

US Tech Test Report:
 FCC ID:
 IC:
 Test Report Number:
 Issue Date:
 Customer:
 Model:

FCC Part 15/IC RSS Certification
 WPEPSASII-03
 8031A-PSASII03
 21-0335
 November 24, 2021
 Emerson Digital Cold Chain, Inc
 PSASII-03

Maximum Permissible Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, **d**, of 20 cm from the EUT.

TABLE 1—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)
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

Therefore, for:

MPE for 902 MHz – 928 MHz

Limit: $(f/1500) \text{ mW/cm}^2 = 915/1500 = 0.61 \text{ mW/cm}^2$

Peak Power (dBm) = 3.0 dBm

Peak Power (Watts) = 0.002 W

Gain of Transmit Antenna = 5 dBi = 3.16, numeric

d = Distance = 20 cm = 0.2 m

$$\begin{aligned}
 S &= (PG / 4\pi d^2) = \text{EIRP} / 4A = 0.002 * (3.16) / 4 * \pi * 0.2 * 0.2 \\
 &= 0.0063 / 0.5030 = 0.0126 \text{ W/m}^2 \\
 &= (0.0126 \text{ W/m}^2) (1 \text{ m}^2/\text{W}) (0.1 \text{ mW/cm}^2) \\
 &= 0.00126 \text{ mW/cm}^2
 \end{aligned}$$

which is << less than $S = 0.61 \text{ mW/cm}^2$

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RSS-102 2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In this case the Emerson radio operates in the 902-928 MHz therefore the limit is equal to:

$$1.31 \times 10^{-2} (915)^{0.6834} = \underline{1.38 \text{ W}}$$

The EIRP for the EUT is equal to $3 \text{ dBm} + 5 \text{ dBi} = 8 \text{ dBm} = 0.006 \text{ W} \ll 1.38 \text{ W}$