	HVIN: E4FLEXV1				Test Number: 230613			
MPE Calculator	RF Exposure uses EIRP for calculation. EIRP is based on TX power added to the antenna gain in dBi.							
	dBi = dB gain compared to an isotropic radiator.							
	S = power density in mW/cm^2							
	Transmitter Output power (mW)	2133.0						
	Transmitter Output power (W)	2.13						
Output Power for % duty Cycle operation (Watts)	100	2.13			Antenna Gain (dBi)	10.3		
Output Power for 100% duty Cycle operation (Watts)		2.13			Antenna Gain (Numeric)	10.72		
Tx Frequency (MHz)	902	Calculation power (Watts)	2.13		dBd + 2.17 = dBi	dBi to dBd	2.17	
					Antenna Gain (dBd)	8.13		
Cable Loss (dB)	0.0	Adjusted Power (dBm)	33.29		Antenna minus cable (dBi)	10.30		
					Antenna Gain (Numeric)	10.72		
	Calculated ERP (mw)	13867.558			EIRP = Po(dBm) + Gain (dB)			
	Calculated EIRP (mw)	22855.988			Radiated (EIRP) dBm	43.590		
					ERP = EIRP - 2.17 dB			
					Radiated (ERP) dBm	41.420		

$$\text{Power density (S) } \text{mW/cm}^2 = \frac{\text{EIRP}}{4\,p\,r^2}$$

r (cm)   EIRP (mW)

	Occupational Limit	FCC radio frequency radiation exposure limits per 1.1310		
3.006666667	mW/cm^2	Frequency (MHz)	Occupational Limit (mW/cm^2)	Public Limit (mW/cm^2)
30.1	W/m^2	30-300	1	0.2
	General Public Limit	300-1,500	f/300	f/1500
0.601333333	mW/cm^2	1,500-10,000	5	1
6.0	W/m^2			

	Occupational Limit	IC radio frequency radiation exposure limits per RSS-102		
$0.6455f^{0.5}$	W/m^2	Frequency (MHz)	Occupational Limit (W/m^2)	Public Limit (W/m^2)
19.4	W/m^2	100-6,000	$0.6455f^{0.5}$	
	General Public Limit	6,000-15,000	50	
$0.02619f^{0.6834}$	W/m^2	48-300		1.291
2.74	W/m^2	300-6,000		$0.02619f^{0.6834}$
		6,000-15,000	50	10

					General Public	Occupational	
f = Transmit Frequency (MHz)			f (MHz) =		902	902	MHz
P_T = Power Input to Antenna (mW)			P_T (mW) =		2,133.0449	2,133.0449	mW
Duty cycle (percentage of operation)			% =		100	100	%
P_A = Adjusted Power due to Duty cycle or Cable Loss (mW)			P_A (mW) =		2,133.04	2,133.04	mW
G_N = Numeric Gain of the Antenna			GN (numeric) =		10.72	10.72	numeric
S_{20} = Power Density of device at 20cm (mW/m^2)		$S_{20}=(P_A G_N)/(4\pi R_{20})^2$	S_{20} (mW/m^2) =		4.55	4.55	mW/m^2
S_{20} = Power Density of device at 20cm (W/m^2)		$S_{20}=(P_A G_N)/(4\pi R_{20})^2$	S_{20} (W/m^2) =		45.47	45.47	W/m^2
S_L = Power Density Limit (W/m^2) FCC			S_L (W/m^2)=		6.013	30.067	W/m^2
S_L = Power Density Limit (W/m^2) Canada			S_L (W/m^2)=		2.740	19.387	W/m^2
R_C = Minimum distance to the Radiating Element for Compliance (cm) FCC		$R_C=\sqrt{(P_A G_N/4\pi S_L)}$	R_C (cm) =		55.0	24.6	cm
R_C = Minimum distance to the Radiating Element for Compliance (cm) Canada		$R_C=\sqrt{(P_A G_N/4\pi S_L)}$	R_C (cm) =		81.5	30.6	cm
S_C = Power Density of the device at the Compliance Distance R_C (W/m^2) FCC		$S_C=(P_A G_N)/(4\pi R_C)^2$	S_C (W/m^2) =		6.01	30.07	W/m^2
S_C = Power Density of the device at the Compliance Distance R_C (W/m^2) Canada		$S_C=(P_A G_N)/(4\pi R_C)^2$	S_C (W/m^2) =		2.74	19.39	W/m^2
R_{20} = 20cm			R20=		20	20	cm

For Compliance with Canada General Population Limits, User Manual must indicate a minimum separation distance of	81.5	cm
Or in Meters for Compliance with Canada General Population Limits, a minimum separation distance of	0.81	Meters

Summary: Standalone MPE Calculations and Summary					Public Limit		Public	
	Tx Duty Cycle (%)	Tx Frequency (MHz)	Power Total (mW)	Antenna Gain (numeric)	S_L (W/m^2)	S_{20} (W/m^2)	R_C (cm)	S_C (W/m^2)
FCC	100	902	2,133	10.72	6.013	45.47	55.0	6.01
Canada	100	902	2,133	10.72	2.740	45.47	81.5	2.74

		Limit		Overall Minimum (cm)	Overall Minimum (inches)
		Public	Occupational		
FCC (cm)		55.0	24.6		
FCC (inches)		22.0	10.0		
Canada (cm)		81.5	30.6		
Canada (inches)		33.0	13.0		

Overall Minimum Limit Public	Overall Minumu Limit Occuppational
82 cm	31 cm
33 inches	13 inches

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Revision 1

Transcore   PMN: E4 FLEX
HVIN: E4FLEXV1
Test: 230613
Test to: 47CFR Parts 2, 90 and RSS-137
File: E4FLEXV1 RFExp

SN: Sample 1
FCC ID: FIHE4FPT90V1
IC: 1584A-E4FRSS137V1
Date: August 30, 2023
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