Radio frequency exposure

LIMIT

According to FCC §1.1310, The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in § 1.1307(b).

EUT Specification

EUT	dynadock WiAC
Frequency band (Operating)	802.11n/a/ac(20MHz): 5180~5240MHz, 5745~5825MHz 802.11n/ac(40MHz): 5190~5230MHz, 5755~5795MHz 802.11ac(80MHz): 5210MHz, 5775MHz
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
Antenna type / gain	PCB Antenna;5.15~5.725GHz Gain = 4dBi , 5.725~5.85GHz Gain = 4dBi;Beaforming Gain=3dBi
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

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

Maximum Permissible Exposure

Test Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm2)	Limit (mW/cm2)
802.11n/a/ac(20MHz)	5180~5240	19.57	7	20	0.090	1
802.11n/ac(40MHz)	5190~5230	16.00	7	20	0.040	1
802.11n/a/ac(20MHz)	5745~5825	19.70	7	20	0.093	1
802.11n/ac(40MHz)	5755~5795	18.54	7	20	0.071	1
802.11ac(80MHz)	5210~5210	18.92	7	20	0.078	1
802.11ac(80MHz)	5775~5775	18.78	7	20	0.075	1

NOTE:

The power density at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/m^2.

EVALUATION RESULTS

No non-compliance noted

The End