

1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant: Dhyan Networks and Technologies, Inc

Address of applicant: 160 Stanford Ave Fremont, CA, USA

Manufacturer: ShenZhen Juyang Wulian Co., Ltd.

Address of manufacturer: A716, floor 7, building D, Juji Industrial Park, Yabian xueziwei, Yabian community, Shajing street, Bao'an District, Shenzhen

General Description of EUT:

Product Name: Smart Light Controller

Trade Name: Ohli Node

Model No.: SLC-N-500-NB

Adding Model(s): /

Rated Voltage: AC120V

Power Adapter /

FCC ID: 2A729-SLC-N-500-NB

Equipment Type: Mobile Device

Technical Characteristics of EUT:	
4G	
Support Networks:	FDD-LTE
Support Band:	FDD-LTE Band 2, 4, 5,12, 13
Uplink Frequency:	FDD-LTE Band 2: Tx: 1850-1910MHz, FDD-LTE Band 4: Tx: 1710-1755MHz, FDD-LTE Band 5: Tx: 824-849MHz, FDD-LTE Band 12: Tx: 699-716MHz, FDD-LTE Band 13: Tx: 777-787MHz,
Downlink Frequency:	FDD-LTE Band 2: Rx: 1930-1990MHz, FDD-LTE Band 4: Rx: 2110-2155MHz, FDD-LTE Band 5: Rx: 869-894MHz, FDD-LTE Band 12: Rx: 729-746MHz, FDD-LTE Band 13: Rx: 746-756MHz,
RF Output Power:	FDD-LTE Band 2: 20.71dBm, FDD-LTE Band 4: 21.80dBm, FDD-LTE Band 5: 21.20dBm,,FDD-LTE Band 12: 22.12dBm, FDD-LTE Band 13: 21.07dBm,
Type of Emission:	FDD-LTE Band 2: 256KG7D, 257KW7D FDD-LTE Band 4: 258KG7D, 250KW7D FDD-LTE Band 5: 261KG7D, 261KW7D FDD-LTE Band 12: 259KG7D, 250KW7D FDD-LTE Band13: 248KG7D, 250KW7D

Type of Modulation:	BPSK, QPSK
Antenna Type:	Spring helical antenna
Antenna Gain:	FDD-LTE Band 2: 1.5dBi, FDD-LTE Band 4: 1.5dBi, FDD-LTE Band 5: 1.5dBi, FDD-LTE Band 12: 1.5dBi, FDD-LTE Band 13: 1.5dBi,

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

For FDD-LTE Band 2:

Maximum Tune-Up output power: 22 (dBm)

Maximum peak output power at antenna input terminal: 158.49(mW)

Prediction distance: >20(cm)

Prediction frequency: 1850.1 (MHz)

Antenna gain: 1.5 (dBi)

Directional gain (numeric gain): 1.41

The worst case is power density at prediction frequency at 20cm: 0.0445 (mw/cm²)

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

For FDD-LTE Band 4:

Maximum Tune-Up output power: 23 (dBm)

Maximum peak output power at antenna input terminal: 199.53(mW)

Prediction distance: >20(cm)

Prediction frequency: 1710.1 (MHz)

Antenna gain: 1.5 (dBi)

Directional gain (numeric gain): 1.41

The worst case is power density at prediction frequency at 20cm: 0.0561 (mw/cm²)

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

For FDD-LTE Band 5:

Maximum Tune-Up output power: 23 (dBm)

Maximum peak output power at antenna input terminal: 199.53(mW)

Prediction distance: >20(cm)

Prediction frequency: 824.1 (MHz)

Antenna gain: 1.5 (dBi)

Directional gain (numeric gain): 1.41

The worst case is power density at prediction frequency at 20cm: 0.0561 (mw/cm²)

MPE limit for general population exposure at prediction frequency: 0.5494 (mw/cm²)

For FDD-LTE Band 12:

Maximum Tune-Up output power: 23.5 (dBm)

Maximum peak output power at antenna input terminal: 223.87(mW)

Prediction distance: >20(cm)

Prediction frequency: 715.9 (MHz)

Antenna gain: 1.5 (dBi)

Directional gain (numeric gain): 1.41

The worst case is power density at prediction frequency at 20cm: 0.0629 (mw/cm²)

MPE limit for general population exposure at prediction frequency: 0.4773 (mw/cm²)

For FDD-LTE Band 13:

Maximum Tune-Up output power: 22.5 (dBm)

Maximum peak output power at antenna input terminal: 177.83(mW)

Prediction distance: >20(cm)

Prediction frequency: 782 (MHz)

Antenna gain: 1.5 (dBi)

Directional gain (numeric gain): 1.41

The worst case is power density at prediction frequency at 20cm: 0.05 (mw/cm²)

MPE limit for general population exposure at prediction frequency: 0.5213 (mw/cm²)

Result: Pass