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Report No.: SHEM120300020802  
Page: 1 of 33

## ***FCC TEST REPORT***

**Application No. :** SHEM120300020802  
**Applicant:** Philips Electronics (Suzhou) Co., Ltd.  
209 ZhuYuan Road , Building B-3rd , 19~21 floor, SuZhou new district, Suzhou  
**FCC ID:** ZQ8RC292A  
**Fundamental Frequency :** 2425MHz-2475MHz  
**Equipment Under Test (EUT):**  
**EUT Name:** Remote Control  
**Brand Name:** Not supplied by the client  
**Model No:** RC2923901/01BR  
**Standards:** FCC PART 15 SUBPART C, Section 15.249  
**Date of Receipt:** March 01, 2012  
**Date of Test:** March 02, 2012 to March 08, 2012  
**Date of Issue:** March 09, 2012  
**Test Result :** **PASS \***

\* In the configuration tested, the EUT complied with the standards specified above.

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E&E Section Head  
SGS-CSTC(Shanghai) Co., Ltd.

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E&E Project Engineer  
SGS-CSTC(Shanghai) Co., Ltd.

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## 2 Test Summary

TEST ITEM	FCC REFERENCE	RESULT
Radiated emission	15.249 & 15.205	Pass
Assigned bandwidth (20dB bandwidth)	15.215(c)	Pass
Antenna Requirement	15.203	PASS
Power line conducted emission	15.207	N/A
Spurious emission for receiver	15B	N/A

Noted 1: NA =Not Applicable



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## 4 General Information

### 4.1 Client Information

Applicant: Philips Electronics (Suzhou) Co.,Ltd.  
Address of Applicant: 209 ZhuYuan Road , Building B-3rd ,19~21 floor, SuZhou new district,Suzhou  
Manufacturer: Philips Electronics (Suzhou) Co.,Ltd.  
Address of Manufacturer: 209 ZhuYuan Road , Building B-3rd ,19~21 floor, SuZhou new district,Suzhou

### 4.2 General Description of E.U.T.

EUT Name: Remote Control  
Brand Name: Not supplied by the client  
Model No: RC2923901/01BR

### 4.3 Details of E.U.T.

EUT Power Supply: Battery 2\*1.5V  
Modulation: O-QPSK  
Antenna diversity: The EUT is supporting antenna diversity over two antennas. For every received packet the digital signal processor in the EUT will select the antenna with the best signal.  
Operation Frequency Range: The EUT application supports **only** 3 RF-channels; these channels are the following:  
CH15 2425 MHz  
CH20 2450 MHz  
CH25 2475 MHz  
RF interface: The EUT does have two RF outputs: RF1 and RF2. Both RF ports are bidirectional and will be used for both transmit (TX) and receive (RX) mode.. The signal configuration of the RF ports is differential. The differential configuration is maintained up to the antenna, so the remote control is using a differential matching and low pass filters and also differential antennas.  
Hardware Version: Not supplied by client  
Software Version: Not supplied by client

### 4.4 Description of Support Units

Name	Model No.	Remark
NA	NA	NA

### 4.5 Standards Applicable for Testing

47CFR Part 15 (2009)  
ANSI C63.10: 2009

### 4.6 Test Location

All tests were performed at SGS E&E EMC lab



SGS-CSTC EMC Laboratory, No.588 West Jindu Road, Songjiang District, Shanghai, China  
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

#### **4.7 Mode of operation during the test / Test peripherals used**

While testing the transmitter mode of the EUT, the internal modulation was used. For the EUT is handheld device, so it was set up and tested in three axes (X and Y and Z). The three axes were tested one by one while the test receiver worked as "max hold" continuously and the highest reading among the whole test procedure was recorded.

#### **4.8 Deviation from Standards**

None.

#### **4.9 Other Information Requested by the Customer**

None.

#### **4.10 Test Confident level**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

#### **4.11 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.



#### 4.12 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2011-6-3	2012-6-1
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2011-6-3	2012-6-1
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2011-3-12	2012-3-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2011-6-3	2012-6-1
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2011-10-7	2012-10-5
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2009P	--	2011-10-13	2012-10-11
7	CLAMP METER	FLUKE	316	86080010	2011-04-22	2012-04-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2011-10-13	2012-10-11
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2011-6-17	2012-6-16
11	Tunable Notch Filter	Wainwright instruments GmbH	WRCT1800.0/ 2000.0-0.2/40- 5SSK	11	2012-1-24	2013-1-22
12	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800.0/880 .0-0.2/40-5SSK	9	2012-1-24	2013-1-22
13	High pass Filter	FSCW	HP 12/2800- 5AA2	19A45-02	2011-4-8	2012-4-7
14	Low noise amplifier	TESEQ	LNA6900	70133	2011-7-5	2012-7-4
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2011-06-04	2012-06-03
16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2011-05-07	2012-05-06
18	AVG Power Sensor	Rohde & Schwarz	NRP-Z22	1137	2011-05-07	2012-05-06
20	Power meter	Rohde & Schwarz	NRP	101641	2011-05-05	2012-05-04

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#### **4.13 E.U.T. Operation**

Input voltage: Battery 2\*1.5V

Operating Environment:

Temperature: 24.0 °C

Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation:

While testing the transmitter mode of the EUT, the internal modulation was used. For the EUT is handheld round-shaped device, it was set up and tested in three axes (X Y&Z). The three axes were tested one by one while the test receiver worked as "max hold" continuously and the highest reading among the whole test procedure was recorded. The EUT has been tested under operating condition. Test program was used to control the EUT for staying in continuous Transmitting mode is programmed. Channel low (2425MHz) mid(2450MHz) high(2475MHz)



## 5 Test Procedure & Measurement Data

### 5.1 Spurious Emission Test

**Test Requirement:** FCC part 15.249 & 15.205  
**Test date:** Mar 2,2012 to Mar 4,2012  
**Limit:** 15.249(a): Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

The radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

**15.249 (d)** Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

**Measurement Procedure:**

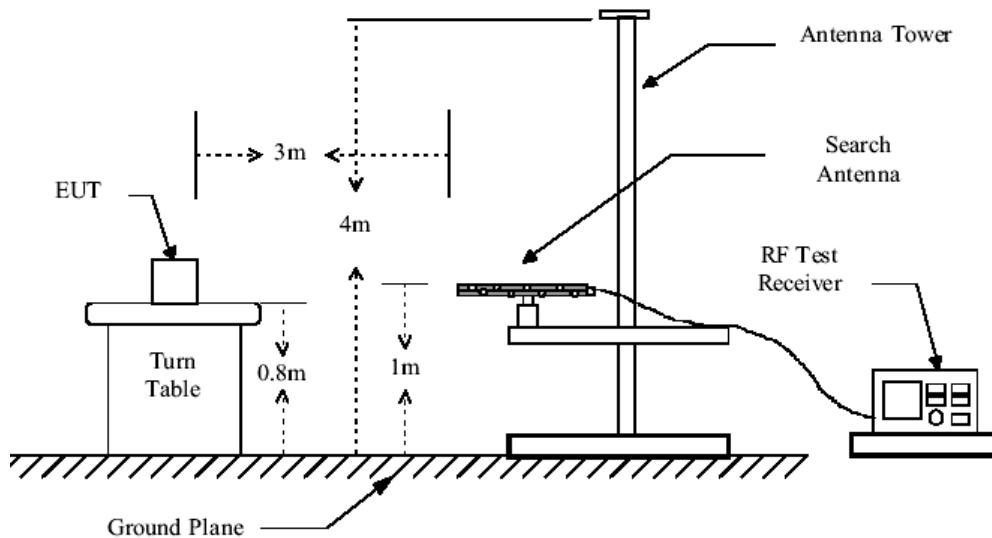
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.  
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz )  
Above 1GHz  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.



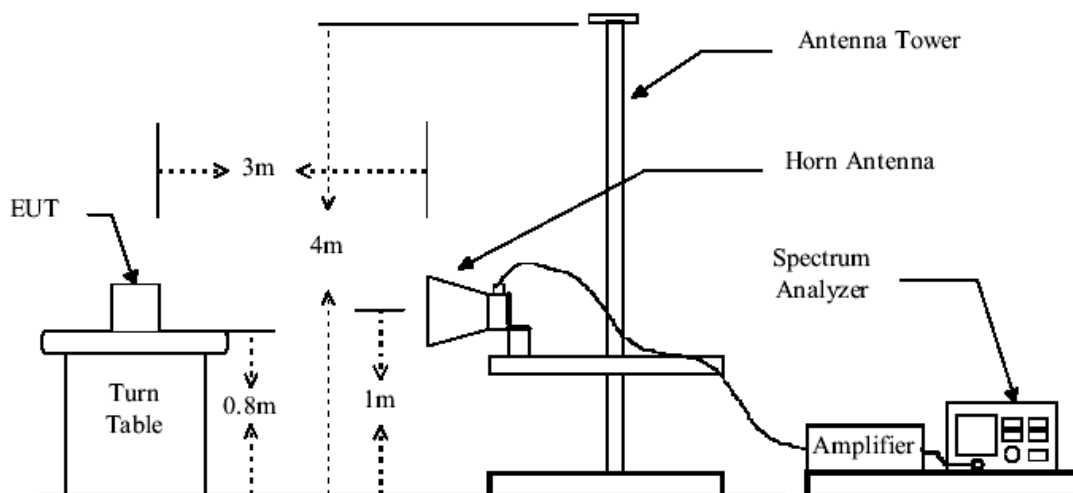
7. The field strength of spurious emission was measured in the following position: EUT satnd-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down postion(X axis) and the wrost case was recored.

#### Radiated Test Set-up:

##### Radiated Emission Test Set-up, Frequency Below 1000MHz



##### Radiated Emission Test Set-up Frequency Over 1GHz

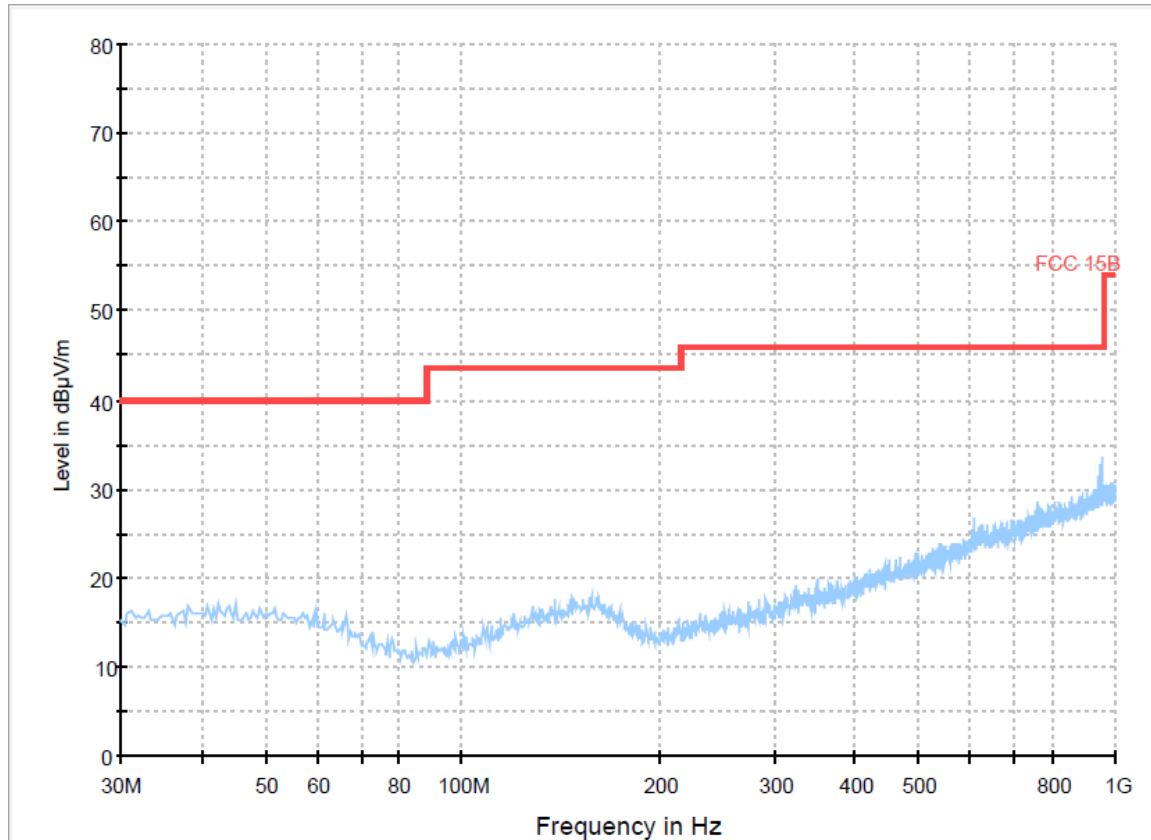


Low noise amplifier was used below 1GHz, High pass Filter was used above 1GHz.



Antenna 1 TX mode

Horizontal:



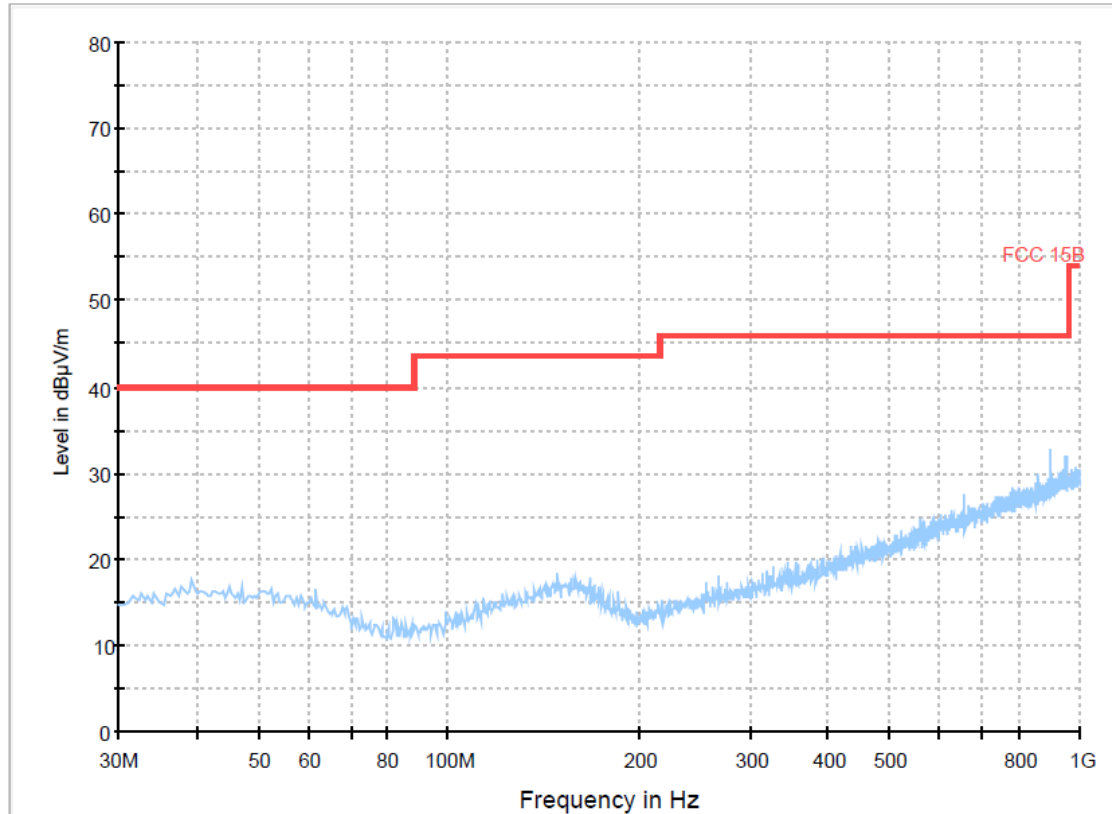
**Note:** Red limit line - Quasi-peak limit;  
Blue plots - Peak detector scan plots.

Frequency (MHz)	Actual Level QP (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.00	*	40.0	*
100.00	*	43.5	*
160.00	*	43.5	*
200.00	*	43.5	*
400.00	*	46.0	*
800.00	*	46.0	*
1000.00	*	54.0	*

\*\*\* means the emission level is 6dB lower than the relevant limit.



Vertical:



Frequency (MHz)	Actual Level QP (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.00	*	40.0	*
100.00	*	43.5	*
160.00	*	43.5	*
200.00	*	43.5	*
400.00	*	46.0	*
800.00	*	46.0	*
1000.00	*	54.0	*

\*\*\* means the emission level is 6dB lower than the relevant limit.



Operation Mode: TX Low CH 2425MHz Antenna 1  
Above 1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Receiver Peak Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Peak Result (dBuV/m)	Peak Limit 3m (dBuV/m)	Margin (dB)
2.425	52.65	PK	H	32.4	85.05	114	28.95
2.425	63.79	PK	V	32.4	96.19	114	17.81

Peak Result=Peak Reading+Correction Factors

Radiated Emissions		Ant	Duty Cycle	Total	FCC Limit	
Frequency (GHz)	Peak Result (dBuV/m)	Pol.	(dB)	Avg Result (dBuV/m)	Average Limit 3m (dBuV/m)	Margin (dB)
2.425	85.05	H	-8.7	76.35	94	17.65
2.425	96.16	V	-8.7	87.46	94	6.54

Average Result=Peak Result+Duty Cycle

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4.849	12.924	PK	H	37.0	49.924	54	4.076
7.274	-1.353	PK	H	43.6	42.247	54	11.753
4.510	16.912	PK	V	37.0	53.912	54	0.088
7.274	7.575	PK	V	43.6	50.175	54	2.825

Remark:

1. For fundamental emission test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The shaded data is the fundamental emission.
7. Duty cycle



## Duty cycle

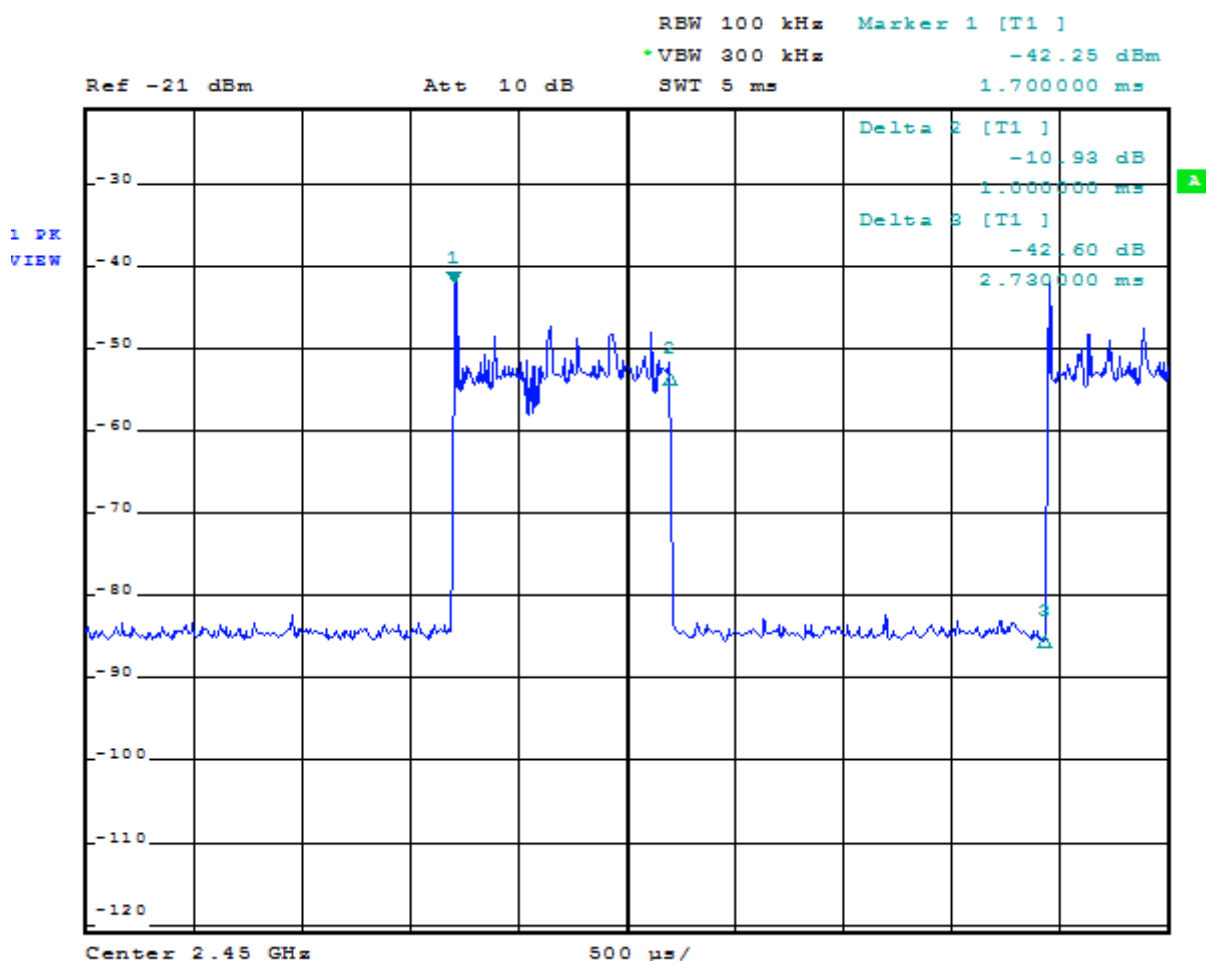
### Measurement Result:

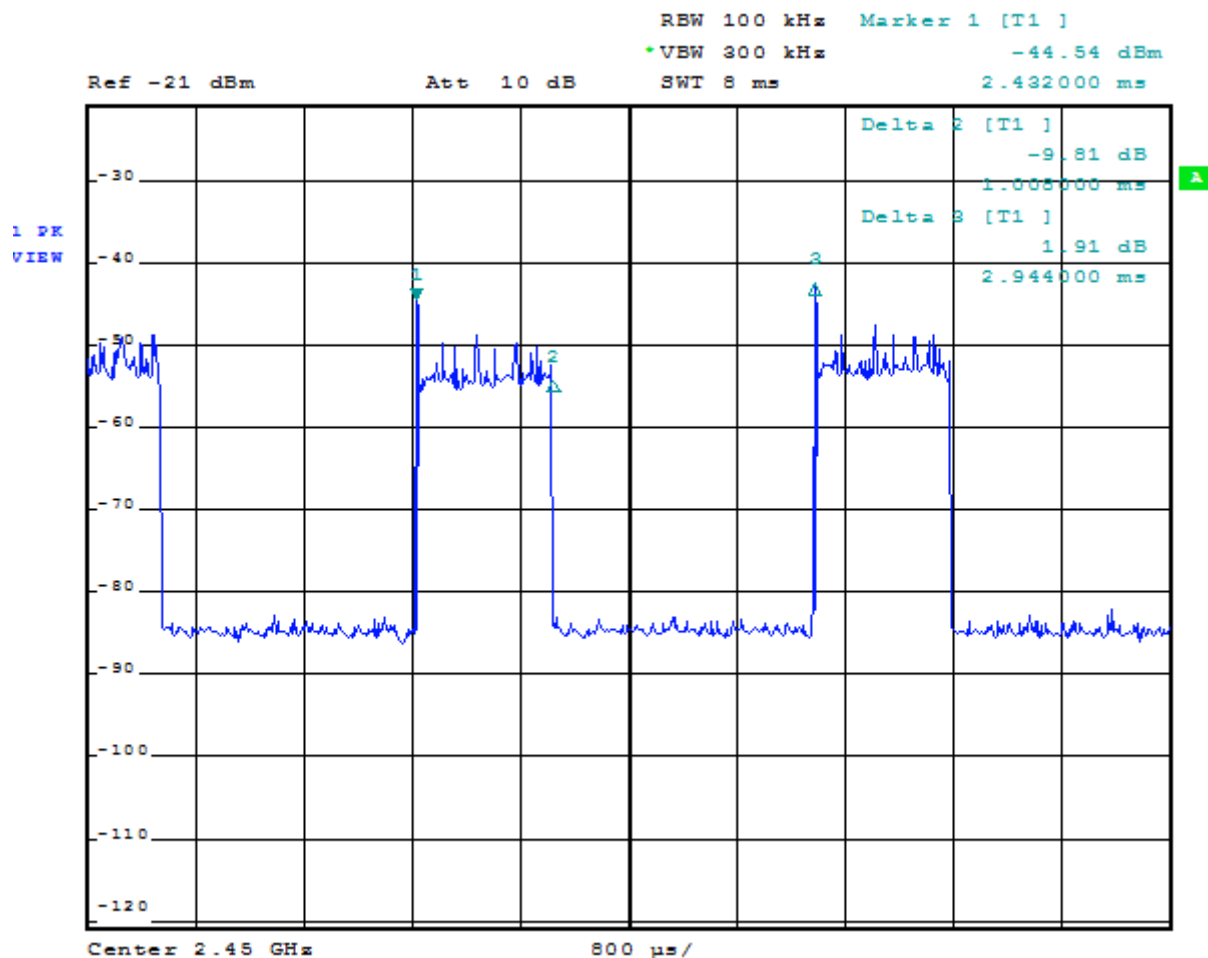
Ton = 1ms

Tp = 2.73ms

Factor =  $20 \cdot \log(Ton/Tp) = 20 \cdot \log(1/2.73) = -8.7\text{dB}$

### Test Plot:







Operation Mode: TX Mid CH 2450 MHz Antenna 1  
Above 1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Receiver Peak Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Peak Result (dBuV/m)	Peak Limit 3m (dBuV/m)	Margin (dB)
2.450	51.17	PK	H	32.4	83.57	114	30.43
2.450	61.90	PK	V	32.4	94.30	114	19.70

Peak Result=Peak Reading+Correction Factors

Radiated Emissions		Ant	Duty Cycle	Total	FCC Limit	
Frequency (GHz)	Peak Result (dBuV/m)	Pol.	(dB)	Avg Result (dBuV/m)	Average Limit 3m (dBuV/m)	Margin (dB)
2.450	83.57	H	-8.7	74.87	94	19.13
2.450	94.30	V	-8.7	85.60	94	8.4

Average Result=Peak Result+Duty Cycle

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4.900	14.849	PK	H	37.0	51.849	54	4.076
7.350	0.376	PK	H	43.6	43.976	54	11.753
4.899	16.933	PK	V	37.0	53.933	54	0.088
7.351	6.575	PK	V	43.6	50.175	54	2.825

Remark:

1. For fundamental emission test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The shaded data is the fundamental emission.



Operation Mode: TX High CH 2475 MHz Antenna 1  
Above 1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Receiver Peak Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Peak Result (dBuV/m)	Peak Limit 3m (dBuV/m)	Margin (dB)
2.475	49.46	PK	H	32.4	81.86	114	32.14
2.475	60.80	PK	V	32.4	93.20	114	20.8

Peak Result=Peak Reading+Correction Factors

Radiated Emissions		Ant	Duty Cycle	Total	FCC Limit	
Frequency (GHz)	Peak Result (dBuV/m)	Pol.	(dB)	Avg Result (dBuV/m)	Average Limit 3m (dBuV/m)	Margin (dB)
2.475	81.86	H	-8.7	73.16	94	20.84
2.475	93.20	V	-8.7	84.5	94	9.5

Average Result=Peak Result+Duty Cycle

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4.950	15.626	PK	H	37.0	52.626	54	1.374
7.425	-1.123	PK	H	43.6	42.477	54	11.523
4.949	16.263	PK	V	37.0	53.263	54	0.737
7.426	2.973	PK	V	43.6	46.573	54	7.427

Remark:

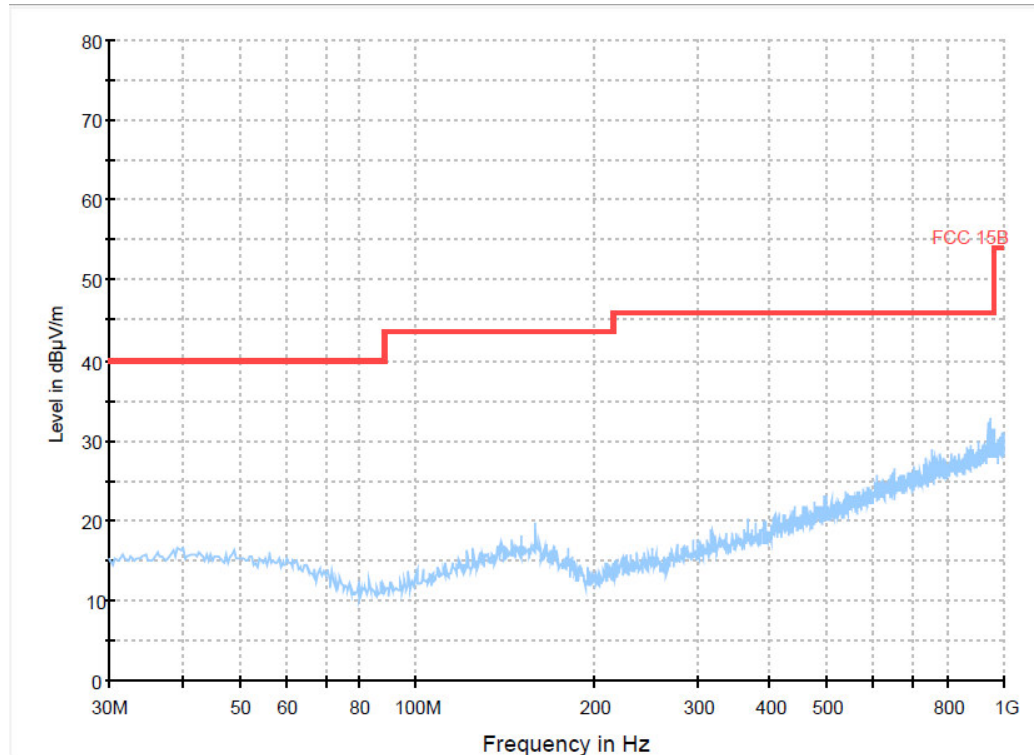
1. For fundamental emission test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The shaded data is the fundamental emission.





TX mode for antenna 2

Horizontal:

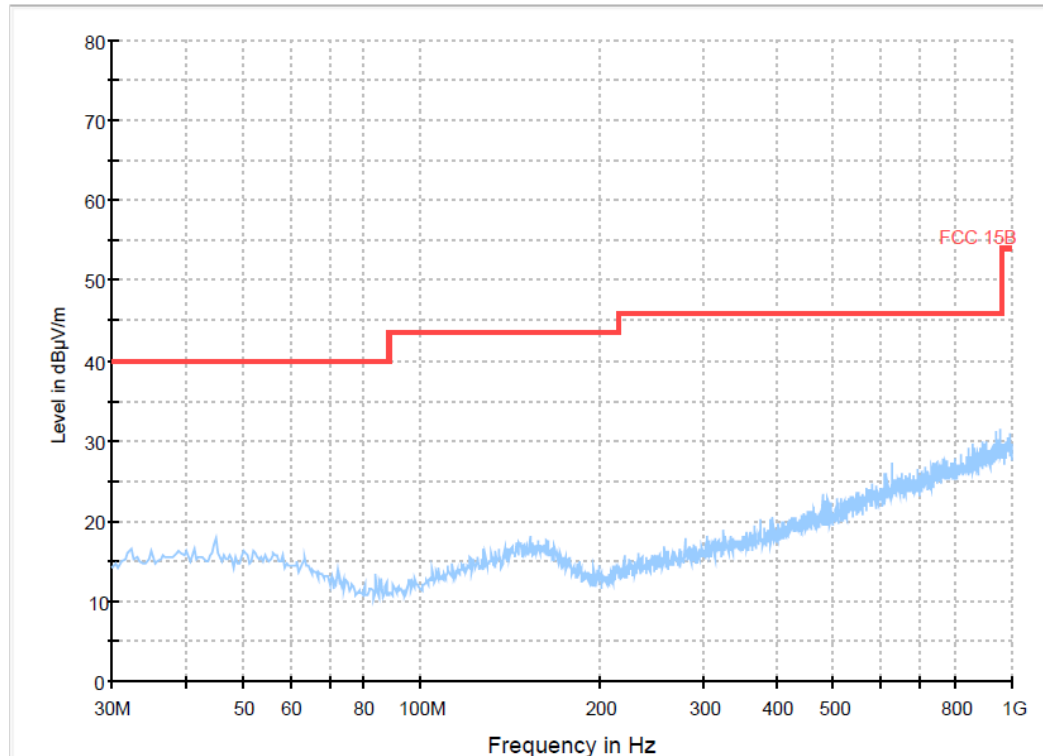


Frequency (MHz)	Actual Level QP (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.00	*	40.0	*
100.00	*	43.5	*
160.00	*	43.5	*
200.00	*	43.5	*
400.00	*	46.0	*
800.00	*	46.0	*
1000.00	*	54.0	*

“\*” means the emission level is 6dB lower than the relevant limit.



Vertical:



Frequency (MHz)	Actual Level QP (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.00	*	40.0	*
100.00	*	43.5	*
160.00	*	43.5	*
200.00	*	43.5	*
400.00	*	46.0	*
800.00	*	46.0	*
1000.00	*	54.0	*

“\*” means the emission level is 6dB lower than the relevant limit.



Operation Mode: TX Low CH 2425 MHz Antenna 2  
Above 1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Receiver Peak Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Peak Result (dBuV/m)	Peak Limit 3m (dBuV/m)	Margin (dB)
2.425	56.87	PK	H	32.4	89.27	114	24.73
2.425	56.66	PK	V	32.4	89.06	114	24.94

Peak Result=Peak Reading+Correction Factors

Radiated Emissions		Ant	Duty Cycle	Total	FCC Limit	
Frequency (GHz)	Peak Result (dBuV/m)	Pol.	(dB)	Avg Result (dBuV/m)	Average Limit 3m (dBuV/m)	Margin (dB)
2.425	89.27	H	-8.7	80.57	94	13.43
2.425	89.06	V	-8.7	80.36	94	13.64

Average Result=Peak Result+Duty Cycle

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4.850	4.628	PK	H	37.0	41.628	54	12.372
7.275	-3.394	PK	H	43.6	40.206	54	13.794
4.850	7.426	PK	V	37.0	44.426	54	9.574
7.274	-0.088	PK	V	43.6	43.512	54	10.488

Remark:

1. For fundamental emission test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The shaded data is the fundamental emission.



Operation Mode: TX Mid CH 2450 MHz Antenna 2  
Above 1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Receiver Peak Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Peak Result (dBuV/m)	Peak Limit 3m (dBuV/m)	Margin (dB)
2.450	52.67	PK	H	32.4	85.07	114	28.93
2.450	55.33	PK	V	32.4	87.73	114	26.27

Peak Result=Peak Reading+Correction Factors

Radiated Emissions		Ant	Duty Cycle	Total	FCC Limit	
Frequency (GHz)	Peak Result (dBuV/m)	Pol.	(dB)	Avg Result (dBuV/m)	Average Limit 3m (dBuV/m)	Margin (dB)
2.450	85.07	H	-8.7	76.37	94	17.63
2.450	87.73	V	-8.7	79.03	94	14.97

Average Result=Peak Result+Duty Cycle

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4.900	13.849	PK	H	37.0	50.849	54	3.151
7.350	1.067	PK	H	43.6	44.667	54	9.333
4.899	15.136	PK	V	37.0	52.136	54	1.864
7.351	6.645	PK	V	43.6	50.245	54	3.755

Remark:

1. For fundamental emission test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The shaded data is the fundamental emission.



Operation Mode: TX High CH 2475 MHz Antenna 2  
Above 1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Receiver Peak Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Peak Result (dBuV/m)	Peak Limit 3m (dBuV/m)	Margin (dB)
2.475	52.64	PK	H	32.4	85.04	114	28.96
2.475	56.38	PK	V	32.4	88.78	114	25.22

Peak Result=Peak Reading+Correction Factors

Radiated Emissions		Ant	Duty Cycle	Total	FCC Limit	
Frequency (GHz)	Peak Result (dBuV/m)	Pol.	(dB)	Avg Result (dBuV/m)	Average Limit 3m (dBuV/m)	Margin (dB)
2.475	85.04	H	-8.7	76.34	94	17.66
2.475	88.78	V	-8.7	80.08	94	13.92

Average Result=Peak Result+Duty Cycle

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (GHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4.950	13.236	PK	H	37.0	50.236	54	3.764
7.425	4.241	PK	H	43.6	47.841	54	6.159
4.950	15.336	PK	V	37.0	52.336	54	1.664
7.425	1.574	PK	V	43.6	45.174	54	8.826

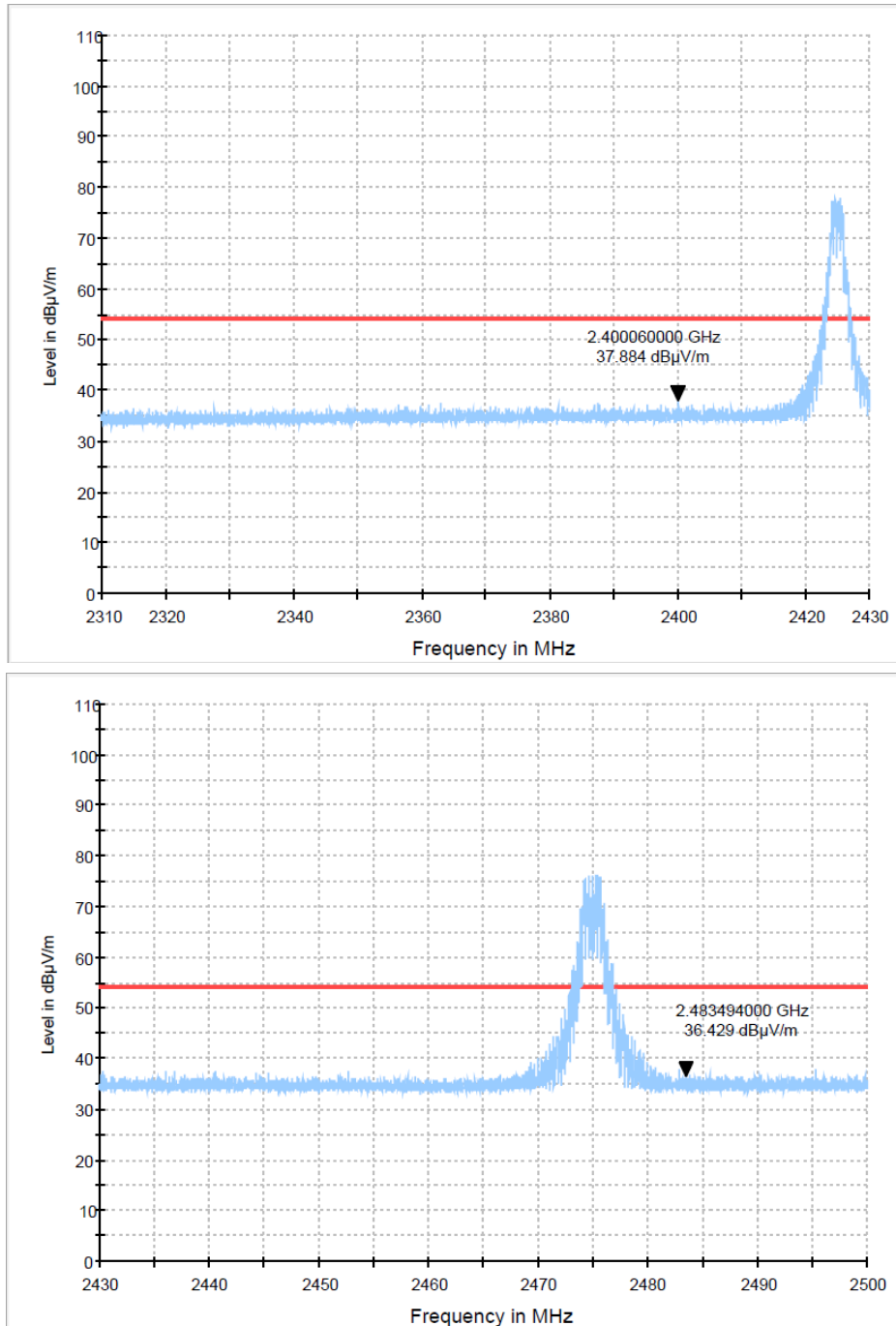
Remark:

1. For fundamental emission test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The shaded data is the fundamental emission.



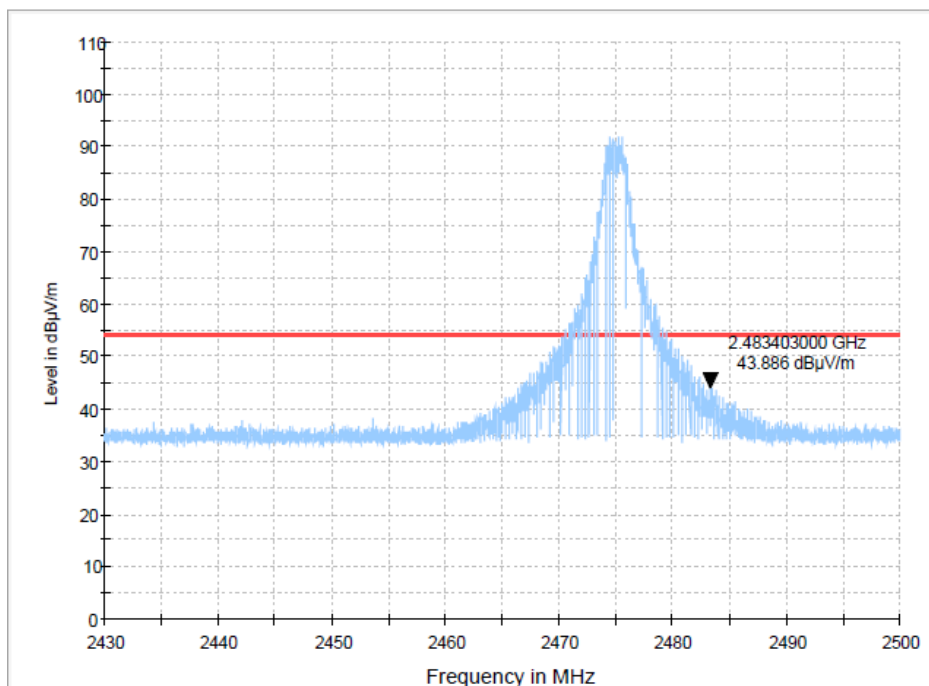
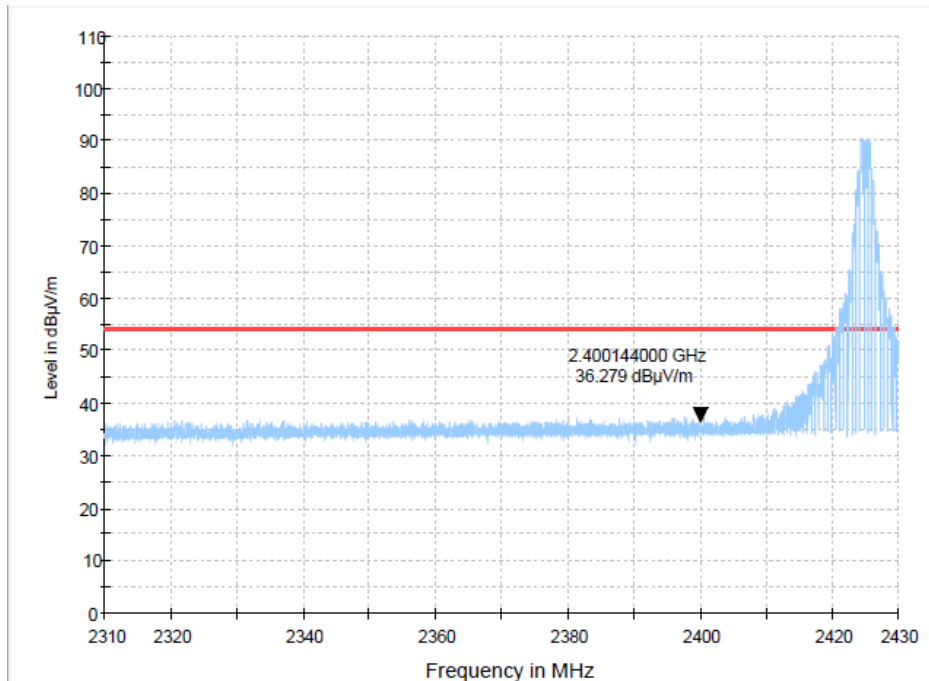
**Test Plot:**

Horizontal, Peak Detector: Antenna 1



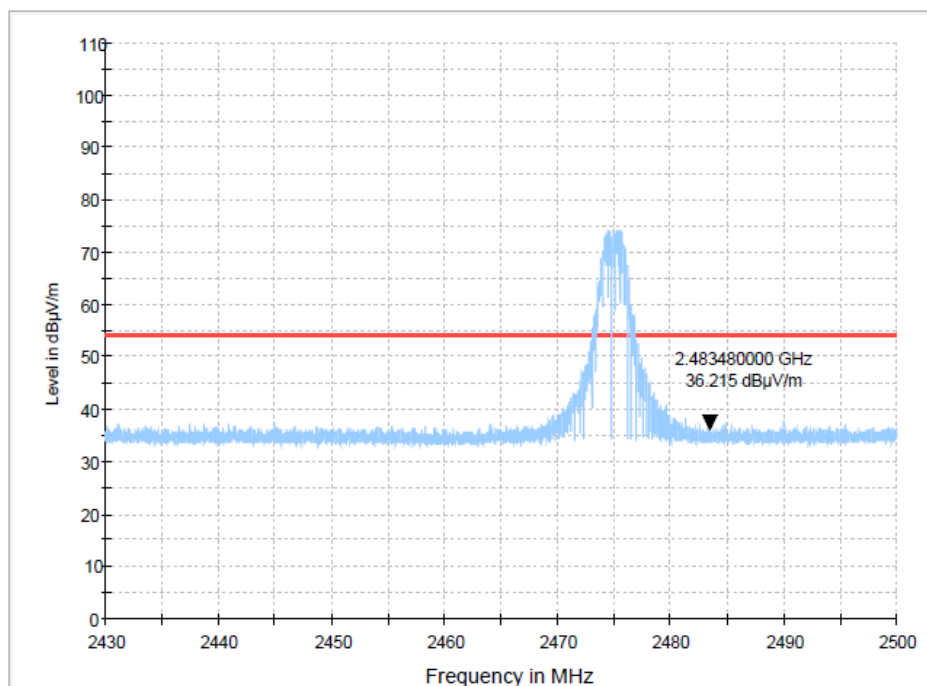
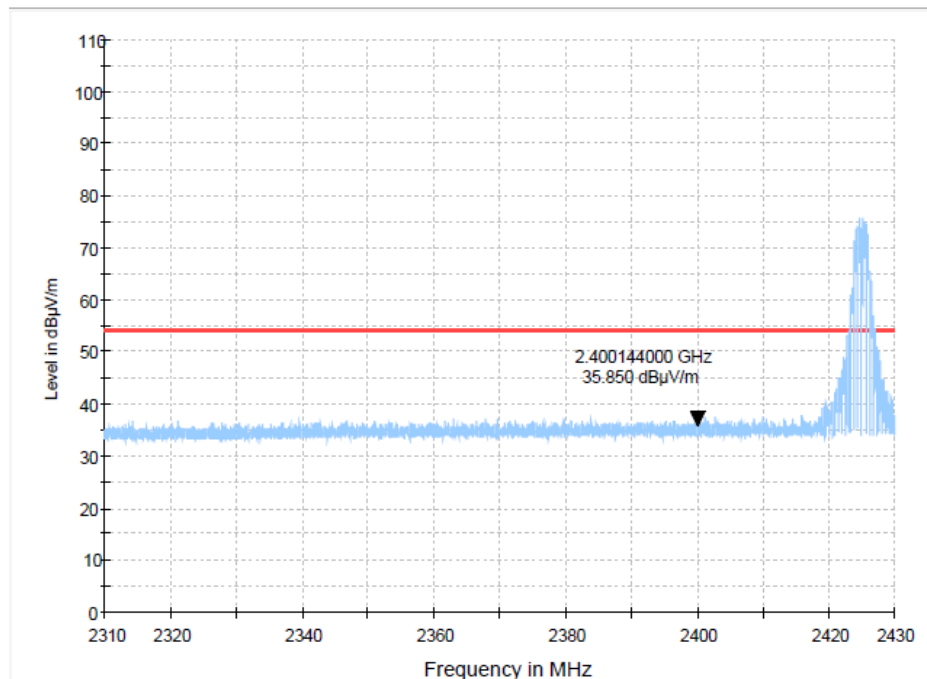


Vertical, Peak Detector: Antenna 1





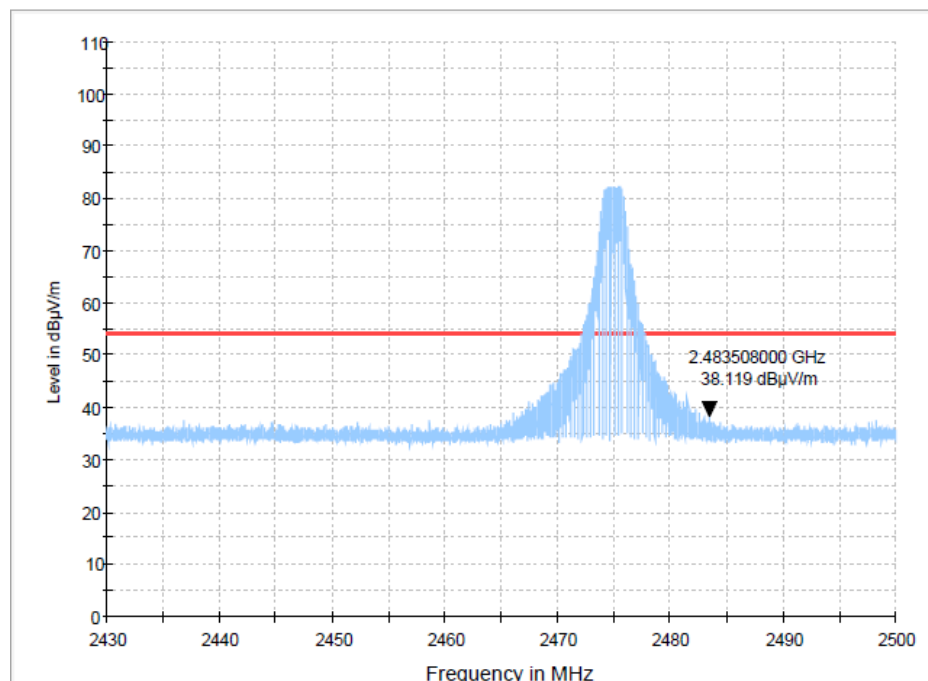
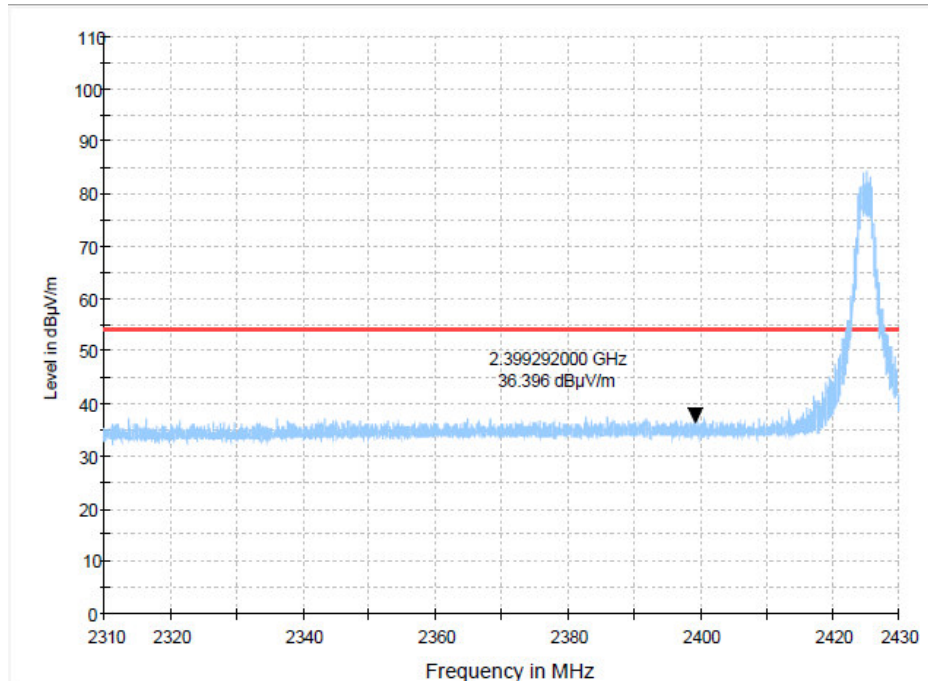
Horizontal, Peak Detector: Antenna 2







Vertical, Peak Detector: Antenna 2





## **5.2 20dB Bandwidth**

**Test Requirement:** FCC Part15 215(c)  
**Test date:** March 5.2012  
**Standard Applicable:** Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band as clause 3.1 shows. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

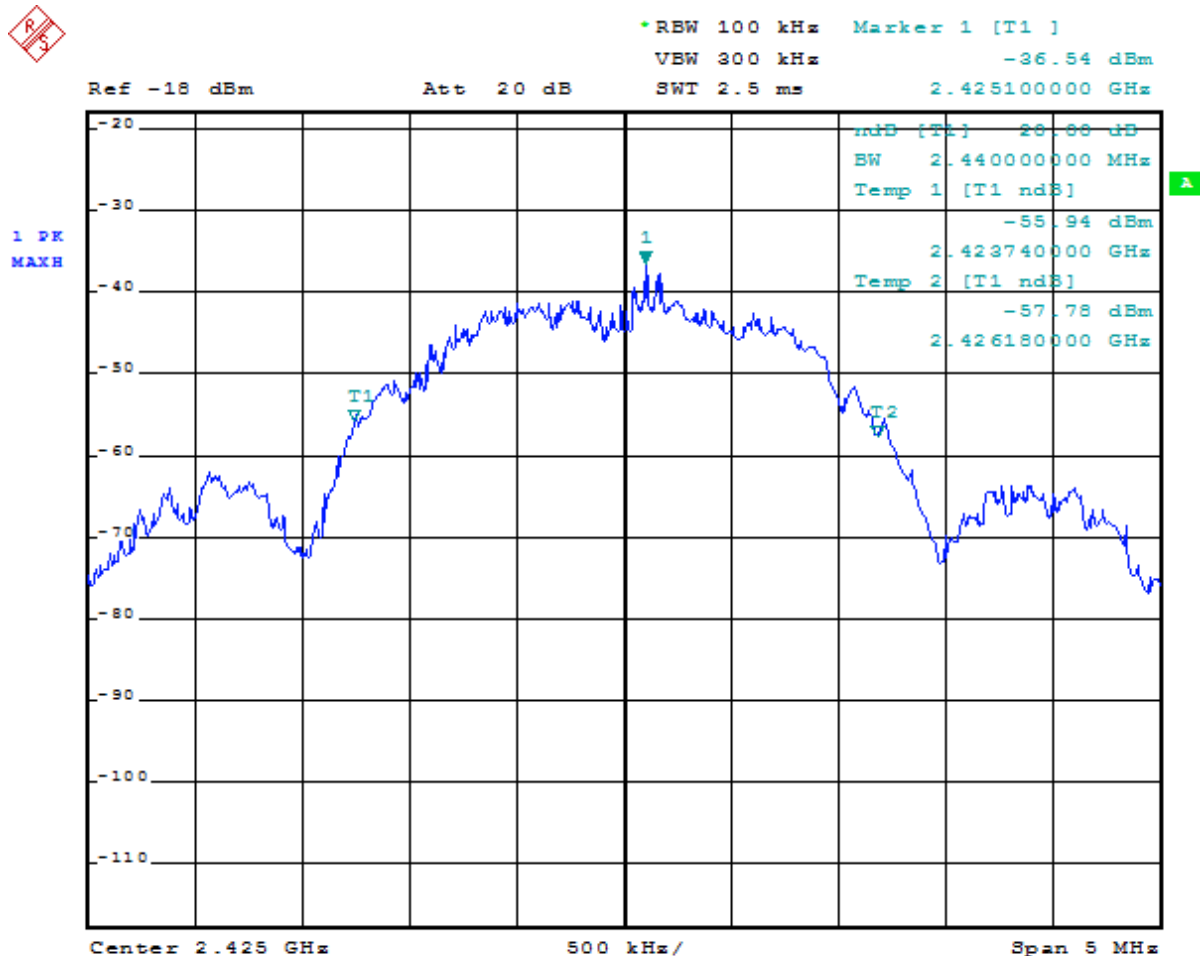
**Measurement Procedure:** The 20dB Bandwidth per FCC § 15.215(c) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 30kHz, the video bandwidth set at 100kHz, and the SPAN>>RBW.

**Measurement Result:**



Antenna	CH	Frequency (MHz)	20dB bandwidth (MHz)	80% of permitted band (MHz)	Result
1	15	2425	2423.74 ~ 2426.18	2408.35 ~ 2475.15	PASS

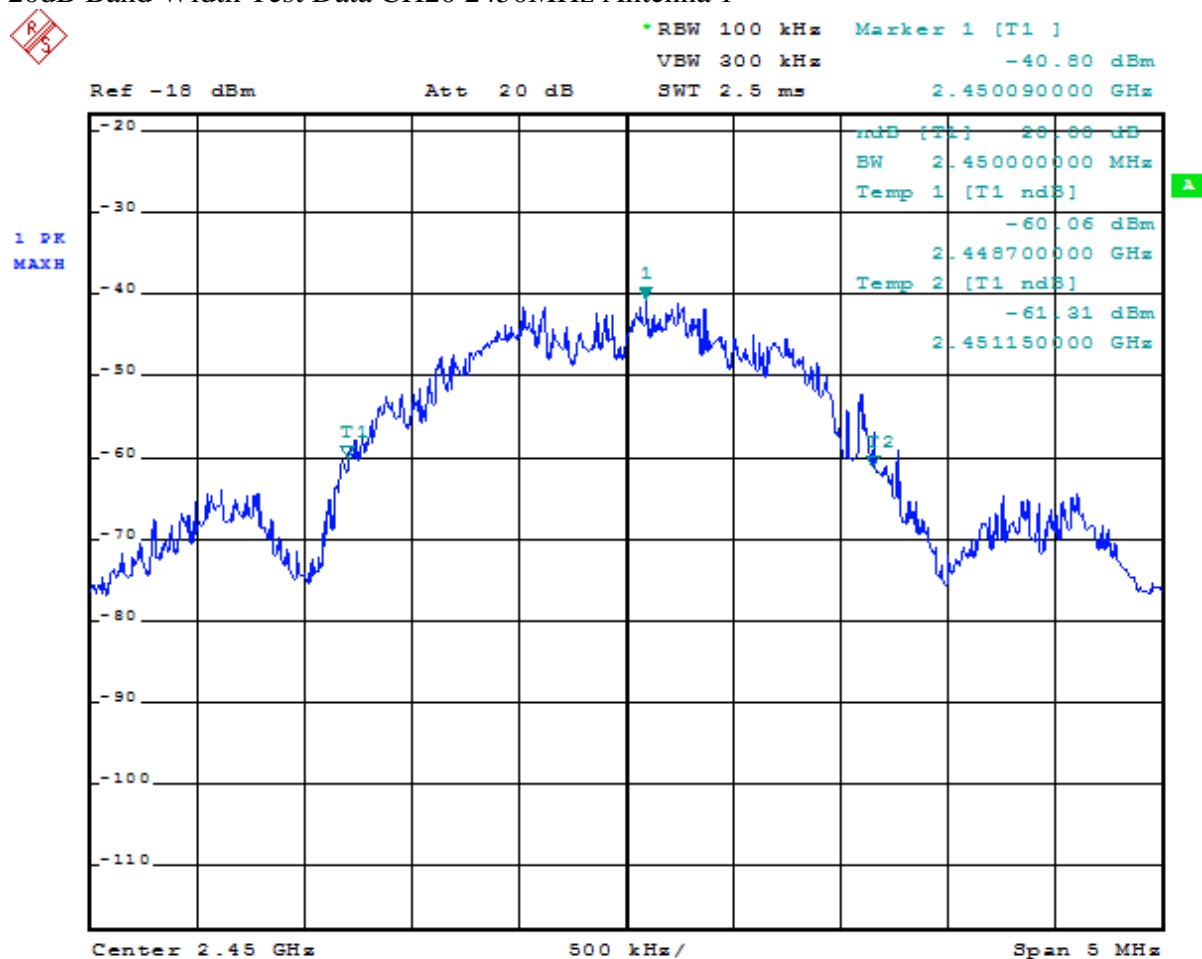
20dB Band Width Test Data CH15 2425MHz Antenna 1





Antenna	CH	Frequency (MHz)	20dB bandwidth (MHz)	80% of permitted band (MHz)	Result
1	20	2450	2448.70 ~ 2451.15	2408.35 ~ 2475.15	PASS

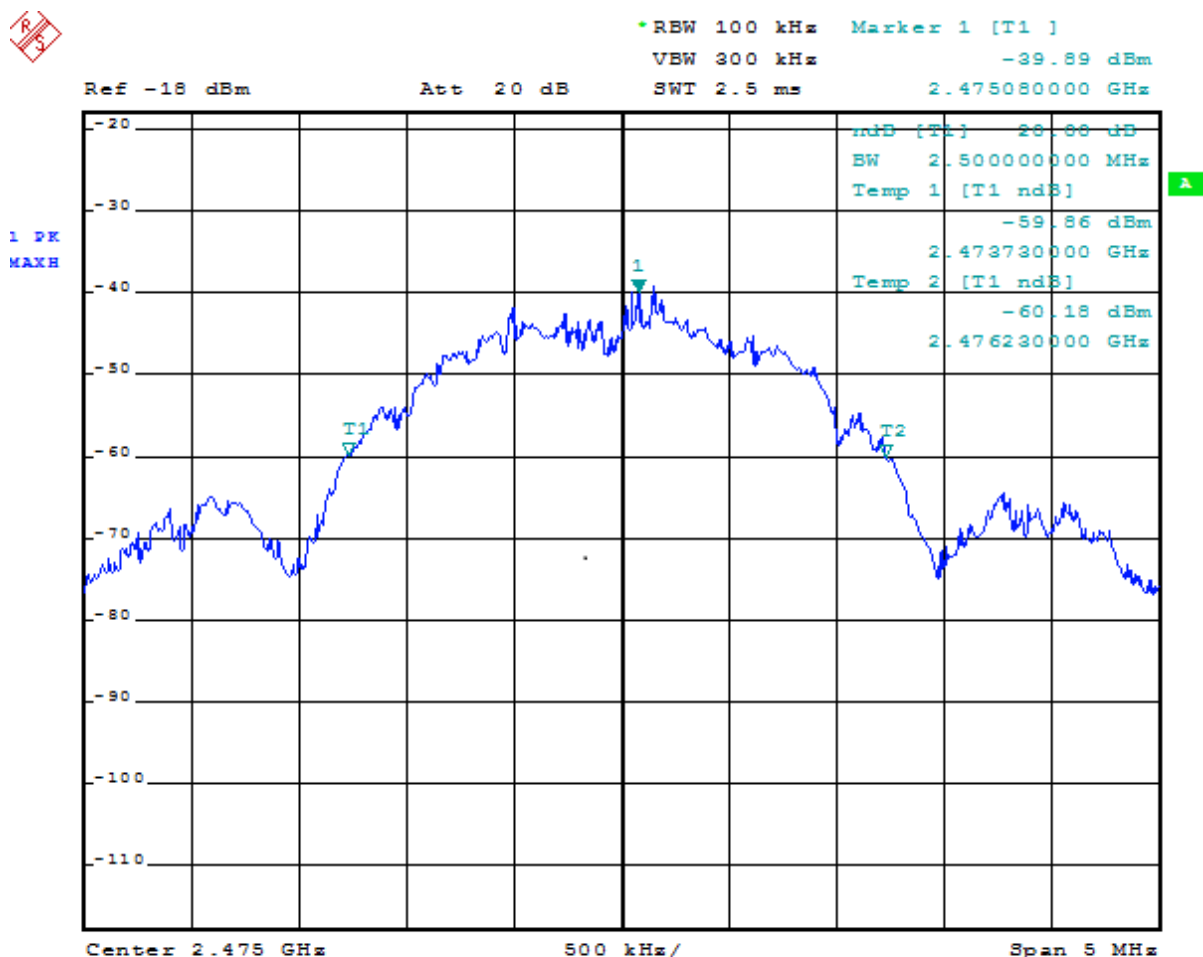
20dB Band Width Test Data CH20 2450MHz Antenna 1





Antenna	CH	Frequency (MHz)	20dB bandwidth (MHz)	80% of permitted band (MHz)	Result
1	25	2475	2473.73 ~ 2476.123	2408.35 ~ 2475.15	PASS

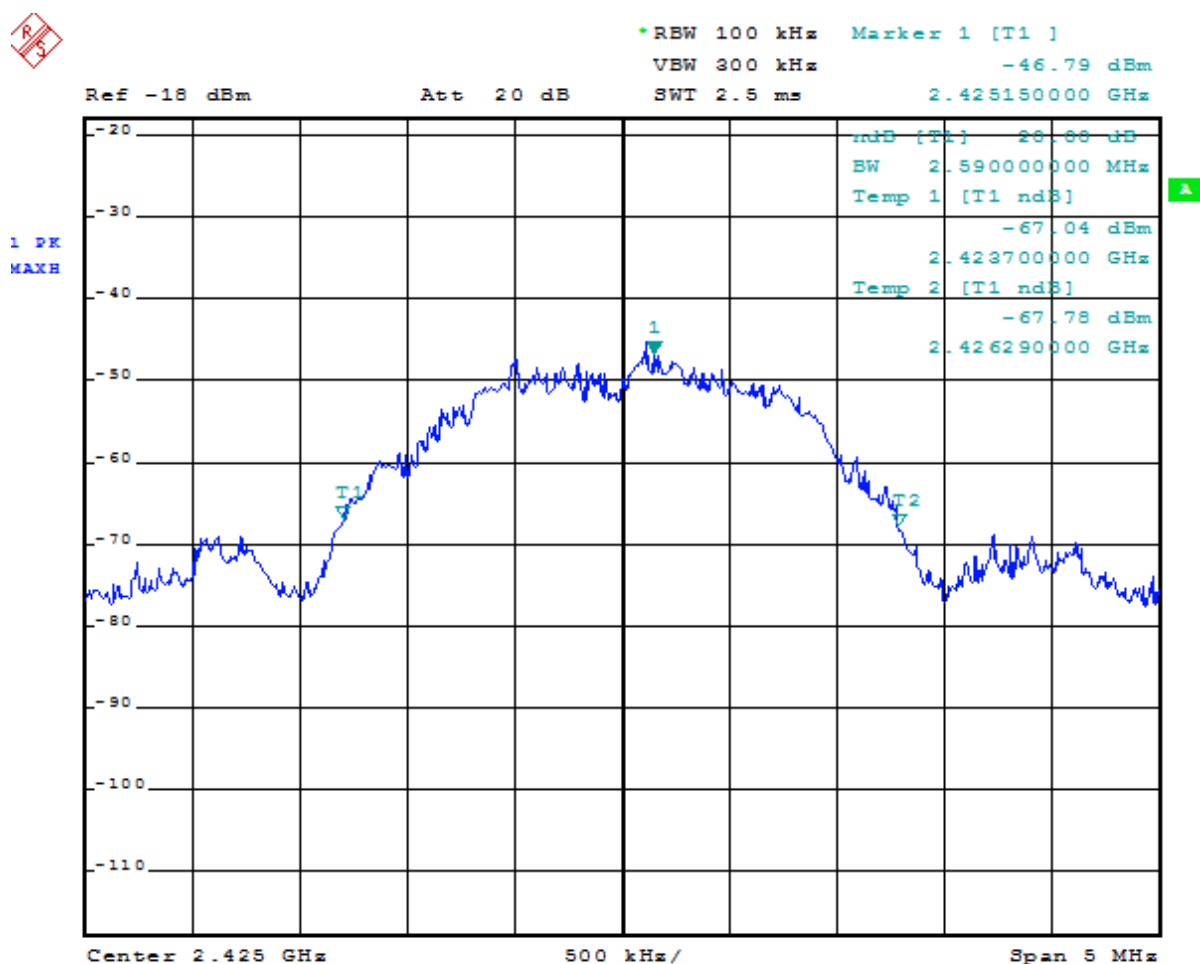
20dB Band Width Test Data CH25 2475MHz Antenna 1





Antenna	CH	Frequency (MHz)	20dB bandwidth (MHz)	80% of permitted band (MHz)	Result
2	15	2425	2473.73 ~ 2476.123	2408.35 ~ 2475.15	PASS

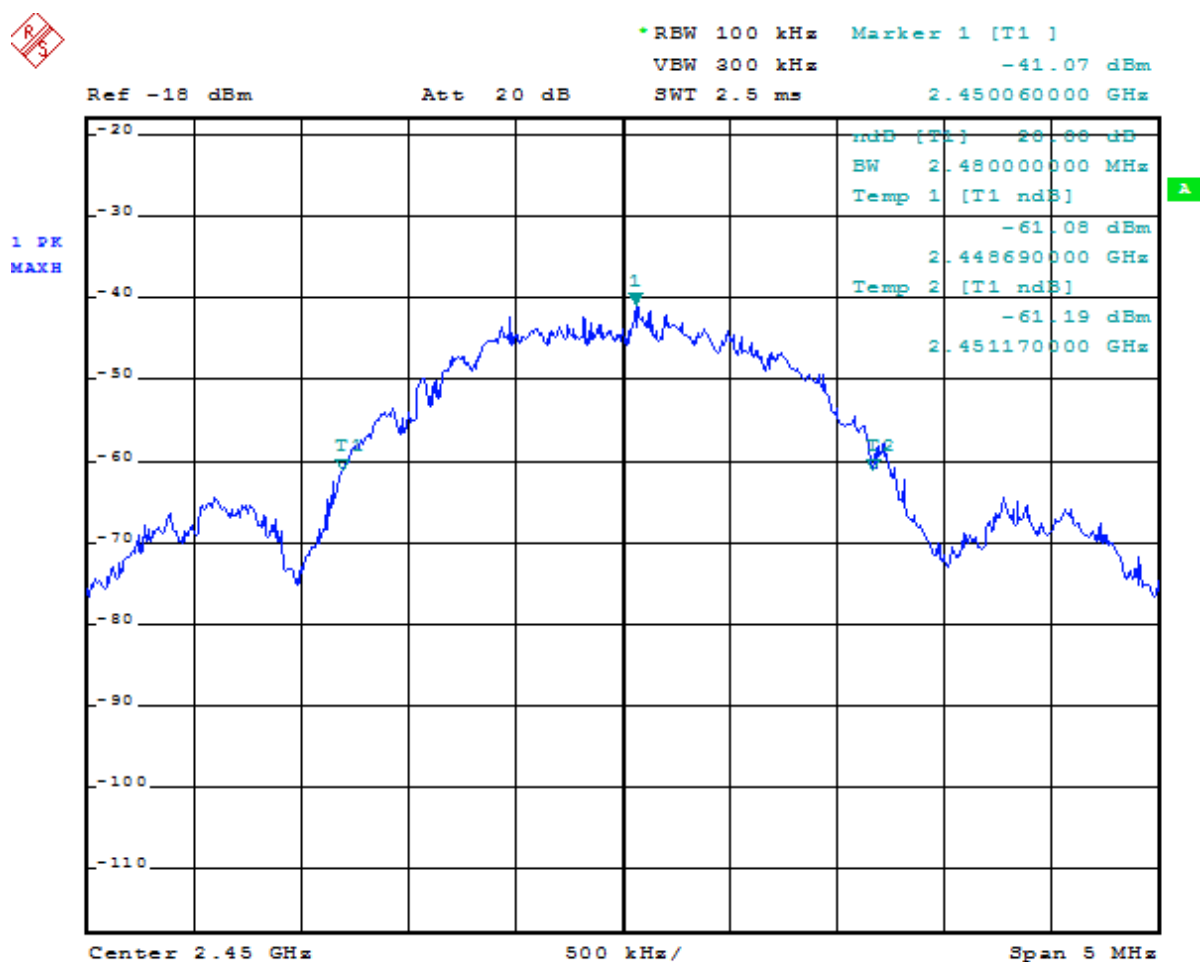
### 20dB Band Width Test Data CH20 2450MHz Antenna 1





Antenna	CH	Frequency (MHz)	20dB bandwidth (MHz)	80% of permitted band (MHz)	Result
2	20	2450	2448.69~ 2451.17	2408.35 ~ 2475.15	PASS

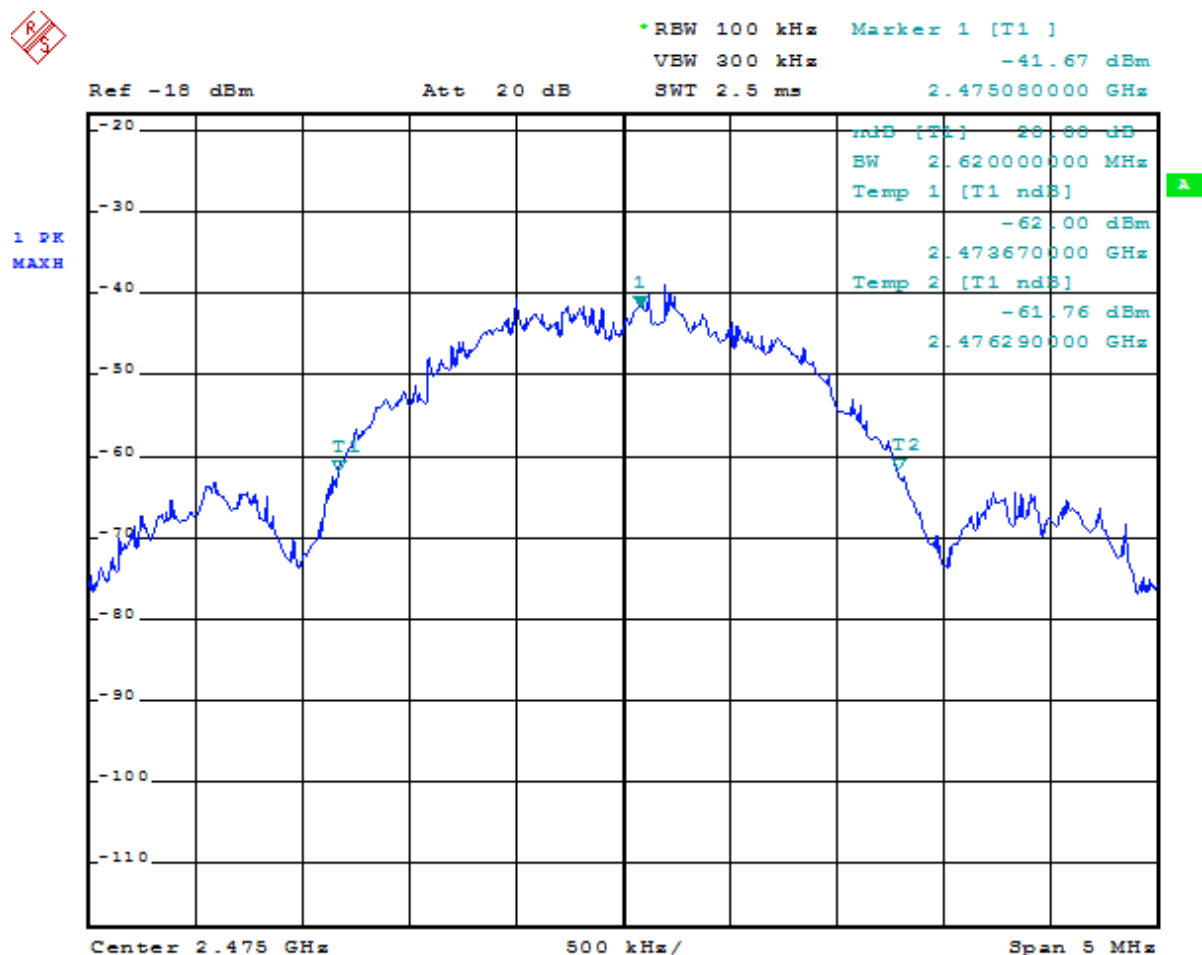
### 20dB Band Width Test Data CH20 2450MHz Antenna 1





Antenna	CH	Frequency (MHz)	20dB bandwidth (MHz)	80% of permitted band (MHz)	Result
2	25	2475	2473.67~2476.29	2408.35 ~ 2475.15	PASS

### 20dB Band Width Test Data CH20 2450MHz Antenna 1







### **5.3 Antenna Requirement**

**Test Requirement:** FCC Part15 15.203

#### **5.3.7.1 Standard 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.

#### **5.3.7.2 Antenna Connected Construction**

The antenna connector is designed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

#### **5.3.7.3 Result**

The EUT antenna is internal Antenna. It comply with the standard requirement.

## ***End of the Report***