

FCC Radio Test Report

FCC ID: H4IDG9088

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

Project No. : 1705021
Equipment : 2.4GHz Dongle
Test Model : SD-9088
Serial Model : N/A
Applicant : Lite-On Technology Corporation
Address : 16F, 392, Ruey Kuang Road, NeiHu, Taipei 11492,
Taiwan, R.O.C.

Date of Receipt : May 08, 2017
Date of Test : May 08, 2017 ~ Jun. 01, 2017
Issued Date : Jun. 03, 2017
Tested by : BTL Inc.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1705021	Original Issue.	Jun. 03, 2017

1. CERTIFICATION

Equipment : 2.4GHz Dongle
Brand Name : DELL
Test Model : SD-9088
Serial Model : N/A
Applicant : Lite-On Technology Corporation
Date of Test : May 08, 2017 ~ Jun. 01, 2017
Test Sample : Engineering Sample
Standard(s) : FCC Part15, Subpart C (15.249) / 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-1-1705021) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

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

NOTE:

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

2.1 TEST FACILITY

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

Conducted emission Test:

C05: (VCCI RN: C-4742; FCC RN:355421; FCC DN:TW1099)

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

Radiated emission Test (Below 1 GHz):

CB15: (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 (Above 1 GHz):

CB15: (FCC RN:674415; FCC DN:TW0659)

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. Conducted emission test:

Test Site	Method	Measurement Frequency Range	U, (dB)
C05	CISPR	150 kHz ~ 30MHz	3.06

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (3m)	CISPR	9kHz ~ 150kHz	2.96
		150kHz ~ 30MHz	2.74

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	30MHz ~ 200MHz	V	4.76
		30MHz ~ 200MHz	H	4.28
		200MHz ~ 1,000MHz	V	5.08
		200MHz ~ 1,000MHz	H	4.50

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	1GHz ~ 6GHz	V	4.48
		1GHz ~ 6GHz	H	4.50
		6GHz ~ 18GHz	V	4.30
		6GHz ~ 18GHz	H	4.14

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (1m)	CISPR	18 ~ 26.5 GHz	4.72
		26.5 ~ 40 GHz	5.20

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	2.4GHz Dongle	
Brand	DELL	
Test Model	SD-9088	
Series Model	N/A	
Model Difference	N/A	
Product Description	Operation Frequency	2405-2474 MHz
	Modulation Technology	GFSK
	Bit Rate of Transmitter	1 Mbps
	Field Strength	46.30 dBuV/m (AVG Max) 71.60 dBuV/m (Peak Max)
Power Source	Supplied from USB Port.	
EUT Power Rating	DC 5V	

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- Channel List:

Channel	Frequency (MHz)
01	2405
02	2407
03	2418
04	2426
05	2430
06	2437
07	2442
08	2447
09	2458
10	2469
11	2471
12	2474

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Printed	N/A	3.58

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:

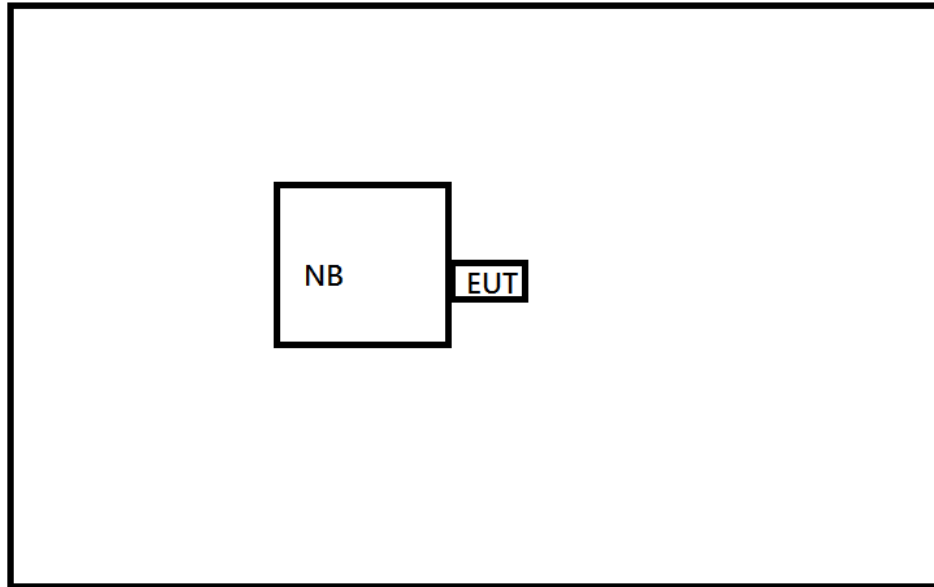
For Conducted Test	
Final Test Mode	Description
Mode 1	TX Mode

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.
-	Notebook PC	ASUS	X450J	N/A	N/A

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

Note:

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

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

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

Note:

- (1) The limit of " * " decreases with the logarithm of the frequency
- (2) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss - Amplifier Gain(if use)
 Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

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

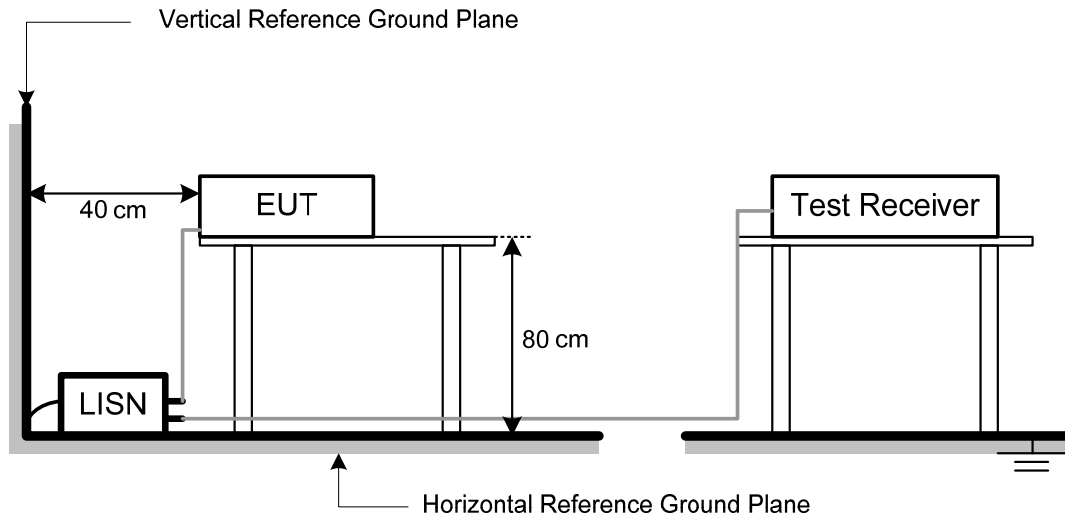
4.1.2 TEST PROCEDURE

- 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



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: 55%
 Test Voltage: AC 120V/60Hz (System)

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 (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

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 2405 MHz (1 Mbps)

Duty Cycle = ON/(ON+OFF)

ON: = 0.445 msec

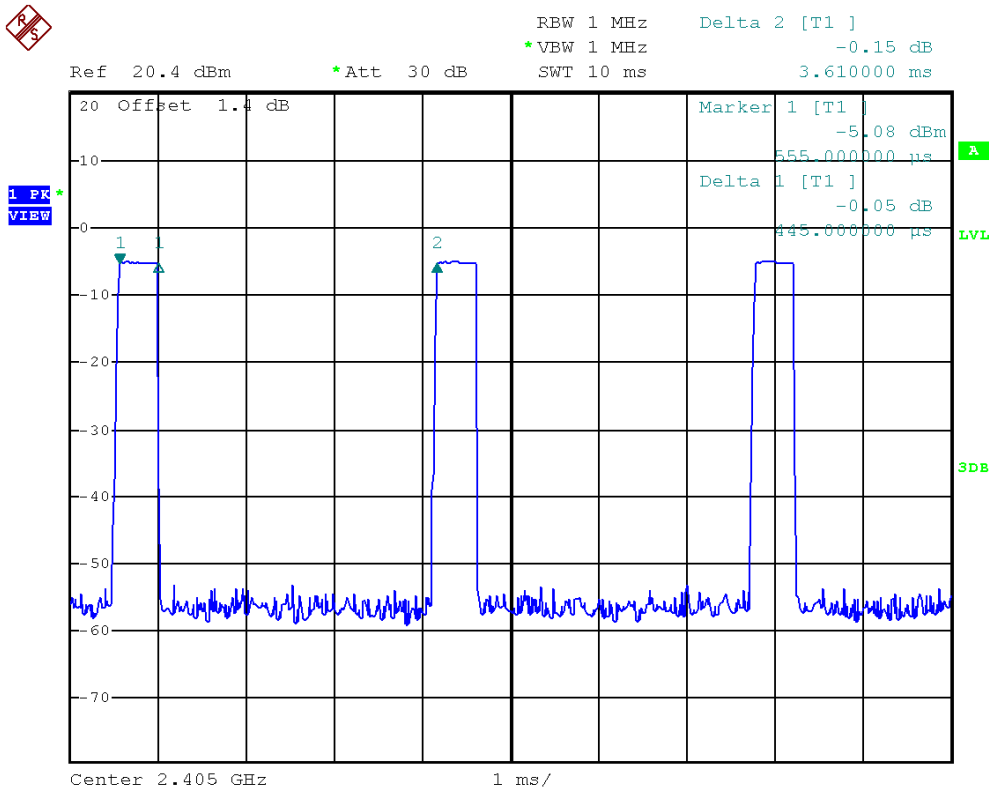
ON+OFF (total time): 3.61 msec

Duty Cycle: 12.33 %

AV = PK + 20 log(Duty Factor)

AV = PK + 0

Total time (ON+OFF) = 3.61 msec, ON = 0.445 msec



Date: 16.MAY.2017 16:47:15

4.2.2 TEST PROCEDURE

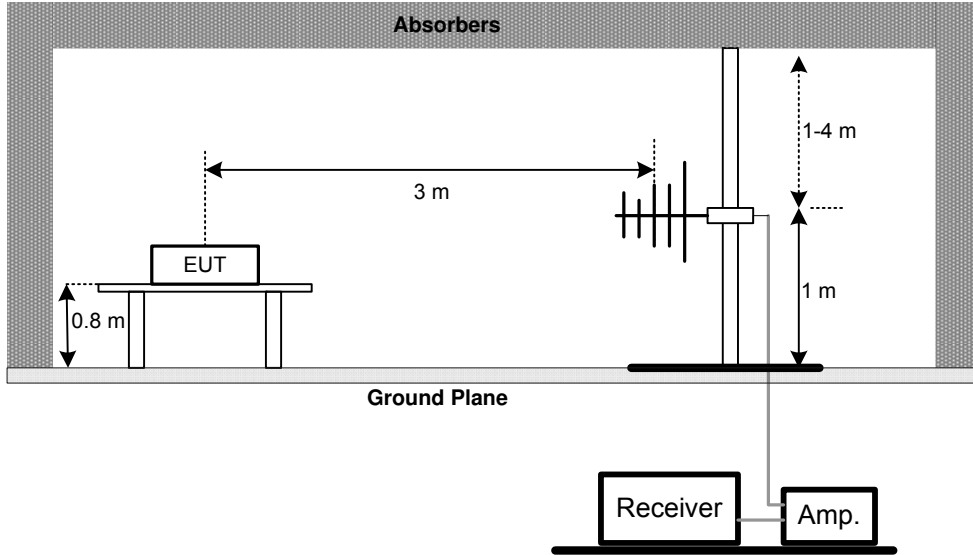
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance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

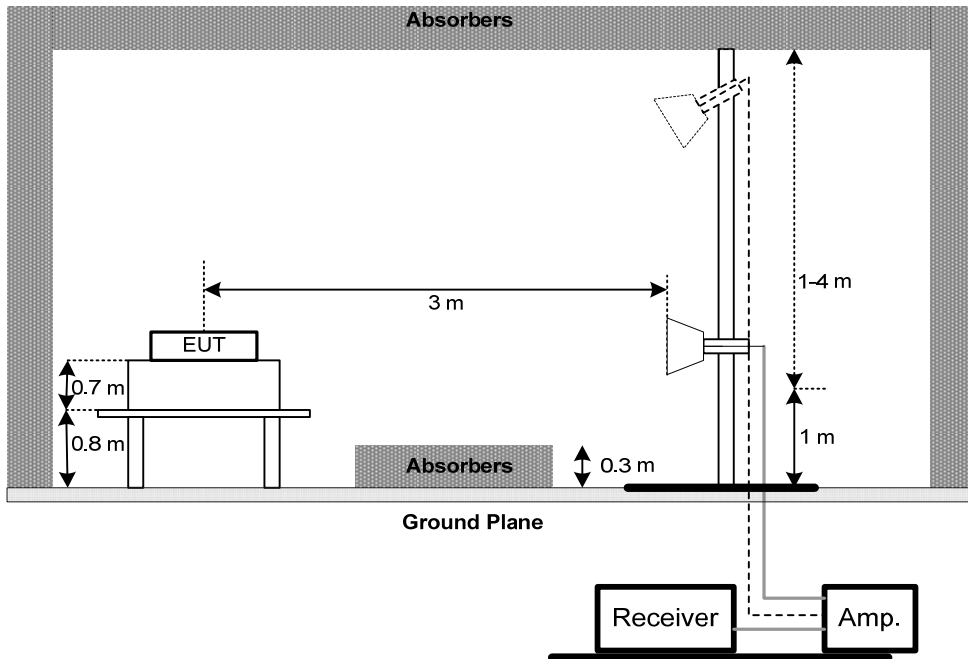
No deviation

4.2.4 TEST SETUP

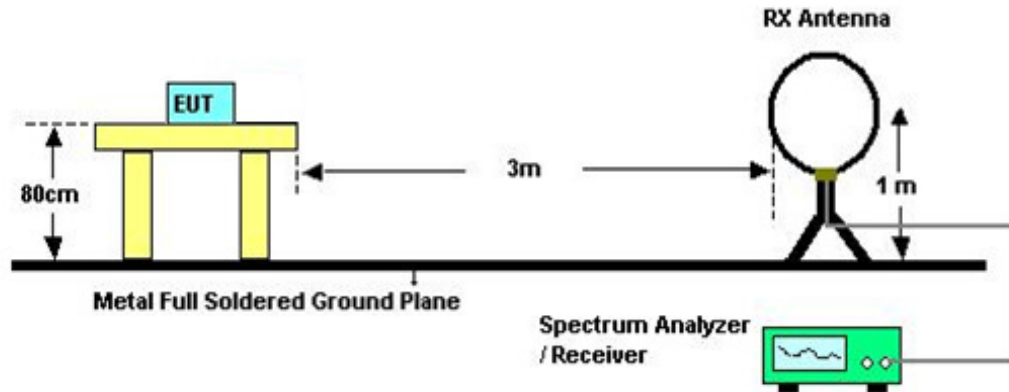
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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

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

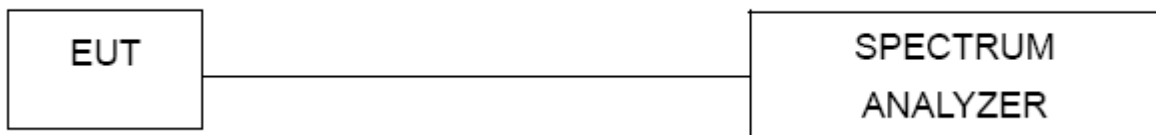
5.1 TEST PROCEDURE

- 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: AC 120V/60Hz (System)

5.6 TEST RESULTS

Please refer to the Attachment E.

6. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Jan. 25, 2018
2	Test Cable	TIMES	CFD300-NL	C02	Jun. 15, 2017
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 09, 2017
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. 28, 2018
2	Preamplifier	EMCI	EMC02325	980217	Dec. 29, 2017
3	Test Cable	EMCI	EMC104-SM-S M-8000	8m	Jan. 04, 2018
4	Test Cable	EMCI	EMC104-SM-S M-800	150207	Jan. 04, 2018
5	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan. 04, 2018
6	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 09, 2018
7	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 22, 2018
8	Loop Ant	EMCO	6502	42960	Nov. 24, 2017
9	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 28, 2018
10	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 16, 2018
11	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 16, 2018

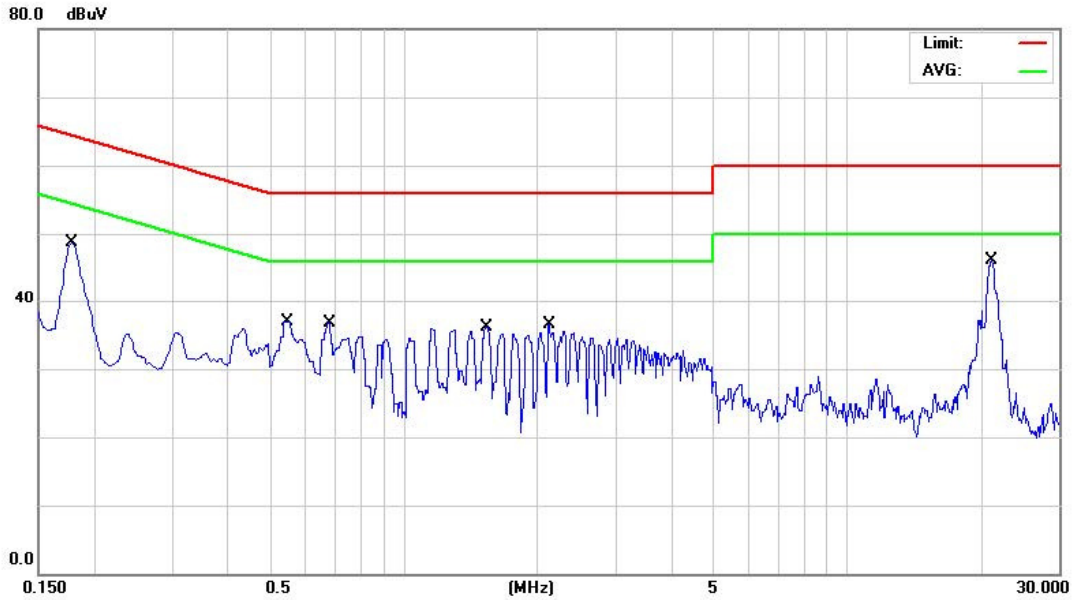
Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

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

ATTACHMENT A - CONDUCTED EMISSION

Test Mode: TX Mode

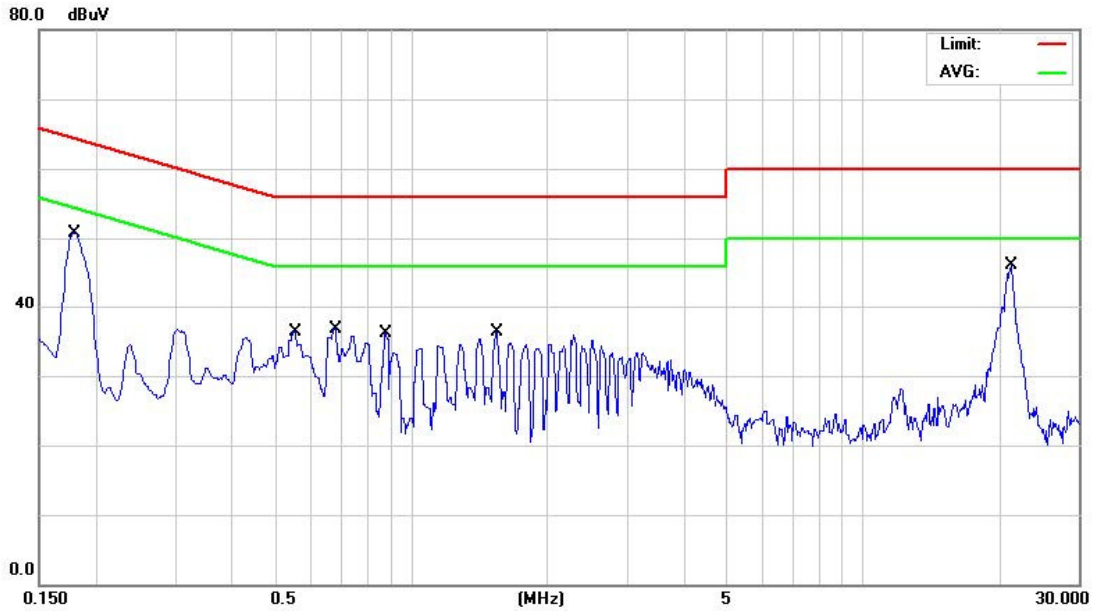
Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1780	35.50	9.75	45.25	64.57	-19.32	QP	
2	*	0.1780	31.20	9.75	40.95	54.57	-13.62	AVG	
3		0.5450	21.70	9.76	31.46	56.00	-24.54	QP	
4		0.5450	16.80	9.76	26.56	46.00	-19.44	AVG	
5		0.6800	22.60	9.77	32.37	56.00	-23.63	QP	
6		0.6800	18.30	9.77	28.07	46.00	-17.93	AVG	
7		1.5350	22.20	9.82	32.02	56.00	-23.98	QP	
8		1.5350	16.50	9.82	26.32	46.00	-19.68	AVG	
9		2.1199	17.90	9.83	27.73	56.00	-28.27	QP	
10		2.1199	5.50	9.83	15.33	46.00	-30.67	AVG	
11		21.1000	32.00	9.98	41.98	60.00	-18.02	QP	
12		21.1000	23.10	9.98	33.08	50.00	-16.92	AVG	

Test Mode: TX Mode

Neutral

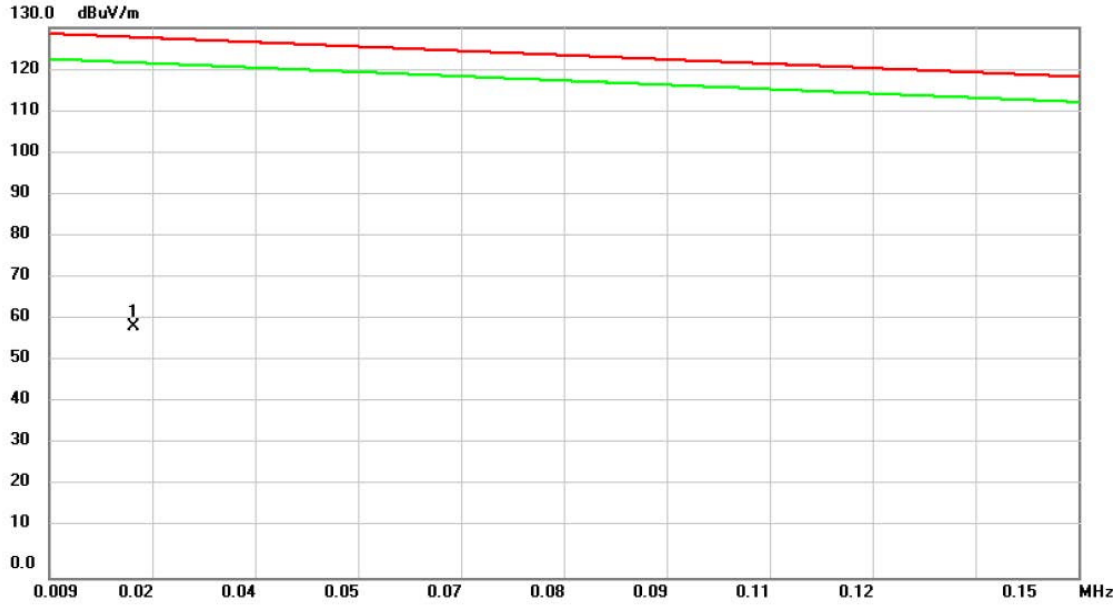


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1794	36.10	9.68	45.78	64.51	-18.73	QP	
2	*	0.1794	31.50	9.68	41.18	54.51	-13.33	AVG	
3		0.5540	22.70	9.70	32.40	56.00	-23.60	QP	
4		0.5540	19.20	9.70	28.90	46.00	-17.10	AVG	
5		0.6800	22.10	9.71	31.81	56.00	-24.19	QP	
6		0.6800	16.80	9.71	26.51	46.00	-19.49	AVG	
7		0.8780	23.40	9.74	33.14	56.00	-22.86	QP	
8		0.8780	12.40	9.74	22.14	46.00	-23.86	AVG	
9		1.5440	21.80	9.77	31.57	56.00	-24.43	QP	
10		1.5440	16.10	9.77	25.87	46.00	-20.13	AVG	
11		21.2000	32.40	10.04	42.44	60.00	-17.56	QP	
12		21.2000	24.00	10.04	34.04	50.00	-15.96	AVG	

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

Test Mode TX Mode_2405 MHz

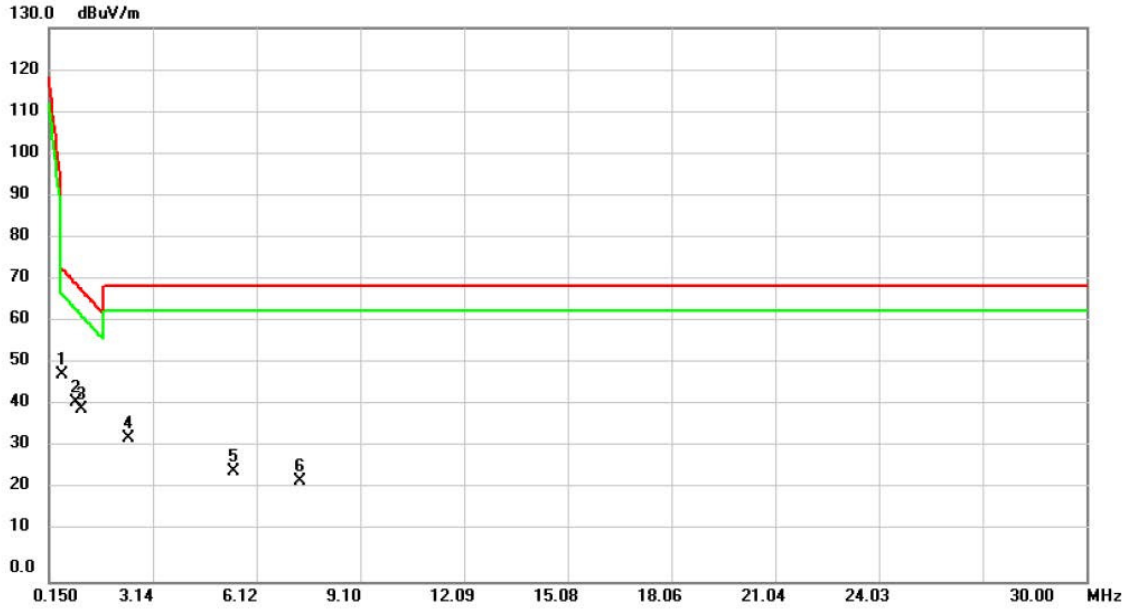
Open



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0206	41.74	17.59	59.33	127.68	-68.35	peak	

Test Mode TX Mode_2405 MHz

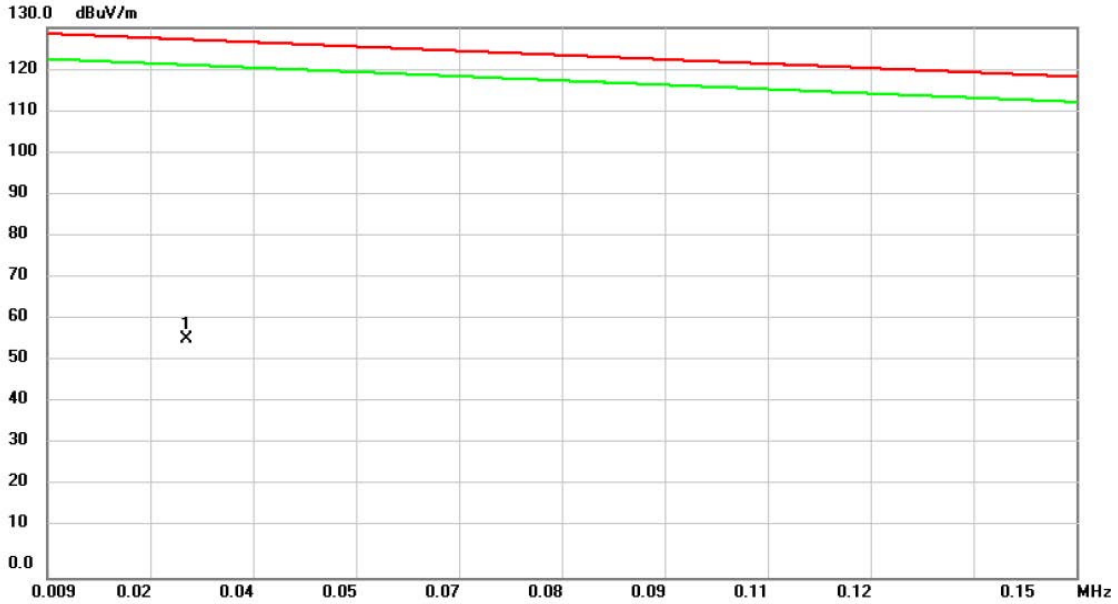
Open



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	0.5381	36.67	11.82	48.49	73.37	-24.88	peak	
2		0.9261	30.04	11.97	42.01	69.91	-27.90	peak	
3		1.1050	28.50	11.95	40.45	68.32	-27.87	peak	
4		2.4186	22.39	11.36	33.75	69.54	-35.79	peak	
5		5.4633	14.46	11.39	25.85	69.54	-43.69	peak	
6		7.3737	12.21	11.35	23.56	69.54	-45.98	peak	

Test Mode TX Mode_2405 MHz

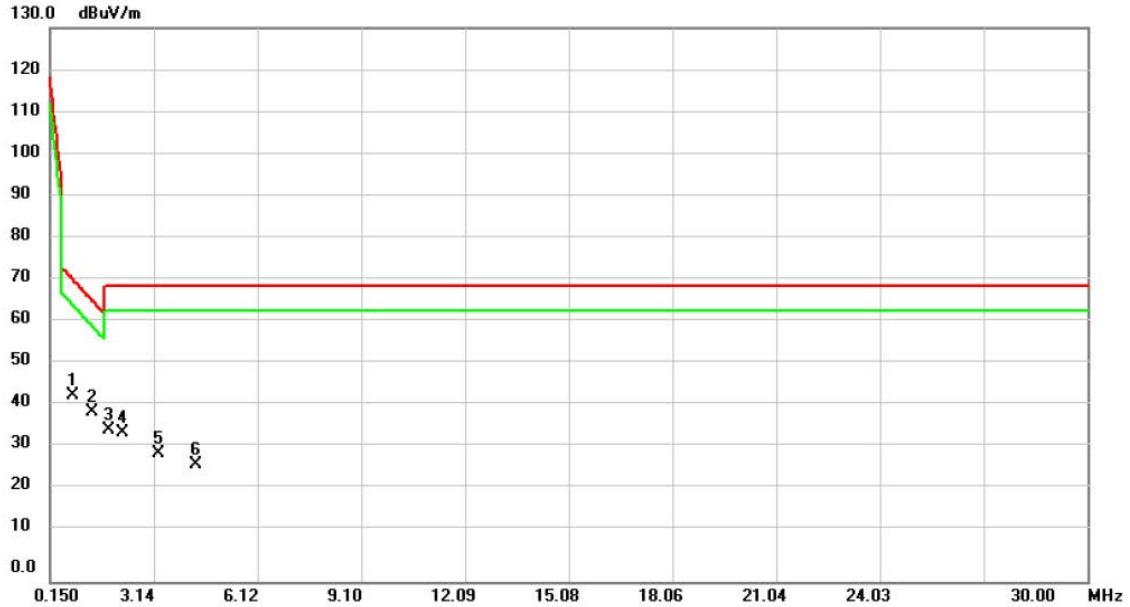
Close



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0280	40.72	15.55	56.27	127.15	-70.88	peak	

Test Mode TX Mode_2405 MHz

Close

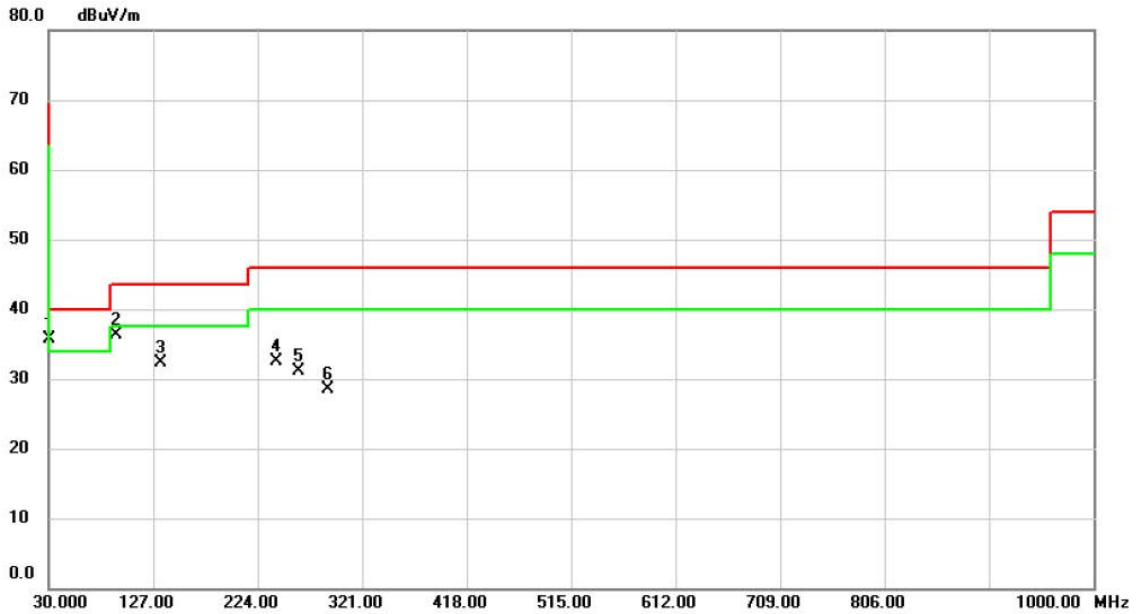


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.8064	31.89	11.92	43.81	70.98	-27.17	peak	
2	*	1.3440	28.07	11.85	39.92	66.19	-26.27	peak	
3		1.8511	24.01	11.62	35.63	69.54	-33.91	peak	
4		2.2395	23.52	11.44	34.96	69.54	-34.58	peak	
5		3.2841	19.08	11.14	30.22	69.54	-39.32	peak	
6		4.3290	16.28	11.30	27.58	69.54	-41.96	peak	

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

Test Mode TX Mode_2474 MHz

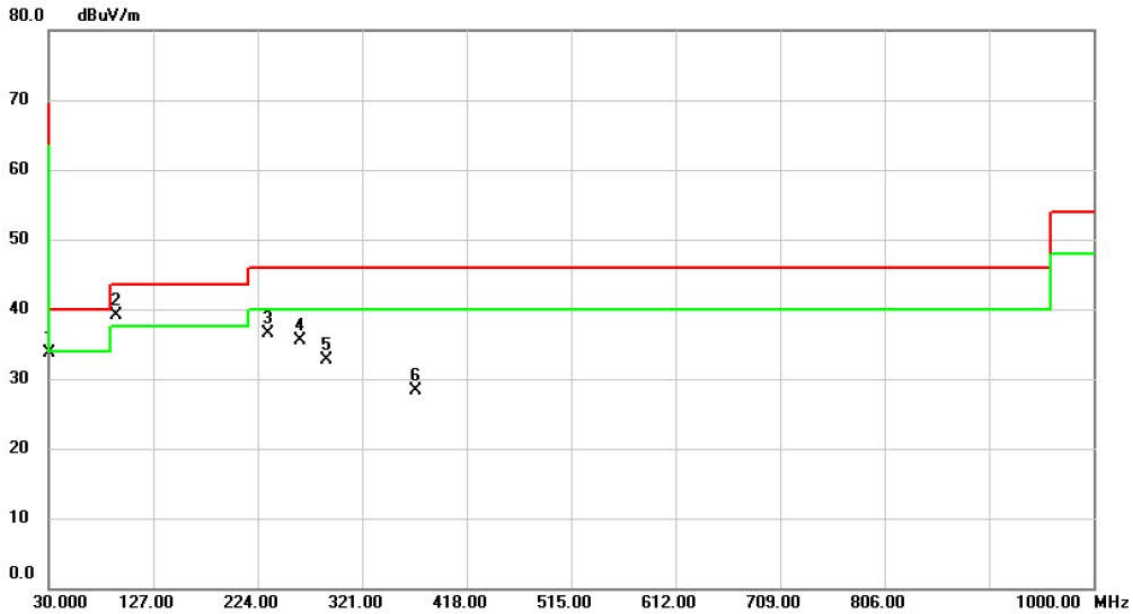
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	30.9700	44.85	-9.13	35.72	40.00	-4.28	peak	
2		93.0500	49.38	-12.98	36.40	43.50	-7.10	peak	
3		133.7900	41.65	-9.42	32.23	43.50	-11.27	peak	
4		241.4600	41.79	-9.36	32.43	46.00	-13.57	peak	
5		261.8300	39.90	-8.71	31.19	46.00	-14.81	peak	
6		289.9600	36.26	-7.71	28.55	46.00	-17.45	peak	

Test Mode TX Mode_2474 MHz

Horizontal

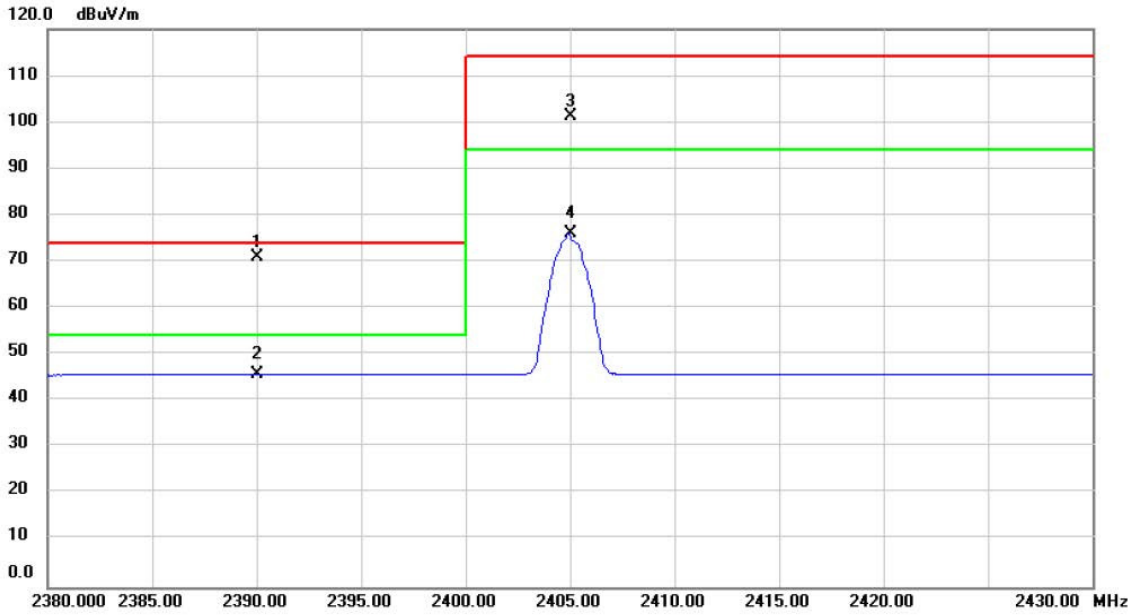


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		30.9700	42.93	-9.13	33.80	40.00	-6.20	peak	
2	*	93.0500	52.08	-12.98	39.10	43.50	-4.40	peak	
3		233.7000	46.35	-9.84	36.51	46.00	-9.49	peak	
4		262.8000	44.08	-8.67	35.41	46.00	-10.59	peak	
5		288.0200	40.43	-7.77	32.66	46.00	-13.34	peak	
6		370.4700	34.02	-5.71	28.31	46.00	-17.69	peak	

ATTACHMENT D -RADIATED EMISSION (ABOVE 1000MHZ)

Test Mode TX Mode_2405 MHz

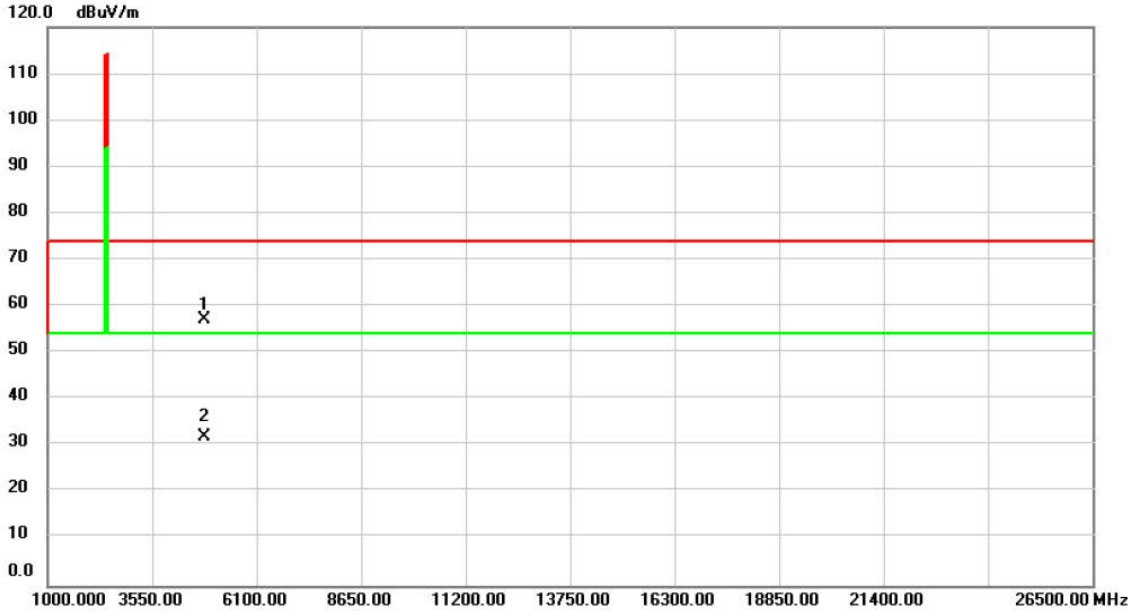
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	2390.000	39.90	31.06	70.96	74.00	-3.04	peak	
2		2390.000	14.60	31.06	45.66	54.00	-8.34	AVG	
3		2405.000	70.17	31.12	101.29	114.00	-12.71	peak	
4		2405.000	44.87	31.12	75.99	94.00	-18.01	AVG	

Test Mode TX Mode_2405 MHz

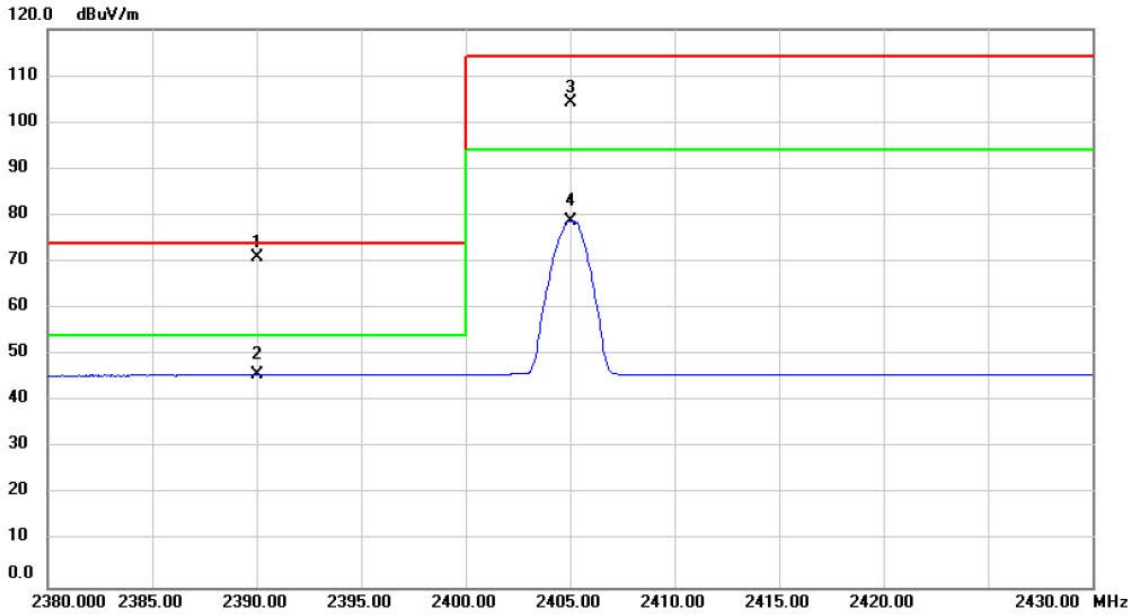
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	4810.000	68.60	-11.39	57.21	74.00	-16.79	peak	
2		4810.000	43.30	-11.39	31.91	54.00	-22.09	AVG	

Test Mode	TX Mode_2405 MHz
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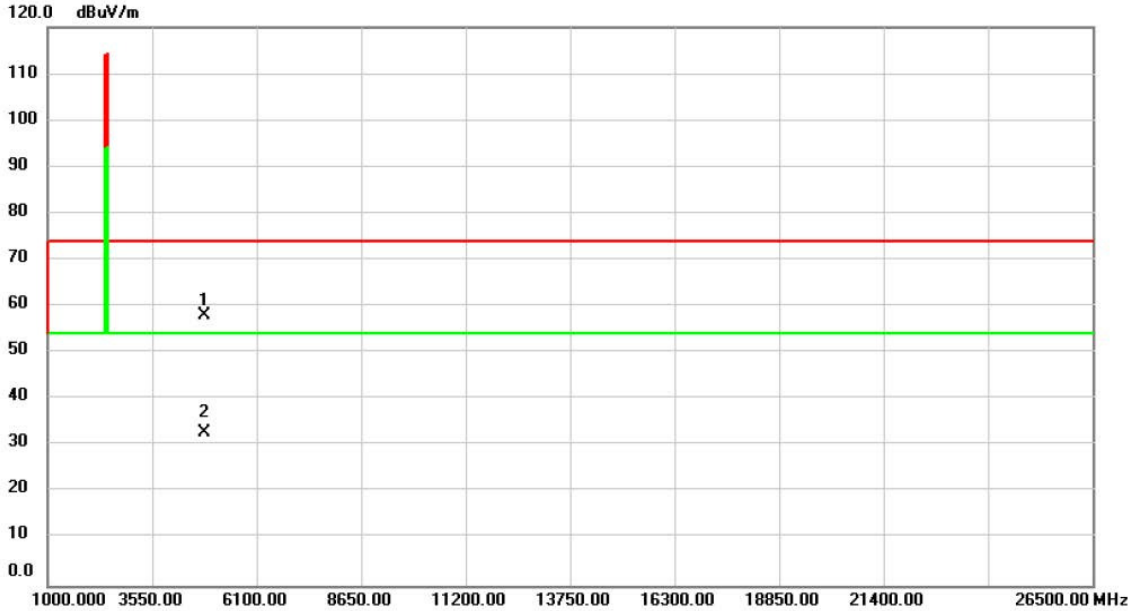
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	2390.000	39.87	31.06	70.93	74.00	-3.07	peak	
2		2390.000	14.57	31.06	45.63	54.00	-8.37	AVG	
3		2405.000	72.99	31.12	104.11	114.00	-9.89	peak	
4		2405.000	47.69	31.12	78.81	94.00	-15.19	AVG	

Test Mode TX Mode_2405 MHz

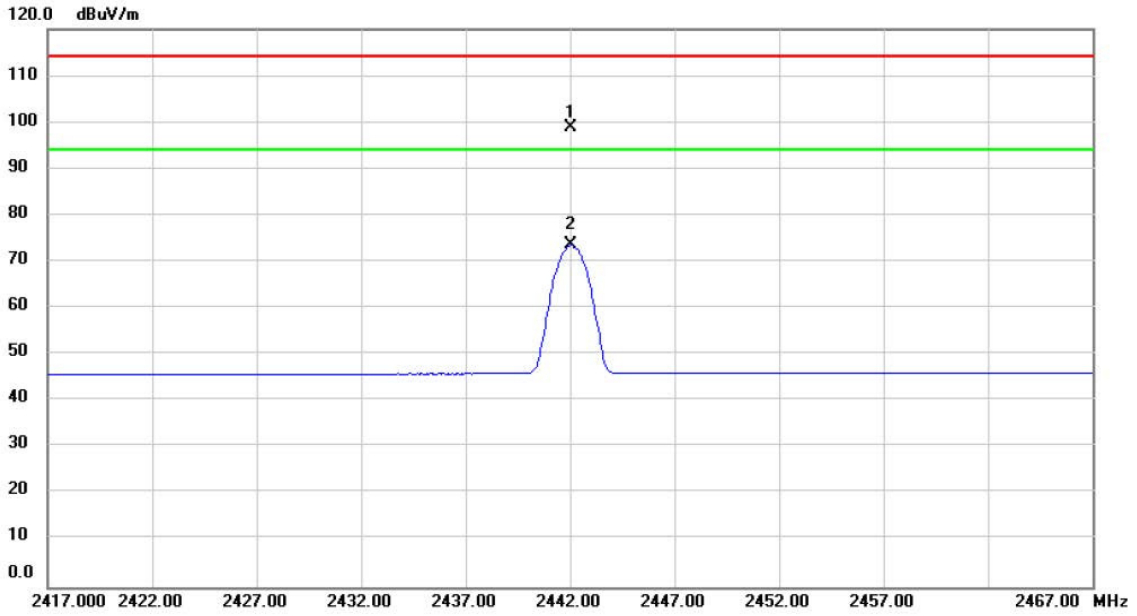
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	4810.000	69.40	-11.39	58.01	74.00	-15.99	peak	
2		4810.000	44.10	-11.39	32.71	54.00	-21.29	AVG	

Test Mode TX Mode_2442 MHz

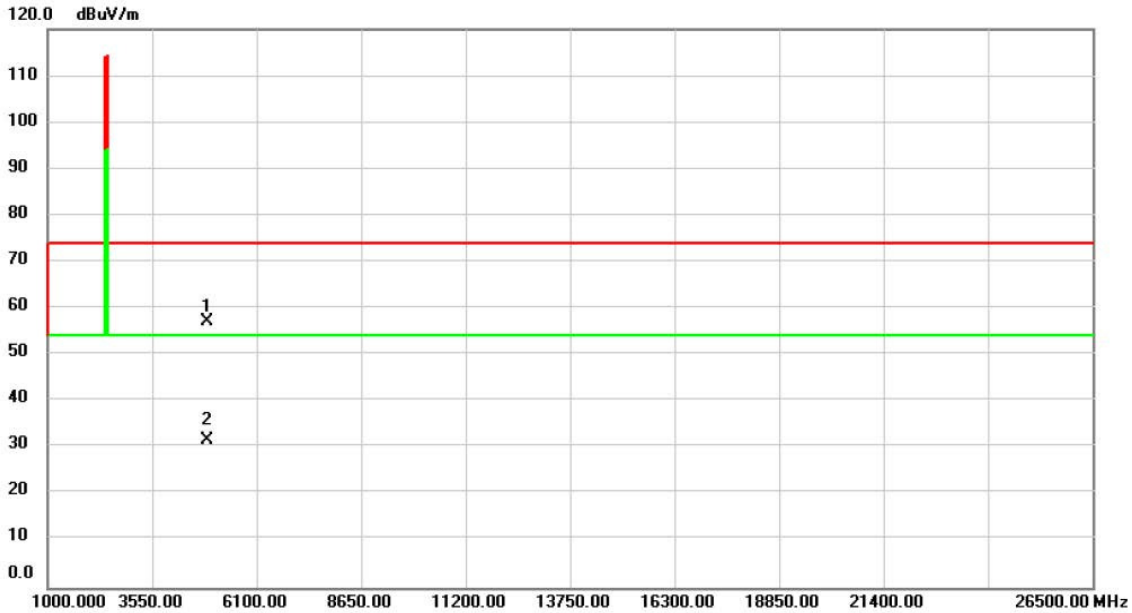
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	2442.000	67.68	31.26	98.94	114.00	-15.06	peak	
2		2442.000	42.38	31.26	73.64	94.00	-20.36	AVG	

Test Mode TX Mode_2442 MHz

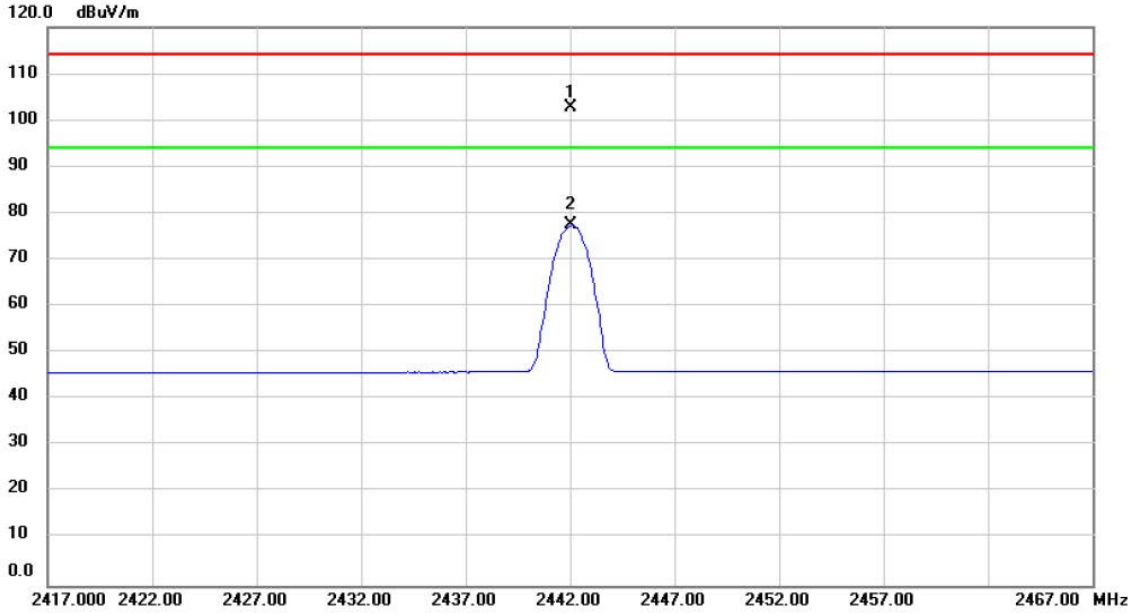
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	4884.000	68.31	-11.28	57.03	74.00	-16.97	peak	
2		4884.000	43.01	-11.28	31.73	54.00	-22.27	AVG	

Test Mode TX Mode_2442 MHz

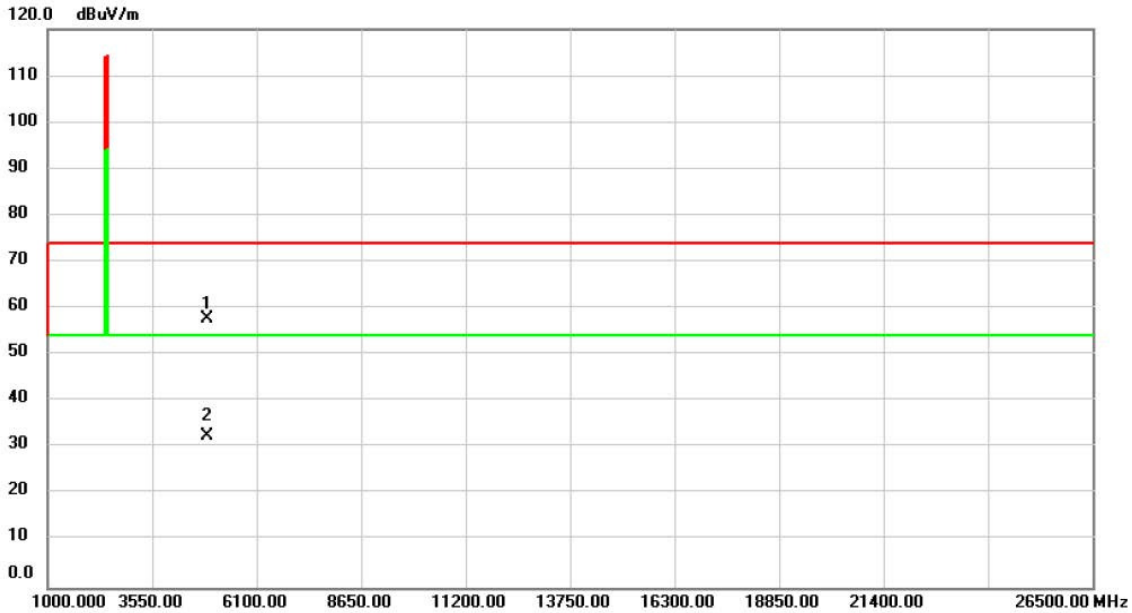
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	2442.000	71.51	31.26	102.77	114.00	-11.23	peak	
2		2442.000	46.21	31.26	77.47	94.00	-16.53	AVG	

Test Mode TX Mode_2442 MHz

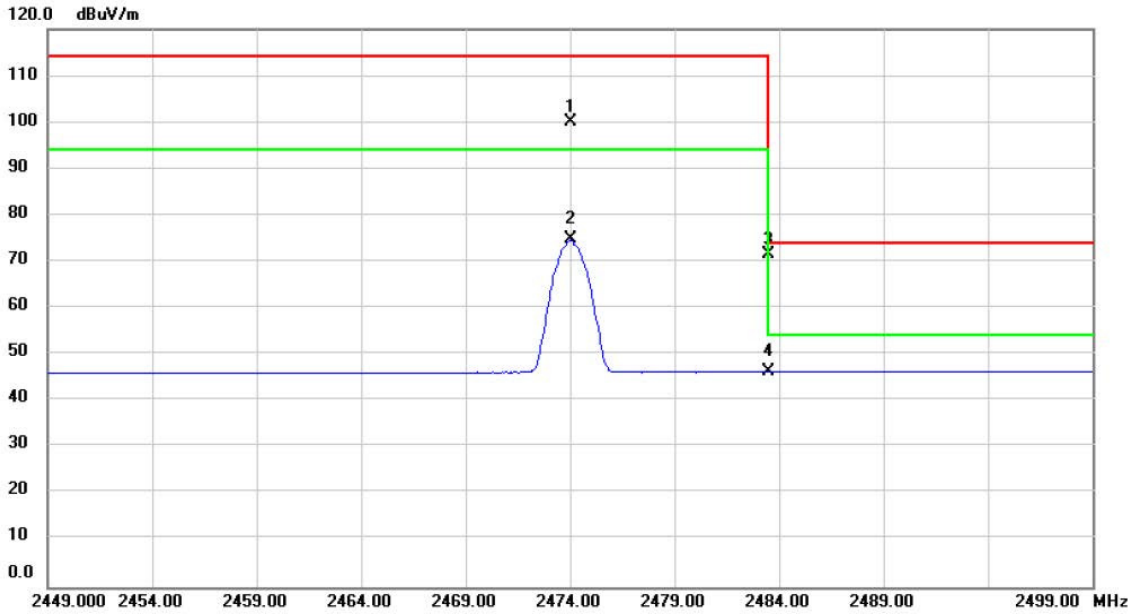
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	4884.000	69.07	-11.28	57.79	74.00	-16.21	peak	
2		4884.000	43.77	-11.28	32.49	54.00	-21.51	AVG	

Test Mode TX Mode_2474 MHz

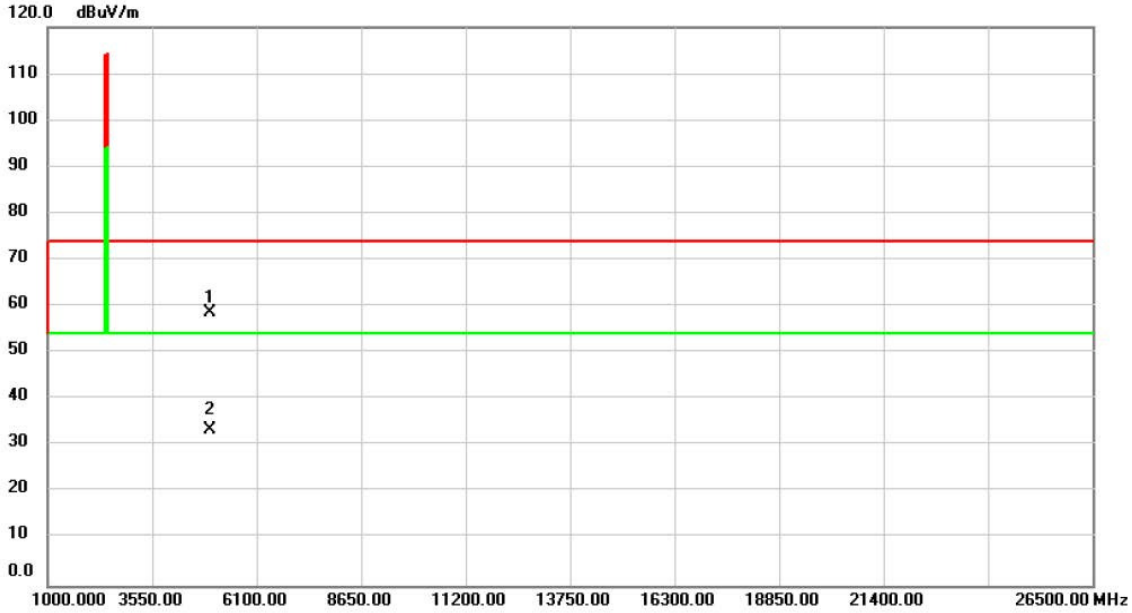
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2474.000	68.66	31.38	100.04	114.00	-13.96	peak	
2		2474.000	43.36	31.38	74.74	94.00	-19.26	AVG	
3	*	2483.500	40.19	31.41	71.60	74.00	-2.40	peak	
4		2483.500	14.89	31.41	46.30	54.00	-7.70	AVG	

Test Mode TX Mode_2474 MHz

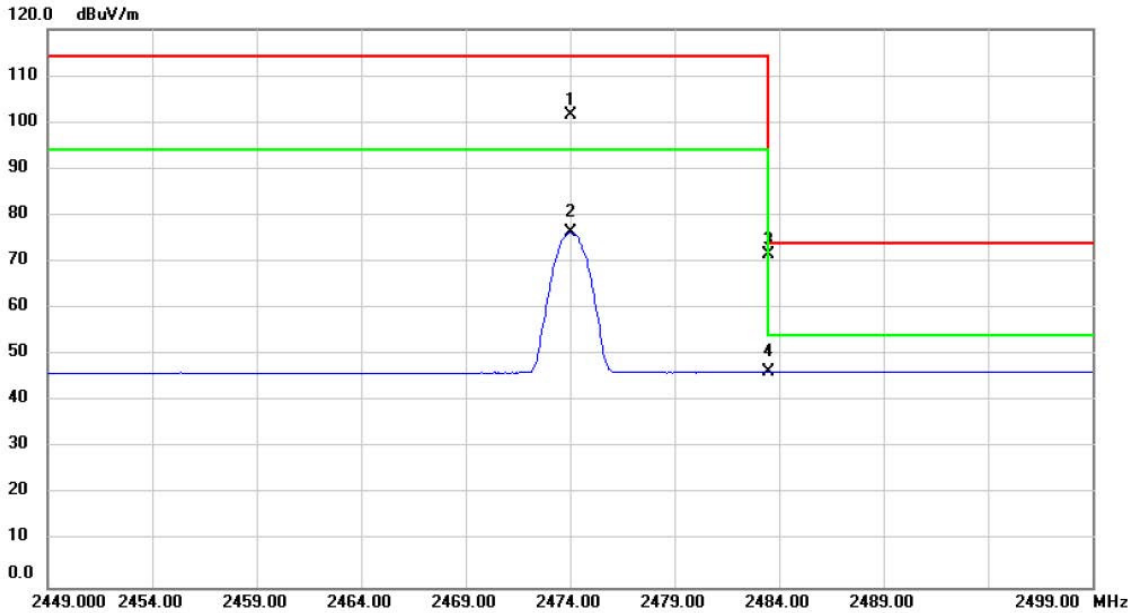
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	4948.000	69.86	-11.17	58.69	74.00	-15.31	peak	
2		4948.000	44.56	-11.17	33.39	54.00	-20.61	AVG	

Test Mode TX Mode_2474 MHz

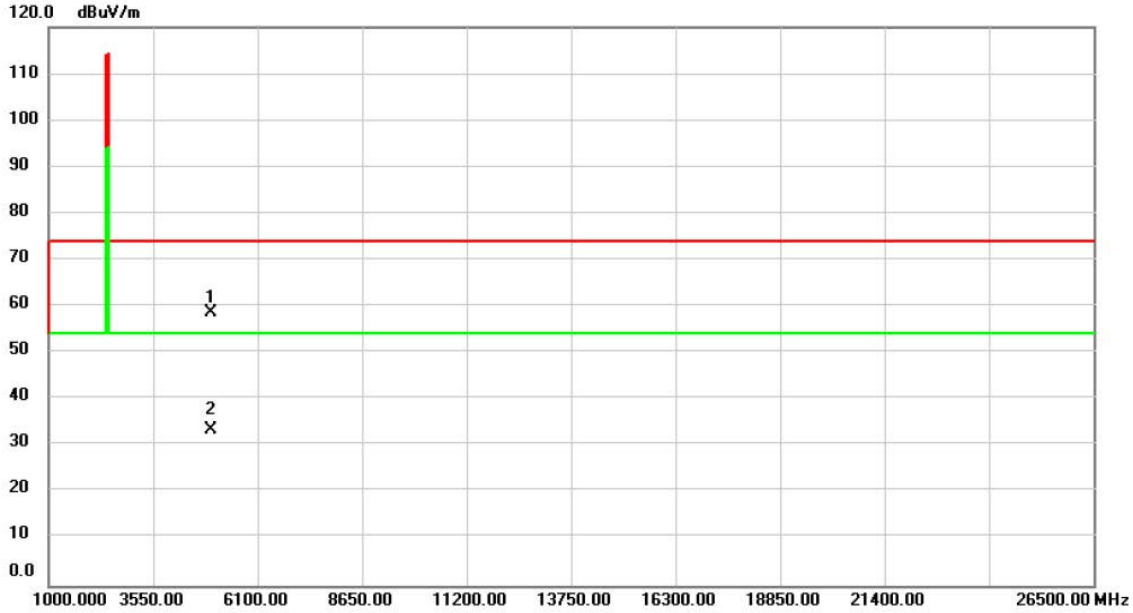
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2474.000	70.30	31.38	101.68	114.00	-12.32	peak	
2		2474.000	45.00	31.38	76.38	94.00	-17.62	AVG	
3	*	2483.500	40.18	31.41	71.59	74.00	-2.41	peak	
4		2483.500	14.88	31.41	46.29	54.00	-7.71	AVG	

Test Mode TX Mode_2474 MHz

Horizontal



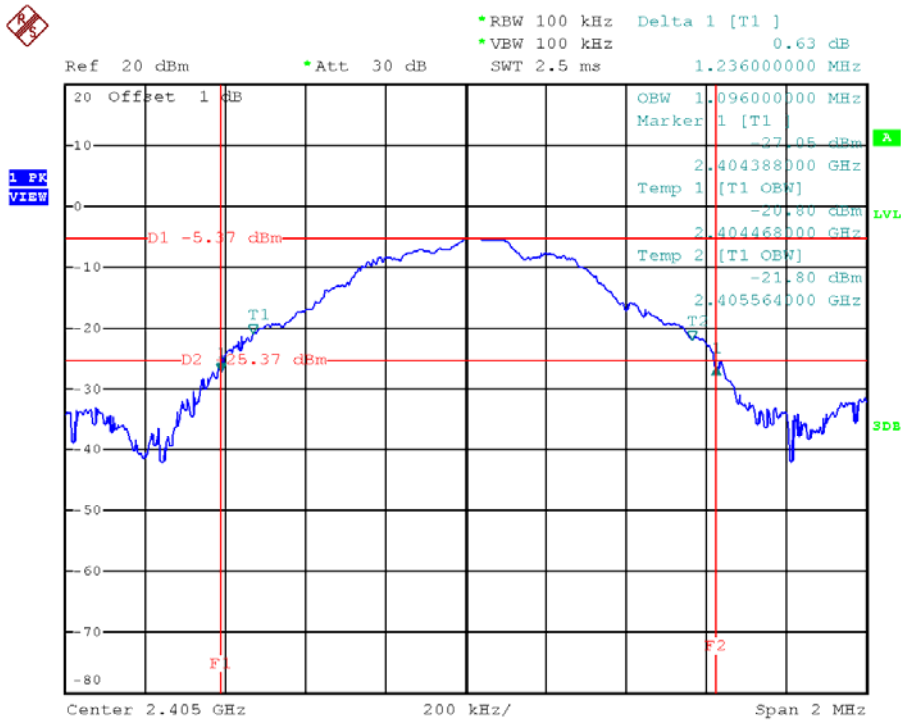
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	4948.000	69.97	-11.17	58.80	74.00	-15.20	peak	
2		4948.000	44.67	-11.17	33.50	54.00	-20.50	AVG	

ATTACHMENT E - BANDWIDTH

Test Mode: TX Mode_2405 MHz/2442 MHz/2474 MHz

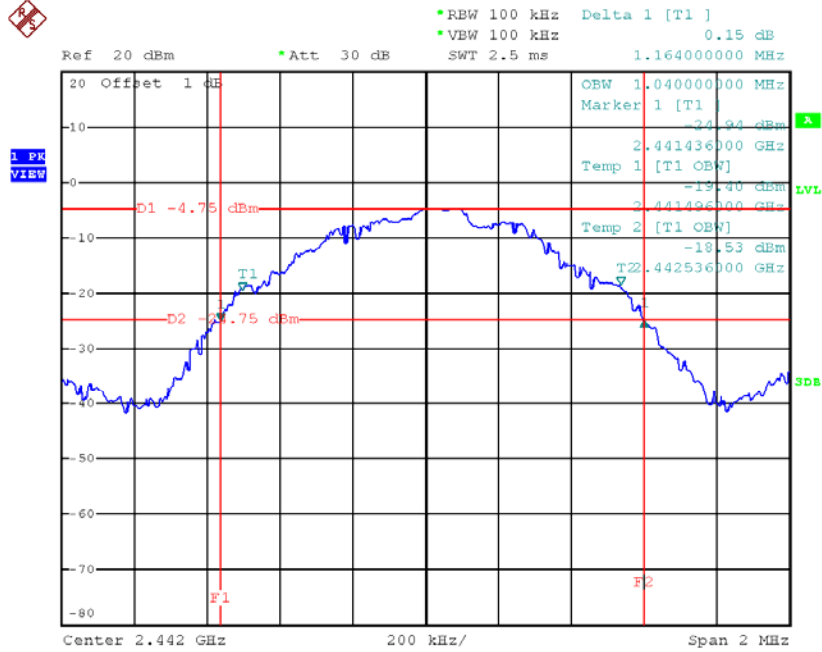
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)
2405	1.23	1.10
2442	1.16	1.04
2474	1.20	1.06

TX Mode_2405 MHz



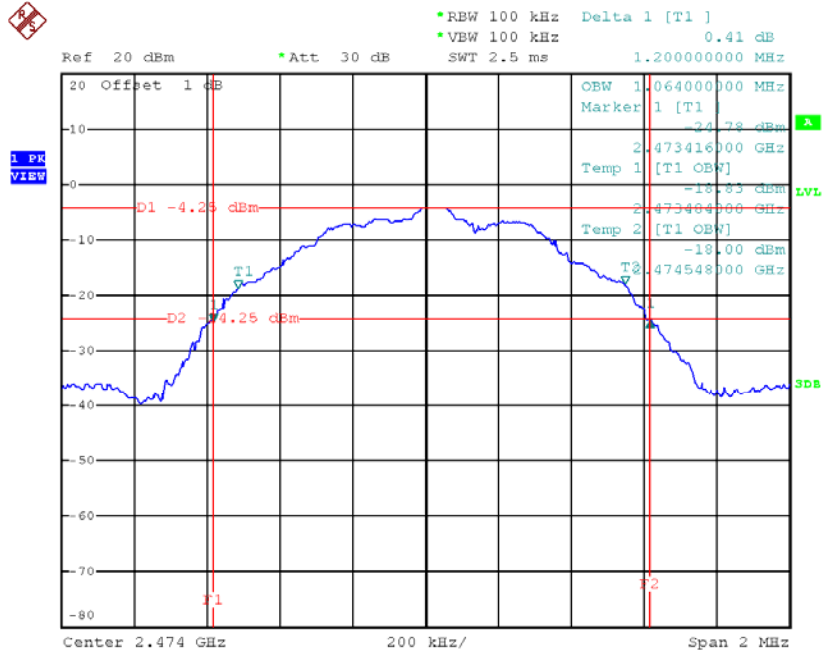
Date: 16.MAY.2017 20:37:10

TX Mode_2442 MHz



Date: 16.MAY.2017 20:39:08

TX Mode_2474 MHz



Date: 16.MAY.2017 20:41:18