9.4 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

9.4.1 Applicable Standard

According to FCC Part 15.247(a)(1)
According to IC RSS-247.5.1
According to 558074 D01 15.247 MEAS GUIDANCE v05r02 Section 9
According to ANSI C63.10 Section 7.8.4

9.4.2 Conformance Limit

For frequency hopping systems operating in the 2400-2483.5MHz band, the average time of occupancy on any channel shall not be greater than 0.4s within a period of 0.4s multiplied by the number of hopping channels employed.

9.4.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.4.4 Test Procedure

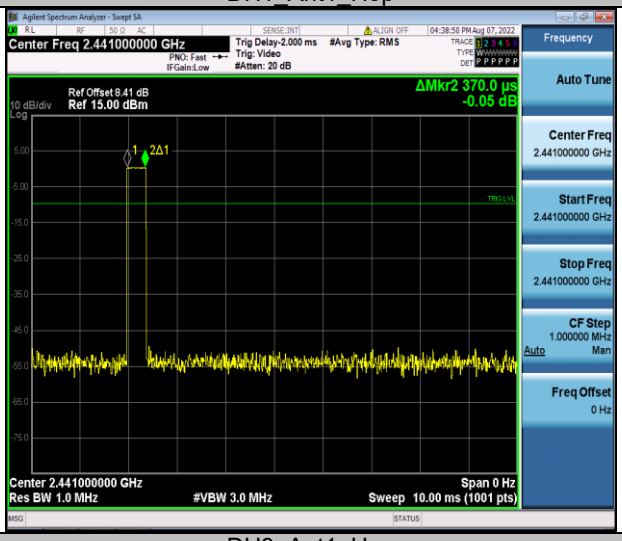
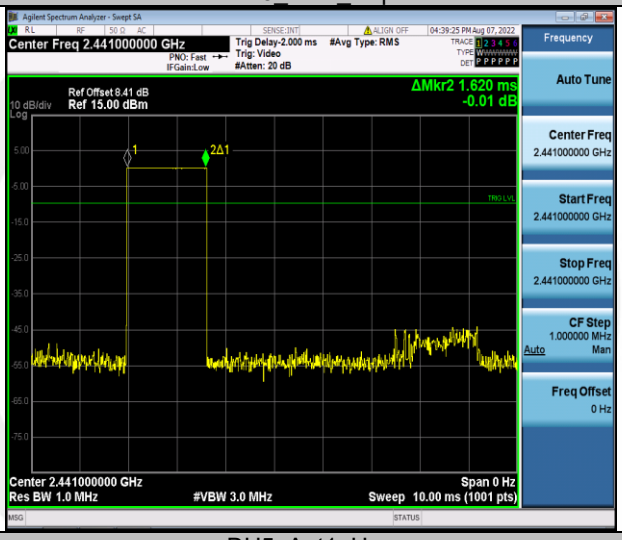
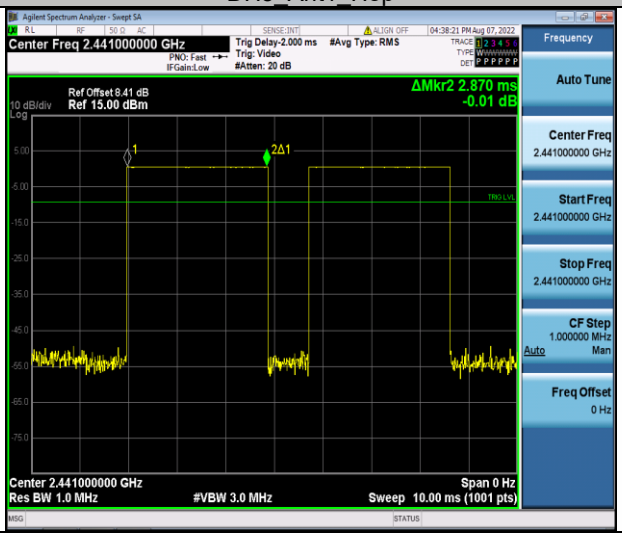
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel
RBW = 1 MHz
VBW ≥ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak
Trace = max hold
If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section.

9.4.5 Test Results

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1011 mbar
Test Engineer:	XXH

Note: TotalHops(DH1)=(1600/2/79)*31.6
TotalHops(DH3)=(1600/4/79)*31.6
TotalHops(DH5)=(1600/6/79)*31.6
Dwell Time= BurstWidth* TotalHops

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.37	320	0.118	≤0.4	PASS
DH3	Ant1	Hop	1.62	160	0.259	≤0.4	PASS
DH5	Ant1	Hop	2.87	106.67	0.306	≤0.4	PASS

DH1_Ant1_Hop

DH3_Ant1_Hop

DH5_Ant1_Hop


9.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER

9.5.1 Applicable Standard

According to FCC Part 15.247(b)(1)
According to RSS-247.5.4
According to RSS-Gen 6.12
According to 558074 D01 15.247 MEAS GUIDANCE v05r02 Section 9
According to ANSI C63.10 Section 7.8.5

9.5.2 Conformance Limit

The max For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.5.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.5.4 Test Procedure

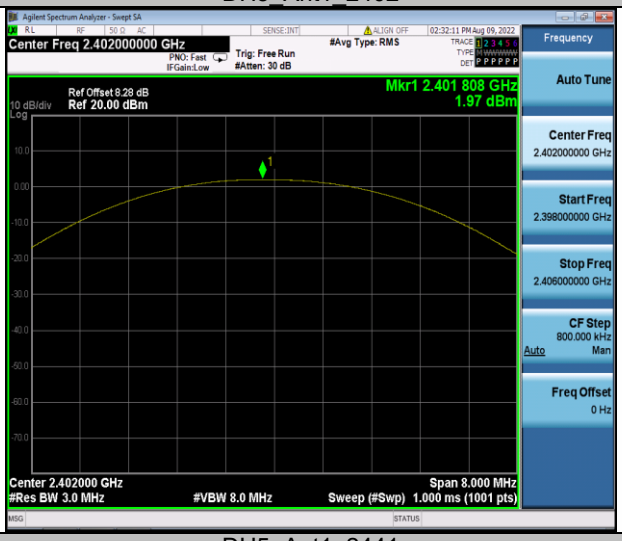
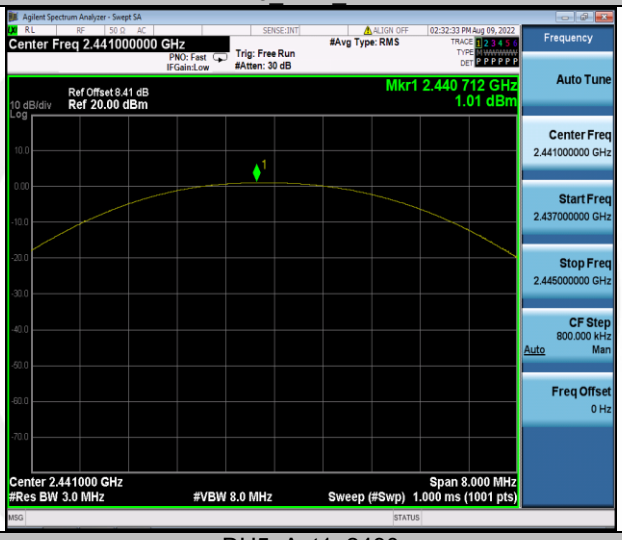
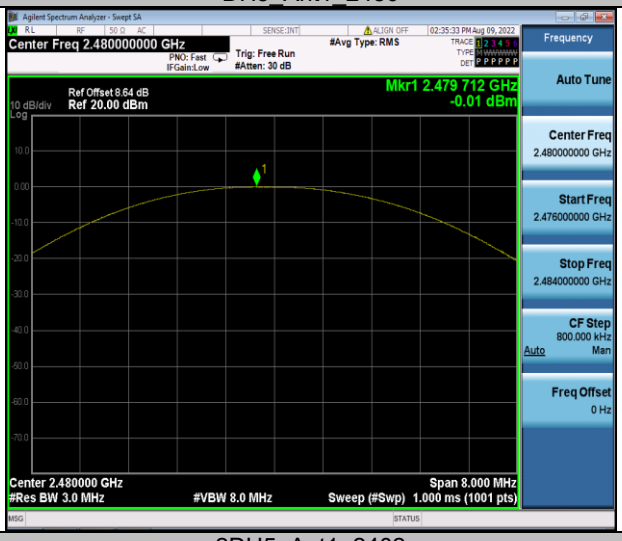
As an alternative to a peak power measurement, compliance with the limit can be based on a measurement of the maximum conducted output power.
Use the following spectrum analyzer settings:
Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel (about 8MHz)
Set RBW > the 20 dB bandwidth of the emission being measured (about 3MHz)
Set VBW ≥ RBW
Set Sweep = auto
Set Detector function = peak
Set Trace = max hold
Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission to determine the peak amplitude level.

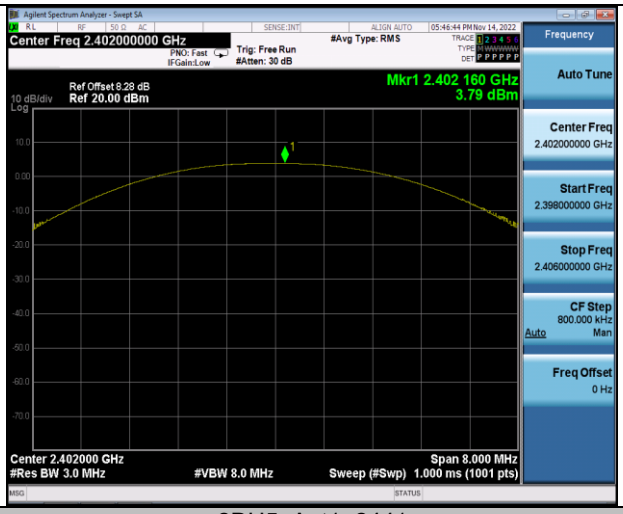
Test Results

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1011 mbar
Test Engineer:	XXH

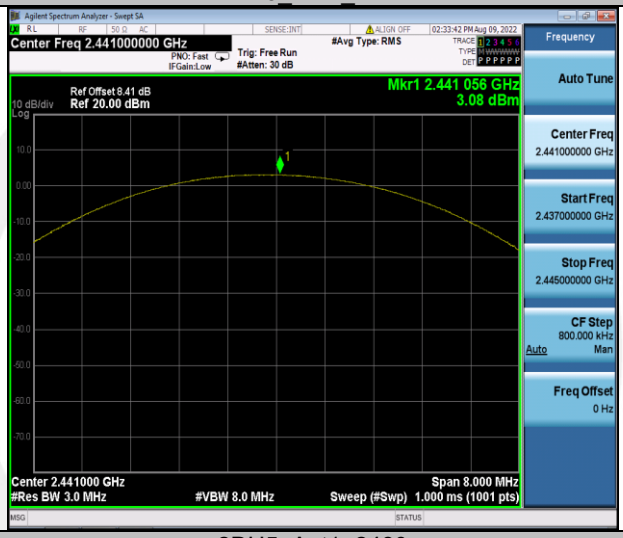
Note: N/A

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	1.97	≤20.97	PASS
		2441	1.01	≤20.97	PASS
		2480	-0.01	≤20.97	PASS
2DH5	Ant1	2402	3.79	≤20.97	PASS
		2441	3.08	≤20.97	PASS
		2480	2.13	≤20.97	PASS
3DH5	Ant1	2402	3.81	≤20.97	PASS
		2441	3.56	≤20.97	PASS
		2480	2.64	≤20.97	PASS

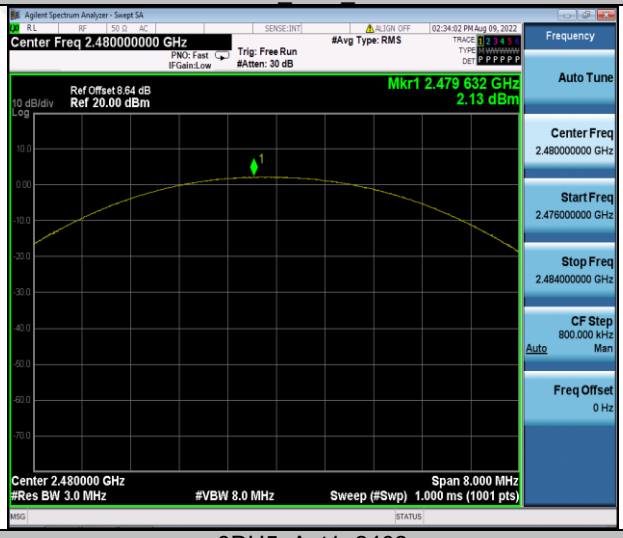
DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402



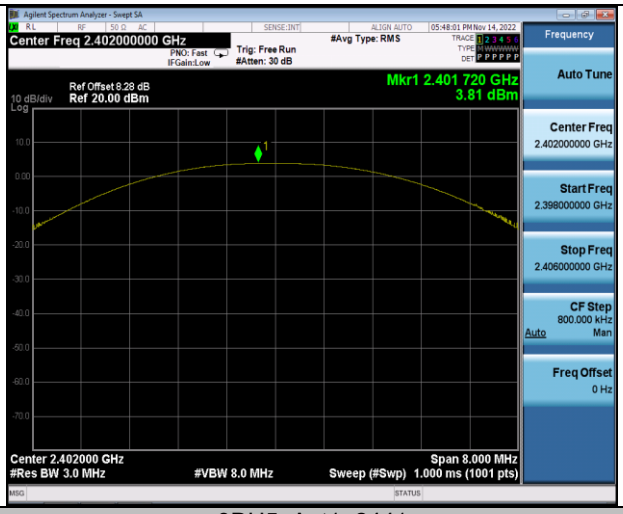
2DH5_Ant1_2441



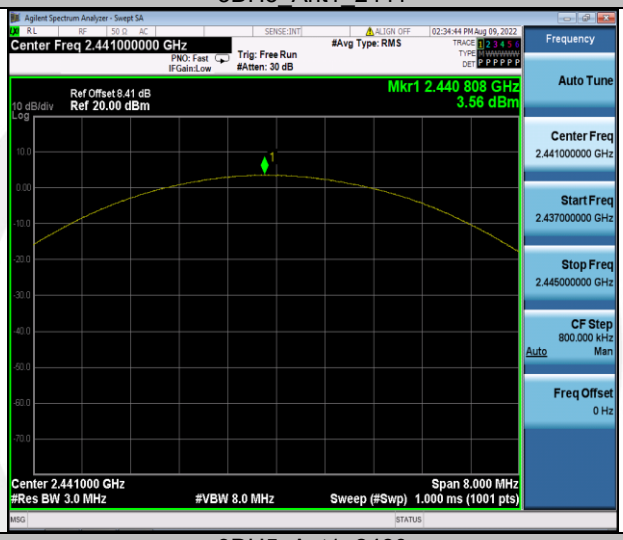
2DH5_Ant1_2480



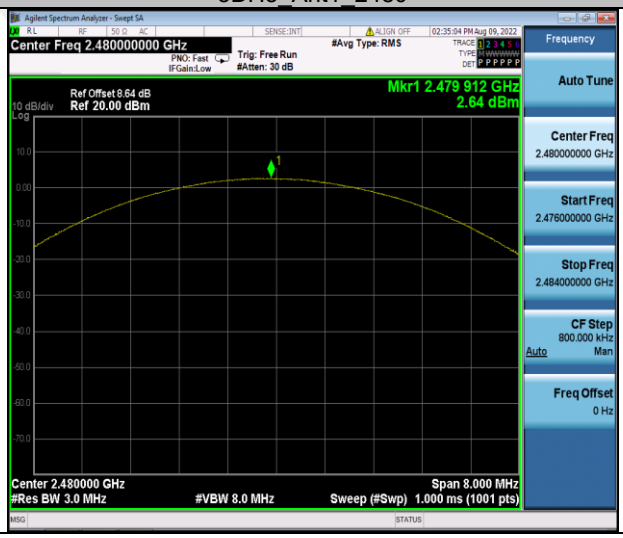
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



9.6 CONDUCTED SUPRIOUS EMISSION

9.6.1 Applicable Standard

According to FCC Part 15.247(d)
According to IC RSS-247 5.5
According to 558074 D01 15.247 MEAS GUIDANCE v05r02 Section 9
According to ANSI C63.10 Section 7.8.8

9.6.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted, provided the transmitter demonstrates compliance with the peak conducted power limits.

9.6.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

9.6.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

- **Reference level measurement**

Establish a reference level by using the following procedure:
Set instrument center frequency to DSS channel center frequency.
Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.
Set the RBW = 100 kHz. Set the VBW ≥ 3 x RBW.
Set Detector = peak. Set Sweep time = auto couple.
Set Trace mode = max hold. Allow trace to fully stabilize.
Use the peak marker function to determine the maximum Maximum conduceted level.
Note that the channel found to contain the maximum conduceted level can be used to establish the reference level.

- **Band-edge measurement**

Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation
Set RBW ≥ 1% of the span=100kHz Set VBW ≥ 3 x RBW
Set Sweep = auto Set Detector function = peak Set Trace = max hold
Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.
Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

- **Emission level measurement**

Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.(30MHz to 25GHz). Set RBW = 100 kHz Set VBW ≥ RBW
Set Sweep = auto Set Detector function = peak Set Trace = max hold
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

9.6.5 Test Results

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar
Test Engineer:	XXH

Note: N/A

Band edge measurements

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	0.41	-56.75	≤-19.59	PASS
		High	2480	-0.30	-56.93	≤-20.3	PASS
		Low	Hop_2402	-0.09	-58.04	≤-20.09	PASS
		High	Hop_2480	-0.24	-56.64	≤-20.24	PASS
2DH5	Ant1	Low	2402	-0.94	-55.29	≤-20.94	PASS
		High	2480	-2.09	-56.99	≤-22.09	PASS
3DH5	Ant1	Low	2402	-0.83	-55.24	≤-20.83	PASS
		High	2480	-1.96	-56.2	≤-21.96	PASS

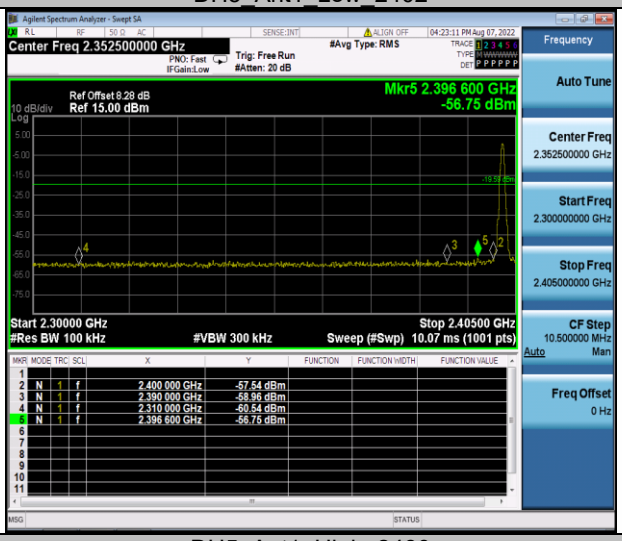
Conducted Spurious Emission

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

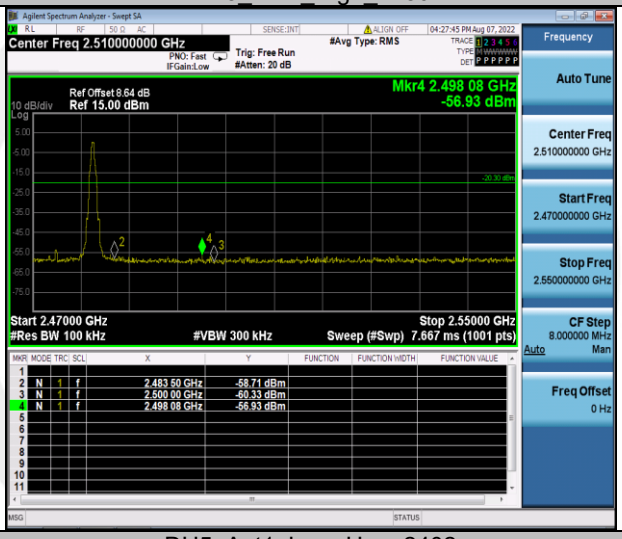
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	0.41	-56.09	≤-19.59	PASS
			1000~26500	0.41	-41.72	≤-19.59	PASS
		2441	30~1000	-0.02	-56.15	≤-20.02	PASS
			1000~26500	-0.02	-40.96	≤-20.02	PASS
		2480	30~1000	-0.30	-56.01	≤-20.3	PASS
			1000~26500	-0.30	-40.37	≤-20.3	PASS

Band edge measurements

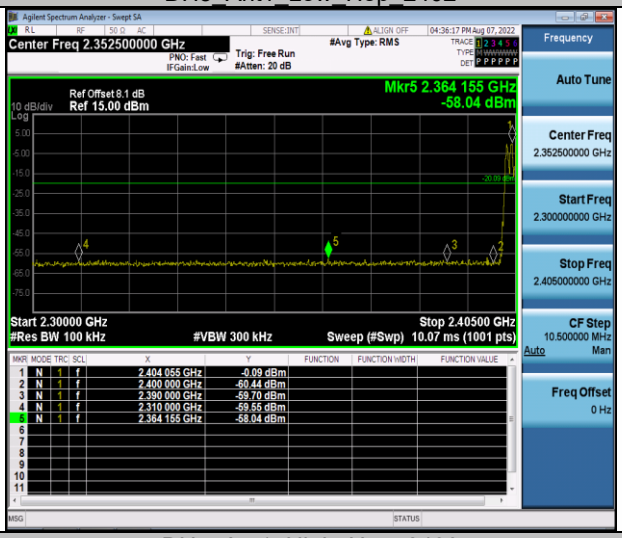
DH5_Ant1_Low_2402



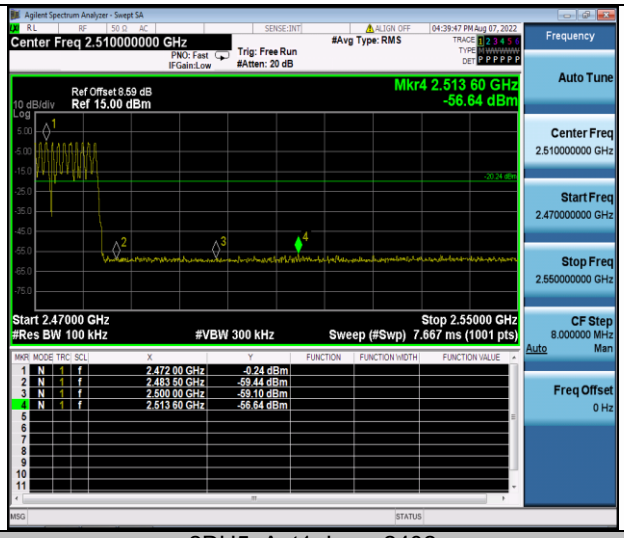
DH5_Ant1_High_2480



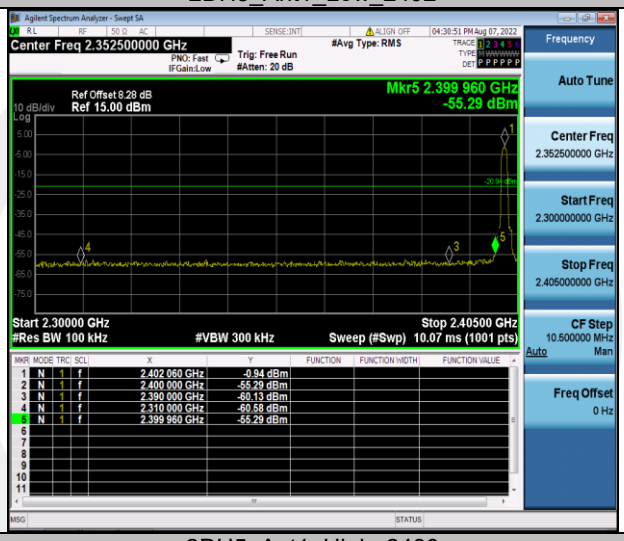
DH5_Ant1_Low_Hop_2402



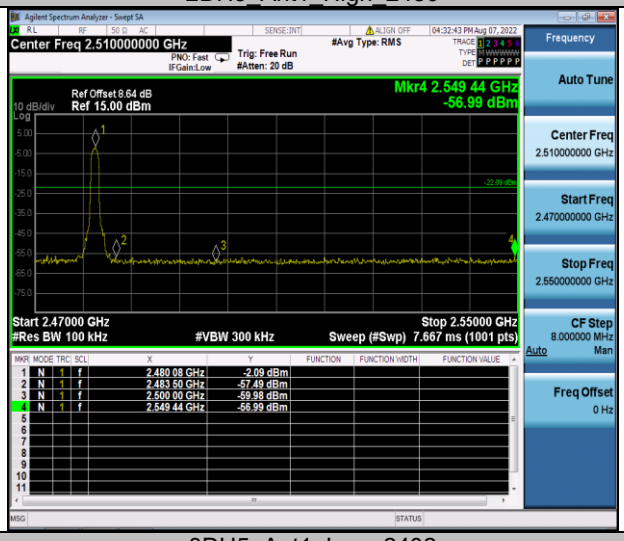
DH5_Ant1_High_Hop_2480



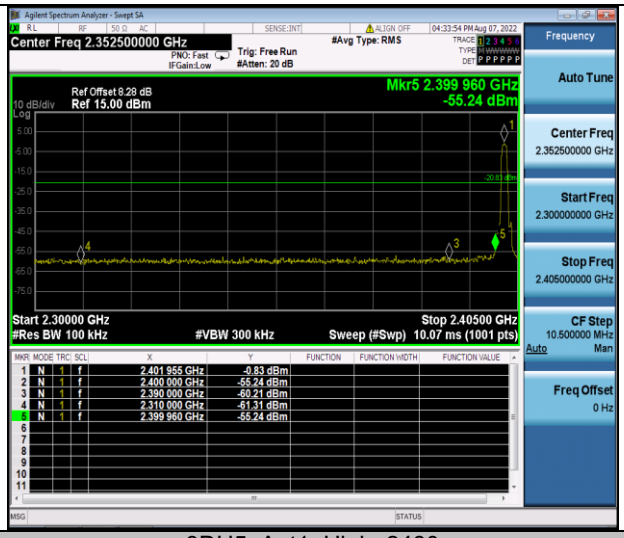
2DH5_Ant1_Low_2402



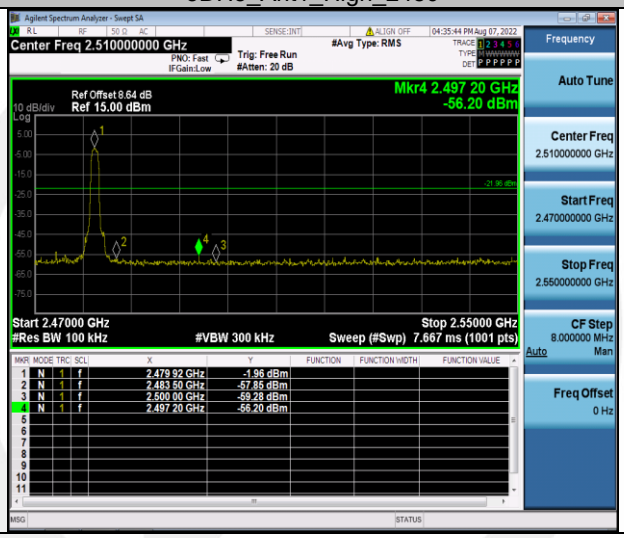
2DH5_Ant1_High_2480



3DH5_Ant1_Low_2402



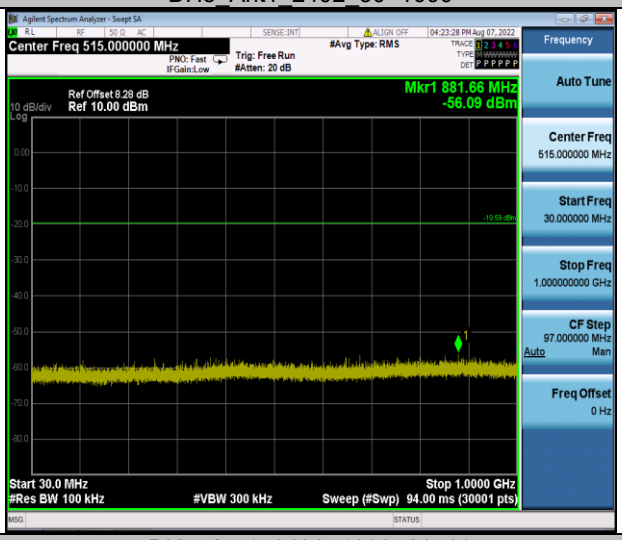
3DH5_Ant1_High_2480



Conducted Spurious Emission

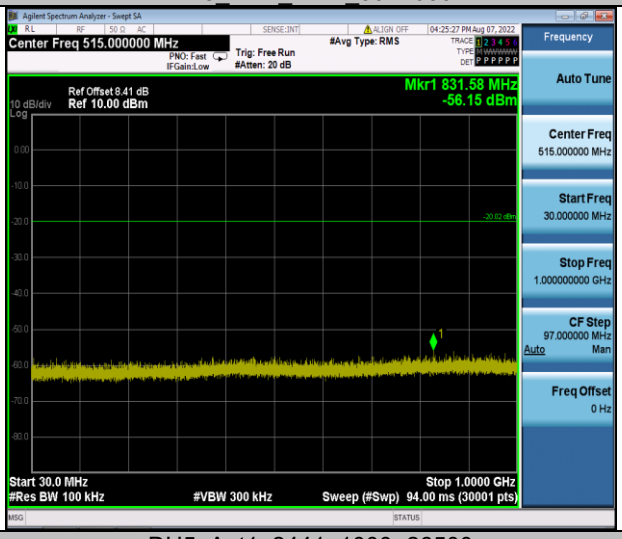
Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result was report as below:

DH5_Ant1_2402_30~1000

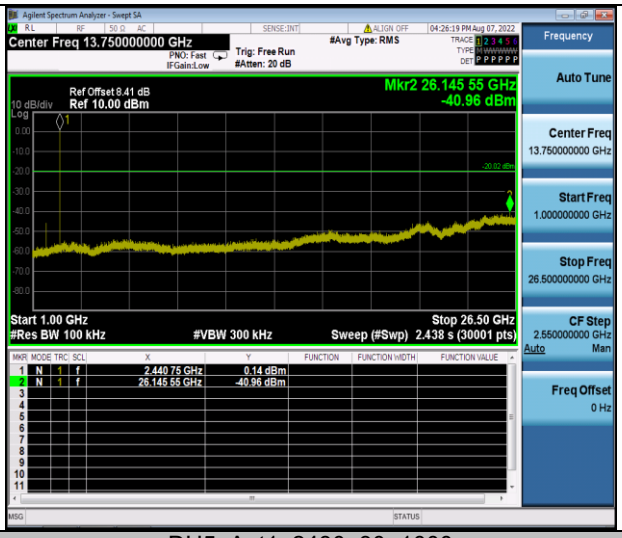


DH5_Ant1_2402_1000~26500

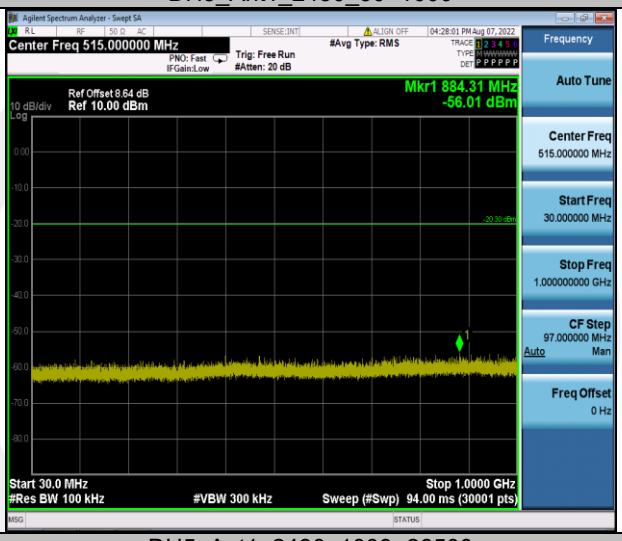
DH5_Ant1_2441_30~1000



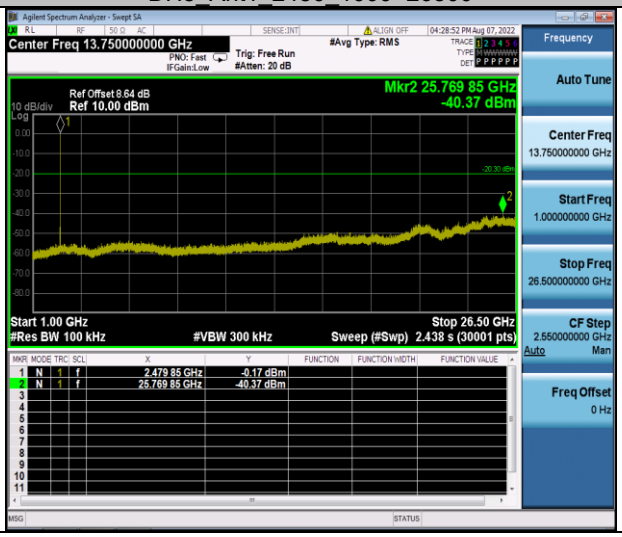
DH5_Ant1_2441_1000~26500



DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500



9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d), 15.205, 15.209
According to RSS-Gen and RSS-247
According to 558074 D01 15.247 MEAS GUIDANCE v05r02 Section 9
According to ANSI C63.10 Section 6.3, 6.4, 6.5, 6.6 and 6.10.5

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 average measurements the resolution bandwidth of spectrum analyzer is 1 MHz with the video bandwidth is ≥ 1/T with peak detector.
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 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. Submit this data.

9.7.5 Test Results

Temperature:	25 ˚C
Relative Humidity:	45%
ATM Pressure:	1011 mbar
Test Engineer:	XXH

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

For Spurious Emission below 30MHz (9KHz to 30MHz), was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

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

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

Test mode: GFSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol.	Reading Level (dBuV/m)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Remark
7362.354	V	49.55	0.49	50.04	74.00	-23.96	peak
7362.354	V	31.62	0.49	32.11	54.00	-21.89	AVG
13311.34	V	50.02	6.81	56.83	74.00	-17.17	peak
13311.34	V	31.94	6.81	38.75	54.00	-15.25	AVG
17906.59	V	49.70	14.04	63.74	74.00	-10.26	peak
17906.59	V	31.22	14.04	45.26	54.00	-8.74	AVG
5872.924	H	50.66	-5.62	45.04	74.00	-28.96	peak
5872.924	H	33.77	-5.62	28.15	54.00	-25.85	AVG
12147.66	H	49.84	6.14	55.98	74.00	-18.02	peak
12147.66	H	32.27	6.14	38.41	54.00	-15.59	AVG
17916.94	H	49.85	14.09	63.94	74.00	-10.06	peak
17916.94	H	31.72	14.09	45.81	54.00	-8.19	AVG

Note:
(1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;
(2) Avg RBW = 1 MHz, VBW = $1/T_{on}$, Detector = Peak, where: T_{on} is transmit duration;
(3) Corrected Reading = Reading Level + Correct Factor;
(4) Correct Factor = Ant_F + Cab_L - Preamp;
(5) Margin = Limit - Corrected Reading;

Test mode: GFSK Frequency: Channel 39: 2441MHz

Freq. (MHz)	Ant.Pol.	Reading Level (dBuV/m)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Remark
5236.247	V	49.42	-5.79	43.63	74.00	-30.37	peak
5236.247	V	31.23	-5.79	25.44	54.00	-28.56	AVG
9832.625	V	50.13	4.79	54.92	74.00	-19.08	peak
9832.625	V	31.78	4.79	36.57	54.00	-17.43	AVG
17909.18	V	49.88	14.05	63.93	74.00	-10.07	peak
17909.18	V	31.18	14.05	45.23	54.00	-8.77	AVG
5252.921	H	49.73	-5.76	43.97	74.00	-30.03	peak
5252.921	H	31.75	-5.76	25.99	54.00	-28.01	AVG
11208.13	H	49.14	6.08	55.22	74.00	-18.78	peak
11208.13	H	32.21	6.08	38.29	54.00	-15.71	AVG
17940.26	H	49.41	14.22	63.63	74.00	-10.37	peak
17940.26	H	31.01	14.22	45.23	54.00	-8.77	AVG

Note:
(1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;
(2) Avg RBW = 1 MHz, VBW = 1/T_{on}, Detector = Peak, where: T_{on} is transmit duration;
(3) Corrected Reading = Reading Level + Correct Factor;
(4) Correct Factor = Ant_F + Cab_L - Preamp;
(5) Margin = Limit - Corrected Reading;

Test mode:	GFSK	Frequency:	Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol.	Reading Level (dBuV/m)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Remark
4801.334	V	49.93	-6.80	43.13	74.00	-30.87	peak
4801.334	V	31.99	-6.80	25.19	54.00	-28.81	AVG
10026.34	V	49.60	5.30	54.90	74.00	-19.10	peak
10026.34	V	31.54	5.30	36.84	54.00	-17.16	AVG
17852.33	V	50.10	13.74	63.84	74.00	-10.16	peak
17852.33	V	31.47	13.74	45.21	54.00	-8.79	AVG
5311.702	H	49.55	-5.66	43.89	74.00	-30.11	peak
5311.702	H	31.43	-5.66	25.77	54.00	-28.23	AVG
10487.26	H	49.57	5.62	55.19	74.00	-18.81	peak
10487.26	H	32.63	5.62	38.25	54.00	-15.75	AVG
17932.49	H	49.83	14.17	64.00	74.00	-10.00	peak
17932.49	H	31.98	14.17	46.15	54.00	-7.85	AVG

Note:
(1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;
(2) Avg RBW = 1 MHz, VBW = 1/T_{on}, Detector = Peak, where: T_{on} is transmit duration;
(3) Corrected Reading = Reading Level + Correct Factor;
(4) Correct Factor = Ant_F + Cab_L - Preamp;
(5) Margin = Limit - Corrected Reading;

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

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

Test mode: GFSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol.	Reading Level (dBuV/m)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Remark
2381.264	V	43.85	5.98	49.83	74.00	-24.17	peak
2381.264	V	25.90	5.98	31.88	54.00	-22.12	AVG
2384.788	H	43.50	6.00	49.50	74.00	-24.50	peak
2384.788	H	25.54	6.00	31.54	54.00	-22.46	AVG

Note: (1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;
(2) Avg RBW = 1 MHz, VBW = 1/T_{on}, Detector = Peak, where: T_{on} is transmit duration;
(3) Corrected Reading = Reading Level + Correct Factor;
(4) Correct Factor = Ant_F + Cab_L - Preamp;
(5) Margin = Limit - Corrected Reading;

Test mode: GFSK Frequency: Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol.	Reading Level (dBuV/m)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Remark
2484.361	V	46.95	6.24	53.19	74.00	-20.81	peak
2484.361	V	29.00	6.24	35.24	54.00	-18.76	AVG
2484.484	H	46.64	6.24	52.88	74.00	-21.12	peak
2484.484	H	28.51	6.24	34.75	54.00	-19.25	AVG

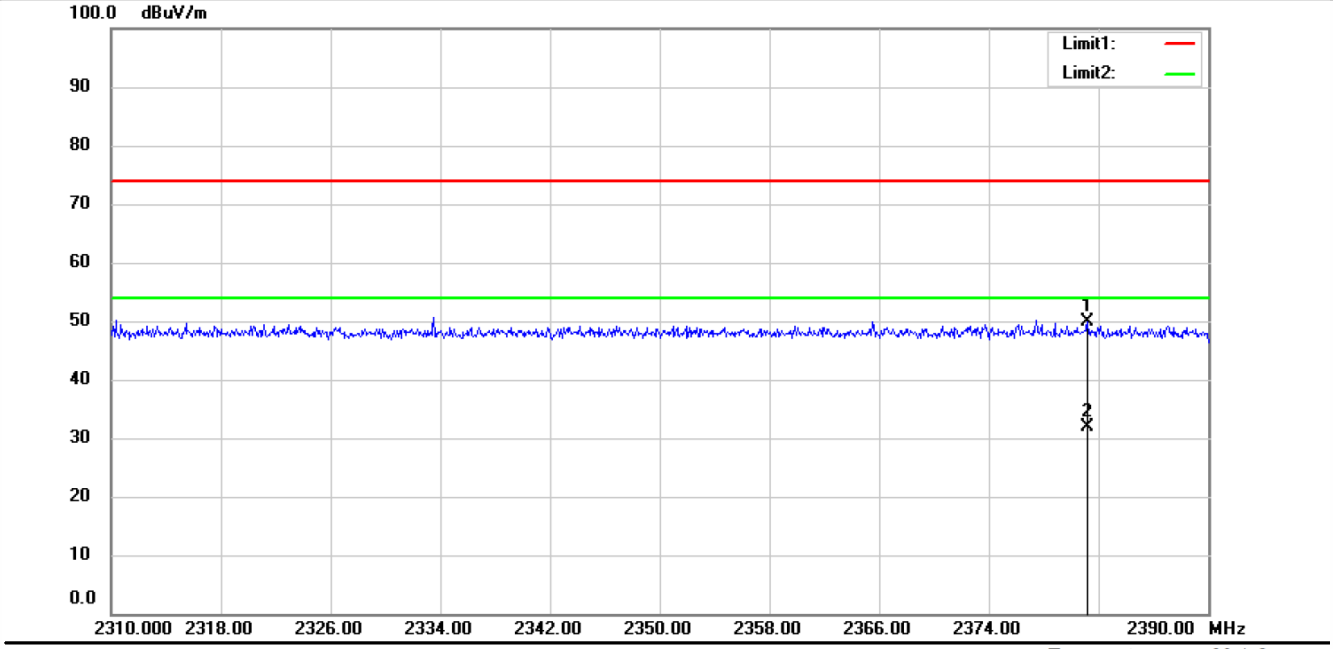
Note: (1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;
(2) Avg RBW = 1 MHz, VBW = 1/T_{on}, Detector = Peak, where: T_{on} is transmit duration;
(3) Corrected Reading = Reading Level + Correct Factor;
(4) Correct Factor = Ant_F + Cab_L - Preamp;
(5) Margin = Limit - Corrected Reading;

Test mode: GFSK Frequency: Hopping

Freq. (MHz)	Ant.Pol.	Reading Level (dBuV/m)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Remark
2400.000	V	43.05	6.05	49.10	74.00	-24.90	peak
2400.000	V	25.06	6.05	31.11	54.00	-22.89	AVG
2483.500	V	42.41	6.24	48.65	74.00	-25.35	peak
2483.500	V	24.30	6.24	30.54	54.00	-23.46	AVG
2400.000	H	42.17	6.05	48.22	74.00	-25.78	peak
2400.000	H	24.20	6.05	30.25	54.00	-23.75	AVG
2483.500	H	42.98	6.24	49.22	74.00	-24.78	peak
2483.500	H	24.91	6.24	31.15	54.00	-22.85	AVG

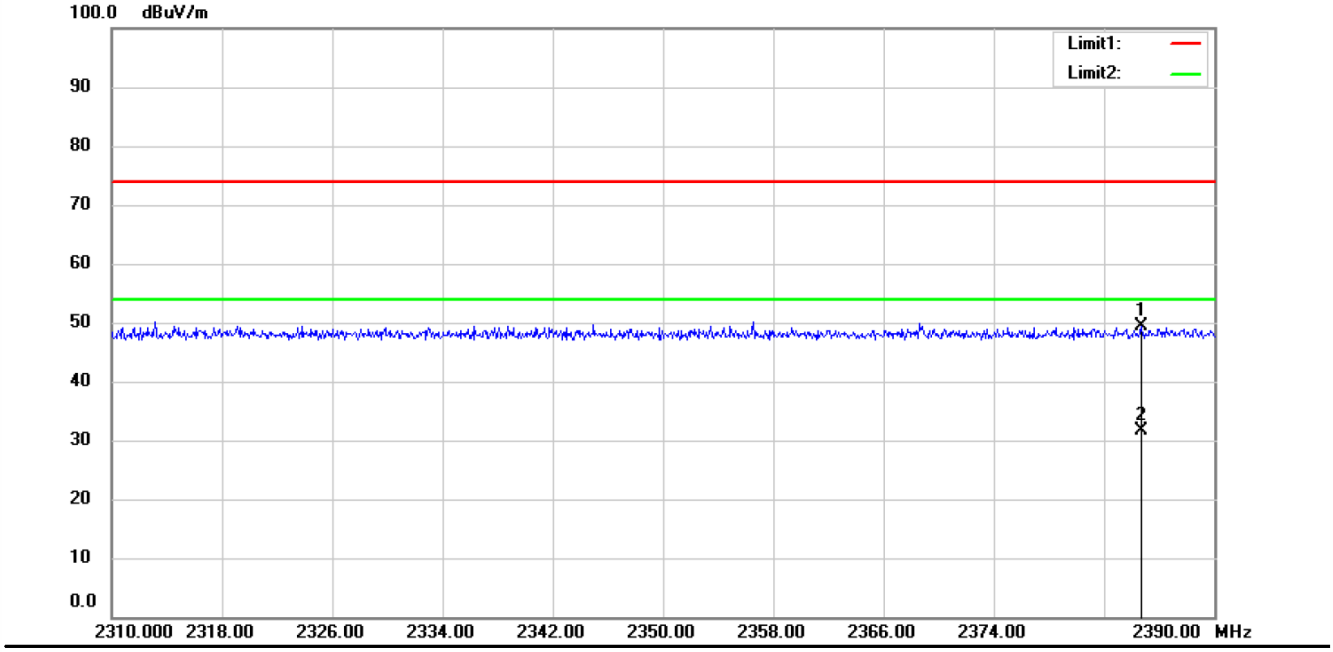
Note: (1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;
(2) Avg RBW = 1 MHz, VBW = 1/T_{on}, Detector = Peak, where: T_{on} is transmit duration;
(3) Corrected Reading = Reading Level + Correct Factor;
(4) Correct Factor = Ant_F + Cab_L - Preamp;
(5) Margin = Limit - Corrected Reading;

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



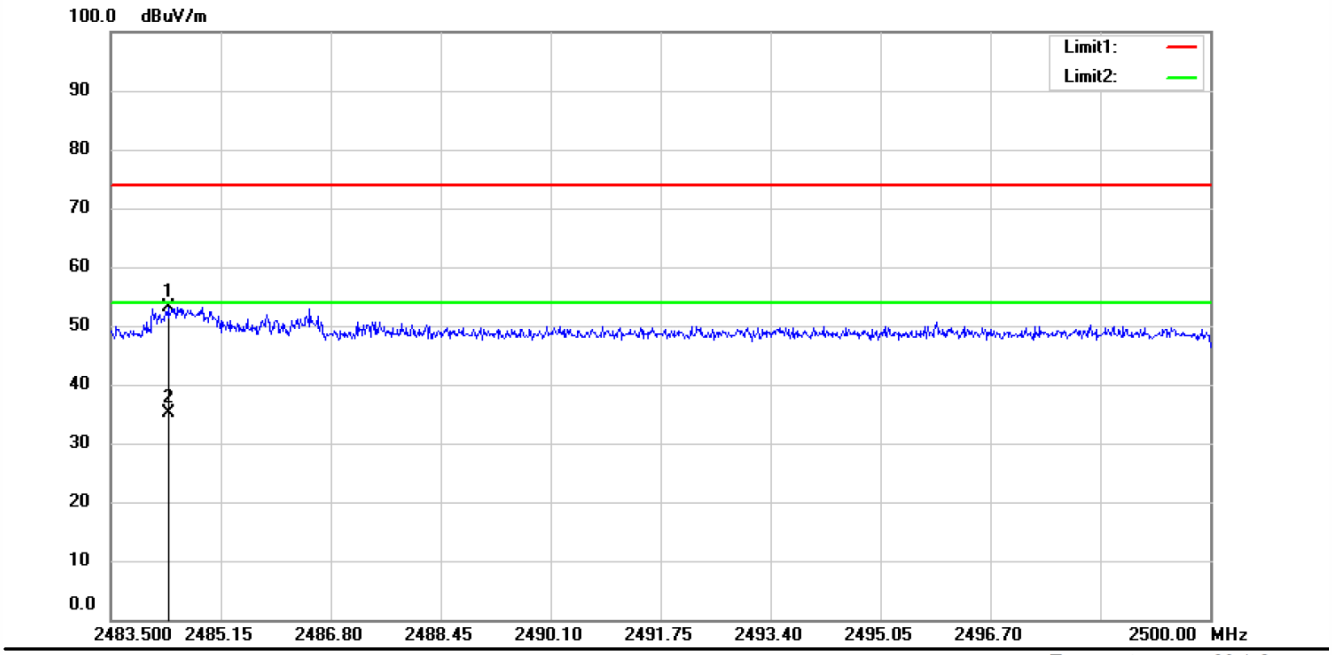
Site 3m Chamber #3 Polarization: *Vertical* Temperature: 28.1 C

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



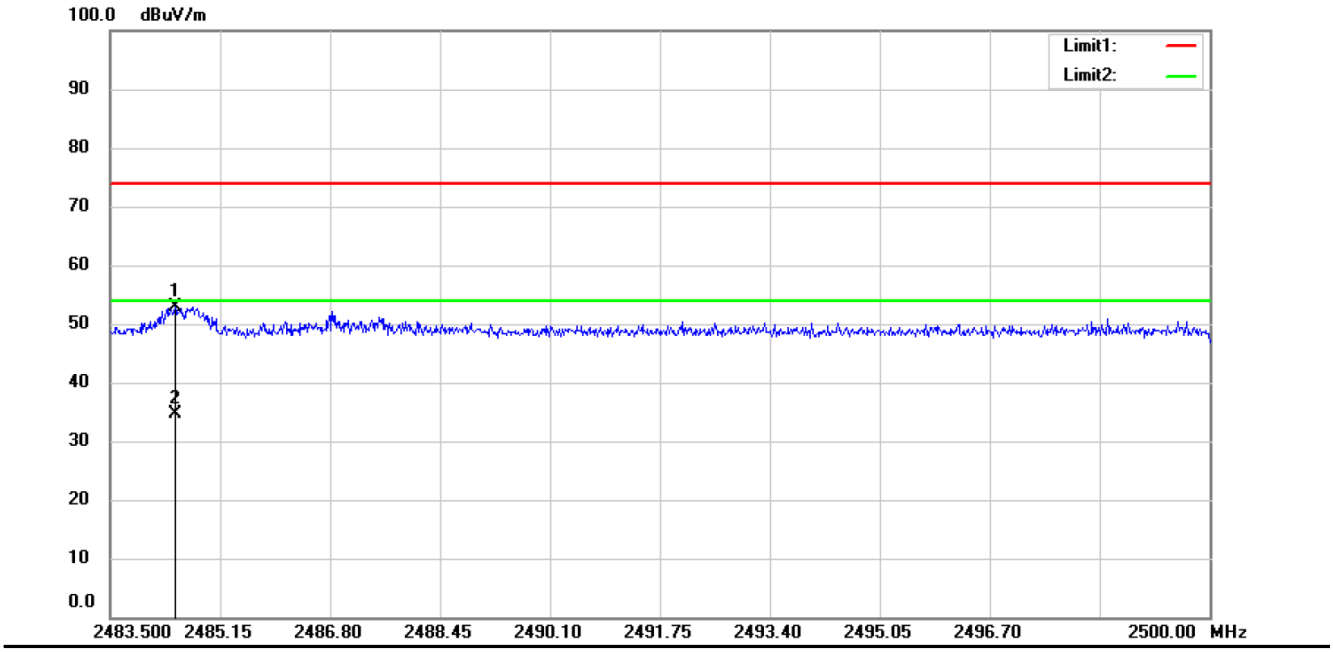
Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 28.1 C

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



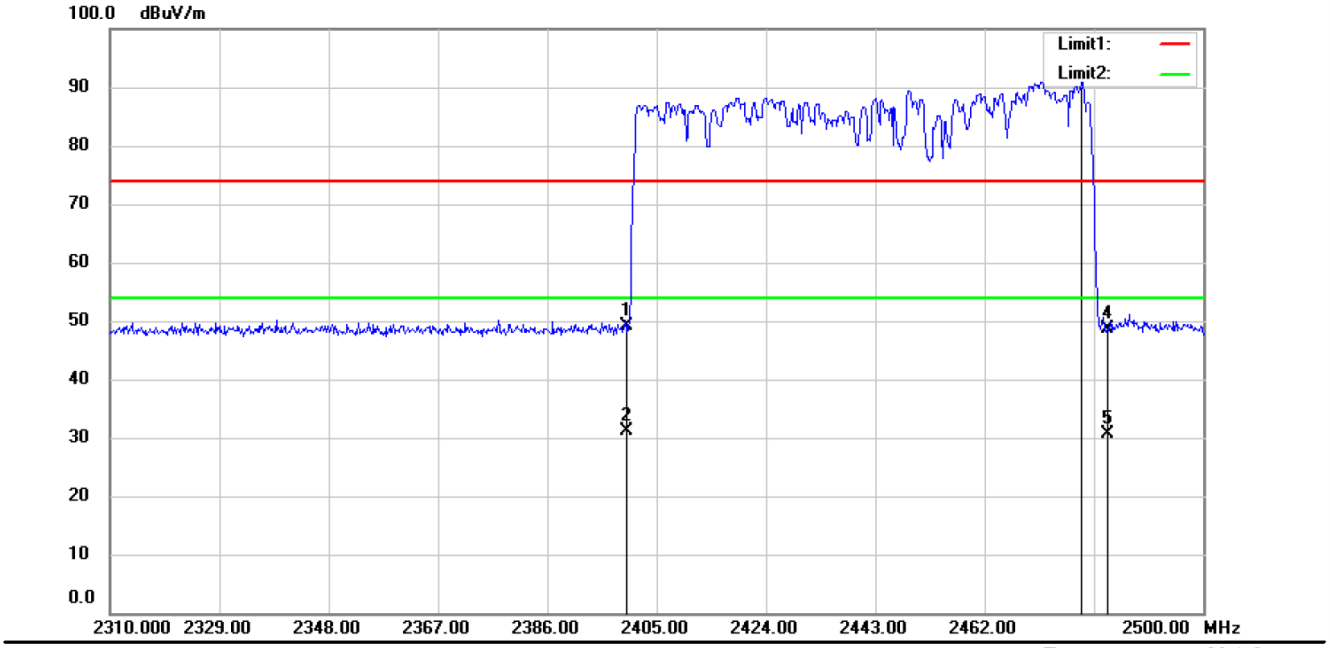
Site 3m Chamber #3 Polarization: ***Vertical*** Temperature: 28.1 C

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



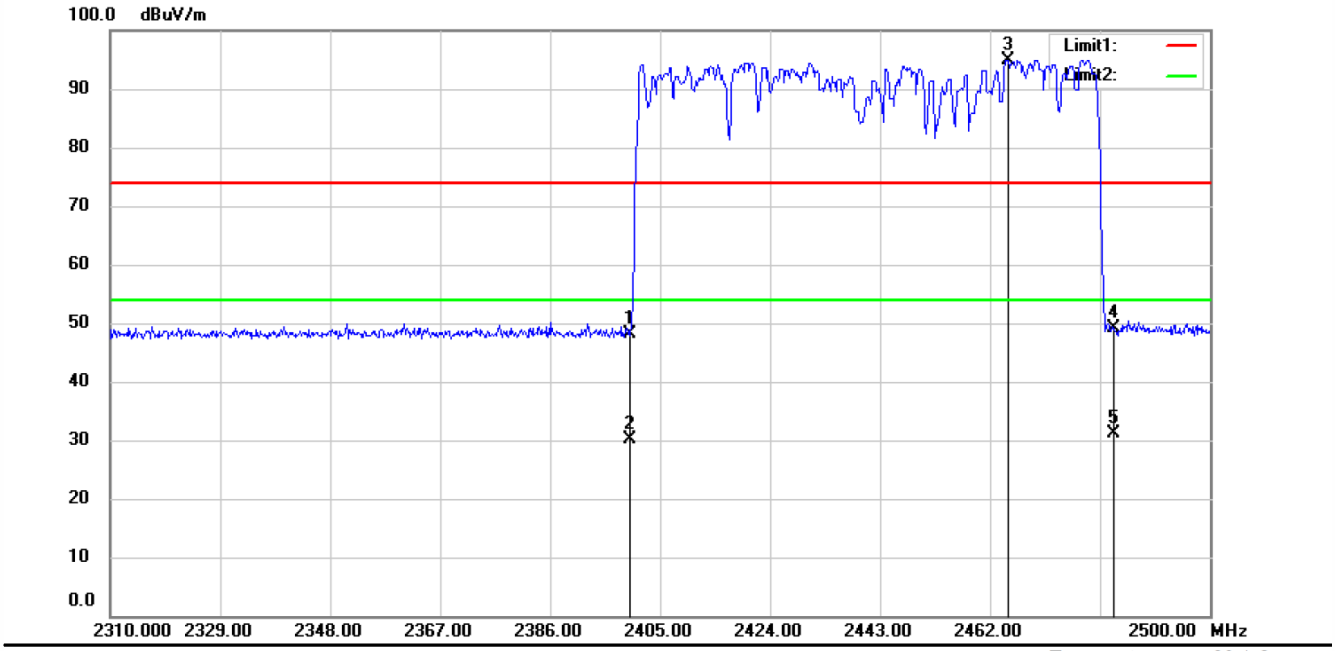
Site 3m Chamber #3 Polarization: ***Horizontal*** Temperature: 28.1 C

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



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 28.1 C

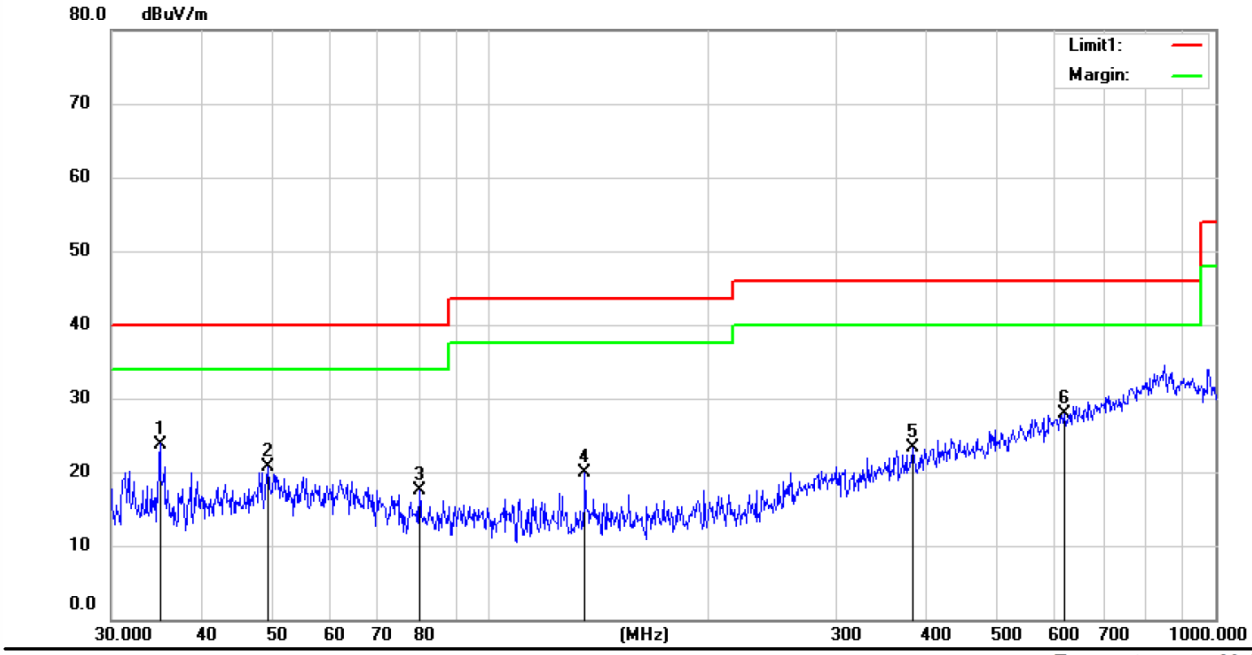
Test Model	Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz		
	Hopping	GFSK	H



Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 28.1 C

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

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



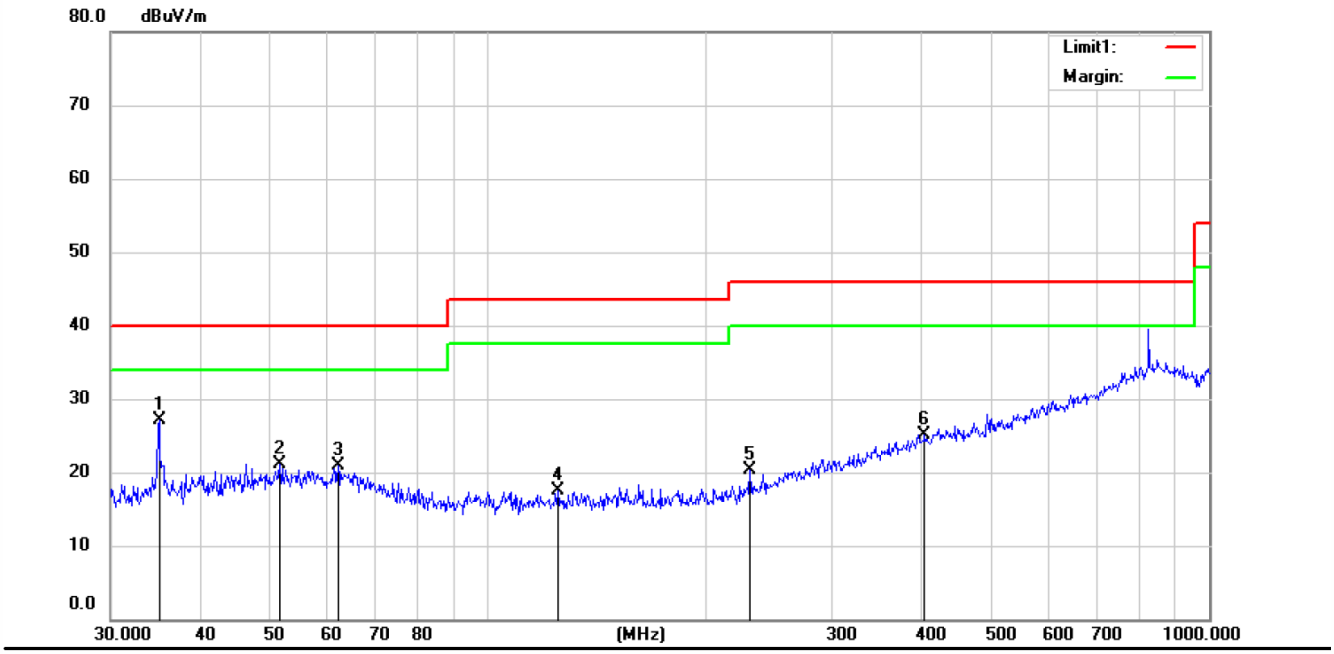
Site 3m Chamber #3 Polarization: *Vertical* Temperature: 28.1 C

Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 43 %

Mode: BT 2402

Note:

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	*	35.0816	32.98	-9.18	23.80	40.00	-16.20	QP			
2		49.5111	28.37	-7.63	20.74	40.00	-19.26	QP			
3		80.0104	27.89	-10.43	17.46	40.00	-22.54	QP			
4		135.0320	29.73	-9.90	19.83	43.50	-23.67	QP			
5		383.5954	26.46	-3.07	23.39	46.00	-22.61	QP			
6		619.6223	26.89	1.06	27.95	46.00	-18.05	QP			



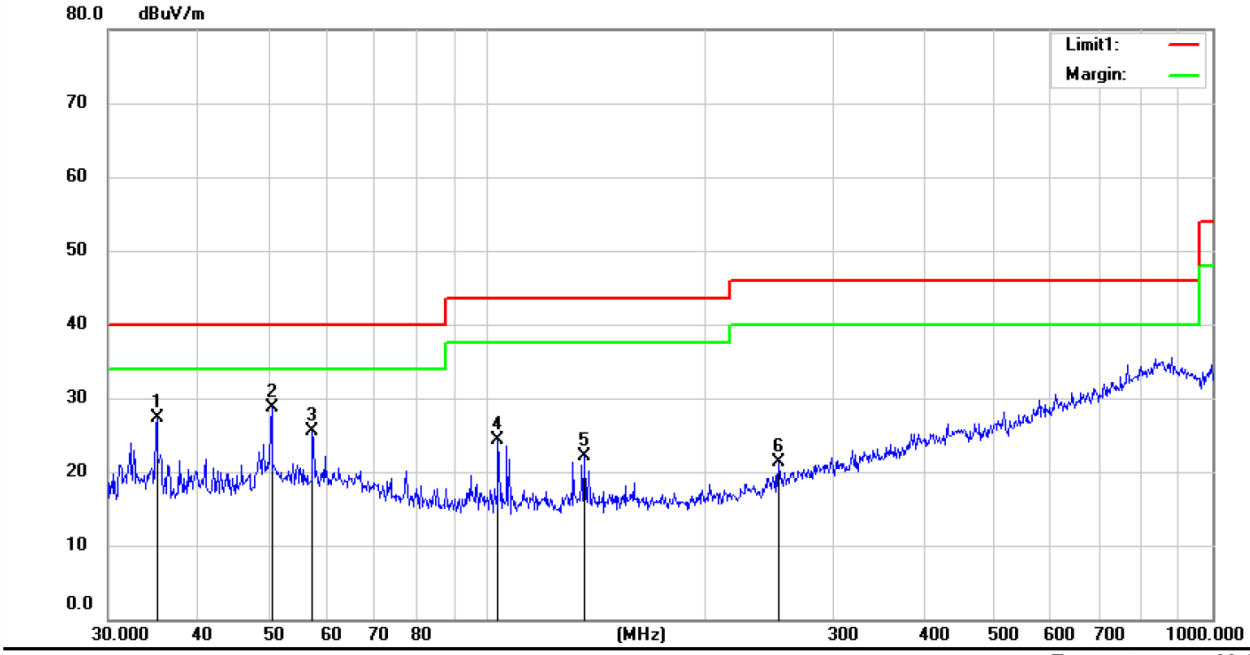
Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 28.1 C

Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 43 %

Mode:BT 2402

Note:

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	*	35.0355	36.20	-9.19	27.01	40.00	-12.99	QP			
2		51.5936	28.59	-7.41	21.18	40.00	-18.82	QP			
3		62.0222	28.42	-7.48	20.94	40.00	-19.06	QP			
4		125.1711	27.49	-10.06	17.43	43.50	-26.07	QP			
5		230.9068	28.82	-8.51	20.31	46.00	-25.69	QP			
6		403.2500	27.69	-2.50	25.19	46.00	-20.81	QP			



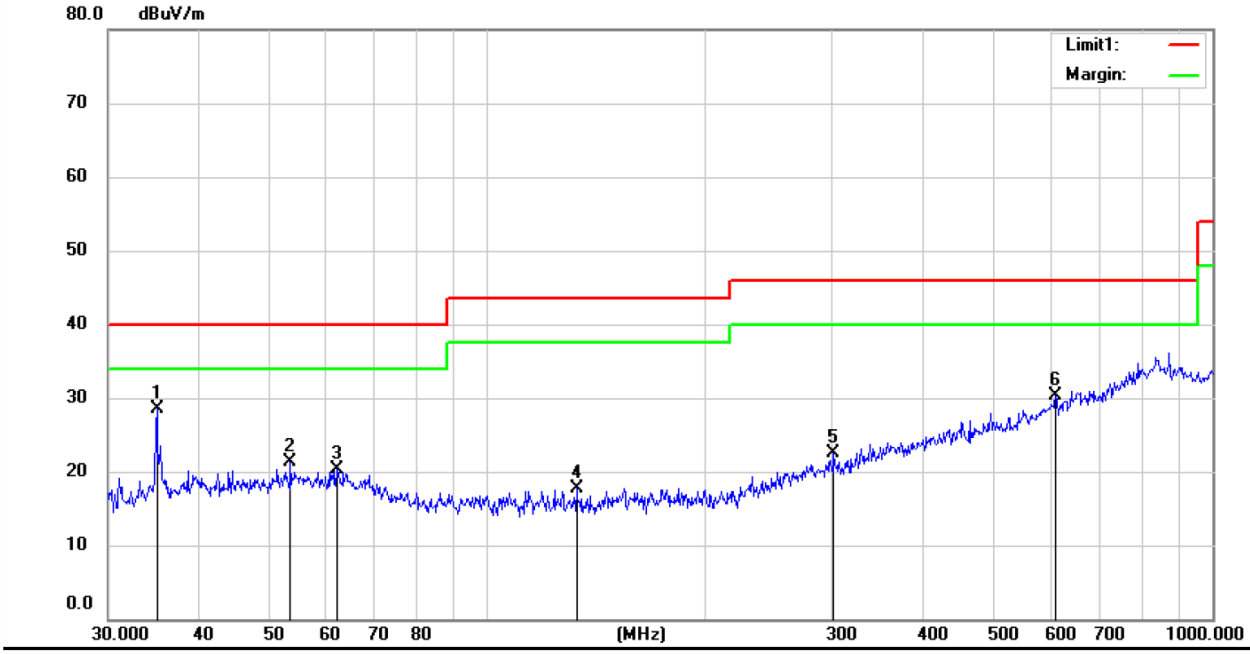
Site 3m Chamber #3 Polarization: *Vertical* Temperature: 28.1 C

Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 43 %

Mode:BT 2441

Note:

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		35.0355	36.56	-9.19	27.37	40.00	-12.63	QP			
2	*	50.4090	36.25	-7.49	28.76	40.00	-11.24	QP			
3		57.5687	33.04	-7.58	25.46	40.00	-14.54	QP			
4		103.6237	34.53	-10.26	24.27	43.50	-19.23	QP			
5		136.3403	32.18	-10.06	22.12	43.50	-21.38	QP			
6		252.3944	28.37	-7.01	21.36	46.00	-24.64	QP			



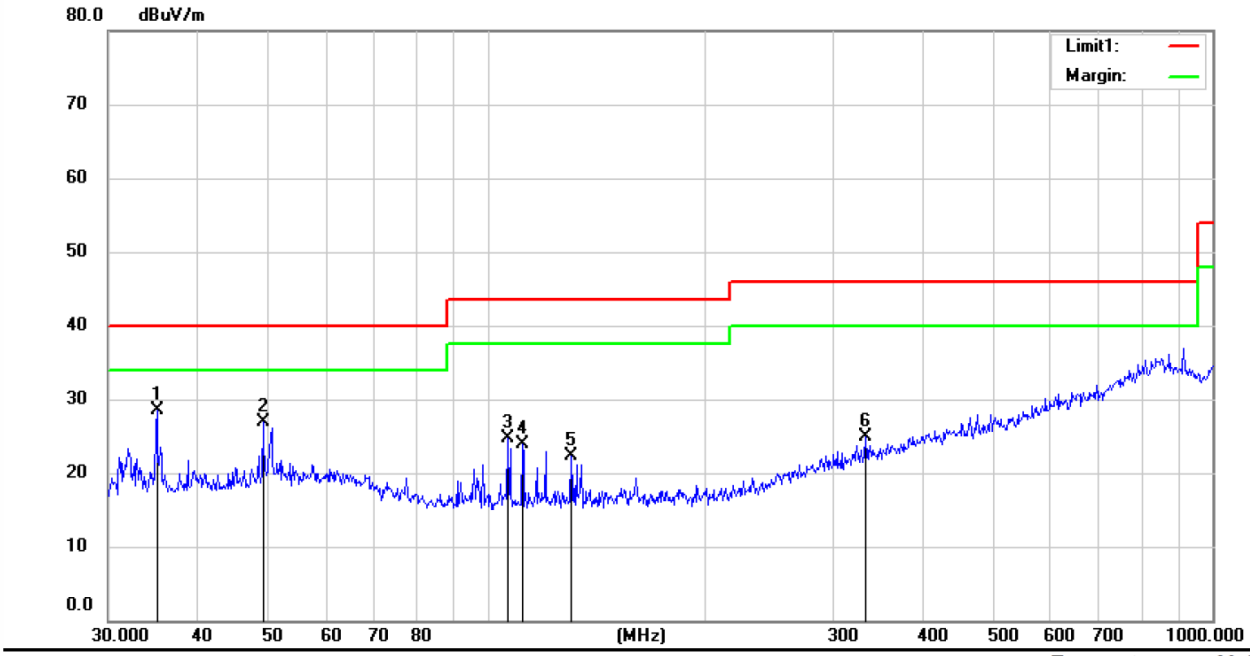
Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 28.1 C

Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 43 %

Mode:BT 2441

Note:

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	*	35.0048	37.62	-9.20	28.42	40.00	-11.58	QP			
2		53.5052	28.69	-7.46	21.23	40.00	-18.77	QP			
3		62.1040	27.83	-7.48	20.35	40.00	-19.65	QP			
4		133.0344	27.81	-10.03	17.78	43.50	-25.72	QP			
5		300.6307	27.56	-5.07	22.49	46.00	-23.51	QP			
6		609.1201	29.31	1.08	30.39	46.00	-15.61	QP			



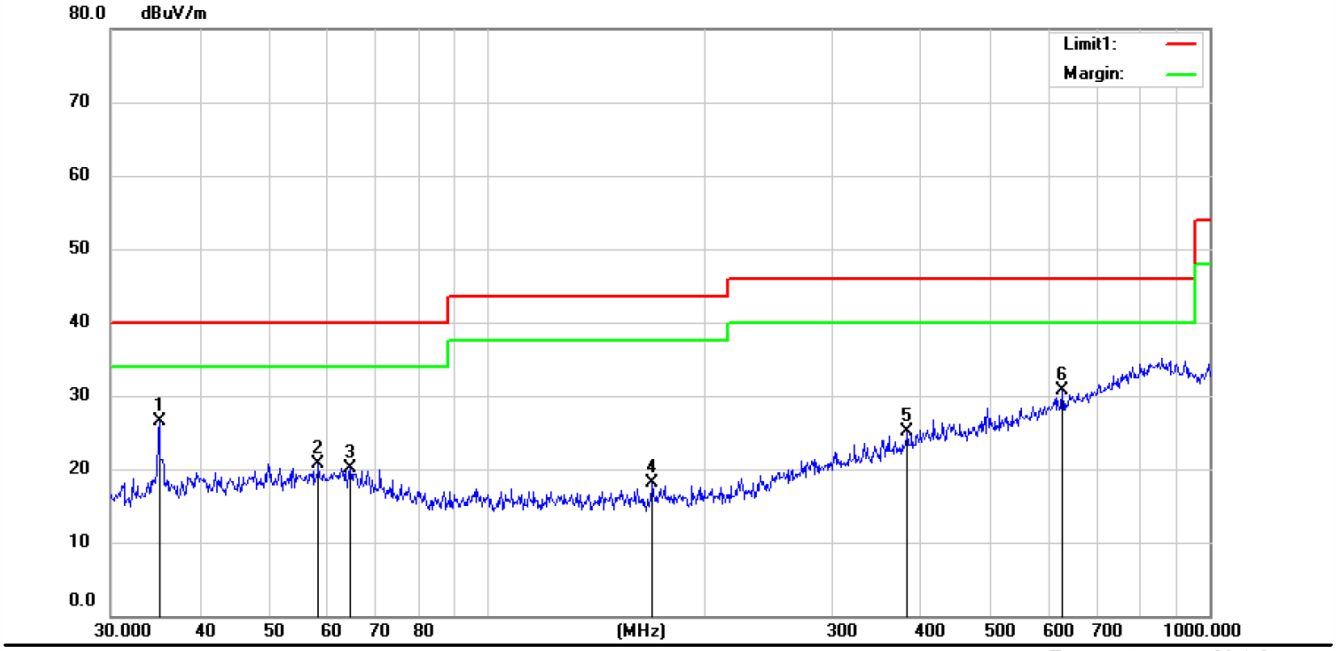
Site 3m Chamber #3 Polarization: *Vertical* Temperature: 28.1 C

Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 43 %

Mode:BT 2480

Note:

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	*	35.0048	37.62	-9.20	28.42	40.00	-11.58	QP			
2		49.1650	34.59	-7.72	26.87	40.00	-13.13	QP			
3		106.8523	34.93	-10.25	24.68	43.50	-18.82	QP			
4		111.8850	33.96	-10.14	23.82	43.50	-19.68	QP			
5		130.6650	32.52	-10.19	22.33	43.50	-21.17	QP			
6		333.2482	29.02	-4.09	24.93	46.00	-21.07	QP			



Site 3m Chamber #3 Polarization: ***Horizontal*** Temperature: 28.1 C

Limit: (RE)FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 43 %

Mode:BT 2480

Note:

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	*	35.0355	35.64	-9.19	26.45	40.00	-13.55	QP			
2		58.2540	28.36	-7.60	20.76	40.00	-19.24	QP			
3		64.4896	27.65	-7.55	20.10	40.00	-19.90	QP			
4		169.5247	27.91	-9.86	18.05	43.50	-25.45	QP			
5		381.4158	28.25	-3.16	25.09	46.00	-20.91	QP			
6		625.3521	29.50	1.11	30.61	46.00	-15.39	QP			

9.8 CONDUCTED EMISSION TEST

9.8.1 Applicable Standard

According to FCC Part 15.207
According to IC RSS-Gen 8.8

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

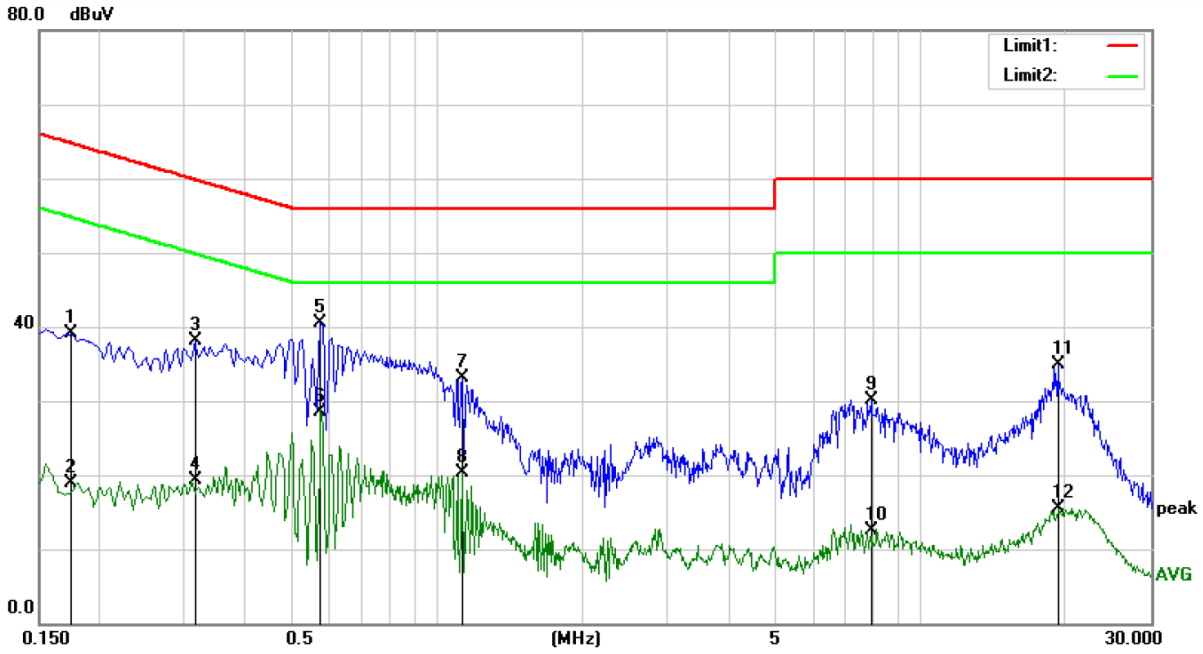
9.8.4 Test Procedure

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

The AC120V &240V voltage have been tested, and the worst result recorded was report as below:



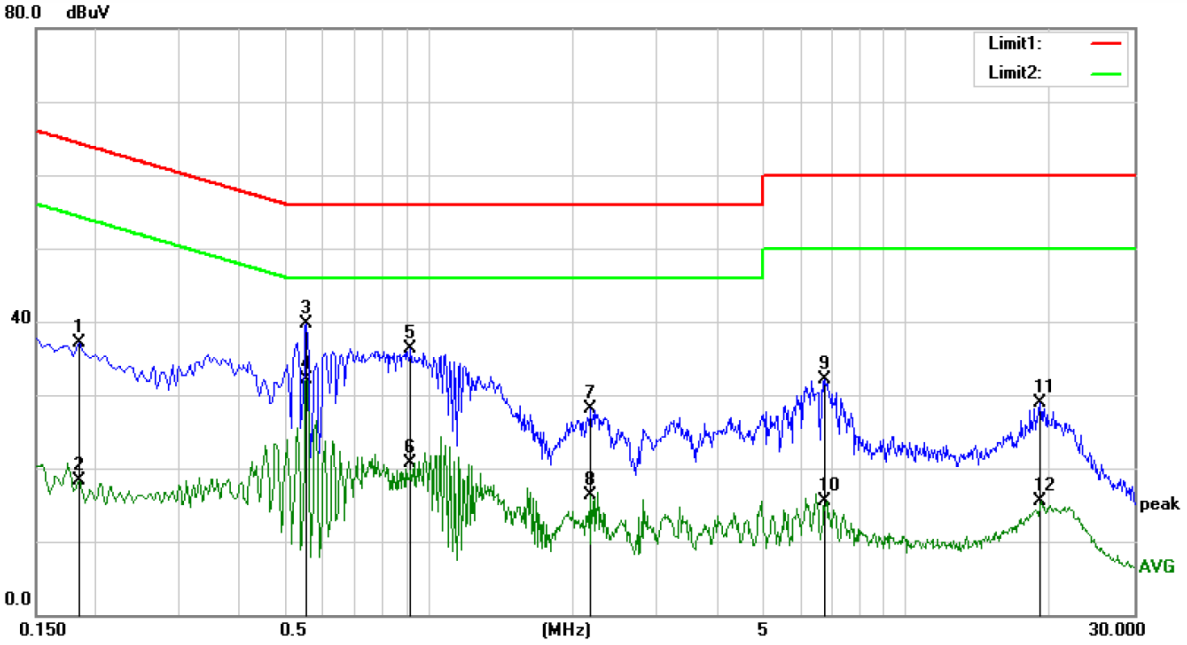
Site Conduction #1 Phase: N Temperature: 21.9

Limit: (CE)FCC PART 15 class B_QP Power: AC 120V/60Hz Humidity: 58 %

Mode: BT Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1750	29.51	9.53	39.04	64.72	-25.68	QP	
2		0.1750	9.46	9.53	18.99	54.72	-35.73	AVG	
3		0.3150	28.60	9.53	38.13	59.84	-21.71	QP	
4		0.3150	9.77	9.53	19.30	49.84	-30.54	AVG	
5	*	0.5750	30.94	9.53	40.47	56.00	-15.53	QP	
6		0.5750	19.07	9.53	28.60	46.00	-17.40	AVG	
7		1.1250	23.53	9.55	33.08	56.00	-22.92	QP	
8		1.1250	10.78	9.55	20.33	46.00	-25.67	AVG	
9		7.9050	20.44	9.64	30.08	60.00	-29.92	QP	
10		7.9050	2.77	9.64	12.41	50.00	-37.59	AVG	
11		19.2550	24.95	9.93	34.88	60.00	-25.12	QP	
12		19.2550	5.65	9.93	15.58	50.00	-34.42	AVG	



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

Limit: (CE)FCC PART 15 class B_QP Power: AC 120V/60Hz Humidity: 58 %

Mode: BT Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1850	27.58	9.53	37.11	64.26	-27.15	QP	
2		0.1850	8.77	9.53	18.30	54.26	-35.96	AVG	
3		0.5550	30.19	9.53	39.72	56.00	-16.28	QP	
4	*	0.5550	22.63	9.53	32.16	46.00	-13.84	AVG	
5		0.9150	26.81	9.55	36.36	56.00	-19.64	QP	
6		0.9150	11.20	9.55	20.75	46.00	-25.25	AVG	
7		2.1800	18.64	9.55	28.19	56.00	-27.81	QP	
8		2.1800	6.66	9.55	16.21	46.00	-29.79	AVG	
9		6.7550	22.43	9.61	32.04	60.00	-27.96	QP	
10		6.7550	5.83	9.61	15.44	50.00	-34.56	AVG	
11		19.0800	18.89	9.93	28.82	60.00	-31.18	QP	
12		19.0800	5.52	9.93	15.45	50.00	-34.55	AVG	

9.9 ANTENNA APPLICATION

9.9.1 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.
FCC 47 CFR Part 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.
RSS-Gen Section 6.8	The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.
RSS-247 Section 5.4	If the transmitter employs an antenna system that emits multiple directional beams, but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device (i.e. the sum of the power supplied to all antennas, antenna elements, staves, etc., and summed across all carriers or frequency channels) shall not exceed the applicable output power limit. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.

9.9.2 Result

PASS.

Note: ☑ Antenna 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)

Please refer to the attached document Internal Photos to show the antenna connector.

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