FCC TEST REPORT
(Part 22)

REPORT NO.: RF130814E06C

MODEL NO.: LN931-NAG

FCC ID: RI7LN931NAG

RECEIVED: Aug. 14, 2013

TESTED: Sep. 06 to 10, 2013

ISSUED: Aug. 14, 2015

APPLICANT: Telit Communications S.p.A.

ADDRESS: Via Stazione di Prosecco n. 5/b 34010 Sgonico - Trieste/Italy

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, R.O.C.

TEST LOCATION (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

TEST LOCATION (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130814E06C	Original release.	Aug. 14, 2015

1 CERTIFICATION

PRODUCT:	Data card
BRAND:	Telit
MODEL:	LN931-NAG
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Telit Communications S.p.A.
TESTED:	Sep. 06 to 10, 2013
STANDARDS:	**FCC PART 22, Subpart H**

The above equipment (Model: LN931-NAG) 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. 14, 2015
Lori Chung / Specialist

Approved by : _____ , **Date:** Aug. 14, 2015
May Chen / 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**	**RESULT**	**REMARK**
2.1046 22.913 (a)	Effective radiated power	PASS	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	PASS	Meet the requirement of limit.
2.1049	Occupied Bandwidth	PASS	Meet the requirement of limit.
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 -4.19dB at 2508.00MHz.

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
Radiated emissions	30MHz ~ 200MHz	5.46 dB
	200MHz ~1000MHz	3.54 dB
	1GHz ~ 18GHz	4.08 dB
	18GHz ~ 40GHz	4.11 dB

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

2.2 TEST SITE AND INSTRUMENTS

For radiated spurious emissions:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
MXE EMI Receiver Agilent	N9038A	MY50010156	Jan. 16, 2013	Jan. 15, 2014
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 30, 2012	Oct. 29, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Mar. 25, 2013	Mar. 24, 2014
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 27, 2012	Nov. 26, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 26, 2012	Dec. 25, 2013
RF Cable	NA	CHHCAB_001	Oct. 07, 2012	Oct. 06, 2013
Software	ADT_Radiated _V8.7.05	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Radio Communication Analyzer	Anritsu	MT8820C	May 30, 2013	May 29, 2014
Universal Radio Communication Tester	R&S	CMU200	Oct. 23, 2012	Oct. 22, 2013

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) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Sep. 06 to 10, 2013

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100060	May 03, 2013	May 02, 2014
Spectrum Analyzer Agilent	E4446A	MY48250113	Dec. 05, 2012	Dec. 04, 2013
AC Power Source EXTECH Electronics	6502	1140503	NA	NA
Temperature & Humidity Chamber TERCHY	MHU-225AU	911033	Dec. 11, 2012	Dec. 10, 2013
DC Power Supply GOOD WILL INSTRUMENT CO., LTD.	GPC - 3030D	7700087	NA	NA
ESG Vector signal generator Agilent	E4438C	MY47271330 506 602 UNJ	Apr. 30, 2013	Apr. 29, 2014
ESG Vector signal generator Agilent	E4438C	MY45094468/0 05 506 602 UK6 UNJ	Dec. 14, 2012	Dec. 13, 2013
Power meter Anritsu	ML2495A	1014008	Apr. 23, 2013	Apr. 22, 2014
Power sensor Anritsu	MA2411B	0917122	Apr. 23, 2013	Apr. 22, 2014
Power meter Anritsu	ML2495A	0824006	May 20, 2013	May 19, 2014
Power sensor Anritsu	MA2411B	0738172	May 20, 2013	May 19, 2014
Power meter Anritsu	ML2487B	0930006	Nov. 14, 2012	Nov. 13, 2013
Power sensor Anritsu	MA2491A	0845370	Nov. 14, 2012	Nov. 13, 2013
Software	Total Power Measurement Tools V7.1	NA	NA	NA
Software	ADT_RF Test Software V6.6.5.3	NA	NA	NA
Radio Communication Analyzer	Anritsu	MT8820C	May 30, 2013	May 29, 2014
Universal Radio Communication Tester	R&S	CMU200	Oct. 23, 2012	Oct. 22, 2013

NOTE: 1. The test was performed in Oven room A.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Sep. 09, 2013

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Data card	
MODEL NO.	LN931-NAG	
POWER SUPPLY	DC 3.3V±5% from host equipment	
VOLTAGE OPERATING	Vnom= 3.3Vdc Vmin= 3.1Vdc Vmax= 4.4Vdc	
HW VERSION	115	
SW VERSION	M9615ACETWMLZD4520	
MODULATION TYPE	**GPRS**	GMSK
	EDGE	8PSK
	WCDMA	BPSK
	CDMA & EVDO	QPSK, OQPSK, HPSK
	LTE	QPSK, 16QAM
FREQUENCY RANGE	**GPRS, EDGE**	824.2MHz ~ 848.8MHz
	WCDMA	826.4MHz ~ 846.6MHz
	CDMA & EVDO	824.7MHz ~ 848.31MHz
	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 5 (Channel Bandwidth 10MHz)	829MHz ~ 844MHz
MAX. ERP POWER	**GPRS**	3162.3mW
	EDGE	1258.9mW
	WCDMA	530.9mW
	CDMA & EVDO	126.1mW
	LTE Band 5 (Channel Bandwidth 1.4MHz)	450.8mW
	LTE Band 5 (Channel Bandwidth 3MHz)	476.4mW
	LTE Band 5 (Channel Bandwidth 5MHz)	397.2mW
	LTE Band 5 (Channel Bandwidth 10MHz)	408.3mW

EMISSION DESIGNATOR	**GPRS**	246KG7W
	EDGE	252KG7W
	WCDMA	4M20F9W
	EVDO	1M29F9W
	LTE Band 5 (Channel Bandwidth 1.4MHz)	QPSK:1M25G7D
		16QAM: 1M24W7D
	LTE Band 5 (Channel Bandwidth 3MHz)	QPSK:2M73G7D
		16QAM: 2M73W7D
	LTE Band 5 (Channel Bandwidth 5MHz)	QPSK: 4M50G7D
		16QAM: 4M50W7D
	LTE Band 5 (Channel Bandwidth 10MHz)	QPSK: 9M03G7D
		16QAM: 9M03W7D
MULTI-SLOTS CLASS	12	
WCDMA RELEASE VERSION	R8	
CATEGORY	LTE: 3	
ANTENNA TYPE	Refer to Note	
I/O PORTS	Refer to users' manual	
DATA CABLE	NA	
ACCESSORY DEVICES	NA	

NOTE:

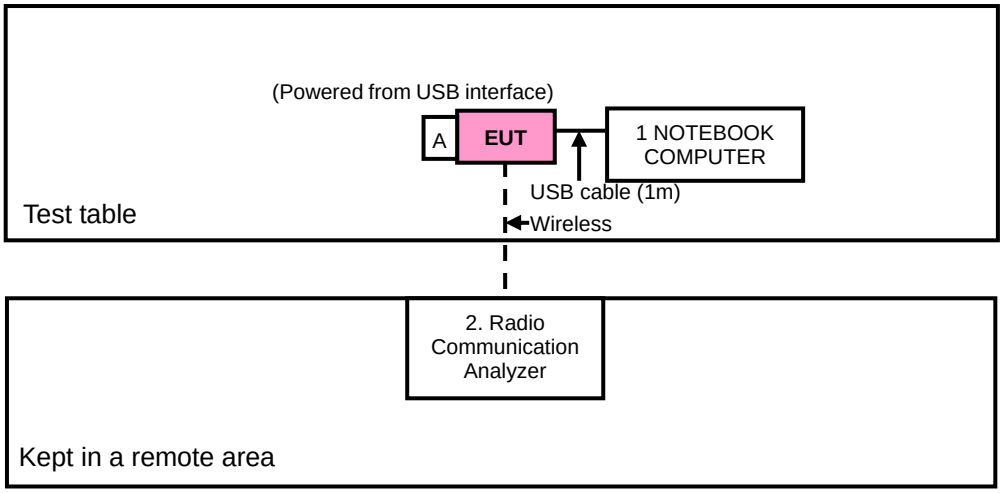
1. The antennas provided to the EUT, please refer to the following table:

Antenna	Antenna Type	Gain(dBi)	Frequency range (MHz to MHz)
1	PIFA	5.28	704~716
2	PIFA	6.33	777~915
3	PIFA	4.97	1710~2690

   The EUT was tested with antenna 2.

2. 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 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: Item A is SIM card.

3.3 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	Radio Communication Analyzer	Anritsu	MT8820C	6201127458	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB cable (1m)
2	NA

NOTE:
1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1-2 act as communication partners to transfer data.

3.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst cases were found when positioned on **X-axis** for GPRS/ WCDMA/ CDMA/ EVDO/ LTE mode in radiated emission below 1GHz and **Y-plane** for GPRS/ WCDMA/ CDMA/ EVDO/ LTE mode in ERP for radiated above 1GHz. Following channel(s) was (were) selected for the final test as listed below:

GPRS MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	128 to 251	128, 190, 251	GPRS, EDGE
FREQUENCY STABILITY	128 to 251	190	GPRS, EDGE
OCCUPIED BANDWIDTH	128 to 251	128, 190, 251	GPRS, EDGE
BAND EDGE	128 to 251	128, 251	GPRS, EDGE
CONDCUDETED EMISSION	128 to 251	190	GPRS, EDGE
RADIATED EMISSION	128 to 251	190	GPRS, EDGE

WCDMA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	4132 to 4233	4132, 4183, 4233	WCDMA
FREQUENCY STABILITY	4132 to 4233	4183	WCDMA
OCCUPIED BANDWIDTH	4132 to 4233	4132, 4183, 4233	WCDMA
BAND EDGE	4132 to 4233	4132, 4233	WCDMA
CONDCUDETED EMISSION	4132 to 4233	4183	WCDMA
RADIATED EMISSION	4132 to 4233	4183	WCDMA

CDMA & EVDO

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	1013 to 777	1013, 384, 777	EVDO Rev.0
FREQUENCY STABILITY	1013 to 777	384	EVDO Rev.0
OCCUPIED BANDWIDTH	1013 to 777	1013, 384, 777	EVDO Rev.0
BAND EDGE	1013 to 777	1013, 777	EVDO Rev.0
CONDCUDETED EMISSION	1013 to 777	384	EVDO Rev.0
RADIATED EMISSION	1013 to 777	1013	EVDO Rev.0

LTE Band 5

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	20407 to 20643	20407, 20525, 20643	1.4M	QPSK	1RB / 0RB offset
	20145 to 20635	20145, 20525, 20635	3M	QPSK	1RB / 0RB offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1RB / 0RB offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1RB / 0RB offset
FREQUENCY STABILITY	20407 to 20643	20525	1.4M	QPSK	1RB / 0RB offset
	20145 to 20635	20525	3M	QPSK	1RB / 0RB offset
	20425 to 20625	20525	5MHz	QPSK	1RB / 0RB offset
	20450 to 20600	20525	10MHz	QPSK	1RB / 0RB offset
OCCUPIED BANDWIDTH	20407 to 20643	20407, 20525, 20643	1.4M	QPSK/16QAM	6 RB / 0 RB Offset
	20145 to 20635	20145, 20525, 20635	3M	QPSK/16QAM	15 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK/16QAM	25 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK/16QAM	50 RB / 0 RB Offset
BAND EDGE	20407 to 20643	20407, 20643	1.4M	QPSK	1 RB / 0 RB Offset
					6 RB / 0 RB Offset
	20145 to 20635	20145, 20635	3M	QPSK	1 RB / 0 RB Offset
					15 RB / 0 RB Offset
	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB / 0 RB Offset
					25 RB / 0 RB Offset
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
CONDCUDETED EMISSION	20407 to 20643	20525	1.4M	QPSK	1RB / 0RB offset
	20145 to 20635	20525	3M	QPSK	1RB / 0RB offset
	20425 to 20625	20525	5MHz	QPSK	1RB / 0RB offset
	20450 to 20600	20525	10MHz	QPSK	1RB / 0RB offset
RADIATED EMISSION	20407 to 20643	20525	1.4M	QPSK	1RB / 0RB offset
	20145 to 20635	20525	3M	QPSK	1RB / 0RB offset
	20425 to 20625	20525	5MHz	QPSK	1RB / 0RB offset
	20450 to 20600	20525	10MHz	QPSK	1RB / 0RB offset

TEST CONDITION:

GPRS/WCDMA/CDMA&EVDO/LTE Band 5

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	25deg. C, 63%RH	3.3Vdc	Rex Huang
FREQUENCY STABILITY	25deg. C, 63%RH	3.3Vdc	Rex Huang
OCCUPIED BANDWIDTH	25deg. C, 63%RH	3.3Vdc	Rex Huang
BAND EDGE	25deg. C, 63%RH	3.3Vdc	Rex Huang
CONDCUDETED EMISSION	25deg. C, 63%RH	3.3Vdc	Rex Huang
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz (SYSTEM)	Rex Huang

3.5 EUT OPERATING CONDITIONS

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

3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI/TIA/EIA-603-C 2004

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

4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GPRS & EDGE, 5MHz for CDMA, EVDO & WCDMA, and 10MHz for LTE mode.

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

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

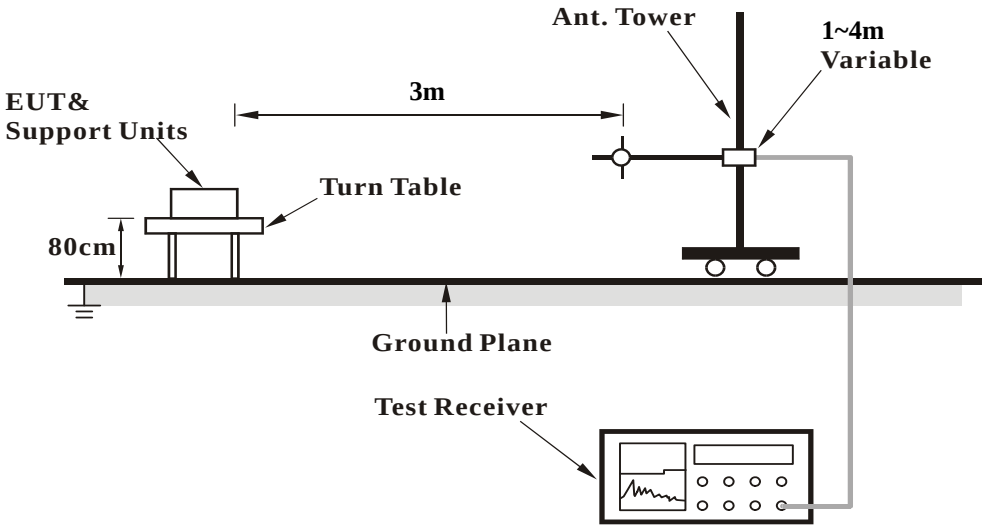
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

CONDUCTED POWER MEASUREMENT:

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

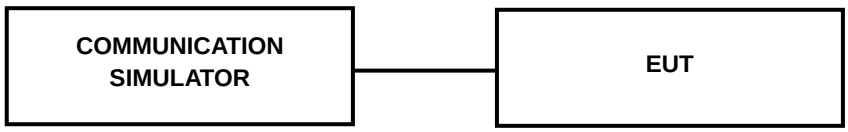
4.1.3 TEST SETUP

EIRP / ERP MEASUREMENT:



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

CONDUCTED POWER MEASUREMENT:



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

4.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GPRS850		
Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GPRS 8	32.60	**32.80**	32.70
GPRS 10	32.30	32.20	32.30
GPRS 11	32.10	32.00	32.20
GPRS 12	31.90	32.00	32.10
EDGE 8 (MCS9)	28.20	28.10	28.00
EDGE 10 (MCS9)	27.80	27.70	28.00
EDGE 11 (MCS9)	27.80	27.60	27.80
EDGE 12 (MCS9)	27.60	27.70	27.70

Band	WCDMA V		
Channel	4132	4183	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	**24.30**	24.20	**24.30**
HSDPA Subtest-1	24.20	24.00	24.00
HSDPA Subtest-2	24.10	24.00	24.10
HSDPA Subtest-3	24.10	24.10	24.20
HSDPA Subtest-4	24.20	24.00	24.10
HSUPA Subtest-1	24.10	24.00	24.20
HSUPA Subtest-2	24.10	24.00	24.10
HSUPA Subtest-3	24.20	24.10	24.20
HSUPA Subtest-4	24.00	24.00	24.20
HSUPA Subtest-5	24.20	24.10	24.10

Band	CDMA2000 BC0		
Channel	1013	384	777
Frequency (MHz)	824.7	836.52	848.31
RC1+SO55	24.10	24.50	24.10
RC3+SO55	24.00	24.40	24.00
RC3+SO32(+ F-SCH)	24.00	24.30	24.00
RC3+SO32(+SCH)	24.00	24.40	24.00
RTAP 153.6	24.00	24.50	**24.60**
RETAP 4096	24.10	**24.60**	24.50

LTE Band 5								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
1.4 MHz	QPSK	20407	824.7	1	0	0	23.8	**23.68**
		20525	836.5	1	0	0	23.8	23.28
		20643	848.3	1	0	0	23.8	23.41
		20407	824.7	1	2	0	23.8	23.3
		20525	836.5	1	2	0	23.8	23.06
		20643	848.3	1	2	0	23.8	23.2
		20407	824.7	1	5	0	23.8	23.48
		20525	836.5	1	5	0	23.8	22.94
		20643	848.3	1	5	0	23.8	23.07
		20407	824.7	3	0	0	23.8	23.33
		20525	836.5	3	0	0	23.8	23.06
		20643	848.3	3	0	0	23.8	23.2
		20407	824.7	3	1	0	23.8	23.3
		20525	836.5	3	1	0	23.8	23.05
		20643	848.3	3	1	0	23.8	23.02
		20407	824.7	3	3	0	23.8	23.47
		20525	836.5	3	3	0	23.8	23.04
		20643	848.3	3	3	0	23.8	23.11
		20407	824.7	6	0	1	23.8	22.38
		20525	836.5	6	0	1	23.8	21.99
		20643	848.3	6	0	1	23.8	22.04
	16QAM	20407	824.7	1	0	1	23.8	**22.57**
		20525	836.5	1	0	1	23.8	22.46
		20643	848.3	1	0	1	23.8	22.36
		20407	824.7	1	2	1	23.8	22.33
		20525	836.5	1	2	1	23.8	22.18
		20643	848.3	1	2	1	23.8	21.98
		20407	824.7	1	5	1	23.8	22.21
		20525	836.5	1	5	1	23.8	22.13
		20643	848.3	1	5	1	23.8	22.06
		20407	824.7	3	0	1	23.8	22.34
		20525	836.5	3	0	1	23.8	22.07
		20643	848.3	3	0	1	23.8	22
		20407	824.7	3	1	1	23.8	22.24
		20525	836.5	3	1	1	23.8	22.2
		20643	848.3	3	1	1	23.8	21.97
		20407	824.7	3	3	1	23.8	22.21
		20525	836.5	3	3	1	23.8	22.25
		20643	848.3	3	3	1	23.8	22.1
		20407	824.7	6	0	2	23.8	21.31
		20525	836.5	6	0	2	23.8	21.09
		20643	848.3	6	0	2	23.8	21.11

LTE Band 5								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
3 MHz	QPSK	20415	825.5	1	0	0	23.8	**23.65**
		20525	836.5	1	0	0	23.8	23.23
		20635	847.5	1	0	0	23.8	23.51
		20415	825.5	1	7	0	23.8	23.33
		20525	836.5	1	7	0	23.8	22.97
		20635	847.5	1	7	0	23.8	23.22
		20415	825.5	1	14	0	23.8	23.32
		20525	836.5	1	14	0	23.8	22.89
		20635	847.5	1	14	0	23.8	23.14
		20415	825.5	8	0	1	23.8	22.36
		20525	836.5	8	0	1	23.8	21.99
		20635	847.5	8	0	1	23.8	22.17
		20415	825.5	8	3	1	23.8	22.38
		20525	836.5	8	3	1	23.8	21.9
		20635	847.5	8	3	1	23.8	22.12
		20415	825.5	8	7	1	23.8	22.33
		20525	836.5	8	7	1	23.8	22.02
		20635	847.5	8	7	1	23.8	22.27
		20415	825.5	15	0	1	23.8	22.39
		20525	836.5	15	0	1	23.8	21.93
		20635	847.5	15	0	1	23.8	22.18
	16QAM	20415	825.5	1	0	1	23.8	**22.56**
		20525	836.5	1	0	1	23.8	22.18
		20635	847.5	1	0	1	23.8	22.47
		20415	825.5	1	7	1	23.8	22.3
		20525	836.5	1	7	1	23.8	21.84
		20635	847.5	1	7	1	23.8	22.26
		20415	825.5	1	14	1	23.8	22.27
		20525	836.5	1	14	1	23.8	21.83
		20635	847.5	1	14	1	23.8	22.14
		20415	825.5	8	0	2	23.8	21.32
		20525	836.5	8	0	2	23.8	20.97
		20635	847.5	8	0	2	23.8	21.22
		20415	825.5	8	3	2	23.8	21.23
		20525	836.5	8	3	2	23.8	20.83
		20635	847.5	8	3	2	23.8	21.08
		20415	825.5	8	7	2	23.8	21.34
		20525	836.5	8	7	2	23.8	20.86
		20635	847.5	8	7	2	23.8	21.1
		20415	825.5	15	0	2	23.8	21.24
		20525	836.5	15	0	2	23.8	20.86
		20635	847.5	15	0	2	23.8	21.13

LTE Band 5								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
5 MHz	QPSK	20425	826.5	1	0	0	23.8	**23.73**
		20525	836.5	1	0	0	23.8	23.26
		20625	846.5	1	0	0	23.8	23.45
		20425	826.5	1	12	0	23.8	23.53
		20525	836.5	1	12	0	23.8	22.95
		20625	846.5	1	12	0	23.8	23.11
		20425	826.5	1	24	0	23.8	23.43
		20525	836.5	1	24	0	23.8	23.05
		20625	846.5	1	24	0	23.8	23.21
		20425	826.5	12	0	1	23.8	22.49
		20525	836.5	12	0	1	23.8	21.92
		20625	846.5	12	0	1	23.8	22.15
		20425	826.5	12	6	1	23.8	22.49
		20525	836.5	12	6	1	23.8	21.92
		20625	846.5	12	6	1	23.8	22.11
		20425	826.5	12	13	1	23.8	22.34
		20525	836.5	12	13	1	23.8	22.05
		20625	846.5	12	13	1	23.8	22.24
		20425	826.5	25	0	1	23.8	22.4
		20525	836.5	25	0	1	23.8	21.89
		20625	846.5	25	0	1	23.8	22.09
	16QAM	20425	826.5	1	0	1	23.8	**22.71**
		20525	836.5	1	0	1	23.8	22.2
		20625	846.5	1	0	1	23.8	22.38
		20425	826.5	1	12	1	23.8	22.34
		20525	836.5	1	12	1	23.8	21.93
		20625	846.5	1	12	1	23.8	22.17
		20425	826.5	1	24	1	23.8	22.38
		20525	836.5	1	24	1	23.8	21.97
		20625	846.5	1	24	1	23.8	22.11
		20425	826.5	12	0	2	23.8	21.41
		20525	836.5	12	0	2	23.8	20.85
		20625	846.5	12	0	2	23.8	21.02
		20425	826.5	12	6	2	23.8	21.48
		20525	836.5	12	6	2	23.8	20.93
		20625	846.5	12	6	2	23.8	21.09
		20425	826.5	12	13	2	23.8	21.33
		20525	836.5	12	13	2	23.8	20.99
		20625	846.5	12	13	2	23.8	21.15
		20425	826.5	25	0	2	23.8	21.43
		20525	836.5	25	0	2	23.8	20.9
		20625	846.5	25	0	2	23.8	21.05

LTE Band 5								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
10MHz	QPSK	20450	829	1	0	0	23.8	**23.68**
		20525	836.5	1	0	0	23.8	23.51
		20600	844	1	0	0	23.8	23.29
		20450	829	1	24	0	23.8	23.41
		20525	836.5	1	24	0	23.8	23.26
		20600	844	1	24	0	23.8	23.09
		20450	829	1	49	0	23.8	23.46
		20525	836.5	1	49	0	23.8	23.27
		20600	844	1	49	0	23.8	23.08
		20450	829	25	0	1	23.8	22.33
		20525	836.5	25	0	1	23.8	22.17
		20600	844	25	0	1	23.8	22.05
		20450	829	25	12	1	23.8	22.3
		20525	836.5	25	12	1	23.8	22.18
		20600	844	25	12	1	23.8	22.01
		20450	829	25	25	1	23.8	22.35
		20525	836.5	25	25	1	23.8	22.17
		20600	844	25	25	1	23.8	22.08
		20450	829	50	0	1	23.8	22.34
		20525	836.5	50	0	1	23.8	22.18
		20600	844	50	0	1	23.8	21.97
	16QAM	20450	829	1	0	1	23.8	**22.58**
		20525	836.5	1	0	1	23.8	22.46
		20600	844	1	0	1	23.8	22.29
		20450	829	1	24	1	23.8	22.24
		20525	836.5	1	24	1	23.8	22.2
		20600	844	1	24	1	23.8	21.99
		20450	829	1	49	1	23.8	22.22
		20525	836.5	1	49	1	23.8	22.11
		20600	844	1	49	1	23.8	21.91
		20450	829	25	0	2	23.8	21.37
		20525	836.5	25	0	2	23.8	21.12
		20600	844	25	0	2	23.8	21.08
		20450	829	25	12	2	23.8	21.36
		20525	836.5	25	12	2	23.8	21.12
		20600	844	25	12	2	23.8	21.07
		20450	829	25	25	2	23.8	21.3
		20525	836.5	25	25	2	23.8	21.17
		20600	844	25	25	2	23.8	21.06
		20450	829	50	0	2	23.8	21.28
		20525	836.5	50	0	2	23.8	21.14
		20600	844	50	0	2	23.8	20.97

ERP POWER (dBm)

GPRS

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	128	824.2	33.6	1.3	34.9	3090.3
	190	836.6	33.8	1.2	35.0	3162.3
	251	848.8	34.0	1.0	35.0	3162.3

EDGE

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	128	824.2	29.7	1.3	31.0	1258.9
	190	836.6	29.8	1.2	31.0	1258.9
	251	848.8	29.9	1.0	30.9	1230.3

WCDMA

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	4132	826.4	25.8	1.3	27.1	507.0
	4183	836.4	25.8	1.2	27.0	495.5
	4233	846.6	26.3	1.0	27.3	530.9

CDMA & EVDO

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	1013	824.7	27.1	1.3	28.4	125.8
	384	836.52	27.7	1.2	28.9	125.6
	777	848.31	29.0	1.1	30.1	126.1

LTE Band 5

CHANNEL BANDWIDTH: 1.4MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	20407	824.7	25.2	1.3	26.5	441.6
	20525	836.5	25.0	1.2	26.2	412.1
	20643	848.3	25.5	1.0	26.5	450.8

LTE Band 5

CHANNEL BANDWIDTH: 3MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	20415	825.5	25.1	1.3	26.4	432.5
	20525	836.5	25.5	1.2	26.7	465.6
	20635	847.5	25.8	1.0	26.8	476.4

LTE Band 5

CHANNEL BANDWIDTH: 5MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	20425	826.5	24.7	1.3	26.0	397.2
	20525	836.5	24.8	1.2	26.0	397.2
	20625	846.5	24.8	1.0	25.8	380.2

LTE Band 5

CHANNEL BANDWIDTH: 10MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)
Y	20450	829	24.8	1.3	26.1	408.3
	20525	836.5	24.9	1.2	26.1	407.4
	20600	844	24.7	1.0	25.7	372.4

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

4.2.2 TEST PROCEDURE

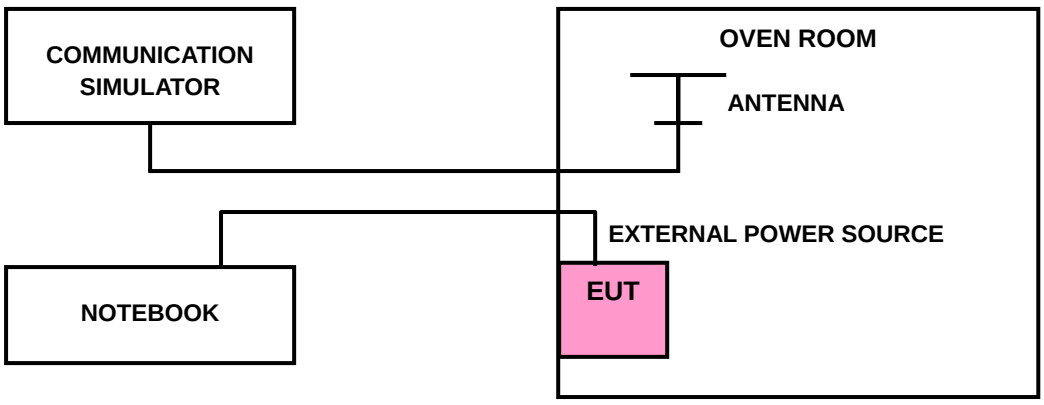
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected notebook. The test voltage range is from 102Vac to 138Vac working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 TEST SETUP



4.2.4 TEST RESULTS

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)								LIMIT (ppm)
	GPRS	EDGE	WCDMA	CDMA & EVDO	LTE Band 5				
					1.4MHz	3MHz	5MHz	10MHz	
102	0.017	0.020	0.007	-0.023	0.032	0.039	0.041	0.042	2.5
138	0.018	0.019	0.005	-0.026	0.038	0.032	0.045	0.027	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 102Vac to 138Vac.

FREQUENCY ERROR VS. TEMPERATURE.

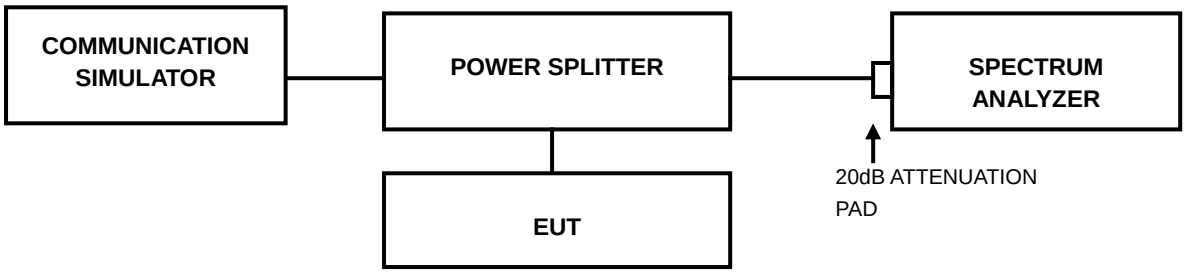
TEMP. (℃)	FREQUENCY ERROR (ppm)								LIMIT (ppm)
	GPRS	EDGE	WCDMA	CDMA & EVDO	LTE Band 5				
					1.4MHz	3MHz	5MHz	10MHz	
75	0.037	0.038	0.026	-0.035	0.038	0.032	0.042	0.029	2.5
70	0.035	0.033	0.023	-0.032	0.033	0.039	0.032	0.053	2.5
60	0.033	0.031	0.022	-0.031	0.037	0.027	0.038	0.055	2.5
50	0.031	0.030	0.017	-0.030	0.050	0.031	0.054	0.031	2.5
40	0.026	0.027	0.013	-0.027	0.042	0.047	0.035	0.029	2.5
30	0.022	0.024	0.011	-0.024	0.045	0.027	0.053	0.051	2.5
20	0.019	0.020	0.007	-0.020	0.053	0.045	0.044	0.053	2.5
10	0.023	0.024	0.010	-0.022	0.029	0.029	0.044	0.033	2.5
0	0.027	0.029	0.012	-0.024	0.032	0.038	0.036	0.030	2.5
-10	0.032	0.031	0.014	-0.026	0.047	0.029	0.051	0.048	2.5
-20	0.035	0.033	0.017	-0.027	0.030	0.041	0.033	0.035	2.5
-30	0.037	0.039	0.020	-0.031	0.043	0.048	0.054	0.047	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 TEST PROCEDURES

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

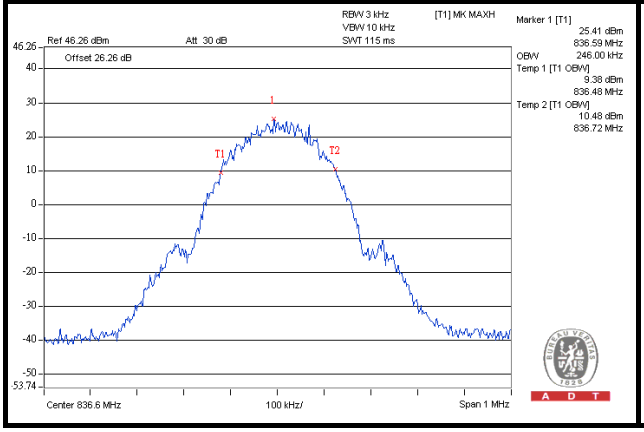
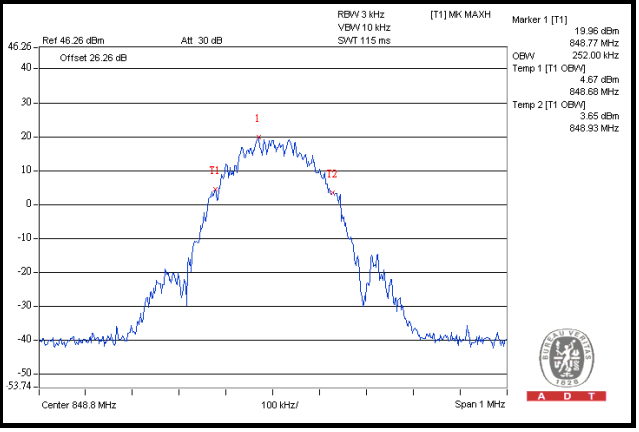
4.3.2 TEST SETUP



4.3.3 TEST RESULTS

GPRS

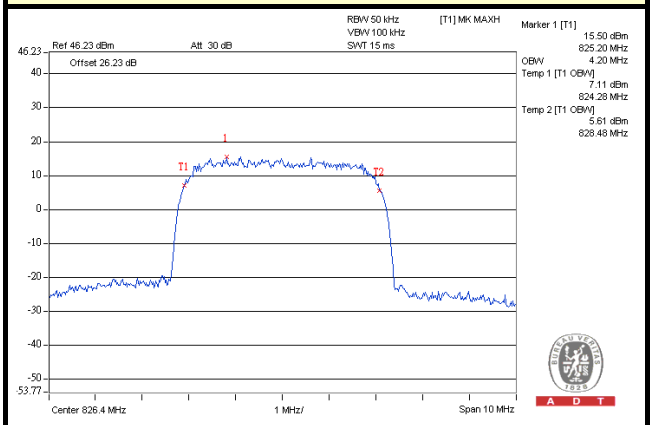
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)	
		GPRS	EDGE
128	824.2	244	246
190	836.4	246	244
251	848.8	242	252

SPECTRUM PLOT OF WORST VALUE	
GPRS	EDGE
	

WCDMA

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
		WCDMA
4132	826.4	4.20
4183	836.6	4.18
4233	846.6	4.18

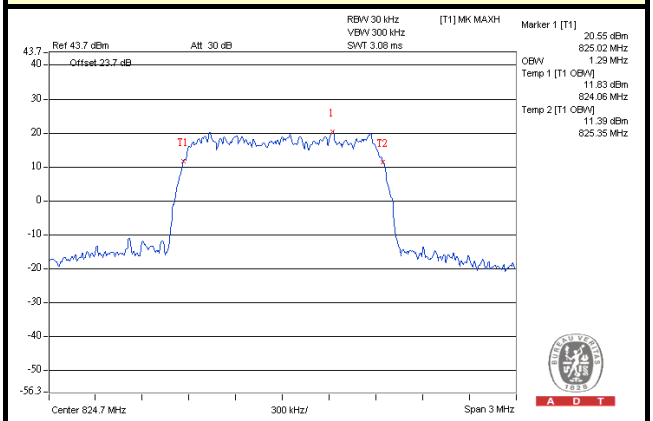
SPECTRUM PLOT OF WORST VALUE
WCDMA



CDMA & EVDO

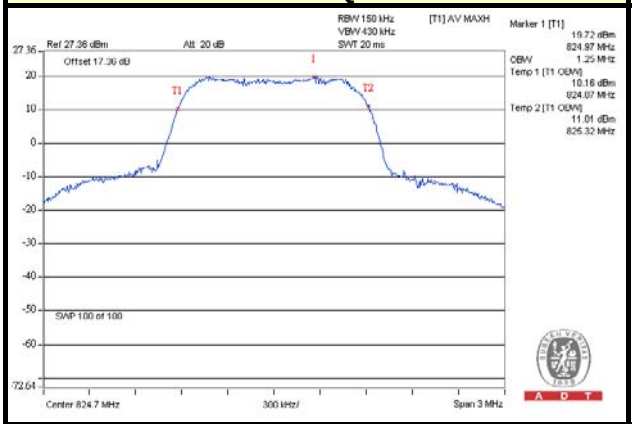
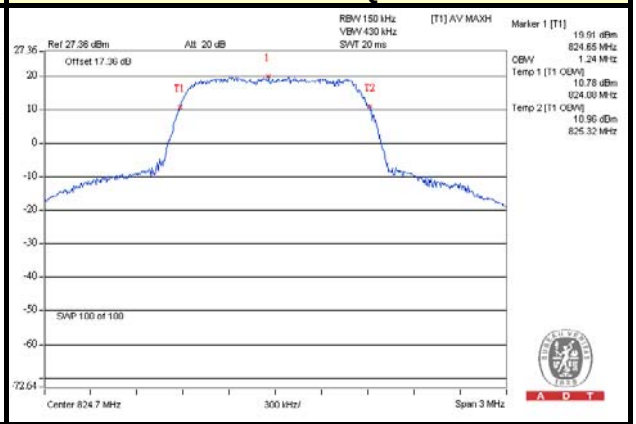
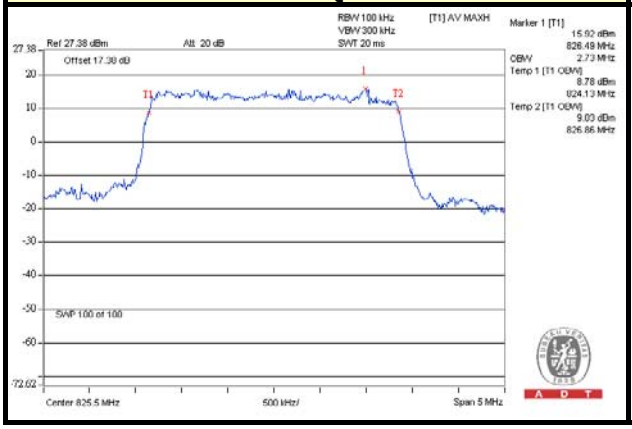
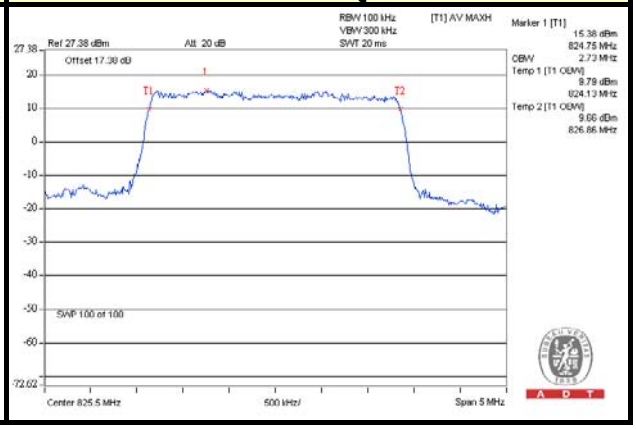
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
1013	824.70	1.29
384	836.52	1.27
777	848.31	1.29

SPECTRUM PLOT OF WORST VALUE
CDMA & EVDO



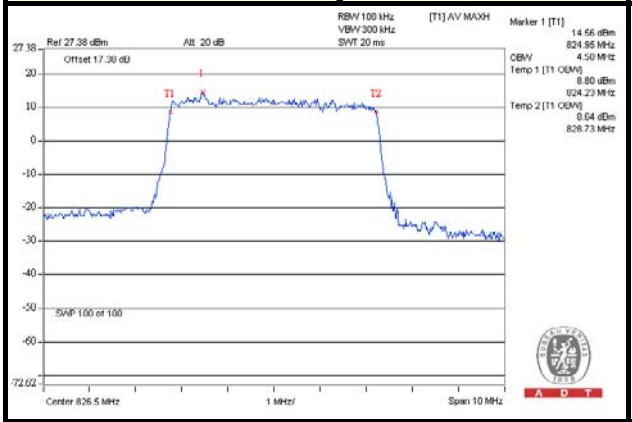
LTE Band 5

LTE BAND 5							
CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	1.25	1.24	20415	825.5	2.73	2.73
20525	836.5	1.24	1.24	20525	836.5	2.72	2.73
20643	848.3	1.23	1.24	20635	847.5	2.72	2.73
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	4.50	4.50	20450	829	9.03	9.00
20525	836.5	4.48	4.50	20525	836.5	8.97	8.93
20625	846.5	4.50	4.50	20600	844	9.00	9.03

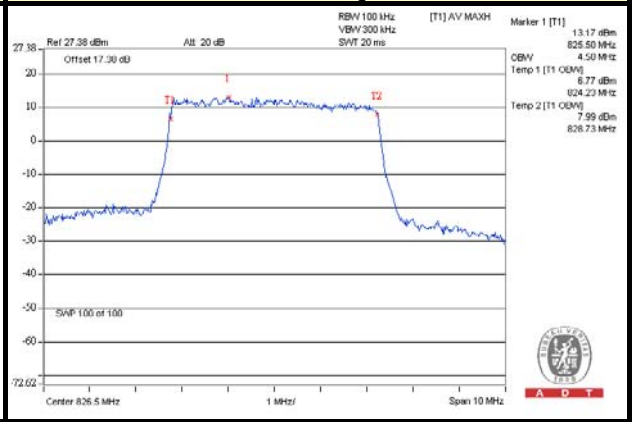
SPECTRUM PLOT OF WORST VALUE	
1.4MHz / QPSK	1.4MHz / 16QAM
	
3MHz / QPSK	3MHz / 16QAM
	

SPECTRUM PLOT OF WORST VALUE

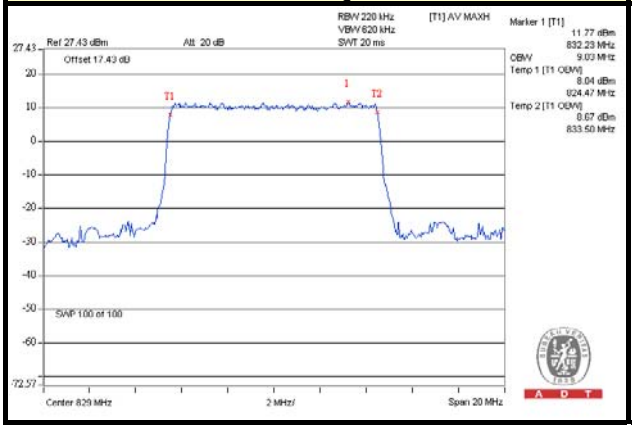
5MHz / QPSK



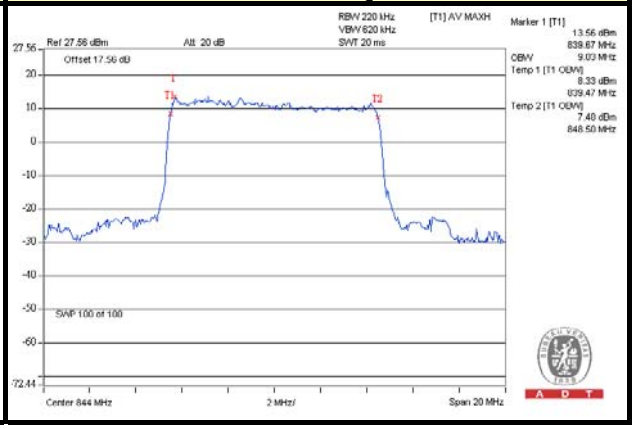
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

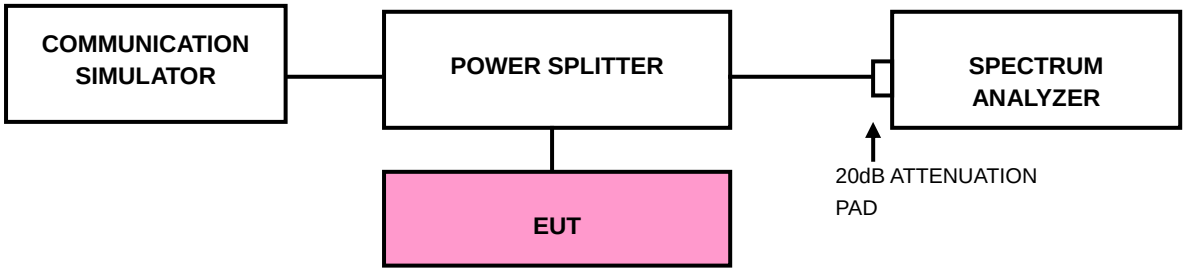


4.4 BAND EDGE MEASUREMENT

4.4.1 LIMITS OF BAND EDGE MEASUREMENT

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

4.4.2 TEST SETUP



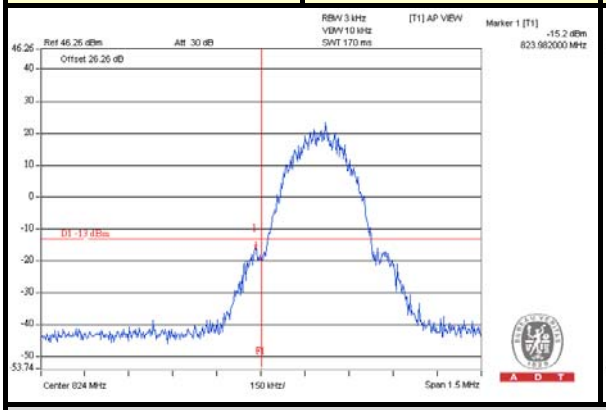
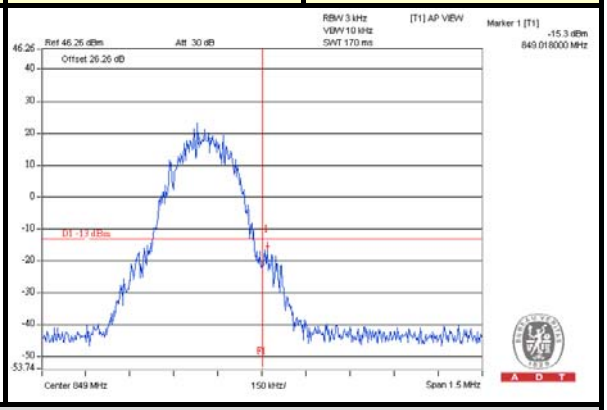
4.4.3 TEST PROCEDURES

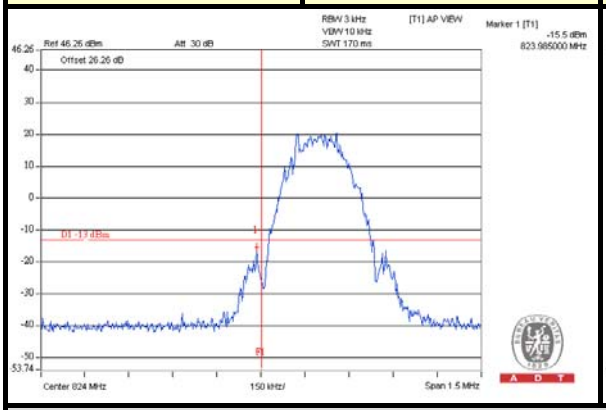
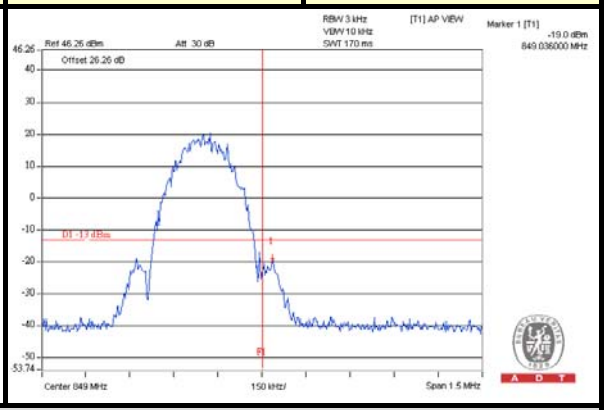
a. All measurements were done at low and high operational frequency range.

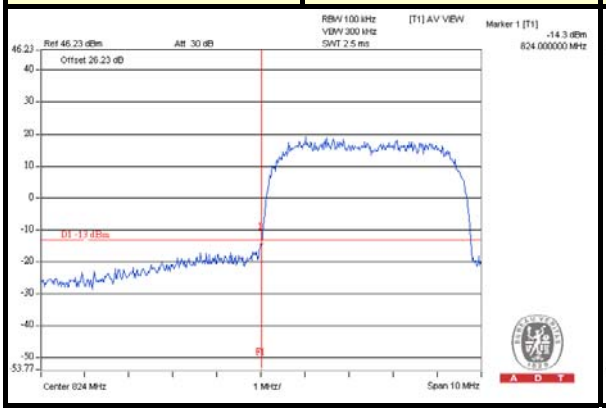
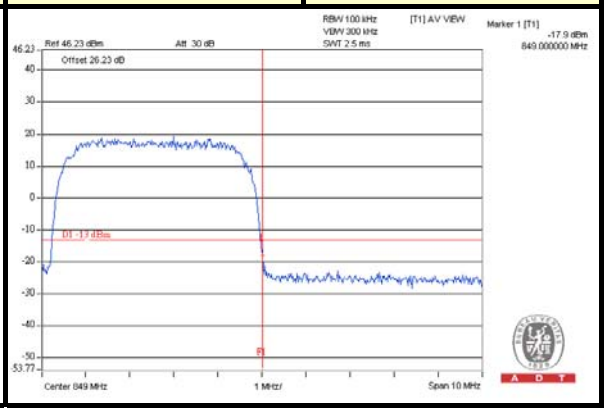
b. The center frequency of spectrum is the band edge frequency and s RB of the spectrum is >1% OCCUPIED BANDWIDTH and VB of the spectrum is ≧ 3*RB.

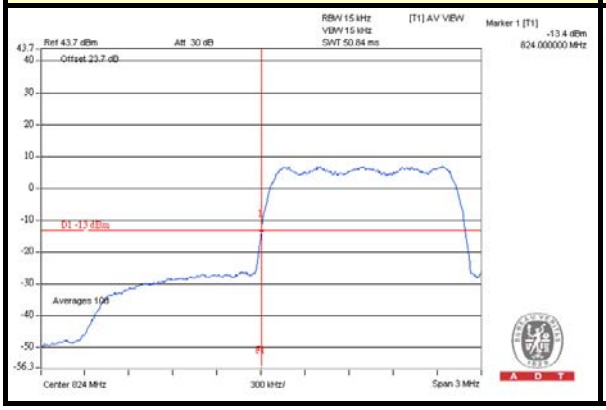
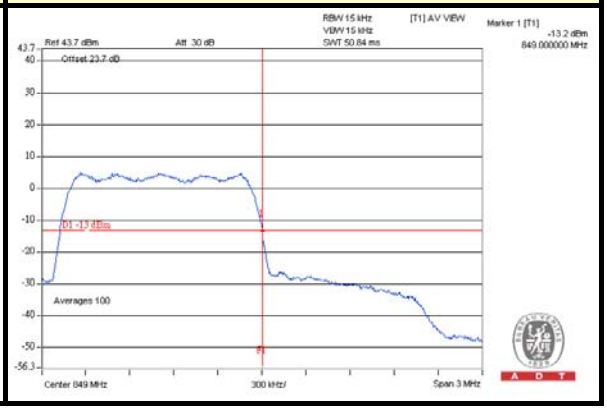
c. Record the max trace plot into the test report.

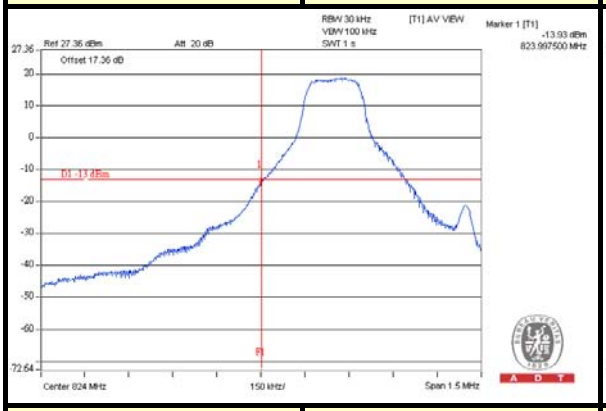
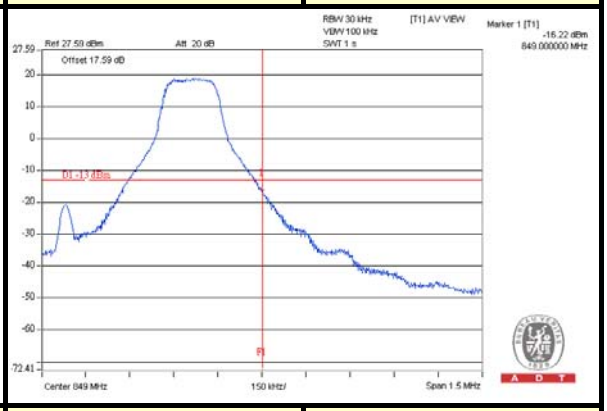
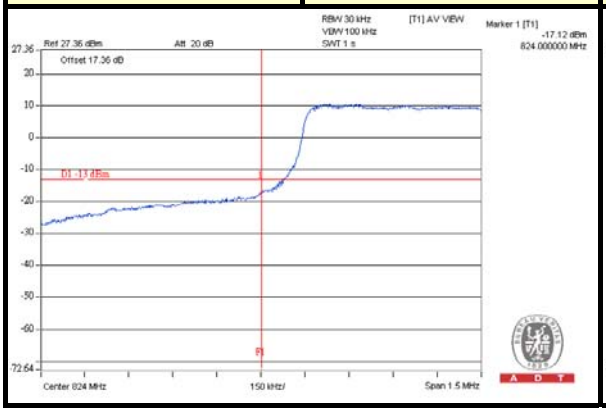
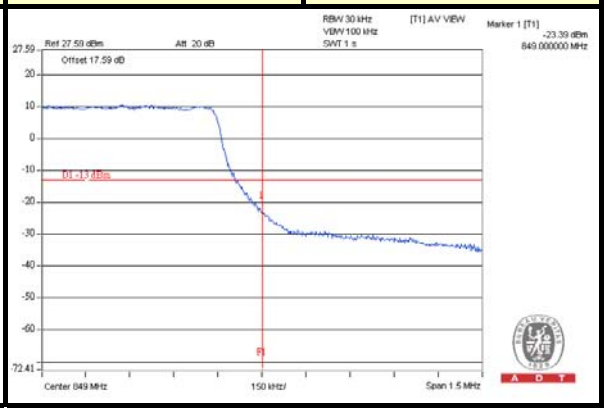
4.4.4 TEST RESULTS

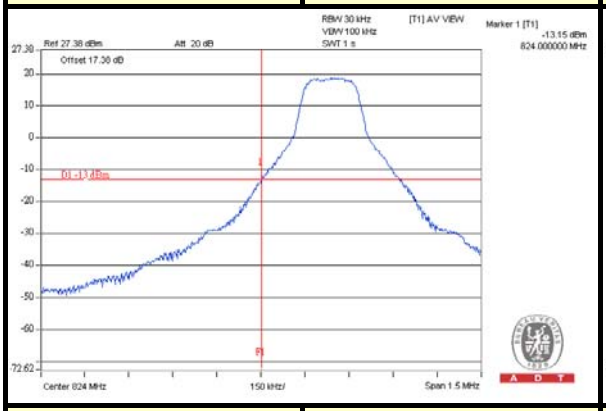
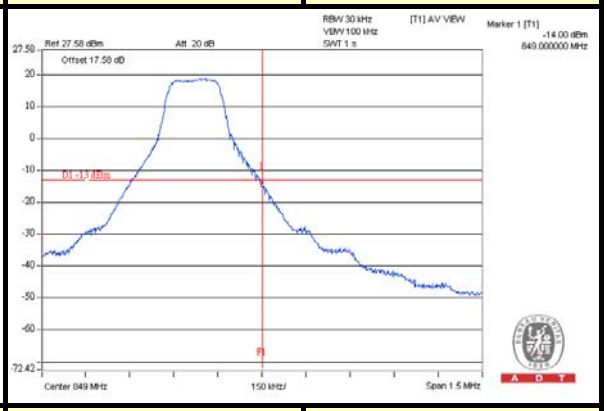
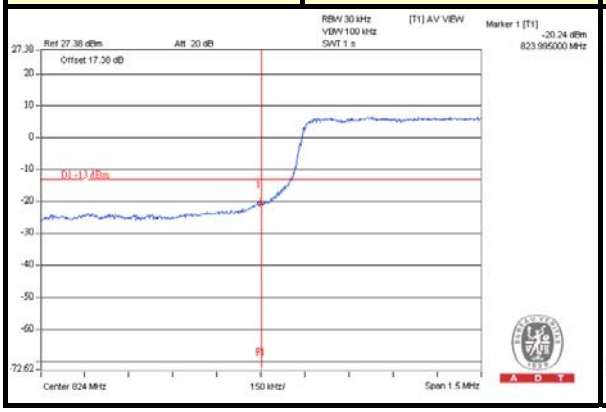
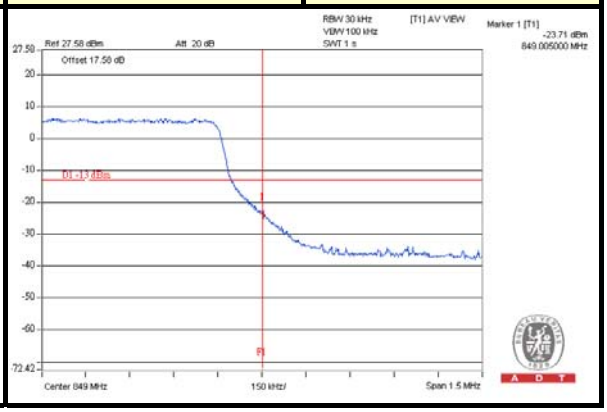
GPRS			
CHANNEL	128	CHANNEL	251
			

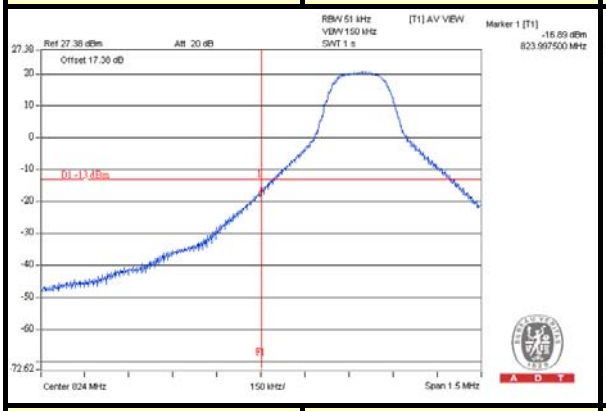
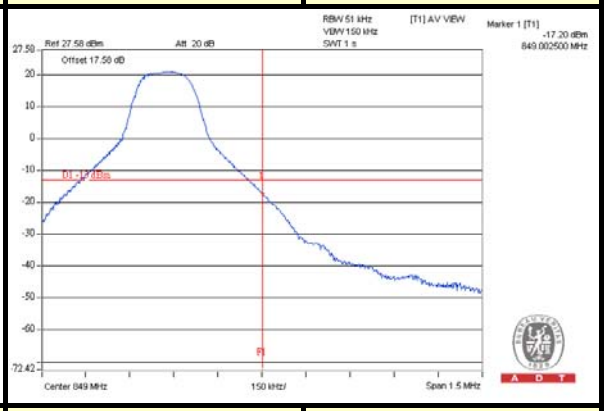
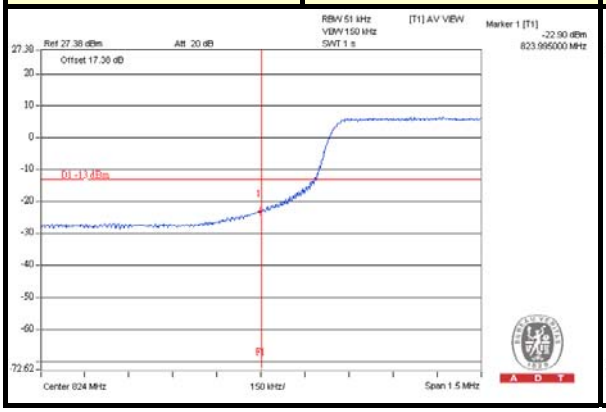
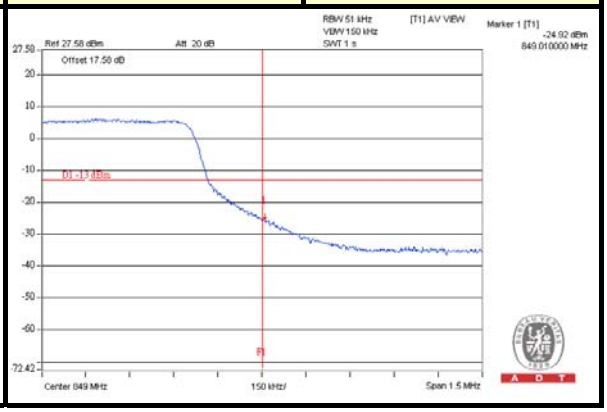
EDGE			
CHANNEL	128	CHANNEL	251
			

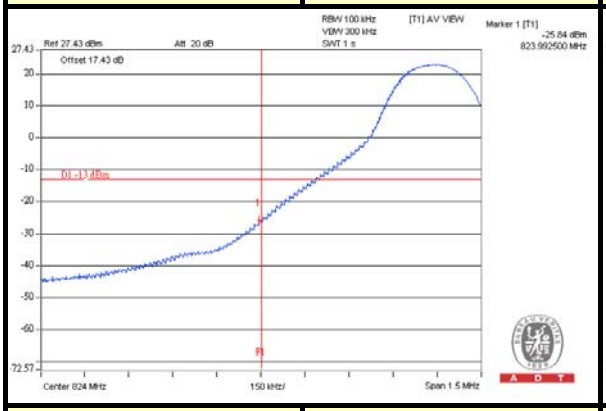
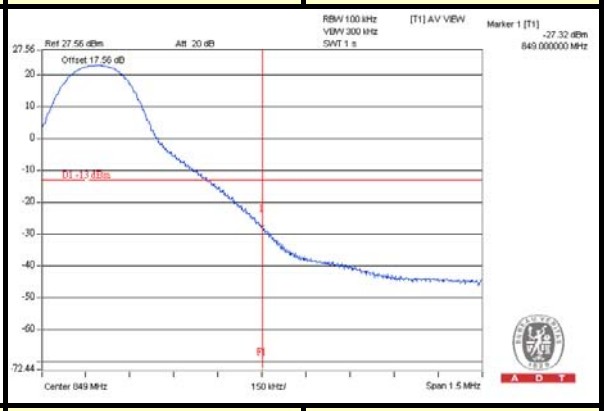
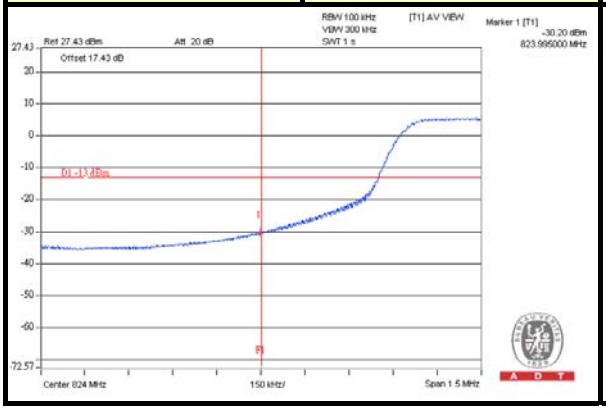
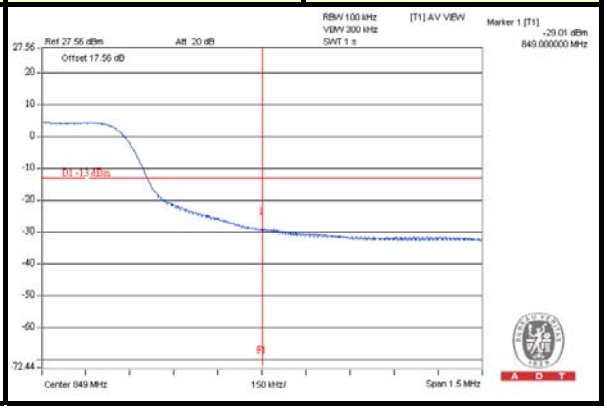
WCDMA			
CHANNEL	4132	CHANNEL	4233
			

EVDO	
CHANNEL 1013	**CHANNEL 777**
	

LTE Band 5 (Channel Bandwidth 1.4MHz)			
CHANNEL 20407	1RB / 0RB offset	CHANNEL20643	1RB / 0RB offset
			
CHANNEL 20407	6RB / 0RB offset	CHANNEL 20643	6RB / 0RB offset
			

LTE Band 5 (Channel Bandwidth 3MHz)			
CHANNEL 20415	1RB / 0RB offset	CHANNEL 20635	1RB / 0RB offset
			
CHANNEL 20415	15RB / 0RB offset	CHANNEL 20635	15RB / 0RB offset
			

LTE Band 5 (Channel Bandwidth 5MHz)			
CHANNEL 20425	1RB / 0RB offset	CHANNEL 20625	1RB / 0RB offset
			
CHANNEL 20425	25RB / 0RB offset	CHANNEL 20625	25RB / 0RB offset
			

LTE Band 5 (Channel Bandwidth 10MHz)			
CHANNEL 20450	1RB / 0RB offset	CHANNEL 20600	1RB / 0RB offset
			
CHANNEL 20450	50RB / 0RB offset	CHANNEL 20600	50RB / 0RB offset
			

4.5 CONDUCTED SPURIOUS EMISSIONS

4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

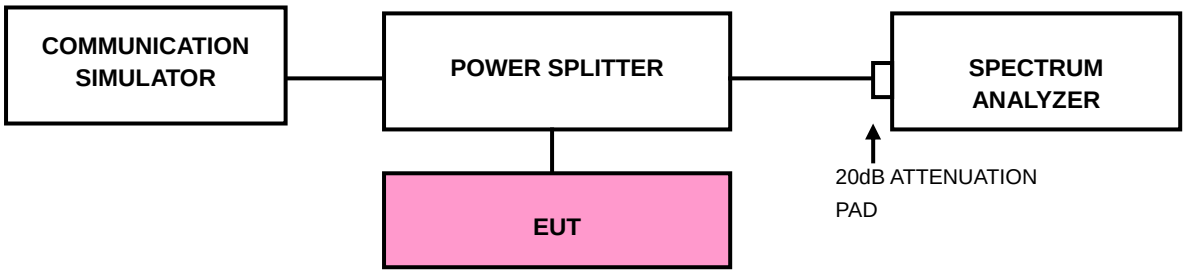
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.5.2 TEST PROCEDURE

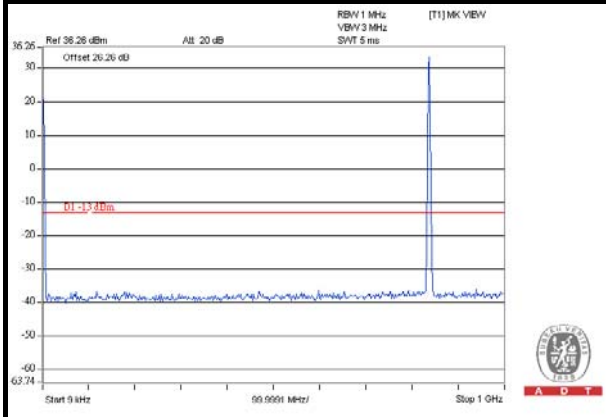
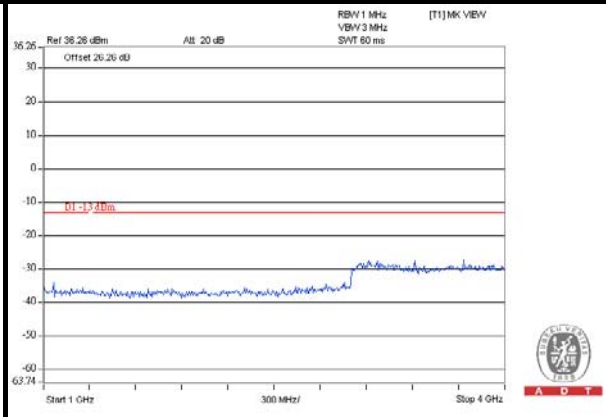
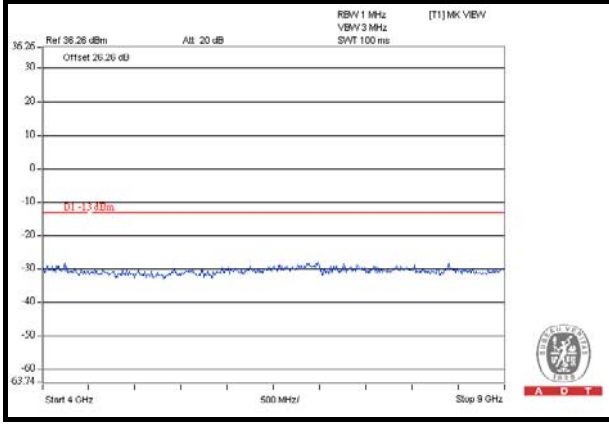
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

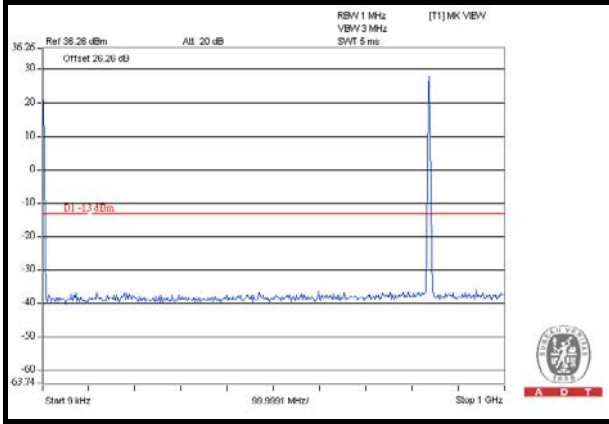
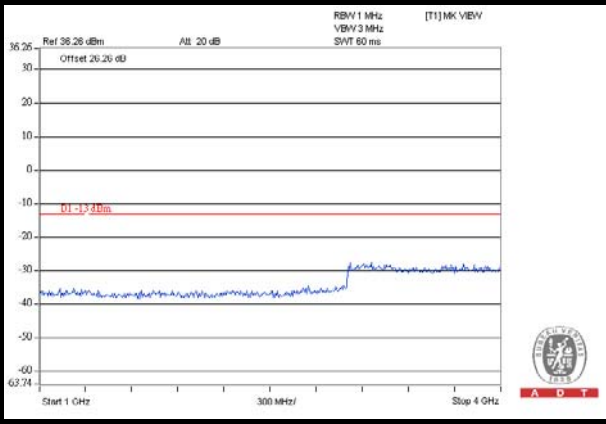
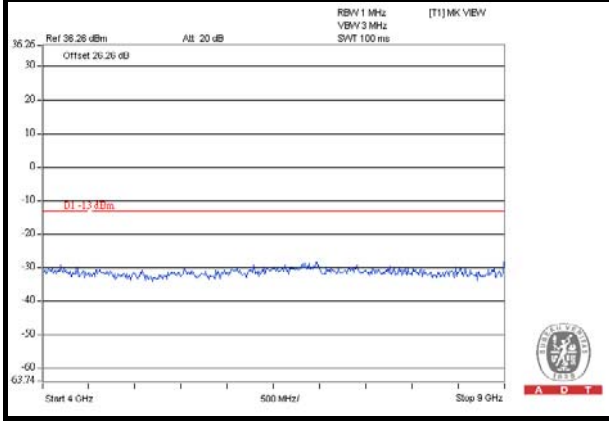
b. Measuring frequency range is from 9kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

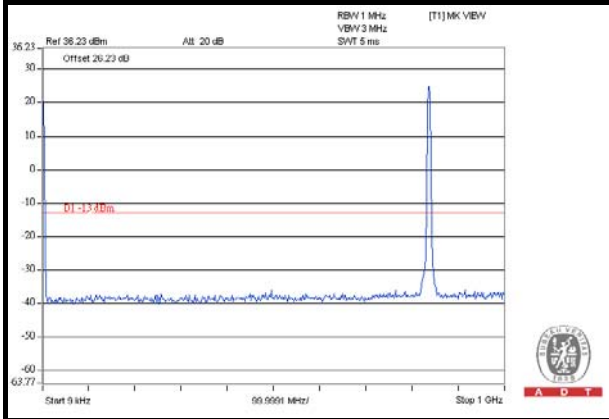
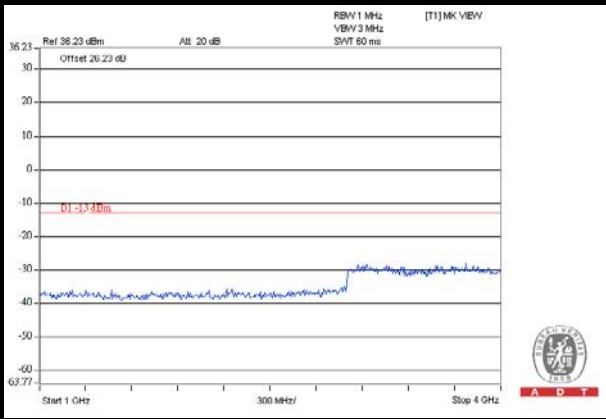
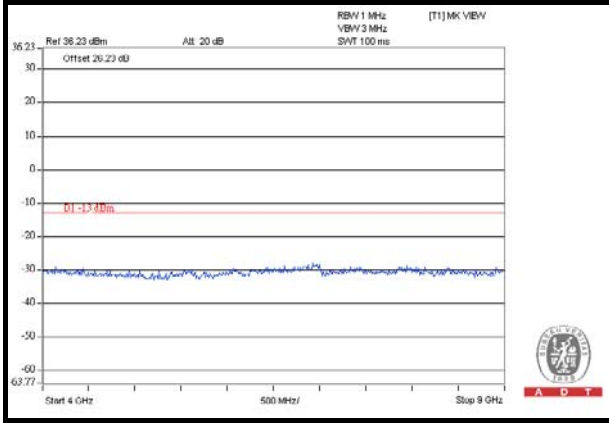
4.5.3 TEST SETUP

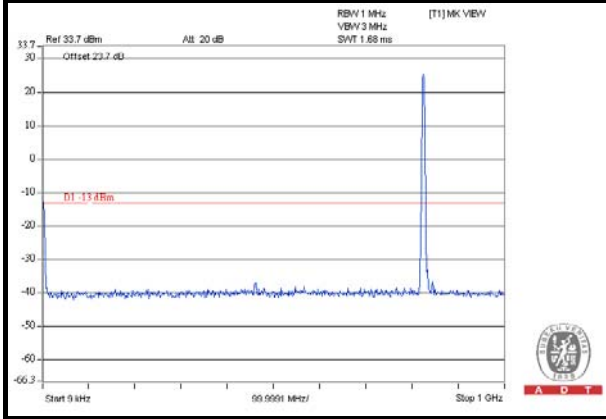
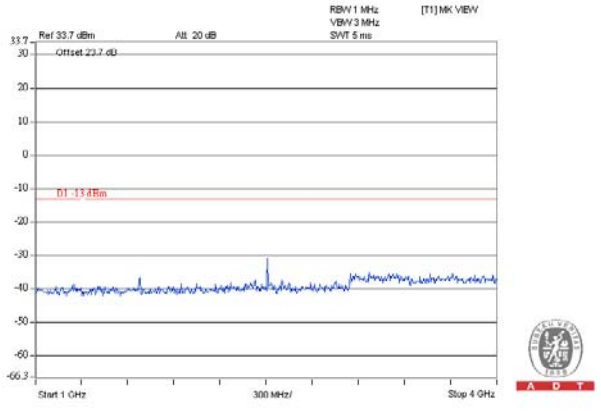
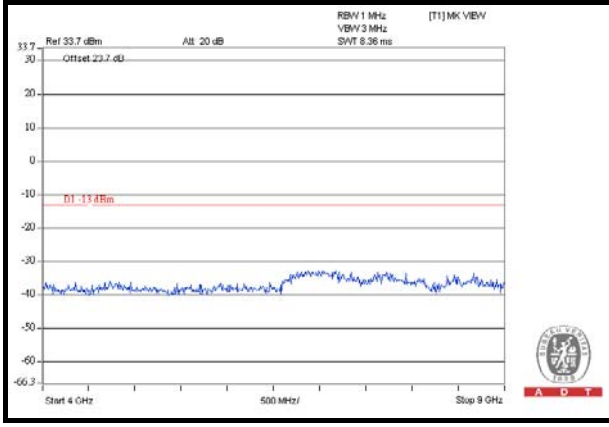


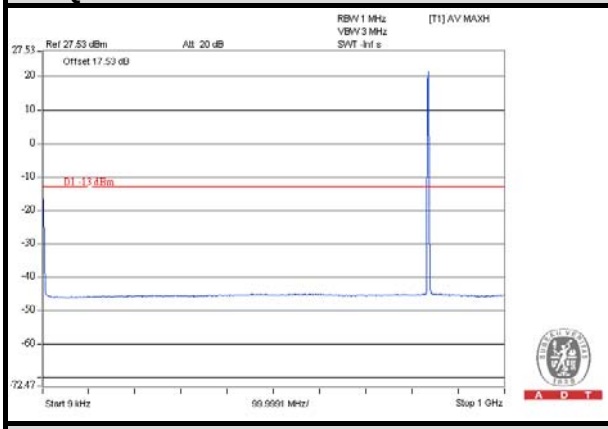
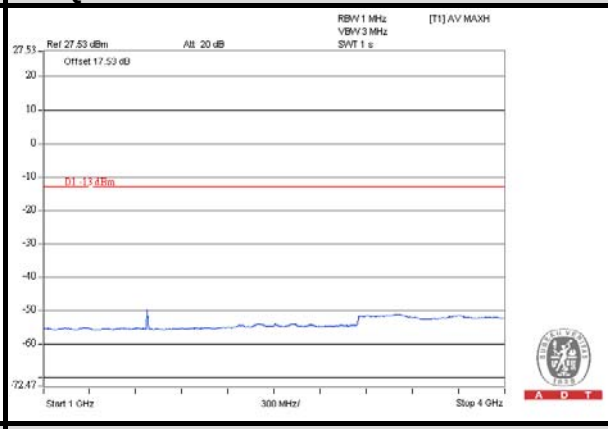
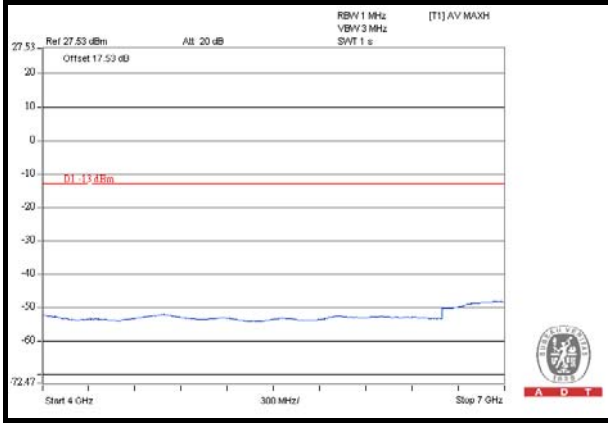
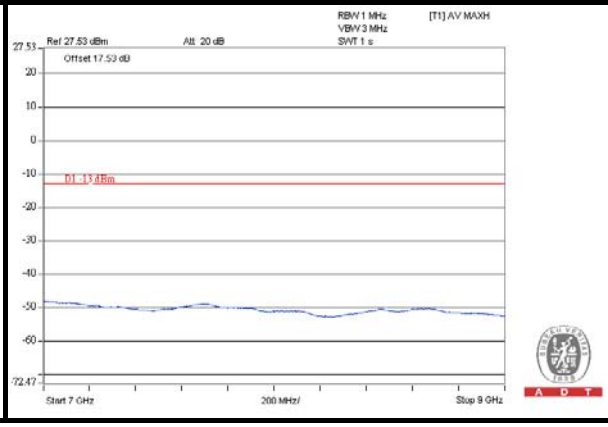
4.5.4 TEST RESULTS

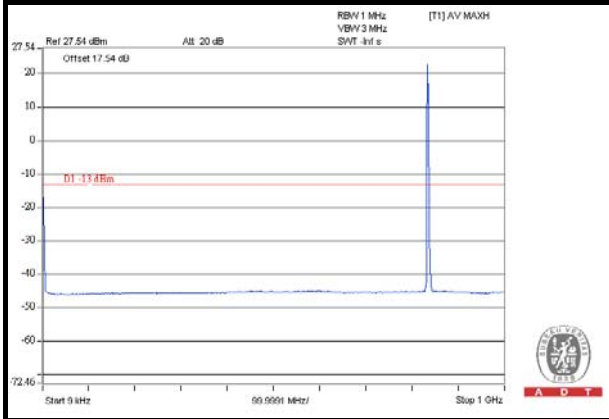
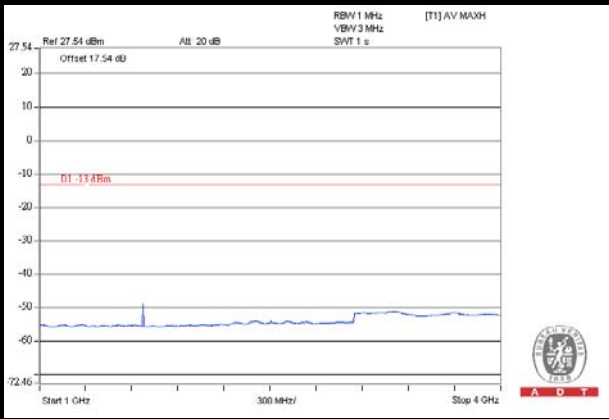
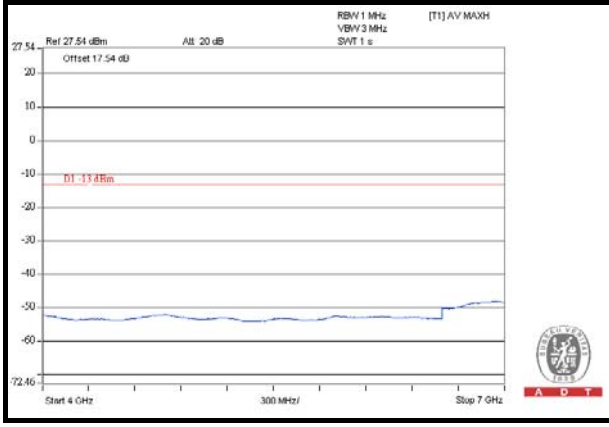
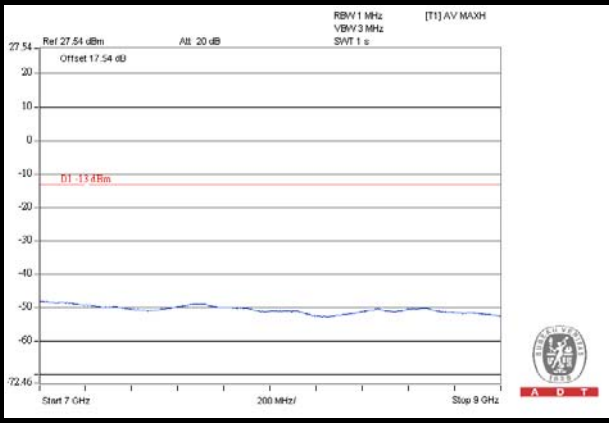
GPRS	
CHANNEL 190	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~9GHz	
	

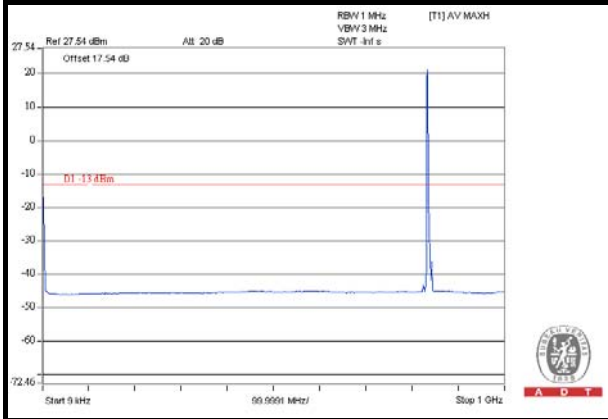
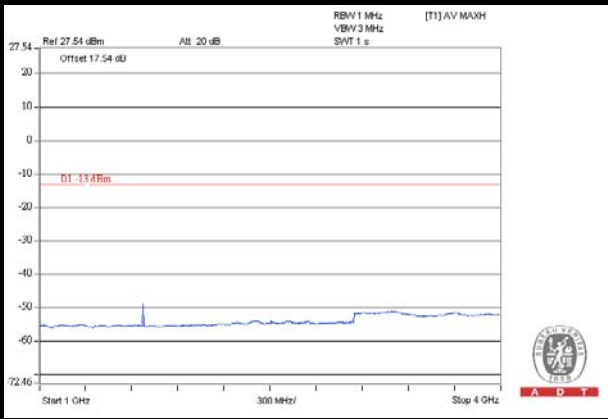
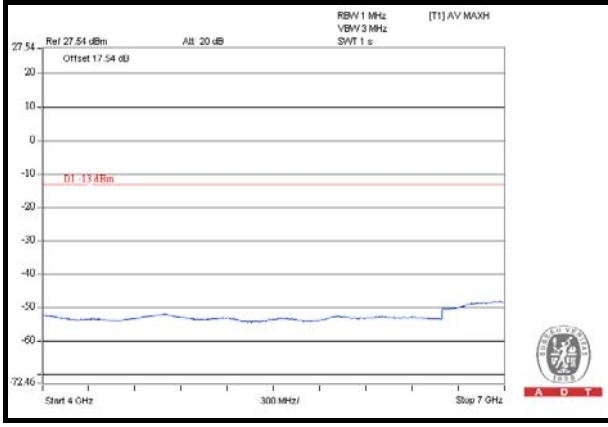
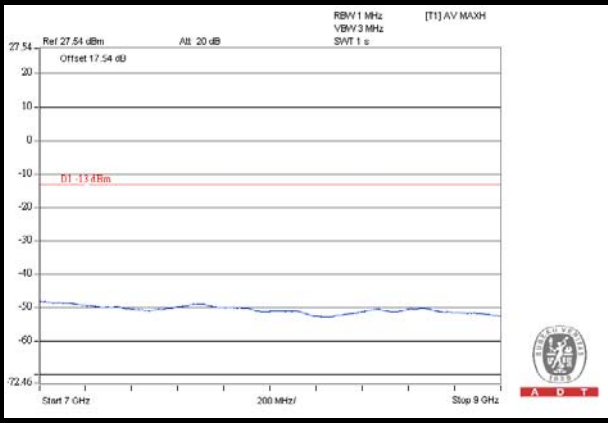
EDGE	
CHANNEL 190	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~9GHz	
	

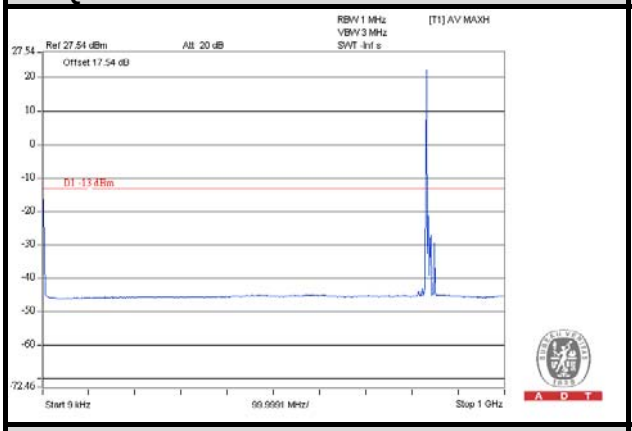
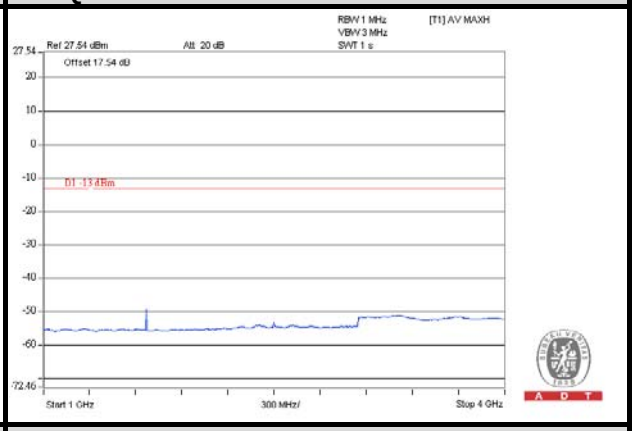
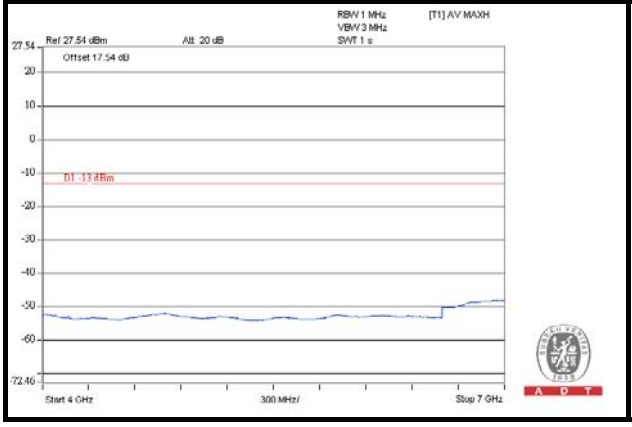
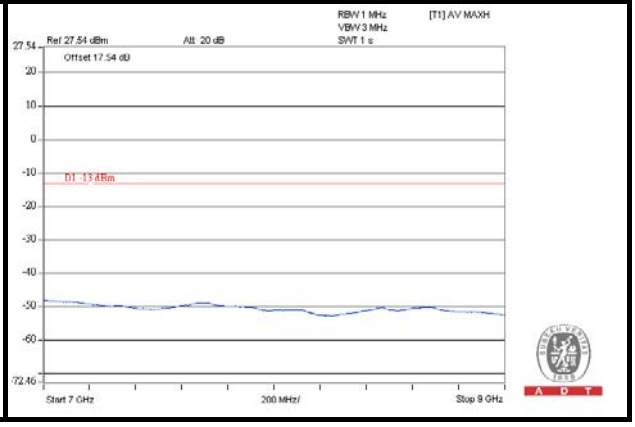
WCDMA	
CHANNEL 4183	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~9GHz	
	

CDMA & EVDO	
CHANNEL 384	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~9GHz	
	

LTE Band 5 (Channel Bandwidth: 1.4MHz)	
CHANNEL 20525	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE :7GHz~9GHz
	

LTE Band 5 (Channel Bandwidth: 3MHz)	
CHANNEL 20525	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE :7GHz~9GHz
	

LTE Band 5 (Channel Bandwidth: 5MHz)	
CHANNEL 20525	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE :7GHz~9GHz
	

LTE Band 5 (Channel Bandwidth: 10MHz)	
CHANNEL 20525	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE :7GHz~9GHz
	

4.6 RADIATED EMISSION MEASUREMENT

4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

4.6.2 TEST PROCEDURES

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

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

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

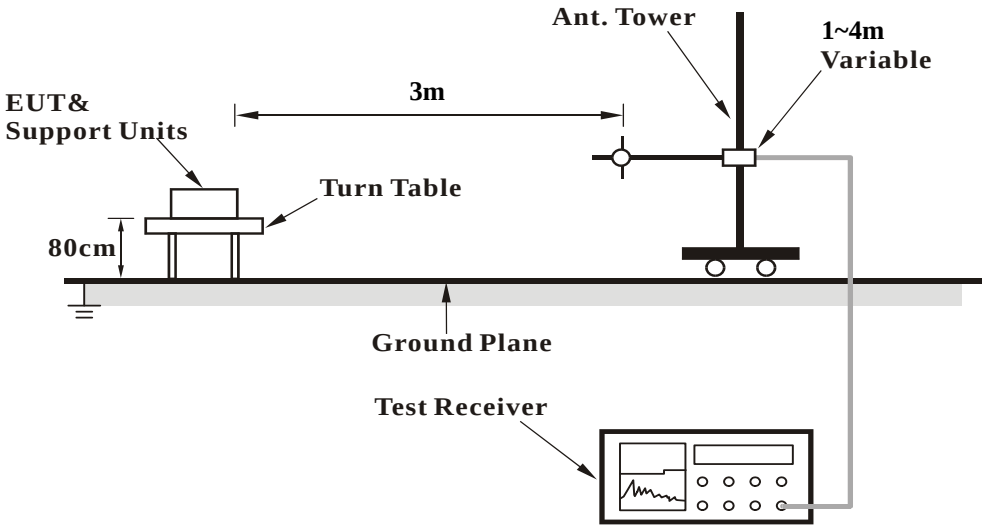
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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

4.6.3 DEVIATION FROM TEST STANDARD

No deviation

4.6.4 TEST SETUP



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

4.6.5 TEST RESULTS

Below 1GHz

GPRS:

MODE	TX channel 190	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	55.8	29.87	-13	-50.73	-8.60	-59.33	-46.33
2	157.51	34.02	-13	-53.49	-1.06	-54.54	-41.54
3	240	33.47	-13	-61.89	3.82	-58.07	-45.07
4	249.37	32.07	-13	-62.18	4.04	-58.14	-45.14
5	480.03	27.81	-13	-68.80	2.86	-65.95	-52.95
6	713.46	32.22	-13	-64.13	1.40	-62.73	-49.73
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	55.8	36.71	-13	-43.89	-8.60	-52.49	-39.49
2	143.93	29.02	-13	-63.79	-1.19	-64.98	-51.98
3	274.73	27.99	-13	-67.03	3.88	-63.15	-50.15
4	299.13	28.01	-13	-67.74	3.72	-64.02	-51.02
5	307.95	27.19	-13	-68.92	3.69	-65.23	-52.23
6	768.02	32.62	-13	-64.60	1.08	-63.52	-50.52

REMARKS:

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

EDGE:

MODE	TX channel 190	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	158.42	33.02	-13	-55.64	-0.75	-56.38	-43.38
2	239	34.47	-13	-60.92	3.81	-57.12	-44.12
3	248.37	33.07	-13	-61.96	3.88	-58.08	-45.08
4	483.03	28.81	-13	-67.64	2.86	-64.78	-51.78
5	715.46	33.22	-13	-63.13	1.37	-61.76	-48.76
6	158.42	33.02	-13	-55.64	-0.75	-56.38	-43.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	56.8	35.61	-13	-45.35	-8.36	-53.71	-40.71
2	142.93	30.02	-13	-63.08	-1.22	-64.30	-51.30
3	274.73	28.99	-13	-66.03	3.88	-62.15	-49.15
4	297.13	30.01	-13	-65.65	3.72	-61.93	-48.93
5	305.84	28.19	-13	-67.92	3.69	-64.23	-51.23
6	769.02	30.62	-13	-66.65	1.10	-65.55	-52.55

REMARKS:

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

WCDMA:

MODE	TX channel 4183	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	54.74	28.78	-13	-51.44	-8.86	-60.30	-47.30
2	158.53	31.02	-13	-56.77	-0.91	-57.68	-44.68
3	240	34.47	-13	-60.89	3.82	-57.07	-44.07
4	248.37	33.47	-13	-61.56	3.88	-57.68	-44.68
5	483.03	26.81	-13	-69.64	2.86	-66.78	-53.78
6	713.35	33.11	-13	-63.24	1.40	-61.83	-48.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	58.7	33.51	-13	-47.83	-7.95	-55.79	-42.79
2	142.73	28.02	-13	-65.14	-1.23	-66.36	-53.36
3	274.73	26.99	-13	-67.01	4.09	-62.92	-49.92
4	295.24	28.21	-13	-67.43	3.74	-63.69	-50.69
5	305.84	28.09	-13	-67.94	3.70	-64.24	-51.24
6	769.23	30.62	-13	-66.66	1.10	-65.56	-52.56

REMARKS:

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

CDMA & EVDO:

MODE	TX channel 384	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	52.92	28.69	-13	-50.87	-9.31	-60.17	-47.17
2	157.49	29.34	-13	-58.16	-1.06	-59.22	-46.22
3	244.87	31.49	-13	-63.67	3.85	-59.82	-46.82
4	245.37	28.55	-13	-66.60	3.86	-62.74	-49.74
5	484.57	27.74	-13	-68.62	2.86	-65.76	-52.76
6	710.57	30.46	-13	-65.89	1.45	-64.44	-51.44
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	61.45	33.39	-13	-49.60	-7.16	-56.76	-43.76
2	145.52	28.45	-13	-63.91	-1.14	-65.05	-52.05
3	272.56	27.68	-13	-67.27	3.89	-63.38	-50.38
4	293.62	27.78	-13	-67.74	3.73	-64.01	-51.01
5	302.17	28.58	-13	-67.29	3.71	-63.59	-50.59
6	771.48	28.37	-13	-69.01	1.13	-67.88	-54.88

REMARKS:

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

LTE Band 5 (Channel Bandwidth 1.4MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	32.64	30.62	-13	-41.59	-14.26	-55.85	-42.85
2	49.52	36.01	-13	-42.32	-10.14	-52.45	-39.45
3	107.9	36.84	-13	-53.41	-0.85	-54.25	-41.25
4	269.93	34.48	-13	-60.40	3.91	-56.49	-43.49
5	345.21	36.31	-13	-61.35	3.61	-57.75	-44.75
6	357.3	39.15	-13	-58.72	3.56	-55.16	-42.16
7	378.38	39.10	-13	-58.76	3.45	-55.31	-42.31
8	895.72	43.22	-13	-55.17	0.54	-54.63	-41.63
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	33.36	39.05	-13	-33.43	-14.08	-47.51	-34.51
2	51.63	41.34	-13	-37.75	-9.62	-47.37	-34.37
3	63.24	43.80	-13	-40.27	-6.64	-46.91	-33.91
4	108.21	42.87	-13	-47.36	-0.86	-48.21	-35.21
5	368.08	37.93	-13	-59.93	3.50	-56.43	-43.43
6	381.95	38.62	-13	-59.23	3.43	-55.80	-42.80
7	395.34	36.32	-13	-61.49	3.38	-58.11	-45.11
8	896.01	43.75	-13	-54.66	0.54	-54.12	-41.12

REMARKS:

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

LTE Band 5 (Channel Bandwidth 3MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	32.68	31.12	-13	-41.11	-14.25	-55.35	-42.35
2	48.88	36.75	-13	-41.34	-10.29	-51.64	-38.64
3	106.99	37.81	-13	-52.48	-0.82	-53.31	-40.31
4	269.4	34.88	-13	-59.98	3.91	-56.07	-43.07
5	345.97	36.14	-13	-61.55	3.60	-57.95	-44.95
6	357.88	40.06	-13	-57.81	3.55	-54.25	-41.25
7	377.93	39.11	-13	-58.75	3.45	-55.30	-42.30
8	895.04	43.53	-13	-54.80	0.55	-54.25	-41.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	34.11	39.65	-13	-33.10	-13.90	-47.00	-34.00
2	51.54	41.66	-13	-37.40	-9.64	-47.04	-34.04
3	63.01	43.92	-13	-40.01	-6.71	-46.71	-33.71
4	107.87	43.46	-13	-46.79	-0.85	-47.63	-34.63
5	367.41	37.45	-13	-60.41	3.50	-56.90	-43.90
6	382.55	38.18	-13	-59.67	3.42	-56.25	-43.25
7	395.22	36.75	-13	-61.06	3.38	-57.67	-44.67
8	895.67	43.89	-13	-54.49	0.54	-53.95	-40.95

REMARKS:

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

LTE Band 5 (Channel Bandwidth 5MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	33.51	30.78	-13	-41.75	-14.04	-55.79	-42.79
2	49.25	35.87	-13	-36.66	-14.04	-50.70	-37.70
3	106.28	37.17	-13	-53.16	-0.80	-53.96	-40.96
4	269.45	35.26	-13	-59.60	3.91	-55.69	-42.69
5	345.64	37.00	-13	-60.68	3.61	-57.08	-44.08
6	358.74	39.41	-13	-58.46	3.55	-54.91	-41.91
7	377.33	39.72	-13	-58.14	3.55	-54.60	-41.60
8	895.38	43.98	-13	-54.38	0.54	-53.84	-40.84
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	33.24	40.39	-13	-32.04	-14.11	-46.15	-33.15
2	50.89	42.26	-13	-30.17	-14.11	-44.28	-31.28
3	62.04	43.07	-13	-40.28	-6.99	-47.26	-34.26
4	107.98	44.06	-13	-46.18	-0.85	-47.03	-34.03
5	366.79	36.46	-13	-61.40	3.51	-57.89	-44.89
6	382.36	38.05	-13	-59.81	3.51	-56.30	-43.30
7	396	37.57	-13	-60.24	3.38	-56.87	-43.87
8	896.08	44.01	-13	-54.41	0.54	-53.87	-40.87

REMARKS:

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

LTE Band 5 (Channel Bandwidth 10MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	34.04	30.13	-13	-42.59	-13.91	-56.50	-43.50
2	49.88	36.78	-13	-35.94	-13.91	-49.86	-36.86
3	106.4	37.81	-13	-52.52	-0.80	-53.32	-40.32
4	269.61	36.21	-13	-58.66	3.91	-54.74	-41.74
5	345.03	36.55	-13	-61.11	3.61	-57.50	-44.50
6	359.01	39.77	-13	-58.10	3.55	-54.55	-41.55
7	378.15	40.68	-13	-57.18	3.55	-53.64	-40.64
8	896.36	43.57	-13	-54.87	0.53	-54.34	-41.34
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	32.35	40.36	-13	-31.75	-14.33	-46.08	-33.08
2	50.03	41.76	-13	-30.35	-14.33	-44.68	-31.68
3	61.18	42.68	-13	-40.15	-7.24	-47.39	-34.39
4	108.15	43.51	-13	-46.72	-0.85	-47.58	-34.58
5	365.84	36.91	-13	-60.95	3.51	-57.44	-44.44
6	381.56	37.07	-13	-60.79	3.51	-57.28	-44.28
7	396.83	36.80	-13	-61.02	3.37	-57.65	-44.65
8	895.84	43.15	-13	-55.25	0.54	-54.71	-41.71

REMARKS:

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

Above 1GHz

GPRS:

MODE	TX channel 190	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.2	41.70	-13	-60.93	6.31	-54.62	-41.62
2	2509.8	46.60	-13	-51.92	6.66	-45.26	-32.26
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.2	41.4	-13	-61.23	6.31	-54.92	-41.92
2	2509.8	48.1	-13	-50.42	6.66	-43.76	-30.76

REMARKS:

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

EDGE:

MODE	TX channel 190	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.2	40.40	-13	-62.23	6.31	-55.92	-42.92
2	2509.8	45.30	-13	-53.22	6.66	-46.56	-33.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.2	40.5	-13	-62.13	6.31	-55.82	-42.82
2	2509.8	47.2	-13	-51.32	6.66	-44.66	-31.66

REMARKS:

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

WCDMA:

MODE	TX channel 4183	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.2	39.70	-13	-62.93	6.31	-56.62	-43.62
2	2509.8	41.10	-13	-57.42	6.66	-50.76	-37.76
3	3346.4	43.20	-13	-59.81	7.63	-52.18	-39.18
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.2	38.9	-13	-63.73	6.31	-57.42	-44.42
2	2509.8	41.3	-13	-57.22	6.66	-50.56	-37.56
3	3346.4	43.2	-13	-59.81	7.63	-52.18	-39.18

REMARKS:

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

CDMA & EVDO:

MODE	TX channel 384	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.04	40.50	-13	-62.13	6.31	-55.82	-42.82
2	2509.56	40.40	-13	-58.12	6.66	-51.46	-38.46
3	3346.08	44.30	-13	-58.71	7.63	-51.08	-38.08
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1673.04	39.4	-13	-63.23	6.31	-56.92	-43.92
2	2509.56	40.3	-13	-58.22	6.66	-51.56	-38.56
3	3346.08	44.2	-13	-58.81	7.63	-51.18	-38.18

REMARKS:

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

LTE Band 5 (Channel Bandwidth 1.4MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	67.49	-13	-35.02	6.35	-28.67	-15.67
2	2508	74.67	-13	-24.14	6.69	-17.45	-4.45
3	3344	63.82	-13	-39.25	7.69	-31.55	-18.55
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	55.49	-13	-47.02	6.35	-40.67	-27.67
2	2508	62.12	-13	-36.69	6.69	-30.00	-17.00
3	3344	65.09	-13	-37.98	7.69	-30.28	-17.28

REMARKS:

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

LTE Band 5 (Channel Bandwidth 3MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	67.63	-13	-34.88	6.35	-28.53	-15.53
2	**2508**	**74.93**	**-13**	**-23.88**	**6.69**	**-17.19**	**-4.19**
3	3344	63.05	-13	-40.02	7.69	-32.32	-19.32
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	55.21	-13	-47.30	6.35	-40.95	-27.95
2	2508	61.53	-13	-37.28	6.69	-30.59	-17.59
3	3344	65.64	-13	-37.43	7.69	-29.73	-16.73

REMARKS:

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

LTE Band 5 (Channel Bandwidth 5MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	68.07	-13	-34.44	6.35	-28.09	-15.09
2	2508	74.30	-13	-24.51	6.69	-17.82	-4.82
3	3344	63.59	-13	-39.48	7.69	-31.78	-18.78
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	55.59	-13	-46.92	6.35	-40.57	-27.57
2	2508	61.93	-13	-36.88	6.69	-30.19	-17.19
3	3344	65.2	-13	-37.87	7.69	-30.17	-17.17

REMARKS:

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

LTE Band 5 (Channel Bandwidth 10MHz):

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	67.03	-13	-35.48	6.35	-29.13	-16.13
2	2508	74.75	-13	-24.06	6.69	-17.37	-4.37
3	3344	63.21	-13	-39.86	7.69	-32.16	-19.16
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Margin (dB)
1	1672	55.7	-13	-46.81	6.35	-40.46	-27.46
2	2508	61.27	-13	-37.54	6.69	-30.85	-17.85
3	3344	65.51	-13	-37.56	7.69	-29.86	-16.86

REMARKS:

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

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6 INFORMATION ON THE TESTING LABORATORIES

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

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

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

Hsin Chu EMC/RF/Telecom Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

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

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

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

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

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

---END---