

FCC Radio Test Report


FCC ID: H4IKBWK118

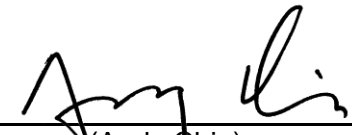
This report concerns: Original Grant

Project No. : 1711195
Equipment : Wireless Keyboard
Test Model : WK118
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 : Nov. 29, 2017
Date of Test : Nov. 29, 2017 ~ Dec. 12, 2017
Issued Date : Dec. 15, 2017
Tested by : BTL Inc.

Testing Engineer : 
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Technical Manager : 
(James Chiu)

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REPORT ISSUED HISTORY

Issue No.	Description	Issued Date
BTL-FCCP-1-1711195	Original Issue.	Dec. 15, 2017

1 CERTIFICATION

Equipment : Wireless Keyboard
Brand Name : DELL
Test Model : WK118
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 : Nov. 29, 2017 ~ Dec. 12, 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-1-1711195) 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

D. Conducted tests:

Item	Method	U
Bandwidth	ANSI	3.8 %
Output Power	ANSI	0.95 dB
Power Spectral Density	ANSI	0.86 dB
Conducted Spurious Emissions	ANSI	2.71 dB

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 Keyboard		
Brand Name	DELL		
Test Model	WK118		
Series Model	N/A		
Model Difference	N/A		
Power Source	Supplied from 2*AAA battery		
Power Rating	3 V _{DC} 30 mA		
Product Specification	Operation Frequency	2405 MHz to 2474 MHz	
	Modulation Type	GFSK	
	Bit Rate of Transmitter	2 Mbps	
	Maximum Output Power	-0.56 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)
1	2405	5	2430	9	2458
2	2407	6	2437	10	2469
3	2418	7	2442	11	2471
4	2426	8	2447	12	2474

(3) Table for Filed Antenna:

Ant.	Brand	Model	Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	-3.27

3.2 TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based 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

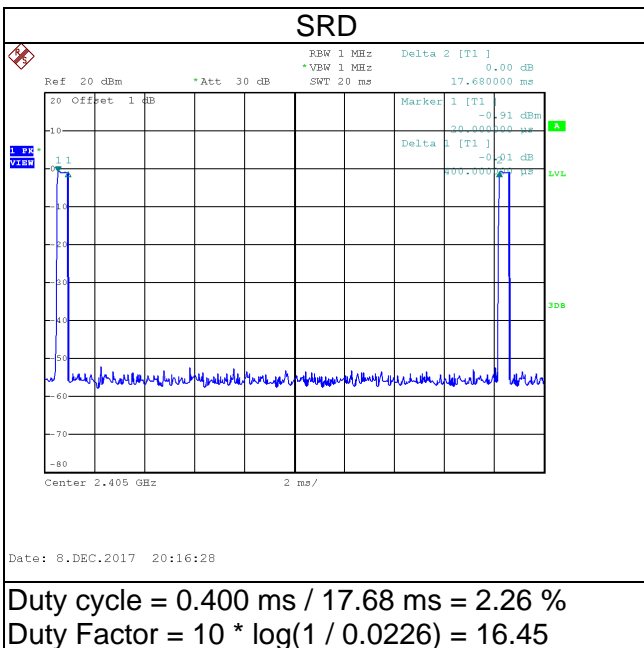
Conducted Test	
Test Mode	Description
1	Transmitting

NOTE:

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

3.3 DUTY CYCLE

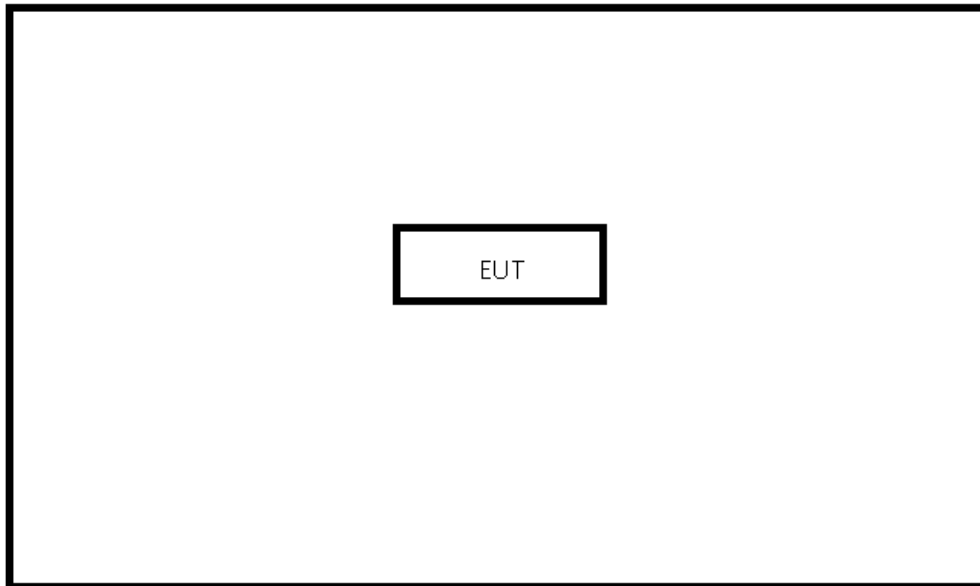
If duty cycle is $\geq 98\%$, duty factor is not required.
 If duty cycle is $< 98\%$, duty factor shall be considered.



Note:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 kHz (Duty cycle $< 98\%$).

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 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
-	-	-	-	-

3.6 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	Liteon EMI Test Tool V 1.0.1		
Frequency (MHz)	2405	2442	2474
Parameter	0	0	0

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

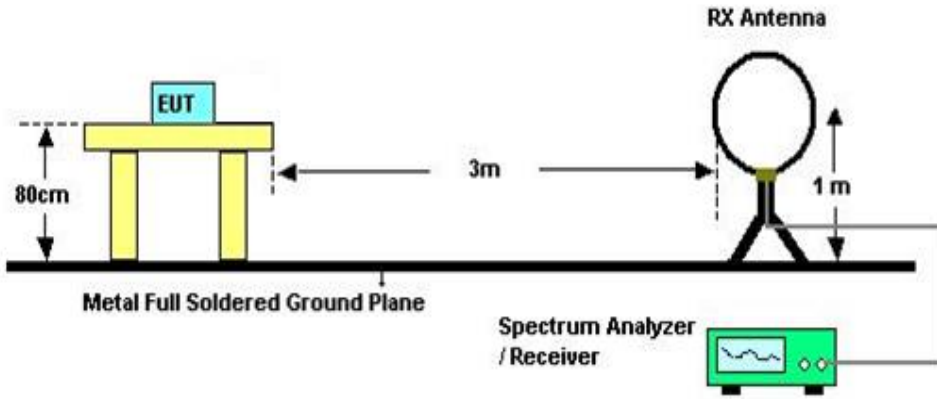
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance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

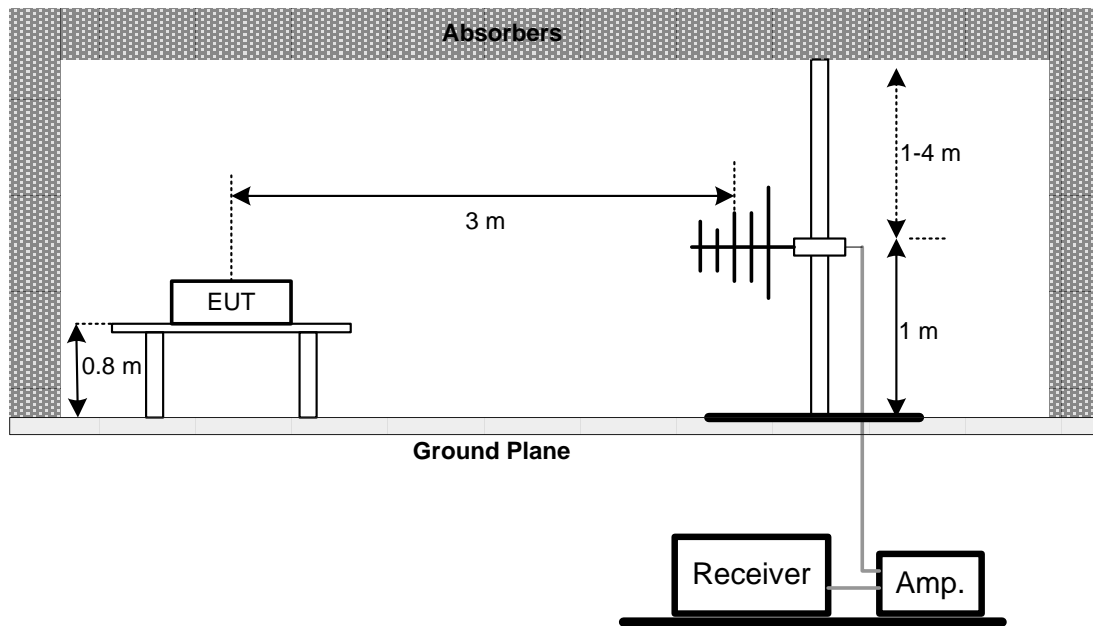
No deviation.

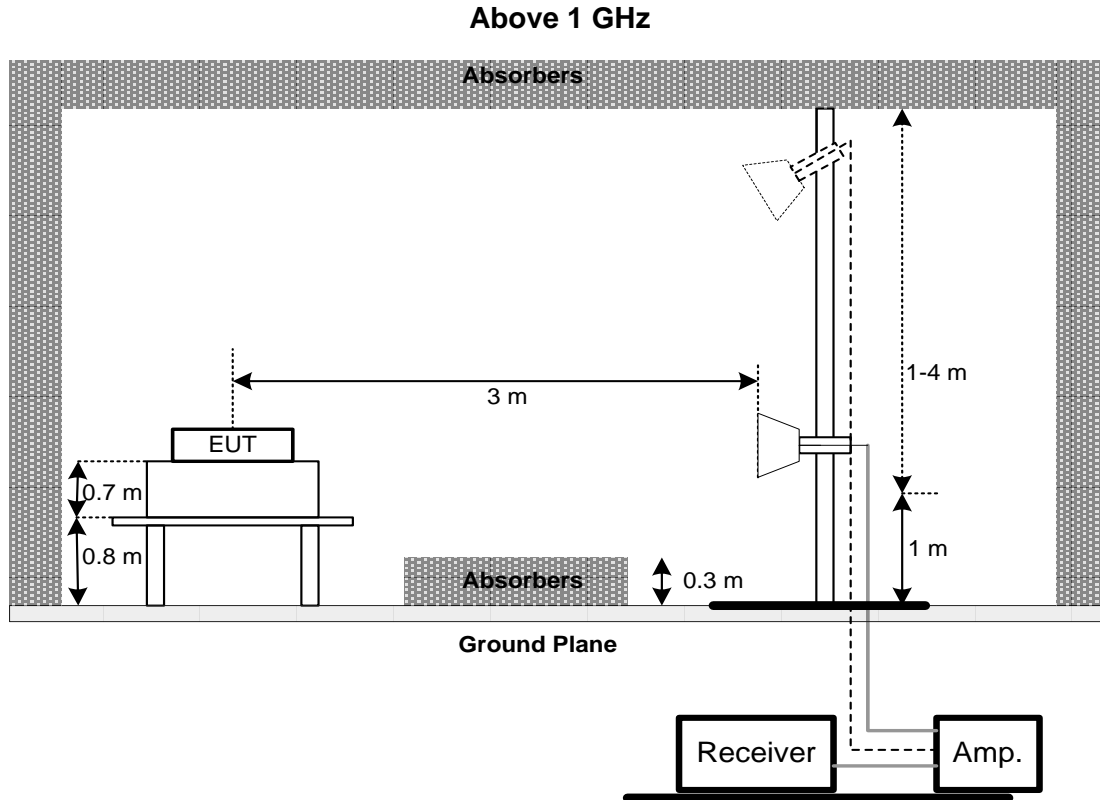
4.4 TEST SETUP

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 3 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: 23 °C Relative Humidity: 70 % Test Voltage: DC 3 V

Please refer to the APPENDIX B.

4.8 TEST RESULT – ABOVE 1000 MHZ

Temperature: 23 °C Relative Humidity: 70 % Test Voltage: DC 3 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

- 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=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. 23, 2018
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	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 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

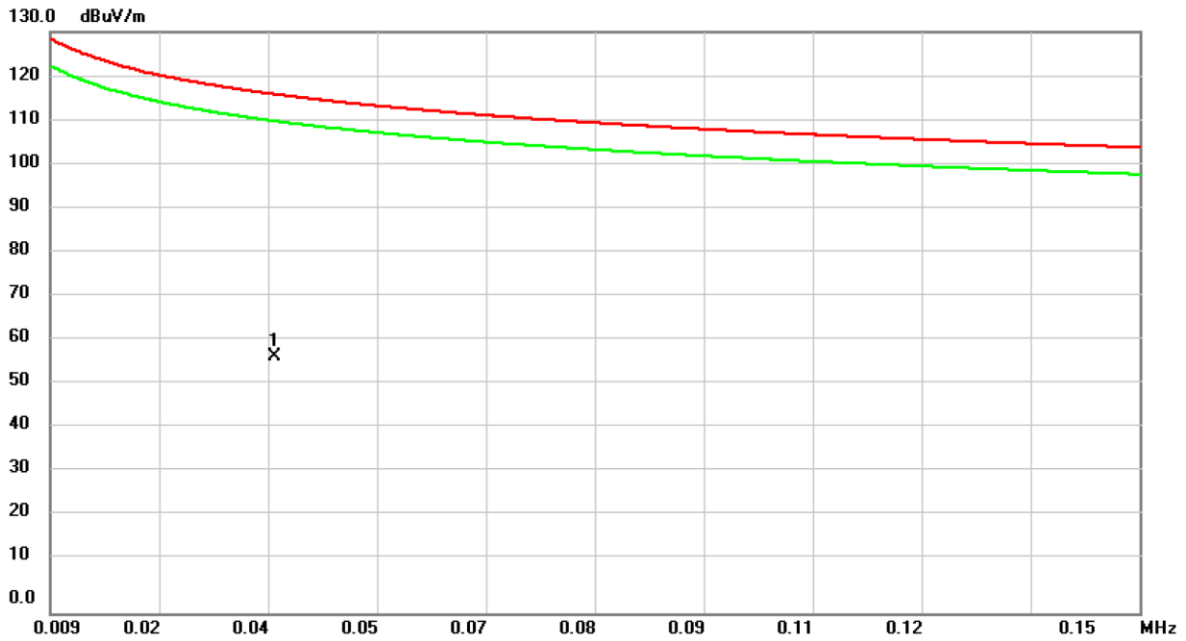
Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

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

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

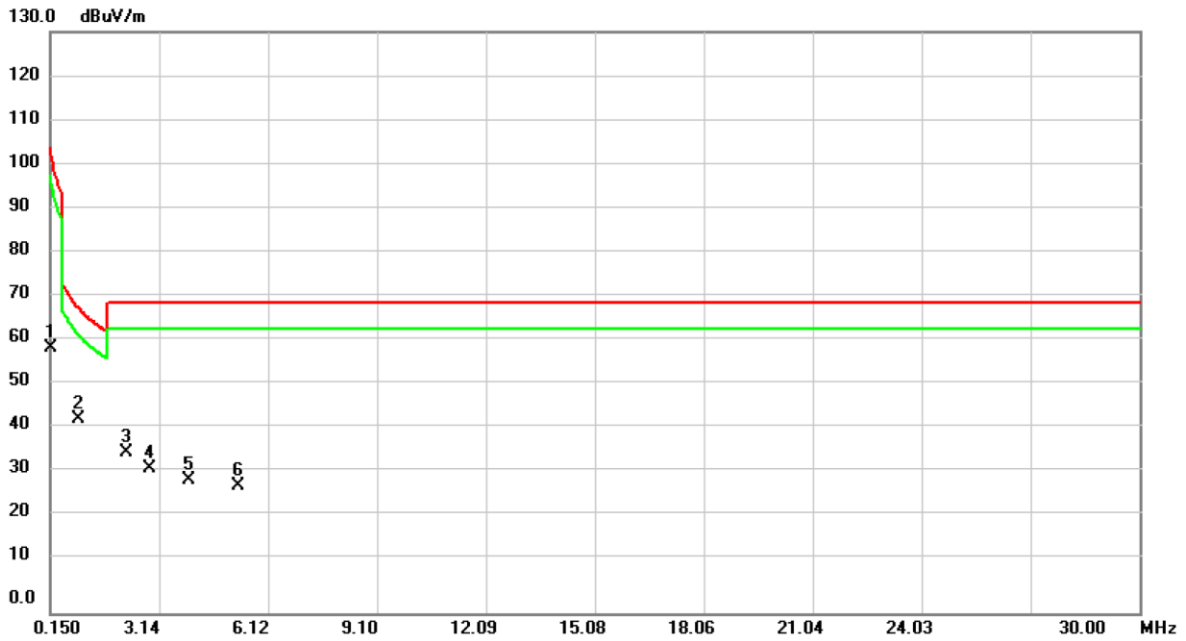
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Test Mode	Mode 1_90	Polarization	Vertical
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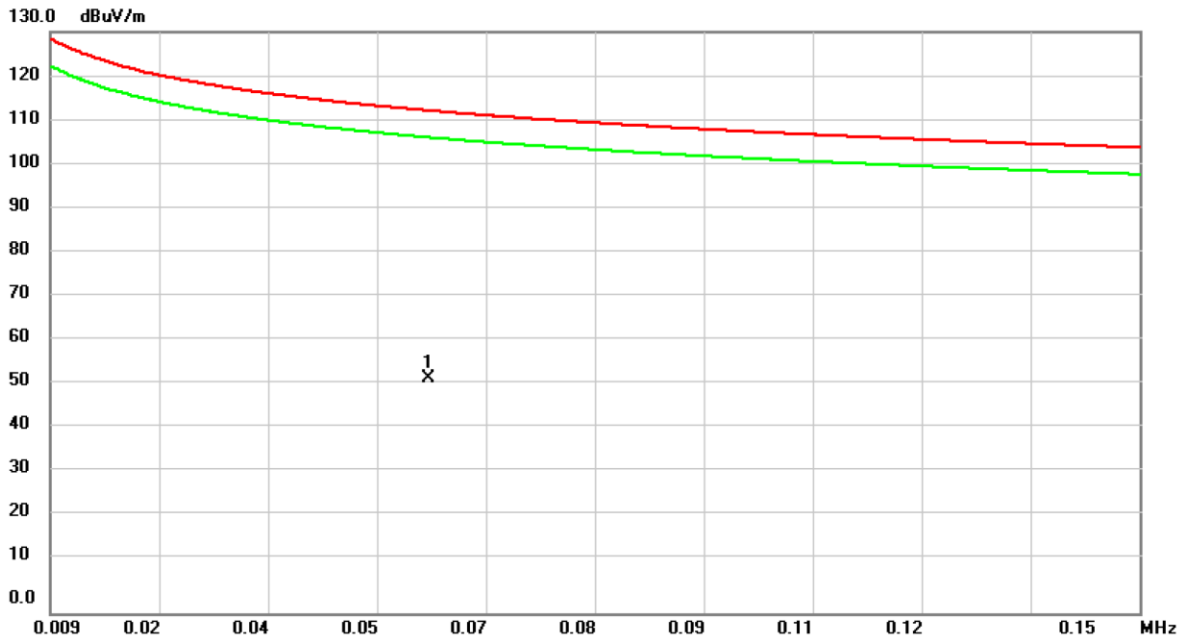
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.0380	43.20	14.20	57.40	116.01	-58.61	peak	

Test Mode	Mode 1_90	Polarization	Vertical
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		0.1500	47.16	12.03	59.19	104.08	-44.89	peak	
2	*	0.9261	31.48	11.97	43.45	68.27	-24.82	peak	
3		2.2395	24.62	11.44	36.06	69.54	-33.48	peak	
4		2.8664	21.25	11.16	32.41	69.54	-37.13	peak	
5		3.9410	18.34	11.24	29.58	69.54	-39.96	peak	
6		5.2842	16.97	11.39	28.36	69.54	-41.18	peak	

Test Mode	Mode 1_0	Polarization	Horizontal
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.0580	39.60	12.86	52.46	112.34	-59.88	peak	

Test Mode	Mode 1_0	Polarization	Horizontal
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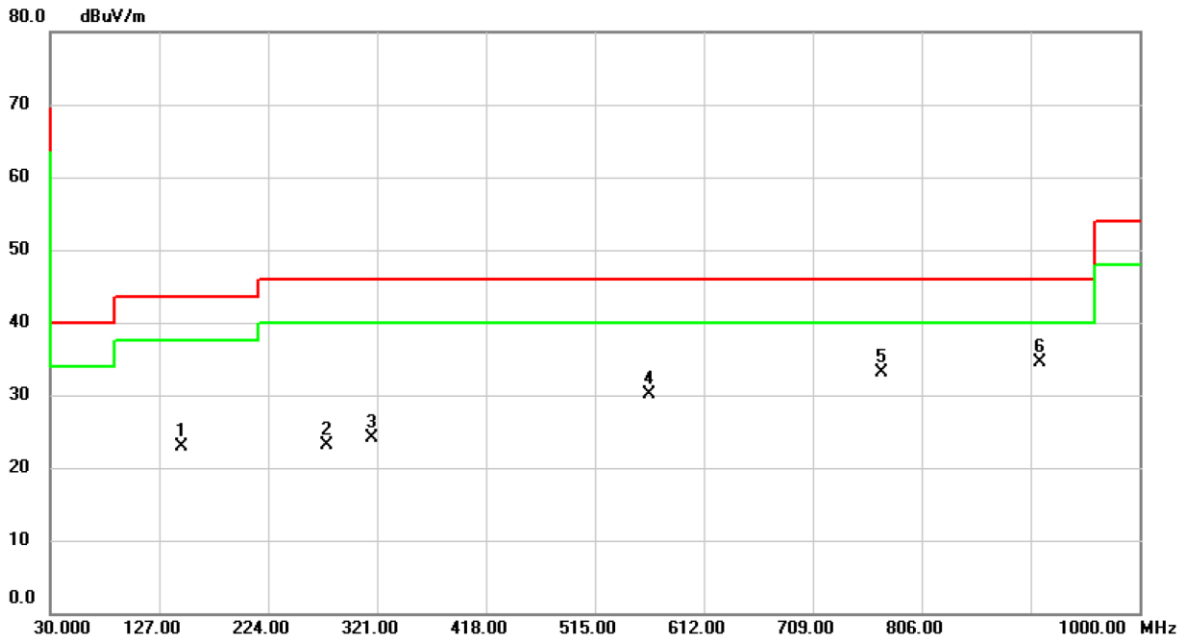


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		0.1500	47.93	12.03	59.96	104.08	-44.12	peak	
2	*	0.8660	30.84	11.95	42.79	68.85	-26.06	peak	
3		2.2096	22.66	11.46	34.12	69.54	-35.42	peak	
4		4.3290	18.38	11.30	29.68	69.54	-39.86	peak	
5		9.2543	12.76	11.31	24.07	69.54	-45.47	peak	
6		11.7911	12.65	11.25	23.90	69.54	-45.64	peak	

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

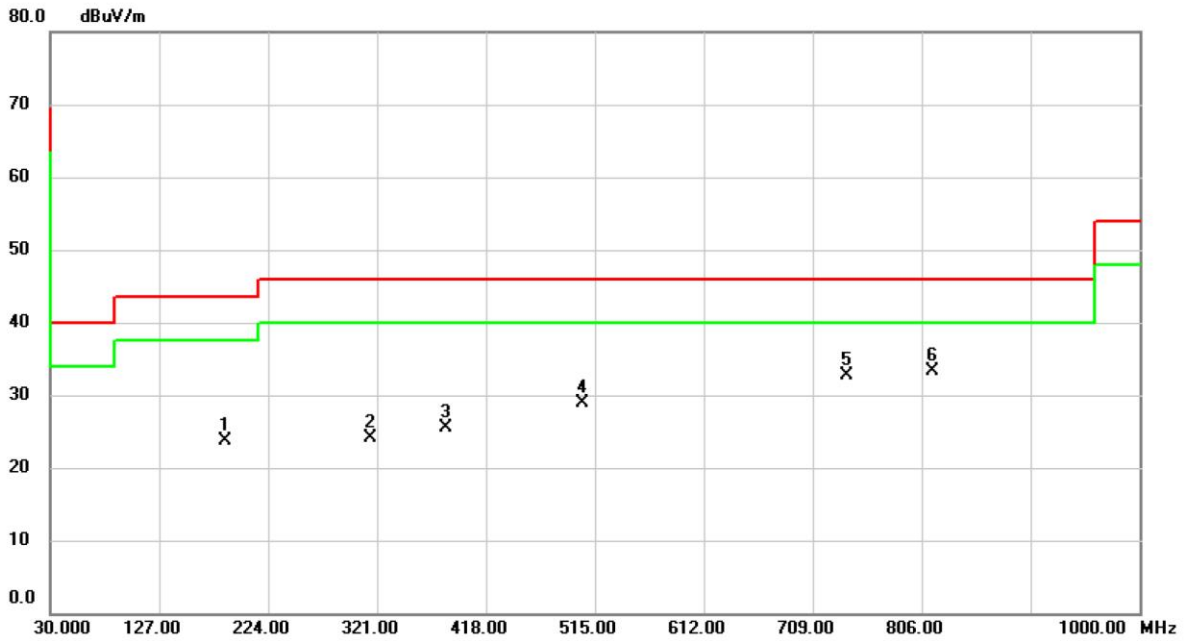
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Test Mode	Mode 1_2474 MHz	Polarization	Vertical
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		146.4000	31.85	-9.04	22.81	43.50	-20.69	peak	
2		276.3800	31.23	-8.18	23.05	46.00	-22.95	peak	
3		316.1500	31.27	-7.09	24.18	46.00	-21.82	peak	
4		563.5000	31.38	-1.37	30.01	46.00	-15.99	peak	
5		770.1100	31.02	2.18	33.20	46.00	-12.80	peak	
6	*	911.7300	30.14	4.30	34.44	46.00	-11.56	peak	

Test Mode	Mode 1_2474 MHz	Polarization	Horizontal
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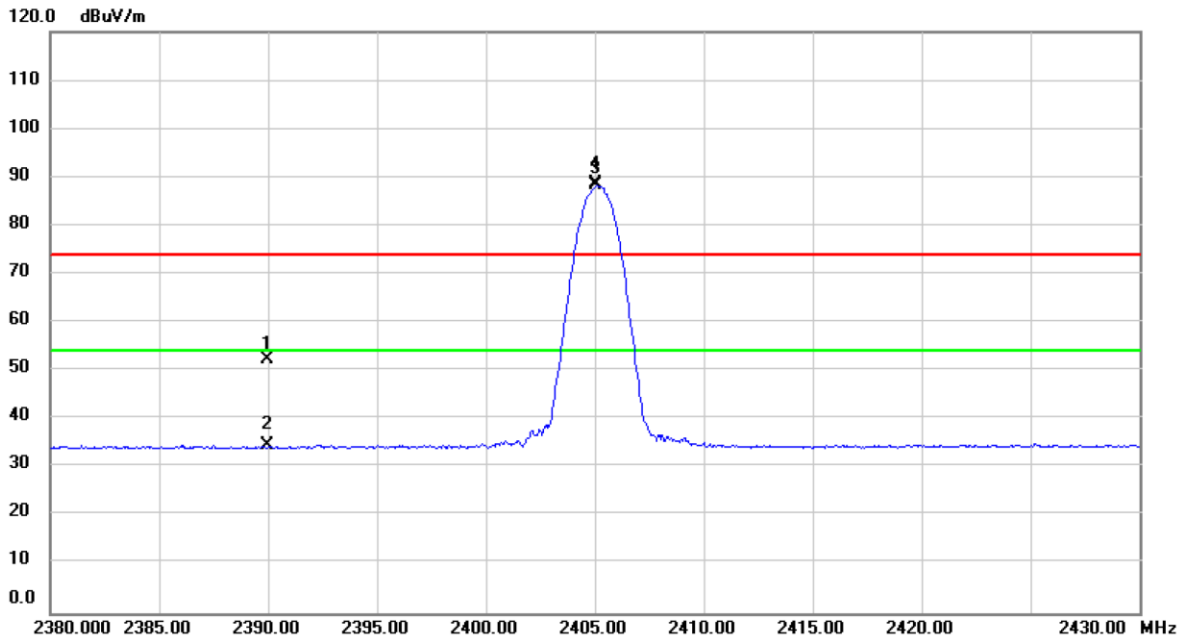


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		186.1700	33.72	-10.06	23.66	43.50	-19.84	peak	
2		315.1800	31.27	-7.11	24.16	46.00	-21.84	peak	
3		382.1100	30.92	-5.40	25.52	46.00	-20.48	peak	
4		504.3300	31.50	-2.64	28.86	46.00	-17.14	peak	
5		739.0700	31.01	1.67	32.68	46.00	-13.32	peak	
6	*	815.7000	30.50	2.81	33.31	46.00	-12.69	peak	

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

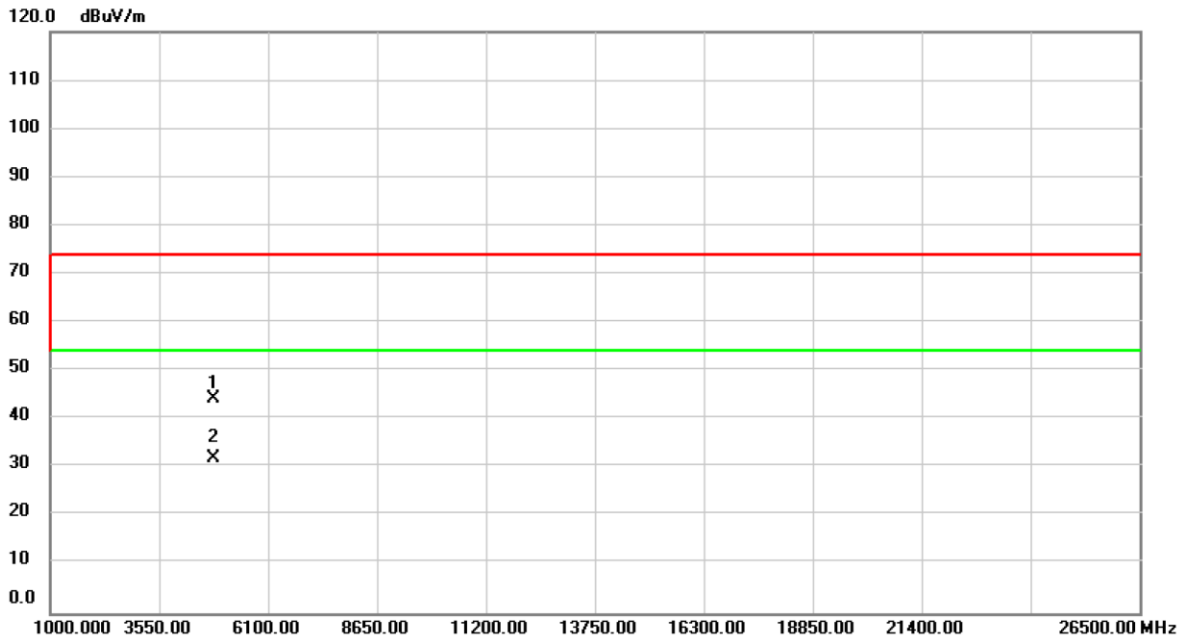
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Test Mode	Mode 1_2405 MHz	Polarization	Vertical
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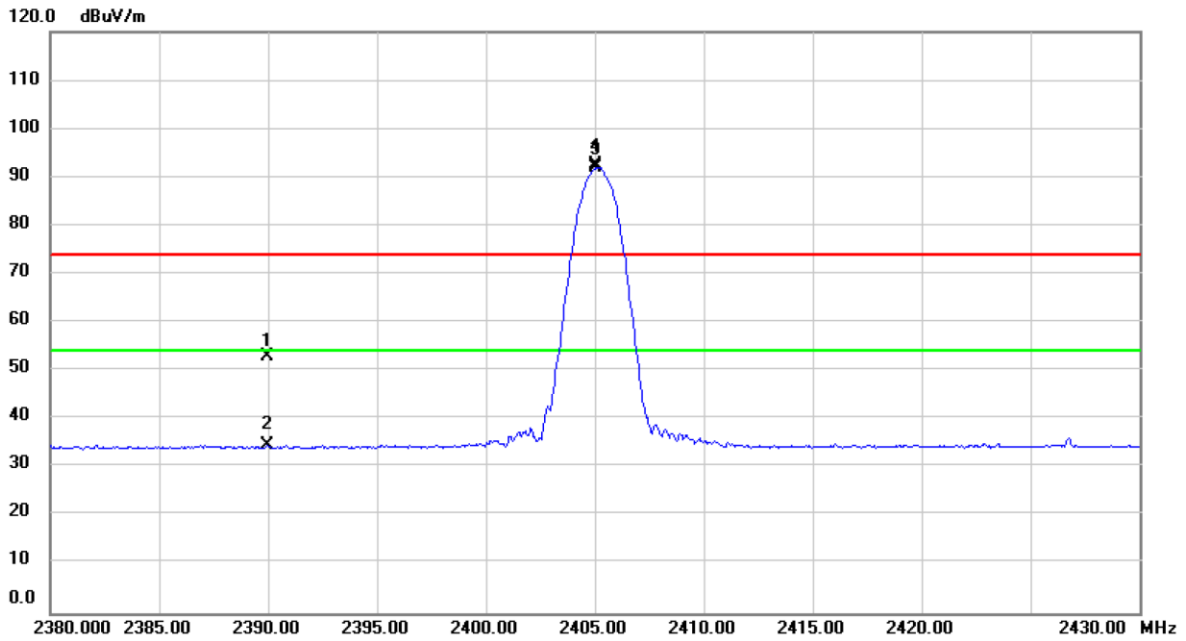
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2389.950	21.43	31.06	52.49	74.00	-21.51	peak	
2		2389.950	3.49	31.06	34.55	54.00	-19.45	AVG	
3	X	2405.000	57.61	31.12	88.73	74.00	14.73	peak	No Limit
4	*	2405.000	57.10	31.12	88.22	54.00	34.22	AVG	No Limit

Test Mode	Mode 1_2405 MHz	Polarization	Vertical
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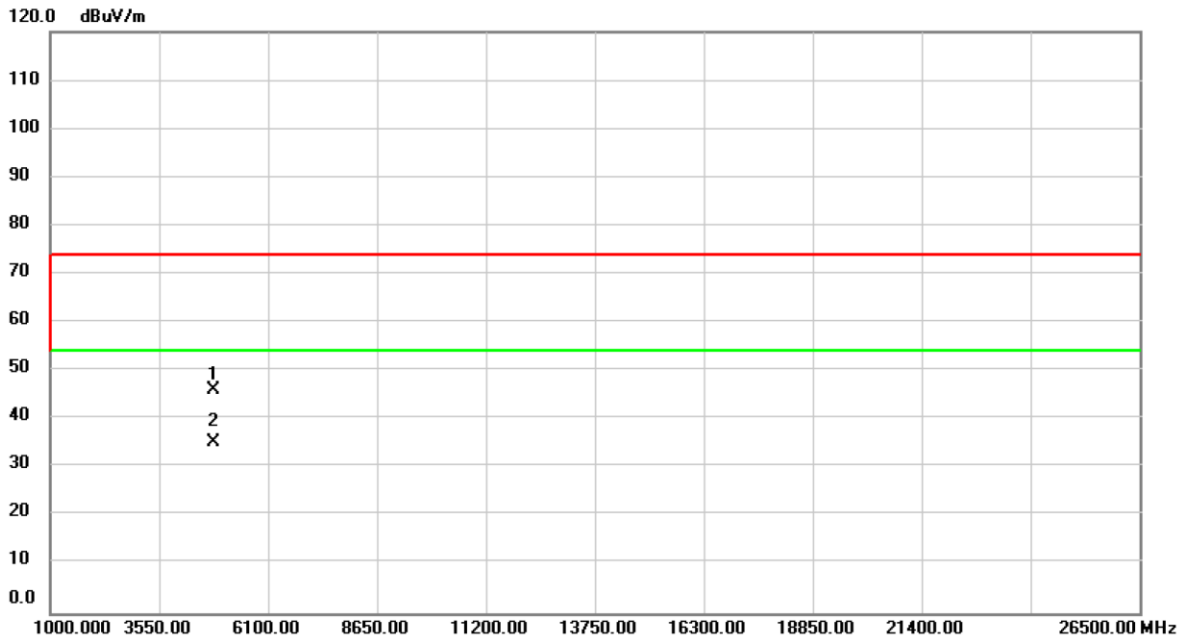
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4810.000	55.51	-11.39	44.12	74.00	-29.88	peak	
2	*	4810.000	43.42	-11.39	32.03	54.00	-21.97	AVG	

Test Mode	Mode 1_2405 MHz	Polarization	Horizontal
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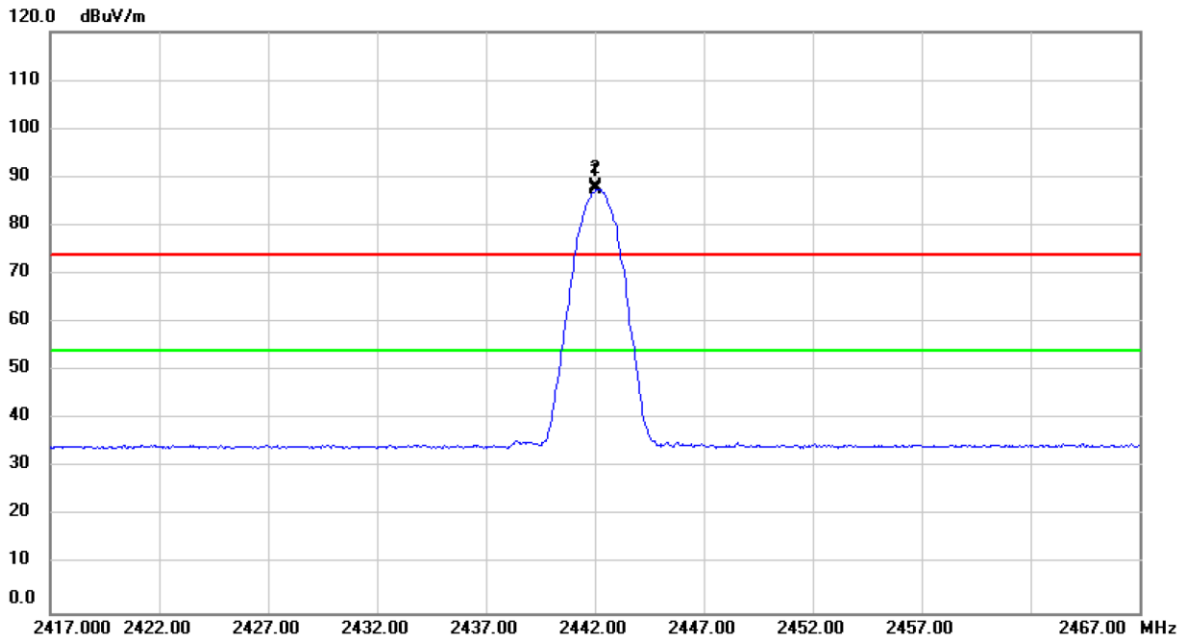
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2389.990	21.91	31.06	52.97	74.00	-21.03	peak	
2		2389.990	3.56	31.06	34.62	54.00	-19.38	AVG	
3	X	2405.000	61.29	31.12	92.41	74.00	18.41	peak	No Limit
4	*	2405.000	60.86	31.12	91.98	54.00	37.98	AVG	No Limit

Test Mode	Mode 1_2405 MHz	Polarization	Horizontal
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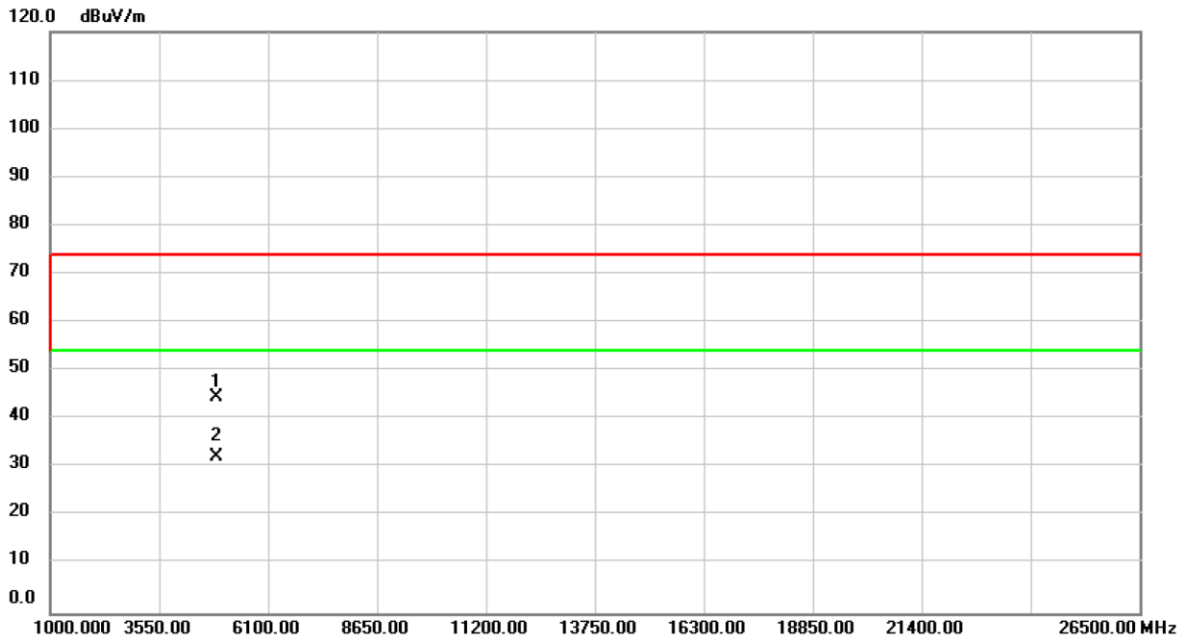
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4810.000	57.50	-11.39	46.11	74.00	-27.89	peak	
2	*	4810.000	46.73	-11.39	35.34	54.00	-18.66	AVG	

Test Mode	Mode 1_2442 MHz	Polarization	Vertical
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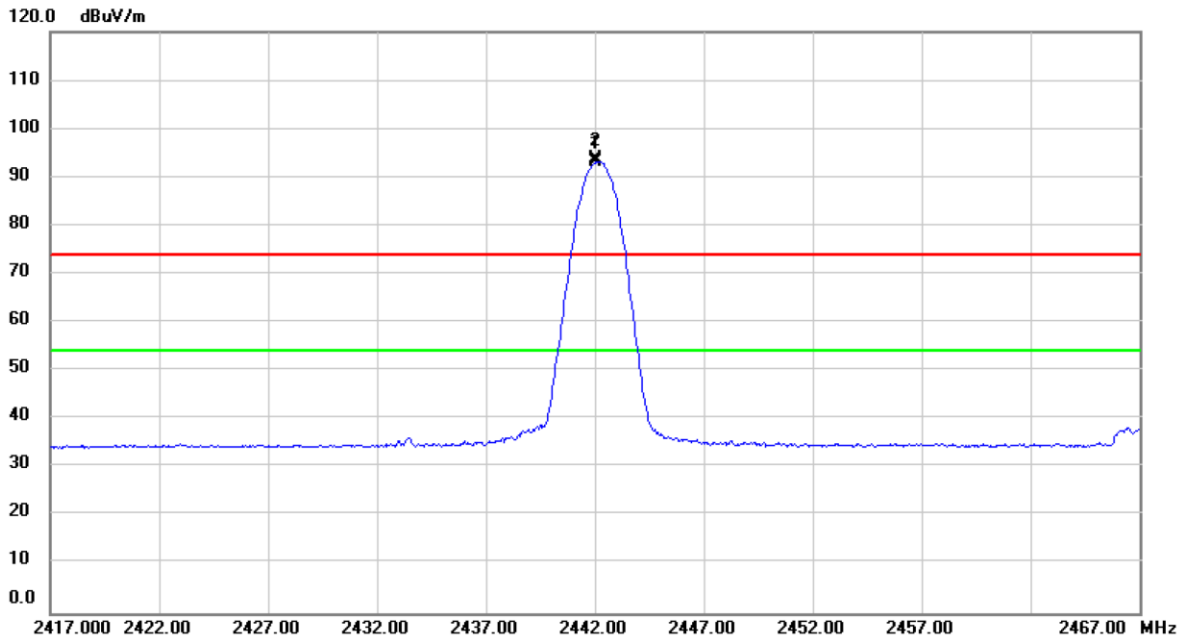
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2442.000	56.85	31.26	88.11	74.00	14.11	peak	No Limit
2	*	2442.000	56.16	31.26	87.42	54.00	33.42	AVG	No Limit

Test Mode	Mode 1_2442 MHz	Polarization	Vertical
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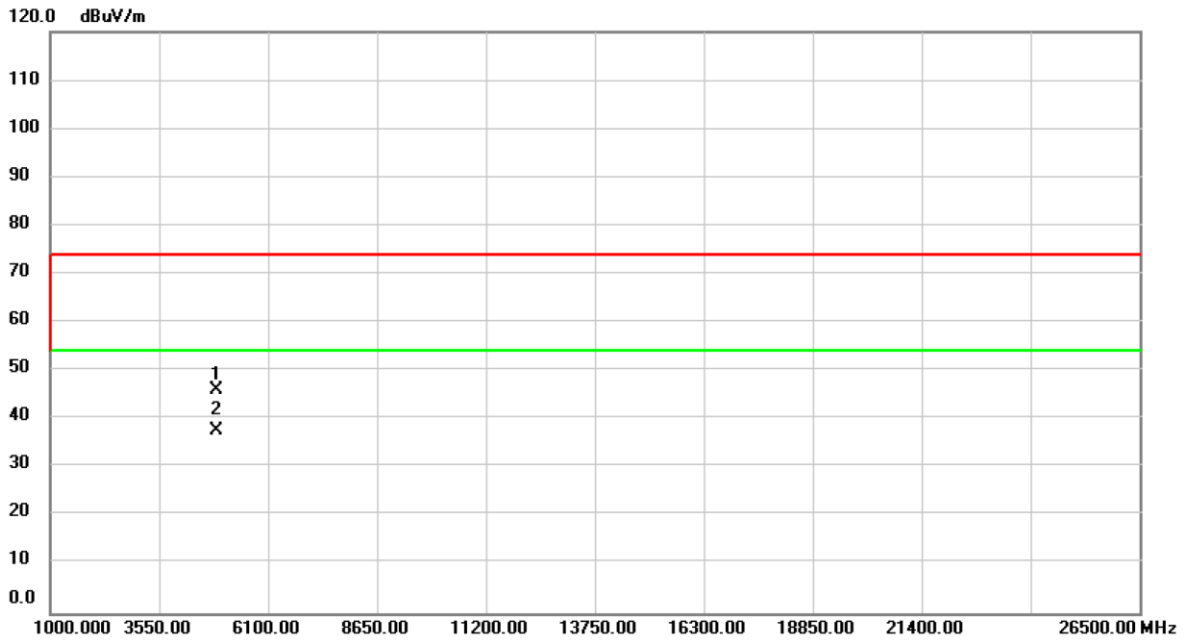
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4884.000	55.90	-11.28	44.62	74.00	-29.38	peak	
2	*	4884.000	43.44	-11.28	32.16	54.00	-21.84	AVG	

Test Mode	Mode 1_2442 MHz	Polarization	Horizontal
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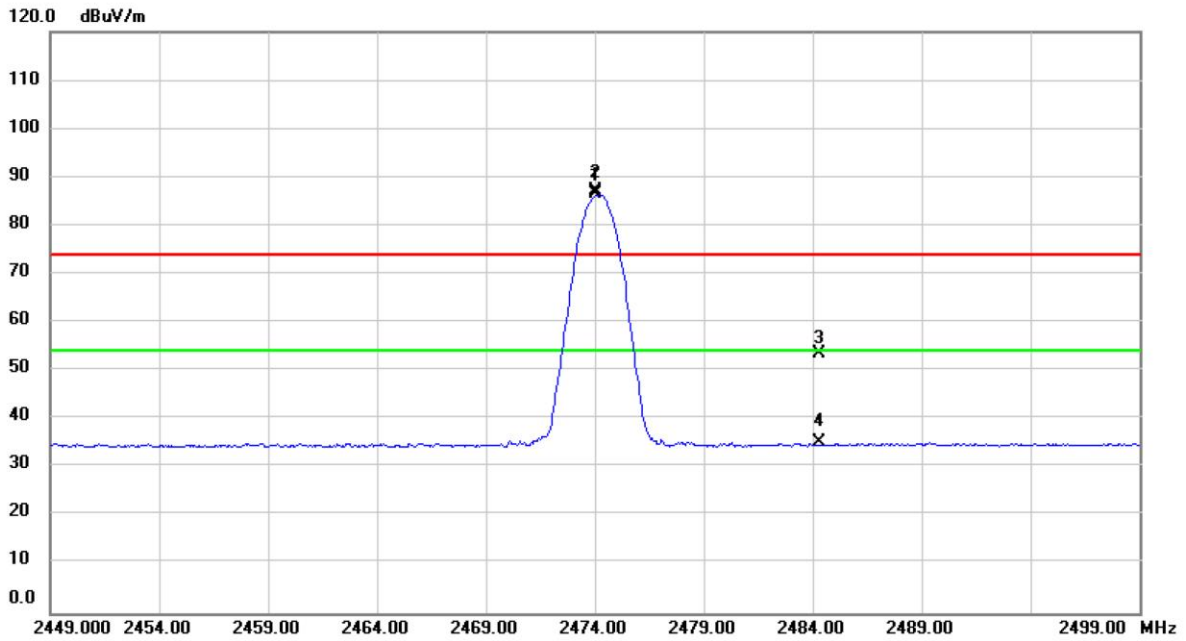
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2442.000	62.57	31.26	93.83	74.00	19.83	peak	No Limit
2	*	2442.000	61.94	31.26	93.20	54.00	39.20	AVG	No Limit

Test Mode	Mode 1_2442 MHz	Polarization	Horizontal
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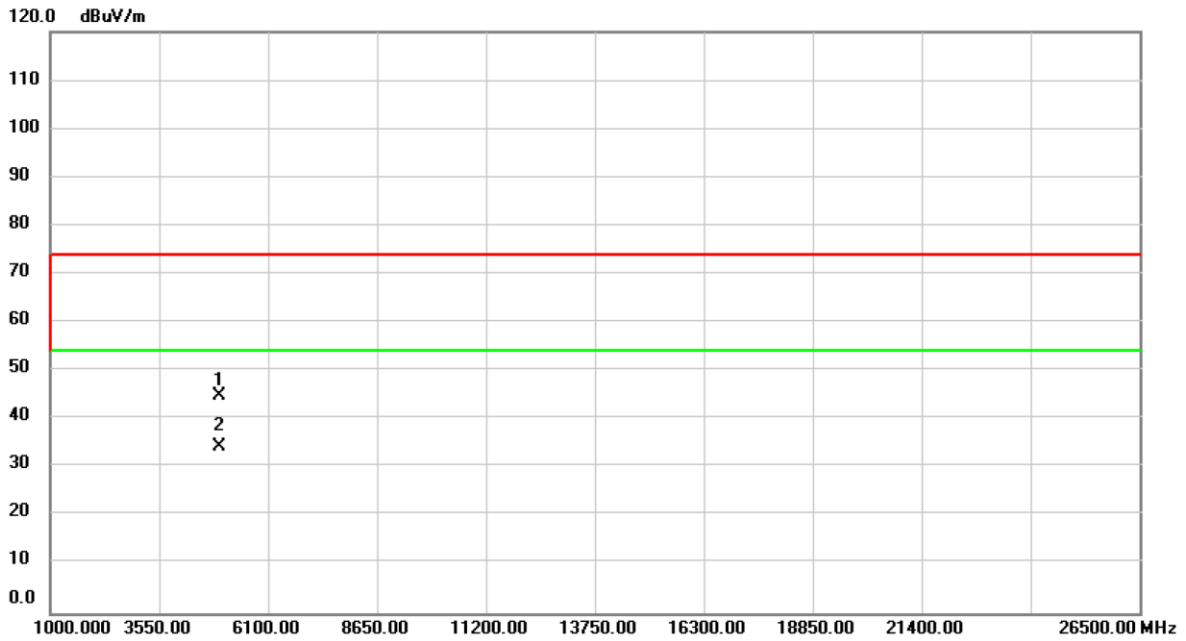
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4884.000	57.21	-11.28	45.93	74.00	-28.07	peak	
2	*	4884.000	49.01	-11.28	37.73	54.00	-16.27	AVG	

Test Mode	Mode 1_2474 MHz	Polarization	Vertical
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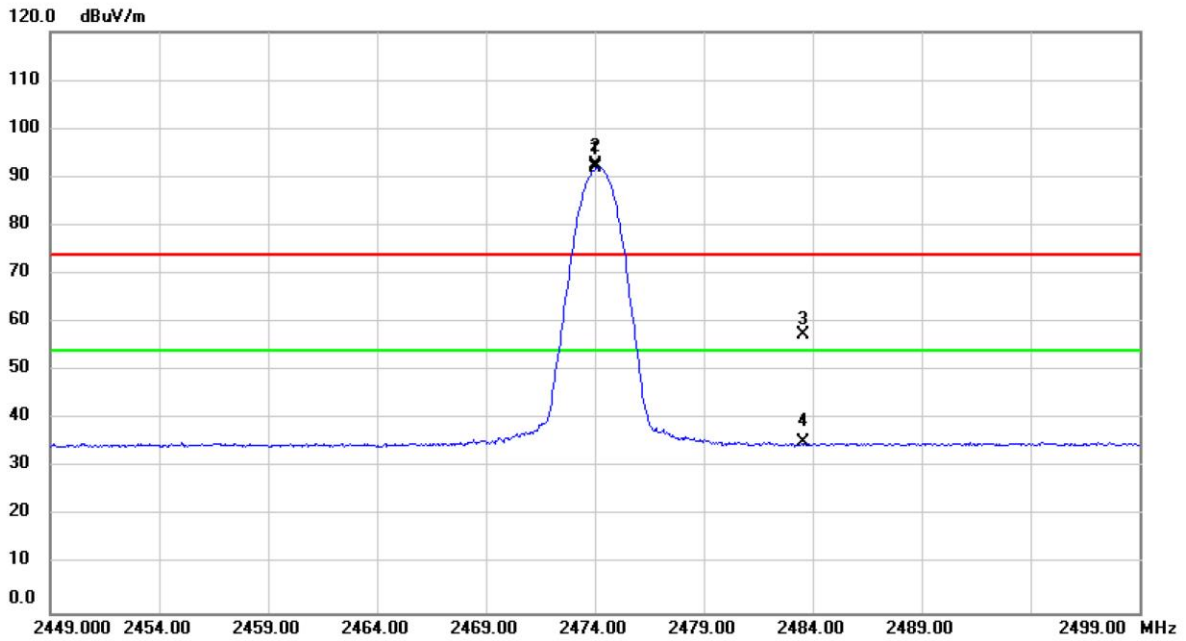
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2474.000	55.85	31.38	87.23	74.00	13.23	peak	No Limit
2	*	2474.000	55.04	31.38	86.42	54.00	32.42	AVG	No Limit
3		2484.291	22.12	31.42	53.54	74.00	-20.46	peak	
4		2484.291	3.72	31.42	35.14	54.00	-18.86	AVG	

Test Mode	Mode 1_2474 MHz	Polarization	Vertical
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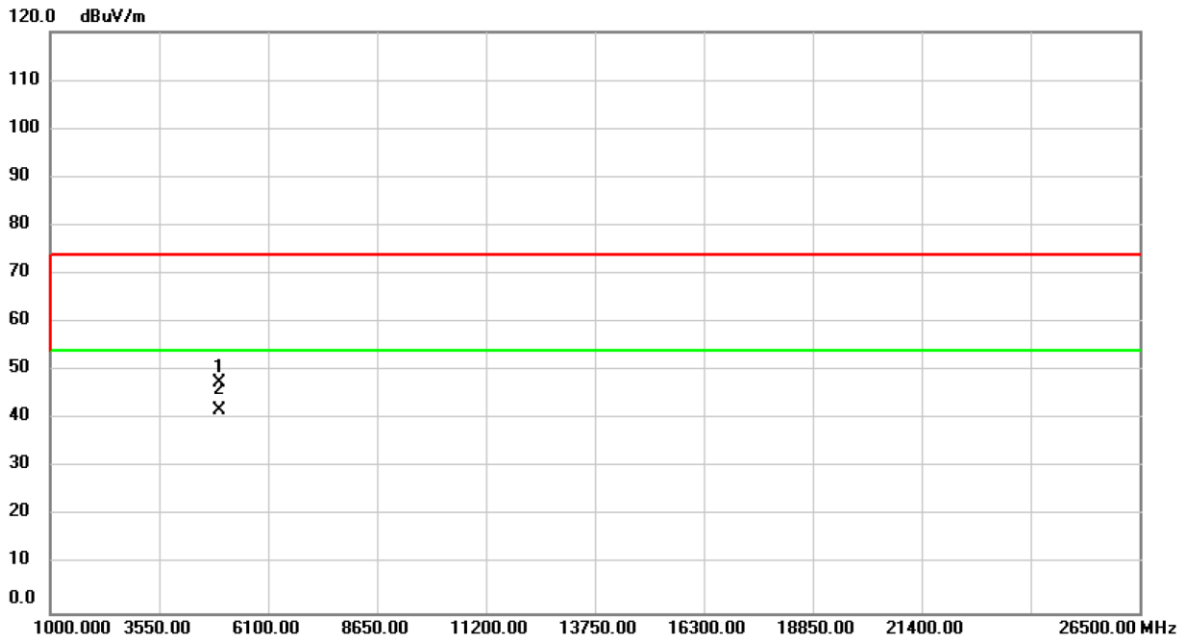
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4948.000	56.04	-11.17	44.87	74.00	-29.13	peak	
2	*	4948.000	45.48	-11.17	34.31	54.00	-19.69	AVG	

Test Mode	Mode 1_2474 MHz	Polarization	Horizontal
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	X	2474.000	61.18	31.38	92.56	74.00	18.56	peak	No Limit
2	*	2474.000	60.57	31.38	91.95	54.00	37.95	AVG	No Limit
3		2483.582	26.12	31.41	57.53	74.00	-16.47	peak	
4		2483.582	3.98	31.41	35.39	54.00	-18.61	AVG	

Test Mode	Mode 1_2474 MHz	Polarization	Horizontal
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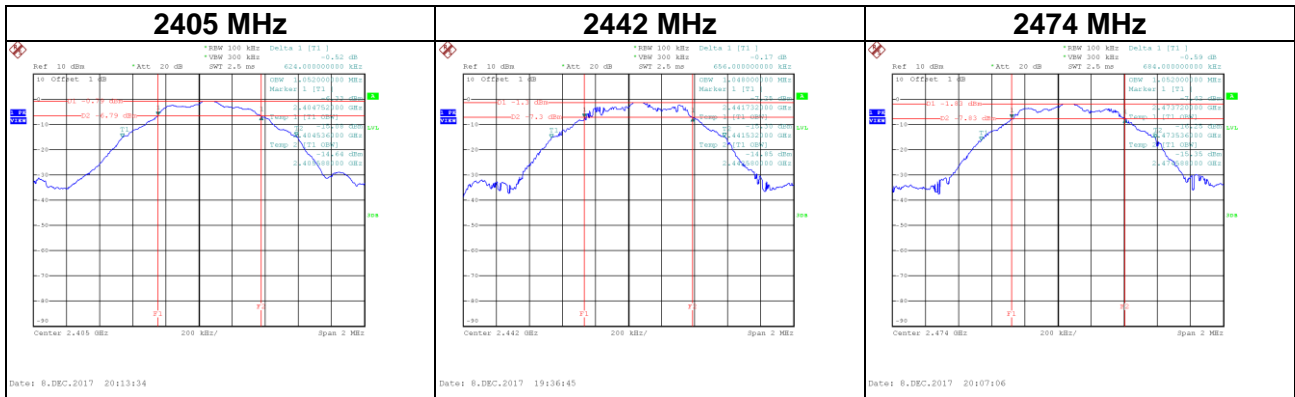


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4948.000	58.59	-11.17	47.42	74.00	-26.58	peak	
2	*	4948.000	53.05	-11.17	41.88	54.00	-12.12	AVG	

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
2405	0.624	1.052	500	Complies
2442	0.656	1.048	500	Complies
2474	0.684	1.052	500	Complies



APPENDIX E PEAK OUTPUT POWER

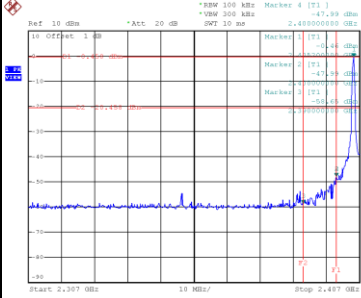
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Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2405	-0.56	0.0009	30.00	1.0000	Complies
2442	-0.90	0.0008	30.00	1.0000	Complies
2474	-1.23	0.0008	30.00	1.0000	Complies

APPENDIX F ANTENNA CONDUCTED SPURIOUS EMISSIONS

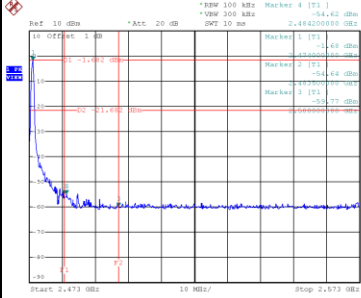
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Bandedge-2405 MHz

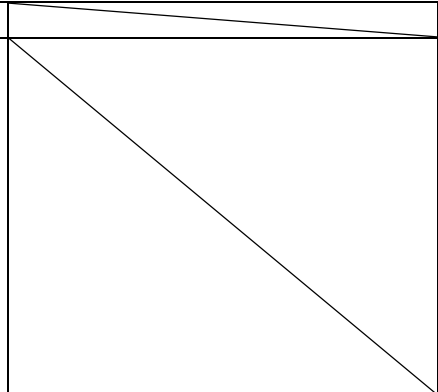


Date: 8.DEC.2017 19:22:10

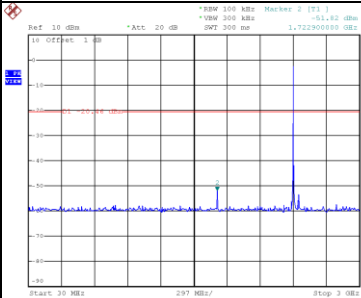
Bandedge-2474 MHz



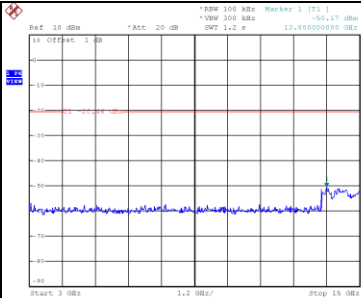
Date: 8.DEC.2017 19:52:00



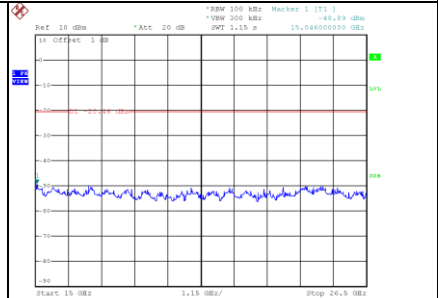
2405 MHz – 10 Harmonics



Date: 8.DEC.2017 19:24:48

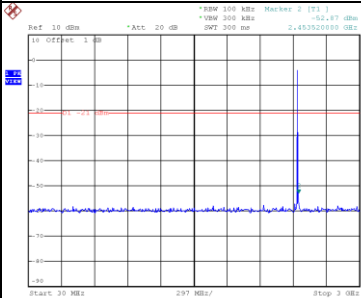


Date: 8.DEC.2017 19:24:55

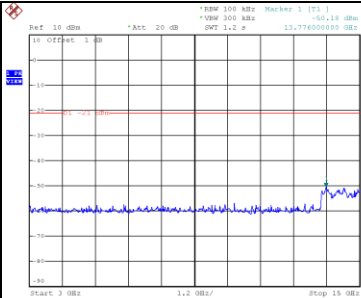


Date: 8.DEC.2017 19:25:02

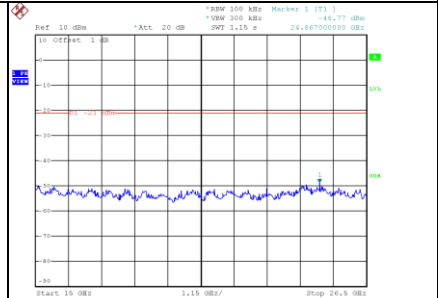
2442 MHz – 10 Harmonics



Date: 8.DEC.2017 19:41:59

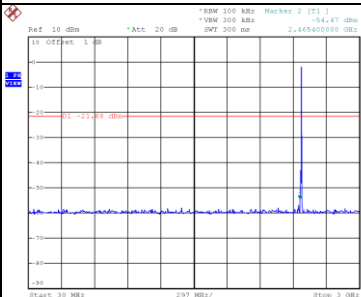


Date: 8.DEC.2017 19:42:06

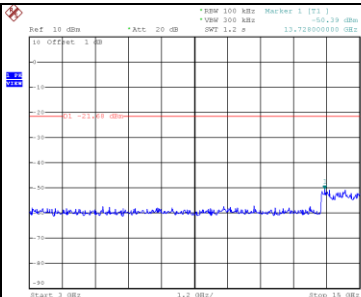


Date: 8.DEC.2017 19:42:13

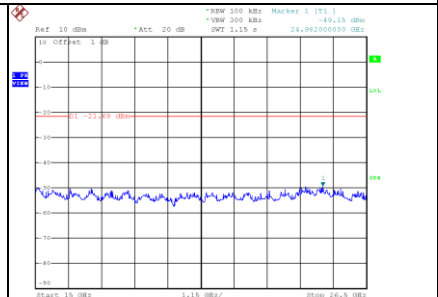
2474 MHz – 10 Harmonics



Date: 8.DEC.2017 19:54:23



Date: 8.DEC.2017 19:54:30



Date: 8.DEC.2017 19:55:07

APPENDIX G POWER SPECTRAL DENSITY

CONTINUE ON NEXT PAGE

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
2405	-9.37	8	Complies
2442	-10.35	8	Complies
2474	-9.85	8	Complies

