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## MPE REPORT

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Report No.: SRTC2021-9004(F)-21061502(I)

Product Name: BT/Wi-Fi Module

Product Model: MW510

Applicant: Hisense Communication Co., Ltd.

Manufacturer: Hisense Communication Co., Ltd.

Specification: FCC Part §2.1091, §2.1093, §1.1307(b), §1.1310 (2020)

FCC ID: SARMW510

The State Radio\_monitoring\_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

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## 1 GENERAL INFORMATION

### 1.1 Notes of the test report

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### 1.2 Information about the testing laboratory

|                      |                                                                      |
|----------------------|----------------------------------------------------------------------|
| Company:             | The State Radio_monitoring_center Testing Center (SRTC)              |
| Address:             | 15th Building, No.30 Shixing Street, Shijingshan District, P.R.China |
| City:                | Beijing                                                              |
| Country or Region:   | P.R.China                                                            |
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| Registration number: | 239125                                                               |

### 1.3 Applicant's details

|                    |                                                                                        |
|--------------------|----------------------------------------------------------------------------------------|
| Company:           | Hisense Communication Co., Ltd.                                                        |
| Address:           | 218 Qianwangang Road, Qingdao Economic& Technological Development Zone, Qingdao, China |
| City:              | Qingdao                                                                                |
| Country or Region: | China                                                                                  |
| Contacted person:  | Wang Haining                                                                           |
| Tel:               | 0532-55756937                                                                          |
| Email:             | wanghaining@hisense.com                                                                |

### 1.4 Manufacturer's details

|                    |                                                                                        |
|--------------------|----------------------------------------------------------------------------------------|
| Company:           | Hisense Communication Co., Ltd.                                                        |
| Address:           | 218 Qianwangang Road, Qingdao Economic& Technological Development Zone, Qingdao, China |
| City:              | Qingdao                                                                                |
| Country or Region: | China                                                                                  |
| Contacted person:  | Wang Haining                                                                           |
| Tel:               | 0532-55756937                                                                          |
| Email:             | wanghaining@hisense.com                                                                |

## 2 DESCRIPTION OF THE DEVICE UNDER TEST

### 2.1 Final Equipment Build Status

|                  |                                                                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Range  | BT/BLE: 2.402GHz~2.480GHz<br>WIFI2.4GHz: 2.412GHz~2.462GHz<br>WIFI5GHz UNII-1: 5.180GHz-5.240GHz<br>WIFI5GHz UNII-2A: 5.260GHz-5.320GHz<br>WIFI5GHz UNII-2C: 5.500GHz-5.720GHz<br>WIFI5GHz UNII-3: 5.745GHz-5.825GHz |
| Mode             | BT:GFSK/π/4DQPSK/8DPSK<br>BLE: GFSK<br>WIFI2.4GHz: 802.11b/g/n HT20/HT40<br>WIFI5GHz: 802.11a/n HT20/n HT40<br>802.11ac VHT20/VHT40/VHT80                                                                            |
| Power Supply     | DC Adapter                                                                                                                                                                                                           |
| Hardware Version | V1.00A                                                                                                                                                                                                               |
| Software Version | ---                                                                                                                                                                                                                  |
| IMEI or Sample   | #1                                                                                                                                                                                                                   |

### **3 REFERENCE SPECIFICATION**

| Specification | Version          | Title                                                                                                                 |
|---------------|------------------|-----------------------------------------------------------------------------------------------------------------------|
| 2.1091        | 2020             | Radio frequency radiation exposure evaluation: mobile devices.                                                        |
| 2.1093        | 2020             | Radio frequency radiation exposure evaluation: portable devices.                                                      |
| 1.1307(b)     | 2020             | Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. |
| 1.1310        | 2020             | Radio frequency radiation exposure limits.                                                                            |
| KDB447498     | October 23, 2015 | RF exposure procedures and equipment authorization policies for mobile and portable devices                           |

#### 4 RESULT SUMMARY

| No. | Test case       | FCC reference                                                                                   |
|-----|-----------------|-------------------------------------------------------------------------------------------------|
| 1   | MPE Calculation | FCC Part §2.1091,<br>FCC Part §2.1093,<br>FCC Part §1.1307(b)<br>FCC Part §1.1310<br>KDB 447498 |

|                                                                                                                                        |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| This Test Report Is Issued by:<br>Mr. Peng Zhen<br> | Checked by:<br>Mr. Li Bin<br> |
| Tested by:<br>Mr. Tong Daocheng<br>                 | Issued date:<br><br>20210714                                                                                      |

## **5 TEST RESULTS**

### **5.1 Average Power Output Test Result**

| Mode       | Maximum Average power(dBm) |
|------------|----------------------------|
| BT         | 9.50                       |
| BLE        | 10.00                      |
| WiFi2.4GHz | 18.50                      |
| WiFi5.2GHz | 18.50                      |
| WiFi5.3GHz | 18.00                      |
| WiFi5.6GHz | 18.50                      |
| WiFi5.8GHz | 18.00                      |

## 5.2 Calculation result

### FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

#### (A) Limits for Occupational/Controlled Exposure ☐

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|-------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | *100                                    | 6                                                                 |
| 3.0-30                | 1842/f                            | 4.89/f                            | *900/f <sup>2</sup>                     | 6                                                                 |
| 30-300                | 61.4                              | 0.163                             | 1.0                                     | 6                                                                 |
| 300-1500              | --                                | --                                | f/300                                   | 6                                                                 |
| 1500-100,000          | --                                | --                                | 5                                       | 6                                                                 |

#### (B) Limits for General Population/Uncontrolled Exposure ☒

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|-------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | *100                                    | 30                                                                |
| 1.34-30               | 824/f                             | 2.19/f                            | *180/f <sup>2</sup>                     | 30                                                                |
| 30-300                | 27.5                              | 0.073                             | 0.2                                     | 30                                                                |
| 300-1500              | --                                | --                                | f/1500                                  | 30                                                                |
| 1500-100,000          | --                                | --                                | 1.0                                     | 30                                                                |

f = frequency in MHz \*Plane-wave equivalent power density



Calculation procedure:

According to §2.1091, §2.1093, §1.1307(b) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

Where S = power density in mW/cm<sup>2</sup>

P = transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

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.

| Band            | Freq. (MHz) | Antenna Gain (dBi) | Maximum Power (dBm) | Maximum EIRP (dBm) | Average EIRP (mW) | Power Density at 20cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Power Density / Limit |
|-----------------|-------------|--------------------|---------------------|--------------------|-------------------|---------------------------------------------|-----------------------------|-----------------------|
| BT              | 2480        | 0.50               | 9.50                | 10.00              | 10.00             | 0.002                                       | 1.000                       | 0.002                 |
| BLE             | 2480        | 0.50               | 10.00               | 10.50              | 11.22             | 0.002                                       | 1.000                       | 0.002                 |
| WLAN2.4GHz Band | 2462        | 3.50               | 18.50               | 22.00              | 158.49            | 0.032                                       | 1.000                       | 0.032                 |
| WLAN5.2GHz Band | 5240        | 3.30               | 18.50               | 21.80              | 151.36            | 0.030                                       | 1.000                       | 0.030                 |
| WLAN5.3GHz Band | 5280        | 3.30               | 18.00               | 21.30              | 134.90            | 0.027                                       | 1.000                       | 0.027                 |
| WLAN5.6GHz Band | 5700        | 3.30               | 18.50               | 21.80              | 151.36            | 0.030                                       | 1.000                       | 0.030                 |
| WLAN5.8GHz Band | 5745        | 3.30               | 18.00               | 21.30              | 134.90            | 0.027                                       | 1.000                       | 0.027                 |

Note:

For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

#### Worst Simultaneous Transmission Result

| BT Power Density / Limit | WLAN Power Density / Limit | Σ(Power Density / Limit) of BT+ WLAN |
|--------------------------|----------------------------|--------------------------------------|
| 0.002                    | 0.032                      | 0.034                                |

Note: Simultaneous Transmission Limit=Power Density<sub>1</sub>/ limit<sub>1</sub> + Power Density<sub>2</sub>/ limit<sub>2</sub><1

According to the KDB447498 D01 section 7.1 determine the device is exclusion from SAR test.

---End of Test Report---