FCC Radio Test Report

FCC ID: 2AVDG-80012

Original Grant

Report No.	:	TB-FCC170164
Applicant	:	Shenzhen Snapmaker Technologies Co., Ltd.
Equipment Under Test (EUT)		
EUT Name	:	Snapmaker Modular 3D Printer
Model No.	:	80012, 80013, 80014, 80015, 80016, 80017
Brand Name	:	SNAPMAKER
Receipt Date	:	2019-10-30
Test Date	:	2019-10-30 to 2019-12-12
Issue Date	:	2019-12-13
Standards	:	FCC Part 15, Subpart C 15.247
Test Method	:	ANSI C63.10: 2013
Conclusions	:	**PASS**

In the configuration tested, the EUT complied with the standards specified above,
The EUT technically complies with the FCC requirements

Test/Witness Engineer	:	Jack Deng
Engineer Supervisor	:	Ivan Su
Engineer Manager	:	Ray Lai

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TB-FCC170164	Rev.01	Initial issue of report	2019-12-13

1. General Information about EUT

1.1 Client Information

Applicant	:	Shenzhen Snapmaker Technologies Co., Ltd.
Address	:	5F, Honglai Kechuang Building 13, Pingshan 1st Road, Nanshan District, Shenzhen, China
Manufacturer	:	Shenzhen Snapmaker Technologies Co., Ltd.
Address	:	5F, Honglai Kechuang Building 13, Pingshan 1st Road, Nanshan District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Snapmaker Modular 3D Printer	
Models No.	:	80012, 80013, 80014, 80015, 80016, 80017	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is sizes.	
Product Description	:	Operation Frequency:	Bluetooth V4.2: 2402~2480 MHz
		Number of Channel:	Bluetooth: 79 Channels **See Note 2**
		Max Peak Output Power:	Laser Camera: 4.646dBm(8-DPSK) Control screen: 5.419dBm(GFSK)
		Antenna Gain:	1.38dBi FPC Antenna provided by the applicant.
		Modulation Type:	GFSK (1 Mbps) π/4-DQPSK (2 Mbps) 8-DPSK (3 Mbps)
Power Rating	:	Power Module(SM3DP005): Input: AC 100-240V, 50/60Hz, 4A. Output: DC 24V, 13.4A, 320W	
Software Version	:	SM2_TP_V1.0	
Hardware Version	:	SM2_5inch_V1.0	
Remark	:	The adapter and antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

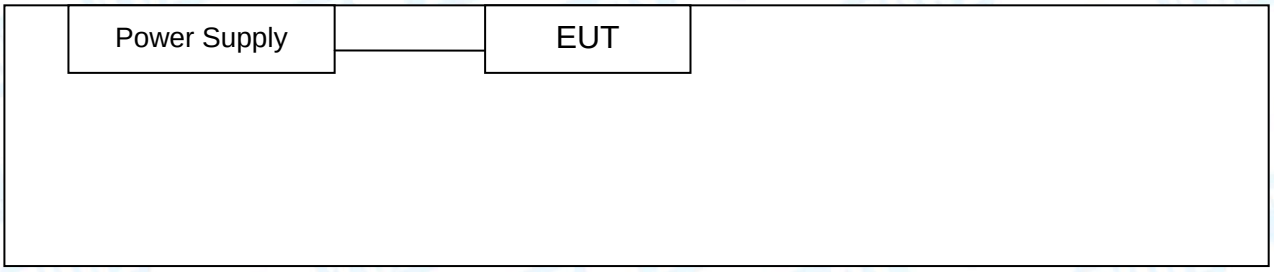
(2) The EUT are two parts with bluetooth, the one is laser camera, the other one is control screen.

(3) Channel List:

Bluetooth Channel List					
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
00	**2402**	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	**39**	**2441**	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	**78**	**2480**
25	2427	52	2454		
26	2428	53	2455		

(4) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested



1.4 Description of Support Units

The EUT has been test as an independent unit.

Name	Model	S/N	Manufacturer	Used "√"
Notebook	161301-CN	15987/00203076	Xiaomi	√

1.5 Description of Test Mode

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 follow was evaluated respectively.

For Conducted Test	
Final Test Mode	**Description**
Mode 1	TX GFSK Mode(Model: 80012)
Mode 2	TX GFSK Mode(Model: 80013)
Mode 3	TX GFSK Mode(Model: 80014)

For Radiated Test below 1GHz	
Final Test Mode	**Description**
Mode 4	TX GFSK Mode(Model: 80012)
Mode 5	TX GFSK Mode(Model: 80013)
Mode 6	TX GFSK Mode(Model: 80014)
For Radiated Test Above 1GHz	
Final Test Mode	**Description**
Mode 7	TX Mode(GFSK) Channel 00/39/78
Mode 8	TX Mode(Pi/4-DQPSK) Channel 00/39/78
Mode 9	TX Mode(8-DPSK) Channel 00/39/78
Mode 10	Hopping Mode(GFSK)
Mode 11	Hopping Mode(Pi /4-DQPSK)
Mode 12	Hopping Mode(8-DPSK)

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate. We have pretested all the test modes above.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

TX Mode: GFSK (1 Mbps)

TX Mode: π/4-DQPSK (2 Mbps)

TX Mode:8-DPSK (3 Mbps)

(2) The EUT was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane as the normal use. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of Bluetooth mode.

Laser Camera			
Test Software Version	**ESP_RF_test_tool_v1.1.0**		
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	3	3	3
π/4-DQPSK	3	3	3
8-DPSK	3	3	3

Control Screen			
Test Software Version	**QRCT**		
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	8	8	8
π/4-DQPSK	8	8	8
8-DPSK	8	8	8

1.7 Measurement Uncertainty

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 %.

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 2				
Standard Section		Test Item	Judgment	Remark
FCC	IC			
15.203		Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A
15.247(d)	RSS 247 5.5	Band Edge	PASS	N/A
15.247(c)& 15.209	RSS 247 5.5	Radiated Spurious Emission	PASS	N/A
15.247(a)	RSS 247 5.1 (1)	99% Occupied Bandwidth & 20dB Bandwidth	PASS	N/A
Note: N/A is an abbreviation for Not Applicable.				

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE
RF Conducted Measurement	MTS-8310	MWRFtest	V2.0.0.0

4. Test Equipment

Conducted Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 13, 2019	Jul. 12, 2020
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 13, 2019	Jul. 12, 2020
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 13, 2019	Jul. 12, 2020
LISN	Rohde & Schwarz	ENV216	101131	Jul. 13, 2019	Jul. 12, 2020
Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	FSVR	1311.006K40-100945-DH	Feb. 10, 2019	Feb. 09, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Jan. 27, 2019	Jan. 26, 2020
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.03, 2019	Mar. 02, 2020
Horn Antenna	ETS-LINDGREN	BBHA 9170	BBHA9170582	Mar.03, 2019	Mar. 02, 2020
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 13, 2019	Jul. 12, 2020
Pre-amplifier	Sonoma	310N	185903	Mar.04, 2019	Mar. 03, 2020
Pre-amplifier	HP	8449B	3008A00849	Mar.03, 2019	Mar. 02, 2020
Pre-amplifier	SKET	LNPA_1840G-50	SK201904032	Jul. 27, 2019	Jul. 26, 2020
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.03, 2019	Mar. 02, 2020
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted Emission					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 13, 2019	Jul. 12, 2020
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 16, 2019	Sep. 15, 2020
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 16, 2019	Sep. 15, 2020
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 16, 2019	Sep. 15, 2020
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO26	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO29	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO31	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO33	Sep. 16, 2019	Sep. 15, 2020

5. Conducted Emission Test

5.1 Test Standard and Limit

5.1.1Test Standard

FCC Part 15.207

5.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

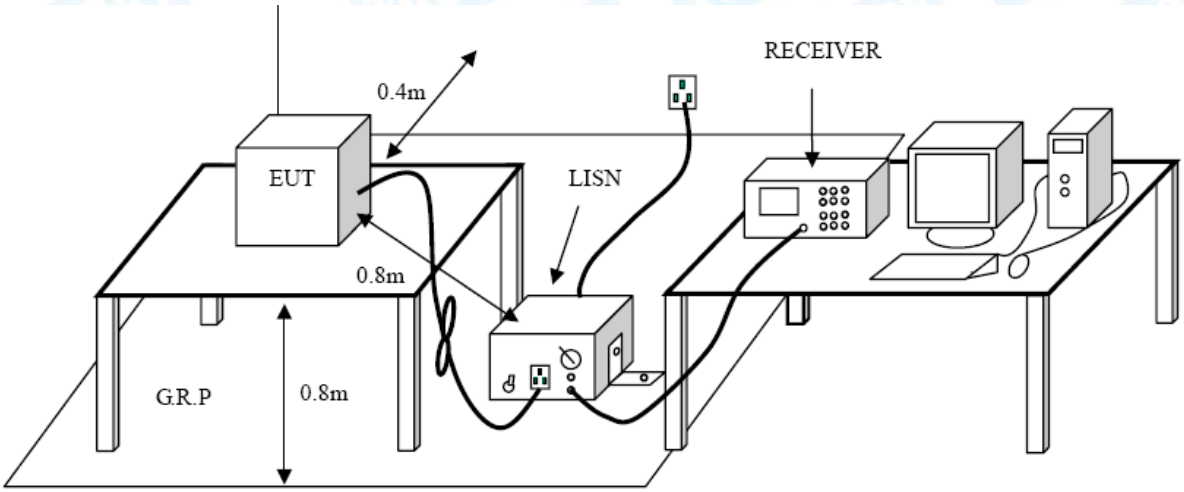
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.2 Test Setup



5.3 Test Procedure

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.

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.

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.

LISN at least 80 cm from nearest part of EUT chassis

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Mode

Please refer to the description of test mode.

5.6 Test Data

Please refer to the Attachment A.

6. Radiated Emission Test

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC Part 15.209

6.1.2 Test Limit

Radiated Emission Limit (9 kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

Radiated Emission Limit (Above 1000MHz)

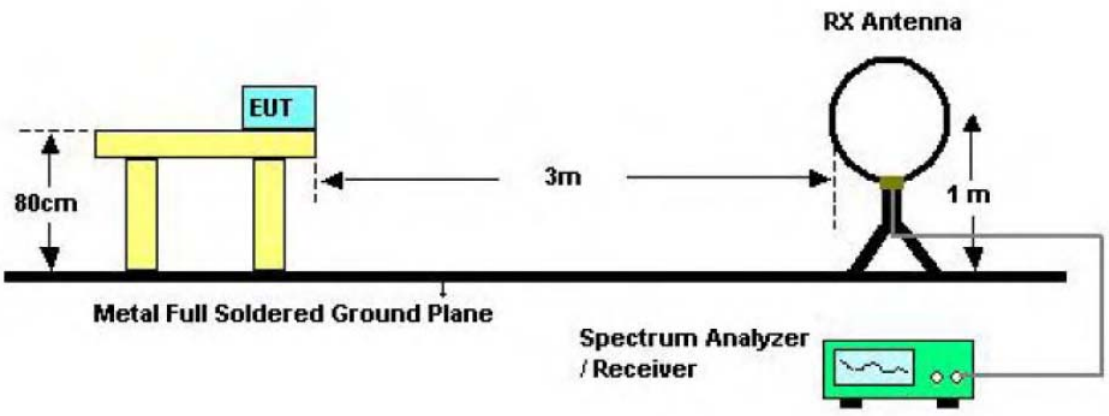
Frequency (MHz)	Distance Meters(at 3m)	
	Peak	Average
Above 1000	74	54

Note:

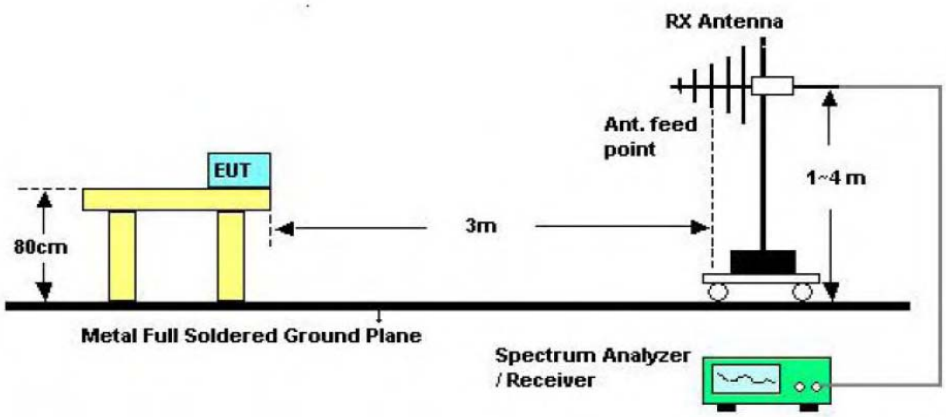
(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level (uV/m)

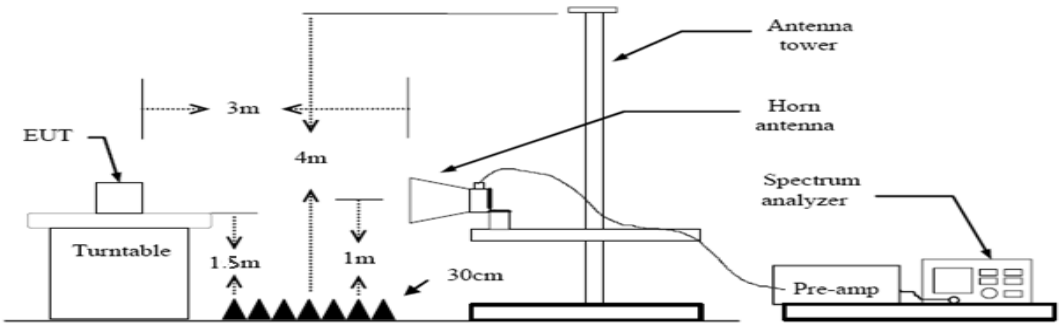
6.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

6.3 Test Procedure

(1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.

(2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

(3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

(4) 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.

(5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

(6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.

(7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

(8) For the actual test configuration, please see the test setup photo.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power in TX mode.

6.6 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Please refer to the Attachment B.

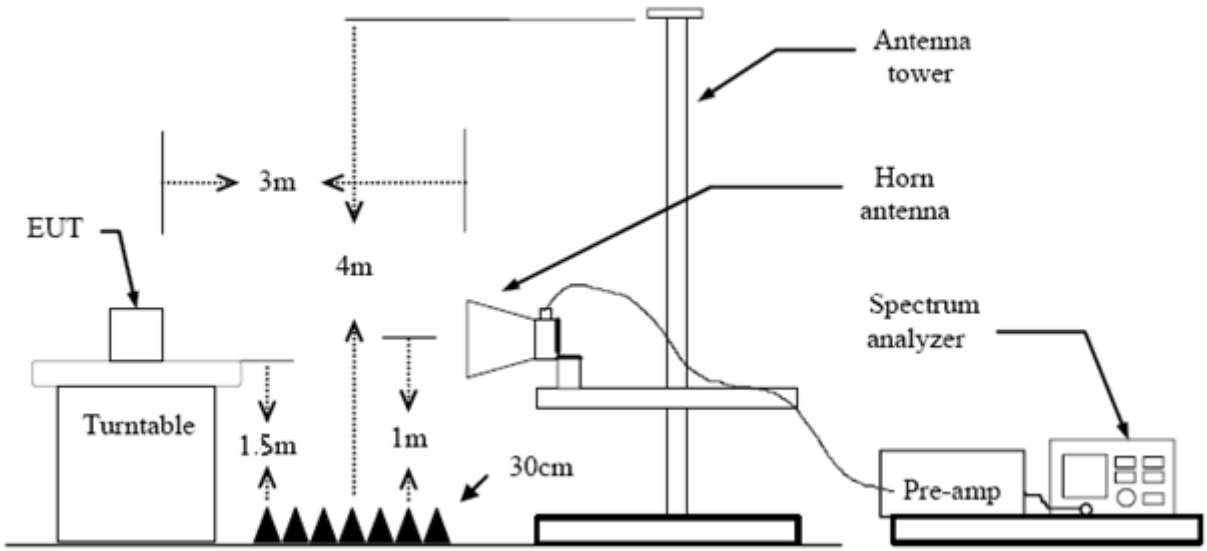
7. Restricted Bands Requirement

7.1 Test Standard and Limit

7.1.1 Test Standard
FCC Part 15.209
FCC Part 15.205
7.1.2 Test Limit

Restricted Frequency Band (MHz)	Distance Meters(at 3m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54
Note: All restriction bands have been tested, only the worst case is reported.		

7.2 Test Setup



7.3 Test Procedure

(1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.

(2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

(3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
(4) 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.
(5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
(6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
(7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with AVG Detector for Average Values.
(8) For the actual test configuration, please see the test setup photo.

7.4 Deviation From Test Standard

No deviation

7.5 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

7.6 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

All restriction bands have been tested, only the worst case is reported.

Please refer to the Attachment C.

8. Number of Hopping Channel

8.1 Test Standard and Limit

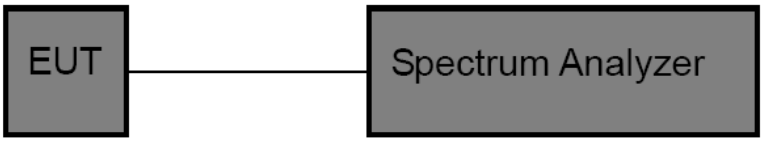
8.1.1 Test Standard

FCC Part 15.247 (a)(1)

8.1.2 Test Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

8.2 Test Setup



8.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Spectrum Setting: RBW=100 KHz, VBW=100 KHz, Sweep time= Auto.

8.5 Deviation From Test Standard

No deviation

8.6 EUT Operating Condition

The EUT was set to the Hopping Mode by the Customer.

8.7 Test Data

Please refer to the Attachment D.

9. Average Time of Occupancy

9.1 Test Standard and Limit

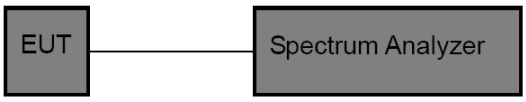
9.1.1 Test Standard

FCC Part 15.247 (a)(1)

9.1.2 Test Limit

Section	Test Item	Limit
15.247(a)(1)	Average Time of Occupancy	0.4 sec

9.2 Test Setup



9.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting: RBW=1MHz, VBW=1MHz.
(3) Use video trigger with the trigger level set to enable triggering only on full pulses.
(4) Sweep Time is more than once pulse time.
(5) Set the centre frequency on any frequency would be measure and set the frequency span to zero.
(6) Measure the maximum time duration of one single pulse.
(7) Set the EUT for packet transmitting.
(8) Measure the maximum time duration of one single pulse.

9.4 Deviation From Test Standard

No deviation

9.5 EUT Operating Condition

The average time of occupancy on any channel within the Period can be calculated with formulas:
{Total of Dwell} = {Pulse Time} * (1600 / X) / {Number of Hopping Frequency} * {Period}
{Period} = 0.4s * {Number of Hopping Frequency}
Note: X=2 or 4 or 6 (1DH1=2, 1DH3=4, 1DH5=6. 2DH1=2, 2DH3=4, 2DH5=6. 3DH1=2, 3DH3=4, 3DH5=6)
The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

The EUT was set to the Hopping Mode by the Customer.

9.6 Test Data

Please refer to the Attachment E.

10. Channel Separation and Bandwidth Test

10.1 Test Standard and Limit

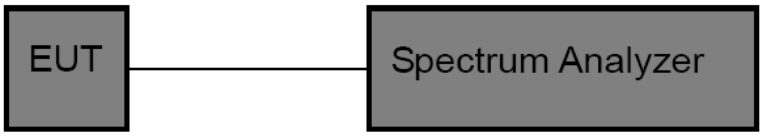
10.1.1 Test Standard

FCC Part 15.247

10.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Bandwidth	<=1 MHz (20dB bandwidth)	2400~2483.5
Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

10.2 Test Setup



10.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Spectrum Setting:
Channel Separation: RBW=100 kHz, VBW=100 kHz.
Bandwidth: RBW=30 kHz, VBW=100 kHz.

(3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.

(4) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:30 kHz, and Video Bandwidth:100 kHz. Sweep Time set auto.

10.4 Deviation From Test Standard

No deviation

10.5 EUT Operating Condition

The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Bandwidth Test.

10.6 Test Data

Please refer to the Attachment F.

11. Peak Output Power Test

11.1 Test Standard and Limit

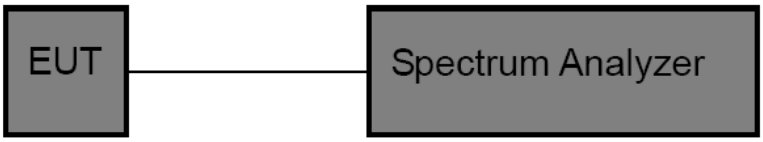
11.1.1 Test Standard

FCC Part 15.247 (b) (1)

11.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125 mW(21dBm)	2400~2483.5

11.2 Test Setup



11.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Spectrum Setting:

Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz.

RBW=3 MHz, VBW=3 MHz for bandwidth more than 1MHz.

11.4 Deviation From Test Standard

No deviation

11.5 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

11.6 Test Data

Please refer to the Attachment G.

12. Antenna Requirement

12.1 Standard Requirement

12.1.1 Standard

FCC Part 15.203

12.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

12.2 Deviation From Test Standard

No deviation

12.3 Antenna Connected Construction

The gains of the antenna used for transmitting is 1.38dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

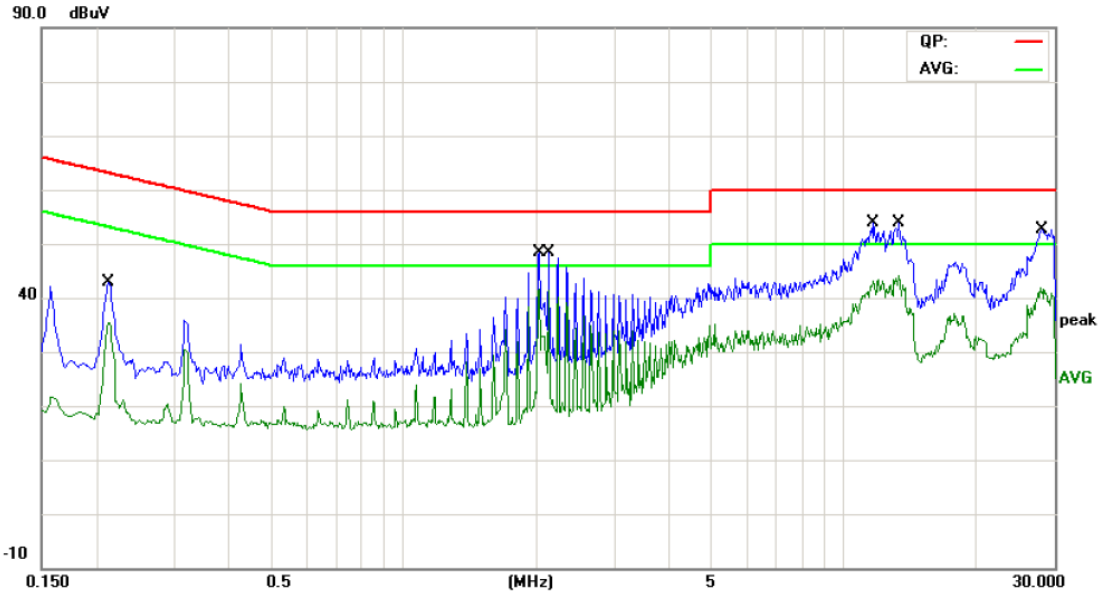
12.4 Result

The EUT antenna is a FPC Antenna. It complies with the standard requirement.

Antenna Type
☐Permanent attached antenna
☒Unique connector antenna
☐Professional installation antenna

Attachment A-- Conducted Emission Test Data

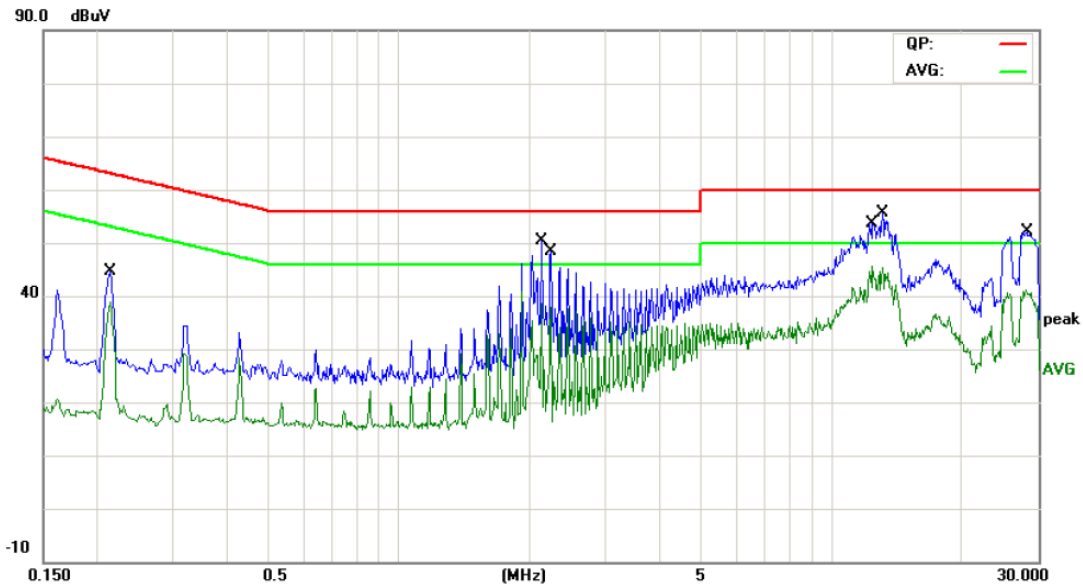
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Line		
Test Mode:	Mode 1(Model: 80012)		
Remark:	Only worse case is reported.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2127	33.01	9.78	42.79	63.10	-20.31	QP
2		0.2127	25.52	9.78	35.30	53.10	-17.80	AVG
3		2.0259	38.61	9.85	48.46	56.00	-7.54	QP
4	*	2.0259	31.67	9.85	41.52	46.00	-4.48	AVG
5		2.1299	38.50	9.84	48.34	56.00	-7.66	QP
6		2.1299	28.07	9.84	37.91	46.00	-8.09	AVG
7		11.6737	43.97	9.82	53.79	60.00	-6.21	QP
8		11.6737	33.43	9.82	43.25	50.00	-6.75	AVG
9		13.2979	43.99	9.82	53.81	60.00	-6.19	QP
10		13.2979	34.31	9.82	44.13	50.00	-5.87	AVG
11		28.1340	43.05	9.55	52.60	60.00	-7.40	QP
12		28.1340	31.36	9.55	40.91	50.00	-9.09	AVG

Emission Level= Read Level+ Correct Factor

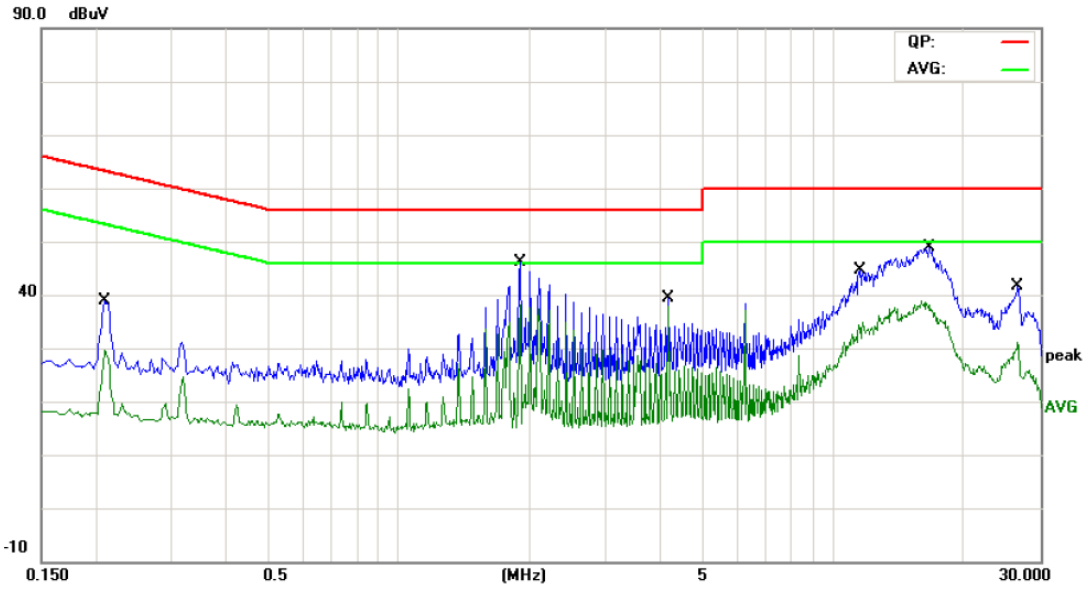
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	Mode 1(Model: 80012)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2139	34.95	9.79	44.74	63.05	-18.31	QP
2		0.2139	29.09	9.79	38.88	53.05	-14.17	AVG
3		2.1229	28.70	9.84	38.54	46.00	-7.46	AVG
4		2.1299	40.49	9.84	50.33	56.00	-5.67	QP
5		2.2378	38.47	9.84	48.31	56.00	-7.69	QP
6		2.2378	28.14	9.84	37.98	46.00	-8.02	AVG
7		12.4419	43.85	9.82	53.67	60.00	-6.33	QP
8		12.4419	35.74	9.82	45.56	50.00	-4.44	AVG
9	*	13.1059	45.86	9.82	55.68	60.00	-4.32	QP
10		13.1059	35.47	9.82	45.29	50.00	-4.71	AVG
11		28.2500	42.62	9.58	52.20	60.00	-7.80	QP
12		28.2500	30.85	9.58	40.43	50.00	-9.57	AVG

Emission Level= Read Level+ Correct Factor

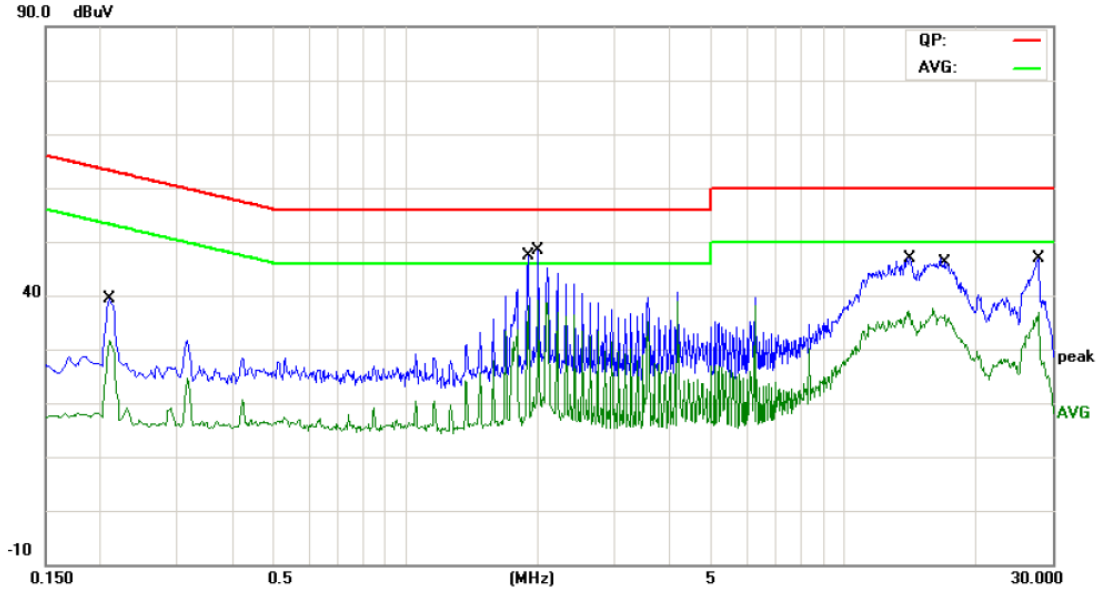
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Line		
Test Mode:	Mode 2(Model: 80013)		
Remark:	Only worse case is reported.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2099	29.06	9.78	38.84	63.21	-24.37	QP
2		0.2099	29.06	9.78	38.84	53.21	-14.37	AVG
3		1.8979	36.24	9.85	46.09	56.00	-9.91	QP
4		1.8979	28.35	9.85	38.20	46.00	-7.80	AVG
5		4.1738	29.56	9.84	39.40	56.00	-16.60	QP
6		4.1738	29.56	9.84	39.40	46.00	-6.60	AVG
7		11.5018	34.85	9.82	44.67	60.00	-15.33	QP
8		11.5018	34.85	9.82	44.67	50.00	-5.33	AVG
9		16.6459	39.08	9.84	48.92	60.00	-11.08	QP
10	*	16.6459	39.08	9.84	48.92	50.00	-1.08	AVG
11		26.5859	32.52	9.23	41.75	60.00	-18.25	QP
12		26.5859	32.52	9.23	41.75	50.00	-8.25	AVG

Emission Level= Read Level+ Correct Factor

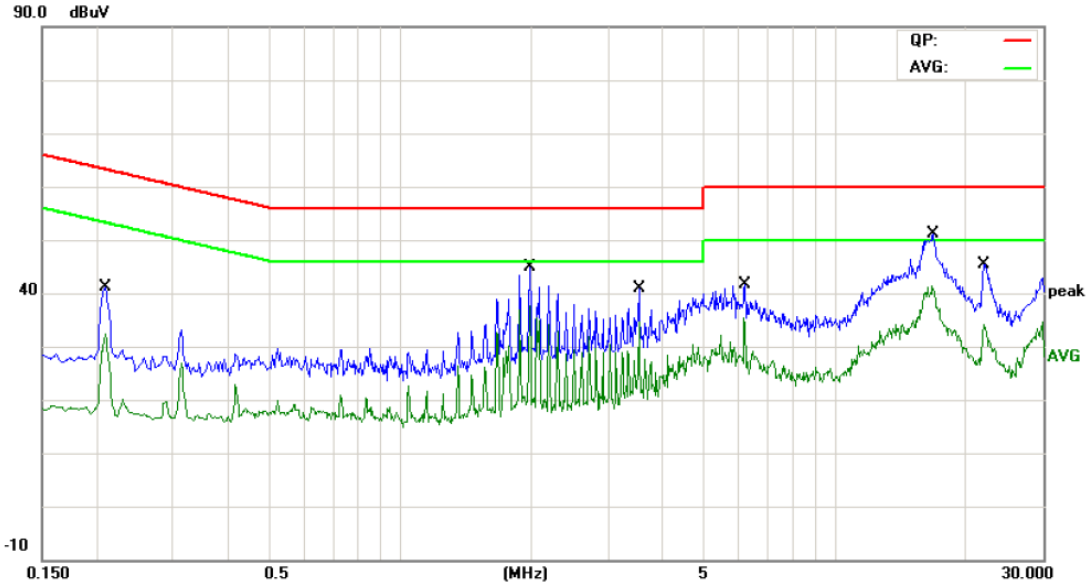
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	Mode 2(Model: 80013)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2099	29.71	9.59	39.30	63.21	-23.91	QP
2		0.2099	22.04	9.59	31.63	53.21	-21.58	AVG
3		1.8979	37.54	9.85	47.39	56.00	-8.61	QP
4		1.8979	28.25	9.85	38.10	46.00	-7.90	AVG
5		2.0059	38.52	9.86	48.38	56.00	-7.62	QP
6	*	2.0059	29.17	9.86	39.03	46.00	-6.97	AVG
7		14.1659	36.98	9.86	46.84	60.00	-13.16	QP
8		14.1659	26.85	9.86	36.71	50.00	-13.29	AVG
9		17.0579	36.48	9.76	46.24	60.00	-13.76	QP
10		17.0579	26.64	9.76	36.40	50.00	-13.60	AVG
11		27.8619	37.20	9.68	46.88	60.00	-13.12	QP
12		27.8619	27.08	9.68	36.76	50.00	-13.24	AVG

Emission Level= Read Level+ Correct Factor

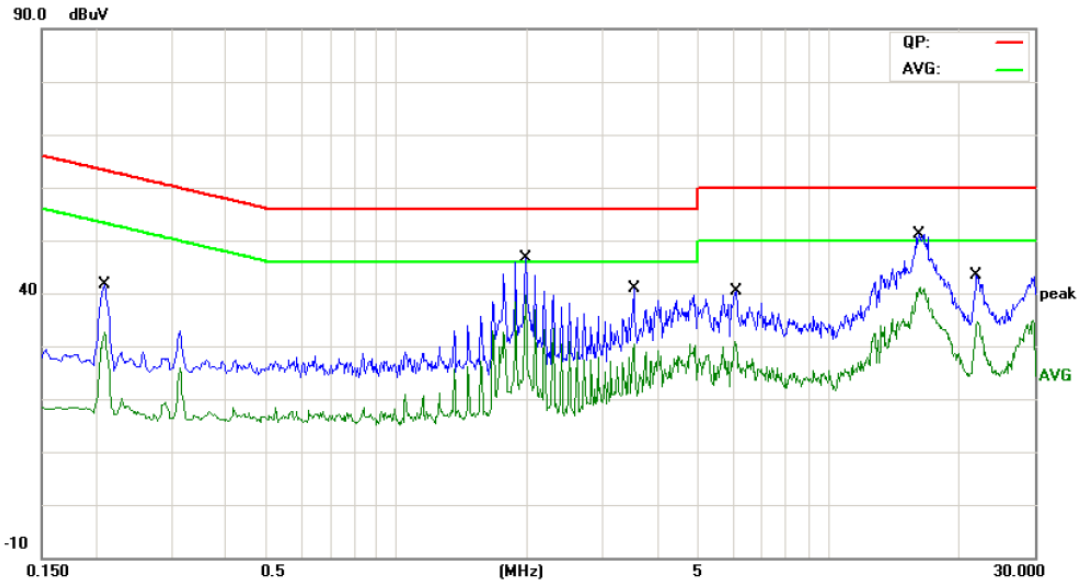
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Line		
Test Mode:	Mode 3(Model: 80014)		
Remark:	Only worse case is reported.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2099	31.46	9.78	41.24	63.21	-21.97	QP
2		0.2099	22.47	9.78	32.25	53.21	-20.96	AVG
3		1.9858	34.97	9.85	44.82	56.00	-11.18	QP
4	*	1.9858	27.74	9.85	37.59	46.00	-8.41	AVG
5		3.5419	31.02	9.85	40.87	56.00	-15.13	QP
6		3.5419	18.02	9.85	27.87	46.00	-18.13	AVG
7		6.1897	31.75	9.84	41.59	60.00	-18.41	QP
8		6.1897	24.44	9.84	34.28	50.00	-15.72	AVG
9		16.7698	41.35	9.84	51.19	60.00	-8.81	QP
10		16.7698	30.97	9.84	40.81	50.00	-9.19	AVG
11		22.0457	35.90	9.47	45.37	60.00	-14.63	QP
12		22.0457	24.38	9.47	33.85	50.00	-16.15	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	Mode 3(Model: 80014)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2099	31.84	9.78	41.62	63.21	-21.59	QP
2		0.2099	22.90	9.78	32.68	53.21	-20.53	AVG
3		1.9858	36.88	9.85	46.73	56.00	-9.27	QP
4	*	1.9858	29.82	9.85	39.67	46.00	-6.33	AVG
5		3.5299	30.99	9.85	40.84	56.00	-15.16	QP
6		3.5299	17.53	9.85	27.38	46.00	-18.62	AVG
7		6.0979	30.60	9.84	40.44	60.00	-19.56	QP
8		6.0979	20.35	9.84	30.19	50.00	-19.81	AVG
9		16.1899	41.36	9.83	51.19	60.00	-8.81	QP
10		16.1899	30.98	9.83	40.81	50.00	-9.19	AVG
11		22.0419	33.96	9.47	43.43	60.00	-16.57	QP
12		22.0419	24.22	9.47	33.69	50.00	-16.31	AVG

Emission Level= Read Level+ Correct Factor

Attachment B-- Radiated Emission Test Data

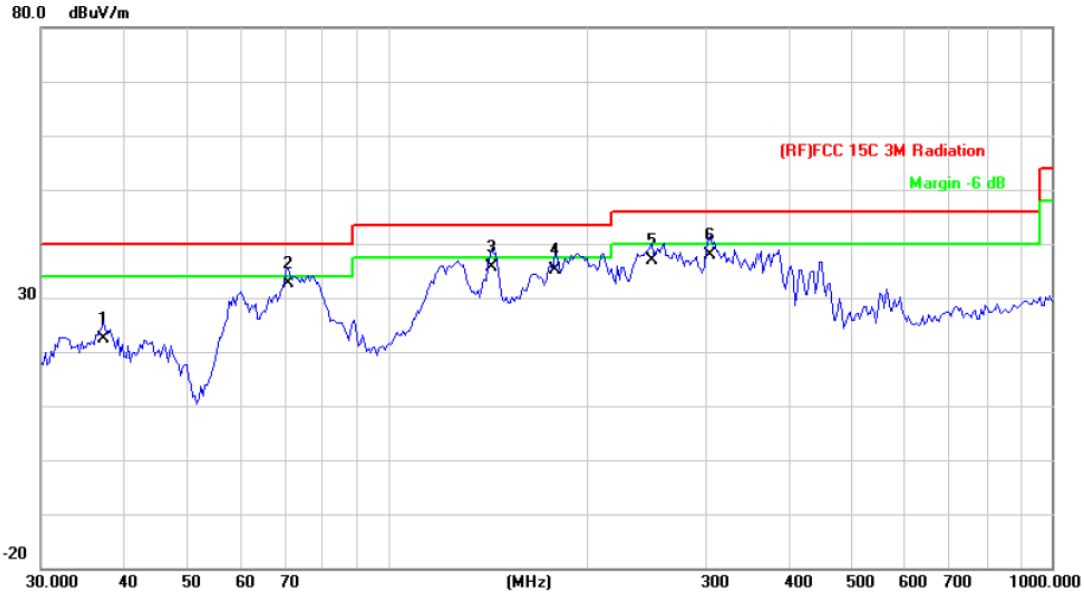
9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz~1GHz

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2441MHz(Model: 80012)		
Remark:	Only worse case is reported		

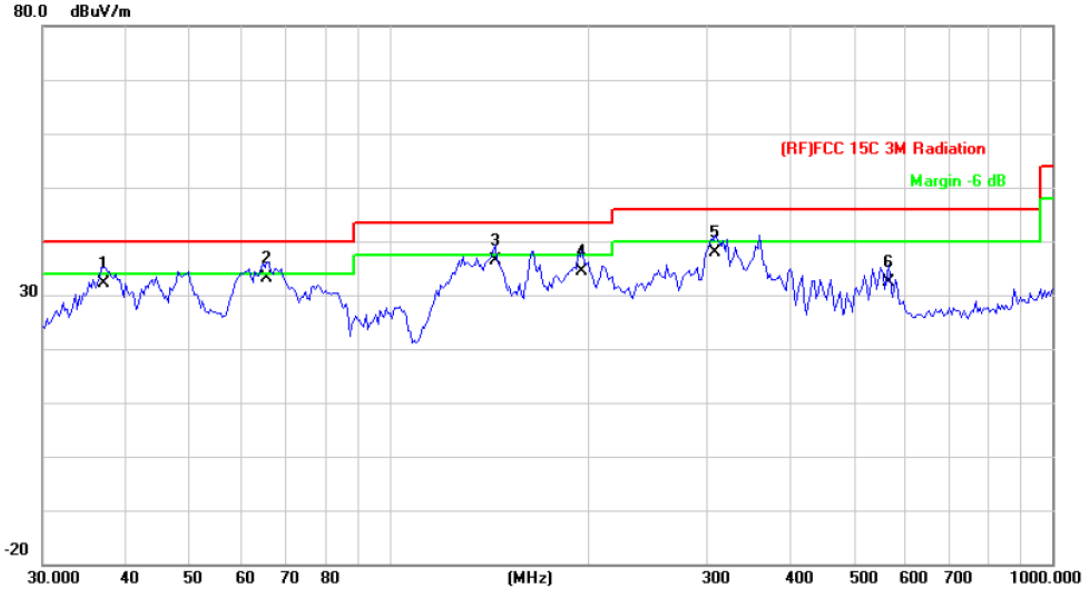


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		37.2854	40.28	-17.88	22.40	40.00	-17.60	QP
2	*	70.5836	56.11	-23.51	32.60	40.00	-7.40	QP
3		143.3259	57.84	-22.14	35.70	43.50	-7.80	QP
4		178.1325	55.40	-20.20	35.20	43.50	-8.30	QP
5		249.4250	53.88	-17.08	36.80	46.00	-9.20	QP
6		305.6800	53.71	-15.81	37.90	46.00	-8.10	QP

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2441MHz(Model: 80012)		
Remark:	Only worse case is reported		

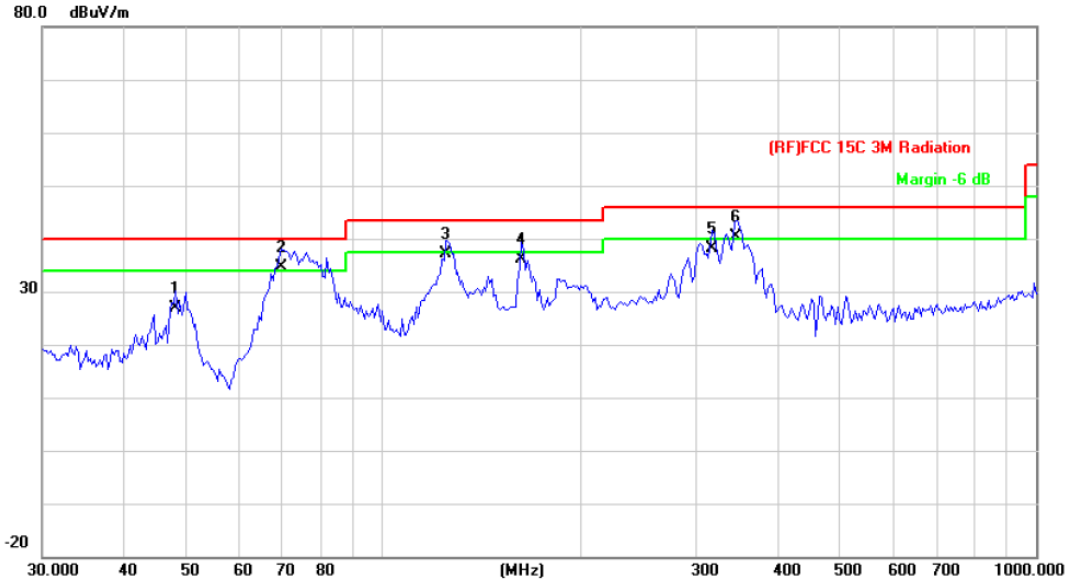


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		37.0248	49.94	-17.74	32.20	40.00	-7.80	QP
2	*	65.3431	57.07	-23.97	33.10	40.00	-6.90	QP
3		144.3348	58.32	-22.02	36.30	43.50	-7.20	QP
4		195.1365	54.13	-19.83	34.30	43.50	-9.20	QP
5		309.9977	53.47	-15.67	37.80	46.00	-8.20	QP
6		566.6221	41.10	-8.60	32.50	46.00	-13.50	QP

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2441MHz(Model: 80013)		
Remark:	Only worse case is reported		

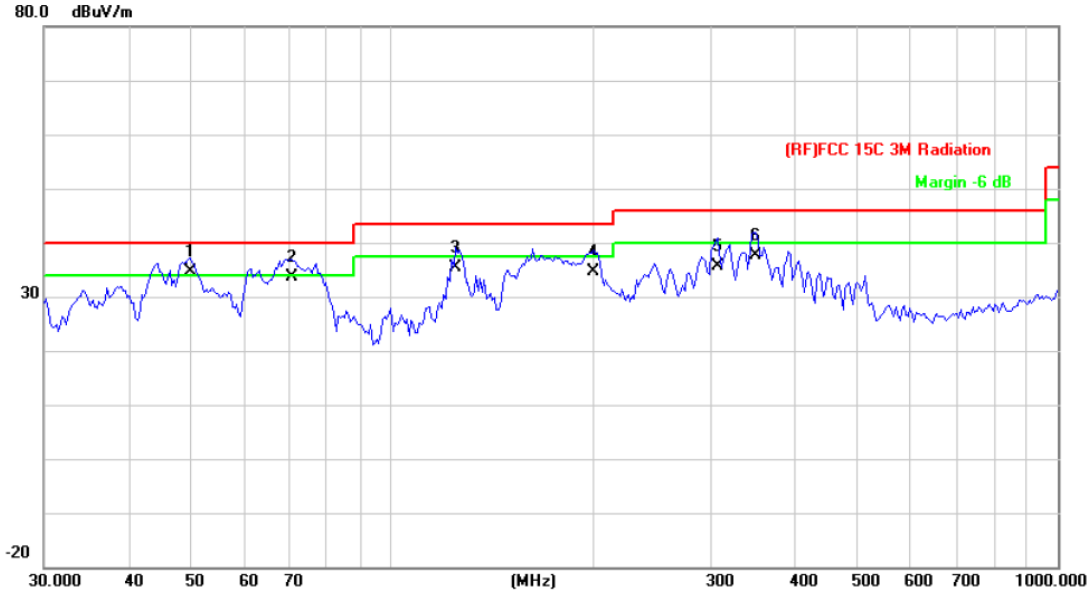


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		47.6584	50.11	-22.46	27.65	40.00	-12.35	QP
2		90.2205	47.45	-21.98	25.47	43.50	-18.03	QP
3		126.3285	52.97	-22.39	30.58	43.50	-12.92	QP
4	*	191.0738	56.69	-19.82	36.87	43.50	-6.63	QP
5		269.4284	52.54	-16.80	35.74	46.00	-10.26	QP
6		337.2155	52.97	-14.99	37.98	46.00	-8.02	QP

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2441MHz(Model: 80013)		
Remark:	Only worse case is reported		

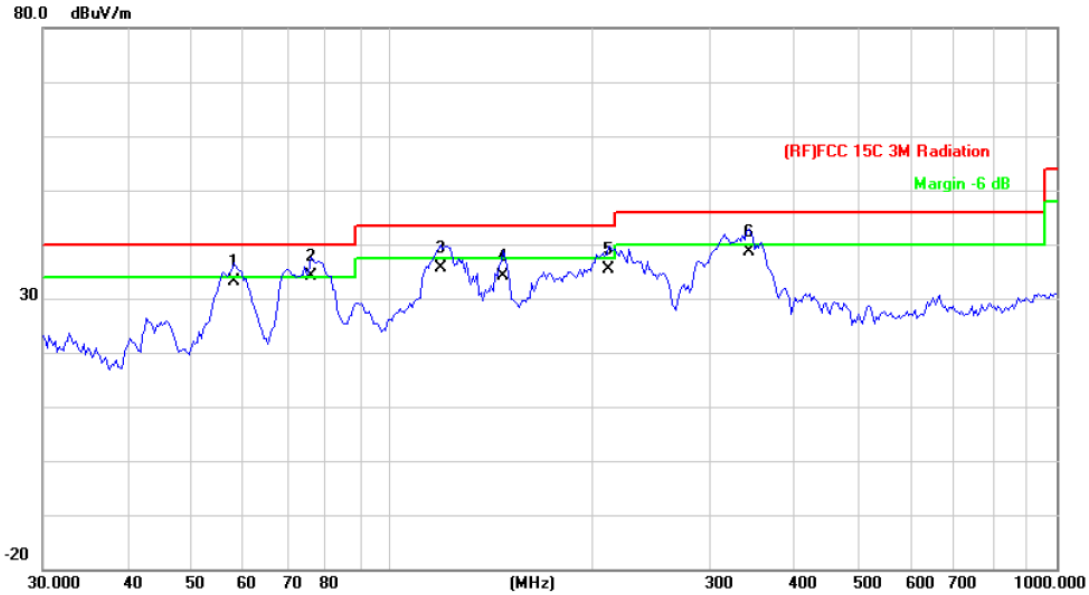


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	49.7068	57.87	-23.25	34.62	40.00	-5.38	QP
2		70.5836	57.13	-23.51	33.62	40.00	-6.38	QP
3		124.5690	57.79	-22.37	35.42	43.50	-8.08	QP
4		200.6880	54.48	-19.86	34.62	43.50	-8.88	QP
5		307.8312	51.43	-15.75	35.68	46.00	-10.32	QP
6		351.7078	51.99	-14.31	37.68	46.00	-8.32	QP

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2441MHz(Model: 80014)		
Remark:	Only worse case is reported		

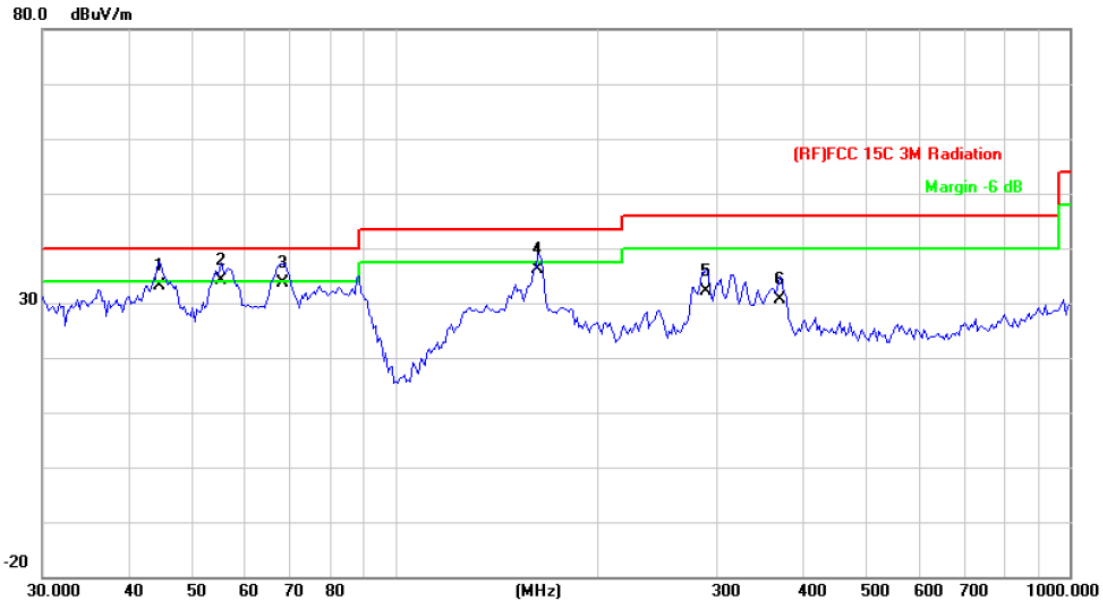


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		57.9992	57.47	-24.22	33.25	40.00	-6.75	QP
2	*	75.7113	57.24	-22.99	34.25	40.00	-5.75	QP
3		118.6013	57.95	-22.33	35.62	43.50	-7.88	QP
4		147.4036	55.95	-21.70	34.25	43.50	-9.25	QP
5		212.2694	54.48	-19.20	35.28	43.50	-8.22	QP
6		344.3854	53.19	-14.57	38.62	46.00	-7.38	QP

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2441MHz(Model: 80014)		
Remark:	Only worse case is reported		



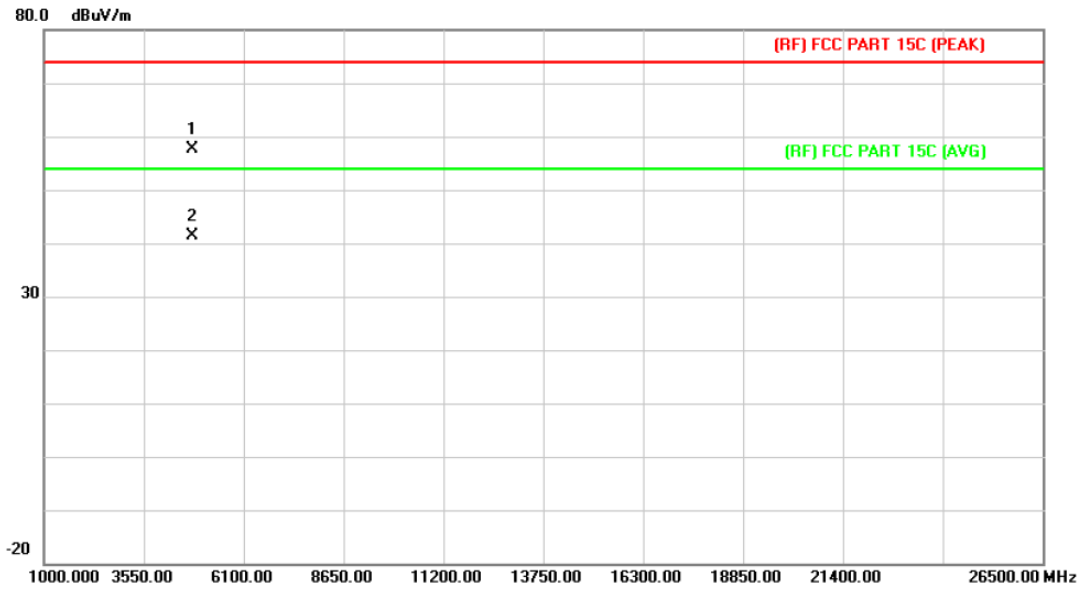
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		44.7433	54.78	-21.53	33.25	40.00	-6.75	QP
2	*	55.2207	58.17	-23.92	34.25	40.00	-5.75	QP
3		68.1512	57.40	-23.73	33.67	40.00	-6.33	QP
4		162.6106	57.00	-20.76	36.24	43.50	-7.26	QP
5		289.0020	48.39	-16.23	32.16	46.00	-13.84	QP
6		372.0045	43.99	-13.37	30.62	46.00	-15.38	QP

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Above 1GHz (Only worse case is reported)

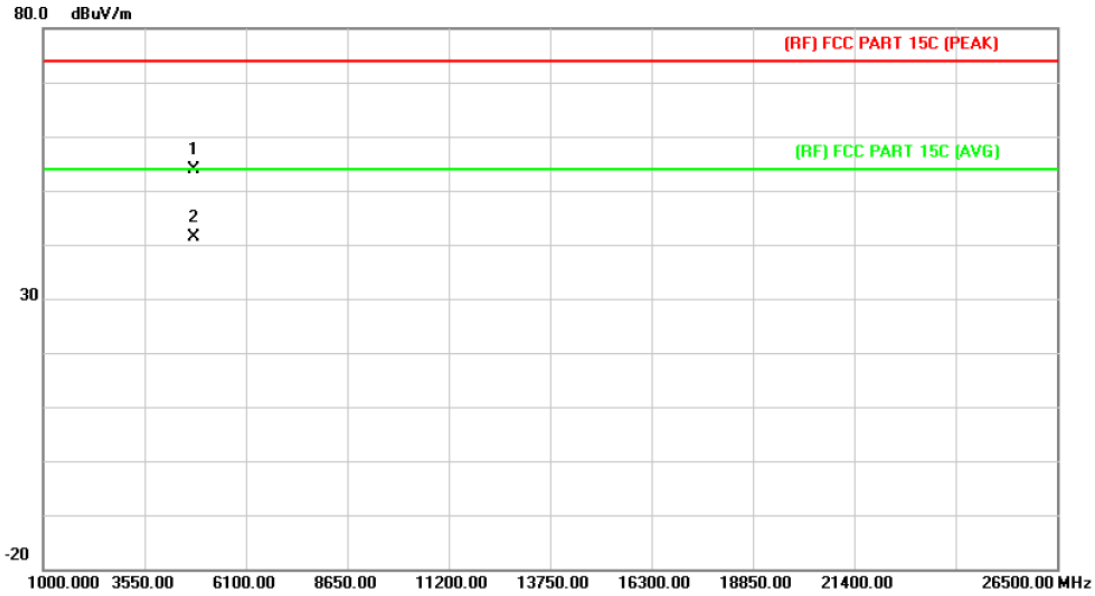
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.586	45.20	12.42	57.62	74.00	-16.38	peak
2	*	4803.604	29.02	12.42	41.44	54.00	-12.56	AVG

Emission Level= Read Level+ Correct Factor

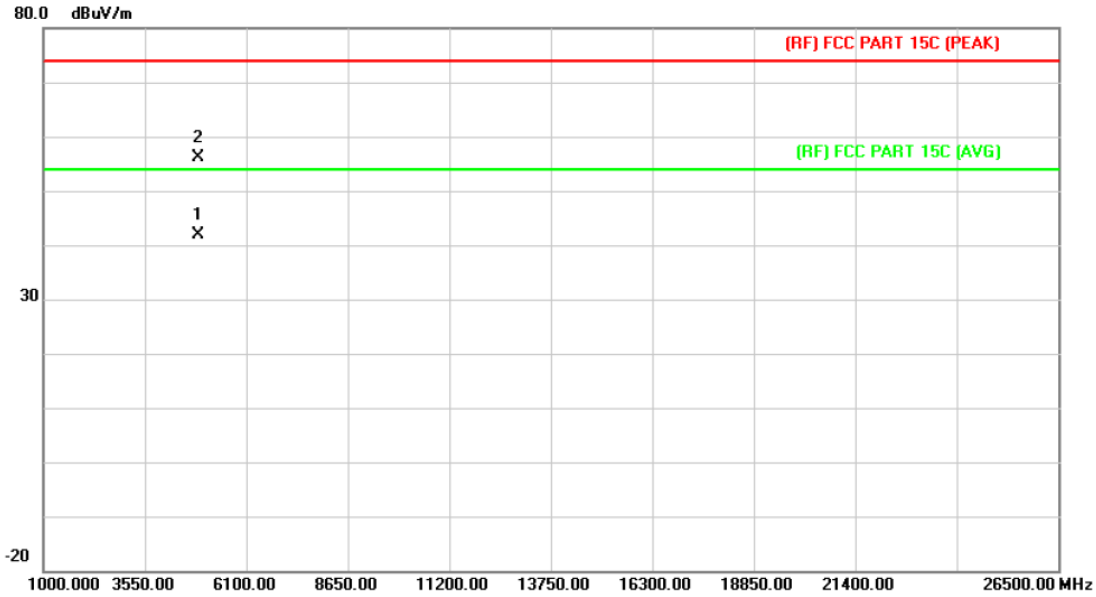
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4805.500	41.46	12.43	53.89	74.00	-20.11	peak
2		4805.500	28.85	12.43	41.28	54.00	-12.72	AVG

Emission Level= Read Level+ Correct Factor

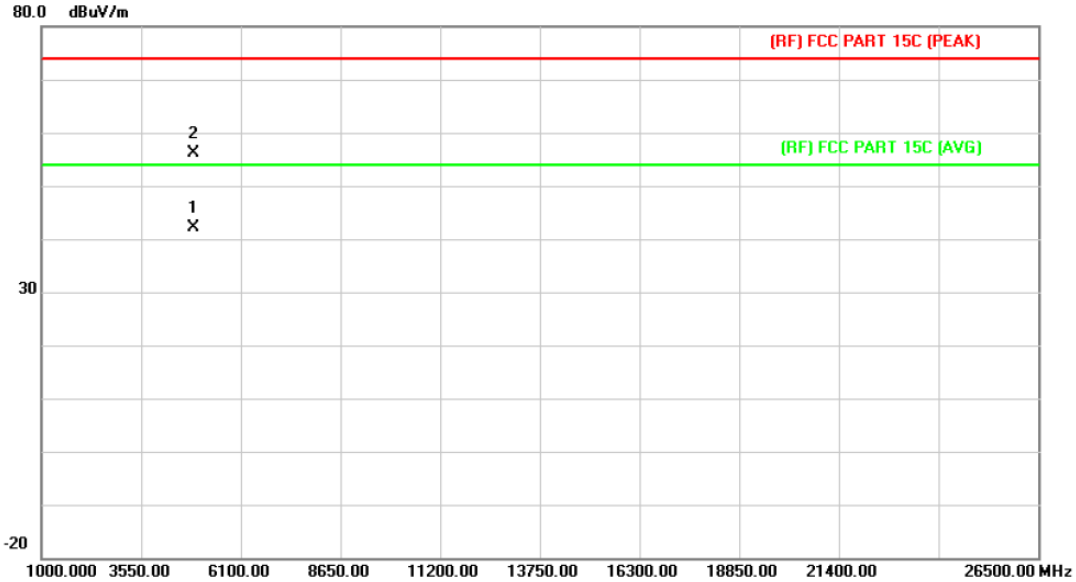
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2441MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.610	29.07	12.90	41.97	54.00	-12.03	AVG
2		4882.084	43.15	12.90	56.05	74.00	-17.95	peak

Emission Level= Read Level+ Correct Factor

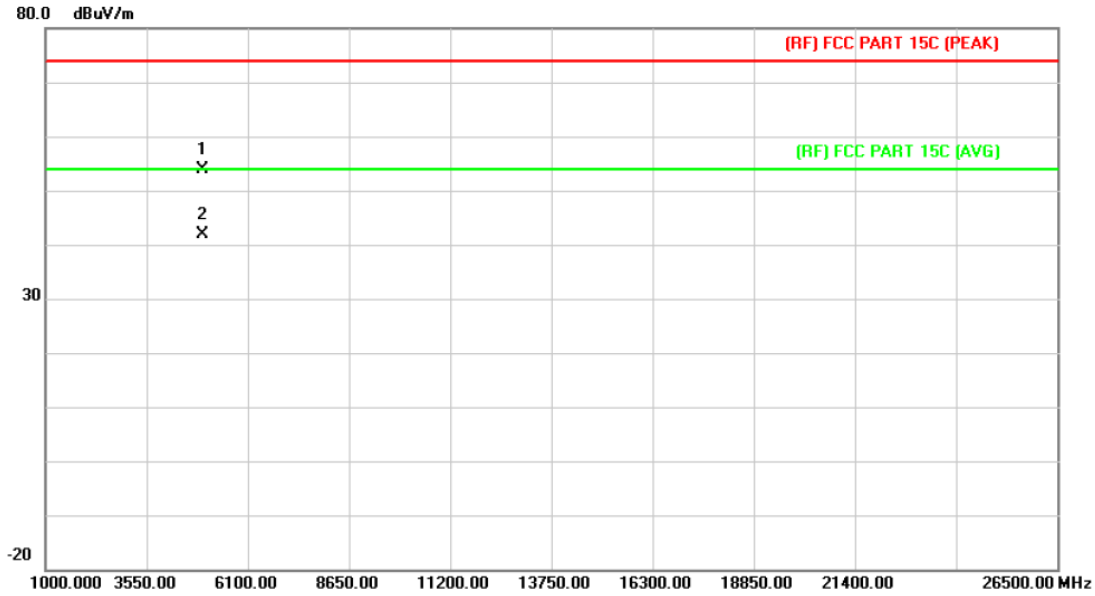
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2441MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.610	29.12	12.90	42.02	54.00	-11.98	AVG
2		4883.332	43.17	12.90	56.07	74.00	-17.93	peak

Emission Level= Read Level+ Correct Factor

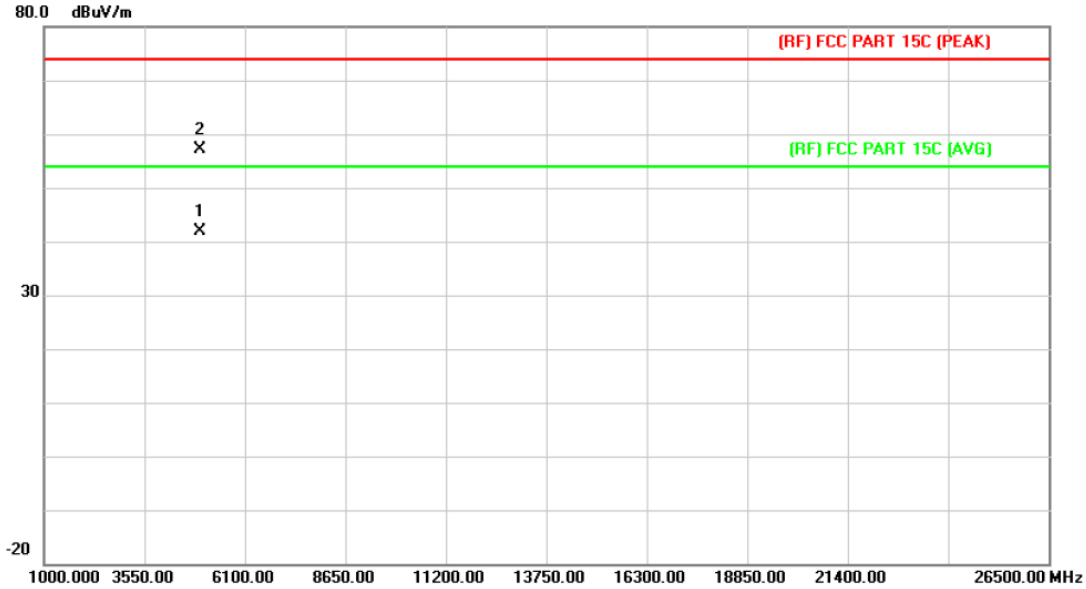
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4961.344	40.41	13.38	53.79	74.00	-20.21	peak
2	*	4961.500	28.59	13.39	41.98	54.00	-12.02	AVG

Emission Level= Read Level+ Correct Factor

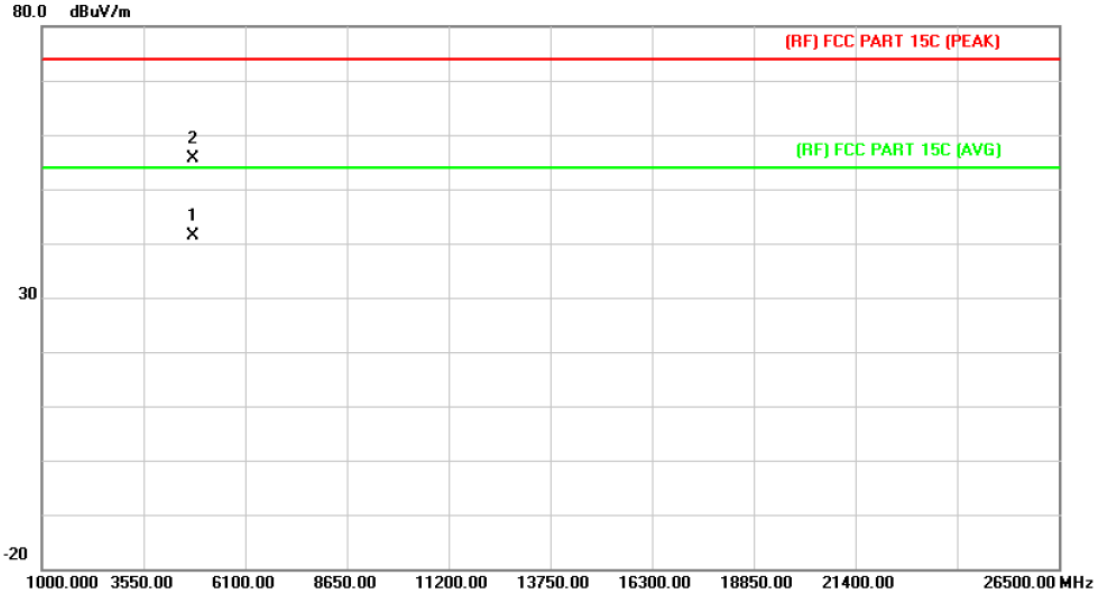
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2480MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.552	28.55	13.38	41.93	54.00	-12.07	AVG
2		4960.582	43.63	13.38	57.01	74.00	-16.99	peak

Emission Level= Read Level+ Correct Factor

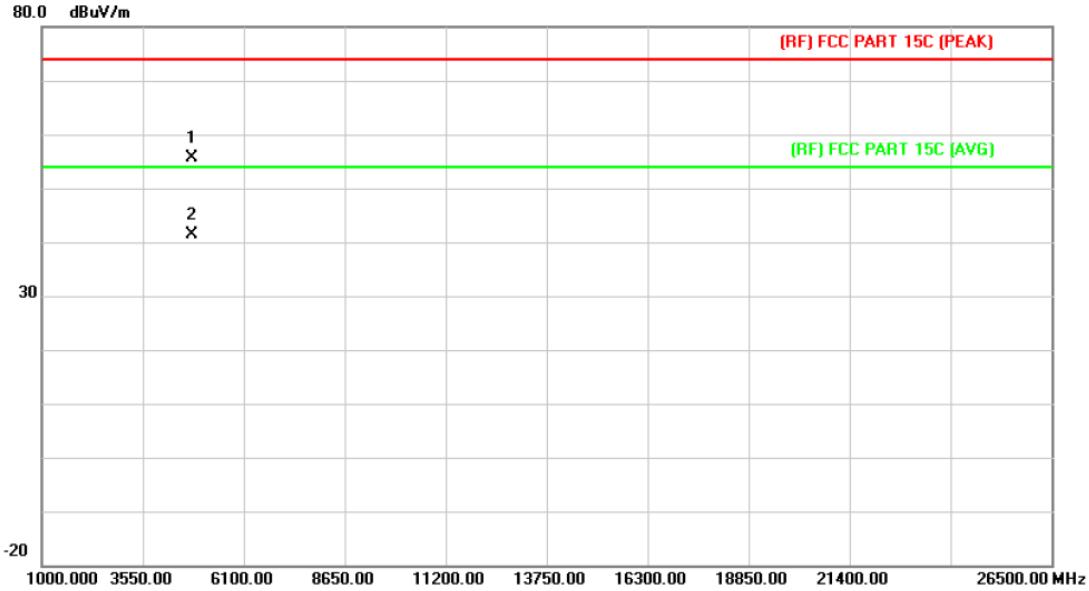
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2402MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.766	29.01	12.42	41.43	54.00	-12.57	AVG
2		4803.880	43.28	12.42	55.70	74.00	-18.30	peak

Emission Level= Read Level+ Correct Factor

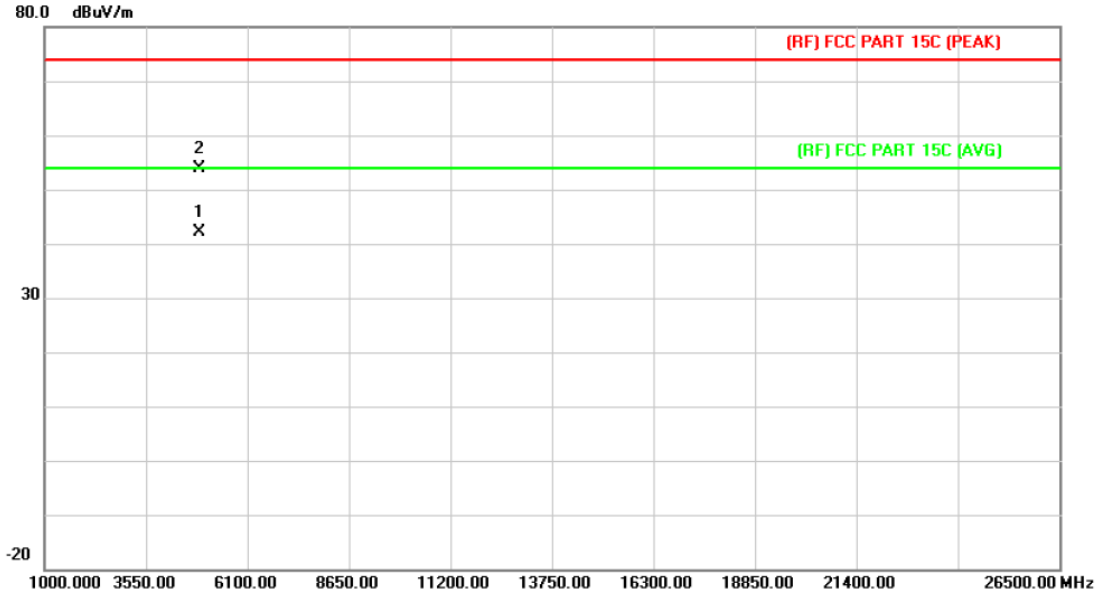
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mode 2402MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4805.446	43.29	12.43	55.72	74.00	-18.28	peak
2	*	4805.500	28.89	12.43	41.32	54.00	-12.68	AVG

Emission Level= Read Level+ Correct Factor

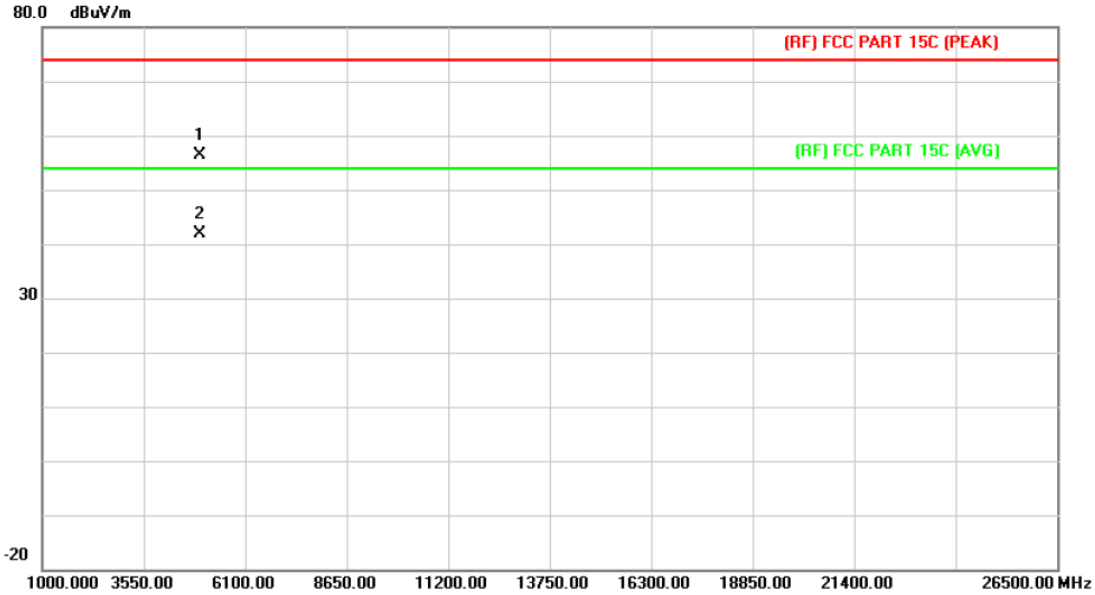
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2441MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4880.500	29.15	12.88	42.03	54.00	-11.97	AVG
2		4881.418	41.07	12.90	53.97	74.00	-20.03	peak

Emission Level= Read Level+ Correct Factor

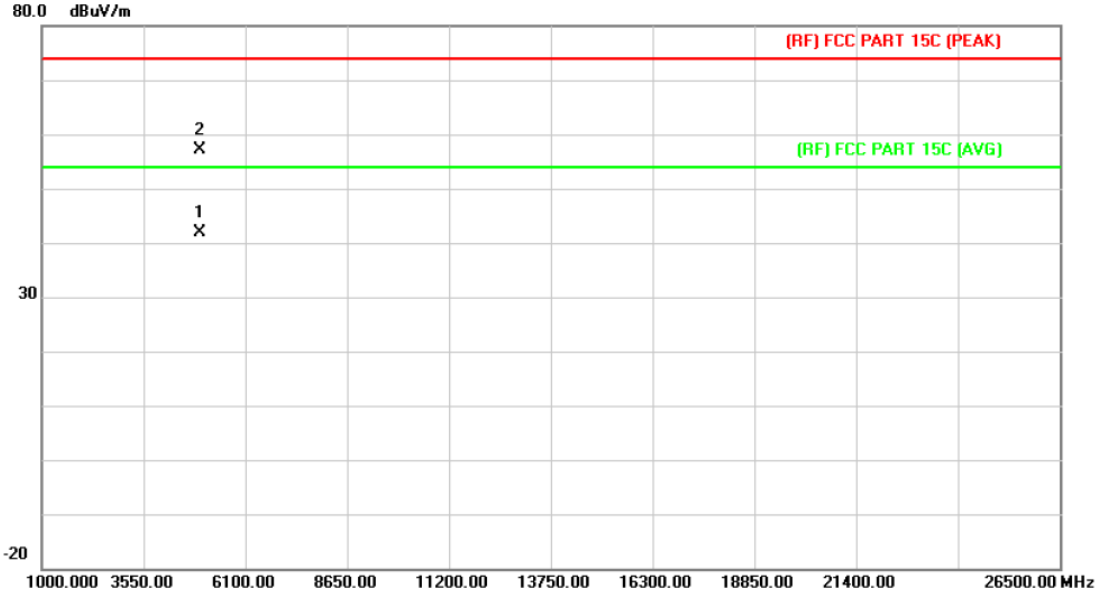
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX π/4-DQPSK Mode 2441MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.420	42.97	13.38	56.35	74.00	-17.65	peak
2	*	4960.420	28.54	13.38	41.92	54.00	-12.08	AVG

Emission Level= Read Level+ Correct Factor

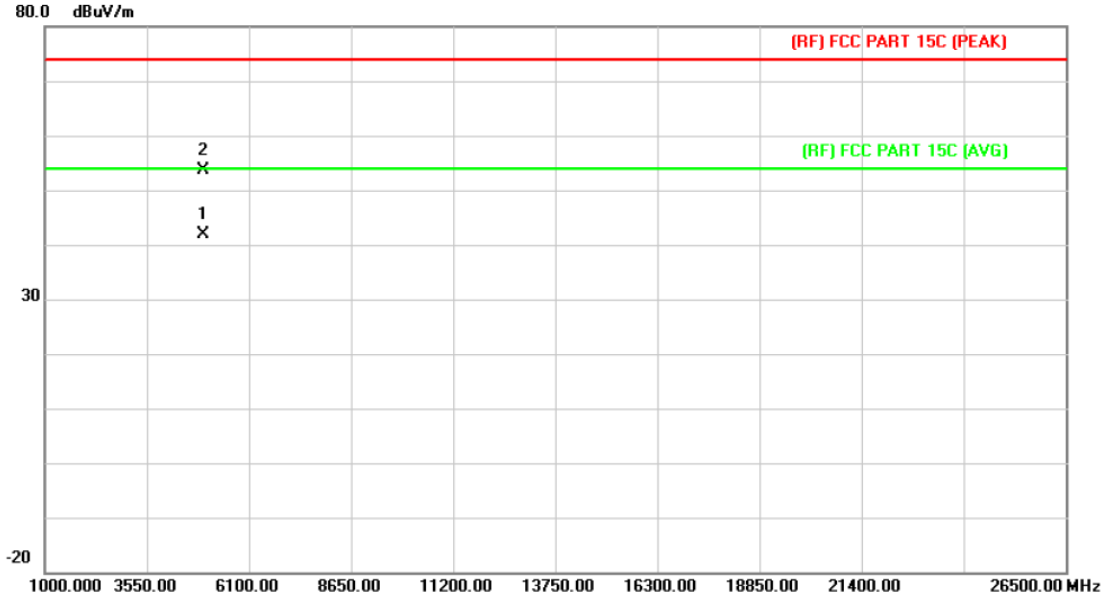
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2480MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.552	28.55	13.38	41.93	54.00	-12.07	AVG
2		4960.582	43.63	13.38	57.01	74.00	-16.99	peak

Emission Level= Read Level+ Correct Factor

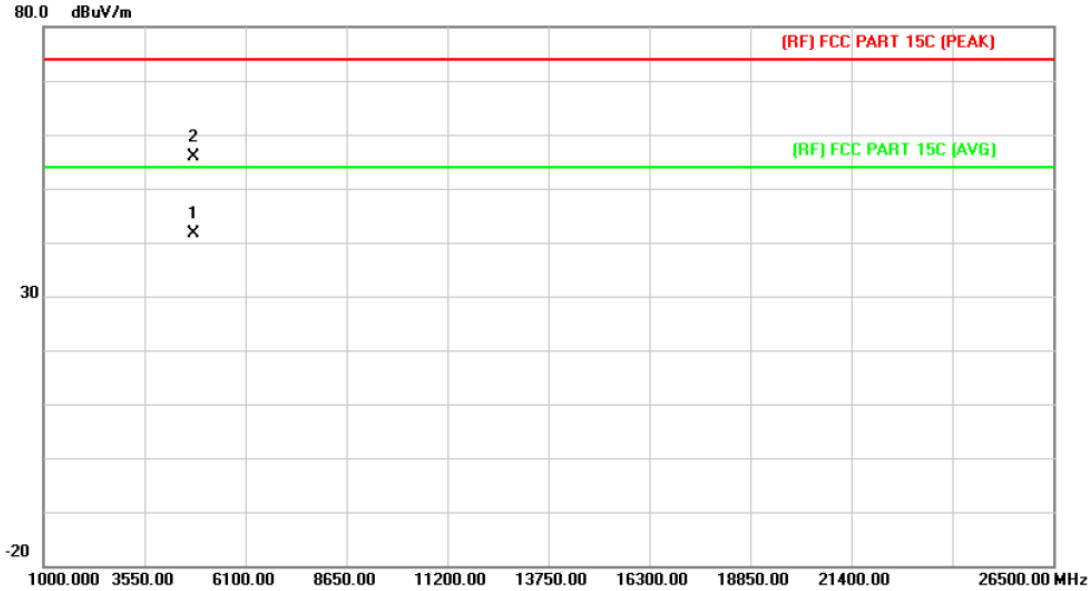
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mode 2480MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4961.032	28.62	13.38	42.00	54.00	-12.00	AVG
2	*	4961.032	40.29	13.38	53.67	74.00	-20.33	peak

Emission Level= Read Level+ Correct Factor

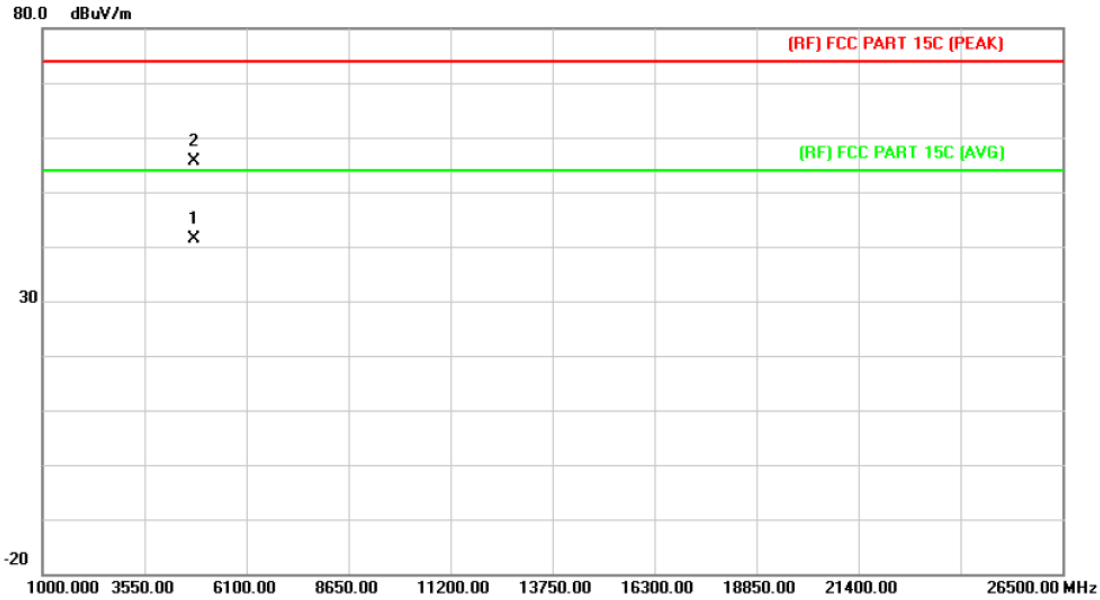
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2402MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.760	29.11	12.42	41.53	54.00	-12.47	AVG
2		4805.386	43.46	12.43	55.89	74.00	-18.11	peak

Emission Level= Read Level+ Correct Factor

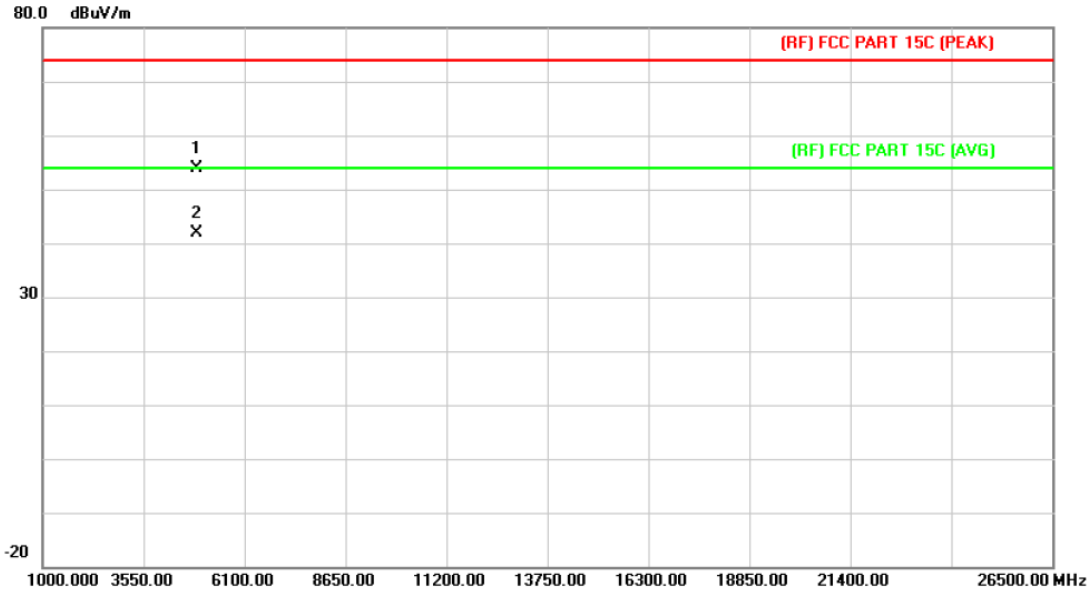
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2402MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.274	28.94	12.41	41.35	54.00	-12.65	AVG
2		4804.996	43.10	12.43	55.53	74.00	-18.47	peak

Emission Level= Read Level+ Correct Factor

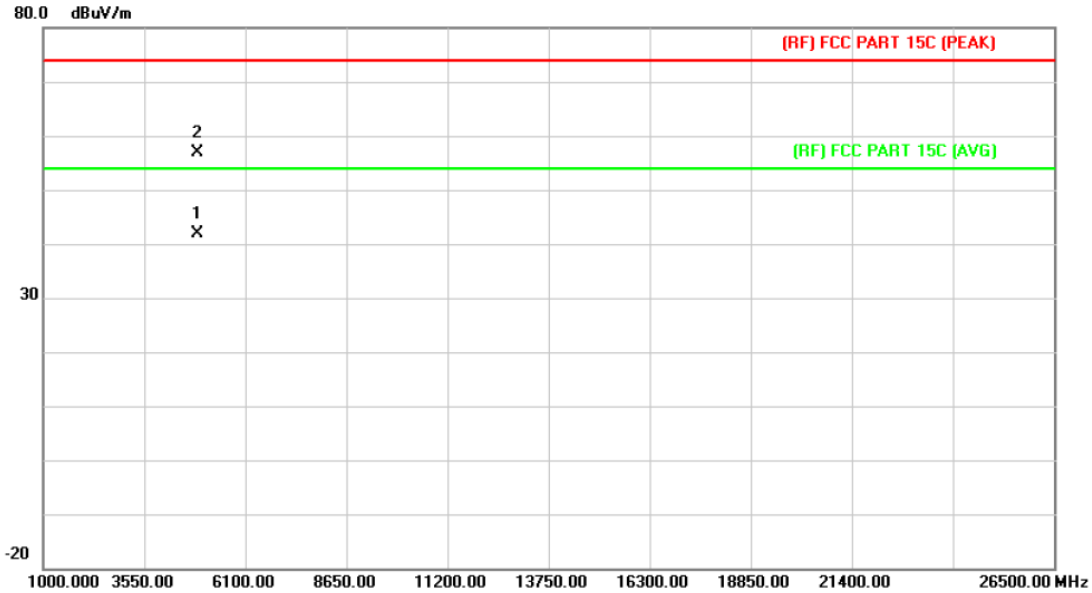
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2441MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4883.500	41.00	12.90	53.90	74.00	-20.10	peak
2		4883.500	29.05	12.90	41.95	74.00	-32.05	peak

Emission Level= Read Level+ Correct Factor

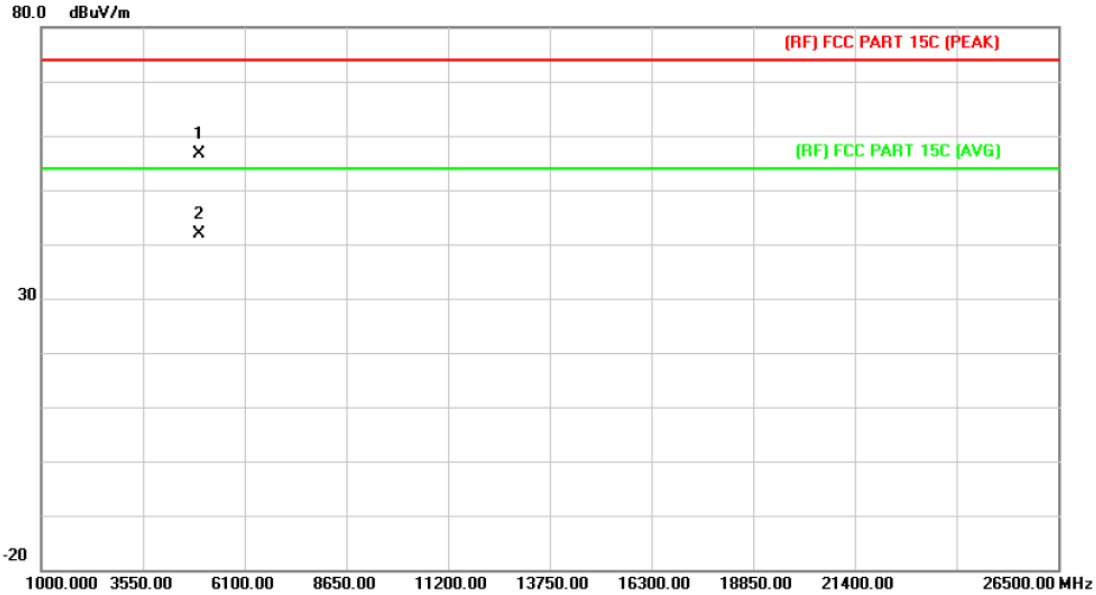
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2441MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.610	29.09	12.90	41.99	54.00	-12.01	AVG
2		4881.760	43.86	12.90	56.76	74.00	-17.24	peak

Emission Level= Read Level+ Correct Factor

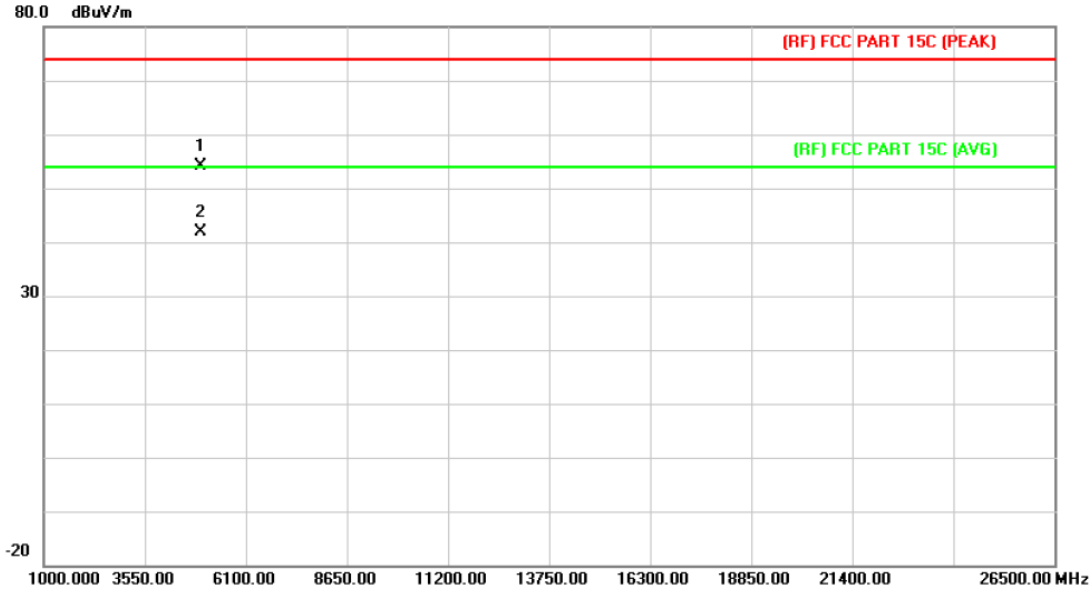
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2480MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.636	43.20	13.38	56.58	74.00	-17.42	peak
2	*	4961.338	28.58	13.38	41.96	54.00	-12.04	AVG

Emission Level= Read Level+ Correct Factor

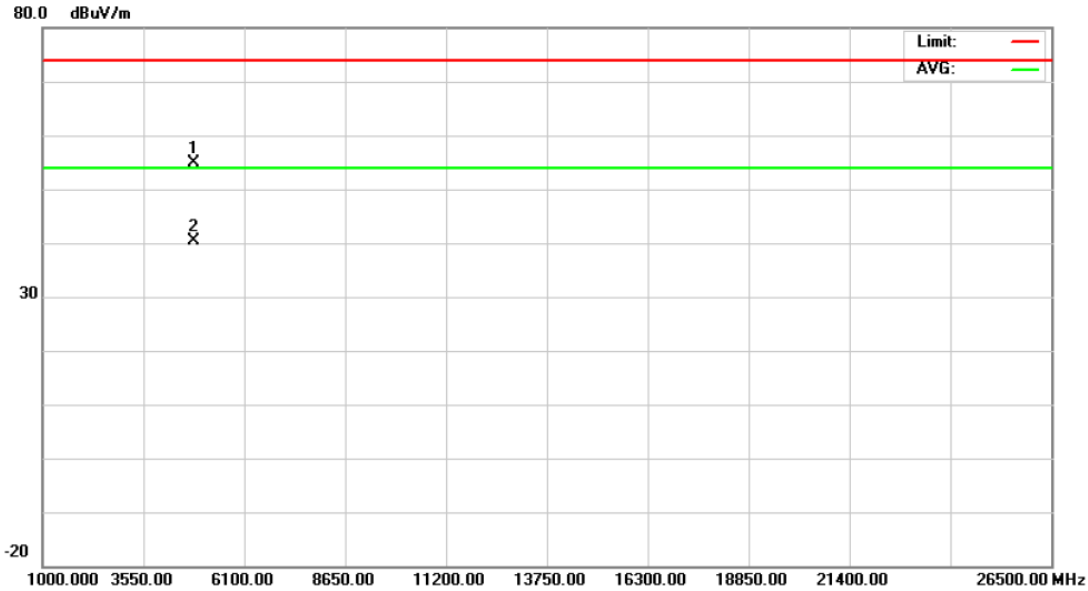
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2480MHz(Laser Camera)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4958.500	40.70	13.37	54.07	74.00	-19.93	peak
2	*	4958.500	28.49	13.37	41.86	54.00	-12.14	AVG

Emission Level= Read Level+ Correct Factor

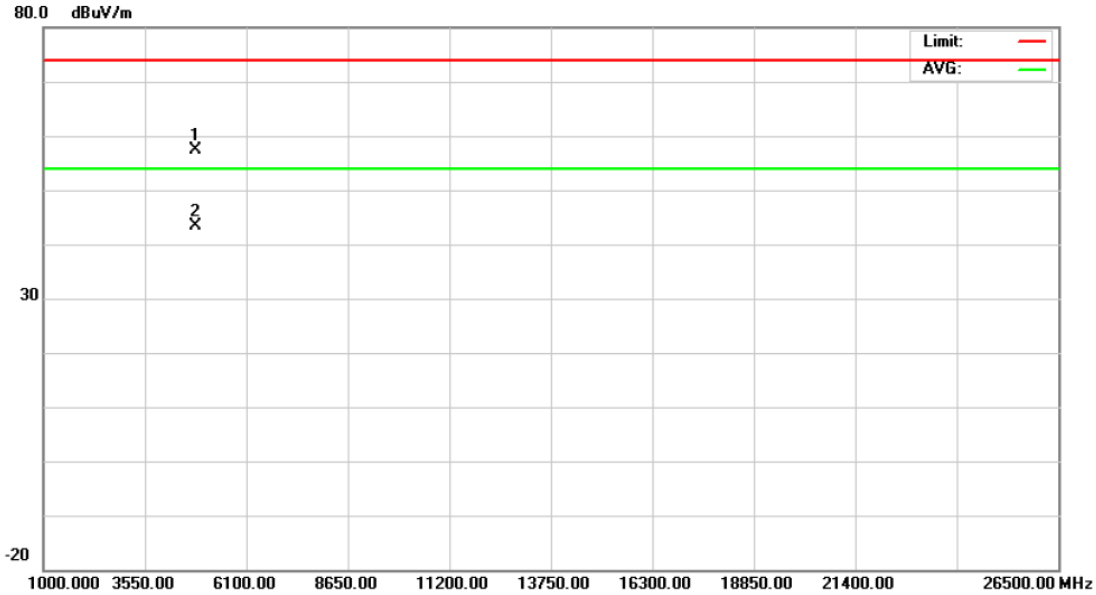
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4803.369	42.40	12.41	54.81	74.00	-19.19	peak
2	*	4803.629	28.06	12.42	40.48	54.00	-13.52	AVG

Emission Level= Read Level+ Correct Factor

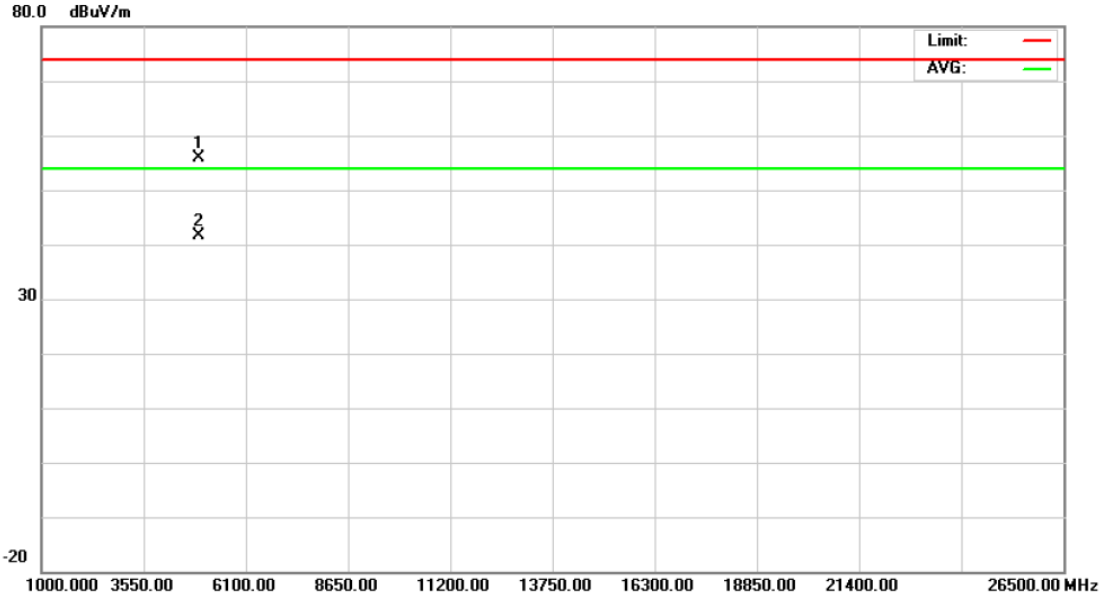
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4803.392	44.94	12.41	57.35	74.00	-16.65	peak
2	*	4803.392	30.88	12.41	43.29	54.00	-10.71	AVG

Emission Level= Read Level+ Correct Factor

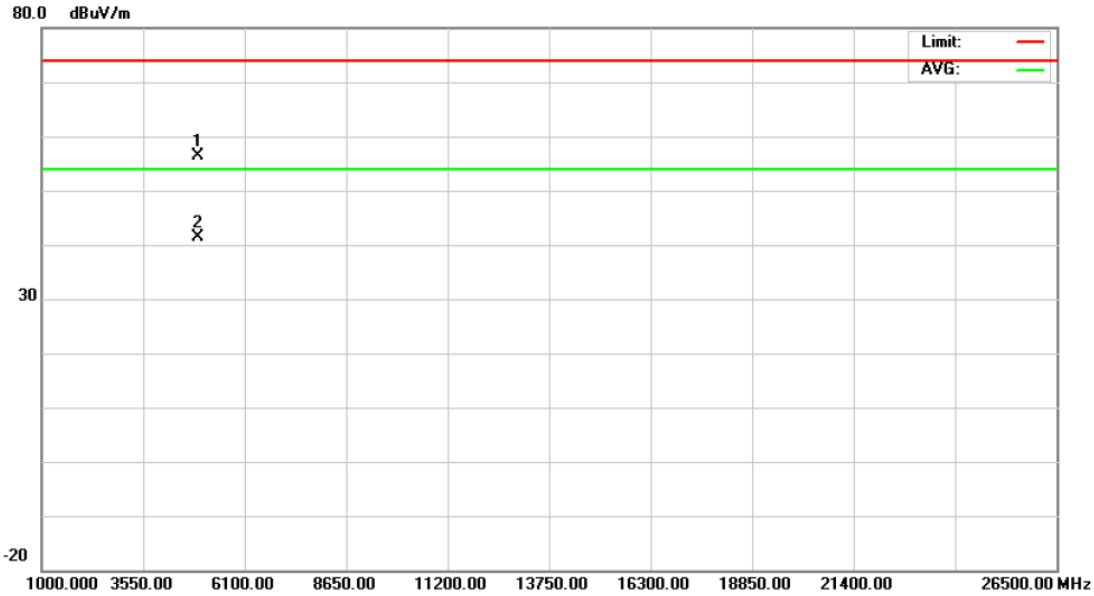
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2441MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4883.265	42.95	12.90	55.85	74.00	-18.15	peak
2	*	4883.269	28.62	12.90	41.52	54.00	-12.48	AVG

Emission Level= Read Level+ Correct Factor

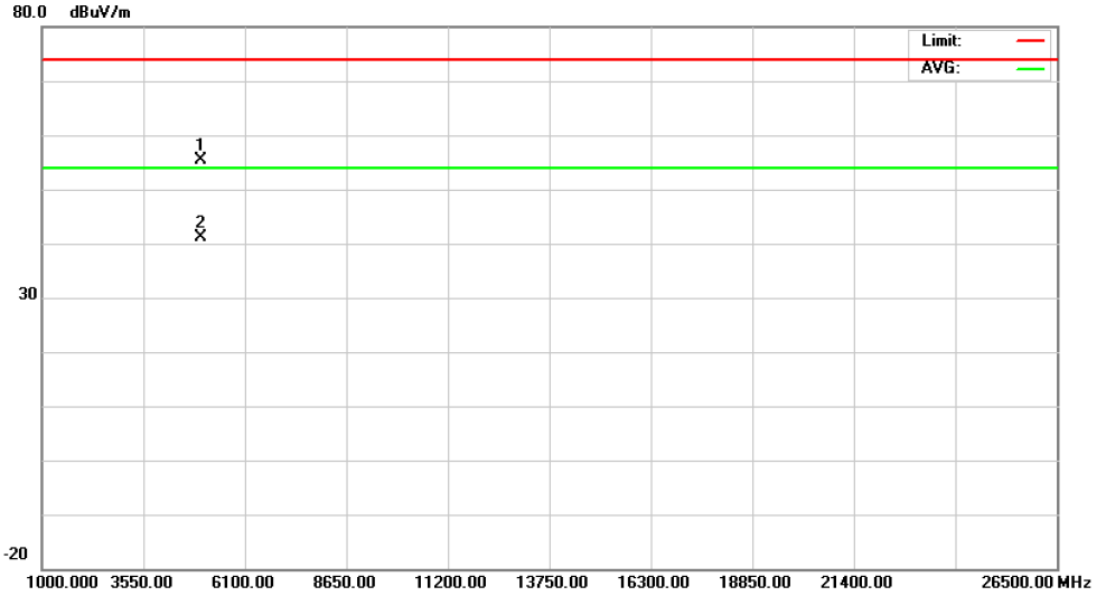
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2441MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4882.752	43.45	12.90	56.35	74.00	-17.65	peak
2	*	4883.922	28.51	12.91	41.42	54.00	-12.58	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4959.263	41.98	13.37	55.35	74.00	-18.65	peak
2	*	4960.260	27.77	13.37	41.14	54.00	-12.86	AVG

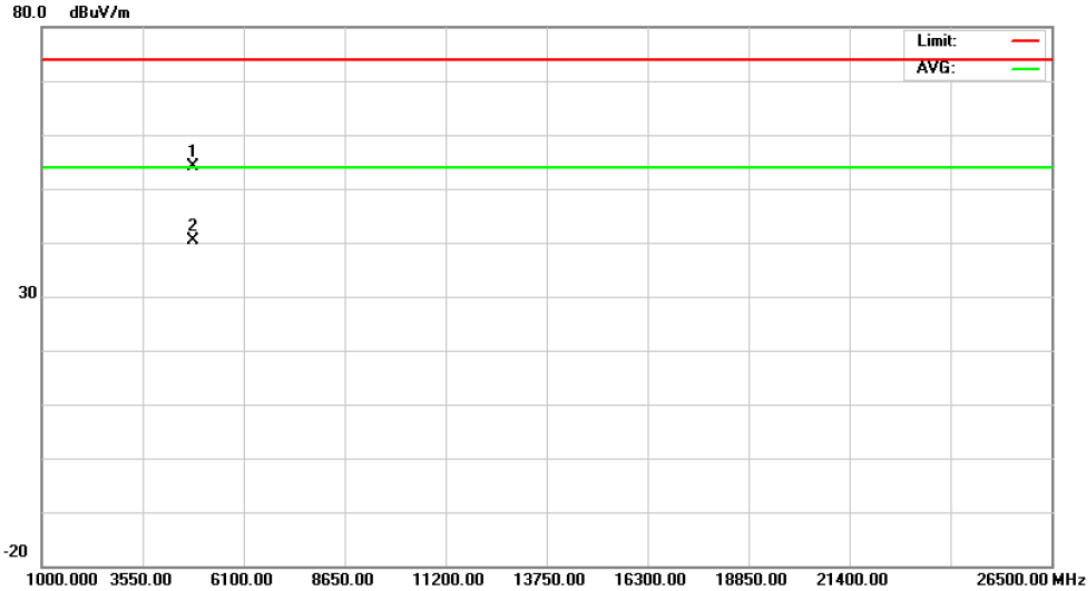
Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2480MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4959.742	43.10	13.37	56.47	74.00	-17.53	peak
2	*	4961.182	27.85	13.38	41.23	54.00	-12.77	AVG

Emission Level= Read Level+ Correct Factor

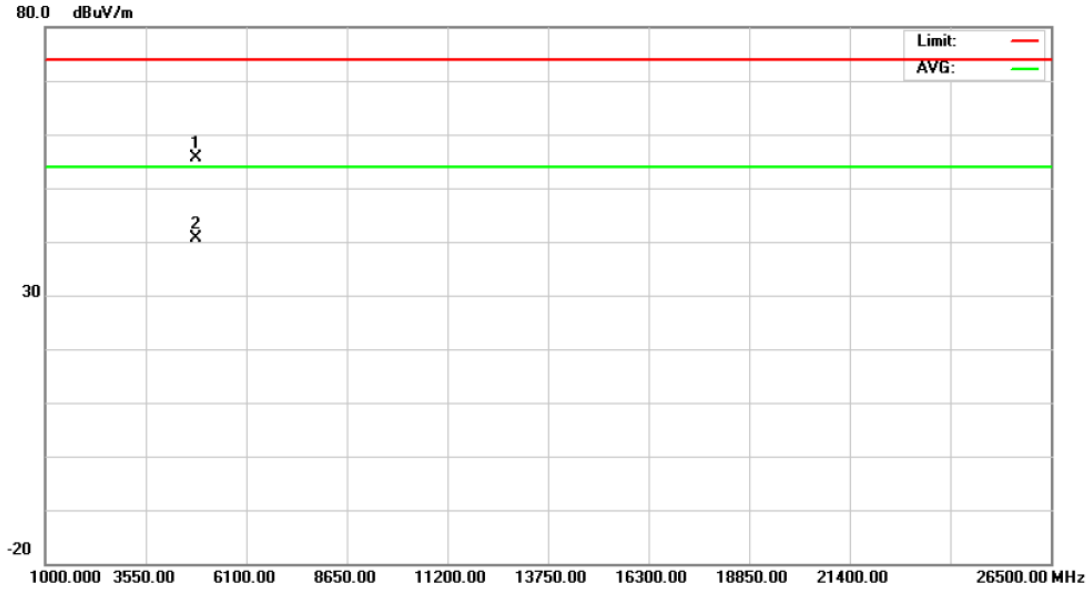
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2402MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4803.622	41.77	12.42	54.19	74.00	-19.81	peak
2	*	4803.622	27.97	12.42	40.39	54.00	-13.61	AVG

Emission Level= Read Level+ Correct Factor

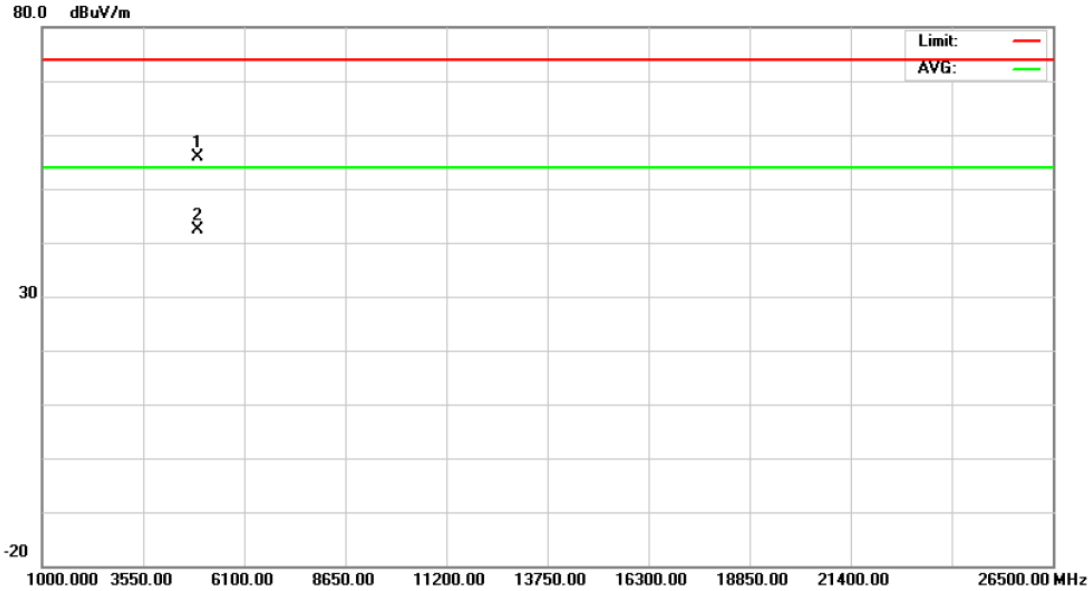
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mode 2402MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4803.923	43.17	12.42	55.59	74.00	-18.41	peak
2	*	4803.923	28.28	12.42	40.70	54.00	-13.30	AVG

Emission Level= Read Level+ Correct Factor

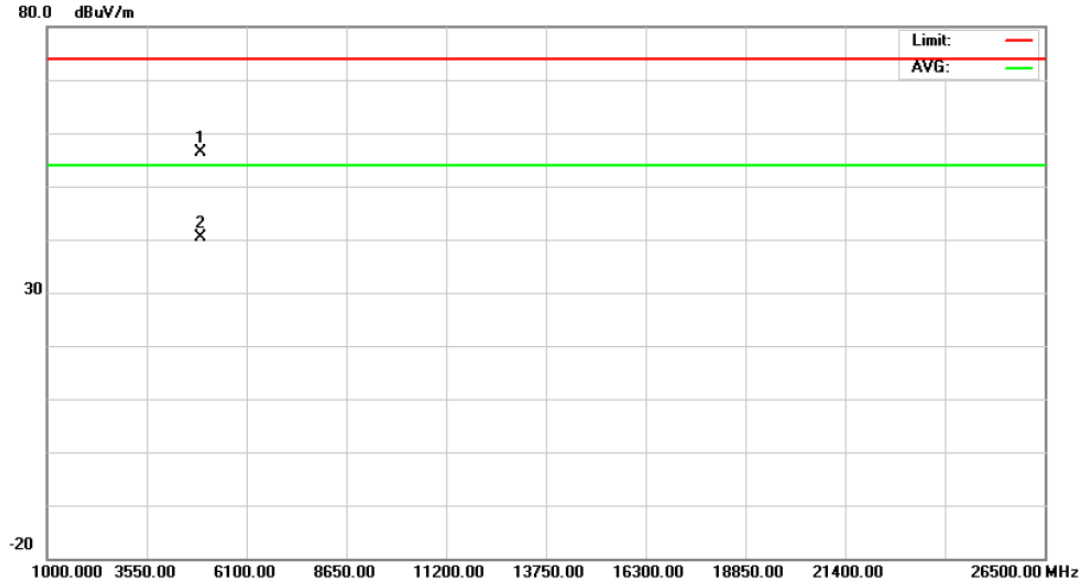
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2441MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4883.269	42.95	12.90	55.85	74.00	-18.15	peak
2	*	4883.269	29.60	12.90	42.50	54.00	-11.50	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX π/4-DQPSK Mode 2441MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4882.923	43.45	12.90	56.35	74.00	-17.65	peak
2	*	4883.296	27.52	12.90	40.42	54.00	-13.58	AVG

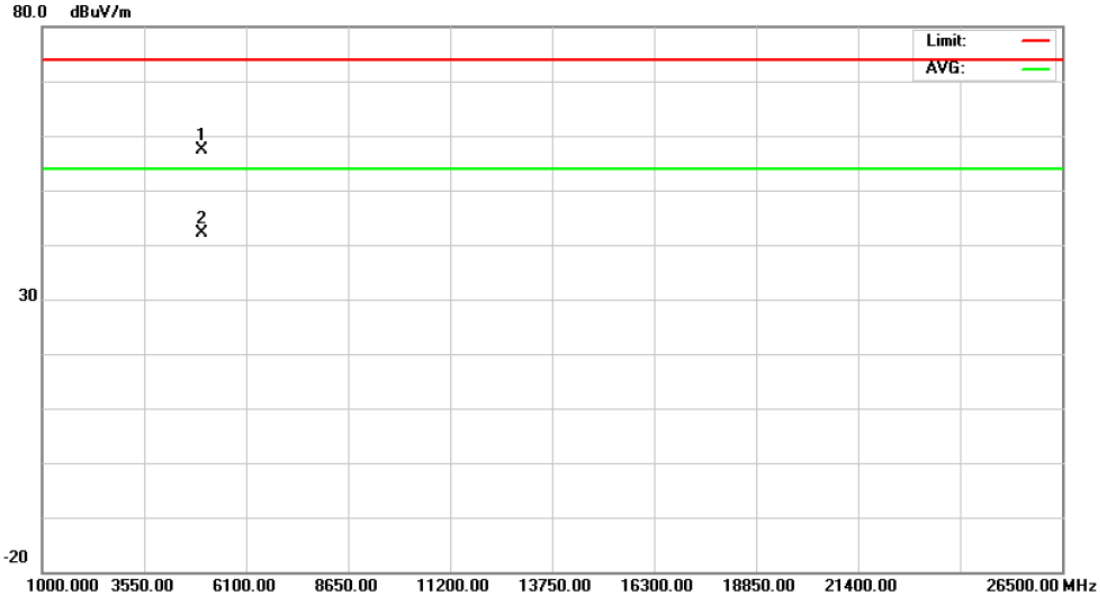
Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2480MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4959.263	41.98	13.37	55.35	74.00	-18.65	peak
2	*	4960.692	27.86	13.38	41.24	54.00	-12.76	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mode 2480MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4959.742	44.10	13.37	57.47	74.00	-16.53	peak
2	*	4961.182	28.75	13.38	42.13	54.00	-11.87	AVG

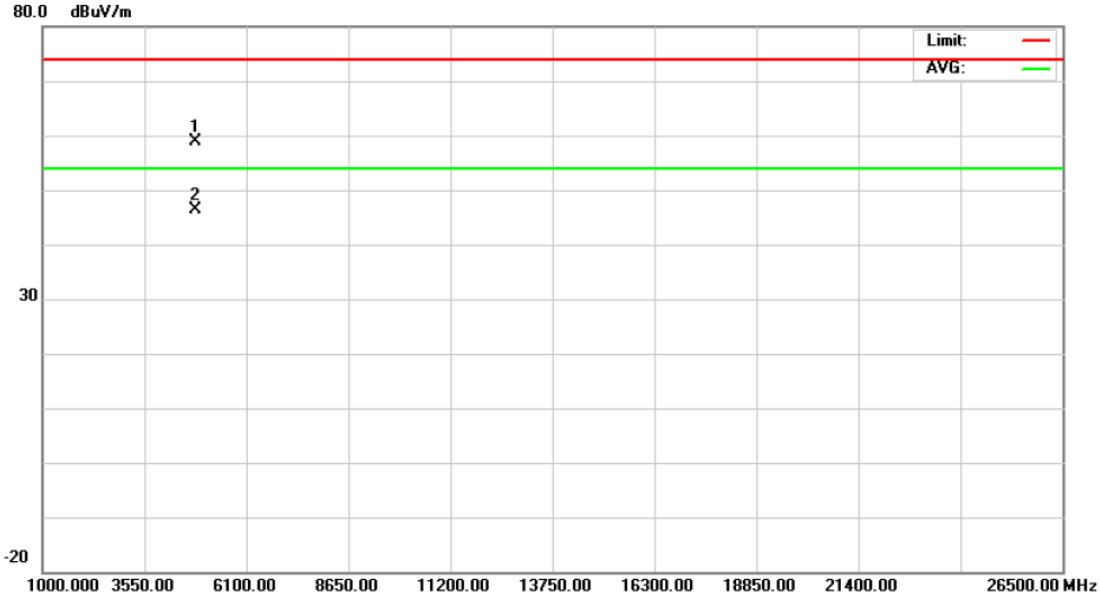
Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2402MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4803.654	43.65	15.56	59.21	74.00	-14.79	peak
2	*	4803.654	31.24	15.56	46.80	54.00	-7.20	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2402MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4803.227	43.25	15.55	58.80	74.00	-15.20	peak
2	*	4803.254	30.85	15.55	46.40	54.00	-7.60	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2441MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	4882.225	31.47	15.92	47.39	54.00	-6.61	AVG
2		4882.251	43.44	15.92	59.36	74.00	-14.64	peak

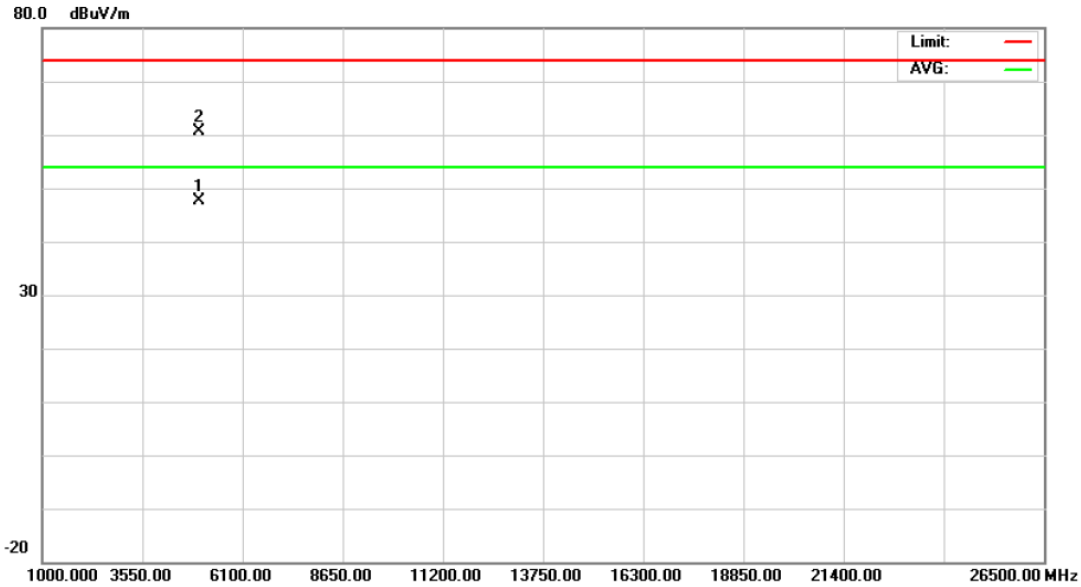
Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2441MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4882.041	43.67	15.92	59.59	74.00	-14.41	peak
2	*	4882.850	30.98	15.92	46.90	54.00	-7.10	AVG

Emission Level= Read Level+ Correct Factor

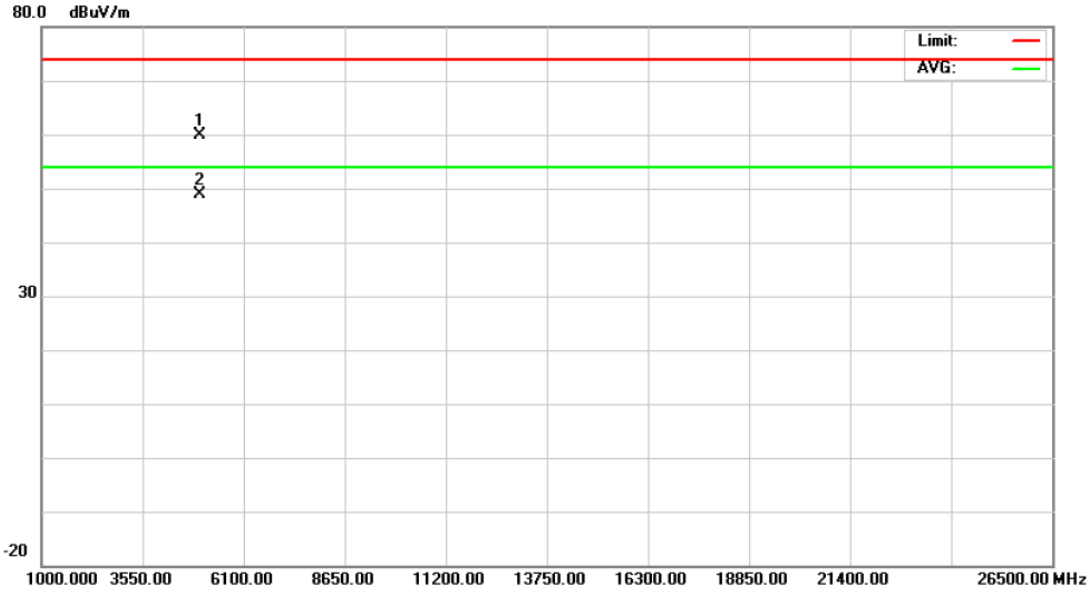
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2480MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	4960.235	31.41	16.26	47.67	54.00	-6.33	AVG
2		4960.251	44.25	16.26	60.51	74.00	-13.49	peak

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2480MHz(Control Screen)		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



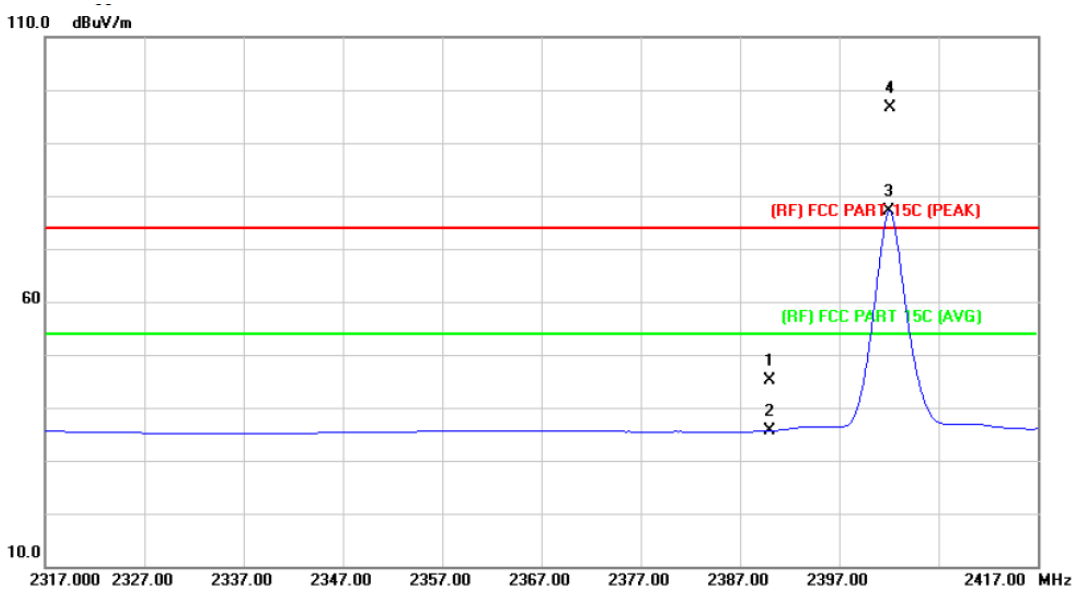
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4960.158	43.58	16.26	59.84	74.00	-14.16	peak
2	*	4960.158	32.58	16.26	48.84	54.00	-5.16	AVG

Emission Level= Read Level+ Correct Factor

Attachment C-- Restricted Bands and Band-edge Test Data

(1) Radiation Test

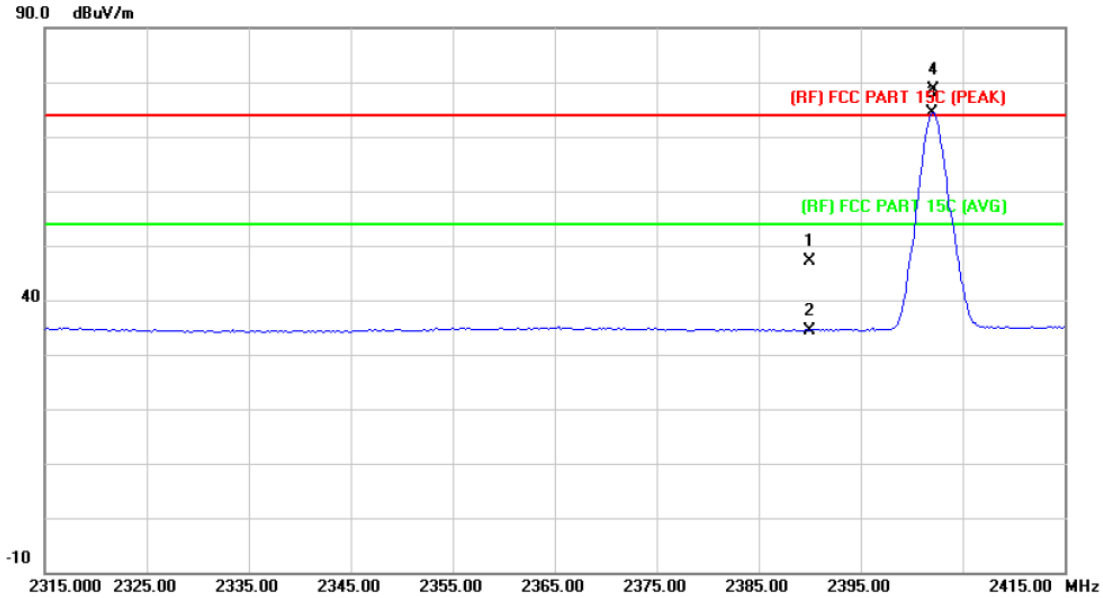
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2402MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	43.73	1.51	45.24	74.00	-28.76	peak
2		2390.000	34.11	1.51	35.62	54.00	-18.38	AVG
3	*	2402.000	75.62	1.56	77.18	Fundamental Frequency		AVG
4	X	2402.200	95.09	1.56	96.65	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

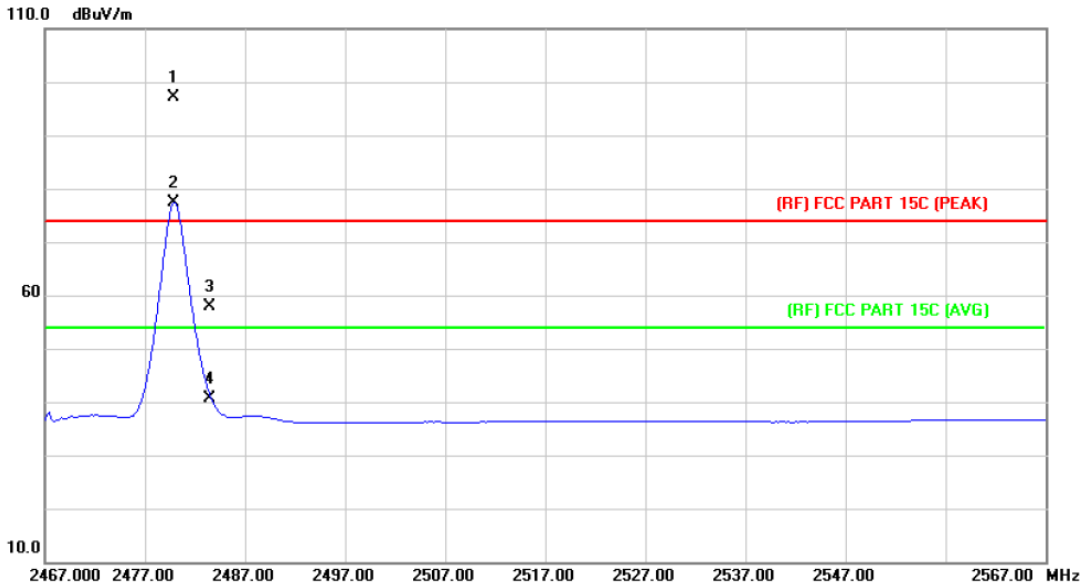
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2402MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	45.52	1.51	47.03	74.00	-26.97	peak
2		2390.000	32.99	1.51	34.50	54.00	-19.50	AVG
3	*	2402.000	72.77	1.56	74.33	Fundamental Frequency		AVG
4	X	2402.200	77.07	1.56	78.63	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

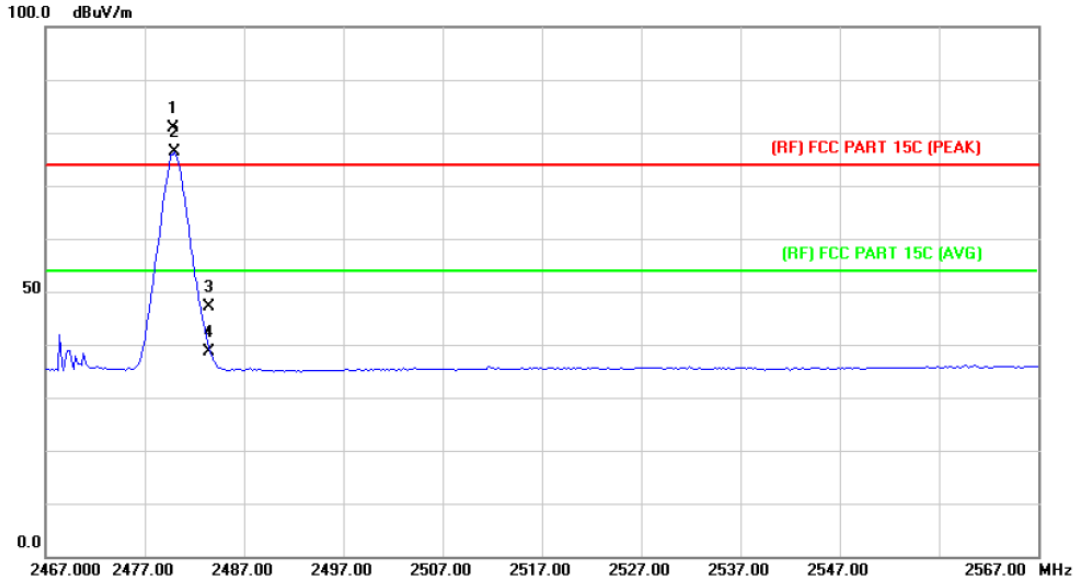
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480 MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2479.800	95.01	2.07	97.08	Fundamental Frequency		peak
2	*	2479.800	75.42	2.07	77.49	Fundamental Frequency		AVG
3		2483.500	55.67	2.10	57.77	74.00	-16.23	peak
4		2483.500	38.62	2.10	40.72	54.00	-13.28	AVG

Emission Level= Read Level+ Correct Factor

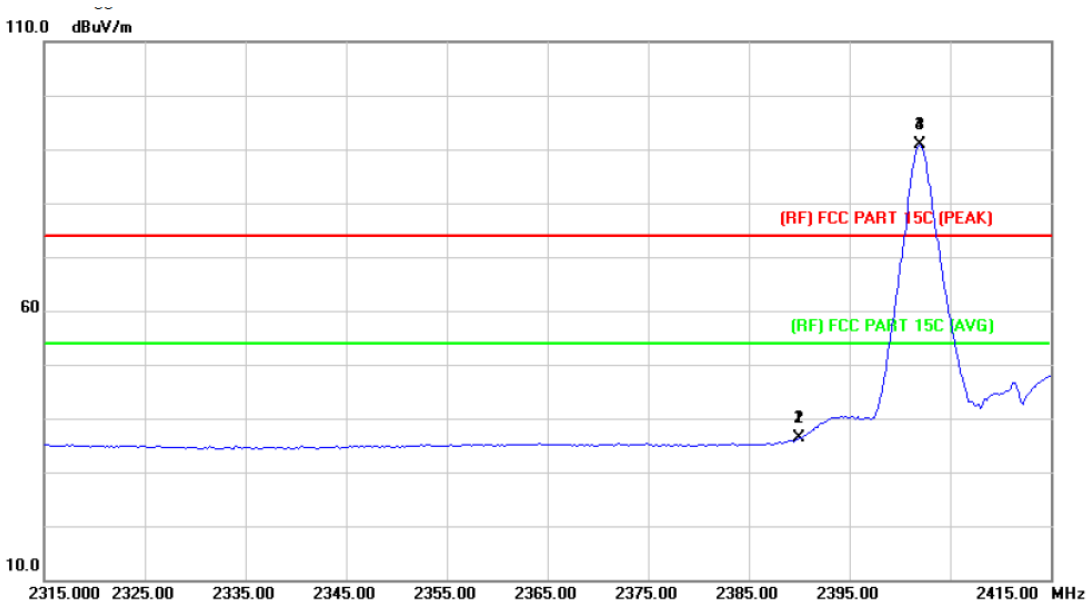
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX GFSK Mode 2480 MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2479.800	78.88	2.07	80.95	Fundamental Frequency		peak
2	*	2480.000	74.40	2.07	76.47	Fundamental Frequency		AVG
3		2483.500	45.01	2.10	47.11	74.00	-26.89	peak
4		2483.500	36.59	2.10	38.69	54.00	-15.31	AVG

Emission Level= Read Level+ Correct Factor

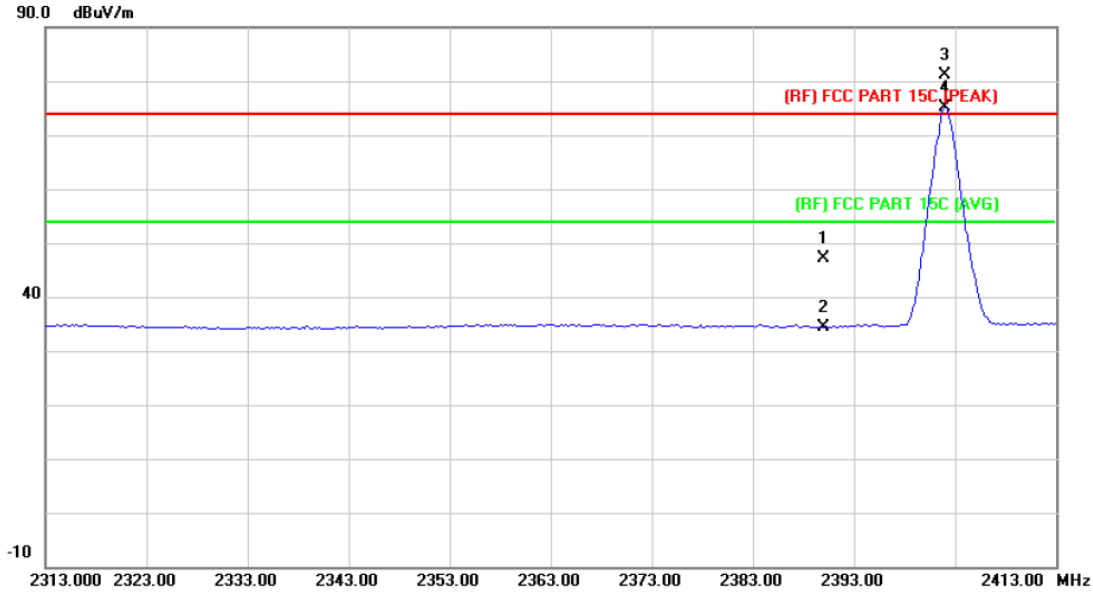
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2402MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	34.75	1.51	36.26	74.00	-37.74	peak
2		2390.000	34.93	1.51	36.44	54.00	-17.56	AVG
3	X	2402.000	89.20	1.56	90.76	Fundamental Frequency		peak
4	*	2402.000	89.22	1.56	90.78	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

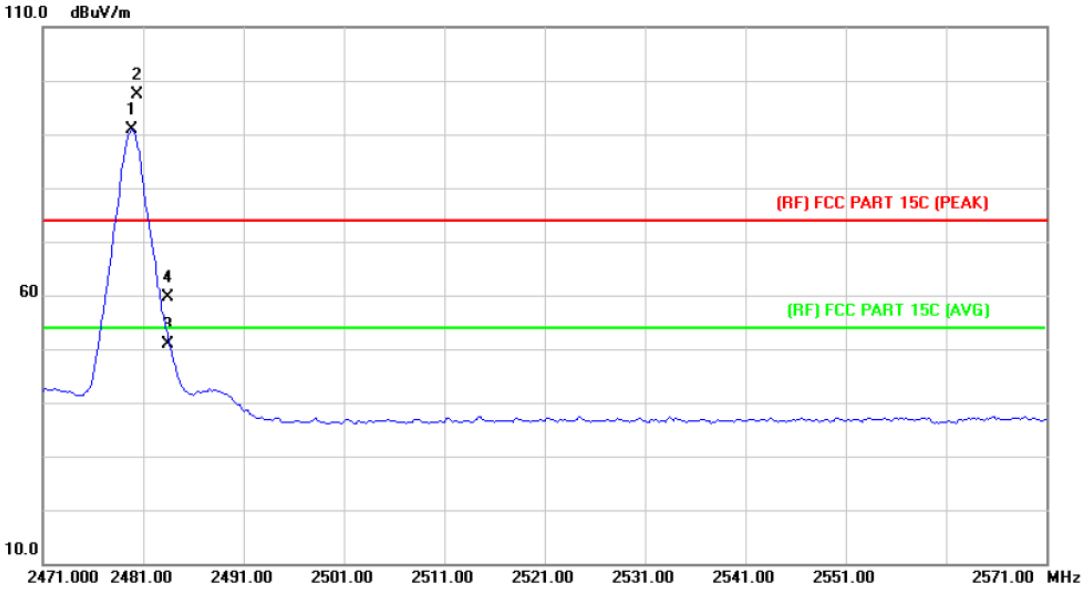
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mode 2402MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	45.50	1.51	47.01	74.00	-26.99	peak
2		2390.000	32.88	1.51	34.39	54.00	-19.61	AVG
3	X	2402.000	79.59	1.56	81.15	Fundamental Frequency		peak
4	*	2402.000	73.59	1.56	75.15	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

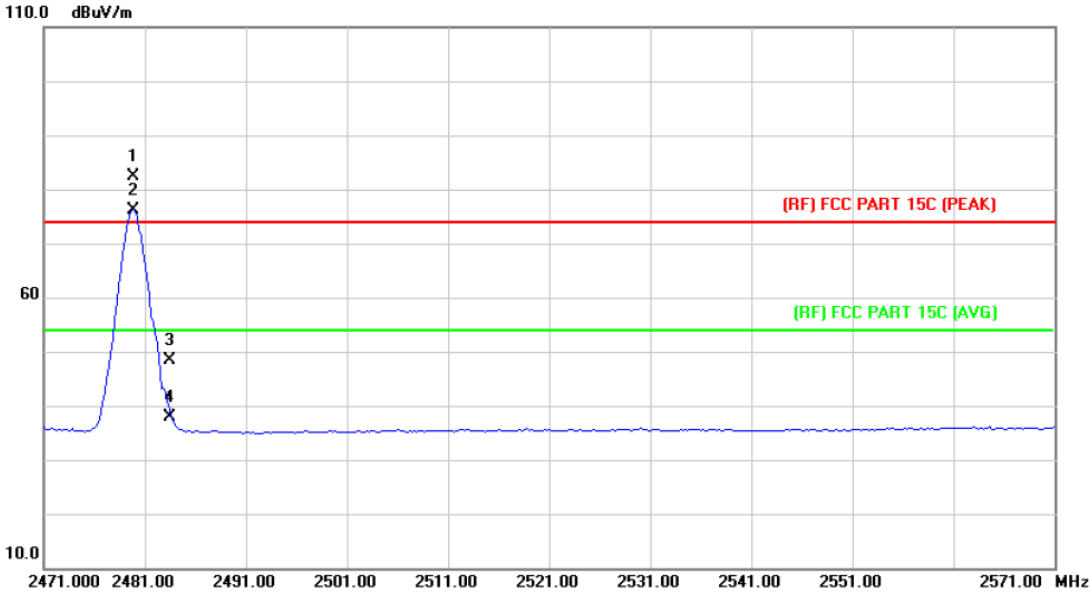
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX π /4-DQPSK Mode 2480MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2479.800	88.85	2.07	90.92	Fundamental Frequency		peak
2	*	2480.400	95.41	2.07	97.48	Fundamental Frequency		peak
3		2483.500	48.89	2.10	50.99	74.00	-23.01	peak
4		2483.500	57.46	2.10	59.56	74.00	-14.44	peak

Emission Level= Read Level+ Correct Factor

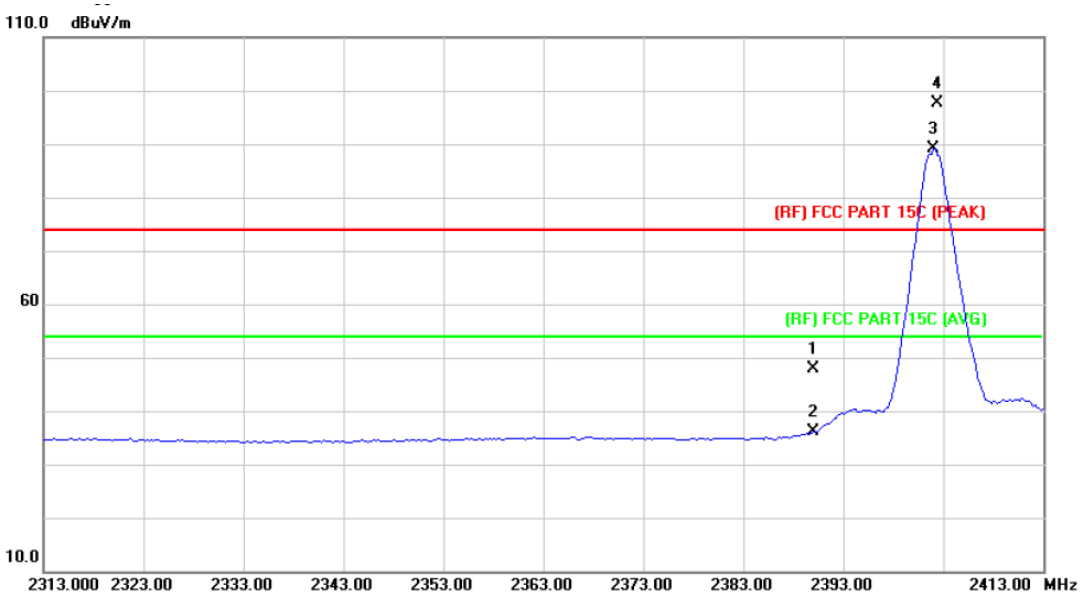
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX π/4-DQPSK Mode 2480MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2479.800	80.25	2.07	82.32	Fundamental Frequency		peak
2	*	2479.800	74.18	2.07	76.25	Fundamental Frequency		AVG
3		2483.500	46.37	2.10	48.47	74.00	-25.53	peak
4		2483.500	35.89	2.10	37.99	54.00	-16.01	AVG

Emission Level= Read Level+ Correct Factor

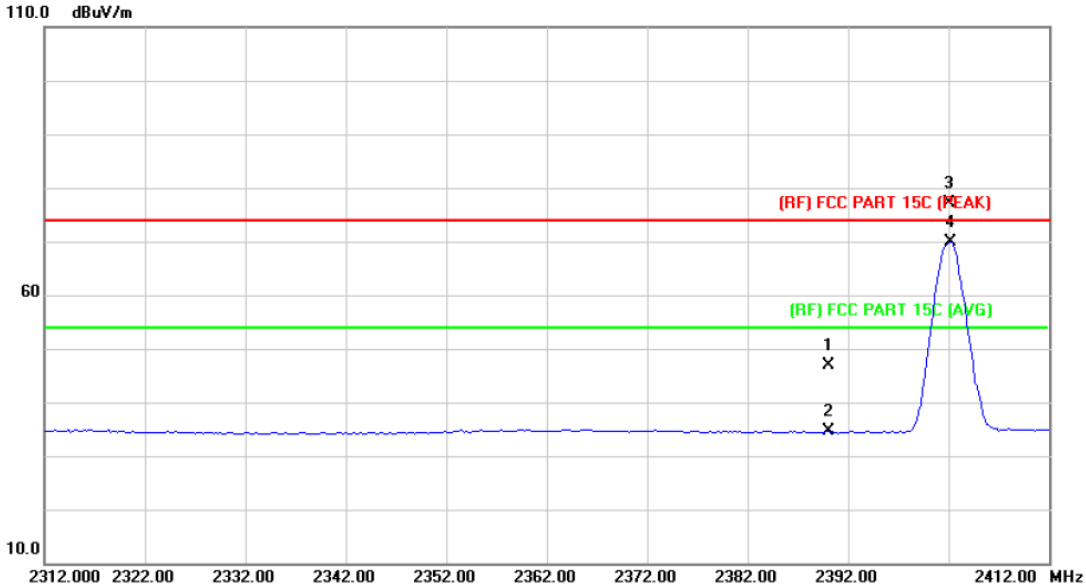
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2402MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	46.47	1.51	47.98	74.00	-26.02	peak
2		2390.000	34.72	1.51	36.23	54.00	-17.77	AVG
3	*	2402.000	87.51	1.56	89.07	Fundamental Frequency		AVG
4	X	2402.400	96.07	1.56	97.63	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2402MHz(Laser Camera)		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	45.36	1.51	46.87	74.00	-27.13	peak
2		2390.000	33.05	1.51	34.56	54.00	-19.44	AVG
3	X	2402.000	75.69	1.56	77.25	Fundamental Frequency		peak
4	*	2402.200	68.42	1.56	69.98	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor