



EMF TEST REPORT

Project Number : EA1706Q-016
Test Report Number : TR-W1706-019
Type of Equipment : Wireless LAN Module
Model Name : TWFM-M311D
Multiple Model Name : N/A
Applicant : Sindoh Co., Ltd.
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Regulation : EN 62311: 2008
Total page of Report : 5 Pages
Date of Receipt : 2017-06-12
Date of Issue : 2017-06-16
Test Result : PASS

This test report only contains the result of a single test of the sample supplied for the examination.
 It is not a generally valid assessment of the features of the respective products of the mass-production.

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CONTENTS

	Page
1. EUT (EQUIPMENT UNDER TEST)	3
2. TEST RESULT	4
2.1 RF EXPOSURE LIMIT	4
2.2 FAR FIELD CALCULATION FORMULA	5
2.3 EMF EVALUATED DATA	5
2.4 CONCLUSION	5

Release Control Record

Issue Report No.	Issued Date	Revisions	Effect Section
TR-W1706-019	2017-06-16	Initial Release	All

1. EUT (Equipment Under Test)

1.1 General Description

The EUT is a wireless LAN module has function for single band 1T1R. The module is based on Marvell 88W8782U solution. The EUT has function for 802.11b/g/n, and measured RF output power is as following table.

1.2 RF Output Power

All data rates have been investigated and the worst one was reported as following table.

Operating Mode	Channel	Frequency (MHz)	Data rate (Mbps)	Output Power (dBm)
802.11b	Low	2 412	1	17.29
	Middle	2 442	1	16.78
	High	2 472	1	17.40
802.11g	Low	2 412	6	16.12
	Middle	2 442	6	15.93
	High	2 472	6	17.48
802.11n HT 20	Low	2 412	6.5	15.47
	Middle	2 442	6.5	14.81
	High	2 472	6.5	16.14
802.11n HT 40	Low	2 422	13.5	15.82
	Middle	2 442	13.5	15.83
	High	2 462	13.5	16.33

2. TEST RESULT

2.1 RF Exposure Limit

According to the EN 62311, the criteria listed in below table shall be used to evaluate the environment impact of human exposure to Radio Frequency radiation as specified table 2 of Council Recommendation 1999/519/EC.

Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μ T)	Equivalent plane wave power density S_{eq} (W/m^2)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	$4\,000/f$	$5\,000/f$	—
0,025-0,8 kHz	$250/f$	$4/f$	$5/f$	—
0,8-3 kHz	$250/f$	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	$0,73/f$	$0,92/f$	—
1-10 MHz	$87/f^{1/2}$	$0,73/f$	$0,92/f$	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375 f^{1/2}$	$0,0037 f^{1/2}$	$0,0046 f^{1/2}$	$f/200$
2-300 GHz	61	0,16	0,20	10

2.2 Far Field Calculation Formula

Acc. to the standard, EN 62311 Annex A, far field electromagnetic field is calculated as follows:

$$E = \sqrt{(30 * P * G) / r}$$

Where

G = Numerical antenna gain relative to an isotropic antenna

r = distance from observation point to the antenna

2.3 EMF Evaluated Data

Mode	P (dBm)	P (W)	G (dBi), Log	G (dBi),Linear	Distance (m)	E Field Strength (V/m)
802.11b	17.40	0.055	2.0	1.58	0.2	8.08
802.11g	17.48	0.056				8.16
802.11n HT20	16.14	0.041				6.99
802.11n HT40	16.33	0.043				7.15

2.4 Conclusion

The maximum E Field strength level of this EUT is 6.49 V/m when safety distance between the EUT and human body is maintained at least 0.2m, so the electromagnetic field of the EUT are MET the RF exposure requirement, 61 V/m mentioned on clause 2.1 in this test report.