

Report No.: SZEM210100112304

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RF Exposure Evaluation Report

Application No.: SZEM2101001123CR

Applicant: DZS, Inc

Address of Applicant: 5700 Tennyson Parkway, Plano, Texas, TX 75024, USA

Manufacturer: DZS, Inc

Address of Manufacturer: 5700 Tennyson Parkway, Plano, Texas, TX 75024, USA

Factory: 1.Aztech Communication Device (DG) Ltd.

2. IOT Manufacturing SDN.BHD

Address of Factory: 1.Jiu Jiang Shui Village Chang Ping Town, Dong Guan City Guang Dong

Province, China

2. No.8&10, Setia Business Park, Jalan Laman Setia 7/4, Taman Laman

Setia, 81550 Gelang Patah, Johor Bahru, Johor Malaysia

Product Name: WLAN AP

Model No.: MR-2100AC, MR-2100AC-XXX (X: 0-9, A-Z or blank, represents different

markets), W1615MR, W1615MR-XXX(X: 0-9, A-Z or blank, represents

different markets) &

Please refer to section 2 of this report which indicates which model was

actually tested and which were electrically identical.

Trade Mark: DZS

FCC ID: 2AZFQMR2100AC

Standards: 47 CFR Part 1.1307, 47 CFR Part 1.1310, 47 CFR Part 2.1091

Date of Receipt: 2021-01-26

Date of Test: 2021-01-30 to 2021-03-10

Date of Issue: 2021-03-11

Test Result : PASS*

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

Keny Xu EMC Laboratory Manager

Keny. Ku



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1 Version

	Revision Record							
Version	Chapter	Date	Modifier	Remark				
01		2021-03-11		Original				

Authorized for issue by:		
	Relisonti	
	Edison Li /Project Engineer	-
	EvicFu	
	Eric Fu /Reviewer	-



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3 General Information

3.1 General Description of EUT

	T =						
Power Supply:	Switching Adapter1						
	Model: HS120150						
	•	OV, 50/60Hz, Max.0.8A					
	Output: DC 12V, 1.5A, 18W						
	Switching Adapte	Switching Adapter?					
	Model: S18B22-1						
		OV, 50/60Hz, Max.0.7A					
	Output: DC 12V,						
Test Voltage:		nd AC 240 V, 50Hz					
, and the second	Note: Both nomin	al AC 120V, 60Hz and AC 240 \ FCC KDB174176 Q4, this report		•			
Cable:	DC cable: 142cm	unshielded					
Internal Source:	More than 108MF	łz					
For 2.4G WiFi:							
	802.11b/g/n(HT20): 2412MHz to 2462MHz						
Operation Frequency:	802.11n(HT40): 2422MHz to 2452MHz						
	802.11b: DSSS(CCK, DQPSK, DBPSK)						
Modulation Type:	802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)						
	802.11n(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM)						
Channel Numbers:	802.11b/g, 802.11n HT20: 11 Channels						
Charmer Numbers.	802.11n HT40: 7 Channels						
Channel Spacing:	5MHz						
Sample Type:	Fixed device						
Antenna Type:	PCB Antenna						
Antenna Gain:	Antenna1:3.82dBi, Antenna2: 3.76dBi						
Antenna Gain.	Note: MIMO for 802.11n						
For 5G WiFi:							
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			
		002.1111(11140)/ac(11140)	3130-3230	_			



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	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 (I	BPSK, QPSK, 16QAM, 64QAM)					
	802.11ac: OFDM	802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)					
TPC Function:	Not support	Not support					
Sample Type:	Fixed device						
Antenna Type:	PCB Antenna						
Antenna Gain:	Antenna1:3.85dBi, Antenna2: 3.77dBi, Antenna3:3.80dBi, Antenna4: 3.70dBi						
	Note: MIMO for 802.11n/ac						

Remark:

Model No.: MR-2100AC, MR-2100AC-XXX (X: 0-9, A-Z or blank, represents different markets), W1615MR, W1615MR-XXX(X: 0-9, A-Z or blank, represents different markets)

Since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on model No.



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3.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

3.3 Test Facility

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

A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCC

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC -Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

3.4 Deviation from Standards

None.

3.5 Abnormalities from Standard Conditions

None

3.6 Other Information Requested by the Customer

None.



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4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: 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 part1.1307(b)

Table 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)	
(A) Lim	its for Occupational	/Controlled Exposu	res		
0.3–3.0	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6	
(B) Limits 1	for General Populati	on/Uncontrolled Exp	oosure		
0.3–1.34	614 824/f 27.5	1.63 2.19/f 0.073	*(100) *(180/f²) 0.2 f/1500	30 30 30 30 30	

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*Pi*R^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

For Uncontrolled Environment, the MPE limit of 300 MHz to 1500 MHz is $f/1500 \ mW/cm^2$, the MPE limit of 1500 MHz to 100000 MHz is $1.0 \ mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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4.1.3 EUT RF Exposure Evaluation

1) Test Results

Note: The 2.4G WiFi and 5G WiFi can't synchronous transmission at the same time.

For 2.4G WiFi:

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm²)	Limit (mW/cm²)	MPE Ratios	Result
Ant1+2	3.82	2.41	16.35	43.15	0.0207	1	0.0207	PASS

Note: Refer to report No. SZEM210100112302 or EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 5G WiFi:

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm²)	Limit (mW/cm²)	MPE Ratios	Result
Ant1+2+3+4	3.85	2.43	16.26	42.27	0.0204	1	0.0204	PASS

Note: Refer to report No. SZEM210100112303 or EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

-End of Report-



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