

RF Exposure Calculations

2.4 GHz Transmitter

Mikrot+B2H49ik	Model: Groove GA52ac	Test Number:		170104a		
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/cm ²					
	Output Power	dBd + 2.17 = dBi			Antenna Gain (dBi)	24
					dBi to dBd	2.2
Tx Frequency (MHz)	2437	Maximum (Watts)	0.200909	Antenna Gain (dBd)	21.83	
Cable Loss (dB)	0.0	(dBm)	23.0	Antenna minus cable (dBd)	24.00	
	Calculated ERP (mw)	30619.634		EIRP = Po(dBm) + Gain (dB)		
	Calculated EIRP (mw)	50466.130		Radiated (EIRP) dBm		47.030
	Power density (S)			ERP = EIRP - 2.17 dB		
	EIRP					
	----- = mW/cm ²					
	4 π r ²					
	EIRP (mW), r (cm)					Radiated (ERP) dBm
	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	300-1,500	£300	£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						
	0.6455 / 0.5	W/m ²	Frequency (MHz)	Occupational Limit (W/m ²)	Public Limit (W/m ²)	
	31.86574	W/m ²	100-6,000	0.6455 / 0.5		
		General Public Limit	6,000-15,000	50		
	0.02619 / 0.6834	W/m ²	48-300		1.291	
	5.40397	W/m ²	300-6,000		0.02619 / 0.6834	
			6,000-15,000	50	10	
EIRP	S	S	Distance		Distance	Distance
milliwatts	mW/cm ²	W/m ²	cm		meter	inches
			Feet			
50466.130	0.10040	1.00399	200.00	2.00	78.74	6.56
50466.130	0.13113	1.31134	175.00	1.75	68.90	5.74
50466.130	0.17849	1.78487	150.00	1.50	59.06	4.92
50466.130	0.25702	2.57022	125.00	1.25	49.21	4.10
50466.130	0.40160	4.01597	100.00	1.00	39.37	3.28
50466.130	0.49580	4.95798	90.00	0.90	35.43	2.95
50466.130	0.53058	5.30581	87.00	0.87	34.25	2.85
50466.130	0.62749	6.27495	80.00	0.80	31.50	2.62
50466.130	0.71395	7.13950	75.00	0.75	29.53	2.46
50466.130	0.81959	8.19585	70.00	0.70	27.56	2.30
50466.130	0.95052	9.50525	65.00	0.650	25.59	2.13
50466.130	0.98046	9.80461	64.00	0.640	25.20	2.10
50466.130	1.11555	11.15546	60.00	0.600	23.62	1.97
50466.130	1.60639	16.06387	50.00	0.500	19.69	1.64
50466.130	3.09874	30.98740	36.00	0.360	14.17	1.18
50466.130	4.77523	47.75228	29.00	0.290	11.42	0.95
50466.130	6.42555	64.25547	25.00	0.250	9.84	0.82
			Frequency (MHz)	Occupational Limit minimum Distance (meters)	Public Limit minimum distance (meters)	
			47CFR 1.1310	0.29	0.64	
			RSS-102	0.36	0.87	

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 Revision 1

Mikrotikls SIA
 Model: RBGrooveGA-52HPacn-US
 Test #: 170104A
 Test to: CFR47 15(c)(e) and RSS-247
 File: RBGrooveGA-52HPacn-US RFExp

S/N: 27895
 FCC ID: TV7GRV-A52HPC
 IC: 7442A-GRVA52HPC
 Date: February 24, 2017
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5 GHz Transmitter

Mikrotik	Model: Groove GA52ac		Test Number:	170104a		
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/cm ²					
			Output Power	dBd + 2.17 = dBi	Antenna Gain (dBi)	32
			Maximum (Watts)		dBi to dBd	2.2
Tx Frequency (MHz)	5785		0.160694		Antenna Gain (dBd)	29.83
Cable Loss (dB)	0.0	(dBm)	22.1		Antenna minus cable (dBi)	32.00
	Calculated ERP (mw)	154525.444		EIRP = Po(dBm) + Gain (dB)		
	Calculated EIRP (mw)	254683.025			Radiated (EIRP) dBm	54.060
		Power density (S)		ERP = EIRP - 2.17 dB		
		EIRP ----- = mW/cm ² 4 p r ²			Radiated (ERP) dBm	51.890
		EIRP (mW), r (cm)				
		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	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				
0.6455 ^{f^{-0.5}}	W/m ²	Frequency (MHz)	Occupational Limit (W/m ²)	Public Limit (W/m ²)		
49.09621	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		
9.75649	W/m ²	300-6,000		0.02619 ^{f^{-0.6834}}		
		6,000-15,000	50	10		
EIRP	S	S	Distance	Distance	Distance	Distance
milliwatts	mW/cm ²	W/m ²	cm	meter	inches	Feet
254683.025	0.50668	5.06676	200.00	2.00	78.74	6.56
254683.025	0.66178	6.61781	175.00	1.75	68.90	5.74
254683.025	0.90076	9.00757	150.00	1.50	59.06	4.92
254683.025	0.96395	9.63949	145.00	1.45	57.09	4.76
254683.025	0.99110	9.91101	143.00	1.43	56.30	4.69
254683.025	1.03403	10.34032	140.00	1.40	55.12	4.59
254683.025	1.29709	12.97090	125.00	1.25	49.21	4.10
254683.025	2.02670	20.26703	100.00	1.00	39.37	3.28
254683.025	2.50210	25.02103	90.00	0.90	35.43	2.95
254683.025	3.16672	31.66724	80.00	0.80	31.50	2.62
254683.025	4.13613	41.36129	70.00	0.700	27.56	2.30
254683.025	4.79693	47.96930	65.00	0.650	25.59	2.13
254683.025	5.62973	56.29731	60.00	0.600	23.62	1.97
254683.025	8.10681	81.06812	50.00	0.500	19.69	1.64
254683.025	12.66689	126.66894	40.00	0.400	15.75	1.31
254683.025	22.51892	225.18924	30.00	0.300	11.81	0.98
254683.025	50.66758	506.67578	20.00	0.200	7.87	0.66
			Frequency (MHz)	Occupational Limit minimum Distance (meters)	Public Limit minimum distance (meters)	
			47CFR 1.1310	0.65	1.45	
			RSS-102	0.65	1.45	

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