

# FCC Radio Test Report

## FCC ID: H4IMS8163

This report concerns: Original Grant

**Project No.** : 1710091  
**Equipment** : Wireless Mouse  
**Test Model** : WM116t  
**Series Model** : N/A  
**Applicant** : Lite-on Technology Corp.  
**Address** : 16F, 392 , Ruey Kuang Road, Neihu, Taipei 11492,  
Taiwan, R.O.C

**Date of Receipt** : Oct. 23, 2017  
**Date of Test** : Oct. 23, 2017 ~ Oct. 27, 2017  
**Issued Date** : Nov. 01, 2017  
**Tested by** : BTL Inc.

**Testing Engineer** :



(Kay Wu)

**Technical Manager** :



(James Chiu)

**Authorized Signatory** :



(Andy Chiu)

# **B T L I N C .**

No.18, Ln. 171, Sec. 2, Jiuzong Rd.,  
Neihu Dist., Taipei City 114, Taiwan (R.O.C.)  
TEL: +886-2-2657-3299 FAX: +886-2-2657-3331



**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL's** reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

**BTL's** report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **BTL-self**, extracts from the test report shall not be reproduced except in full with **BTL's** authorized written approval.

**BTL's** laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**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.

## CONTENTS

REPORT ISSUED HISTORY		5
1	CERTIFICATION	6
2	SUMMARY OF TEST RESULTS	7
2.1	TEST FACILITY	8
2.2	MEASUREMENT UNCERTAINTY	8
3	GENERAL INFORMATION	10
3.1	DESCRIPTION OF EUT	10
3.2	TEST MODES	11
3.3	BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	12
3.4	SUPPORT UNITS	12
3.5	PARAMETERS OF TEST SOFTWARE	12
4	TRANSMITTER RADIATED EMISSIONS TEST	13
4.1	LIMIT	13
4.2	TEST PROCEDURE	14
4.3	DEVIATION FROM TEST STANDARD	14
4.4	TEST SETUP	15
4.5	EUT OPERATING CONDITIONS	16
4.6	TEST RESULT – 9 KHZ TO 30 MHZ	16
4.7	TEST RESULT – 30MHZ TO 1000 MHZ	16
4.8	TEST RESULT – ABOVE 1000 MHZ	17
5	6 DB BANDWIDTH TEST	18
5.1	LIMIT	18
5.2	TEST PROCEDURE	18
5.3	DEVIATION FROM TEST STANDARD	18
5.4	TEST SETUP	18
5.5	EUT OPERATING CONDITIONS	18
5.6	TEST RESULT	18
6	PEAK OUTPUT POWER TEST	19
6.1	LIMIT	19
6.2	TEST PROCEDURE	19
6.3	DEVIATION FROM TEST STANDARD	19
6.4	TEST SETUP	19
6.5	EUT OPERATING CONDITIONS	19
6.6	TEST RESULT	19
7	ANTENNA CONDUCTED SPURIOUS EMISSIONS TEST	20
7.1	LIMIT	20
7.2	TEST PROCEDURE	20
7.3	DEVIATION FROM TEST STANDARD	20
7.4	TEST SETUP	20
7.5	EUT OPERATING CONDITIONS	20
7.6	TEST RESULT	20

8	POWER SPECTRAL DENSITY	21
8.1	LIMIT	21
8.2	TEST PROCEDURE	21
8.3	DEVIATION FROM TEST STANDARD	21
8.4	TEST SETUP	21
8.5	EUT OPERATING CONDITIONS	21
8.6	TEST RESULT	21
9	LIST OF MEASURING EQUIPMENTS	22
10	EUT TEST PHOTO	23
APPENDIX A	TRANSMITTER RADIATED EMISSIONS - 9 KHZ TO 30 MHZ	26
APPENDIX B	TRANSMITTER RADIATED EMISSIONS - 30 MHZ TO 1000 MHZ	31
APPENDIX C	TRANSMITTER RADIATED EMISSIONS - ABOVE 1000 MHZ	34
APPENDIX D	6 DB BANDWIDTH	47
APPENDIX E	PEAK OUTPUT POWER	49
APPENDIX F	ANTENNA CONDUCTED SPURIOUS EMISSIONS	51
APPENDIX G	POWER SPECTRAL DENSITY	53

**REPORT ISSUED HISTORY**

Issue No.	Description	Issued Date
BTL-FCCP-1-1710091	Original Issue.	Nov. 01, 2017

## 1 CERTIFICATION

Equipment : Wireless Mouse  
Brand Name : DELL  
Test Model : WM116t  
Series Model : N/A  
Applicant : Lite-on Technology Corp.  
Manufacturer : LITE-ON TECHNOLOGY CORP.  
Address : 16F, 392 , Ruey Kuang Road, Neihu, Taipei 11492, Taiwan, R.O.C  
Date of Test : Oct. 23, 2017 ~ Oct. 27, 2017  
Test Sample : Engineering Sample  
Standard(s) : FCC Part15, Subpart C (§15.247)  
ANSI C63.10-2013

The above equipment has been tested and found in 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-1-1710091) 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 standards.

FCC Part15, Subpart C (§15.247)				
FCC Clause No	Description	Test Result	Judgement	Remark
15.207	Conducted Emissions	-----	N/A	NOTE (1) NOTE (2)
15.209/15.205	Transmitter Radiated Emissions	APPENDIX A APPENDIX B APPENDIX C	Pass	-----
15.247(a)(2)	6 dB Bandwidth	APPENDIX D	Pass	-----
15.247(b)(3)	Peak Output Power	APPENDIX E	Pass	-----
15.247(d)	Antenna Conducted Spurious Emissions	APPENDIX F	Pass	-----
15.247(e)	Power Spectral Density	APPENDIX G	Pass	-----
15.203	Antenna Requirement	-----	Pass	-----

**NOTE:**

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) Input power is supplied by battery.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

- CB05:** (FCC RN:674415; FCC DN:TW0659)  
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
- CB08:** (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-1)  
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
- CB11:** (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-2)  
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
- CB15:** (FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-2)  
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

## 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 BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{CISPR}$  requirement.

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 emissions test:

Applied	Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
<input type="checkbox"/>	C05	CISPR	150 kHz ~ 30MHz	2.68	C05

### B. Radiated emissions below 1 GHz test:

Applied	Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
<input type="checkbox"/>	CB08 (10m)	CISPR	30 MHz ~ 200 MHz	V	3.62
			30 MHz ~ 200 MHz	H	3.28
			200 MHz ~ 1,000 MHz	V	4.06
			200 MHz ~ 1,000 MHz	H	3.64
<input type="checkbox"/>	CB08 (3m)	CISPR	30 MHz ~ 200 MHz	V	3.62
			30 MHz ~ 200 MHz	H	3.34
			200 MHz ~ 1,000 MHz	V	4.02
			200 MHz ~ 1,000 MHz	H	3.60
<input type="checkbox"/>	CB11 (3m)	CISPR	30 MHz ~ 200 MHz	V	4.04
			30 MHz ~ 200 MHz	H	3.76
			200 MHz ~ 1,000 MHz	V	4.24
			200 MHz ~ 1,000 MHz	H	3.84
<input checked="" type="checkbox"/>	CB15 (3m)	CISPR	30 MHz ~ 200 MHz	V	4.76
			30 MHz ~ 200 MHz	H	4.28
			200 MHz ~ 1,000 MHz	V	5.08
			200 MHz ~ 1,000 MHz	H	4.50
<input type="checkbox"/>	CB16 (3m)	CISPR	30 MHz ~ 200 MHz	V	4.76
			30 MHz ~ 200 MHz	H	4.28
			200 MHz ~ 1,000 MHz	V	5.08
			200 MHz ~ 1,000 MHz	H	4.50



C. Radiated emissions above 1 GHz test:

Applied	Test Site	Method	Measurement Frequency Range	Ant. H / V	U (dB)
<input type="checkbox"/>	CB08 (3m)	CISPR	1 GHz ~ 6 GHz	V	4.28
			1 GHz ~ 6 GHz	H	4.28
			6 GHz ~18 GHz	V	3.56
			6 GHz ~18 GHz	H	3.66
<input type="checkbox"/>	CB11 (3m)	CISPR	1 GHz ~ 6 GHz	V	4.46
			1 GHz ~ 6 GHz	H	4.40
			6 GHz ~18 GHz	V	4.18
			6 GHz ~18 GHz	H	4.34
<input checked="" type="checkbox"/>	CB15 (3m)	CISPR	1 GHz ~ 6 GHz	V	4.48
			1 GHz ~ 6 GHz	H	4.50
			6 GHz ~18 GHz	V	4.30
			6 GHz ~18 GHz	H	4.14
<input type="checkbox"/>	CB16 (3m)	CISPR	1 GHz ~ 6 GHz	V	4.48
			1 GHz ~ 6 GHz	H	4.50
			6 GHz ~18 GHz	V	4.30
			6 GHz ~18 GHz	H	4.14

Applied	Test Site	Method	Measurement Frequency Range	U (dB)
<input type="checkbox"/>	CB08 (1m)	CISPR	18 GHz ~ 26.5 GHz	4.72
			26.5 GHz ~ 40 GHz	5.20
<input type="checkbox"/>	CB11 (1m)	CISPR	18 GHz ~ 26.5 GHz	4.80
			26.5 GHz ~ 40 GHz	5.28
<input checked="" type="checkbox"/>	CB15 (1m)	CISPR	18 GHz ~ 26.5 GHz	4.80
			26.5 GHz ~ 40 GHz	5.28
<input type="checkbox"/>	CB16 (1m)	CISPR	18 GHz ~ 26.5 GHz	4.80
			26.5 GHz ~ 40 GHz	5.28

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification. Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our  $U_{lab}$  values in CISPR 16-4-2 terminology. Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called  $U_{CISPR}$ , as follows:  
 Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB  
 Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

### 3 GENERAL INFORMATION

#### 3.1 DESCRIPTION OF EUT

Equipment	Wireless Mouse		
Brand Name	DELL		
Test Model	WM116t		
Series Model	N/A		
Model Difference	N/A		
Power Source	Supplied from 1*AA battery		
Power Rating	DC 1.5 V 40 mA		
Product Specification	Operation Frequency	2402 MHz to 2479 MHz	
	Modulation Type	GFSK	
	Bit Rate of Transmitter	2 Mbps	
	Maximum Output Power	0.90 dBm	

**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)
00	2402	26	2428	52	2454
01	2403	27	2429	53	2455
02	2404	28	2430	54	2456
03	2405	29	2431	55	2457
04	2406	30	2432	56	2458
05	2407	31	2433	57	2459
06	2408	32	2434	58	2460
07	2409	33	2435	59	2461
08	2410	34	2436	60	2462
09	2411	35	2437	61	2463
10	2412	36	2438	62	2464
11	2413	37	2439	63	2465
12	2414	38	2440	64	2466
13	2415	39	2441	65	2467
14	2416	40	2442	66	2468
15	2417	41	2443	67	2469
16	2418	42	2444	68	2470
17	2419	43	2445	69	2471
18	2420	44	2446	70	2472
19	2421	45	2447	71	2473
20	2422	46	2448	72	2474
21	2423	47	2449	73	2475
22	2424	48	2450	74	2476
23	2425	49	2451	75	2477
24	2426	50	2452	76	2478
25	2427	51	2453	77	2479

- (3) Table for Filed Antenna:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
0	N/A	N/A	PCB	N/A	0.83

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

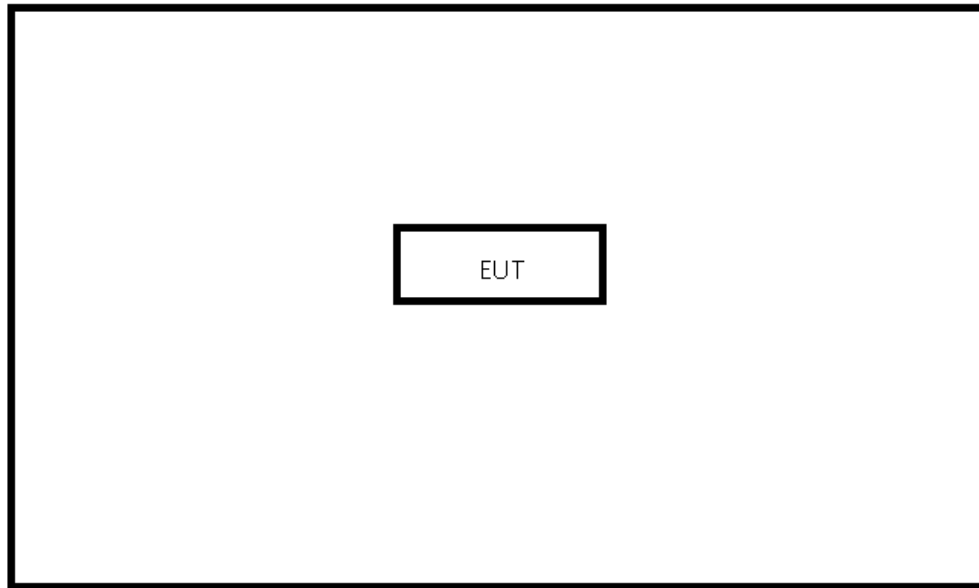
Radiated Emissions Test	
Test Mode	Description
1	Transmitting

Conducted Test	
Test Mode	Description
1	Transmitting

**NOTE:**

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

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



### 3.4 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	Brand	Model/Type No.	FCC ID	Series No.
-	-	-	-	-	-

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

### 3.5 PARAMETERS OF TEST SOFTWARE

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

Test Software Version	N/A		
Frequency (MHz)	2402	2440	2479
Parameter	def.	def.	def.

## 4 TRANSMITTER RADIATED EMISSIONS TEST

### 4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

#### LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

Frequency (MHz)	Field Strength (microvolts/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

#### LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	Radiated Emissions (dBuV/m)		Measurement Distance (meters)
	Peak	Average	
Above 1000	74	54	3

#### NOTE:

- (1) The limit for radiated test was performed according to FCC Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)  
 Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average

Spectrum 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 TEST PROCEDURE

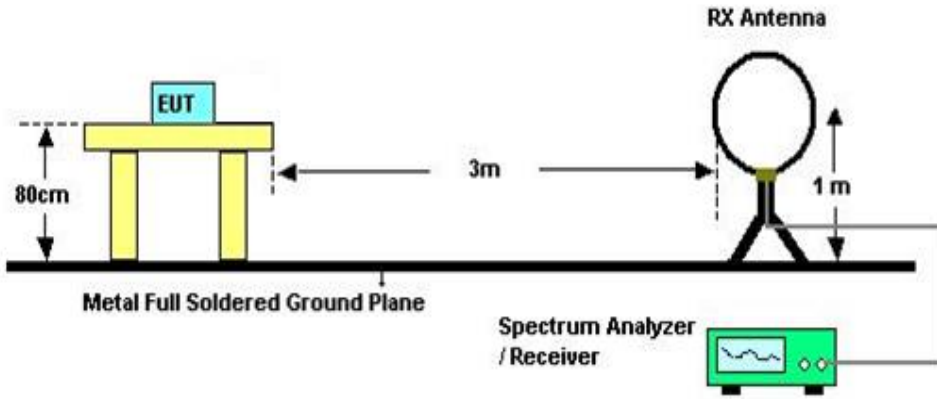
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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 1.5 m, 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.

## 4.3 DEVIATION FROM TEST STANDARD

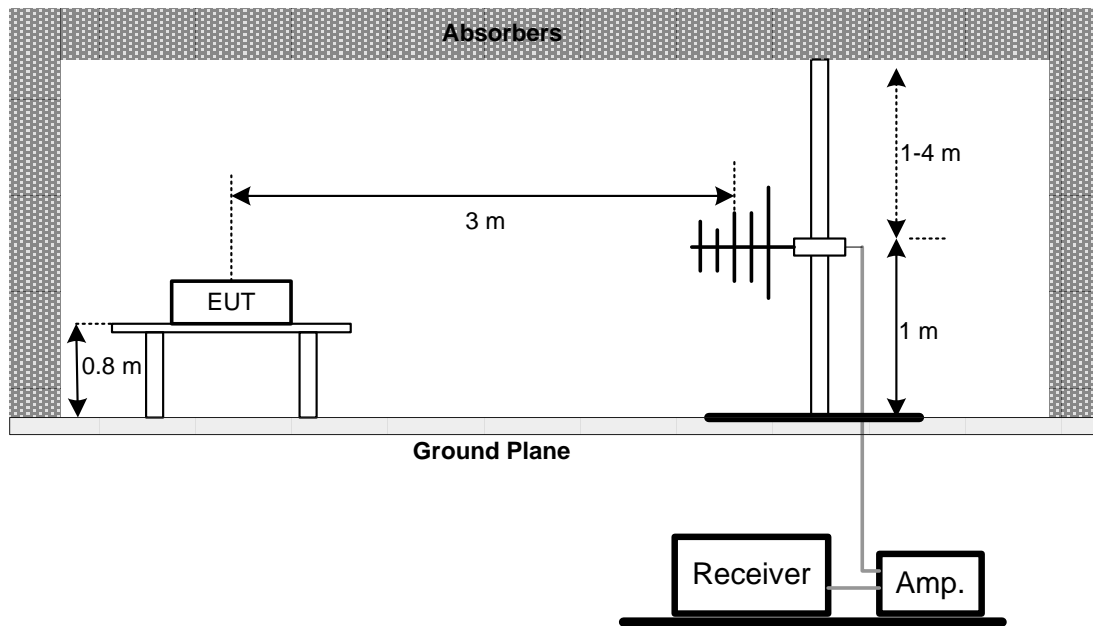
No deviation.

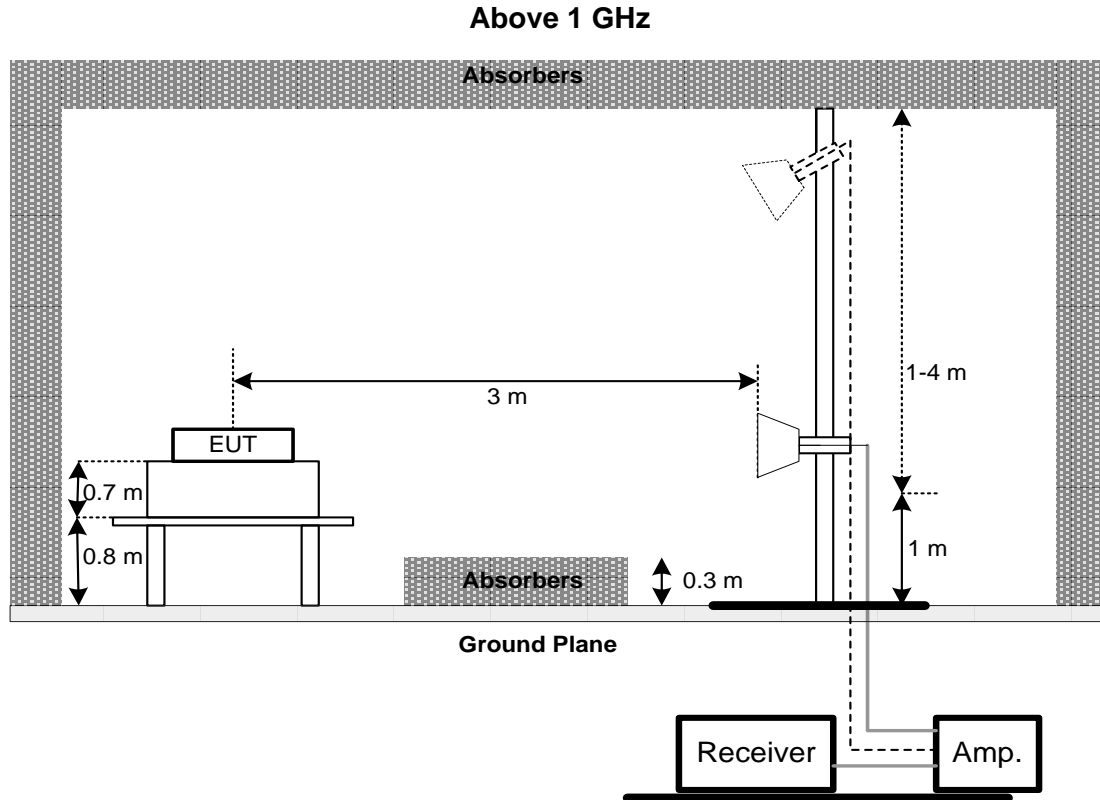
### 4.4 TEST SETUP

#### Below 30 MHz



#### 30 MHz to 1 GHz





#### 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULT – 9 KHZ TO 30 MHZ

Temperature: 23 °C    Relative Humidity: 70 %    Test Voltage: DC 1.5 V

Please refer to the APPENDIX A.

**NOTE:**

- (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.

#### 4.7 TEST RESULT – 30MHZ TO 1000 MHZ

Temperature: 25 °C    Relative Humidity: 45 %    Test Voltage: DC 1.5 V

Please refer to the APPENDIX B.



#### 4.8 TEST RESULT – ABOVE 1000 MHZ

Temperature: 25 °C    Relative Humidity: 45 %    Test Voltage: DC 1.5 V

Please refer to the APPENDIX C.

**NOTE:**

- (1) No limit: This is fundamental signal, the judgment is not applicable.  
For fundamental signal judgment was referred to Peak output test.

**5 6 DB BANDWIDTH TEST**

**5.1 LIMIT**

FCC Part15, Subpart C (§15.247)			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	2400-2483.5	PASS

**5.2 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=300KHz, Sweep time = 2.5 ms.

**5.3 DEVIATION FROM TEST STANDARD**

No deviation.

**5.4 TEST SETUP**



**5.5 EUT OPERATING CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

**5.6 TEST RESULT**

Please refer to the APPENDIX D.

## 6 PEAK OUTPUT POWER TEST

### 6.1 LIMIT

FCC Part15, Subpart C (§15.247)				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Maximum Output Power	1 Watt or 30dBm	2400-2483.5	PASS

### 6.2 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
- b. The maximum peak conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance.

### 6.3 DEVIATION FROM TEST STANDARD

No deviation.

### 6.4 TEST SETUP



### 6.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 6.6 TEST RESULT

Please refer to the APPENDIX E.

## 7 ANTENNA CONDUCTED SPURIOUS EMISSIONS TEST

### 7.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

### 7.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW = 100 kHz, VBW=300 kHz, Sweep time = Auto.
- Offset = antenna gain + cable loss.

### 7.3 DEVIATION FROM TEST STANDARD

No deviation.

### 7.4 TEST SETUP



### 7.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 7.6 TEST RESULT

Please refer to the APPENDIX F.

## 8 POWER SPECTRAL DENSITY

### 8.1 LIMIT

FCC Part15, Subpart C (§15.247)				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

### 8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW=3KHz, VBW=10KHz, Sweep time = Auto.

### 8.3 DEVIATION FROM TEST STANDARD

No deviation.

### 8.4 TEST SETUP



### 8.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 8.6 TEST RESULT

Please refer to the APPENDIX G.

## 9 LIST OF MEASURING EQUIPMENTS

Transmitter Radiated Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Preamplifier	EMCI	012645B	980267	Feb. 28, 2018
2	Preamplifier	EMCI	EMC02325	980217	Dec. 29, 2017
3	Test Cable	EMCI	EMC104-SM-SM-8000	8m	Jan. 04, 2018
4	Test Cable	EMCI	EMC104-SM-SM-800	150207	Jan. 04, 2018
5	Test Cable	EMCI	EEMC104-SM-SM-3000	151205	Jan. 04, 2018
6	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 09, 2018
7	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 22, 2018
8	Loop Ant	EMCO	6502	42960	Nov. 24, 2017
9	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 28, 2018
10	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 16, 2018
11	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 16, 2018

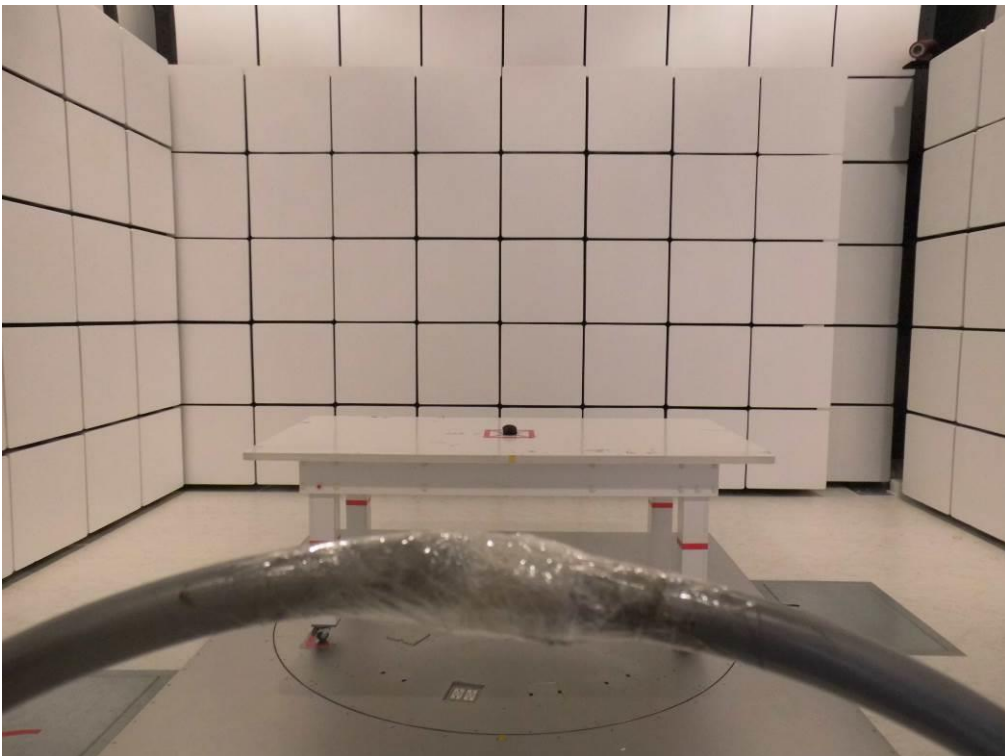
6 dB Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

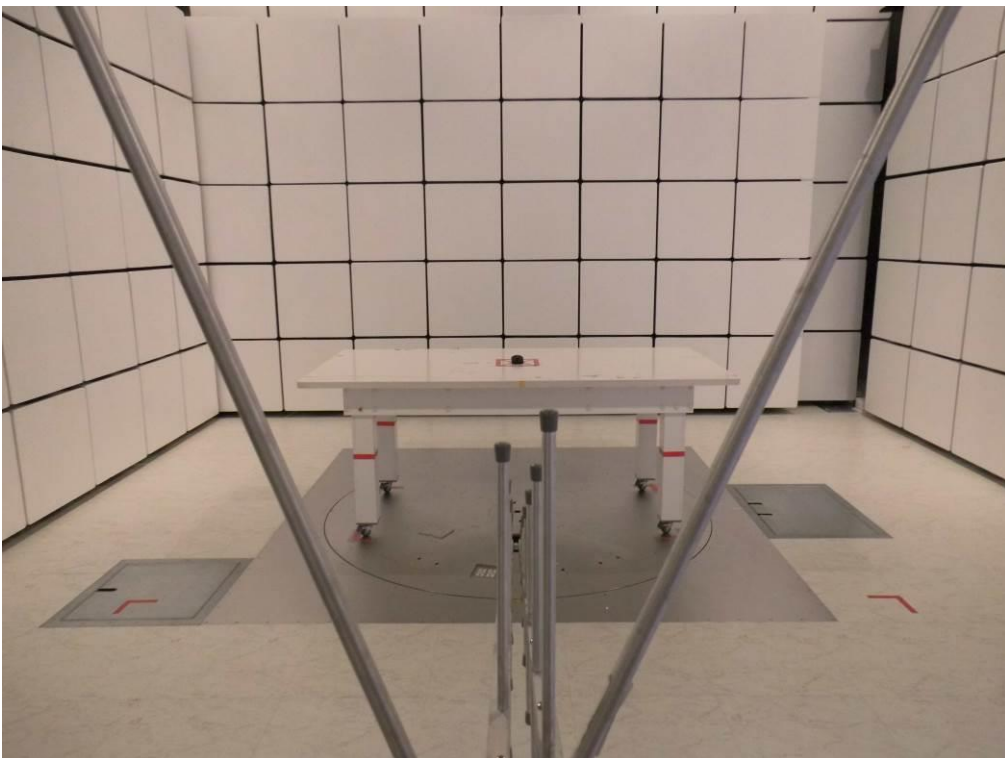
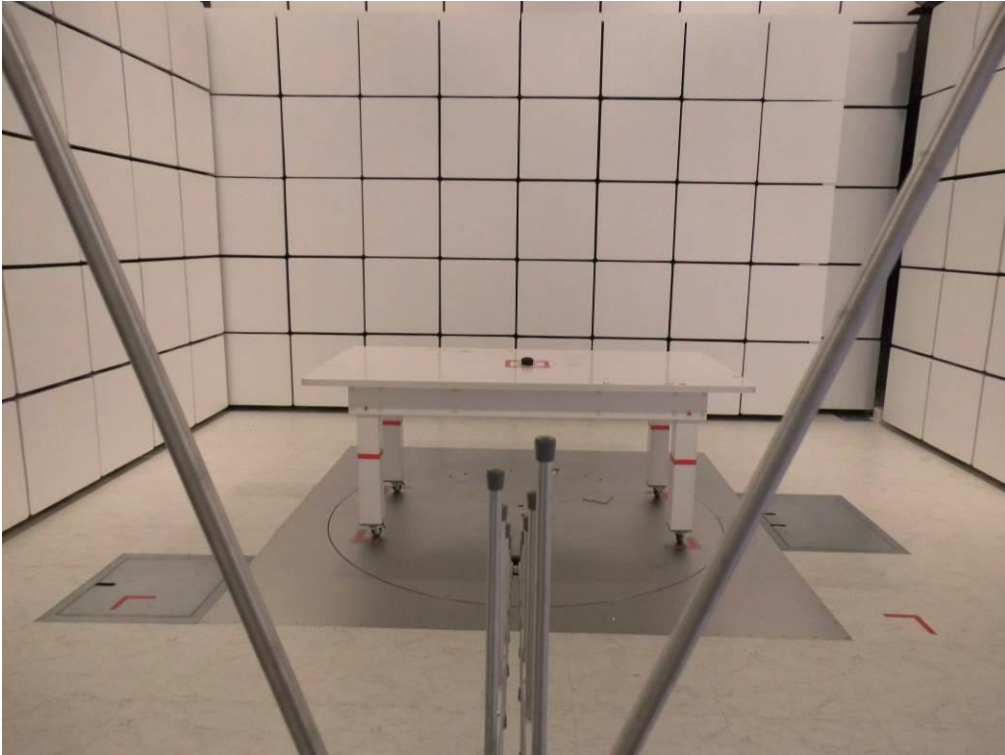
Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Aug. 16, 2018

Antenna Conducted Spurious Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

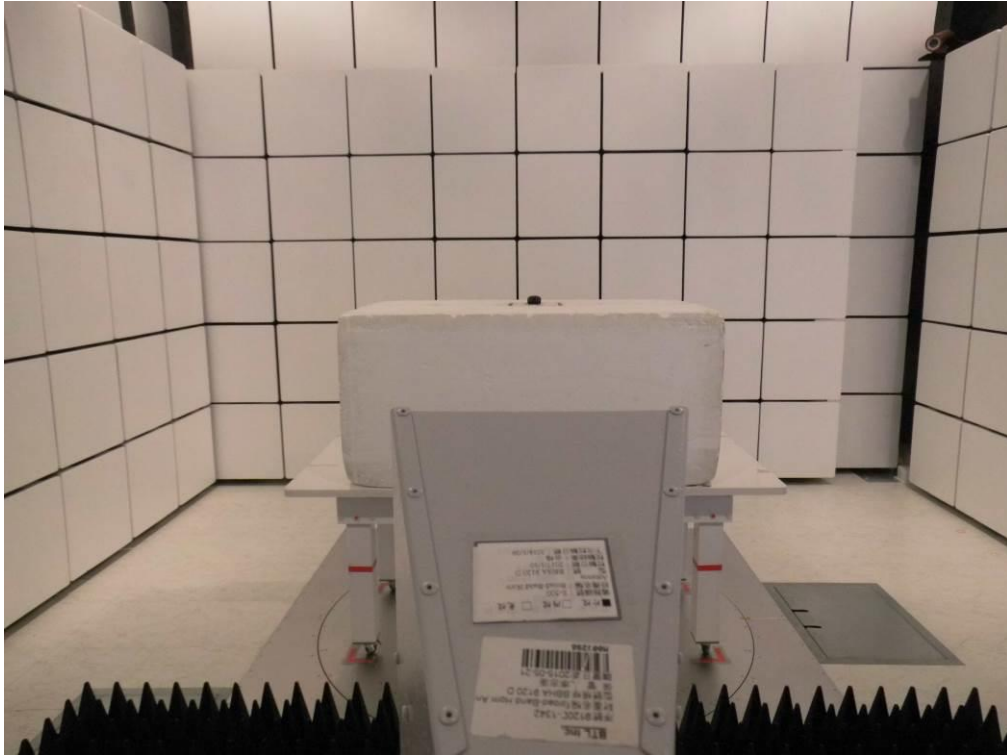
Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.  
All calibration period of equipment list is one year.

**10 EUT TEST PHOTO****Transmitter Radiated Emissions Test Photos****9 kHz to 30 MHz**

**Transmitter Radiated Emissions Test Photos****30 MHz to 1000 MHz**

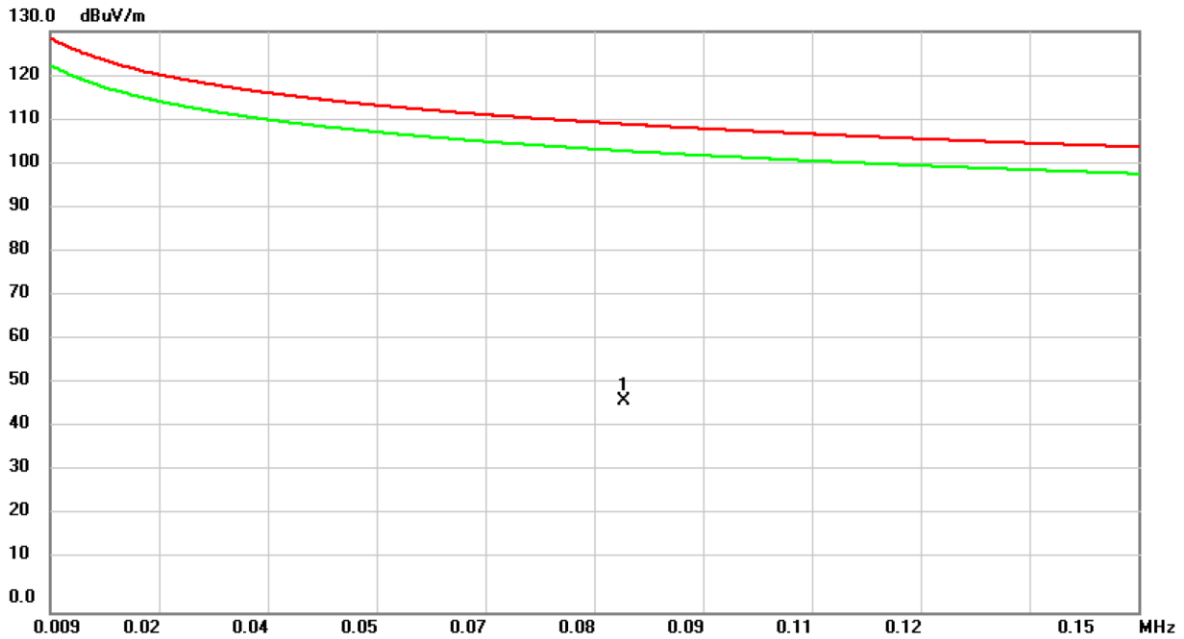


**Transmitter Radiated Emissions Test Photos****Above 1000 MHz**

**APPENDIX A TRANSMITTER RADIATED EMISSIONS -  
9 KHZ TO 30 MHZ**

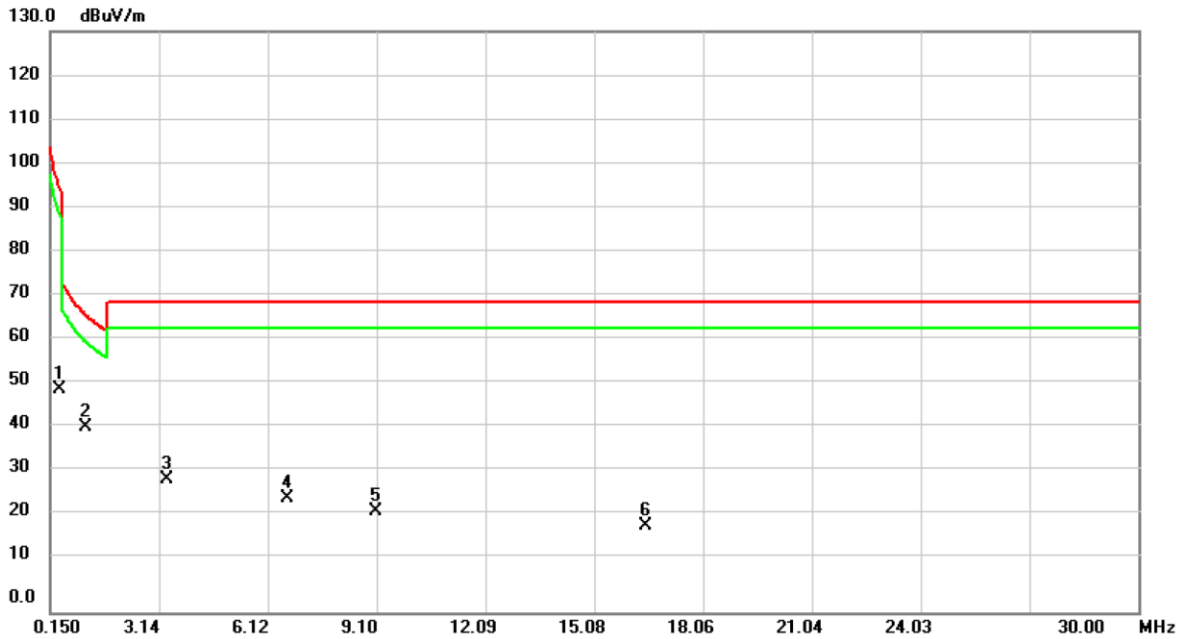
**CONTINUE ON NEXT PAGE**

Test Mode	Mode 1_90	Polarization	Vertical
-----------	-----------	--------------	----------



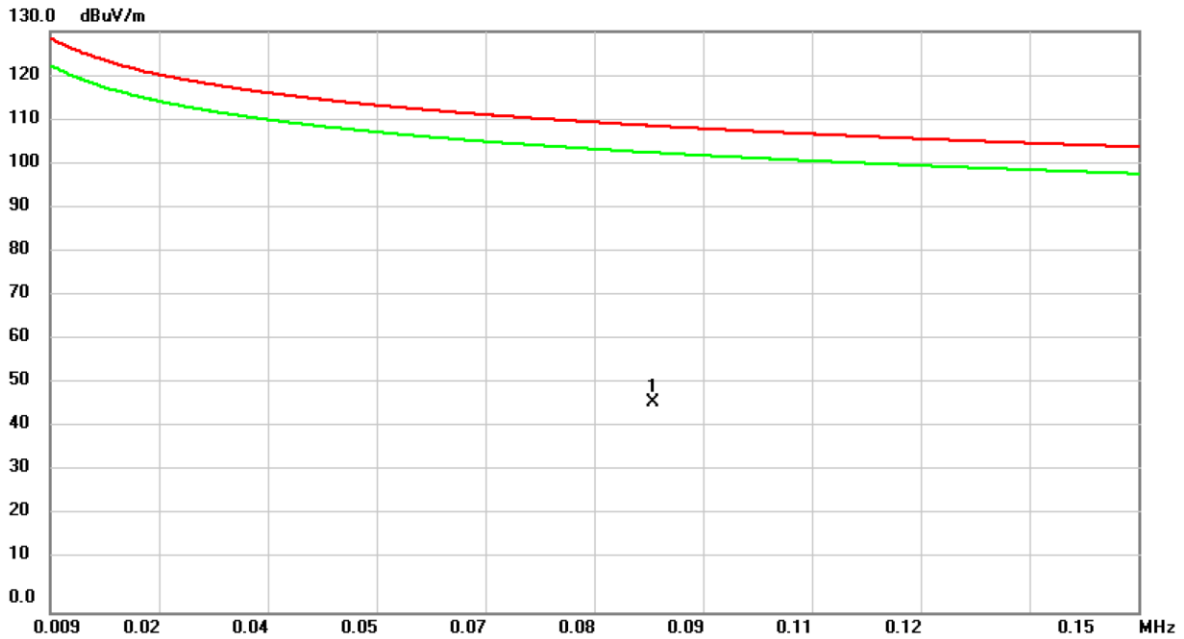
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.0833	34.89	12.40	47.29	109.19	-61.90	peak	

Test Mode	Mode 1_90	Polarization	Vertical
-----------	-----------	--------------	----------



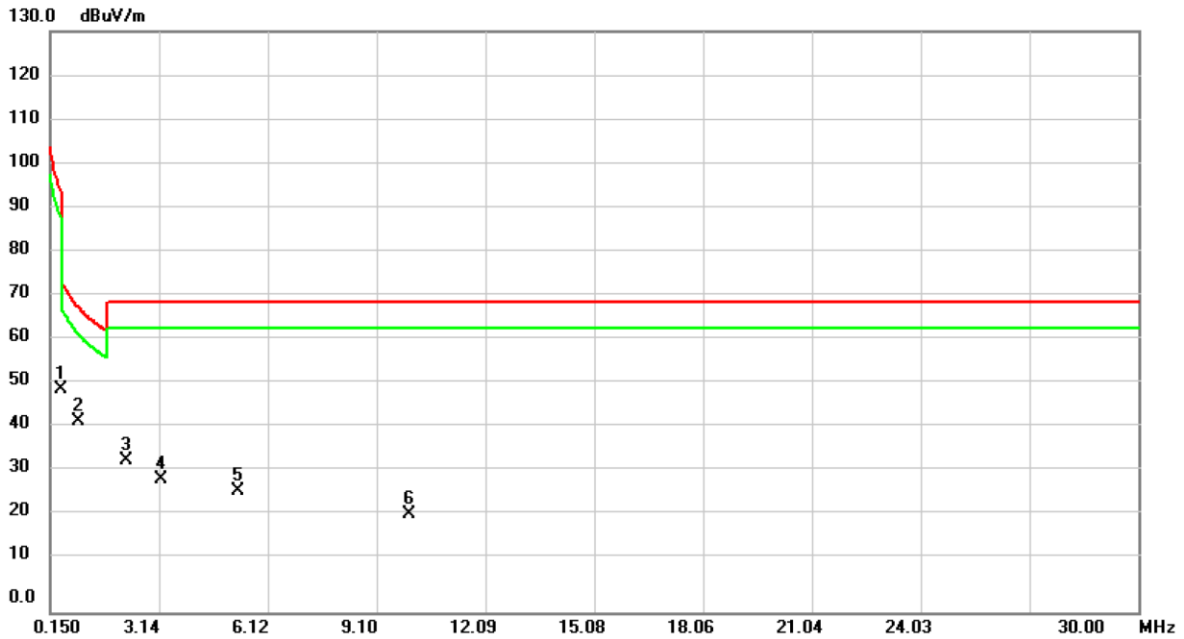
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		0.3888	38.05	11.80	49.85	95.81	-45.96	peak	
2	*	1.1052	29.35	11.95	41.30	66.73	-25.43	peak	
3		3.3340	18.43	11.15	29.58	69.54	-39.96	peak	
4		6.6374	14.15	11.37	25.52	69.54	-44.02	peak	
5		9.0652	11.30	11.32	22.62	69.54	-46.92	peak	
6		16.4680	8.18	11.11	19.29	69.54	-50.25	peak	

Test Mode	Mode 1_0	Polarization	Horizontal
-----------	----------	--------------	------------



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.0872	34.62	12.33	46.95	108.79	-61.84	peak	

Test Mode	Mode 1_0	Polarization	Horizontal
-----------	----------	--------------	------------

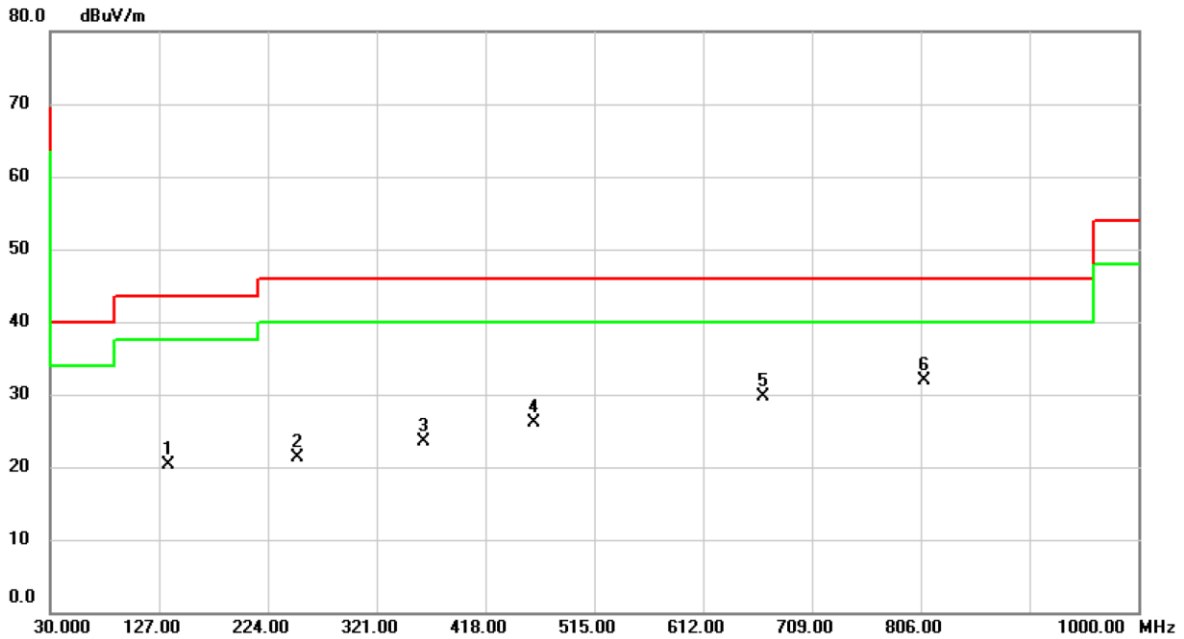


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		0.4286	38.11	11.80	49.91	94.96	-45.05	peak	
2	*	0.9062	30.78	11.96	42.74	68.46	-25.72	peak	
3		2.2196	22.55	11.45	34.00	69.54	-35.54	peak	
4		3.1748	18.62	11.13	29.75	69.54	-39.79	peak	
5		5.2842	15.78	11.39	27.17	69.54	-42.37	peak	
6		9.9806	10.65	11.30	21.95	69.54	-47.59	peak	

**APPENDIX B TRANSMITTER RADIATED EMISSIONS -  
30 MHZ TO 1000 MHZ**

**CONTINUE ON NEXT PAGE**

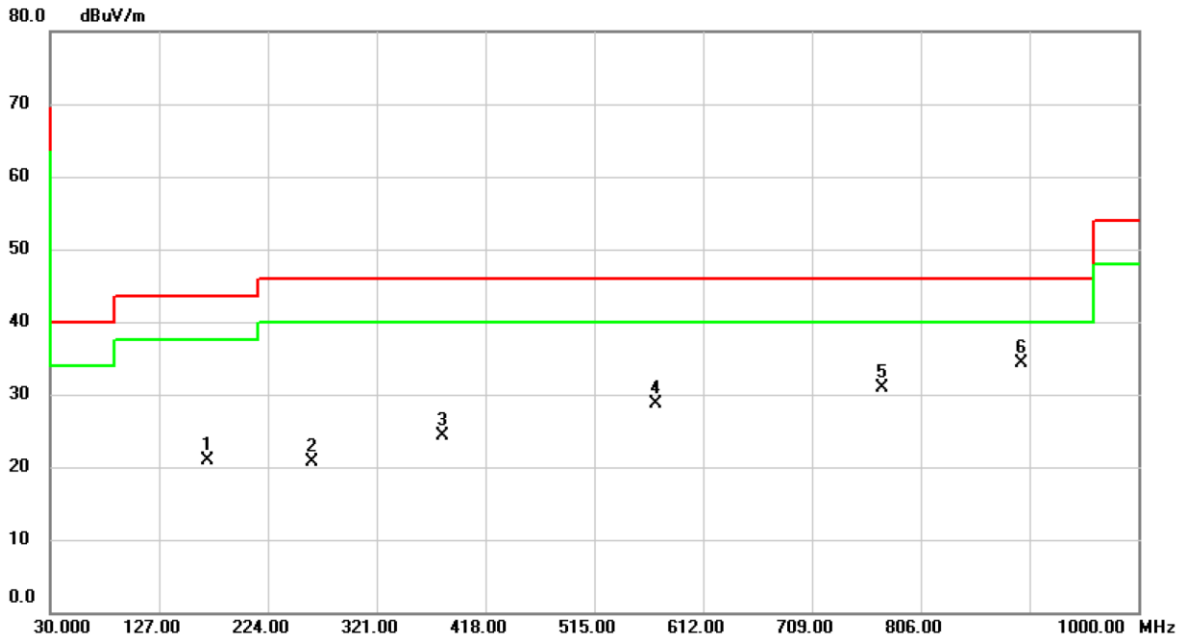
Test Mode	Mode 1_2479 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		135.7300	29.60	-9.33	20.27	43.50	-23.23	peak	
2		250.1900	30.30	-9.07	21.23	46.00	-24.77	peak	
3		362.7100	29.43	-5.90	23.53	46.00	-22.47	peak	
4		460.6800	29.44	-3.38	26.06	46.00	-19.94	peak	
5		665.3500	29.53	0.24	29.77	46.00	-16.23	peak	
6	*	808.9100	29.28	2.72	32.00	46.00	-14.00	peak	



Test Mode	Mode 1_2479 MHz	Polarization	Horizontal
-----------	-----------------	--------------	------------

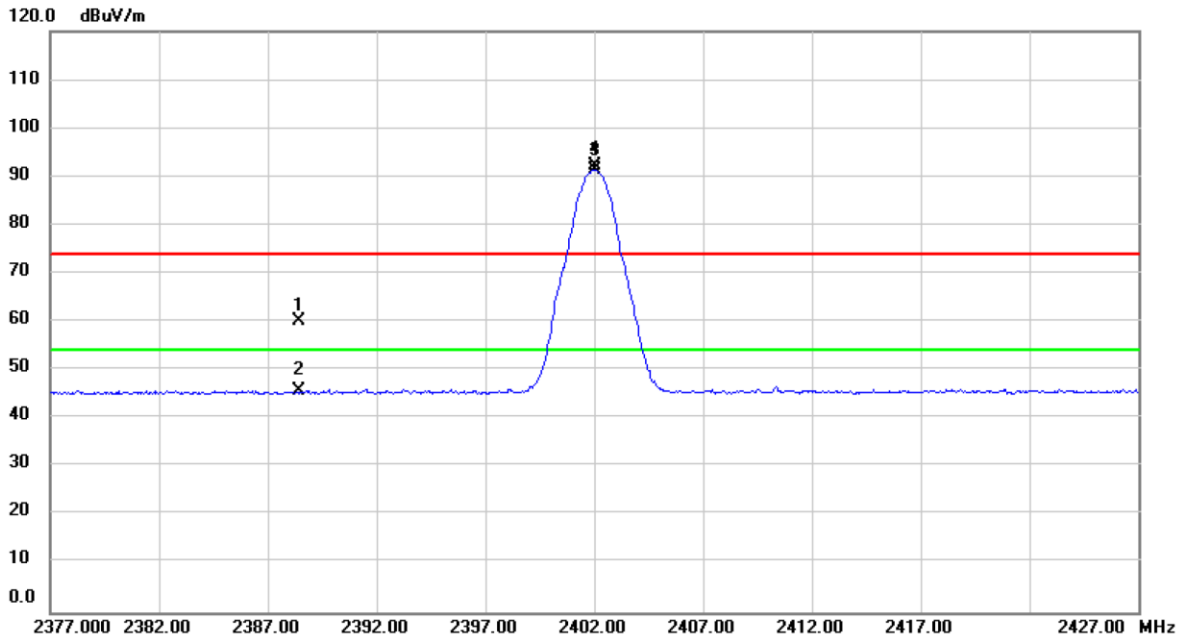


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		169.6800	29.48	-8.60	20.88	43.50	-22.62	peak	
2		263.7700	29.30	-8.64	20.66	46.00	-25.34	peak	
3		380.1700	29.85	-5.46	24.39	46.00	-21.61	peak	
4		569.3200	29.83	-1.22	28.61	46.00	-17.39	peak	
5		772.0500	28.71	2.21	30.92	46.00	-15.08	peak	
6	*	896.2100	30.20	4.05	34.25	46.00	-11.75	peak	

**APPENDIX C TRANSMITTER RADIATED EMISSIONS -  
ABOVE 1000 MHZ**

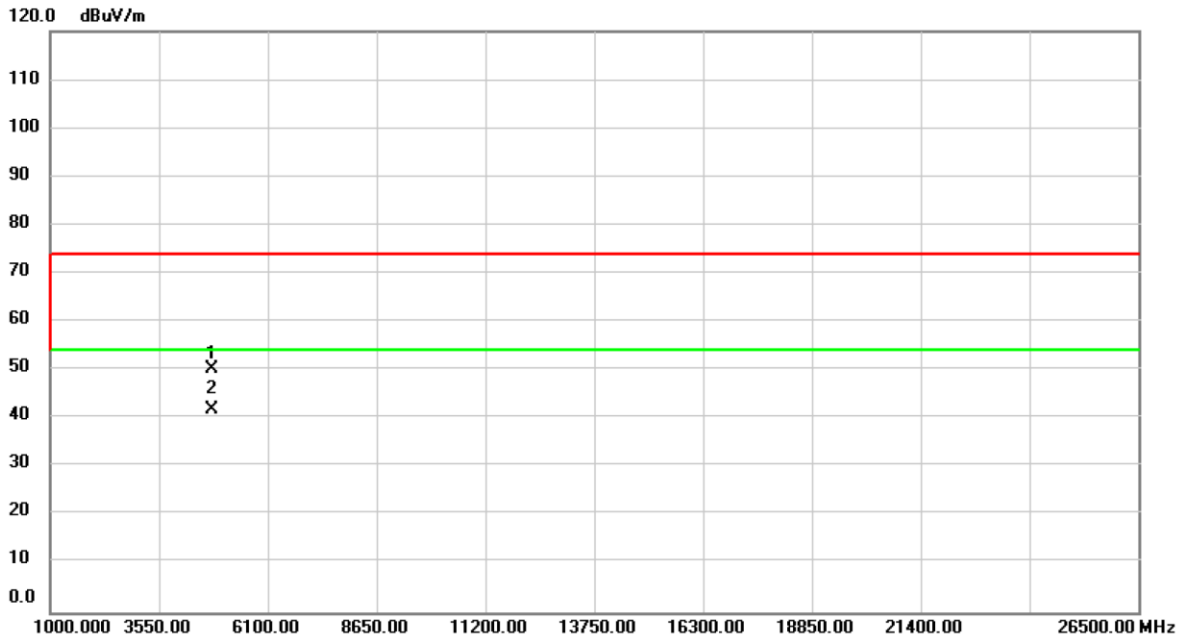
**CONTINUE ON NEXT PAGE**

Test Mode	Mode 1_2402 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



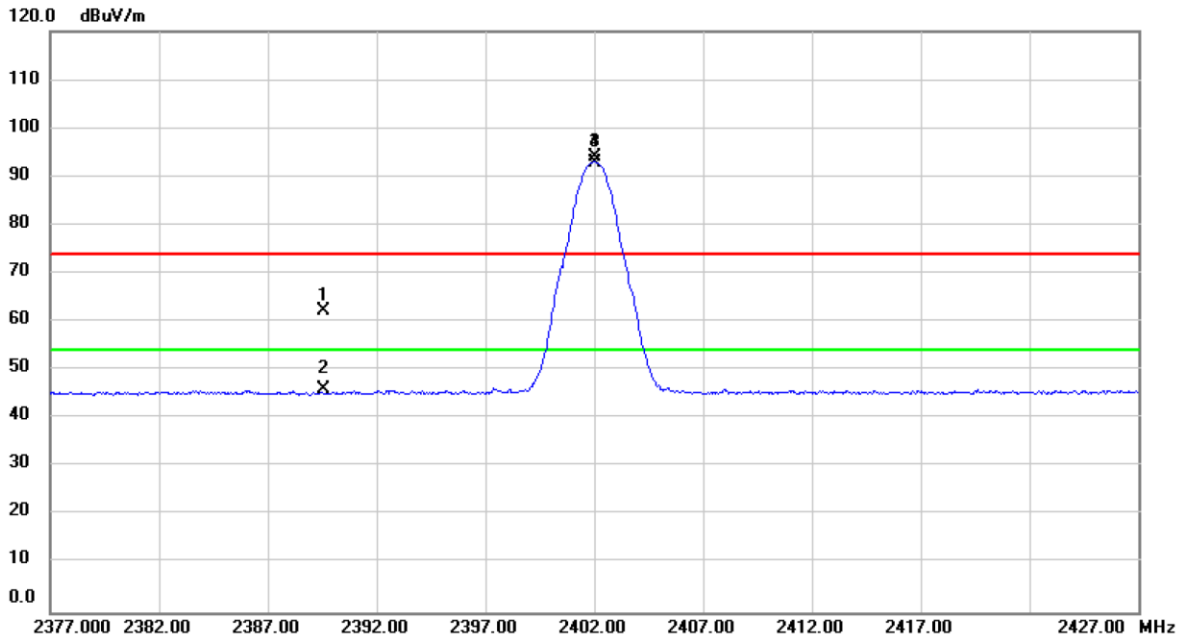
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2388.453	29.02	31.06	60.08	74.00	-13.92	peak	
2		2388.453	14.84	31.06	45.90	54.00	-8.10	AVG	
3	X	2402.000	61.02	31.11	92.13	74.00	18.13	peak	No Limit
4	*	2402.000	60.19	31.11	91.30	54.00	37.30	AVG	No Limit

Test Mode	Mode 1_2402 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



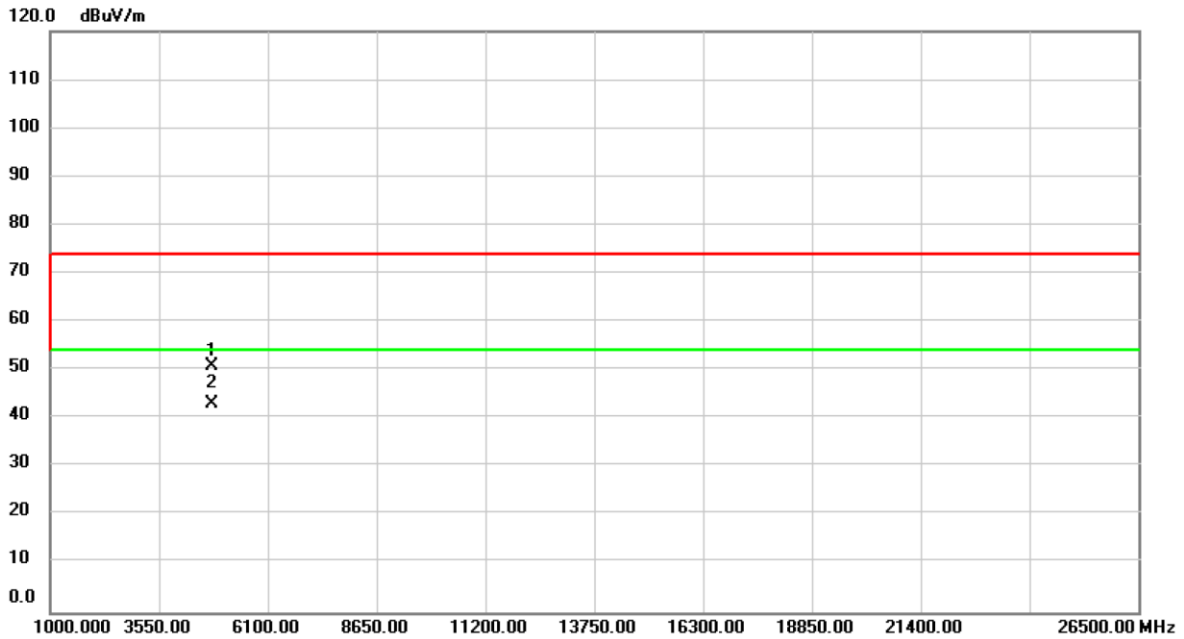
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	61.69	-11.40	50.29	74.00	-23.71	peak	
2	*	4804.000	53.39	-11.40	41.99	54.00	-12.01	AVG	

Test Mode	Mode 1_2402 MHz	Polarization	Horizontal
-----------	-----------------	--------------	------------



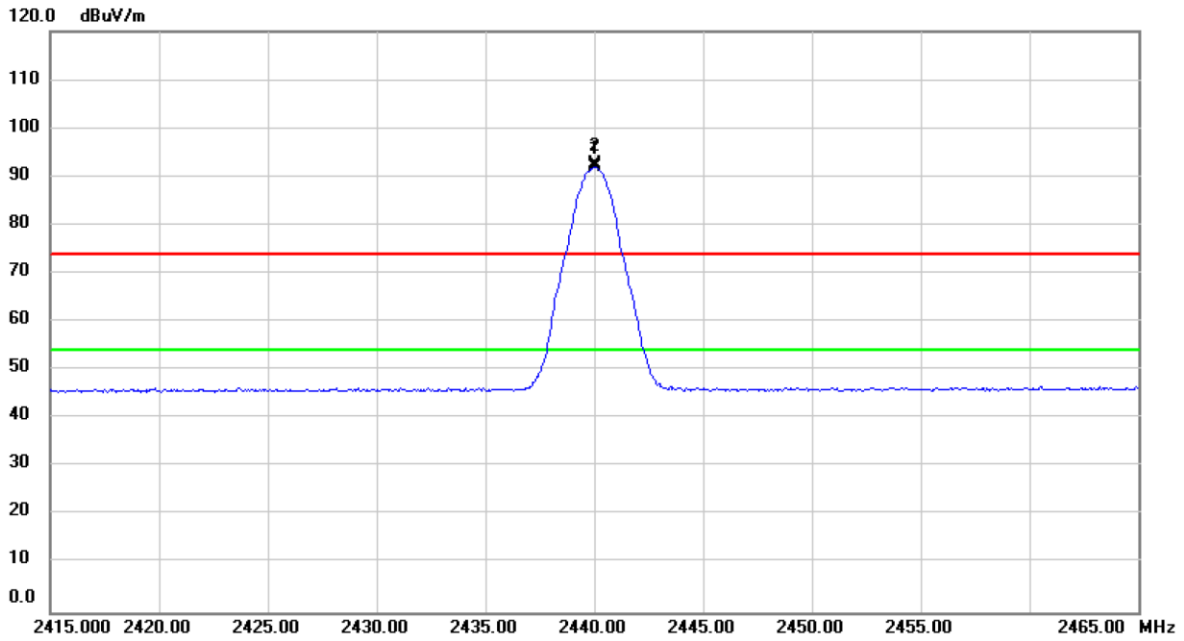
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2389.571	31.13	31.06	62.19	74.00	-11.81	peak	
2		2389.571	14.97	31.06	46.03	54.00	-7.97	AVG	
3	X	2402.000	62.83	31.11	93.94	74.00	19.94	peak	No Limit
4	*	2402.000	61.88	31.11	92.99	54.00	38.99	AVG	No Limit

Test Mode	Mode 1_2402 MHz	Polarization	Horizontal
-----------	-----------------	--------------	------------



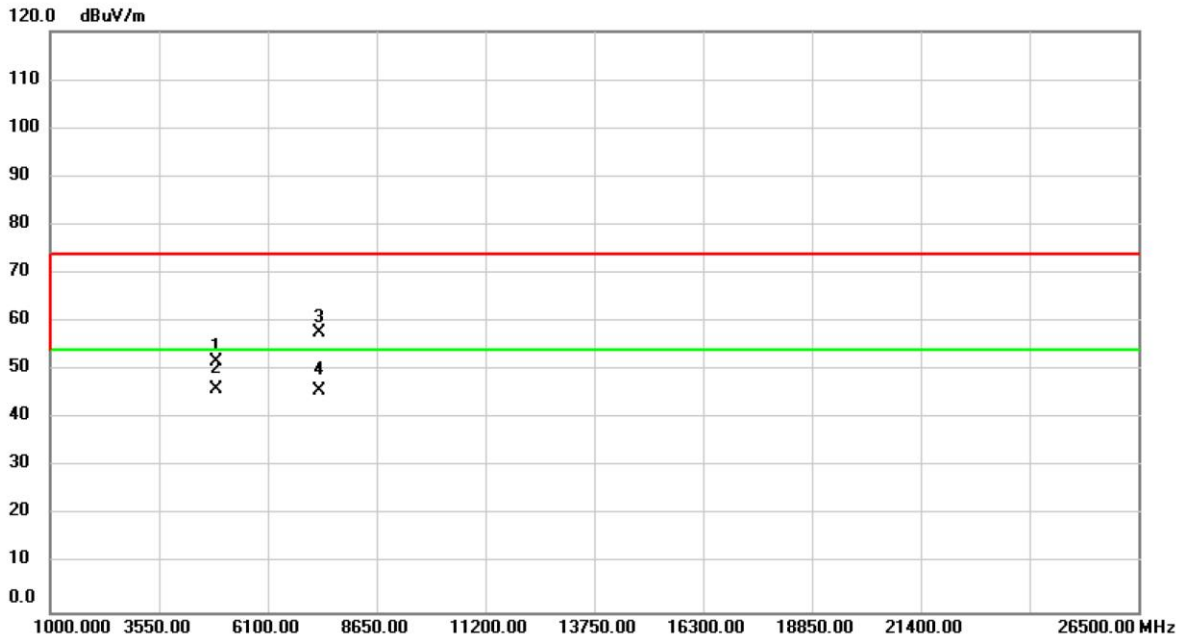
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	62.17	-11.40	50.77	74.00	-23.23	peak	
2	*	4804.000	54.59	-11.40	43.19	54.00	-10.81	AVG	

Test Mode	Mode 1_2440 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	X	2440.000	61.27	31.25	92.52	74.00	18.52	peak	No Limit
2	*	2440.000	60.62	31.25	91.87	54.00	37.87	AVG	No Limit

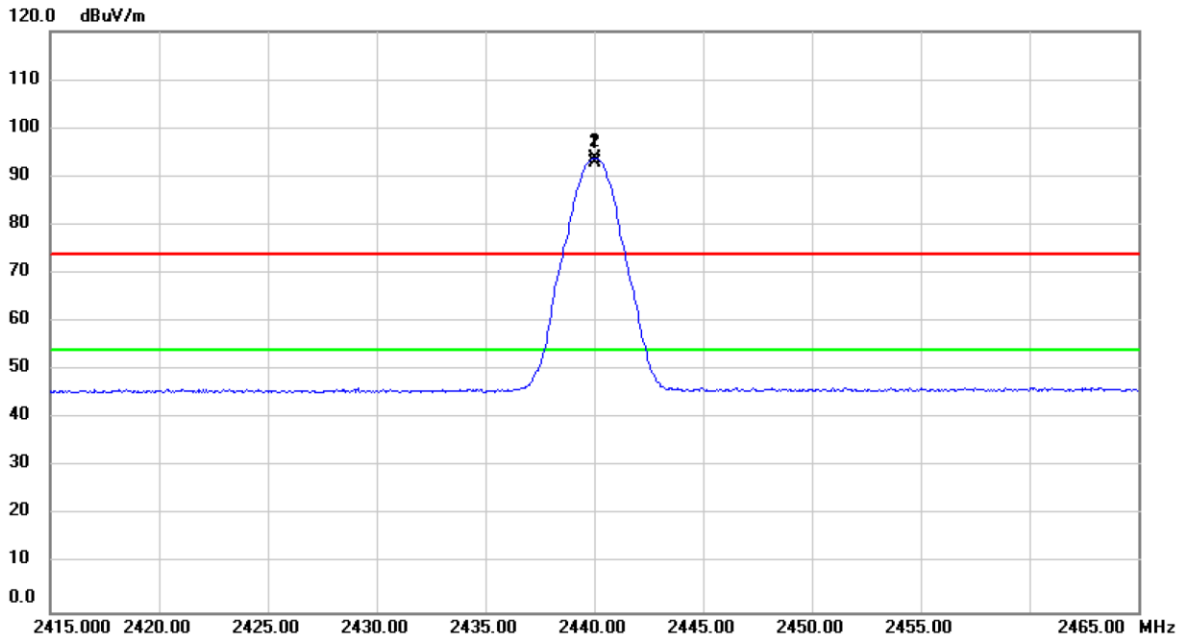
Test Mode	Mode 1_2440 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4880.000	62.89	-11.28	51.61	74.00	-22.39	peak	
2	*	4880.000	57.47	-11.28	46.19	54.00	-7.81	AVG	
3		7320.000	62.71	-5.10	57.61	74.00	-16.39	peak	
4		7320.000	50.80	-5.10	45.70	54.00	-8.30	AVG	

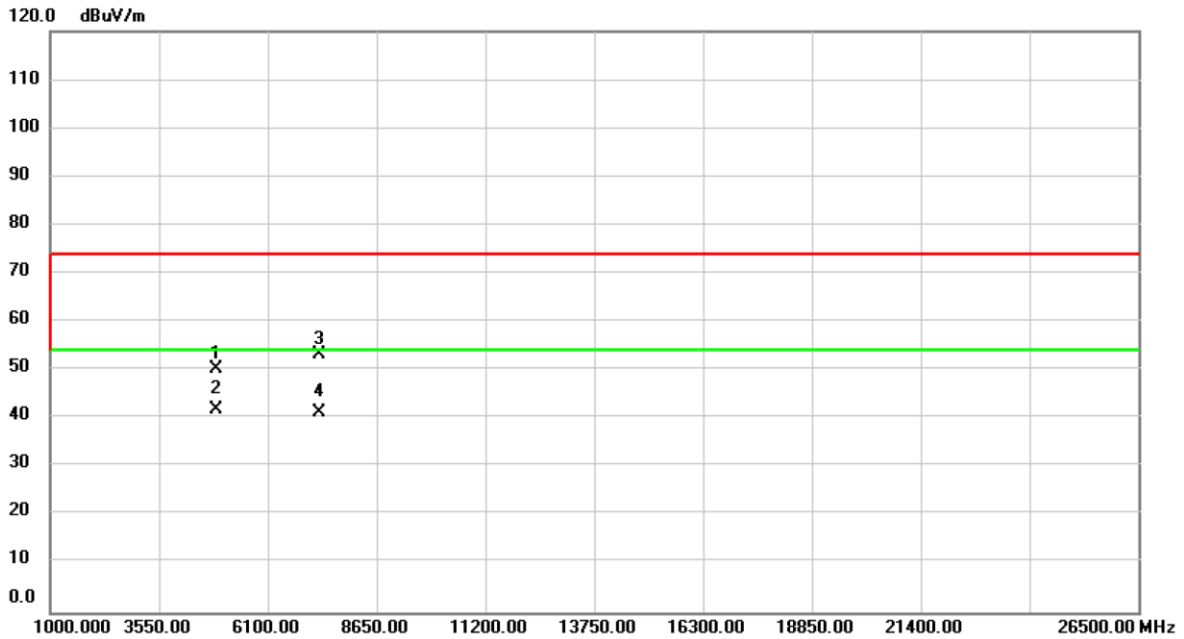


Test Mode	Mode 1_2440 MHz	Polarization	Horizontal
-----------	-----------------	--------------	------------



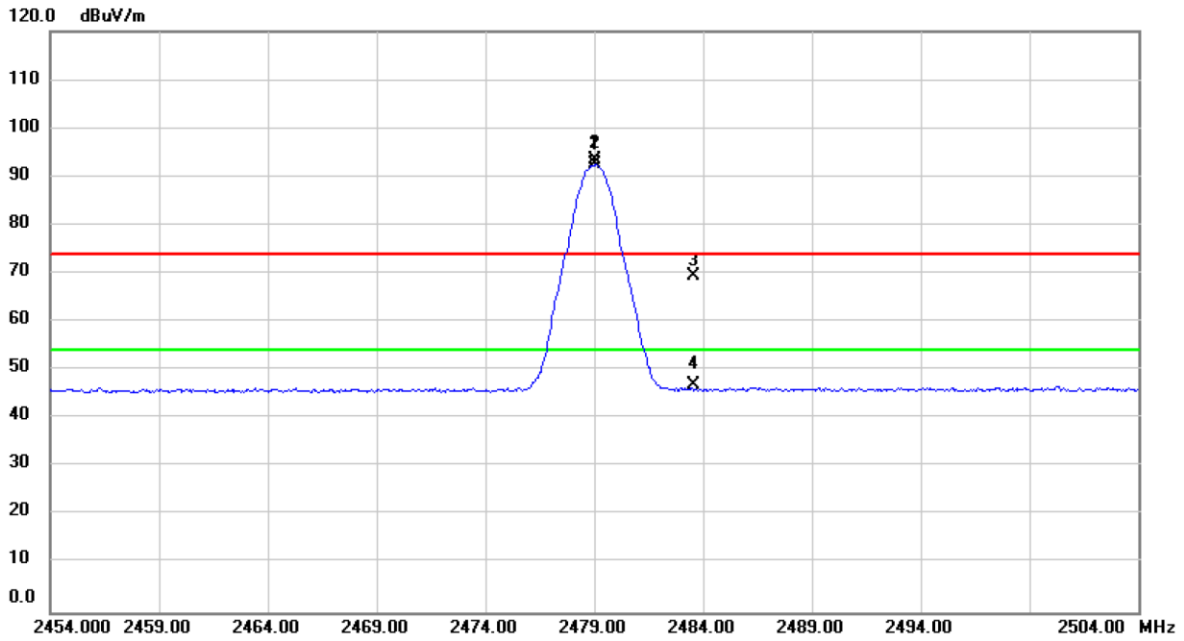
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	X	2440.000	62.60	31.25	93.85	74.00	19.85	peak	No Limit
2	*	2440.000	61.63	31.25	92.88	54.00	38.88	AVG	No Limit

Test Mode	Mode 1_2440 MHz	Polarization	Horizontal
-----------	-----------------	--------------	------------



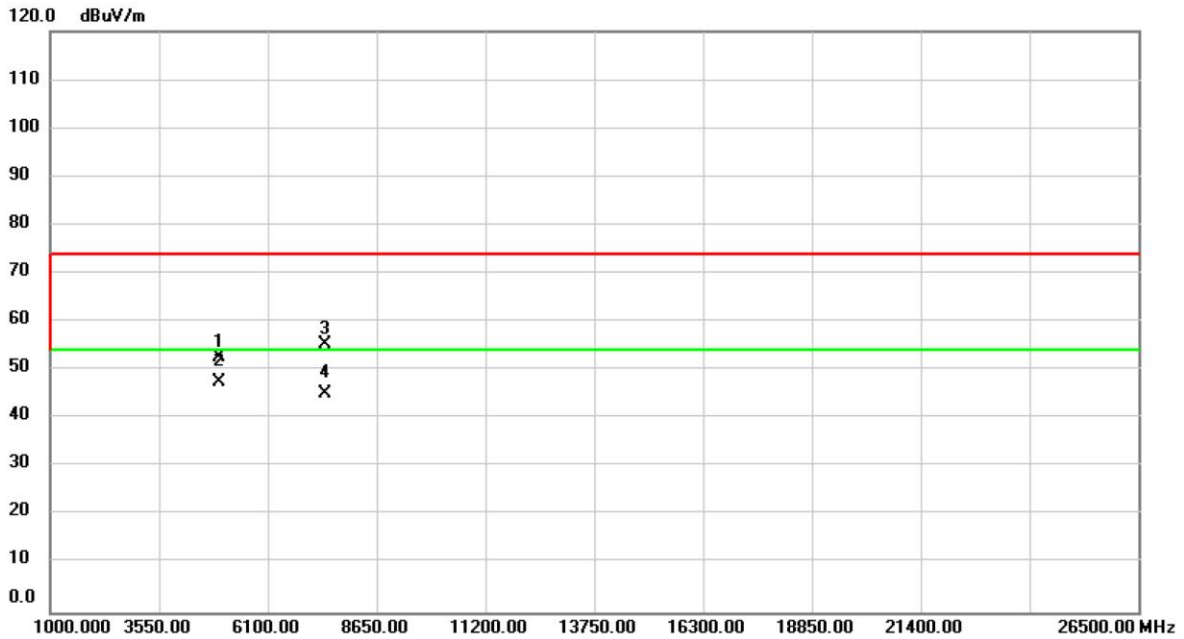
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4880.000	61.45	-11.28	50.17	74.00	-23.83	peak	
2	*	4880.000	53.19	-11.28	41.91	54.00	-12.09	AVG	
3		7320.000	58.46	-5.10	53.36	74.00	-20.64	peak	
4		7320.000	46.28	-5.10	41.18	54.00	-12.82	AVG	

Test Mode	Mode 1_2479 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



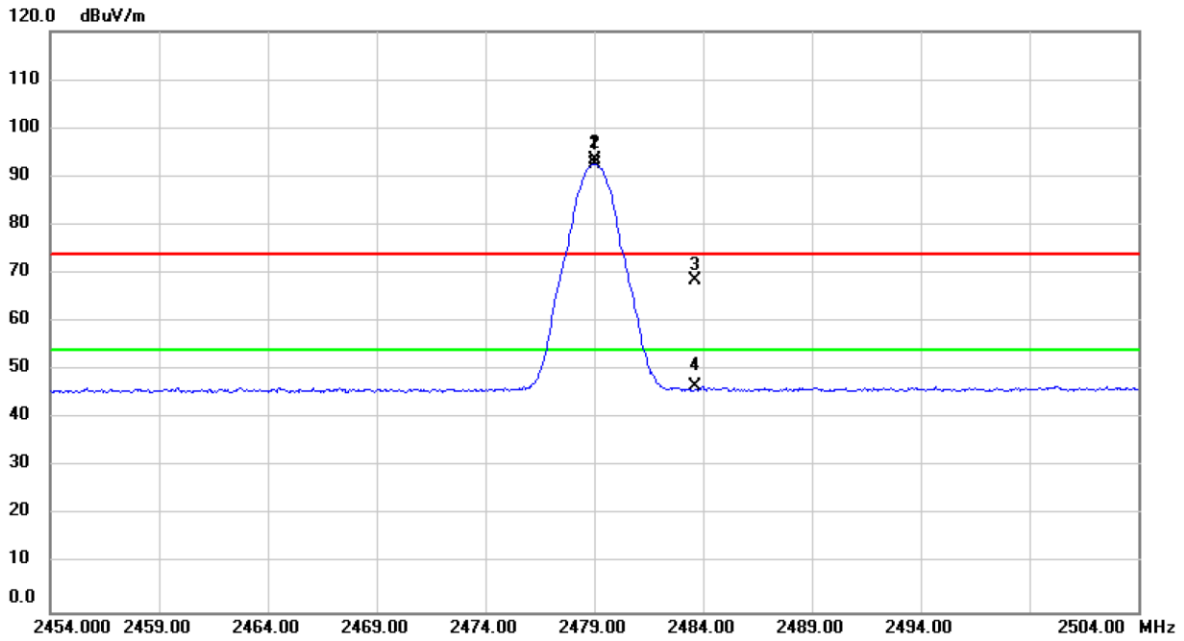
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2479.000	61.94	31.39	93.33	74.00	19.33	peak	No Limit
2	*	2479.000	61.05	31.39	92.44	54.00	38.44	AVG	No Limit
3		2483.561	38.05	31.41	69.46	74.00	-4.54	peak	
4		2483.561	15.50	31.41	46.91	54.00	-7.09	AVG	

Test Mode	Mode 1_2479 MHz	Polarization	Vertical
-----------	-----------------	--------------	----------



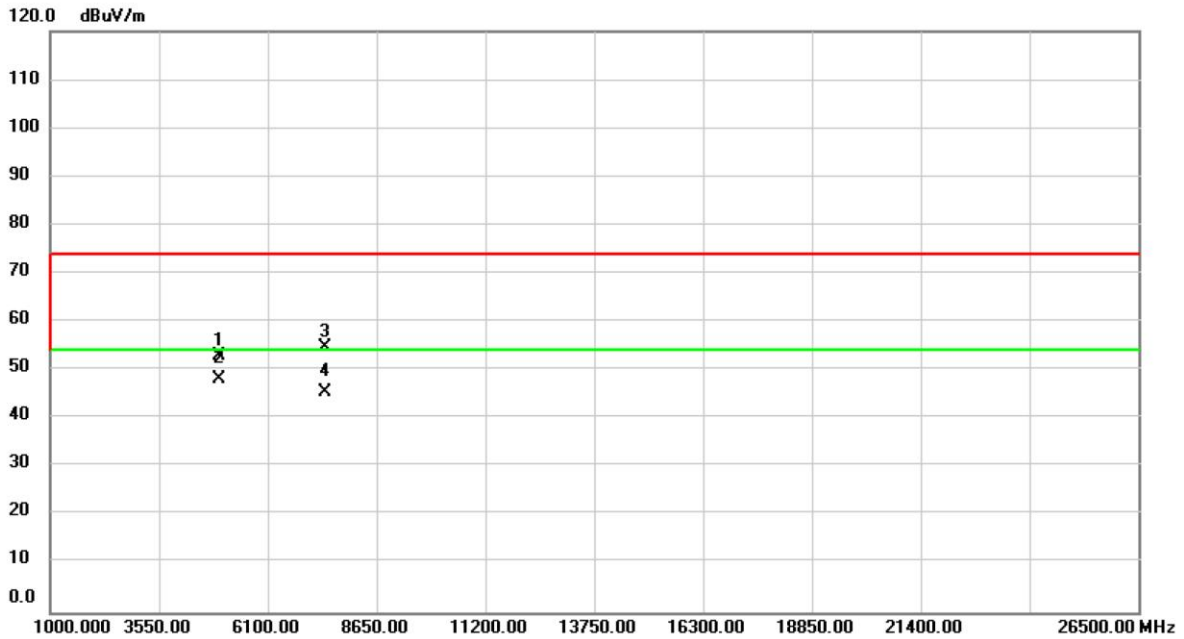
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4958.000	63.96	-11.17	52.79	74.00	-21.21	peak	
2	*	4958.000	58.64	-11.17	47.47	54.00	-6.53	AVG	
3		7437.000	60.03	-4.69	55.34	74.00	-18.66	peak	
4		7437.000	49.72	-4.69	45.03	54.00	-8.97	AVG	

Test Mode Mode 1\_2479 MHz Polarization Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2479.000	61.96	31.39	93.35	74.00	19.35	peak	No Limit
2	*	2479.000	61.26	31.39	92.65	54.00	38.65	AVG	No Limit
3		2483.623	37.27	31.41	68.68	74.00	-5.32	peak	
4		2483.623	15.32	31.41	46.73	54.00	-7.27	AVG	

Test Mode	Mode 1_2479 MHz	Polarization	Horizontal
-----------	-----------------	--------------	------------

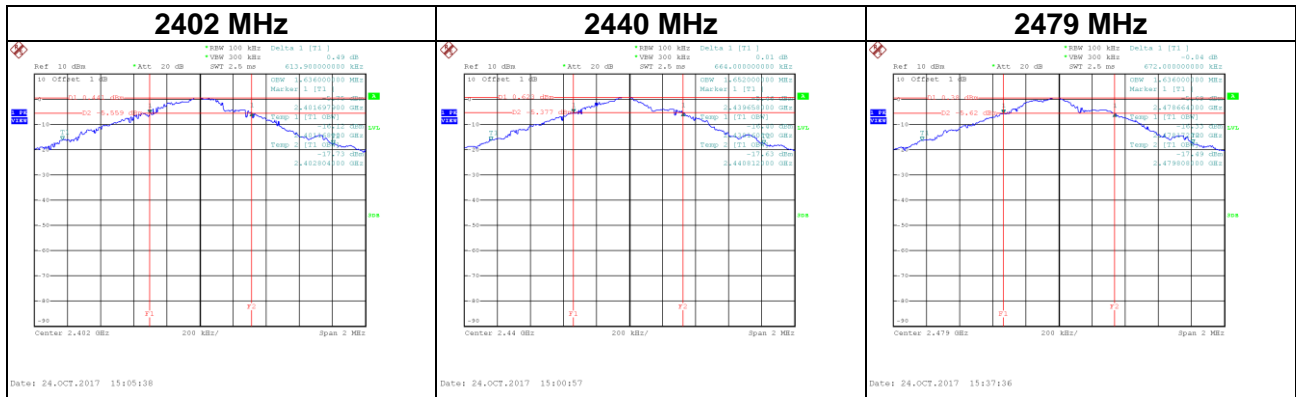


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4958.000	64.18	-11.17	53.01	74.00	-20.99	peak	
2	*	4958.000	59.36	-11.17	48.19	54.00	-5.81	AVG	
3		7437.000	59.50	-4.69	54.81	74.00	-19.19	peak	
4		7437.000	50.25	-4.69	45.56	54.00	-8.44	AVG	

## APPENDIX D 6 DB BANDWIDTH

CONTINUE ON NEXT PAGE

Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied BW (MHz)	6 dB BW Min. Limit (kHz)	Result
2402	0.61	1.64	500	Complies
2440	0.66	1.65	500	Complies
2479	0.67	1.64	500	Complies





## APPENDIX E PEAK OUTPUT POWER

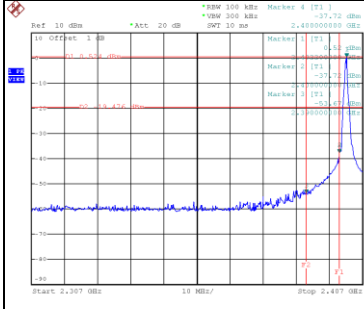
CONTINUE ON NEXT PAGE

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2402	0.78	0.0012	30.00	1.0000	Complies
2440	0.90	0.0012	30.00	1.0000	Complies
2479	0.81	0.0012	30.00	1.0000	Complies

## APPENDIX F ANTENNA CONDUCTED SPURIOUS EMISSIONS

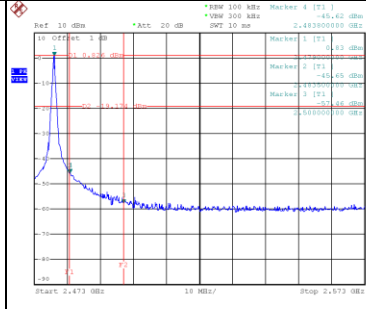
CONTINUE ON NEXT PAGE

**Bandedge-2402 MHz**

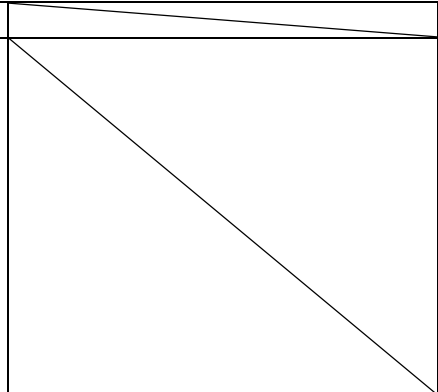


Date: 24.OCT.2017 15:06:22

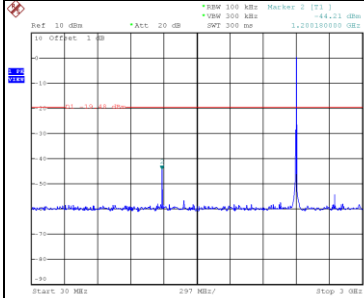
**Bandedge-2479 MHz**



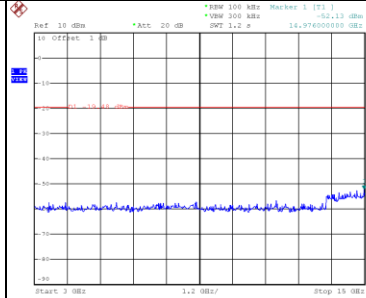
Date: 24.OCT.2017 15:10:35



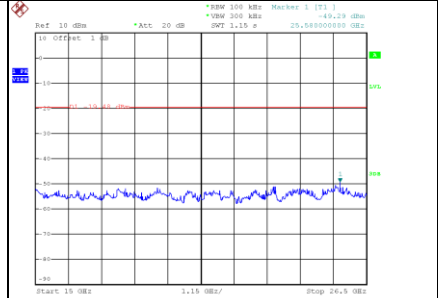
**2402 MHz – 10 Harmonics**



Date: 24.OCT.2017 15:06:55

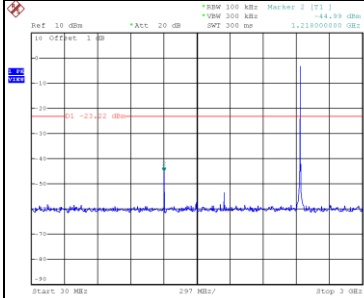


Date: 24.OCT.2017 15:07:02

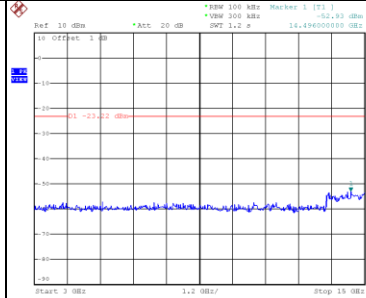


Date: 24.OCT.2017 15:07:08

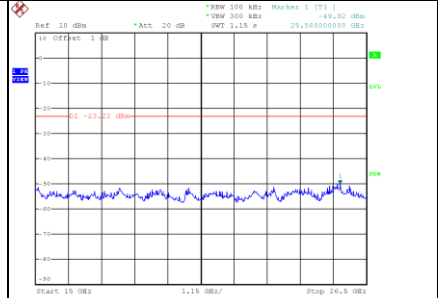
**2440 MHz – 10 Harmonics**



Date: 24.OCT.2017 15:01:12

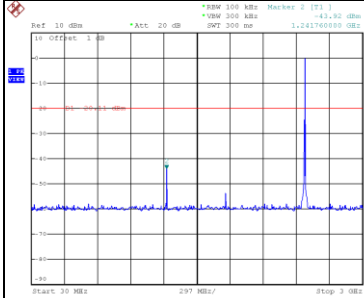


Date: 24.OCT.2017 15:01:19

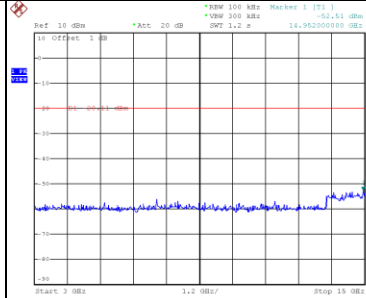


Date: 24.OCT.2017 15:01:26

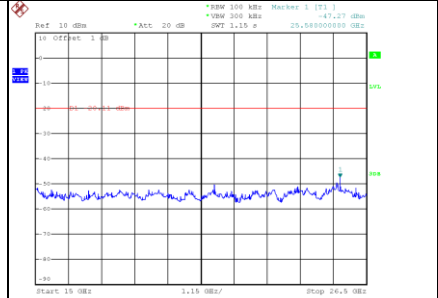
**2479 MHz – 10 Harmonics**



Date: 24.OCT.2017 15:19:54



Date: 24.OCT.2017 15:20:01



Date: 24.OCT.2017 15:20:08

## APPENDIX G POWER SPECTRAL DENSITY

CONTINUE ON NEXT PAGE

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
2402	-11.44	8	Complies
2440	-11.14	8	Complies
2479	-12.29	8	Complies

