

Maximum Permissible Exposure Evaluation

FCC ID: LNQSBRT8812AU

1. Client Information

Applicant : Actiontec Electronics Inc
Address : 760 North Mary Ave., Sunnyvale, California 94086 United States
Manufacturer : Actiontec Electronics Inc
Address : 760 North Mary Ave., Sunnyvale, California 94086 United States

2. General Description of EUT

EUT Name	:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module
Models No.	:	SBRT8812AU
Brand Name	:	Actiontec
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	2.4G:802.11b: 21.61 dBm 802.11g: 26.38 dBm 802.11n (HT20): 26.88 dBm 802.11n (HT40): 25.53 dBm

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			<p>5G: U-NII-1: 802.11a: 14.11dBm 802.11n(HT20): 13.47dBm 802.11n(HT40): 13.66dBm 802.11ac(20): 13.16dBm 802.11ac(40): 13.55dBm 802.11ac(80): 13.88dBm</p> <p>U-NII-3: 802.11a: 14.26dBm 802.11n(HT20): 14.02dBm 802.11n(HT40): 14.45dBm 802.11ac(20): 13.83dBm 802.11ac(40): 13.85dBm 802.11ac(80): 13.98dBm</p>
		Antenna Gain:	2412MHz~2462MHz:2.18 dBi (PIFA Antenna) 5150MHz~5250MHz:4.33 dBi (PIFA Antenna) 5725MHz~5850MHz:5.62 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 Supply	:	DC Power by USB Cable	
Power Rating	:	DC 5V by USB Cable for Host System.	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
<p>Note:More detail information about Equipment, please refer to User's manual, more information about the RF, please refer to test report.</p>			

MPE Calculations for WIFI

1. Antenna Gain:

2412MHz~2462MHz:2.18 dBi (PIFA Antenna)
5150MHz~5250MHz:4.33 dBi (PIFA Antenna)
5725MHz~5850MHz:5.62 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 Tolerance (dB)	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
2.4G							
802.11b	1	2412	21.61	2.18	±1	20	0.05994
802.11g	1	2412	26.38	2.18	±1	20	0.17978
802.11n (HT20)	2	2412	26.88	2.18	±1	20	0.20172
802.11n (HT40)	2	2422	25.53	2.18	±1	20	0.14782
5G U-NII-1							
802.11a	1	5200	14.11	4.33	±1	20	0.01749
802.11n (HT20)	2	5240	13.47	4.33	±1	20	0.01509
802.11ac (HT20)	2	5240	13.66	4.33	±1	20	0.01577
802.11n (HT40)	2	5230	13.16	4.33	±1	20	0.01405
802.11ac(40)	2	5230	13.55	4.33	±1	20	0.01537
802.11ac(80)	2	5210	13.88	4.33	±1	20	0.01659

5G U-NII-3							
802.11a	1	5825	14.26	5.62	±1	20	0.02436
802.11n (HT20)	2	5745	14.02	5.62	±1	20	0.02305
802.11ac (HT20)	2	5745	14.45	5.62	±1	20	0.02545
802.11n (HT40)	2	5755	13.83	5.62	±1	20	0.02207
802.11ac(40)	2	5755	13.85	5.62	±1	20	0.02217
802.11ac(80)	2	5775	13.98	5.62	±1	20	0.02284

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 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 0.20172mW / 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.