B04684 RF Exclusion / MPE Calculator
Worst Case – 5GHz

	Model: B04684		Test Number: 230821B		
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 (dBm)	16.00			
	Transmitter Output power (mW)	39.81			
Output Power for % duty Cycle operation (Watts)	100	0.0398		Antenna Gain (dBi)	2.8
	Output Power for 100% duty Cycle operation (Watts)	0.04		Antenna Gain (Numeric)	1.91
Tx Frequency (MHz)	5745	Calcualtion power (Watts)	0.04	dBd + 2.17 = dBi	dBi to dBd	2.2
				Antenna Gain (dBd)	0.63
Cable Loss (dB)	0.0	Adjusted Power (dBm)	16.00	Antenna minus cable (dBi)	2.80
	Calculated ERP (mw)	46.026		EIRP = Po(dBM) + Gain (dB)	
	Calculated EIRP (mw)	75.858		Radiated (EIRP) dBm	18.800
				ERP = EIRP - 2.17 dB	
				Radiated (ERP) dBm	16.630

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

r (cm)   EIRP (mW)

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

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

f = Transmit Frequecny (MHz)		f (MHz) =	5745 MHz
P$_T$ = Power Input to Antenna (mW)		P$_T$ (mW) =	39.8107 mW
Duty cycle (percentage of operation)		% =	100 %
P$_A$ = Adjusted Power due to Duty cycle or Cable Loss (mW)		P$_A$ (mW) =	39.81 mW
G$_N$ = Numeric Gain of the Antenna		GN (numeric) =	2.17 numeric
S$_{20}$ = Power Density of device at 20cm (mW/m^2)	$S_{20}=(P_AG_N)/(4\pi R_{20})^2$	S$_{20}$ (mW/m^2) =	0.02 mW/m^2
S$_{20}$ = Power Density of device at 20cm (W/m^2)	$S_{20}=(P_AG_N)/(4\pi R_{20})^2$	S$_{20}$ (W/m^2) =	0.17 W/m^2
S$_L$ = Power Density Limit (W/m^2)		S$_L$ (W/m^2)=	9.710 W/m^2
R$_C$ = Minimum distance to the Radiating Element for Compliance (cm)	$R_C=\sqrt{(P_AG_N/4\pi S_L)}$	R$_C$ (cm) =	2.7 cm
S$_C$ = Power Density of the device at the Compliance Distance R$_C$ (W/m^2)	$S_C=(P_AG_N)/(4\pi R_C)^2$	S$_C$ (W/m^2) =	9.71 W/m^2
R$_{20}$ = 20cm		R20=	20 cm
	For Complaince with Canada General Population Limits, User Manual must indicate a minimum seperation distance of	2.7 cm
	Or in Meters for Complaince with Canada General Population Limits, a minimum seperation distance of	0.03 Meters