

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

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: Thermal Receipt Printer
Trade Name: HPRT, iDPRT
Model No.: TP808
Adding Model(s): P808, TP808-i, TP808Si, TP808-Wi, TP808H, P38, FFSP8000, FFSP8U01, FFSP8U02, FFSP8U03, FFSP8U04, FFSP8U05, FFSP8X01, FFSP8X02, FFSP8X03, FFSP8X04, FFSP8X05, POS80D, POS80H, POS80Hi, TP3260
Rated Voltage: DC 24V
GM53-240200-D
Input: AC100-240V 50/60Hz 2.0A
Output:DC24V2.0A
Power Adapter Model: AP113G-240200
Input: AC100-240V 50/60Hz 1.5A
Output:DC24V2.0A
FCC ID: 2AUTE-TP808P
Equipment Type: Fixed device

Technical Characteristics of EUT:	
Wi-Fi	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20)
RF Output Power:	12.29dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Quantity of Channels:	11 for 802.11b/g/n(HT20)
Channel Separation:	5MHz
Type of Antenna:	FPC Antenna
Antenna Gain:	0.88dBi
Bluetooth	
Bluetooth Version:	V5.2
Frequency Range:	2402-2480MHz

RF Output Power:	4.68dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Quantity of Channels:	79/40
Channel Separation:	1MHz /2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	5.09dBi

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: 12.5 (dBm)

Maximum peak output power at antenna input terminal: 17.78(mW)

Prediction distance: >20 (cm)

Prediction frequency: 2412 (MHz)

Antenna gain: 0.88 (dBi)

Directional gain (numeric gain): 1.22

The worst case is power density at prediction frequency at 20cm: 0.0043(mw/cm²)

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

Bluetooth

Maximum Tune-Up output power: 5.0 (dBm)

Maximum peak output power at antenna input terminal: 3.16(mW)

Prediction distance: >20 (cm)

Prediction frequency: 2480 (MHz)

Antenna gain: 5.09 (dBi)

Directional gain (numeric gain): 1.22

The worst case is power density at prediction frequency at 20cm: 0.0008(mw/cm²)

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

Mode for Simultaneous Multi-band Transmission

The worst case is Wi-Fi+ Bluetooth

Evaluation Result: $0.0043/1+0.0008/1=0.0051$

Limit: 1

Result: Pass