

Appendix E. RF Exposure Evaluation

The BT/WiFi 9560NGW and 60GHz SNAP (FCC ID: EJE-WB0109) are also integrated in this host, when the host insert to the 60GHz charging cradle (FCC ID: EJE-SBC001), the 60GHz feather of host device will be turn on and transmission, in such users scenarios which the device will keep away 20cm distance from human body. Therefore, additional evaluate MPE of the WWAN, BT/WiFi and 60GHz simultaneous transmission analysis is necessary.

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-EM7455D2.

Band	Frequency (MHz)	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
WCDMA Band II	1852.4	2.51	24.00	26.51	0.447713	447.713304	0.089115	1	0.089115
WCDMA Band IV	1712.4	2.07	24.00	26.07	0.404576	404.575892	0.080529	1	0.080529
WCDMA Band V	826.4	-0.36	24.00	23.64	0.231206	231.206479	0.046020	0.550933	0.083532
LTE Band 2	1850.7	2.51	24.00	26.51	0.447713	447.713304	0.089115	1	0.089115
LTE Band 4	1710.7	2.07	24.00	26.07	0.404576	404.575892	0.080529	1	0.080529
LTE Band 5	824.7	-0.19	24.00	23.81	0.240436	240.436280	0.047858	0.549800	0.087045
LTE Band 7	2502.5	0.76	23.00	23.76	0.237684	237.684029	0.047310	1	0.047310
LTE Band 12	699.7	-1.71	24.00	23.32	0.169434	169.433780	0.033725	0.466467	0.072299
LTE Band 13	779.5	-0.68	24.00	26.51	0.214783	214.783047	0.042751	0.519667	0.082267
LTE Band 25	1850.7	2.51	24.00	26.51	0.447713	447.713304	0.089115	1	0.089115
LTE Band 26	814.7	-0.19	24.00	23.81	0.240436	240.436280	0.047858	0.549800	0.087045
LTE Band 41	2498.5	1.41	23.00	24.41	0.276058	276.057786	0.054948	1	0.054948

2.2 Standalone Power Density Calculations for FCC ID: EJE-WB0109.

Band	Frequency (MHz)	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
2.4GHz WLAN	2412.0	0.11	18.00	18.110	0.064714	64.714262	0.012881	1	0.012881
5GHz WLAN	5180.0	2.99	16.50	19.490	0.088920	88.920112	0.017699	1	0.017699
Bluetooth	2402.0	-0.56	11.00	10.440	0.011066	11.066238	0.002203	1	0.002203
SNAP	60480.0			-1.08	0.000780	0.779830	0.000155	1	0.000155

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

Band	Frequency (MHz)	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
SNAP	60480.0			-2.65	0.000543	0.543250	0.000108	1	0.000108

**2.4 Collocated Power Density Calculation**

FCC ID: EJE-EM7455D2	FCC ID: EJE-WB0109			FCC ID : EJE-SBC001	Σ (Power Density / Limit)
WWAN Maximum Power Density / Limit	Bluetooth Power Density / Limit	2.4GHz / 5GHz WLAN Maximum Power Density / Limit	SNAP Power Density / Limit	SNAP Power Density / Limit	
0.089115	0.002203	0.017699	0.000155	0.000108	0.10928

Note:

- For FCC ID: EJE-EM7455D2:
 - WWAN,Bluetooth,2.4GHz WLAN and SNAP can transmit simultaneously
 - WWAN,Bluetooth,5GHz WLAN and SNAP 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)].
- 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.