Maximum Permissible Exposure Evaluation

FCCID: 2AMM6EWN8822CSS3DA

1. Client Information

Applicant	:	Earda Technologies Co.,Ltd
Address	:	Block A, LianFeng Creative Industry Park,2 JiSheng Road., HuangGe Town, NanSha District, Guangzhou, PRC.
Manufacturer	:	Earda Technologies Co.,Ltd
Address	:	Block A, LianFeng Creative Industry Park,2 JiSheng Road., HuangGe Town, NanSha District, Guangzhou, PRC.

2. General Description of EUT

EUT Name	:	WiFi & BT combo module	
Models No.	:	EWN-8822CSS3DA	
Model Different	:	N/A	
Brand Name	:	EARDATEK	
Sample ID	:	HC-C-202408-0012-01-01	
Product Description	:	Operation Frequency:	Bluetoot&BLE: 2402MHz~2480MHz U-NII-1: 5180MHz~5240MHz U-NII-2A: 5260MHz~5320MHz U-NII-2C: 5500MHz~5720MHz U-NII-3: 5745MHz~5825MHz 802.11b/g/n(HT20)/n(HT40): 2412MHz~2462MHz
Power Rating	:	DC 3.3V	
Software Version	:	V1.0	
Hardware Version	:	A1.0	
Remark	:	The antenna gain provided by the manufacturer, the verified for the RF conduction test provided by TOBY test lab.	

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Method of Measurement for FCC

1. Max. Antenna Gain:

Antenna			
Antenna Type: PCB	BT&BLE	Max. Gain:	2.4G: 5.25dBi
	Antenna 1	Max. Gain:	2.4G: 3.29dBi
			U-NII-1: 4.93dBi
			U-NII-2A: 5.40dBi
			U-NII-2C: 5.55dBi
			U-NII-3: 5.44dBi
	Antenna 2	Max. Gain:	2.4G: 3.29dBi
			U-NII-1: 4.93dBi
			U-NII-2A: 5.40dBi
			U-NII-2C: 5.55dBi
			U-NII-3: 5.44dBi
NOTE: The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.			

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

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0.
This means that:

∑ of MPE ratios ≤ 1.0

4. Test Result:

Worst MPE Result							
Test Mode	Antenna	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	Max. ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm^2) [S]
Bluetooth&BLE	/	11.70	11±1	12	5.25	20	0.0106
2.4G b	Ant1	18.96	18±1	19	3.29	20	0.0337
	Ant2	18.95	18±1	19	3.29	20	0.0337
2.4G g	Ant1	15.26	15±1	16	3.29	20	0.0169
	Ant2	14.88	15±1	16	3.29	20	0.0169
2.4G n20	Ant1	11.76	11±1	12	3.29	20	0.0067
	Ant2	11.38	11±1	12	3.29	20	0.0067
2.4G n40	Ant1	11.73	11±1	12	3.29	20	0.0067
	Ant2	10.96	11±1	12	3.29	20	0.0067
5G a	Ant1	21.18	21±1	22	5.55	20	0.1132
	Ant2	21.43	21±1	22	5.55	20	0.1132
5G n20	Ant1	19.54	20±1	21	5.55	20	0.0899
	Ant2	20.65	20±1	21	5.55	20	0.0899
5G n40	Ant1	18.12	19±1	20	5.55	20	0.0714
	Ant2	19.05	19±1	20	5.55	20	0.0714
5G ac20	Ant1	19.09	19±1	20	5.55	20	0.0714
	Ant2	19.97	19±1	20	5.55	20	0.0714
5G ac40	Ant1	17.73	18±1	19	5.55	20	0.0567
	Ant2	19.07	19±1	20	5.55	20	0.0714
5G ac80	Ant1	18.22	19±1	20	5.55	20	0.0714
	Ant2	19.41	19±1	20	5.55	20	0.0714
Note: The antenna gain used max. antenna gain							

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: 2402~2480MHz&2412~2462MHz&5180~5825MHz
MPE limit S: 1mW/ cm^2
The MPE is calculated as ***0.1132mW / cm^2 < limit 1mW / cm^2***.

6. Summary simultaneous transmission information

Modulation Type	Work Frequency Band	Transmit Antenna		Simultaneous Transmission
		Antenna 1	Antenna 2	
Bluetooth	2.4GHz	Yes	/	/
Bluetooth LE	2.4GHz	Yes	/	/
IEEE 802.11a	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	No
IEEE 802.11b	2.4GHz	Yes	Yes	No
IEEE 802.11g	2.4GHz	Yes	Yes	No
IEEE 802.11n HT20	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT40	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11n HT40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT80	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes

7. Summary simultaneous transmission results

Antenna 1 and Antenna 2 for 2.4GWLAN& 5GWLAN

Worst Modulation Type	MPE Antenna 1 (mW/cm^2)	MPE Antenna 2 (mW/cm^2)	∑MPE ratios	Limit	Results
IEEE 802.11b	0.0067	0.0067	0.0134	1.0	PASS
IEEE 802.11n20	0.0899	0.0899	0.1798	1.0	PASS

Bluetooth and WiFi support Synchronization transmitther

Maximum MPE ratio Bluetooth	Maximum MPE ratio WiFi	∑MPE ratios	Limit	Results
0.0106	0.1798	0.1904	1	PASS

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.

-----END OF THE REPORT-----