



11. Radio Frequency Exposure

11.1 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

11.2 EUT Specification

Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2412MHz ~ 2462MHz <input checked="" type="checkbox"/> WLAN: 5150MHz ~ 5250MHz <input type="checkbox"/> WLAN: 5250MHz ~ 5350MHz <input type="checkbox"/> WLAN: 5470MHz ~ 5725MHz <input checked="" type="checkbox"/> WLAN: 5725MHz ~ 5850MHz <input type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5\text{mW}/\text{cm}^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1\text{mW}/\text{cm}^2$)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A
Remark: 1. The maximum output power is <u>29.82dBm (959.97mW)</u> at <u>2437MHz</u> (with <u>numeric 3 antenna gain.</u>) 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 $1.0\text{ mW}/\text{cm}^2$ even if the calculation indicates that the power density would be larger.	



11.3 Test Results

No non-compliance noted.

11.4 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 / cm²



11.5 Maximum Permissible Exposure

Max. output power	<p>Non-Beamforming Band: 2412MHz ~ 2462MHz 802.11b: 28.76dBm (750.89mW) 802.11g: 29.65dBm (922.10mW) 802.11ac VHT20: 29.82dBm (959.97mW) 802.11ac VHT40: 26.36dBm (432.92mW)</p> <p>Beamforming Band: 2412-2462MHz 802.11ac VHT20 (20MHz): 23.80 dBm (240.026 mW) 802.11ac VHT40 (40MHz): 20.34 dBm (108.245 mW)</p>
Antenna gain (Max)	3dBi

Maximum Permissible Exposure (Non-Beamforming)

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
802.11b	2412-2462	28.76	3	20	0.2981	1
802.11g	2412-2462	29.65	3	20	0.3660	1
802.11ac VHT20	2412-2462	29.82	3	20	0.3811	1
802.11ac VHT40	2412-2452	26.36	3	20	0.1718	1

Maximum Permissible Exposure (Beamforming)

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
802.11ac VHT20	2412-2462	23.80	9.02	20	0.3811	1
802.11ac VHT40	2412-2452	20.34	9.02	20	0.1718	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 ²)
2.4G 11ac VHT20	2412-2462	29.82	3	20	0.3811
5G 11ac VHT40	5725-5850	23.97	5	20	0.1568
Co-location Total					0.5379
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 ²)
2.4G 11ac VHT20	2412-2462	23.80	9.02	20	0.3811
5G 11ac VHT40	5725-5850	17.95	11.02	20	0.1568
Co-location Total					0.6988
Maximum Permissible Exposure Limit					1