

uSTDN™ Transponder

The uSTDN™ S-Band Transponder design has significant and successful flight heritage based upon several transponders developed for U.S. Space programs. This compact, low current implementation is the “next-generation” system. uSTDN™ is available with Commercial Aerospace, Class B, and upon request, Class S screened components.



The unit operates at a single frequency within the 2200-2300 telemetry band, and adheres to the standard STDN 240/221 turnaround ratio for compatibility with established ground stations. The transmit frequency is controlled by an internal crystal oscillator circuit meeting the stability requirements defined in the specifications and phase locked to the carrier of the uplink signal in a ratio of 240/221.

A VCO operating at the transmit frequency is internally locked to the crystal oscillator and linear phase modulated to enable a cleaner and more compact design solution. The receiver is a dual conversion approach with demodulation occurring at a low IF using a low power analog I and Q demodulator for demodulation and carrier tracking.

Features for Space

- Radiation Hardened:
 - TID from 30 to 100 krad
 - No SEL or SEFI (>120MeV/mg/cm²)
- Ruggedized: against vibration / shock / thermal
- Temperature: -24 to +61 °C

Elements

- S-Band , CCSDS compliant
- Transmit: 1.5 Mbps@2200-2290 MHz
- Receive: 4.0 Kbps@2025-2120 MHz
- RF Output: 5W
- Input Power: <16W, 12V to 40V

Space Micro Inc

μSTDN1000

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Specifications

- Power Input 12 to 40V with a single point ground
- DC power consumption..... < 16W
- Monitors
 - Loop Stress
 - RF power monitor 0-5V range
 - Case temperature (via thermister output)
 - Carrier Lock
 - Subcarrier lock

Transmitter Section

- Operating Frequency 2200-2290 MHz
- Stability..... +/- 20ppm @ -10 to +35C
- RF Power Output..... 5W min into VSWR of less than 1.5:1
- Modulation..... Suppressed Carrier BPSK
- Data Rate up to 1.5 Mbps
- Spurious Emission..... < -60 dBc
- Spurious (2100-2200MHz) < -73 dBc
- Spurious 4.5 – 6.0MHz < -40 dBc
- Data Input Serial RS-422
- Transmitter Control..... TTL command ON/OFF
- Transmitter Level Control TTL controllable (5W, 3W, 2W, 0.5W)
- Inrush Current < 1.0A 200ms

Receiver Section

- Operating Frequency 2025-2120 MHz
- Carrier Acquisition..... -125 dBm @ +/- 60KHz with 30 kHz/s sweep
- Demodulation..... PM carrier, suppressed carrier BPSK on 16 kHz
- Subcarrier CCSDS compliant
- Data Rate Up to 4 Kbps
- Inrush Current <750mA, total energy <200mJ
- Size..... 175mm x 110mm x 50mm
- Weight 1.0 Kg

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