

EMC TEST REPORT



Standard(s):

**47 CFR FCC Part 15.247
RSS 247, Issue 4, 2025**

**FCC ID: DGF-90670
IC: 458A-90670**

Product: 3M™ WorkTunes™ In-Ear Electronic Hearing Protector (BR/EDR)

Model(s): 90670

**Company Name:
3M Company**

3M Division: Consumer Safety & Well-Being

**Address:
3M Center, Building 251
St. Paul, MN 55144-1000, USA**

**Report Number: HRE202511500-1
Report Issue Date: January 29, 2026**

Report Prepared by:

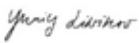
Signature: 
Yuriv Litvinov



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1.0 Test Summary

Based on the results of our investigation, we have concluded the product tested **comply** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

	Requirement – Test	Test Description	Result	Comments
4.1	FCC Part 15.247(a)(1)/ RSS-247(6.3.1(a)/RSS-Gen (6.7)	20dB Bandwidth	pass	
4.2	FCC Part 15.247(b)(1)/ RSS-247(6.3.2)	Maximum Peak Conducted Output Power	pass	
4.3	FCC Part 15.247(a)(1)/ RSS-247(6.3.1)	Channel Separation	pass	
4.4	FCC Part 15.247(a)(1)/ RSS-247(6.2.3.1)	Number of Channels	pass	
4.5	FCC Part 15.247(a)(1)/ RSS-247(6.3.1)	Time of Occupancy	pass	
4.6	FCC Part 15.209 RSS-Gen, 8.9	Radiated Emissions in restricted band	pass	
4.7	FCC Part 15.247(d)/ RSS-247(5.5)	Radiated Emissions in non-restricted band	pass	
4.8	FCC Part 15.247(d)(1)/ RSS-247(6.6)	Band-edge Emissions Measurements	pass	
4.9	FCC Part 15.207/ RSS-Gen (8.8)	Conducted Emissions	pass	
4.10	FCC Part 15.247(i)/ RSS 102 Issue 6	RF Exposure Compliance	pass	

Note:	
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1.1 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements. The measurement uncertainty figures were calculated and correspond to a coverage factor of k=2, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Radiated emissions 30MHz to 1000MHz	4.9 dB
Radiated emissions 1GHz to 18GHz	4.6 dB
Conducted emissions 150KHz to 30MHz (AMN)	2.7 dB
Conducted emissions 150KHz to 30MHz (AAN)	1.92 dB
RF frequency	$\pm 3 \times 10^{-8}$
RF power, conducted	1.4 dB
RF Power Spectral Density	0.96 dB

1.2 Test Facility

Test Facility Accreditations:	ISO/IEC 17025:2017, NVLAP LAB CODE: 200033-0
	FCC OET Designation Number: US5320
	ISED CAB identifier: US0012
	Chinese Taipei - (NCC) CAB identifier: US0012



2.0 Equipment Description

2.1	Equipment Under Test				
Description:		In-Ear Protector with Bluetooth audio.			
Model(s):		90670			
Serial number:		N/A			
3M Division:		Consumer Safety & Well-Being			
Modifications and Special Measures:		none			
Frequency Range:		2402.0-2480.0 MHz			
Channel No.:		79			
Modulation Type:		GFSK, $\pi/4$ -DQPSK and 8DPSK			
FCC Classification:		Spread Spectrum Transmitter (DSS)			
Output Power EIRP:		5.5dBm (3.55mW)			
Antenna Type and Antenna Assembly Gain:		☐ External	☒ Integral PCB Antenna	☐ Dedicated	
		☒ 0dBi	☐ Declared by the Manufacturer	☒ Measured	
Test Deviations or Exclusions		☐ Yes	☒ No		
Rated Power:		Voltage:	☐ 120VAC	☐ 230VAC	☒ 5VDC
		Phase:	☐ 1ph	☐ 3ph	☒ Internal Battery
		Frequency:	☐ 50Hz	☐ 60Hz	
		Current:	N/A		
Test Dates:		01/12-01/16/2026			
Received Date:		01/08/2026			
Received Conditions:		☐ Poor	☒ Good		
		☒ Prototype	☐ Production		

3.0 EUT Configuration

3.1 System Configuration

No.	Product Type	Manufacturer	Model	Comments
1	Headset	3M	90760	EUT
2				

3.2 Input/Output Ports of EUT

No.	Description	Type	Comments
1			
2			

3.3 Cables

No.	Description	Type	Length	Shielding	Comments
1					
2					

3.4 Measurement Arrangements of EUT

	Intended Operational Arrangement(s)	Comments
☒	Table-top only	
☐	Floor-standing only	
☐	Floor-standing or table-top	
☒	Other	Body-worn

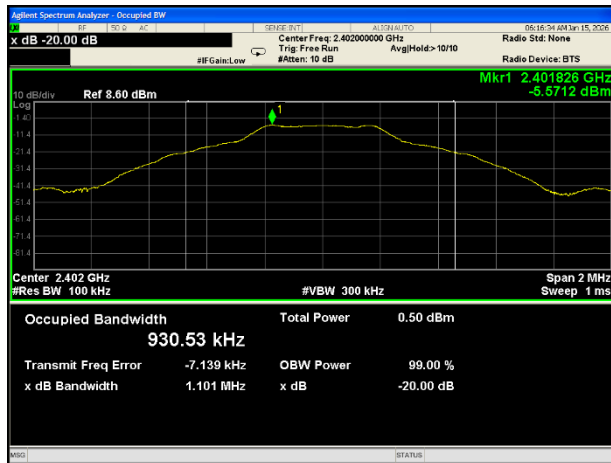
3.5 Exercising of EUT and Interfaces

No.	Mode of Operation
1	Worst Case Bluetooth protocol BR (DH5)-1mbps and EDR (3-DH5)-3mbps
2	Transmitting at lowest, middle and highest channels of operation using modulated carrier at each operation mode according to applicable Bluetooth test protocol.
3	Device programming using BT_Tool ver.1 software for continuous transmission of modulated carrier at maximum rated RF output power and Duty Cycle.

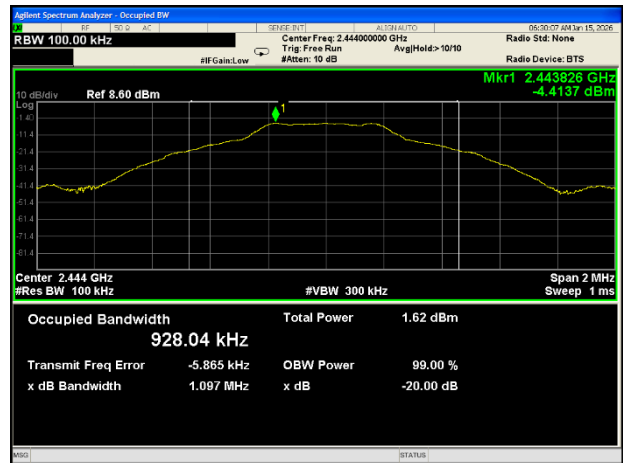
4.0 Test Conditions and Results

4.1	20dB Bandwidth		
		Laboratory Ambient Temperature:	23°C
		Relative Humidity:	48%
		Atmospheric Pressure:	1011 mbars
Reference Standard(s):	☒ ANSI C63.10:2020, Section 11.8.2 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2402.0-2480.0 MHz	RBW = 30KHz VBW ≥ 3 x RBW	
Nominal Voltage:	☐ 120VAC ☒ 5VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/14/2026

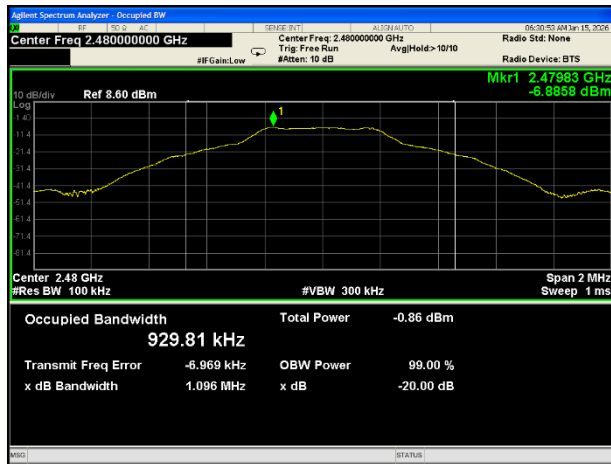
Frequency (MHz)	Data Rate	Modulations	RSS-Gen 99% Bandwidth (KHz)	FCC 15.247 20dB Bandwidth (KHz)	Results
2402	1 Mbps	GFSK	846.9	1101	pass
2441	1 Mbps	GFSK	850.7	1097	pass
2480	1 Mbps	GFSK	848.0	1005	pass
2402	3 Mbps	8DPSK	1170.4	1374	pass
2441	3 Mbps	8DPSK	1170.8	1369	pass
2480	3 Mbps	8DPSK	1171.8	1370	pass



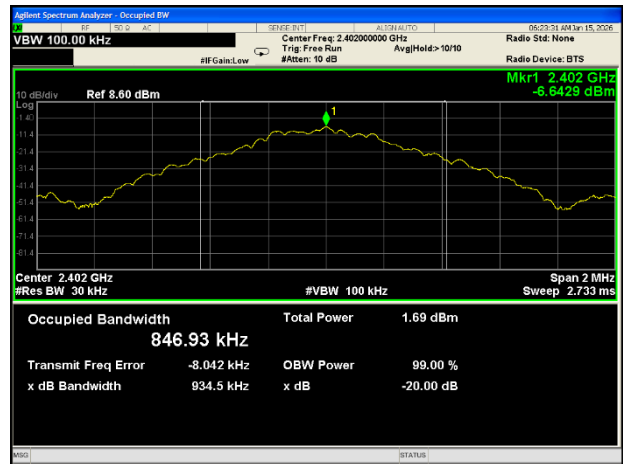
FCC OBW -Low Channel (1Mbps)



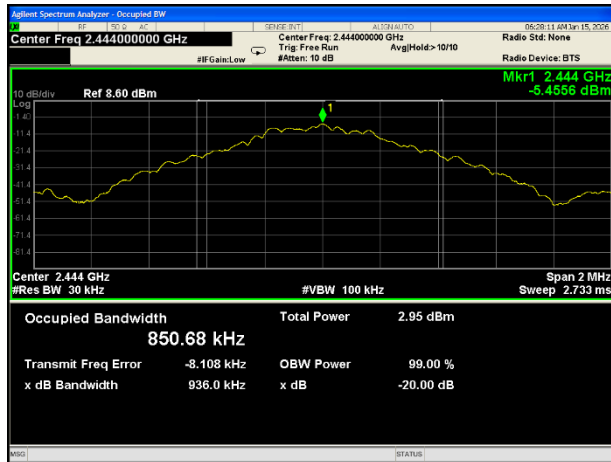
FCC OBW - Mid Channel (1Mbps)



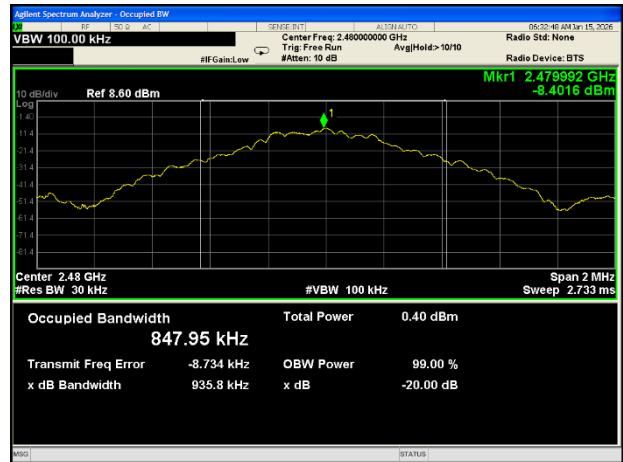
FCC OBW - High Channel (1Mbps)



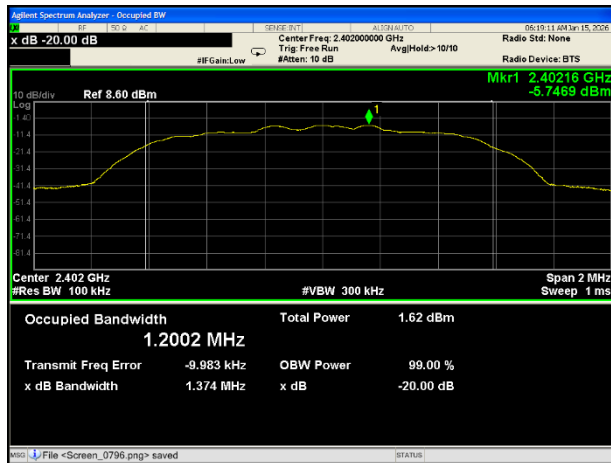
RSS Gen OBW -Low Channel (1Mbps)



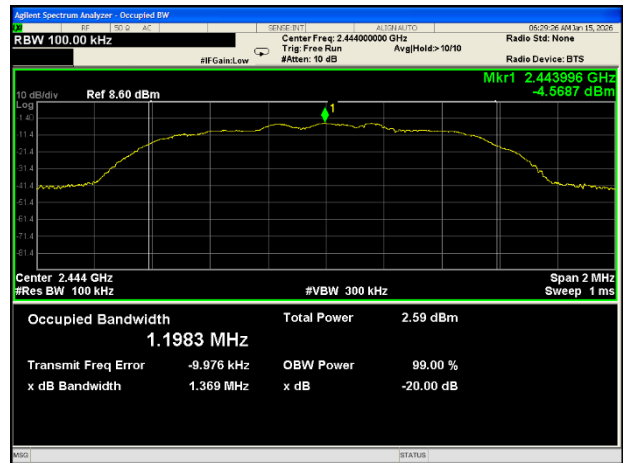
FCC OBW - Mid Channel (1Mbps)



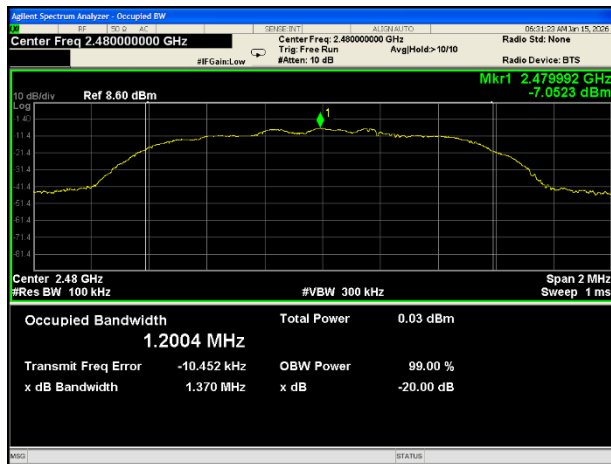
RSS Gen OBW - High Channel (1Mbps)



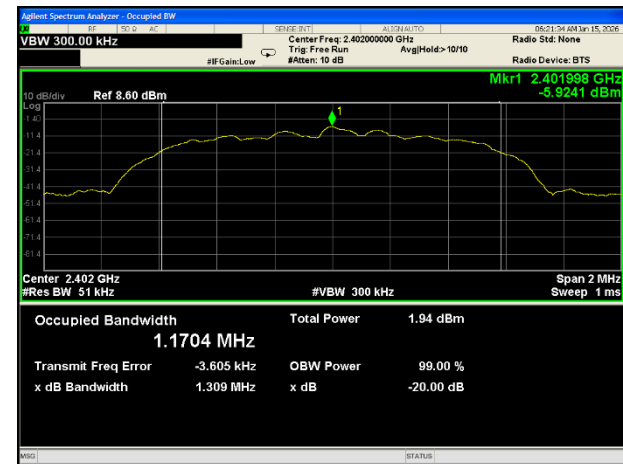
FCC OBW - Low Channel (3Mbps)



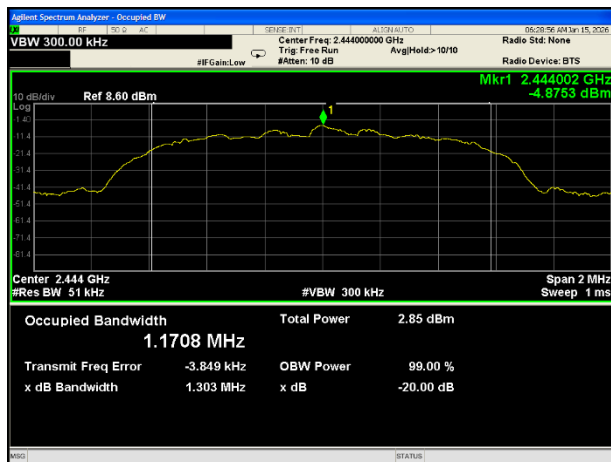
FCC OBW - Mid Channel (3Mbps)



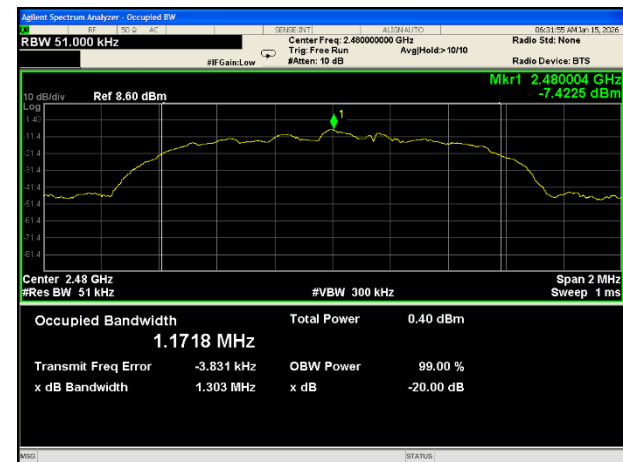
FCC OBW - High Channel (3Mbps)



RSS Gen OBW - Low Channel (3Mbps)



RSS Gen OBW - Mid Channel (3Mbps)

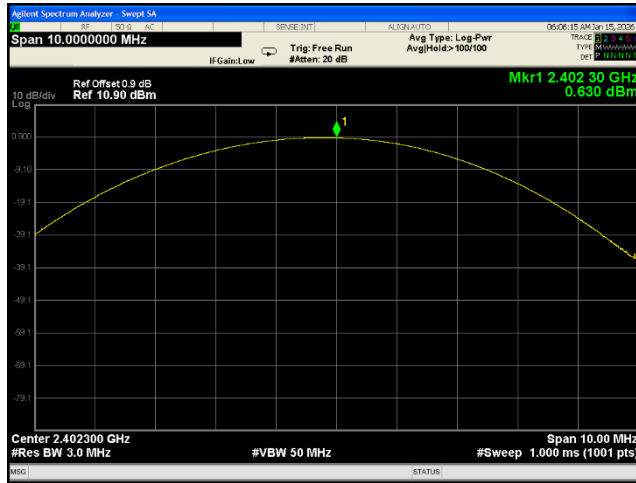


RSS Gen OBW - High Channel (3Mbps)

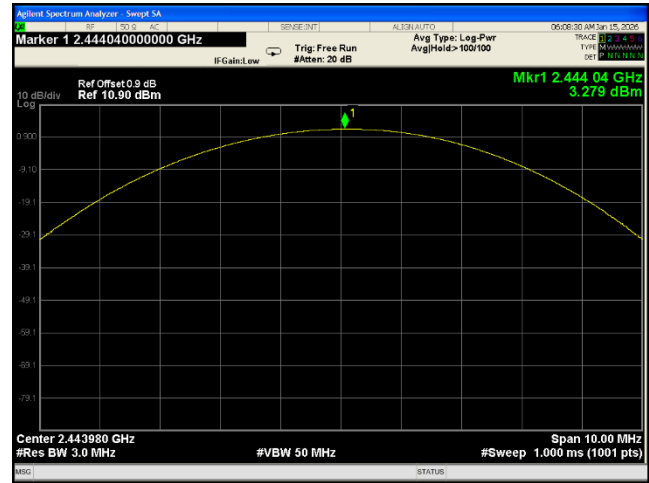
4.2	Maximum Output Power		
Method:	Measurements were performed with CW carrier at the highest power level at which the transmitter is intended to operate. The analyzer offset was adjusted to compensate for the attenuator and other losses.		
		Laboratory Ambient Temperature:	23°C
		Relative Humidity:	48%
		Atmospheric Pressure:	1011 mbars
Reference Standard(s):	☒ ANSI C63.10:2020, Section 11.9 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074		Measurement Point ☒ Conducted ☐ Radiated at 3 meters
Frequency Range:	☒ 2402.0 – 2480.0 MHz		
Antenna Gain:	0dBi		Maximum RF Conducted Power: 5.5dBm
Limit:	30 dBm		
Nominal Voltage:		☐ 120VAC ☒ 5VDC	
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/14/2026

Note:	EIRP (dBm) = Conducted Power (dBm) +Antenna Gain (dBi)= 5.4+0= 5.4dBm(3.55mW) All modes of operation and data were investigated. The results shown represent the worst case.
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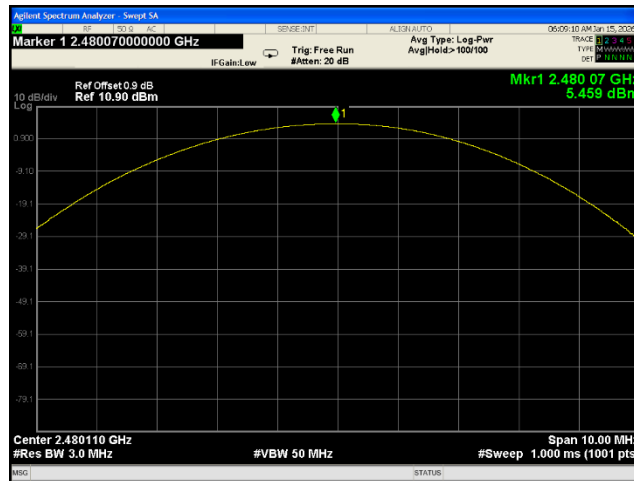
Frequency (MHz)	Data Rate	Modulations	PeakConducted Power (dBm)	Limit (dBm)	Results
2402	1 Mbps	GFSK	0.63	30	pass
2440	1 Mbps	GFSK	3.3	30	pass
2480	1 Mbps	GFSK	5.5	30	pass
2402	3 Mbps	8DPSK	0.69	30	pass
2440	3 Mbps	8DPSK	3.3	30	pass
2480	3 Mbps	8DPSK	5.4	30	pass



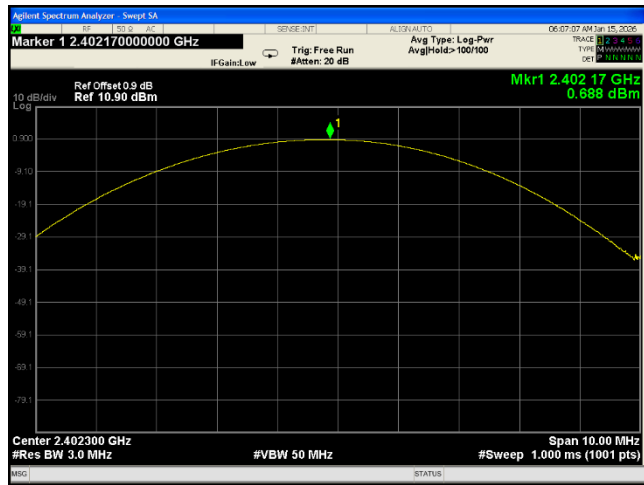
Low Channel (1Mbps)



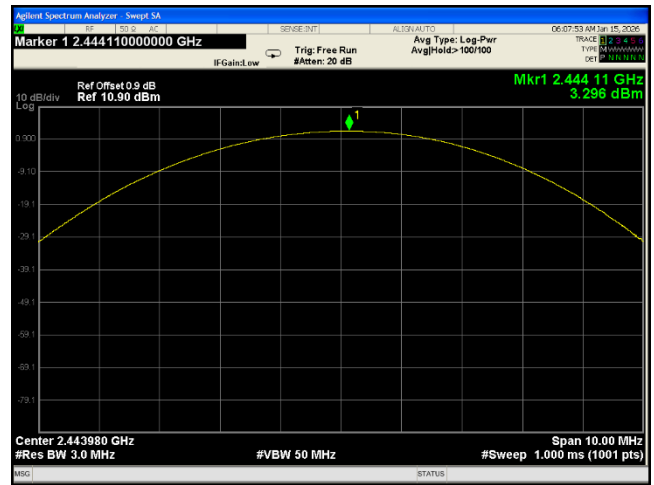
Power Mid Channel (1Mbps)



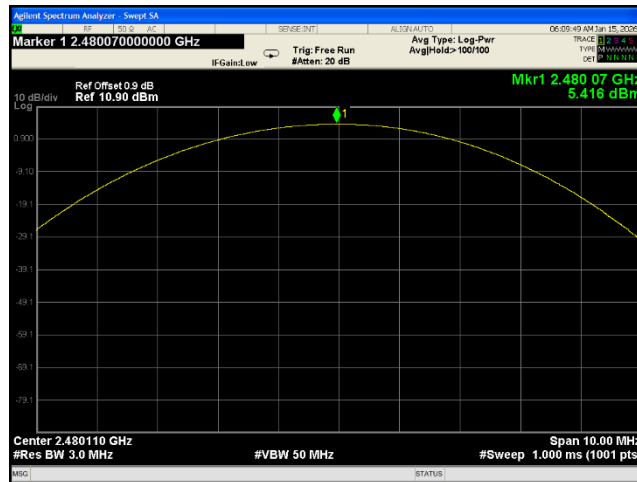
High Channel (1Mbps)



Low Channel (3Mbps)



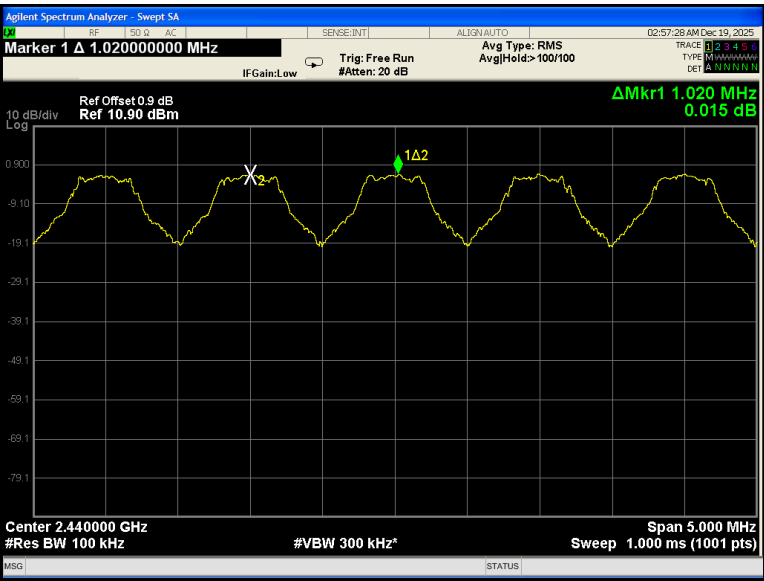
Mid Channel (3Mbps)



High Channel (3Mbps)

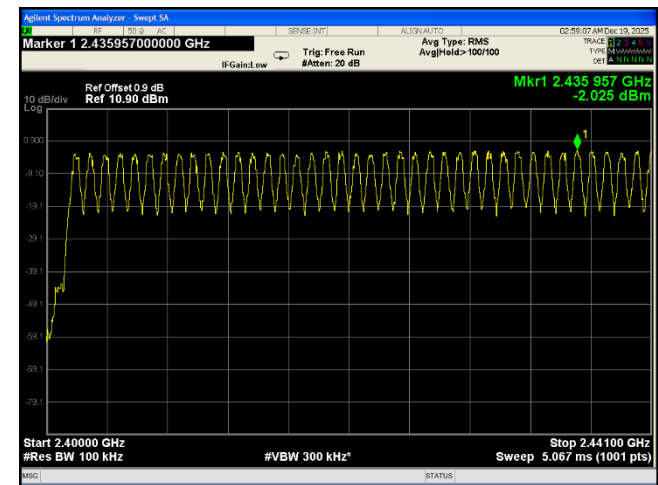
4.3	Carrier Frequency Separation		
Method:	The measurements were made with transmitter set to transmit a continuously with hopping function enabled.		
		Laboratory Ambient Temperature:	23°C
		Relative Humidity:	48%
		Atmospheric Pressure:	1011 mbars
Reference Standard(s):	☒ ANSI C63.10:2020, Section 7.8 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated ☐	
	Frequency Range:		
Antenna Gain:		☒ 0dBi	Result
Limit:		☐ >25KHz	1.020MHz
		☒ >2/3 the value of the 20dB Bandwidth	
		☐	
Nominal Voltage:		☐ 230VAC ☒ 5VDC	
Test Personnel:		Yuriy Litvinov <i>Yuriy Litvinov</i>	Date: 01/14/2026

Note:	The EUT complies with the minimum channel separation requirement when it is operating in 1x/EDR mode using 79 channels. All modes of operation and data were investigated. The results shown represent the worst case.
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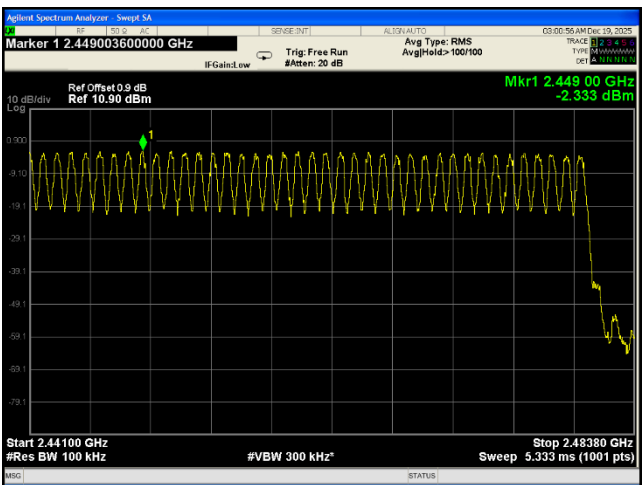


4.4	Number of Hopping Frequencies		
Method:	The measurements were made with transmitter set to transmit a continuously with hopping function enabled.		
		Laboratory Ambient Temperature:	23°C
		Relative Humidity:	48%
		Atmospheric Pressure:	1011 mbars
Reference Standard(s):	☒ ANSI C63.10:2020, Section 7.8 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2402.0 – 2480.0 MHz		
Antenna Gain:	0dBi		Result
Limit:	☒ >75 Hopping Channels		79
Nominal Voltage:		☐ 120VAC ☒ 5VDC	
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 06/20/2024

Note:	The frequency spectrum was broken up into two subranges to clearly show all the hopping frequencies.
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Low End Spectrum

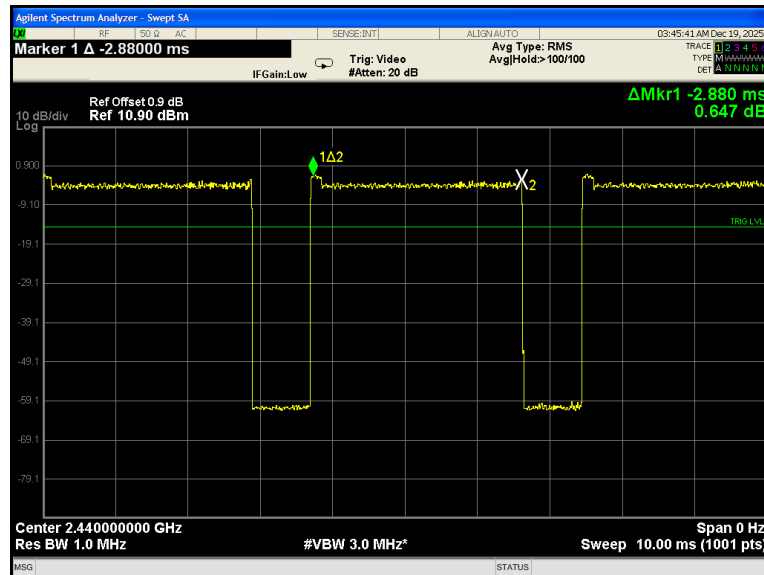


High End Spectrum



4.5	Time of Occupancy		
Method:	The measurements were made with transmitter set to transmit a continuously with hopping function enabled.		
	Laboratory Ambient Temperature:	23°C	
	Relative Humidity:	48%	
	Atmospheric Pressure:	1011 mbars	
Reference Standard(s):	☒ ANSI C63.10:2020, Section 7.8 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2402.0 – 2480.0 MHz		
Antenna Gain:	0dBi	Result	
Limit (dwell time):	☒ <0.4 sec within a period of 0.4 sec x N hopping channels	307ms/channel	
Nominal Voltage:	☐ 120VAC ☒ 5VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>	Date: 02/07/2024	

Note:	Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600hops/s. Since 1x/EDR use 5 transmit and 1 receive slot the actual hopping rate $1600/6=266.67$ hops/slot. 400ms x 79 channels=31.6 (Time of Occupancy). - Worst case BT has 266.67 hops/second 1x/(EDR modes DH5 operation). $266.67/79 = 3.38$ hops/second (#of hops/second on one channel). $3.38 \times 31.6=106.67$ (#hops over a 31.6 second period). 106.67×2.88 /channel=307ms (worst case dwell time for one channel in 1x/EDR)
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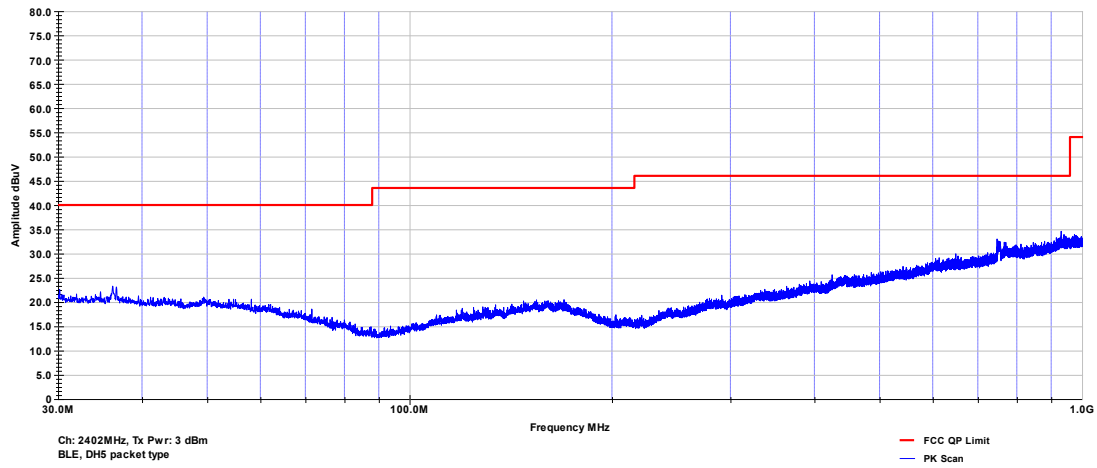
4.6	Radiated Emissions in restricted band				
Method:	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4 standards. EUT was rotated through three orthogonal axes to determine which attitude (orientation) and arrangement produces the highest emission relative to the limit; the attitude and device arrangement that produces the highest emission relative to the limit was used in making final radiated emission measurements. Spurious Radiated emissions measurements were performed with external preamp and a high pass filter. Final measurements were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.				
Test Verification: ☒	Laboratory Ambient Temperature:		23°C		
	Relative Humidity:		55%		
	Atmospheric Pressure:		1011 mbars		
Reference Standard(s):	☒ ANSI C63.10:2020, Section 11.12.1		Measurement Distance		
	☒ FCC Part 15.205/15.209/RSS Gen (8.9) ☒ KDB 558074		☒ 3 Meters ☐		
Frequency Range:	☒ 30 MHz to 1 GHz		RBW = 100KHz, VBW ≥ 3 x RBW		
	☒ 1 GHz to 25 GHz		RBW = 1MHz, VBW ≥ 3 x RBW		
Nominal Voltage:	☐ 120VAC ☒ 5VDC				
Test Personnel:	Jayden Alstad <i>JA</i>		Date: 01/15/2026		
Limits –15.209 and RSS Gen					
Frequency (MHz)	Limit dB (µV/m)				
	Quasi-Peak	Average	Peak	Distance	Results
0.009-0.490		2400/F(KHz)		300	N/A
0.490-1.705	24000/F(KHz)			30	N/A
1.705-30	30			30	N/A
30 to 88	40			3	pass
88 to 216	43.5			3	pass
216 to 960	46			3	pass
Above 960		54	74	3	pass

Modifications:	
Note:	The lower limit applies at the transition frequency. An inverse proportionality factor of 20 dB per decade has been used to normalize the measured data to the specified distance for determining compliance. All modes of operation and data were investigated. The results shown represent the worst case. No radiated spurious emissions were detected above 18GHz For emission in the restricted bands, the limit of 15.209 was used. There are no emissions were detected in the 15.205 restricted band within 30dB below 15.209 limit adjacent or nearby to 2400-2483.5MHz frequency band during operation at the high channel.



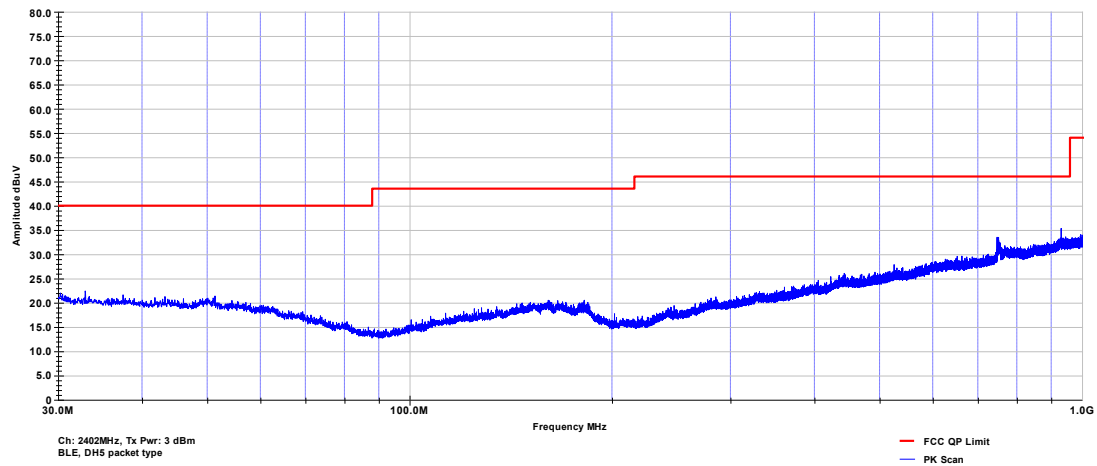
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)

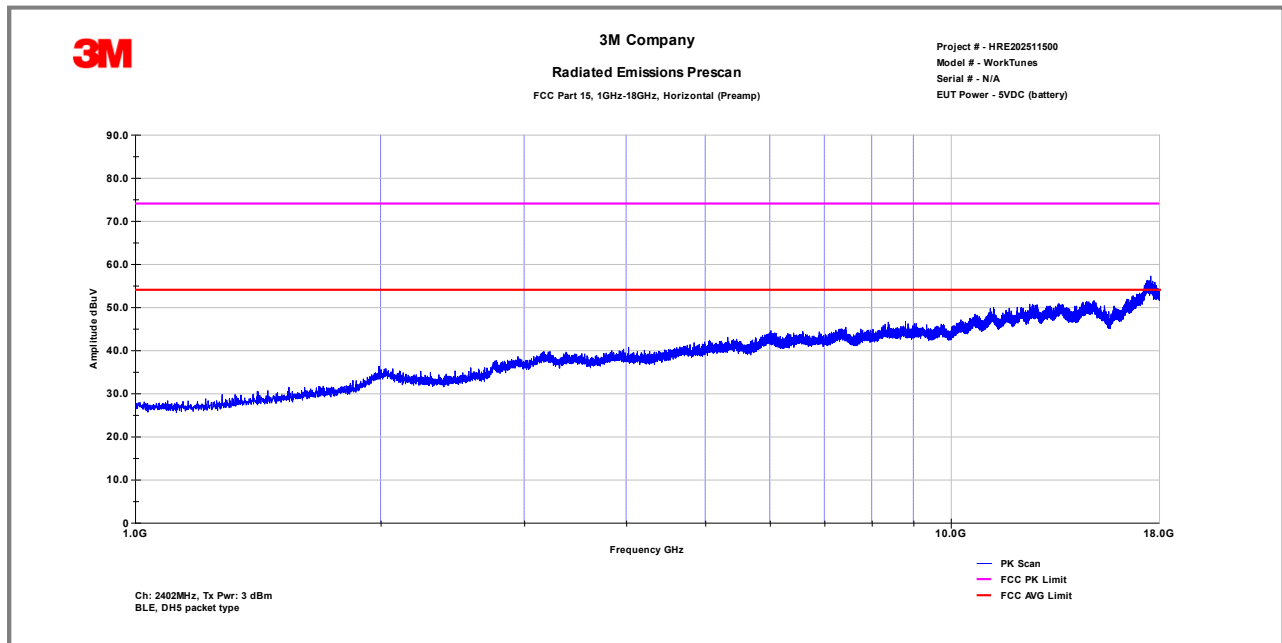
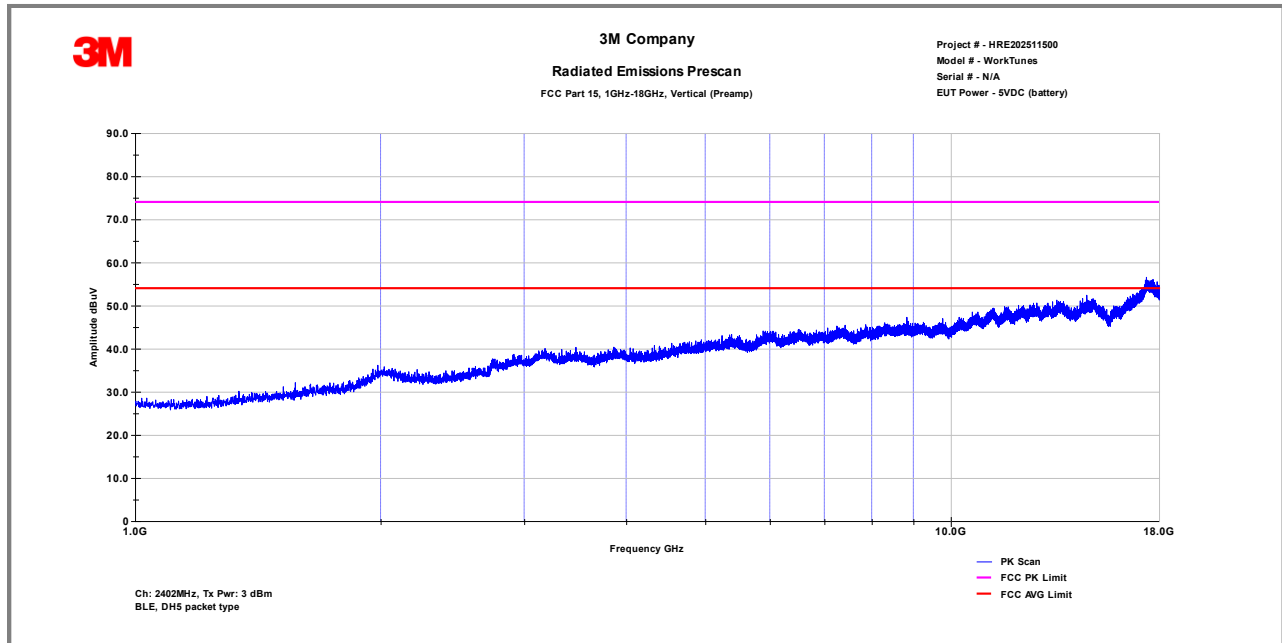


3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Horizontal

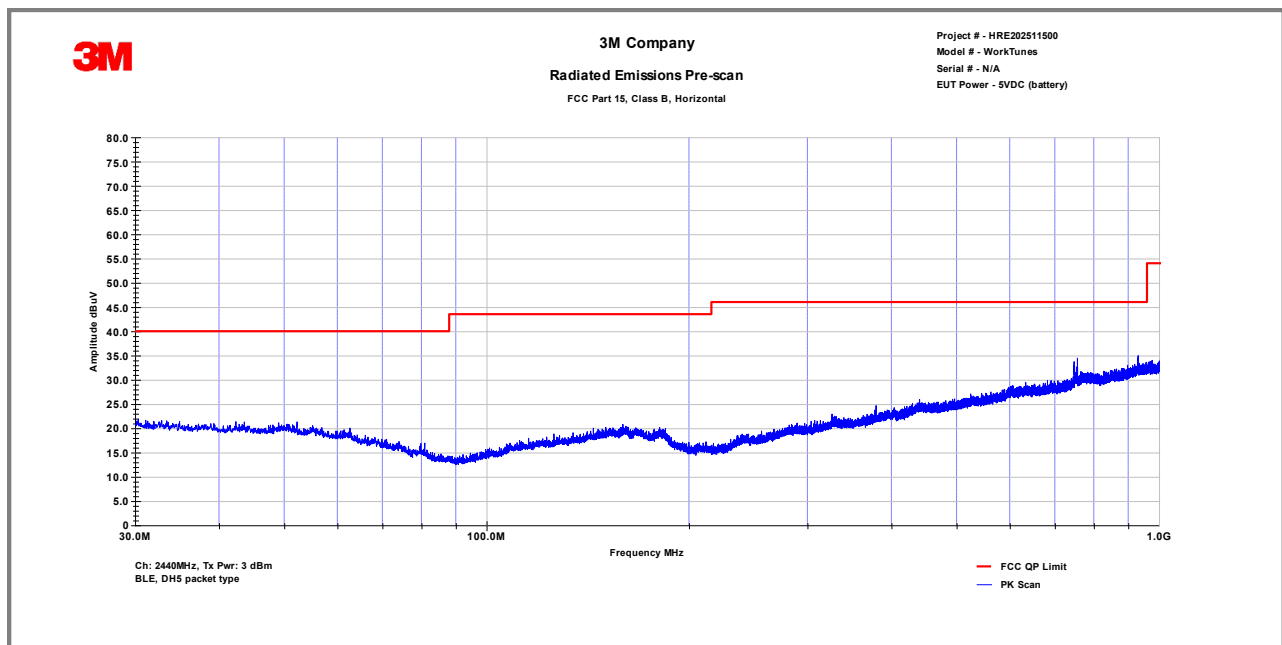
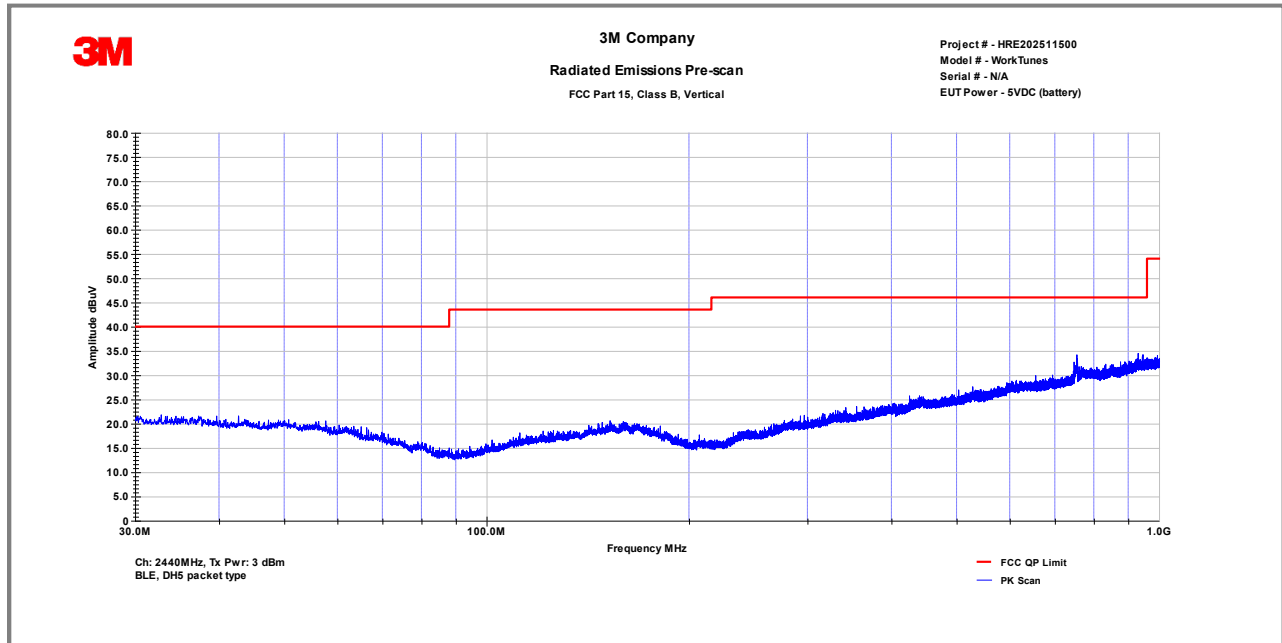
Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)



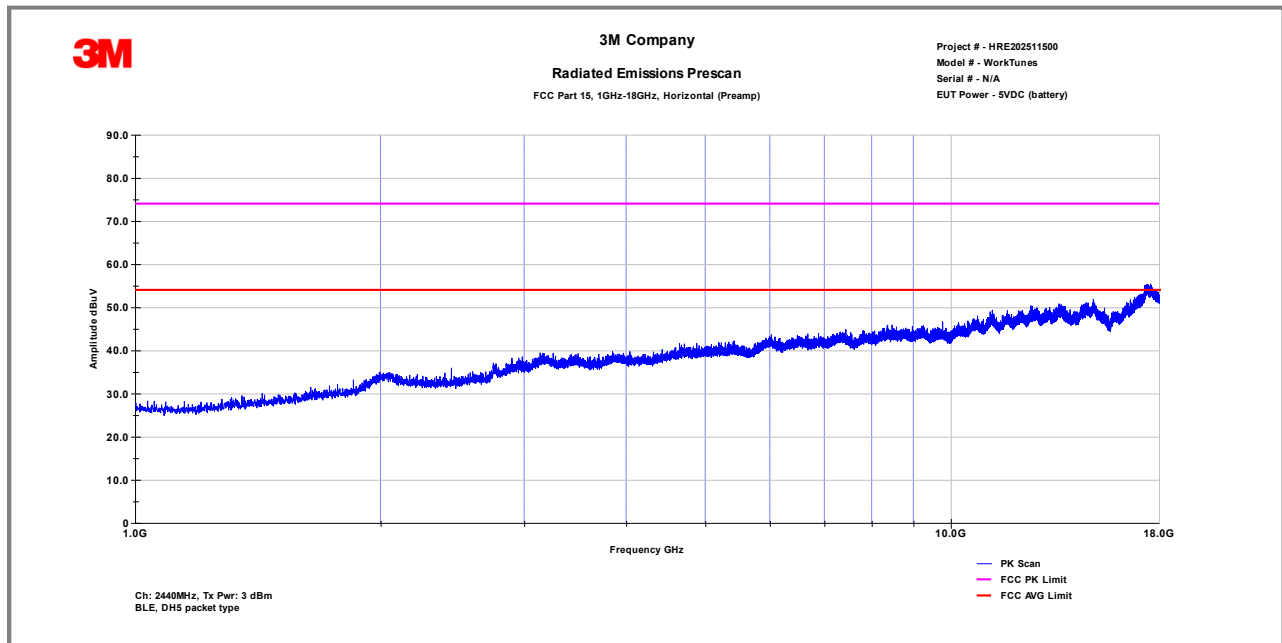
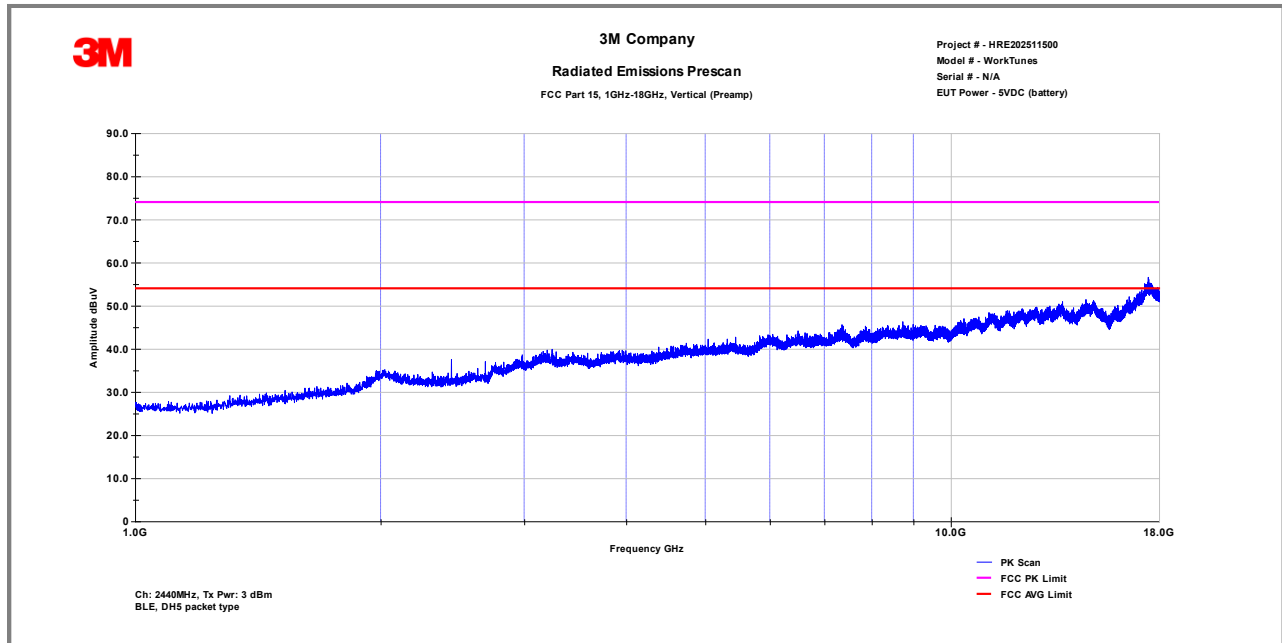
FCC Part 15.209 Radiated Emissions in restricted band – Low Channel (DH5)



FCC Part 15.209 Radiated Emissions in restricted band – Low Channel (DH5)



FCC Part 15.209 Radiated Emissions in restricted band – Mid Channel (DH5)

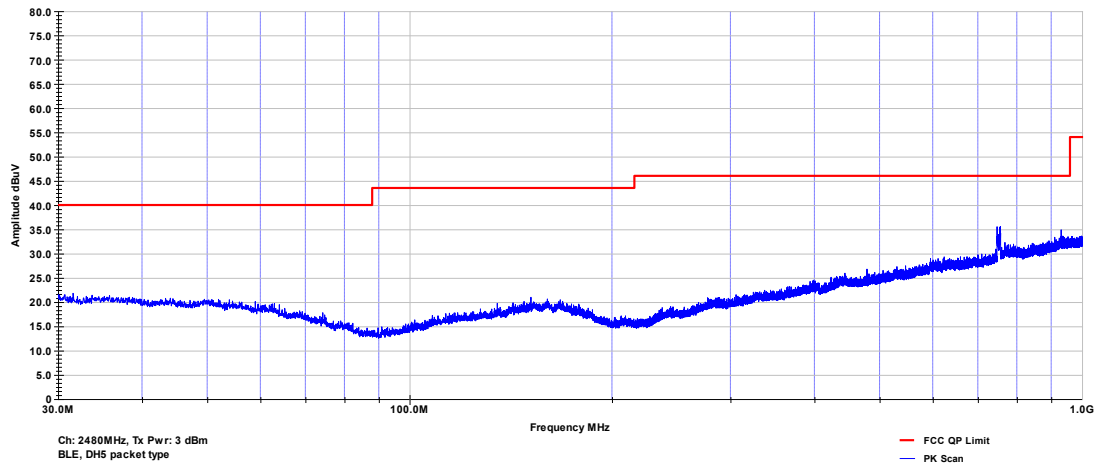


FCC Part 15.209 Radiated Emissions in restricted band – Mid Channel (DH5)



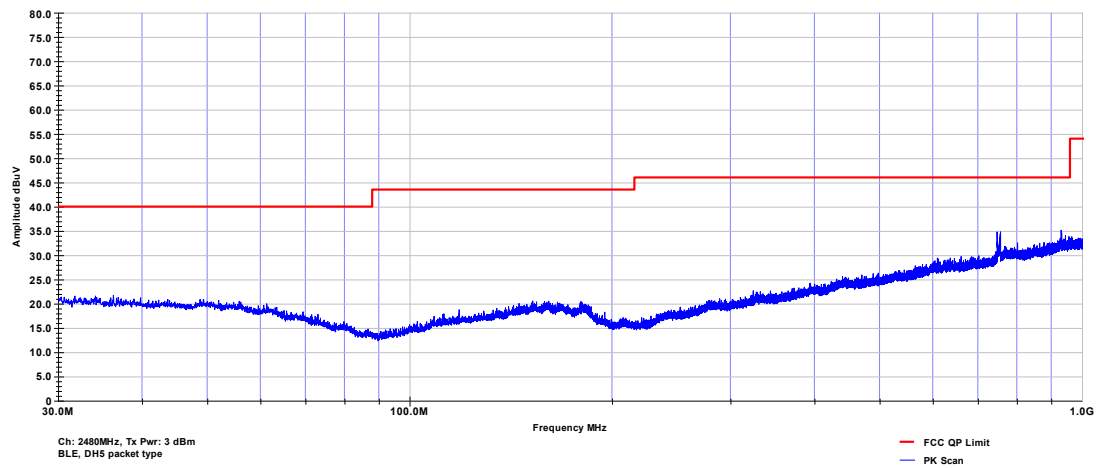
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

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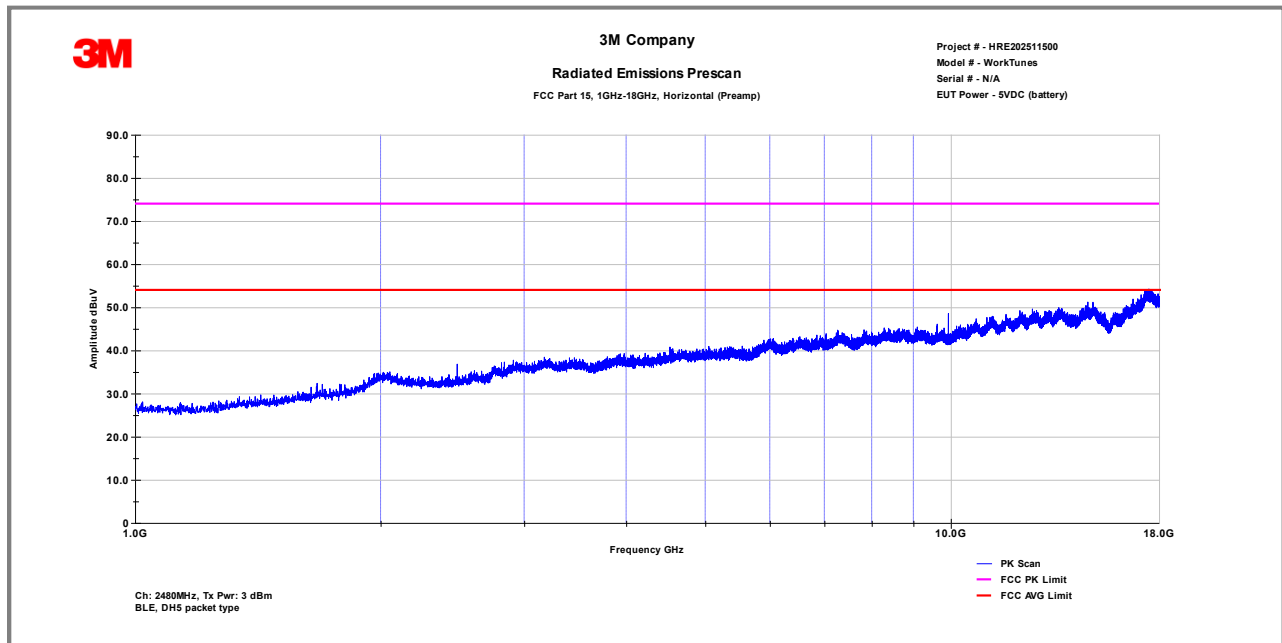
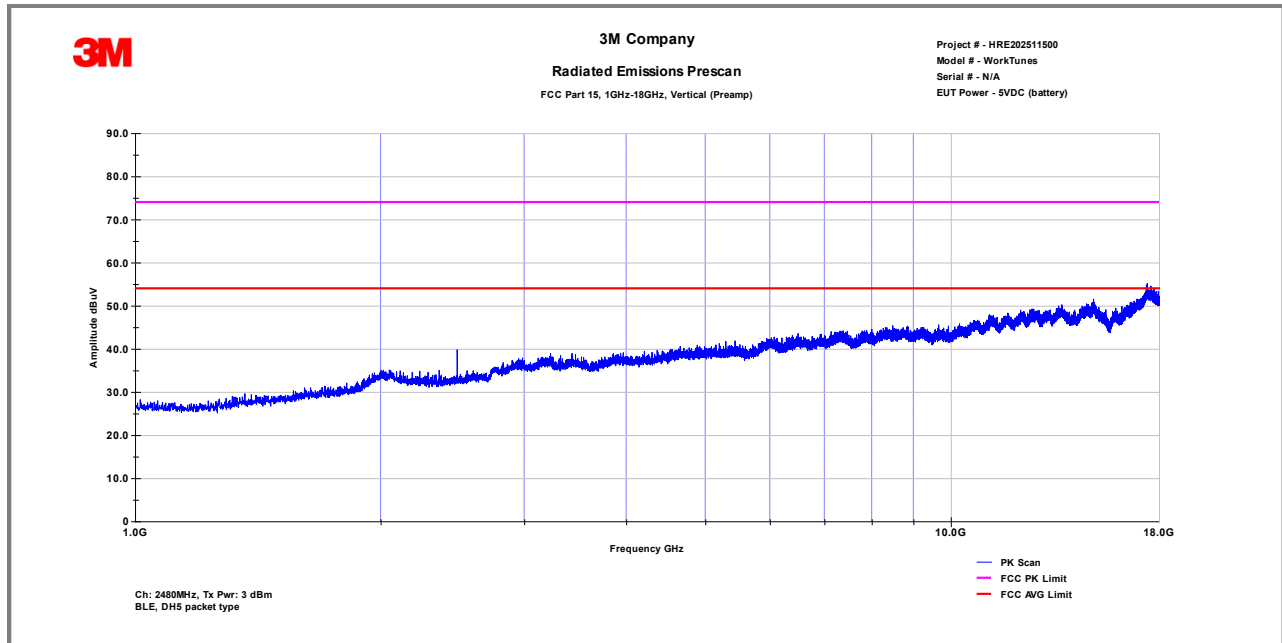


3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Horizontal

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)



FCC Part 15.209 Radiated Emissions in restricted band – High Channel (DH5)



FCC Part 15.209 Radiated Emissions in restricted band – High Channel (DH5)



Tables - Radiated Emissions in restricted band

Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
35.84	V	3.9	17.1	21	40	-19
50.69	H	2.5	18.5	20.9	40	-19.1
116.84	V	2.2	15.6	17.8	43.5	-25.7
620.75	H	3.1	26.3	29.4	46	-16.6
754.46	H	3.3	28.3	31.6	46	-14.4
929.57	H	4.1	30.2	34.3	46	-11.7
Notes:	Net Reading (dB μ V) = Reading (dB μ V) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) Low Channel-DH5					

Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
32.9	H	4.1	16.8	21	40	-19
58.22	H	2.3	18	20.3	40	-19.7
181.01	V	2	16.7	18.7	43.5	-24.8
653.09	H	2.7	26.5	29.3	46	-16.7
749.18	H	3.3	28.1	31.3	46	-14.7
929.12	H	3.7	30.2	33.9	46	-12.1
Notes:	Net Reading (dB μ V) = Reading (dB μ V) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) Mid Channel-DH5					

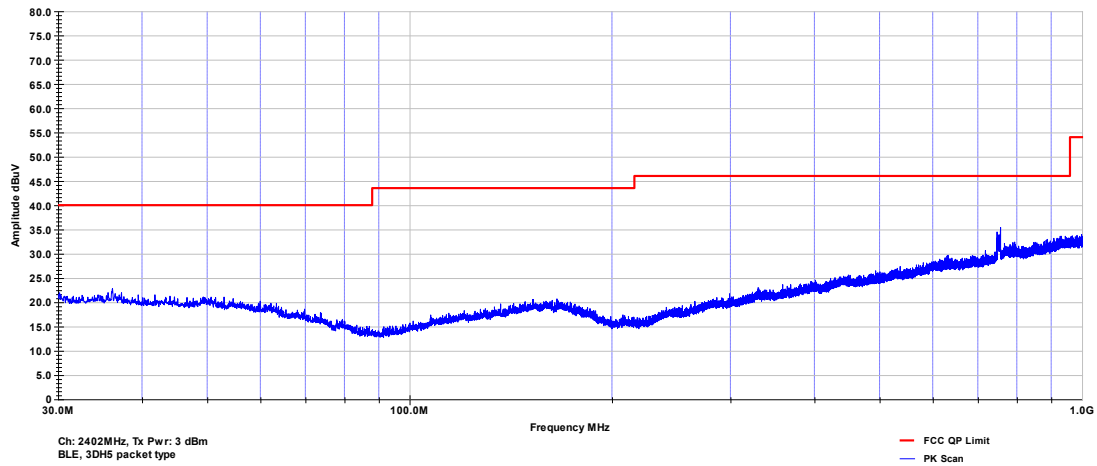
Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
32.9	H	4.1	16.8	21	40	-19
58.22	H	2.3	18	20.3	40	-19.7
181.01	V	2	16.7	18.7	43.5	-24.8
653.09	H	2.7	26.5	29.3	46	-16.7
749.18	H	3.3	28.1	31.3	46	-14.7
929.12	H	3.7	30.2	33.9	46	-12.1
Notes:	Net Reading (dB μ V) = Reading (dB μ V) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) High Channel-DH5					

[illegible]



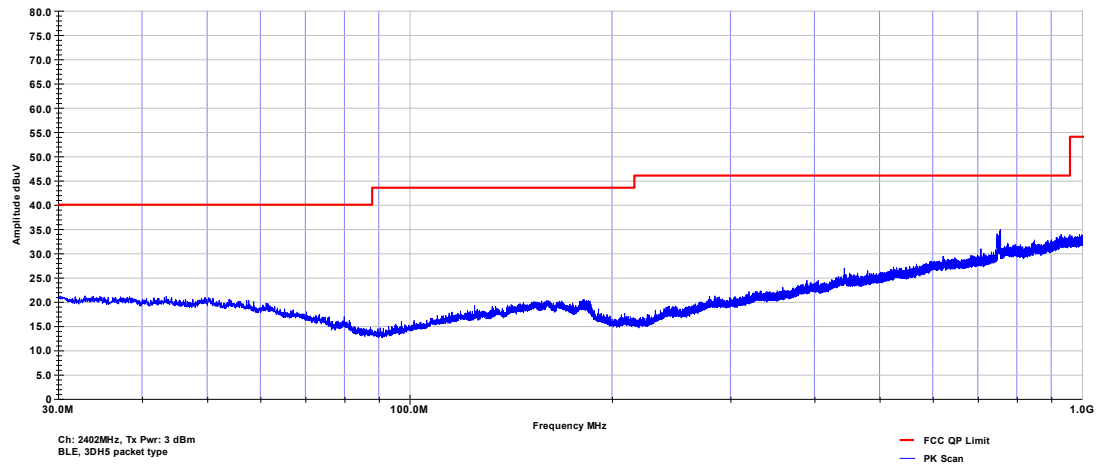
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)

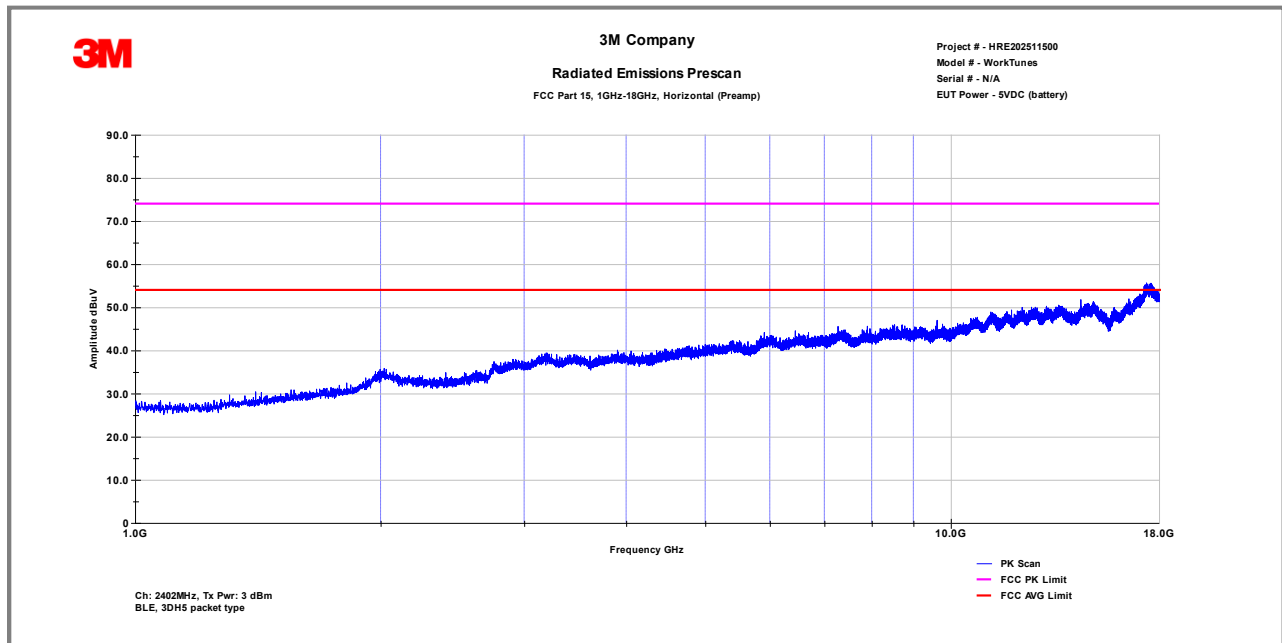
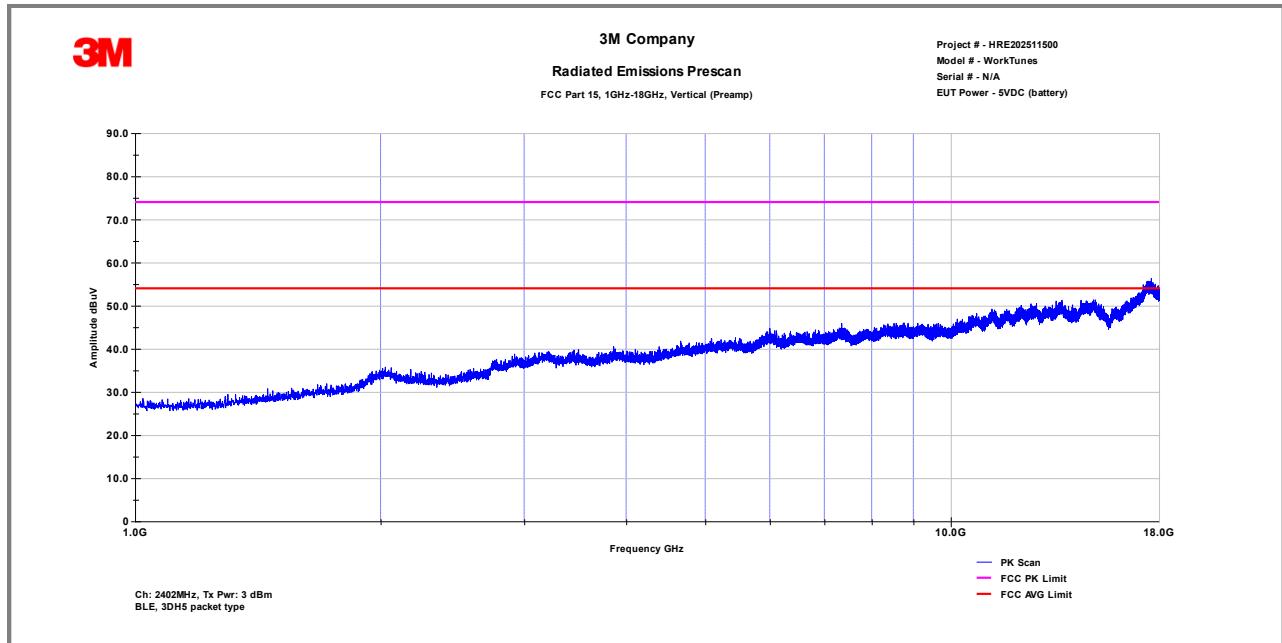


3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Horizontal

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)



FCC Part 15.209 Radiated Emissions in restricted band – Low Channel (3-DH5)

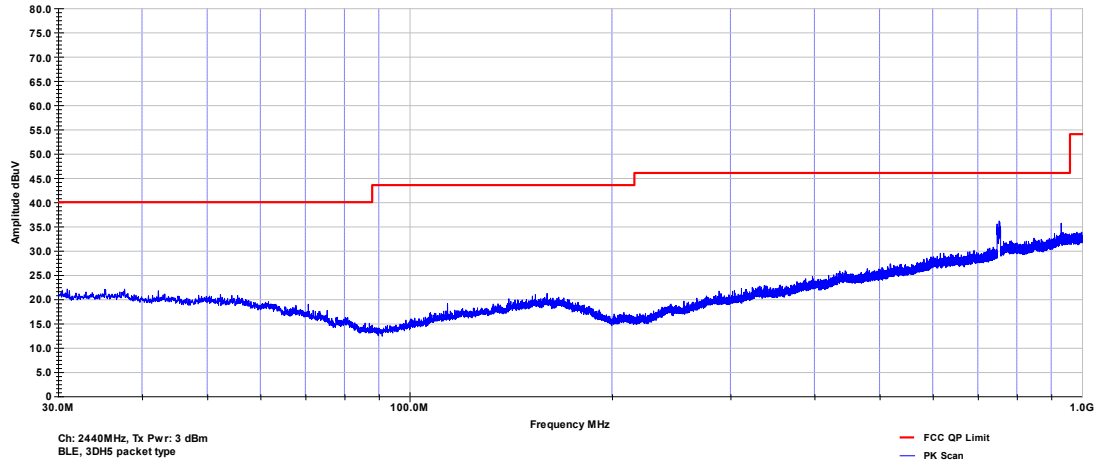


FCC Part 15.209 Radiated Emissions in restricted band – Low Channel (3-DH5)



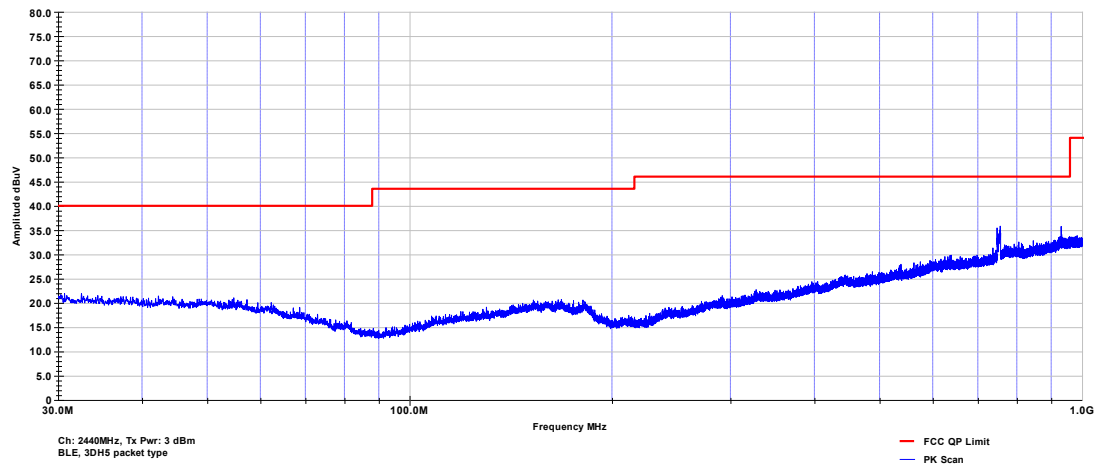
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)

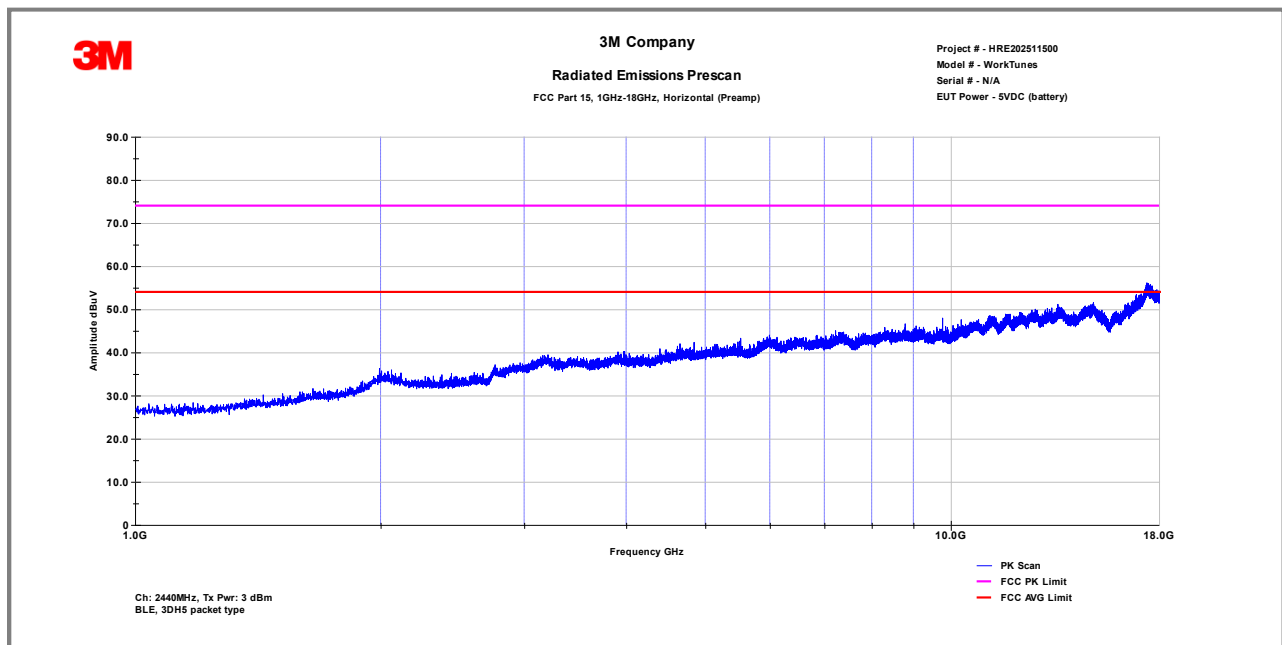
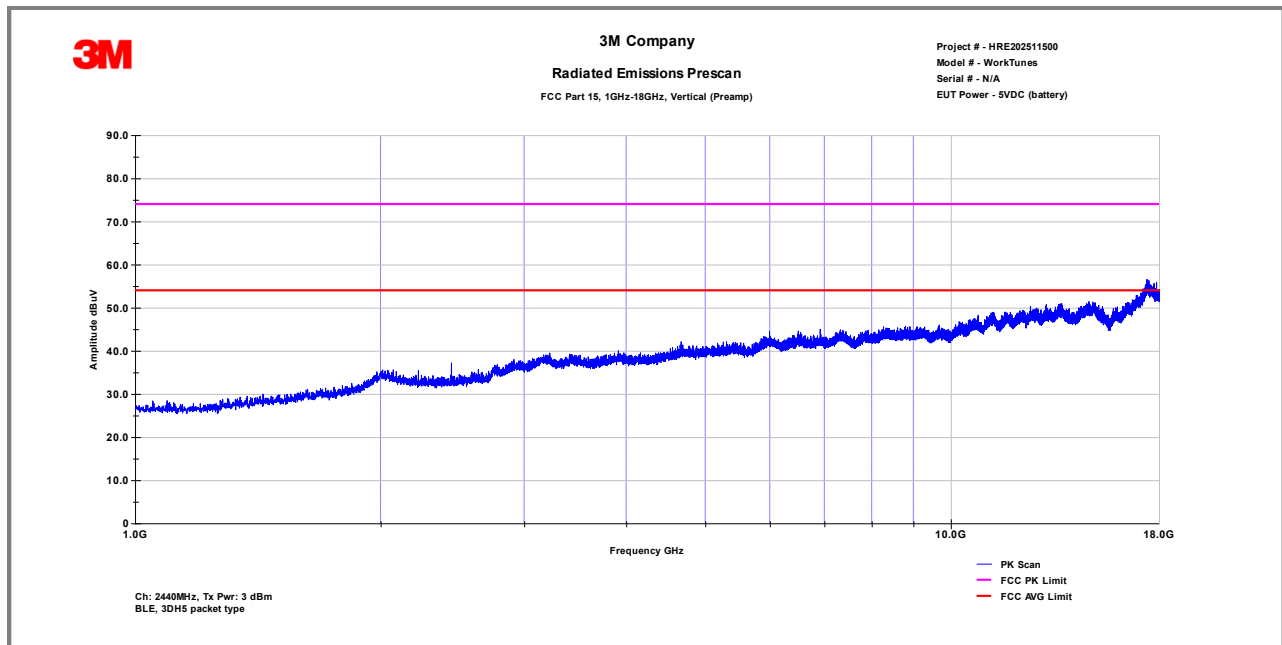


3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Horizontal

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)



FCC Part 15.209 Radiated Emissions in restricted band – Mid Channel (3-DH5)

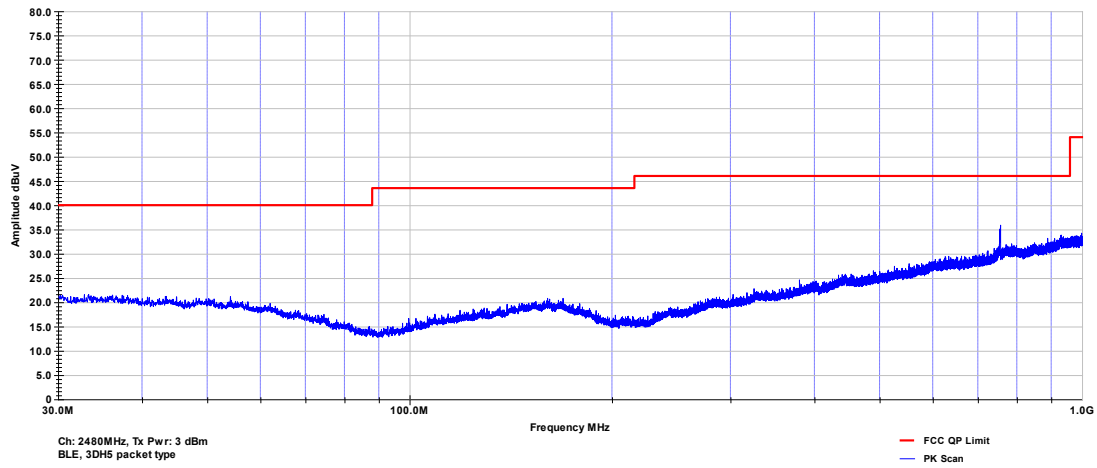


FCC Part 15.209 Radiated Emissions in restricted band – Mid Channel (3-DH5)



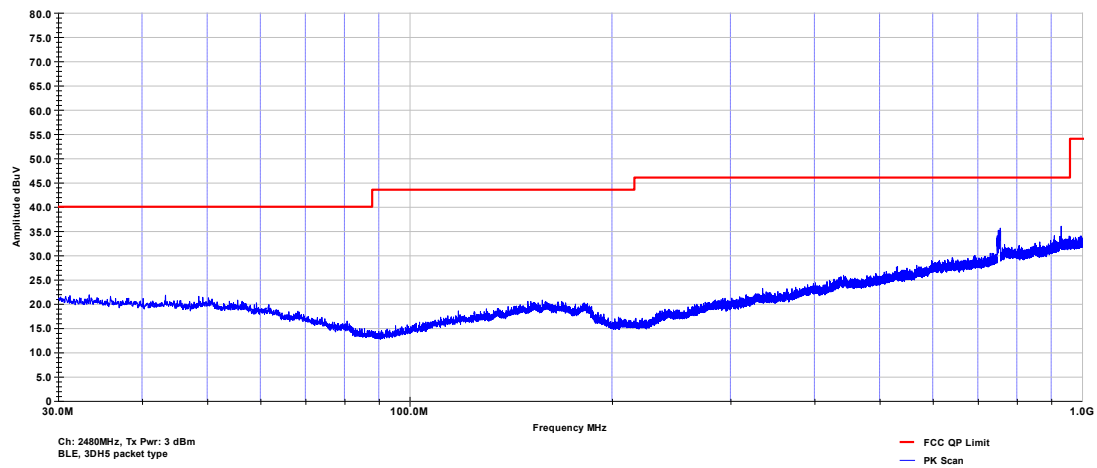
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)

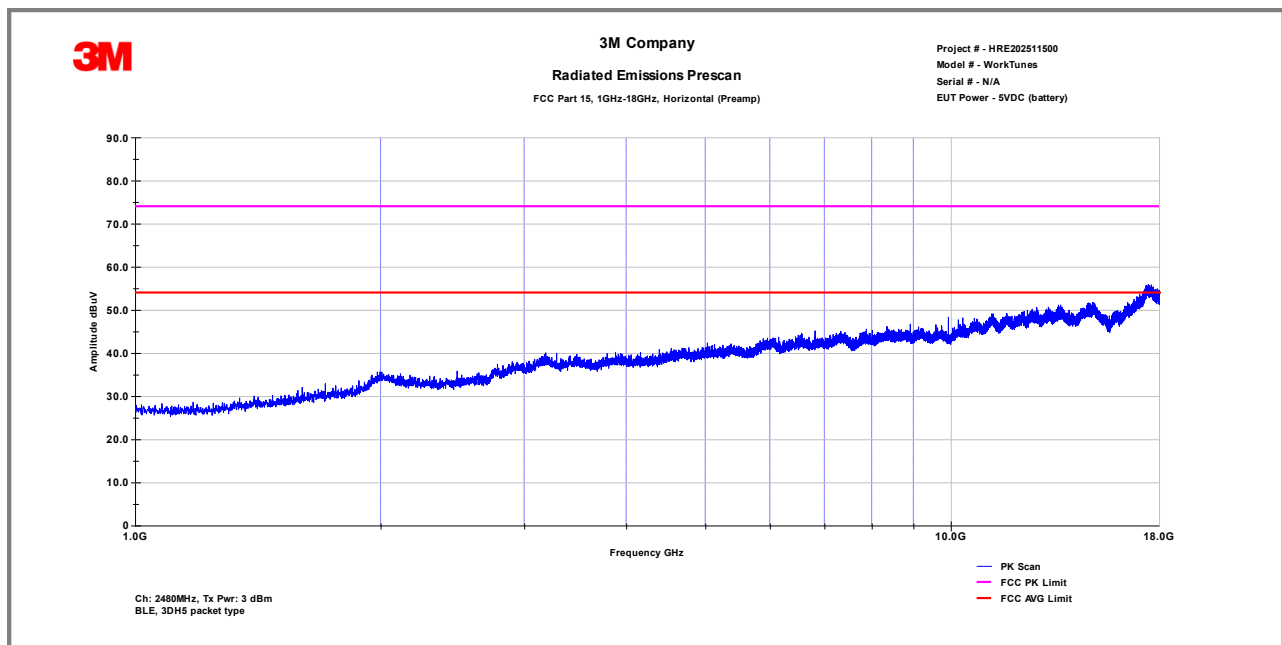
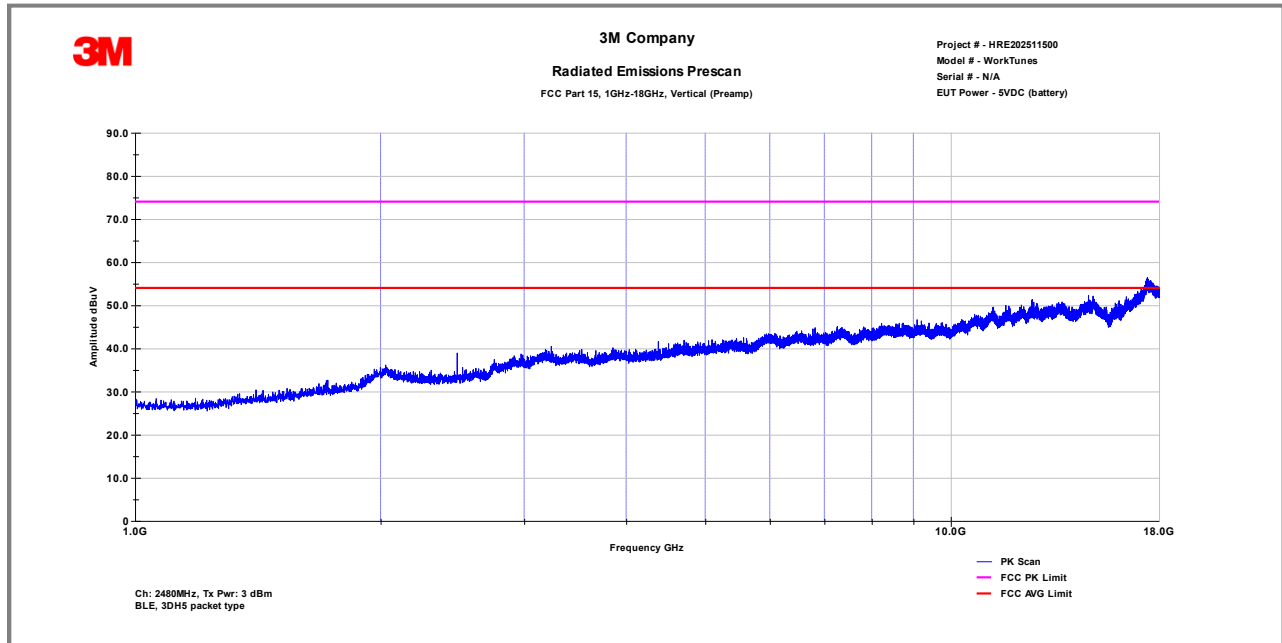


3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Horizontal

Project # - HRE202511500
 Model # - WorkTunes
 Serial # - N/A
 EUT Power - 5VDC (battery)



FCC Part 15.209 Radiated Emissions in restricted band –High Channel (3-DH5)



FCC Part 15.209 Radiated Emissions in restricted band –High Channel (3-DH5)



Tables - Radiated Emissions in restricted band

Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
35.51	V	4	17.1	21.1	40	-18.9
114.65	V	2.4	15.2	17.6	43.5	-25.9
159.29	V	2.4	18.6	21	43.5	-22.5
443.75	H	3.3	22.6	25.9	46	-20.1
752.06	H	3.6	28.2	31.8	46	-14.2
929.93	H	3.7	30.1	33.8	46	-12.2
Notes:	Net Reading (dB μ V) = Reading (dB μ V) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) Low Channel-3DH5					

Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
35.51	V	4	17.1	21.1	40	-18.9
114.65	V	2.4	15.2	17.6	43.5	-25.9
159.29	V	2.4	18.6	21	43.5	-22.5
443.75	H	3.3	22.6	25.9	46	-20.1
752.06	H	3.6	28.2	31.8	46	-14.2
929.93	H	3.7	30.1	33.8	46	-12.2
Notes:	Net Reading (dB μ V) = Reading (dB μ V) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) Mid Channel-3DH5					

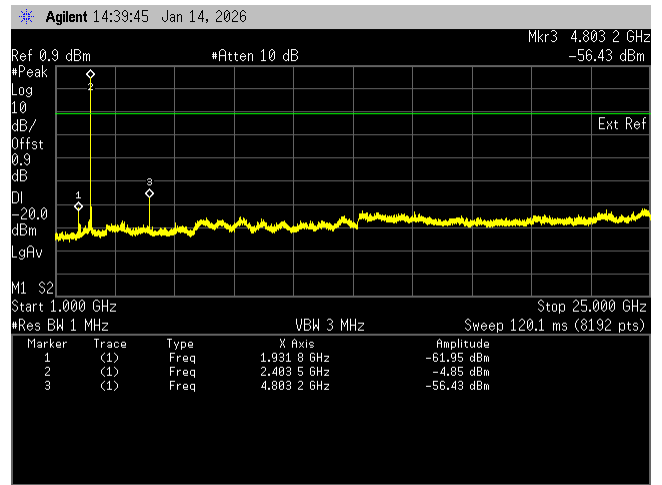
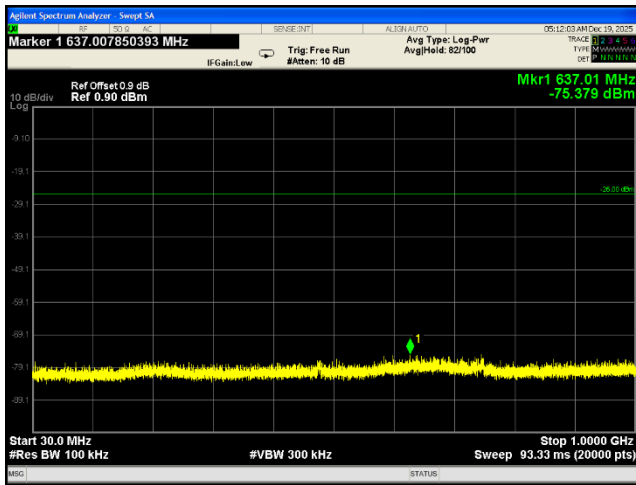
Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
33.44	H	4.2	16.9	21.1	40	-18.9
160.73	V	2.4	18.6	20.9	43.5	-22.6
379.1	H	3	20.9	23.9	46	-22.1
641.75	H	3.2	26.6	29.8	46	-16.2
755.96	H	3	28.3	31.3	46	-14.7
929.57	V	3.8	30.2	34	46	-12
Notes:	Net Reading (dB μ V) = Reading (dB μ V) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) Mid Channel-3DH5					

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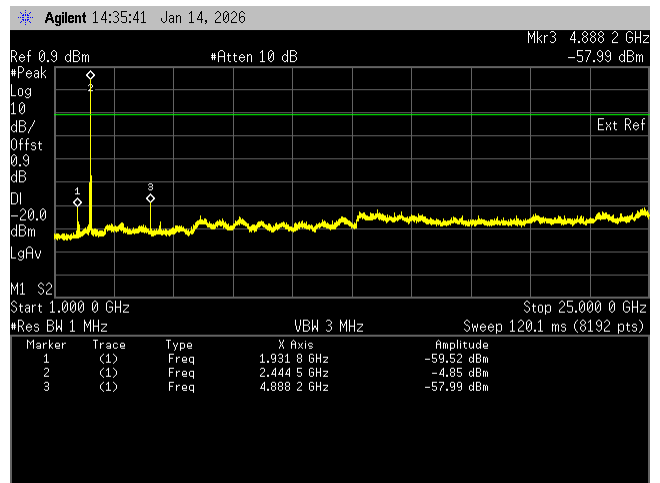
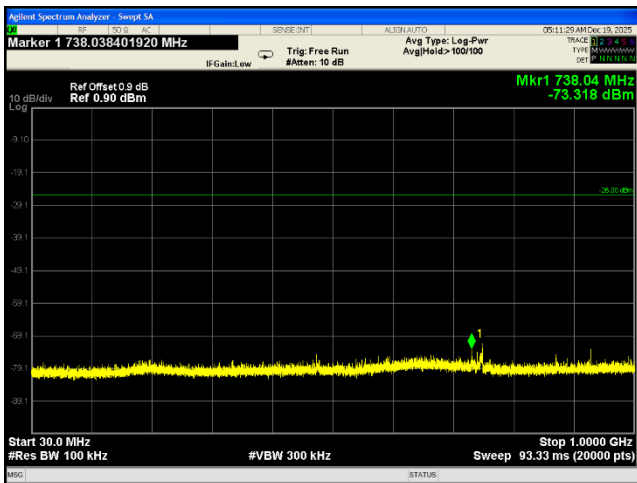
3M	3M EMC Laboratory	Report Number: HRE202511500-1 Date: January 29, 2026	Page 32 of 40
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4.7	Radiated Emissions in non-restricted band		
Method:	Antenna-port conducted measurements were used in addition to radiated measurements for determining compliance in the restricted frequency bands requirements using the proper antenna impedance matching. The measurements were made with transmitter set to transmit continuously low, medium and high channels. The notch filter was installed in the signal path to minimize the radiated power on the fundamental transmitting frequency in order to avoid saturation effect. Conducted out-of-band spurious emissions were investigated from 30MHz up to 25GHz to include 10 th harmonic		
		Laboratory Ambient Temperature:	23°C
		Relative Humidity:	48%
		Atmospheric Pressure:	1011 mbars
Reference Standard(s):	☒ ANSI C63.10:2020, Section 11.11 ☒ FCC Part 15.247/RSS Gen (8.9) ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2402.0-2480.0MHz		
In-band power in 100KHz:	☒ 5.5dBm	Results:	
Limit:	☒ -14.5dBm (20dBc below in-band power)	>50dBc	
Nominal Voltage:	☐ 120VAC ☒ 5VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/14/2026

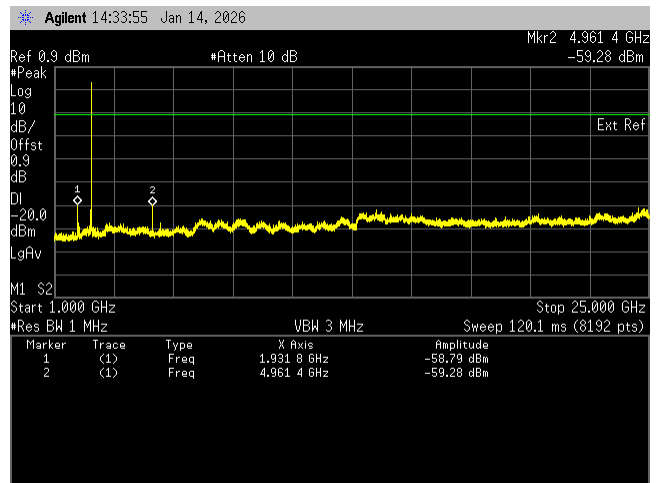
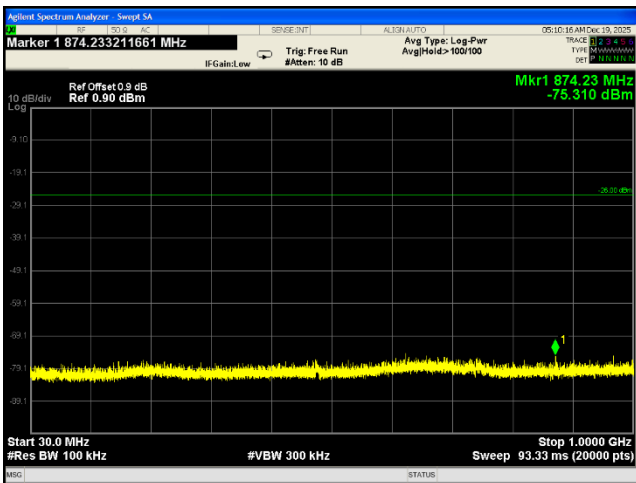
Note:	Out-of -the band conducted spurious emissions were investigated for all data rates and the worst-case emissions were found with the EUT transmitting at 3mbps. The display line shown on the plots is the limit at 20dB below the fundamental emissions measured in a 100KHz bandwidth.
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Conducted Spurious - Low Channel (3-DH5)



Conducted Spurious - Mid Channel (3-DH5)

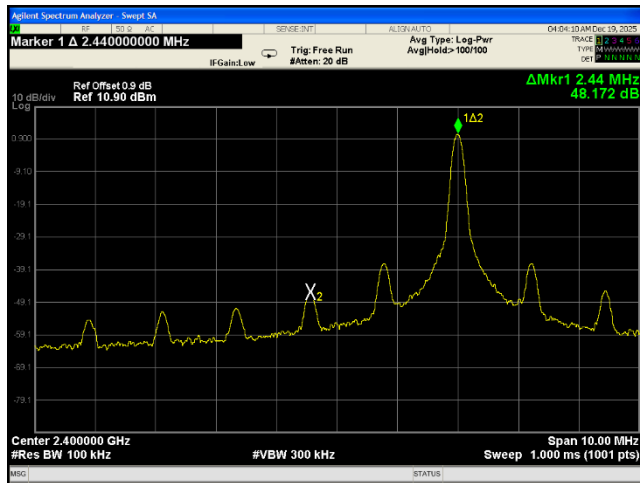


Conducted Spurious - High Channel (3-DH5)

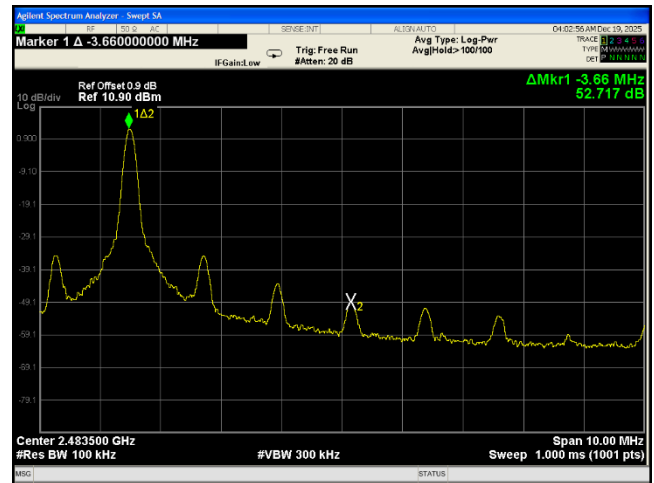
3M	3M EMC Laboratory	Report Number: HRE202511500-1 Date: January 29, 2026	Page 34 of 40
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4.8	Band-Edge Compliance		
Method:	The measurements were made with transmitter set to transmit continuously with modulated signal at low and high channels.		
	Laboratory Ambient Temperature:	23°C	
	Relative Humidity:	48%	
	Atmospheric Pressure:	1011 mbars	
Reference Standard(s):	☒ ANSI C63.10:2020, Section 6.10.4 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2402.0-2480.0 MHz		
In-band power in 100KHz:	☒ 5.5dBm		
Limit:	☒ >30dBc Low Ch., 2402 MHz > 48dBc High Ch., 2480 MHz > 50dBc		
Nominal Voltage:	☐ 120VAC ☒ 5VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/14/2026

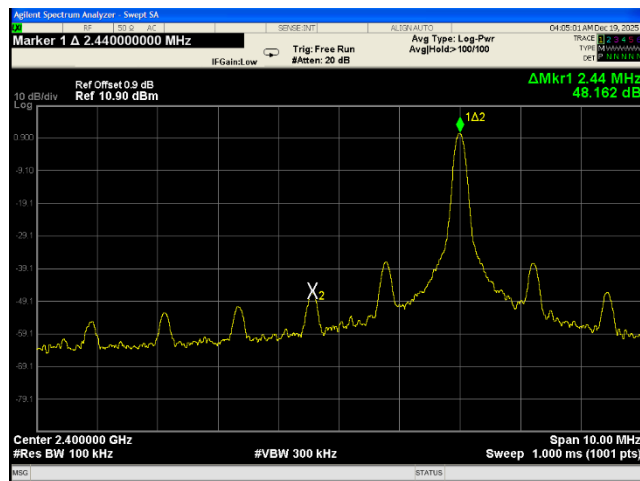
Note:	Out-of-band conducted spurious emissions at the band edge were investigated for all data rates in hopping and no-hopping modes.
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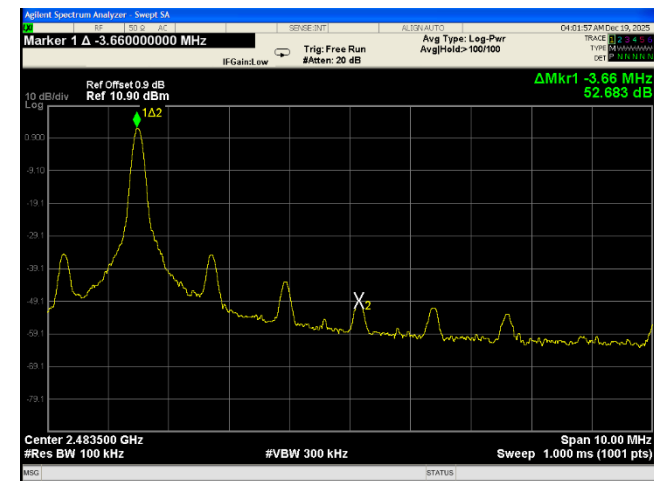
Band Edge – DH5 Low Channel
Center Freq. 2.400GHz
(BT with Hopping Disabled)



Band Edge – DH5 High Channel
Center Freq. 2.4835GHz
(BT with Hopping Disabled)



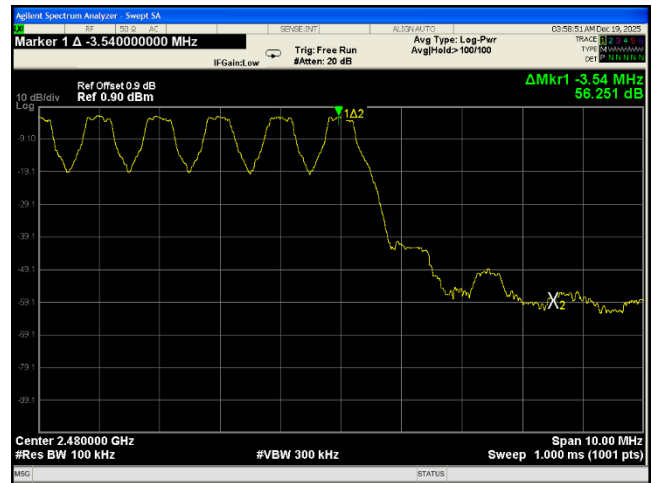
Band Edge – 3DH5 Low Channel
Center Freq. 2.400GHz
(BT with Hopping Disabled)



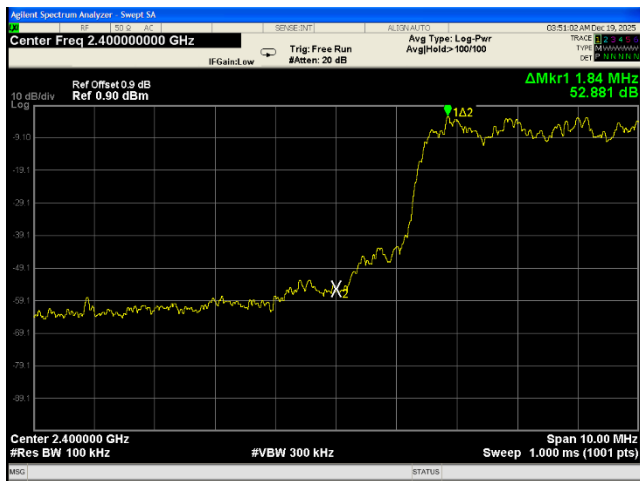
Band Edge – 3DH5 High Channel
Center Freq. 2.4835GHz
(BT with Hopping Disabled)



Band Edge – DH5 Low Channel
Center Freq. 2.400GHz
(BT with Hopping Enabled)



Band Edge – DH5 High Channel
Center Freq. 2.4835GHz
(BT with Hopping Enabled)



Band Edge – 3DH5 Low Channel
Center Freq. 2.400GHz
(BT with Hopping Enabled)



Band Edge – 3DH5 High Channel
Center Freq. 2.4835GHz
(BT with Hopping Enabled)

4.9	Conducted Emissions Data			
Method:	The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.			
	All power was connected to the system through Artificial Mains Network (AMN). All tested telecommunications lines were connected to an Asymmetric Artificial Network (AAN) and conducted voltage measurements on telecommunications lines were made at the output of the ISN. Where an AAN was not appropriate or available measurements were made using a Capacitive Voltage Probe.			
Test Verification: ☒	Laboratory Ambient Temperature:		23°C	
	Relative Humidity:		48%	
	Atmospheric Pressure:		1011 mbars	
Reference Standard(s):	☒ FCC 15.207/RSS Gen (8.8) ☒ ANSI C63.4:2014 ☒ ANSI C63.10:2020		Measurement Point ☒ Mains ☐ Telecommunication ports ☐	
Nominal Voltage:		☒ 120VAC ☐ 230VAC ☐ VDC		
Test Personnel:		Jayden Alstad <i>JA</i>	Date: 01/15/2026	
Limits – Part 15.207/RSS Gen – AC Mains				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Average	Result	Comments
0.15 to 0.50	66 to 56	56 to 46	pass	Time Domain Scan
0.50 to 5	56	46	pass	Time Domain Scan
5 to 30	60	50	pass	Time Domain Scan

Modifications:	
Note:	Battery can be charged when removed from WS Adapter. Test data is for reference only.

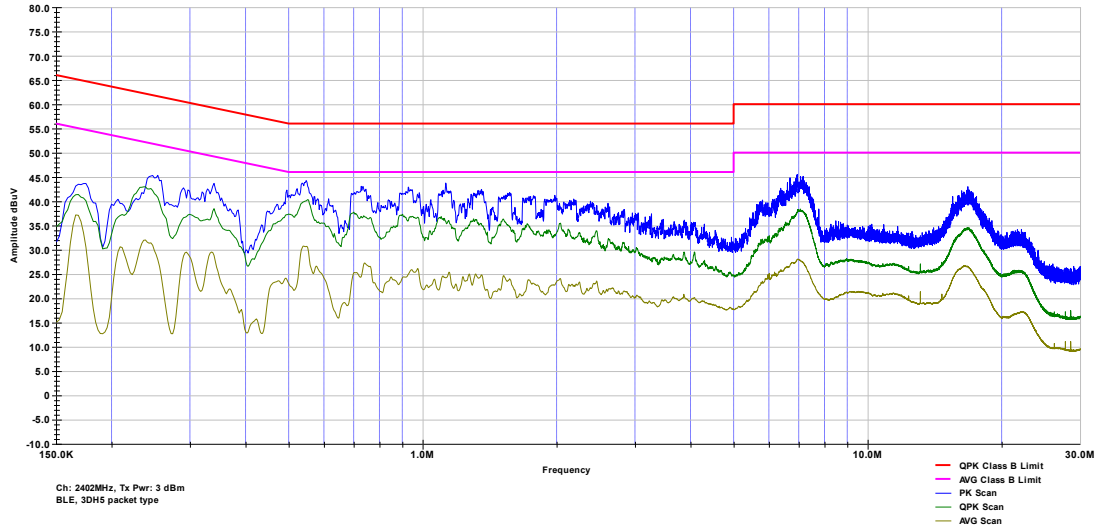


3M Company

Conducted Emissions

CISPR 32_FCC Part 15, Class B, Line 2

Project # - HRE202511500
 Model # - 90670
 Serial # - HRE202511500-6
 EUT Power - 120VAC/60Hz

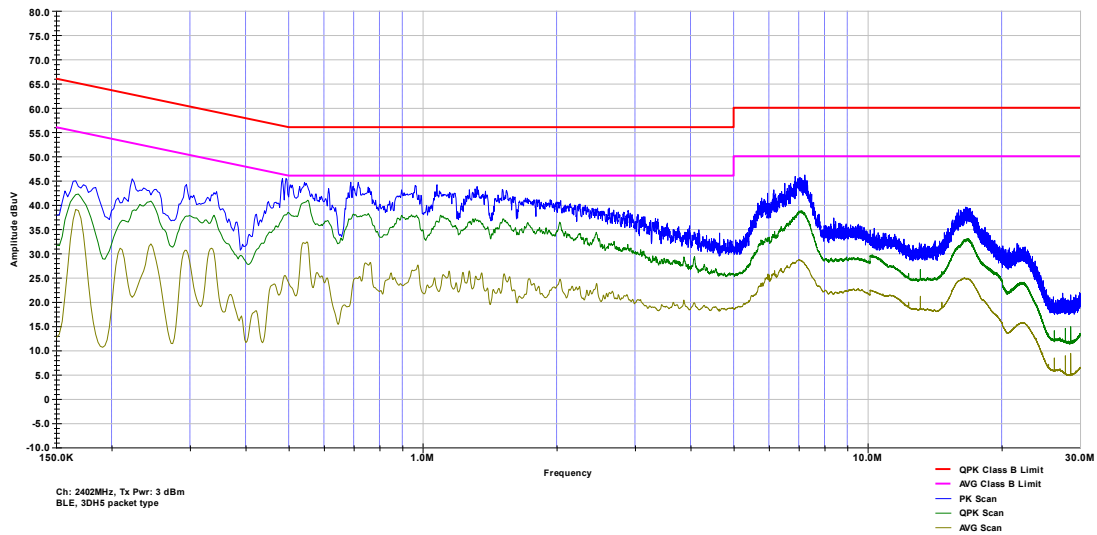


3M Company

Conducted Emissions

CISPR 32_FCC Part 15, Class B, Line 1

Project # - HRE202511500
 Model # - 90670
 Serial # - HRE202511500-6
 EUT Power - 120VAC/60Hz





4.8	RF Exposure Evaluation		
Reference Standard(s):	☐ KDB 447498 RF Exposure Guidance v06 ☒ KDB 447498 Interim RF Exposure Guidance v01 ☒ RSS 102, Issue 6 ☐	☐ MPE ☐ SAR Evaluation ☒ SAR Test Exclusion	
Frequency Range(s):	☒ 2402-2480.0MHz ☐		
Antenna Separation Distance:	>6mm		
RF Exposure Conditions:	Portable (Body-worn)		
2.4GHz Antenna Gain:	0dBi		
BR/EDR the source-based output power:	3.55mW(5.5dBm)*0.7(FHSS worst case duty cycle)= 2.485mW(3.95dBm)		
BR/EDR EIRP/ERP output power:	EIRP=3.95dBm + 0dBi=3.95dBm, ERP=3.95dBm - 2.15dB=1.8dBm(1.5mW)		
The SAR Exclusion Threshold Level			
FCC Part 2.1093	3mW≤5mm @2.45GHz		
RSS 102, Issue	3mW≤5mm @2.45GHz		
Note:			

3M	3M EMC Laboratory	Report Number: HRE202511500-1 Date: January 29, 2026	Page 40 of 40
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5.0	Test Equipment				
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Last Cal. Date	Check
Biconilog Antenna	Schwarzbeck	VULB 9168	9168-1070	10/20/2025	☒
Horn Antenna	A.H. Systems	SAS 571	1010	10/20/2025	☒
Loop Antenna	A.H. Systems	EHA-51B	1213E	10/20/2025	☐
EMI Receiver	Rohde & Schwarz	ESW26	101412	10/20/2025	☒
Signal Analyzer	Agilent	N9000A	MY53031040	10/20/2025	☒
EMI Receiver	Agilent	E4448A	1530975	10/20/2025	☒
LISN	TESEQ	NNB51	1130	10/20/2025	☒
Coaxial Cable	Insulated Wire	2803	CBL2039	10/20/2025	☒
EMC Software	ETS-Lindgren	TILE 7		N/A	☒
Equipment Calibration Interval:		☒ 12 months ☐ 24 months			

6.0	Report revision history		
Revision Level	Date	Report Number	Notes
0	01/29/2026	HRE202511500-1	Original Issue