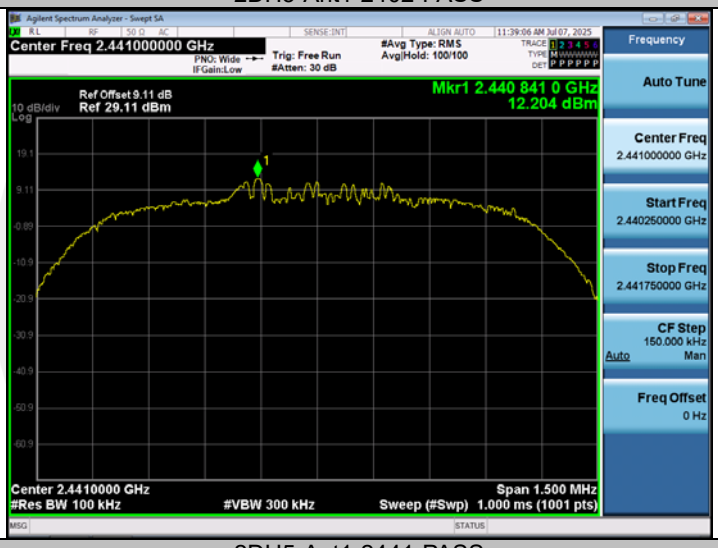
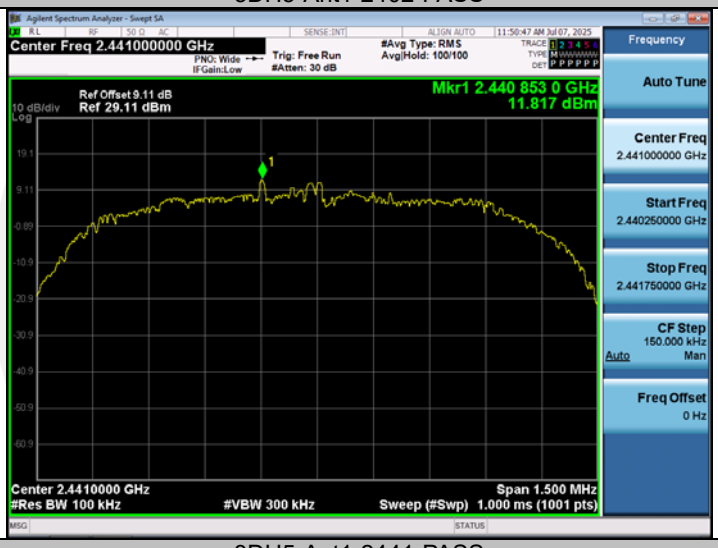
2DH5-Ant1-2402-PASS



2DH5-Ant1-2441-PASS

2DH5-Ant1-2480-PASS

3DH5-Ant1-2402-PASS

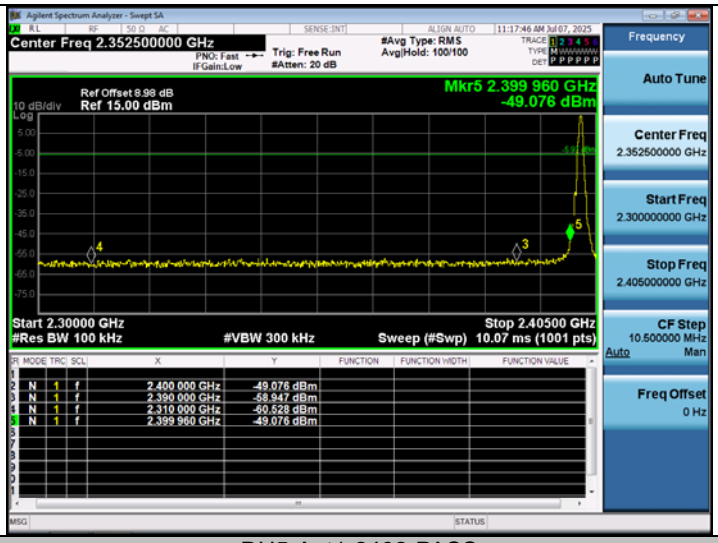


3DH5-Ant1-2441-PASS

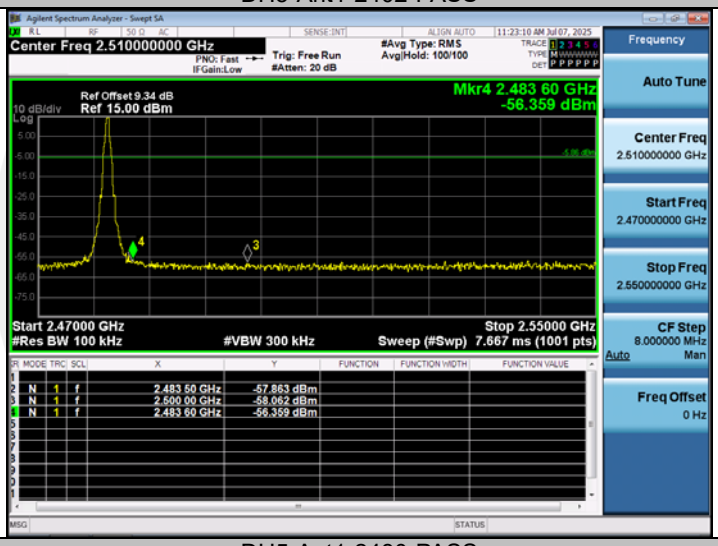
3DH5-Ant1-2480-PASS

Band edge measurements

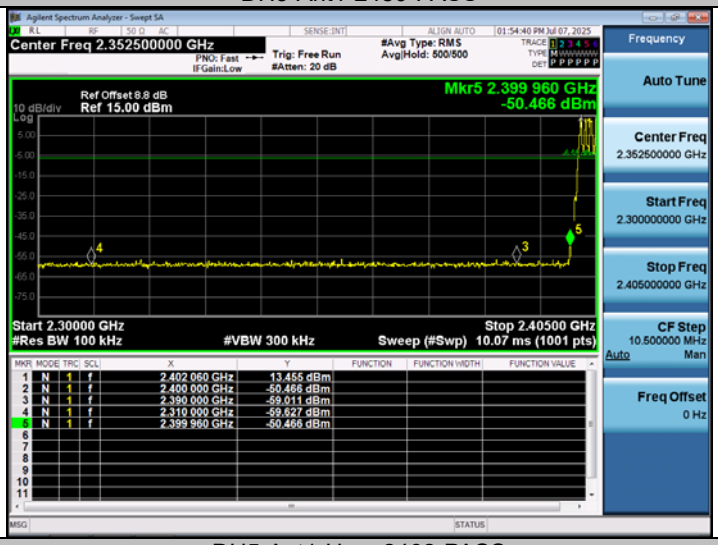
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	14.03	-49.08	≤-5.97	PASS
		High	2480	14.14	-56.36	≤-5.86	PASS
		Low	Hop_2402	13.46	-50.47	≤-6.55	PASS
		High	Hop_2480	13.87	-56.71	≤-6.14	PASS
2DH5	Ant1	Low	2402	12.22	-47.47	≤-7.78	PASS
		High	2480	11.73	-56.91	≤-8.27	PASS
		Low	Hop_2402	9.61	-44.9	≤-10.39	PASS
		High	Hop_2480	12.89	-56.34	≤-7.11	PASS
3DH5	Ant1	Low	2402	12.04	-46.55	≤-7.96	PASS
		High	2480	11.98	-55.87	≤-8.02	PASS
		Low	Hop_2402	9.77	-43.83	≤-10.23	PASS
		High	Hop_2480	13.72	-56.25	≤-6.28	PASS



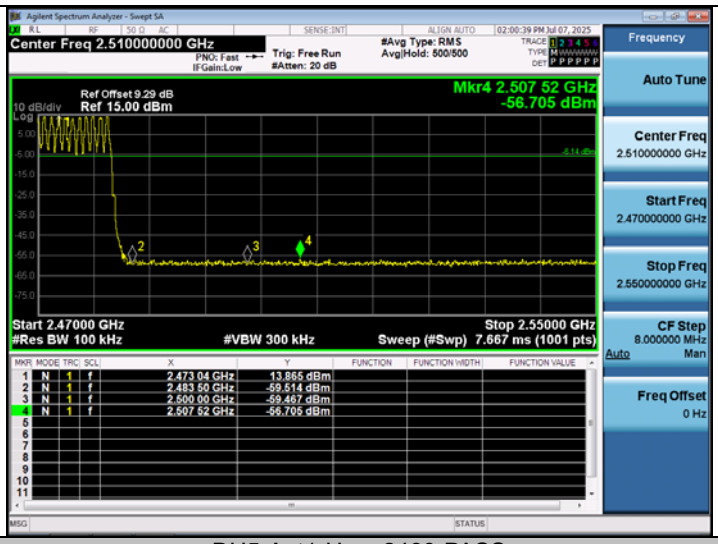
DH5-Ant1-2402-PASS



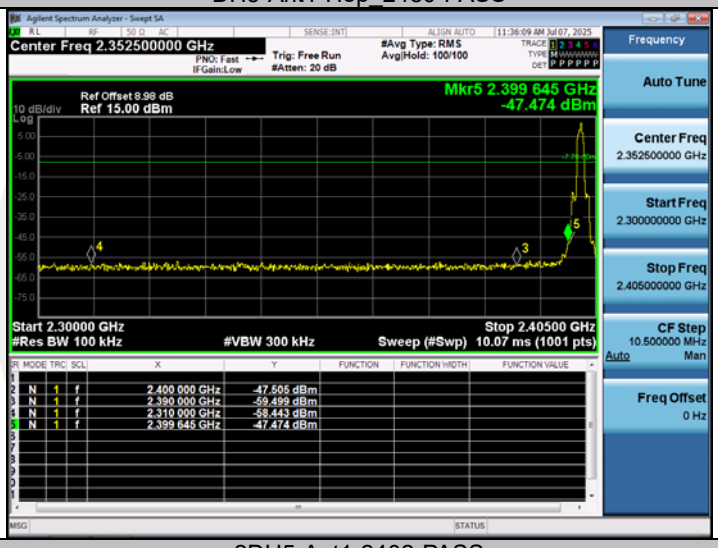
DH5-Ant1-2480-PASS



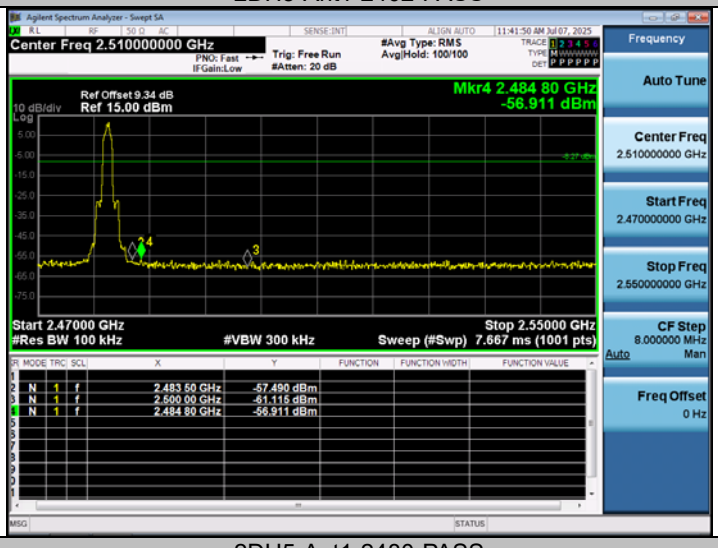
DH5-Ant1-Hop_2402-PASS



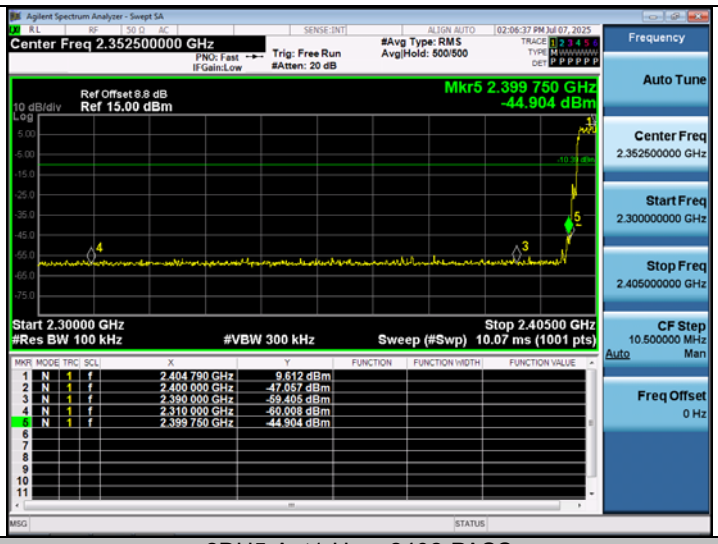
DH5-Ant1-Hop_2480-PASS



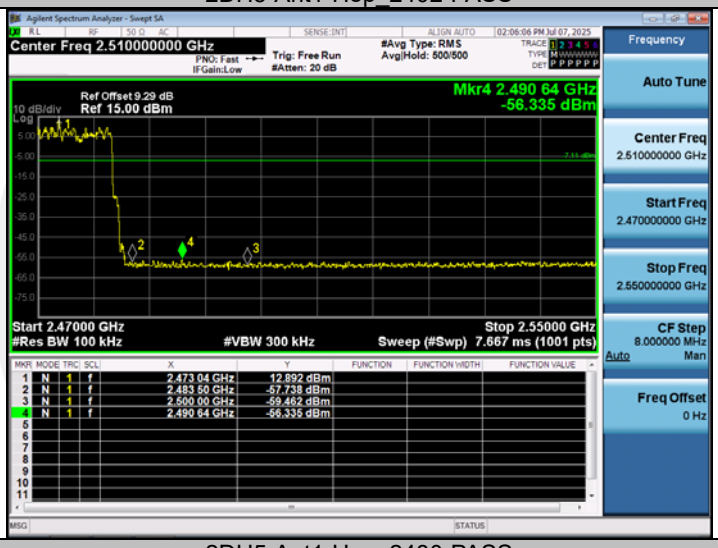
2DH5-Ant1-2402-PASS



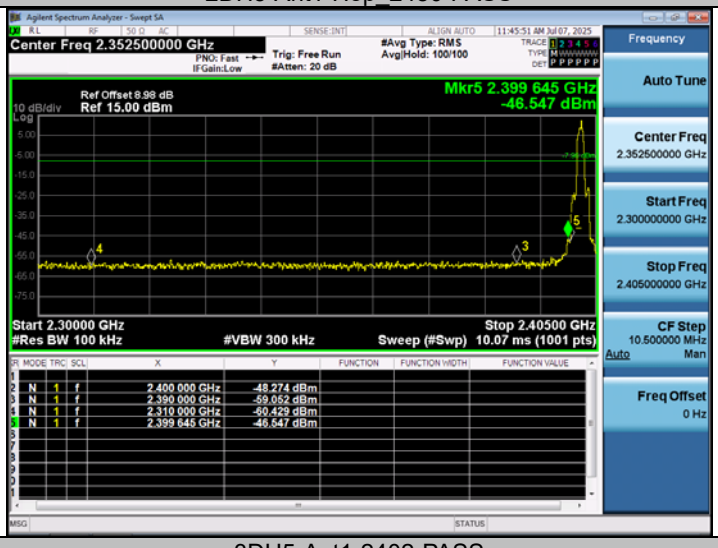
2DH5-Ant1-2480-PASS



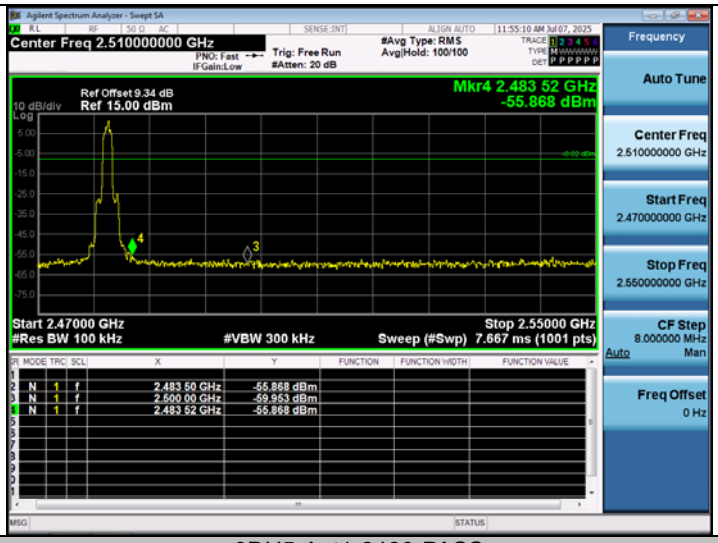
2DH5-Ant1-Hop_2402-PASS



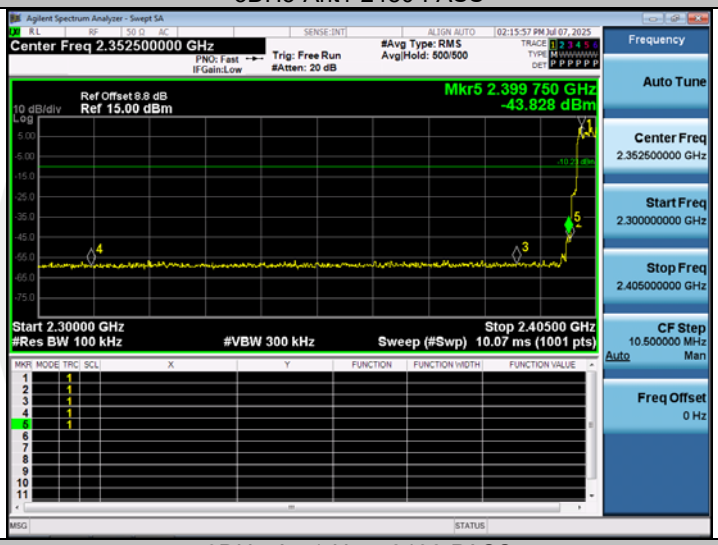
2DH5-Ant1-Hop_2480-PASS



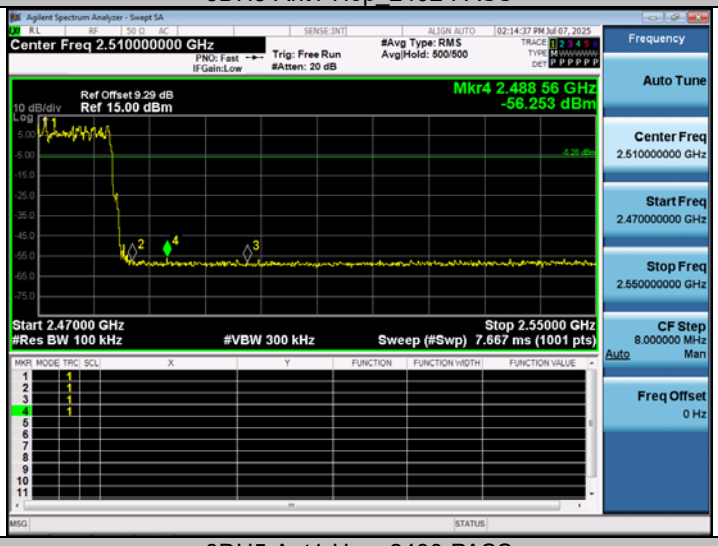
3DH5-Ant1-2402-PASS



3DH5-Ant1-2480-PASS



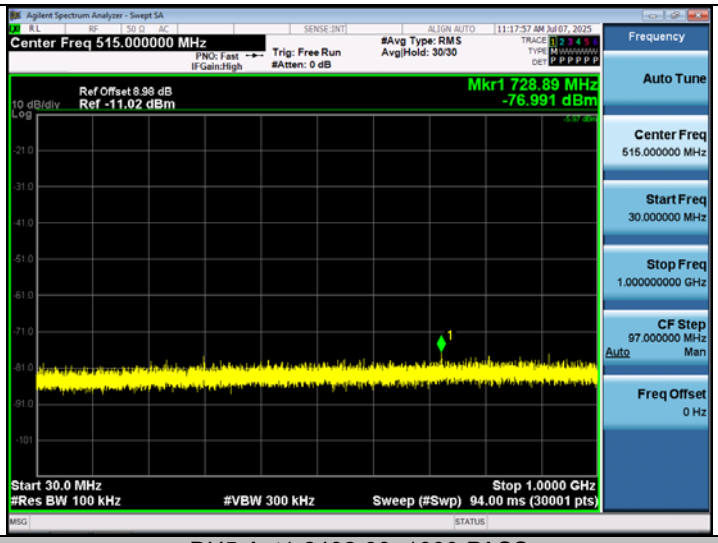
3DH5-Ant1-Hop_2402-PASS



3DH5-Ant1-Hop_2480-PASS

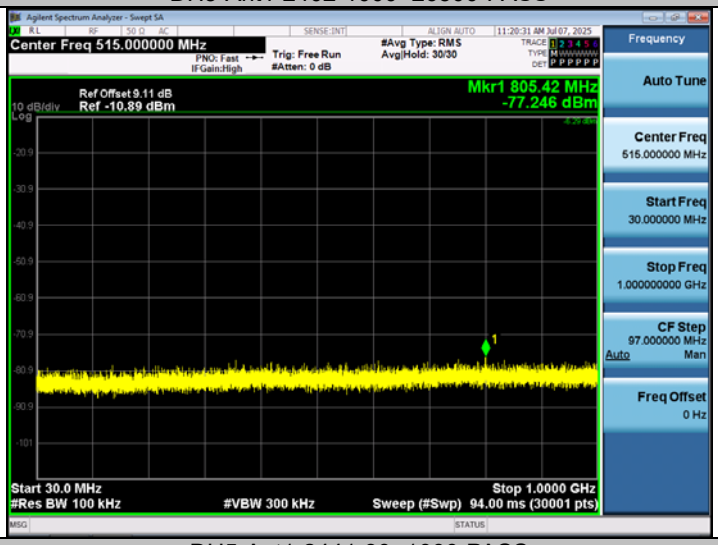
Conduceted Spurious Emission

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	14.03	-76.99	≤-5.97	PASS
			1000~26500	14.03	-49.94	≤-5.97	PASS
		2441	30~1000	13.71	-77.25	≤-6.29	PASS
			1000~26500	13.71	-49.5	≤-6.29	PASS
		2480	30~1000	14.14	-77.4	≤-5.86	PASS
			1000~26500	14.14	-49.56	≤-5.86	PASS
2DH5	Ant1	2402	30~1000	12.22	-78.8	≤-7.78	PASS
			1000~26500	12.22	-50.1	≤-7.78	PASS
		2441	30~1000	12.20	-78.61	≤-7.8	PASS
			1000~26500	12.20	-49.87	≤-7.8	PASS
		2480	30~1000	11.73	-78.23	≤-8.27	PASS
			1000~26500	11.73	-49.42	≤-8.27	PASS
3DH5	Ant1	2402	30~1000	12.04	-78.57	≤-7.96	PASS
			1000~26500	12.04	-50.22	≤-7.96	PASS
		2441	30~1000	11.82	-78.59	≤-8.18	PASS
			1000~26500	11.82	-50.19	≤-8.18	PASS
		2480	30~1000	11.98	-78.7	≤-8.02	PASS
			1000~26500	11.98	-49.79	≤-8.02	PASS



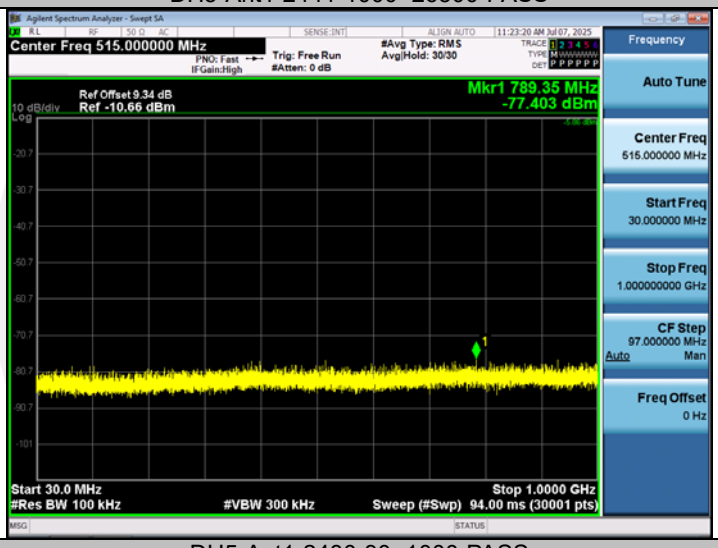
DH5-Ant1-2402-30~1000-PASS

DH5-Ant1-2402-1000~26500-PASS



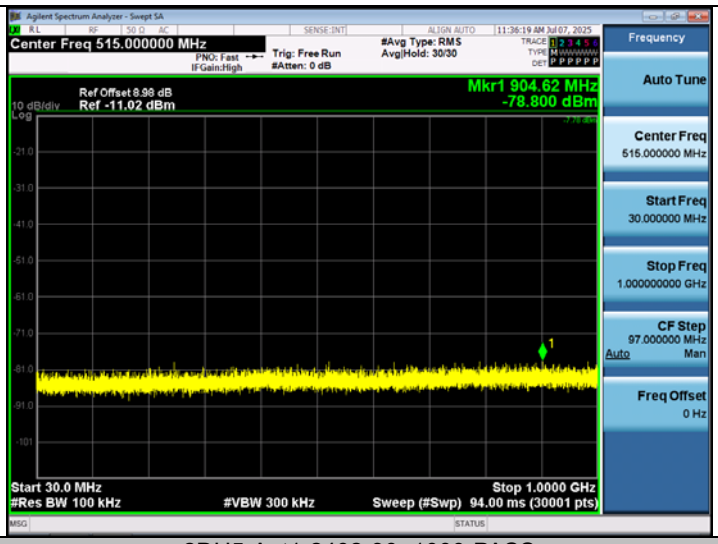
DH5-Ant1-2441-30~1000-PASS

DH5-Ant1-2441-1000~26500-PASS



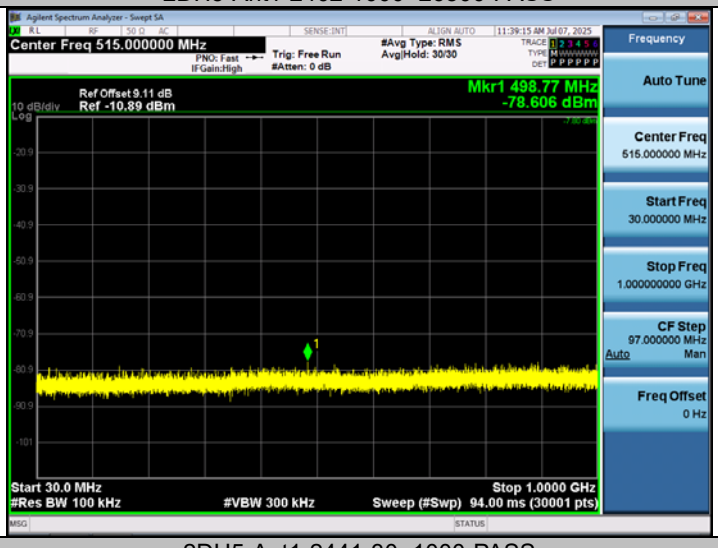
DH5-Ant1-2480-30~1000-PASS

DH5-Ant1-2480-1000~26500-PASS



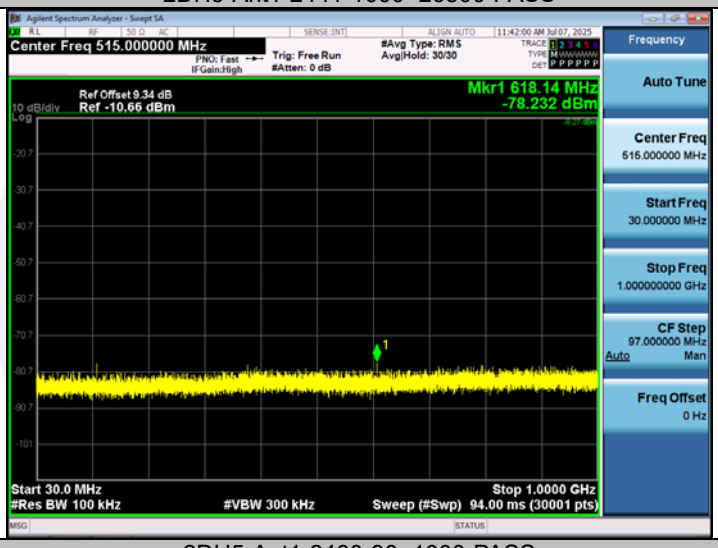
2DH5-Ant1-2402-30~1000-PASS

2DH5-Ant1-2402-1000~26500-PASS



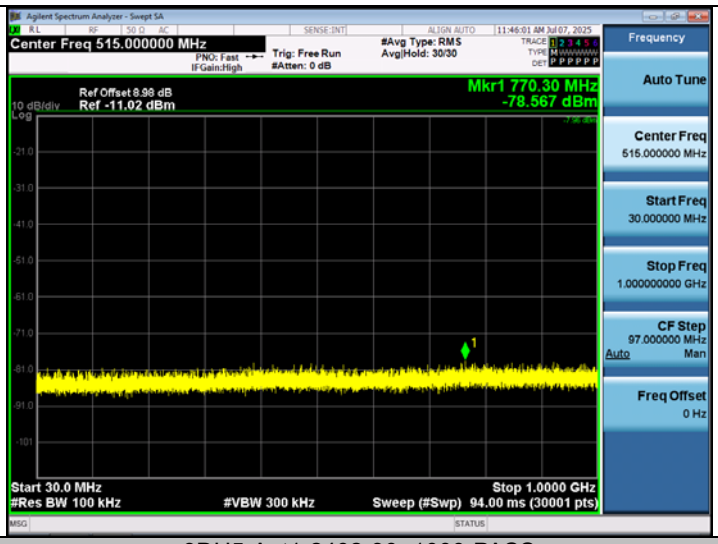
2DH5-Ant1-2441-30~1000-PASS

2DH5-Ant1-2441-1000~26500-PASS



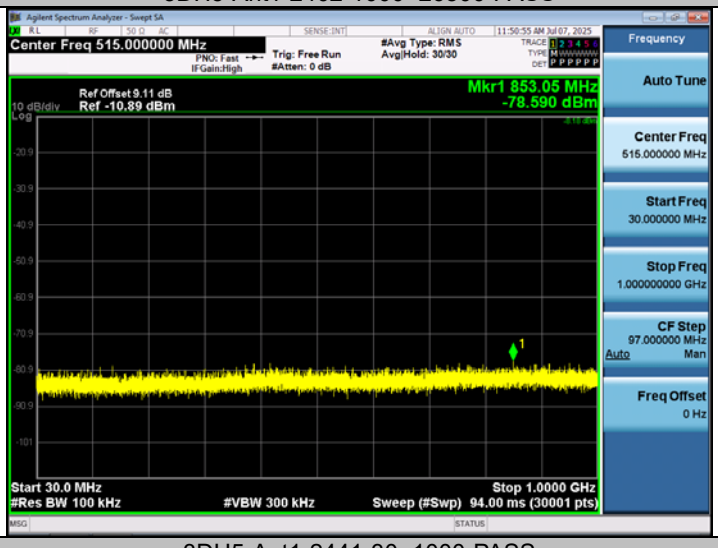
2DH5-Ant1-2480-30~1000-PASS

2DH5-Ant1-2480-1000~26500-PASS



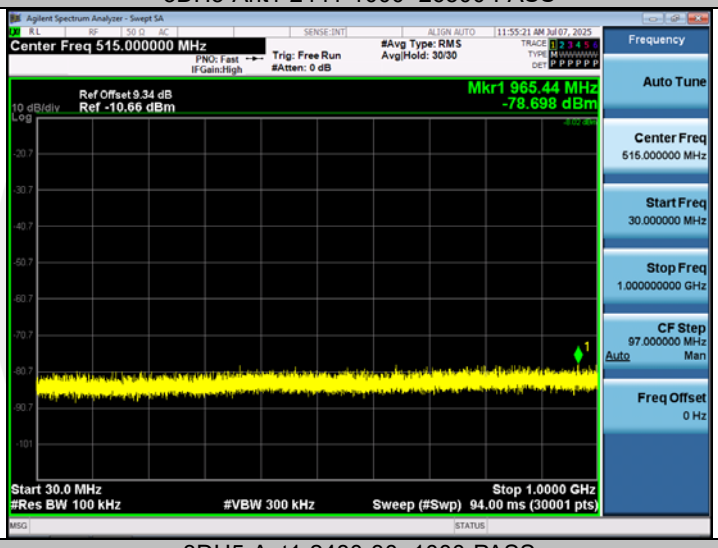
3DH5-Ant1-2402-30~1000-PASS

3DH5-Ant1-2402-1000~26500-PASS



3DH5-Ant1-2441-30~1000-PASS

3DH5-Ant1-2441-1000~26500-PASS



3DH5-Ant1-2480-30~1000-PASS

3DH5-Ant1-2480-1000~26500-PASS

9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.7.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	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	Above 38.6
13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
For Above 1GHz:
The EUT was placed on a turn table which is 1.5m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz
VBW ≥ RBW

Sweep = auto
Detector function = peak
Trace = max hold
For Below 1GHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 100 kHz for
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 30MHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 9kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 150KHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 200Hz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

9.7.5 Test Results

Pass

■ Spurious Emission below 30MHz (9KHz to 30MHz)

Temperature:	25° C
Relative Humidity:	60%
ATM Pressure:	1011 mbar

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

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

■ Spurious Emission Above 1GHz (1GHz to 25GHz)

Bluetooth (GFSK, π/4-DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below:

Test mode: GFSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8205	V	56.35	74.00	17.65	peak
11508.75	V	64.37	74.00	9.63	peak
17272.5	V	67.16	74.00	6.84	peak
8205	V	39.80	54.00	14.20	AVG
11508.75	V	44.86	54.00	9.14	AVG
17272.5	V	45.52	54.00	8.48	AVG
4803.75	H	47.95	74.00	26.05	peak
9973.125	H	62.02	74.00	11.98	peak
16441.875	H	66.58	74.00	7.42	peak
4803.75	H	42.72	54.00	11.28	AVG
9973.125	H	42.49	54.00	11.51	AVG
16441.875	H	45.16	54.00	8.84	AVG

Test mode: GFSK Frequency: Channel 39: 2441MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7321.875	V	54.53	74.00	19.47	peak
10102.5	V	58.83	74.00	15.17	peak
17576.25	V	66.59	74.00	7.41	peak
7321.875	V	42.65	54.00	11.35	AVG
10102.5	V	41.85	54.00	12.15	AVG
17576.25	V	46.39	54.00	7.61	AVG
7323.75	H	54.88	74.00	19.12	peak
11548.125	H	60.17	74.00	13.83	peak
17986.875	H	67.37	74.00	6.63	peak
7323.75	H	46.36	54.00	7.64	AVG
11548.125	H	43.84	54.00	10.16	AVG
17986.875	H	47.51	54.00	6.49	AVG

Test mode:	GFSK	Frequency:	Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7440.0000	V	51.25	74.00	22.75	peak
13151.25	V	64.41	74.00	9.59	peak
17514.375	V	65.71	74.00	8.29	peak
7440.0000	V	42.63	54.00	11.37	AVG
13151.25	V	46.15	54.00	7.85	AVG
17514.375	V	45.64	54.00	8.36	AVG
7440.0000	H	52.11	74.00	21.89	peak
10096.875	H	58.73	74.00	15.27	peak
17548.125	H	65.66	74.00	8.34	peak
7440.0000	H	45.74	54.00	8.26	AVG
10096.875	H	41.87	54.00	12.13	AVG
17548.125	H	45.89	54.00	8.11	AVG

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Only records the worst data in tabular form.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

Bluetooth (GFSK, π/4-DQPSK, 8DPSK, Hopping) mode have been tested, and the worst result(GFSK, Hopping) was report as below:

Test mode:	GFSK	Frequency:	Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2389.0397	V	45.36	74.00	28.64	peak
2389.0397	V	37.72	54.00	16.28	AVG
2389.8933	H	44.95	74.00	29.05	peak
2389.8933	H	37.93	54.00	16.07	AVG

Test mode:	GFSK	Frequency:	Channel 78: 2480MHz

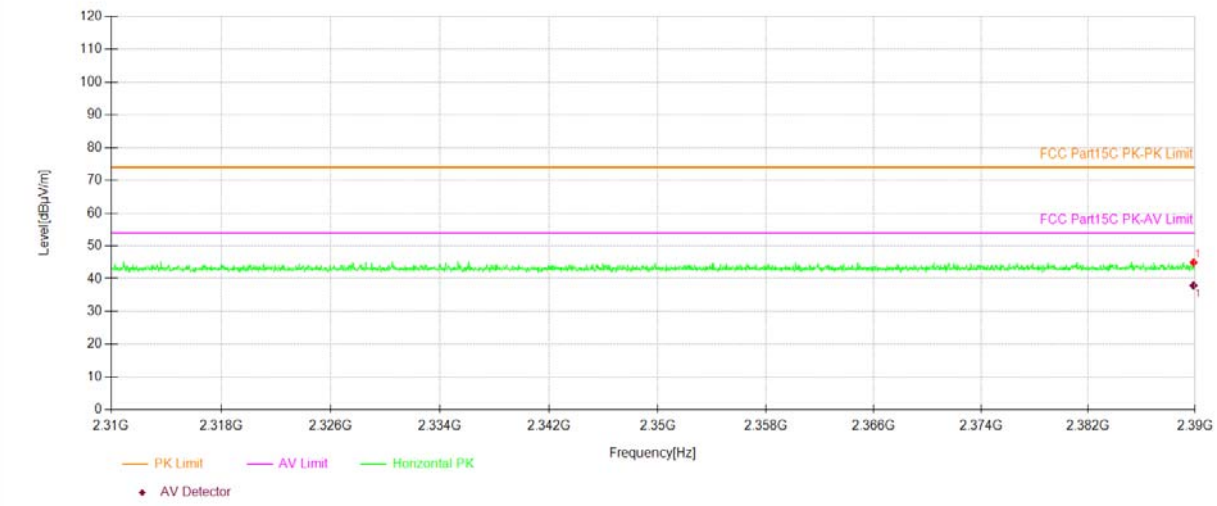
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2483.7508	V	50.78	74.00	23.22	peak
2483.7508	V	38.23	54.00	15.77	AVG
2483.759	H	51.21	74.00	22.79	peak
2483.759	H	37.88	54.00	16.12	AVG

Test mode:	GFSK	Frequency:	Hopping

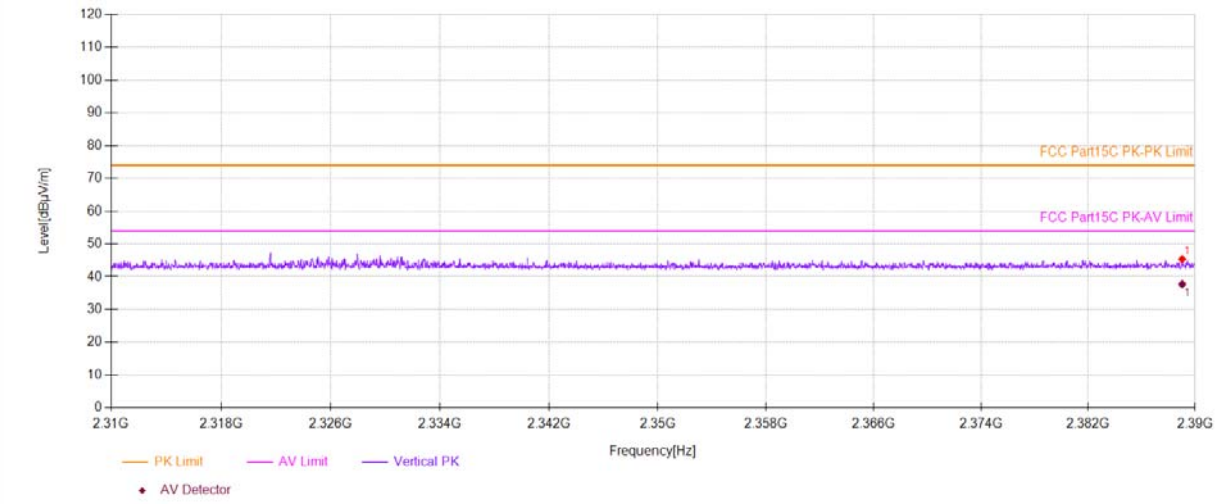
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2390.0000	V	42.84	74.00	31.16	peak
2483.5000	V	43.76	74.00	30.24	peak
2390.0000	V	37.92	54.00	16.08	AVG
2483.5000	V	37.82	54.00	16.18	AVG
2390.0000	H	43.75	74.00	30.25	peak
2483.5000	H	43.53	74.00	30.47	peak
2390.0000	H	37.59	54.00	16.41	AVG
2483.5000	H	38.00	54.00	16.00	AVG

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) 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.

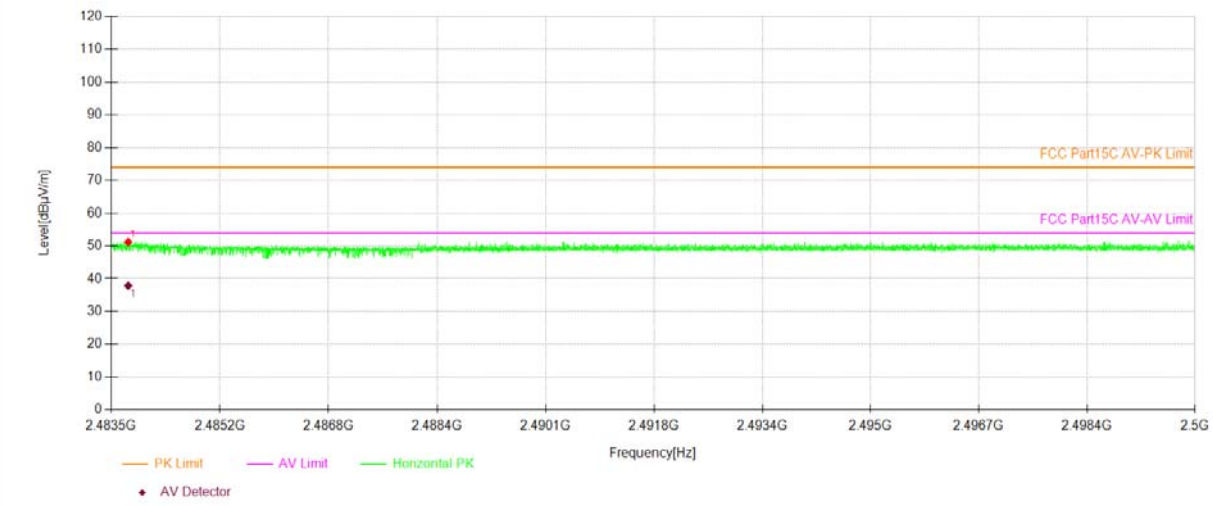
Test Model	Spurious Emission in Restricted Band 2310-2390MHz BT		
	Channel 0: 2402MHz	GFSK	H
		Test By: HYD	



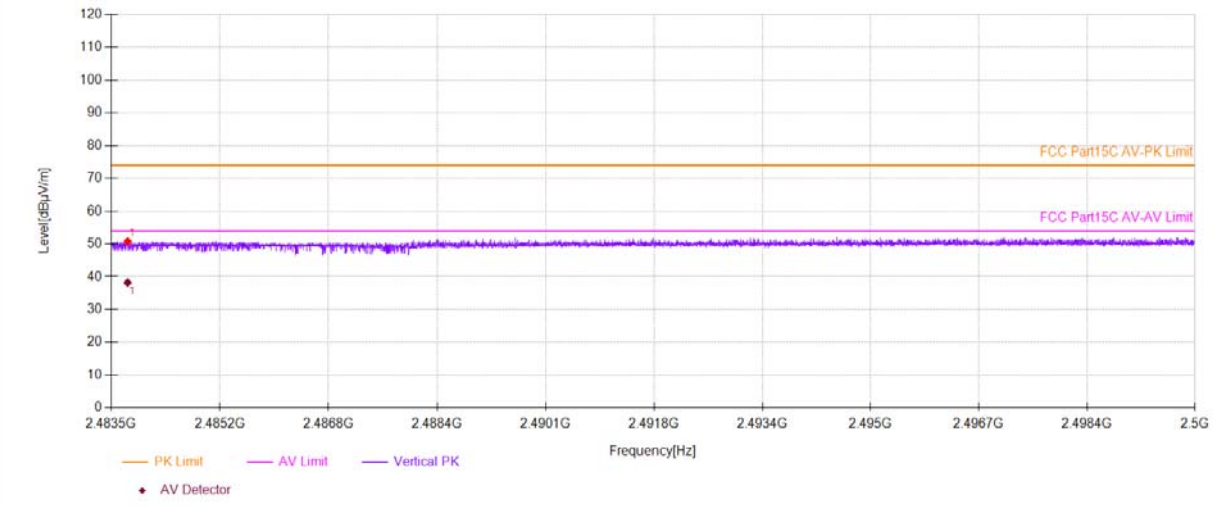
Test Model	Spurious Emission in Restricted Band 2310-2390MHz BT		
	Channel 0: 2402MHz	GFSK	V
		Test By: HYD	



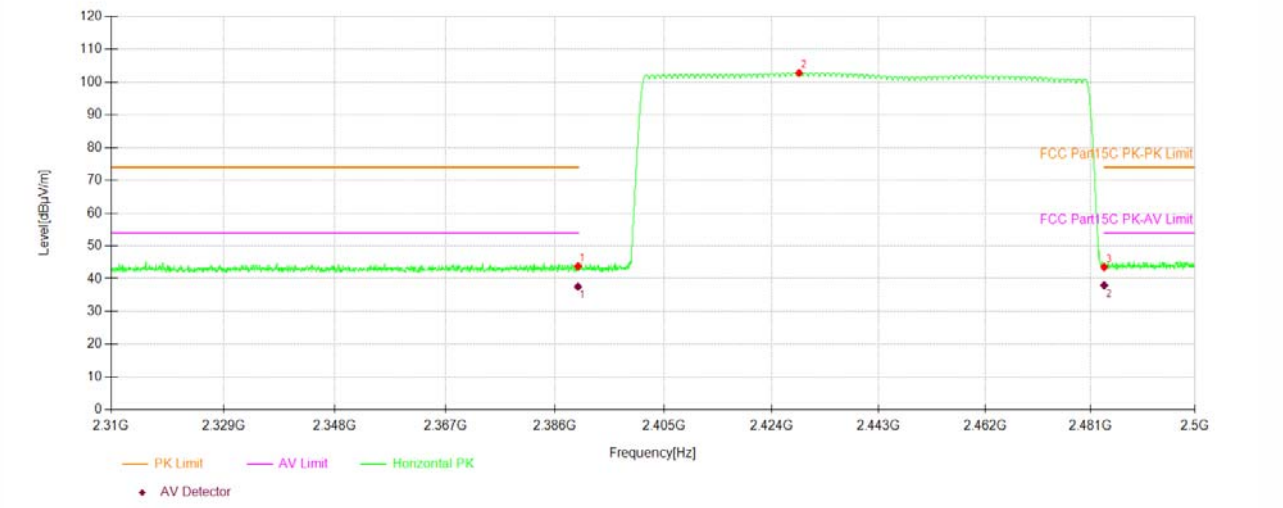
Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz BT Channel 78: 2480MHz	GFSK Test By: HYD	H



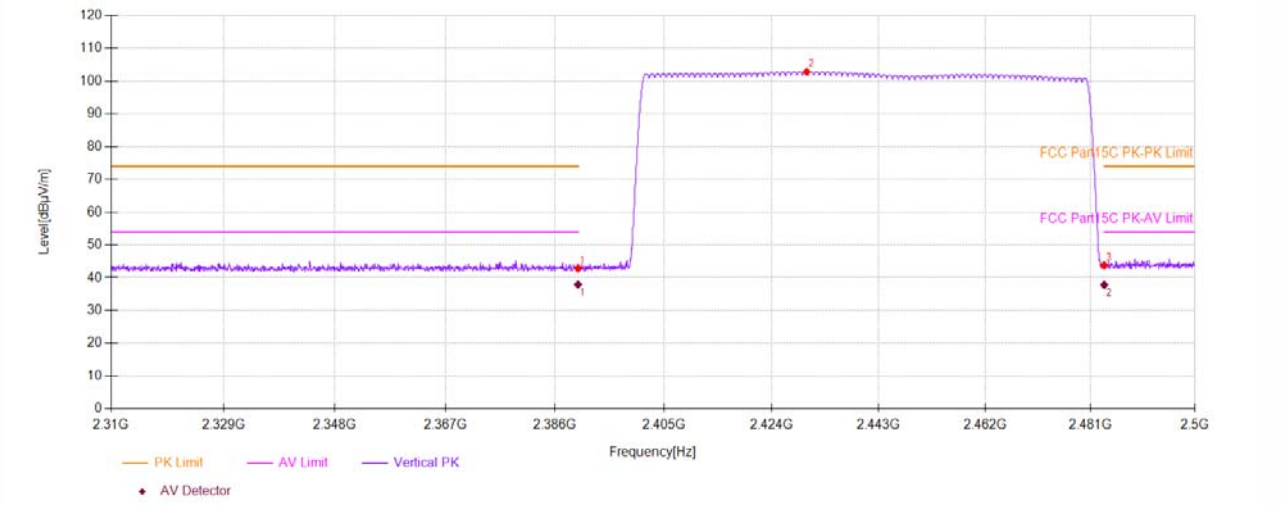
Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz BT Channel 78: 2480MHz	GFSK Test By: HYD	V



Test Model	Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz BT Hopping GFSK H Test By: HYD



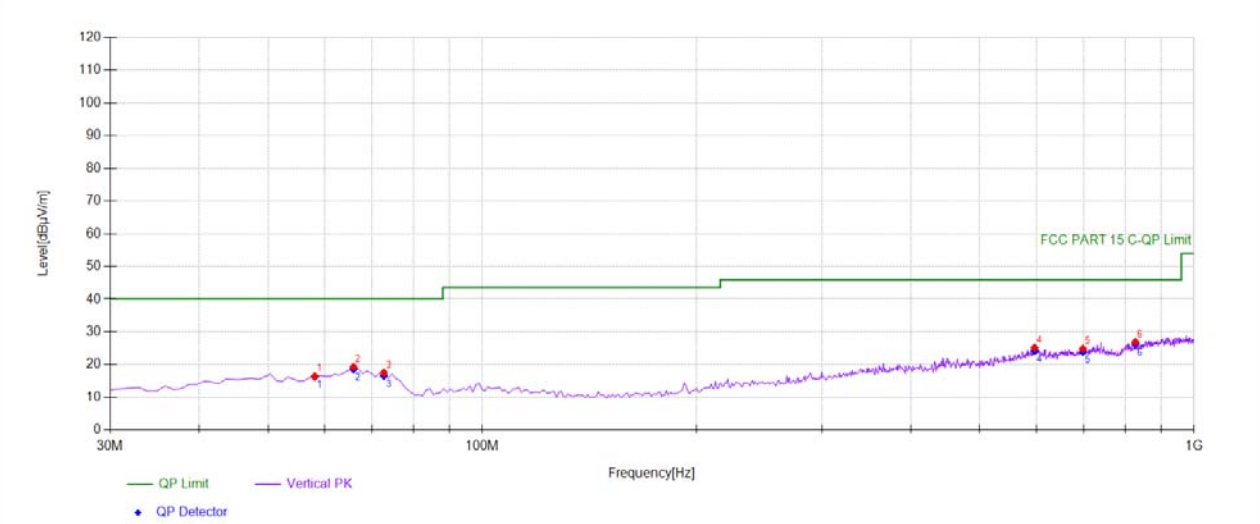
Test Model	Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz BT Hopping GFSK V Test By: HYD



■ Spurious Emission below 1GHz (30MHz to 1GHz)

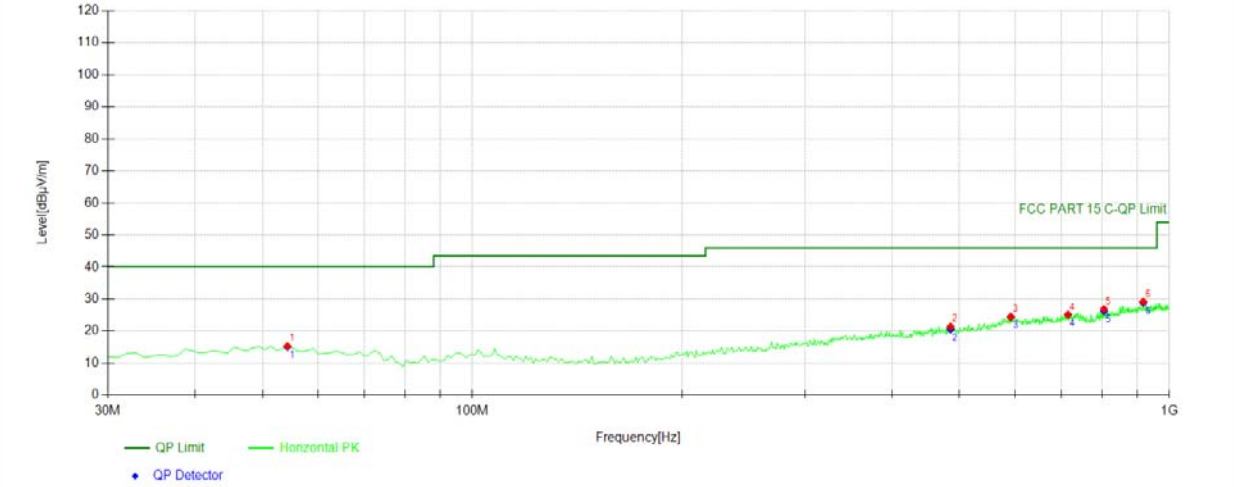
Bluetooth (GFSK, π/4-DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below:

Test mode:	GFSK	Frequency:	Channel 0: 2402MHz



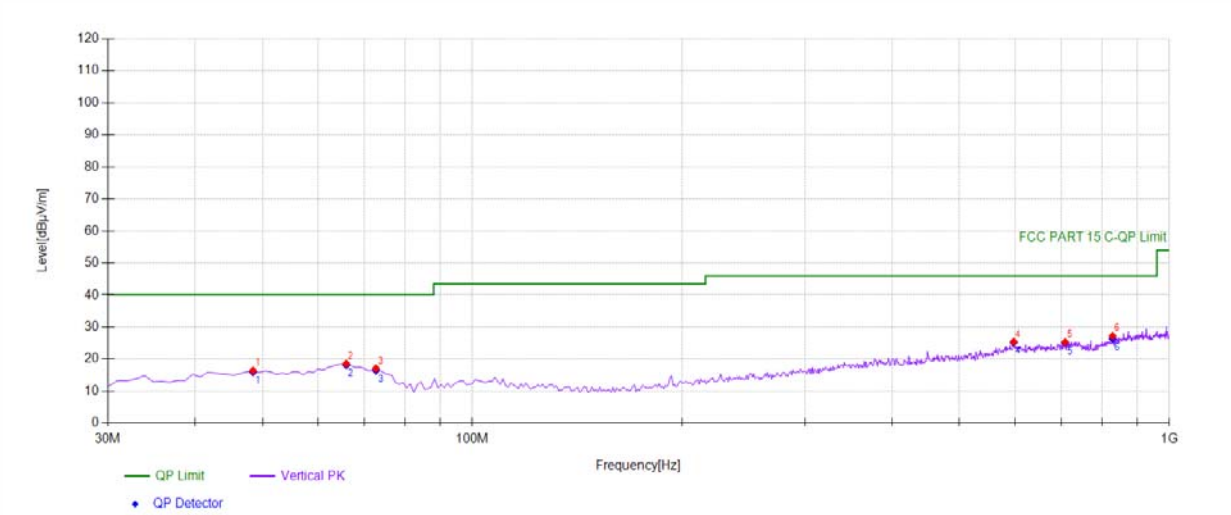
Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	58.1582	33.55	-17.14	16.41	PK	40.00	23.59	Vertical
2	65.9259	37.53	-18.21	19.32	PK	40.00	20.68	Vertical
3	72.7227	36.73	-19.19	17.54	PK	40.00	22.46	Vertical
4	597.047	31.45	-6.28	25.17	PK	46.00	20.83	Vertical
5	698.028	30.79	-5.96	24.83	PK	46.00	21.17	Vertical
6	827.167	31.49	-4.62	26.87	PK	46.00	19.13	Vertical

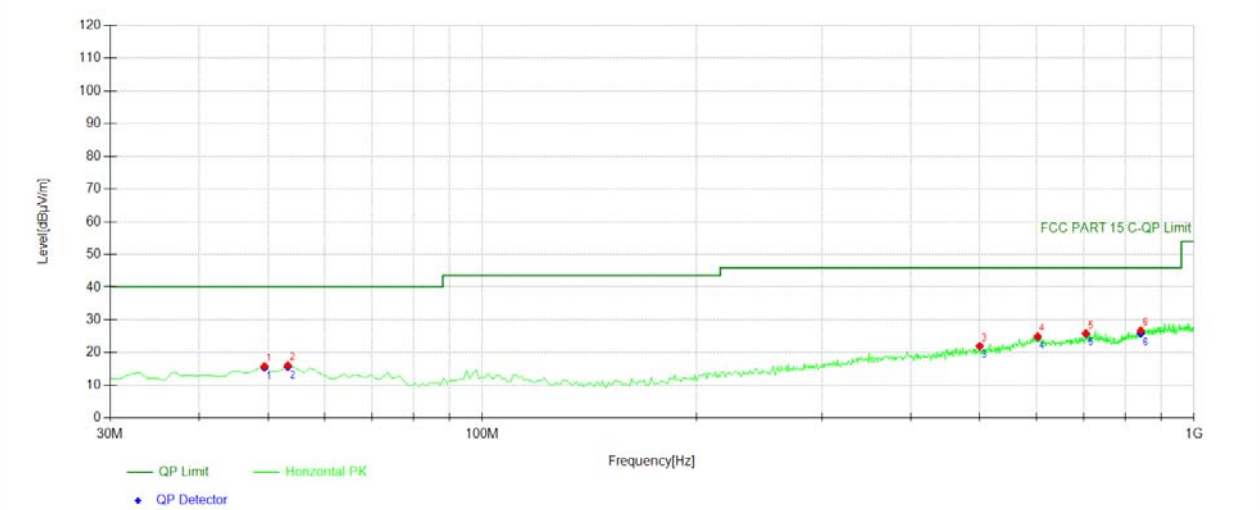


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	54.2743	31.93	-16.60	15.33	PK	40.00	24.67	Horizontal
2	485.385	31.29	-9.90	21.39	PK	46.00	24.61	Horizontal
3	592.192	31.01	-6.56	24.45	PK	46.00	21.55	Horizontal
4	715.505	30.89	-5.76	25.13	PK	46.00	20.87	Horizontal
5	805.805	31.85	-4.97	26.88	PK	46.00	19.12	Horizontal
6	917.467	31.79	-2.61	29.18	PK	46.00	16.82	Horizontal

Test mode:	GFSK	Frequency:	Channel 39: 2441MHz

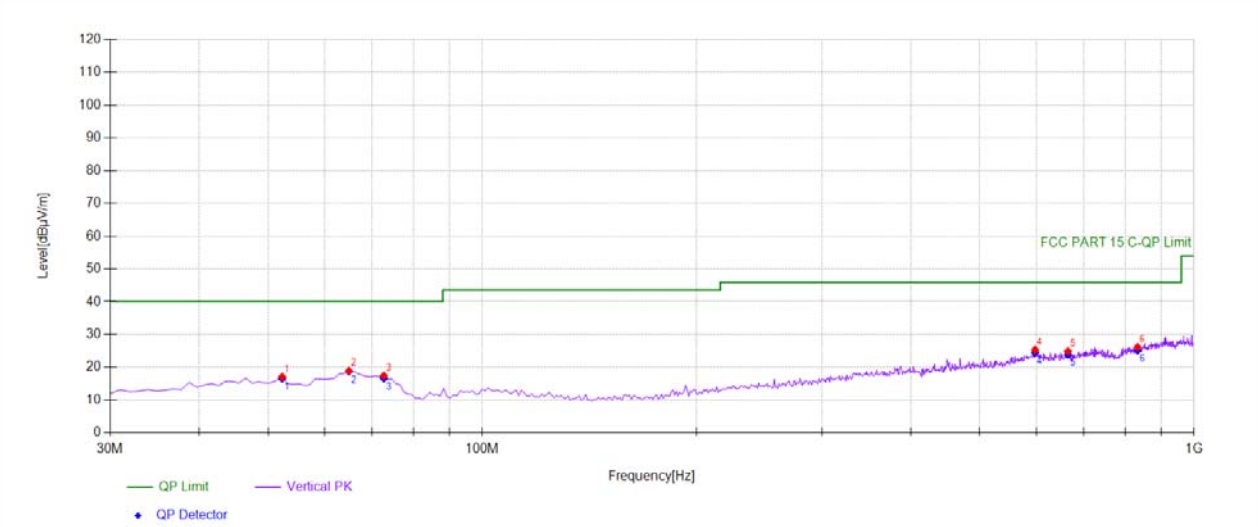


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	48.4484	32.60	-16.24	16.36	PK	40.00	23.64	Vertical
2	65.9259	36.74	-18.21	18.53	PK	40.00	21.47	Vertical
3	72.7227	36.25	-19.19	17.06	PK	40.00	22.94	Vertical
4	598.018	31.64	-6.22	25.42	PK	46.00	20.58	Vertical
5	708.708	31.09	-5.80	25.29	PK	46.00	20.71	Vertical
6	829.109	31.82	-4.59	27.23	PK	46.00	18.77	Vertical



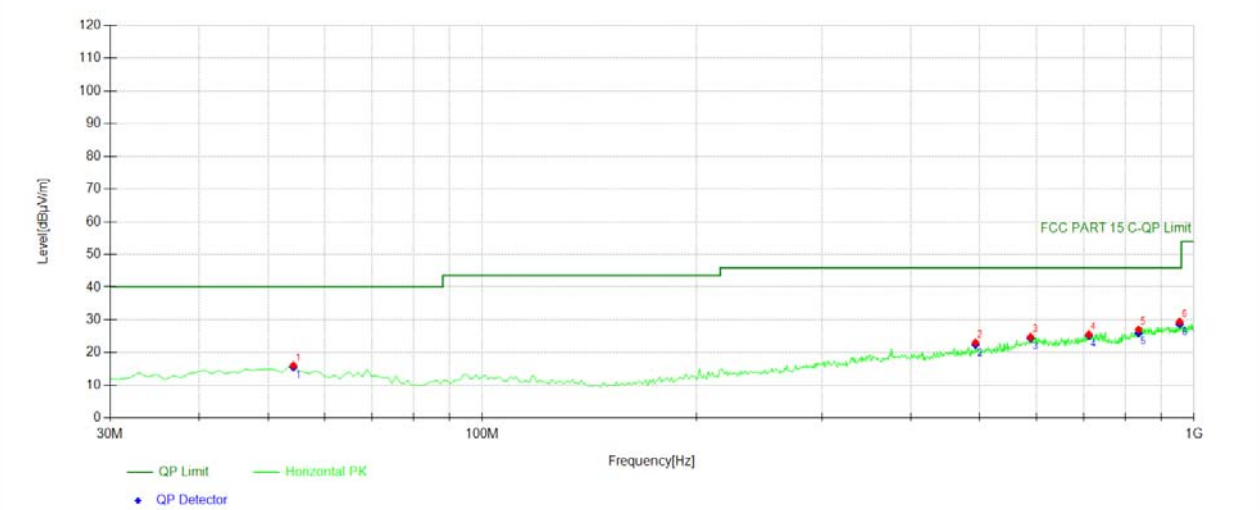
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	49.4194	31.96	-16.10	15.86	PK	40.00	24.14	Horizontal
2	53.3033	32.57	-16.47	16.10	PK	40.00	23.90	Horizontal
3	499.95	31.91	-9.93	21.98	PK	46.00	24.02	Horizontal
4	602.872	31.23	-6.26	24.97	PK	46.00	21.03	Horizontal
5	704.824	31.75	-5.83	25.92	PK	46.00	20.08	Horizontal
6	841.731	31.00	-4.28	26.72	PK	46.00	19.28	Horizontal

Test mode:	GFSK	Frequency:	Channel 78: 2480MHz



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	52.3323	33.40	-16.34	17.06	PK	40.00	22.94	Vertical
2	64.955	36.97	-18.07	18.90	PK	40.00	21.10	Vertical
3	72.7227	36.61	-19.19	17.42	PK	40.00	22.58	Vertical
4	598.018	31.54	-6.22	25.32	PK	46.00	20.68	Vertical
5	665.015	31.56	-6.70	24.86	PK	46.00	21.14	Vertical
6	832.993	30.65	-4.52	26.13	PK	46.00	19.87	Vertical



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity
1	54.2743	32.65	-16.60	16.05	PK	40.00	23.95	Horizontal
2	493.153	32.98	-9.90	23.08	PK	46.00	22.92	Horizontal
3	589.279	31.47	-6.73	24.74	PK	46.00	21.26	Horizontal
4	711.621	31.28	-5.78	25.50	PK	46.00	20.50	Horizontal
5	835.905	31.41	-4.45	26.96	PK	46.00	19.04	Horizontal
6	954.364	31.74	-2.31	29.43	PK	46.00	16.57	Horizontal

9.8 CONDUCTED EMISSION TEST

9.8.1 Applicable Standard

According to FCC Part 15.207(a)

9.8.2 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.		

9.8.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

9.8.4 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.

9.8.5 Test Results

Pass

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