



FCC RF Test Report - EDR

**Product Name: HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone
with Bluetooth**

Model Number: HUAWEI U8350-51/U8350-51

**Report No: SYBH(Z-RF)005072011-2004
FCC ID: QISU8350-51**

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REPORT ON **FCC 47CFR part 15 subpart C Test of
HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with
Bluetooth**

REGULATION **FCC CFR47 Part 2: Subpart J;
FCC CFR47 Part 15: Subpart C;**

CONCLUSION **Pass**

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1 Summary

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

Summary of results

FCC Measurement Specification	Description	Result
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 U8350-51/U8350-51 is 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 Bluetooth test data included in this report.

2.1.2 Support function and Service

The Mobile Phone S7-201C support the Bluetooth's function and service as follows:

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.

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.18, 2011 –Jul.20, 2011

3.2 General Set up Description

The Bluetooth hopping frequency system of Mobile Phone S7-201C 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: π /4-DQPSK

TM2: 8DPSK



4 Product Description

4.1 Technical Characteristics

4.1.1 Frequency Range

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

Channel Spacing / Separation

Channel spacing:	1 MHz
Channel separation:	1 MHz

4.1.3 Type of Emission

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

Antenna Information

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



4.1.5 Environmental Requirements

Environmental Requirements

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

4.1.6 Power Source

Power Source

AC voltage nominal:	~120V
AC voltage range	~100V-240V
AC current maximal:	1A

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:

Applied RF module DC Voltages and Currents

Voltage:	≡ +3.6~+4.2V
Current:	1A According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)



4.2 EUT Identification List

4.2.1 Board Information

Board Information

HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
HUAWEI U8350-51/U8350-51		
Main board of Wireless Gateway		
Hardware Version	Software Version	Serial Number
HD1U835M	U8350-51V100R001C00B616	W5S7NA1153000051

4.2.2 Adapter Technical Data

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: HB5I1H Rated capacity: 1200mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

4.2.4 FCC Identification

Grantee Code: **QIS**
 Product Code: **U8350-51**
 FCC Identification: **QISU8350-51**



5 Main Test Instruments

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
Test receiver	R&S	ESIB26	100318	May.04.2012
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
Horn Antenna	ETS-LINDGREN	3160	60008	Sep.20.2011
Horn Antenna	ETS-LINDGREN	3160	60006	Oct.27.2011
Test receiver	R&S	ESU26	36090302083	Jun.24.2012



6 Transmitter Measurements

6.1 20dB bandwidth measurement

6.1.1 Test Conditions

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

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

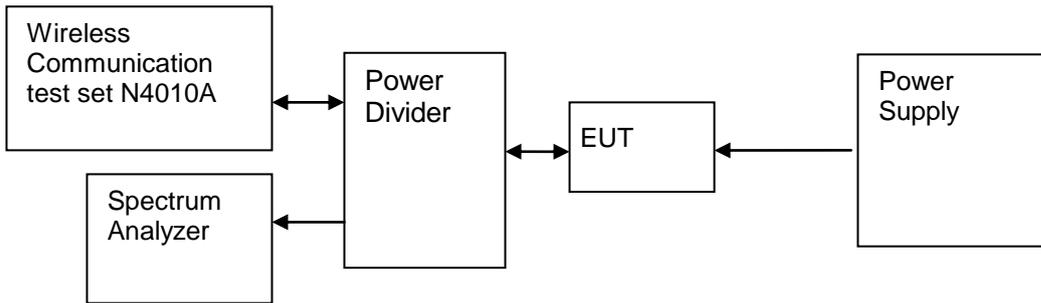


Figure 1. Test Set-up

6.1.4 Measurement Results

Measurement Results TM1 (Modulation: $\pi/4$ -DQPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.285	Pass
20dB	M	40	2.442	1.279	Pass
20dB	T	78	2.480	1.281	Pass

Measurement Results TM1 (Modulation: 8DPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.276	Pass
20dB	M	40	2.442	1.279	Pass
20dB	T	78	2.480	1.281	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

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

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.

Limits TM1 (Modulation: $\pi/4$ -DQPSK)

Regulation:	≥ 0.025 or $2/3$ of the 20 dB bandwidth
Limit:	$\geq 2/3 \times 1.279\text{M} = 0.853\text{ MHz}$

Limits TM2 (Modulation: 8DPSK)

Regulation:	≥ 0.025 or $2/3$ of the 20 dB bandwidth
Limit:	$\geq 2/3 \times 1.279\text{M} = 0.853\text{ MHz}$

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

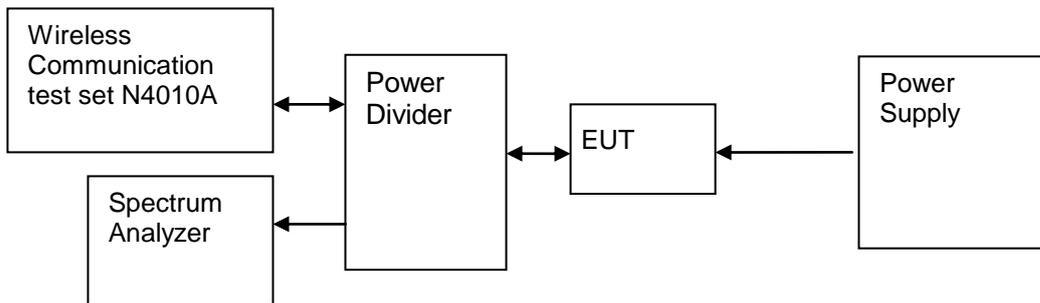


Figure 2. Test Set-up

6.2.4 Measurement Results

Measurement Results TM1 (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	1.0	≥ 0.853	Pass
40	2.442	41	2.443	0.95	≥ 0.853	Pass

Measurement Results TM2 (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	≥ 0.853	Pass
40	2.442	41	2.443	1.15	≥ 0.853	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

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

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.

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

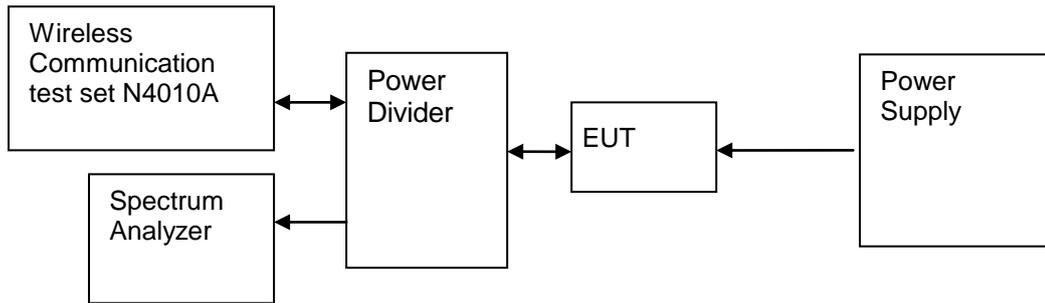


Figure 3. Test Set-up

6.3.4 Measurement Results

Measurement Results TM1 (Modulation: $\pi/4$ -DQPSK)

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

Measurement Results TM2 (Modulation: 8-DPSK)

Measured frequency range [MHz]	Channel No. range	Measured Channel No.	Limit	Result
2400 to 2483.5	0-78	79	≥ 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

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

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.

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

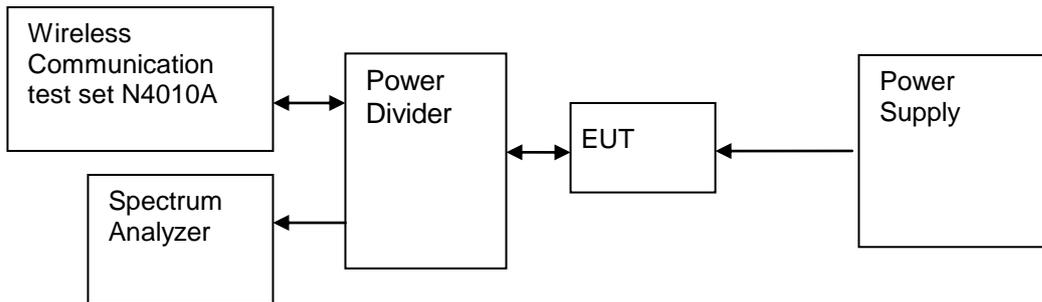


Figure 4. Test Set-up

6.4.4 Measurement Results

Measurement Results TM1 (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	≤ 0.4	Pass

Measurement Results TM2 (Modulation: 8DPSK)

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	≤ 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

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

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.

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

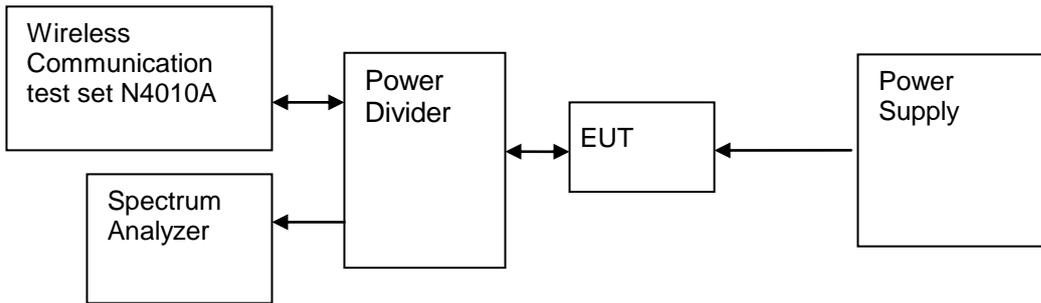


Figure 5. Test Set-up

6.5.4 Measurement Results

Measurement Results TM1 (Modulation: $\pi/4$ -DQPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	6.41	< 30	Pass
Middle	40	2442	7.60	< 30	Pass
Top	78	2480	6.67	< 30	Pass

Measurement Results TM2 (Modulation: 8DPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	6.40	< 30	Pass
Middle	40	2442	7.60	< 30	Pass
Top	78	2480	6.69	< 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

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

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.

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

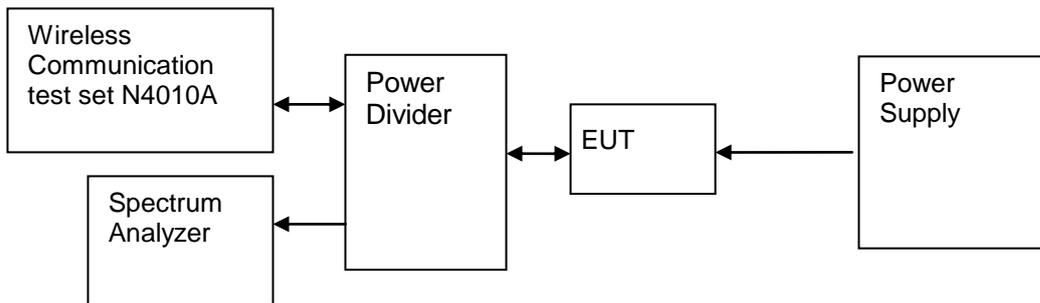


Figure 6. Test Set-up

6.6.4 Measurement Results

Measurement Results for Band Edge immediately outside the 2.4GHz Band
 TM1 (Modulation: $\pi/4$ -DQPSK)

	Chan- nel No.	Carrier Freque- ncy [MHz]	Carrier Power [dBm]	Frequen- cy Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	4.83	Off	-51.44	< -15.17	Pass
	-	-	4.47	On	-54.96	< -15.53	Pass
High Edge	78	2480	5.06	Off	-54.49	< -14.94	Pass
	-	-	4.28	On	-53.69	< -15.72	Pass

Measurement Results for Band Edge immediately outside the 2.4GHz Band
 TM2 (Modulation: 8DPSK)

	Chan- nel No.	Carrier Freque- ncy [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	4.83	Off	-50.63	<-15.17	Pass
	-	-	4.79	On	-54.51	<-15.21	Pass
High Edge	78	2480	5.08	Off	-54.48	<-14.92	Pass
	-	-	4.99	On	-54.21	<-15.01	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

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

6.7.2 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

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.

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

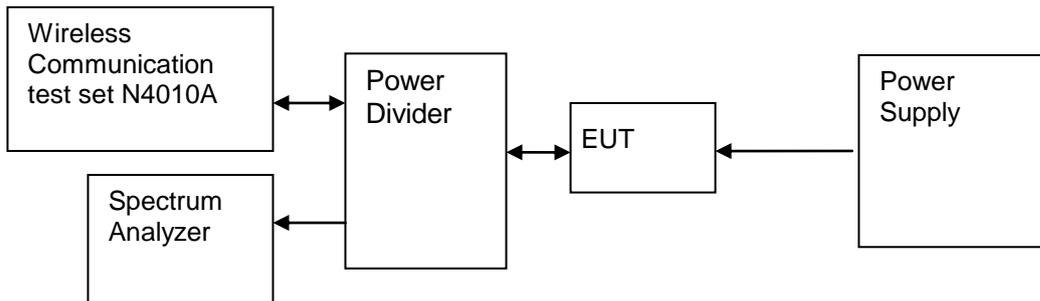


Figure 7. Test Set-up

6.7.4 Measurement Results

Measurement Results TM1 (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	.68	Off	-41.09	< -19.32	Pass
9kHz-25GHz	40	2442	2.72	Off	-45.55	< -17.28	Pass
9kHz-25GHz	78	2480	4.28	Off	-47.23	< -15.72	Pass

Measurement Results TM2 (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	4	Off	-41.1	< -16	Pass
9kHz-25GHz	40	2442	3.87	Off	-44.7	< -16.13	Pass
9kHz-25GHz	78	2480	2.2	Off	-47.09	< -17.8	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

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

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 10th harmonics of carrier frequency should be meet the requirement of following table.

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	AV
Above 1000	500	74	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 (2009). 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.

The EUT 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 - 10th Carrier Frequency: 1 MHz

Test set up

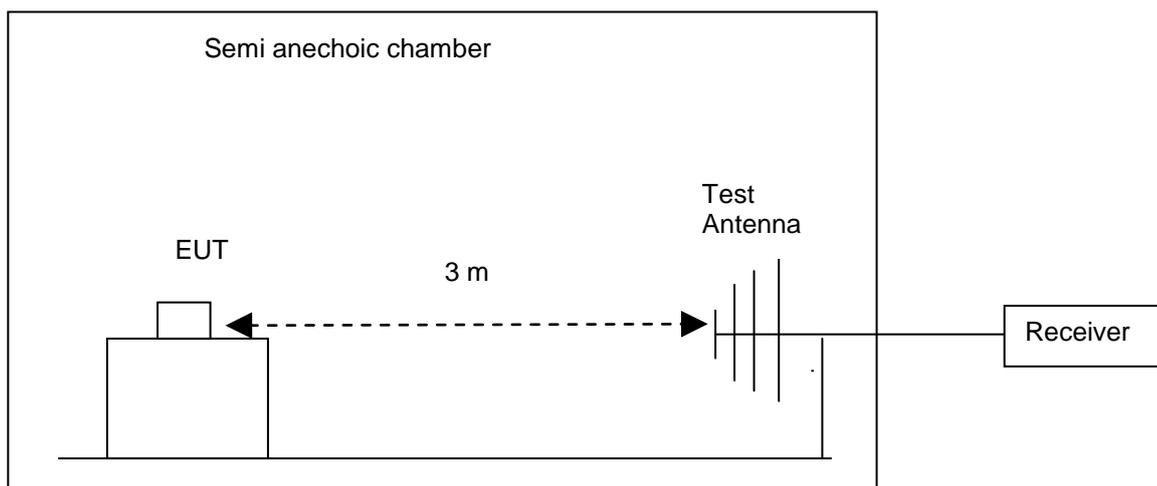


Figure 8. Test Set up

6.8.4 Measurement Results

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

Measured Result of channel: 0 (2402MHz)

MEASUREMENT RESULT (30MHz to 1GHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Plarization
55.400000	28.80	12.4	40.0	11.2	141.0	146.00	VERTICAL
150.420000	21.60	8.9	43.5	21.9	120.0	105.00	HORIZONTAL
214.200000	27.30	12.7	43.5	16.2	101.0	235.00	VERTICAL
224.100000	33.80	13.1	46.0	12.2	122.0	210.00	HORIZONTAL
300.200000	24.70	15.5	46.0	21.3	120.0	57.00	VERTICAL
632.210000	38.50	22.8	46.0	7.5	174.0	124.00	HORIZONTAL

MEASUREMENT RESULT: PK Detector (1GHz to 18GHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4881.000000	40.10	7.1	74.0	33.9	152.0	250.00	HORIZONTAL
11822.500000	45.40	7.3	74.0	28.6	125.0	140.00	HORIZONTAL



17994.100000	52.50	19.4	74.0	21.5	120.0	254.00	HORIZONTAL
2310.000000	58.70	33.3	74.0	15.3	100.0	293.00	HORIZONTAL
2390.000000	59.20	33.5	74.0	14.8	118.0	234.00	HORIZONTAL
2483.500000	59.30	33.7	74.0	14.7	133.0	326.00	VERTICAL
2500.000000	59.30	33.8	74.0	14.7	122.0	170.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector (1GHz to 18GHz)

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
4883.500000	31.70	7.1	54.0	12.3	100.0	1.00	HORIZONTAL
7132.000000	30.90	10.5	54.0	13.1	132.0	74.00	HORIZONTAL
14054.500000	39.30	21.5	54.0	14.7	152.0	204.00	VERTICAL
2310.000000	45.40	33.3	54.0	8.6	200.0	114.00	HORIZONTAL
2390.000000	46.30	33.5	54.0	7.7	121.0	299.00	VERTICAL
2483.500000	46.40	33.7	54.0	7.6	200.0	277.00	VERTICAL
2500.000000	46.50	33.8	54.0	7.5	198.0	359.00	HORIZONTAL

Measured Result of channel: 40 (2442MHz)

MEASUREMENT RESULT (30MHz to 1GHz)

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
40.020000	21.50	13.1	40.0	18.5	100.0	121.00	VERTICAL
90.600000	10.10	11.9	43.5	33.4	194.0	0.00	VERTICAL
155.400000	18.20	9.3	43.5	25.3	103.0	192.00	VERTICAL
313.620000	24.80	15.8	46.0	21.2	100.0	242.00	HORIZONTAL
563.340000	28.40	21.7	46.0	17.6	165.0	251.00	VERTICAL
642.540000	31.20	22.8	46.0	14.8	100.0	218.00	HORIZONTAL

MEASUREMENT RESULT: PK Detector (1GHz to 18GHz)

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
6802.100000	40.20	10.1	74.0	33.8	141.0	239.00	HORIZONTAL
10646.500000	44.10	6.6	74.0	29.9	102.0	186.00	HORIZONTAL
17820.500000	52.40	18.7	74.0	21.6	123.0	201.00	VERTICAL

MEASUREMENT RESULT: AV Detector (1GHz to 18GHz)

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
4960.500000	29.10	7.1	54.0	24.9	110.0	360.00	VERTICAL
6804.000000	31.10	10.1	54.0	22.9	105.0	23.00	HORIZONTAL
17950.000000	42.70	27.4	54.0	11.3	125.0	20.00	HORIZONTAL

Measured Result of channel: 78 (2480MHz)

MEASUREMENT RESULT (30MHz to 1GHz)

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
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40.020000	21.20	13.1	40.0	18.8	104.0	240.00	VERTICAL
144.360000	18.90	8.8	43.5	24.6	106.0	330.00	VERTICAL
245.760000	28.60	14.1	46.0	17.4	117.0	185.00	HORIZONTAL
316.440000	25.80	15.9	46.0	20.2	100.0	237.00	HORIZONTAL
563.160000	31.70	21.7	46.0	14.3	137.0	133.00	HORIZONTAL
645.000000	30.30	22.8	46.0	15.7	100.0	186.00	HORIZONTAL

MEASUREMENT RESULT: PK Detector (1GHz to 18GHz)

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
10360.500000	45.10	5.7	74.0	28.9	100.0	243.00	HORIZONTAL
14596.500000	48.90	14.2	74.0	25.1	150.0	87.00	HORIZONTAL
17919.500000	52.90	19.2	74.0	21.1	134.0	359.00	VERTICAL
2310.000000	58.50	33.3	74.0	15.5	104.0	250.00	HORIZONTAL
2390.000000	59.00	33.5	74.0	15.0	192.0	180.00	VERTICAL
2483.500000	62.10	33.7	74.0	11.9	119.0	48.00	HORIZONTAL
2500.000000	59.70	33.8	74.0	14.3	141.0	221.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector (1GHz to 18GHz)

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
4960.000000	29.30	7.1	54.0	24.7	121.0	216.00	HORIZONTAL
7439.500000	32.90	11.5	54.0	21.1	140.0	276.00	HORIZONTAL
14493.000000	37.80	22.7	54.0	16.2	160.0	219.00	VERTICAL
2310.000000	45.40	33.3	54.0	8.6	151.0	32.00	HORIZONTAL
2390.000000	46.30	33.5	54.0	7.7	104.0	51.00	VERTICAL
2483.500000	47.30	33.7	54.0	6.7	100.0	217.00	HORIZONTAL
2500.000000	46.50	33.8	54.0	7.5	166.0	192.00	HORIZONTAL

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

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	23.5°C
Relative humidity:	55 %
Test Configurations:	TM1/TM2 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

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.
 Limits

Frequency of Emission (MHz)	Conducted Limit (dB μ 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.

The EUT 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.

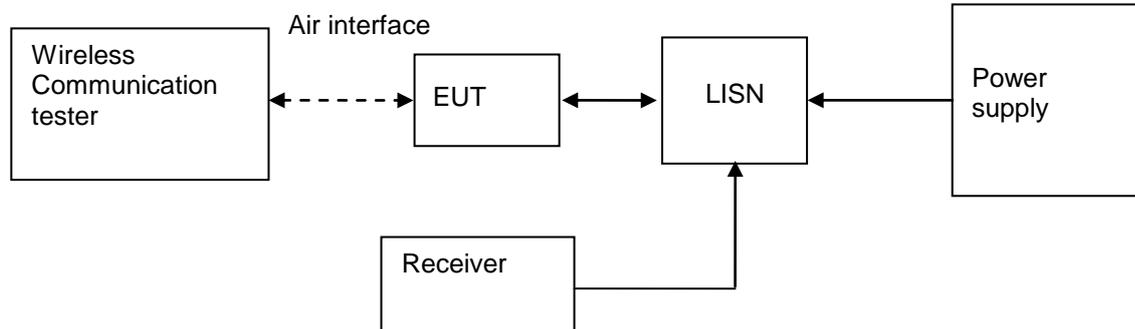


Figure 9. Test Set-up

6.9.4 Measurement Results

MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.206000	36.60	10.0	63	26.4	N	FLO
0.438000	37.70	10.1	57	19.3	N	FLO
1.174000	30.20	10.1	56	25.8	N	FLO
4.118000	31.20	10.2	56	24.8	N	FLO
6.694000	31.90	10.2	60	28.1	N	FLO
21.830000	32.00	10.4	60	28.0	L1	FLO

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.342000	27.00	10.0	49	22.0	N	FLO
0.438000	29.70	10.1	47	17.3	N	FLO
0.876000	24.40	10.1	46	21.6	N	FLO
4.700000	23.50	10.2	46	22.5	N	FLO
6.898000	23.10	10.2	50	26.9	N	FLO
21.908000	22.30	10.4	50	27.7	L1	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:

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 μ V/m)	U=2.2dB; k=2 U=5dB; k=2
Conducted emission test for power port	Disturbance Voltage(dB μ 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 -----