

Maximum Permissible Exposure Evaluation

FCC ID: V7TPA7

1. Client Information

Applicant : SHENZHEN TENDA TECHNOLOGY CO.,LTD
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Manufacturer : SHENZHEN TENDA TECHNOLOGY CO.,LTD
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052

2. General Description of EUT

EUT Name	:	AV 1000 AC Wi-Fi Powerline Extender	
Models No.	:	PA7	
Brand Name	:	/	
Product Description	:	Operation Frequency: 2.4G: 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz 5G : U-NII-1: 5150MHz~5250MHz U-NII-3: 5725MHz~5850MHz	
	:	Number of Channel:	2.4G: 802.11b/g/n(HT20): 11channels 802.11n(HT40): 7channels 5G: U-NII-1: 20MHz Bandwidth: 4 channels 40MHz Bandwidth: 2 channels 80MHz Bandwidth: 1 channels U-NII-3: 20MHz Bandwidth: 5 channels 40MHz Bandwidth: 2 channels 80MHz Bandwidth: 1 channels
	:	Output Power	802.11b: 10.835 dBm 802.11g: 14.463dBm 802.11n (HT20): 14.776 dBm 802.11n (HT40): 13.680 dBm

TB-RF-075-1.0

		5G: U-NII-1: 802.11a: 14.641dBm 802.11n(HT20): 14.522dBm 802.11n(HT40): 14.653dBm 802.11ac(20): 14.763dBm 802.11ac(40): 14.547dBm 802.11ac(80): 14.490dBm U-NII-3: 802.11a: 14.830dBm 802.11n(HT20): 14.853dBm 802.11n(HT40): 15.087dBm 802.11ac(20): 14.756dBm 802.11ac(40):15.050 dBm 802.11ac(80): 15.070dBm
	Antenna Gain:	2412MHz~2462MHz:2.3 dBi (PIFA Antenna) 5150MHz~5850MHz:4.1 dBi (PIFA Antenna)
	Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: QPSK , BPSK, 16QAM , 64QAM with OFDM 802.11n: BPSK , QPSK , 16QAM ,64QAM with OFDM 802.11a: OFDM (QPSK, BPSK, 16QAM) 802.11ac: OFDM (QPSK, BPSK, 16QAM, 64QAM, 256QAM)
	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 802.11a: 6/9/12/18/24/36/48/54 Mbps 802.11ac: at most 433.3 Mbps
Power Rating	:	Input/Output: AC100V-240V,0.1A,50/60Hz
Connecting I/O Port(S)	:	Please refer to the User's Manual
Note: More detail information about Equipment, please refer to User's manual, more information about the RF, please refer to test report.		

MPE Calculations for WIFI

1. Antenna Gain:

2412MHz~2462MHz:2.3 dBi (PIFA Antenna)

5150MHz~5850MHz:4.1 dBi (PIFA Antenna)

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 including Tolerance (dBm)	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
2.4G							
802.11b	1	2437	10.835	2.3	10±1	20	0.0043
802.11g	1	2462	14.463	2.3	14±1	20	0.0107
802.11n (HT20)	1	2462	14.776	2.3	14±1	20	0.0107
802.11n (HT40)	1	2452	13.680	2.3	14±1	20	0.0107
5G U-NII-1							
802.11a	1	5200	14.641	4.1	14±1	20	0.0162
802.11n (HT20)	1	5200	14.522	4.1	14±1	20	0.0162
802.11ac (HT20)	1	5200	14.763	4.1	14±1	20	0.0162
802.11n (HT40)	1	5190	14.653	4.1	14±1	20	0.0162
802.11ac(40)	1	5190	14.547	4.1	14±1	20	0.0162
802.11ac(80)	1	5210	14.490	4.1	14±1	20	0.0162

5G U-NII-3							
802.11a	1	5825	14.830	4.1	14±1	20	0.0162
802.11n (HT20)	1	5825	14.853	4.1	14±1	20	0.0162
802.11ac (HT20)	1	5825	14.756	4.1	14±1	20	0.0162
802.11n (HT40)	1	5755	15.087	4.1	15±1	20	0.0204
802.11ac(40)	1	5755	15.050	4.1	15±1	20	0.0204
802.11ac(80)	1	5775	15.070	4.1	15±1	20	0.0204

Note:
 (1) N_{TX}= Number of Transmit Antennas
 (2) RF Output power specifies that Maximum Conducted Peak Output Power for 2.4G and Maximum Conducted Average Output Power for 5G.
 (3) Maximum Output Power including Turn-up Tolerance was used to calculate MPE.

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 2.4G: 802.11b/g/n (2412~2462 MHz)

5G: U-NII-1: 5150MHz~5250MHz

U-NII-3: 5725MHz~5850MHz

MPE limit S: 1 mW/ cm²

The MPE is calculated as 0.01650632mW / 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.