



FCC Test Report

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

Model Number: HUAWEI U8650 -1/U8650 -1

**Report No: SYBH(Z-RF)019032011-2002
FCC ID: QISU8650-1**

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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



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1 Summary

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

Table 1 Summary of results

| FCC Measurement Specification | Description | Result |
|--------------------------------------|---|---------------|
| 15.247 (a) (2) | 6dB bandwidth measurement | PASS |
| 15.247 (b) (3) | Conducted Peak output power | PASS |
| 15.247 (d) | Band edge compliance measurement | PASS |
| 15.247 (d) | Conducted RF spurious | PASS |
| 15.247 (e) | Power spectral density | PASS |
| 15.247 (d) / 15.205 & 15.209 | Radiated spurious emission & Radiated restricted band measurement | PASS |
| 15.207 | Conducted emission test for power port | PASS |



2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI U8650 -1/U8650 -1 subscriber equipment in the WCDMA/GSM system. The HSDPA/UMTS frequency band is Band I and Band VIII, they cannot be used in this report. The GSM/GPRS/EDGE frequency band includes GSM900 and DCS1800 and PCS1900, but only PCS1900 band test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSDPA/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.

Note: Only WLAN function was considered in this report.

2.1.2 Support function and Service

HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth 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
Mar.18, 2010 – Mar.19, 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: | - |
|-----------------------|---|

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): | -2.6 (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: | 1A |

4.1.7 Tune-up Procedure

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

Please reference the document Tune-up Procedure in TCF.

4.1.8 Applied DC Voltages and Currents

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

The voltage and current in the final RF stage is:

Table 10 Applied RF module DC Voltages and Currents

| | |
|----------|---|
| Voltage: |  +3.3V |
| 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 U8650 -1/U8650 -1 | | |
| Board and Module | | |
| Model name | Serial Number | |
| MAIN BOARD | 0286502112000324 | |

4.2.2 Battery

| Name | Qty. | Manufacture | Serials number | Description |
|------------------------|------|-------------------------------------|----------------------|---|
| Rechargeable Li-ion | 1 | Huawei Technologies Co., Ltd. | WHCB304HI10324 94 | Battery Model: HB5K1H Rated capacity: 1400mAh Nominal Voltage: +3.7V Charging Voltage: +4.2V |

4.2.3 FCC Identification

Grantee Code: QIS
Product Code: U8650-1
FCC Identification: QISU8650-1



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 |
| Spectrum Analyzer | Agilent | E4440A | MY49420179 | Apr.24,2011 |
| Signal Analyzer | R&S | FSQ31 | 200021 | Sep.27,2011 |
| Temperature Chamber | WEISS | WKL64 | 24600294 | Jan.03,2012 |
| Signal generator | Agilent | E8257D | MY49281095 | Jul.9.2011 |
| Vector Signal Generator | R&S | SMU200A | 104162 | Sep.07,2011 |
| Broadband Antenna | SCHWARZBECK | VULB 9163 | 9163-356 | 05.14.2011 |
| Horn Antenna | R&S | HF906 | 100683 | 05.14.2011 |
| Horn Antenna | ETS-Lindgren | 3160 | 00091989 | 09.28.2011 |
| LISN | R&S | ENV216 | 100382 | 07.24.2011 |
| Signal Analyzer | Agilent | E4440A | 3608083811 | 12.17.2011 |



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: | 24.8°C |
| Relative humidity: | 45% |
| 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 |
|---------------------|---|

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 |
|--------|----------|

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

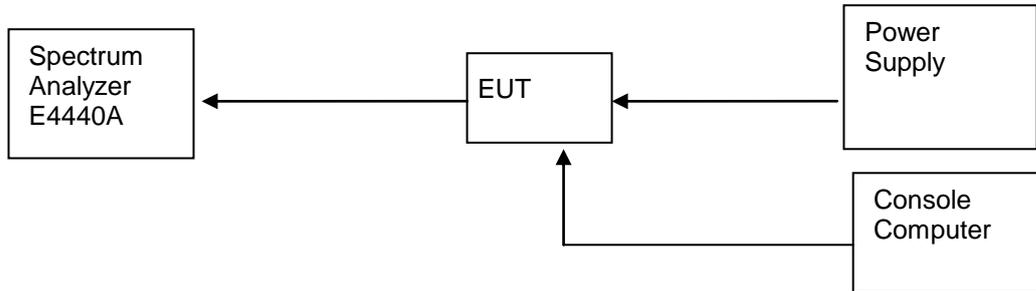


Figure 1. Test Set-up

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 | 11.322 | Pass |
| | M | 6dB Bandwidth | 6 | 2.437 | 11.355 | Pass |
| | T | 6dB Bandwidth | 11 | 2.462 | 11.265 | Pass |
| TM2 | B | 6dB Bandwidth | 1 | 2.412 | 17.564 | Pass |
| | M | 6dB Bandwidth | 6 | 2.437 | 17.583 | Pass |
| | T | 6dB Bandwidth | 11 | 2.462 | 17.519 | Pass |
| TM3 | B | 6dB Bandwidth | 1 | 2.412 | 17.527 | Pass |
| | M | 6dB Bandwidth | 6 | 2.437 | 17.573 | Pass |
| | T | 6dB Bandwidth | 11 | 2.462 | 17.532 | 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: | 24.8°C |
| Relative humidity: | 45% |
| 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 |
|----------------------|---|

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 |
|---|-----------------|

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

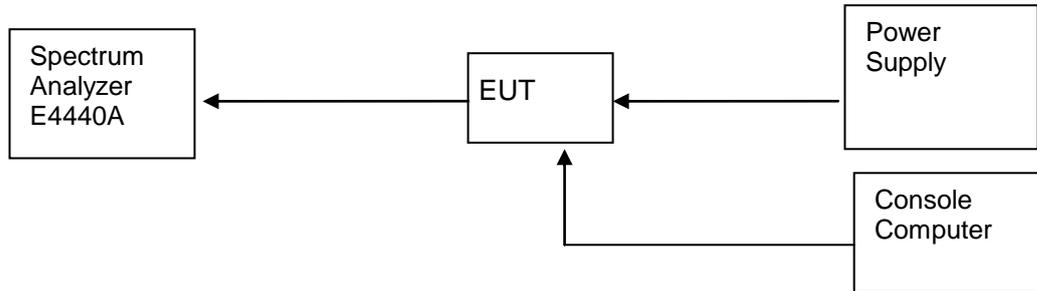


Figure 2. Test Set-up

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 | 13.67 | < 30 | Pass |
| | Middle | 6 | 2437 | 13.28 | < 30 | Pass |
| | Top | 11 | 2462 | 13.55 | < 30 | Pass |
| TM2 | Bottom | 1 | 2412 | 9.90 | < 30 | Pass |
| | Middle | 6 | 2437 | 10.24 | < 30 | Pass |
| | Top | 11 | 2462 | 8.71 | < 30 | Pass |
| TM3 | Bottom | 1 | 2412 | 7.61 | < 30 | Pass |
| | Middle | 6 | 2437 | 7.13 | < 30 | Pass |
| | Top | 11 | 2462 | 6.34 | < 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: | 24.8°C |
| Relative humidity: | 45% |
| 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 |
|----------------------|---|

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 |
|---------------------|---------------|

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

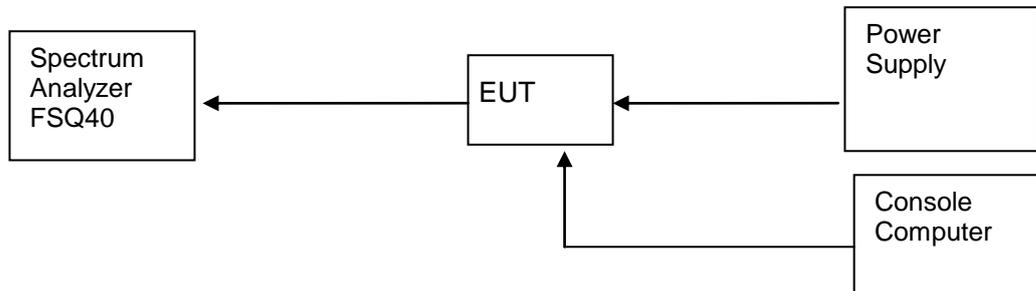


Figure 3. Test Set-up

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 | 7.16 | -41.44 | -12.80 | Pass |
| | High Edge | 11 | 2462 | 4.99 | -39.40 | -15.00 | Pass |
| TM2 | Low Edge | 1 | 2412 | 1.16 | -31.40 | -18.80 | Pass |
| | High Edge | 11 | 2462 | 0.08 | -27.11 | -19.90 | Pass |
| TM3 | Low Edge | 1 | 2412 | -0.85 | -34.79 | -20.80 | Pass |
| | High Edge | 11 | 2462 | -1.59 | -28.33 | -21.60 | 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: | 24.8°C |
| Relative humidity: | 45% |
| 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 |
|----------------------|---|

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

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

Test setup

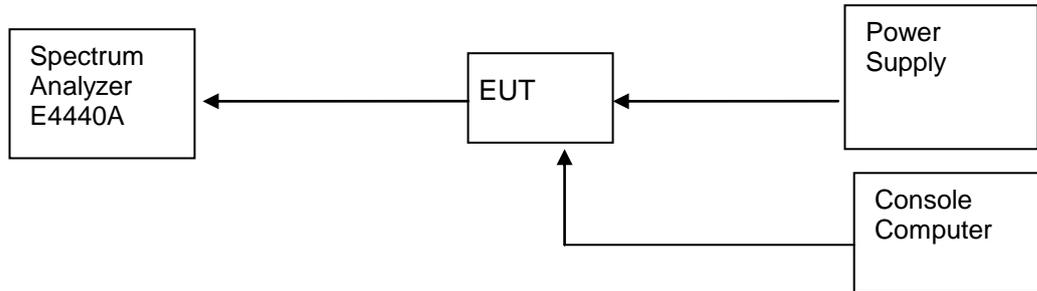


Figure 4. Test Set-up

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 | 12.62 | -42.48 | -7.4 | Pass |
| | 9kHz-26GHz | 6 | 2437 | 6.14 | -42.47 | -13.9 | Pass |
| | 9kHz-26GHz | 11 | 2462 | 11.21 | -41.32 | -8.8 | Pass |
| TM2 | 9kHz-26GHz | 1 | 2412 | 6.24 | -41.85 | -13.8 | Pass |
| | 9kHz-26GHz | 6 | 2437 | 6.92 | -41.05 | -13.1 | Pass |
| | 9kHz-26GHz | 11 | 2462 | 4.93 | 41.94 | -15.1 | Pass |
| TM3 | 9kHz-26GHz | 1 | 2412 | 4.48 | -42.4 | -15.5 | Pass |
| | 9kHz-26GHz | 6 | 2437 | 6.32 | -42.22 | -13.7 | Pass |
| | 9kHz-26GHz | 11 | 2462 | 4.03 | -41.85 | -16.0 | 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: | 24.8°C |
| Relative humidity: | 45% |
| 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 |
|----------------------|---|

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 |
|---------------------|------------|

6.5.3 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 and.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

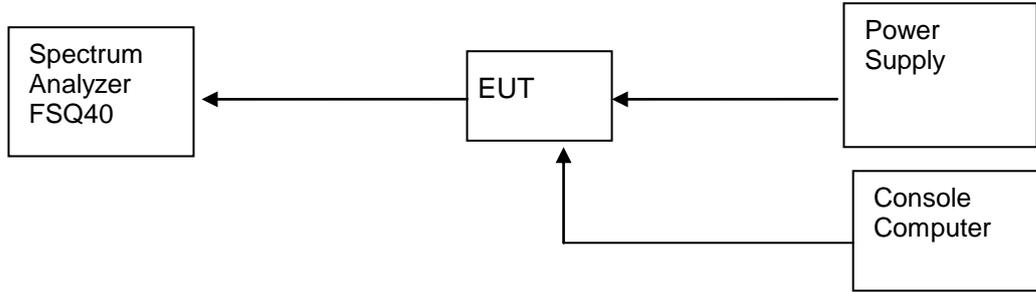


Figure 5. Test Set-up

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 | -7.17 | 8 | Pass |
| | 6 | 2437 | -7.83 | 8 | Pass |
| | 11 | 2462 | -9.59 | 8 | Pass |
| TM2 | 1 | 2412 | -15.00 | 8 | Pass |
| | 6 | 2437 | -17.51 | 8 | Pass |
| | 11 | 2462 | -16.41 | 8 | Pass |
| TM3 | 1 | 2412 | -14.94 | 8 | Pass |
| | 6 | 2437 | -17.41 | 8 | Pass |
| | 11 | 2462 | -16.38 | 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: | 25.1 °C |
| Relative humidity: | 43% |
| Test Configurations: | TM1/TM2/TM3 at channel No.1, 6, 11 |

6.6.2 Test Specifications and Limits

6.6.2.1 Specification

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

6.6.2.2 Supporting Standards

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 10th 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 – 10th Carrier Frequency: 1 MHz

Test set up

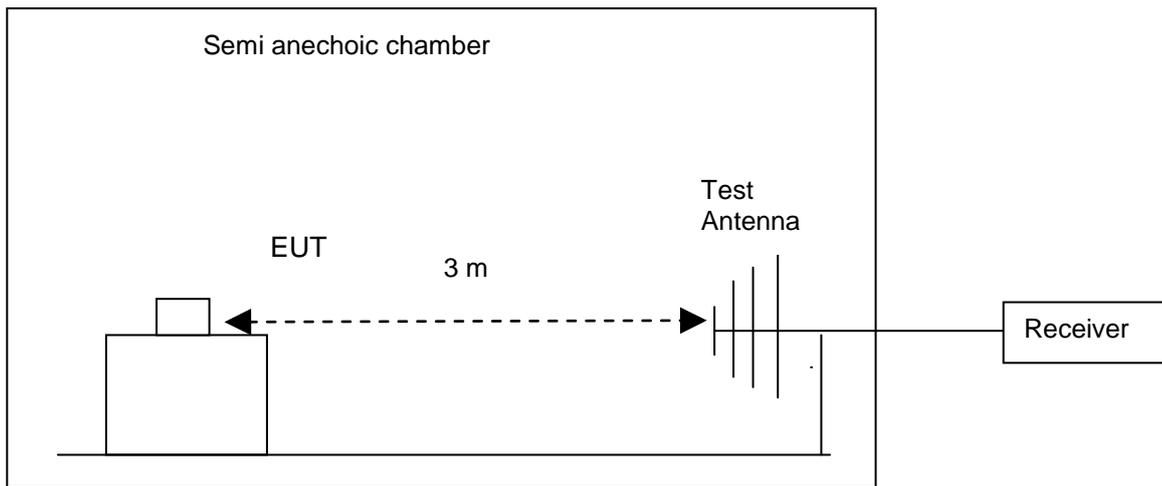


Figure 6. Test Set up

6.6.4 Measurement Results

Note 1: The following measurement results exceed the limit line is the carrier frequency.
 Note 2: This test was carried out in all the test modes, here only the worst test result was shown.

Measured Result of channel: 1 (2412MHz)

Table 36 MEASUREMENT RESULT

| Frequency (MHz) | Level (dBµV/m) | Transd (dB) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Azimuth (deg) | Polarisation |
|-----------------|----------------|-------------|----------------|-------------|-------------|---------------|--------------|
| 33.284000 | 28.30 | 11.7 | 40.0 | 11.7 | 100.0 | 27.00 | VERTICAL |
| 54.712000 | 19.50 | 12.7 | 40.0 | 20.5 | 200.0 | 193.00 | VERTICAL |
| 169.676000 | 15.40 | 10.0 | 43.5 | 28.1 | 105.0 | 209.00 | VERTICAL |
| 178.512000 | 18.40 | 10.8 | 43.5 | 25.1 | 100.0 | 271.00 | VERTICAL |
| 544.008000 | 25.60 | 21.3 | 46.0 | 20.4 | 200.0 | 42.00 | VERTICAL |
| 958.092000 | 33.00 | 26.7 | 46.0 | 13.0 | 194.0 | 195.00 | HORIZONTAL |
| 3209.700000 | 14.70 | -8.3 | 54.0 | 39.3 | 100.0 | 288.00 | VERTICAL |
| 4955.000000 | 19.10 | -3.7 | 54.0 | 34.9 | 110.0 | 338.00 | HORIZONTAL |
| 8219.100000 | 21.50 | 2.6 | 54.0 | 32.5 | 121.0 | 6.00 | VERTICAL |
| 11361.700000 | 24.70 | 7.1 | 54.0 | 29.3 | 124.0 | 135.00 | VERTICAL |
| 14470.100000 | 29.40 | 12.3 | 54.0 | 24.6 | 145.0 | 73.00 | HORIZONTAL |
| 17960.200000 | 32.90 | 17.1 | 54.0 | 21.1 | 128.0 | 248.00 | HORIZONTAL |



| | | | | | | | |
|-------------|-------|------|------|------|-------|--------|------------|
| 2310.000000 | 39.00 | 33.3 | 54.0 | 15.0 | 142.0 | 223.00 | HORIZONTAL |
| 2390.000000 | 40.40 | 33.5 | 54.0 | 15.6 | 151.0 | 353.00 | VERTICAL |
| 2483.500000 | 39.70 | 33.7 | 54.0 | 14.3 | 107.0 | 327.00 | VERTICAL |
| 2500.000000 | 39.50 | 33.8 | 54.0 | 14.5 | 131.0 | 215.00 | HORIZONTAL |

Measured Result of channel: 6 (2437MHz)

Table 37 MEASUREMENT RESULT

| Frequency (MHz) | Level (dBµV/m) | Transd (dB) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Azimuth (deg) | Polarisation |
|-----------------|----------------|-------------|----------------|-------------|-------------|---------------|--------------|
| 33.344000 | 25.40 | 11.7 | 40.0 | 14.6 | 140.0 | 73.00 | VERTICAL |
| 55.368000 | 20.40 | 12.6 | 40.0 | 19.6 | 121.0 | 317.00 | VERTICAL |
| 172.664000 | 17.80 | 10.3 | 43.5 | 25.7 | 100.0 | 21.00 | VERTICAL |
| 177.024000 | 18.10 | 10.7 | 43.5 | 25.4 | 139.0 | 312.00 | VERTICAL |
| 530.516000 | 25.30 | 20.9 | 46.0 | 20.7 | 160.0 | 253.00 | HORIZONTAL |
| 950.332000 | 30.90 | 26.6 | 46.0 | 15.1 | 112.0 | 166.00 | HORIZONTAL |
| 3215.800000 | 23.10 | -8.3 | 54.0 | 30.9 | 101.0 | 3.00 | HORIZONTAL |
| 4822.600000 | 23.90 | -4.1 | 54.0 | 30.1 | 104.0 | 25.00 | VERTICAL |
| 7159.300000 | 20.40 | 0.6 | 54.0 | 33.6 | 115.0 | 220.00 | VERTICAL |
| 10090.800000 | 23.50 | 5.2 | 54.0 | 30.5 | 100.0 | 141.00 | HORIZONTAL |
| 14392.500000 | 29.20 | 12.0 | 54.0 | 24.8 | 120.0 | 165.00 | VERTICAL |
| 17986.400000 | 33.30 | 17.2 | 54.0 | 20.7 | 200.0 | 141.00 | HORIZONTAL |

Measured Result of channel: 11 (2462MHz)

Table 38 MEASUREMENT RESULT

| Frequency (MHz) | Level (dBµV/m) | Transd (dB) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Azimuth (deg) | Polarisation |
|-----------------|----------------|-------------|----------------|-------------|-------------|---------------|--------------|
| 33.584000 | 23.50 | 11.7 | 40.0 | 16.5 | 100.0 | 96.00 | VERTICAL |
| 53.216000 | 21.00 | 12.7 | 40.0 | 19.0 | 100.0 | 350.00 | VERTICAL |
| 97.216000 | 19.40 | 12.9 | 43.5 | 24.1 | 136.0 | 0.00 | VERTICAL |
| 200.000000 | 28.20 | 12.1 | 43.5 | 15.3 | 168.0 | 246.00 | HORIZONTAL |
| 556.072000 | 28.90 | 21.5 | 46.0 | 17.1 | 110.0 | 253.00 | VERTICAL |
| 906.520000 | 34.20 | 26.2 | 46.0 | 11.8 | 100.0 | 241.00 | HORIZONTAL |
| 3488.300000 | 15.90 | -21.0 | 54.0 | 38.1 | 141.0 | 58.00 | VERTICAL |
| 4819.600000 | 25.40 | -4.1 | 54.0 | 28.6 | 160.0 | 238.00 | VERTICAL |
| 6695.900000 | 21.10 | -15.9 | 54.0 | 32.9 | 151.0 | 218.00 | VERTICAL |
| 9952.400000 | 25.90 | -10.4 | 54.0 | 28.1 | 121.0 | 108.00 | VERTICAL |
| 12794.200000 | 28.00 | -6.0 | 54.0 | 26.0 | 114.0 | 250.00 | HORIZONTAL |
| 17322.500000 | 30.40 | -2.0 | 54.0 | 23.6 | 106.0 | 219.00 | HORIZONTAL |
| 2310.000000 | 39.20 | 33.3 | 54.0 | 14.8 | 155.0 | 254.00 | VERTICAL |
| 2390.000000 | 39.60 | 33.5 | 54.0 | 14.4 | 141.0 | 141.00 | HORIZONTAL |
| 2483.500000 | 42.50 | 33.7 | 54.0 | 11.5 | 125.0 | 307.00 | VERTICAL |
| 2500.000000 | 39.50 | 33.8 | 54.0 | 14.5 | 127.0 | 340.00 | HORIZONTAL |

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 39 Test Conditions

| | |
|----------------------|----------------------|
| Preconditioning: | 0.5 hour |
| Measured at: | Power port |
| Ambient temperature: | 25.1 °C |
| Relative humidity: | 43% |
| Test Configurations: | TM1 at channel No. 7 |

6.7.2 Test Specifications and Limits

6.7.2.1 Specification

CFR 47 (FCC) part 15.207 and KDB 558074

6.7.2.2 Supporting Standards

Table 40 Supporting Standards:

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

6.7.2.3 Limits

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

Table 41 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.

6.7.3 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.

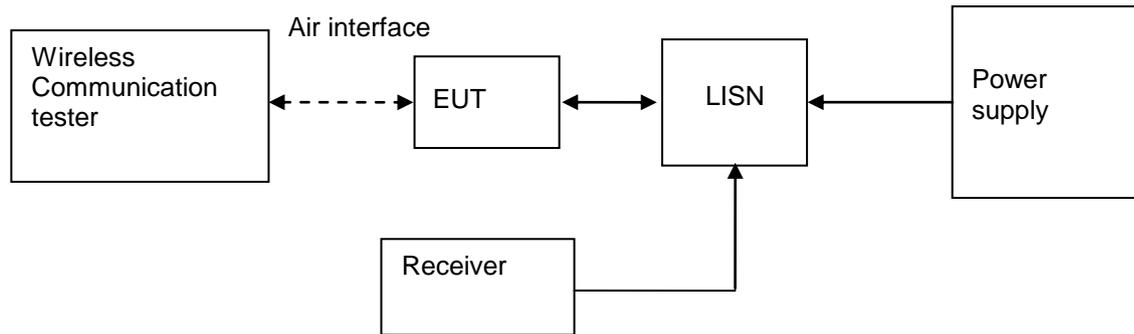


Figure 7. Test Set-up

6.7.4 Measurement Results

Table 42 MEASUREMENT RESULT:QP DECTER

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|---------------|------------------|-----------|------------------|-----------|------|-----|
| 0.242000 | 46.20 | 10.0 | 62 | 15.8 | L1 | FLO |
| 0.670000 | 42.50 | 10.1 | 56 | 13.5 | N | FLO |
| 1.922000 | 35.40 | 10.1 | 56 | 20.6 | N | FLO |
| 2.150000 | 35.40 | 10.1 | 56 | 20.6 | L1 | FLO |
| 6.774000 | 35.20 | 10.2 | 60 | 24.8 | N | FLO |
| 24.714000 | 33.40 | 10.4 | 60 | 26.6 | L1 | FLO |

Table 43 MEASUREMENT RESULT:AV DECTER

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|---------------|------------------|-----------|------------------|-----------|------|-----|
| 0.414000 | 24.70 | 10.0 | 48 | 23.3 | N | FLO |
| 0.672000 | 30.20 | 10.1 | 46 | 15.8 | N | FLO |
| 2.132000 | 25.30 | 10.1 | 46 | 20.7 | N | FLO |
| 2.698000 | 25.40 | 10.2 | 46 | 20.6 | L1 | FLO |
| 6.858000 | 24.60 | 10.2 | 50 | 25.4 | N | FLO |
| 13.218000 | 21.70 | 10.3 | 50 | 28.3 | N | FLO |

6.7.5 Conclusion

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



7 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 44 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 μ V/m) | U=4.1dB; k=2 U=4.1dB; k=2 |
| Conducted emission test for power port | Disturbance Voltage(dB μ 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)