Radio Frequency Exposure

LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	WiFi Access Point
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☒ WLAN: 5.150GHz ~ 5.250GHz ☐ WLAN: 5.250GHz ~ 5.350GHz ☐ WLAN: 5.470GHz ~ 5.725GHz ☒ WLAN: 5.725GHz ~ 5.850GHz ☐ Bluetooth: 2.402GHz ~ 2.480 GHz
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
Max. output power	Band: 2412-2462MHz 802.11b: 27.26 dBm (532.28 mW) 802.11g: 29.63 dBm (918.47 mW) 802.11n (20MHz): 29.66 dBm (923.90 mW) 802.11n (40MHz): 28.87 dBm (770.34 mW) Band: 5150-5250 MHz 802.11a: 25.22 dBm 802.11an (20MHz): 25.47 dBm 802.11an (40MHz): 24.31 dBm 802.11ac (20MHz): 25.53 dBm 802.11ac (40MHz): 24.37 dBm 802.11ac (80MHz): 14.70 dBm Band: 5725-5850 MHz 802.11a: 28.48 dBm 802.11an (20MHz): 28.44 dBm 802.11an (40MHz): 27.78 dBm 802.11ac (20MHz): 28.50 dBm 802.11ac (40MHz): 27.83 dBm 802.11ac (80MHz): 21.06 dBm
Antenna gain (Max)	2412-2462MHz: 4.6dBi 5150-5250MHz: 5.1dBi
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A
Remark: *1. The maximum output power is 29.66dBm (923.90 mW) at 2437 MHz (with numeric 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^2 even if the calculation indicates that the power density would be larger.*	

**Note: Simultaneous transmission is not applicable for this EUT.*

TEST RESULTS

No non-compliance noted.

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 / cm²

Maximum Permissible Exposure

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm2)	Limit (mW/cm2)
11b	2412-2462	27.26	4.6	20	0.3054	1
11g	2412-2462	29.63	4.6	20	0.5270	1
11n HT20	2412-2462	29.66	4.6	20	0.5306	1
11n HT40	2422-2452	28.87	4.6	20	0.4420	1
11a	5150-5250	25.22	5.1	20	0.2142	1
	5725-5850	28.48	5.1	20	0.4535	1
11n HT20	5150-5250	25.47	5.1	20	0.2266	1
	5725-5850	28.44	5.1	20	0.4496	1
11n HT40	5150-5250	24.31	5.1	20	0.1738	1
	5725-5850	27.78	5.1	20	0.3863	1
11ac VHT20	5150-5250	25.53	5.1	20	0.2300	1
	5725-5850	28.50	5.1	20	0.4562	1
11ac VHT40	5150-5250	24.37	5.1	20	0.1760	1
	5725-5850	27.83	5.1	20	0.3908	1
11ac VHT80	5150-5250	14.70	5.1	20	0.0190	1
	5725-5850	21.06	5.1	20	0.0822	1

NOTE:

Total (Chain0+Chain1) , the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density