

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: ShenZhen Foscam Intelligent Technology Co., Ltd.  
Address of applicant: 9/F, Block F5, TCL International E City, No.1001 ZhongShanyuan Rd.,  
NanShan District, Shenzhen, China

Manufacturer: ShenZhen Foscam Intelligent Technology Co., Ltd.  
Address of manufacturer: 9/F, Block F5, TCL International E City, No.1001 ZhongShanyuan Rd.,  
NanShan District, Shenzhen, China

### General Description of EUT:

Product Name: UHD 4.0MP Wi-Fi Camera  
Trade Name: FOSCAM  
R4S, R4M, PT4, R4M VX, PT4 VX, R4S, R2 V(X), R2C V(X), R2E V(X), R2S V(X), R2 Lite V(X), R2 Pro V(X), R4 V(X), R4S V(X), R4C V(X), R4E V(X), R4 Lite V(X), R4 Pro V(X), FI9225P V(X), FI9235P V(X), MPS4010, MPS2010, MPS401(X), MPS201(X) (“VX”represent the software version, which “X”can be from 0 which “X”can be from 0)  
Model No.:  
FCC ID: ZDER4S  
Rated Voltage: DC 5V

### Technical Characteristics of EUT:

WiFi 2.4G  
Support Standards: 802.11b, 802.11g, 802.11n  
Frequency Range: 2412-2462MHz for 802.11b/g/n-HT20  
2422-2452MHz for 802.11n-HT40  
RF Output Power: 16.31dBm (Conducted)  
Type of Modulation: CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM  
Data Rate: 1-11Mbps, 6-54Mbps, up to 150Mbps  
Quantity of Channels: 11 for 802.11b/g/n-HT20  
7 for 802.11n-HT40  
Channel Separation: 5MHz  
Type of Antenna: SMA Reverse threads antenna  
Antenna Gain: 2.0dBi  
WiFi 5G  
Support Standards: 802.11a, 802.11n(HT20) , 802.11n-HT40, 802.11ac-VH80  
Frequency Range: 5150-5250MHz, 5725-5850MHz  
RF Output Power: 13.33dBm (Conducted)  
Type of Modulation: QPSK, 16QAM, 64QAM  
Data Rate: 6-54Mbps, up to 433.3Mbps

Type of Antenna: SMA Reverse threads antenna  
 Antenna Gain: 2dBi

### 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 equivalent 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

WiFi 2.4G

Maximum Tune-Up output power: 17 (dBm)

Maximum peak output power at antenna input terminal: 50.12 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2412 (MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.016(mw/cm<sup>2</sup>)

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

WiFi 5.2G

Maximum Tune-Up output power: 14 (dBm)

Maximum peak output power at antenna input terminal: 25.12 (mW)

Prediction distance: >20(cm)

Prediction frequency: 5180 (MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.008(mw/cm<sup>2</sup>)

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

WiFi 5.8G

Maximum Tune-Up output power: 14 (dBm)

Maximum peak output power at antenna input terminal: 25.12 (mW)

Prediction distance: >20(cm)

Prediction frequency: 57450 (MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.008(mw/cm<sup>2</sup>)

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

Result: Pass