9.4 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

According to FCC Part 15.247(a)(1)(iii) and 558074 D01 15.247 Meas Guidance V05r02

Conformance Limit

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

Test Configuration

Test according to clause 7.1 radio frequency test setup 1

Test Procedure

■ According to FCC Part15.247(a)(1)(iii)
The EUT must have its hopping function enabled. Use the following spectrum analyzersettings:
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 subparagraphsof this Section.

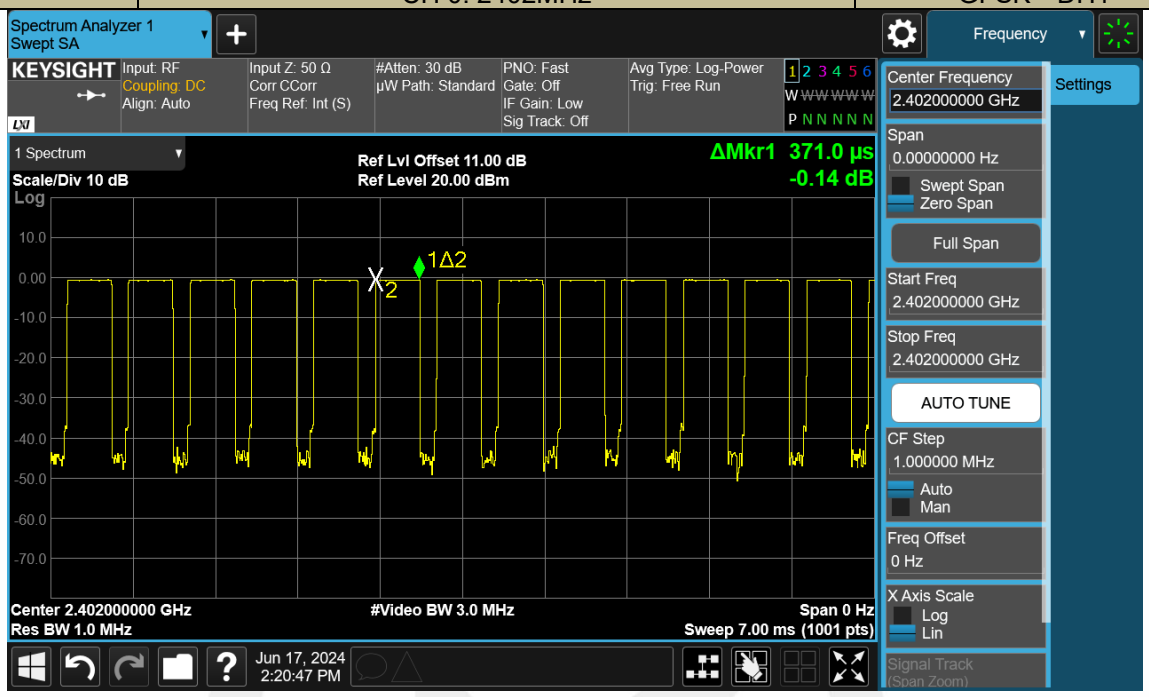
Test Results

Temperature:	26 ℃	Test Date:	June 17, 2024
Humidity:	62 %	Test By:	Lucas Xu

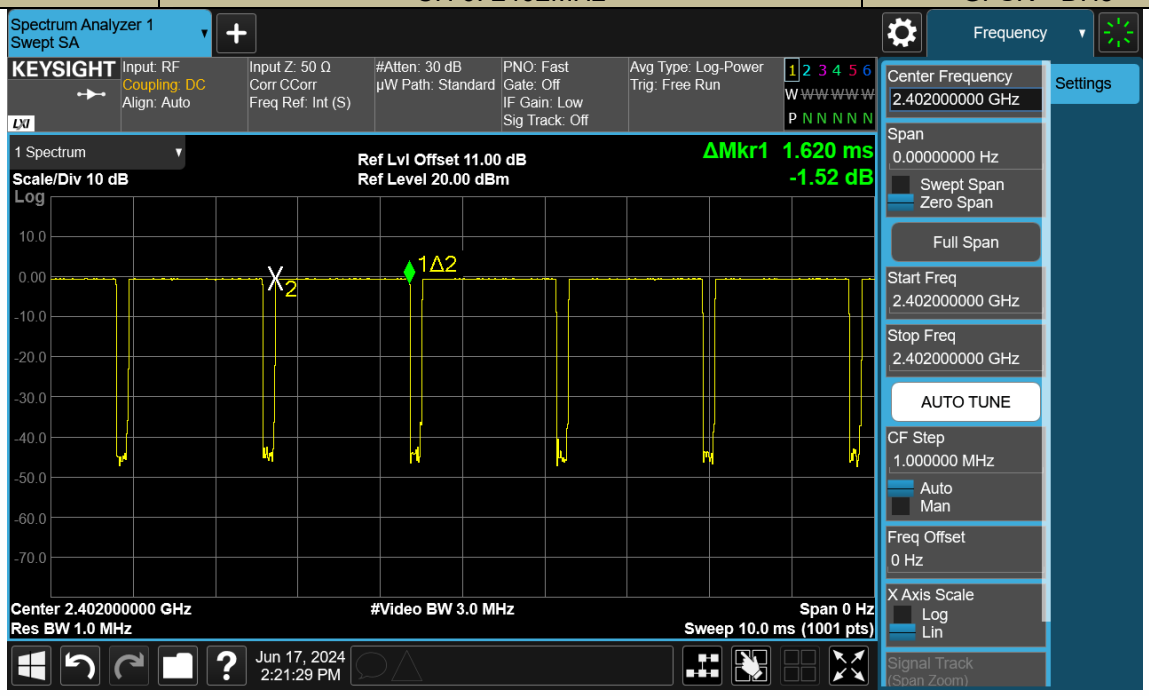
Modulation Mode	Channel Number	Packet type	Pluse width (ms)	DwellTime (ms)	Limit (ms)	Verdict
GFSK	0	DH1	0.371	118.72	<400	PASS
	0	DH3	1.620	259.20	<400	PASS
	0	DH5	2.868	305.92	<400	PASS

Note1: DwellTime(DH1)=PW*(1600/2/79)*31.6
DwellTime(DH3)=PW*(1600/4/79)*31.6
DwellTime(DH5)=PW*(1600/6/79)*31.6
Note2: Bluetooth (GFSK, pi/4-DQPSK, 8DPSK)mode have been tested, and the worst results has been recorded on the follow page.

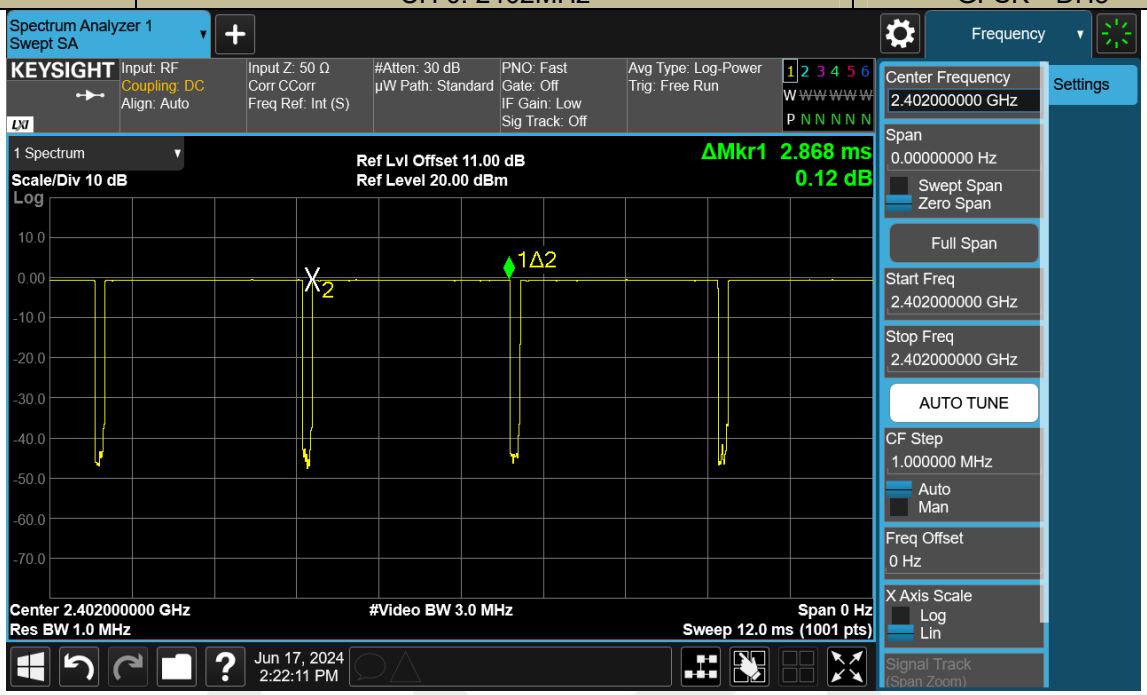
Test Model	Average Time Of Occupancy (Dwell Time)	
	CH 0: 2402MHz	GFSK DH1



Test Model	Average Time Of Occupancy (Dwell Time)	
	CH 0: 2402MHz	GFSK DH3



Test Model	Average Time Of Occupancy (Dwell Time)	
	CH 0: 2402MHz	GFSK DH5



9.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC Part 15.247(b)(1) and 558074 D01 15.247 Meas Guidance V05r02

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.

Test Configuration

Test according to clause 7.1 radio frequency test setup 1

Test Procedure

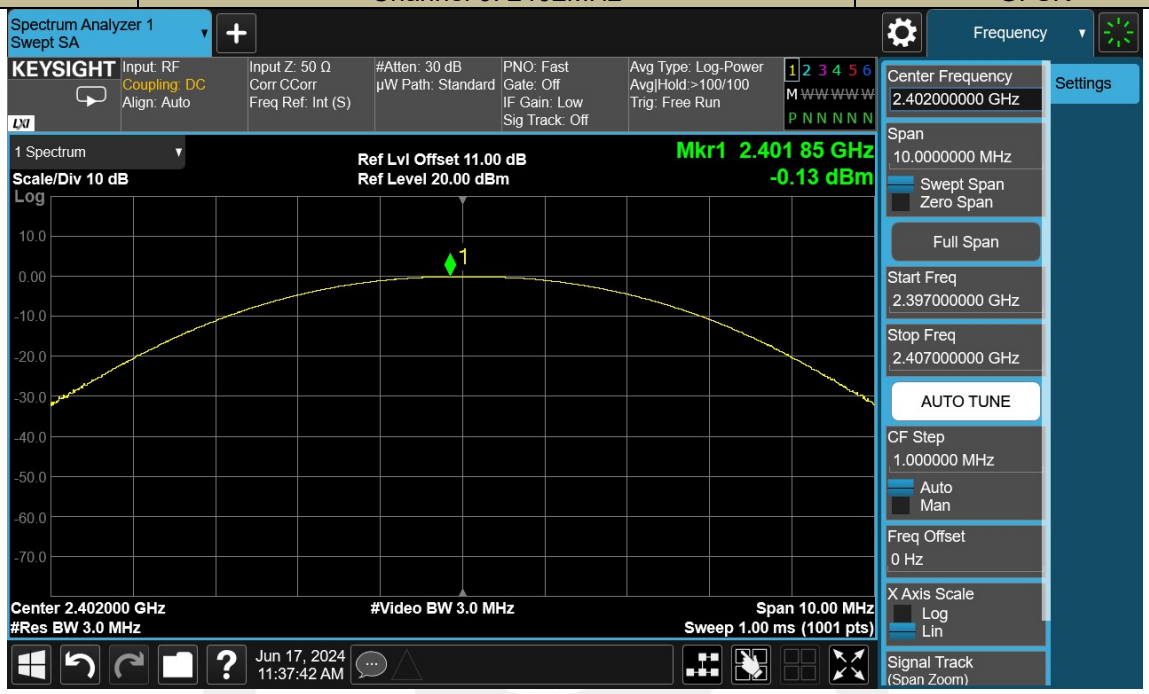
■ According to FCC Part15.247(b)(1)
As an alternative to a peak power measurement, compliance with the limit can be based on a measurement of the maximum conducted output power.
Use the following spectrum analyzer settings:
Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel(about 10MHz)
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 emissionto determine the peak amplitude level.

Test Results

Temperature:	26 ℃	Test Date:	June 17, 2024
Humidity:	62 %	Test By:	Lucas Xu

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
GFSK	0	2402	-0.13	21	PASS
	39	2441	-0.01	21	PASS
	78	2480	-0.88	21	PASS
pi/4-DQPSK	0	2402	-0.14	21	PASS
	39	2441	-0.09	21	PASS
	78	2480	-0.94	21	PASS
8DPSK	0	2402	0.18	21	PASS
	39	2441	0.29	21	PASS
	78	2480	-0.65	21	PASS
Note:N/A					

Test Model	Maximum PeakConducted Output Power	
	Channel 0: 2402MHz	GFSK

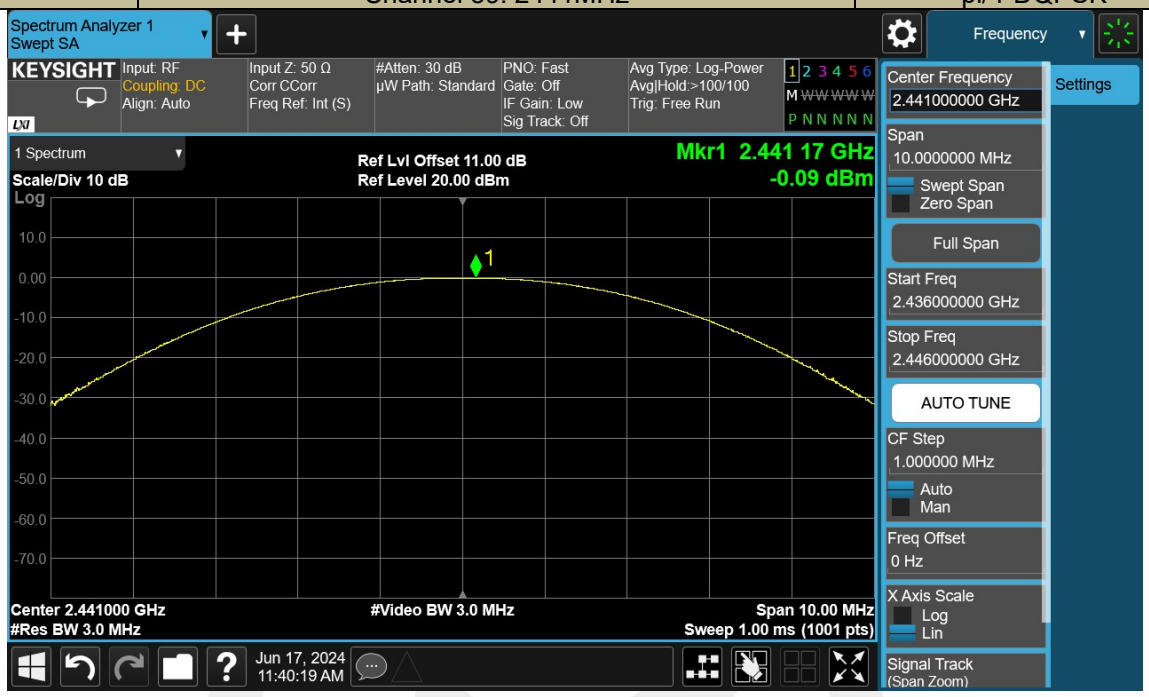


Test Model	Maximum PeakConducted Output Power	
	Channel 39: 2441MHz	GFSK

Test Model	Maximum PeakConducted Output Power	
	Channel 78: 2480MHz	GFSK

Test Model	Maximum PeakConducted Output Power	
	Channel 0: 2402MHz	pi/4-DQPSK

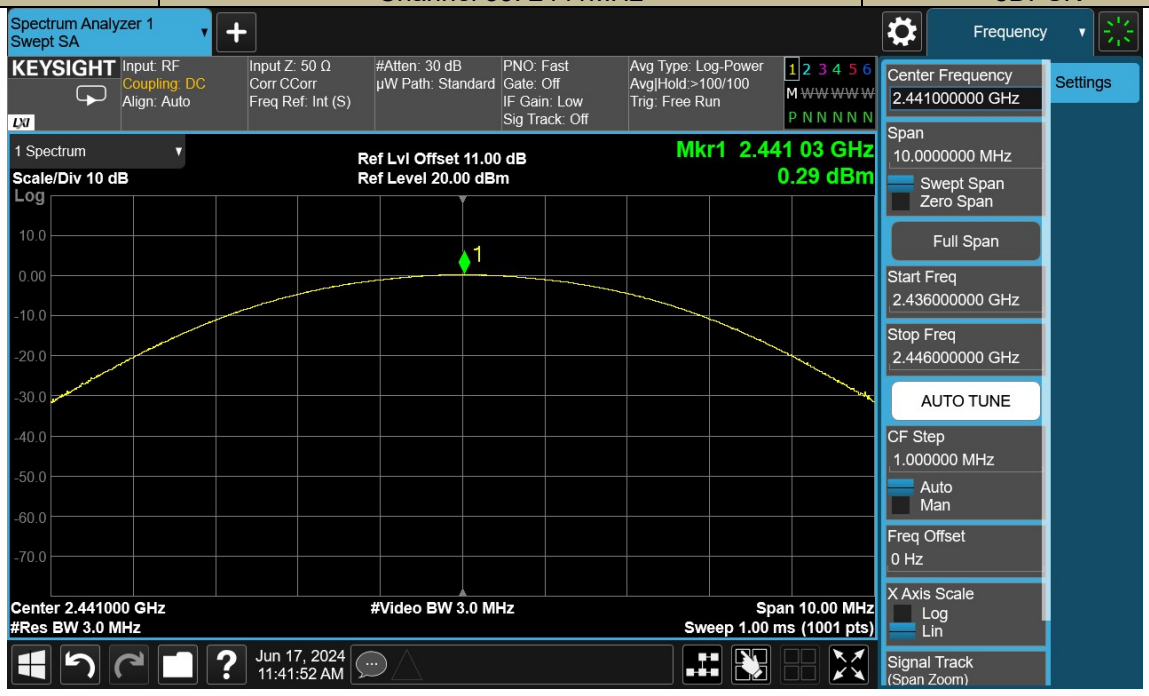
Test Model	Maximum PeakConducted Output Power	
	Channel 39: 2441MHz	pi/4-DQPSK



Test Model	Maximum PeakConducted Output Power	
	Channel 78: 2480MHz	pi/4-DQPSK

Test Model	Maximum PeakConducted Output Power	
	Channel 0: 2402MHz	8DPSK

Test Model	Maximum PeakConducted Output Power	
	Channel 39: 2441MHz	8DPSK



Test Model	Maximum PeakConducted Output Power	
	Channel 79: 2480MHz	8DPSK

9.6 CONDUCTED SUPRIOUS EMISSION

Applicable Standard

According to FCC Part 15.247(d) and 558074 D01 15.247 Meas Guidance V05r02

Conformance Limit

According to FCC Part 15.247(d):
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.

Test Configuration

Test according to clause 7.1 radio frequency test setup 1

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 Maximumconducetedlevel.
Note that the channel found to contain the maximum conduceted level can be used to establish the reference level.

- **Band-edge Compliance of RF Conducted Emissions**

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=100kHzSet VBW ≥ RBW
Set Sweep = autoSetDetector function = peakSetTrace = 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.

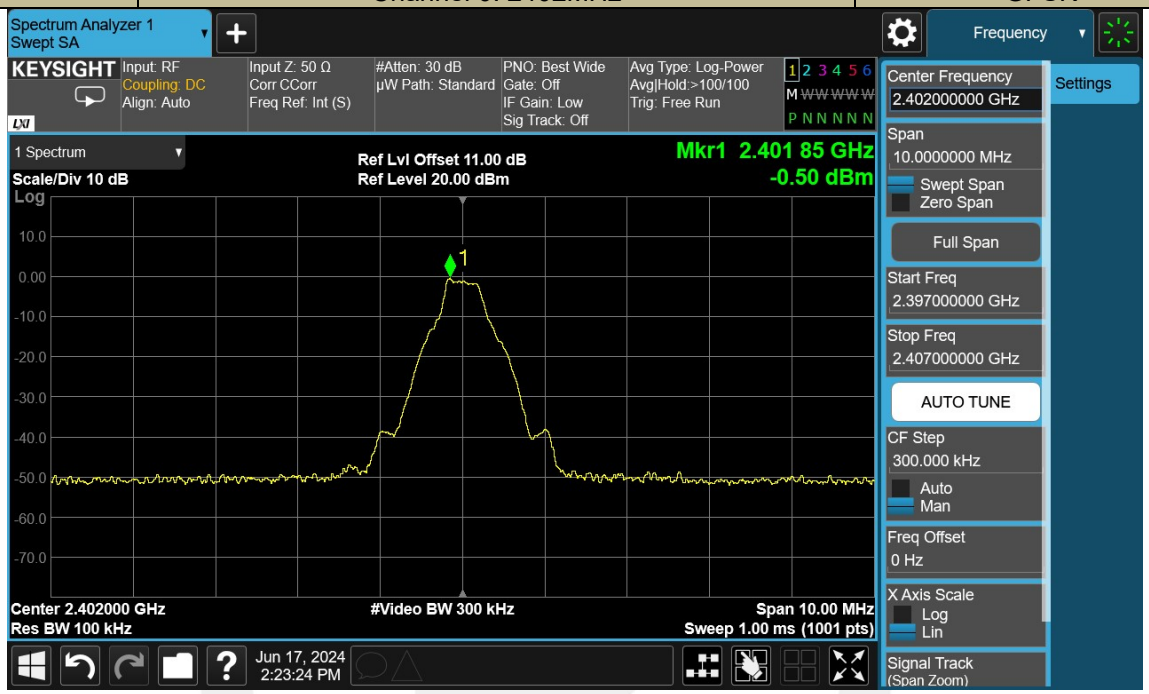
- **ConducetedSpurious RF Conducted Emission**

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 kHzSetVBW≥ RBW
Set Sweep = autoSetDetector function = peakSetTrace = 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.

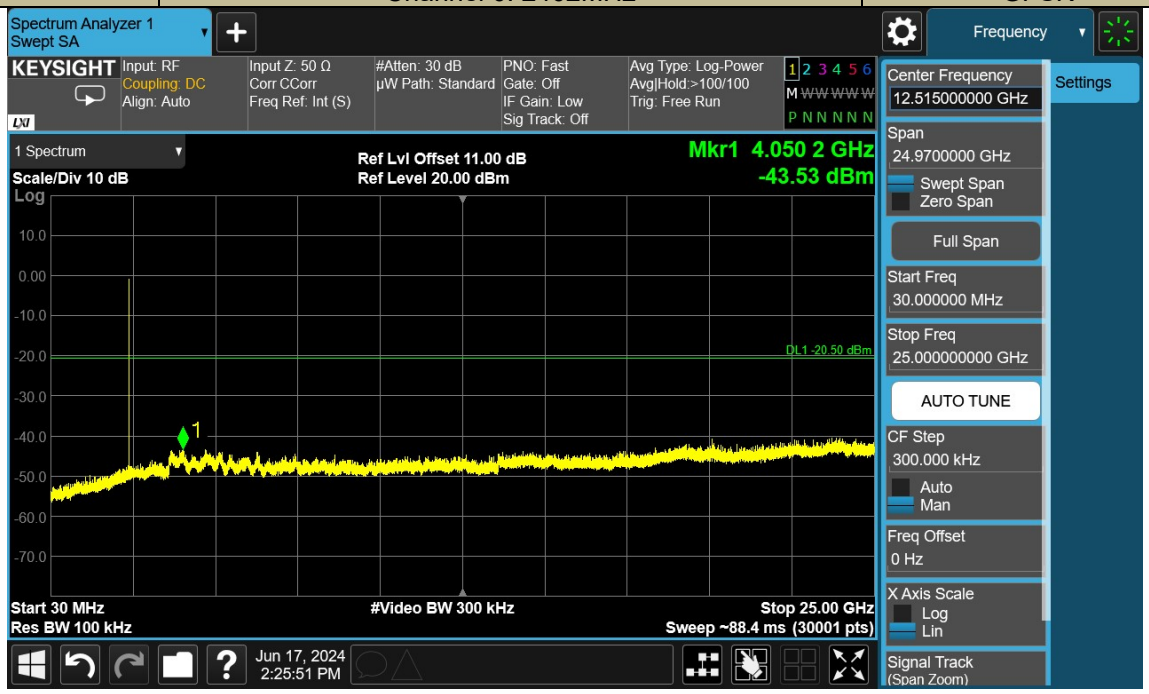
Test Results

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

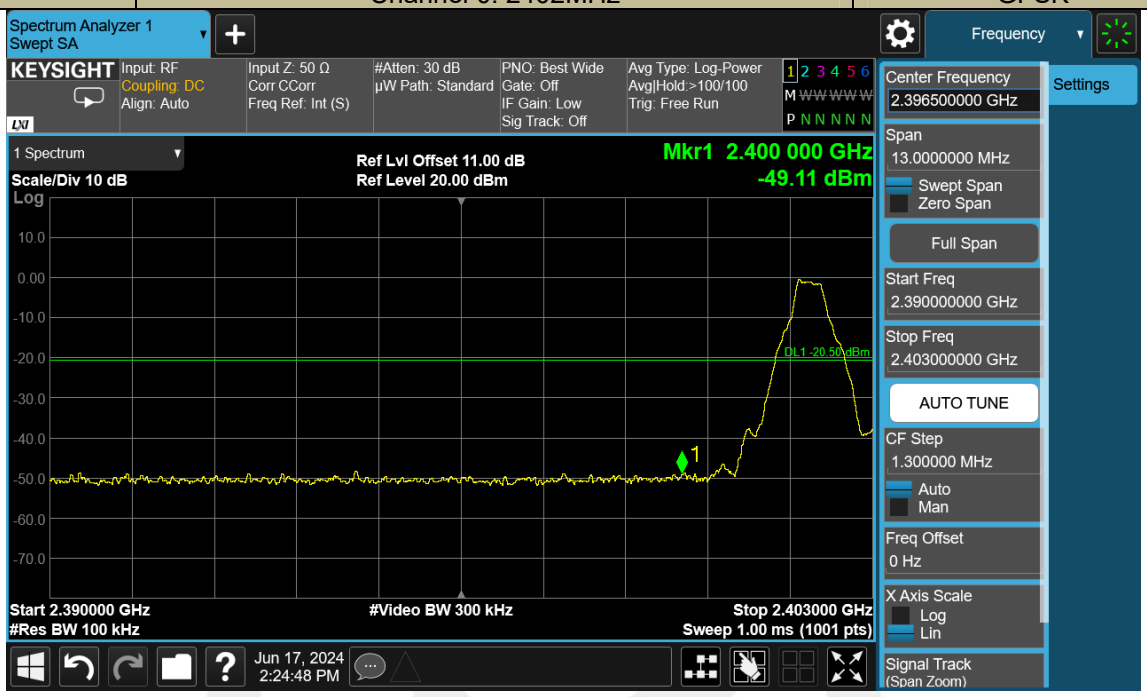
Test Model	Maximum Conduceted Level RBW=100kHz	
	Channel 0: 2402MHz	GFSK



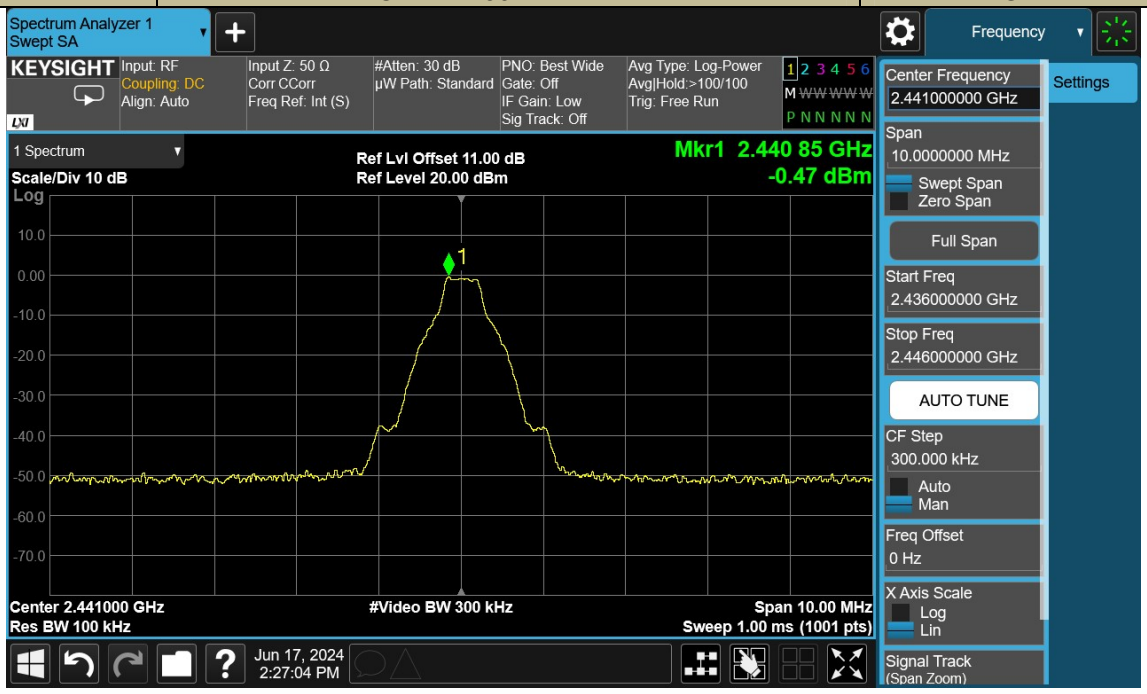
Test Model	ConducetedSpurious RF Conducted Emission(30 MHz-25GHz)	
	Channel 0: 2402MHz	GFSK



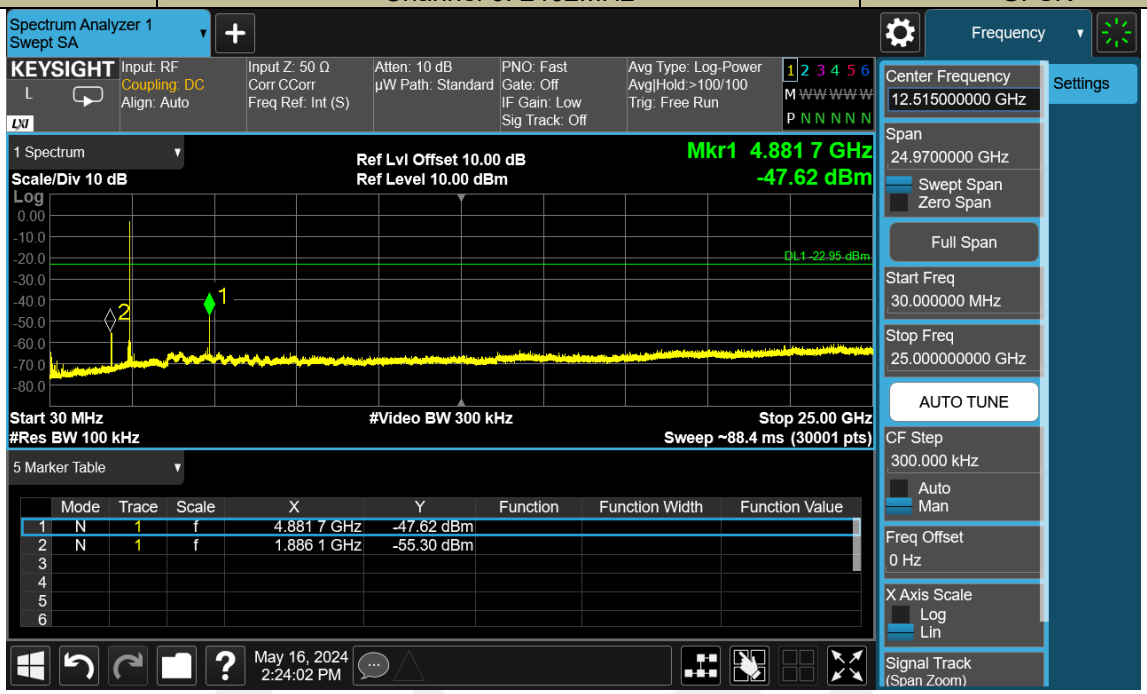
Test Model	Band-edge Conducted Emissions	
	Channel 0: 2402MHz	GFSK



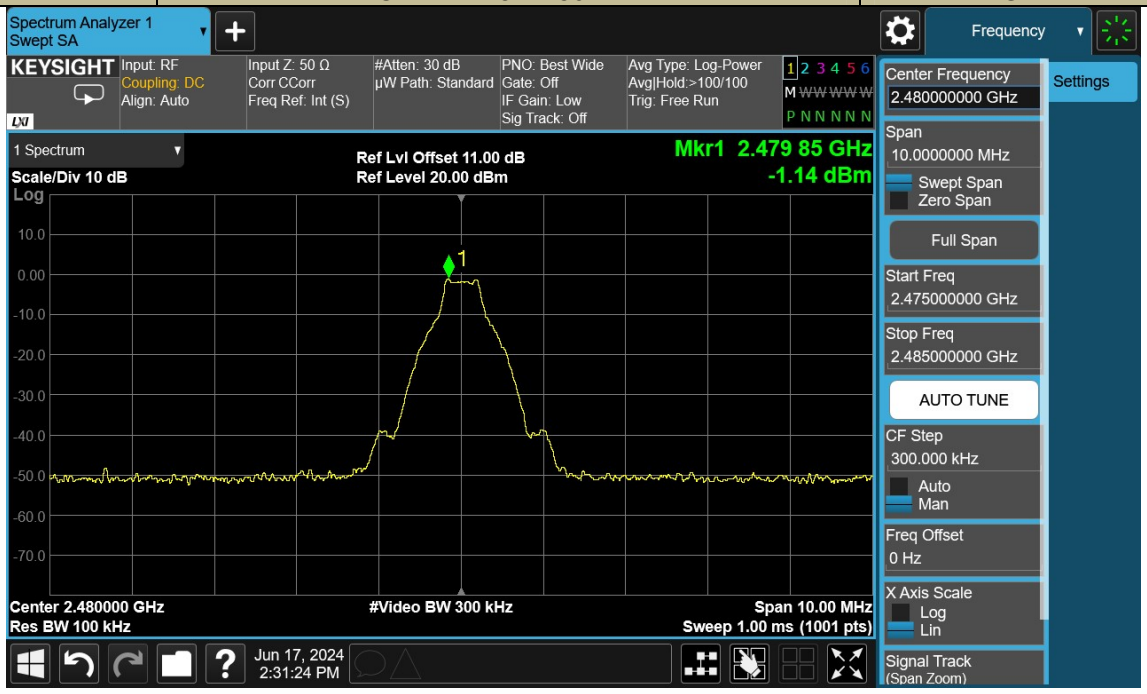
Test Model	Maximum Conduceted Level RBW=100kHz	
	Channel 39: 2441MHz	GFSK



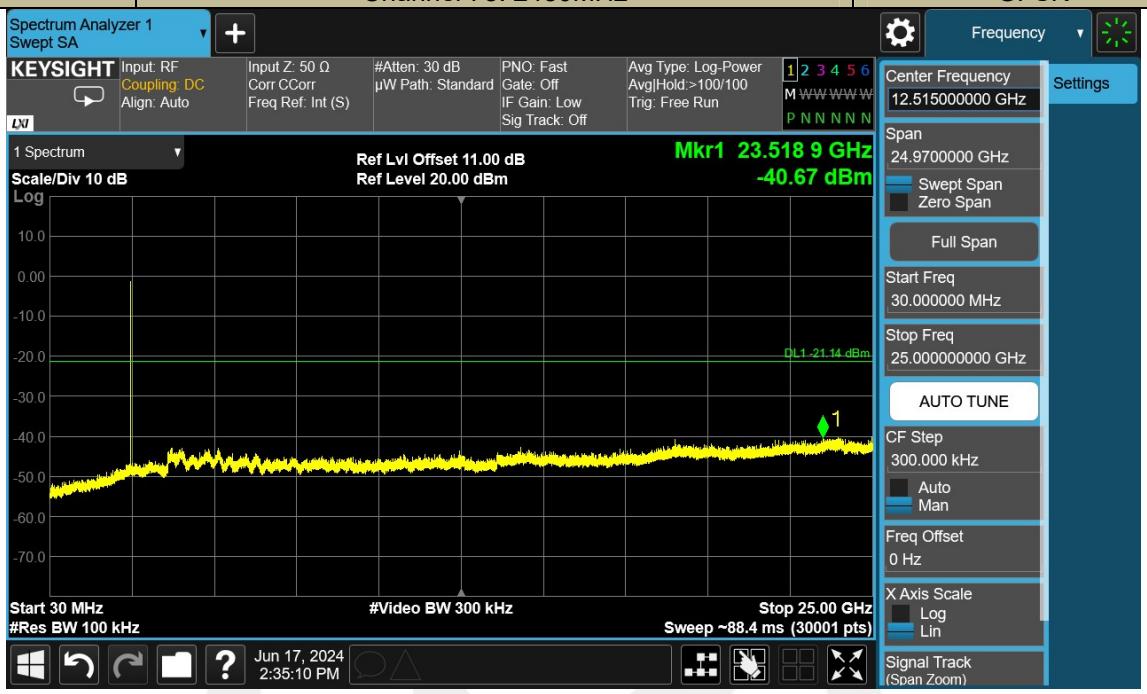
Test Model	ConducetedSpurious RF Conducted Emission(30 MHz-25GHz)	
	Channel 0: 2402MHz	GFSK



Test Model	Maximum Conduceted Level RBW=100kHz	
	Channel 78: 2480MHz	GFSK

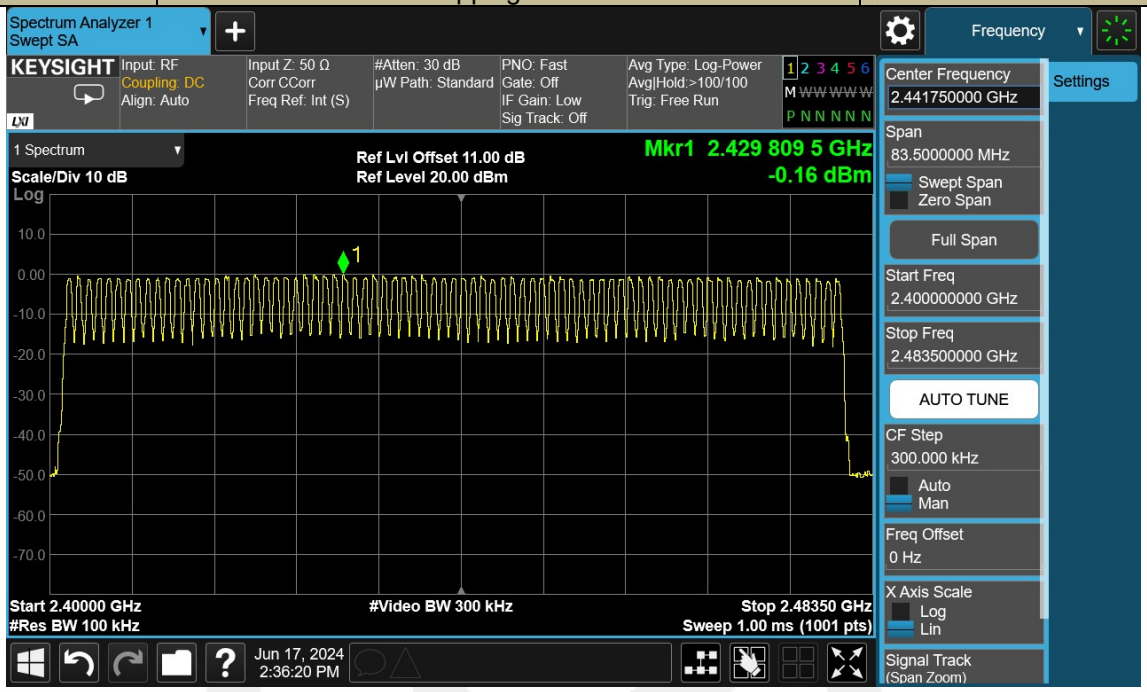


Test Model	ConducetedSpurious RF Conducted Emission(30 MHz-25 GHz)	
	Channel 78: 2480MHz	GFSK

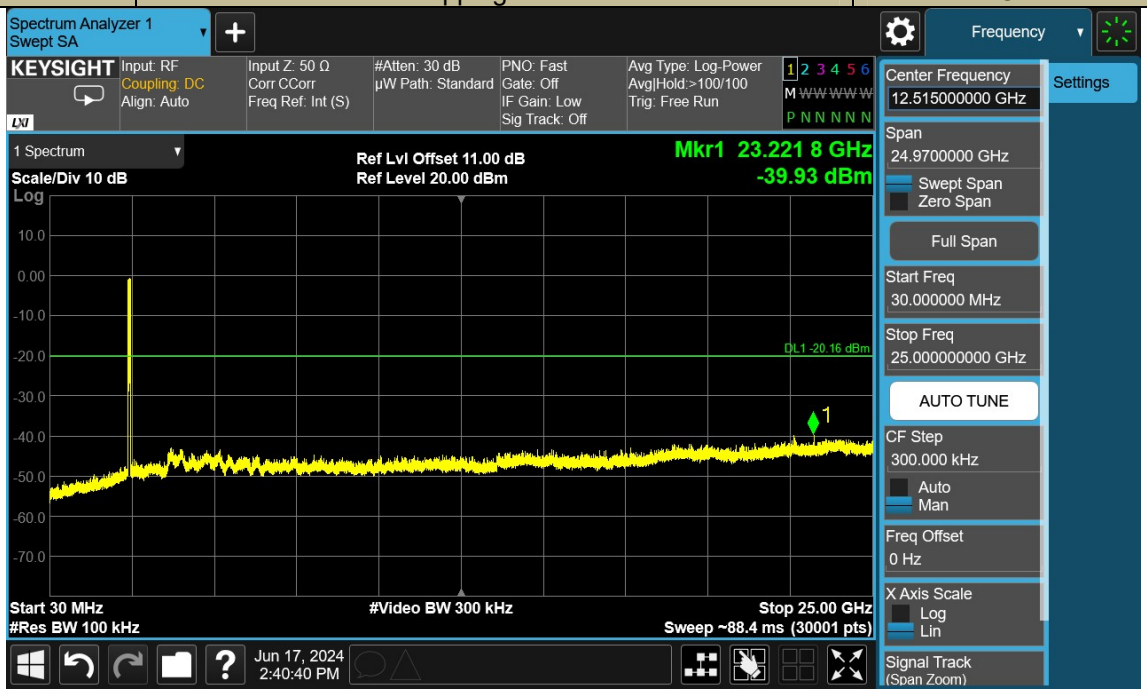


Test Model	Band-edge Conducted Emissions	
	Channel 78: 2480MHz	GFSK

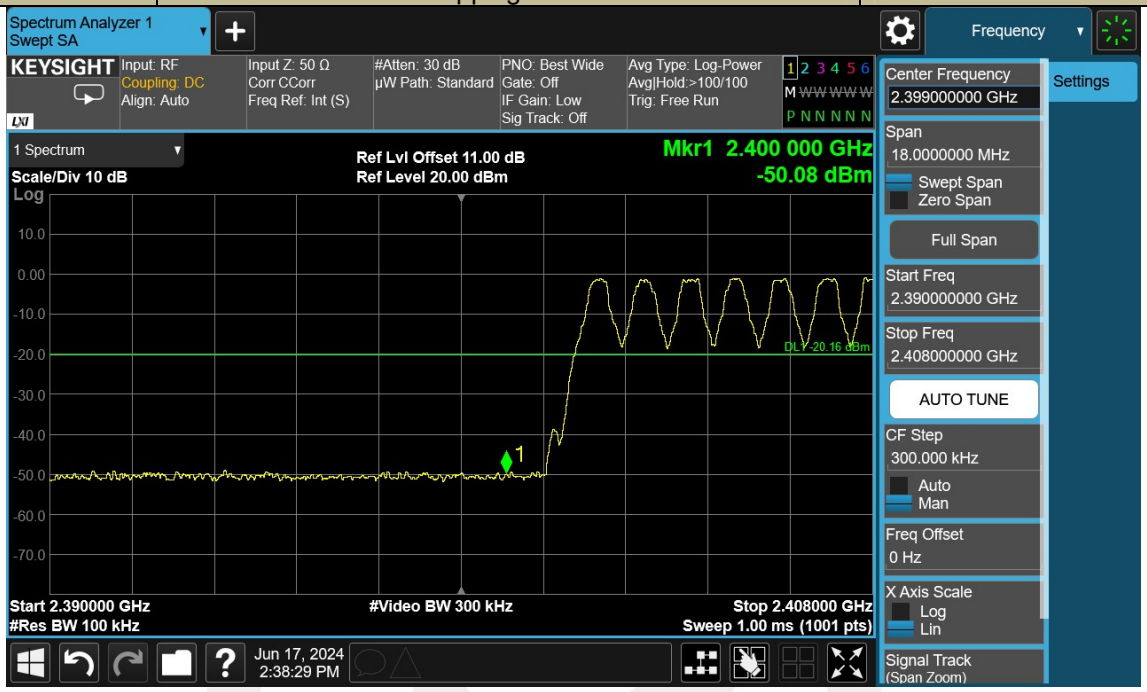
Test Model	Maximum Conduceted Level RBW=100kHz	
	Hopping Mode	GFSK

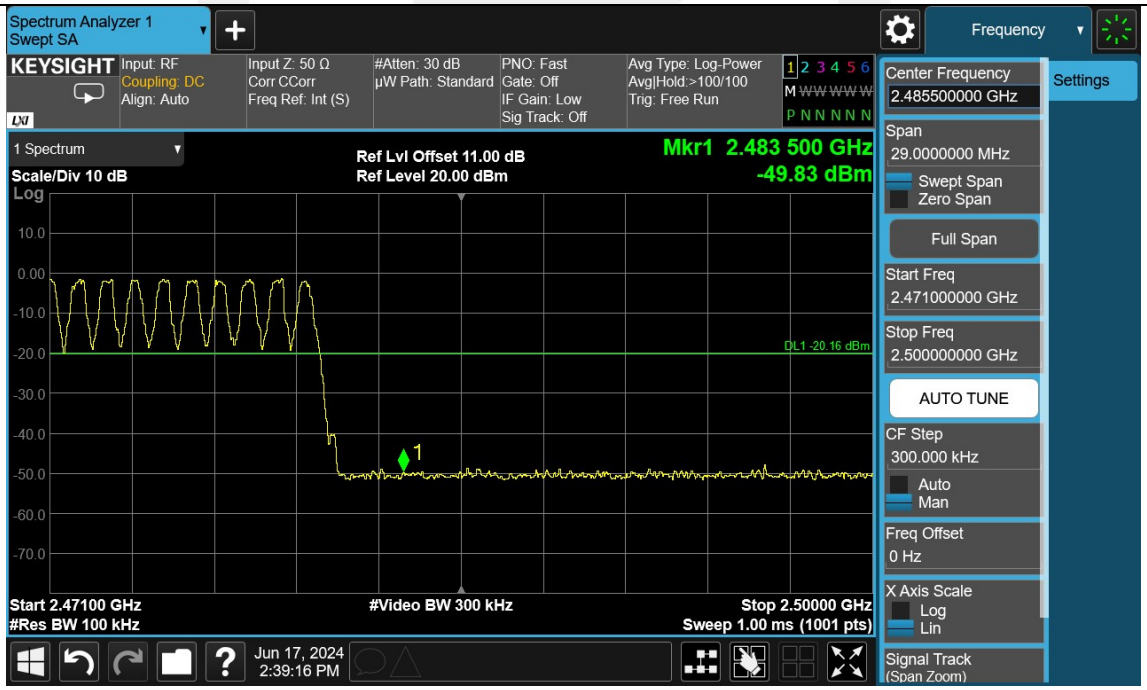


Test Model	ConducetedSpurious RF Conducted Emission(30 MHz-25GHz)	
	Hopping Mode	GFSK



Test Model	Band-edge Conducted Emissions	
	Hopping Mode	GFSK





9.7 RADIATED SPURIOUS EMISSION

Applicable Standard

According to FCC Part 15.247(d) and 15.209 and 558074 D01 15.247 Meas Guidance V05r02

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
10.495-0.505	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	(2)
13.36-13.41			

According to FCC Part15.209,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

Test Configuration

Test according to clause 7.2 radio frequency test setup 2

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:
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 = 1 MHz for f ≥ 1 GHz(1GHz to 25GHz), 100 kHz for f < 1 GHz(30MHz to 1GHz)
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

Follow the guidelines in ANSI C63.10-2014 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.

Test Results

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

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	TX Mode		

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

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	GFSK	Frequency:	Channel 0: 2402MHz

Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
4804.000	50.38	-8.8	41.58	74.00	32.42	PK+	V	PASS
4804.000	35.77	-8.8	26.97	54.00	27.03	AVG	V	PASS
13677.000	41.15	8.52	49.67	74.00	24.33	PK+	V	PASS
13677.000	27.46	8.52	35.98	54.00	18.02	AVG	V	PASS
17971.000	39.16	13.31	52.47	74.00	21.53	PK+	V	PASS
17971.000	24.23	13.31	37.54	54.00	16.46	AVG	V	PASS
Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
4804.000	51.73	-8.8	42.93	74.00	31.07	PK+	H	PASS
4804.000	37.74	-8.8	28.94	54.00	25.06	AVG	H	PASS
14315.000	41.19	8.86	50.05	74.00	23.95	PK+	H	PASS
14315.000	27.26	8.86	36.12	54.00	17.88	AVG	H	PASS
17998.000	38.85	13.64	52.49	74.00	21.51	PK+	H	PASS
17998.000	26.10	13.64	39.74	54.00	14.26	AVG	H	PASS

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	GFSK	Frequency:	Channel 39: 2441MHz

Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
4882.000	51.07	-8.21	42.86	74.00	31.14	PK+	V	PASS
4882.000	36.06	-8.21	27.85	54.00	26.15	AVG	V	PASS
17752.500	40.11	11.4	51.51	74.00	22.49	PK+	V	PASS
17752.500	25.31	11.4	36.71	54.00	17.29	AVG	V	PASS
17964.500	39.37	13.23	52.60	74.00	21.40	PK+	V	PASS
17964.500	25.41	13.23	38.64	54.00	15.36	AVG	V	PASS
Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
4882.000	50.40	-8.21	42.19	74.00	31.81	PK+	H	PASS
4882.000	36.36	-8.21	28.15	54.00	25.85	AVG	H	PASS
17564.000	39.49	11.19	50.68	74.00	23.32	PK+	H	PASS
17564.000	24.48	11.19	35.67	54.00	18.33	AVG	H	PASS
17968.000	39.26	13.27	52.53	74.00	21.47	PK+	H	PASS
17968.000	26.17	13.27	39.44	54.00	14.56	AVG	H	PASS

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	GFSK	Frequency:	Channel 78: 2480MHz

Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
4960.000	50.57	-7.41	43.16	74.00	30.84	PK+	V	PASS
4960.000	36.04	-7.41	28.63	54.00	25.37	AVG	V	PASS
14694.500	39.63	9.15	48.78	74.00	25.22	PK+	V	PASS
14694.500	25.61	9.15	34.76	54.00	19.24	AVG	V	PASS
17942.500	39.09	12.96	52.05	74.00	21.95	PK+	V	PASS
17942.500	24.91	12.96	37.87	54.00	16.13	AVG	V	PASS
Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.	Pol.	Verdict
4960.000	48.43	-7.41	41.02	74.00	32.98	PK+	H	PASS
4960.000	35.00	-7.41	27.59	54.00	26.41	AVG	H	PASS
17597.500	39.46	11.37	50.83	74.00	23.17	PK+	H	PASS
17597.500	24.27	11.37	35.64	54.00	18.36	AVG	H	PASS
17931.500	39.60	12.83	52.43	74.00	21.57	PK+	H	PASS
17931.500	25.29	12.83	38.12	54.00	15.88	AVG	H	PASS

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) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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

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

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	GFSK	Frequency:	Channel 0: 2402MHz

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Over(dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Over (dB)
2350.880	H	57.55	74.00	-16.45	44.62	54.00	-9.38
2372.000	V	57.26	74.00	-16.74	43.17	54.00	-10.83

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	GFSK	Frequency:	Channel 78: 2480MHz

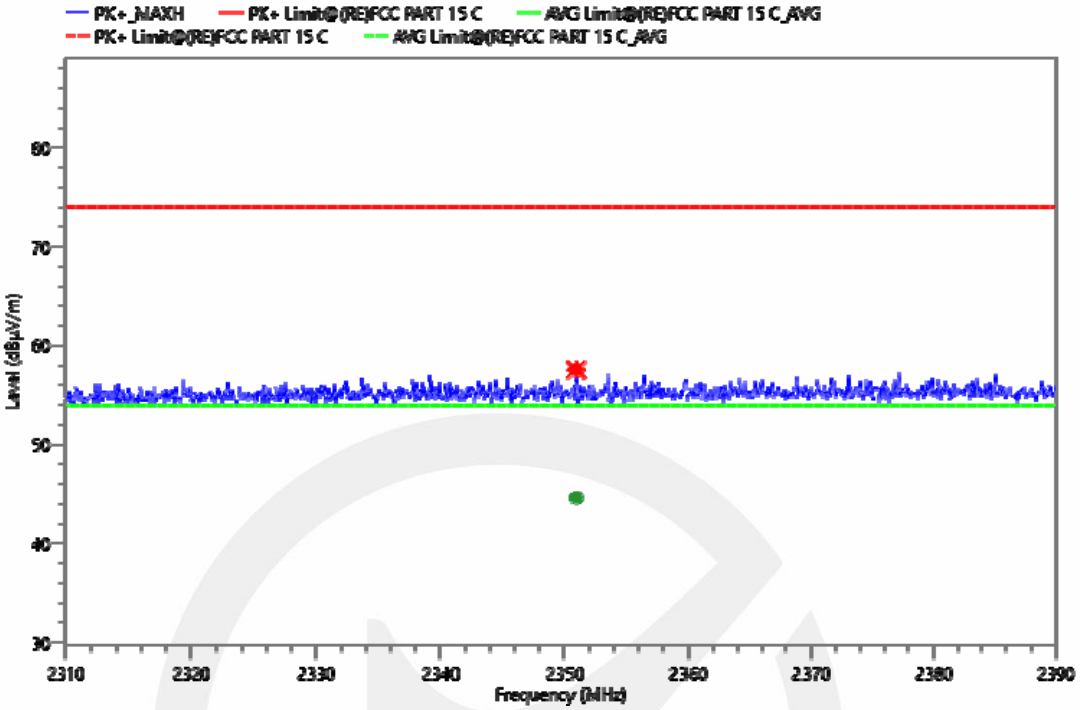
Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Over(dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Over (dB)
2493.458	H	58.30	74.00	-15.70	43.25	54.00	-10.75
2484.853	V	57.65	74.00	-16.35	42.75	54.00	-11.25

Temperature:	20 ℃	Test Date:	June 19, 2024
Humidity:	69 %	Test By:	Lucas Xu
Test mode:	GFSK	Frequency:	Hopping

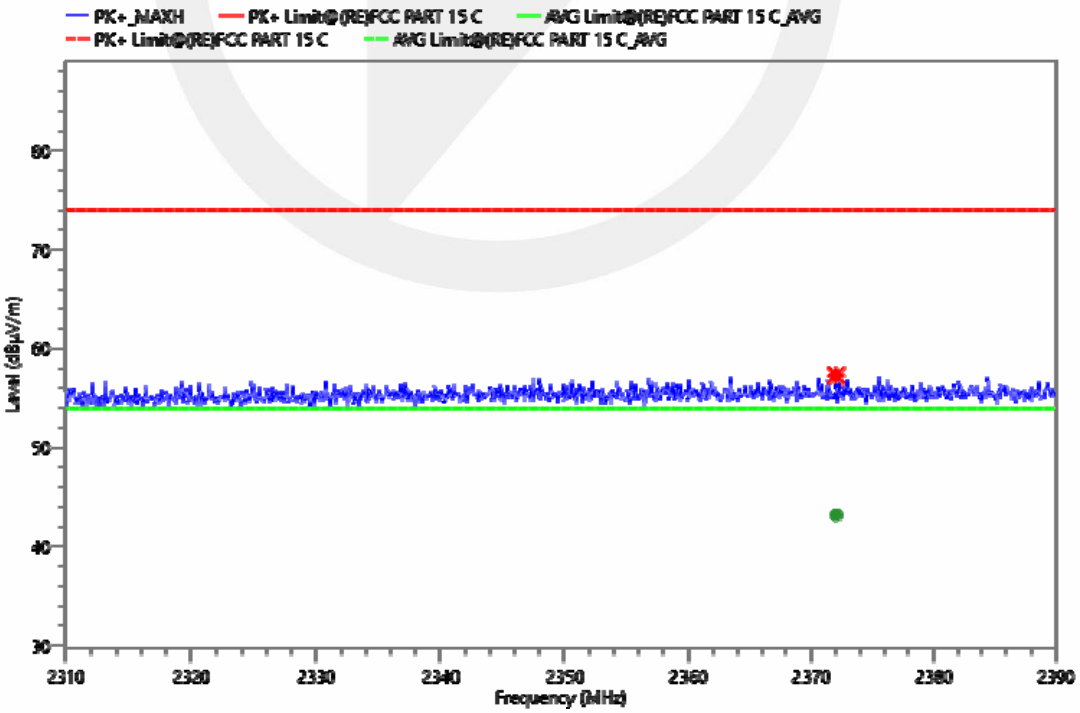
Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Over(dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Over (dB)
2400.000	H	55.63	74.00	-18.37	40.32	54.00	-13.68
2483.500	H	40.32	74.00	-16.36	42.54	54.00	-11.46
2400.000	V	56.09	74.00	-17.91	42.31	54.00	-11.69
2483.500	V	56.40	74.00	-17.60	41.54	54.00	-12.46

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) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

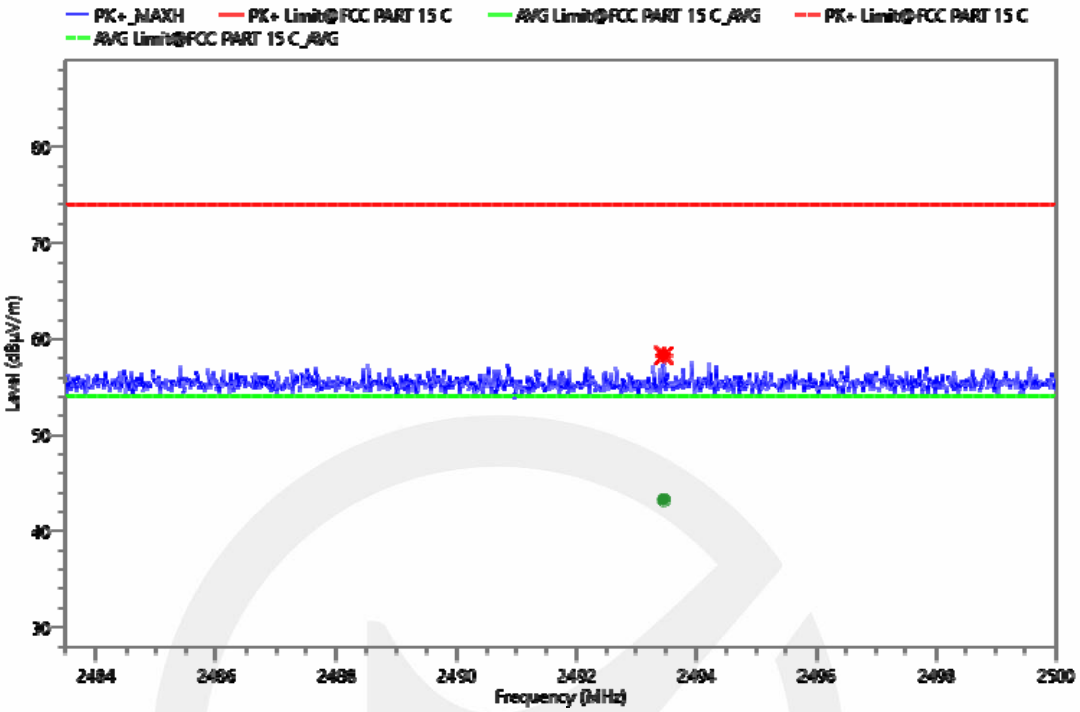
Test Model	Spurious Emission in Restricted Band 2310-2390MHz		
	Channel 0: 2402MHz	GFSK	H



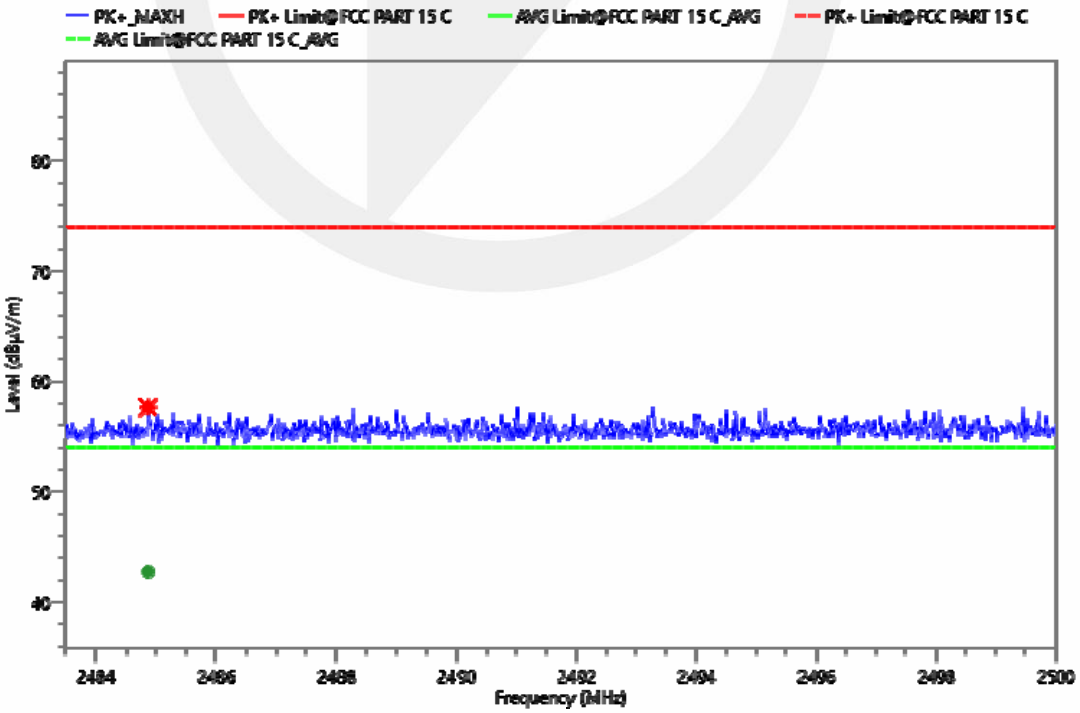
Test Model	Spurious Emission in Restricted Band 2310-2390MHz		
	Channel 0: 2402MHz	GFSK	V



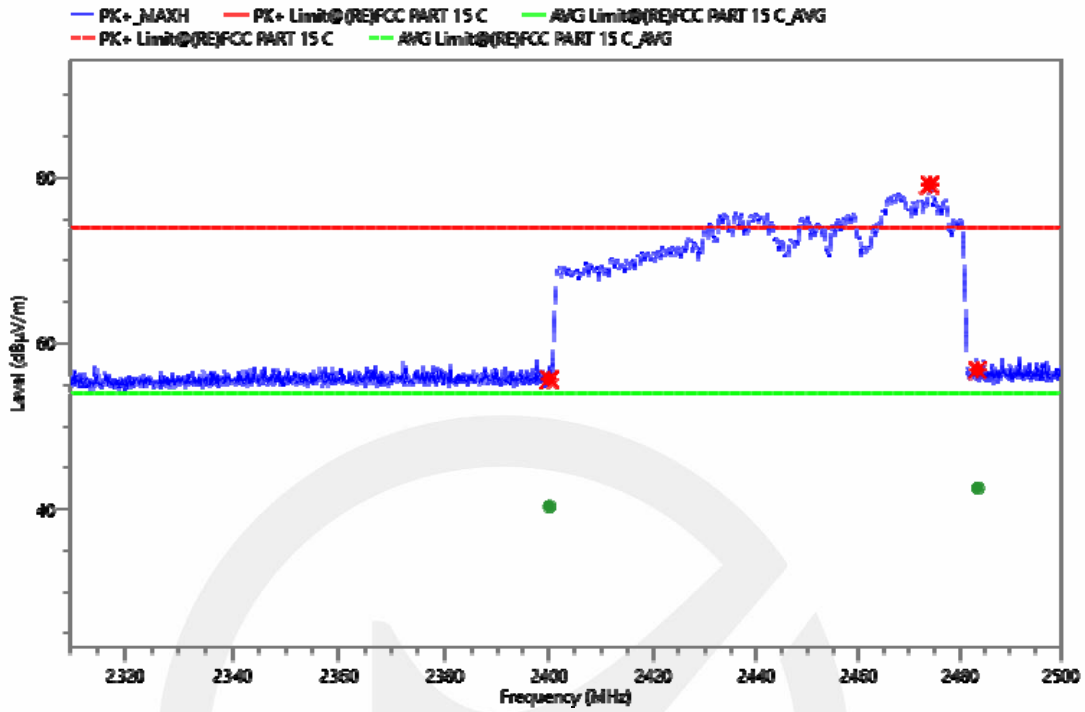
Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz		
	Channel 78: 2480MHz	GFSK	H



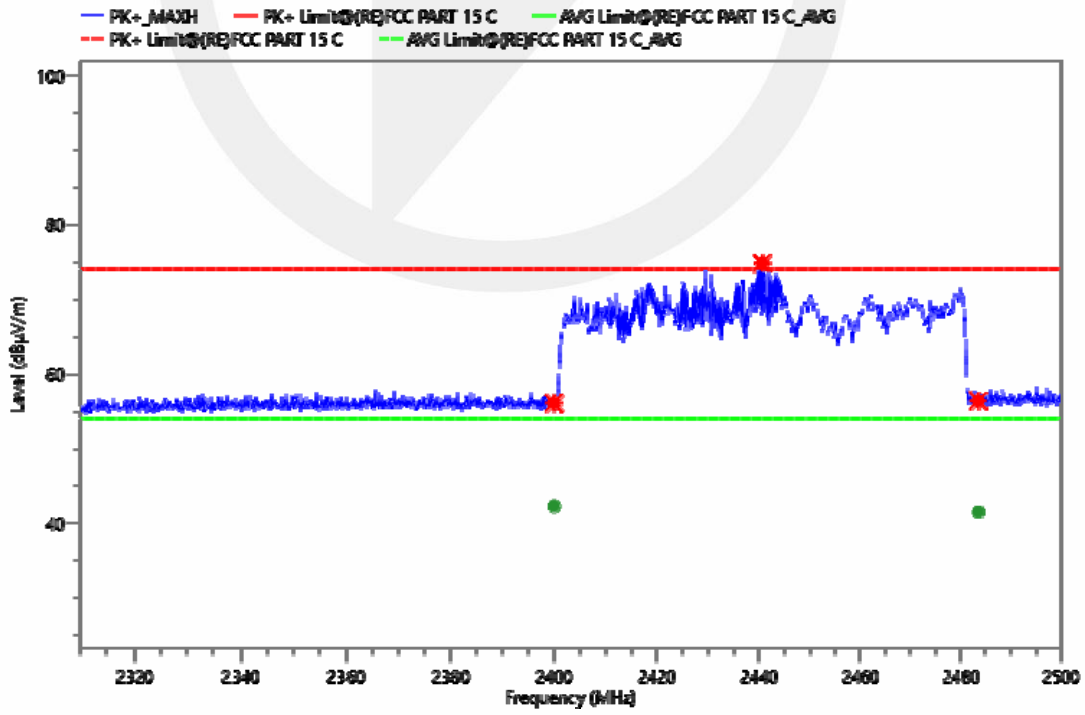
Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz		
	Channel 78: 2480MHz	GFSK	V



Test Model	Spurious Emission in Restricted Band 2310-2390&2483.5-2500MHz		
	Hopping	GFSK	H



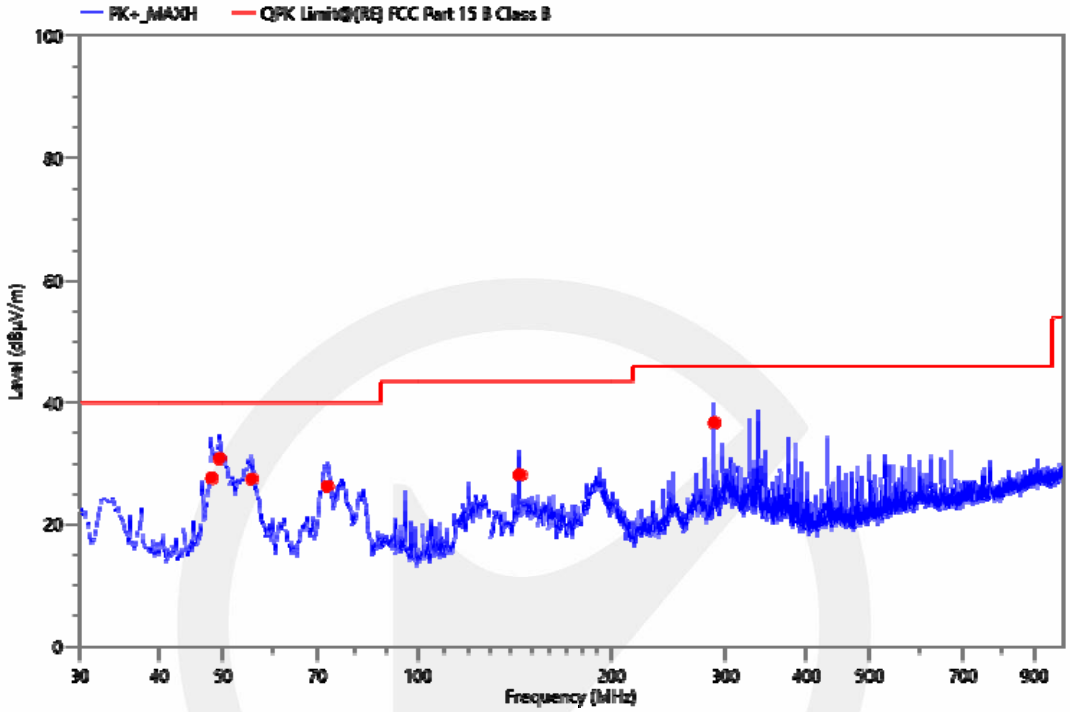
Test Model	Spurious Emission in Restricted Band2310-2390&2483.5-2500MHz		
	Hopping	GFSK	V



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

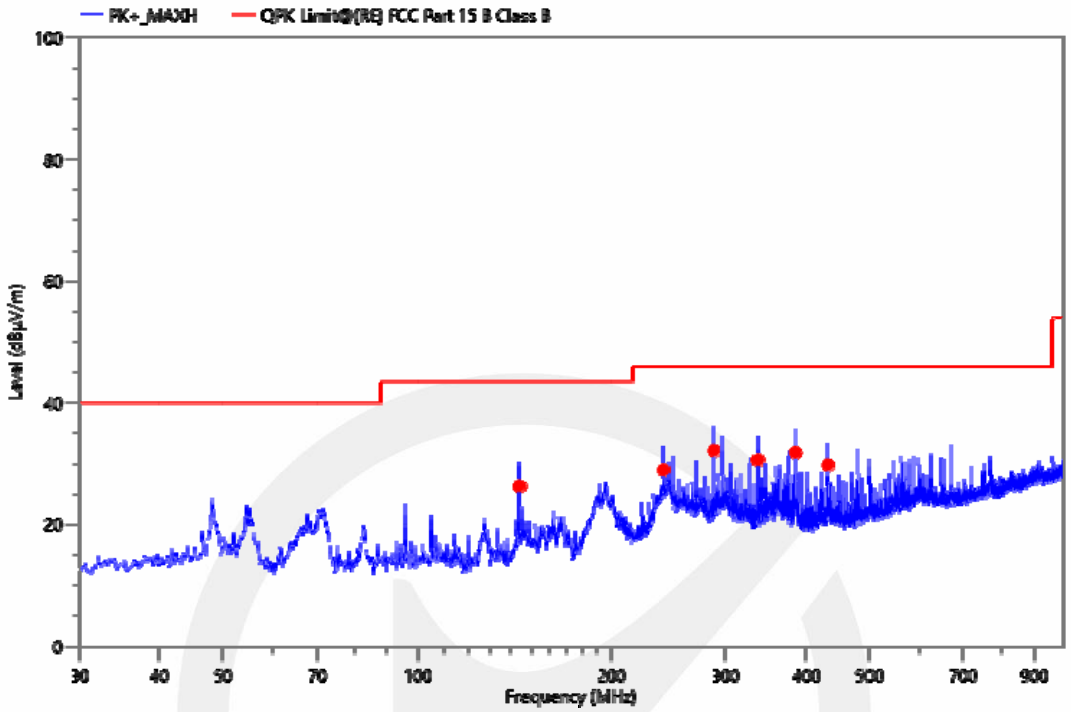
Bluetooth (GFSK, pi/4-DQPSK, 8DPSK)mode have been tested, and the worst result was report as below:

Project Information			
Mode:	TX2402	Voltage:	AC 120V/60Hz
Environment:	Temp: 22 ℃; Humi:62 %	Engineer:	Cheis Fan



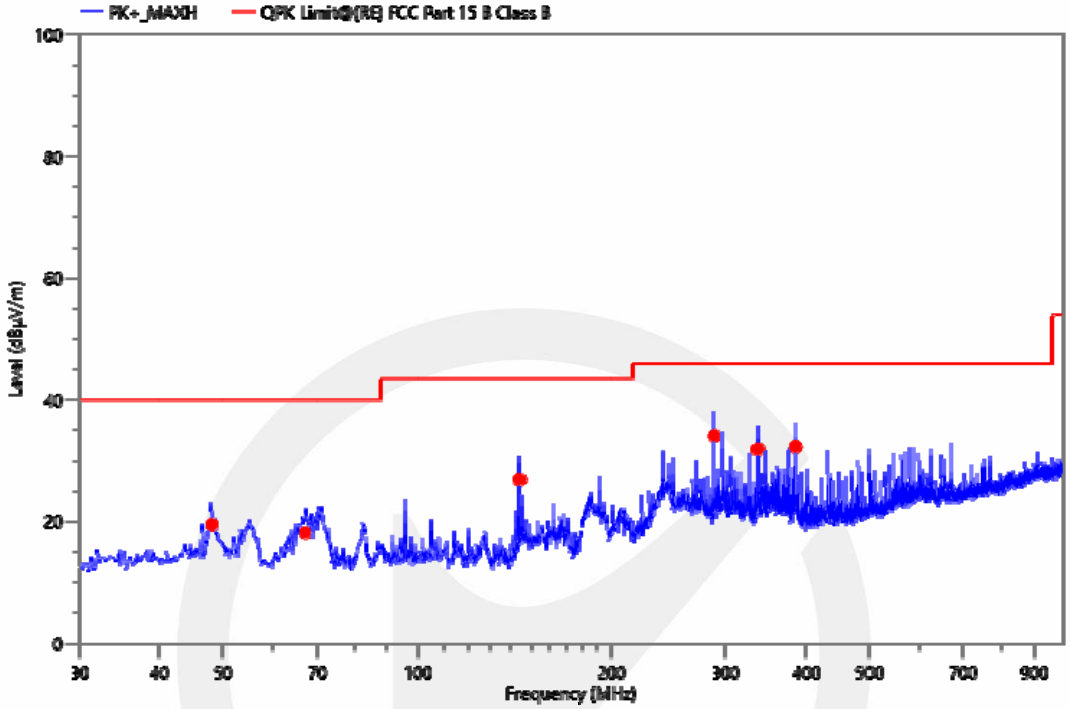
No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	48.001	51.75	-24.12	27.63	40.00	12.37	QPK	100	V	256.5	PASS
2	49.400	54.95	-24.15	30.80	40.00	9.20	QPK	100	V	232.5	PASS
3	55.511	52.55	-25.1	27.45	40.00	12.55	QPK	200	V	238.0	PASS
4	72.486	53.28	-27.01	26.27	40.00	13.73	QPK	100	V	175.0	PASS
5	143.975	55.78	-27.62	28.16	43.50	15.34	QPK	100	V	0.0	PASS
6	288.000	59.26	-22.55	36.71	46.00	9.29	QPK	100	V	356.5	PASS

Project Information			
Mode:	TX2402	Voltage:	AC 120V/60Hz
Environment:	Temp: 22 ℃; Humi:62 %	Engineer:	Cheis Fan



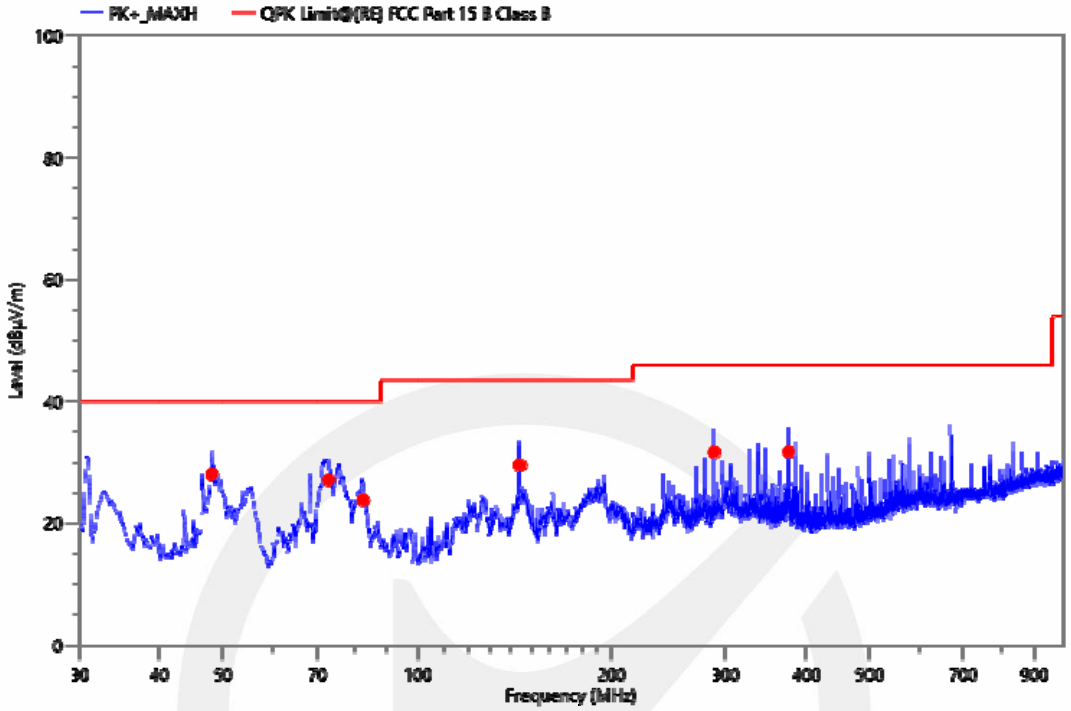
No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	143.975	53.92	-27.62	26.30	43.50	17.20	QPK	200	H	175.6	PASS
2	240.005	52.23	-23.27	28.96	46.00	17.04	QPK	100	H	309.9	PASS
3	288.020	54.70	-22.55	32.15	46.00	13.85	QPK	100	H	81.9	PASS
4	336.035	51.42	-20.82	30.60	46.00	15.40	QPK	100	H	302.4	PASS
5	384.050	52.19	-20.37	31.82	46.00	14.18	QPK	100	H	106.4	PASS
6	432.065	48.78	-19	29.78	46.00	16.22	QPK	100	H	266.9	PASS

Project Information			
Mode:	TX2441	Voltage:	AC 120V/60Hz
Environment:	Temp: 22 ℃; Humi:62 %	Engineer:	Cheis Fan



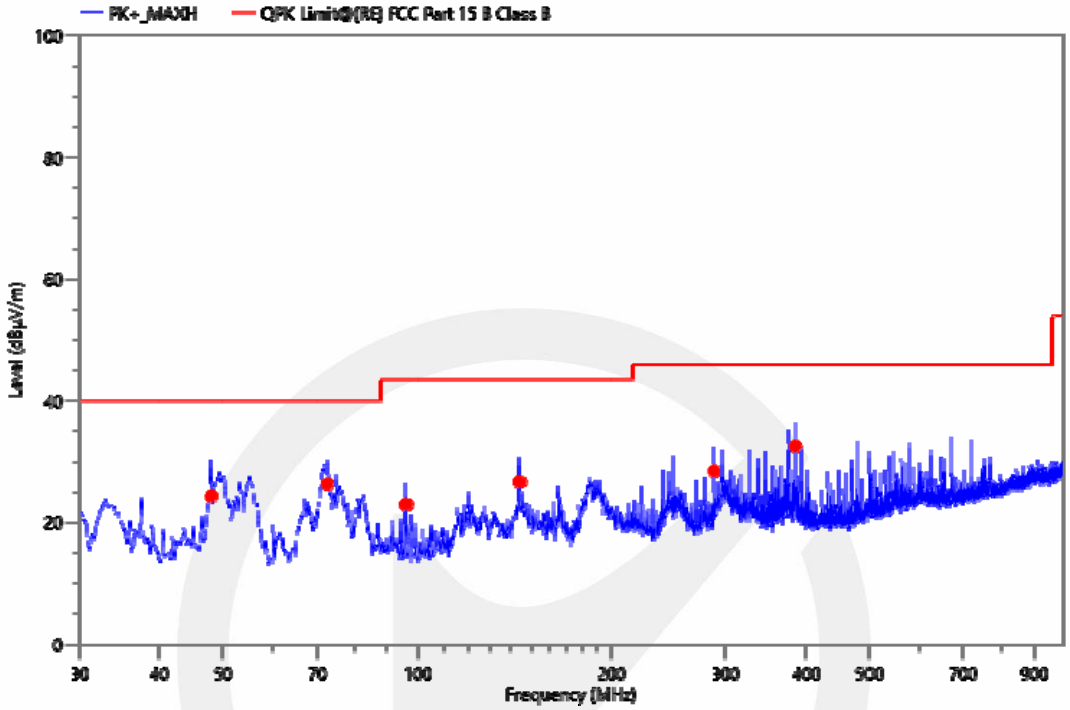
No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	48.042	43.60	-24.12	19.48	40.00	20.52	QPK	200	H	297.4	PASS
2	66.957	44.87	-26.69	18.18	40.00	21.82	QPK	200	H	331.9	PASS
3	143.975	54.52	-27.62	26.90	43.50	16.60	QPK	200	H	167.9	PASS
4	288.020	56.66	-22.55	34.11	46.00	11.89	QPK	100	H	248.7	PASS
5	336.035	52.69	-20.82	31.87	46.00	14.13	QPK	100	H	310.2	PASS
6	384.050	52.67	-20.37	32.30	46.00	13.70	QPK	100	H	102.2	PASS

Project Information			
Mode:	TX2441	Voltage:	AC 120V/60Hz
Environment:	Temp: 22 ℃; Humi:62 %	Engineer:	Cheis Fan



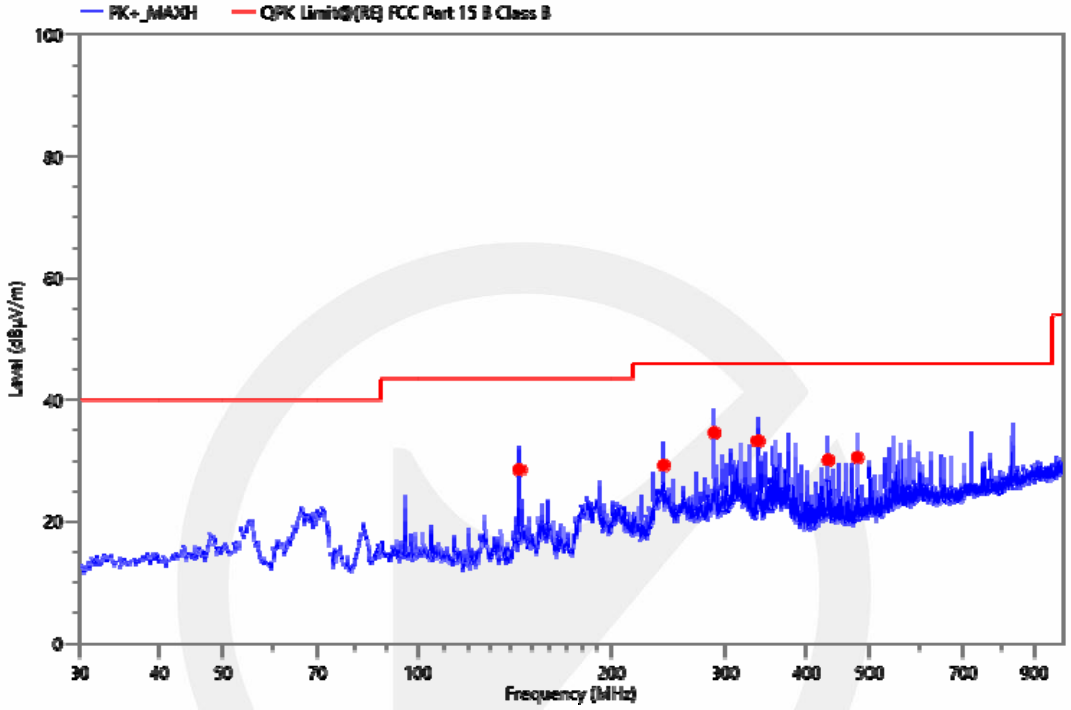
No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	48.042	52.14	-24.12	28.02	40.00	11.98	QPK	100	V	238.2	PASS
2	72.874	54.10	-27.01	27.09	40.00	12.91	QPK	100	V	350.2	PASS
3	82.477	50.51	-26.71	23.80	40.00	16.20	QPK	100	V	324.2	PASS
4	143.975	57.16	-27.62	29.54	43.50	13.96	QPK	100	V	328.2	PASS
5	288.020	54.21	-22.55	31.66	46.00	14.34	QPK	200	V	225.7	PASS
6	375.029	51.92	-20.21	31.71	46.00	14.29	QPK	100	V	297.2	PASS

Project Information			
Mode:	TX2480	Voltage:	AC 120V/60Hz
Environment:	Temp: 22 ℃; Humi:62 %	Engineer:	Cheis Fan



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	47.945	48.47	-24.12	24.35	40.00	15.65	QPK	100	V	47.7	PASS
2	72.486	53.34	-27.01	26.33	40.00	13.67	QPK	100	V	330.7	PASS
3	96.057	48.57	-25.6	22.97	43.50	20.53	QPK	100	V	345.2	PASS
4	143.975	54.31	-27.62	26.69	43.50	16.81	QPK	200	V	304.2	PASS
5	288.020	51.00	-22.55	28.45	46.00	17.55	QPK	100	V	232.2	PASS
6	384.050	52.89	-20.37	32.52	46.00	13.48	QPK	200	V	227.2	PASS

Project Information			
Mode:	TX2480	Voltage:	AC 120V/60Hz
Environment:	Temp: 22 ℃; Humi:62 %	Engineer:	Cheis Fan



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Height (cm)	Pol.	Azimuth (deg)	Verdict
1	143.975	56.13	-27.62	28.51	43.50	14.99	QPK	200	H	0.4	PASS
2	240.005	52.50	-23.27	29.23	46.00	16.77	QPK	100	H	321.9	PASS
3	288.020	57.14	-22.55	34.59	46.00	11.41	QPK	100	H	295.9	PASS
4	336.035	54.06	-20.82	33.24	46.00	12.76	QPK	100	H	312.4	PASS
5	431.968	49.11	-18.99	30.12	46.00	15.88	QPK	100	H	68.9	PASS
6	480.080	49.37	-18.85	30.52	46.00	15.48	QPK	100	H	355.4	PASS

9.8 CONDUCTED EMISSION TEST

Applicable Standard

According to FCC Part 15.207(a)

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.

Test Configuration

Test according to clause 7.3 conducted emission test setup

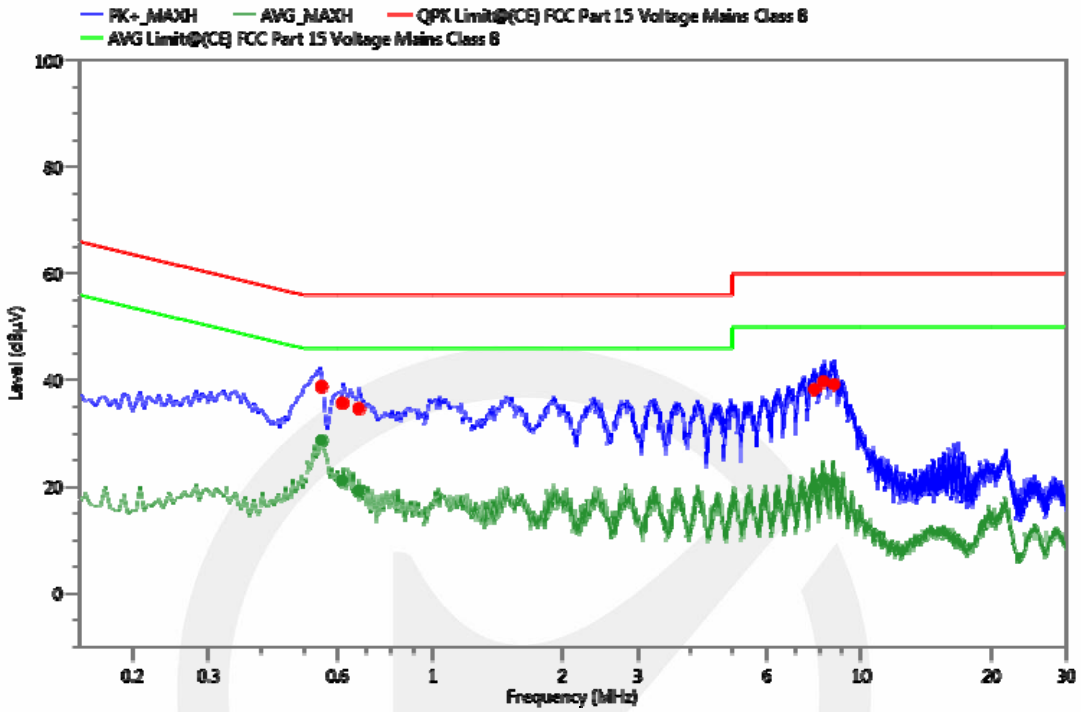
Test Procedure

The EUT was placed on a table which is 0.1m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

Test Results

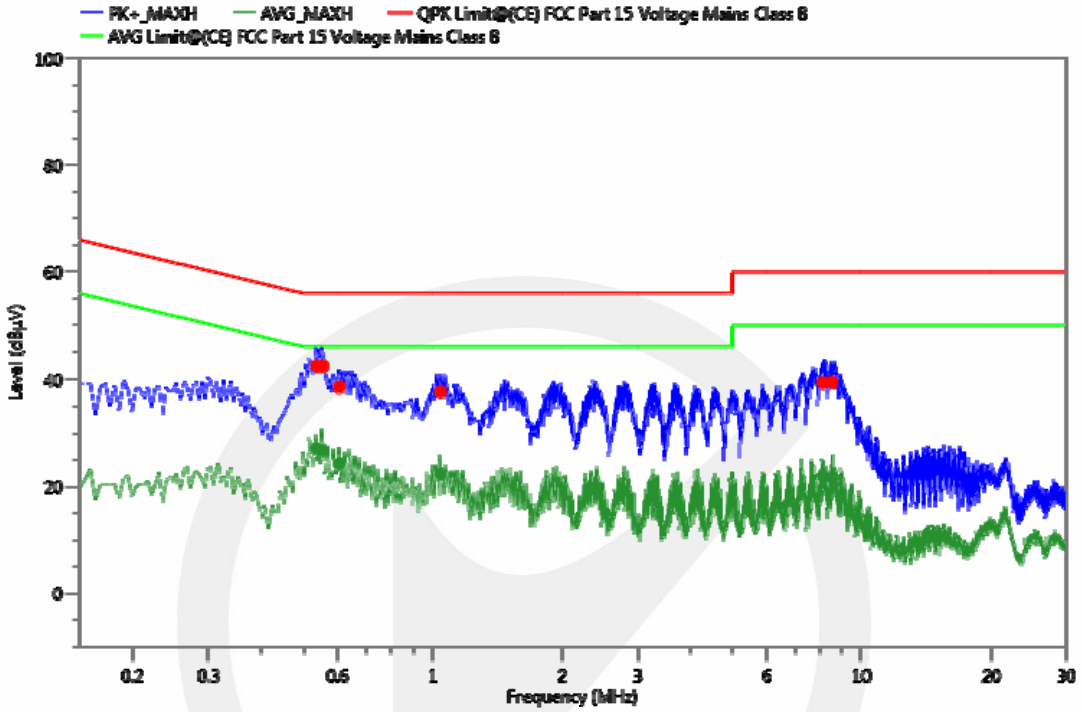
Pass.
Bluetooth (GFSK, pi/4-DQPSK, 8DPSK)mode have been tested, and the worst result was report as below:

Project Information			
Mode:	TX2402	Voltage:	AC 120V/60Hz
Environment:	Temp: 20 ℃; Humi:59 %	Engineer:	WK Luo



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV)	Limit (dBµV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.549	28.73	10.06	38.79	56.00	17.21	QPK	N	GND	PASS
2	0.549	18.58	10.06	28.64	46.00	17.36	AVG	N	GND	PASS
3	0.615	25.62	10.07	35.69	56.00	20.31	QPK	N	GND	PASS
4	0.615	11.06	10.07	21.13	46.00	24.87	AVG	N	GND	PASS
5	0.673	24.58	10.09	34.67	56.00	21.33	QPK	N	GND	PASS
6	0.673	9.04	10.09	19.13	46.00	26.87	AVG	N	GND	PASS
7	7.761	28.15	10.05	38.20	60.00	21.80	QPK	N	GND	PASS
8	7.761	9.70	10.05	19.75	50.00	30.25	AVG	N	GND	PASS
9	8.155	29.62	10.06	39.68	60.00	20.32	QPK	N	GND	PASS
10	8.155	11.37	10.06	21.43	50.00	28.57	AVG	N	GND	PASS
11	8.639	29.04	10.07	39.11	60.00	20.89	QPK	N	GND	PASS
12	8.639	10.73	10.07	20.80	50.00	29.20	AVG	N	GND	PASS

Project Information			
Mode:	TX2402	Voltage:	AC 120V/60Hz
Environment:	Temp: 20 ℃; Humi:59 %	Engineer:	WK Luo



No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV)	Limit (dBµV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.535	32.50	10.05	42.55	56.00	13.45	QPK	L1	GND	PASS
2	0.535	17.01	10.05	27.06	46.00	18.94	AVG	L1	GND	PASS
3	0.552	32.53	10.06	42.59	56.00	13.41	QPK	L1	GND	PASS
4	0.552	16.64	10.06	26.70	46.00	19.30	AVG	L1	GND	PASS
5	0.606	28.56	10.07	38.63	56.00	17.37	QPK	L1	GND	PASS
6	0.606	14.16	10.07	24.23	46.00	21.77	AVG	L1	GND	PASS
7	1.042	27.57	10.17	37.74	56.00	18.26	QPK	L1	GND	PASS
8	1.042	12.06	10.17	22.23	46.00	23.77	AVG	L1	GND	PASS
9	8.128	29.35	10.05	39.40	60.00	20.60	QPK	L1	GND	PASS
10	8.128	11.97	10.05	22.02	50.00	27.98	AVG	L1	GND	PASS
11	8.545	29.46	10.07	39.53	60.00	20.47	QPK	L1	GND	PASS
12	8.545	11.49	10.07	21.56	50.00	28.44	AVG	L1	GND	PASS

9.9 ANTENNA APPLICATION

Antenna Requirement

Standard	Requirement
FCC CRF Part15.203	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 intentionalradiators 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 15.247 (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.

Result

Pass.

The EUT has 1 PCB Antenna: The PCB Antenna Gain is 1.67 dBi;

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)

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

*** End of Report ***

声 明
Statement

1. 本报告无授权批准人签字及“检验检测专用章”无效；
   This report will be void without authorized signature or special seal for testing report.

2. 未经许可本报告不得部分复制；
   This report shall not be copied partly without authorization.

3. 本报告的检测结果仅对送测样品有效，委托方对样品的代表性和资料的真实性负责；
   The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.

4. 本检测报告中检测项目标注有特殊符号则该项目不在资质认定范围内，仅作为客户委托、科研、教学或内部质量控制等目的使用；
   The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

5. 本检测报告以实测值进行符合性判定，未考虑不确定度所带来的风险，本实验室不承担相关责任，特别约定、标准或规范中有明确规定的除外；
   The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6. 对本检测报告若有异议，请于收到报告之日起 20 日内提出；
   Objections shall be raised within 20 days from the date receiving the report.