



# FCC&IC Test Report - EDR

**Product Name: SONIC;Sonic;HSDPA/UMTS/GPRS/GSM/EDGE  
Mobile Phone with Bluetooth; Sapphire**

**Model Number: HUAWEI U8652/U8652/Huawei U8652/U8652-51**

**Report No: SYBH(Z-RF)019052011-2004**

**FCC ID: QISU8652**

**IC ID: 6369A-U8652**

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**REPORT ON**

FCC 47CFR part 15 subpart C Test of  
SONIC;Sonic;HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone  
with Bluetooth; Sapphire

M/N: HUAWEI U8652/U8652/Huawei U8652/U8652-51  
Report No: SYBH(Z-RF)019052011-2004

**REGULATION**

FCC CFR47 Part 2: Subpart J;  
FCC CFR47 Part 15: Subpart C;  
RSS-Gen Issue 2  
RSS-210 Issue

**CONCLUSION**

**Pass**

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## Contents

<b>1</b>	<b><u>Summary</u></b> .....	<b>5</b>
<b>2</b>	<b><u>Product Description</u></b> .....	<b>6</b>
2.1	PRODUCTION INFORMATION .....	6
2.2	MODIFICATION INFORMATION .....	6
<b>3</b>	<b><u>Test Site Description</u></b> .....	<b>7</b>
3.1	TESTING PERIOD .....	7
3.2	GENERAL SET UP DESCRIPTION .....	7
<b>4</b>	<b><u>Product Description</u></b> .....	<b>8</b>
4.1	TECHNICAL CHARACTERISTICS.....	8
4.2	EUT IDENTIFICATION LIST.....	10
<b>5</b>	<b><u>Main Test Instruments</u></b> .....	<b>11</b>
<b>6</b>	<b><u>Transmitter Measurements</u></b> .....	<b>12</b>
6.1	20DB BANDWIDTH MEASUREMENT .....	12
6.2	CARRIER FREQUENCY SEPARATION MEASUREMENT.....	14
6.3	NUMBER OF HOPPING CHANNEL.....	16
6.4	TIME OF OCCUPANCY.....	18
6.5	PEAK OUTPUT POWER .....	20
6.6	BAND EDGE SPURIOUS EMISSION.....	22
6.7	CONDUCTED RF SPURIOUS.....	24
6.8	RADIATED SPURIOUS EMISSION & SPURIOUS IN RESTRICTED BAND.....	26
6.9	CONDUCTED EMISSION AT POWER PORT.....	30
<b>7</b>	<b><u>System Measurement Uncertainty</u></b> .....	<b>32</b>
<b>8</b>	<b><u>Appendices List</u></b> .....	<b>33</b>



# 1 Summary

The table below summarizes the measurements and results for the EUT. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

<b>FCC Measurement Specification</b>	<b>RSS-210 Issue</b>	<b>Description</b>	<b>Result</b>
15.247 (a) (1)	Annex 2 & Annex 8	20dB bandwidth measurement	PASS
15.247 (a) (1)	Annex 1 & Annex 2 & Annex 6	Carrier frequency separation measurement	PASS
15.247 (a) (1) III	Annex 8	Number of hopping channel	PASS
15.247 (a) (1) III	Annex 8	Time of occupancy	PASS
15.247 (b) (1)	Annex 4& Annex 13	Peak output power	PASS
15.247 (d)	Annex 2 & Annex 8	Band edge compliance measurement	PASS
15.247 (d)	Annex 13	Conducted RF spurious	PASS
15.247 (d) / 15.205 & 15.209	Annex 7	Radiated spurious emission & Radiated restricted band measurement	PASS
15.207	Annex 13	Conducted emission test for power port	PASS



## 2 Product Description

### 2.1 Production Information

#### 2.1.1 General Description

HUAWEI U8652/U8652/Huawei U8652/U8652-51 subscriber equipment in the WCDMA/GSM system. The HSDPA/UMTS frequency band is Band I and Band II and Band V. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSDPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video, MMS service, GPS,AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

Note: only BT band test data included in this report

#### 2.1.2 Support function and Service

The EUT 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	TM1	/
Data and Voice	Modulation: 8DPSK	TM2	/

### 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

Jul.10, 2011 to Jul.15, 2011

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

The Bluetooth hopping frequency system of Mobile Phone 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:**  $\pi$  /4-DQPSK Modulation

**TM2:** 8DPSK Modulation



## 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):	-0.6 (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:	650mA

#### 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

Product Name : SONIC;Sonic;HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; Sapphire		
HUAWEI U8652/U8652/Huawei U8652/U8652-51		
Board and Module		
Hardware Version	Software Version	S/N
HD1U865M51	U8652V100R001USAC07B819	R8K2A11151800003

### 4.2.2 Adapter

AC/DCAdapter Model	HW-050100U1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

### 4.2.3 Battery Technical Data

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB5K1H Rated capacity: 1400mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

### 4.2.4 FCC Identification

Grantee Code: QIS  
 Product Code: U8652  
 FCC Identification: QISU8652

### 4.2.5 IC Identification

IC Identification: 6369A-U8652



## 5 Main Test Instruments

Table 12 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2011
Universal Radio Communication Tester	R&S	CMU200	105822	Oct.24,2011
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.04,2011
Spectrum Analyzer	Agilent	E4440A	MY49420179	Apr.24,2012
Signal Analyzer	R&S	FSQ40	100025	Oct.09,2011
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2011
Temperature Chamber	ESPEC	MW3030	611403	May.12,2012
Signal Generator	R&S	SMR40	100325	May.12,2012
Vector Signal Generator	R&S	SMU200A	104162	Sep.07,2011
Spectrum Analyzer	R&S	FSU26	EG26725	Mar.07,2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Dec.13.2011
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Dec.13.2011
Horn Antenna	R & S	HF906	359287/005	May.07, 2012
Horn Antenna	R & S	HF906	359287/006	April.27, 2012
Broadband Antenna	SCHAFFNER	CBL 6112B	2536	Sep.21, 2011
Broadband Antenna	SCHAFFNER	CBL 6112B	2941	Jun.11, 2012
Test receiver	R&S	ESU26	36090302083	Jun.17.2012
Horn Antenna	ETS-LINDGREN	3160	60008	Sep.20.2011
Horn Antenna	ETS-LINDGREN	3160	60006	Oct.27.2011



## 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:	55%
Test Configurations:	TM1/TM2 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

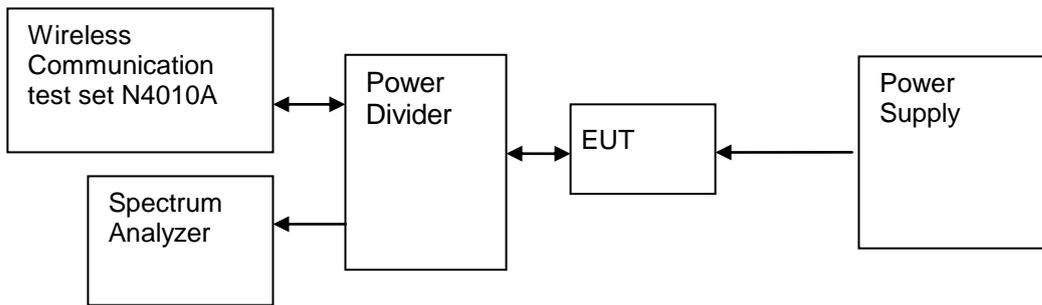


Figure 1. Test Set-up

### 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	1.299	Pass
20dB	M	40	2.442	1.285	Pass
20dB	T	78	2.480	1.293	Pass

Table 16 Measurement Results (Modulation: 8DPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.294	Pass
20dB	M	40	2.442	1.289	Pass
20dB	T	78	2.480	1.297	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:	55%
Test Configurations:	TM1/TM2 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:	$\geq 2/3 \times 1.285M = 0.571$ MHz

Table 20 Limits (Modulation: 8DPSK)

Regulation:	$\geq 0.025$ or $2/3$ of the 20 dB bandwidth
Limit:	$\geq 2/3 \times 1.289M = 0.573$ MHz

### 6.2.3 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, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

## Test setup

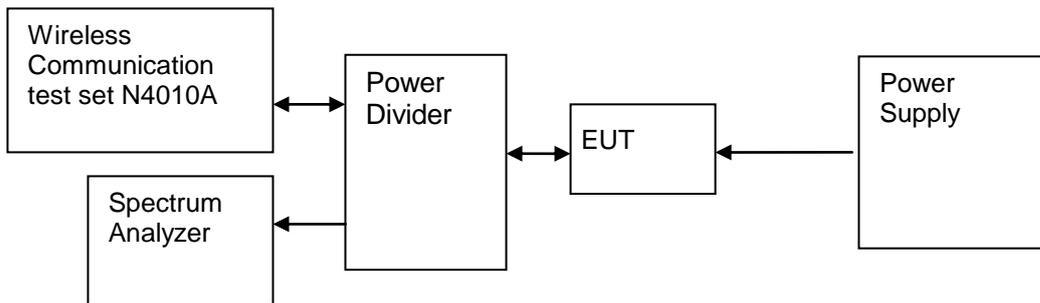


Figure 2. Test Set-up

### 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	1.15	$\geq 0.571$	Pass
40	2.442	41	2.443	1.0	$\geq 0.571$	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	1.0	$\geq 0.573$	Pass
40	2.442	41	2.443	0.85	$\geq 0.573$	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:	55%
Test Configurations:	TM1/TM2 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	$\geq 15$ hopping frequency channel
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### 6.3.3 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, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
- Count the quantity of peaks to get the number of hopping channels.

## Test setup

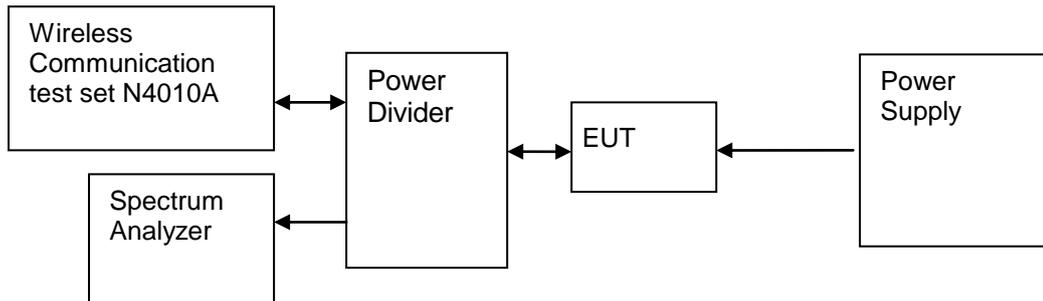


Figure 3. Test Set-up

### 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:	55%
Test Configurations:	TM1/TM2 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	≤ 0.4s
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### 6.4.3 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.
- (c) 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.
- (d) 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.
- (e) Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts.

## Test setup

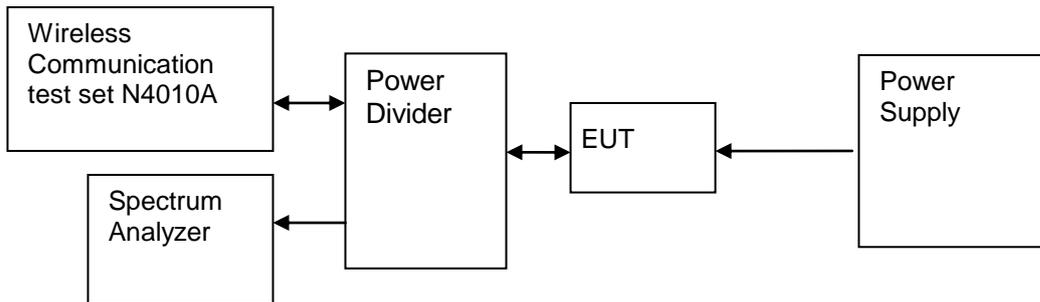


Figure 4. Test Set-up

### 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
1.2	106.7	0.12804	$\leq 0.4$	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:	55%
Test Configurations:	TM1/TM2 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

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

## Test setup

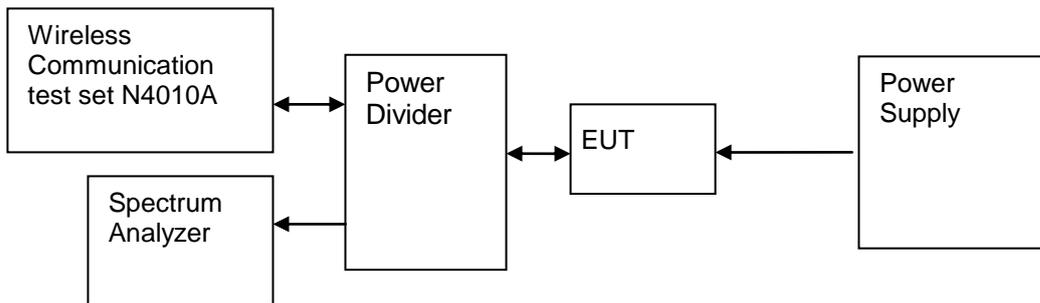


Figure 5. Test Set-up

## 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	10.81	< 30	Pass
Middle	40	2442	11.43	< 30	Pass
Top	78	2480	11.03	< 30	Pass

Table 37 Measurement Results (Modulation: 8DPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	10.82	< 30	Pass
Middle	40	2442	11.42	< 30	Pass
Top	78	2480	11.06	< 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:	55%
Test Configurations:	TM1/TM2 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

- 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 mobile phone to transmit at high, low frequency and measure the conducted band edge spurious separately.
- Switch on the frequency hopping function, and repeat above measurement.

## Test setup

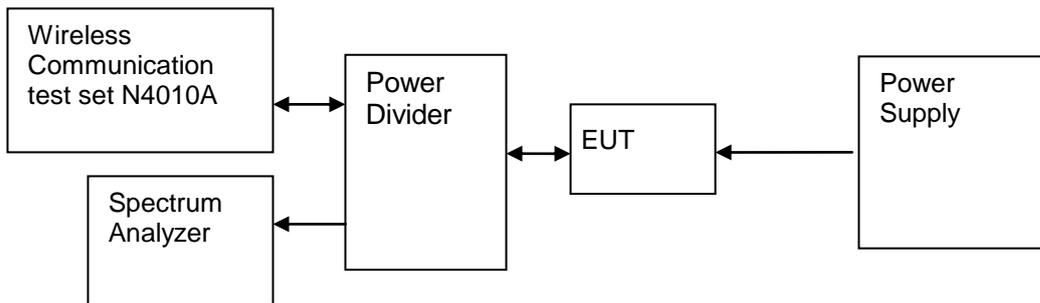


Figure 6. Test Set-up

### 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]	Result
Low Edge	0	2402	8.09	Off	-44.91	< -11.91	Pass
	-	-	8.01	On	-48.59	< -11.99	Pass
High Edge	78	2480	8.53	Off	-50.57	< -11.47	Pass
	-	-	8.5	On	-51.78	< -11.5	Pass

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]	Result
Low Edge	0	2402	8.02	Off	-44.07	<-11.98	Pass
	-	-	7.11	On	-48.18	<-12.89	Pass
High Edge	78	2480	8.56	Off	-50.78	<-11.44	Pass
	-	-	8.54	On	-51.95	<-11.46	Pass

### 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/TM2 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

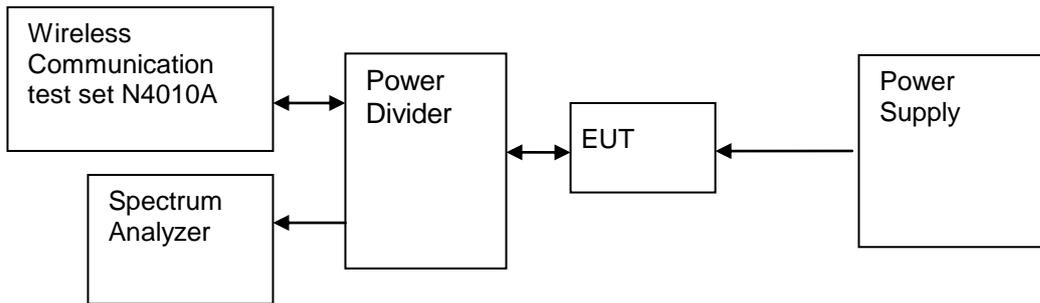


Figure 7. Test Set-up

## 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	6.74	Off	-40.28	< -13.26	Pass
9kHz-25GHz	40	2442	6.59	Off	-45.23	< -13.41	Pass
9kHz-25GHz	78	2480	5.93	Off	-46.5	< -14.07	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	5.44	Off	-40.43	< -14.56	Pass
9kHz-25GHz	40	2442	6.51	Off	-44.32	< -13.49	Pass
9kHz-25GHz	78	2480	7.91	Off	-46.77	< -12.09	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/TM2 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 S7-201C 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**

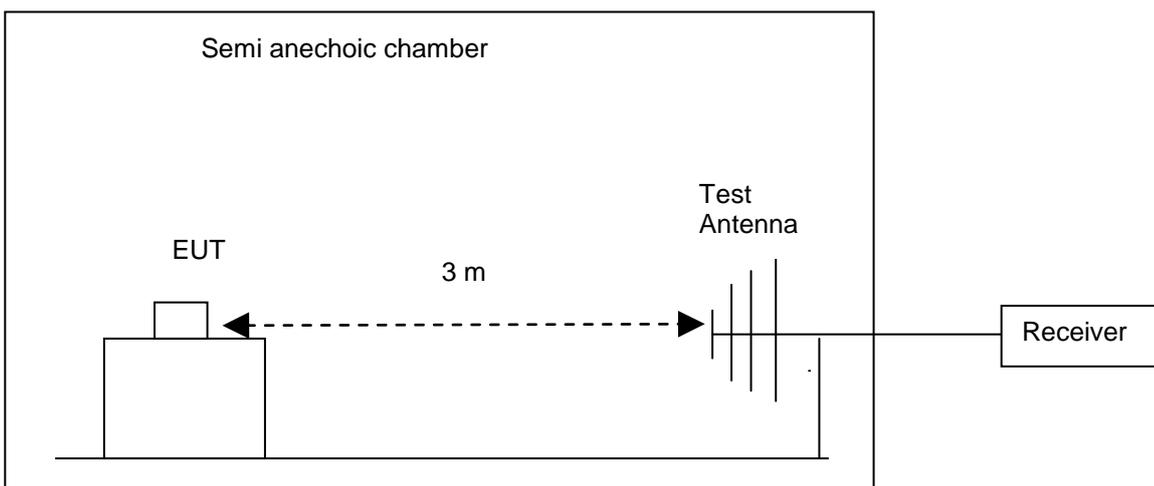


Figure 8. Test Set up

**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
37.860000	33.40	-8.5	40	6.6	107.0	104.00	VERTICAL
39.300000	33.20	-9.3	40	6.8	100.0	34.00	VERTICAL
59.280000	17.60	-16.2	40	22.4	142.0	280.00	VERTICAL
172.320000	15.20	-11.9	43.5	28.3	141.0	360.00	HORIZONTAL
192.300000	17.10	-12.1	43.5	26.4	166.0	343.00	HORIZONTAL
359.760000	19.40	-5.4	46	26.6	110.0	62.00	VERTICAL
1100.000000	41.30	-6.5	54.0	12.7	200.0	240.00	HORIZONTAL
1423.000000	45.8	-4.3	54.0	8.2	100.0	90.00	HORIZONTAL
2402.000000	72.10	2.0	54.0	-18.1	110.0	0.00	VERTICAL
3750.000000	43.50	7.0	54.0	10.5	100.0	0.00	VERTICAL
5925.500000	48.60	12.7	54.0	5.4	200.0	300.00	HORIZONTAL
12921.000000	44.00	31.6	54.0	10.0	100.0	150.00	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
37.860000	33.40	-8.5	40	6.6	107.0	104.00	VERTICAL
39.300000	33.20	-9.3	40	6.8	100.0	34.00	VERTICAL
59.280000	17.60	-16.2	40	22.4	142.0	280.00	VERTICAL
172.320000	15.20	-11.9	43.5	28.3	141.0	360.00	HORIZONTAL
192.300000	17.10	-12.1	43.5	26.4	166.0	343.00	HORIZONTAL
359.760000	19.40	-5.4	46	26.6	110.0	62.00	VERTICAL
1100.000000	41.70	-6.5	54.0	12.3	200.0	0.00	HORIZONTAL
2442.000000	71.90	2.1	54.0	-17.9	100.0	270.00	VERTICAL
3750.000000	42.00	7.0	54.0	12.0	100.0	120.00	VERTICAL
5925.500000	49.80	12.7	54.0	4.2	110.0	90.00	VERTICAL
12924.500000	45.00	31.6	54.0	9.0	200.0	270.00	HORIZONTAL
25998.000000	50.00	52.1	54.0	4.0	210.0	180.00	VERTICAL

**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
37.860000	33.40	-8.5	40	6.6	107.0	104.00	VERTICAL
39.300000	33.20	-9.3	40	6.8	100.0	34.00	VERTICAL
59.280000	17.60	-16.2	40	22.4	142.0	280.00	VERTICAL
172.320000	15.20	-11.9	43.5	28.3	141.0	360.00	HORIZONTAL
192.300000	17.10	-12.1	43.5	26.4	166.0	343.00	HORIZONTAL
359.760000	19.40	-5.4	46	26.6	110.0	62.00	VERTICAL
1100.000000	40.90	-6.5	54.0	13.1	200.0	272.00	VERTICAL
2480.000000	72.30	2.3	54.0	-18.3	100.0	200.00	VERTICAL
3750.000000	40.90	7.0	54.0	13.1	100.0	4.00	VERTICAL
5087.500000	45.60	12.1	54.0	8.4	110.0	276.00	VERTICAL
9980.000000	45.20	25.1	54.0	8.8	300.0	286.00	HORIZONTAL
22248.500000	50.0	48.8	54.0	4.0	100.0	193.00	VERTICAL

Table 54 Measurement Results for Band Edge(2310 MHz -2390MHz, 2483.5 MHz -2500MHz)

Channel No	Channel No	Carrier Frequency [MHz]	Max. Delta Spurious Level [dB]	Carrier Frequency Level test in 3 meters [dBμV/m]	Band Edge Max. Spurious Level [dBμV/m]	Limit (AV) [dBuV/m]	Result
Low Edge	0	2310-2390	63.18	72.10	8.92	54	Pass
High Edge	78	2483.5-2500	61.10	72.30	11.2	54	Pass

Notes:

1. Band Edge Max. Spurious Level = Carrier Frequency Level test in 3 meters - Max. Delta Spurious Level;
2. Max. Delta Spurious Level is got from the Band Edge test result appendix F;
3. The Carrier Frequency Levels test in 3 meters are got from the radiated spurious emission which is appendix H;
4. Because the PK detector value is smaller than AV Limit line, so the AV detector value is certainly



smaller than AV limit line.

### 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 55 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 56 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 57 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 S7-201C 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.

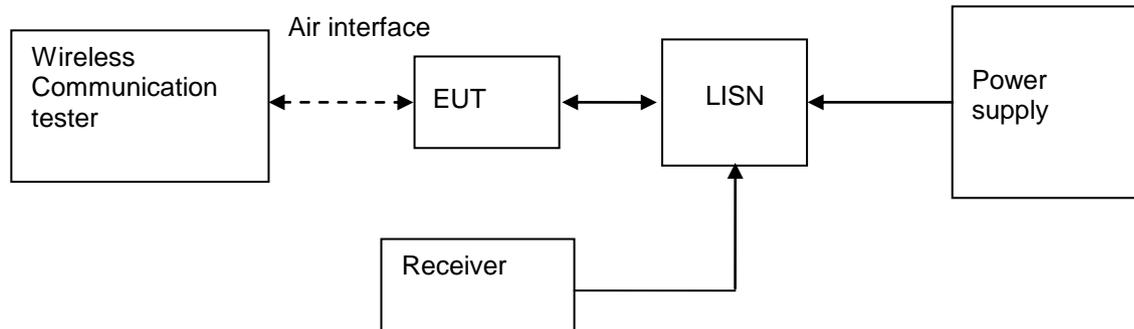


Figure 9. Test Set-up

### 6.9.4 Measurement Results

Table 58 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.195000	43.90	10.1	64	20.1	QP	N	FLO
0.253500	40.80	10.0	62	21.2	QP	N	FLO
0.330000	39.10	10.1	59	19.9	QP	N	FLO
0.816000	39.10	10.0	56	16.9	QP	L3	FLO
1.140000	40.00	10.1	56	16.0	QP	L3	FLO
3.426000	33.90	10.1	56	22.1	QP	L3	FLO

Table 59 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.190500	36.20	10.1	54	17.8	AV	L3	FLO
0.321000	31.80	10.1	50	18.2	AV	L3	FLO
0.798000	30.30	10.0	46	15.7	AV	L3	FLO
1.707000	32.60	10.0	46	13.4	AV	L3	FLO
2.593500	34.40	10.1	46	11.6	AV	L3	FLO
5.379000	28.90	10.1	50	21.1	AV	L3	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 60 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=4dB; k=2



## 8 Appendices List

Appendix A	Measurement Results 20dB bandwidth measurement
Appendix B	Measurement Results Carrier frequency separation measurement
Appendix C	Measurement Results Number of hopping channel
Appendix D	Measurement Results Time of occupancy
Appendix E	Measurement Results Peak output power
Appendix F	Measurement Results Band edge compliance measurement
Appendix G	Measurement Results Conducted RF spurious
Appendix H	Measurement Results Radiated spurious emission
Appendix I	Measurement Results Conducted emission test for power port
Appendix J	Photos of Test Setup

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