

1. RF Exposure Requirements

1.1 General Information

Client Information

Applicant: Xiamen Hanin Electronic Technology Co.,Ltd.
Address of applicant: Room 305A, Angye Building, Pioneering Park,Torch High- tech,Zone, Xiamen,China

Manufacturer: Xiamen Hanin Electronic Technology Co.,Ltd.
Address of manufacturer: No.96, Rongyuan Road, Tong'an District, Xiamen, China

General Description of EUT:

Product Name: Portable Label Printer
Trade Name: /
Model No.: HPL3D2303
Adding Model(s): HM-T300 Pro, HM-T300, HM-T3, HM-T310, HM-T320, HM-T330, HM-T350, HM-T360, HM-T380, HM-T388, HM-T390, MK3, MK3 Pro, iM-T3, iMOVE3pro, XT300, M33, MT31, BMT3, BMTU31, BMTU32, BMTU33, BMTU34, BMTU35, BMTX31, BMTX32, BMTX33, BMTX34, BMTX35, HM-T3 Pro, HM-T3P, HM-T3M Pro, HM-T3PM, T3 Pro, T3P, T3M Pro, T3PM, HM-T300P, HM-T300M Pro, HM-T300PM, M300 Pro, M300P, M300M Pro, M300PM, BMTU30 Pro, BMTU31Pro, BMTU32 Pro, BMTU33 Pro, BMTU34 Pro, BMTU35 Pro

Rated Voltage: DC7.4V
Battery Capacity: 1800mAh
SW-0018

Adapter Model 1: Input:AC100-240 50/60Hz 0.3A
Output:DC5V1.0A
TC331E-5100

Adapter Model 2: Input:AC100-240 50/60Hz 0.25A
Output:DC5V1.0A

FCC ID: 2AUTE-HPL3D2303
Equipment Type: Mobile device

Technical Characteristics of EUT:

Bluetooth (BLE mode)

Bluetooth Version: V5.0(BLE mode)
Frequency Range: 2402-2480MHz
RF Output Power: 2.92dBm (Conducted)
Data Rate: 1Mbps
Modulation: GFSK
Quantity of Channels: 40

| | |
|--------------------------------|----------------------------|
| Channel Separation: | 2MHz |
| Type of Antenna: | PCB Antenna |
| Antenna Gain: | 0.9dBi |
| Bluetooth (BR/EDR mode) | |
| Bluetooth Version: | V5.0(BR/EDR mode) |
| Frequency Range: | 2402-2480MHz |
| RF Output Power: | 3.31dBm (Conducted) |
| Data Rate: | 1Mbps, 2Mbps, 3Mbps |
| Modulation: | GFSK, $\pi/4$ DQPSK, 8DPSK |
| Quantity of Channels: | 79 |
| Channel Separation: | 1MHz |
| Type of Antenna: | PCB Antenna |
| Antenna Gain: | 0.9dBi |

1.2 RF Exposure Exemption

According to §1.1307(b)(3) and KDB 447498 D04 Interim General RF Exposure Guidance v01, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Option A: FCC Rule Part 1.1307 (b)(3)(i)(A): The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

Option B: FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option C: FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.

| Single RF Sources Subject to Routine Environmental Evaluation | |
|---|--------------------------------------|
| RF Source frequency (MHz) | Threshold ERP (watts) |
| 0.3-1.34 | 1,920 R ² |
| 1.34-30 | 3,450 R ² /f ² |
| 30-300 | 3.83 R ² |
| 300-1,500 | 0.0128 R ² f |
| 1,500-100,000 | 19.2R ² |

For Multiple RF sources: FCC Rule Part 1.1307(b)(3)(ii):

- (A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).
- (B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

1.3 Calculated Result

| Radio Access Technology | Prediction Frequency (MHz) | Output Power (dBm) | Antenna Gain (dBi) | Duty Cycle (%) | Tune-Up Time-Averaged Power (dBm) | ERP (dBm) |
|-------------------------|----------------------------|--------------------|--------------------|----------------|-----------------------------------|-----------|
| Bluetooth | 2402 | 3.31 | 0.9 | 100 | 4.00 | 2.75 |

| Frequency (MHz) | Option | Min. Distance (cm) | Max. Power | | Exposure Limit (mW) | Ratio | Result |
|-----------------|--------|--------------------|------------|------|---------------------|-------|-----------|
| | | | (dBm) | (mW) | | | Pass/Fail |
| 2402 | B | 0.5 | 4.00 | 2.51 | 2.788 | 0.90 | Pass |

Note: 1. Time-Averaged Power=Output Power * Duty Cycle; ERP= Time-Averaged Power+ Antenna gain-2.15dB

2. Option A, B and C refers as clause 1.2.

3. For option B, Max (time-averaged power, effective radiated power (ERP)) converts to Max. Power. For option C, ERP converts to Max. Power;

4. For option B, P_{th} (mW) converts to Exposure Limit (mW); For option C, ERP (W) converts to Exposure

Limit (mW).

5. Ratio= Tune-Up ERP (mW)/ Exposure Limit (mW)

Mode for Simultaneous Multi-band Transmission:

| Radio Access Technology | Ratio 1 | Ratio 2 | Simultaneous Ratio | Limit | Result |
|-------------------------|---------|---------|--------------------|-------|-----------|
| | | | | | Pass/Fail |
| -- | -- | -- | -- | -- | -- |

Result: Pass