FCC TEST REPORT

FCC ID:2A5A8SGDC2K

Product	:	DASH CAMERA
Model Name	:	SG9667DC2K
Brand	:	N/A
Report No.	:	PTC22021400302E-FC01

Prepared for

RuiYou Pty Ltd

Unit 10 /53-55 ,Governor Macquarie Drive , Chipping Norton , 2170 , Sydney, Australia

Prepared by

Precise Testing & Certification Co., Ltd

Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

1 TEST RESULT CERTIFICATION

Applicant's name	:	RuiYou Pty Ltd
Address	:	Unit 10 /53-55 ,Governor Macquarie Drive , Chipping Norton , 2170 , Sydney, Australia
Manufacture's name	:	RuiYou Pty Ltd
Address	:	Unit 10 /53-55 ,Governor Macquarie Drive , Chipping Norton , 2170 , Sydney, Australia
Product name	:	DASH CAMERA
Model name	:	SG9667DC2K
Standards	:	FCC CFR47 Part 15 Section 15.407
Test procedure	:	ANSI C63.10:2013
Test Date	:	Mar. 02, 2022 to Mar. 10, 2022
Date of Issue	:	Mar. 10, 2022
Test Result	:	Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Test Engineer:

Carson Zhong

Carson Zhong / Engineer

Technical Manager:

Wu Weimin

Wu Weimin / Manager

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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	N/A
Radiated Spurious Emissions	15.205(a) 15.209 15.407(b)	PASS
Emission and Occupied Bandwidth	15.407(a)(e)	PASS
Maximum Peak Output Power	15.407(a)(1)	PASS
Power Spectral Density	15.407(a)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A: Not Applicable		

3 General Information

3.1 General Description of E.U.T.

Product Name	:	DASH CAMERA
Model Name	:	SG9667DC2K
Additional model	:	N/A
Specification	:	802.11b/g/n HT20/HT40 802.11a
Operation Frequency	:	2412-2462MHz 5150-5250 MHz 5725MHz~5850MHz
Number of Channel	:	11 channels for 802.11b/g; n(HT20) 7 channels for 802.11n(HT40) 4 channels for 802.11a 5150-5250 MHz 5 channels for 802.11a 5725MHz~5850MHz
Type of Modulation	:	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/g/n;
Antenna installation	:	FPC antenna
Antenna Gain	:	2.29 dBi For 2.4G wifi 2.64 dBi For 5G Wifi
Power supply	:	DC 12V
Hardware Version	:	N/A
Software Version	:	N/A

3.2 Channel List

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11b: 1 Mbps; 802.11g: 6 Mbps; 802.11n (HT20): MCS0; 802.11a: 6 Mbps) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for 802.11 b/g/n

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

Frequency and Channel list for 802.11 a

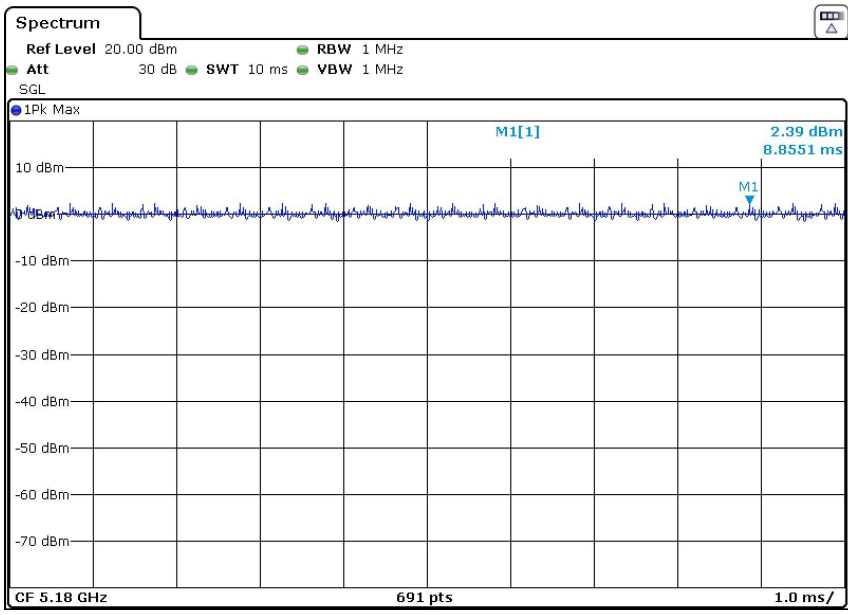
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	149	5745
40	5200	48	5240	153	5765
157	5485	161	5805	165	5825

The maximum duty cycle as following table:

Test Mode	Duty Cycle(%)
802.11a	100%

Test Plots:

802.11a



3.3 Test Site

Precise Testing & Certification Co., Ltd

Address: Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	SER MY5111038	10Hz-30GHz	Aug. 21, 2022
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug. 21, 2022
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug. 21, 2022
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug. 21, 2022
Signal Analyzer 40GHZ	Rohde&Schwarz	FSV40	101456	10Hz-40GHz	Aug. 21, 2022

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug. 21, 2022
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug. 21, 2022
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug. 21, 2022
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug. 21, 2022
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Aug. 21, 2022
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Aug. 21, 2022
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug. 21, 2022
Power Amplifier	LUNAR EM	LNA1G18-40	J10100000081	1GHz-26.5GHz	Aug. 21, 2022
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-181	14GHz-40GHz	Aug. 21, 2022
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Aug. 21, 2022

Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug. 21, 2022
RF Cable	R&S	R204	R21X	1GHz-40GHz	Aug. 21, 2022

Conducted Emissions

Name of Equipment	**Manufacturer**	**Model**	**Serial No.**	**Characteristics**	**Calibration Due**
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug. 21, 2022
Artificial Mains Network	Rohde&Schwarz	ENV216	102453	9KHz-300MHz	Aug. 21, 2022
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Aug. 21, 2022

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB

4.3 Description of Support Units

Equipment	Model No.	Series No.
N/A	N/A	N/A

5 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method	:	ANSI C63.10: 2013
Test Result	:	PASS
Frequency Range	:	150kHz to 30MHz
Class/Severity	:	Class B

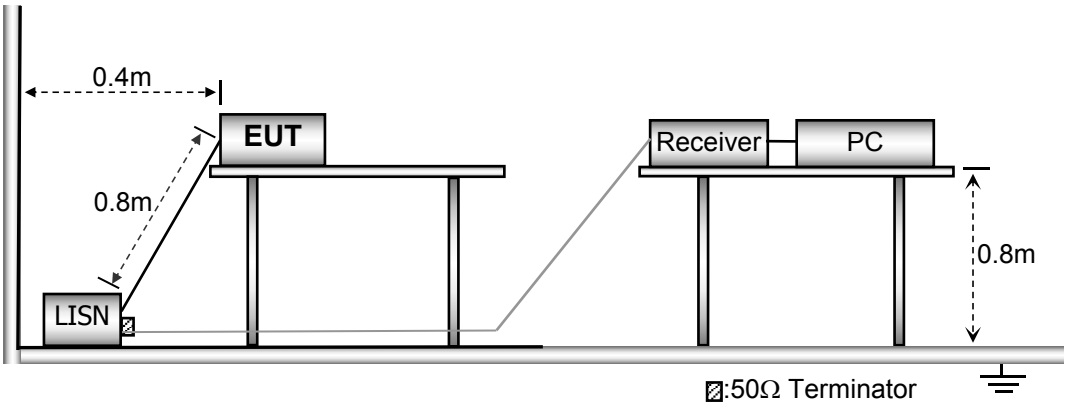
5.1 E.U.T. Operation

Operating Environment :

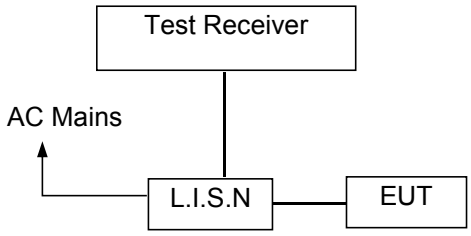
Temperature	:	23.9 °C
Humidity	:	51.4 % RH
Atmospheric Pressure	:	101.21kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies
2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

N/A

6 Radiated Spurious Emissions

Test Requirement	:	FCC CFR47 Part 15 Section 15.209 & 15.407(b)
Test Method	:	ANSI C63.10:2013
Test Result	:	PASS
Measurement Distance	:	3m

Limit

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band

shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

Further.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1MHz

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature: : 24.5 °C

Humidity: : 52 % RH

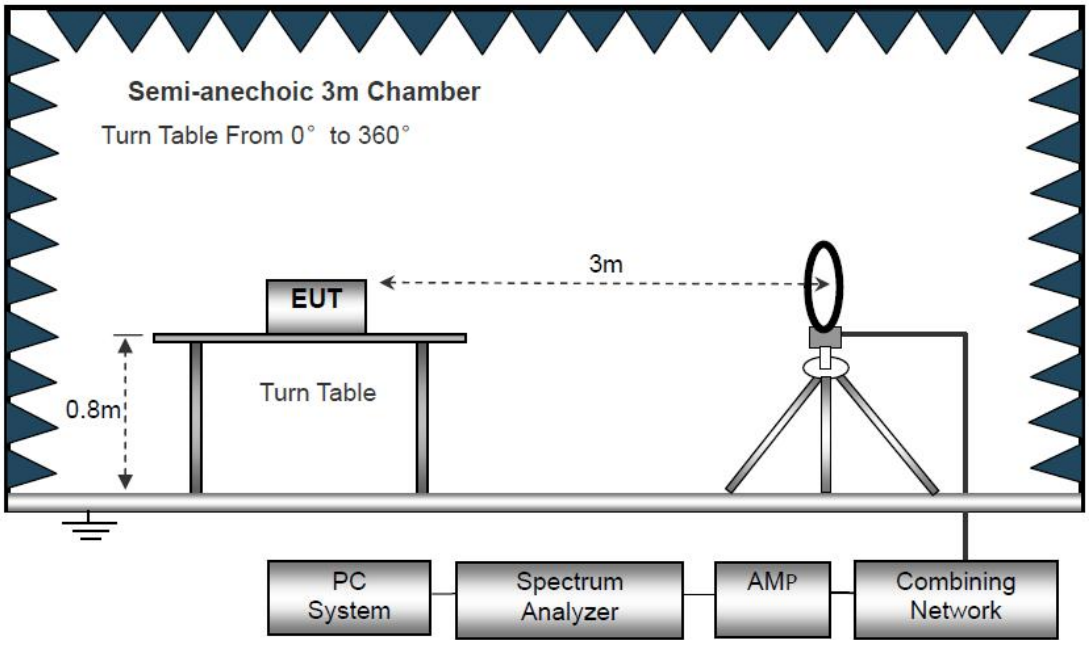
Atmospheric Pressure: : 101.3kPa

Test Voltage : DC 12V

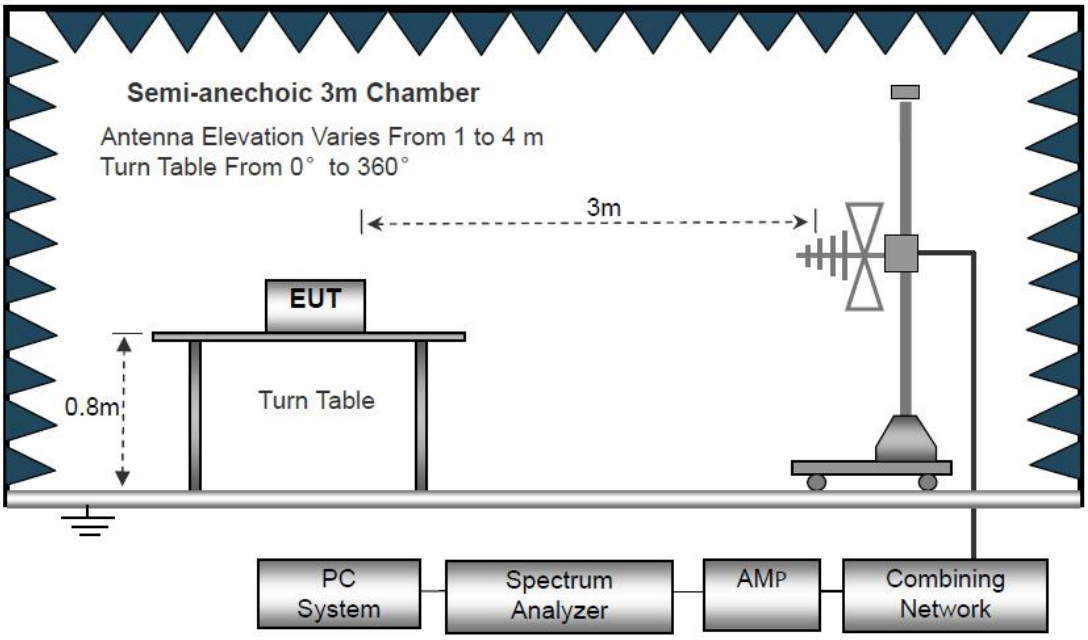
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

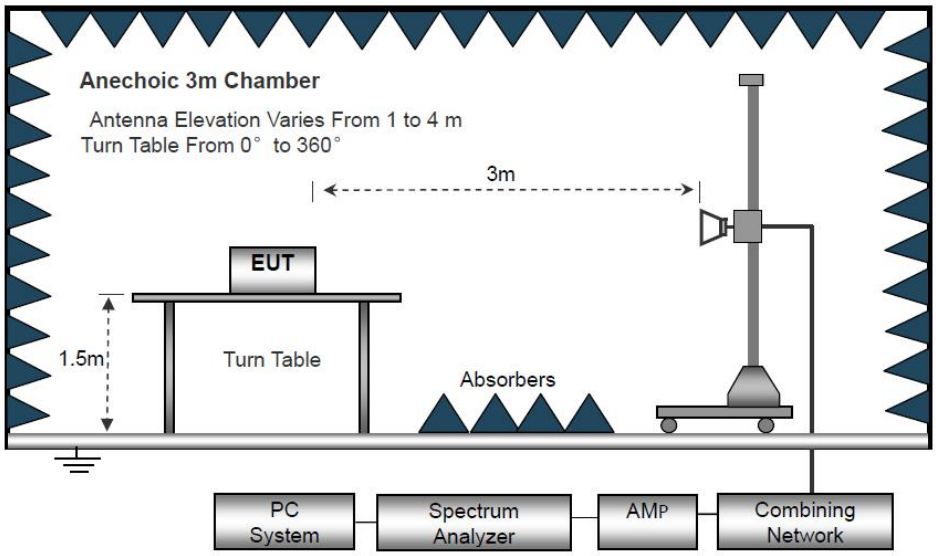
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

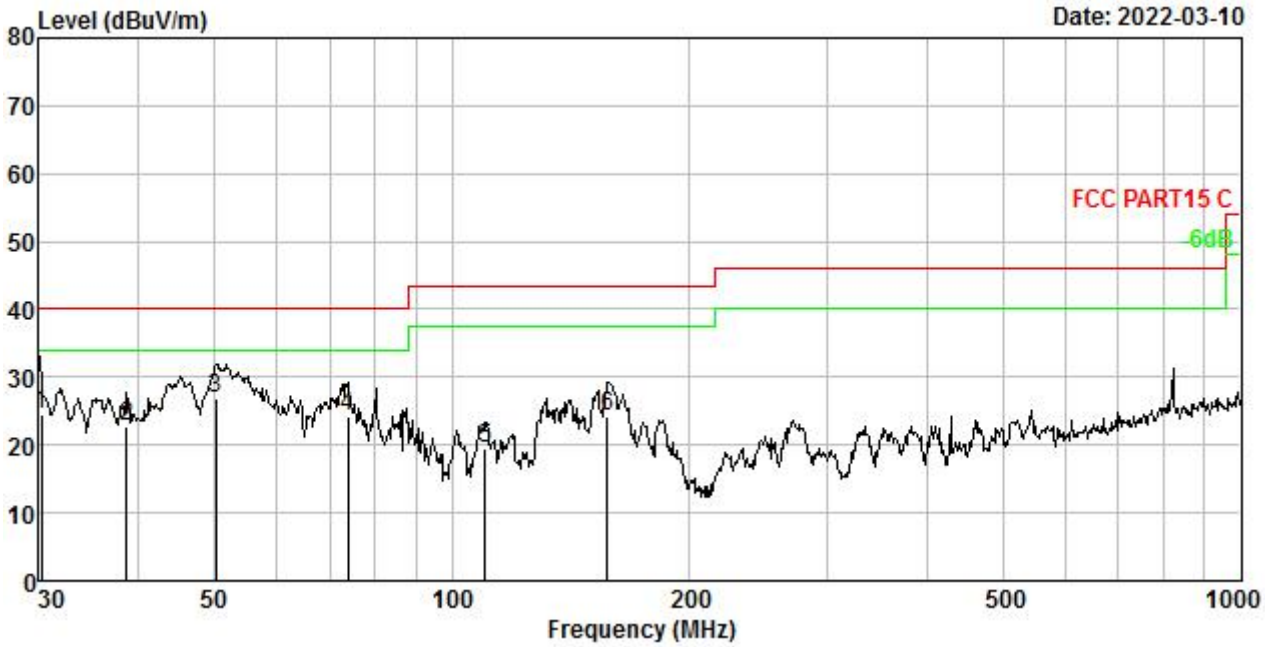
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

All the modulation modes were tested the data of the worst mode (TX 802.11a Channel 36，CH149) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:

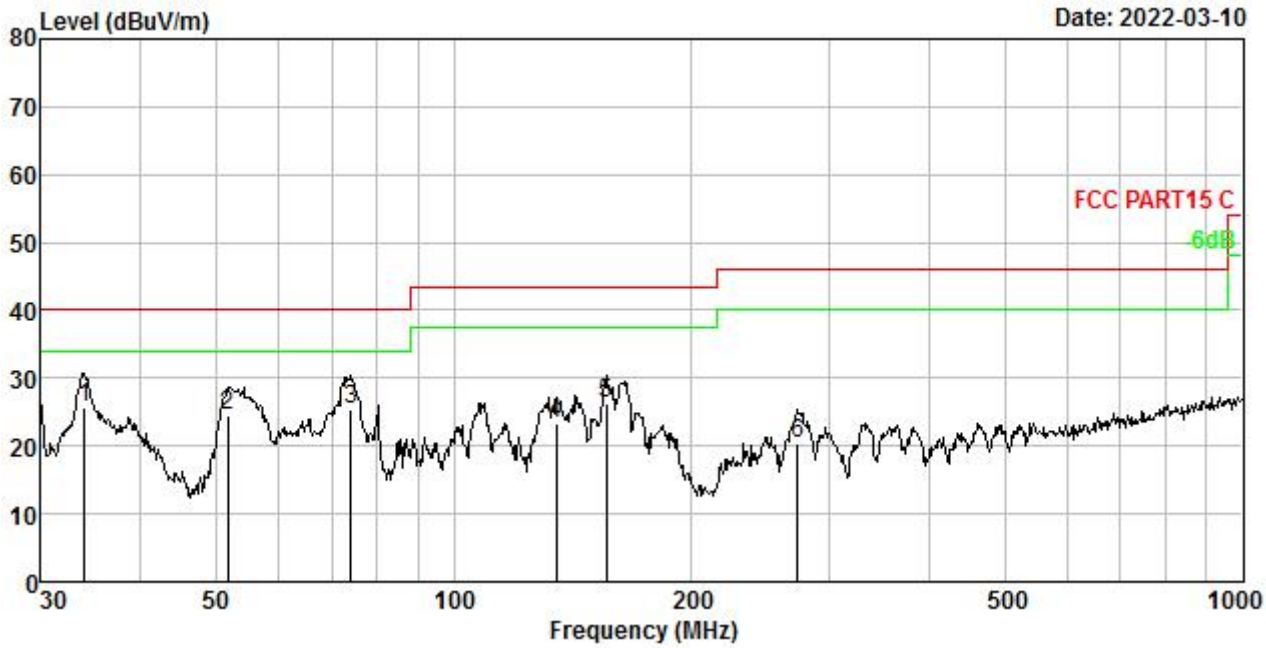
Antenna Polarization: Horizontal(CH36)



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	30.161	1.21	11.72	41.56	29.89	24.60	40.00	-15.40	QP
2.	38.739	1.64	12.12	39.00	29.91	22.85	40.00	-17.15	QP
3.	50.286	2.09	12.10	42.63	29.92	26.90	40.00	-13.10	QP
4.	73.846	2.75	9.56	41.75	29.96	24.10	40.00	-15.90	QP
5.	110.373	3.44	10.85	35.14	30.00	19.43	43.50	-24.07	QP
6.	157.578	4.05	14.01	36.23	30.02	24.27	43.50	-19.23	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

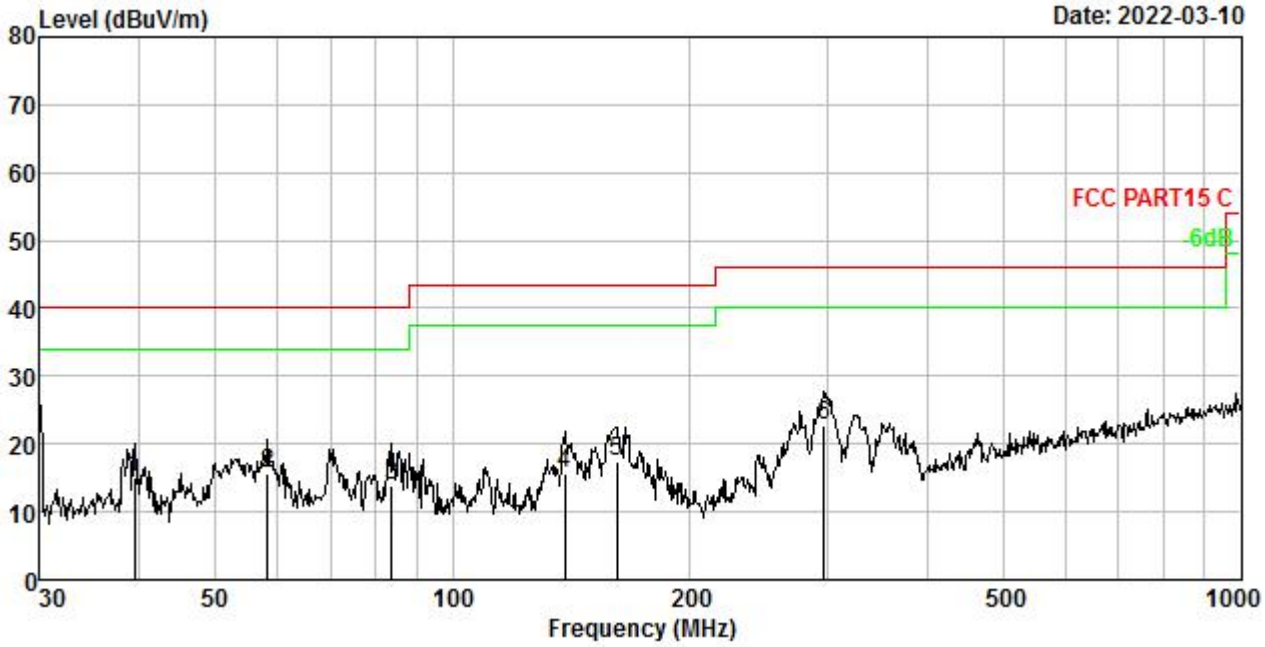
Antenna Polarization: Vertical (CH36)



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	34.002	1.42	12.11	42.14	29.90	25.77	40.00	-14.23	QP
2.	51.724	2.14	12.10	40.21	29.92	24.53	40.00	-15.47	QP
3.	74.106	2.76	9.52	42.95	29.96	25.27	40.00	-14.73	QP
4.	134.937	3.79	12.99	36.49	30.01	23.26	43.50	-20.24	QP
5.	155.920	4.04	13.95	38.38	30.02	26.35	43.50	-17.15	QP
6.	273.108	5.00	12.84	32.76	30.26	20.34	46.00	-25.66	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

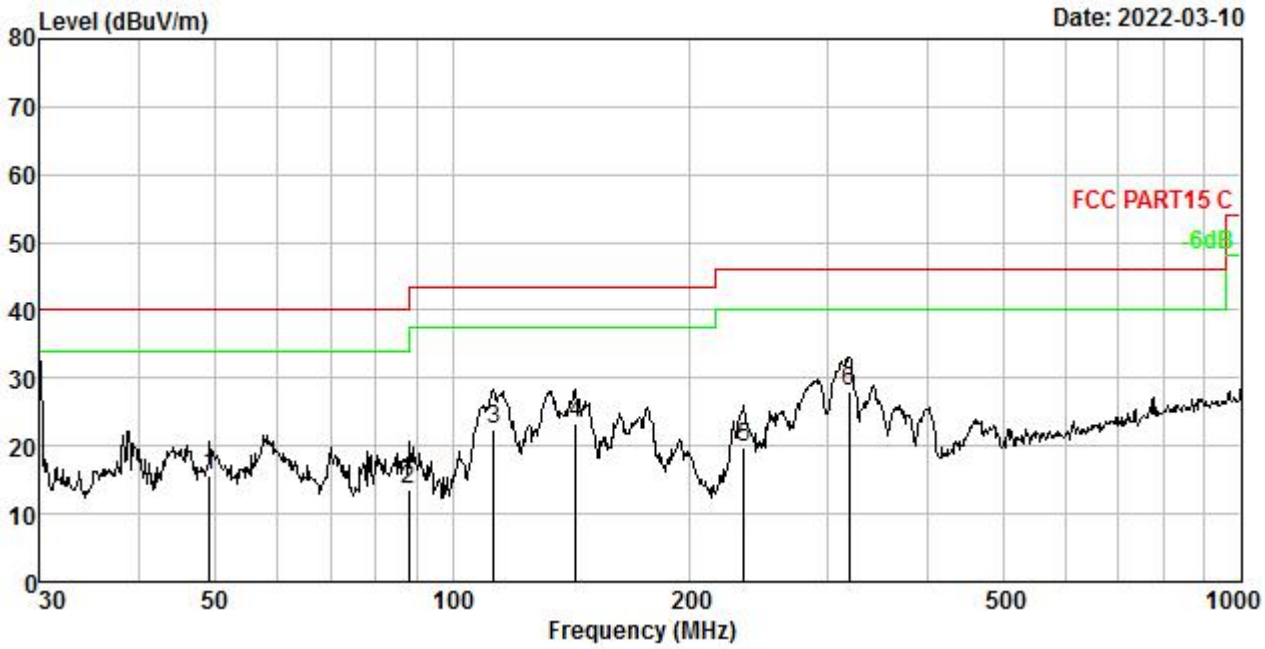
Antenna Polarization: Horizontal(CH149)



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	39.567	1.68	12.11	31.32	29.91	15.20	40.00	-24.80	QP
2.	58.310	2.34	11.83	31.53	29.94	15.76	40.00	-24.24	QP
3.	83.838	2.97	8.77	32.19	29.97	13.96	40.00	-26.04	QP
4.	138.796	3.84	13.23	28.70	30.01	15.76	43.50	-27.74	QP
5.	161.515	4.10	13.97	29.45	30.02	17.50	43.50	-26.00	QP
6.	296.175	5.14	13.15	34.71	30.31	22.69	46.00	-23.31	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Antenna Polarization: Vertical (CH149)



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	49.233	2.05	12.13	31.45	29.92	15.71	40.00	-24.29	QP
2.	88.080	3.05	9.01	31.62	29.98	13.70	43.50	-29.80	QP
3.	112.732	3.48	11.14	37.70	30.00	22.32	43.50	-21.18	QP
4.	143.271	3.89	13.44	35.99	30.02	23.30	43.50	-20.20	QP
5.	234.693	4.74	12.08	33.24	30.15	19.91	46.00	-26.09	QP
6.	318.933	5.27	13.68	39.61	30.40	28.16	46.00	-17.84	QP

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Test Frequency: From 1GHz to 40GHz

802.11a

Test Mode: 5180					Test channel: Lowest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
10360	47.53	34.56	5.36	31.25	56.2	67.2	-11	V
15540	42.25	36.22	7.85	30.63	55.69	67.2	-11.51	V
20720	43.39	38.97	8.56	34.95	55.97	67.2	-11.23	V
10360	48.27	33.57	5.36	31.25	55.95	67.2	-11.25	H
15540	42.26	36.49	7.85	30.63	55.97	67.2	-11.23	H
20720	42.81	39.92	8.56	34.95	56.34	67.2	-10.86	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
10360	30.25	34.56	5.36	31.25	38.92	54	-15.08	V
15540	28.52	36.22	7.85	30.63	41.96	54	-12.04	V
20720	27.43	38.97	8.56	34.95	40.01	54	-13.99	V
10360	31.05	33.57	5.36	31.25	38.73	54	-15.27	H
15540	25.97	36.49	7.85	30.63	39.68	54	-14.32	H
20720	26.93	39.92	8.56	34.95	40.46	54	-13.54	H

802.11a

Test Mode:5200					Test channel: Middle			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
10400	47.85	34.63	5.36	31.25	56.59	67.2	-10.61	V
15600	43.33	36.42	7.85	30.63	56.97	67.2	-10.23	V
20800	44.28	38.81	8.56	34.95	56.7	67.2	-10.5	V
10400	46.86	33.93	5.36	31.25	54.9	67.2	-12.3	H
15600	42.05	36.55	7.85	30.63	55.82	67.2	-11.38	H
20800	43.39	39.94	8.56	34.95	56.94	67.2	-10.26	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
10400	32.45	34.39	5.36	31.25	40.95	54	-13.05	V
15600	27.51	36.74	7.85	30.63	41.47	54	-12.53	V
20800	28.85	38.96	8.56	34.95	41.42	54	-12.58	V
10400	32.09	33.77	5.36	31.25	39.97	54	-14.03	H
15600	27.49	36.69	7.85	30.63	41.4	54	-12.6	H
20800	28.17	39.35	8.56	34.95	41.13	54	-12.87	H

802.11a

Test Mode:5240					Test channel: High			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
10480	46.93	34.68	5.36	31.25	55.72	67.2	-11.48	V
17520	42.52	36.52	7.85	30.63	56.26	67.2	-10.94	V
20960	43.36	38.77	8.56	34.95	55.74	67.2	-11.46	V
10480	47.85	33.99	5.36	31.25	55.95	67.2	-11.25	H
17520	44.91	36.84	7.85	30.63	58.97	67.2	-8.23	H
20960	44.25	39.93	8.56	34.95	57.79	67.2	-9.41	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
10480	32.26	34.82	5.36	31.25	41.19	54	-12.81	V
17520	26.91	36.91	7.85	30.63	41.04	54	-12.96	V
20960	27.87	38.74	8.56	34.95	40.22	54	-13.78	V
10480	31.59	33.95	5.36	31.25	39.65	54	-14.35	H
17520	26.43	36.63	7.85	30.63	40.28	54	-13.72	H
20960	28.13	39.91	8.56	34.95	41.65	54	-12.35	H

802.11a

Test Mode: 5745					Test channel: Lowest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
11490	48.25	35.26	5.42	31.75	57.18	67.2	-10.02	V
17235	43.39	36.88	7.32	30.96	56.63	67.2	-10.57	V
22980	44.02	39.14	8.85	35.25	56.76	67.2	-10.44	V
11490	48.79	34.21	5.42	31.75	56.67	67.2	-10.53	H
17235	43.36	37.52	7.32	30.96	57.24	67.2	-9.96	H
22980	43.15	39.88	8.85	35.25	56.63	67.2	-10.57	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
11490	31.82	34.96	5.42	31.75	40.45	54	-13.55	V
17235	27.79	36.74	7.32	30.96	40.89	54	-13.11	V
22980	28.06	39.14	8.85	35.25	40.8	54	-13.2	V
11490	32.28	34.02	5.42	31.75	39.97	54	-14.03	H
17235	27.49	36.57	7.32	30.96	40.42	54	-13.58	H
22980	27.83	39.89	8.85	35.25	41.32	54	-12.68	H

802.11a

Test Mode:5785					Test channel: Middle			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
11570	47.55	35.26	5.42	31.75	56.48	67.2	-10.72	V
17355	43.61	36.88	7.32	30.96	56.85	67.2	-10.35	V
23140	44.08	39.14	8.85	35.25	56.82	67.2	-10.38	V
11570	47.51	34.21	5.42	31.75	55.39	67.2	-11.81	H
17355	41.86	37.52	7.32	30.96	55.74	67.2	-11.46	H
23140	42.97	39.88	8.85	35.25	56.45	67.2	-10.75	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
11570	31.79	34.96	5.42	31.75	40.42	54	-13.58	V
17355	28.14	36.74	7.32	30.96	41.24	54	-12.76	V
23140	27.46	39.14	8.85	35.25	40.2	54	-13.8	V
11570	33.29	34.02	5.42	31.75	40.98	54	-13.02	H
17355	28.51	36.57	7.32	30.96	41.44	54	-12.56	H
23140	28.12	39.89	8.85	35.25	41.61	54	-12.39	H

802.11a

Test Mode:5825					Test channel: High			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
11650	48.15	35.26	5.42	31.75	57.08	67.2	-10.12	V
17475	43.36	36.88	7.32	30.96	56.6	67.2	-10.6	V
23300	44.25	39.14	8.85	35.25	56.99	67.2	-10.21	V
11650	48.74	34.21	5.42	31.75	56.62	67.2	-10.58	H
17475	43.69	37.52	7.32	30.96	57.57	67.2	-9.63	H
23300	44.38	39.88	8.85	35.25	57.86	67.2	-9.34	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
11650	33.26	34.96	5.42	31.75	41.89	54	-12.11	V
17475	27.15	36.74	7.32	30.96	40.25	54	-13.75	V
23300	28.22	39.14	8.85	35.25	40.96	54	-13.04	V
11650	32.95	34.02	5.42	31.75	40.64	54	-13.36	H
17475	27.58	36.57	7.32	30.96	40.51	54	-13.49	H
23300	27.34	39.89	8.85	35.25	40.83	54	-13.17	H

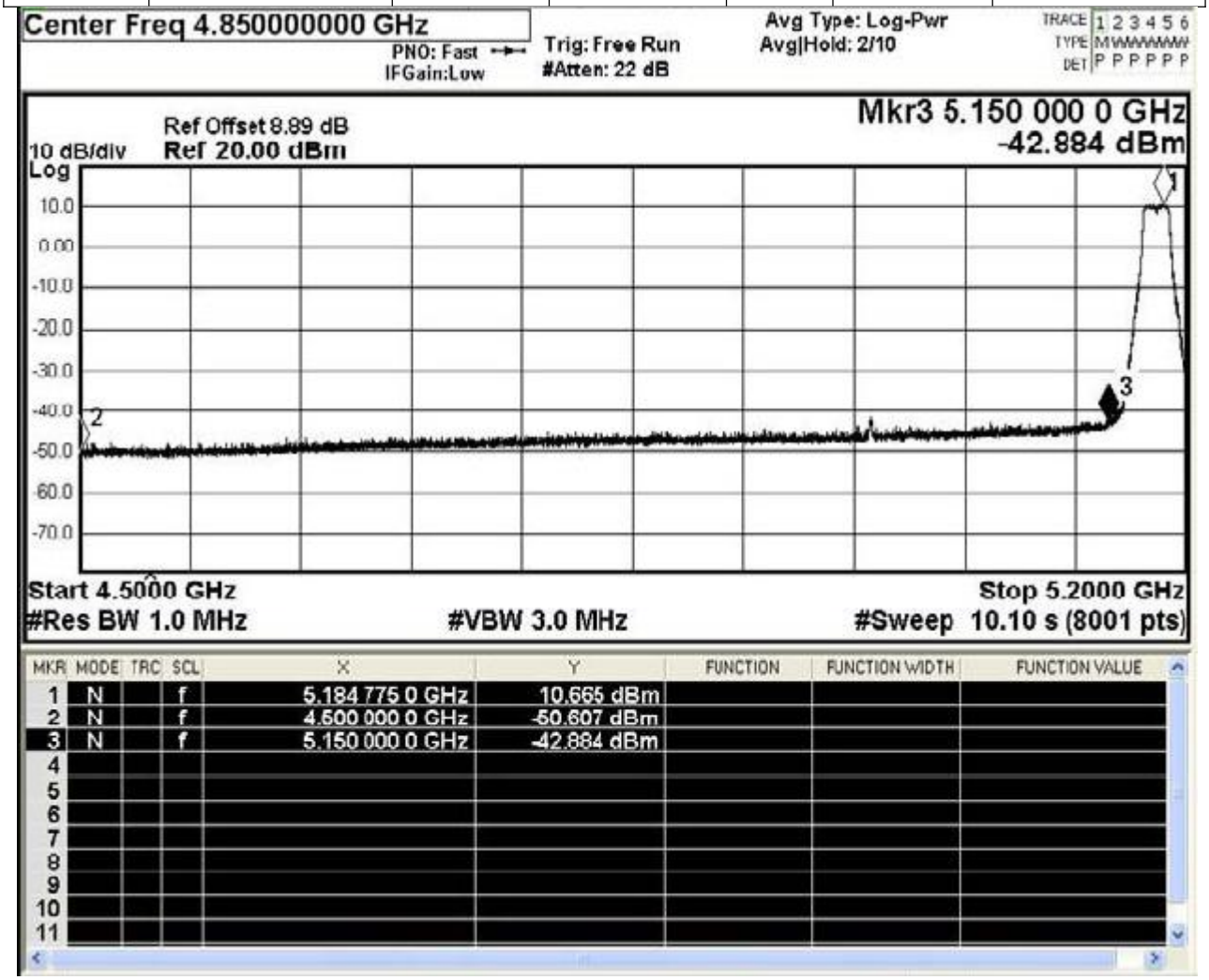
Note:

1. The testing has been conformed to 10*5825MHz=58250MHz.
2. All other emissions more than 30dB below the limit.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
   Emission Level = Reading + Factor
   Margin=Emission Level-Limit
4. X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

Undesirable emission

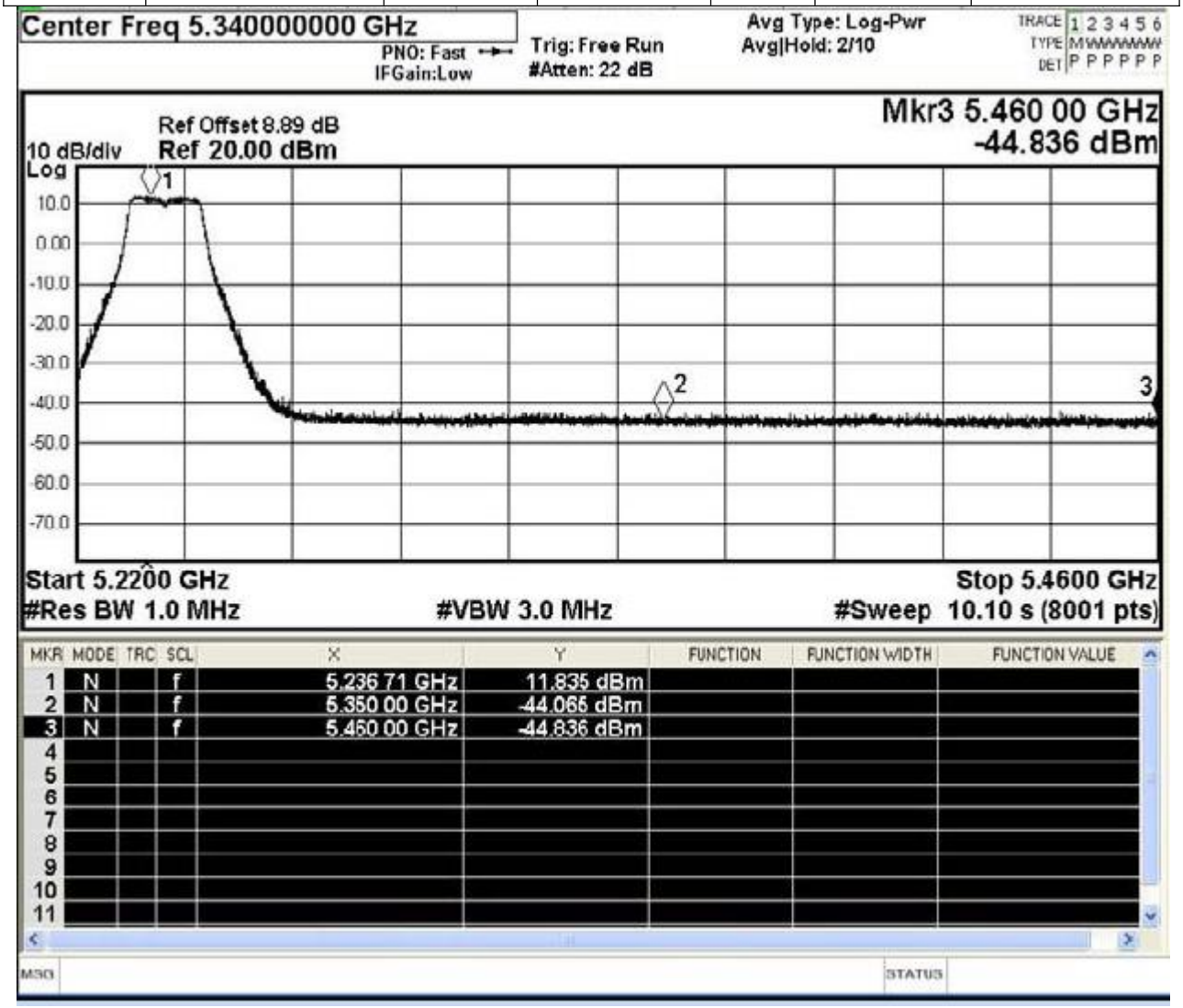
Channel 36 5180MHz

Frequency (MHz)	Conducted Power(dBm)	Antenna Gain(dBi)	Covert Conducted Power(dBm)	Limit (dBm)	Over (dB)	Test Result
4500	-50.61	2.64	-47.97	-27	-20.97	PASS
5150	-42.88	2.64	-40.24	-27	-13.24	



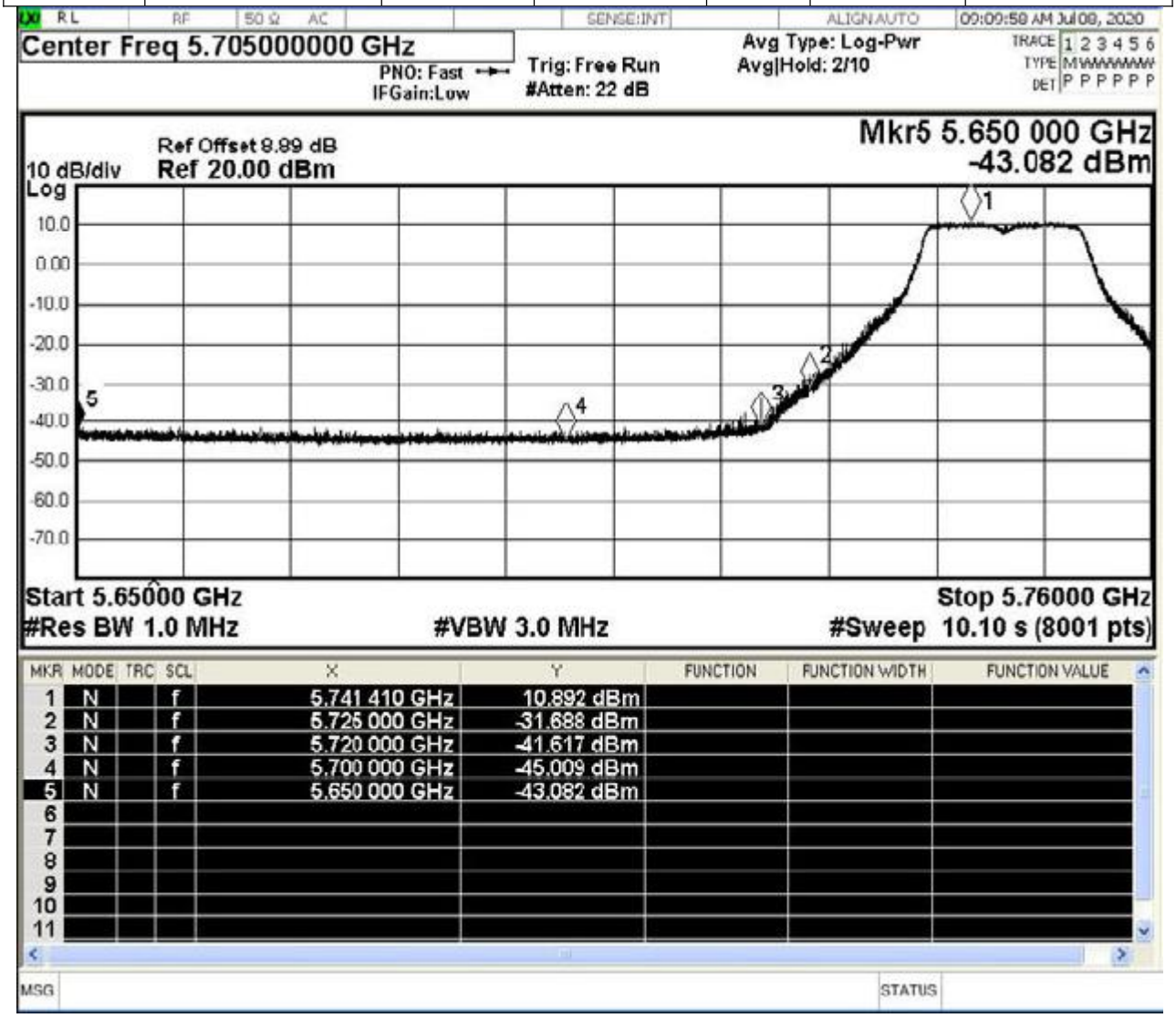
Channel 48 5240MHz

Frequency (MHz)	Conducted Power(dBm)	Antenna Gain(dBi)	Covert Conducted Power(dBm)	Limit (dBm)	Over (dB)	Test Result
5460	-44.836	2.64	-42.196	-27	-15.196	PASS
5350	-44.065	2.64	-41.425	-27	-14.425	



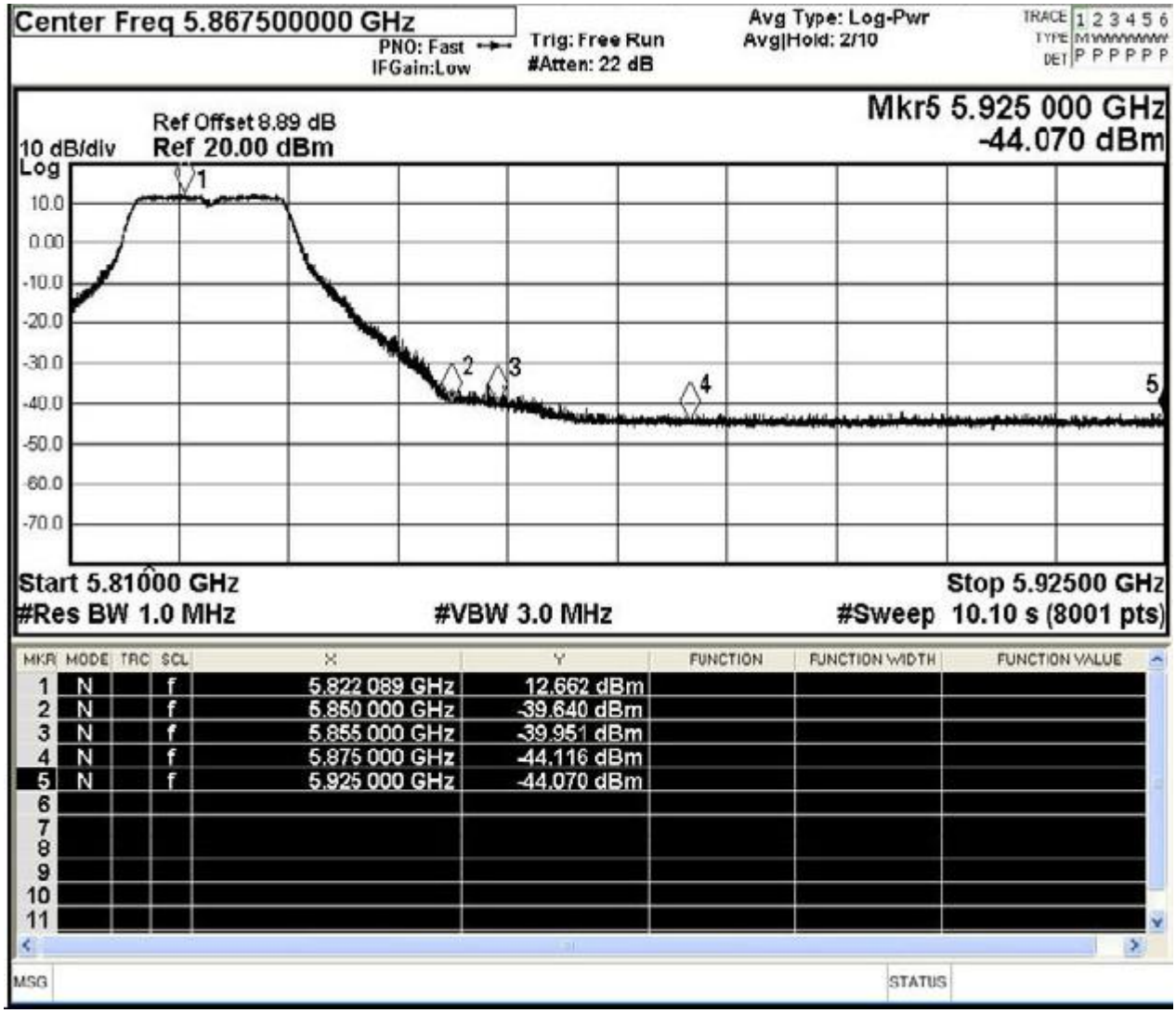
Channel 149 5745MHz

Frequency (MHz)	Conducted Power(dBm)	Antenna Gain(dBi)	Covert Conducted Power(dBm)	Limit (dBm)	Over (dB)	Test Result
5650	-43.082	2.64	-40.442	-27	-13.442	PASS
5700	-45.009	2.64	-42.369	10	-52.369	
5720	-41.617	2.64	-38.977	15.6	-54.577	
5725	-31.688	2.64	-29.048	27	-56.048	



Channel 165 5825MHz

Frequency (MHz)	Conducted Power(dBm)	Antenna Gain(dBi)	Covert Conducted Power(dBm)	Limit (dBm)	Over (dB)	Test Result
5850	-39.64	2.64	-37	27	-64	PASS
5855	-39.951	2.64	-37.311	15.6	-52.911	
5875	-44.116	2.64	-41.476	10	-51.476	
5925	-44.07	2.64	-41.43	-27	-14.43	



7 Emission Bandwidth and Occupied Bandwidth

Test Requirement	:	FCC CFR47 Part 15 Section 15.407(a)(e)
Test Method	:	ANSI C63.10:2013
Test Limit		According to FCC §15.407(a), The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth. As per FCC §15.407(e): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

7.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01,
Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth; b) Set the VBW > RBW; c) Detector = Peak; d) Trace mode = max hold; e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%;99% Occupied Bandwidth
The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99% occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ⩾ 3 • RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise,
peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

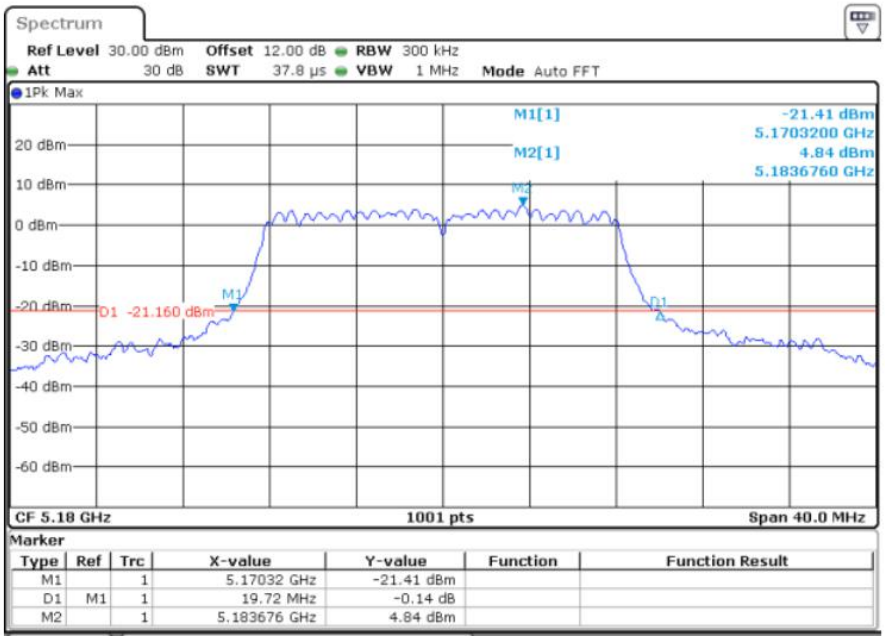
7.2 Test Result

PASS

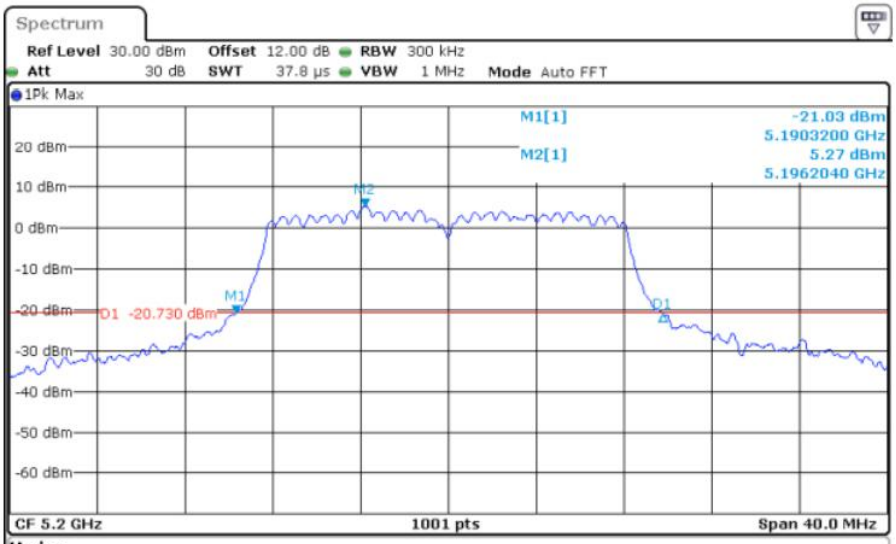
Modulation	26dB Emission Bandwidth(MHz)		
	Channel 36	Channel 40	Channel 48
802.11a	19.72	19.44	19.72

Modulation	6dB Emission Bandwidth(MHz)			Limit
	Channel 149	Channel 157	Channel 165	
802.11a	16.36	16.32	16.32	≥500kHz

26dB Emission Bandwidth Channel 36



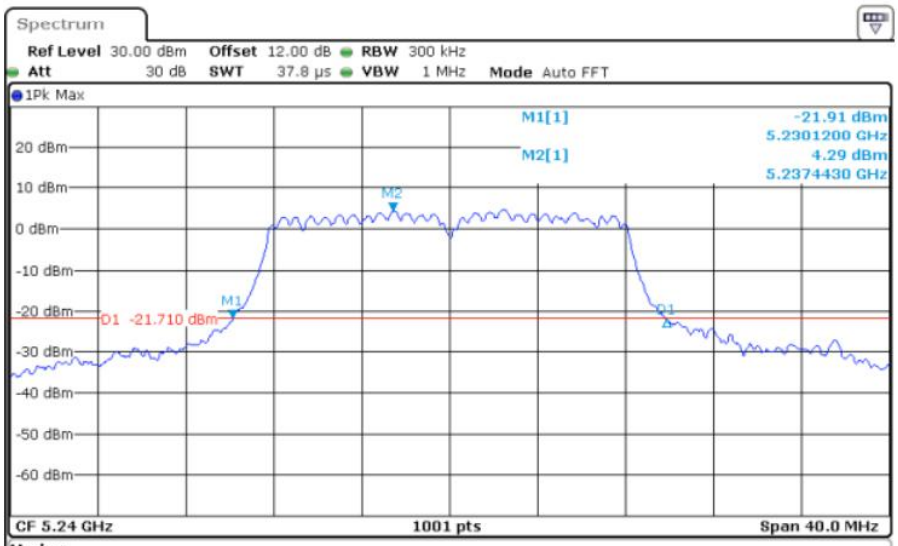
26dB Emission Bandwidth Channel 40



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.19032 GHz	-21.03 dBm		
D1	M1	1	19.44 MHz	0.10 dB		
M2		1	5.196204 GHz	5.27 dBm		

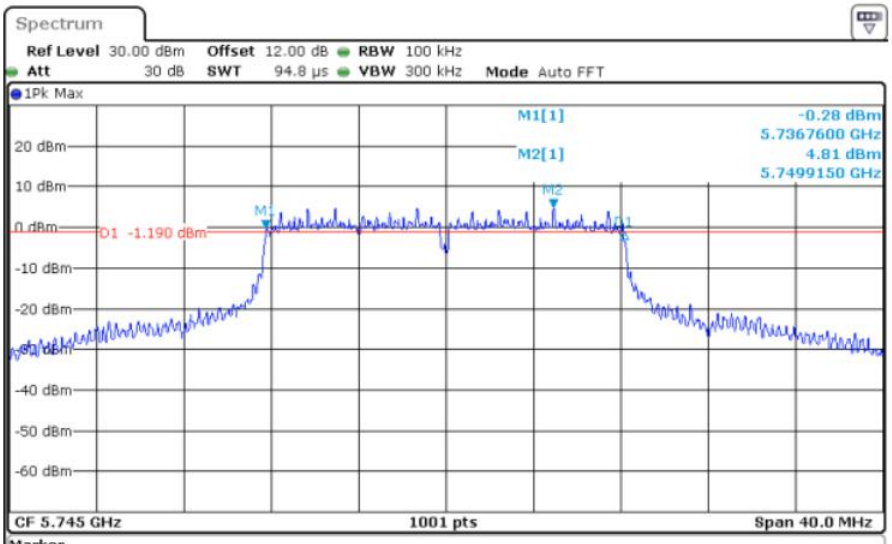
26dB Emission Bandwidth Channel 48



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.23012 GHz	-21.91 dBm		
D1	M1	1	19.72 MHz	-0.04 dB		
M2		1	5.237443 GHz	4.29 dBm		

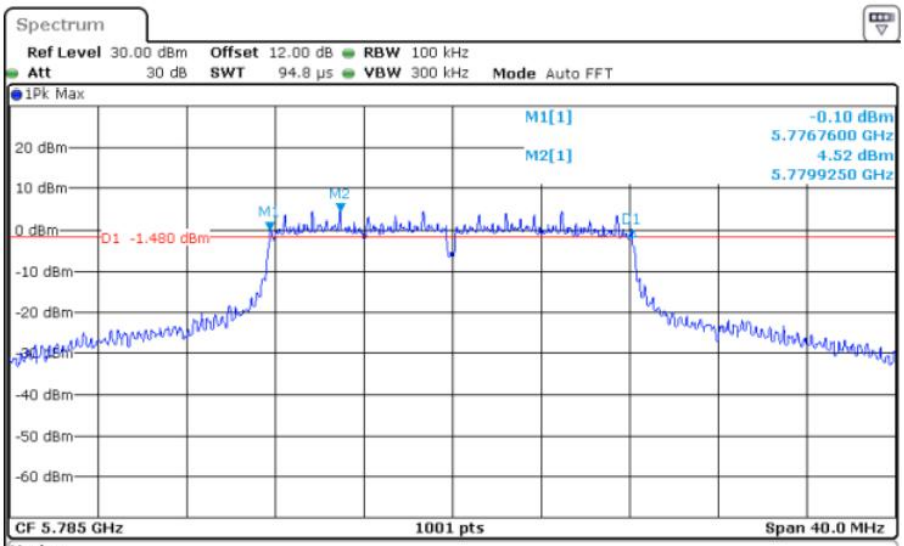
6dB Emission Bandwidth Channel 149



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.73676 GHz	-0.28 dBm		
D1	M1	1	16.36 MHz	-0.84 dB		
M2		1	5.749915 GHz	4.81 dBm		

6dB Emission Bandwidth Channel 157



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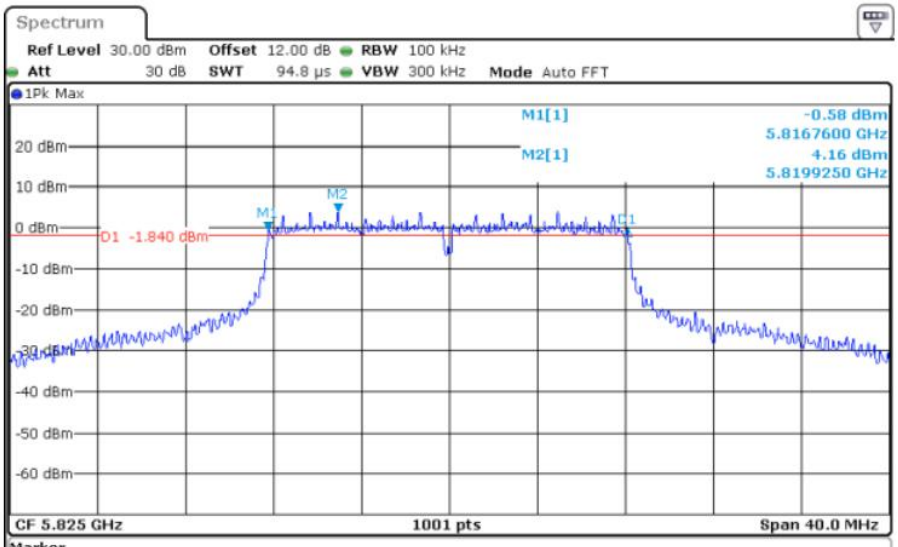
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.77676 GHz	-0.10 dBm		
D1	M1	1	16.32 MHz	0.40 dB		
M2		1	5.779925 GHz	4.52 dBm		

6dB Emission Bandwidth Channel 165



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Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.81676 GHz	-0.58 dBm		
D1	M1	1	16.32 MHz	0.38 dB		
M2		1	5.819925 GHz	4.16 dBm		

8 Maximum Peak Output Power

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

8.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, The use Power Meter 1. Place the EUT on a bench and set it in transmitting mode. 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power meter.

8.2 Test Result

Modulation	Maximum Peak Output Power (dBm)			Limit
	Channel 36	Channel 40	Channel 48	
802.11a	18.780	18.751	18.816	0.25W(23.98dBm)

Modulation	Maximum Peak Output Power (dBm)			Limit
	Channel 149	Channel 157	Channel 165	
802.11a	18.632	18.559	18.714	1W(30dBm)

9 Power Spectral density

Test Requirement	:	FCC CFR47 Part 15 Section 15.2407(a)
Test Method	:	ANSI C63.10:2013
Test Limit	:	For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHzband. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to┐multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations

9.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 and ANSI 63.10: 2013 Sec 10.3.7.For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set the RBW to 1 MHz.

b) Set the VBW to be at least 1 MHz (a VBW of 3 MHz is desirable).

c) Set the frequency span to examine the spectrum across a convenient frequency segment (e.g., 600 MHz).

d) Select the power averaging (rms) detector.

e) Set the sweep time so that there is no more than a 1 ms integration period over each measurement bin.

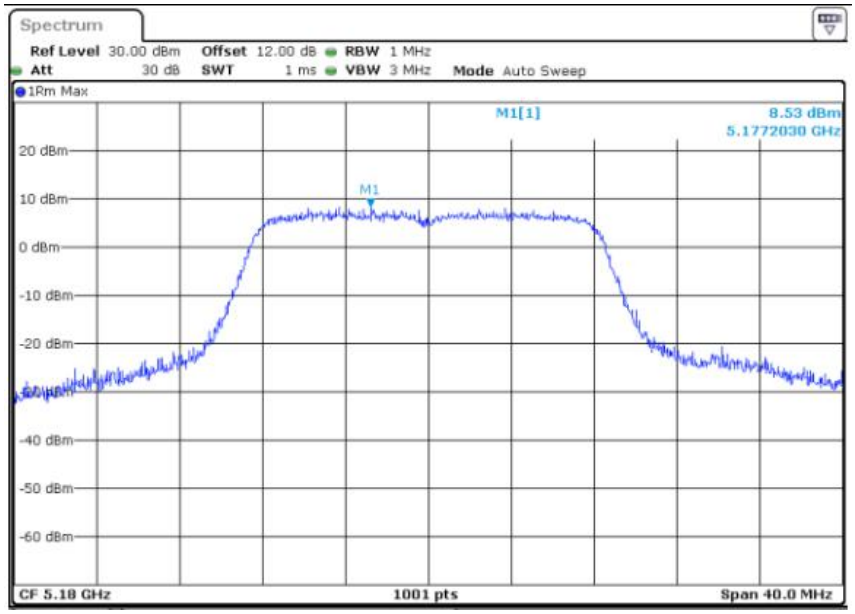
f) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

9.2 Test Result

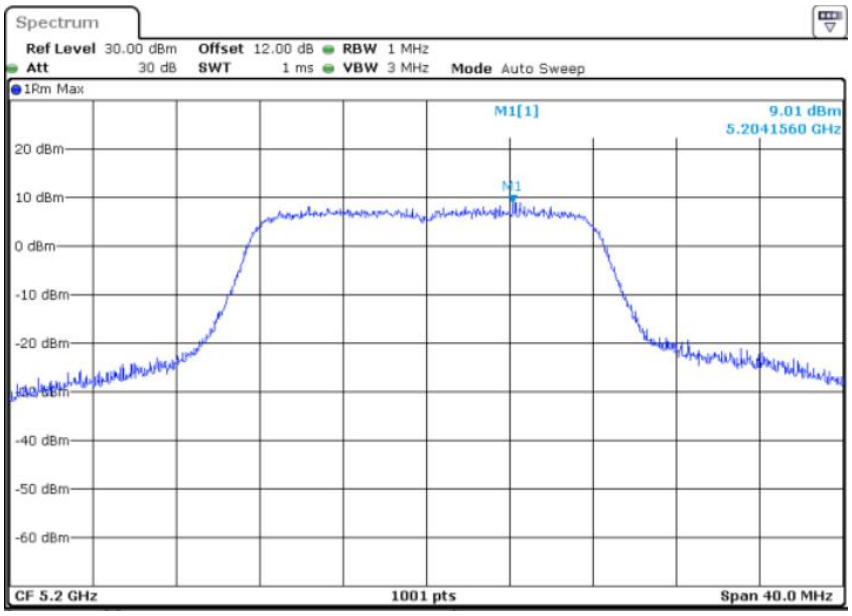
Modulation	Power Spectral density (dBm/MHz)			Limit(dBm/MHz)
	Channel 36	Channel 40	Channel 48	
802.11a	8.53	9.01	8.68	11

Modulation	Power Spectral density (dBm/500KHz)			Limit (dBm/500KHz)
	Channel 149	Channel 157	Channel 165	
802.11a	13.84	13.82	13.30	30

Channel 36



Channel 40



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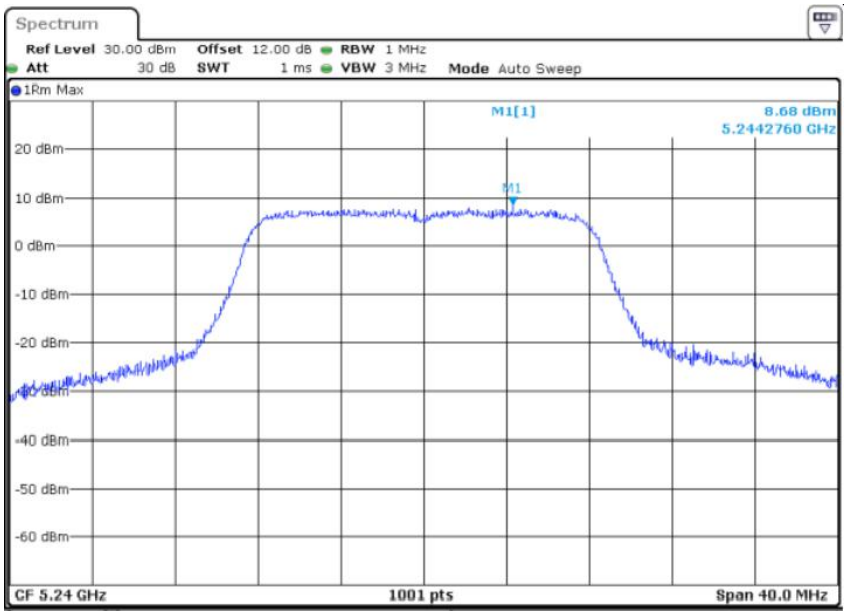

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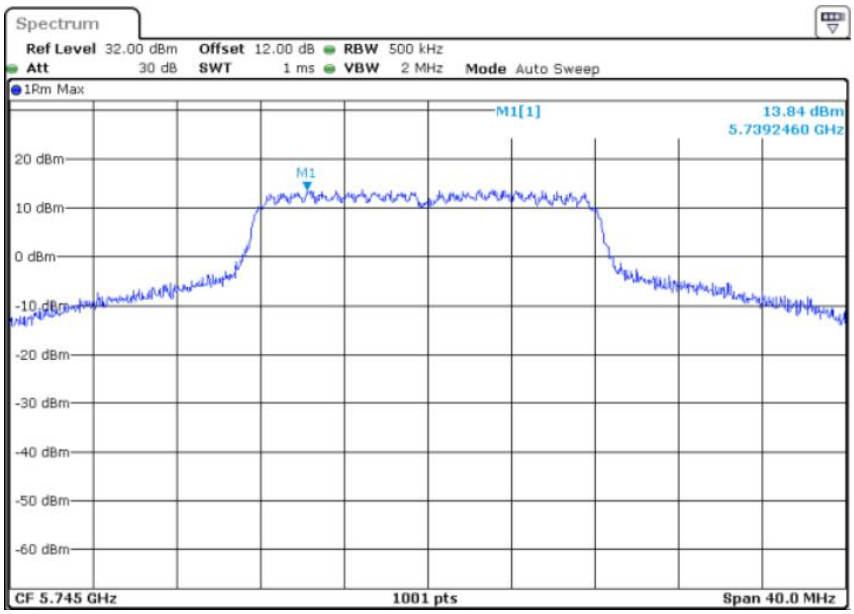

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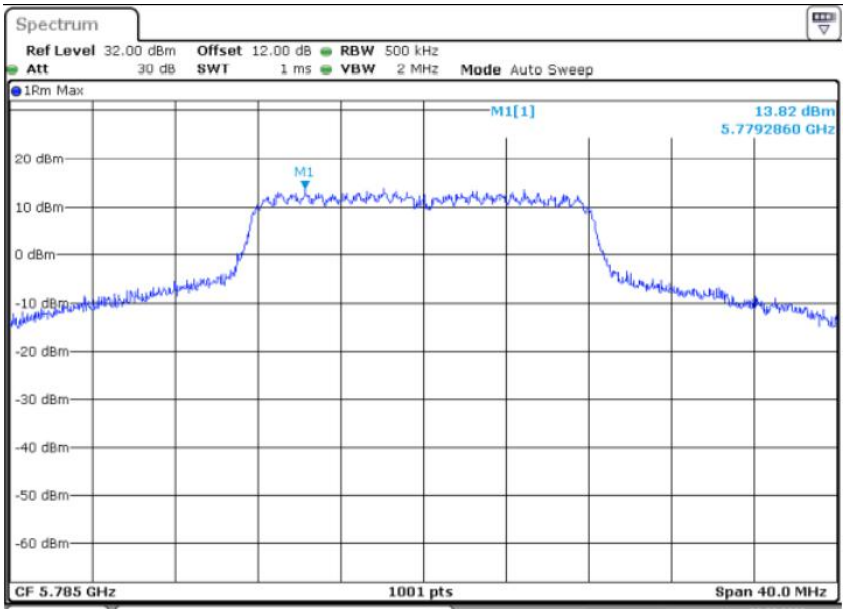
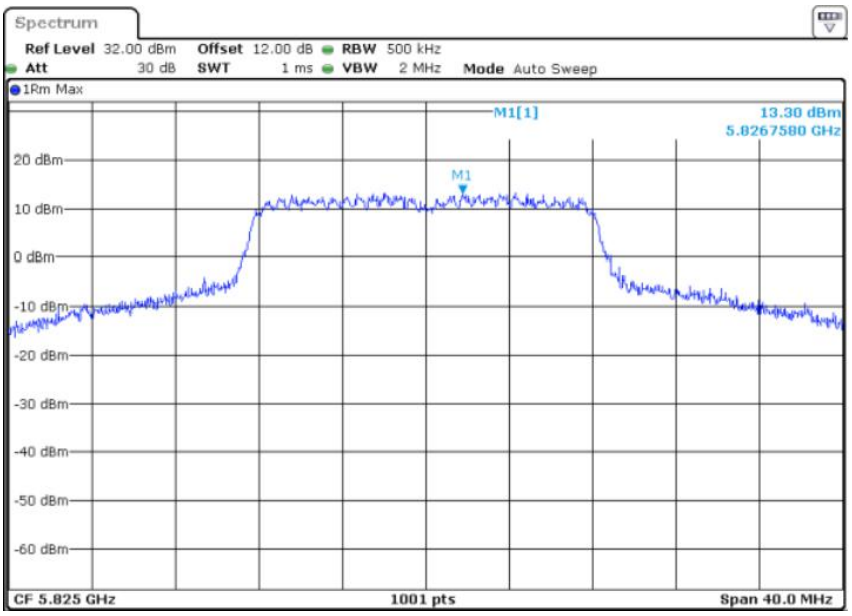


Channel 165


Spectrum
Ref Level 32.00 dBm Offset 12.00 dB RBW 500 kHz
Att 30 dB SWT 1 ms VBW 2 MHz Mode Auto Sweep
1Rm Max
M1[1] 13.30 dBm
5.8267580 GHz
M1
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 5.825 GHz
1001 pts
Span 40.0 MHz

10 Antenna Application

10.1 Antenna Requirement

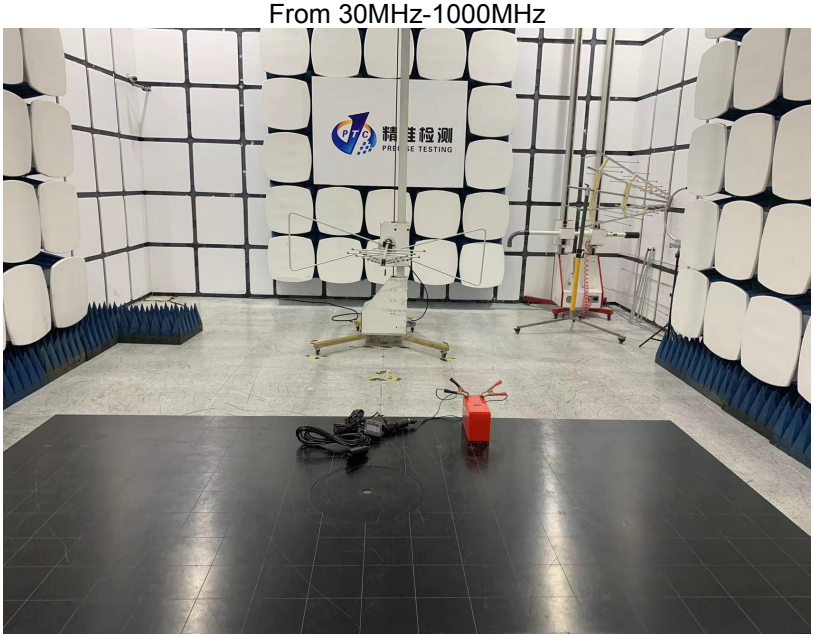
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2 Result

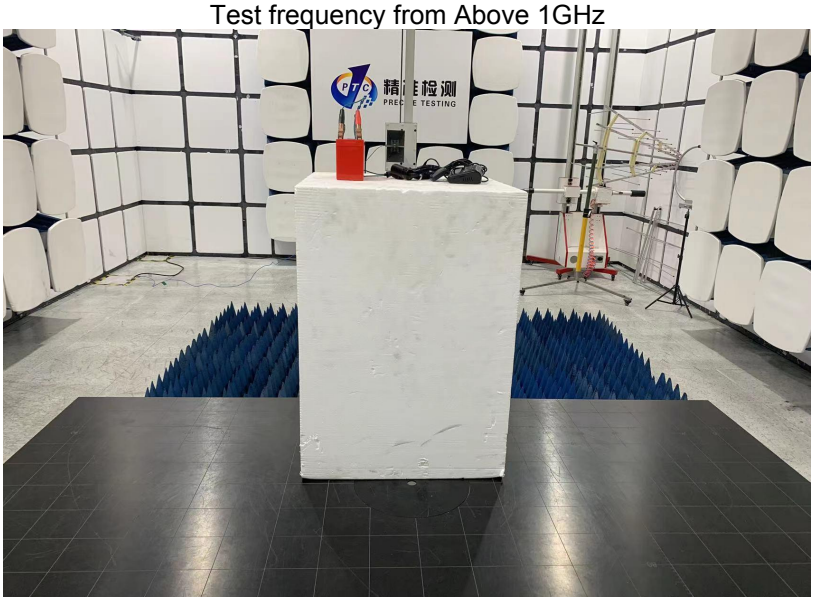
The EUT'S antenna, permanent attached antenna,is FPC Antenna. The antenna's gain is 2.64 dBi and meets the requirement.

11 Test Setup

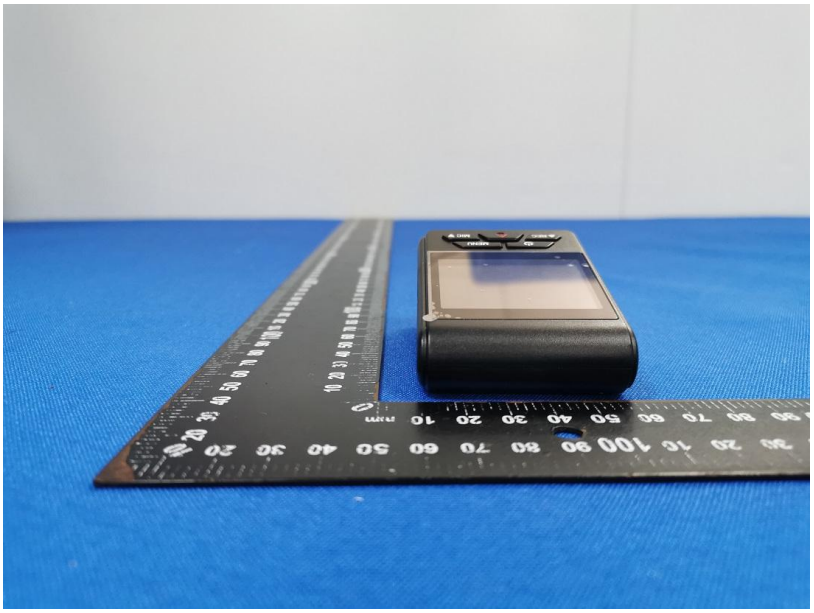
Radiated Spurious Emissions
From 30MHz-1000MHz

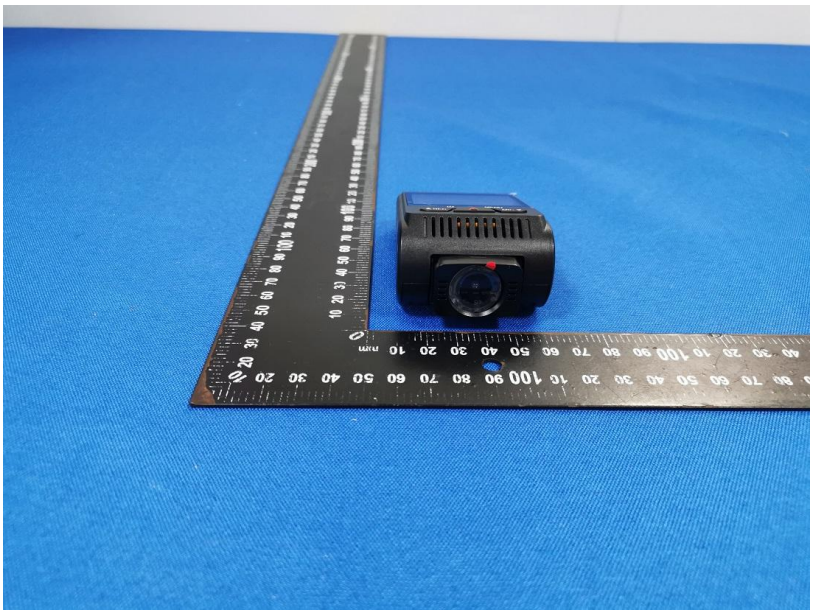


Test frequency from Above 1GHz

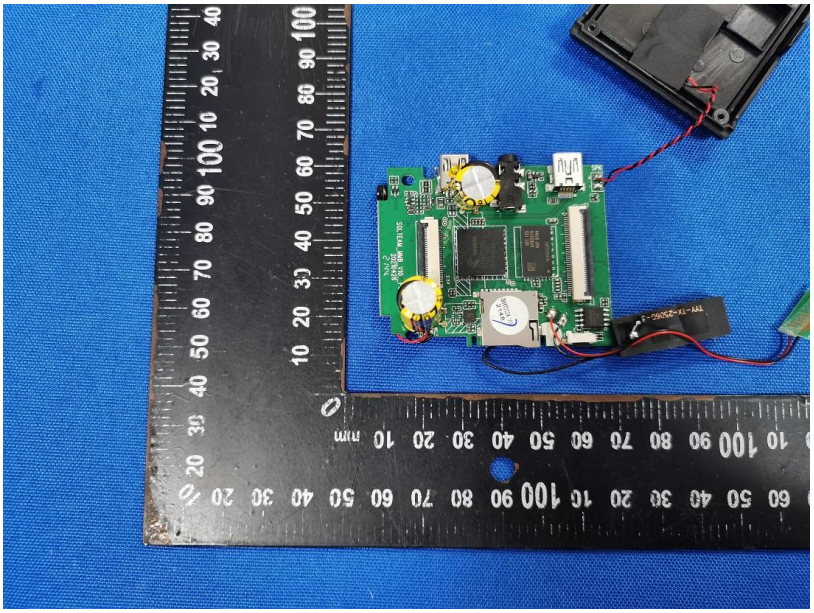


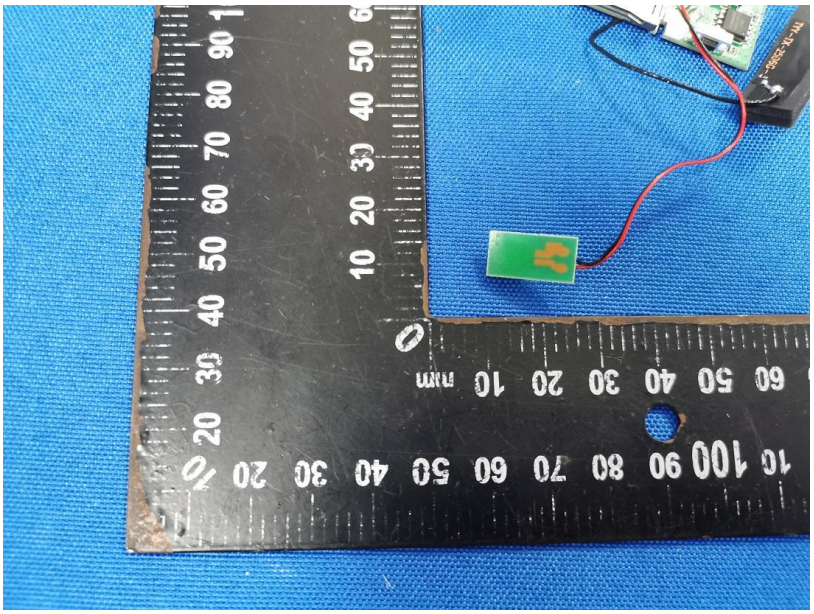
12 EUT PHOTOS

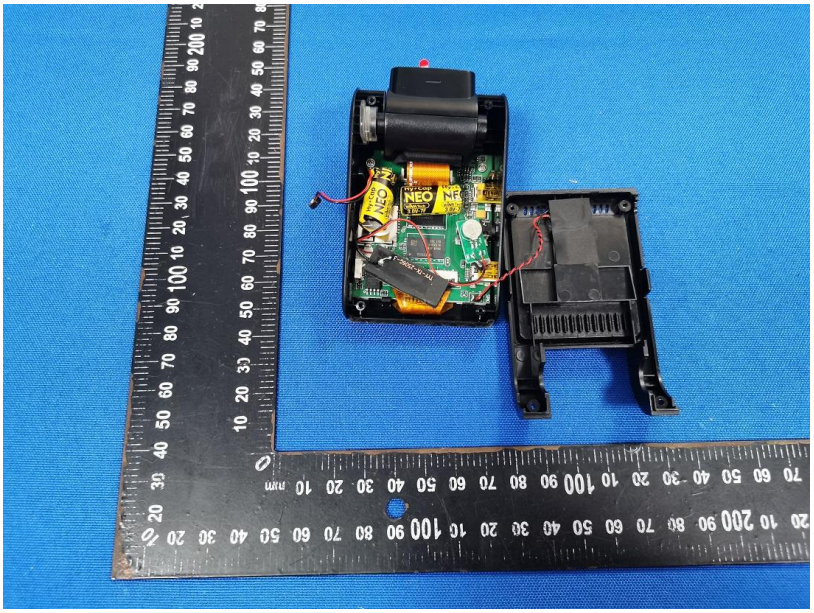


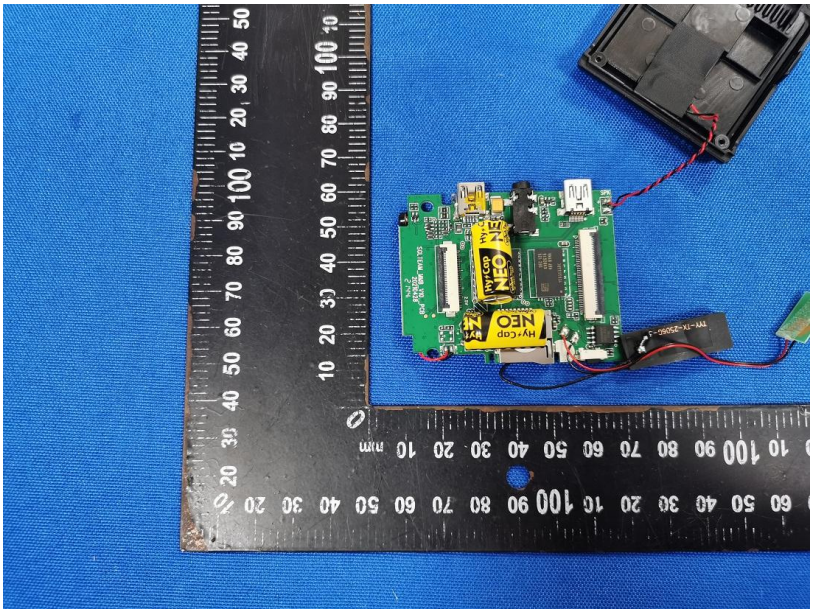


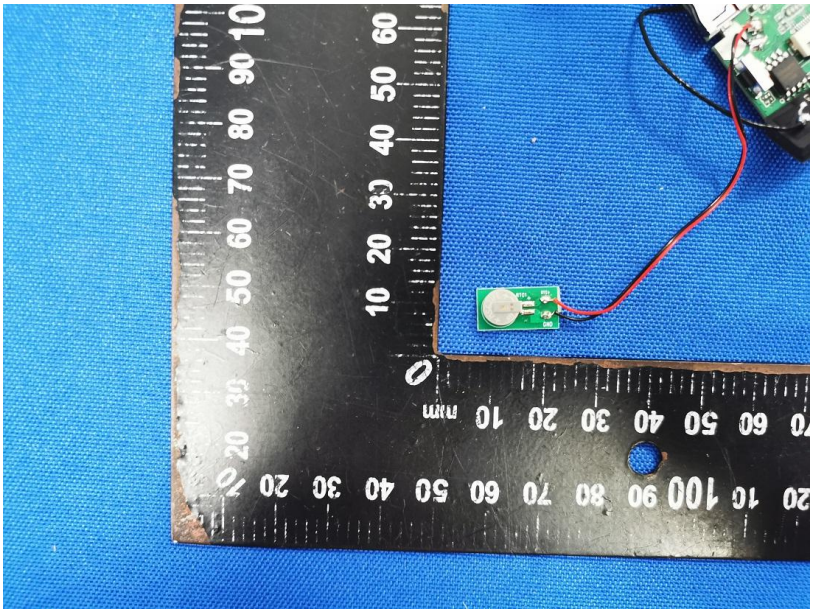
MENU
REC
MIC

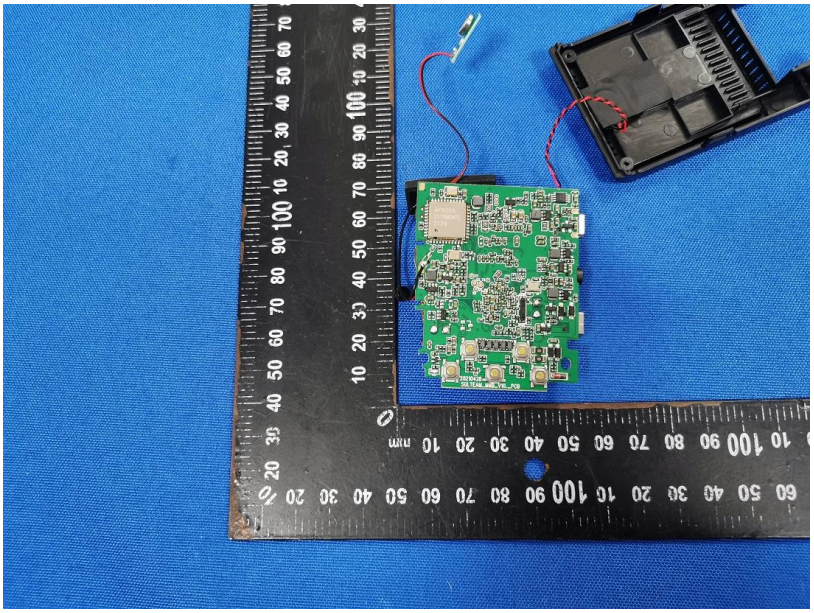







HY-COP
NEO
HY-COP
NEO





********THE END REPORT********