## **RF** Exposure Calculations

## 2.4 GHz Transmitter

Mikrot+B2:H49ik	Model: RBMetalG-52SHPa	cn-US To	est Number:	161104		
	MPE 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/cn	m^2				
				15.1 . 1.5 . 15.1	Antenna Gain (dBi)	2
	2425	Output Power	0.05121	dBd + 2.17 = dBi	dBi to dBd	2
Tx Frequency (MHz)	2437	Maximum (Watts)	0.261216	) 	Antenna Gain (dBd)	21.8
Cable Loss (dB)	0.0	(dBm)	24.2		Antenna minus cable (dBi)	24.0
	C.1.1. IEDD( )	20010 717		EIDD D (IDM) C: (ID)		
	Calculated ERP (mw) Calculated EIRP (mw)			EIRP = Po(dBM) + Gain (dB)	Radiated (EIRP) dBm	48.17
	Calculated EIRF (IIIW)			ERP = EIRP - 2.17 dB	Radiated (EIRF) dbiii	40.1
		Power density (S)		LAC - LIC - 2.17 UD	Radiated (ERP) dBm	46.00
		EIRP				
		= mW/cm/	2			
		4 p r^2				
		EIRP (mW), r (cm)				
	Occupational Limit		FCC radio frequency radiation exposure	limits per 1.1310		
5		Frequency (MHz)	Occupational Limit (mW/cm²)	Public Limit (mW/cm <sup>2</sup> )		
50		300-1,500	f/300	f/1500		
	General Public Limit	1,500-10,000	5	1		
1 10	mW/cm <sup>2</sup>					
	,,,,,,,					
	O		IC radio frequency radiation exposure lin			
$0.6455 f^{0.5}$	Occupational Limit	Frequency (MHz)				
	\		Occupational Limit (W/m²)	Public Limit (W/m²)		
31.86574		100-6,000 6,000-15,000	$0.6455f^{0.5}$			
$0.02619f^{0.6834}$	General Public Limit	48-300	50	1.291		
	W/m <sup>2</sup>					
5.40397	W/m <sup>2</sup>	300-6,000	50	$0.02619f^{0.6834}$		
		6,000-15,000	50	10		
EIRP	S 2	S 2	Distance	Distance	Distance	Distance
milliwatts	mW/cm <sup>2</sup>	W/m <sup>2</sup>	cm	meter	inches	Feet
65614.527	0.52214 0.97982	5.221 9.798	100.00 73.00	1.00 0.73	39.37 28.74	3.28 2.40
65614.527 65614.527	1.06560	10.656	70.00	0.73	27.56	2.40
65614.527	1.45040	14.504	60.00	0.60	23.62	1.97
65614.527	2.08858	20.886	50.00	0.50	19.69	1.64
65614.527	3.10615	31.061	41.00	0.41	16.14	1.35
65614.527	4.79471	47.947	33.00	0.33	12.99	1.08
65614.527	5.50413	55.041	30.80	0.31	12.13	1.01
65614.527	30.89608	308.961	13.00	0.13	5.12	0.43
65614.527	48.27513	482.751	10.40	0.10	4.09	0.34
65614.527	145.03995	1450.399 1726.095	5.50	0.060	2.36	0.20
65614.527 65614.527	172.60952 208.85753	2088.575	5.50 5.00	0.055 0.050	2.17 1.97	0.18
65614.527	326.33988	3263.399	4.00	0.030	1.57	0.10
65614.527	580.15979	5801.598	3.00	0.030	1.18	0.10
65614.527	1305.35953	13053.595	2.00	0.020	0.79	0.07
65614.527	5221.43813	52214.381	1.00	0.010	0.39	0.03
		Frequency (MHz)	Occupational Limit minimum Distance (meters)	Public Limit minimum distance (meters)		
		47CFR 1.1310	0.33	0.73		
		7/CIN 1.1310	0.55	0.75		

Rogers Labs, Inc. 4405 W. 259th Terrace Louisburg, KS 66053 Phone/Fax: (913) 837-3214

Revision 1

Mikrotikls SIA Model: RBMetalG-52SHPacn-US Test #: 161104

FCC ID: TV7MTLG52SHPN IC: 7442A-MG52SHPAC Test to: CFR47 15(c) and RSS-247 Date: January 31, 2017

S/N: 6695056E2E31/624

File: RBMetalG-52SHPacn-US RFExp Page 1 of 2

## 5 GHz Transmitter

J OHZ Hansi		***	T	151104		
Mikrotik	Model: RBMetalG-52SHPac		Test Number:	161104		
MPE Calculator	MPE 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/cn	n^2				
					Antenna Gain (dBi)	32
		Output Power		dBd + 2.17 = dBi	dBi to dBd	2.2
Tx Frequency (MHz)	5785	Maximum (Watts)	0.261216		Antenna Gain (dBd)	29.83
C-ld- I (dD)	0.0	(4D)	24.2		Automo minos1-1- (4D2)	22.00
Cable Loss (dB)	0.0	(dBm)	24.2		Antenna minus cable (dBi)	32.00
	Calculated ERP (mw)	251100 642		EIDD = Do(dDM) + Coin (dD)		
	Calculated ERP (mw)			EIRP = Po(dBM) + Gain (dB)	Radiated (EIRP) dBm	56.170
	Calculated LINI (IIIW)			ERP = EIRP - 2.17 dB	Radiated (EIRI ) dBill	30.17
		Power density (S)		Elit - Elit 2.17 dB	Radiated (ERP) dBm	54.00
		EIRP			rationated (Esta ) desir	21.00
		= mW/cr	n^2			
		4 p r^2				
		EIRP (mW), r (cm)				
	Occupational Limit		FCC radio frequency radiation exposure	limits per 1.1310		
5		Frequency (MHz)	Occupational Limit (mW/cm <sup>2</sup> )	Public Limit (mW/cm <sup>2</sup> )		
50		300-1,500	f/300	f/1500		
50	General Public Limit	1,500-10,000	5	1		
	mW/cm <sup>2</sup>	1,500-10,000		ı		
1						
10	W/m <sup>2</sup>					
	0 4 171 4		TO P. C. P. C. P.			
0.5	Occupational Limit		IC radio frequency radiation exposure lin			
$0.6455f^{0.5}$	\	Frequency (MHz)	Occupational Limit (W/m <sup>2</sup> )	Public Limit (W/m <sup>2</sup> )		
49.09621	W/m <sup>2</sup>	100-6,000	$0.6455f^{0.5}$			
	General Public Limit	6,000-15,000	50			
$0.02619f^{0.6834}$	W/m <sup>2</sup>	48-300		1.291		
9.75649	$W/m^2$	300-6,000		$0.02619f^{0.6834}$		
		6,000-15,000	50	10		
EIRP	S	S	Distance	Distance	Distance	Distance
milliwatts	mW/cm <sup>2</sup>	$W/m^2$	cm	meter	inches	Feet
413999.675	0.36606	3.661	300.00	3.00	118.11	9.84
413999.675	0.52712	5.271	250.00	2.50	98.43	8.20
413999.675	0.82363	8.236	200.00	2.00	78.74	6.56
413999.675	0.96260	9.626	185.00	1.85	72.83	6.07
413999.675	0.99460	9.946	182.00	1.82	71.65	5.97
413999.675	1.46422	14.642	150.00	1.50	59.06	4.92
413999.675	2.10848	21.085	125.00	1.25	49.21	4.10
413999.675	3.29450	32.945	100.00	1.00	39.37	3.28
413999.675	4.06729	40.673	90.00	0.90	35.43	2.95
413999.675	4.55987	45.599	85.00	0.85	33.46	2.79
413999.675	4.66908	46.691	84.00	0.840	33.07	2.76
413999.675 413999.675	4.78227	47.823	83.00	0.830	32.68	2.72
413999.675	4.89962 4.95992	48.996 49.599	82.00 81.50	0.820 0.815	32.28 32.09	2.69 2.67
413999.675	4.95992 5.85690	58.569	75.00	0.750	29.53	2.46
413999.675	6.72348	67.235	70.00	0.700	27.56	2.40
413999.675	7.79764	77.976	65.00	0.650	25.59	2.13
413999.073	1.17104	77.270	05.00	0.000	20.07	2.13
			Occupational Limit minimum Distance			
		Frequency (MHz)	(meters)	Public Limit minimum distance (meters)		
		47CFR 1.1310	0.81	1.82		
		RSS-102	0.82	1.85		
		N35-102	0.62	1.63		

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