

Maximum Permissible Exposure Evaluation

Test Report No : CSTPOC12-FCC0043-1

Equipment Name : Access Point
Model No. : WRO-100
Applicant : OPHIT CO., LTD.
Address : #302, Suntechnovil, 5-27 Mangpo-dong, Yeongtong-gu,
Suwon-city, Gyeonggi-do, Korea

This report applies only to the product named in the title of this report manufactured at the location indicated. Test results apply only to the particular equipment and functionality described in this test report.

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1. General Description of EUT

Item		Specification	note
CPU		320MHz MIPS32bIT	H/W SECTION
Dimension		140 mm x 85 mm x 50 mm	
RF spec	Frequency Range	2412 MHz ~ 2472 MHz (802.11 b, g, n(HT20)), 2422 MHz ~ 2462 MHz (802.11 n(HT40))	
	Channel	13 (802.11 b, g, n(HT20)), 9 (802.11 n(HT40))	
	Data spreading Method	DSSS(802.11b), OFDM (802.11g, n(HT20), n(HT40))	
	RF Output Power	802.11b : 9.54 mW (Port 1), 9.54 mW (Port 2) 802.11g : 9.33 mW (Port 1), 8.87 mW (Port 2) 802.11n(HT20) : 10.04 mW (Port 1), 10.06 mW (Port 2) 802.11n(HT40) : 10.25 mW (Port 1), 10.59 mW (Port 2) * Conducted power including antenna gain, declared by the applicant	
	Antenna Gain	1) Any transmit signals are correlated, Directional Gain = GANT + 10 log(N) dBi = 2 + 10 log(2) = 5 dBi 2) All transmit signals are completely uncorrelated, Directional Gain = GANT = 2 dBi	
Power Source		AC 110V	Adaptor (Input : AC 100V~240V, Output : DC +5V 2.0A)

NOTE:

1. This report is issued as a supplementary report of the original report.
2. The EUT, operates in the 2.4GHz frequency range, lets you connect WiFi devices to the network.
3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

2. General Information of Test

Certification Service Technology Inc. (CSTech)	
Test Site Location	1055, Singil-dong ,Danwon-gu ,Ansan-si, Gyeonggi-do, Korea 425-839
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3. RF Exposure Measurement

3.1 Introduction & Standard

RF Exposure Requirements	: 47 CFR §1.1307(b)
RF Radiation Exposure Limits	: 47 CFR §1.1310
RF Radiation Exposure Guidelines	: FCC OST/OET Bulletin Number 65
EUT Frequency Band	: 2412 MHz ~ 2472 MHz (WiFi)
Limits for General Population/Uncontrolled Exposure in the band of	: 1500 MHz ~ 100000 MHz
Power Density Limit	: 1 mW/ cm ²

3.2 Compliance criteria

Evaluating for Power flux density

Equations are accurate in the far-field If antenna but will over-predict in the near field.

Under above describe specification of EUT and Antenna, Equivalent plane wave power density is calculated as below underlined quotation formula ;

$$S_{eq} (W/m^2) = E \times H = E^2/\eta = \frac{\sqrt{PG(\phi, \Phi)}/4\pi r^2}{}$$

Where :

- $S_{eq} (W/m^2)$ = Equivalent plane wave power density
- $E (V/m)$ = Electric field strength
- $H (A/m)$ = Magnetic field strength
- $\eta (\Omega)$ = Free space wave impedance = $120 \pi \Omega$
- ϕ, Φ = elevation and azimuth angles
- $P (W)$ = Power input to the antenna
- $G (dBi)$ = Antenna gain relative to an isotropic antenna
- $r (m)$ = distance from observation point to the antenna

3.2.1 Accordingly as a result of calculated value

3.2.1.1 Port 1

- $P (W) = 10.25 \text{ mW}$
- $G (dBi) = 2 \text{ dBi}$ (Conversion 2 dBi to Linearity value is 1.58)
- $r (m)$ = setting a distance (20cm) from the antenna to calibrated tuned receiving antenna in far field

$$S_{eq} (W/m^2) : \sqrt{0.01025 \times 1.58 / 4 \times 3.14 \times 0.2^2} = 0.17954$$

3.2.1.2 Port 2

- P(W) = 10.59 mW
- G(dBi) = 2 dBi (Conversion 2 dBi to Linearity value is 1.58)
- r(m) = setting a distance (20cm) from the antenna to calibrated tuned receiving antenna in far field

$$S_{eq}(W/m^2) : \sqrt{0.01059 \times 1.58} / 4 \times 3.14 \times 0.2^2 = 0.18249$$

$$\therefore \text{Port 1} + \text{Port 2} = 0.17954 + 0.18249 = \underline{\underline{0.36203}}$$

So, above calculated 0.36203 W/m² is comply with the value required standard