

FCC Radio Partial Test Report

FCC ID: WS2-WG7833B0

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

Project No. : 1806T107A
Equipment : Wireless module
Test Model : WG7833-B0
Series Model : N/A
Applicant : Jorjin Technologies INC.
Address : 17F., No 239, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City, 22161, TAIWAN, R.O.C.

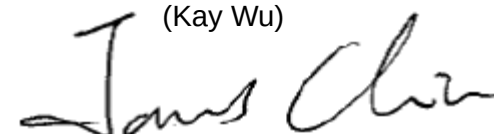
Date of Receipt : Sep. 04, 2018
Date of Test : Sep. 04, 2018 ~ Oct. 08, 2018
Issued Date : Oct. 11, 2018
Tested by : BTL Inc.

Testing Engineer



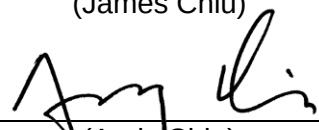
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Declaration

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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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.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements in all the possible configurations as representative of its intended use.

Limitation

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

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Oct. 11, 2018

1. CERTIFICATION

Equipment : Wireless module
Brand Name : Jorjin
Test Model : WG7833-B0
Series Model : N/A
Applicant : Jorjin Technologies INC.
Manufacturer : Jorjin Technologies INC.
Address : 17F., No 239, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City, 22161,
TAIWAN, R.O.C.
Date of Test : Sep. 04, 2018 ~ Oct. 08, 2018
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-1-1806T107A) 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).

Test results included in this report is only for the Bluetooth EDR part.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15, Subpart C (15.247)			
Standard(s) Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	-----
15.247(d) 15.209	Radiated emission	PASS	-----
15.203	Antenna Requirement	PASS	-----

Note:

- (1) "N/A" denotes test is not applicable in this test report
- (2) Accord to the EUT(Report Number: T150417W02-RP3 and model: WG7833-B0, WG7833BEM2A, WG7833BEM2B) has been certificated, Conducted and Radiated emission were criticized and reconfirmed in this report.
- (3) Compared with the previous report (T150417W02-RP3), added one PCB type antennas.

2.1 TEST FACILITY

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

Conducted emission Test:

C05: (VCCI RN: C-14742; FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test (Below 1 GHz):

CB15: (VCCI RN: R-20020; FCC RN:674415; FCC DN:TW0659; ISED Assigned Code:20088-5)

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB15: (VCCI RN: G-20031; FCC RN:674415; FCC DN:TW0659; ISED Assigned Code:20088-5)

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 emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
C05	CISPR	150 kHz ~ 30MHz	2.68

B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (3m)	CISPR	9kHz ~ 150kHz	2.82
		150kHz ~ 30MHz	2.58

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
CB15 (3m)	CISPR	30MHz ~ 200MHz	V	4.20
		30MHz ~ 200MHz	H	3.64
		200MHz ~ 1,000MHz	V	4.56
		200MHz ~ 1,000MHz	H	3.90

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
CB15 (3m)	CISPR	1GHz ~ 6GHz	V	4.46
		1GHz ~ 6GHz	H	4.40
		6GHz ~ 18GHz	V	3.88
		6GHz ~ 18GHz	H	4.00

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (1m)	CISPR	18 ~ 26.5 GHz	4.62
		26.5 ~ 40 GHz	5.12

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless module
Brand Name	Jorjin
Test Model	WG7833-B0
Series Model	N/A
Model Difference	N/A
Power Source	Powered from host device via USB Cable
Power Rating	DC 5V
Products Covered	N/A
Operation Frequency	2402~2480 MHz
Modulation Technique	GFSK(1Mbps), $\pi/4$ -DQPSK(2Mbps), 8-DPSK(3Mbps)

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	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3. Table for Filed Antenna:

Ant.	Brand	Model	Type	Connector	Gain (dBi)		
					2.4 GHz	Band 1	Band 4
1	Liteon	Locix	PCB	N/A	3.83	4.10	2.27

3.2 DESCRIPTION OF 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 possibly 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 Emission	
Final Test Mode	Description
Mode 1	TX Mode

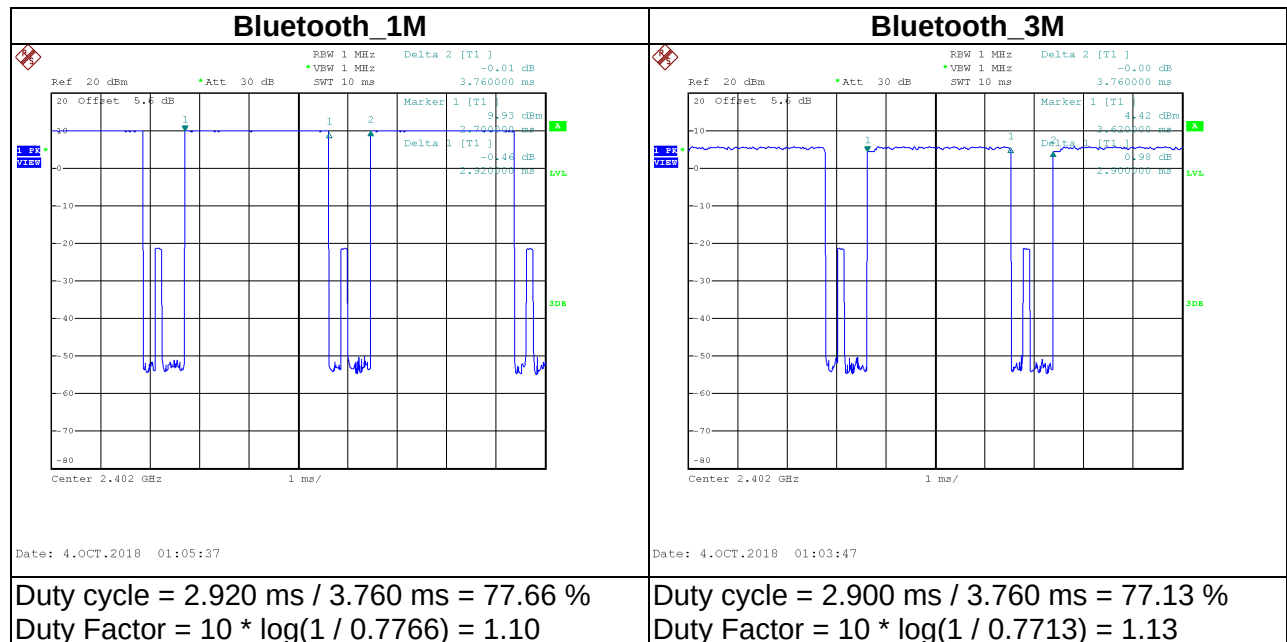
For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode

Note:

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

3.3 DUTY CYCLE

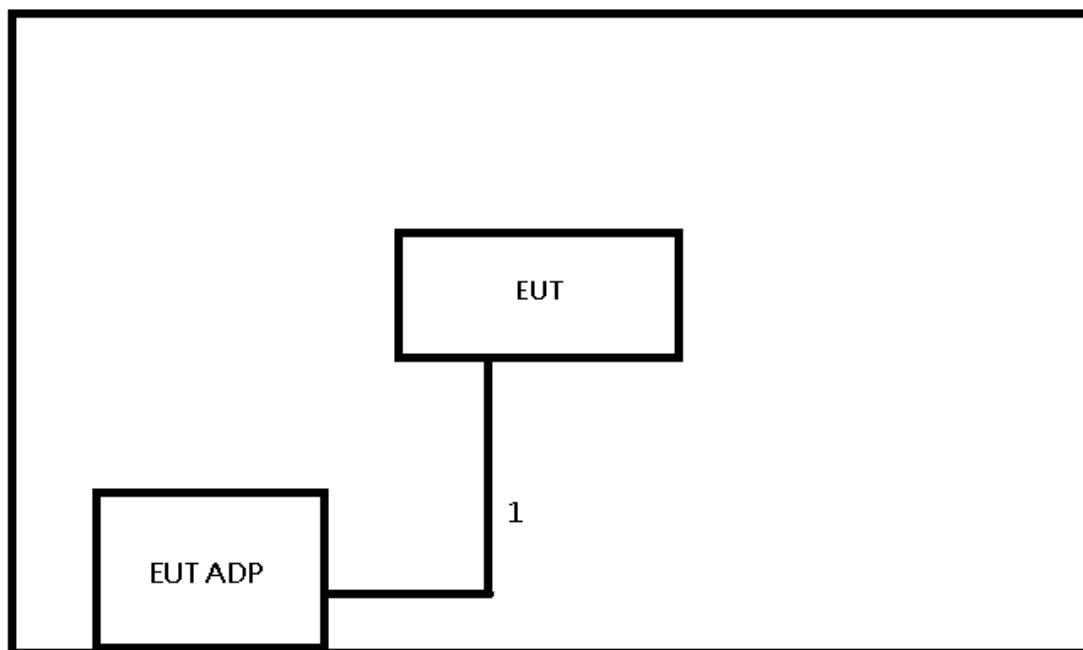
If duty cycle is $\geq 98\%$, duty factor is not required.
If duty cycle is $< 98\%$, duty factor shall be considered.



Note:

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

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
1	NO	NO	1.5m	Power Cable

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 -0.50	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 + Attenuator Factor(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

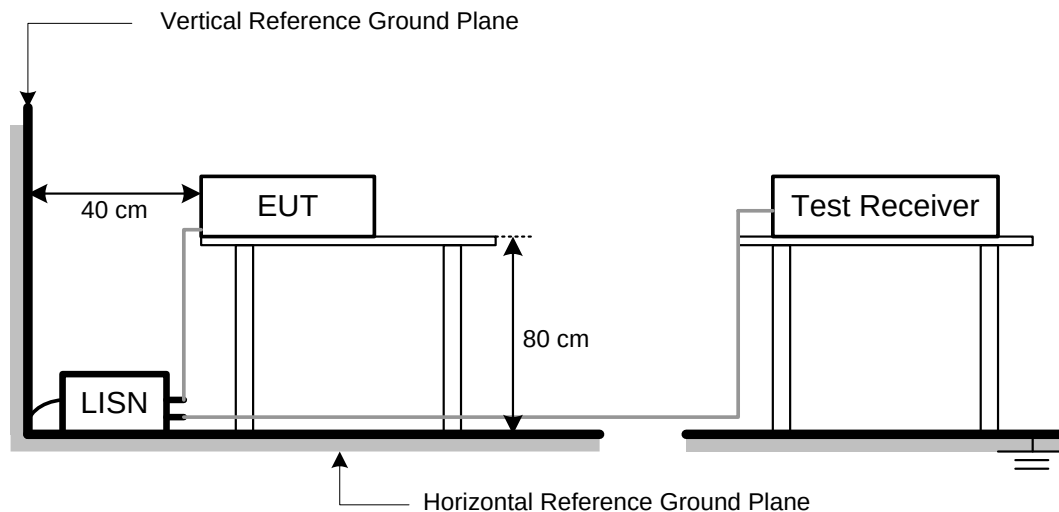
4.1.2 TEST PROCEDURE

- 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 equipment 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



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: 25°C

Relative Humidity: 45%

Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Appendix 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 (Frequency Range 9KHz -1000MHz)

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.

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 EMISSION MEASUREMENT (Above 1000MHz)

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

Notes:

- (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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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

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

4.2.2 TEST PROCEDURE

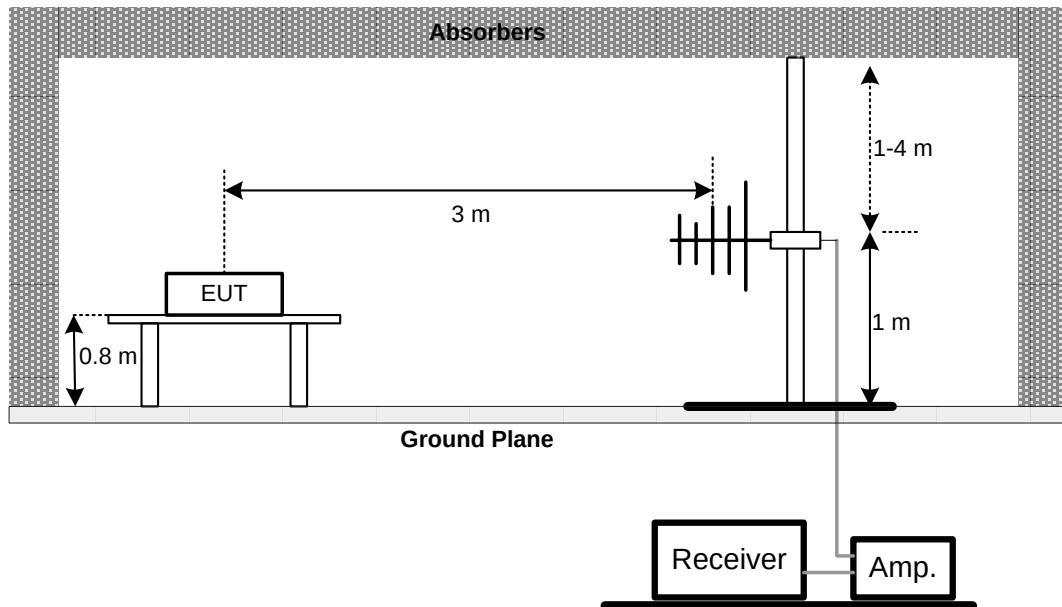
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 m above the ground at a 3 m semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 m semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8m 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.
- 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).
- 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.
- 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.
- 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)
- 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)
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

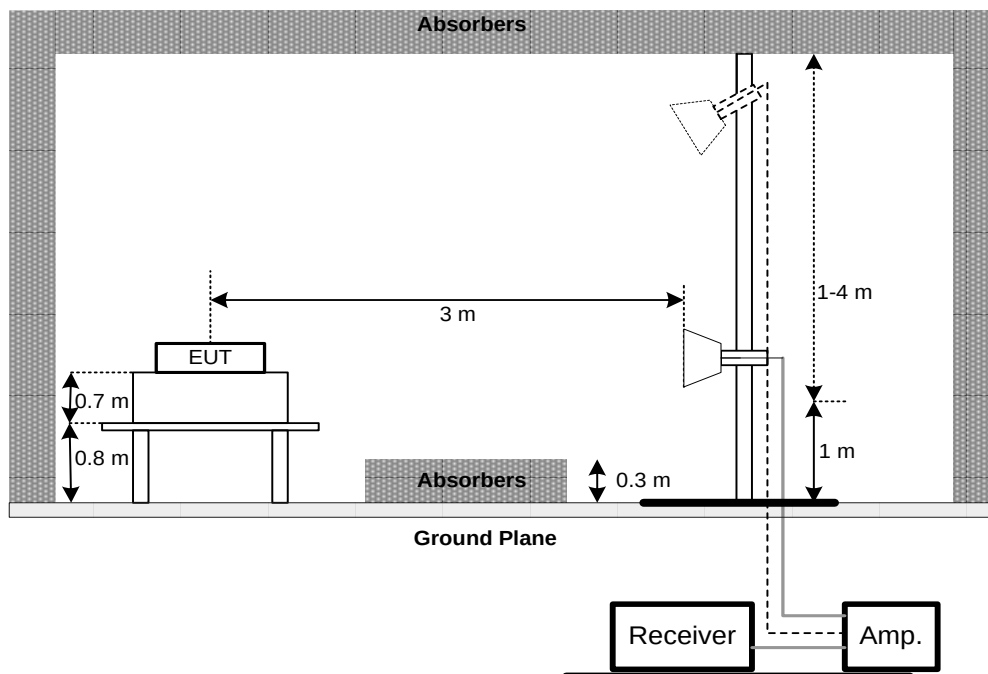
No deviation

4.2.4 TEST SETUP

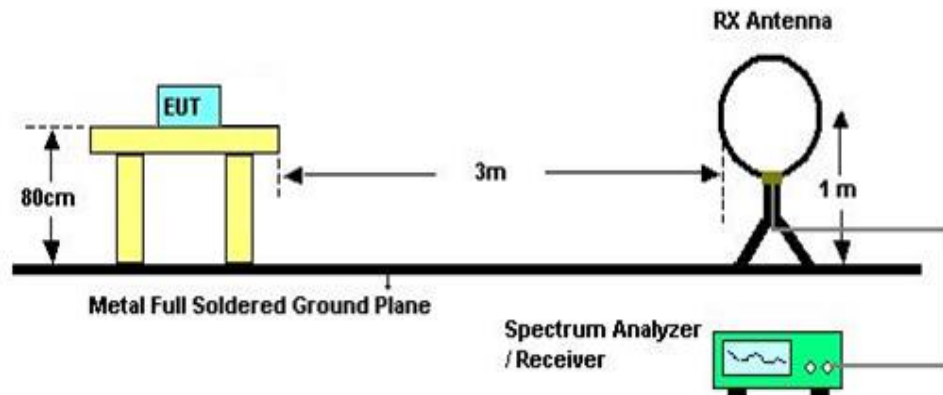
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For Radiated Emissions Below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.2.6 EUT TEST CONDITIONS

Temperature: 23°C Relative Humidity: 70% Test Voltage: AC 120V/60Hz

4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix 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 1000 MHZ)

Please refer to the Appendix C.

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Appendix D.

Remark:

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

5. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Mar. 08, 2019
2	Test Cable	EMCI	EMCCFD300-BM-B MR-6000	170715	Aug. 07, 2019
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 10, 2018
4	Measurement Software	EZ	EZ EMC (Version NB-03A)	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Preamplifier	EMCI	012645B	980267	Feb. 27, 2019
2	Preamplifier	EMCI	EMC02325	980217	Dec. 27, 2018
3	Preamplifier	EMCI	EMC2654045	980030	Feb. 13, 2019
4	Test Cable	EMCI	EMC104-SM-S M-8000	8m	Jan. 03, 2019
5	Test Cable	EMCI	EMC104-SM-S M-800	150207	Jan. 03, 2019
6	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan. 03, 2019
7	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 08, 2019
8	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 21, 2019
9	Loop Ant	EMCI	LPA600	274	May 03, 2019
10	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 27, 2019
11	Horn Ant	Schwarzbeck	BBHA 9170	187	Dec. 05, 2018
12	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 15, 2019
13	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 15, 2019

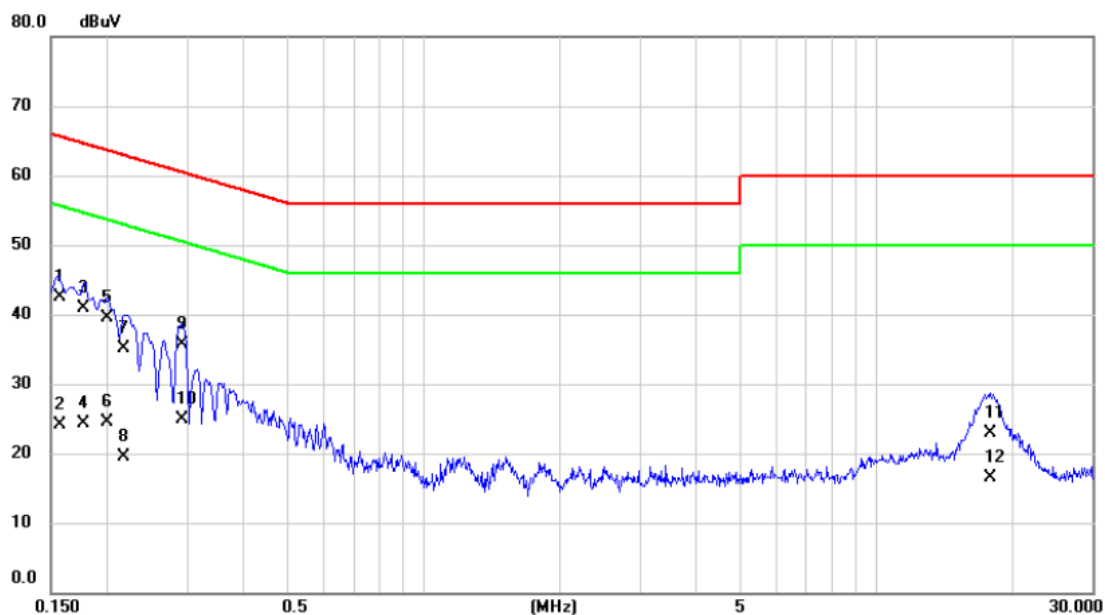
Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

APPENDIX A – CONDUCTED EMISSION

Test Mode TX 2402MHz _CH00_1Mbps

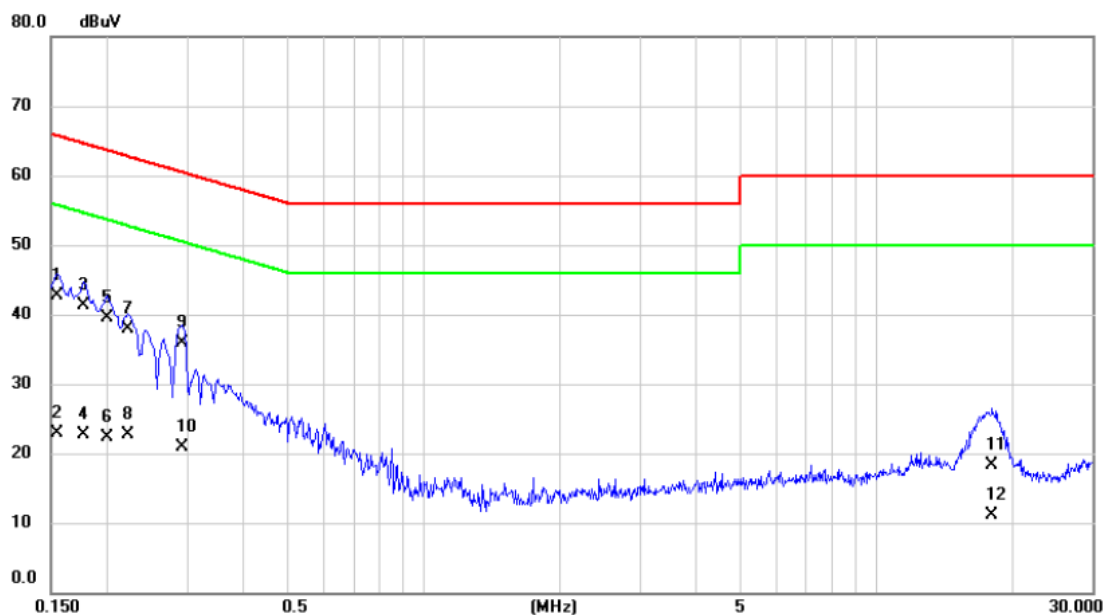
Phase

Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1568	32.90	9.63	42.53	65.63	-23.10	QP	
2		0.1568	14.40	9.63	24.03	55.63	-31.60	AVG	
3		0.1770	31.30	9.63	40.93	64.63	-23.70	QP	
4		0.1770	14.70	9.63	24.33	54.63	-30.30	AVG	
5		0.1995	29.80	9.63	39.43	63.63	-24.20	QP	
6		0.1995	14.80	9.63	24.43	53.63	-29.20	AVG	
7		0.2175	25.40	9.64	35.04	62.91	-27.87	QP	
8		0.2175	9.80	9.64	19.44	52.91	-33.47	AVG	
9		0.2917	26.10	9.66	35.76	60.48	-24.72	QP	
10		0.2917	15.20	9.66	24.86	50.48	-25.62	AVG	
11		17.9093	13.00	9.96	22.96	60.00	-37.04	QP	
12		17.9093	6.60	9.96	16.56	50.00	-33.44	AVG	

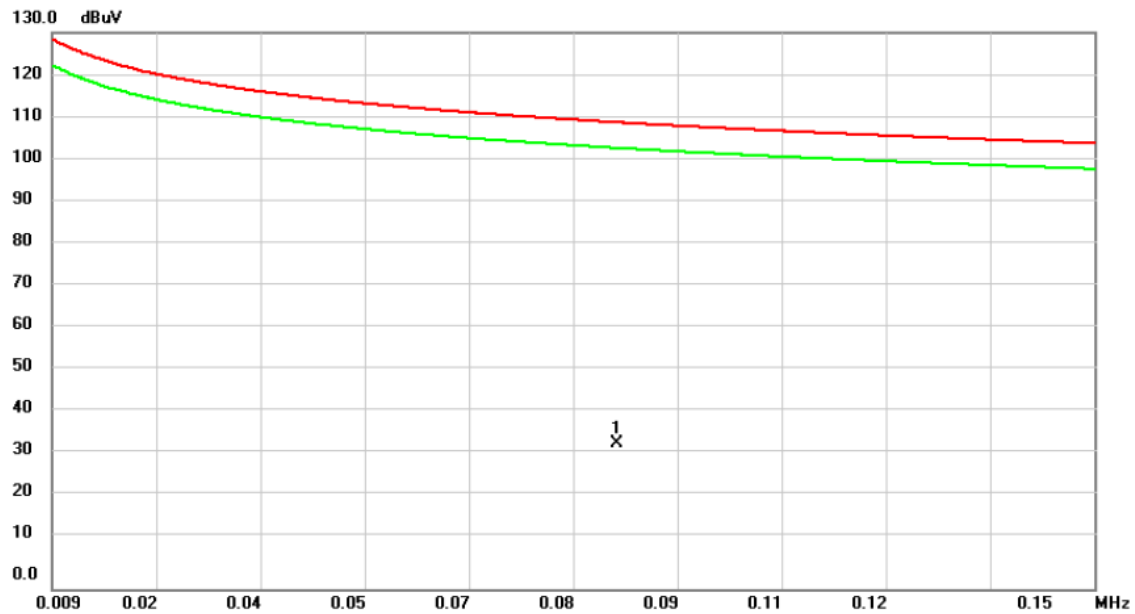
Test Mode	TX 2402MHz _CH00_1Mbps	Phase	Neutral
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1545	33.00	9.62	42.62	65.75	-23.13	QP	
2		0.1545	13.30	9.62	22.92	55.75	-32.83	AVG	
3		0.1770	31.70	9.61	41.31	64.63	-23.32	QP	
4		0.1770	13.00	9.61	22.61	54.63	-32.02	AVG	
5		0.1995	29.90	9.61	39.51	63.63	-24.12	QP	
6		0.1995	12.70	9.61	22.31	53.63	-31.32	AVG	
7		0.2220	28.20	9.62	37.82	62.74	-24.92	QP	
8		0.2220	13.10	9.62	22.72	52.74	-30.02	AVG	
9		0.2917	26.30	9.64	35.94	60.48	-24.54	QP	
10		0.2917	11.20	9.64	20.84	50.48	-29.64	AVG	
11		18.0015	8.30	9.97	18.27	60.00	-41.73	QP	
12		18.0015	1.20	9.97	11.17	50.00	-38.83	AVG	

APPENDIX B – RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode	TX 2402MHz _CH00_1Mbps	Azimuth Angle	90°
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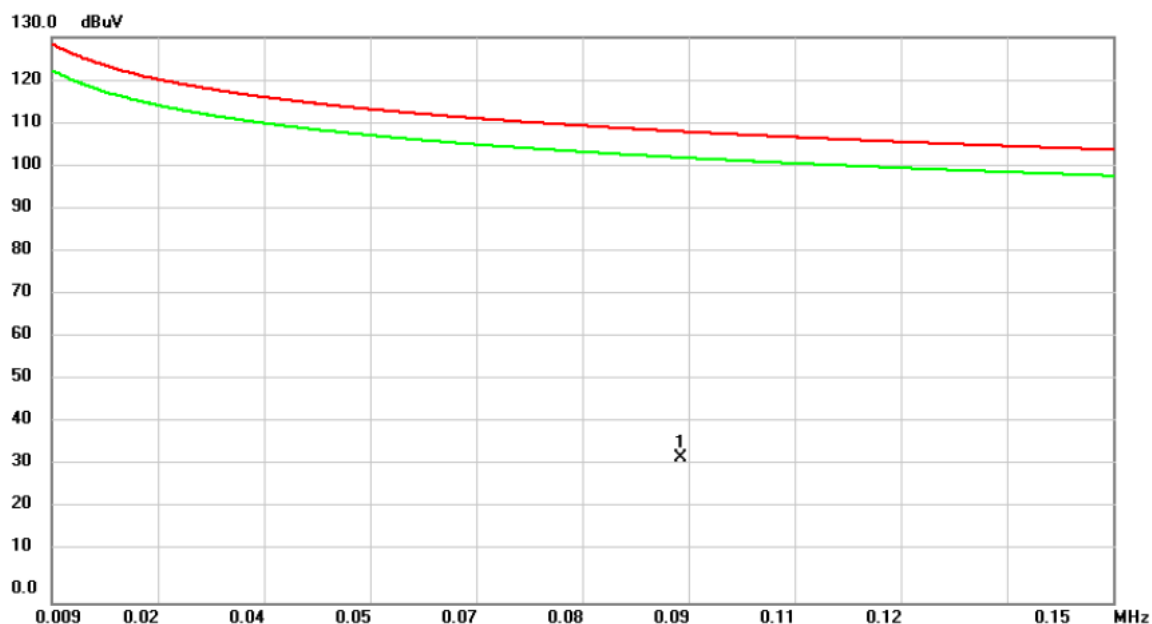
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.0855	16.24	17.71	33.95	108.97	-75.02	peak	

Test Mode	TX 2402MHz _CH00_1Mbps	Azimuth Angle	90°
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	29.85	13.19	43.04	104.08	-61.04	peak	
2		0.4485	31.79	4.20	35.99	94.57	-58.58	peak	
3		0.5680	31.60	2.90	34.50	72.52	-38.02	peak	
4	*	3.5827	41.17	-3.74	37.43	69.54	-32.11	peak	
5		4.6275	34.38	-3.88	30.50	69.54	-39.04	peak	
6		6.9260	34.35	-4.11	30.24	69.54	-39.30	peak	

Test Mode	TX 2402MHz _CH00_1Mbps	Azimuth Angle	0°
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.0926	16.40	16.98	33.38	108.27	-74.89	peak	

Test Mode TX 2402MHz _CH00_1Mbps

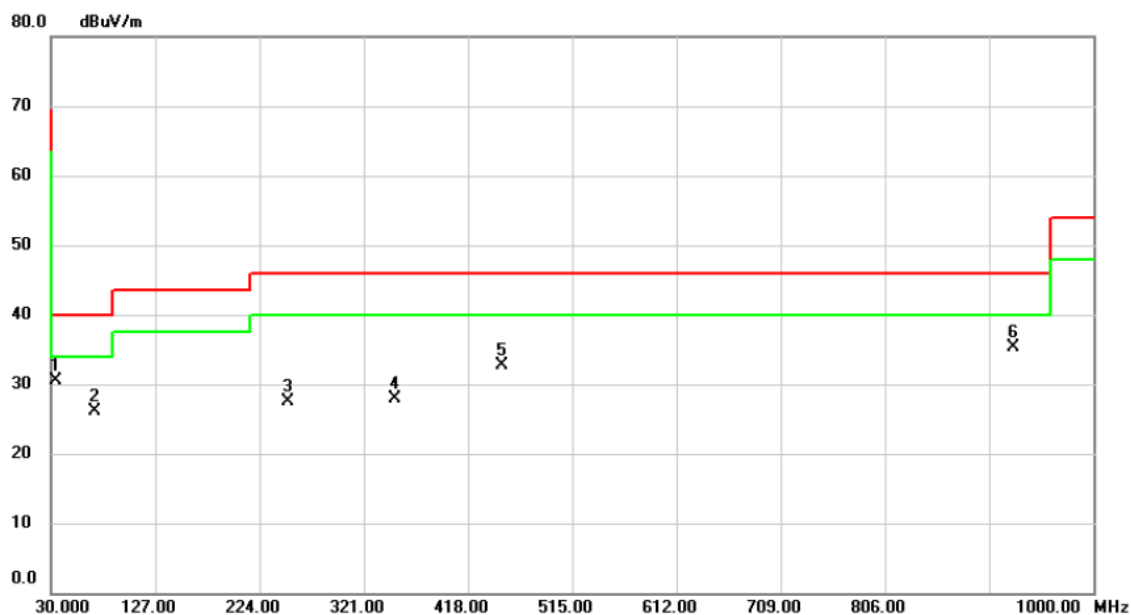
Azimuth Angle 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	30.76	13.19	43.95	104.08	-60.13	peak	
2		0.4485	29.69	4.20	33.89	94.57	-60.68	peak	
3		0.5978	30.49	2.63	33.12	72.07	-38.95	peak	
4	*	3.5827	43.08	-3.74	39.34	69.54	-30.20	peak	
5		4.6872	35.16	-3.89	31.27	69.54	-38.27	peak	
6		6.1498	38.37	-4.04	34.33	69.54	-35.21	peak	

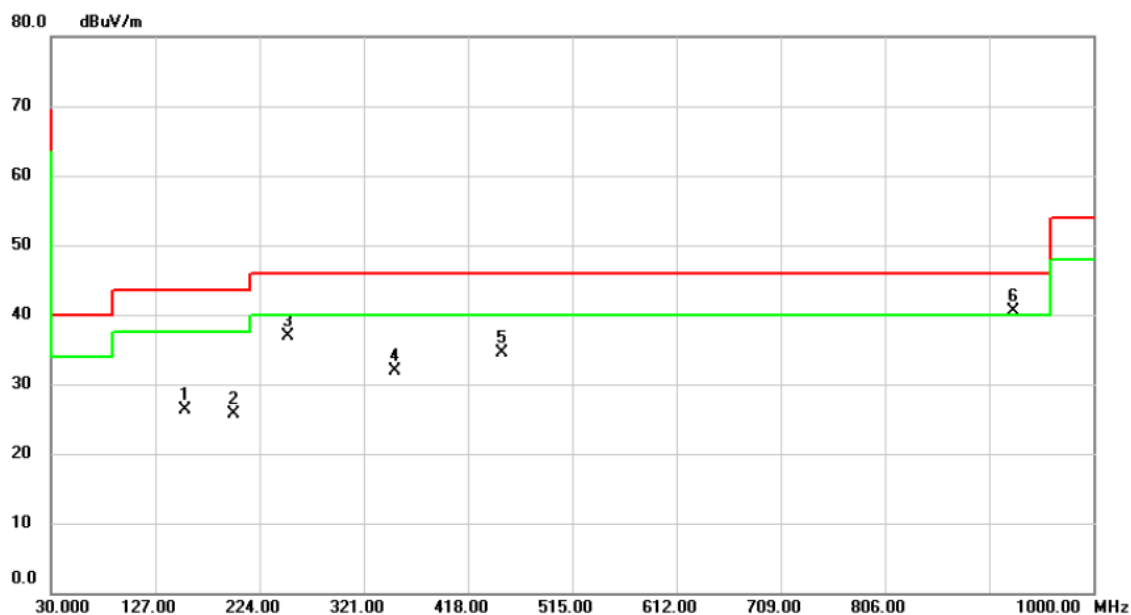
APPENDIX C – RADIATED EMISSION (30MHZ TO 1000MHZ)

Test Mode	TX G MODE 2412MHz	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	*	33.8800	39.48	-9.02	30.46	40.00	-9.54	peak	
2		70.7400	36.96	-10.83	26.13	40.00	-13.87	peak	
3		250.1900	36.64	-9.10	27.54	46.00	-18.46	peak	
4		350.1000	34.07	-6.20	27.87	46.00	-18.13	peak	
5		450.0100	36.42	-3.80	32.62	46.00	-13.38	peak	
6		925.3100	29.93	5.39	35.32	46.00	-10.68	peak	

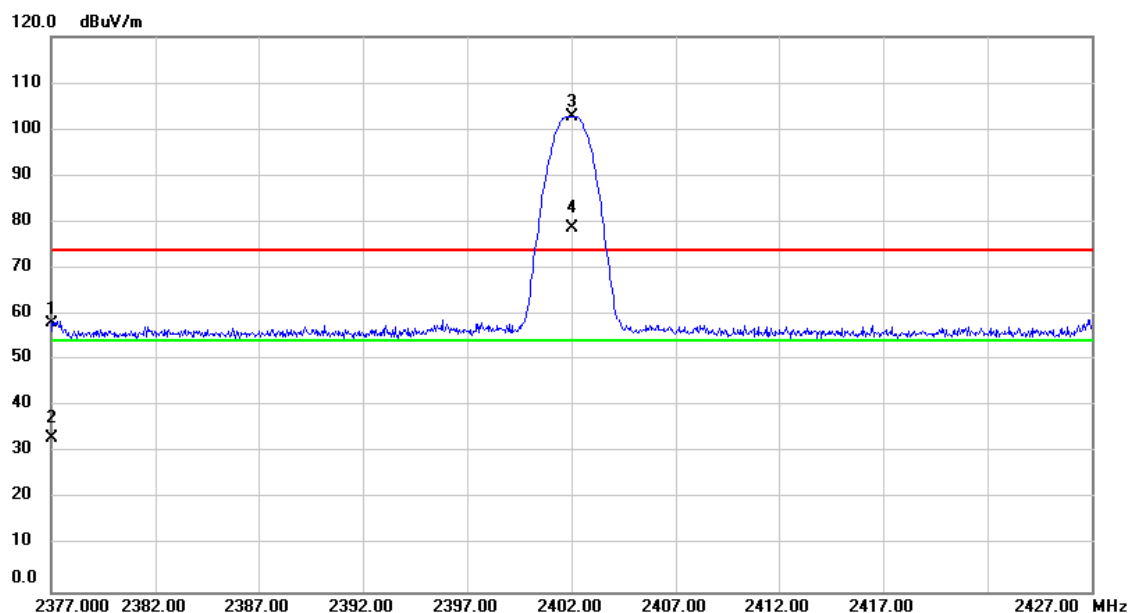
Test Mode	TX G MODE 2412MHz	Polarization	Horizontal
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		155.1300	34.87	-8.58	26.29	43.50	-17.21	peak	
2		199.7500	36.64	-10.90	25.74	43.50	-17.76	peak	
3		250.1900	46.04	-9.10	36.94	46.00	-9.06	peak	
4		350.1000	38.04	-6.20	31.84	46.00	-14.16	peak	
5		450.0100	38.24	-3.80	34.44	46.00	-11.56	peak	
6	*	925.3100	35.05	5.39	40.44	46.00	-5.56	peak	

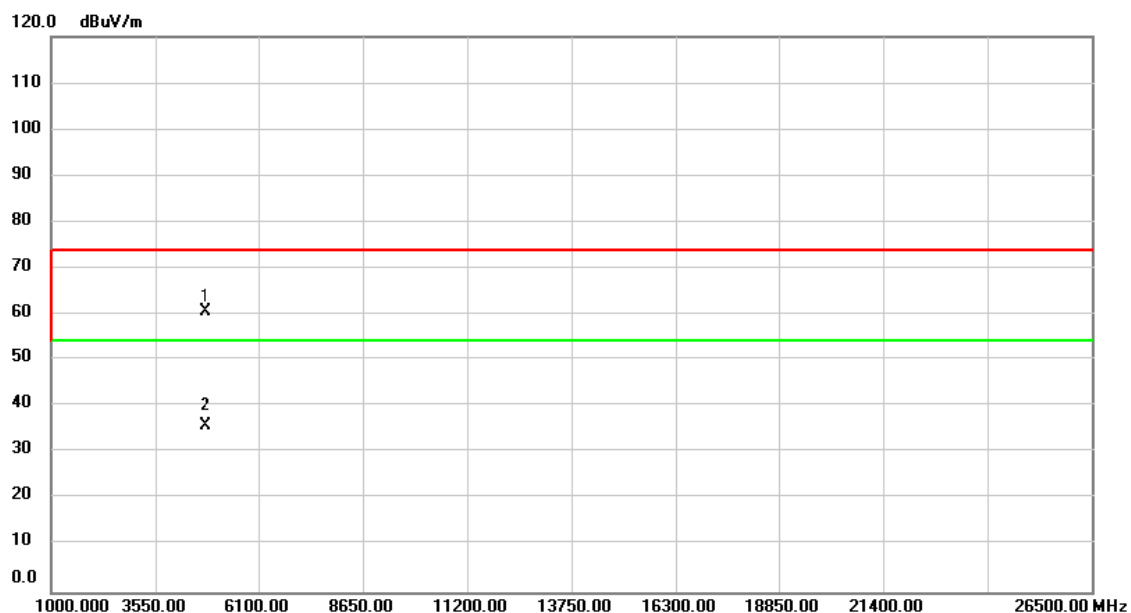
APPENDIX D – RADIATED EMISSION (ABOVE 1000MHZ)

Test Mode	TX Mode 2402MHz _CH00_1Mbps	Polarization	Vertical
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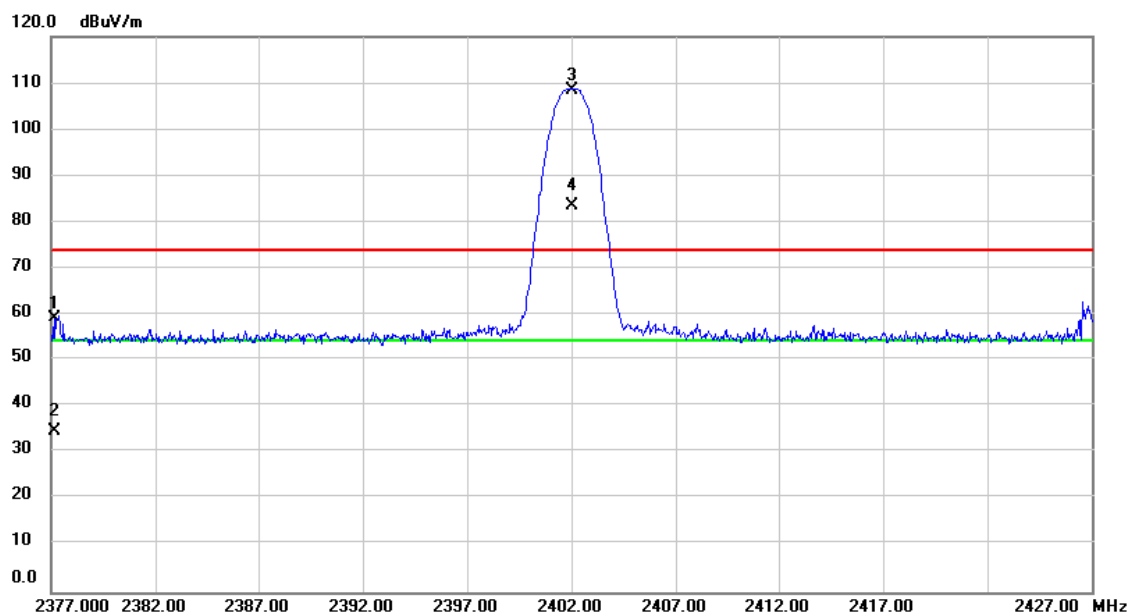
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2377.026	27.18	30.80	57.98	74.00	-16.02	peak	
2		2377.026	2.46	30.80	33.26	54.00	-20.74	AVG	
3	*	2402.000	71.96	30.89	102.85	74.00	28.85	peak	No Limit
4	X	2402.000	47.84	30.89	78.73	54.00	24.73	AVG	No Limit

Test Mode	TX Mode 2402MHz _CH00_1Mbps	Polarization	Vertical
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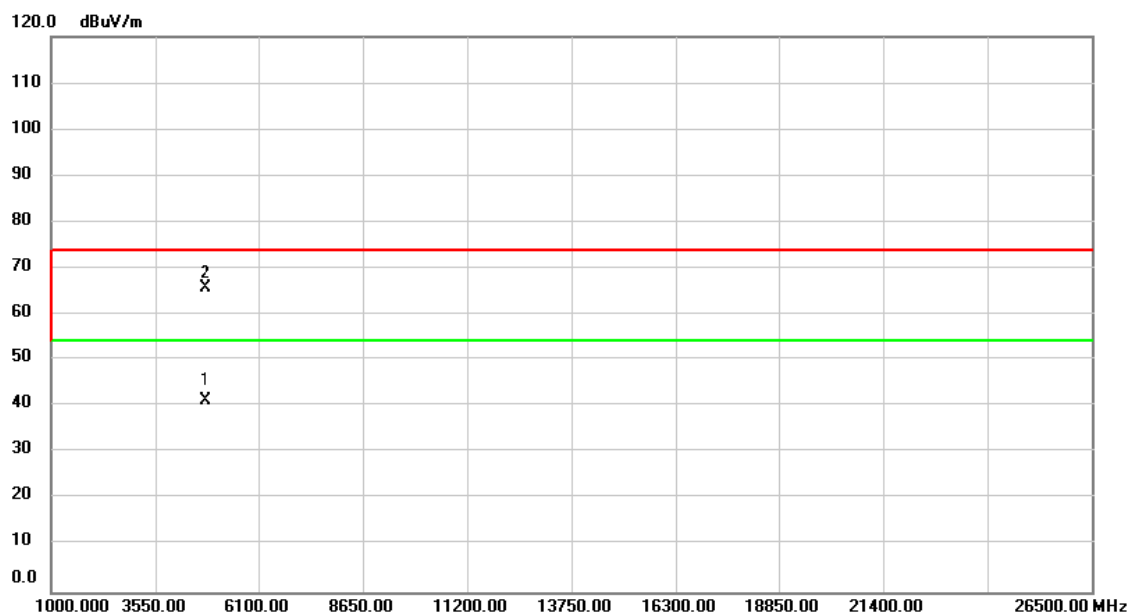
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4804.000	72.20	-11.49	60.71	74.00	-13.29	peak	
2		4804.000	47.48	-11.49	35.99	54.00	-18.01	AVG	

Test Mode	TX Mode 2402MHz _CH00_1Mbps	Polarization	Horizontal
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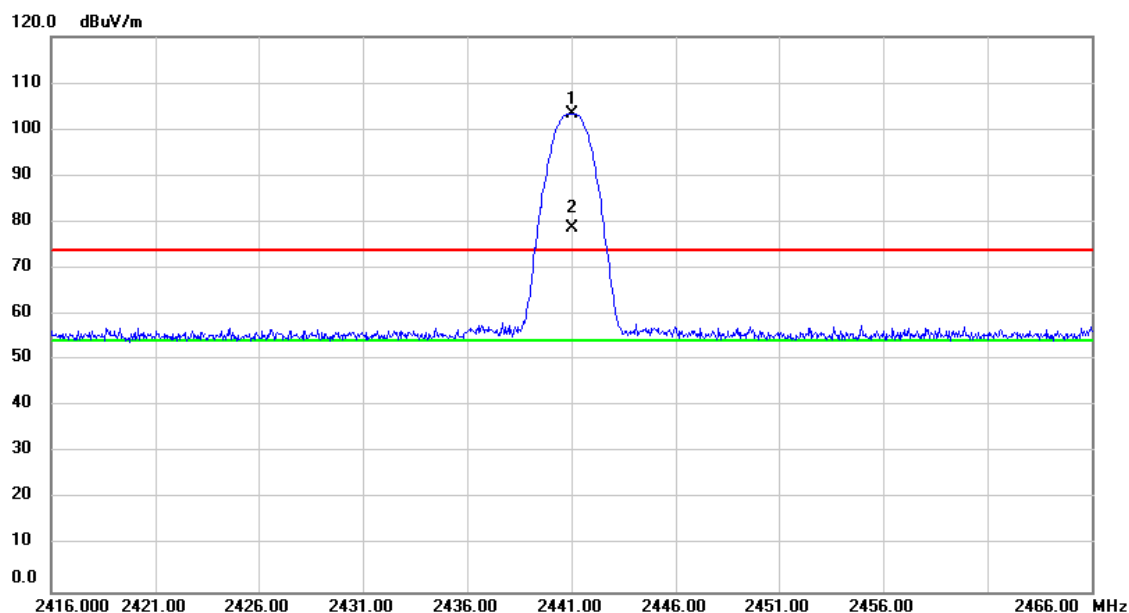
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2377.182	28.45	30.80	59.25	74.00	-14.75	peak	
2		2377.182	3.73	30.80	34.53	54.00	-19.47	AVG	
3	*	2402.000	77.43	30.89	108.32	74.00	34.32	peak	No Limit
4	X	2402.000	52.71	30.89	83.60	54.00	29.60	AVG	No Limit

Test Mode	TX Mode 2402MHz _CH00_1Mbps	Polarization	Horizontal
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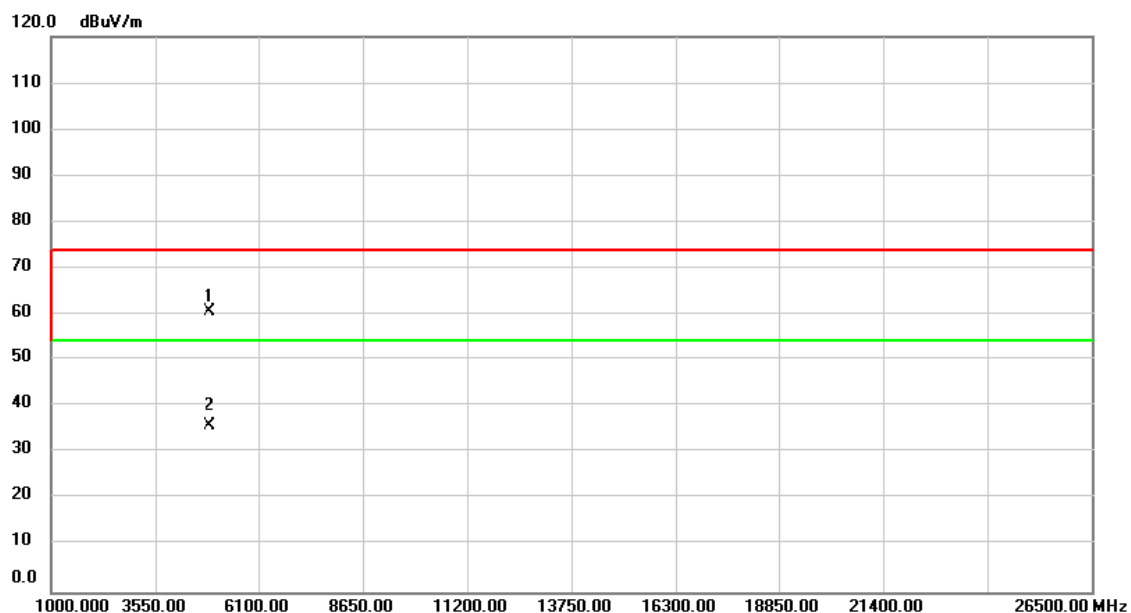
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4803.615	52.77	-11.49	41.28	54.00	-12.72	AVG	
2	*	4804.000	77.49	-11.49	66.00	74.00	-8.00	peak	

Test Mode	TX Mode 2441MHz _CH39_1Mbps	Polarization	Vertical
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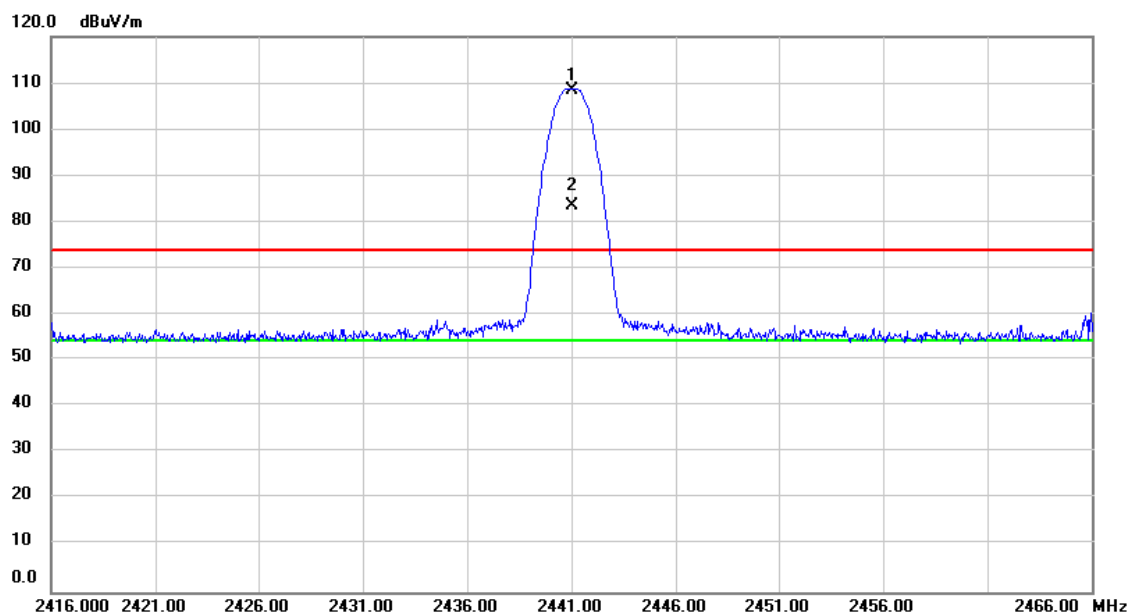
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2441.000	72.31	31.02	103.33	74.00	29.33	peak	No Limit
2	X	2441.000	47.59	31.02	78.61	54.00	24.61	AVG	No Limit

Test Mode	TX Mode 2441MHz _CH39_1Mbps	Polarization	Vertical
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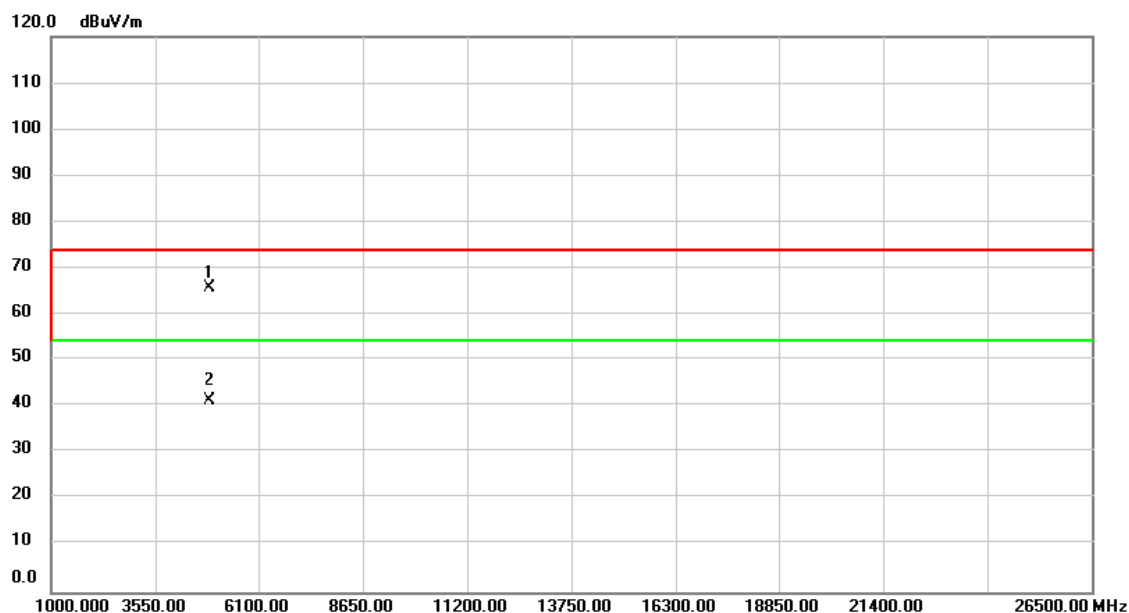
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.000	72.11	-11.42	60.69	74.00	-13.31	peak	
2		4882.000	47.39	-11.42	35.97	54.00	-18.03	AVG	

Test Mode	TX Mode 2441MHz _CH39_1Mbps	Polarization	Horizontal
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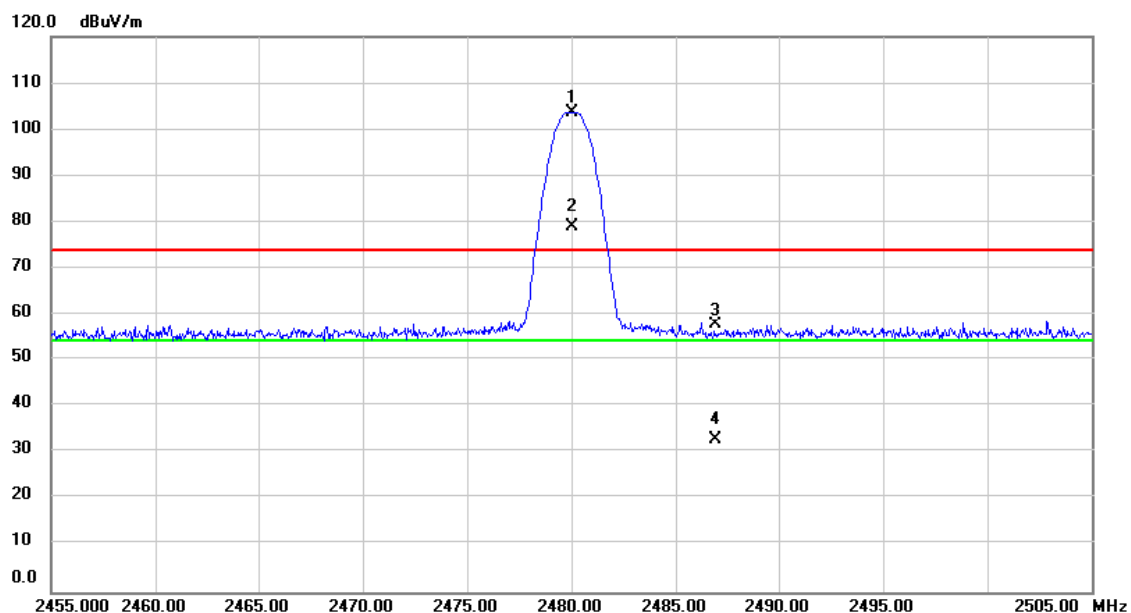
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2441.000	77.34	31.02	108.36	74.00	34.36	peak	No Limit
2	X	2441.000	52.62	31.02	83.64	54.00	29.64	AVG	No Limit

Test Mode	TX Mode 2441MHz _CH39_1Mbps	Polarization	Horizontal
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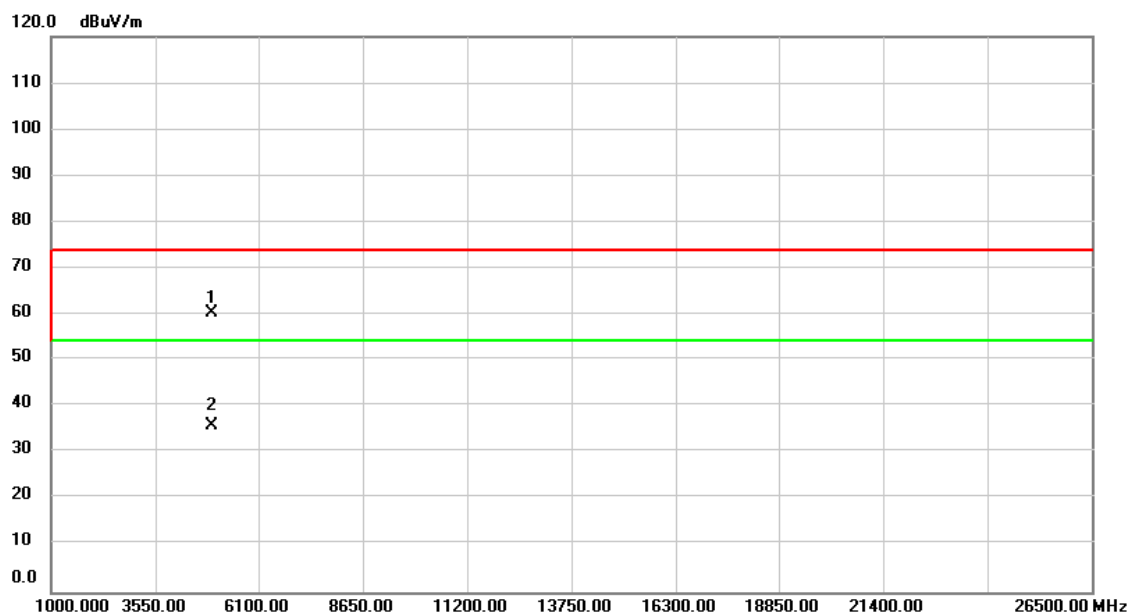
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.000	77.32	-11.42	65.90	74.00	-8.10	peak	
2		4882.000	52.60	-11.42	41.18	54.00	-12.82	AVG	

Test Mode	TX Mode 2480MHz _CH78_1Mbps	Polarization	Vertical
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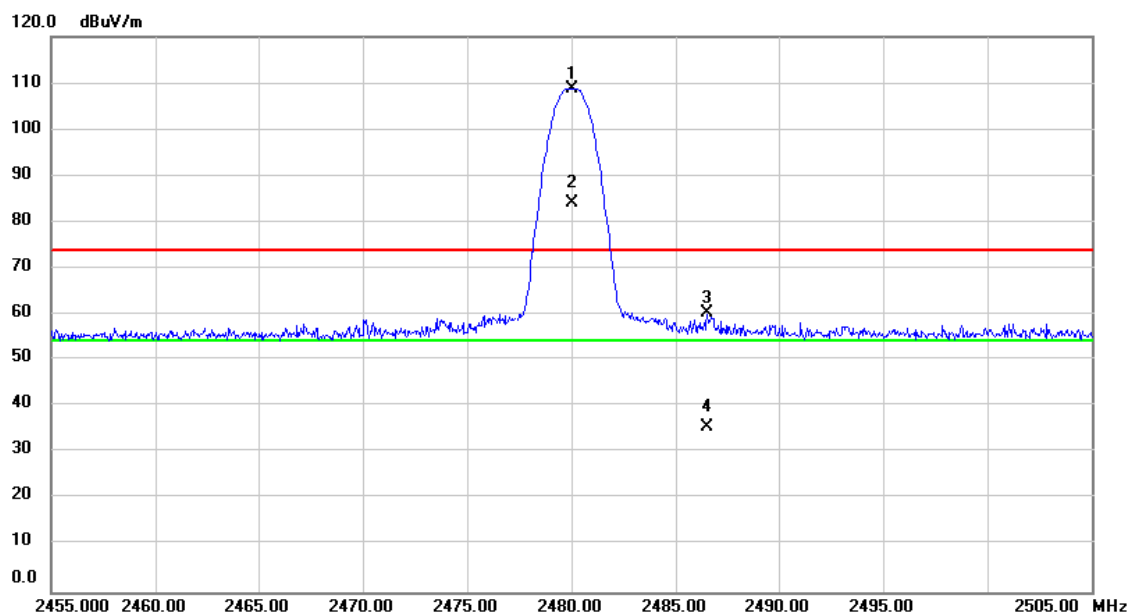
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2480.000	72.61	31.16	103.77	74.00	29.77	peak	No Limit
2	X	2480.000	47.89	31.16	79.05	54.00	25.05	AVG	No Limit
3		2486.932	26.52	31.18	57.70	74.00	-16.30	peak	
4		2486.932	1.80	31.18	32.98	54.00	-21.02	AVG	

Test Mode	TX Mode 2480MHz _CH78_1Mbps	Polarization	Vertical
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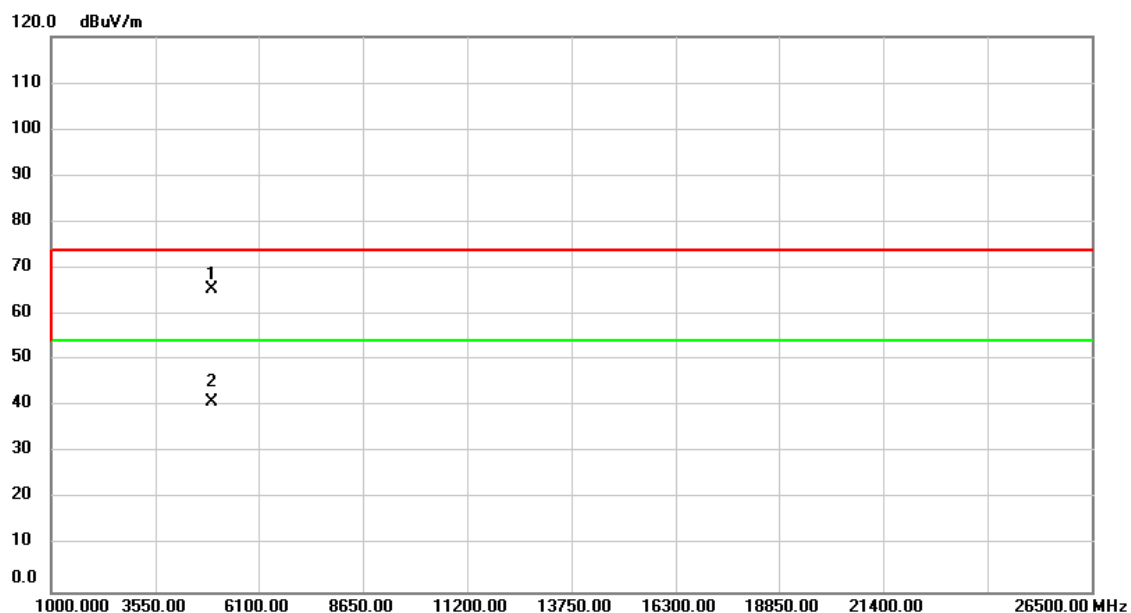
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.000	71.82	-11.33	60.49	74.00	-13.51	peak	
2		4960.000	47.10	-11.33	35.77	54.00	-18.23	AVG	

Test Mode	TX Mode 2480MHz _CH78_1Mbps	Polarization	Horizontal
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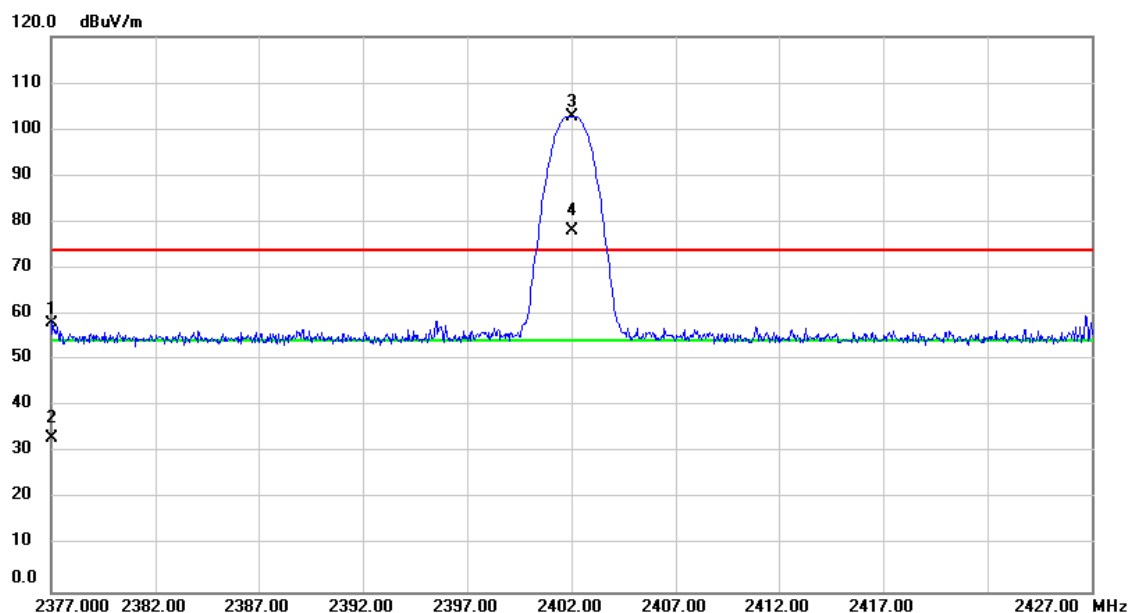
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2480.000	77.70	31.16	108.86	74.00	34.86	peak	No Limit
2	X	2480.000	52.98	31.16	84.14	54.00	30.14	AVG	No Limit
3		2486.470	29.18	31.18	60.36	74.00	-13.64	peak	
4		2486.470	4.46	31.18	35.64	54.00	-18.36	AVG	

Test Mode	TX Mode 2480MHz _CH78_1Mbps	Polarization	Horizontal
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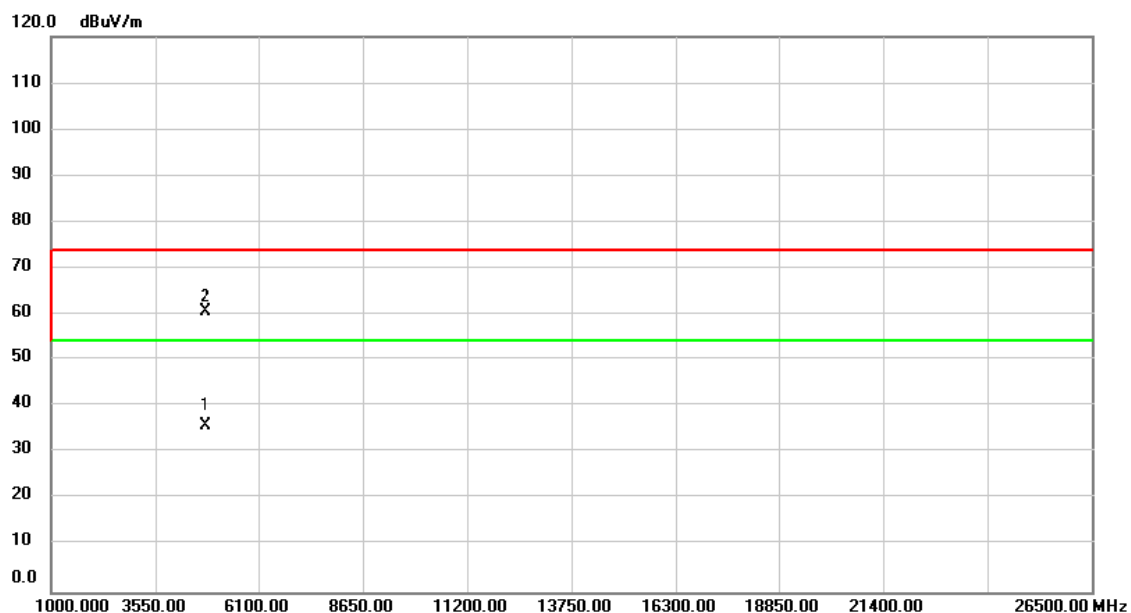
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.000	77.01	-11.33	65.68	74.00	-8.32	peak	
2		4960.000	52.29	-11.33	40.96	54.00	-13.04	AVG	

Test Mode	TX Mode 2402MHz _CH00_ 3Mbps	Polarization	Vertical
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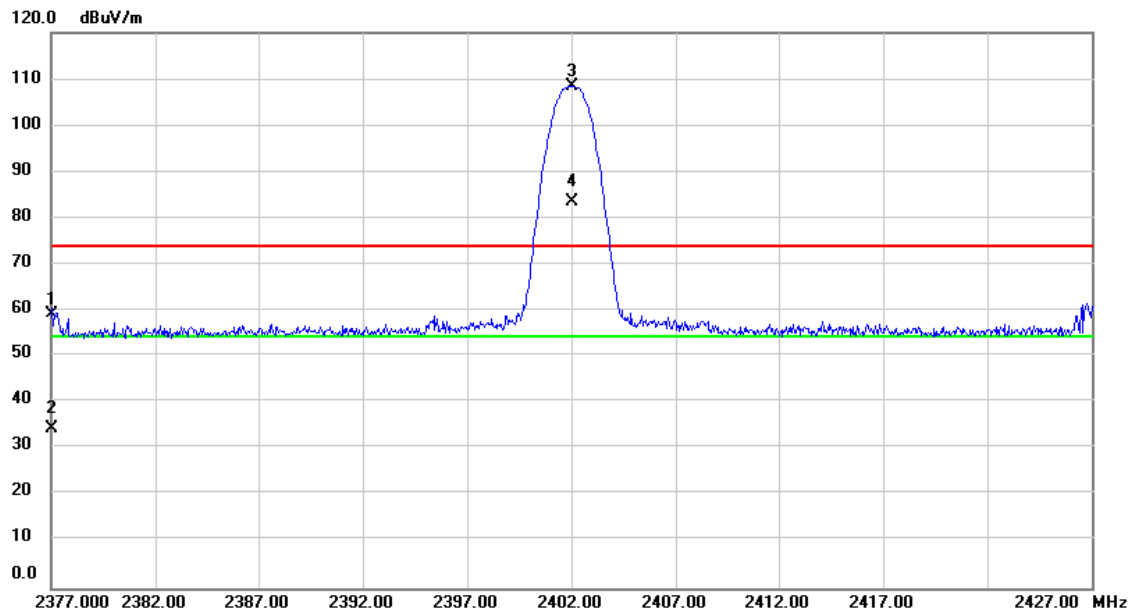
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2377.026	27.11	30.80	57.91	74.00	-16.09	peak	
2		2377.026	2.39	30.80	33.19	54.00	-20.81	AVG	
3	*	2402.000	71.95	30.89	102.84	74.00	28.84	peak	No Limit
4	X	2402.000	47.23	30.89	78.12	54.00	24.12	AVG	No Limit

Test Mode	TX Mode 2402MHz _CH00_3Mbps	Polarization	Vertical
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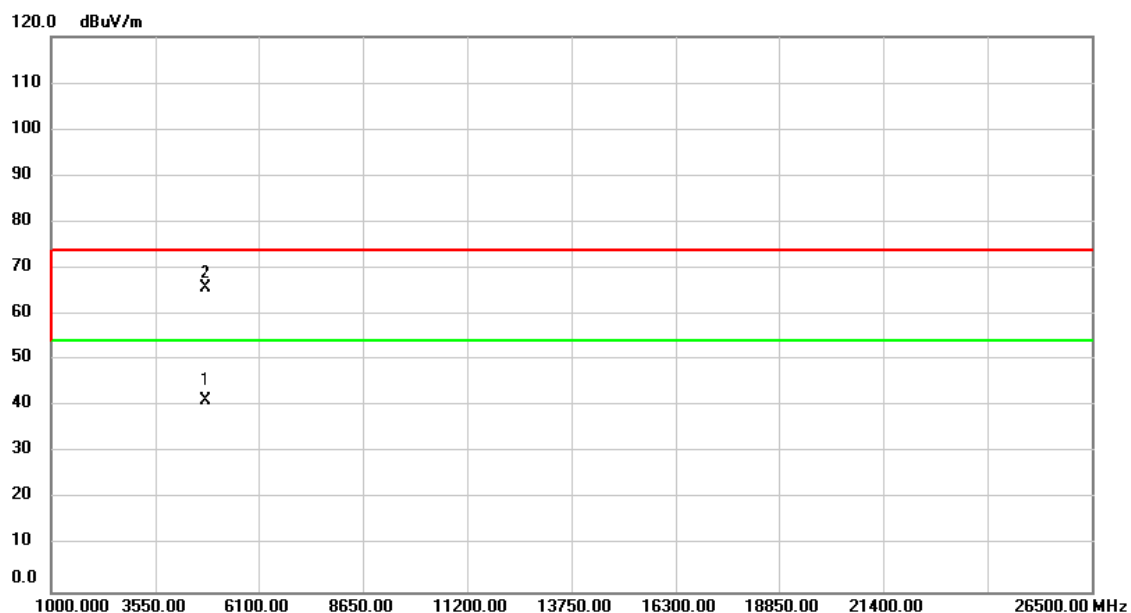
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4803.720	47.43	-11.49	35.94	54.00	-18.06	AVG	
2	*	4804.000	72.15	-11.49	60.66	74.00	-13.34	peak	

Test Mode	TX Mode 2402MHz _CH00_ 3Mbps	Polarization	Horizontal
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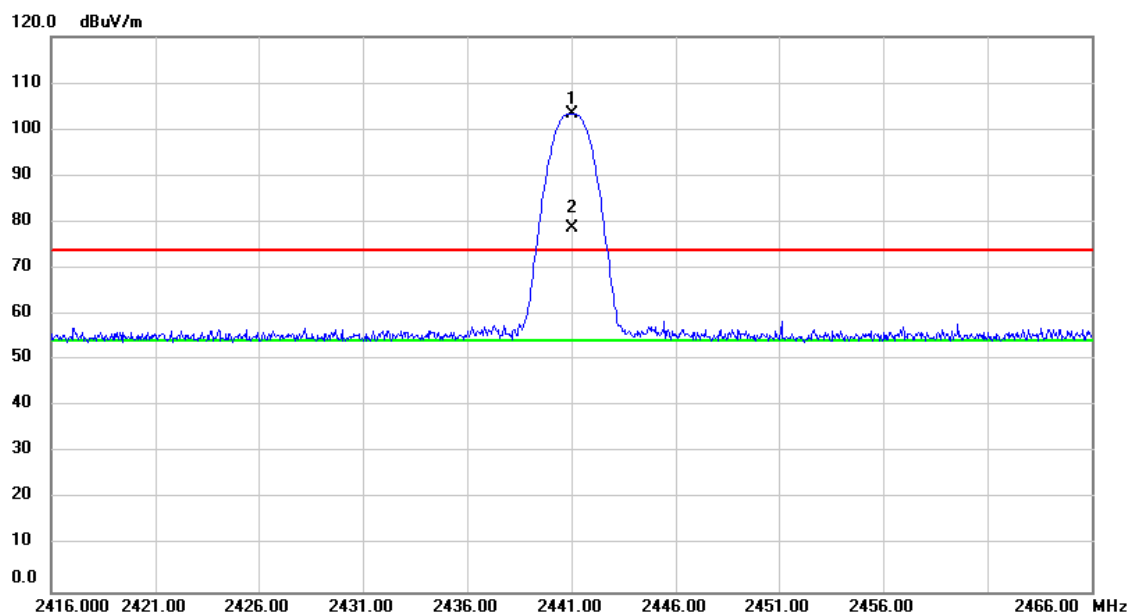
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2377.026	28.39	30.80	59.19	74.00	-14.81	peak	
2		2377.026	3.67	30.80	34.47	54.00	-19.53	AVG	
3	*	2402.000	77.44	30.89	108.33	74.00	34.33	peak	No Limit
4	X	2402.000	52.72	30.89	83.61	54.00	29.61	AVG	No Limit

Test Mode	TX Mode 2402MHz _CH00_ 3Mbps	Polarization	Horizontal
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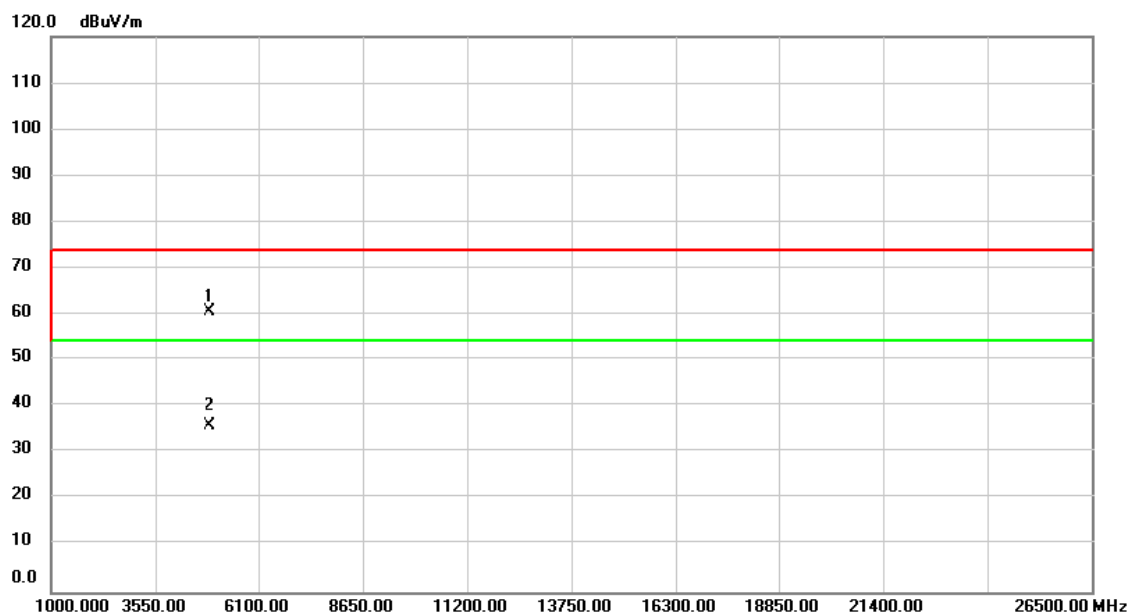
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4803.615	52.73	-11.49	41.24	54.00	-12.76	AVG	
2	*	4804.000	77.45	-11.49	65.96	74.00	-8.04	peak	

Test Mode	TX Mode 2441MHz _CH39_ 3Mbps	Polarization	Vertical
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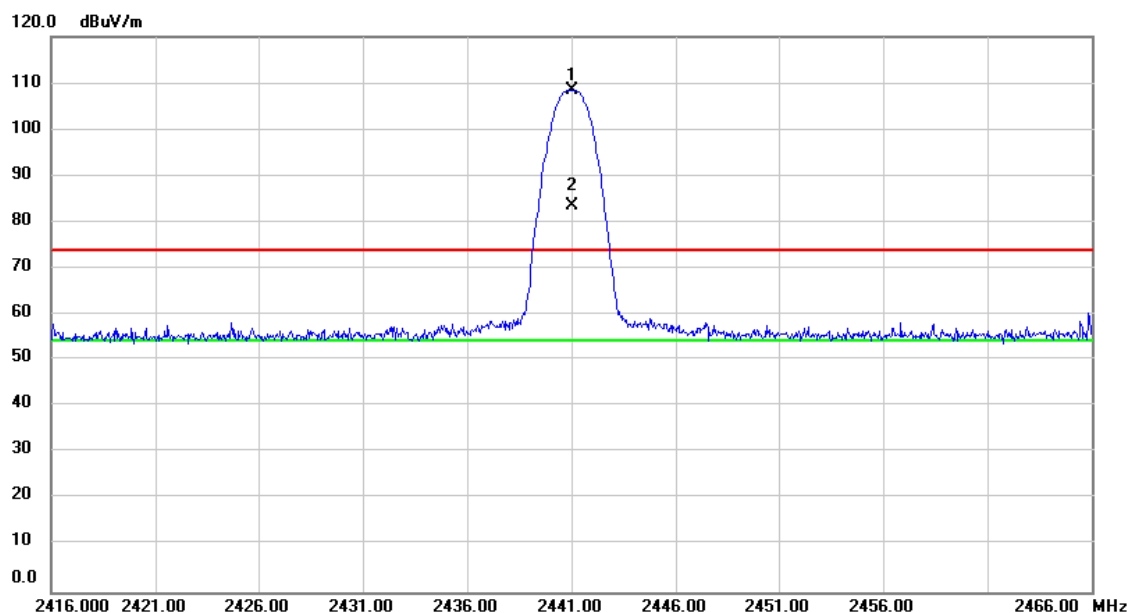
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2441.000	72.32	31.02	103.34	74.00	29.34	peak	No Limit
2	X	2441.000	47.60	31.02	78.62	54.00	24.62	AVG	No Limit

Test Mode	TX Mode 2441MHz _CH39_ 3Mbps	Polarization	Vertical
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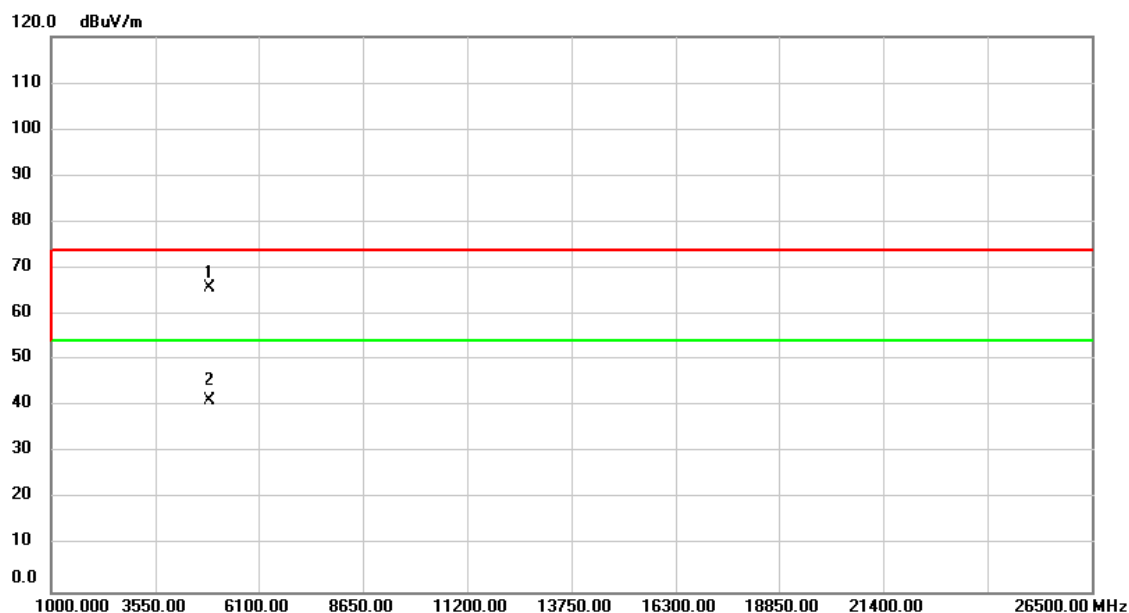
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.000	72.03	-11.42	60.61	74.00	-13.39	peak	
2		4882.000	47.31	-11.42	35.89	54.00	-18.11	AVG	

Test Mode	TX Mode 2441MHz _CH39_ 3Mbps	Polarization	Horizontal
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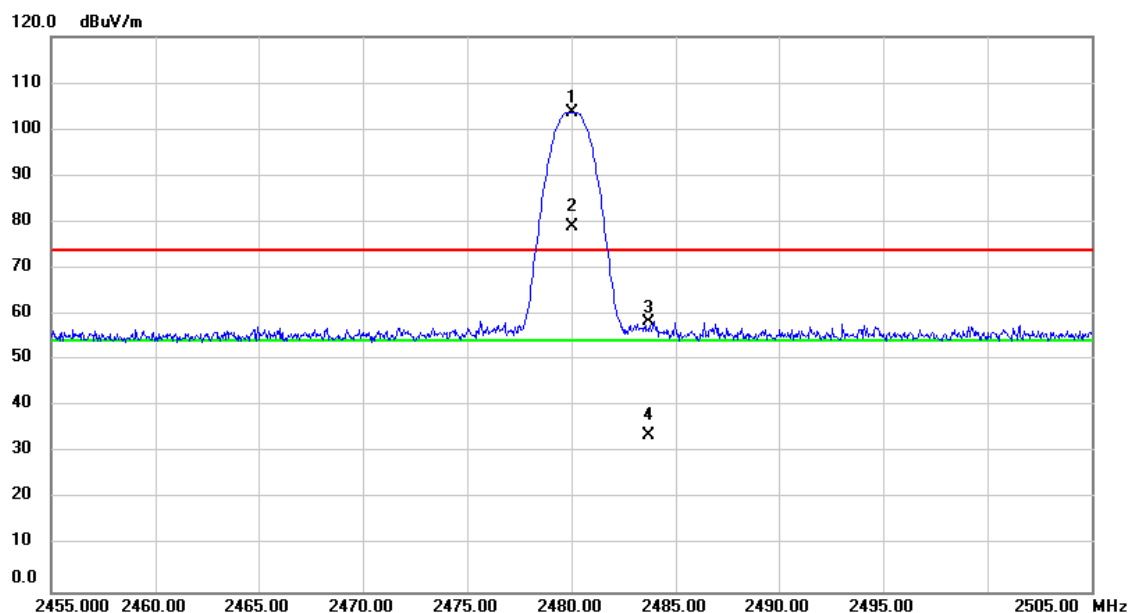
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2441.000	77.37	31.02	108.39	74.00	34.39	peak	No Limit
2	X	2441.000	52.65	31.02	83.67	54.00	29.67	AVG	No Limit

Test Mode	TX Mode 2441MHz _CH39_ 3Mbps	Polarization	Horizontal
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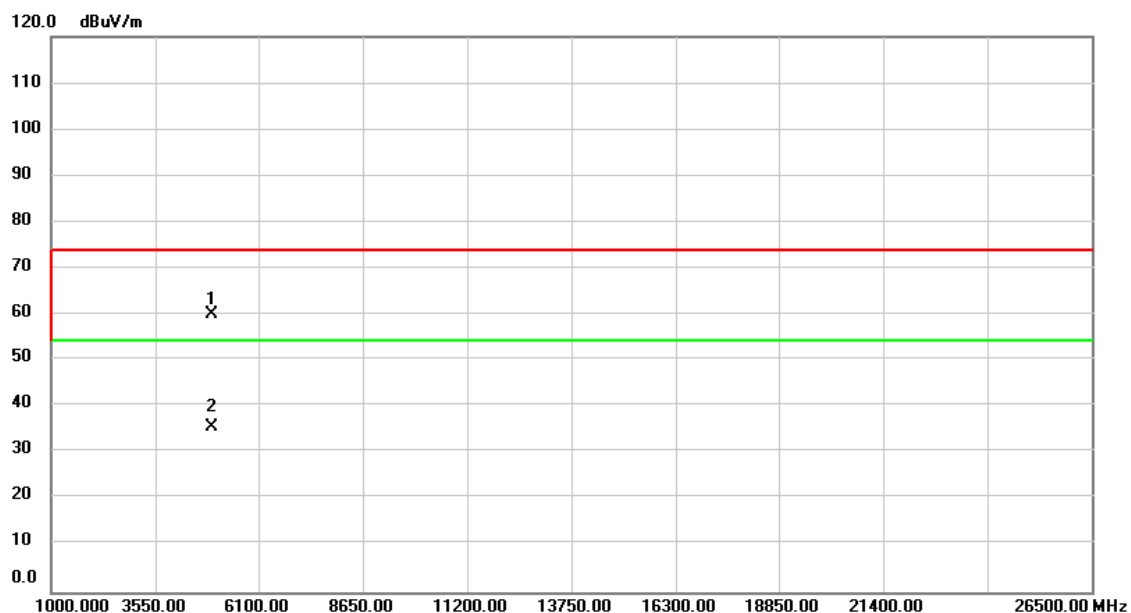
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.000	77.25	-11.42	65.83	74.00	-8.17	peak	
2		4882.275	52.53	-11.42	41.11	54.00	-12.89	AVG	

Test Mode	TX Mode 2480MHz _CH78_ 3Mbps	Polarization	Vertical
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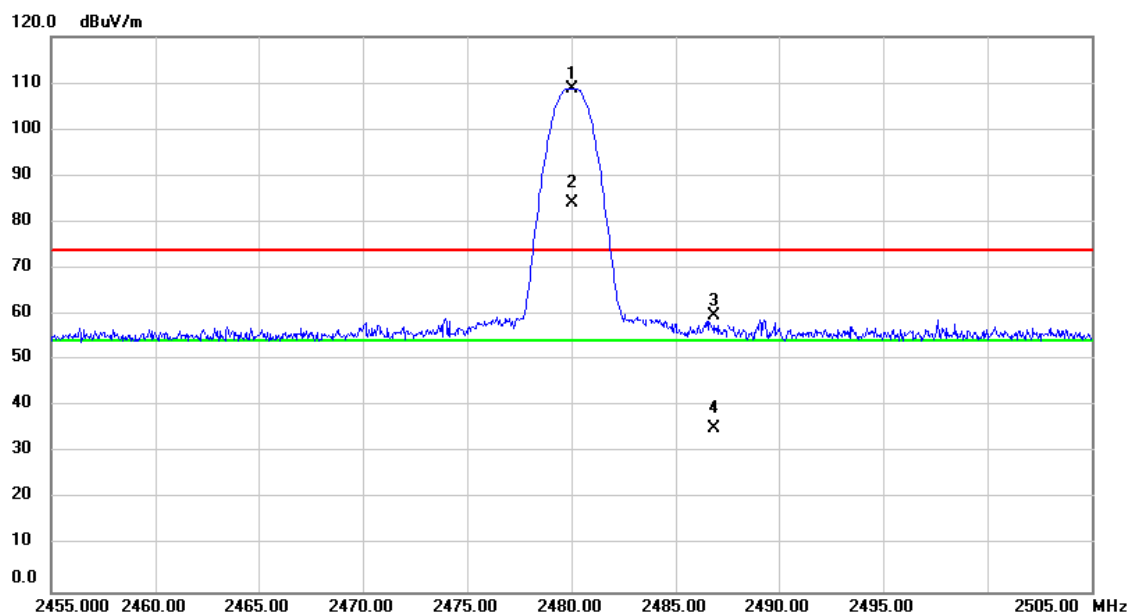
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2480.000	72.60	31.16	103.76	74.00	29.76	peak	No Limit
2	X	2480.000	47.88	31.16	79.04	54.00	25.04	AVG	No Limit
3		2483.698	27.25	31.17	58.42	74.00	-15.58	peak	
4		2483.698	2.53	31.17	33.70	54.00	-20.30	AVG	

Test Mode	TX Mode 2480MHz _CH78_ 3Mbps	Polarization	Vertical
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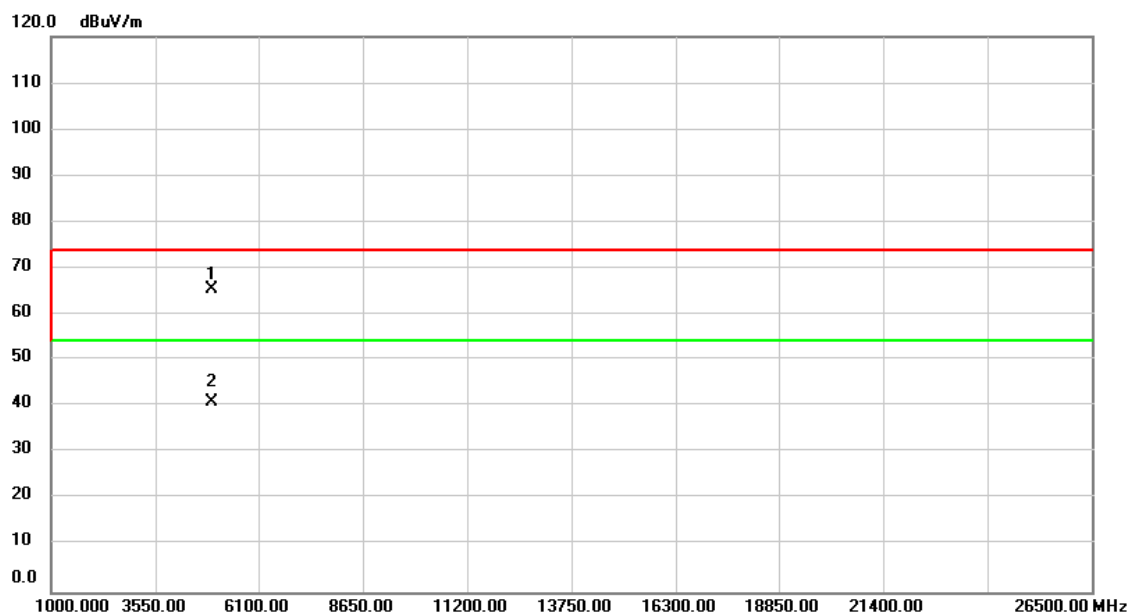
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.000	71.56	-11.33	60.23	74.00	-13.77	peak	
2		4960.000	46.84	-11.33	35.51	54.00	-18.49	AVG	

Test Mode	TX Mode 2480MHz _CH78_ 3Mbps	Polarization	Horizontal
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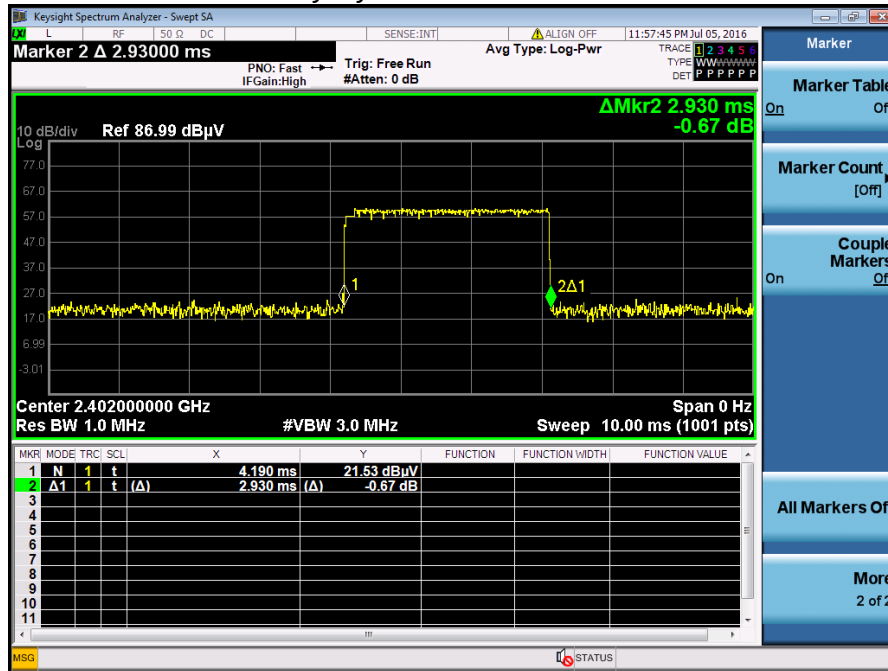
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2480.000	77.68	31.16	108.84	74.00	34.84	peak	No Limit
2	X	2480.000	52.96	31.16	84.12	54.00	30.12	AVG	No Limit
3		2486.833	28.70	31.18	59.88	74.00	-14.12	peak	
4		2486.833	3.98	31.18	35.16	54.00	-18.84	AVG	

Test Mode	TX Mode 2480MHz _CH78_ 3Mbps	Polarization	Horizontal
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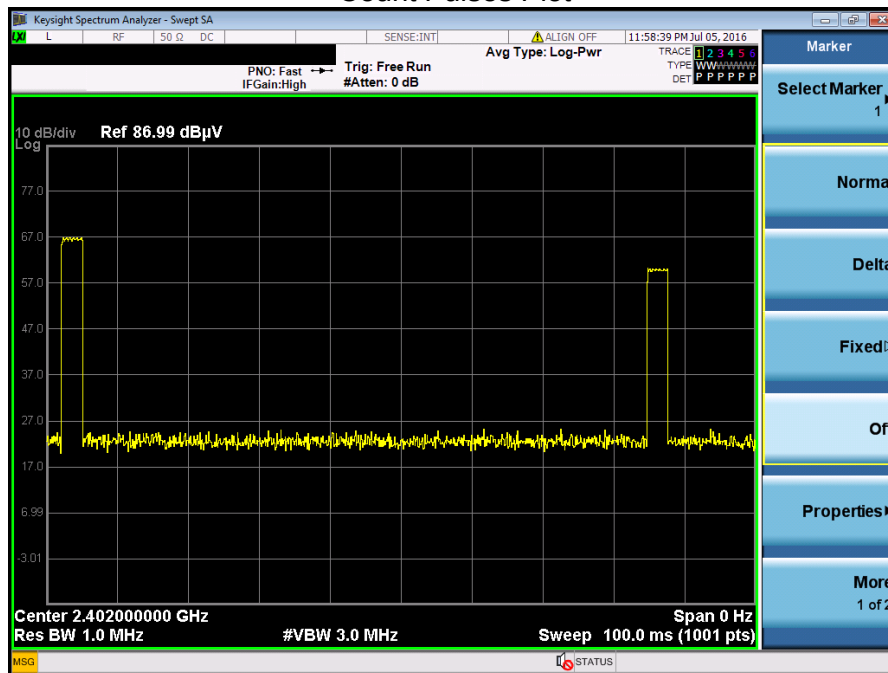


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.000	76.98	-11.33	65.65	74.00	-8.35	peak	
2		4960.000	52.26	-11.33	40.93	54.00	-13.07	AVG	

Duty Cycle Correction Factor



Count Pulses Plot



$$20\log(\text{Dwell Time}/100\text{ms})=20\log(\text{Time On}*\text{Number of hopping}/100\text{ms})$$

Time On(ms)	Number of hopping	Dwell Time	20log(Dwell Time/100ms)
2.905	2	5.81	-24.72

The average values are:

Average = Peak value + 20log (Dwell Time/100ms).

Where the duty factor is calculated from following formula:

$$20\log (\text{Dwell Time}/100\text{ms}) = 20\log (5.81/100) = -24.72$$

Please see as below for plotted duty.

APPENDIX – REFERENCE INFORMATION

Normal Condition Power Table

Test Mode	BT EDR
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	Frequency (MHz)	ANT-0		Total Power		Limit	
		Peak	Average	Peak	Average	Peak	PASS/ Fail
		dBm	dBm	dBm	dBm	dBm	
1M_DH5	2402	10.76	10.63	10.76	10.63	21.00	PASS
1M_DH5	2441	10.81	10.69	10.81	10.69	21.00	PASS
1M_DH5	2480	10.46	10.32	10.46	10.32	21.00	PASS
3M_DH5	2402	7.83	5.16	7.83	5.16	21.00	PASS
3M_DH5	2441	7.75	5.04	7.75	5.04	21.00	PASS
3M_DH5	2480	7.37	4.55	7.37	4.55	21.00	PASS