

EXHIBIT 14. MPE CALCULATIONS

The following MPE calculations are based on a dipole antenna or printed circuit board antenna, and a Bluetooth and WLAN radio paired to each.

BT With Dipole Antenna

<u>Prediction of MPE limit at a given distance</u>			
Equation from page 18 of OET Bulletin 65, Edition 97-01			
$S = \frac{PG}{4\pi R^2}$			
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		
Maximum peak output power at antenna input terminal:	8.00 (dBm)		
Maximum peak output power at antenna input terminal:	6.310 (mW)		
Antenna gain(typical):	4.3 (dBi)		
Maximum antenna gain:	2.692 (numeric)		
Prediction distance:	20 (cm)		
Prediction frequency:	2400 (MHz)		
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm ²)		
Power density at prediction frequency:	0.003379 (mW/cm ²)		
Maximum allowable antenna gain:	29.0 (dBi)		
Margin of Compliance at	20	cm =	24.7 dB

BT With PIFA Antenna

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

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

Maximum peak output power at antenna input terminal:	8.00 (dBm)
Maximum peak output power at antenna input terminal:	6.310 (mW)
Antenna gain(typical):	-0.6 (dBi)
Maximum antenna gain:	0.871 (numeric)
Prediction distance:	20 (cm)
Prediction frequency:	2402 (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm ²)
Power density at prediction frequency:	0.001093 (mW/cm ²)
Maximum allowable antenna gain:	29.0 (dBi)
Margin of Compliance at 20 cm =	29.6 dB

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WLAN With Dipole Antenna

<u>Prediction of MPE limit at a given distance</u>			
Equation from page 18 of OET Bulletin 65, Edition 97-01			
$S = \frac{PG}{4\pi R^2}$			
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		
Maximum peak output power at antenna input terminal:	8.00	(dBm)	
Maximum peak output power at antenna input terminal:	6.310	(mW)	
Antenna gain(typical):	4.3	(dBi)	
Maximum antenna gain:	2.692	(numeric)	
Prediction distance:	20	(cm)	
Prediction frequency:	2402	(MHz)	
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm ²)	
Power density at prediction frequency:	0.003379	(mW/cm ²)	
Maximum allowable antenna gain:	29.0	(dBi)	
Margin of Compliance at 20 cm =	24.7	dB	

WLAN With PIFA Antenna

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

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

Maximum peak output power at antenna input terminal:	20.10 (dBm)
Maximum peak output power at antenna input terminal:	102.329 (mW)
Antenna gain(typical):	-0.6 (dBi)
Maximum antenna gain:	0.871 (numeric)
Prediction distance:	20 (cm)
Prediction frequency:	2402 (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm ²)
Power density at prediction frequency:	0.017731 (mW/cm ²)
Maximum allowable antenna gain:	16.9 (dBi)
Margin of Compliance at 20 cm =	17.5 dB

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