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

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		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_{TX}	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/ cm^2
The MPE is calculated as 0.01421mW / cm^2 < limit 1 mW / cm^2. 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.