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 = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/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 27.56dBm (570.74mW) at 2437MHz (with numeric 4.85 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^2 even if the calculation indicates that the power density would be larger.

12.3 Test Results

No non-compliance noted.

12.4 Calculation

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

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 (mW) = P (W) / 1000 and
d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ **Equation 1**

Where d = Distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

12.5 Maximum Permissible Exposure

Max. output power	Non-Beamforming 802.11b: 22.56 dBm (180.49mW) 802.11g: 27.38 dBm (547.22mW) 802.11n HT20: 27.54 dBm (567.41mW) 802.11n HT40: 19.91 dBm (97.98mW) VHT20: 27.56 dBm (570.74mW) VHT40: 19.95 dBm (98.77mW) Beamforming 802.11g: 24.37 dBm (273.63mW) 802.11n HT20: 24.53 dBm (283.73mW) 802.11n HT40: 16.90 dBm (48.99mW) VHT20: 24.55 dBm (285.39mW) VHT40: 16.94 dBm (49.39mW)
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/cm2)	Limit (mW/cm2)
802.11b	2412-2462	22.56	4.85	25	0.0702	1
802.11g	2412-2462	27.38	4.85	25	0.2129	1
802.11n HT20	2412-2462	27.54	4.85	25	0.2207	1
802.11n HT40	2422-2452	19.91	4.85	25	0.0381	1
VHT20	2412-2462	27.56	4.85	25	0.2220	1
VHT40	2422-2452	19.95	4.85	25	0.0384	1

Maximum Permissible Exposure (Beamforming)

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm2)	Limit (mW/cm2)
802.11g	2412-2462	24.37	7.64	25	0.2023	1
802.11n HT20	2412-2462	24.53	7.64	25	0.2098	1
802.11n HT40	2422-2452	16.90	7.64	25	0.0362	1
VHT20	2412-2462	24.55	7.64	25	0.2110	1
VHT40	2422-2452	16.94	7.64	25	0.0365	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	27.56	4.85	25	0.2220
802.11ac VHT40	5150-5250	26.64	4.81	25	0.1777
802.11ac VHT20	5725-5850	28.47	4.9	25	0.2769
Co-location Total					0.6766
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	24.55	7.64	25	0.2110
802.11ac VHT40	5150-5250	23.63	7.51	25	0.1655
802.11ac VHT20	5725-5850	25.46	7.56	25	0.2555
Co-location Total					0.632
Maximum Permissible Exposure Limit					1