FCC Radio Test Report

FCC ID: P9M-JUNO

Report No.	:	TB-FCC156015
Applicant	:	Phottix (HK) Ltd.
Equipment Under Test (EUT)		
EUT Name	:	Juno Flash
Model No.	:	F1102
Serial Model No.	:	N/A
Brand Name	:	Phottix®
Receipt Date	:	2017-07-05
Test Date	:	2017-07-06 to 2017-07-11
Issue Date	:	2017-07-12
Standards	:	FCC Part 15, Subpart C (15.249: 2016)
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 : IVAN SU

Approved& Authorized :

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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1. General Information about EUT

1.1 Client Information

Applicant	:	Phottix (HK) Ltd.
Address	:	Unit 1 & 13, 8/F., Block B, Hoi Luen Ind. Centre, 55 Hoi Yuen Rd, Kwun Tong, Kln, HongKong, China
Manufacturer	:	Sky Wise Medical Instrument (Shenzhen) Co., Ltd
Address	:	Building 9,10, No.12 South Pingxi Road, Xinsheng Community, LongGang Street, LongGang District, Shenzhen City, People's Republic Of China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Juno Flash	
Models No.	:	F1102	
Model Difference	:	N/A	
Product Description	:	Operation Frequency: 2409~2431MHz, 2464MHz	
		Number of Channels:	13 Channels(See Note 2)
		Out Power:	106.11 dBuV/m@3m Peak 85.57 dBuV/m@3m Avg
		Antenna Gain:	0 dBi PCB Antenna
		Modulation Type:	GFSK
Power Supply	:	DC power by AA battery.	
Power Rating	:	DC 4*1.5V by AA Battery	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

Note:

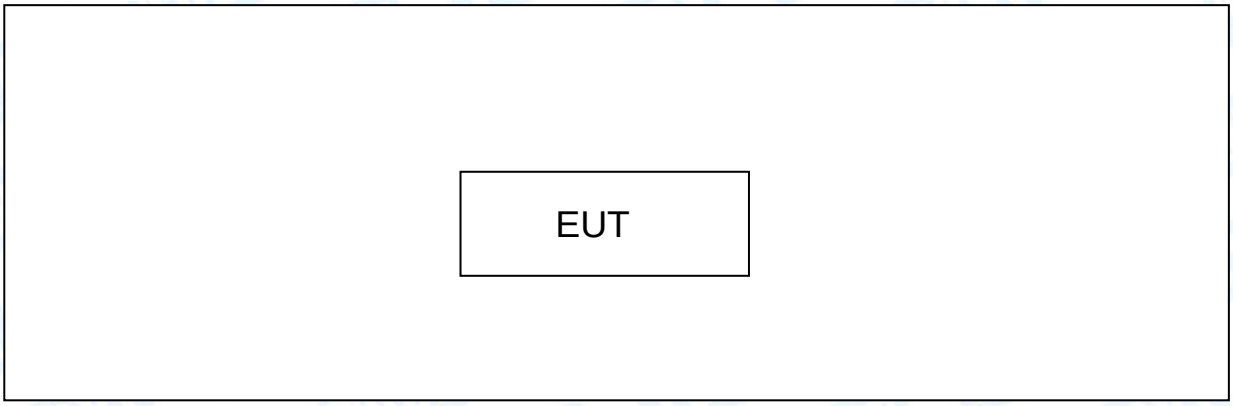
(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) Channel List:

Channel List					
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
01	**2464**	07	2413	13	2425
02		08	2415	14	2427
03		09	2417	15	2429
04		10	2419	16	**2431**
05	**2409**	11	**2421**		
06	2411	12	2423		

1.3 Block Diagram Showing the Configuration of System Tested

TX Mode



1.4 Description of Support Units

The EUT has been test as an independent unit.

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	N/A
For Radiated Test	
Final Test Mode	Description
Mode 2	TX Mode(CH01/CH05/CH011/CH016)

Note:

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.

(1)According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels.

(2)During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.

(3) The EUT is considered a portable unit; it 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. 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 RF mode.

Test Software Version	N/A			
Frequency	2464 MHz	2409MHz	2421 MHz	2431 MHz
GFSK	DEF	DEF	DEF	DEF

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.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

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(15.249)			
Standard Section	**Test Item**	**Judgment**	**Remark**
15.203	Antenna Requirement	PASS	N/A
15.205	Restricted Bands	PASS	N/A
15.207	AC Power Conducted Emission	N/A	N/A
15.249 &15.209	Radiated Spurious Emission	PASS	N/A
15.215(C)	20dB Bandwidth	PASS	N/A
Note: N/A is an abbreviation for Not Applicable.			

3. Test Equipment

Conducted Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 22, 2016	Jul. 21, 2017
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 22, 2016	Jul. 21, 2017
LISN	Rohde & Schwarz	ENV216	101131	Jul. 22, 2016	Jul. 21, 2017
Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 25, 2017	Mar. 24, 2018
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 25, 2017	Mar. 24, 2018
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 25, 2017	Mar. 24, 2018
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 25, 2017	Mar. 24, 2018
Loop Antenna	Laplace instrument	RF300	0701	Mar. 25, 2017	Mar. 24, 2018
Pre-amplifier	Sonoma	310N	185903	Mar. 24, 2017	Mar. 23, 2018
Pre-amplifier	HP	8449B	3008A00849	Mar. 29, 2017	Mar. 28, 2018
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 29, 2017	Mar. 28, 2018
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. 22, 2016	Jul. 21, 2017
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Power Meter	Anritsu	ML2495A	25406005	Jul. 22, 2016	Jul. 21, 2017
Power Sensor	Anritsu	ML2411B	25406005	Jul. 22, 2016	Jul. 21, 2017

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard

FCC Part 15.207

4.1.2 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

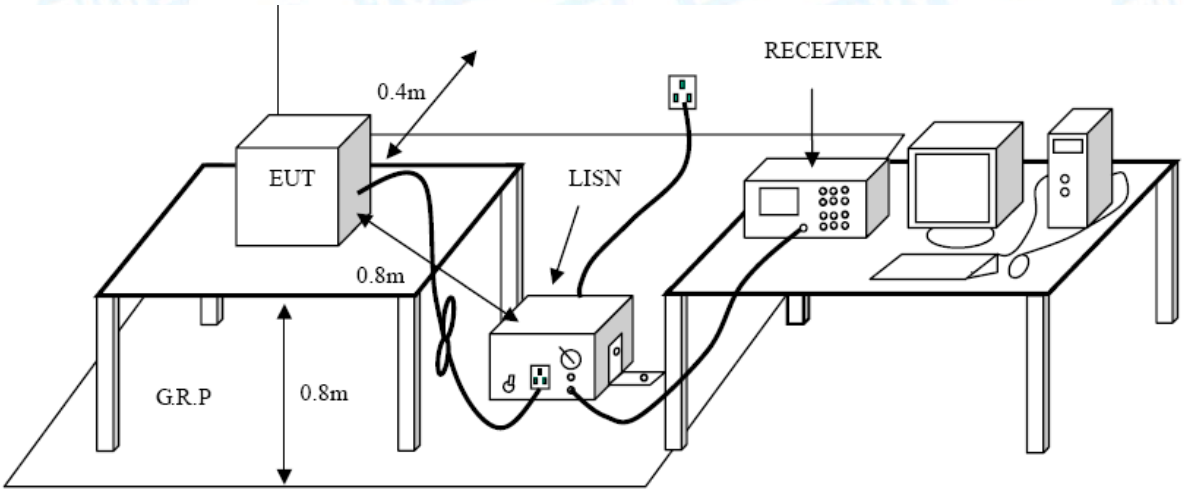
Notes:

(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.

4.2 Test Setup



4.3 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 is 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.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

The EUT is powered by DC battery, no requirement for this test item.

5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.209

5.1.2 Test Limit

Radiated Emission Limit (9kHz~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)

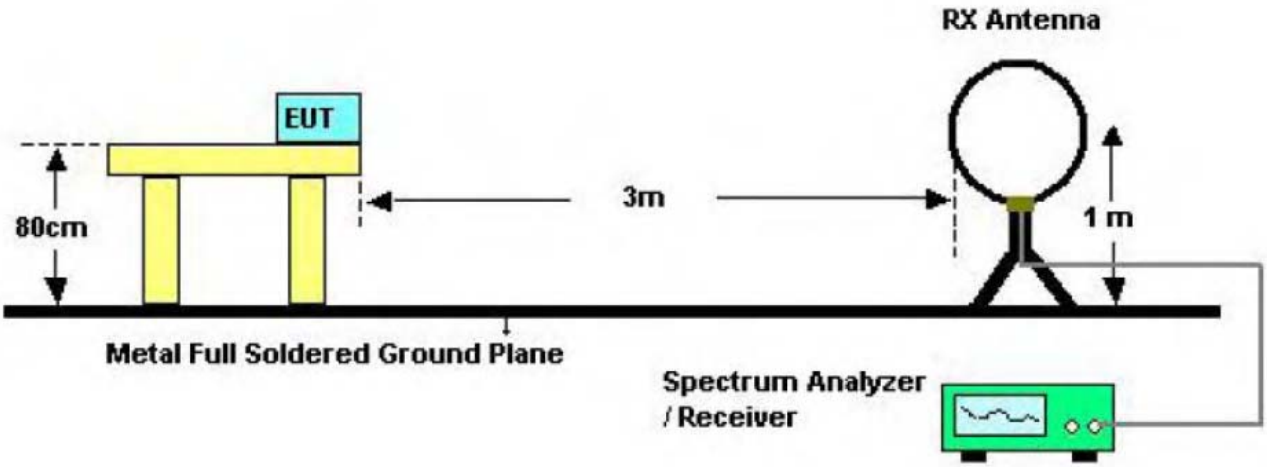
Limits of radiated emission measurement (15.249)

FCC Part 15 (15.249), Subpart C	
Limit	**Frequency Range (MHz)**
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400~2483.5
Field strength of fundamental 500 μV/m (94 dBμV/m) @ 3 m	Above 2483.5

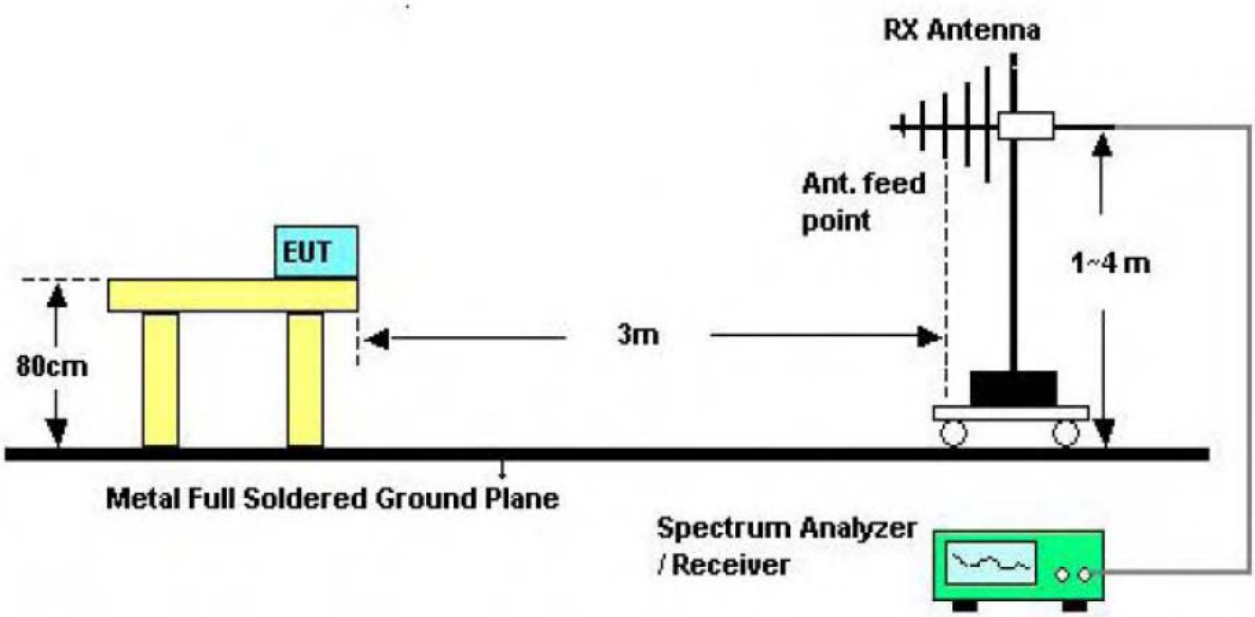
Restricted bands requirement for equipment operating in 2400MHz to 2483.5 MHz (15.249)

Restricted Frequency Band (MHz)	(dBuV/m)(at 3 M)
2310~2390	Attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation
2483.5~2500	

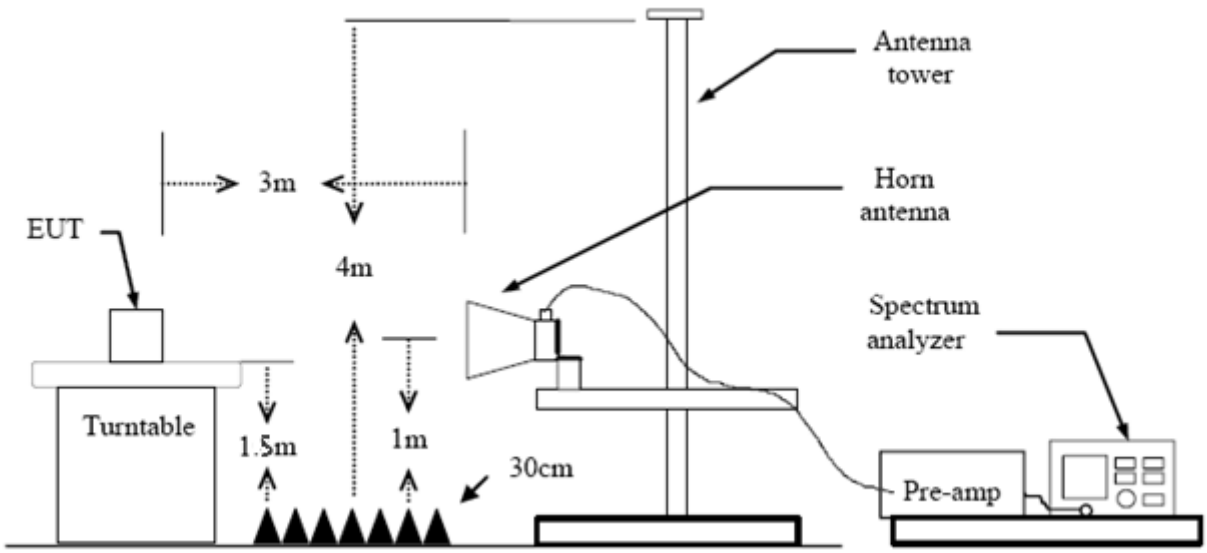
5.2 Test Setup



Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup



Above 1GHz Test Setup

5.3 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.

5.4 EUT Operating Condition

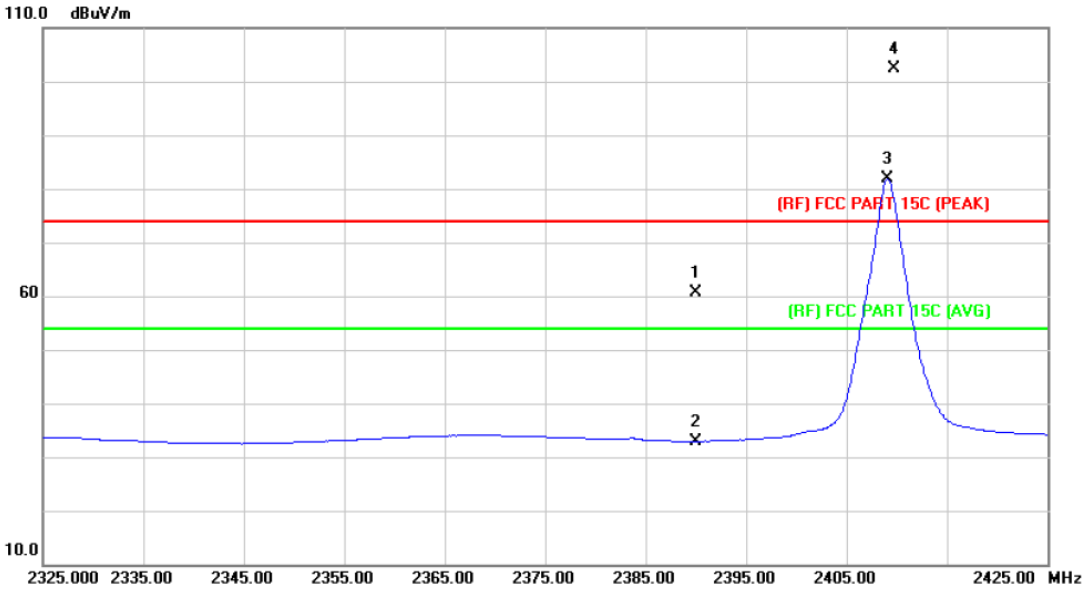
The EUT was set to Continual Transmitting in maximum power, and new batteries are used during testing.

5.5 Test Data

Please see the next page.

5.6.1 Field Strength of the Fundamental

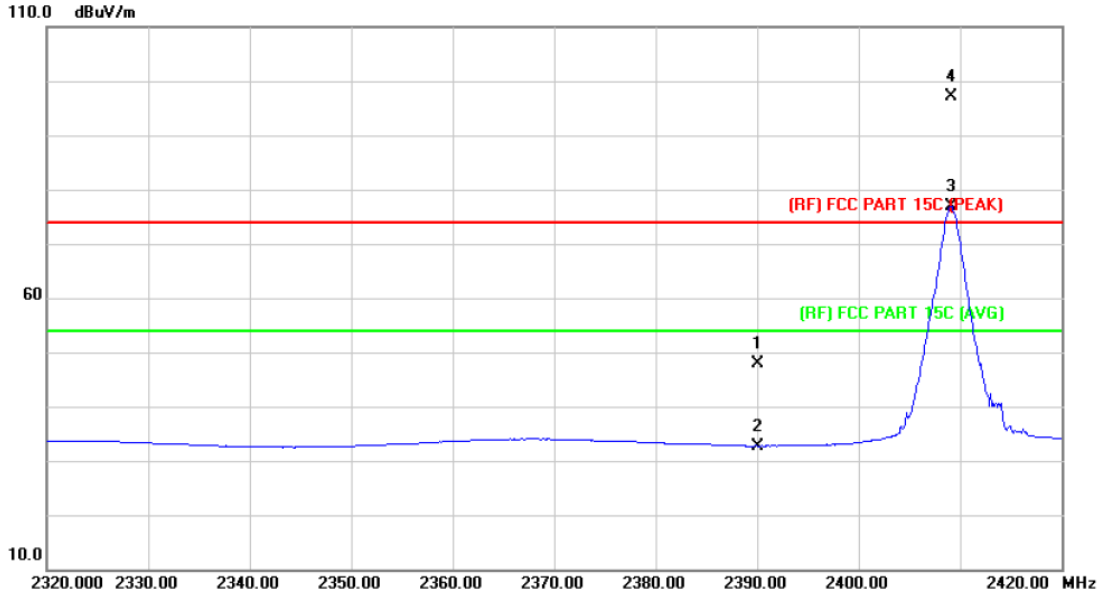
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2409MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	59.98	0.77	60.75	74.00	-13.25	peak
2		2390.000	32.19	0.77	32.96	54.00	-21.04	AVG
3	X	2409.100	80.96	0.85	81.81	**94.00**	**-12.19**	AVG
4	*	2409.700	101.41	0.85	102.26	**114.00**	**-11.74**	peak

Emission Level= Read Level+ Correct Factor

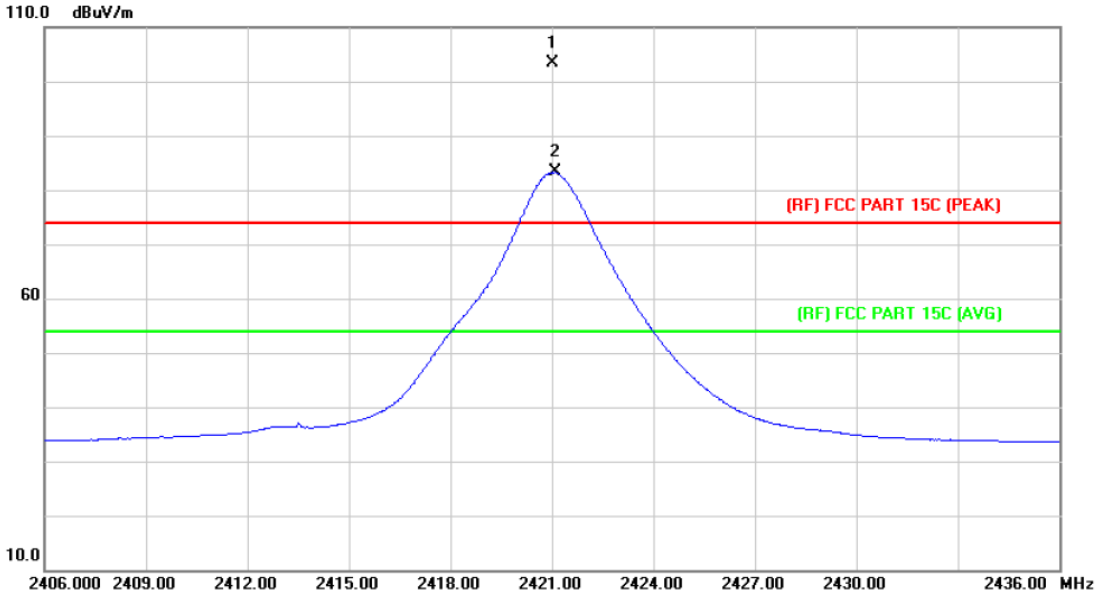
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2409MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	47.16	0.77	47.93	74.00	-26.07	peak
2		2390.000	31.96	0.77	32.73	54.00	-21.27	AVG
3	X	2409.100	76.11	0.85	76.96	**94.00**	**-17.04**	AVG
4	*	2409.200	96.36	0.85	97.21	**114.00**	**-16.79**	peak

Emission Level= Read Level+ Correct Factor

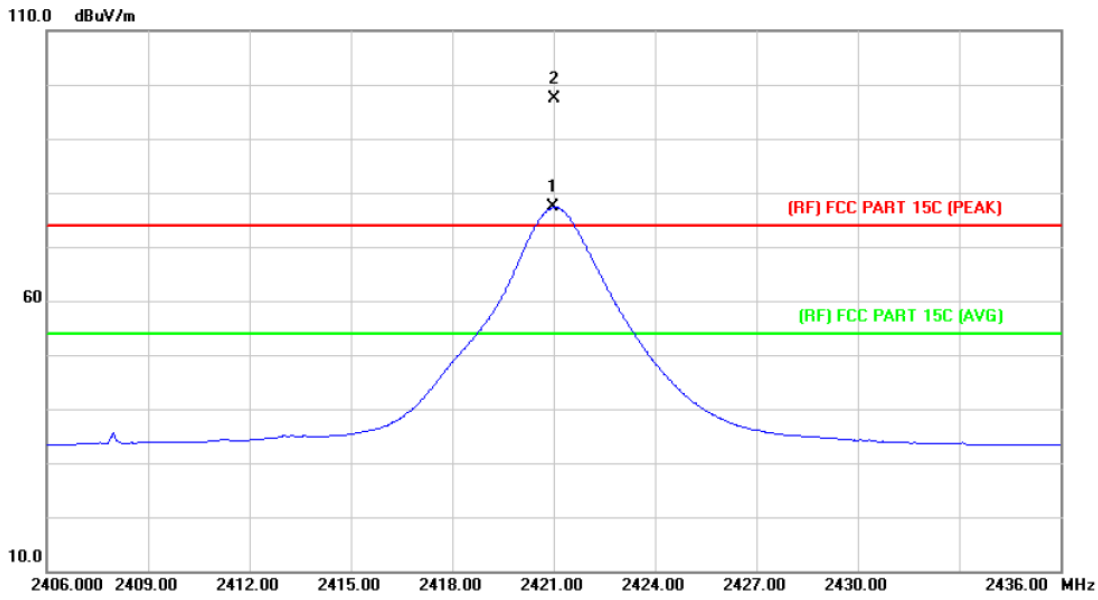
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2421MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2421.030	102.52	0.90	103.42	**114.00**	**-10.58**	peak
2	X	2421.090	82.36	0.90	83.26	**94.00**	**-10.74**	AVG

Emission Level= Read Level+ Correct Factor

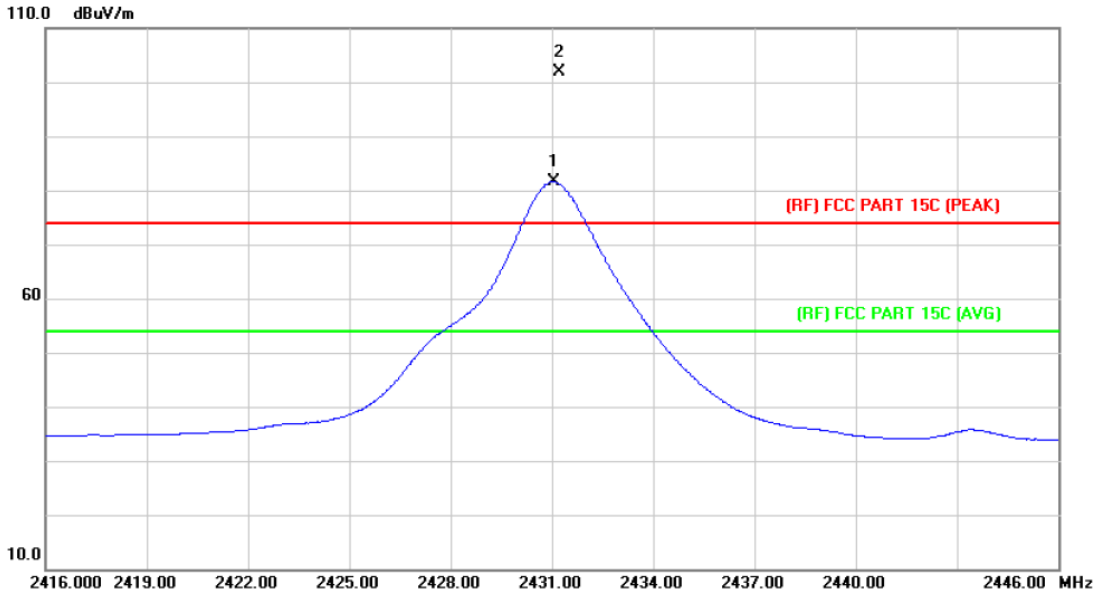
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2421MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2420.970	76.47	0.90	77.37	**94.00**	**-16.63**	AVG
2	*	2421.000	96.56	0.90	97.46	**114.00**	**-16.54**	peak

Emission Level= Read Level+ Correct Factor

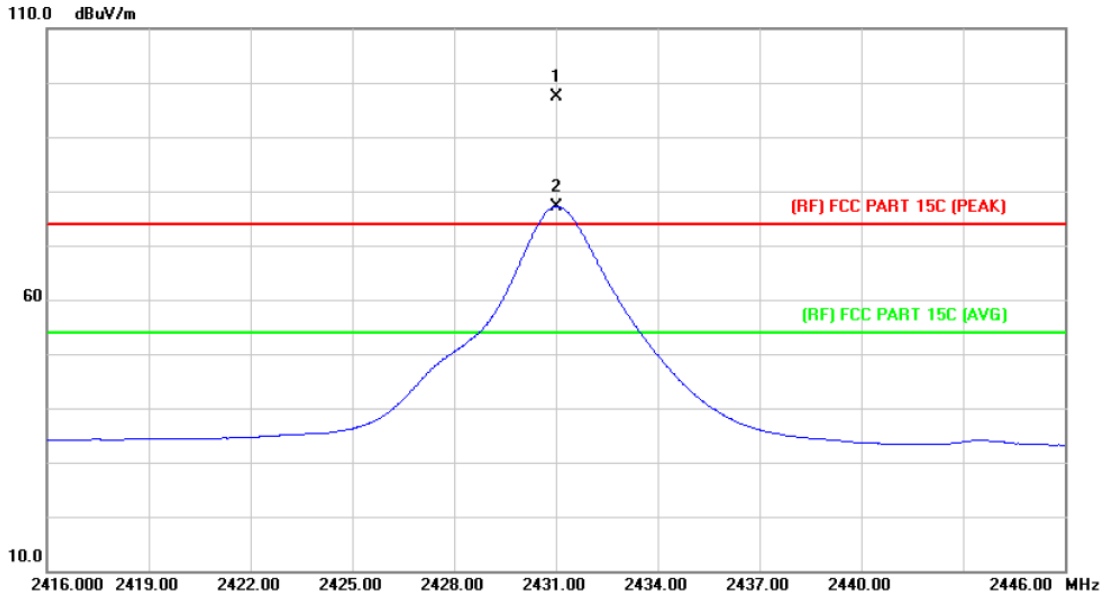
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2431MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2431.060	80.75	0.95	81.70	**94.00**	**-12.30**	AVG
2	*	2431.210	101.02	0.95	101.97	**114.00**	**-12.03**	peak

Emission Level= Read Level+ Correct Factor

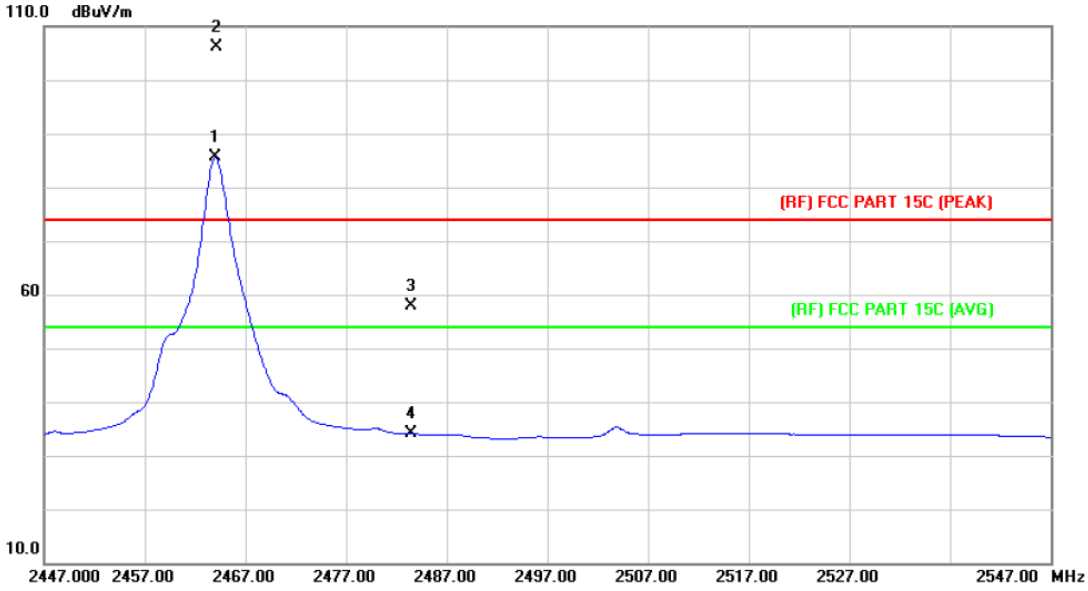
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2431MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2431.000	96.54	0.95	97.49	**114.00**	**-16.51**	peak
2	X	2431.030	76.30	0.95	77.25	**94.00**	**-16.75**	AVG

Emission Level= Read Level+ Correct Factor

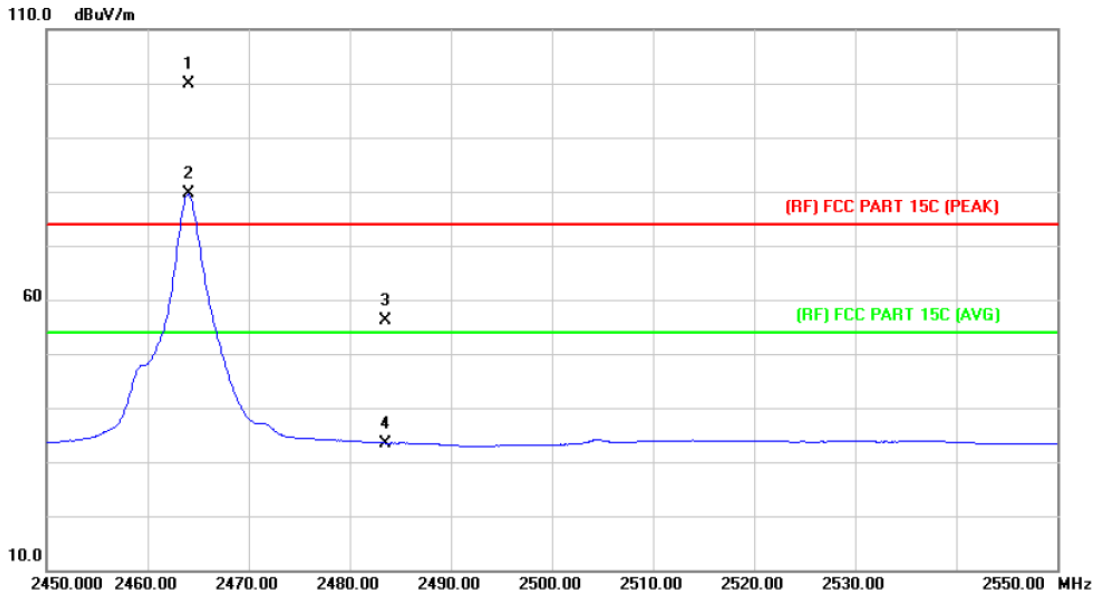
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2464MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2464.000	84.49	1.08	85.57	**94.00**	**-8.43**	AVG
2	*	2464.100	105.03	1.08	106.11	**114.00**	**-7.89**	peak
3		2483.500	56.77	1.17	57.94	74.00	-16.06	peak
4		2483.500	32.84	1.17	34.01	54.00	-19.99	AVG

Emission Level= Read Level+ Correct Factor

EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2464MHz		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2464.000	98.85	1.08	99.93	**114.00**	**-14.07**	peak
2	X	2464.000	78.46	1.08	79.54	**94.00**	**-14.46**	AVG
3		2483.500	54.99	1.17	56.16	74.00	-17.84	peak
4		2483.500	32.33	1.17	33.50	54.00	-20.50	AVG

Emission Level= Read Level+ Correct Factor

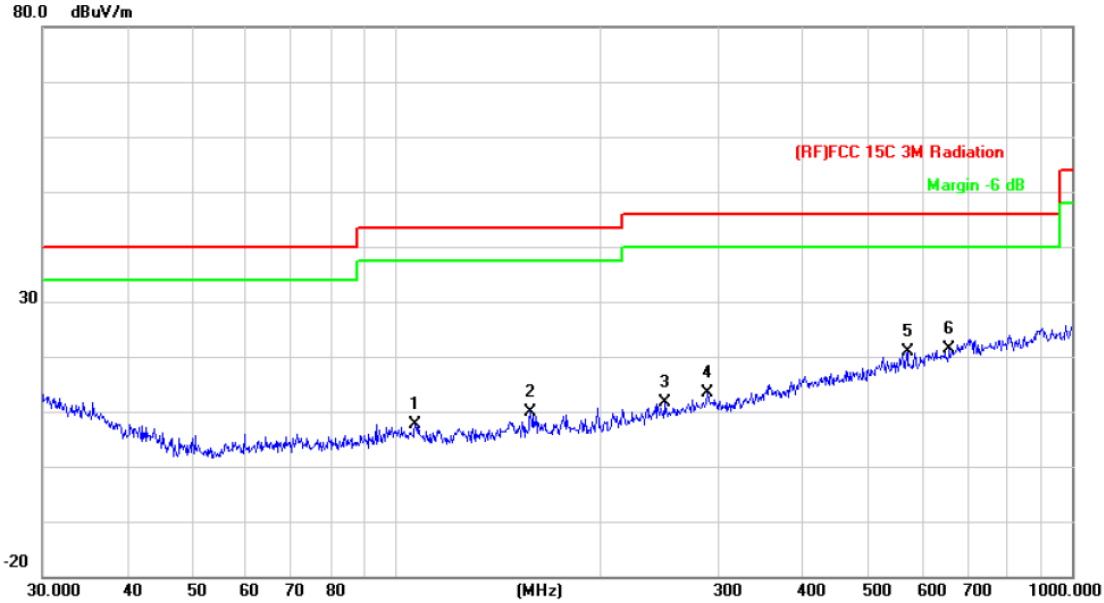
5.6.2 Radiated Spurious Emission (9 KHz~30 MHz)

From 9 KHz to 30 MHz: 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.

5.6.3 Radiated Spurious Emission (Below 1 GHz)

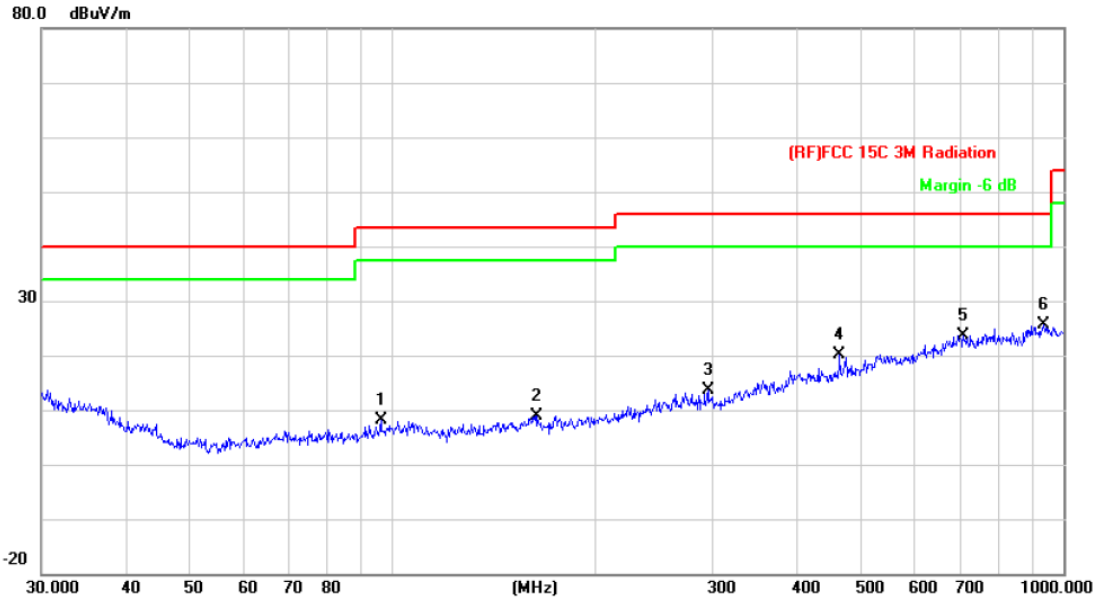
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2409MHz		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		106.7587	29.15	-21.40	7.75	43.50	-35.75	peak
2		158.1123	30.17	-20.17	10.00	43.50	-33.50	peak
3		249.4250	29.07	-17.44	11.63	46.00	-34.37	peak
4		289.0021	29.78	-16.52	13.26	46.00	-32.74	peak
5		570.6100	30.03	-9.24	20.79	46.00	-25.21	peak
6	*	658.8362	28.62	-7.34	21.28	46.00	-24.72	peak

Emission Level= Read Level+ Correct Factor

EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2409MHz		
Remark:	Only worse case is reported		

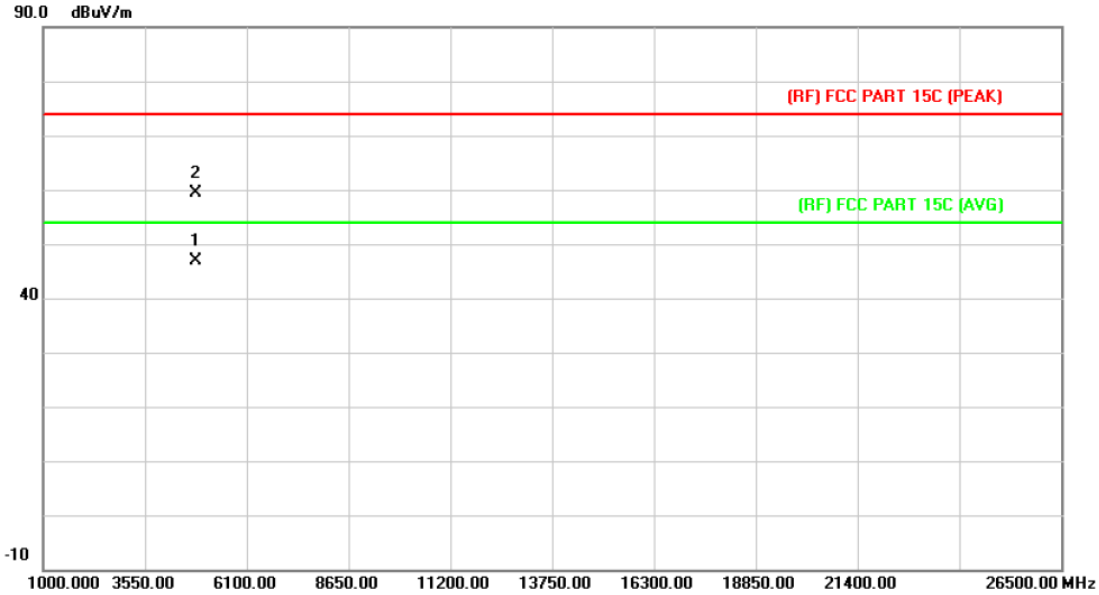


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		96.0986	29.95	-21.73	8.22	43.50	-35.28	peak
2		164.3301	29.18	-20.31	8.87	43.50	-34.63	peak
3		295.1469	30.14	-16.39	13.75	46.00	-32.25	peak
4		463.9696	31.39	-11.16	20.23	46.00	-25.77	peak
5		709.1823	29.60	-5.93	23.67	46.00	-22.33	peak
6	*	935.5463	29.19	-3.46	25.73	46.00	-20.27	peak

Emission Level= Read Level+ Correct Factor

5.6.4 Radiated Spurious Emission (Above 1 GHz)

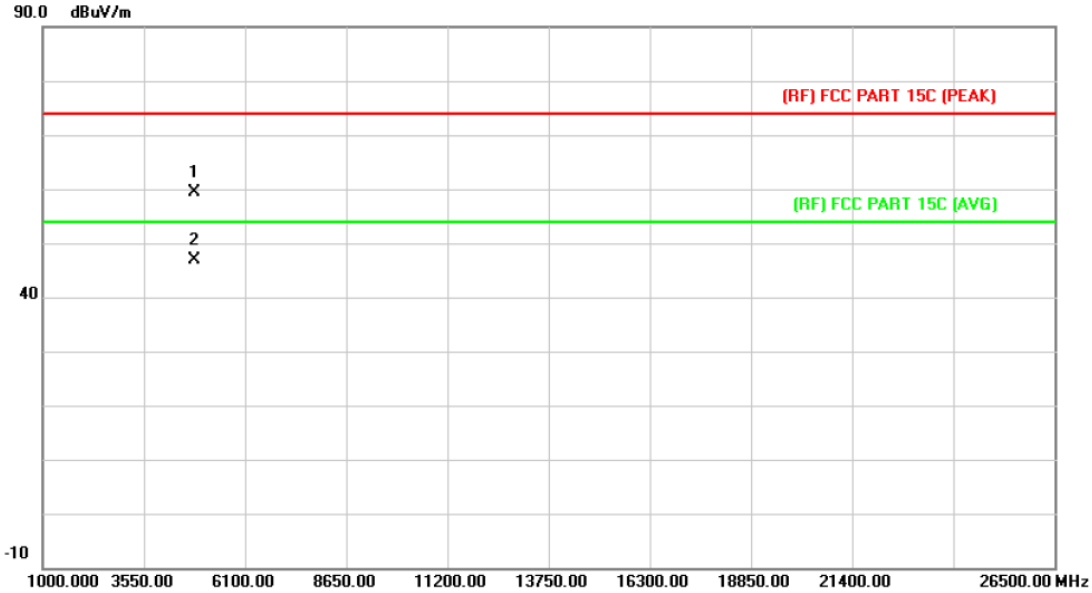
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2409MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4818.005	33.46	13.53	46.99	54.00	-7.01	AVG
2		4818.320	45.91	13.53	59.44	74.00	-14.56	peak

Emission Level= Read Level+ Correct Factor

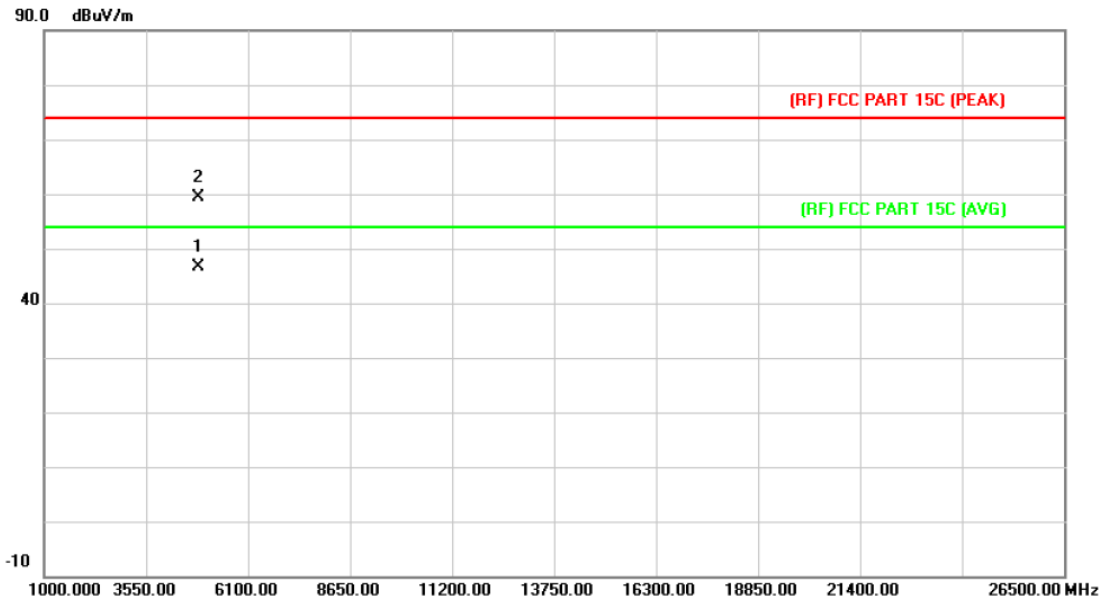
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2409MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4817.925	45.89	13.53	59.42	74.00	-14.58	peak
2	*	4817.955	33.45	13.53	46.98	54.00	-7.02	AVG

Emission Level= Read Level+ Correct Factor

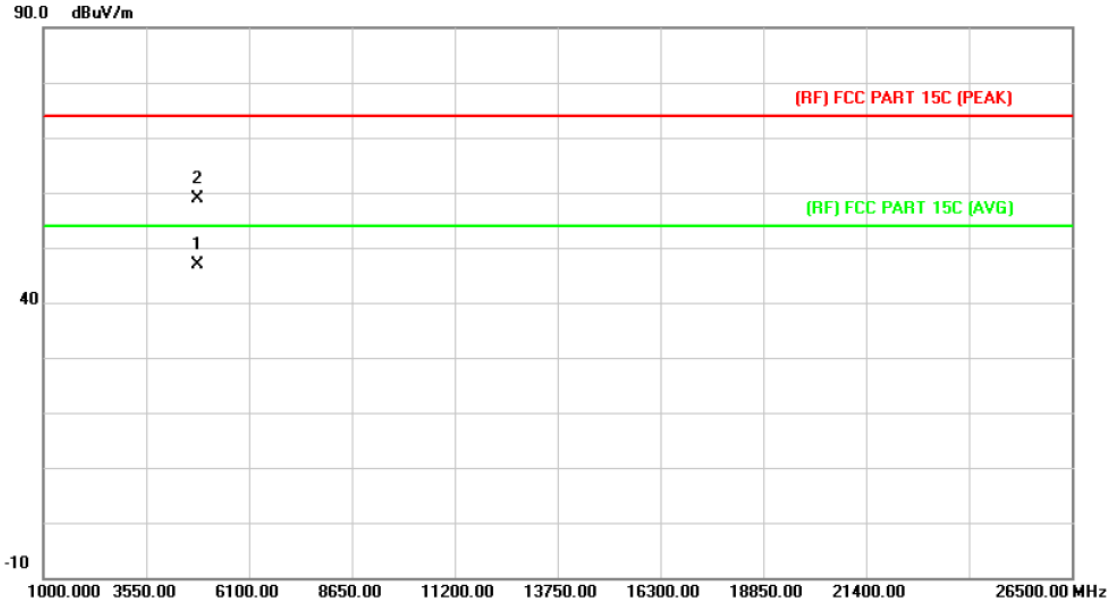
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2421MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4842.155	32.84	13.67	46.51	54.00	-7.49	AVG
2		4842.285	45.81	13.67	59.48	74.00	-14.52	peak

Emission Level= Read Level+ Correct Factor

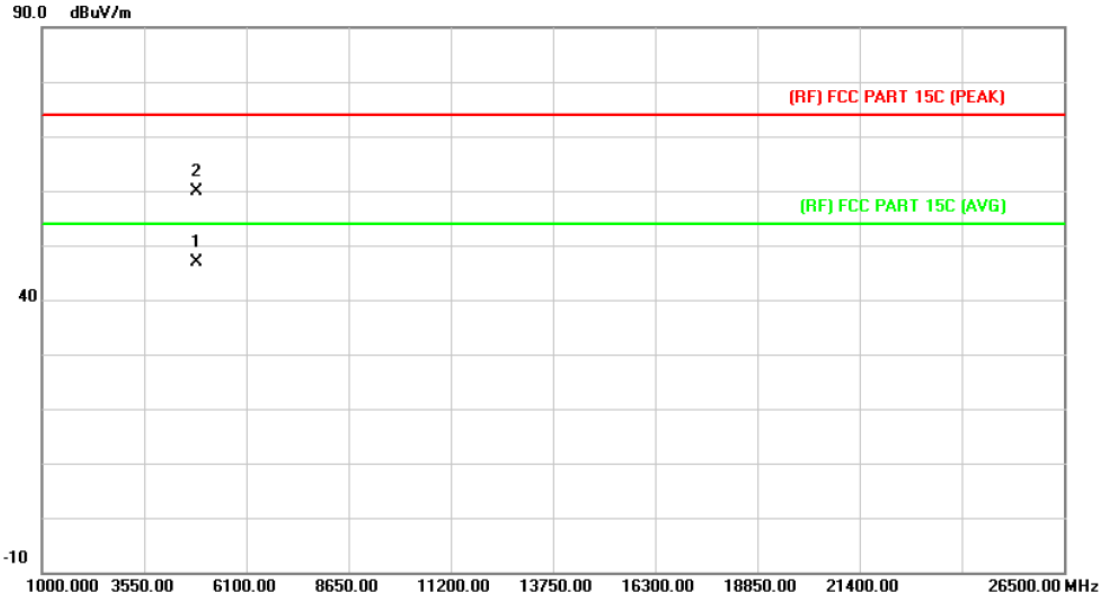
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2421MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4841.820	33.31	13.67	46.98	54.00	-7.02	AVG
2		4841.855	45.29	13.67	58.96	74.00	-15.04	peak

Emission Level= Read Level+ Correct Factor

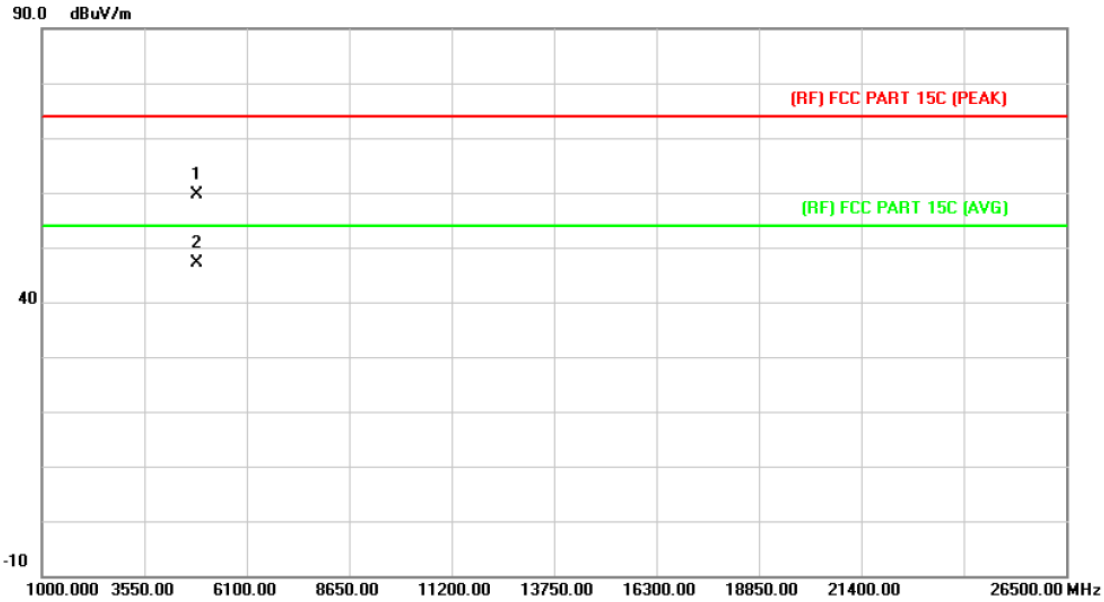
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2431MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4861.850	33.08	13.79	46.87	54.00	-7.13	AVG
2		4862.120	46.17	13.79	59.96	74.00	-14.04	peak

Emission Level= Read Level+ Correct Factor

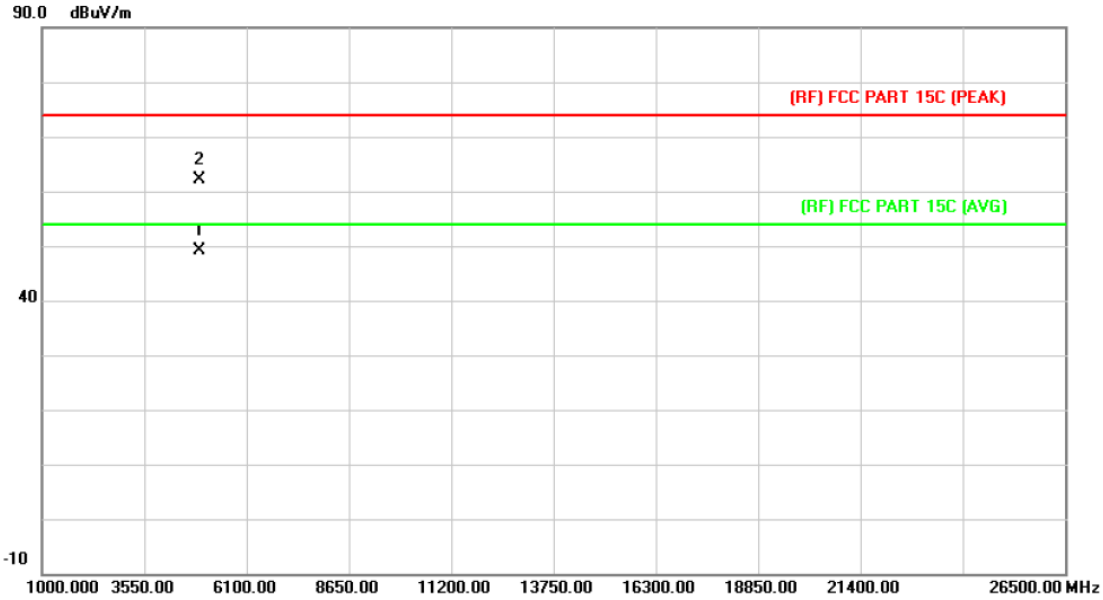
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2431MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4861.730	45.84	13.79	59.63	74.00	-14.37	peak
2	*	4861.880	33.32	13.79	47.11	54.00	-6.89	AVG

Emission Level= Read Level+ Correct Factor

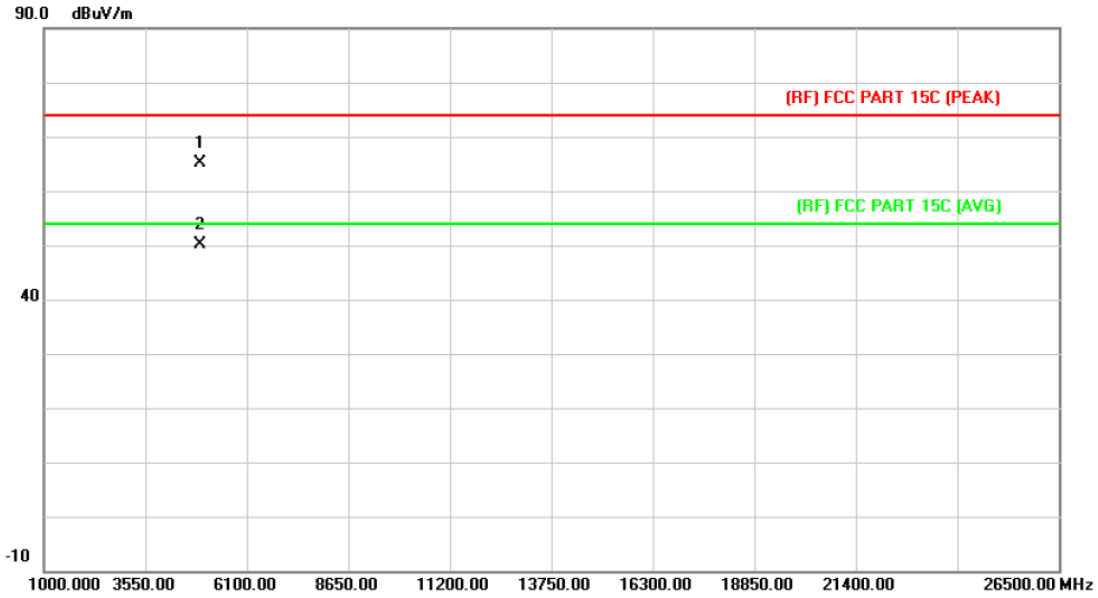
EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Horizontal		
Test Mode:	TX 2464MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4927.970	35.07	14.18	49.25	54.00	-4.75	AVG
2		4928.385	48.01	14.18	62.19	74.00	-11.81	peak

Emission Level= Read Level+ Correct Factor

EUT:	Juno Flash	**Model Name :**	F1102
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 6V		
Ant. Pol.	Vertical		
Test Mode:	TX 2464MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

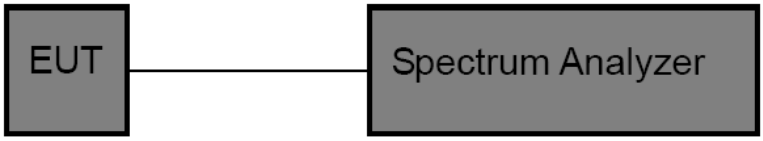


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4927.910	50.97	14.18	65.15	74.00	-8.85	peak
2	*	4928.130	36.01	14.18	50.19	54.00	-3.81	AVG

Emission Level= Read Level+ Correct Factor

6. Bandwidth Test

6.1 Test Setup



6.2 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:

Bandwidth: RBW=100 kHz, VBW=300kHz.

(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.

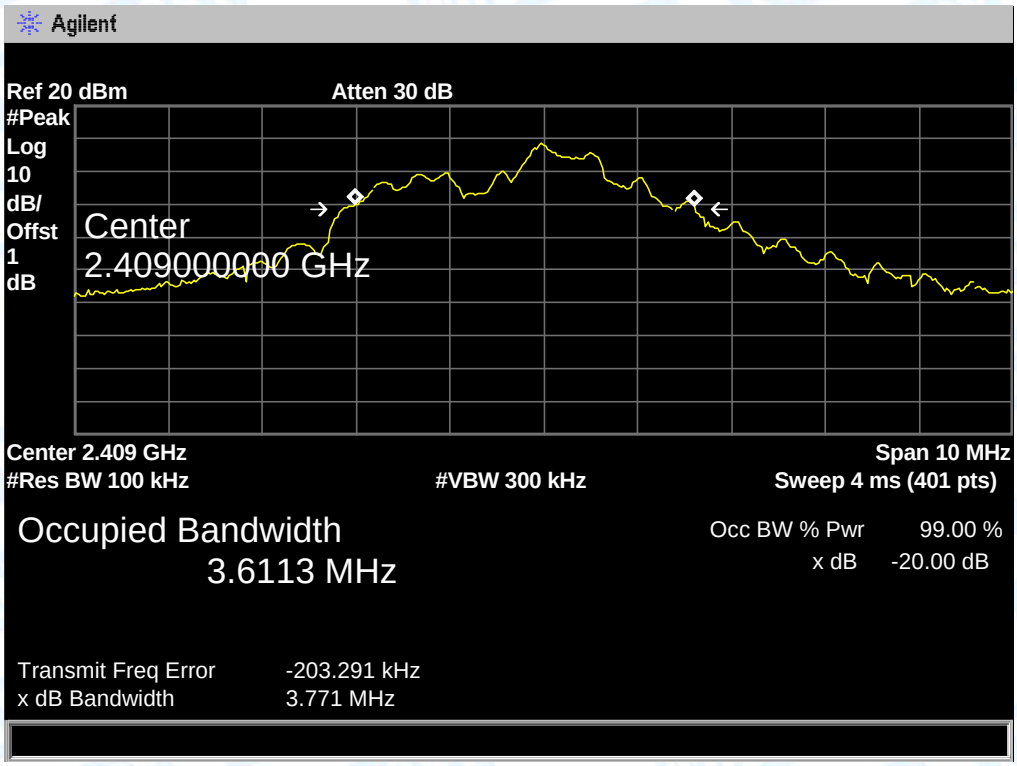
6.3 EUT Operating Condition

The EUT was set to continuously transmitting for the Bandwidth Test.

6.4 Test Data

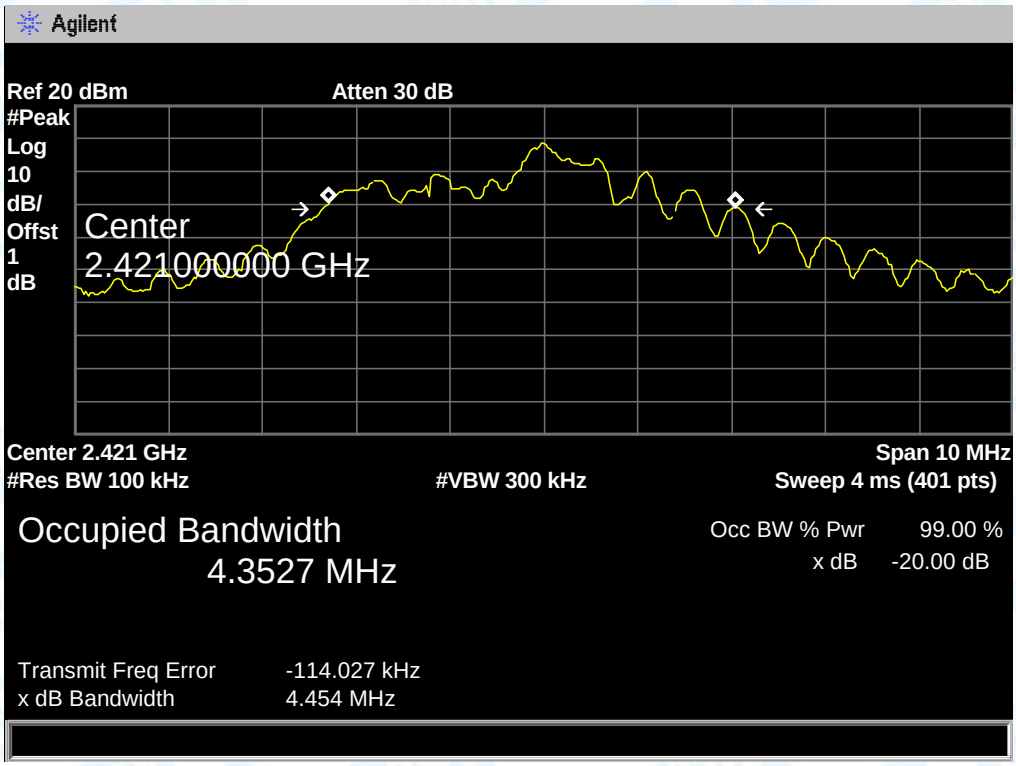
Low Channel Frequency (MHz)	20dB Bandwidth (MHz)
2409	3.771

2409 MHz



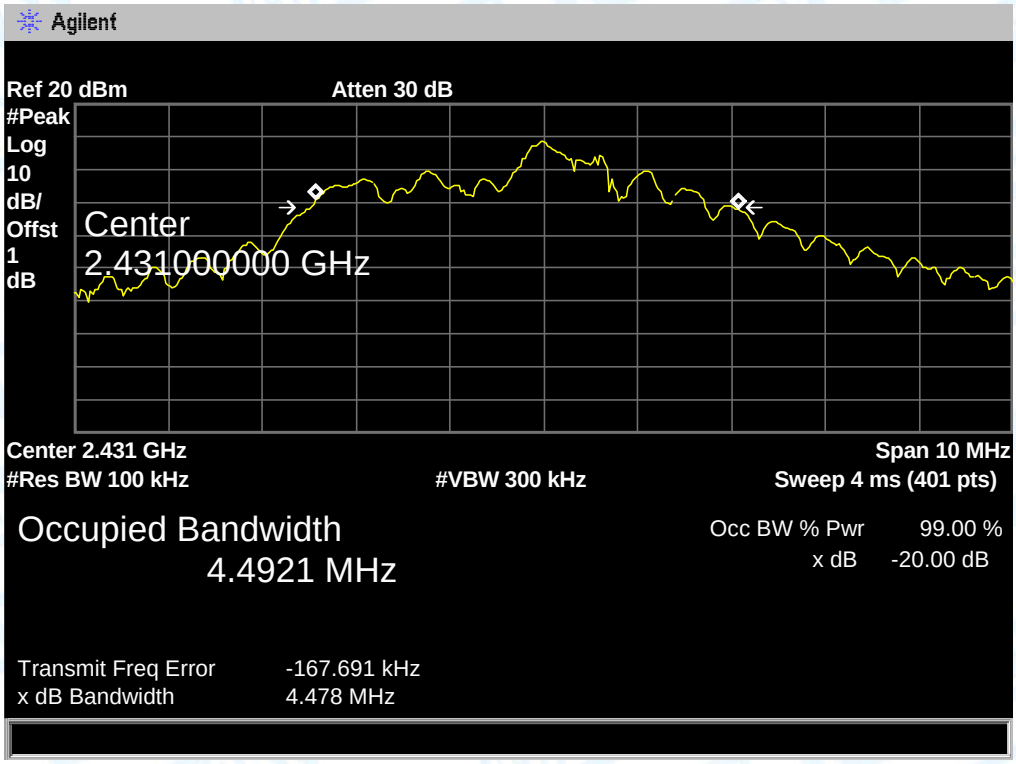
MID Channel Frequency (MHz)	20dB Bandwidth (MHz)
2421	4.454

2421 MHz



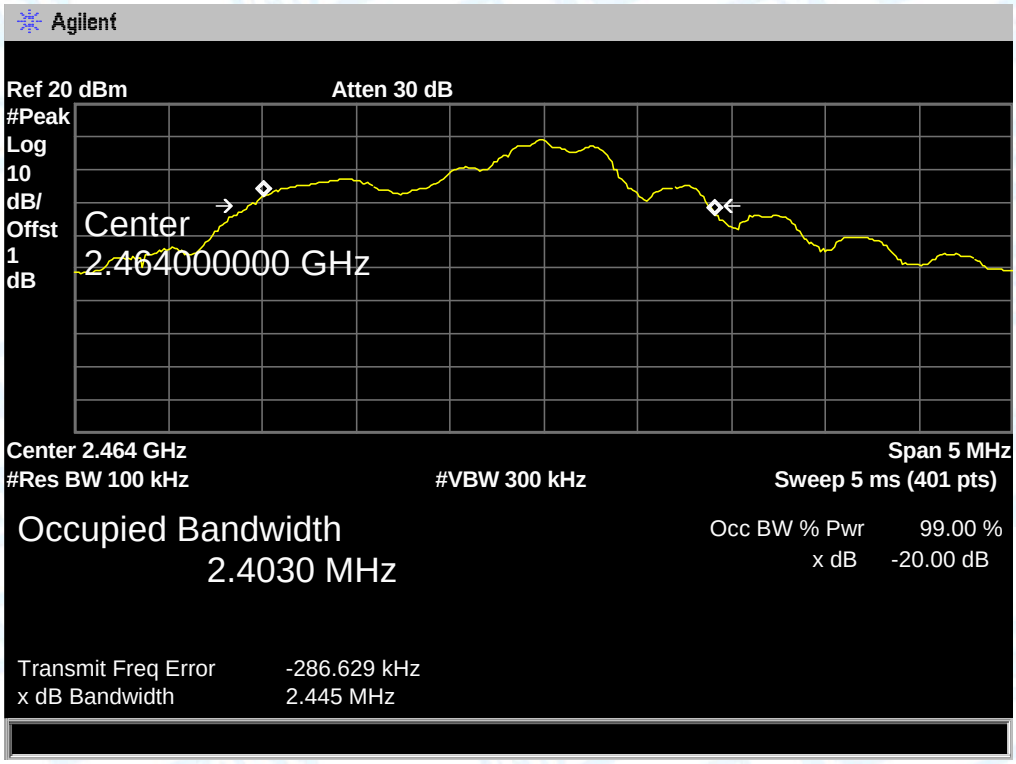
HIGH Channel Frequency (MHz)	20dB Bandwidth (MHz)
2431	4.478

2431 MHz



HIGH Channel Frequency (MHz)	20dB Bandwidth (MHz)
2464	2.445

2464 MHz



7. Antenna Requirement

7.1 Standard Requirement

7.1.1 Standard

FCC Part 15.203

7.1.2 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.

7.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

7.3 Result

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

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

-----END OF REPORT----