μXTx-100 X-Band Transmitter

Space Micro celebrates its 13-year anniversary in 2015 and continues to support the Space Industry with innovative, affordable and high performance Digital/Image Processing, RF Communication and Attitude Determination Sensor Products.

Space Micro’s expanding RF product line includes SGLS/STDN Transponders/Transceivers, X/Ku/Ka-Band Transmitters and various other custom RF and power amplifier products. These units feature software defined architecture with parts program levels available up to NASA level 1/Military Class S. The μSTDN-100 (STDN Transponder) successfully launched on both the NASA IRIS and LADEE missions (with very positive feedback) and has been recently selected for another deep space mission. Our leading high data rate μKaTX-300 (Ka-Band Transmitter), is also in production on two different programs.

Space Micro's μXTX-100 radiation hardened X-Band Transmitter is designed to meet stringent space requirements for earth imaging and other high-speed downlink applications. Space Micro was selected to provide the mission critical X-Band Transmitter for the NASA IRIS mission, which successfully launched in September 2013. The unit continues to operate nominally with very positive feedback ongoing.

**Features**

- Radiation Hardened (TID, SEU, SEL)
- Reconfigurable Center Frequency
- PA Options to 12W
- QPSK, OQPSK, 8PSK, Modulation
- Data Rate Options to 50Mbps
- Part level options from Commercial Space to full Class B/NASA Level II
μXTx-100 X-Band Transmitter

Specifications

**RF Output Characteristics**

Output Frequency Range
- X-Band, 8.0 to 8.4 GHz

Frequency Stability
- Short Term: (1 second $10^{-9}$)
- Temperature ($-24^\circ$C to $+61^\circ$C):
  - Aging: 4 ppm maximum
  - First year: +2 ppm maximum
  - Following Year: +1 ppm maximum

Output Power
- 1 W-10W

**Operating Modes**

- QPSK, OQPSK, 8PSK

**Modulation Imbalance**

- Phase: $\pm 2^\circ$
- Amplitude: $\pm 0.1dB$
- I/Q Offset (stagger) Ratio: $50 \pm 5%$

**Input Interface**

- Parallel or Serial Data and Clock
- Optional User Specified Commands
  - RS-422, LVDS 8/16 bit, LVDS Serial
  - SEI (Flexible, Single Ended Interface)
  - TX Power ON/OFF
  - 7/8 LDPC or Reed-Solomon Encode/Bypass
  - Randomize Encode/Bypass
  - Data Input Select
  - RF Power Adjust
  - Data rate Select
  - NRZ-L to M Conversion Select
  - Playback Enable/Disable

**Data Rate**

- To 50 Mbps

**Telemetry Output Interface**

- Serial RS422 or analog
- Encoding Mode
- Converter Secondary Voltage
- RF Output Power
- Temperature
- Phase Lock

**Power Requirements**

- Input Voltage: 28Vdc ± 6 Volts
- DC Power Consumption:
  - 5W Output Power: 60W
  - 8W Output Power: 80W
  - 10W Output Power: 95W

**Physical Characteristics**

- Dimensions: 7'(W) x 6.0''(D) x 4''(H)
- Mass: <7.5 lbs.

**Environmental Specifications**

- Operating Temperature: -24°C to +65°C
- Random Vibration: > 14.1 Grms, 3-axis
- Thermal Cycles: > 23,000
- EMI/EMC: Tailored MIL-STD-461

**Radiation**

- Total Dose: 100 krad (Chassis)
- Latch-up: Immune

**Part Level Screening**

- EM – Engineering Model
- FMB – Flight Model Class B
- FM2 - Flight Model NASA Level II
- FM1 - Flight Model NASA Level I

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Specifications Subject to Changes Without Notice

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