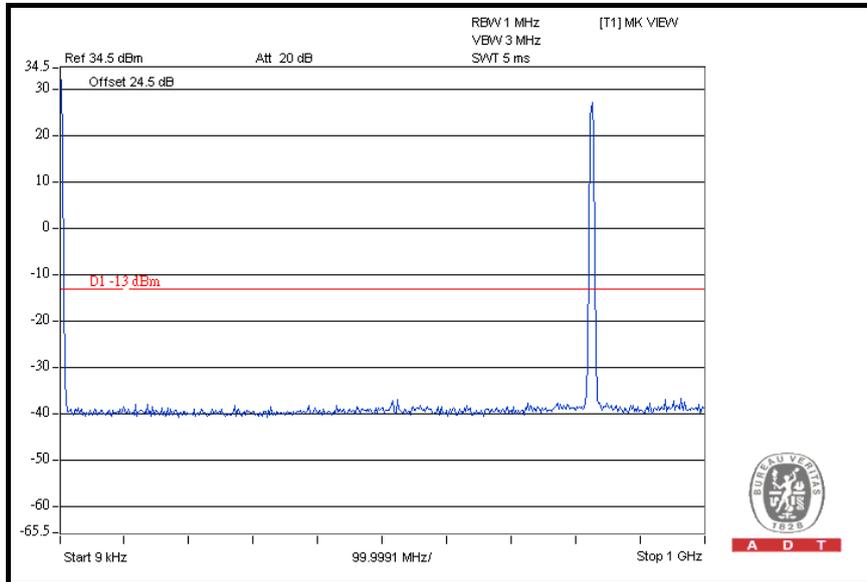




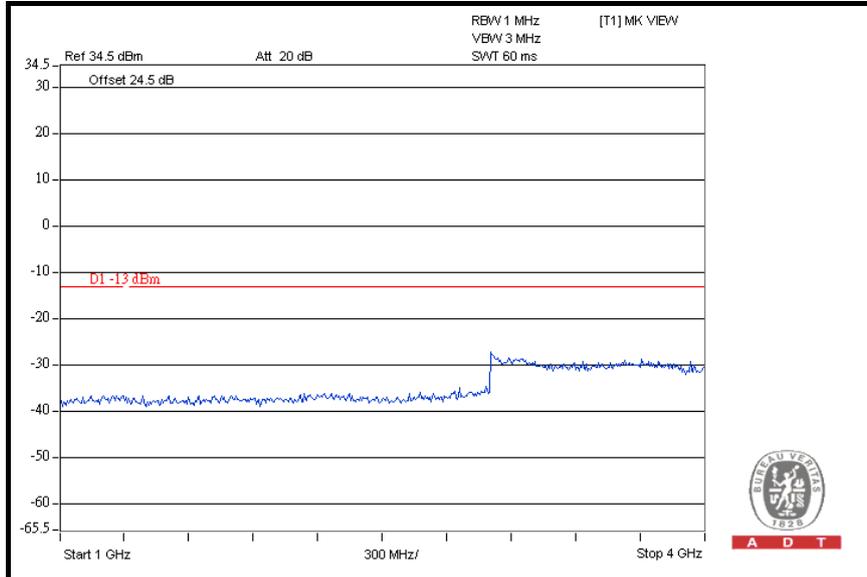
A D T

FOR CDMA:

CH 1013: 9kHz ~ 1GHz



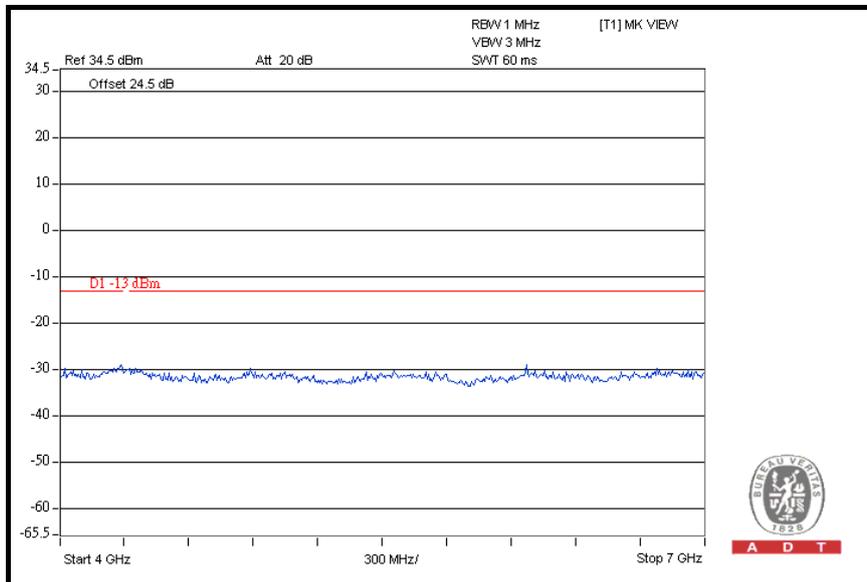
1GHz ~ 4GHz



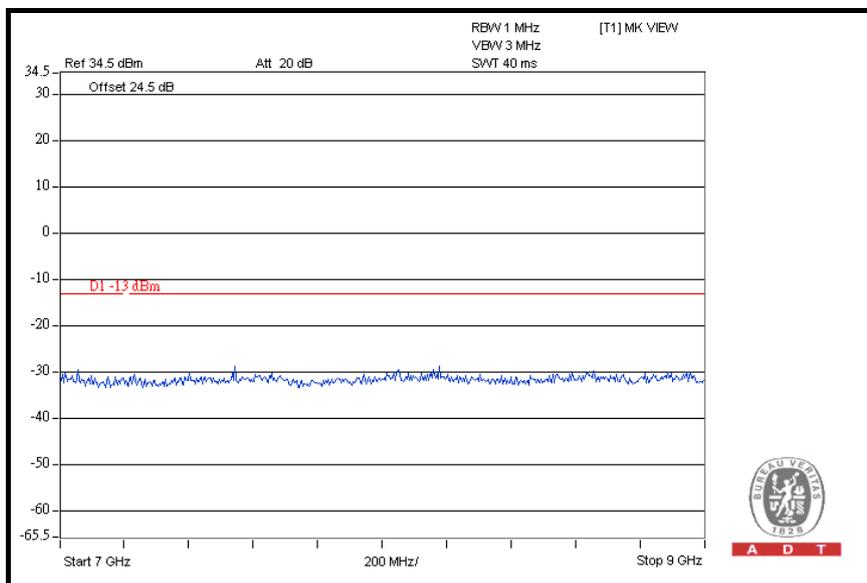


A D T

4GHz ~ 7GHz



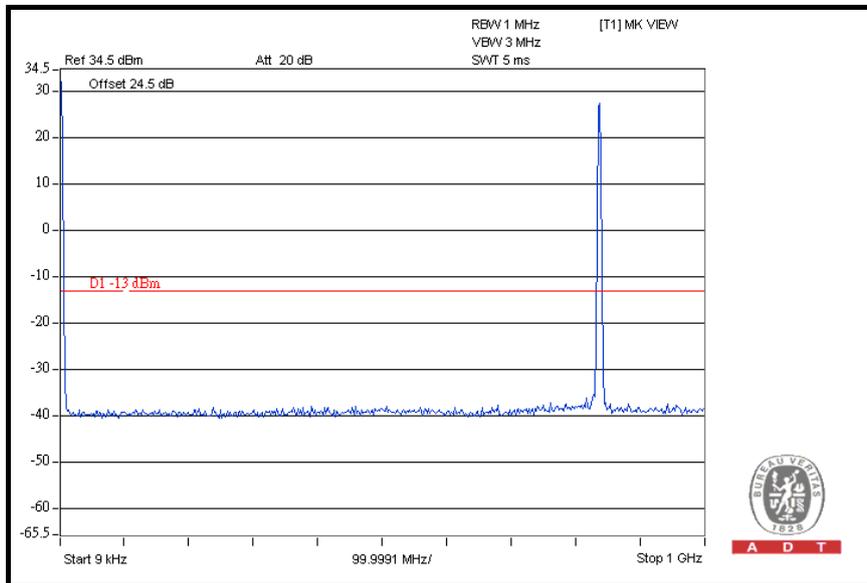
7GHz ~ 9GHz



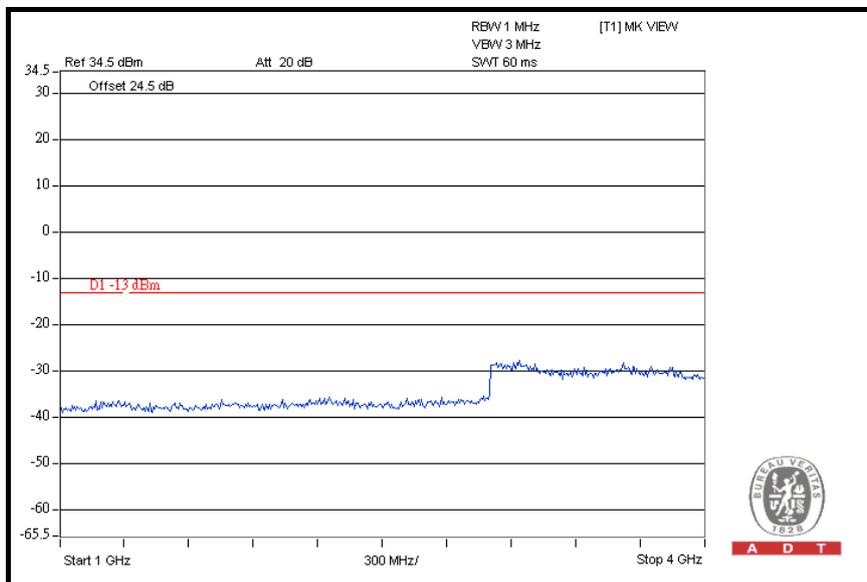


A D T

CH 384: 9kHz ~ 1GHz



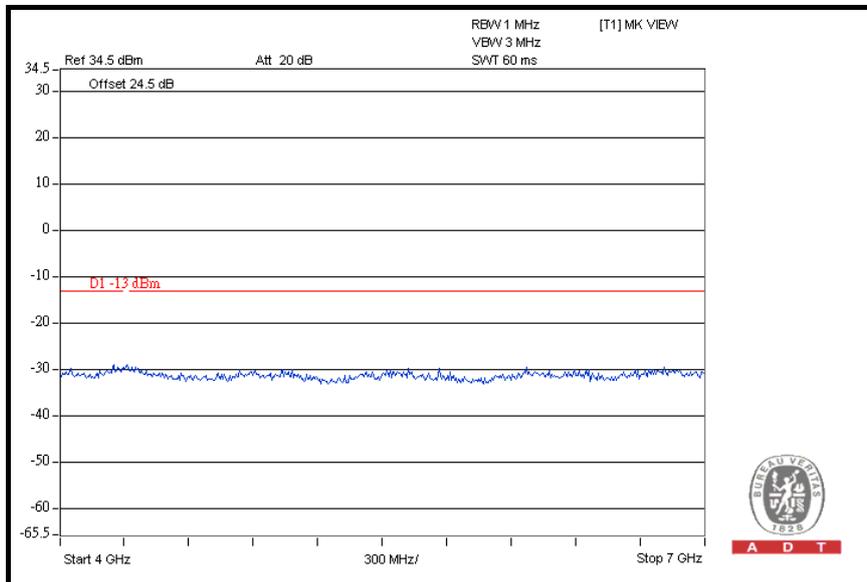
1GHz ~ 4GHz



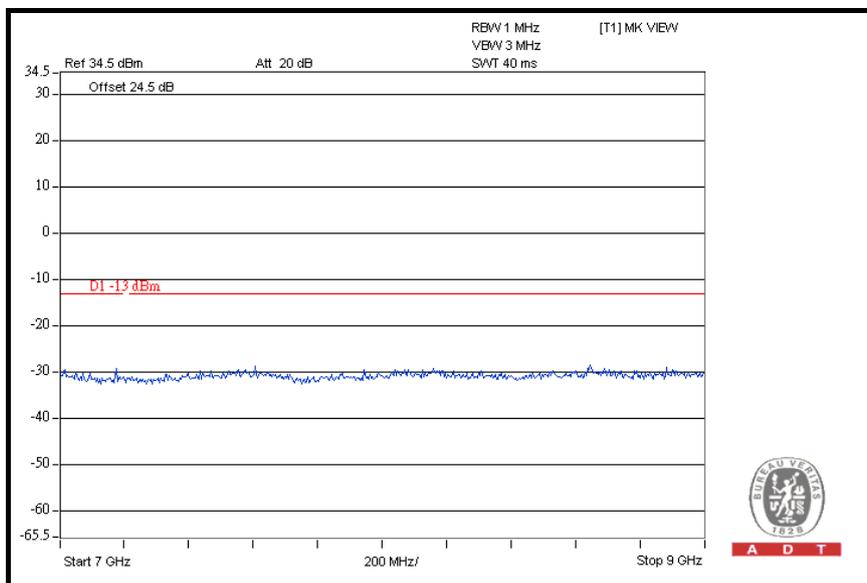


A D T

4GHz ~ 7GHz



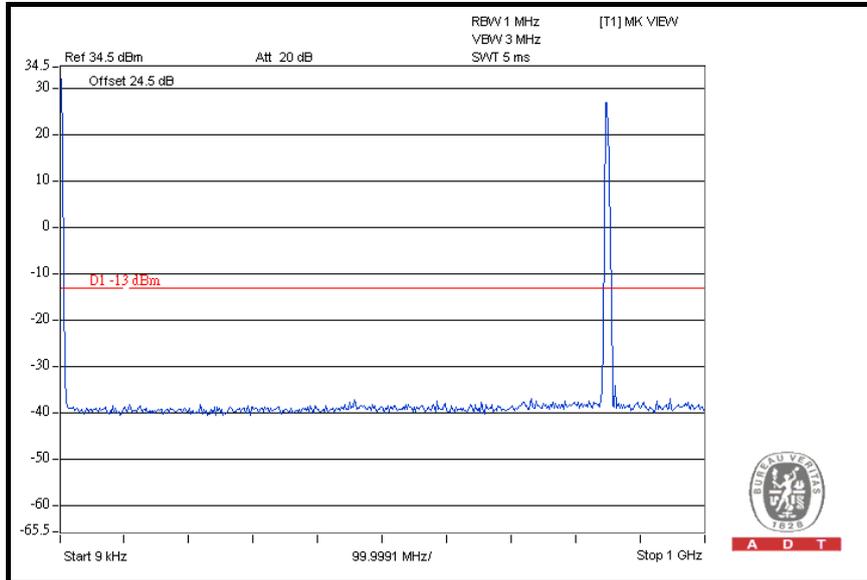
7GHz ~ 9GHz



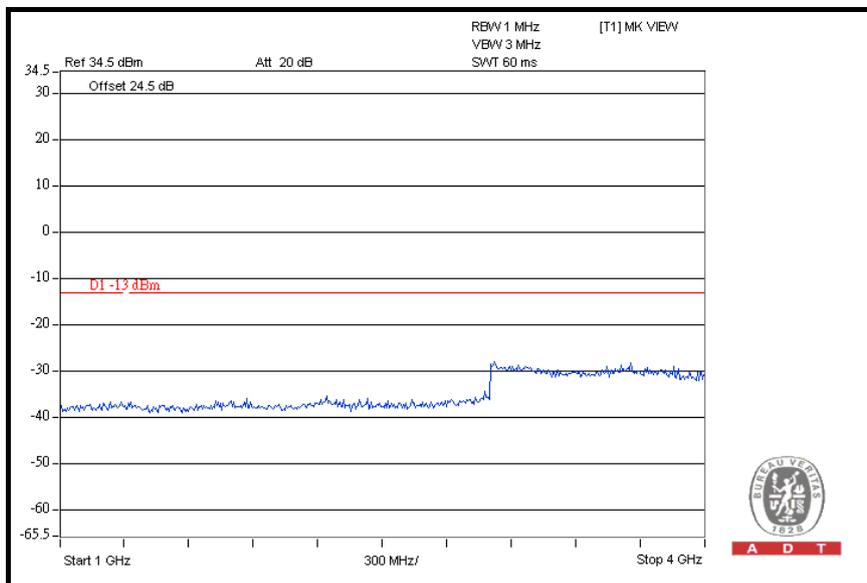


A D T

CH 777: 9kHz ~ 1GHz



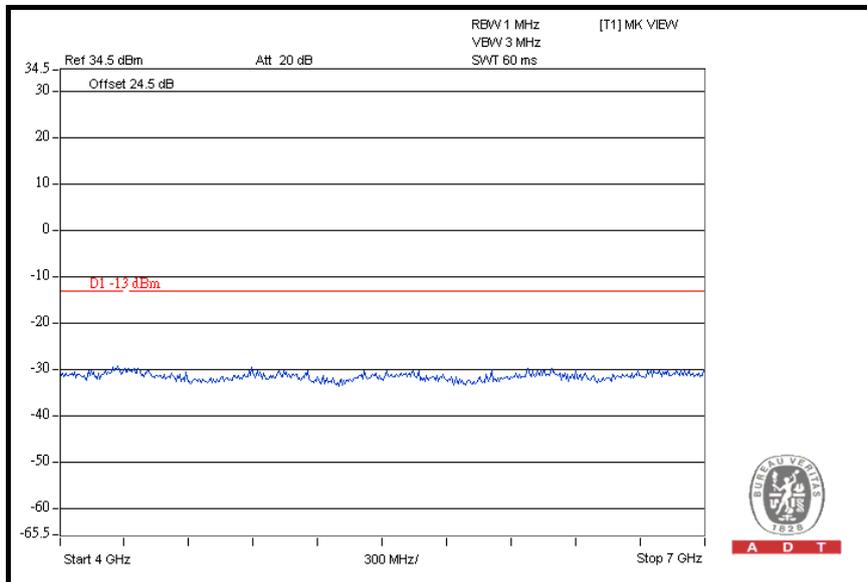
1GHz ~ 4GHz



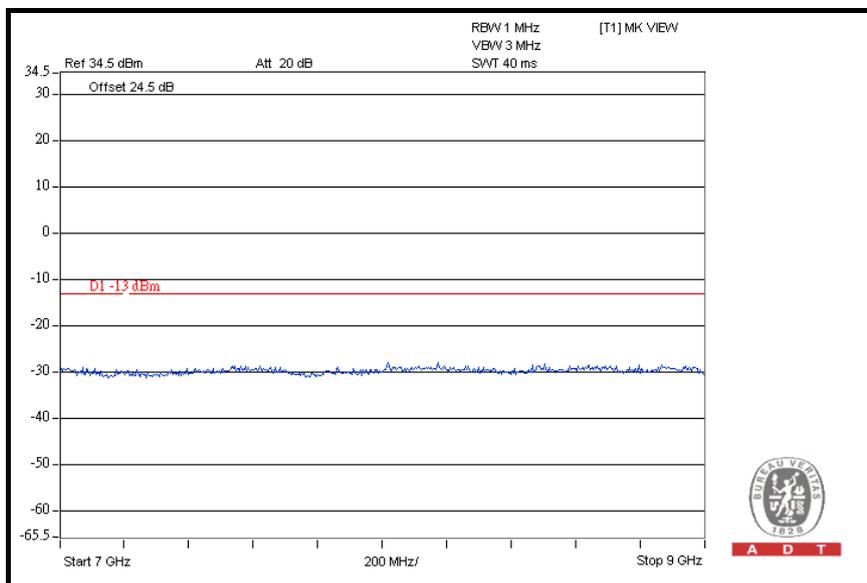


A D T

4GHz ~ 7GHz



7GHz ~ 9GHz

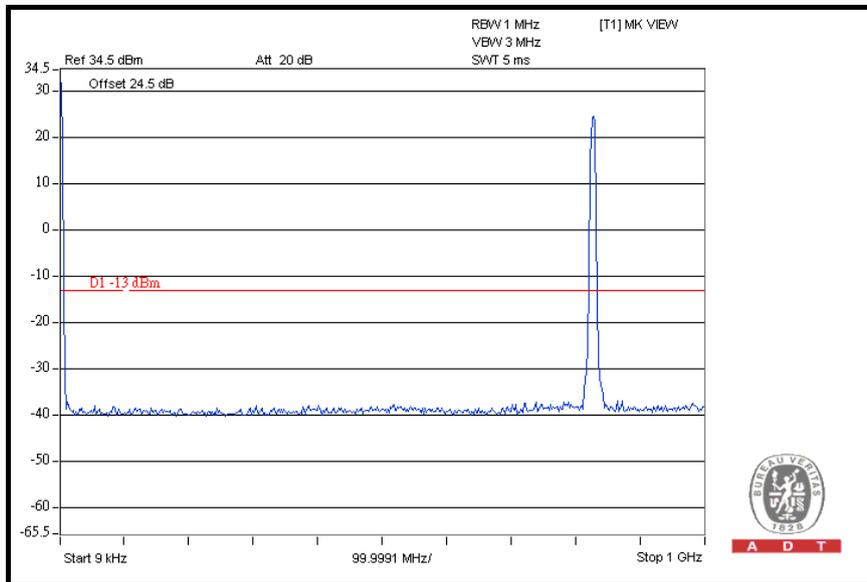




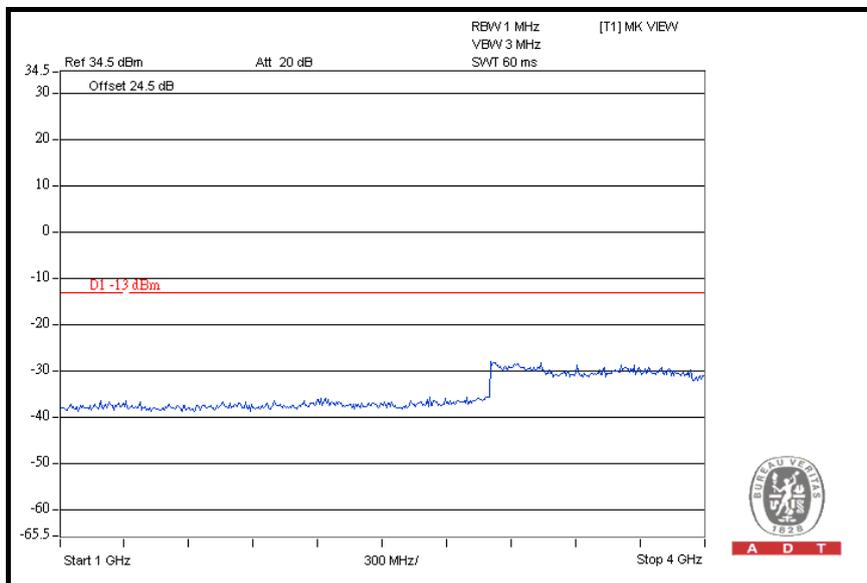
A D T

FOR WCDMA:

CH 4132: 9kHz ~ 1GHz



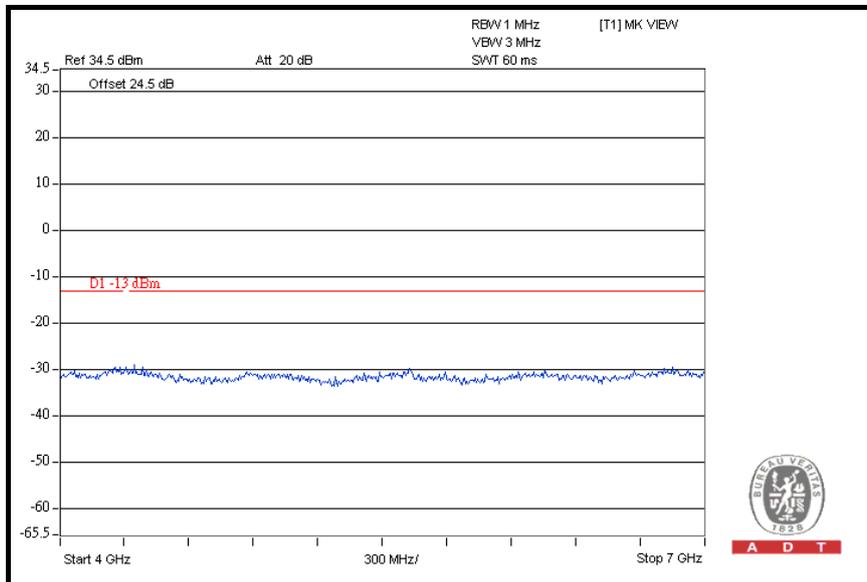
1GHz ~ 4GHz



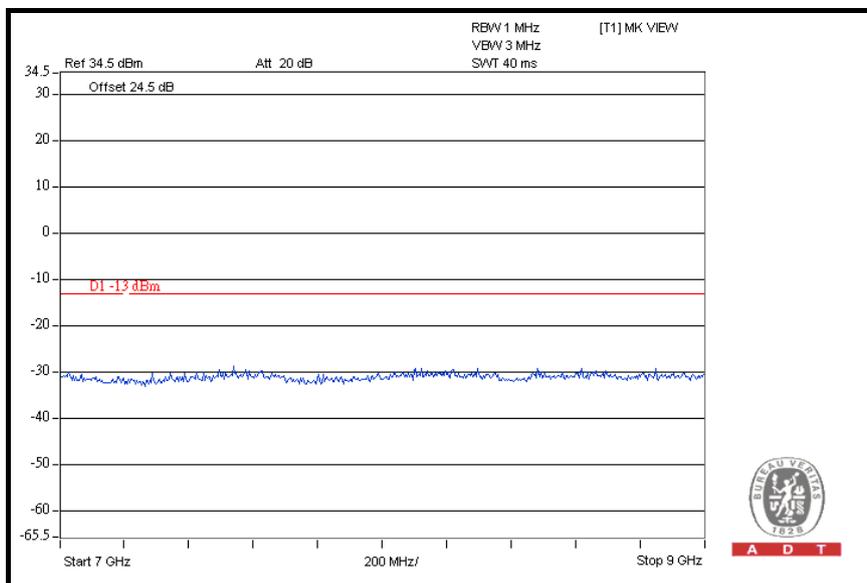


A D T

4GHz ~ 7GHz



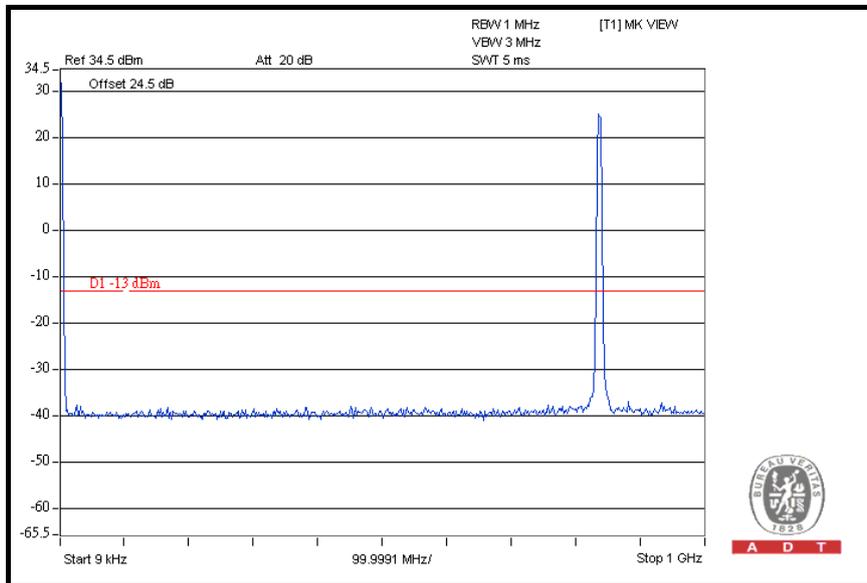
7GHz ~ 9GHz



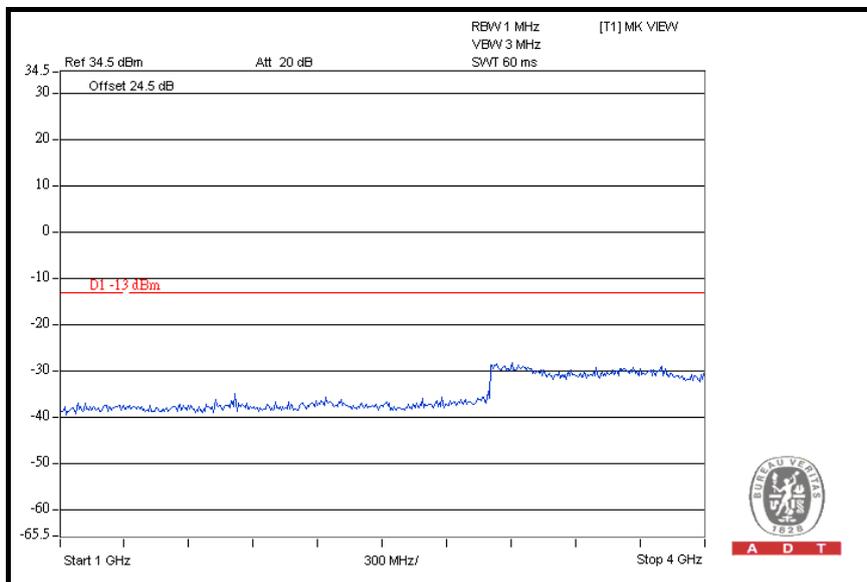


A D T

CH 4182: 9kHz ~ 1GHz



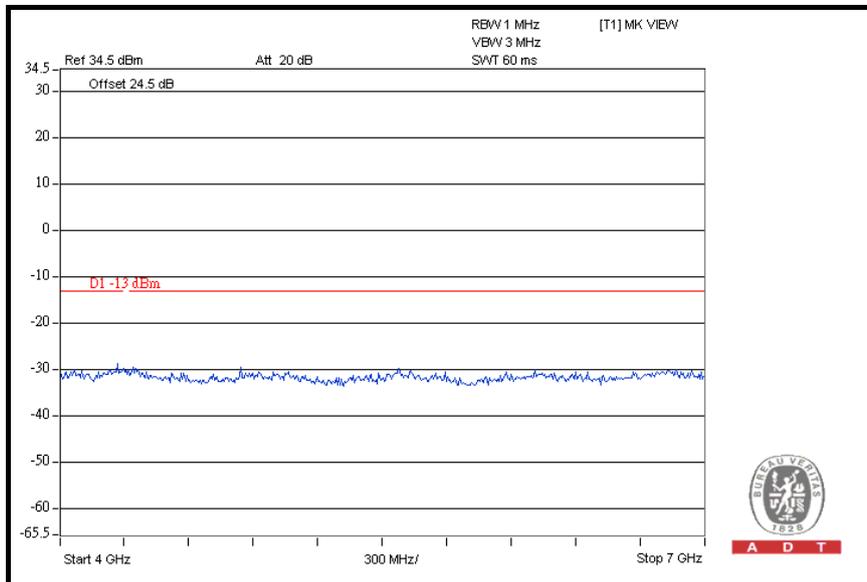
1GHz ~ 4GHz



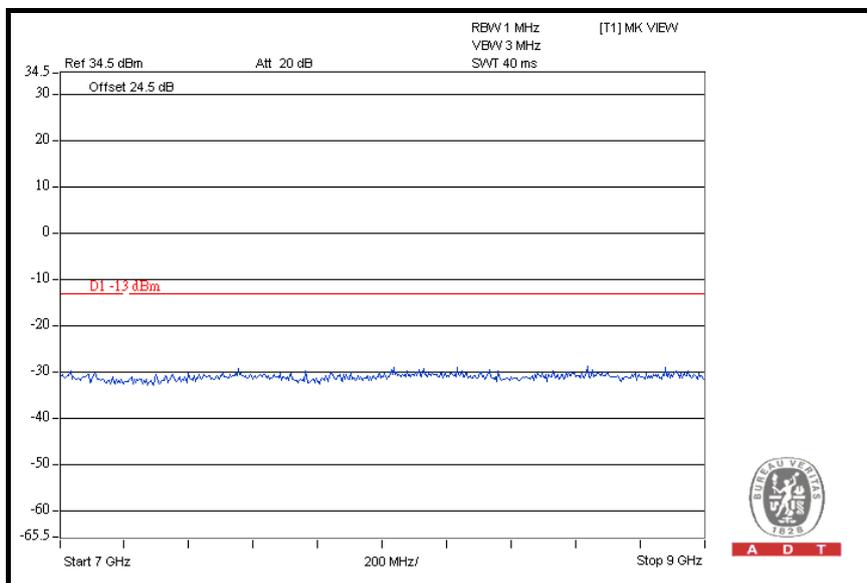


A D T

4GHz ~ 7GHz



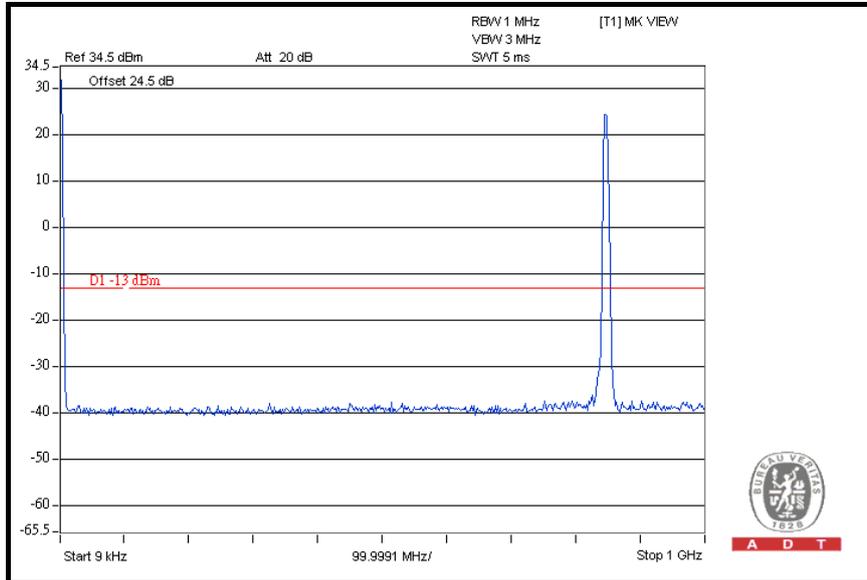
7GHz ~ 9GHz



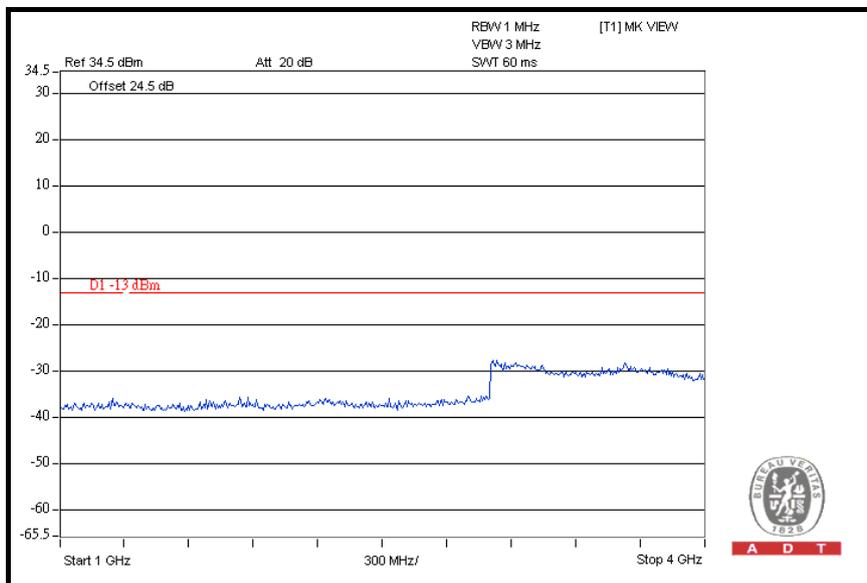


A D T

CH 4233: 9kHz ~ 1GHz



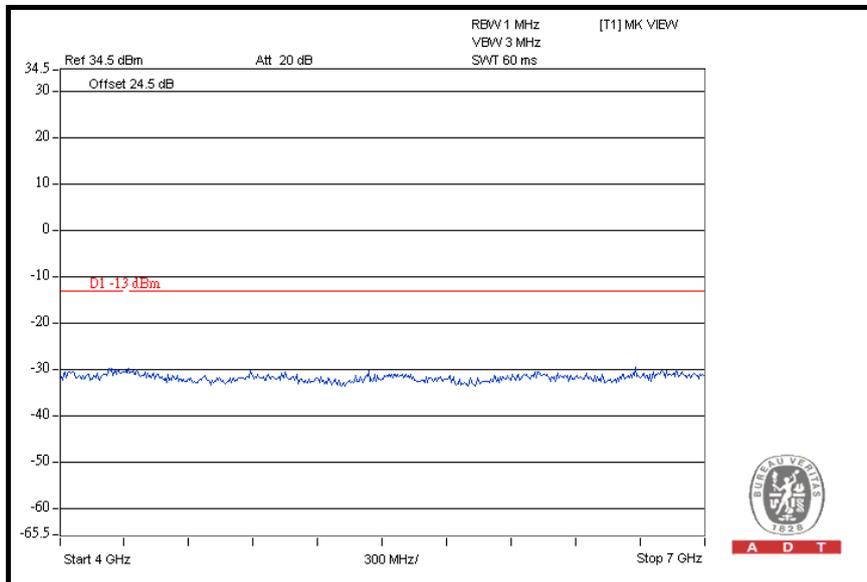
1GHz ~ 4GHz



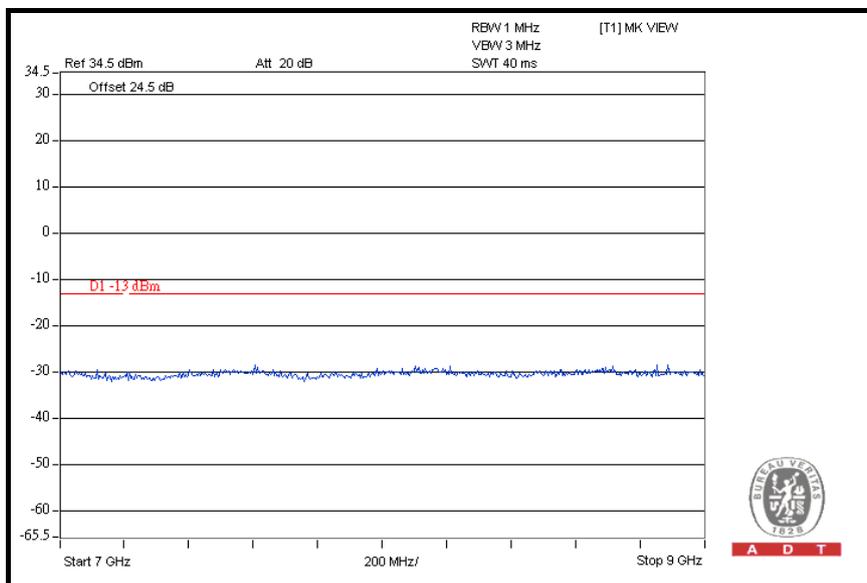


A D T

4GHz ~ 7GHz



7GHz ~ 9GHz





4.6 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The emission limit equal to -13 dBm. So the limit of emission is the same absolute specified line.

LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.2

NOTE: The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts.}$$

4.6.2 TEST INSTRUMENTS

Same as 4.1.2.

4.6.3 TEST PROCEDURES

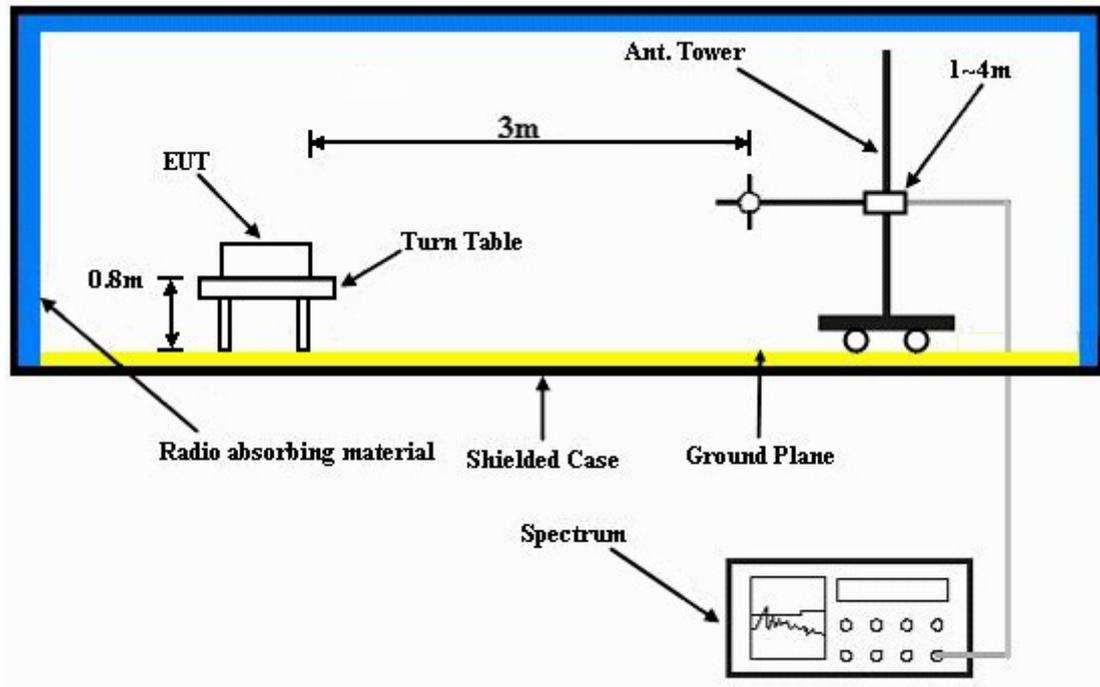
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



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

4.6.6 EUT OPERATING CONDITIONS

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



4.6.7 TEST RESULTS

FOR GPRS:

MODE	TX channel 251	FREQUENCY RANGE	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	INPUT POWER	120Vac, 60 Hz
TESTED BY	David Huang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	166.07	38.3	82.2	-43.9	2.00 H	10	24.3	14.0
2	296.31	40.0	82.2	-42.2	1.00 H	184	25.2	14.8
3	445.99	36.8	82.2	-45.4	2.00 H	247	18.1	18.7
4	665.65	34.3	82.2	-47.9	1.00 H	94	10.8	23.5
5	700.64	41.2	82.2	-41.0	1.00 H	343	17.1	24.1
6	751.18	40.2	82.2	-42.0	1.00 H	211	15.5	24.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	41.4	82.2	-40.8	1.00 V	346	28.9	12.5
2	290.48	37.8	82.2	-44.4	2.00 V	175	23.3	14.5
3	432.38	39.6	82.2	-42.6	1.00 V	295	21.3	18.3
4	500.42	40.1	82.2	-42.1	1.00 V	10	19.9	20.2
5	665.65	40.9	82.2	-41.3	2.00 V	226	17.4	23.5
6	751.18	37.7	82.2	-44.5	2.00 V	37	13.0	24.7

NOTE:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. This is valid for all 3 channels.



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FOR CDMA:

MODE	TX channel 777	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	INPUT POWER	120Vac, 60 Hz
TESTED BY	David Huang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	168.02	37.5	82.2	-44.7	2.00 H	10	23.80	13.7
2	284.65	39.4	82.2	-42.8	1.00 H	265	25.10	14.3
3	444.05	36.9	82.2	-45.3	2.00 H	259	18.30	18.6
4	665.65	45.0	82.2	-37.2	1.00 H	97	21.50	23.5
5	700.64	39.9	82.2	-42.3	1.00 H	115	15.80	24.1
6	751.18	42.1	82.2	-40.1	1.00 H	106	17.40	24.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.94	42.0	82.2	-40.2	1.00 V	178	29.50	12.5
2	298.26	37.5	82.2	-44.7	2.00 V	184	22.70	14.8
3	432.38	38.3	82.2	-43.9	1.00 V	325	20.00	18.3
4	500.42	38.5	82.2	-43.7	1.00 V	31	18.30	20.2
5	665.65	41.2	82.2	-41.0	1.00 V	268	17.70	23.5
6	700.64	38.5	82.2	-43.7	2.00 V	10	14.40	24.1

NOTE:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. This is valid for all 3 channels.



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FOR WCDMA:

MODE	TX channel 4233	FREQUENCY RANGE	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	INPUT POWER	120Vac, 60 Hz
TESTED BY	David Huang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	168.02	38.6	82.2	-43.6	2.00 H	10	24.9	13.7
2	286.59	39.3	82.2	-42.9	1.00 H	181	24.9	14.4
3	438.22	39.4	82.2	-42.8	2.00 H	109	20.9	18.5
4	665.65	43.3	82.2	-38.9	1.00 H	118	19.8	23.5
5	700.64	39.6	82.2	-42.6	2.00 H	124	15.5	24.1
6	751.18	41.5	82.2	-40.7	1.00 H	205	16.8	24.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	41.1	82.2	-41.10	1.00 V	346	28.6	12.5
2	168.02	33.2	82.2	-49.00	1.00 V	301	19.5	13.7
3	288.54	37.8	82.2	-44.40	2.00 V	163	23.3	14.5
4	399.34	37.0	82.2	-45.20	2.00 V	10	19.6	17.4
5	650.10	39.9	82.2	-42.30	1.00 V	10	16.6	23.3
6	665.65	41.2	82.2	-41.00	1.00 V	247	17.7	23.5

NOTE:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. This is valid for all 3 channels.



4.7 RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 22.917 (a), On any frequency outside a licensee's frequency block within GPRS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The emission limit equal to -13dBm .

4.7.2 TEST INSTRUMENTS

Same as 4.1.2.

4.7.3 TEST PROCEDURES

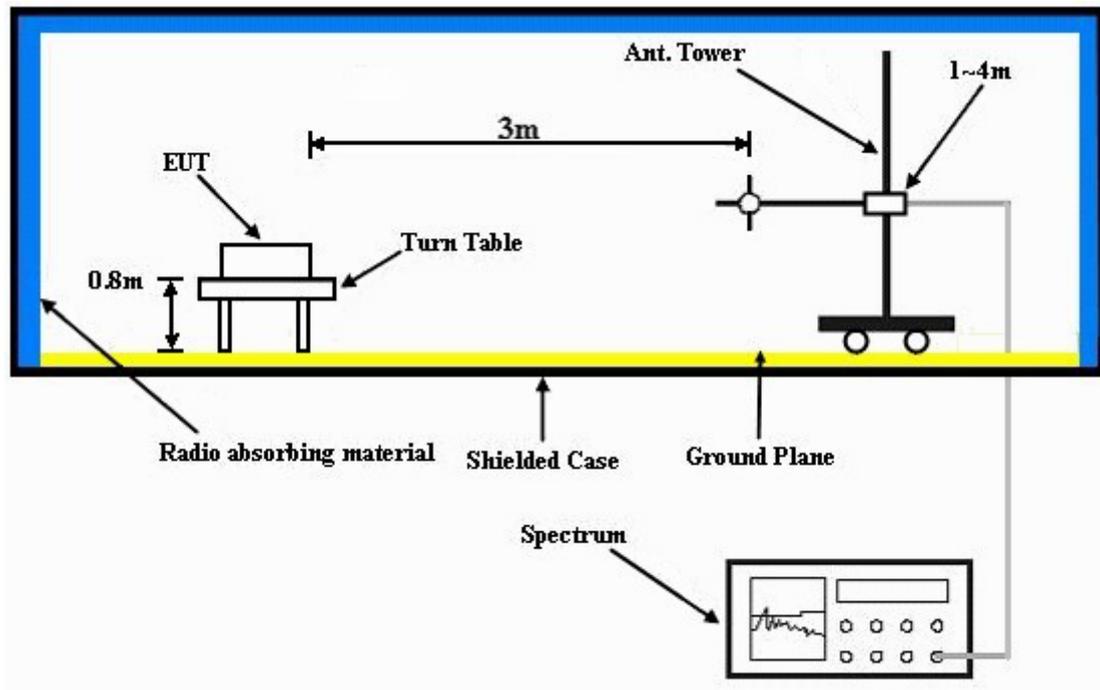
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi.}$

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



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

4.7.6 EUT OPERATING CONDITIONS

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



4.7.7 TEST RESULTS

FOR GPRS BAND:

MODE	TX channel 128	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1648.4	51.2	-13.0	-51.0	7.6	-43.4
2	2472.6	47.5	-13.0	-55.4	8.4	-47.0
3	3296.8	43.4	-13.0	-61.2	9.9	-51.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1648.4	53.2	-13.0	-49.0	7.6	-41.4
2	2472.6	50.9	-13.0	-52.0	8.4	-43.6
3	3296.8	43.8	-13.0	-60.8	9.9	-50.9

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



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MODE	TX channel 190	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1673.2	55.2	-13.0	-47.1	7.7	-39.4
2	2509.8	48.7	-13.0	-54.3	8.4	-45.9
3	3346.4	43.4	-13.0	-61.0	9.9	-51.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1673.2	55.4	-13.0	-46.9	7.7	-39.2
2	2509.8	49.4	-13.0	-53.6	8.4	-45.2
3	3346.4	42.8	-13.0	-61.0	9.9	-51.7

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



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MODE	TX channel 251	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1697.6	54.4	-13.0	-48.2	7.9	-40.3
2	2546.4	51.1	-13.0	-52.0	8.5	-43.5
3	3395.2	43.9	-13.0	-60.4	9.9	-50.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1697.6	56.6	-13.0	-46.0	7.9	-38.1
2	2546.4	51.9	-13.0	-51.2	8.5	-42.7
3	3395.2	43.6	-13.0	-60.7	9.9	-50.8

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



FOR CDMA BAND:

MODE	Channel 1013	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1649.4	42.3	-13.0	-59.9	7.6	-52.3
2	2474.1	42.6	-13.0	-60.3	8.4	-51.9
3	3298.8	45.9	-13.0	-58.7	9.9	-48.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1649.4	44.3	-13.0	-57.9	7.6	-50.3
2	2474.1	41.0	-13.0	-61.9	8.4	-53.5
3	3298.8	48.1	-13.0	-56.5	9.9	-46.6

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



MODE	Channel 384	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1673.04	45.6	-13.0	-56.7	7.7	-49.0
2	2509.56	41.3	-13.0	-61.7	8.4	-53.3
3	3346.08	44.4	-13.0	-60.0	9.9	-50.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1673.04	45.7	-13.0	-56.6	7.7	-48.9
2	2509.56	40.8	-13.0	-62.2	8.4	-53.8
3	3346.08	46.6	-13.0	-57.8	9.9	-47.9

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



MODE	Channel 777	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1696.62	48.6	-13.0	-54.0	7.9	-46.1
2	2544.93	42.4	-13.0	-60.7	8.5	-52.2
3	3393.24	45.5	-13.0	-58.8	9.9	-48.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1696.62	49.2	-13.0	-53.4	7.9	-45.5
2	2544.93	41.3	-13.0	-61.8	8.5	-53.3
3	3393.24	46.3	-13.0	-58.0	9.9	-48.1

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



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FOR WCDMA BAND:

MODE	TX channel 4132	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1652.8	41.7	-13.0	-60.5	7.6	-52.9
2	2479.2	39.8	-13.0	-63.1	8.4	-54.7
3	3305.6	44.8	-13.0	-59.8	9.9	-49.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1652.8	42.4	-13.0	-59.8	7.6	-52.2
2	2479.2	39.8	-13.0	-63.1	8.4	-54.7
3	3305.6	43.8	-13.0	-60.8	9.9	-50.9

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



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MODE	TX channel 4182	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1672.8	44.1	-13.0	-58.2	7.7	-50.5
2	2509.2	39.8	-13.0	-63.2	8.4	-54.8
3	3345.6	44.7	-13.0	-59.7	9.9	-49.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1672.8	44.2	-13.0	-58.1	7.7	-50.4
2	2509.2	40.0	-13.0	-63.0	8.4	-54.6
3	3345.6	42.9	-13.0	-61.5	9.9	-51.6

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



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MODE	TX channel 4233	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Mark Liao		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1693.2	46.7	-13.0	-55.9	7.9	-48.0
2	2539.8	41.9	-13.0	-61.2	8.5	-52.7
3	3386.4	44.6	-13.0	-59.7	9.9	-49.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1693.2	46.0	-13.0	-56.6	7.9	-48.7
2	2539.8	40.0	-13.0	-63.1	8.5	-54.6
3	3386.4	43.3	-13.0	-61.0	9.9	-51.1

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



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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.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

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Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

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Web Site: www.adt.com.tw

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



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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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