RADIO FREQUENCY EXPOSURE

LIMIT

See § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	Fixed Wireless Terminal
Frequency band (Operating)	☒ 850 MHz ☐ 1900 MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☒ General Population/Uncontrolled exposure (S=0.567mW/cm^2)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	850 MHz: 28.90 dBm (776.2 mW)
Antenna gain (Max)	-4.21 dBi (Numeric gain: 0.38)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation

Remark:

1. *The maximum output power is 28.90dBm (776.2mW) at 850MHz (with 0.38 numeric antenna gain.)*
2. *MPE estimate is used to justify the compliance.*
3. *For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 0.567 mW/cm^2 even if the calculation indicates that the power density would be larger.*

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 (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***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 = 776.2mW

Numeric Antenna gain = 0.38

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 = 0.0587 mW / cm²

(For mobile or fixed location transmitters, the maximum power density is 0.567 mW/cm² even if the calculation indicates that the power density would be larger.

RADIO FREQUENCY EXPOSURE

LIMIT

See § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	Fixed Wireless Terminal
Frequency band (Operating)	☐ 850 MHz ☒ 1900 MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☒ General Population/Uncontrolled exposure (S=1.267mW/cm^2)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	1900 MHz: 23.60 dBm (229.1 mW)
Antenna gain (Max)	-4.67 dBi (Numeric gain: 0.34)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation

Remark:

1. *The maximum output power is 23.60dBm (229.1mW) at 1900MHz (with 0.34 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 maximum power density is1.267 mW/cm^2 even if the calculation indicates that the power density would be larger.*

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 (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***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 = 229.1mW

Numeric Antenna gain = 0.34

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 = 0.0155 mW / cm²

(For mobile or fixed location transmitters, the maximum power density is 1.267 mW/cm² even if the calculation indicates that the power density would be larger.