



# FCC Test Report

**Product Name: CDMA Mobile Phone  
With Bluetooth**

**Model Number: HUAWEI C5610**

**Report No: SYBHZ(R) E012042010EB-4  
FCC ID: QISC5610**

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**REPORT ON** FCC 47CFR part 15 subpart C Test of CDMA Mobile Phone With Bluetooth

M/N: C5610

Report No: SYBHZ(R) E012042010EB-4

FCC ID: QISC5610

**REGULATION** **FCC CFR47 Part 2: Subpart J;**

**FCC CFR47 Part 15: Subpart C;**

**CONCLUSION** **Pass**

**General Manager**

2010.04.14  
Date

张兴海  
Name



signature

**Test Lab Engineer**

2010-04-12  
Date

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Name signature



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# 1 Summary

The table below summarizes the measurements and results for the CDMA Mobile Phone With Bluetooth C5610. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

<b>FCC Measurement Specification</b>	<b>Description</b>	<b>Result</b>
15.247 (a) (1)	20dB bandwidth measurement	PASS
15.247 (a) (1)	Carrier frequency separation measurement	PASS
15.247 (a) (1) III	Number of hopping channel	PASS
15.247 (a) (1) III	Time of occupancy	PASS
15.247 (b) (1)	Peak output power	PASS
15.247 (d)	Band edge compliance measurement	PASS
15.247 (d)	Conducted RF spurious	PASS
15.247 (d) / 15.205 & 15.209	Radiated spurious emission & Radiated restricted band measurement	PASS
15.207	Conducted emission test for power port	PASS



## 2 Product Description

### 2.1 Production Information

#### 2.1.1 General Description

Huawei CDMA Mobile Phone With Bluetooth - C5610 is subscriber equipment in the CDMA system. The frequency band is US Cellular. The Mobile Phone implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice and SMS service etc. The Mobile Phone uses QSC1110 single chipset and Zero-IF technologies.

#### 2.1.2 Support function and Service

The Mobile Phone C5610 support the Bluetooth's function and service as follows:

Table 2 Service and Test mode List

Service Name	Characteristic	Corresponding Test Mode	Note
Data and Voice	Modulation: $\pi/4$ -DQPSK		/
Data and Voice	Modulation: 8DPSK		

### 2.2 Modification Information

For original equipment, following table is not application.

Table 3 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information
Not applicable!				
Not applicable!				
Not applicable!				



### **3 Test Site Description**

The test site of:

***Huawei Technologies Co. Ltd.  
P.O. Box 518129  
Huawei base, bantian,  
Longgang District, Shenzhen, China***

#### **3.1 Testing Period**

The test have been performed during the period of

Apr.01, 2010 to Apr.12, 2010

#### **3.2 General Set up Description**

The Bluetooth hopping frequency system of Mobile Phone C5610 can Support 2.4GHz Band. For compliance with FCC regulation 47CFR part15 subpart C, we set the mobile phone as following test mode to do all compliance tests.

##### **Bluetooth MODE:**

**TM1:** GFSK Modulation

$\pi$  /4-DQPSK

8DPSK



## 4 Product Description

### 4.1 Technical Characteristics

#### 4.1.1 Frequency Range

Table 4 Frequency Range

Uplink band:	2400 to 2483.5 MHz	
Downlink band:	2400 to 2483.5 MHz	
Hop frequency support:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

#### 4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

Channel spacing:	1 MHz
Channel separation:	1 MHz

#### 4.1.3 Type of Emission

Table 6 Type of Emission

Emission Designation:	-
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According to CFR 47 (FCC) part 2, subpart C, section 2.201 and 2.202

#### 4.1.4 Antenna Information

Table 7 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	0 (from 2400MHz to 2500MHz)



#### 4.1.5 Environmental Requirements

Table 8 Environmental Requirements

Minimum temperature:	- 10 °C
Maximum temperature:	+ 55 °C
Relative Humidity:	5%-95%

#### 4.1.6 Power Source

Table 9 Power Source

AC voltage nominal:	~120V
AC voltage range	~100V-240V
AC current maximal:	400mA

#### 4.1.7 Tune-up Procedure

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (9).

Please reference the document Tune-up Procedure in TCF.

#### 4.1.8 Applied DC Voltages and Currents

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8).

The voltage and current in the final RF stage is:

Table 10 Applied RF module DC Voltages and Currents

Voltage:	 3.7V
Current:	100mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)



## 4.2 EUT Identification List

### 4.2.1 Board Information

Table 11 Board Information

CDMA Mobile Phone With Bluetooth		
C5610		
Board and Module		
Equipment Designation / Description	Serial Number	Remarks
-Main board	/	/
-LCD	CT020TN07	991G011004M0
-Battery	BAA9224X84900510	HB5D1

### 4.2.2 Adapter Technical Data

AC/DC Adapter Model:	HS-050040E5	HS-050040U5
Manufacturer:	SHENZHEN HUNTKEY POWER TECHNOLOGY CO., LTD	SHENZHEN HUNTKEY POWER TECHNOLOGY CO., LTD
Rated Voltage	~ 120V, 60Hz	~ 120V, 60Hz
Input Voltage:	~ 100-240V 50/60Hz	~ 100-240V 50/60Hz
Output Voltage;	<b>===</b> 5.0V	<b>===</b> 5.0V
Rated Power:	2W	2W
S/N:	HKA7C286678	HKA7C354288

### 4.2.3 Battery Technical Data

Battery Model: HB5D1  
 Rated capacity: 800mAh  
 Nominal Voltage: **===** 3.7V  
 Charging Voltage: **===** 4.2V

### 4.2.4 FCC Identification

Grantee Code: QIS  
 Product Code: C5610  
 FCC Identification: QIS C5610



## 5 Main Test Instruments

Table 12 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)
Receiver	R&S	ESU26	100150	07.06.2010
Pre-Amplifier	R&S	SCA-SCU 18	10003	07.08.2010
Pre-Amplifier	R&S	SCA-SCU 26	3357-3358	07.08.2010
BiLog Antenna	SCHWARZBECK	VULB 9163	9163-356	06.23.2010
Horn Antenna	R&S	HF906	100683	06.18.2010
Horn Antenna	ETS-Lindgren	3160	00091989	09.20.2010
LISN	R&S	ENV216	100382	08.11.2010
Universal Radio Communication Tester	R&S	CBT	100548	02.21.2011
Signal Analyzer	Agilent	E4440A	MY46187664	02.02.2011



## 6 Transmitter Measurements

### 6.1 20dB bandwidth measurement

#### 6.1.1 Test Conditions

Table 13 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	76%
Test Configurations:	TM1 at channel No.0, 40, 78

#### 6.1.2 Test Specifications and Limits

##### 6.1.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) and DA 00-705

##### 6.1.2.2 Supporting Standards

Table 14 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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##### 6.1.2.3 Limits

Not Applicable.

#### 6.1.3 Test Method and Setup

- (a) Connect test port of mobile phone to universal communication tester.
- (b) Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number and test the 20dB bandwidth with universal communication tester.

## Test setup

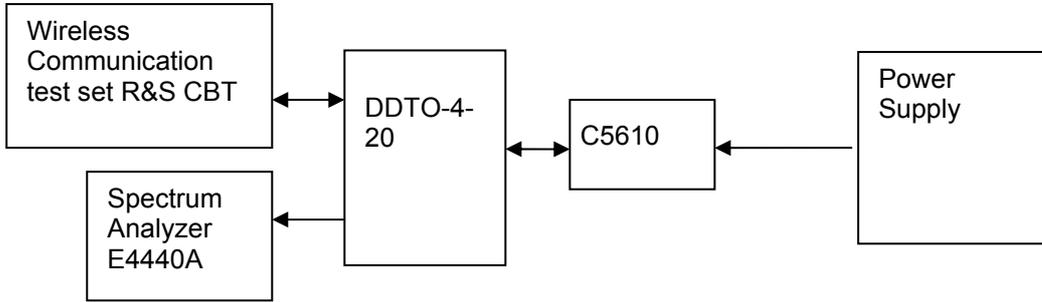


Figure 1. Test Set-up

### 6.1.4 Measurement Results

Table 15 Measurement Results (Modulation:  $\pi/4$ -DQPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.288M	Pass
20dB	M	40	2.442	1.277M	Pass
20dB	T	78	2.480	1.270M	Pass

Table 16 Measurement Results (Modulation: 8DPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.279M	Pass
20dB	M	40	2.442	1.281M	Pass
20dB	T	78	2.480	1.284M	Pass

### 6.1.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix A.



## 6.2 Carrier frequency separation measurement

### 6.2.1 Test Conditions

Table 17 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	76%
Test Configurations:	TM1 at channel No.39, 40, 41

### 6.2.2 Test Specifications and Limits

#### 6.2.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) and DA 00-705

#### 6.2.2.2 Supporting Standards

Table 18 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.2.2.3 Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Table 19 Limits (Modulation:  $\pi/4$ -DQPSK)

Regulation:	$\geq 0.025$ or $2/3$ of the 20 dB bandwidth
Limit:	$\geq 2/3 \times 1.277M = 0.851$ MHz

Table 20 Limits (Modulation: 8DPSK)

Regulation:	$\geq 0.025$ or $2/3$ of the 20 dB bandwidth
Limit:	$\geq 2/3 \times 1.281M = 0.854$ MHz

### 6.2.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

## Test setup

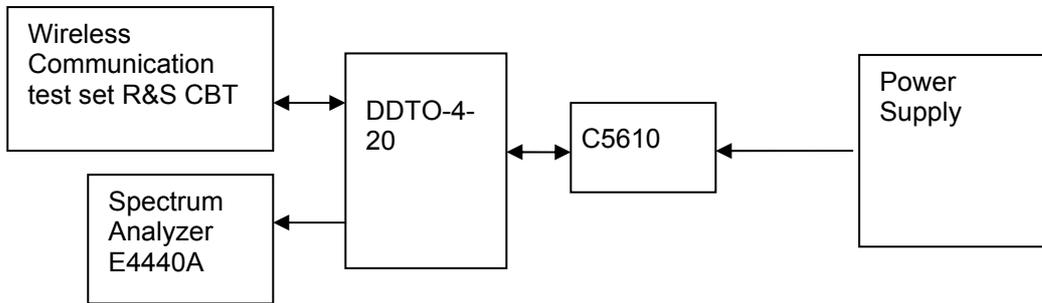


Figure 2. Test Set-up

### 6.2.4 Measurement Results

Table 21 Measurement Results (Modulation:  $\pi/4$ -DQPSK)

Channel No.	Frequency [GHz]	Channel No.	Frequency [GHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2.442	39	2.441	0.95	$\geq 0.851$	Pass
40	2.442	41	2.443	1.0	$\geq 0.851$	Pass

Table 22 Measurement Results (Modulation: 8DPSK)

Channel No.	Frequency [GHz]	Channel No.	Frequency [GHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2.442	39	2.441	0.884	$\geq 0.854$	Pass
40	2.442	41	2.443	0.933	$\geq 0.854$	Pass

### 6.2.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix B.



## 6.3 Number of hopping channel

### 6.3.1 Test Conditions

Table 23 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	76%
Test Configurations:	TM1 at hopping frequency state

### 6.3.2 Test Specifications and Limits

#### 6.3.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) iii and DA 00-705

#### 6.3.2.2 Supporting Standards

Table 24 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.3.2.3 Limits

Number of hopping channel should be compliance with the requirements in part15.247 (a) (1) iii.

Table 25 Limits

Limits	≥ 15 hopping frequency channel
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### 6.3.3 Test Method and Setup

- (a) Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- (b) Set the mobile phone to transmit maximum output power at 2.4GHz and switch on frequency hopping function, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
- (c) Count the quantity of peaks to get the number of hopping channels.

### Test setup

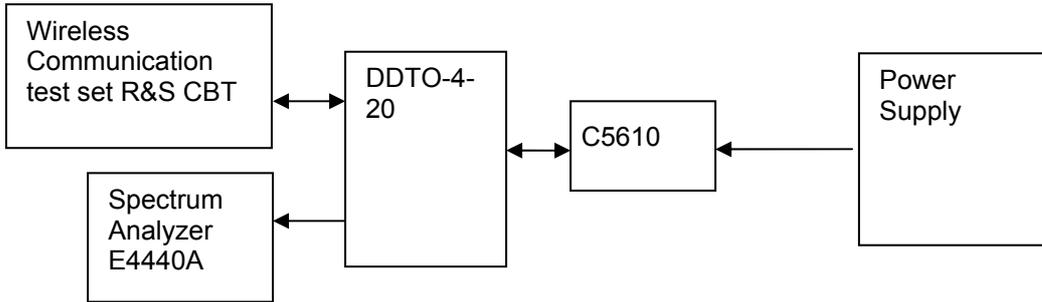


Figure 3. Test Set-up

### 6.3.4 Measurement Results

Table 26 Measurement Results (Modulation:  $\pi/4$ -DQPSK)

Measured frequency range [MHz]	Channel No. range	Measured Channel No.	Limit	Result
2400 to 2483.5	0-78	79	$\geq 15$	Pass

Table 27 Measurement Results (Modulation: 8-DPSK)

Measured frequency range [MHz]	Channel No. range	Measured Channel No.	Limit	Result
2400 to 2483.5	0-78	79	$\geq 15$	Pass

### 6.3.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix C.

## 6.4 Time of occupancy

### 6.4.1 Test Conditions

Table 28 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	76%
Test Configurations:	TM1 at hopping frequency state

### 6.4.2 Test Specifications and Limits

#### 6.4.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) iii and DA 00-705

#### 6.4.2.2 Supporting Standards

Table 29 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.4.2.3 Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Table 30 Limits

Limits for time of occupancy	$\leq 0.4s$
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### 6.4.3 Test Method and Setup

- Connect test port of mobile phone to spectrum analyzer and universal communication tester.
- Set the mobile phone to transmit maximum output power at 2.4GHz and switch on frequency hopping function.
- Set the span of spectrum analyzer to 0 Hz, and set the resolution bandwidth to 1 MHz and the video bandwidth to 1 MHz, then get the time domain measured diagram. and set sweep time to 2 times of one burst occupancy time, and measure the time of occupancy of one burst.
- Set the resolution bandwidth to 1 MHz and the video bandwidth to 3 MHz, and set the sweep time to a period (0.4 seconds multiplied by the number of hopping channels employed), and count the number of the bursts.
- Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts.

## Test setup

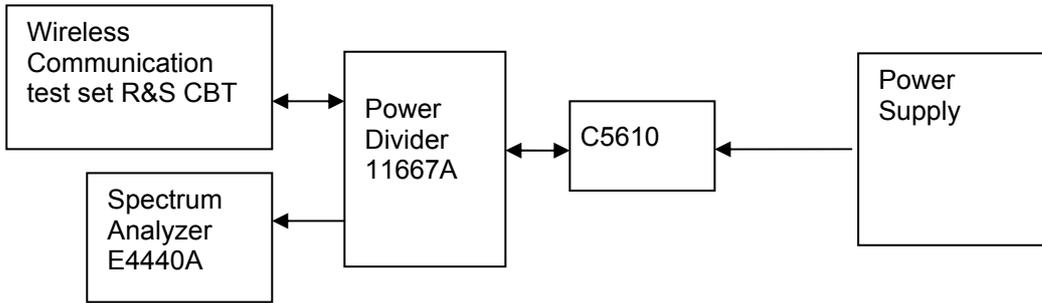


Figure 4. Test Set-up

### 6.4.4 Measurement Results

Table 31 Measurement Results (Modulation:  $\pi/4$ -DQPSK)

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
2.9	106.7	0.30943	$\leq 0.4$	Pass

Table 32 Measurement Results (Modulation: 8DPSK)

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
2.8	106.7	0.29876	$\leq 0.4$	Pass

Note: The result is measured at 2-DH5\3-DH5 mode in  $\pi/4$ -DQPSK\8DPSK modulation, which has longest time in one transmission burst.

### 6.4.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix D.



## 6.5 Peak output power

### 6.5.1 Test Conditions

Table 33 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	76%
Test Configurations:	TM1 at channel No.0, 40, 78

### 6.5.2 Test Specifications and Limits

#### 6.5.2.1 Specification

CFR 47 (FCC) part 15.247 (b) (1) and DA 00-705

#### 6.5.2.2 Supporting Standards

Table 34 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.5.2.3 Limits

Compliance with part 15.247 (b) (1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watt.

Table 35 Limits

2.4GHz and 5.8GHz hopping frequency system	1 Watt (=30 dBm)
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### 6.5.3 Test Method and Setup

- (a) Connect test port of mobile phone to universal communication tester.
- (b) Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the mobile phone to transmit at high, middle and low frequency and measure the conducted output power separately.

## Test setup

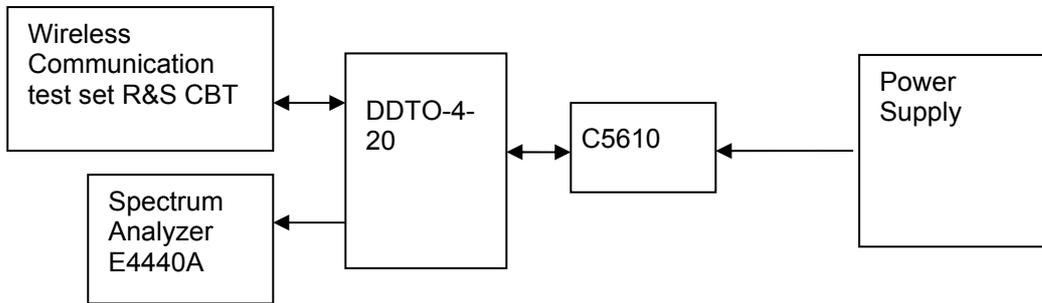


Figure 5. Test Set-up

## 6.5.4 Measurement Results

Table 36 Measurement Results (Modulation:  $\pi/4$ -DQPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	6.48	< 30	Pass
Middle	40	2442	5.8	< 30	Pass
Top	78	2480	4.33	< 30	Pass

Table 37 Measurement Results (Modulation: 8DPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	6.41	< 30	Pass
Middle	40	2442	5.78	< 30	Pass
Top	78	2480	4.29	< 30	Pass

## 6.5.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix E.



## 6.6 Band edge spurious emission

### 6.6.1 Test Conditions

Table 38 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	76%
Test Configurations:	TM1 at channel No. 0, 78 and frequency hopping state

### 6.6.2 Test Specifications and Limits

#### 6.6.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and DA 00-705

#### 6.6.2.2 Supporting Standards

Table 39 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.6.2.3 Limits

Compliance with part 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 40 Limits

Band edge spurious:	20 dBc/100kHz
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### 6.6.3 Test Method and Setup

- (a) Connect test port of mobile phone to spectrum analyzer and universal communication tester
- (b) Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the mobile phone to transmit at high, low frequency and measure the conducted band edge spurious separately.
- (d) Switch on the frequency hopping function, and repeat above measurement.

## Test setup

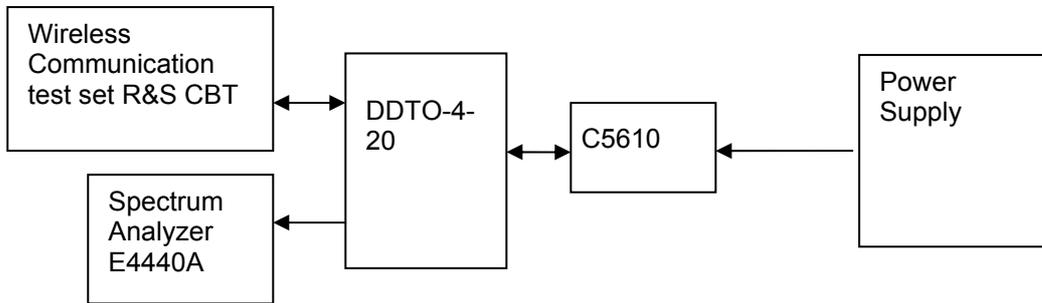


Figure 6. Test Set-up

### 6.6.4 Measurement Results

Table 41 Measurement Results for Band Edge immediately outside the 2.4GHz Band  
(Modulation:  $\pi/4$ -DQPSK)

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]
Low Edge	0	2402	4.85	Off	-45.65	< -15.15
	-	-	4.76	On	-49.44	< -15.24
High Edge	78	2480	1.33	Off	-50.75	< -18.67
	-	-	2.9	On	-48.58	< -17.1

Table 42 Measurement Results for Band Edge immediately outside the 2.4GHz Band  
(Modulation: 8DPSK)

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]
Low Edge	0	2402	4.66	Off	-45.18	<-15.34
	-	-	4.24	On	-49.2	<-15.76
High Edge	78	2480	0.96	Off	-50.14	<-19.04
	-	-	2.39	On	-49.13	<-17.61

### 6.6.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix F.



## 6.7 Conducted RF spurious

### 6.7.1 Test Conditions

Table 43 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	76%
Test Configurations:	TM1 at channel No.0, 40, 78

### 6.7.2 Test Specifications and Limits

#### 6.7.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and DA 00-705

#### 6.7.2.2 Supporting Standards

Table 44 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
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#### 6.7.2.3 Limits

Compliance with part 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 45 Limits

Band edge spurious:	20 dBc/100kHz
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### 6.7.3 Test Method and Setup

- (a) Connect test port of mobile phone to spectrum analyzer and universal communication tester
- (b) Set the mobile phone to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the mobile phone to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.
- (d) Switch on the frequency hopping function, and repeat above measurement.

## Test setup

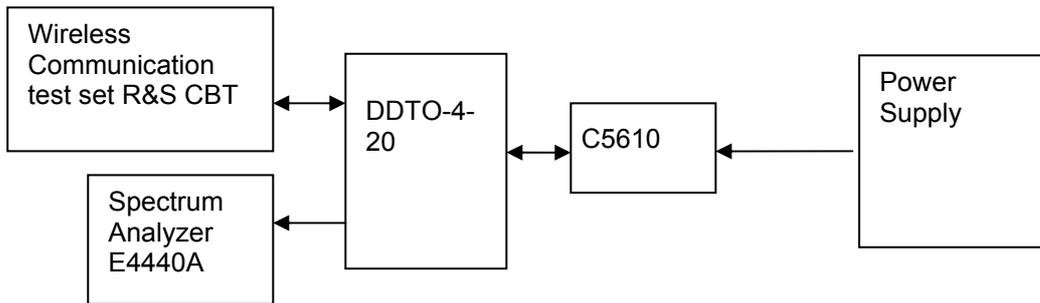


Figure 7. Test Set-up

## 6.7.4 Measurement Results

Table 46 Measurement Results (Modulation:  $\pi/4$ -DQPSK)

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-25GHz	0	2402	5.93	Off	-24.15	< -14.1	Pass
9kHz-25GHz	40	2442	5.63	Off	-24.71	< -14.4	Pass
9kHz-25GHz	78	2480	4.06	Off	-24.22	< -15.9	Pass

Table 47 Measurement Results (Modulation: 8DPSK)

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-25GHz	0	2402	6.03	Off	-24.33	< -14.0	Pass
9kHz-25GHz	40	2442	5.46	Off	-24.94	< -14.5	Pass
9kHz-25GHz	78	2480	3.81	Off	-23.88	< -16.2	Pass

## 6.7.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix G.

## 6.8 Radiated spurious emission & spurious in restricted band

### 6.8.1 Test Conditions

Table 48 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Enclosure
Ambient temperature:	25 °C
Relative humidity:	55 %
Test Configurations:	TM1 at channel No.0, 40, 78

### 6.8.2 Test Specifications and Limits

#### 6.8.2.1 Specification

CFR 47 (FCC) part 15.247 (d), 15.205 & 15.209 and DA 00-705

#### 6.8.2.2 Supporting Standards

Table 49 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

#### 6.8.2.3 Limits

According to part 15.247 (d) / 15.205 & 15.209, all spurious emission in the frequency range from 30MHz to 10<sup>th</sup> harmonics of carrier frequency should be meet the requirement of following table.

Table 50 Limits

Frequency (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance (meters)	Detector
30 - 88	100	40	3	QP
88 - 216	150	43.5	3	QP
216 - 960	200	46	3	QP
960 -1000	500	54	3	QP
Above 1000	500	54	3	PK

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a) (see above table).

### 6.8.3 Test Method and Setup

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2003). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4. The Radiated Disturbance measurements were made using a Rohde and Schwarz Test Receiver and control software.

A preliminary scan and a final scan of the emissions were made by using test script of software; the emissions were measured using a Quasi-Peak Detector below 1GHz, and AV detector above 1GHz. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

Huawei CDMA Mobile Phone with Bluetooth C5610 was communicated with the BTS simulator through Air interface. The Mobile Phone transmits maximum output power at 2.4GHz and switch off frequency hopping function.

Measurement bandwidth: 30 MHz - 1000 MHz: 120 kHz  
Measurement bandwidth: 1000 MHz - 10<sup>th</sup> Carrier Frequency: 1 MHz

**Test set up**

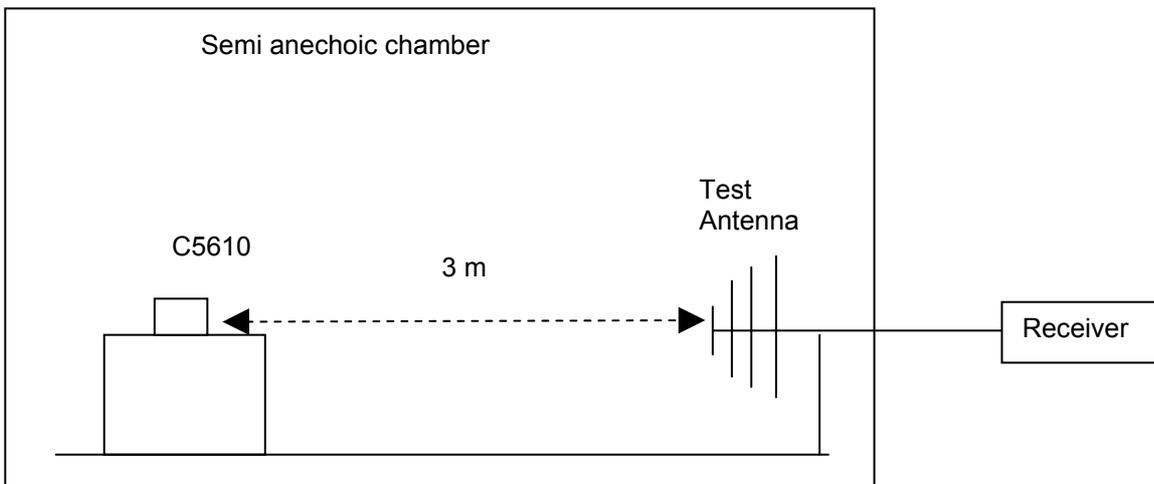


Figure 8. Test Set up

**6.8.4 Measurement Results**

Note: The following measurement results exceed the limit line is the carrier frequency.

**Measured Result of channel: 0 (2402MHz)**

Table 51 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
37.620000	23.00	-12.2	40.0	17.0	291.0	214.00	HORIZONTAL
86.960000	19.50	-17.8	40.0	20.5	266.0	94.00	HORIZONTAL
92.890000	20.90	-14.0	43.5	22.6	270.0	64.00	VERTICAL
293.000000	18.60	-13.7	46.0	27.4	157.0	33.00	VERTICAL
525.300000	24.30	-3.8	46.0	21.7	127.0	282.00	HORIZONTAL
906.200000	30.60	0.7	46.0	15.4	164.0	320.00	VERTICAL
3552.500000	36.70	-7.2	54.0	17.3	107.0	345.00	VERTICAL
5274.000000	39.20	-2.8	54.0	14.8	176.0	201.00	VERTICAL
8176.500000	40.30	2.5	54.0	13.7	166.0	27.00	HORIZONTAL
11917.500000	40.90	6.9	54.0	13.1	123.0	316.00	HORIZONTAL
13975.000000	44.90	10.8	54.0	9.1	175.0	333.00	VERTICAL
17763.500000	48.80	15.9	54.0	5.2	123.0	85.00	VERTICAL
19019.500000	30.40	18.6	54.0	23.6	111.0	9.00	VERTICAL
19480.500000	29.80	18.9	54.0	24.2	125.0	254.00	VERTICAL



20869.500000	31.70	20.2	54.0	22.3	121.0	35.00	HORIZONTAL
22548.500000	32.30	20.3	54.0	21.7	143.0	28.00	VERTICAL
24575.000000	30.90	22.0	54.0	23.1	155.0	288.00	HORIZONTAL
26496.500000	32.50	27.9	54.0	21.5	119.0	210.00	VERTICAL
2310.000000	34.70	-11.9	54.0	19.3	118.0	128.00	HORIZONTAL
2390.000000	32.60	-11.6	54.0	21.4	153.0	199.00	HORIZONTAL
2402.000000	75.10	-11.5	54.0	-20.1	181.0	36.00	VERTICAL
2483.500000	31.80	-11.3	54.0	22.2	127.0	211.00	HORIZONTAL
2500.000000	31.50	-11.1	54.0	22.5	155.0	22.00	HORIZONTAL

**Measured Result of channel: 40 (2442MHz)**

Table 52 MEASUREMENT RESULT

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
37.300000	29.80	-11.0	40.0	10.2	228.0	286.00	VERTICAL
85.760000	20.50	-16.9	40.0	19.5	121.0	83.00	HORIZONTAL
96.040000	21.90	-15.5	43.5	21.6	232.0	170.00	HORIZONTAL
276.940000	20.00	-12.0	46.0	26.0	170.0	75.00	VERTICAL
526.580000	24.30	-3.8	46.0	21.7	160.0	96.00	HORIZONTAL
954.300000	32.30	2.7	46.0	13.7	145.0	328.00	HORIZONTAL
3224.500000	36.20	-8.3	54.0	17.8	118.0	128.00	HORIZONTAL
5542.500000	39.80	-2.3	54.0	14.2	153.0	199.00	HORIZONTAL
7573.500000	40.10	1.6	54.0	13.9	181.0	36.00	VERTICAL
12686.500000	43.60	8.4	54.0	10.4	127.0	211.00	HORIZONTAL
14474.500000	46.60	12.3	54.0	7.4	155.0	22.00	HORIZONTAL
17986.000000	49.20	17.2	54.0	4.8	134.0	4.00	VERTICAL
18786.000000	30.30	18.5	54.0	23.7	150.0	155.00	HORIZONTAL
19475.000000	29.40	18.9	54.0	24.6	136.0	359.00	HORIZONTAL
21778.000000	30.70	20.5	54.0	21.2	121.0	170.00	HORIZONTAL
24191.000000	30.50	21.5	54.0	23.4	133.0	129.00	HORIZONTAL
25395.000000	30.00	23.1	54.0	24.0	100.0	132.00	VERTICAL
26497.000000	32.90	27.9	54.0	21.1	104.0	349.00	HORIZONTAL

**Measured Result of channel: 78 (2480MHz)**

Table 53 MEASUREMENT RESULT

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
37.700000	27.20	-11.6	40.0	12.8	241.0	185.00	VERTICAL
87.500000	19.80	-16.9	40.0	20.2	166.0	40.00	VERTICAL
96.000000	20.90	-15.8	43.5	22.6	272.0	165.00	VERTICAL
295.450000	18.90	-12.0	46.0	27.1	270.0	59.00	HORIZONTAL
537.240000	24.20	-4.3	46.0	21.8	227.0	342.00	HORIZONTAL
875.790000	31.10	1.6	46.0	14.9	111.0	63.00	VERTICAL
3603.500000	36.50	-7.0	54.0	17.5	150.0	86.00	VERTICAL
4744.500000	37.20	-4.2	54.0	16.8	171.0	114.00	HORIZONTAL
7083.000000	39.60	0.4	54.0	14.4	125.0	289.00	HORIZONTAL
8434.500000	42.30	3.0	54.0	11.7	177.0	177.00	HORIZONTAL
13642.000000	46.80	10.2	54.0	7.2	186.0	324.00	HORIZONTAL
17985.500000	49.70	17.2	54.0	4.3	162.0	282.00	VERTICAL
19475.000000	29.50	18.9	54.0	24.5	108.0	262.00	HORIZONTAL
20467.000000	30.00	19.7	54.0	24.0	183.0	352.00	VERTICAL
21773.000000	30.20	20.5	54.0	23.8	102.0	164.00	HORIZONTAL
23534.000000	29.80	20.5	54.0	24.2	142.0	81.00	HORIZONTAL



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24195.500000	29.50	21.5	54.0	24.5	188.0	336.00	VERTICAL
26498.000000	32.30	27.9	54.0	21.7	115.0	230.00	HORIZONTAL
2310.000000	33.30	-11.9	54.0	20.7	165.0	357.00	VERTICAL
2390.000000	34.60	-11.6	54.0	19.4	124.0	128.00	HORIZONTAL
2480.000000	76.20	-11.3	54.0	-22.2	102.0	345.00	VERTICAL
2483.500000	42.20	-11.3	54.0	11.8	136.0	100.00	HORIZONTAL
2500.000000	32.80	-11.1	54.0	21.2	187.0	263.00	VERTICAL

### 6.8.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix H.

## 6.9 Conducted Emission at Power Port

### 6.9.1 Test Conditions

Table 54 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	23.5°C
Relative humidity:	55 %
Test Configurations:	TM1 at channel No. 40

### 6.9.2 Test Specifications and Limits

#### 6.9.2.1 Specification

CFR 47 (FCC) part 15.207 and DA 00-705

#### 6.9.2.2 Supporting Standards

Table 55 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
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#### 6.9.2.3 Limits

Compliance with part15.207, conducted emission must meet the requirement of following table.

Table 56 Limits

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: \* Decreases with the logarithm of the frequency.

### 6.9.3 Test Method and Setup

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4: 2003.

Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

Huawei CDMA Mobile Phone with Bluetooth C5610 was communicated with the BTS simulator through Air interface, the BTS simulator controls the Mobile Phone to transmitter the maximum power which defined in specification of product. The Mobile Phone operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

### Test Set-up

The Mobile Phone was setup in the screened chamber and operated under nominal conditions.

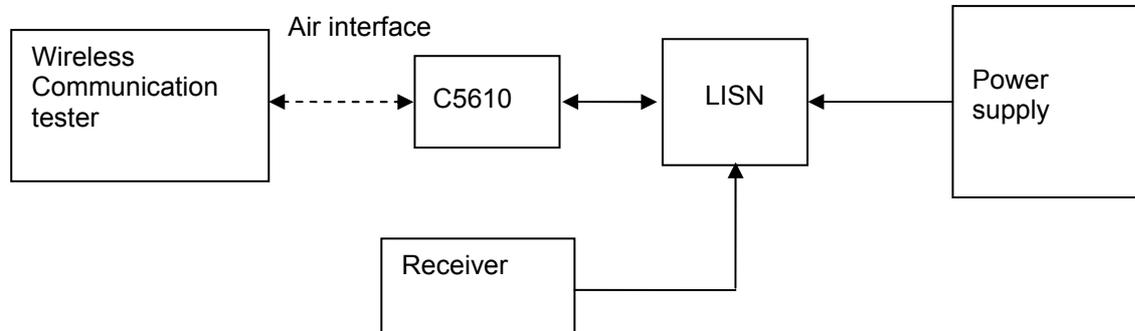


Figure 9. Test Set-up

### 6.9.4 Measurement Results

Table 57 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.253500	52.20	10.0	62	9.8	QP	N	FLO
0.397500	50.50	10.0	58	7.5	QP	N	FLO
0.514500	51.80	10.1	56	4.2	QP	N	FLO
1.140000	43.20	10.1	56	12.8	QP	N	FLO
2.089500	37.90	10.1	56	18.1	QP	N	FLO
23.631000	26.60	10.4	60	33.4	QP	N	FLO

Table 58 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.258000	38.50	10.0	52	13.0	AV	N	FLO
0.379500	35.70	10.0	48	12.6	AV	N	FLO
0.528000	35.00	10.1	46	11.0	AV	N	FLO
0.811500	28.20	10.1	46	17.8	AV	N	FLO
1.662000	27.90	10.1	46	18.1	AV	N	FLO
24.211500	12.50	10.4	50	37.5	AV	N	FLO

### 6.9.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix I.



## 7 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 59 System Measurement Uncertainty

Items		Extended Uncertainty
20dB bandwidth measurement	Magnitude (%)	U=0.2%; k=2
Carrier frequency separation measurement	Magnitude (%)	U=0.2%; k=2
Time of occupancy	Magnitude (%)	U=0.2%; k=2
Peak output power	Power(dBm)	U=0.39dB; k=2
Band edge compliance measurement	Disturbance Power(dBm)	U=2.0dB; k=2
Conducted RF spurious	Disturbance Power(dBm)	U=2.0dB; k=2
Radiated spurious emission & Radiated restricted band measurement	Field strength (dB $\mu$ V/m)	U=2.2dB; k=2 U=5dB; k=2
Conducted emission test for power port	Disturbance Voltage(dB $\mu$ V)	U=3.2dB; k=2



## 8 Appendices List

Appendix A	Measurement Results 20dB bandwidth measurement	7 pages
Appendix B	Measurement Results Carrier frequency separation measurement	3 pages
Appendix C	Measurement Results Number of hopping channel	3 pages
Appendix D	Measurement Results Time of occupancy	5 pages
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Appendix J	Photos of Test Setup	3 pages

----- End of Report -----