

Harman International Industries, Inc.

MPE ASSESSMENT REPORT

Report Type:

FCC Part §2.1091, §2.1093 and §1.1307(b) assessment report

MODEL:

AP72598V

REPORT NUMBER:

220201028SHA-004

ISSUE DATE:

March 16, 2022

DOCUMENT CONTROL NUMBER:

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Report no.: 220201028SHA-004

Applicant: Harman International Industries, Inc.

8500 Balboa Blvd, Northridge, CA 91329, USA

Manufacturer: Dalian Golden Hualu Digital Technology Co., Ltd.

No.1 Hua Road, Qixianling, High-Tech Industrial Zone, Dalian, Liaoning, China

Manufacturing site: Dalian Golden Hualu Digital Technology Co., Ltd.

No.1 Hua Road, Qixianling, High-Tech Industrial Zone, Dalian, Liaoning, China

Product Name: WiFi & BT Platform Module

Type/Model: AP72598V FCC ID: APIAP72598V

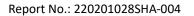
SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

KDB447498 D01 General RF Exposure Guidance v06 FCC Part2.1091, FCC Part2.1093 FCC Part1.1307(b)

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Bn'de Liu	Warkeyou	
Project Engineer	Reviewer	
Erick Liu	Wakevou Wang	

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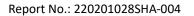




TEST REPORT

Revision History

Report No.	Version	Description	Issued Date	
220201028SHA-004	Rev. 01	Initial issue of report	March 16, 2022	

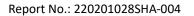




1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	WiFi & BT Platform Module
Type/Model:	AP72598V
Description of EUT:	The EUT is wireless module with WiFi and Bluetooth function, it has only one model.
Rating:	4.5-5.5V DC
EUT type:	☐ Table top ☐ Floor standing
Software Version:	/
Hardware Version:	/
Sample received date:	January 17, 2022
Date of test:	January 17, 2022 ~ March 17, 2022



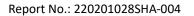


1.2 Technical Specification

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20)
	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)
	IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Operating Frequency:	IEEE 802.11n(HT20): OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Type of Modulation:	2412MHz to 2462MHz for IEEE 802.11b/g/n(HT20)
Channel Number:	11 Channels for 802.11b, 802.11g, 802.11n(HT20)
Channel Separation:	5MHz
Antenna Information:	PCB Antenna 0&1: 3.19dBi

	5150 ~ 5250MHz			
	5250 ~ 5350MHz			
	5470 ~ 5725MHz			
Frequency Range:	5725 ~ 5850MHz			
	802.11a, 802.11n(HT20), 802.11n(HT40), 802.11ac(VHT20),			
Support Standards:	802.11ac(VHT40), 802.11ac(VHT80)			
Type of Modulation:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
	For 5180 ~ 5240MHz band: Channel 36 - 48			
	For 5260 ~ 5320MHz Band: Channel 52 - 64			
	For 5500 ~ 5700MHz Band: Channel 100 - 140			
Channel Number:	For 5745 ~ 5825MHz band: Channel 149 - 165			
Antenna Information:	PCB Antenna 0&1: 3.94dBi			

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	IEEE 802.15.1
Type of Modulation:	GFSK
Channel Number:	40
Data Rate:	1Mbps
Channel Separation:	2MHz
Antenna Information:	PCB Antenna: 3.19dBi

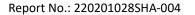




1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized,	CNAS Accreditation Lab Registration No. CNAS L0139
certified, or accredited by these organizations:	FCC Accredited Lab Designation Number: CN0175
organizations.	IC Registration Lab CAB identifier.: CN0051
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02





2 MPE Assessment

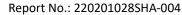
Test result: Pass

2.1 MPE Assessment Limit

Mobile device exposure for standalone operations:

Frequency range	E-field strength (V/m)	H-field strength B-field (A/m) (uT)		Equivalent plane wave power density	
	(*//	(, 4,,	(41)	S_{eq} (W/m ²)	
0-1 Hz	-	3,2 × 10 ⁴	4 × 10 ⁴	-	
1-8 Hz	10 000	$3.2 \times 10^4/f^2$	$4 \times 10^4/f^2$	-	
8-25 Hz	10 000	4 000/f	5 000/f	-	
0,025-0,8 kHz	250/f	4/f	5/f	-	
0,8-3 kHz	250/f	5	6,25	-	
3-150 kHz	87	5	6,25	-	
0,15-1 MHz	87	0,73/f	0,92/f	-	
1-10 MHz	87/f ^{1/2}	0,73/f	0,92/f	-	
10-400 MHz	28	0,073	0,092	2	
400-2 000 MHz	1,375 f ^{1/2}	0,0037 f ^{1/2}	0,0046 f ^{1/2}	f/200	
2-300 GHz	61	0,16	0,20	10	

Mobile device exposure for simultaneous transmission operations: the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is \leq 1.0





TEST REPORT

2.2 Assessment Results

Power density (S) is calculated according to the formula:

 $S = PG / (4\pi R^2)$

Where S = power density in mW/cm²

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 220201028SHA-001 & 220201028SHA-002 & 220201028SHA-003:

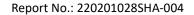
The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

Mode	Frequency band	Power		Antenna Gain	R	S	Limits
	(MHz)	dBm	mW	dBi	(cm)	(mW/cm ²)	(mW/cm ²)
BLE	2402 - 2480	5.32	3.40	3.19	20	0.0014	1
2.4G WIFI	2412 - 2462	23.80	239.88	3.19	20	0.0995	1
5G WIFI	5180 – 5240	20.44	110.66	3.94	20	0.0546	1
	5260 - 5320	20.17	103.99	3.94	20	0.0513	1
	5500 - 5700	20.29	106.91	3.94	20	0.0527	1
	5745 - 5825	20.29	106.91	3.94	20	0.0527	1

The WiFi and BLE cannot support simultaneous transmission.

The worst MPE = 0.0995mW/cm2 < 1 mW/cm2.

Note: 1 mW/cm2 from 1.310 Table 1.





Appendix I

Definition below must be outlined in the User Manual:

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operations at closer than this distance is not recommended.