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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.

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: 8-Sep-23
Test Engineer: Joseph Brunett
EUT: Lionel Base 3
EUT Mode: Worst Case
Meas. Distance: 3m

								Canada ISED RSS-102 MPE			USA FCC 1.1310 MPE	
R0	Mode	Freq. MHz	Max Efield @ 3m dBuV/m	Worst Case Po/EIRP(Avg) dBm	E20cm(Avg) dBuV/m	S20cm(Avg) mW/cm2		SC6 Limit (S20cm) mW/cm2	MPE Ratio		S Limit mW/cm2	MPE Ratio
R1	RFM75	2406	101.8	6.6	125.3	0.000909		0.54742	0.00166		1.00000	0.00091
R2		2434										
R3		2478										
R4	TICC	2404	98.4	3.2	121.9	0.000416		0.54742	0.00076		1.00000	0.00042
R5		2447										
R6		2480										
R7	BLE	2402		5.6	124.3	0.000721		0.54742	0.00132		1.00000	0.00072
R8		2440										
R9		2480										
R10	WLAN – B/G/N	2412		20.1	138.9	0.020546		0.54742	0.03753		1.00000	0.02055
R11		2437										
R12		2462										
R13								**MPE Max (<1):**	**.041269**		**MPE Total (<1):**	**.022592**
R14								Complies?	**Yes**		Complies?	**Yes**
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12

(ROW)	(COLUMN)	NOTE:
R0	C3	As Measured / Computed from highest fundamental emission, see fundamental emission section of this report. NOTE: Peak values are used to show compliance.
R0	C4	Maximum of either EIRP or Pout as measured. EIRP is computed from field strength: EIRP = Field Strength - 95.22
R0	C5	Computed from E-Field@3m: E20(cm) = E-Field@3m + 20*LOG10(3/0.2). NOTE: Peak values are used to show compliance.
R0	C6	EIRP (mW) = S (mW/cm^2) x 4 x PI x 20cm^2
R0	C11	For FCC MPE, use of 300 kHz limit for signals below 300 kHz as previously requested by FCC.

Summary:

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