



FCC Part 15 Certification Test Report

Applicant: Prom Hong Kong Ltd.
Address: 1426, Hollywood Plaza, 610, Nathan Rd, MongKok, Kowloon,
Hong Kong
EUT: Music trainer
Model Number: MFX121
FCC ID: Z2Y11091

In Accordance with Standards: FCCC Rules and Regulations Part 15 Subpart C: 15.247

Test Procedure Used: ANSI C63.10:2009; ANSI C63.4:2009

Test Result: In the configuration tested, the EUT complied with the standards specified above

Note: The test results are contained in this test report and IEIE EMC Public laboratory is assumed of full responsibility for the accuracy and completeness of these tests. This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of IEIE EMC Public Laboratory. The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

Report No IEIE-F11006

Date of Test : 2011/09/23—2011/09/26 **Date of Report:** 2011/09/27

Tested by : Damon_Hu **Reported by :** TaTa_Chen
Engineer Assistant

Approved & Authorized Signer :



2011.10.08

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1. SUMMARY OF TEST STANDARDS AND RESULTS

Description of Test Item	Standard	Results
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.10: 2009	PASS
Radiated Emission Test	FCC Part 15: 15.209 ANSI C63.10: 2009	PASS
Band Edge Compliance Test	FCC Part 15: 15.247 ANSI C63.10: 2009	PASS
Antenna Port Conducted spurious emissions test	FCC Part 15: 15.247 ANSI C63.10: 2009	PASS
6dB Bandwidth Test	FCC Part 15: 15.247 ANSI C63.10: 2009	PASS
Output Power Test	FCC Part 15: 15.247 ANSI C63.10: 2009	PASS
Power Spectral Density Test	FCC Part 15: 15.247 ANSI C63.10: 2009	PASS
Antenna requirement	FCC Part 15: 15.203	PASS

2. GENERAL TEST INFORMATION

2.1. Description of Device (EUT)

EUT Name	: Music trainer
Model Number	: MFX121
FCC ID	: Z2Y11091
Power Supply	: 3.7V from built-in battery or DC 5V from external Power supply
Radio Technology	: IEEE 802.15.4
Operation frequency	: 2405MHz-2480MHz
Modulation	: QPSK
Antenna	: Integrated Antenna, 0dBi gain
Applicant	: Prom Hong Kong Ltd. 1426, Hollywood Plaza, 610, Nathan Rd, MongKok, Kowloon, Hong Kong
Manufacturer	: Prom Hong Kong Ltd. 1426, Hollywood Plaza, 610, Nathan Rd, MongKok, Kowloon, Hong Kong
Date of Receipt	: 2011-09-15
Sample Type	: Series production

2.2. Assistant equipment used for test

Description	: Power Adapter
Manufacturer	: S.T.
Model No.	: SW-050100EU

2.3. Block Diagram EUT configuration

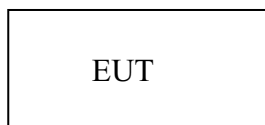
For Power line conducted emissions test and radiated emissions test from 30MHz to 1GHz



For Radiated emissions test above 1GHz



For all other conducted test



Note: Based pre-scan test, above configuration will lead worst emissions.

2.4. Work mode of EUT set for test

EUT was set to continuous radio transmitting mode, and selected low, middle and high channel as below:

Channel	Frequency (MHz)
Low	2405
Middle	2440
High	2480

2.5. Test Environment Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

2.6. Test Laboratory

Institute of Electronic And Information Engineering In Dongguan, University Of Electronic Science And Technology Of China EMC Public Laboratory (IEIE EMC Public Laboratory)

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499-8151

FCC Registered No.: 877865 IC Registered No.: 9748A

2.7. Measurement Uncertainty

(95% confidence levels, k=2)

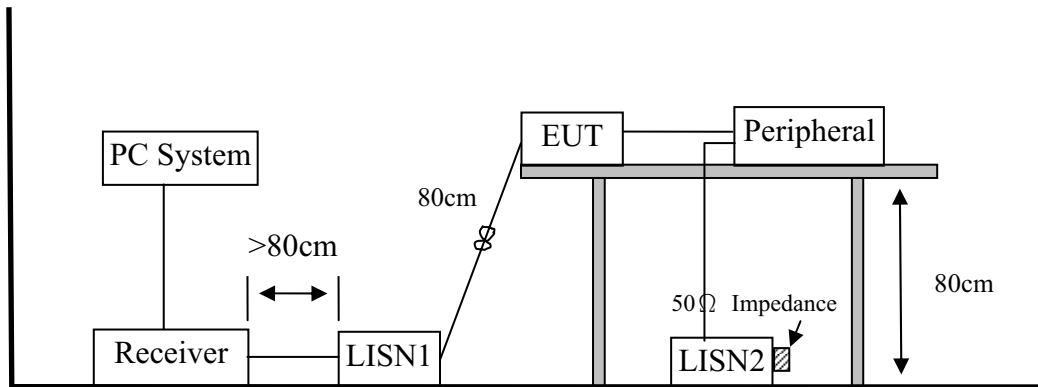
Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	3.10dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	R&S	ESU8	100316	2010-11-30	1 Year
2.	LISN 1	R&S	ENV216	101109	2011-01-07	1 Year
3.	LISN 2	R&S	ESH2-Z5	100309	2011-01-20	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	101242	2011-12-02	1 Year
5.	Test software	R&S	EMC32	/	/	/

3.2. Block Diagram of Test Setup



3.3. Power Line Conducted Emission Limits

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

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

3.4. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and simulator as shown in section 2.3 and 3.2
- (3) The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N1), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and

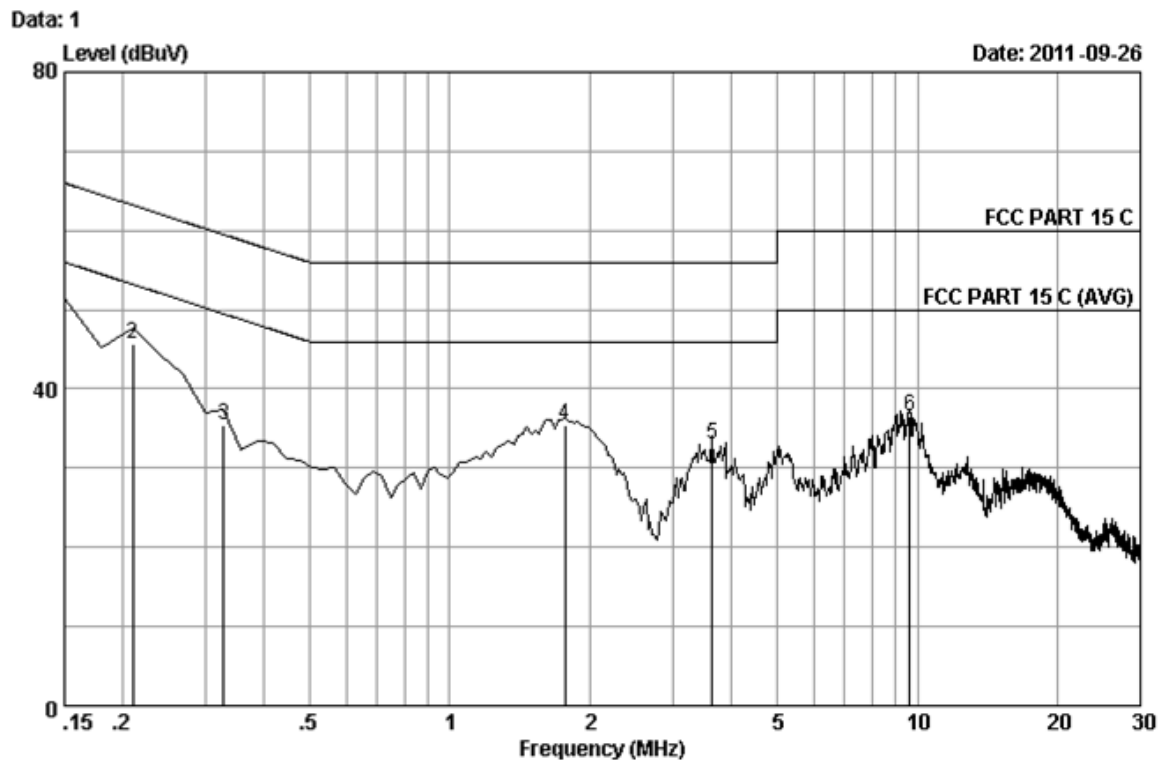
photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2009 and ANSI C64.10:2009 on conducted Emission test.

- (4) The bandwidth of test receiver is set at 10KHz.
- (5) The frequency range from 150 KHz to 30MHz is checked.

3.5. Test Result

PASS. (See below detailed test result)

Note: All emissions not reported below are too low against the prescribed limits.



Dis./Ant. : ** 2009 KNW407 VA LISN phase: L
 Limit : FCC PART 15 C
 Env./Ins. : Temp:23'C Humi:54% Engineer : Damon Hu
 EUT : Music trainer
 Power Rating : DC 5V From Adapter AC 120V/60Hz
 Test Mode : Charging And Tx Mode

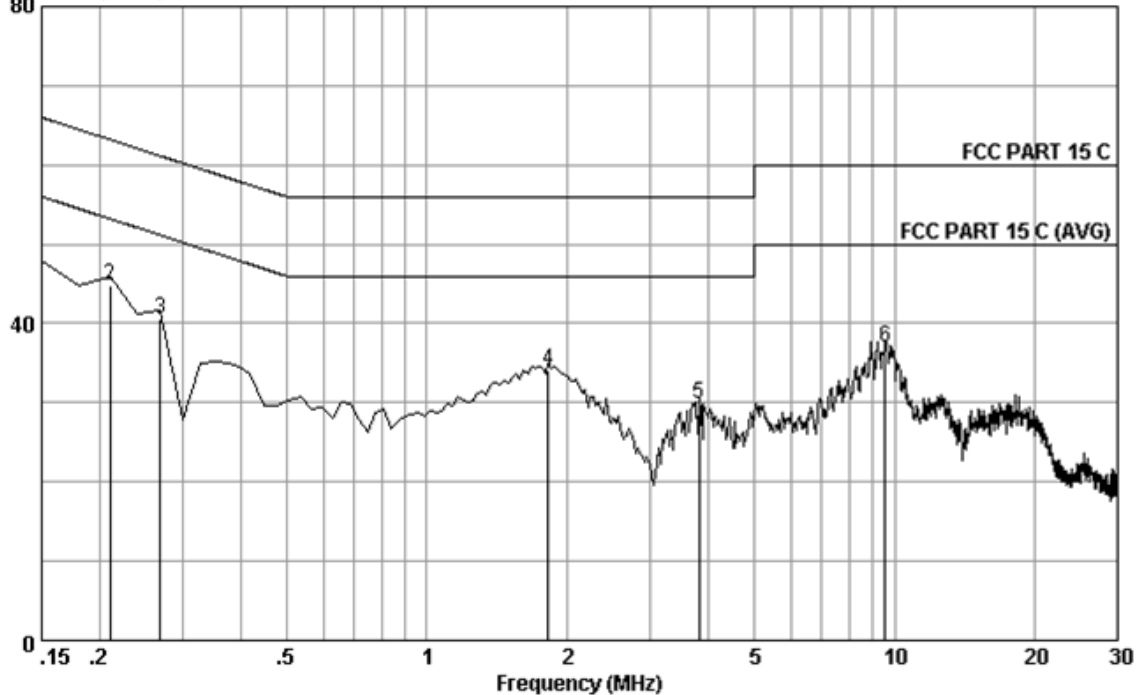
No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.47	9.88	39.21	49.56	66.00	16.44	QP
2	0.20970	0.42	9.88	35.38	45.68	63.22	17.54	QP
3	0.32910	0.37	9.89	25.16	35.42	59.47	24.05	QP
4	1.762	0.36	9.89	25.08	35.33	56.00	20.67	QP
5	3.642	0.37	9.91	22.75	33.03	56.00	22.97	QP
6	9.642	0.43	9.94	26.12	36.49	60.00	23.51	QP

Remarks: 1. Emission Level=LISN Factor+Cable Loss+Reading.
 2. If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

Data: 2

Level (dBuV)

Date: 2011-09-26



Dis./Ant. : ** 2009 KNW407 VB

LISN phase: N

Limit : FCC PART 15 C

Env./Ins. : Temp: 23°C Humi: 54%

Engineer : Damon Hu

EUT : Music trainer

Power Rating : DC 5V From Adapter AC 120V/60Hz

Test Mode : Charging And Tx Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.49	9.88	35.57	45.94	66.00	20.06	QP
2	0.20970	0.44	9.88	34.56	44.88	63.22	18.34	QP
3	0.26940	0.42	9.88	30.29	40.59	61.14	20.55	QP
4	1.822	0.36	9.89	23.73	33.98	56.00	22.02	QP
5	3.822	0.37	9.91	19.49	29.77	56.00	26.23	QP
6	9.553	0.44	9.94	26.55	36.93	60.00	23.07	QP

Remarks: 1. Emission Level = LISN Factor + Cable Loss + Reading.

2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

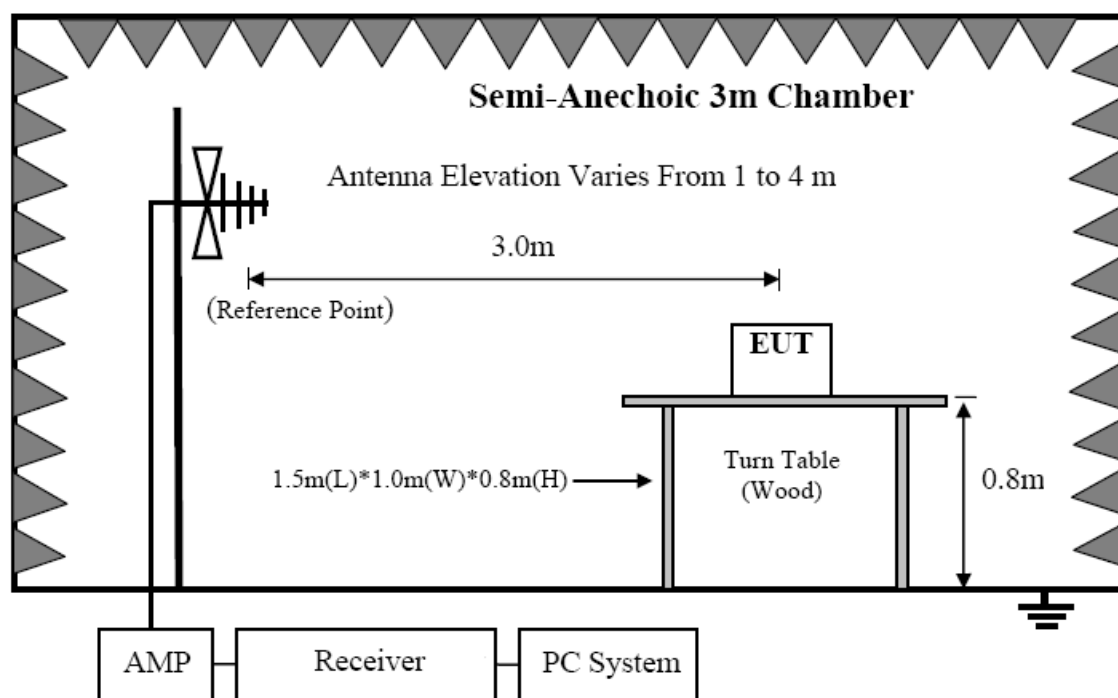
4. RADIATED EMISSION TEST

4.1. Test Equipment

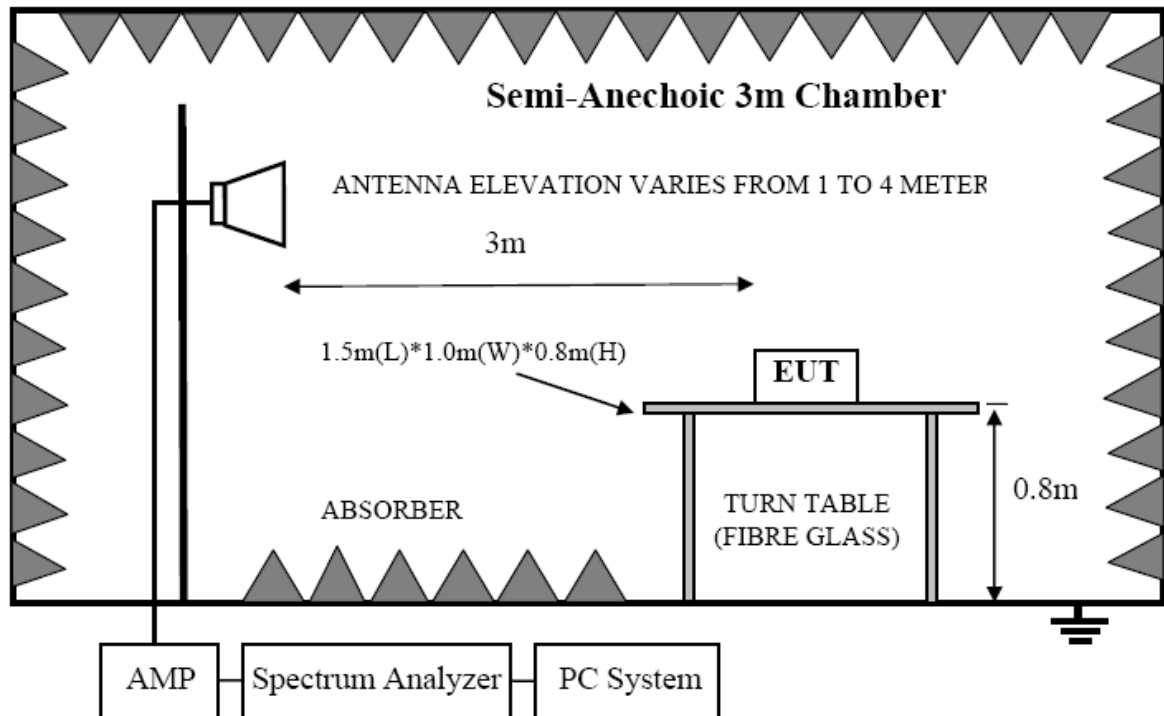
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESU8	100316	2010-11-30	1 Year
2	Spectrum analyzer	R&S	FSU	1166.1660.26	2010-11-30	1 Year
3	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2010-11-09	2 Year
4	Double Ridged Horn Antenna	R&S	HF907	100276	2011-01-17	2 Year
5	Pre-Amplifier	R&S	SCU-01	10049	2010-11-25	1 Year
6	Pre-Amplifier	R&S	SCU-26	10189	2010-11-25	1 Year
7	RF Cable	R&S	R01	10403	2010-11-25	1 Year
8	Test software	R&S	EMC32	/	/	/

4.2. Block Diagram of Test Setup

4.2.1. In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



4.2.2. In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

4.3. Radiated Emission Limit

4.3.1. FCC Part 15C 15.205 restricted bands of operation

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
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

4.3.2. FCC Part 15C 15.209 limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/\text{F}(\text{KHz})$	/
0.490 ~ 1.705	30	$24000/\text{F}(\text{KHz})$	/
1.705 ~ 30.0	30	30	30
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	PK: 5000	74
		Average: 500	54

Remark: (1) Emission level $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system
- (4) For frequency above 1GHz, the level of emissions shall comply both with PK limit and Average limit. And if peak level comply with average limit, then the average level is deemed to comply with average limit.
- (5) This limit not applies to fundamental emissions of device.

4.3.3. Radiated emissions limit for this reported device

All the emissions appearing within clause 4.3.1 15.205 restricted frequency bands shall not exceed the limits shown in clause 4.3.2 FCC 15.209 limit, all the other emissions except fundamental emissions shall be at least 20dB below the fundamental emissions, or comply with clause 4.3.2 15.209 limits.

4.4. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and simulator as shown in section 2.3 and 4.2
- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
 - (a) Change work frequency or channel of device if practicable.
 - (b) Change modulation type of device if practicable.
 - (c) Change power supply range from 85% to 115% of the rated supply voltage for AC power supply.
 - (d) For hand-held or body-worn devices, rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9MHz to 25GHz (tenth harmonic of fundamental frequency)

was investigated, and no any obvious emission were detected from 9KHz to 30MHz and 18GHz to 25GHz, so below final test was performed with frequency range from 30MHz to 18GHz.

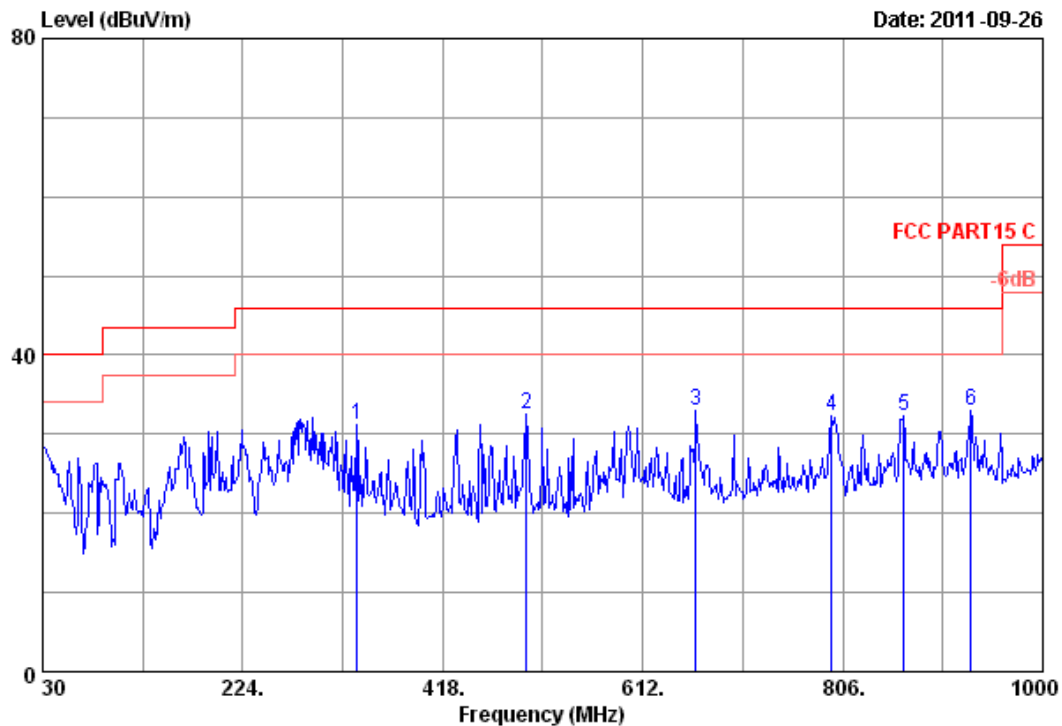
- (5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2009 on Radiated Emission test.
- (6) For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI Receiver and the bandwidth of Receiver is 120 KHz.
- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

4.5. Test Results

PASS. (See below detailed test data)

All the emissions from 9KHz to 25GHz were comply with 15.209 limit.

Data: 30



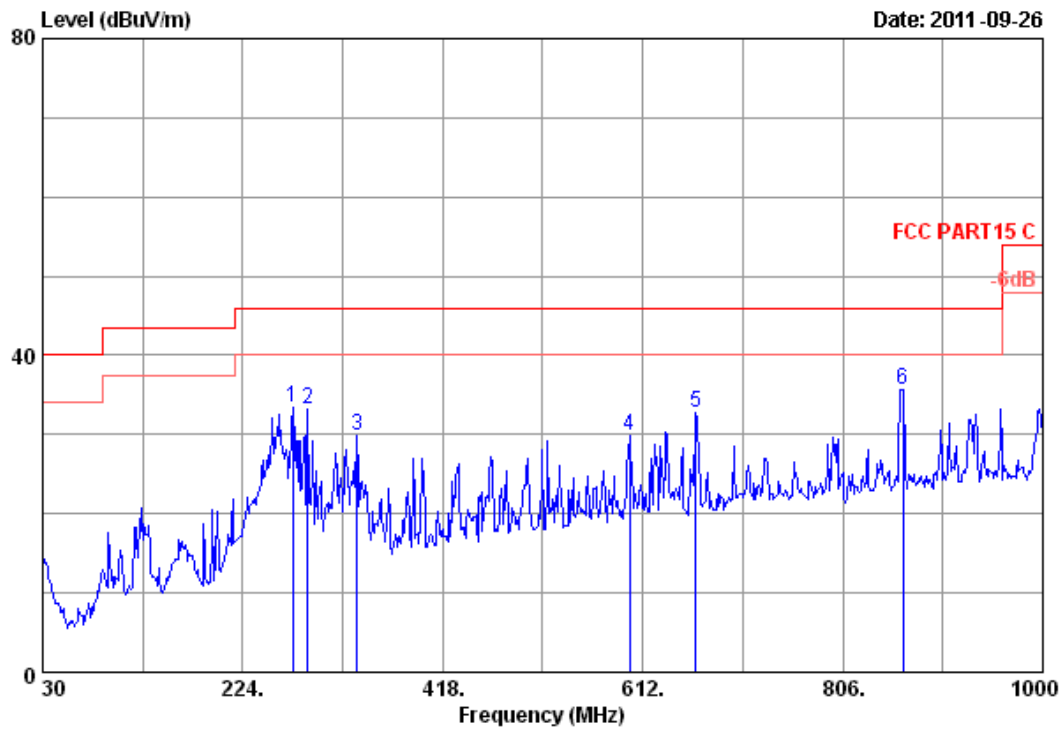
Site no. : RF Chamber Data no. : 30
 Dis. / Ant. : 3m CBL6111C Ant. pol. : HORIZONTAL
 Limit : FCC PART15 C
 Env. / Ins. : 23°C/54% Engineer : Damon Hu
 EUT : Music trainer
 Power Rating : DC 5V From Adapter AC 120V/60Hz
 Test mode : Charging And Tx Mode

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	334.580	14.60	2.40	14.26	31.26	46.00	14.74	QP
2	499.480	18.10	2.99	11.39	32.48	46.00	13.52	QP
3	663.410	20.47	3.43	9.04	32.94	46.00	13.06	QP
4	795.330	21.80	3.76	6.76	32.32	46.00	13.68	QP
5	865.170	22.80	3.96	5.66	32.42	46.00	13.58	QP
6	930.160	23.50	4.13	5.36	32.99	46.00	13.01	QP

Remarks:

- Emission Level= Antenna Factor + Cable Loss + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 29



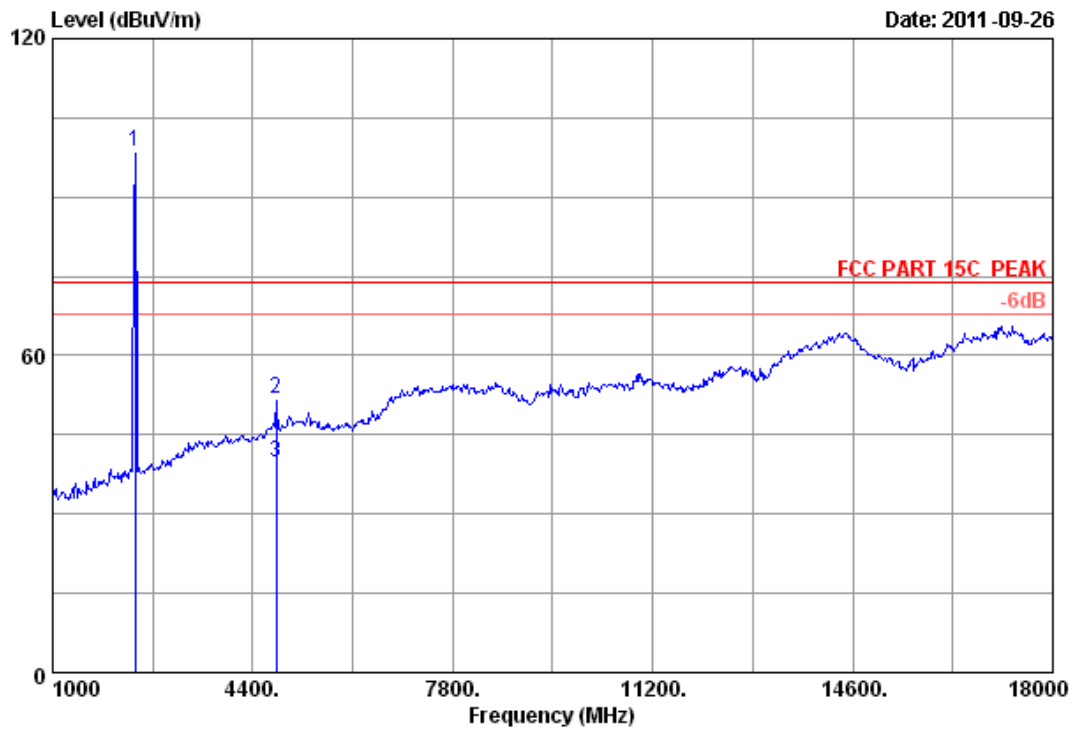
Site no. : RF Chamber Data no. : 29
Dis. / Ant. : 3m CBL6111C Ant. pol. : VERTICAL
Limit : FCC PART15 C
Env. / Ins. : 23°C/54% Engineer : Damon Hu
EUT : Music trainer
Power Rating : DC 5V From Adapter AC 120V/60Hz
Test mode : Charging And Tx Mode

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	272.500	13.35	2.20	17.97	33.52	46.00	12.48	QP
2	287.050	13.34	2.28	17.59	33.21	46.00	12.79	QP
3	334.580	14.60	2.40	12.82	29.82	46.00	16.18	QP
4	599.390	19.68	3.23	6.86	29.77	46.00	16.23	QP
5	663.410	20.47	3.43	8.77	32.67	46.00	13.33	QP
6	864.200	22.82	3.96	8.88	35.66	46.00	10.34	QP

Remarks:

- Emission Level= Antenna Factor + Cable Loss + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 1



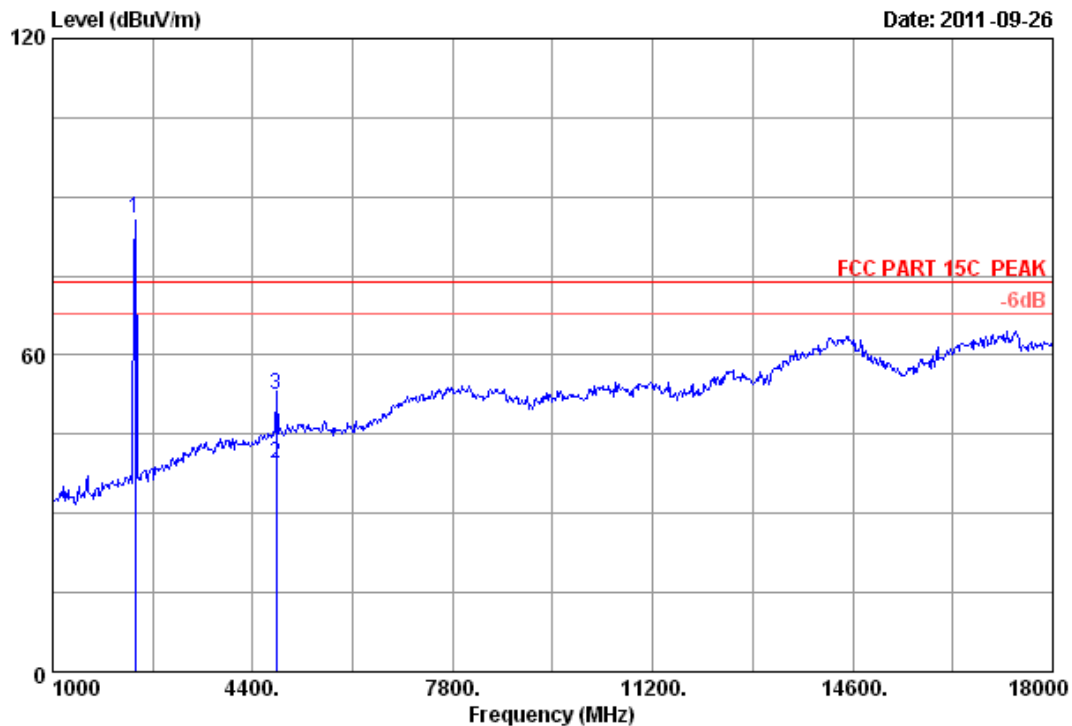
Site no. : 3m Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(0905) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23°C/54% Engineer : Damon Hu
 EUT : Music trainer
 Power : DC 5V From Adapter AC 120V/60Hz
 Test mode : Tx 2405MHz

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)		
1 2405.000	30.42	6.23	38.89	89.63	87.39	74.00	-13.39	Peak	
2 4810.000	34.36	10.53	35.37	42.36	51.88	74.00	22.12	Peak	
3 4810.000	34.36	10.53	35.37	30.42	39.94	74.00	34.06	Average	

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 2



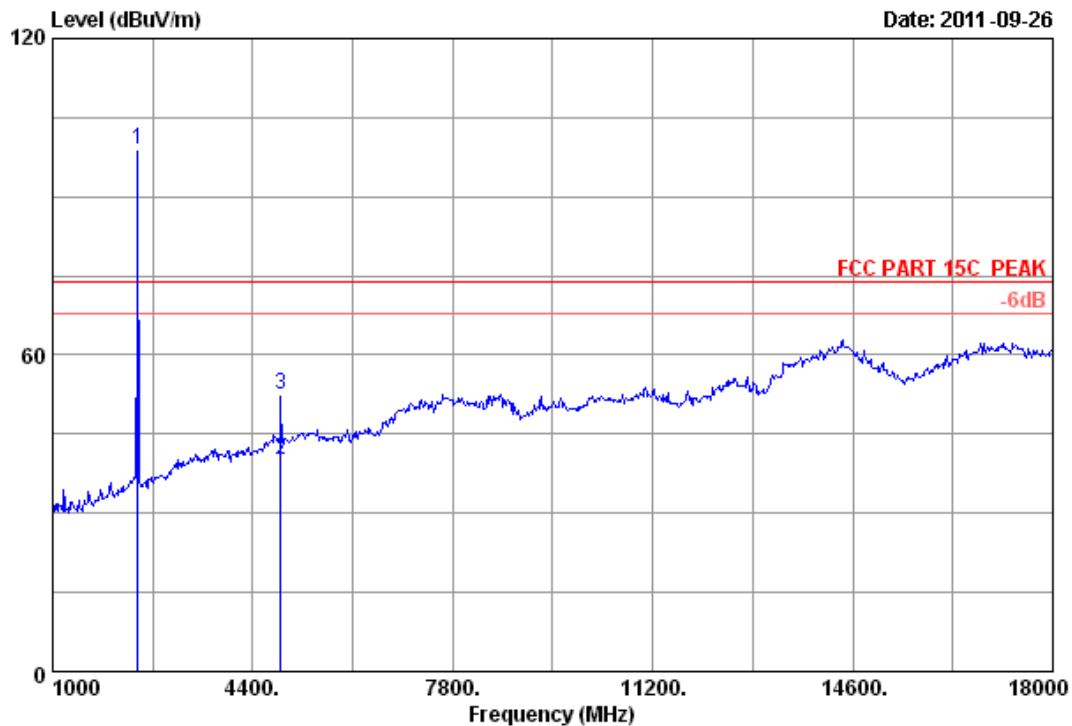
Site no. : 3m Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(0905) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23°C/54% Engineer : Damon Hu
 EUT : Music trainer
 Power : DC 5V From Adapter AC 120V/60Hz
 Test mode : Tx 2405MHz

		Ant.	Cable	Amp.		Emission			
	Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	2405.000	30.42	6.23	38.89	92.45	90.21	74.00	-16.21	Peak
2	4804.000	34.36	10.53	35.37	29.86	39.38	74.00	34.62	Average
3	4804.000	34.36	10.53	35.37	42.82	52.34	74.00	21.66	Peak

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 3



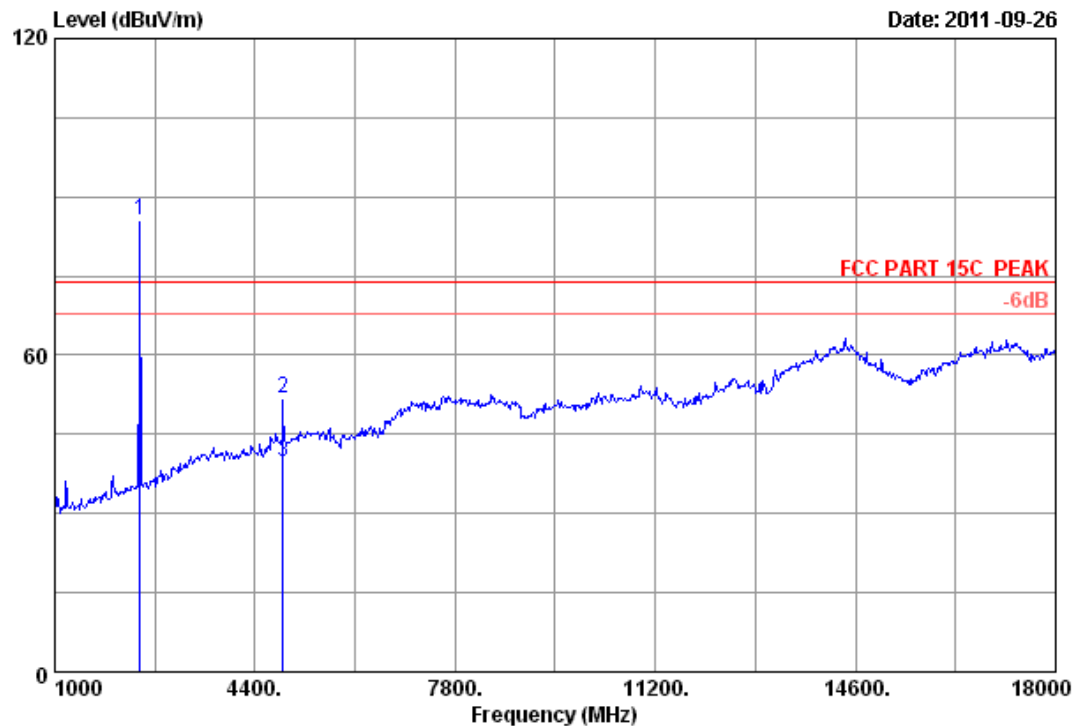
Site no. : 3m Chamber Data no. : 3
 Dis. / Ant. : 3m 3115(0905) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23°C/54% Engineer : Damon Hu
 EUT : Music trainer
 Power : DC 5V From Adapter AC 120V/60Hz
 Test mode : Tx 2440MHz

		Ant.	Cable	Amp.		Emission			
	Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	2440.000	30.32	6.30	39.39	87.04	84.27	74.00	-10.27	Peak
2	4882.000	34.78	10.57	35.36	30.25	40.24	74.00	33.76	Average
3	4882.000	34.78	10.57	35.36	42.50	52.49	74.00	21.51	Peak

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 4



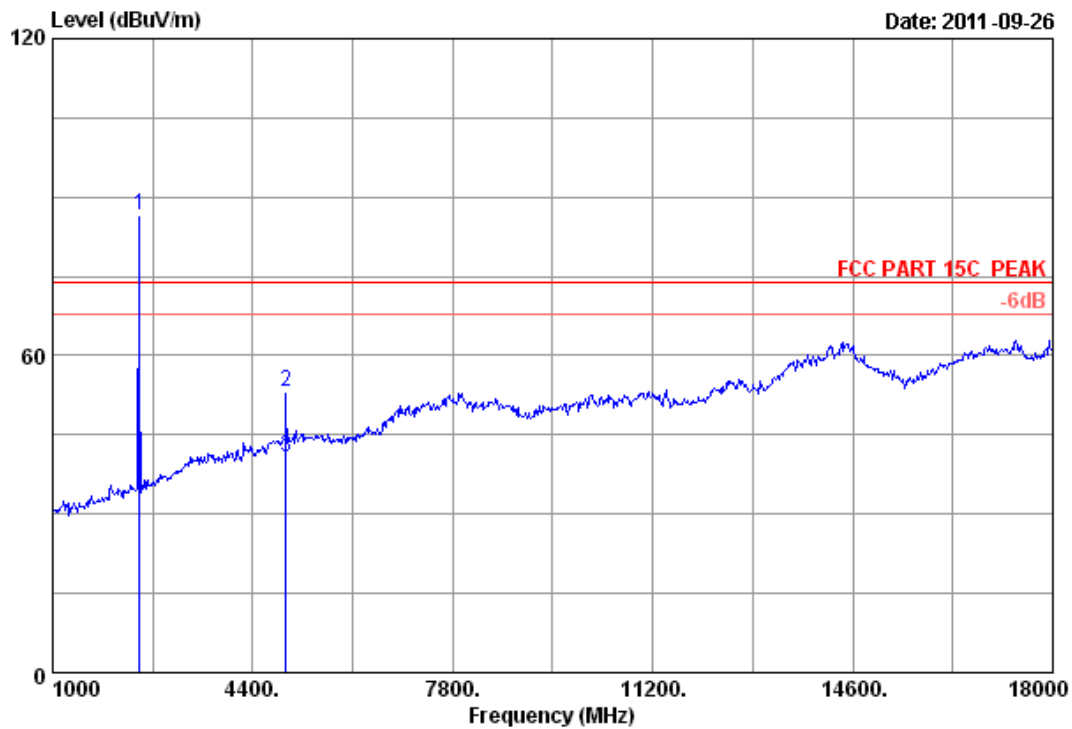
Site no. : 3m Chamber Data no. : 4
 Dis. / Ant. : 3m 3115 (0905) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23°C/54% Engineer : Damon Hu
 EUT : Music trainer
 Power : DC 5V From Adapter AC 120V/60Hz
 Test mode : Tx 2440MHz

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)		
1 2440.000	30.32	6.30	39.39	90.29	87.52	74.00	-13.52	Peak	
2 4882.000	34.78	10.57	35.36	41.98	51.97	74.00	22.03	Peak	
3 4882.000	34.78	10.57	35.36	29.66	39.65	74.00	34.35	Average	

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 5



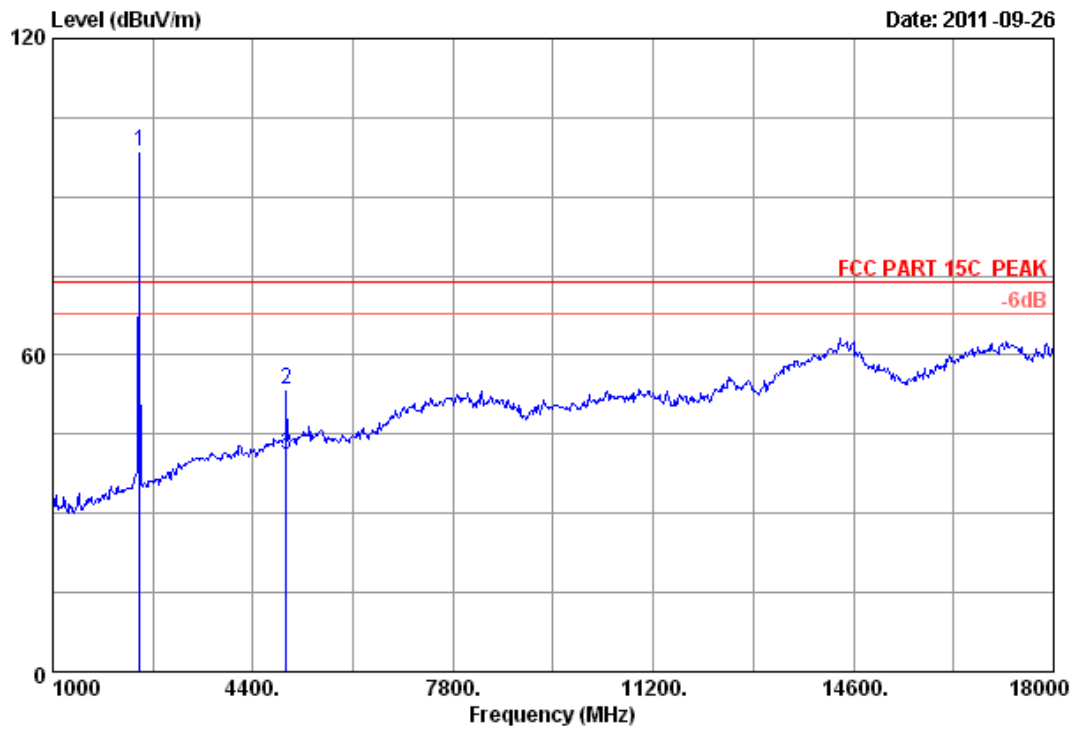
Site no. : 3m Chamber Data no. : 5
 Dis. / Ant. : 3m 3115(0905) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23°C/54% Engineer : Damon Hu
 EUT : Music trainer
 Power : DC 5V From Adapter AC 120V/60Hz
 Test mode : Tx 2480MHz

		Ant.	Cable	Amp.		Emission			
	Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.000	30.39	6.45	39.79	87.35	84.40	74.00	-10.40	Peak
2	4960.000	35.29	10.59	35.37	42.74	53.25	74.00	20.75	Peak
3	4960.000	35.29	10.59	35.37	30.42	40.93	74.00	33.07	Average

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Data: 6



Site no.	: 3m Chamber	Data no.	: 6
Dis. / Ant.	: 3m 3115 (0905)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer	: Damon Hu
EUT	: Music trainer		
Power	: DC 5V From Adapter AC 120V/60Hz		
Test mode	: Tx 2480MHz		

		Ant.	Cable	Amp.		Emission			
	Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.000	30.39	6.45	39.79	84.40	81.45	74.00	-07.45	Peak
2	4960.000	35.29	10.59	35.37	43.06	53.57	74.00	20.43	Peak
3	4960.000	35.29	10.59	35.37	30.57	41.08	74.00	32.92	Average

Remarks:

- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

5. BAND EDGE COMPLIANCE

5.1. Test Equipment

Same with clause 4.1

5.2. Block Diagram of Test Setup

Same with clause 4.2

5.3. Limit

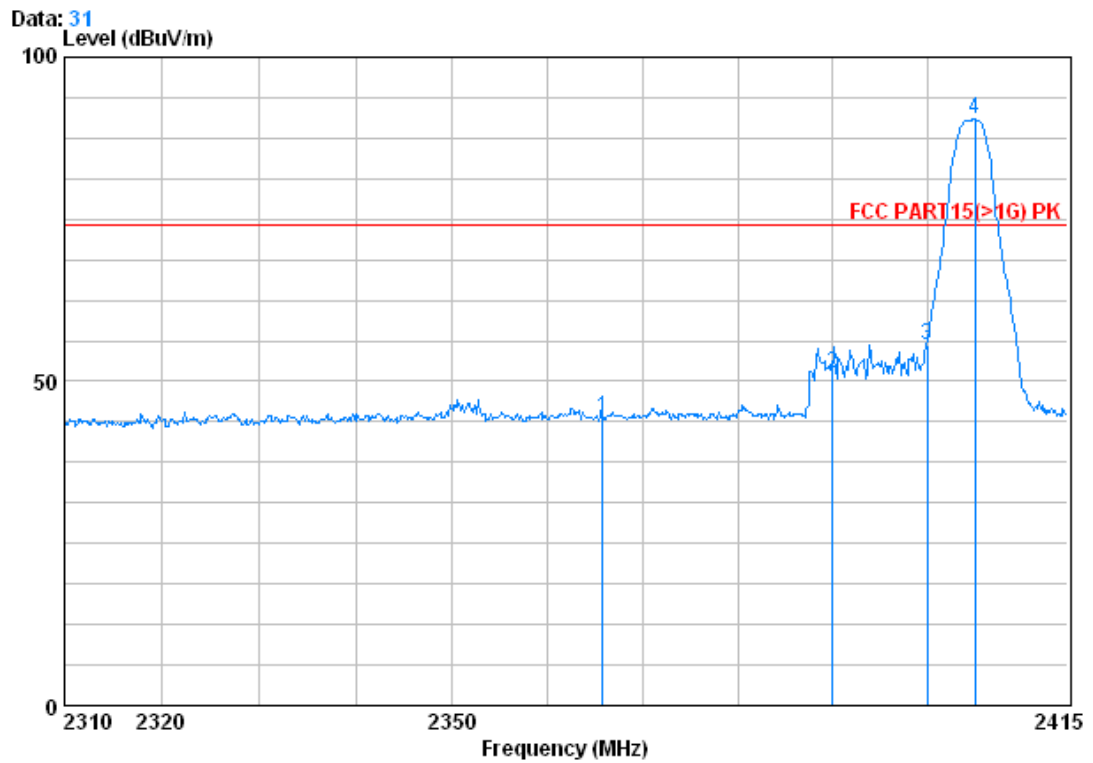
All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in clause 4.3.2 FCC15.209 limit, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

5.4. Test Procedure

Same with clause 4.4 except change investigated frequency range from 2310MHz to 2415MHz and 2475MHz to 2500MHz

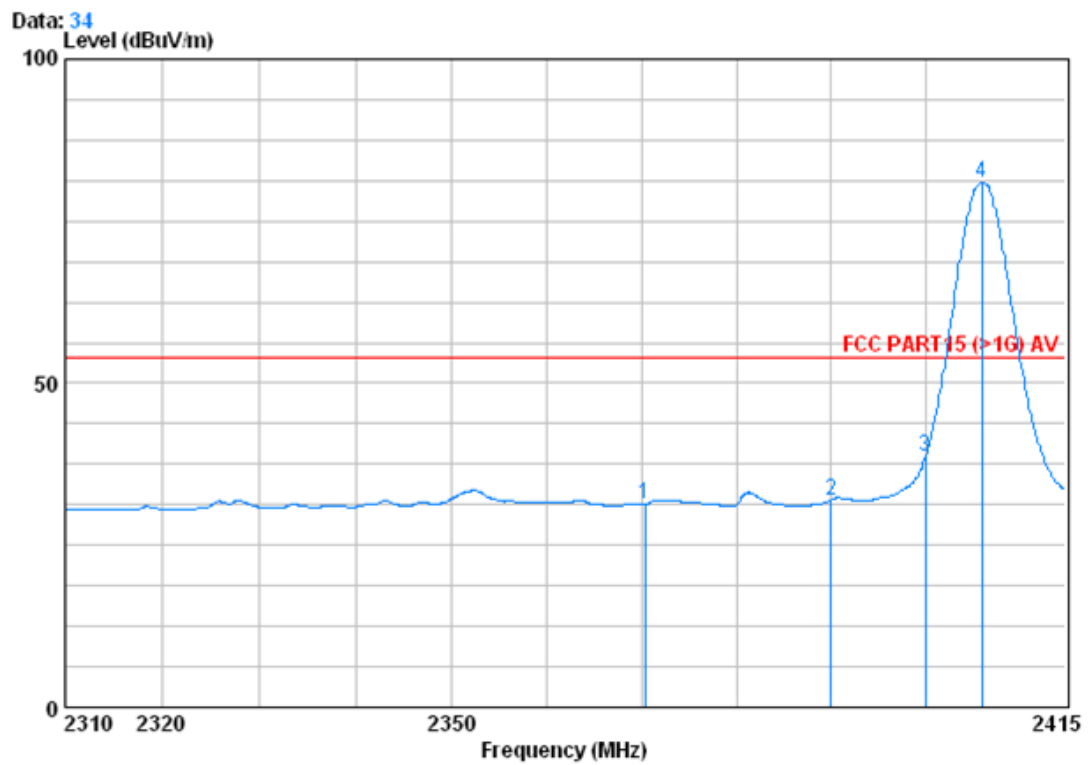
5.5. Test Results

PASS. (See below detailed test data)



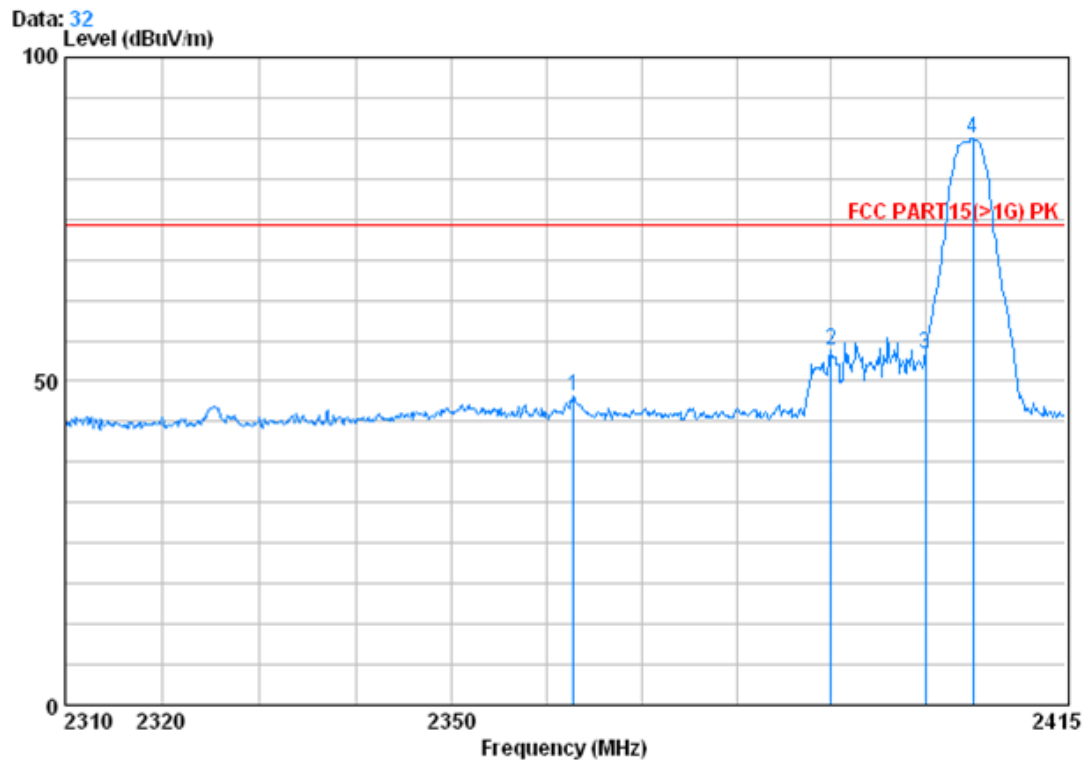
Condition : FCC PART15(>1G) PK 3m ANT3117(>1G) VERTICAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2405 bandedge

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2365.755	6.20	29.91	39.27	47.65	44.48	74.00	-29.52
2	2390.000	6.28	29.98	39.03	53.98	51.21	74.00	-22.79
3	2400.000	6.34	30.03	38.87	58.19	55.69	74.00	-18.31
4 @	2405.130	6.25	30.05	38.83	92.90	90.38	74.00	16.38



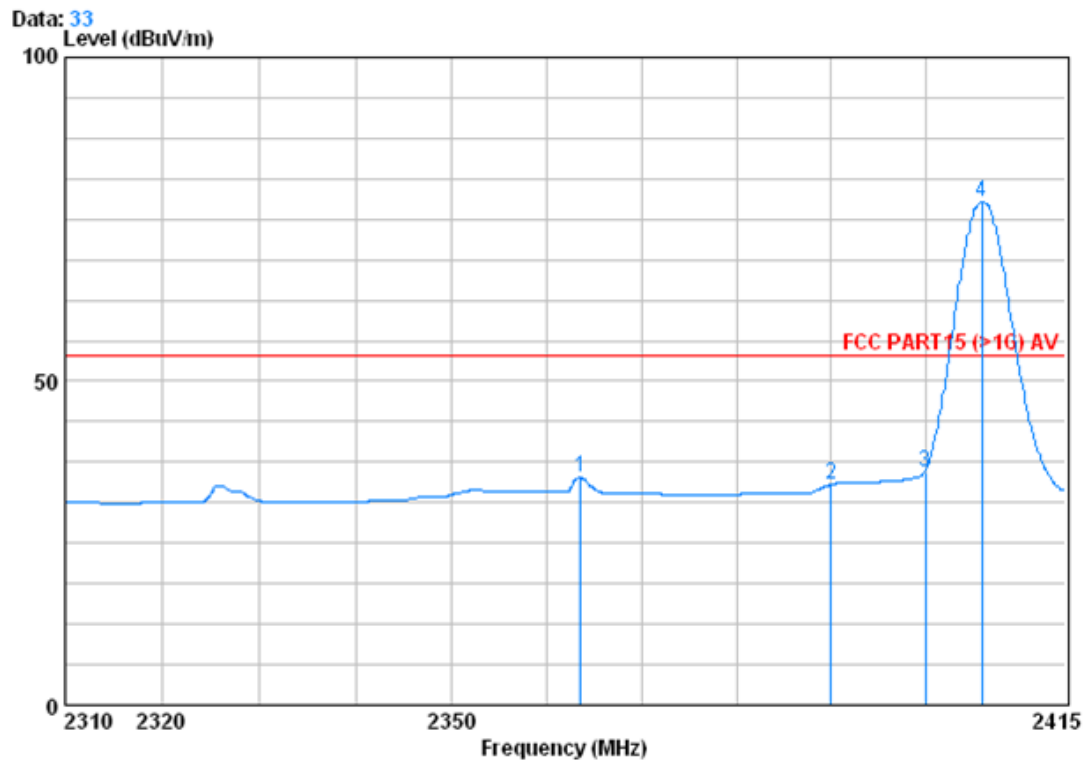
Condition : FCC PART15 (>1G) AV 3m ANT3117(>1G) VERTICAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2405 bandedge

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2370.270	6.23	29.93	39.19	34.33	31.30	54.00	-22.70
2	2390.000	6.28	29.98	39.03	34.63	31.87	54.00	-22.13
3	2400.000	6.34	30.03	38.87	41.06	38.56	54.00	-15.44
4 @	2406.075	6.25	30.05	38.83	83.43	80.90	54.00	26.90



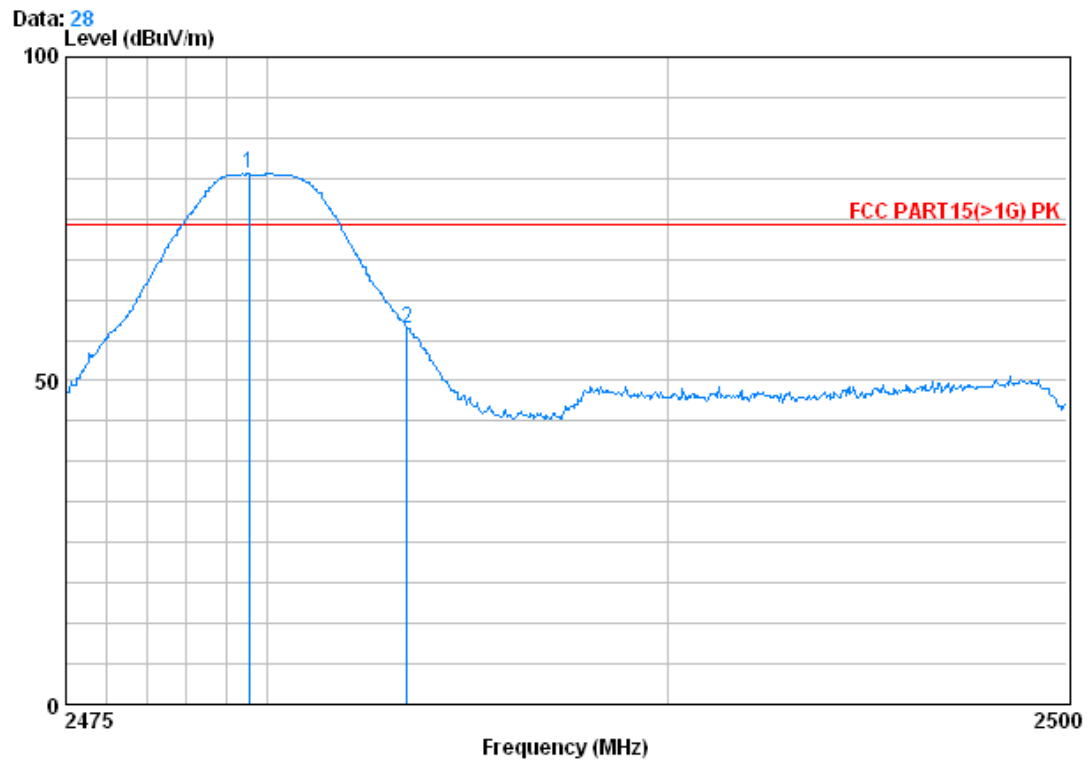
Condition : FCC PART15(>1G) PK 3m ANT3117(>1G) HORIZONTAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2405 bandedge

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2362.815	6.17	29.88	39.35	51.01	47.72	74.00	-26.28
2	2390.000	6.28	29.98	39.03	57.63	54.87	74.00	-19.13
3	2400.000	6.34	30.03	38.87	56.84	54.34	74.00	-19.66
4 @	2405.130	6.25	30.05	38.83	89.90	87.38	74.00	13.38



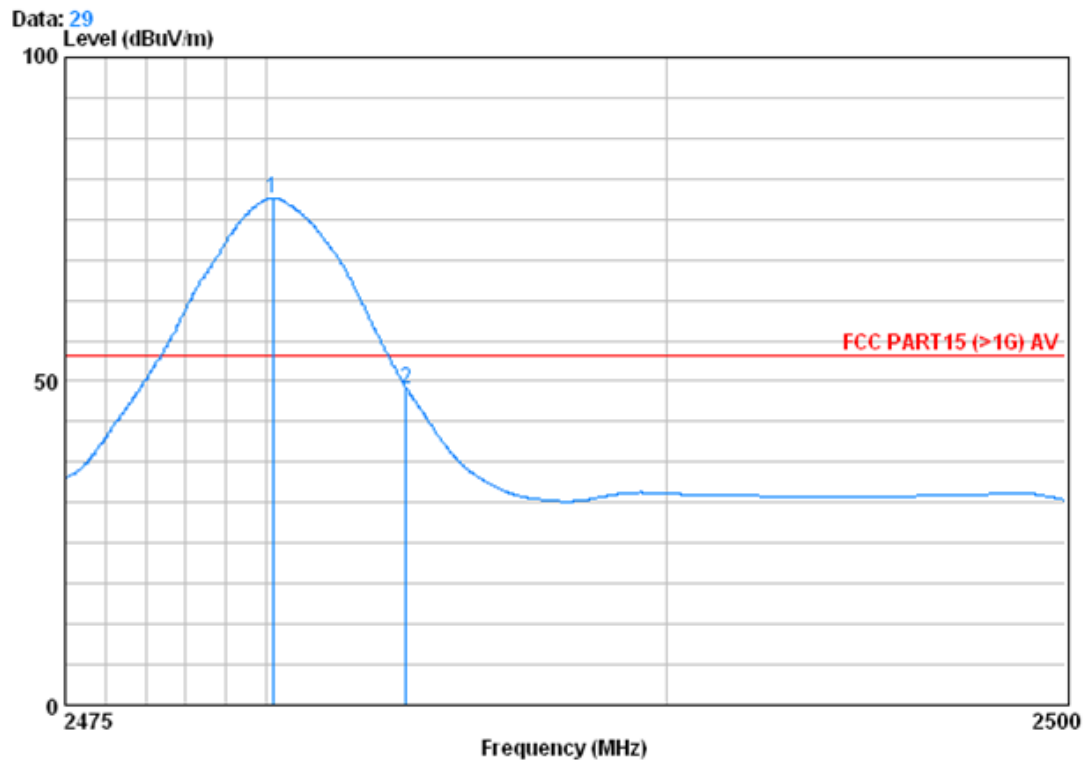
Condition : FCC PART15 (>1G) AV 3m ANT3117(>1G) HORIZONTAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2405 bandedge

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	Limit
1	2363.550	6.20	29.91	39.27	38.32	35.16	54.00	-18.84
2	2390.000	6.28	29.98	39.03	36.78	34.01	54.00	-19.99
3	2400.000	6.34	30.03	38.87	38.60	36.10	54.00	-17.90
4	2406.075	6.25	30.05	38.83	80.16	77.64	54.00	23.64



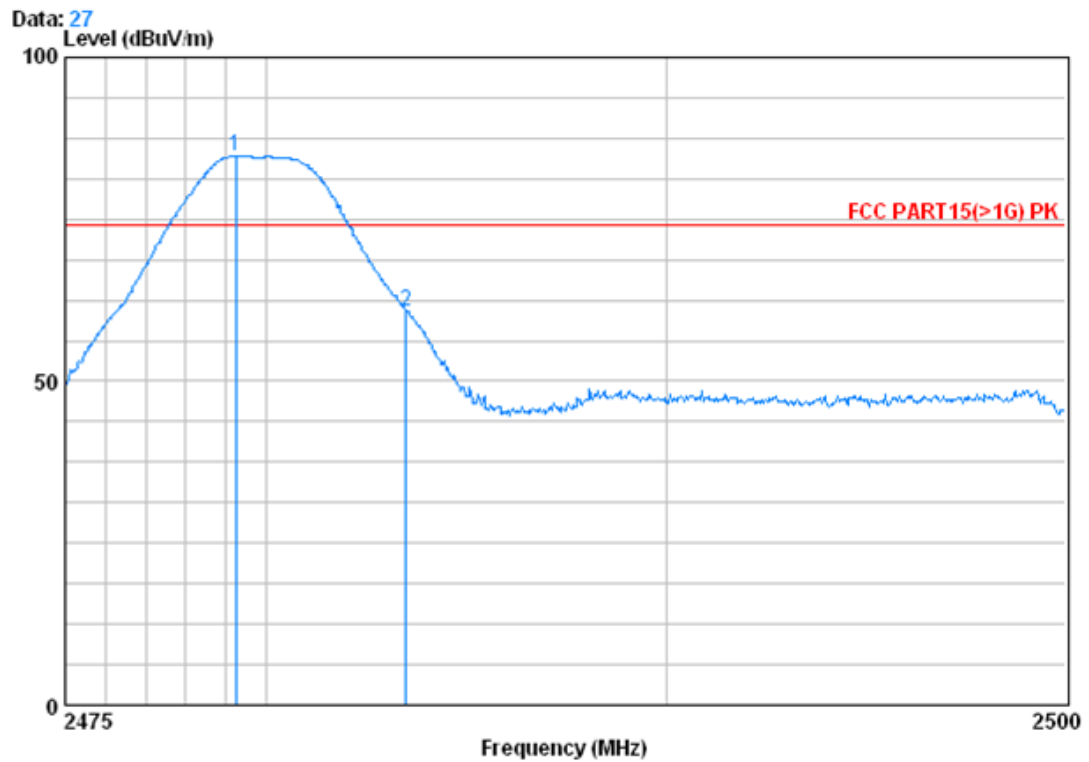
Condition : FCC PART15(>1G) PK 3m ANT3117(>1G) HORIZONTAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2480 bandedge

		Freq	CableAntenna Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	X	2479.550	6.45	30.30	39.72	84.88	81.91	74.00	7.91
2		2483.500	6.22	30.32	39.53	61.14	58.15	74.00	-15.85



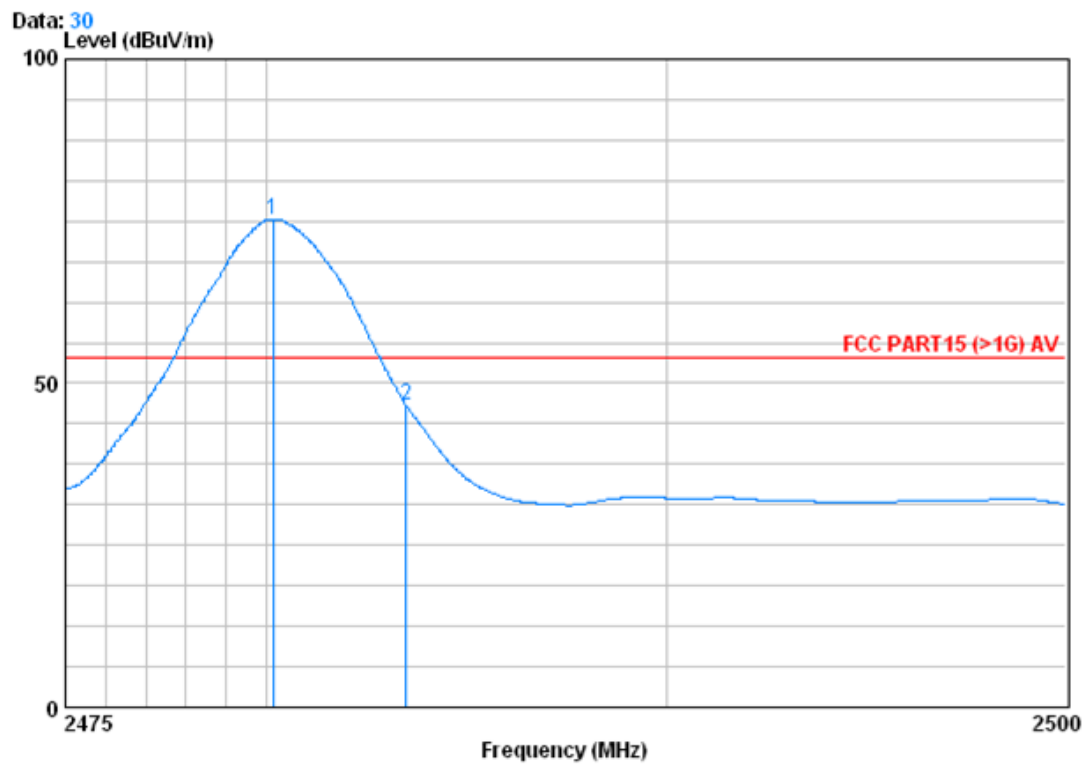
Condition : FCC PART15 (>1G) AV 3m ANT3117(>1G) HORIZONTAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2480 bandedge

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2480.175	6.45	30.30	39.72	81.22	78.25	54.00	24.25
2	2483.500	6.22	30.32	39.53	51.88	48.89	54.00	-5.11



Condition : FCC PART15(>1G) PK 3m ANT3117(>1G) VERTICAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2480 bandedge

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2479.250	6.45	30.30	39.72	87.71	84.74	74.00	10.74
2	2483.500	6.22	30.32	39.53	63.73	60.74	74.00	-13.26



Condition : FCC PART15 (>1G) AV 3m ANT3117(>1G) VERTICAL
EUT : Music trainer
Job No. : 6906RF
Mode : 2480 bandedge

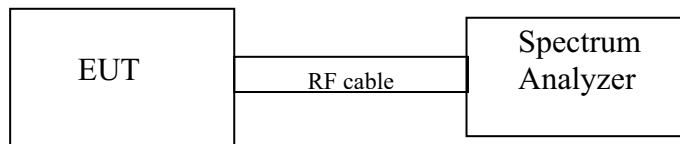
	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 @	2480.175	6.45	30.30	39.72	78.31	75.34	54.00	21.34
2	2483.500	6.22	30.32	39.53	49.50	46.51	54.00	-7.49

6. ANTENNA PORT CONDUCTED EMISSIONS

6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2010-11-30	1 Year
2	RF Cable	R&S	R01	10403	2010-11-25	1 Year

6.2. Block Diagram of Test Setup



Note: An appropriate attenuator may be used to protect the Spectrum Analyzer.

6.3. Limit

In any 100kHz bandwidth outside the frequency bands 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.

6.4. Test Procedure

The EUT's antenna port was connected to a Spectrum Analyzer. All the conducted emissions from 9 KHz to 25GHz were measured and the Spectrum Analyzer's RBW is set to 100 kHz, VBW is set to 300 kHz.

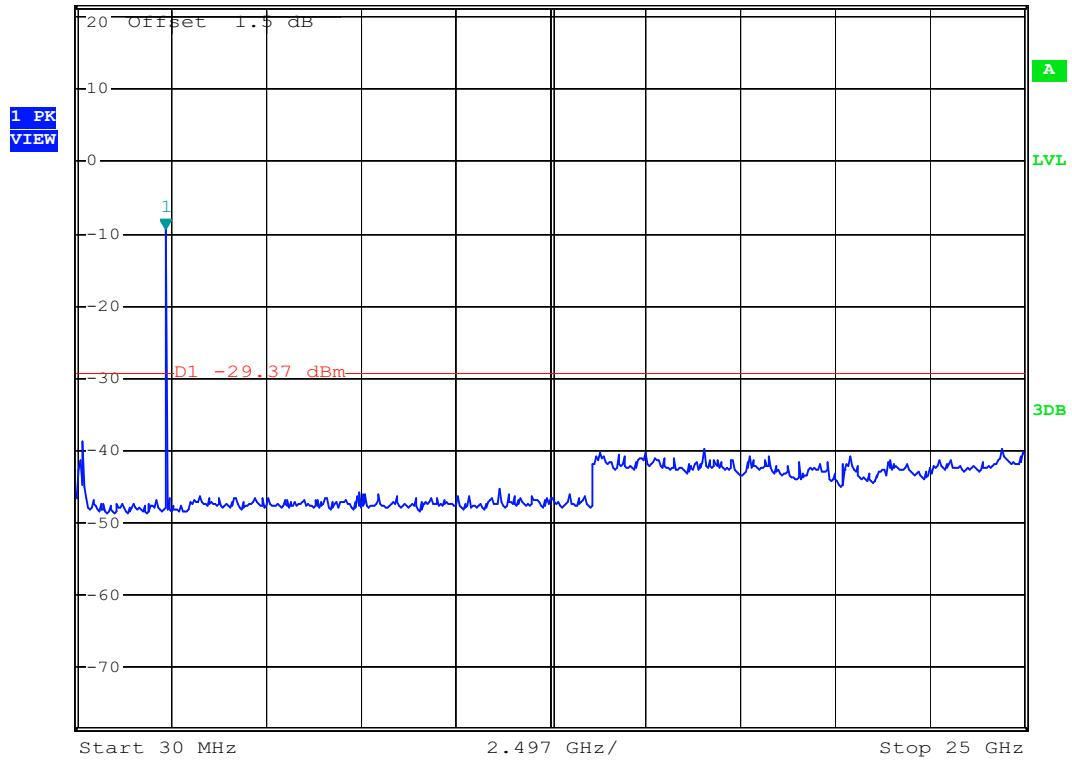
6.5. Test Results

PASS (See below original test data)

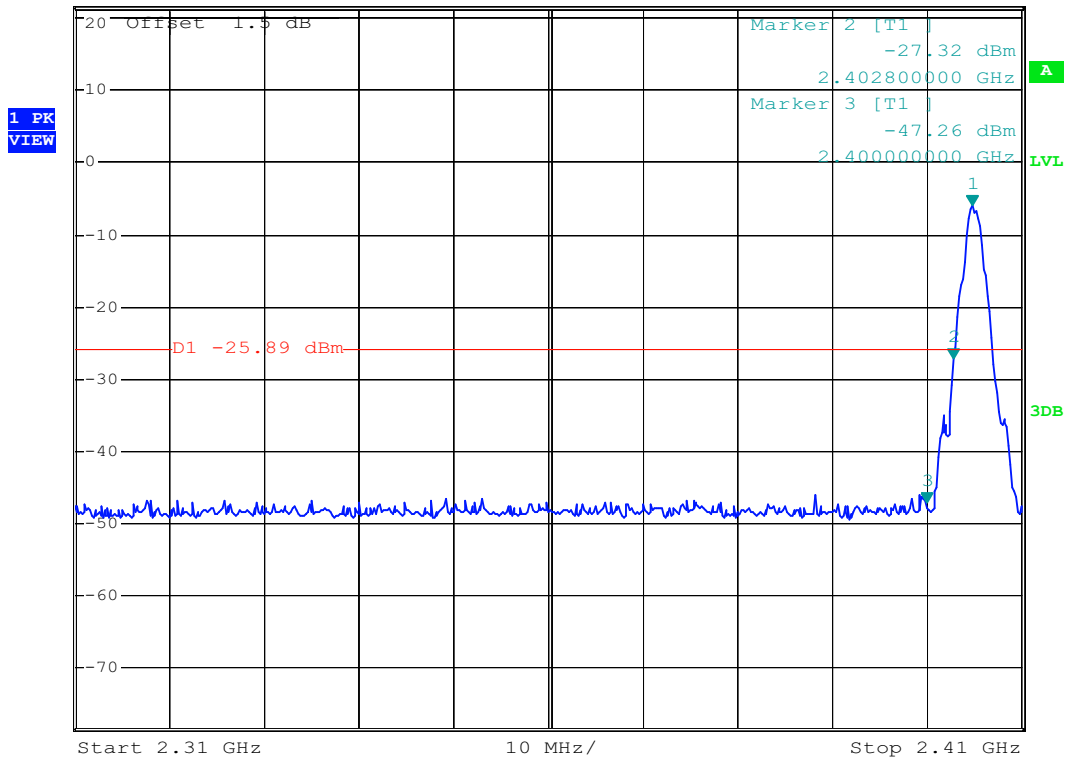
CH Low: 2405MHz



*RBW 100 kHz Marker 1 [T1]
 *VBW 300 kHz -9.37 dBm
 Ref 21.5 dBm *Att 30 dB SWT 2.5 s 2.377180000 GHz



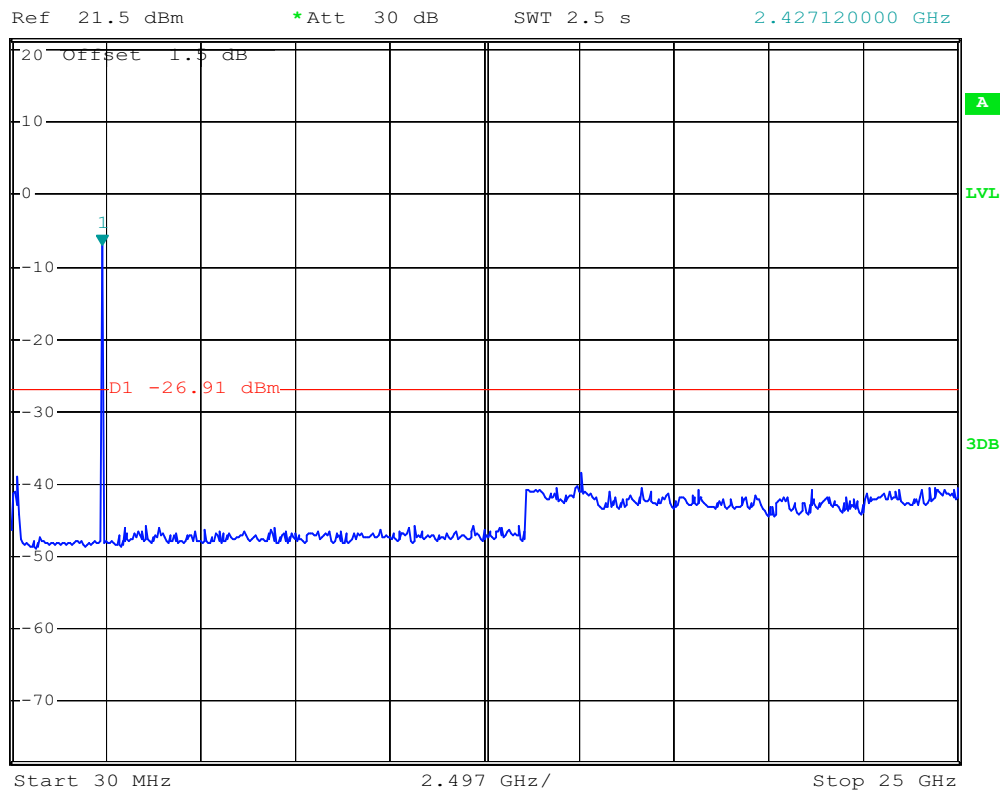
*RBW 100 kHz Marker 1 [T1]
 *VBW 300 kHz -5.89 dBm
 Ref 21.5 dBm *Att 30 dB SWT 10 ms 2.404800000 GHz



CH Middle: 2440MHz



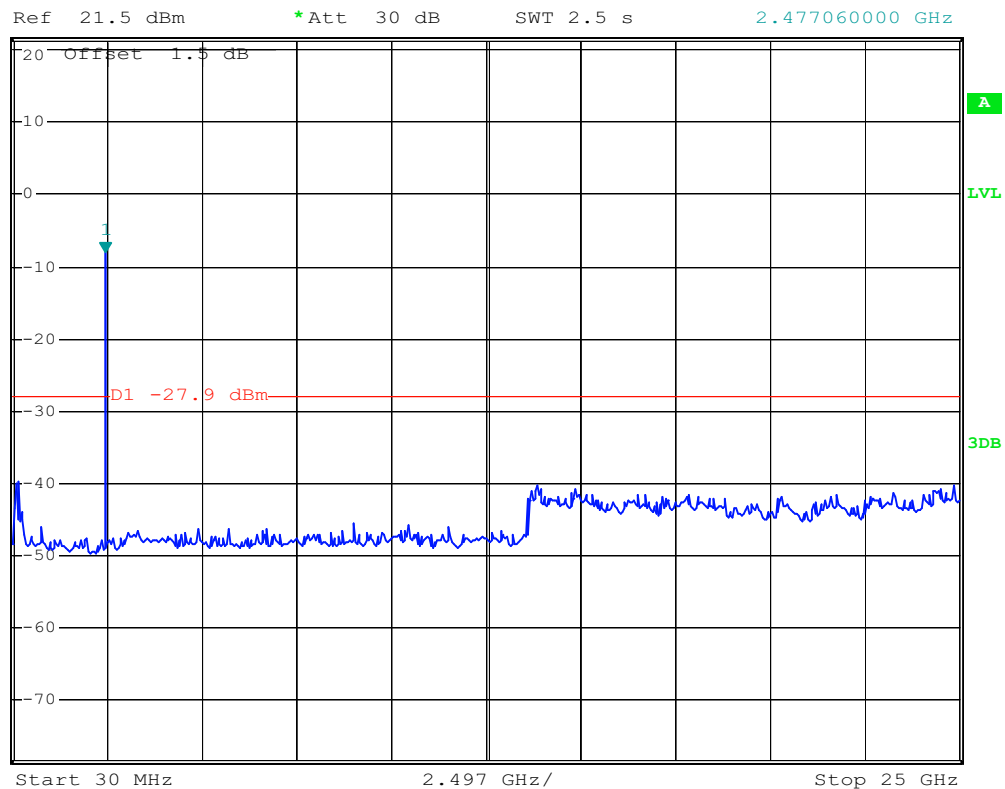
*RBW 100 kHz Marker 1 [T1]
 *VBW 300 kHz -6.91 dBm
 *Att 30 dB SWT 2.5 s 2.427120000 GHz

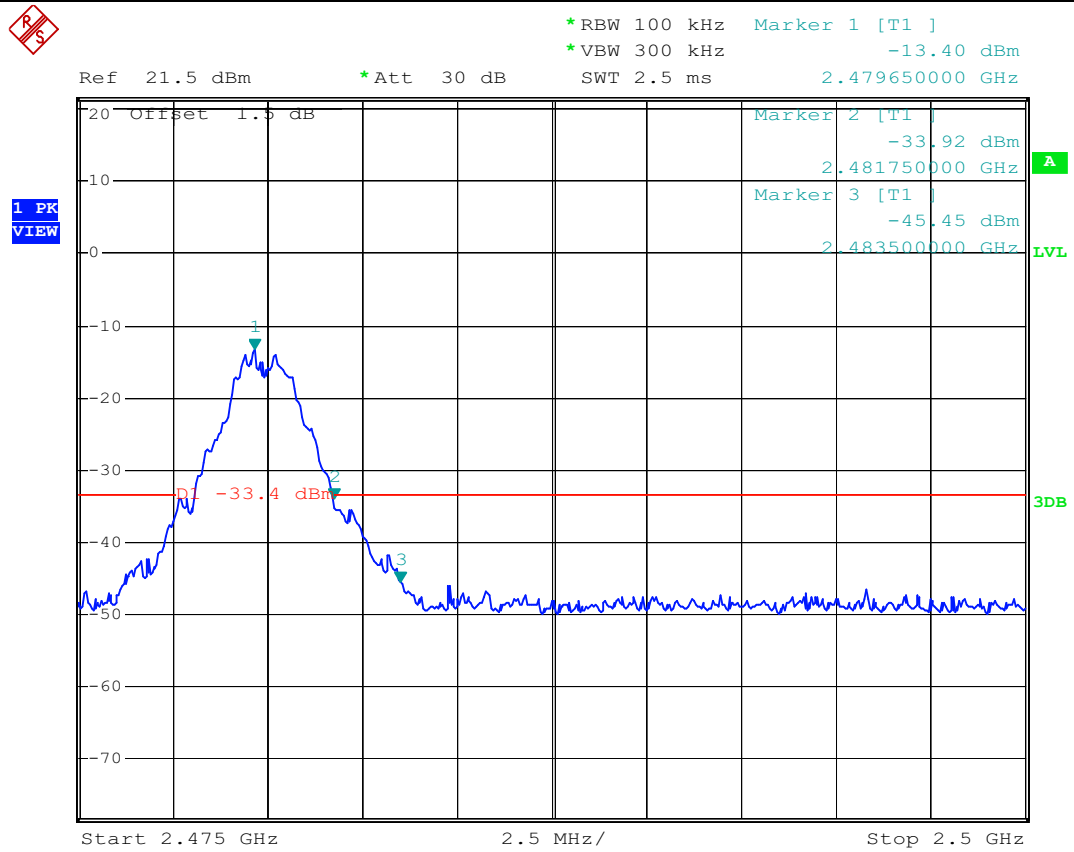


CH High: 2480MHz



*RBW 100 kHz Marker 1 [T1]
 *VBW 300 kHz -7.90 dBm
 *Att 30 dB SWT 2.5 s 2.477060000 GHz



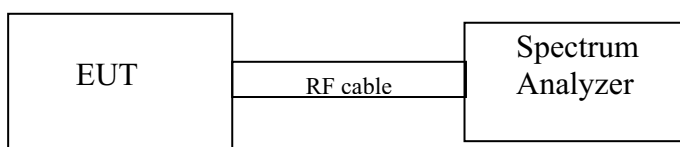


7. 6DB BANDWIDTH TEST

7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2010-11-30	1Year
2	RF Cable	R&S	R01	10403	2010-11-25	1Year

7.2. Block Diagram of Test Setup



Note: An appropriate attenuator may be used to protect the Spectrum Analyzer.

7.3. Limit

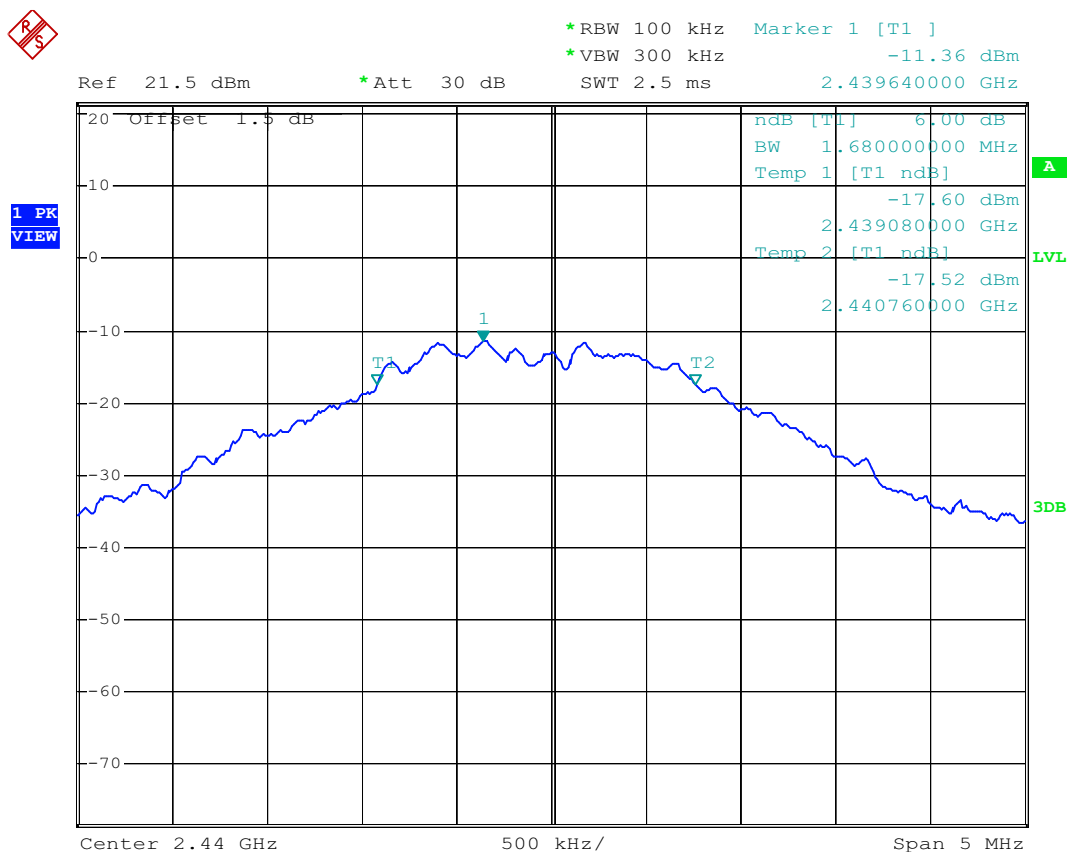
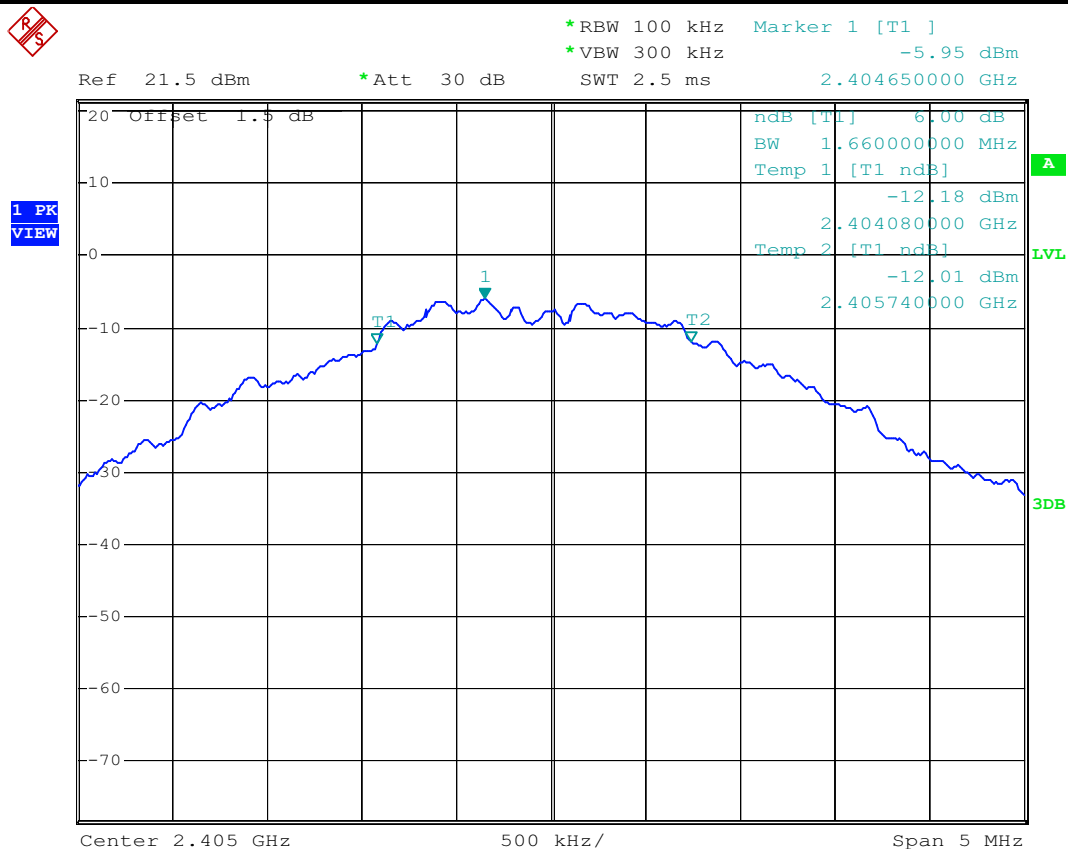
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

7.4. Test Procedure

The EUT's antenna port was connected to a Spectrum Analyzer. The 6dB bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 300 kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

7.5. Test Results

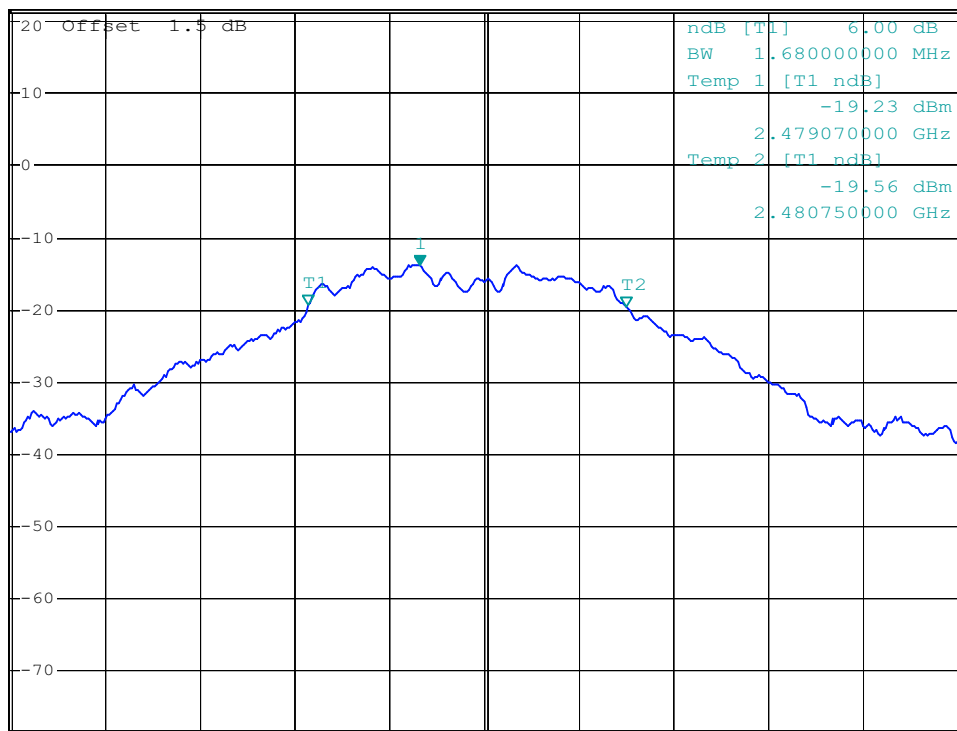
Test date:2011-09-23		Pressure: 100.6 kpa	Humidity: 57 %
Tested by: Damon Hu		Test site: 1#Shield room	Temperature : 24°C
Test Mode	CH	6dB bandwidth (MHz)	Limit (KHz)
Tx Mode	CH low	1.66	>500
	CH Middle	1.68	>500
	CH High	1.68	>500
Conclusion : PASS			





*RBW 100 kHz Marker 1 [T1]
 *VBW 300 kHz -13.68 dBm
 Ref 21.5 dBm *Att 30 dB SWT 2.5 ms 2.479660000 GHz

1 PK
VIEW



Center 2.48 GHz

500 kHz/

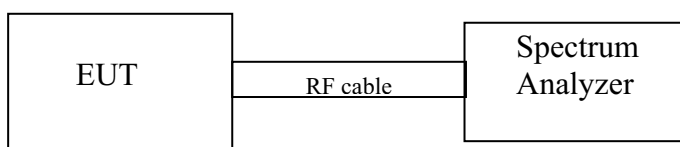
Span 5 MHz

8. OUTPUT POWER TEST

8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2010-11-30	1Year
2	RF Cable	R&S	R01	10403	2010-11-25	1Year

8.2. Block Diagram of Test Setup



Note: An appropriate attenuator may be used to protect the Spectrum Analyzer.

8.3. Limit

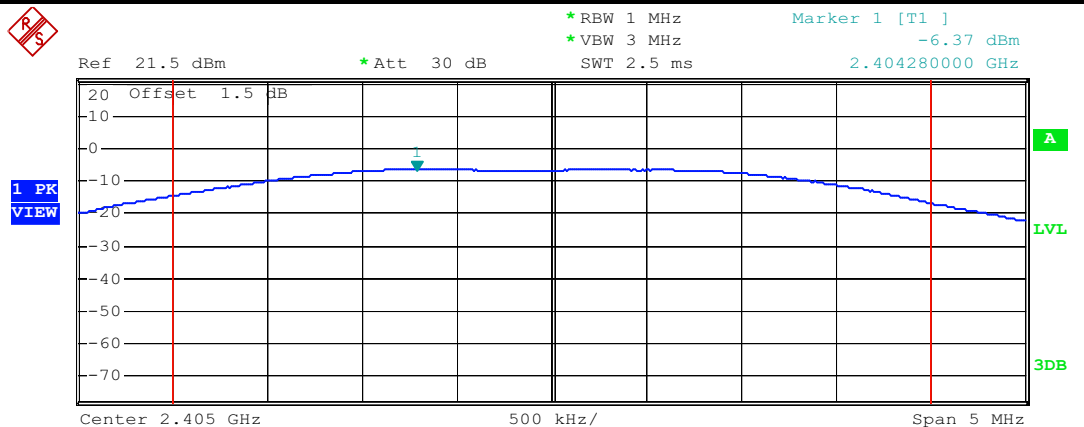
For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm).

8.4. Test Procedure

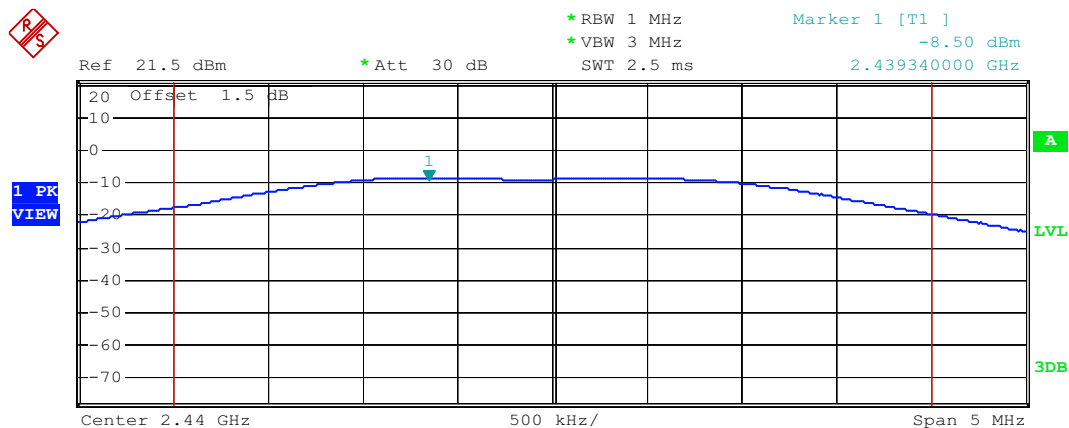
The EUT's antenna port was connected to a Spectrum Analyzer. Measure the Peak output power of EUT with Spectrum Analyzer, and the Spectrum Analyzer's RBW is set above 6dB bandwidth of EUT.

8.5. Test Results

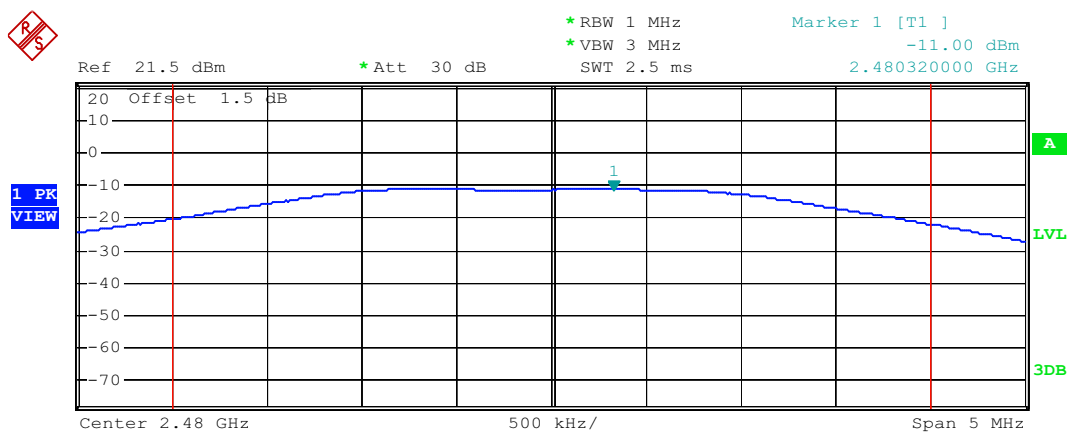
Test date:2011-09-23		Pressure: 100.6 kpa	Humidity: 57 %
Tested by: Damon Hu		Test site: 1#Shield room	Temperature : 24℃
Test Mode	CH	Peak Output Power (dBm)	Limit (dBm)
Tx Mode	CH low	-2.74	30
	CH Middle	-5.11	30
	CH High	-7.66	30
Conclusion : PASS			



Tx Channel
Bandwidth 4 MHz Power -2.74 dBm



Tx Channel
Bandwidth 4 MHz Power -5.11 dBm



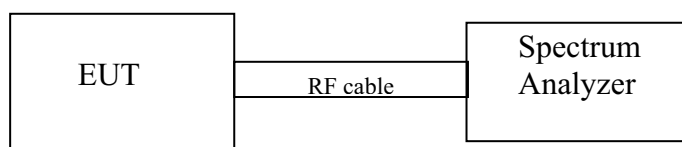
Tx Channel
Bandwidth 4 MHz Power -7.66 dBm

9. POWER SPECTRAL DENSITY TEST

9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2010-11-30	1Year
2	RF Cable	R&S	R01	10403	2010-11-25	1Year

9.2. Block Diagram of Test Setup



Note: An appropriate attenuator may be used to protect the Spectrum Analyzer.

9.3. Limit

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm).

9.4. Test Procedure

The EUT's antenna port was connected to a Spectrum Analyzer. Follow the test procedure as described in ANSI C.10: 2009 Clause 6.11.2.3 to measure out power density with 3 KHz bandwidth.

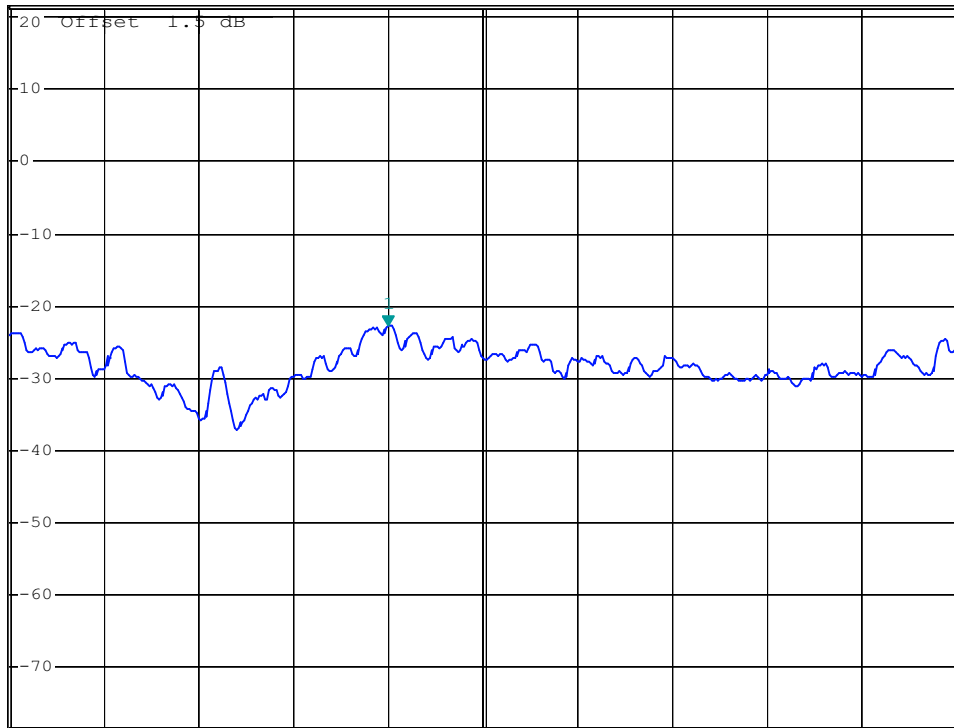
9.5. Test Results

Test date: 2011-09-23		Pressure: 100.6 kpa	Humidity: 57 %
Tested by: Damon Hu		Test site: 1#Shield room	Temperature:24°C
Test Mode	CH	Power Density (dBm/3KHz)	Limit (dBm/3KHz)
Tx Mode	CH low	-22.82	8
	CH Middle	-25.29	8
	CH High	-27.49	8
Conclusion : PASS			



Ref 21.5 dBm *Att 30 dB *RBW 3 kHz *VBW 10 kHz *SWT 100 s Marker 1 [T1] -22.82 dBm 2.404968200 GHz

1 PK
VIEW

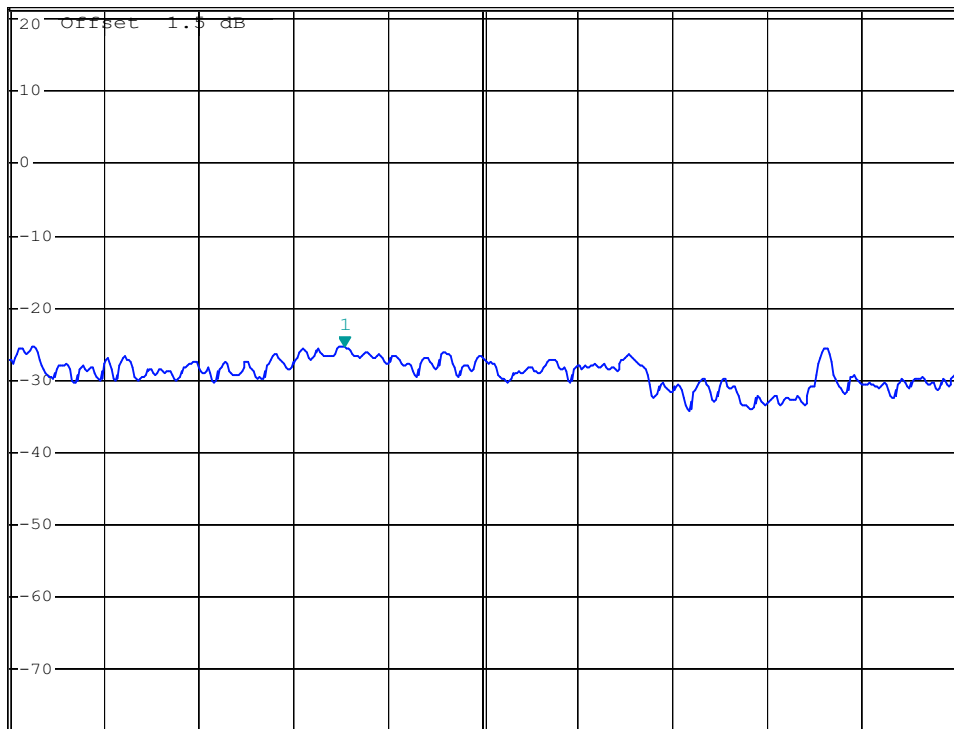


Center 2.4049982 GHz 30 kHz/ Span 300 kHz

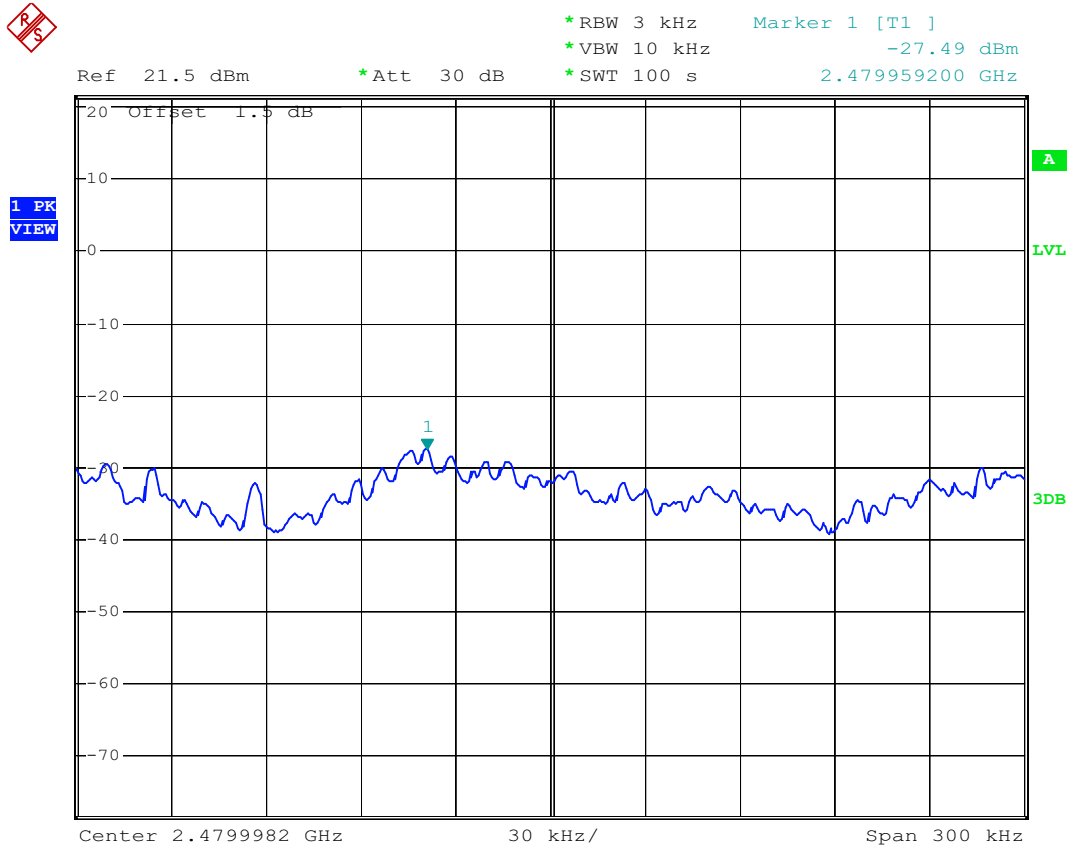


Ref 21.5 dBm *Att 30 dB *RBW 3 kHz *VBW 10 kHz *SWT 100 s Marker 1 [T1] -25.29 dBm 2.439596400 GHz

1 PK
VIEW



Center 2.4396402 GHz 30 kHz/ Span 300 kHz



10. ANTENNA REQUIREMENTS

10.1. STANDARD REQUIREMENTS

For intentional device, according to FCC 47 CFR 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. ANTENNA CONNECTED CONSTRUCTION OF EUT

The antennas used for this product is integrated patch antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 0dBi.