47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091
Maximum Permissible Exposure Calculations

For FCC ID: 2AA6Z-78T

EUT Device Category = General Population/Uncontrolled Exposure

EUT consists of one transceiver that may operate using Bluetooth over a frequency range of 2402 MHz to 2480 MHz (ISM), using 802.11bgn operating over a range of 2412 MHz to 2462 MHz (ISM), using 802.15ac from 5180 MHz to 5240 MHz (UNII-1) or 5745 MHz to 5825 MHz (UNII-3). Only one operational mode can be active at any given time.

MPE Summary:

According subpart 1.1307 (b)(1) and 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density

Calculated Formulary:

Predication of MPE limit at a given distance

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

S = power density (in appropriate units, e.g. mW/cm^2)
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)
PG = EIRP

Bluetooth SDR

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
2402	2.93	1.0	3.93	2.47	0.000492	1.0	-0.999508
2441	2.77	1.0	3.77	2.38	0.000474	1.0	-0.999526
2480	2.55	1.0	3.55	2.26	0.000451	1.0	-0.999549

Bluetooth EDR

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
2402	0.67	1.0	1.67	1.47	0.000292	1.0	-0.999708
2441	0.69	1.0	1.69	1.48	0.000294	1.0	-0.999706
2480	0.83	1.0	1.83	1.52	0.000303	1.0	-0.999697

802.11b

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
2412	12.89	1.0	13.89	24.49	0.004872	1.0	-0.995128
2437	13.17	1.0	14.17	26.12	0.005197	1.0	-0.994803
2462	13.41	1.0	14.41	27.61	0.005492	1.0	-0.994508

802.11g

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
2412	9.49	1.0	10.49	11.19	0.002227	1.0	-0.997773
2437	9.94	1.0	10.94	12.42	0.002470	1.0	-0.997530
2462	10.59	1.0	10.59	11.46	0.002279	1.0	-0.997721

802.11n (HT20)

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
2412	9.92	1.0	10.92	12.36	0.002459	1.0	-0.997541
2437	10.35	1.0	11.35	13.65	0.002715	1.0	-0.997285
2462	10.93	1.0	11.93	15.60	0.003103	1.0	-0.996897

802.11ac (UNII-1)

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
5180	12.5	1.0	13.5	22.4	0.0045	1.0	-0.9955
5200	12.2	1.0	13.2	20.9	0.0042	1.0	-0.9958
5240	12.0	1.0	13.0	20.0	0.0040	1.0	-0.9960
5190	12.4	1.0	13.4	21.9	0.0044	1.0	-0.9956
5230	11.7	1.0	12.7	18.6	0.0037	1.0	-0.9963

802.11ac (UNII-3)

Freq (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Δ
5745	12.6	1.0	13.6	22.9	0.0046	1.000	-0.9954
5785	11.7	1.0	12.7	18.6	0.0037	1.000	-0.9963
5825	12.6	1.0	13.6	22.9	0.0046	1.000	-0.9954
5755	13.2	1.0	14.2	26.3	0.0052	1.000	-0.9948
5795	13.0	1.0	14.0	25.1	0.0050	1.000	-0.9950

Result: The device meets FCC MPE limit at 20 cm for General Population/Uncontrolled Exposure as specified in 47 CRF §1.1310 and §2.1091.