



# FCC Test Report

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

**Model Number: T-Mobile Pulse/Pulse/U8220**

**Report No: SYBHZ(R)E022052009EB-3  
FCC ID: QISU8220**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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

M/N: T-Mobile Pulse/Pulse/U8220

Report No: SYBHZ(R)E022052009EB-3

FCC ID: QISU8220

**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 HUAWEI HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth - T-Mobile Pulse/Pulse/U8220. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

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



## 2 Product Description

### 2.1 Production Information

#### 2.1.1 General Description

HUAWEI HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth-T-Mobile Pulse/Pulse/U8220 is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band I and Band VIII, they can't be used in this report. The GSM/GPRS/EDGE frequency band includes GSM900 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video, MMS service, GPS, 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	Characteristic	Corresponding Test Mode	Note
Data and Voice	Modulation: GFSK,	TM1	

### 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!				



### **3 Test Site Description**

The test site of:

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



The test site description has been submitted to  and registration granted under the registration number **97456** on April 20, 2006. The test site has been accredited by



and the accredited number is **2174.01** in June of 2006.

#### **3.1 Testing Period**

The test have been performed during the period of

July.20, 2009 to July.28, 2009

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

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

**Bluetooth MODE:**

**TM1:** GFSK Modulation



## 4 Product Description

### 4.1 Technical Characteristics

#### 4.1.1 Frequency Range

Table 4 Frequency Range

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

#### 4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

Channel spacing:	1 MHz
Channel separation:	1 MHz

#### 4.1.3 Type of Emission

Table 6 Type of Emission

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

#### 4.1.4 Antenna Information

Table 7 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	0.03 (from 2400MHz to 2500MHz)

#### 4.1.5 Environmental Requirements

Table 8 Environmental Requirements

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

## 4.1.6 Power Source

Table 9 Power Source

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

## 4.1.7 Tune-up Procedure

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

Please reference the document Tune-up Procedure in TCF.

## 4.1.8 Applied DC Voltages and Currents

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

The voltage and current in the final RF stage is:

Table 10 Applied RF module DC Voltages and Currents

Voltage:	 +2.8V
Current:	100mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)

## 4.2 EUT Identification List

### 4.2.1 Board Information

Table 11 Board Information



HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
T-Mobile Pulse/Pulse/U8220		
Board and Module		
Equipment Designation / Description	Model	Remarks
-Main board	HD1U822M	HD1U822M VER.C
-Battery	HB4F1	T-MOBILE PULSE/PULSE/U8220

#### 4.2.2 Adapter Technical Data

AC/DCAdapter Model	:	HS-050040E5
Manufacturer	:	Huawei Technologies Co., Ltd.
Input Voltage	:	~100-240V 50/60Hz 0.2A
Output Voltage	:	5V  400mA
Rated Power	:	2W
S/N	:	BYA951515019
AC/DCAdapter Model	:	HS-050040B6
Manufacturer	:	Huawei Technologies Co., Ltd.
Input Voltage	:	~100-240V 50/60Hz 0.2A
Output Voltage	:	5V  400mA
Rated Power	:	2W
S/N	:	BYA930682154

#### 4.2.3 Battery Technical Data

Name	Qty.	Manufacture	Serials number	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	SAC9212HI033879 7	Battery Model: HB4F1 Rated capacity: 1500mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

#### 4.2.4 FCC Identification

Grantee Code: QIS  
 Product Code: U8220  
 FCC Identification: QISU8220

### 5 Main Test Instruments

Table 12 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)



Signal Analyzer	R&S	FSQ 40	100025	10.05.2009
Test Receiver Display Unit	R&S	ESMI 804.8932.52	829214/011	04.21.2010
RF SWITCH	R&S	EMI RF SWITCH	NA	04.21.2010
Receiver	R&S	ESU26	100150	08.27.2009
Pre-Amplifier	Agilent	8447D	2944A10146	05.11.2010
Pre-Amplifier	Agilent	8447D	2944A10174	05.11.2010
Broadband Antenna	SCHWARZBECK	CBL 6112B	2747	11.09.2009
Horn Antenna	R&S	HF906	359287/006	01.23.2010
Horn Antenna	ETS-Lindgren	3160	00060006	09.26.2009
Signal Generator	R&S	SMR 40	100325	05.11.2010
Artificial Mains Network	R&S	ENV4200	100001	05.11.2010
Universal Radio Communication Tester	R&S	CMU200	105822	10.21.2009

## 6 Transmitter Measurements

### 6.1 20dB bandwidth measurement

#### 6.1.1 Test Conditions

Table 13 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	23.5 °C
Relative humidity:	55%

Test Configurations:	TM1 at channel No.0, 40, 78
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## 6.1.2 Test Specifications and Limits

### 6.1.2.1 Specification

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

### 6.1.2.2 Supporting Standards

Table 14 Supporting Standards:

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

Not Applicable.

## 6.1.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer and universal communication tester.
- (b) Set the EUT 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 spectrum analyzer.

## Test setup

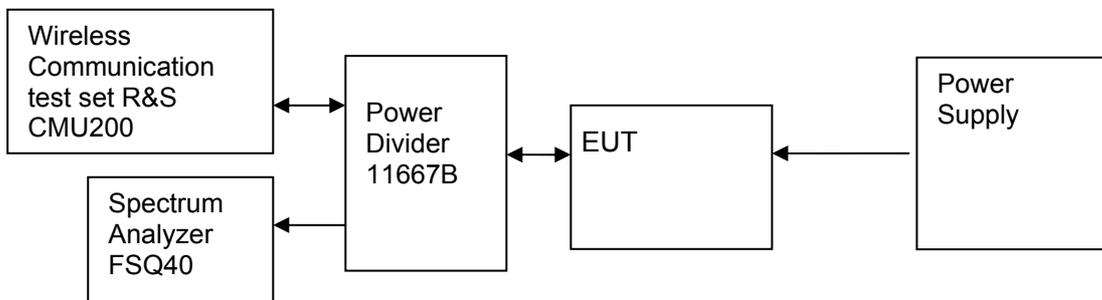


Figure 1. Test Set-up



## 6.1.4 Measurement Results

Table 15 Measurement Results

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	0.960	PASS
20dB	M	40	2.442	0.963	PASS
20dB	T	78	2.480	0.987	PASS

## 6.1.5 Conclusion

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



## 6.2 Carrier frequency separation measurement

### 6.2.1 Test Conditions

Table 16 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	23.5 °C
Relative humidity:	55%
Test Configurations:	TM1 at channel No.39, 40, 41

### 6.2.2 Test Specifications and Limits

#### 6.2.2.1 Specification

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

#### 6.2.2.2 Supporting Standards

Table 17 Supporting Standards:

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

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

Table 18 Limits

Regulation:	$\geq 0.025$ or $2/3$ of the 20 dB bandwidth
Limit:	$2/3 \times 0.987 = 0.66$

### 6.2.3 Test Method and Setup

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

### Test setup

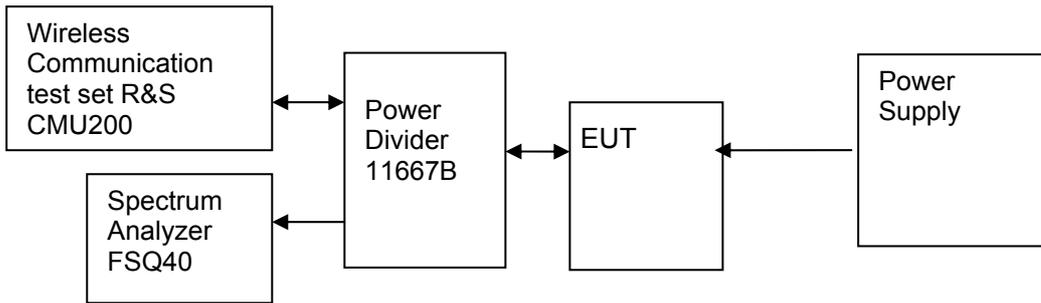


Figure 2. Test Set-up

## 6.2.4 Measurement Results

Table 19 Measurement Results

Channel No.	Frequency [GHz]	Channel No.	Frequency [GHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2.442	39	2.441	0.888	0.66	PASS
40	2.442	41	2.443	0.992	0.66	PASS

## 6.2.5 Conclusion

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

## 6.3 Number of hopping channel

### 6.3.1 Test Conditions

Table 20 Test Conditions



Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	22 °C
Relative humidity:	52 %
Test Configurations:	TM1 at hopping frequency state

### 6.3.2 Test Specifications and Limits

#### 6.3.2.1 Specification

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

#### 6.3.2.2 Supporting Standards

Table 21 Supporting Standards:

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

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

Table 22 Limits

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

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

### Test setup

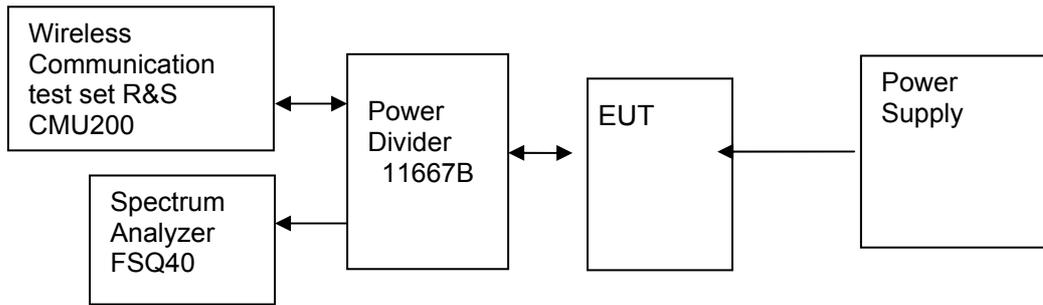


Figure 3. Test Set-up

### 6.3.4 Measurement Results

Table 23 Measurement Results

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

Table 24 Test Conditions



Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55 %
Test Configurations:	TM1 at hopping frequency state

## 6.4.2 Test Specifications and Limits

### 6.4.2.1 Specification

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

### 6.4.2.2 Supporting Standards

Table 25 Supporting Standards:

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

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

Table 26 Limits

Limits for time of occupancy	≤ 0.4s
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## 6.4.3 Test Method and Setup

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

## Test setup

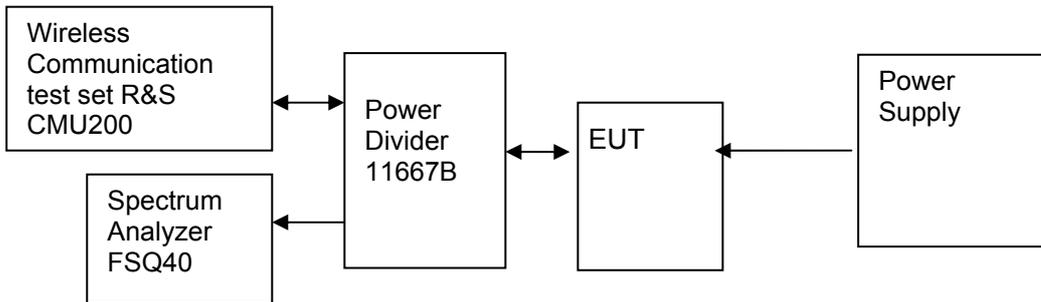


Figure 4. Test Set-up

### 6.4.4 Measurement Results

Table 27 Measurement Results

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
3.0	106.7	0.32	≤ 0.4	PASS

Note: The result is measured at DH5 mode in GFSK modulation, which has longest time in one transmission burst.

### 6.4.5 Conclusion

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



## 6.5 Peak output power

### 6.5.1 Test Conditions

Table 28 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	23.5°C
Relative humidity:	55 %
Test Configurations:	TM1 at channel No.0, 40, 78

### 6.5.2 Test Specifications and Limits

#### 6.5.2.1 Specification

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

#### 6.5.2.2 Supporting Standards

Table 29 Supporting Standards:

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

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

Table 30 Limits

2.4GHz and 5.8GHz hopping frequency system	1 Watt / 30 dBm
Other frequency hopping systems	0.125 Watts / 21 dBm

### 6.5.3 Test Method and Setup

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

## Test setup

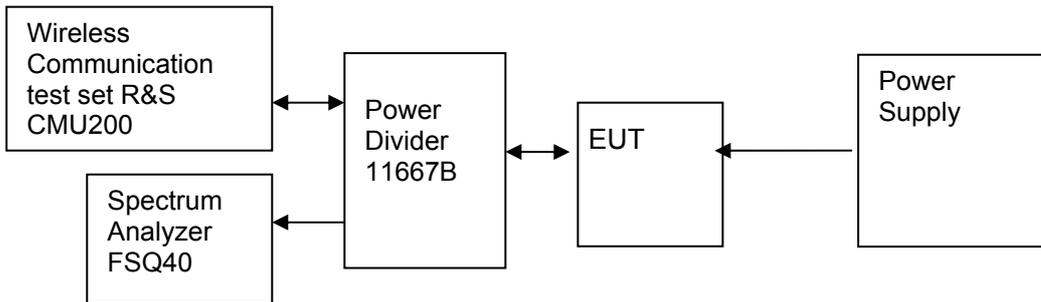


Figure 5. Test Set-up

## 6.5.4 Measurement Results

Table 31 Measurement Results

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	7.32	< 30	PASS
Middle	40	2442	6.97	< 30	PASS
Top	78	2480	6.78	< 30	PASS

## 6.5.5 Conclusion

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



## 6.6 Band edge spurious emission

### 6.6.1 Test Conditions

Table 32 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	20°C
Relative humidity:	50 %
Test Configurations:	TM1 at channel No. 0, 78 and frequency hopping state

### 6.6.2 Test Specifications and Limits

#### 6.6.2.1 Specification

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

#### 6.6.2.2 Supporting Standards

Table 33 Supporting Standards:

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

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

Table 34 Limits

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

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

### Test setup

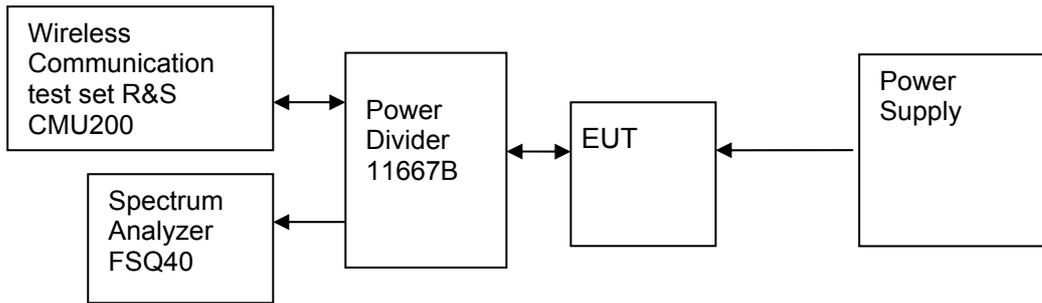


Figure 6. Test Set-up

### 6.6.4 Measurement Results

Table 35 Measurement Results

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	6.78	Off	-54.15	< -13.3	PASS
	-	-	6.79	On	-52.88	< -13.3	PASS
High Edge	78	2480	6.57	Off	-52.37	< -13.4	PASS
	-	-	6.57	On	-52.33	< -13.4	PASS

### 6.6.5 Conclusion

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



## 6.7 Conducted RF spurious

### 6.7.1 Test Conditions

Table 36 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna Connector
Ambient temperature:	22 °C
Relative humidity:	53 %
Test Configurations:	TM1 at channel No.0, 40, 78

### 6.7.2 Test Specifications and Limits

#### 6.7.2.1 Specification

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

#### 6.7.2.2 Supporting Standards

Table 37 Supporting Standards:

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

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

Table 38 Limits

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

- (a) Connect test port of EUT to spectrum analyzer and universal communication tester
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the EUT 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

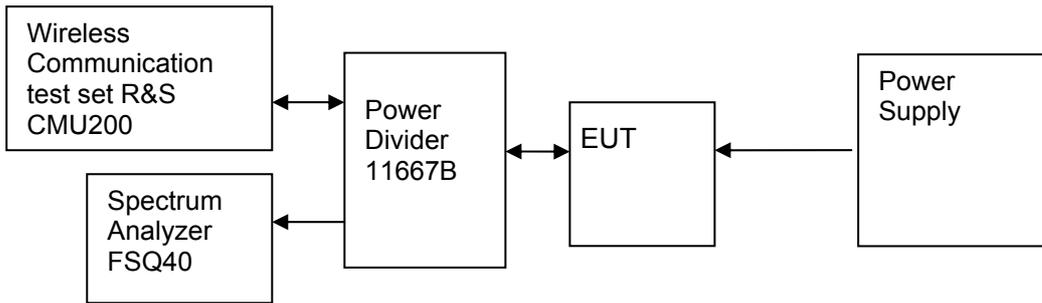


Figure 7. Test Set-up

## 6.7.4 Measurement Results

### 6.7.4.1 Measurement Results

Table 39 Measurement Results

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-26GHz	0	2402	6.89	Off	-42.89	< -13.2	PASS
9kHz-26GHz	40	2442	6.06	Off	-48.55	< -14.0	PASS
9kHz-26GHz	78	2480	6.15	Off	-51.85	< -13.9	PASS

## 6.7.5 Conclusion

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



## 6.8 Radiated spurious emission & spurious in restricted band

### 6.8.1 Test Conditions

Table 40 Test Conditions

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

### 6.8.2 Test Specifications and Limits

#### 6.8.2.1 Specification

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

#### 6.8.2.2 Supporting Standards

Table 41 Supporting Standards:

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

#### 6.8.2.3 Limits

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

Table 42 Limits

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

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table 42).

### 6.8.3 Test Method and Setup

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

A preliminary scan and a final scan of the emissions were made by using test script of software; the emissions were measured using a Quasi-Peak Detector below 1GHz, and AV detector above 1GHz.

The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

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

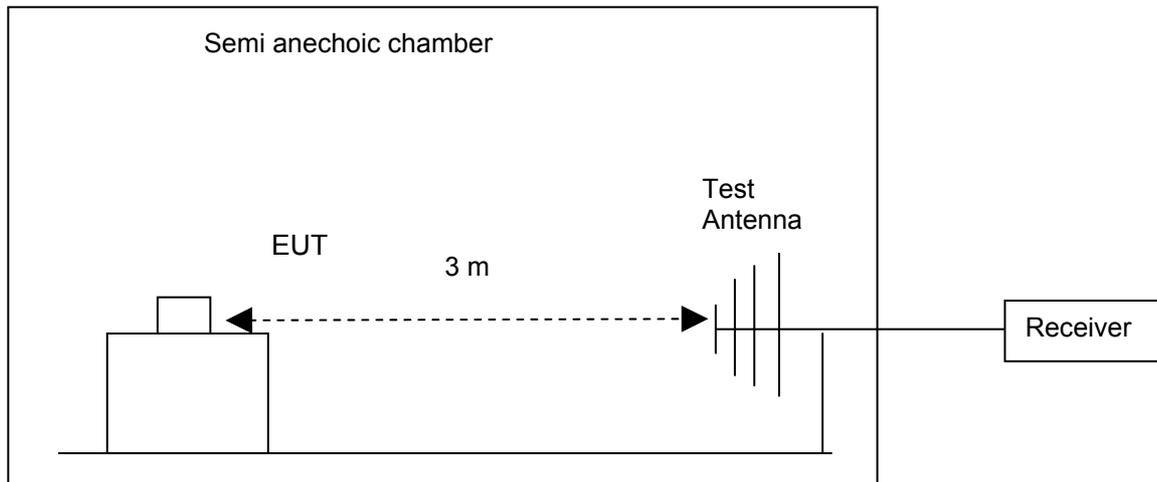


Figure 8. Test Set up

## 6.8.4 Measurement Results

### 6.8.4.1 Measurement Result

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

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

Table 43 MEASUREMENT RESULT

Frequency (MHz)	Level (dB $\mu$ V/m)	Transd (dB)	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
40.020000	26.70	13.1	40.0	13.3	102.0	98.00	VERTICAL
53.340000	24.50	12.7	40.0	15.5	103.0	255.00	HORIZONTAL
102.240000	21.50	12.9	43.5	22.0	101.0	0.00	VERTICAL
201.900000	22.40	12.1	43.5	21.1	122.0	337.00	HORIZONTAL
554.880000	29.70	21.0	46.0	16.3	102.0	28.00	HORIZONTAL
942.540000	35.80	26.5	46.0	10.2	200.0	146.00	HORIZONTAL
1895.000000	11.30	-8.6	54.0	42.7	166.0	340.00	VERTICAL
2402.000000	78.20	-6.8	54.0	-24.2	103.0	102.00	VERTICAL
4257.000000	21.00	-0.7	54.0	33.0	196.0	147.00	HORIZONTAL
6597.000000	23.90	1.8	54.0	30.1	261.0	48.00	HORIZONTAL
12078.000000	30.30	12.5	54.0	23.7	140.0	201.00	HORIZONTAL
17876.000000	42.60	26.0	54.0	11.4	143.0	313.00	VERTICAL
19005.500000	31.10	18.6	54.0	22.9	192.0	119.00	HORIZONTAL
19569.000000	30.90	18.9	54.0	23.1	224.0	250.00	HORIZONTAL
20892.000000	32.10	20.2	54.0	21.9	269.0	75.00	HORIZONTAL
22463.000000	33.20	20.3	54.0	20.8	132.0	101.00	VERTICAL



24526.000000	32.60	21.9	54.0	21.4	247.0	45.00	VERTICAL
26495.000000	34.10	27.9	54.0	19.9	194.0	236.00	VERTICAL
2310.000000	13.60	-7.3	54.0	40.4	249.0	194.00	HORIZONTAL
2390.000000	16.70	-6.9	54.0	37.3	242.0	236.00	HORIZONTAL
2402.000000	78.20	-6.7	54.0	-24.2	113.0	122.00	VERTICAL
2483.500000	14.90	-6.7	54.0	39.1	153.0	114.00	HORIZONTAL
2500.000000	14.10	-6.6	54.0	39.9	269.0	66.00	HORIZONTAL

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

Table 44 MEASUREMENT RESULT

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
40.020000	26.80	13.1	40.0	13.2	100.0	220.00	VERTICAL
53.280000	24.00	12.7	40.0	16.0	254.0	32.00	VERTICAL
100.020000	22.20	13.1	43.5	21.3	212.0	359.00	HORIZONTAL
197.760000	22.20	12.0	43.5	21.3	145.0	121.00	HORIZONTAL
523.920000	29.20	20.5	46.0	16.8	300.0	172.00	HORIZONTAL
908.100000	35.50	26.3	46.0	10.5	208.0	338.00	VERTICAL
1827.000000	10.7	-9.2	54.0	43.3	191.0	329.00	VERTICAL
2442.000000	78.60	-6.9	54.0	-24.6	211.0	128.00	HORIZONTAL
4215.000000	20.20	-0.6	54.0	33.8	274.0	158.00	VERTICAL
6358.000000	22.80	5.5	54.0	31.3	244.0	81.00	HORIZONTAL
12008.000000	30.10	12.1	54.0	23.9	258.0	31.00	HORIZONTAL
17845.000000	42.30	25.5	54.0	11.7	110.0	280.00	HORIZONTAL
18395.000000	30.30	17.8	54.0	23.7	175.0	272.00	VERTICAL
19496.000000	30.20	18.9	54.0	23.8	193.0	254.00	VERTICAL
21768.000000	32.10	20.5	54.0	21.9	143.0	353.00	VERTICAL
24083.000000	31.80	21.5	54.0	22.2	278.0	288.00	VERTICAL
25502.000000	32.40	23.1	54.0	21.6	174.0	327.00	HORIZONTAL
26496.000000	38.30	27.9	54.0	15.7	150.0	25.00	VERTICAL

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

Table 45 MEASUREMENT RESULT

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
40.020000	26.80	13.1	40.0	13.2	132.0	318.00	HORIZONTAL
53.340000	24.50	12.7	40.0	15.5	100.0	127.00	HORIZONTAL
100.020000	22.10	13.1	43.5	21.4	115.0	241.00	HORIZONTAL
201.720000	23.30	12.1	43.5	20.2	126.0	340.00	HORIZONTAL
539.160000	29.50	20.9	46.0	16.5	123.0	183.00	VERTICAL
920.640000	35.80	26.5	46.0	10.2	156.0	142.00	VERTICAL
1653.000000	10.0	-10.8	54.0	44.0	118.0	230.00	HORIZONTAL
2480.000000	78.10	-6.8	54.0	-24.1	256.0	271.00	VERTICAL
3982.000000	20.70	-0.9	54.0	33.3	100.0	6.00	HORIZONTAL
6602.000000	23.60	5.4	54.0	30.4	256.0	72.00	VERTICAL
12087.000000	31.80	13.4	54.0	22.2	201.0	139.00	HORIZONTAL
17102.000000	42.60	25.9	54.0	11.4	122.0	175.00	HORIZONTAL
19705.000000	30.60	19.0	54.0	23.4	244.0	257.00	HORIZONTAL
20486.000000	31.10	19.7	54.0	22.9	239.0	149.00	HORIZONTAL
21785.000000	31.20	20.5	54.0	22.8	151.0	28.00	VERTICAL
23526.000000	30.80	20.5	54.0	23.2	109.0	322.00	HORIZONTAL
24212.000000	31.90	21.5	54.0	22.1	191.0	71.00	VERTICAL
26498.000000	34.30	27.9	54.0	19.7	108.0	66.00	HORIZONTAL
2310.000000	13.00	-7.1	54.0	41.0	110.0	176.00	VERTICAL
2390.000000	13.10	-6.9	54.0	40.9	185.0	43.00	HORIZONTAL



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2480.000000	78.30	-6.9	54.0	-24.3	177.0	89.00	VERTICAL
2483.500000	41.10	-6.7	54.0	12.9	185.0	140.00	HORIZONTAL
2500.000000	12.30	-6.6	54.0	41.7	152.0	219.00	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

Table 46 Test Conditions

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

### 6.9.2 Test Specifications and Limits

#### 6.9.2.1 Specification

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

#### 6.9.2.2 Supporting Standards

Table 47 Supporting Standards:

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

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

Table 48 Limits

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

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

### 6.9.3 Test Method and Setup

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

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

The EUT was communicated with the BTS simulator through Air interface, the BTS simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

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

## Test Set-up

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

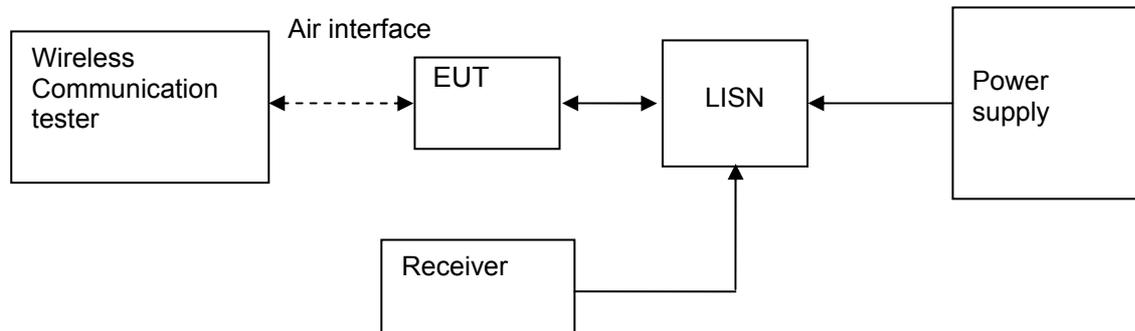


Figure 9. Test Set-up

## 6.9.4 Measurement Results

Table 49 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.267000	39.20	10.0	61	21.8	QP	N	FLO
1.014000	33.90	10.1	56	22.1	QP	N	FLO
3.736500	38.70	10.2	56	17.3	QP	N	FLO
5.370000	36.10	10.2	60	23.9	QP	N	FLO
7.201500	39.80	10.2	60	20.2	QP	N	FLO
17.367480	29.40	10.1	60	30.6	QP	N	FLO

Table 50 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.258000	32.30	10.0	52	19.7	AV	N	FLO
1.036500	25.00	10.1	46	21.0	AV	N	FLO
3.759000	23.60	10.2	46	22.4	AV	N	FLO
5.329500	21.80	10.2	50	28.2	AV	N	FLO
7.174500	25.90	10.2	50	24.1	AV	N	FLO
16.575000	13.10	10.3	50	43.1	AV	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:

Table 51 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 (dBμV/m)	U=2.2dB; k=2 U=5dB; k=2
Conducted emission test for power port	Disturbance Voltage(dBμV)	U=4dB; k=2

## 8 Appendices

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(END OF REPORT)