

TEST REPORT



Applicant:	Hua Kang Plastic Products (DongYuan) Ltd.
Address:	Xudong Fumin Industrial Park , DongYuan County , HeYuan City , Guang Dong

Manufacturer or Supplier	Hua Kang Plastic Products (DongYuan) Ltd.
Address	Xudong Fumin Industrial Park , DongYuan County , HeYuan City , Guang Dong
Product:	Toy RC Giant Crusher 4 x 4
Brand Name:	Sharper Image
Model:	1015454
Additional Model & Model Difference	1018183, 101XXXX, see items 3.1
Date of tests:	Apr. 22, 2024 ~ May 13, 2024

the tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.249**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Eric Fang Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	 Date: May 23, 2024

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Test Report No.: RF2404WDG0209-1

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2404WDG0209-1	Original release	May 23, 2024

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	N/A	Powered from battery
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	9KHz ~ 30MHz	2.80dB
	30MHz ~ 1GMHz	4.65dB
	1GHz ~ 18GHz	5.01dB
	18GHz ~ 40GHz	4.10dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Toy RC Giant Crusher 4 x 4
MODEL NO.	1015454
ADDITIONAL MODELS	1018183, 101XXXX
FCC ID	2BFIQ6014R
NOMINAL VOLTAGE	DC 9.6V from Li-ion battery Battery charging: DC 5V from USB Host Unit
MODULATION TECHNOLOGY	GFSK
OPERATING FREQUENCY	2410MHz ~ 2473MHz
ANTENNA TYPE	Wire Antenna, with 0dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	See note 6

NOTES:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
- Please refer to the EUT photo document (Reference No.: 2404WDG0209-1) for detailed product photo.
- Additional models (see above table) are identical with the test model 1015454 except the color of the appearance and model name for trading purpose. And for 101XXXX, where XXXX can be digits 0000-9999 which represent different customers.
- The truck has two color. And in charging mode the wireless function can't use.
- Product cable information as follows:

ID	Descriptions	Qty.	Length (m)	Shielding (Y/N)	Cores (Qty.)	Remark
1	USB-A to USB-C cable	1	1.5	N	0	N/A

3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on X axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	-	√	DC 9.6V from Battery

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
BW: 20db bandwidth

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

Following channel(s) was (were) selected for the test as listed below.

TESTED CHANNEL	TESTED FREQUENCY
Low	2410 MHz
Middle	2442 MHz
High	2473 MHz

Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2410MHz	21	2431MHz	42	2452MHz
1	2411MHz	22	2432MHz	43	2453MHz
2	2412MHz	23	2433MHz	44	2454MHz
3	2413MHz	24	2434MHz	45	2455MHz
4	2414MHz	25	2435MHz	46	2456MHz
5	2415MHz	26	2436MHz	47	2457MHz
6	2416MHz	27	2437MHz	48	2458MHz
7	2417MHz	28	2438MHz	49	2459MHz
8	2418MHz	29	2439MHz	50	2460MHz
9	2419MHz	30	2440MHz	51	2461MHz
10	2420MHz	31	2441MHz	52	2462MHz
11	2421MHz	32	2442MHz	53	2463MHz
12	2422MHz	33	2443MHz	54	2464MHz
13	2423MHz	34	2444MHz	55	2465MHz
14	2424MHz	35	2445MHz	56	2466MHz
15	2425MHz	36	2446MHz	57	2467MHz
16	2426MHz	37	2447MHz	58	2468MHz
17	2427MHz	38	2448MHz	59	2469MHz
18	2428MHz	39	2449MHz	60	2470MHz
19	2429MHz	40	2450MHz	61	2471MHz
20	2430MHz	41	2451MHz	62	2472MHz
				63	2473MHz

Note: The more detailed channel, please refer to the product specifications



TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC 9.6V from Battery	Alex
BW	25deg. C, 56%RH	DC 9.6V from Battery	Vincent
PLC	-	-	-

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.249

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without any other necessary accessories or support units

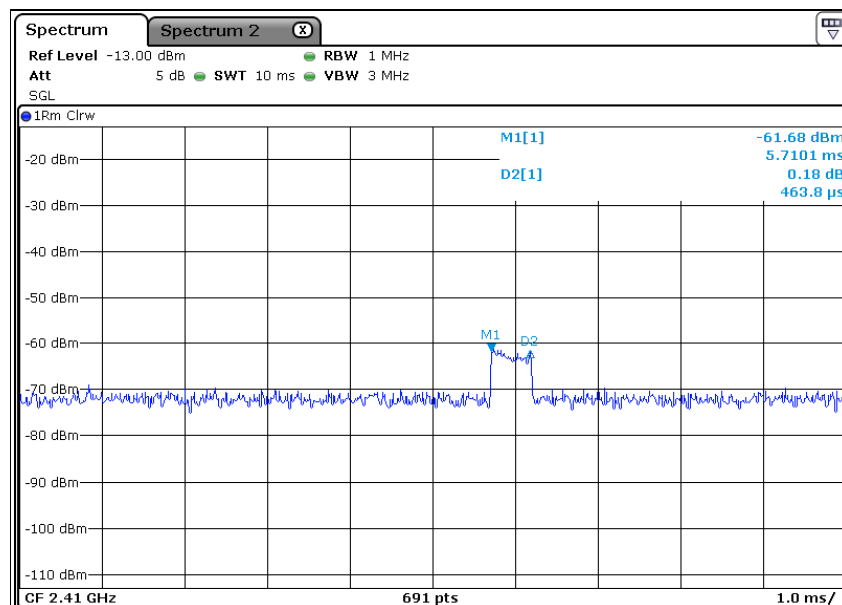
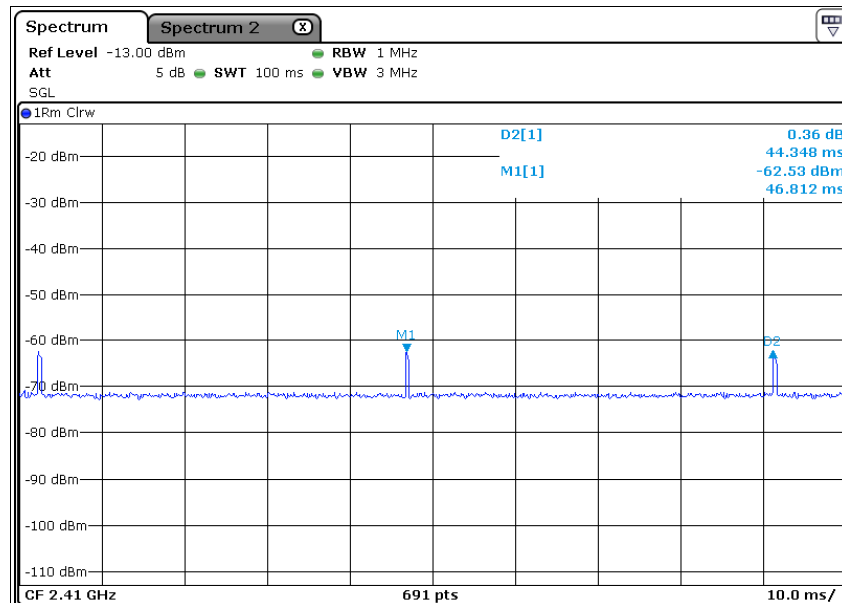
3.5 DUTY CYCLE OF TESET SIGNAL

$T_p = 44.348 \text{ ms}$

$T_{on} = 463.8 / 1000 = 0.4638 \text{ ms}$

Duty Cycle = $T_{on} / T_p * 100\% = 0.4638 / 44.348 \approx 1.0458\%$

AV factor = $20 \log (\text{Duty cycle}) = 20 \log (1.0458\%) \approx -39.61 \text{ dB}$



4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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
Above 960	500	3

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTES:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Jan. 02, 25
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Apr. 05, 25
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May. 09, 24
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Mar. 06, 25
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Jan. 08, 25
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	Apr. 01, 25
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Apr. 01, 25
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May 20, 24
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Apr. 24, 24
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Jan. 02, 25
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A

NOTES:

1. The test was performed in 966 Chamber.
2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. 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 from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1.3m above the ground.
- g. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTES:

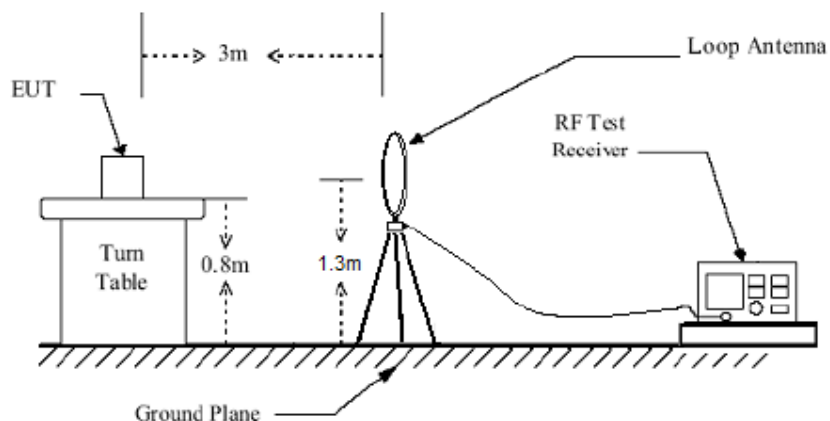
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. Average value =PK Emission +AV Factor.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

4.1.4 DEVIATION FROM TEST STANDARD

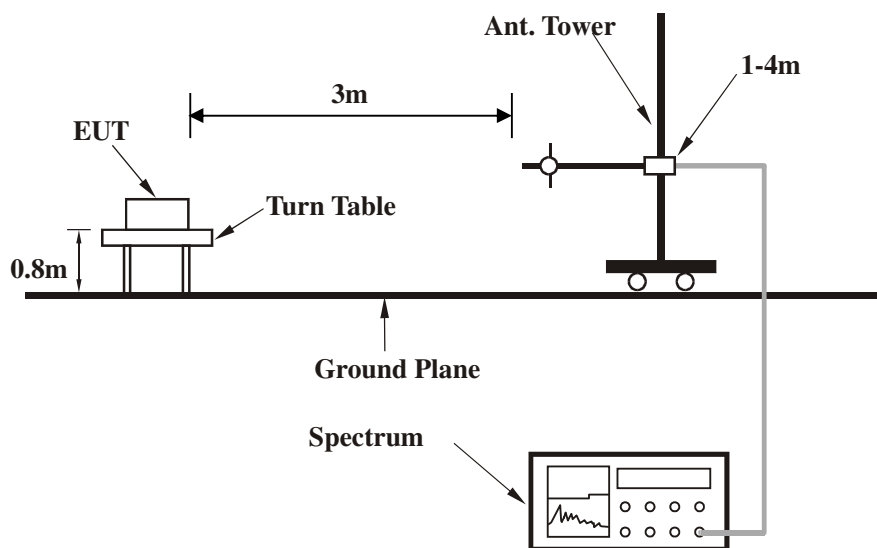
No deviation.

4.1.5 TEST SETUP

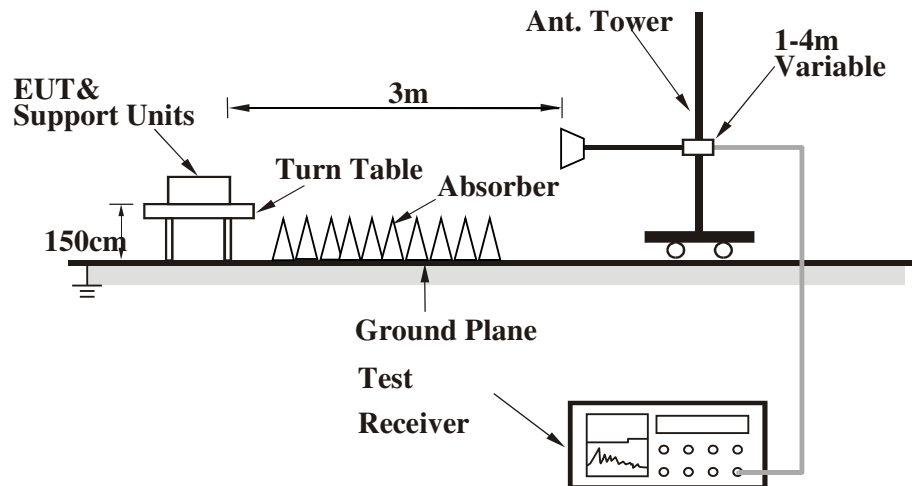
Below 30MHz test setup



Below 1GHz test setup



Above 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Turned on the power of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.1.7 TEST RESULTS

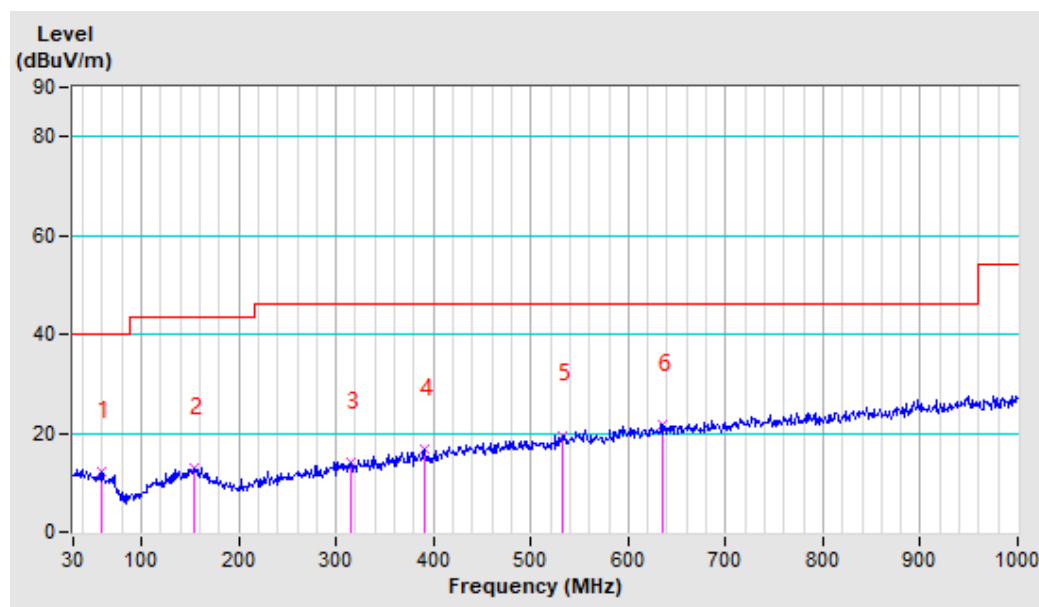
BELOW 1GHz WORST-CASE DATA

CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	58.13	12.31 QP	40.00	-27.69	1.00 H	306	26.40	-14.09
2	154.16	12.89 QP	43.50	-30.61	1.00 H	174	25.60	-12.71
3	315.18	14.03 QP	46.00	-31.97	1.00 H	58	25.26	-11.23
4	389.87	16.70 QP	46.00	-29.30	1.00 H	183	26.52	-9.82
5	531.49	19.61 QP	46.00	-26.39	1.00 H	177	26.77	-7.16
6	636.25	21.83 QP	46.00	-24.17	1.00 H	285	26.80	-4.97

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.

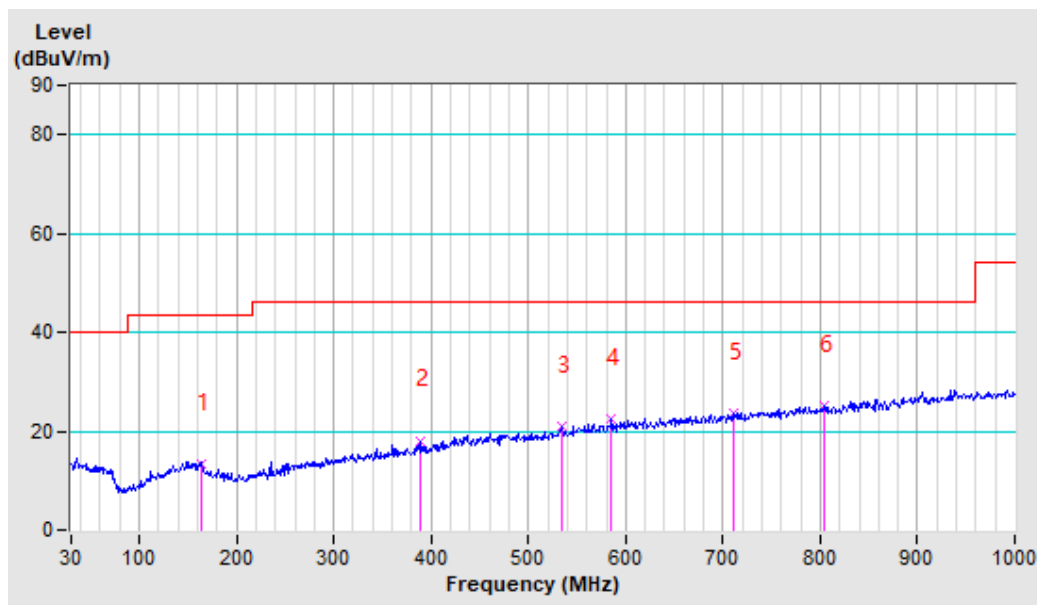


CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	163.86	13.47 QP	43.50	-30.03	1.00 V	158	26.66	-13.19
2	387.93	18.11 QP	46.00	-27.89	1.00 V	122	27.97	-9.86
3	534.40	20.80 QP	46.00	-25.20	1.00 V	212	27.89	-7.09
4	585.81	22.49 QP	46.00	-23.51	1.00 V	134	28.46	-5.97
5	709.97	23.49 QP	46.00	-22.51	1.00 V	182	27.24	-3.75
6	803.09	25.17 QP	46.00	-20.83	1.00 V	262	27.20	-2.03

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

CHANNEL	TX Low Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

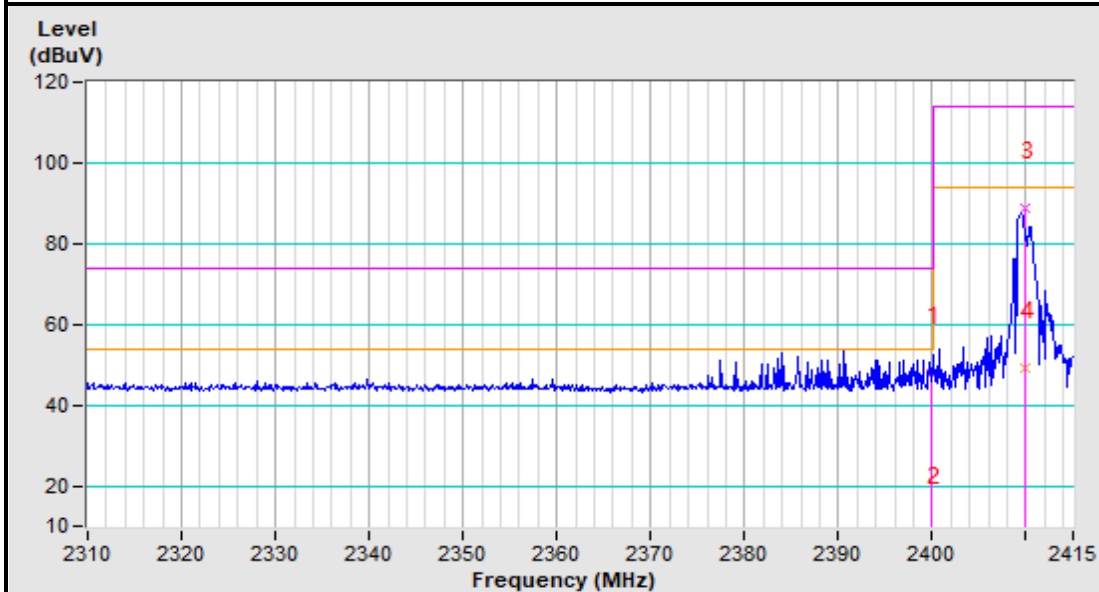
ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	47.84 PK	74.00	-26.16	1.20 H	180	51.58	-3.74
2	2400.00	8.23 AV	54.00	-45.77	1.20 H	180	11.95	-3.74
3	*2410.00	88.96 PK	114.00	-25.04	1.20 H	180	92.71	-3.75
4	*2410.00	49.35 AV	94.00	-44.65	1.20 H	180	53.08	-3.75
5	4820.00	61.14 PK	74.00	-12.86	1.00 H	258	63.31	-2.17
6	4820.00	21.53 AV	54.00	-32.47	1.00 H	258	23.68	-2.17
7	7230.00	51.95 PK	74.00	-22.05	1.00 H	230	51.08	0.87
8	7230.00	12.34 AV	54.00	-41.66	1.00 H	230	11.45	0.87
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	50.16 PK	74.00	-23.84	1.20 V	150	53.90	-3.74
2	2400.00	10.55 AV	54.00	-43.45	1.20 V	150	14.27	-3.74
3	*2410.00	81.71 PK	114.00	-32.29	1.20 V	150	85.46	-3.75
4	*2410.00	42.10 AV	94.00	-51.90	1.20 V	150	45.83	-3.75
5	4820.00	60.06 PK	74.00	-13.94	1.00 V	248	62.23	-2.17
6	4820.00	20.41 AV	54.00	-33.55	1.00 V	248	22.60	-2.17
7	7230.00	51.94 PK	74.00	-22.06	1.00 V	236	51.07	0.87
8	7230.00	12.29 AV	54.00	-41.67	1.00 V	236	11.44	0.87

REMARK:

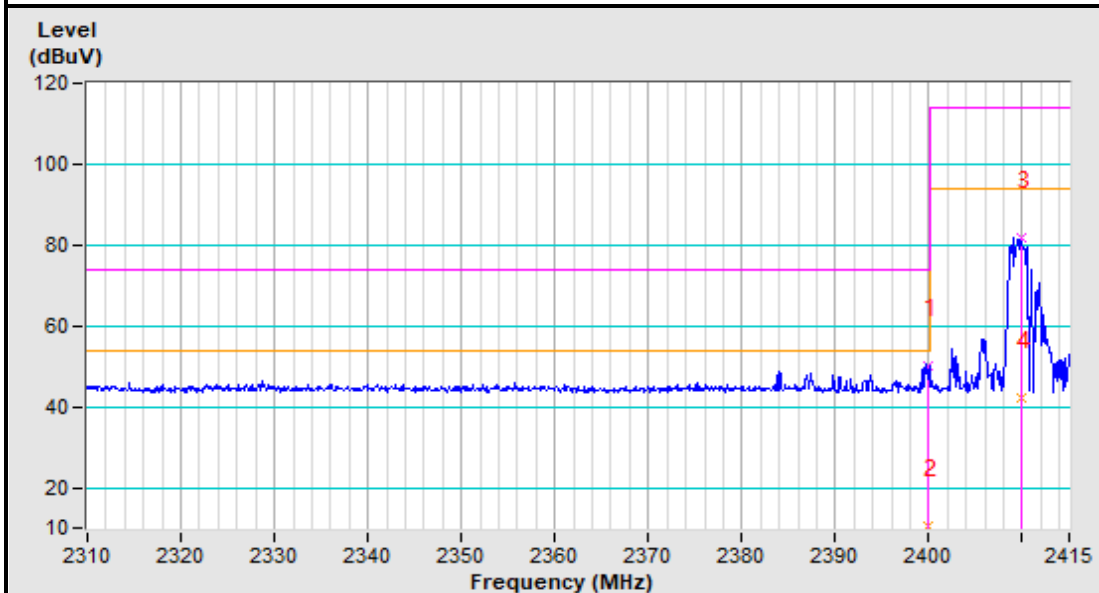
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. Average value = PK Emission + 20*log(duty cycle) Where the duty factor is calculated from following formula: 20 log (Duty cycle) = 20Log(1.0458%) = -39.61dB, Please see page 9 for plotted duty.

Band edge Plot

2410MHz Horizontal



2410MHz Vertical



CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	88.21 PK	114.00	-25.79	1.50 H	160	91.96	-3.75
2	*2442.00	48.60 AV	94.00	-45.40	1.50 H	160	52.33	-3.75
3	4884.00	60.19 PK	74.00	-13.81	1.55 H	130	62.35	-2.16
4	4884.00	20.58 AV	54.00	-33.42	1.55 H	130	22.72	-2.16
5	7326.00	51.62 PK	74.00	-22.38	1.55 H	136	51.15	0.47
6	7326.00	12.01 AV	54.00	-41.99	1.55 H	136	11.52	0.47
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	82.71 PK	114.00	-31.29	1.25 V	200	86.46	-3.75
2	*2442.00	43.10 AV	94.00	-50.90	1.25 V	200	46.83	-3.75
3	4884.00	60.93 PK	74.00	-13.07	1.00 V	250	63.09	-2.16
4	4884.00	21.32 AV	54.00	-32.68	1.00 V	250	23.46	-2.16
5	7326.00	51.93 PK	74.00	-22.07	1.00 V	250	51.46	0.47
6	7326.00	12.32 AV	54.00	-41.68	1.00 V	250	11.83	0.47

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. Average value = PK Emission + 20*log(duty cycle) Where the duty factor is calculated from following formula: 20 log (Duty cycle) = 20Log(1.0458%) = -39.61dB, Please see page 9 for plotted duty.

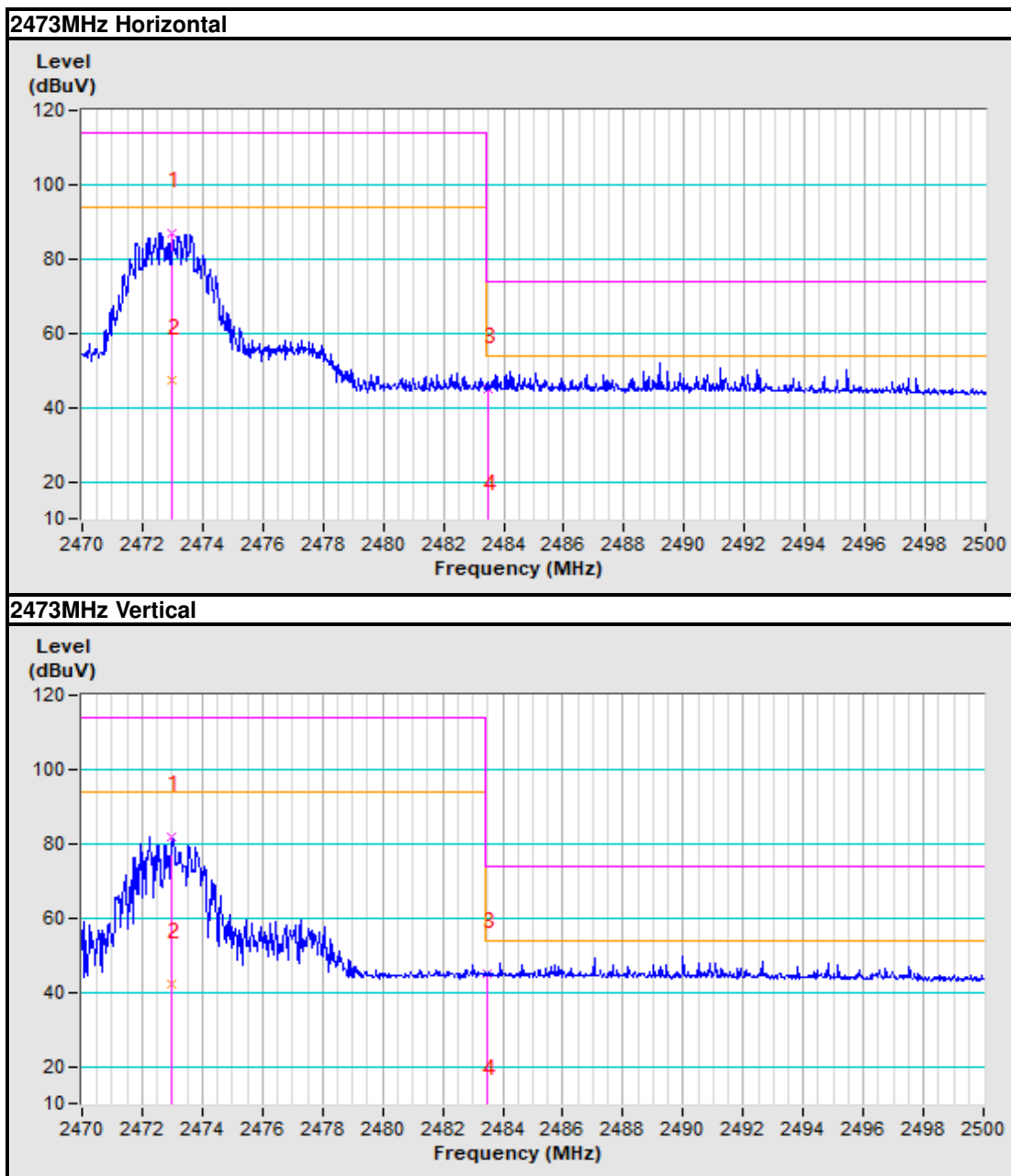
CHANNEL	TX High Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2473.00	87.09 PK	114.00	-26.91	1.00 H	185	90.85	-3.76
2	*2473.00	47.48 AV	94.00	-46.52	1.00 H	185	51.22	-3.76
3	2483.50	45.07 PK	74.00	-28.93	1.50 H	160	48.82	-3.75
4	2483.50	5.46 AV	54.00	-48.54	1.50 H	160	9.19	-3.75
5	4946.00	58.49 PK	74.00	-15.51	2.00 H	150	60.64	-2.15
6	4946.00	18.88 AV	54.00	-35.12	2.00 H	150	21.01	-2.15
7	7419.00	50.97 PK	74.00	-23.03	2.00 H	150	50.88	0.09
8	7419.00	11.36 AV	54.00	-42.64	2.00 H	150	11.25	0.09
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2473.00	81.84 PK	114.00	-32.16	1.20 V	130	85.60	-3.76
2	*2473.00	42.33 AV	94.00	-51.67	1.20 V	130	46.07	-3.76
3	2483.50	44.88 PK	74.00	-29.12	1.20 V	130	48.63	-3.75
4	2483.50	5.27 AV	54.00	-48.73	1.20 V	130	9.00	-3.75
5	4946.00	57.54 PK	74.00	-16.46	1.00 V	120	59.69	-2.15
6	4946.00	17.93 AV	54.00	-36.07	1.00 V	120	20.06	-2.15
7	7419.00	51.11 PK	74.00	-22.89	1.20 V	150	51.02	0.09
8	7419.00	11.50 AV	54.00	-42.50	1.20 V	150	11.39	0.09

REMARK:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.
6. Average value = PK Emission + 20*log(duty cycle) Where the duty factor is calculated from following formula: $20 \log (\text{Duty cycle}) = 20 \log (1.0458\%) = -39.61 \text{ dB}$, Please see page 9 for plotted duty.

Band edge Plot



4.2 20dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Power Sensor	Keysight	U2021XA	MY57320002	May 11, 24
Power Meter	Anritsu	ML2495A	1139001	Jul. 11, 24
Power Sensor	Anritsu	MA2411B	1531155	Jul. 11, 24
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Oct. 15, 24
Oscilloscope	Agilent	DSO9254A	MY51260160	Jul. 11, 24
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Jan. 01, 25
Signal Generator	Agilent	N5183A	MY50140980	Jul. 23, 24
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Jul. 11, 24
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A

NOTES:

1. The test was performed in RF Test Shielded Room.
2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

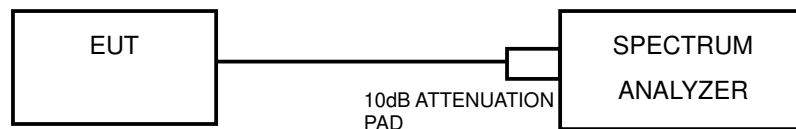
4.2.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



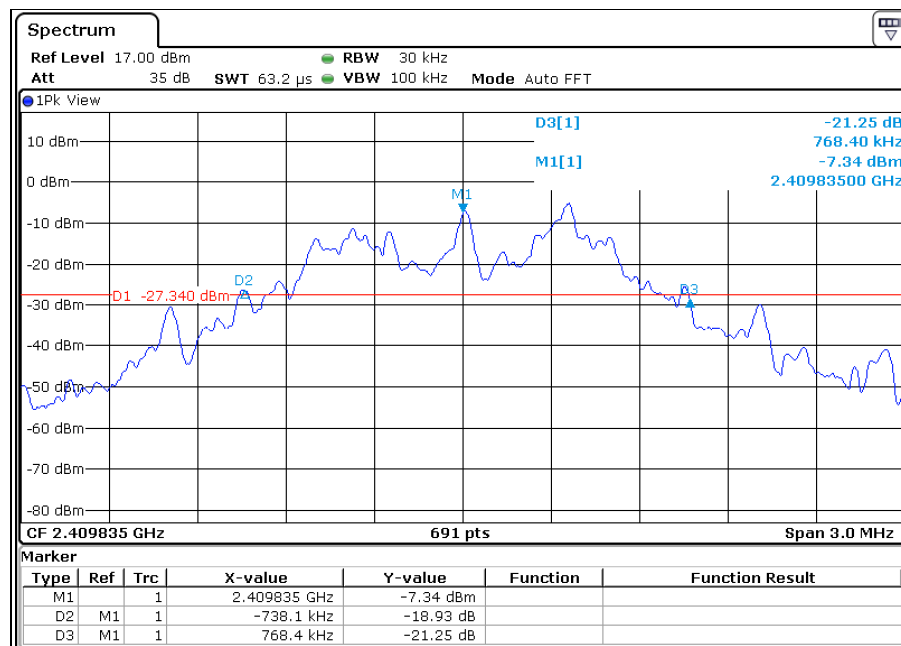
4.2.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

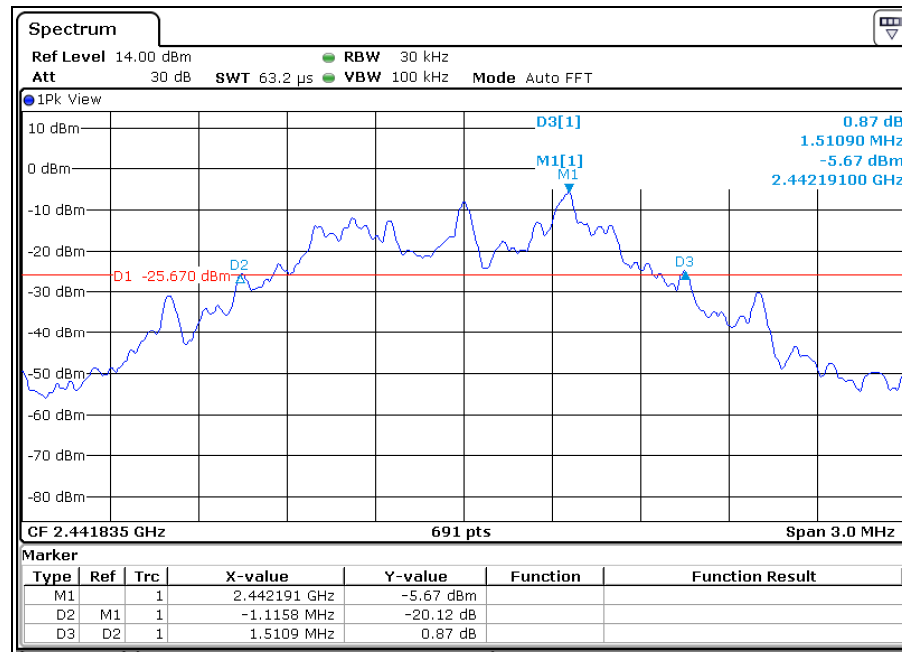
4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2410	0.7684
Middle	2442	1.5109
High	2473	1.5109

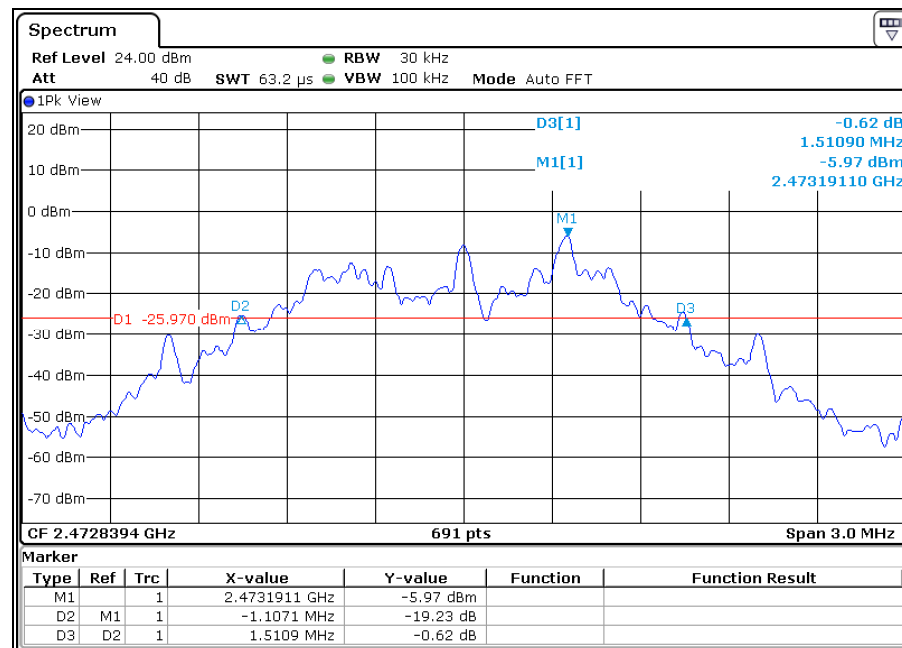
Test Data: Low channel



Test Data: Middle channel



Test Data: High channel



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---