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

General Description of EUT:

Product Name:	Portable Label Printer
Trade Name	/
Model No.:	HM-A300E
Adding Model(s):	HM-A300, HM-E3, E3PLUS, E35, E36, E39, iM-E3, iME31, ME35, HM-A310E, HM-A320E, HMA330E, HM-A350E, HM-A360E, HMA380E, HM-A388E, HMA390E, BMA3E, BMAU31E, BMAU32E, BMAU33E, BMAU34E, BMAU35E, BMAE31, BMAE32, BMAE33, BMAE34, BMAE35, HM-A316E, HMA318E, HM-A326E, HM-A328E, HMA358E, HM-A366E, HM-A368E, HM-A398E
Rated Voltage:	DC7.4V
Battery Capacity:	2000mAh
Adapter Model 1#:	TC331U-5100 Input: AC100-240V 50/60Hz 0.25A Output:DC5V1.0A
Adapter Model 2#:	PS06CA050K1000UU Input: AC100-240V 50/60Hz 0.25A Output:DC5V1.0A
Software Version:	SW HM-A300E
Hardware Version:	HM-A300EMB
FCC ID:	2AUTE-HMDL22001
Equipment Type:	Mobile device

Technical Characteristics of EUT:

Bluetooth(BLE mode)

Bluetooth Version:	V5.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	6.97dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz

Type of Antenna:	PCB Antenna
Antenna Gain:	1dBi

Bluetooth (BR/EDR mode)

Bluetooth Version:	V5.0 (BR/EDR mode)
Frequency Range:	2402-2480MHz
RF Output Power:	7.15dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, π/4 DQPSK, 8DPSK
Quantity of Channels:	79
Channel Separation:	1MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	1dBi

1.2 RF Exposure Exemption

According to §1.1307(b)(3) and 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:

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

Where

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

and

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

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^2f
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	Min. Frequency	Max. Output Power	Max. Tune-Up Output Power	Antenna Gain	Duty Cycle	Tune-Up EIRP
	(MHz)	(dBm)	(dBm)	(dBi)	(%)	(dBm)
Bluetooth	2402	7.15	8.0	1.0	100	9.0

Frequency	Option	Min. Distance	Tune-Up ERP		Exposure Limit	Ratio	Result
(MHz)		(cm)	(dBm)	(mW)	(mW)		Pass/Fail
2402	C	20.00	6.85	4.84	768.00	0.01	Pass

Note: 1. ERP=EIRP-2.15dB; EIRP= Output Power + Antenna gain

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

3. For option B, Pth(mW) convert to Exposure Limit(mW); For option C, ERP(W) convert to Exposure Limit(mW).

4. 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
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Result: Pass