

RF EXPOSURE REPORT

Product: Indoor CPE

Model Name: WF821E

FCC ID: SRQ-WF821E

Applicant: ZTE Corporation

Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,
Nanshan District, Shenzhen, Guangdong, P.R.China

Manufacturer: ZTE Corporation

Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,
Nanshan District, Shenzhen, Guangdong, P.R.China

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Report No.: SA160412W003

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA160412W003	Original release	Apr. 26, 2016



Test Report No.: SA160412W003

1 CERTIFICATION

PRODUCT: Indoor CPE
BRAND NAME: ZTE
MODEL NAME: WF821E
APPLICANT: ZTE Corporation
TESTED: Apr. 13, 2016 ~ Apr. 25, 2016
TEST SAMPLE: Identical Prototype
STANDARDS: **FCC Part 2 (Section 2.1091)**
FCC OET Bulletin 65, Supplement C (01-01)
IEEE C95.1

The above equipment has been tested by **Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : , **DATE:** Apr. 26, 2016
(Amyee Qian / Engineer)

APPROVED BY : , **DATE:** Apr. 26, 2016
(William Chung / Manager)

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Indoor CPE		
BRAND NAME	ZTE		
MODEL NAME	WF821E		
PRODUCT TYPE	Fixed Station		
POWER SUPPLY	12Vdc (POE adapter)		
MODULATION TECHNOLOGY	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM	
	LTE	LTE Band 43, QPSK, 16QAM	
FREQUENCY RANGE	WLAN	2412-2462MHz for 11b/g/n(HT20)/n(HT40)	
	LTE Band 43 (Channel Bandwidth: 5MHz)	3652.5MHz ~ 3697.5MHz	
	LTE Band 43 (Channel Bandwidth: 10MHz)	3655.0MHz ~ 3695.0MHz	
	LTE Band 43 (Channel Bandwidth: 15MHz)	3657.5MHz ~ 3692.5MHz	
	LTE Band 43 (Channel Bandwidth: 20MHz)	3660.0MHz ~ 3690.0MHz	
ANTENNA TYPE	WLAN: PCB antenna with 3dBi gain LTE Band 43: Fixed Internal antenna with 7dBi gain		
HW VERSION	A1		
SW VERSION	WF821E_US_V1.0.0B02		
DATA CABLE	N/A		
I/O PORTS	Refer to user's manual		

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapters:

POE ADAPTER 1	
BRAND:	N/A
MODEL:	RD1201000-C55-26MG
INPUT:	AC 100-240V, 600mA
OUTPUT:	DC 12V, 1000mA



POE ADAPTER 2	
BRAND:	N/A
MODEL:	RD1201500-C55-24MG
INPUT:	AC 100-240V, 600mA
OUTPUT:	DC 12V, 1500mA

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3 RF EXPOSURE

3.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

3.2 MPE CALCULATION FORMULA

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

3.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 80cm away from the body of the user. So, this device is classified as **Fixed Station**.

3.4 CONDUCTED POWER

WIFI

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	13.93	N/A
6	2437	14.11	N/A
11	2462	14.38	N/A

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	12.34	N/A
6	2437	12.39	N/A
11	2462	12.67	N/A

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.34	10.44	13.40	N/A
6	2437	10.56	10.32	13.45	N/A
11	2462	10.66	10.45	13.57	N/A

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
3	2422	9.69	9.91	12.81	N/A
6	2437	9.82	9.98	12.91	N/A
9	2452	9.93	10.01	12.98	N/A

LTE BAND 43

Band/BW	Modulation	RB Size	RB Offset	CH 44115	CH 44340	CH 44565	MPR
				3652.5 MHz	3675.0 MHz	3697.5 MHz	
43 / 5	QPSK	1	0	27.73	27.78	27.72	0
		1	12	27.53	27.67	27.65	0
		1	24	27.37	27.35	27.37	0
		12	0	26.60	26.52	26.52	1
		12	6	26.39	26.53	26.72	1
		12	13	26.25	26.30	26.30	1
		25	0	26.43	26.39	26.48	1
	16QAM	1	0	27.00	27.04	27.02	1
		1	12	26.87	26.67	26.80	1
		1	24	26.58	26.57	26.67	1
		12	0	25.49	25.50	25.68	2
		12	6	25.45	25.52	25.58	2
		12	13	25.30	25.37	25.40	2
		25	0	25.40	25.50	25.47	2

Band/BW	Modulation	RB Size	RB Offset	CH 44140	CH 44340	CH 44540	MPR
				3655.0 MHz	3675.0 MHz	3695.0 MHz	
43 / 10	QPSK	1	0	27.77	27.82	27.76	0
		1	24	27.57	27.71	27.69	0
		1	49	27.41	27.39	27.41	0
		25	0	26.64	26.56	26.56	1
		25	12	26.43	26.57	26.76	1
		25	25	26.29	26.34	26.34	1
		50	0	26.47	26.43	26.52	1
	16QAM	1	0	27.04	27.08	27.06	1
		1	24	26.91	26.71	26.84	1
		1	49	26.62	26.61	26.71	1
		25	0	25.53	25.54	25.72	2
		25	12	25.49	25.56	25.62	2
		25	25	25.34	25.41	25.44	2
		50	0	25.44	25.54	25.51	2

Band/BW	Modulation	RB Size	RB Offset	CH 44165	CH 44340	CH 44515	MPR
				3657.5 MHz	3675.0 MHz	3692.5 MHz	
43 / 15	QPSK	1	0	27.83	27.88	27.82	0
		1	37	27.63	27.77	27.75	0
		1	74	27.47	27.45	27.47	0
		36	0	26.70	26.62	26.62	1
		36	19	26.49	26.63	26.82	1
		36	39	26.35	26.40	26.40	1
		75	0	26.53	26.49	26.58	1
	16QAM	1	0	27.10	27.14	27.12	1
		1	37	26.97	26.77	26.90	1
		1	74	26.68	26.67	26.77	1
		36	0	25.59	25.60	25.78	2
		36	19	25.55	25.62	25.68	2
		36	39	25.40	25.47	25.50	2
		75	0	25.50	25.60	25.57	2

Band/BW	Modulation	RB Size	RB Offset	CH 44190	CH 44340	CH 44490	MPR
				3660.0 MHz	3675.0 MHz	3690.0 MHz	
43 / 20	QPSK	1	0	27.86	27.91	27.85	0
		1	50	27.66	27.80	27.78	0
		1	99	27.50	27.48	27.50	0
		50	0	26.73	26.65	26.65	1
		50	25	26.52	26.66	26.85	1
		50	50	26.38	26.43	26.43	1
		100	0	26.56	26.52	26.61	1
	16QAM	1	0	27.13	27.17	27.15	1
		1	50	27.00	26.80	26.93	1
		1	99	26.71	26.70	26.80	1
		50	0	25.62	25.63	25.81	2
		50	25	25.58	25.65	25.71	2
		50	50	25.43	25.50	25.53	2
		100	0	25.53	25.63	25.60	2

3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

WIFI

Band	Frequency (MHz)	Antenna Gain (dBi)	Conducted Time Average Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
11b	2412	3	13.93	49.317	0.001	1.00	PASS
11b	2462	3	14.38	54.702	0.001	1.00	PASS

LTE

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Conducted Time Average Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
Band43	3675.0	QPSK	7	27.91	3097.419	0.039	1.00	PASS



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3.6 CONCLUSION OF SIMULTANEOUS TRANSMITTER

Both of the WLAN and plug-in device can transmit simultaneously, the formula of calculated the MPE is:

$$\text{CPD1/LPD1} + \text{CPD2/LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is $0.001/1.00 + 0.001/1.00 + 0.039/1.00 = 0.041$, which is less than "1", This confirmed that the device comply with FCC 1.1310 MPE limit.

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