



MPE TEST REPORT

No. ECIT-2012-0029-MPE

For

Client : D-Link Corporation

Production : DC-HSPA+ module

Model Name : DWM-800B

Hardware Version: 1.0

Software Version: 1.0

Issued date: 2013-4-17

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn



CONTENTS

1.	TEST LABORATORY	3
1.1.	TESTING LOCATION	3
1.2.	PROJECT DATA	3
1.3.	SIGNATURE	3
2.	CLIENT INFORMATION.....	4
2.1.	APPLICANT INFORMATION.....	4
2.2.	MANUFACTURER INFORMATION.....	4
3.	EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	5
3.1.	ABOUT EUT	5
3.2.	INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	5
3.3.	INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	5
4.	REFERENCE DOCUMENTS	6
4.1.	APPLICABLE STANDARDS.....	6
4.2.	TEST LIMITS.....	6
5.	TEST RESULTS	7
5.1.	CONDUCTED PF POWER OUTPUT	7
5.2.	CALCULATION INFORMATION	7
5.3.	RESULT OF GSM835	7
5.4.	RESULT OF GSM1900	8
5.5.	RESULT OF WCDMA BAND II	8
5.6.	RESULT OF WCDMA BAND V	9



1. Test Laboratory

1.1. Testing Location

Company Name: ECIT Shanghai, East China Institute of Telecommunications
Address: 7F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai,
P. R. China
Postal Code: 200001
Telephone: 86-21-63843300
Fax: 86-21-63843301

1.2. Project data

Project Leader: Liu Jianquan
Testing Start Date: Apr 17, 2013
Testing End Date: Apr 17, 2013

1.3. Signature

Hu Jiajing
(Prepared this test
report)

Yu Naiping
(Reviewed this test report)

Zheng Zhongbin
Director of the laboratory
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: D-Link Corporation
Address /Post: 17595 Mt. Herrmann, Fountain Valley, California, United States
Country: United States
Telephone: +886-2-6600-0123
Postal Code: 92708
Contact: Michael Boschma

2.2. Manufacturer Information

Company Name: Shanghai BroadMobi Communication Technology Co., Ltd
Address /Post: Rm.901, Building9, No.1515 Gumei Rd.,Xuhui District, Shanghai, P.R.China
Country: China
Telephone: +44 (0)20 8839 8888
Fax: +86-21-60913308-818
Contact: Jacqueline Zeng



3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	DC-HSPA+ module
Model name	DWM-800B
UMTS Frequency Band	WCDMA BandII; WCDMA BandV
GSM Frequency Band	GSM835/GSM1900
Antenna Type	External Antenna

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version:
S1	IMEI: 355413050010541	1.0	1.0

*EUT ID: is used to identify the test sample in the lab internally.

Note: the EUT has no earphone.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	N/A	N/A	N/A
AE2	Headset	N/A	N/A	N/A

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Applicable Standards

The MPE report was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 2.1091.

The limits standard is based on the Council Recommendation 1999/519/EC.

FCC CFR 47, Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS, Oct 1,2011

Section 2.1091 Radiofrequency radiation exposure evaluation: mobile devices, Oct 1,2011

4.2. Test Limits

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

Limits for Occupational / Controlled Exposure

Frequency Range [MHz]	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density (S) [mW/cm ²]	Averaging Times E ² , H ² or S [minutes]
0.3 – 3.0	614	1.63	(100)*	6
3.0 – 30	1824/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6

Limits for General Population / Uncontrolled Exposure

Frequency Range [MHz]	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density (S) [mW/cm ²]	Averaging Times E ² , H ² or S [minutes]
0.3 – 1.34	614	1.63	(100)*	30
1.34 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	--	--	F/1500	30
1500 - 100000	--	--	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

For the DUT, the limits for Occupational /Controlled Exposure are applicable.

5. Test Results

5.1. Conducted PF Power Output

Table 5.1: The Conducted Power For GSM

GSM 835MHZ	Conducted Power (dBm)		
	Channel 128 (824.2MHz)	Channel 190 (836.6MHz)	Channel 251 (848.8MHz)
	32.0	31.9	31.8
GSM 1900MHZ	Conducted Power (dBm)		
	Channel 512 (1850.2MHz)	Channel 661 (1880MHz)	Channel 810 (1909.8MHz)
	28.3	27.9	27.8

Table 5.2: The conducted Power for WCDMA

Item	FDDII Conducted Power(dBm)		
	9262 (1852.4MHz)	9400 (1880MHz)	9537 (1907.6MHz)
WCDMA Band II	25.4	23.5	23.9
Item	FDDV Conducted Power(dBm)		
	4133 (826.4MHz)	4175 (836.6MHz)	4232 (846.6MHz)
WCDMA Band V	25.6	24.9	25.5

5.2. Calculation Information

From the antenna specifications provided by the applicant, the antenna gain is -0.71 dBi in GSM 835MHz/WCDMA band V and 2.92 dBi in GSM 1900MHz/WCDMA band II.

So for conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

Based on the FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091, the DUT is evaluated as a mobile device.

5.3. Result of GSM835

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 824.2 – 848.8 MHz; as per the original test report the highest power is GSM835, Low channel 128. The maximum conducted power is 32.0 dBm . The maximum gain is -0.71dBi.The

resulted power density at a distance of 20cm can be deducted as follows:

$$\text{EIRP}=32.0+(-0.71)=31.29 \text{ dBm}=1345.86 \text{ mW}$$

$$\text{Power Density}=\text{EIRP}*\text{Duty Cycle}/(4\pi R^2)=1345.86*8.3/(4*\pi *20^2)=2.22 \text{ mW/cm}^2$$

Where Duty Cycle is 8.3 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 824.2/300 = 2.75 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

5.4. Result of GSM1900

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 1850.2 – 1909.8 MHz; as per the original test report the highest power is GSM1900, Low channel 512. The maximum conducted power is 28.3 dBm . The maximum gain is 2.92 dBi. The resulted power density at a distance of 20cm can be deducted as follows:

$$\text{EIRP}=28.3+2.92=31.22 \text{ dBm}=1324.34 \text{ mW}$$

$$\text{Power Density}=\text{EIRP}*\text{Duty Cycle}/(4\pi R^2)=1324.34*8.3/(4*\pi *20^2)=2.187 \text{ mW/cm}^2$$

Where Duty Cycle is 8.3 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1850.2/300 = 6.167 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

5.5. Result of WCDMA Band II

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 1852.4 – 1907.8 MHz; as per the original test report the highest power is WCDMA Band II, Low channel. The maximum conducted power is 25.4 dBm . The maximum gain is 2.92 dBi. The resulted power density at a distance of 20cm can be deducted as follows:

$$\text{EIRP}=25.4+2.92=28.32 \text{ dBm}=679.20 \text{ mW}$$

$$\text{Power Density}=\text{EIRP}*\text{Duty Cycle}/(4\pi R^2)=679.20*1/(4*\pi *20^2)=0.135 \text{ mW/cm}^2$$

Where Duty Cycle is 1 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:



$$\text{MPE limit} = 1852.4/300 = 6.174 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

5.6. Result of WCDMA Band V

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 826.4 – 846.6 MHz; as per the original test report the highest power is WCDMA Band V, Low channel. The maximum conducted power is 25.6 dBm . The maximum gain is -0.71 dBi. The resulted power density at a distance of 20cm can be deducted as follows:

$$\text{EIRP} = 25.6 + (-0.71) = 24.89 \text{ dBm} = 308.32 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} \cdot \text{Duty Cycle} / (4\pi R^2) = 308.32 \cdot 1 / (4 \cdot \pi \cdot 20^2) = 0.061 \text{ mW/cm}^2$$

Where Duty Cycle is 1 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 826.4/300 = 2.75 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

Note: $\pi=3.1416$

So the product is under the MPE limits. All is pass.

*****END OF REPORT*****