PD2-TX-5000-S RF Exposure

Calculation method of RF power density:

The PD2-TX-5000-S user manual states that the ***minimum*** safe antenna to body distance is 30 cm.
Therefore the power density, S, at a distance of 30 cm, in mW/cm^2 is:

*S = (P * G) / (4 * Pi * r^2)* Eq. 1

Where:
S = allowable power density in mW/cm^2
P = power to the antenna in mW
G = numeric gain of the antenna
R = 30 cm (minimum safe distance specified in user manual)

The limit for Maximum Permissible Exposure (MPE) General Population in the frequency band 1.50 – 100 GHz is 1 mW/cm^2 (47 CFR 1.1310).

Antennas intended for use with this device have a maximum gain of 2.1 dBi.

The maximum transmitter power is 5,000 mW.

Conversion of antenna gain from dB to numeric:

$$G = 10^{(2.1/10)} = 1.62$$

Substitute P, G, and r into Eq. 1 to solve for the power density in *mW / cm^2:*

*S = (P * G) / (4 * Pi * r^2)*

*S = (5000 * 1.62) / (4 * 3.14 * 30^2)*

S = 0.72 mW / cm^2

Therefore, the Maximum Permissible Exposure (MPE) limits, as specified in FCC 47 CFR 1.1310 for general population use, are not exceeded when the device is used as described in the Operator's Manual.

PD2-TX-5000-S SAR Testing

Relevant FCC Chapter:
2.1093 Radiofrequency radiation exposure evaluation: portable devices.
2.1093
(c)Portable devices that operate in
the Cellular Radiotelephone Service,
the Personal Communications Service (PCS),
the Satellite Communications Services,
the General Wireless Communications Service,
the Wireless Communications Service,
the Maritime Services,
the Specialized Mobile Radio Service,
the 4.9 GHz Band Service,
the Wireless Medical Telemetry Service (WMTS)
and the Medical Implant Communications Service (MICS),
authorized under subpart H of part 22 of this chapter, parts 24, 25, 26, 27, 80, and 90 of this chapter, subparts H and I of part 95 of this chapter, and unlicensed personal communication service, unlicensed NII devices and millimeter wave devices authorized under subparts D and E, §§15.253, 15.255 and 15.257 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use. 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.

The PD2-TX-5000-S operates in the services delineated by 2.1093 (c). However, the PD2-TX-5000-S is not designed for body-worn applications and, as such, the PD2-TX-5000-S Operator's Manual states that "a separation distance of at least 30 cm must be maintained between the antenna and the body of the user or nearby persons."

The antenna supplied with the PD2-TX-5000-S has a gain of 2.1dBi. The MPE (Maximum Permissible Exposure) calculation for the PD2-TX-5000-S, operating with this antenna, and the minimum body-antenna separation stated above (30cm), yields a Power Density of 0.72mW/cm^2. The limit for Maximum Permissible Exposure (MPE) (General Population) in the frequency band 1.50 – 100 GHz is 1 mW/cm^2 (47 CFR 1.1310).

The intended usage of the PD2-TX-5000-S and the resulting MPE level exempt the PD2-TX-5000-S from SAR testing and none was performed.

Spurious Radiated Emissions – 2.1053, 90.210(d)

Measurements performed by RETLIF TESTING LABS

ATTACHMENT FILE:
[14]H25PD2TX5000S_R-5558N.PDF