

Maximum Permissible Exposure Evaluation

FCC ID: 2AUEN-MS1200

1. Client Information

Applicant	:	Shenzhen COMNECT Technology Co., Ltd.
Address	:	G Zone, 3/F, Building 1, Baisha High-Tech Park, No. 3011, Shahe Road West, XiLi Street, Nanshan District, Shenzhen, China
Manufacturer	:	Shenzhen COMNECT Technology Co., Ltd.
Address	:	G Zone, 3/F, Building 1, Baisha High-Tech Park, No. 3011, Shahe Road West, XiLi Street, Nanshan District, Shenzhen, China

2. General Description of EUT

EUT Name	:	AC1200 Dual Band Whole Mesh WiFi System	
Models No.	:	AR-M405, MS1200S, M1200S, EMESH2200, EMESH3300, InFi S3	
Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz U-NII-1: 5180MHz~5240MHz U-NII-3: 5745MHz~5825MHz
Power Rating	:	Adapter(RD1201000-C55-35MGD): Input: AC 100-240V, 50/60Hz, 0.6A max Output: DC 12V, 1A	
Software Version	:	N/A	
Hardware Version	:	V1.0	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

MPE Calculations for WIFI

1. Antenna Gain:

PCB Antenna: 3dBi.

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}	Freq. (MHz)	Conducted Power(max) (dBm) [P]		ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]			Power Density Limit (mW/ cm ²)	Result
			Ant a	Ant b			Ant 1	Ant 2	Sum		
802.11b	1	2412	13.36	13.11	3	20	0.0086	0.0081	---	1.000	PASS
		2437	12.90	12.52	3	20	0.0077	0.0071	---		
		2462	12.20	11.69	3	20	0.0066	0.0059	---		
802.11g	1	2412	19.49	21.41	3	20	0.0353	0.0549	---		
		2437	19.88	21.69	3	20	0.0386	0.0586	---		
		2462	19.41	20.46	3	20	0.0347	0.0441	---		
802.11n (HT20)	2	2412	18.67	20.56	3	20	0.0292	0.0452	0.0744		
		2437	19.28	20.72	3	20	0.0336	0.0469	0.0805		
		2462	18.59	19.61	3	20	0.0287	0.0363	0.0650		
802.11n (HT40)	2	2422	17.62	20.18	3	20	0.0229	0.0414	0.0643		
		2437	17.72	20.62	3	20	0.0235	0.0458	0.0693		
		2452	17.47	20.12	3	20	0.0222	0.0408	0.0630		

Note:
(1) N_{TX}= Number of Transmit Antennas
(2) RF Output power specifies that Maximum Conducted Peak Output Power.

Worst Maximum MPE Result

Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm) [P]		ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]			Power Density Limit (mW/ cm ²)	Result
			Ant a	Ant b			Ant 1	Ant 2	Sum		
802.11a	1	5180	18.94	19.23	3	20	0.0311	0.0332	---	1.000	PASS
		5200	19.04	19.31	3	20	0.0318	0.0339	---		
		5240	19.25	19.35	3	20	0.0334	0.0342	---		
802.11n (HT20)	2	5180	16.10	14.70	3	20	0.0162	0.0117	0.0279		
		5200	16.13	15.00	3	20	0.0163	0.0126	0.0289		
		5240	16.39	15.23	3	20	0.0173	0.0132	0.0305		
802.11ac (VHT20)	2	5180	15.61	14.43	3	20	0.0144	0.0110	0.0254		
		5200	15.58	14.18	3	20	0.0143	0.0104	0.0247		
		5240	15.79	14.67	3	20	0.0151	0.0116	0.0267		
802.11n (HT40)	2	5190	15.97	16.67	3	20	0.0157	0.0184	0.0341		
		5230	16.37	17.05	3	20	0.0172	0.0201	0.0373		
802.11ac (VHT40)	2	5190	17.23	16.68	3	20	0.0210	0.0185	0.0395		
		5230	15.76	16.44	3	20	0.0150	0.0175	0.0325		
802.11ac (VHT80)	2	5210	16.27	14.79	3	20	0.0168	0.0120	0.0288		

Worst Maximum MPE Result

Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm) [P]		ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]			Power Density Limit (mW/ cm ²)	Result
			Ant a	Ant b			Ant 1	Ant 2	Sum		
802.11a	1	5745	20.19	22.98	3	20	0.0415	0.0788	---	1.000	PASS
		5785	21.56	23.59	3	20	0.0569	0.0907	---		
		5825	21.64	21.14	3	20	0.0579	0.0516	---		
802.11n (HT20)	2	5745	20.53	23.01	3	20	0.0448	0.0794	0.1242		
		5785	21.91	24.03	3	20	0.0616	0.1004	0.1620		
		5825	21.96	21.52	3	20	0.0623	0.0563	0.1186		
802.11ac (VHT20)	2	5745	22.76	23.72	3	20	0.0749	0.0935	0.1684		
		5785	22.29	24.22	3	20	0.0673	0.1049	0.1722		
		5825	22.47	21.73	3	20	0.0701	0.0591	0.1292		
802.11n (HT40)	2	5755	20.13	22.58	3	20	0.0409	0.0719	0.1128		
		5795	21.59	23.39	3	20	0.0572	0.0866	0.1438		
802.11ac (VHT40)	2	5755	21.41	22.51	3	20	0.0549	0.0708	0.1257		
		5795	21.61	23.46	3	20	0.0575	0.0881	0.1456		
802.11ac (VHT80)	2	5775	20.47	21.66	3	20	0.0442	0.0582	0.1024		

Note:

(1) N_{TX}= Number of Transmit Antennas

(2) RF Output power specifies that Maximum Conducted AVG 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 802.11a/b/g/n/ac

MPE limit S: 1mW/ cm²

Because the 2.4G WiFi and 5G WiFi can be operated simultaneously, So the worst MPE is calculated as $(0.0805+0.1722)mW/cm^2=0.2527mW/cm^2 < \text{limit } 1mW / cm^2$.

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.

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