SGS-CSTC Standards Technical Services
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1 Cover Page

FCC MPE REPORT

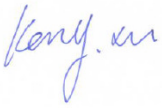
Application No.:	SHEM1412003180RF
Applicant:	Shanghai Xunzhao Communication Technology Co., Ltd
FCC ID:	2ADY6WC18R2211
Equipment Under Test (EUT): **NOTE:** The following sample(s) was/were submitted and identified by the client as	
Product Name:	WiFi Modular
Model No.(EUT):	WC18R2211
Standards:	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance
Date of Receipt:	December 11, 2014
Date of Test:	December 23, 2014 to May 17, 2015
Date of Issue:	May 26, 2015
Test Result:	**Pass***

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

Parlam Zhan
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	May 26, 2015	/	Original

Authorized for issue by:				
Engineer		Eddy Zong **Print Name**		
Clerk		Susie Liu **Print Name**		
Reviewer		Keny Xu **Print Name**		

3 Contents

4 General Information

4.1 Client Information

Applicant:	Shanghai Xunzhao Communication Technology Co., Ltd
Address of Applicant:	1759 Jinshajiang road putuo district of Shanghai
Manufacturer:	Shanghai Xunzhao Communication Technology Co., Ltd
Address of Manufacturer:	1759 Jinshajiang road putuo district of Shanghai
Factory:	Shanghai Xunzhao Communication Technology Co., Ltd
Address of Factory:	1759 Jinshajiang road putuo district of Shanghai

4.2 General Description of E.U.T.

Product Description:	802.11 a/b/g/n/ac 2T/2R Dual Band USB Module
Brand Name:	EBD
Power Supply:	DC 5V from USB Interface

4.3 Details of E.U.T.

Operation Frequency:	*For 2.4G Band:* 802.11 b/g/n20: 2412MHz-2462MHz; 802.11 n40: 2422MHz-2452MHz *For 5G U-NII Band:* 802.11a/n(HT20)/ac(VHT20):U-NII 1:5180-5240MHz, U-NII 2A:5260-5320MHz, U-NII-2C:5500-5720MHz, U-NII-3:5745-5825MHz 802.11n(HT40)/ac(VHT40): U-NII 1:5190-5230MHz, U-NII 2A:5270-5310MHz, U-NII 2C:5500-5720MHz, U-NII 3:5755-5795MHz 802.11ac(VHT80): U-NII 1:5210 MHz, U-NII 2A:5290 MHz, U-NII 2C:5530-5690MHz, U-NII 3:5775 MHz
Modulation Technique:	DSSS(CCK, DQPSK, DBPSK) for 802.11 b OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) Remark: 256QAM for 802.11 ac only
Data Rate:	802.11b: 1/2/5.5/11Mbps, 802.11g/a: 6/9/12/18/24/36/48/54Mbps 802.11n(HT20)/n(HT40): MCS0-7 up to 300Mbps 802.11ac(VHT20)/ac(VHT40)/ac(VHT80): MCS0-7 up to 866.3Mbps
DFS mode	Client without radar detection
Support TPC:	☒Yes ☐No
Antenna Type	Monopole Antenna 2*2 MIMO without 802.11 beam forming function 2.4G and 5G technology cannot transmit at the same time.
Antenna Gain	3dBi

4.4 Test Location

All tests were performed at SGS E&E EMC lab

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

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4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 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. Date of expiry: 2017-07-14.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2017-09-16.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1. Expiry Date: 2017-06-18.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5 Test Standards and Limits

According to§1.1310 Radiofrequency radiation exposure limits:

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

6 Measurement and Calculation

6.1 Maximum transmit power

For 2.4G Band:

a. Single Input Single Output mode:

Test mode	Test Channel	Reading Power (dBm)		Output Power (dBm)		Limit (dBm)	Result
		Antenna A	Antenna B	Antenna A	Antenna B		
802.11b	2412	20.43	21.84	20.93	22.34	30	Pass
	2437	20.59	22.14	21.09	22.64		Pass
	2462	20.93	22.23	21.43	22.73		Pass
802.11g	2412	21.01	22.28	21.51	22.78		Pass
	2437	21.12	22.35	21.62	22.85		Pass
	2462	**21.33**	**22.72**	**21.83**	**23.22**		Pass
802.11n20	2412	18.78	20.19	19.28	20.69		Pass
	2437	18.94	20.27	19.44	20.77		Pass
	2462	19.25	20.57	19.75	21.07		Pass
802.11n40	2422	18.41	19.62	18.91	20.12		Pass
	2437	18.70	19.92	19.20	20.42		Pass
	2452	18.94	20.07	19.44	20.57		Pass

b. Spatial Diversity Multiplexing-MIMO function mode:

Test mode	Test Channel	Reading Power (dBm)		Output Power (dBm)			Limit (dBm)	Result
		Antenna A	Antenna B	Antenna A	Antenna B	MIMO		
802.11n20	2412	18.45	18.09	18.95	18.59	21.78	30	Pass
	2437	18.57	17.03	19.07	17.53	21.38		Pass
	2462	17.93	17.79	18.43	18.29	21.37		Pass
802.11n40	2422	16.26	16.17	16.76	16.67	19.73		Pass
	2437	16.89	17.32	17.39	17.82	20.62		Pass
	2452	16.44	16.50	16.94	17.00	19.98		Pass

For U-NII Band:

a. Single Input Single Output mode:

Test Mode	Band	CH No.	Freq (MHz)	Reading (dBm)		Conducted Power (dBm)		Limit (dBm)	Result
				Ant A	Ant B	Ant A	Ant B		
802.11a	U-NII 1	36	5180	10.07	11.72	10.57	12.22	24	Pass
		40	5200	10.67	9.43	11.17	9.93		Pass
		48	5240	8.83	10.51	9.33	11.01		Pass
	U-NII 2A	52	5260	9.84	11.24	10.34	11.74		Pass
		56	5280	7.88	8.87	8.38	9.37		Pass
		64	5320	8.53	9.79	9.03	10.29		Pass
	U-NII 2C	100	5500	7.72	8.60	8.22	9.10		Pass
		120	5600	9.79	10.36	10.29	10.86		Pass
		140	5700	10.90	13.13	11.40	13.63		Pass
		144	5720	11.26	11.69	11.76	12.19		Pass
	U-NII-3	149	5745	11.27	11.34	11.77	11.84	30	Pass
		157	5785	10.03	10.53	10.53	11.03		Pass
		165	5825	9.75	9.80	10.25	10.30		Pass
802.11n (HT20)	U-NII 1	36	5180	10.13	11.48	10.63	11.98	24	Pass
		40	5200	10.64	12.00	11.14	12.50		Pass
		48	**5240**	**11.89**	**13.34**	**12.39**	**13.84**		Pass
	U-NII 2A	52	5260	12.38	14.08	12.88	14.58		Pass
		56	5280	12.88	14.28	13.38	14.78		Pass
		64	5320	7.17	8.32	7.67	8.82		Pass
	U-NII 2C	100	5500	6.38	7.17	6.88	7.67		Pass
		120	5600	9.57	10.20	10.07	10.70		Pass
		140	5700	10.46	11.29	10.96	11.79		Pass
		144	5720	12.23	12.32	12.73	12.82		Pass
	U-NII-3	149	5745	11.30	11.13	11.80	11.63	30	Pass
		157	5785	10.38	10.75	10.88	11.25		Pass
		165	5825	11.00	9.91	11.50	10.41		Pass

Test Mode	Band	CH No.	Freq (MHz)	Reading (dBm)		Conducted Power (dBm)		Limit (dBm)	Result
				Ant A	Ant B	Ant A	Ant B		
802.11n (HT40)	U-NII-1	38	5190	13.09	10.36	13.59	10.86	24	Pass
		46	5230	12.41	9.74	12.91	10.24		Pass
	U-NII 2A	54	5270	11.10	11.97	11.60	12.47		Pass
		62	5310	8.94	10.49	9.44	10.99		Pass
	U-NII 2C	102	5510	8.37	9.04	8.87	9.54		Pass
		118	5590	9.83	10.46	10.33	10.96		Pass
		134	5670	10.70	11.18	11.20	11.68		Pass
		142	5710	11.50	12.45	12.00	12.95		Pass
	U-NII-3	151	5755	8.74	7.97	9.24	8.47	30	Pass
		159	5795	8.49	8.50	8.99	9.00		Pass
802.11ac (VHT20)	U-NII 1	36	5180	9.69	8.83	10.19	8.47	24	Pass
		40	5200	9.26	10.28	9.76	9.00		Pass
		48	5240	9.69	10.90	10.19	10.41		Pass
	U-NII 2A	52	5260	11.52	11.91	12.02	12.41		Pass
		56	5280	8.86	9.21	9.36	9.71		Pass
		64	5320	9.12	9.00	9.62	9.50		Pass
	U-NII 2C	100	5500	8.01	7.88	8.51	8.38		Pass
		120	5600	9.70	10.23	10.20	10.73		Pass
		140	5700	12.08	12.75	12.58	13.25		Pass
		144	5720	12.16	12.05	12.66	12.55		Pass
	U-NII-3	149	5745	11.67	12.55	12.17	8.47	30	Pass
		157	5785	10.99	11.87	11.49	9.00		Pass
		165	5825	10.80	10.59	11.30	10.41		Pass
802.11ac (VHT40)	U-NII-1	38	5190	8.72	9.81	9.22	10.86	24	Pass
		46	5230	9.95	8.75	10.45	10.24		Pass
	U-NII 2A	54	5270	9.90	10.67	10.40	11.17		Pass
		62	5310	8.96	9.80	9.46	10.30		Pass
	U-NII 2C	102	5510	10.05	10.96	10.55	11.46		Pass
		118	5590	10.29	9.81	10.79	10.31		Pass
		134	5670	10.61	10.35	11.11	10.85		Pass
		142	5710	11.24	11.64	11.74	12.14		Pass
	U-NII-3	151	5755	10.95	10.27	11.45	8.47	30	Pass
		159	5795	10.11	9.10	10.61	9.00		Pass
802.11ac (VHT80)	U-NII-1	42	5210	6.21	7.50	6.71	10.41	24	Pass
	U-NII 2A	58	5290	7.04	8.05	7.54	8.55		Pass
	U-NII 2C	106	5530	5.50	5.70	6.00	6.20		Pass
		122	5610	5.64	5.21	6.14	5.71		Pass
		138	5690	5.47	5.75	5.97	6.25		Pass
	U-NII-3	155	5775	5.43	6.57	5.93	7.07	30	Pass

b. Spatial Diversity Multiplexing-MIMO function mode:

Test Mode	Band	CH No.	Freq (MHz)	Reading (dBm)		Conducted Power (dBm)			Limit (dBm)	Result
				Ant A	Ant B	Ant A	Ant B	MIMO		
802.11n (HT20)	U-NII 1	36	5180	5.39	11.07	5.89	11.57	13.11	24	Pass
		40	5200	6.52	10.33	7.02	10.83	12.84		Pass
		48	5240	6.70	10.96	7.20	11.46	13.34		Pass
	U-NII 2A	52	5260	10.65	8.36	11.15	8.86	13.16		Pass
		56	5280	9.31	11.72	9.81	12.22	14.19		Pass
		64	5320	7.42	7.41	7.92	7.91	10.93		Pass
	U-NII 2C	100	5500	7.18	4.74	7.68	5.24	9.64		Pass
		120	5600	10.63	7.13	11.13	7.63	12.73		Pass
		140	5700	10.25	7.41	10.75	7.91	12.57		Pass
		144	5720	10.81	9.76	11.31	10.26	13.83		Pass
	U-NII-3	**149**	**5745**	**8.40**	**7.84**	**8.90**	**8.34**	**12.14**	30	Pass
		157	5785	8.36	6.75	8.86	7.25	11.64		Pass
		165	5825	7.58	5.83	8.08	6.33	10.80		Pass
802.11n (HT40)	U-NII-1	38	5190	5.77	8.96	6.27	9.46	11.66	24	Pass
		46	**5230**	**5.72**	**9.91**	**6.22**	**10.41**	**12.31**		Pass
	U-NII 2A	54	5270	6.12	7.05	6.62	7.55	10.12		Pass
		62	5310	5.27	6.47	5.77	6.97	9.42		Pass
	U-NII 2C	102	5510	6.54	6.99	7.04	7.49	10.28		Pass
		118	5590	7.24	6.90	7.74	7.40	10.58		Pass
		134	5670	7.75	10.27	8.25	10.77	12.70		Pass
		142	5710	8.02	8.44	8.52	8.94	11.75		Pass
	U-NII-3	151	5755	8.49	6.03	8.99	6.53	10.94	30	Pass
		159	5795	6.99	5.87	7.49	6.37	9.98		Pass

Test Mode	Band	CH No.	Freq (MHz)	Reading (dBm)		Conducted Power (dBm)			Limit (dBm)	Result
				Ant A	Ant B	Ant A	Ant B	MIMO		
802.11ac (VHT20)	U-NII 1	36	5180	6.60	5.31	7.10	5.81	9.51	24	Pass
		40	5200	6.76	7.31	7.26	7.81	10.55		Pass
		48	5240	7.88	7.13	8.38	7.63	11.03		Pass
	U-NII 2A	**52**	**5260**	**11.16**	**12.10**	**11.66**	**12.60**	**15.17**		Pass
		56	5280	8.00	9.57	8.50	10.07	12.37		Pass
		64	5320	7.63	9.21	8.13	9.71	12.00		Pass
	U-NII 2C	100	5500	7.90	7.93	8.40	8.43	11.43		Pass
		120	5600	10.58	9.98	11.08	10.48	13.80		Pass
		140	**5700**	**13.19**	**12.70**	**13.69**	**13.20**	**16.46**		Pass
		144	5720	12.32	12.43	12.82	12.93	15.89		Pass
	U-NII-3	149	5745	7.60	9.22	8.10	9.72	12.00	30	Pass
		157	5785	6.26	8.88	6.76	9.38	11.27		Pass
		165	5825	5.41	8.27	5.91	8.77	10.58		Pass
802.11ac (VHT40)	U-NII-1	38	5190	5.68	7.33	6.18	7.83	10.09	24	Pass
		46	5230	8.18	7.11	8.68	7.61	11.19		Pass
	U-NII 2A	**54**	**5270**	**10.30**	**8.14**	**10.80**	**8.64**	**12.86**		Pass
		62	5310	8.59	6.76	9.09	7.26	11.28		Pass
	U-NII 2C	102	5510	10.19	5.52	10.69	6.02	11.96		Pass
		118	5590	10.95	6.49	11.45	6.99	12.78		Pass
		134	5670	11.77	7.82	12.27	8.32	13.74		Pass
		142	**5710**	**11.77**	**9.04**	**12.27**	**9.54**	**14.13**		Pass
	U-NII-3	151	5755	10.21	6.09	10.71	6.59	12.13	30	Pass
		159	5795	3.85	7.06	4.35	7.56	9.26		Pass
802.11ac (VHT80)	U-NII-1	42	5210	1.40	2.98	1.90	3.48	5.77	24	Pass
	U-NII 2A	58	5290	3.52	7.23	4.02	7.73	9.27		Pass
	U-NII 2C	106	5530	3.05	5.31	3.55	5.81	7.84		Pass
		122	5610	2.37	6.74	2.87	7.24	8.59		Pass
		138	5690	2.42	6.60	2.92	7.10	8.50		Pass
	U-NII-3	155	5775	4.56	3.13	5.06	3.63	7.41	30	Pass

Remark:

1) Output Peak Power = Reading Power + Cable loss+ Duty Cycle Correction Factor

2) Cable loss= 0.5dB. Duty cycle of test signal is > 98%, duty factor is not required, reference Section 7.4

3) Per KDB 662911, the conducted powers at Antenna A and Antenna B were first measured separately during MIMO transmission as shown in section above. The measured values were then summed in linear power units then converted back to dBm.

6.2 MPE Calculation

According to the formula S=$\frac{PG}{4R^2\pi}$, we can calculate S which is MPE.

Note:

1) P (Watts) =Power Input to antenna =$10^{\frac{dBm}{10}}$ / 1000

2) G (Antenna gain in numeric) = 10^ (Antenna gain in dBi /10)

3) R = distance to the center of radiation of antenna (in meter) = 20cm

4) MPE limit = 1mW/cm²

For 2.4G Band:

The Max Conducted Peak Output Power is 23.22dBm(209.89mW) in channel 6;

The best case gain of the antenna is 3dBi. 3dB logarithmic terms convert to numeric result is nearly 1.995

So, S= $\frac{PG}{4R^2\pi}$ =$\frac{192.75\times1.995}{4\times400\times3.14}$ =0.0833 mW/cm^2

For 5G U-NII Band:

The Max Conducted Peak Output Power is 16.46dBm(44.26mW) in channel 160;

The best case gain of the antenna is 3dBi. 3dB logarithmic terms convert to numeric result is nearly 1.995

So, S= $\frac{PG}{4R^2\pi}$ =$\frac{44.26\times1.995}{4\times400\times3.14}$ =0.0177 mW/cm^2

The BT and the DTS modules cann't simultaneous transmitting at frequency 2.4GHz band, according to the KDB447498 D01 section 7.2 determine the device is exclusion from SAR test.

7 EUT Constructional Details

Refer to the < WC18R2211_External Photos > & < WC18R2211_Internal Photos>.

--End of the Report--