

1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	TIC Audio Inc
Address of applicant:	15224 Stafford Street, City of Industry, CA 91744
Manufacturer:	ZhangZhou Yile Electronics Technology Co., Ltd
Address of manufacturer:	Lantian Industrial District, Zhangzhou, Fujian, China

General Description of EUT:

Product Name:	Outdoor Wifi&Bluetooth Receiver-Amplifier
Trade Name:	TIC
Model No.:	AMP100, APM50, AMP6, AMP8, AMP10, AMP16, AMP18, AMP28, AMP150, AMP200, AMP66, AMP68, AMP86, AMP88, AMP98, WBR1, WBR2, WBR5, WBR6, WBR8, WBR10, WBR12 , WBR16, WBR66, WBR68, WBR86, WBR88, WB6, WB8, WB16, WB18, WB66, WB60, WB68, WB86, WB88, WB98, WB80, WB36, WB38, WB5, WB4, WB3, WB1, WB2, WB7, WB17, WB26, WB28, WB38, WB48, WBL56, WBL58, WBL510, WBL516, WBL566, WBL568, WBL588, WBL598, WBL586, WBL578, WBL577, WBL580, WBP6, WBP5, WBP8, WBP10, WBP16, WBP18, WBP66, WBP68, WBP86, WBP88, WBP77, WBP98
FCC ID:	2AJNG-AMP100
Rated Voltage:	Adapter: DC20V

Technical Characteristics of EUT:

Wi-Fi	
Support Standards:	802.11b, 802.11g, 802.11n(HT20)
Frequency Range:	2412-2462MHz
RF Output Power:	11.32dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 72.2Mbps
Quantity of Channels:	11
Channel Separation:	5MHz
Type of Antenna:	SMA-reverse
Antenna Gain:	3.0dBi
Bluetooth	
Bluetooth Version:	V4.2
Frequency Range:	2402-2480MHz
RF Output Power:	6.404dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps

Modulation:	GFSK, Pi/4 QDPSK, 8DPSK
Quantity of Channels:	79/40
Channel Separation:	1/2MHz
Type of Antenna:	SMA-reverse
Antenna Gain:	3.0dBi

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 equivalents power density

1.3 MPE Calculation Method

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

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

WiFi

Maximum Tune-Up output power: 12.0 (dBm)

Maximum peak output power at antenna input terminal: 15.85 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2412 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.006(mw/cm²)

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

BT

Maximum Tune-Up output power: 7.0 (dBm)

Maximum peak output power at antenna input terminal: 5.01 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2402 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.002(mw/cm²)

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

Result: Pass