
# FCC
# RF Test Report

**Product Name: HSPA+ USB Stick**

**Model Number: E3533s-58**

**Report No: SYBH(Z-RF)023082013-2001**

**FCC ID：QISE3533S-58**

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

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# Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.

2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.

3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.

4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-2.

5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

6. The test report is invalid if there is any evidence of erasure and/or falsification.

7. The test report is only valid for the test samples.

8. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

| | |
|---|---|
| **Applicant:** | Huawei Technologies Co., Ltd. |
| **Address:** | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |

| | |
|---|---|
| **Date of Receipt Sample:** | 2013-08-26 |
| **Start Date of Test:** | 2013-08-27 |
| **End Date of Test:** | 2013-09-03 |

**Test Result:** Pass

| | | | |
|---|---|---|---|
| **Approved by Senior Engineer:** | 2013-09-04 | Dai Linjun |  |
| | Date | Name | Signature |

| | | | |
|---|---|---|---|
| **Prepared by:** | 2013-09-04 | Zhu Mingjing |  |
| | Date | Name | Signature |

## Modification Record

| No. | Last Report No. | Modification Description |
|---|---|---|
| 1 | | First report. |
| | | |
| | | |
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| | | |

# CONTENT

# 1 General Information

## 1.1 Applied Standard

| | |
|---|---|
| Applied Rules: | 47 CFR FCC Part 02:2012 |
| | 47 CFR FCC Part 22: 2012 |
| | 47 CFR FCC Part 24: 2012 |
| | 47 CFR FCC Part 27: 2012 |
| Test Method: | FCC KDB 971168 D01 Power Meas License Digital Systems v02r01 |

## 1.2 Test Location

| | |
|---|---|
| Test Location 1: | Reliability Laboratory of Huawei Technologies Co., Ltd. |
| Address: | Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C |

## 1.3 Test Environment Condition

| | |
|---|---|
| Ambient Temperature: | -10 to 45 °C |
| Ambient Relative Humidity: | 5%-100% |
| Atmospheric Pressure: | Not applicable |

# 2 Test Summary

## 2.1 Cellular Band (824-849 MHz paired with 869-894 MHz)

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict (NOTE 2) |
|---|---|---|---|---|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §22.913 | FCC: ERP ≤ 7 W. | Appendix A | Pass |
| Modulation Characteristics | §2.1047 | Digital modulation | Appendix C | Pass |
| Bandwidth | §2.1049 | OBW: No limit.<br>EBW: No limit. | Appendix D | Pass |
| Band Edges Compliance | §2.1051, §22.917 | ≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. | Appendix E | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §22.917 | FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10$^{th}$ harmonics but outside authorized operating frequency ranges. | Appendix F | Pass |
| Field Strength of Spurious Radiation | §2.1053, §22.917 | FCC: ≤ -13 dBm/100 kHz. | Appendix G | Pass |
| Frequency Stability | §2.1055, §22.355 | ≤ ±2.5ppm. | Appendix H | Pass |
| NOTE: For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”. | | | | |

## 2.2 PCS Band (1850-1915 MHz paired with 1930-1995 MHz)

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict (NOTE 2) |
|---|---|---|---|---|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §24.232 | EIRP ≤ 2 W | Appendix A | Pass |
| Peak-Average Ratio | §2.1046, §24.232 | FCC: Limit≤13 dB | Appendix B | Pass |
| Modulation Characteristics | §2.1047 | Digital modulation | Appendix C | Pass |
| Bandwidth | §2.1049 | OBW: No limit.<br>EBW: No limit. | Appendix D | Pass |
| Band Edges Compliance | §2.1051, §24.238 | ≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. | Appendix E | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §24.238 | ≤ -13 dBm/1 MHz, from 9 kHz to 10$^{th}$ harmonics but outside authorized operating frequency ranges. | Appendix F | Pass |
| Field Strength of Spurious Radiation | §2.1053, §24.238 | ≤ -13 dBm/1 MHz. | Appendix G | Pass |
| Frequency Stability | §2.1055, §24.235 | FCC: within authorized frequency block. | Appendix H | Pass |
| NOTE: For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”. | | | | |

## 2.3 AWS Band (1710-1755 MHz paired with 2110-2155 MHz)

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict (NOTE 2) |
|---|---|---|---|---|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §27.50(d) | EIRP ≤ 1 W | Appendix A | Pass |
| Peak-Average Ratio | §2.1046, §27.50(d) | FCC: Limit≤13 dB | Appendix B | Pass |
| Modulation Characteristics | §2.1047 | Digital modulation | Appendix C | Pass |
| Bandwidth | §2.1049 | OBW: No limit.<br>EBW: No limit. | Appendix D | Pass |
| Band Edges Compliance | §2.1051, §27.53(h) | ≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. | Appendix E | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §27.53(h) | ≤ -13 dBm/1 MHz, from 9 kHz to 10$^{th}$ harmonics but outside authorized operating frequency ranges. | Appendix F | Pass |
| Field Strength of Spurious Radiation | §2.1053, §27.53(h) | ≤ -13 dBm/1 MHz. | Appendix G | Pass |
| Frequency Stability | §2.1055, §27.54 | Within authorized bands of operation/frequency block. | Appendix H | Pass |
| NOTE: For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”. | | | | |

# 3 Description of the Equipment under Test (EUT)

## 3.1 General Description

E3533s-58 HSPA+/WCDMA/EDGE/GPRS/GSM 7 bands USB Stick is subscriber equipment in the UMTS/GSM system. E3533s-58 implement such functions as RF signal receiving/transmitting, HSPA+/WCDMA and EDGE/GPRS/GSM protocol processing, data service etc. Externally it provides USB interface (to connect to the notebook etc.), USIM card interface.

## 3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

### 3.2.1 Board

| Board | | |
|---|---|---|
| Serial Number | Hardware Version | Description |
| X3N01A9381200104 | CH1E3533SM | Main Board |

## 3.3 Technical Specification

| Characteristics | Description | |
|---|---|---|
| Radio System Type | ☒ GSM<br>☒ UMTS | |
| Supported Frequency Range | GSM850/ WCDMA850 | Transmission (TX): 824 to 849 MHz |
| | | Receiving (RX): 869 to 894 MHz |
| | GSM1900/ WCDMA1900 | Transmission (TX): 1850 to 1910 MHz |
| | | Receiving (RX): 1930 to 1990 MHz |
| | WCDMA1700 | Transmission (TX): 1710 to 1755 MHz |
| | | Receiving (RX): 2110 to 2155 MHz |
| TX and RX Antenna Ports | TX & RX port: | 1 |
| | TX-only port: | 0 |
| | RX-only port: | 0 |
| Target TX Output Power | GSM850: 32.0dBm<br>GSM1900 29.0dBm<br>UMTS850 22.0dBm<br>UMTS1900: 22.0dBm<br>UMTS1700 22.0dBm | |
| Supported Channel Bandwidth | GSM system: | ☒ 200 kHz |
| | UMTS system: | ☒ 5 MHz |
| Designation of Emissions (Note: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.) | GSM850: | 245KGXW, 242KG7W |
| | GSM1900: | 246KGXW, 248KG7W |
| | UMTS850: | 4M16F9W |
| | UMTS1900: | 4M17F9W |
| | UMTS1700: | 4M16F9W |

# 4 General Test Conditions / Configurations

## 4.1 Test Modes

NOTE: The test mode(s) are selected according to relevant radio technology specifications.

| Test Mode | Test Modes Description |
|---|---|
| GSM/TM1 | GSM system, GSM/GPRS, GMSK modulation |
| GSM/TM2 | GSM system, EDGE, 8PSK modulation |
| UMTS/TM1 | WCDMA system, QPSK modulation |
| UMTS/TM2 | HSDPA system, QPSK modulation |
| UMTS/TM3 | HSUPA system, QPSK modulation |

NOTE: HSPA+ implementation of this device, 16QAM is not used for uplink. The uplink Category and release number is same as HSUPA, RF test is not required.

Test Environment

| Environment Parameter | Selected Values During Tests | |
|---|---|---|
| Relative Humidity | 5%-100% | |
| Temperature | TN | Ambient |
| Voltage | VL | 4.75V |
| | VN | 5V |
| | VH | 5.25V |

NOTE: VL= lower extreme test voltage
VN= nominal voltage
VH= upper extreme test voltage
TN= normal temperature

## 4.2 Test Frequency

| Test Mode | TX / RX | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| GSM850 | TX | Channel 128 | Channel 190 | Channel 251 |
| | | 824.2MHz | 836.6MHz | 848.8MHz |
| | RX | Channel 128 | Channel 190 | Channel 251 |
| | | 869.2MHz | 881.6MHz | 893.8MHz |
| WCDMA850 | TX | Channel 4132 | Channel 4182 | Channel 4233 |
| | | 826.4MHz | 836.4MHz | 846.6MHz |
| | RX | Channel 4357 | Channel 4407 | Channel 4458 |
| | | 871.4MHz | 881.4MHz | 891.6MHz |
| Test Mode | TX / RX | RF Channel | | |
| | | Low (L) | Middle (M) | High (H) |
| GSM1900 | TX | Channel 512 | Channel 661 | Channel 810 |
| | | 1850.2MHz | 1880.0MHz | 1909.8MHz |
| | RX | Channel 512 | Channel 661 | Channel 810 |
| | | 1930.2 MHz | 1960.0 MHz | 1989.8 MHz |
| WCDMA1900 | TX | Channel 9262 | Channel9400 | Channel9538 |
| | | 1852.4MHz | 1880.0MHz | 1907.6MHz |
| | RX | Channel 9662 | Channel 9800 | Channel 9938 |
| | | 1932.4 MHz | 1960.0 MHz | 1987.6 MHz |
| Test Mode | TX / RX | RF Channel | | |
| | | Low (L) | Middle (M) | High (H) |
| WCDMA1700 | TX | Channel1312 | Channel1413 | Channel1513 |
| | | 1712.4MHz | 1732.6MHz | 1752.6MHz |

| Test Mode | TX / RX | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| | RX | Channel 1537 | Channel 1638 | Channel 1738 |
| | | 2112.4 MHz | 2132.6 MHz | 2152.6 MHz |

## 4.3 DESCRIPTION OF TESTS

### 4.3.1 Radiated Power and Radiated Spurious Emissions

Radiated spurious emissions are investigated indoors in a semi-anechoic chamber to determine the frequencies producing the worst case emissions. Final measurements for radiated power and radiated spurious emissions are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Emissions are also investigated with the receive antenna horizontally and vertically polarized.

A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other non-metallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized. Measure the EUT maximum RF power and record the result.

A half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_{d\ [dBm]} = P_{g\ [dBm]} - \text{cable loss}_{\ [dB]} + \text{antenna gain}_{\ [dBd/dBi]}$$

Where, $P_d$ is the dipole equivalent power, $P_g$ is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to Pg [dBm] – cable loss [dB].

The calculated Pd levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power}_{[\text{Watts}]})$.

Note: Reference test setup 3

### 4.3.2 Occupied Bandwidth

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.
Note: Reference test setup 1.

### 4.3.3 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its $10_{th}$ harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
Note: Reference test setup 1.

### 4.3.4 Peak-Average Ratio

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.
Note: Reference test setup 1.

### 4.3.5 Frequency Stability / Temperature Variation

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm ) of the center frequency.

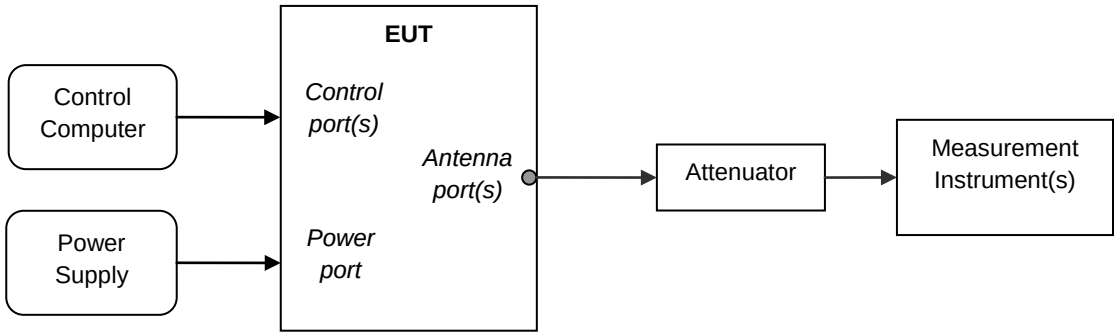
**Time Period and Procedure:**

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

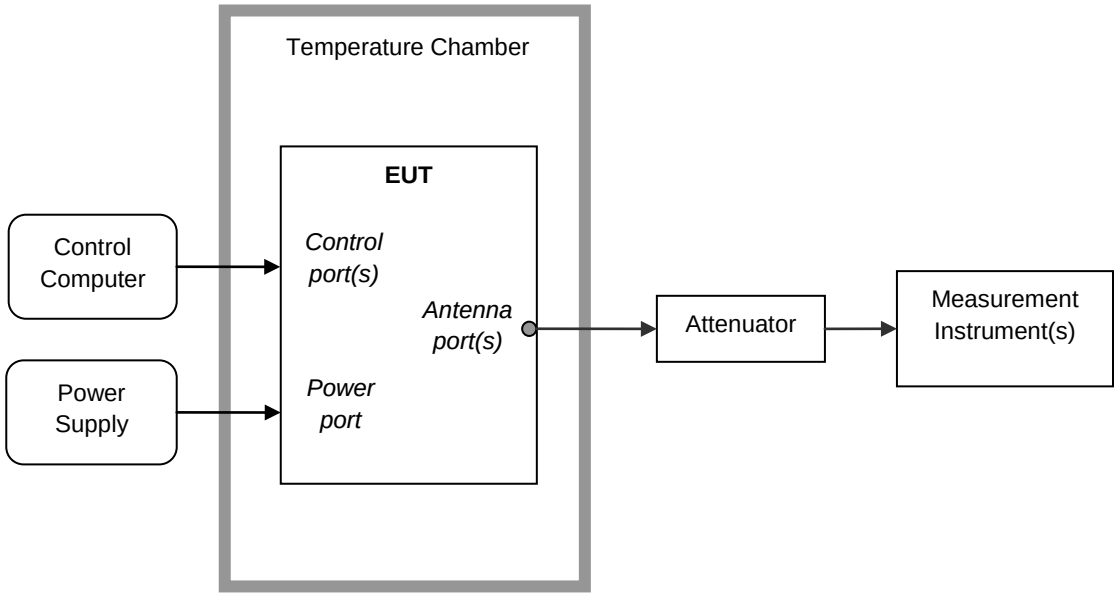
Note: Reference test setup 2.

## 4.4 Test Setups

### 4.4.1 Test Setup 1



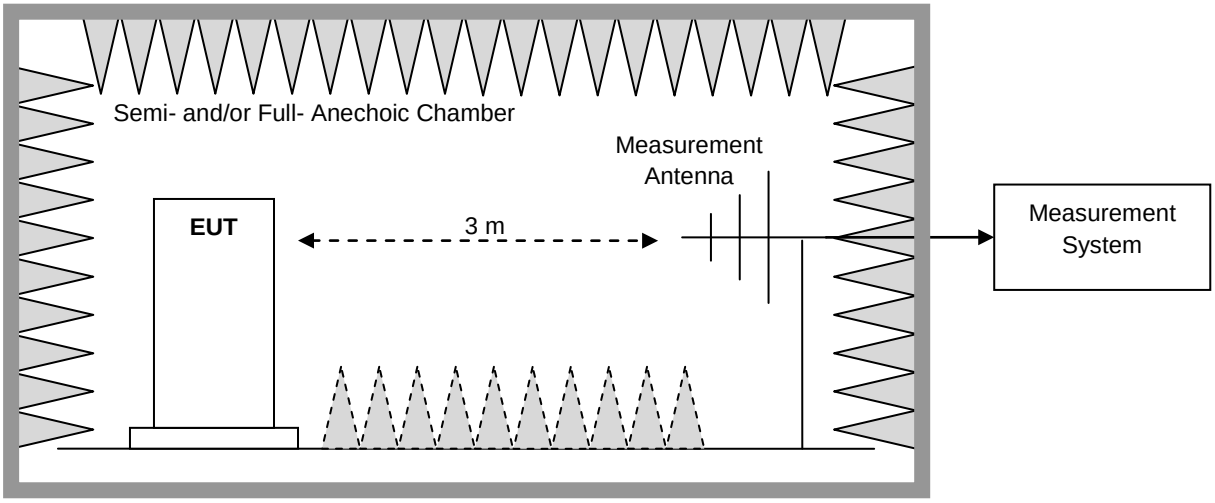

### 4.4.2 Test Setup 2



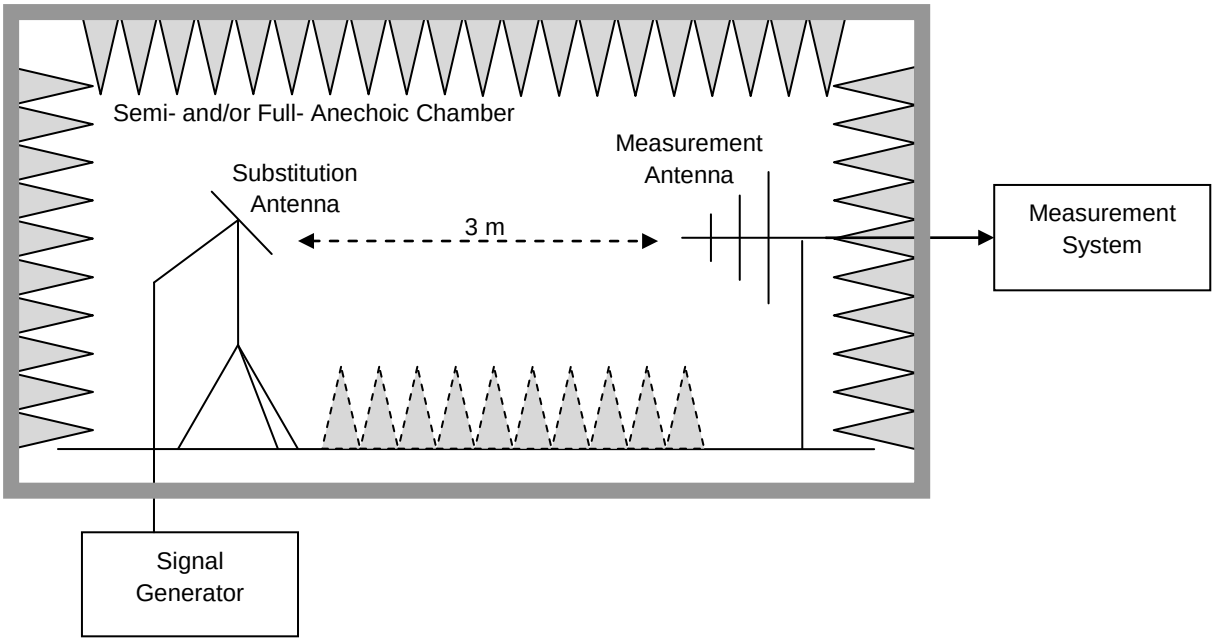
### 4.4.3 Test Setup 3

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

#### 4.4.3.1 Step 1: Pre-test




#### 4.4.3.2 Step 2: Substitution method to verify the maximum ERP



## 4.5 Test Conditions

| Test Case | | Test Conditions | |
|---|---|---|---|
| Transmit Output Power Data | Average Power, Total | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| | Average Power, Spectral Density (if required) | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| Peak-to-Average Ratio (if required) | | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| Modulation Characteristics | | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | M (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| Bandwidth | Occupied Bandwidth | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| | Emission Bandwidth (if required) | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| Band Edges Compliance | | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, H (L= low channel, M= middle channel, H= high channel ) |
| | | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| Spurious Emission at Antenna Terminals | | Test Env. | Ambient Climate & Rated Voltage |
| | | Test Setup | Test Seup 1 |
| | | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel ) |

| Test Case | Test Conditions | |
|---|---|---|
| | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |
| Field Strength of Spurious Radiation | Test Env. | Ambient Climate & Rated Voltage |
| | Test Setup | Test Seup 3 |
| | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1/TM2/TM3<br>NOTE: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected. |
| | RF Channels (TX) | L, M, H<br>(L= low channel, M= middle channel, H= high channel ) |
| Frequency Stability | Test Env. | (1) -30 °C to +50 °C with step 10 °C at Rated Voltage;<br>(2) VL, VN and VH of Rated Voltage at Ambient Climate. |
| | Test Setup | Test Seup 2 |
| | RF Channels (TX) | L, M, H<br>(L= low channel, M= middle channel, H= high channel ) |
| | Test Mode | GSM/TM1,GSM/TM2,UMTS/TM1 |

## 5 Main Test Instruments

| Equipment Name | Manufacturer | Model | Serial Number | Cal Date | Cal. Due |
|---|---|---|---|---|---|
| Power supply | KEITHLEY | 2303 | 1288003 | 2012-11-19 | 2014-11-18 |
| Universal Radio Communication Tester | R&S | CMU200 | 123299 | 2012-09-20 | 2013-09-19 |
| Signal Analyzer | R&S | FSQ31 | 200021 | 2012-11-09 | 2013-11-08 |
| Spectrum Analyzer | Agilent | N9030A | MY49431698 | 2012-11-09 | 2013-11-08 |
| Universal Radio Communication Tester | Agilent | E5515C | MY50260239 | 2012-11-09 | 2013-11-08 |
| Temperature Chamber | WEISS | WKL64 | 56246002940010 | 2013-01-29 | 2014-01-28 |
| Signal generator | Agilent | E8257D | MY49281095 | 2012-09-14 | 2013-09-13 |
| Vector Signal Generator | R&S | SMU200A | 104162 | 2012-10-16 | 2013-10-15 |
| Spectrum analyzer | R&S | FSU3 | 200474 | 2013-01-29 | 2014-01-28 |
| Spectrum analyzer | R&S | FSU43 | 100144 | 2013-01-29 | 2014-01-28 |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S | HF907 | 100304 | 2013-02-02 | 2014-02-01 |
| Trilog Broadband Antenna (30M~3GHz) | SCHWARZBECK | VULB 9163 | 9163-521 | 2011-12-09 | 2013-12-08 |
| Pyramidal Horn Antenna(18GHz-26.5GHz) | ETS-Lindgren | 3160-09 | 00091989 | 2011-10-20 | 2013-10-19 |
| LOOP Antennas(9kHz-30MHz) | R&S | HFH2-Z2 | 100262 | 2013-03-.23 | 2015-03-22 |
| 150M－1G Biconical VHF-UHF Broadband Antenna | SCHWARZBECK | VUBA 9117 | 9117-213 | 2013-02-02 | 2015-02-01 |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S | HF907 | 100391 | 2011-10-12 | 2013-10-11 |

## 6 Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

| Test Item | | Extended Uncertainty |
|---|---|---|
| Transmit Output Power Data | Power [dBm] | U = 0.39 dB |
| Bandwidth | Magnitude [%] | U = 0.2% |
| Band Edge Compliance | Disturbance Power [dBm] | U = 2.0 dB |
| Spurious Emissions, Conducted | Disturbance Power [dBm] | U = 2.0 dB |
| Field Strength of Spurious Radiation | ERP [dBm] | For 3 m Chamber:<br>U = 4.6 dB (30 MHz to 1GHz)<br>U = 3.0 dB (above 1 GHz)<br>For 10 m Chamber:<br>U = 4.6 dB (30 MHz to 1GHz)<br>U = 3.0 dB (above 1 GHz) |
| Frequency Stability | Frequency Accuracy [ppm] | U = 0.21 ppm |

END