


FCC TEST REPORT

For

ShenZhen YuYuanXin Electronic Technology Co., Ltd.

Wii Neutral Remote Controller

Trade Name : 

Model No. : TYW-1137, TYW-1200, TYW-1123

FCC ID : YXDTYW

Operating Frequency : 2402 MHz-2480 MHz

Type of Modulation : GFSK

Antenna Gain : 0dBi

Applicant : ShenZhen YuYuanXin Electronic Technology Co., Ltd.
4 F, Building A, Mingxingdongli, Baiyunshan New Village,
Shanghenglang, Longhua, Bao'an, Shenzhen, China

Regulation : **FCC Part 15.247 Subpart C**

Prepared by : Shenzhen AOV Testing Technology Co., Ltd.
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Nanshan District, Shenzhen, Guangdong, China

Test Date : October 19-22, 2010

Date of Report : October 22, 2010

TABLE OF CONTENT

Description	Page
Test Report Declaration	
1. GENERAL INFORMATION	4
1.1. General Information	4
1.2. Test Facility	4
1.3. Test Instrument Used	5
2. MAXIMUM PEAK CONDUCTED RF OUTPUT POWER	6
2.1. Rules Part No.	6
2.2. Limits	6
2.3. Test Procedure	6
2.4. Test Result.....	6
3. HOPPING CHANNEL SEPARATION	9
3.1. Test Standard.....	9
3.2. Limits	9
3.3. Test Procedure	9
3.4. Test Result.....	9
4. NUMBER OF HOPPING FREQUENCY	12
4.1. Test Standard.....	12
4.2. Limits	12
4.3. Test Procedure	12
4.4. Test Result.....	12
5. BAND EDGE	13
5.1. Rules Part No.	13
5.2. Limits	13
5.3. Test Procedure	13
5.4. Test Result.....	13
6. 20DB BANDWIDTH	16
6.1. Rules Part No.	16
6.2. Limits	16
6.3. Test Procedure	16
6.4. Test Result.....	16
7. DWELL TIME	19
7.1. Rules Part No.	19
7.2. Limits	19
7.3. Test Procedure	19
7.4. Test Result.....	19
8. RADIATED EMISSION	23
8.1. Rules Part No.	23
8.2. Limits	23
8.3. Test Procedure	23
8.4. Test Result.....	23
9. RESTRICTED BANDS OF OPERATION	26
10. ANTENNA REQUIREMENT	27
11. PHOTOGRAPH OF TEST	28
11.1. Radiated Emission	28

TEST REPORT DECLARATION

Applicant : ShenZhen YuYuanXin Electronic Technology Co., Ltd.
 Manufacturer : ShenZhen YuYuanXin Electronic Technology Co., Ltd.
 EUT Description : Wii Neutral Remote Controller

Test Procedure Used:
FCC Part 15.247 Subpart C

The E. U. T. listed below has been completed RFI testing by Shenzhen AOV Testing Technology Co., Ltd. at the test site of Bontek Compliance Testing Laboratory Ltd. And the Interference emissions can pass **FCC Subpart C** limitations.

The test configurations and the facility comply with the radiated and AC line conducted test site criteria in **ANSI C63.4-2003**.

Date of Test: _____ October 19-22, 2010 _____

Bessy

Prepared by: _____
 Project Engineer

Koss

Reviewer : _____
 Project Manager

1. GENERAL INFORMATION

1.1. General Information

Applicant : ShenZhen YuYuanXin Electronic Technology Co., Ltd.
4 F, Building A, Mingxingdongli, Baiyunshan New Village,
Shanghenglang, Longhua, Bao'an, Shenzhen, China

Manufacturer : ShenZhen YuYuanXin Electronic Technology Co., Ltd.
4 F, Building A, Mingxingdongli, Baiyunshan New Village,
Shanghenglang, Longhua, Bao'an, Shenzhen, China

1.2. Test Facility

Test Firm : Bontek Compliance Testing Laboratory Ltd.
Certificated by FCC, Registration No.: 338263
Address : FL.1, Building H-3, Hua Qiao Cheng East Industrial Area
Qiaocheng East Road, Nanshan, Shenzhen, P.R.China
Tel : 86-755-86337020
Fax : 86-755-86337028

1.3. Test Instrument Used

No.	Equipment	Manufacturer	Model No.	S/N	Calibrate date	Calibrate Interval
1.	EMI Test Receiver	R&S	ESPI	100097	2010-2-22	one year
2.	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07101	2010-2-22	one year
3.	EMI Test Receiver	R&S	ESCI	100687	2010-2-22	one year
4.	EMI Test Receiver	R&S	FSU	BCT-019	2010-2-22	one year
5.	Amplifier	HP	8447D	1937A02492	2010-2-22	one year
6.	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2010-2-22	one year
7.	Horn Antenna	SCHWARZBECK	BBHA9120A	B08000991-0001	2010-2-22	one year
8.	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2010-2-22	one year
9.	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2010-2-22	one year
10.	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2010-2-22	one year
11.	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	D-69250	2010-2-22	one year
12.	Positioning Controller	C&C	CC-C-1F	MF7802113	2010-2-22	one year
13.	Triple-Loop Antenna	EVERFINE	LLA-2	607004	2010-2-22	one year
14.	10dB attenuator	SCHWARZBECK	MTAIMP-136	R65.90.0001 #06	2010-2-22	one year

2. MAXIMUM PEAK CONDUCTED RF OUTPUT POWER

2.1. Rules Part No.

15.247(b)

2.2. Limits

The maximum peak conducted RF output power measurement is 120mW(20.79dBm).

2.3. Test Procedure

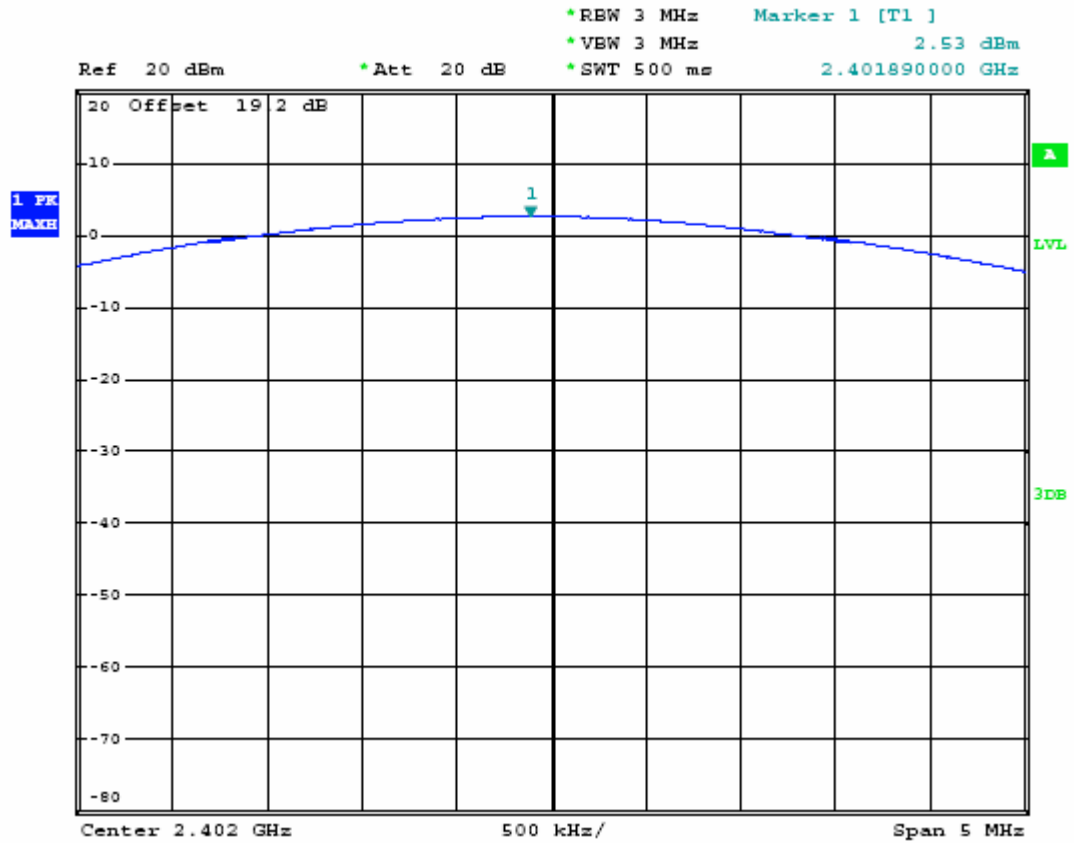
The antenna of the EUT was connected to the RF input cord of power meter with a coaxial cable, power was read directly from the meter and cable loss was added to the reading to obtain power at the EUT antenna terminal. The EUT output power was set to maximum to produce the worse case test result.

2.4. Test Result

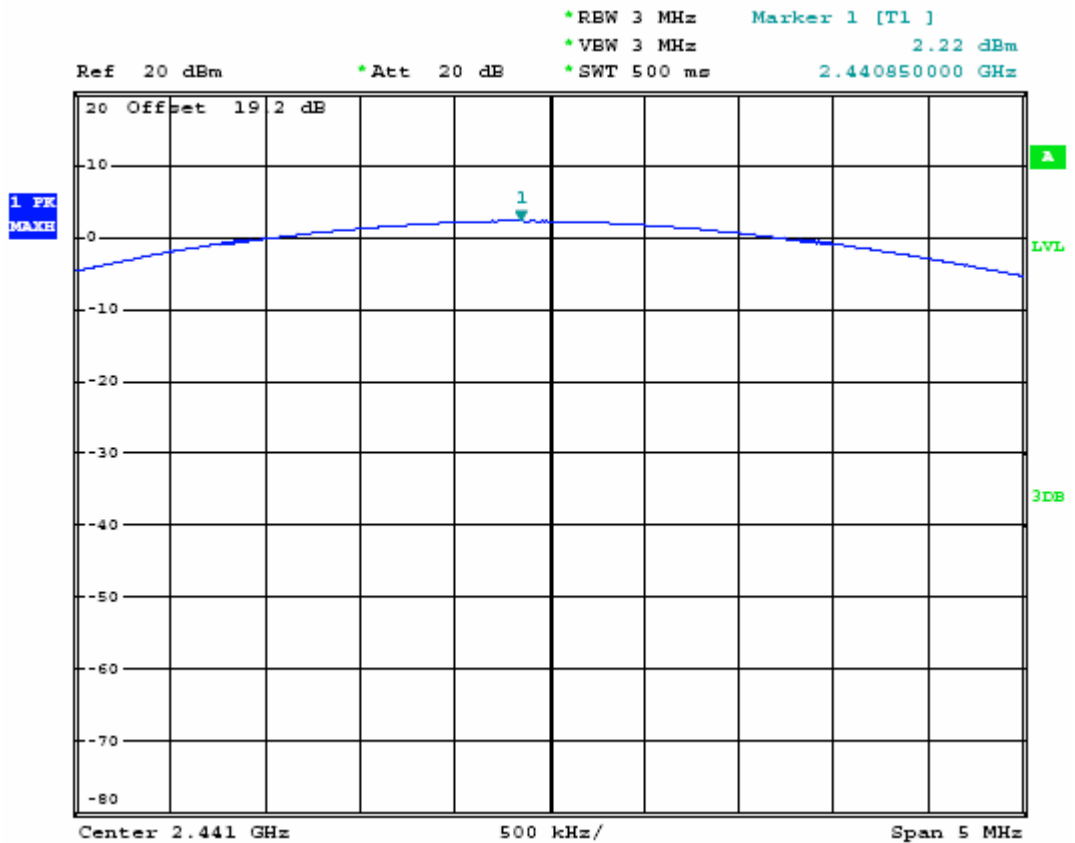
PASS

Channel	Frequency (MHz)	Peak output power (dBm)	Limit (dBm)
Low	2402	2.53	20.79
Middle	2441	2.22	20.79
High	2480	1.50	20.79

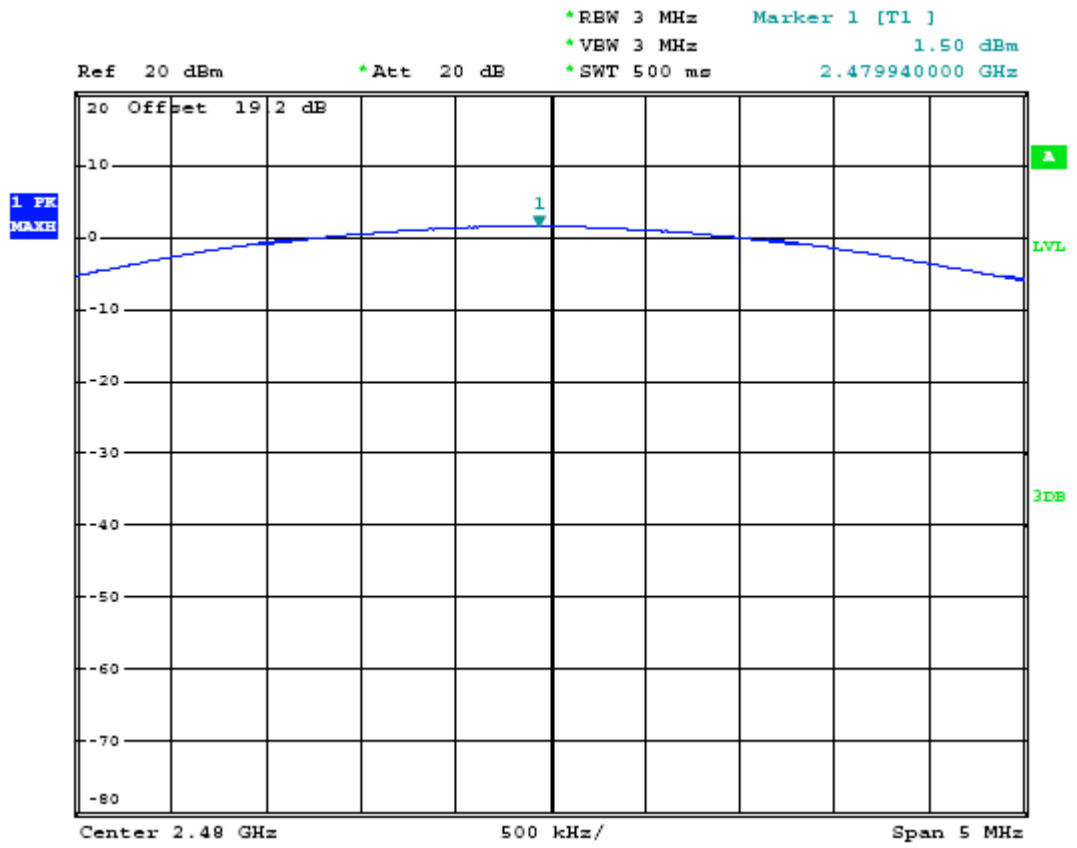
Low Channel: 2402MHz



Middle Channel: 2441MHz



High Channel: 2480MHz



3. HOPPING CHANNEL SEPARATION

3.1. Test Standard

15.247(a)

3.2. Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2480.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

3.3. Test Procedure

Record the respond of frequency waveform when the EUT was working by a spectrum analyzer or EMI Receiver.

3.4. Test Result

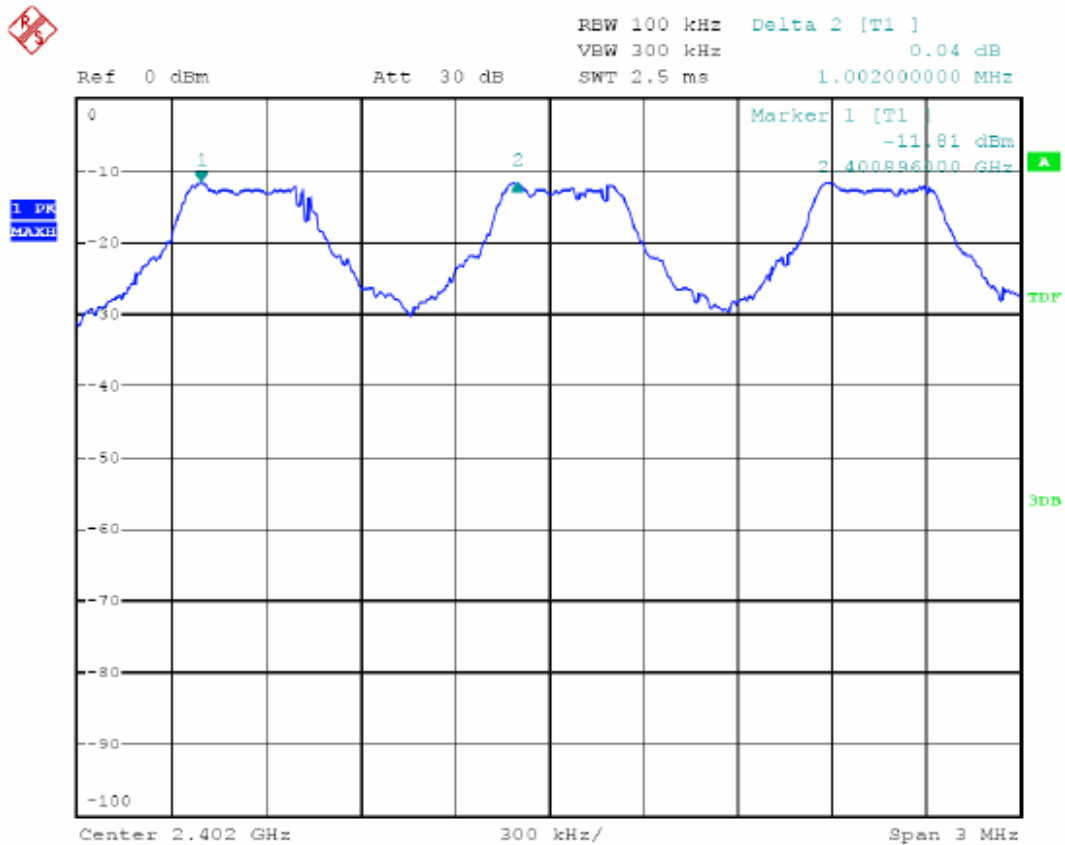
PASS

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
Low	2402	1.002	1.0
Middle	2441	1.002	1.0
High	2480	1.002	1.0

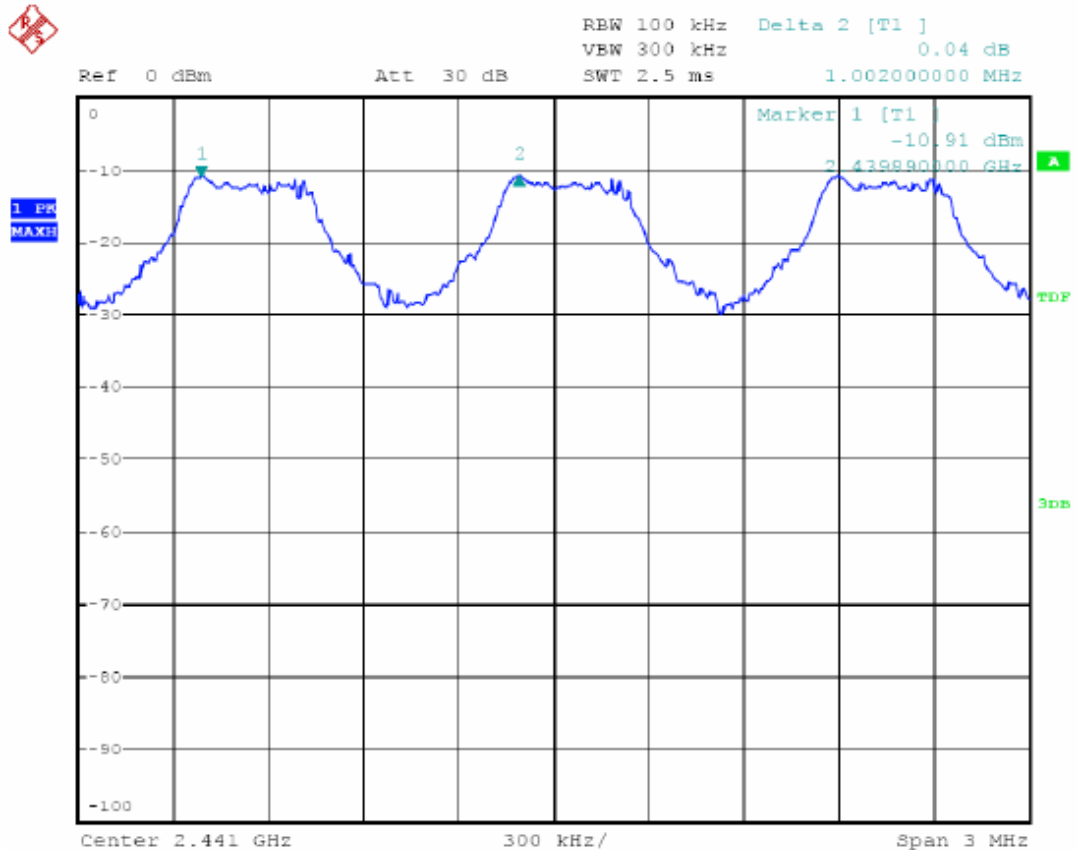
Channel Separation > 2/3 of 20dB Bandwidth

Detailed information, Please refer to the following page.

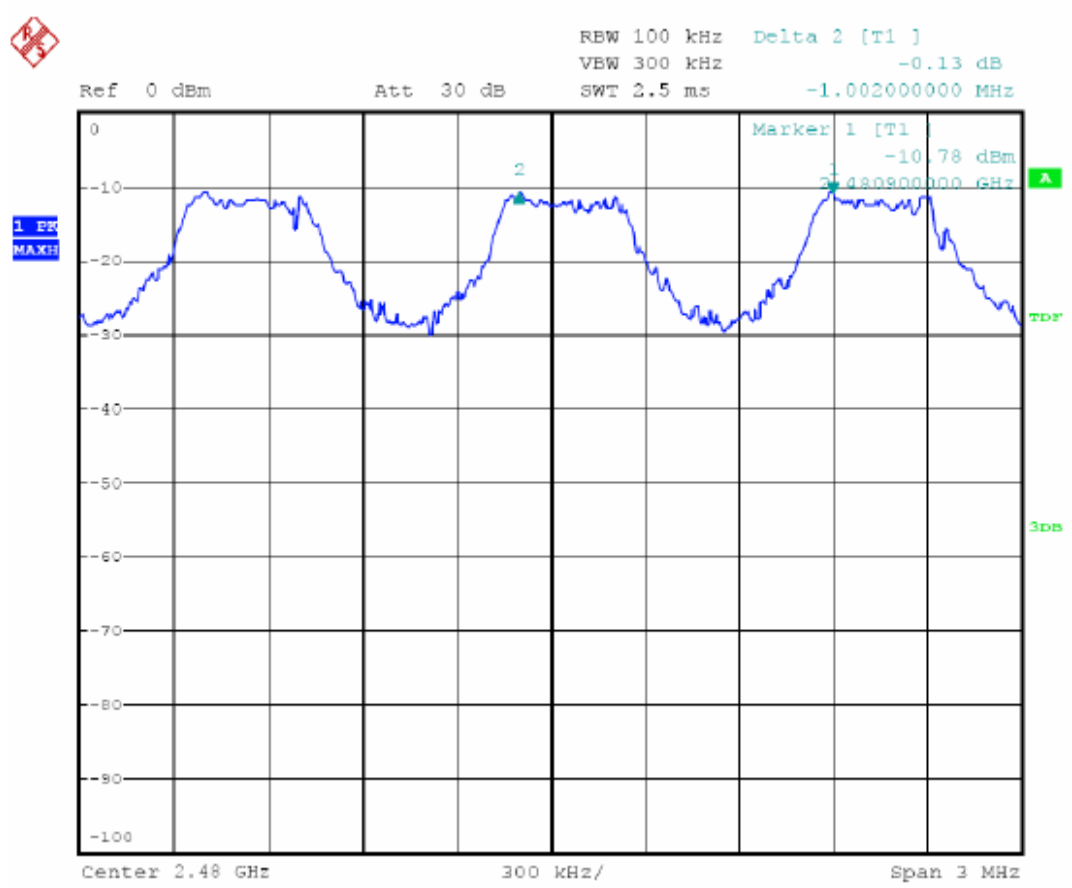
Low Channel: 2402MHz



Middle Channel: 2441MHz



High Channel: 2480MHz



5. BAND EDGE

5.1. Rules Part No.

15.247(c)

5.2. Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.3. Test Procedure

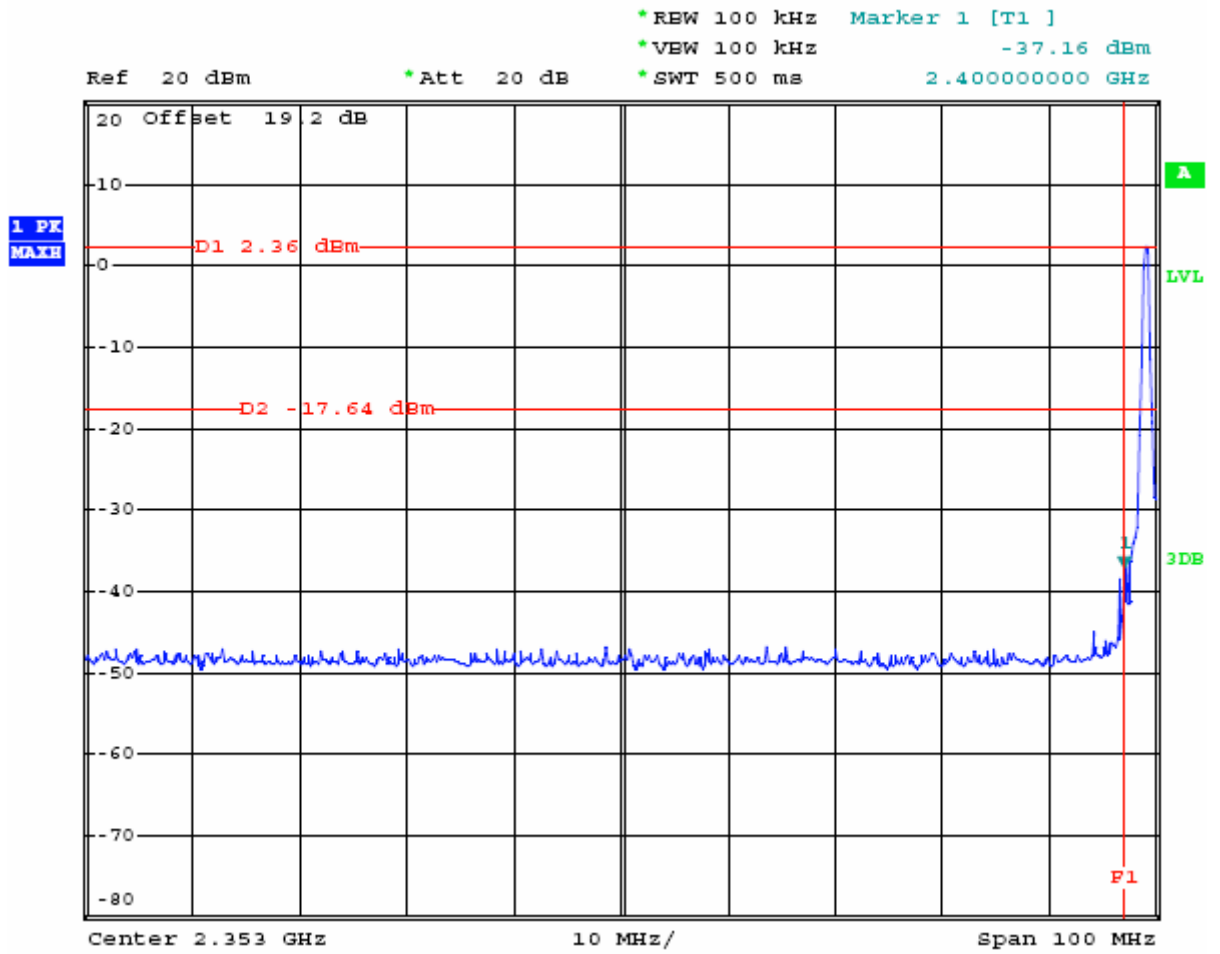
1. The transmitter output was connected to the spectrum analyzer via a low loss cable.
2. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 kHz bandwidth from band edge.
3. The band edges was measured and recorded.

5.4. Test Result

PASS

Detailed information, Please refer to the following page.

Low channel: 2402MHz



6. 20DB BANDWIDTH

6.1.Rules Part No.

15.247(b)

6.2.Limits

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

6.3.Test Procedure

The transmitter output is connected to the spectrum analyzer, The spectrum analyzer Center frequency is set to the transmitter frequency, The RBW is set to 10K Hz and VBW is set 30 KHz

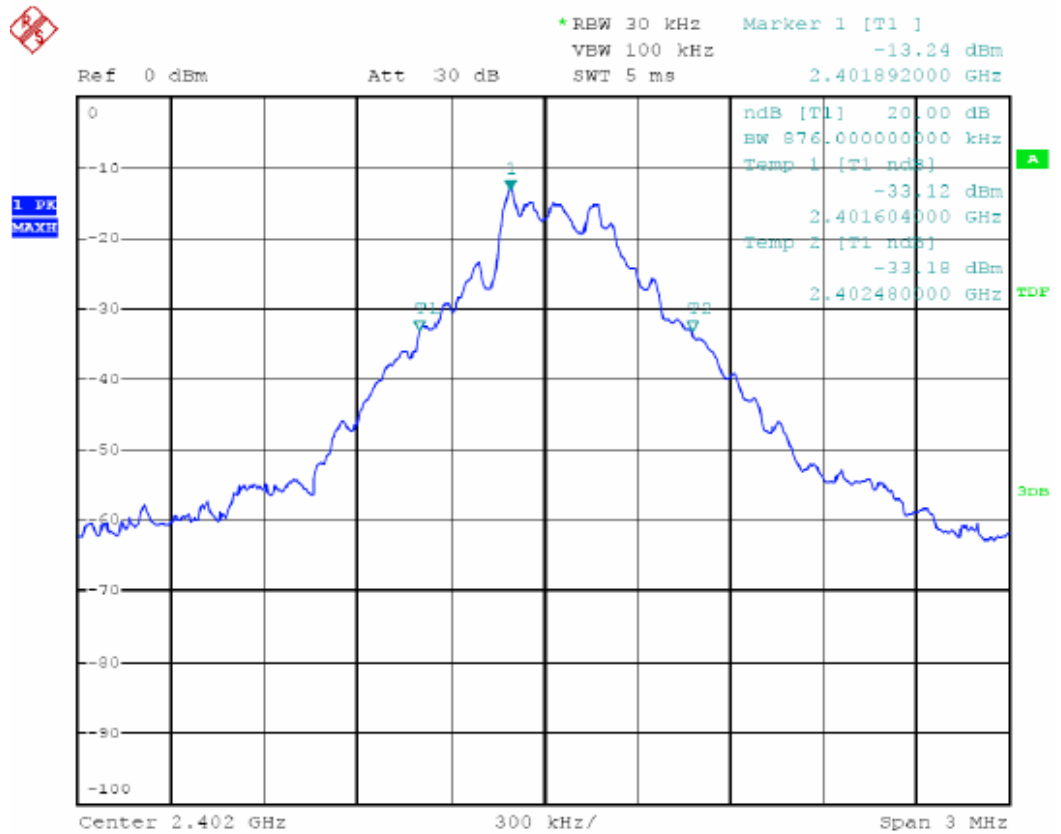
6.4.Test Result

PASS

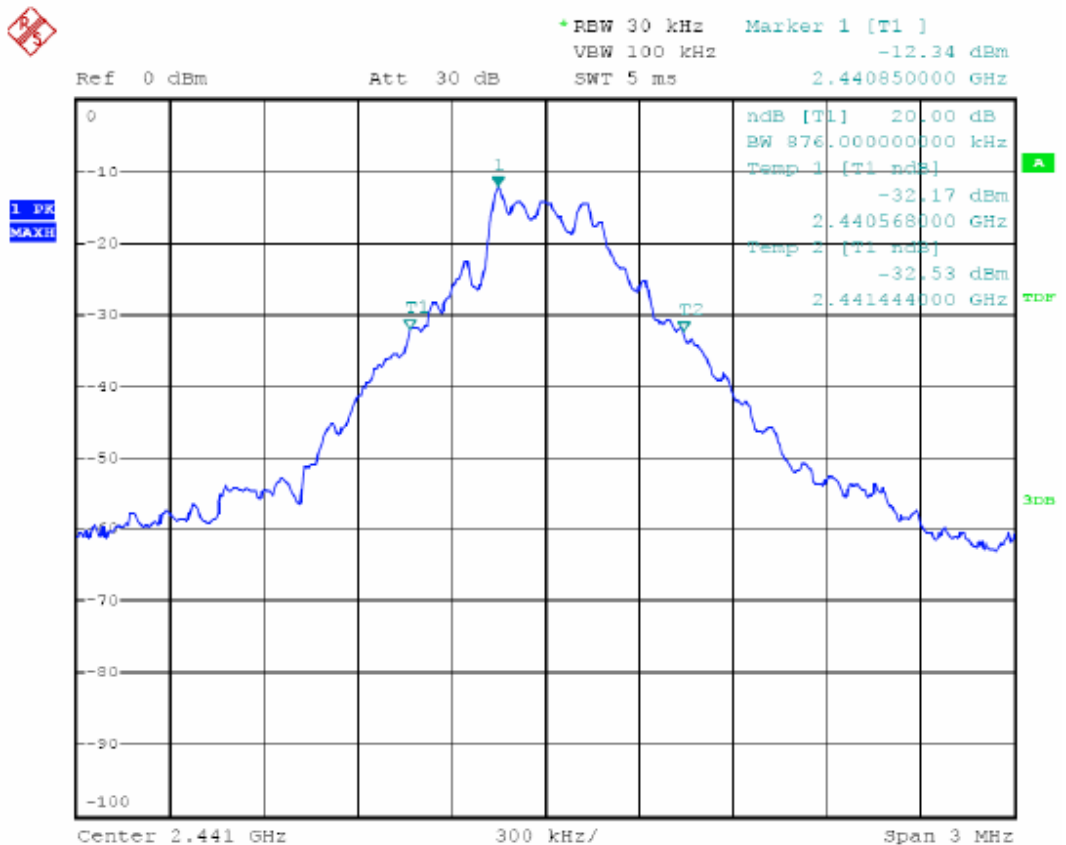
Channel	Frequency(MHz)	20dB Bandwidth (MHz)
Low	2402	0.876
Middle	2441	0.876
High	2480	0.870

Detailed information, Please refer to the following page.

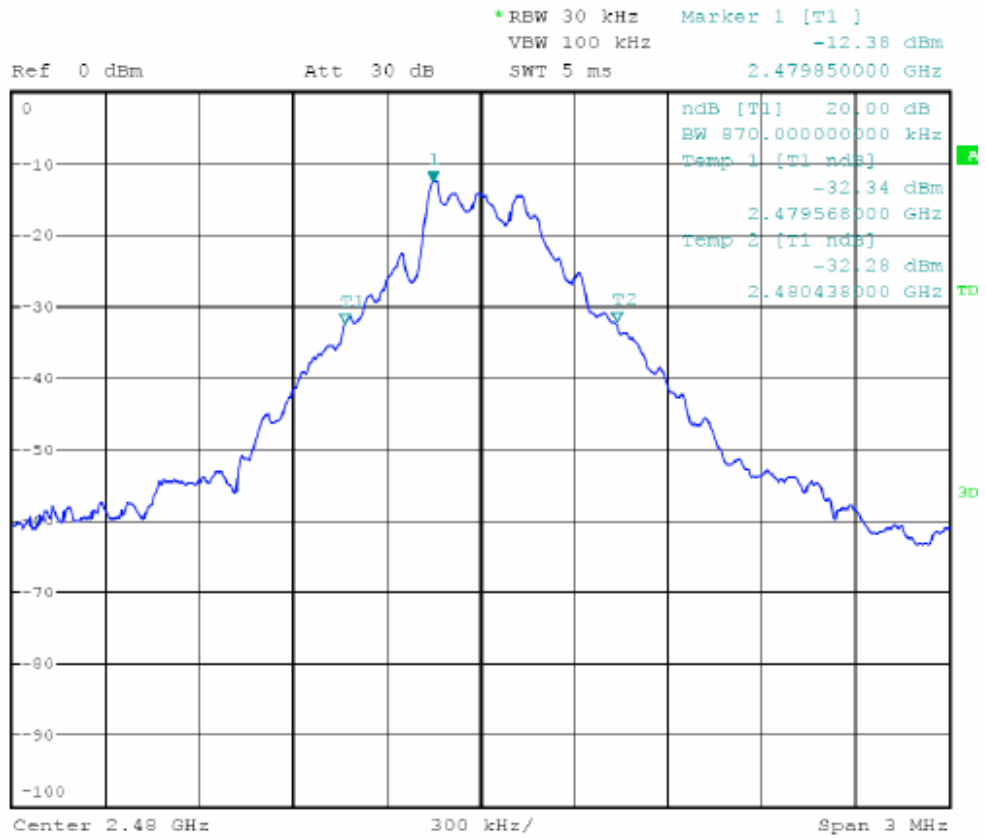
Low Channel: 2402MHz



Middle Channel: 2441MHz



High Channel: 2480MHz



7. DWELL TIME

7.1. Rules Part No.

15.247(a)

7.2. Limits

Per 15.247(a) (1)(iii) At least 15 hopping Frequencies. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

7.3. Test Procedure

The transmitter output was connected to EMI receiver with a low loss cable, the band edge was measured and recorded.

7.4. Test Result

PASS

Channel	Frequency (MHz)	Pulse Width (msec)	Occupied Time (0.4 sec X 79)	Dwell Time (ms)	Limit (sec)
Low	2402	0.416	31.6	131.5	0.4
Middle	2441	0.420	31.6	132.7	0.4
High	2480	0.416	31.6	131.5	0.4

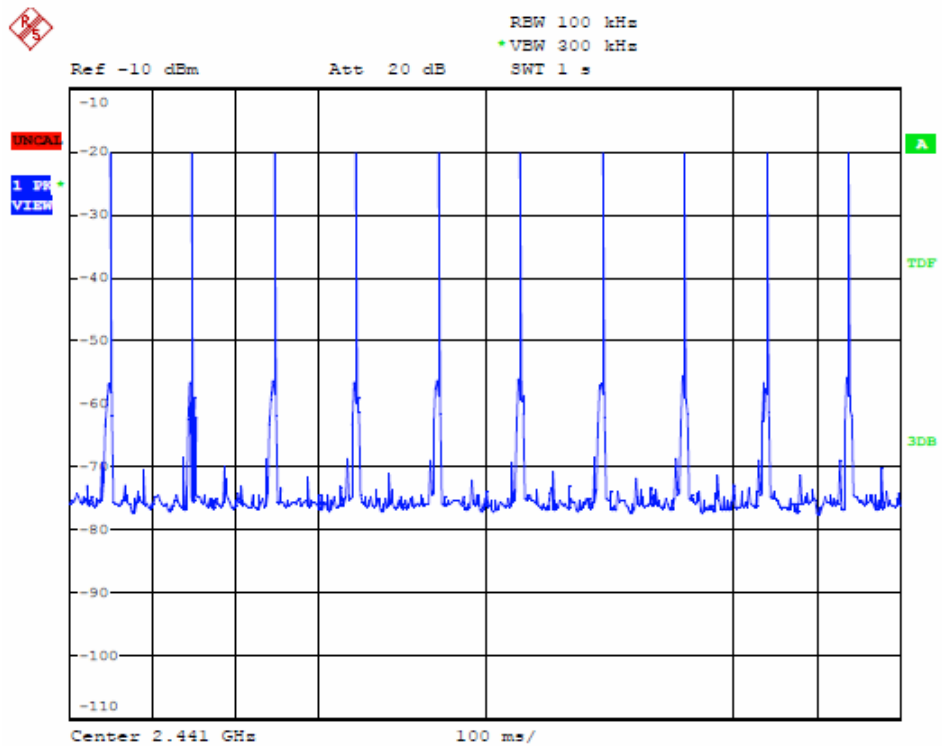
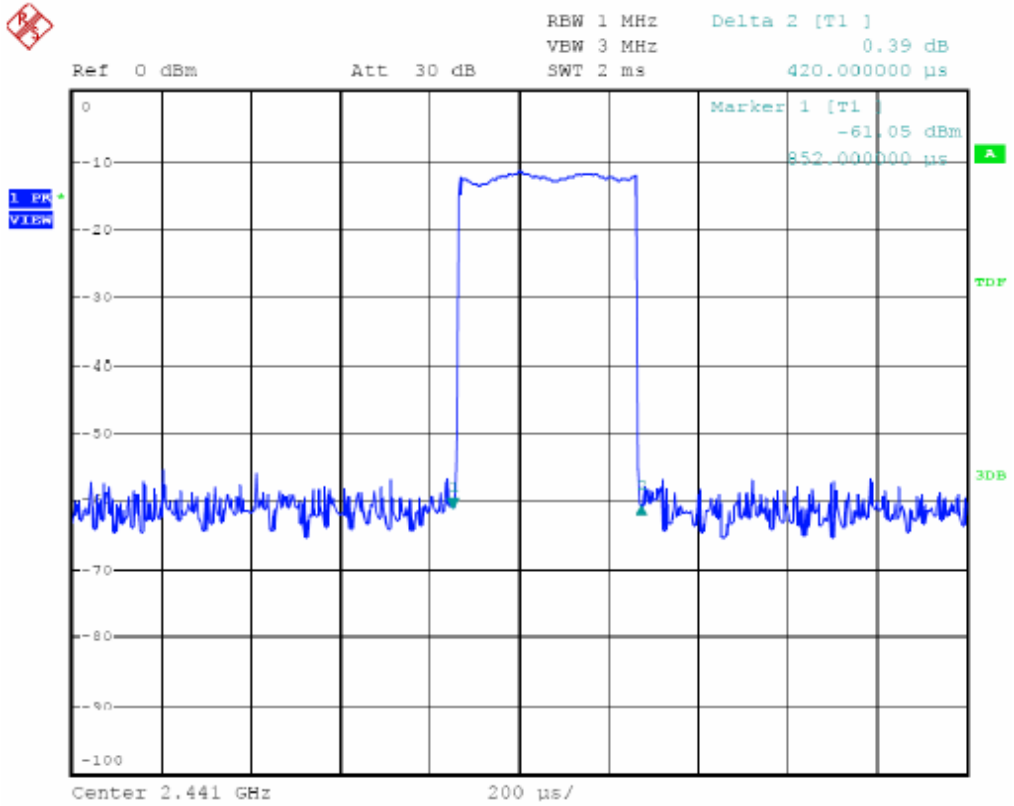
Detailed information, Please refer to the following page.

A period transmit time= $79 \times 0.4 = 31.6$ s

Dwell time=Pulse time*burst (in 1sec) *31.6

Burst in 1 sec.=10(Burst is 10 times be measured)

Middle Channel: 2441MHz



8. RADIATED EMISSION

8.1. Rules Part No.

15.209

8.2. Limits

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of (MHz)	Emission Field Strength (microvolts/meter)
30 - 88	100 (40)
88 - 216	150 (43.5)
216 - 960	200 (46.0)
Above 960	500 (54.0)

8.3. Test Procedure

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:

The EUT is placed on a turned table that is 0.8 meter above the ground. The turned table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on the antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (log periodical antenna and horn antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

8.4. Test Result

PASS

The frequency range from 30MHz to 25GHz is investigated.

Detailed information, Please refer to the following page.

A. Harmonics Radiated Emission Data

Low Channel: 2402MHz

Frequency (MHz)	Peak (dBuV/m)	Limit (dBuV/m) Peak	Margin (dBuV/m) Peak	Horizontal/Vertical
4804	50.80	74.00	-23.20	Horizontal
4804	51.16	74.00	-22.84	Vertical
7206	48.26	74.00	-25.74	Horizontal
7206	47.63	74.00	-26.37	Vertical
9608	46.35	74.00	-27.65	Horizontal
9608	45.39	74.00	-28.61	Vertical
24020	45.60	74.00	-28.40	Horizontal
24020	45.80	74.00	-28.20	Vertical

Middle Channel: 2441MHz

Frequency (MHz)	Peak (dBuV/m)	Limit (dBuV/m) Peak	Margin (dBuV/m) Peak	Horizontal/Vertical
4882	51.80	74.00	-22.20	Horizontal
4882	51.50	74.00	-22.50	Vertical
7323	49.26	74.00	-24.74	Horizontal
7323	48.53	74.00	-25.47	Vertical
9764	46.37	74.00	-27.63	Horizontal
9764	45.89	74.00	-28.11	Vertical
24410	45.90	74.00	-28.10	Horizontal
24410	45.50	74.00	-28.50	Vertical

High Channel:2480MHz

Frequency (MHz)	Peak (dBuV/m)	Limit (dBuV/m) Peak	Margin (dBuV/m) Peak	Horizontal/Vertical
4960	52.00	74.00	-22.00	Horizontal
4960	51.16	74.00	-22.84	Vertical
7440	48.56	74.00	-25.44	Horizontal
7440	48.65	74.00	-25.35	Vertical
9920	47.38	74.00	-26.62	Horizontal
9920	46.95	74.00	-27.05	Vertical
24800	46.60	74.00	-27.40	Horizontal
24800	45.90	74.00	-28.10	Vertical

B. General Radiated Emission Data

Frequency (MHz)	Peak (dBuV/m)	Limit (dBuV/m) Peak	Margin (dBuV/m) Peak	Horizontal/Vertical
47.46	23.20	40.00	-16.80	Horizontal
55.22	22.60	40.00	-17.40	Horizontal
97.90	25.10	43.50	-18.40	Horizontal
291.90	26.80	46.00	-19.20	Horizontal
551.86	31.00	46.00	-15.00	Horizontal
891.36	37.60	46.00	-8.40	Horizontal
47.46	27.20	40.00	-12.80	Vertical
55.22	22.50	40.00	-17.50	Vertical
107.60	24.60	43.50	-18.90	Vertical
307.42	26.70	46.00	-19.30	Vertical
555.74	30.70	46.00	-15.30	Vertical
850.62	36.50	46.00	-9.50	Vertical

9. RESTRICTED BANDS OF OPERATION

Section 15.205:

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
¹ 0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
2. 17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
2. 20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 –	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.52525	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	156.7 – 156.9	3260 – 3267	23.6 – 24.0
12.29 – 12.293	162.0125 – 167.17	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	167.72 – 173.2	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	240 – 285	3600 – 4400	(²)
13.36 – 13.41	322 – 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

10.ANTENNA REQUIREMENT

According to Section 15.203, 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.

Antenna is fixed by PCB, can not be changed except take apart the product.
Therefore the EUT complies with Section 15.203 of the FCC rules.

11.PHOTOGRAPH OF TEST

11.1.Radiated Emission

Below 1GHz



Above 1GHz

