



## 14. Radio Frequency Exposure

### 14.1. 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

### 14.2. EUT Specification

|                                   |                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency band (Operating)</b> | <input type="checkbox"/> WLAN: 2412MHz ~ 2462MHz<br><input type="checkbox"/> WLAN: 5150MHz ~ 5250MHz<br><input checked="" type="checkbox"/> WLAN: 5250MHz ~ 5350MHz<br><input checked="" type="checkbox"/> WLAN: 5470MHz ~ 5725MHz<br><input 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 = 5mW/cm <sup>2</sup> )<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )                                                                                                                                                   |
| <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                                                                                                                                                                                                                  |

**Remark:**

1. The maximum output power is 23.34dBm (215.85mW) at 5270MHz (with numeric 4.2 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<sup>2</sup> even if the calculation indicates that the power density would be larger.

### 14.3. Test Results

No non-compliance noted.



#### 14.4.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:

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

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>



#### 14.5. Maximum Permissible Exposure

|                    |                                                                                                                                                                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Max. output power  | Non-Beamforming<br>Band: 5250MHz ~ 5350MHz<br>802.11a: 20.61 dBm (114.98mW)<br>802.11an HT20: 21.06 dBm (127.62mW)<br>802.11an HT40: 23.32 dBm (214.63mW)<br>802.11ac VHT20: 21.09 dBm (128.47mW)<br>802.11ac VHT40: 23.34 dBm (215.85mW)<br>802.11ac VHT80: 17.62 dBm (57.80mW) |
|                    | Band: 5470MHz ~ 5725MHz<br>802.11a: 20.15 dBm (103.53mW)<br>802.11an HT20: 19.67 dBm (92.70mW)<br>802.11an HT40: 22.79 dBm (190.25mW)<br>802.11ac VHT20: 19.70 dBm (93.34mW)<br>802.11ac VHT40: 22.82 dBm (191.57mW)<br>802.11ac VHT80: 22.35 dBm (171.919mW)                    |
|                    | Beamforming<br>Band: 5250MHz ~ 5350MHz<br>802.11a: 17.60 dBm (57.49mW)<br>802.11an HT20: 18.05 dBm (63.81mW)<br>802.11an HT40: 20.31 dBm (107.32mW)<br>802.11ac VHT20: 18.08 dBm (64.24mW)<br>802.11ac VHT40: 20.33 dBm (107.93mW)<br>802.11ac VHT80: 14.61 dBm (28.90mW)        |
| Antenna gain (Max) | Band: 5470MHz ~ 5725MHz<br>802.11a: 17.14 dBm (51.77mW)<br>802.11an HT20: 16.66 dBm (46.35mW)<br>802.11an HT40: 19.78 dBm (95.13mW)<br>802.11ac VHT20: 16.69 dBm (46.67mW)<br>802.11ac VHT40: 19.81 dBm (95.79mW)<br>802.11ac VHT80: 19.34 dBm (85.9mW)                          |
|                    | 5250MHz-5350MHz: ANT A: 4.02 dBi ; ANT B: 4.2 dBi<br>5470MHz-5725MHz: ANT A: 4.83 dBi ; ANT B: 4.05 dBi                                                                                                                                                                          |

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

| Modulation Mode | Frequency band (MHz) | Max. Conducted output power (dBm) | Antenna gain (dBi) | Distance (cm) | Power density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------------|----------------------|-----------------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 802.11a         | 5250-5350            | 20.61                             | 4.2                | 20            | 0.0602                              | 1                           |
| 802.11a         | 5470-5725            | 20.15                             | 4.83               | 20            | 0.0626                              | 1                           |
| 802.11an HT20   | 5250-5350            | 21.06                             | 4.2                | 20            | 0.0668                              | 1                           |
| 802.11an HT20   | 5470-5725            | 19.67                             | 4.83               | 20            | 0.0561                              | 1                           |
| 802.11an HT40   | 5250-5350            | 23.32                             | 4.2                | 20            | 0.1123                              | 1                           |
| 802.11an HT40   | 5470-5725            | 22.79                             | 4.83               | 20            | 0.1151                              | 1                           |
| 802.11ac VHT20  | 5250-5350            | 21.09                             | 4.2                | 20            | 0.0672                              | 1                           |
| 802.11ac VHT20  | 5470-5725            | 19.70                             | 4.83               | 20            | 0.0565                              | 1                           |
| 802.11ac VHT40  | 5250-5350            | 23.34                             | 4.2                | 20            | 0.1129                              | 1                           |
| 802.11ac VHT40  | 5470-5725            | 22.82                             | 4.83               | 20            | 0.1159                              | 1                           |
| 802.11ac VHT80  | 5250-5350            | 17.62                             | 4.2                | 20            | 0.0302                              | 1                           |
| 802.11ac VHT80  | 5470-5725            | 22.35                             | 4.83               | 20            | 0.1039                              | 1                           |

**Maximum Permissible Exposure (Beamforming)**

| Modulation Mode | Frequency band (MHz) | Max. Conducted output power (dBm) | Antenna gain (dBi) | Distance (cm) | Power density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------------|----------------------|-----------------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 802.11a         | 5250-5350            | 17.60                             | 7.12               | 20            | 0.0589                              | 1                           |
| 802.11a         | 5470-5725            | 17.14                             | 7.46               | 20            | 0.0574                              | 1                           |
| 802.11an HT20   | 5250-5350            | 18.05                             | 7.12               | 20            | 0.0654                              | 1                           |
| 802.11an HT20   | 5470-5725            | 16.66                             | 7.46               | 20            | 0.0514                              | 1                           |
| 802.11an HT40   | 5250-5350            | 20.31                             | 7.12               | 20            | 0.1100                              | 1                           |
| 802.11an HT40   | 5470-5725            | 19.78                             | 7.46               | 20            | 0.1055                              | 1                           |
| 802.11ac VHT20  | 5250-5350            | 18.08                             | 7.12               | 20            | 0.0658                              | 1                           |
| 802.11ac VHT20  | 5470-5725            | 16.69                             | 7.46               | 20            | 0.0517                              | 1                           |
| 802.11ac VHT40  | 5250-5350            | 20.33                             | 7.12               | 20            | 0.1106                              | 1                           |
| 802.11ac VHT40  | 5470-5725            | 19.81                             | 7.46               | 20            | 0.1062                              | 1                           |
| 802.11ac VHT80  | 5250-5350            | 14.61                             | 7.12               | 20            | 0.0296                              | 1                           |
| 802.11ac VHT80  | 5470-5725            | 19.34                             | 7.46               | 20            | 0.0952                              | 1                           |

**Maximum Permissible Exposure (Co-location)****(Non-Beamforming)**

| Modulation Mode                    | Frequency band (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) |
|------------------------------------|----------------------|-----------------------------------|-------------------|---------------|-------------------------------------|
| 2.4G 11b                           | 2412-2462            | 24.37                             | 4.85              | 20            | 0.1661                              |
| 5G 11ac VHT40                      | 5250-5350            | 23.34                             | 4.20              | 20            | 0.1129                              |
| 5G 11ac VHT40                      | 5470-5725            | 22.82                             | 4.83              | 20            | 0.1159                              |
| Co-location Total                  |                      |                                   |                   |               | 0.3949                              |
| Maximum Permissible Exposure Limit |                      |                                   |                   |               | 1                                   |

**(Beamforming)**

| Modulation Mode                    | Frequency band (MHz) | Max. Conducted output power (dBm) | Antenna Gain(dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) |
|------------------------------------|----------------------|-----------------------------------|-------------------|---------------|-------------------------------------|
| 2.4G VHT20                         | 2412-2462            | 20.77                             | 7.64              | 20            | 0.1381                              |
| 5G 11ac VHT40                      | 5250-5350            | 20.33                             | 7.12              | 20            | 0.1106                              |
| 5G 11ac VHT40                      | 5470-5725            | 19.81                             | 7.46              | 20            | 0.1062                              |
| Co-location Total                  |                      |                                   |                   |               | 0.3549                              |
| Maximum Permissible Exposure Limit |                      |                                   |                   |               | 1                                   |