



## 13. Radio Frequency Exposure

### 13.1.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

### 13.2.EUT Specification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency band (Operating)</b>                                                                                                                                                                                                                                                                                                                                                                                                                              | <input checked="" type="checkbox"/> WLAN: 2412MHz ~ 2462MHz<br><input checked="" type="checkbox"/> WLAN: 5150MHz ~ 5250MHz<br><input checked="" type="checkbox"/> WLAN: 5250MHz ~ 5350MHz<br><input checked="" type="checkbox"/> WLAN: 5470MHz ~ 5725MHz<br><input checked="" type="checkbox"/> WLAN: 5725MHz ~ 5850MHz<br><input type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz |
| <b>Device category</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)                                                                                                                                                                                                                                                            |
| <b>Exposure classification</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 | <input type="checkbox"/> Occupational/Controlled exposure ( $S = 5\text{mW}/\text{cm}^2$ )<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure ( $S=1\text{mW}/\text{cm}^2$ )                                                                                                                                                                        |
| <b>Antenna diversity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <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                                                                                                                                        |
| <b>Evaluation applied</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <input checked="" type="checkbox"/> MPE Evaluation*<br><input type="checkbox"/> SAR Evaluation<br><input type="checkbox"/> N/A                                                                                                                                                                                                                                                   |
| <b>Remark:</b><br>1. The maximum conducted output power is <u>23.00dBm</u> at <u>5180MHz</u> (with <u>6.91dBi</u> antenna gain.)<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 $0.195\text{ mW}/\text{cm}^2$ even if the calculation indicates that the power density would be larger. |                                                                                                                                                                                                                                                                                                                                                                                  |

### 13.3.Test Results

No non-compliance noted.



### 13.4.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>

**13.5.Maximum Permissible Exposure****Maximum Permissible Exposure (Non-Beamforming)**

| 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> ) |
|-------------------------|-----------------------------------|-------------------|---------------|-------------------------------------|-----------------------------|
| 5180-5240               | 23.00                             | 6.91              | 20            | 0.195                               | 1                           |
| 5260-5320               | 21.71                             | 6.72              | 20            | 0.139                               | 1                           |
| 5500-5700               | 22.86                             | 6.34              | 20            | 0.166                               | 1                           |
| 5745-5825               | 22.67                             | 7.08              | 20            | 0.188                               | 1                           |

**Maximum Permissible Exposure (Beamforming)**

| 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> ) |
|-------------------------|----------------------------------|-------------------|---------------|-------------------------------------|-----------------------------|
| 5180-5240               | 19.99                            | 9.92              | 20            | 0.195                               | 1                           |
| 5260-5320               | 18.70                            | 9.73              | 20            | 0.139                               | 1                           |
| 5500-5700               | 19.85                            | 9.35              | 20            | 0.166                               | 1                           |
| 5745-5825               | 19.66                            | 10.09             | 20            | 0.188                               | 1                           |

**Maximum Permissible Exposure (Co-location)****2.4G + 5G Band2 + 5G Band3****(Non-Beamforming)**

| Modulation Mode                    | Channel Frequency (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) |
|------------------------------------|-------------------------|-----------------------------------|-------------------|---------------|-------------------------------------|
| 11b                                | 2412-2462               | 22.54                             | 5.2               | 20            | 0.118                               |
| 11ac VHT40                         | 5260-5320               | 21.71                             | 6.72              | 20            | 0.139                               |
| 11ac VHT40                         | 5500-5700               | 22.86                             | 6.34              | 20            | 0.166                               |
| Co-location Total                  |                         |                                   |                   |               | 0.423                               |
| Maximum Permissible Exposure Limit |                         |                                   |                   |               | 1                                   |

**(Beamforming)**

| Modulation Mode                    | Channel Frequency (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) |
|------------------------------------|-------------------------|-----------------------------------|-------------------|---------------|-------------------------------------|
| 11g                                | 2412-2462               | 19.47                             | 8.21              | 20            | 0.117                               |
| 11ac VHT40                         | 5260-5320               | 18.70                             | 9.73              | 20            | 0.139                               |
| 11ac VHT40                         | 5500-5700               | 19.85                             | 9.35              | 20            | 0.166                               |
| Co-location Total                  |                         |                                   |                   |               | 0.422                               |
| Maximum Permissible Exposure Limit |                         |                                   |                   |               | 1                                   |

**Maximum Permissible Exposure (Co-location)****2.4G + 5G Band1 + 5G Band4****Non-Beamforming)**

| Modulation Mode                    | Channel Frequency (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) |
|------------------------------------|-------------------------|-----------------------------------|-------------------|---------------|-------------------------------------|
| 11b                                | 2412-2462               | 22.54                             | 5.2               | 20            | 0.118                               |
| 11a                                | 5180-5240               | 23                                | 6.91              | 20            | 0.195                               |
| 11ac VHT40                         | 5745-5825               | 22.67                             | 7.08              | 20            | 0.188                               |
| Co-location Total                  |                         |                                   |                   |               | 0.501                               |
| Maximum Permissible Exposure Limit |                         |                                   |                   |               | 1                                   |

**(Beamforming)**

| Modulation Mode                    | Channel Frequency (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) |
|------------------------------------|-------------------------|-----------------------------------|-------------------|---------------|-------------------------------------|
| 11g                                | 2412-2462               | 19.47                             | 8.21              | 20            | 0.117                               |
| 11a                                | 5180-5240               | 19.99                             | 9.92              | 20            | 0.195                               |
| 11ac VHT40                         | 5745-5825               | 19.66                             | 10.09             | 20            | 0.188                               |
| Co-location Total                  |                         |                                   |                   |               | 0.500                               |
| Maximum Permissible Exposure Limit |                         |                                   |                   |               | 1                                   |