



MPE Report

According to
FCC CFR Title 47 Part 15 Subpart E (15.407)

Applicant : Amcrest Technologies LLC

Address : 16727 Park Row Dr.Houston, TX 77084

Manufacturer : Zhejiang Dahua Vision Technology Co., Ltd.

Address : No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Equipment : 2K Dual Band Pan/Tilt Wireless IP Camera

Model No. : IP3M-941B, IP3M-941W, IP3M-941S, IP3M-941B-UK, IP3M-941W-UK,
IP3M-941S-UK, IP3M-941B-EU, IP3M-941W-EU, IP3M-941S-EU,
IP3M-941B-*****, IP3M-941W-*****, IP3M-941S-***** (***** can be "A-Z",
or "-" or blank)

FCC ID : AMCREST

■ The test result refers exclusively to the test presented test model / sample.,

■ Without written approval of **Cerpass Technology (Suzhou) Co.,Ltd.** the test report shall not be reproduced except in full.

Prepared By:

Kerry Zhou

Approved by:

Miro Chueh (EMC/RF Manager)

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory



NVLAP LAB Code:	200954-0
TAF LAB Code:	1439

Cerpass Technology (SuZhou) Co., Ltd.



NVLAP LAB Code:	200814-0
CNAS LAB Code:	L5515



Radio Frequency Exposure

LIMIT

For 2.4G Band: According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

For 5.0G Band: According to FCC §1.1310, The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in § 1.1307(b).

**EUT Specification**

EUT	2K Dual Band Pan/Tilt Wireless IP Camera		
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☒ WLAN: 5.150GHz ~ 5.250GHz ☒ WLAN: 5.745GHz ~ 5.825GHz ☐ Bluetooth: 2.402GHz ~ 2.480 GHz		
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)		
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)		
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity		
Max. output power for 2.4G Band	Mode	Power (dBm)	Power (W)
	IEEE802.11b	25.11	0.3243
	IEEE802.11g	25.39	0.3459
	IEEE802.11n(20MHz)	25.39	0.3459
	IEEE802.11n(40MHz)	25.37	0.3443
Max. output power for 5.150-5.250GHz	IEEE802.11a	14.44	0.0278
	IEEE802.11n(20MHz)	14.54	0.0284
	IEEE802.11ac(20MHz)	14.47	0.0280
	IEEE802.11n(40MHz)	14.03	0.0253
	IEEE802.11ac(40MHz)	14.11	0.0258
	IEEE802.11ac(80MHz)	12.52	0.0179
Max. output power for 5.745-5.850GHz	IEEE802.11a	14.24	0.0265
	IEEE802.11n(20MHz)	14.13	0.0259
	IEEE802.11ac(20MHz)	14.12	0.0258
	IEEE802.11n(40MHz)	13.12	0.0205
	IEEE802.11ac(40MHz)	13.16	0.0207
	IEEE802.11ac(80MHz)	13.41	0.0219
Antenna gain (Max)	6.12dBi for 2.4G Band		
	2.83dBi for 5.150-5.250GHz 3.15dBi for 5.745-5.850GHz		
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A		
Remark:			
1. The maximum output power is 25.89dBm (0.3459W) at 2412MHz (with numeric 4.093antenna gain).			



for 2.4G band

The maximum output power is 14.54dBm (0.0284W) at 5240MHz (with numeric 1.919 antenna gain.)

The maximum output power is 14.24dBm (0.0265W) at 5825MHz (with numeric 2.065 antenna gain.)

2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.

*Note: Simultaneous transmission is not applicable for this EUT.

**TEST RESULTS FOR 2.4G BAND**

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter
 P = Power in Watts
 G = Numeric antenna gain
 d = Distance in meters
 S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm
 P = Power in mW
 G = Numeric antenna gain
 S = Power density in mW / cm²

Maximum Permissible Exposure

Modulation Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm2)	Limit (mW/cm2)
IEEE802.11b	2412-2462	25.11	6.12	20	0.2642	1
IEEE802.11g	2412-2462	25.39	6.12	20	0.2818	1
IEEE802.11n20	2412-2462	25.39	6.12	20	0.2818	1
IEEE802.11n40	2422-2452	25.37	6.12	20	0.2805	1

**TEST RESULTS FOR 5150-5250MHZ**

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Maximum Permissible Exposure

Modulation Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm2)	Limit (mW/cm2)
IEEE802.11a	5180-5240	14.44	2.83	20	0.0106	1
IEEE802.11n(20MHz)	5180-5240	14.54	2.83	20	0.0109	1
IEEE802.11ac(20MHz)	5180-5240	14.47	2.83	20	0.0107	1
IEEE802.11n(40MHz)	5190-5230	14.03	2.83	20	0.0097	1
IEEE802.11ac(40MHz)	5190-5230	14.11	2.83	20	0.0098	1
IEEE802.11ac(80MHz)	5210	12.52	2.83	20	0.0068	1

**TEST RESULTS FOR 5745-5825MHZ**

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter
 P = Power in Watts
 G = Numeric antenna gain
 d = Distance in meters
 S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$
$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm
 P = Power in mW
 G = Numeric antenna gain
 S = Power density in mW / cm²

**Maximum Permissible Exposure**

Modulation Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
IEEE802.11a	5745-5825	14.24	3.15	20	0.0109	1
IEEE802.11n(20MHz)	5745-5825	14.13	3.15	20	0.0106	1
IEEE802.11ac(20MHz)	5745-5825	14.12	3.15	20	0.0106	1
IEEE802.11n(40MHz)	5755-5795	13.12	3.15	20	0.0084	1
IEEE802.11ac(40MHz)	5755-5795	13.16	3.15	20	0.0085	1
IEEE802.11ac(80MHz)	5775	13.41	3.15	20	0.0090	1