Hisense Communication Co., Ltd.

MPE ASSESSMENT REPORT

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

Model:
MW604

REPORT NUMBER:
220100379SHA-007

ISSUE DATE:
March 1, 2022

DOCUMENT CONTROL NUMBER:
TTRFFCCMPE-01_V1 © 2018 Intertek

Intertek Testing Services Shanghai
Building No.86, 1198 Qinzhou Road (North)
Caohejing Development Zone
Shanghai 200233, China

Telephone: 86 21 6127 8200
www.intertek.com

Total Quality. Assured.

TEST REPORT

Report no.: 220100379SHA-007

Applicant:	Hisense Communication Co., Ltd. No.218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, Shandong Province,China
Manufacturer:	Hisense Communication Co., Ltd. No.218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, Shandong Province,China
Product Name:	BT/Wi-Fi Module
Type/Model:	MW604
FCC ID:	SARMW604

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:	**REVIEWED BY:**
Project Engineer Dylan Tang	Reviewer Wakeyou Wang

Total Quality. Assured.

TEST REPORT

Revision History

Report No.	Version	Description	Issued Date
211001862SHA-004	Rev. 01	Initial issue of report	March 1, 2022

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	BT/Wi-Fi Module
Type/Model:	MW604
Description of EUT:	The EUT is a BT/Wi-Fi Module which supports WIFI and Bluetooth function, and has only one model.
Rating:	DC 5V
EUT type:	☒ Table top ☐ Floor standing
Product Marketing Name:	MW604
HVIN:	MW604
Software Version:	/
Hardware Version:	V1.00
Serial numbers:	0211022-65-001(for radiation sample), 0211022-65-002(for conduction sample)
Sample received date:	December 15, 2021
Date of test:	December 15, 2021 ~ February 25, 2022

1.2 Technical Specification

Frequency Range:	2402-2480MHz
Support Standards:	IEEE 802.15.1
Type of Modulation:	GFSK
Channel Number:	40
Data Rate:	1Mbps
Channel Separation:	2MHz
Antenna Information:	0.7dBi, PCB antenna

Frequency Range:	2402-2480MHz
Support Standards:	Bluetooth 5.2 (BR+EDR)
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK, π/4 DQPSK, 8DPSK
Channel Number:	79 (0 - 78)
Data Rate:	1Mbps
Channel Separation:	1 MHz
Antenna:	Internal PCB antenna, 0.7dBi gain

TEST REPORT

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20), IEEE 802.11n(HT40), IEEE 802.11ac(VHT20), IEEE 802.11ax(VHT40),IEEE 802.11ax(HE20), IEEE 802.11ax(HE40)
Type of Modulation:	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) IEEE 802.11n(HT40): OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11ac(VHT20): OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11ac(VHT40): OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11ax(HE20): OFDMA (64-QAM, 16-QAM, QPSK, BPSK ,1024QAM) IEEE 802.11ax(HE40): OFDMA (64-QAM, 16-QAM, QPSK, BPSK ,1024QAM)
Operating Frequency:	2412MHz to 2462MHz for IEEE 802.11b/g/n(HT20))/ac(VHT20) /ax(HE20) 2422MHz to 2452MHz for IEEE 802.11n(HT40) /ac(VHT20)/ax(HE40)
Channel Number:	11 Channels for 802.11b, 802.11g ,802.11n(HT20) ,802.11ax(HE20) and /ac(VHT20) 7 Channels for 802.11n(HT40) , 802.11ax(HE40) and /ac(VHT40)
Channel Separation:	5 MHz
Antenna Information:	PCB antenna 1: 1.2dBi PCB antenna 2: 1.3dBi

Frequency Range:	5150 ~ 5250MHz 5250 ~ 5350MHz 5470 ~ 5725MHz 5725 ~ 5850MHz
Support Standards:	802.11a, 802.11n(HT20), 802.11n(HT40), 802.11ac(HT20), 802.11ac(HT40), 802.11ac(HT80), 802.11ax(HE20), 802.11ax(HE40) , 802.11ax(HE80)
Type of Modulation:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM,1024QAM)
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
Antenna Information:	PCB antenna 1: 1.9dBi PCB antenna 2: 1.7dBi

TEST REPORT

Frequency Range:	5925 ~ 6425MHz 6425 ~ 6525MHz 6525 ~ 6875MHz 6875 ~ 7125MHz
Support Standards:	802.11n(HT20), 802.11n(HT40), 802.11ac(HT20), 802.11ac(HT40), 802.11ac(HT80), 802.11ax(HE20), 802.11ax(HE40) , 802.11ax(HE80)
Type of Modulation:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) OFDMA (BPSK, QPSK, 16QAM, 64QAM,256QAM,1024QAM)
Channel Number:	For 5925 ~ 6425MHz band: Channel 1 - 93 For 6425 ~ 6525MHz Band: Channel 97 - 119 For 6525 ~ 6875MHz Band: Channel 117 - 187 For 6875 ~ 7125MHz band: Channel 189 - 233
Antenna Information:	PCB antenna 1: 2.0dBi PCB antenna 2: 1.9dBi

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: CN1175
	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 (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**

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/cm^2

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 220100379SHA-001&220100379SHA-002&220100379SHA-003&220100379SHA-004&220100379SHA-005:

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.

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.

Frequency band	Power		Antenna Gain	R	S	Limits
(MHz)	dBm	mW	dBi	(cm)	(mW/cm2)	(mW/cm2)
2402 – 2480	6.86	4.85	0.7	20	0.0010	1
2412 – 2462	19.74	94.19	4.96	20	0.093	1
5180 – 5825	18.28	67.30	4.96	20	0.066	1
5925 – 7125	0.16	1.04	4.96	20	0.001	1

Note: 1 mW/cm2 from 1.310 Table 1.

BT/BLE and 2.4G WIFI can simultaneous transmitting, so the maximum rate of MPE is, 0.0010/1+0.093/1=0.094<=1.0.

BT/BLE and 5G WIFI can simultaneous transmitting, so the maximum rate of MPE is, 0.0010/1+0.066/1=0.067<=1.0.

BT/BLE and 6G WIFI can simultaneous transmitting, so the maximum rate of MPE is, 0.0010/1+0.001/1=0.0011<=1.0.

Total Quality. Assured.

TEST REPORT

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**********