



Appendix E. RF Exposure Evaluation

1. The (FCC ID: EJE-WB0105) can be used with (FCC ID: EJE-SBC001), the following MPE analysis was performed on (FCC ID: EJE-WB0105) collocation with (FCC ID: EJE-SBC001).

1. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



2. RF Exposure Evaluation

2.1 Standalone Power Density Calculations for FCC ID: EJE-WB0105.

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
Bluetooth	-1.25	6.00	4.75	0.0030	2.9854	0.0006	1.0000	0.0006
2.4GHz WLAN	-1.25	15.0	13.75	0.0237	23.7137	0.0047	1.0000	0.0047
5GHz WLAN	1.92	15.0	16.92	0.0492	49.2040	0.0098	1.0000	0.0098
WiGig			-1.40	0.0007	0.7244	0.0001	1.0000	0.0001

2.2 Standalone Power Density Calculations for FCC ID: EJE-SBC001.

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WiGig			-2.65	0.0005	0.5433	0.0001	1.0000	0.0001

2.3 Collocated Power Density Calculation

FCC ID: EJE-WB0105			FCC ID : EJE-SBC001	Σ (Power Density / Limit)
Bluetooth Power Density / Limit	2.4GHz / 5GHz WLAN Maximum Power Density / Limit	WiGig Power Density / Limit	WiGig Power Density / Limit	
0.0006	0.0098	0.0001	0.0001	0.0107

Note:

- For FCC ID: EJE-WB0105:
 - Bluetooth, 2.4GHz WLAN and WiGig can transmit simultaneously
 - Bluetooth, 5GHz WLAN and WiGig can transmit simultaneously
- Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission) / (corresponding MPE limit)], for (Bluetooth + 2.4GHz/5GHz WLAN + WiGig) of (FCC ID : EJE-WB0105) with WiGig of (FCC ID : EJE-SBC001).
- Considering all antenna collocation of the EIRP performance listed in the table above, the aggregated (power density / limit) is smaller than 1, and MPE of all collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.