FCC TEST REPORT (PART 22)

REPORT NO.: RF110615E06

MODEL NO.: MAX HD2, Device Connector M1, Express, AP Pro Duo, Air Connector Duo, Air Switch

FCC ID: U8G-P1820

RECEIVED: June 15, 2011

TESTED: Aug. 04 to 05, 2011

ISSUED: Aug. 23, 2011

APPLICANT: Pismo Labs Technology Limited

ADDRESS: 1703A, 17/F, Park Building 476 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong

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

LAB ADDRESS : No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110615E06	Original release	Aug. 23, 2011

1 CERTIFICATION

PRODUCT :	Pepwave Wireless Product
BRAND NAME :	Pepwave
MODEL NO.:	MAX HD2, Device Connector M1, Express, AP Pro Duo, Air Connector Duo, Air Switch
APPLICANT :	Pismo Labs Technology Limited
TESTED :	Aug. 04 to 05, 2011
TEST SAMPLE :	R&D SAMPLE
STANDARDS :	**FCC Part 22, Subpart H**
	ANSI C63.4-2003

The above equipment (model: MAX HD2) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** *Aug. 23, 2011*
(Midoli Peng, Specialist)

APPROVED BY : _____ , **DATE:** *Aug. 23, 2011*
(May Chen, Deputy 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. Max. e.r.p is 30.2dBm at 848.8MHz
2.1055	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. ±2.5ppm	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 -23.03dB at 2472.6MHz.

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:

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

Measurement	Value
Radiated emissions (30MHz-1GHz)	4 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Pepwave Wireless Product
MODEL NO.	MAX HD2, Device Connector M1, Express, AP Pro Duo, Air Connector Duo, Air Switch
FCC ID	U8G-P1820
POWER SUPPLY	DC 12V from adapter (Class II, AC 2Pin) or DC 48V from PoE Adapter
MODULATION TYPE	GMSK, 8PSK (for GSM / GPRS / E-GPRS) QPSK, OQPSK, HPSK (for CDMA) BPSK (for WCDMA)
OPERATING FREQUENCY	824.2MHz ~ 848.8MHz (for GSM / GPRS / E-GPRS) 824.7MHz ~ 848.31MHz (for CDMA) 826.4MHz ~ 846.6MHz (for WCDMA)
NUMBER OF CHANNEL	124 (for GSM / GPRS / E-GPRS) 788 (for CDMA) 102 (for WCDMA)
MAX. ERP POWER	GSM Mode: 30.2dBm (1.0471Watts) GPRS Mode: 30.2dBm (1.0471Watts) E-GPRS Mode: 30.1dBm (1.0233Watts) CDMA Mode: 21.8dBm (0.1514Watts) WCDMA Mode: 21.6dBm (0.1439Watts)
ANTENNA TYPE	Please see note
MAX. ANTENNA GAIN	Please see note
DATA CABLE	NA
I/O PORTS	LAN (RJ-45) port x 4 (Ethernet, 10Mbps / 100Mbps / 1000Mbps) WAN port x 2 USB port x 1 (3G) Antenna port x 4 Power (Terminal Block) port x 1 (10Vdc – 30Vdc) Cellular (Main) port x 2 GPS / Cellular (Aux) port x 2
ACCESSORY DEVICES	Adapter x 1

NOTE:

1. The EUT has six model names which are identical to each other in all aspects except for the following table:

Product Name	Model Name
Pepwave Wireless Product	MAX HD2
	Device Connector M1
	Express
	AP Pro Duo
	Air Connector Duo
	Air Switch

From the above models, model: **MAX HD2** was selected as representative model for the test and its data was recorded in this report.

2. There are four antennas provided to this EUT, please refer to the following table:

WLAN Antenna Spec.						
No.	Brand	Model	Antenna Type	Gain(dBi)	Connecter Type	Frequency range (GHz)
1	KBT	TQ-2400CI	Dipole	5	R-SMA	2.4 ~ 2.4835
2	KBT	TQ-2400CI	Dipole	5	R-SMA	2.4 ~ 2.4835
GPS Antenna Spec.						
No.	Brand	Model	Antenna Type	Gain(dBi)	Connecter Type	Frequency range (GHz)
3	Chang Hong	GPS-01	Magnetic	-1	R-SMA Male	1.57542 (+/- 1.023)
GSM / GPRS / E-GPRS / CDMA / WCDMA Antenna Spec.						
No.	Brand	Model	Antenna Type	Gain(dBi)	Connecter Type	Frequency range (MHz)
4	Chang Hong	GSM-01	Magnetic Base	3	R-SMA Male	850/900/1800/ 1900/2170

3. The device support time division techonlogy, no simultaneosuly transmission. (WLAN, GSM, CDMA and WCDMA technology cannot transmit at same time.)

4. The EUT inside has one WLAN 802.11b/g/n Module which model name is N21 and FCC ID: U8G-P1121.

5. The communicated functions of EUT listed as below:

		GSM (850&1900MHz)	CDMA (850&1900MHz)	WCDMA (850&1900MHz)
2G	GPRS	√		
	EDGE	√		
3G	CDMA		√	
	1*EVDO		√	
	WCDMA			√
	Release 5 HSDPA			√
	Release 6 HSUPA			√

6. The EUT must be supplied with one power adapter and following different models could be chosen: (The PoE adapter is only for test.)

Adapter 1 (Supply to DC Jack)	
Brand:	Ten Pao
Model No.:	S040EM1200300
Input power :	100-240V, 50/60Hz, 1.2A
Output power :	12V, 3000mA DC output cable(shielded, 1.55m, with one core)
Adapter 2 (Supply to Terminal Block)	
Brand:	Ten Pao
Model No.:	S040EM1200300
Input power :	100-240V, 50/60Hz, 1.2A
Output power :	12V, 3000mA DC output cable(shielded, 1.55m, with one core)
PoE Adapter	
Brand:	NA
Model No.:	PSE-G300
Input power :	100-240V, 50/60Hz AC output cable (unshielded, 1.8m)
Output power :	48V, 630mA, 30W

7. The EUT was pre-tested in chamber under following test modes :

Pre-test Mode	Description
Mode A	Laying-flat type: EUT + Adapter 1
Mode B	Laying-flat type: EUT + Adapter 2
Mode C	**Laying-flat type: EUT + PoE Adapter**
Mode D	Stand-up type: EUT + PoE Adapter

The worse spurious emission was found in **Mode C**. Therefore only the test data of the modes were recorded in this report.

8. 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 GSM, 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	GSM, GPRS, E-GPRS
MIDDLE	190	836.6 MHz	GSM, GPRS, E-GPRS
HIGH	251	848.8 MHz	GSM, GPRS, E-GPRS

NOTE:

1. Below 1 GHz, the channel 128, 190, and 251 were pre-tested in chamber. The channel 251was 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 GSM/GPRS/E-GPRS class 10 device, 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 has GSM, GPRS, E-GPRS functions. After pre-testing, GSM 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	1x EV-DO, CDMA2000(SO55)
MIDDLE	384	836.52 MHz	1x EV-DO, CDMA2000(SO55)
HIGH	777	848.31 MHz	1x EV-DO, CDMA2000(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. The EUT has 1x EV-DO, CDMA2000(SO32), CDMA2000(SO2), CDMA2000(SO9) & CDMA2000(SO55) functions. After pre-testing, CDMA2000(SO55) function is the worst case for all the emission tests.

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.
4. The EUT has WCDMA-RMC, WCDMA-AMR, HSUPA & HSDPA functions. After pre-testing, WCDMA-RMC function is the worst case for all the emission tests.

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR GSM, 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, data rates, 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
128 to 251	128, 190, 251	GSM, GPRS, E-GPRS

FREQUENCY STABILITY MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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	GSM

OCCUPIED BANDWIDTH MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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	GSM, GPRS, E-GPRS

BAND EDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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	GSM, GPRS, E-GPRS

CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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	GSM

RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, xyz axis and antenna ports (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	GSM

RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, xyz axis and antenna ports (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	GSM

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
OP	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
FS	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
OB	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
EM	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
BE	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
CE	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
RE < 1G	27deg. C, 63%RH	120Vac, 60Hz	Evan Huang
RE ³ 1G	27deg. C, 63%RH	120Vac, 60Hz	Evan Huang

FOR CDMA:

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
1013 to 777	1013, 384, 777	1x EV-DO, 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	1x EV-DO , 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	1x EV-DO , 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	384	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	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
FS	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
OB	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
EM	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
BE	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
CE	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
RE < 1G	27deg. C, 63%RH	120Vac, 60Hz	Evan Huang
RE ³ 1G	27deg. C, 63%RH	120Vac, 60Hz	Evan Huang

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, HSDPA, HSUPA

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, HSDPA, HSUPA

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, HSDPA, HSUPA

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	4182	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	TESTED BY
OP	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
FS	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
OB	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
EM	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
BE	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
CE	27deg. C, 63%RH	120Vac, 60Hz	Wen Yu
RE < 1G	27deg. C, 63%RH	120Vac, 60Hz	Evan Huang
RE ³ 1G	27deg. C, 63%RH	120Vac, 60Hz	Evan Huang

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

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

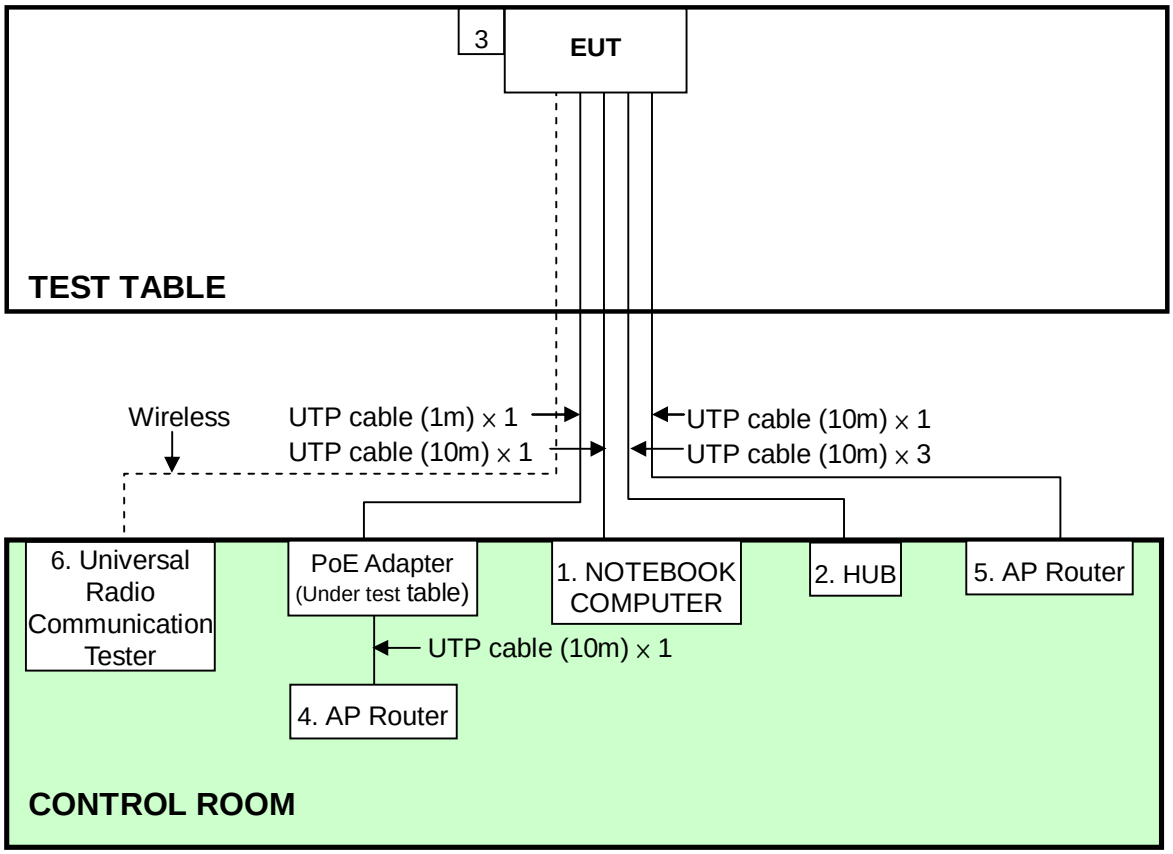
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP17L	CN-ONF743-48643-7AV-0124	FCC DoC
2	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC
3	3.5G USB WIRELESS DEVICE	HUAWEI	E169u	Q54CAB1042404880	QISE169
4	AP Router	NA	SUS-AGN1	2830-82E7-CDC3	U8G-P1213
5	AP Router	NA	SUS-AGN1	2830-830D-2266	U8G-P1213
6	Universal Radio Communication Tester	R&S	CMU200	1100.0008.02	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable, 10m
2	UTP cable, 10m
3	NA
4	UTP cable, 10m
5	UTP cable, 10m
6	NA

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: 1. Supply unit 3 is the 3.5G USB WIRELESS DEVICE.

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

Test date: Aug. 04, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30 , 2010	Nov. 29 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 01, 2010	Oct. 31, 2011
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 03, 2010	Sep. 02, 2011
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 17, 2010	Dec. 16, 2011
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 104+ Sucoflex 106	RF104-101+RF106-101	Aug. 24, 2010	Aug. 23, 2011
RF Cable	8DFB	STCCAB-30M-1GHz	NA	NA
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-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 (GSM, 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 (GSM, 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.

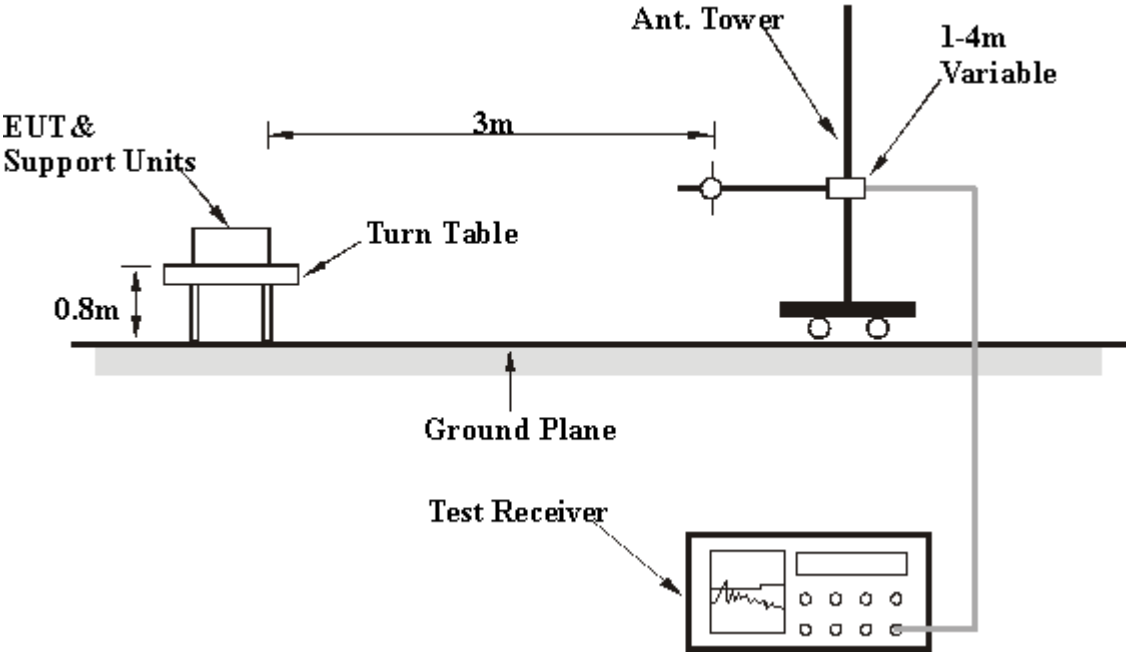
d. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable . Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step c. Record the power level of S.G

e. EIRP = Output power level of S.G – TX cable loss + 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 power = E.I.P.R power - 2.15dBi.

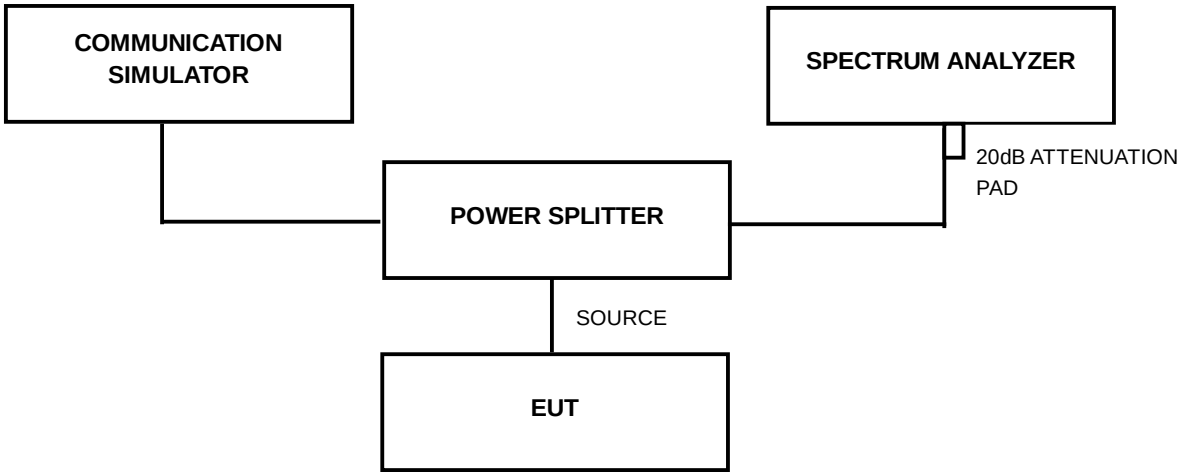
4.1.4 TEST SETUP

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 GSM, GPRS & E-GPRS:

GSM MODE

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	28.0	2.4	30.4	1.0965
190	836.6	28.3	2.4	30.7	1.1749
251	848.8	28.6	2.4	31.0	1.2589

GPRS MODE

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	27.9	2.4	30.3	1.0715
190	836.6	28.2	2.4	30.6	1.1482
251	848.8	28.5	2.4	30.9	1.2303

E-GPRS MODE

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	27.9	2.4	30.3	1.0715
190	836.6	28.1	2.4	30.5	1.122
251	848.8	28.5	2.4	30.9	1.2303

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.

GSM MODE

ERP POWER					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	28.1	1.3	29.4	0.867
190	836.6	28.6	1.2	29.8	0.9572
251	848.8	29.2	1.0	30.2	1.0471

GPRS MODE

ERP POWER					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
128	824.2	28.0	1.3	29.3	0.8414
190	836.6	28.6	1.2	29.8	0.9484
251	848.8	29.1	1.0	30.2	1.0471

E-GPRS MODE

ERP POWER					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	PEAK OUTPUT POWER	
				dBm	Watt
128	824.2	27.9	1.3	29.2	0.8279
190	836.6	28.5	1.2	29.7	0.9354
251	848.8	29.1	1.0	30.1	1.0233

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

FOR CDMA:

1x EV-DO MODE

WORST CASE CONDUCTED POWER								
CHANNEL	FREQ. (MHz)	Rev. A	Rev. 0	CORR. FACTOR (dB)	Rev. A		Rev. 0	
		RAW VALUE (dBm)			OUTPUT POWER			
					dBm	Watt	dBm	Watt
1013	824.70	24.5	24.4	2.4	26.9	0.48.8	26.8	0.4786
384	836.52	24.8	24.6	2.4	27.2	0.5248	27.0	0.5012
777	848.31	24.2	24.3	2.4	26.6	0.4571	26.7	0.4677

CDMA 2000 MODE

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+ SCH)	SO9		SO2	SO55	TDSO SO32 (FCH)	TDSO SO32 (FCH+ SCH)	SO9
1013	824.70	RC1	24.5	24.6	-	-	24.3	2.4	26.9	27.0	-	-	26.7
		RC3	24.6	24.6	24.5	24.4	24.4	2.4	27.0	27.0	26.9	26.8	26.8
384	836.52	RC1	24.8	24.8	-	-	24.7	2.4	27.2	27.2	-	-	27.1
		RC3	24.9	24.9	24.8	24.7	24.8	2.4	27.3	27.3	27.2	27.1	27.2
777	848.31	RC1	24.2	24.2	-	-	24.2	2.4	26.6	26.6	-	-	26.6
		RC3	24.3	24.4	24.1	24.1	24.2	2.4	26.7	26.8	26.5	26.5	26.6

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.

1x EV-DO MODE

ERP POWER								
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	19.0	18.9	1.3	20.3	0.1067	20.2	0.105
384	836.52	20.1	20.1	1.2	21.3	0.1349	21.3	0.1349
777	848.31	20.8	20.7	1.1	21.8	0.1514	21.8	0.1514

CDMA 2000 MODE

ERP POWER (SO55)					
CHANNEL NO.	FREQUENCY (MHz)	S.G. VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
1013	824.70	19.1	1.3	20.4	0.1099
384	836.52	20.3	1.2	21.4	0.1387
777	848.31	20.8	1.1	21.8	0.1514

REMARKS: 1. Peak Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space 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	24.3	2.4	26.7	0.4677
4182	836.4	24.6	2.4	27.0	0.5012
4233	846.6	24.2	2.4	26.6	0.4571

WCDMA-AMR MODE A

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.2	2.4	26.6	0.4571
4182	836.4	24.1	2.4	26.5	0.4467
4233	846.6	23.8	2.4	26.2	0.4169

WCDMA-AMR MODE B

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.3	2.4	26.7	0.4677
4182	836.4	24.6	2.4	27.0	0.5012
4233	846.6	24.2	2.4	26.6	0.4571

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-AMR MODE C

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.2	2.4	26.6	0.4571
4182	836.4	24.6	2.4	27.0	0.5012
4233	846.6	24.2	2.4	26.6	0.4571

WCDMA-AMR MODE D

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.3	2.4	26.7	0.4677
4182	836.4	24.5	2.4	26.9	0.4898
4233	846.6	24.2	2.4	26.6	0.4571

WCDMA-AMR MODE E

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.2	2.4	26.6	0.4571
4182	836.4	24.1	2.4	26.5	0.4467
4233	846.6	23.8	2.4	26.2	0.4169

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-AMR MODE F

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.1	2.4	26.5	0.4467
4182	836.4	24.1	2.4	26.5	0.4467
4233	846.6	23.7	2.4	26.1	0.4074

WCDMA-AMR MODE G

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.0	2.4	26.4	0.4365
4182	836.4	24.2	2.4	26.6	0.4571
4233	846.6	23.8	2.4	26.2	0.4169

WCDMA-AMR MODE H

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.1	2.4	26.5	0.4467
4182	836.4	24.2	2.4	26.6	0.4571
4233	846.6	23.8	2.4	26.2	0.4169

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-RMC MODE

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	23.7	2.4	26.1	0.4074
4182	836.4	23.7	2.4	26.1	0.4074
4233	846.6	23.7	2.4	26.1	0.4074

HSDPA MODE- Subtest 1

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	23.7	2.4	26.1	0.4074
4182	836.4	24.1	2.4	26.5	0.4467
4233	846.6	23.0	2.4	25.4	0.3467

HSDPA MODE- Subtest 2

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	23.9	2.4	26.3	0.4266
4182	836.4	23.8	2.4	26.2	0.4169
4233	846.6	23.0	2.4	25.4	0.3467

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- Subtest 3

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	22.8	2.4	25.2	0.3311
4182	836.4	23.0	2.4	25.4	0.3467
4233	846.6	23.3	2.4	25.7	0.3715

HSDPA MODE- Subtest 4

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	21.9	2.4	24.3	0.2692
4182	836.4	22.0	2.4	24.4	0.2754
4233	846.6	21.8	2.4	24.2	0.2630

HSUPA MODE- Subtest 1

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.2	2.4	26.6	0.4571
4182	836.4	24.5	2.4	26.9	0.4898
4233	846.6	24.1	2.4	26.5	0.4467

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- Subtest 2

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.2	2.4	26.6	0.4571
4182	836.4	24.4	2.4	26.8	0.4786
4233	846.6	24.0	2.4	26.4	0.4365

HSUPA MODE- Subtest 3

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.1	2.4	26.5	0.4467
4182	836.4	24.5	2.4	26.9	0.4898
4233	846.6	24.0	2.4	26.4	0.4365

FOR HSUPA MODE- Subtest 4

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.2	2.4	26.6	0.4571
4182	836.4	24.5	2.4	26.9	0.4898
4233	846.6	24.1	2.4	26.5	0.4467

HSUPA MODE- Subtest 5

CONDUCTED OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	Watt
4132	826.4	24.0	2.4	26.4	0.4365
4182	836.4	24.4	2.4	26.8	0.4786
4233	846.6	24.0	2.4	26.4	0.4365

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	19.1	1.3	20.3	0.1081
4182	836.4	20.1	1.2	21.3	0.1337
4233	846.6	20.5	1.1	21.6	0.1439

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

2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

According to the FCC part 2.4235 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℃~50℃.

4.2.2 TEST INSTRUMENTS

Test date: Aug. 04, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Sep. 08, 2010	Sep. 07, 2011
OVEN	MHU-225AU	911033	Dec. 17, 2010	Dec. 16, 2011
HUBER+SUHNER	SUCOFLEX104	222684/4	Aug. 14, 2010	Aug. 13, 2011
AC POWER SOURCE	6205	1140503	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.

4.2.3 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 GSM / 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 GSM link channel is the 190, the CDMA link channel is the 384 and the WCDMA link channel is the 4182.

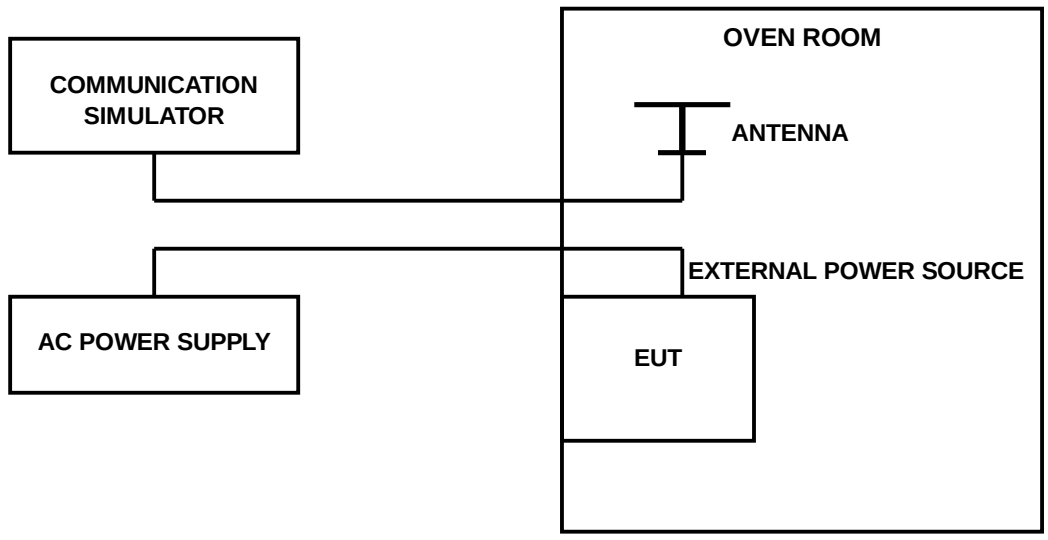
b. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.

c. EUT is connected the external power supply to control the AC input power. The various Volts from the minimum 102 Volts to 138 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.

4.2.4 TEST SETUP



4.2.5 TEST RESULTS

FOR GSM:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	**FREQUENCY ERROR (Hz)**	**FREQUENCY ERROR (ppm)**	**LIMIT (ppm)**
102	-40	-0.048	2.5
138	-44	-0.053	2.5

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. (℃)	**FREQUENCY ERROR (Hz)**	**FREQUENCY ERROR (ppm)**	**LIMIT (ppm)**
50	-56	-0.067	2.5
40	-48	-0.057	2.5
30	-43	-0.051	2.5
20	-44	-0.053	2.5
10	-42	-0.050	2.5
0	-38	-0.045	2.5
-10	-39	-0.047	2.5
-20	-42	-0.050	2.5
-30	-51	-0.061	2.5

FOR CDMA:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	**FREQUENCY ERROR (Hz)**	**FREQUENCY ERROR (ppm)**	**LIMIT (ppm)**
102	-72	-0.086	2.5
138	-82	-0.098	2.5

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. (℃)	**FREQUENCY ERROR (Hz)**	**FREQUENCY ERROR (ppm)**	**LIMIT (ppm)**
50	-88	-0.105	2.5
40	-85	-0.102	2.5
30	-84	-0.100	2.5
20	-79	-0.094	2.5
10	-75	-0.090	2.5
0	-73	-0.087	2.5
-10	-75	-0.090	2.5
-20	-81	-0.097	2.5
-30	-80	-0.096	2.5

FOR WCDMA:

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	**FREQUENCY ERROR (Hz)**	**FREQUENCY ERROR (ppm)**	**LIMIT (ppm)**
102	-62	-0.074	2.5
138	-58	-0.069	2.5

AFC FREQUENCY ERROR vs. TEMP.			
TEMP. (℃)	**FREQUENCY ERROR (Hz)**	**FREQUENCY ERROR (ppm)**	**LIMIT (ppm)**
50	-61	-0.073	2.5
40	-52	-0.062	2.5
30	-65	-0.078	2.5
20	-55	-0.066	2.5
10	-52	-0.062	2.5
0	-57	-0.068	2.5
-10	-54	-0.065	2.5
-20	-56	-0.067	2.5
-30	-63	-0.075	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

Test date: Aug. 04, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Sep. 08, 2010	Sep. 07, 2011
OVEN	MHU-225AU	911033	Dec. 17, 2010	Dec. 16, 2011
HUBER+SUHNER	SUCOFLEX104	222684/4	Aug. 14, 2010	Aug. 13, 2011
AC POWER SOURCE	6205	1140503	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

Same as Item 4.2.4 (Conducted Power 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 (GSM, GPRS & E-GPRS) / 1013, 384 and 777 (1x EV-DO & CDMA) / 4132, 4182 and 4233 (WCDMA, HSDPA & HSUPA) (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

Same as Item 4.1.5

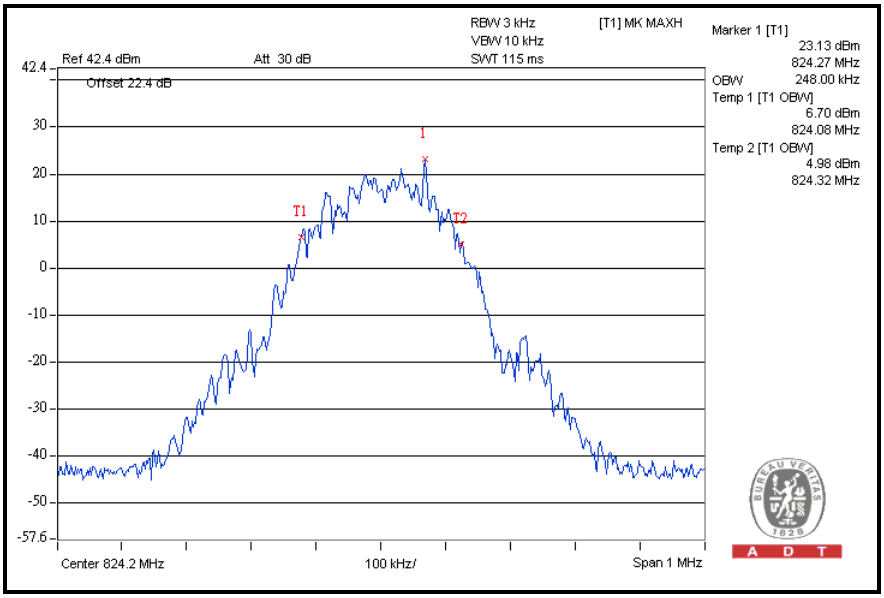
4.3.6 TEST RESULTS

FOR GSM, GPRS & E-GPRS:

GSM MODE

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)
128	824.2	248.0
190	836.6	244.0
251	848.8	244.0

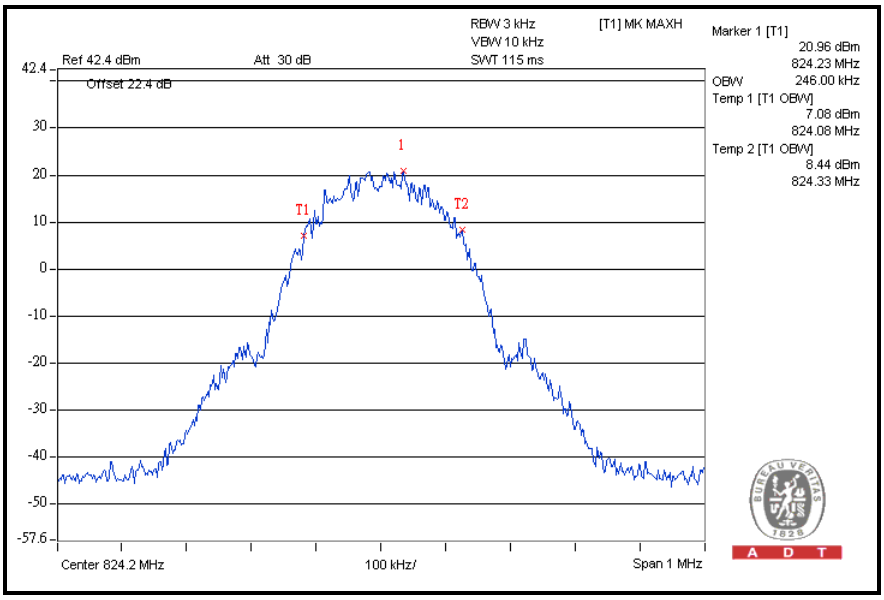
CH 128



GPRS MODE

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)
128	824.2	246.0
190	836.6	242.0
251	848.8	244.0

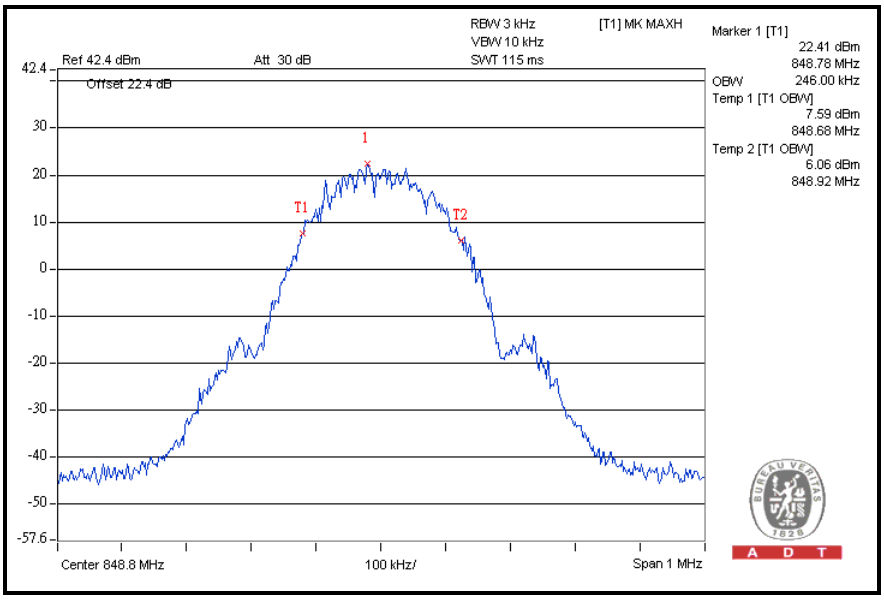
CH 128



E-GPRS MODE

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)
128	824.2	244.0
190	836.6	246.0
251	848.8	246.0

CH 251

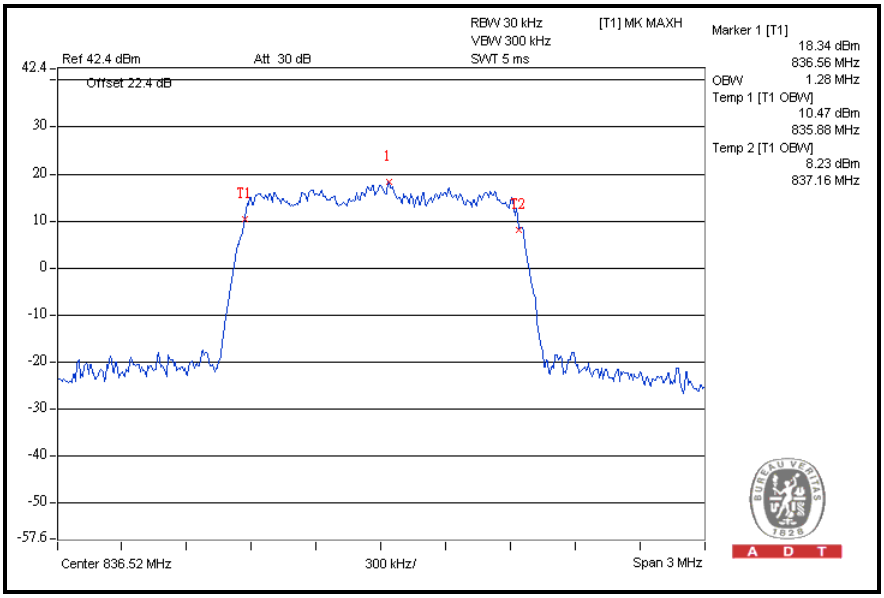


FOR CDMA

CDMA 2000:

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

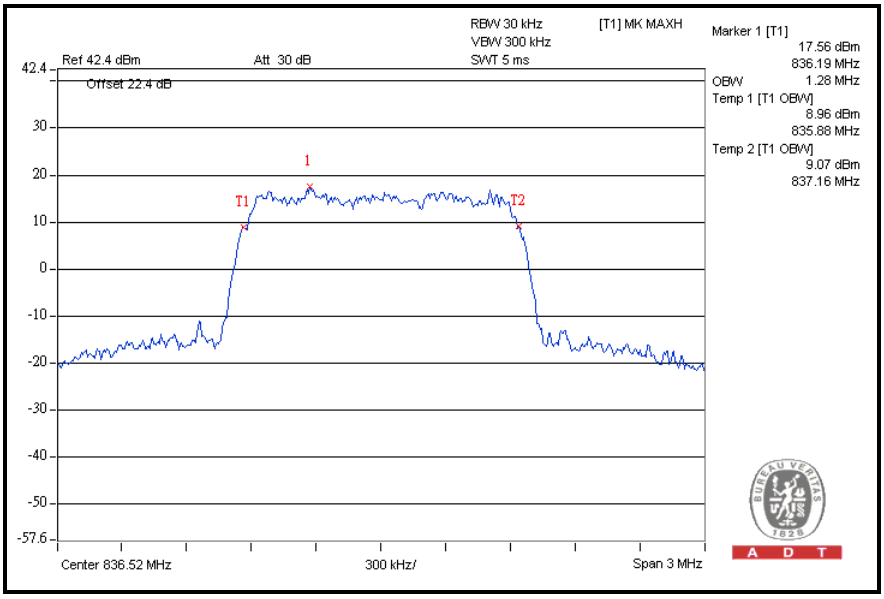
CH 384



1x 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

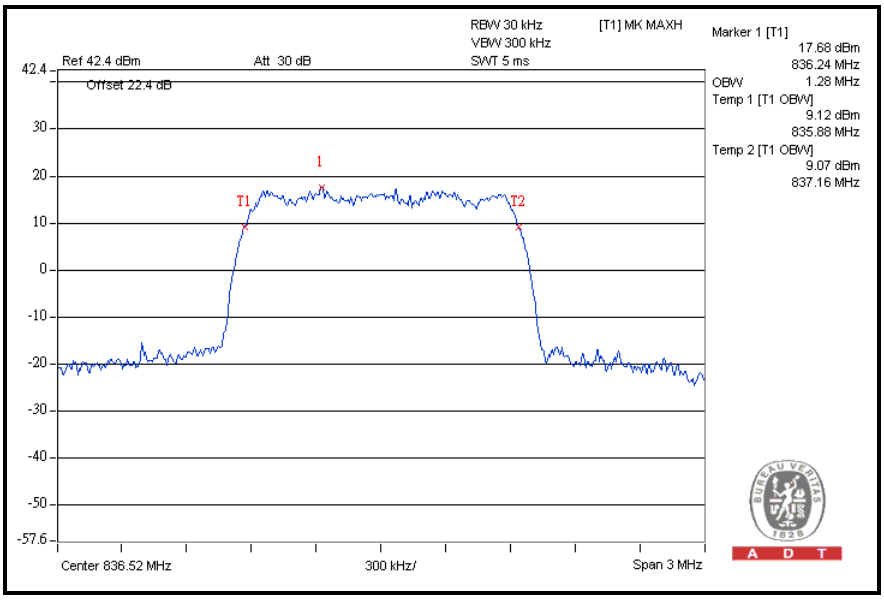
CH 384



1x EV-DO Rev. 0

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

CH 384

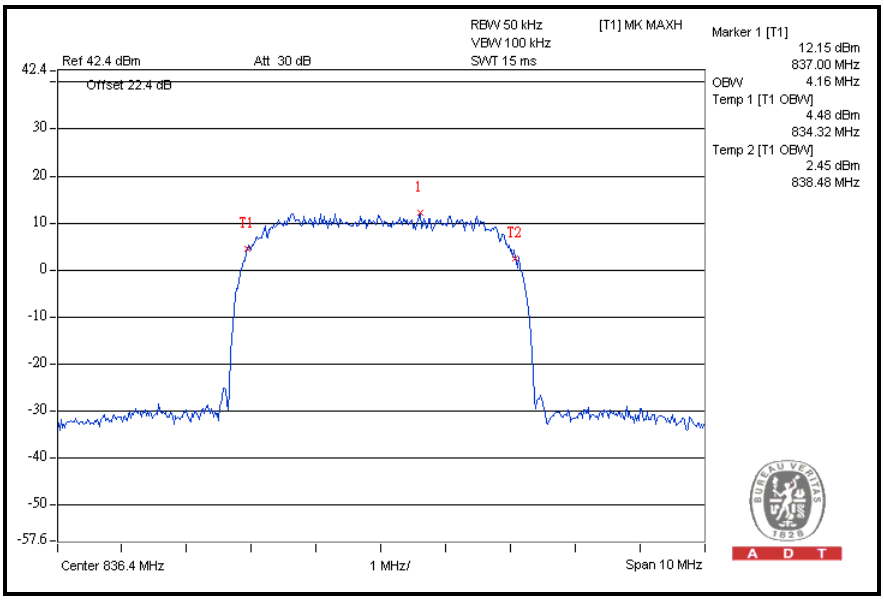


FOR WCDMA:

WCDMA:

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

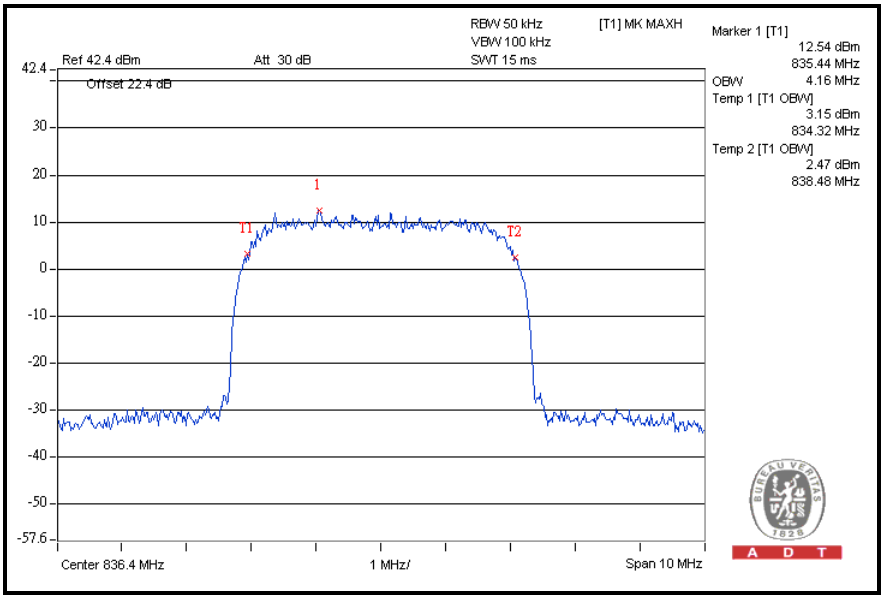
CH 4182



HSDPA:

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

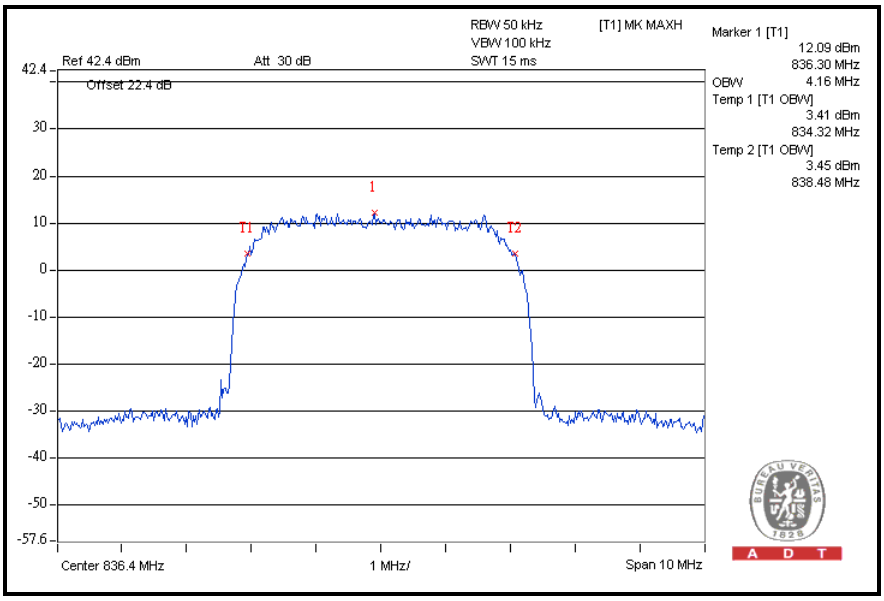
CH 4182



HSUPA:

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

CH 4182



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

Test date: Aug. 04, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Sep. 08, 2010	Sep. 07, 2011
OVEN	MHU-225AU	911033	Dec. 17, 2010	Dec. 16, 2011
HUBER+SUHNER	SUCOFLEX104	222684/4	Aug. 14, 2010	Aug. 13, 2011
AC POWER SOURCE	6205	1140503	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

Same as Item 4.2.4 (Conducted Power 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 (GSM, GPRS & E-GPRS) / 1013 and 777 (1x EV-DO & CDMA) / 4132 and 4233 (WCDMA, HSDPA & HSUPA) (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).

4.4.5 EUT OPERATING CONDITION

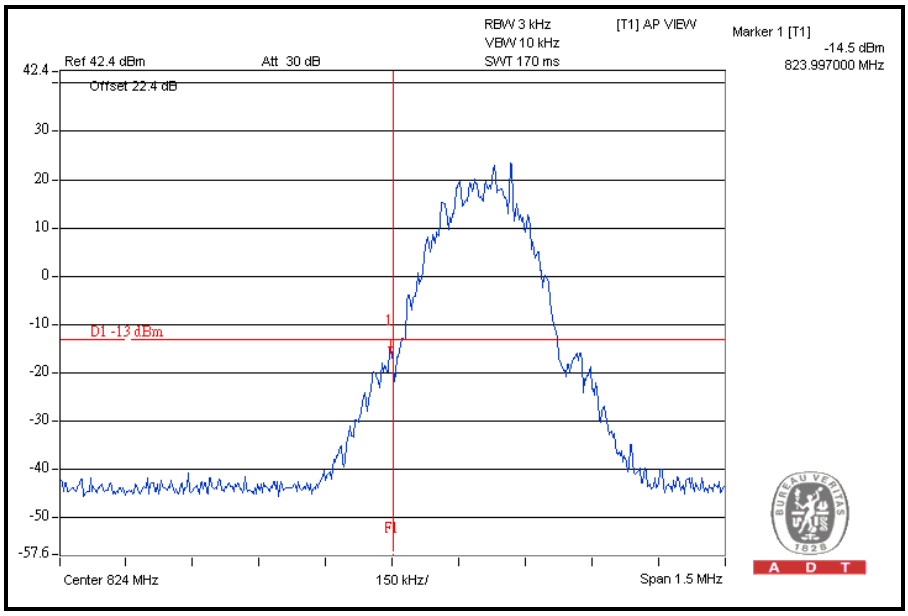
Same as Item 4.1.5

4.4.6 TEST RESULTS

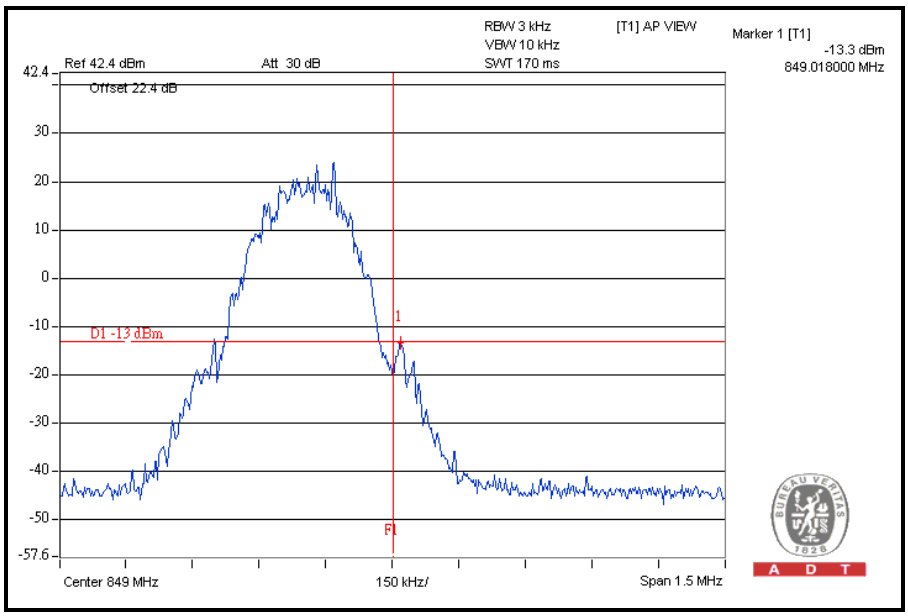
FOR GSM / GPRS / E-GPRS:

GSM MODE

LOWER BAND EDGE

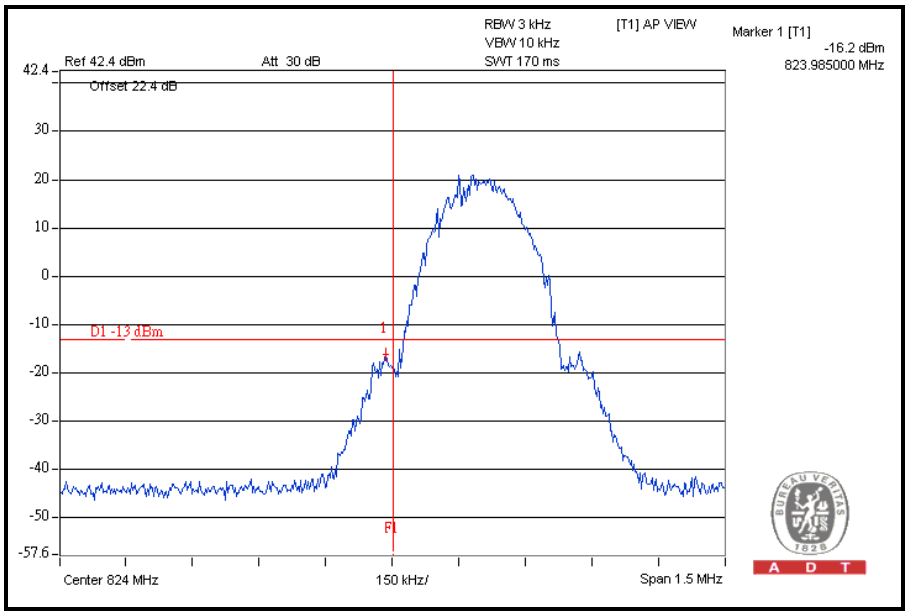


HIGHER BAND EDGE

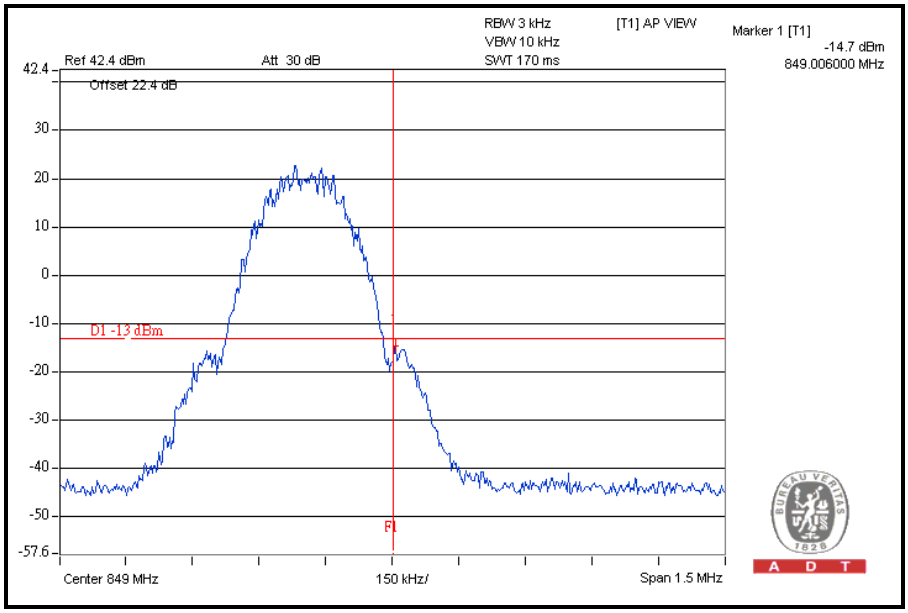


GPRS MODE

LOWER BAND EDGE

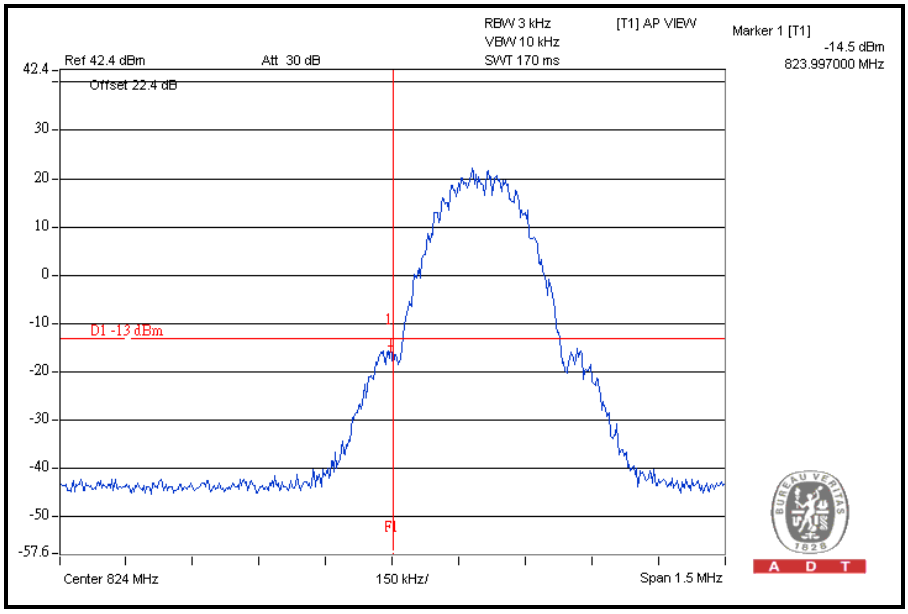


HIGHER BAND EDGE

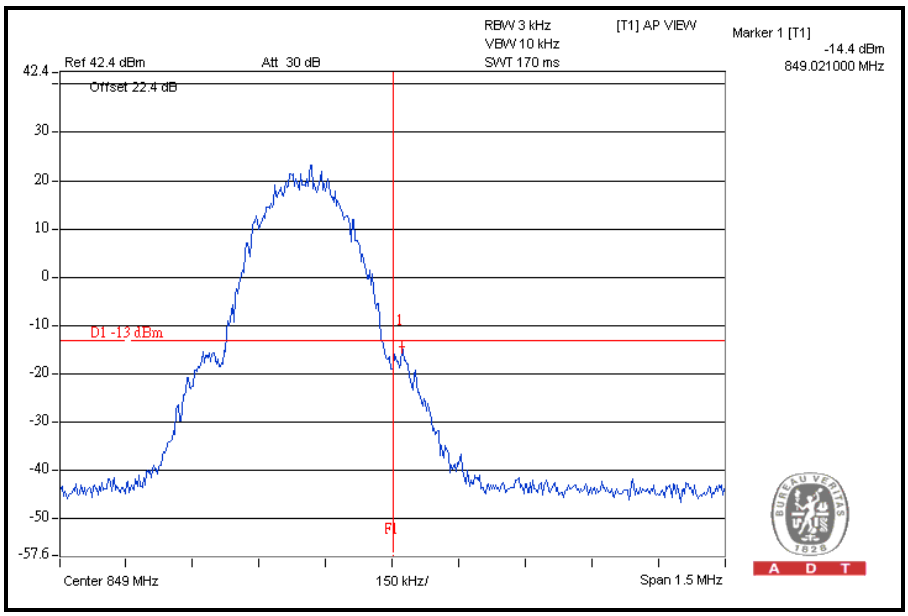


E-GPRS MODE

LOWER BAND EDGE



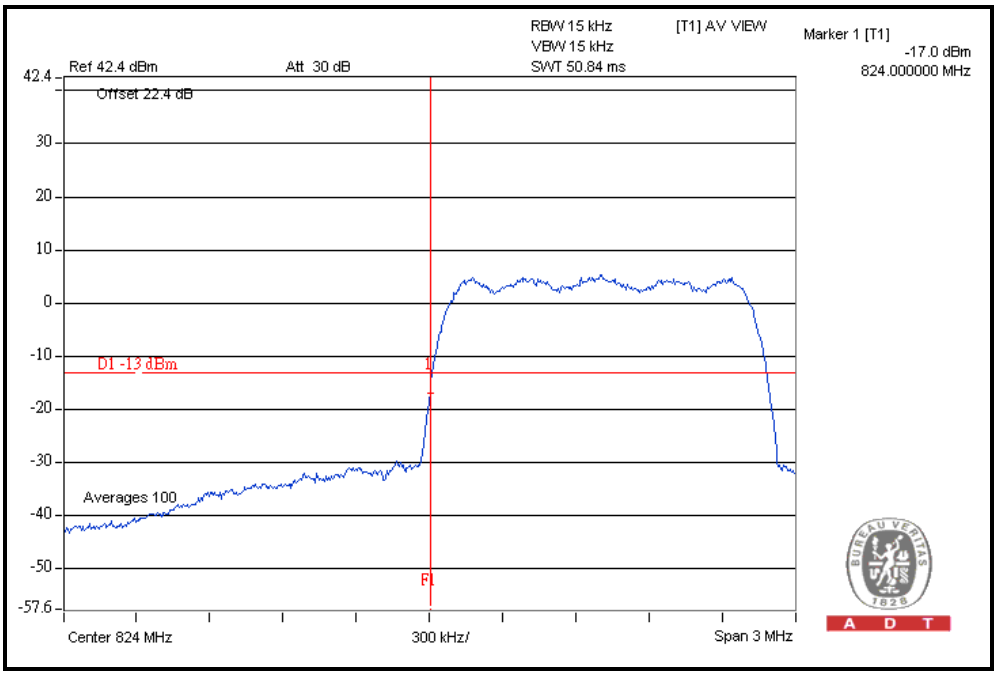
HIGHER BAND EDGE



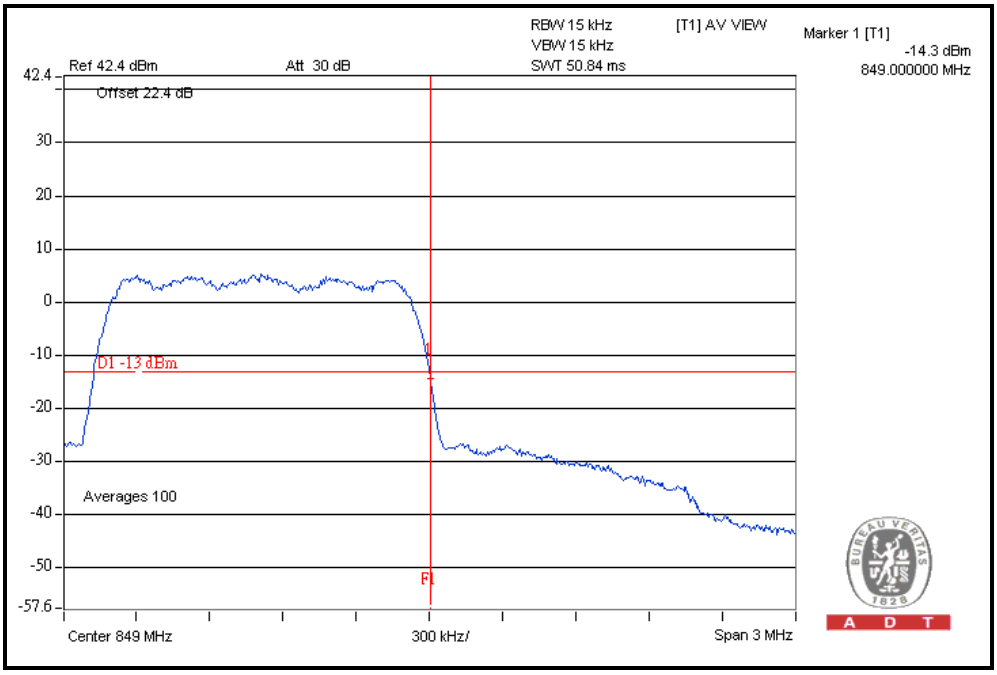
FOR CDMA:

CDMA 2000:

LOWER BAND EDGE

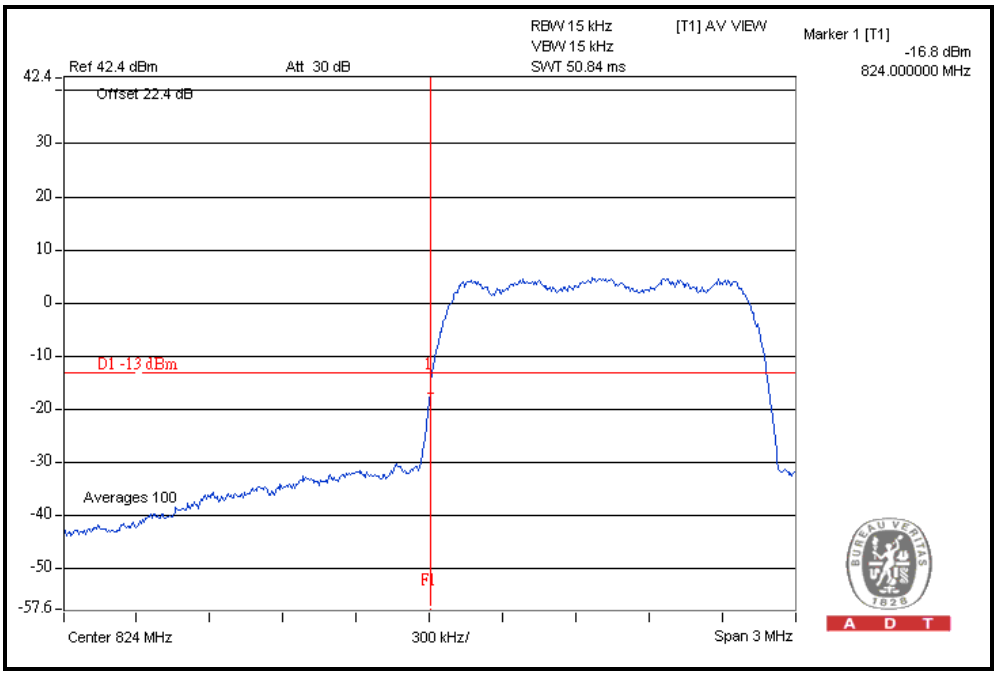


HIGHER BAND EDGE

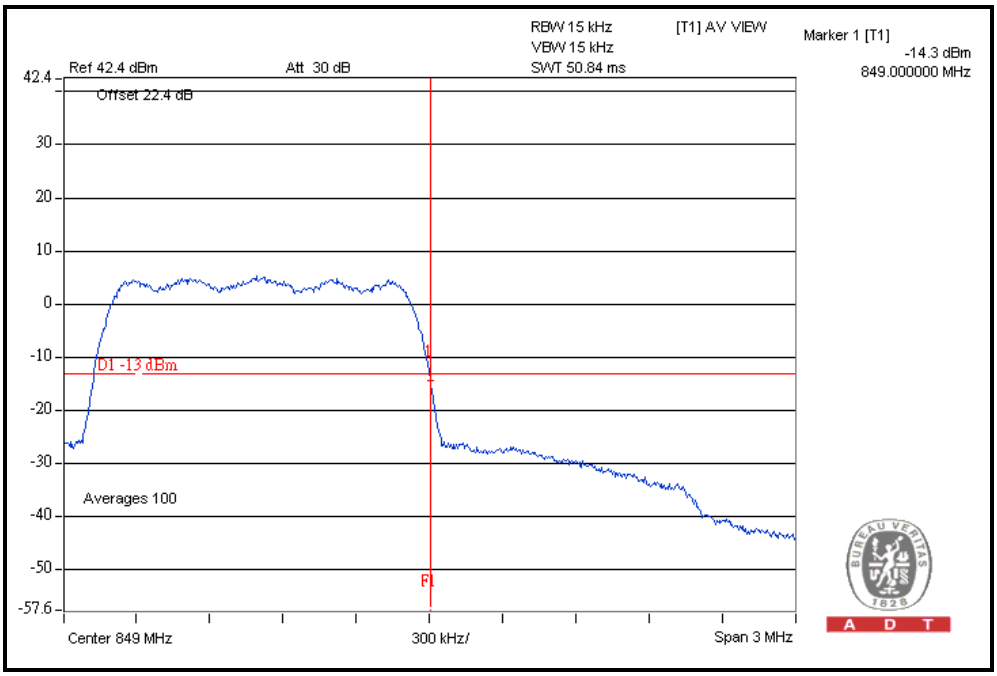


1x EV-DO Rev. A:

LOWER BAND EDGE

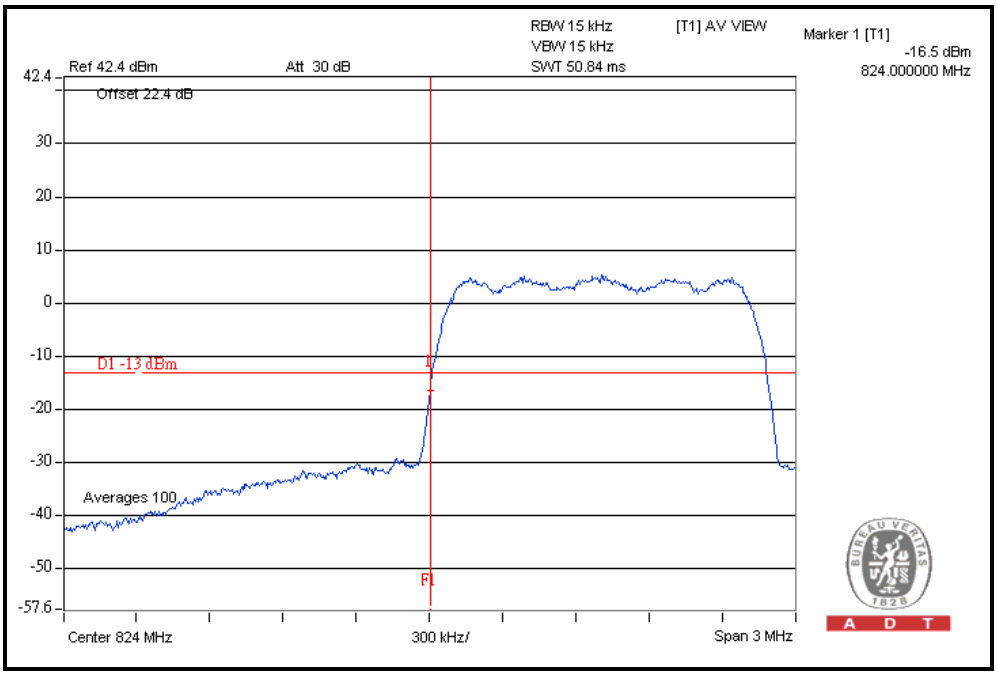


HIGHER BAND EDGE

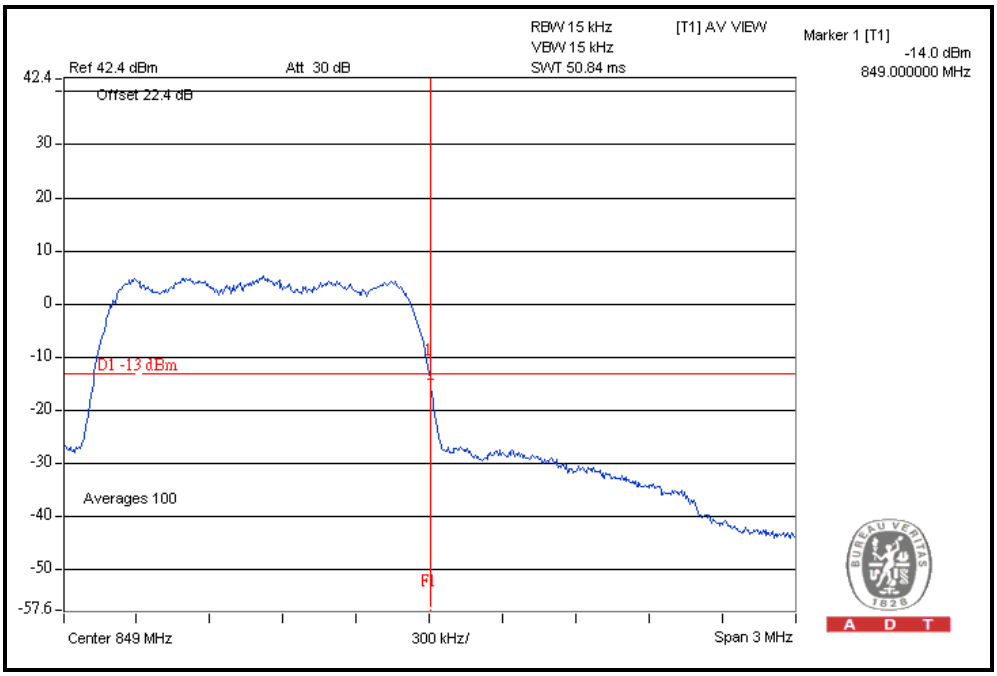


1x EV-DO Rev. 0:

LOWER BAND EDGE



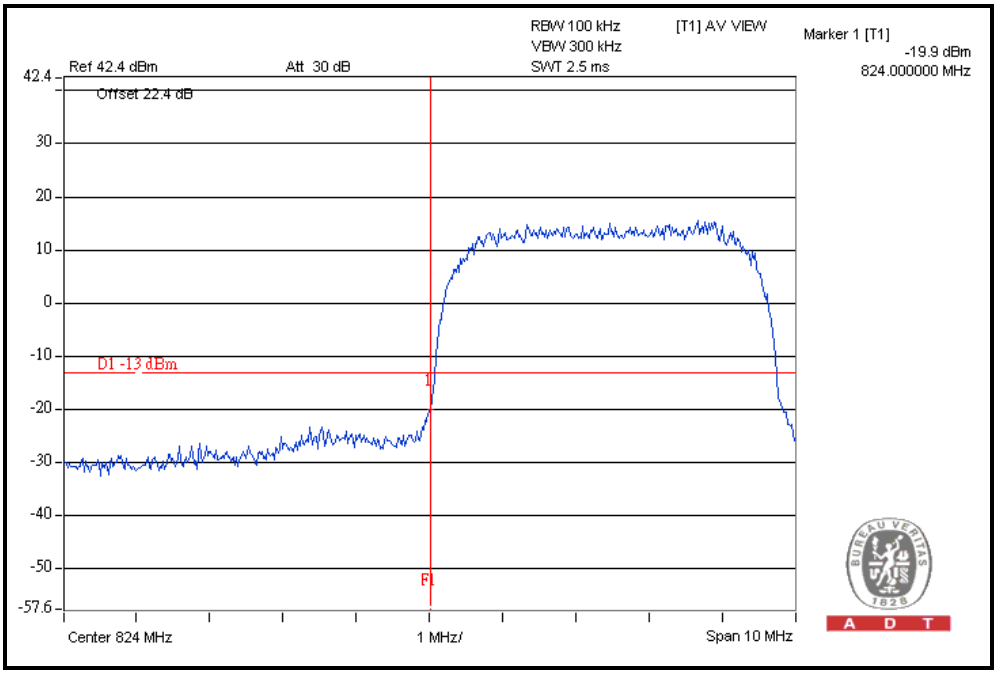
HIGHER BAND EDGE



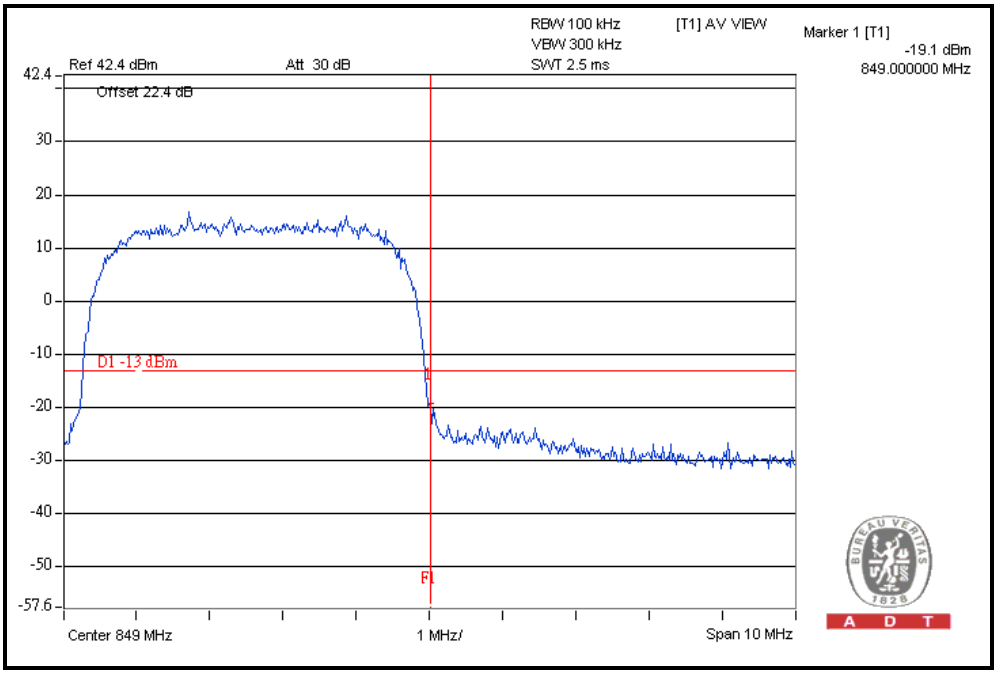
FOR WCDMA:

WCDMA MODE

LOWER BAND EDGE

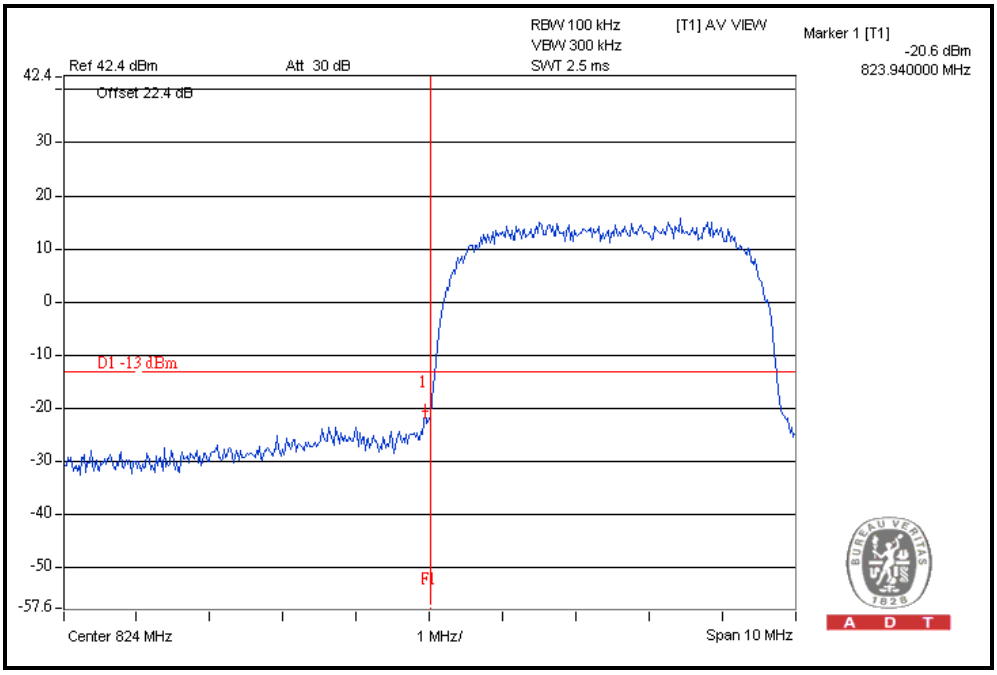


HIGHER BAND EDGE

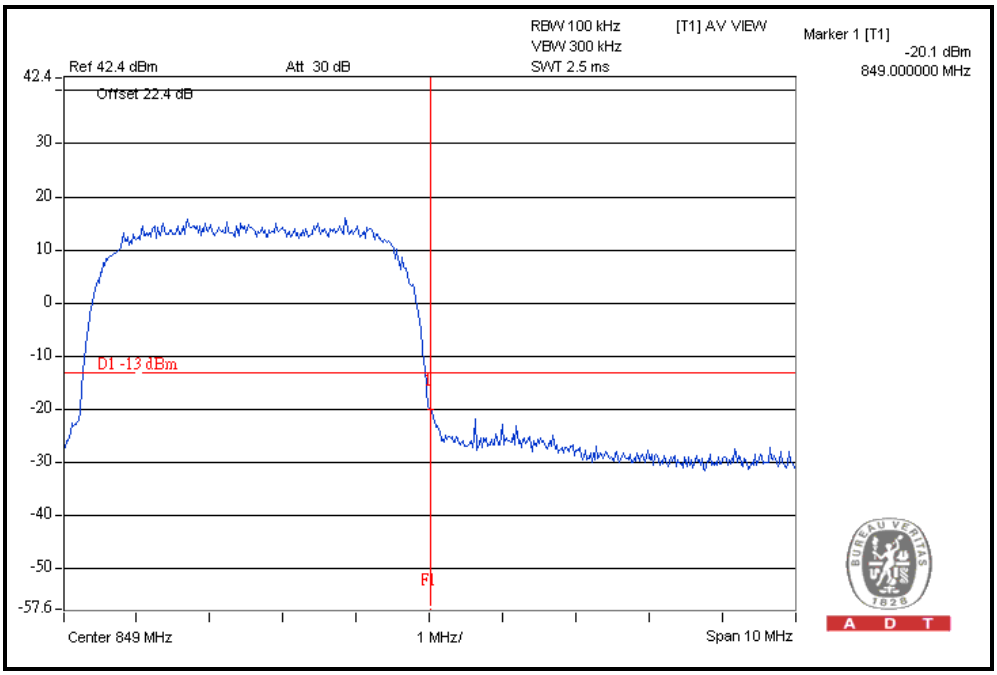


HSDPA MODE

LOWER BAND EDGE

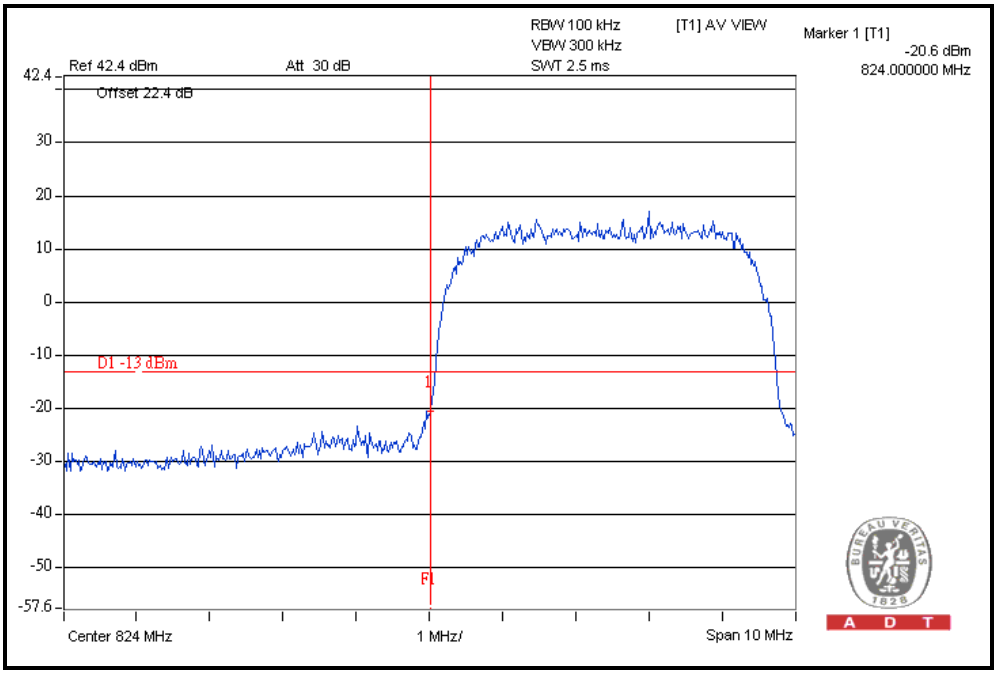


HIGHER BAND EDGE

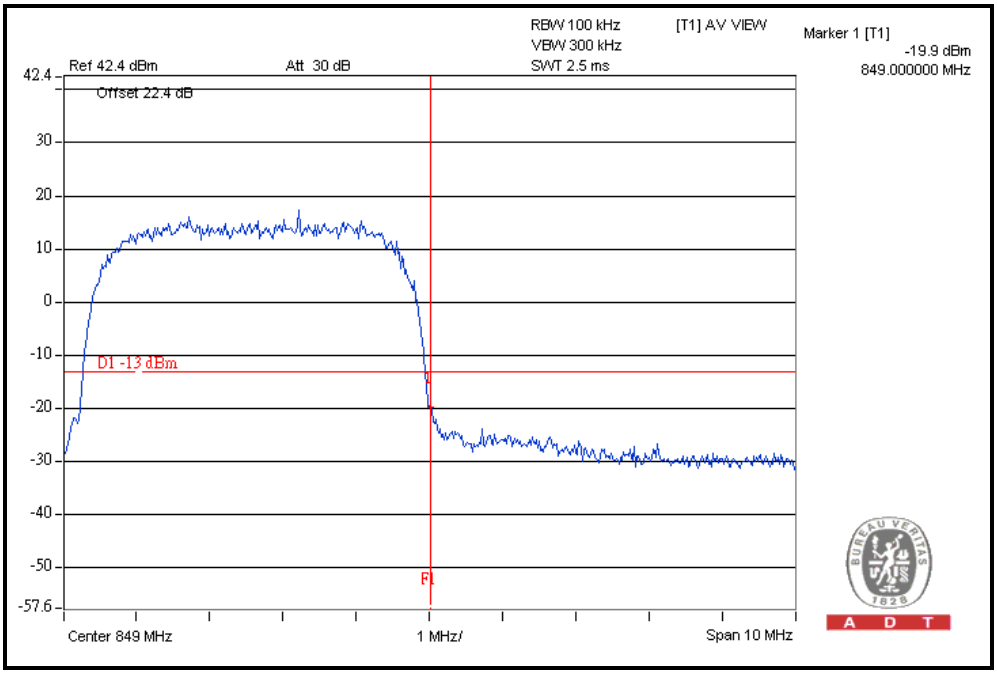


HSUPA MODE

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 GSM spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission equal to –13dBm.

4.5.2 TEST INSTRUMENTS

Test date: Aug. 04, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Sep. 08, 2010	Sep. 07, 2011
OVEN	MHU-225AU	911033	Dec. 17, 2010	Dec. 16, 2011
HUBER+SUHNER	SUCOFLEX104	222684/4	Aug. 14, 2010	Aug. 13, 2011
AC POWER SOURCE	6205	1140503	NA	NA
Wainwright Instruments Band Reject Filter	WRCG1850/1910-1830/1930-60/10SS	SN1	NA	NA
* Wainwright Instruments High Pass Filter	WHK3.1/18G-10SS	SN1	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

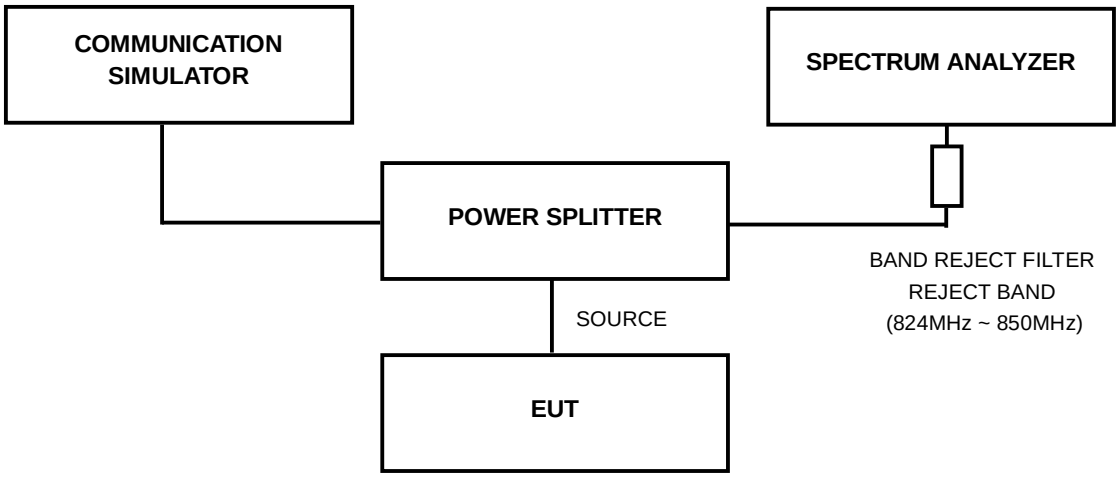
a. The EUT makes a phone call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 128, 190 and 251 (GSM) / 1013, 384 and 777 (CDMA) / 4132, 4182 and 4233 (WCDMA) (low, middle and high operational frequency range.)

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 6dB 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



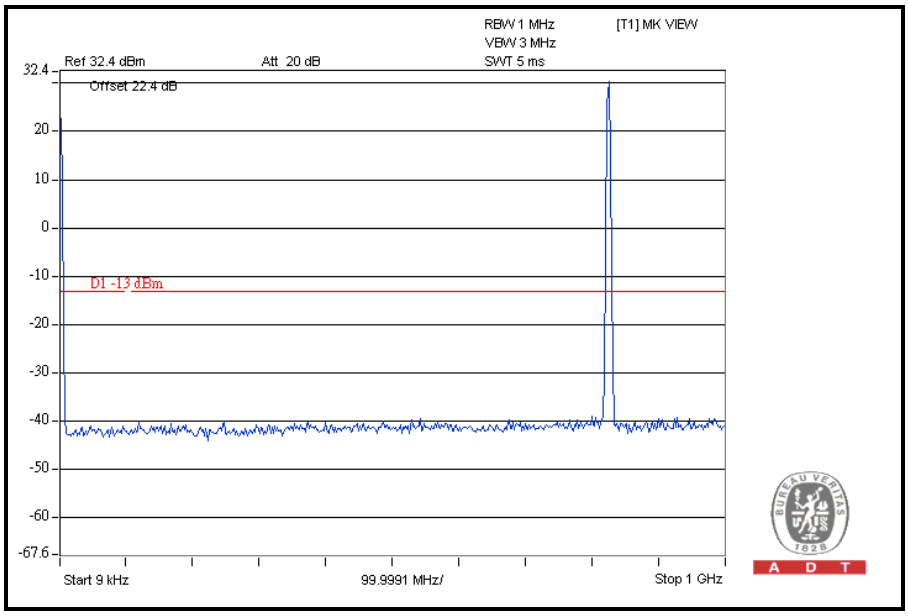
4.5.5 EUT OPERATING CONDITIONS

Same as Item 4.1.5

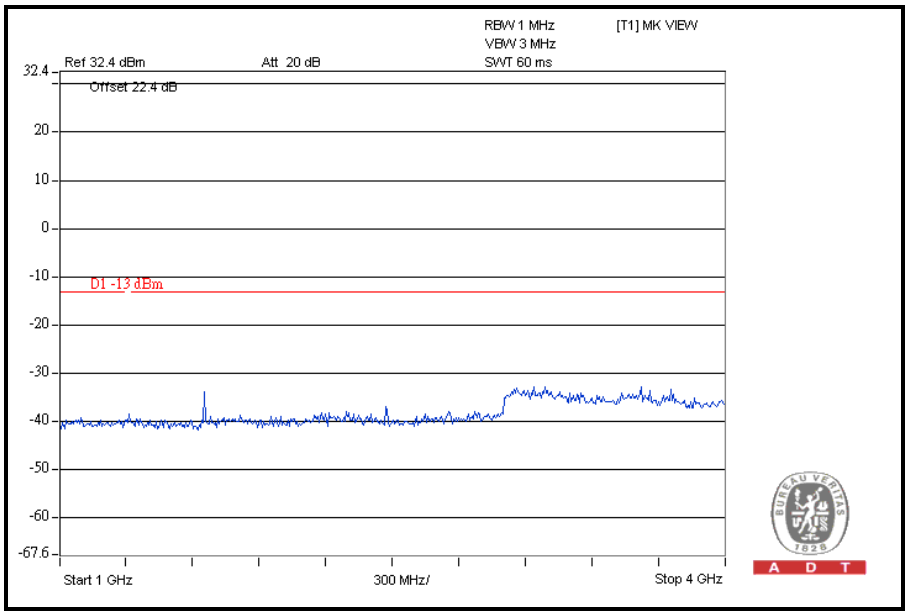
4.5.6 TEST RESULTS

FOR GSM:

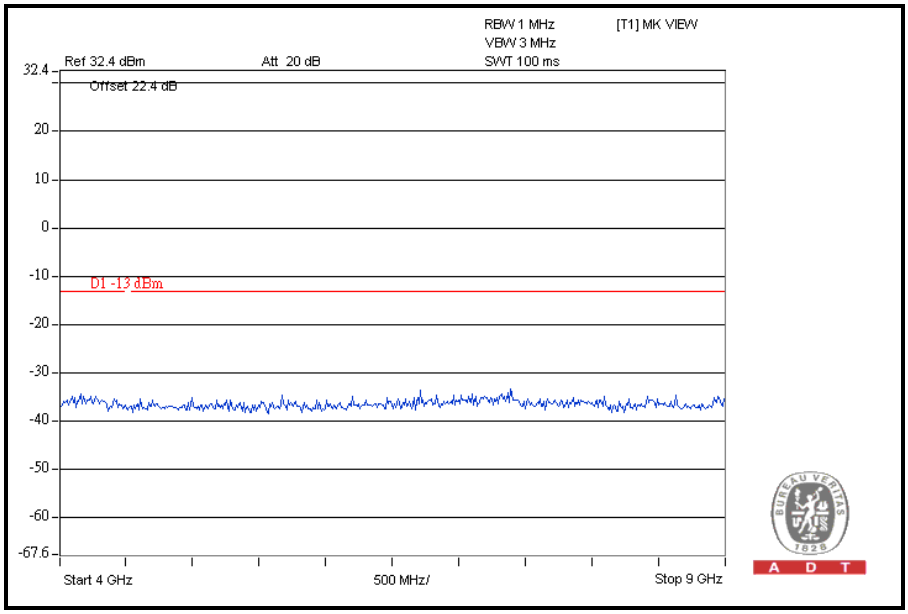
CH 128: 9kHz ~ 1GHz



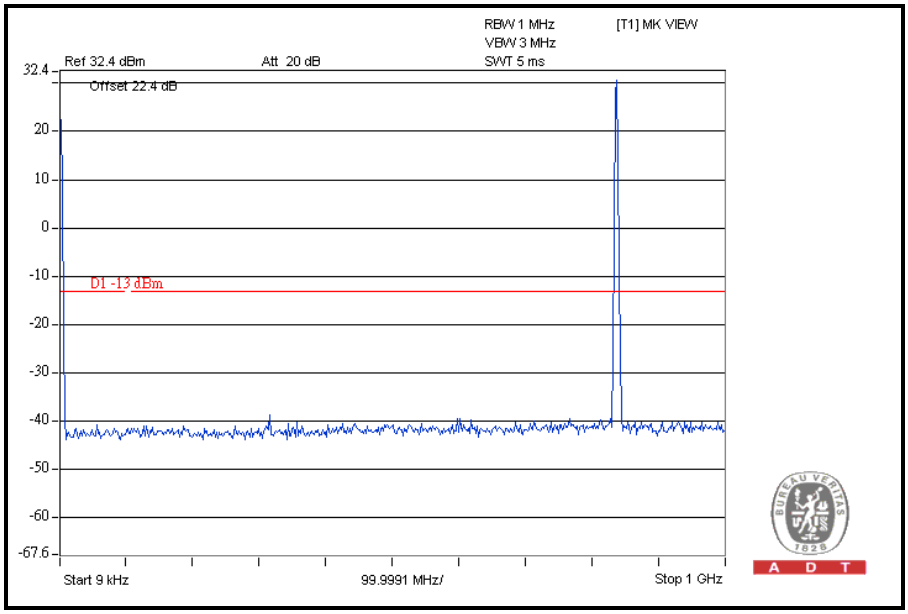
1GHz ~ 4GHz



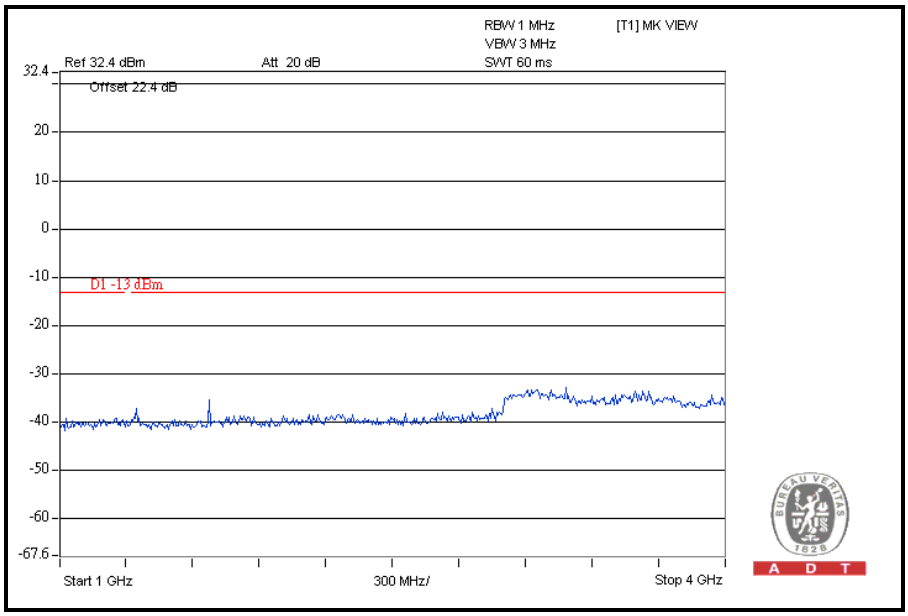
4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

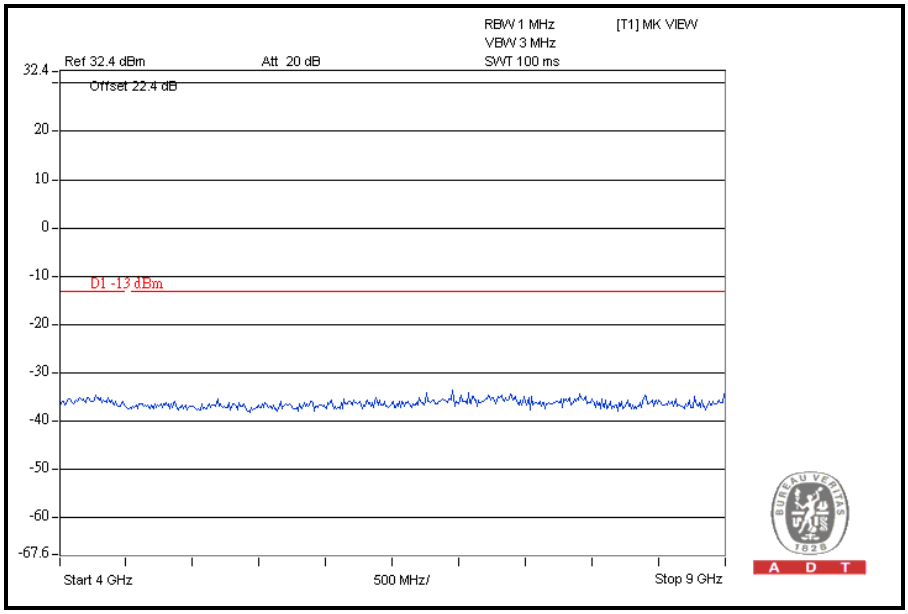
CH 190: 9kHz ~ 1GHz



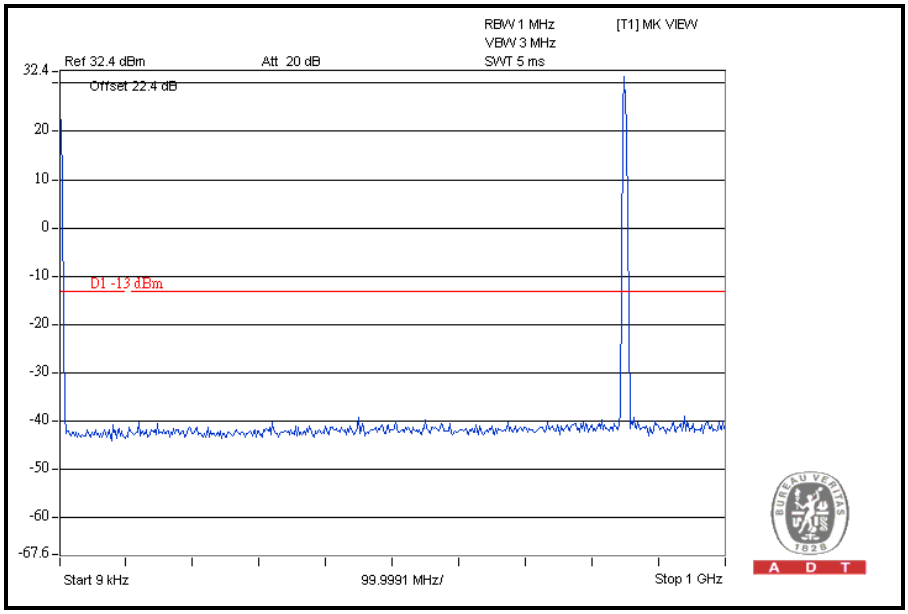
1GHz ~ 4GHz



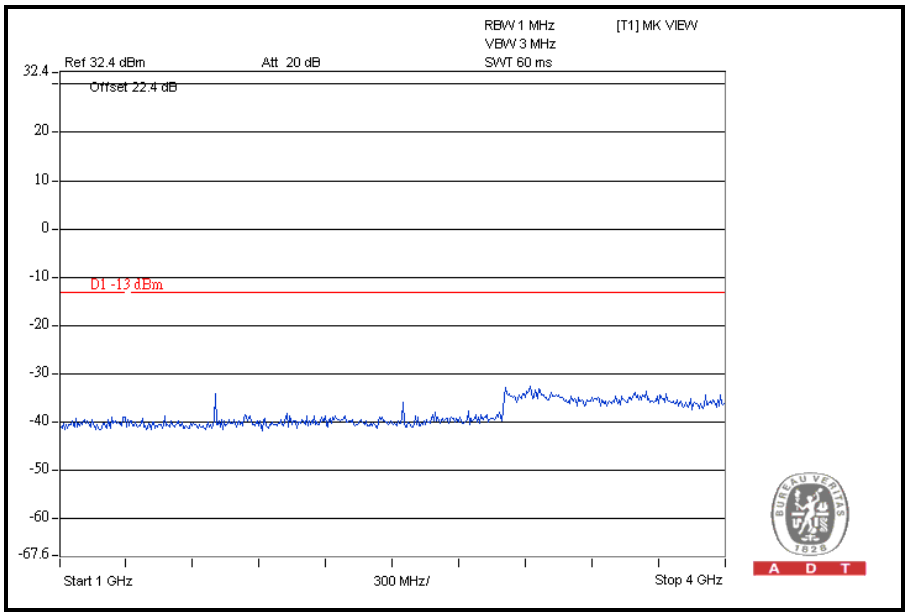
4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

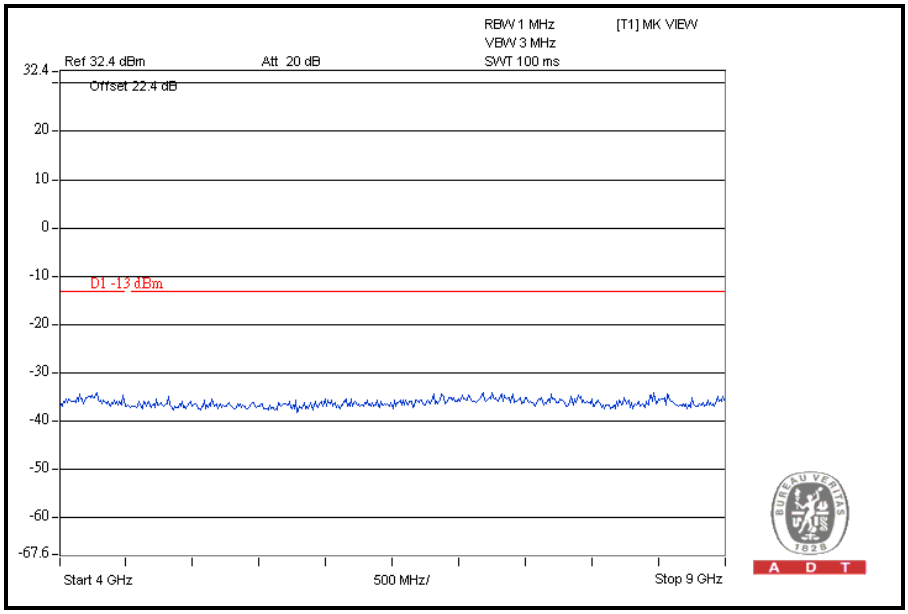
CH 251: 9kHz ~ 1GHz



1GHz ~ 4GHz

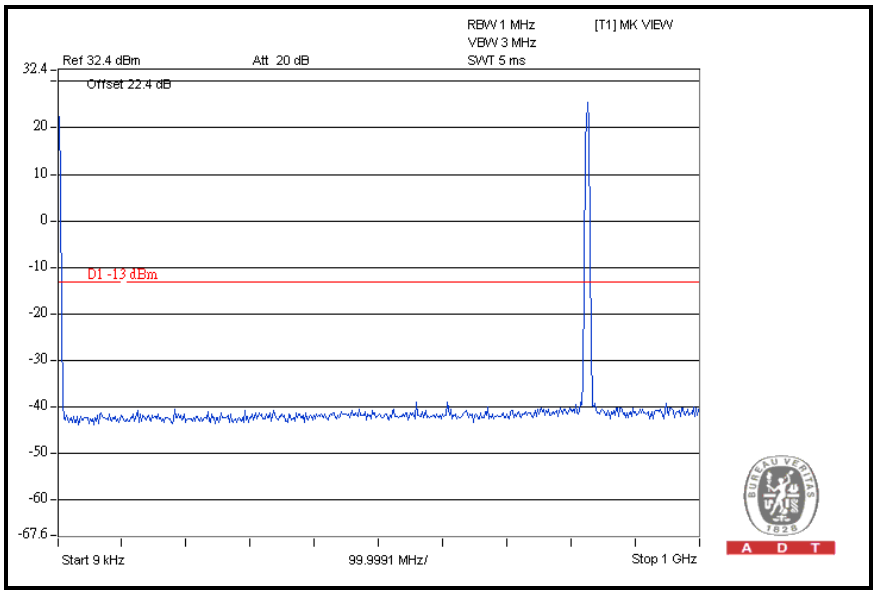


4GHz ~ 9GHz

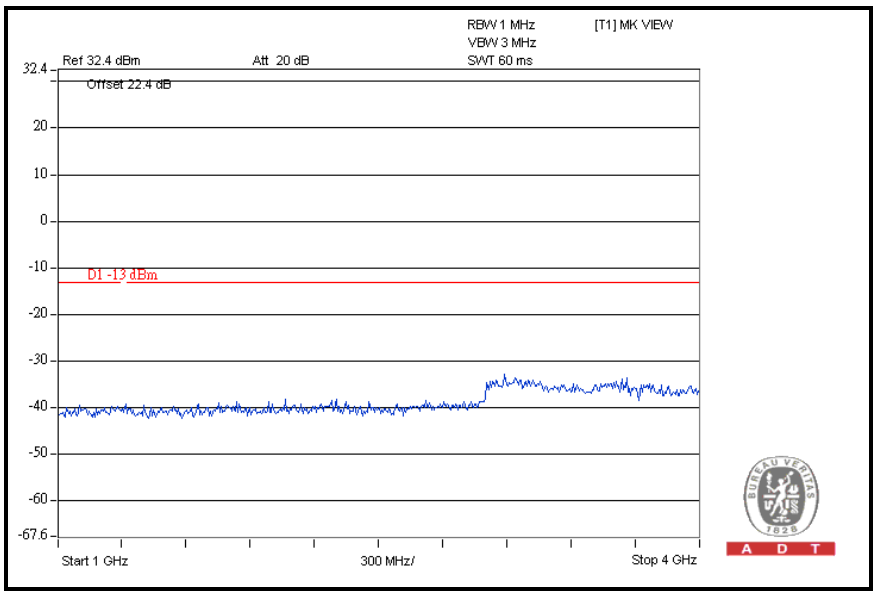

RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

FOR CDMA:

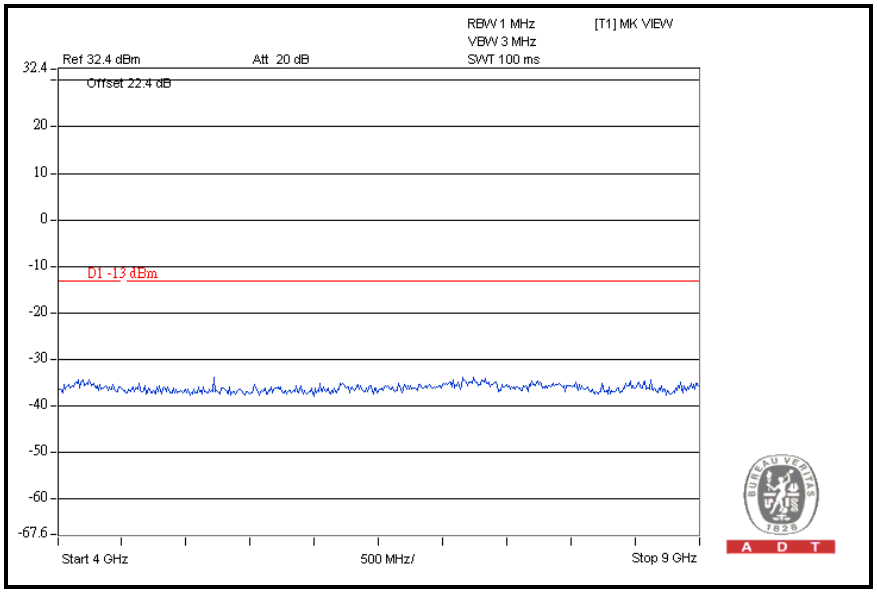
CH 1013: 9kHz ~ 1GHz



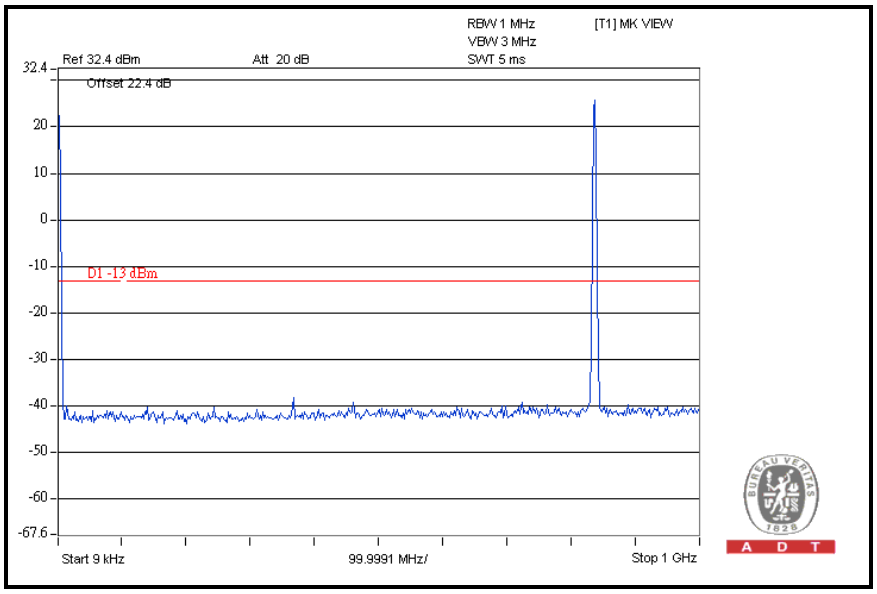
1GHz ~ 4GHz



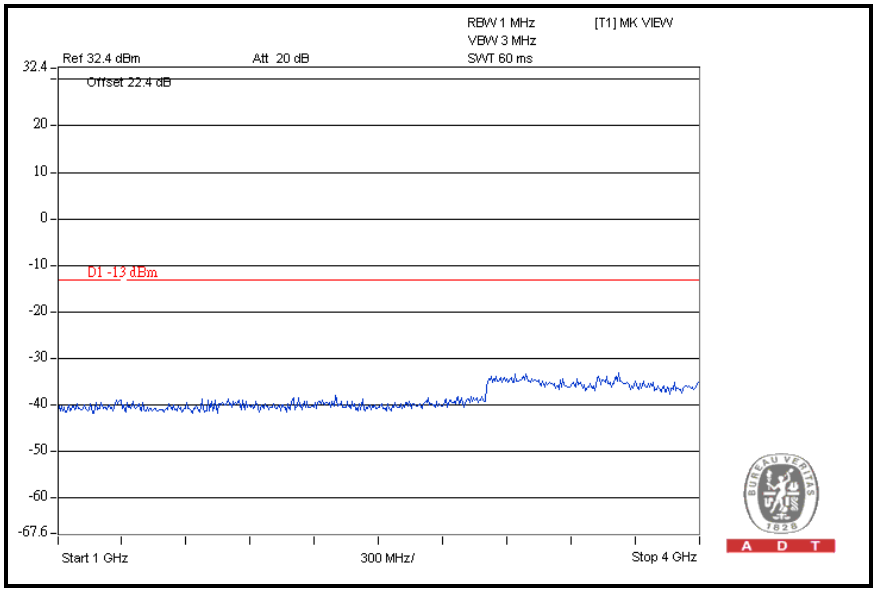
4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

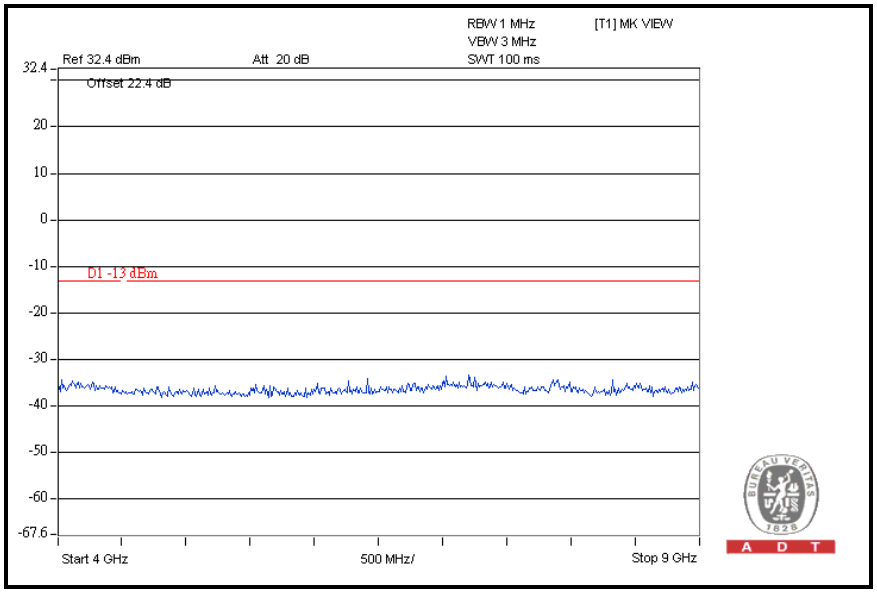
CH 384: 9kHz ~ 1GHz



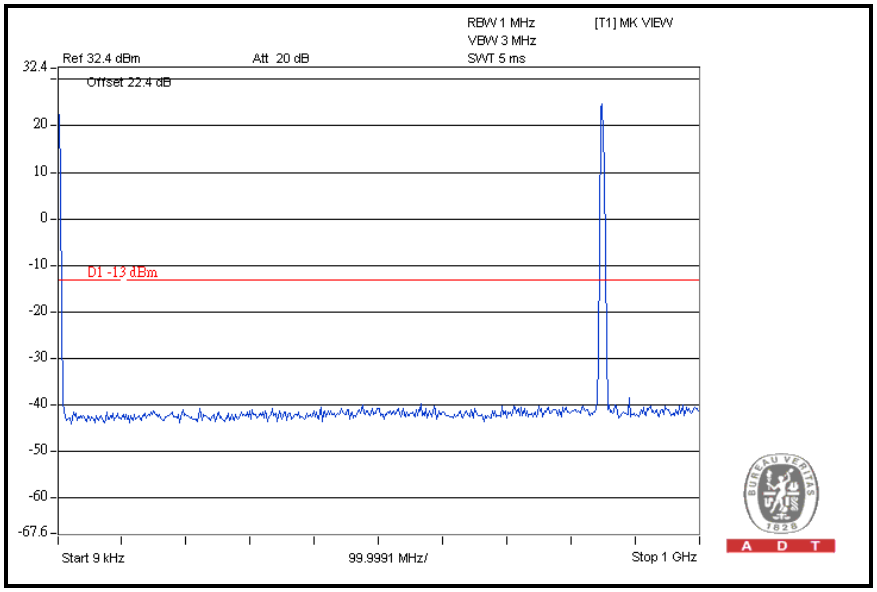
1GHz ~ 4GHz



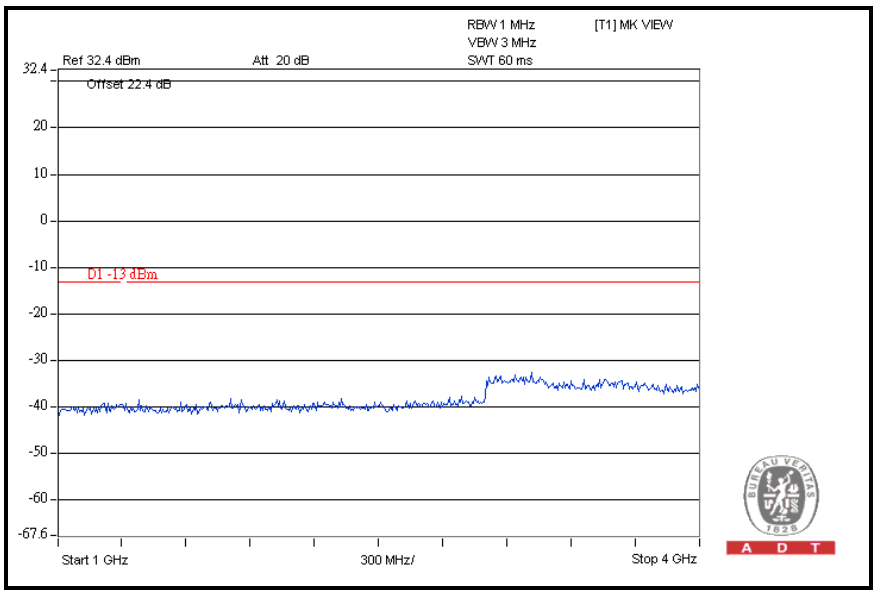
4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

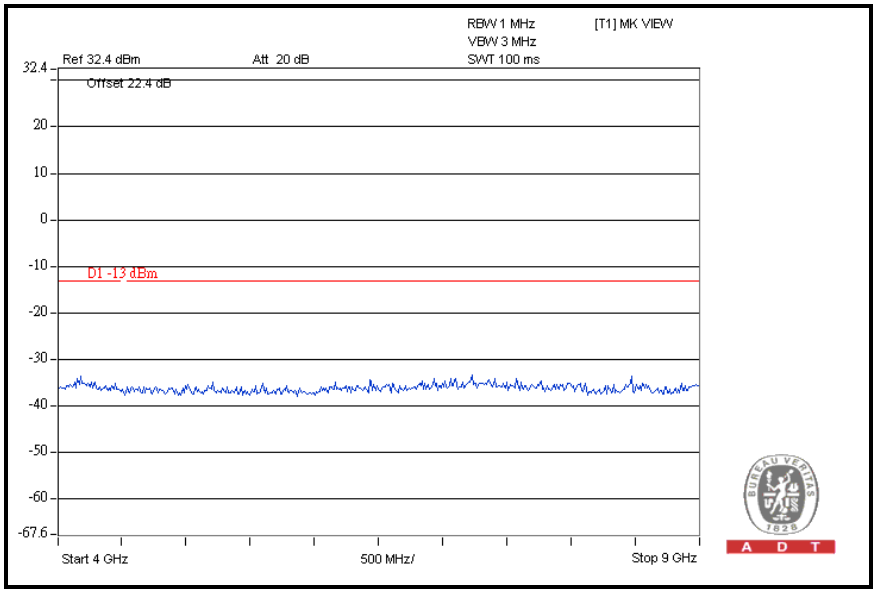
CH 777: 9kHz ~ 1GHz



1GHz ~ 4GHz

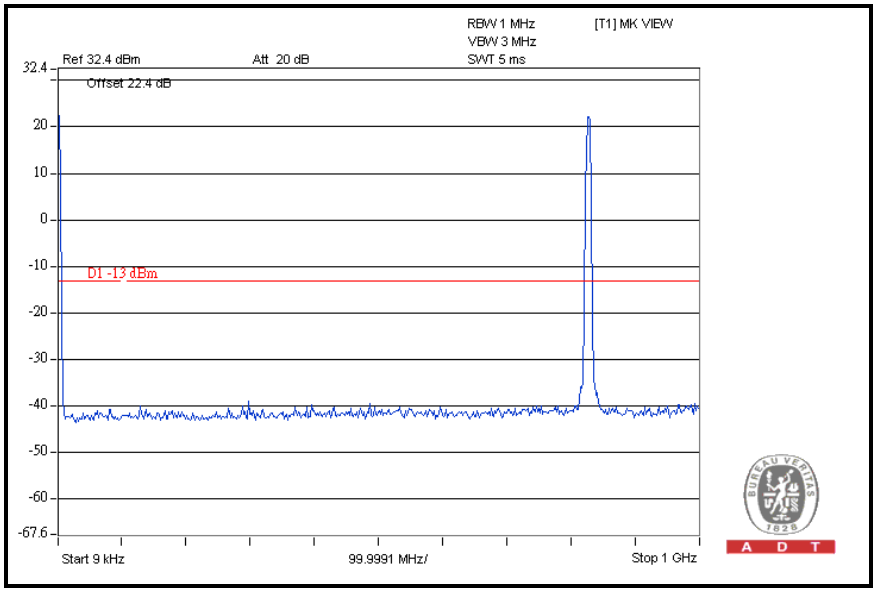


4GHz ~ 9GHz

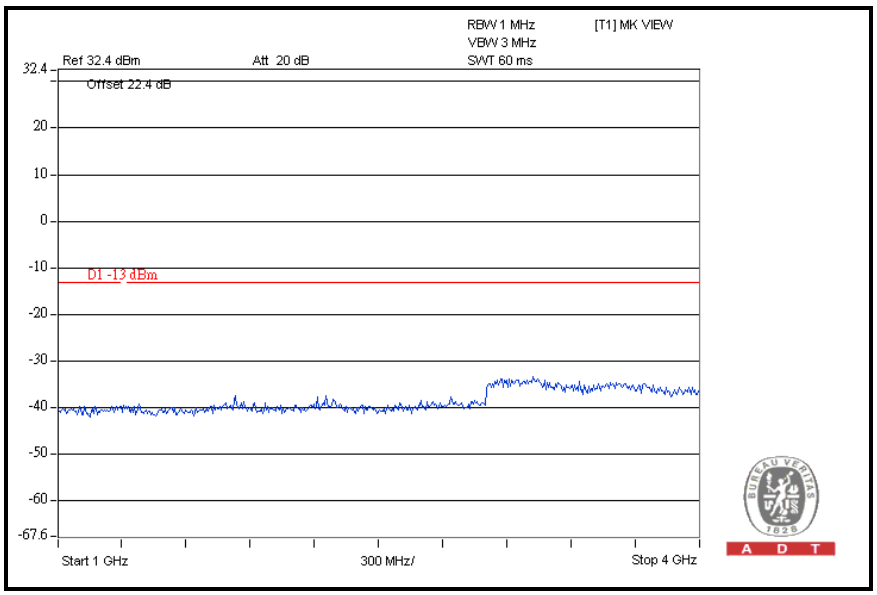

RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

FOR WCDMA:

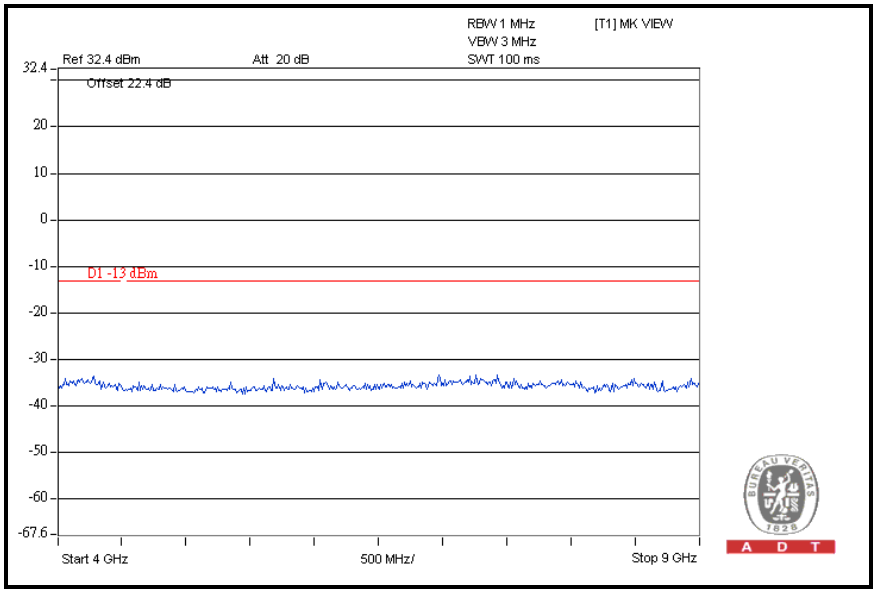
CH 4132: 9kHz ~ 1GHz



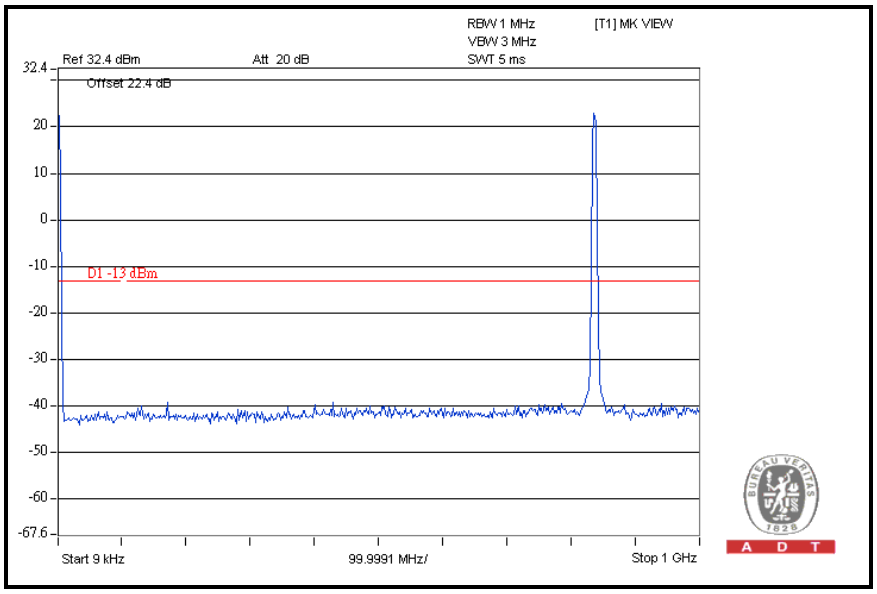
1GHz ~ 4GHz



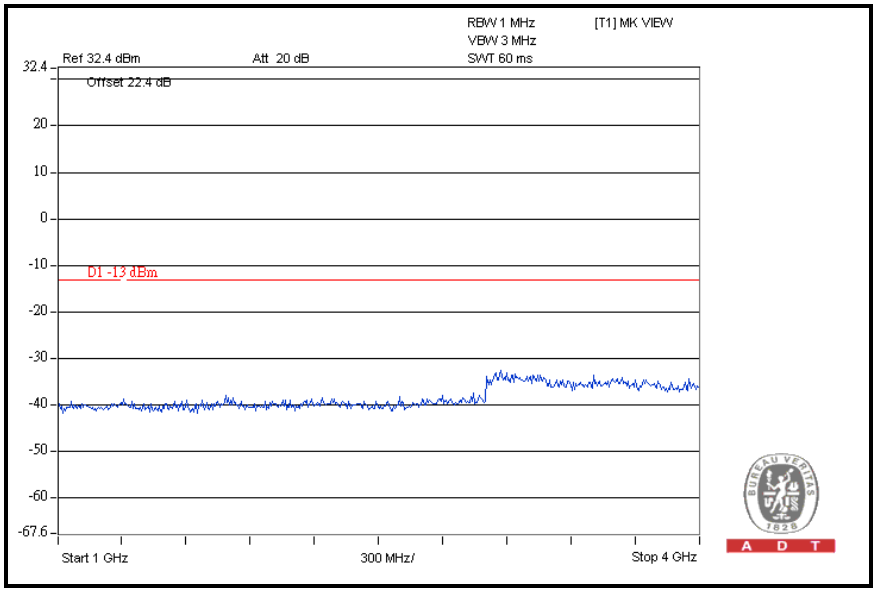
4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

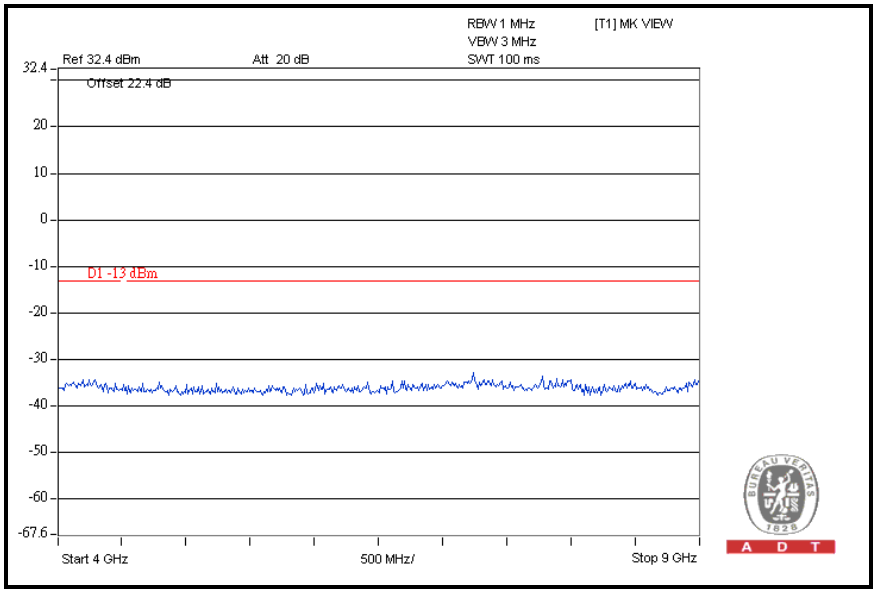
CH 4182: 9kHz ~ 1GHz



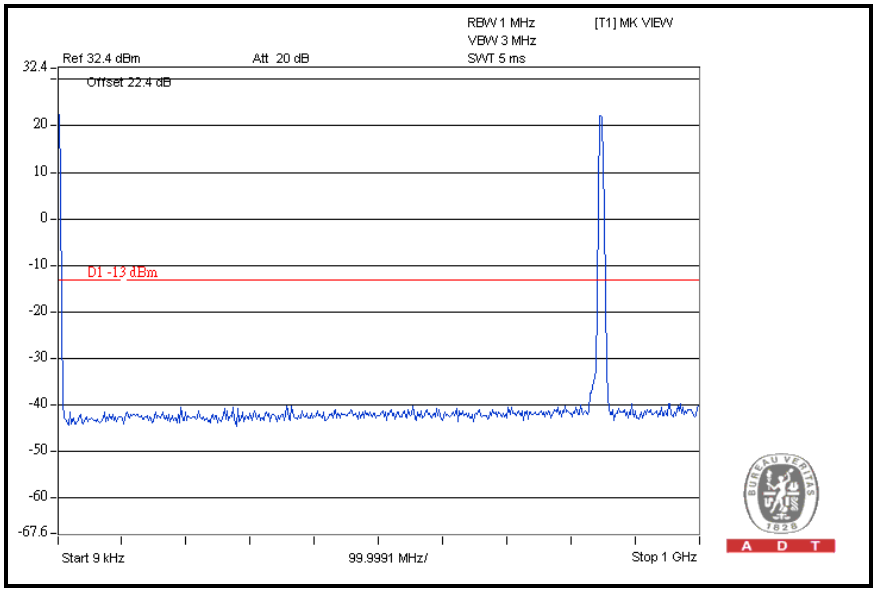
1GHz ~ 4GHz



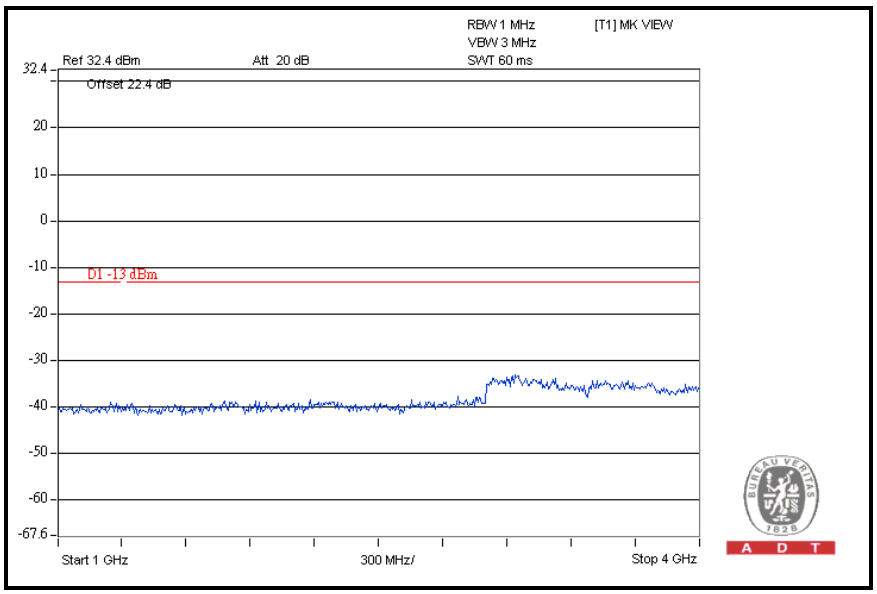
4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

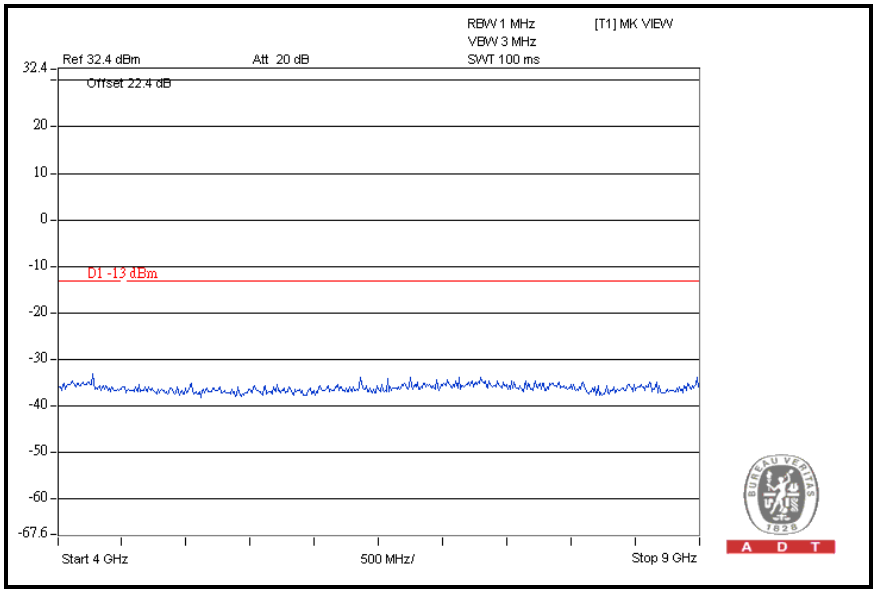
CH 4233: 9kHz ~ 1GHz



1GHz ~ 4GHz



4GHz ~ 9GHz


RBW 1 MHz
VBW 3 MHz
SWT 100 ms
[T1] MK VIEW
Ref 32.4 dBm
Att 20 dB
Offset 22.4 dB
32.4
20
10
0
-10
-20
-30
-40
-50
-60
-67.6
D1 -13 dBm
Start 4 GHz
500 MHz/
Stop 9 GHz

4.6 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 22.917(a), On any frequency outside a licensee's frequency block within GSM spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The emission of limit equal to –13dBm. So the limit of emission is the same absolute specified line.

LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.22

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

Test date: Aug. 05, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30 , 2010	Nov. 29 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 01, 2010	Oct. 31, 2011
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 03, 2010	Sep. 02, 2011
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 17, 2010	Dec. 16, 2011
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 104+ Sucoflex 106	RF104-101+RF106-101	Aug. 24, 2010	Aug. 23, 2011
RF Cable	8DFB	STCCAB-30M-1GHz	NA	NA
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.6.3 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the open site, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

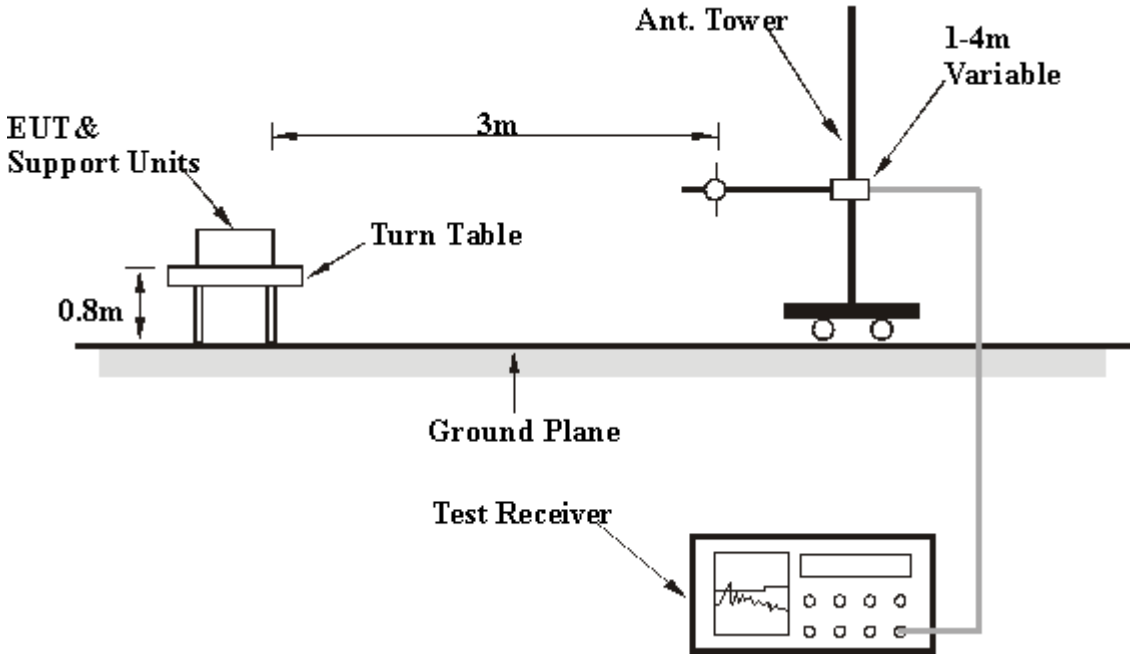
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

NOTE: The resolution bandwidth 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

Same as Item 4.1.5

4.6.7 TEST RESULTS

FOR GSM:

MODE	TX channel 251	FREQUENCY RANGE	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	75.36	36.58	-13	-54.75	-3.12	-57.87
2	96.42	35.24	-13	-56.05	-0.83	-56.88
3	125.04	37.29	-13	-53.40	-1.22	-54.62
4	225.48	33.59	-13	-61.82	4.01	-57.81
5	240.06	35.26	-13	-60.09	3.82	-56.28
6	329.4	30.54	-13	-66.47	3.64	-62.82
7	479.2	37.58	-13	-59.08	2.86	-56.22
8	500.2	34.26	-13	-61.26	2.89	-58.37
9	624.8	30.19	-13	-64.62	1.77	-62.85
10	750.8	39.47	-13	-56.94	0.83	-56.12

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	45.66	44.49	-13	-32.44	-11.08	-43.52
2	103.98	48.96	-13	-41.50	-0.74	-42.24
3	117.48	42.33	-13	-47.40	-1.11	-48.52
4	189.3	45.62	-13	-48.96	3.19	-45.78
5	210.36	42.58	-13	-52.88	4.21	-48.67
6	479.2	30.85	-13	-65.81	2.86	-62.95
7	624.8	34.66	-13	-60.15	1.77	-58.38
8	673.8	40.29	-13	-55.34	1.68	-53.66
9	718.6	35.66	-13	-60.69	1.32	-59.37
10	750.8	39.87	-13	-56.54	0.83	-55.72

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

FOR CDMA:

MODE	TX channel 384	FREQUENCY RANGE	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	75.36	36.74	-13	-54.59	-3.12	-57.71
2	96.42	35.26	-13	-56.03	-0.83	-56.86
3	125.04	37.48	-13	-53.21	-1.22	-54.43
4	225.48	33.94	-13	-61.47	4.01	-57.46
5	240.06	35.47	-13	-59.88	3.82	-56.07
6	329.4	31.57	-13	-65.44	3.64	-61.79
7	479.2	37.89	-13	-58.77	2.86	-55.91
8	500.2	34.58	-13	-60.94	2.89	-58.05
9	624.8	31.66	-13	-63.15	1.77	-61.38
10	750.8	39.47	-13	-56.94	0.83	-56.12

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	45.66	44.65	-13	-32.28	-11.08	-43.36
2	103.98	48.59	-13	-41.87	-0.74	-42.61
3	117.48	43.29	-13	-46.44	-1.11	-47.56
4	189.3	45.63	-13	-48.95	3.19	-45.77
5	210.36	43.29	-13	-52.17	4.21	-47.96
6	479.2	31.56	-13	-65.10	2.86	-62.24
7	624.8	34.28	-13	-60.53	1.77	-58.76
8	673.8	42.58	-13	-53.05	1.68	-51.37
9	718.6	35.74	-13	-60.61	1.32	-59.29
10	750.8	40.19	-13	-56.22	0.83	-55.40

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

FOR WCDMA:

MODE	TX channel 4182	FREQUENCY RANGE	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	75.36	36.52	-13	-54.81	-3.12	-57.93
2	96.42	35.49	-13	-55.80	-0.83	-56.63
3	125.04	37.34	-13	-53.35	-1.22	-54.57
4	225.48	33.64	-13	-61.77	4.01	-57.76
5	240.06	35.37	-13	-59.98	3.82	-56.17
6	329.4	31.26	-13	-65.75	3.64	-62.10
7	479.2	37.16	-13	-59.50	2.86	-56.64
8	500.2	34.29	-13	-61.23	2.89	-58.34
9	624.8	31.27	-13	-63.54	1.77	-61.77
10	750.8	39.25	-13	-57.16	0.83	-56.34

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	45.66	44.23	-13	-32.70	-11.08	-43.78
2	103.98	48.26	-13	-42.20	-0.74	-42.94
3	117.48	43.15	-13	-46.58	-1.11	-47.70
4	189.3	45.74	-13	-48.84	3.19	-45.66
5	210.36	43.16	-13	-52.30	4.21	-48.09
6	479.2	31.26	-13	-65.40	2.86	-62.54
7	624.8	34.15	-13	-60.66	1.77	-58.89
8	673.8	41.26	-13	-54.37	1.68	-52.69
9	718.6	35.42	-13	-60.93	1.32	-59.61
10	750.8	39.45	-13	-56.96	0.83	-56.14

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

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 GSM spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The limit of emission equal to –13dBm.

4.7.2 TEST INSTRUMENTS

Test date: Aug. 05, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30 , 2010	Nov. 29 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 01, 2010	Oct. 31, 2011
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 03, 2010	Sep. 02, 2011
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 17, 2010	Dec. 16, 2011
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 104+ Sucoflex 106	RF104-101+R F106-101	Aug. 24, 2010	Aug. 23, 2011
RF Cable	8DFB	STCCAB-30M-1GHz	NA	NA
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.7.3 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the open site, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

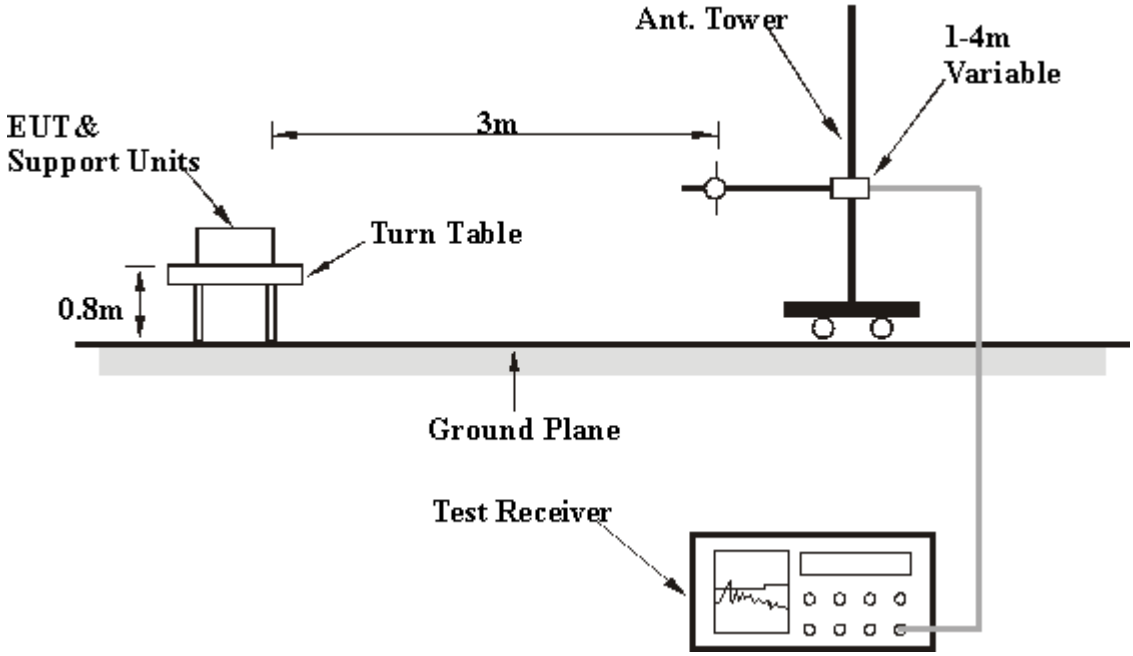
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

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

Same as Item 4.1.5

4.7.7 TEST RESULTS

FOR GSM BAND:

MODE	TX channel 128	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	44.26	-13	-58.49	6.26	-52.23
2	2472.6	53.05	-13	-45.53	6.66	-38.87
3	3296.8	41.55	-13	-61.40	7.56	-53.85

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	50.61	-13	-52.14	6.26	-45.88
2	**2472.6**	**55.89**	**-13**	**-42.69**	**6.66**	**-36.03**
3	3296.8	41.09	-13	-61.86	7.56	-54.31

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

MODE	TX channel 190	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	46.63	-13	-56.00	6.31	-49.69
2	2509.8	51.7	-13	-46.82	6.66	-40.16
3	3346.4	40.53	-13	-62.48	7.63	-54.85

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	49.2	-13	-53.43	6.31	-47.12
2	2509.8	55.41	-13	-43.11	6.66	-36.45
3	3346.4	41.32	-13	-61.69	7.63	-54.06

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

MODE	TX channel 251	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	43.13	-13	-59.38	6.35	-53.02
2	2546.4	50.41	-13	-48.42	6.69	-41.72
3	3395.2	42.06	-13	-61.01	7.70	-53.31

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	49.73	-13	-52.78	6.35	-46.42
2	2546.4	54.18	-13	-44.65	6.69	-37.95
3	3395.2	42.8	-13	-60.27	7.70	-52.57

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

FOR CDMA BAND:

MODE	TX channel 1013	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	41.22	-13	-61.53	6.27	-55.26
2	2474.1	41.67	-13	-56.90	6.66	-50.24
3	3298.8	42.19	-13	-60.76	7.56	-53.20

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	46.38	-13	-56.37	6.27	-50.10
2	2474.1	40.11	-13	-58.46	6.66	-51.80
3	3298.8	43.29	-13	-59.66	7.56	-52.10

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

MODE	TX channel 384	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	42.38	-13	-60.25	6.31	-53.94
2	2509.56	40.26	-13	-58.26	6.66	-51.60
3	3346.08	42.69	-13	-60.32	7.63	-52.69

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	47.26	-13	-55.37	6.31	-49.06
2	2509.56	41.25	-13	-57.27	6.66	-50.61
3	3346.08	43.28	-13	-59.73	7.63	-52.10

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

MODE	TX channel 777	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	43.48	-13	-59.03	6.35	-52.68
2	2544.93	41.75	-13	-57.06	6.69	-50.37
3	3393.24	43.58	-13	-59.49	7.69	-51.79

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	46.95	-13	-55.56	6.35	-49.21
2	2544.93	42.34	-13	-56.47	6.69	-49.78
3	3393.24	44.53	-13	-58.54	7.69	-50.84

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

FOR WCDMA BAND:

MODE	TX channel 4132	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	40.89	-13	-61.84	6.27	-55.57
2	2479.2	40.42	-13	-58.13	6.66	-51.47
3	3305.6	41.36	-13	-61.60	7.57	-54.03

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	46.35	-13	-56.38	6.27	-50.11
2	2479.2	39.67	-13	-58.88	6.66	-52.22
3	3305.6	43.17	-13	-59.79	7.57	-52.22

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

MODE	TX channel 4182	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	42.29	-13	-60.34	6.31	-54.03
2	2509.2	39.88	-13	-58.64	6.66	-51.98
3	3345.6	42.53	-13	-60.48	7.63	-52.85

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	47.02	-13	-55.61	6.31	-49.30
2	2509.2	40.91	-13	-57.61	6.66	-50.95
3	3345.6	42.94	-13	-60.07	7.63	-52.44

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

MODE	TX channel 4233	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	27deg. C, 63%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Evan Huang		

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	42.95	-13	-59.58	6.34	-53.23
2	2539.8	41.07	-13	-57.70	6.69	-51.01
3	3386.4	42.96	-13	-60.10	7.69	-52.42

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	46.77	-13	-55.76	6.34	-49.41
2	2539.8	41.8	-13	-56.97	6.69	-50.28
3	3386.4	43.57	-13	-59.49	7.69	-51.81

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

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

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

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

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