Radio Test Report

FCC ID: 2AA9K-FRR913

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

Issued Date : Nov. 28, 2013
Project No. : 1311037
Equipment : Frenzy Remote Control
Model Name : FRR913V1

Applicant : Western Leaf Electronics Inc.
Address : 200, 638 11th Ave SW Calgary, AB, T2ROE CANADA

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Nov. 05, 2013
Date of Test: Nov. 05, 2013 ~ Nov. 25, 2013

Testing Engineer : (Josh Lin)

Technical Manager : (Jeff Yang)

Authorized Signatory : (Andy Chiu)

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Testing Laboratory
0659

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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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.

Table of Contents

Table of Contents

REPORT ISSUED HISTORY

Revised Version No.	Description	Issued Date
-	Initial Issue.	Nov. 28, 2013

1 CERTIFICATION

Equipment	:	Frenzy Remote Control
Brand Name	:	Frenzy by Western Leaf
Model Name	:	FRR913V1
Applicant	:	Western Leaf Electronics Inc.
Date of Test	:	Nov. 05, 2013 ~ Nov. 25, 2013
Standards	:	FCC Part 15, Subpart C: 2012 ANSI C63.4: 2009

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1311037) 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

Standard Clause	Test Item	Result
15.207	Conducted Emission	**N/A**
15.247 (c)	Antenna conducted Spurious Emission	**PASS**
15.247 (a)(2)	6dB Bandwidth	**PASS**
15.247 (b)	Maximum Peak Conducted Output Power	**PASS**
15.247 (c)	Radiated Spurious Emission	**PASS**
15.247 (d)(e)	Power Spectral Density	**PASS**
15.205	Restricted Bands	**PASS**
15.203	Antenna Requirement	**PASS**

NOTE:
(1) N/A: denotes test is not applicable in this Test Report

2.1 TEST FACILITY

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

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

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

The reported uncertainty of measurement **y ± U**，where expended 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.

Radiated emission test:

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
CB08	Radiated emission at 3m	Horizontal Polarization	30 - 200MHz	3.35 dB	
			200 - 1000MHz	3.11 dB	
			1 - 18GHz	3.97 dB	
			18 - 40GHz	4.01 dB	
		Vertical Polarization	30 - 200MHz	3.22 dB	
			200 - 1000MHz	3.24 dB	
			1 - 18GHz	4.05 dB	
			18 - 40GHz	4.04 dB	

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}.

If U_{lab} is less than or equal to U_{CISPR}, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{CISPR}, then:

- compliance is deemed to occur if no measured disturbance level, increased by (U_{lab} - U_{CISPR}), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} - U_{CISPR}), exceeds the disturbance limit.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Frenzy Remote Control
Brand Name	Frenzy by Western Leaf
Model Name	FRR913V1
OEM Brand/Model Name	N/A
Model Difference	N/A
Product Description	The EUT is a Frenzy Remote Control. Operation Frequency: 2402 MHz - 2479 MHz Modulation Type: GFSK Bit Rate of Transmitter: 1 Mbps Number Of Channel: Please refer to the Note 2. Antenna Designation: Please refer to the Note 3. Antenna Gain(Peak): Please refer to the Note 3. Maximum Peak Conducted Output Power: -6.76 dBm (0.0002 W) More details of EUT technical specification, please refer to the User's Manual.
Power Source	Battery supplied.
Power Rating	I/P: DC 1.5V (1 * AAA Battery)
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	N/A
EUT Modification(s)	N/A

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		
25	2427	52	2454		
26	2428	53	2455		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Printed	N/A	0.00

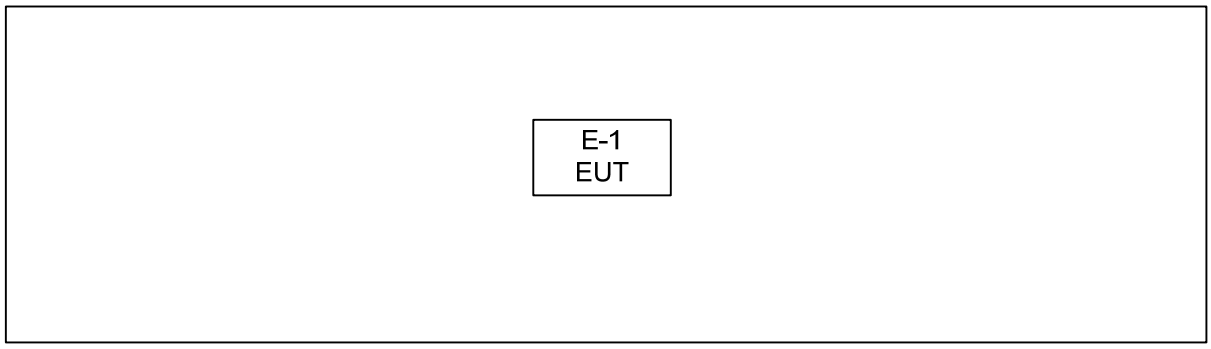
3.2 DESCRIPTION OF TEST MODES

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.

Test Items	Mode	Data Rate	Channel	Note
Antenna conducted Spurious Emission	GFSK	1 Mbps	00/37/77	
6 dB Bandwidth	GFSK	1 Mbps	00/37/77	
Maximum Peak Conducted Output Power	GFSK	1 Mbps	00/37/77	
Radiated Spurious Emission (30 MHz to 1 GHz)	GFSK	1 Mbps	37	
Radiated Spurious Emission (above 1 GHz)	GFSK	1 Mbps	00/37/77	
Restricted Bands	GFSK	1 Mbps	00/37/77	
Antenna Requirement	-----	-----	-----	

NOTE: The measurements are performed at the highest, middle, lowest available channels.

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 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.	Note
E-1	Frenzy Remote Control	Frenzy by Western Leaf	FRR913V1	2AA9K-FRR913	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
N/A	-	-	-	-

NOTE: The support equipment was authorized by Declaration of Conformity (DOC).

4 ANTENNA CONDUCTED SPURIOUS EMISSION

4.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Antenna conducted Spurious Emission	30-25000	20 dB less than the peak value of fundamental frequency

4.2 MEASUREMENT INSTRUMENTS LIST

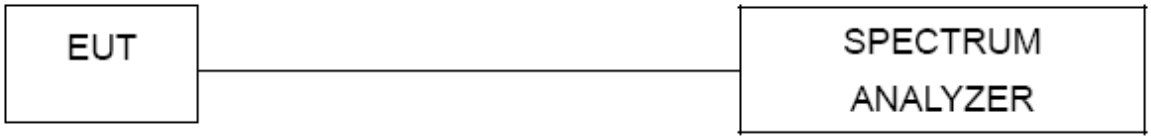
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

4.3 TEST PROCEDURES

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.

4.4 TEST SETUP LAYOUT



4.5 DEVIATION FROM TEST STANDARD

No deviation

4.6 EUT OPERATING CONDITIONS

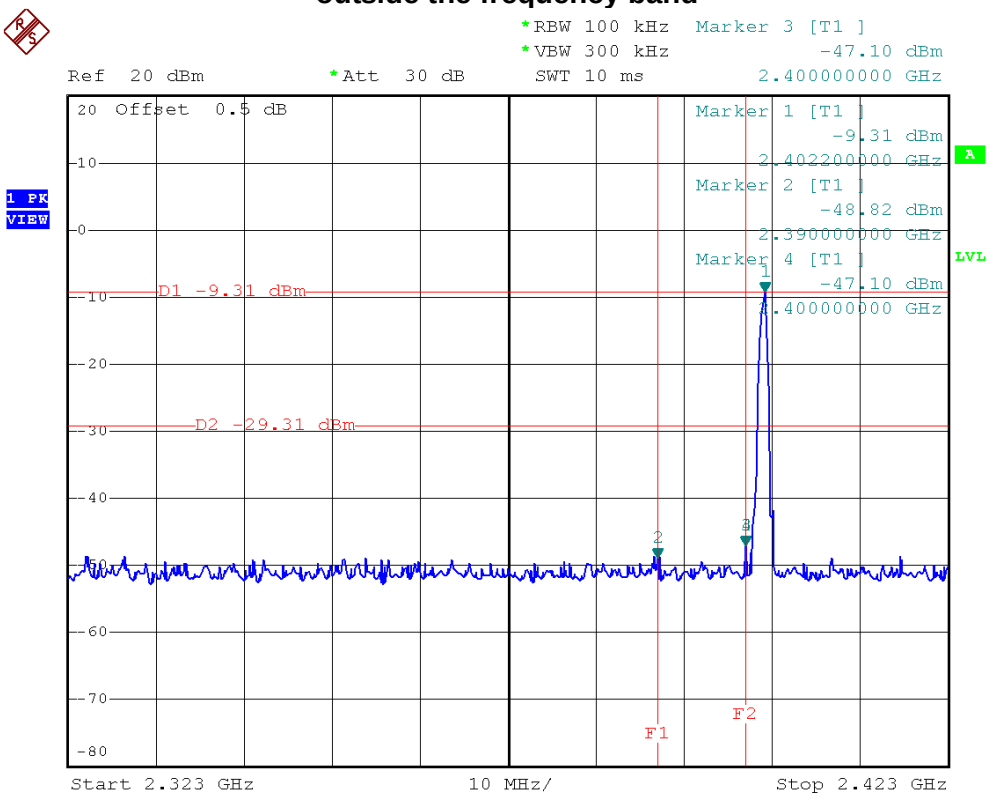
The EUT used during radiated emission measurement was designed to exercise in a manner similar to a typical use.

4.7 TEST RESULTS

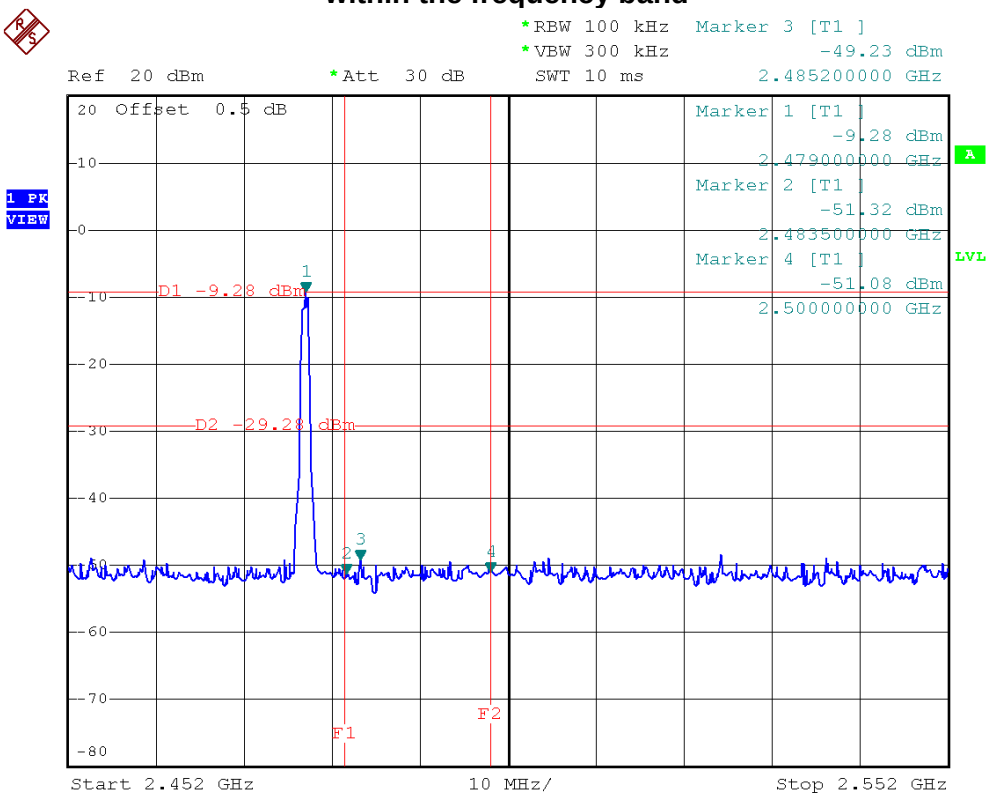
EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz/2479 MHz		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-47.10	2485.20	-49.23
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

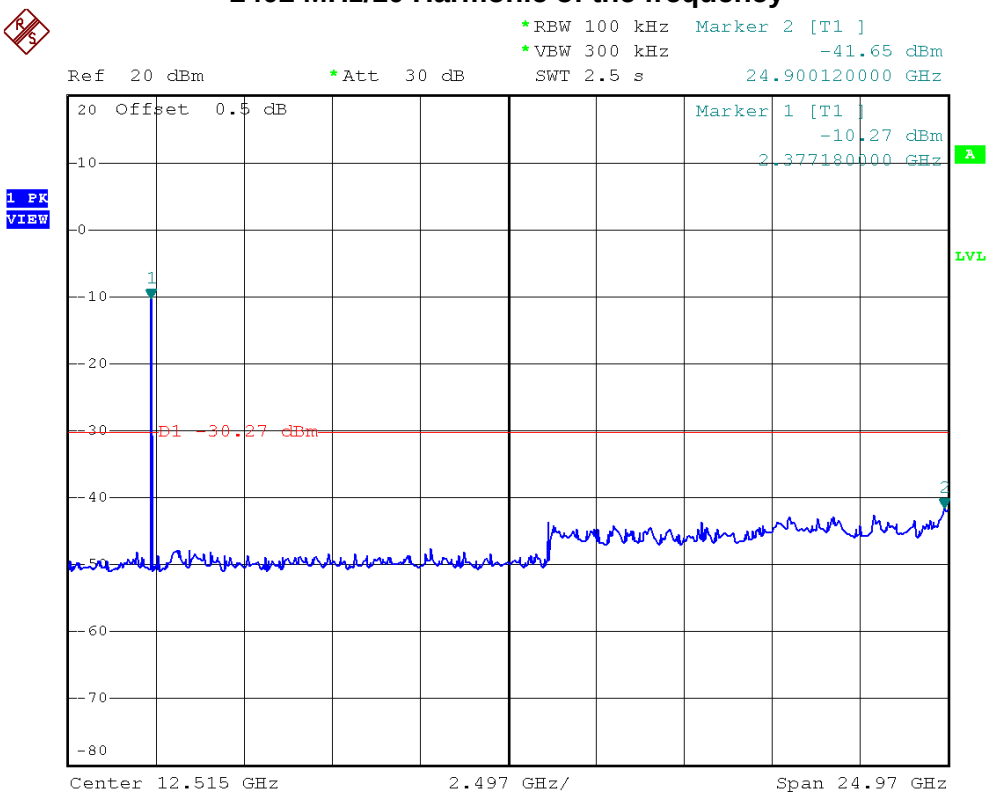
The max. radio frequency power in any 100kHz bandwidth outside the frequency band



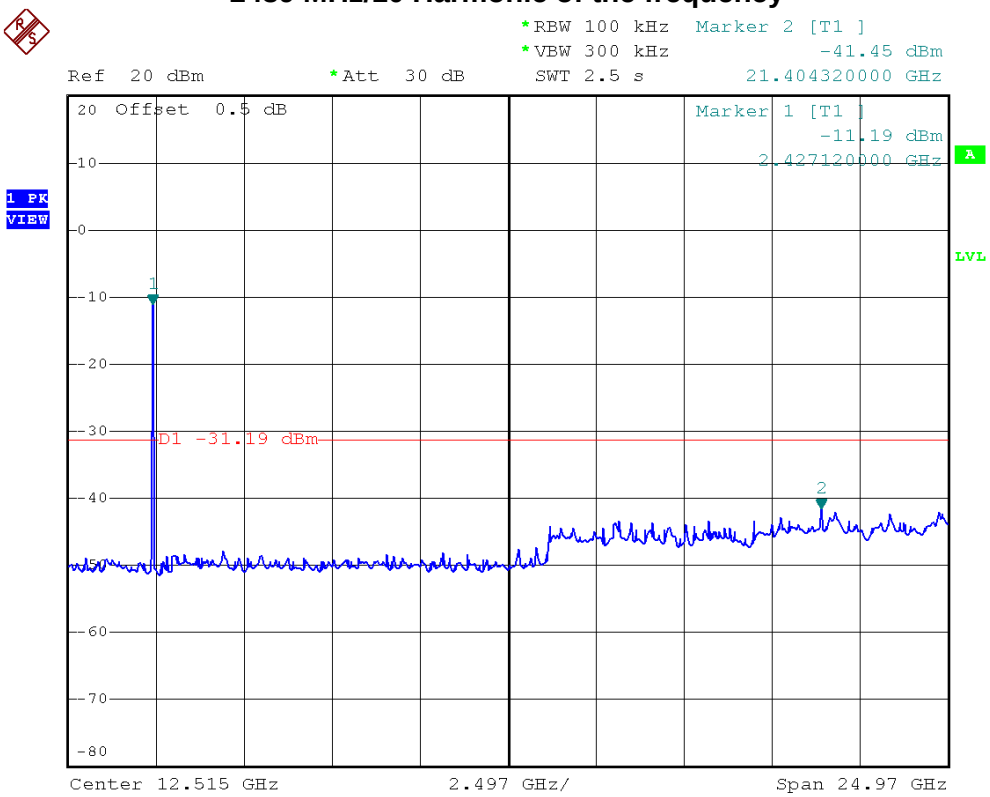
The max. radio frequency power in any 100 kHz bandwidth within the frequency band



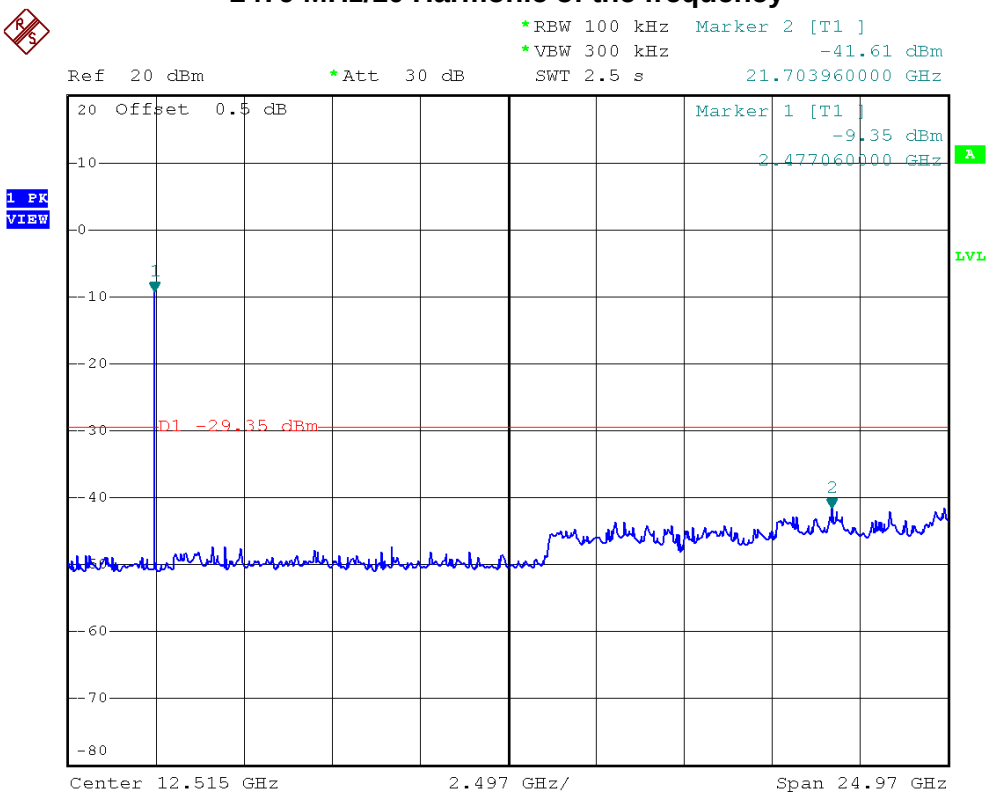
2402 MHz/10 Harmonic of the frequency



2439 MHz/10 Harmonic of the frequency



2479 MHz/10 Harmonic of the frequency



5 6 DB BANDWIDTH

5.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Bandwidth	2400-2483.5	>= 500KHz (6 dB bandwidth)

5.2 MEASUREMENT INSTRUMENTS LIST

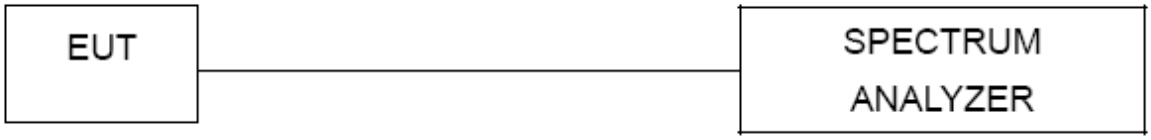
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

5.3 TEST PROCEDURES

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.

5.4 TEST SETUP LAYOUT



5.5 DEVIATION FROM TEST STANDARD

No deviation

5.6 EUT OPERATING CONDITIONS

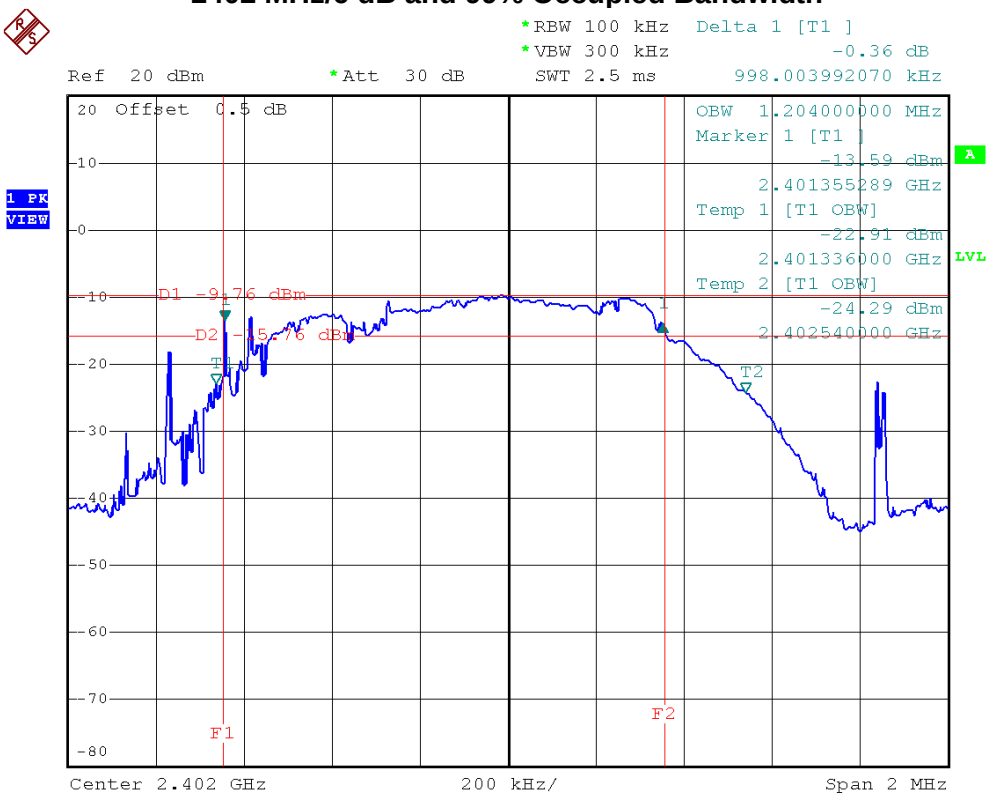
The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.7 TEST RESULTS

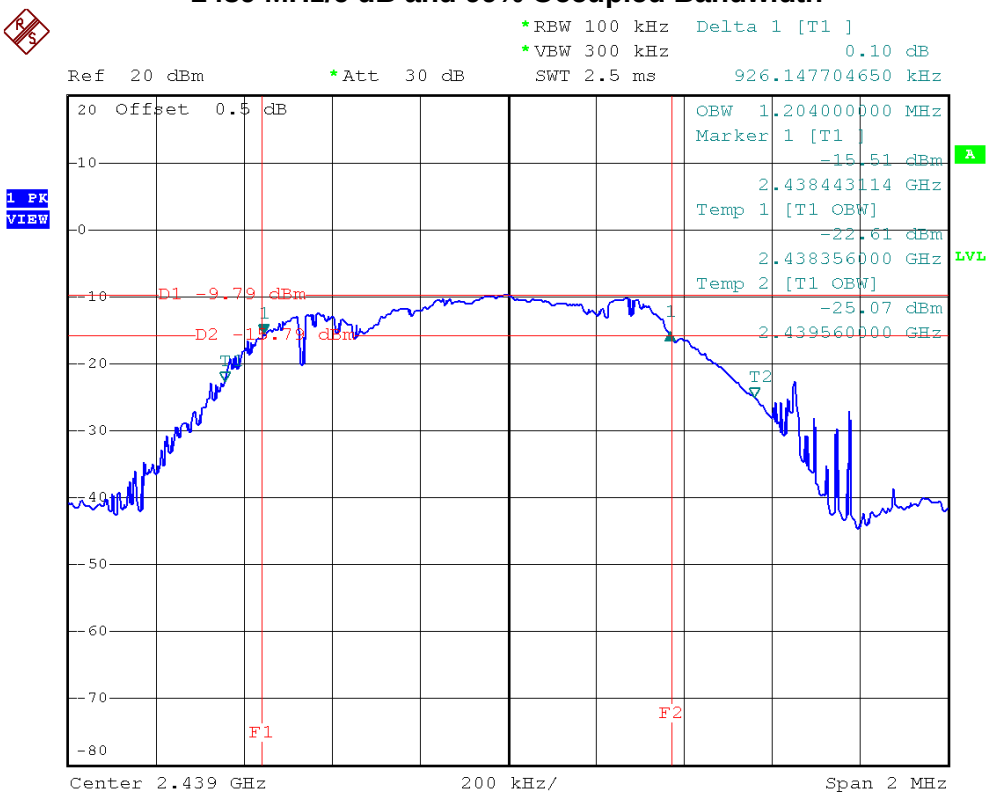
EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz, 2439 MHz, 2479 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2402 MHz	1.00	1.20	>=500 kHz	PASS
2439 MHz	0.93	1.20	>=500 kHz	PASS
2479 MHz	0.92	1.12	>=500 kHz	PASS

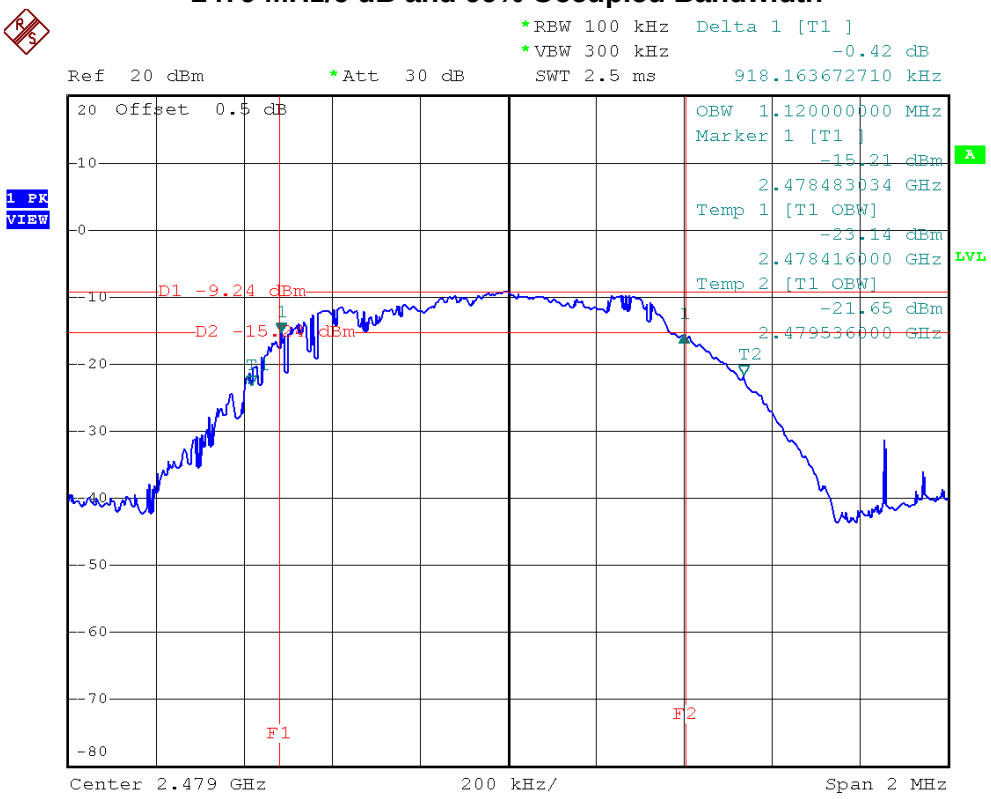
2402 MHz/6 dB and 99% Occupied Bandwidth



2439 MHz/6 dB and 99% Occupied Bandwidth



2479 MHz/6 dB and 99% Occupied Bandwidth



6 MAXIMUM PEAK CONDUCTED OUTPUT POWER

6.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Maximum Peak Conducted Output Power	2400-2483.5	1 watt or 30 dBm

6.2 MEASUREMENT INSTRUMENTS LIST

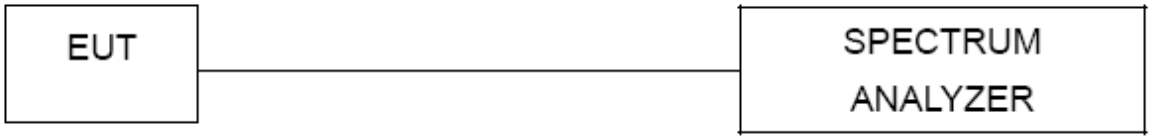
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

6.3 TEST PROCEDURES

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= 3 MHz, VBW= 3 MHz, Sweep time = Auto.

6.4 TEST SETUP LAYOUT



6.5 DEVIATION FROM TEST STANDARD

No deviation

6.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.7 TEST RESULTS

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz, 2439 MHz, 2479 MHz		

Frequency	Peak Output Power		Limit		Result
	(dBm)	(W)	(dBm)	(W)	
2402 MHz	-6.76	0.0002	30	1	PASS
2439 MHz	-7.24	0.0002	30	1	PASS
2479 MHz	-7.82	0.0002	30	1	PASS

7 RADIATED SPURIOUS EMISSION (9 KHZ TO 1 GHZ)

7.1 LIMIT

20 dB in any 100 kHz bandwidth outside the operating frequency band. 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 Range: 9 kHz to 1 GHz		
FREQUENCY (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
Above 960	500	3

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

1. The limit for radiated test was performed according to FCC PART 15B.
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

7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 15, 2014
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2014
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 13, 2014
5	Microflex Cable	EMC	S104-SMA	8m	May. 13, 2014
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2014
7	Test Cable	LMR	LMR-400	12m	May. 14, 2014
8	Test Cable	LMR	LMR-400	3m	May. 14, 2014
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2014
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 11, 2014
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 18, 2014
12	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 24, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

7.3 MEASURING INSTRUMENTS SETTING

EMI Test Receiver	Parameter Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

7.4 TEST PROCEDURES

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz. For frequencies above 1 GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

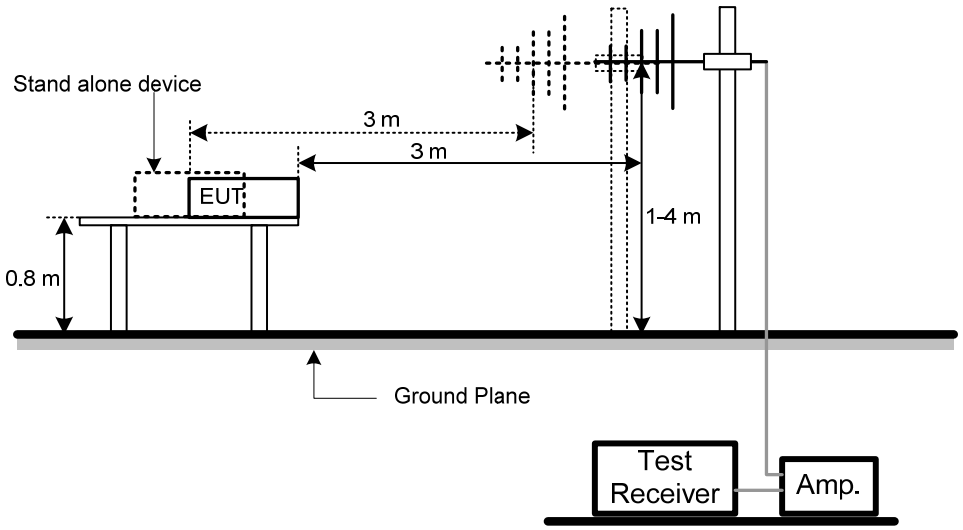
NOTE:

a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz; SPA setting in RBW=100 kHz, VBW =100 kHz, Swp. Time = 0.3 sec./ MHz.
b. 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.

7.5 DEVIATION FROM TEST STANDARD

No deviation

7.6 TEST SETUP LAYOUT



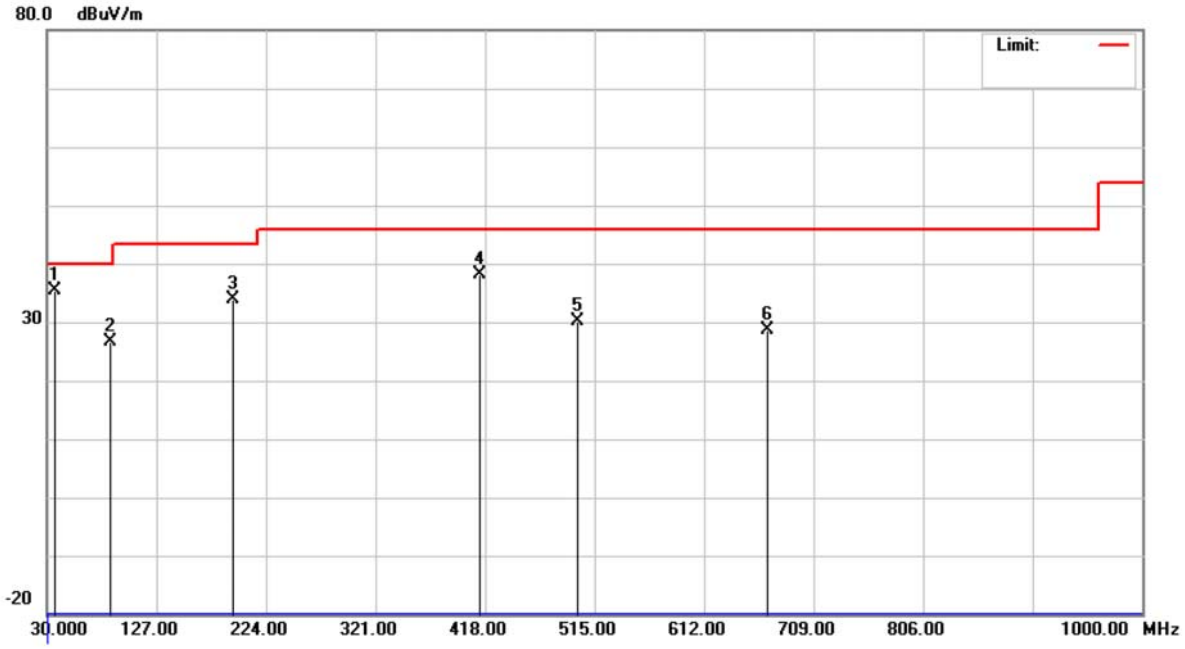
7.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.8 TEST RESULTS

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2439 MHz		

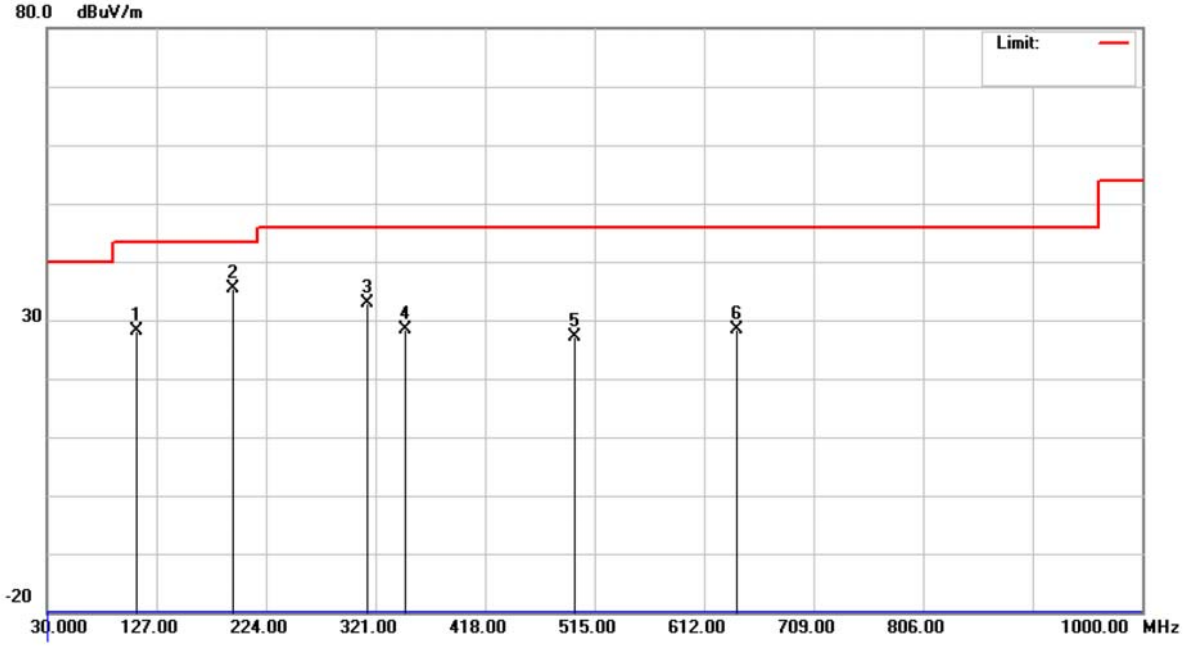
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	37.2750	50.24	-14.74	35.50	40.00	-4.50	peak	
2		85.7750	46.21	-19.62	26.59	40.00	-13.41	peak	
3		194.8999	50.78	-16.82	33.96	43.50	-9.54	peak	
4		413.1499	48.91	-10.81	38.10	46.00	-7.90	peak	
5		500.4500	39.73	-9.48	30.25	46.00	-15.75	peak	
6		667.7750	35.42	-6.74	28.68	46.00	-17.32	peak	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2439 MHz		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		110.0250	45.46	-17.37	28.09	43.50	-15.41	peak	
2	*	194.8999	52.29	-16.82	35.47	43.50	-8.03	peak	
3		313.7250	46.36	-13.37	32.99	46.00	-13.01	peak	
4		347.6749	40.99	-12.52	28.47	46.00	-17.53	peak	
5		498.0249	36.70	-9.50	27.20	46.00	-18.80	peak	
6		641.0999	35.13	-6.87	28.26	46.00	-17.74	peak	

8 RADIATED SPURIOUS EMISSION (ABOVE 1 GHZ)

8.1 LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. 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 Range: 9 kHz to 1 GHz		
FREQUENCY (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
Above 960	500	3

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

(1) The limit for radiated test was performed according to FCC PART 15B.
(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

8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 15, 2014
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2014
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 13, 2014
5	Microflex Cable	EMC	S104-SMA	8m	May. 13, 2014
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2014
7	Test Cable	LMR	LMR-400	12m	May. 14, 2014
8	Test Cable	LMR	LMR-400	3m	May. 14, 2014
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2014
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 11, 2014
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 18, 2014
12	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 24, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

8.3 MEASURING INSTRUMENTS SETTING

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

8.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.
f. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

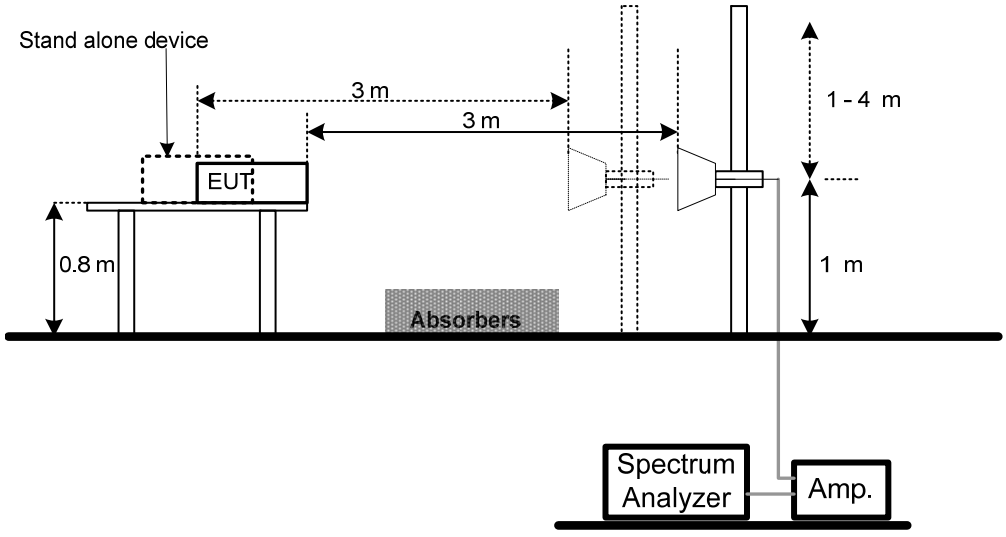
NOTE:

a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. 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.

8.5 DEVIATION FROM TEST STANDARD

No deviation

8.6 TEST SETUP LAYOUT



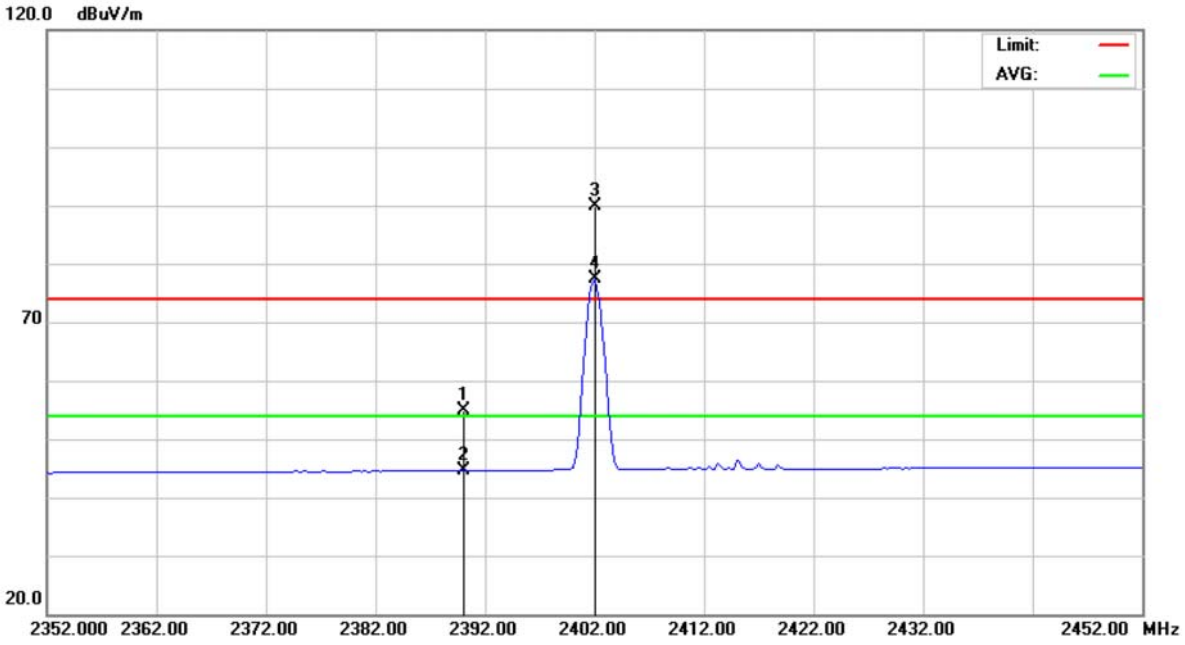
8.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.8 TEST RESULTS

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz		

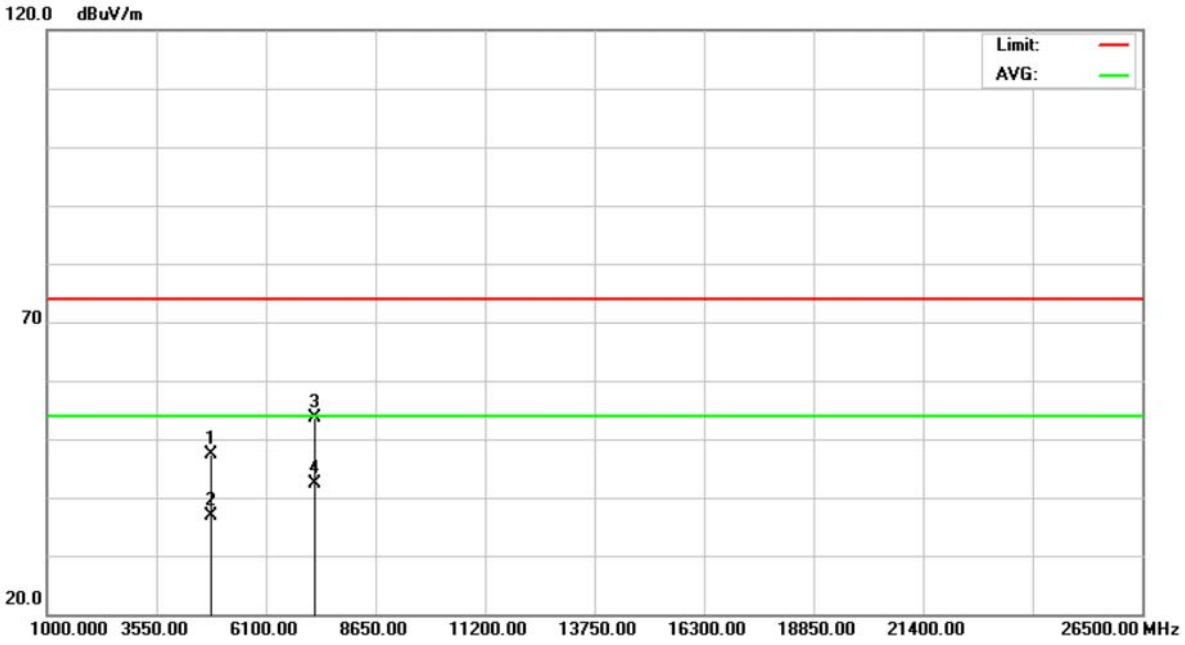
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.17	31.67	54.84	74.00	-19.16	peak	
2		2390.000	12.95	31.67	44.62	54.00	-9.38	AVG	
3	X	2402.000	58.25	31.72	89.97	74.00	15.97	peak	
4	*	2402.000	45.75	31.72	77.47	54.00	23.47	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz		

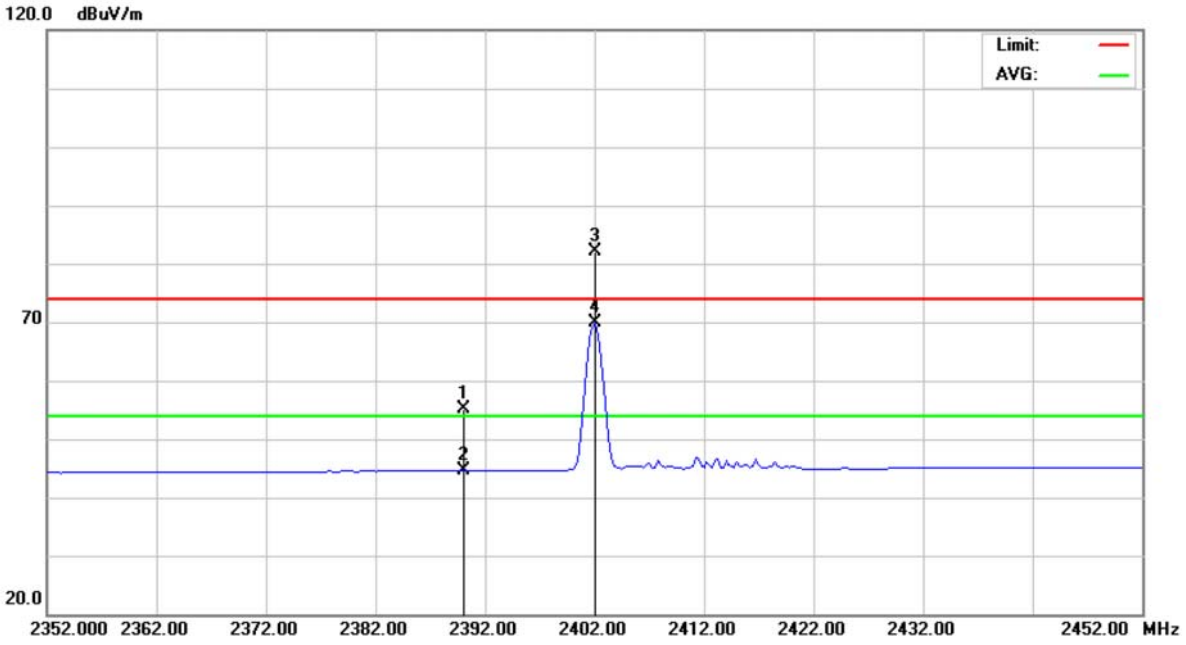
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4803.915	41.59	5.69	47.28	74.00	-26.72	peak	
2		4803.915	31.26	5.69	36.95	54.00	-17.05	AVG	
3		7206.055	41.52	12.18	53.70	74.00	-20.30	peak	
4	*	7206.055	30.13	12.18	42.31	54.00	-11.69	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz		

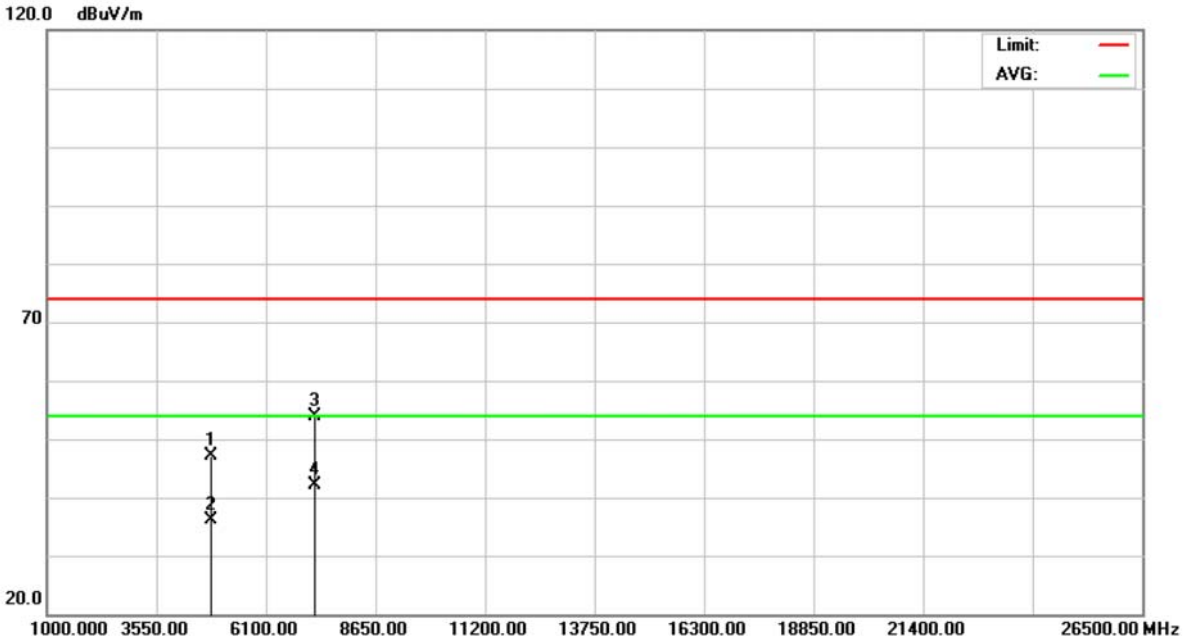
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.42	31.67	55.09	74.00	-18.91	peak	
2		2390.000	12.95	31.67	44.62	54.00	-9.38	AVG	
3	X	2402.000	50.47	31.72	82.19	74.00	8.19	peak	
4	*	2402.000	38.17	31.72	69.89	54.00	15.89	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz		

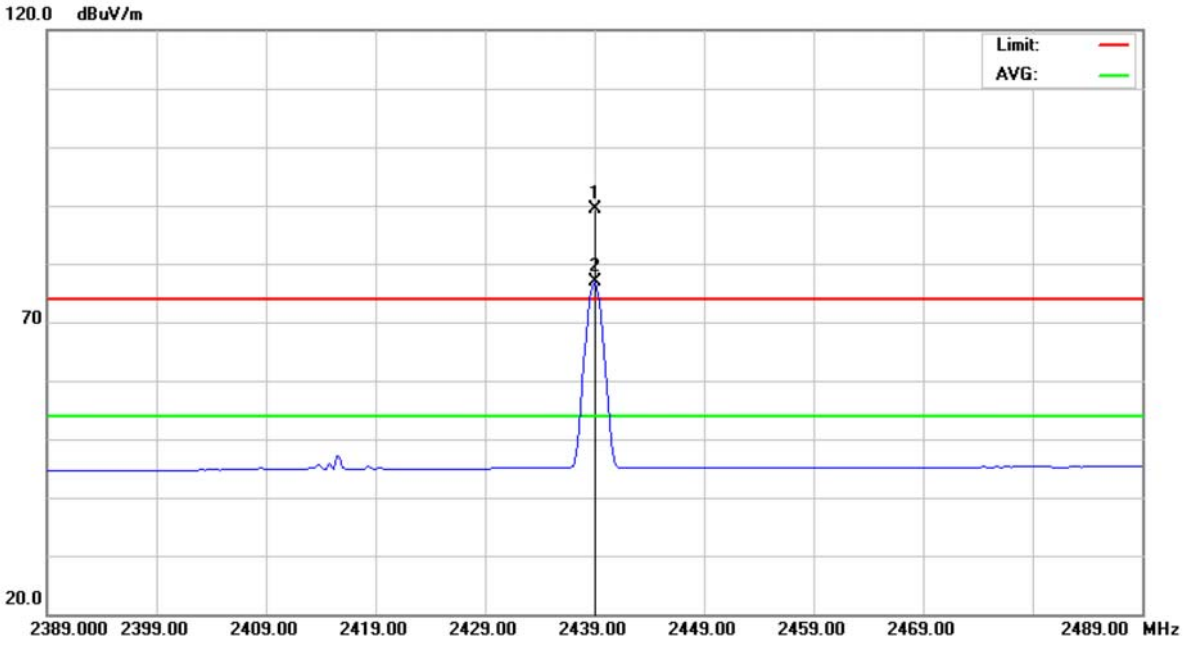
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4803.800	41.47	5.69	47.16	74.00	-26.84	peak	
2		4803.800	30.39	5.69	36.08	54.00	-17.92	AVG	
3		7206.130	41.60	12.18	53.78	74.00	-20.22	peak	
4	*	7206.130	30.00	12.18	42.18	54.00	-11.82	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2439 MHz		

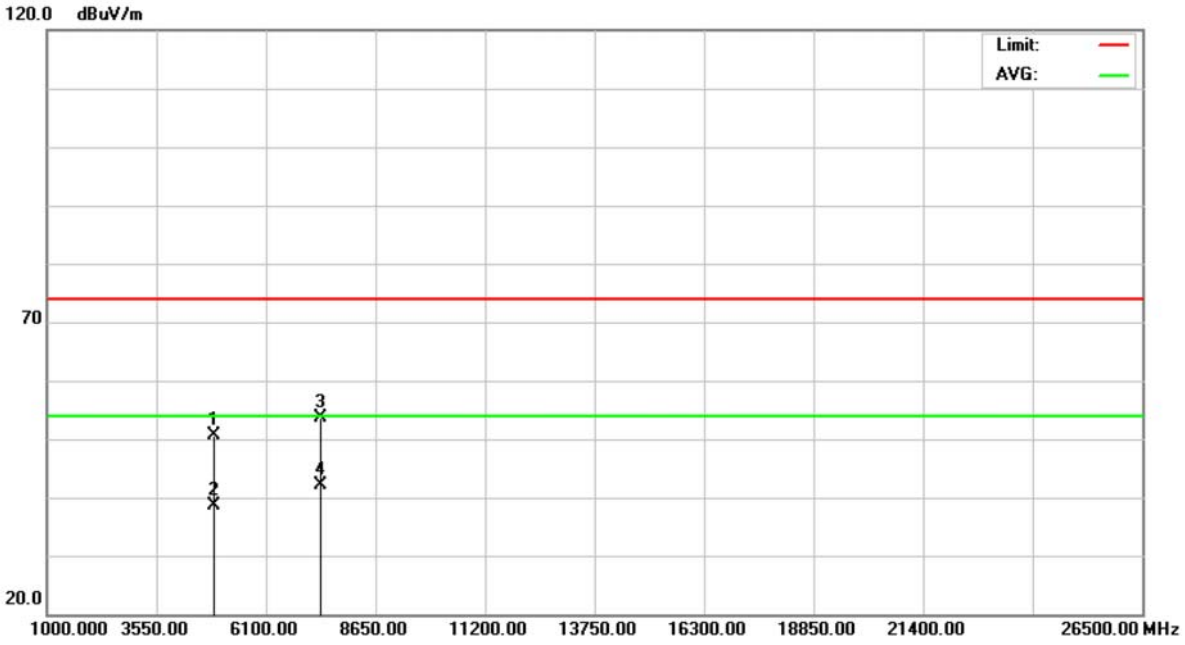
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2439.000	57.44	31.89	89.33	74.00	15.33	peak	
2	*	2439.000	44.91	31.89	76.80	54.00	22.80	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2439 MHz		

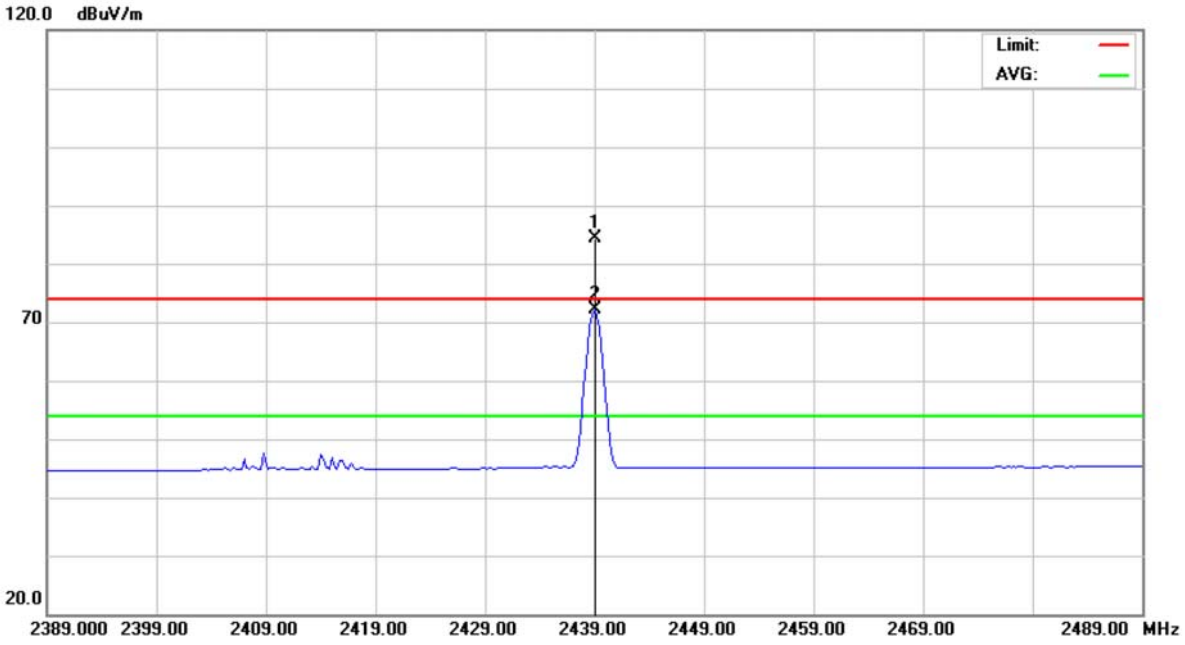
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4877.770	44.92	5.78	50.70	74.00	-23.30	peak	
2		4877.770	32.96	5.78	38.74	54.00	-15.26	AVG	
3		7317.095	41.04	12.59	53.63	74.00	-20.37	peak	
4	*	7317.095	29.61	12.59	42.20	54.00	-11.80	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2439 MHz		

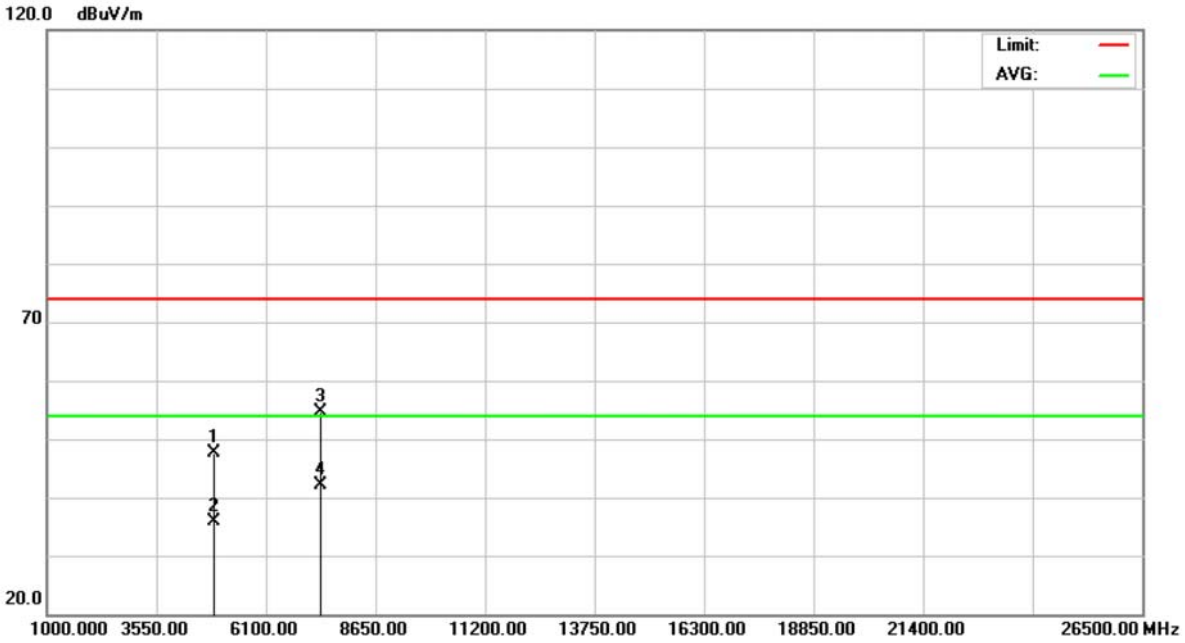
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2439.000	52.58	31.89	84.47	74.00	10.47	peak	
2	*	2439.000	40.12	31.89	72.01	54.00	18.01	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2439 MHz		

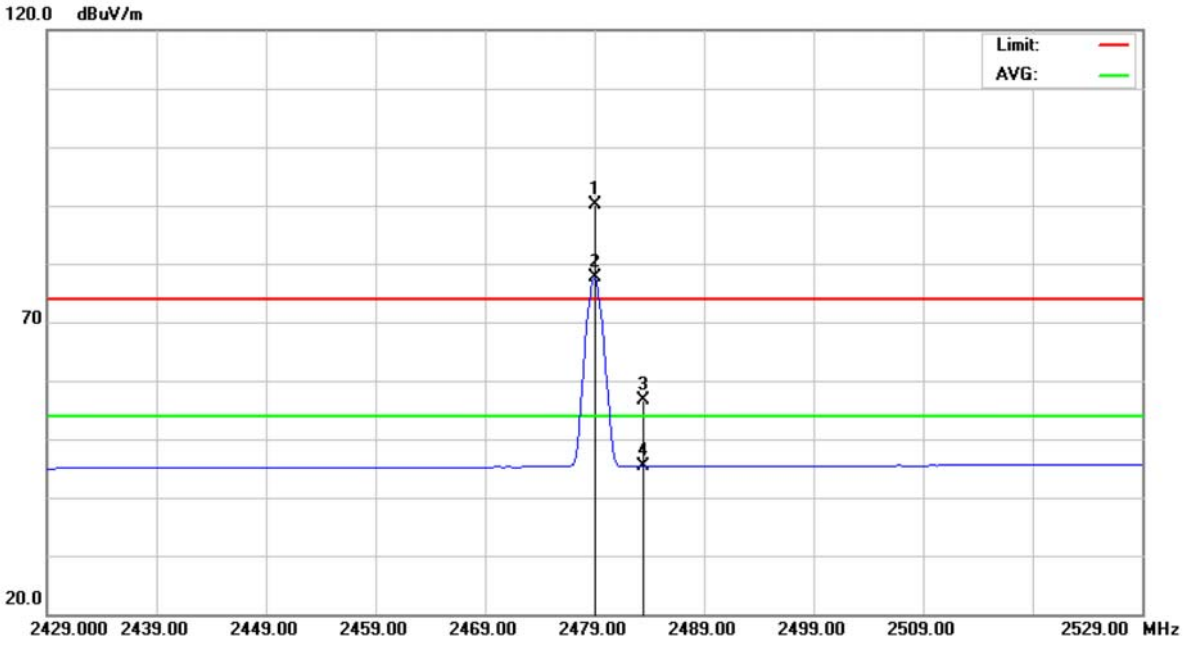
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4877.985	41.86	5.78	47.64	74.00	-26.36	peak	
2		4877.985	29.98	5.78	35.76	54.00	-18.24	AVG	
3		7316.975	42.16	12.59	54.75	74.00	-19.25	peak	
4	*	7316.975	29.56	12.59	42.15	54.00	-11.85	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2479 MHz		

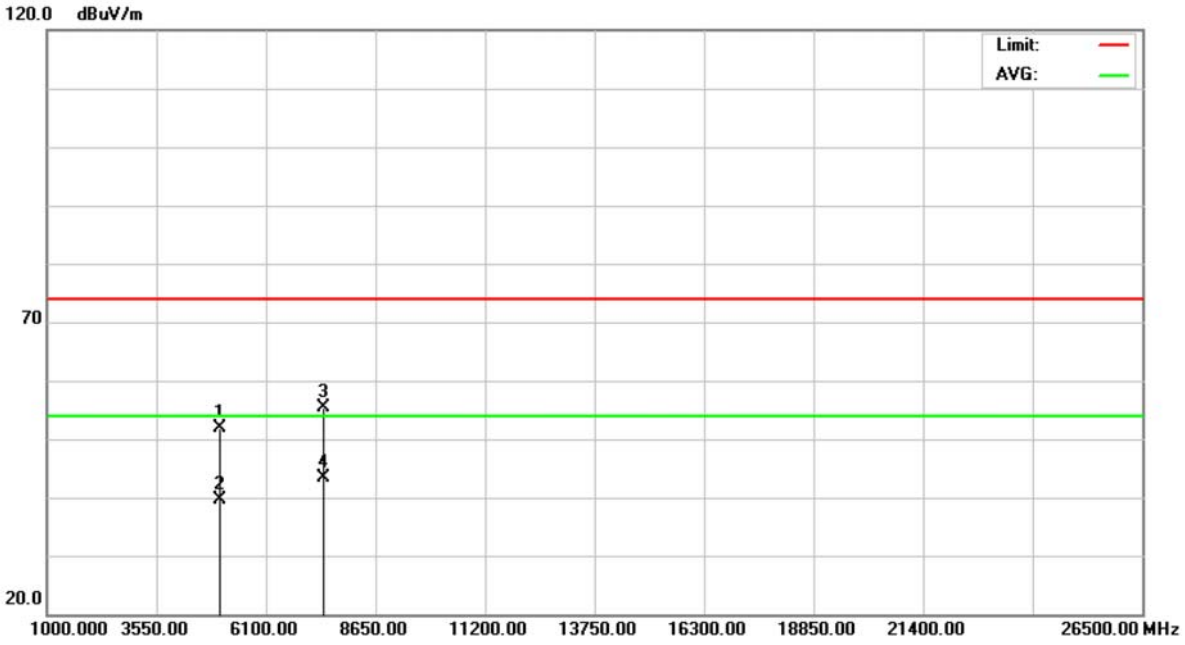
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2479.000	57.97	32.07	90.04	74.00	16.04	peak	
2	*	2479.000	45.44	32.07	77.51	54.00	23.51	AVG	
3		2483.500	24.55	32.09	56.64	74.00	-17.36	peak	
4		2483.500	13.23	32.09	45.32	54.00	-8.68	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2479 MHz		

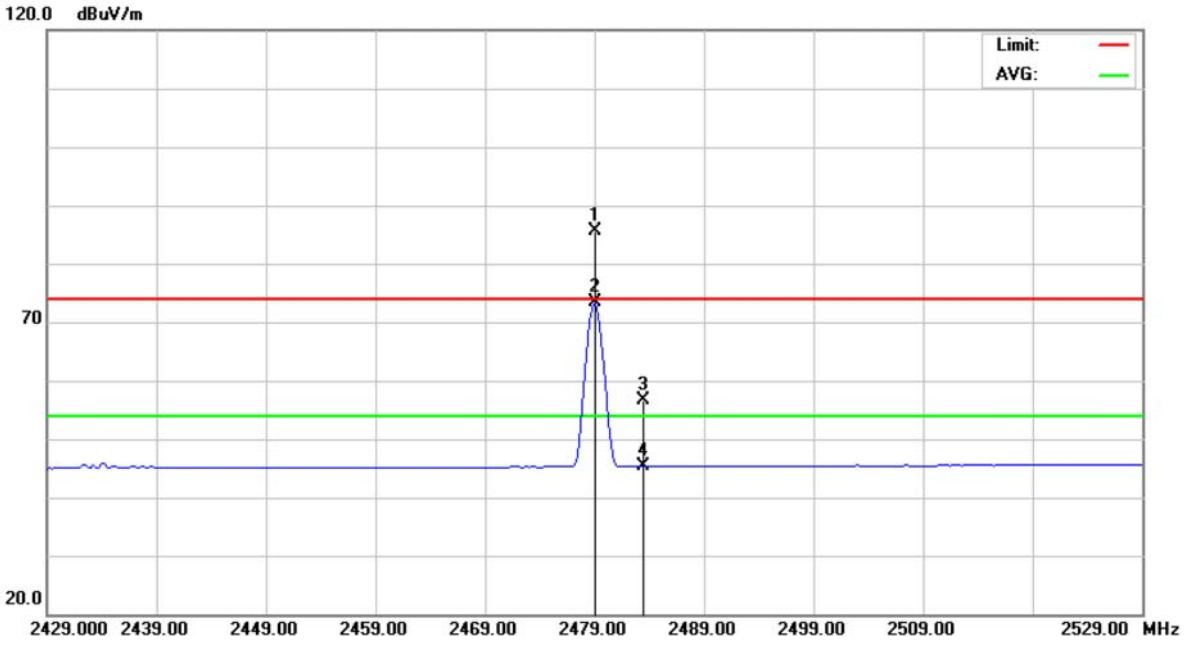
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4957.975	45.88	5.89	51.77	74.00	-22.23	peak	
2		4957.975	33.67	5.89	39.56	54.00	-14.44	AVG	
3		7436.630	42.31	13.03	55.34	74.00	-18.66	peak	
4	*	7436.630	30.47	13.03	43.50	54.00	-10.50	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2479 MHz		

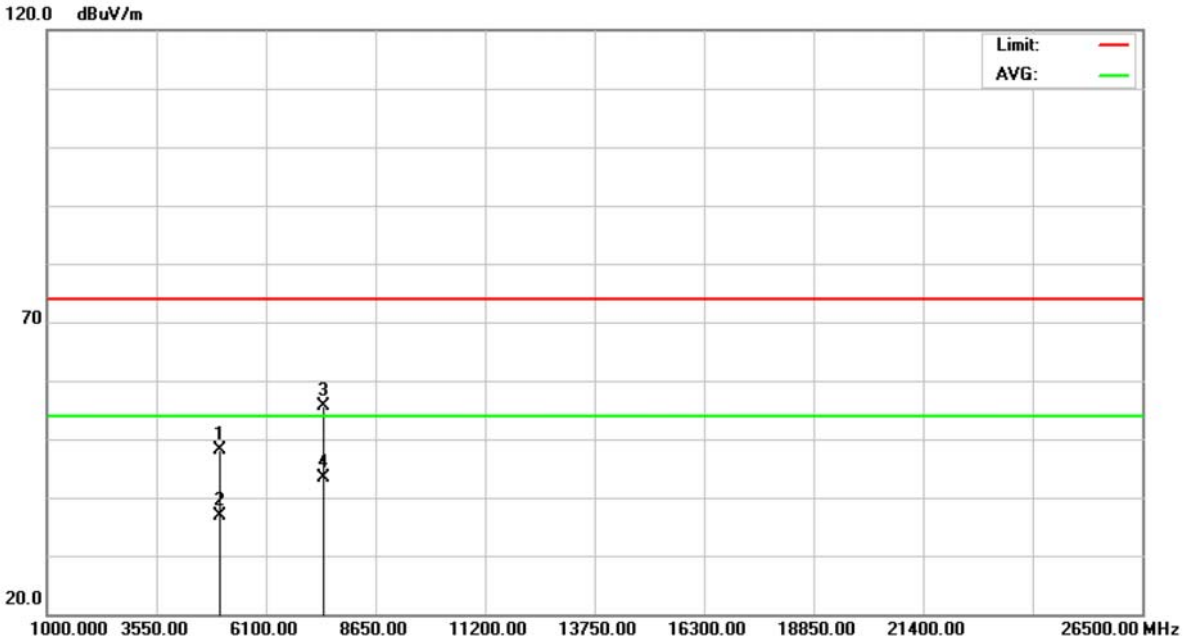
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2479.000	53.64	32.07	85.71	74.00	11.71	peak	
2	*	2479.000	41.21	32.07	73.28	54.00	19.28	AVG	
3		2483.500	24.53	32.09	56.62	74.00	-17.38	peak	
4		2483.500	13.23	32.09	45.32	54.00	-8.68	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2479 MHz		

Polarization: Horizontal

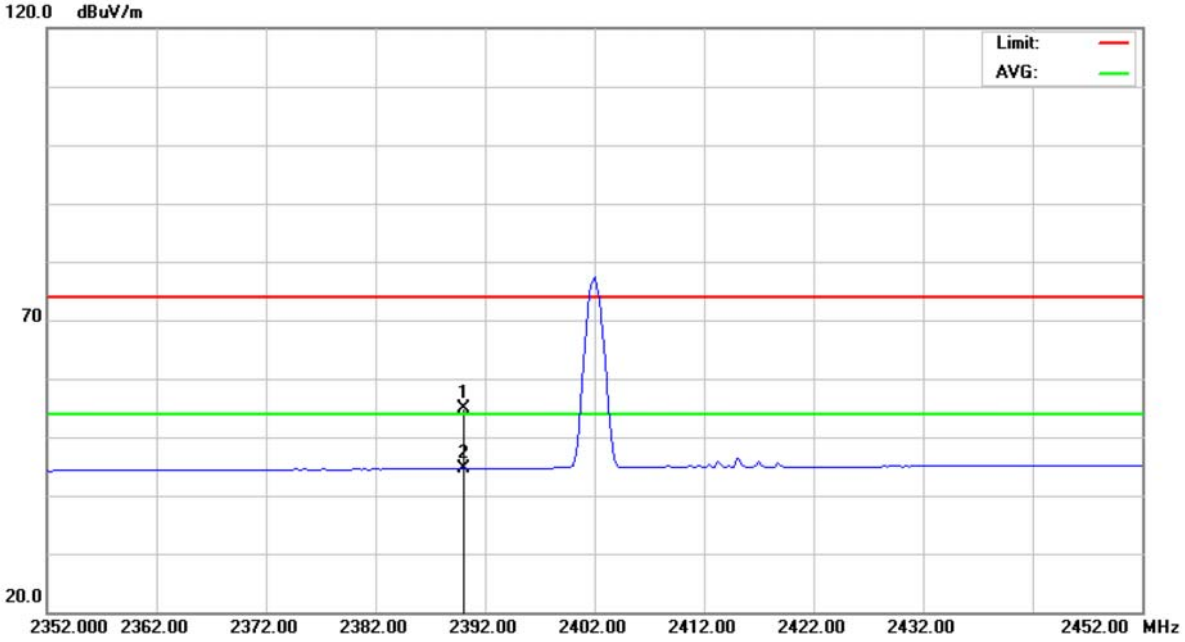


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4958.220	42.24	5.89	48.13	74.00	-25.87	peak	
2		4958.220	30.98	5.89	36.87	54.00	-17.13	AVG	
3		7437.065	42.61	13.04	55.65	74.00	-18.35	peak	
4	*	7437.065	30.45	13.04	43.49	54.00	-10.51	AVG	

8.9 TEST RESULTS (RESTRICTED BANDS)

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	24°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

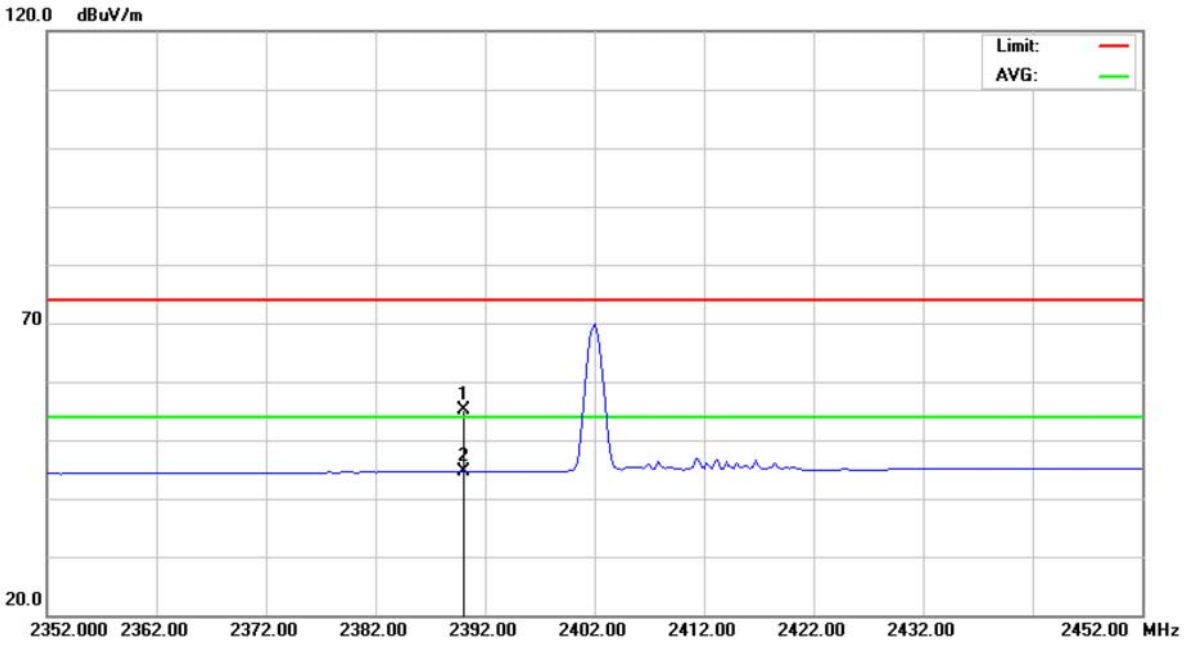
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.17	31.67	54.84	74.00	-19.16	peak	
2	*	2390.000	12.95	31.67	44.62	54.00	-9.38	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	24°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

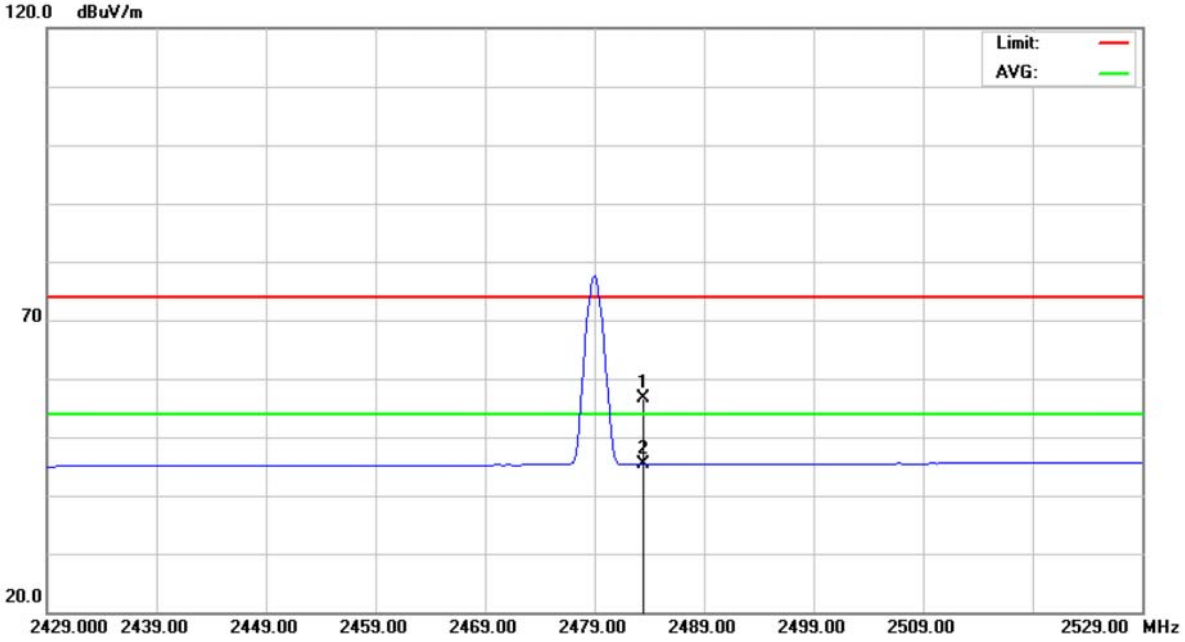
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.42	31.67	55.09	74.00	-18.91	peak	
2	*	2390.000	12.95	31.67	44.62	54.00	-9.38	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	24°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2479 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

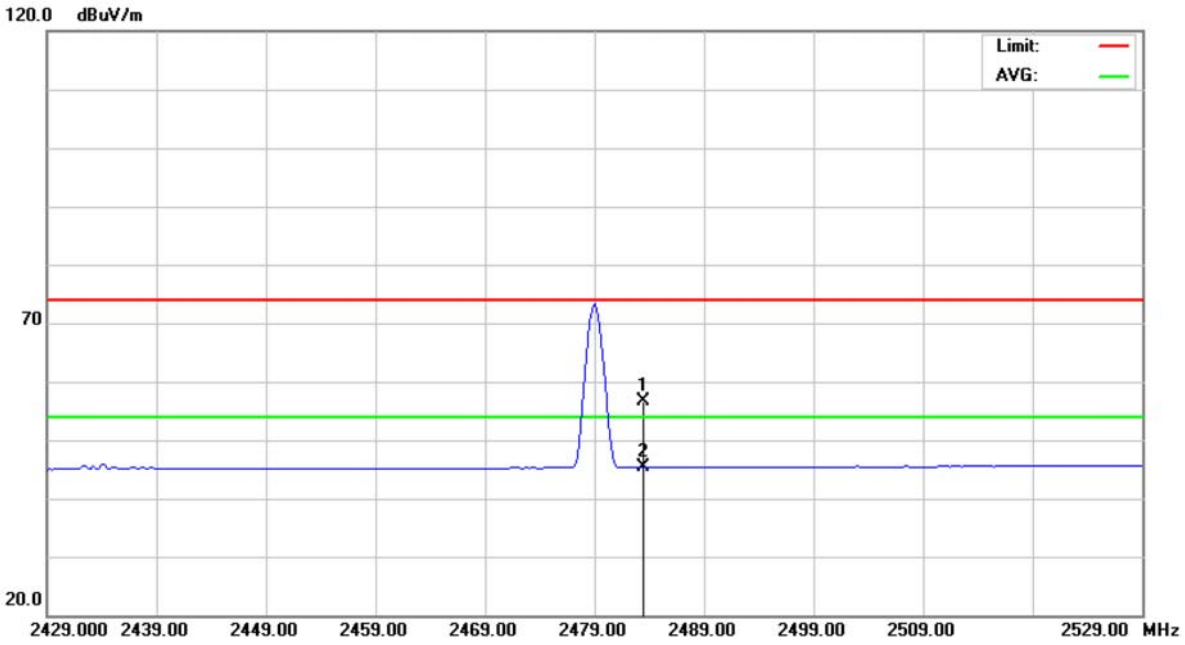
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.55	32.09	56.64	74.00	-17.36	peak	
2	*	2483.500	13.23	32.09	45.32	54.00	-8.68	AVG	

EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	24°C	Relative Humidity	46%
Test Voltage	DC 1.5V		
Test Mode	2479 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.53	32.09	56.62	74.00	-17.38	peak	
2	*	2483.500	13.23	32.09	45.32	54.00	-8.68	AVG	

9 POWER SPECTRAL DENSITY

9.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Power Spectral Density	2400-2483.5	8 dBm (in any 3 kHz)

9.2 MEASUREMENT INSTRUMENTS LIST

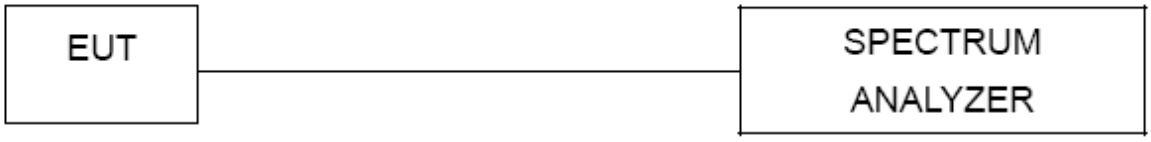
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Sep. 08, 2014

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

9.3 TEST PROCEDURES

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=3 kHz, VBW=30 kHz, Sweep time = 500s.

9.4 TEST SETUP LAYOUT



9.5 DEVIATION FROM TEST STANDARD

No deviation

9.6 EUT OPERATING CONDITIONS

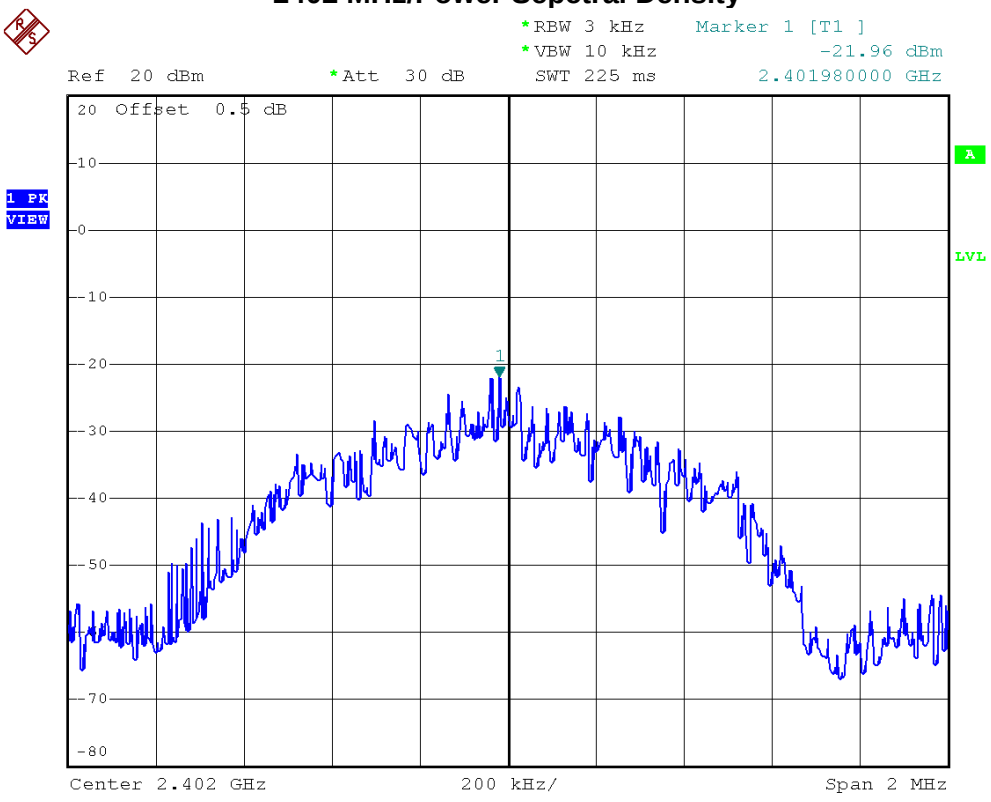
The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

9.7 TEST RESULTS

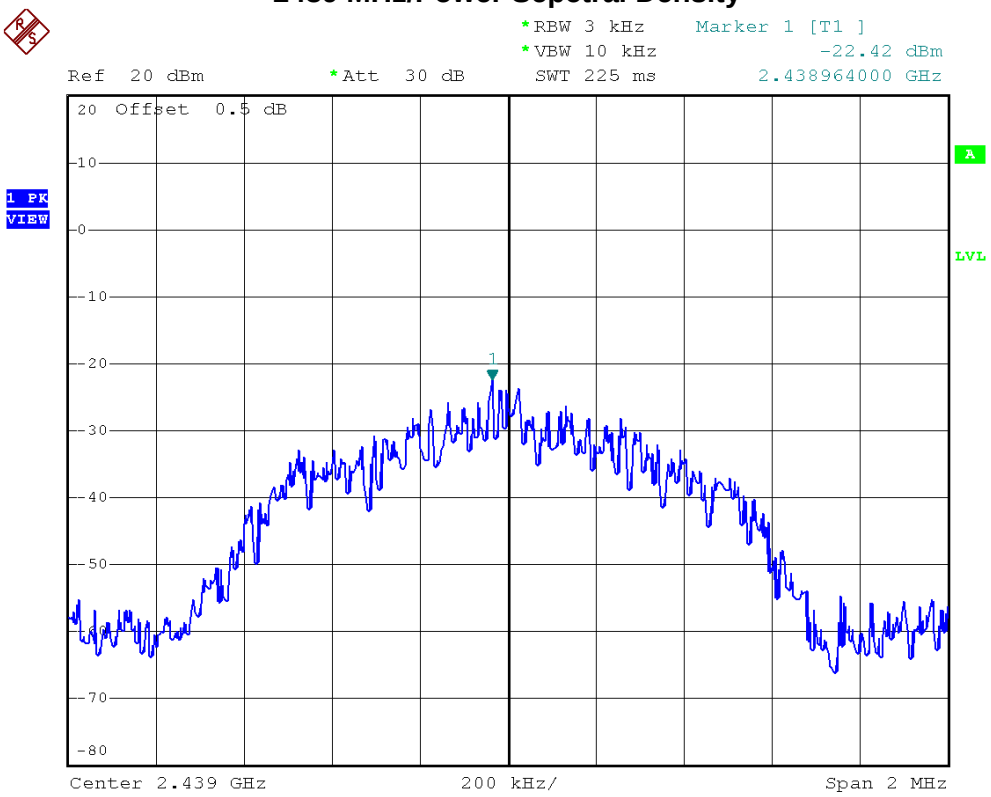
EUT	Frenzy Remote Control	Model Name	FRR913V1
Temperature	26°C	Relative Humidity	60%
Test Voltage	DC 1.5V		
Test Mode	2402 MHz, 2439 MHz, 2479 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2402 MHz	-21.96	8	PASS
2439 MHz	-22.42	8	PASS
2479 MHz	-21.37	8	PASS

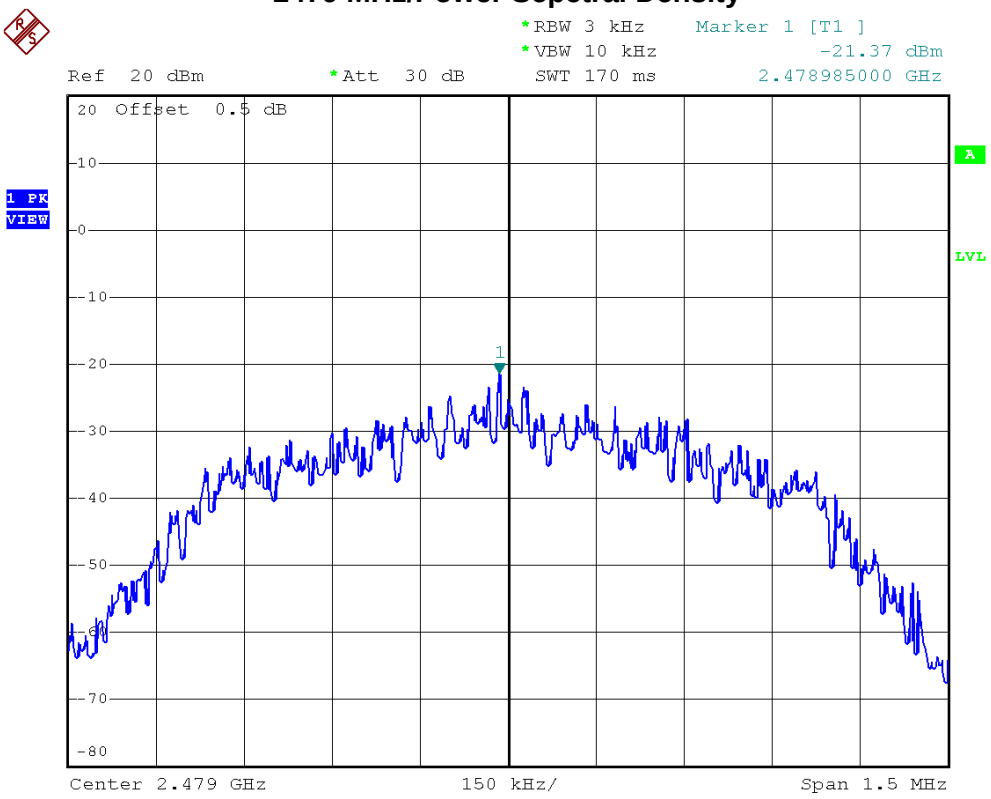
2402 MHz/Power Sepctral Density



2439 MHz/Power Sepctral Density



2479 MHz/Power Sepctral Density



10 EUT TEST PHOTO

Radiated spurious emission test photos