



# Variant FCC RF Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : LTE uFi  
**BRAND NAME** : ZTE  
**MODEL NAME** : MF923  
**FCC ID** : SRQ-MF923  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

This is a variant report which is only valid together with the original test report. The product was received on Sep. 12, 2016 and completely tested on Sep. 30, 2016. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

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Approved by: Jones Tsai / Manager



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**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China**



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### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.2	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.54 dB at 2389.690 MHz



# 1 General Description

## 1.1 Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.2 Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	LTE uFi
Brand Name	ZTE
Model Name	MF923
FCC ID	SRQ-MF923
EUT supports Radios application	WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/ WLAN 2.4GHz 802.11b/g/n HT20/HT40/ WLAN 5GHz 802.11a/n HT20/HT40/
IMEI Code	Conducted: 865135023724618 Radiated: N/A
HW Version	xx4A
SW Version	MF923V2.3
EUT Stage	Identical Prototype

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



### 1.4 Product Specification subjective to this standard

Product Specification subjective to this standard			
<b>Tx/Rx Channel Frequency Range</b>	802.11b/g/n : 2412 MHz ~ 2462 MHz		
<b>Maximum Output Power to antenna</b>	Chain Port 0: 802.11b : 17.47 dBm (0.0558 W) Chain Port 1: 802.11g : 21.31 dBm (0.1352 W) Chain Port 0+1: 802.11n HT20 : 22.15 dBm (0.1641 W) Chain Port 0+1: 802.11n HT40 : 19.46 dBm (0.0883 W)		
<b>Antenna Type</b>	Chain Port 0: IFA Antenna Chain Port 1: IFA Antenna		
<b>Antenna Gain</b>	Chain Port 0: 1.50dBi Chain Port 1: 1.50 dBi Chain Port 0+1: 1.50 dBi		
<b>Type of Modulation</b>	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)		
<b>Antenna Function for Transmitter</b>		Chain Port 0	Chain Port 1
	802.11 b	V	V
	802.11 g	V	V
	802.11 n SISO	V	V
	802.11 n MIMO	V	V



### 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

### 1.6 Testing Location

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.		
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC Registration No.</b>
	TH01-KS	03CH03-KS	306251

**Note:** The test site complies with ANSI C63.4 2014 requirement.

### 1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		



### 2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test shown in the following tables.

Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11b RF Power (dBm)				
			Data Rate	Power vs. Data Rate			
			1Mbps	Channel	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412	0	17.47	CH 01	17.45	17.43	17.40
CH 06	2437	0	16.26				
CH 11	2462	0	17.07				
CH 01	2412	1	16.87	CH 06	17.43	17.45	17.42
CH 06	2437	1	17.46				
CH 11	2462	1	17.42				

Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11g RF Power (dBm)									
			Data Rate	Power vs. Data Rate								
			6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps	
CH 01	2412	0	20.69	CH 06	20.67	20.52	20.39	20.49	20.46	20.51	20.42	
CH 06	2437	0	20.72									
CH 11	2462	0	20.42									
CH 01	2412	1	20.29	CH 06	21.25	21.19	21.12	21.16	21.22	21.17	21.21	
CH 06	2437	1	21.31									
CH 11	2462	1	20.48									



Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11n HT-20 RF Power (dBm)								
			MCS Index	Power vs. MCS Index							
			MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	0	20.92	CH 11	20.66	20.64	20.75	20.73	20.87	20.78	20.86
CH 06	2437	0	20.02								
CH 11	2462	0	20.96								
CH 01	2412	1	19.94	CH 11	20.59	20.41	20.56	20.43	20.49	20.25	20.48
CH 06	2437	1	20.34								
CH 11	2462	1	20.67								
CH 01	2412	0+1(0)	19.05	CH 11	18.30	18.32	18.71	18.39	18.40	18.31	18.62
CH 06	2437	0+1(0)	18.07								
CH 11	2462	0+1(0)	19.06								
CH 01	2412	0+1(1)	18.88	CH 11	19.18	19.16	19.14	18.78	18.92	19.20	18.86
CH 06	2437	0+1(1)	18.91								
CH 11	2462	0+1(1)	19.22								
CH 01	2412	0+1	21.98	CH 11	21.77	21.77	21.94	21.60	21.68	21.79	21.75
CH 06	2437	0+1	21.52								
CH 11	2462	0+1	22.15								

Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11n HT-40 RF Power (dBm)								
			MCS Index	Power vs. MCS Index							
			MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	0	15.66	CH 09	15.99	15.98	16.00	16.03	15.99	15.83	15.80
CH 06	2437	0	15.39								
CH 09	2452	0	16.17								
CH 03	2422	1	16.13	CH 09	16.55	16.71	16.32	16.28	16.43	16.22	16.36
CH 06	2437	1	16.23								
CH 09	2452	1	16.75								
CH 03	2422	0+1(0)	15.82	CH 09	15.92	15.97	16.00	15.93	15.81	15.98	15.88
CH 06	2437	0+1(0)	15.76								
CH 09	2452	0+1(0)	16.01								
CH 03	2422	0+1(1)	16.18	CH 09	16.73	16.60	16.81	16.73	16.83	16.80	16.76
CH 06	2437	0+1(1)	16.33								
CH 09	2452	0+1(1)	16.85								
CH 03	2422	0+1	19.01	CH 09	19.35	19.31	19.43	19.36	19.36	19.42	19.35
CH 06	2437	0+1	19.06								
CH 09	2452	0+1	19.46								

Note: Chain Port 0+1 is a calculated result from sum of the power Chain Port 0+1(0) and Chain Port 0+1(1).



### 2.3 Test Mode

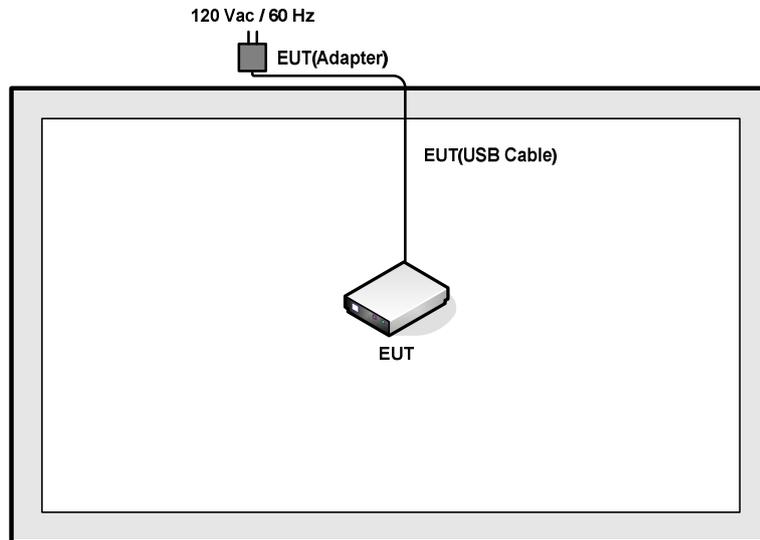
Final results of test modes, data rates and test channels are shown as following table.

Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0/ MCS8	1/6/11
		802.11n HT40	MCS0/ MCS8	3/6/9
Radiated TCs	Radiated Spurious Emission	802.11b	1 Mbps	11
		802.11g	6 Mbps	11
		802.11n HT20	MCS0/ MCS8	11
		802.11n HT40	MCS0/ MCS8	3

**Remark:** For Radiated Test Cases, all the test modes were performed with Adapter, Battery and USB Cable.

## 2.4 Connection Diagram of Test System

<WLAN Tx Mode>



## 2.5 EUT Operation Test Setup

For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

### 3 Test Result

#### 3.1 Peak Output Power Measurement

##### 3.1.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

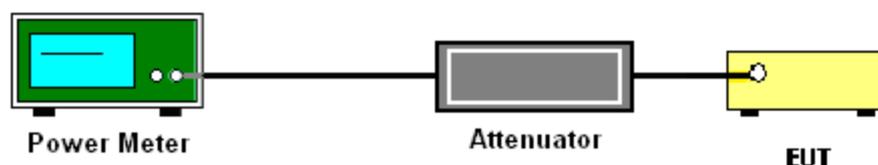
##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

##### 3.1.4 Test Setup





3.1.5 Test Result of Peak Output Power

Test Band :	2.4GHz	Temperature :	24~25°C
Test Engineer :	Ivan Zhang	Relative Humidity :	54~55%

Mod.	Data Rate	N <sub>TX</sub>	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Max. Limit (dBm)		DG (dBi)		Pass/Fail
					Chain Port 0	Chain Port 1	SUM	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11b	1Mbps	1	1	2412	17.47	16.87		30.00	30.00	1.50	1.50	Pass
11b	1Mbps	1	6	2437	16.26	17.46		30.00	30.00	1.50	1.50	Pass
11b	1Mbps	1	11	2462	17.07	17.42		30.00	30.00	1.50	1.50	Pass
11g	6Mbps	1	1	2412	20.69	20.29		30.00	30.00	1.50	1.50	Pass
11g	6Mbps	1	6	2437	20.72	21.31		30.00	30.00	1.50	1.50	Pass
11g	6Mbps	1	11	2462	20.42	20.48		30.00	30.00	1.50	1.50	Pass
HT20	MCS0	1	1	2412	20.92	19.94		30.00	30.00	1.50	1.50	Pass
HT20	MCS0	1	6	2437	20.02	20.34		30.00	30.00	1.50	1.50	Pass
HT20	MCS0	1	11	2462	20.96	20.67		30.00	30.00	1.50	1.50	Pass
HT40	MCS0	1	3	2422	15.66	16.13		30.00	30.00	1.50	1.50	Pass
HT40	MCS0	1	6	2437	15.39	16.23		30.00	30.00	1.50	1.50	Pass
HT40	MCS0	1	9	2452	16.17	16.75		30.00	30.00	1.50	1.50	Pass
HT20	MCS8	2	1	2412	19.05	18.88	21.98	30.00		1.50		Pass
HT20	MCS8	2	6	2437	18.07	18.91	21.52	30.00		1.50		Pass
HT20	MCS8	2	11	2462	19.06	19.22	22.15	30.00		1.50		Pass
HT40	MCS8	2	3	2422	15.82	16.18	19.01	30.00		1.50		Pass
HT40	MCS8	2	6	2437	15.76	16.33	19.06	30.00		1.50		Pass
HT40	MCS8	2	9	2452	16.01	16.85	19.46	30.00		1.50		Pass

Note: Measured power (dBm) has offset with cable loss.



3.1.6 Test Result of Average output Power (Reporting Only)

Test Band :	2.4GHz	Temperature :	24~25°C
Test Engineer :	Ivan Zhang	Relative Humidity :	54~55%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	Sum Power	
11b	1Mbps	1	1	2412	0.03	0.03	13.46	13.55	-	
11b	1Mbps	1	6	2437	0.03	0.03	13.00	14.21		
11b	1Mbps	1	11	2462	0.03	0.03	13.43	14.17		
11g	6Mbps	1	1	2412	0.19	0.21	10.42	10.72		
11g	6Mbps	1	6	2437	0.19	0.21	12.36	13.19		
11g	6Mbps	1	11	2462	0.19	0.21	11.22	11.43		
HT20	MCS0	1	1	2412	0.19	0.22	11.50	10.94		
HT20	MCS0	1	6	2437	0.19	0.22	11.20	11.45		
HT20	MCS0	1	11	2462	0.19	0.22	12.13	11.81		
HT40	MCS0	1	3	2422	0.41	0.44	5.97	6.48		
HT40	MCS0	1	6	2437	0.41	0.44	5.89	6.66		
HT40	MCS0	1	9	2452	0.41	0.44	6.35	6.96		
HT20	MCS8	2	1	2412	0.22	0.21	8.67	8.80		11.74
HT20	MCS8	2	6	2437	0.22	0.21	8.29	9.24		11.80
HT20	MCS8	2	11	2462	0.22	0.21	8.88	9.64		12.29
HT40	MCS8	2	3	2422	0.79	0.78	6.16	6.42	9.30	
HT40	MCS8	2	6	2437	0.79	0.78	6.04	6.76	9.43	
HT40	MCS8	2	9	2452	0.79	0.78	6.35	7.17	9.79	

Note: Measured power (dBm) has offset with cable loss and duty factor.



### 3.2 Radiated Band Edges and Spurious Emission Measurement

#### 3.2.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

#### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

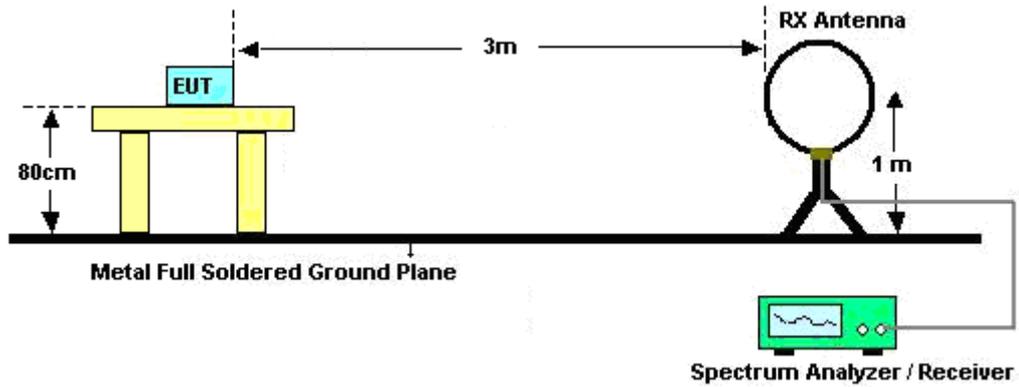


### **3.2.3 Test Procedure**

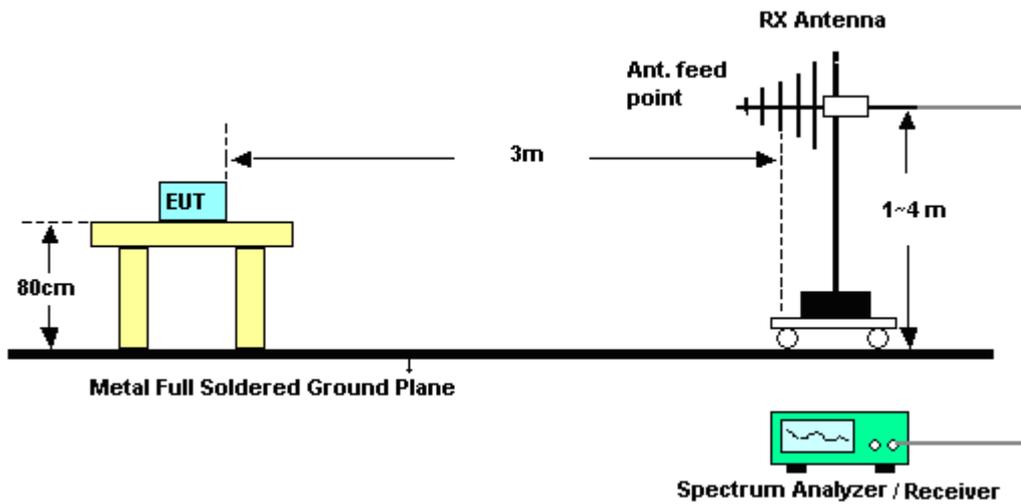
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz;  $VBW \geq RBW$ ; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.  
For average measurement:
    - $VBW = 10$  Hz, when duty cycle is no less than 98 percent.
    - $VBW \geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.2.4 Test Setup

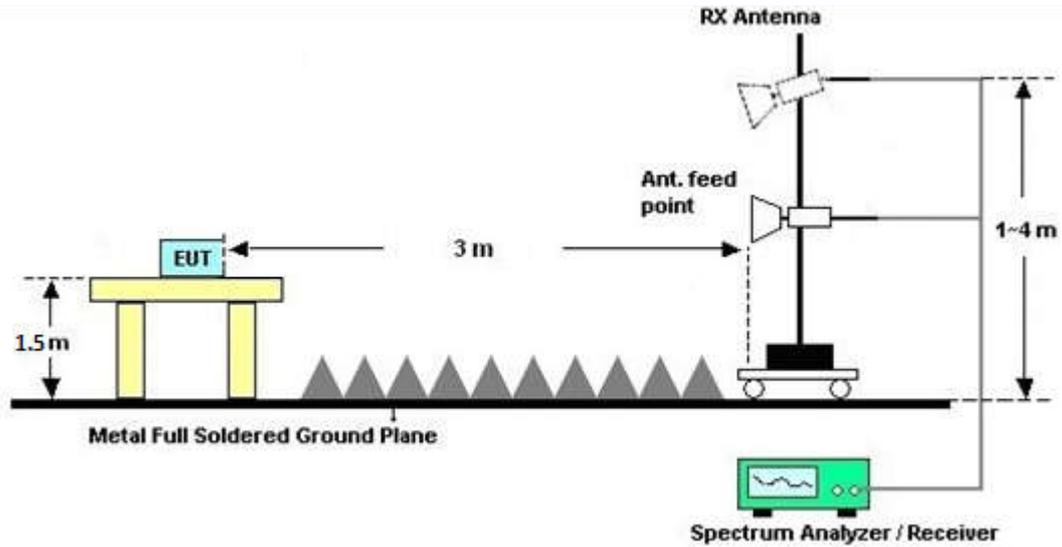
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.2.5 Test Results of Radiated Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

### 3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A.

### 3.2.7 Duty Cycle

Please refer to Appendix B.

### 3.2.8 Test Result of Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> Harmonic)

Please refer to Appendix A.



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 09, 2016	Sep. 28, 2016	Aug. 08, 2017	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 20, 2016	Sep. 28, 2016	Jan. 19, 2017	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 20, 2016	Sep. 28, 2016	Jan. 19, 2017	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 24, 2015	Sep. 30, 2016	Oct. 23, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44GHz	Apr. 22, 2016	Sep. 30, 2016	Apr. 21, 2017	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 07, 2015	Sep. 30, 2016	Nov. 06, 2016	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz~2GHz	Apr. 16, 2016	Sep. 30, 2016	Apr. 15, 2017	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Apr. 16, 2016	Sep. 30, 2016	Apr. 15, 2017	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Oct. 10, 2015	Sep. 30, 2016	Oct. 09, 2016	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9kHz~1GHz	Aug. 09, 2016	Sep. 30, 2016	Aug. 08, 2017	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	1943529	1GHz~18GHz	Jan. 20, 2016	Sep. 30, 2016	Jan. 19, 2017	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 24, 2015	Sep. 30, 2016	Oct. 23, 2016	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18GHz~40GHz	Jan. 20, 2016	Sep. 30, 2016	Jan. 19, 2017	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Sep. 30, 2016	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Sep. 30, 2016	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Sep. 30, 2016	NCR	Radiation (03CH03-KS)

NCR: No Calibration Required



## 5 Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.5 dB
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### Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.5 dB
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### Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.6 dB
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## Appendix A. Radiated Spurious Emission

For Ant. 0

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
0		( MHz )	( dB $\mu$ V/m )	( dB )	( dB $\mu$ V/m )	( dB $\mu$ V )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b CH 11 2462MHz		2484.22	55.18	-18.82	74	58.97	27.64	5.51	36.94	109	206	P	H
	!	2483.5	49.18	-4.82	54	52.97	27.64	5.51	36.94	109	206	A	H
	*	2462	103.98	-	-	107.93	27.51	5.5	36.96	109	206	P	H
	*	2462	100.65	-	-	104.6	27.51	5.5	36.96	109	206	A	H
		2483.68	55.9	-18.1	74	59.69	27.64	5.51	36.94	243	84	P	V
	!	2483.5	49.88	-4.12	54	53.67	27.64	5.51	36.94	243	84	A	V
	*	2462	105.66	-	-	109.61	27.51	5.5	36.96	243	84	P	V
	*	2460	101.89	-	-	105.84	27.51	5.5	36.96	243	84	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
0		( MHz )	( dB $\mu$ V/m )	( dB )	( dB $\mu$ V/m )	( dB $\mu$ V )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b CH 11 2462MHz		4926	46.09	-27.91	74	43.27	31.67	7.8	36.65	100	360	P	H
		7386	46.44	-27.56	74	39.07	34.29	9.86	36.78	100	360	P	H
		4926	49.85	-24.15	74	47.03	31.67	7.8	36.65	100	360	P	V
		7386	46.86	-27.14	74	39.49	34.29	9.86	36.78	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
2.4GHz 802.11b LF		30.95	23.5	-16.5	40	27.27	26.86	0.66	31.29	300	125	P	H
		96.93	23.34	-20.16	43.5	34.94	18.66	1.19	31.45	-	-	P	H
		166.77	25.1	-18.4	43.5	37.87	17.2	1.56	31.53	-	-	P	H
		200.72	20.12	-23.38	43.5	34.06	15.82	1.73	31.49	-	-	P	H
		206.54	20.32	-23.18	43.5	34.09	15.98	1.73	31.48	-	-	P	H
		454.86	28.85	-17.15	46	32.15	25.28	2.66	31.24	-	-	P	H
		31.94	29.1	-10.9	40	33.2	26.52	0.68	31.3	100	25	P	V
		37.76	27.34	-12.66	40	34.44	23.52	0.74	31.36	-	-	P	V
		52.31	26.51	-13.49	40	41.54	15.5	0.87	31.4	-	-	P	V
		165.8	28.33	-15.17	43.5	41.06	17.24	1.56	31.53	-	-	P	V
		171.62	28.31	-15.19	43.5	41.26	16.99	1.59	31.53	-	-	P	V
		199.75	27.53	-15.97	43.5	41.49	15.8	1.73	31.49	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



For Ant. 1

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11g CH 11 2462MHz	!	2483.8	69.77	-4.23	74	73.56	27.64	5.51	36.94	100	118	P	H
	!	2484.1	51.02	-2.98	54	54.81	27.64	5.51	36.94	100	118	A	H
	*	2468	103.56	-	-	107.51	27.51	5.5	36.96	100	118	P	H
	*	2464	93.97	-	-	97.92	27.51	5.5	36.96	100	118	A	H
		2483.68	64.06	-9.94	74	67.85	27.64	5.51	36.94	354	1	P	V
		2483.8	47.31	-6.69	54	51.1	27.64	5.51	36.94	354	1	A	V
	*	2466	98.54	-	-	102.49	27.51	5.5	36.96	354	1	P	V
	*	2466	89.96	-	-	93.91	27.51	5.5	36.96	354	1	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz  
WIFI 802.11g (Harmonic @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)
<b>802.11g CH 11 2462MHz</b>		4926	42.57	-31.43	74	39.75	31.67	7.8	36.65	100	360	P	H
		7386	46.21	-27.79	74	38.84	34.29	9.86	36.78	100	360	P	H
		4926	41.74	-32.26	74	38.92	31.67	7.8	36.65	100	360	P	V
		7386	45.48	-28.52	74	38.11	34.29	9.86	36.78	100	360	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
2.4GHz 802.11g LF		30.97	24.5	-15.5	40	28.27	26.86	0.66	31.29	-	-	P	H
		43.58	21.13	-18.87	40	31.72	20	0.82	31.41	-	-	P	H
		96.93	28.34	-15.16	43.5	39.94	18.66	1.19	31.45	-	-	P	H
		166.77	30.1	-13.4	43.5	42.87	17.2	1.56	31.53	200	125	P	H
		211.39	23.7	-19.8	43.5	37.35	16.1	1.73	31.48	-	-	P	H
		454.86	27.85	-18.15	46	31.15	25.28	2.66	31.24	-	-	P	H
		31.89	29.1	-10.9	40	33.2	26.52	0.68	31.3	100	25	P	V
		52.31	26.51	-13.49	40	41.54	15.5	0.87	31.4	-	-	P	V
		99.84	27.87	-15.63	43.5	39.2	18.9	1.21	31.44	-	-	P	V
		165.8	30.33	-13.17	43.5	43.06	17.24	1.56	31.53	-	-	P	V
		199.75	27.53	-15.97	43.5	41.49	15.8	1.73	31.49	-	-	P	V
	455.83	27.92	-18.08	46	31.26	25.24	2.66	31.24	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



For Ant. 0+1

## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency ( MHz )	Level ( dB $\mu$ V/m )	Over Limit ( dB )	Limit Line ( dB $\mu$ V/m )	Read Level ( dB $\mu$ V )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT20 CH 11 2462MHz		2485.84	64.49	-9.51	74	68.28	27.64	5.51	36.94	166	27	P	H
		2483.62	47.39	-6.61	54	51.18	27.64	5.51	36.94	166	27	A	H
	*	2464	100.16	-	-	104.11	27.51	5.5	36.96	166	27	P	H
	*	2466	92.42	-	-	96.37	27.51	5.5	36.96	166	27	A	H
		2485.9	65.34	-8.66	74	69.13	27.64	5.51	36.94	100	47	P	V
		2484.1	47.83	-6.17	54	51.62	27.64	5.51	36.94	100	47	A	V
	*	2466	100.85	-	-	104.8	27.51	5.5	36.96	100	47	P	V
	*	2466	93.25	-	-	97.2	27.51	5.5	36.96	100	47	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency ( MHz )	Level ( dB $\mu$ V/m )	Over Limit ( dB )	Limit Line ( dB $\mu$ V/m )	Read Level ( dB $\mu$ V )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT20 CH 11 2462MHz		4926	42.3	-31.7	74	39.48	31.67	7.8	36.65	100	360	P	H
		7386	45.61	-28.39	74	38.24	34.29	9.86	36.78	100	360	P	H
		4926	44.02	-29.98	74	41.2	31.67	7.8	36.65	100	360	P	V
		7386	45.27	-28.73	74	37.9	34.29	9.86	36.78	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz  
WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI Ant. 0+1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT40 CH 03 2422MHz		2387.74	66.58	-7.42	74	71.13	27	5.47	37.02	132	186	P	H
	!	2389.69	52.46	-1.54	54	57.01	27	5.47	37.02	132	186	A	H
	*	2416	96.48	-	-	100.88	27.13	5.47	37	132	186	P	H
	*	2436	88	-	-	92.25	27.26	5.48	36.99	132	186	A	H
		2388.65	60.67	-13.33	74	65.22	27	5.47	37.02	128	184	P	V
		2387.87	47.27	-6.73	54	51.82	27	5.47	37.02	128	184	A	V
	*	2426	93.86	-	-	98.11	27.26	5.48	36.99	128	184	P	V
*	2418	85.57	-	-	89.97	27.13	5.47	37	128	184	A	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz  
WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant. 0+1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT40 CH 03 2422MHz		4902	42.61	-31.39	74	39.84	31.64	7.78	36.65	100	360	P	H
		7356	46.18	-27.82	74	38.92	34.19	9.82	36.75	100	360	P	H
		4902	42.53	-31.47	74	39.76	31.64	7.78	36.65	100	0	P	V
		7356	45.33	-28.67	74	38.07	34.19	9.82	36.75	100	0	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
2.4GHz 802.11n HT20 LF		30.89	25.5	-14.5	40	29.27	26.86	0.66	31.29	100	256	P	H
		96.93	20.34	-23.16	43.5	31.94	18.66	1.19	31.45	-	-	P	H
		127.97	24.77	-18.73	43.5	36.58	18.33	1.36	31.5	-	-	P	H
		166.77	25.1	-18.4	43.5	37.87	17.2	1.56	31.53	-	-	P	H
		367.56	28.28	-17.72	46	35.19	21.96	2.36	31.23	-	-	P	H
		454.86	27.85	-18.15	46	31.15	25.28	2.66	31.24	-	-	P	H
		31.92	29.1	-10.9	40	33.2	26.52	0.68	31.3	300	125	P	V
		38.73	26.41	-13.59	40	34.17	22.86	0.75	31.37	-	-	P	V
		47.46	25.23	-14.77	40	38.11	17.7	0.84	31.42	-	-	P	V
		171.62	30.31	-13.19	43.5	43.26	16.99	1.59	31.53	-	-	P	V
		199.75	27.53	-15.97	43.5	41.49	15.8	1.73	31.49	-	-	P	V
	284.14	26.41	-19.59	46	37.4	18.4	2.01	31.4	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



**Emission below 1GHz**

**2.4GHz WIFI 802.11n HT40 (LF)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
<b>2.4GHz 802.11n HT40 LF</b>		30.91	25.5	-14.5	40	29.27	26.86	0.66	31.29	100	25	P	H
		77.53	22.67	-17.33	40	37.89	15.2	1.07	31.49	-	-	P	H
		96.93	23.34	-20.16	43.5	34.94	18.66	1.19	31.45	-	-	P	H
		166.77	24.1	-19.4	43.5	36.87	17.2	1.56	31.53	-	-	P	H
		367.56	27.28	-18.72	46	34.19	21.96	2.36	31.23	-	-	P	H
		454.86	28.85	-17.15	46	32.15	25.28	2.66	31.24	-	-	P	H
		31.92	29.1	-10.9	40	33.2	26.52	0.68	31.3	300	154	P	V
		37.76	27.34	-12.66	40	34.44	23.52	0.74	31.36	-	-	P	V
		52.31	26.51	-13.49	40	41.54	15.5	0.87	31.4	-	-	P	V
		99.84	22.87	-20.63	43.5	34.2	18.9	1.21	31.44	-	-	P	V
		165.8	28.33	-15.17	43.5	41.06	17.24	1.56	31.53	-	-	P	V
		199.75	27.53	-15.97	43.5	41.49	15.8	1.73	31.49	-	-	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against limit line.												



**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

- Level(dBμV/m) =  
Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

- Level(dBμV/m)  
= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)  
= 55.45 (dBμV/m)
- Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

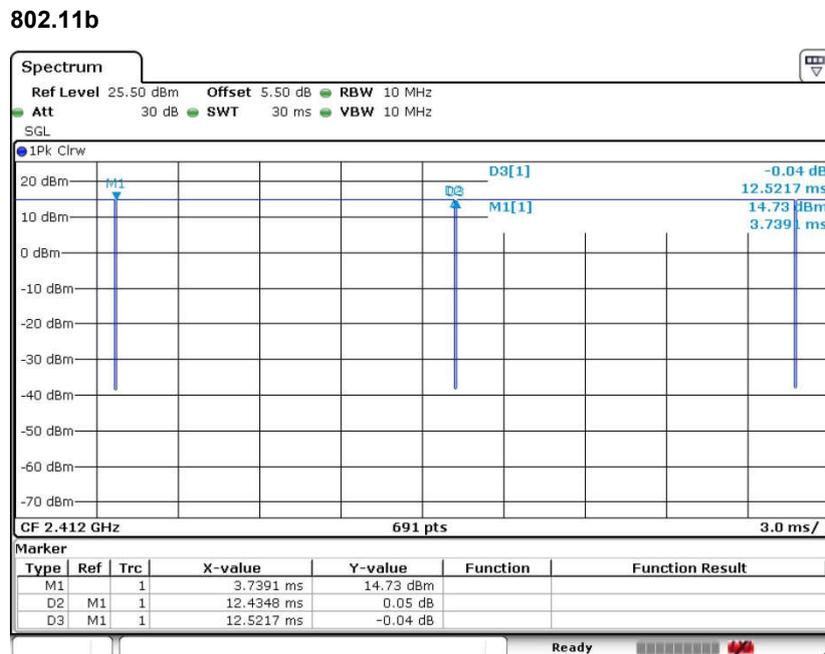
- Level(dBμV/m)  
= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)  
= 43.54 (dBμV/m)
- Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 43.54(dBμV/m) – 54(dBμV/m)  
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



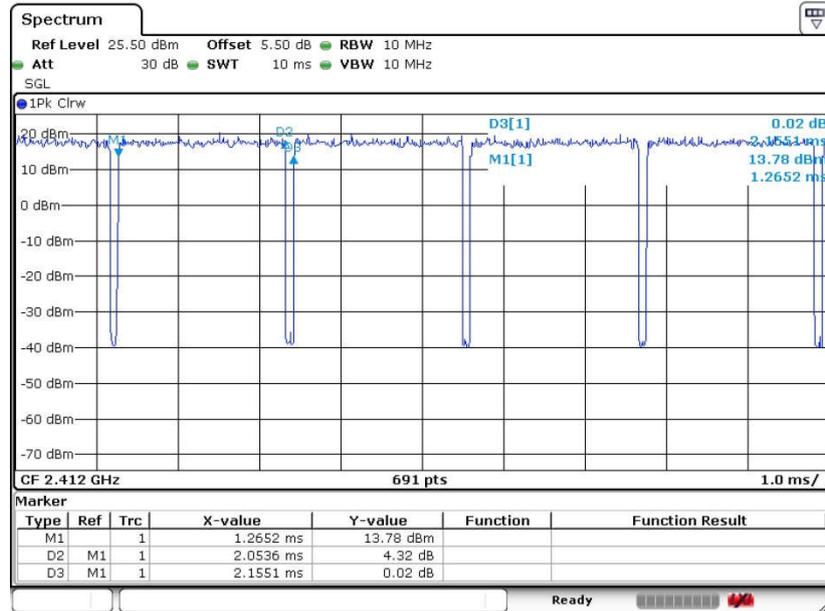
## Appendix B. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
0	802.11b	99.31	-	-	10Hz
1	802.11g	95.29	2.05	0.49	1kHz
0+1	2.4GHz 802.11n HT20	90.86	0.98	1.02	3kHz
0+1	2.4GHz 802.11n HT40	77.63	0.34	2.92	3kHz

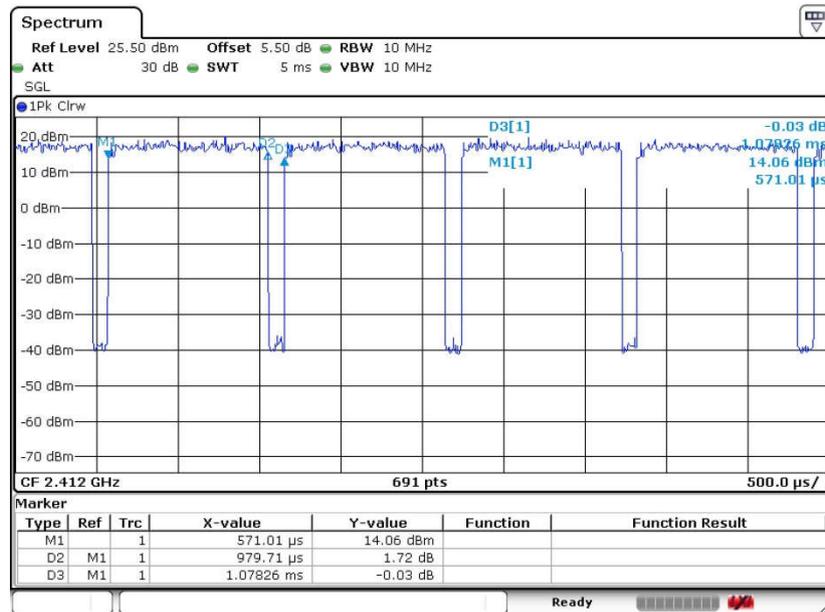




802.11g

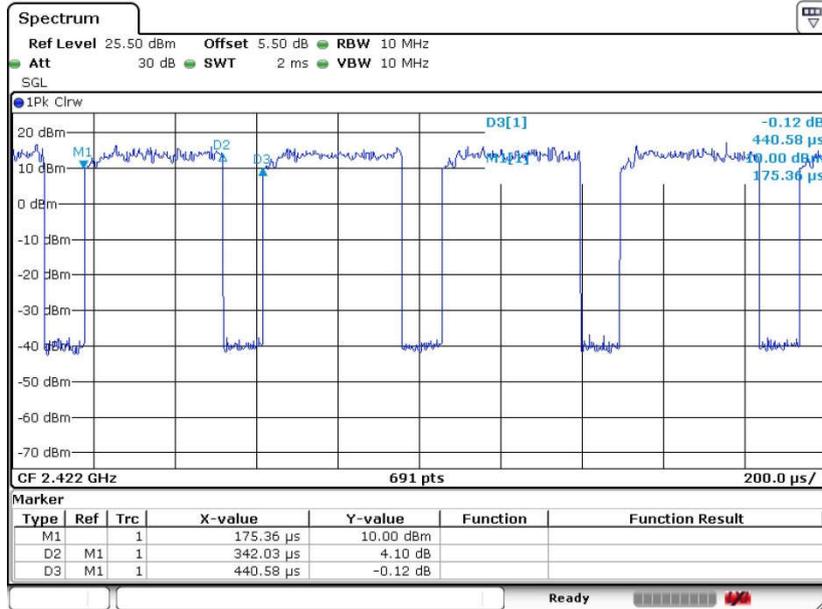


802.11n20





**802.11n40**





## **Appendix D. Product Equality Declaration**

**ZTE CORPORATION****Product Change Description**

As the applicant of the below model, [ZTE Corporation] declares that the product,

[MF923]

[ZTE Corporation]

is the variant of the initial certified product,

[MF923]

[ZTE Corporation]

**SOFTWARE MODIFICATIONS:**

Protocol Stack changes: NO

MMS/STK changes: NO

JAVA changes: NO

Other changes detailed: NO

**HARDWARE MODIFICATION:**

Band changes: NO

Power Amplifier changes: Yes, for LTE b2/4/5,WCDMA b1/2/5; The new PA chip component is pin-for-pin compatible and an equivalent chip as old chip, it has the same basic function as the old one, no radio parameters changed.

Antenna changes: NO

PCB Layout changes: NO

Components on PCB changes: NO

LCD changes: NO

Speaker changes: NO

Camera changes: NO

Vibrator changes: NO

Bluetooth changes: NO  
FM changes: NO

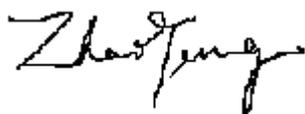
Other changes: SIM slot changed to the second vender.  
Touch Panel changed to the second vender.  
A LDO(which used for Micro-SD slot power supply)  
changed to the second vender.

### **MECHANICAL MODIFICATIONS:**

Use new metal front/back cover or keypad: NO  
Mechanical shell changes: NO  
Other changes detailed: NO

### **ACCESSORY MODIFICATIONS:**

Battery changes: NO  
AC Adaptor changes: NO  
Earphone changes: NO



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