

# SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Application No..: GZEM1611007752CR Page: 1 of 3 FCC ID: 2AEZACAPSULE

## **RF Exposure Compliance Requirement**

#### 1. Standard requirement

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

### (a) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm <sup>2</sup> )	Averaging Times IEI <sup>2</sup> ,IHI <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

#### (b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S)(mW/cm²)	Averaging Times  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100000			1.0	30

Note: f=frequency in MHz; \*Plane-wave equivalent power density

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# SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Application No..: GZEM1611007752CR Page: 2 of 3 FCC ID: 2AEZACAPSULE

### 2. MPE Calculation Method

 $E (V/m) = (30^{\circ}P^{\circ}G)^{0.5}/d$  Power Density:  $Pd(W/m^2) = E^2/377$ 

E=Electric Field (V/m)

P=Peak RF output Power (W)

G=EUT Antenna numeric gain (numeric)

d= Separation distance between radiator and human body (m)

The formula can be changed to

 $Pd = (30*P*G)/(377*d^2)$ 

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

### 3. Calculated Result and Limit

(1)802.11b 11Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	2.512	23.03	200.909	0.10040	1	Pass
2442	2.512	24.00	251.189	0.12552	1	Pass
2462	2.512	23.20	208.930	0.10440	1	Pass

(2) 802.11g 54Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	2.512	22.86	193.197	0.09654	1	Pass
2442	2.512	23.5	223.872	0.11187	1	Pass
2462	2.512	23.41	219.280	0.10958	1	Pass

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# SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Application No..: GZEM1611007752CR Page: 3 of 3 FCC ID: 2AEZACAPSULE

#### 3) 802.11n HT20 65Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	2.512	23.03	200.909	0.10040	1	Pass
2442	2.512	22.76	188.799	0.09435	1	Pass
2462	2.512	23.68	233.346	0.11661	1	Pass

3) 802.11n HT40 135Mbps data rate:

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2422	2.512	22.2	165.959	0.08293	1	Pass
2442	2.512	23.14	206.063	0.10297	1	Pass
2452	2.512	23.38	217.771	0.10882	1	Pass

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