CTKu-900

Ku-BAND COMMERCIAL TC&R/TT&C TELEMETRY TRANSMITTER

The CTKu-900 is the newest addition to the commercial Telemetry, Command and Ranging (TC&R)/Telemetry, Tracking and Control (TT&C) marketplace, and paves the way for a lower cost approach, faster delivery times, increased performance and greater flexibility.

L-3 Telemetry & RF Products (L-3 T&RF) has a rich heritage of flight-proven satellite products. Utilizing Fractional-N PLL technology, combined with L-3 T&RF's proprietary circuit design, this transmitter provides the flexibility of high-resolution frequency synthesis while avoiding traditional fractional spurs and requiring only 14.2 W of primary power consumption.

This innovative technique allows for sub kHz (<100 PPB) tuning over a 500 MHz window around the default factory-set channel while maintaining spurious-free performance. Tuning is provided by two (primary and redundant) RS-232 serial interfaces over a RS-485 physical interface.

Single bit commanding for dual frequency transmitter applications is also available.

This topology is standardized upon a single 100 MHz TCXO, which is also in the CRKu-900 receiver, thereby greatly reducing traditional long-lead crystal oscillator procurement problems. Simultaneous high and low output power ports are a standard feature of the CTKu-900.

The CTKu-900 is also extremely flexible with spacecraft bus designs. By standardizing on 16 subcarrier telemetry channels (8 TM1, 8 TM2) with four ranging channels, this product offers unparalleled flexibility for redundancy and cross strapping. Having just four connectors (RF Hi, RF Low, DC Power, and Interface) combined with the vertical-mounting structure allows for high-density integration and simplified spacecraft wiring.

All these features were strategically designed to meet the fast-paced commercial satellite market, and reach a short delivery lead-time.

The CTKu-900 is a fully qualified design, and can be provided standalone or in conjunction with the CRKu-900, the corresponding Ku-Band commercial TC&R/TT&C receiver.

FEATURES

- PM transmitter for commercial TC&R/TT&C telemetry applications
- Frequency agile in flight (< 1 kHz resolution)
- Frequency tuning across 500 MHz band
- Supports video downlinks > 1 MHz bandwidth for all ranging channels
- Commandable or factory-set data rates, Dual RF output power
- High-reliability, radiation-hardened, 22.5-year mission life

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SPECIFICATIONS

TRANSMITTER/BASEBAND

Transmit frequency	10.7 GHz to 12.75 GHz
Frequency stability	±1 ppm
RF power	Simultaneous 1 W and 10 mW output
IPM	@ 100 Hz to 53 dBc/Hz @ 1 kHz to 63 dBc/Hz
Spurious outputs	-55 dBc maximum
Harmonics	-50 dBc maximum

TELEMETRY CHANNEL

Bandwidth	100 Hz to 1 MHz
Peak phase deviation	Adjustable to 3 radians
Modulation type	PM
Frequency tuning	500 MHz
Ranging phase delay	>200 ns
Ranging delay variation	±25 ns
Redundant differential ranging and telemetry inputs	

INPUT INTERFACE

Telemetry	Analog differential input
Input signal level	4 Vpp
Input impedance	10 kohm

INPUT SERIAL INTERFACE

Data rate	500 kbps
Serial protocol	Similar to RS-232
Physical interface	RS-485, dual redundant (optional 120Ω termination)
Commandable 3-bit address	

POWER REQUIREMENTS

Voltage	+95 to +105 VDC 500 kbps
Power consumption	14.2 W typical

GENERAL

Size	8.5 in. L x 2.34 in. W x 6.25 in. H
Weight	3.85 lb.

ENVIRONMENTAL

Temperature	-15 °C to +60 °C (Acceptance)
Vibration	14.9 Grms
Altitude	Unlimited
EMI	MIL-STD-461C (tailored)
Radiation	100 krads (chassis)
Mission life	22.5 years

STANDARD FEATURES

Factory set or commandable data rates and frequency

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ML636 Rev C