FCC TEST REPORT

(PART 27)

REPORT NO.:	RF140630C01-9
MODEL NO.:	F-02G
FCC ID:	VQK-F02G
RECEIVED:	Aug. 05, 2014
TESTED:	Sep. 10 ~ Sep. 11, 2014
ISSUED:	Sep. 12, 2014

APPLICANT:	FUJITSU LIMITED
ADDRESS:	1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, 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
RF140630C01-9	Original release	Sep. 12, 2014

1 CERTIFICATION

PRODUCT:	Smart Phone
MODEL:	F-02G
BRAND:	FUJITSU
APPLICANT:	FUJITSU LIMITED
TESTED:	Sep. 10 ~ Sep. 11, 2014
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 27, Subpart L**

The above equipment (model: F-02G) 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 : Celine Chou **, DATE :** Sep. 12, 2014

Celine Chou / Specialist

APPROVED BY : Bruce Chen **, DATE :** Sep. 12, 2014

Bruce Chen / Project Engineer

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 27 & Part 2			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
2.1046 27.50(d)(4)	Equivalent isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.50(d)(5)	Peak to average ratio	PASS	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -5.32dB at 1420.00MHz.

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	3.86 dB
	200MHz ~1000MHz	3.87 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 17, 2014	Feb. 16, 2015
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2014	Aug. 25, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2014	Aug. 25, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 26, 2014	Aug. 25, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Sep. 09, 2014	Sep. 08, 2015
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 3.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 988962.

5. The IC Site Registration No. is IC 7450F-3.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Smart Phone	
MODEL NO.	F-02G	
POWER SUPPLY	3.8Vdc (Battery) 5Vdc (Adapter or cradle when normal charging) 9Vdc (Adapter or cradle when quick charging)	
MODULATION TYPE	QPSK, 16QAM	
FREQUENCY RANGE	709MHz ~ 711MHz	
MAX. EIRP POWER	**5MHz**	111.686mW (20.48dBm)
	10MHz	105.439mW (20.23dBm)
ANTENNA TYPE	λ/4 Monopole antenna with -4.2dBi gain	
DATA CABLE	N/A	
I/O PORTS	Refer to user's manual	
ACCESSORY DEVICES	Refer to Note as below	

NOTE:

1. The EUT contains the following accessories.

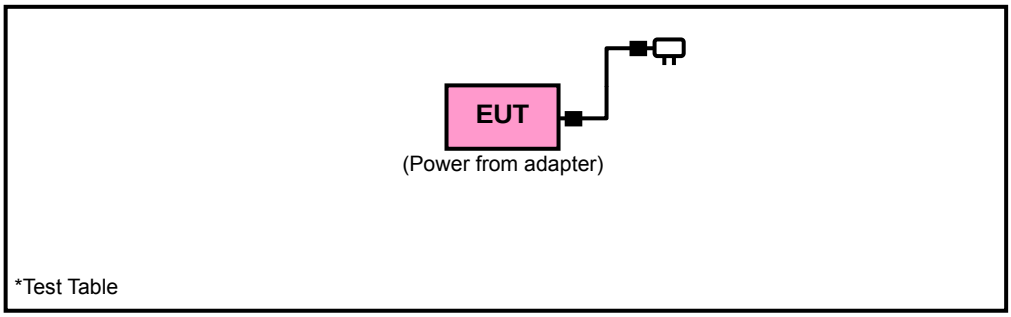
PRODUCT	BRAND	MODEL	DESCRIPTION
Battery	NTT docomo	NA	3.8Vdc, 3500mA, 13.3Wh
Cradle	Fujitsu Limited	F47	Input: 5.0Vdc, 1.5A 9.0Vdc, 1.5A Output: 5.0Vdc, 1.5A 9.0Vdc, 1.5A

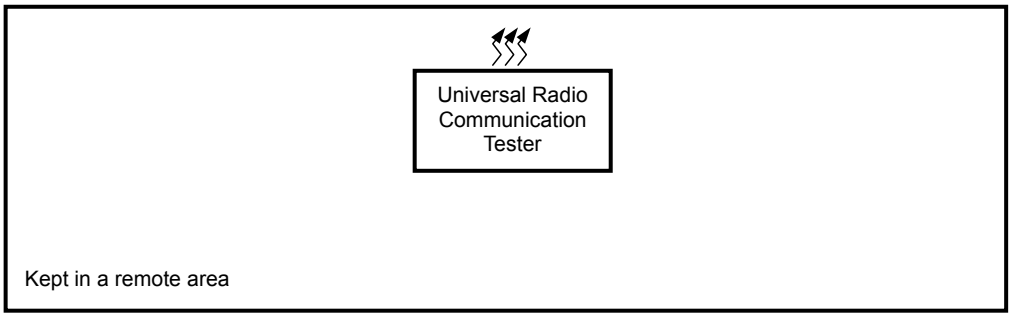
2. The following adapter is support unit only.

PRODUCT	BRAND	MODEL	DESCRIPTION
Adapter	NTT docomo	AC Adaptor 05	Input: 100-240Vac, 0.12A, 50-60Hz, 0.4A Output: 5.0Vdc, 1.5A 9.0Vdc, 1.5A Power line: 1.25m cable with two cores attached on adapter

3. SW version is R15Ae.
4. HW version is V2.1.0.
5. IMEI Code: 354014060011254.
6. The above EUT information is 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





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	Adapter	NTT docomo	AC Adaptor 05	NA	NA
2	Universal Radio Communication Tester	R&S	CMU200	117260	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

NOTE:
1. For item 1: 1.25m DC cable with 2 cores.
2. Item 1 is provided by the client.
3. Item 2 acted as a communication partner 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 case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below:

Test results are presented in the report as below.

Test Mode	Test Condition
A	Power from adapter
B	Power from battery

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION TYPE	MODE
A	ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB / 24 RB Offset
		23755 to 23825	23780, 23790, 23800	10MHz	QPSK	1 RB / 49 RB Offset
B	FREQUENCY STABILITY	23755 to 23825	23790	5MHz	QPSK	1 RB / 24 RB Offset
		23755 to 23825	23790	10MHz	QPSK	1 RB / 49 RB Offset
A	OCCUPIED BANDWIDTH	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		23755 to 23825	23780, 23790, 23800	10MHz	QPSK, 16QAM	1 RB / 49 RB Offset
A	PEAK TO AVERAGE RATIO	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		23755 to 23825	23780, 23790, 23800	10MHz	QPSK, 16QAM	1 RB / 49 RB Offset
A	BAND EDGE	23755 to 23825	23755, 23825	5MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset
		23755 to 23825	23780 23800	10MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset
A	CONDCUDETED EMISSION	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB / 24 RB Offset
		23755 to 23825	23780, 23790, 23800	10MHz	QPSK	1 RB / 49 RB Offset
A	RADIATED EMISSION BELOW 1GHz	23755 to 23825	23755	5MHz	QPSK	1 RB / 24 RB Offset
		23755 to 23825	23780	10MHz	QPSK	1 RB / 49 RB Offset
A	RADIATED EMISSION ABOVE 1GHz	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB / 24 RB Offset
		23755 to 23825	23780, 23790, 23800	10MHz	QPSK	1 RB / 49 RB Offset

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	22deg. C, 71%RH	120Vac, 60Hz	Nick Hsu
FREQUENCY STABILITY	24deg. C, 64%RH	3.9Vdc	Match Tsui
OCCUPIED BANDWIDTH	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
BAND EDGE	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
CONDCUDETED EMISSION	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
RADIATED EMISSION	21deg. C, 71%RH	120Vac, 60Hz	Nick Hsu

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 27

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

Portable stations (hand-held devices) operating in the 698-716MHz band is limited to 3 watts ERP

4.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RBW and VBW is 10MHz for LTE.

b. E.I.R.P power 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 a. Record the power level of S.G

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

e. E.R.P = E.I.R.P- 2.15 dB

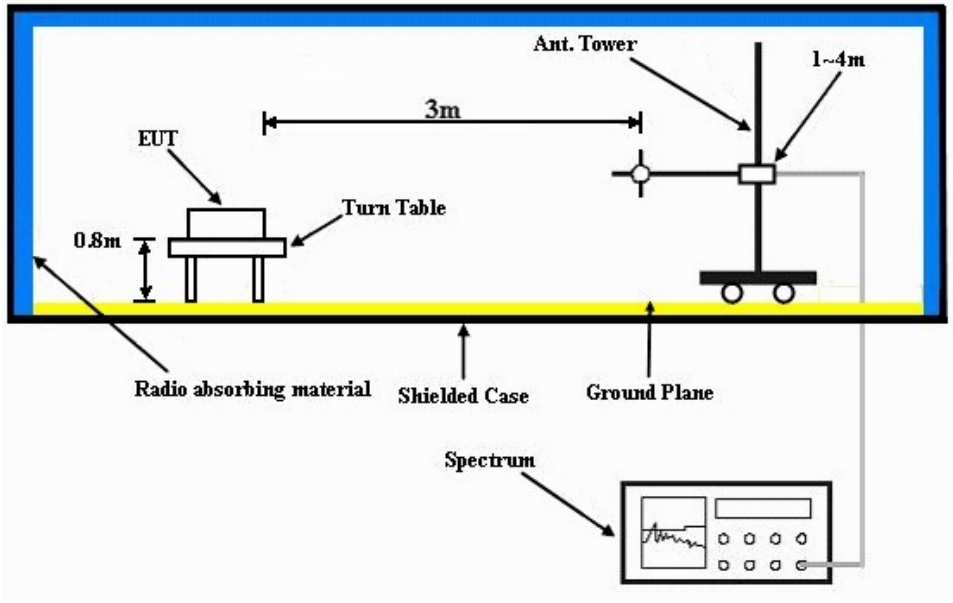
CONDUCTED POWER MEASUREMENT:

a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.

b. 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 / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23755	Mid CH 23790	High CH 23825		Low CH 23755	Mid CH 23790	High CH 23825	
			706.5 MHz	710.0 MHz	713.5 MHz		706.5 MHz	710.0 MHz	713.5 MHz	
17 / 5M	1	0	23.14	23.15	23.13	0	22.11	22.12	22.10	1
	1	12	23.26	23.27	23.25	0	22.23	22.24	22.22	1
	1	24	23.27	23.28	23.26	0	22.24	22.25	22.23	1
	12	0	22.16	22.17	22.15	1	21.13	21.14	21.12	2
	12	6	22.21	22.22	22.20	1	21.18	21.19	21.17	2
	12	13	22.28	22.29	22.27	1	21.25	21.26	21.24	2
	25	0	22.23	22.24	22.22	1	21.20	21.21	21.19	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23780	Mid CH 23790	High CH 23800		Low CH 23780	Mid CH 23790	High CH 23800	
			709.0 MHz	710.0 MHz	711.0 MHz		709.0 MHz	710.0 MHz	711.0 MHz	
17 / 10M	1	0	23.28	23.29	23.27	0	22.22	22.23	22.21	1
	1	24	23.40	23.41	23.39	0	22.34	22.35	22.33	1
	1	49	23.41	23.42	23.40	0	22.35	22.36	22.34	1
	25	0	22.30	22.31	22.29	1	21.24	21.25	21.23	2
	25	12	22.35	22.36	22.34	1	21.29	21.30	21.28	2
	25	25	22.42	22.43	22.41	1	21.36	21.37	21.35	2
	50	0	22.37	22.38	22.36	1	21.31	21.32	21.30	2

ERP POWER (dBm)

CHANNEL BANDWIDTH: 5MHz QPSK

MODE		TX channel 23755					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	706.50	-10.55	20.82	-1.07	19.75	34.77	-15.02
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	706.50	-18.36	9.81	-1.07	8.74	34.77	-26.03

MODE		TX channel 23790					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	710.00	-9.82	21.55	-1.07	**20.48**	34.77	-14.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	710.00	-18.80	9.37	-1.07	8.30	34.77	-26.47

MODE		TX channel 23825					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	713.50	-10.36	21.01	-1.07	19.94	34.77	-14.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	713.50	-18.87	9.30	-1.07	8.23	34.77	-26.54

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

CHANNEL BANDWIDTH: 10MHz QPSK

MODE		TX channel 23780					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	709.00	-10.47	20.90	-1.07	19.83	34.77	-14.94
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	709.00	-18.64	9.53	-1.07	8.46	34.77	-26.31

MODE		TX channel 23790					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	710.00	-10.07	21.30	-1.07	**20.23**	34.77	-14.54
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	710.00	-20.53	7.64	-1.07	6.57	34.77	-28.20

MODE		TX channel 23800					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	711.00	-10.44	20.93	-1.07	19.86	34.77	-14.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	711.00	-19.11	9.06	-1.07	7.99	34.77	-26.78

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

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 TEST PROCEDURE

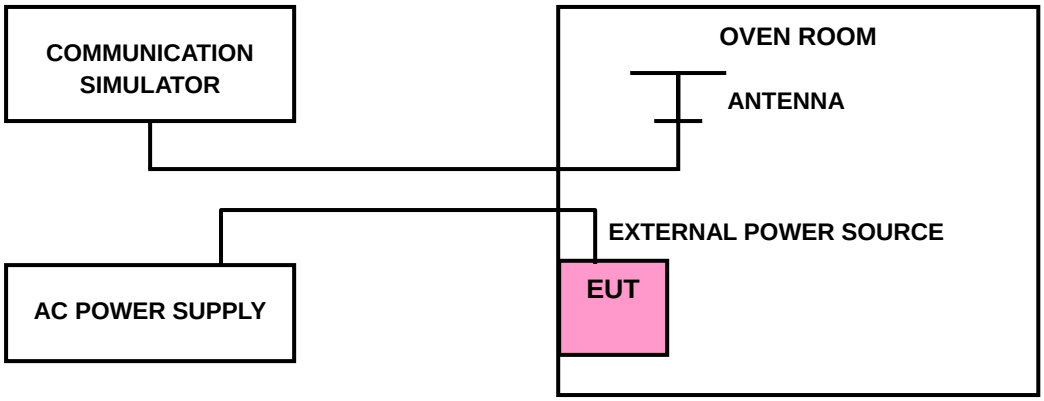
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

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

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

4.2.3 TEST SETUP



4.2.4 TEST RESULTS

FREQUENCY ERROR vs. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	5MHz	10MHz	
4.29	-0.017	-0.017	2.5
3.90	-0.014	-0.018	2.5
3.51	-0.018	-0.020	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.51Vdc to 4.29Vdc.

FREQUENCY ERROR vs. TEMPERATURE

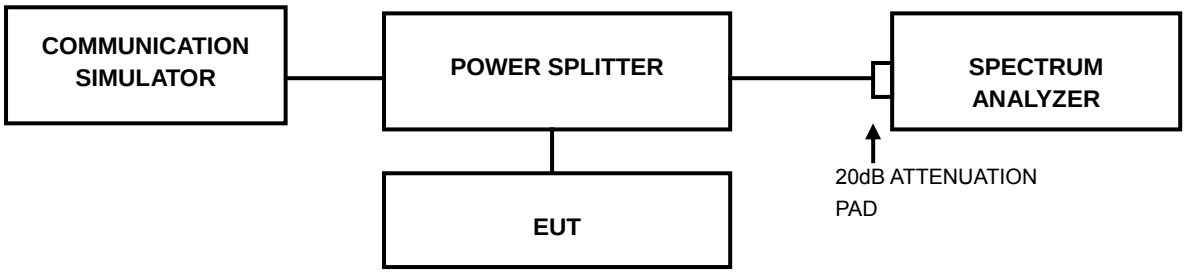
TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	5MHz	10MHz	
55	-0.027	-0.028	2.5
50	-0.030	-0.031	2.5
40	-0.025	-0.024	2.5
30	-0.015	-0.021	2.5
20	-0.014	-0.018	2.5
10	-0.018	-0.015	2.5
0	-0.017	-0.023	2.5
-10	-0.023	-0.027	2.5
-20	-0.030	-0.028	2.5

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

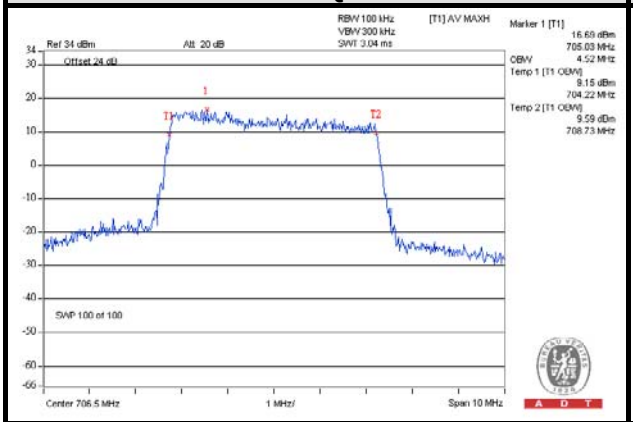


4.3.3 TEST RESULTS

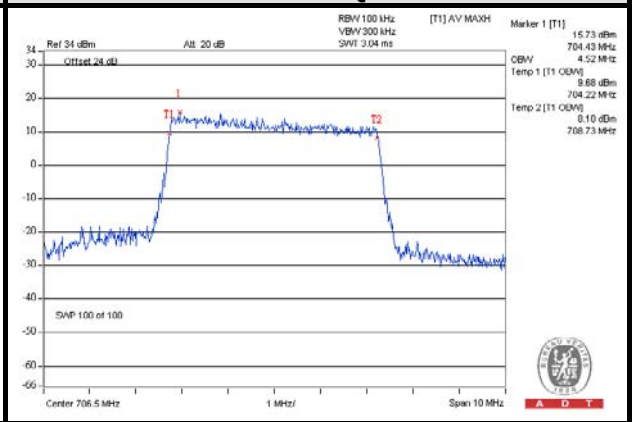
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	4.52	4.52	23780	709.0	9.00	9.07
23790	710.0	4.50	4.50	23790	710.0	9.03	9.03
23825	713.5	4.50	4.48	23800	711.0	9.03	9.00

SPECTRUM PLOT OF WORST VALUE

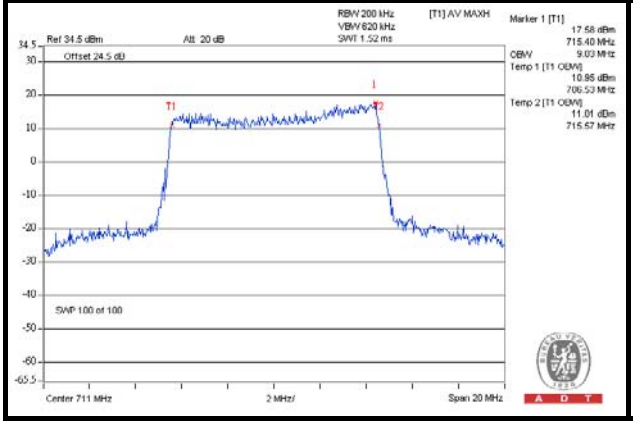
5MHz / QPSK



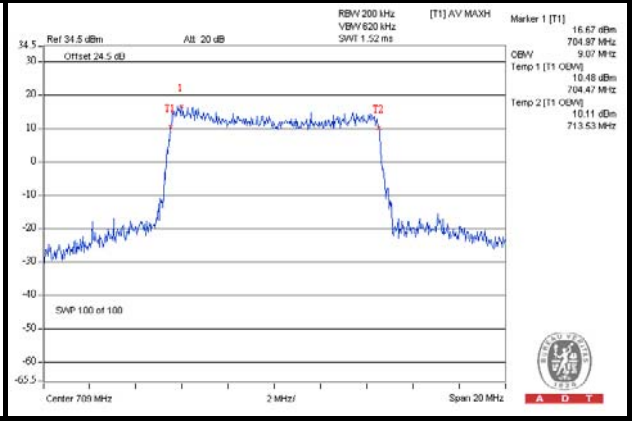
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

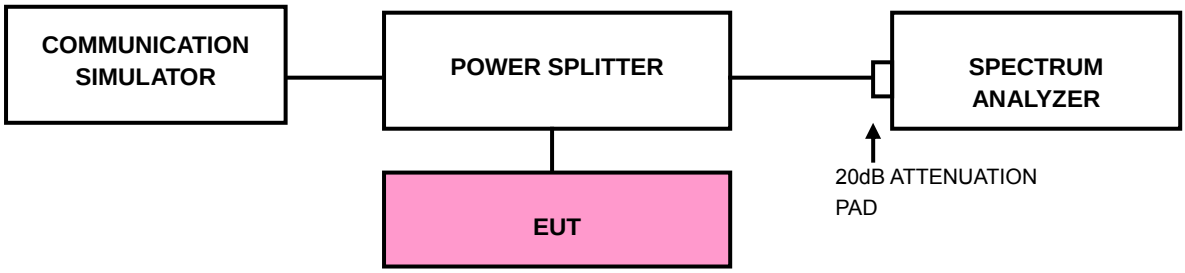


4.4 PEAK TO AVERAGE RATIO

4.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST PROCEDURES

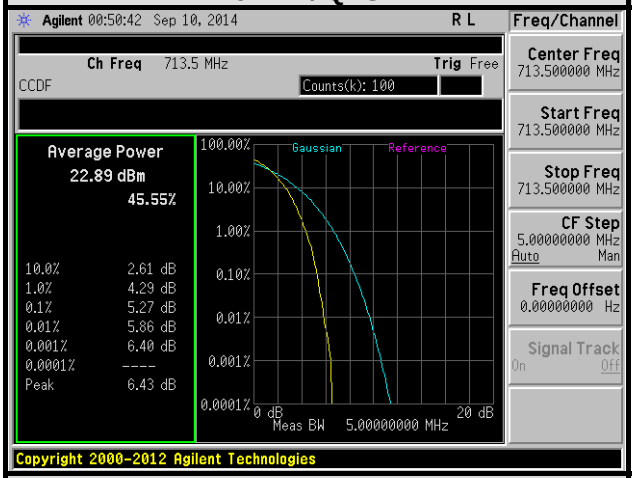
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.4.4 TEST RESULTS

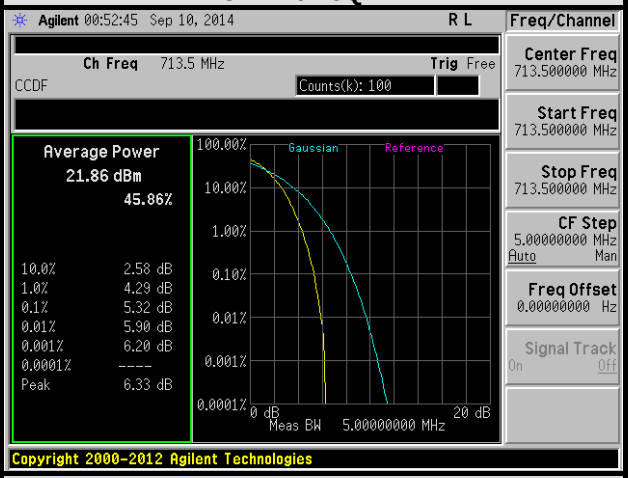
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	5.19	5.22	23780	709.0	6.10	6.09
23790	710.0	5.19	5.27	23790	710.0	6.08	6.08
23825	713.5	5.27	5.32	23800	711.0	6.08	6.08

SPECTRUM PLOT OF WORST VALUE

5MHz / QPSK



5MHz / 16QAM



10MHz / QPSK

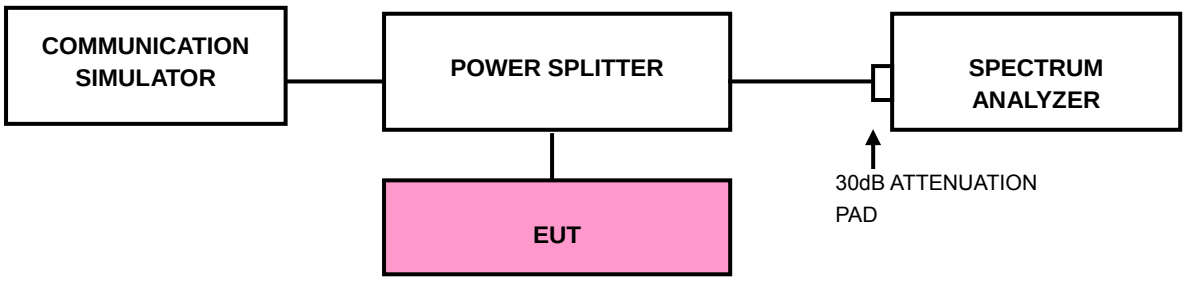
10MHz / 16QAM

4.5 BAND EDGE MEASUREMENT

4.5.1 LIMITS OF BAND EDGE MEASUREMENT

For operations in the 698-716 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

4.5.2 TEST SETUP



4.5.3 TEST PROCEDURES

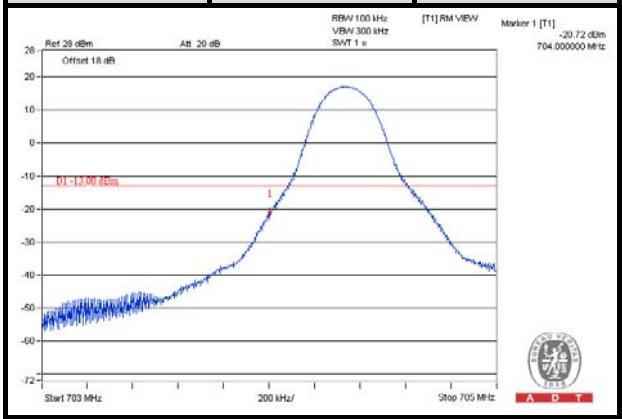
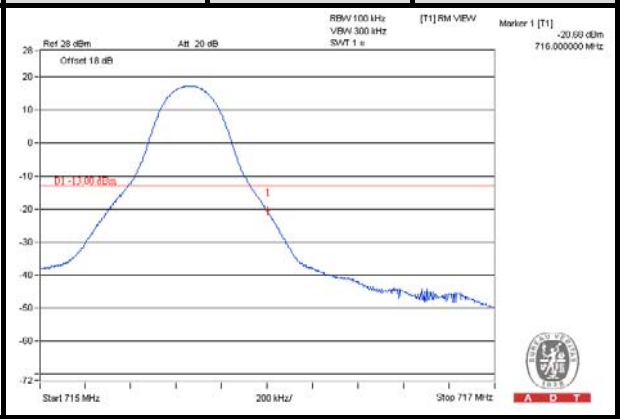
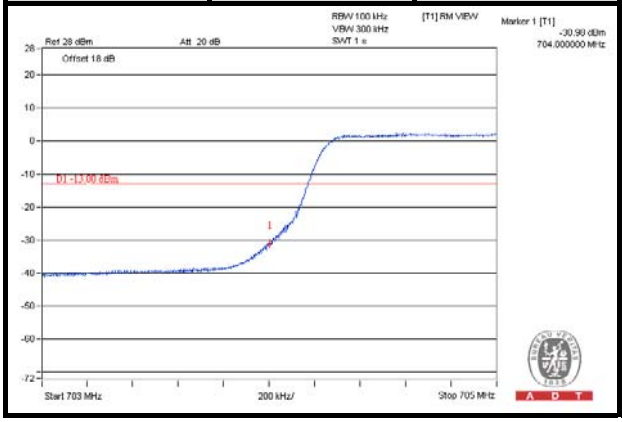
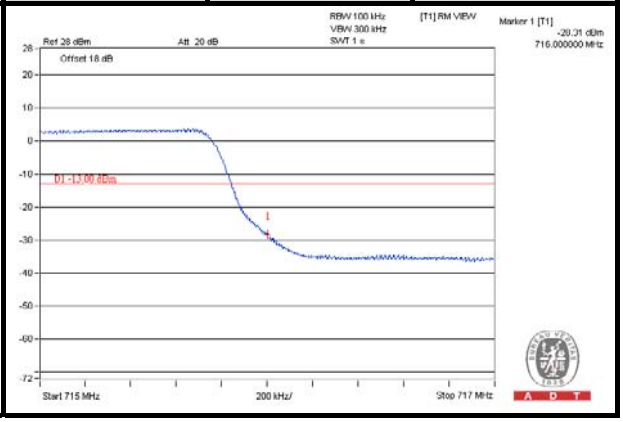
a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).

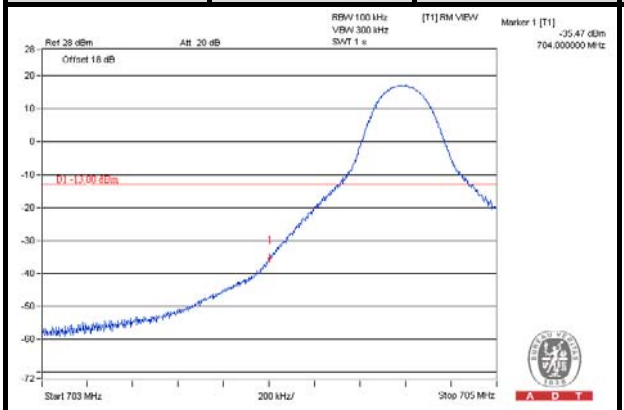
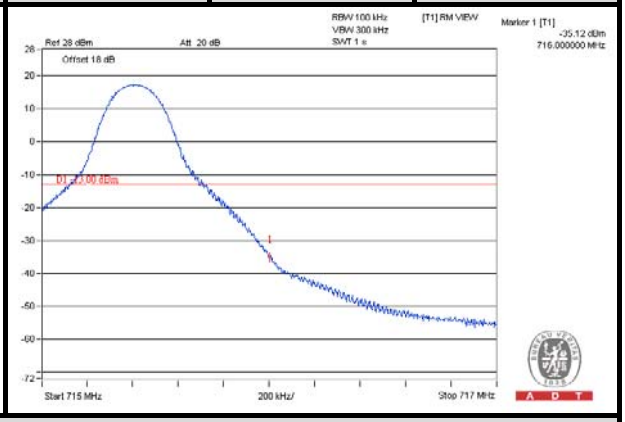
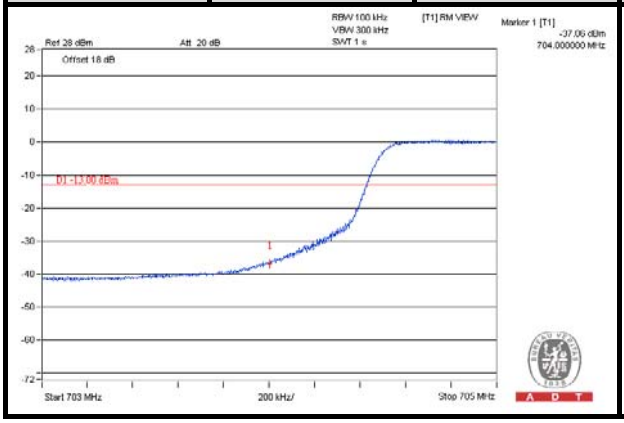
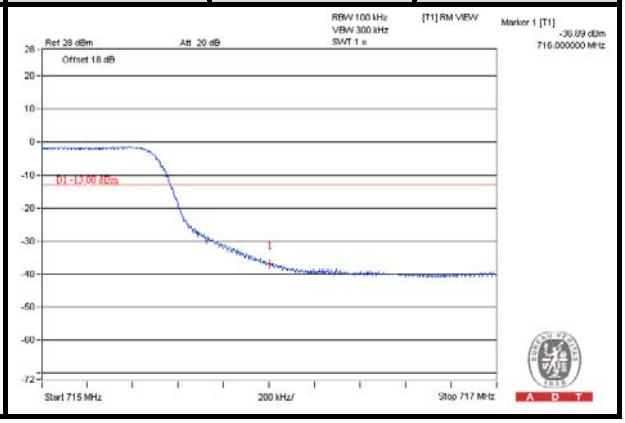
b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz.

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

4.5.4 TEST RESULTS

Channel Bandwidth: 5MHz / QPSK					
CHANNEL	23755	1 RB	CHANNEL	23825	24 RB
					
Channel Bandwidth: 5MHz / QPSK					
CHANNEL	23755	25 RB	CHANNEL	23825	0 RB
					

Channel Bandwidth: 10MHz / QPSK					
CHANNEL	23780	1 RB	CHANNEL	23800	49 RB
					
Channel Bandwidth: 10MHz / QPSK					
CHANNEL	23780	50 RB	CHANNEL	23800	0 RB
					

4.6 CONDUCTED SPURIOUS EMISSIONS

4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

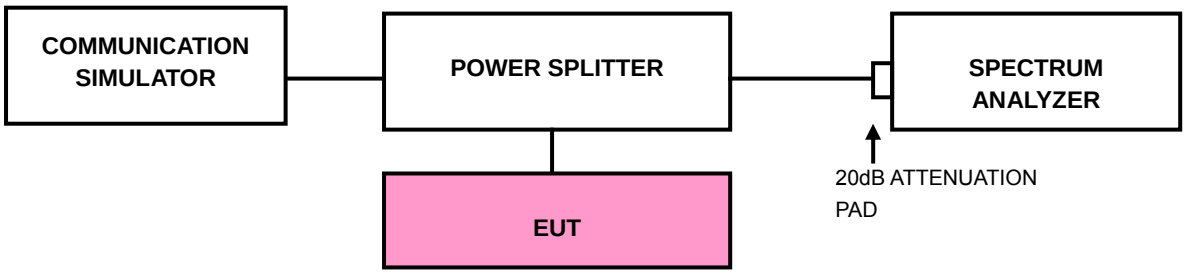
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.6.2 TEST PROCEDURE

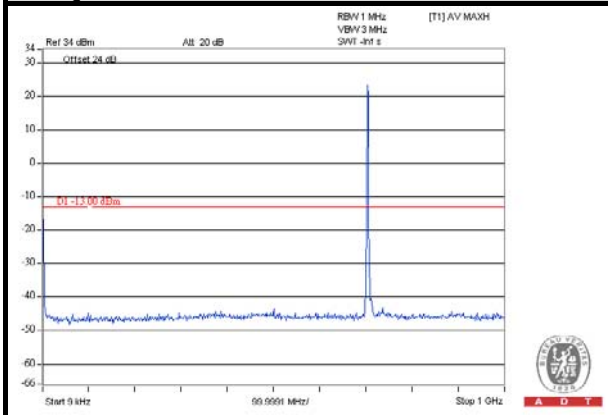
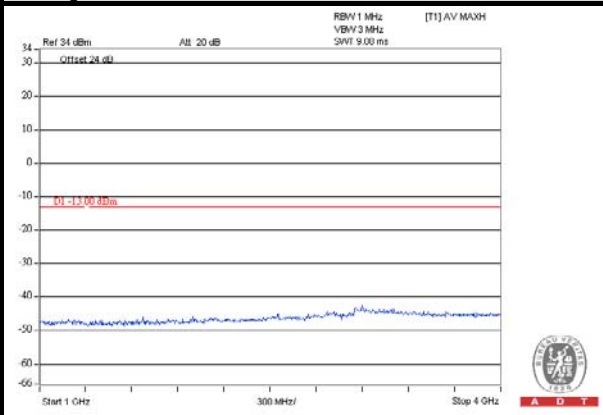
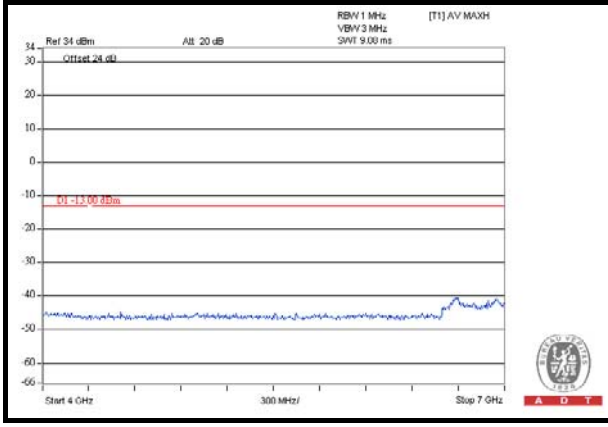
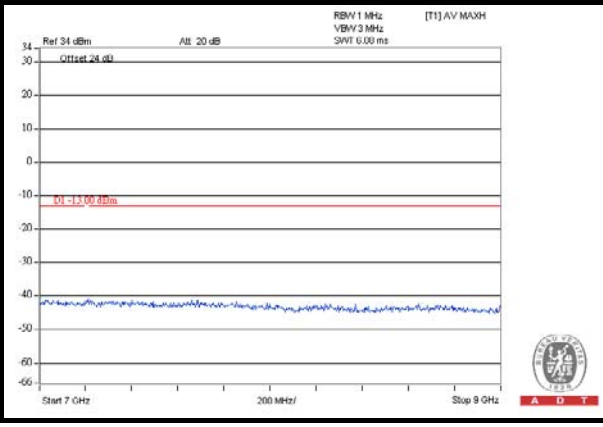
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

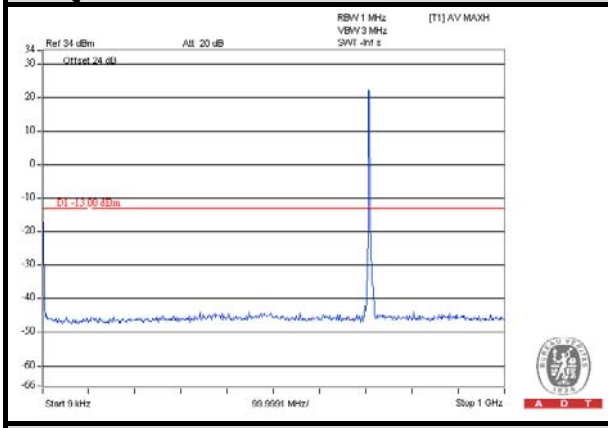
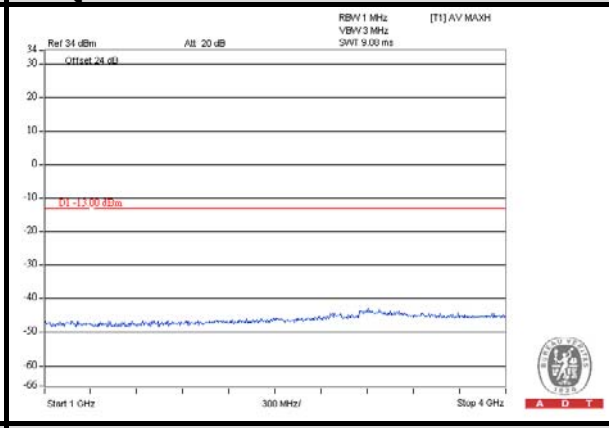
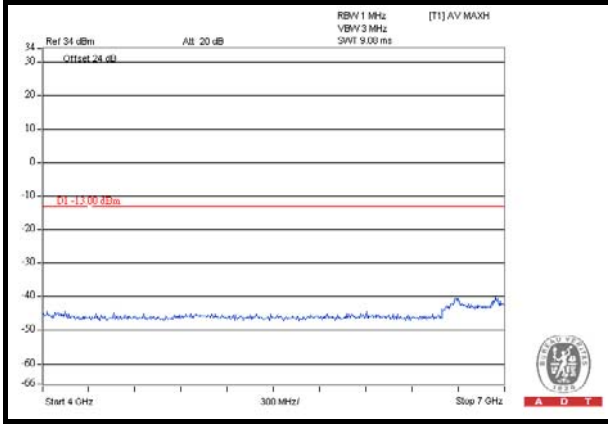
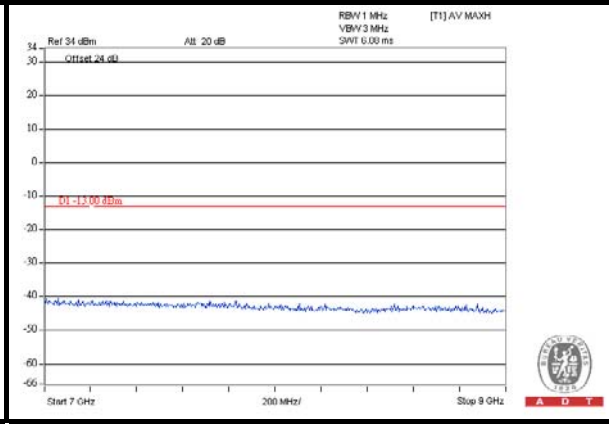
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

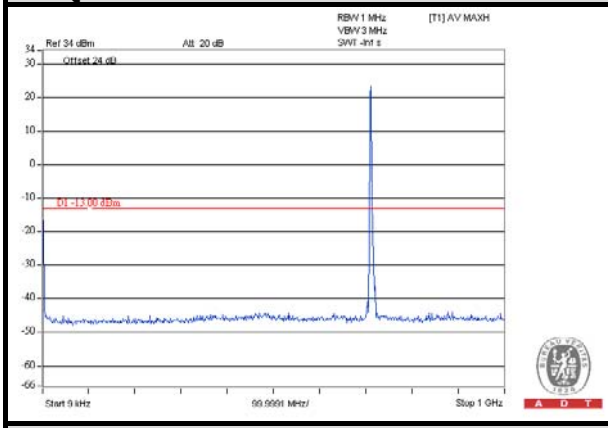
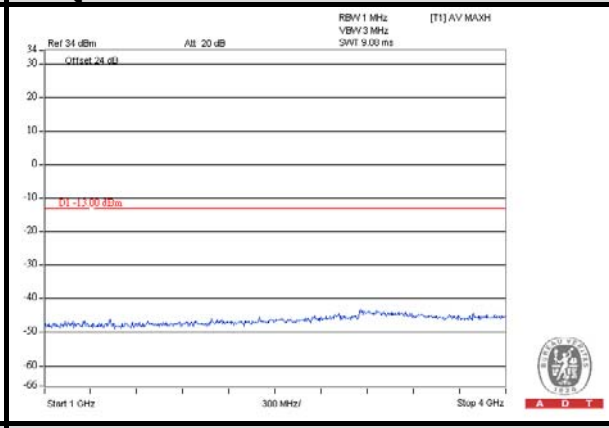
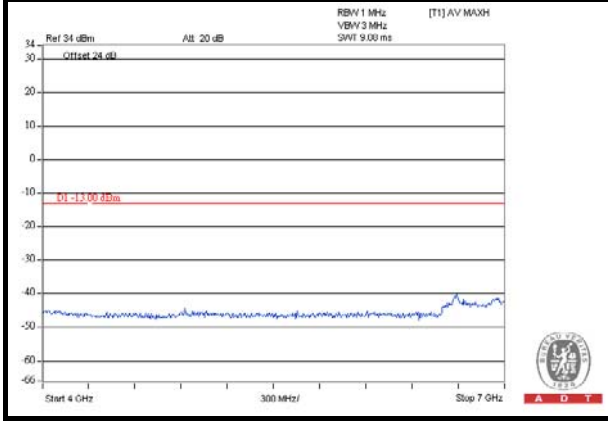
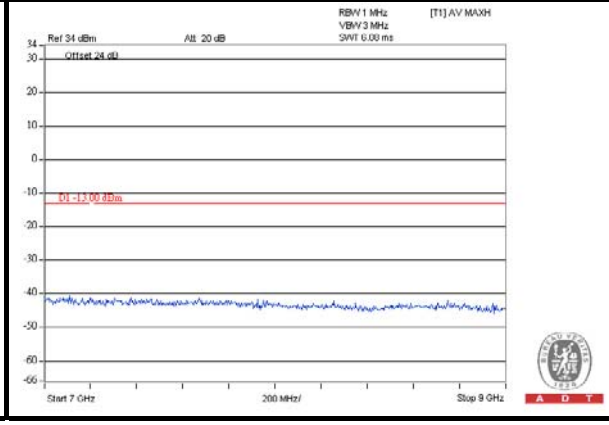
4.6.3 TEST SETUP

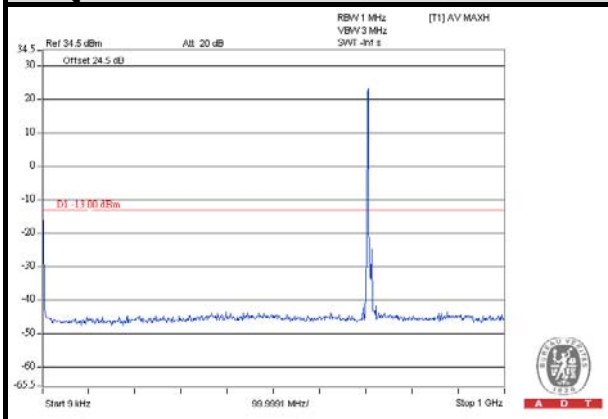
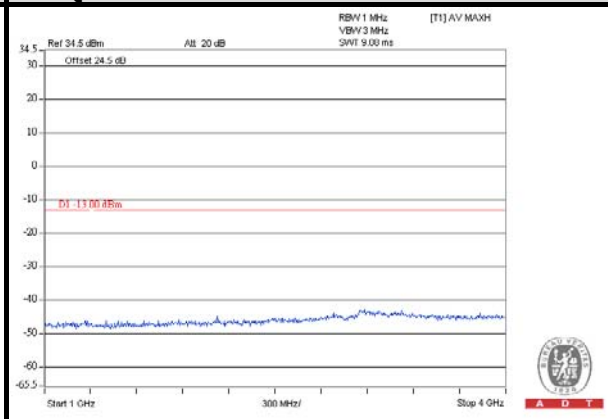
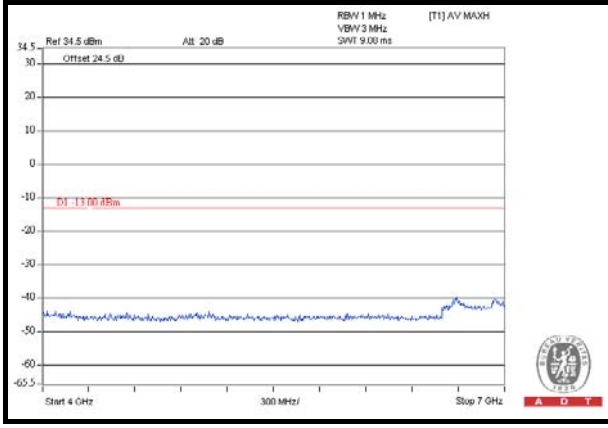
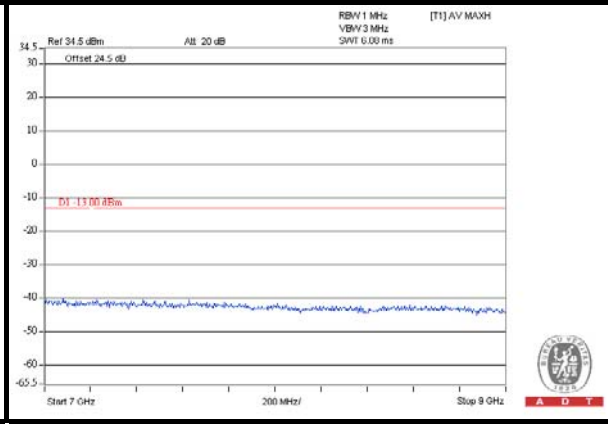


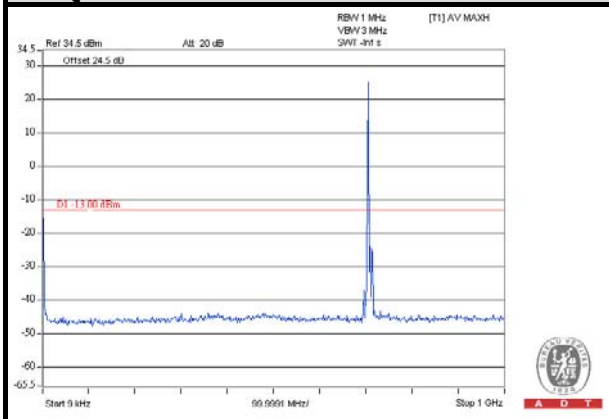
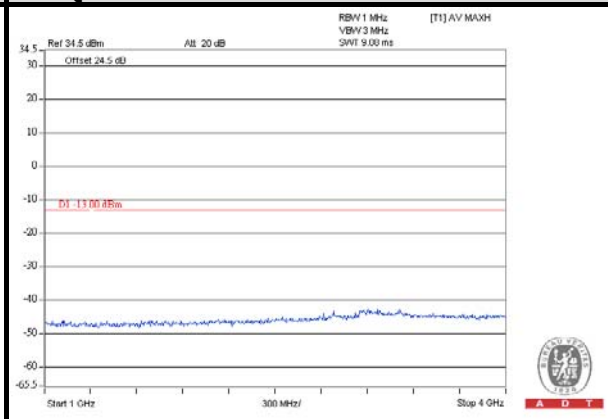
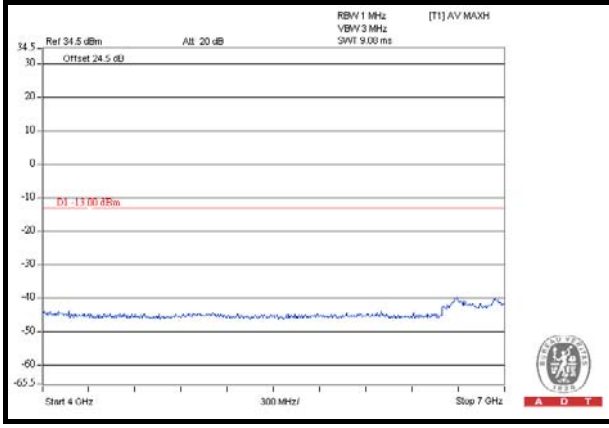
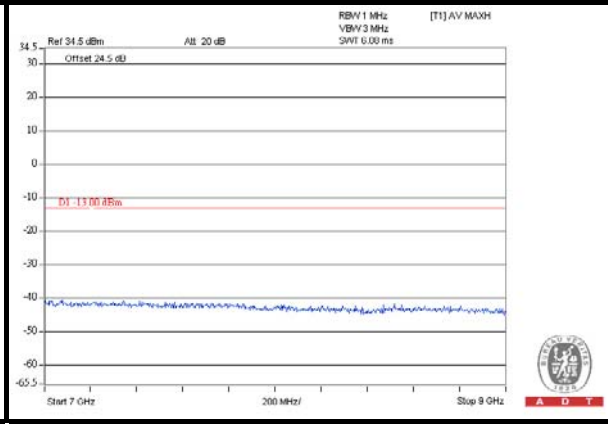
4.6.4 TEST RESULTS

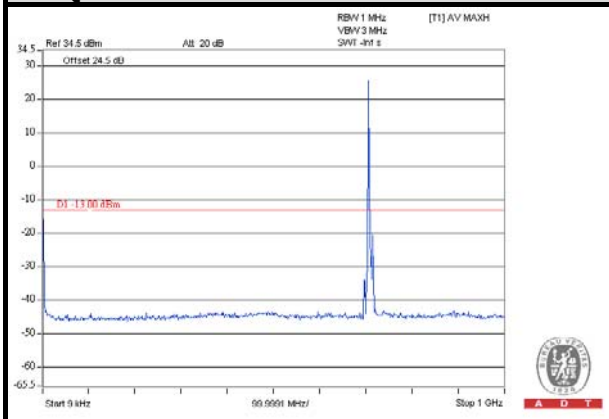
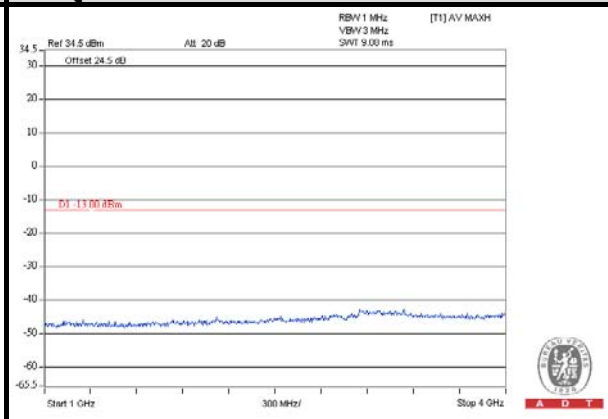
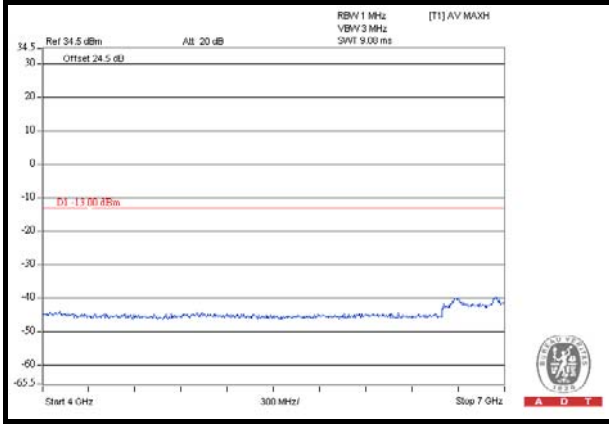
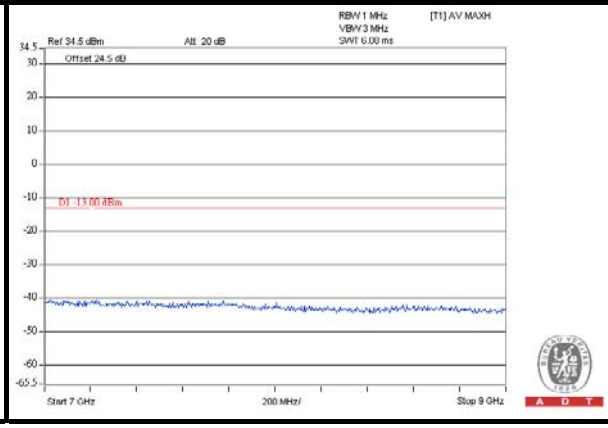
Channel Bandwidth: 5MHz / QPSK	
CHANNEL 23755	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

Channel Bandwidth: 5MHz / QPSK	
CHANNEL 23790	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

Channel Bandwidth: 5MHz / QPSK	
CHANNEL 23825	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

Channel Bandwidth: 10MHz / QPSK	
CHANNEL 23780	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

Channel Bandwidth: 10MHz / QPSK	
CHANNEL 23790	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

Channel Bandwidth: 10MHz / QPSK	
CHANNEL 23800	
FREQUENCY RANGE : 9kHz~1GHz	FREQUENCY RANGE : 1GHz~4GHz
	
FREQUENCY RANGE : 4GHz~7GHz	FREQUENCY RANGE : 7GHz~9GHz
	

4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

4.7.2 TEST 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.

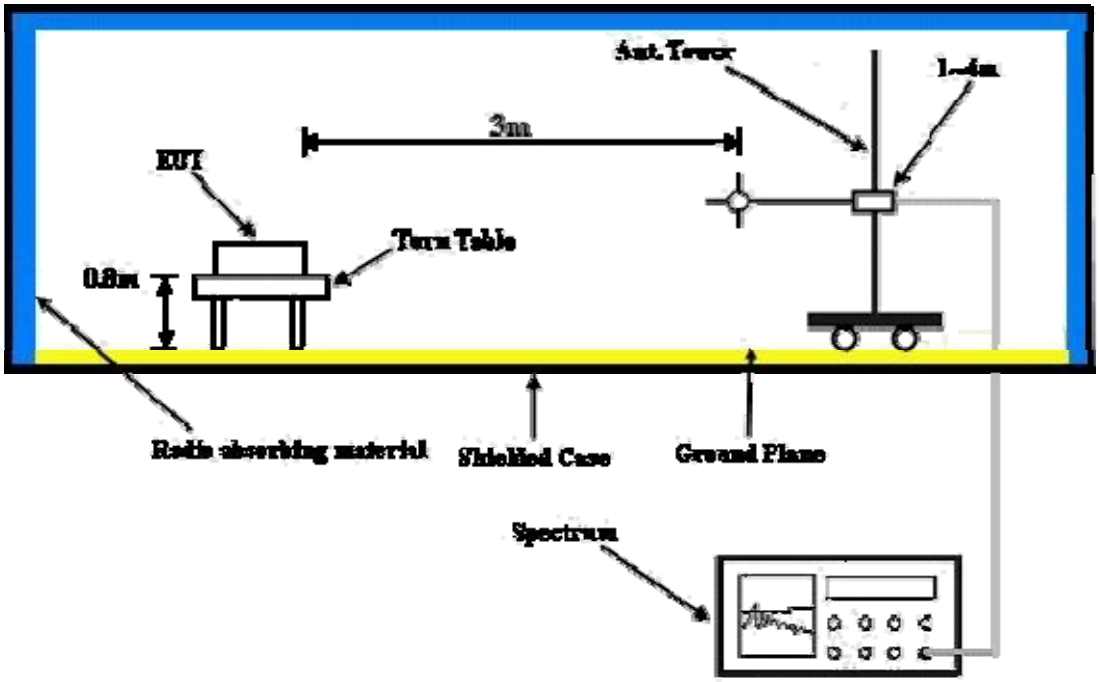
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

4.7.3 DEVIATION FROM TEST STANDARD

No deviation

4.7.4 TEST SETUP



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

4.7.5 TEST RESULTS

BELOW 1GHz

CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 23755	**FREQUENCY RANGE**	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	39.72	-31.84	-18.95	-10.93	-29.88	-13.00	-16.88
2	74.71	-37.82	-44.00	-3.42	-47.42	-13.00	-34.42
3	98.04	-47.03	-57.00	0.92	-56.08	-13.00	-43.08
4	152.46	-53.71	-59.76	-0.03	-59.79	-13.00	-46.79
5	362.40	-59.14	-68.22	5.22	-63.00	-13.00	-50.00
6	428.50	-62.40	-69.36	5.15	-64.21	-13.00	-51.21
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	57.21	-34.03	-34.20	-8.20	-42.40	-13.00	-29.40
2	70.82	-35.84	-39.77	-4.73	-44.50	-13.00	-31.50
3	98.04	-41.17	-48.78	0.92	-47.86	-13.00	-34.86
4	362.40	-53.29	-61.14	5.22	-55.92	-13.00	-42.92
5	613.17	-59.56	-61.87	4.53	-57.34	-13.00	-44.34
6	811.44	-58.02	-56.79	4.01	-52.78	-13.00	-39.78

REMARKS:

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

CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 23780	FREQUENCY RANGE	Below 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	37.78	-38.34	-25.24	-11.18	-36.42	-13.00	-23.42
2	105.81	-45.93	-55.40	0.64	-54.76	-13.00	-41.76
3	181.62	-53.19	-64.11	3.12	-60.99	-13.00	-47.99
4	362.40	-59.16	-68.24	5.22	-63.02	-13.00	-50.02
5	428.50	-62.56	-69.52	5.15	-64.37	-13.00	-51.37
6	815.33	-62.05	-62.87	3.99	-58.88	-13.00	-45.88
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.72	-35.24	-32.26	-10.93	-43.19	-13.00	-30.19
2	64.99	-38.50	-40.84	-6.30	-47.14	-13.00	-34.14
3	98.04	-40.78	-48.39	0.92	-47.47	-13.00	-34.47
4	296.31	-54.73	-63.53	5.15	-58.38	-13.00	-45.38
5	362.40	-53.41	-61.26	5.22	-56.04	-13.00	-43.04
6	494.59	-58.29	-63.71	4.91	-58.80	-13.00	-45.80

REMARKS:

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

ABOVE 1GHz

CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 23755	FREQUENCY RANGE	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1413.00	-25.91	-27.25	4.75	-22.50	-13.00	-9.50
2	2119.50	-49.90	-50.10	6.36	-43.74	-13.00	-30.74
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1413.00	-30.49	-34.01	4.75	-29.26	-13.00	-16.26
2	2119.50	-52.03	-52.25	6.36	-45.89	-13.00	-32.89

REMARKS:

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

MODE	TX channel 23790	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	**1420.00**	**-21.69**	**-23.10**	**4.78**	**-18.32**	**-13.00**	**-5.32**
2	2130.00	-50.65	-50.76	6.36	-44.40	-13.00	-31.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	1420.00	-29.85	-33.42	4.78	-28.64	-13.00	-15.64
2	2130.00	-55.80	-55.90	6.36	-49.54	-13.00	-36.54

REMARKS:

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

MODE	TX channel 23825	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	1427.00	-23.64	-25.12	4.81	-20.31	-13.00	-7.31
2	2140.50	-48.83	-48.86	6.36	-42.50	-13.00	-29.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	1427.00	-30.03	-33.65	4.81	-28.84	-13.00	-15.84
2	2140.50	-49.54	-49.52	6.36	-43.16	-13.00	-30.16

REMARKS:

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

CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 23780	**FREQUENCY RANGE**	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	**INPUT POWER**	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	1418.00	-26.78	-28.17	4.77	-23.40	-13.00	-10.40
2	2127.00	-50.02	-50.17	6.37	-43.80	-13.00	-30.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	**Freq. (MHz)**	**Reading (dBm)**	**S.G Power Value (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
1	1418.00	-29.42	-32.97	4.77	-28.20	-13.00	-15.20
2	2127.00	-49.03	-49.17	6.37	-42.80	-13.00	-29.80

REMARKS:

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

MODE	TX channel 23790	FREQUENCY RANGE	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1420.00	-24.87	-26.28	4.78	-21.50	-13.00	-8.50
2	2130.00	-50.25	-50.36	6.36	-44.00	-13.00	-31.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1420.00	-31.01	-34.58	4.78	-29.80	-13.00	-16.80
2	2130.00	-48.46	-48.56	6.36	-42.20	-13.00	-29.20

REMARKS:

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

MODE	TX channel 23800	FREQUENCY RANGE	Above 1000 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 71%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1422.00	-25.46	-26.89	4.79	-22.10	-13.00	-9.10
2	2133.00	-50.77	-50.86	6.36	-44.50	-13.00	-31.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1422.00	-32.30	-35.89	4.79	-31.10	-13.00	-18.10
2	2133.00	-49.40	-49.46	6.36	-43.10	-13.00	-30.10

REMARKS:

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

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 are made to the EUT by the lab during the test.

---END---