

Company: MikroTik

Test of: RBD52G-5HacD2HnD-TC

To: FCC CFR 47 Part 1.1310

Report No.: MIKO65-MPE FCC Rev A

MPE/RF EXPOSURE TEST REPORT



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FROM



Test of: MikroTik RBD52G-5HacD2HnD-TC

To: FCC CFR 47 Part 1.1310

Test Report Serial No.: MIKO65-MPE FCC Rev A

This report supersedes: NONE

Applicant: MikroTik
Aizkraukles iela 23
Riga, LV-1006
Latvia

Product Function: 802.11b/g/n/ac wireless router

Issue Date: 22nd December 2017

This Test 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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1. MAXIMUM PERMISSIBLE EXPOSURE

Calculations for Maximum Permissible Exposure Levels

$$\text{Power Density} = P_d \text{ (mW/cm}^2\text{)} = \text{EIRP}/(4*\pi*d^2)$$

$$\text{EIRP} = P * G$$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

Numeric Gain = $10^{(G \text{ (dBi)}/10)}$

The calculations in the table below use the highest conducted power values together with the lowest antenna gain specified for the EUT. These calculations represent worst case in terms of the exposure levels.

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)	Calculated Power Density (mW/cm ²) @ Safe Distance
2400.0 - 2483.5	2.50	1.78	24.01	251.75	0.09	1.00	6.00	1.00
5150.0 - 5250.0	2.50	1.78	21.06	127.60	0.05	1.00	5.00	1.00
5725.0 - 5850.0	2.50	1.78	20.36	108.67	0.04	1.00	4.00	1.00

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

For non-DFS operation the unit is limited to transmitting one of the following modes;

Mode 0	Mode 1
a).. 2.4 GHz WiFi	a).. 2.4 GHz WiFi
b).. UNII Band 1 WiFi	b).. UNII Band 3 WiFi

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Assessment for simultaneous operation Mode 0:

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Minimum Safe Distance for Summation (cm)	Power Density Limit (mW/cm ²) E _{ref}	Power Density (mW/cm ²) @ 20cm	Summation E _i /E _{ref}
2400.0 - 2483.5	2.50	1.78	24.01	251.75	20	1.00	0.09	0.09
5150.0 - 5250.0	2.50	1.78	21.06	127.60	20	1.00	0.05	0.05
Total Evaluation:								0.14

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i: calculated E-field Strength for transmitter

E_{ref}: E-field strength related limit

Assessment for simultaneous operation Mode 1:

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Minimum Safe Distance for Summation (cm)	Power Density Limit (mW/cm ²) E _{ref}	Power Density (mW/cm ²) @ 20cm	Summation E _i /E _{ref}
2400.0 - 2483.5	2.50	1.78	24.01	251.75	20	1.00	0.09	0.09
5725.0 - 5850.0	2.50	1.78	20.36	108.67	20	1.00	0.04	0.04
Total Evaluation:								0.13

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i: calculated E-field Strength for transmitter

E_{ref}: E-field strength related limit



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

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