

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 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:	String Lights for All-Year Use
Trade Name:	Yunjin
Model No.:	AT1438
Adding Model(s):	YJ-3, YJ-5, AT1326, AT1308, YJ-312, YJ-SC15A, YJ-SC15AO, YJ-2, YJ-SW15A, YJ-SW15A, YJ-SW15AO, AT1327, AT1450,
Rated Voltage:	Input: AC120V, 60Hz, 0.2A Output 1: DC5V, max.2A Output 2: AC120V, max.5A
Power Adapter	/
FCC ID:	2A2QE-AT1438

### Technical Characteristics of EUT:

#### WIFI:

Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20)
RF Output Power:	15.48dBm (Conducted)
Type of Modulation:	DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM
Quantity of Channels:	11 for 802.11b/g/n(HT20)
Channel Separation:	5MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	0dBi
Support Standards:	802.11b, 802.11g, 802.11n

## 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 <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> 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 <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> 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/cm<sup>2</sup>)

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 WIFI:

Maximum Tune-Up output power: 16(dBm)

Maximum peak output power at antenna input terminal: 39.81(mW)

Prediction distance: >20(cm)

Prediction frequency: 2437(MHz)

Antenna gain: 0 (dBi)

Directional gain (numeric gain): 1.00

The worst case is power density at prediction frequency at 20cm: 0.0079(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

Result: Pass