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RF Exposure Evaluation Report

Application No.:	KSCR2112000377AT
FCC ID:	2ADTD-CP03029601220
Applicant:	Hangzhou Hikvision Digital Technology Co.,Ltd.
Address of Applicant:	No. 555, Qianmo Road, Binjiang District,Hangzhou
Manufacturer:	Hangzhou Hikvision Digital Technology Co.,Ltd.
Address of Manufacturer:	No. 555, Qianmo Road, Binjiang District,Hangzhou
Factory:	1.Hangzhou Hikvision Electronics Co., Ltd. 2.Hangzhou Hikvision Technology Co., Ltd. 3.CHONGQING HIKVISION TECHNOLOGY CO.,LTD.
Address of Factory:	1.No.299,Qiushi Road,Tonglu Economic Development Zone,Tonglu County, Hangzhou,Zhejiang 2.No.700 Dongliu Road, Binjiang District, Hangzhou 310052, China 3.No.118, Haikang Road, Area C, Jianqiao Industrial Park, Dadukou District, Chongqing, 401325,China
Equipment Under Test (EUT):	
EUT Name:	AX PRO
Model No.:	DS-PWA96-M2H-WA,DS-PWA96-M2H-WAUHK, DS-PWA96-M2H-WACKV,DS-PWA96-M2H-WAUVS, DS-PWA96-M2H-WAKVO,DS-PWA96-M2H-WAHUN
Trade mark:	HIKVISION
Standard(s) :	FCC Rules 47 CFR §2.1091
Date of Receipt:	2021-12-23
Date of Test:	2022-01-06 to 2022-01-26
Date of Issue:	2022-01-27

Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin
Laboratory Manager

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Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2022-01-27	/

Authorized for issue by:				
		Damon zhou		
		Damon Zhou / Project Engineer		
		Eric Lin		
		Eric Lin / Reviewer		

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3 General Information

3.1 General Description of E.U.T.

Power supply:	AC 100~240V 50/60Hz

3.2 Technical Specifications

915MHz

Operation Frequency:	912.5MHz ~ 917.4MHz
Number of Channels:	50
Channel Spacing:	100kHz
Modulation Type:	FSK
Spectrum Spread:	Frequency Hopping Spread Spectrum (FHSS)
Antenna Gain:	Ant1: 3.30dBi (Provided by manufacturer) Ant2: -0.39dBi (Provided by manufacturer)
Antenna Type:	Ant1: PCB Antenna Ant2: PCB Antenna

920MHz

Antenna Gain:	Ant1: 3.30dBi (Provided by manufacturer) Ant2: -0.39dBi (Provided by manufacturer)
Antenna Type:	Ant1: PCB Antenna Ant2: PCB Antenna
Modulation Type:	FSK
Operation Frequency:	920MHz
Channel Number:	1

2.4GHz

Antenna Gain:	Ant1: 2.04dBi (Provided by manufacturer) Ant2: 3.51dBi (Provided by manufacturer) Directional gain:5.85dBi
Antenna Type:	Ant1: PCB Antenna Ant2: PCB Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Data Rate:	802.11b:1/2/5.5./11Mbps 802.11g:6/9/12/18/24/36/48/54Mbps 802.11n:MCS0-MCS7
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz

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4G

LTE Operation Frequency Band:	LTE Band 2,4,5,12,13,14,25,26,41,66,71
Modulation Type:	QPSK, 16QAM
Antenna Type:	LDS
Antenna Gain:	Band 2:-2.51dBi Band 4: -2.94dBi Band 5: -2.51dBi Band 12:-6.76 dBi Band 13: -4.48dBi Band 14:-2.81 dBi Band 25: -2.51dBi Band 26: -2.51dBi Band 41: -2.08dBi Band 66: -2.7dBi Band 71: -6.91dBi

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3.3 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED (CAB identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600,C-11707, T-11499, G-10216 respectively.

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4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to§1.1310, the limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm^2)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

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5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report KSCR211200037701, KSCR211200037702, KSCR211200037703

915MHz

Test Mode	Channel	Antenna 1		Antenna 2	
		Antenna Power[dBm]	Antenna Power[mW]	Antenna Power[dBm]	Antenna Power[mW]
FSK	912.5	-3.44	**0.45**	-3.12	**0.49**
	915.0	-3.52	0.44	-3.17	0.48
	917.4	-3.61	0.44	-3.22	0.48

2.4GHz

Test Mode	Channel	Antenna 1 Power[dBm]	Antenna 2 Power[dBm]	MIMO Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]	MIMO Power[mW]
11B	2412	15.65	14.78	NA	**36.73**	**30.06**	N/A
11B	2437	14.80	14.11	NA	30.20	25.76	N/A
11B	2462	15.07	14.25	NA	32.14	26.61	N/A
11G	2412	14.46	14.45	NA	27.93	27.86	N/A
11G	2437	14.47	14.45	NA	27.99	27.86	N/A
11G	2462	14.31	14.48	NA	26.98	28.05	N/A
11N20 MIMO	2412	11.77	11.95	14.87	15.03	15.67	**30.69**
11N20 MIMO	2437	11.07	11.34	14.22	12.79	13.61	26.42
11N20 MIMO	2462	11.62	11.54	14.59	14.52	14.26	28.77
11N40 MIMO	2422	11.28	11.27	14.29	13.43	13.40	26.85
11N40 MIMO	2437	11.06	11.03	14.06	12.76	12.68	25.47
11N40 MIMO	2452	7.83	8.14	11.00	6.07	6.52	12.59

920MHz

Test Mode	Channel	Antenna 1		Antenna 2	
		EIRP [dBm]	EIRP [mW]	EIRP [dBm]	EIRP [mW]
FSK	920	-13.75	**0.042**	-12.38	**0.058**

EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77, d=3m

EIRP[dBm] = E[dBμV/m] - 95.2

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5.2 MPE Calculation

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

1) P (mW)
2) R = distance to the center of radiation of antenna (in meter) = 20cm
3) For 912.5MHz ~ 917.4MHz, MPE limit: 912.5MHz / 1500 = 0.608mW/cm^2
4) For 2.4GHz, MPE limit = 1mW/cm^2
5) For 920MHz, MPE limit = 920/1500 = 0.613mW/cm^2
6) For LTE B2, MPE limit = 1mW/cm^2, LTE B4, MPE limit = 1mW/cm^2,

LTE B5, MPE limit = 0.57mW/cm^2, LTE B12 MPE limit = 0.48mW/cm^2,

LTE B13, MPE limit = 0.52mW/cm^2, LTE B14, MPE limit = 1mW/cm^2,

LTE B25, MPE limit = 1mW/cm^2, LTE B26, MPE limit = 0.57mW/cm^2,

LTE B26 (Part 90), MPE limit = 0.57mW/cm^2, LTE B41, MPE limit = 1mW/cm^2,

LTE B66, MPE limit = 1mW/cm^2, LTE B71, MPE limit = 1mW/cm^2

For 2.4G WiFi –Antenna1:

The max. antenna gain is		2.04	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
36.73	1.600	20	0.01169	1	Pass

For 2.4G WiFi –Antenna2:

The max. antenna gain is		3.51	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
30.06	2.244	20	0.01342	1	Pass

In MIMO mode:

The max. antenna gain is		5.85	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
30.69	3.846	20	0.02348	1	Pass

For 915MHz –Antenna1:

The max. antenna gain is		3.3	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
0.45	2.138	20	0.00019	0.608	Pass

For 915MHz–Antenna2:

The max. antenna gain is		-0.39	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
0.49	0.914	20	0.00009	0.608	Pass

For 920MHz –Antenna1:

$S= \frac{PG}{4R^2\pi} = \frac{0.042}{4\times400\times3.14}$ = 0.00000836 mW/cm² < 0.613mW/cm²

For 920MHz –Antenna2:

$S= \frac{PG}{4R^2\pi} = \frac{0.058}{4\times400\times3.14}$ = 0.0000115 mW/cm² < 0.613mW/cm²

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For LTE

Power data based on report No. STS2006195W01.

Band Information	Antenna Gain (dBi)	Gain in Linear Scale G	Operation Distance R(cm)	Max Tune-up power (dBm)	Max Tune-up power (mW)	Power Density (mW/cm²)	Limit (mW/cm²)	Result
LTE Band 2	-2.51	0.56	20	23	199.53	0.022	1.00	Pass
LTE Band 4	-2.94	0.51	20	23	199.53	0.020	1.00	Pass
LTE Band 5	-2.51	0.56	20	25	316.23	0.035	0.57	Pass
LTE Band 12	-6.76	0.21	20	24	251.19	0.011	0.48	Pass
LTE Band 13	-4.48	0.36	20	23	199.53	0.014	0.52	Pass
LTE Band 14	-2.81	0.52	20	22	158.49	0.017	1.00	Pass
LTE Band 25	-2.51	0.56	20	23	199.53	0.022	1.00	Pass
LTE Band 26	-2.51	0.56	20	25	316.23	0.035	0.57	Pass
LTE Band 26 (Part 90)	-2.51	0.56	20	25	316.23	0.035	0.57	Pass
LTE Band 41	-2.08	0.62	20	25	316.23	0.039	1.00	Pass
LTE Band 66	2.7	1.86	20	23	199.53	0.074	1.00	Pass
LTE Band 71	-6.91	0.20	20	22	158.49	0.006	1.00	Pass

The WiFi&915MHz&920MHz&LTE function can simultaneous transmitting.so the maximum rate of MPE 0.023/1.0+0.00019/0.608+0.0000115/0.613+0.074/1=0.097<=1.0.

According to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

--End of the Report--

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