

1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

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General Description of EUT:

Product Name: Thermal Transfer Barcode Printer
Trade Name: /
Model No.: iT4B
Adding Model(s): iT4S Plus, HY108 Plus, HY4 Plus, DP4 Plus, DP46, DTP8, DT46, T46P,
HT4, D46, T46, iT46, HT46, Etron
Rated Voltage: DC24V
MODEL: GM53-240200-D
Power Adapter Model #1: INPUT: 100-240V 50/60Hz, 2.0A, MAX
Output: DC24V, 2.0A
MODEL: SW-0209
Power Adapter Model #2: INPUT: 100-240V 50/60Hz, 2.0A, MAX
Output: DC24V, 2.0A
FCC ID: 2AUTE-IT4B21
Equipment Type: Mobile

Technical Characteristics of EUT:	
Wi-Fi	
Support Standards:	802.11b
Frequency Range:	2412-2462MHz for 802.11b
RF Output Power:	17.79dBm (Conducted)
Type of Modulation:	CCK
Quantity of Channels:	11 for 802.11b
Channel Separation:	5MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	1dBi
Bluetooth	
Bluetooth Version:	V5.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	1.845dBm (Conducted)

Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	0.5dBi

1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, 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.

(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 ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	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 ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz; * = Plane-wave equivalent power density

1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mw/cm²)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

1.4 MPE Calculation Result

Wi-Fi

Maximum Tune-Up output power: 18(dBm)

Maximum peak output power at antenna input terminal: 63.10 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2462 (MHz)

Antenna gain: 1.0(dBi)

Directional gain (numeric gain): 1.26

The worst case is power density at prediction frequency at 20cm: 0.0158 (mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

Bluetooth

Maximum Tune-Up output power: 2(dBm)

Maximum peak output power at antenna input terminal: 1.58 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2480 (MHz)

Antenna gain: 0.5 (dBi)

Directional gain (numeric gain): 1.12

The worst case is power density at prediction frequency at 20cm: 0.0004 (mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

Mode for Simultaneous Multi-band Transmission

Wi-Fi+ Bluetooth

The worst case is power density at prediction frequency at 20cm: 0.0158+0.0004=0.0162(mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

Result: Pass