



# FCC TEST REPORT (PART 22)

**REPORT NO.:** RF991207D25C-3

**MODEL NO.:** PCG-4121AL, PCG-4121BL

**FCC ID:** AK8PCG4121AL

**RECEIVED:** Dec. 10, 2010

**TESTED:** Dec. 17 ~ Dec. 20, 2010

**ISSUED:** Dec. 23, 2010

**APPLICANT:** Sony Corporation

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Dec. 23, 2010



# 1 CERTIFICATION

**PRODUCT:** Personal Computer  
**MODEL NO.:** PCG-4121AL, PCG-4121BL  
**BRAND:** SONY  
**APPLICANT:** Sony Corporation  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**TESTED :** Dec. 17 ~ Dec. 20, 2010  
**STANDARDS :** **FCC Part 22, Subpart H**  
ANSI C63.4-2003

The above equipment (model: PCG-4121AL) 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 : Dec. 23, 2010  
Andrea Hsia / Specialist

APPROVED BY : Gary Chang , DATE : Dec. 23, 2010  
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.r.p peak power	PASS	Meet the requirement of limit. Minimum passing margin is 29.4dBm at 848.8MHz.
2.1055	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. $\pm 2.5$ 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 -35.7dB 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

<b>PRODUCT</b>	Personal Computer
<b>MODEL NO.</b>	PCG-4121AL, PCG-4121BL
<b>FCC ID</b>	AK8PCG4121AL
<b>NOMINAL VOLTAGE</b>	11.1Vdc (Li-Lon battery) 19.5Vdc (Adapter) 5Vdc (Adapter)
<b>OPERATION TEMPERATURE RANGE</b>	-20°C ~ 55°C
<b>MODULATION TYPE</b>	GMSK, 8PSK (for GPRS, E-GPRS) QPSK, OQPSK, HPSK (for CDMA) BPSK (for WCDMA)
<b>FREQUENCY RANGE</b>	824.2MHz ~ 848.8MHz (for GPRS, E-GPRS) 824.7MHz ~ 848.31MHz (for CDMA) 826.4MHz ~ 846.6MHz (for WCDMA)
<b>NUMBER OF CHANNEL</b>	124 (for GPRS, E-GPRS) 788 (for CDMA) 102 (for WCDMA)
<b>MAX. ERP POWER</b>	GPRS Mode: 29.4dBm (0.8610Watts) E-GPRS Mode: 24.7dBm (0.2917Watts) CDMA Mode: 21.2dBm (0.1303Watts) WCDMA Mode: 21.2dBm (0.1303Watts)
<b>ANTENNA TYPE</b>	Refer to note as below
<b>MAX. ANTENNA GAIN</b>	Refer to note as below
<b>I/O PORTS</b>	Refer to user's manual
<b>DATA CABLE</b>	NA
<b>ACCESSORY DEVICES</b>	Adapter, Battery

**NOTE:**

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

BRAND	MODELNAME	TOPCOVER LESS OF ODD
SONY	PCG-4121AL	Without
SONY	PCG-4121BL	With

- \*\*During the test, the model no.: PCG-41211L 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
PIFA	Hirose U.FL	ACON	0.23dBi



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4. The EUT is a Personal Computer. The functions of EUT listed as below:

	TEST STANDARD	REFERENCE REPORT
WLAN 802.11b/g	FCC Part 15, Subpart C (Section 15.247)	RF991207D25C-1
BLUETOOTH	FCC Part 15, Subpart C (Section 15.247)	RF991207D25C-2
GSM 850 / CDMA 850 / WCDMA 850	FCC Part 22	RF991207D25C-3
PCS 1900 / CDMA 1900 / WCDMA 1900	FCC Part 24	RF991207D25C-4

5. The EUT were powered by the following adapters:

Adapter 1 (2PIN)	
BRAND:	NJRC
MODEL:	VGP-AC19V31
INPUT:	100-240Vac, 50/60Hz, 1.5A
OUTPUT:	19.5Vdc, 4.7A
POWER LINE:	AC: 0.8m non-shielded cable without core DC: 1.8m non-shielded cable without core

Adapter 2 (3PIN)	
BRAND:	NJRC
MODEL:	VGP-AC19V32
INPUT:	100-240Vac, 50/60Hz, 1.5A
OUTPUT:	19.5Vdc, 4.7A
POWER LINE:	AC: 0.8m non-shielded cable without core DC: 1.8m non-shielded cable without core

Adapter 3 (3PIN)	
BRAND:	Liteon
MODEL:	VGP-AC19V36
INPUT:	100-240Vac, 50/60Hz, 1.5A
OUTPUT:	19.5Vdc, 4.7A
POWER LINE:	AC: 0.8m non-shielded cable without core DC: 1.8m non-shielded cable without core

Adapter 4 (3PIN)	
BRAND:	Delta
MODEL:	VGP-AC19V42
INPUT:	100-240Vac, 50/60Hz, 1.5A
OUTPUT:	19.5Vdc, 4.7A
POWER LINE:	AC: 0.8m non-shielded cable without core DC: 1.8m non-shielded cable without core

Adapter 5 (3PIN)	
BRAND:	Delta
MODEL:	VGP-AC19V51
INPUT:	100-240Vac, 50/60Hz, 1.5A
OUTPUT:	19.5Vdc, 4.7A 5Vdc, 1.5A 5Vdc, 1.5A
POWER LINE:	AC: 0.8m non-shielded cable without core DC: 1.8m non-shielded cable without core

6. The EUT had lithium battery listed as below:

LI-ION BATTERY	
<b>BRAND:</b>	Sony
<b>MODEL:</b>	VGP-BPS24
<b>RATING:</b>	11.1Vdc, 4400mAh

\*\*Battery 1 was chosen as the representative for testing.

7. The communicated functions of EUT listed as below:

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

8. The EUT has no voice function.

9. Hardware version: P3

10. Software version: D1025MSTUTABGD3600 (GPRS & WCDMA)

11. IMEI Code: 001012345678901

12. 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. The EUT has GPRS & E-GPRS functions. After pre-testing, GPRS function is the worst case for all the emission tests.

#### 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	SO32
MIDDLE	384	836.52 MHz	SO32
HIGH	777	848.31 MHz	SO32

#### 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. In this report, CDMA2000 (SO32) was the worst case for all test items, therefore, only the data was recorded in the following section.

**FOR WCDMA:**

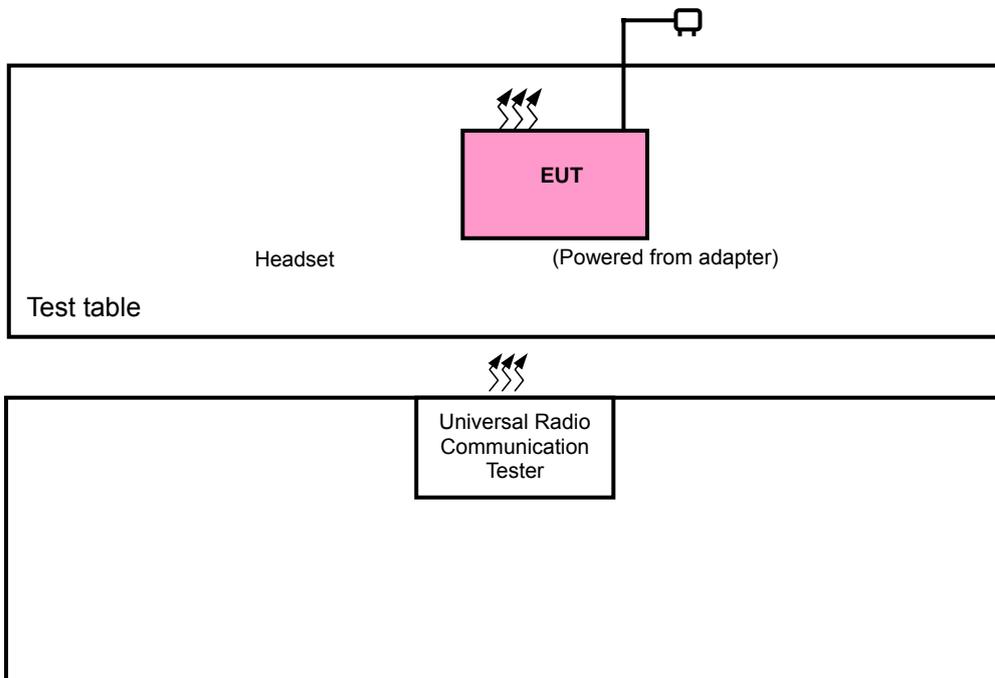
102 channels are provided to this EUT. Therefore, the low, middle and high channels are chosen for testing.

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

**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.
4. WCDMA-RMC mode has been chosen for the worst case to do the final test and record.

**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

#### 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, 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, 68%RH, 991 hPa	120Vac, 60Hz	Sun Lin
RE ≥ 1G	25deg. 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

### 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, 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, 68%RH, 991 hPa	120Vac, 60Hz	Sun Lin
RE ≥ 1G	25deg. C, 65%RH, 991 hPa	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

**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



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### **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, 68%RH, 991 hPa	120Vac, 60Hz	Sun Lin
RE ≥ 1G	25deg. 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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
1	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU200	104484	Feb. 02, 2010	Feb. 01, 2011
2	NJZ-2000 (GPRS+WCDMA SIMULATOR)	JRC	NJZ-2000	ET00054	Sep. 30, 2010	Sep. 29, 2011

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	ESI7	838496/016	Dec. 29, 2009	Dec. 28, 2010
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jan. 11, 2010	Jan. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 28, 2010	Apr. 27, 2011
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 05, 2010	Jan. 04, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Dec. 25, 2009	Dec. 24, 2010
Preamplifier Agilent	8449B	3008A01961	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8447D	2944A10738	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274041/4	Aug. 21, 2010	Aug. 20, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283397/4	Aug. 21, 2010	Aug. 20, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT.	TT100.	TT93021704	NA	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA	NA

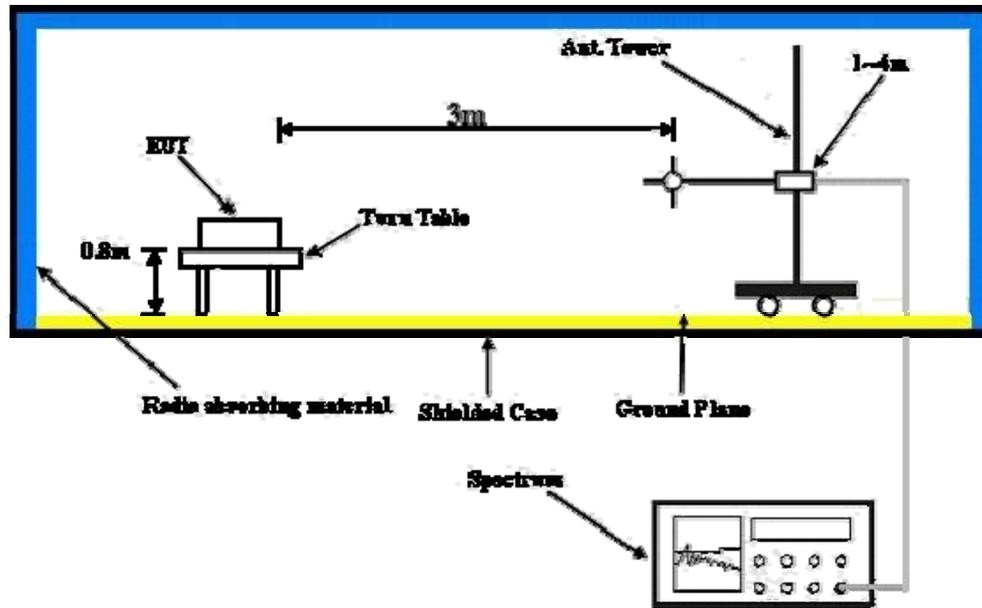
- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 4.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 988962.
  5. The IC Site Registration No. is IC7450F-4.

#### 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,  
 $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi.}$

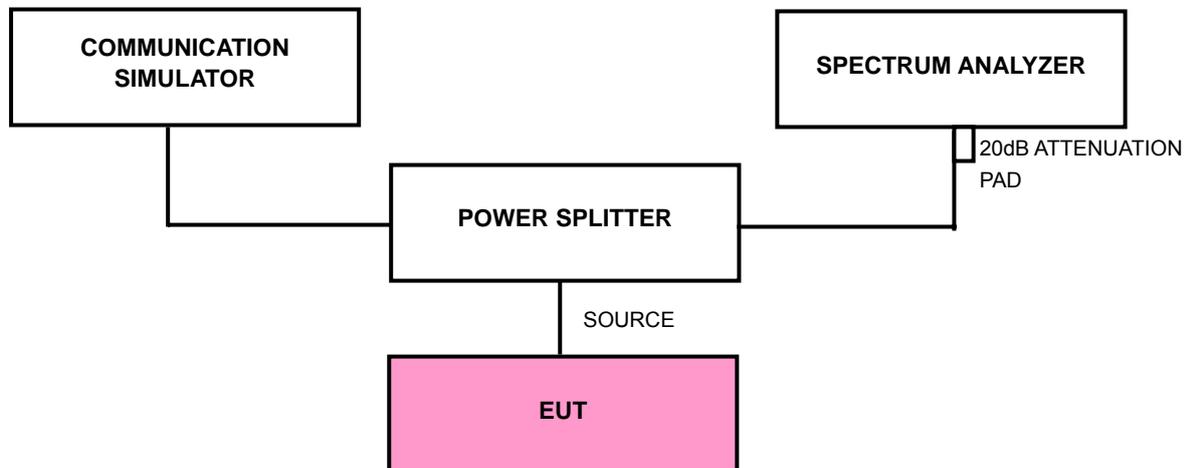
#### 4.1.4 TEST SETUP

##### 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

- 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.

#### 4.1.6 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	8.60	23.50	32.10	1.6218
190	836.6	8.80	23.50	32.30	1.6982
251	848.8	8.65	23.50	32.15	1.6406

##### 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	3.62	23.50	27.12	0.5152
190	836.6	3.46	23.50	26.96	0.4966
251	848.8	3.43	23.50	26.93	0.4932

- 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	36.8	-8.6	28.2	0.6531
190	836.6	37.0	-8.6	28.4	0.6839
251	848.8	38.1	-8.7	<b>29.4</b>	<b>0.8610</b>

**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	31.0	-8.6	22.4	0.1718
190	836.6	32.1	-8.6	23.5	0.2213
251	848.8	33.4	-8.7	<b>24.7</b>	<b>0.2917</b>

**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	0.6	0.5	23.50	24.11	0.2576	24.03	0.2529
384	836.52	0.8	0.6	23.50	24.31	0.2698	24.13	0.2588
777	848.31	0.6	0.5	23.50	24.09	0.2564	24.01	0.2518

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	0.83	0.75		-	-	23.50	24.33
		RC3	0.85	0.88	0.92	0.88	23.50	24.35	24.38	24.42	24.38
384	836.52	RC1	0.96	0.91	-	-	23.50	24.46	24.41	-	-
		RC3	1.10	0.93	1.15	0.99	23.50	24.60	24.43	24.65	24.49
777	848.31	RC1	0.79	0.86	-	-	23.50	24.29	24.36	-	-
		RC3	0.93	0.89	0.98	0.85	23.50	24.43	24.39	24.48	24.35

**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.



A D T

### 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	28.0	27.9	-8.6	19.4	0.0861	19.3	0.0841
384	836.52	27.4	28.0	-8.6	18.8	0.0750	19.4	0.0861
777	848.31	29.0	28.9	-8.7	20.3	0.1059	20.2	0.1035

### CDMA MODE

ERP POWER (SO32)					
CHANNEL NO.	FREQUENCY (MHz)	S.G. VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
1013	824.70	28.6	-8.6	20.0	0.0989
384	836.52	28.9	-8.6	20.3	0.1059
777	848.31	29.9	-8.7	21.2	0.1303

**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	0.88	23.50	24.38	0.2742
4182	836.4	1.09	23.50	24.59	0.2877
4233	846.6	1.01	23.50	24.51	0.2825

**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	0.86	23.50	24.36	0.2729
4182	836.4	1.02	23.50	24.52	0.2831
4233	846.6	0.97	23.50	24.47	0.2799

**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	0.63	23.50	24.13	0.2588
4182	836.4	0.91	23.50	24.41	0.2761
4233	846.6	0.86	23.50	24.36	0.2729

**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	-0.47	23.50	23.03	0.2009
4182	836.4	-0.31	23.50	23.19	0.2084
4233	846.6	-0.37	23.50	23.13	0.2056

**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	-0.98	23.50	22.52	0.1786
4182	836.4	-0.98	23.50	22.52	0.1786
4233	846.6	-1.13	23.50	22.37	0.1726

#### 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	-0.96	23.50	22.54	0.1795
4182	836.4	-0.56	23.50	22.94	0.1968
4233	846.6	-0.18	23.50	23.32	0.2148

#### 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	-0.57	23.50	22.93	0.1963
4182	836.4	-0.20	23.50	23.30	0.2138
4233	846.6	-0.49	23.50	23.01	0.2000

#### 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	-0.67	23.50	22.83	0.1919
4182	836.4	0.06	23.50	23.56	0.2270
4233	846.6	0.08	23.50	23.58	0.2280

**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	-0.20	23.50	23.30	0.2138
4182	836.4	-0.85	23.50	22.65	0.1841
4233	846.6	-0.42	23.50	23.08	0.2032

#### 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	-0.79	23.50	22.71	0.1866
4182	836.4	0.39	23.50	23.89	0.2449
4233	846.6	-0.35	23.50	23.15	0.2065

- 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	28.3	-8.6	19.7	0.0923
4182	836.4	28.6	-8.6	20.0	0.0989
4233	846.6	29.8	-8.7	<b>21.2</b>	<b>0.1303</b>

**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)  $-30^{\circ}\text{C} \sim 55^{\circ}\text{C}$ .

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY44360124	Feb. 05, 2010	Feb. 04, 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	920409	May 06, 2010	May 05, 2011

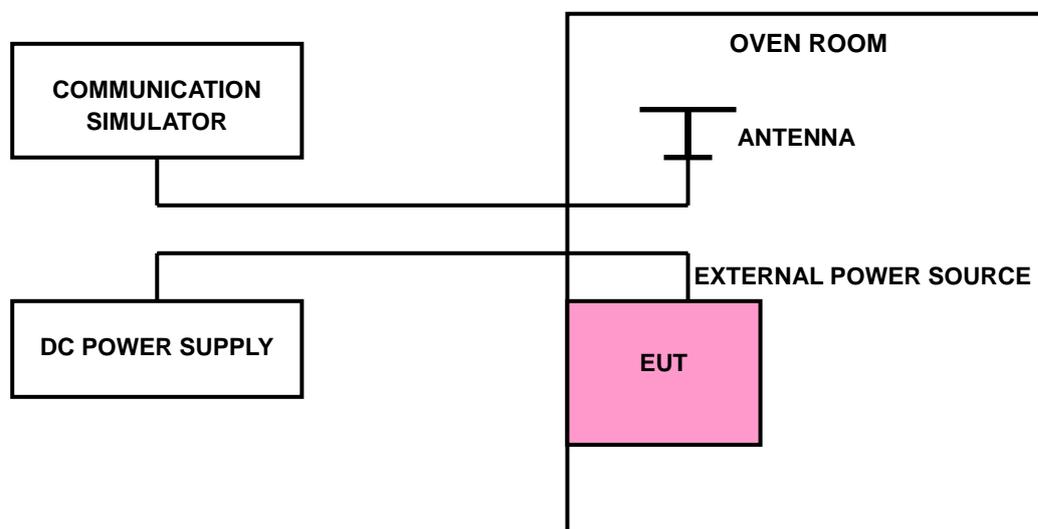
**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

#### 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  $\pm 0.5^{\circ}\text{C}$  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



#### 4.2.5 TEST RESULTS

##### FOR GPRS:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
126.5	-15	-0.018	2.5
93.5	-10	-0.012	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. (°C)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
55	22	0.026	2.5
50	20	0.024	2.5
40	21	0.025	2.5
30	8	0.010	2.5
20	-13	-0.016	2.5
10	-18	-0.022	2.5
0	-18	-0.022	2.5
-10	-13	-0.016	2.5
-20	-13	-0.016	2.5
-30	-12	-0.014	2.5

**FOR CDMA:**

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
126.5	9	0.011	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. (°C)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
55	19	0.023	2.5
50	18	0.022	2.5
40	20	0.024	2.5
30	14	0.017	2.5
20	4	0.005	2.5
10	-7	-0.008	2.5
0	-12	-0.014	2.5
-10	-16	-0.019	2.5
-20	-19	-0.023	2.5
-30	-22	-0.026	2.5

**FOR WCDMA:**

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
126.5	-18	-0.022	2.5
93.5	-9	-0.011	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. (°C)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
55	24	0.029	2.5
50	22	0.026	2.5
40	23	0.027	2.5
30	11	0.013	2.5
20	-7	-0.008	2.5
10	-18	-0.022	2.5
0	-19	-0.023	2.5
-10	-15	-0.018	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

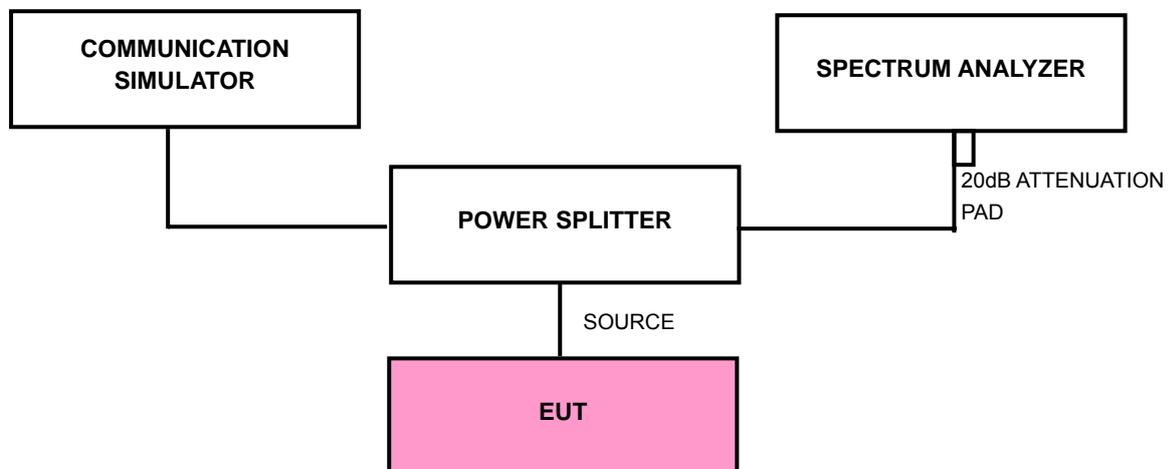
According to FCC 2.1049 (h) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100040	Jul. 09, 2010	Jul. 08, 2011
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 25, 2010	Jun. 24, 2011
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 (WCDMA) / 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. This splitter loss and cable loss is the worst loss 23.5dB in the transmitted path track.
- 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.

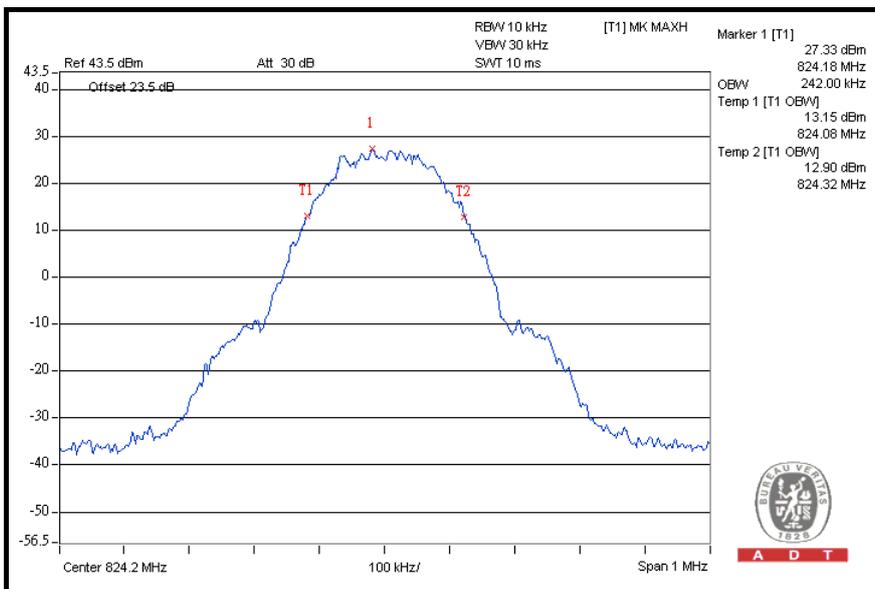
### 4.3.6 TEST RESULTS

**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	242
251	848.8	242

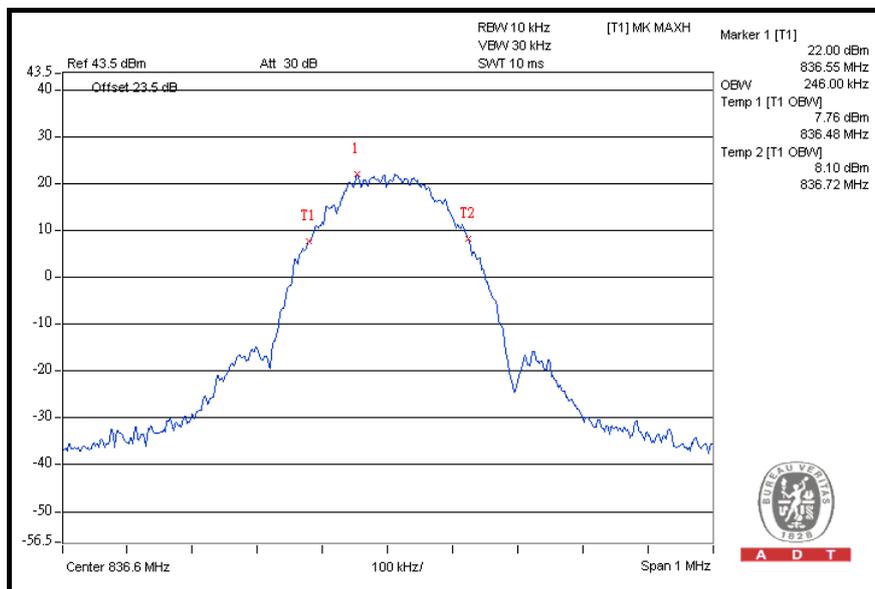
#### CH 128



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

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)
128	824.2	246
190	836.6	246
251	848.8	244

**CH 190**

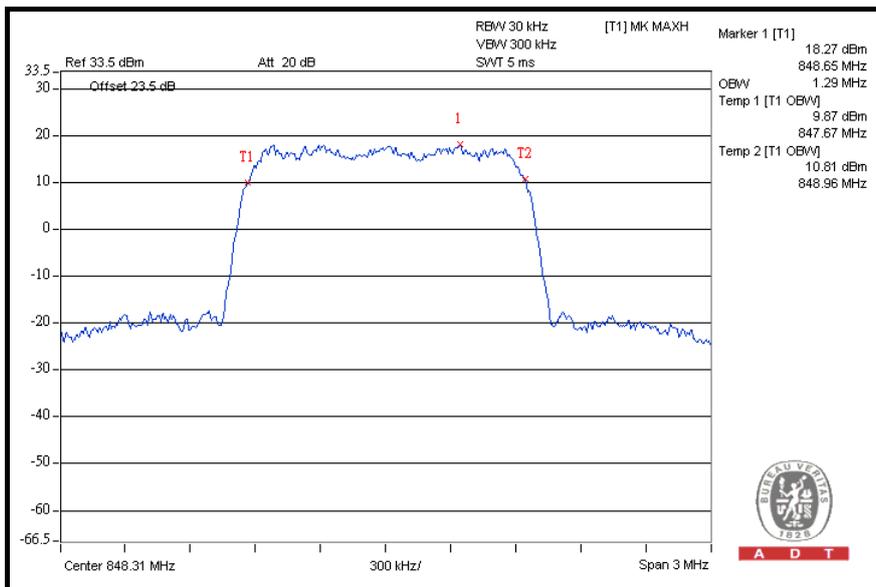


FOR CDMA

FOR SO32:

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
1013	824.70	1.28
384	836.52	1.28
777	848.31	1.29

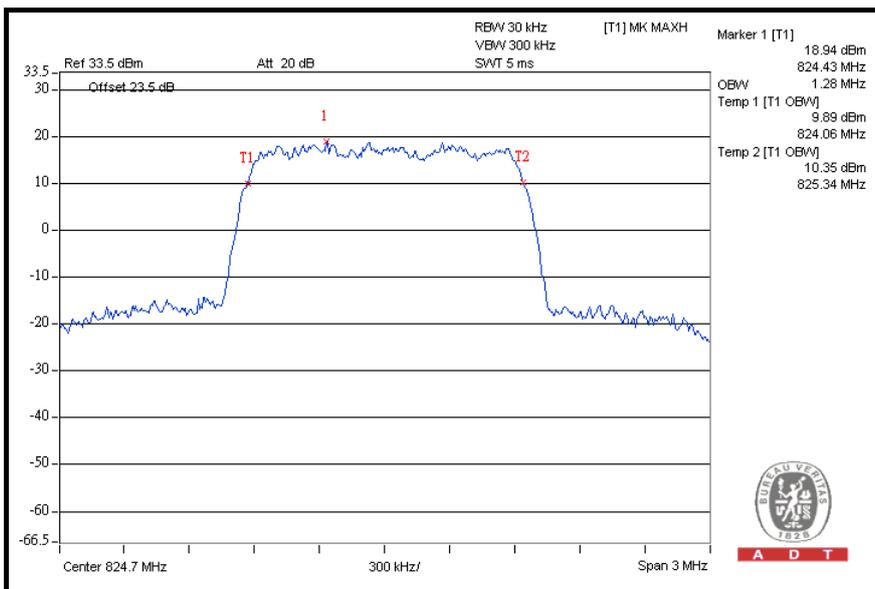
CH 777



FOR EV-DO Rev. A:

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

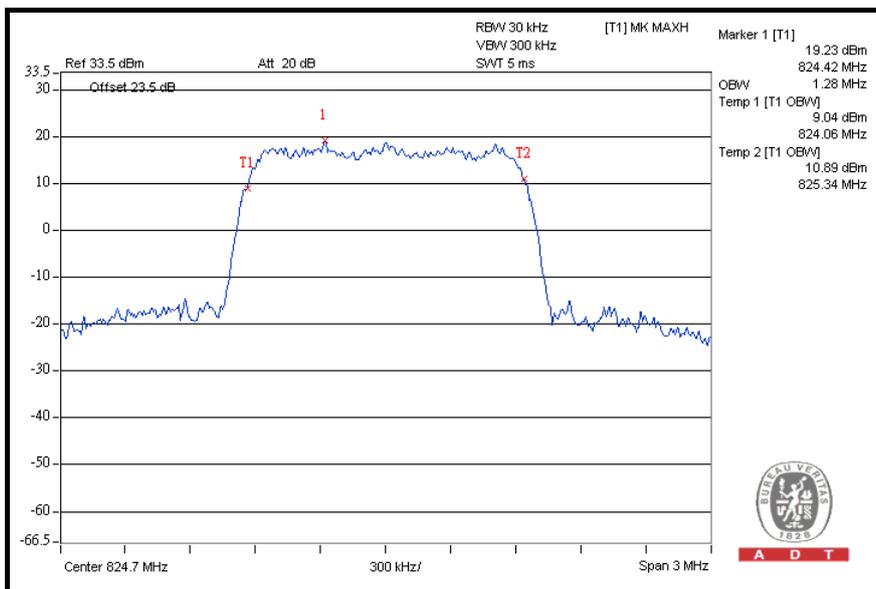
CH 1013



FOR EV-DO Rev. 0

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

CH 1013

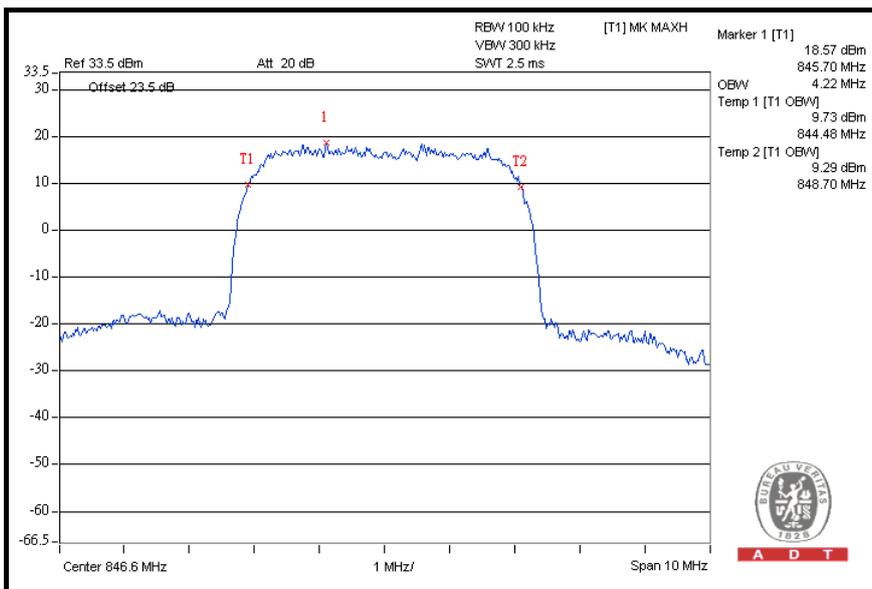


**FOR WCDMA:**

**FOR WCDMA-RMC:**

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
4132	826.4	4.18
4182	836.4	4.20
4233	846.6	4.22

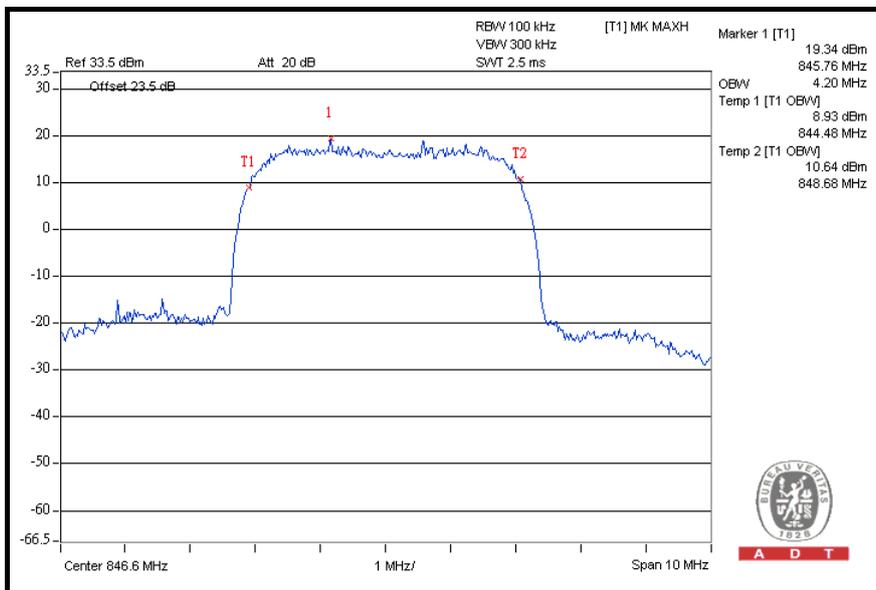
**CH 4233**



**FOR HSDPA:**

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
4132	826.4	4.18
4182	836.4	4.20
4233	846.6	4.20

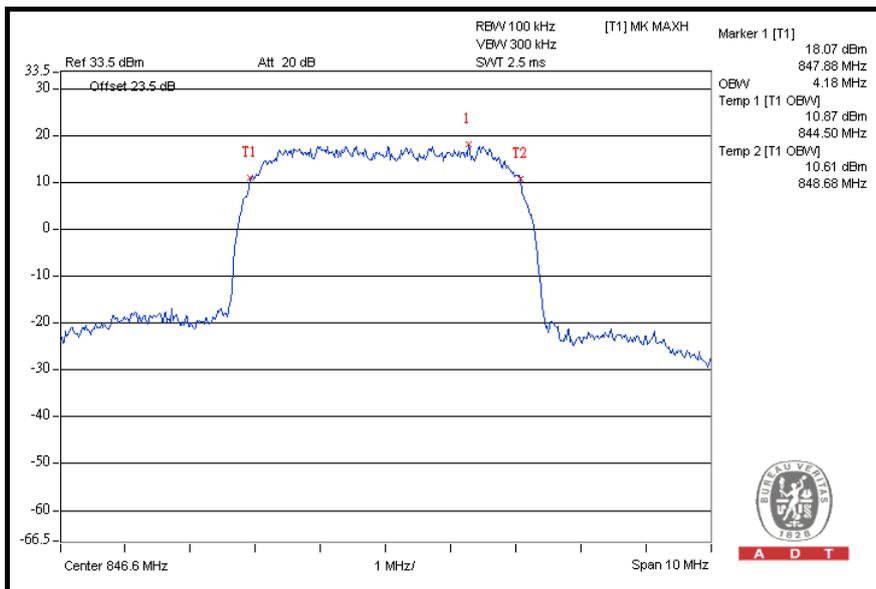
**CH 4233**



**FOR HSUPA:**

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
4132	826.4	4.18
4182	836.4	4.18
4233	846.6	4.18

**CH 4233**



## 4.4 BAND EDGE MEASUREMENT

### 4.4.1 LIMITS OF BAND EDGE MEASUREMENT

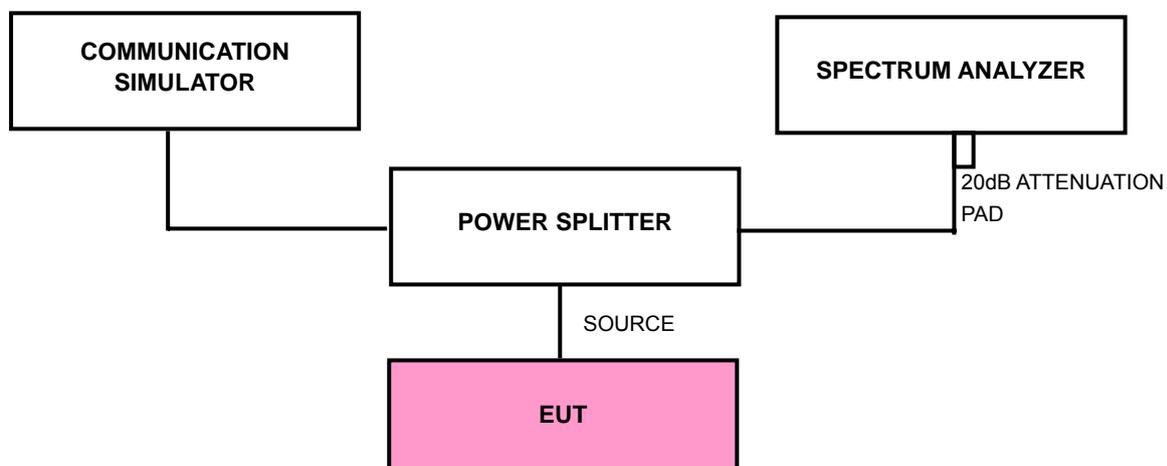
According to FCC 22.917 specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution 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	100040	Jul. 09, 2010	Jul. 08, 2011
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 25, 2010	Jun. 24, 2011
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 phone 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 23.5dB 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

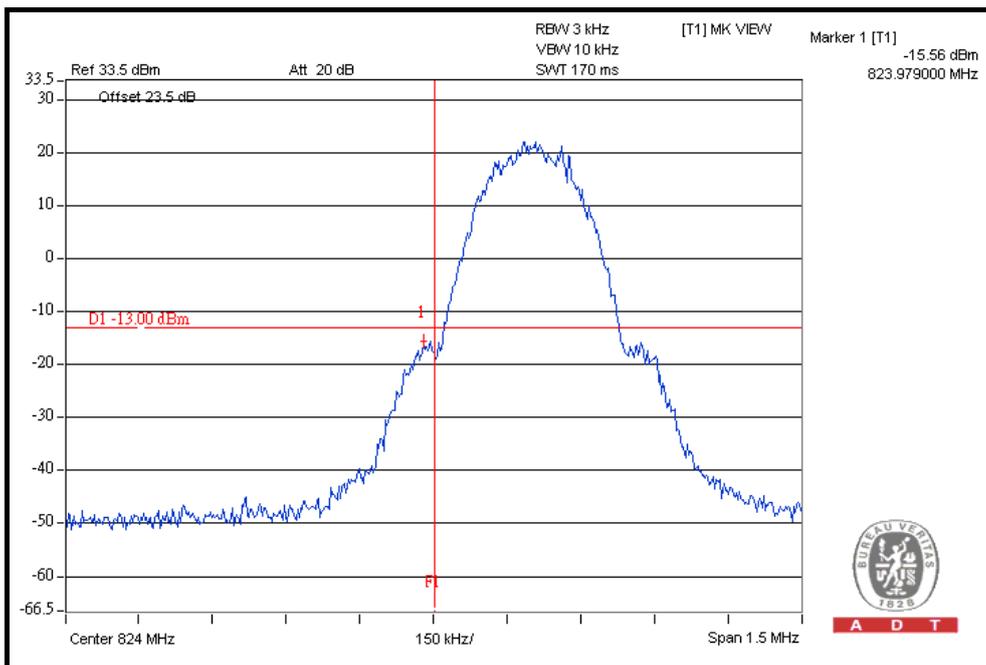
- a. The EUT makes a phone call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

#### 4.4.6 TEST RESULTS

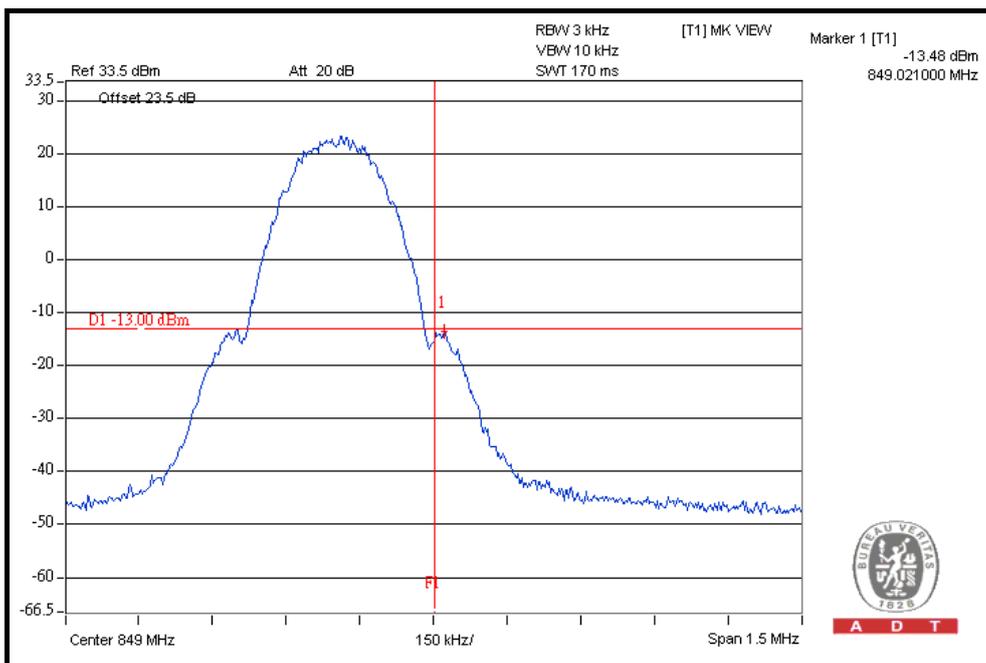
**FOR GPRS / E-GPRS:**

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

##### LOWER BAND EDGE



##### HIGHER BAND EDGE

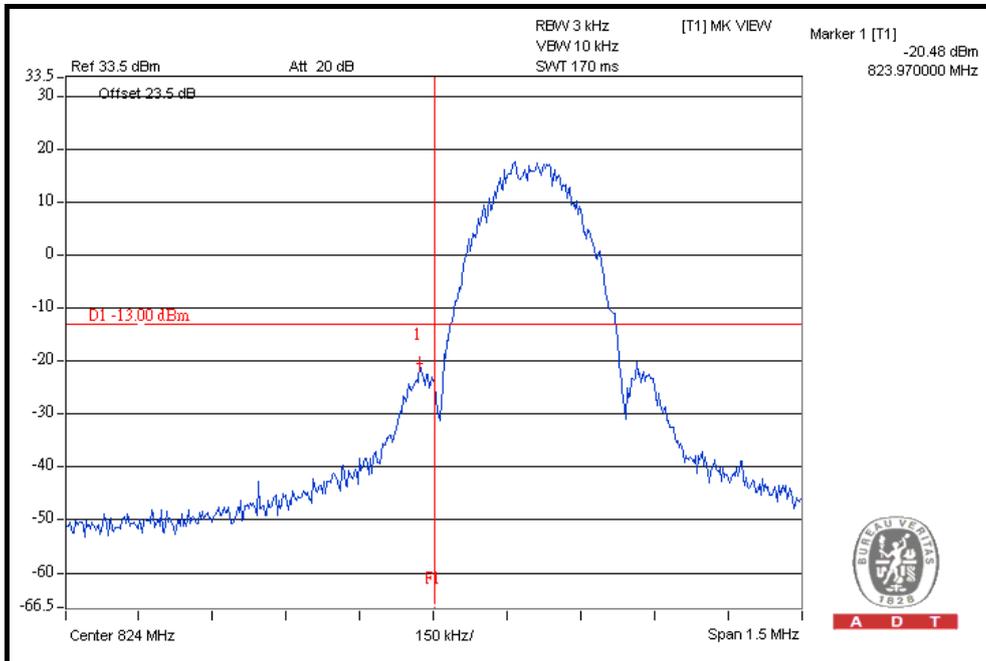




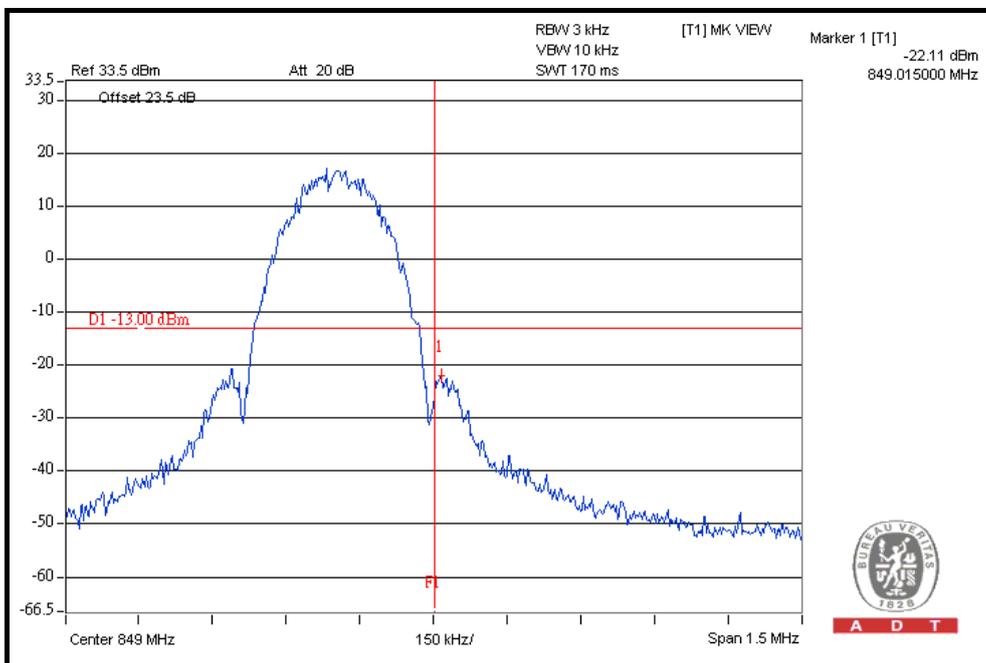
A D T

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

#### LOWER BAND EDGE



#### HIGHER BAND EDGE



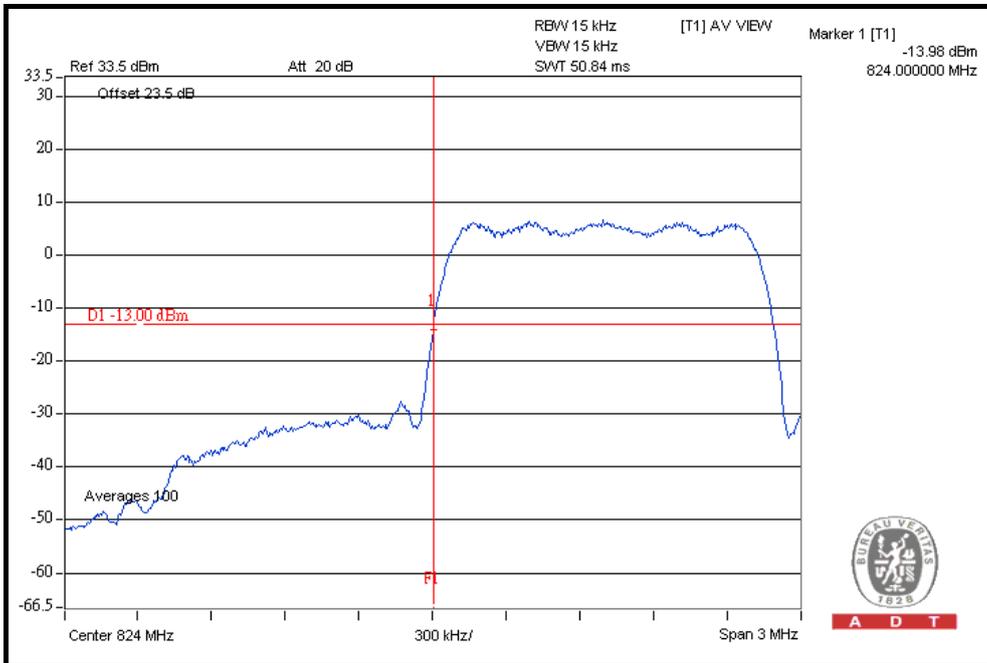


A D T

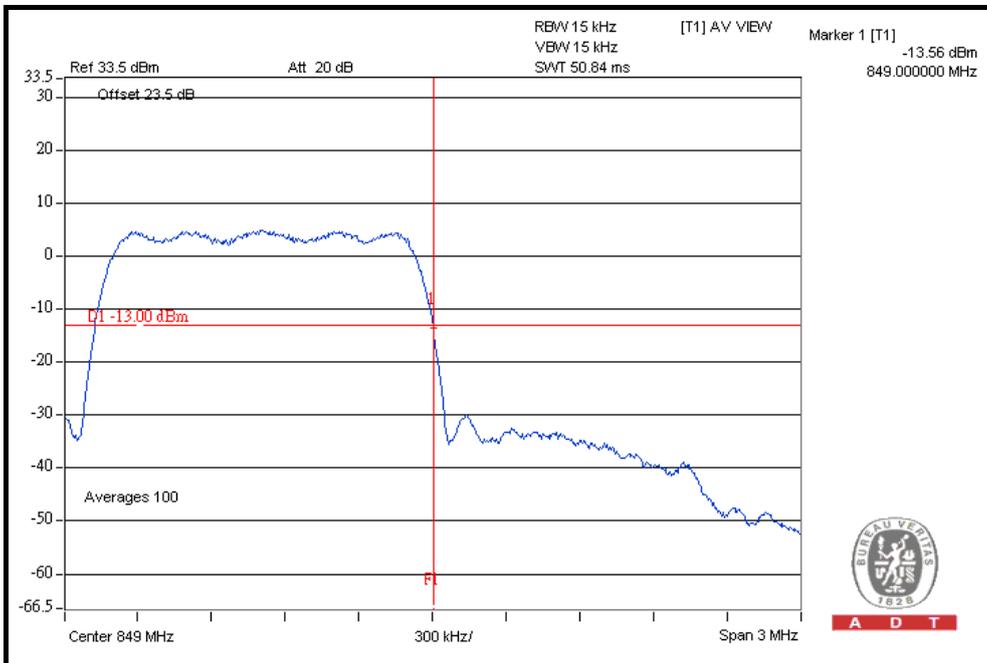
FOR CDMA:

FOR SO32:

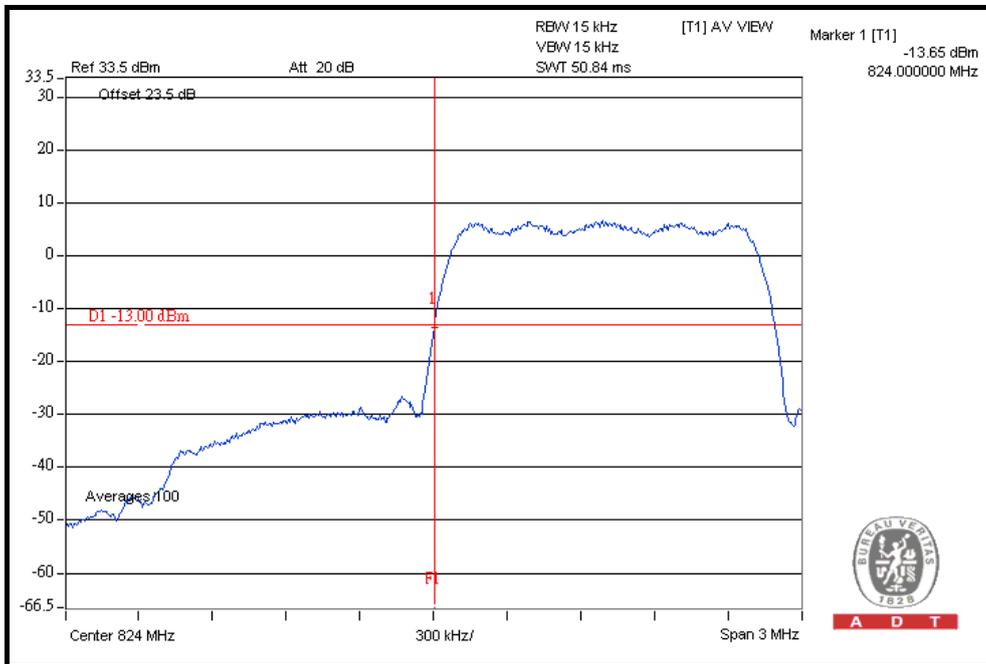
### LOWER BAND EDGE



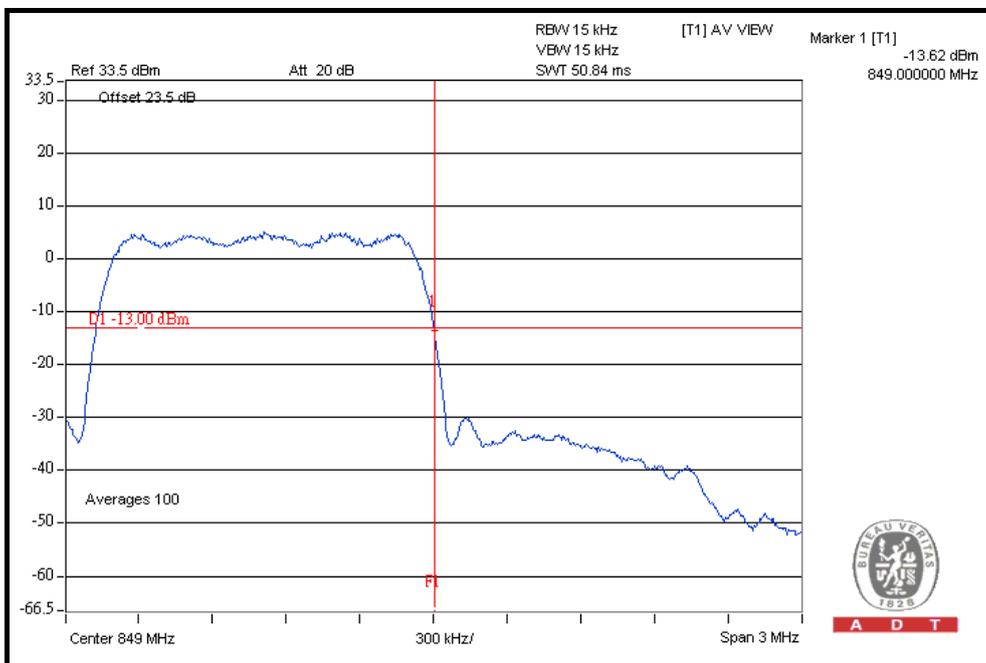
### HIGHER BAND EDGE



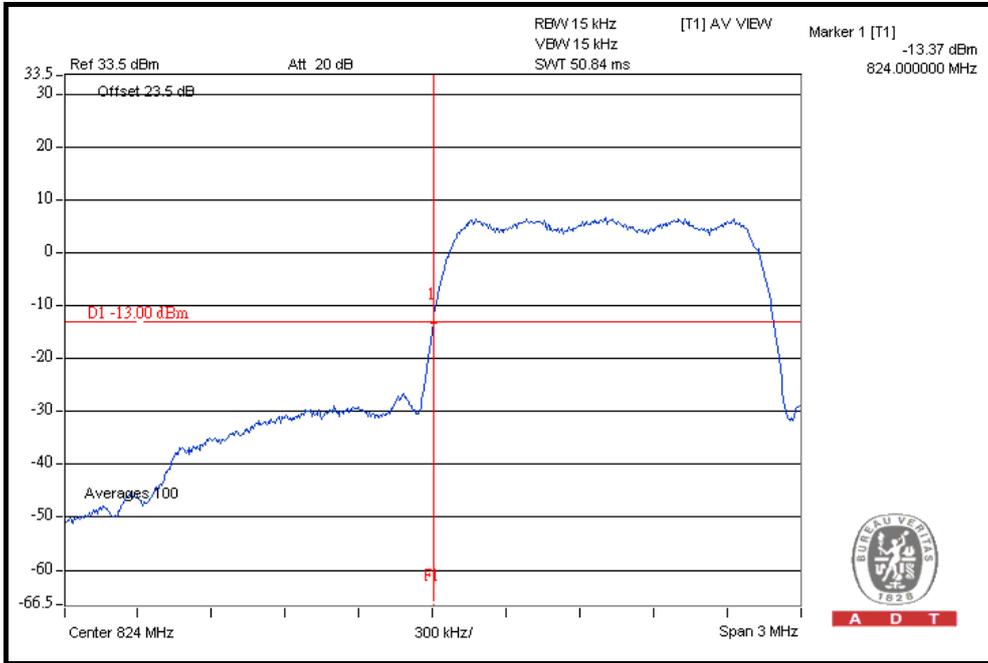
**FOR EV-DO Rev. A:  
LOWER BAND EDGE**



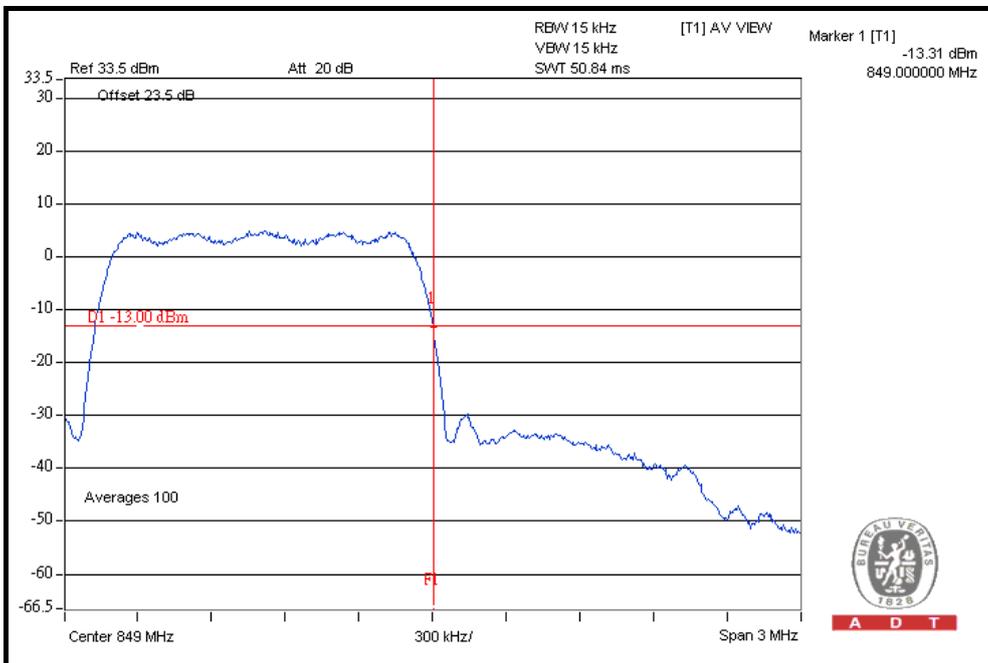
**HIGHER BAND EDGE**



**FOR EV-DO Rev. 0:  
LOWER BAND EDGE**



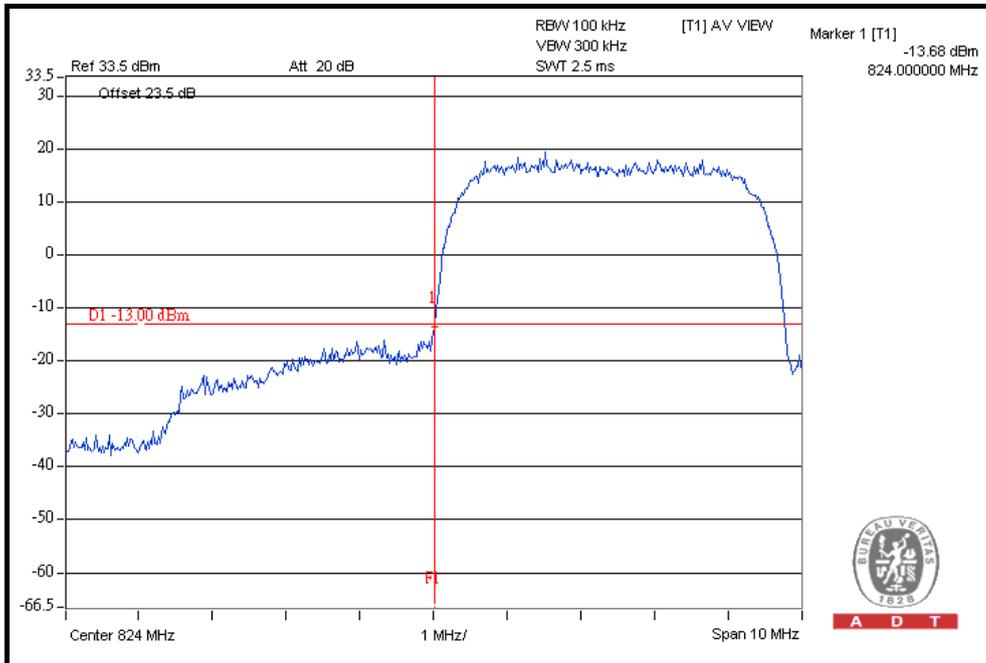
**HIGHER BAND EDGE**



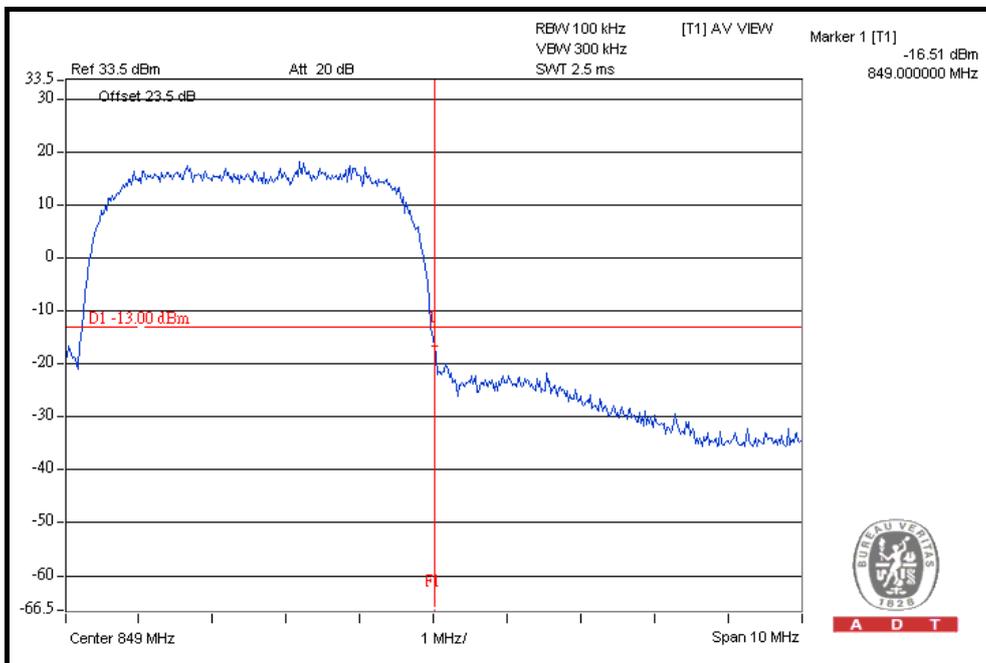
FOR WCDMA:

WCDMA MODE

LOWER BAND EDGE

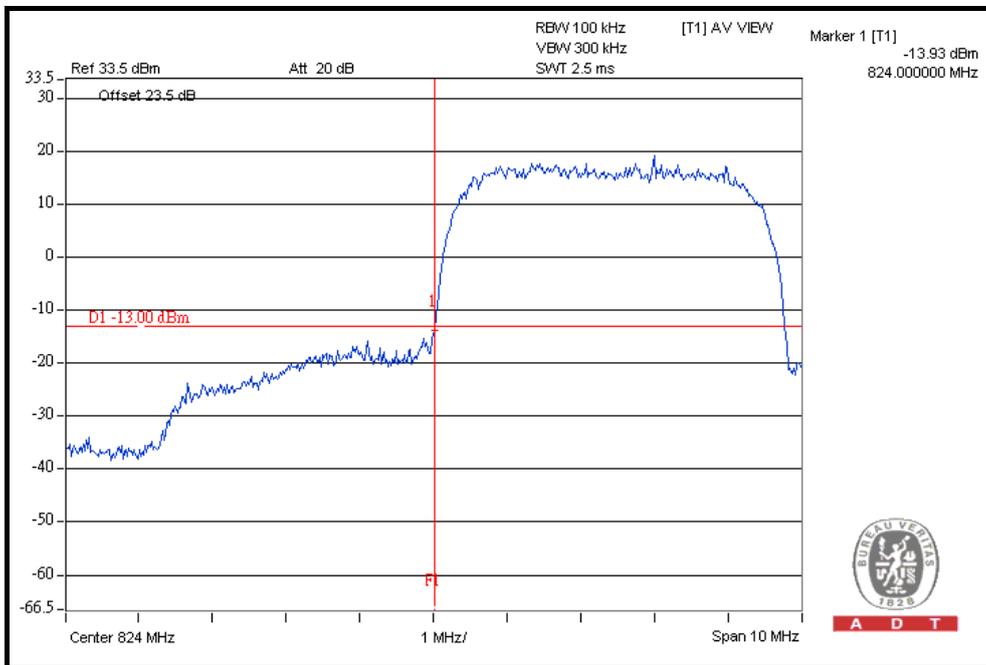


HIGHER BAND EDGE

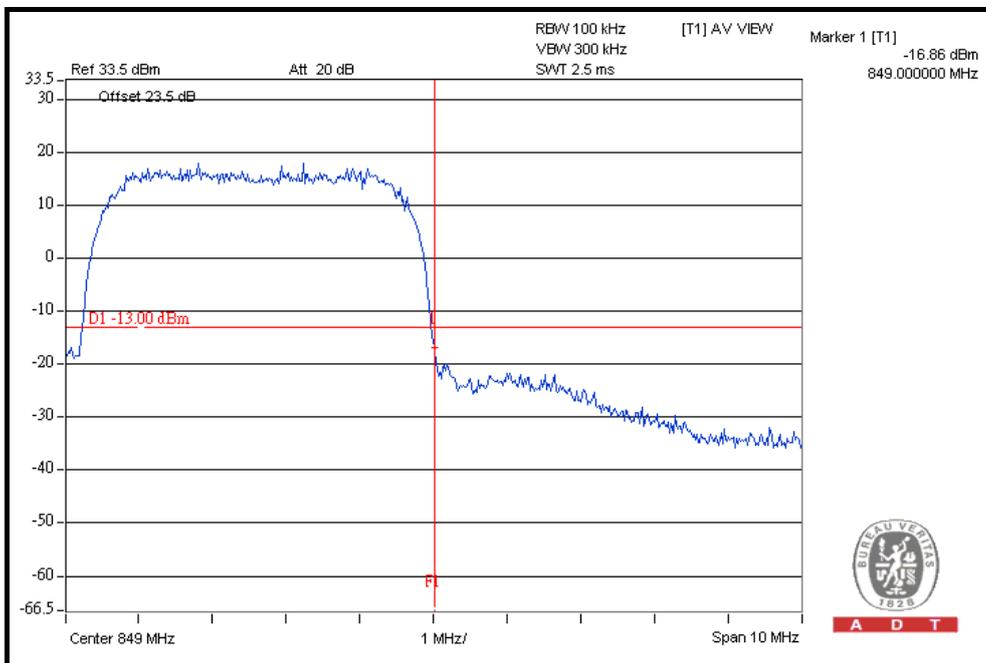


### HSDPA MODE

#### LOWER BAND EDGE

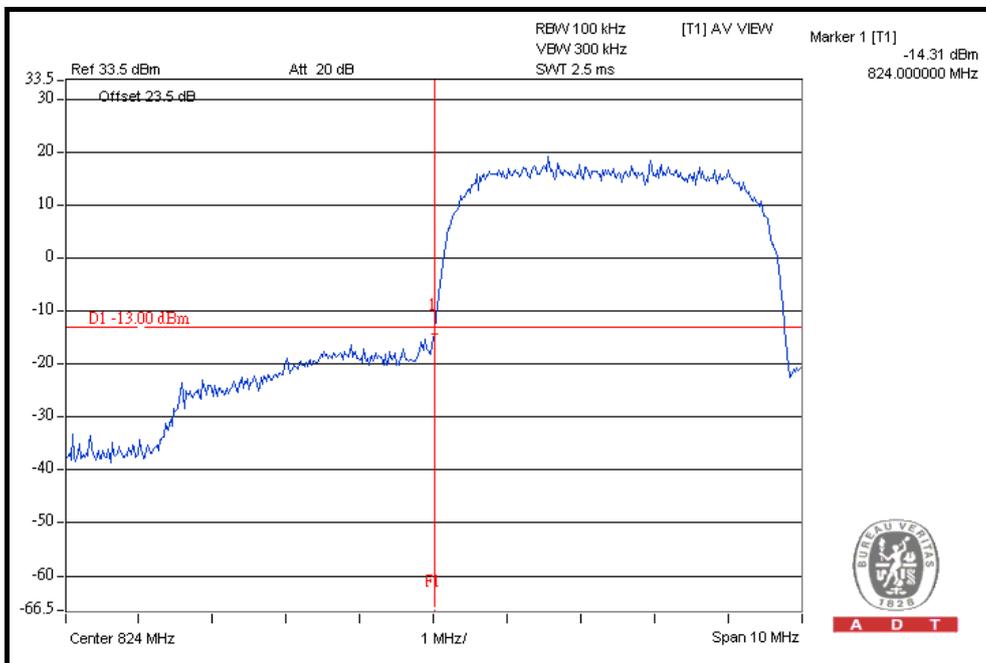


#### HIGHER BAND EDGE

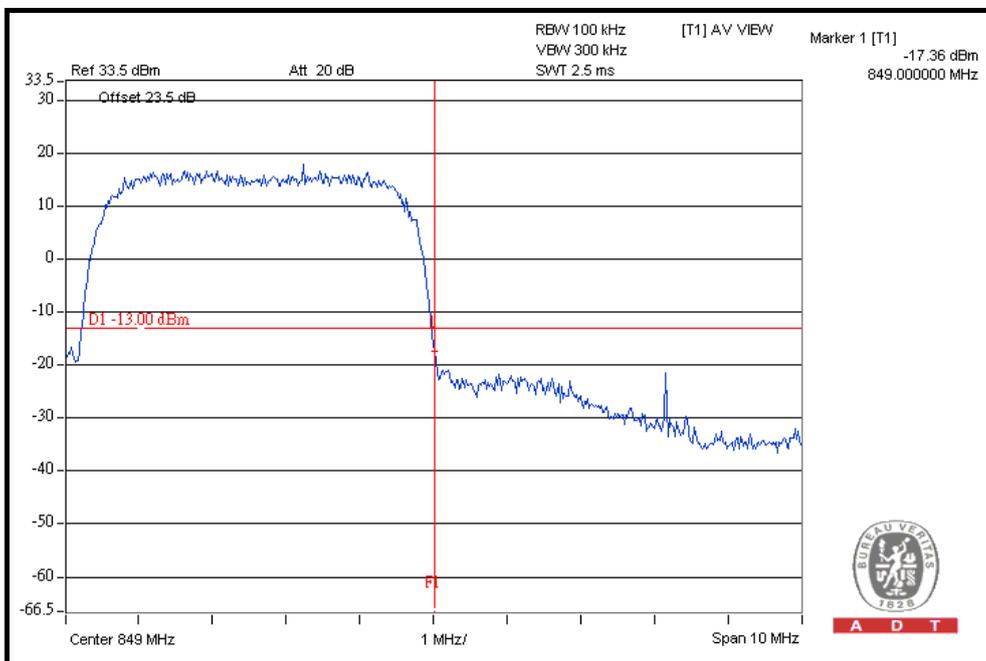


## HSUPA MODE

### 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  $-13\text{dBm}$ .

### 4.5.2 TEST INSTRUMENTS

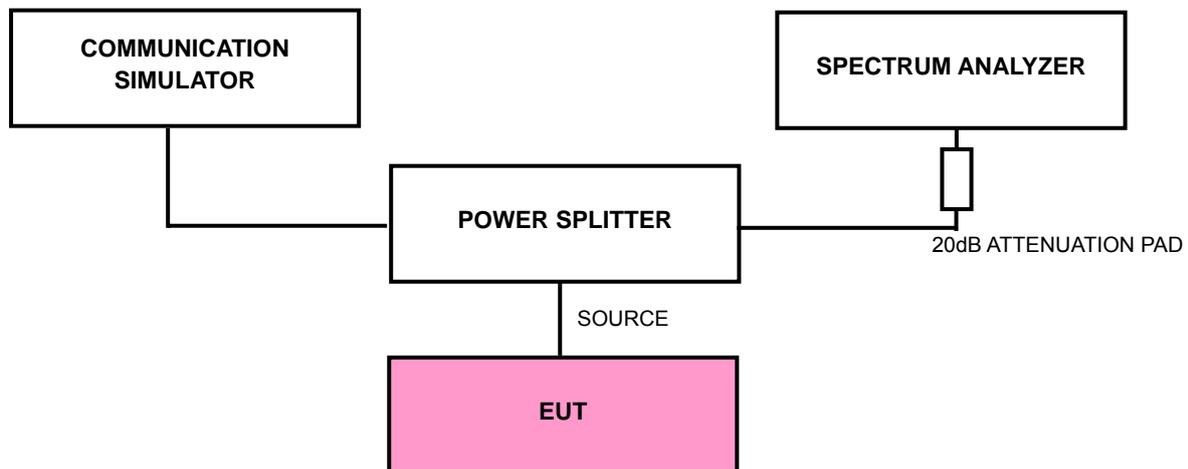
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100040	Jul. 09, 2010	Jul. 08, 2011
Wainwright Instruments Band Reject Filter	WRCG 824/849-810/ 863-60/9SS	SN1	Mar. 25, 2010	Mar. 24, 2011
WI Highpass filter	WHK1.5/15G-10ST	SN1	Mar. 30, 2010	Mar. 29, 2011
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 25, 2010	Jun. 24, 2011
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. This splitter loss and cable loss are the worst loss 23.5dB in the transmitted path track.
- c. When the spectrum scanned from 9kHz to 1GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.
- d. When the spectrum scanned 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



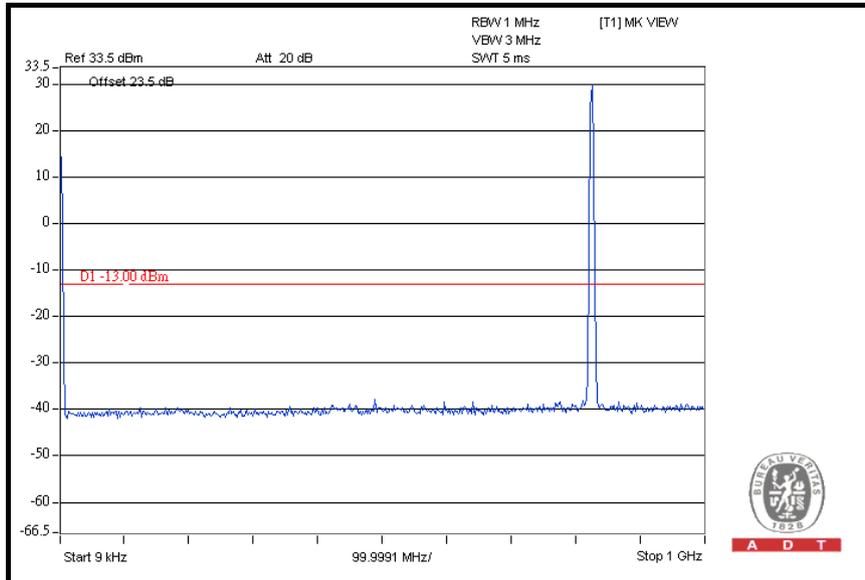
#### 4.5.5 EUT OPERATING CONDITIONS

- 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.

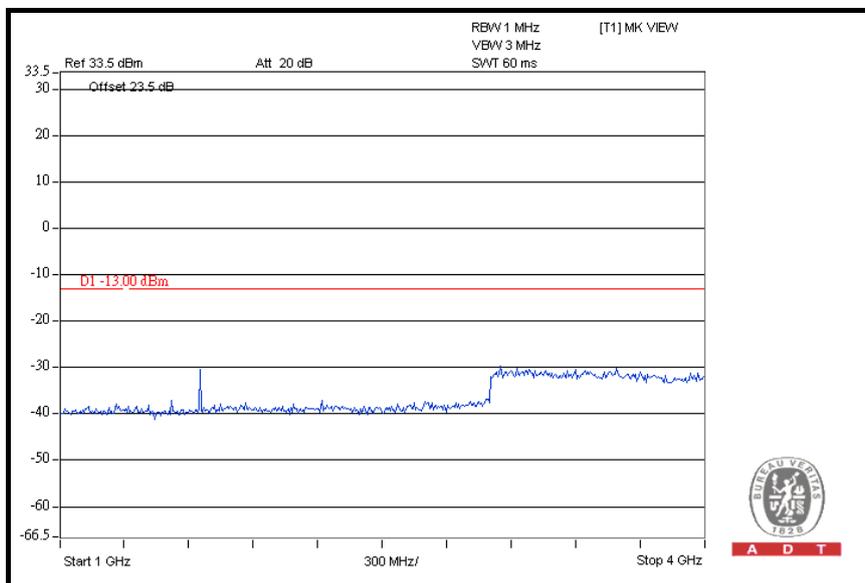
## 4.5.6 TEST RESULTS

**FOR GPRS:**

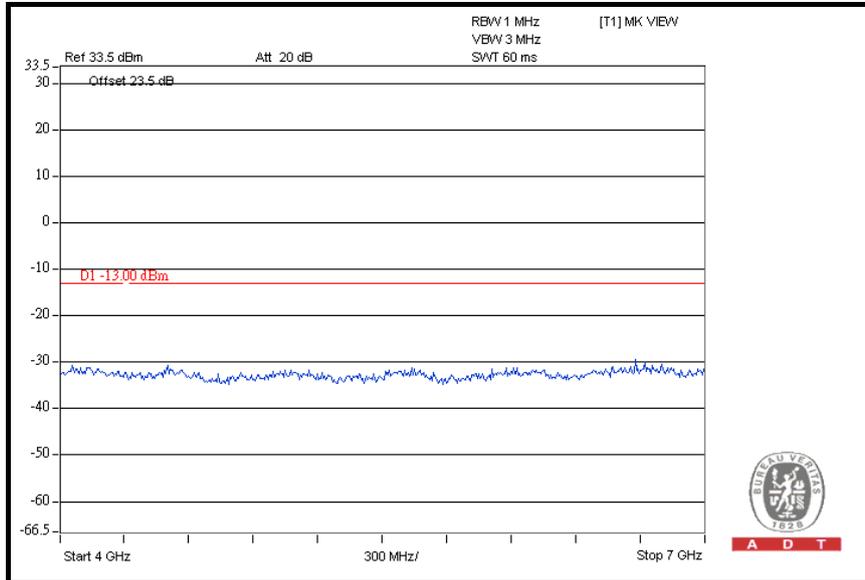
**CH 128: 9kHz ~ 1GHz**



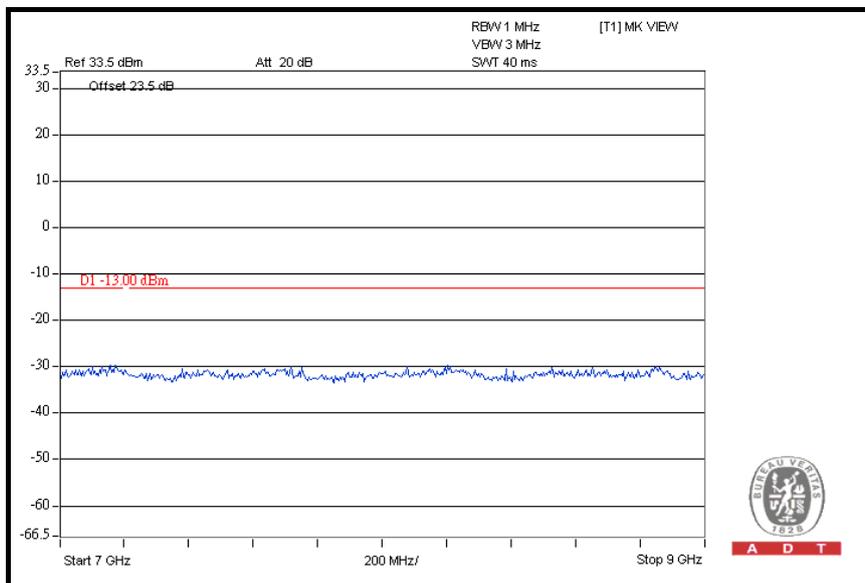
**1GHz ~ 4GHz**



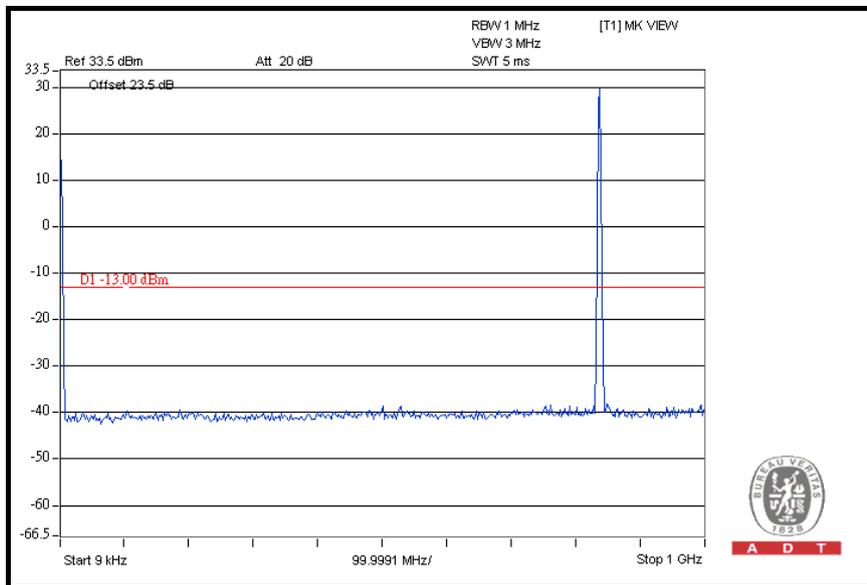
### 4GHz ~ 7GHz



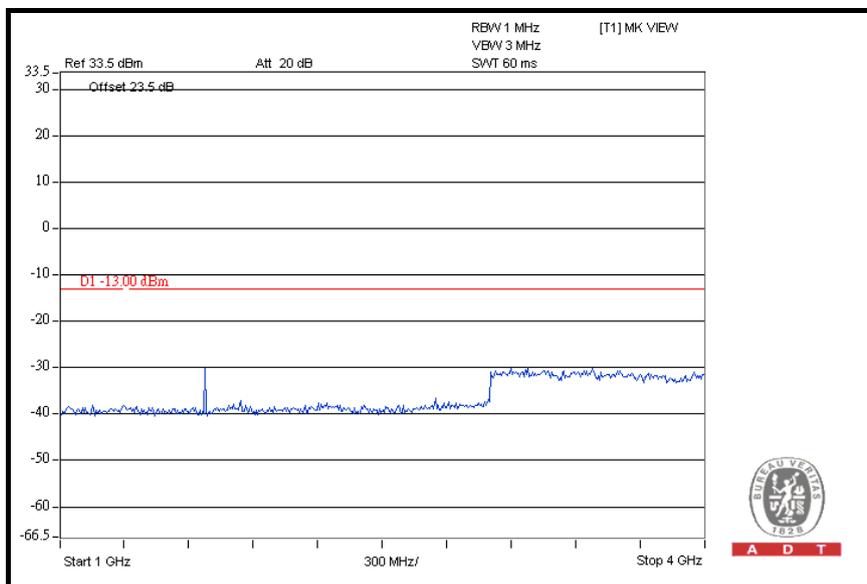
### 7GHz ~ 9GHz



### CH 190: 9kHz ~ 1GHz



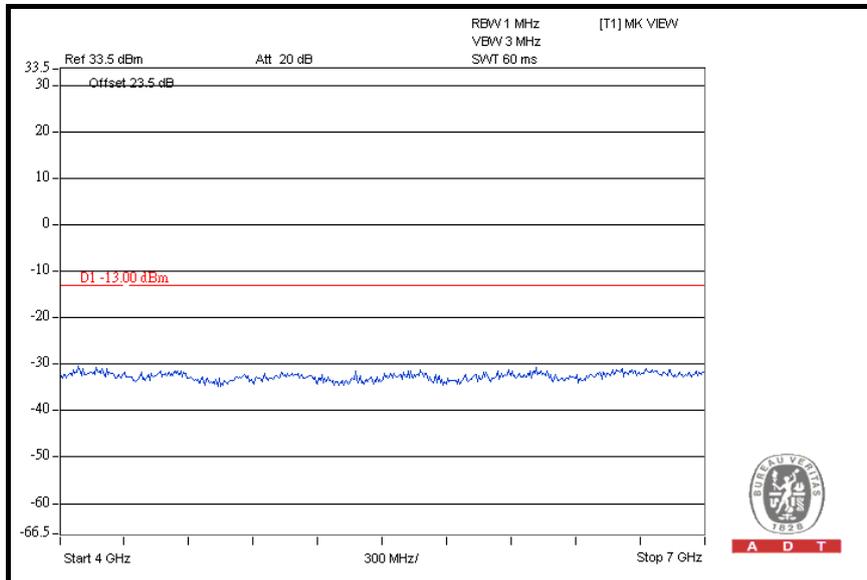
### 1GHz ~ 4GHz



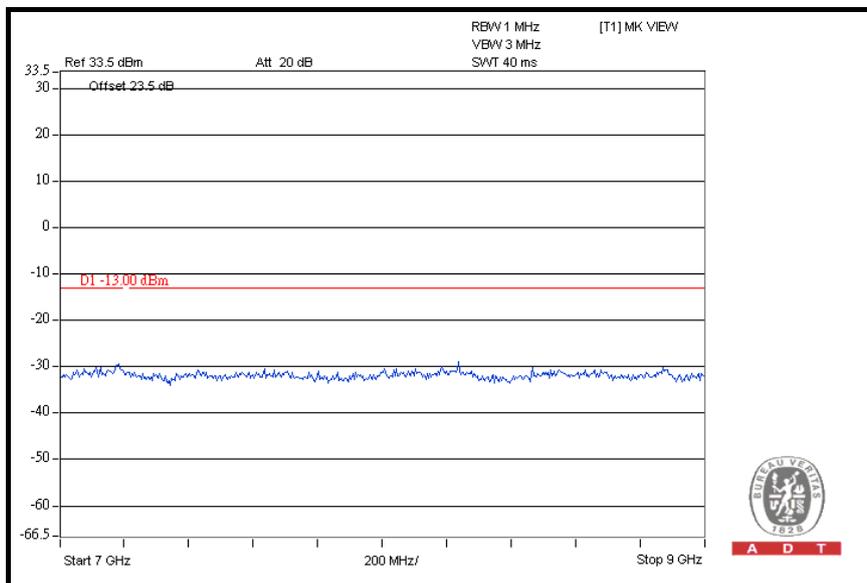


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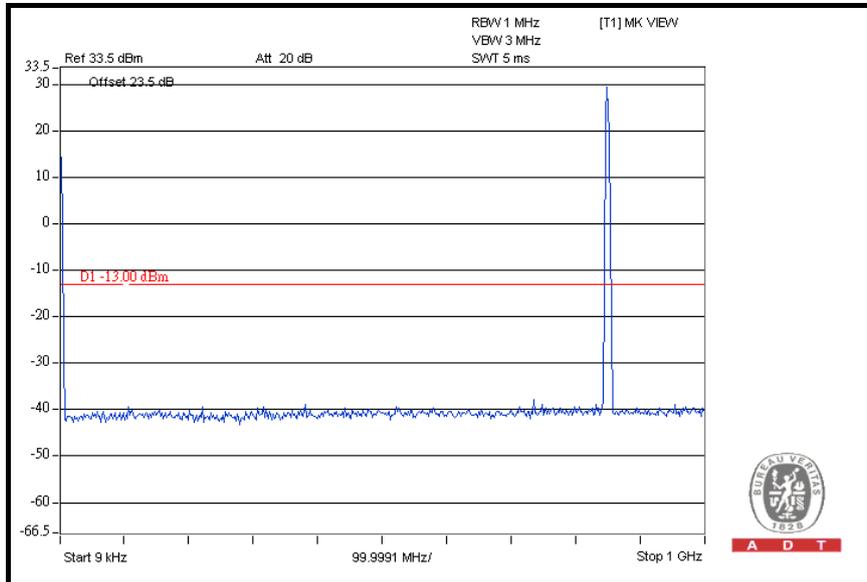
### 4GHz ~ 7GHz



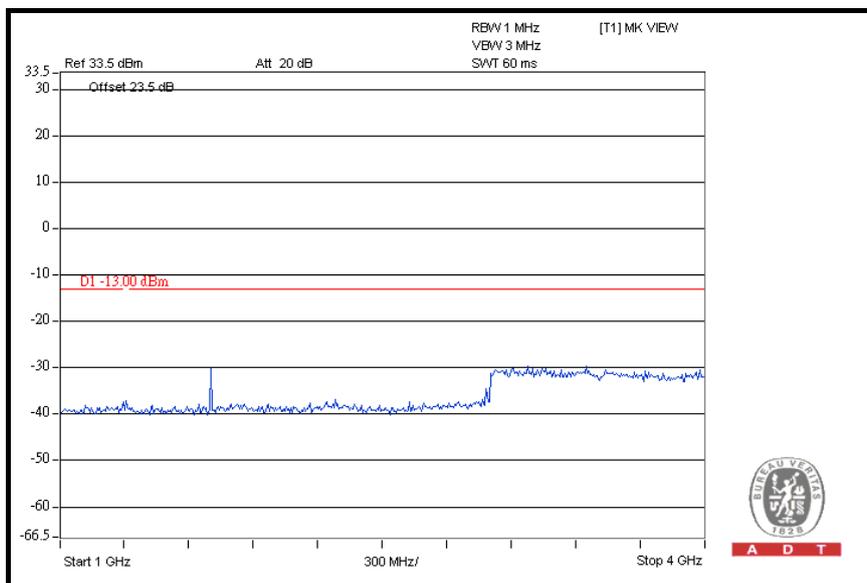
### 7GHz ~ 9GHz



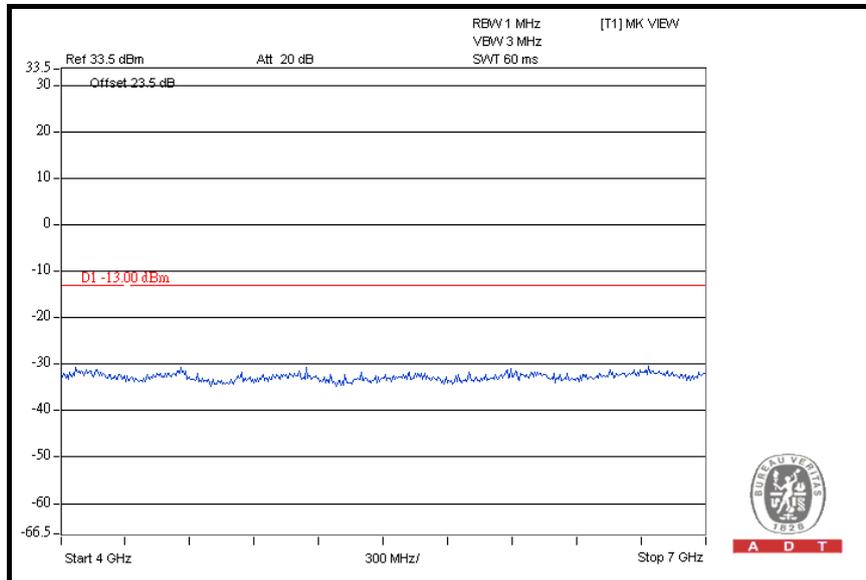
**CH 251: 9kHz ~ 1GHz**



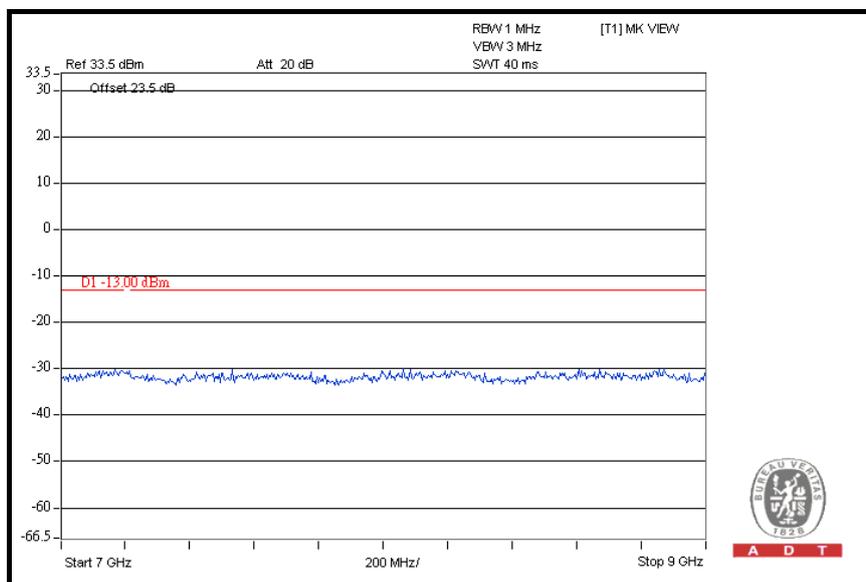
**1GHz ~ 4GHz**



### 4GHz ~ 7GHz

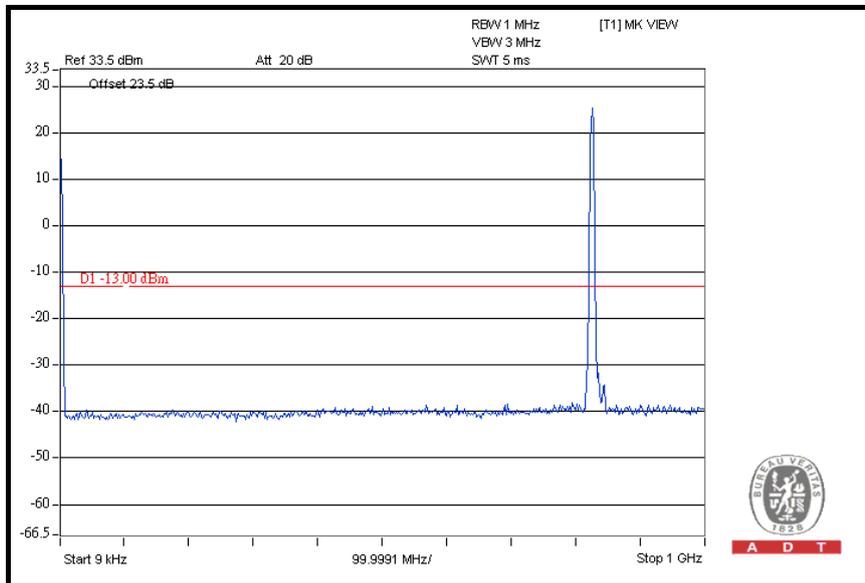


### 7GHz ~ 9GHz

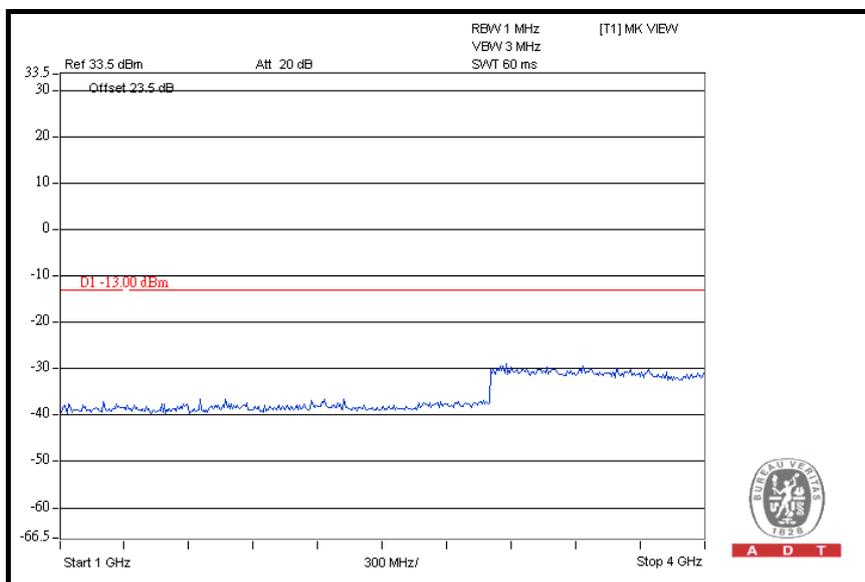


**FOR CDMA:**

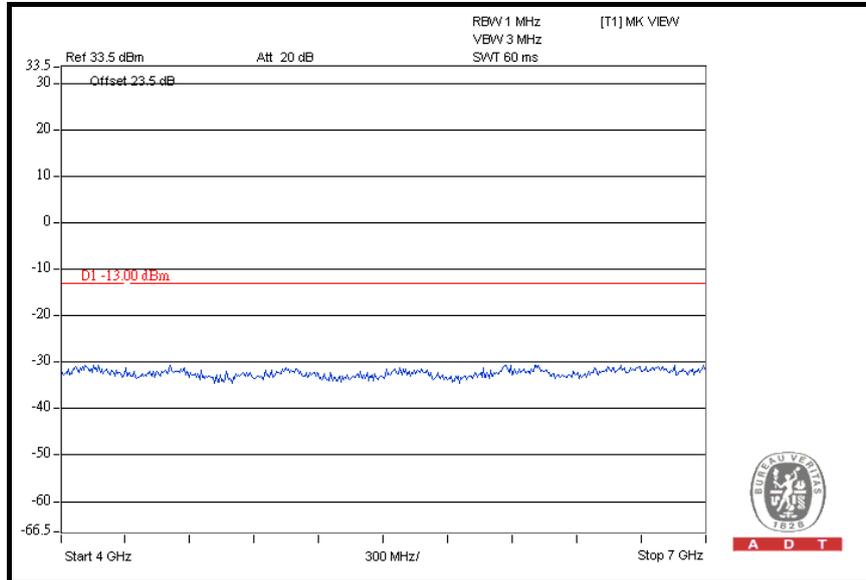
**CH 1013: 9kHz ~ 1GHz**



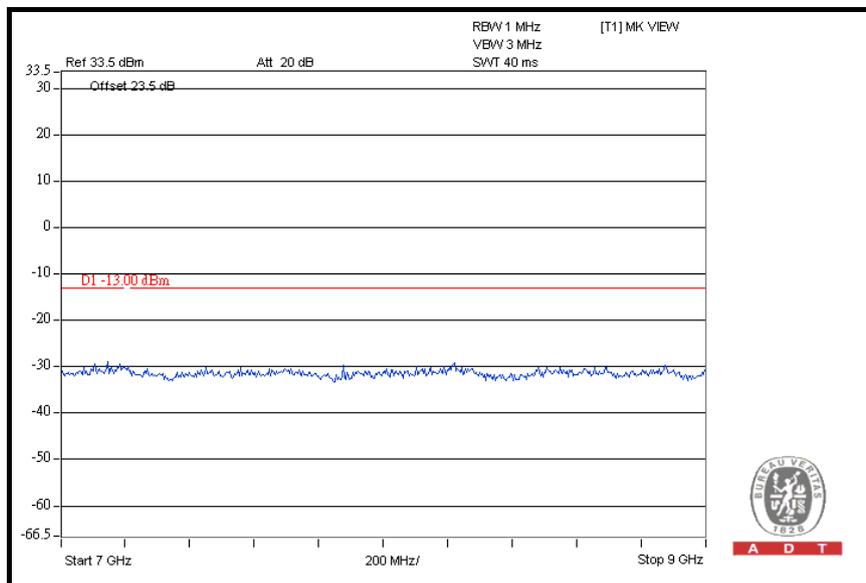
**1GHz ~ 4GHz**



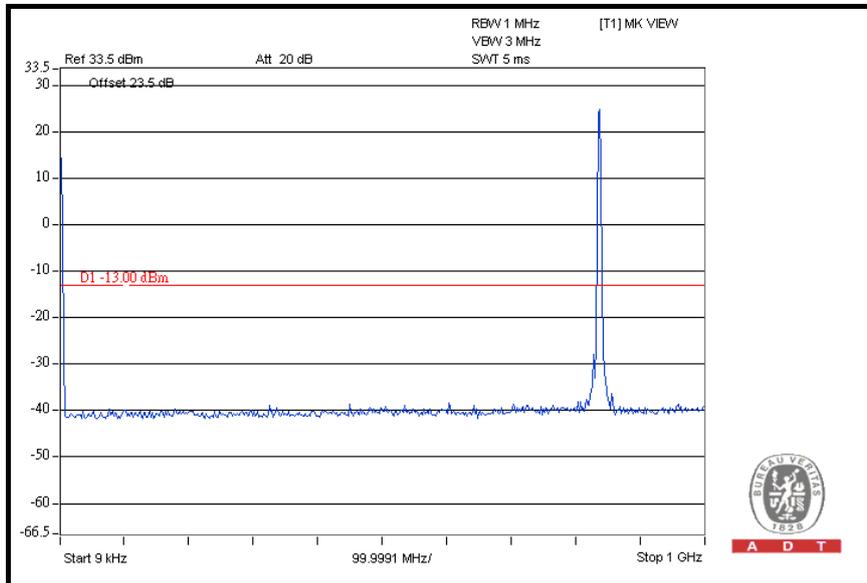
### 4GHz ~ 7GHz



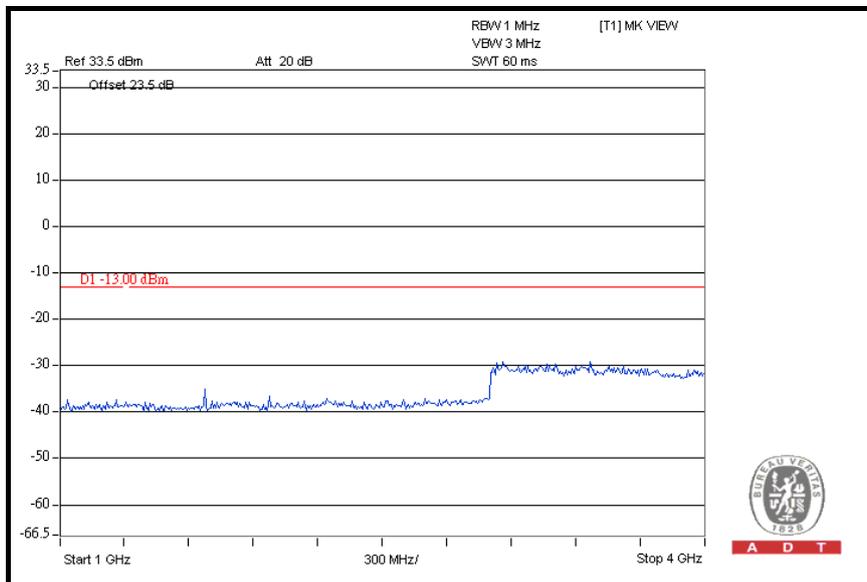
### 7GHz ~ 9GHz



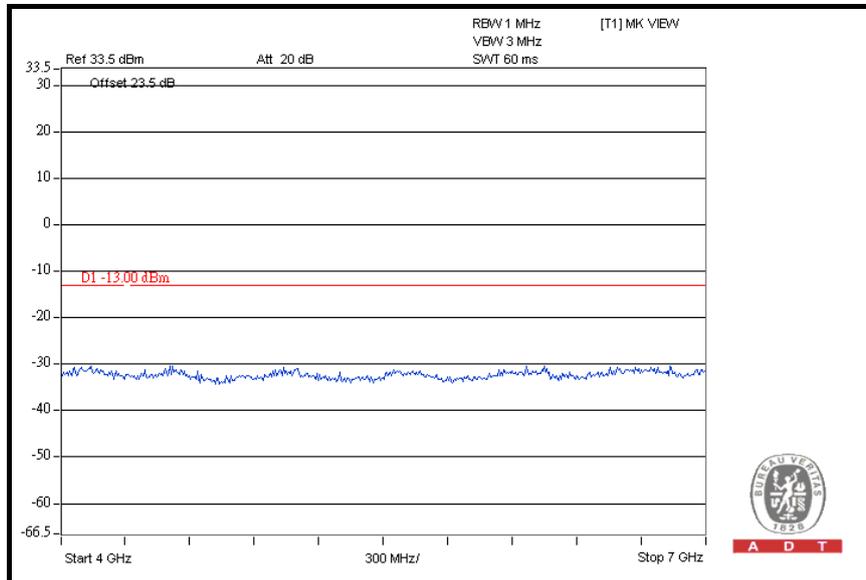
**CH 384: 9kHz ~ 1GHz**



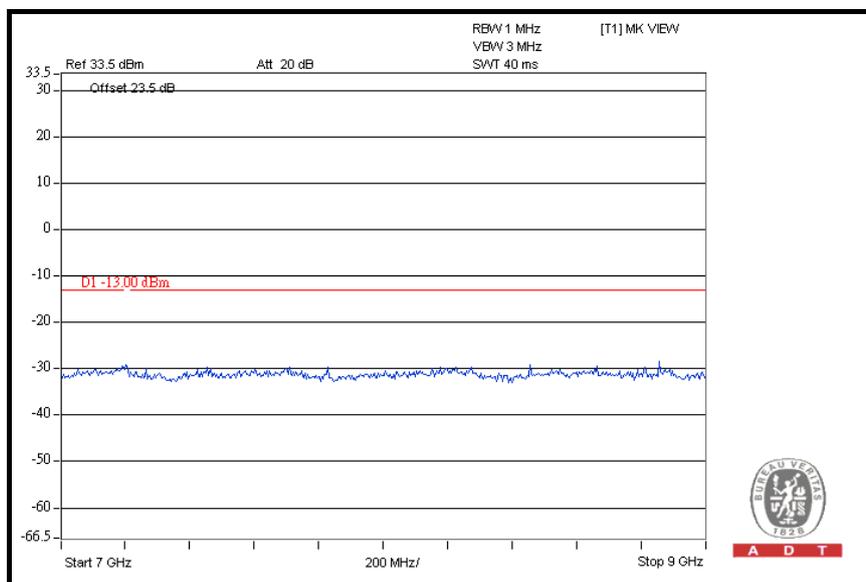
**1GHz ~ 4GHz**



### 4GHz ~ 7GHz



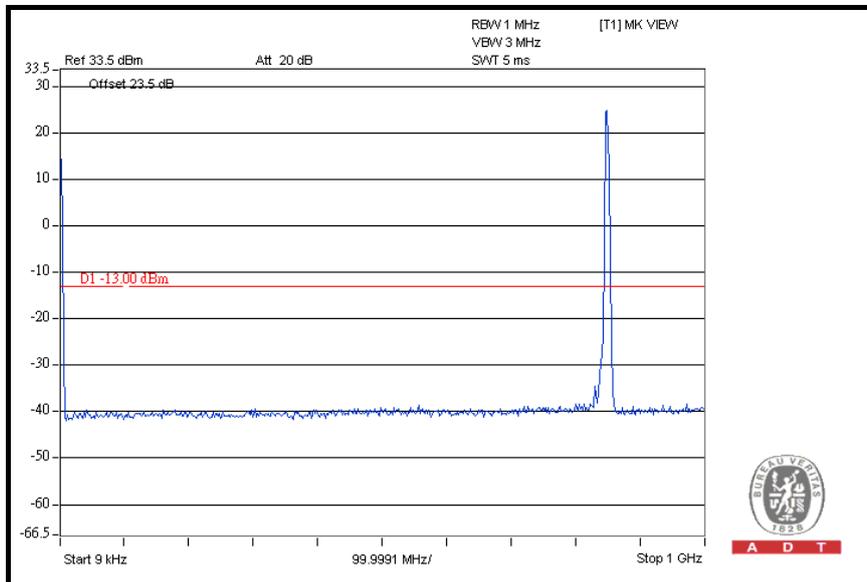
### 7GHz ~ 9GHz



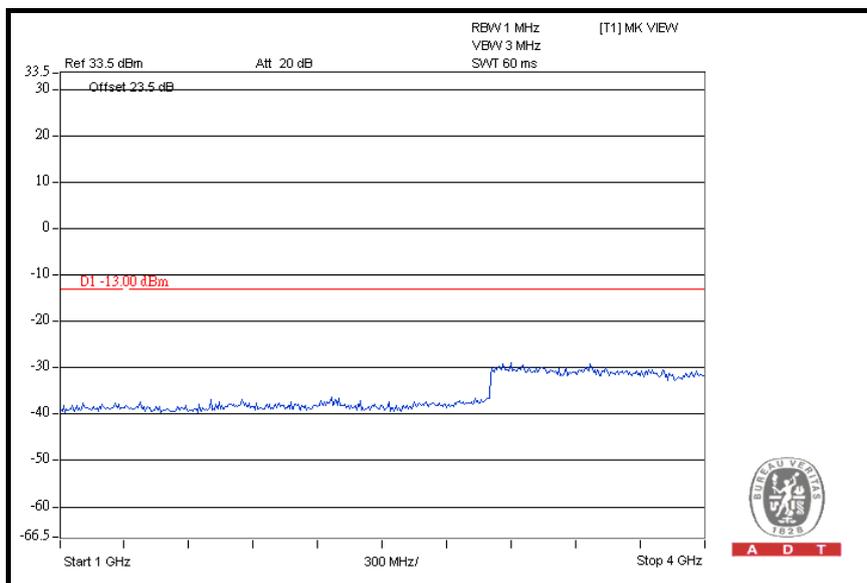


A D T

### CH 777: 9kHz ~ 1GHz



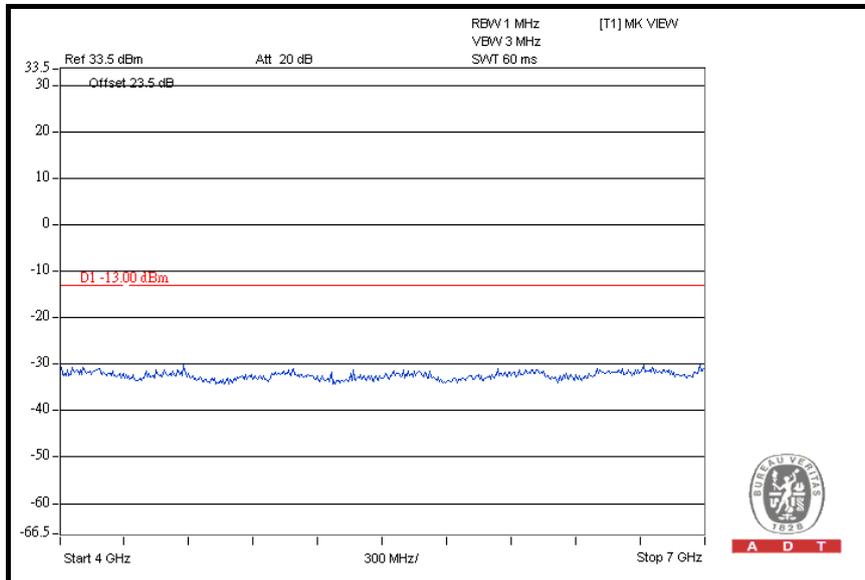
### 1GHz ~ 4GHz



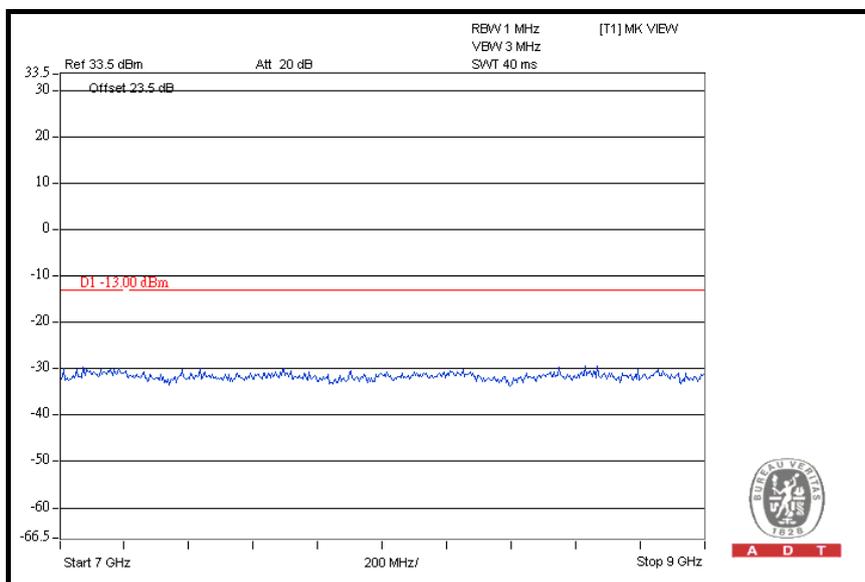


A D T

### 4GHz ~ 7GHz

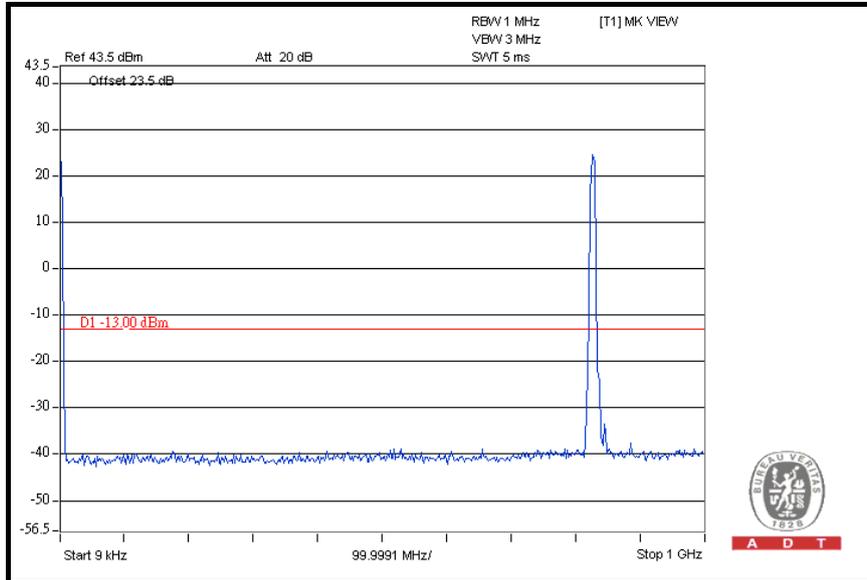


### 7GHz ~ 9GHz

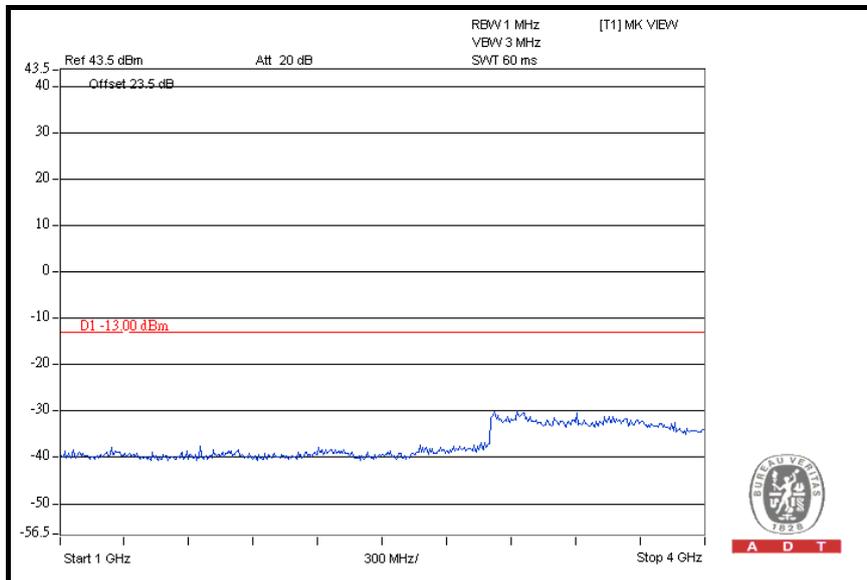


**FOR WCDMA:**

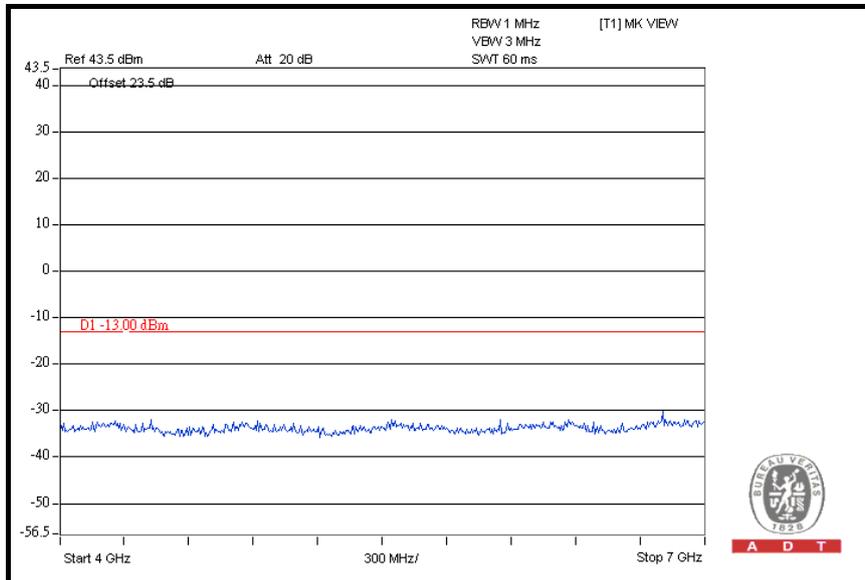
**CH 4132: 9kHz ~ 1GHz**



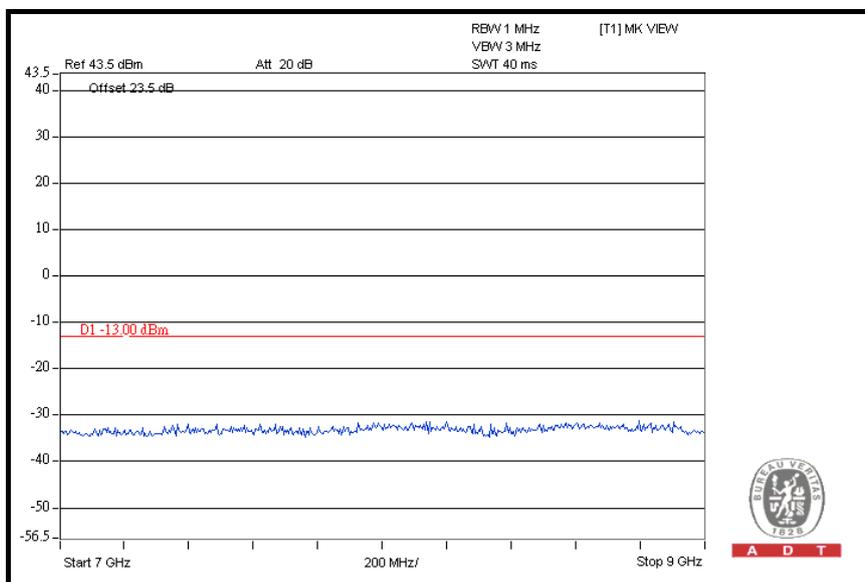
**1GHz ~ 4GHz**



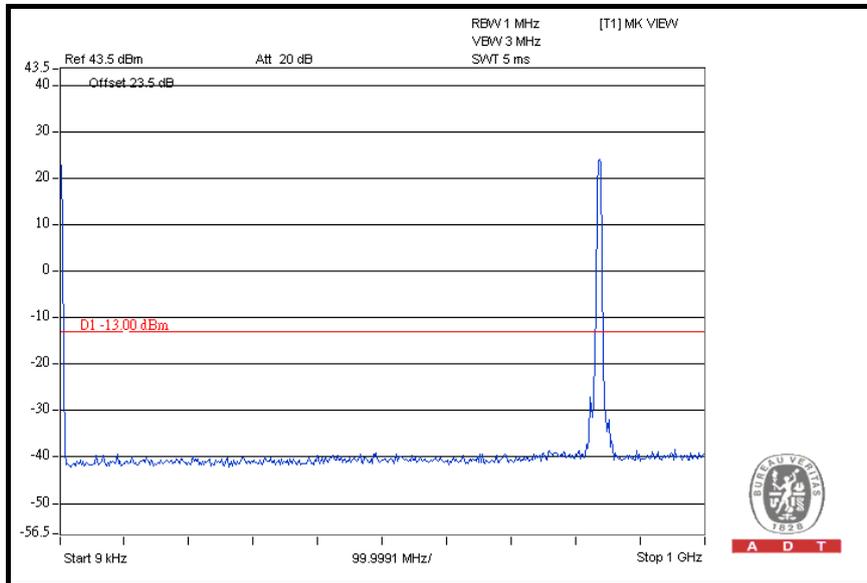
### 4GHz ~ 7GHz



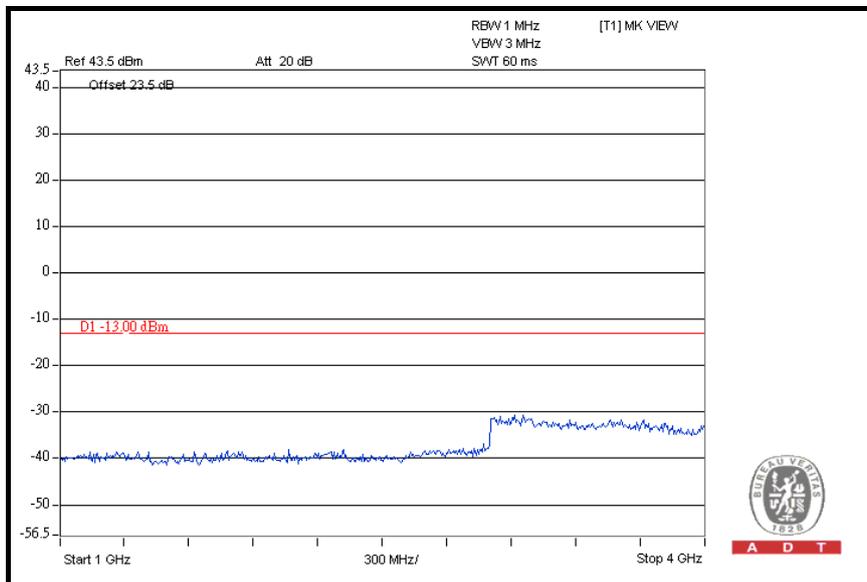
### 7GHz ~ 9GHz



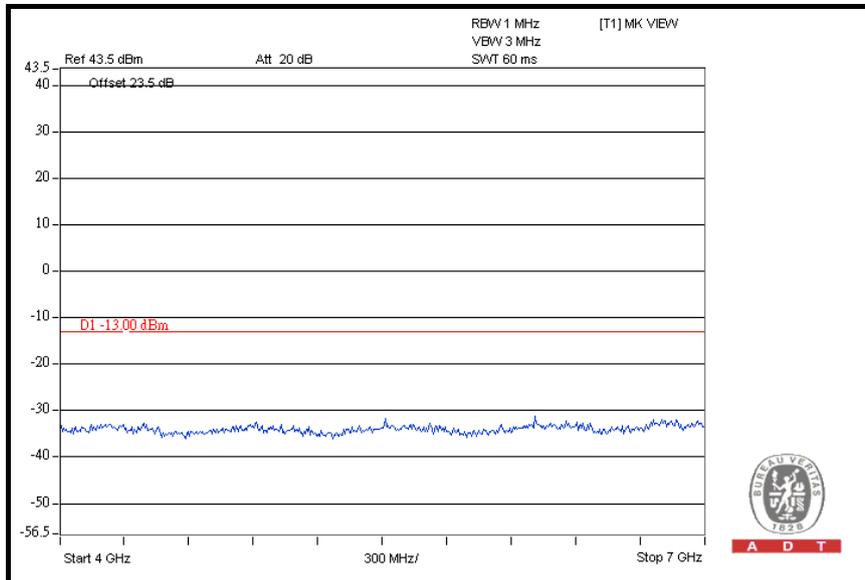
**CH 4182: 9kHz ~ 1GHz**



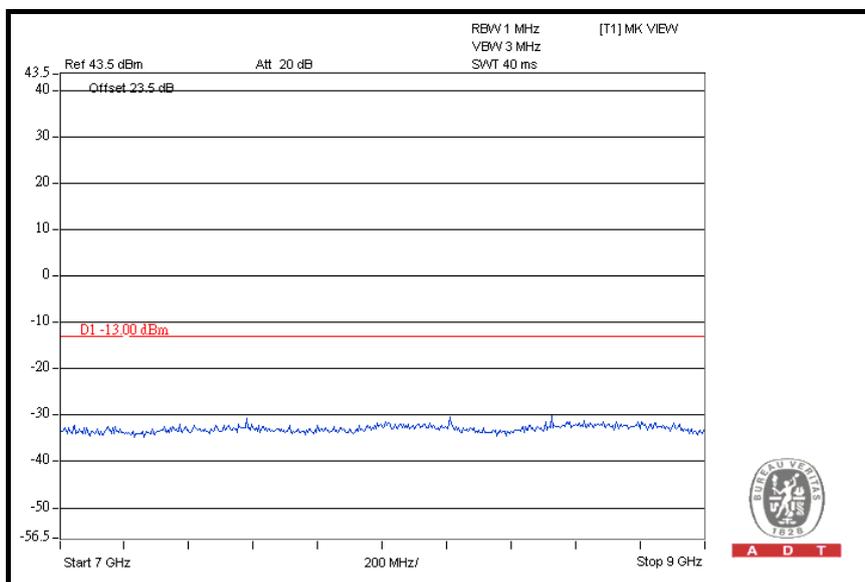
**1GHz ~ 4GHz**



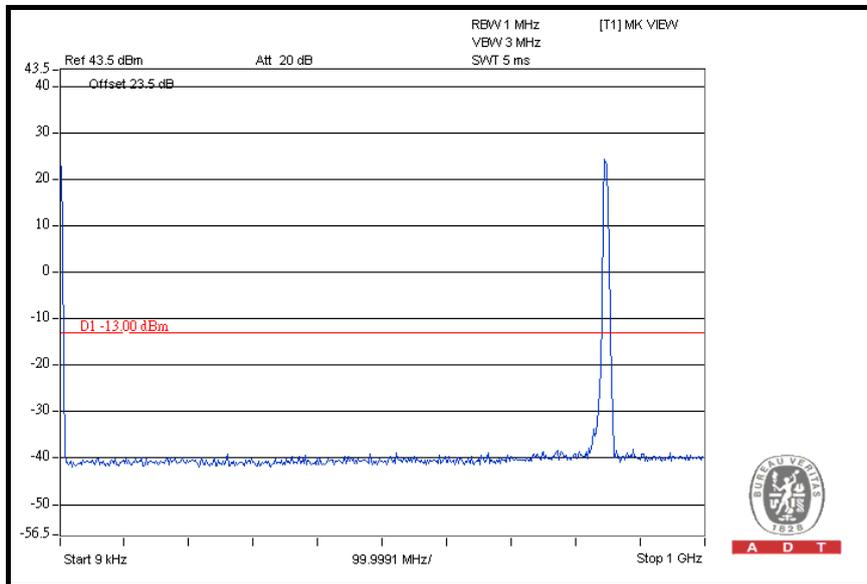
### 4GHz ~ 7GHz



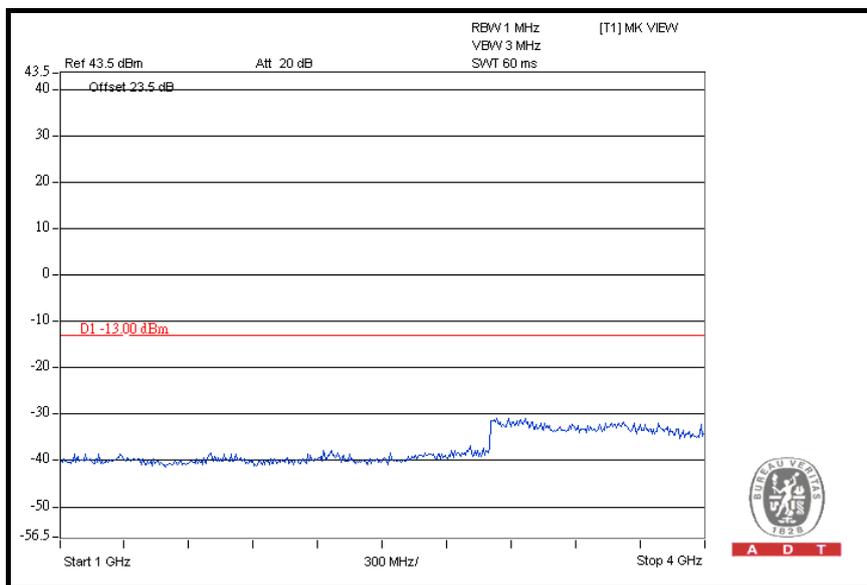
### 7GHz ~ 9GHz



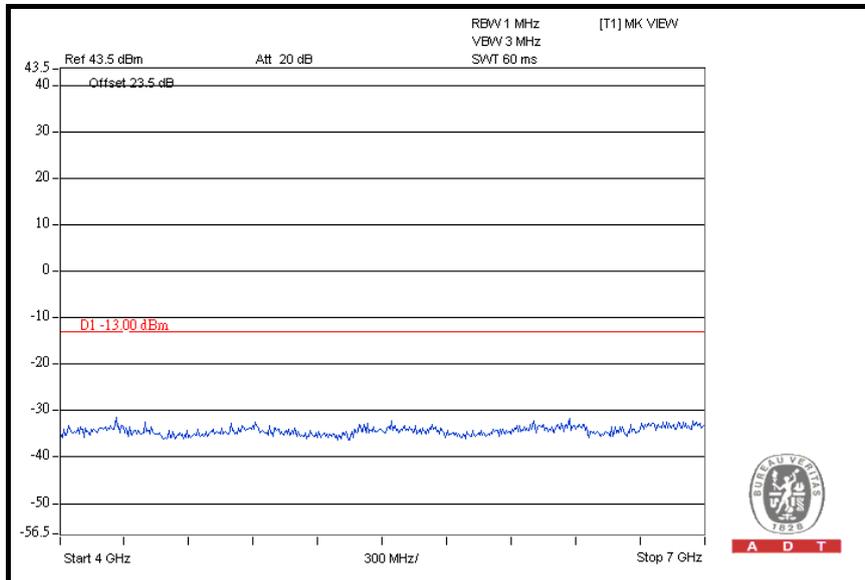
**CH 4233: 9kHz ~ 1GHz**



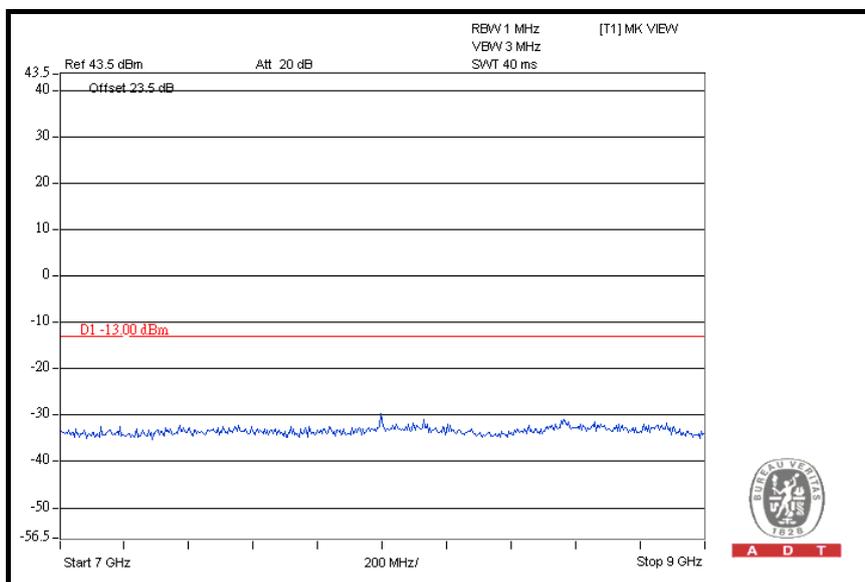
**1GHz ~ 4GHz**



### 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

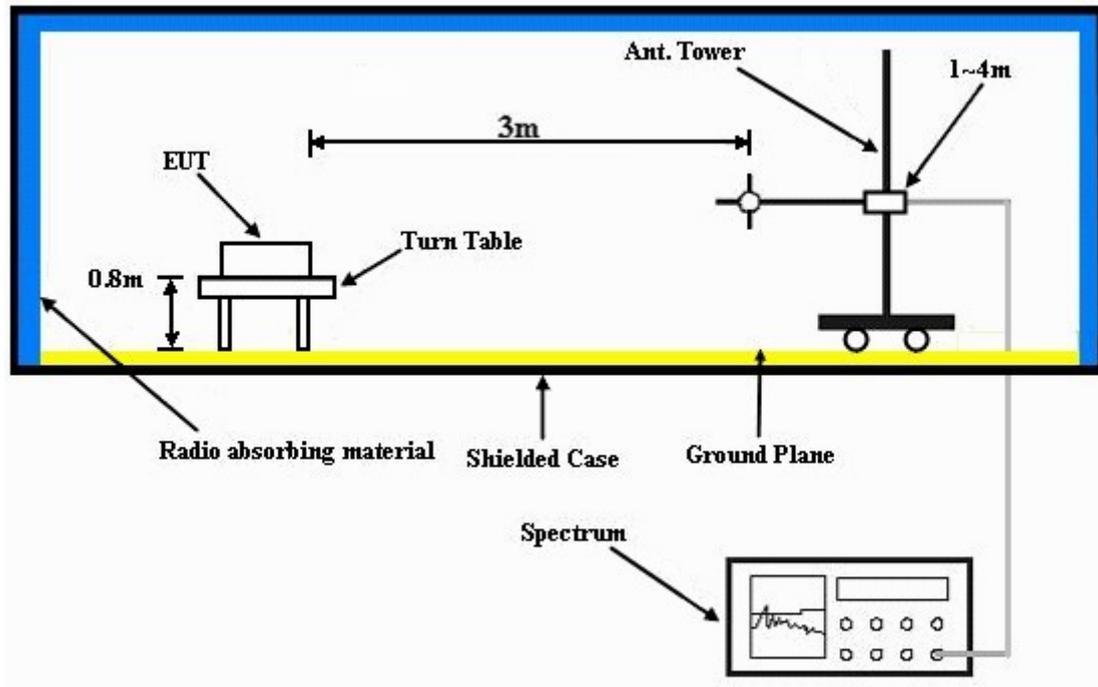
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on 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

- 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.

#### 4.6.7 TEST RESULTS

##### FOR GPRS:

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH, 991hPa	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Sun Lin		

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	30.00	45.0	82.2	-37.3	2.00 H	139	32.4	12.6
2	144.69	48.7	82.2	-33.6	1.50 H	199	34.4	14.3
3	247.72	45.6	82.2	-36.7	1.25 H	76	32.7	12.9
4	323.53	46.9	82.2	-35.4	1.00 H	265	31.3	15.6
5	502.36	45.8	82.2	-36.5	1.50 H	190	25.5	20.3
6	784.23	47.5	82.2	-34.8	1.25 H	16	22.4	25.1

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	30.00	55.4	82.2	-26.9	1.50 V	271	42.8	12.6
2	51.38	50.3	82.2	-32.0	1.25 V	109	36.0	14.3
3	232.16	49.9	82.2	-32.4	2.00 V	19	37.8	12.1
4	319.64	48.3	82.2	-34.0	1.50 V	346	32.8	15.5
5	377.96	43.2	82.2	-39.1	1.25 V	316	26.3	16.9
6	531.52	47.7	82.2	-34.6	1.00 V	10	26.8	20.9

##### 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:**

<b>MODE</b>	TX channel 777	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH, 991hPa	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Sun Lin		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	129.14	47.4	82.2	-34.9	1.25 H	223	34.1	13.3
2	166.07	44.6	82.2	-37.7	1.25 H	31	30.6	14.0
3	313.81	47.1	82.2	-35.2	1.00 H	256	31.8	15.3
4	494.59	42.4	82.2	-39.9	1.50 H	145	22.3	20.1
5	556.79	45.1	82.2	-37.2	1.25 H	304	23.6	21.5
6	778.40	46.8	82.2	-35.5	1.25 H	316	21.8	25.0
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	47.49	49.2	82.2	-33.1	1.25 V	76	34.7	14.5
2	129.14	40.1	82.2	-42.2	1.50 V	184	26.8	13.3
3	315.75	48.0	82.2	-34.3	1.50 V	316	32.6	15.4
4	449.88	43.2	82.2	-39.1	1.00 V	172	24.4	18.8
5	549.02	46.1	82.2	-36.2	1.00 V	1	24.8	21.3
6	749.24	45.6	82.2	-36.7	1.50 V	10	20.9	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.

**FOR WCDMA:**

<b>MODE</b>	TX channel 4233	<b>FREQUENCY RANGE</b>	Below 1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH, 991hPa	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Sun Lin		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	131.08	47.0	82.2	-35.3	1.50 H	223	33.6	13.4
2	166.07	45.8	82.2	-36.5	1.25 H	160	31.8	14.0
3	253.55	48.0	82.2	-34.3	1.50 H	70	34.8	13.2
4	315.75	47.7	82.2	-34.6	1.25 H	229	32.3	15.4
5	543.19	43.4	82.2	-38.9	1.25 H	127	22.2	21.2
6	751.18	46.9	82.2	-35.4	1.50 H	210	22.2	24.7
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	66.93	52.1	82.2	-30.2	1.00 V	7	39.7	12.4
2	129.14	43.6	82.2	-38.7	1.50 V	313	30.3	13.3
3	195.23	43.2	82.2	-39.1	1.25 V	88	32.3	10.9
4	311.86	47.0	82.2	-35.3	1.50 V	334	31.7	15.3
5	531.52	48.0	82.2	-34.3	1.75 V	43	27.1	20.9
6	749.24	45.1	82.2	-37.2	1.25 V	178	20.4	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.

## 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  $-13\text{dBm}$ .

### 4.7.2 TEST INSTRUMENTS

Same as 4.1.2.

#### 4.7.3 TEST PROCEDURES

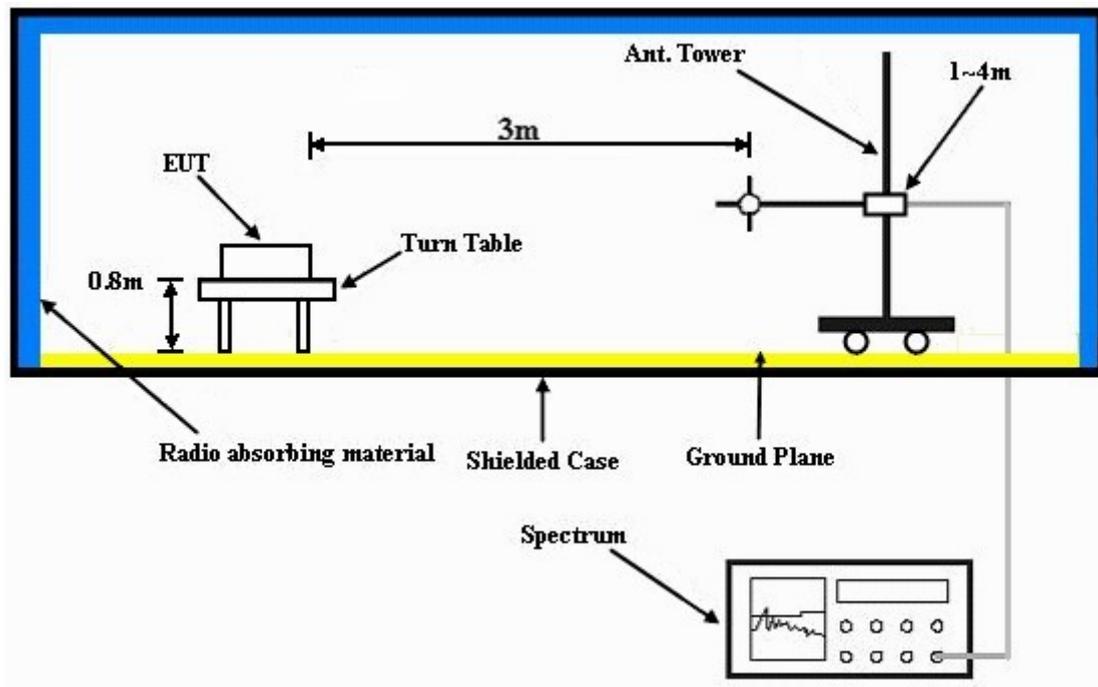
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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

- 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.

#### 4.7.7 TEST RESULTS

##### FOR GPRS BAND:

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	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	49.4	-13.0	-52.8	7.6	-45.2
2	2472.6	53.5	-13.0	-49.6	8.4	-41.2
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	45.4	-13.0	-57.0	7.6	-49.4
2	2472.6	52.4	-13.0	-50.7	8.4	-42.3

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

<b>MODE</b>	TX channel 190	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	Mark Liao		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1673.2	55.7	-13.0	-46.3	7.7	-38.6
2	2509.8	55.4	-13.0	-47.1	8.4	-38.7
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1673.2	53.7	-13.0	-48.2	7.7	-40.5
2	2509.8	52.4	-13.0	-50.0	8.4	-41.6

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



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<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	Mark Liao		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1697.6	58.8	-13.0	-43.6	7.9	-35.7
2	2546.4	58.4	-13.0	-44.7	8.5	-36.2

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1697.6	54.3	-13.0	-48.0	7.9	-40.1
2	2546.4	53.5	-13.0	-49.3	8.5	-40.8

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

**FOR CDMA BAND:**

<b>MODE</b>	Channel 1013	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	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	43.4	-13.0	-58.5	7.6	-50.9
2	2474.1	41.9	-13.0	-60.7	8.4	-52.3

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	1649.4	44.3	-13.0	-57.5	7.6	-49.9
2	2474.1	41.0	-13.0	-61.6	8.4	-53.2

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

<b>MODE</b>	Channel 384	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	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	46.4	-13.0	-56.0	7.7	-48.3
2	2509.56	41.8	-13.0	-61.3	8.4	-52.9

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	1673.04	45.2	-13.0	-57.2	7.7	-49.5
2	2509.56	41.9	-13.0	-61.2	8.4	-52.8

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



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<b>MODE</b>	Channel 777	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	Mark Liao		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 m</b>						
<b>NO.</b>	<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV)</b>	<b>LIMIT (dBm)</b>	<b>S.G POWER VALUE (dBm)</b>	<b>CORRECTION FACTOR (dB)</b>	<b>POWER VALUE (dBm)</b>
1	1696.62	52.4	-13.0	-49.4	7.9	-41.5
2	2544.93	43.5	-13.0	-59.2	8.5	-50.7

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 m</b>						
<b>NO.</b>	<b>FREQ. (MHz)</b>	<b>EMISSION LEVEL (dBuV)</b>	<b>LIMIT (dBm)</b>	<b>S.G POWER VALUE (dBm)</b>	<b>CORRECTION FACTOR (dB)</b>	<b>POWER VALUE (dBm)</b>
1	1696.62	44.4	-13.0	-57.4	7.9	-49.5
2	2544.93	42.1	-13.0	-60.4	8.5	-51.9

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

**FOR WCDMA BAND:**

<b>MODE</b>	TX channel 4132	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	Mark Liao		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1652.8	40.8	-13.0	-61.2	7.6	-53.6
2	2479.2	44.3	-13.0	-58.7	8.4	-50.3
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1652.8	38.8	-13.0	-63.2	7.6	-55.6
2	2479.2	42.3	-13.0	-60.5	8.4	-52.1

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

<b>MODE</b>	TX channel 4182	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	Mark Liao		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>						
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	-57.7	7.7	-50.0
2	2509.2	47.4	-13.0	-55.1	8.4	-46.7
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1672.8	41.1	-13.0	-60.6	7.7	-52.9
2	2509.2	42.4	-13.0	-60.1	8.4	-51.7

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



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<b>MODE</b>	TX channel 4233	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 63%RH, 991hPa
<b>TESTED BY</b>	Mark Liao		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1693.2	49.4	-13.0	-52.8	7.9	-44.9
2	2539.8	42.8	-13.0	-60.2	8.5	-51.7

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	1693.2	46.9	-13.0	-55.1	7.9	-47.2
2	2539.8	40.8	-13.0	-62.2	8.5	-53.7

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

## 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](http://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  
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab:**  
Tel: 886-3-3183232  
Fax: 886-3-3185050

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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

## **7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**