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RF EXPOSURE CALCULATIONS

Requirement:

According to USA CFR 15 §1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines. For Canada, RSS-102 sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radiocommunication apparatus designed to be used within the vicinity of the human body.

Maximum Permissible Exposure Calculations:

USA REF: 1.1310, 2.1091/1093, 447498 D01 General RF Exposure Guidance v06
 IC REF: RSS-102 Issue 5, Safety Code 6
 Min. Sep. Distance: 20 cm (Mobile)

Test Date: 11-Jun-18
 Test Engineer: J. Brunett
 EUT: GridConnect ESP32
 EUT Mode: Worst Case
 Meas. Distance: 3 meters

Mode	Freq. MHz	Worst Case E3(Avg)* dBuV/m	E20cm(Avg) dBuV/m	H20cm(Avg) dBuA/m	Canada ISED RSS-102 MPE			USA FCC 1.1310 MPE		
					SC6 Limit (E20cm) dBuV/m	SC6 Limit (H20cm) dBuA/m	Worst Case MPE Ratio	E20cm Limit*** dBuV/m	H20cm Limit*** dBuA/m	Worst Case MPE Ratio
Mode	Freq. MHz	Worst Case EIRP(Avg)** dBm	E20cm(Avg) dBuV/m	S20cm(Avg)**** mW/cm2	SC6 Limit (S20cm) mW/cm2	MPE Ratio		S Limit mW/cm2	MPE Ratio	
BLE	2402	6.8	125.5	0.00094	5.5	0.0001722		1.00000	0.0009429	
BLE	2440	7.5	126.2	0.00111	5.5	0.0002033		1.00000	0.0011129	
BLE	2480	8.5	127.2	0.00139	5.5	0.0002548		1.00000	0.0013946	
WLAN – B/G/N	L	15.8	134.5	0.00749	5.5	0.0013674		1.00000	0.0074856	
WLAN – B/G/N	M	15.5	134.2	0.00699	5.5	0.0012761		1.00000	0.0069859	
WLAN – B/G/N	H	15.3	134.0	0.00667	5.5	0.0012187		1.00000	0.0066715	
MPE Total (<1):						.001622		MPE Total (<1):	.008880	
Complies?						Yes		Complies?	Yes	

*As Measured / Computed from highest fundamental emission, see fundamental emission section of this report.
 **maximum of either EIRP or Pout as measured.
 *** For FCC MPE, use of 300 kHz limit for signals below 300 kHz as previously requested by FCC.
 **** EIRP (mW) = S (mW/cm²) x 4 x PI x 20cm²

Summary:

The EUT with all transmitters is compliant with both the FCC power density limit and the ISED Exposure Evaluation limits.