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	GSM/EDGE Dual SIM Mobile Phone
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ Bluetooth: 2.402GHz ~ 2.480 GHz
Device category	☒ Portable (<20cm separation) ☐ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)

Antenna diversity	☒ Single antenna
	☐ Multiple antennas
	   ☐ Tx diversity
	   ☐ Rx diversity
	   ☒ Tx/Rx diversity

Max. output power	IEEE 802.11b: 13.09 dBm (20.37mW) IEEE 802.11g: 12.81 dBm (19.10mW)
Antenna gain (Max)	1dBi (Numeric gain: 1.259)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. *The maximum output power is 13.09dBm (20.37mW) at 2412MHz (with 1.259 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 is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.*

TEST RESULTS

Calculation

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

$\qquad$ *Where $\quad$ E = Field strength in Volts / meter*
$\qquad\qquad$ *P = Power in Watts*
$\qquad\qquad$ *G = Numeric antenna gain*
$\qquad\qquad$ *d = Distance in meters*
$\qquad\qquad$ *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:

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

Changing to units of mW and cm, using:

$\qquad$ *P (mW) = P (W) / 1000 and*
$\qquad$ *d (cm) = d(m) / 100*

Yields

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

$\qquad$ *Where $\quad$ d = Distance in cm*
$\qquad\qquad$ *P = Power in mW*
$\qquad\qquad$ *G = Numeric antenna gain*
$\qquad\qquad$ *S = Power density in mW / cm^2*

Maximum Permissible Exposure

EUT output power = 20.37mW
Numeric Antenna gain =1.259
Substituting the MPE safe distance using d = 20 cm into Equation 1:

Yields

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

Where $\quad$ P = Power in mW
$\qquad$ *G = Numeric antenna gain*
$\qquad$ *S = Power density in mW / cm^2*
→ *Power density =0.005mW / cm^2*

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)