

# Maximum Permissible Exposure Evaluation

## FCC ID: LNQSBRT8812AUA

### 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

<b>EUT Name</b>	:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	
<b>Models No.</b>	:	SBRT8812AUA	
<b>Brand Name</b>	:	Actiontec	
<b>Product Description</b>	:	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: 22.71 dBm 802.11g: 26.69 dBm 802.11n (HT20): 26.66 dBm 802.11n (HT40): 26.64 dBm

*TB-RF-075-1.0*

			<p>5G: U-NII-1:              802.11a: 13.98dBm              802.11n(HT20): 12.64dBm              802.11n(HT40): 12.22dBm              802.11ac(20): 12.23dBm              802.11ac(40): 12.20dBm              802.11ac(80): 12.42dBm</p> <p>U-NII-3:              802.11a: 14.69dBm              802.11n(HT20): 12.30dBm              802.11n(HT40): 12.22dBm              802.11ac(20): 12.24dBm              802.11ac(40): 12.16dBm              802.11ac(80): 12.22dBm</p>
		Antenna Gain:	<b>Please see the page of 3</b>
		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
<b>Power Supply</b>	:	DC Power by USB Cable	
<b>Power Rating</b>	:	DC 5V by USB Cable for Host System.	
<b>Connecting I/O Port(S)</b>	:	Please refer to the User's Manual	
<p><b>Note:</b>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:

Ant.	Model Name	Antenna Type	BAND(MHz)	Gain (dBi)
1	N2420DG	Embedded Ant	2412~2462	3.56
			5180~5240	4.60
			5745~5775	2.28
2	N2420DGL	Embedded Ant	2412~2462	3.94
			5180~5240	5.86
			5745~5775	2.39

### 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 <sub>TX</sub>	Frequency (MHz)	Power (dBm) [P]	ANT Gain (dBi) [G]	Turn-up Power Tolerance (dB)	Distance (cm) [R]	Power Density (mW/ cm <sup>2</sup> ) [S]
<b>2.4G</b>							
802.11b	1	2412	22.71	3.94	±1	20	0.11581
802.11g	1	2412	26.69	3.94	±1	20	0.28956
802.11n (HT20)	2	2412	26.66	3.94	±1	20	0.28757
802.11n (HT40)	2	2422	26.61	3.94	±1	20	0.28428
<b>5G U-NII-1</b>							
802.11a	1	5200	13.98	5.86	±1	20	0.02414
802.11n (HT20)	2	5240	12.64	5.86	±1	20	0.01773
802.11ac (HT20)	2	5240	12.22	5.86	±1	20	0.01610
802.11n (HT40)	2	5230	12.23	5.86	±1	20	0.01613

802.11 ac(40)	2	5230	12.20	5.86	±1	20	0.01602
802.11 ac(80)	2	5210	12.42	5.86	±1	20	0.01686
<b>5G U-NII-3</b>							
802.11a	1	5825	14.64	2.39	±1	20	0.01264
802.11n (HT20)	2	5745	12.30	2.39	±1	20	0.00737
802.11ac (HT20)	2	5745	12.22	2.39	±1	20	0.00724
802.11n (HT40)	2	5755	12.24	2.39	±1	20	0.00727
802.11 ac(40)	2	5755	12.16	2.39	±1	20	0.00714
802.11 ac(80)	2	5775	12.22	2.39	±1	20	0.00724
<b>Note:</b>							
(1) N <sub>TX</sub> = 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 <sup>2</sup> )
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/ cm<sup>2</sup>

The MPE is calculated as 0.28956 mW / cm<sup>2</sup> < limit 1 mW / cm<sup>2</sup>. 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.