

Maximum Permissive Exposure

FCC ID: 2AUYW-A010001

Product Name: Duke Energy Gateway

Model No: DK-GW001-A01-C001

1. According to FCC CFR 47 §1.1310, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b).

Table 1 Limits for Maximum Permissible Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits For Occupational / Control Exposures (f = frequency)				
30-300	61.4	0.163	1.0	6
300-1500	...	...	f/300	6
1500-100,000	...	...	5.0	6
(B) Limits For General Population / Uncontrolled Exposure (f = frequency)				
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

Duke Energy Business Services LLC declares that the product described above has been evaluated and found to comply with the RF exposure limits for humans, as specified based on ANSI/FCC recommendation.

Based on safety distance (r) **20cm**, the antenna gain (G) is **2.065Numerical**, and the highest power output (P) is **35.075mW**, the power density (S) is **0.014409mW/cm²**.

RF Exposure Calculations:

$$S = (P * G) / (4 * \pi * r^2) \text{ or } r = \sqrt{(P * G) / (4 * \pi * S)}$$

Where :

WLAN 2.4G

Based on safety distance (r)=	20 cm	
Highest Power Output (P)=	24 dBm =	251.189 mW
Antenna Gain (G)=	3.73 dBi =	2.360 Numerical
MPE (S) = (P*G) / (4* π *r ²) =	= (251.189*2.360)/(4*π*20²)= 0.117935 mW/cm ²	

WLAN 5G

Based on safety distance (r)=	20 cm	
Highest Power Output (P)=	13 dBm =	19.953 mW
Antenna Gain (G)=	3.92 dBi =	2.466 Numerical
MPE (S) = (P*G) / (4* π *r ²) =	= (19.953*2.466)/(4*π*20²)= 0.009789 mW/cm ²	

BT

Based on safety distance (r)=	20 cm	
Highest Power Output (P)=	6 dBm =	3.981 mW
Antenna Gain (G)=	3.73 dBi =	2.360 Numerical
MPE (S) = (P*G) / (4* π *r ²) =	= (3.981*2.360)/(4*π*20²)= 0.001869 mW/cm ²	

ZigBee

Based on safety distance (r)=	20 cm	
Highest Power Output (P)=	12 dBm =	15.849 mW
Antenna Gain (G)=	3.73 dBi =	2.360 Numerical
MPE (S) = (P*G) / (4* π *r ²) =	= (15.849*2.360)/(4*π*20²)= 0.007441 mW/cm ²	

Zwave

Based on safety distance (r)=	20 cm	
Highest Power Output (P)=	-2.2 dBm =	0.603 mW
Antenna Gain (G)=	3.15 dBi =	2.065 Numerical
MPE (S) = (P*G) / (4* π *r ²) =	= (0.603*2.065)/(4*π*20²)= 0.000248 mW/cm ²	

2. MPE Calculation for Simultaneous

WLAN 2.4G (mW/cm ²)	ZigBee (mW/cm ²)	Zwave (mW/cm ²)	Total (mW/cm ²)	Limit (mW/cm ²)
0.117935	0.007441	0.000248	0.125624	≤ 1

WLAN 5G (mW/cm ²)	ZigBee (mW/cm ²)	Zwave (mW/cm ²)	Total (mW/cm ²)	Limit (mW/cm ²)
0.009789	0.007441	0.000248	0.017478	≤ 1

BT (mW/cm ²)	ZigBee (mW/cm ²)	Zwave (mW/cm ²)	Total (mW/cm ²)	Limit (mW/cm ²)
0.001869	0.007441	0.000248	0.009558	≤ 1

WLAN 2.4G (mW/cm ²)	BT (mW/cm ²)	Total (mW/cm ²)	Limit (mW/cm ²)
0.117935	0.001869	0.119804	≤ 1

WLAN 5G (mW/cm ²)	BT (mW/cm ²)	Total (mW/cm ²)	Limit (mW/cm ²)
0.009789	0.001869	0.011658	≤ 1

Sincerely Yours,



Mr. Ben Cheng
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