



FCC Radio Test Report

FCC ID: OJ2-SP3XX-WSXXX

Report No. : TB-FCC124393
Applicant : Hichan Technology Corp.
Equipment Under Test (EUT)
EUT Name : Wireless Storage
Model No. : SP300
Serial No. : Please see page 4.
Brand Name : Wi-Disk
Receipt Date : 2012-06-28
Test Date : 2012-06-30 to 2012-07-09
Issue Date : 2012-07-10
Standards : FCC Part 15, Subpart C(15.247)
Test Method : ANSI C63.4:2003
Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above,
The EUT technically complies with the FCC requirements

Test/Witness Engineer : 

Approved& Authorized : 

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information About EUT

1.1 Client Information

Applicant	:	Hichan Technology Corp.
Address	:	12F., No.2,Jian 8th Rd., Zhonghe Dist., New Taipei City 23511, Taiwan
Manufacturer	:	Flastar Technology Co., Ltd.
Address	:	12F., No.2,Jian 8th Rd., Zhonghe Dist., New Taipei City 23511, Taiwan

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Wireless Storage
Models No.	:	SP300, SP300A, SP300B, SP300C, SP300D, SP300E, WD100, WD200, WD300, WD400, WD500, WS100, WS200, WS300, WS400, WS500, SP310.
Model Difference	:	The different models are identical in schematic, structure and critical component, the only different is the appearance.
Product Description	Operation Frequency: 802.11b/g/n: 2412MHz~2462MHz	
	Number of Channel:	802.11b/g/n(20M):11 Channels 802.11n(40):7 Channels see note (3)
	Out Power:	802.11b: 12.89 dBm 802.11g: 11.56 dBm 802.11n (20M): 12.83 dBm 802.11n (40M): 12.53 dBm
	Antenna Gain:	0 dBi
	Modulation Type:	802.11b: CCK, QPSK, BPSK 802.11g: OFDM 802.11n: OFDM
	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	USB Charging from PC. DC Voltage supplied from Li-Polymer battery.
Power Rating	:	USB DC 5V form PC. DC 3.7V 2100mAh from Li-Polymer battery
Connecting I/O Port(S)	:	Please refer to the User's Manual

Note:

(1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC

KDB 558074.

(2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

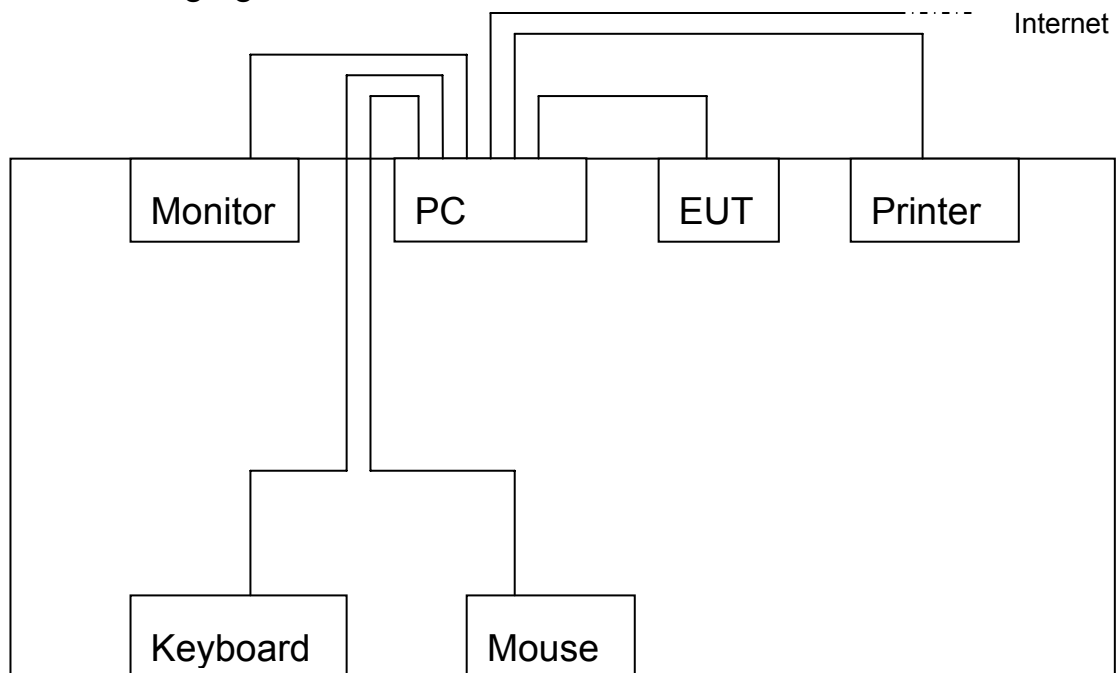
(3) Channel List:

CH 01~CH 11 for 802.11b/g/n(20M) and CH 03~CH 09 for 802.11n(40M)

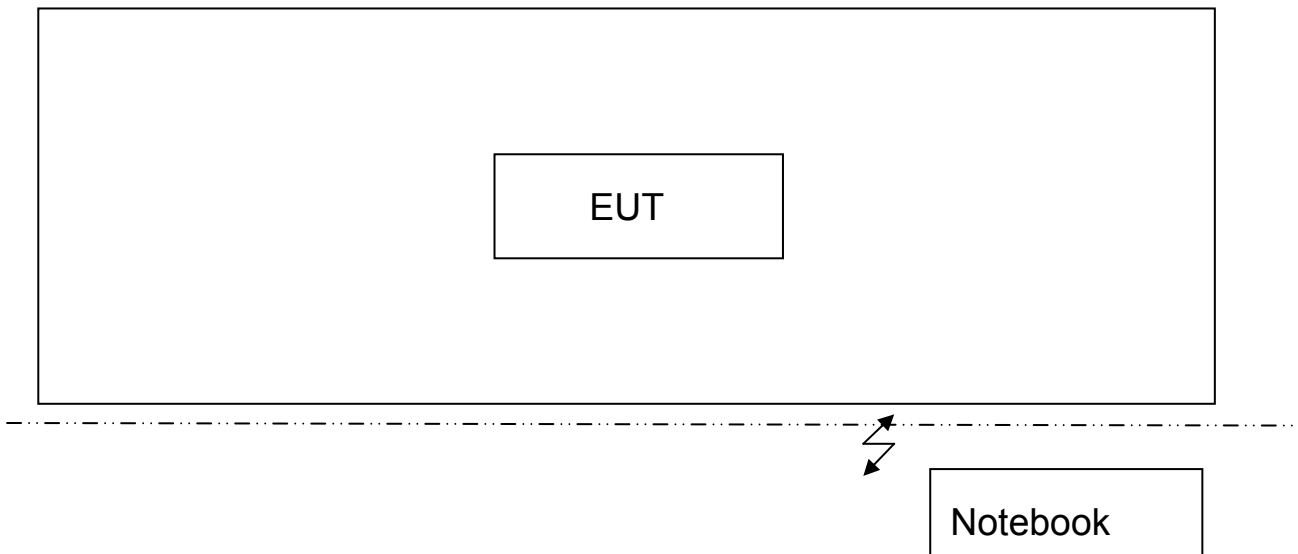
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		

1.3 Block Diagram Showing The Configuration of System Tested

Mode 1: Charging Mode



Mode 2: TX Mode



1.4 Description of Support Units

Name	Model	S/N	Manufacturer	Used “√”
Notebook	B470A2450	VNF3G06957	Lenovo	√
Printer	HP1505n	VNF3G06957	HP	√
LCD Monitor	E170Sc	----	DELL	√
PC	OPTIPLEX380	----	DELL	√
Keyboard	L100	U01C	DELL	√
Mouse	M-UARDEL7	----	DELL	√

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test	
Final Test Mode	Description
Mode 1	USB Charging Mode

For Radiated Test	
Final Test Mode	Description
Mode 2	TX Mode B Mode Channel 01/06/11
Mode 3	TX Mode G Mode Channel 01/06/11
Mode 4	TX Mode N(20M) Mode Channel 01/06/11
Mode 5	TX Mode N(40M) Mode Channel 03/06/09

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
802.11b Mode: CCK (1 Mbps)
802.11g Mode: OFDM (6 Mbps)
802.11n (20M) Mode: OFDM (6.5 Mbps)
802.11n (40M) Mode: OFDM (6.5 Mbps)
The equipment have two antennas, ANT 0 and ANT 1.
For 802.11b/g/n(20M) the only one antenna transmitting, ANT 0 or ANT 1.
For 802.11n(20M)/n(40M) ANT 0 and ANT 1 will transmitting at the same time.
We pre-tested all modes, and find ANT 0 was the worst mode, so the test data only showed the ANT 0 Mode.
- (2) During the testing procedure, the continuously transmitting mode was programmed by the customer.
- (3) The EUT is considered a mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

Test Software Version	Test Program: rf.cgi		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b DSSS	13	13	13
IEEE 802.11g OFDM	12	12	12
IEEE 802.11n(20M) OFDM	10	10	10
IEEE 802.11n(40M) OFDM	10	10	10

1.7 Test Facility

The tests were performed at:

Bontek Compliance Testing Laboratory Ltd

1/F., Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, 518055 China

Tel: 86-755-86337020 Fax: 86-755-86337028

At the time of testing, the Laboratory is accredited. It is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 338263.

The test report was fulfilled by Shenzhen Toby Technology Co., Ltd. Shenzhen Toby Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements results.

2. Test Summary

FCC Part 15 Subpart C(15.247)			
Standard Section	Test Item	Judgment	Remark
15.203	Antenna Requirement	PASS	N/A
15.207	Conducted Emission	PASS	N/A
15.205	Restricted Bands	PASS	N/A
15.247(a)(2)	6dB Bandwidth	PASS	N/A
15.247(b)	Peak Output Power	PASS	N/A
15.247(e)	Power Spectral Density	PASS	N/A
15.247(d)	Radiated Spurious Emission	PASS	N/A
15.247(d)	Antenna Conducted Spurious Emission	PASS	N/A
Note: N/A is an abbreviation for Not Applicable.			

3. Conducted Emission Test

3.1 Test Standard and Limit

3.1.1 Test Standard

FCC Part 15.207

3.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

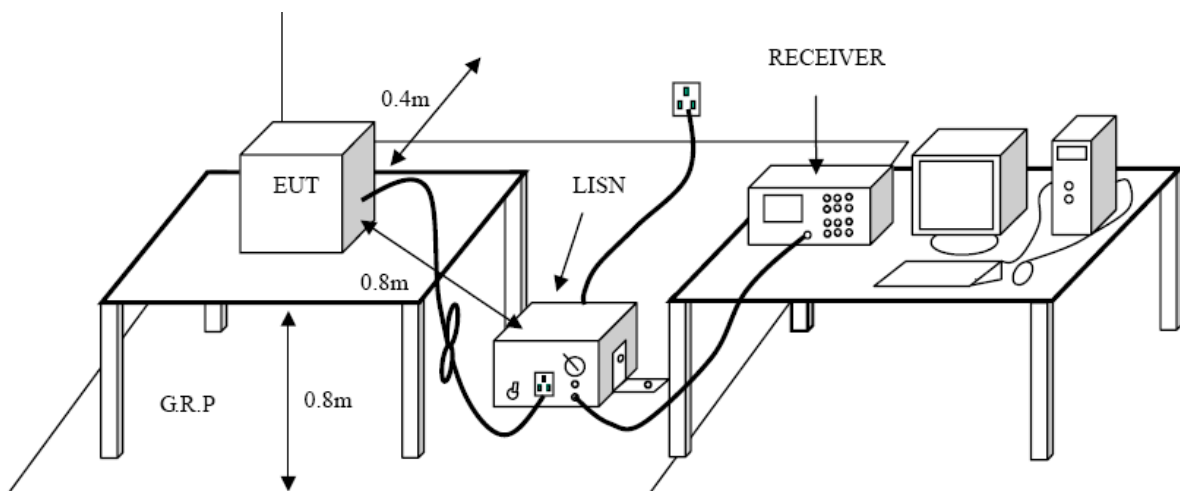
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.2 Test Setup



3.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

3.4 Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
EMI Test Receiver	ROHDE&SCHWARZ	ESC30	DE25181	2011-08-11	2012-08-11
50ΩCoaxial Switch	Anritsu	MP59B	X10321	2011-08-11	2012-08-11
L.I.S.N	EMCO	3624/1	00063417	2011-08-11	2012-08-11
L.I.S.N	EMCO	3624/1	00063417	2011-08-11	2012-08-11

3.5 EUT Operating Mode

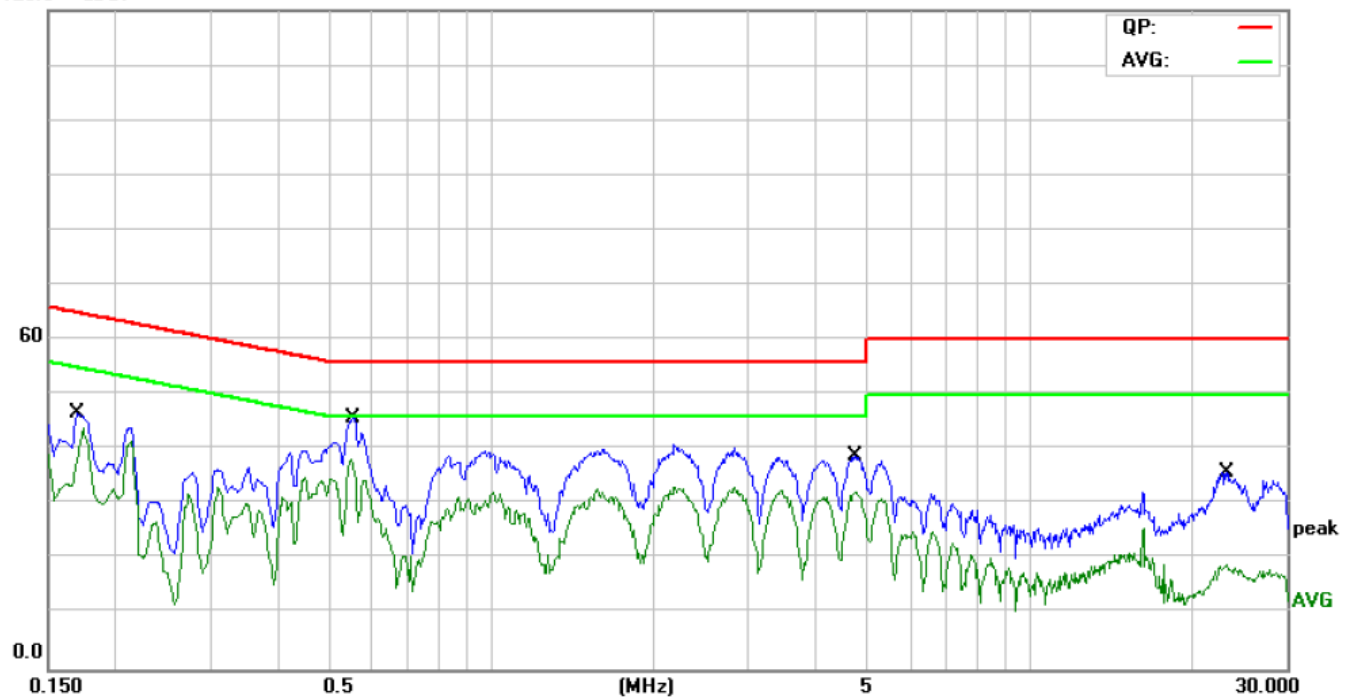
Please refer to the description of test mode.

3.6 Test Data

Please see the next page.

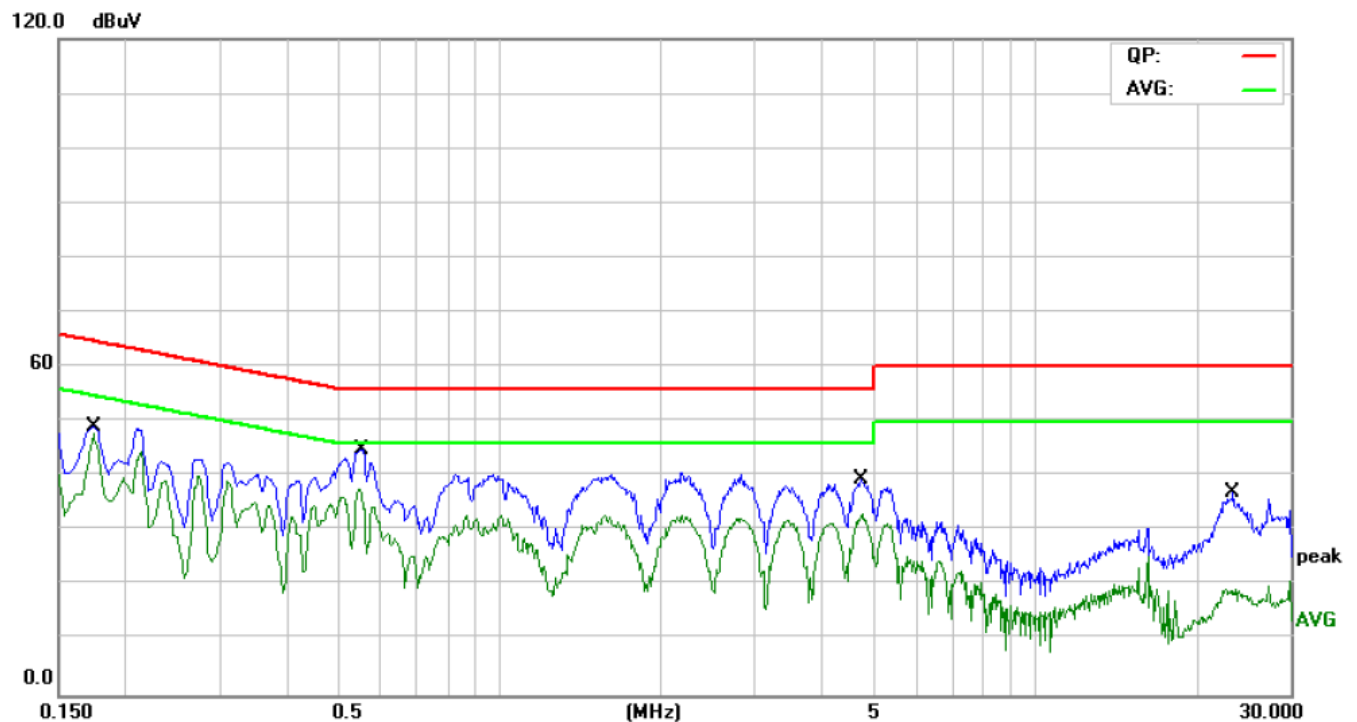
E.U.T :	Wireless Storage	Model Name :	SP300
Temperature :	23°C	Relative Humidity :	51 %
Terminal	Line		
Test Voltage :	AC 120 V / 60Hz		
Test Mode :	USB Charging Mode		

120.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1700	33.22	10.67	43.89	64.96	-21.07	QP	
2		0.1700	29.06	10.67	39.73	54.96	-15.23	AVG	
3		0.5540	36.12	9.43	45.55	56.00	-10.45	QP	
4	*	0.5540	28.32	9.43	37.75	46.00	-8.25	AVG	
5		4.7460	26.89	9.43	36.32	56.00	-19.68	QP	
6		4.7460	22.83	9.43	32.26	46.00	-13.74	AVG	
7		23.2380	19.66	10.16	29.82	60.00	-30.18	QP	
8		23.2380	6.44	10.16	16.60	50.00	-33.40	AVG	

E.U.T :	Wireless Storage	Model Name :	SP300
Temperature :	23°C	Relative Humidity :	51 %
Terminal	Neutral		
Test Voltage :	AC 120 V / 60Hz		
Test Mode :	USB Charging Mode		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	Factor	ment	dBuV	dB	Detector	Comment
1		0.1740	37.71	10.65	48.36	64.76	-16.40	QP	
2	*	0.1740	37.16	10.65	47.81	54.76	-6.95	AVG	
3		0.5540	35.21	9.46	44.67	56.00	-11.33	QP	
4		0.5540	27.44	9.46	36.90	46.00	-9.10	AVG	
5		4.7460	27.07	9.46	36.53	56.00	-19.47	QP	
6		4.7460	22.97	9.46	32.43	46.00	-13.57	AVG	
7		23.4540	20.30	10.15	30.45	60.00	-29.55	QP	
8		23.4540	7.09	10.15	17.24	50.00	-32.76	AVG	

4. Radiated Emission Test

4.1 Test Standard and Limit

4.1.1 Test Standard

FCC Part 15.209

4.1.2 Test Limit

Radiated Emission Limit(9kHz~1000MHz)

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

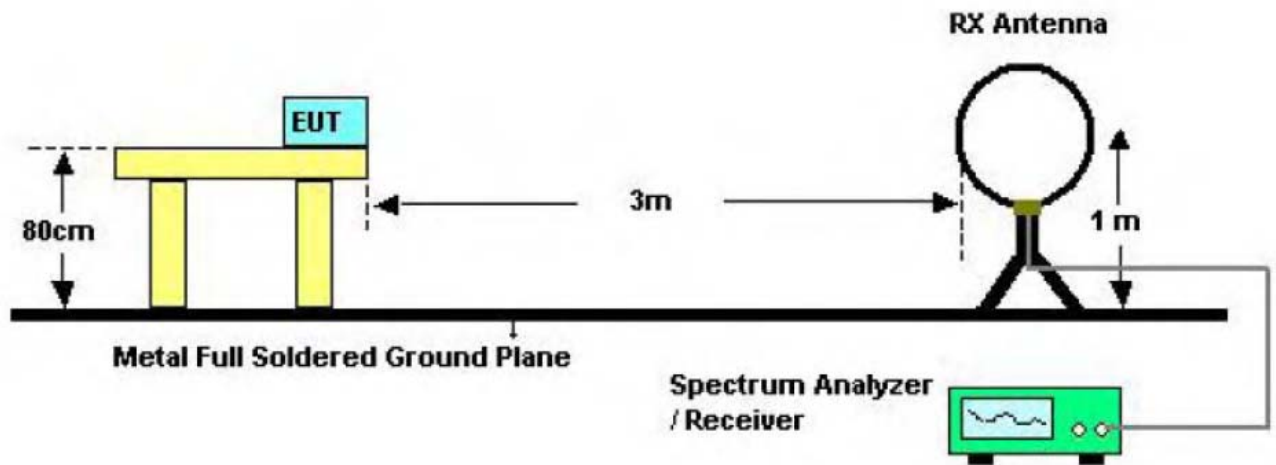
Radiated Emission Limit (Above 1000MHz)

Frequency (MHz)	Class A (dBUV/m)(at 3 M)		Class B (dBUV/m)(at 3 M)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

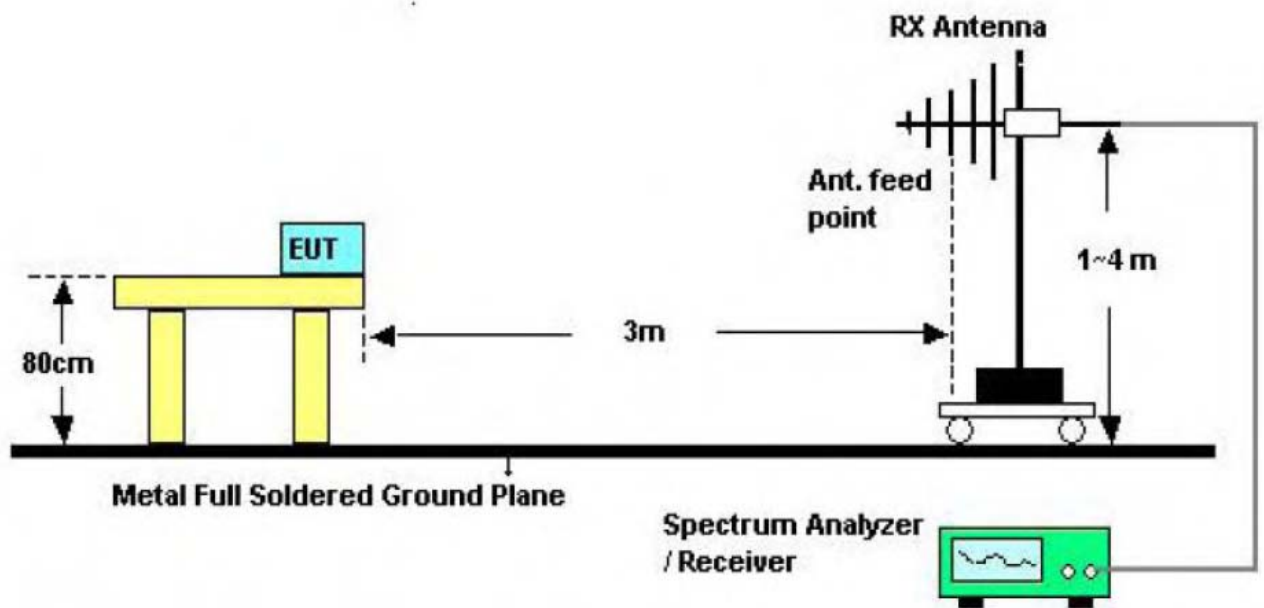
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBUV/m)=20log Emission Level(uV/m)

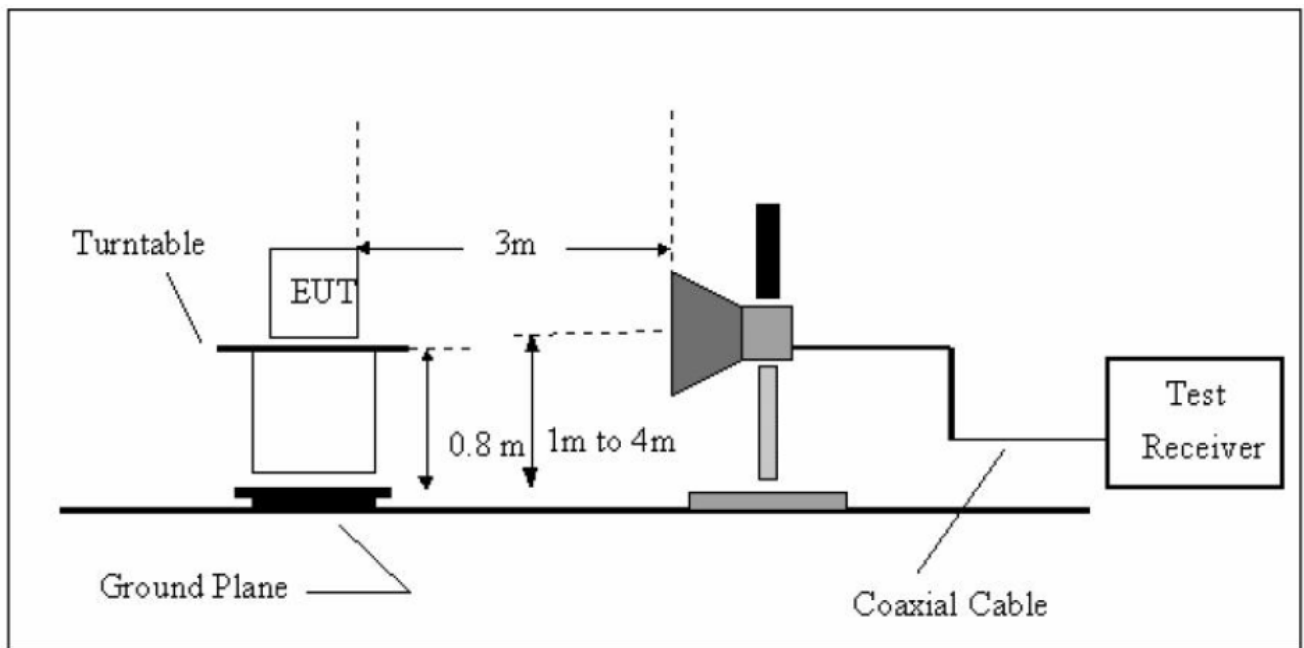
4.2 Test Setup



Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup



Above 1GHz Test Setup

4.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (5) For the actual test configuration, please see the test setup photo.

4.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

4.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2011-08-12	2012-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2011-08-12	2012-08-11
Trilog Broadband Antenna	SCHWARZBEC K	VULB9163	9163-333	2011-07-21	2012-07-20
Horn Antenna	SCHWARZBEC K	BBHX 9120	9120-426	2011-07-21	2012-07-20
RF Switch	EM	EMSW18	SW060023	2011-08-12	2012-08-11
Amplifier	Agilent	8447F	3113A06717	2011-08-12	2012-08-11
Coaxial Cable	SCHWARZBEC K	AK9513	9513-10	2011-08-12	2012-08-11
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2011-08-12	2012-08-11
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2011-08-12	2012-08-11
Receiver Horn Antenna	ROHDE& SCHWARZ	HF906	100013	2011-08-12	2012-08-11

4.6 Test Data

Please see the next page.

Operation Mode:	802.11b	Test Date :	July 04, 2012
	TX 2412MHz		
Frequency Range:	30~1000MHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit (3m) (dBuV/m)	Margin (dB)	Note
180.020	H	32.60	43.50	10.90	PK
260.410	H	33.45	46.00	12.55	PK
364.130	H	32.74	46.00	13.26	PK
495.730	H	38.61	46.00	7.39	PK
507.420	H	38.17	46.00	7.83	PK
755.190	H	40.35	46.00	5.65	PK
313.280	V	30.52	46.00	15.48	PK
497.650	V	35.71	46.00	10.29	PK
510.050	V	37.85	46.00	8.15	PK
625.230	V	38.24	46.00	7.76	PK
730.370	V	39.36	46.00	6.64	PK
770.460	V	38.27	46.00	7.73	PK

Note:

- (1) All Readings are Peak Value.
- (2) Emission Level= Reading Level+ Probe Factor +Cable Loss
- (3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:	802.11b TX 2412MHz	Test Date :	July 04, 2012
Frequency Range:	1-25GHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4826.120	V	54.06	44.21	74.00	54.00	19.94	9.79
7235.610	V	48.11	37.34	74.00	54.00	25.89	16.66
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4823.340	H	51.52	42.73	74.00	54.00	22.48	11.27
7234.850	H	45.70	36.87	74.00	54.00	28.30	17.13
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level + Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11b TX 2437MHz	Test Date :	July 04, 2012
Frequency Range:	1-25GHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4874.230	V	52.46	43.78	74.00	54.00	21.54	10.22
7310.520	V	47.16	38.11	74.00	54.00	26.84	15.89
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4874.260	H	50.32	41.49	74.00	54.00	23.68	12.51
7311.210	H	46.62	37.45	74.00	54.00	27.38	16.55
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level + Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11b TX 2462MHz	Test Date :	July 04, 2012
Frequency Range:	1-25GHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	E+mission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4924.950	V	52.35	42.86	74.00	54.00	21.65	11.14
7388.800	V	48.30	38.07	74.00	54.00	25.70	15.93
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4925.140	H	49.72	40.33	74.00	54.00	24.28	13.67
7388.900	H	46.42	37.19	74.00	54.00	27.58	16.81
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level + Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode: 802.11g TX 2412MHz Test Date : July 04, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Measured Distance: 3m Humidity : 65 %
 Test Voltage: DC 3.7V

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4826.200	V	52.32	43.66	74.00	54.00	21.68	10.34
7412.420	V	46.40	37.05	74.00	54.00	27.60	16.95
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4830.100	H	50.11	42.34	74.00	54.00	22.13	7.58
7235.510	H	45.73	36.19	74.00	54.00	31.44	15.31
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level + Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode: 802.11g TX 2437MHz Test Date : July 04, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Measured Distance: 3m Humidity : 65 %
 Test Voltage: DC 3.7V

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4885.360	V	51.63	42.08	74.00	54.00	22.37	11.92
7321.200	V	46.74	37.40	74.00	54.00	27.26	16.60
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4874.270	H	49.38	40.26	74.00	54.00	24.62	13.74
7318.210	H	44.19	35.39	74.00	54.00	29.81	18.61
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level + Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11g TX 2462MHz	Test Date :	July 04, 2012
Frequency Range:	1-25GHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4927.200	V	51.06	41.75	74.00	54.00	22.94	12.25
7391.230	V	46.09	37.27	74.00	54.00	27.91	16.73
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4926.520	H	49.04	40.42	74.00	54.00	24.96	13.58
7390.470	H	45.13	36.02	74.00	54.00	28.87	17.98
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level + Probe Factor +Cable Loss
(3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode: 802.11n(20M) TX 2412MHz Test Date : July 04, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Measured Distance: 3m Humidity : 65 %
 Test Voltage: DC 3.7V

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4829.120	V	48.61	40.39	74.00	54.00	25.39	13.61
7240.310	V	43.95	34.76	74.00	54.00	30.05	19.24
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4829.600	H	46.07	38.71	74.00	54.00	27.93	15.29
7233.470	H	42.25	33.73	74.00	54.00	31.75	20.27
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level + Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode: 802.11n Test Date : July 04, 2012
 TX 2437MHz
 Frequency Range: 1-25GHz Temperature : 28 °C
 Measured Distance: 3m Humidity : 65 %
 Test Voltage: DC 3.7V

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4887.120	V	49.16	42.41	74.00	54.00	24.84	11.59
7330.290	V	42.07	34.61	74.00	54.00	31.93	19.39
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4886.920	H	46.15	37.84	74.00	54.00	27.85	16.16
7331.260	H	41.67	33.63	74.00	54.00	32.33	20.37
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level + Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11n TX 2462MHz	Test Date :	July 04, 2012
Frequency Range:	1-25GHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4928.100	V	48.43	41.09	74.00	54.00	25.57	12.91
7392.320	V	41.72	35.44	74.00	54.00	32.28	18.56
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4930.230	H	45.71	39.82	74.00	54.00	28.29	14.18
7392.140	H	40.60	34.27	74.00	54.00	33.40	19.73
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level + Probe Factor +Cable Loss
(3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode: 802.11n(40M) TX 2422MHz Test Date : July 04, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Measured Distance: 3m Humidity : 65 %
 Test Voltage: DC 3.7V

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4839.190	V	46.07	40.71	74.00	54.00	27.93	13.29
7254.200	V	42.31	35.38	74.00	54.00	31.69	18.62
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4836.400	H	44.21	39.07	74.00	54.00	29.79	14.93
7260.120	H	40.17	34.39	74.00	54.00	33.83	19.61
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level + Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode: 802.11n(40M) TX 2437MHz Test Date : July 04, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Measured Distance: 3m Humidity : 65 %
 Test Voltage: DC 3.7V

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4879.710	V	46.47	39.82	74.00	54.00	27.53	14.18
7439.200	V	41.87	35.28	74.00	54.00	32.13	18.72
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4879.260	H	43.76	37.41	74.00	54.00	30.24	16.59
7342.340	H	39.68	34.72	74.00	54.00	34.32	19.28
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level + Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	802.11n(40M) TX 2452MHz	Test Date :	July 04, 2012
Frequency Range:	1-25GHz	Temperature :	28 °C
Measured Distance:	3m	Humidity :	65 %
Test Voltage:	DC 3.7V		

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)		Limit3m (dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4911.300	V	45.24	39.37	74.00	54.00	28.76	14.63
7362.480	V	40.83	34.79	74.00	54.00	33.17	19.21
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
--	V	--	--	74.00	54.00	--	--
4920.230	H	42.07	37.41	74.00	54.00	31.93	16.59
7365.370	H	38.36	33.52	74.00	54.00	35.64	20.48
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--
--	H	--	--	74.00	54.00	--	--

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level + Probe Factor +Cable Loss
(3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Restricted Bands Requirement

5.1 Test Standard and Limit

5.1.1 Test Standard

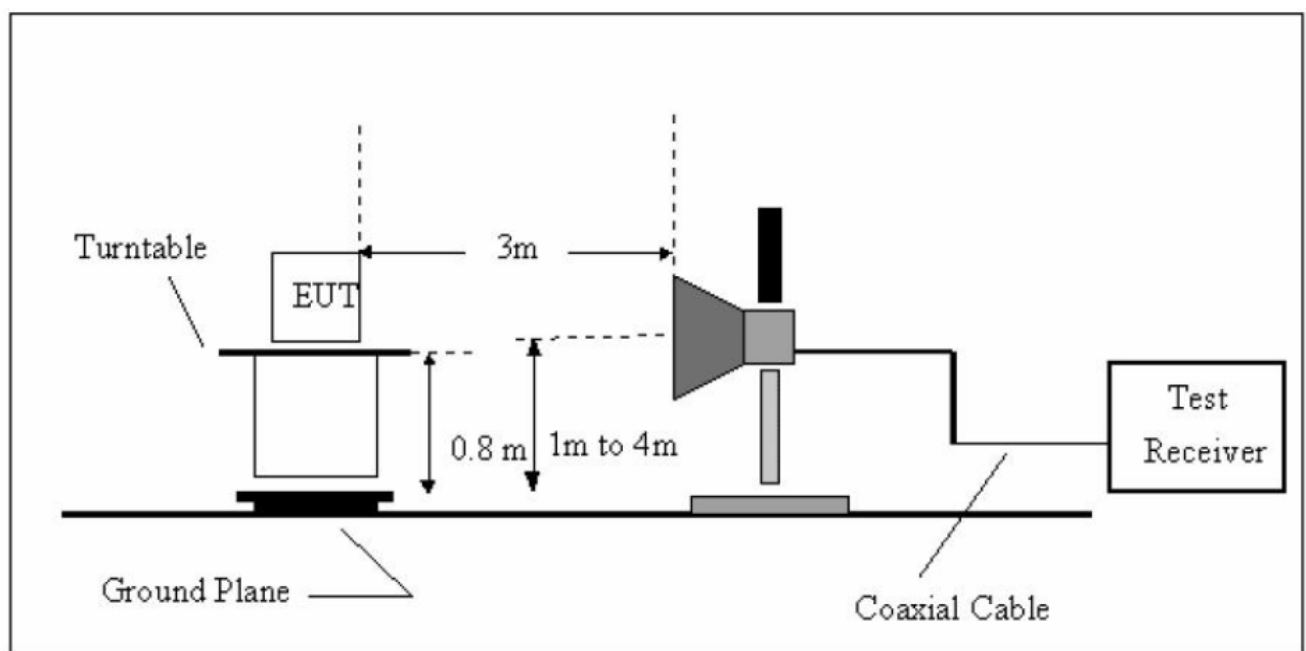
FCC Part 15.209

FCC Part 15.205

5.1.2 Test Limit

Restricted Frequency Band (MHz)	Class B (dBuV/m)(at 3 M)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

5.2 Test Setup



5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

- (4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (5) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2011-08-12	2012-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2011-08-12	2012-08-11
Trilog Broadband Antenna	SCHWARZBEC K	VULB9163	9163-333	2011-07-21	2012-07-20
Horn Antenna	SCHWARZBEC K	BBHX 9120	9120-426	2011-07-21	2012-07-20
RF Switch	EM	EMSW18	SW060023	2011-08-12	2012-08-11
Amplifier	Agilent	8447F	3113A06717	2011-08-12	2012-08-11
Coaxial Cable	SCHWARZBEC K	AK9513	9513-10	2011-08-12	2012-08-11
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2011-08-12	2012-08-11
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2011-08-12	2012-08-11
Receiver Horn Antenna	ROHDE& SCHWARZ	HF906	100013	2011-08-12	2012-08-11

5.6 Test Data

Please see the next page.

Spectrum Detector: PK
Temperature : 28 °C

Test Date : July 06, 2012
Humidity : 65 %

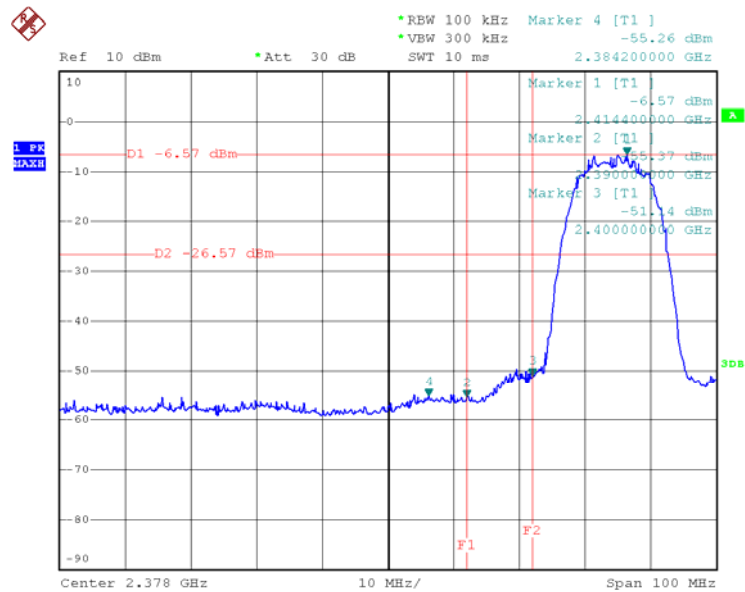
802.11b Mode

1. Conducted Test

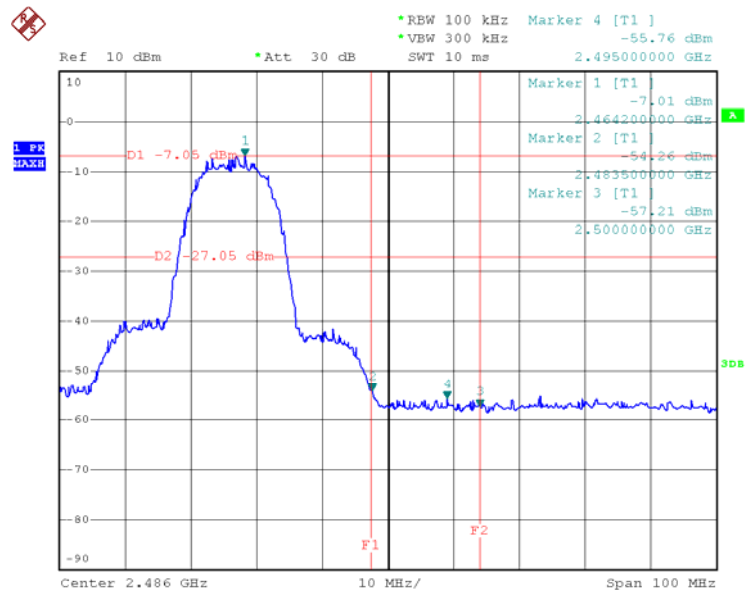
Frequency (MHz)	Peak Power Output(dBm)	Emission Read Value(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
<2400	-6.57	-55.26	48.69	>20dBc
>2483.5	-7.05	-55.76	48.71	>20dBc

2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PEAK	AV	PEAK	AV
<2400	H	50.21	44.07	74.00	54.00
<2400	V	48.72	41.39	74.00	54.00
>2483.5	H	51.47	44.78	74.00	54.00
>2483.5	V	50.26	43.62	74.00	54.00



Date: 6.JUL.2012 16:41:01



Date: 6.JUL.2012 16:54:29

Spectrum Detector: PK
Temperature : 28 °C

Test Date : July 06, 2012
Humidity : 65 %

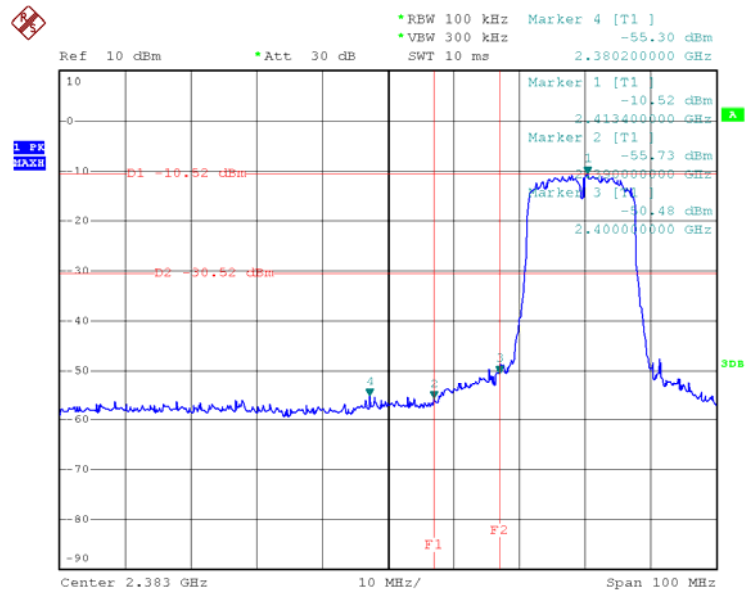
802.11g Mode

1. Conducted Test

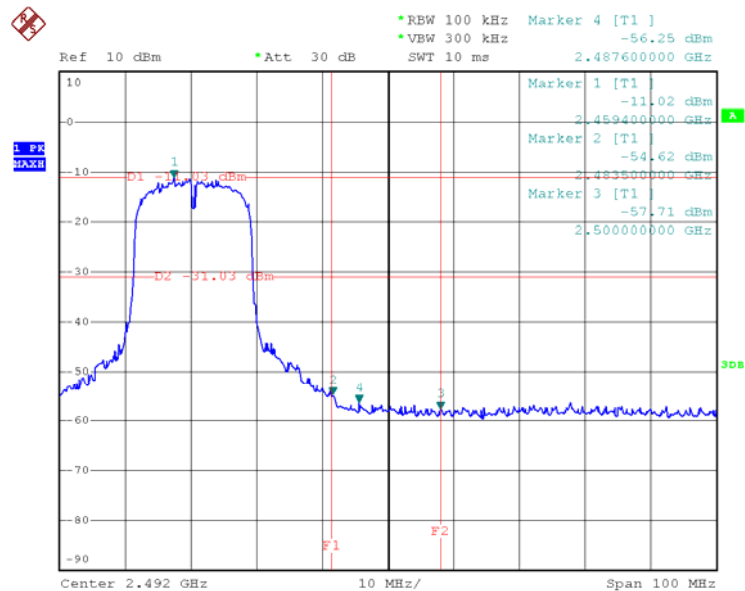
Frequency (MHz)	Peak Power Output(dBm)	Emission Read Value(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
<2400	-10.52	-55.30	44.78	>20dBc
>2483.5	-11.03	-56.25	45.22	>20dBc

2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PEAK	AV	PEAK	AV
<2400	H	52.35	45.71	74.00	54.00
<2400	V	50.96	44.06	74.00	54.00
>2483.5	H	53.16	45.96	74.00	54.00
>2483.5	V	52.73	44.27	74.00	54.00



Date: 6.JUL.2012 17:18:08



Date: 6.JUL.2012 17:48:37

Spectrum Detector: PK
Temperature : 28 °C

Test Date : July 06, 2012
Humidity : 65 %

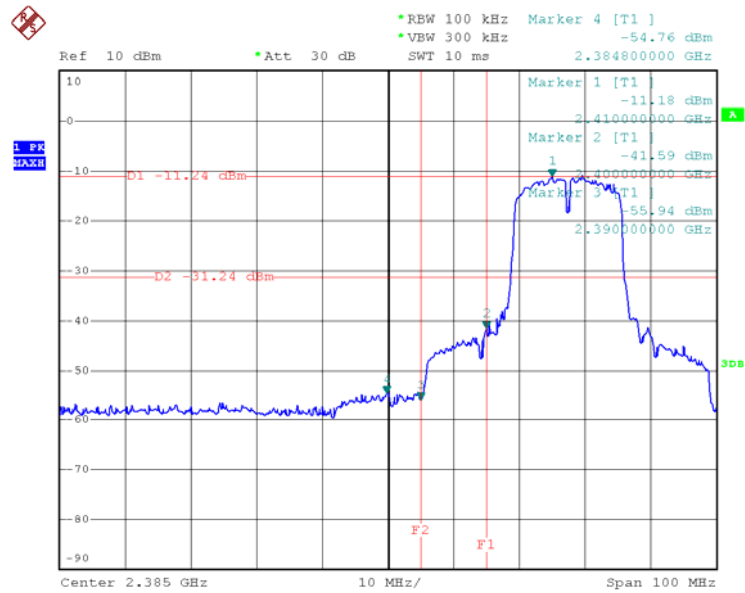
802.11n (20M) Mode

1. Conducted Test

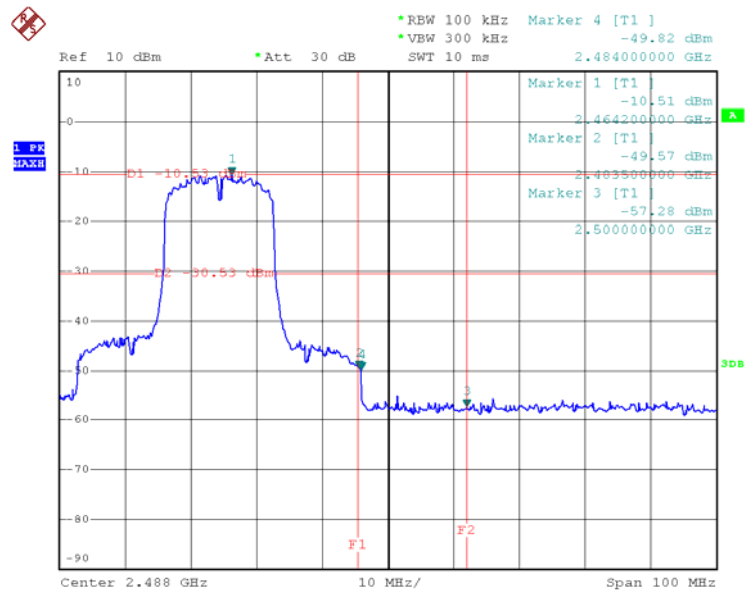
Frequency (MHz)	Peak Power Output(dBm)	Emission Read Value(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
<2400	-11.24	-54.76	43.52	>20dBc
>2483.5	-10.53	-49.82	39.29	>20dBc

2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PEAK	AV	PEAK	AV
<2400	H	51.45	42.34	74.00	54.00
<2400	V	50.38	40.27	74.00	54.00
>2483.5	H	51.73	41.89	74.00	54.00
>2483.5	V	49.88	41.60	74.00	54.00



Date: 6.JUL.2012 17:34:34



Date: 6.JUL.2012 17:02:59

Spectrum Detector: PK
Temperature : 28 °C

Test Date : July 06, 2012
Humidity : 65 %

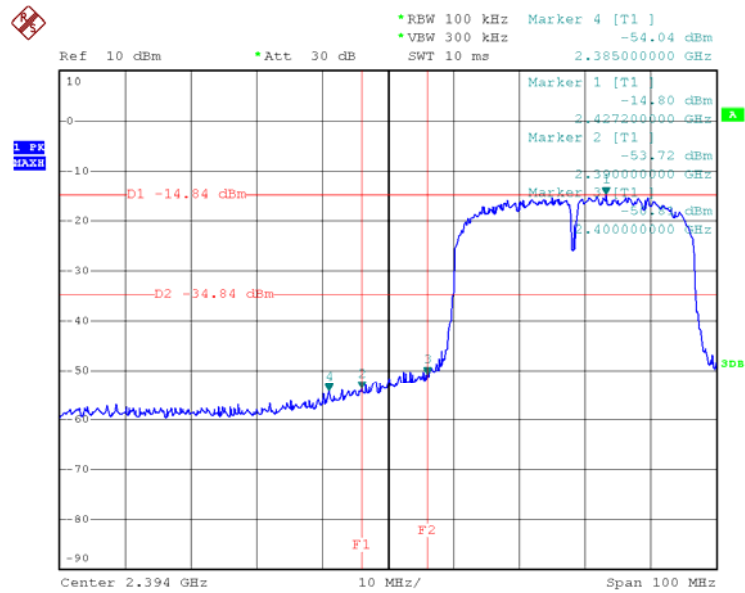
802.11n (40M) Mode

1. Conducted Test

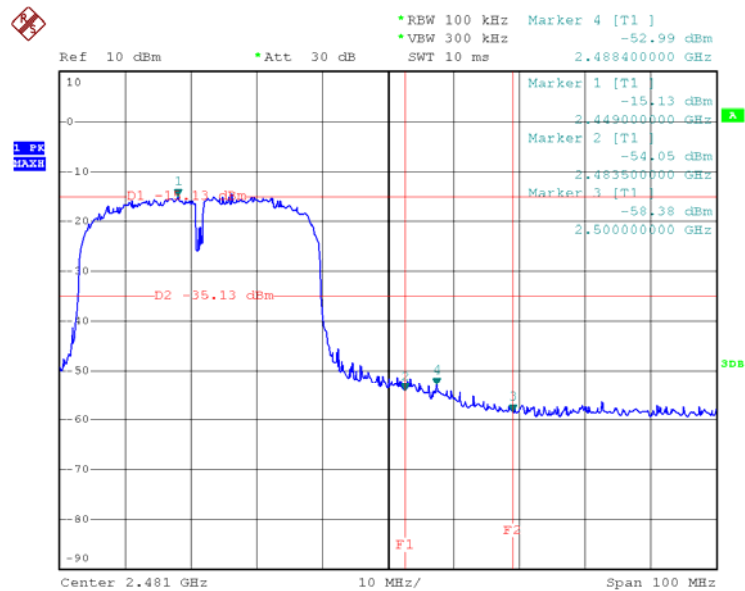
Frequency (MHz)	Peak Power Output(dBm)	Emission Read Value(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
<2400	-14.84	-54.04	39.20	>20dBc
>2483.5	-15.13	-52.99	37.86	>20dBc

2. Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PEAK	AV	PEAK	AV
<2400	H	52.74	42.93	74.00	54.00
<2400	V	50.63	41.75	74.00	54.00
>2483.5	H	52.63	42.48	74.00	54.00
>2483.5	V	50.16	40.79	74.00	54.00



Date: 6.JUL.2012 18:18:09



SLTG

Date: 6.JUL.2012 17:56:13

6. Bandwidth Test

6.1 Test Standard and Limit

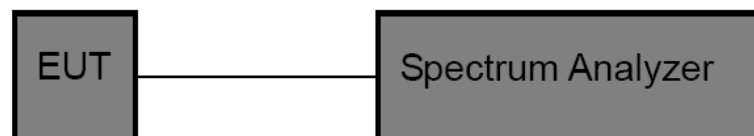
8.1.1 Test Standard

FCC Part 15.247 (a)(2)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Bandwidth	≥ 500 KHz (6dB bandwidth)	2400~2483.5

6.2 Test Setup



6.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:300 kHz, and Video Bandwidth:1MHz, Detector: Peak, Sweep Time set auto.

6.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

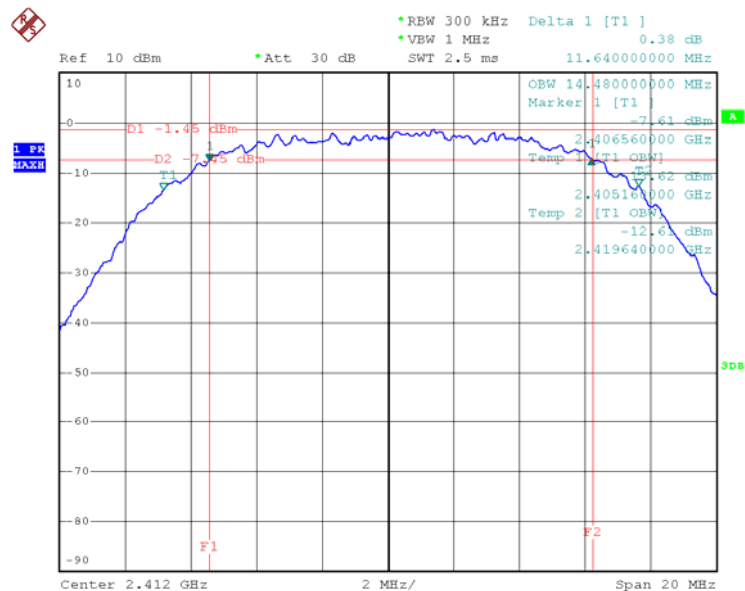
6.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2011-08-12	2012-08-11

6.6 Test Data

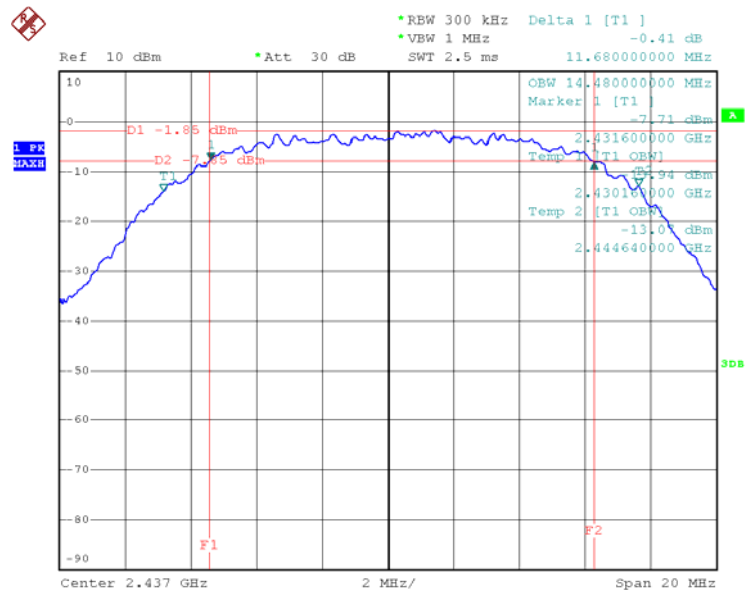
802.11b			
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit
2412	11.64	14.48	>=500 kHz
2437	11.68	14.48	>=500 kHz
2462	11.84	14.48	>=500 kHz

2412 MHz



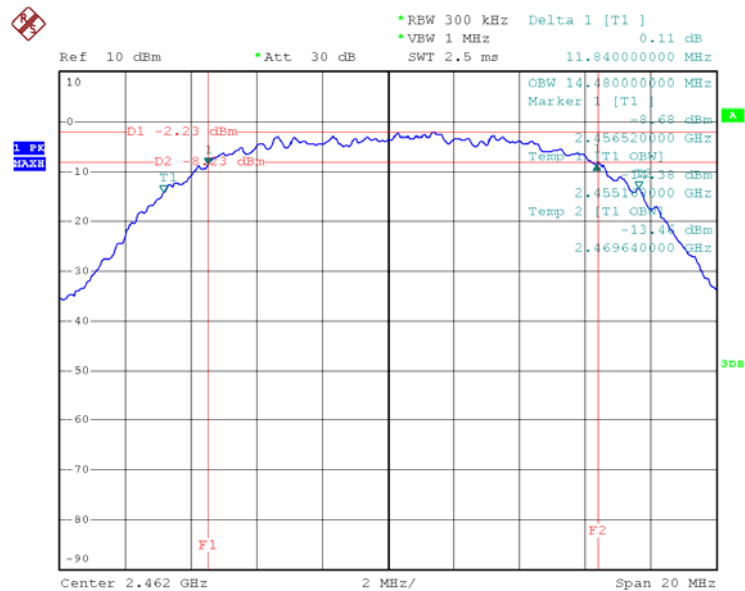
Date: 6.JUL.2012 16:37:09

2437 MHz



Date: 6.JUL.2012 16:46:46

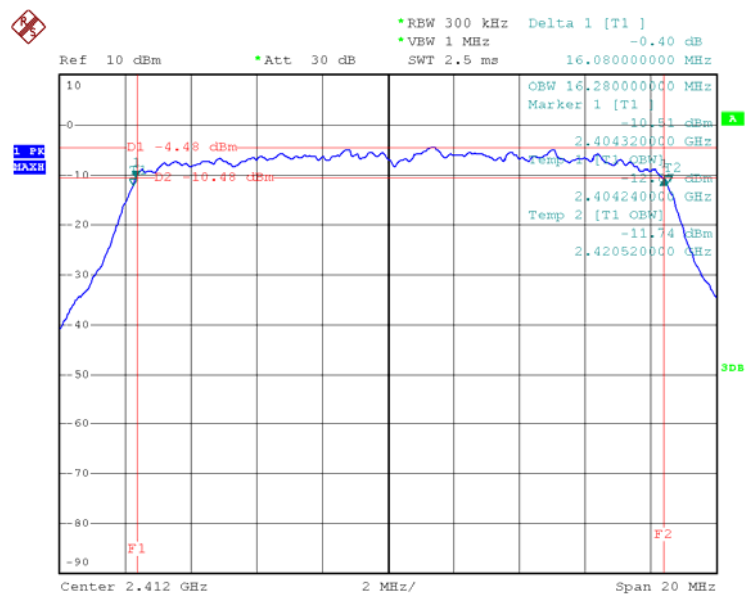
2462 MHz



Date: 6.JUL.2012 16:52:16

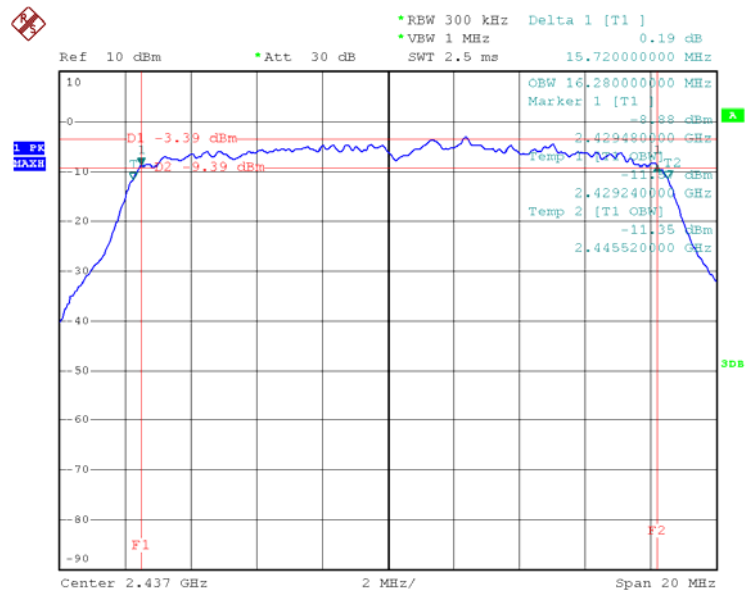
802.11g			
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit
2412	16.08	16.28	>=500 kHz
2437	15.72	16.28	>=500 kHz
2462	16.12	16.32	>=500 kHz

2412 MHz



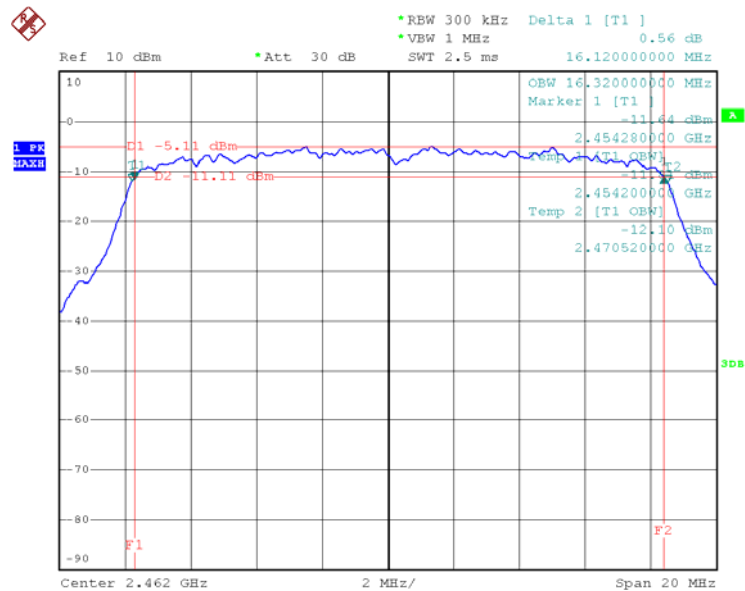
Date: 6.JUL.2012 17:16:52

2437 MHz



Date: 6.JUL.2012 17:07:54

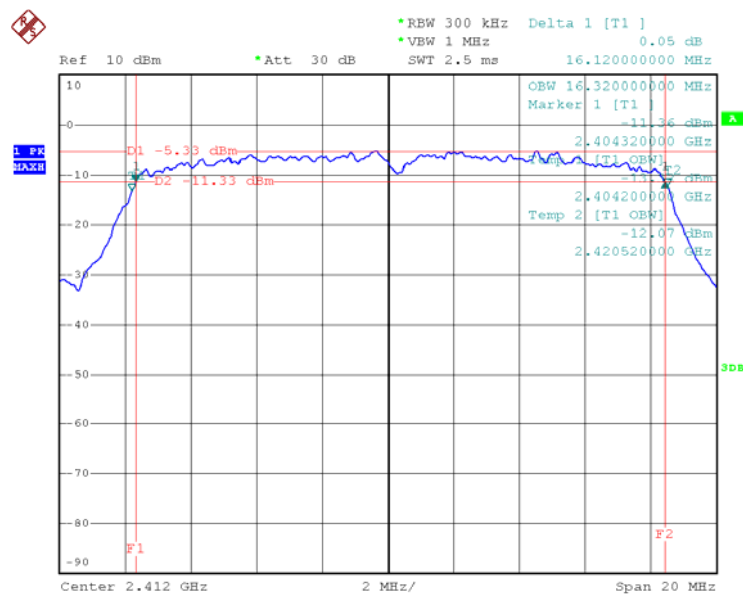
2462 MHz



Date: 6.JUL.2012 17:01:34

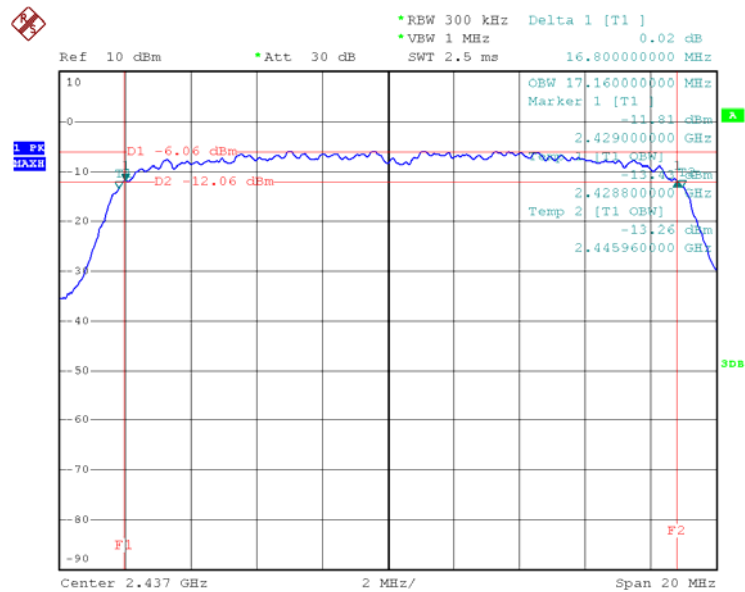
802.11n (20M)			
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit
2412	16.12	16.32	>=500 kHz
2437	16.80	17.16	>=500 kHz
2462	16.68	17.16	>=500 kHz

2412 MHz



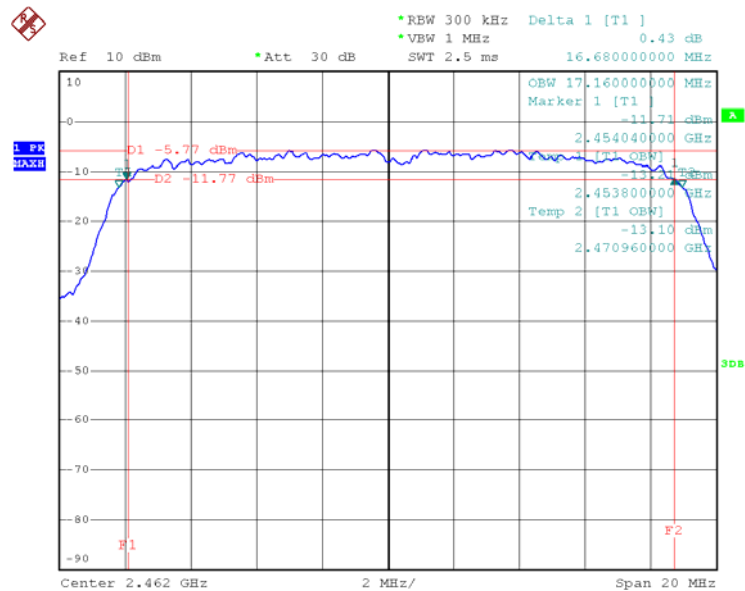
Date: 6.JUL.2012 17:32:34

2437 MHz



Date: 6.JUL.2012 17:42:21

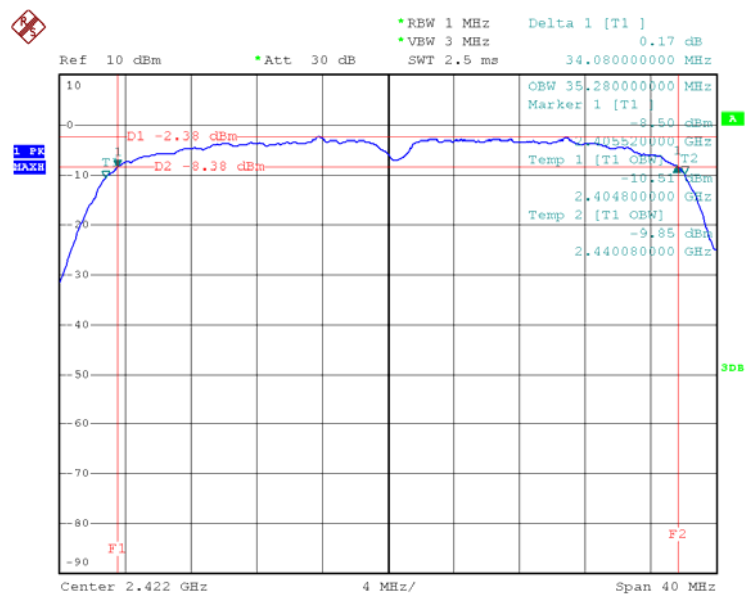
2462 MHz



Date: 6.JUL.2012 17:47:08

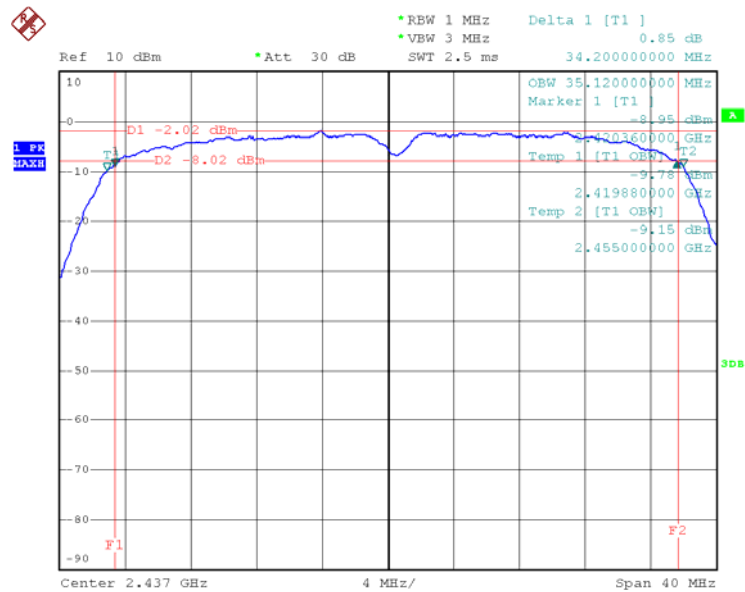
802.11n (40M)			
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit
2422	34.08	35.28	>=500 kHz
2437	34.20	35.12	>=500 kHz
2452	33.76	35.20	>=500 kHz

2422 MHz



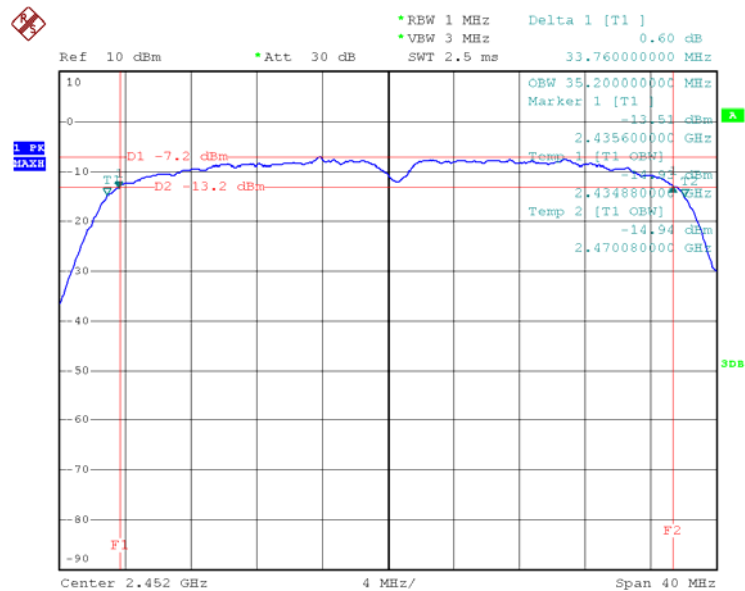
Date: 19.JUL.2012 10:46:22

2437 MHz



Date: 19.JUL.2012 11:08:24

2452 MHz



SLTG

Date: 19.JUL.2012 11:17:39

7. Peak Output Power Test

7.1 Test Standard and Limit

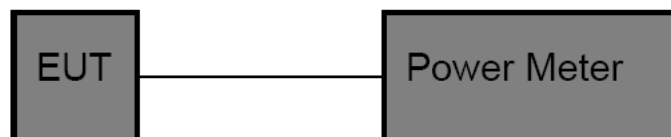
9.1.1 Test Standard

FCC Part 15.247 (b)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

7.2 Test Setup



7.3 Test Procedure

The EUT was directly connected to the power meter and antenna output port as show in the block diagram above.

7.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

7.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Power Meter	Boonton	4232A	29002	2011-08-12	2012-08-11
Power Sensor	Boonton	51085	31286	2011-08-12	2012-08-11
Power Meter	Agilent	N1912A	MY451016	2012-06-19	2013-06-18
Power Sensor	Agilent	N1921A	MY452419	2012-06-19	2013-06-18

7.6 Test Data

Note: Boonton Power Meter for b/g/n(20M), Agilent Power Meter for n(40M).

801.11b Mode			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH01	2412	12.89	30
CH 06	2437	12.85	30
CH11	2462	12.76	30

801.11g Mode			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH01	2412	11.24	30
CH 06	2437	11.56	30
CH11	2462	10.85	30

801.11n(20M) Mode-ANT 0			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH01	2412	10.24	30
CH 06	2437	9.92	30
CH11	2462	10.11	30

801.11n(20M) Mode-ANT 1			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH01	2412	9.35	30
CH 06	2437	9.27	30
CH11	2462	9.30	30

801.11n(40M) Mode-ANT 0			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH03	2412	9.86	30
CH 06	2437	9.74	30
CH09	2462	9.62	30

801.11n(40M) Mode-ANT 1			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH03	2412	9.15	30
CH 06	2437	9.20	30
CH09	2462	9.04	30

801.11n(20M) Mode-ANT 0+ANT 1			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH01	2412	12.83	27
CH 06	2437	12.62	27
CH11	2462	12.73	27

801.11n(40M) Mode-ANT 0+ANT 1			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
CH03	2412	12.53	27
CH 06	2437	12.49	27
CH09	2462	12.35	27

Note: (1) Antenna Gain=0 dBi.

(2) RF conducted output power were measured individually by each antenna port, and the total power was summed up mathematically.

(3) The Equipment have two antenna 2T2R, so

Directional Gain= $G(\text{ANT})+10\log(N)$ dBi,

(4) Directional Gain= $0+10\log(2)=3$ dBi, so the out power limit is 27 dBm.

8. Power Spectral Density Test

8.1 Test Standard and Limit

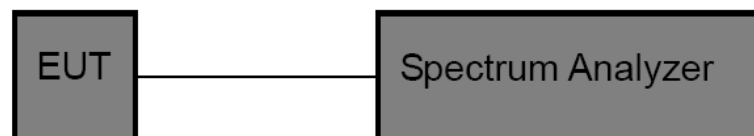
8.1.1 Test Standard

FCC Part 15.247 (e)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

8.2 Test Setup



8.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Measure the spectral power density the spectrum analyzer was set to Resolution Bandwidth=100 kHz, and Video Bandwidth $\geq$ 300 kHz, Detector: Peak, Span to 5%~30% greater than EBW, Sweep time auto.
- (3) Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a BWCF=-15.2 dB.

8.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

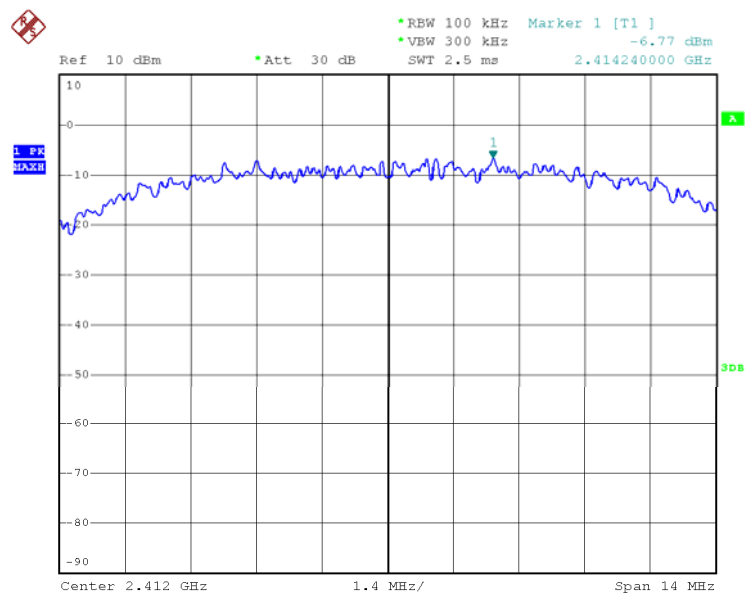
8.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2011-08-12	2012-08-11

8.6 Test Data

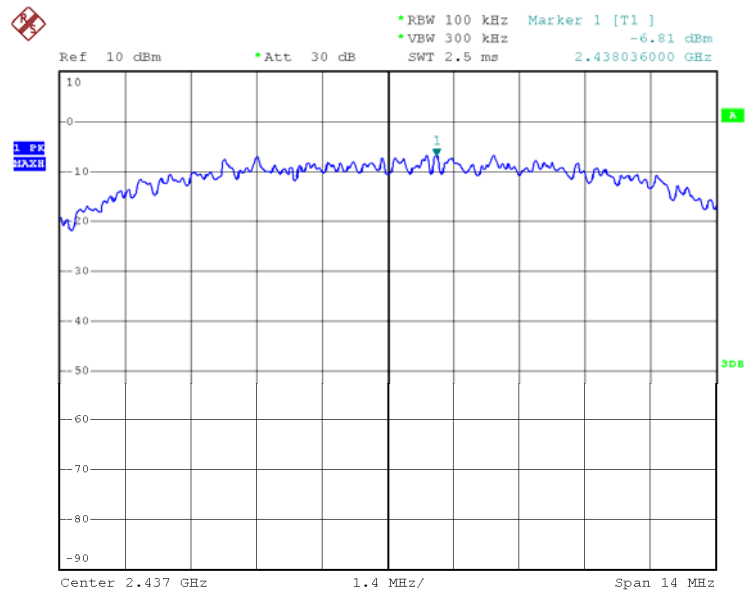
801.11b Mode				
Test Channel	Frequency (MHz)	Power Level (100 kHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 01	2412	-6.77	-21.97	8
CH 06	2437	-6.81	-22.01	8
CH 11	2462	-7.23	-22.43	8
Note: Power Density=Power Level-15.2				

2412 MHz



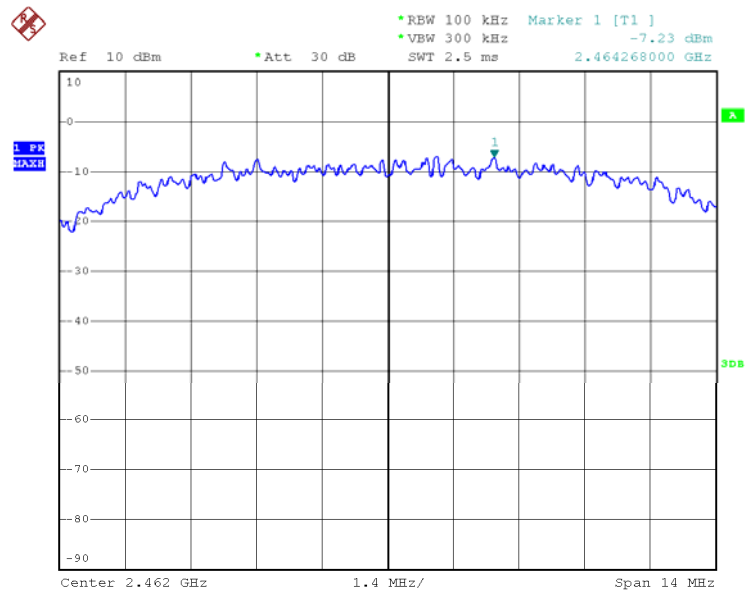
Date: 6.JUL.2012 16:42:10

2437 MHz



Date: 6.JUL.2012 16:47:51

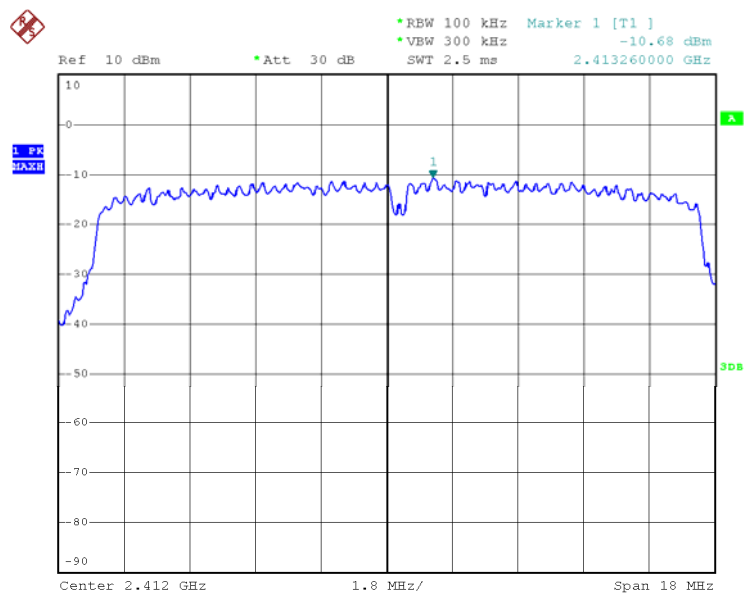
2462 MHz



Date: 6.JUL.2012 16:55:12

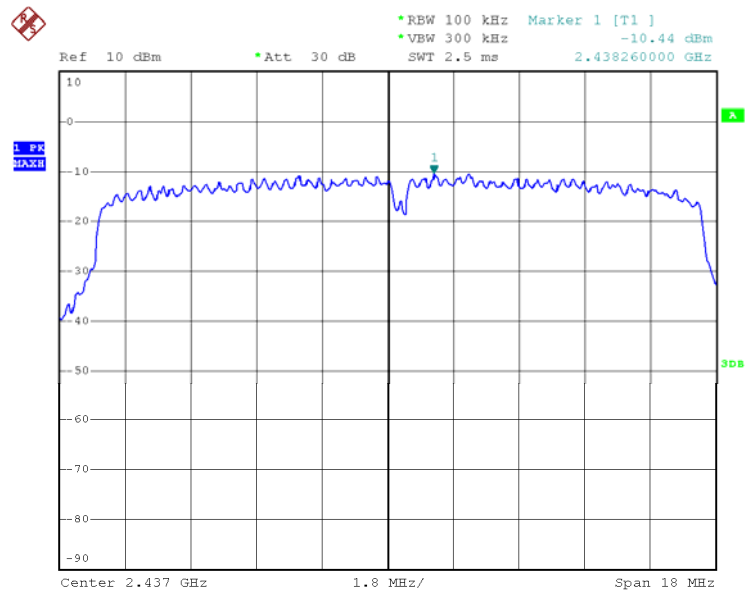
801.11g Mode				
Test Channel	Frequency (MHz)	Power Level (100 kHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 01	2412	-10.68	-25.88	8
CH 06	2437	-10.44	-25.64	8
CH 11	2462	-7.93	-23.13	8
Note: Power Density=Power Level-15.2				

2412 MHz



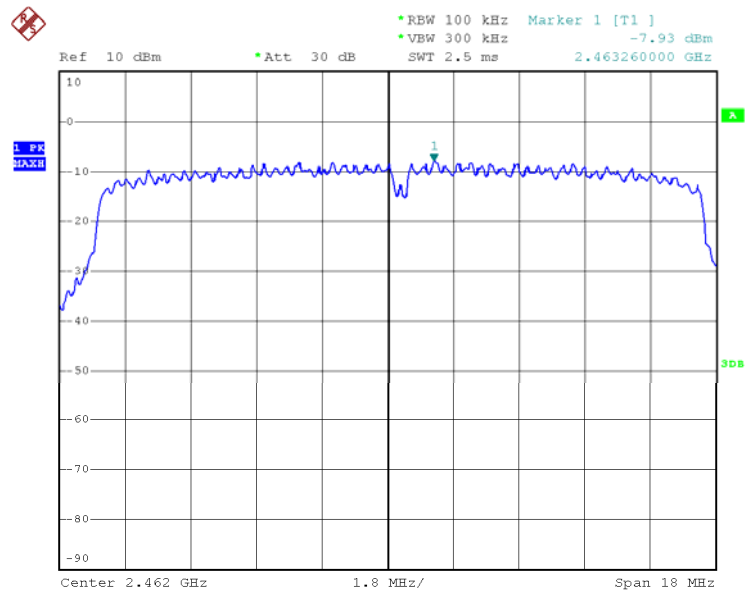
Date: 6.JUL.2012 17:19:22

2437 MHz



Date: 6.JUL.2012 17:09:51

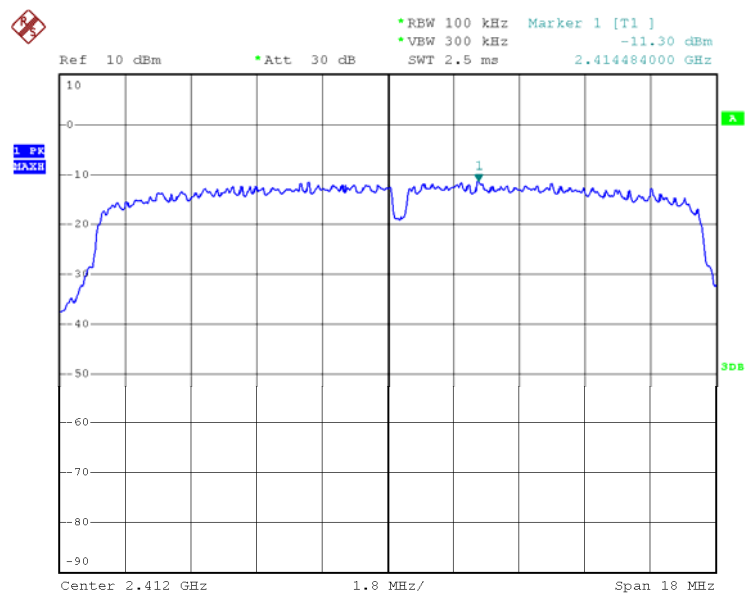
2462 MHz



Date: 6.JUL.2012 17:23:21

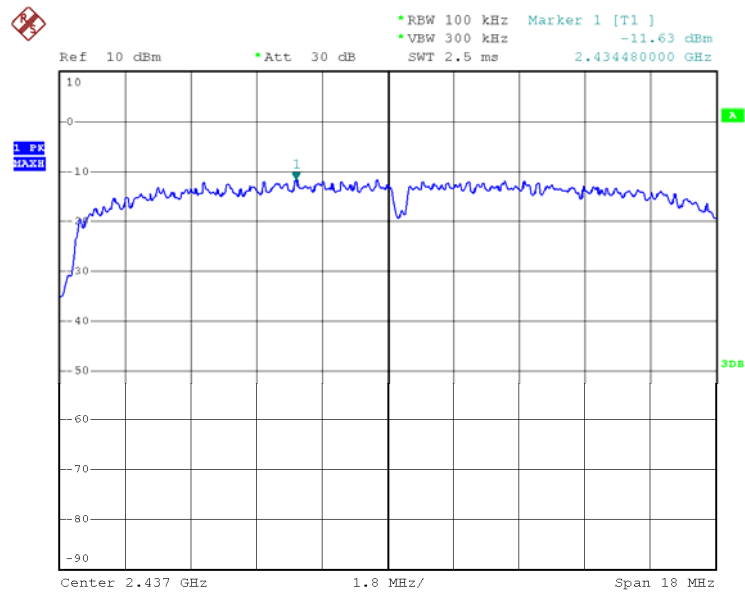
801.11n(20M) Mode-ANT 0				
Test Channel	Frequency (MHz)	Power Level (100 kHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 01	2412	-11.30	-26.50	8
CH 06	2437	-11.63	-26.83	8
CH 11	2462	-11.27	-26.47	8
Note: Power Density=Power Level-15.2				

2412 MHz



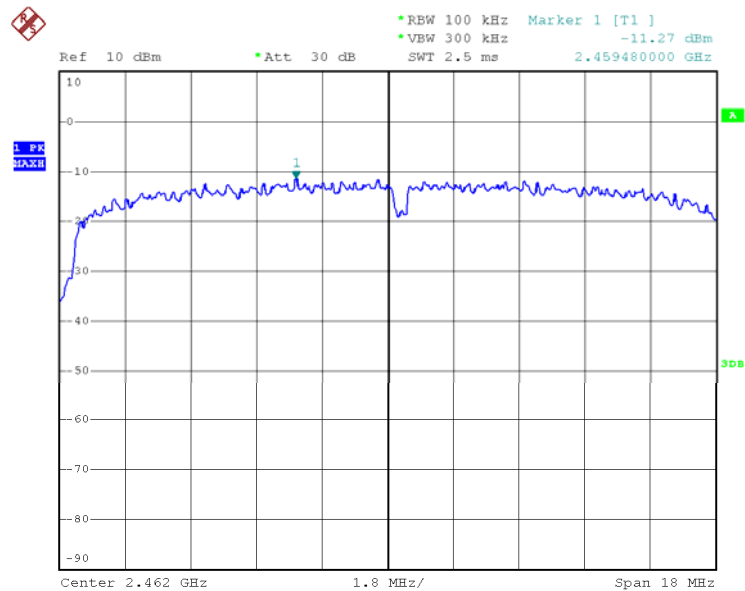
Date: 6.JUL.2012 17:35:53

2437 MHz



Date: 6.JUL.2012 17:43:07

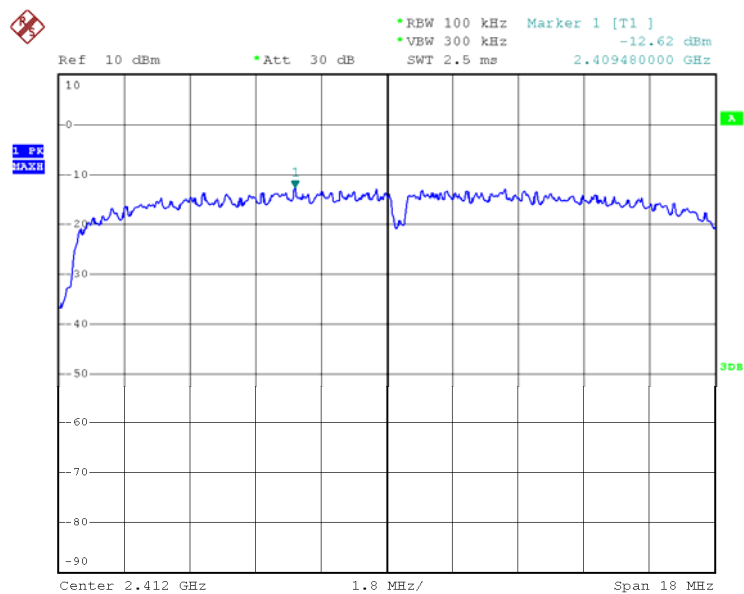
2462 MHz



Date: 6.JUL.2012 17:49:25

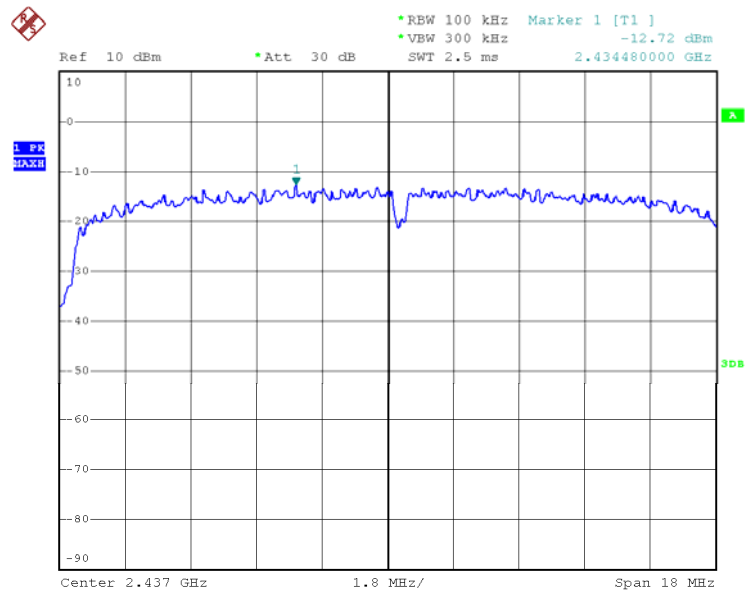
801.11n(20M) Mode-ANT 1				
Test Channel	Frequency (MHz)	Power Level (100 kHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 01	2412	-12.62	-27.82	8
CH 06	2437	-12.72	-27.92	8
CH 11	2462	-13.06	-28.26	8
Note: Power Density=Power Level-15.2				

2422 MHz



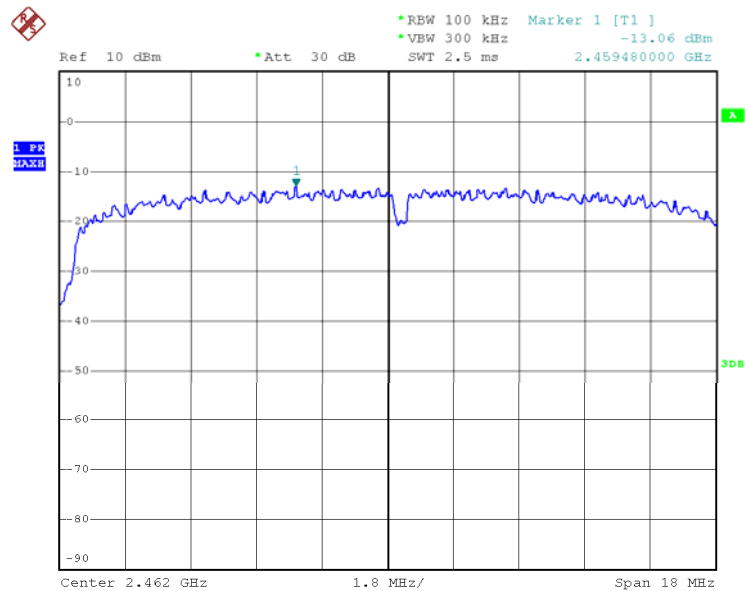
Date: 9.JUL.2012 16:14:41

2437 MHz



Date: 9.JUL.2012 16:23:24

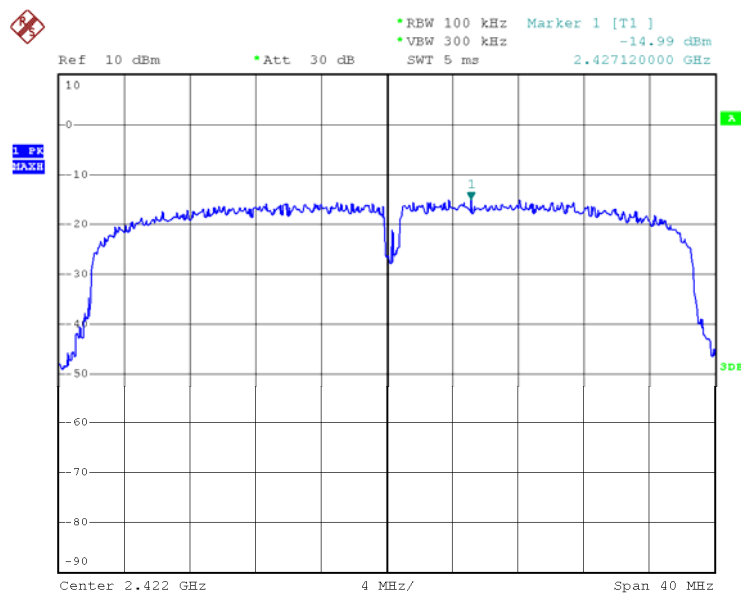
2462 MHz



Date: 9.JUL.2012 16:32:31

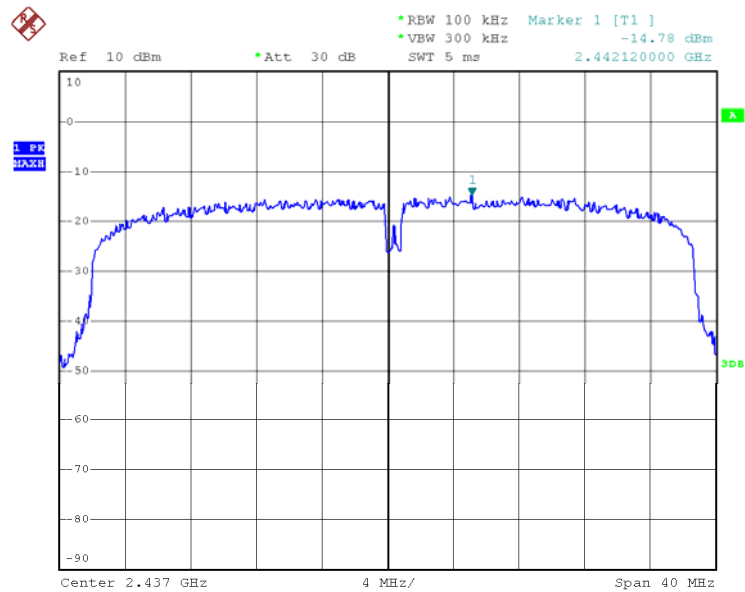
801.11n(40M) Mode-ANT 0				
Test Channel	Frequency (MHz)	Power Level (100 kHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 03	2422	-14.99	-30.19	8
CH 06	2437	-14.78	-29.98	8
CH 09	2452	-15.21	-26.47	8
Note: Power Density=Power Level-15.2				

2422 MHz



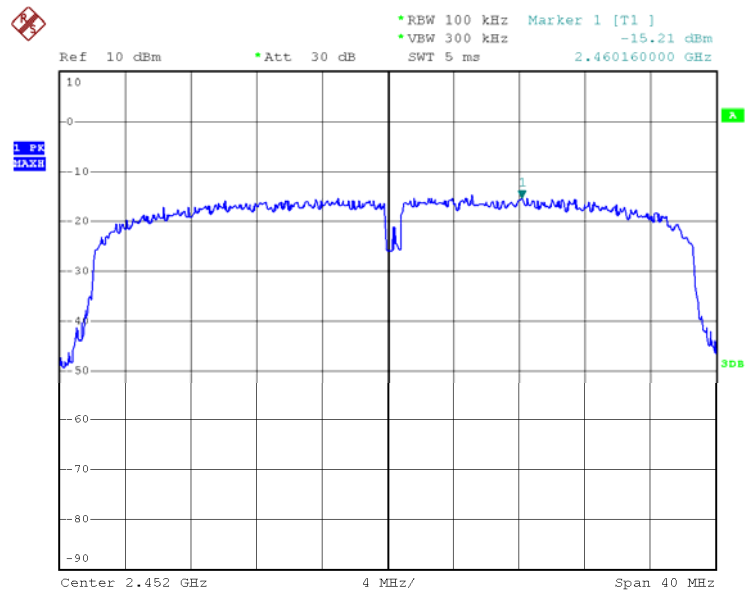
Date: 6.JUL.2012 18:19:03

2437 MHz



Date: 6.JUL.2012 18:07:31

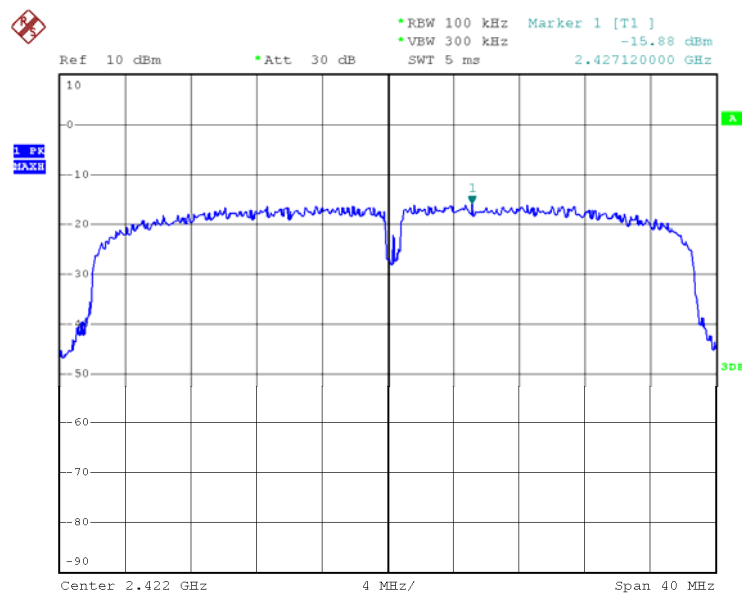
2452 MHz



Date: 6.JUL.2012 17:57:12

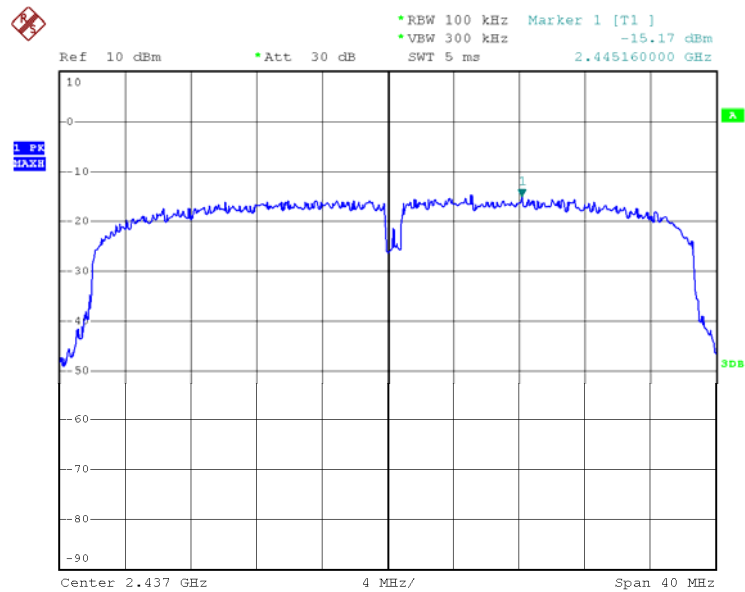
801.11n(40M) Mode-ANT 1				
Test Channel	Frequency (MHz)	Power Level (100 kHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 03	2422	-15.88	-31.08	8
CH 06	2437	-15.17	-30.37	8
CH 09	2452	-15.71	-30.91	8
Note: Power Density=Power Level-15.2				

2422 MHz



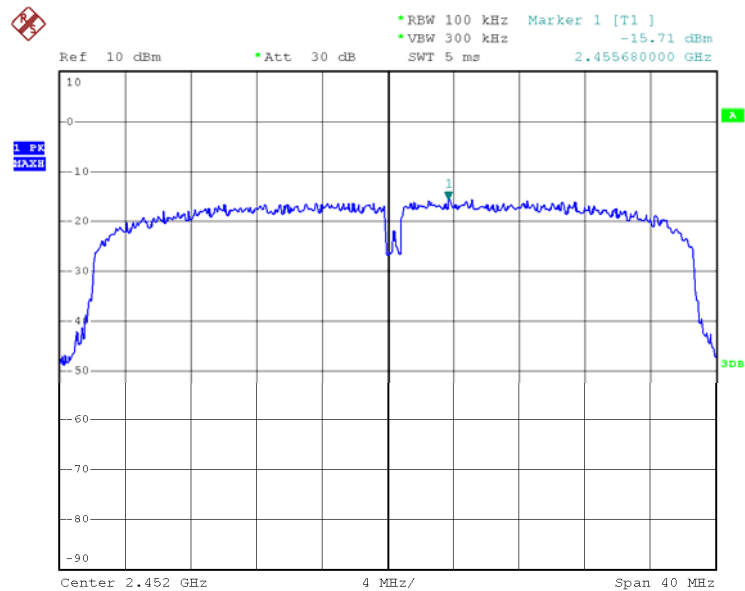
Date: 9.JUL.2012 15:35:57

2437 MHz



Date: 9.JUL.2012 15:55:16

2452 MHz



Date: 9.JUL.2012 16:03:11

801.11n(20M) Mode-ANT 0+ANT 1			
Test Channel	Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 01	2412	-24.10	5
CH 06	2437	-24.33	5
CH 11	2462	-24.40	5

801.11n(40M) Mode-ANT 0+ANT 1			
Test Channel	Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)
CH 03	2412	-27.60	5
CH 06	2437	-27.16	5
CH 09	2462	-25.13	5

Note: (1) Antenna Gain=0 dBi.

(2) RF conducted output power were measured individually by each antenna port, and the total power was summed up mathematically.

(3) The Equipment have two antenna 2T2R, so

Directional Gain=G(ANT)+10log(N) dBi,

(4) Directional Gain=0+10log(2)=3 dBi, so the power density limit is 5dBm.

9. Antenna Conducted Spurious Emission

9.1 Test Standard and Limit

10.1.1 Test Standard

FCC Part 15.247 (c)(d)

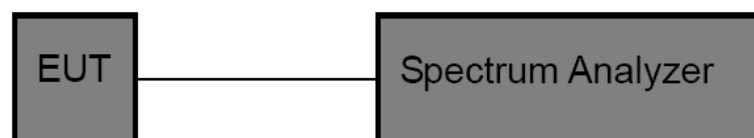
10.1.2 Test Limit

(1) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above~960	500	3

(2) If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

9.2 Test Setup



9.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Spectrum Setting:
RBW=100 KHz, VBW=300 KHz.
Frequency range: from 30MHz to 26.5 GHz.

9.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

9.5 Test Equipment

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2011-08-12	2012-08-11

9.6 Test Data

Unwanted Emission Level of Non-Restricted Frequency Bands

801.11b Mode				
Test Channel	Max. Emission Level (dBm)	Power Density (dBm)	Limit (dBm)	Result
CH 01	-57.35	-21.97	-41.97	Compliance
CH 06	-57.20	-22.01	-40.01	Compliance
CH 11	-57.54	-22.43	-42.43	Compliance

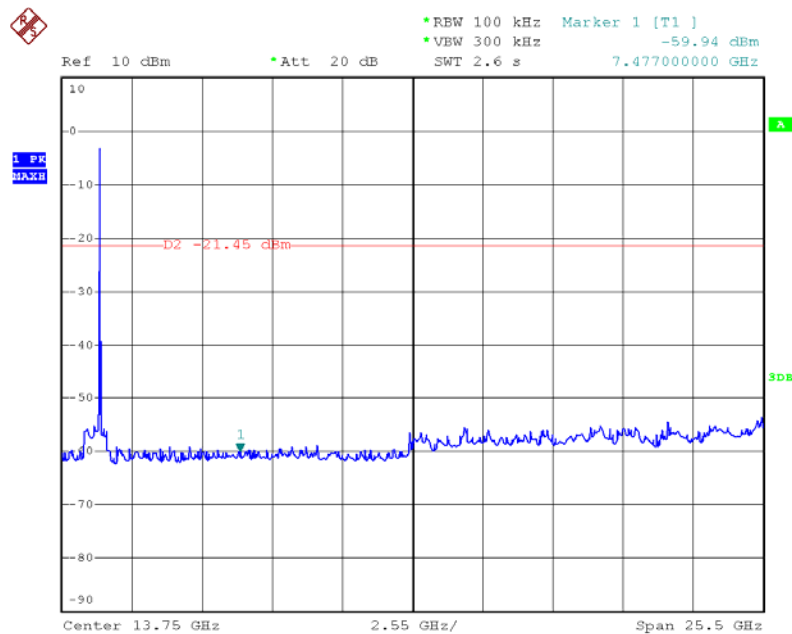
801.11g Mode				
Test Channel	Max. Emission Level (dBm)	Power Density (dBm)	Limit (dBm)	Result
CH 01	-57.54	-25.88	-45.88	Compliance
CH 06	-57.19	-25.64	-45.64	Compliance
CH 11	-57.13	-23.13	-43.13	Compliance

801.11n(20M) Mode				
Test Channel	Max. Emission Level (dBm)	Power Density (dBm)	Limit (dBm)	Result
CH 01	-57.87	-24.10	-44.10	Compliance
CH 06	-58.08	-24.33	-44.33	Compliance
CH 11	-57.00	-24.40	-44.40	Compliance

801.11n(40M) Mode				
Test Channel	Max. Emission Level (dBm)	Power Density (dBm)	Limit (dBm)	Result
CH 03	-57.67	-27.60	-47.60	Compliance
CH 06	-58.32	-27.16	-47.16	Compliance
CH 09	-57.89	-25.13	-45.13	Compliance

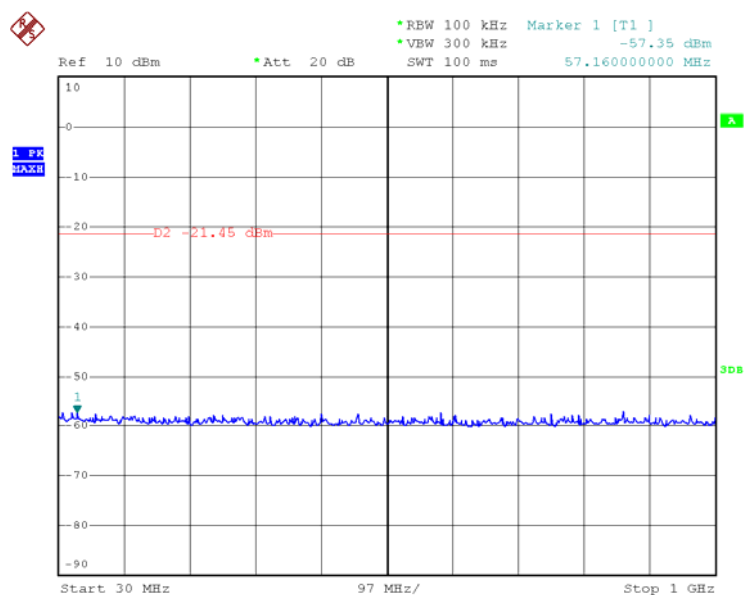
802.11b Mode TX CH 01 2412MHz

Above 1 GHz



Date: 9.JUL.2012 16:02:39

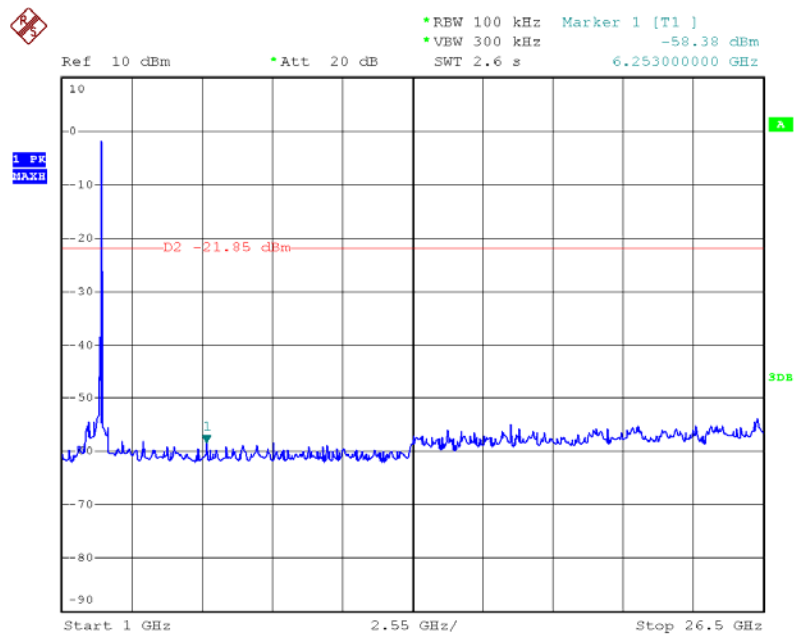
Bellow 1 GHz



Date: 9.JUL.2012 17:02:21

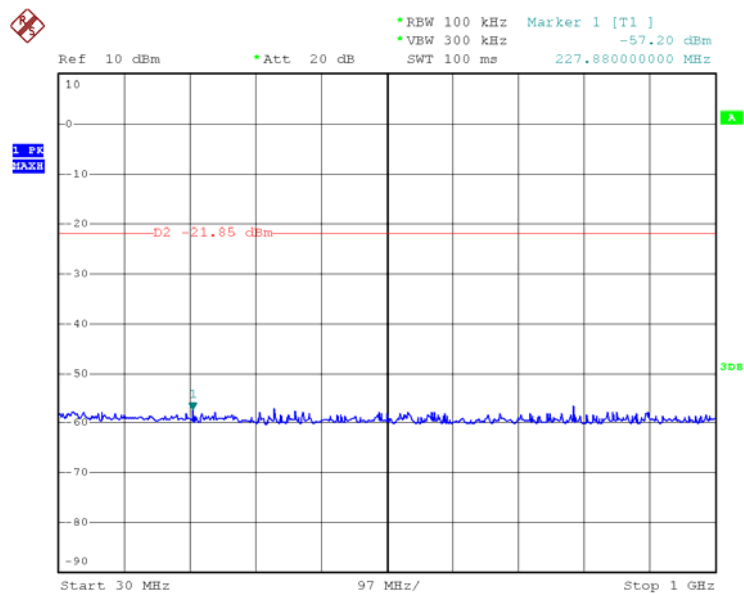
802.11b Mode TX CH 06 2437MHz

Above 1 GHz



Date: 9.JUL.2012 16:27:26

Bellow 1 GHz

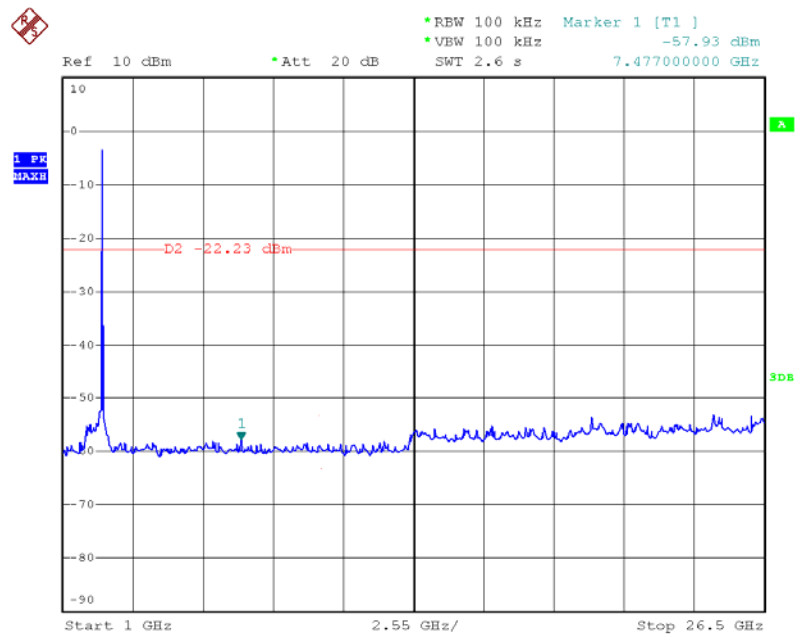


Date: 9.JUL.2012 17:03:29

802.11b Mode

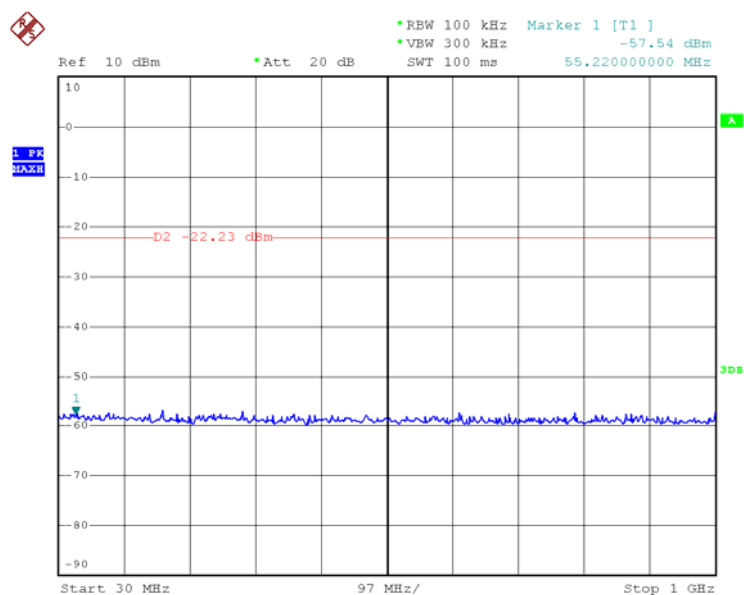
TX CH 11 2462MHz

Above 1 GHz



Date: 9.JUL.2012 17:11:43

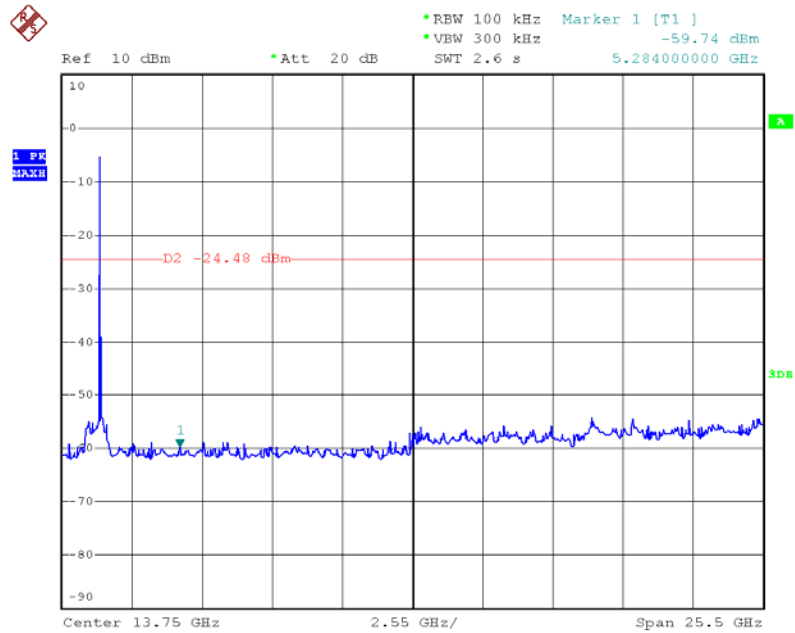
Bellow 1 GHz



Date: 9.JUL.2012 17:05:43

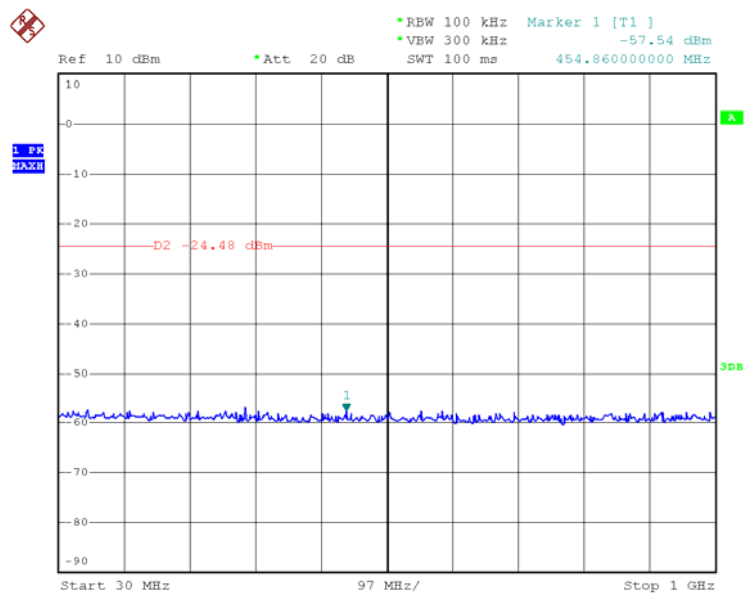
802.11g Mode TX CH 01 2412MHz

Above 1 GHz



Date: 9.JUL.2012 16:43:45

Bellow 1 GHz

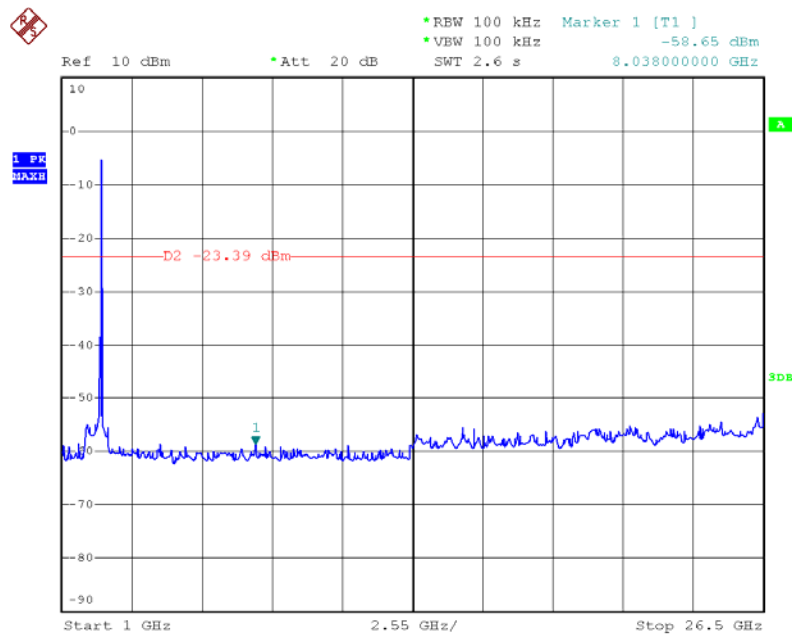


Date: 9.JUL.2012 17:11:20

802.11g Mode

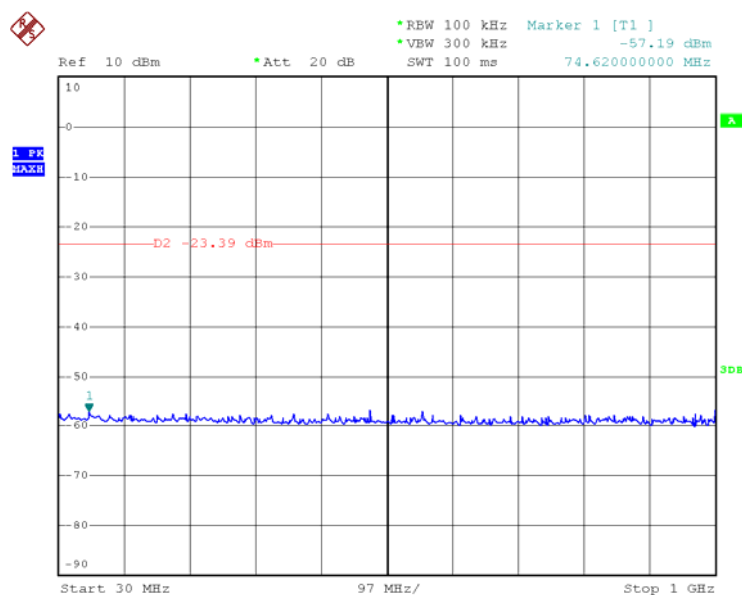
TX CH 06 2437MHz

Above 1 GHz



Date: 9.JUL.2012 16:47:38

Bellow 1 GHz

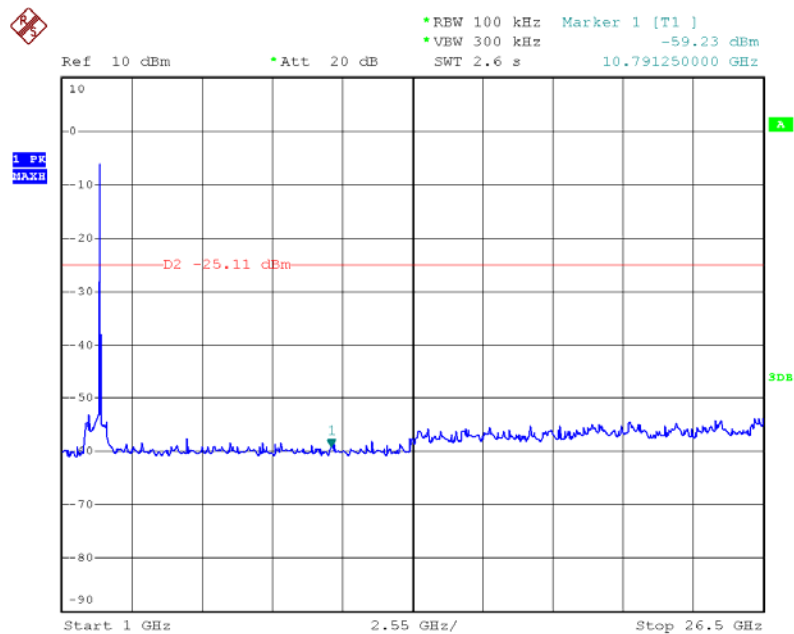


Date: 9.JUL.2012 17:13:05

802.11g Mode

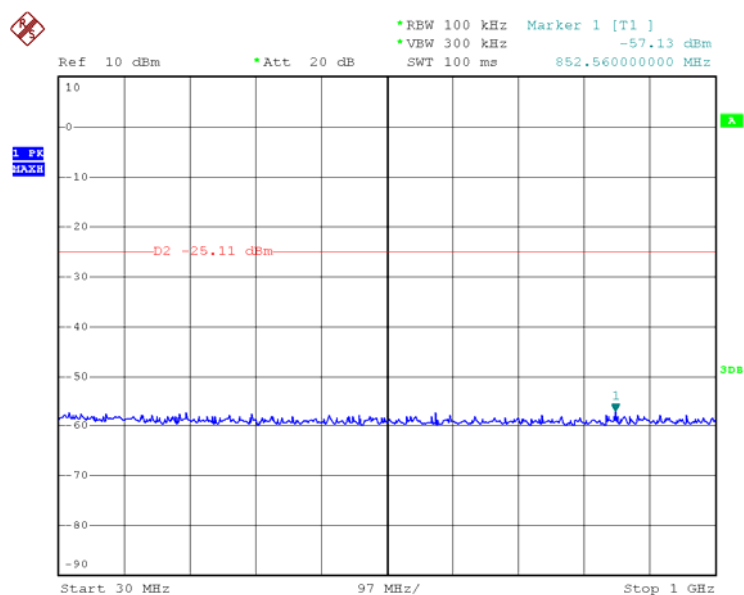
TX CH 11 2462MHz

Above 1 GHz



Date: 9.JUL.2012 17:44:36

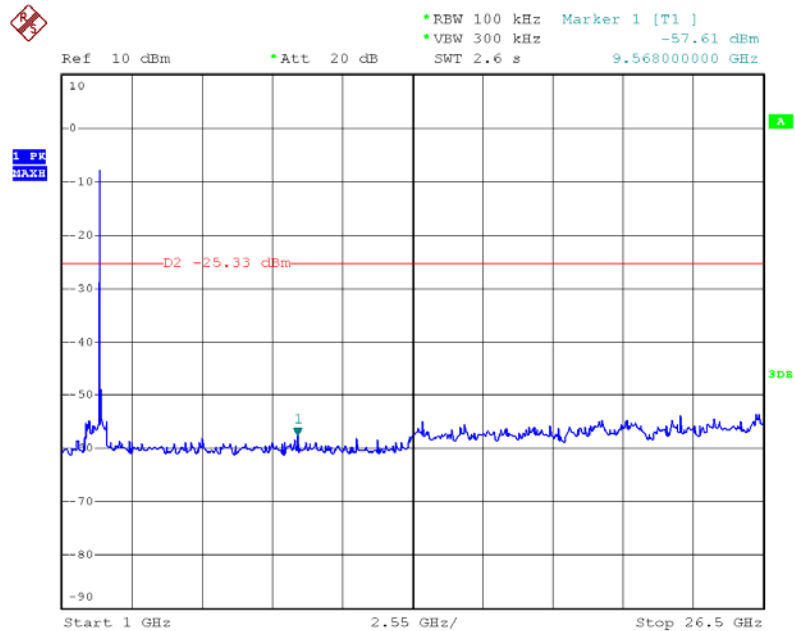
Bellow 1 GHz



Date: 9.JUL.2012 17:14:43

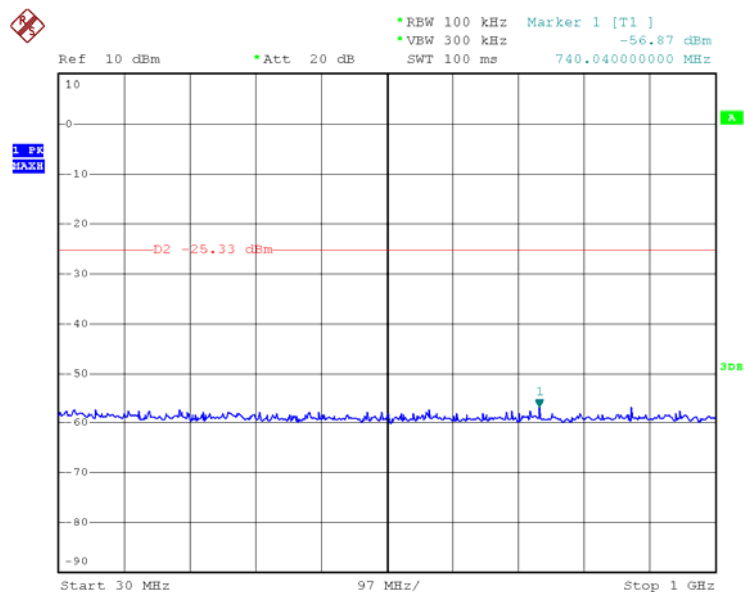
802.11n (20M) Mode TX CH 01 2412MHz

Above 1 GHz



Date: 9.JUL.2012 17:59:20

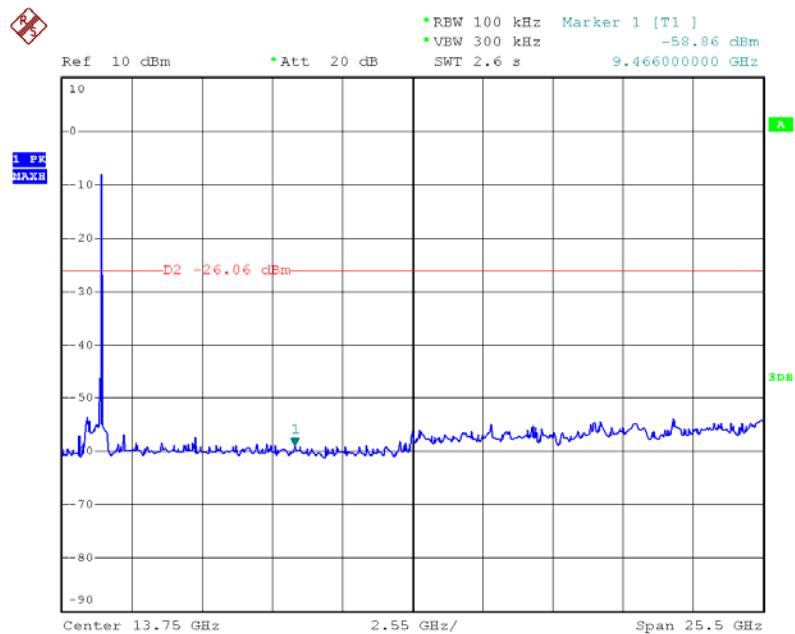
Bellow 1 GHz



Date: 9.JUL.2012 17:16:31

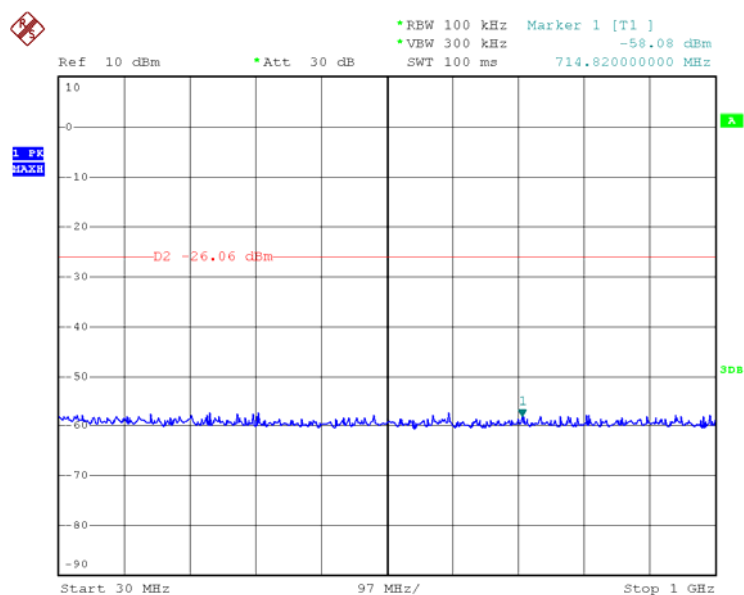
802.11n (20M) Mode TX CH 06 2437MHz

Above 1 GHz



Date: 9.JUL.2012 17:00:17

Bellow 1 GHz

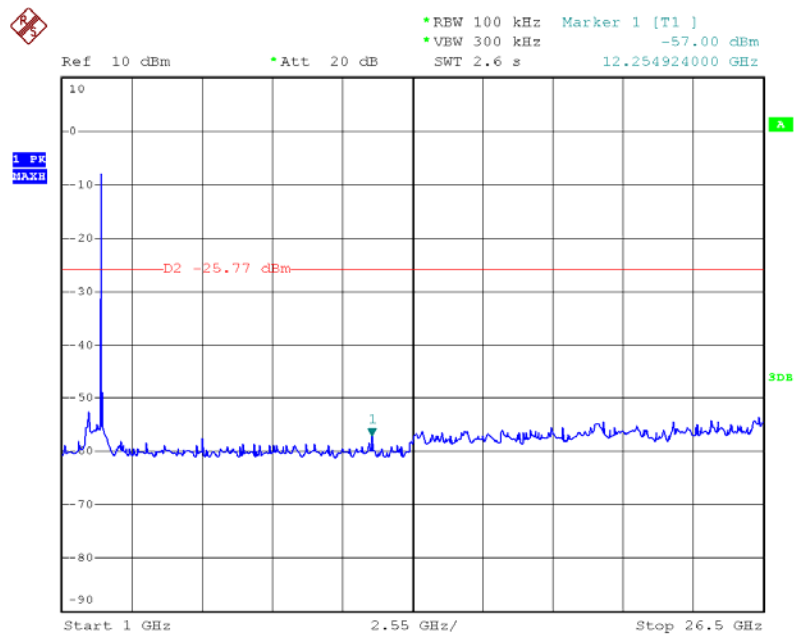


Date: 9.JUL.2012 17:17:29

802.11n (20M) Mode

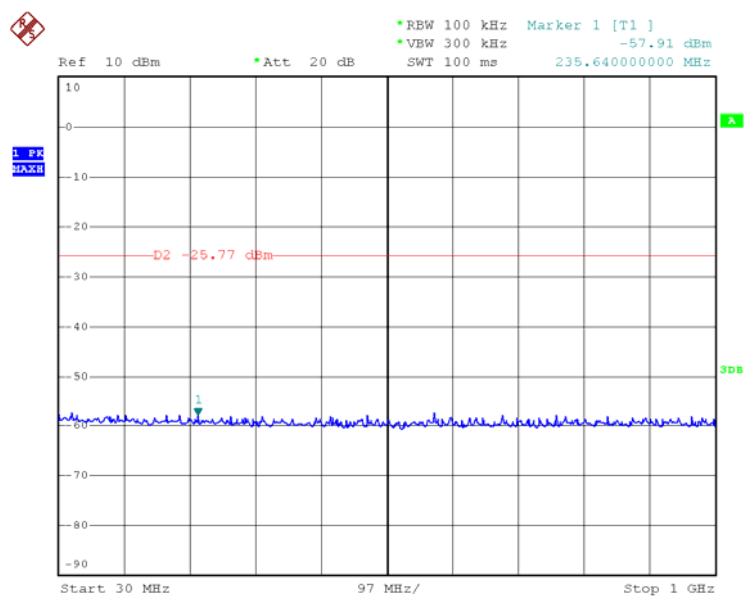
TX CH 11 2462MHz

Above 1 GHz



Date: 9.JUL.2012 17:11:57

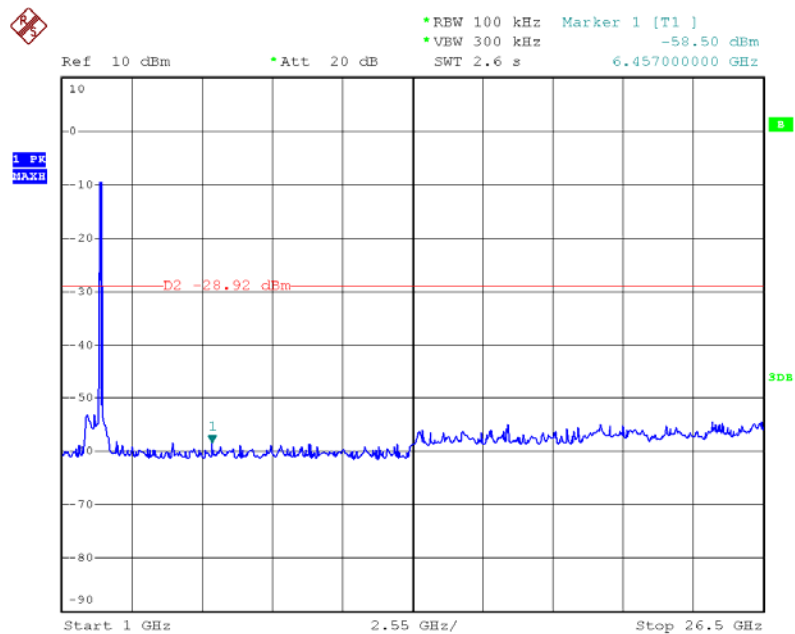
Bellow 1 GHz



Date: 9.JUL.2012 17:18:44

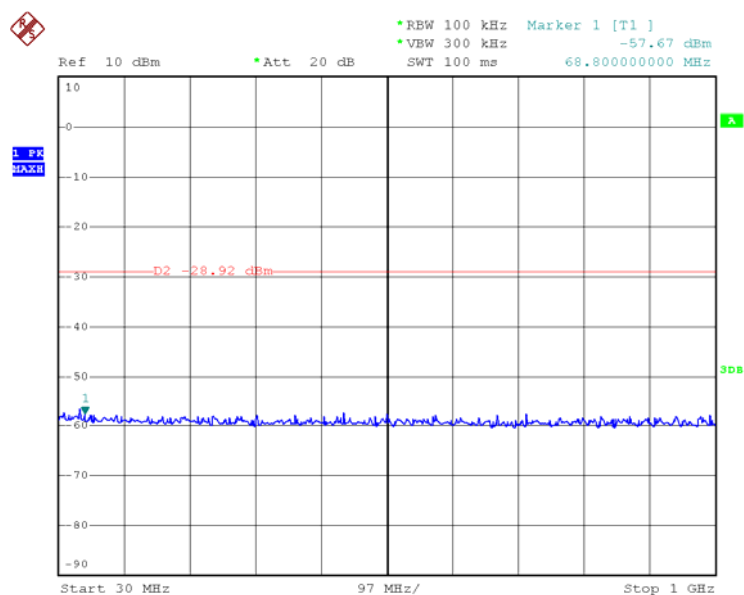
802.11n (40M) Mode TX CH 03 2422MHz

Above 1 GHz



Date: 9.JUL.2012 17:11:45

Bellow 1 GHz

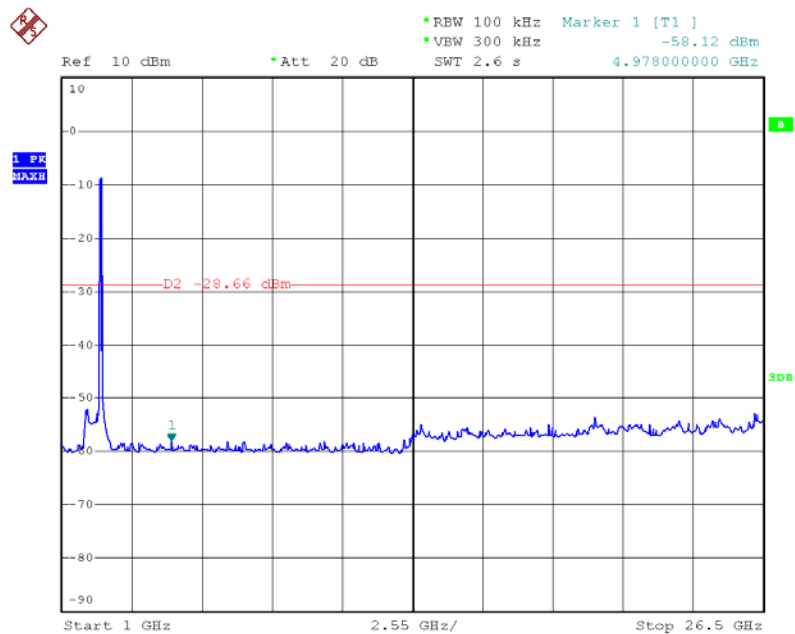


Date: 9.JUL.2012 17:20:00

802.11n (40M) Mode

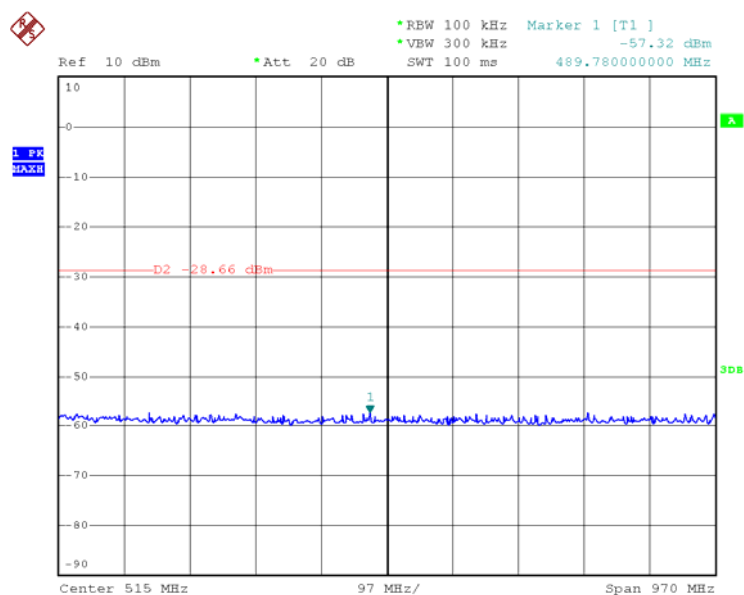
TX CH 06 2437MHz

Above 1 GHz



Date: 9.JUL.2012 17:28:48

Bellow 1 GHz

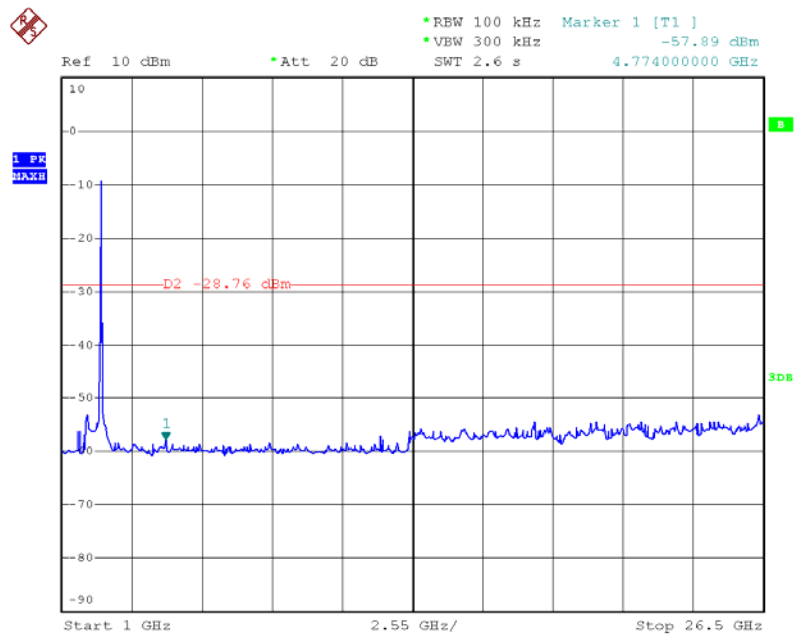


Date: 9.JUL.2012 17:36:15

802.11n (40M) Mode

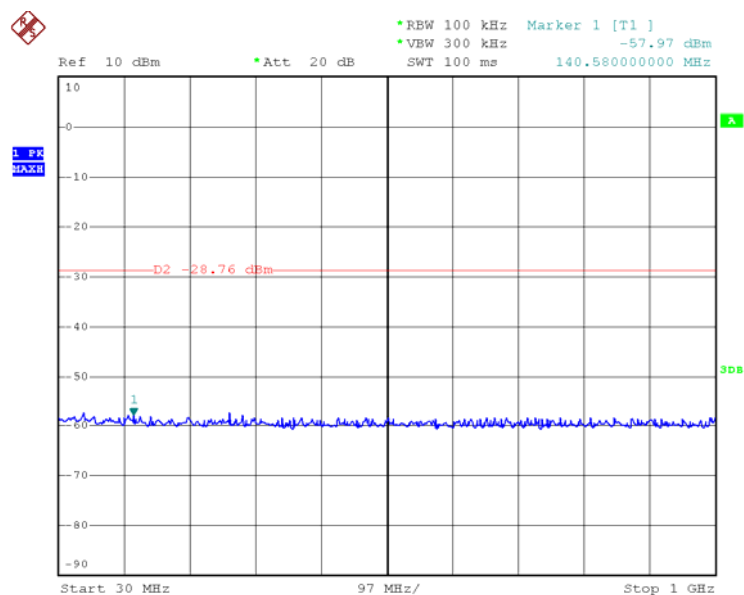
TX CH 09 2452MHz

Above 1 GHz



Date: 9.JUL.2012 17:48:52

Bellow 1 GHz



Date: 9.JUL.2012 17:29:07

10. Antenna Requirement

10.1 Standard Requirement

11.1.1 Standard

FCC Part 15.203

11.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0 Bi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.2 Result

The EUT antenna is a Chip Antenna. It complies with the standard requirement.