

1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant: Yuyao Yunjin Electrical Appliance Co., Ltd
Address of applicant: No.5 Gongji Road ,Simen Town,Yuyao,Ningbo, Zhejiang
China

Manufacturer: Yuyao Yunjin Electrical Appliance Co., Ltd
Address of manufacturer: No.5 Gongji Road ,Simen Town,Yuyao,Ningbo, Zhejiang
China

General Description of EUT:

Product Name: LED Pathway Lights

Trade Name:  ATOMI SMART,  Yunjin

Model No.: AT1558- followed by 18AWG, 18AWG5A or 18AWG8A
AT1593- followed by 18AWG, 18AWG5A or 18AWG8A;
AT1592- followed by 18AWG, 18AWG5A or 18AWG8A;
AT1594- followed by 18AWG, 18AWG5A or 18AWG8A;
AT1684- followed by 18AWG, 18AWG5A or 18AWG8A;
AT1685- followed by 18AWG, 18AWG5A or 18AWG8A;
YJCP-1- followed by 18AWG, 18AWG5A or 18AWG8A;
AT1608-followed by 18AWG,18AWG5A or 18AWG8A;
AT1609-followed by 18AWG,18AWG5A or 18AWG8A;
AT1620-followed by 18AWG,18AWG5A or 18AWG8A;
AT1621-followed by 18AWG,18AWG5A or 18AWG8A

Adding Model(s):

Rated Voltage: AC 120V/ 60Hz

Power Adapter /

FCC ID: 2A2QE-AT1558

Technical Characteristics of EUT:

Bluetooth

Bluetooth Version: V5.0 (BLE mode)

Frequency Range: 2402-2480MHz

RF Output Power: 9.98dBm (Conducted)

Data Rate: 1Mbps

Modulation: GFSK

Quantity of Channels: 40

Channel Separation: 1MHz

Type of Antenna: Integral Antenna

Antenna Gain: 2.16dBi

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

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

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

For Bluetooth

Maximum Tune-Up output power: 10(dBm)

Maximum peak output power at antenna input terminal: 10.00(mW)

Prediction distance: >20(cm)

Prediction frequency: 2440(MHz)

Antenna gain: 2.16 (dBi)

Directional gain (numeric gain): 1.64

The worst case is power density at prediction frequency at 20cm: 0.0033(mw/cm²)

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

Result: Pass