

## Space-qualified Telemetry Transmitter

### 5 Watt, L-Band, QPSK

### STTL-3400 Series

- **5W, High-Reliability**
- **Radiation Hardened**
- **Launch-proven, Rugged design**
- **L-Band Operation (1690.0-1710.0 MHz)**
- **QPSK Modulation**
- **Forward Error Correction (FEC)**



### Description

Microwave Innovations offers its 5W, L-Band, Space-qualified Telemetry Transmitter for those needing high-reliability and proven performance in a robust, radiation-tolerant package. This transmitter is designed to operate with mission assurance in LEO environments.

The 5W, QPSK Telemetry Transmitter is a Space-COTS product, which leverages off our established designs, while using radiation-tolerant components to meet stringent space requirements at low cost.

This Space-Commercial-Off-The-Shelf (S-COTS) product which supports a Fixed Rate Data Input or a Clock & Data Input for dynamic data rate requirements. The design features a high-efficiency DC Regulator, and a high-reliability RF power amplifier with an RF Isolator protected output as standard. An isolated DC Power Regulator is included to support isolated power return interests. Full spectral efficiency is supported even at Low Data Rates with Ultra-Low Phase Noise Performance during high shock and vibration

environments. An IRIG compatible Randomizer is featured and an Appendix-N compliant user interface are also standard. Data & Clock inputs are 100-ohm balanced RS422 with passive terminations.

Other features include;

- Differential Clock and Data
- RF Enable
- Freq Lock Indicator
- Health Status Indicator
- Soft Reset Control
- RF Mute Indicator

The Space-qualified Telemetry Transmitter is leveraging off our well established high-reliability designs that have been flown on the most demanding programs. The S-COTS design can be supplied with a high-reliability Parts Program for established reliability and performance meeting the most extreme mission performance requirements.

Microwave Innovations' high-reliability, high-shock, and extreme environmental performance heritage is broadly recognized for ground, air, sea, and space environments.



### SPECIFICATIONS

#### RF Output

**Frequency:** 1690.0-1710.0 MHz  
(Frequency Step Size 0.5 or 1.0 MHz)

**Carrier Stability:** Within  $\pm 0.001\%$  over temperature

**RF Power:** 5 Watts (Minimum)

**VSWR:** 1.5:1 (Maximum)

**Impedance:** 50 Ohms (Nominal)

**Loading:** Normal operation into any Load VSWR and any Phase Angle

**Open/Short Protection:** No damage due to Open or Short of unlimited duration

**Harmonic & Spurious Level:** In accordance with IRIG 106-96

**Modulation Input:** Input Data Rates: 1 Mbps (+/-100ppm expected)

**Data & Clock Input:** RS-422, 100-ohm Differential Input, passive term.

**Encoding:** NRZ-M Differential Encoding of data, expected

**Forward Error Correction (FEC):** Convolutional Encoding

#### Environmental Specification

**Temperature:** -20°C to +50°C Acceptance Level  
-30°C to +70°C (Qualification Level)

**Random Vibration:** 6.8 Grms (Qualification and Acceptance)

**Pyroshock:** Complex Spectrum; 50 G's @ 100 Hz, 800 G's @ 900Hz, 800 G's @ 10 kHz

**Acceleration:** 100G

**Altitude:** Unlimited

**EMC:** Per MIL-STD-461-E

#### Mechanical Specifications

**Weight:** 2.125 Lbs. (34 oz.) max.

**Dimensions:** as per outline drawing

#### Power Requirements

**Input Voltage:** +22 to +34 VDC

**Maximum Input Power:** 50 Watts

**Isolated Power RTN:** PWR RTN Isolated from Chassis >1 Mega Ohm

### CONNECTORS

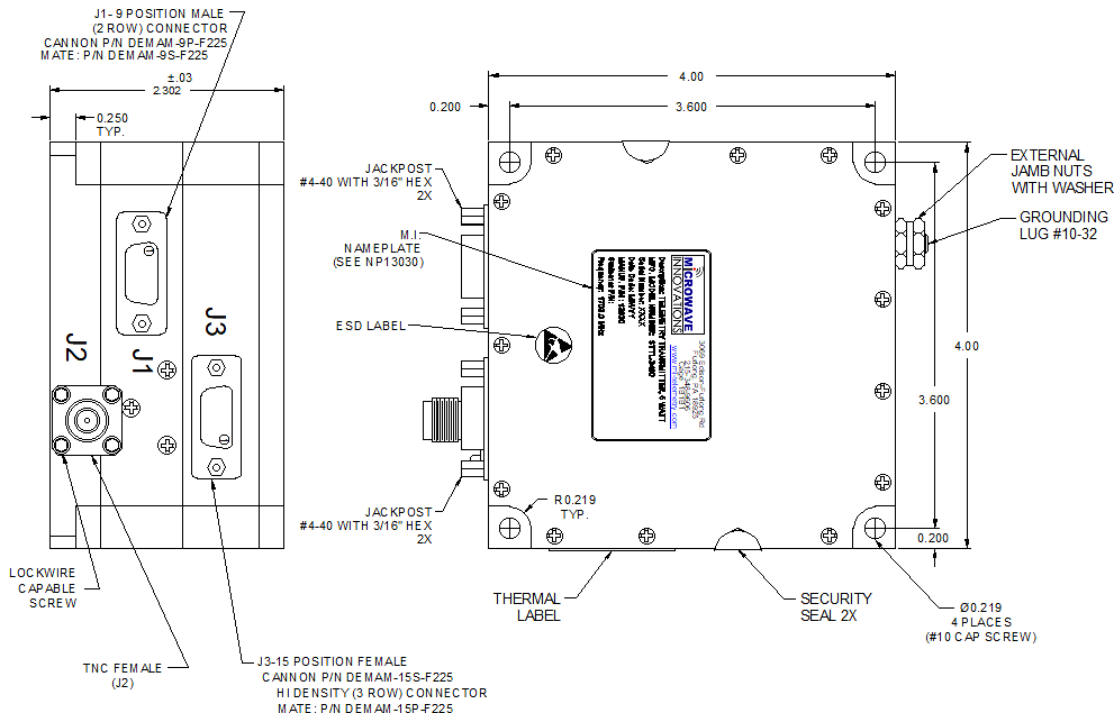
J1-POWER INPUT HIGH DENSITY D CONNECTOR

PIN	Function
1	+28VDC (A) Input
2	ISO (A) RTN
3	+28VDC (B) Input
4	ISO (B) RTN
5	+28VDC (C) Input
6	ISO (C) RTN
7	NC
8	RTD
9	RTD

J-3 DATA/CLK INPUT HIGH DENSITY D CONNECTOR

PIN	Function
1	Differential Data Input (+)
2	Differential Data Input (-)
3	NC
4	Differential CLK Input (+)
5	Differential CLK Input (-)
6	TX Enable Control (+)
7	TX Enable Control (+)

PIN	Function
8	Freq. Locked Indicator (+)
9	Freq. Locked Indicator (-)
10	Health Status Indicator (+)
11	Health Status Indicator (-)
12	Soft Reset Control (+)
13	Soft Reset Control (-)
14	RF Mute Indicator (+)
15	RF Mute Indicator (-)



### Unique Customer Requirements Are Welcome, Including:

Connector Types, PWR Non-Isolated, Isolated, Enclosure Size, Data Rates, RF Center Frequency & Power, etc.

