



# FCC Test Report

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

**Model Number: HUAWEI U8820/Huawei U8820/U8820/Titan**

**Report No: SYBH(Z-RF)016042011-2006  
FCC ID: QISU8820**

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

**M/N:**                            **HUAWEI U8820/Huawei U8820/U8820/Titan**

**Report No:**                 **SYBH(Z-RF)016042011-2006**

**FCC ID: QISU8820**

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

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

**CONCLUSION**                **PASS**

**Approved By**                 2011-07-08                    Chen Xiaohong                    *Chen Xiaohong*

**Date**                            **Name**                            **Signature**

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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	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
<b>7</b>	<b><u>System Measurement Uncertainty</u></b> .....	<b>29</b>
<b>8</b>	<b><u>Appendices</u></b> .....	<b>30</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>Description</b>	<b>Result</b>
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

HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth-HUAWEI U8820/Huawei U8820/U8820/Titan is subscriber equipment in the WCDMA/GSM system. The WCDMA frequency bands are Band I and Band IV and Band II. The GSM/GPRS/EDGE frequency bands include GSM850 and GSM900 and DCS1800 and PCS1900, but only WIFI test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA 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.

#### 2.1.2 Support function and Service

The EUT support the function and service as follows:

Table 2 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.

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  
Jun.23, 2011 – Jun.27, 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

Table 4 Frequency Range

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

#### 4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / raster

Channel spacing:	22 MHz
Channel raster:	5 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):	-1.0 (from 2400MHz to 2500MHz)



#### 4.1.5 Environmental Requirements

Table 8 Environmental Requirements

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

#### 4.1.6 Power Source

Table 9 Power Source

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

#### 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:	1 A 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

HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
HUAWEI U8820/Huawei U8820/U8820/Titan		
Board and Module		
Hardware Version	Software Version	Serial Number
HD1U882M	U8820V100R001USAC189B625SP01	T2C2C11131100186

### 4.2.2 Adapter Technical Date

AC/DCAdapter Model	HW-050100E1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	=== +5.0V,1A
Rated Power	5W

### 4.2.3 Battery Technical Date

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: U8820  
 FCC Identification: QISU8820



## 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
Wireless Communication Test set	Agilent	N4010A	MY49081592	Dec.14,2011
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.04,2011
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2011
Temperature Chamber	WEISS	WKL64	24600294	Jan.25,2012
Signal generator	Agilent	E8257D	MY49281095	Jul.09.2011
Vector Signal Generator	R&S	SMU200A	104162	Sep.07,2011
Test receiver	R&S	ESU26	36090302083	Jun.24.2012
EMI Test receiver	R&S	FSQ43	100048	Jun.23,2012
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	Apr.27, 2012
Horn Antenna	R & S	HF906	100684	Jun.28,2011
Broadband Antenna	SCHAFFNER	CBL 6112B	2536	Sep.21, 2011
Broadband Antenna	SCHAFFNER	CBL 6112B	2941	Jun.20, 2012
Broadband Antenna	SCHAFFNER	VULB 9163	9163-357	Sep.28,2011
Horn Antenna	ETS-LINDGREN	3160	60008	Sep.20,2011
Horn Antenna	ETS-LINDGREN	3160	91989	Sep.28,2011



## 6 Transmitter Measurements

### 6.1 6dB 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/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

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

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.

Table 15 Limits

Limits	≥ 500kHz
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#### 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**

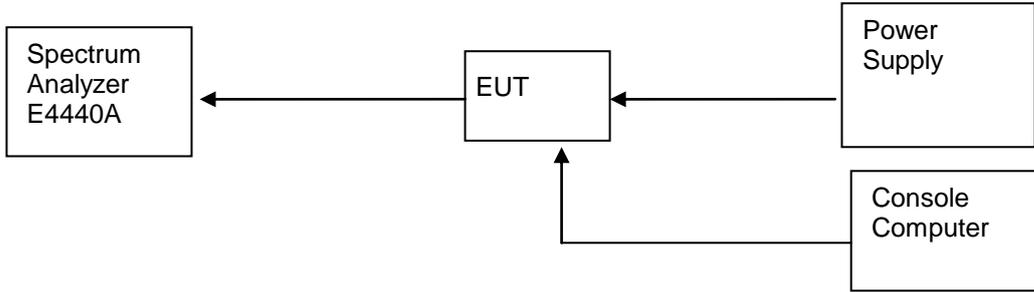


Figure 1. Test Set-up

**6.1.4 Measurement Results**

Table 16 Measurement Results

Test condition	Channel Position	Bandwidth Type	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
TM1	B	6dB Bandwidth	1	2.412	9.326	Pass
	M	6dB Bandwidth	6	2.437	9.305	Pass
	T	6dB Bandwidth	11	2.462	9.343	Pass
TM2	B	6dB Bandwidth	1	2.412	16.447	Pass
	M	6dB Bandwidth	6	2.437	16.390	Pass
	T	6dB Bandwidth	11	2.462	16.430	Pass
TM3	B	6dB Bandwidth	1	2.412	17.298	Pass
	M	6dB Bandwidth	6	2.437	17.566	Pass
	T	6dB Bandwidth	11	2.462	17.576	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

Table 17 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

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

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.

Table 19 Limits

2.4GHz and 5.8GHz system using digital modulation	1 Watt / 30 dBm
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### 6.2.3 Test Method and Setup

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

## Test setup

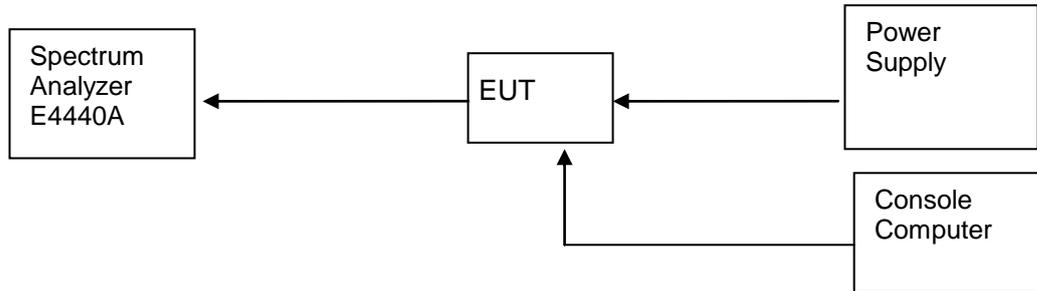


Figure 2. Test Set-up

## 6.2.4 Measurement Results

Table 20 Measurement Results

Test condition	Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
TM1	Bottom	1	2412	18.80	< 30	Pass
	Middle	6	2437	18.17	< 30	Pass
	Top	11	2462	17.71	< 30	Pass
TM2	Bottom	1	2412	14.96	< 30	Pass
	Middle	6	2437	14.79	< 30	Pass
	Top	11	2462	14.83	< 30	Pass
TM3	Bottom	1	2412	11.76	< 30	Pass
	Middle	6	2437	11.84	< 30	Pass
	Top	11	2462	11.55	< 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

Table 21 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

Table 22 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

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 23 Limits

Band edge spurious:	20 dBc/100kHz
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### 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

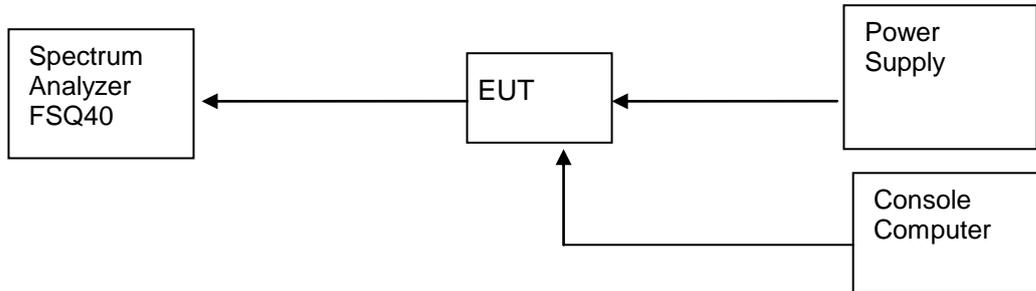


Figure 3. Test Set-up

### 6.3.4 Measurement Results

Table 24 Measurement Results

Test condition		Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	Low Edge	1	2412	5.79	-36.67	-14.2	Pass
	High Edge	11	2462	5.22	-39.94	-14.8	Pass
TM2	Low Edge	1	2412	-0.71	-38.23	-20.7	Pass
	High Edge	11	2462	-1.54	-30.74	-21.5	Pass
TM3	Low Edge	1	2412	-3.83	-40.53	-23.8	Pass
	High Edge	11	2462	-3.95	-31.70	-24.0	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

Table 25 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

Table 26 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

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 27 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

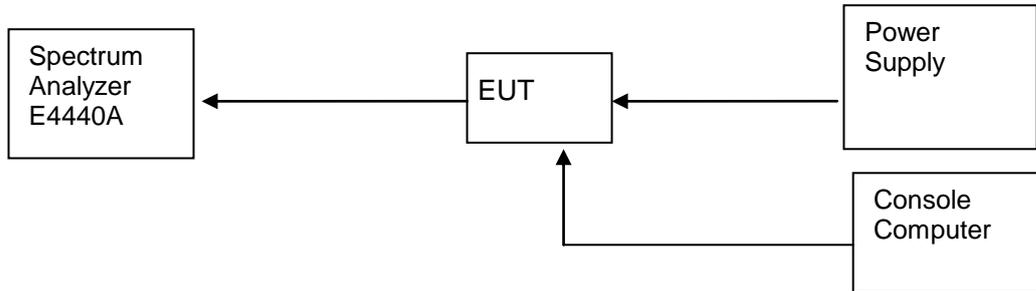


Figure 4. Test Set-up

## 6.4.4 Measurement Results

Table 28 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	11.31	-42.56	-9	Pass
	9kHz-26GHz	6	2437	11.57	-42.63	-8	Pass
	9kHz-26GHz	11	2462	11.47	-42.61	-9	Pass
TM2	9kHz-26GHz	1	2412	5.07	-42.28	-15	Pass
	9kHz-26GHz	6	2437	5.27	-42.96	-15	Pass
	9kHz-26GHz	11	2462	4.78	-42.51	-15	Pass
TM3	9kHz-26GHz	1	2412	1.15	-42.31	-19	Pass
	9kHz-26GHz	6	2437	1.28	-42.21	-19	Pass
	9kHz-26GHz	11	2462	2.67	-42.69	-17	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

Table 29 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

Table 30 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 (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.

Table 31 Limits

Band edge spurious:	8 dBm/3kHz
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### 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

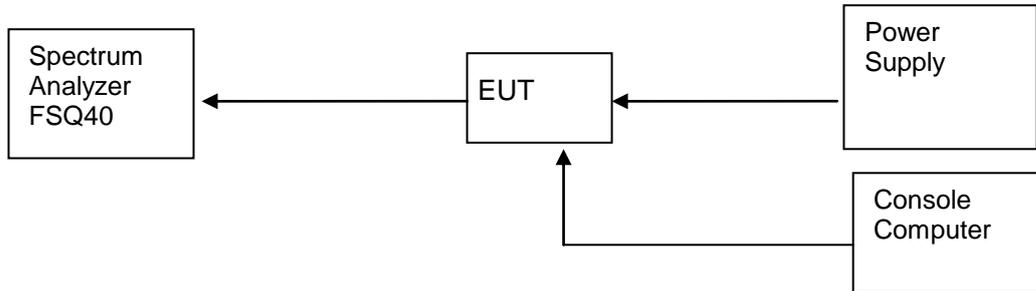


Figure 5. Test Set-up

## 6.5.4 Measurement Results

Table 32 Measurement Results

Test condition	Channel No.	Carrier Frequency [MHz]	Measured Power spectral density [dBm]	Limit [dBm]	Result
TM1	1	2412	-8.25	8	Pass
	6	2437	-8.20	8	Pass
	11	2462	-8.68	8	Pass
TM2	1	2412	-15.60	8	Pass
	6	2437	-15.60	8	Pass
	11	2462	-15.42	8	Pass
TM3	1	2412	-17.62	8	Pass
	6	2437	-17.81	8	Pass
	11	2462	-18.16	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

Table 33 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25°C
Relative humidity:	55%
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

Table 34 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 10<sup>th</sup> harmonics of carrier frequency should be meet the requirement of following table.

Table 35 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 – 10<sup>th</sup> Carrier Frequency: 1 MHz

**Test set up**

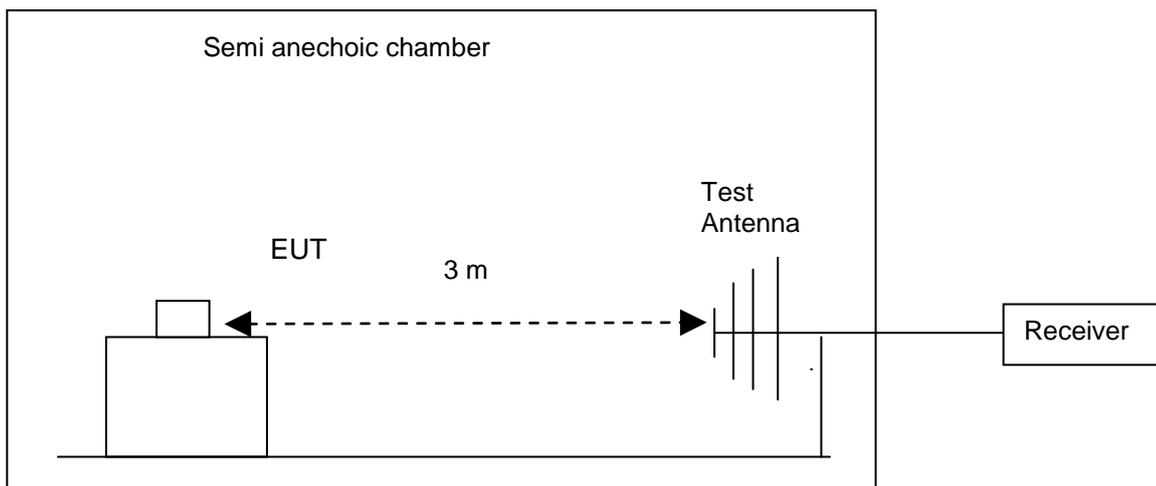


Figure 6. Test Set up

**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 36 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
32.220000	18.90	11.7	40.0	21.1	172.0	28.00	VERTICAL
33.420000	23.90	11.7	40.0	16.1	103.0	184.00	VERTICAL
53.340000	18.10	12.7	40.0	21.9	100.0	114.00	HORIZONTAL
180.000000	15.30	10.9	43.5	28.2	157.0	155.00	VERTICAL
368.340000	16.20	17.4	46.0	29.8	117.0	259.00	HORIZONTAL
831.180000	25.70	25.3	46.0	20.3	130.0	26.00	HORIZONTAL



**(1GHz-18GHz)**

Table 37 MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
5936.500000	40.20	-1.1	74.0	33.8	100.0	281.00	VERTICAL
10205.500000	44.60	6.0	74.0	29.4	150.0	284.00	HORIZONTAL
17989.000000	51.90	19.3	74.0	22.1	100.0	59.00	HORIZONTAL

Table 38 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
5886.000000	28.20	-0.9	54.0	25.8	150.0	259.00	HORIZONTAL
14520.000000	36.70	14.9	54.0	17.3	147.0	45.00	HORIZONTAL
17924.500000	38.80	19.3	54.0	15.2	109.0	240.00	VERTICAL

**(2.3GHz-2.51GHz)**

Table 39 MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	58.40	33.3	74.0	15.6	120.0	309.00	HORIZONTAL
2390.000000	59.20	33.5	74.0	14.8	118.0	200.00	HORIZONTAL
2483.500000	58.30	33.7	74.0	15.7	147.0	114.00	VERTICAL
2500.000000	59.50	33.8	74.0	14.5	124.0	27.00	HORIZONTAL

Table 40 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	45.40	33.3	54.0	8.6	155.0	302.00	VERTICAL
2390.000000	46.30	33.5	54.0	7.7	100.0	0.00	HORIZONTAL
2483.500000	46.40	33.8	54.0	7.6	109.0	0.00	VERTICAL
2500.000000	46.50	33.8	54.0	7.5	161.0	67.00	VERTICAL



**Measured Result of channel: 6 (2437MHz)**

**(30MHz-1GHz)**

Table 41 MEASUREMENT RESULT

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
33.720000	25.30	11.7	40.0	14.7	100.0	123.00	VERTICAL
40.020000	19.20	13.1	40.0	20.8	100.0	254.00	VERTICAL
157.200000	9.90	9.4	43.5	33.6	153.0	349.00	VERTICAL
224.520000	12.00	13.2	46.0	34.0	107.0	4.00	VERTICAL
628.020000	23.30	22.8	46.0	22.7	189.0	226.00	HORIZONTAL
938.760000	27.10	26.5	46.0	18.9	147.0	136.00	HORIZONTAL

**(1GHz-18GHz)**

Table 42 MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
6978.500000	42.20	1.3	74.0	31.8	110.0	227.00	VERTICAL
14483.000000	49.80	14.5	74.0	24.2	150.0	321.00	HORIZONTAL
17964.000000	51.30	18.9	74.0	22.7	113.0	129.00	HORIZONTAL

Table 43 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
6976.500000	29.60	1.2	54.0	24.4	104.0	151.00	HORIZONTAL
14524.500000	36.40	14.8	54.0	17.6	100.0	69.00	VERTICAL
18000.000000	39.00	19.5	54.0	15.0	104.0	44.00	VERTICAL

**Measured Result of channel: 11 (2462MHz)**

**(30MHz-1GHz)**

Table 44 MEASUREMENT RESULT

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
31.020000	14.70	11.8	40.0	25.3	137.0	135.00	VERTICAL
33.480000	25.10	11.7	40.0	14.9	100.0	131.00	VERTICAL
40.020000	21.70	13.1	40.0	18.3	100.0	42.00	VERTICAL
85.200000	11.50	10.2	40.0	28.5	122.0	83.00	VERTICAL
221.760000	11.50	13.0	46.0	34.5	128.0	329.00	VERTICAL
855.780000	26.00	25.6	46.0	20.0	100.0	320.00	VERTICAL



**(1GHz-18GHz)**

Table 45 MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
5936.500000	40.20	-1.1	74.0	33.8	100.0	281.00	VERTICAL
10205.500000	44.60	6.0	74.0	29.4	150.0	284.00	HORIZONTAL
17989.000000	51.90	19.3	74.0	22.1	100.0	59.00	HORIZONTAL

Table 46 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
5886.000000	28.20	-0.9	54.0	25.8	150.0	259.00	HORIZONTAL
14520.000000	36.70	14.9	54.0	17.3	147.0	45.00	HORIZONTAL
17924.500000	38.80	19.3	54.0	15.2	109.0	240.00	VERTICAL

**(2.3GHz-2.51GHz)**

Table 47 MEASUREMENT RESULT:PK DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	58.40	33.3	74.0	15.6	120.0	309.00	HORIZONTAL
2390.000000	59.20	33.5	74.0	14.8	118.0	200.00	HORIZONTAL
2483.500000	58.30	33.7	74.0	15.7	147.0	114.00	VERTICAL
2500.000000	59.50	33.8	74.0	14.5	124.0	27.00	HORIZONTAL

Table 48 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	45.40	33.3	54.0	8.6	155.0	302.00	VERTICAL
2390.000000	46.30	33.5	54.0	7.7	100.0	0.00	HORIZONTAL
2483.500000	46.40	33.8	54.0	7.6	109.0	0.00	VERTICAL
2500.000000	46.50	33.8	54.0	7.5	161.0	67.00	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

Table 49 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1 at channel No. 6

### 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

Table 50 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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#### 6.7.2.3 Limits

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

Table 51 Limits

Frequency of Emission (MHz)	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.

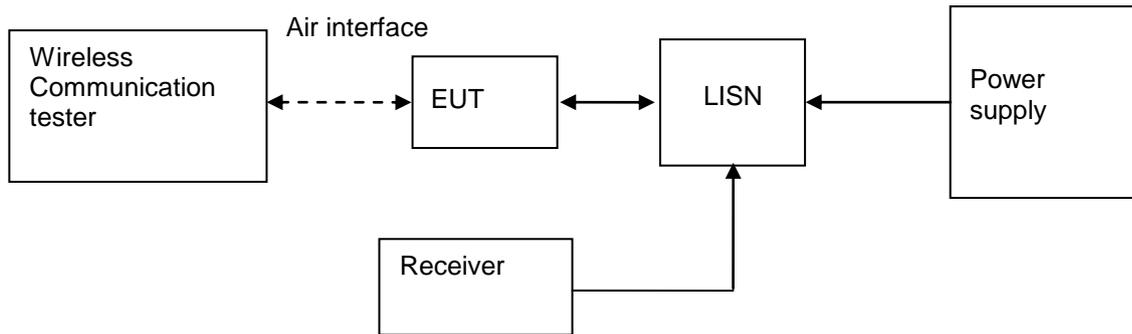


Figure 7. Test Set-up

## 6.7.4 Measurement Results

Table 52 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.192000	41.70	10.1	64	22.3	N	FLO
0.444000	34.90	10.1	57	22.1	N	FLO
1.372000	29.20	10.1	56	26.8	N	FLO
2.062000	28.30	10.1	56	27.7	N	FLO
6.302000	26.90	10.2	60	33.1	N	FLO
29.328000	32.40	10.4	60	27.6	L1	FLO

Table 53 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.384000	25.70	10.0	48	22.3	N	FLO
0.444000	29.80	10.1	47	17.2	N	FLO
1.250000	22.00	10.1	46	24.0	N	FLO
2.558000	22.30	10.1	46	23.7	N	FLO
5.348000	21.40	10.2	50	28.6	N	FLO
29.284000	19.60	10.4	50	30.4	L1	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:

Table 54 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 (dB $\mu$ V/m)	U=4.1dB; k=2 U=4.1dB; k=2
Conducted emission test for power port	Disturbance Voltage(dB $\mu$ V)	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	3 pages
Appendix H	Photos of Test Setup	3 pages

(END OF REPORT)