

Maximum Permissible Exposure Evaluation

FCC ID: 2ADHQHR103-W

1. Client Information

Applicant : Macro Plus
Address : 109 Dabutou, Songyuan Village, Guanlan Town, Baoan District,
Shenzhen, China
Manufacturer : Macro Plus
Address : 109 Dabutou, Songyuan Village, Guanlan Town, Baoan District,
Shenzhen, China

2. General Description of EUT

EUT Name	:	IP Fusion Curve	
Models No.	:	HR103-W	
Model Difference	:	N/A	
Product Description	:	Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz	
	:	Number of Channel:	802.11b/g/n(HT20): 11channels 802.11n(HT40): 7channels
	:	Out Power	802.11b: 15.41 dBm 802.11g: 15.20 dBm 802.11n (HT20): 15.44 dBm 802.11n (HT40): 15.54 dBm
	:	Antenna Gain:	2 dBi (FPC Antenna)
	:	Modulation Type:	802.11b: CCK, QPSK, BPSK 802.11g: OFDM 802.11n: OFDM

		Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	DC power supplied by AC/DC Adapter	
Power Rating	:	AC/DC Adapter: Input: AC 100~240V 50/60Hz 0.15A Output: DC 5V 1A	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

Note:

- (1) More detail information about Equipment, please refer to User's manual, more information about the RF, please refer to test report.
- (2) Antenna information provided by the applicant.

Ant. No.	Brand	Model Name	Antenna Type	Gain (dBi)
1	N/A	FR1213C5	FPC Ant.	2.0

MPE Calculations for WIFI

1. Antenna Gain:

FPC Antenna: 2 dBi.

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna

4. Test Result:

Worst Maximum MPE Result							
Mode	N _T x	Frequency (MHz)	Power (dBm) [P]	ANT Gain (dBi) [G]	Turn-up Power Tolerance (dB)	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11b	1	2437	15.41	2	± 1	20	0.01379
802.11g	1	2462	15.20	2	± 1	20	0.01314
802.11n (HT20)	1	2462	15.44	2	± 1	20	0.01389
802.11n (HT40)	1	2437	15.54	2	± 1	20	0.01421
Note: (1) N _{TX} = Number of Transmit Antennas (2) RF Output power specifies that Maximum Conducted Peak Output Power.							

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm ²)
300-1,500	F/1500
1,500-100,000	1.0

For 802.11b/g/n (2412~2462 MHz)

MPE limit S: 1 mW/ cm²

The MPE is calculated as 0.01421mW / cm² < limit 1 mW / cm². So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.