



**1 Cover Page**

**RF MPE REPORT**

**Application No.:** SHEM2105004934CR  
**FCC ID:** SVN-WR5210-IDC  
**Applicant:** ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.  
**Address of Applicant:** No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
**Manufacturer:** ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.  
**Address of Manufacturer:** No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
**Equipment Under Test (EUT):**  
**EUT Name:** Wireless Router  
**Model No.:** DH-WR5210-IDC  
**Add Model No.:** DH-WR5200-IDC,WR5210-IDC,WR5200-IDC  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
 KDB447498 D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-05-27  
**Date of Test:** 2021-06-04 to 2021-06-14  
**Date of Issue:** 2021-06-15

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

*Parlam Zhan*

Parlam Zhan  
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Revision Record			
Version	Description	Date	Remark
00	Original	201-06-15	/

<b>Authorized for issue by:</b>			
		<i>Michael Niu</i>	
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		<b>Parlam Zhan / Reviewer</b>	



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### 3 General Information

#### 3.1 General Description of E.U.T.

Power supply:	AC 100-240V~50/60Hz by adapter Adapter: MANUFACTURER: SHENZHEN TRANSIN TECHNOLOGIES Co., LTD MODEL: TS-A012-120100A1 INPUT: 100-240V~50/60Hz 0.4A OUTPUT: DC 12.0V 1.0A
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#### 3.2 Technical Specifications

##### 2.4GHz

Antenna Gain:	Antenna 1:5dBi (Provided by the manufacturer) Antenna 2:5dBi (Provided by the manufacturer) Directional gain:8.01dBi
Antenna Type:	Antenna 1: Dipole Antenna Antenna 2: Dipole 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: MCS 0 to 7 for HT20MHz MCS 0 to 7 for HT40MHz
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

##### 5GHz

Antenna Gain:	Ant 1:5dBi (Provided by the manufacturer) Ant 2:5dBi (Provided by the manufacturer) Directional gain:8.01dBi
Antenna Type:	Antenna 1: Dipole Antenna Antenna 2: Dipole Antenna



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Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)/ac(HT20)	5180-5240	4
		802.11n(HT40)/ac(HT40)	5190-5230	2
		802.11ac(HT80)	5210	1
	UNII Band III	802.11a/n(HT20)/ac(HT20)	5745-5825	5
		802.11n(HT40)/ac(HT40)	5755-5795	2
802.11ac(HT80)		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: MCS0-7 802.11ac: MCS0-9			
Channel Spacing:	802.11a/n(HT20)/ac(HT20): 20MHz 802.11n(HT40)/ac(HT40): 40MHz 802.11ac(HT80): 80MHz			

Selected Test Channel for 802.11a/n(HT20)/ac(HT20)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH36)	5180MHz
	The middle channel (CH40)	5200MHz
	The highest channel (CH48)	5240MHz
U-NII Band III	The lowest channel (CH149)	5745MHz
	The middle channel (CH157)	5785MHz
	The highest channel (CH165)	5825MHz

Selected Test Channel for 802.11n(HT40)/ac(HT40)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH38)	5190MHz
	The highest channel (CH46)	5230MHz
U-NII Band III	The lowest channel (CH151)	5755MHz
	The highest channel (CH159)	5795MHz



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Selected Test Channel for 802.11ac(HT80)		
Band	Channel	Frequency
U-NII Band I	One channel (CH42)	5210MHz
U-NII Band III	One channel (CH155)	5775MHz

### 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-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 <sup>2</sup> )	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

2.4GHz for FCC

The Power Data is based on the RF Test Report SHEM210500493401-2.4GHz

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	18.50	18.75	NA	70.79	74.99	N/A
11B	2437	18.48	18.81	NA	70.47	76.03	N/A
11B	2462	19.14	19.10	NA	<b>82.04</b>	<b>81.28</b>	N/A
11G	2412	18.57	18.88	NA	71.94	77.27	N/A
11G	2437	18.71	18.81	NA	74.30	76.03	N/A
11G	2462	18.87	19.10	NA	77.09	81.28	N/A
11N20MIMO	2412	15.77	15.97	18.88	37.76	39.54	77.27
11N20MIMO	2437	15.89	16.21	19.06	38.82	41.78	<b>80.54</b>
11N20MIMO	2462	16.03	15.15	18.62	40.09	32.73	72.78
11N40MIMO	2422	15.01	15.06	18.05	31.70	32.06	63.83
11N40MIMO	2437	15.07	15.50	18.30	32.14	35.48	67.61
11N40MIMO	2452	15.09	15.72	18.43	32.28	37.33	69.66



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5GHz for FCC

The Power Data is based on the RF Test Report SHEM2100500493402-5GHz

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	17.47	16.76	/	55.85	47.42	NA
	5200	17.45	16.62	/	55.59	45.92	NA
	5240	17.76	17.90	/	59.70	61.66	NA
	5745	18.15	18.03	/	<b>65.31</b>	63.53	NA
	5785	17.86	17.88	/	61.09	61.38	NA
	5825	18.00	18.07	/	63.10	<b>64.12</b>	NA
802.11n(HT20)	5180	15.55	15.39	18.48	35.89	34.59	70.47
	5200	15.36	15.36	18.37	34.36	34.36	68.71
	5240	15.68	15.63	18.67	36.98	36.56	73.62
	5745	15.48	15.20	18.35	35.32	33.11	68.39
	5785	15.34	15.05	18.21	34.20	31.99	66.22
	5825	15.48	15.26	18.38	35.32	33.57	68.87
802.11n(HT40)	5190	15.41	15.48	18.46	34.75	35.32	70.15
	5230	15.77	15.73	18.76	37.76	37.41	75.16
	5755	15.54	15.33	18.45	35.81	34.12	69.98
	5795	15.31	15.26	18.30	33.96	33.57	67.61
802.11ac(VHT20)	5180	15.38	15.50	18.45	34.51	35.48	69.98
	5200	15.39	15.42	18.42	34.59	34.83	69.50
	5240	15.68	15.73	18.72	36.98	37.41	74.47
	5745	15.36	15.27	18.33	34.36	33.65	68.08
	5785	15.24	15.00	18.13	33.42	31.62	65.01
	5825	15.44	15.26	18.36	34.99	33.57	68.55
802.11ac(VHT40)	5190	15.39	15.51	18.46	34.59	35.56	70.15
	5230	15.78	15.78	18.79	37.84	37.84	<b>75.68</b>
	5755	15.58	15.35	18.48	36.14	34.28	70.47
	5795	15.48	15.22	18.36	35.32	33.27	68.55
802.11ac(VHT80)	5210	15.44	16.03	18.76	34.99	40.09	75.16
	5775	15.54	15.26	18.41	35.81	33.57	69.34



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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) MPE limit = 1mW/cm<sup>2</sup>

For 2.4G WiFi –Antenna1:

The max. antenna gain is 5 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
82.04	3.162	20	0.05161	1	Pass

For 2.4G WiFi –Antenna2:

The max. antenna gain is 5 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
81.28	3.162	20	0.05113	1	Pass

In MIMO mode:

The max. antenna gain is 8.01 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
80.54	6.324	20	0.10133	1	Pass



For 5G WiFi–Antenna1:

The max. antenna gain is 5 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
65.31	3.162	20	0.04109	1	Pass

For 5G WiFi–Antenna2:

The max. antenna gain is 5 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
64.12	3.162	20	0.04034	1	Pass

In MIMO mode:

The max. antenna gain is 8.01 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
75.68	6.324	20	0.09522	1	Pass

2.4G WiFi and 5G WiFi modules can simultaneous transmitting, so the maximum rate of MPE is  $0.10133/1.0+0.09522/1.0=0.20 \leq 1.0$ . according to the KDB447498 section 7.2 determine the device is exclusion from SAR test

**--End of the Report--**



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