1 FCC Limits

§ 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Part 1.1310 Limits for Maximum Permissible Exposure (MPE)

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

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

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

2 Test Procedure

An MPE evaluation for was performed in order to show that the device was compliant with the general population exposure limits from FCC §2.1091. The maximum power density was calculated for each transmitter band at a separation distance of "x"cm using the maximum declared output power including tune up tolerance.

For each transmitter the maximum RF exposure at a "x" cm distance using the formula:

$$Conducted\,Power_{mW} = 10^{Conducted Power(dBm)/10}$$

$$PowerDensity = \frac{Conducted Power_{mW} \times Ant.Gain}{4\pi \times (x)^2}$$

3 Results:

The TB 5G RU is not supplied with an antenna. The maximum antenna gains were supplied by the manufacturer and are shown in the table below for each band. These antenna gains were used to calculate a safe separation distance such that the RF exposure levels would be equal to or less than the required limits for general population exposure for FCC Part 1.1310. As shown below the minimum safe separation distance was 1090cm (10.9 meters) for the worst case transmit band (n29).

FCC MPE Data

Duty Cycle	100 (%)						
Separation Dist.	1090 (cm)						
Operating Mode	**Frequecy (MHz)**	**Declared Max Cond. Power (Inc. Tolerance) (dBm)**	**Duty Cycle Adjusted Cond. Output Power (dBm)**	**Antenna Gain (dB)**	**MPE Value (mW/cm^2)**	**MPE Limit (mW/cm^2)**	**Margin to Limit (mW/cm^2)**
n29	717	52.78	52.78	15.7	0.4720	0.48	**0.0060**
n71	617	52.05	52.05	15.3	0.3639	0.41	**0.0475**
n26	862	47.62	47.62	16.3	0.1652	0.57	**0.4095**