The Device is a portable BLE Sensor GEN2 for IoT applications. BLE Sensor GEN2 is suitable for commercial indoor / outdoor application.

BLE Sensor GEN2 is evaluated for RF radiation exposure according to the provisions of FCC §2.1093, MPE guidelines identified in FCC §1.1310 and FCC KDB 447498:2015.

§2.1093 Radiofrequency radiation exposure evaluation: portable devices.

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

(c)(1) Portable devices that operate in the Cellular Radiotelephone Service pursuant to part 22 of this chapter; the Personal Communications Service (PCS) pursuant to part 24 of this chapter; the Satellite Communications Services pursuant to part 25 of this chapter; the Miscellaneous Wireless Communications Services pursuant to part 27 of this chapter; the Upper Microwave Flexible Use Service pursuant to part 30 of this chapter; the Maritime Services (ship earth station devices only) pursuant to part 80 of this chapter; the Specialized Mobile Radio Service, the 4.9 GHz Band Service, and the 3650 MHz Wireless Broadband Service pursuant to part 90 of this chapter; the Wireless Medical Telemetry Service (WMTS), the Medical Device Radiocommunication Service (MedRadio), and the 76-81 GHz Band Radar Service pursuant to subparts H, I, and M of part 95 of this chapter, respectively; **unlicensed personal communication service**, unlicensed NII devices and millimeter-wave devices authorized under §§15.255(f), 15.257(g), 15.319(i), and 15.407(f) of this chapter; and the Citizens Broadband Radio Service pursuant to part 96 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use.

(2) All other portable transmitting devices are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in §§1.1307(c) and 1.1307(d) of this chapter.

As per FCC KDB 447498:2015 clauses 4.3 General SAR test exclusion guidance.

4.3.1. Standalone SAR test exclusion considerations

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

f (GHz) is the RF channel transmit frequency in GHz

SAR Test Exclusion Thresholds Table at Selected Frequencies and Test Separation Distances for 100 MHz – 6 GHz and ≤ 50 mm

(The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.)

MHz	**5**	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	**16**	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

LoRa and BLE RF conducted power measurement and antenna gain as per ETC test reports t29e20a289-P-DTS_FCC and t29e20a289-P-DSS_FCC section 2.3.5 are reported below.

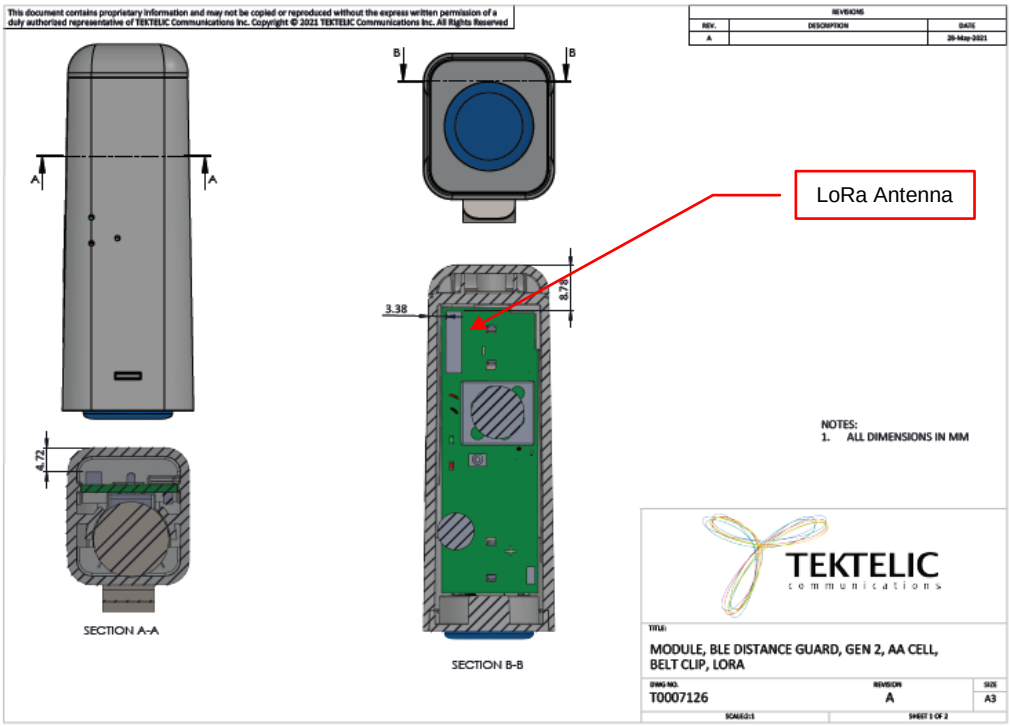
The maximum duty cycle for radio is stated in the Operation Description exhibit section 2.1 control by SW to be 0.67%. The worst-case value is in bold below

TX Mode	Frequency (MHz)	Conducted RF Output 100% Duty Cycle (dBm)	Max. antenna gain (dBi)	Conducted EIRP 100% duty Cycle(dBm)	EIRP 100% Duty Cycle (mW)	EIRP 0.67% Duty Cycle (mW)
LoRa 500 KHz	903	18.59	2.8	21.39	72.3	0.48
	907.8	18.64	2.8	21.44	73.1	0.49
	914.2	18.67	2.8	21.47	73.6	0.49
LoRa 125 KHz	902.3	18.55	2.8	21.35	71.6	0.48
	908.7	18.68	2.8	21.48	73.8	0.495
	914.9	18.68	2.8	21.48	73.8	0.495
BLE	2402	0.79	1.1	1.89	1.55	-
	2438	0.42	1.1	1.52	1.42	-
	2480	0.38	1.1	1.48	1.41	-
Using a worst case scenario after tuning procedure						
Tx Power		**22**	**2.8**	**24.8**	**302**	**2.02**

Calculated Worse Case Average EIRP is = 2.0 mW

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz.

As per customer provided diagram of unit the minimum test separation distance is **3.38mm** which is. < 5 mm.



According to 4.1 f) of FCC KDB 447498:2015. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Calculations:

Worse Average Power= 2 mW

Distance= 5 mm

Frequencies= .903 GHz

[(2 mW / 5 mm)] x [√ (0.903 GHz)] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR

0.421 < 3.0 (1-g SAR Limit) => SAR test excluded for 1g and 10g SAR tests

EUT meet SAR exception limit