



8.5 RADIO FREQUENCY EXPOSURE

LIMIT

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 levels in excess of the Commission's guidelines. See §15.247(i) and §1.1307(b)(1) of this chapter.

EUT Specification

EUT	Air Keyboard
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others: 902MHz~928MHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm2) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Max. output power	3.07dBm (2.0277 mW)
Antenna gain (Max)	0.74 dBi (Numeric gain: 1.1857)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Remark:

1. The maximum output power is 3.07(2.0277mW) at 926.8MHz (with 1.1857 numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.

TEST RESULTS

No non-compliance noted.



CALCULATION

Given

$$E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

- Where E = Field strength in Volts / meter
- P = Power in Watts
- G = Numeric antenna gain
- d = Distance in meters
- S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P (mW) = P (W) / 1000 \text{ and}$$

$$d (cm) = d(m) / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

- Where d = Distance in cm
- P = Power in mW
- G = Numeric antenna gain
- S = Power density in mW / cm²

Maximum Permissible Exposure

EUT output power = 2.0276mW

Numeric Antenna gain =1.1857

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

Yields

$$S = 0.000199 \times P \times G$$

- Where P = Power in mW
- G = Numeric antenna gain
- S = Power density in mW / cm²

Power density = 0.000478 mW / cm²

(For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.)