

1 Cover Page

RF Exposure Evaluation Report

Application No.: KSCR2111000221AT
FCC ID: 2ADTD-R010203114
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 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: Wireless Repeater
Model No.: DS-PR1-WA
Add Model No.: DS-PR1-WAUHK,DS-PR1-WACKV,DS-PR1-WAUVS,DS-PR1-WAKVO,DS-PR1-WAHUN
Standard(s) : FCC Rules 47 CFR §2.1091
 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2021-11-08
Date of Test: 2021-11-19 to 2021-11-29
Date of Issue: 2021-11-30

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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3 General Information

3.1 General Description of E.U.T.

Power supply:	AC 100-240V,50/60Hz,0.2A Max by adapter or DC 3.8V by Rechargeable li-ion Polymer Battery Battery Model: 765965 Nominal Voltage: 3.8V Capacity: 4520mAh 17.176Wh
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3.2 Technical Specifications

912.5MHz ~ 917.4MHz

Operation Frequency:	912.5MHz ~ 917.4MHz
Spectrum Spread:	Frequency Hopping Spread Spectrum (FHSS)
Number of Channels:	50
Channel Spacing:	100kHz
Modulation Type:	FSK
Antenna Gain:	Antenna 1:0.79dBi (Provided by manufacturer) Antenna 2:2.1dBi (Provided by manufacturer)
Antenna Type:	Antenna 1: Helical Antenna Antenna 2: Helical Antenna

920MHz

Antenna Gain:	Antenna 3:-1.03dBi (Provided by manufacturer) Antenna 4:2.85dBi (Provided by manufacturer)
Antenna Type:	Antenna 3: Helical Antenna Antenna 4: PCB Antenna
Modulation Type:	FSK
Operation Frequency:	920MHz
Channel Number:	1



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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 (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



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5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report KSCR211100022101(912.5MHz ~ 917.4MHz), KSCR211100022102(920MHz)

912.5MHz ~ 917.4MHz

Test Mode	Channel	Antenna1 Power[dBm]	Antenna2 Power[dBm]	Antenna1 Power[mW]	Antenna2 Power[mW]
FSK	912.5MHz	9.70	9.62	9.33	9.16
	917.4 MHz	9.51	9.52	8.93	8.95

920MHz

Test Mode	Channel	Antenna3 Level (dBuV/m)	Antenna4 Level (dBuV/m)	Antenna3 Power [dBm]	Antenna4 Power [dBm]	Antenna3 Power [mW]	Antenna4 Power [mW]
FSK	920 MHz	93.63	93.85	-1.57	-1.35	0.6966	0.7328

$$EIRP[dBm] = E[dBuV/m] + 20 \log(d[meters]) - 104.77$$

$$EIRP[dBm] = E[dBuV/m] - 95.2$$

$$= 93.85 \text{ dBuV/m} - 95.2$$



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5.2 MPE Calculation

For WiFi:

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/cm².

For 920MHz, MPE limit = 920/1500 = 0.613mW/cm²

For 912.5MHz ~ 917.4MHz

Antenna 1:

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
9.33	1.199	20	0.00223	0.608	Pass

Antenna 2:

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
9.16	1.622	20	0.00296	0.608	Pass

For 920MHz

Antenna 3:

$$S = \frac{PG}{4R^2\pi} = 0.6966/(4*400*3.14)=0.000139 \text{ mW/cm}^2 < 0.613\text{mW/cm}^2$$

Antenna 4:

$$S = \frac{PG}{4R^2\pi} = 0.7328*/(4*400*3.14)=0.000146 \text{ mW/cm}^2 < 0.613\text{mW/cm}^2$$

The 915MHz and 920MHz can simultaneous transmit, the Max. sum of the MPE ratios for 912.5MHz~917.4MHz and 920MHz is 0.00223/0.608 + 0.00296/0.608 + 0.000139/0.613 + 0.000146/0.613 = 0.009 < 1

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



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--End of the Report--



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