

KI-57 (CXS-810/C)

SECURE SGLS TRANSPONDER



L3 is the primary domestic supplier of Telemetry, Tracking and Command (TT&C) transponders offering proven designs and flexibility for short-and long-term applications.

NSA CERTIFIED



L3 Telemetry & RF Products (L3 T&RF) is a primary domestic supplier of Telemetry, Tracking and Command (TT&C) transponders offering proven designs and flexibility for short- and long-term applications.

The CXS-810/C SGLS transponder continues the tradition of meeting high-reliability and radiation-hardening mission requirements with more than 70 delivered transponders and over 1.5 million hours of successful on-orbit operations since 1997.

The CXS-810/C meets the high-reliability U.S. Department of Defense (DoD) standard for a SGLS-compatible transponder, providing TT&C between U.S. Air Force satellite control facilities and military satellites. The CXS-810/C is provided either with embedded encryption and decryption, or is compatible with external encryption devices, such as L-3 T&RF's MCU-110B.

The CXS-810/C is a Technology Readiness Level 9 (TRL-9) design currently in orbit on many successful programs. The CXS-810/C utilizes a custom radiation-hardened, multi-function ASIC which results in reduced mass, power consumption, footprint and improved performance. Ranging, coherency, convolutional encoding, code conversion, direct modulation and subcarrier modulation are all standard features.

Optional configurations include custom interface characteristics for command function inputs, telemetry outputs, dual encryption, simultaneous dual modulation and integrated diplexer capabilities.

FEATURES

- Secure SGLS transponder
- NSA certified, embedded encryption/decryption (optional)
- Utilizes multi-function ASIC for improved performance
- Flight-proven
- High-reliability, radiation-hardened
- 15-year mission life
- Diplexer (optional)



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SECURE SGLS TRANSPONDER



SPECIFICATIONS

RECEIVER/DEMODULATOR

Receive frequency	1760 to 1840 MHz
Carrier tracking range	±105 kHz

CARRIER ACQUISITION

Threshold	-120 dBm
Carrier tracking threshold	-123 dBm

ACQUISITION TIME

Noise figure	5 dB maximum
Spurious response	> 60 dB below desired response

RANGING CHANNEL

Bandwidth	1.5 kHz to 1 MHz
Delay	2.5 µsec maximum
Delay variation	±40 nsec maximum
Uplink modulation index	0.3 radians (nominal)
Turnaround ratio	1:1 (nominal)

COMMAND CHANNEL

Pre-detection bandwidth	300 kHz
Modulation type	AM/FSK/PM
Modulation index	1.0 radians
FSK tone frequencies	65, 76, 95 kHz
Data rate	2000 or 1000 bps (auto-detect)
Threshold (10 ⁻⁶ BER)	-110 dBm at 2 kbps (1 radian mod index)

OUTPUT INTERFACE

Outputs	"S", "0", "1", read pulse
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TRANSMITTER/BASEBAND

Transmit frequency	2200 to 2300 MHz
Coherent turnaround ratio	256/205
Frequency stability	±20 ppm
RF Power	5 W minimum
IPM	< 3.5 ° rms (ambient)
IAM	< 1%

TELEMETRY CHANNEL

Bandwidth	100 Hz to 10 MHz
Subcarrier frequencies	1.024 MHz or 1.7 MHz
Direct carrier modulation	8.0 Msps (NRZ) maximum
BPSK	4.0 Msps maximum 20 dB carrier null

SUBCARRIER BPSK

Modulation rates	1.024 MHz: 128 kbps maximum, 1.7 MHz: 256 kbps maximum
Convolutional encoding	R=1/2, K=7, no inversion (CCSDS or JPL type)
Command type	28 V or 5 V latching relay

INPUT INTERFACE

RS-422

POWER REQUIREMENTS

Input voltage	+22 to +36 VDC
Power consumption	Transmitter: 35 W maximum Receiver: 5.5 W maximum, 5.0 W maximum (standby)
Over/Reverse voltage	No damage ±50 VDC

ENCRYPTION/DECRYPTION

Encrypt	Pegasus
Decrypt	Cardholder

ENCRYPT DATA RATE

Narrow band	500 bps to 256 kbps
Wide band	150 kbps to 8 Mbps
Decrypt data rate	1 kbps or 2 kbps

GENERAL

Dimensions	8 in. L x 5.5 in. W x 3.5 in. H
Weight	(with COMSEC) 8.3 lb. maximum (w/o COMSEC) 5.8 lb. maximum

ENVIRONMENTAL

Temperature	-24 °C to +61 °C
Vibration	19 Grms
Altitude	Unlimited
EMI	MIL-STD-461C/D (tailored)
Radiation	100 krads (chassis)
TEMPEST	NACSIM 5100A-compliant

OPTIONS

Custom Interfaces, Simultaneous Transmitter Dual-mode Modulation, Diplexer

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