



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

12.2 EUT Specification

Frequency band (Operating)	☒ WLAN: 2412MHz ~ 2462MHz ☒ WLAN: 5150MHz ~ 5250MHz ☐ WLAN: 5250MHz ~ 5350MHz ☐ WLAN: 5470MHz ~ 5725MHz ☒ WLAN: 5725MHz ~ 5850MHz ☐ Bluetooth: 2402MHz ~ 2480MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure ($S = 5\text{mW}/\text{cm}^2$) ☒ General Population/Uncontrolled exposure ($S=1\text{mW}/\text{cm}^2$)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A
Remark: 1. The maximum output power is <u>23.78 dBm (238.96mW)</u> at <u>2437MHz</u> (with <u>numeric 4.85 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.	



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:

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

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



12.5 Maximum Permissible Exposure

Max. output power	Non-Beamforming 802.11b: 22.56 dBm (180.49mW) 802.11g: 23.35 dBm (216.42mW) 802.11n HT20: 23.71 dBm (235.07mW) 802.11n HT40: 19.26 dBm (84.25mW) VHT20: 23.78 dBm (238.96mW) VHT40: 19.33 dBm (85.62mW) Beamforming 802.11g: 20.34 dBm (108.22) 802.11n HT20: 20.70 dBm (117.54mW) 802.11n HT40: 16.25 dBm (42.13mW) VHT20: 20.77 dBm (119.49mW) VHT40: 16.32 dBm (42.81mW)
Antenna gain (Max)	ANT A: 4.85 dBi ; ANT B: 4.4 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 ²)	Limit (mW/cm ²)
802.11b	2412-2462	22.56	4.85	20	0.1096	1
802.11g	2412-2462	23.35	4.85	20	0.1315	1
802.11n HT20	2412-2462	23.71	4.85	20	0.1429	1
802.11n HT40	2422-2452	19.26	4.85	20	0.0512	1
VHT20	2412-2462	23.78	4.85	20	0.1452	1
VHT40	2422-2452	19.33	4.85	20	0.0520	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)
802.11g	2412-2462	20.34	7.64	20	0.1250	1
802.11n HT20	2412-2462	20.70	7.64	20	0.1358	1
802.11n HT40	2422-2452	16.25	7.64	20	0.0487	1
VHT20	2412-2462	20.77	7.64	20	0.1381	1
VHT40	2422-2452	16.32	7.64	20	0.0495	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)
VHT20	2412-2462	23.78	4.85	20	0.1452
802.11a	5150-5250	22.95	4.81	20	0.1188
802.11a	5725-5850	22.83	4.90	20	0.1180
Co-location Total					0.382
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)
VHT20	2412-2462	20.77	7.64	20	0.1381
802.11a	5150-5250	19.94	7.51	20	0.1106
802.11a	5725-5850	19.82	7.56	20	0.1089
Co-location Total					0.3576
Maximum Permissible Exposure Limit					1