



MEASUREMENT REPORT

FCC PART 15.249

FCC ID: 2ARDMEDC212S

Applicant: ShenZhen Easydetek Technology CO. LTD.

Application Type: Certification

Product: Microwave

Model No.: EDC212S-A

Serial Model No.: EDC212S-X ("X" means A-Z)

Brand Name: Easy Detek

FCC Classification: Part 15 low power transceiver, RX verified (DXT)

FCC Rule Part(s): Part 15.249

Test Procedure(s): ANSI C63.10 - 2013

Test Date: March 31 ~ July 20, 2021

Reviewed By:

Vincent Yu

Vincent Yu

Approved By:

Robin Wu

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2103RSZ044-U1	Rev. 01	Initial Report	07-20-2021	Valid

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1. GENERAL INFORMATION

1.1. Applicant

ShenZhen Easydetek Technology CO. LTD.

6/F Fuyuan Industrial&commercial Building Hangcheng Industrial Park, Baoan District, Shenzhen
518000, China

1.2. Manufacturer

ShenZhen Easydetek Technology CO. LTD.

6/F Fuyuan Industrial&commercial Building Hangcheng Industrial Park, Baoan District, Shenzhen
518000, China

1.1. Testing Facility

☐	Test Site – MRT Suzhou Laboratory
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian’edang Rd., Wuzhong Economic Development Zone, Suzhou, China
	Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China
	Laboratory Accreditations
	A2LA: 3628.01 FCC: CN1166 VCCI: R-20025, G-20034, C-20020, T-20020
	CNAS: L10551 ISED: CN0001
☒	Test Site – MRT Shenzhen Laboratory
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China
	Laboratory Accreditations
	A2LA: 3628.02 FCC: CN1284
	CNAS: L10551 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	Laboratory Accreditations
	TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Microwave
Model No.	EDC212S-A
Serial Model No.	EDC212S-X ("X" means A-Z)
Brand Name	Easy Detek
Operation Temperature	-20 ~ 70°C
Working Frequency Range	5730MHz ~ 5870MHz
Input	AC 100V~240V 50/60Hz
Antenna Type	PCB Antenna
Antenna Gain	4dBi
Channel Number	512

Note 1: It could be such as different infrared receiver, different photosensitive, different dip switch.

Note 2: All the above information is declared by manufacturer.

2.2. Frequency List

Channel No.	512												
Unit	MHz												
5730.000	5740.686	5751.372	5762.058	5772.744	5783.430	5794.116	5804.802	5815.488	5826.174	5836.860	5847.546	5858.232	5868.918
5730.274	5740.960	5751.646	5762.332	5773.018	5783.704	5794.390	5805.076	5815.762	5826.448	5837.134	5847.820	5858.506	5869.192
5730.548	5741.234	5751.920	5762.606	5773.292	5783.978	5794.664	5805.350	5816.036	5826.722	5837.408	5848.094	5858.780	5869.466
5730.822	5741.508	5752.194	5762.880	5773.566	5784.252	5794.938	5805.624	5816.310	5826.996	5837.682	5848.368	5859.054	5869.740
5731.096	5741.782	5752.468	5763.154	5773.840	5784.526	5795.212	5805.898	5816.584	5827.270	5837.956	5848.642	5859.328	5870.000
5731.370	5742.056	5752.742	5763.428	5774.114	5784.800	5795.486	5806.172	5816.858	5827.544	5838.230	5848.916	5859.602	
5731.644	5742.330	5753.016	5763.702	5774.388	5785.074	5795.760	5806.446	5817.132	5827.818	5838.504	5849.190	5859.876	
5731.918	5742.604	5753.290	5763.976	5774.662	5785.348	5796.034	5806.720	5817.406	5828.092	5838.778	5849.464	5860.150	
5732.192	5742.878	5753.564	5764.250	5774.936	5785.622	5796.308	5806.994	5817.680	5828.366	5839.052	5849.738	5860.424	
5732.466	5743.152	5753.838	5764.524	5775.210	5785.896	5796.582	5807.268	5817.954	5828.640	5839.326	5850.012	5860.698	
5732.740	5743.426	5754.112	5764.798	5775.484	5786.170	5796.856	5807.542	5818.228	5828.914	5839.600	5850.286	5860.972	
5733.014	5743.700	5754.386	5765.072	5775.758	5786.444	5797.130	5807.816	5818.502	5829.188	5839.874	5850.560	5861.246	
5733.288	5743.974	5754.660	5765.346	5776.032	5786.718	5797.404	5808.090	5818.776	5829.462	5840.148	5850.834	5861.520	
5733.562	5744.248	5754.934	5765.620	5776.306	5786.992	5797.678	5808.364	5819.050	5829.736	5840.422	5851.108	5861.794	
5733.836	5744.522	5755.208	5765.894	5776.580	5787.266	5797.952	5808.638	5819.324	5830.010	5840.696	5851.382	5862.068	
5734.110	5744.796	5755.482	5766.168	5776.854	5787.540	5798.226	5808.912	5819.598	5830.284	5840.970	5851.656	5862.342	
5734.384	5745.070	5755.756	5766.442	5777.128	5787.814	5798.500	5809.186	5819.872	5830.558	5841.244	5851.930	5862.616	
5734.658	5745.344	5756.030	5766.716	5777.402	5788.088	5798.774	5809.460	5820.146	5830.832	5841.518	5852.204	5862.890	
5734.932	5745.618	5756.304	5766.990	5777.676	5788.362	5799.048	5809.734	5820.420	5831.106	5841.792	5852.478	5863.164	
5735.206	5745.892	5756.578	5767.264	5777.950	5788.636	5799.322	5810.008	5820.694	5831.380	5842.066	5852.752	5863.438	
5735.480	5746.166	5756.852	5767.538	5778.224	5788.910	5799.596	5810.282	5820.968	5831.654	5842.340	5853.026	5863.712	
5735.754	5746.440	5757.126	5767.812	5778.498	5789.184	5799.870	5810.556	5821.242	5831.928	5842.614	5853.300	5863.986	
5736.028	5746.714	5757.400	5768.086	5778.772	5789.458	5800.142	5810.830	5821.516	5832.202	5842.888	5853.574	5864.260	
5736.302	5746.988	5757.674	5768.360	5779.046	5789.732	5800.418	5811.104	5821.790	5832.476	5843.162	5853.848	5864.534	
5736.576	5747.262	5757.948	5768.634	5779.320	5790.006	5800.692	5811.378	5822.064	5832.750	5843.436	5854.122	5864.808	
5736.850	5747.536	5758.222	5768.908	5779.594	5790.280	5800.966	5811.652	5822.338	5833.024	5843.710	5854.396	5865.082	
5737.124	5747.810	5758.496	5769.182	5779.868	5790.554	5801.240	5811.926	5822.612	5833.298	5843.984	5854.670	5865.356	
5737.398	5748.084	5758.770	5769.456	5780.142	5790.828	5801.514	5812.200	5822.886	5833.572	5844.258	5854.944	5865.630	
5737.672	5748.358	5759.044	5769.730	5780.416	5791.102	5801.788	5812.474	5823.160	5833.846	5844.532	5855.218	5865.904	
5737.946	5748.632	5759.318	5770.004	5780.690	5791.376	5802.062	5812.748	5823.434	5834.120	5844.806	5855.492	5866.178	
5738.220	5748.906	5759.592	5770.278	5780.964	5791.650	5802.336	5813.022	5823.708	5834.394	5845.080	5855.766	5866.452	
5738.494	5749.180	5759.866	5770.552	5781.238	5791.924	5802.610	5813.296	5823.982	5834.668	5845.354	5856.040	5866.726	
5738.768	5749.454	5760.140	5770.826	5781.512	5792.198	5802.884	5813.570	5824.256	5834.942	5845.628	5856.314	5867.000	
5739.042	5749.728	5760.414	5771.100	5781.786	5792.472	5803.158	5813.844	5824.530	5835.216	5845.902	5856.588	5867.274	
5739.316	5750.002	5760.688	5771.374	5782.060	5792.746	5803.432	5814.118	5824.804	5835.490	5846.176	5856.862	5867.548	
5739.590	5750.276	5760.962	5771.648	5782.334	5793.020	5803.706	5814.392	5825.078	5835.764	5846.450	5857.136	5867.822	
5739.864	5750.550	5761.236	5771.922	5782.608	5793.294	5803.980	5814.666	5825.352	5836.038	5846.724	5857.410	5868.096	
5740.138	5750.824	5761.510	5772.196	5782.882	5793.568	5804.254	5814.940	5825.626	5836.312	5846.998	5857.684	5868.370	
5740.412	5751.098	5761.784	5772.470	5783.156	5793.842	5804.528	5815.214	5825.900	5836.586	5847.272	5857.958	5868.644	

2.3. Test Frequency

Test Channel	Test Frequency
Low	5730 MHz
Middle	5800 MHz
High	5870 MHz

2.4. Test Mode

Test Mode	Transmit
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2.5. Test Environment Condition

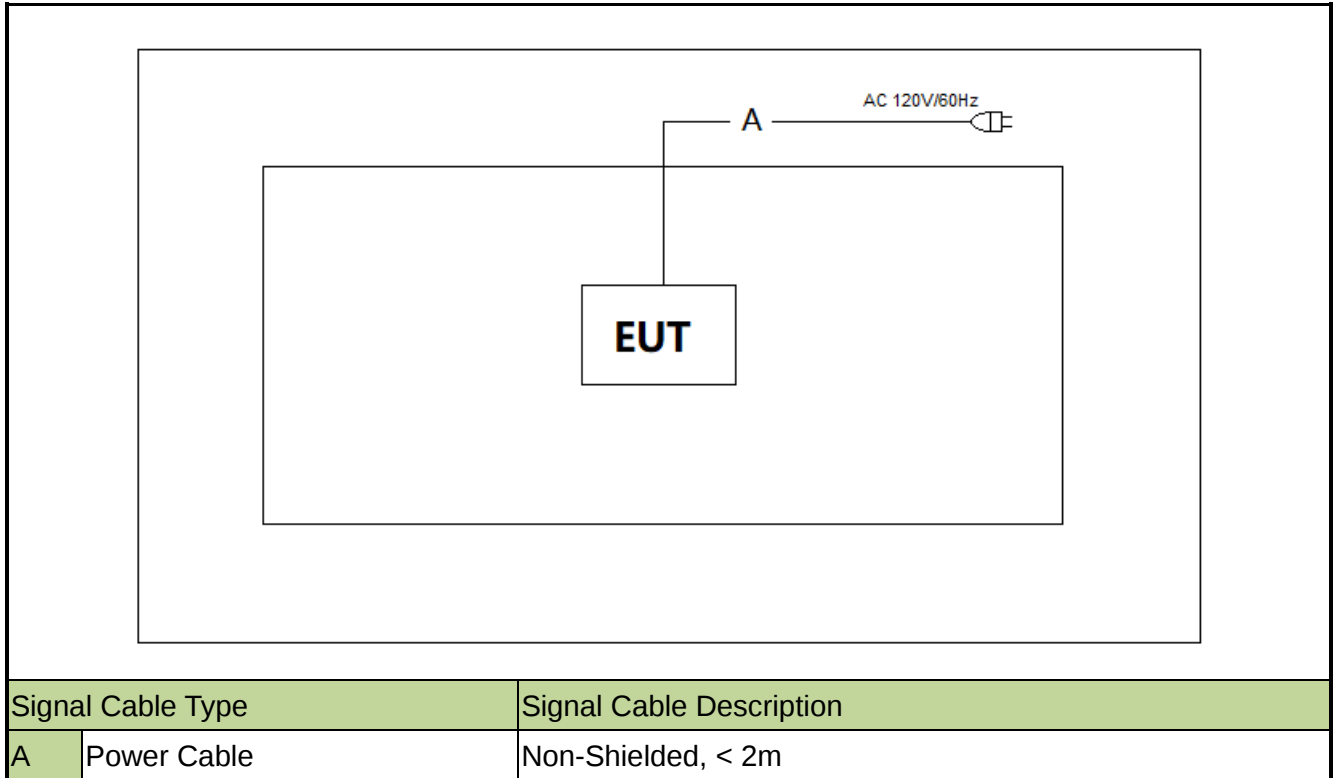
Ambient Temperature	15°C ~ 35°C
Relative Humidity	20%RH ~75%RH

2.6. Test Software

The EUT will be in transmitting mode after power supply.

2.7. Test Configuration

The ANSI C63.10: 2013 was used to reference the appropriate EUT setup for testing.



3. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna of the EUT is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

This unit complies with the requirement of §15.203.

4. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission (NS-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESL3	MRTSUE06576	1 year	2021/07/09
				1 year	2022/06/27
ENV216-LV-NETZNACHB	R&S	ENV216	MRTSUE06577	1 year	2021/07/09
				1 year	2022/07/04
ENV216-LV-NETZNACHB	R&S	ENV216	MRTSUE06578	1 year	2021/07/09
				1 year	2022/07/04
Temperature/Humidity Meter	deli	NO.8813	MRTSUE06587	1 year	2021/07/08
				1 year	2022/06/30
Shielding Anechoic Chamber	BOOMWAVE	SR2	MRTSUE06551	5 year	2024/06/04

Radiated Emission (NS-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06575	1 year	2021/07/09
				1 year	2022/06/27
EXA Signal Analyzer	Keysight	N9010A	MRTSUE06195	1 year	2022/03/17
Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2021/09/26
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06292	1 year	2021/10/24
Broad-Band Horn Antenna	Schwarzbeck	9120D	MRTSUE06572	1 year	2022/03/14
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06573	1 year	2021/07/03
				1 year	2022/06/30
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
				1 year	2022/06/09
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06574	1 year	2021/07/13
				1 year	2022/07/12
Anechoic Chamber	BOOMWAVE	AC1	MRTSUE06496	1 year	2021/07/25
				1 year	2022/07/24
Temperature/Humidity Meter	deli	NO.8813	MRTSUE06588	1 year	2021/07/08
				1 year	2022/06/30

Conducted Test Equipment (NS-TR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Thermal Hygrometer	DELI	No.8813	MRTSUE06783	1 year	2021/05/13
				1 year	2022/05/09
USB wideband power sensor	Keysight	U2021XA	MRTSUE06581	1 year	2021/08/20
10dB Attenuator	MVE	10dB	N/A	1 year	2021/08/20
EXA Signal Analyzer	Keysight	N9010A	MRTSUE06195	1 year	2022/03/17

Software	Version	Function
EMI Software	V3	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Occupied Bandwidth
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.28%

6. TEST RESULT

6.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 6.2
15.209 15.249	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 6.3 & 6.4
15.215(c)	20dB Spectrum Bandwidth	20 dB bandwidth of the emission in the specific band		Pass	Section 6.5

Notes:

1. All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
2. The analyzer plots shown in this section were all taken with an offset into the analyzer. The offset was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

6.2. Conducted Emission

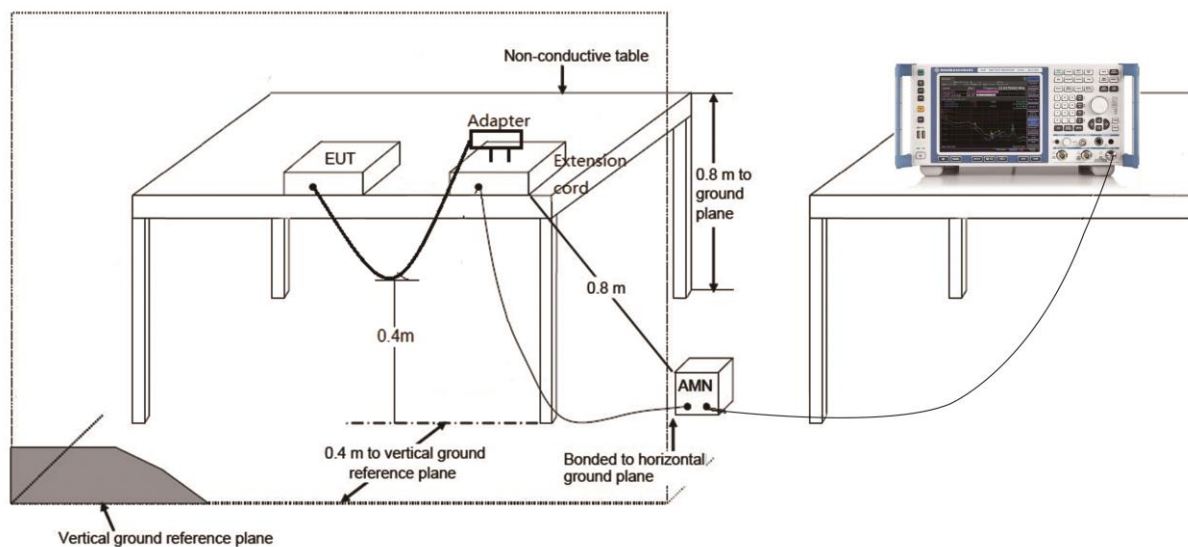
6.2.1. Test Limit

FCC Part 15.207 Limits		
Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15 ~ 0.50	66 ~ 56	56 ~ 46
0.50 ~ 5.0	56	46
5.0 ~ 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

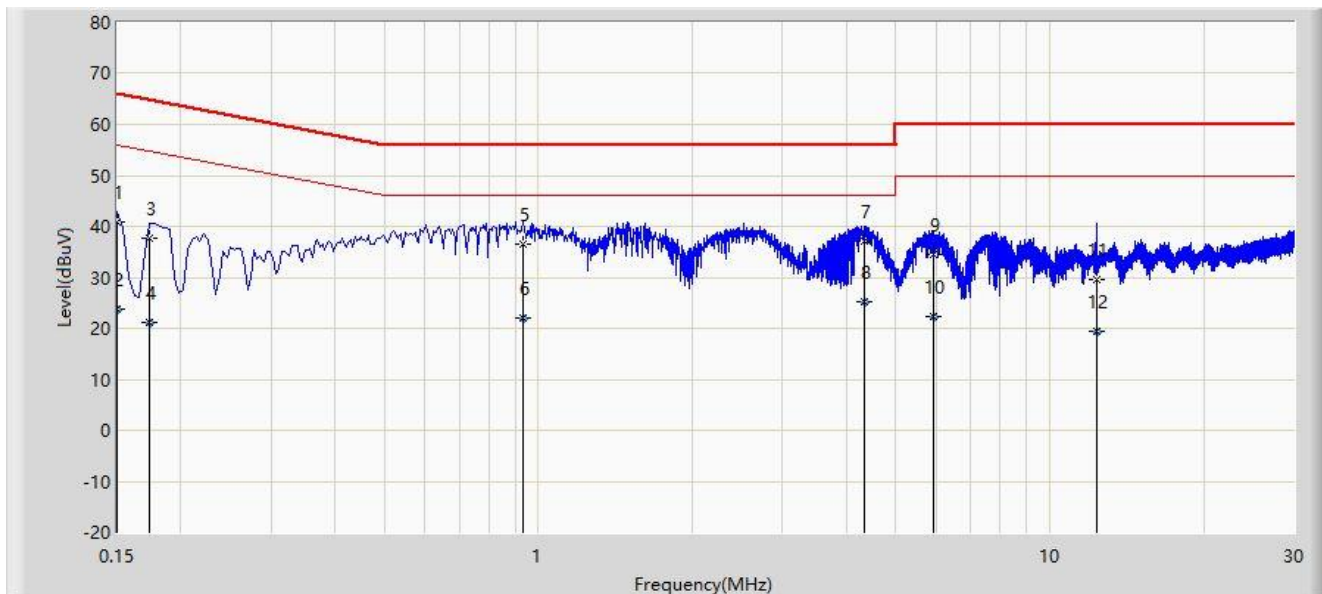
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.2.2. Test Setup



6.2.3.Test Result

Site: NS-SR2	Time: 2021/05/21
Limit: FCC_Part15.207_CE_AC Power	Engineer: Flag Yang
Probe: ENV216_102493_Filter Off_0.15~30MHz	Polarity: Line
EUT: Microwave	Power: AC 120V/60Hz
Test Mode: Transmit at Channel 5800MHz	

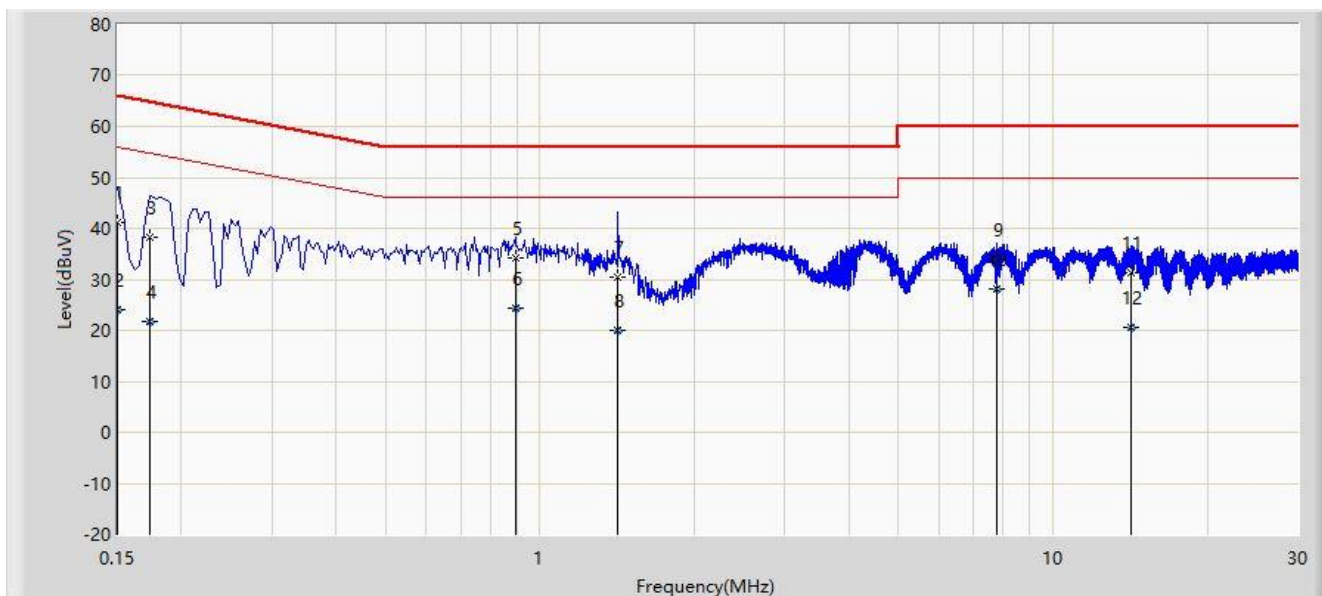


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1			0.150	40.908	31.373	-25.092	66.000	9.536	QP
2			0.150	23.719	14.183	-32.281	56.000	9.536	AV
3			0.174	37.812	28.271	-26.955	64.767	9.541	QP
4			0.174	21.299	11.758	-33.468	54.767	9.541	AV
5			0.934	36.576	26.988	-19.424	56.000	9.589	QP
6			0.934	22.016	12.427	-23.984	46.000	9.589	AV
7		*	4.326	37.167	27.484	-18.833	56.000	9.683	QP
8			4.326	25.199	15.516	-20.801	46.000	9.683	AV
9			5.938	34.537	24.818	-25.463	60.000	9.719	QP
10			5.938	22.455	12.735	-27.545	50.000	9.719	AV
11			12.314	29.583	19.763	-30.417	60.000	9.820	QP
12			12.314	19.280	9.460	-30.720	50.000	9.820	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: NS-SR2	Time: 2021/05/21
Limit: FCC_Part15.207_CE_AC Power	Engineer: Flag Yang
Probe: ENV216_102493_Filter Off_0.15~30MHz	Polarity: Neutral
EUT: Microwave	Power: AC 120V/60Hz
Test Mode: Transmit at Channel 5800MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1			0.150	41.073	31.538	-24.927	66.000	9.536	QP
2			0.150	24.036	14.501	-31.964	56.000	9.536	AV
3			0.174	38.180	28.639	-26.587	64.767	9.541	QP
4			0.174	21.677	12.135	-33.091	54.767	9.541	AV
5			0.894	34.061	24.463	-21.939	56.000	9.598	QP
6			0.894	24.267	14.669	-21.733	46.000	9.598	AV
7		*	1.418	30.349	20.737	-25.651	56.000	9.612	QP
8			1.418	19.894	10.282	-26.106	46.000	9.612	AV
9			7.794	34.004	24.241	-25.996	60.000	9.763	QP
10			7.794	28.066	18.302	-21.934	50.000	9.763	AV
11			14.186	31.255	21.365	-28.745	60.000	9.890	QP
12			14.186	20.652	10.763	-29.348	50.000	9.890	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

6.3. Radiated Emission

6.3.1. Test Limit

FCC Part 15.249 Limits		
Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902 ~ 908	50	500
2400 ~ 2483.5	50	500
5725 ~ 5875	50	500
24000 ~ 24250	250	2500

Note: FCC Part 15.249 (d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

FCC Part 15.209 Limits		
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
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

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBμV/m) = 20 log E field strength (μV/m).

6.3.2. Test Procedure Used

ANSI C63.10-2013 Section 6.3 (General Requirements)

ANSI C63.10-2013 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10-2013 Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10-2013 Section 6.6 (Standard test method above 1GHz)

6.3.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

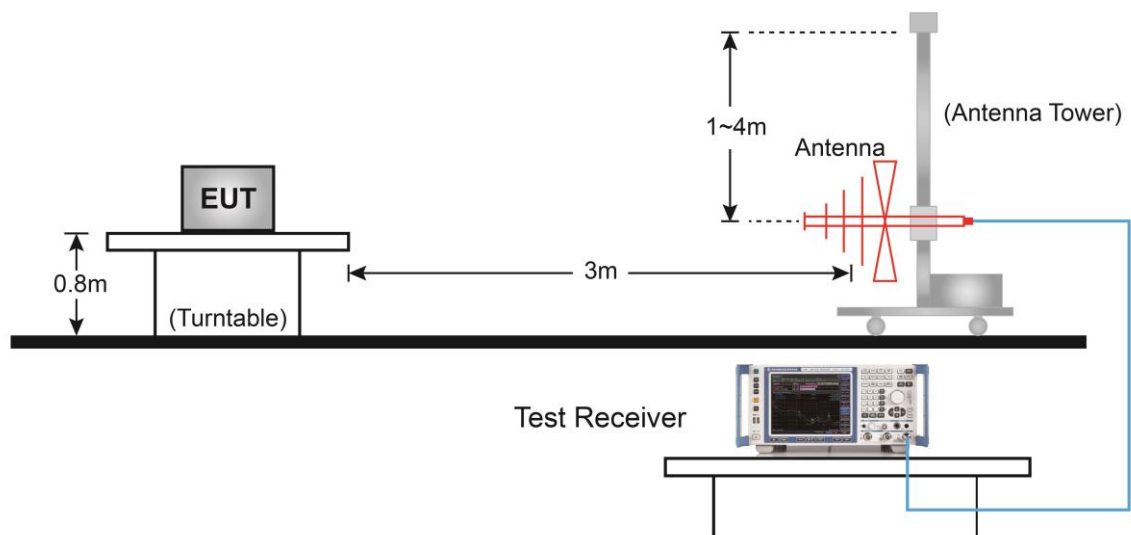
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

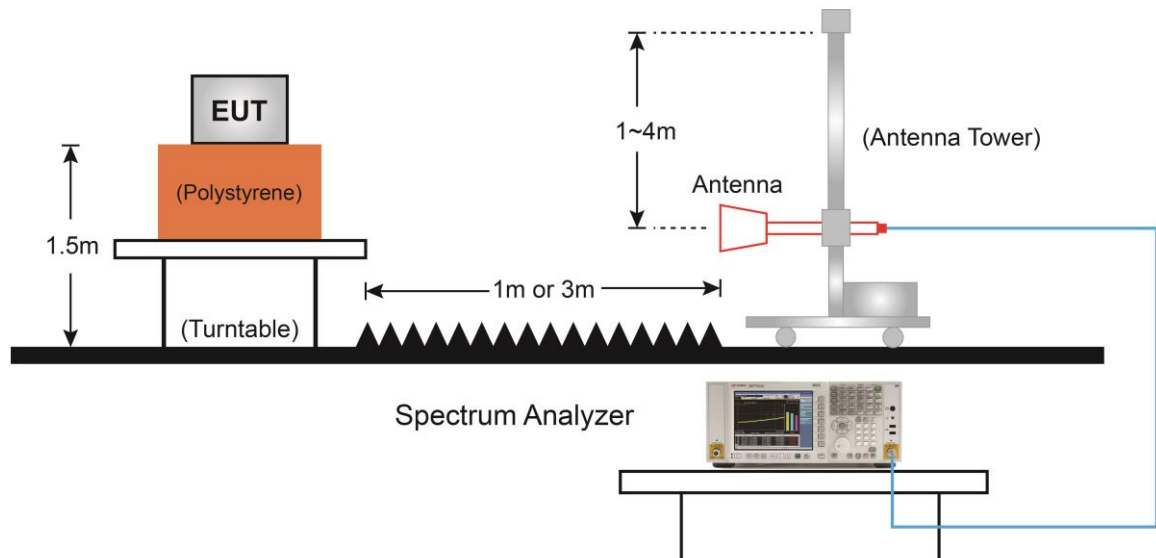
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 10 Hz.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.3.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.3.5. Test Result

Product	Microwave	Test Engineer	Dillon Dlao
Test Site	NS-AC1	Test Date	2021/05/09
Remark	Fundamental Radiated Emission		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
5730	60.9	4.1	65.0	114.0	-49.0	PK	Horizontal
	57.2	4.1	61.3	94.0	-32.7	AV	Horizontal
	65.9	4.1	70.1	114.0	-43.9	PK	Vertical
	63.1	4.1	67.2	94.0	-26.8	AV	Vertical
5800	58.3	4.4	62.7	114.0	-51.3	PK	Horizontal
	54.9	4.4	59.3	94.0	-34.7	AV	Horizontal
	65.9	4.4	70.3	114.0	-43.7	PK	Vertical
	64.8	4.4	69.2	94.0	-24.8	AV	Vertical
5870	60.4	4.7	65.1	114.0	-48.9	PK	Horizontal
	56.0	4.7	60.7	94.0	-33.3	AV	Horizontal
	66.2	4.7	70.9	114.0	-43.1	PK	Vertical
	64.5	4.7	69.3	94.0	-24.7	AV	Vertical

Note: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Product	Microwave	Test Engineer	Dillon Diao
Test Site	NS-AC1	Test Date	2021/05/06
Remark	Radiated Emission - 5730MHz		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
7978.5	37.7	11.0	48.7	74.0	-25.3	Peak	Horizontal
8675.5	37.1	12.3	49.4	74.0	-24.6	Peak	Horizontal
11200.0	35.8	16.5	52.4	74.0	-21.6	Peak	Horizontal
8701.0	36.8	12.7	49.5	74.0	-24.5	Peak	Vertical
10163.0	37.0	14.6	51.6	74.0	-22.4	Peak	Vertical
12084.0	36.9	16.0	52.9	74.0	-21.1	Peak	Vertical

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 2: Average measurement was not performed when the peak level lower than average limit.

Product	Microwave	Test Engineer	Dillon Diao
Test Site	NS-AC1	Test Date	2021/05/06
Remark	Radiated Emission - 5800MHz		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
8420.5	37.3	11.0	48.3	74.0	-25.7	Peak	Horizontal
9381.0	37.3	13.3	50.5	74.0	-23.5	Peak	Horizontal
10945.0	36.1	15.8	51.8	74.0	-22.2	Peak	Horizontal
8114.5	38.4	11.1	49.5	74.0	-24.5	Peak	Vertical
9508.5	36.4	13.0	49.5	74.0	-24.5	Peak	Vertical
11200.0	34.8	16.5	51.4	74.0	-22.6	Peak	Vertical

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 2: Average measurement was not performed when the peak level lower than average limit.

Product	Microwave	Test Engineer	Dillon Diao
Test Site	NS-AC1	Test Date	2021/05/06
Remark	Radiated Emission - 5870MHz		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
8055.0	37.2	11.5	48.7	74.0	-25.3	Peak	Horizontal
10154.5	37.4	14.4	51.8	74.0	-22.2	Peak	Horizontal
11616.5	34.7	16.7	51.4	74.0	-22.6	Peak	Horizontal
7868.0	38.3	10.2	48.4	74.0	-25.6	Peak	Vertical
9483.0	37.8	13.0	50.8	74.0	-23.2	Peak	Vertical
10783.5	36.6	15.4	52.0	74.0	-22.0	Peak	Vertical

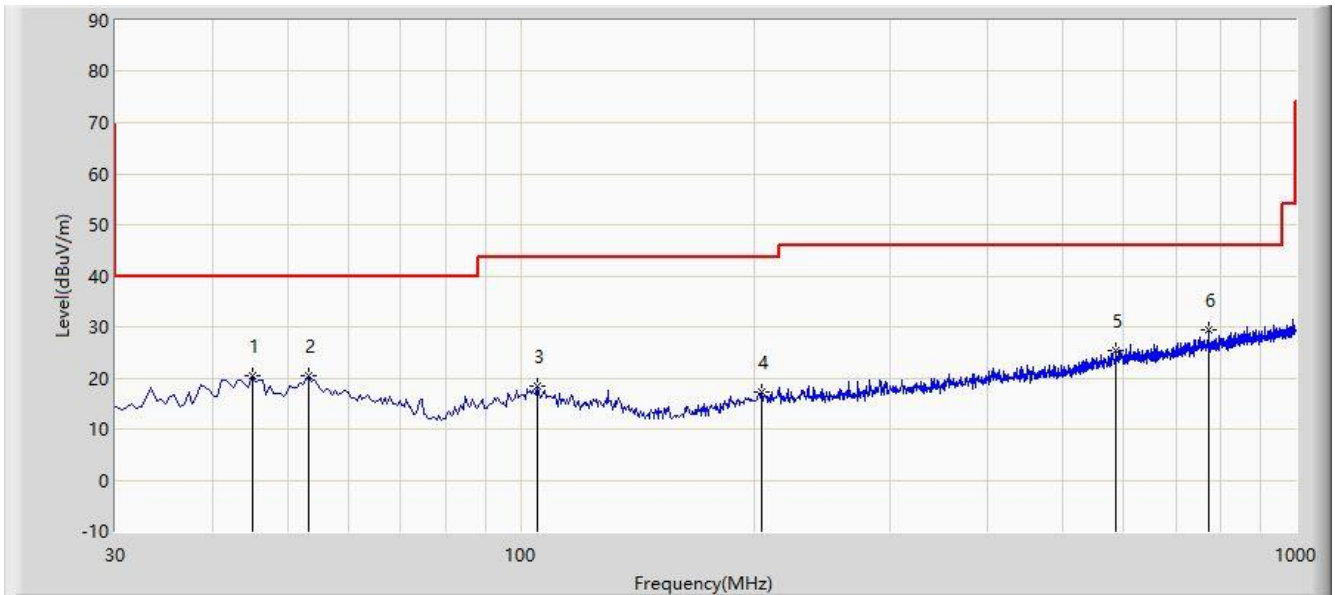
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 2: Average measurement was not performed when the peak level lower than average limit.

The Worst Case of Radiated Emission below 1GHz:

Site: NS-AC1	Date: 2021/03/31
Limit: FCC_Part 15.209_RE(3m)	Engineer: Antony Yang
Probe: NS-AC1_VULB9162	Polarity: Horizontal
EUT: Microwave	Power: AC 120V/60Hz
Test Mode: Transmit at Channel 5800MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB)	Type
1		*	45.035	20.568	1.652	-19.432	40.000	18.916	PK
2			53.280	20.380	0.732	-19.620	40.000	19.648	PK
3			105.175	18.410	0.286	-25.090	43.500	18.123	PK
4			204.600	17.386	-0.138	-26.114	43.500	17.524	PK
5			585.325	25.382	0.856	-20.618	46.000	24.526	PK
6			772.535	29.308	2.274	-16.692	46.000	27.034	PK

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

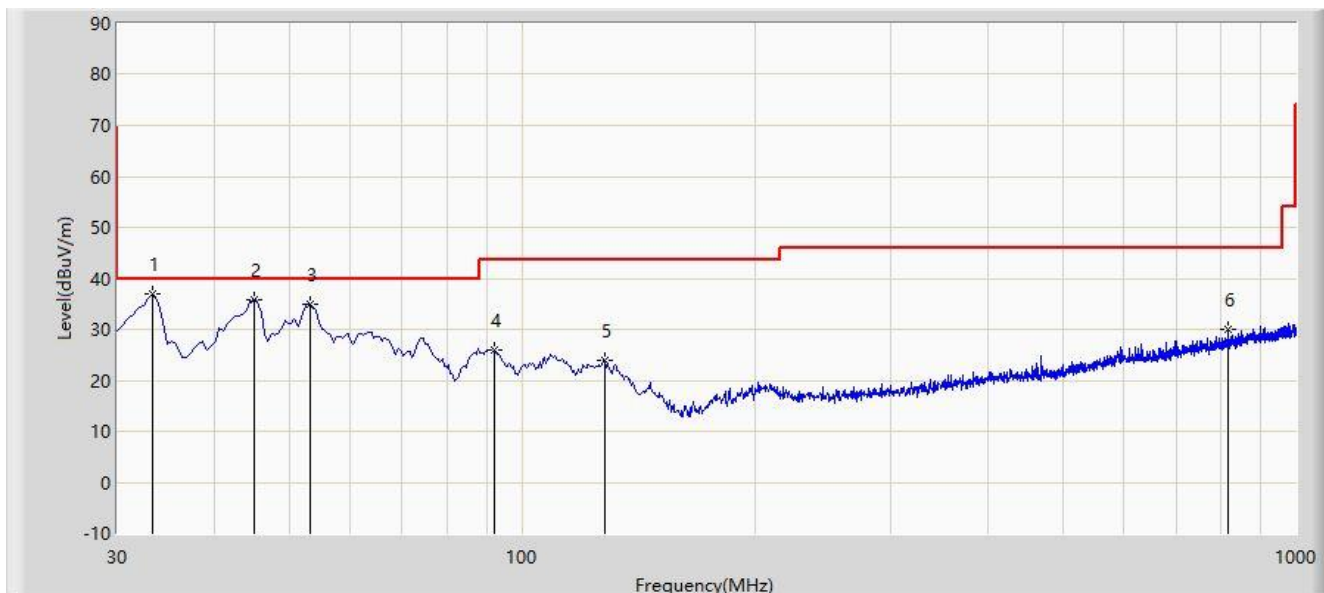
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: QP measurement was not performed when the peak level lower than QP limit.

Note 3: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 40GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

Site: NS-AC1	Date: 2021/03/31
Limit: FCC_Part 15.209_RE(3m)	Engineer: Antony Yang
Probe: NS-AC1_VULB9162	Polarity: Vertical
EUT: Microwave	Power: AC 120V/60Hz
Test Mode: Transmit at Channel 5800MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	33.395	36.991	20.554	-3.009	40.000	16.437	PK
2			45.035	35.802	16.886	-4.198	40.000	18.916	PK
3			53.280	34.908	15.260	-5.092	40.000	19.648	PK
4			92.080	26.055	9.905	-17.445	43.500	16.150	PK
5			127.970	24.044	9.123	-19.456	43.500	14.921	PK
6			817.155	30.105	2.493	-15.895	46.000	27.612	PK

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: QP measurement was not performed when the peak level lower than QP limit.

Note 3: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 40GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

6.4. Radiated Restricted Band Edge Measurement

6.4.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15.209 Limits		
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
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

6.4.2. Test Procedure Used

ANSI C63.10-2013 Section 6.3 (General Requirements)

ANSI C63.10-2013 Section 6.6 (Standard test method above 1GHz)

ANSI C63.10-2013 Section 6.10.5 (Restricted-band band-edge measurements)

6.4.3. Test Setting

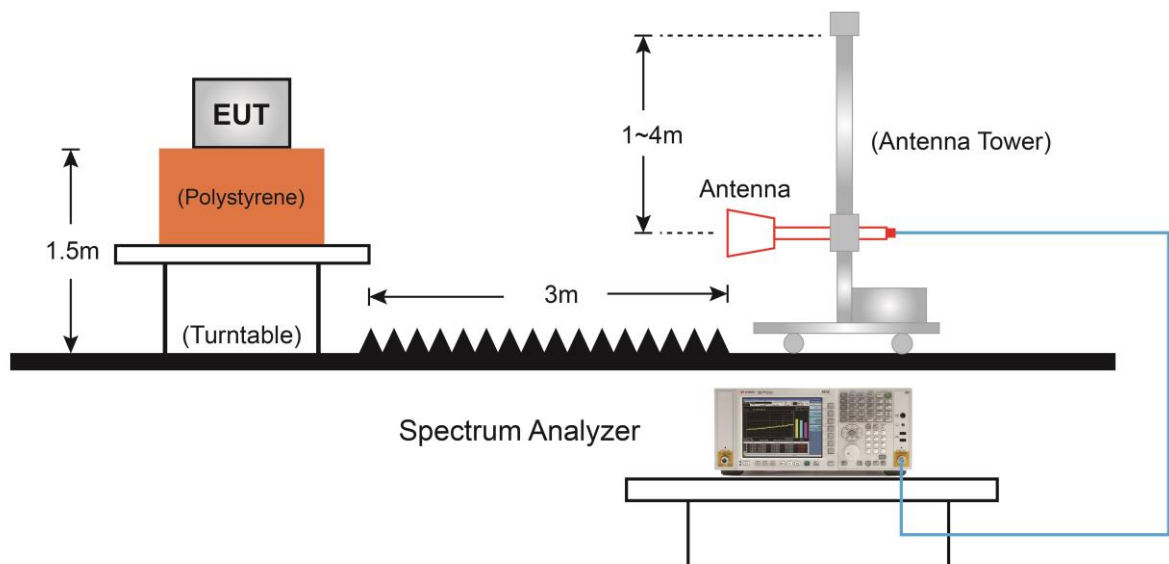
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

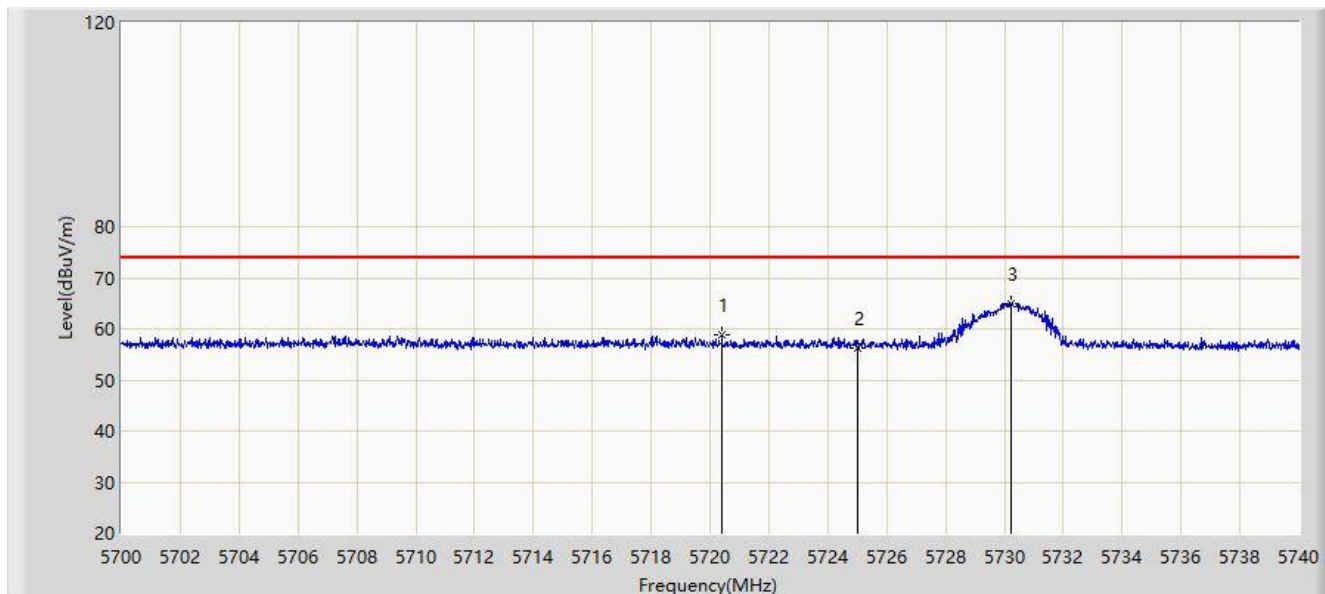
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.4.4. Test Setup



6.4.5. Test Result

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Horizontal
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5730MHz	

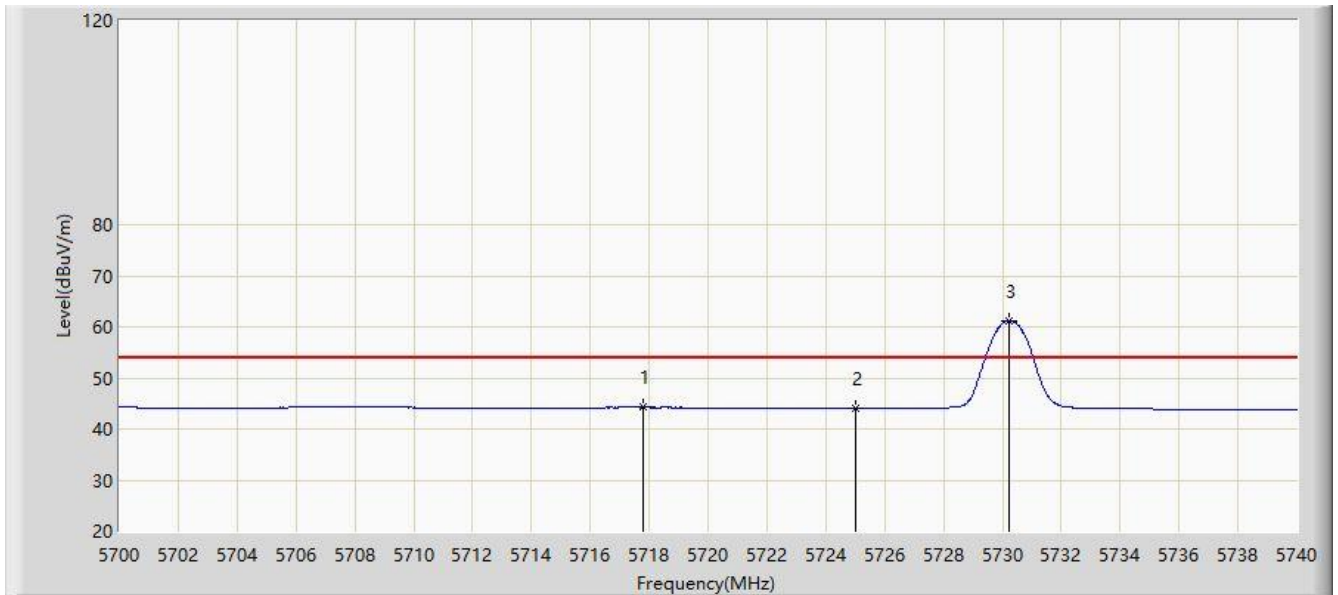


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5720.400	58.916	54.761	-15.084	74.000	4.155	PK
2			5725.000	56.260	52.136	-17.740	74.000	4.124	PK
3		*	5730.240	65.014	60.872	-48.986	114.000	4.141	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Horizontal
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5730MHz	

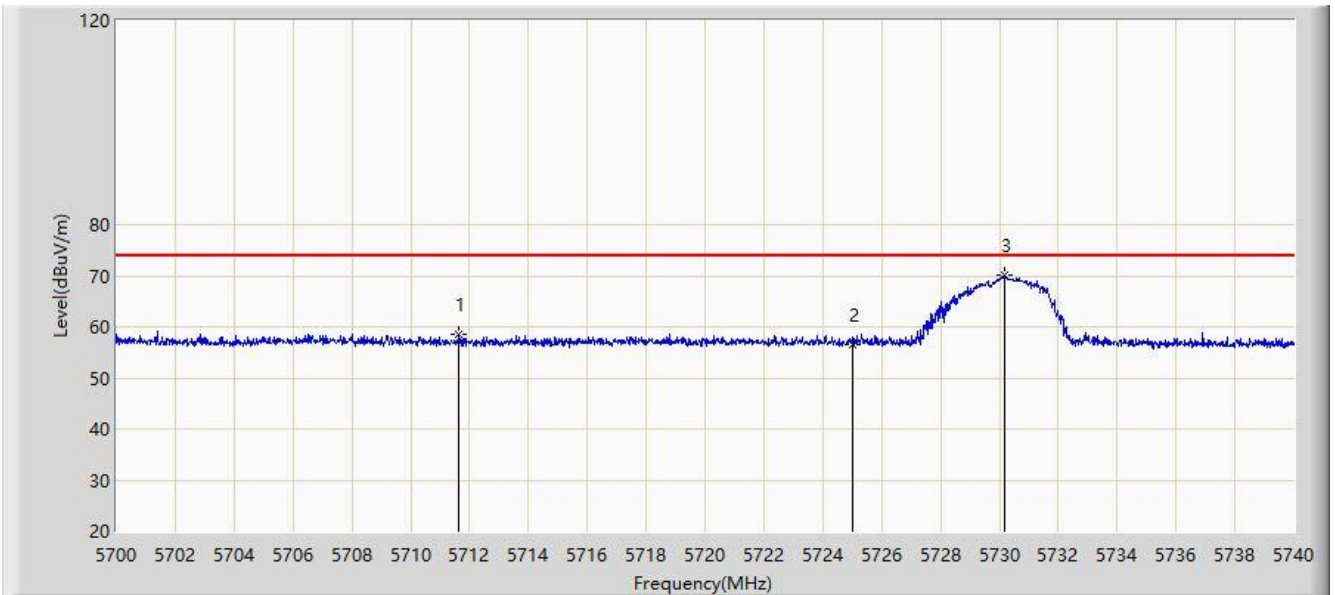


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5717.780	44.215	40.041	-9.785	54.000	4.174	AV
2			5725.000	44.061	39.937	-9.939	54.000	4.124	AV
3		*	5730.240	61.298	57.156	-32.702	94.000	4.141	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Vertical
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5730MHz	

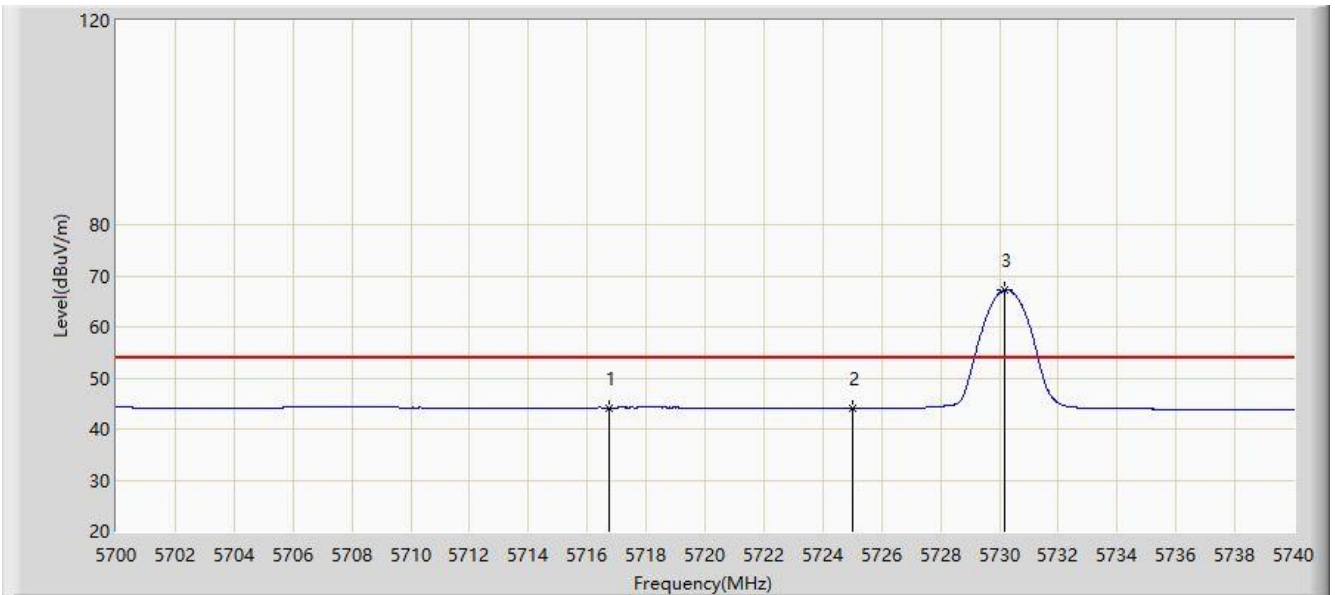


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5711.640	58.596	54.380	-15.404	74.000	4.216	PK
2			5725.000	56.516	52.392	-17.484	74.000	4.124	PK
3		*	5730.200	70.065	65.924	-43.935	114.000	4.141	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Vertical
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5730MHz	

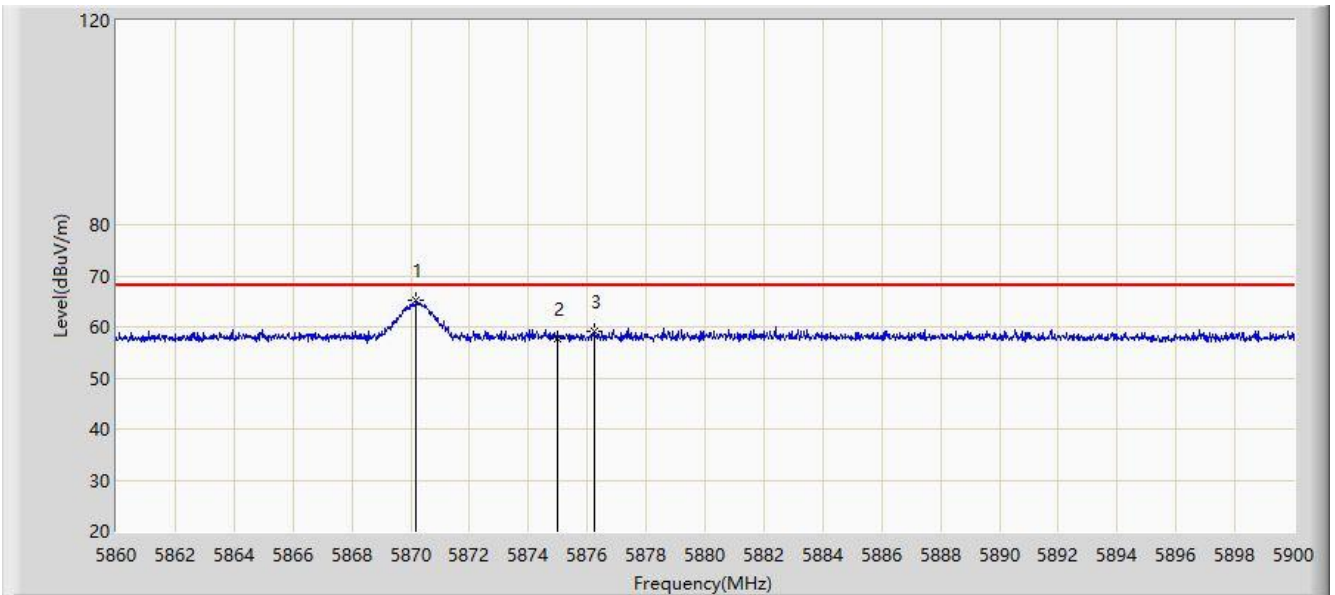


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB)	Type
1			5716.760	44.195	40.014	-9.805	54.000	4.180	AV
2			5725.000	44.047	39.923	-9.953	54.000	4.124	AV
3		*	5730.180	67.217	63.076	-31.783	94.000	4.141	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Horizontal
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5870MHz	

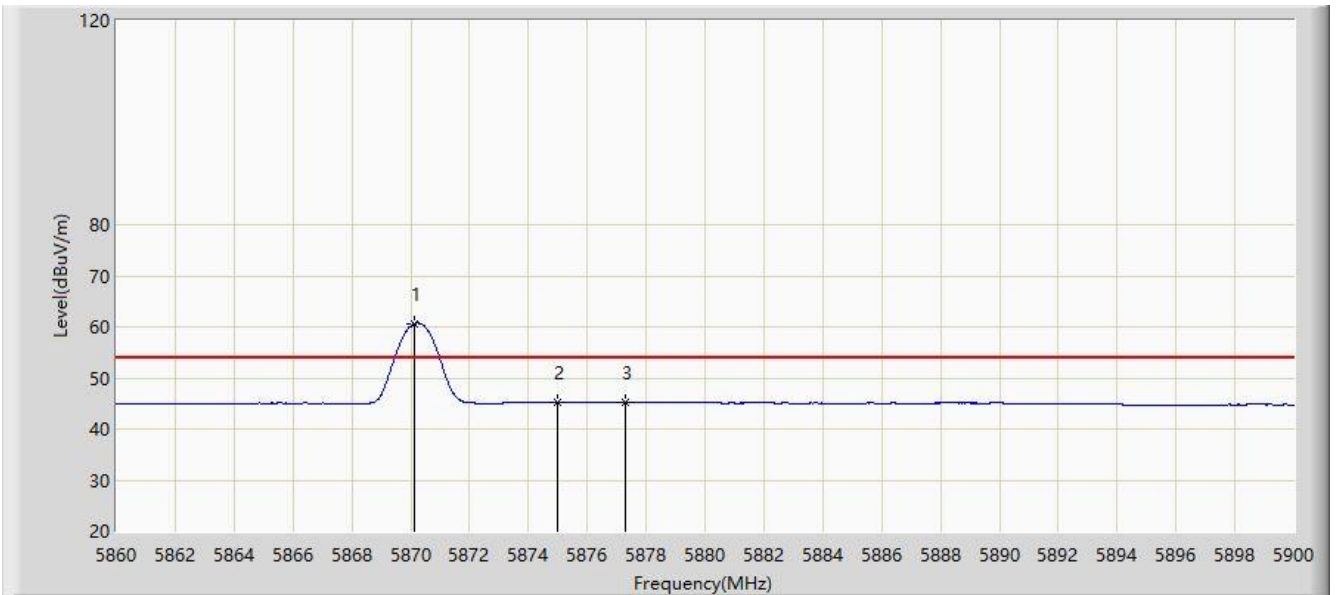


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB)	Type
1		*	5870.180	65.141	60.431	-48.859	114.000	4.709	PK
2			5875.000	57.797	53.098	-16.203	74.000	4.700	PK
3			5876.220	59.132	54.435	-14.868	74.000	4.697	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Horizontal
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5870MHz	

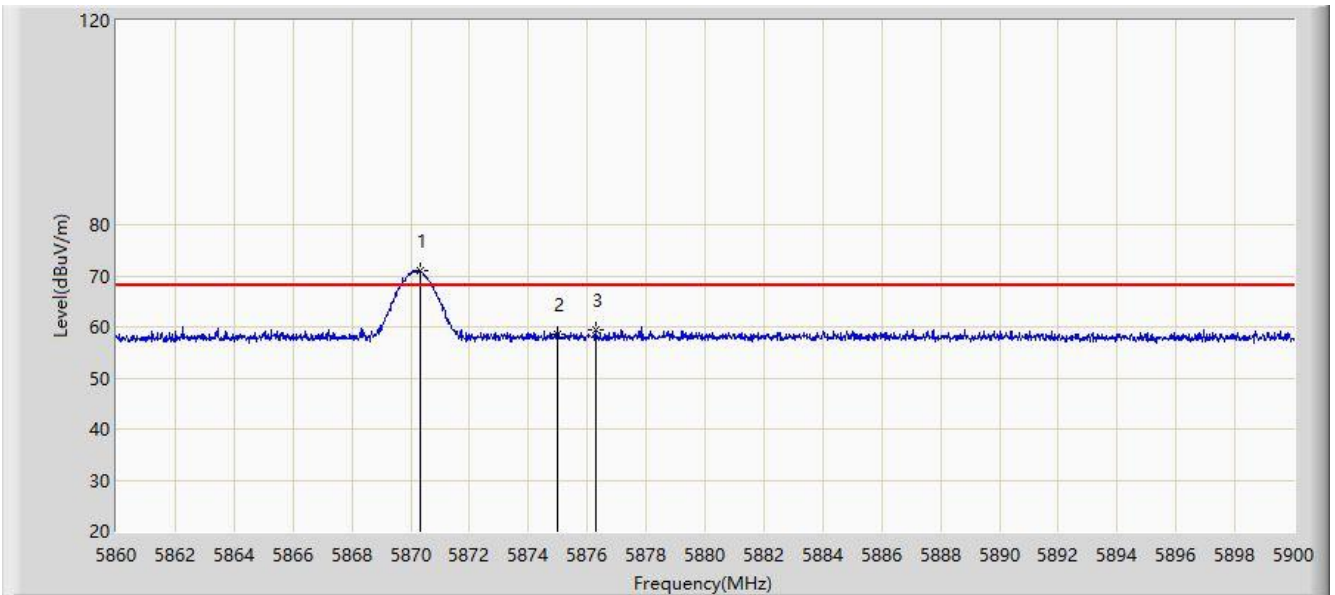


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5870.140	60.685	55.975	-33.315	94.000	4.709	AV
2			5875.000	45.103	40.404	-8.897	54.000	4.700	AV
3			5877.280	45.141	40.447	-8.859	54.000	4.695	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Vertical
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5870MHz	

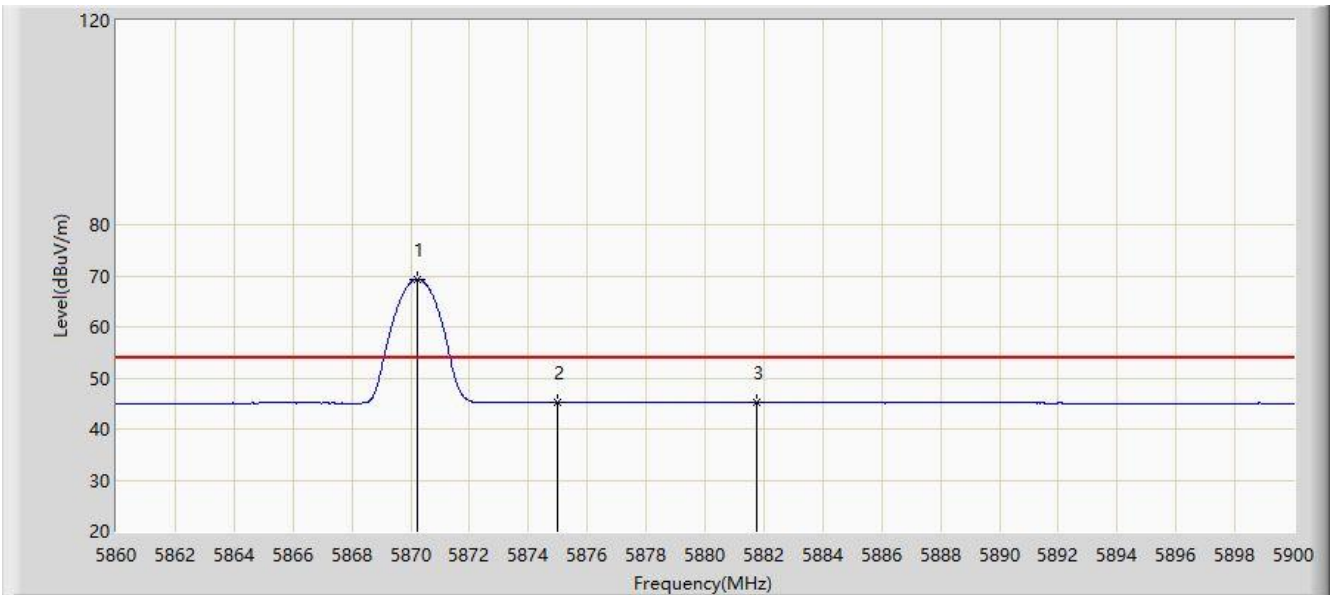


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB)	Type
1		*	5870.340	70.912	66.202	-43.088	114.000	4.709	PK
2			5875.000	58.655	53.956	-15.345	74.000	4.700	PK
3			5876.300	59.530	54.834	-14.470	74.000	4.696	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: NS-AC1	Date: 2021/05/09
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D_2111	Polarity: Vertical
EUT: Microwave	Power: AC 120V/60Hz
Note: Transmit at channel 5870MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5870.220	69.253	64.543	-24.747	94.000	4.710	AV
2			5875.000	45.172	40.473	-8.828	54.000	4.700	AV
3			5881.740	45.162	40.459	-8.838	54.000	4.704	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

6.5. 20dB Spectrum Bandwidth Measurement

6.5.1. Test Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission in the specific band (5725~5875MHz).

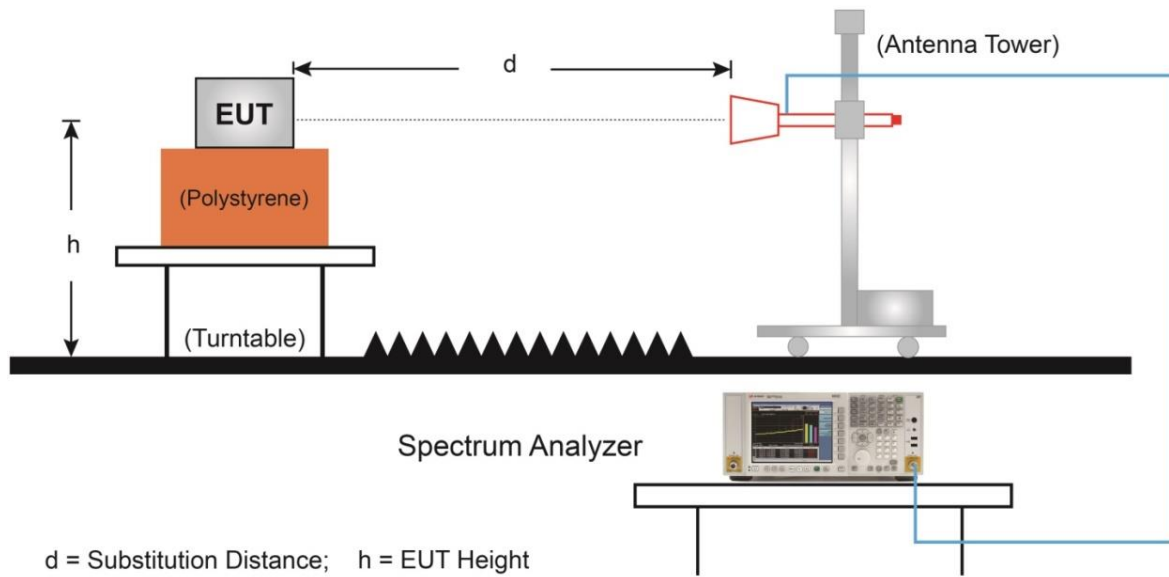
6.5.2. Test Procedure used

ANSI C63.10-2013 Section 6.9.2

6.5.3. Test Setting

1. Set RBW $\geq 1\%$ to 5% of the OBW
2. VBW = Approximately three times RBW
3. Span = Approximately 2 to 5 times the OBW, centered on a hopping channel
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

6.5.4. Test Setup



6.5.5. Test Result

Product	Microwave	Test Engineer	Dillon Diao
Test Site	NS-AC1	Test Date	2021/05/09~2021/07/20

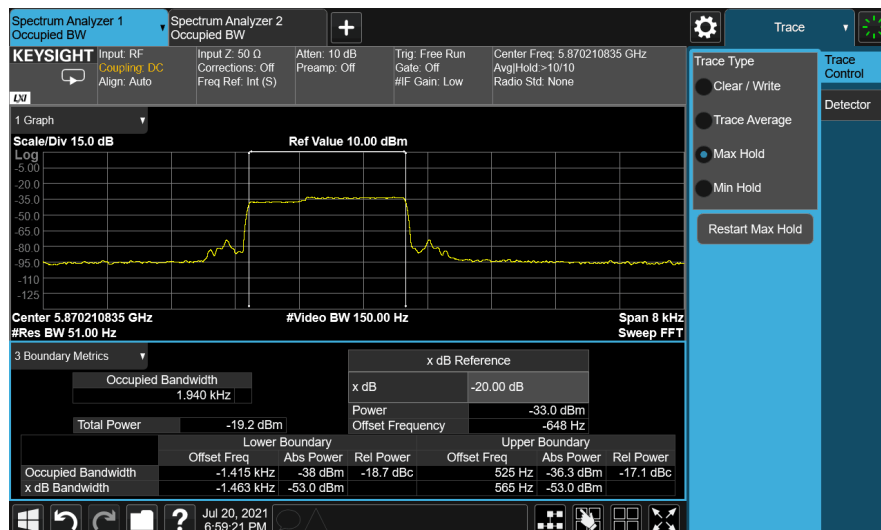
Frequency (MHz)	20dB Bandwidth (kHz)	Low Frequency Range (MHz)	High Frequency Range (MHz)	Limit (MHz)	Result
5730	2995	5728.503	--	> 5725	Pass
5870	1940	--	5870.211	< 5875	Pass

20dB Spectrum Bandwidth Measurement

5730 MHz



5870 MHz



7. CONCLUSION

The data collected relate only the item(s) tested and show that this device is in compliance with Part 15C of the FCC Rules.

Appendix A - Test Setup Photograph

Refer to “2103RSZ044-UT” file.

Appendix B - EUT Photograph

Refer to “2103RSZ044-UE” file.