



FCC Test Report

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

Model Number: HUAWEI U8800-51/U8800-51

**Report No: SYBH(Z-RF)011062011-2005
FCC ID: QISU8800-51**

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

Tel: +86 755 28780808 Fax: +86 755 89652518



Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
4. The test report is invalid if not marked with "exclusive stamp for the test report".
5. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
8. Normally, the test report is only responsible for the samples that have undergone the test.
9. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.



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

M/N: **HUAWEI U8800-51/U8800-51**

Report No: **SYBH(Z-RF)011062011-2005**
FCC ID: QISU8800-51

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

CONCLUSION **PASS**

Approved By	2011-07-03	Chen Xiaohong	Chen Xiaohong
	Date	Name	Signature

Reviewed By	2011-07-03	Xu Guangyi	Xuguangyi
	Date	Name	Signature

Operator By	2011-07-03	Huang Qiuliang	Huang Qiuliang
	Date	Name	Signature



Contents

1	<u>Summary</u>	5
2	<u>Product Description</u>	6
2.1	PRODUCTION INFORMATION	6
2.2	MODIFICATION INFORMATION	6
3	<u>Test Site Description</u>	7
3.1	TESTING PERIOD	7
3.2	GENERAL SET UP DESCRIPTION	7
4	<u>Product Description</u>	8
4.1	TECHNICAL CHARACTERISTICS	8
4.2	EUT IDENTIFICATION LIST	10
5	<u>Main Test Instruments</u>	11
6	<u>Transmitter Measurements</u>	12
6.1	6dB BANDWIDTH MEASUREMENT	12
6.2	PEAK OUTPUT POWER	14
6.3	BAND EDGE SPURIOUS EMISSION	16
6.4	CONDUCTED RF SPURIOUS	18
6.5	POWER SPECTRAL DENSITY	20
6.6	RADIATED SPURIOUS EMISSION & SPURIOUS IN RESTRICTED BAND	22
6.7	CONDUCTED EMISSION AT POWER PORT	27
7	<u>System Measurement Uncertainty</u>	29
8	<u>Appendices</u>	30



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) (2)	6dB bandwidth measurement	PASS
15.247 (b) (3)	Conducted Peak output power	PASS
15.247 (d)	Band edge compliance measurement	PASS
15.247 (d)	Conducted RF spurious	PASS
15.247 (e)	Power spectral density	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 U8800-51/U8800-51 is subscriber equipment in the WCDMA/GSM system. The HSPA+/UMTS frequency band is Band I and Band II and Band V, but only Band II and Band V test data included in this report. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only GSM850 and PCS1900MHz bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA+/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 WLAN function was considered in this report.

2.1.2 Support function and Service

The EUT support the function and service as follows:

Service and Test mode List

Service Name	mode	Characteristic	Corresponding Test Mode	Note
Data	DSSS	Modulation: QPSK	TM1	
Data	OFDM	Modulation: 64QAM	TM2	
Data	OFDM	Modulation: 64QAM 16QAM,BPSK,QPSK	TM3	

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!				



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
Jun.18, 2011 – Jun.23, 2011

3.2 General Set up Description

The WLAN digitally modulated systems of the EUT can Support 2.4GHz Band. For compliance with FCC regulation 47CFR part15 subpart C, we set the EUT as following test modes to do all compliance tests.

WLAN MODE:

TM1: DSSS mode ,QPSK Modulation,11Mbps data rate

TM2: OFDM mode,64QAM Modulation,54 Mbps data rate

TM3: OFDM mode,64QAM Modulation,65 Mbps data rate



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:	☐ YES	☒ NO

4.1.2 Channel Spacing / Separation

Channel Spacing / raster	
Channel spacing:	22 MHz
Channel raster:	5 MHz

4.1.3 Type of Emission

Type of Emission	
Emission Designation:	-

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):	-0.8 (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:	 +3.7V
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

Board Information

HSPA+/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
HUAWEI U8800-51/U8800-51		
Equipment Designation / Description	Soft Version	Serial Number
MAINBOARD	U8800V100R001USAC07B628SP01	T8W7ND1160900503

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

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB4F1 Rated capacity: 1500mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

4.2.4 FCC Identification

Grantee Code: QIS
Product Code: U8800-51
FCC Identification: QISU8800-51



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
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 6dB 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/TM3 at channel No.1, 6, 11

6.1.2 Test Specifications and Limits

6.1.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (2) and KDB 558074

6.1.2.2 Supporting Standards

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

6.1.2.3 Limits

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Limits	
Limits	≥ 500kHz

6.1.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power at 2.4GHz, then set the measured frequency number and test the 6dB bandwidth with spectrum analyzer.

Test setup

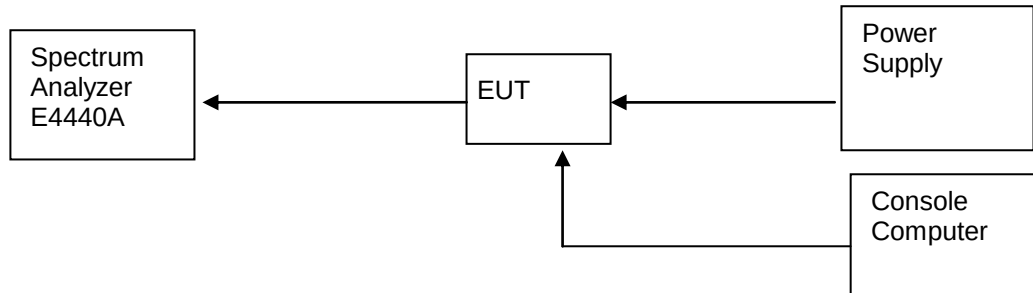


Figure 1. Test Set-up

6.1.4 Measurement Results

Measurement Results

Test condition	Channel Position	Bandwidth Type	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
TM1	B	6dB Bandwidth	1	2.412	8.987	Pass
	M	6dB Bandwidth	6	2.437	9.089	Pass
	T	6dB Bandwidth	11	2.462	9.092	Pass
TM2	B	6dB Bandwidth	1	2.412	16.177	Pass
	M	6dB Bandwidth	6	2.437	16.395	Pass
	T	6dB Bandwidth	11	2.462	16.321	Pass
TM3	B	6dB Bandwidth	1	2.412	17.402	Pass
	M	6dB Bandwidth	6	2.437	17.508	Pass
	T	6dB Bandwidth	11	2.462	17.028	Pass

6.1.5 Conclusion

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



6.2 Peak output power

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/TM3 at channel No.1, 6, 11

6.2.2 Test Specifications and Limits

6.2.2.1 Specification

CFR 47 (FCC) part 15.247 (b) (3) and KDB 558074

6.2.2.2 Supporting Standards

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

6.2.2.3 Limits

Compliance with part 15.247 (b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level.

Limits	
2.4GHz and 5.8GHz system using digital modulation	1 Watt / 30 dBm

6.2.3 Test Method and Setup

- Connect test port of EUT to spectrum analyzer.
- Set the EUT to transmit maximum output power.
- Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

Test setup

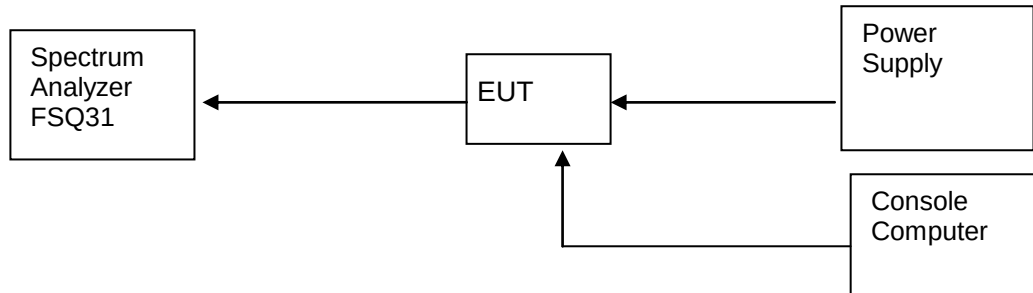


Figure 2. Test Set-up

6.2.4 Measurement Results

Measurement Results						
Test condition	Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
TM1	Bottom	1	2412	19.67	< 30	Pass
	Middle	6	2437	19.15	< 30	Pass
	Top	11	2462	19.64	< 30	Pass
TM2	Bottom	1	2412	16.99	< 30	Pass
	Middle	6	2437	16.73	< 30	Pass
	Top	11	2462	16.84	< 30	Pass
TM3	Bottom	1	2412	14.01	< 30	Pass
	Middle	6	2437	13.61	< 30	Pass
	Top	11	2462	14.21	< 30	Pass

6.2.5 Conclusion

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



6.3 Band edge spurious emission

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/TM3 at channel No. 1, 11

6.3.2 Test Specifications and Limits

6.3.2.1 Specification

CFR 47 (FCC) part 15.247(d) and KDB 558074

6.3.2.2 Supporting Standards

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

6.3.2.3 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

6.3.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.

Test setup

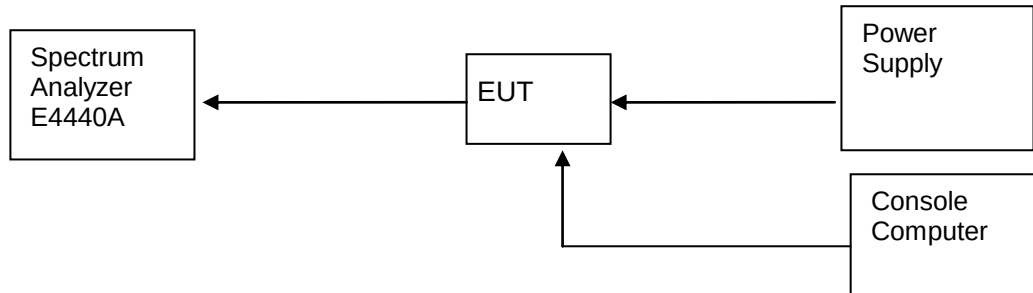


Figure 3. Test Set-up

6.3.4 Measurement Results

Measurement Results

Test condition		Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	Low Edge	1	2412	5.6	-50.38	<-14.4	Pass
	High Edge	11	2462	5.6	-50.49	<-14.4	Pass
TM2	Low Edge	1	2412	0.3	-49.63	<-19.7	Pass
	High Edge	11	2462	0.8	-46.55	<-19.2	Pass
TM3	Low Edge	1	2412	-2.1	-50.44	<-22.1	Pass
	High Edge	11	2462	-1.8	-48.88	<-21.8	Pass

6.3.5 Conclusion

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



6.4 Conducted RF spurious

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/TM3 at channel No.1, 6, 11

6.4.2 Test Specifications and Limits

6.4.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and KDB 558074

6.4.2.2 Supporting Standards

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

6.4.2.3 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

6.4.3 Test Method and Setup

- Connect test port of EUT to spectrum analyzer
- Set the EUT to transmit maximum output power at 2.4GHz and.
- Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

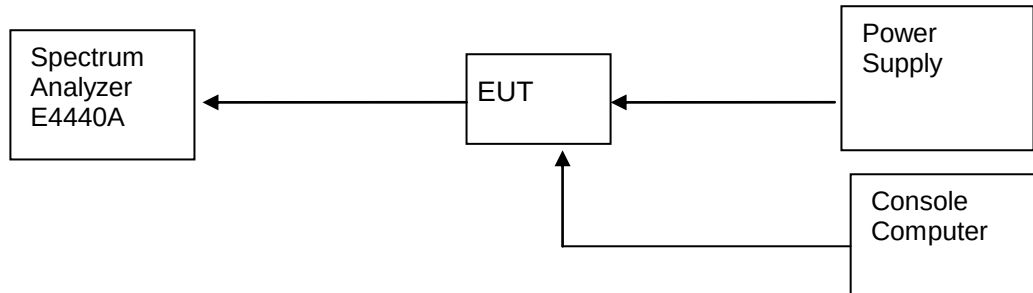


Figure 4. Test Set-up

6.4.4 Measurement Results

Measurement Results							
Test condition	Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	9kHz-26GHz	1	2412	11.48	-42.05	<-8.5	Pass
	9kHz-26GHz	6	2437	11.33	-42.88	<-8.7	Pass
	9kHz-26GHz	11	2462	11.59	-42.52	<-8.4	Pass
TM2	9kHz-26GHz	1	2412	7.21	-41.59	<-12.8	Pass
	9kHz-26GHz	6	2437	7.66	-41.79	<-12.3	Pass
	9kHz-26GHz	11	2462	8.75	-41.52	<-11.3	Pass
TM3	9kHz-26GHz	1	2412	4.29	-42.14	<-15.7	Pass
	9kHz-26GHz	6	2437	4.16	-42.72	<-15.8	Pass
	9kHz-26GHz	11	2462	3.92	-42.48	<-16.1	Pass

6.4.5 Conclusion

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



6.5 Power spectral density

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/TM3 at channel No.1, 6, 11

6.5.2 Test Specifications and Limits

6.5.2.1 Specification

CFR 47 (FCC) part 15.247 (e) and KDB 558074

6.5.2.2 Supporting Standards

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

6.5.2.3 Limits

Compliance with part 15.247 (e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. The same method of determining the conducted output power shall be used to determine the power spectral density.

Limits	
Band edge spurious:	8 dBm/3kHz

6.5.3 Test Method and Setup

- Connect test port of EUT to spectrum analyzer
- Set the EUT to transmit maximum output power at 2.4GHz and.
- Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

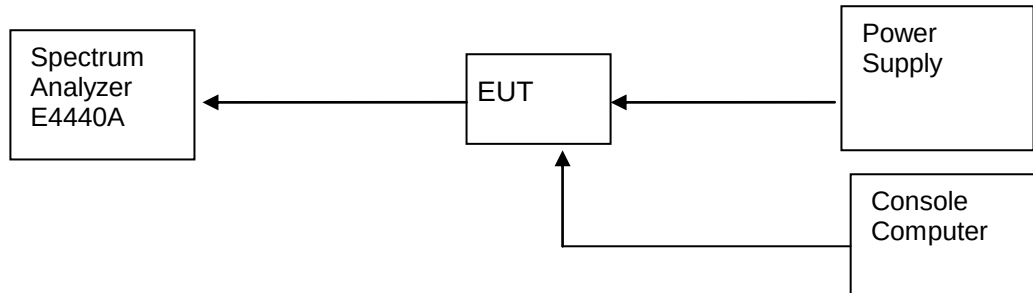


Figure 5. Test Set-up

6.5.4 Measurement Results

Measurement Results					
Test condition	Channel No.	Carrier Frequency [MHz]	Measured Power spectral density [dBm]	Limit [dBm]	Result
TM1	1	2412	-9.04	<8	Pass
	6	2437	-9.19	<8	Pass
	11	2462	-8.46	<8	Pass
TM2	1	2412	-14.13	<8	Pass
	6	2437	-14.15	<8	Pass
	11	2462	-13.90	<8	Pass
TM3	1	2412	-18.75	<8	Pass
	6	2437	-18.50	<8	Pass
	11	2462	-18.14	<8	Pass

6.5.5 Conclusion

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

6.6 Radiated spurious emission & spurious in restricted band

6.6.1 Test Conditions

Test Conditions	
Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25.1 °C
Relative humidity:	43%
Test Configurations:	TM1/TM2/TM3 at channel No.1, 6, 11

6.6.2 Test Specifications and Limits

6.6.2.1 Specification

CFR 47 (FCC) part 15.247 (d), 15.205 & 15.209 and KDB 558074

6.6.2.2 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

6.6.2.3 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
0.009 - 0.490	2400/F(kHz)	20*lg(2400/F(kHz))	300	QP
0.490 - 1.705	24000/F(kHz)	20*lg(24000/F(kHz))	30	QP
1.705 - 30	30	29.5	30	QP
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)(above table 42).

6.6.3 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.

The EUT was communicated with the BTS simulator through Air interface. The EUT operated on the typical channel.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz

Measurement bandwidth: 1000 MHz – 10th Carrier Frequency: 1 MHz

Test set up

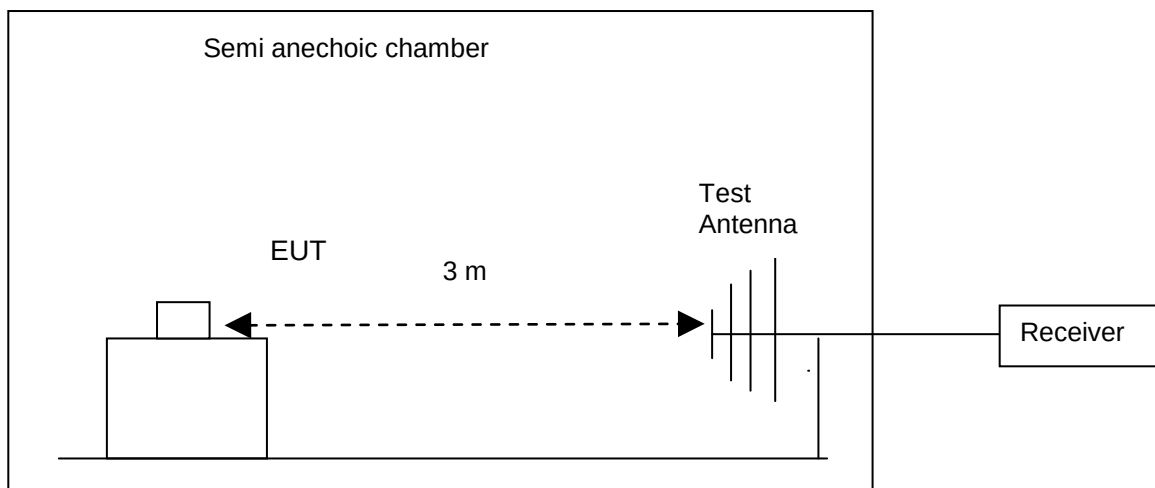


Figure 6. Test Set up

6.6.4 Measurement Results

Note 1: The following measurement results exceed the limit line is the carrier frequency.

Note 2: This test was carried out in all the test modes, here only the worst test result was shown.

Measured Result of channel: 1 (2412MHz)

(30MHz-1GHz)

Table 1 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
33.300000	30.00	11.7	40.0	10.0	121.0	108.00	VERTICAL
62.040000	21.80	12.5	40.0	18.2	122.0	289.00	VERTICAL
150.500000	16.30	9.0	43.5	27.2	200.0	225.00	HORIZONTAL
228.000000	18.90	13.0	46.0	27.1	109.0	333.00	HORIZONTAL
319.980000	28.10	16.0	46.0	17.9	108.0	343.00	HORIZONTAL
901.000000	30.50	26.2	46.0	15.5	147.0	122.00	HORIZONTAL



(1GHz-18GHz)

MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
4924.000000	53.20	-3.3	74.0	20.8	101.0	291.00	HORIZONTAL
7385.000000	46.60	1.8	74.0	27.4	100.0	14.00	VERTICAL
17843.000000	51.90	18.5	74.0	22.1	142.0	359.00	VERTICAL

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
4924.000000	48.20	-3.3	54.0	5.8	101.0	298.00	HORIZONTAL
7385.000000	37.60	1.8	54.0	16.4	109.0	14.00	VERTICAL
17995.500000	39.40	19.4	54.0	14.6	141.0	65.00	HORIZONTAL

(2.3GHz-2.51GHz)

MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	52.00	33.3	74.0	22.0	150.0	149.00	HORIZONTAL
2390.000000	52.50	33.5	74.0	21.5	145.0	129.00	VERTICAL
2483.500000	51.40	33.7	74.0	22.6	101.0	252.00	HORIZONTAL
2500.000000	51.60	33.8	74.0	22.4	121.0	211.00	VERTICAL

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	38.00	33.3	54.0	16.0	100.0	359.00	HORIZONTAL
2390.000000	38.50	33.5	54.0	15.5	141.0	349.00	HORIZONTAL
2483.500000	38.40	33.7	54.0	15.6	125.0	52.00	VERTICAL
2500.000000	38.40	33.8	54.0	15.6	136.0	251.00	VERTICAL



Measured Result of channel: 6 (2437MHz)

(30MHz-1GHz)

Table 2 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
32.340000	27.10	11.7	40.0	12.9	100.0	295.00	VERTICAL
58.500000	25.30	12.4	40.0	14.7	200.0	178.00	VERTICAL
61.440000	25.30	11.8	40.0	14.7	122.0	164.00	VERTICAL
211.200000	28.50	12.6	43.5	15.0	153.0	267.00	HORIZONTAL
224.400000	33.20	13.2	46.0	12.8	100.0	240.00	HORIZONTAL
299.220000	27.80	15.5	46.0	18.2	100.0	138.00	HORIZONTAL

(1GHz-18GHz)

MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
4923.800000	45.70	-3.8	74.0	28.3	147.0	300.00	VERTICAL
7387.000000	47.20	1.0	74.0	26.8	107.0	219.00	VERTICAL
9554.400000	49.90	5.0	74.0	24.1	127.0	182.00	HORIZONTAL

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
3827.800000	24.40	-6.2	54.0	29.6	124.0	172.00	HORIZONTAL
14563.700000	34.20	12.2	54.0	19.8	120.0	252.00	VERTICAL
16658.600000	33.40	12.8	54.0	20.6	141.0	304.00	HORIZONTAL

Measured Result of channel: 11 (2462MHz)

(30MHz-1GHz)

Table 3 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
32.220000	25.70	11.7	40.0	14.3	103.0	295.00	VERTICAL
58.440000	16.80	12.4	40.0	23.2	157.0	127.00	HORIZONTAL
209.940000	23.50	12.5	43.5	20.0	125.0	248.00	HORIZONTAL
224.400000	33.30	13.2	46.0	12.7	107.0	243.00	HORIZONTAL
299.220000	26.90	15.5	46.0	19.1	100.0	223.00	HORIZONTAL
901.320000	26.80	26.2	46.0	19.2	119.0	156.00	HORIZONTAL



(1GHz-18GHz)

MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
3282.500000	40.30	-6.0	74.0	33.7	105.0	356.00	VERTICAL
6771.500000	42.00	0.3	74.0	32.0	117.0	0.00	VERTICAL
17937.500000	51.90	19.3	74.0	22.1	150.0	196.00	VERTICAL

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
3282.500000	25.30	-6.0	54.0	28.7	139.0	227.00	HORIZONTAL
6851.000000	29.50	1.0	54.0	24.5	131.0	129.00	HORIZONTAL
18000.000000	39.50	19.5	54.0	14.5	100.0	80.00	VERTICAL

(2.3GHz-2.51GHz)

MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	52.50	33.3	74.0	21.5	150.0	149.00	HORIZONTAL
2390.000000	52.30	33.5	74.0	21.7	145.0	129.00	VERTICAL
2483.500000	52.40	33.7	74.0	21.6	101.0	252.00	HORIZONTAL
2500.000000	51.60	33.8	74.0	22.4	121.0	211.00	VERTICAL

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	38.00	33.3	54.0	16.0	129.0	105.00	HORIZONTAL
2390.000000	39.00	33.5	54.0	15.0	141.0	214.00	HORIZONTAL
2483.500000	49.90	33.7	54.0	5.1	152.0	34.00	VERTICAL
2500.000000	41.00	33.7	54.0	13.0	132.0	154.00	VERTICAL

6.6.5 Conclusion

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



6.7 Conducted Emission at Power Port

6.7.1 Test Conditions

Test Conditions	
Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1 at channel No. 7

6.7.2 Test Specifications and Limits

6.7.2.1 Specification

CFR 47 (FCC) part 15.207 and KDB 558074

6.7.2.2 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

6.7.2.3 Limits

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

Frequency of Emission (MHz)	Limits	
	Conducted Limit (dBμV)	
	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.

6.7.3 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 Wireless Modem to transmitter the maximum power which defined in specification of product. The Wireless Modem operated on the typical channel.

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

Test Set-up

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

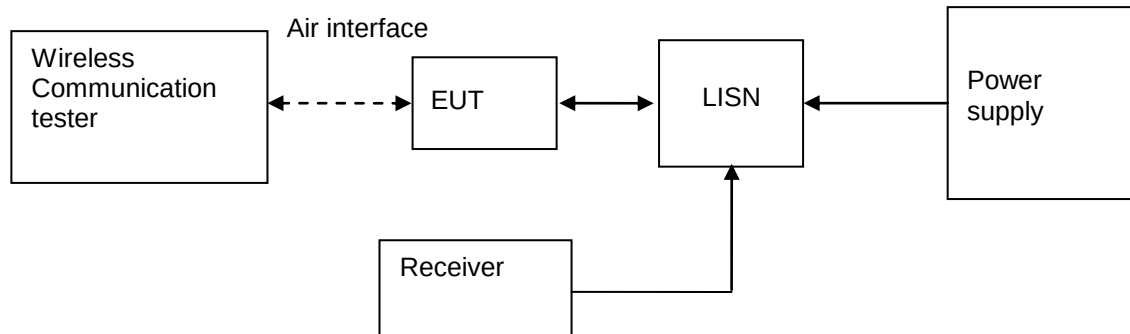


Figure 7. Test Set-up

6.7.4 Measurement Results

MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.384000	42.30	10.0	58	15.7	N	FLO
0.662000	45.60	10.1	56	10.4	N	FLO
0.898000	42.90	10.1	56	13.1	N	FLO
3.600000	40.60	10.2	56	15.4	N	FLO
6.968000	40.40	10.2	60	19.6	N	FLO
13.578000	38.10	10.3	60	21.9	N	FLO

MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.390000	29.60	10.0	48	18.4	N	FLO
0.662000	33.30	10.1	46	12.7	N	FLO
1.362000	29.40	10.1	46	16.6	N	FLO
2.478000	29.30	10.1	46	16.7	N	FLO
7.544000	29.70	10.2	50	20.3	N	FLO
13.080000	26.50	10.3	50	23.5	N	FLO

6.7.5 Conclusion

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



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
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=0.4dB; k=2
Power spectral density	Disturbance Power(dBm)	U=0.4dB; k=2
Radiated spurious emission & Radiated restricted band measurement	Field strength (dBμV/m)	U=4.1dB; k=2
		U=4.1dB; k=2
Conducted emission test for power port	Disturbance Voltage(dBμV)	U=3.4dB; k=2



8 Appendices

Appendix A	Measurement Results 6dB bandwidth measurement	10 pages
Appendix B	Measurement Results Peak output power	10 pages
Appendix C	Measurement Results Band edge compliance measurement	7 pages
Appendix D	Measurement Results Conducted RF spurious	28 pages
Appendix E	Measurement Results Power spectral density	10 pages
Appendix F	Measurement Results Radiated spurious emission	15 pages
Appendix G	Measurement Results Conducted emission test for power port	2 pages
Appendix H	Photos of Test Setup	3 pages

(END OF REPORT)