

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:

240100930SHA-002

ISSUE DATE:

January 31, 2024

DOCUMENT CONTROL NUMBER:

TTRFFCCMPE-01_V1 © 2018 Intertek



TEST REPORT

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)

PREPARED BY:



Project Engineer
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REVIEWED BY:



Reviewer
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Revision History

Report No.	Version	Description	Issued Date
240100930SHA-002	Rev. 01	Initial issue of report	January 31, 2024

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:	<input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing
Software Version:	BCM4362A2_001.003.006.1012.1017_Decrease_BDR_EDR_LE_3dB_2022_0105_2
Hardware Version:	/
Sample received date:	December 19, 2023
Sample Identification Number:	A231219-47-001
Date of test:	December 19, 2023 – January 19, 2024

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1.2 Technical Specification

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20)
Operating Frequency:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) 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

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	Bluetooth 5.1 (BR+EDR)
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Number:	79 (0 - 78)
Data Rate:	Max 3 Mbps
Channel Separation:	1 MHz

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

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

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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, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

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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 (A/m)	B-field (uT)	Equivalent plane wave power density S_{eq} (W/m ²)
0-1 Hz	-	$3,2 \times 10^4$	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 ≤ 1.0**

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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 & 240100930SHA-001:

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)
BR-EDR	2402 - 2480	7.76	5.97	3.19	20	0.0025	1
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, BR-EDR 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.

*****END*****