



FCC Test Report

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

**Model Number: HUAWEI U7515/U7515/ HUAWEI U7510-
5/U7510-5**

**Report No: SYBHZ(R)E062092009EB-4
FCC ID: QISU7515**

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REPORT ON

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

M/N: HUAWEI U7515/U7515/ HUAWEI U7510-5/U7510-5

Report No: SYBHZ(R)E062092009EB-4

FCC ID: QISU7515

REGULATION

FCC CFR47 Part 2: Subpart J;

FCC CFR47 Part 15: Subpart C;

CONCLUSION

Pass

General Manager

2009-09-23

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Test Lab Engineer

2009-09-22

Date

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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	20DB BANDWIDTH MEASUREMENT	12
6.2	CARRIER FREQUENCY SEPARATION MEASUREMENT	14
6.3	NUMBER OF HOPPING CHANNEL.....	16
6.4	TIME OF OCCUPANCY	18
6.5	PEAK OUTPUT POWER.....	20
6.6	BAND EDGE SPURIOUS EMISSION	22
6.7	CONDUCTED RF SPURIOUS	24
6.8	RADIATED SPURIOUS EMISSION & SPURIOUS IN RESTRICTED BAND	26
6.9	CONDUCTED EMISSION AT POWER PORT	30
7	<u>System Measurement Uncertainty</u>	32
8	<u>Appendices</u>	33



1 Summary

The table below summarizes the measurements and results for the HUAWEI HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth - HUAWEI U7515/U7515/ HUAWEI U7510-5/U7510-5. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

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



2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth - HUAWEI U7515/U7515/ HUAWEI U7510-5/U7510-5 is subscriber equipment in the WCDMA/GSM system. The HSDPA/UMTS frequency band is Band I, it can't be used in this report. The GSM/GPRS frequency band includes GSM900 and DCS1800 and PCS1900, but only PCS1900MHz band test data included in this report. The Mobile Phone implements such functions as RF signal receiving /Transmitting, WCDMA and GSM/GPRS protocol processing, voice, video and MMS service 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: $\pi/4$ -DQPSK, 8DPSK	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!				
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***

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

Sep.15, 2009 to Sep.22, 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: π /4-DQPSK,8DPSK Modulation



4 Product Description

4.1 Technical Characteristics

4.1.1 Frequency Range

Table 4 Frequency Range

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

4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

Channel spacing:	1 MHz
Channel separation:	1 MHz

4.1.3 Type of Emission

Table 6 Type of Emission

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

4.1.4 Antenna Information

Table 7 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	0.03 (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

HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
HUAWEI U7515/U7515/ HUAWEI U7510-5/U7510-5		
Board and Module		
Equipment Designation / Description	Model	Remarks
-Main board	HD1U751M	HD1U751M VER.B
-Battery	HB5A2	HUAWEI U7515/U7515/ HUAWEI U7510-5/U7510-5

4.2.2 Adapter Technical Data

AC/DCAdapter Model	:	HS-050040U6
Manufacturer	:	Huawei Technologies Co., Ltd.
Input Voltage	:	~100-240V 50/60Hz 0.2A
Output Voltage	:	5V 400mA
Rated Power	:	2W
S/N	:	XQH962600647

4.2.3 Battery Technical Data

Name	Qty.	Manufacture	Serials number	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	YAC9402HI105192 1	Battery Model: HB5A2 Rated capacity: 1000mAh Nominal Voltage: +3.7V Charging Voltage: +4.2V

4.2.4 FCC Identification

Grantee Code: QIS
 Product Code: U7515
 FCC Identification: QISU7515



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	08.27.2010
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

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

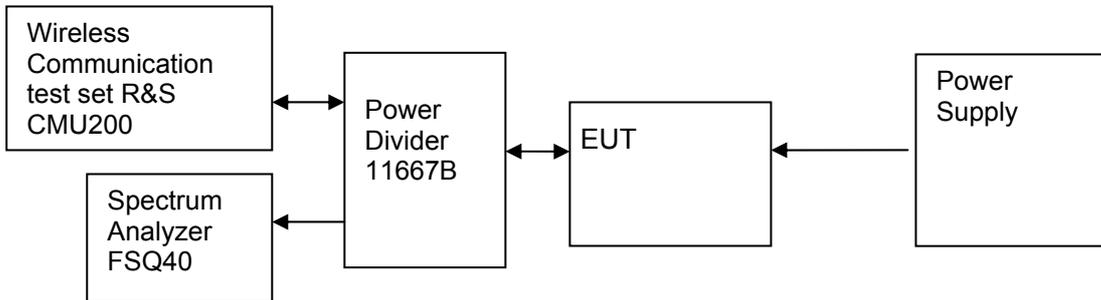


Figure 1. Test Set-up

6.1.4 Measurement Results

Table 15 Measurement Results (Modulation: $\pi/4$ -DQPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.3	PASS
20dB	M	40	2.442	1.327	PASS
20dB	T	78	2.480	1.297	PASS

Table 16 Measurement Results (Modulation: 8DPSK)

Bandwidth Type	Channel Position	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
20dB	B	0	2.402	1.283	PASS
20dB	M	40	2.442	1.283	PASS
20dB	T	78	2.480	1.293	PASS

6.1.5 Conclusion

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

6.2 Carrier frequency separation measurement

6.2.1 Test Conditions

Table 17 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	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 18 Supporting Standards:

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

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

Table 19 Limits Measurement Results (Modulation: $\pi/4$ -DQPSK)

Regulation:	≥ 0.025 or $2/3$ of the 20 dB bandwidth
Limit:	$2/3 \times 1.327 = 0.88$

Table 20 Limits Measurement Results (Modulation: 8DPSK)

Regulation:	≥ 0.025 or $2/3$ of the 20 dB bandwidth
Limit:	$2/3 \times 1.293 = 0.86$

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

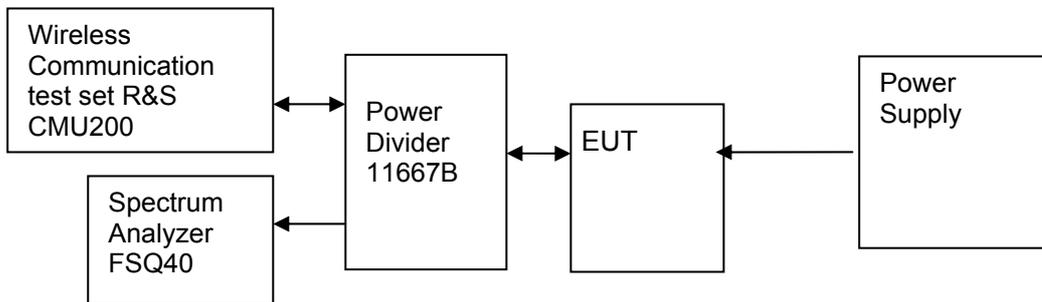


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 21 Measurement Results (Modulation: $\pi/4$ -DQPSK)

Channel No.	Frequency [GHz]	Channel No.	Frequency [GHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2.442	39	2.441	0.967	0.88	PASS
40	2.442	41	2.443	1.017	0.88	PASS

Table 22 Measurement Results (Modulation: 8DPSK)

Channel No.	Frequency [GHz]	Channel No.	Frequency [GHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2.442	39	2.441	0.967	0.86	PASS
40	2.442	41	2.443	1.017	0.86	PASS

6.2.5 Conclusion

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

6.3 Number of hopping channel

6.3.1 Test Conditions

Table 23 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	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 24 Supporting Standards:

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

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

Table 25 Limits

Limits	≥15 hopping frequency channel
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6.3.3 Test Method and Setup

- Connect test port of EUT to spectrum analyzer and universal communication tester.
- 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.
- Count the quantity of peaks to get the number of hopping channels.

Test setup

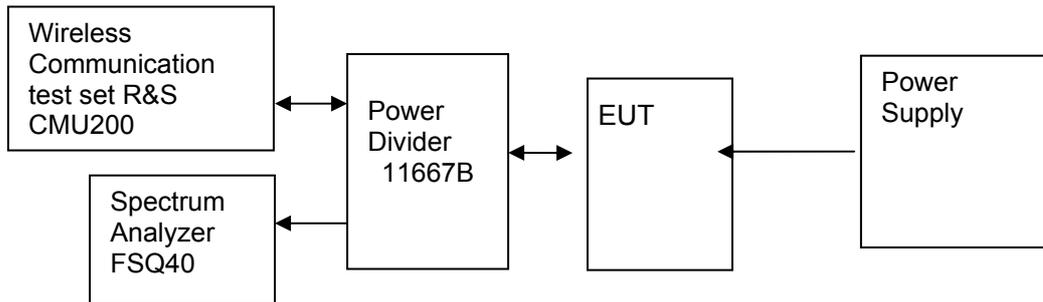


Figure 3. Test Set-up

6.3.4 Measurement Results

Table 26 Measurement Results (Modulation: $\pi/4$ -DQPSK)

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

Table 27 Measurement Results (Modulation: 8DPSK)

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 28 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 29 Supporting Standards:

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

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

Table 30 Limits

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

- (a) Connect test port of 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

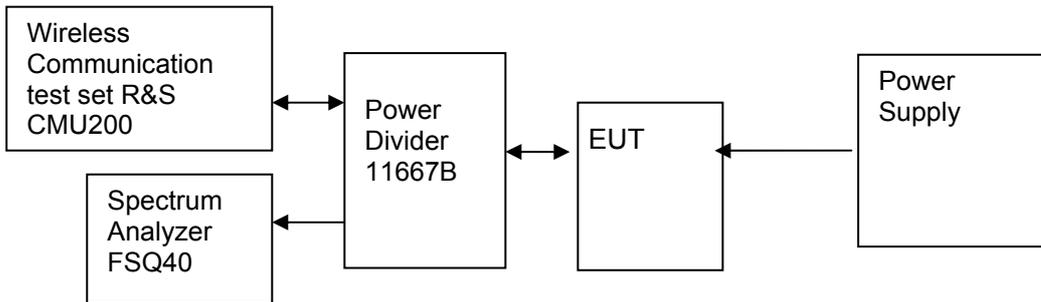


Figure 4. Test Set-up

6.4.4 Measurement Results π

Table 31 Measurement Results (Modulation: $\pi/4$ -DQPSK)

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
2.93	106.7	0.32	≤ 0.4	PASS

Table 32 Measurement Results (Modulation: 8DPSK)

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
2.93	106.7	0.32	≤ 0.4	PASS

6.4.5 Conclusion

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



6.5 Peak output power

6.5.1 Test Conditions

Table 33 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	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 34 Supporting Standards:

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

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

Table 35 Limits

2.4GHz and 5.8GHz hopping frequency system	1 Watt / 30 dBm
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

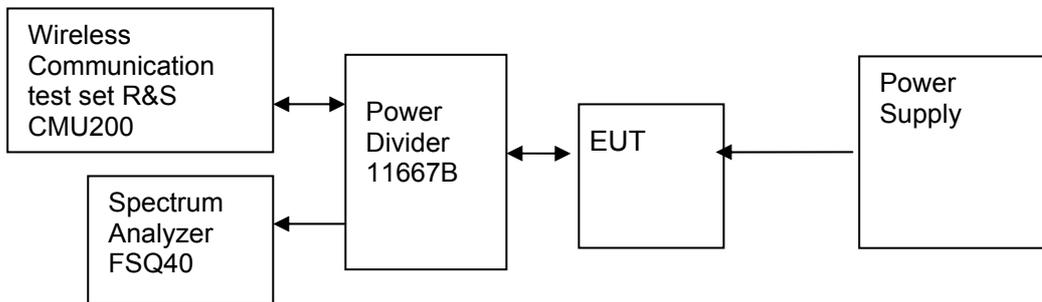


Figure 5. Test Set-up

6.5.4 Measurement Results

Table 36 Measurement Results (Modulation: $\pi/4$ -DQPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	6.24	< 30	PASS
Middle	40	2442	6.01	< 30	PASS
Top	78	2480	5.98	< 30	PASS

Table 37 Measurement Results (Modulation: 8DPSK)

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
Bottom	0	2402	5.38	< 30	PASS
Middle	40	2442	5.34	< 30	PASS
Top	78	2480	5.20	< 30	PASS

6.5.5 Conclusion

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

6.6 Band edge spurious emission

6.6.1 Test Conditions

Table 38 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	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 39 Supporting Standards:

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

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

Table 40 Limits

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

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

Test setup

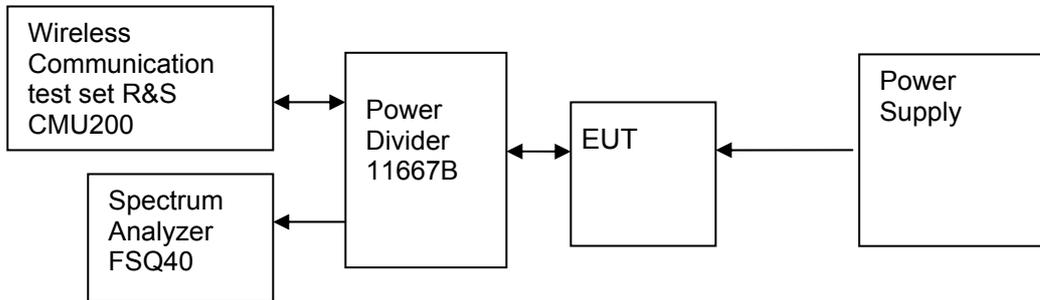


Figure 6. Test Set-up

6.6.4 Measurement Results

Table 41 Measurement Results for Band Edge immediately outside the 2.4G Band
 (Modulation: $\pi/4$ -DQPSK)

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	3.68	Off	-33.77	<-16.4	PASS
	-	-	3.61	On	-39.94	<-16.4	PASS
High Edge	78	2480	3.4	Off	-40.09	<-16.6	PASS
	-	-	3.32	On	-41.98	<-16.7	PASS

Table 42 Measurement Results for Band Edge immediately outside the 2.4G Band
 (Modulation: 8DPSK)

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	1.89	Off	-44.9	<-18.1	PASS
	-	-	-0.36	On	-44.16	<-20.4	PASS
High Edge	78	2480	1.71	Off	-44.69	<-18.3	PASS
	-	-	0.87	On	-43.95	<-19.3	PASS

6.6.5 Conclusion

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

6.7 Conducted RF spurious

6.7.1 Test Conditions

Table 43 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna Connector
Ambient temperature:	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 44 Supporting Standards:

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

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

Table 45 Limits

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

- (a) Connect test port of 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

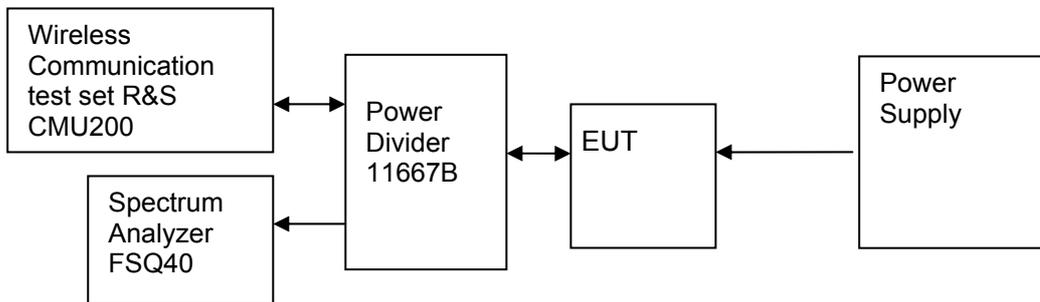


Figure 7. Test Set-up

6.7.4 Measurement Results

6.7.4.1 Measurement Results

Table 46 Measurement Results (Modulation: $\pi/4$ -DQPSK)

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-26GHz	0	2402	0.6	Off	-37.25	< -19.4	PASS
9kHz-26GHz	40	2442	0.22	Off	-38.64	< -19.8	PASS
9kHz-26GHz	78	2480	2.61	Off	-36.31	< -17.4	PASS

Table 47 Measurement Results (Modulation: 8DPSK)

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-26GHz	0	2402	-0.93	Off	-34.94	< -20.9	PASS
9kHz-26GHz	40	2442	0.67	Off	-36.26	< -19.4	PASS
9kHz-26GHz	78	2480	-2.71	Off	-37.38	< -22.7	PASS

6.7.5 Conclusion

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

6.8 Radiated spurious emission & spurious in restricted band

6.8.1 Test Conditions

Table 48 Test Conditions

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

6.8.2 Test Specifications and Limits

6.8.2.1 Specification

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

6.8.2.2 Supporting Standards

Table 49 Supporting Standards:

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

6.8.2.3 Limits

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

Table 50 Limits

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

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(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 – 10th Carrier Frequency: 1 MHz

Test set up

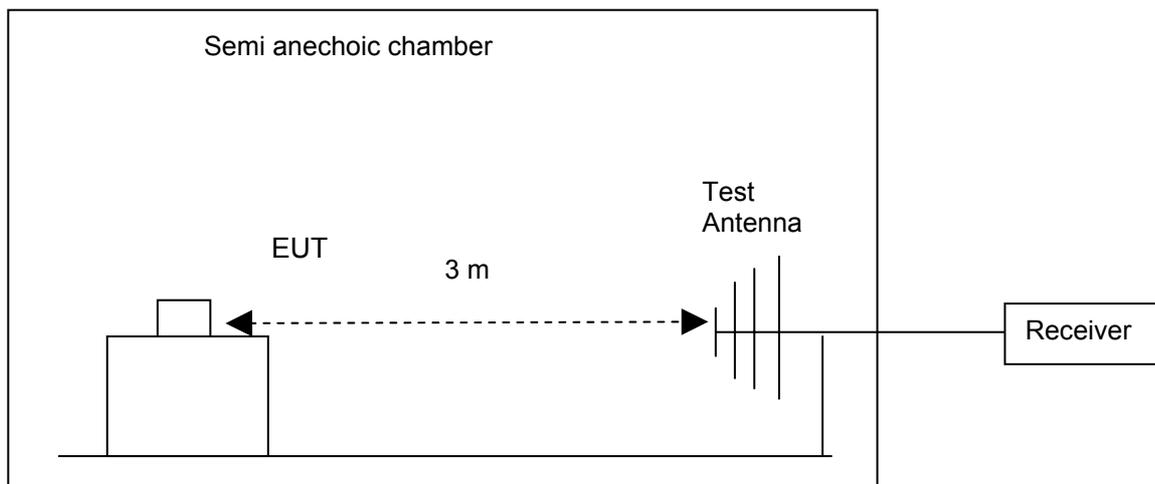


Figure 8. Test Set up

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 51 MEASUREMENT RESULT

Frequency (MHz)	Level (dB μ V/m)	Transd (dB)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
40.020000	24.10	13.1	40.0	15.9	291.0	132.00	VERTICAL
60.000000	21.20	12.3	40.0	18.8	195.0	72.00	HORIZONTAL
101.940000	21.30	12.9	43.5	22.2	190.0	318.00	HORIZONTAL
221.160000	27.40	13.0	46.0	18.6	140.0	208.00	HORIZONTAL
363.300000	31.90	17.4	46.0	14.1	134.0	108.00	VERTICAL
924.600000	35.60	26.5	46.0	10.4	137.0	147.00	HORIZONTAL
2402.000000	77.40	-11.5	54.0	-23.4	183.0	286.00	HORIZONTAL
3367.000000	18.50	-7.8	54.0	35.5	179.0	77.00	VERTICAL
4338.500000	19.80	-5.4	54.0	34.2	181.0	297.00	VERTICAL
6325.000000	22.30	-1.2	54.0	31.7	180.0	118.00	HORIZONTAL
8558.000000	25.40	3.1	54.0	28.6	164.0	288.00	VERTICAL
12263.500000	30.10	7.8	54.0	23.9	102.0	323.00	HORIZONTAL
18777.000000	30.90	18.5	54.0	23.1	187.0	210.00	HORIZONTAL
19492.000000	30.00	18.9	54.0	24.0	116.0	104.00	HORIZONTAL
21785.000000	32.10	20.5	54.0	21.9	137.0	73.00	HORIZONTAL



24191.000000	30.80	21.5	54.0	23.2	132.0	165.00	VERTICAL
25284.000000	30.80	23.1	54.0	23.2	166.0	321.00	VERTICAL
26492.000000	38.20	27.9	54.0	15.8	194.0	282.00	HORIZONTAL
2310.000000	14.50	-11.9	54.0	39.5	182.0	54.00	VERTICAL
2390.000000	14.60	-11.6	54.0	39.4	168.0	175.00	VERTICAL
2402.000000	77.60	-11.5	54.0	-23.6	138.0	343.00	VERTICAL
2483.500000	14.20	-11.3	54.0	39.8	160.0	202.00	HORIZONTAL
2500.000000	13.70	-11.1	54.0	40.7	133.0	232.00	HORIZONTAL

Measured Result of channel: 40 (2442MHz)

Table 52 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
33.360000	21.10	11.7	40.0	18.9	151.0	16.00	HORIZONTAL
60.000000	21.40	12.3	40.0	18.6	167.0	122.00	HORIZONTAL
104.400000	20.80	12.7	43.5	22.7	110.0	40.00	VERTICAL
205.260000	25.20	12.2	43.5	18.3	145.0	132.00	HORIZONTAL
363.120000	30.80	17.4	46.0	15.2	189.0	307.00	VERTICAL
941.220000	36.50	26.5	46.0	9.5	194.0	158.00	HORIZONTAL
2442.000000	77.50	-11.4	54.0	-23.5	126.0	131.00	HORIZONTAL
3220.500000	18.70	-8.3	54.0	35.3	151.0	334.00	VERTICAL
4380.000000	20.80	-5.7	54.0	33.2	158.0	232.00	VERTICAL
7228.000000	28.30	0.6	54.0	26.7	151.0	307.00	VERTICAL
11003.500000	28.50	6.7	54.0	26.5	103.0	351.00	HORIZONTAL
14586.500000	33.60	12.2	54.0	20.4	187.0	154.00	HORIZONTAL
19479.000000	30.10	18.9	54.0	23.9	113.0	192.00	HORIZONTAL
20487.000000	31.20	19.7	54.0	22.8	191.0	354.00	HORIZONTAL
21778.000000	31.20	20.5	54.0	22.8	140.0	42.00	VERTICAL
23535.000000	30.90	20.5	54.0	23.1	149.0	18.00	HORIZONTAL
24212.000000	30.40	21.5	54.0	23.6	122.0	346.00	HORIZONTAL
26495.000000	33.90	27.9	54.0	20.1	118.0	212.00	VERTICAL

Measured Result of channel: 78 (2480MHz)

Table 53 MEASUREMENT RESULT

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
40.020000	24.20	13.1	40.0	15.8	155.0	41.00	HORIZONTAL
60.000000	21.30	12.3	40.0	18.7	126.0	18.00	HORIZONTAL
102.960000	21.20	12.8	43.5	22.3	181.0	72.00	VERTICAL
189.540000	24.00	11.8	43.5	19.5	117.0	201.00	HORIZONTAL
363.240000	30.50	17.4	46.0	15.5	122.0	41.00	VERTICAL
932.460000	35.70	26.5	46.0	10.3	114.0	97.00	HORIZONTAL
2480.000000	77.20	-11.3	54.0	-23.2	117.0	182.00	VERTICAL
3560.000000	20.00	-7.2	54.0	34.0	147.0	236.00	VERTICAL
4837.500000	23.30	-4.1	54.0	30.7	129.0	122.00	VERTICAL
6068.000000	23.50	-1.5	54.0	30.5	185.0	191.00	VERTICAL
7937.500000	26.40	1.9	54.0	27.6	137.0	76.00	HORIZONTAL
14601.000000	35.20	12.1	54.0	18.8	157.0	152.00	VERTICAL
18779.000000	30.70	18.5	54.0	23.3	122.0	36.00	HORIZONTAL
19495.000000	30.00	18.9	54.0	24.0	154.0	120.00	VERTICAL
21781.000000	32.30	20.5	54.0	21.7	150.0	138.00	HORIZONTAL
24196.000000	30.60	21.5	54.0	23.4	131.0	91.00	HORIZONTAL
25282.000000	30.60	23.1	54.0	23.4	198.0	222.00	VERTICAL
26496.000000	38.00	27.9	54.0	16.0	196.0	180.00	HORIZONTAL
2310.000000	14.50	-11.9	54.0	39.5	182.0	54.00	VERTICAL



2390.000000	16.80	-11.6	54.0	37.2	115.0	29.00	HORIZONTAL
2480.000000	77.60	-11.3	54.0	-23.6	142.0	140.00	VERTICAL
2483.500000	38.40	-11.3	54.0	15.6	200.0	21.00	HORIZONTAL
2500.000000	17.50	-11.1	54.0	36.5	162.0	300.00	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 54 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 55 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 56 Limits

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

Note: * Decreases with the logarithm of the frequency.

6.9.3 Test Method and Setup

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

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

The EUT was communicated with the BTS simulator through Air interface, the BTS simulator controls the 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.

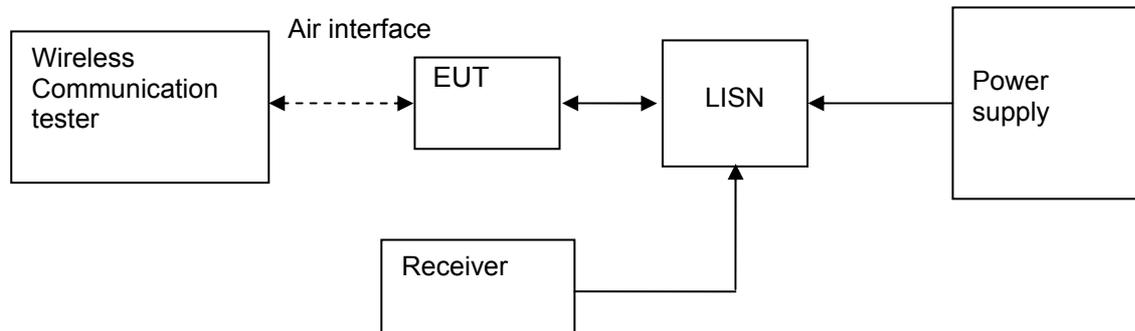


Figure 9. Test Set-up

6.9.4 Measurement Results

Table 57 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	41.30	10.1	64	22.7	QP	N	FLO
1.374000	35.70	10.1	56	20.3	QP	L1	FLO
1.689000	37.70	10.1	56	18.3	QP	N	FLO
3.417000	35.10	10.2	56	20.9	QP	L1	FLO
3.727500	36.80	10.2	56	19.2	QP	N	FLO
8.997000	32.60	10.3	60	27.4	QP	N	FLO

Table 58 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	27.90	10.1	54	26.1	AV	N	FLO
1.437000	27.30	10.1	46	18.7	AV	L1	FLO
1.738500	25.00	10.1	46	21.0	AV	N	FLO
3.421500	26.00	10.2	46	20.0	AV	L1	FLO
3.687000	24.50	10.2	46	21.5	AV	N	FLO
9.028500	24.10	10.3	50	25.9	AV	N	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 59 System Measurement Uncertainty

Items		Extended Uncertainty
20dB bandwidth measurement	Magnitude (%)	U=0.2%; k=2
Carrier frequency separation measurement	Magnitude (%)	U=0.2%; k=2
Time of occupancy	Magnitude (%)	U=0.2%; k=2
Peak output power	Power(dBm)	U=0.39dB; k=2
Band edge compliance measurement	Disturbance Power(dBm)	U=2.0dB; k=2
Conducted RF spurious	Disturbance Power(dBm)	U=2.0dB; k=2
Radiated spurious emission & Radiated restricted band measurement	Field strength (dB μ V/m)	U=2.2dB; k=2 U=5dB; k=2
Conducted emission test for power port	Disturbance Voltage(dB μ V)	U=4dB; k=2



8 Appendices

Appendix A	Measurement Results 20dB bandwidth measurement	7
Appendix B	Measurement Results Carrier frequency separation measurement	3
Appendix C	Measurement Results Number of hopping channel	3
Appendix D	Measurement Results Time of occupancy	5
Appendix E	Measurement Results Peak output power	7
Appendix F	Measurement Results Band edge compliance measurement	17
Appendix G	Measurement Results Conducted RF spurious	19
Appendix H	Measurement Results Radiated spurious emission	12
Appendix I	Measurement Results Conducted emission test for power port	2
Appendix J	Photos of Test Setup	3

(END OF REPORT)