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RF Test Report

Test Report Number	HME-23071962-LCG-FCC-IC-PUT
FCC ID	BYM1414
ISED ID	1860A-1414
Applicant	HM Electronics Inc
Applicant Address	2848 Whiptail Loop, Carlsbad, CA 92010 USA
Product Name	Wireless Beltpack
Model (s)	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 Subpart D RSS-213 Issue 3, Mar 2015
Test Result	**PASS**

Issued by:

Vista Compliance Laboratories
1261 Puerta Del Sol, San Clemente, CA 92673 USA
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Lining

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REVISION HISTORY

Report Number	Version	Description	Issued Date
HME-23071962-LCG-FCC-IC-PUT	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 Subpart D RSS-213 Issue 3, Mar 2015	N/A	Pass
Emission Bandwidth	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Occupied Bandwidth	RSS-Gen Issue 5, Feb 2021	RSS-Gen Issue 5, Feb 2021	Pass
Peak Transmit Power	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Power Spectral Density	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Automatic Discontinuation of Transmission	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Monitoring time	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Monitoring threshold	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Maximum transmit duration	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Acknowledgements	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
LIC confirmation, LIC selection	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Random Waiting	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	N/A
Monitoring Bandwidth, Monitoring Reaction Time	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Monitoring antenna	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Fair access	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Frame period and jitter, Frame and repetition stability	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Emission Inside and Outside of the sub-band	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
Frquency Stability	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (2013)	Pass
AC Power Line Conducted Emissions	47 CFR Part 15 Subpart D RSS-213 Issue 3, Mar 2015	ANSI C63.17 (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, 3.6VDC
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	EUT has two antenna ports for TX diversity.

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 558074 D01 15.247 Meas Guidance v05r02

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 / Deviations from Standards

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
Test software/command	FSII_BP_1_9_Release_5_3_32_0 DECT product test software

5.2 Supporting Equipment

Description	Manufacturer	Model #	Serial #
Laptop	Dell	Latitude E6440	FFF4JC2

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 Results

7.1 Antenna Requirement

7.1.1 Requirement

§ 15.317

An unlicensed PCS device must meet the antenna requirement of § 15.203.

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 Emission Bandwidth

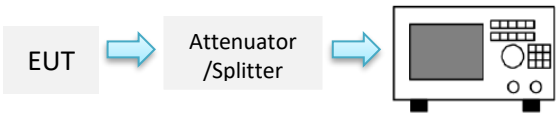
7.2.1 Requirement

§ 15.323 (a), RSS-213 §5.5

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compli ance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Operation shall be contained within the 1920-1930 MHz band. The emission bandwidth shall be less than 2.5 MHz. The power level shall be as specified in §15.319(c), but in no event shall the emission bandwidth be less than 50 kHz.

7.2.2 Test Setup



7.2.3 Test Procedure

According to subclause 6.1.3 of ANSI C63.17-2013:

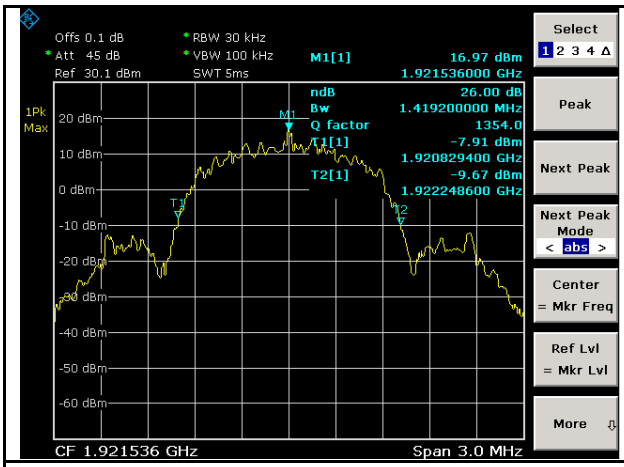
The automatic bandwidth measurement capability of an instrument is employed using the X dB bandwidth mode with X set to 26 dB, if the functionality described below is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 26 dB.

1. Set RBW to approximately 1% of the emission BW.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Span ≥ 2 x expected emission bandwidth
7. Allow the trace to stabilize.
8. Use automatic bandwidth measurement capability on instrument to obtain BW result.

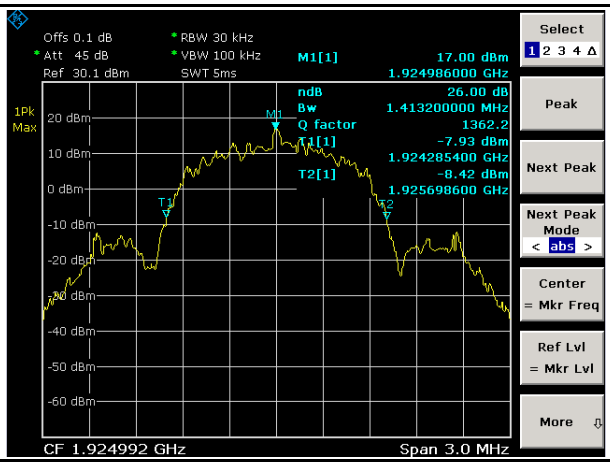
7.2.4 Test Result

Mode	Frequency (MHz)	Measured Bandwidth (MHz)	Limit	Result
DECT	1921.536	1.419	50 kHz < OBW <2.5 MHz	Pass
DECT	1924.992	1.413	50 kHz < OBW <2.5 MHz	Pass
DECT	1928.448	1.419	50 kHz < OBW <2.5 MHz	Pass

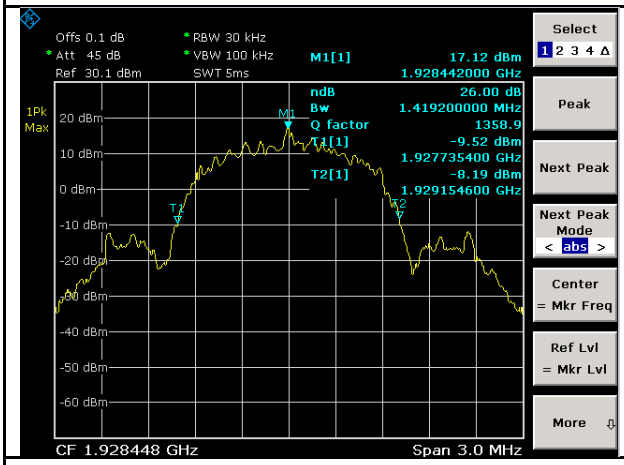
7.2.5 Test Plots



Low Channel



Mid Channel



High Channel

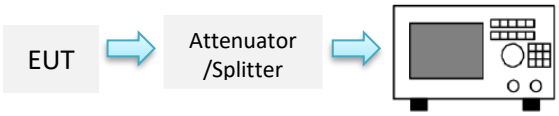
7.3 Occupied Bandwidth (99%)

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

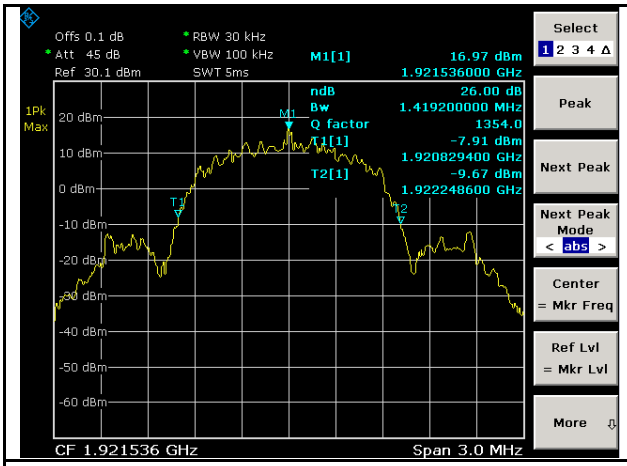
The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW ≥ 3 × RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this 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.

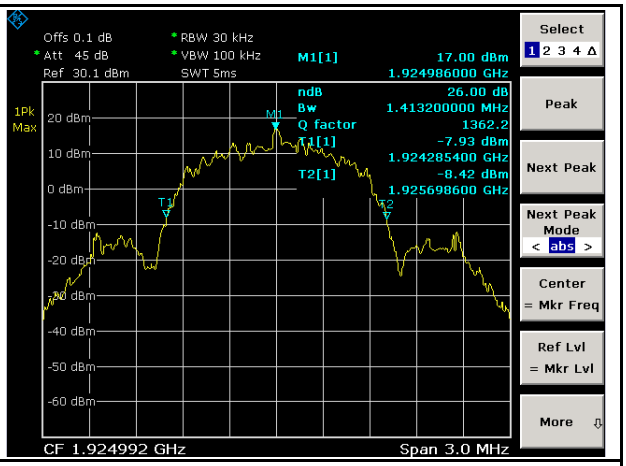
7.3.4 Test Result

Mode	Frequency (MHz)	Measured 99% OBW (KHz)	Limit (KHz)	Result
DECT	1921.536	1064.6	N/A	N/A
DECT	1924.992	1059.7	N/A	N/A
DECT	1928.448	1066.1	N/A	N/A

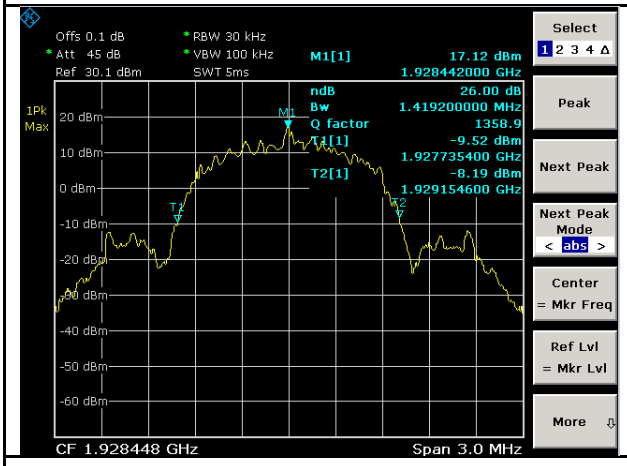
7.3.5 Test Plots



Low Channel



Mid Channel



High Channel

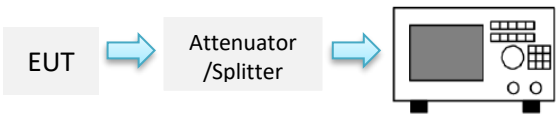
7.4 Peak Transmit Power

7.4.1 Requirement

§ 15.319 (c), RSS-213 §5.6

The peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

7.4.2 Test Setup



7.4.3 Test Procedure

Peak Transmit Power measurement is according to subclause 6.1.2 of ANSI C63.17-2013:

1. Set the RBW ≥ Emission bandwidth
2. Set VBW ≥ RBW.
2. Set SPAN = Zero
3. Sweep time = auto couple.
4. Detector = peak.
5. Trigger mode = video
6. Use peak marker function to determine the peak amplitude level.

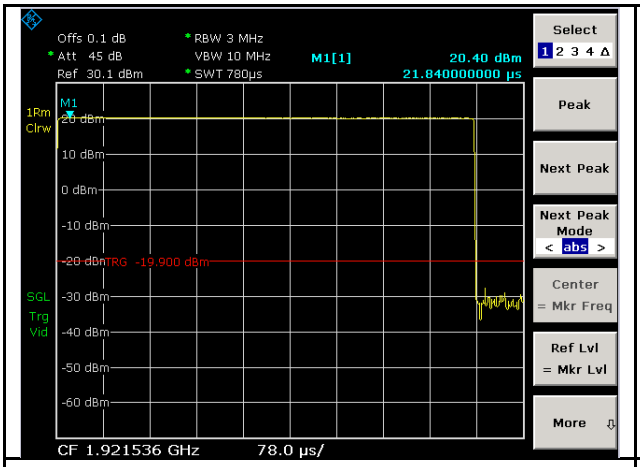
7.4.4 Test Result

Mode	Port	Frequency (MHz)	Measured Peak Output Power (dBm)	Limit (dBm)	Result
DECT	J501	1921.536	20.40	20.75	Pass
DECT	J501	1924.992	20.29	20.75	Pass
DECT	J501	1928.448	20.51	20.75	Pass
DECT	J502	1921.536	20.36	20.75	Pass
DECT	J502	1924.992	20.45	20.75	Pass
DECT	J502	1928.448	20.44	20.75	Pass

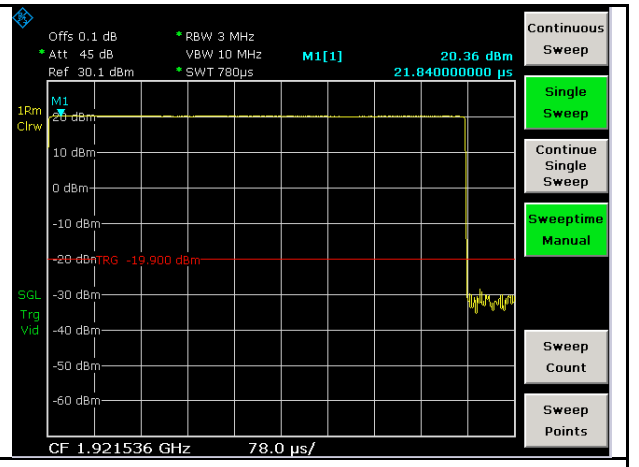
Note:

1. Limit = 100 microwatts multiplied by the square root of the emission bandwidth in hertz
2. Peak antenna gain is less than 3 dBi; transmit power reduction is not required.

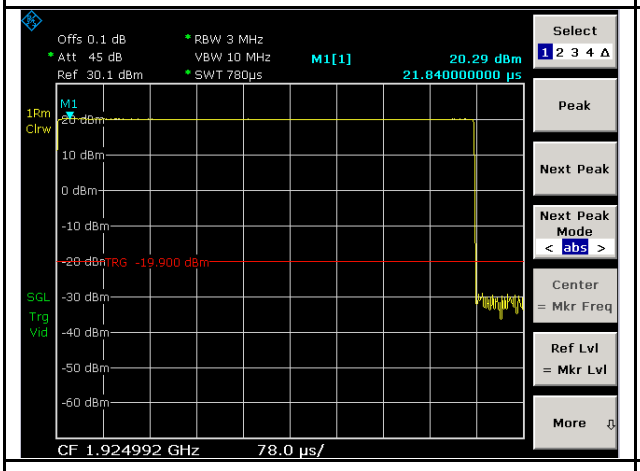
7.4.5 Test Plots



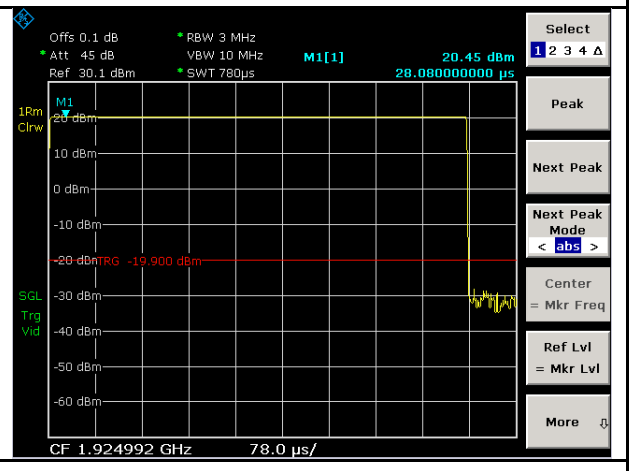
Low Channel at port J501



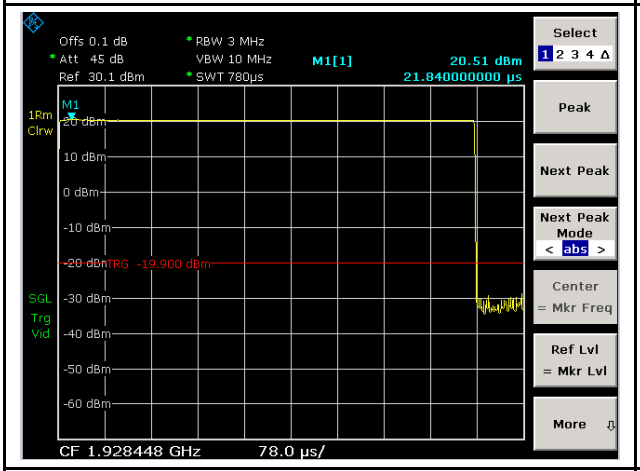
Low Channel at port J502



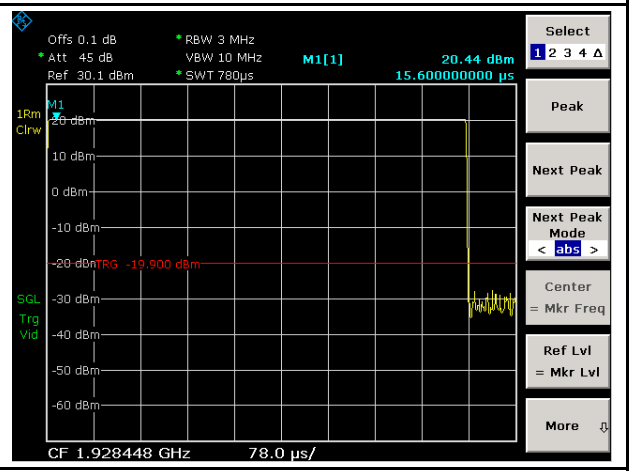
Mid Channel at port J501



Mid Channel at port J502



High Channel at port J501



High Channel at port J502

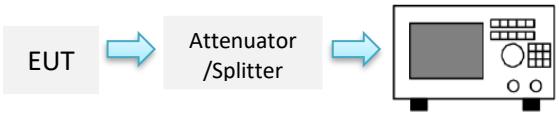
7.5 Power Spectral Density

7.5.1 Requirement

§ 15.319 (d), RSS-213 §5.7

Power spectral density shall not exceed 3 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

7.5.2 Test Setup



7.5.3 Test Procedure

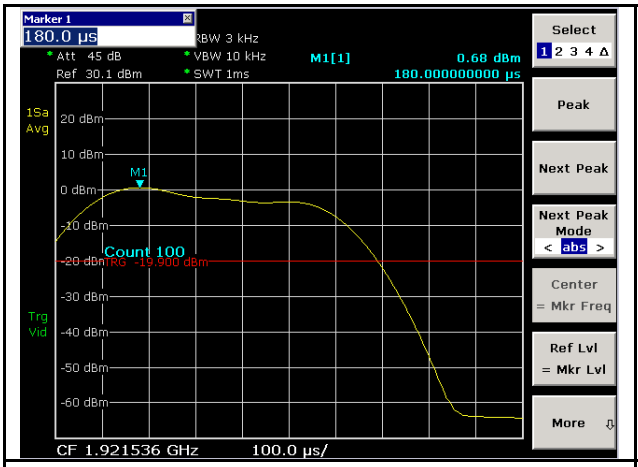
Power Spectral Density measurement is according to subclause 6.1.5 of ANSI C63.17-2013:

1. Set analyser centre frequency to frequency with maximum level
2. Set the span to zero span
3. Set the RBW = 3 kHz
4. Set the VBW ≥ 3 x RBW.
5. Detector = sample.
6. Sweep time = auto couple.
7. Trace mode = average (100 sweeps minimum)
8. Use the peak marker function to determine the maximum amplitude level within the RBW.

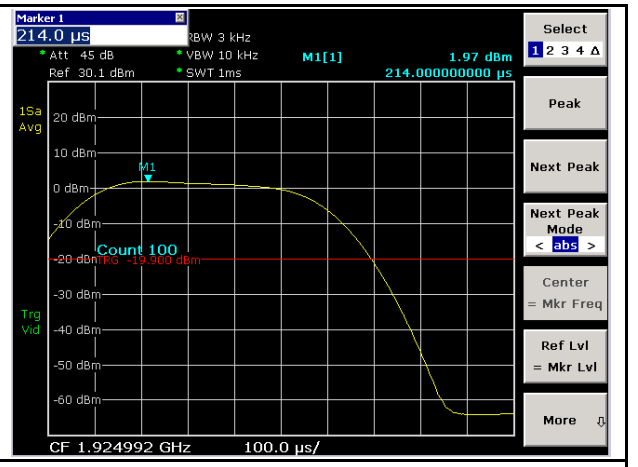
7.5.4 Test Result

Mode	Frequency (MHz)	Measured PSD (dBm/3KHz)	Max PSD (dBm/3KHz)	Result
DECT	1921.536	0.68	4.77	Pass
DECT	1924.992	1.97	4.77	Pass
DECT	1928.448	2.60	4.77	Pass

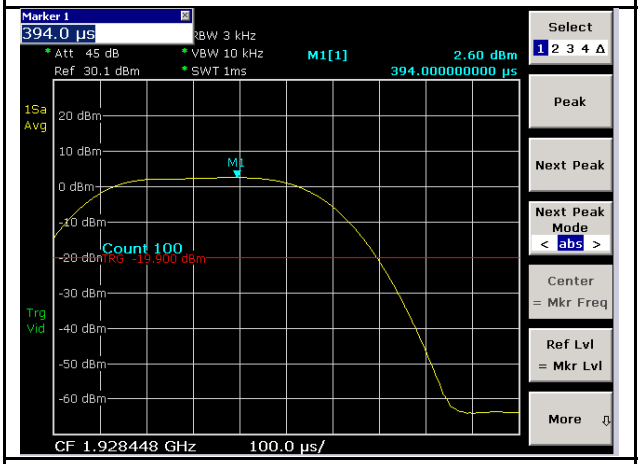
7.5.5 Test Plots



Low Channel



Mid Channel



High Channel

7.6 Specific protocol requirements for devices operating in the 1920-1930 MHz band.

7.6.1 Automatic Discontinuation of Transmission Requirement

7.6.1.1 Requirement

§ 15.319 (f), RSS-213 §5.2

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. The provisions in this section are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

7.6.1.2 Test Result

No.	Test	Reaction of EUT	Result
1	Remove Power from companion device	A	Pass
2	Remove Power from EUT	C	Pass
2	Switch off the companinon device	A	Pass
3	Terminate call at the companion device side	N/A	N/A
4	Switch off the EUT	C	Pass
5	Terminate call at the EUT side	C	Pass

A – Connection terminated and transmission ceased
B – Connection terminated but EUT transmits control or signalling information
C – Connection terminated but companion device transmits control or signalling information
N/A – Not applicable

7.6.2 Monitoring Time

7.6.2.1 Requirement

§ 15.319 (c)(1), RSS-213 §5.2(1)

Immediately prior to initiating a transmission, devices must monitor the combined time and spectrum window that they intend to use to verify if the channel is free for at least 10 ms for systems designed to use a 10 ms or shorter frame period, or at least 20 ms for systems designed to use a 20 ms frame period.

7.6.2.2 Test Result

Initial Transmit Channel	Interferer Level	Final Transmit Channel	Result
F1	T_U + U_M + 20 dB	F2	Pass
F2	Tu + UM + 20 dB	F1	Pass

7.6.3 Monitoring Threshold

7.6.3.1 Requirement

§ 15.319 (c)(2), RSS-213 §5.2(2)

The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device.

§ 15.319 (c)(5), RSS-213 §5.2(5)

If access to spectrum is not available as determined by the above, and a minimum of 20 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level may be accessed. A device utilizing the provisions of this paragraph must have monitored all access channels defined for its system within the last 10 seconds and must verify, within the 20 milliseconds (40 milliseconds for devices designed to use a 20 milliseconds frame period) immediately preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the previously detected value. The power measurement resolution for this comparison must be accurate to within 6 dB. No device or group of co-operating devices located within 1 meter of each other shall during any frame period occupy more than 6 MHz of aggregate bandwidth, or alternatively, more than one third of the time and spectrum windows defined by the system.

§ 15.319 (c)(9), RSS-213 §5.2(9)

Devices that have a power output lower than the maximum permitted under this subpart may increase their monitoring detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

7.6.3.2 Test Result

Lower threshold: $T_L = -174+10Log_{10}B + M_L + P_{MAX}-P_{EUT}$(dBm)

Where: B=Emission bandwidth (Hz)

M_u =dB the threshold may exceed thermal noise
(30 for T_L
$P_{MAX} = 5Log_{10}B-10$(dBm)
P_{EUT} =Transmitted power (dBm)

Lower Threshold		
B	1.413	MHz
ML	30	dB
PEUT	20.51	dBm
TL	-62.26	dBm

7.6.4 Maximum Transmission Duration

7.6.4.1 Requirement

§ 15.319 (c)(3), RSS-213 §5.2(3)

If no signal above the threshold level is detected, transmission may commence and continue with the same emission bandwidth in the monitored time and spectrum windows without further monitoring. However, occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

7.6.4.2 Test Result

Measuremed Maximum Transmission Duration (min)	Limit (min)	Result
150	480	Pass

Note: EUT ceased transmission at current channel and moved to a different channel after repeaing the access criteria.

7.6.5 Acknowledgements

7.6.5.1 Requirement

§ 15.319 (c)(4), RSS-213 §5.2(4)

Once access to specific combined time and spectrum windows is obtained an acknowledgment from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgments must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgment, at which time the access criteria must be repeated.

7.6.5.2 Test Result

Initial Transmission without Acknowlegements		
Maximum Initial Transmission (s)	Limit (s)	Result
0	30	Pass
Transmission Time without Acknlowdegements		
Time Needed to Cease Transmission	Limit (s)	Result
5	30	Pass

7.6.6 LIC confirmation, LIC selection

7.6.6.1 Requirement

§ 15.319 (c)(5), RSS-213 §5.2(5)

If access to spectrum is not available as determined by the above, and a minimum of 20 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level may be accessed. A device utilizing the provisions of this paragraph must have monitored all access channels defined for its system within the last 10 seconds and must verify, within the 20 milliseconds (40 milliseconds for devices designed to use a 20 milliseconds frame period) immediately preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the previously detected value. The power measurement resolution for this comparison must be accurate to within 6 dB. No device or group of co-operating devices located within 1 meter of each other shall during any frame period occupy more than 6 MHz of aggregate bandwidth, or alternatively, more than one third of the time and spectrum windows defined by the system.

7.6.6.2 Test Result

Inteferer Level F1	Interferer Level F2	Operating Channel	Result
T_L + U_M + 7 dB	T_L + U_M	F2	Pass
T_L + U_M	T_L + U_M + 7 dB	F1	Pass
T_L + U_M + 1 dB	T_L + U_M + 6 dB	F2	Pass
T_L + U_M + 6 dB	T_L + U_M + 1 dB	F1	Pass

TL – Lower threshold power level

7.6.7 Random Waiting

7.6.7.1 Requirement

§ 15.319 (c)(6), RSS-213 §5.2(6)

If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same windows after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available.

7.6.7.2 Test Result

N/A. EUT does not transmit control and signalling data.
This test is for EUTs that transmit control and signaling channels and that use the provisions of FCC § 15.323(c)(6), thus to verify that the EUT (if in deferral) waits for a channel to go clear, then implements a 10 ms to 150 ms hold off prior to using the channel.

7.6.8 Monitoring Bandwidth, Monitoring Reaction Time

7.6.8.1 Requirement

§ 15.319 (c)(7), RSS-213 §5.2(7)

The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission and have a maximum reaction time less than 50xSQRT (1.25/emission bandwidth in MHz) microseconds for signals at the applicable threshold level but shall not be required to be less than 50 microseconds. If a signal is detected that is 6 dB or more above the applicable threshold level, the maximum reaction time shall be 35xSQRT (1.25/emission bandwidth in MHz) microseconds but shall not be required to be less than 35 microseconds.

7.6.8.2 Test Result

Initial Transmit Channel	Interferer Level	Transmission Status	Result
FLow + 30% BW	Tu + UM + 10 dB	N/A	N/A
FLow - 30% BW	Tu + UM + 10 dB	N/A	N/A
FHigh + 30% BW	Tu + UM + 10 dB	N/A	N/A
FLow - 30% BW	Tu + UM + 10 dB	N/A	N/A

Operating Channel	Pulse Width	Level	Transmission Status	Result
FLow	50	Tu + UM	No	Pass
FMid	50	Tu + UM	No	Pass
FHigh	50	Tu + UM	No	Pass
FLow	35	Tu + UM + 6 dB	No	Pass
FMid	35	Tu + UM + 6 dB	No	Pass
FHigh	35	Tu + UM + 6 dB	No	Pass

Note: EUT uses the same antenna for transmission and receiving, so the bandwidth will be equal to the emission bandwidth of the intended transmission. The monitoring bandwidth test is not applicable.

7.6.9 Monitoring Antenna

7.6.9.1 Requirement

§ 15.319 (c)(8), RSS-213 §5.2(8)

The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

7.6.9.2 Test Result

Pass. EUT uses the same antenna for transmission andreception.

7.6.10 Fair Access

7.6.10.1 Requirement

§ 15.319 (c)(12), RSS-213 §5.2(12)

The provisions of (c)(10) or (c)(11) of this section shall not be used to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum to other devices.

7.6.10.2 Test Result

Pass. EUT does not work in a mode which denies fair access to spectrum for other participants.

7.6.11 Frame Period and Jitter, Frame and Repetition Stability

7.6.11.1 Requirement

§ 15.319 (3), RSS-213 §5.2(13)

The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of an intentional radiator operating in this band shall be 20 milliseconds or 10 milliseconds/X where X is a positive whole number. Each device that implements time division for the purposes of maintaining a duplex connection on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 50 parts per million (ppm). Each device which further divides access in time in order to support multiple communication links on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 10 ppm. The jitter (time-related, abrupt, spurious variations in the duration of the frame interval) introduced at the two ends of such a communication link shall not exceed 25 microseconds for any two consecutive transmissions. Transmissions shall be continuous in every time and spectrum window during the frame period defined for the device.

7.6.11.2 Test Result

Frame Period and Jitter

Max Positive Jitter (uS)	Max Negative Jitter (uS)	Frame Period (mS)	Jitter Limit (uS)	Frame Period Limit (mS)	Result
0.10	-0.20	10	25	20 or 10/x	Pass

Note: x is a positive whole number.

Frame Repetition Stability:

Frame Repetition Stability (ppm)	Limit (ppm)	Result
0.05	10	Pass

7.7 Conducted In-Band and Out of Band Emission

7.7.1 Requirement

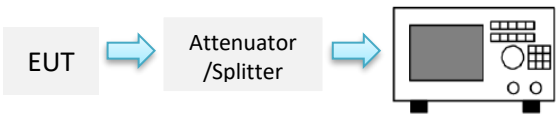
§ 15.323 (d)(1), RSS-213 §5.8.1

Out of Band Emissions: Emissions shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the band edge and 1.25 MHz above or below the band; 50 dB between 1.25 and 2.5 MHz above or below the band; and 60 dB at 2.5 MHz or greater above or below the band.

§ 15.323 (d)(2), RSS-213 §5.8.2

In-Band Emissions: Emissions inside the band must comply with the following emission mask: In the bands between 1B and 2B measured from the center of the emission bandwidth, the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth, the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the band edge, the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator. "B" is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

7.7.2 Test Setup



7.7.3 Test Procedure

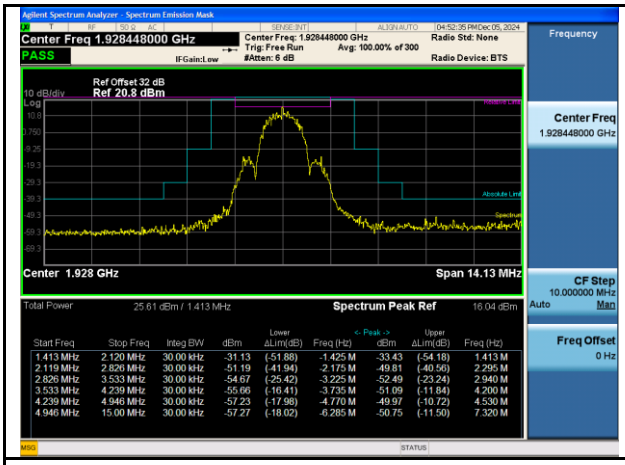
According to subclause 6.1.6.1 and 6.1.6.2 in ANSI C63.17-2013:

1. Set RBW to approximately 1% of the emission BW.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Span is set to wide enough to cover test region
7. Allow the trace to stabilize.
8. Use marker peak function to identify the maximum emission level

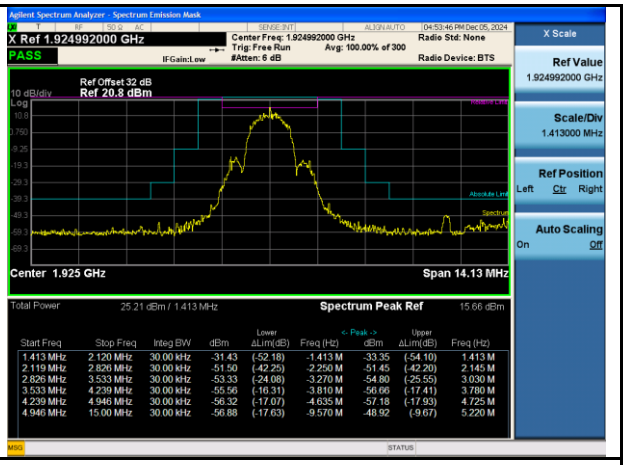
7.7.4 Test Result

See test plots

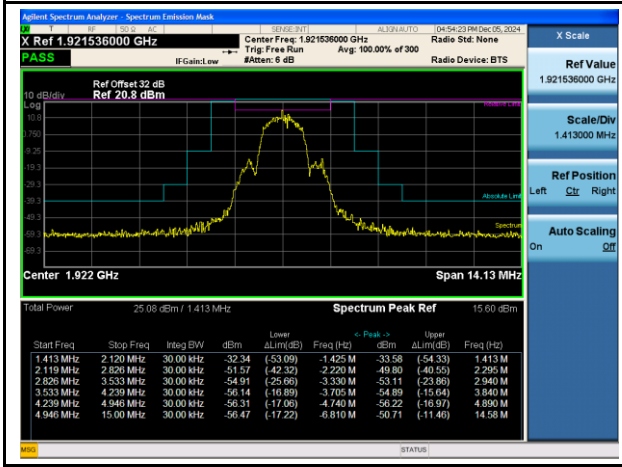
7.7.5 Test Plots



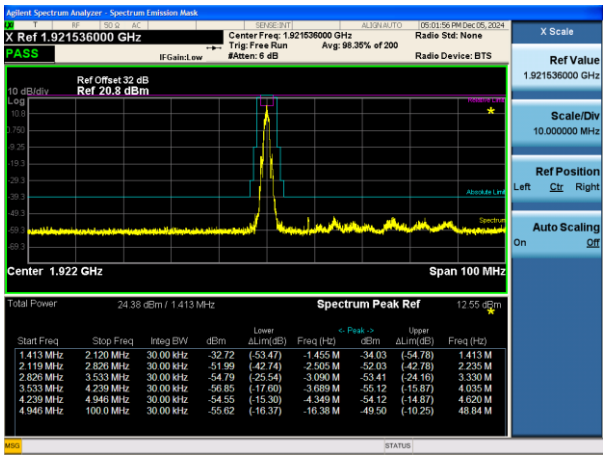
In Band Emission - Low Channel



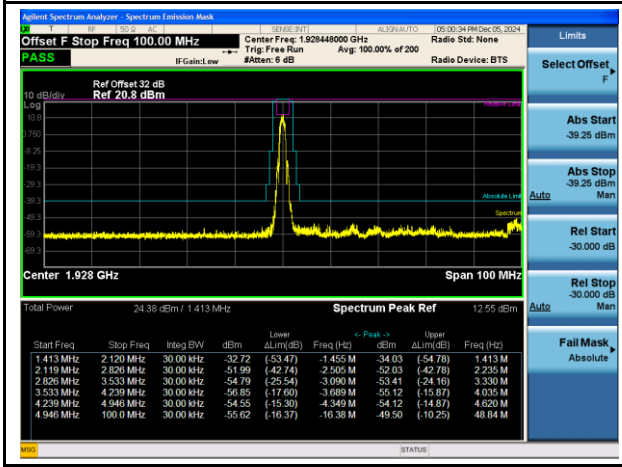
In Band Emission - Mid Channel



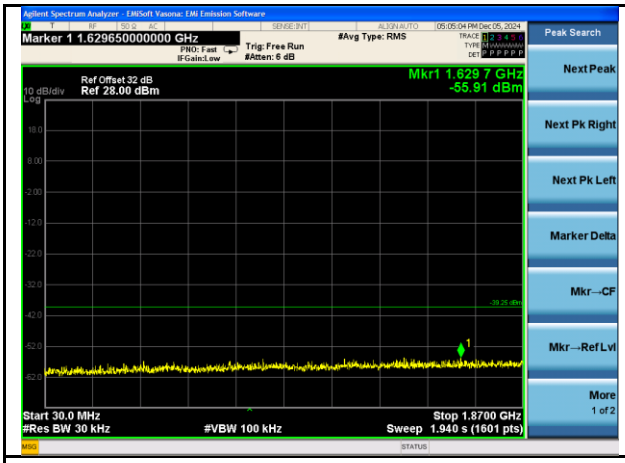
In Band Emission - High Channel



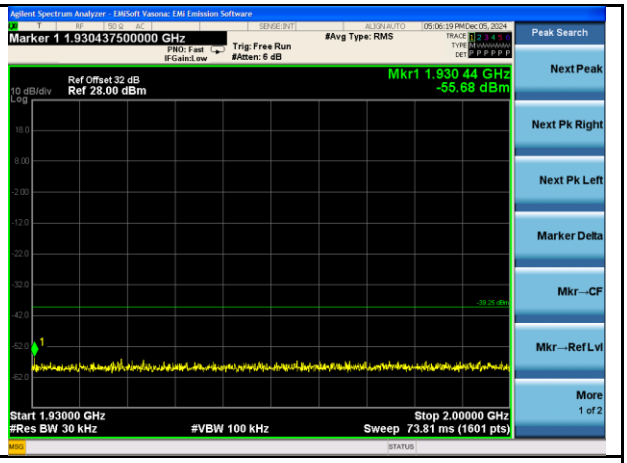
Out of Band Edge – Low Channel



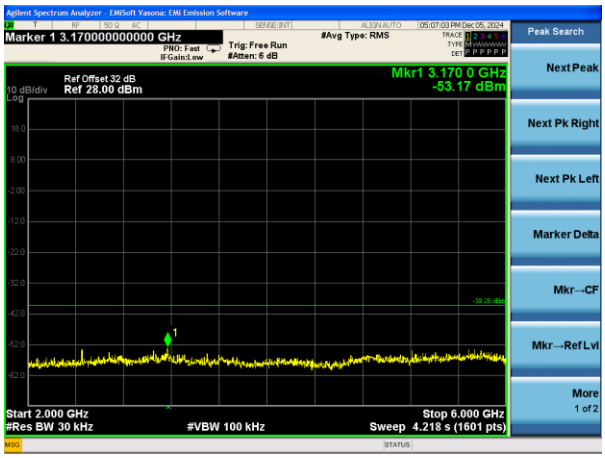
Out of Band Edge – High Channel



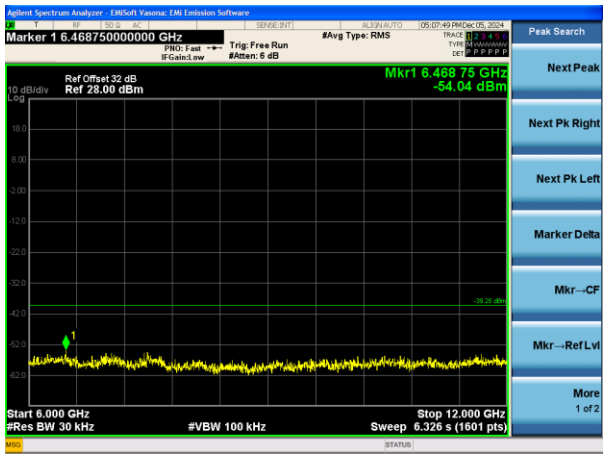
Out of Band Emission – Low Channel -1



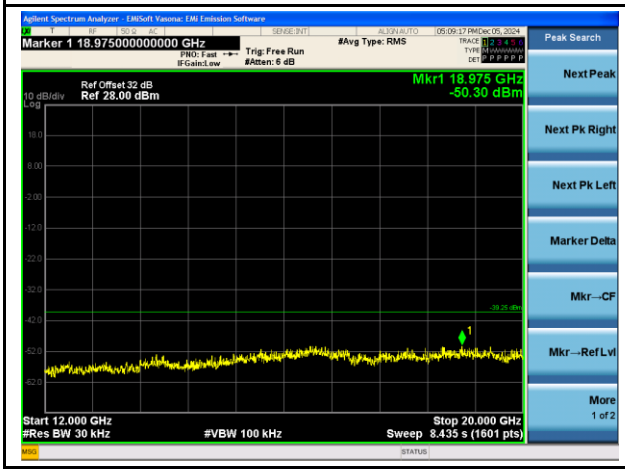
Out of Band Emission – Low Channel -2



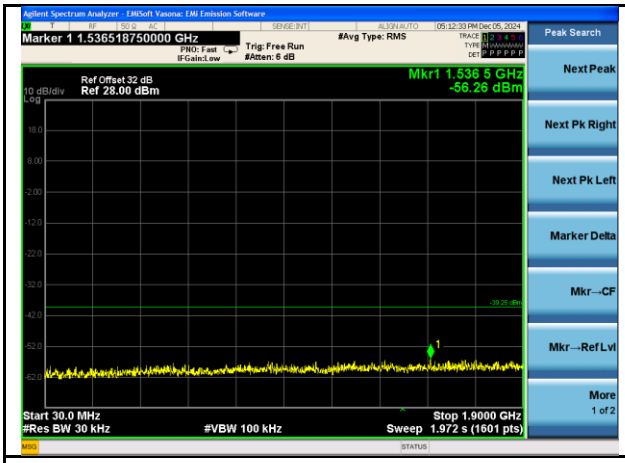
Out of Band Emission – Low Channel -3



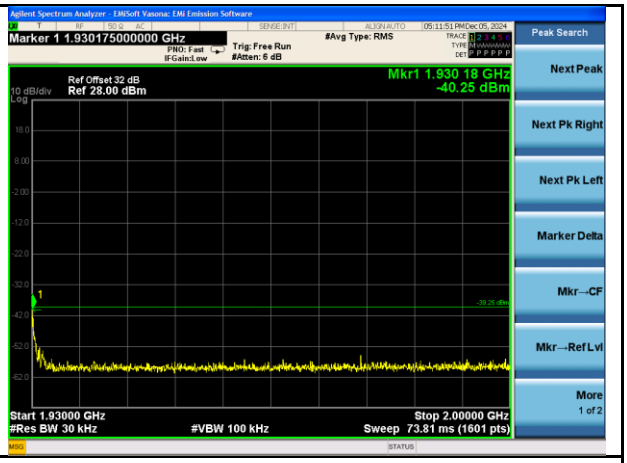
Out of Band Emission – Low Channel -4



Out of Band Emission – Low Channel -5

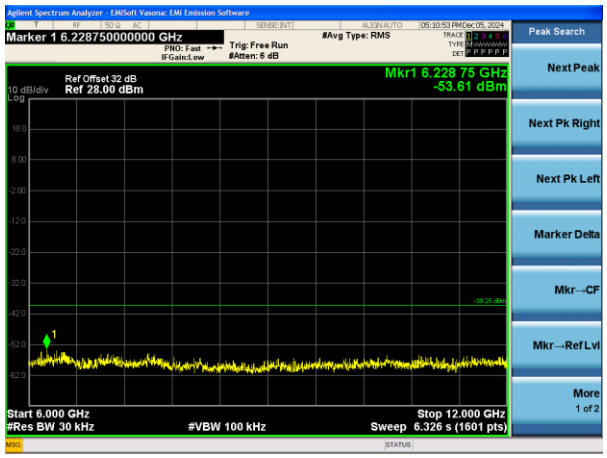


Out of Band Emission – High Channel -1



Out of Band Emission – High Channel -2

Out of Band Emission – High Channel -3



Out of Band Emission – High Channel -4

Out of Band Emission – High Channel -5

7.8 Radiated Spurious Emissions

7.8.1 Requirement

§ 15.323 (d)(1), RSS-213 §5.8.1

Out of Band Emissions: Emissions shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the band edge and 1.25 MHz above or below the band; 50 dB between 1.25 and 2.5 MHz above or below the band; and 60 dB at 2.5 MHz or greater above or below the band.

§ 15.323 (d)(2), RSS-213 §5.8.2

In-Band Emissions: Emissions inside the band must comply with the following emission mask: In the bands between 1B and 2B measured from the center of the emission bandwidth, the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth, the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the band edge, the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator. "B" is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

§ 15.209(a) RSS-Gen §8.9

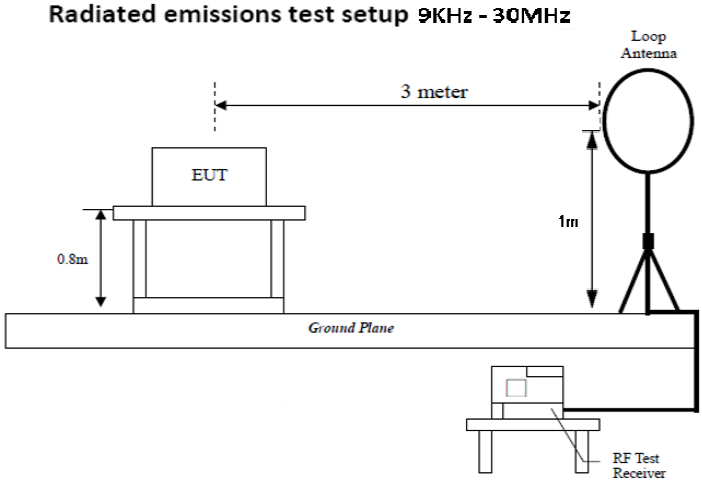
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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)).

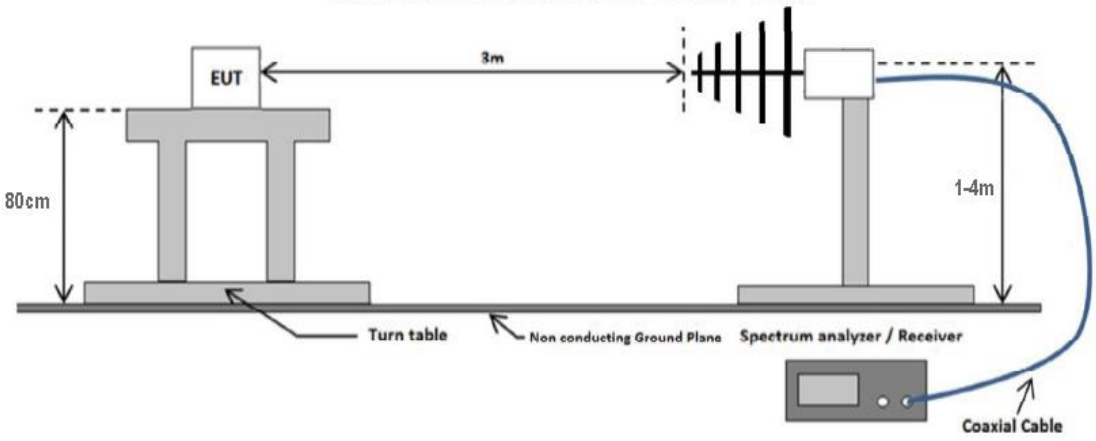
Frequency Range (MHZ)	Field Strength (μV/m)
0.009~0.490	2400/F(KHz)
0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

7.8.2 Test Setup

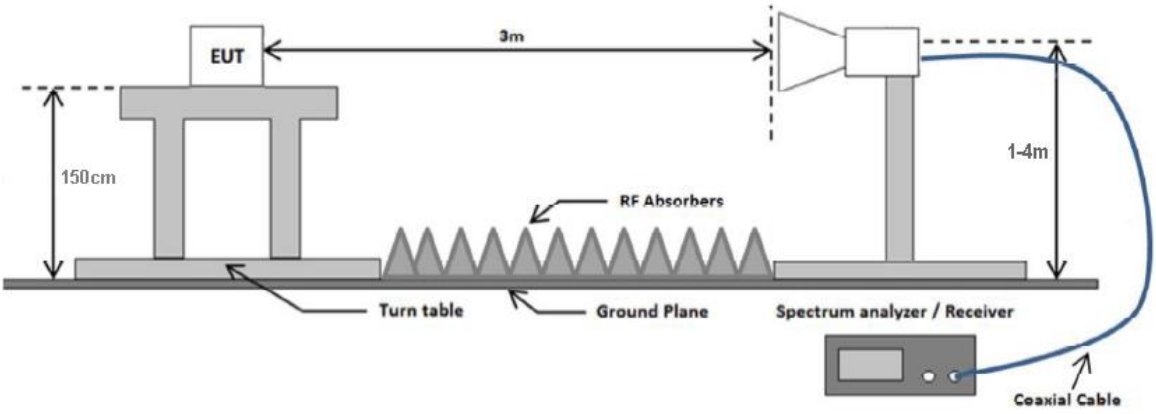
Radiated emissions test setup 9KHz - 30MHz



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



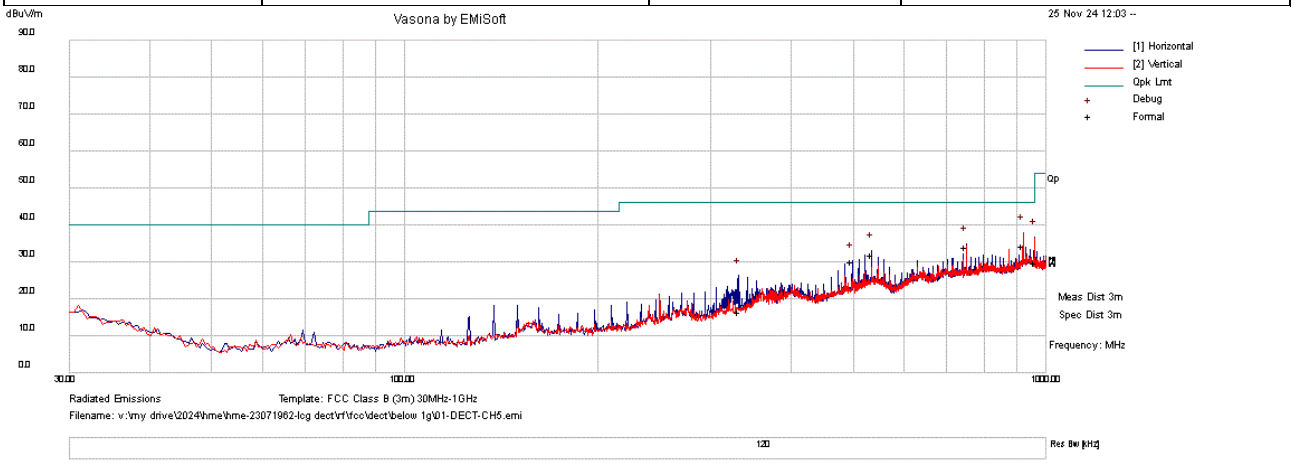
7.8.3 Test Procedure

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.

7.8.4 Test Result

RADIATED EMISSIONS BELOW 1 GHZ

Test Standard:	15.209, 15.247, RSS-247	Mode:	TX Mode
Frequency Range:	30 MHz - 1 GHz	Test Date:	11/25/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Mid ch	Test Result:	Pass



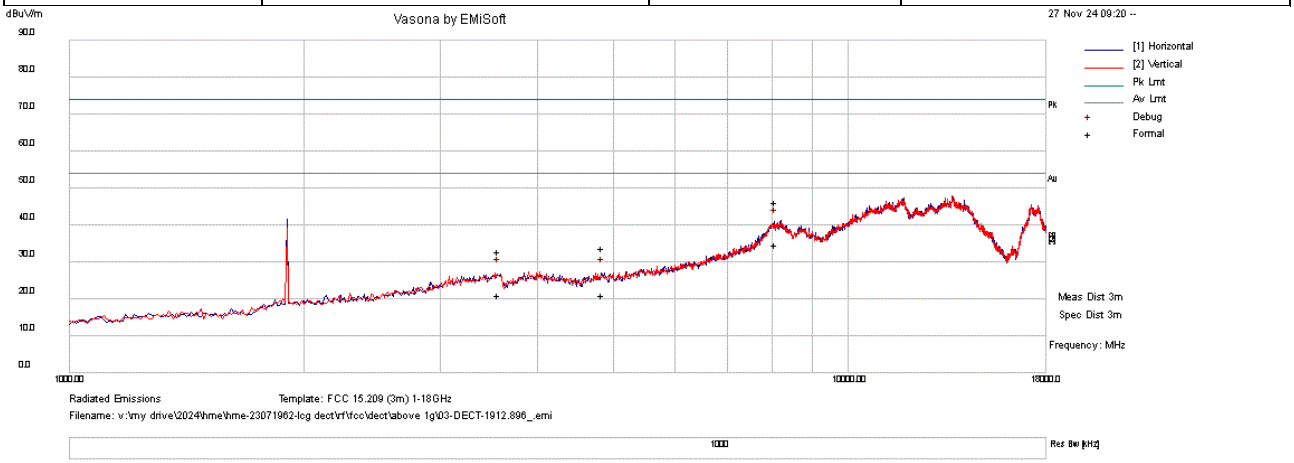
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	920.0	21.3	4.6	8.6	34.5	Quasi Max	V	243	24	46	-11.5	Pass
2	750.1	24.2	4.1	5.8	34.1	Quasi Max	H	108	59	46	-11.9	Pass
3	534.0	25.7	3.4	2.9	32	Quasi Max	H	165	236	46	-14	Pass
4	498.0	27.0	3.3	-0.3	30	Quasi Max	H	171	75	46	-16	Pass
5	960.0	16.8	4.7	8.4	29.9	Quasi Max	H	164	329	46	-16.1	Pass
6	331.8	19.7	2.7	-6.0	16.4	Quasi Max	V	249	293	46	-29.6	Pass

Remarks:

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

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	15.209, RSS-Gen	Mode:	Cont-TX
Frequency Range:	1 GHz – 18GHz	Test Date:	11/27/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Low Channel	Test Result:	Pass

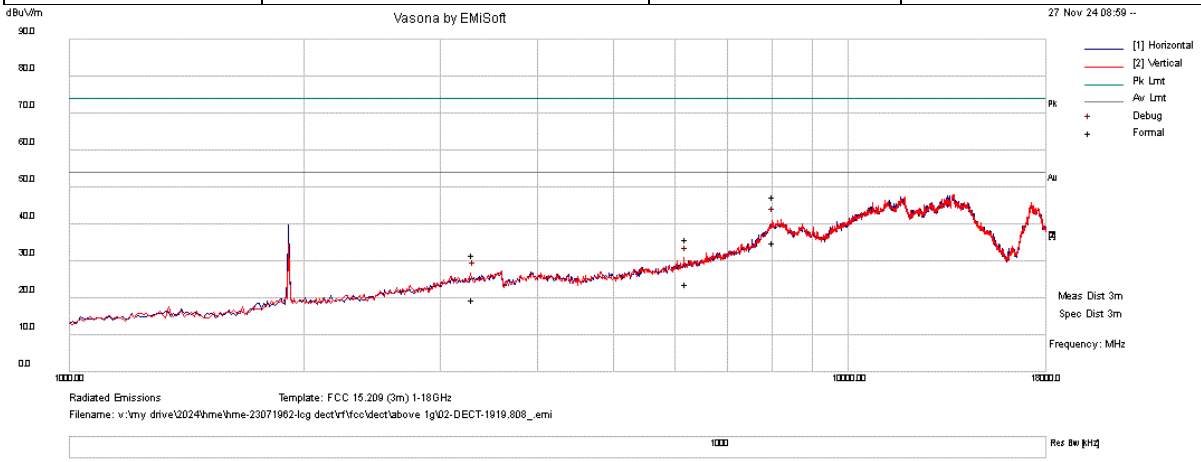


No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8082.357	16.30	14.20	15.80	46.30	Peak Max	H	161	15	74	-27.70	Pass
2	3558.725	20.10	8.40	4.40	32.90	Peak Max	H	165	17	74	-41.10	Pass
3	4839.073	18.70	9.20	6.00	33.90	Peak Max	H	131	152	74	-40.10	Pass
4	8082.357	4.50	14.20	15.80	34.50	Average Max	H	161	15	54	-19.50	Pass
5	3558.725	8.20	8.40	4.40	21.00	Average Max	H	165	17	54	-33.00	Pass
6	4839.073	5.80	9.20	6.00	21.00	Average Max	H	131	152	54	-33.00	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Frequency at around 1920MHz is fundamental.

Test Standard:	15.209, 15.247, RSS-247	Mode:	Cont-TX
Frequency Range:	1 GHz – 18GHz	Test Date:	11/27/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	Mid Channel	Test Result:	Pass

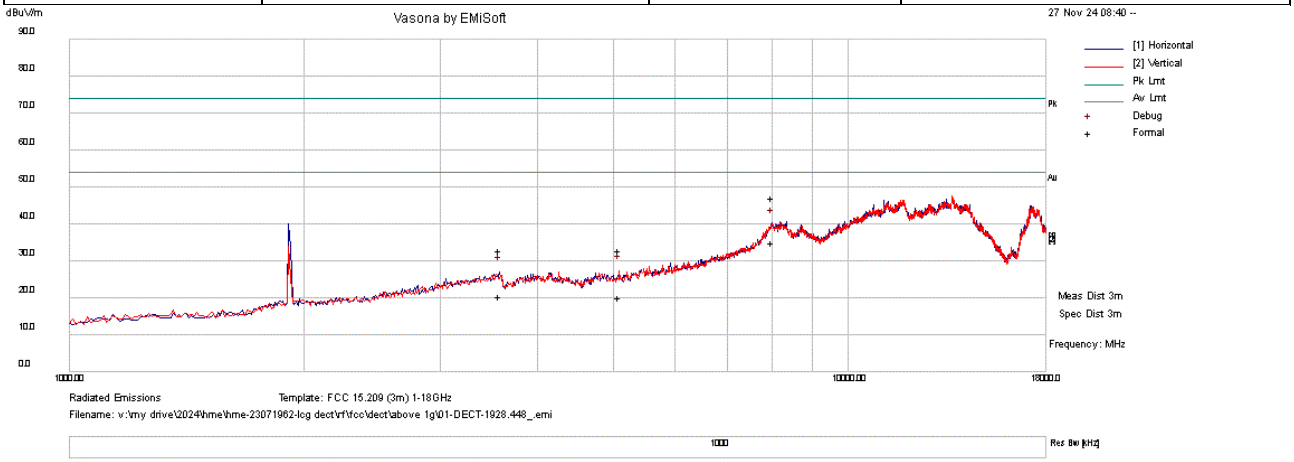


No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8023.793	17.40	14.30	15.80	47.50	Peak Max	H	129	0	74	-26.50	Pass
2	6202.644	17.10	11.80	6.80	35.70	Peak Max	V	145	76	74	-38.30	Pass
3	3307.317	20.10	8.00	3.50	31.60	Peak Max	V	126	8	74	-42.40	Pass
4	8023.793	4.90	14.30	15.80	35.00	Average Max	H	129	0	54	-19.00	Pass
5	6202.644	5.20	11.80	6.80	23.80	Average Max	V	145	76	54	-30.20	Pass
6	3307.317	8.00	8.00	3.50	19.50	Average Max	V	126	8	54	-34.50	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Frequency at around 1920MHz is fundamental.

Test Standard:	15.209, 15.247, RSS-247	Mode:	Cont-TX
Frequency Range:	1 GHz – 18GHz	Test Date:	11/26/2024
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Lining
Remark:	BLE Ch39	Test Result:	Pass



No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8002.486	17.00	14.30	15.90	47.20	Peak Max	H	396	0	74	-26.80	Pass
2	5089.878	17.20	9.70	5.80	32.70	Peak Max	V	194	60	74	-41.30	Pass
3	3574.252	19.90	8.40	4.50	32.80	Peak Max	H	138	0	74	-41.20	Pass
4	8002.486	4.80	14.30	15.90	35.00	Average Max	H	396	0	54	-19.00	Pass
5	5089.878	4.70	9.70	5.80	20.20	Average Max	V	194	60	54	-33.80	Pass
6	3574.252	7.70	8.40	4.50	20.60	Average Max	H	138	0	54	-33.40	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Frequency at around 1920MHz is fundamental.

Radiated Emission between 9KHz – 30MHz test result

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

Radiated Emission between 18GHz – 26GHz test result

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

7.9 Conducted Emissions

7.9.1 Requirement

§ 15.315, RSS-213 §5.4

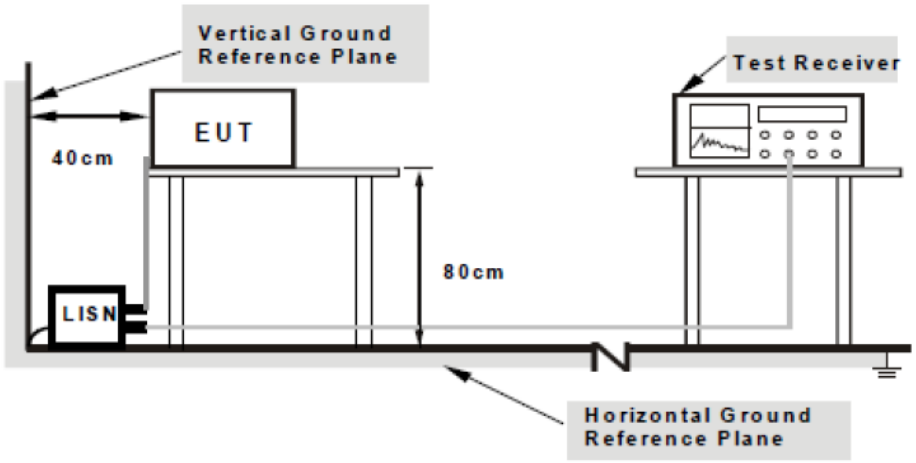
An unlicensed PCS device that is designed to be connected to the public utility (AC) power line must meet the limits specified in § 15.207 and RSS-Gen.

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.			

7.9.2 Test setup



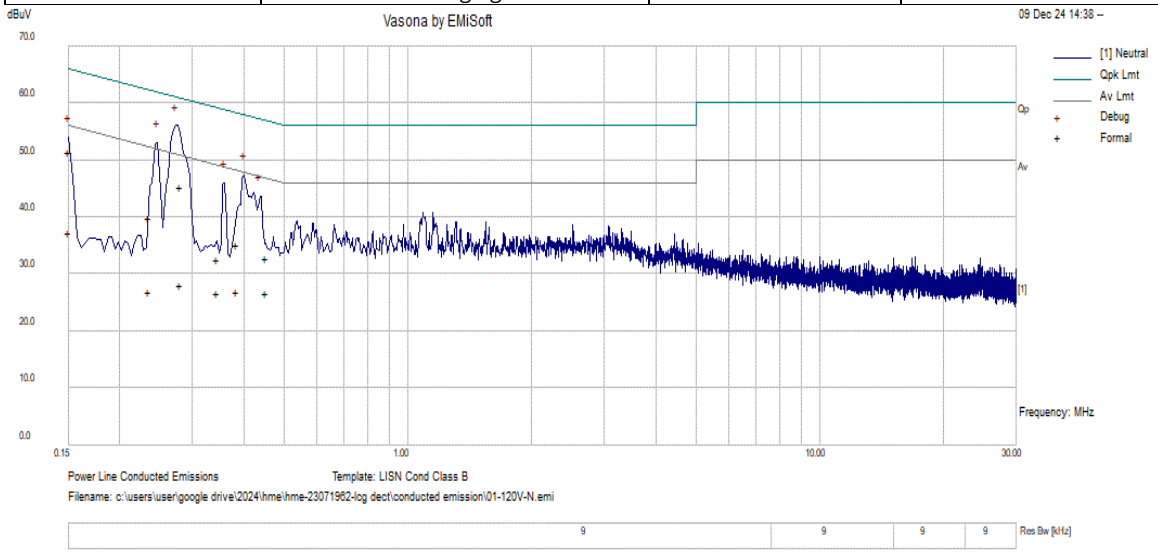
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

7.9.3 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.

7.9.4 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

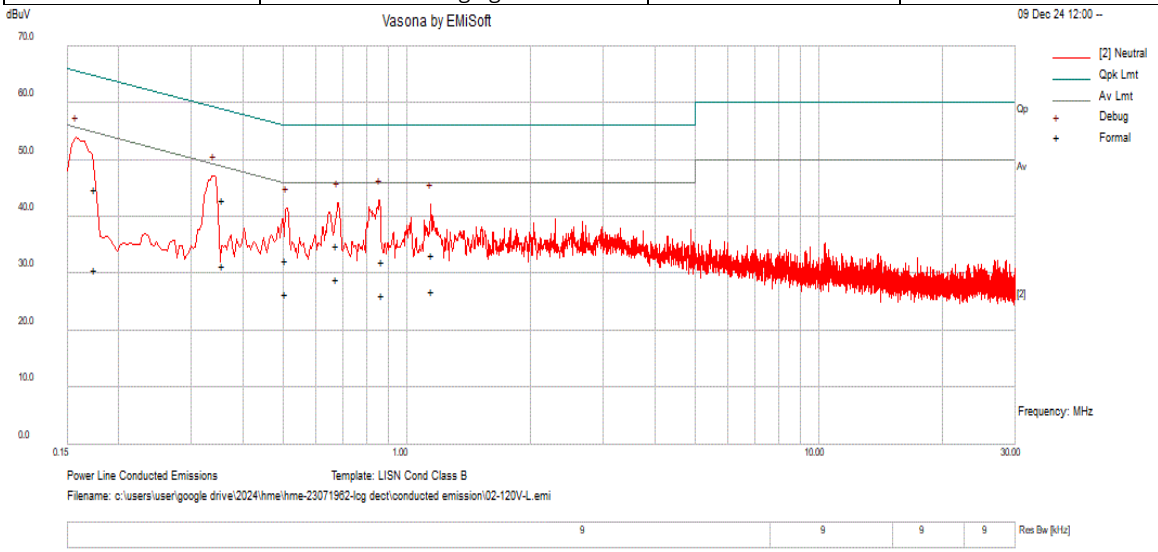


No.	Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass/Fail
1	0.28	35.23	10.04	0.14	45.41	Quasi Peak	Neutral	60.80	-15.39	Pass
2	0.24	29.78	10.04	0.16	39.98	Quasi Peak	Neutral	62.24	-22.26	Pass
3	0.38	24.96	10.04	0.12	35.12	Quasi Peak	Neutral	58.20	-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.

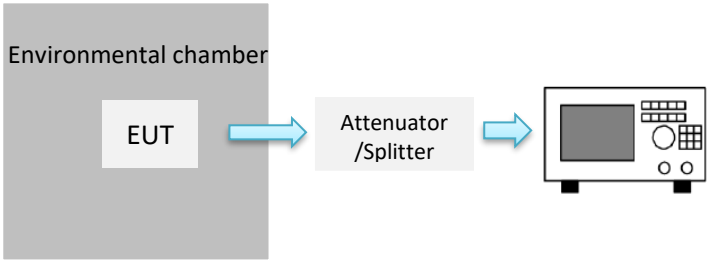
7.10 Frequency Stability and time stability

7.10.1 Requirement

Per §15.323 (f)

The frequency stability of the carrier frequency of the intentional radiator shall be maintained within ±10ppm over 1hour or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of -20º to +50º C at normal supply voltage and over a variation in the primary supply voltage of 85% to 115% of the rated supply voltage at a temperature of 20 ºC. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage.

7.10.2 Test Setup



7.10.3 Test Procedure

According to section 6.2 of ANSI C63.17-2013

- The EUT was set up in the thermal chamber and connected with the communication tester.
- With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
- With power OFF, the temperature was raised in 10°C steps up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
- The frequency error was monitored and measured under variation of ambient temperature and variation of primary supply voltage.
- For battery operated devices, the testing is performed with a new battery; the variation of supply voltage testsing is not required.

7.10.4 Test Result

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within ±10ppm of the operating frequency over a temperature variation of -20ºC to +50ºC at normal supply voltage.

Reference Frequency: 1924.992MHz at 20°C at 3.6 VDC

Frequency Stability over Temperature						
Temperature	Test Mode	Frequency (MHz)	Measured Freq.(MHz)	Freq. Drift (ppm)	Limit (ppm)	Result
50	DECT	1924.992	1924.98295	-4.70	±10	Pass
40	DECT	1924.992	1924.98612	-3.05	±10	Pass
30	DECT	1924.992	1924.99325	0.65	±10	Pass
20	DECT	1924.992	Reference			
10	DECT	1924.992	1924.99503	1.57	±10	Pass
0	DECT	1924.992	1924.99711	2.65	±10	Pass
-10	DECT	1924.992	1924.99717	2.69	±10	Pass
-20	DECT	1924.992	1925.00103	4.69	±10	Pass

Frequency Stability versus Time:

Average Mean Carrier Frequency (MHz)	Max Frequency Difference(KHz)	Min Frequency Difference(KHz)	Max Deviation (ppm)	Limit (ppm)
1924.992	1.25	-1.20	0.65	±10

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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