MPE/RF EXPOSURE EVALUATION

FCC CFR 47 Part 1.1310

Report No.: MIKO120-U14A Rev A FCC MPE

Company: Mikrotikls SIA

Evaluation of: RBMetalG-52SHPacn-US

MPE/RF EXPOSURE EVALUATION

FROM

Evaluation of: Mikrotikls SIA RBMetalG-52SHPacn-US

To: FCC CFR 47 Part 1.1310

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Applicant: Mikrotikls SIA
Brīvības gatve 214i
Rīga, LV 1039
Latvia

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This Report is Issued Under the Authority of:

MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

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Calculations for RF Exposure Evaluation
Power Density = Pd (W/m^2) = EIRP/(4*π*d^2)
EIRP = P * G
P = Peak output power (W)
G = Antenna numeric gain (numeric)
d = Separation distance (m)
Numeric Gain = 10 ^ (G (dBi)/10)

These calculations represent worst case in terms of the exposure levels.

Limits for Occupational/Controlled Exposure for professional installation: 5 mW/cm^2

Point to Point Operation

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm^2) @ 20cm	Power Density Limit (mW/cm^2)	Min Calculated safe distance for Limit (cm)
2400.0 - 2483.5	24.00	251.19	24.16	260.62	10.04	5.00	32.28
5250.0 - 5350.0	8.00	6.31	19.26	84.33	0.09	5.00	2.91
5470.0 - 5725.0	8.00	6.31	19.04	80.17	0.12	5.00	2.84

Point to Point Assessment at calculated minimum safe distance of 33cm

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm^2) @ 33cm	Power Density Limit (mW/cm^2)
2400.0 - 2483.5	24.00	251.19	24.16	260.62	4.78	5.00
5250.0 - 5350.0	8.00	6.31	19.26	84.33	0.04	5.00
5470.0 - 5725.0	8.00	6.31	19.04	80.17	0.06	5.00

Assessment for Simultaneous Operation of 2.4 GHz and 5 GHz radios at 33 cm.
Assessment of worst case exposure conditions with the 2 radios transmitting simultaneously.

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm^2) E_i	Power Density Limit (mW/cm^2) E_{ref}	E_i/E_{ref}
2400.0 - 2483.5	24.00	251.19	24.16	260.62	4.79	5.00	0.957
5250.0 - 5350.0	8.00	6.31	19.26	84.33	0.04	5.00	0.008
						Summation of Ratio:	**0.965**

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^{n} Ei/Eref \leq 1$$

Where
Ei: calculated E-field Strength for transmitter
Eref: E-field strength related limit

Minimum Safe Distance = 0.33 m
Note: for mobile or fixed location transmitters the minimum separation distance is 0.20m, even if calculations indicate the MPE distance to be less.

Specification - RF Exposure Evaluation Limits

The Limit is defined in Table 1 of FCC §1.1310.

Specification - Maximum Permissible Exposure Limits

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1500	30
1,500-100,000	--	--	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MiCOM Labs
opening wireless markets

575 Boulder Court
Pleasanton, California 94566, USA
Tel: +1 (925) 462 0304
Fax: +1 (925) 462 0306
www.micomlabs.com