6. Measurement Data (continued)

6.11. Public Exposure to Radio Frequency Energy Levels (1.1307 (b)(2))

6.11.1. SAR Test Exclusion Calculation

Requirement: Portable devices as defined in § 2.1093 of this chapter operating under Part 15 are subject to radio frequency radiation exposure requirements as specified in 1.1307(b)(2) and 2.1093 of this chapter.

For a 1-g SAR, the test exclusion result must be ≤ 3.0.

Test Notes: The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by the following formula:

$$\text{SAR Test Exclusion} = \frac{P_{MAX}}{d_{MIN}} \times \sqrt{f_{(GHz)}} \quad (1)$$

P_{MAX}	mW	Maximum power of channel, including tune-up tolerance
d_{MIN}	mm	Minimum test separation distance, mm (≤ 50 mm)
$f_{(GHz)}$	GHz	$f_{(GHz)}$ is the RF channel transmit frequency in GHz (>100 MHz and <6 GHz)

(1) FCC OET 447498 - Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

Result: The device under test meets the exclusion requirement detailed in FCC OET 447498.

Channel:		**4, 64M**	
Input:	P_{MAX}	0.281	mW
	d_{MIN}	5.000	mm
	$f_{(GHz)}$	3.746	GHz
Test Exclusion:		**0.109**	
Limit Exemption:		**3.000**	

[1] Taken from the peak data in Section 6.5 of this test report (converted to mW).

The device does not exceed the test limit exemption and therefore a routine SAR Evaluation is not required.

Note: The Laird Connectivity BT900 module is used for setup and configuration of the device and is not used/operated simultaneously with the UWB radio.

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6. Measurement Data (continued)

6.11.2 RF Exposure for devices that operate above 6 GHz (1.1310)

Requirements: 2.1093(b): A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

2.1093 (d): Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified 47 CFR 1.1310. Measurements and calculations to demonstrate compliance with MPE Field strength or power density limits for device operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure for devices that operate between 1500 to 100,000 MHz is 1.0 mW/cm^2 using a 30 minute averaging time.

Center Frequency (GHz)	MPE Distance (cm)	DUT Peak Output Power (dBm)	DUT Antenna Gain (dBi)	DUT Peak Power (mW)	Power Density		FCC Limit (mW/cm^2)
					(mW/cm^2)	(W/m^2)	
	(1)	(2)	(3)		(4)		(5)
6.488	20	-4.44	0.0	0.360	0.0000716	0.0007157	1
2.4 GHz WLAN	20	20.70	6.0	117.5	0.0930529	0.9305295	1
				SUM	**0.0931245**	**0.9312452**	

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 5 centimeters of the body of the user.
2. Section 6.7 of this test report. Measured Peak Power at 3 Meters.
3. Antenna Gain included in the measured values of Section 6.7
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

Note: The Laird Connectivity BT900 module is used for setup and configuration of the device and is not used/operated simultaneously with the UWB radio.

Worse Case mode of the FCC ID: PHV9865 module was 2.4 GHz in 2x2 Mimo operation on Channel 11 with an output power of 20.7 dBm and a combined antenna gain of 6.0 dBi

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