



## 12. Radio Frequency Exposure

### 12.1 Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in FCC Part 2 (Section 2.1091)

KDB 447498

IEEE C95.1:2005

### 12.2 EUT Specification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency band (Operating)                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input checked="" type="checkbox"/> WLAN: 2412MHz ~ 2462MHz<br><input checked="" type="checkbox"/> WLAN: 5150MHz ~ 5250MHz<br><input type="checkbox"/> WLAN: 5250MHz ~ 5350MHz<br><input type="checkbox"/> WLAN: 5470MHz ~ 5725MHz<br><input checked="" type="checkbox"/> WLAN: 5725MHz ~ 5850MHz<br><input type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz |
| Device category                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)                                                                                                                                                                                                                                      |
| Exposure classification                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> )<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )                                                                                                                                                              |
| Antenna diversity                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> Single antenna<br><input checked="" type="checkbox"/> Multiple antennas<br><input type="checkbox"/> Tx diversity<br><input type="checkbox"/> Rx diversity<br><input checked="" type="checkbox"/> Tx/Rx diversity                                                                                                                  |
| Evaluation applied                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <input checked="" type="checkbox"/> MPE Evaluation*<br><input type="checkbox"/> SAR Evaluation<br><input type="checkbox"/> N/A                                                                                                                                                                                                                             |
| <b>Remark:</b><br><br>1. The maximum conducted output power is <u>29.63dBm (917.369mW)</u> at <u>2437MHz</u> (with <u>3.9dBi antenna gain.</u> )<br>2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.<br>3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm <sup>2</sup> even if the calculation indicates that the power density would be larger. |                                                                                                                                                                                                                                                                                                                                                            |



### 12.3 Test Results

No non-compliance noted.

### 12.4 Calculation

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

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:

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

Changing to units of mW and cm, using:

$P \text{ (mW)} = P \text{ (W)} / 1000$  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 / cm<sup>2</sup>



## 12.5 Maximum Permissible Exposure

|                    |                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|
| Max. output power  | Band: 2412MHz ~ 2462MHz<br>802.11b: 21.88dBm<br>802.11g: 29.44dBm<br>802.11n HT20: 29.45dBm<br>802.11n HT40: 29.63dBm |
| Antenna gain (Max) | 3.9dBi                                                                                                                |

### Maximum Permissible Exposure

| Channel Frequency (MHz) | Max. Conducted output power(dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-------------------------|----------------------------------|-------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462               | 29.63                            | 3.9               | 20            | 0.448                               | 1                           |

### Maximum Permissible Exposure(Co-location)

| Modulation Mode    | Channel Frequency (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | MPE Ratio |
|--------------------|-------------------------|-----------------------------------|-------------------|---------------|-------------------------------------|-----------------------------|-----------|
| 11n40              | 2412-2462               | 29.63                             | 3.9               | 20            | 0.448                               | 1.000                       | 0.448     |
| 11ac80             | 5725-5850               | 25.04                             | 3.59              | 20            | 0.145                               | 1.000                       | 0.145     |
| Co-location Total  |                         |                                   |                   |               |                                     |                             | 0.593     |
| Σ MPE ratios Limit |                         |                                   |                   |               |                                     |                             | 1         |