

1 Cover Page

RF Exposure Evaluation Report

Application No.: KSCR2109000086AT
FCC ID: 2ADTD-03C5ACO
IC: 20199-03C5ACO
Applicant: Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Applicant: No.555 Qianmo Road, Binjiang District Hangzhou 310052, China
Manufacturer: Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Manufacturer: No.555 Qianmo Road, Binjiang District Hangzhou 310052, China
Factory: 1.Hangzhou Hikvision Technology Co., Ltd.
 2.Hangzhou Hikvision Electronics Co.,Ltd.
 3.Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Factory: 1.No.700, Dongliu Road, Binjiang District, Hangzhou Ctiy, Zhejiang, 310052, China
 2.No.299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou, Zhejiang, 310052, China.
 3.No.555 Qianmo Road, Binjiang District Hangzhou 310052, China
Equipment Under Test (EUT):
EUT Name: Wireless Bridge
Model No.: DS-3WF03C-5AC/O, DS-3WF03C-5ACUHK/O, DS-3WF03C-5ACCKV/O, DS-3WF03C-5ACUVS/O, DS-3WF03C-5ACKVO/O, DS-3WF03C-5ACHUN/O, DS-XXXXXXXXXXXXX (X can be numbers 0-9 or A-Z or / or - or * or blank)
Standard(s) : FCC Rules 47 CFR §2.1091
 KDB447498 D01 General RF Exposure Guidance v06
 RSS-102 Issue 5 Amendment 1 (February 2, 2021)
Date of Receipt: 2021-09-18
Date of Test: 2021-10-18 to 2021-11-12
Date of Issue: 2021-11-12

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin
Laboratory Manager



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For IC Model No.: DS-3WF03C-5AC/O, DS-3WF03C-5ACUHK/O, DS-3WF03C-5ACCKV/O, DS-3WF03C-5ACUVS/O, DS-3WF03C-5ACKVO/O, DS-3WF03C-5ACHUN/O



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Revision Record			
Version	Description	Date	Remark
00	Original	2021-11-12	/

Authorized for issue by:			
		 <hr/> Damon Zhou / Project Engineer	
		 <hr/> Eric Lin / Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 12V by Adapter or DC 12V by PoE Adapter: MODEL: ADS-12FG-12N 12012EPCU INPUT: 100-240~50/60Hz, Max. 0.3A OUTPUT: DC 12V, 1A
Serial Number:	G31241650
Firmware Version:	V1.0.0 build210831

3.2 Technical Specifications

5G

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)/ac(VHT20)	5180-5240	4
		802.11n(HT40)/ac(VHT40)	5190-5230	2
		802.11ac(VHT80)	5210	1
	UNII Band II-A	802.11a/n(HT20)/ac(VHT20)	5260-5320	4
		802.11n(HT40)/ac(VHT40)	5270-5310	2
		802.11ac(VHT80)	5290	1
	UNII Band II-C	802.11a/n(HT20)/ac(VHT20)	5500-5720	12
		802.11n(HT40)/ac(VHT40)	5510-5710	6
		802.11ac(VHT80)	5530~5690	3
UNII Band III	802.11a/n(HT20)/ac(VHT20)	5745-5825	5	
	802.11n(HT40)/ac(VHT40)	5755-5795	2	
	802.11ac(VHT80)	5775	1	
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps			
Channel Spacing:	802.11a/n(HT20)/ac(VHT20): 20MHz 802.11n(HT40)/ac(VHT40): 40MHz 802.11ac(VHT80): 80MHz			
Antenna Gain:	Antenna 1:9dBi (Provided by manufacturer) Antenna 2:9dBi (Provided by manufacturer) Directional gain:9dBi *			
Antenna Type:	Antenna 1:PCB Antenna Antenna 2:PCB Antenna			



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* Remark 1: The antenna of the EUT is cross-polarized, so the Directional Gain: 9dBi.

Remark 2: For frequencies falling between 5150-5250MHz and 5600-5650MHz will not be used in Canada.

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 (ISED) Canada as an accredited testing laboratory.

CAB Identifier: CN0072.

- **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

4.2 ISED Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W

For 5G device, the limit of worse case is 4.53W



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5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report KSCR210900008601

5GHz for FCC

Test Mode	Test Channel	Antenna 1 Power[dBm]	Antenna 2 Power[dBm]	MIMO Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]	MIMO Power[mW]
802.11a	5180	8.62	9.50	NA	7.28	8.91	NA
	5200	8.67	8.17	NA	7.36	6.56	NA
	5240	9.20	8.69	NA	8.32	7.40	NA
	5260	9.72	10.07	NA	9.38	10.16	NA
	5300	9.40	8.84	NA	8.71	7.66	NA
	5320	9.69	8.99	NA	9.31	7.93	NA
	5500	6.57	8.24	NA	4.54	6.67	NA
	5580	8.94	8.52	NA	7.83	7.11	NA
	5700	10.62	10.05	NA	11.53	10.12	NA
	5720	11.01	10.04	NA	12.62	10.09	NA
	5745	3.21	9.90	NA	2.09	9.77	NA
	5785	9.96	9.65	NA	9.91	9.23	NA
5825	5.96	8.86	NA	3.94	7.69	NA	
802.11n(HT20)	5180	9.08	8.15	11.65	8.09	6.53	14.62
	5200	9.45	8.87	12.18	8.81	7.71	16.52
	5240	8.60	8.09	11.36	7.24	6.44	13.68
	5260	10.30	7.76	12.22	10.72	5.97	16.67
	5300	10.11	9.32	12.74	10.26	8.55	18.79
	5320	10.48	9.56	13.05	11.17	9.04	20.18
	5500	9.14	8.46	11.82	8.20	7.01	15.21
	5580	9.91	9.69	12.81	9.79	9.31	19.10
	5700	11.52	10.48	14.04	14.19	11.17	25.35
	5720	11.92	10.83	14.42	15.56	12.11	27.67
	5745	11.54	8.83	13.40	14.26	7.64	21.88
	5785	10.98	9.00	13.11	12.53	7.94	20.46
5825	10.66	8.57	12.75	11.64	7.19	18.84	
802.11n(HT40)	5190	10.13	9.40	12.79	10.30	8.71	19.01



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	5230	9.75	9.29	12.54	9.44	8.49	17.95
	5270	9.86	9.10	12.51	9.68	8.13	17.82
	5310	10.00	9.26	12.66	10.00	8.43	18.45
	5510	9.31	8.20	11.80	8.53	6.61	15.14
	5550	9.34	9.05	12.21	8.59	8.04	16.63
	5670	11.12	9.87	13.55	12.94	9.71	22.65
	5710	12.32	10.49	14.51	17.06	11.19	28.25
	5755	10.94	8.55	12.92	12.42	7.16	19.59
	5795	10.47	8.63	12.66	11.14	7.29	18.45
802.11ac(VHT20)	5180	5.83	6.62	9.25	3.83	4.59	8.41
	5200	7.40	7.05	10.24	5.50	5.07	10.57
	5240	8.49	8.11	11.31	7.06	6.47	13.52
	5260	11.30	1.15	11.70	13.49	1.30	14.79
	5300	10.73	9.20	13.04	11.83	8.32	20.14
	5320	10.94	9.49	13.29	12.42	8.89	21.33
	5500	10.01	8.04	12.15	10.02	6.37	16.41
	5580	10.60	9.43	13.06	11.48	8.77	20.23
	5700	12.10	10.42	14.35	16.22	11.02	27.23
	5720	11.6	10.73	14.2	14.45	11.83	26.30
	5745	12.44	8.71	13.97	17.54	7.43	24.95
	5785	11.79	9.04	13.64	15.10	8.02	23.12
5825	11.98	8.63	13.63	15.78	7.29	23.07	
802.11ac(VHT40)	5190	10.05	9.36	12.73	10.12	8.63	18.75
	5230	10.04	9.43	12.76	10.09	8.77	18.88
	5270	10.29	9.15	12.77	10.69	8.22	18.92
	5310	10.21	7.48	12.07	10.50	5.60	16.11
	5510	9.81	8.37	12.16	9.57	6.87	16.44
	5550	9.87	9.25	12.58	9.71	8.41	18.11
	5670	11.70	10.27	14.05	14.79	10.64	25.41
	5710	11.82	10.49	14.22	15.21	11.19	26.42
	5755	11.49	8.70	13.33	14.09	7.41	21.53
	5795	11.11	8.95	13.17	12.91	7.85	20.75



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802.11ac(VHT80)	5210	9.26	7.81	11.61	8.43	6.04	14.49
	5290	9.11	5.09	10.56	8.15	3.23	11.38
	5530	8.82	7.46	11.20	7.62	5.57	13.18
	5610	8.99	8.71	11.86	7.93	7.43	15.35
	5690	11.76	10.31	14.11	15.00	10.74	25.76
	5775	6.51	7.56	10.08	4.48	5.70	10.19

5GHz EIRP for ISED

Test Mode	Frequency (MHz)	Tx Type	Measured Output Power (dBm)			EIRP (dBm)			EIRP (mw)		
			Ant 1	Ant 2	Total	Ant 1	Ant 2	Total	Ant 1	Ant 2	Total
802.11a	5260	SISO	9.72	10.07	/	18.72	19.07	/	74.47	80.72	/
	5300	SISO	9.40	8.84	/	18.40	17.84	/	69.18	60.81	/
	5320	SISO	9.69	8.99	/	18.69	17.99	/	73.96	62.95	/
	5500	SISO	6.57	8.24	/	15.57	17.24	/	36.06	52.97	/
	5580	SISO	8.94	8.52	/	17.94	17.52	/	62.23	56.49	/
	5700	SISO	10.62	10.05	/	19.62	19.05	/	91.62	80.35	/
	5720	MIMO	11.01	10.04	/	20.01	19.04	/	100.23	80.17	/
	5745	SISO	3.21	9.90	/	12.21	18.90	/	16.63	77.62	/
	5785	SISO	9.96	9.65	/	18.96	18.65	/	78.70	73.28	/
	5825	SISO	5.96	8.86	/	14.96	17.86	/	31.33	61.09	/
802.11n(HT20)	5260	MIMO	10.30	7.76	12.22	19.30	16.76	21.22	85.11	47.42	132.43
	5300	MIMO	10.11	9.32	12.74	19.11	18.32	21.74	81.47	67.92	149.28
	5320	MIMO	10.48	9.56	13.05	19.48	18.56	22.05	88.72	71.78	160.32
	5500	MIMO	9.14	8.46	11.82	18.14	17.46	20.82	65.16	55.72	120.78
	5580	MIMO	9.91	9.69	12.81	18.91	18.69	21.81	77.80	73.96	151.71
	5700	MIMO	11.52	10.48	14.04	20.52	19.48	23.04	112.72	88.72	201.37
	5720	MIMO	11.92	10.83	14.42	20.92	19.83	23.42	123.59	96.16	219.79
	5745	MIMO	11.54	8.83	13.40	20.54	17.83	22.40	113.24	60.67	173.78
	5785	MIMO	10.98	9.00	13.11	19.98	18.00	22.11	99.54	63.10	162.55
	5825	MIMO	10.66	8.57	12.75	19.66	17.57	21.75	92.47	57.15	149.62
802.11n(HT40)	5270	MIMO	9.86	9.10	12.51	18.86	18.10	21.51	76.91	64.57	141.58
	5310	MIMO	10.00	9.26	12.66	19.00	18.26	21.66	79.43	66.99	146.55
	5510	MIMO	9.31	8.20	11.80	18.31	17.20	20.80	67.76	52.48	120.23
	5550	MIMO	9.34	9.05	12.21	18.34	18.05	21.21	68.23	63.83	132.13
	5670	MIMO	11.12	9.87	13.55	20.12	18.87	22.55	102.80	77.09	179.89
	5710	MIMO	12.32	10.49	14.51	21.32	19.49	23.51	135.52	88.92	224.39
	5755	MIMO	10.94	8.55	12.92	19.94	17.55	21.92	98.63	56.89	155.60
	5795	MIMO	10.47	8.63	12.66	19.47	17.63	21.66	88.51	57.94	146.55



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802.11ac(VHT20)	5260	MIMO	11.30	1.15	11.70	20.30	10.15	20.70	107.15	10.35	117.49
	5300	MIMO	10.73	9.20	13.04	19.73	18.20	22.04	93.97	66.07	159.96
	5320	MIMO	10.94	9.49	13.29	19.94	18.49	22.29	98.63	70.63	169.43
	5500	MIMO	10.01	8.04	12.15	19.01	17.04	21.15	79.62	50.58	130.32
	5580	MIMO	10.60	9.43	13.06	19.60	18.43	22.06	91.20	69.66	160.69
	5700	MIMO	12.10	10.42	14.35	21.10	19.42	23.35	128.82	87.50	216.27
	5720	MIMO	11.6	10.73	14.2	20.6	19.73	23.2	114.82	93.97	208.93
	5745	MIMO	12.44	8.71	13.97	21.44	17.71	22.97	139.32	59.02	198.15
	5785	MIMO	11.79	9.04	13.64	20.79	18.04	22.64	119.95	63.68	183.65
	5825	MIMO	11.98	8.63	13.63	20.98	17.63	22.63	125.31	57.94	183.23
802.11ac(VHT40)	5270	MIMO	10.29	9.15	12.77	19.29	18.15	21.77	84.92	65.31	150.31
	5310	MIMO	10.21	7.48	12.07	19.21	16.48	21.07	83.37	44.46	127.94
	5510	MIMO	9.81	8.37	12.16	18.81	17.37	21.16	76.03	54.58	130.62
	5550	MIMO	9.87	9.25	12.58	18.87	18.25	21.58	77.09	66.83	143.88
	5670	MIMO	11.70	10.27	14.05	20.70	19.27	23.05	117.49	84.53	201.84
	5710	MIMO	11.82	10.49	14.22	20.82	19.49	23.22	120.78	88.92	209.89
	5755	MIMO	11.49	8.70	13.33	20.49	17.70	22.33	111.94	58.88	171.00
	5795	MIMO	11.11	8.95	13.17	20.11	17.95	22.17	102.57	62.37	164.82
802.11ac(VHT80)	5290	MIMO	9.11	5.09	10.56	18.11	14.09	19.56	64.71	25.64	90.36
	5530	MIMO	8.82	7.46	11.20	17.82	16.46	20.20	60.53	44.26	104.71
	5690	MIMO	11.76	10.31	14.11	20.76	19.31	23.11	119.12	85.31	204.64
	5775	MIMO	6.51	7.56	10.08	15.51	16.56	19.08	35.56	45.29	80.91



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5.2 MPE Calculation

For FCC:

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) MPE limit = 1mW/cm²

For 5G WiFi - Antenna 1:

The max. antenna gain is 9 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
17.54	7.943	20	0.02772	1	Pass

For 5G WiFi - Antenna 2:

The max. antenna gain is 9 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
12.11	7.943	20	0.01914	1	Pass

In MIMO mode:

The max. antenna gain is 9 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
28.25	7.943	20	0.04464	1	Pass

For ISED:

For 5GHz WiFi SISO mode:

Antenna 1:E.I.R.P.= P*G= 0.139W<4.50W

Antenna 2:E.I.R.P.= P*G= 0.096W<4.50W

For 5GHz WiFi MIMO mode: E.I.R.P.= P*G= 0.224W<4.50W

So the device is exclusion from SAR test

--End of the Report--



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