

## Maximum Permissible Exposure (MPE) Calculation

FCC rule part 1.1310 provides the following Exposure limits:

### Limits for Occupational / Control Exposures:

300-1500MHz:  $f(\text{MHz})/300\text{mW}/\text{cm}^2$  over 6 minutes;  
 1500-100,000MHz:  $5\text{mW}/\text{cm}^2$  over 6 minutes

### Limits for General Population / Uncontrolled Exposure:

300-1500MHz:  $f(\text{MHz})/1500\text{mW}/\text{cm}^2$  over 6 minutes;  
 1500-100,000MHz:  $1\text{mW}/\text{cm}^2$  over 30 minutes

EUT details:

FCC ID: U8G-P1217  
 Equipment: Mobile Equipment  
 Users: General population  
 Distance (R) = 20 cm  
 Limit applied:  $1\text{mW}/\text{cm}^2$

The Friis formula is applied to calculation the field power density:

$P_d = (P_{out} * G) / (4 * \pi * r^2)$ , where:

$P_d$  = power density in  $\text{mW}/\text{cm}^2$   
 $P_{out}$  = output power to antenna in mW  
 $G$  = Gain of antenna in linear scale  
 $\pi = 3.1416$   
 $R$  = distance between observation point and center of the radiator in cm

The measured Peak values are:

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Reading Value (dBm)	Attenuator (dB)	Corrected Value		Limit		Result
				(dBm)	(watts)	(dBm)	(watts)	
Low	2412	6.73	10	16.73	0.0471	30	1	Pass
Mid	2437	6.81	10	16.81	0.0480			Pass
High	2462	5.85	10	15.85	0.0385			Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Reading Value (dBm)	Attenuator (dB)	Corrected Value		Limit		Result
				(dBm)	(watts)	(dBm)	(watts)	
Low	2412	9.58	10	19.58	0.0908	30	1	Pass
Mid	2437	6.12	10	16.12	0.0409			Pass
High	2462	4.24	10	14.24	0.0265			Pass

Test mode: IEEE 802.11n HT20

Channel	Frequency (MHz)	Reading Value (dBm)	Attenuator (dB)	Corrected Value		Limit		Result
				(dBm)	(watts)	(dBm)	(watts)	
Low	2412	8.17	10	18.17	0.0656	30	1	Pass
Mid	2437	9.17	10	19.17	0.0826			Pass
High	2462	9.53	10	19.53	0.0897			Pass

Test mode: IEEE 802.11n HT40

Channel	Frequency (MHz)	Reading Value (dBm)	Attenuator (dB)	Corrected Value		Limit		Result
				(dBm)	(watts)	(dBm)	(watts)	
Low	2422	14.61	10	14.61	0.0289	30	1	Pass
Mid	2437	15.98	10	15.98	0.0396			Pass
High	2452	15.01	10	15.01	0.0317			Pass

Highest measured Peak output power: 90.8 mW equals 19.58 dBm  
 Antenna gain of EUT: 5dBi equals 3.16 in linear scale

Highest Power Density generated =  $(90.8 * 3.16) / (4 * \pi * 20^2) \text{mW}/\text{cm}^2 = 0.0571 \text{mW}/\text{cm}^2$

Conclusion: 20cm is a safe distance because, since at this distance, the EUT emits far under the permissible limit of  $1 \text{mW}/\text{cm}^2$