FCC PART 15.247 TEST REPORT

Prepared For	Shenzhen LOHAS technology Co., LTD
Product Name:	2.4G Receive Device
Trade Name:	
Model Name :	D10
FCC ID:	Z8UD10
Prepared By	DongGuan Precise Testing Service Co.,Ltd.
	F616A Room, 6th Floor, Meixin Business Center, Dongcheng Middle Road, Dongguan, Guangdong, China
Test Date:	Nov.01 ~ Nov.07, 2011
Date of Report :	Nov.07, 2011

VERIFICATION OF COMPLIANCE

Applicant:	Shenzhen LOHAS technology Co., LTD
Address	B1104, #1 Building, Tianan Digital Innovation Park, Longgang District, Shenzhen, Guangdong, China
Manufacturer Name:	Shenzhen LOHAS technology Co., LTD
Address:	B1104, #1 Building, Tianan Digital Innovation Park, Longgang District, Shenzhen, Guangdong, China
Product Description:	2.4G Receive Device
Brand Name:	Lefant
Model Name:	D10
Test procedure	ANSI C63.4 : 2003

Prepared by : Assistant

Reviewer : Supervisor

Approved & Authorized Signer : Jack Ou / Manager

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a receiver of remote controller, It is short range, lower power. And it is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following:

Operation Frequency	2.402 GHz to 2.480GHz
Output Power	-0.21dBm
Modulation	GFSK
Number of channels	79
Antenna Designation	Integrated Antenna
Antenna Gain	-2.0dbi
Power Supply	DC 5V by PC

1.2 TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	0	2402MHZ
	1	2403MHZ
	:	:
	38	2440 MHZ
	39	2441 MHZ
	40	2442 MHZ
	:	:
	77	2479 MHZ
	78	2480 MHZ

1.3 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: Z8UD10 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

1.4 TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.5 TEST FACILITY

All measurement facilities used to collect the measurement data are located at

World Standardization Certification&TestingCO.,LTD

Building A, Baoshi Road, Baoshi Science & Technology Park, Bao'an District, Shenzhen, Guangdong,

China.
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC register No.: 131628

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

1.6 SPECIAL ACCESSORIES

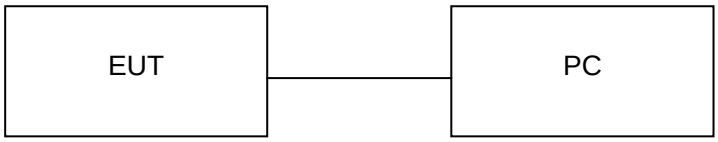
Not available for this EUT intended for grant.

1.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 CONFIGURATION OF TESTED SYSTEM



2.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID
1	2.4G Receive Device	N/A	D10	Z8UD10
2	PC	IBM	--	--

3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.207	Conduction Emission	N/A
§15.209	Radiated Emission	Compliant
§15.247	Maximum Output Power	Compliant
§15.247	20 dB Bandwidth	Compliant
§15.247	Band Edges	Compliant
§15.247	Spurious Emission	Compliant
§15.247	Frequency Separation	Compliant
§15.247	Number of Hopping Frequency	Compliant
§15.247	Time of Occupancy	Compliant

4. DESCRIPTION OF TEST MODES

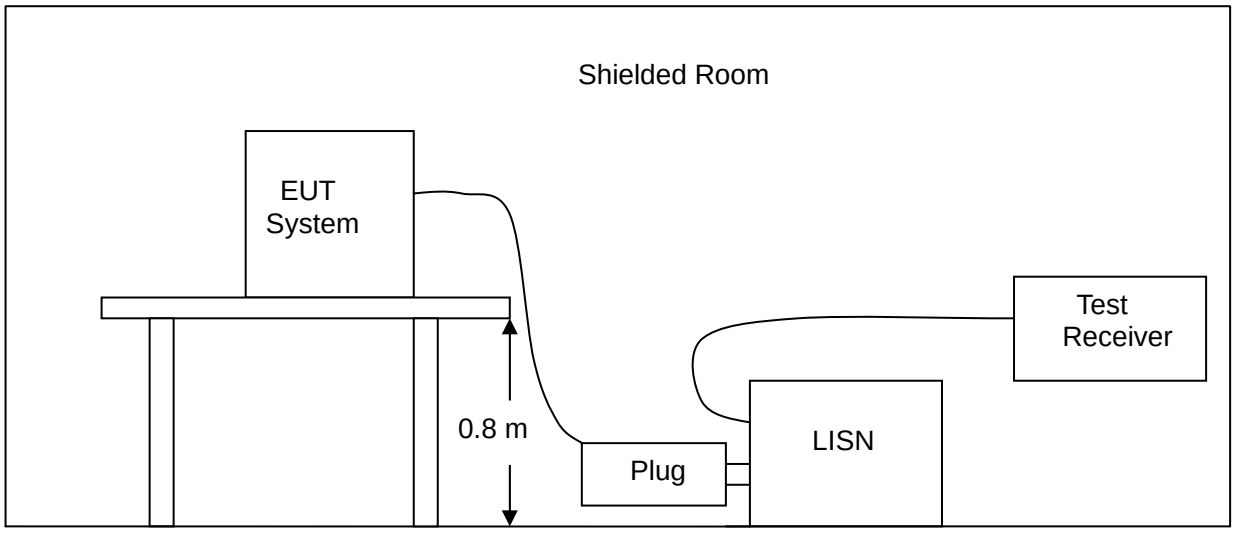
1. The EUT has been set to operate continuously on the lowest, the middle and the highest operation frequency individually.
2. The EUT stays in continuous transmitting mode on the operation frequency being set.

5. CONDUCTION EMISSIONS

5.1 MEASUREMENT PROCEDURE:

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. The EUT received DC3.7V through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.3 MEASUREMENT EQUIPMENT USED:

Conducted Emission Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Cal. Date**
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2012
LISN	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2012
LISN	EMCO	3816/2	00042990	05/29/2012
50Ω Coaxial Switch	Anritsu	MP59B	M20531	05/29/2012

5.4 LIMITS AND MEASUREMENT RESULT:

LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

1**Note: 1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

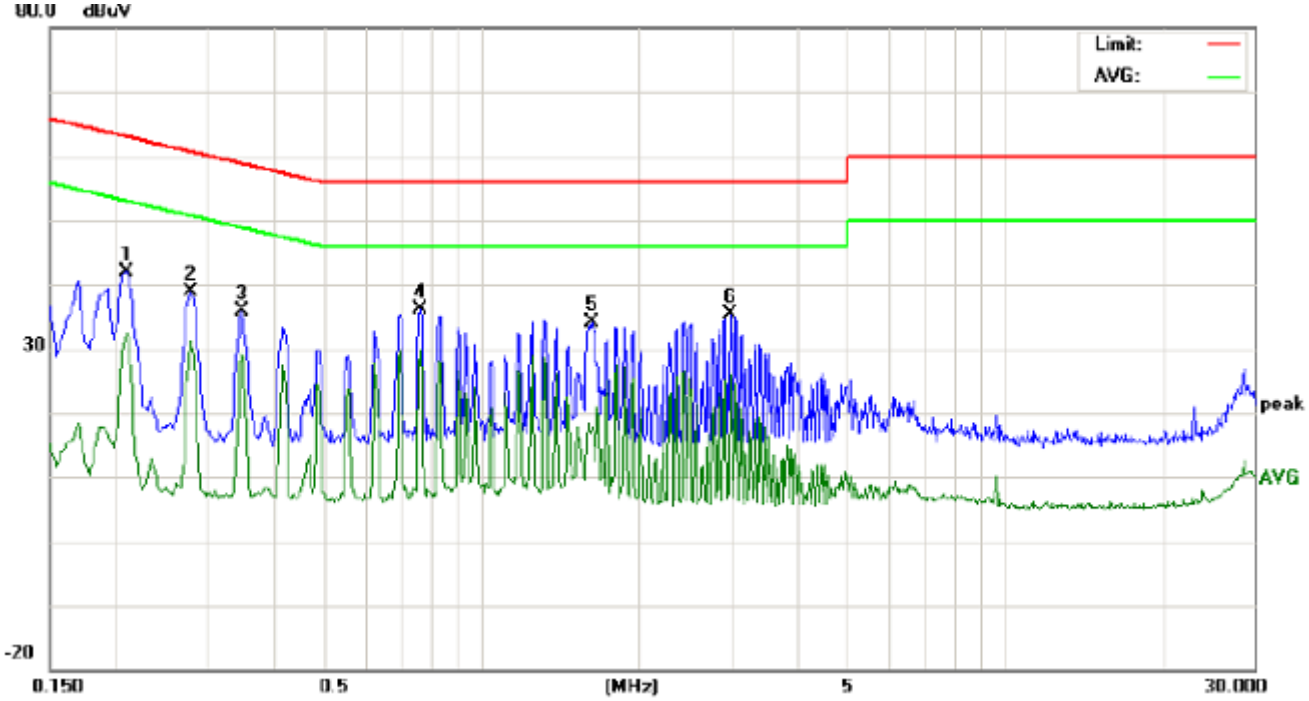
MEASURING INSTRUMENT AND SETTING

The following table is the setting of receiver.

Receiver Parameter	Setting
Attenuation	10dB
Start Frequency	0.15MHz
Stop Frequency	30MHz
6dB bandwidth	9KHz for QP
IF bandwidth	9KHz for AV

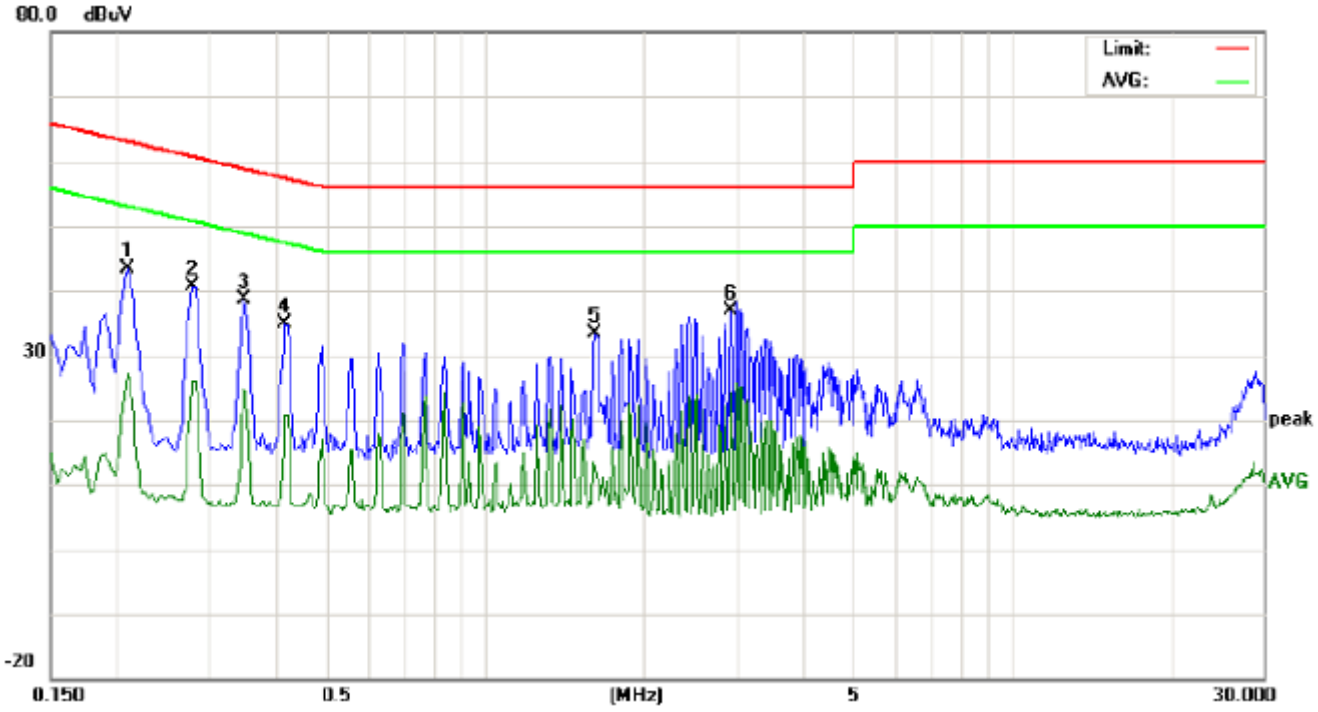
TEST RESULT

LINE CONCUTED EMISSION TEST LINE 1-L



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2100	31.71		22.27	10.23	41.94		32.50	63.20	53.20	-21.26	-20.70	P	
2	0.2779	28.60		20.91	10.28	38.88		31.19	60.88	50.88	-22.00	-19.69	P	
3	0.3500	25.60		18.85	10.31	35.91		29.16	58.96	48.96	-23.05	-19.80	P	
4	0.7660	25.92		19.63	10.30	36.22		29.93	56.00	46.00	-19.78	-16.07	P	
5	1.6300	23.78		7.46	10.34	34.12		17.80	56.00	46.00	-21.88	-28.20	P	
6	2.9940	24.87		15.22	10.55	35.42		25.77	56.00	46.00	-20.58	-20.23	P	

LINE CONCUTED EMISSION TEST LINE 2-N



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2100	33.10		16.89	10.23	43.33		27.12	63.20	53.20	-19.87	-26.08	P	
2	0.2779	30.36		15.51	10.28	40.64		25.79	60.88	50.88	-20.24	-25.09	P	
3	0.3500	28.33		14.51	10.31	38.64		24.82	58.96	48.96	-20.32	-24.14	P	
4	0.4180	24.43		10.20	10.34	34.77		20.54	57.49	47.49	-22.72	-26.95	P	
5	1.6260	23.12		2.22	10.34	33.46		12.56	56.00	46.00	-22.54	-33.44	P	
6	2.9300	26.46		13.28	10.53	36.99		23.81	56.00	46.00	-19.01	-22.19	P	

6. MAXIMUM OUTPUT POWER

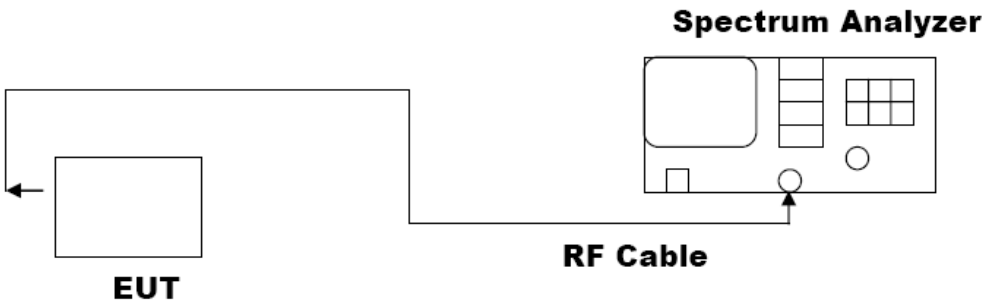
6.1 MEASUREMENT PROCEDURE:

CONDUCTED METHOD
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set SPA Centre Frequency = Operation Frequency, RBW= 3 MHz,
   VBW= 3 MHz.
5. Set SPA Trace 1 Max hold, then View.

RADIATED METHOD
According to ANSI C63.4:2003

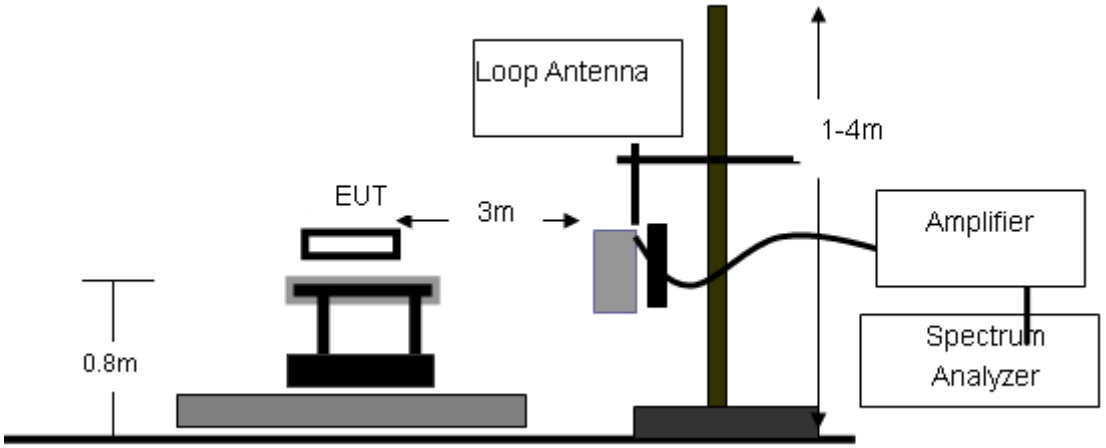
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

CONDUCTED METHOD

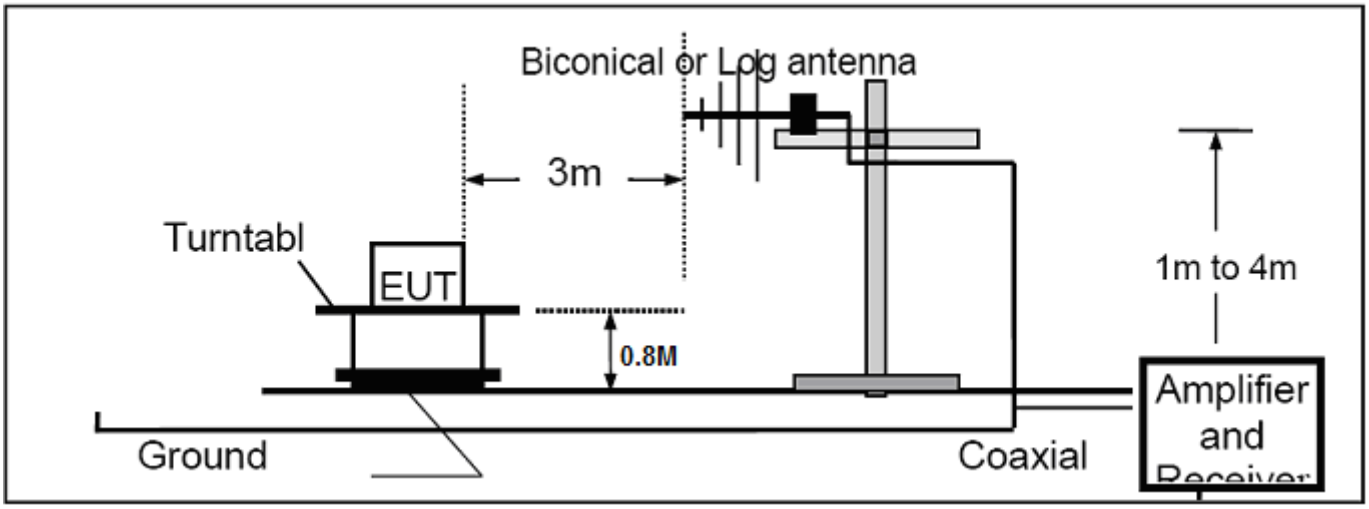


RADIATED EMISSION TEST SETUP

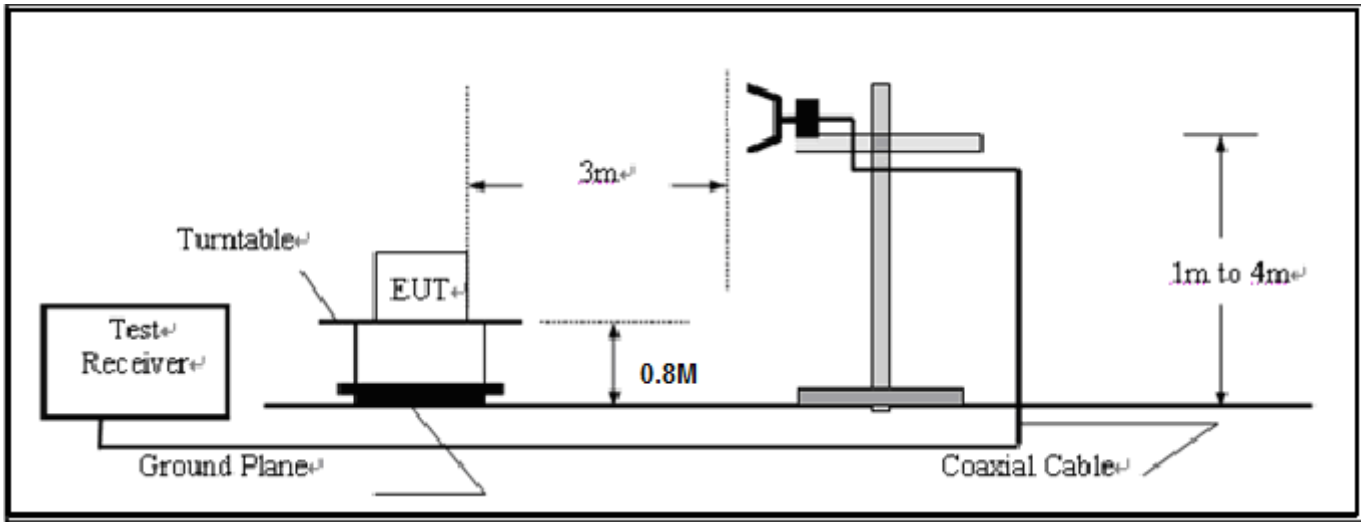
RADIATED MISSION TEST SETUP BELOW 30MHz



RADIATED MISSION TEST SETUP 30MHz-1000MHz



RADIATED MISSION TEST SETUP ABOVE 1000MHz



6.3 MEASUREMENT EQUIPMENT USED (RADIATED EMISSION):

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSEM30	849720/019	05/29/2011	05/29/2012
Amplifier	H.P.	8449B	3008A00277	05/29/2011	05/29/2012
Horn Antenna	Sunol Sciences	DRH-118	A052604	05/29/2011	05/29/2012
Horn Antenna	A.H. Systems Inc.	SAS-574	--	05/29/2011	05/29/2012
EMI Test Receiver	Rohde & Schwarz	ESCI	100028	05/29/2011	05/29/2012
Amplifier	H.P.	HP8447E	1937A01046	05/29/2011	05/29/2012
Broadband Antenna	Sunol Sciences	JB1	A040904-2	05/29/2011	05/29/2012
LOOP ANTENNA	R&S	HM525	--	05/29/2011	05/29/2012

6.4 LIMITS AND MEASUREMENT RESULT:

Operation Mode:	RF MODE(CONDUCTED)	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH		

Channel	Frequency (MHZ)	Reading (dBm)	Limit (dBm)	Result
0	2402	-0.21	30	Pass
39	2441	-0.43	30	Pass
78	2480	-0.53	30	Pass

7. 20 DB BANDWIDTH

7.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW= 100 KHz.
4. Set SPA Trace 1 Max hold, then View.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in Section 6.2

7.3 MEASUREMENT EQUIPMENT USED:

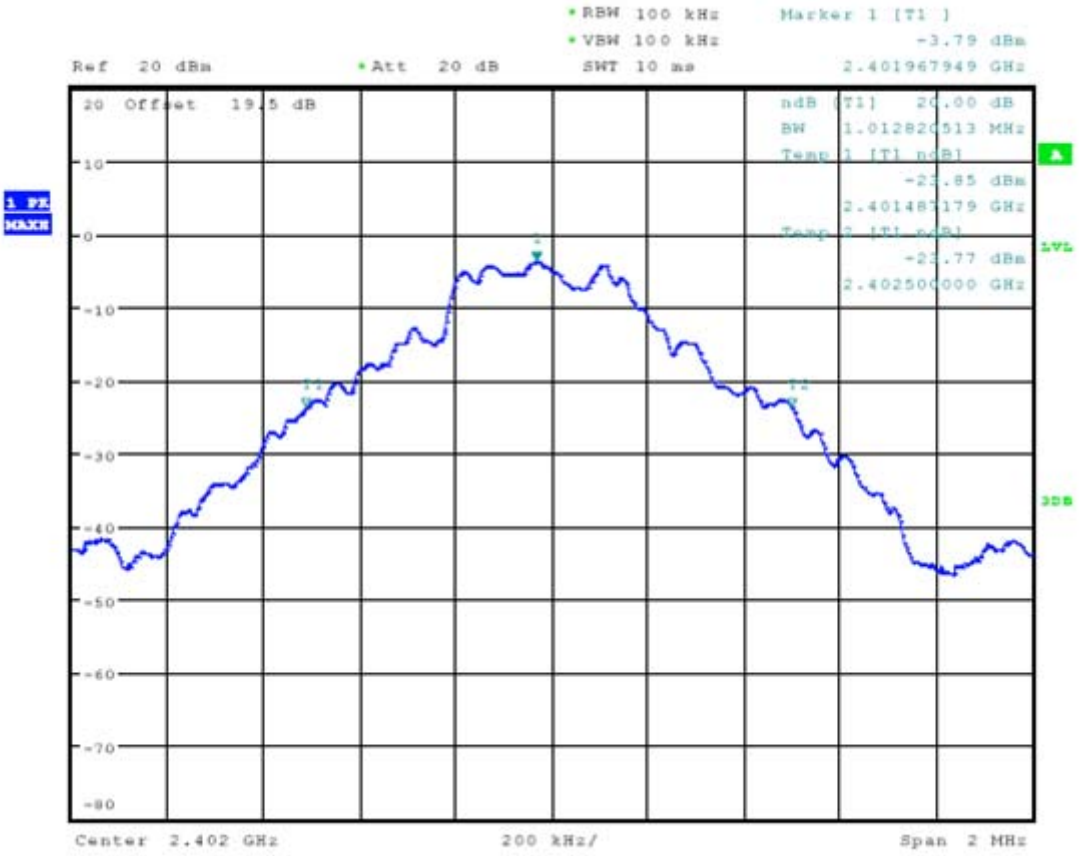
The same as described in Section 6.3

7.4 LIMITS AND MEASUREMENT RESULTS:

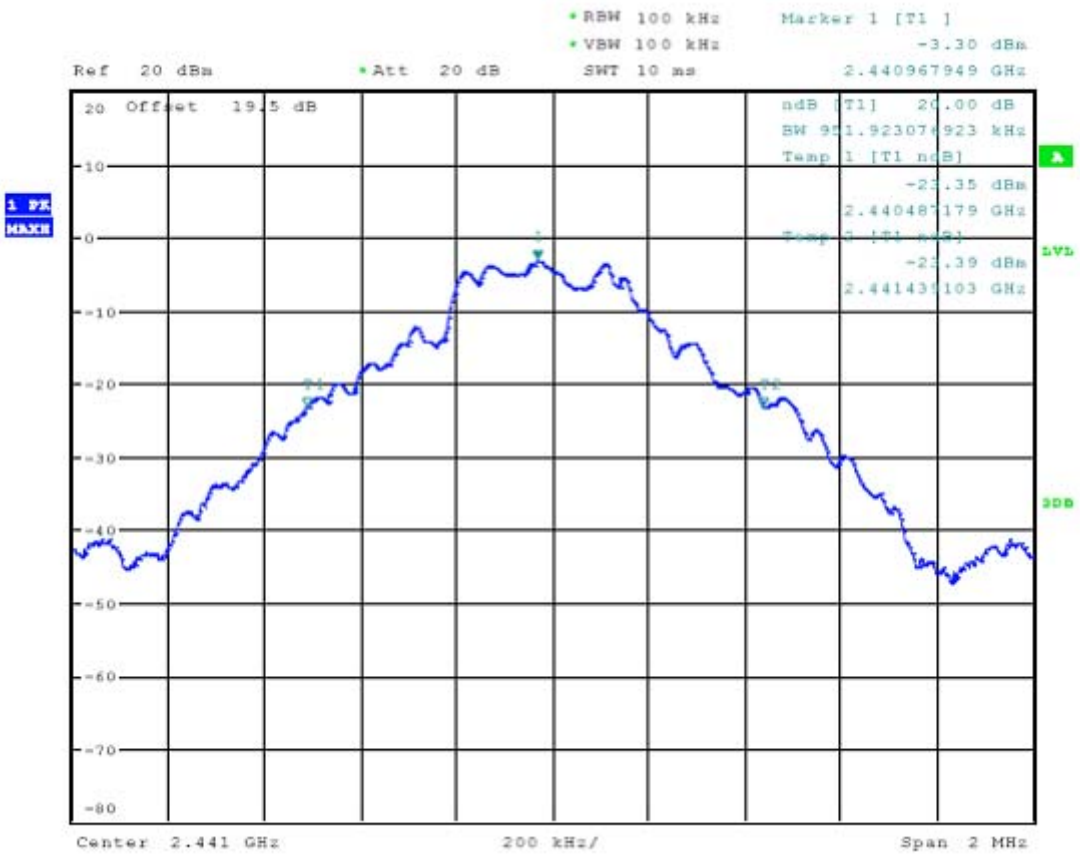
Operation Mode:	RF MODE	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH	Polarity:	--

LIMITS AND MEASUREMENT RESULT		
channel	20 dB Bandwidth	Criteria
Bottom Channel	1.012	PASS
Middle Channel	0.951	PASS
Top Channel	0.958	PASS

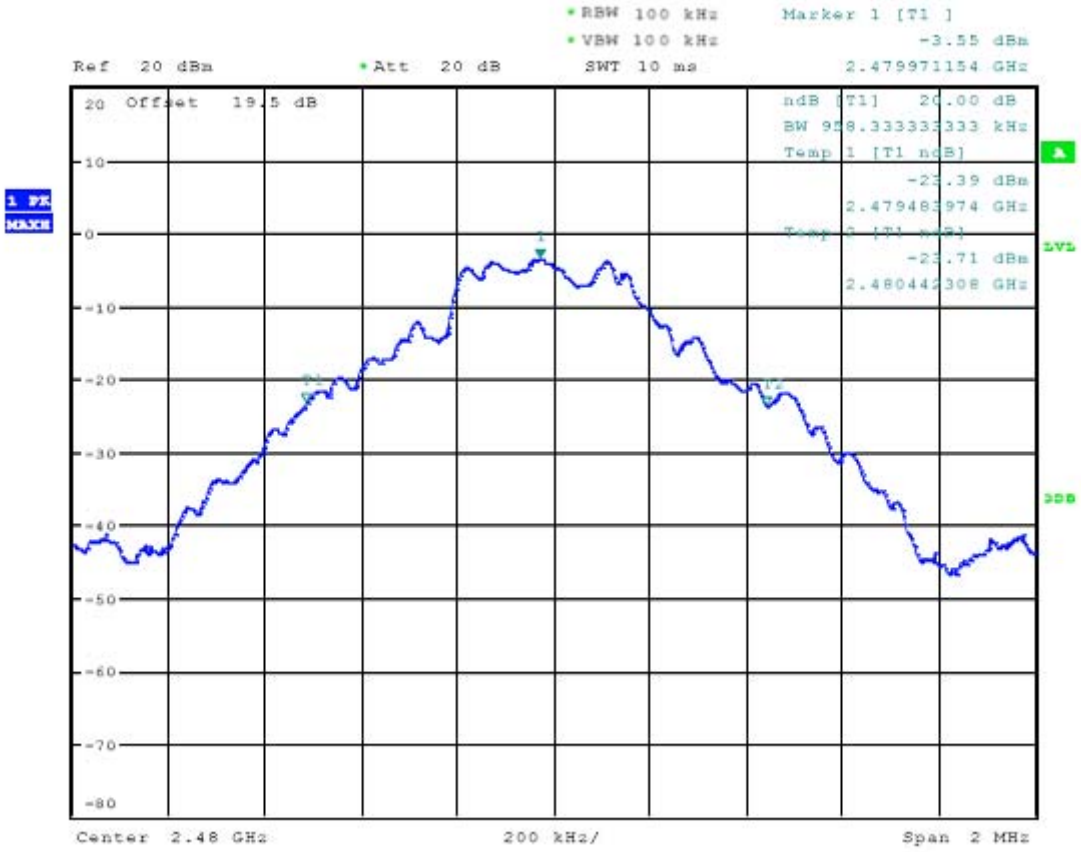
TEST PLOT OF BANDWIDTH FOR BOTTOM CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR TOP CHANNEL

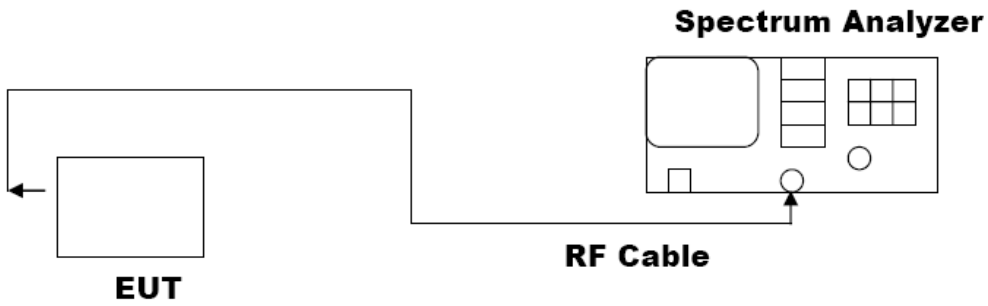


8. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY (N/A)

8.1 MEASUREMENT PROCEDURE:

(1). The EUT was placed on a turn table which is 0.8m above ground plane.
(2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
(3), Set the EUT Work on the top, the middle and the bottom operation frequency individually.
(4). Set SPA Centre Frequency = Operation Frequency, RBW= 3 KHz,
VBW= 10 KHz., Sweep time= Auto
(5). Set SPA Trace 1 Max hold, then View.

8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3 MEASUREMENT EQUIPMENT USED:

SHIELDING ROOM					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	US41421290	04/16/2011	04/15/2012

8.4 LIMITS AND MEASUREMENT RESULT:

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (dBm/3KHz)		Criteria
8 dBm / 3KHz	Bottom Channel	--	--
	Middle Channel	--	--
	Top Channel	--	--

9. OUT OF BAND EMISSION

9.1 MEASUREMENT PROCEDURE:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW= 100 KHz.
4. Set SPA Trace 1 Max hold, then View.

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in section 6.2

1. Conducted test setup
2. Radiated Emission test Setup

9.3 MEASUREMENT EQUIPMENT USED:

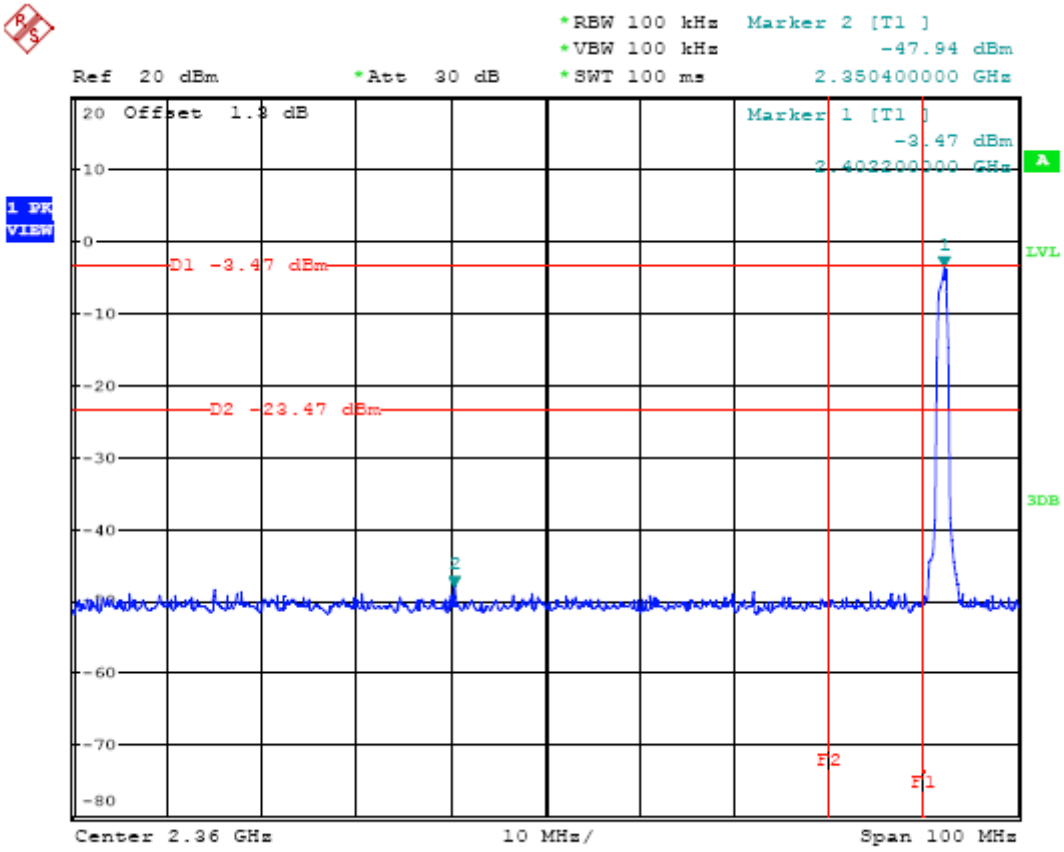
The Same as described in section 6.3

9.4 LIMITS AND MEASUREMENT RESULT:

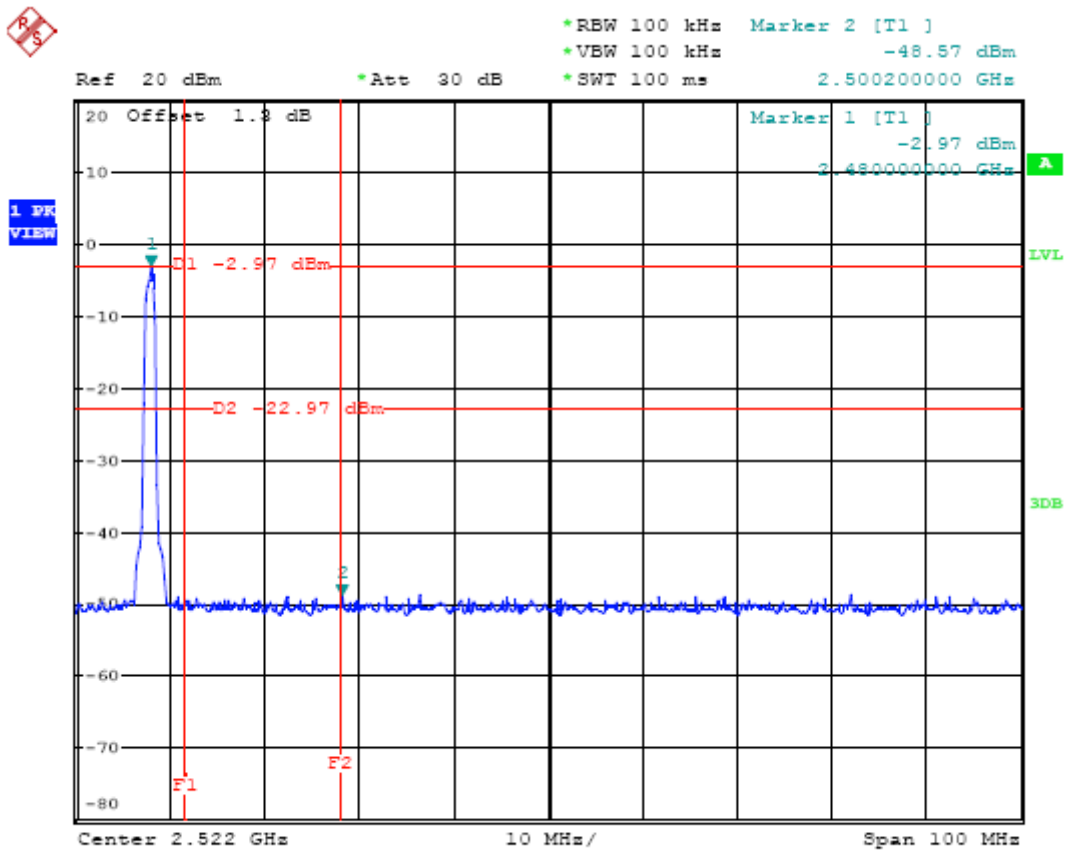
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))	At least -20dBc than the limit Specified on the TOP Channel	PASS

Humidity:	55 % RH	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Test Method	Conducted		

TEST PLOT OF BAND ELDG FOR BOTTOM CHANNEL (2.402GHz)



TEST PLOT OF BAND ELDG FOR TOP CHANNEL (2.480GHz)



RADIATED EMISSSION

MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

The following table is the setting of spectrum analyzer and receiver.'

Spectrum Parameter	Setting
Start Frequency	1GHz
Stop Frequency	26.5GHz
RB/VB(Emission in restricted band)	1MHz/1MHz for Peark, 1MHz/10Hz for Average
RB/VB(Emission in non-restricted band)	1MHz/1MHz for Peak

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

TEST SET-UP

The Same as described in section 6.2

TEST RESULT OF RADIATED EMISSION TEST (9KHz ~30MHz)

Distance	3m	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH		

Operation Mode: RF Mode

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

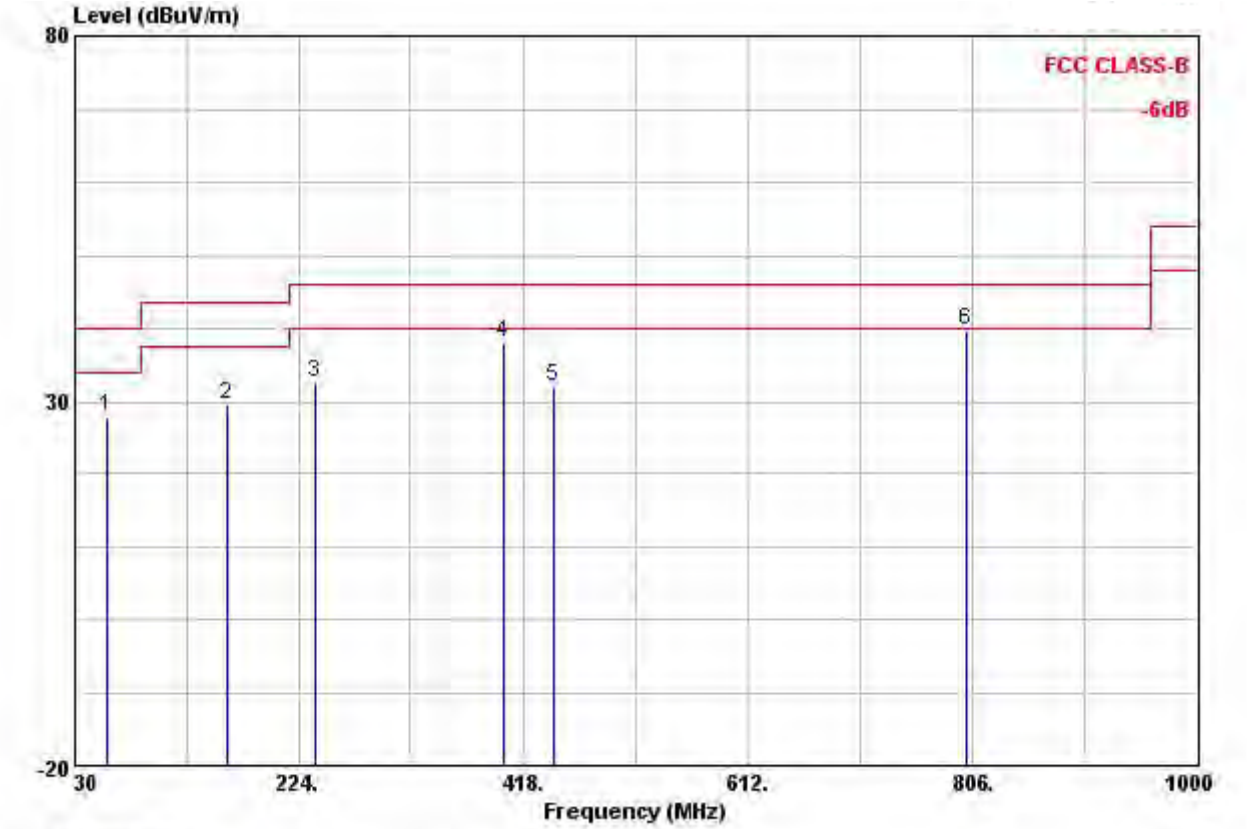
Distance extrapolation factor = 20 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

TEST RESULT OF RADIATED EMISSION TEST (30MHZ-1GHZ)

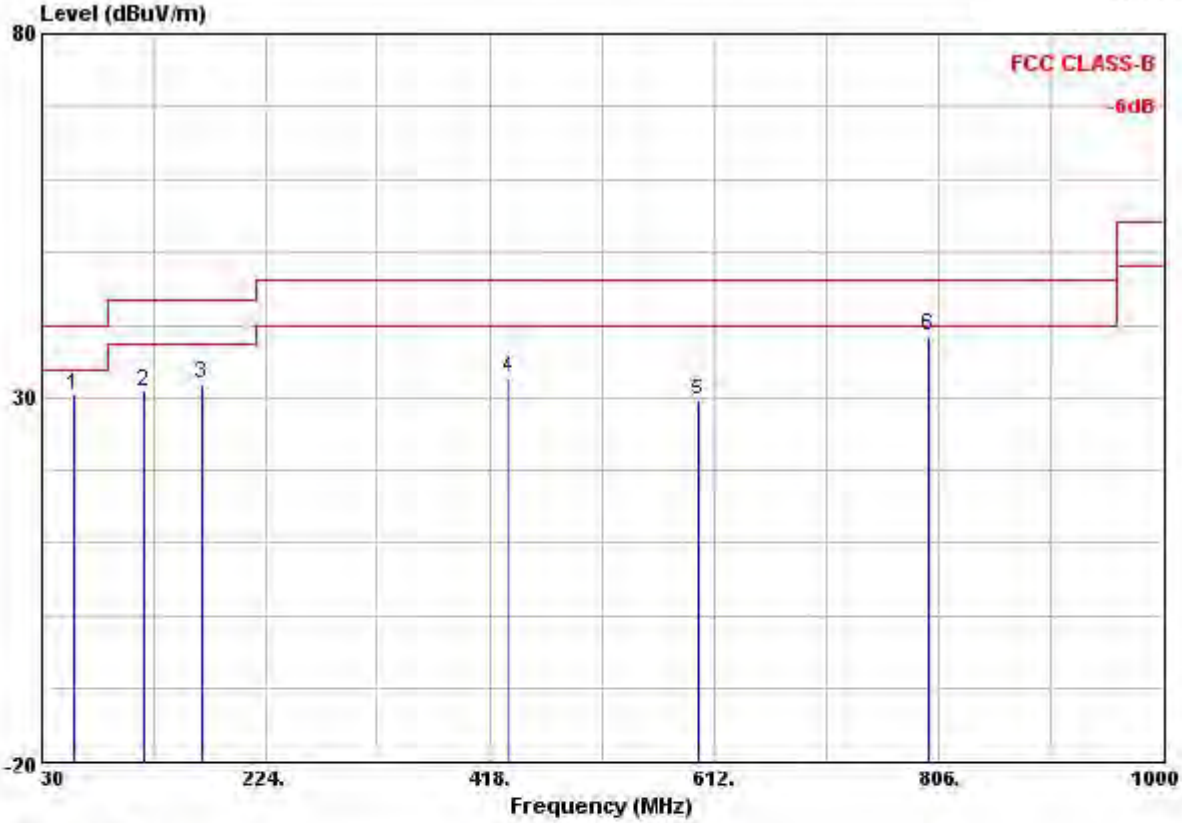
Operation Mode:	BT MODE	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH		

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	59.100	28.04	-11.96	40.00	51.07	6.43	0.83	30.29	Peak	---	---
2	160.950	29.48	-14.02	43.50	47.69	10.81	1.29	30.31	Peak	---	---
3	237.580	32.57	-13.43	46.00	48.45	13.02	1.55	30.45	Peak	---	---
4 @	400.540	38.06	-7.94	46.00	50.26	16.21	2.04	30.45	Peak	---	---
5	444.190	31.99	-14.01	46.00	43.55	16.55	2.13	30.24	Peak	---	---
6 @	800.180	39.71	-6.29	46.00	42.49	24.20	2.92	29.90	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	59.100	30.29	-9.71	40.00	53.32	6.43	0.83	30.29	Peak	---	---
2	118.270	30.92	-12.58	43.50	47.89	12.14	1.13	30.24	Peak	---	---
3	167.740	31.98	-11.52	43.50	50.10	10.85	1.32	30.29	Peak	---	---
4	435.460	32.77	-13.23	46.00	44.45	16.48	2.11	30.27	Peak	---	---
5	599.390	29.57	-16.43	46.00	35.16	22.05	2.43	30.07	Peak	---	---
6 @	796.300	38.66	-7.34	46.00	41.54	24.10	2.92	29.90	Peak	---	---

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

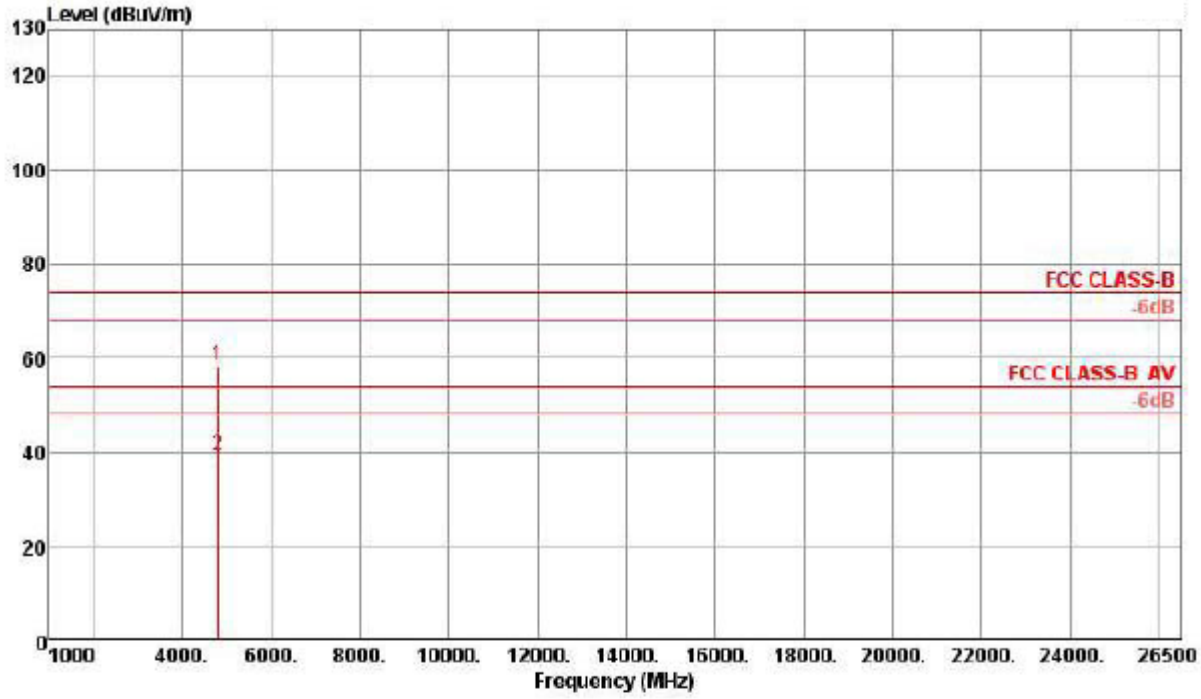
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

TEST RESULT OF RADIATED EMISSION TEST (1GHZ-10TH HARMONIC)

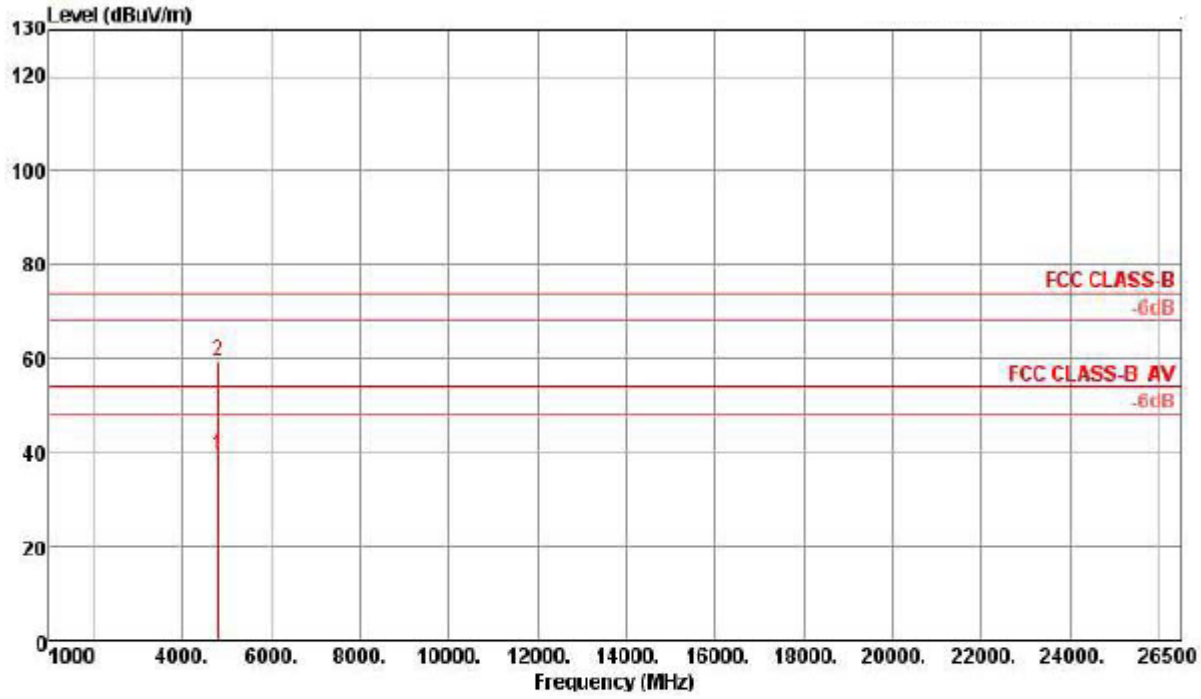
Operation Mode:	**channel 0(2402MHz)**	Test Date:	Apr.11, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1 p	4804.00	58.13	74.00	-15.87	56.19	3.96	33.02	35.04	237	100	Peak	HORIZONTAL
2 a	4804.05	39.07	54.00	-14.93	37.13	3.96	33.02	35.04	237	100	Average	HORIZONTAL

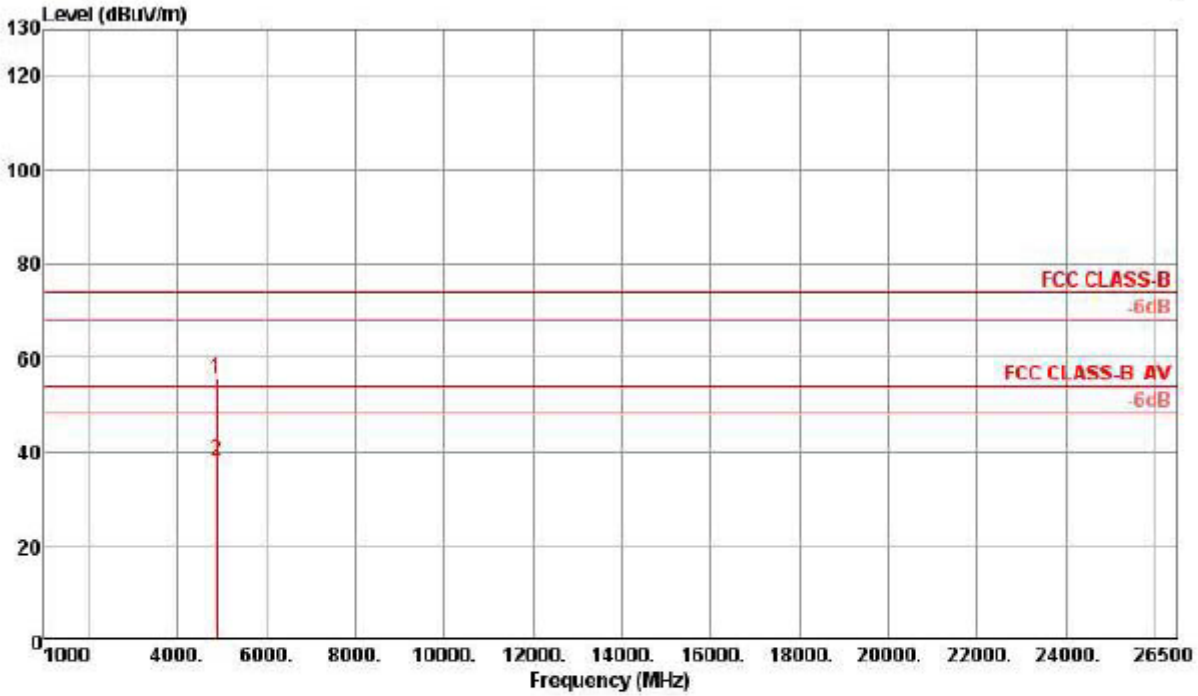
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1 a	4803.99	39.53	54.00	-14.47	37.59	3.96	33.02	35.04	261	172	Average	VERTICAL
2 p	4804.06	59.46	74.00	-14.54	57.52	3.96	33.02	35.04	261	172	Peak	VERTICAL

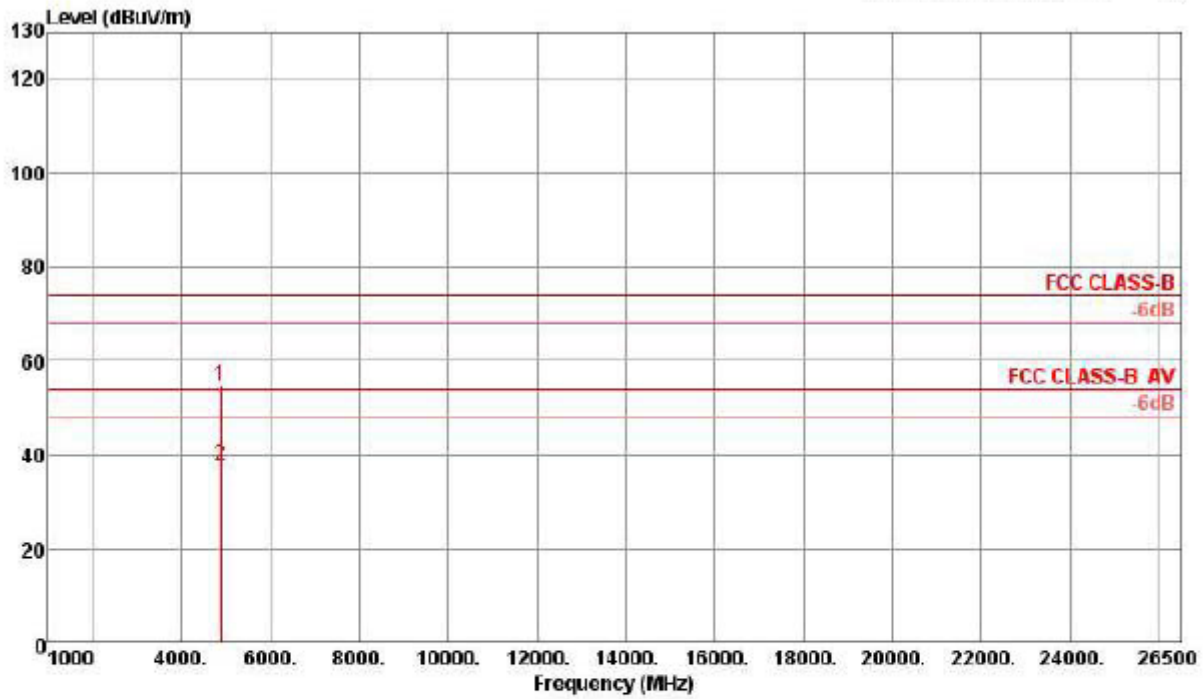
Operation Mode:	**channel 39(2441MHz)**	Test Date:	Apr.11, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1 p	4881.94	55.39	74.00	-18.61	53.29	3.97	33.16	35.03	47	100	Peak	HORIZONTAL
2 a	4882.03	38.08	54.00	-15.92	35.98	3.97	33.16	35.03	47	100	Average	HORIZONTAL

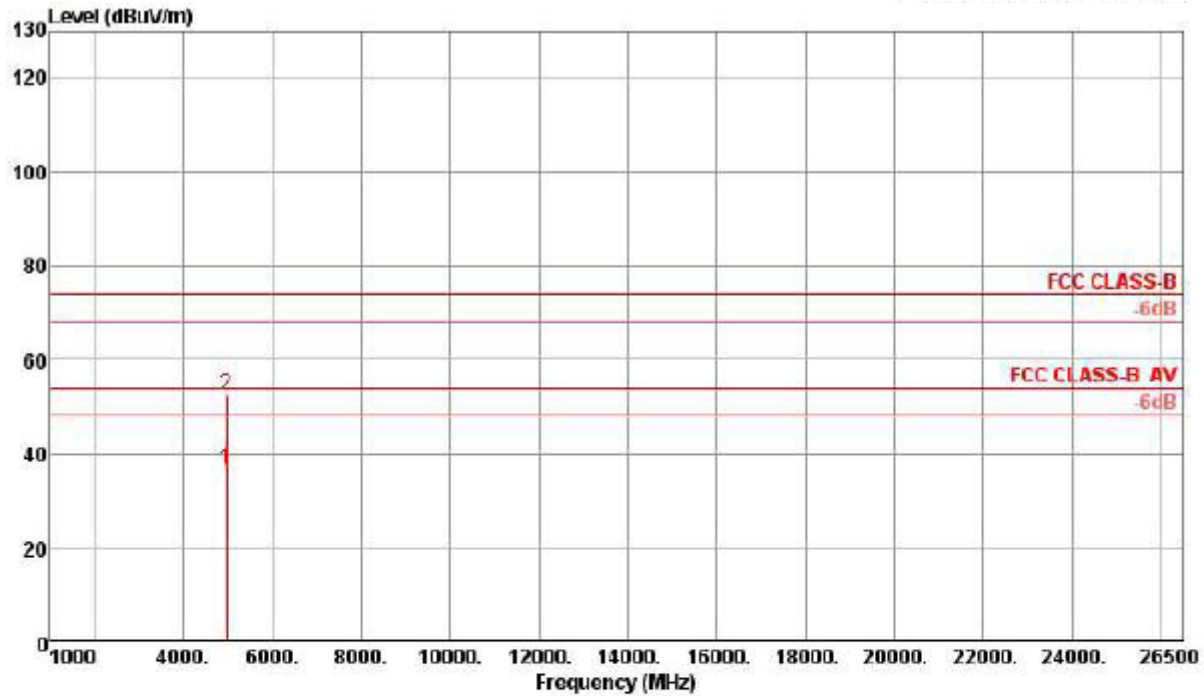
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1 p	4881.99	54.83	74.00	-19.17	52.73	3.97	33.16	35.03	342	129	Peak	VERTICAL
2 a	4882.03	37.59	54.00	-16.41	35.49	3.97	33.16	35.03	342	129	Average	VERTICAL

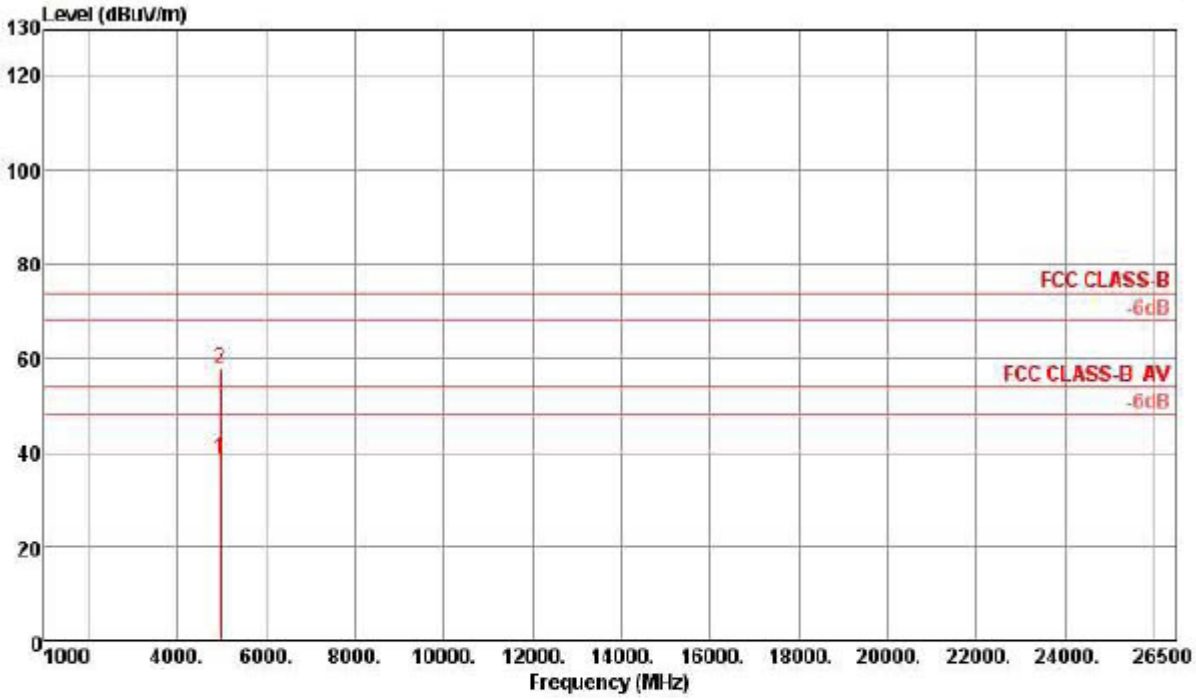
Operation Mode:	channel 78(2480MHz)	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Humidity:	55 % RH		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1 a	4960.01	36.47	54.00	-17.53	34.16	3.99	33.33	35.01	128	100	Average	HORIZONTAL
2 p	4960.09	52.46	74.00	-21.54	50.15	3.99	33.33	35.01	128	100	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1 a	4960.03	38.87	54.00	-15.13	36.56	3.99	33.33	35.01	6	113	Average	VERTICAL
2 p	4960.18	58.08	74.00	-15.92	55.77	3.99	33.33	35.01	6	113	Peak	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Humidity:	55 % RH	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Test Method	Band Edge Emission		

Band Edge Emission for Bottom Channel

Channel 0

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1		2389.76	43.87	74.00	-30.13	12.94	2.76	28.17	0.00	187	106	Peak	VERTICAL
2		2390.00	33.61	54.00	-20.39	2.68	2.76	28.17	0.00	187	106	Average	VERTICAL
3	a	2402.12	54.43	54.00			2.76	28.21	0.00	187	106	Average	VERTICAL
4	p	2402.24	91.94	74.00			2.76	28.21	0.00	187	106	Peak	VERTICAL

Band Edge Emission for Top Channel

Channel 78

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	p	2479.89	90.98	74.00			2.81	28.37	0.00	274	101	Peak	VERTICAL
2	a	2480.13	53.49	54.00			2.81	28.37	0.00	274	101	Average	VERTICAL
3	!	2483.50	38.98	54.00	-15.02	7.80	2.81	28.37	0.00	274	101	Average	VERTICAL
4		2483.50	53.08	74.00	-20.92	21.90	2.81	28.37	0.00	274	101	Peak	VERTICAL

10. NUMBER OF HOPPING FREQUENCY

10.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz, span=20MHz
4. Set the Spectrum Analyzer as RBW = VBW = 100KHz

10.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2
1. Conducted Method.

10.3 MEASUREMENT EQUIPMENT USED

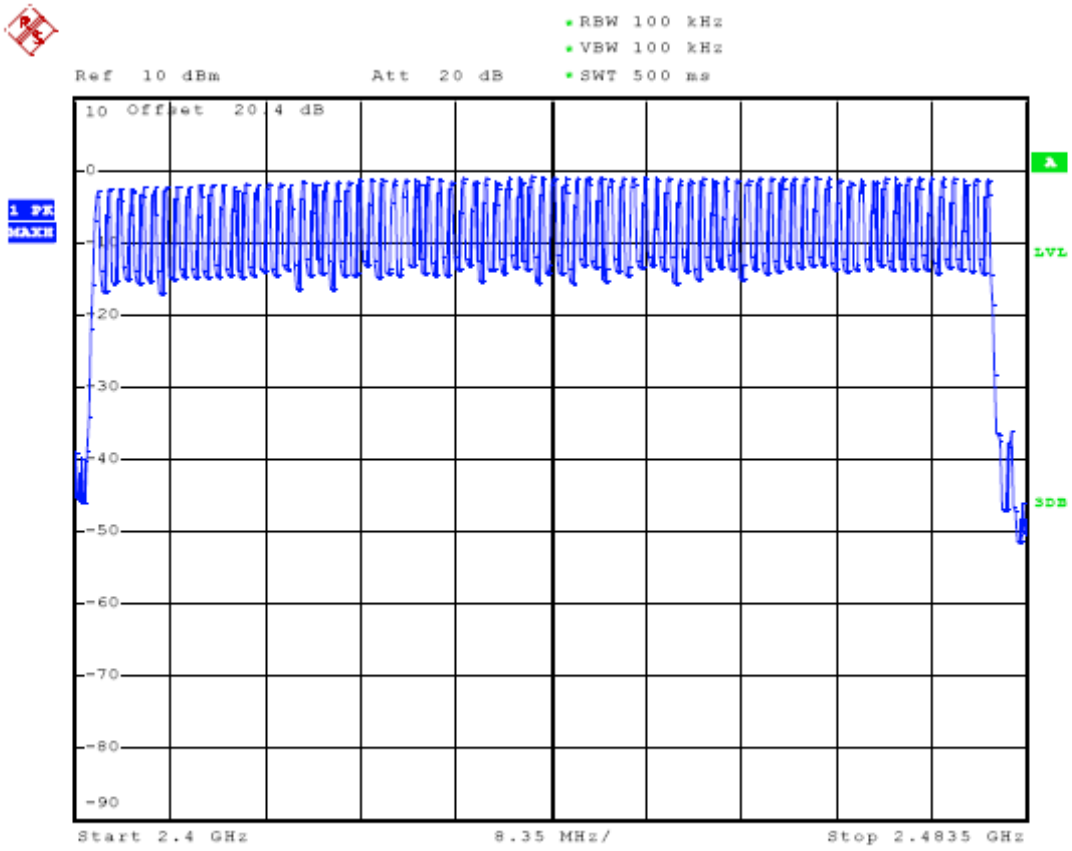
The Same as described in section 6.3

10.4 LIMITS AND MEASUREMENT RESULT:

TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS

Humidity:	55 % RH	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones

NUMBER OF HOPPING CHANNEL PLOT ON CHANNEL 0~78



11. TIME OF OCCUPANCY (DWELL TIME)

11.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set center frequency of spectrum analyzer = Operating frequency
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0 Hz,

11.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2
Conducted Method

11.3 MEASUREMENT EQUIPMENT USED

The same as described in section 6.3

11.4 LIMITS AND MEASUREMENT RESULT

BOTTOM CHANNEL(1Mbps)					
Mode	Frequency	Spectrum Reading	Test Result	Limit	Pass / Fail
	(MHz)	(uS)	(mS)	(mS)	
DH1	2402	410	131.2	400	Pass
DH3	2402	1670	267.2	400	Pass
DH5	2402	2920	311.5	400	Pass

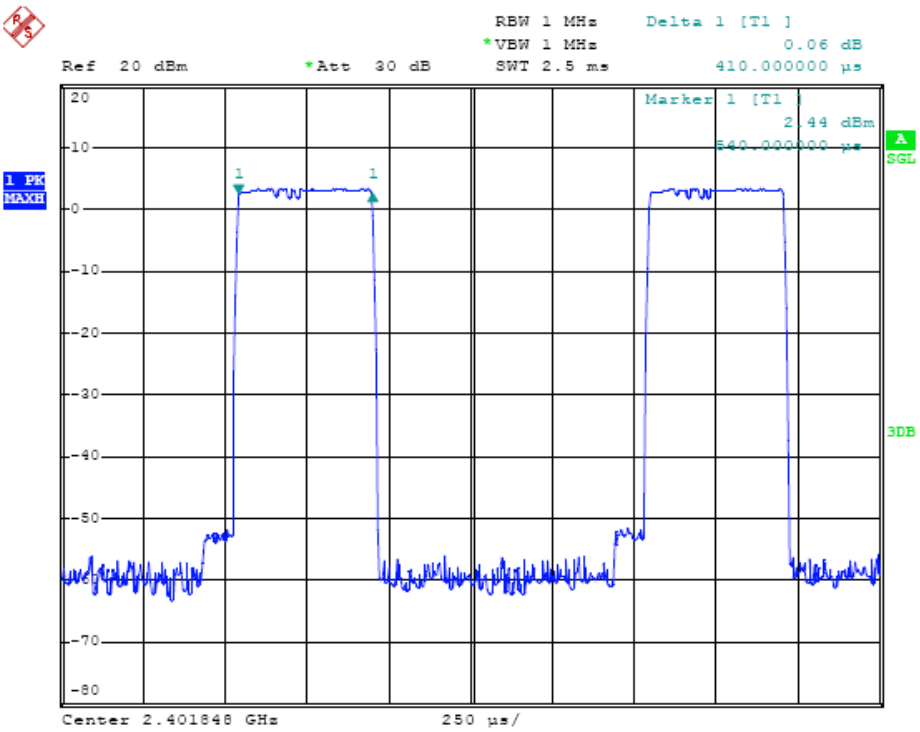
MIDDLE CHANNEL(1Mbps)					
Mode	Frequency	Spectrum Reading	Test Result	Limit	Pass / Fail
	(MHz)	(uS)	(mS)	(mS)	
DH1	2441	410	131.2	400	Pass
DH3	2441	1660	265.6	400	Pass
DH5	2441	2920	311.5	400	Pass

TOP CHANNEL(1Mbps)					
Mode	Frequency	Spectrum Reading	Test Result	Limit	Pass / Fail
	(MHz)	(uS)	(mS)	(mS)	
DH1	2480	410	131.2	400	Pass
DH3	2480	1670	267.2	400	Pass
DH5	2480	2920	311.5	400	Pass

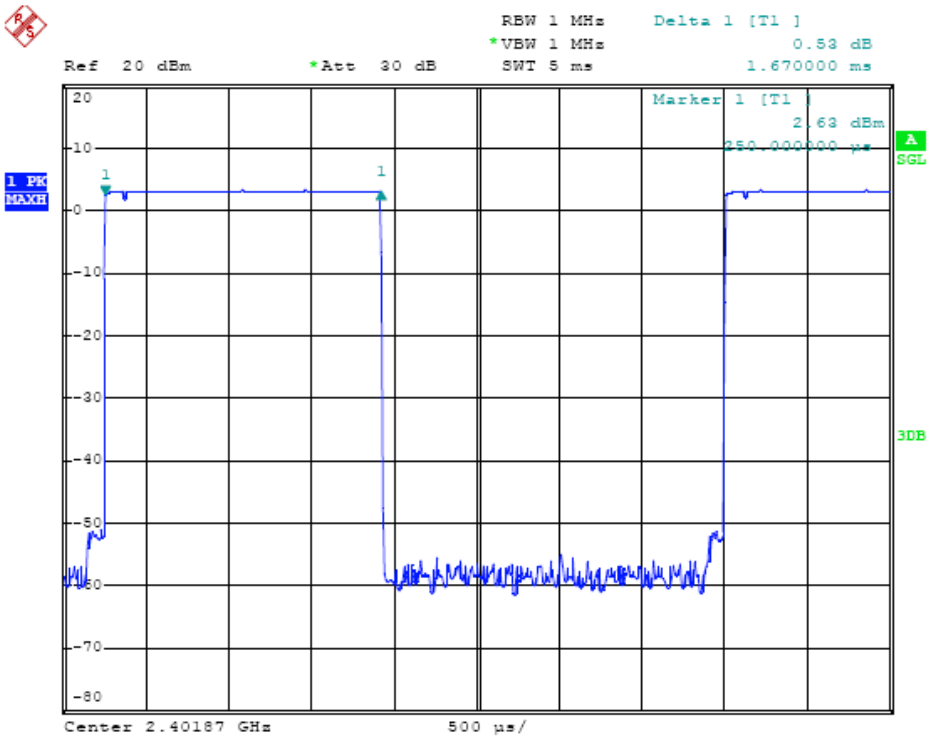
A Period Time = 79*0.4=31.6 S
DH1 Time Slot: Reading * (1600/2)*31.6/79
DH3 Time Slot: Reading * (1600/4)*31.6/79
DH5 Time Slot: Reading * (1600/6)*31.6/79

Humidity:	55 % RH	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Configurations	DH1, DH3, DH5		

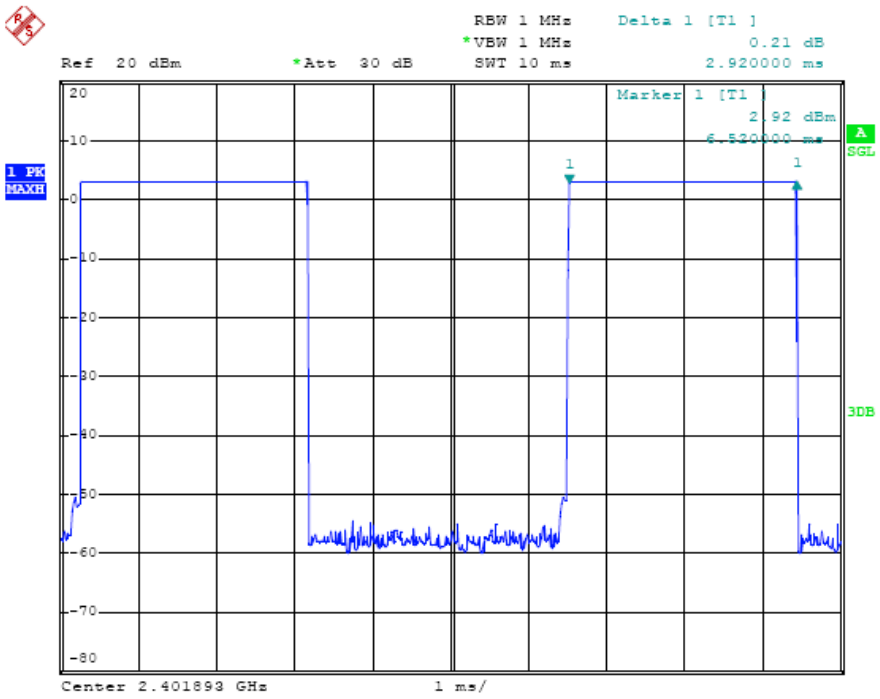
TEST PLOT DH1 MODE BOTTOM CHANNEL



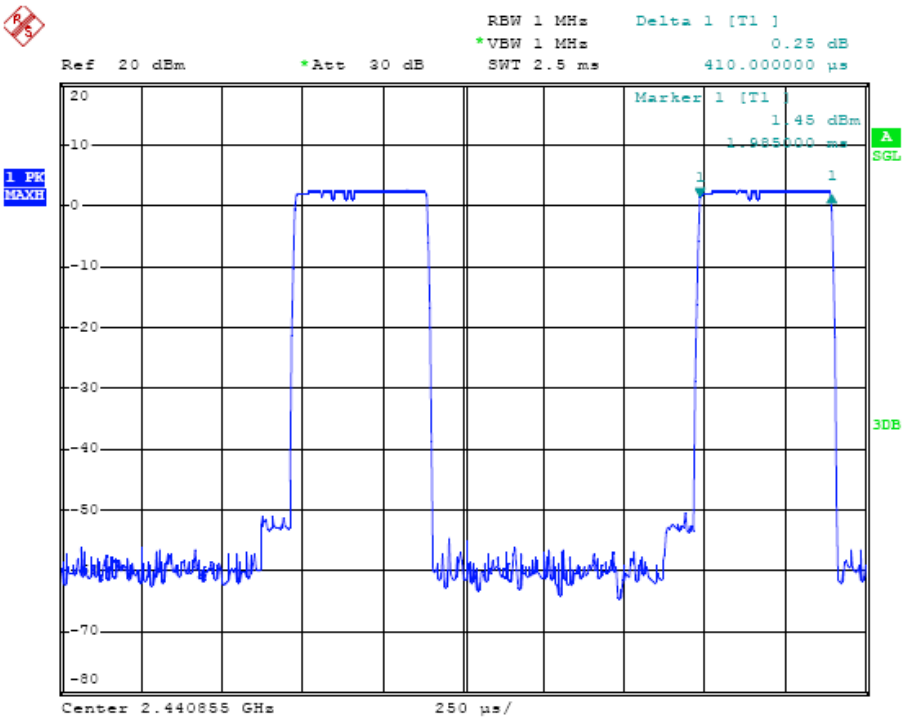
TEST PLOT DH3 MODE BOTTOM CHANNEL



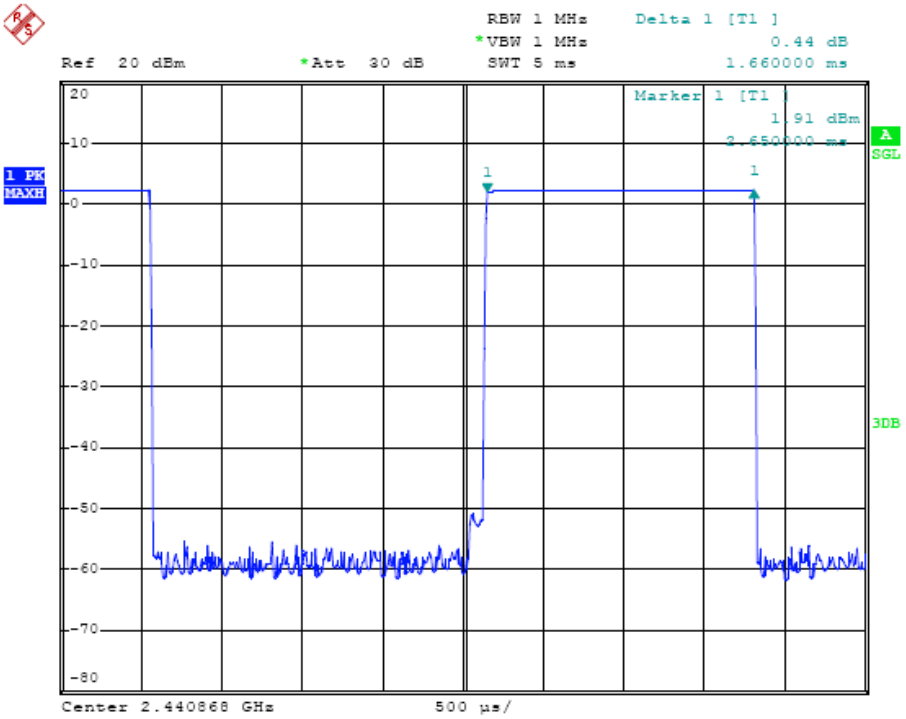
TEST PLOT DH5 MODE BOTTOM CHANNEL



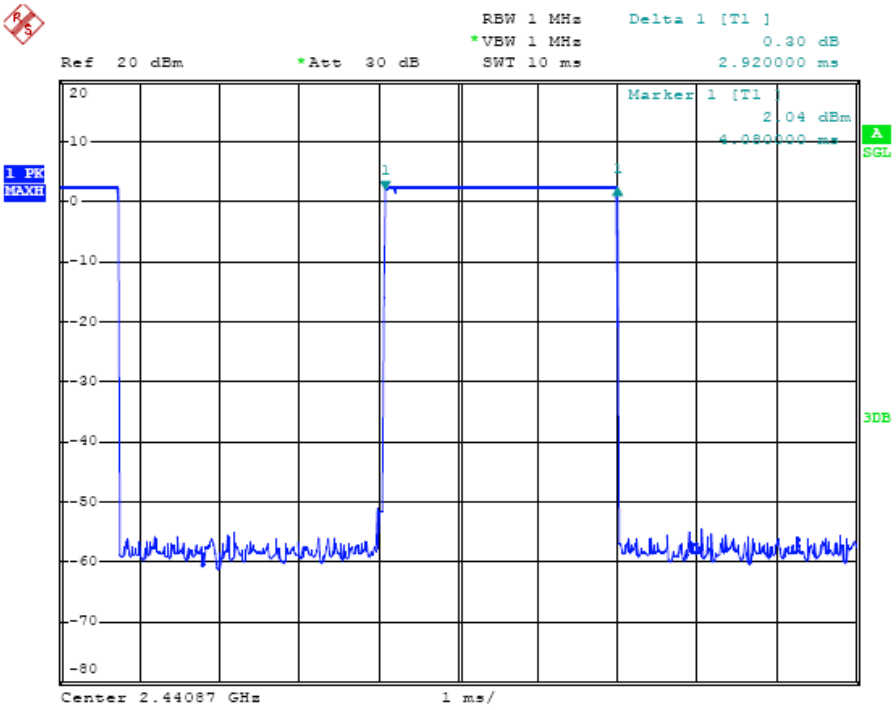
TEST PLOT DH1 MODE MIDDLE CHANNEL



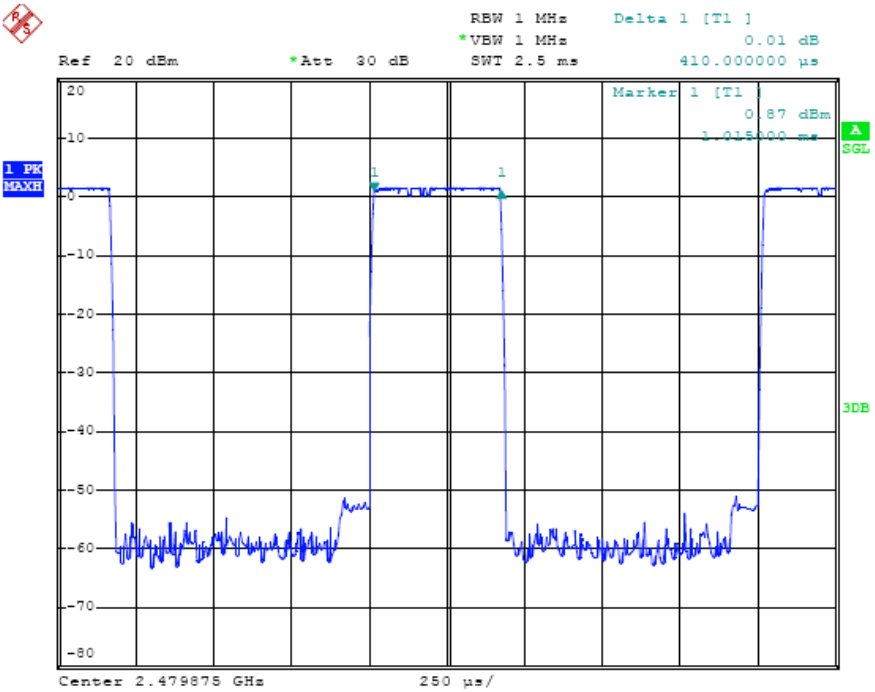
TEST PLOT DH3 MODE MIDDLE CHANNEL



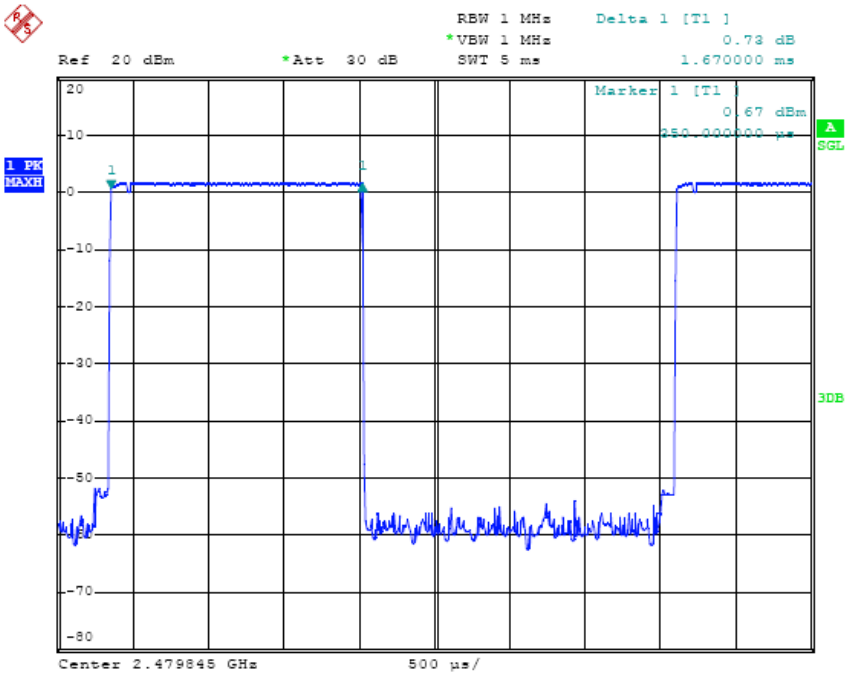
TEST PLOT DH5 MODE MIDDLE CHANNEL



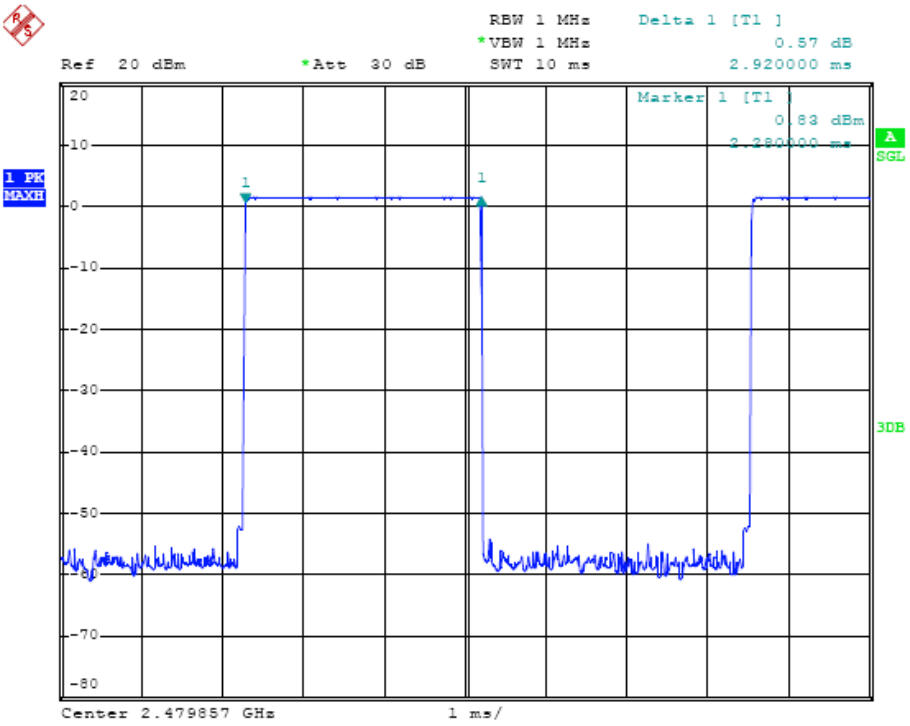
TEST PLOT DH1 MODE TOP CHANNEL



TEST PLOT DH3 MODE TOP CHANNEL



TEST PLOT DH5 MODE TOP CHANNEL



12. FREQUENCY SEPARATION

12.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set center frequency of spectrum analyzer = Middele of Operating frequency
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span = 5 MHz,

12.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2

12.3 MEASUREMENT EQUIPMENT USED

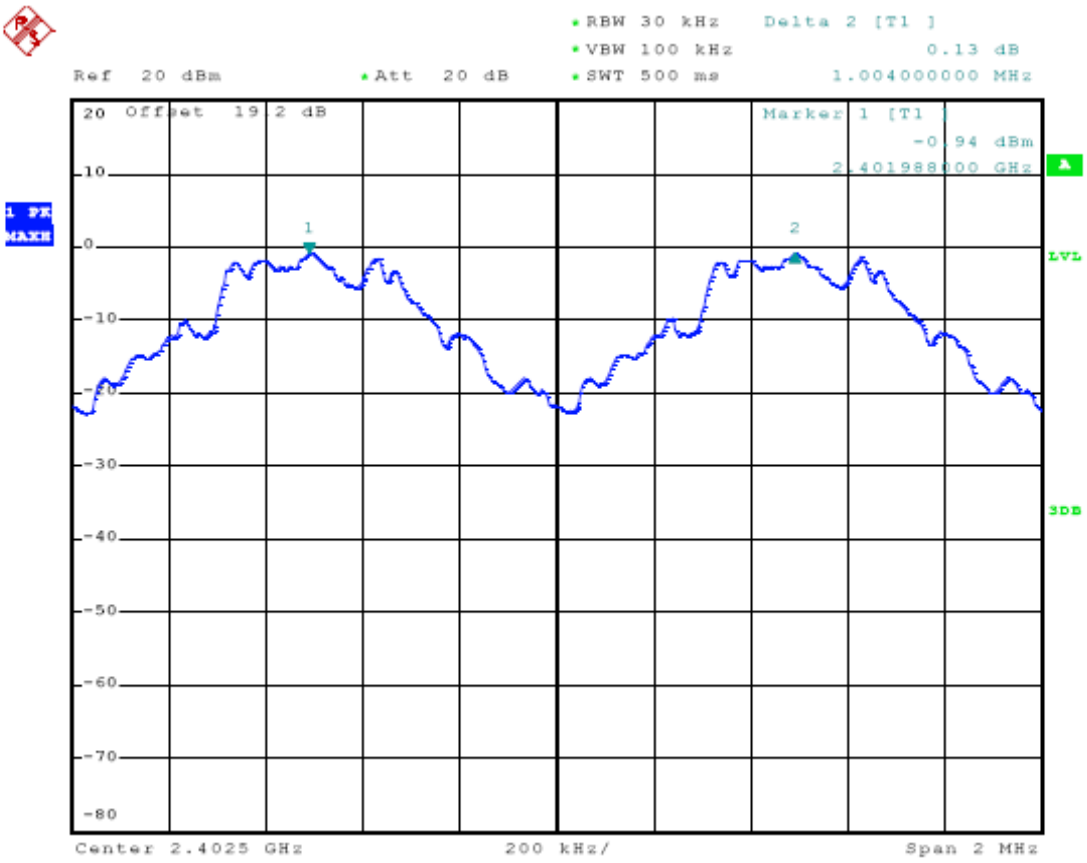
The same as described in section 6.3

12.4 LIMITS AND MEASUREMENT RESULT

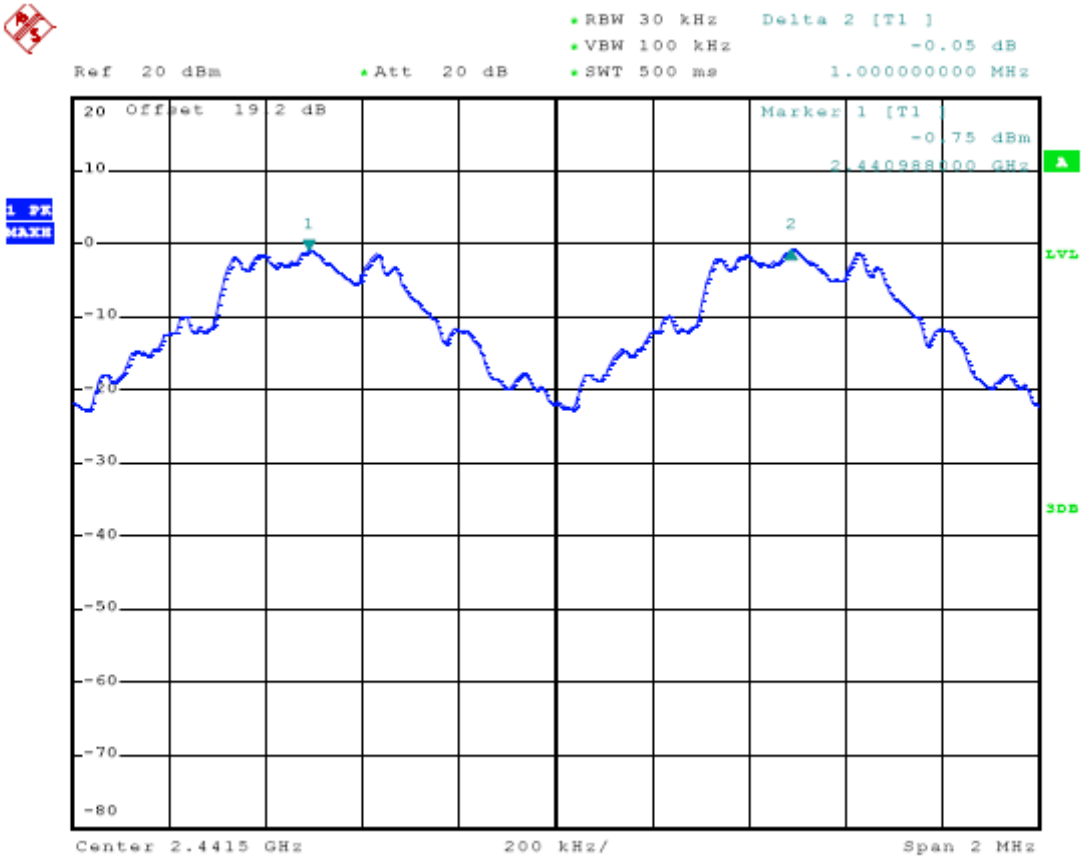
CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	KHz	KHz	Pass
CH00-CH01	1004	>=25 KHz or 2/3 20 dB BW	
CH39-CH40	1000		
CH77-CH78	1000		

Humidity:	55 % RH	Test Date:	Nov.02, 2011
Temperature:	25°C	Tested by:	Jones
Configurations	Channel 0-1, channel39-40, channel78-79		

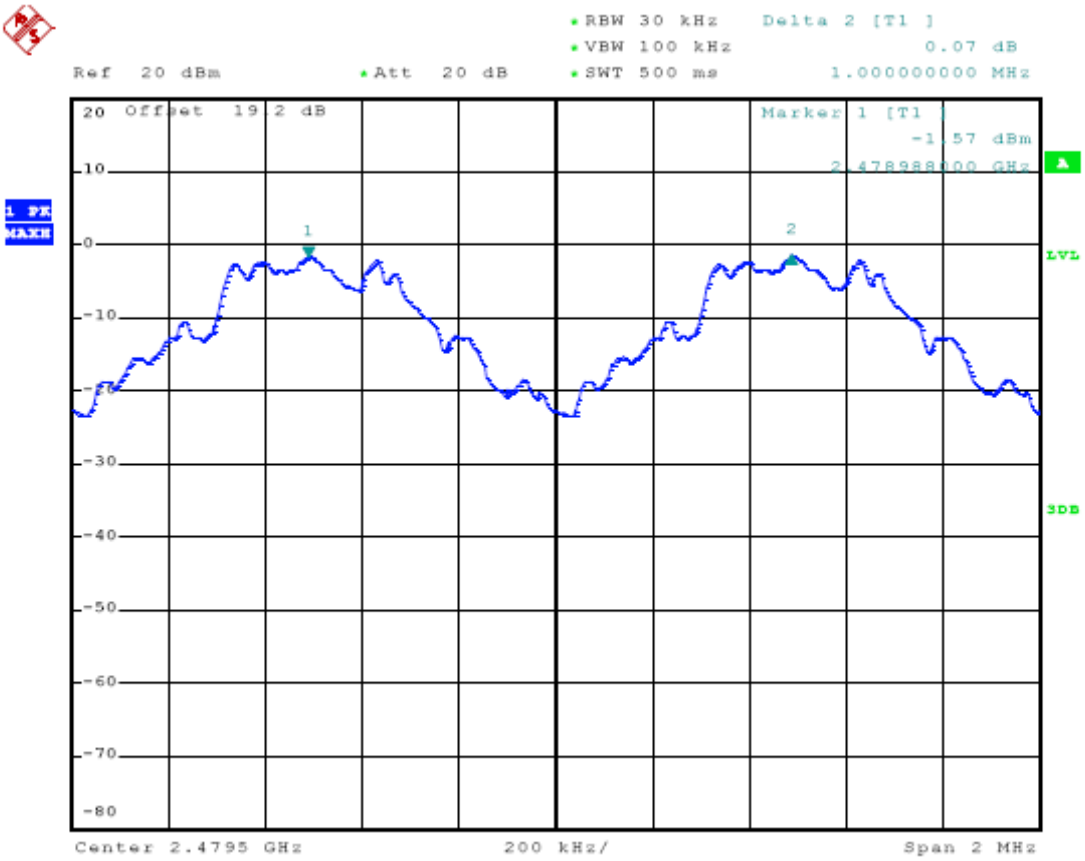
TEST PLOT FOR FREQUENCY SEPARATION –CHANNEL0-1(1Mbps)



TEST PLOT FOR FREQUENCY SEPARATION –CHANNEL39-40(1Mbps)

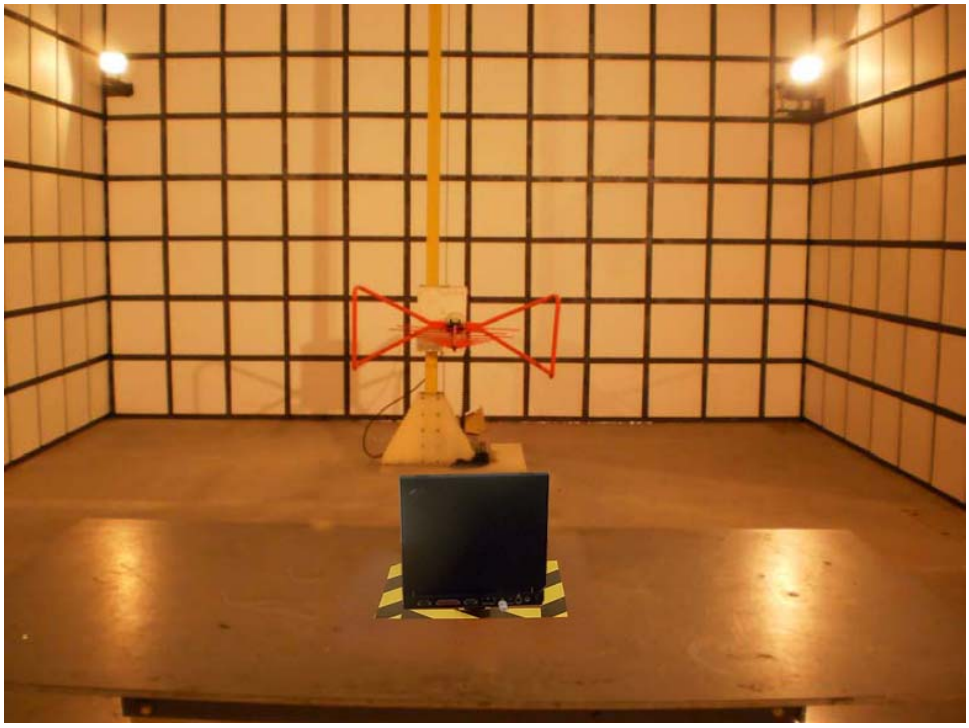


TEST PLOT FOR FREQUENCY SEPARATION -CHANNEL77-78(1Mbps)

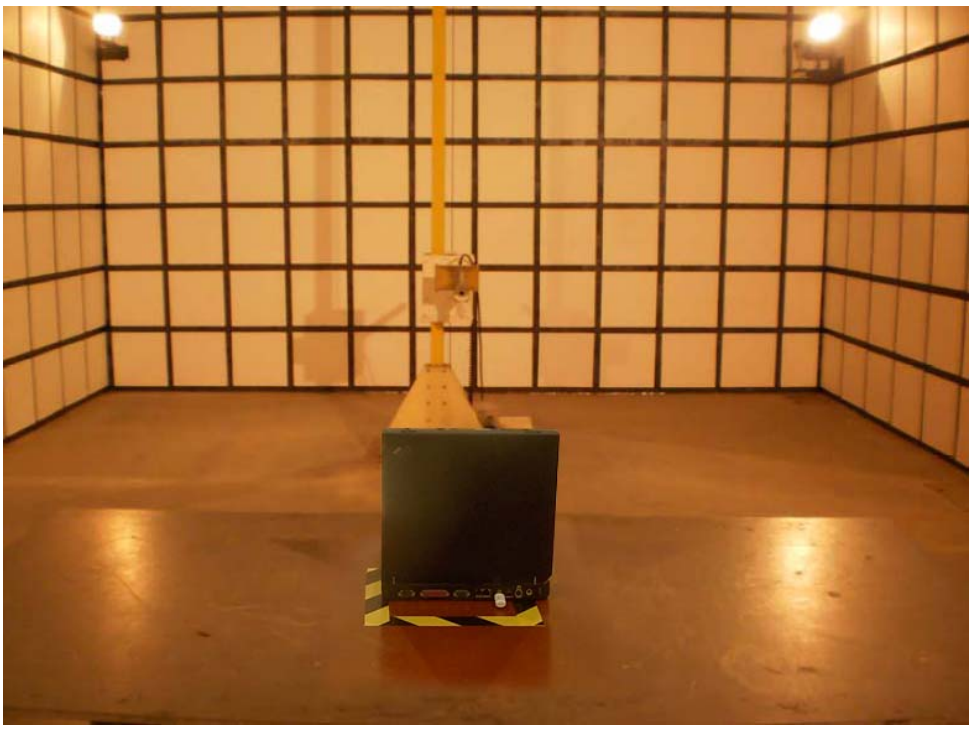


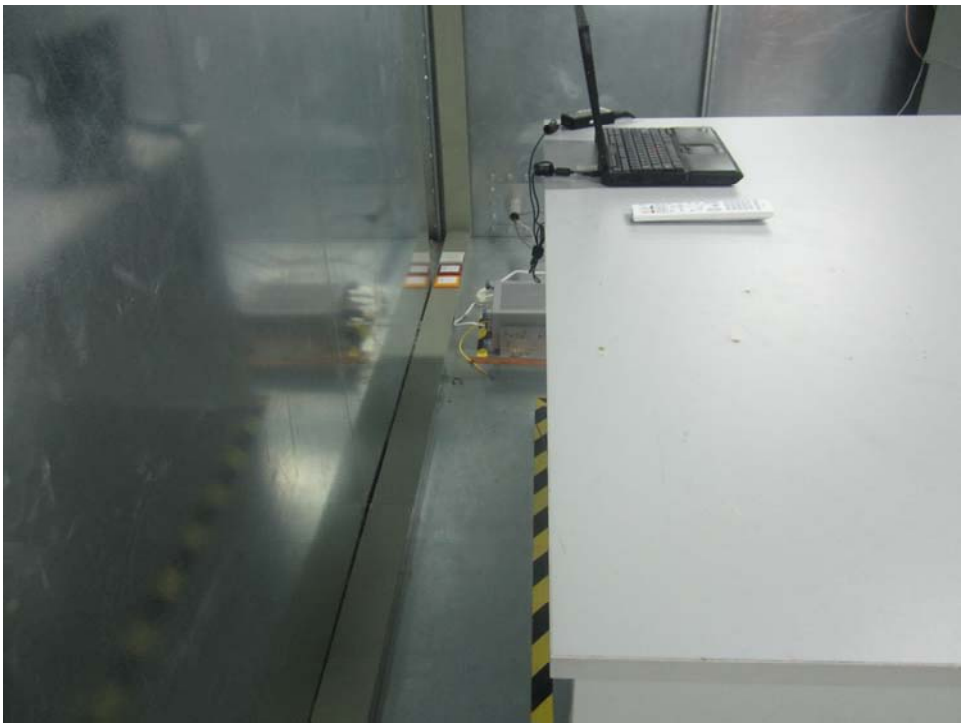
PPENDIX 1

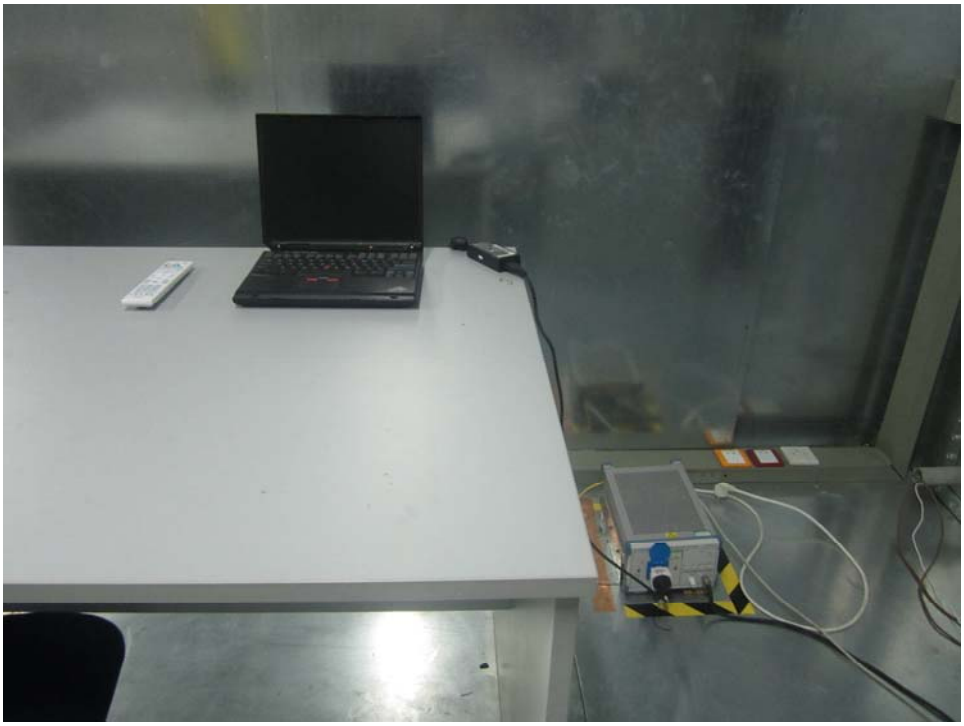
PHOTOGRAPHS OF THE TEST SETUP



PHOTOGRAPHS OF THE TEST SETUP(>1GHZ)







---- **END OF REPORT** ----