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RF Test Report

Test Report Number	HME-23071962-LCG-FCC-IC-DSS
FCC ID	BYM1414
IC	1860A-1414
Applicant	HM Electronics Inc
Applicant Address	2848 Whiptail Loop, Carlsbad, CA 92010 USA
Product Name	Wireless Beltpack
Model Number	1414
Date of Receipt	10/21/2024 – 12/13/2024
Date of Test	12/13/2024
Report Issue Date	12/13/2024
Test Standards	47 CFR Part 15.247 RSS 247 Issue3, August 2023
Test Result	**PASS**

Issued by:

Vista Compliance Laboratories
1261 Puerta Del Sol, San Clemente, CA 92673 USA
www.vista-compliance.com

Lining	
Lining Li (Test Engineer)	**David Zhang (Technical Manager)**

REVISION HISTORY

Report Number	Version	Description	Issued Date
HME-23071962-LCG-FCC-IC-DSS	01	Initial report	12/13/2024

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1 Test Summary

Test Item	Test Requirement	Test Method	Result
Antenna Requirement	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
20 dB Bandwidth	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Occupied Bandwidth	RSS-Gen Issue 5, Feb 2021	RSS-Gen Issue 5, Feb 2021	Pass
Number of Hopping Channel	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Conducted Maximum Output Power	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Channel Separation	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Time of Occupancy	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Conducted Band-Edge	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Frequency Hopping System Requirement	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass
AC Power Line Conducted Emissions	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023	ANSI C63.10 (2013)	Pass

2 General Information

2.1 Applicant

Applicant	HM Electronics Inc
Applicant address	2848 Whiptail Loop, Carlsbad, CA 92010 USA
Manufacturer	HM Electronics Inc
Manufacturer Address	2848 Whiptail Loop, Carlsbad, CA 92010 USA

2.2 Product information

Product Name	Wireless Beltpack
Model Number	1414
Family Models	N/A
Serial Number	067DD41F
Frequency Band	Bluetooth BDR/EDR/BLE: 2402-2480MHz DECT radio: 1920-1930MHz
Type of modulation	Bluetooth BDR/EDR: GFSK, π/4 DQPSK, 8DPSK Bluetooth BLE: GFSK DECT: GFSK
Equipment Class	DTS, PUT
Antenna Information	Bluetooth: Integral PCB/Printed Inverted-F quarter wave antenna, 1.5 dBi peak gain DECT radio: two Integral antennas, - PCB/Printed Inverted-F quarter wave antenna, 2.2 dBi peak gain - Plated Inverted-F, soldered onto PCB, 2.35 dBi peak gain
Clock Frequencies	N/A
Input Power	Detachable/Rechargeable Li-ion battery, 3.7VDC
Power Adapter Manufacturer/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Simultaneous Transmission	BLE and DECT can transmit simultaneously which has been evaluated in current report
Additional Info	N/A

2.3 Test standard and method

Test standard	47 CFR Part 15.247 RSS-247 Issue 3, Aug 2023
Test method	ANSI C63.10-2013

3 Test site information

Lab performing tests	Vista Laboratories, Inc.
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.vista-compliance.com

Test Condition	Temperature	Humidity	Atmospheric Pressure
RF Testing	23.5°C	58.2%	996 mbar
Radiated Emission Testing	23.5°C	58.2%	996 mbar

4 Modification of EUT

The EUT is an engineering test sample loaded with RF testing firmware specifically designed to support the RF TX/RX measurement in different aspects.

5 Test configuration and operation

5.1 EUT test configuration

EUT's RF antenna port is connected to spectrum analyzer through RF test cable for measurement.

The following software was used for testing and to monitor EUT performance.

Software	Description
EMISoft Vasona	EMC/RF Spurious emission test software used during testing
BluetTest3	Bluetooth RF testing used for sending RF command to set EUT into RF test mode

5.2 Supporting Equipment

Description	Manufacturer	Model #	Serial #
Laptop	Dell	Latitude E6440	FFF4JC2
Debugger	Qualcomm	TRBI 200	N215998

6 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
RF Output Power (Conducted)	±1.2 dB
Power Spectral Density	±0.9 dB
Unwanted Emission (conducted)	±2.6 dB
Occupied Channel Bandwidth	±5 %
Radiated Emission (9KHz-30MHz)	±3.5 dB
Radiated Emission (30MHz-1GHz)	±4.6 dB
Radiated Emission (1-18GHz)	±4.9 dB
Radiated Emission (18-40GHz)	±3.5 dB

7 Test summary and result

7.1 Antenna Requirement

7.1.1 Requirement

Per § 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.

7.1.2 Result

Analysis:

- EUT uses integrated antennas for both BLE and DECT that are permantly attached and not accessible to end user. No standard RF connector is used.

Conclusion:

- EUT complies with antenna requirement in § 15.203.

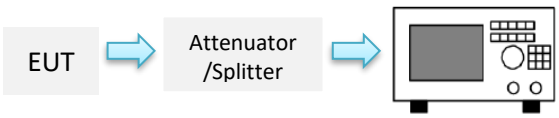
7.2 20 dB Bandwidth

7.2.1 Requirement

Per § 15.247 (a) (1) (i), RSS-247 §5.1, b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

7.2.2 Test setup



7.2.3 Test Procedure

According to section 6.9.2, in ANSI C63.10-2013:

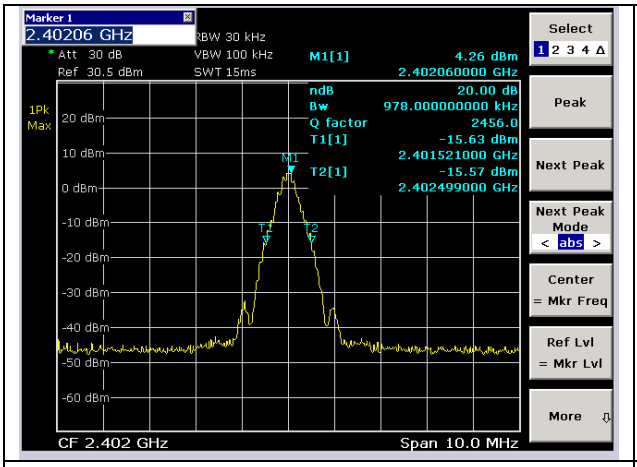
Measurement is made with the occupied bandwidth measurement function incorporated in spectrum analyzer. The following setting are used per ANSI C63.10-2013.

1. Set Center Frequency = Nominal EUT channel center frequency.
2. Set Span to be between two times and five times of the OBW.
3. RBW shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times RBW.
4. Set detection mode to peak and trace mode to max hold.
5. Use the occupied bandwidth measurement function to place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-xx dB down amplitude” determined.
6. The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labelled. Tabular data may be reported in addition to the plot(s).

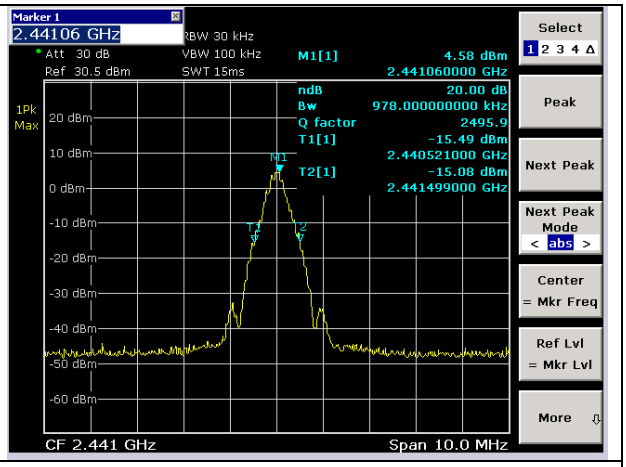
7.2.4 Test Result

Mode/ Modulation	Data rate	Packet Type	Frequency (MHz)	Measured Bandwidth (kHz)	2/3 of 20 dB Bandwidth (kHz)	Maximum Bandwidth (kHz)	Result
BDR/GFSK	1Mbps	DH5	2402	978	652.00	N/A	Pass
			2441	978	652.00	N/A	Pass
			2480	978	652.00	N/A	Pass
EDR/8DPSK	3Mbps	3DH5	2402	1357	904.67	N/A	Pass
			2441	1357	904.67	N/A	Pass
			2480	1357	904.67	N/A	Pass

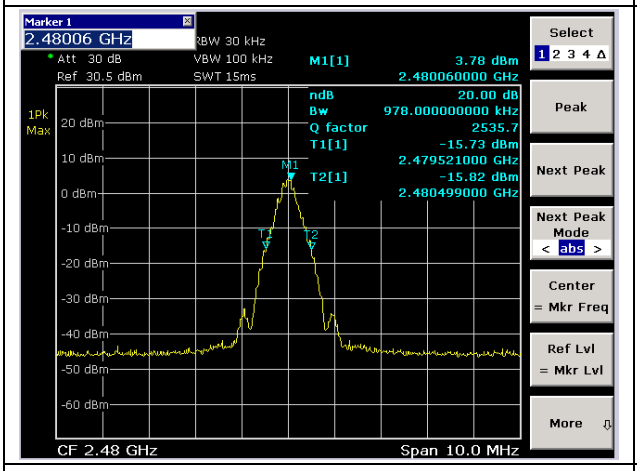
7.2.5 Test Plots



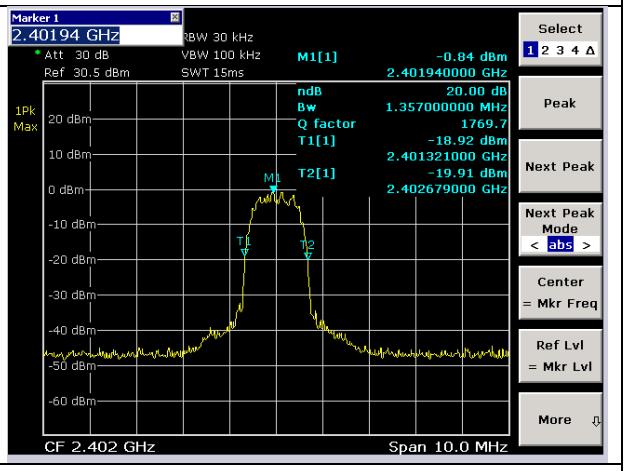
BT-GFSK-20 dB BW-Low



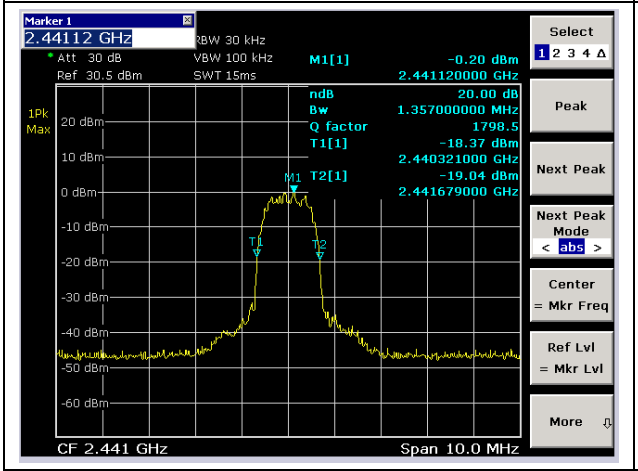
BT-GFSK-20 dB BW-Mid



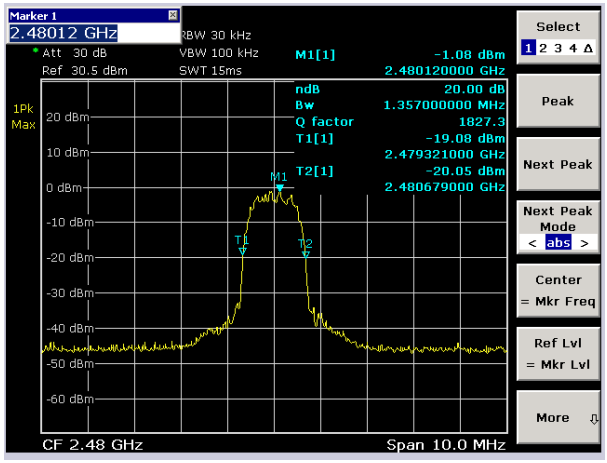
BT-GFSK-20 dB BW-High



BT-8DPSK-20 dB BW-Low



BT-8DPSK -20 dB BW-Mid



BT-8DPSK-20 dB BW-High

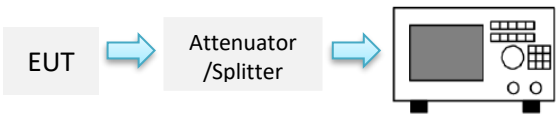
7.3 Occupied Bandwidth (99%)

7.3.1 Requirement

RSS-Gen §6.7

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

7.3.2 Test setup



7.3.3 Test Procedure

According to section RSS-Gen §6.7

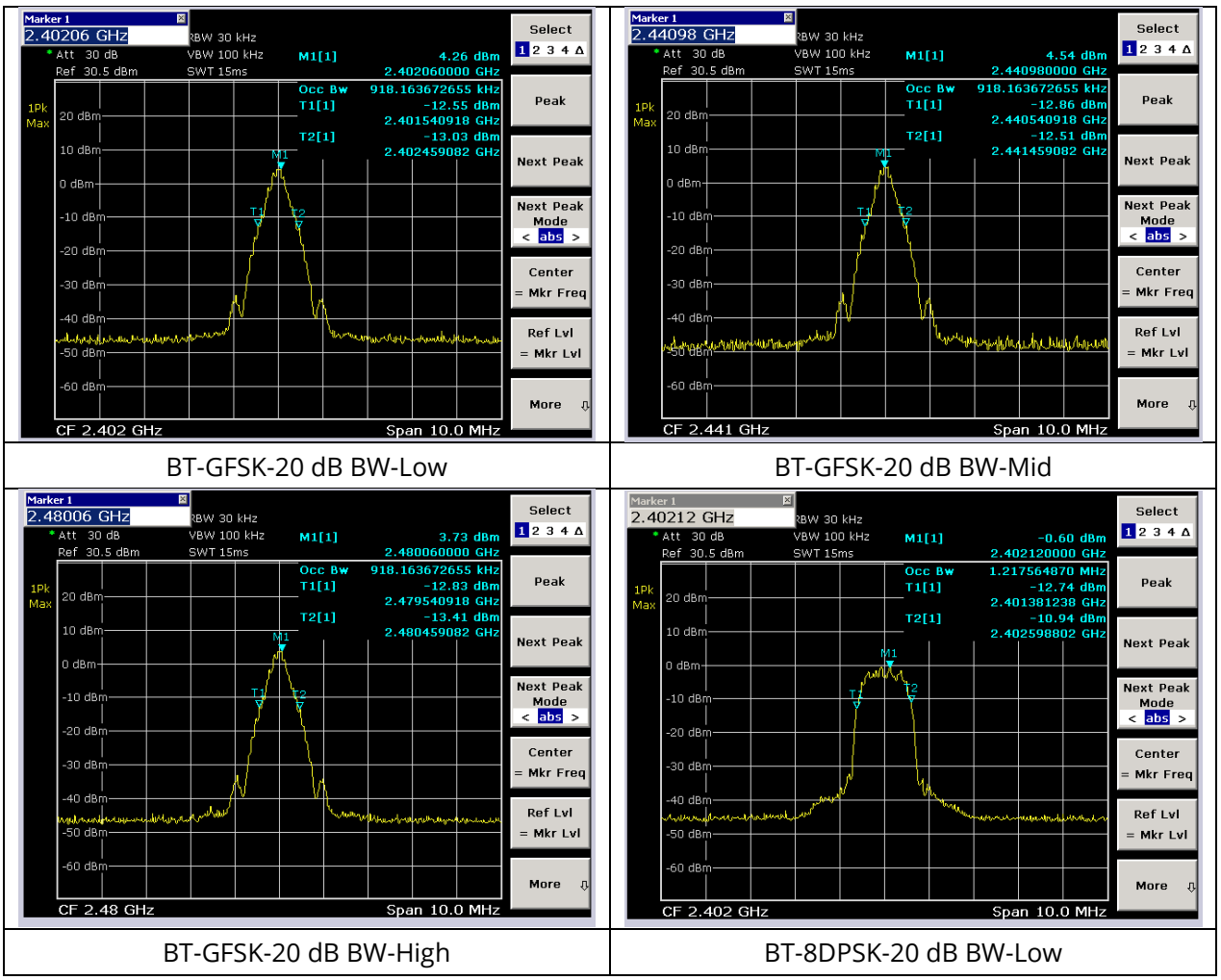
The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW ≥ 3 × RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

1. Set RBW = 1% to 5% of the actual occupied BW.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Span = large enough to capture all products of the modulation process
7. Allow the trace to stabilize.
8. Use automatic bandwidth measurement capability on instrument to obtain BW result.

7.3.4 Test Result

Mode/ Modulation	Data rate	Packet Type	Frequency (MHz)	Measured 99% OBW (kHz)	Limit (kHz)	Result
BDR/GFSK	1Mbps	DH5	2402	918.16	N/A	N/A
			2441	918.16	N/A	N/A
			2480	918.16	N/A	N/A
EDR/8DPSK	3Mbps	3DH5	2402	1217.56	N/A	N/A
			2441	1217.56	N/A	N/A
			2480	1217.56	N/A	N/A

7.3.5 Test Plots

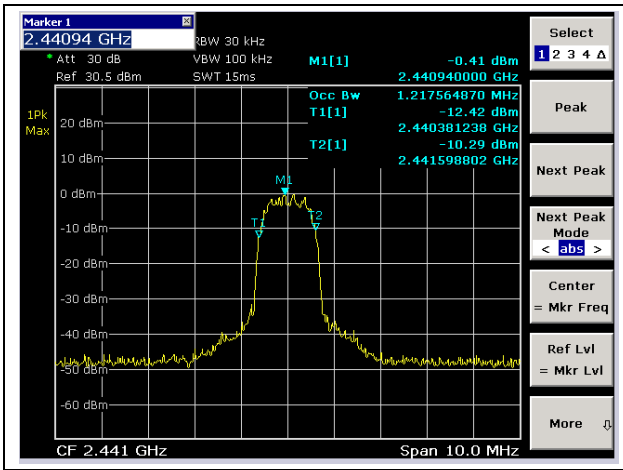


BT-GFSK-20 dB BW-Low

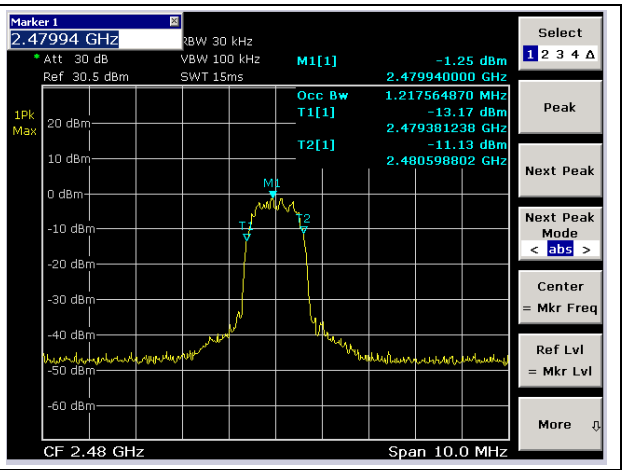
BT-GFSK-20 dB BW-Mid

BT-GFSK-20 dB BW-High

BT-8DPSK-20 dB BW-Low



BT-8DPSK -20 dB BW-Mid



BT-8DPSK-20 dB BW-High

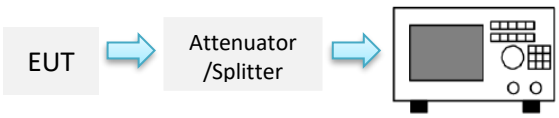
7.4 Number of Hopping Channel

7.4.1 Requirement

Per § 15.247 (a) (1) (iii), RSS-247 §5.1, d)

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

7.4.2 Test setup



7.4.3 Test Procedure

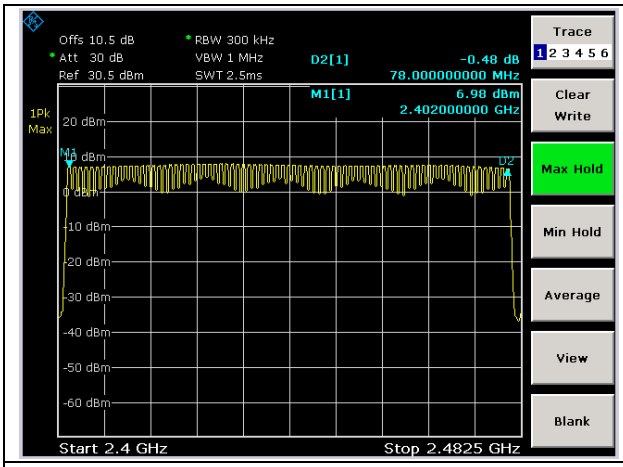
According to section 7.8.3, in ANSI C63.10-2013:
Measurement is made with spectrum analyzer. The following setting is used.

1. Set Span to be the frequency band of operation.
2. Set RBW to less 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW ≥ RBW.
4. Sweep: Auto.
5. Detector function: Peak.
6. Trace: Max hold.
7. Allow the trace to stabilize.

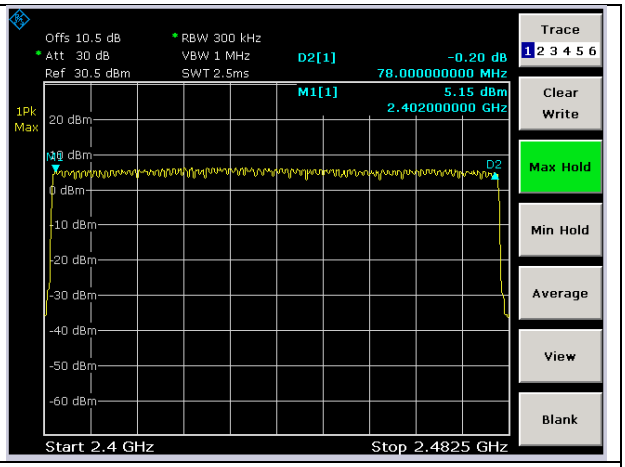
7.4.4 Test Result

Mode/ Modulation	Data rate	Packet Type	Frequency Range (MHz)	Channel Number	Minimum Limit	Result
BDR/GFSK	1Mbps	DH5	2400-2483.5	79	15	Pass
EDR/8DPSK	3Mbps	3DH5	2400-2483.5	79	15	Pass

7.4.5 Test Plots



BT-GFSK- Hopping Channel Number



BT-8DPSK - Hopping Channel Number

7.5 Maximum Output Power

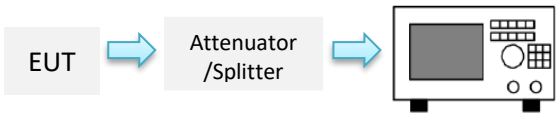
7.5.1 Requirement

Per § 15.247 (a)(1), RSS-247 §5.4, b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Per § 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

7.5.2 Test setup



7.5.3 Test Procedure

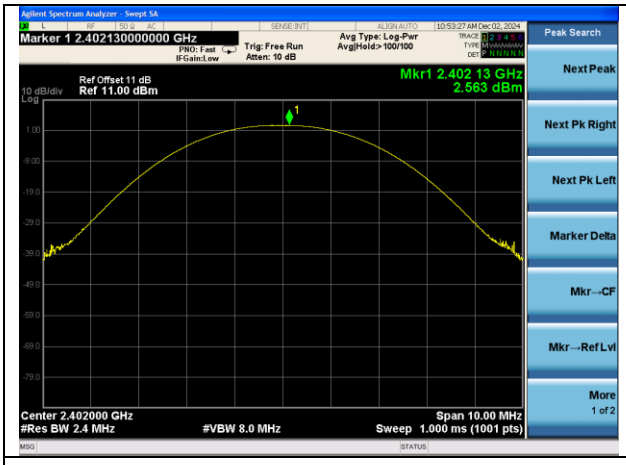
According to section 7.8.5 of ANSI C63.10-2013. The measurement was made with EUT directly connected to spectrum analyzer. The following setting is used.

1. Set the RBW > 20 dB BW
2. Set VBW ≥ RBW.
3. Set span to approximately five times the 20 dB bandwidth, centered on a hopping channel.
4. Sweep time = auto couple.
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.

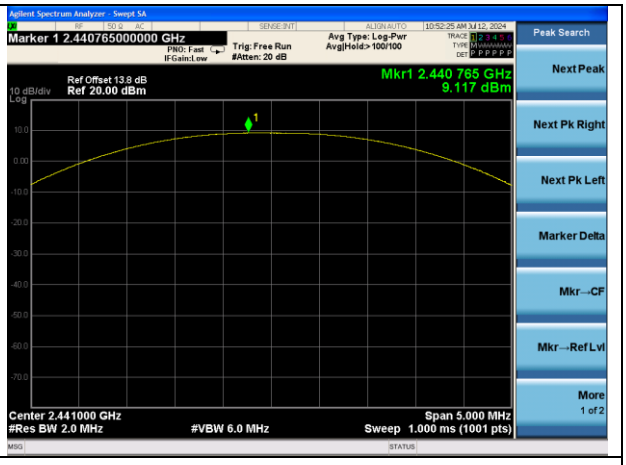
7.5.4 *Test Result*

Mode/ Modulation	Data rate	Packet Type	Frequency (MHz)	Measured Output Power (dBm)	Maximum Output Power (dBm)	Result
BDR/GFSK	1Mbps	DH5	2402	2.563	21	Pass
			2441	3.124	21	Pass
			2480	2.205	21	Pass
EDR/π/4 DQPSK	2Mbps	2DH5	2402	4.962	21	Pass
			2441	5.603	21	Pass
			2480	4.627	21	Pass
EDR/8DPSK	3Mbps	3DH5	2402	5.559	21	Pass
			2441	6.156	21	Pass
			2480	5.223	21	Pass

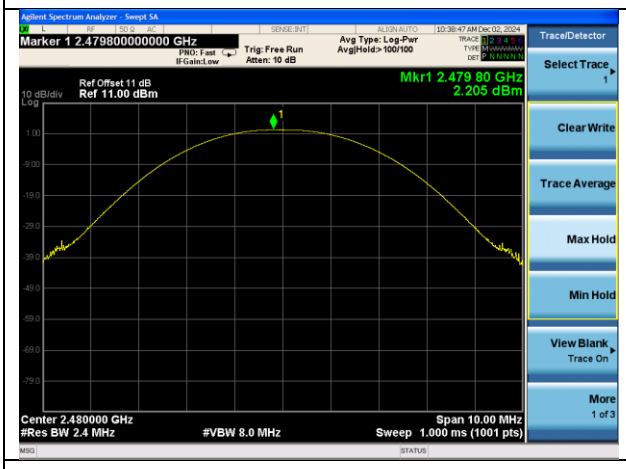
7.5.5 Test Plots



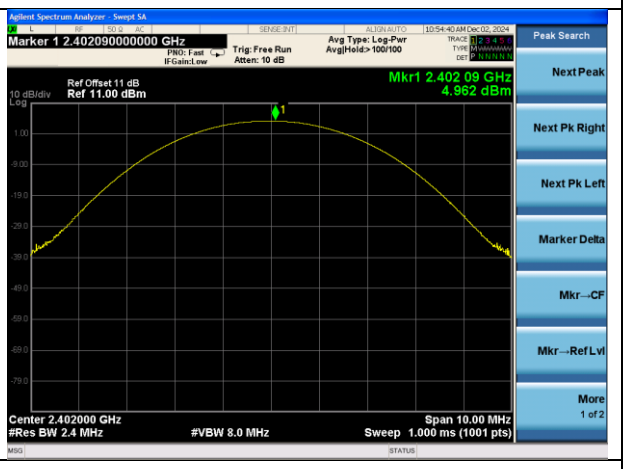
BT-GFSK-PWR-Low



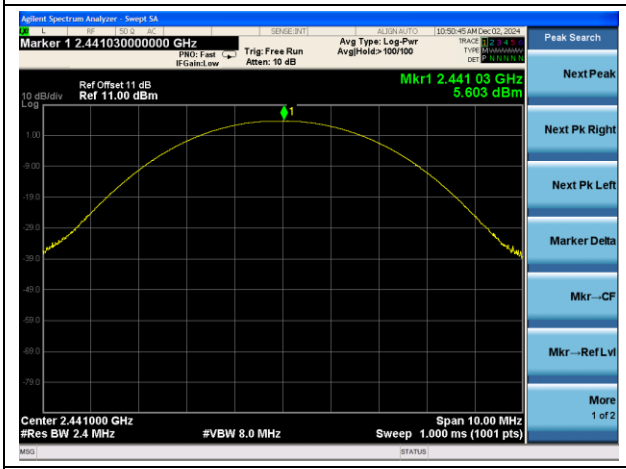
BT-GFSK-PWR-Mid



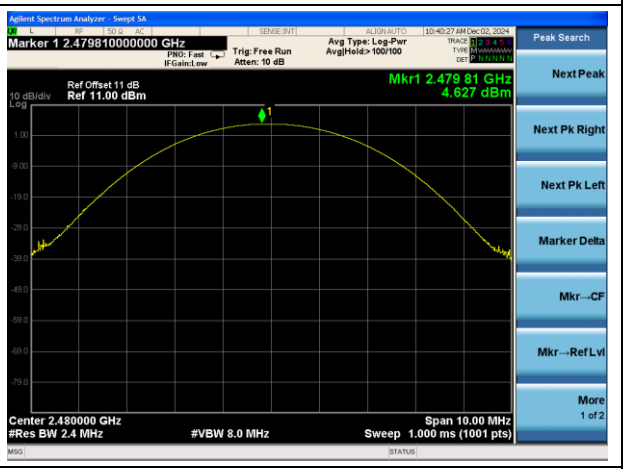
BT-GFSK-PWR-High



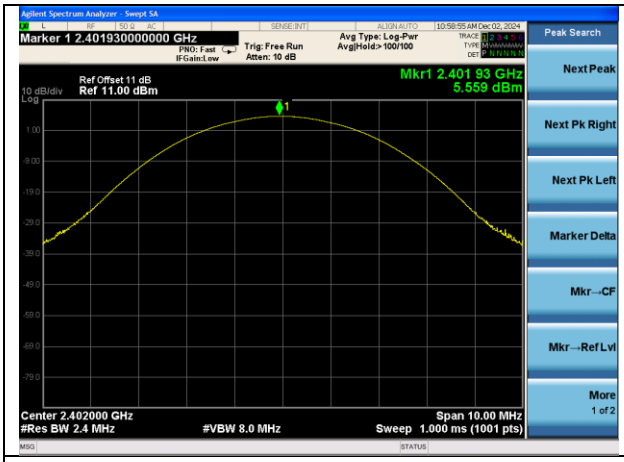
BT-π/4 DQPSK-PWR-Low



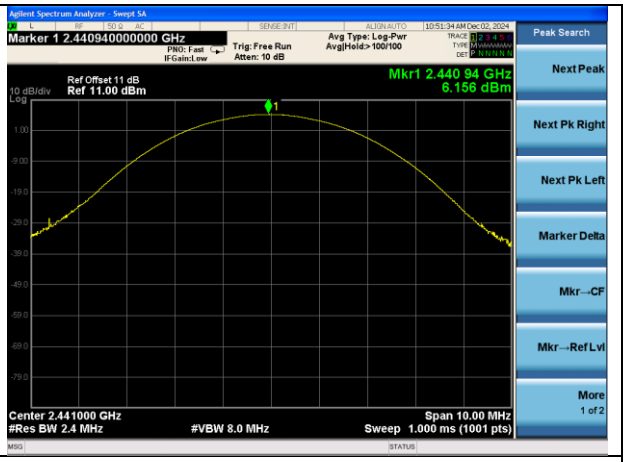
BT-π/4 DQPSK-PWR-Mid



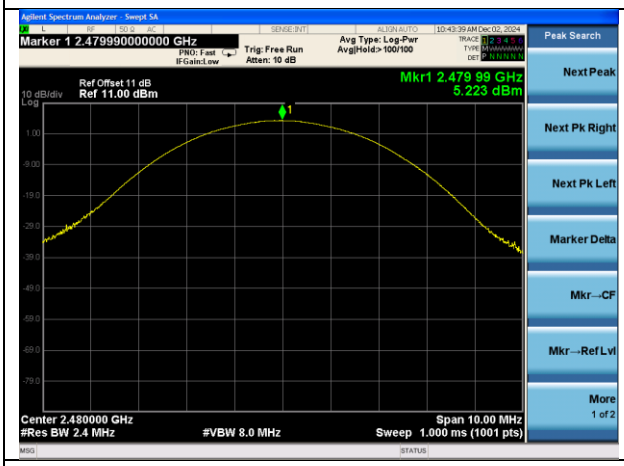
BT-π/4 DQPSK-PWR-High



BT-8DPSK-PWR-Low



BT-8DPSK-PWR-Mid



BT-8DPSK-PWR-High

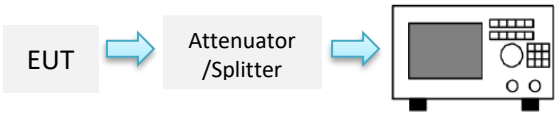
7.6 Channel Separation

7.6.1 Requirement

Per § 15.247 (a) (1), RSS-247 §5.1, b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

7.6.2 Test setup



7.6.3 Test Procedure

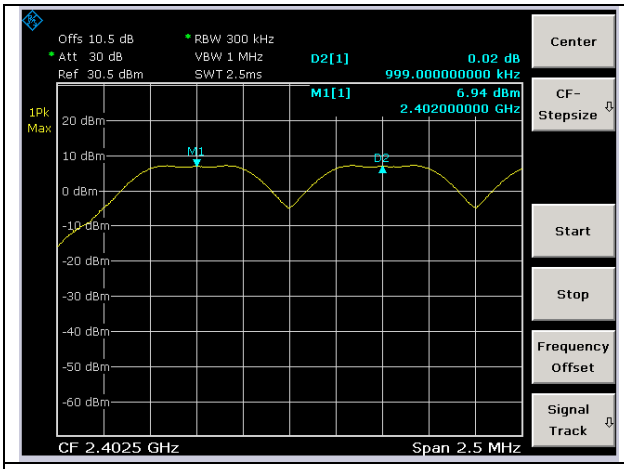
According to section 7.8.2 of ANSI C63.10-2013. The measurement was made with spectrum analyzer. The following setting is used.

1. Set the Span wide enough to capture the peaks of two adjacent channels.
2. RBW: Start with the RBW set to approximately 30% of the channel spacing
3. VBW ≥ RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine separation between the peaks of adjacent channels.

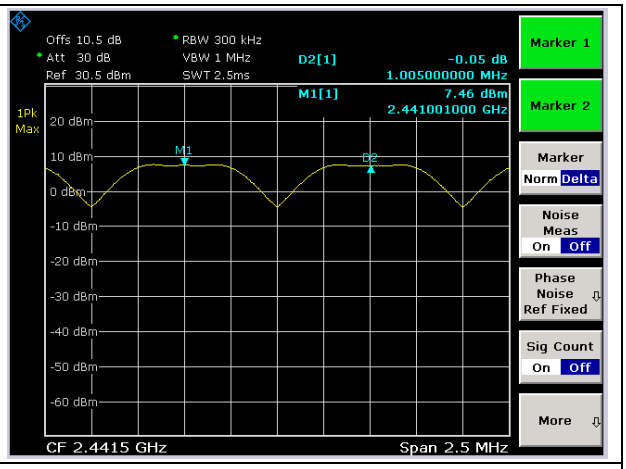
7.6.4 Test Result

Mode/ Modulation	Data rate	Packet Type	Frequency (MHz)	Channel Separation (kHz)	2/3 of 20 dB Bandwidth (kHz)	Result
BDR/GFSK	1Mbps	DH5	2402	999	652	Pass
			2441	1005	652	Pass
			2480	999	652	Pass
EDR/8DPSK	3Mbps	3DH5	2402	999	904.67	Pass
			2441	1003	904.67	Pass
			2480	1000	904.67	Pass

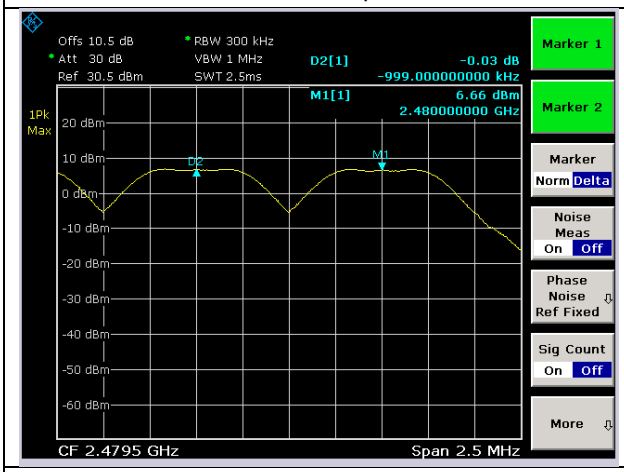
7.6.5 Test Plots



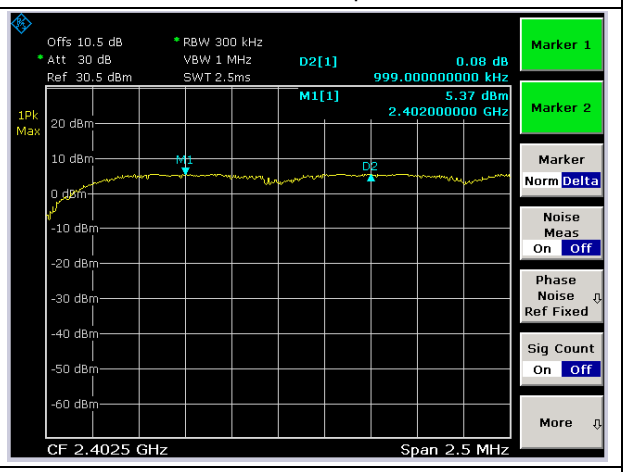
BT-GFSK-Channel Separation-Low



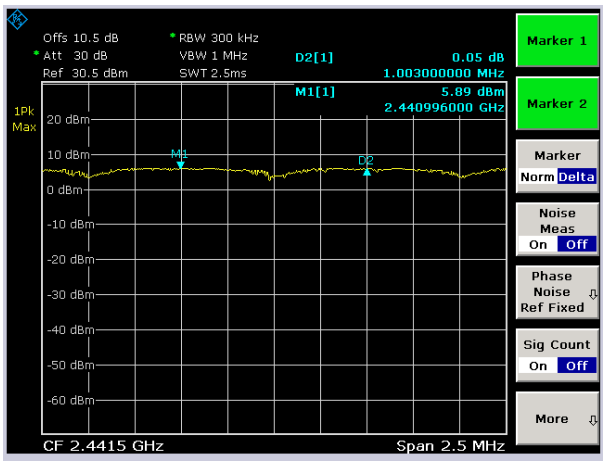
BT-GFSK-Channel Separation-Mid



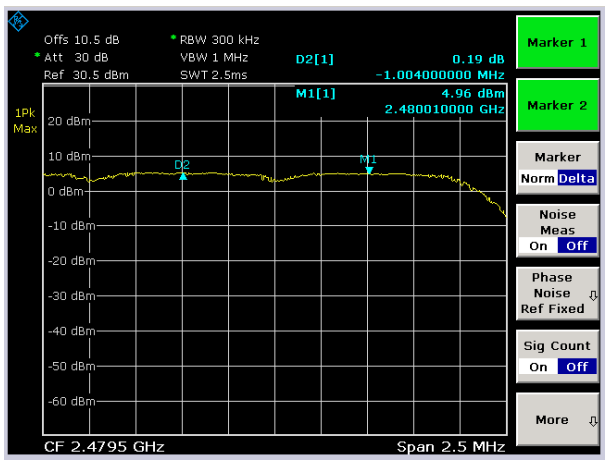
BT-GFSK-Channel Separation-High



BT-8DPSK-Channel Separation-Low



BT-8DPSK-Channel Separation-Mid



BT-8DPSK-Channel Separation-High

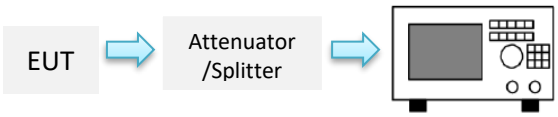
7.7 Time of Occupancy

7.7.1 Requirement

Per § 15.247 (a) (1) (iii), RSS-247 §5.1, d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

7.7.2 Test setup



7.7.3 Test Procedure

According to section 7.8.4 of ANSI C63.10-2013. The measurement was made with spectrum analyzer. The following setting is used.

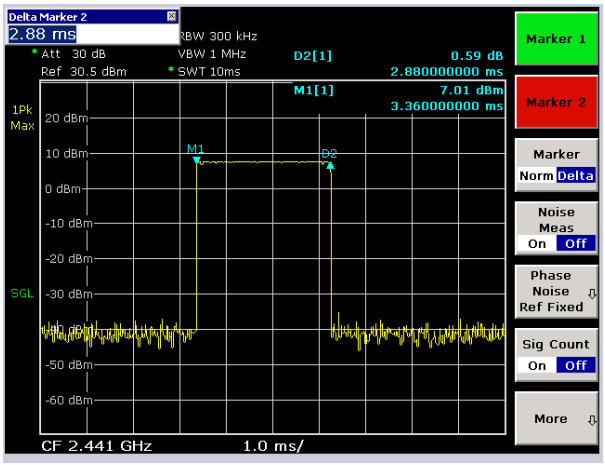
1. Set Span to zero, centered on a hopping channel.
2. RBW shall be ≤ channel spacing.
3. VBW ≥ RBW.
4. Detector = peak.
5. Sweep time = auto couple. As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the marker-delta function to determine the transmit time per hop.

7.7.4 Test Result

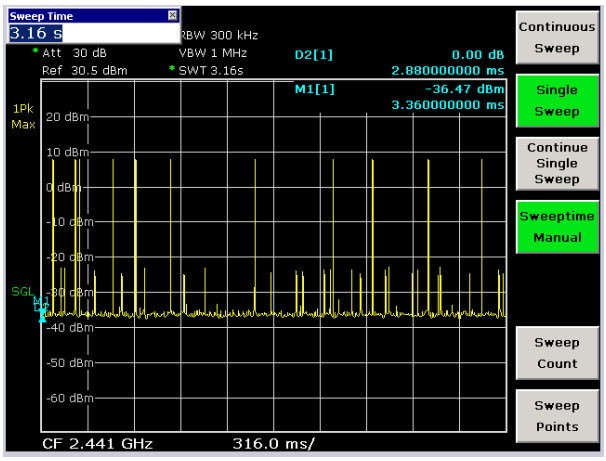
Mode/ Modulation	Data Rate	Packet Type	Freq. (MHz)	Number of Hopping Freq.	Dwell Time per Hop (mS)	Observation period (S)	Number of Hopping in period	Total Dwell Time (mS)	Limit (mS)
BT-GFSK	1Mbps	DH5	2441	79	2.880	31.6	110	316.8	400
BT-8DPSK	3Mbps	3-DH5	2441	79	2.880	31.6	120	345.6	400

The Observation period: T=0.4 second * 79 channels = 31.6 s

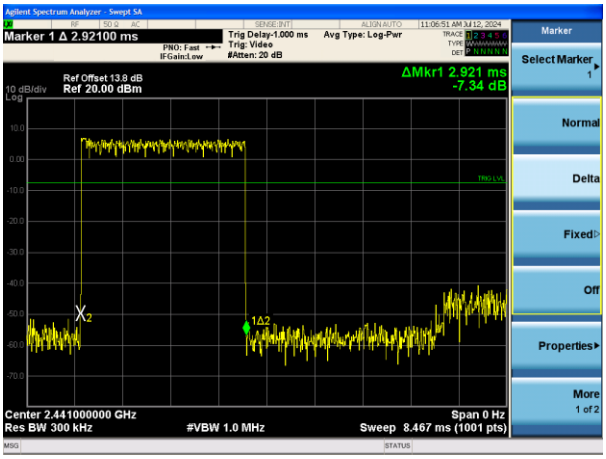
7.7.5 Test Plots



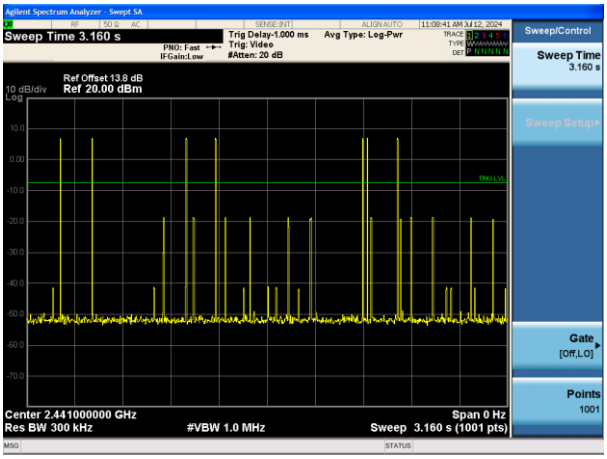
Dwell Time_BDR_GFSK_M CH_Pulse



Dwell Time_BDR_GFSK_M CH_Period



Dwell Time_EDR_8DPSK_M CH_Pulse



Dwell Time_EDR_8DPSK_M CH_Period

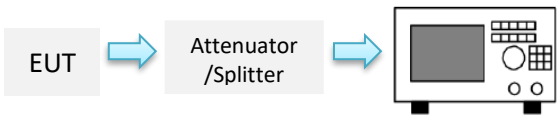
7.8 Conducted Band-Edge & Unwanted Emissions Measurement

7.8.1 Requirement

Per § 15.247 (d), RSS-247 §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

7.8.2 Test setup



7.8.3 Test Procedure

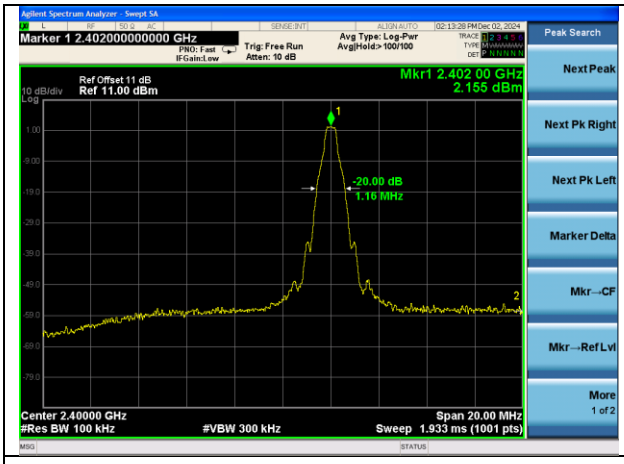
According to section 7.8.8 of ANSI C63.10-2013.

Connect the primary antenna port through an attenuator to the spectrum analyzer input; in the results, account for all losses between the unlicensed wireless device output and the spectrum analyzer. The instrument shall span 30 MHz to 10 times the operating frequency in GHz, with a resolution bandwidth of 100 kHz, video bandwidth of 300 kHz, and a coupled sweep time with a peak detector. The band 30 MHz to the highest frequency may be split into smaller spans, as long as the entire spectrum is covered. The following setting is used.

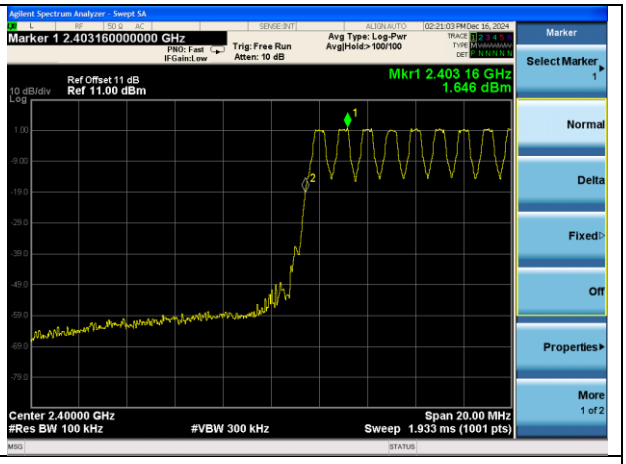
7.8.4 Test Result

See test plots

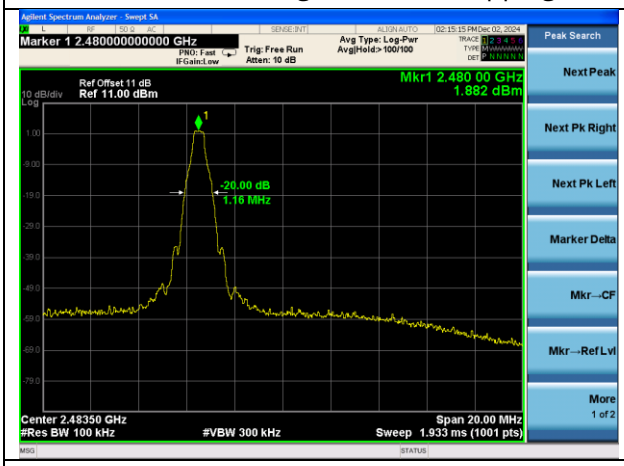
7.8.5 Test plots



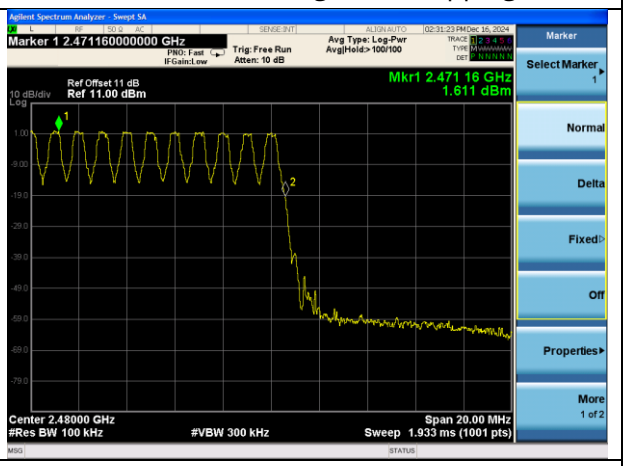
BT-GFSK-Band Edge-Low-Non hopping



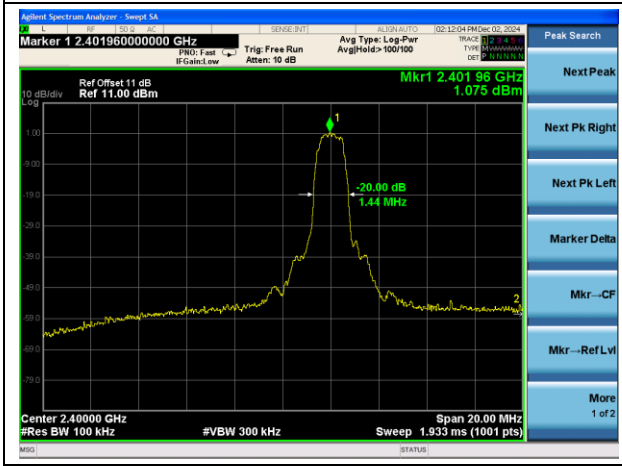
BT-GFSK-Band Edge-Low-Hopping



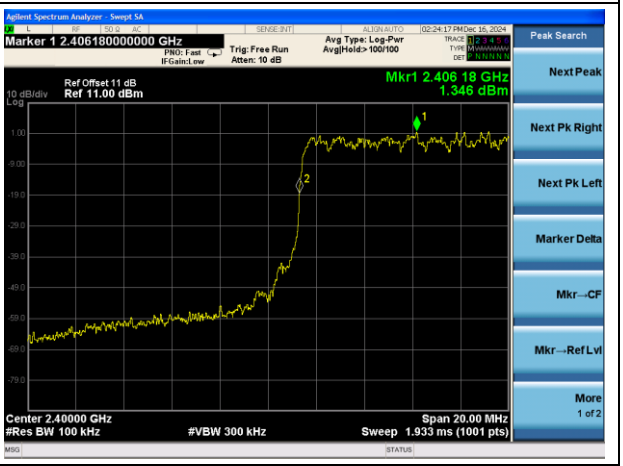
BT-GFSK-Band Edge-High-Non hopping



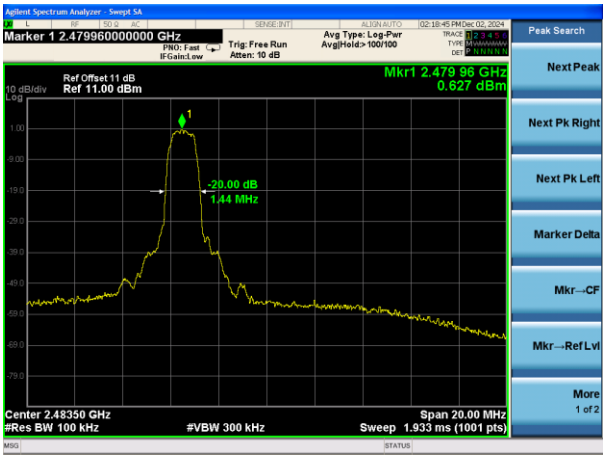
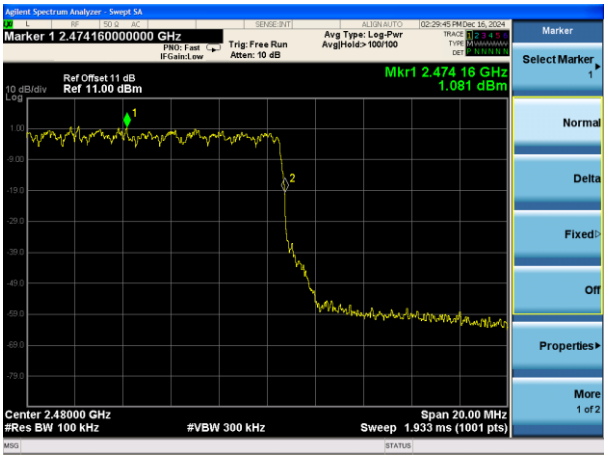
BT-GFSK-Band Edge-High-Hopping



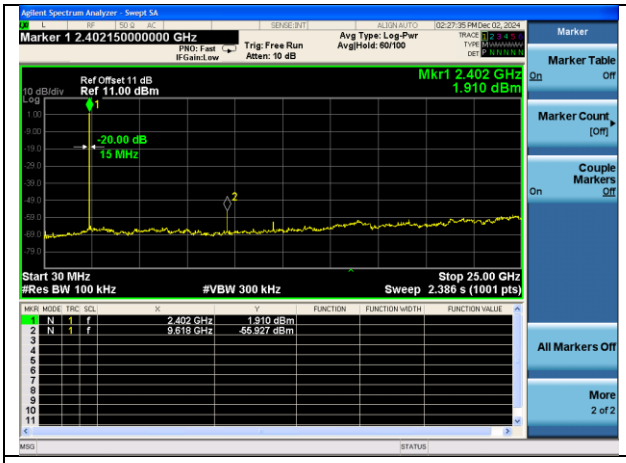
BT-8DPSK-Band Edge-Low-Non hopping



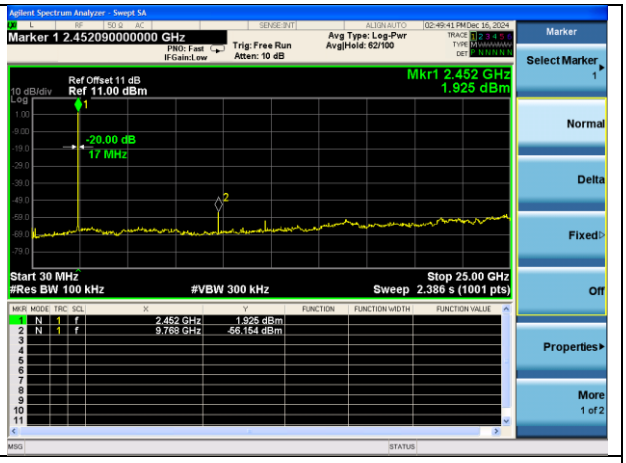
BT-8DPSK-Band Edge-Low-Hopping

	
BT-8DPSK-Band Edge-High-Non hopping	BT-8DPSK-Band Edge-High-Hopping

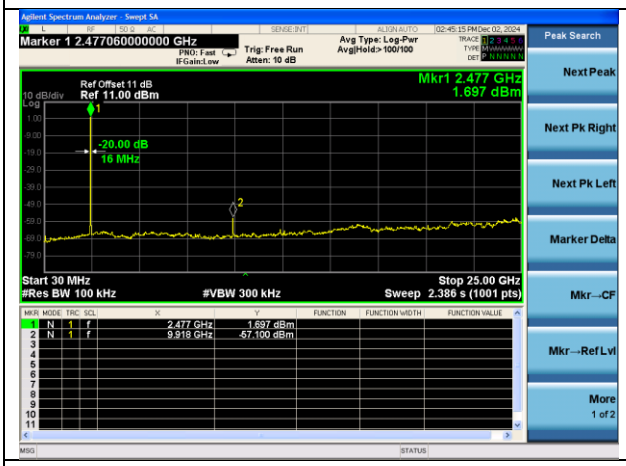
Conducted Spurious Emission Test Result



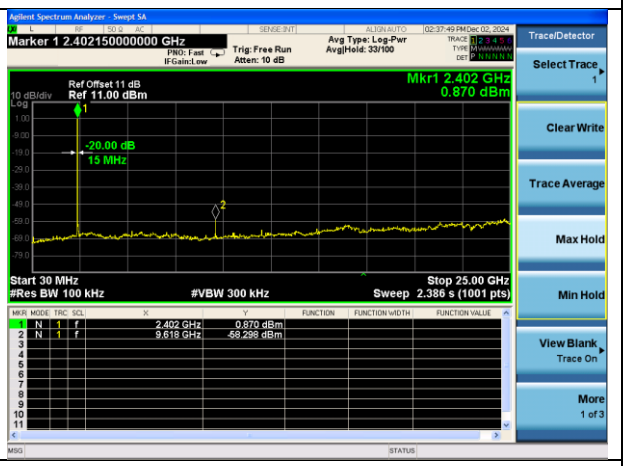
BT-GFSK-CSE-Low



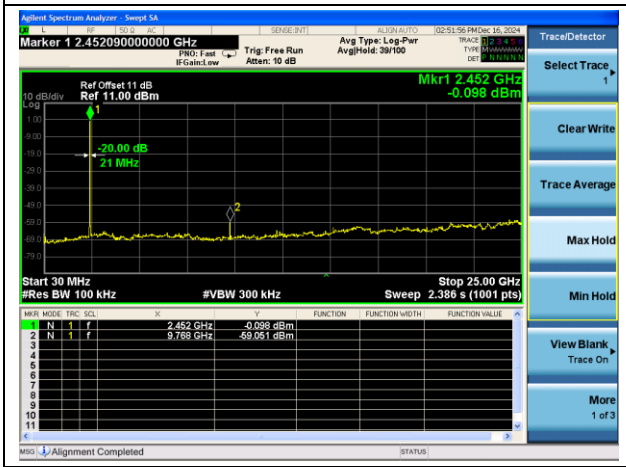
BT-GFSK-CSE-Mid



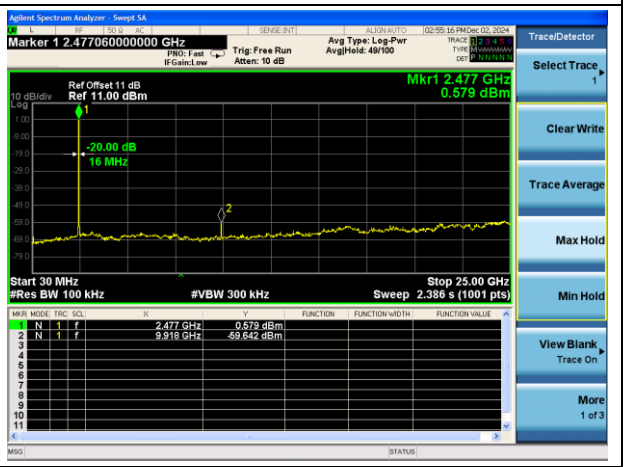
BT-GFSK-CSE-High



BT-8DPSK-CSE-Low



BT-8DPSK-CSE-Mid



BT-8DPSK-CSE-High

7.9 Frequency Hopping System Requirement

7.9.1 Requirement

Per § 15.247 (a) (1), RSS-247 §5.1, a)

The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Per § 15.247 (g), frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

Per § 15.247 (h), the incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

7.9.2 Result

Analysis:

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centered from 2402 to 2480MHz) in the range 2,400-2,483.5MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless device are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

This device was tested with an Bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements for DA 00-705 and FCC Part 15.247 rule.

An example of Pseudorandom Frequency Hopping Sequence Table as below:
08, 24, 40, 56, 40, 56, 72, 09, 01, 09, 33, 41, 33, 41, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40, 48, 72, 01, 72, 01, 25, 33, 12, 28, 44, 60, 42, 58, 74, 11, 05, 13, 37, 45 etc.

The system receiver has input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

Conclusion:

EUT complies with frequency hopping system requirement in § 15.247.

7.10 Radiated Band-Edge & Spurious Emissions into Restricted Frequency Bands

7.10.1 Requirement

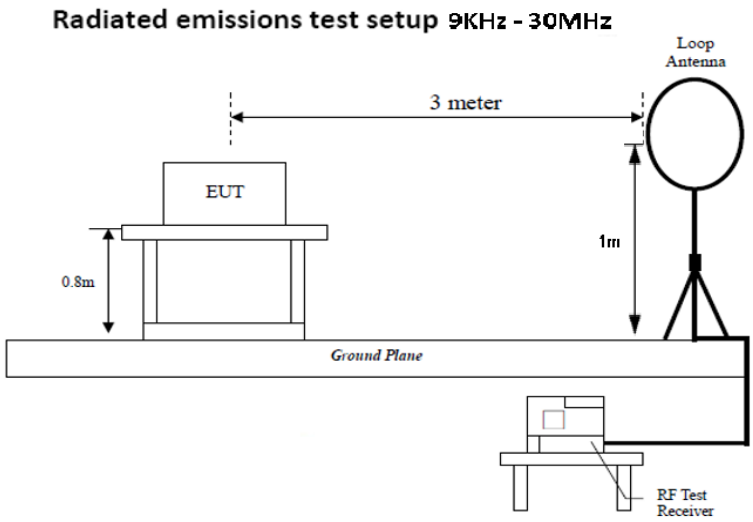
§ 15.247 (d), RSS-247 §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

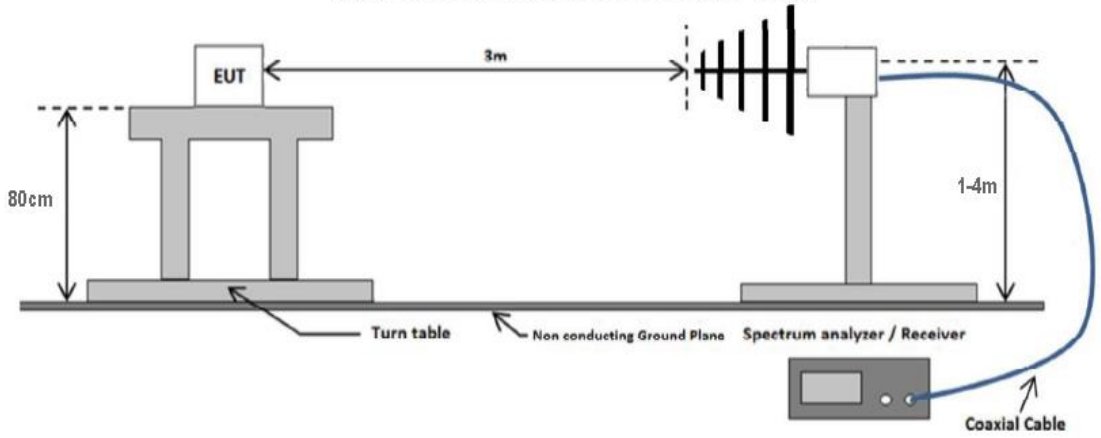
Attenuation below the general limits specified in §15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency range (MHz)	Field Strength (μV/m)
0.009~0.490	2400/F(KHz)
0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

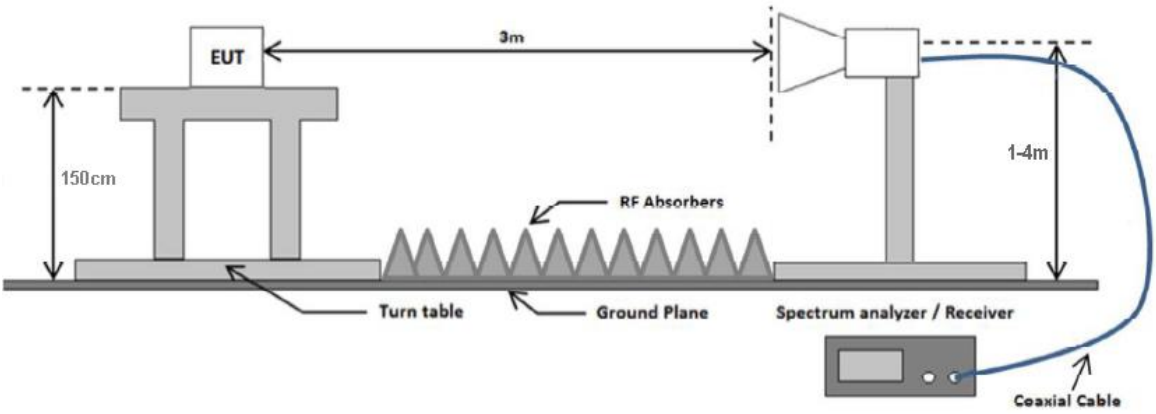
7.10.2 Test setup



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



7.10.3 *Test Procedure*

According to section 8.6 in KDB 558074 D01 DTS Meas Guidance v05r02 and subclause 11.12.2.7 Radiated spurious emission measurements in ANSI C62.10-2013 as well as the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was used during the scanning to point to EUT to maximize the emission. The process will be repeated in 3 EUT orientations.

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
   a) Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
   b) The EUT was then rotated to the direction that gave the maximum emission.
   c) Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 300 Hz for frequency below 150KHz.
4. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 10 kHz for frequency between 150KHz – 30MHz.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak detection at frequency between 30MHz - 1GHz.
6. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak and average measurement at frequency above 1GHz.
7. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

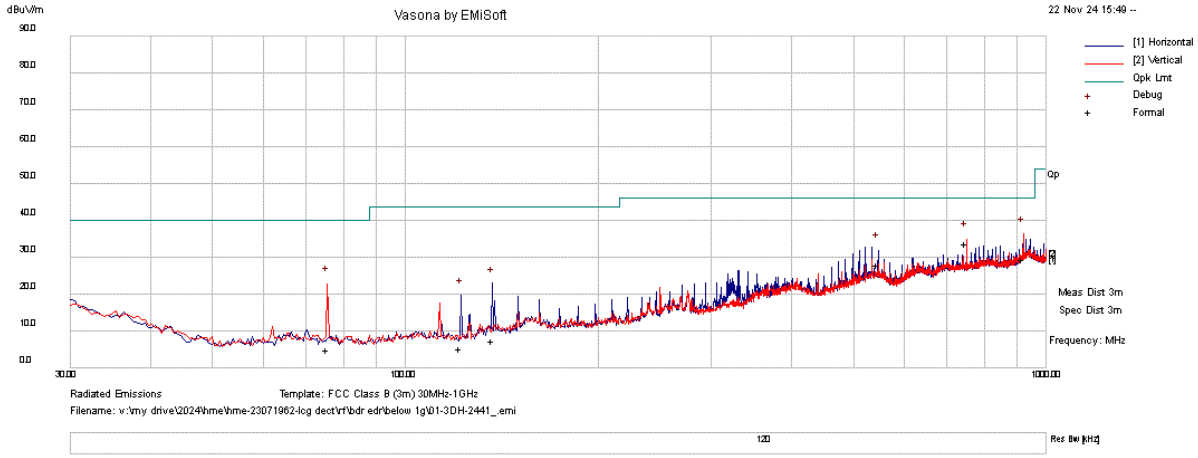
7.10.4 Test Result

Radiated Emission between 9KHz – 30MHz test result

Note: no substantial emission is found other than the noise floor. Different modes have been verified.

RADIATED EMISSIONS BELOW 1 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	EDR Cont-TX
Frequency Range:	30 MHz - 1 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Lining
Remark:	Mid channel	Test Result:	Pass



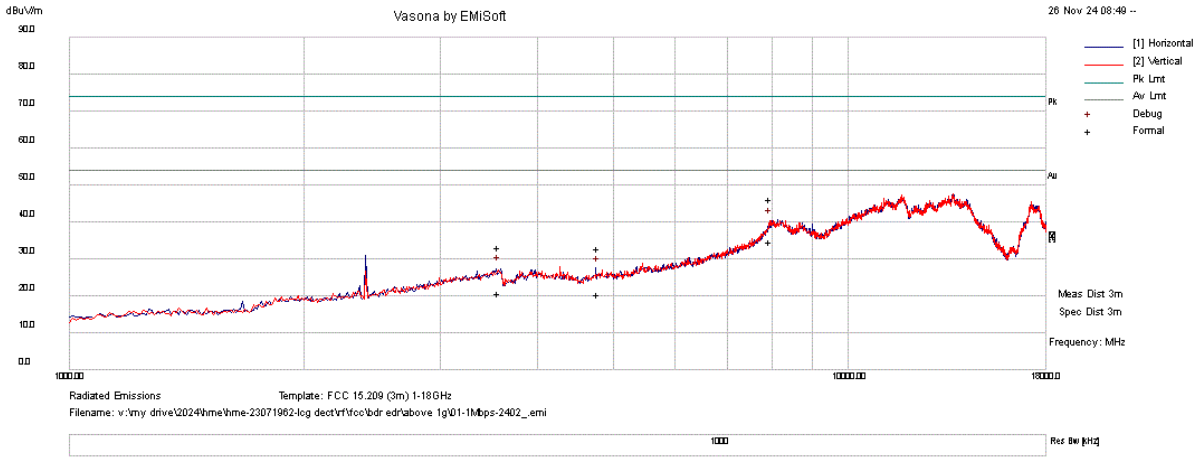
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	920.2	16.4	4.6	8.6	29.6	Quasi Max	V	192	302	46	-16.4	Pass
2	750.1	23.8	4.1	5.8	33.7	Quasi Max	V	354	298	46	-12.3	Pass
3	546.0	21.3	3.5	3.2	28	Quasi Max	H	100	236	46	-18	Pass
4	75.4	18.1	1.1	-14.3	5	Quasi Max	V	166	340	40	-35	Pass
5	136.9	18.1	1.7	-12.5	7.3	Quasi Max	H	136	102	43.5	-36.2	Pass
6	122.0	17.6	1.6	-13.9	5.3	Quasi Max	H	122	136	43.5	-38.2	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BDR Cont-TX
Frequency Range:	1 GHz – 18 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Low Channel	Test Result:	Pass



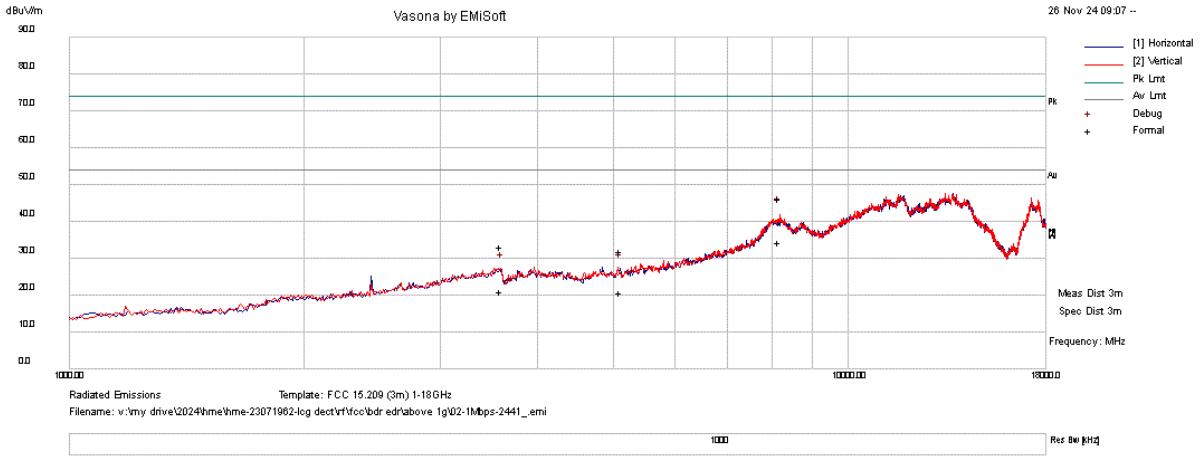
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	7966.252	16.50	14.20	15.40	46.10	Peak Max	H	122	64	74	-27.90	Pass
2	3557.600	20.30	8.40	4.40	33.10	Peak Max	H	118	100	74	-40.90	Pass
3	4778.027	17.80	9.10	6.00	32.90	Peak Max	H	156	30	74	-41.10	Pass
4	7966.252	5.20	14.20	15.40	34.80	Average Max	H	122	64	54	-19.20	Pass
5	3557.600	8.10	8.40	4.40	20.90	Average Max	H	118	100	54	-33.10	Pass
6	4778.027	5.40	9.10	6.00	20.50	Average Max	H	156	30	54	-33.50	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BDR Cont-TX
Frequency Range:	1 GHz – 18 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Mid Channel	Test Result:	Pass



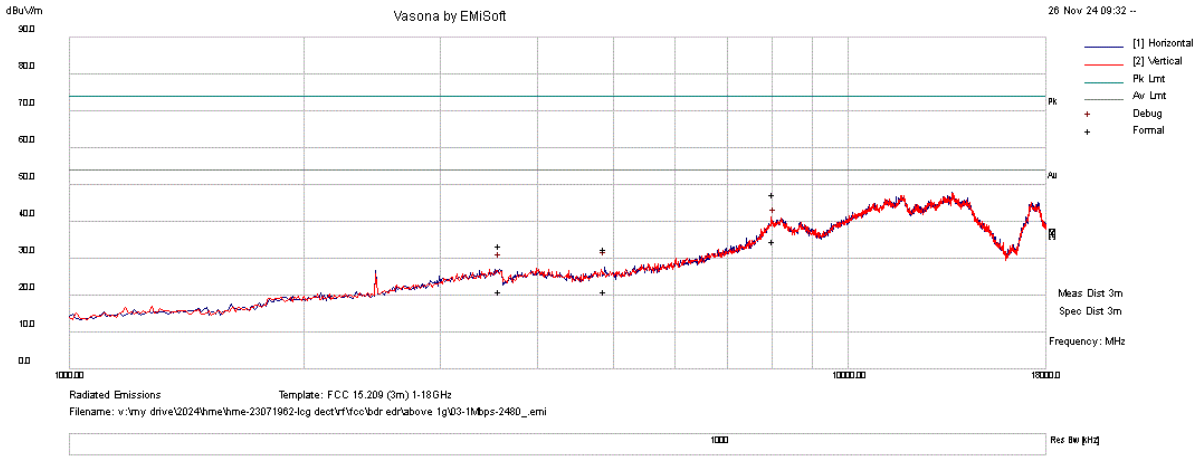
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8173.390	16.30	14.20	15.60	46.10	Peak Max	V	151	4	74	-27.90	Pass
2	3591.887	20.10	8.40	4.50	33.00	Peak Max	H	178	84	74	-41.00	Pass
3	5105.514	16.40	9.70	5.80	31.90	Peak Max	H	100	0	74	-42.10	Pass
4	8173.390	4.60	14.20	15.60	34.40	Average Max	V	151	4	54	-19.60	Pass
5	3591.887	8.10	8.40	4.50	21.00	Average Max	H	178	84	54	-33.00	Pass
6	5105.514	5.10	9.70	5.80	20.60	Average Max	H	100	0	54	-33.40	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BDR Cont-TX
Frequency Range:	1 GHz – 18 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	High Channel	Test Result:	Pass



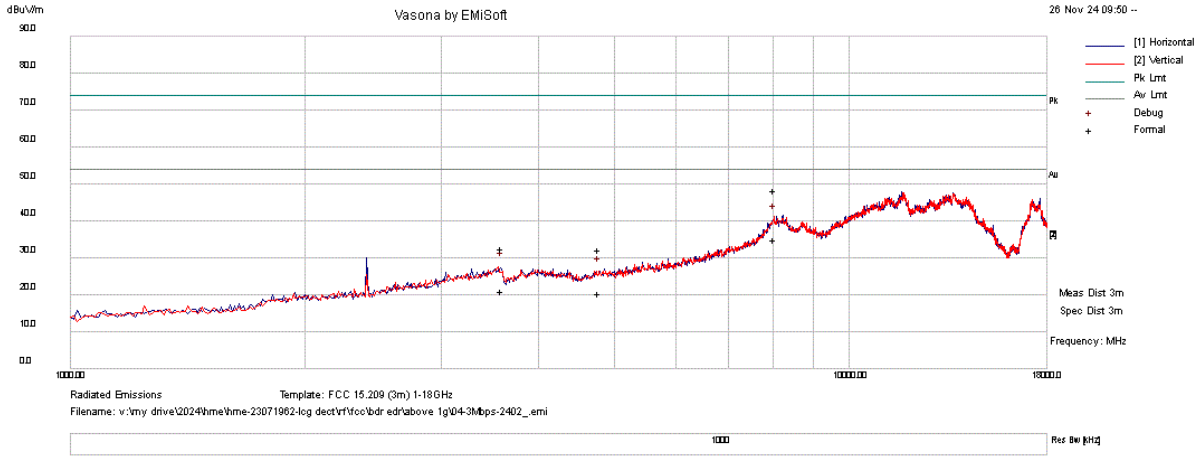
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8046.751	17.30	14.20	15.80	47.30	Peak Max	V	185	11	74	-26.70	Pass
2	4872.633	17.40	9.30	5.90	32.60	Peak Max	H	158	37	74	-41.40	Pass
3	3573.667	20.50	8.40	4.50	33.40	Peak Max	H	157	88	74	-40.60	Pass
4	8046.751	4.70	14.20	15.80	34.70	Average Max	V	185	11	54	-19.30	Pass
5	4872.633	5.80	9.30	5.90	21.00	Average Max	H	158	37	54	-33.00	Pass
6	3573.667	8.10	8.40	4.50	21.00	Average Max	H	157	88	54	-33.00	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	EDR Cont-TX
Frequency Range:	1 GHz – 18 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Low Channel	Test Result:	Pass



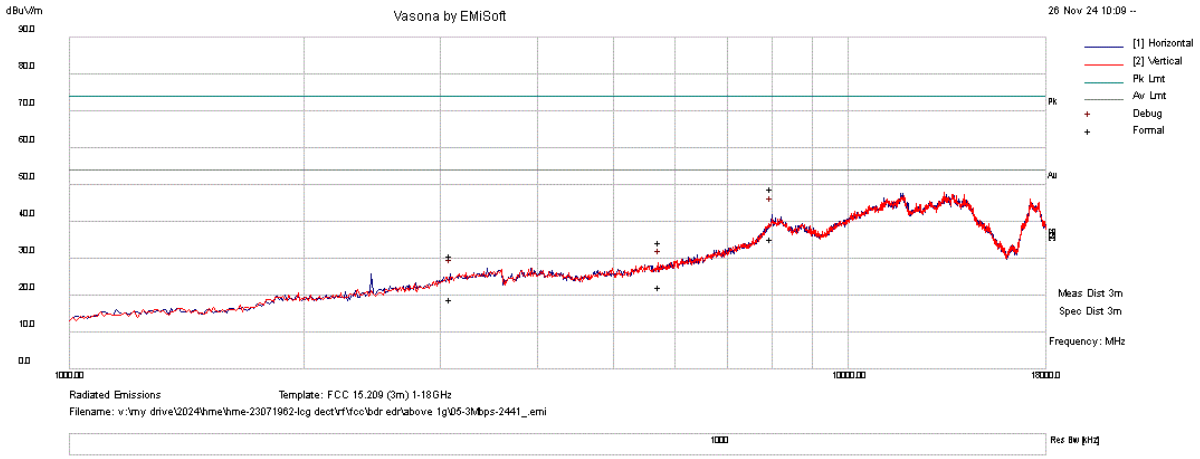
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8023.511	18.30	14.30	15.80	48.40	Peak Max	V	164	89	74	-25.60	Pass
2	3582.665	19.60	8.40	4.50	32.50	Peak Max	H	119	0	74	-41.50	Pass
3	4774.427	17.30	9.10	6.00	32.40	Peak Max	H	206	148	74	-41.60	Pass
4	8023.511	4.90	14.30	15.80	35.00	Average Max	V	164	89	54	-19.00	Pass
5	3582.665	8.10	8.40	4.50	21.00	Average Max	H	119	0	54	-33.00	Pass
6	4774.427	5.50	9.10	6.00	20.60	Average Max	H	206	148	54	-33.40	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	EDR Cont-TX
Frequency Range:	1 GHz – 18 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Mid Channel	Test Result:	Pass



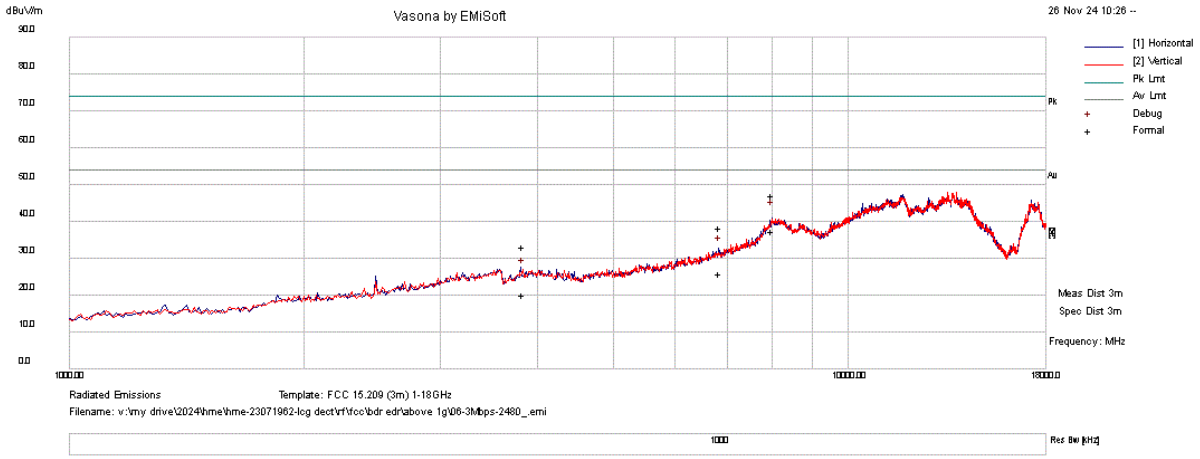
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	7990.820	19.00	14.20	15.70	48.90	Peak Max	H	180	9	74	-25.10	Pass
2	5732.378	17.00	11.40	5.90	34.30	Peak Max	V	161	10	74	-39.70	Pass
3	3087.563	19.80	7.70	3.10	30.60	Peak Max	H	127	43	74	-43.40	Pass
4	7990.820	5.30	14.20	15.70	35.20	Average Max	H	180	9	54	-18.80	Pass
5	5732.378	4.90	11.40	5.90	22.20	Average Max	V	161	10	54	-31.80	Pass
6	3087.563	8.20	7.70	3.10	19.00	Average Max	H	127	43	54	-35.00	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	EDR Cont-TX
Frequency Range:	1 GHz – 18 GHz	Test Date:	11/22/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	High Channel	Test Result:	Pass



No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8000.723	16.90	14.30	15.90	47.10	Peak Max	H	135	125	74	-26.90	Pass
2	6865.428	17.30	12.30	8.60	38.20	Peak Max	H	161	0	74	-35.80	Pass
3	3829.305	18.60	9.20	5.40	33.20	Peak Max	H	178	132	74	-40.80	Pass
4	8000.723	7.30	14.30	15.90	37.50	Average Max	H	135	125	54	-16.50	Pass
5	6865.428	5.00	12.30	8.60	25.90	Average Max	H	161	0	54	-28.10	Pass
6	3829.305	5.40	9.20	5.40	20.00	Average Max	H	178	132	54	-34.00	Pass

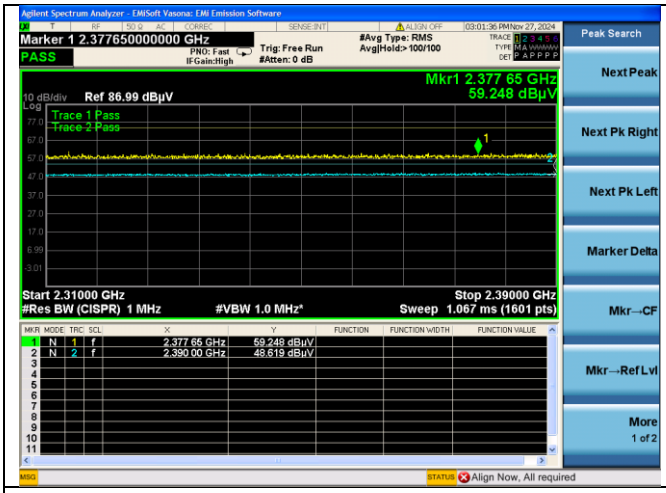
Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

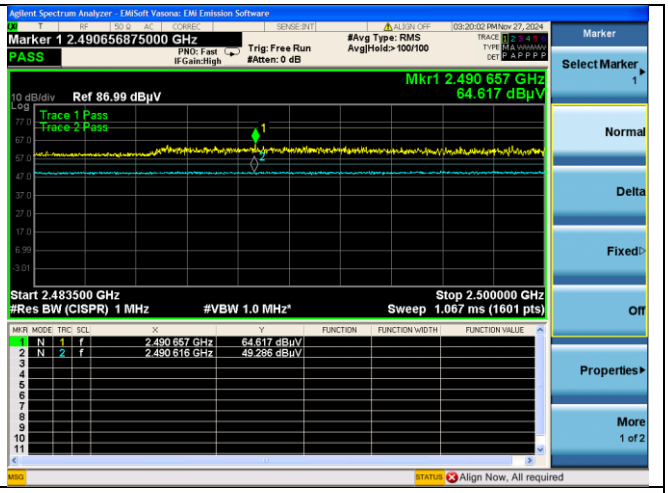
18GHz – 40GHz test result

Note: no substantial emission is found other than the noise floor. Different modes have been verified.

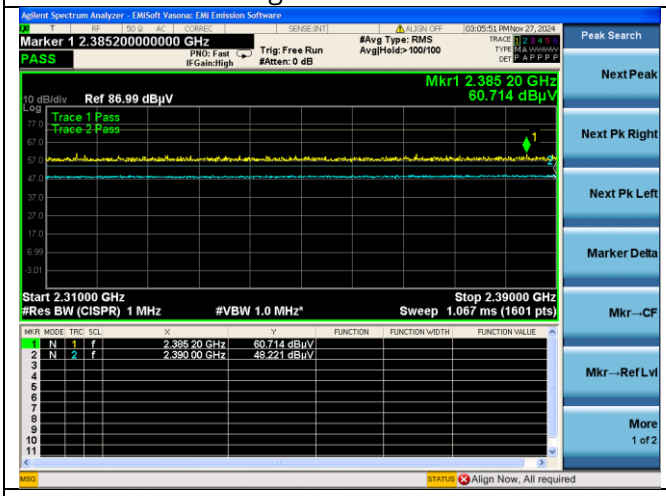
Restricted Band Measurement Plots:



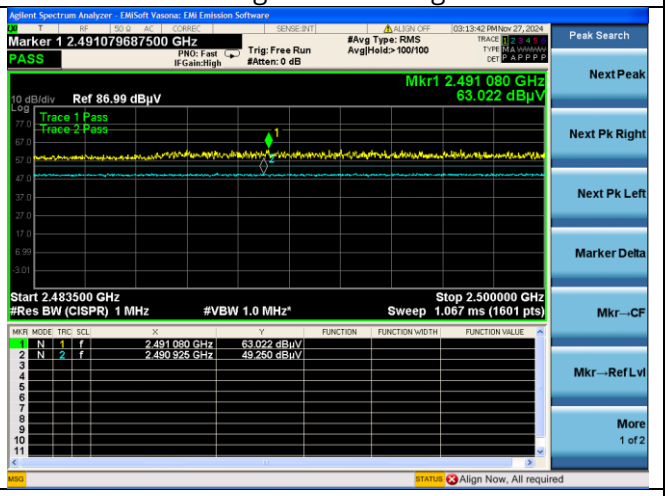
Band Edge - BT BDR Low CH



Band Edge - BT BDR High CH



Band Edge - BT EDR Low CH



Band Edge - BT EDR High CH

7.11 Conducted Emissions

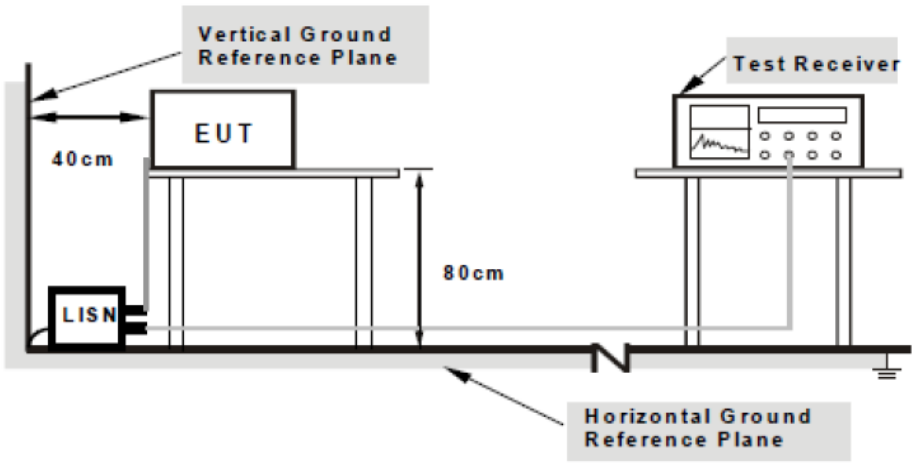
7.11.1 Requirement

Per § 15.207 (a), an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Limits for Conducted Emissions at the Mains Ports

Section	Frequency ranges (MHz)	Limit (dBuV)	
		QP	Average
Class B devices	0.15 – 0.5	66 – 56	56 – 46
	0.5 – 5	56	46
	5 - 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies.			

7.11.2 Test setup



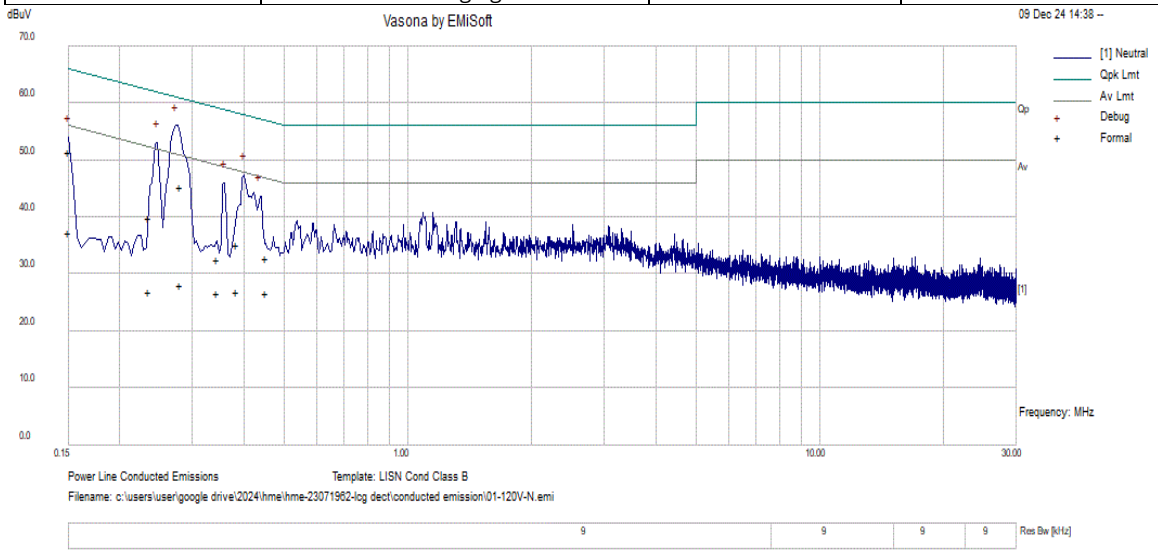
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

7.11.3 Test Procedure

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50µH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment was powered separately from another main supply.
5. The EUT was switched on and allowed to warm up to its normal operating condition.
6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
7. High peaks, relative to the limit line, were then selected.
8. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made
9. All possible modes of operation were investigated. Only the worst case emissions were measured and reported. All other emissions were relatively insignificant.

7.11.4 Test Result

Test Standard:	LISN B Cond Class B	Mode:	Conducted Emission
Frequency Range:	0.15 - 30MHz	Test Date:	12/09/2024
Line:	Neutral	Test Personnel:	Lining
Remark:	EUT in Charging mode	Test Result:	Pass

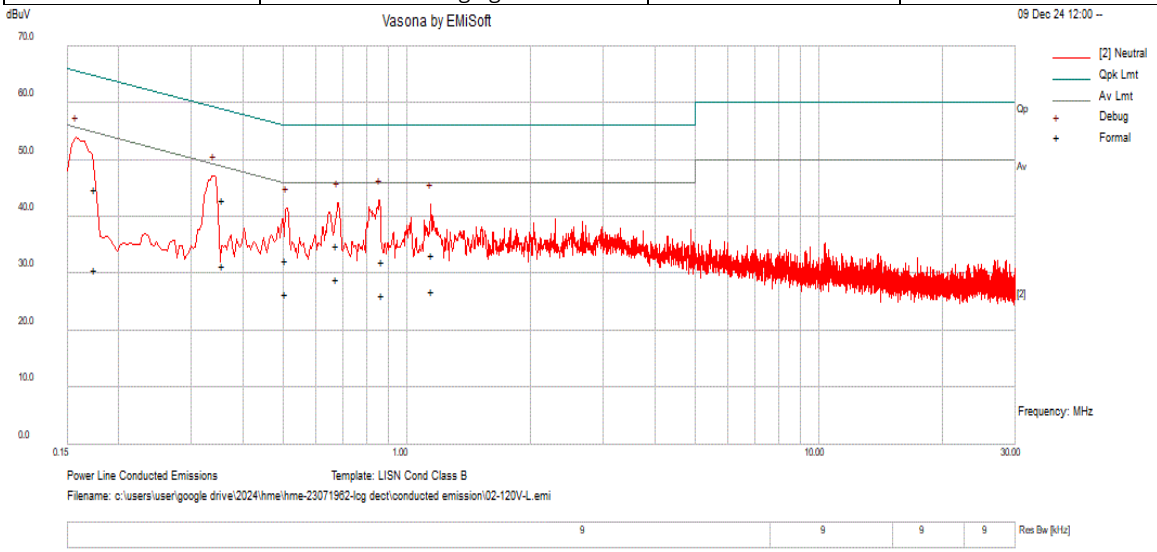


No.	Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass/Fail
1	0.28	35.23	10.04	0.14	45.41	Quasi Peak	Neutral	60.80	-15.39	Pass
2	0.24	29.78	10.04	0.16	39.98	Quasi Peak	Neutral	62.24	-22.26	Pass
3	0.38	24.96	10.04	0.12	35.12	Quasi Peak	Neutral	58.20	-23.08	Pass
4	0.15	41.07	10.03	0.24	51.34	Quasi Peak	Neutral	65.98	-14.64	Pass
5	0.35	22.39	10.04	0.12	32.55	Quasi Peak	Neutral	59.07	-26.52	Pass
6	0.45	22.67	10.04	0.11	32.82	Quasi Peak	Neutral	56.81	-23.99	Pass
7	0.28	17.94	10.04	0.14	28.12	Average	Neutral	50.80	-22.68	Pass
8	0.24	16.78	10.04	0.16	26.98	Average	Neutral	52.24	-25.26	Pass
9	0.38	16.75	10.04	0.12	26.91	Average	Neutral	48.20	-21.29	Pass
10	0.15	27.11	10.03	0.24	37.38	Average	Neutral	55.98	-18.60	Pass
11	0.35	16.58	10.04	0.12	26.74	Average	Neutral	49.07	-22.33	Pass
12	0.45	16.67	10.04	0.11	26.82	Average	Neutral	46.81	-19.99	Pass

Remarks:

1. The emission levels of other frequencies were very low against the limit.
2. Factor = Inert loss of LISN
3. Margin value = Emission level - Limit value
4. Emission Level = Raw Value + Cable loss + Factors Value.
5. EUT is battery operated only; it's charging mode has a indirect connection to AC power line.

Test Standard:	LISN B Cond Class B	Mode:	Conducted Emission
Frequency Range:	0.15 - 30MHz	Test Date:	12/09/2024
Line:	Live	Test Personnel:	Lining
Remark:	EUT in Charging mode	Test Result:	Pass



No.	Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass/Fail
1	0.18	34.67	10.04	0.21	44.92	Quasi Peak	Live	64.71	-19.79	Pass
2	0.36	32.86	10.04	0.12	43.02	Quasi Peak	Live	58.78	-15.76	Pass
3	0.87	21.97	10.05	0.10	32.12	Quasi Peak	Live	56.00	-23.88	Pass
4	0.67	24.77	10.05	0.11	34.93	Quasi Peak	Live	56.00	-21.07	Pass
5	1.15	23.27	10.05	0.10	33.42	Quasi Peak	Live	56.00	-22.58	Pass
6	0.51	22.20	10.04	0.10	32.34	Quasi Peak	Live	56.00	-23.66	Pass
7	0.18	20.37	10.04	0.21	30.62	Average	Live	54.71	-24.09	Pass
8	0.36	21.31	10.04	0.12	31.47	Average	Live	48.78	-17.31	Pass
9	0.87	16.13	10.05	0.10	26.28	Average	Live	46.00	-19.72	Pass
10	0.67	18.92	10.05	0.11	29.08	Average	Live	46.00	-16.92	Pass
11	1.15	16.82	10.05	0.10	26.97	Average	Live	46.00	-19.03	Pass
12	0.51	16.32	10.04	0.10	26.46	Average	Live	46.00	-19.54	Pass

Remarks:

1. The emission levels of other frequencies were very low against the limit.
2. Factor = Inert loss of LISN
3. Margin value = Emission level - Limit value
4. Emission Level = Raw Value + Cable loss + Factors Value.
5. EUT is battery operated only; it's charging mode has a indirect connection to AC power line.

8 EUT and Test Setup Photos

See FCC exhibits

9 Test instrument list

Equipment	Manufacturer	Model	Instrument Number	Cal. Date	Cal. Due
Semi-Anechoic Chamber	ETS-Lindgren	10M	VL001	05/24/2024	05/24/2027
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A1)	N/A1)
Spectrum Analyzer	Keysight	N9020A	MY50110074	05/15/2024	05/15/2026
EMC Test Receiver	R&S	ESL6	100230	05/14/2024	05/14/2025
LISN (9KHz – 30MHz)	EMCO	3816/2	9705-1066	05/28/2024	05/28/2025
Bi-Log Antenna	ETS-Lindgren	3142E	217921	07/25/2024	07/25/2025
Horn Antenna (1-18GHz)	Electro-Metrics	EM-6961	6292	07/22/2024	07/22/2025
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	07/22/2024	07/22/2025
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	05/17/2024	05/17/2025
RF Attenuator	Pasternack	PE7005-3	VL061	07/29/2024	07/29/2025
EM Center Control	ETS-Lindgren	7006-001	160136	N/A1)	N/A1)
Turn Table	ETS-Lindgren	2181-3.03	VL002	N/A1)	N/A1)
Boresight Antenna Tower	ETS-Lindgren	2171B	VL003	N/A1)	N/A1)
Loop Antenna (9k-30MHz)	Com-Power	AL-130	121012	06/13/2024	06/13/2026
RE test cable (below 6GHz)	Vista	RE-6GHz-01	RE-6GHz-01	07/29/2024	07/29/2025
RE test cable (1-18GHz)	PhaseTrack	II-240	RE-18GHz-01	07/29/2024	07/29/2025
RE test cable (>18GHz)	Sucoflex	104	344903/4	07/29/2024	07/29/2025
Pulse limiter	Com-Power	LIT-930A	531727	07/29/2024	07/29/2025
CE test cable #1	FIRST RF	FRF-C-1002-001	CE-6GHz-01	07/29/2024	07/29/2025
CE test cable#2	FIRST RF	FRF-C-1002-001	CE-6GHz-02	07/29/2024	07/29/2025
USB RF Power Sensor	ETS-Lindgren	7002-006	SN 00151268	05/14/2024	05/14/2026
Agilent Signal Generator	MXG N5182A	N5182A	US47080548	05/15/2024	05/15/2025
Power Splitter/Combiner	Mini-Circuits	ZFSC-2-9G+	VL052	N/A1)	N/A1)
Power Splitter/Combiner	Mini-Circuits	ZFSC-2-9G+	VL053	N/A1)	N/A1)
Power Splitter/Combiner	Mini-Circuits	ZFSC-2-9G+	VL054	N/A1)	N/A1)
Power Splitter/Combiner	Mini-Circuits	ZFSC-2-9G+	VL055	N/A1)	N/A1)
2.4GHz Notch Filter	Micro-Tronics	BRM50702	VL063	N/A1)	N/A1)
5GHz Notch Filter	Micro-Tronics	BRM50716	VL064	N/A1)	N/A1)
Horn Antenna (1-18GHz)	FT-RF	HA-07M18G-NF	180010HA	N/A1)	N/A1)
DECT Communication Tester	R&S	CMD60	845660/013	05/15/2024	05/15/2026
Wideband Communication	R&S	CMW500	147508	05/15/2023	05/15/2025
Temperature/Humidity Chamber	Bemco	FBW1.5-100/350	3621-9	05/16/2024	05/16/2027
Synthesized Signal Generator	Anritsu	68367C A/NV	11625	05/14/2024	05/14/2025
Spectrum Analyser (9kHz-43GHz)	Anritsu	MS2830A	6201145210	05/16/2024	05/16/2025

Note:

1) This equipment is not for measurement purposes and only requires functional verification. Calibration is not required.

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