10-Watt Version

	Model: GMN-02002		Test Number: 190715	
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 maximum Output power operating at 100% (Watts)	13.3352		
	Percent Duty Cycle operation (%)	0.5	Antenna Gain (dBi)	2.2
	Output Power for 100% duty Cycle operation (Watts)	6.6676	Antenna Gain (Numeric)	1.66
Tx Frequency (MHz)	127 Calcualtion power (Watts)	6.6676	dBd + 2.17 = dBi dBi to dBd	2.2
			Antenna Gain (dBd)	0.03
Cable Loss (dB) 0.0	Adjusted Power (dBm)	38.24	Antenna minus cable (dBi)	2.20
	Calculated ERP (mw) 6,713.82	6.71	EIRP = Po(dBM) + Gain (dB)	
	Calculated EIRP (mw) 11,065.47	11.07	Radiated (EIRP) dBm	40.440
			ERP = EIRP - 2.17 dB	
			Radiated (ERP) dBm	38.270

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

r (cm)   EIRP (mW)

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

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

f = Transmit Frequecny (MHz)		f (MHz) =	127
P$_T$ = Power Input to Antenna (mW)		P$_T$ (mW) =	13,335.2143
Duty cycle (percentage of operation)		% =	0.5
P$_A$ = Adjusted Power due to Duty cycle or Cable Loss (mW)		P$_A$ (mW) =	6,667.61
G$_N$ = Numeric Gain of the Antenna		GN (numeric) =	1.66
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) =	22.01
S$_L$ = Power Density Limit (W/m^2)		S$_L$ (W/m^2)= 1.291	
R$_C$ = Minimum distance to the Radiating Element for Compliance (cm)	$R_C=\sqrt{(P_A G_N/4\pi S_L)}$	R$_C$ (cm) =	82.6
S$_C$ = Power Density of the device at the Compliance Distance R$_C$ (W/m^2)	$S_C=(P_A G_N)/(4\pi R_C)^2$	S$_C$ (W/m^2) =	1.29
R$_{20}$ = 20cm		R20=	20
	For Compliance with Canada General Population Limits, User Manual must indicate a minimum seperation distance of	82.59	cm
	Or in Meters for Compliance with Canada General Population Limits, a minimum seperation distance of	0.83	Meters

16-Watt Version

	Model: GMN-02002		Test Number: 190715			
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 maximum Output power operating at 100% (Watts)		18.4077			
	Percent Duty Cycle operation (%)		0.5	Antenna Gain (dBi)		2.2
	Output Power for 100% duty Cycle operation (Watts)		9.2039	Antenna Gain (Numeric)		1.66
Tx Frequency (MHz)	127	Calcualtion power (Watts)	9.2039	dBd + 2.17 = dBi	dBi to dBd	2.2
					Antenna Gain (dBd)	0.03
Cable Loss (dB)	0.0	Adjusted Power (dBm)	39.64	Antenna minus cable (dBi)		2.20
	Calculated ERP (mw) 9,267.66		9.27	EIRP = Po(dBM) + Gain (dB)		
	Calculated EIRP (mw) 15,274.61		15.27	Radiated (EIRP) dBm		41.840
				ERP = EIRP - 2.17 dB		
				Radiated (ERP) dBm		39.670

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

r (cm)   EIRP (mW)

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

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

f = Transmit Frequecny (MHz)		f (MHz) =	127
P$_T$ = Power Input to Antenna (mW)		P$_T$ (mW) =	18,407.7200
Duty cycle (percentage of operation)		% =	0.5
P$_A$ = Adjusted Power due to Duty cycle or Cable Loss (mW)		P$_A$ (mW) =	9,203.86
G$_N$ = Numeric Gain of the Antenna		GN (numeric) =	1.66
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) =	30.39
S$_L$ = Power Density Limit (W/m^2)		S$_L$ (W/m^2)= 1.291	
R$_C$ = Minimum distance to the Radiating Element for Compliance (cm)	$R_C=\sqrt{(P_A G_N/4\pi S_L)}$	R$_C$ (cm) =	97.0
S$_C$ = Power Density of the device at the Compliance Distance R$_C$ (W/m^2)	$S_C=(P_A G_N)/(4\pi R_C)^2$	S$_C$ (W/m^2) =	1.29
R$_{20}$ = 20cm		R20=	20
	For Compliance with Canada General Population Limits, User Manual must indicate a minimum seperation distance of	97.03	cm
	Or in Meters for Compliance with Canada General Population Limits, a minimum seperation distance of	0.97	Meters