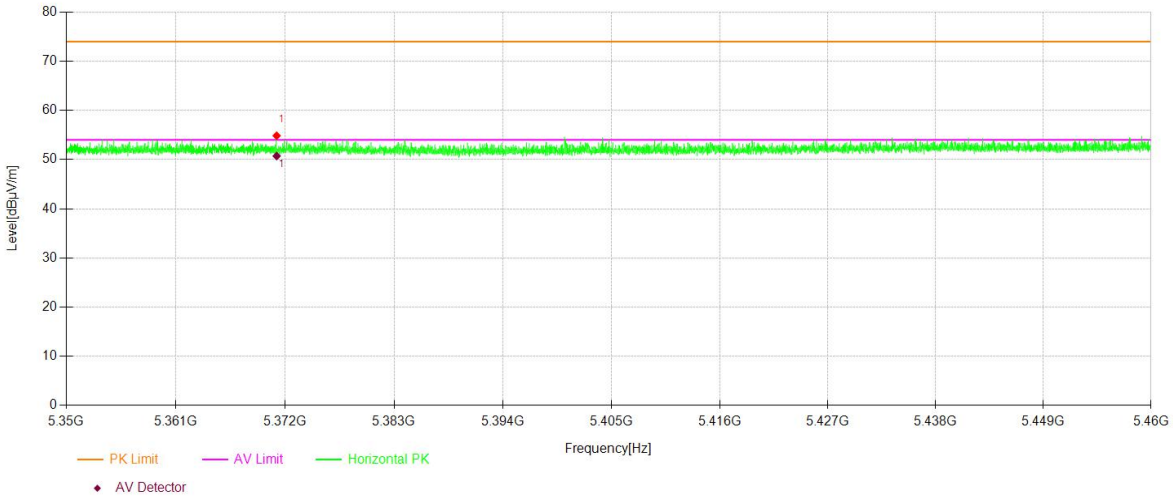
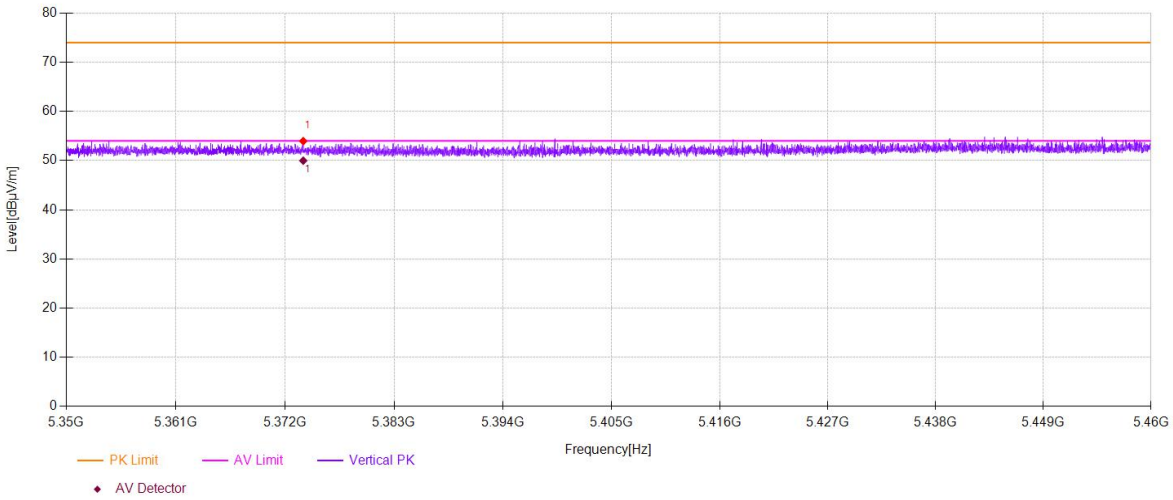
Test Model	UNII Band I Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz) ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☐ 5180 ☐ 5220 ☒ 5240 Ant.Pol H



Test Model	UNII Band I Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz) ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☐ 5180 ☐ 5220 ☒ 5240 Ant.Pol V



■ ☒For Undesirable radiated Spurious Emission in UNII Band III
All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:
☒Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency(MHz):	5745
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11519.7	V	59.77	-35.46	-27	8.46
15533.7	V	62.33	-32.9	-27	5.9
17489.7	V	66.21	-29.02	-27	2.02
12582.7	H	59.40	-35.83	-27	8.83
14530.2	H	61.67	-33.56	-27	6.56
17498.2	H	66.78	-28.45	-27	1.45

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency(MHz):	5785
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10669.3	V	59.52	-35.71	-27	8.71
14547.2	V	61.50	-33.73	-27	6.73
17498.2	V	66.90	-28.33	-27	1.33
11511.2	H	59.47	-35.76	-27	8.76
14589.7	H	61.79	-33.44	-27	6.44
17498.2	H	65.78	-29.45	-27	2.45

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency(MHz):	5825
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11502.7	V	59.51	-35.72	-27	8.72
15601.8	V	62.37	-32.86	-27	5.86
17489.7	V	67.00	-28.23	-27	1.23
11536.7	H	60.70	-34.53	-27	7.53
14555.7	H	61.84	-33.39	-27	6.39
17498.2	H	66.22	-29.01	-27	2.01

Note: (1) All Readings are Peak Value(VBW=300kHz)
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

Frequency: 802.11a		Frequency(MHz): 5745			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11519.7	V	59.77	74.00	14.23	peak
15533.7	V	62.33	74.00	11.67	peak
17489.7	V	66.21	74.00	7.79	peak
11519.75	V	46.14	54.00	7.86	AVG
15533.76	V	43.11	54.00	10.89	AVG
17489.74	V	45.09	54.00	8.91	AVG
12582.7	H	59.40	74.00	14.60	peak
14530.2	H	61.67	74.00	12.33	peak
17498.2	H	66.78	74.00	7.22	peak
12582.79	H	48.58	54.00	5.42	AVG
14530.26	H	44.65	54.00	9.35	AVG
17498.24	H	44.65	54.00	9.35	AVG

Frequency: 802.11a		Frequency(MHz): 5785			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10669.3	V	59.52	74.00	14.48	peak
14547.2	V	61.50	74.00	12.50	peak
17498.2	V	66.90	74.00	7.10	peak
10669.33	V	46.30	54.00	7.70	AVG
14547.27	V	45.05	54.00	8.95	AVG
17498.24	V	45.20	54.00	8.80	AVG
11511.2	H	59.47	74.00	14.53	peak
14589.7	H	61.79	74.00	12.21	peak
17498.2	H	65.78	74.00	8.22	peak
11511.25	H	46.62	54.00	7.38	AVG
14589.79	H	45.13	54.00	8.87	AVG
17498.24	H	45.20	54.00	8.80	AVG

Frequency: 802.11a		Frequency(MHz): 5825			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11502.7	V	59.51	74.00	14.49	peak
15601.8	V	62.37	74.00	11.63	peak
17489.7	V	67.00	74.00	7.00	peak
11502.75	V	46.67	54.00	7.33	AVG
15601.80	V	43.68	54.00	10.32	AVG
17489.7	V	44.33	54.00	9.67	AVG
11536.7	H	60.70	74.00	13.30	peak
14555.7	H	61.84	74.00	12.16	peak
17498.2	H	66.22	74.00	7.78	peak
11536.76	H	46.49	54.00	7.51	AVG
14555.77	H	45.49	54.00	8.51	AVG
17498.24	H	45.31	54.00	8.69	AVG

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor +Cable Loss.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4)Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

- ☒ Undesirable radiated Spurious Emission in band edge

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency:	5745
Test mode:	802.11a		

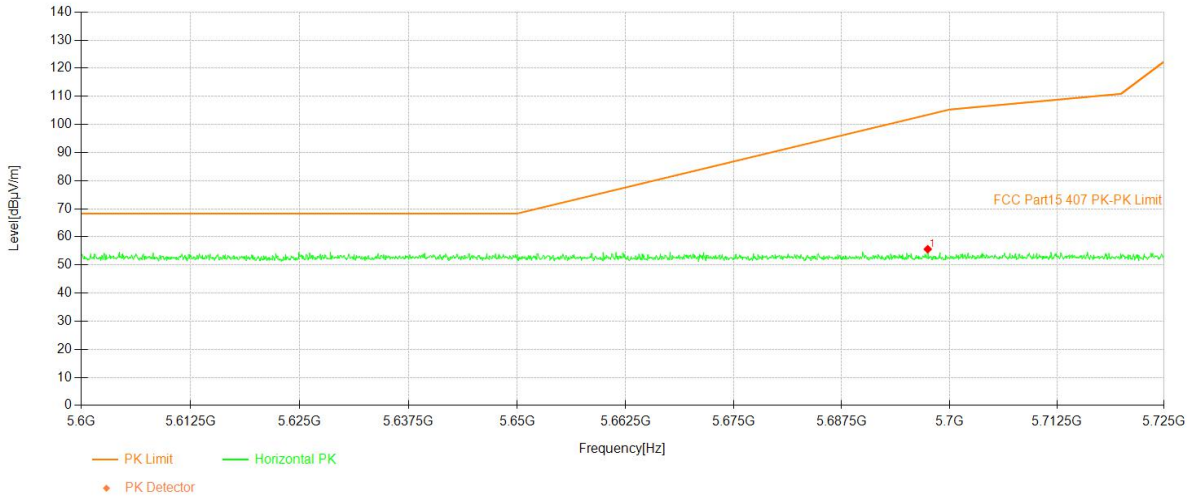
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5697.48	H	55.62	-39.61	27.0	PASS
5713.05	V	54.82	-40.41	27.0	PASS

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency:	5825
Test mode:	802.11a		

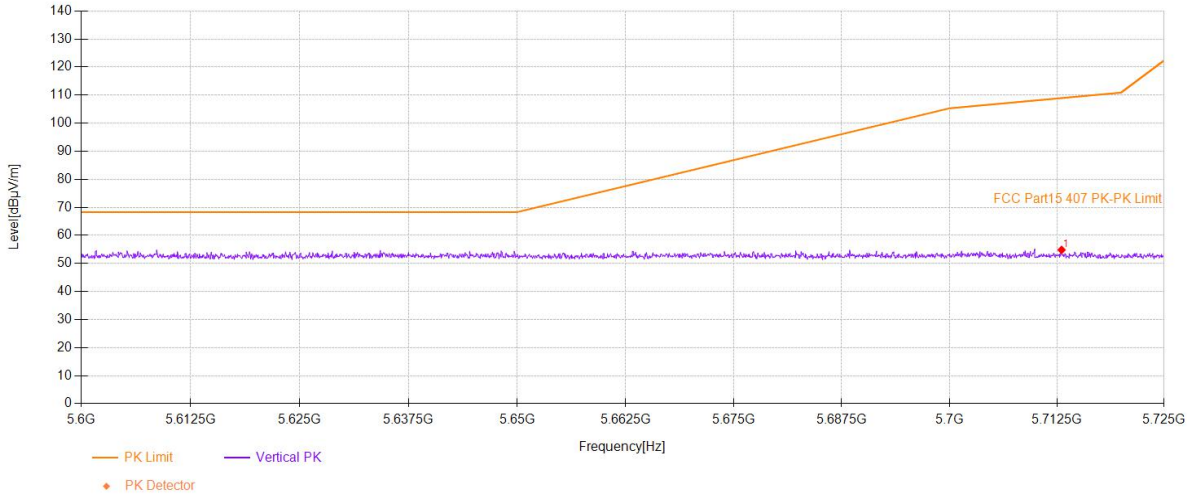
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5850.12	H	58.31	-36.92	27.0	PASS
5850.93	V	56.48	-38.75	27.0	PASS

Note: (1) All Readings are Peak Value (VBW=3MHz)
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

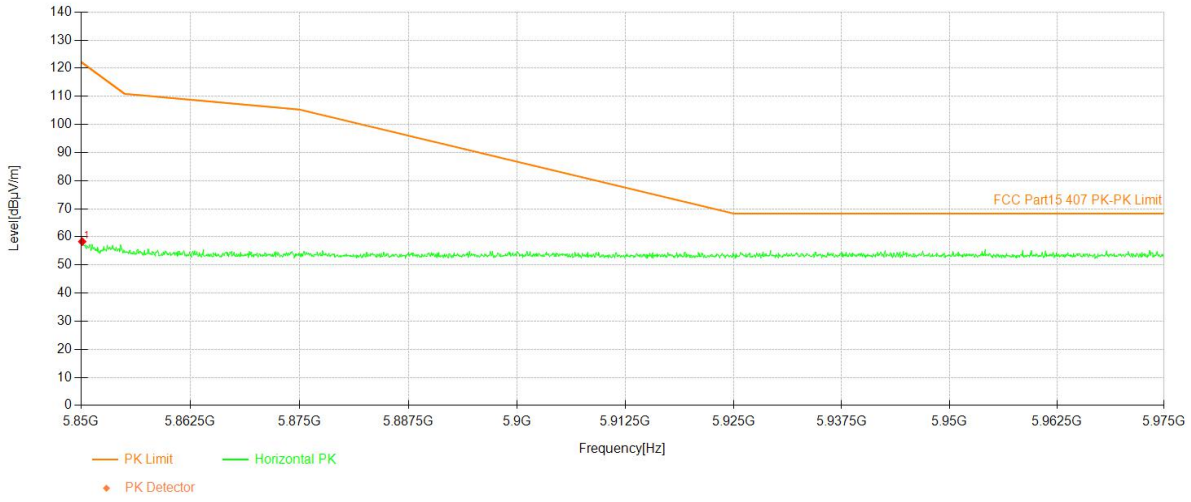
Test Model	UNII Band III Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5745 Ant.Pol H



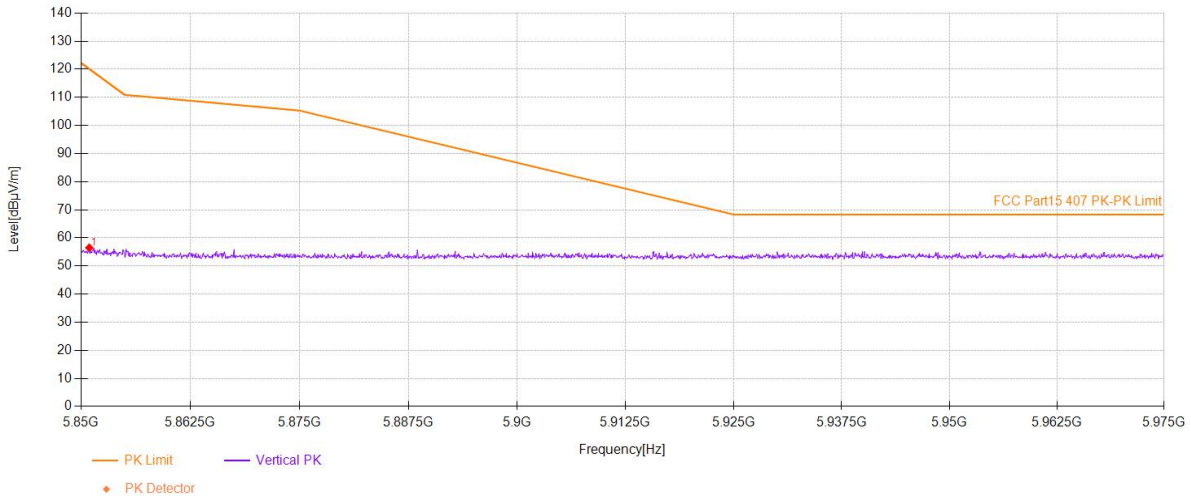
Test Model	UNII Band III Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5745 Ant.Pol V



Test Model	UNII Band III Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5825 Ant.Pol H

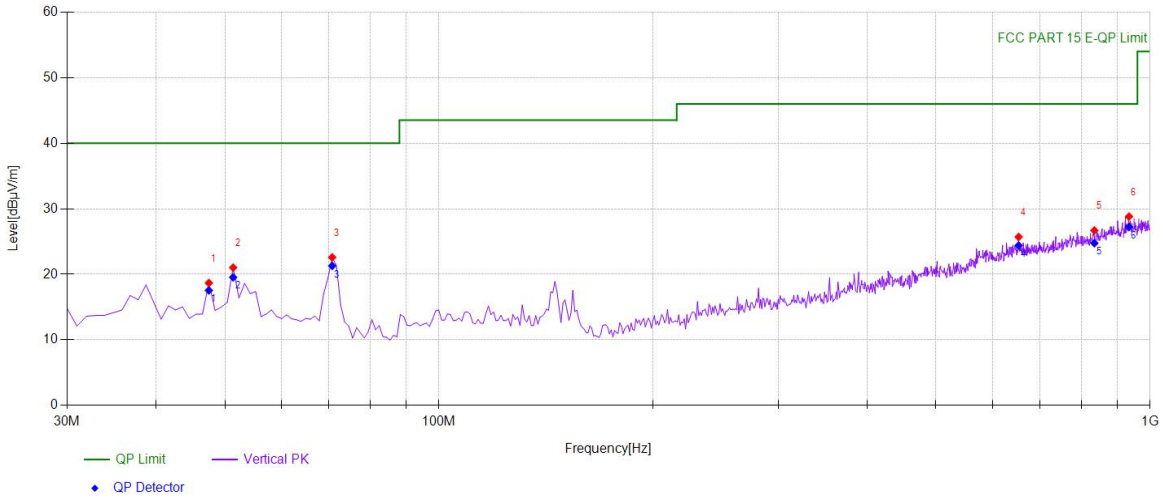


Test Model	UNII Band III Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5825 Ant.Pol V

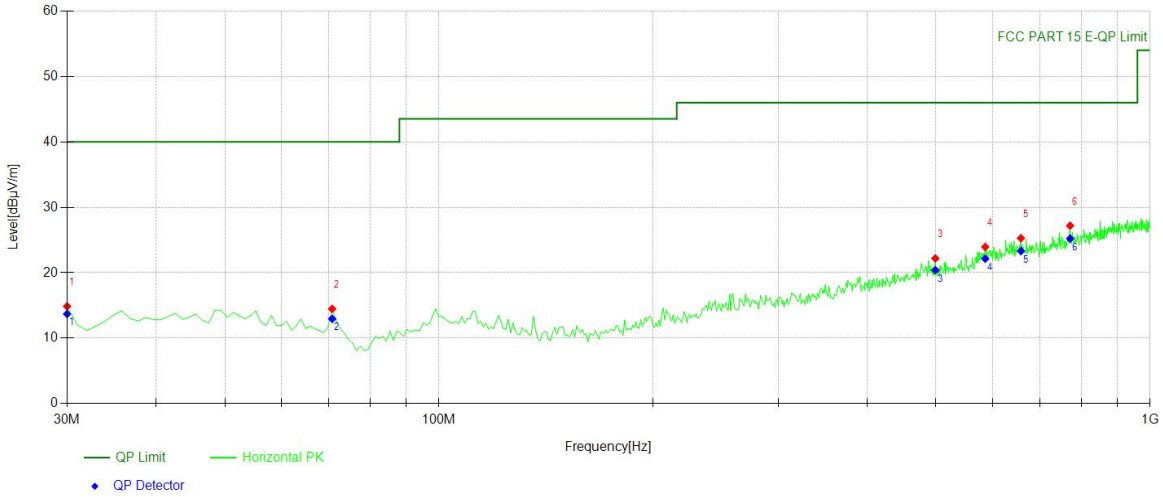


- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)
  All modes have been tested, and the worst result recorded was report as below:

Test mode:	802.11a	Frequency:	5180

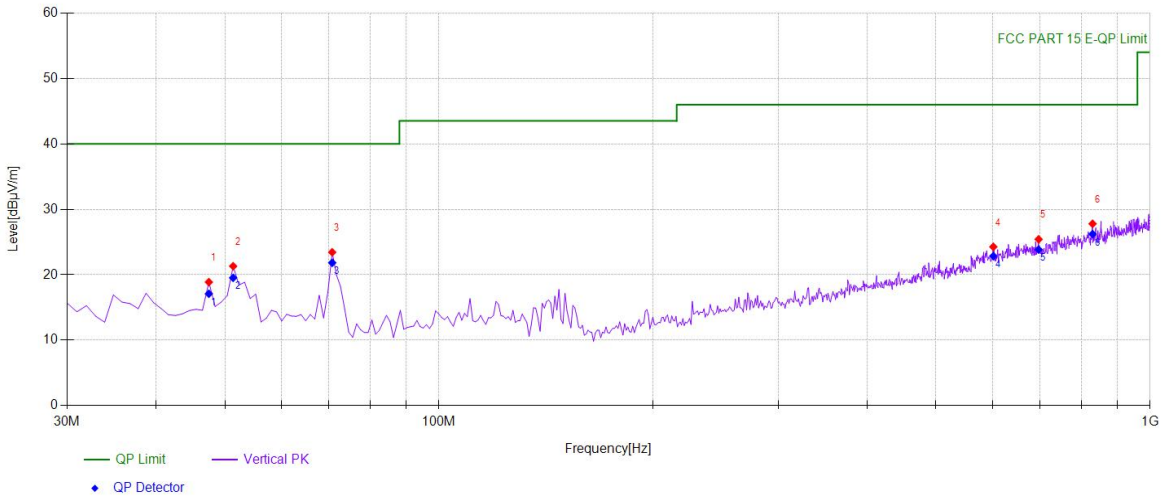


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	36.07	-17.39	18.68	PK	40.00	21.32	Vertical
2	51.3614	38.42	-17.39	21.03	PK	40.00	18.97	Vertical
3	70.7808	42.67	-20.08	22.59	PK	40.00	17.41	Vertical
4	653.363	31.89	-6.19	25.70	PK	46.00	20.30	Vertical
5	834.934	30.68	-3.99	26.69	PK	46.00	19.31	Vertical
6	933.974	31.36	-2.55	28.81	PK	46.00	17.19	Vertical

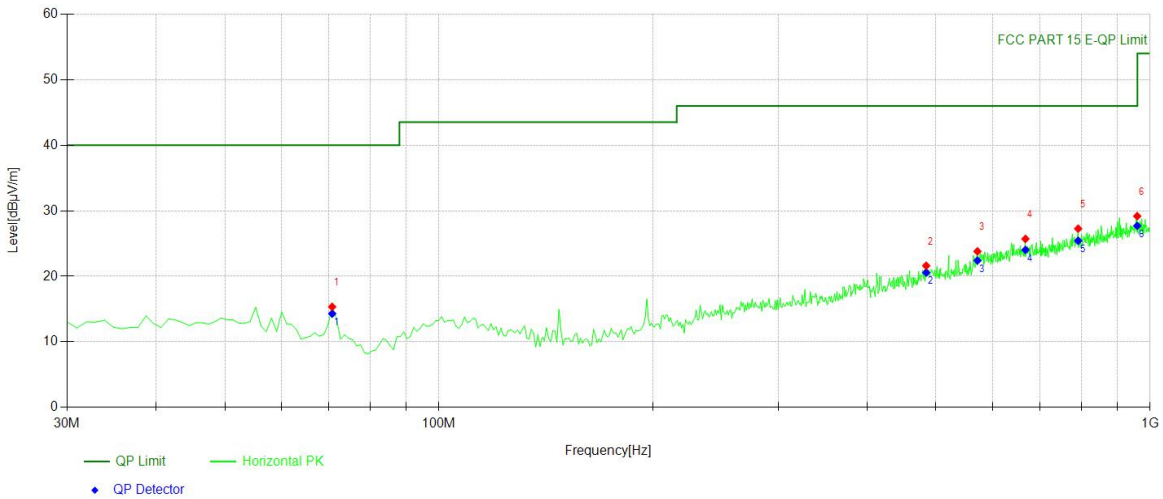


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	30	33.40	-18.53	14.87	PK	40.00	25.13	Horizontal
2	70.7808	34.56	-20.08	14.48	PK	40.00	25.52	Horizontal
3	498.979	31.95	-9.76	22.19	PK	46.00	23.81	Horizontal
4	586.366	31.09	-7.14	23.95	PK	46.00	22.05	Horizontal
5	658.218	31.44	-6.15	25.29	PK	46.00	20.71	Horizontal
6	771.821	32.13	-4.94	27.19	PK	46.00	18.81	Horizontal

Test mode:	802.11a	Frequency:	5220

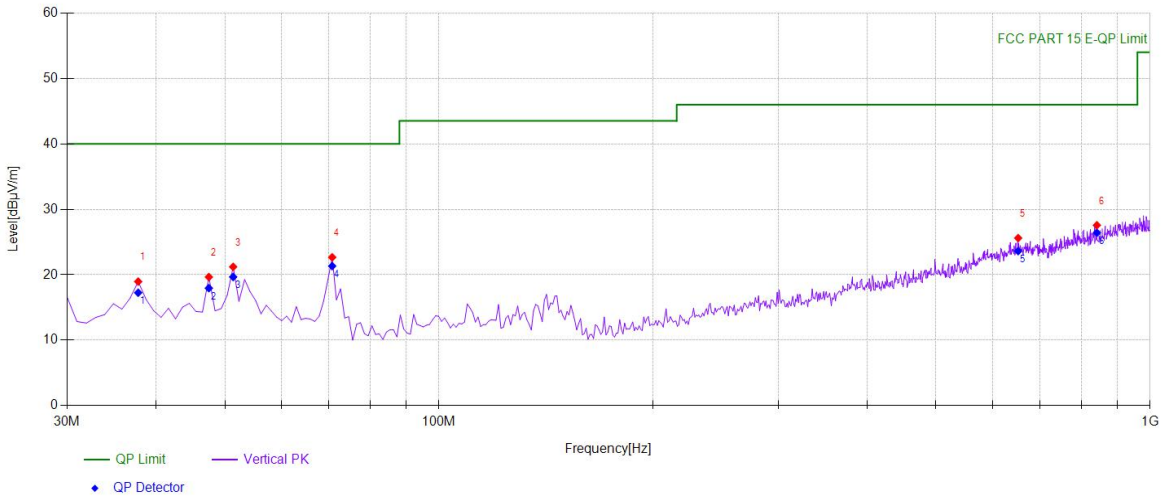


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	36.27	-17.39	18.88	PK	40.00	21.12	Vertical
2	51.3614	38.70	-17.39	21.31	PK	40.00	18.69	Vertical
3	70.7808	43.52	-20.08	23.44	PK	40.00	16.56	Vertical
4	601.9010	31.40	-7.13	24.27	PK	46.00	21.73	Vertical
5	697.0571	31.39	-5.97	25.42	PK	46.00	20.58	Vertical
6	830.0801	31.91	-4.12	27.79	PK	46.00	18.21	Vertical

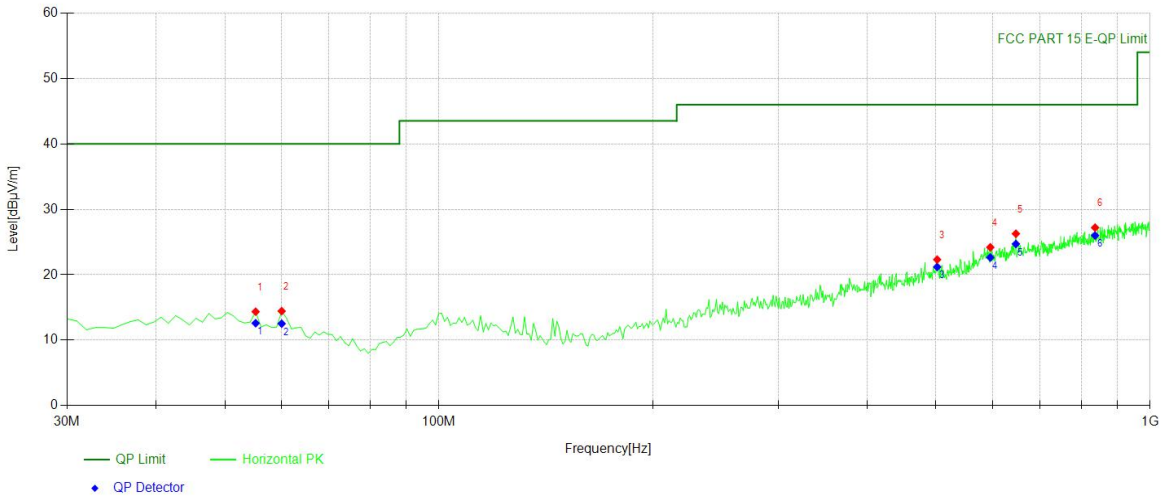


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	70.7808	35.43	-20.08	15.35	PK	40.00	24.65	Horizontal
2	484.414	31.40	-9.79	21.61	PK	46.00	24.39	Horizontal
3	571.801	31.70	-7.89	23.81	PK	46.00	22.19	Horizontal
4	667.927	31.86	-6.15	25.71	PK	46.00	20.29	Horizontal
5	792.212	31.77	-4.50	27.27	PK	46.00	18.73	Horizontal
6	959.219	31.46	-2.28	29.18	PK	46.00	16.82	Horizontal

Test mode:	802.11a	Frequency:	5240



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	37.7678	37.01	-18.05	18.96	PK	40.00	21.04	Vertical
2	47.4775	37.05	-17.39	19.66	PK	40.00	20.34	Vertical
3	51.3614	38.60	-17.39	21.21	PK	40.00	18.79	Vertical
4	70.7808	42.75	-20.08	22.67	PK	40.00	17.33	Vertical
5	652.392	31.81	-6.20	25.61	PK	46.00	20.39	Vertical
6	841.731	31.42	-3.85	27.57	PK	46.00	18.43	Vertical



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	55.2452	32.27	-17.91	14.36	PK	40.00	25.64	Horizontal
2	60.1001	33.01	-18.56	14.45	PK	40.00	25.55	Horizontal
3	501.891	32.08	-9.76	22.32	PK	46.00	23.68	Horizontal
4	596.076	31.34	-7.14	24.20	PK	46.00	21.80	Horizontal
5	647.537	32.50	-6.23	26.27	PK	46.00	19.73	Horizontal
6	836.876	31.14	-3.94	27.20	PK	46.00	18.80	Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		31.3442	37.14	-14.50	22.64	40.00	-17.36	QP			
2	*	50.4310	42.60	-11.96	30.64	40.00	-9.36	QP			
3		57.5434	37.62	-12.08	25.54	40.00	-14.46	QP			
4		77.4230	39.19	-14.55	24.64	40.00	-15.36	QP			
5		138.6300	37.12	-14.37	22.75	43.50	-20.75	QP			
6		855.1484	29.30	2.55	31.85	46.00	-14.15	QP			

8.5 POWER LINE CONDUCTED EMISSIONS

8.5.1 Applicable Standard

According to FCC Part 15.207(a)

8.5.2 Conformance Limit

Conducted Emission Limit		
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.

8.5.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

8.5.4 Test Procedure

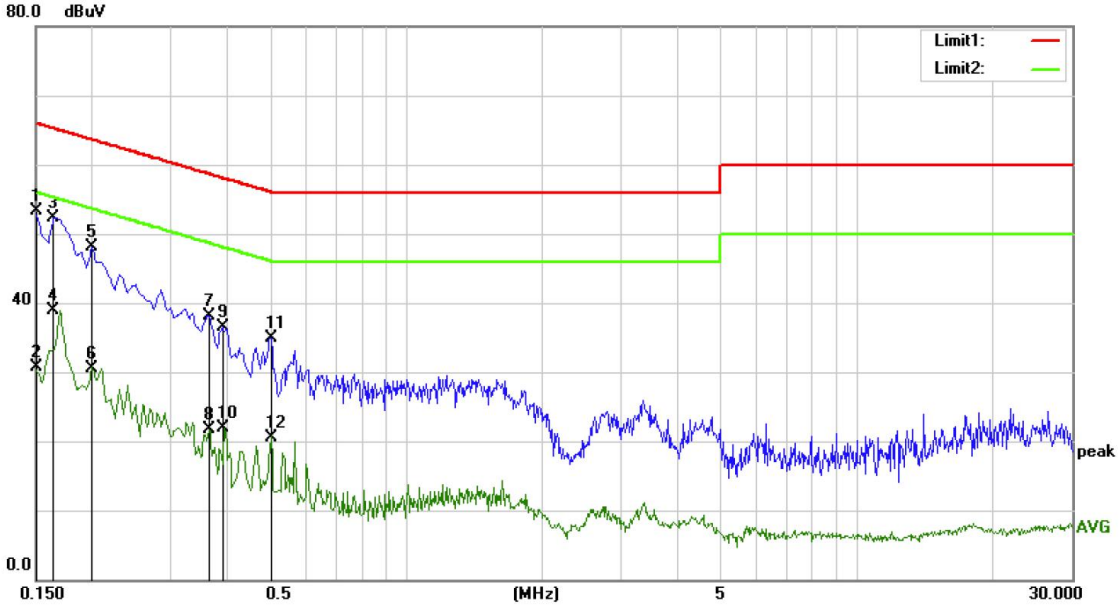
The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

8.5.5 Test Results

Pass

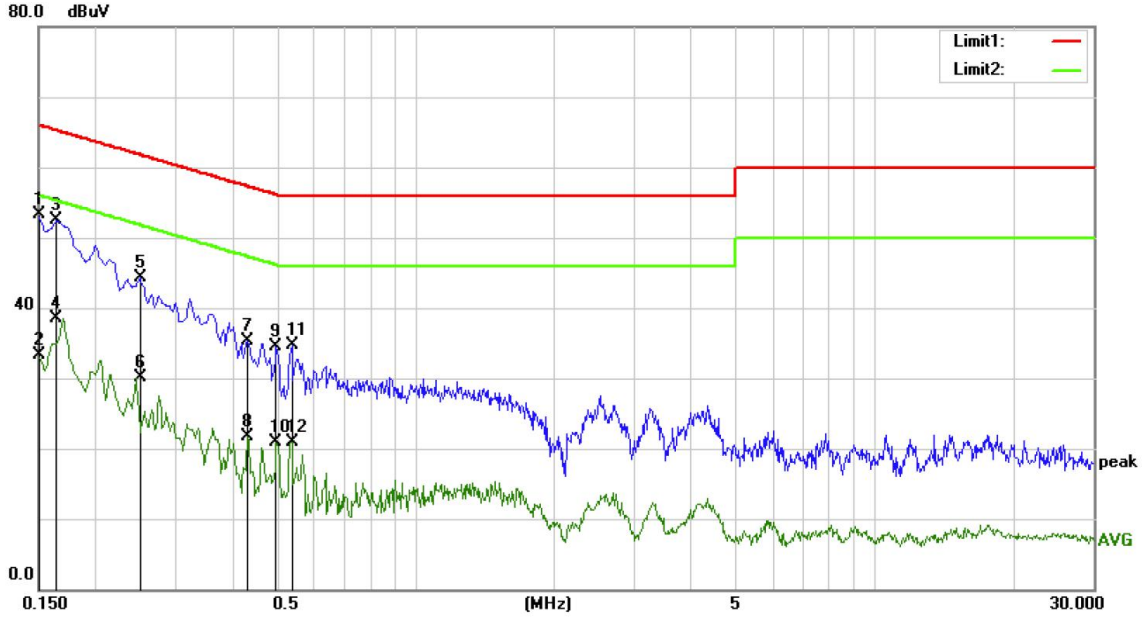
The 120V &240V voltagehave been tested, and the worst result recorded was report as below.

Temperature :	21.9℃	ATM Pressure:	1011 mbar
Humidity :	58 %	Test Engineer:	KK



Site Conduction #1 Phase: *L1* Temperature: 21.9

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	43.59	9.78	53.37	66.00	-12.63	QP	
2		0.1500	20.84	9.78	30.62	56.00	-25.38	AVG	
3		0.1650	42.48	9.85	52.33	65.21	-12.88	QP	
4		0.1650	29.01	9.85	38.86	55.21	-16.35	AVG	
5		0.2000	38.18	10.00	48.18	63.61	-15.43	QP	
6		0.2000	20.60	10.00	30.60	53.61	-23.01	AVG	
7		0.3650	28.16	9.92	38.08	58.61	-20.53	QP	
8		0.3650	11.73	9.92	21.65	48.61	-26.96	AVG	
9		0.3900	26.56	9.88	36.44	58.06	-21.62	QP	
10		0.3900	12.03	9.88	21.91	48.06	-26.15	AVG	
11		0.5000	25.12	9.84	34.96	56.00	-21.04	QP	
12		0.5000	10.76	9.84	20.60	46.00	-25.40	AVG	



Site Conduction #1 Phase: *N* Temperature: 21.9

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	43.44	9.78	53.22	66.00	-12.78	QP	
2		0.1500	23.59	9.78	33.37	56.00	-22.63	AVG	
3	*	0.1650	42.65	9.85	52.50	65.21	-12.71	QP	
4		0.1650	28.57	9.85	38.42	55.21	-16.79	AVG	
5		0.2500	34.25	10.01	44.26	61.76	-17.50	QP	
6		0.2500	20.04	10.01	30.05	51.76	-21.71	AVG	
7		0.4300	25.52	9.85	35.37	57.25	-21.88	QP	
8		0.4300	11.77	9.85	21.62	47.25	-25.63	AVG	
9		0.4950	24.73	9.84	34.57	56.08	-21.51	QP	
10		0.4950	11.15	9.84	20.99	46.08	-25.09	AVG	
11		0.5350	24.89	9.85	34.74	56.00	-21.26	QP	
12		0.5350	11.09	9.85	20.94	46.00	-25.06	AVG	

8.6 ANTENNA APPLICATION

8.6.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 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. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

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 15.407 (a), 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.

8.6.2 Result

PASS

Temperature :	25℃	ATM Pressure:	1011 mbar
Humidity :	60 %	Test Engineer:	XXH

The EUT is integrated antenna, the antenna gain as below:

B1: 5150-5250MHz：0.8dBi

B4: 5725-5850MHz：1.6dBi

☒ Antennas use a permanently attached antenna which is not replaceable.

☐ Not using a standard antenna jack or electrical connector for antenna replacement

☐ The antenna has to be professionally installed (please provide method of installation)

Which in accordance to section 15.203, please refer to the internal photos.

Detail of factor for radiated emission

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

--- End of Report ---

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