

Radio Test Report

Report No.: STS2310303H02

Issued for

Mikrotiks SIA

Unijas 2, Riga, LV-1039 Latvia

Product Name: Chateau Pro ax

Brand Name: MikroTik

Model Name: H53UiG-5HaxQ2HaxQ-US

Series Model(s): N/A

FCC ID: TV7H53U52HAX

Test Standards: FCC 47CFR §2.1091

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.



TEST REPORT

Applicant's Name.....: Mikrotikls SIA
 Address: Unijas 2, Riga, LV-1039 Latvia
Manufacturer's Name.....: Mikrotikls SIA
 Address: Unijas 2, Riga, LV-1039 Latvia

Product Description

Product Name.....: Chateau Pro ax
 Brand: MikroTik
 Model Number: H53UiG-5HaxQ2HaxQ-US
 Series Model(s).....: N/A
Standards.....: FCC 47CFR §2.1091
 447498 D01 Interim General RF Exposure Guidance v06

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Date of Test.....:
 Date of receipt of test item.....: 11 Oct. 2023
 Date (s) of performance of tests.....: 11 Oct. 2023 ~ 14 Mar. 2024
 Date of Issue.....: 14 Mar. 2024
 Test Result.....: **Pass**

Testing Engineer :

Aaron Bu

(Aaron Bu)

Technical Manager :

Chris Chen

(Chris Chen)

Authorized Signatory :

Bovey Yang

(Bovey Yang)





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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	13 Mar. 2024	STS2310303H03	ALL	Initial Issue

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Chateau Pro ax	
Brand	MikroTik	
Model Number	H53UiG-5HaxQ2HaxQ-US	
Series Model(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is a Chateau Pro ax	
	Operation Frequency:	2.4GWLAN: 802.11b/g/n/ax(20MHz): 2412~2472MHz 802.11n/ax(40MHz):2422~2462MHz 5.2G WLAN: IEEE 802.11a/ n(HT20)/ac(VHT20)/ax(HE20): 5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40)/ax(HE40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80)/ax(HE80):5.210GHz 5.3G WLAN: IEEE 802.11a/ n(HT20)/ac(VHT20)/ax(HE20): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40)/ax(HE40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80)/ax(HE80): 5.290GHz 5.6G WLAN: IEEE 802.11a/ n(HT20)/ac(VHT20) /ax(HE20): 5.500GHz-5.700GHz IEEE 802.11 n(HT40)/ac(VHT40)/ax(HE40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80)/ax(HE80): 5.530GHz-5.610GHz 5.8G WLAN: IEEE 802.11a/ n(HT20)/ac(VHT20)/ax(HE20): 5.745GHz-5.825GHz IEEE 802.11a/ n(HT40)/ac(VHT40)/ax(HE40): 5.755GHz-5.795GHz IEEE 802.11ac(VHT80)/ax(HE80):5.775GHz 5.9G WLAN: IEEE 802.11a/ n(HT20)/ac(VHT20))/ax(HE20): 5.845GHz -5.885GHz IEEE 802.11a/ n(HT40)/ac(VHT40)/ax(HE40): 5835GHz -5875GHz IEEE 802.11ac(VHT80)/ax(HE80):5855 GHz



	Modulation Type:	2.4G WLAN 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11ax(OFDM, OFDMA): BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024QAM 5GGWLAN 802.11a(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM):BPSK,QPSK,16-QAM,64-QAM,256-QAM 802.11ax(OFDM,OFDMA):BPSK,QPSK,16-QAM,64-QAM,256-QAM,1024QAM
	Antenna gain:	2.4G WLAN: ANT1:3.89 dBi ANT 2:5.04 dBi ANT 3:3.71 dBi ANT 4:5.04 dBi MIMO:10.46 dBi 5GWLAN: ANT 1 : 5.70 dBi ANT 2 : 6.01 dBi ANT 3 : 3.99 dBi ANT 4 : 6.01 dBi MIMO : 11.49 dBi
	Antenna Designation :	Omni
Adapter	Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 48V 1.35A	
Hardware Version	r3	
Software Version	RouterOS V7	



1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01



2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.



2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
2.4G WIFI	AV	24±1dBm
5G WIFI	AV	23±1dBm

Protocol	Fre. (MHz)	Separation distance (cm)	Max Turn up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Ratio	Result
2.4G WIFI	2437	20	25.00	5.04	30.04	1009.3	0.2008	1	0.2008	Pass
5G WIFI	5755	20	24.00	6.01	30.01	1002.3	0.1994	1	0.1994	Pass

Multiple transmission:

$$2.4G\ WLAN + 5G\ WLAN = 0.2008 + 0.1994 = 0.4002 < 1$$

Note: 1. The Maximum power is less than the limit, complies with the exemption requirements.

$$2. ERP = EIRP - 2.15$$

*****END OF THE REPORT*****