

EMC TEST REPORT



Standard(s):

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

**FCC ID: DGFPD20184602
IC: 458A-PSD20184602**

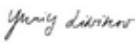
**Product: 3M™ Scott™ XD PASS Alarm (PASS Alarm)
Model(s): 201846-02**

**Company Name:
3M Company**

**Address:
Fire & SCBA Solutions
4320 Goldmine Road, Monroe, NC 28110**

**Report Number: HRE202510498-1
Report Issue Date: February 9, 2026**

Report Prepared by:

Signature: 
**Yuriy Litvinov
Lead EMC Engineer**

**Tested by:
3M Company, Hardgoods Regulatory Engineering Laboratory
410 E. Fillmore Avenue, Building 76
St. Paul, Minnesota 55107-1208, USA**



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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)(2)/ RSS-247(6.3.1(a))/RSS-Gen (6.7)	DTS Bandwidth	pass	
4.2	FCC Part 15.247(b)(3)/ RSS-247(6.3.2)	Maximum Peak Conducted Output Power	pass	
4.3	FCC Part 15.247(e)/ RSS-247(6.3.1(b))	Maximum Power Spectral Density level	pass	
4.4	FCC Part 15.209 RSS-Gen, 8.9	Radiated Emissions in restricted band	pass	
4.5	FCC Part 15.247(d)/ RSS-247(6.6)	Radiated Emissions in non-restricted band	pass	
4.6	FCC Part 15.247(d)(1)/ RSS-247(6.6)	DTS Band-edge Emissions Measurements	pass	
4.7	FCC Part 15.207/ RSS-Gen (8.8)	Conducted Emissions	N/A	
4.8	FCC Part 15.247(i)/ RSS 102 Issue 5	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 US502
	ISED Canada CAB identifier: US0012



2.0 Equipment Description

2.1	Equipment Under Test			
Description:	Sensor Module Assembly: Electronics control module for battery power, audio (alarm tones), the Integrated Pak-Tracker 2.0 PCBA, Ultra-Wide Band PCBA, data logging, and the motion sensor. Sensor Module contains two antennas (IPT&BFE) controlled by RF Switch.			
Model(s):	201846-02			
Serial number:	N/A			
3M Division:	Personal Safety			
Modifications and Special Measures:	none			
Frequency Range:	2425.00 MHz			
Channel No.:	1			
Modulation Type:	OQPSK (250 kb/s 802.15.4)			
FCC Classification:	Digital Transmission System (DTS)			
Conducted RF Output Power:	20.7dBm (117.5mW)			
Antenna Type and Antenna Assembly Gain:	☐ External	☒ Integral PCB Antenna	☐ Dedicated	
	☒ 4dBi (IPT) ☒ 4dBi (BFE)	☐ Declared by the Manufacturer	☒ Measured	
Test Deviations or Exclusions	☐ Yes	☒ No		
Rated Power:	Voltage:	☐ 120VAC	☐ 230VAC	☒ 9VDC
	Phase:	☐ 1ph	☐ 3ph	☒ 6 (AA) batteries
	Frequency:	☐ 50Hz	☐ 60Hz	
	Current:	N/A		
Test Dates:	01/05-0/09/2026			
Received Date:	12/12/2025			
Received Conditions:	☐ Poor	☒ Good		
	☒ Prototype	☐ Production		

3.0 EUT Configuration

3.1 System Configuration

No.	Product Type	Manufacturer	Model	Comments
1	EUT	3M	201846-02	
2	Notebook PC	HP	Zbook	Support Equipment
3				

3.2 Input/Output Ports of EUT

No.	Description	Type	Comments
1	Pressure Transducer	12 pin	Bulkhead Mount Circular Connector
2	Sensor Module, Console	11 pin	Bulkhead Mount Circular Connector

3.3 Cables

No.	Description	Type	Length	Shielding	Comments
1	Control Cables	Twisted Pair	1m	Yes	
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

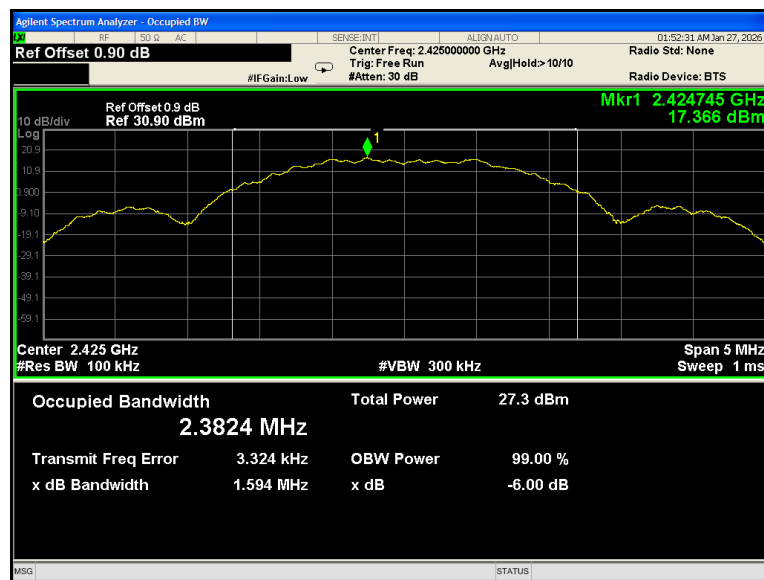
3.5 Exercising of EUT and Interfaces

No.	Mode of Operation
1	Continues transmission of modulated and CW signals at 2425.0MHz at rated power and data rate.
2	Device programming over Python 3.14.0 Terminal Software using SCBA Radio Testing GUI ver. 1.2.0 provided by the manufacturer for continuous transmission of modulated carrier at maximum rated RF output power and Duty Cycle.

4.0 Test Conditions and Results

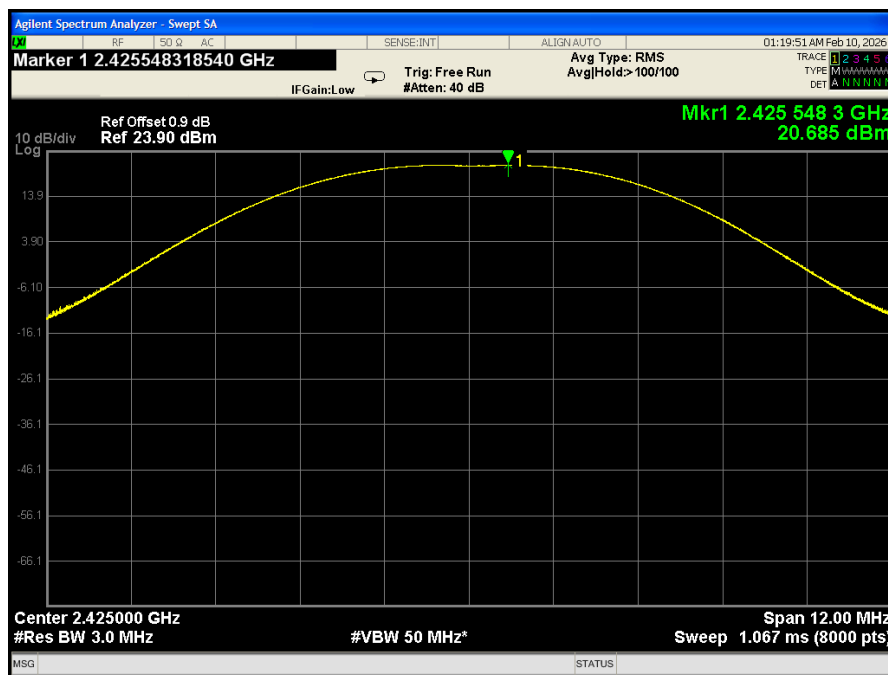
4.1	DTS Bandwidth		
	Laboratory Ambient Temperature:	23°C	
	Relative Humidity:	48%	
	Atmospheric Pressure:	1011 mbars	
Reference Standard(s):	☒ ANSI C63.10:2020, Section 11.8.2 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2425.0MHz	RBW = 100KHz VBW ≥ 3 x RBW	
Nominal Voltage:		☐ 120VAC ☒ 9VDC	
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>	Date: 01/21/2026	

Frequency (MHz)	Data Rate	99% dB Bandwidth (KHz)	6 dB Bandwidth (KHz)	6dB OBW Limit (KHz)	Results
2425	N/A	2382	1594	> 500	pass



4.2	Maximum Output Power		
Method:	Measurements was 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	
Frequency Range:	☒ 2425.0MHz		
Antenna Gain:	4.0dBi	Maximum Conducted RMS Power:	
Limit:	30 dBm	20.7dBm (117.5mW)	
Nominal Voltage:	☐ 120VAC ☒ 9VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/21/2026

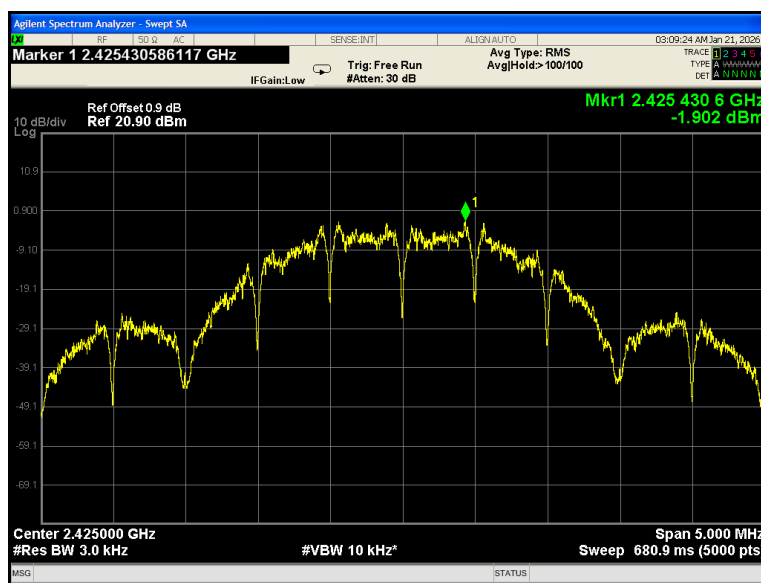
Note:	EIRP (dBm) = Conducted Power (dBm) +Antenna Gain (dBi)= 20.7+4.0=24.7dBm
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Conducted RF Power

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4.3	Maximum Power Spectral Density level		
Method:	Measurements was performed with modulated 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 11.10.2 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2425.0 MHz		PSD Results
PSD Limit:	8 dBm in any 3KHz band		-1.9dBm
Nominal Voltage:	☐ 120VAC ☒ 9VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/21/2026



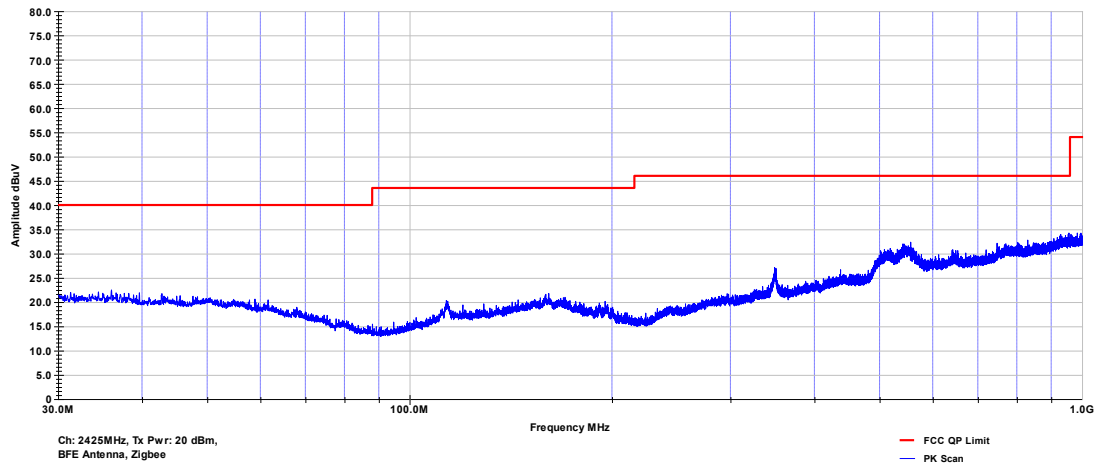
4.4	Radiated Emissions in restricted band					
Method:	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4 standards. EUT was rotated through three orthogonal axes to determine which attitude (orientation) and arrangement produces the highest emission relative 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 ☒ FCC Part 15.205/15.209/RSS Gen (8.9) ☒ KDB 558074		Measurement Distance		
				☒ 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 ☒ 9VDC				
Test Personnel:		Jayden Alstad <i>J.A.</i>			Date: 01/19/2026	
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 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. No radiated spurious emissions were detected above 18GHz



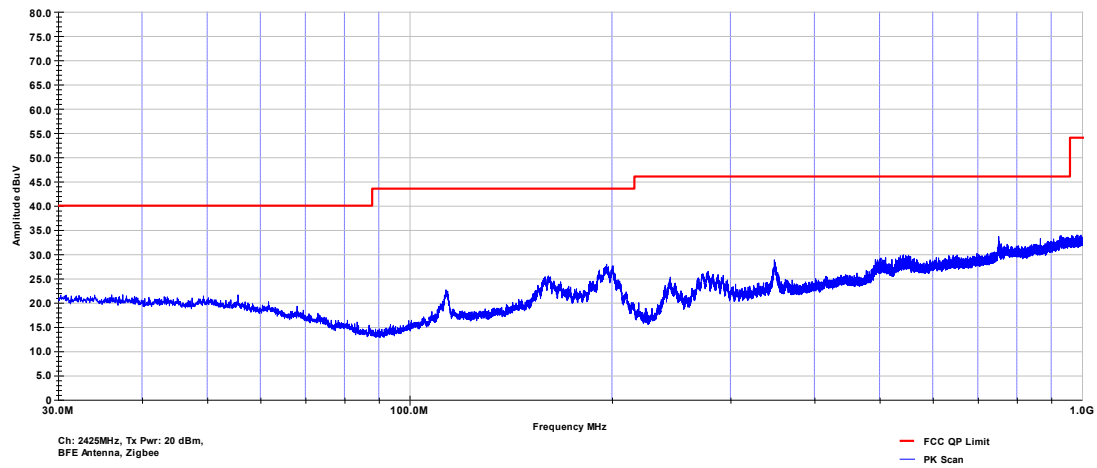
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project# - HRE202510498
 Model # - XD2025
 Serial # - N/A
 EUT Power - 9VDC (6 AA batteries)

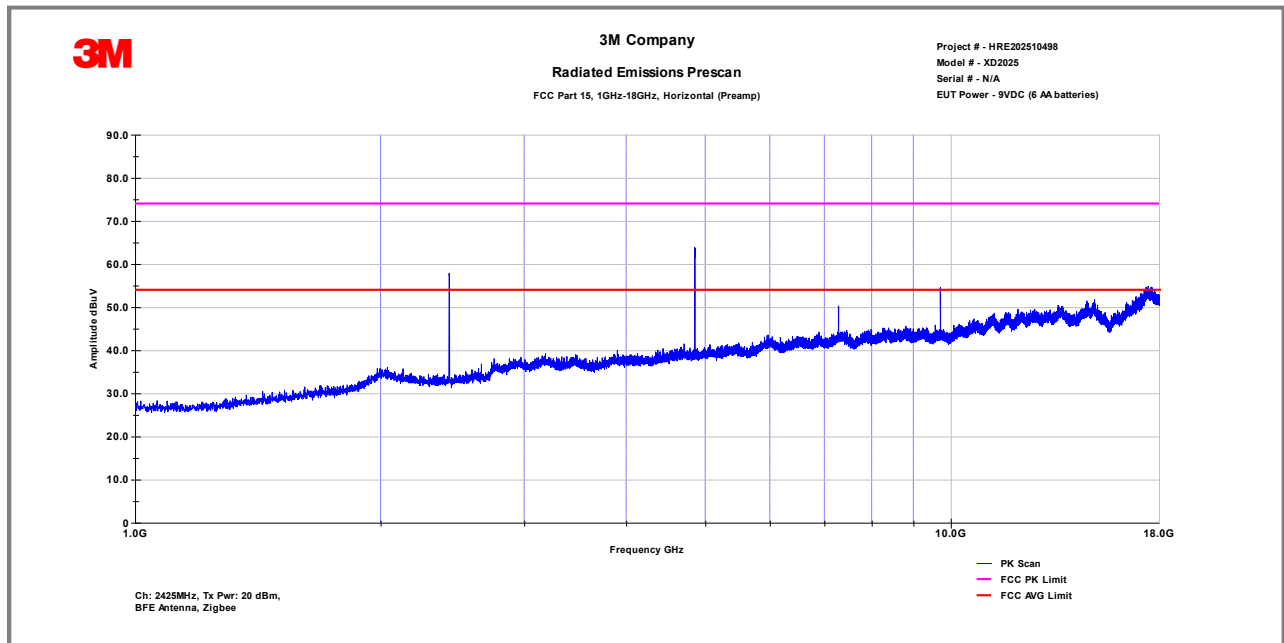
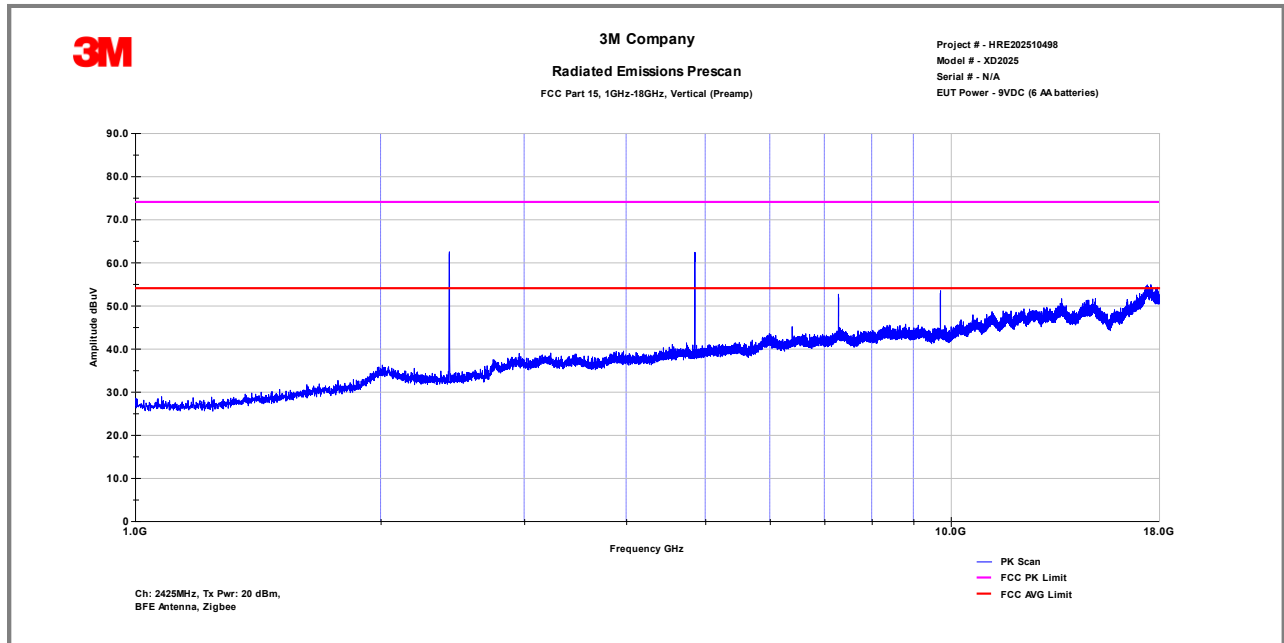


3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Horizontal

Project # - HRE202510498
 Model # - XD2025
 Serial # - N/A
 EUT Power - 9VDC (6 AA batteries)



FCC Part 15.209 Radiated Emissions in restricted band - BFE Antenna



FCC Part 15.209 Radiated Emissions in restricted band - BFE Antenna

Table - Radiated Emissions in restricted band

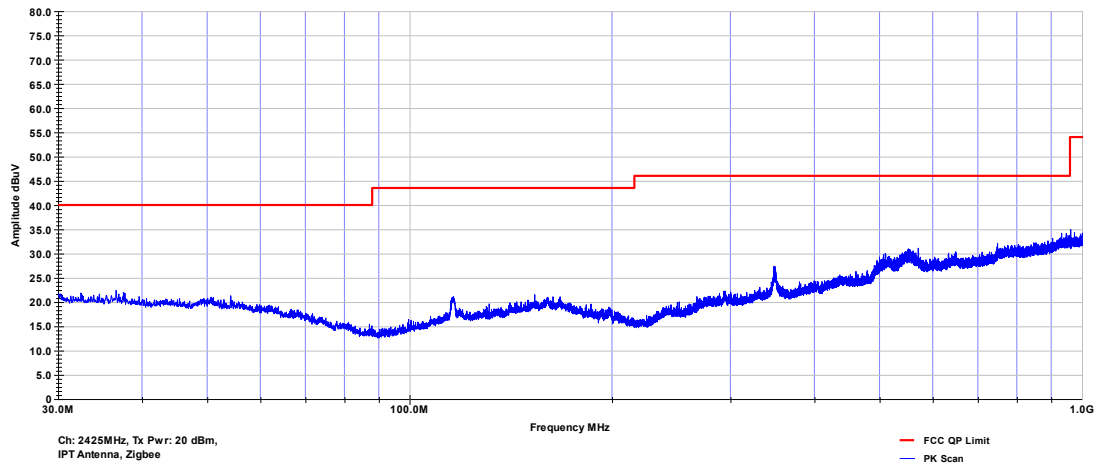
Frequency (MHz)	Pol.	QP Reading dBμV/m	Total CF dB	Net at 3 m dBμV/m	Limit (dBμV/m)	Margin dB
113.75	V	3.1	15.2	18.3	43.5	-25.2
195.68	H	7.5	15.4	22.8	43.5	-20.7
347.36	V	4.2	19.9	24.1	46	-21.9
556.22	H	3.3	24.4	27.8	46	-18.2
Notes:	Net Reading (dBuV) = Reading (dBμV) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) PASS Alarm 2425.0MHz BFE Antenna					

[illegible]



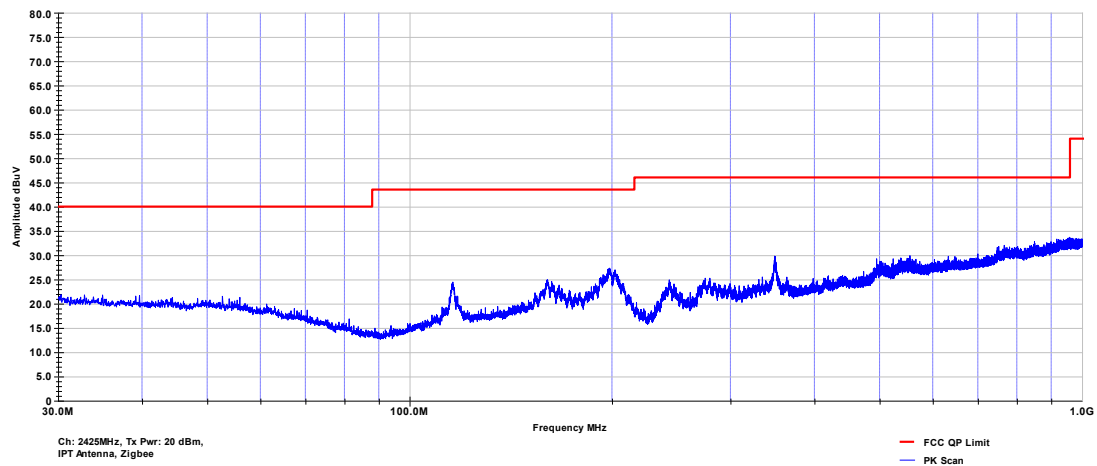
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project# - HRE202510498
 Model # - XD2025
 Serial # - N/A
 EUT Power - 9VDC (6 AA batteries)



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

Project # - HRE202510498
 Model # - XD2025
 Serial # - N/A
 EUT Power - 9VDC (6 AA batteries)



FCC Part 15.209 Radiated Emissions in restricted band - IPT Antenna

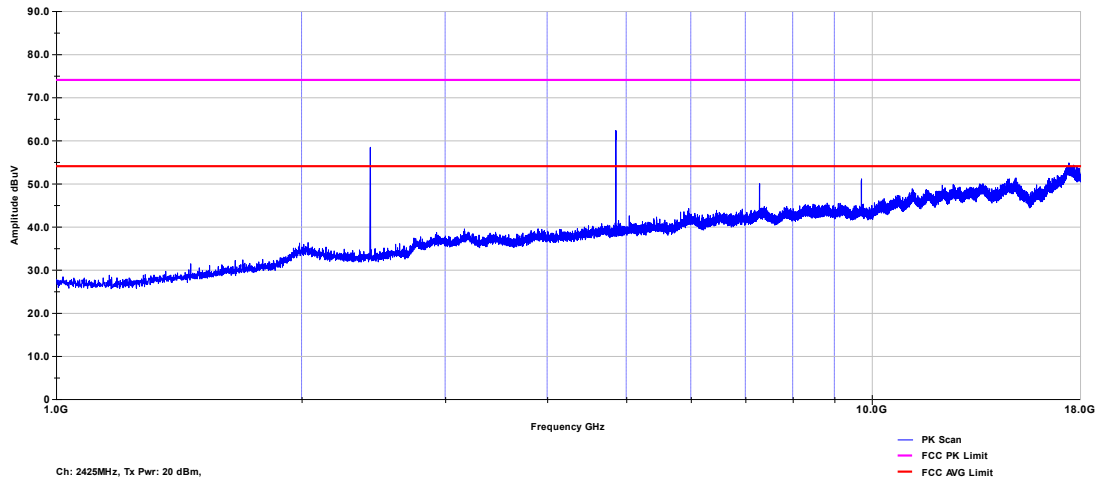


3M Company

Radiated Emissions Prescan

FCC Part 15, 1GHz-18GHz, Vertical (Preamp)

Project # - HRE202510498
 Model # - XD2025
 Serial # - N/A
 EUT Power - 9VDC (6 AA batteries)

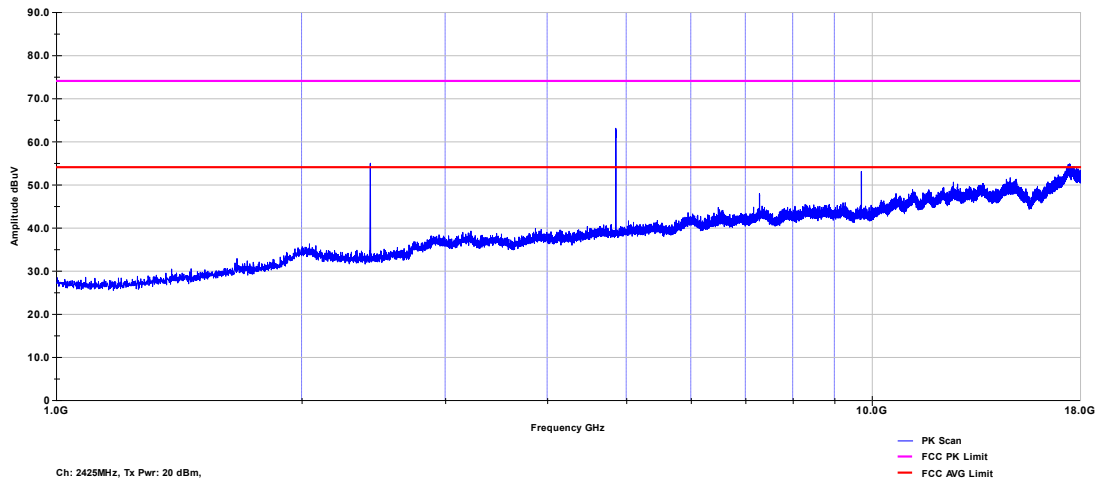


3M Company

Radiated Emissions Prescan

FCC Part 15, 1GHz-18GHz, Horizontal (Preamp)

Project # - HRE202510498
 Model # - XD2025
 Serial # - N/A
 EUT Power - 9VDC (6 AA batteries)



FCC Part 15.209 Radiated Emissions in restricted band - IPT Antenna

Table - Radiated Emissions in restricted band

Frequency (MHz)	Pol.	QP Reading dBµV/m	Total CF dB	Net at 3 m dBµV/m	Limit (dBµV/m)	Margin dB
113.75	V	3.1	15.2	18.3	43.5	-25.2
195.68	H	7.5	15.4	22.8	43.5	-20.7
347.36	V	4.2	19.9	24.1	46	-21.9
556.22	H	3.3	24.4	27.8	46	-18.2
Notes:	Net Reading (dBuV) = Reading (dBµV) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB) PASS Alarm 2425.0MHz IPT Antenna					

[illegible]

**Duty Cycle Correction factor**

IEEE 802.15.4 PHY

Data Rate: 250 kbps/31.25 kbytes/sec

Symbols/byte: 2 sym/byte

Symbol Timing: 62.5 ksym/sec

0.000016 sec/sym

Byte Timing: 0.000032 sec/byte

PHY Preamble: 4 bytes

PHY SFD: 1 byte

PHY PHR: 1 byte

PHY PSDU:

> PASS payload 19 bytes

> Optional payload (max) 65 bytes

> CRC 2 bytes

Tot Packet Len (max): 92 bytes

Max time TX PKT: 0.002944 sec

Carrier on to packet start 0.000032 sec, max

Packet end to carrier off 0.000160 sec, max

Max time TX PKT 0.003136 sec

Maximum beacon rate: 20 beacons/sec

Minimum beacon period: 0.050 sec

Beacon jitter (max): +/- 0.25 beacon period

> Shortest interval incl. 2 beacons: 25 msec

> Shortest interval incl. 3 beacons: 75 msec

> Shortest interval incl. 4 beacons: 125 msec

Max beacon count (100 msec interval): 3 (the worst case)

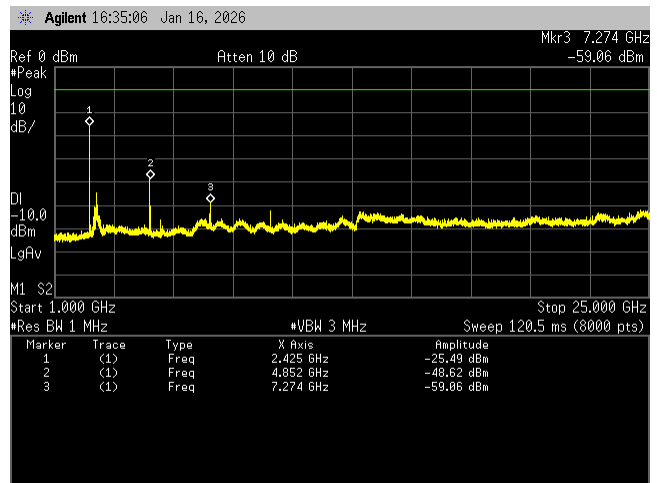
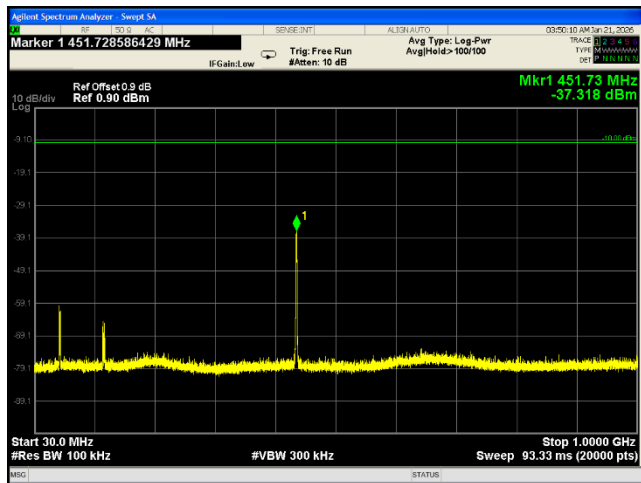
Max time TX (in 100 msec interval): 0.009408 sec/9.408 msec

Duty cycle = Time On /100 msec **$20 \cdot \log_{10}(9.4/100) = -20.53 \text{ dB}$ which was be applied to the Peak measurement for a corrected Average value**



4.5	Radiated Emissions in non-restricted band		
Method:	The measurements were made with transmitter set to transmit continuously.		
	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 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2425.0 MHz		
In-band power in 100KHz:	☒ 20.8dBm		Results:
Limit:	☒ -9.2dBm (30dBc below in-band power)		
Nominal Voltage:	☐ 120VAC ☒ 9VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/21/2026

Note: A notch filter was installed to prevent system overload at 2.4GHz

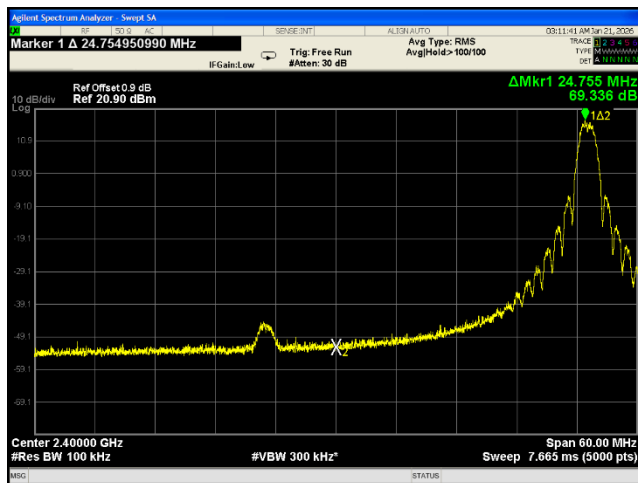
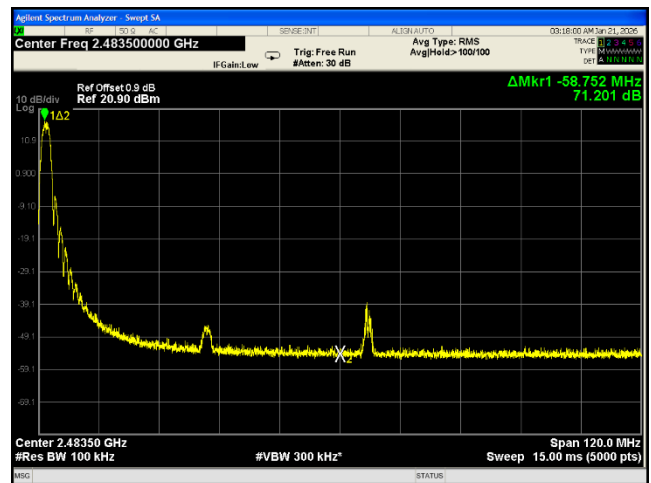


Conducted Spurious -2425.0 MHz



4.6	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 11.13.2 ☒ FCC Part 15.247/RSS 247 ☒ KDB 558074	Measurement Point ☒ Conducted ☐ Radiated	
Frequency Range:	☒ 2425.0MHz	Results	
Limit:	☒ >30dBc	Low, 2402 MHz > 69dBc High, 2480 MHz > 71dBc	
Nominal Voltage:	☐ 120VAC ☒ 9VDC		
Test Personnel:	Yuriy Litvinov <i>Yuriy Litvinov</i>		Date: 01/21/2026

Note:

Band Edge - Low
Center Freq. 2.400GHzBand Edge - High
Center Freq. 2.4835GHz

4.7	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:		
		Relative Humidity:		
		Atmospheric Pressure:		
Reference Standard(s):		☐ RSS Gen/FCC 15.207 ☐ ANSI C63.4:2014 ☐ ANSI C63.10:2020	Measurement Point ☐ Mains ☐ Telecommunication ports ☐	
Nominal Voltage:		☐ 120VAC ☐ 230VAC ☐ VDC		
Test Personnel:			Date:	
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	N/A	
0.50 to 5	56	46	N/A	
5 to 30	60	50	N/A	

Modifications:	
Note:	



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 (DTS) ☒ 6489.6 MHz (UWB)	
Antenna Separation Distance:	>40mm	
RF Exposure Conditions:	Portable (Body-worn)	
BFE and IPT Antennas Gain:	4.0dBi	
PASS Alarm BLE output power:	117.5mW(20.7dBm)* 0.094 (worst case duty cycle)= 11mW(10.4dBm)	
PASS Alarm BLE EIRP/ERP output power:	EIRP=10.4dBm + 4dBi=14.4dBm, ERP=14.4dBm - 2.15dB=12.25dBm(16.8mW)	
AoA Beacon BLE the source-based conducted output power:	123mW(20.9dBm)*0.1(worst case duty cycle) =12.3mW(10.9dBm)	
AoA Beacon BLE EIRP/ERP output power:	EIRP=10.9dBm + 4.0dBi=14.9dBm, ERP=14.9dBm - 2.15dB= 12.75dBm(18.8mW)	
NDT BLE the source-based conducted output power:	6.1mW(7.84dBm)*0.8(worst case duty cycle) =4.88mW(6.88dBm)	
NDT BLE EIRP/ERP output power:	EIRP=6.88dBm + 4.0dBi=8.88dBm, ERP=8.88dBm - 2.15dB=6.73dBm(4.7mW)	
Body-Are-Network BLE the source-based conducted output power:	1.17mW(0.68dBm)*0.8(worst case duty cycle) =0.9mW(-0.46dBm)	
Body-Are-Network BLE EIRP/ERP output power:	EIRP=-0.46dBm + 4.0dBi=3.54dBm, ERP=3.45dBm - 2.15dB= 1.4dBm(1.38mW)	
UWB EIPR power:	50dBuV(-47.4 dBm/MHz) = 0.00002(mW/MHz). 99% OBW = 560MHz 0.00002(mW/MHz) x 560MHz = 0.01mW <1mW (meets 1mW test exemption)	
The SAR Exclusion Threshold Level		
FCC Part 2.1093	143mW<40mm @2.45GHz	
FCC Part 1.1307	UWB Exempt from RF exposure SAR evaluation as its output power meets the 1mW test exemption threshold stated in Section 1.1307(b)(3)(i)(A).	
RSS 102, Issue 6	170mW<40mm @2.45GHz	
RSS 102, Issue 6	UWB Exempt from RF exposure SAR evaluation according to Section 6.5 if power is less than or equal to 1mW from 6GHz to 30GHz.	
Note:	Each transmitter is connected to exactly one antenna at any given time. Transmitters cannot be connected to the same antenna at the same time.	

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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	02/09/2026	HRE202510498-1	Original Issue