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.)*			

for2.4G band
The maximum output power is 14.54dBm (0.0284W) at 5240MHz (with numeric 1.919antenna gain.)
The maximum output power is 14.24dBm (0.0265W) at 5825MHz (with numeric 2.065antenna 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 (mW) = P (W) / 1000 and
d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***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:

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

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and
d (cm) = d(m) / 100

Yields

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

Where *d = Distance in cm*
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

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 (mW) = P (W) / 1000 and
d (cm) = d(m) / 100

Yields

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