

Certification Test Report

FCC ID: 2AWTM-RTLS-OEM001 IC: 21847-RTLSOEM001

Radio Standard Specification: FCC 47 CFR Part 15.250 Subpart C ISED Canada's Radio Standards Specification: RSS-220, Issue 1

TÜV SÜD Report Number: RD72160943.301

Manufacturer: Mirion Technologies Model: UWB OEM Tag

Test Begin Date: June 17, 2020 Test End Date: July 7, 2020

Report Issue Date: October 8, 2020



FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 2955.18

This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, ANSI, or any agency of the Federal Government.

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with FCC 47 CFR 15.250 Subpart C and RSS-220, Issue 1.

1.2 Product Description

Ultra-Wideband Transceiver module with integrated planar antenna controlled via off-board microprocessor via serial interface.

Technical Information:

Detail	Description
Transmit Frequency / Carrier Wave	6178.9 MHz to 6731.4 MHz (Channel 5) / 6489.6 MHz
Receiver Frequency / Carrier Wave	6178.9 MHz to 6731.4 MHz (Channel 5) / 6489.6 MHz
Modulation Format	UWB using PRF16, PRF64
Operating Voltage	3.3Vdc
Antenna Type / Gain:	Planar PCB / 1.4dBi
Temperature Category	-20C to +60C
Type of equipment:	Mobile
Hardware version:	A
Software release:	5.6.4

Manufacturer Information: Mirion Technologies (MGPI) SAS 174 Route d'Eyguiéres 13113 Lamanon France

Contact: David Jarrow 1-770-432-2744 DJarrow@Mirion.com

EUT Serial Numbers: 0B:00:01BA

Test Sample Condition: The test samples were provided in good working order with no visible defects.

1.3 Test Methodology and Considerations

The device is physically small and can be used in many orientations. Therefore, the EUT was evaluated in the X, Y, and Z planes. The worst-case plane was X-Plane. The data in the report represents worst case.

The EUT Power setting for PRF16 was: Coarse Gain 0, Fine Gain 9

The EUT Power setting for PRF64 was: Coarse Gain 1, Fine Gain 4

For testing, the client provided software to control and configure the EUT.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

TÜV SÜD America Inc. 2320 Presidential Drive, Suite 101 Durham, NC 27703 Phone: (919) 381-4235

2.2 Laboratory Accreditations/Recognitions/Certifications

TÜV SÜD America Inc. (Durham) is accredited to ISO/IEC 17025 by A2LA accreditation program, and has been issued certificate number 2955.18 in recognition of this accreditation. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

The Semi-Anechoic Chamber Test Site and Conducted Emissions Site have been fully described, submitted to, and accepted by the FCC and Innovation, Science and Economic Development (ISED) Canada.

FCC Designation Number: US1245 FCC Test Firm Registration Number: 238628 ISED Canada Company Number: 20446

2.3 Radiated Emissions Test Site Description

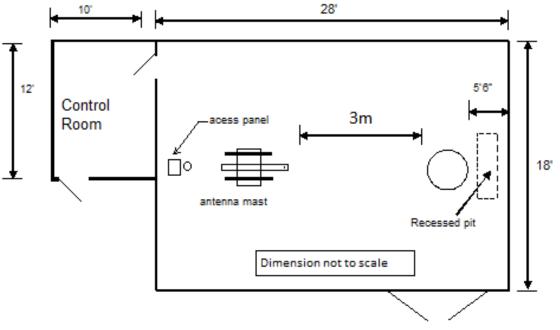
2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 18' x 28' x 18' shielded enclosure. The chamber is lined with Samwha Electronics Co. LTD Ferrite Absorber, model number SFA300 (HSN-1). The ferrite tile is 10cm x 10 cm and weighs approximately 1.4lbs. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber. On top of the ferrite tiles is DMAS HT-45 (Dutch Microwave Absorber Solutions) hybrid absorber on all walls except the wall behind the antenna mast which has a shorter DMAS HT-25 absorber.

The turntable is 1.50m in diameter and is located 150cm from the back wall of the chamber. The chamber is grounded via 1 - 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using short #6 copper wire. The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the turntable. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane.

Behind the turntable is a 2' x 6' x 1.5' deep shielded pit used for support equipment if necessary. The pit is equipped with 2 - 4" PVC chase from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

To comply with the requirements of the test methods given on page 4, RF absorbing foam was placed inside the chamber in a configuration that provided the best results. First, a 12ft X 12ft. patch of 10" tall absorber was placed on the floor between the turntable and the receiving antenna. This absorber meets the absorption requirements specified in ANSI C63.4:2009.



A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:



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3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
- RSS-220, Issue 1 (March 2009) Amendment 1 (July 2018) Devices Using Ultra-Wideband (UWB) Technology

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Asset ID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
DEMC0426	Thermotron	S-8 Mini Max	Environmental Chamber	25-2888-10	1/23/2020	1/23/2021
DEMC3002	Rohde & Schwarz	ESU40	Receiver	100346	1/22/2020	1/22/2021
DEMC3006	Rohde & Schwarz	TS-PR18	Amplifier	122006	1/23/2020	1/23/2021
DEMC3007	Rohde & Schwarz	TS-PR26	Amplifier	100051	1/23/2020	1/23/2021
DEMC3012	Rohde & Schwarz	EMC32-EB	Software	100731	NCR	NCR
DEMC3014	EMCO	3115	Antenna	9901-5653	4/12/2019	4/12/2021
DEMC3016	Fei Teng Wireless Technology	HA-07M18G- NF	Antenna	2013120203	4/8/2020	4/8/2021
DEMC3032	Hasco, Inc.	HLL142-S1-S1- 192/WA	Cable	3075	1/23/2020	1/23/2021
DEMC3033	Hasco, Inc.	HLL142-S1-S1- 36	Cable	1435	1/23/2020	1/23/2021
DEMC3038	Florida RF Labs	NMSE-290AW- 60.0-NMSE	Cable Set	1448	1/27/2020	1/27/2021
DEMC3039	Florida RF Labs	NMSE-290AW- 396.0-NMSE	Cable Set	1447	1/27/2020	1/27/2021
DEMC3055	Rohde & Schwarz	3005	Cable	3055	1/23/2020	1/23/2021
DEMC3085	Rohde & Schwarz	FSW43	Spectrum Analyzer	103997	1/22/2020	1/22/2021
DEMC3161	TESEQ	CBL-6112D	Antenna	51323	2/18/2020	2/18/2021
332	Rohde & Schwarz	TS-PR40	Amplifier	100021	6/12/2020	6/12/2022
333	Rohde & Schwarz	3160-10	Antenna	49404	NCR	NCR
335	Suhner	SF-102A	Cable	882/2A	6/23/2020	6/23/2021

Table 4-1:	Test Ec	luipment
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NCR = No Calibration Required

DMAS MT-25 RF absorber material was used on the floor for all final measurements above 1 GHz.

Asset DEMC3002: Firmware Version: ESU40 is 4.73 SP4

Asset DEMC3012: Software Version: EMC32-B is 10.50.00

Asset DEMC3020: Firmware Rev: 2.20.382.113

Asset DEMC3085: Instrument Firmware 2.90 SP1

All assets were only used within their current calibration cycle.

5 SUPPORT EQUIPMENT

Table 5-1	FUT and	Support	Equipment
Table J-1.		Support	Lyuipinent

ltem #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Mirion Technologies	UWB OEM Tag	See Section 1.2

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

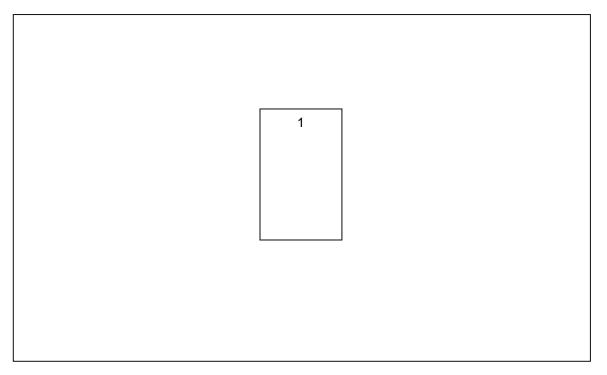


Figure 6-1: EUT Test Setup Block Diagram

7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement - FCC: 15.203 and RSS-220, Issue 1, Section 5.1 (b) / 5.3.1(a)

The antennas are non-detachable PCB trace antennas.

7.2 Band of Operations – FCC 15.250(a) and RSS-220, Issue 1, Section 5.1 (a)

7.2.1 Measurement Procedure

The EUT was placed in an environmental chamber and the center frequency and 10dB bandwidth were measured in accordance with ANSI C63.10: 2013 Section 10.1. The resolution bandwidth (RBW) of the spectrum analyzer was set to 1MHz. The video bandwidth (VBW) was set to \geq 1 to 3 times the RBW. The trace was set to max hold with a Peak detector active.

7.2.2 Measurement Results

Measurement performed by: Chris Gormley

Temperature	Measured -10dB Band Edges 15.25 Frequency			15.250 Freq	uency Limits	
°C	(MHz)	Lower	Upper	Fmin (MHz)	Fmax (MHz)	
-20	6490	6138.4	6827.7	5925	7250	
-10	6488	6156.3	6833.7	5925	7250	
0	6488	6188.3	6865.6	5925	7250	
10	6476	6232.3	6855.6	5925	7250	
20	6480	6236.3	6821.2	5925	7250	
30	6490	6214.3	6825.7	5925	7250	
40	6490	6322.2	6787.7	5925	7250	
50	6400	6212.3	6807.7	5925	7250	
60	6402	6238.3	6789.7	5925	7250	

 Table 7.2.2-2: Frequency Stability over Temperature

*Note - RSS-220 limits: The -10 dB bandwidth of the device shall be totally contained in the band 3.1-10.6 GHz

7.3 10 dB Bandwidth – FCC 15.250(a) and RSS-220 5.1(a)

7.3.1 Measurement Procedure

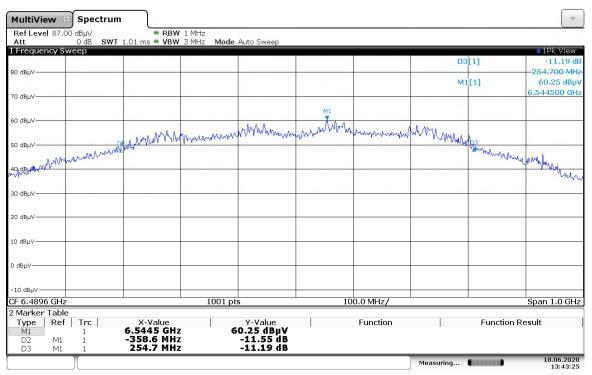
The 10 dB bandwidth was measured in accordance with the ANSI C63.10: 2013 Section 10.1. The resolution bandwidth (RBW) of the spectrum analyzer was set to 1MHz. The video bandwidth (VBW) was set to \geq 1 to 3 times the RBW. The trace was set to max hold with a Peak detector active.

7.3.2 Measurement Results

Measurement Performed By: Chris Gormley

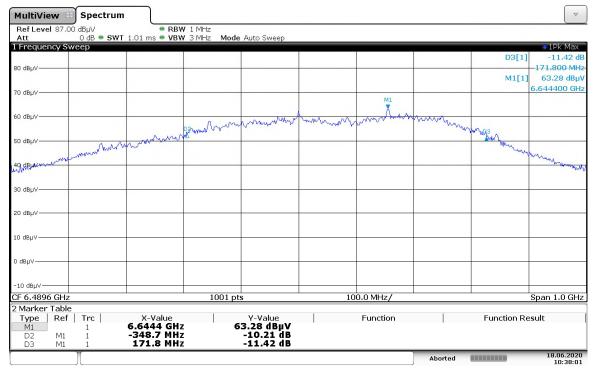
Modulation Format	Frequency fc [MHz]	10 dB Bandwidth [MHz]
PRF16	6544.5	613.3
PRF 64	6644.4	520.5

Table 7 3 2-1 10 dB Bandwidth



13:43:25 18.06.2020

Figure 7.3.2-1: 10 dB Bandwidth – PRF16



10:38:02 18.06.2020

Figure 7.3.2-2: 10 dB Bandwidth – PRF64

7.4 Fundamental Emission Peak Power – FCC 15.250(d) and RSS-220, Issue 1, Section 5.3.1(g)

7.4.1 Measurement Procedure

The maximum peak radiated output power was measured in accordance with ANSI C63.10: 2013 Section 10.3.5. The Resolution Bandwidth (RBW) of the spectrum analyzer was set to 50MHz. The Video Bandwidth (VBW) was set to its maximum 80MHz. The trace was set to max hold with a peak detector active.

The RMS power was measured with RBW of the spectrum analyzer set to 1MHz and the VBW set to 3MHz. A longer sweep time was utilized a to ensure a 1ms integration period over each measurement bin.

7.4.2 Measurement Results

Measurement Performed By: Chris Gormley

Field Strength to EIRP (dBm): Corrected Field Strength – 95.2 = EIRP (dBm)

 $R_{C} = R_{U} + CF_{T}$

Where:

CF⊤	=	Total Correction Factor (AF+CA-PA)
Rυ	=	Uncorrected Reading
Rc	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
PA	=	Preamplifier Gain

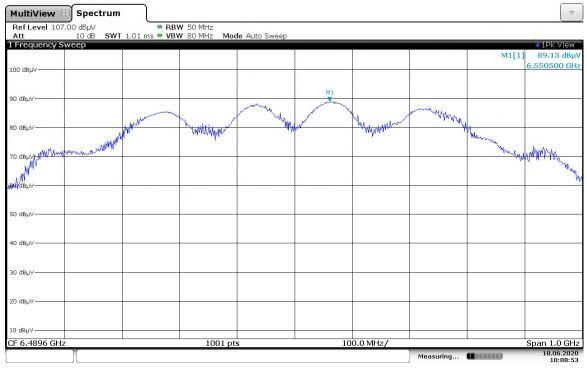
Example Calculation:

89.13dBm + 5.79dB = 94.92dBuV 94.92dBuV - 95.2 = -0.28dBm EIRP

Per FCC 15.250(d) and RSS-220, Section 5.3.1(g) the peak limit on the fundamental is 0 dBm EIRP.

Modulation Format	Detector	Frequency (MHz)	Measured Power (dBuV)	Correction (dB/m)	Output Power (EIRP) (dBm)	Limit (dBm)
PRF16	Peak	6550.5	89.13	5.79	-0.28	0
PRF16	RMS	6533.6	41.12	5.75	-48.33	-41.3
PRF64	Peak	6559.5	85.01	5.81	-4.38	0
PRF64	RMS	6616.5	47.15	5.94	-42.11	-41.3

Table 7.4.2-1: Maximum Radiated Output Power



10:08:54 18.06.2020



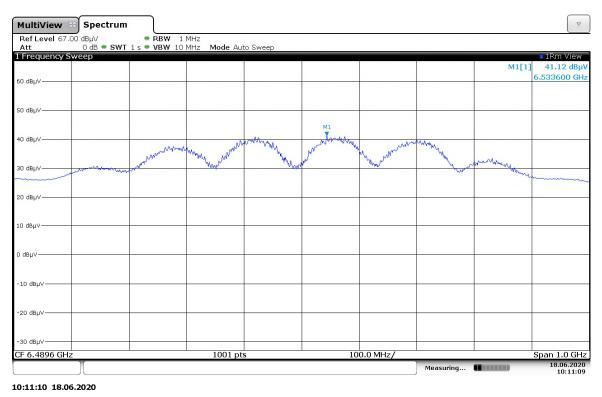


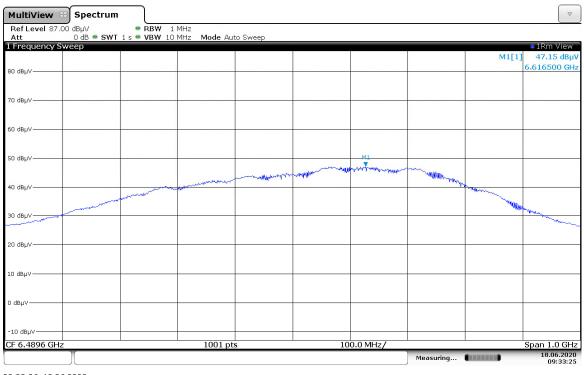
Figure 7.4.2-2: RMS Power Plot – PRF16

Model: UWB OEM Tag

MultiView 😁	Spectrum	J						
Ref Level 107.0		RBW 50 MHz						
Att 1 Frequency Sw	10 dB SW 11.01 /eep	.ms 🗢 VBW 80 MHz 🛛 Mo	de Auto Sweep					1Pk View
							M1[1]	
100 dBµV								6.559500 GHz
90 dBµV								
50 0004			. Internet	M1	managen -	man		
80 dBµ∨		- which and a second				The second se	han	
70 dBµV	and the second						and the second	
Manuel								and the state man
60 dBµV								
50 dBµV								
40 dBµV								
30 dBµV								
30 UBHV								
20 dBµV								
10 dBµ∨								
CF 6.4896 GHz		1001 pt	6	10	0.0 MHz/			Span 1.0 GHz
	Л					Measuring		18.06.2020 09:39:32

09:39:32 18.06.2020





09:33:26 18.06.2020

Figure 7.4.2-4: RMS Power Plot – PRF64

7.5 Radiated emissions above 960 MHz – FCC 15.250(d)(1) and RSS-220, Issue 1, Section 5.3.1(d)

7.5.1 Measurement Procedure

The rms-average power spectral density was measured in accordance with the ANSI C63.10 Section 10.3.7. The equipment under test was tested radiated. The resolution bandwidth (RBW) of the spectrum analyzer was set to 1 MHz. The video bandwidth (VBW) was set to \geq 1 MHz. Span was set to a convenient frequency segment. The trace was set to max hold with an RMS detector active. The sweep time did not exceed 1ms per bin.

7.5.1.1 Sample Calculation:

Field Strength to EIRP (dBm): Field Strength -95.2_{3m} (104.7_{1m}) = EIRP (dBm) (Applied using amplitude offset in plots)

 $R_C = R_U + CF_T$

Where:

- CF_T = Total Correction Factor (AF+CA-PA)
- R_U = Uncorrected Reading
- Rc = Corrected Level
- AF = Antenna Factor
- CA = Cable Attenuation
- PA = Preamplifier Gain

Example Calculation: RMS

Corrected Level: 28.38 + 5.11 = 33.49dBuV/m Convert from dBuV to dBm: 33.49 - 104.7 = -71.21dBm/MHz

Table 7.5.1.1-1 Limits from 15.250(d)(1):

Frequency	EIRP
MHz	dBm
960 to 1610	-75.3
1610 to 1990	-63.3
1990 to 3100	-61.3
3100 to 5925	-51.3
5925 to 7250	-41.3
7250 to 10600	-51.3
Above 10600	-61.3

Table 7.5.1.1-2 Limits from RSS-220 Section 5.3.1(d):

Frequency	EIRP
MHz	dBm
960 to 1610	-75.3
1610 to 4750	-70.0
4750 to 10600	-41.3
Above 10600	-61.3

7.5.2 Measurement Results

Measurement Performed By: Chris Gormley

Table 7.5.2-1: Radiated Emissions above 960MHz – PRF16

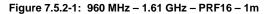
Emission Frequency MHz	Reading From plot dBµV	Antenna Polarity	Measurement Distance m	Correction Factors dB/m	Corrected EIRP dBm	Limit dBm
1151.96	18.83	V	1	-7.05	-92.92	-75.3
1247.39	18.32	Н	1	-7.00	-93.38	-75.3
6297.65	33.49	V	1	5.11	-66.10	-41.3
6297.65	28.38	Н	1	5.11	-71.21	-41.3
6563.94	32.87	V	1	5.82	-66.01	-41.3
6564.9	43.86	Н	1	5.82	-55.02	-41.3
8753	16.38	V	1	10.84	-77.48	-51.3
8568.7	16.04	Н	1	11.04	-77.62	-51.3

Table 7.5.2-2: Radiated Emissions above 960MHz – PRF64

Emission Frequency MHz	Reading From plot dBµV	Antenna Polarity	Measurement Distance m	Correction Factors dB/m	Corrected EIRP dBm	Limit dBm
1267.39	18.63	Н	1	-6.99	-93.06	-75.3
1227.09	18.61	V	1	-7.01	-93.1	-75.3
6292.01	28.06	Н	1	5.09	-71.55	-41.3
6299.53	35.02	V	1	5.11	-64.57	-41.3
6663.78	34.59	Н	1	6.04	-64.07	-41.3
6618.54	42.18	V	1	5.94	-56.58	-41.3
8741.9	16.53	Н	1	10.85	-77.32	-51.3
8747.6	16.51	V	1	10.85	-77.34	-51.3

MultiView 8	Spectrum								
Ref Level 77.4	6 dBµV Offset 0 dB ● SWT		3WI1 MHz 3WI3 MHz Moo	la Auto Curra					
1 Frequency Sv		52 S 🔍 VE	STATE AND A	de Auto Sweep					●1Rm View
							MI	[1]	18.83 dBµV
70 dBµV									1.1519640 GHz
re dopt						-			
60 dBµV									
50 dBµV									
40 dBµV									
40 UBH V						-			
30 dBµV									
FCC 15_250		M	1						
10 dBµV									
10 0004									
0 dBµV									
-10 dBµV									
-20 dBµV									
960.0 MHz			32001 pt	re -	6	4.0 MHz/			1.6 GHz
900.0 MI12	T		52001 pt	.3	0.		Measuring		18.06.2020
L							measuring		16:15:10

16:15:11 18.06.2020



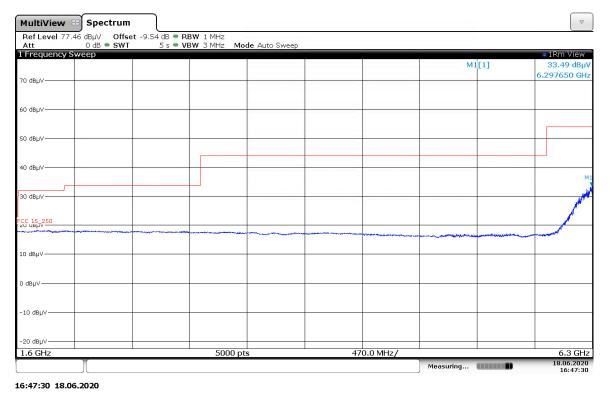
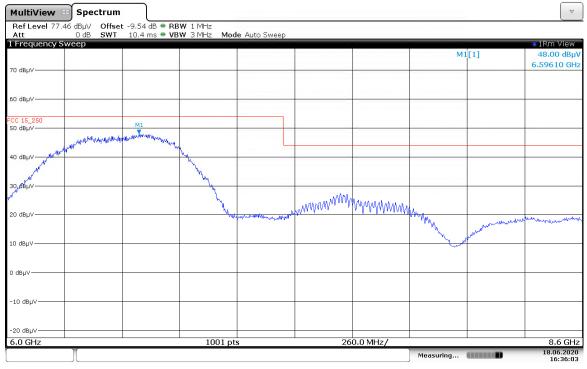


Figure 7.5.2-2: 1.61 GHz - 6.3 GHz - PRF16 - 1m

Model: UWB OEM Tag



16:36:03 18.06.2020

Figure 7.5.2-3: 6 GHz – 8.6 GHz – PRF16 – 1m

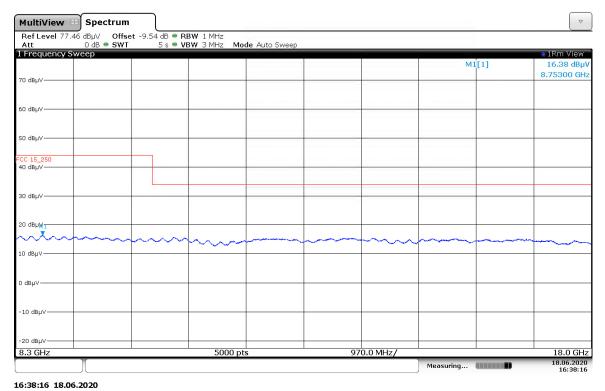
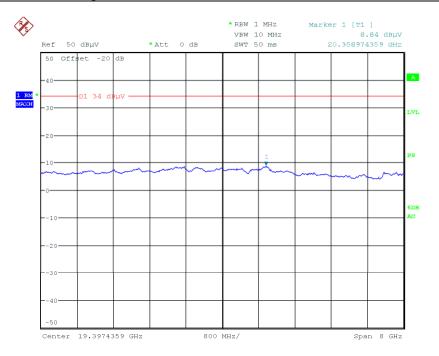


Figure 7.5.2-4: 8.3 GHz - 18 GHz - PRF16 - 1m

FCC: 2AWTM-RTLS-OEM001



Date: 6.JUL.2020 14:05:09

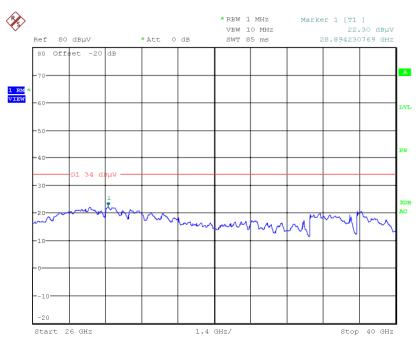


Figure 7.5.2-5: 18-26 GHz – PRF16 – 30cm

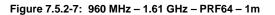
Date: 7.JUL.2020 15:27:17

Figure 7.5.2-6: 26-40 GHz - PRF16 - 30cm

TÜV SÜD America Inc.

MultiView 8	Spectrum								
Ref Level 77.4	6 dBµV Offset - 0 dB ● SWT		WI1MHz WF3MHz Moo	de Auto Cuicon					
1 Frequency Sv		2 S 🖉 MB.	WINZ WIN	de Auto Sweep					•1Rm View
								M1[1]	
70 dBµV									1.227090 GHz
70 dBh4									
60 dBµV									
50 dBµV									
40 dBµV									
30 dBµV									
FCC 15_250				M1					
20 ubpv			والمرجعة مريرة والمحتول ومردو ومعاور يتعارف مرد						
10 dBµV									
0 dBµV									
0 0000									
-10 dBµV									
-20 dBµV									
960.0 MHz			5000 pt	s	65	5.0 MHz/			1.61 GHz
			_ 000 pt	**			Measuring		22.06.2020
									08:35:15

08:35:15 22.06.2020



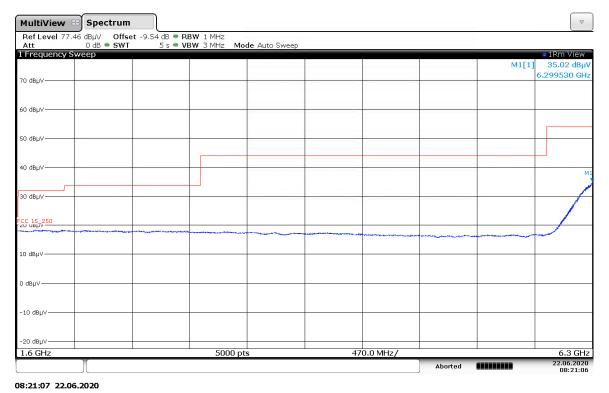


Figure 7.5.2-8: 1.61 GHz - 6.3 GHz - PRF64 - 1m

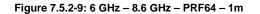
Model: UWB OEM Tag

FCC: 2AWTM-RTLS-OEM001

IC: 21847-RTLSOEM001

MultiView 😁	Spectrum								
Ref Level 77.46 Att	odBµV Offset 0 dB ● SWT		3W 1 MHz 3W 3 MHz Moo	la Auto Cueso					
1 Frequency Sw		5 S 🔍 VI		le Auto Sweep					• 1Rm View
							M	1[1]	42.18 dBµV
70 dBµV									6.618540 GHz
60 dBµV									
FCC 15_250 50 dBµV									
50 dbp+		M1							
40 dBµV		and the second second		-					
40 UBHV	and the second descent of the second s	and the second second							
	and the second sec								
30 dBµV									
20 ⁶ dBµV									
				the second second					
10 dBµV									
0 dBµV									
-10 dBµ∨									
-20 dBµV									
6.0 GHz	~		5000 pts	6	26	0.0 MHz/			8.6 GHz
							Measuring		22.06.2020 08:37:31

08:37:31 22.06.2020



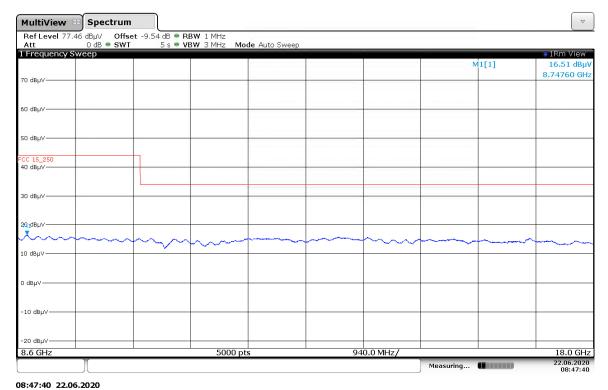
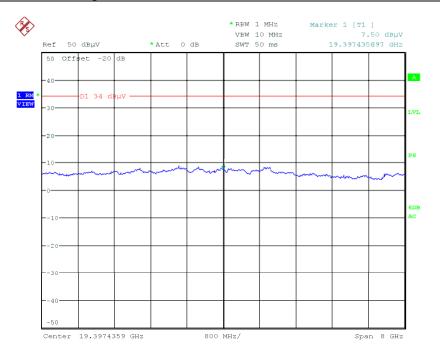


Figure 7.5.2-10: 8.3 GHz - 18 GHz - PRF64 - 1m

FCC: 2AWTM-RTLS-OEM001



Date: 6.JUL.2020 12:24:33

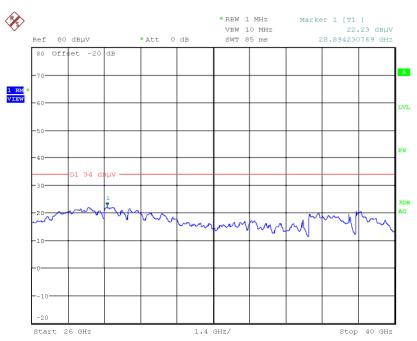


Figure 7.5.2-11: 18-26 GHz – PRF64 – 30cm

Date: 7.JUL.2020 15:21:07

Figure 7.5.2-12: 26-40 GHz - PRF64 - 30cm

7.6 Radiated emissions at or below 960 MHz, FCC 15.250(d)(4) and RSS-220, Issue 1, Section 5.3.1(c) / 3.4

7.6.1 Measurement Procedure

The unwanted emissions from the lowest frequency generated or 9 kHz to 960 MHz in accordance with ANSI 63.10: 2013 Section 10.2. For peak prescans of the frequency range 30MHz to 960MHz, the Resolution Bandwidth (RBW) of the spectrum analyzer was set to 100 kHz, and the Video Bandwidth (VBW) was set to 300 kHz. For final measurements, the receiver function of the analyzer was employed, and the resolution bandwidth was 120kHz.

The correction factor is a combination of measurement cable(s) loss, preamplifier gain, antenna factor, and a distance correction factor (if needed).

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)		
0.009-0.490	2,400/F (F in kHz)	300		
0.490-1.705	24,000/F (F in kHz)	30		
1.705-30	30	30		
30.0 to 88.0	100	3		
88.0 to 216.0	150	3		
216.0 to 960.0	200	3		

Table 7.6.2.1-1 Limits from FCC 15.209 and RSS-220, Section 3.4:

7.6.2 Measurement Results

Measurement Performed By: Chris Gormley

Frequency (MHz)			Antenna Polarity	Turntable Position	Antenna Height	Correction Factors	Corrected Level (dBuV/m)		_	-imit BuV/m)		argin dB)
	pk	Qpk/Avg	(H/V)	(o)	(cm)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
30.01	4.10	-2.30	Н	0	100	23.19		20.89		40.0		19.11
76.28	3.40	-3.10	Н	0	100	11.33		8.23		40.0		31.77
195.83	4.50	-1.60	Н	0	100	13.93		12.33		43.5		31.17
357.05	4.10	-2.40	Н	0	100	19.65		17.25		46.0		28.75
617.23	6.00	-0.40	Н	0	100	24.03		23.63		46.0		22.37
976.67	5.80	-0.50	Н	0	100	26.97		26.47		54.0		27.53

Full Spectrum

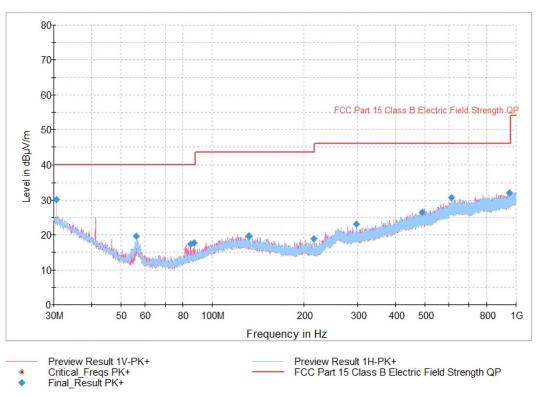


Figure 7.6.2.-1: Emission Profile 30MHz-1GHz

7.7 Radiated Emissions in the GPS bands FCC 15.250(d)(2) and RSS-220, Issue 1, Section 5.3.1(e)

7.7.1 Measurement Procedure

Unwanted emissions in the above bands were measured radiated in accordance with ANSI 63.10: 2013 Section 10.3.10. The resolution bandwidth (RBW) of the spectrum analyzer was set to 1 kHz. The ratio of the RBW to Video Bandwidth (VBW) was set to \geq 3 where possible. The trace was set to max hold with the RMS detector active. The sweep time did not exceed 1ms per bin.

7.7.2 Sample Calculation:

Field Strength to EIRP (dBm): Field Strength – 95.2 = EIRP (dBm) R_c = R_U + CF_T

Where:

CF⊤	=	Total Correction Factor (AF+CA-PA)
Rυ	=	Uncorrected Reading
Rc	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
PΔ	_	Preamplifier Gain

PA = Preamplifier Gain

-78.41dBm + -7.29dB = --85.7dBm EIRP

The frequency bands to be investigated and the associated limits are:

Table 7.7.2-1 Frequency Bands

Frequency MHz	EIRP dBm
1164 to 1240	-85.3
1559 to 1610	-85.3

7.7.3 Measurement Results:

Measurement Performed By: Chris Gormley

There were no emissions above the noise floor of the analyzer for either PRF16 or PRF64 modulation formats. See plots on the following pages.

Model: UWB OEM Tag

FCC: 2AWTM-RTLS-OEM001

MultiView 8	3) Spectrum								
Ref Level 67.0 Att	00 dBµV 0 dB • SWT		1 kHz D kHz Mode Au	uto Sweep					SGL
1 Frequency S		703 0 001 10	SKI12 MOUCAL						●1Rm Max
							MI	[1]	6.64 dBµV
60 dBµV									66405500 GHz
00 ubh4-									
50 dBµV									
40 dBµV									
30 dBµV									
50 dbp (
20 dBµV									
10 dBµV									
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-30 dBµV									
1.164 GHz	1	1	76000 pt	l Is	7	.6 MHz/	1	1	1.24 GHz
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L							Ready		11:23:27

11:23:28 18.06.2020

Figure 7.7.3-1: 1.164 GHz – 1.24 GHz – 16PRF – 3m

MultiView	Spectrum								
Ref Level 67.0 Att		• RBW : 51 s • VBW 10	L kHz) kHz Mode Au	ito Sweep					SGL
1 Frequency S								1	●1Rm Max
							MI	[1]	5.86 dBµV 95365500 GHz
60 dBµV								1.5	93303300 0112
50 dBµ∨									
40 dBµV									
30 dBµV									
20 dBµV									
10 dBµV							M1		
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-20 dBµV	1, 1,					1 1 1 1 1			
-30 dBµV									
1.559 GHz		1	51000 pt	S	5	.1 MHz/			1.61 GHz
	Π						Ready	00000000	18.06.2020 11:20:28

11:20:28 18.06.2020

Figure 7.7.3-2: 1.559 GHz – 1.610 GHz – 16PRF – 3m

Model: UWB OEM Tag

MultiView 8	Spectrum								
Ref Level 67.0 Att	0 dBµV 0 dB • SWT		L kHz) kHz Mode Au	to Swoon					SGL
1 Frequency Sv		703 0 00 10	JKHZ MOUE AL	по эмеер					●1Rm Max
								M1[1]	6.43 dBµV
50 Jp. 11									79182500 GHz
60 dBµV									
50 dBµV									
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and a second second second second second second second second second second second second second second second									
30 dBµV									
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and the states						Transfer in	nationale.		
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-20 dBµV	1								
-30 dBµ∨									
1.164 GHz			76000 pt	S	7	.6 MHz/			1.24 GHz
[Ready		18.06.2020 11:05:49

11:05:50 18.06.2020

Figure 7.7.3-1: 1.164 GHz – 1.24 GHz – 64PRF – 3m

MultiView	Spectrum								
Ref Level 67.0 Att		• RBW 51 s • VBW 1	1 kHz 0 kHz Mode Au	ito Sweep					SGL
1 Frequency S		913 - V BW 1						1	●1Rm Max
							MI	[1]	6.35 dBµV 07102500 GHz
60 dBµV								1.0	07102300 GHZ
50 dBµV									
40 dBµ∨									
30 dBµV									
20 dBµV									
10 dBµV									MI
Mangandal	Libeline crategies	ու տեղել գերել են հետ	late hit of the second sector	like to a la de alcate la			halala sutra dinal na	היייה היישראלי איניייי	addited in the state of the second
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-30 dBµ∨									
1.559 GHz		·	51000 pt	ts	5	.1 MHz/			1.61 GHz
	J						Ready		18.06.2020 11:08:04

11:08:05 18.06.2020

Figure 7.7.3-2: 1.559 GHz – 1.610 GHz – 64PRF – 3m

7.8 Transmit On/Off Requirements – RSS-220, Issue 1, Section 5.3.1(b)

The device is to transmit only when it is sending information to an associated receiver. The device shall cease transmission of information within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB device at least every 10 seconds or the UWB device shall cease transmitting any information other than periodic signals used for the establishment or re-establishment of a communication link with an associated receiver.

The Theory of Operation, provided under a separate cover, contains detailed information supporting the transmission time of the device.

8 MEASUREMENT UNCERTAINTY

The expanded laboratory measurement uncertainty figures (U_{Lab}) provided below correspond to an expansion factor (coverage factor) k = 1.96 which provide confidence levels of 95%.

Parameter	U _{lab}
Occupied Channel Bandwidth	± 0.004%
RF Conducted Output Power	± 0.689 dB
Power Spectral Density	±0.5 dB
Antenna Port Conducted Emissions	± 2.717 dB
Radiated Emissions	± 5.877 dB
Temperature	± 0.860 °C
Radio Frequency	±2.832 x 10-8
AC Power Line Conducted Emissions	±2.85 dB

9 CONCLUSION

In the opinion of TÜV SÜD America Inc. the UWB OEM Tag manufactured by Mirion Technologies meets the requirements of FCC 15.250 and RSS-220, Issue 1.

END REPORT