

FCC Radio Test Report

FCC ID: H4IKB9069

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

Project No. : 1605169
Equipment : Wireless Keyboard
Test Model : WK117
Applicant : Lite-On Technology Corporation
Address : 16F, 392, Ruey Kuang Road, NeiHu, Taipei 11492,
Taiwan, R.O.C.

Date of Receipt : May 17, 2016
Date of Test : May 17, 2016 ~ May 26, 2016
Issued Date : May 31, 2016
Tested by : BTL Inc.

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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-1-1605169	Original Issue.	May 31, 2016

1. CERTIFICATION

Equipment : Wireless Keyboard
Brand Name : DELL
Test Model. : WK117
Applicant : Lite-On Technology Corporation
Date of Test : May 17, 2016 ~ May 26, 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-1-1605169) 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	N/A	NOTE(1)
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:

Radiated emission Test (Below 1 GHz):

CB11: (VCCI RN: R-4260; FCC RN:949005; FCC DN:TW1082; IC Assigned Code:20088)
No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test (Above 1 GHz):

CB11: (VCCI RN: G-868; FCC RN:949005; FCC DN:TW1082; IC Assigned Code:20088)
No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules for reference only.

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%**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

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

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U,(dB)
CB11 (3m)	CISPR	9kHz ~ 150kHz	4.00
		150kHz ~ 30MHz	4.00

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
CB11 (3m)	CISPR	30MHz ~ 200MHz	V	3.06
		30MHz ~ 200MHz	H	2.58
		200MHz ~ 1,000MHz	V	3.50
		200MHz ~ 1,000MHz	H	3.10

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
CB11 (3m)	CISPR	1GHz ~ 6GHz	V	4.14
		1GHz ~ 6GHz	H	4.14
		6GHz ~ 18GHz	V	5.34
		6GHz ~ 18GHz	H	5.34

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

It can be seen that our U_{lab} values are smaller than U_{CISPR} .

3. GENERAL INFORMATION

3.1 DESCRIPTION OF EUT

Product Name	Wireless Keyboard	
Brand	DELL	
Test Model	WK117	
Model Difference	N/A	
Product Description	Operation Frequency	2403-2480 MHz
	Modulation Technology	GFSK
	Bit Rate of Transmitter	1 Mbps
	Field Strength	66.65 dBuV/m (AVG Max) 98.62 dBuV/m (Peak Max)
Power Source	Supplied from 2*AAA battery	
EUT Power Rating	DC 3V 50mA	

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	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
26	2428	52	2454	78	2480

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Printed	N/A	-2.00	

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:

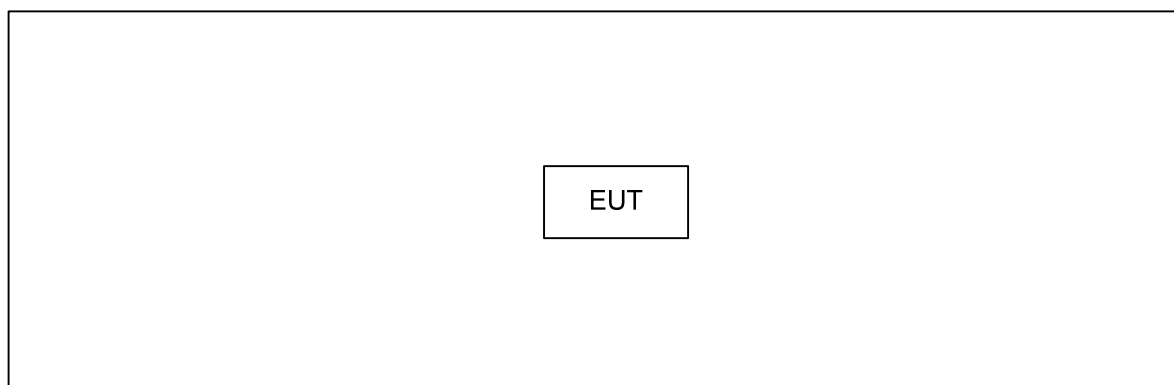
For Conducted Test	
Final Test Mode	Description
Mode 1	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode NOTE (1)

Note:

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

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



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.
-	-	-	-	-	-

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 (dBμV)	
	Quasi-peak	Average
0.15 -0.5	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

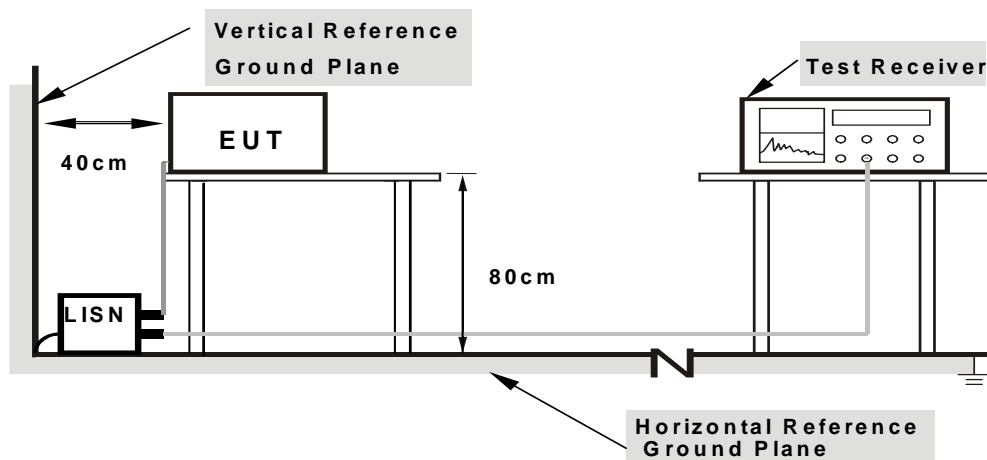
4.1.2 TEST PROCEDURE

- a. 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.
- b. 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.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. 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: N/A
Relative Humidity: N/A
Test Voltage: N/A

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 μ V/m (94 dB μ V/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 μ V/m (54 dB μ 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

DUTY CYCLE: TX 2403 MHz (1 Mbps)

Dwell time = ON/ON+OFF

ON: $0.100 \times 2 = 0.200$ msec

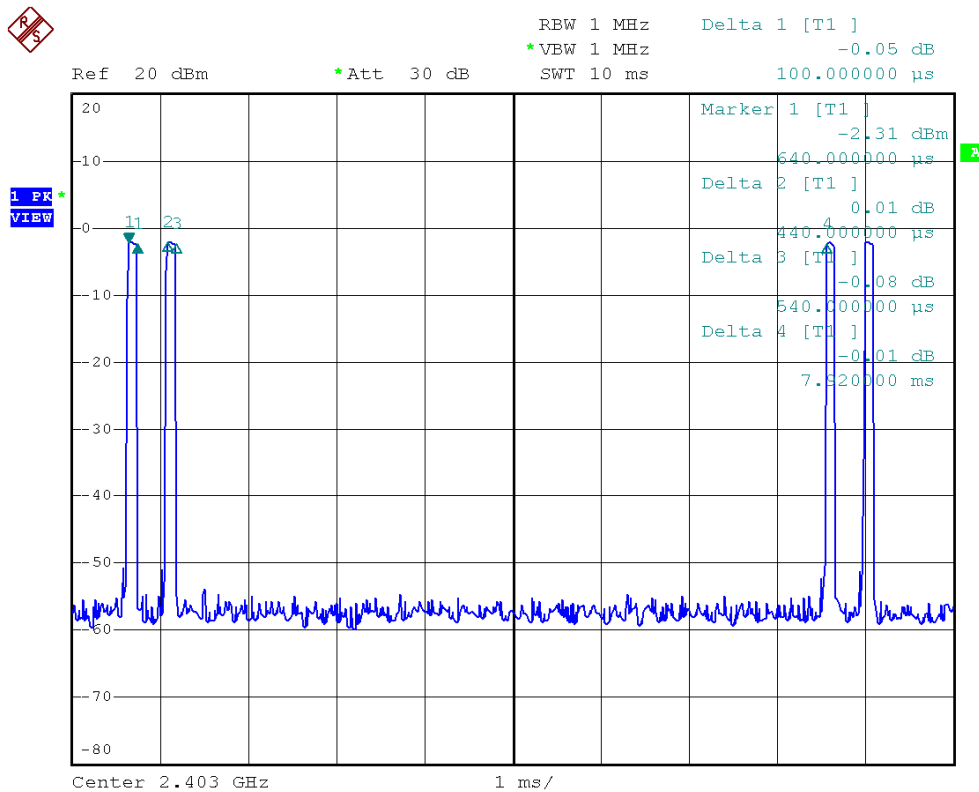
ON+OFF (total time): 7.920 msec

Dwell time: 2.53 %

AV = PK + 20 log(Dwell time)

AV = PK – 31.95

Total time (ON+OFF) = 7.920 msec; ON = 0.200 msec



Date: 24.MAY.2016 19:35:59

4.2.2 TEST PROCEDURE

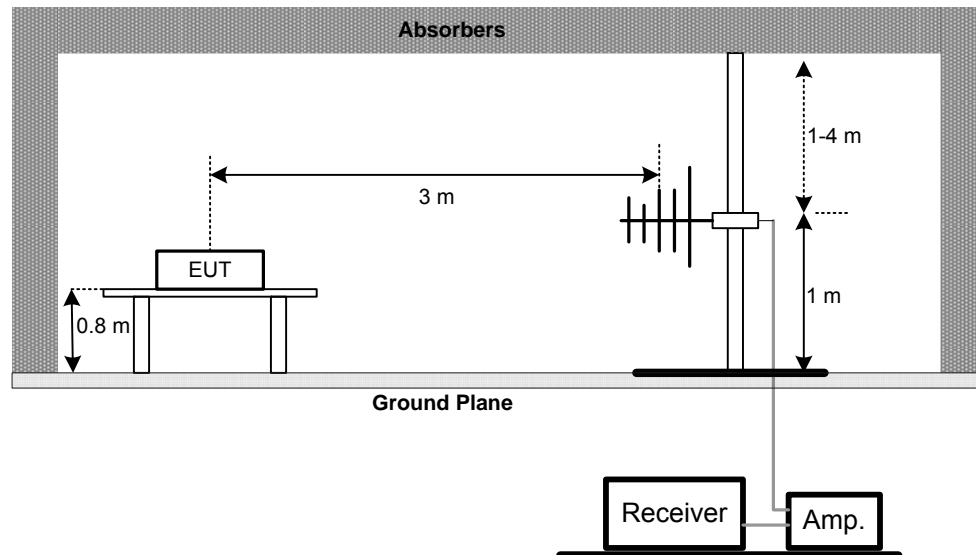
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance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

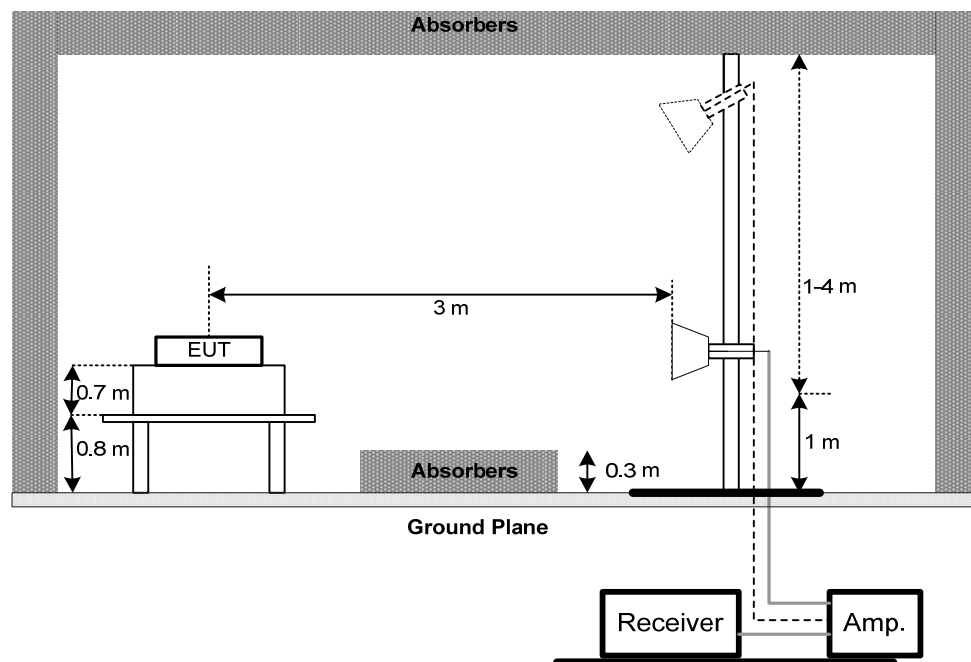
No deviation

4.2.4 TEST SETUP

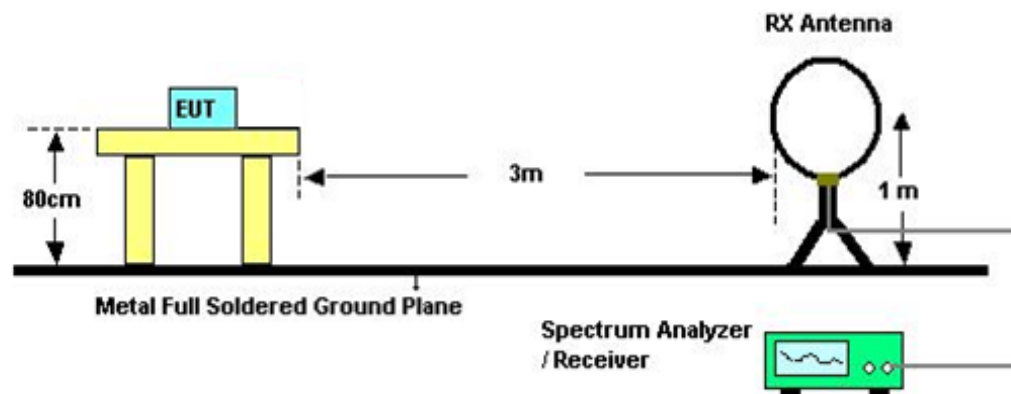
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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: 55%

Test Voltage: DC 3V

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

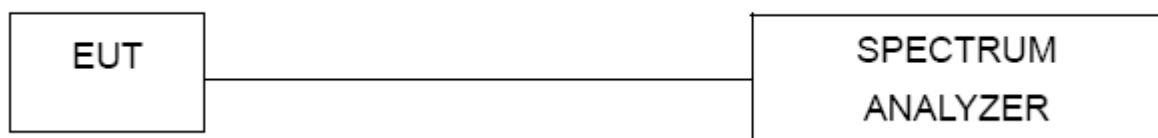
5.1 TEST PROCEDURE

- 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: 55%
Test Voltage: DC 3V

5.6 TEST RESULTS

Please refer to the Attachment E.

6. MEASUREMENT INSTRUMENTS LIST

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9038A	MY51210215	Jun. 07, 2016
2	Loop Antenna	EMCO	6502	00042960	Nov. 15, 2016
3	Pre-Amplifier	HP	8447D	2944A08891	Mar. 08, 2017
4	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	9168-364	Feb. 03, 2017
5	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0624	Feb. 03, 2017
6	Pre-Amplifier	Agilent	8449B	3008A02331	Jan. 23, 2017
7	Horn Antenna	Schwarzbeck	BBHA 9120	D-546	Nov. 04, 2016
8	Test Cable	EMCI	EMC8D-NM-N M-8000	150301	Mar. 08, 2017
9	Test Cable	EMCI	EMC104-SM-S M-2500	150303	Mar. 08, 2017
10	Test Cable	EMCI	EMC104-NM-S M-1000	150304	Mar. 08, 2017
11	Test Cable	EMCI	EMC104-SM-S M-800	150305	Mar. 08, 2017
12	Test Cable	EMCI	EMC104-SM-S M-2500	150306	Mar. 08, 2017
13	Test Cable	EMCI	EMC104-SM-S M-6000	151203	Mar. 08, 2017
14	Test Cable	EMCI	S104-SMAP-1	130503	Mar. 28, 2017
15	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 14, 2017
16	Measurement Software	Farad	EZ EMC (Version NB-03A)	N/A	N/A

Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 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

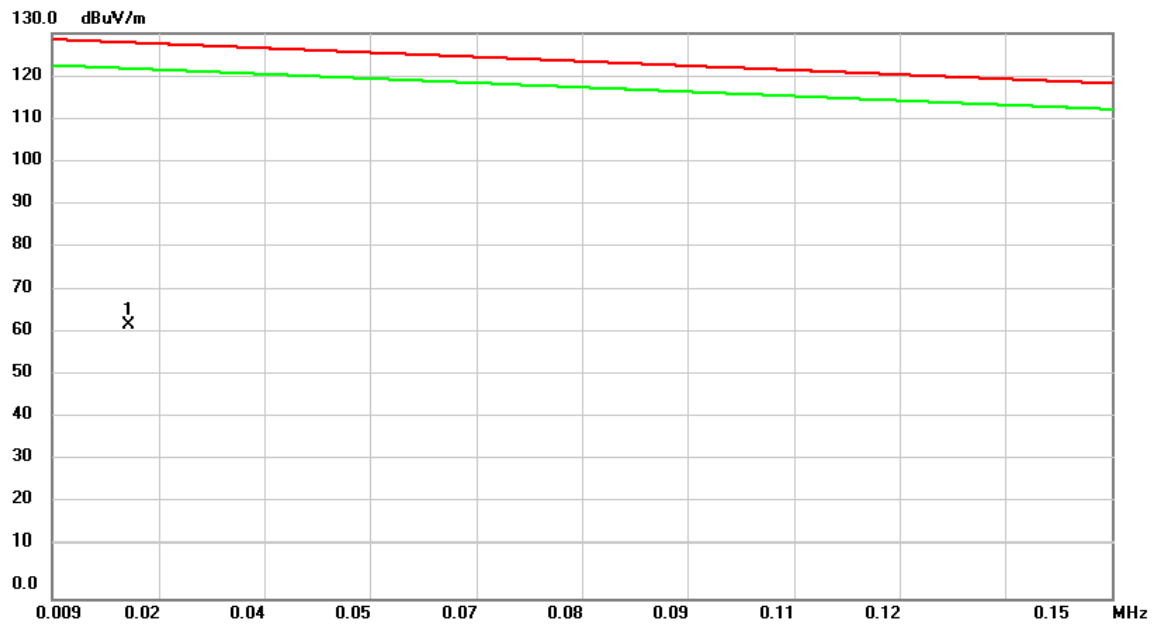
Test Mode: N/A

Note: "N/A" denotes test is not applicable to this device.

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

Test Mode	TX Mode_2403 MHz
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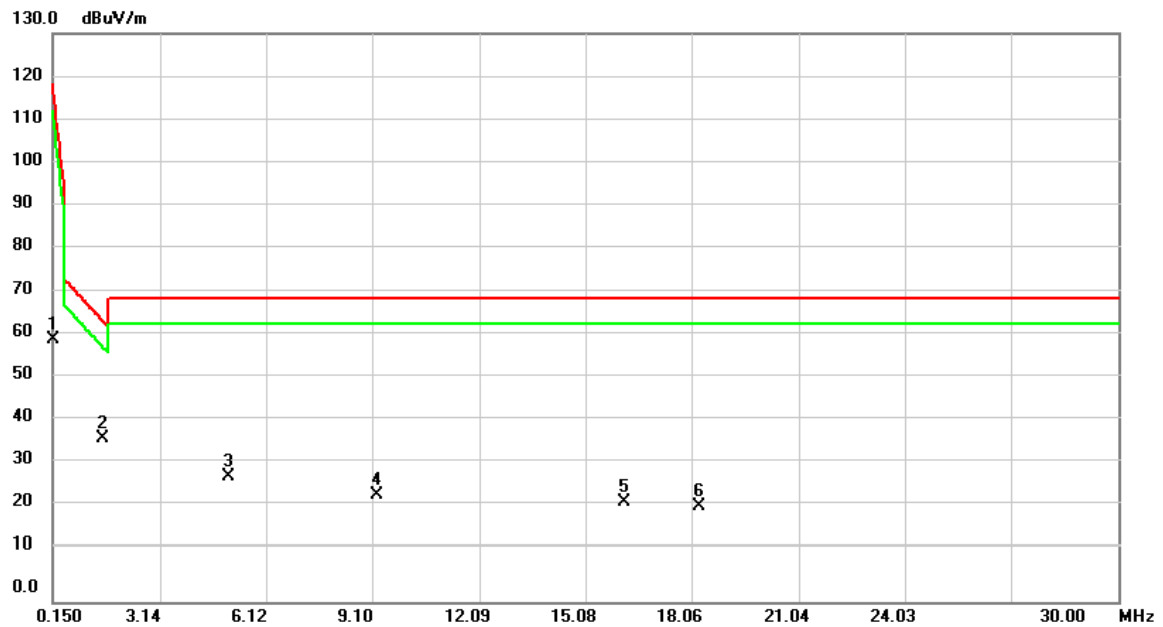
Open



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0190	44.79	18.02	62.81	127.80	-64.99	peak	

Test Mode	TX Mode_2403 MHz
-----------	------------------

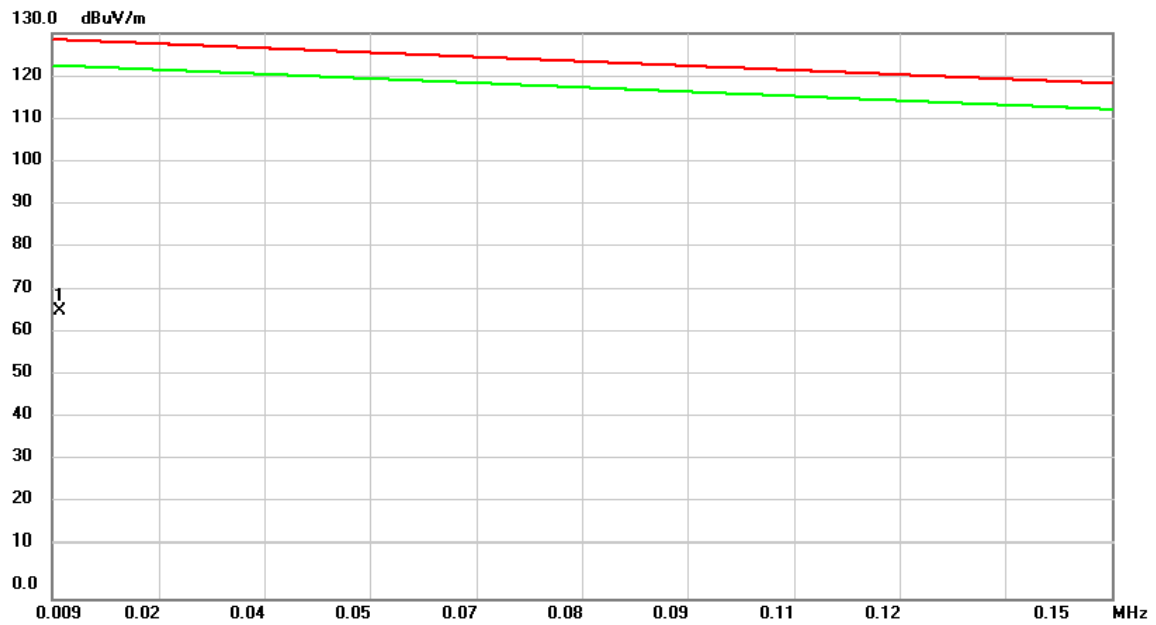
Open



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.1500	47.93	12.03	59.96	118.34	-58.38	peak	
2	*	1.5530	25.58	11.75	37.33	64.32	-26.99	peak	
3		5.0750	16.98	11.40	28.38	69.54	-41.16	peak	
4		9.2543	12.76	11.31	24.07	69.54	-45.47	peak	
5		16.1794	11.63	11.11	22.74	69.54	-46.80	peak	
6		18.2987	10.55	11.05	21.60	69.54	-47.94	peak	

Test Mode	TX Mode_2403 MHz
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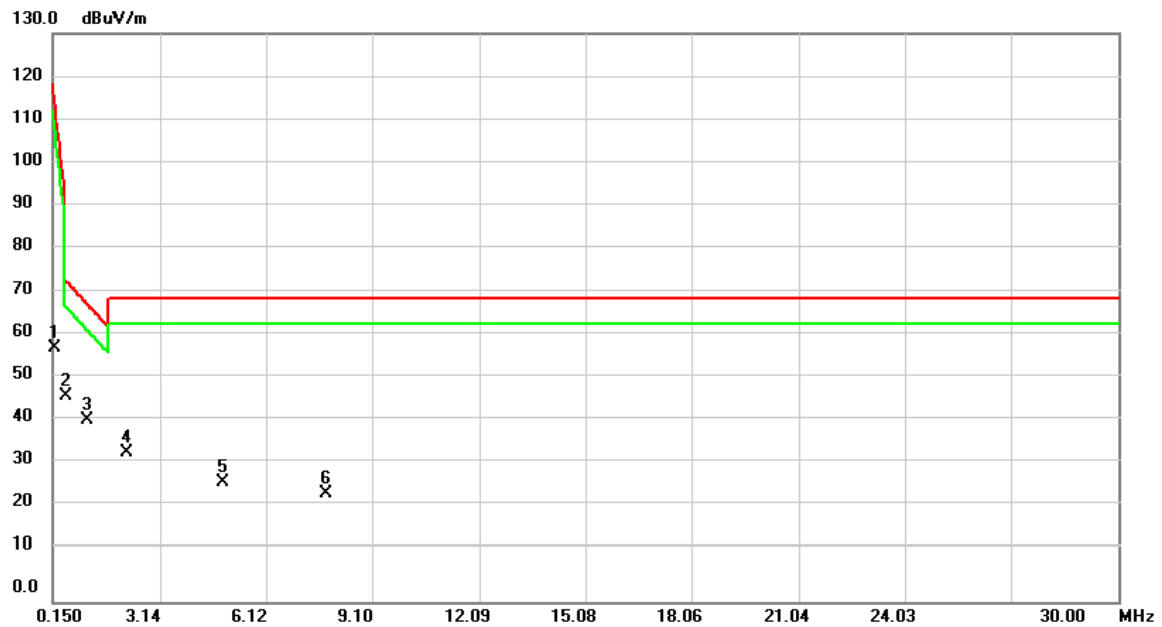
Close



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0100	45.72	20.50	66.22	128.45	-62.23	peak	

Test Mode	TX Mode_2403 MHz
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Close

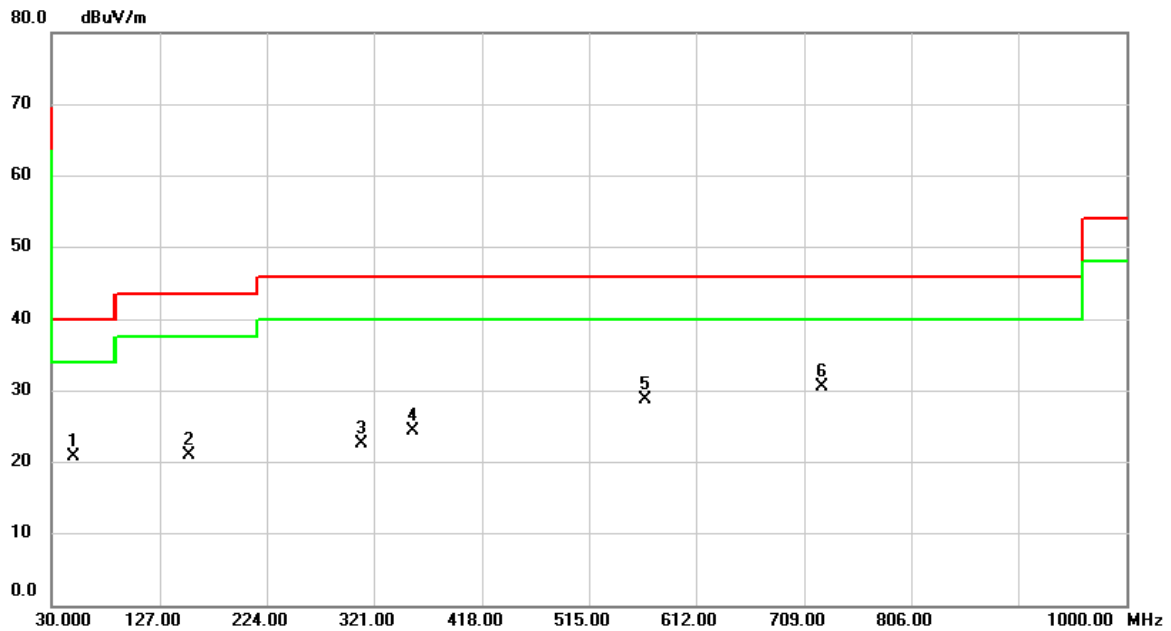


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		0.1898	45.98	11.97	57.95	115.47	-57.52	peak	
2	*	0.5082	35.29	11.80	47.09	73.64	-26.55	peak	
3		1.1052	29.35	11.95	41.30	68.32	-27.02	peak	
4		2.1798	22.36	11.47	33.83	69.54	-35.71	peak	
5		4.8862	15.84	11.38	27.22	69.54	-42.32	peak	
6		7.7916	13.20	11.34	24.54	69.54	-45.00	peak	

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

Test Mode	TX Mode_2403 MHz
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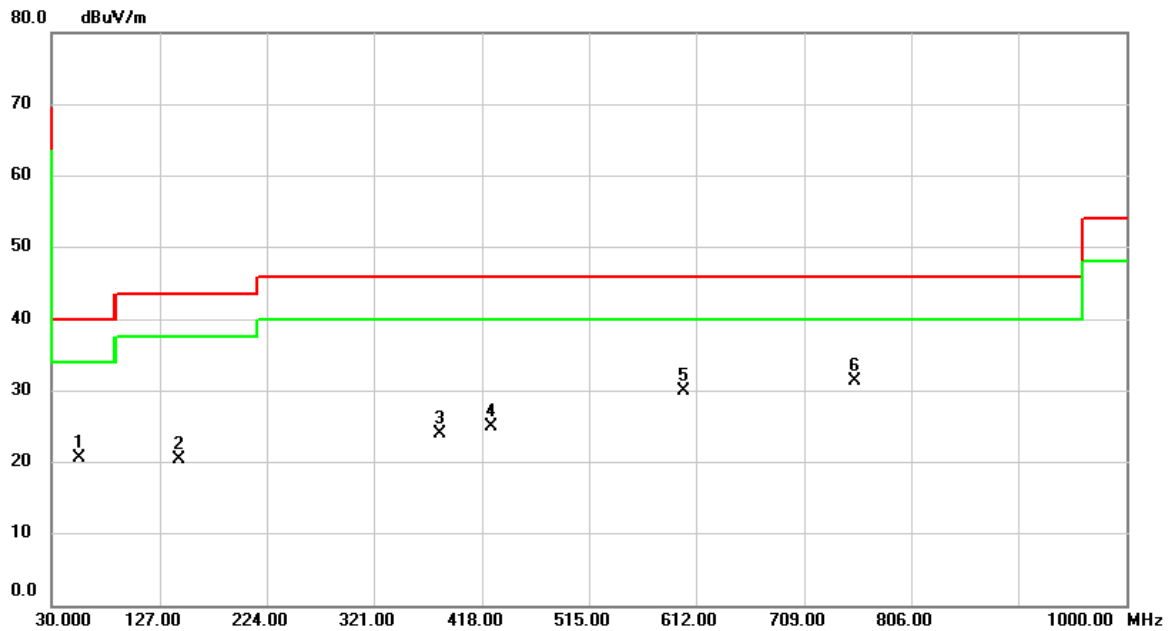
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		49.4000	29.04	-8.25	20.79	40.00	-19.21	peak	
2		153.1900	29.55	-8.68	20.87	43.50	-22.63	peak	
3		309.3600	29.78	-7.22	22.56	46.00	-23.44	peak	
4		355.9200	30.22	-5.86	24.36	46.00	-21.64	peak	
5		566.4100	29.90	-1.10	28.80	46.00	-17.20	peak	
6	*	724.5200	28.69	1.80	30.49	46.00	-15.51	peak	

Test Mode TX Mode_2403 MHz

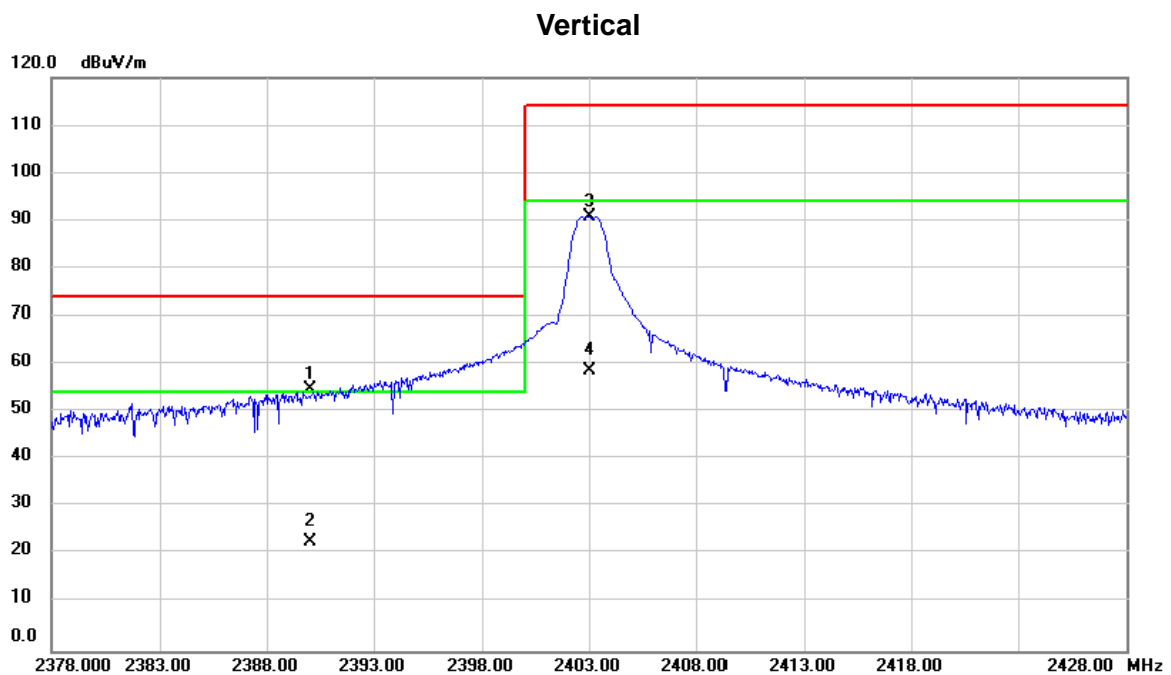
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		55.2200	29.12	-8.56	20.56	40.00	-19.44	peak	
2		144.4600	29.01	-8.69	20.32	43.50	-23.18	peak	
3		380.1700	29.34	-5.34	24.00	46.00	-22.00	peak	
4		425.7600	29.11	-4.19	24.92	46.00	-21.08	peak	
5		600.3600	30.14	-0.22	29.92	46.00	-16.08	peak	
6	*	754.5900	28.93	2.39	31.32	46.00	-14.68	peak	

ATTACHMENT D -RADIATED EMISSION (ABOVE 1000MHZ)

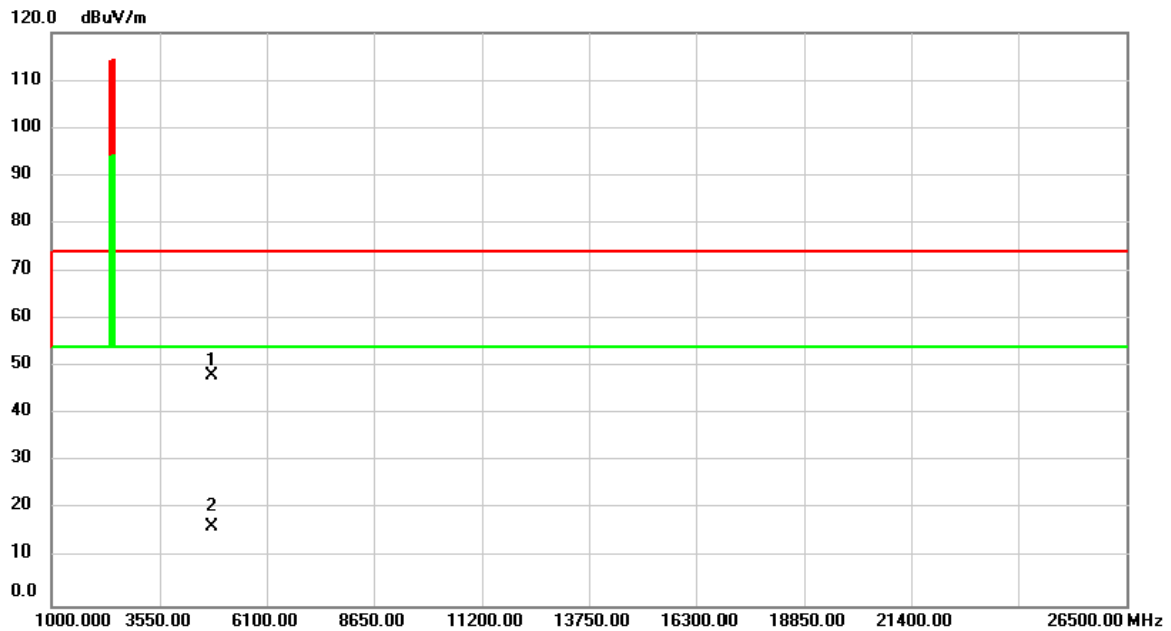
Test Mode	TX Mode_2403 MHz
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2390.000	22.92	31.70	54.62	74.00	-19.38	peak	
2		2390.000	-9.05	31.70	22.65	54.00	-31.35	AVG	
3		2403.000	58.88	31.76	90.64	114.00	-23.36	peak	
4		2403.000	26.91	31.76	58.67	94.00	-35.33	AVG	

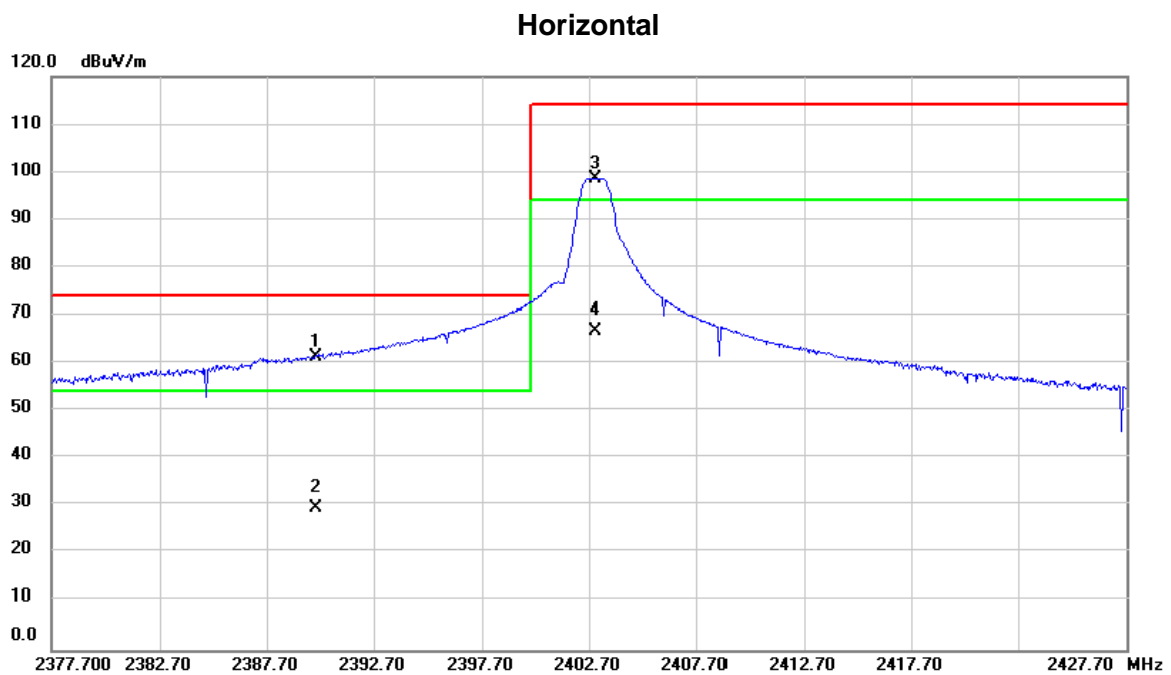
Test Mode	TX Mode_2403 MHz
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Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4806.000	58.72	-10.51	48.21	74.00	-25.79	peak	
2		4806.000	26.75	-10.51	16.24	54.00	-37.76	AVG	

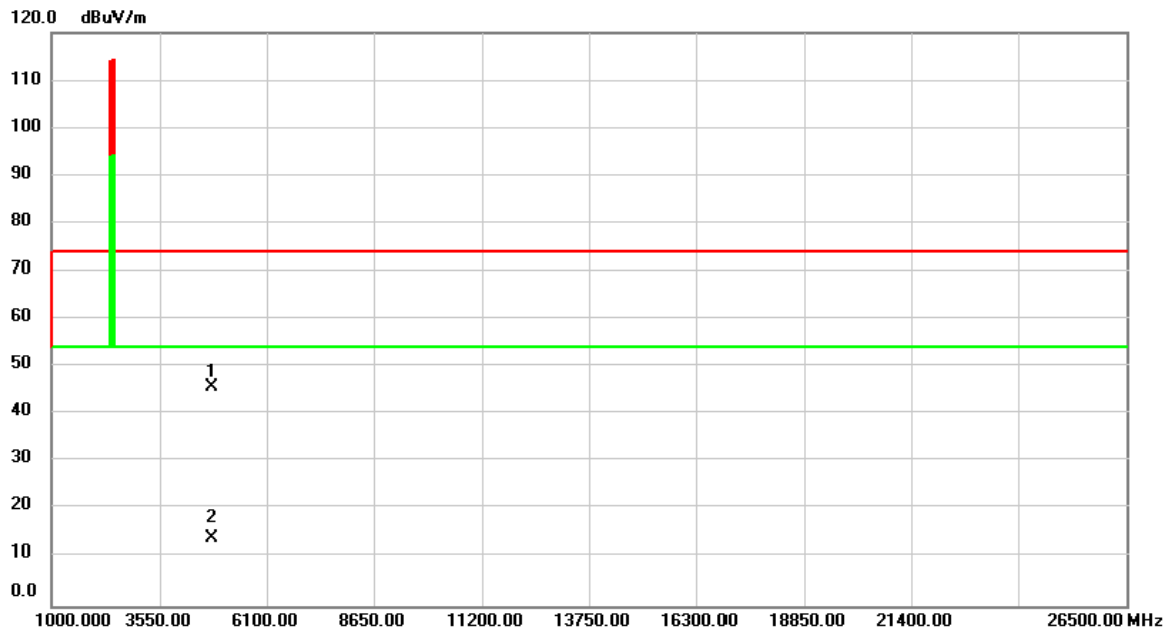
Test Mode	TX Mode_2403 MHz
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2390.000	29.74	31.70	61.44	74.00	-12.56	peak	
2		2390.000	-2.23	31.70	29.47	54.00	-24.53	AVG	
3		2403.000	66.86	31.76	98.62	114.00	-15.38	peak	
4		2403.000	34.89	31.76	66.65	94.00	-27.35	AVG	

Test Mode	TX Mode_2403 MHz
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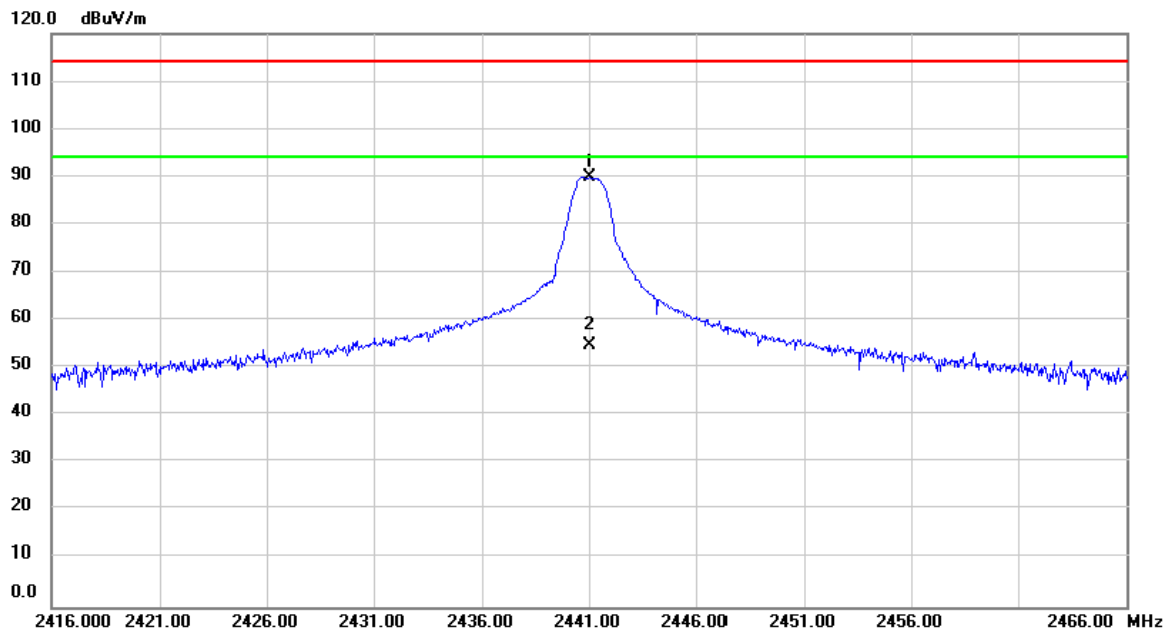
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4806.000	56.41	-10.51	45.90	74.00	-28.10	peak	
2		4806.000	24.44	-10.51	13.93	54.00	-40.07	AVG	

Test Mode	TX Mode_2441 MHz
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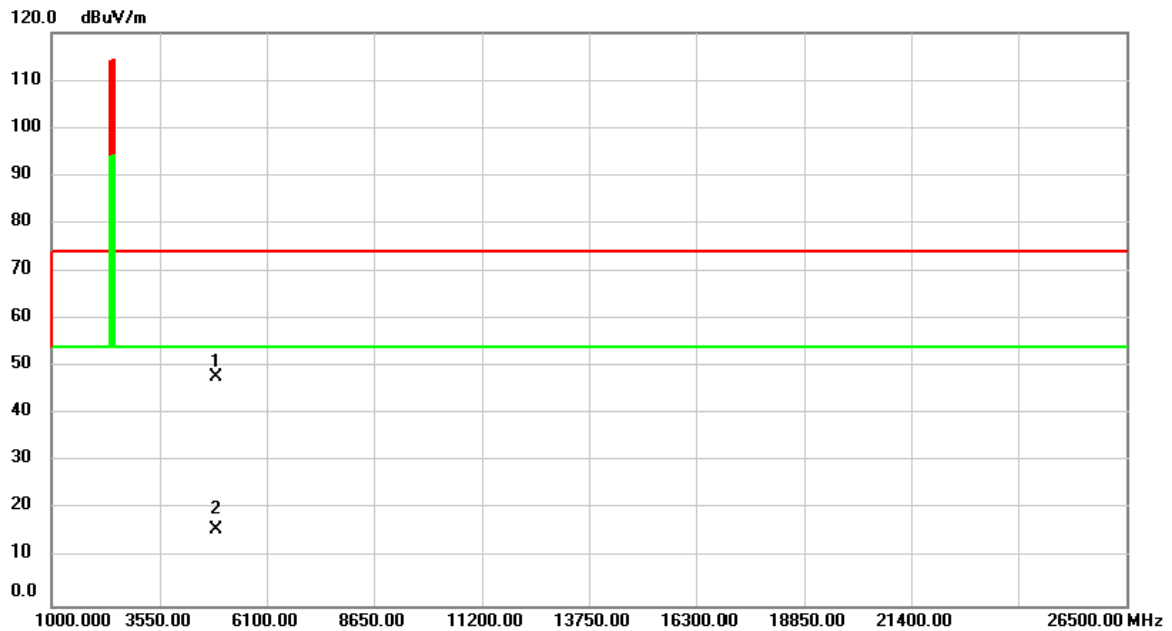
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2441.000	57.86	31.90	89.76	114.00	-24.24	peak	
2		2441.000	22.89	31.90	54.79	94.00	-39.21	AVG	

Test Mode	TX Mode_2441 MHz
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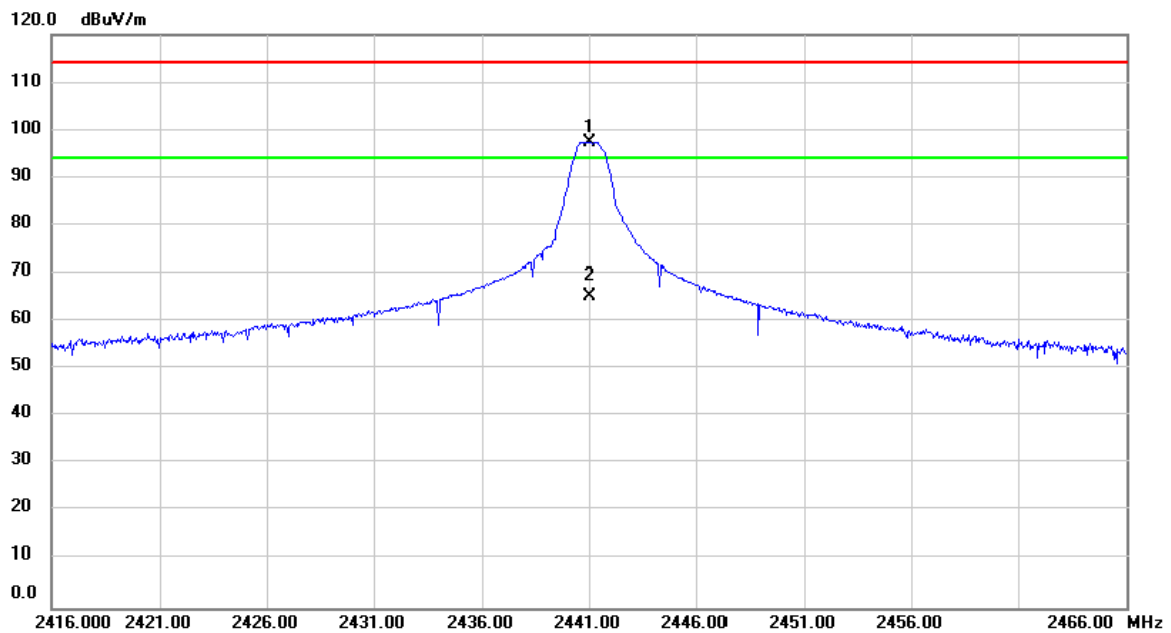
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.000	58.10	-10.39	47.71	74.00	-26.29	peak	
2		4882.000	26.13	-10.39	15.74	54.00	-38.26	AVG	

Test Mode	TX Mode_2441 MHz
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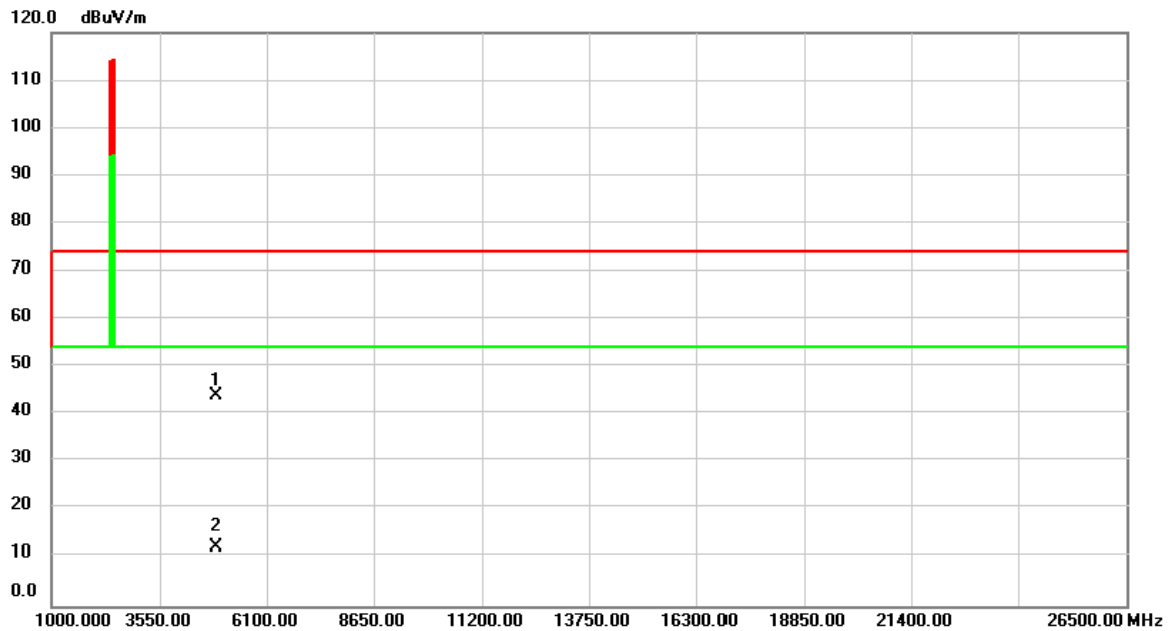
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2441.000	65.46	31.90	97.36	114.00	-16.64	peak	
2		2441.000	33.49	31.90	65.39	94.00	-28.61	AVG	

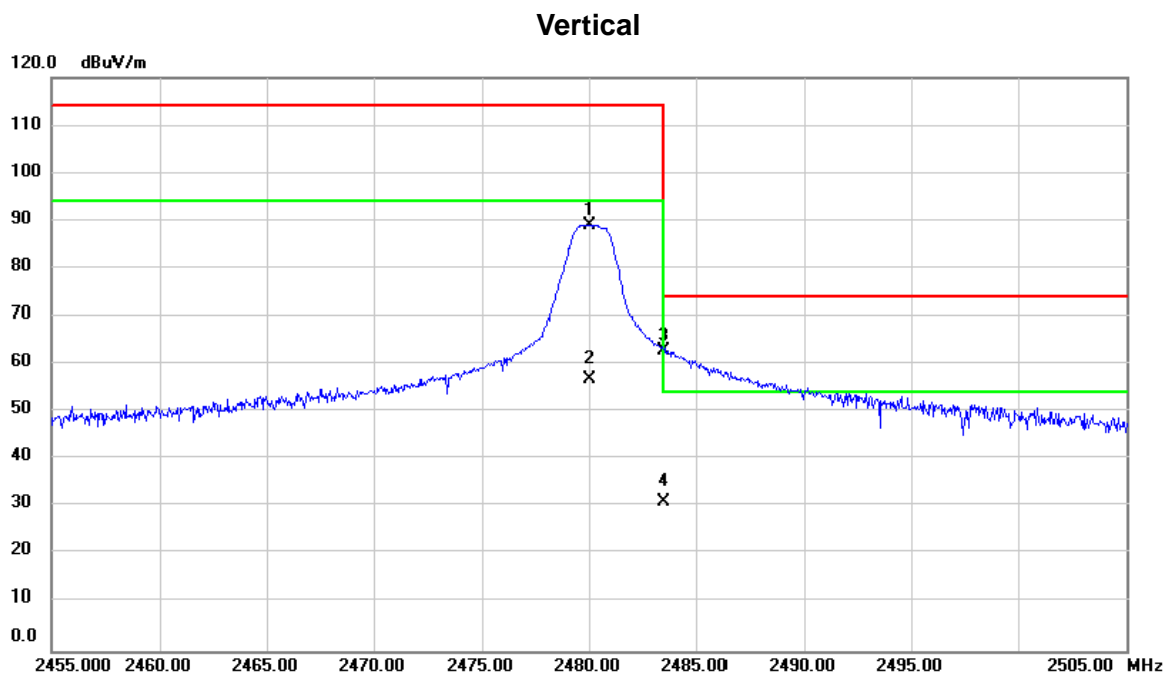
Test Mode	TX Mode_2441 MHz
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Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.000	54.44	-10.39	44.05	74.00	-29.95	peak	
2		4882.000	22.47	-10.39	12.08	54.00	-41.92	AVG	

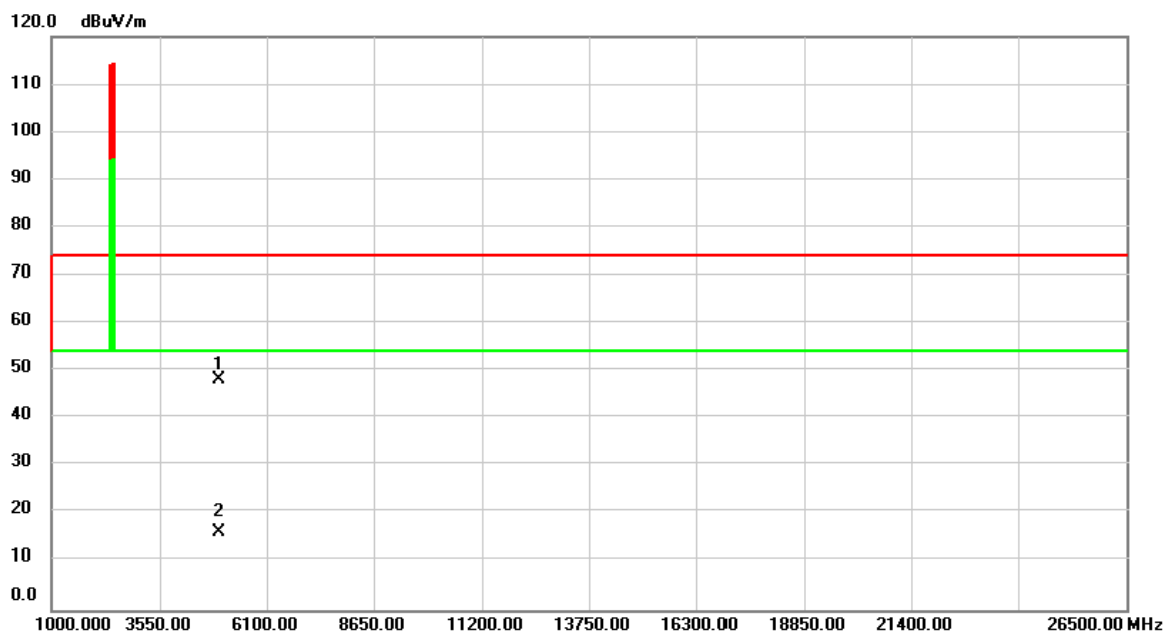
Test Mode	TX Mode_2480 MHz
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2480.000	56.88	32.05	88.93	114.00	-25.07	peak	
2		2480.000	24.91	32.05	56.96	94.00	-37.04	AVG	
3	*	2483.500	30.86	32.06	62.92	74.00	-11.08	peak	
4		2483.500	-1.11	32.06	30.95	54.00	-23.05	AVG	

Test Mode	TX Mode_2480 MHz
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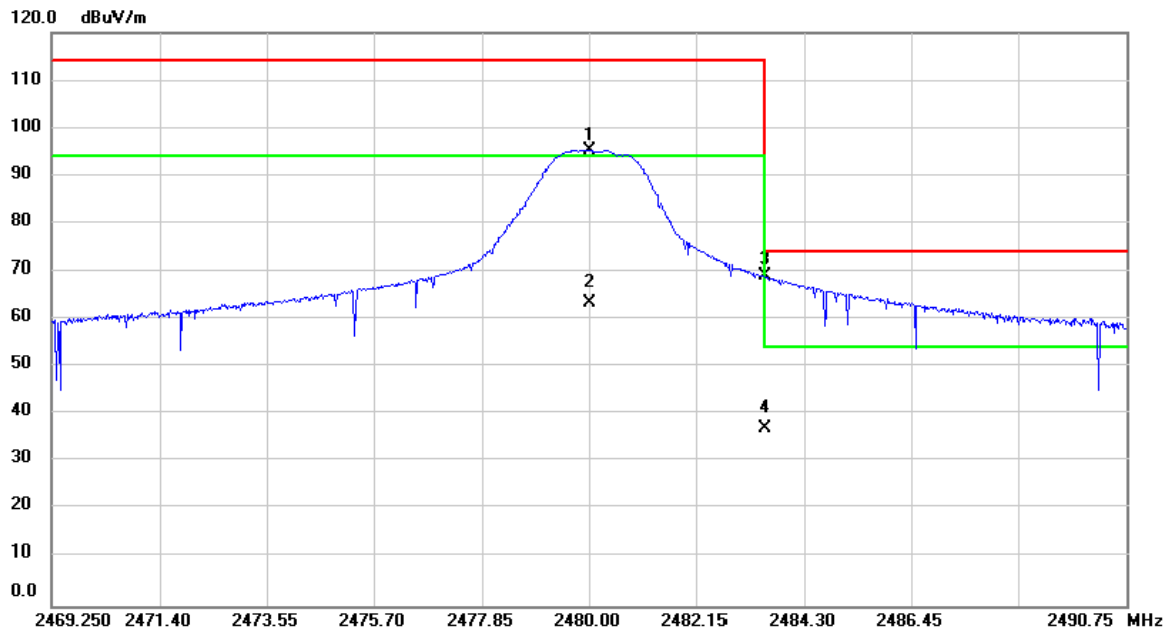
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.000	58.32	-10.26	48.06	74.00	-25.94	peak	
2		4960.000	26.35	-10.26	16.09	54.00	-37.91	AVG	

Test Mode	TX Mode_2480 MHz
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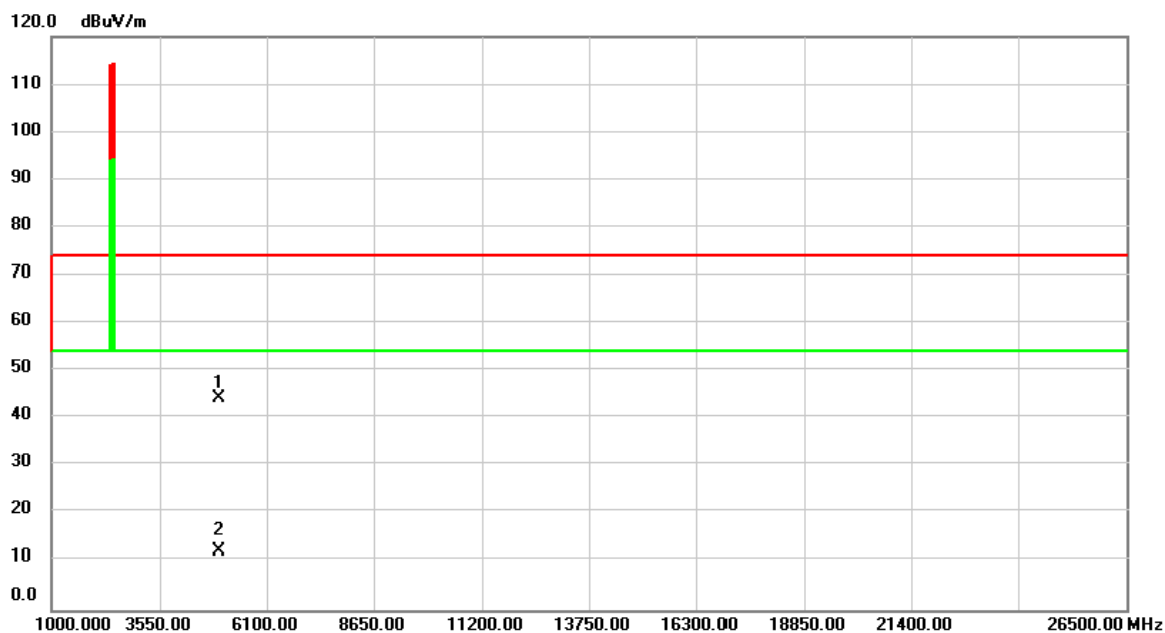
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2480.000	63.31	32.05	95.36	114.00	-18.64	peak	
2		2480.000	31.34	32.05	63.39	94.00	-30.61	AVG	
3	*	2483.500	37.10	32.06	69.16	74.00	-4.84	peak	
4		2483.500	5.13	32.06	37.19	54.00	-16.81	AVG	

Test Mode	TX Mode_2480 MHz
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Horizontal



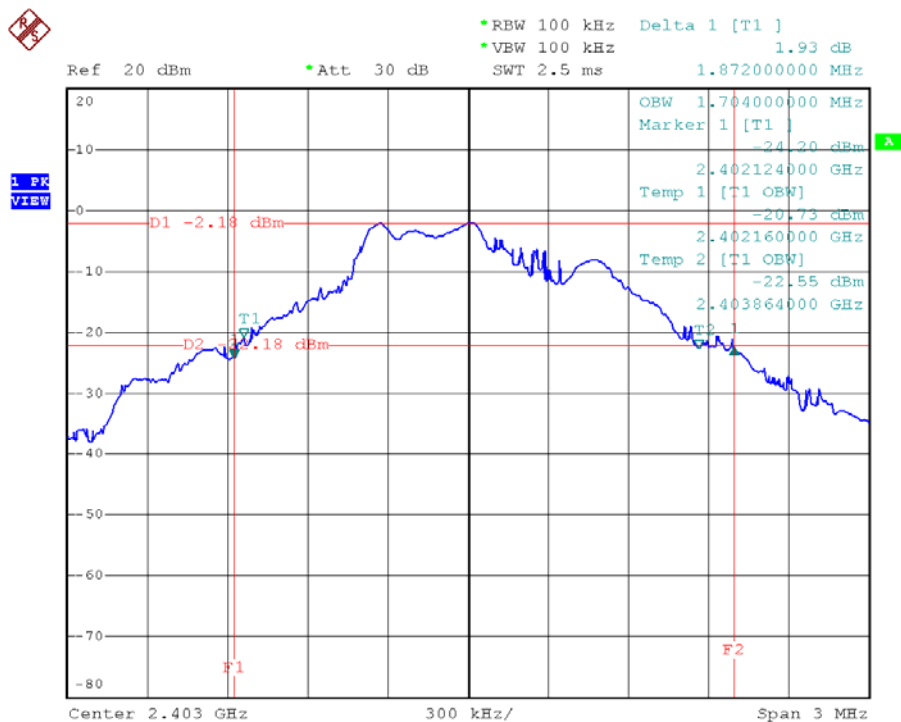
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.000	54.46	-10.26	44.20	74.00	-29.80	peak	
2		4960.000	22.49	-10.26	12.23	54.00	-41.77	AVG	

ATTACHMENT E - BANDWIDTH

Test Mode:	TX Mode_2403 MHz/2441 MHz/2480 MHz
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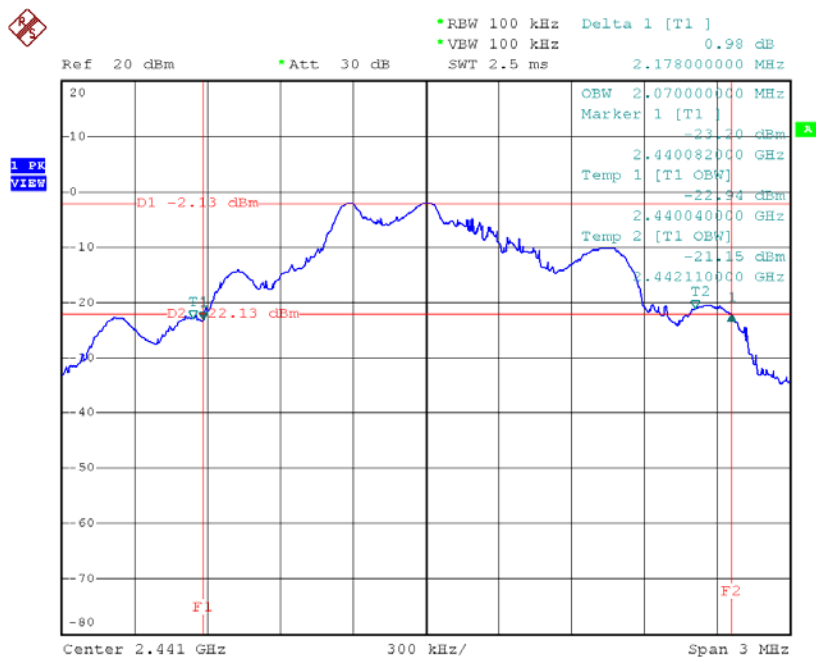
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)
2403	1.87	1.70
2441	2.18	2.07
2480	2.16	2.07

TX Mode_2403 MHz



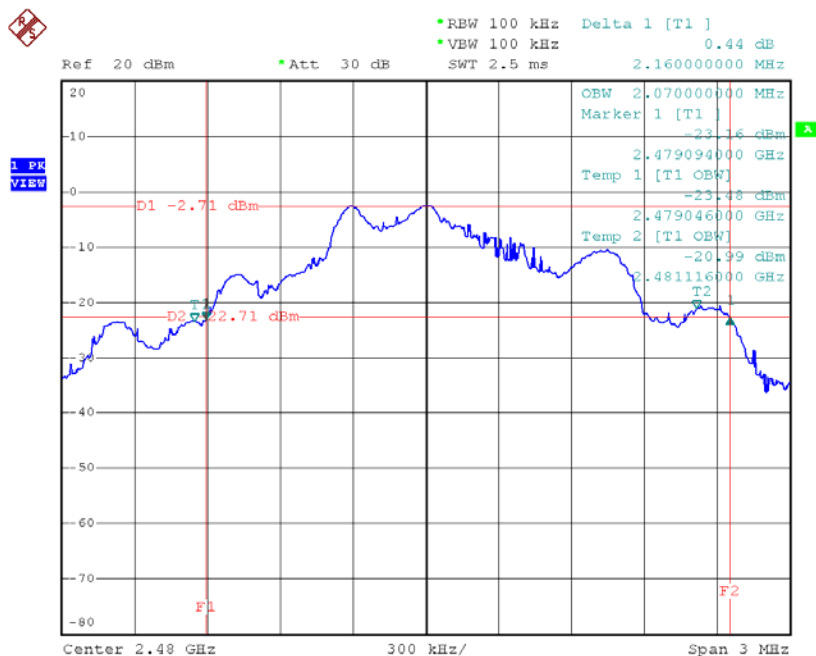
Date: 24.MAY.2016 19:48:38

TX Mode_2441 MHz



Date: 24.MAY.2016 19:54:24

TX Mode_2480 MHz



Date: 24.MAY.2016 19:57:31