MPE CALCULATIONS

Systems operating under the provision of 47 CFR 1.1307(b)(1) shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines.

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user or nearby persons and can therefore be considered a mobile transmitter per 47 CFR 2.1091(b). The MPE calculation for this exposure is shown below.

Using the Antennas with highest output power:
The peak radiated output power (EIRP) is calculated as follows:

Frequency (GHz)	Peak Output Power (dBm)	Antenna Gain (dBi)	EIRP (P+G) (dBm)	EIRP (mw)
2.4	26.94	5.0	31.94	1563.15

EIRP = P + G Where P = Power input to the antenna (mW). G = Power gain of the antenna (dBi)

The numeric gain (G) of the antenna with a gain specified in dB is determined by:

Frequency (GHz)	Antenna Gain (dBi)	Numeric Antenna Gain
2.4	5.0	3.16

G = Log-1 (dB antenna gain/10)

Power density at the specific separation:

Frequency (GHz)	Numeric Power Gain of the Antenna (G)	Power input to the antenna (P) (mW)	Maximum Power Spectral Density $S=PG/(4\pi R^2)$ (mW/cm^2)	Maximum Power Spectral Density Limit (mW/cm^2)
2.4	3.16	494.31	0.31	1.00

$S = PG/(4R^2\pi)$

S = Maximum power density (mW/cm^2)

P = Power input to the antenna (mW).

G = Numeric power gain of the antenna

R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The maximum permissible exposure (MPE) for the general population is 1mW/cm^2.

The power density at 20cm does not exceed the 1mW/cm^2 limit. Therefore, the exposure condition is compliant with FCC rules.