# MPE Calculations for Crystal (HSTNN-L01C)

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 Wistron NeWeb Triple Band PIFA Antennas:**

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G
EIRP = 17.53 dBm + 2.84 dBi
EIRP = 20.37 dBm (108.89 mW)

Where
P = Power input to the antenna (dBm).
G = Power gain of the antenna (dBi) – worst case

**Power density at the specific separation:**

$S = PG/(4R^2\Pi)$
$S = (56.62 \times 1.923) / (4 \times 20^2 \times \Pi)$
**$S = 0.0217$ mW/cm$^2$**

Where
S = Maximum power density (mW/cm$^2$)
P = Power input to the antenna (mW).
G = Numeric power gain of the antenna – worst case
R = Distance to the center of the radiation of the antenna (20 cm = 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.

The numeric gain (G) of the antenna with a gain specified in dB is determined by:
G = Log -1 (dB antenna gain/10)
G = Log -1 (2.84 dBi/10)
G = 1.923