

Test Number:	200429							
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)	266.0						
	Transmitter Output power (W)	0.266						
Output Power for % duty Cycle operation (Watts)	100	0.266	Antenna Gain (dBi)	12				
Output Power for 100% duty Cycle operation (Watts)	0.266		Antenna Gain (Numeric)	15.85				
Tx Frequency (MHz)	2437	Calculation power (Watts)	0.266	dBd + 2.17 = dBi	dBi to dBd	2.2		
				Antenna Gain (dBd)	9.83			
Cable Loss (dB)	0.0	Adjusted Power (dBm)	24.25	Antenna minus cable (dB)	12.00			
				Antenna Gain (Numeric)	15.85			
	Calculated ERP (mw)	2557.889		EIRP = Po(dBm) + Gain (dB)				
	Calculated EIRP (mw)	4215.816		Radiated (EIRP) dBm	36.249			
				ERP = EIRP - 2.17 dB				
				Radiated (ERP) dBm	34.079			
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> $\text{Power density (S) mW/cm}^2 = \frac{\text{EIRP}}{4 \pi r^2}$ $r \text{ (cm) } = \sqrt{\frac{\text{EIRP (mW)}}{4 \pi S}}$ </div>							
	Occupational Limit	FCC radio frequency radiation exposure limits per 1.1310						
		Frequency (MHz)	Occupational Limit (mW/cm ²)	Public Limit (mW/cm ²)				
5	mW/cm ²	30-300	1	0.2				
50	W/m ²	300-1,500	ƒ/300	ƒ/1500				
	General Public Limit	1,500-10,000	5	1				
1	mW/cm ²							
10	W/m ²							
	Occupational Limit	IC radio frequency radiation exposure limits per RSS-102						
		Frequency (MHz)	Occupational Limit (W/m ²)	Public Limit (W/m ²)				
0.6455 f ^{0.5}	W/m ²	100-6,000	0.6455 f ^{0.5}					
39.7	W/m ²	6,000-15,000	50					
	General Public Limit	48-300		1.291				
0.02619 f ^{0.6834}	W/m ²	300-6,000		0.02619 f ^{0.6834}				
5.4	W/m ²	6,000-15,000	50	10				
f = Transmit Frequency (MHz)				f (MHz) =	2437 MHz			
P _T = Power Input to Antenna (mW)				P _T (mW) =	266.0000 mW			
Duty cycle (percentage of operation)				% =	100 %			
P _A = Adjusted Power due to Duty cycle or Cable Loss (mW)				P _A (mW) =	266.00 mW			
G _N = Numeric Gain of the Antenna				G _N (numeric) =	15.85 numeric			
S ₂₀ = Power Density of device at 20cm (mW/m ²)		S ₂₀ =(P _A G _N)/(4πR ₂₀) ²		S ₂₀ (mW/m ²) =	0.84 mW/m ²			
S ₂₀ = Power Density of device at 20cm (W/m ²)		S ₂₀ =(P _A G _N)/(4πR ₂₀) ²		S ₂₀ (W/m ²) =	8.39 W/m ²			
S _L = Power Density Limit (W/m ²)				S _L (W/m ²) =	5.404 W/m ²			
R _C = Minimum distance to the Radiating Element for Compliance (cm)		R _C =√(P _A G _N /4πS _L)		R _C (cm) =	24.9 cm			
S _C = Power Density of the device at the Compliance Distance R _C (W/m ²)		S _C =(P _A G _N)/(4πR _C) ²		S _C (W/m ²) =	5.40 W/m ²			
R ₂₀ = 20cm				R ₂₀ =	20 cm			
					For Compliance with Canada General Population Limits, User Manual must indicate a minimum separation distance of 24.9 cm			
					Or in Meters for Compliance with Canada General Population Limits, a minimum separation distance of 0.25 Meters			
Summary: Standalone MPE Calculations and Summary								
Band (MHz)	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)
2402-2480	100	2437	266	15.85	5.404	8.39	24.9	5.40
Band (MHz)	Tx Duty Cycle (%)	Tx Frequency (MHz)	Power Total (mW)	Antenna Gain (dBi)	S _L (W/m ²)	S ₂₀ (W/m ²)	R _C (cm)	S _C (W/m ²)
5150-5825	100	5745	48.00	31.62	9.710	3.02	11.2	9.71

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Revision 1

Mikrotikls SIA
Model: RBD22UGS-5HPacD2HnD-15S-US
Test: 200429 S/N: CCD703CA62E5/015 IC: 7442A-D53AC
Test to: C2PC 15C, 15E, RSS-247 Date: July 7, 2020
File: D2352AC RFExp

FCC ID: TV7D2352AC
Date: July 7, 2020
Page 1 of 2

Test Number: 200429								
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)	48.0						
	Transmitter Output power (W)	0.048						
Output Power for % duty Cycle (Watts)	100	0.048		Antenna Gain (dBi)	15			
Output Power for 100% duty Cycle operation (Watts)		0.048		Antenna Gain (Numeric)	31.62			
Tx Frequency (MHz)	5745	Calculation power (Watts)	0.05	dBi + 2.17 = dBd	dBi to dBd	2.2		
				Antenna Gain (dBd)	12.83			
Cable Loss (dB)	0.0	Adjusted Power (dBm)	16.81	Antenna minus cable (dBd)	15.00			
				Antenna Gain (Numeric)	31.62			
	Calculated ERP (mw)	920.961		EIRP = Po(dBm) + Gain (dB)				
	Calculated EIRP (mw)	1517.893		Radiated (EIRP) dBm	31.812			
				ERP = EIRP - 2.17 dB				
				Radiated (ERP) dBm	29.642			
	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> Power density (S) mW/cm² = $\frac{\text{EIRP}}{4 \pi r^2}$ r (cm) = $\sqrt{\frac{\text{EIRP}}{4 \pi S}}$ </div>							
	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	1/300	1/1500				
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						
0.6455 f ^{0.5}	W/m ²	Frequency (MHz)	Occupational Limit (W/m ²)	Public Limit (W/m ²)				
60.9	W/m ²	100-6,000	0.6455 f ^{0.5}					
	General Public Limit	6,000-15,000	50					
0.02619 f ^{0.6834}	W/m ²	48-300		1.291				
9.7	W/m ²	300-6,000		0.02619 f ^{0.6834}				
		6,000-15,000	50	10				
f = Transmit Frequency (MHz)				f (MHz) =	5745 MHz			
P _T = Power Input to Antenna (mW)				P _T (mW) =	48.0000 mW			
Duty cycle (percentage of operation)				% =	100 %			
P _A = Adjusted Power due to Duty cycle or Cable Loss (mW)				P _A (mW) =	48.00 mW			
G _N = Numeric Gain of the Antenna				G _N (numeric) =	31.62 numeric			
S ₂₀ = Power Density of device at 20cm (mW/m ²)	S ₂₀ = (P _A G _N)/(4πR ₂₀) ²			S ₂₀ (mW/m ²) =	0.30 mW/m ²			
S ₂₀ = Power Density of device at 20cm (W/m ²)	S ₂₀ = (P _A G _N)/(4πR ₂₀) ²			S ₂₀ (W/m ²) =	3.02 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 = √(P _A G _N /4πS _L)			R _C (cm) =	11.2 cm			
S _C = Power Density of the device at the Compliance Distance R _C (W/m ²)	S _C = (P _A G _N)/(4πR _C) ²			S _C (W/m ²) =	9.71 W/m ²			
R ₂₀ = 20cm				R ₂₀ =	20 cm			
	For Compliance with Canada General Population Limits, User Manual must indicate a minimum separation distance of				11.2 cm			
	Or in Meters for Compliance with Canada General Population Limits, a minimum separation distance of				0.11 Meters			
Summary: Standalone MPE Calculations and Summary								
Band (MHz)	Tx Duty Cycle (%)	Tx Frequency (MHz)	Power Total (mW)	Antenna Gain (dBi)	S _L (W/m ²)	S ₂₀ (W/m ²)	R _C (cm)	S _C (W/m ²)
2402-2480	100	2437	266.00	12	5.404	8.39	24.9	5.40
Band (MHz)	Tx Duty Cycle (%)	Tx Frequency (MHz)	Power Total (mW)	Antenna Gain (dBi)	S _L (W/m ²)	S ₂₀ (W/m ²)	R _C (cm)	S _C (W/m ²)
5150-5825	100	5745	48.00	15	9.710	3.02	11.2	9.71

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 Page 2 of 2