

EMC TEST REPORT



Standard(s):

**47 CFR FCC Part 15.247
RSS 247, Issue 3, 2023**

**FCC ID: Y9ZMRX21A1WS7
IC: 4406A-MRX21A1WS7**

Class II Permissive Change

Product: WS™ ALERT™ X+

Model(s): MRX21A3WS7-NA

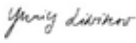
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**Report Number: HRE202303408-6
Report Issue Date: September 15, 2025**

Report Prepared by:

Signature: 
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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 15.209 RSS-Gen, 8.9	Radiated Emissions in restricted band	pass	

Note:	Radiated Emissions testing for Class II PC to verify digital circuitry updates. RF portion has not been changed.
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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:	WS ALERT XPV Headset helps protect against hazardous noise, has Bluetooth wireless communication, noise-cancelling boom microphone, and level-dependent function for ambient listening.			
Model(s):	MRX21A3WS7-NA			
Serial number:	3000802120024			
3M Division:	Personal Safety			
Modifications and Special Measures:	none			
Frequency Range:	2402.0-2480.0 MHz			
Channel No.:	39			
Modulation Type:	GFSK			
FCC Classification:	Digital Transmission System (DTS)			
Output Power EIRP:	3.7dBm (2.3mW), (1dBm Conducted RF Power)			
Antenna Type and Antenna Assembly Gain:	☐ External	☒ Integral PCB Antenna	☐ Dedicated	
	☒ 2.7dBi	☐ Declared by the Manufacturer	☒ Measured	
Test Deviations or Exclusions	☐ Yes	☒ No		
Rated Power:	Voltage:	☒ 120VAC	☐ 230VAC	☒ 3VDC
	Phase:	☐ 1ph	☐ 3ph	☒ USB-C
	Frequency:	☐ 50Hz	☒ 60Hz	
	Current:	N/A		
Test Dates:	07/08/2025			
Received Date:	07/03/2025			
Received Conditions:	☐ Poor	☒ Good		
	☒ Prototype	☐ Production		

3.0 EUT Configuration

3.1 System Configuration

No.	Product Type	Manufacturer	Model	Comments
1	EUT	3M	MRX21A3WS7	
2	USB Charger	Apple	M1385	Support Equipment
3	Wireless Connectivity Tester	R&S	CMW270	Support equipment

3.2 Input/Output Ports of EUT

No.	Description	Type	Comments
1	DC Power	USB-C	
2			

3.3 Cables

No.	Description	Type	Length	Shielding	Comments
1	USB-C	USB 2.0	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 Primary function(s) of EUT

No.	List of Essential Functions
1	Voice communications and audio listing over Bluetooth.
2	

3.6 Exercising of EUT and Interfaces

No.	Mode of Operation
1	Bluetooth operation in paired mode with R&S CMW270 wireless connectivity tester representing a worst case configuration.
2	
3	

4.0 Test Conditions and Results

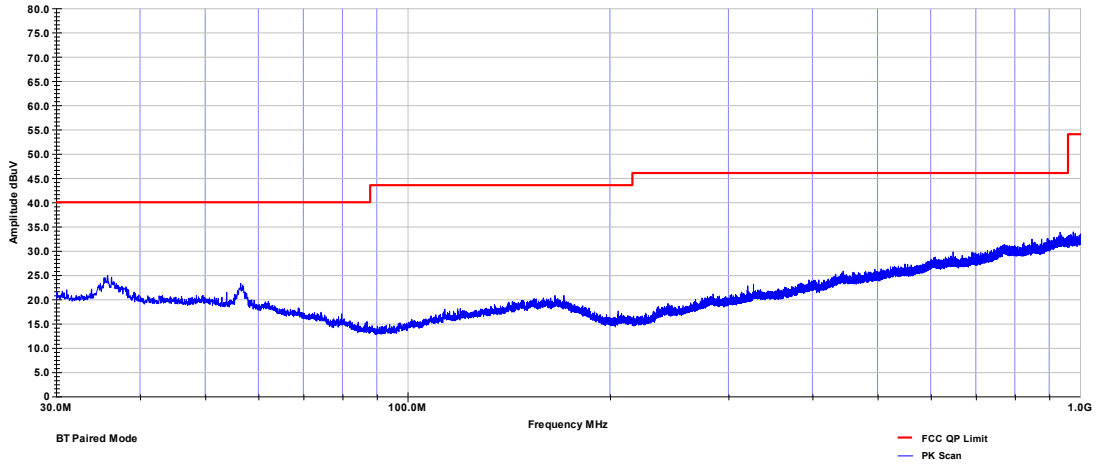
4.1	Radiated Emissions in restricted band				
Method:	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4 standards. EUT was rotated through three orthogonal axes to determine which attitude (orientation) and arrangement produces the highest emission relative 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 ☒ 3.0VDC				
Test Personnel:	Keith Schwartz <i>KS</i>			Date: 07/08/2025	
Limits –15.209 and RSS Gen					
Frequency (MHz)	Limit dB (µV/m)			Distance	Results
	Quasi-Peak	Average	Peak		
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. Worst case configuration. See section 3.6.



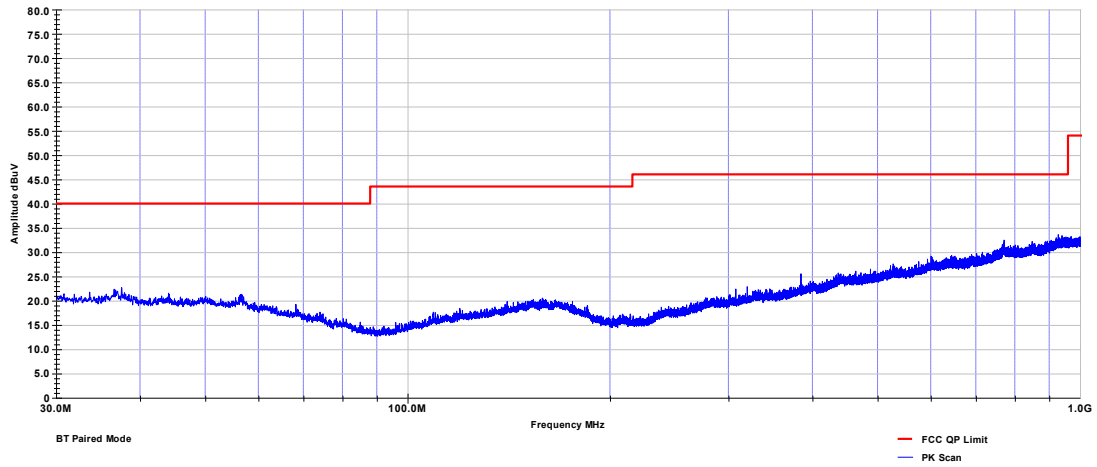
3M Company
Radiated Emissions Pre-scan
 FCC Part 15, Class B, Vertical

Project# - HRE202303408
 Model # - MRX21A3WS7
 Serial # -
 EUT Power - 3VDC



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

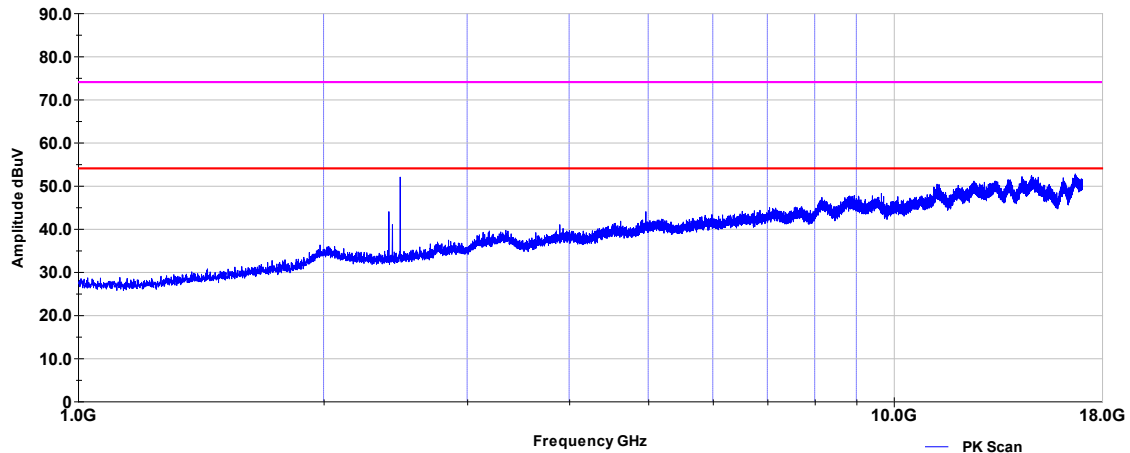
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 Model # - MRX21A3WS7
 Serial # -
 EUT Power - 3VDC





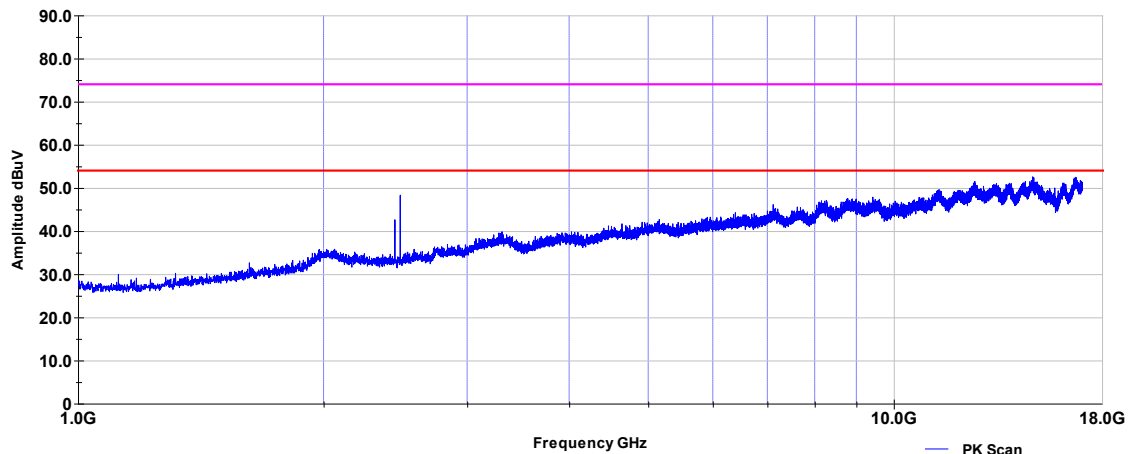
3M Company
Radiated Emissions Prescan
 FCC Part 15, 1GHz-18GHz, Vertical (Preamp)

Project # - HRE202303408
 Model # - MRX21A3WS7
 Serial # -
 EUT Power - 3VDC



3M Company
Radiated Emissions Prescan
 FCC Part 15, 1GHz-18GHz, Horizontal (Preamp)

Project # - HRE202303408
 Model # - MRX21A3WS7
 Serial # -
 EUT Power - 3VDC



Tables - 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
35.72	V	4	16.9	20.8	40	-19.2
55.88	H	2.5	18.1	20.6	40	-19.4
325.97	H	2.5	19.3	21.8	46	-24.2
383.15	H	3.2	20.7	23.8	46	-22.2
974.96	V	3.6	30.1	33.7	54	-20.3
Notes:	Net Reading (dBuV) = Reading (dBμV) + Antenna CF(dB)+Cable CF(dB) – Amp Gain(dB)					

[illegible]

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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	10/20/2023	☒
Horn Antenna	A.H. Systems	SAS 571	1010	10/20/2023	☒
Loop Antenna	A.H. Systems	EHA-51B	1213E	10/20/2023	☐
EMI Receiver	Rohde & Schwarz	ESW26	101412	10/20/2023	☒
Signal Analyzer	Agilent	N9000A	MY53031040	10/20/2023	☒
EMI Receiver	Agilent	E4448A	1530975	10/20/2023	☒
LISN	TESEQ	NNB51	1130	10/20/2023	☒
Coaxial Cable	Insulated Wire	2803	CBL2039	10/20/2023	☒
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	09/15/2025	HRE202303408-6	Original Issue