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Report No.: 2209RSU050-U4 Report Version: V01 Issue Date: 2022-11-26

RF Exposure Evaluation Declaration

FCC ID: TV7CPG52X

Applicant: Mikrotikls SIA

Product: cAP ax

Model No.: cAPGi-5HaxD2HaxD-US

Brand Name: MikroTik

FCC Classification: Digital Transmission System (DTS)

Unlicensed National Information Infrastructure (NII)

FCC Rule Part(s): Part15 Subpart C (Section 15.247)

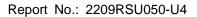
Result: Complies

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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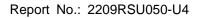
Revision History

Report No.	Version	Description	Issue Date	Note
2209RSU050-U4	Rev. 01	Initial Report	2022-11-26	Valid



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1. General Information

1.1. Applicant

Mikrotikls SIA

Brivibas gatve 214i, Riga, LV-1039 LATVIA

1.2. Manufacturer

Mikrotikls SIA

Brivibas gatve 214i, Riga, LV-1039 LATVIA

1.3. Testing Facility

	Test Site - MRT	Test Site – MRT Suzhou Laboratory							
	Laboratory Location (Suzhou - Wuzhong)								
D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China									
	Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, Chin								
	Laboratory Accre	editations							
Ĭ	A2LA: 3628.01		CNAS	S: L10551					
	FCC: CN1166		ISED: CN0001						
	VOCI:	□R-20025	□G-20034	□C-20020	□T-20020				
	VCCI:	□R-20141	□G-20134	□C-20103	□T-20104				
	Test Site - MRT	Shenzhen Laborat	ory						
	Laboratory Loca	tion (Shenzhen)							
	1G, Building A, Ju	ınxiangda Building,	Zhongshanyuan Roa	ad West, Nanshan Dis	strict, Shenzhen, China				
	Laboratory Accreditations								
	A2LA: 3628.02	CNAS: L10551							
	Test Site – MRT Taiwan Laboratory								
	Laboratory Loca	tion (Taiwan)							
	No. 38, Fuxing 2n	ıd Rd., Guishan Dis	st., Taoyuan City 333,	Taiwan (R.O.C.)					
	Laboratory Accre	editations							
	TAF: L3261-19072	25							
	FCC: 291082, TW	√3261	ISED:	TW3261					



1.4. Product Information

Product Name	cAP ax		
Model No.	cAPGi-5HaxD2HaxD-US		
EUT Identification No.	20220920Sample#03		
Wi-Fi Specification	802.11a/b/g/n/ac/ax, VHT		
Hardware Version	r2		
Software Version	RouterOS v7		
Antenna Information	Refer to Section 1.7		
Operating Temp.	0 ~ 40°C		
Operating Environment	Indoor Use		
Accessories			
Adapter #1	Model: SAW36-240-1500U		
	Input: 100-240V ~ 50/60Hz, 1.3A		
	Output: 24V, 1.5A		
Adapter #2 Model: MT48-480095-11SGU			
	Input: 100-240V ~ 50/60Hz, 1.0A Max		
	Output: 48V, 0.95A		
PoE Injector	Gigabit PoE		
	Input Power: 18 - 57VDC		

Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.



1.5. Antenna Details

Antenna Type	Frequency Band	Max Peak Gain	CDD Directional Gain (dBi)		
	(MHz)	(dBi)	For Power	For PSD	
Wi-Fi Antenna (2*2 MIMO)					
	2.400 ~ 2483.5	5.90	5.90	8.91	
Internal;	5150 ~ 5250	5.45	5.45	8.46	
Semi-directional	5250 ~ 5350	5.35	5.35	8.36	
Antenna	5470 ~ 5725	6.20	6.20	9.21	
	5725 ~ 5850	6.00	6.00	9.01	

Note: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

• For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log
$$(N_{ANT}/N_{SS})$$
 dB = 3.01;

· For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB for
$$N_{ANT} \le 4$$
;

1.6. Device Classification

According to the user manual, the antenna of this device is at least 30 cm away from the body of the user, this device is classified as a Mobile Device. So, the RF exposure evaluation requirements of § 2.1091 for mobile device exposure conditions subject to MPE limits.



2. RF Exposure Evaluation

2.1. Test Limits

According to FCC Part 2.1091, A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons.

According to FCC Part 1.1307(b)(3)(i)(C), for the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (watts)			
0.3-1.34	1.920 R ²			
1.34-30	3.450 R ² /f ²			
30-300	3.83 R ²			
300-1500	0.0128 R ² f			
1500-100,000	19.2 R ²			
f = frequency in MHz, R = minimum separation distance in meters.				

According to FCC Part 1.1307(b)(3)(ii)(B), in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{\text{th},i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{\text{th},j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \le 1$$



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2.2. Test Result

Product	cAP ax
Test Item	RF Exposure Evaluation

Test	Frequency	Max.	Max.	Max. EIRP	Compliance	ERP	Threshold
Mode	Band	Conducted	Antenna	(dBm)	Distance (R)	(W)	ERP
	(MHz)	Power	Gain		(m)		(W)
		(dBm)	(dBi)				
802.11b/g/n/ax, VHT	2412 ~ 2462	24.93	5.90	30.83	0.30	0.738	1.728
802.11a/n/ac/ax	5180 ~ 5240	25.16	5.45	30.61	0.30	0.702	1.728
	5260 ~ 5320	22.80	5.35	28.15	0.30	0.398	1.728
	5500 ~ 5720	23.50	6.20	29.70	0.30	0.569	1.728
	5745 ~ 5825	25.57	6.00	31.57	0.30	0.875	1.728

Note:

- 1. EIRP (dBm) = Max. Conducted Power (dBm) + Max. Antenna Gain (dBi)
- 2. ERP (W) = $10^{[ERP (dBm) 30)]/10}$ = $10^{[EIRP (dBm) 2.15 (dB) 30]/10}$
- 3. Threshold ERP (W) = $19.2 * R^2$ (W) = $19.2 * 0.30^2$ (W) = 1.728 (W)

The 2.4GHz WLAN and 5GHz WLAN can transmit simultaneously.

Exposure Ratio =
$$0.738 / 1.728 + 0.875 / 1.728 = 0.9334 < 1$$
.

Therefore, this device meets the RF Exposure requirements when it is installed and operated with a minimum distance of 30cm between the radiator and user.