



FCC Test Report

Product Name: WebConnect Glide

Model Number: UMG1691

Report No: SYBHZ(R)E010022010EB-4
FCC ID: QISE1691

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REPORT ON **FCC Test of WebConnect Glide**

M/N: UMG1691

Report No: SYBHZ(R)E010022010EB-4

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

FCC CFR47 Part 27: Subpart C&L;

CONCLUSION **Pass**

General Manager

Jan. 28, 2010

张兴海

Date

Name

signature



**Technical Responsibility
For Area of Testing**

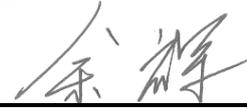
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Test Lab Engineer

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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	EFFECTIVE RADIATED POWER OF TRANSMITTER (EIRP).....	12
6.2	CONDUCTED POWER OF TRANSMITTER.....	16
7	<u>System Measurement Uncertainty</u>	18



1 Summary

The table below summarizes the measurements and results for the HUAWEI UMG1691 USB Stick. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	27.50(d)(2)	Effective Radiated Power of Transmitter	PASS
2.1046	27.50(d)(2)	Conducted Power of Transmitter	PASS
2.1047	/	Modulation Characteristics	PASS
2.1049	/	Occupied Bandwidth	PASS
2.1051	27.53(g)	Band Edges Compliance	PASS
2.1051	27.53(g)	Spurious Emission at Antenna Terminal	PASS
2.1055	27.54	Frequency Stability	PASS

Note: The Radiated Spurious Emissions' test results are shown in the EMC report.



2 Product Description

2.1 Production Information

2.1.1 General Description

HUAWEI UMG1691 USB Stick is subscriber equipment in the GSM/UMTS system. The frequency band is 1700M. The UMG1691 implements such functions as RF signal receiving / Transmitting, HSUPA/HSDPA/WCDMA/EDGE/GPRS/GSM protocol processing and data service etc. Externally it provides USB interface (to connect to the notebook etc.), USIM card interface. It has an internal antenna. UMG1691 uses Qualcomm MSM6290 chipset and Zero-IF technologies.

2.1.2 Support function and Service

The HUAWEI UMG1691 USB Stick support the function and service as follows:

Table 2 Service and Test mode List

Service Name	Characteristic	Corresponding Test Mode	Note
Data	Modulation: QPSK	TM1	HSUPA

Note: * The WCDMA test condition & settings are defined in 3GPP TS 34.121 V7.5.0:2007.

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

Jan. 21, 2010 – Jan. 21, 2010

3.2 General Set up Description

HUAWEI UMG1691USB Stick can support GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA mode and AWS Band. During this measurement, the HUAWEI UMG1691 USB Stick just works in WCDMA/HSDPA/HSUPA mode and AWS Band.

TM1: HSUPA Mode with QPSK Modulation



4 Product Description

4.1 Technical Characteristics

4.1.1 Frequency Range

Table 4 Frequency Range

Uplink band:	1710 to 1755 MHz
Downlink band:	2110 to 2155 MHz

4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

	HSUPA
Channel raster	200k Hz
Channel spacing:	5MHz

4.1.3 Type of Emission

Table 6 Type of Emission

	HSUPA
Emission Designation:	5M00F9W

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

4.1.4 Environmental Requirements

Table 7 Environmental Requirements

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

4.1.5 Power Source

Table 8 Power Source

DC voltage nominal:	 5.0V; Supplied by USB port of notebook
DC voltage range	 4.75- 5.25V
DC current maximal:	500mA

4.1.6 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.

4.1.7 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 9 Applied RF Module Voltages and Currents

Voltage:	 2.85V (for the RF IC)
Current:	150mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)
Voltage:	 3.6V (for the PA module)
Current:	350mA According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)



4.2 EUT Identification List

4.2.1 Board Information

Table 10 Board Information

WebConnect Glide		
UMG1691		
Board and Module		
Model name	Serial Number	Remarks
UMG1691	QC7NAB19B0201878	CD98TCPU

4.2.2 Adapter Technical Data

Not Applicable.

4.2.3 Battery Technical Data

Not Applicable.

4.2.4 FCC Identification

FCC Identification: QISE1691



5 Main Test Instruments

Table 11 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until (MM.DD.YYYY)
EMI Test receiver	R&S	ESIB 26	100318	4.22, 2010
Broadband Antenna	Schaffner	CBL 6112B	2941	4.17, 2010
Horn Antenna	R & S	HF906	359287/006	6.19.2010
Tunable Dipole	Schwarzbeck	D69250- UHAP/D69250-VHAP	979/917	11.20.2010
Signal Generator	R&S	SMR 40	100325	5.12, 2010
Vector Signal Generator	R&S	SMU200A	3605064030	06.14.2010
Power Supply	Agilent	66311B	MY43006371	04.26.2010
Climate Chamber	WEISS	WK11-600/70	5922602844001 0	9.26.2010
Universal Radio Communication Tester	R&S	CMU200	113164	06.17.2010
Spectrum Analyzer	R&S	FSU26	200002	04.29.2010



6 Transmitter Measurements

6.1 Effective Radiated Power of Transmitter (EIRP)

6.1.1 Test Conditions

Table 12 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1 at frequency Bottom, Middle, Top

6.1.2 Test Specifications and Limits

6.1.2.1 Specification

CFR 47 (FCC) part 2.1046 and Part 27.50(d)2

6.1.2.2 Supporting Standards

Table 13 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
3GPP TS 34.121 V7.5.0:2007	Technical Specification Group Radio Access Network; User Equipment (UE) conformance specification; Radio transmission and reception (FDD);

6.1.2.3 Limits

Compliance with Part 27.232, mobile/portable stations are limited to 1 watt EIRP peak power. $W(\text{dBm}) = 10 \cdot \log(W_{\text{in mW}})$.

Table 14 Limits

Maximum Output Power (Watts)	< 1 Watt
Maximum Output Power (dBm)	< 30 dBm

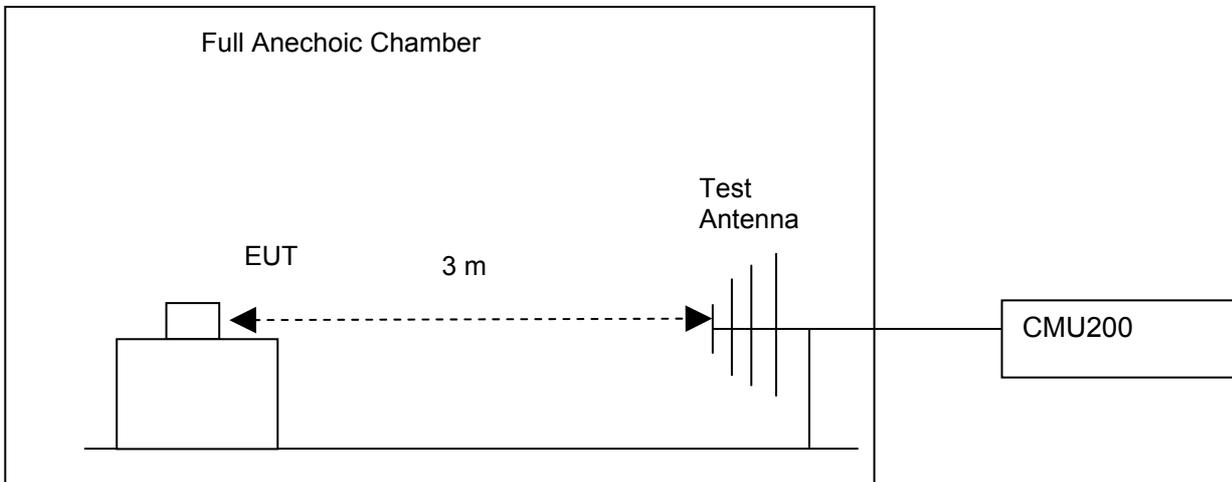
6.1.3 Test Method and Setup

- (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, EIRP shall be measured when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1033(c)(8). Connect the HUAWEI UMG1691 USB Stick to the wireless communication tester CMU200 via the air interface. The band is set as AWS.
- (b) Test the Radiated maximum output power by the CMU200 received from test antenna.
- (c) Use substitution method to verify the maximum output power. The EUT is substituted by a horn antenna. The horn is connected to a signal generator. And then adjust the output level of the signal

generator to get the same received power recorded in step (b) on CMU200, and record the power level of Signal Generator. Of course, the cable loss at the test frequency should be compensated.

Test setup

Step 1: Pre-test



Step 2: Substitution method to verify the maximum EIRP

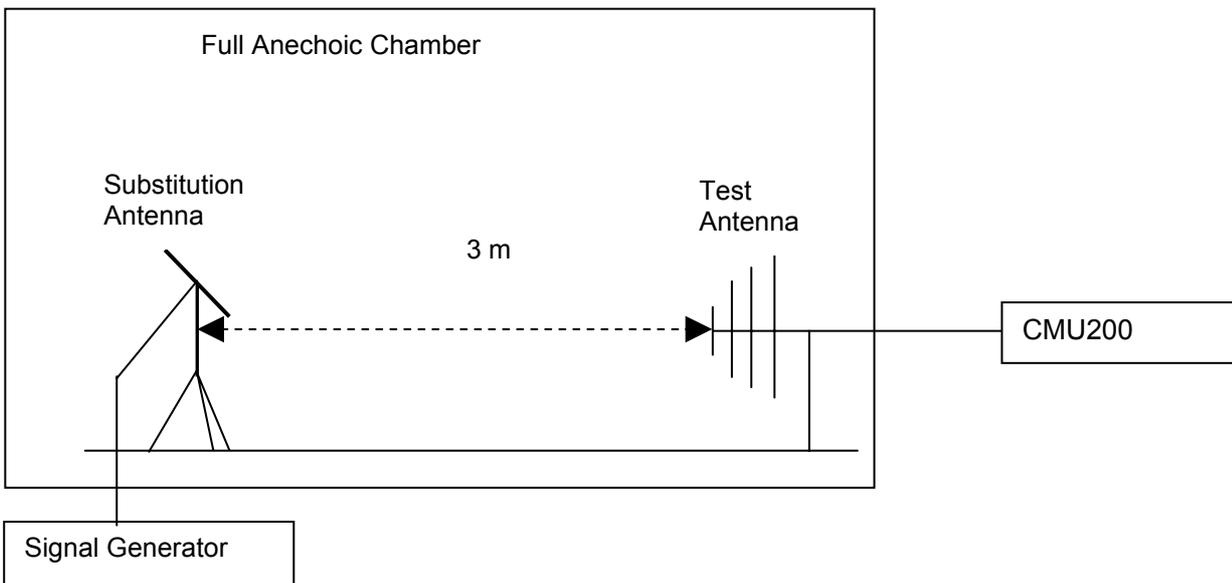


Figure 1. Test Set-up

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

There is a constant difference of 2.15 dB between ERP and EIRP.

$EIRP (dBm) = ERP (dBm) + 2.15$ (ITU-R Recommendation SM.329-10).

EIRP was measured using 1 host.

BenQ Joy book S72



6.1.4 Measurement Results

6.1.4.1 Pre-test Results

For HSUPA test mode, there are 5 sub-tests for different configuration. For the sub-test 1, the max power of UMG1691 is the maximum as followed table.

The channel is mid range.

Table 15 HSUPA conducted max power pre-scan

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI	Test result
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	20.02
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	18.44
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4 4	2	2.0	1.0	15	92	19.05
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	18.65
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	19.92

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

For the following test, the TM1 was used for HSUPA.

Table 16 Measurement Results

TEST CONDITIONS		RF Output Power (EIRP)					
		Channel1312(B) 1712.4MHz		Channel1412(M) 1732.4MHz		Channel1513(T) 1752.6MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
TM1	T_{nom} (25 °C)	21.96	30	22.84	30	22.48	30
	Vnom (5.0V)						



6.1.4.2 Substitution Results

Table 17 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
TM1	1712.4	21.96	Horn Ant.	18.31	4.5	1.0	21.81	30	Pass
TM1	1732.4	22.84	Horn Ant.	19.10	4.5	1.0	22.60	30	Pass
TM1	1752.6	22.48	Horn Ant.	18.46	4.8	1.0	22.26	30	Pass

Note: a, For get the EIRP (Effective Isotropic Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

NOTE: SGP- Signal Generator Level

b, RBW=10kHz, VBW=300kHz, and integrated by the instrument to 5M for TM1 and TM2 and TM1.

6.1.5 Conclusion

The equipment **PASSED** the requirement of this clause.

6.2 Conducted Power of Transmitter

6.2.1 Test Conditions

Table 18 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	52 %
Test Configurations:	TM1 at frequency Bottom, Middle, Top

6.2.2 Test Specifications and Limits

6.2.2.1 Specification

CFR 47 (FCC) part 2.1047 and Part 27.50(d)(2)

6.2.2.2 Supporting Standards

Table 19 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
3GPP TS 34.121 V8.4.0:2008	Technical Specification Group Radio Access Network; User Equipment (UE) conformance specification; Radio transmission and reception (FDD);

6.2.2.3 Limits

Compliance with Part 27.232, in no any case may the peak power of a mobile station transmitter exceed 2 W. The calculated longitude EIRP by following formula:

$$EIRP(dBm) = 10 * \log(EIRP_{mW}).$$

And for conducted power, we can use Antenna Gain to calculate the limit. So the conducted power:

$$P_{cod.}(dBm) = EIRP(dBm) - Gain(dBi).$$

and $Gain(dBi) = Gain(dBd) + 2.15dB$

Table 20 Limits

Maximum Output Power (Watts)	< 1 Watt (30 dBm)
Antenna Gain(dBi):	2.82
Maximum Conducted Output Power (dBm)	< 27.18

6.2.3 Test Method and Setup

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, Conducted maximum power shall be measured when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1033(c)(8). Connect the HUAWEI UMG1691 USB Stick to the wireless communication tester CMU200 via the antenna connector. The band class is set as AWS.
(b) Test the Conducted maximum output power by the CMU200.

Test setup

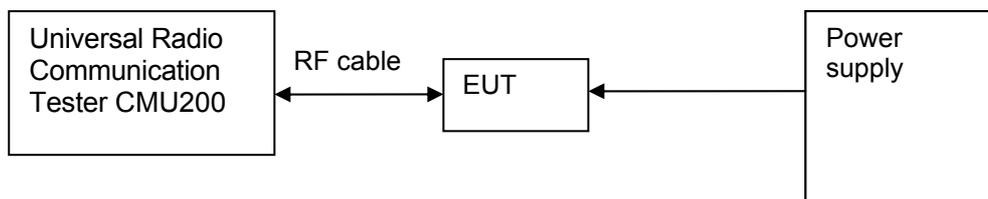


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 21 Measurement Results

TEST CONDITIONS		RF Output Power(Conducted)					
		Channel1312(B) 1712.4MHz		Channel1412(M) 1732.4MHz		Channel1513(T) 1752.6MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
TM1	T _{nom} (25 °C) V _{nom} (5.0V)	19.14	27.18	20.02	27.18	19.66	27.18

6.2.5 Conclusion

The equipment **PASSED** the requirement of this clause.



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 22 System Measurement Uncertainty

Items		Extended Uncertainty
Effective Radiated Power of Transmitter	EIRP (dBm)	U=3dB; k=2
Band Width	Magnitude (%)	U=0.2%; k=2
Band Edge Compliance	Disturbance Power(dBm)	U=2.0dB; k=2
Conducted Spurious Emission at Antenna Terminal	Disturbance Power(dBm)	U=2.0dB; k=2
Frequency Stability	Frequency Accuracy(ppm)	U=0.21ppm; k=2