



Radio Frequency Exposure

LIMIT

According to §15.247(i), 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 § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	GPON ONT
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.425GHz ~ 2.475GHz <input type="checkbox"/> WLAN: 5.150GHz ~ 5.250GHz <input type="checkbox"/> WLAN: 5.725GHz ~ 5.850GHz <input checked="" type="checkbox"/> Bluetooth: 2.402GHz ~ 2.480 GHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5\text{mW/cm}^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1\text{mW/cm}^2$)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	DSSS(O-QPSK): -1.65 dBm (0.00068 W) GFSK: 2.121 dBm (0.00163W)
Antenna gain (Max)	4.55dBi
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A
Remark: <ol style="list-style-type: none">1. The maximum output power is <u>2.121 dBm (0.00163W)</u> at <u>2402MHz</u> (with <u>numeric 4.55 antenna gain.</u>)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 maximum power density is <u>1.0 mW/cm²</u> even if the calculation indicates that the power density would be larger.	

*Note: Simultaneous transmission is not applicable for this EUT.

**TEST RESULTS**

No non-compliance noted.

Calculation

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

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:

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

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$
$$d \text{ (cm)} = d \text{ (m)} / 100$$

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**

Modulation Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm2)	Limit (mW/cm2)
DSSS(O-QPSK)	2425-2475	-1.65	4.55	20	0.00062	1
GFSK	2402-2480	2.121	4.55	20	0.00148	1

NOTE:

Total (Chain0+Chain1) , the formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density