

# FCC Radio Test Report

## FCC ID: RWO-DGRFG5

This report concerns (check one):  Original Grant  Class II Change

**Project No.** : 1612C191  
**Equipment** : USB Dongle  
**Test Model** : DGRFG5  
**Applicant** : Razer Inc.  
**Address** : 201 3rd Street, Suite 900, San Francisco, CA 94103

**Date of Receipt** : Dec. 16, 2016  
**Date of Test** : Dec. 16, 2016 ~ Dec. 27, 2016  
**Issued Date** : Dec. 28, 2016  
**Tested by** : BTL Inc.

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**B T L I N C .**

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## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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## REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-2-1612C191	Original Issue.	Dec. 28, 2016

## 1. CERTIFICATION

Equipment : USB Dongle  
Brand Name : RAZER  
Model Name : DGRFG5  
Applicant : Razer Inc.  
Manufacturer : Razer (Asia-Pacific) Pte.,Ltd.  
Address : 514 Chai Chee Lane #07-01 ~ 06 Singapore 469029  
Factory : RAZER TECHNOLOGY AND DEVELOPMENT (SHENZHEN) CO., LTD  
Address : East Wing, 3rd Floor, Block 2, Phase 1 of Vision Shenzhen Business Park Keji South Road, Hi-Tech Industrial Park, Shenzhen 518057, China  
Date of Test : Dec. 16, 2016 ~ Dec. 27, 2016  
Test Sample : Engineering Sample  
Standard(s) : FCC Part15, Subpart C (15.249) / ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-2-1612C191) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15, Subpart C (15.249)			
Standard(s) Section	Test Item	Judgment	Remark
15.207(a)	Conducted Emission	PASS	
15.205	Restricted Band of Operation	PASS	
15.209 15.249(a)	Radiated Emissions	PASS	
15.215(c)	20dB Bandwidth Test	PASS	

NOTE:

(1)" N/A" denotes test is not applicable to this device.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's test firm number for FCC: 319330

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

### A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 KHz ~ 30MHz	1.94

### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
DG-CB03	CISPR	9KHz~30MHz	V	3.79
		9KHz~30MHz	H	3.57
		30MHz ~ 200MHz	V	3.82
		30MHz ~ 200MHz	H	3.78
		200MHz ~ 1,000MHz	V	4.10
		200MHz ~ 1,000MHz	H	4.06
		1GHz~18GHz	V	3.12
		1GHz~18GHz	H	3.68
		18GHz~40GHz	V	4.15
		18GHz~40GHz	H	4.14

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 3. GENERAL INFORMATION

#### 3.1 DESCRIPTION OF EUT

Equipment	USB Dongle	
Brand Name	RAZER	
Model Name	DGRFG5	
Model Difference	The system's model name is RZ01-0212, and the system is contain a Gaming Mouse (Model name: RC30-021203) and USB Dongle (Model name: DGRFG5).	
Product Description	Operation Frequency	2403-2479 MHz
	Modulation Technology	GFSK
	Bit Rate of Transmitter	2 Mbps
	Field Strength	89.78 dBuV/m (Peak Max) 69.02 dBuV/m (AVG Max)
Power Source	Supplied from USB port.	
EUT Power Rating	DC 5V, 500mA	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

## 2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453		
25	2427	52	2454		
26	2428	53	2455		
27	2429	54	2456		

## 3. Table for Filed Antenna

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Printed	N/A	2.26

### 3.2 DESCRIPTION OF TEST MODES

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 above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test	
Final Test Mode	Description
Mode 1	TX Mode

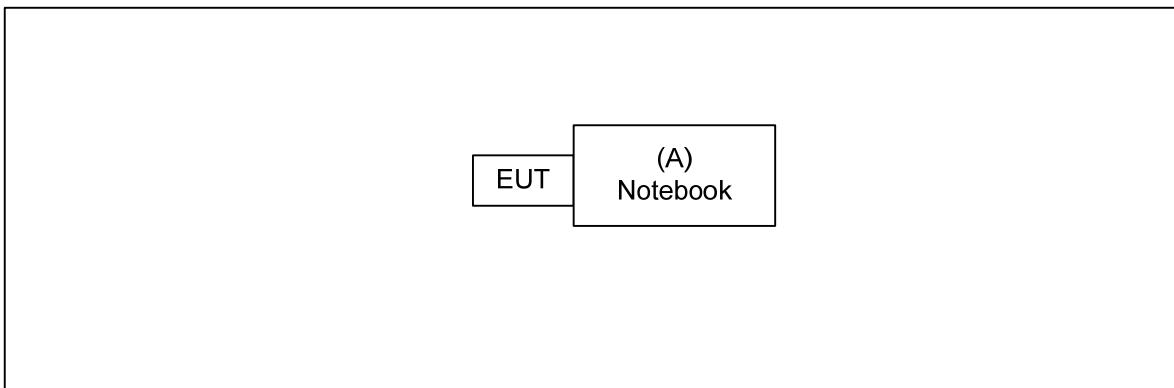
For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode <b>NOTE (1)</b>

Note:

(1) The measurements are performed at the high, middle, low available channels.

### 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated TX Mode:



### 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
A	Notebook	Lenovo	INSPIRON 1420-	DOC	JX193A01SDC2

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

Note:

- (1) The support equipment was authorized by Declaration of Conformity (DOC).

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 -0.	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

Note:

(1) The limit of " \* " decreases with the logarithm of the frequency

(2) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss - Amplifier Gain(if use)

Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

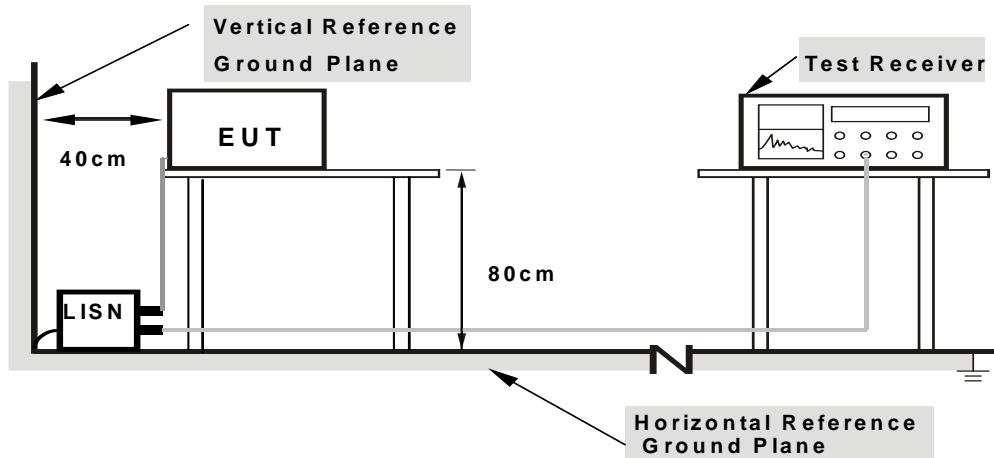
#### 4.1.2 TEST PROCEDURE

- 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.4 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

#### 4.1.6 EUT TEST CONDITIONS

Temperature: 23°C

Relative Humidity: 60%

Test Voltage: AC 120V/60Hz

#### 4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “\*” marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) “N/A” denotes test is not applicable to this device.

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/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
960~1000	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other 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 comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

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

### LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range(MHz)
Field strength of fundamental 50000 $\mu$ V/m (94 dB $\mu$ V/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 $\mu$ V/m (54 dB $\mu$ V/m) @ 3 m	Above 2483.5

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz~110KHz for QP detector
Start ~ Stop Frequency	110KHz~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

#### 4.2.2 TEST PROCEDURE

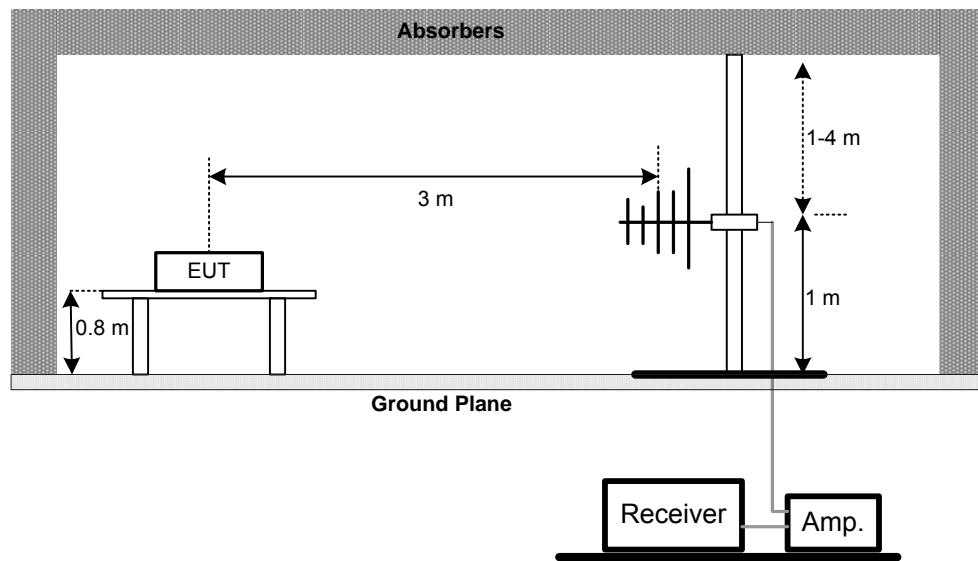
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.2.3 DEVIATION FROM TEST STANDARD

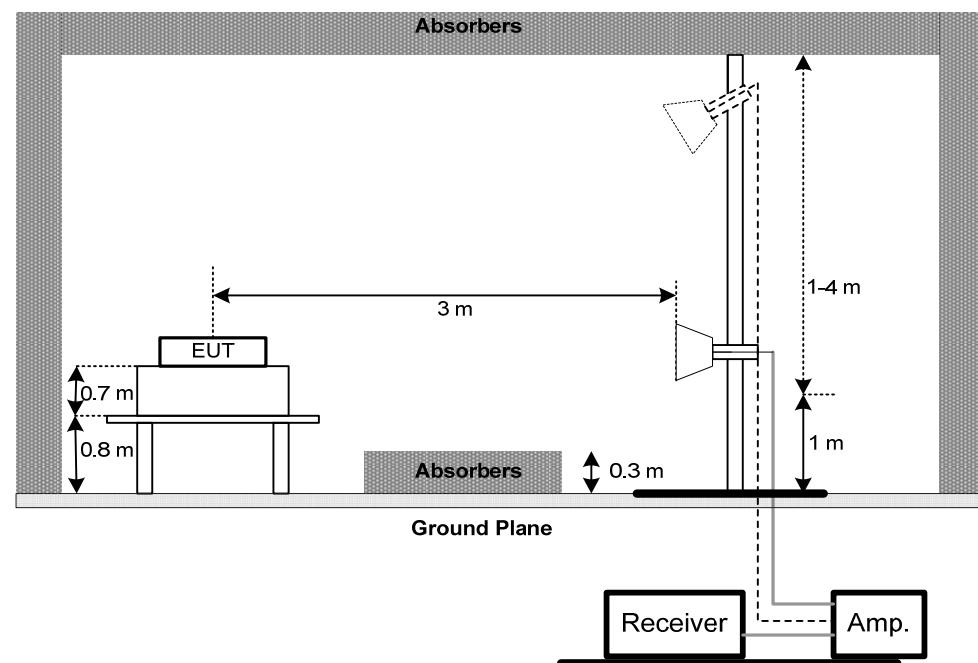
No deviation

#### 4.2.4 TEST SETUP

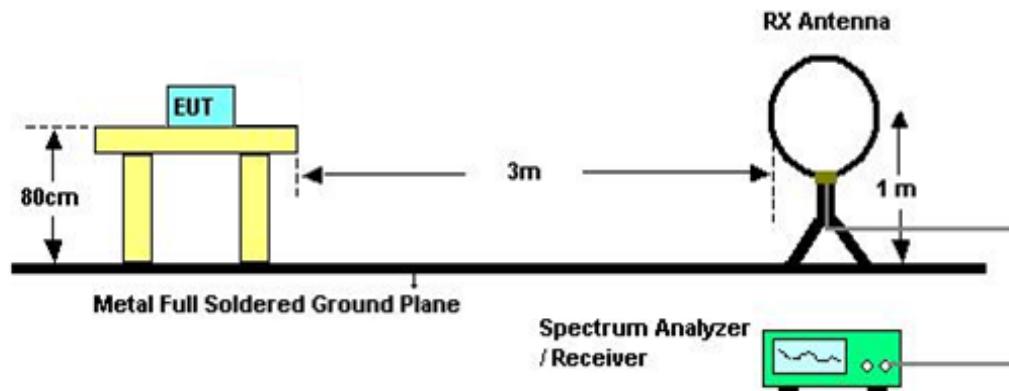
##### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



##### (B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.2.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 60%

Test Voltage: DC 5V

#### 4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment B

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.2.8 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Attachment C.

Remark:

- (1) Measuring frequency range from 30MHz to 1000MHz.
- (2) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

#### 4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

Remark:

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (2) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (3) EUT Orthogonal Axis:  
"X" - denotes Laid on Table, "Y" - denotes Vertical Stand, "Z" - denotes Side Stand
- (4) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (5) No limit: This is fundamental signal, the judgment is not applicable.  
For fundamental signal judgment was referred to Peak output test.

## 5. BANDWIDTH TEST

### 5.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

### 5.2 DEVIATION FROM STANDARD

No deviation.

### 5.3 TEST SETUP



### 5.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 5.5 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 60%

Test Voltage: DC 5V

### 5.6 TEST RESULTS

Please refer to the Attachment E.

## 6. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 27, 2017
2	LISN	EMCO	3816/2	52765	Mar. 27, 2017
3	50Ω Terminator	SHX	TF2-3G-A	8122901	Mar. 27, 2017
4	TWO-LINE V-NETWORK	R&S	ENV216	101447	Mar. 27, 2017
5	Cable	emci	RG223(9KHz-30 MHz)(5m)	N/A	Mar. 10, 2017
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 27, 2017
2	Amplifier	HP	8447D	2944A09673	Oct. 20, 2017
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 04, 2017
4	Test Cable	emci	LMR-400(30MH z-1GHz)	C-01	Jun. 26, 2017
5	Controller	CT	SC100	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Antenna	ETS	3115	00075789	Mar. 27, 2017
8	Amplifier	Agilent	8449B	3008A02274	Nov. 01, 2017
9	Test Cable	emci	EMC104-SM-S M-10000(1GHz- 26.5GHz)	C-68	Jun. 26, 2017
10	Broad-Band Horn Antenna	Schwarbeck	BBHA 9170	9170319	Mar. 27, 2017
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 27, 2017
12	EMI Test Receiver	R&S	ESCI	100895	Mar. 27, 2017
13	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 07, 2017

Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Sep. 04, 2017

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

**ATTACHMENT A - CONDUCTED EMISSION**

Test Mode: TX MODE

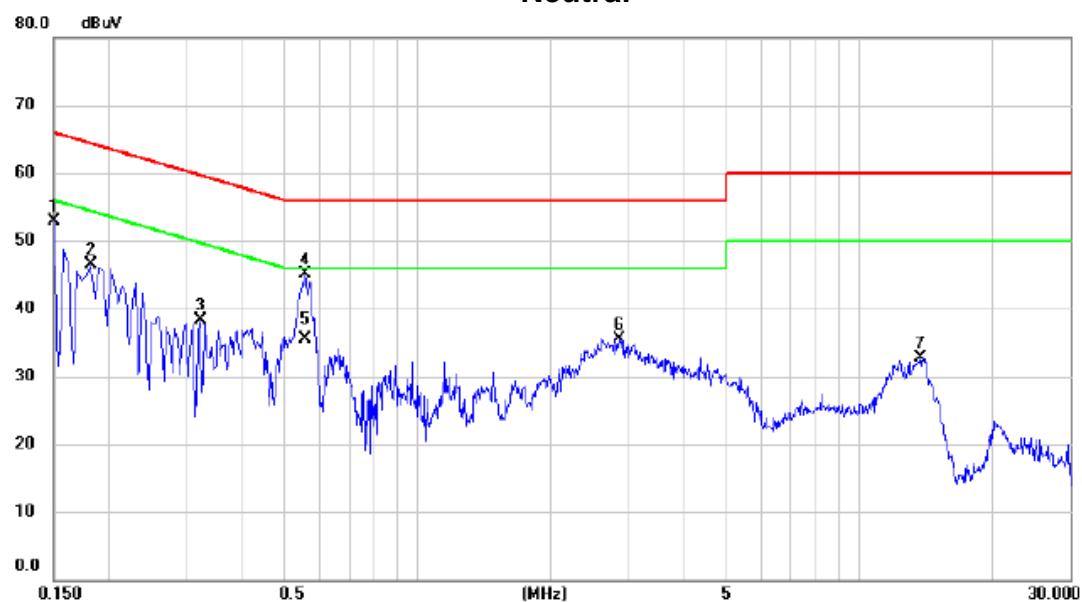
## Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dB	Margin Detector	Comment
1		0.154	42.99	9.52	52.51	65.78	-13.27	peak
2		0.406	29.93	9.55	39.48	57.73	-18.25	peak
3		0.550	35.58	9.64	45.22	56.00	-10.78	peak
4	*	0.550	27.90	9.64	37.54	46.00	-8.46	AVG
5		0.962	23.45	9.76	33.21	56.00	-22.79	peak
6		2.598	24.52	10.09	34.61	56.00	-21.39	peak
7		13.214	18.77	10.30	29.07	60.00	-30.93	peak

Test Mode: TX MODE

## Neutral

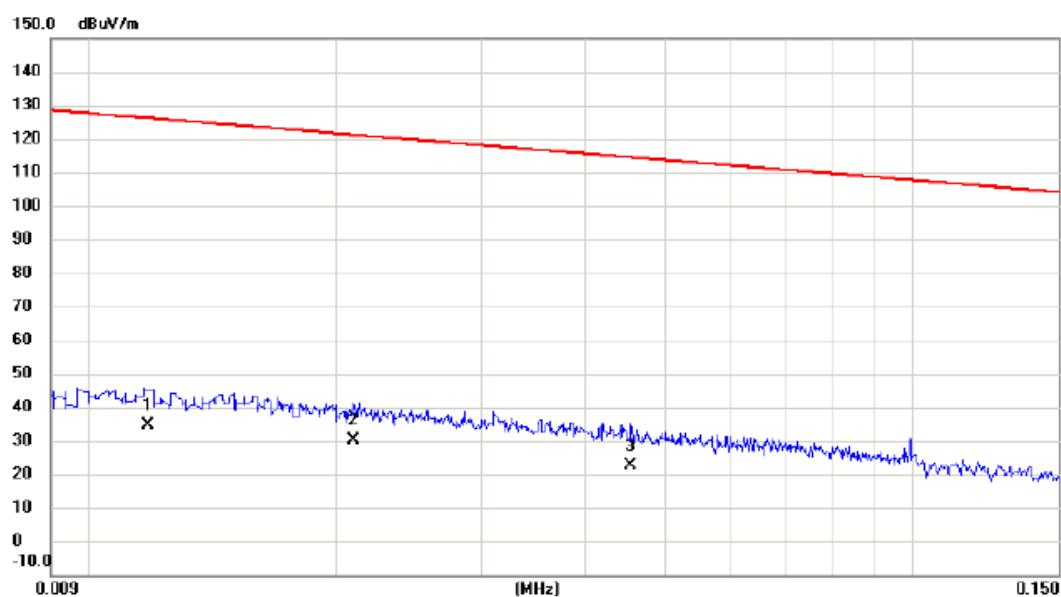


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV	dB	Detector	Comment
1		0.150	43.40	9.52	52.92	66.00	-13.08	peak
2		0.182	37.04	9.47	46.51	64.39	-17.88	peak
3		0.322	28.75	9.53	38.28	59.66	-21.38	peak
4		0.558	35.61	9.44	45.05	56.00	-10.95	peak
5	*	0.558	26.00	9.44	35.44	46.00	-10.56	AVG
6		2.866	25.76	9.79	35.55	56.00	-20.45	peak
7		13.726	22.41	10.35	32.76	60.00	-27.24	peak

**ATTACHMENT B - RADIATED EMISSION (9KHZ TO 30MHZ)**

Test Mode: TX Mode

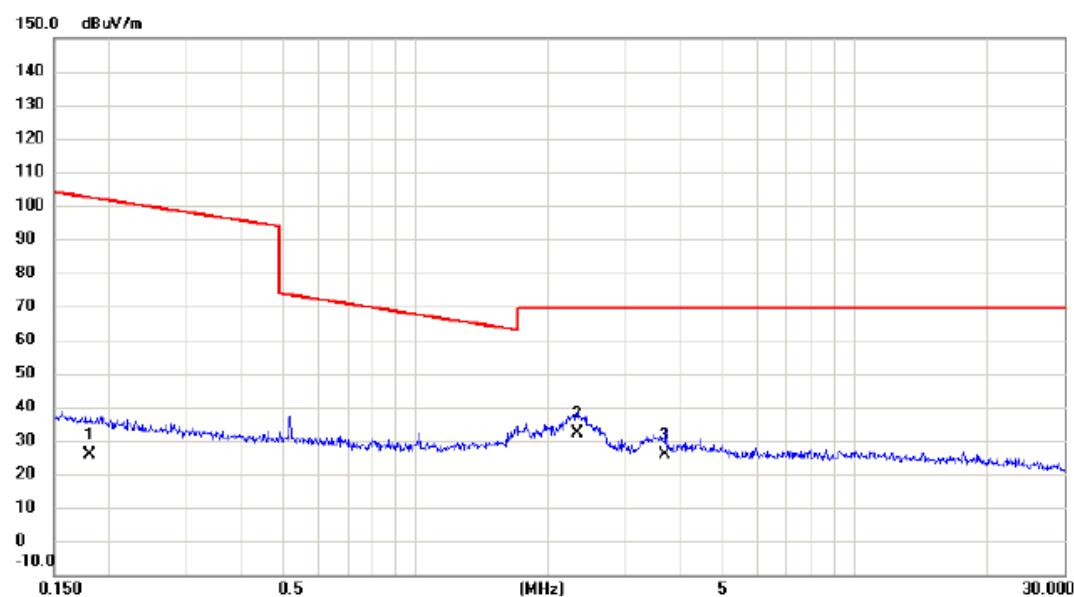
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB	Margin	Detector	Comment
1		0.0118	34.40	0.02	34.42	126.17	-91.75	AVG	
2	*	0.0210	30.10	0.02	30.12	121.16	-91.04	AVG	
3		0.0454	22.50	0.02	22.52	114.46	-91.94	AVG	

Test Mode: TX Mode

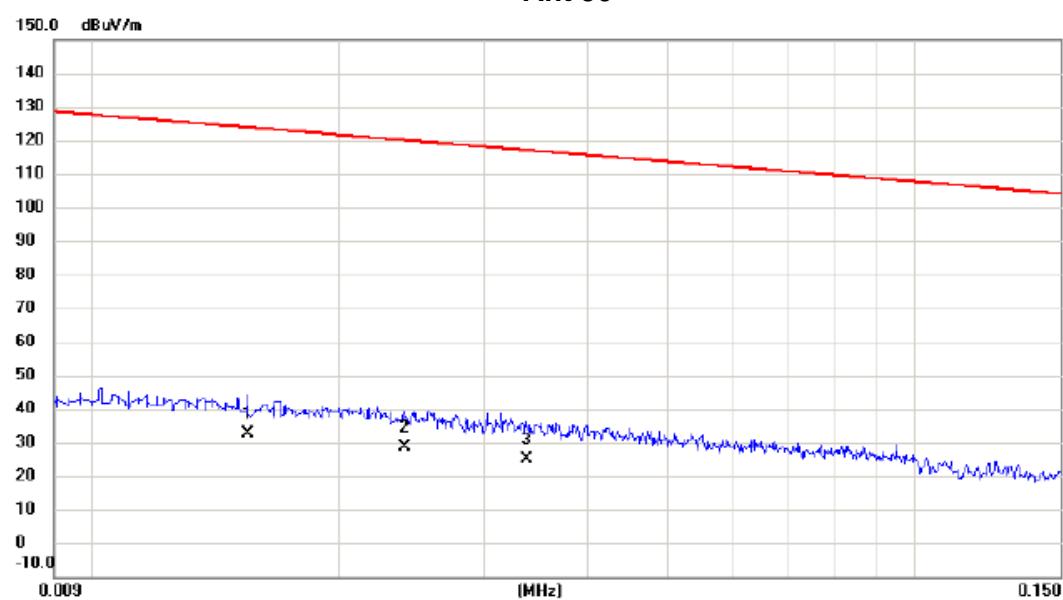
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB	Margin Detector	Comment
1		0.1815	25.70	0.04	25.74	102.43	-76.69	AVG
2	*	2.3336	32.20	0.11	32.31	69.54	-37.23	QP
3		3.7001	25.80	0.15	25.95	69.54	-43.59	QP

Test Mode: TX Mode

Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	0.0155	32.40	0.02	32.42	123.80	-91.38	AVG
2		0.0240	28.60	0.02	28.62	120.00	-91.38	AVG
3		0.0338	24.90	0.02	24.92	117.03	-92.11	AVG

Test Mode: TX Mode

Ant 90°

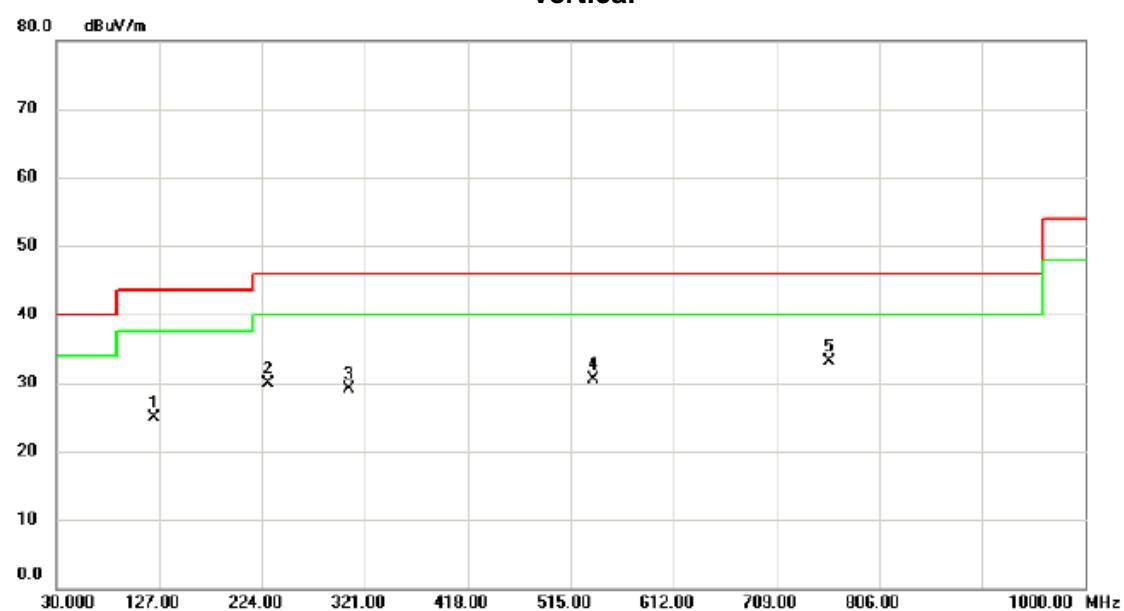


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV/m	Limit dB	Margin Detector	Comment
1		0.2220	25.70	0.05	25.75	100.68	-74.93	AVG
2	*	2.2486	31.30	0.11	31.41	69.54	-38.13	QP
3		3.4906	27.30	0.14	27.44	69.54	-42.10	QP

**ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)**

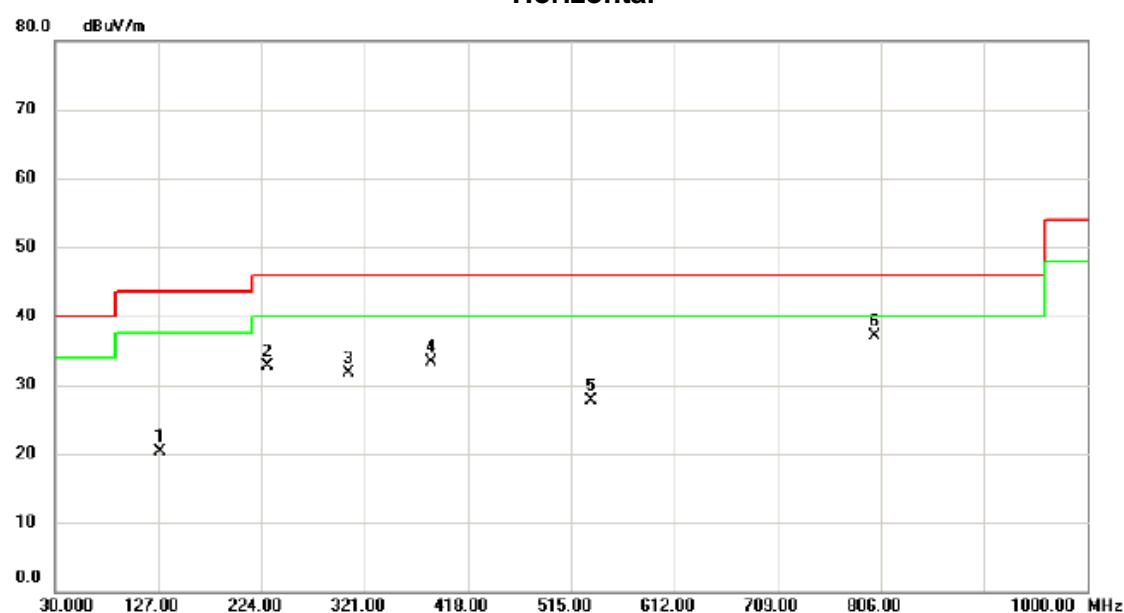
Test Mode: TX 2403MHz

## Vertical



No.	Mk.	Reading		Correct Factor	Measure- ment	Limit	Margin	Comment
		MHz	dBuV	dB	dBuV/m	dB	Detector	
1		122.635	38.00	-13.17	24.83	43.50	-18.67	peak
2		229.820	43.35	-13.38	29.97	46.00	-16.03	peak
3		306.450	39.38	-10.30	29.08	46.00	-16.92	peak
4		536.340	36.38	-5.96	30.42	46.00	-15.58	peak
5 *		758.955	34.61	-1.57	33.04	46.00	-12.96	peak

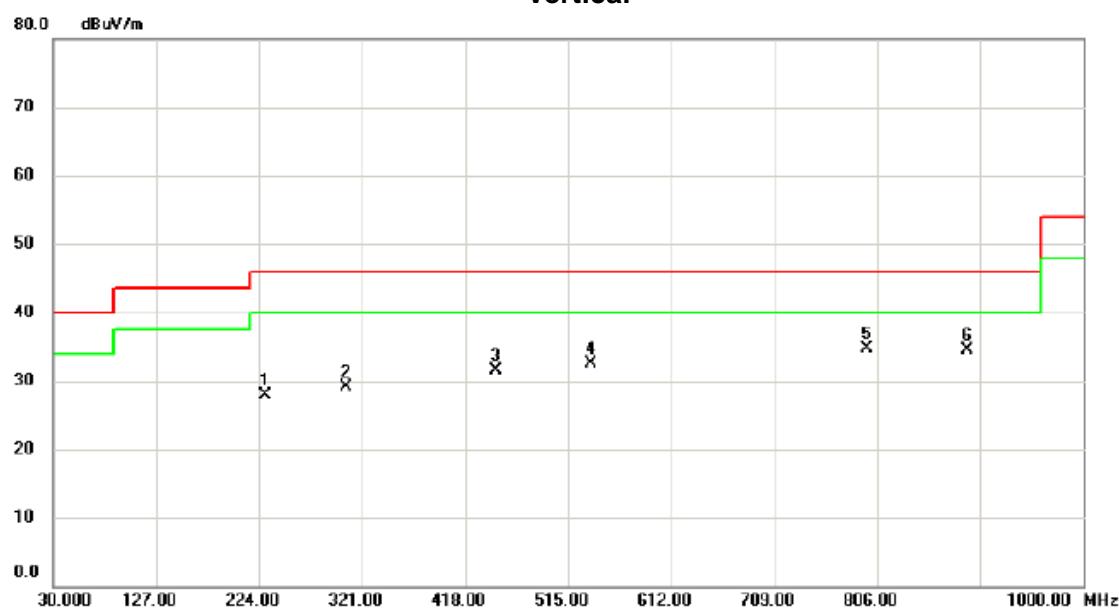
Test Mode: TX 2403MHz

**Horizontal**

No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Comment
			dBuV	dB	dBuV/m	dB	Detector	
1		128.455	32.83	-12.52	20.31	43.50	-23.19	peak
2		229.820	46.09	-13.38	32.71	46.00	-13.29	peak
3		306.450	42.09	-10.30	31.79	46.00	-14.21	peak
4		383.080	42.30	-8.94	33.36	46.00	-12.64	peak
5		533.430	34.05	-6.26	27.79	46.00	-18.21	peak
6 *		799.695	36.90	0.25	37.15	46.00	-8.85	peak

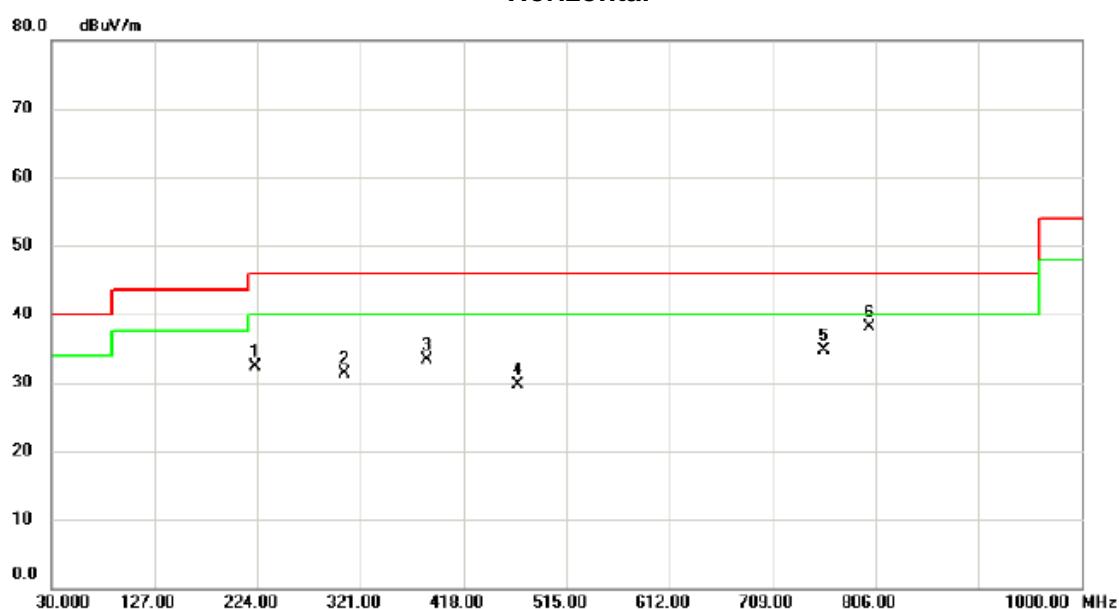
Test Mode: TX 2440MHz

## Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure-ment dBuV/m	Limit dB	Margin Detector	Comment
1		229.820	41.35	-13.38	27.97	46.00	-18.03	peak
2		306.450	39.38	-10.30	29.08	46.00	-16.92	peak
3		447.100	39.41	-7.99	31.42	46.00	-14.58	peak
4		536.340	38.38	-5.96	32.42	46.00	-13.58	peak
5 *		796.300	34.59	0.09	34.68	46.00	-11.32	peak
6		890.875	32.59	1.93	34.52	46.00	-11.48	peak

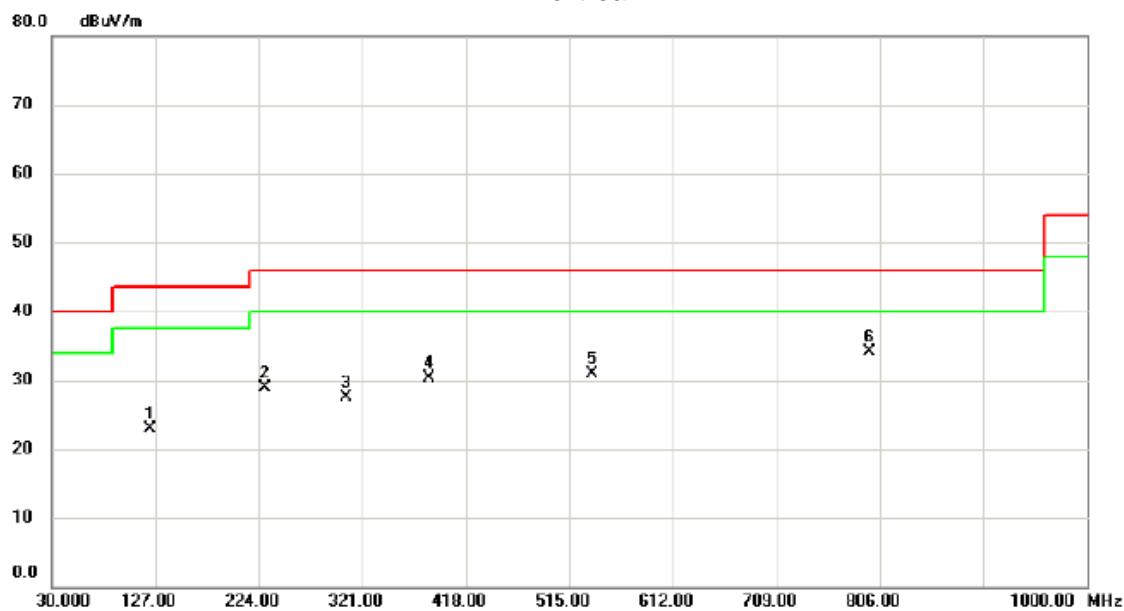
Test Mode: TX 2440MHz

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Comment
			Level	Factor	ment			
1		222.545	46.33	-14.03	32.30	46.00	-13.70	peak
2		306.450	41.59	-10.30	31.29	46.00	-14.71	peak
3		383.080	42.30	-8.94	33.36	46.00	-12.64	peak
4		468.925	38.41	-8.64	29.77	46.00	-16.23	peak
5		757.985	36.42	-1.62	34.80	46.00	-11.20	peak
6 *		799.695	37.90	0.25	38.15	46.00	-7.85	peak

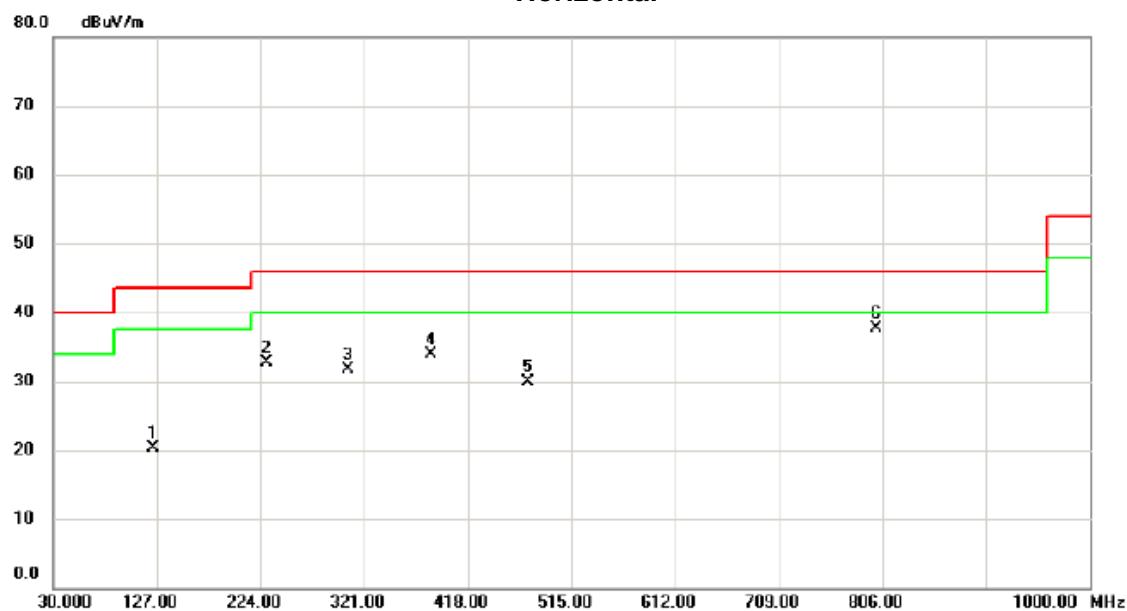
Test Mode: TX 2479MHz

## Vertical



No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Detector	Comment
			dBuV	dB	dBuV/m				
1		122.635	36.00	-13.17	22.83	43.50	-20.67	peak	
2		229.820	42.35	-13.38	28.97	46.00	-17.03	peak	
3		306.450	37.88	-10.30	27.58	46.00	-18.42	peak	
4		383.080	39.24	-8.94	30.30	46.00	-15.70	peak	
5		536.340	36.88	-5.96	30.92	46.00	-15.08	peak	
6 *		796.300	34.09	0.09	34.18	46.00	-11.82	peak	

Test Mode: TX 2479MHz

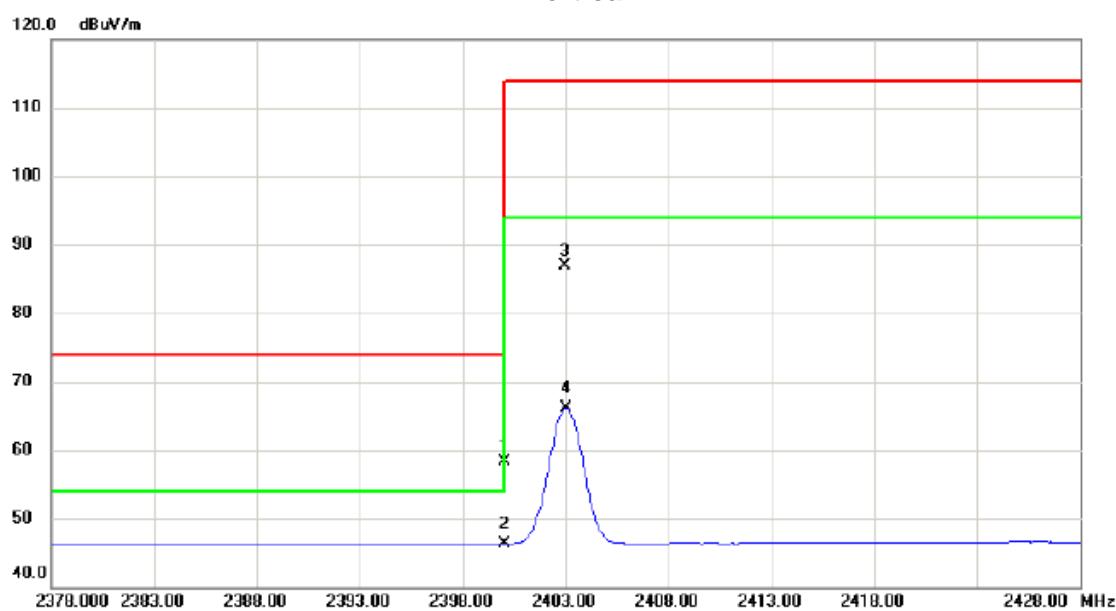
**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Comment
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	
1		124.090	33.32	-13.00	20.32	43.50	-23.18	peak
2		229.820	46.09	-13.38	32.71	46.00	-13.29	peak
3		306.450	42.09	-10.30	31.79	46.00	-14.21	peak
4		383.080	42.80	-8.94	33.86	46.00	-12.14	peak
5		474.745	38.74	-8.85	29.89	46.00	-16.11	peak
6 *		799.695	37.40	0.25	37.65	46.00	-8.35	peak

**ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)**

Test Mode TX Mode\_2403 MHz

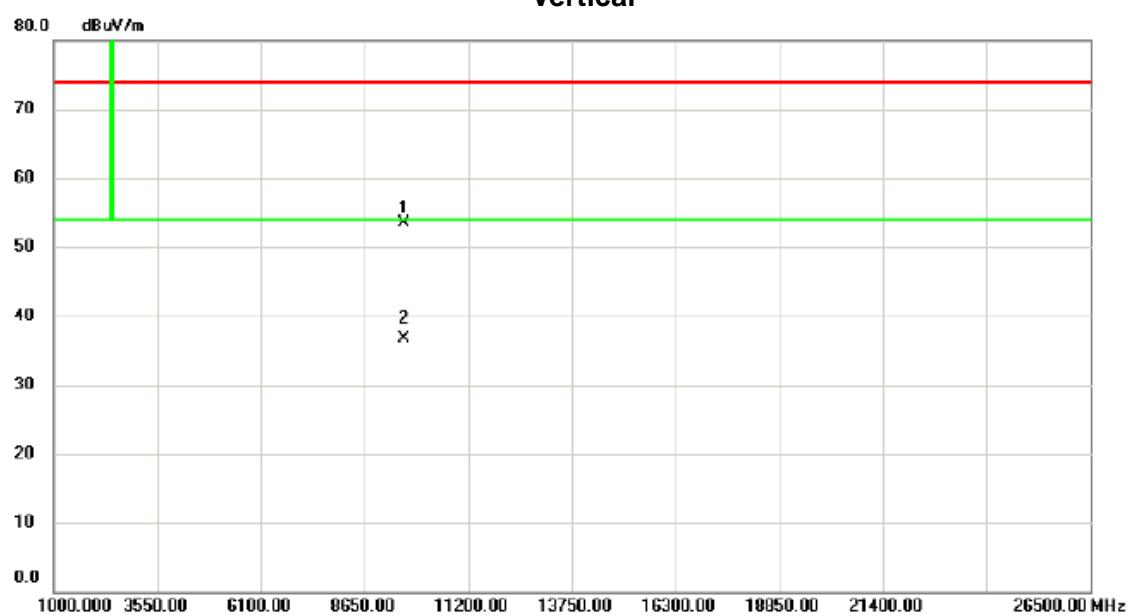
## Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB	Margin Detector	Comment
1		2400.000	25.27	33.05	58.32	74.00	-15.68	peak
2	*	2400.000	13.30	33.05	46.35	54.00	-7.65	AVG
3		2402.950	53.90	33.06	86.96	114.00	-27.04	peak
4		2403.000	33.03	33.06	66.09	94.00	-27.91	AVG

Test Mode | TX Mode\_2403 MHz

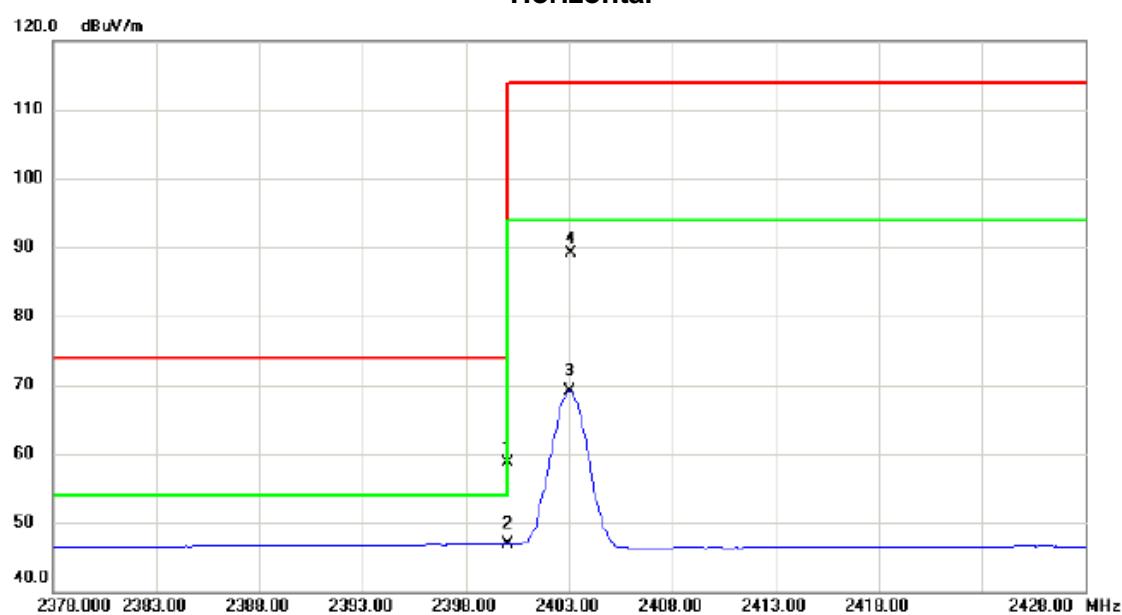
## Vertical



No.	Mk.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	9612.150	40.11	13.41	53.52	74.00	-20.48	peak
2 *	9612.755	23.32	13.41	36.73	54.00	-17.27	AVG

Test Mode TX Mode\_2403 MHz

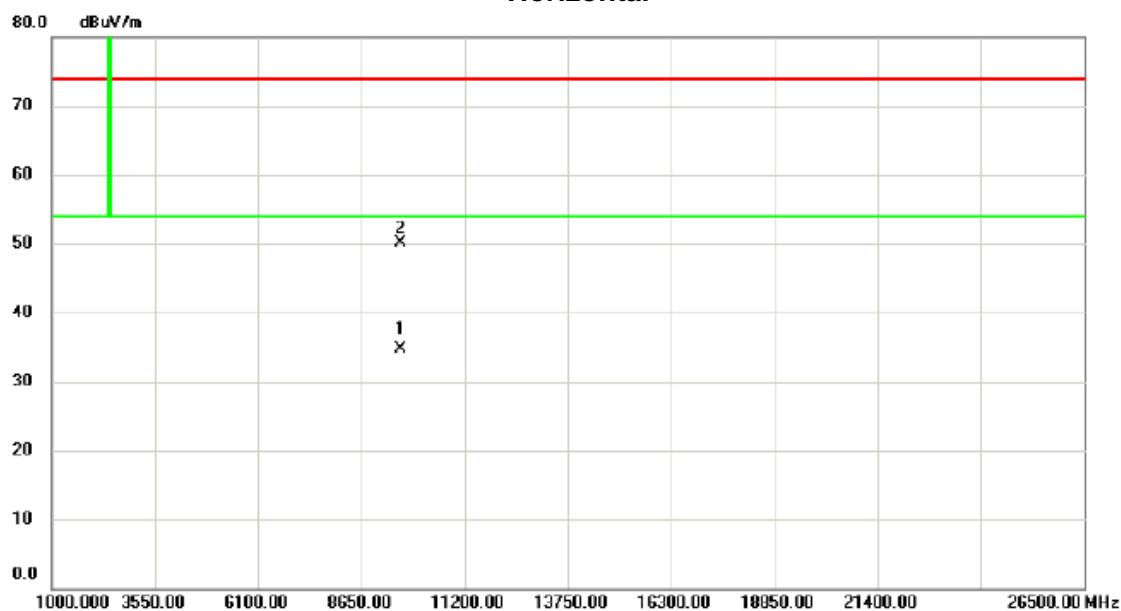
## Horizontal



No.	Mk.	Reading		Correct Factor	Measure- ment	Limit	Margin	Comment
		Freq. MHz	Level dBuV					
1	2400.000	25.70	33.05	58.75	74.00	-15.25	peak	
2 *	2400.000	13.80	33.05	46.85	54.00	-7.15	AVG	
3	2403.000	36.03	33.06	69.09	94.00	-24.91	AVG	
4	2403.100	56.13	33.07	89.20	114.00	-24.80	peak	

Test Mode TX Mode\_2403 MHz

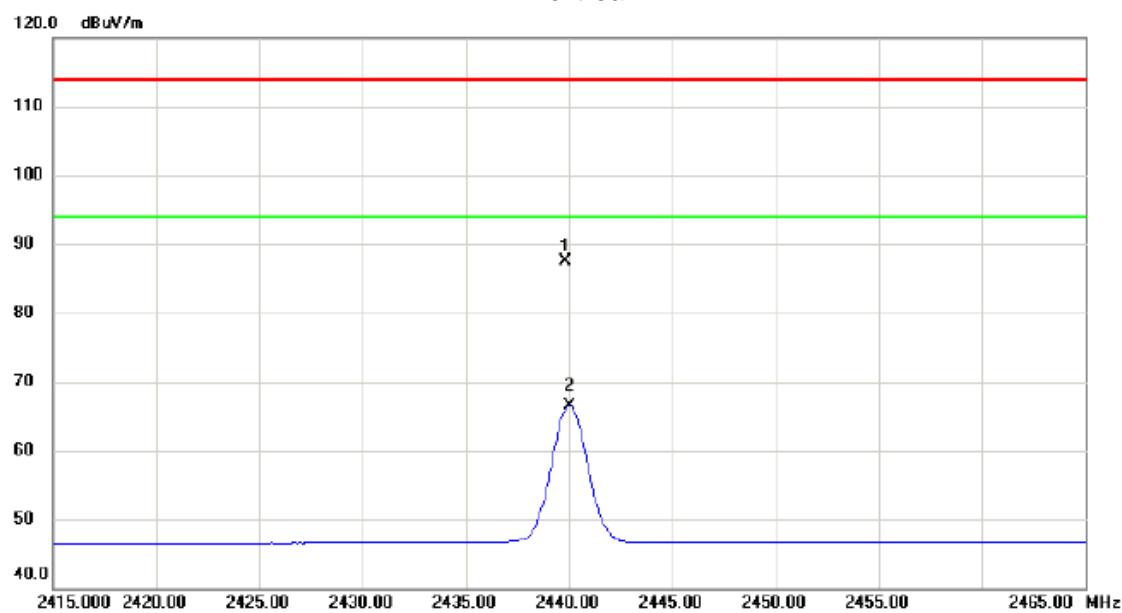
## Horizontal



No.	Mk.	Reading		Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV					
1	*	9612.010	21.32	13.41	34.73	54.00	-19.27	AVG
2		9612.150	36.74	13.41	50.15	74.00	-23.85	peak

Test Mode TX Mode\_2440 MHz

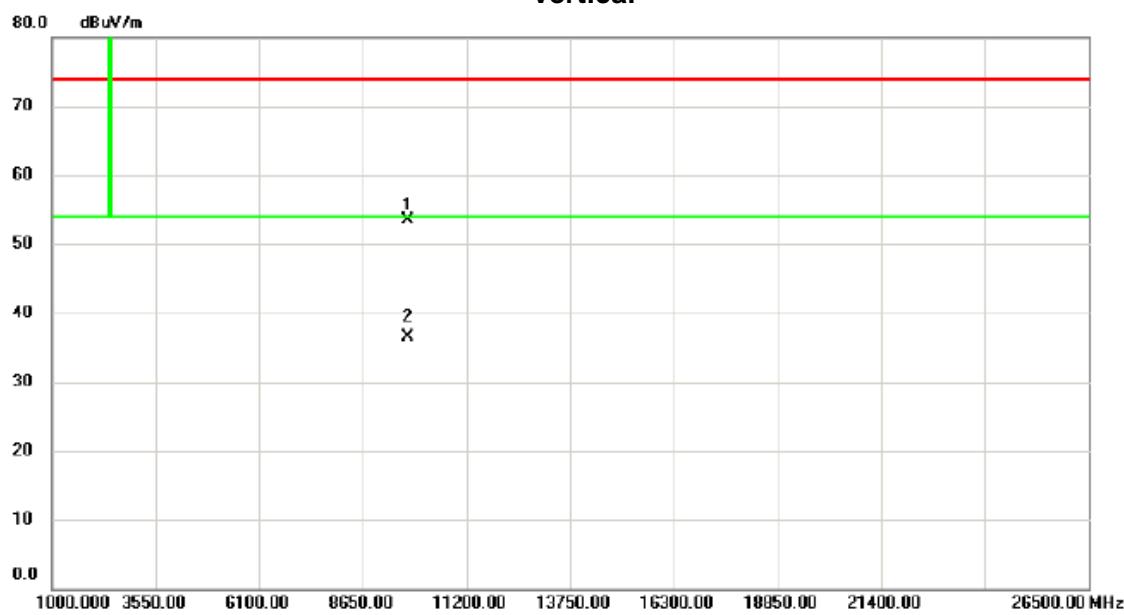
## Vertical



No.	Mk.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
	MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	2439.800	54.35	33.22	87.57	114.00	-26.43 peak
2		2440.000	33.30	33.22	66.52	94.00	-27.48 AVG

Test Mode | TX Mode\_2440 MHz

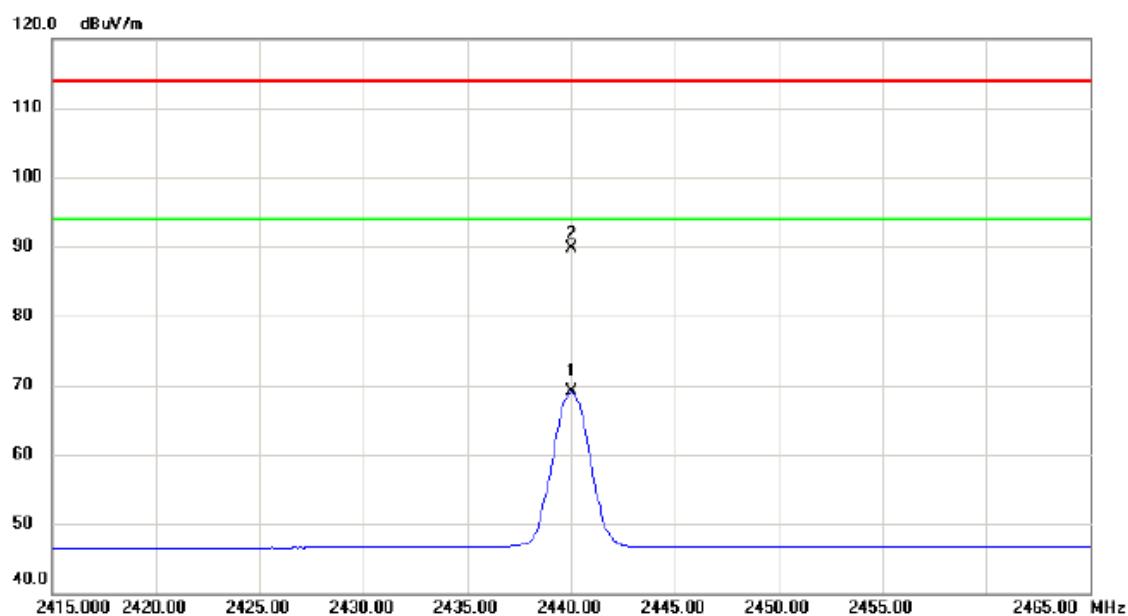
## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		9760.250	39.79	13.68	53.47	74.00	-20.53	peak
2 *		9760.310	22.85	13.68	36.53	54.00	-17.47	AVG

Test Mode TX Mode\_2440 MHz

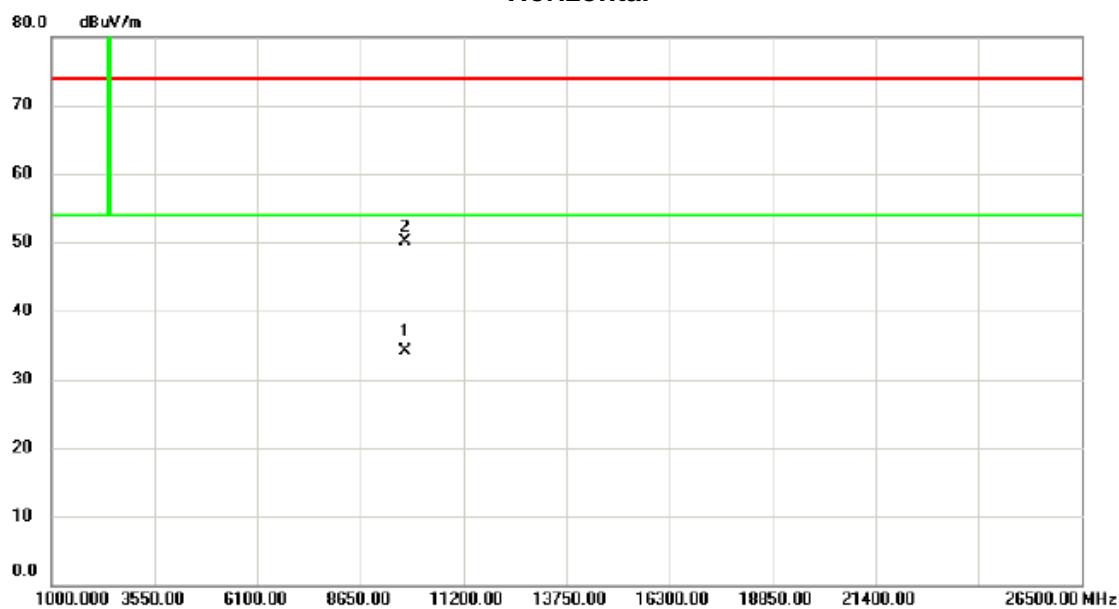
## Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		2440.000	35.80	33.22	69.02	94.00	-24.98	AVG
2 *		2440.010	56.56	33.22	89.78	114.00	-24.22	peak

Test Mode | TX Mode\_2440 MHz

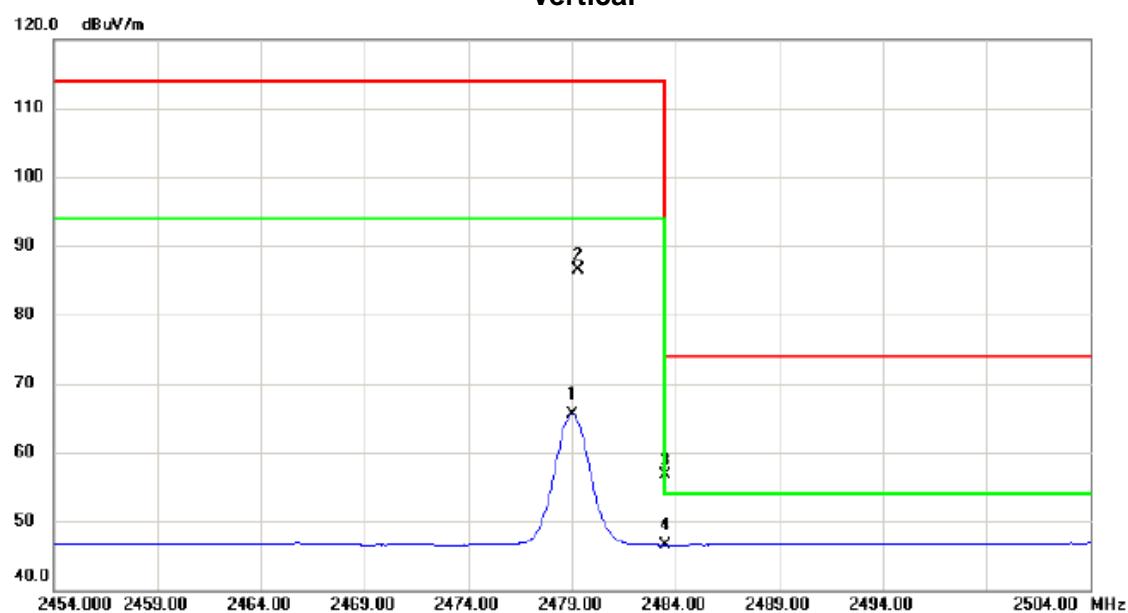
## Horizontal



No.	Mk.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	9760.165	20.45	13.68	34.13	54.00	-19.87	AVG
2		9760.285	36.33	13.68	50.01	74.00	-23.99	peak

Test Mode TX Mode\_2479 MHz

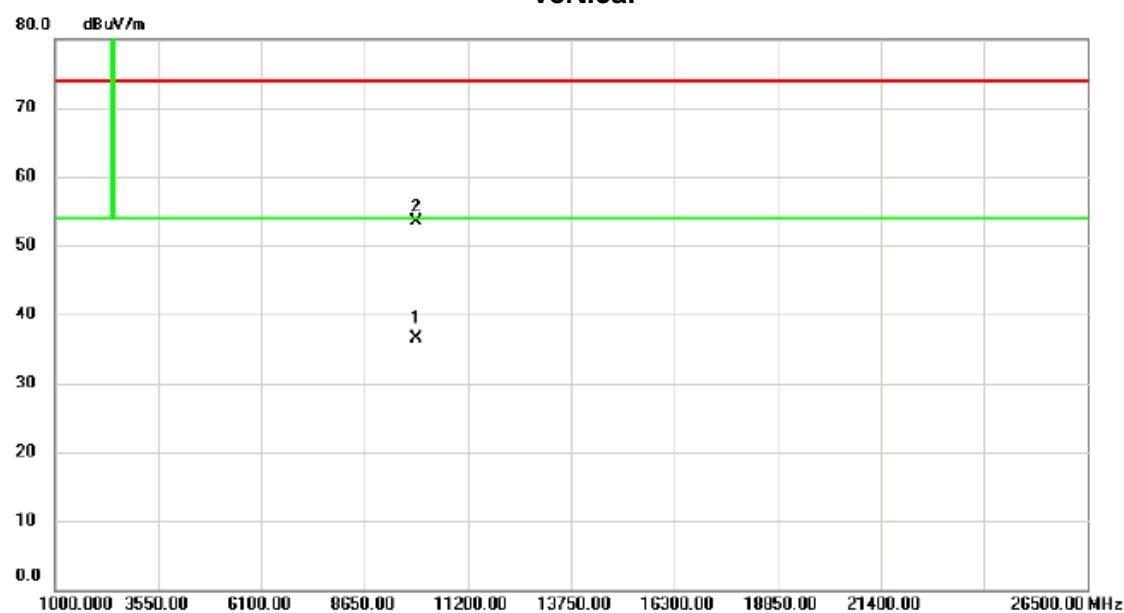
## Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		2479.000	32.13	33.38	65.51	94.00	-28.49	AVG
2		2479.300	53.08	33.38	86.46	114.00	-27.54	peak
3		2483.500	23.37	33.40	56.77	74.00	-17.23	peak
4 *		2483.500	13.19	33.40	46.59	54.00	-7.41	AVG

Test Mode TX Mode\_2479 MHz

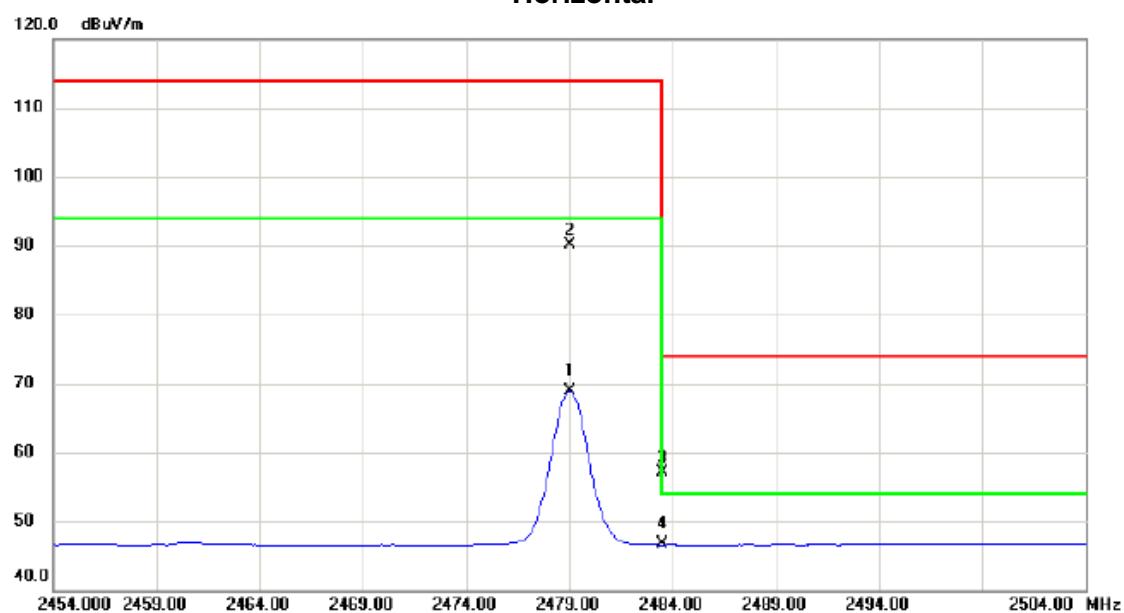
## Vertical



No.	Mk.	Reading		Correct Factor	Measure- ment	Limit	Margin
		Freq. MHz	Level dBuV				
1	*	9916.550	22.61	13.96	36.57	54.00	-17.43 AVG
	2	9916.750	39.54	13.96	53.50	74.00	-20.50 peak

Test Mode | TX Mode\_2479 MHz

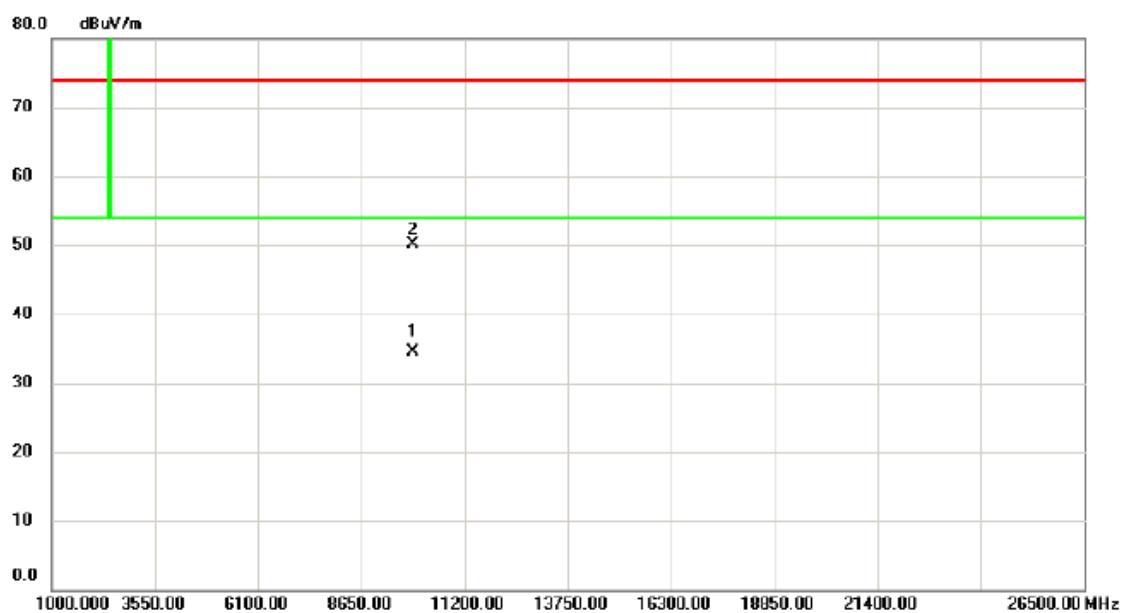
## Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Comment
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	
1		2479.000	35.54	33.38	68.92	94.00	-25.08	AVG
2		2479.050	56.73	33.38	90.11	114.00	-23.89	peak
3		2483.500	23.71	33.40	57.11	74.00	-16.89	peak
4 *		2483.500	13.20	33.40	46.60	54.00	-7.40	AVG

Test Mode | TX Mode\_2479 MHz

## Horizontal



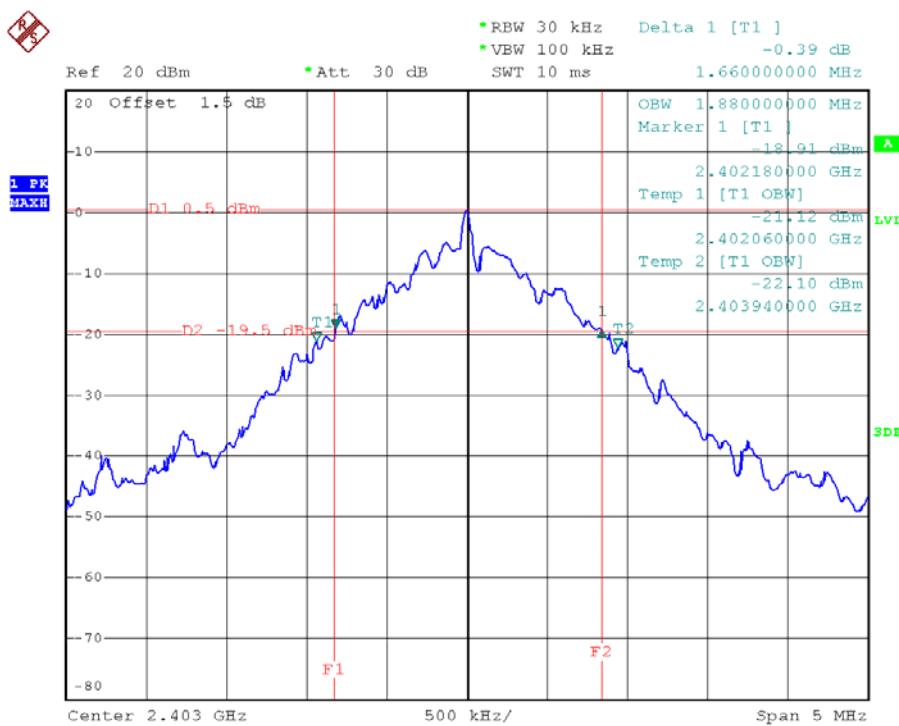
No.	Mk.	Reading		Correct Factor	Measure- ment	Limit	Margin	
		Freq. MHz	Level dBuV					
1	*	9916.120	20.64	13.96	34.60	54.00	-19.40	AVG
2		9916.150	36.17	13.96	50.13	74.00	-23.87	peak

## ATTACHMENT E - BANDWIDTH

Test Mode: TX Mode\_2403 MHz/2440 MHz/2479 MHz

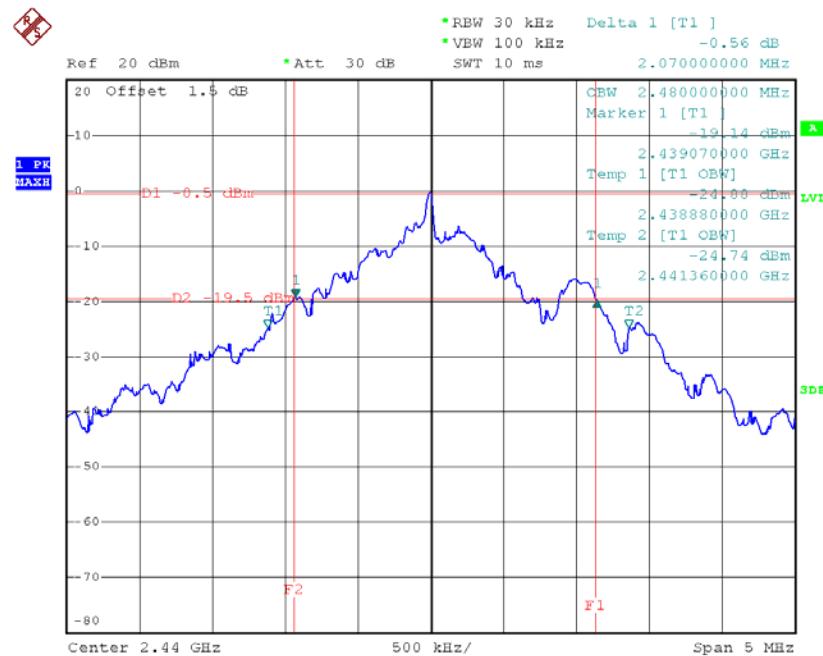
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)
2403	1.660	1.880
2440	2.070	2.480
2479	1.856	2.700

### TX Mode\_2403 MHz



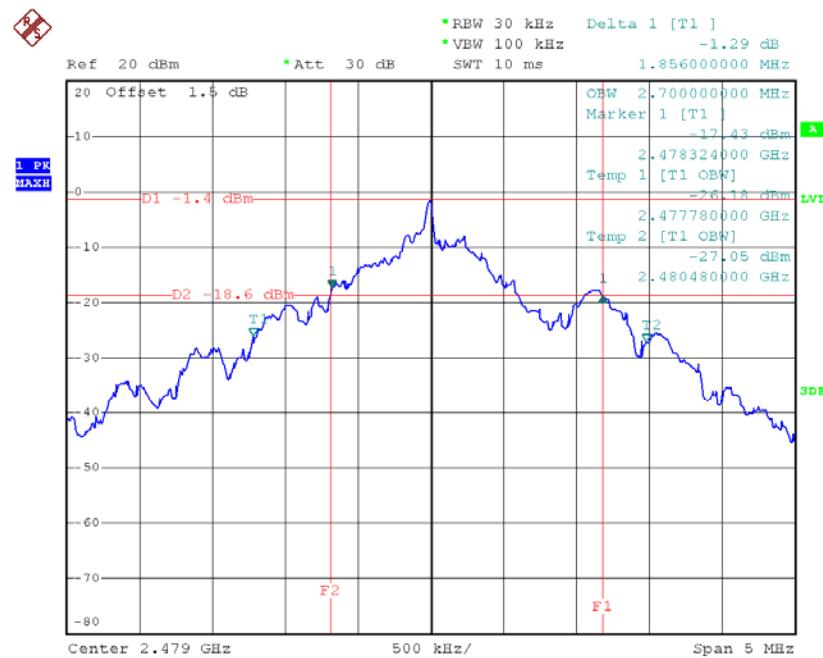
Date: 22.DEC.2016 11:19:30

## TX Mode\_2440 MHz



Date: 22.DEC.2016 11:16:49

## TX Mode\_2479 MHz



Date: 22.DEC.2016 11:12:57