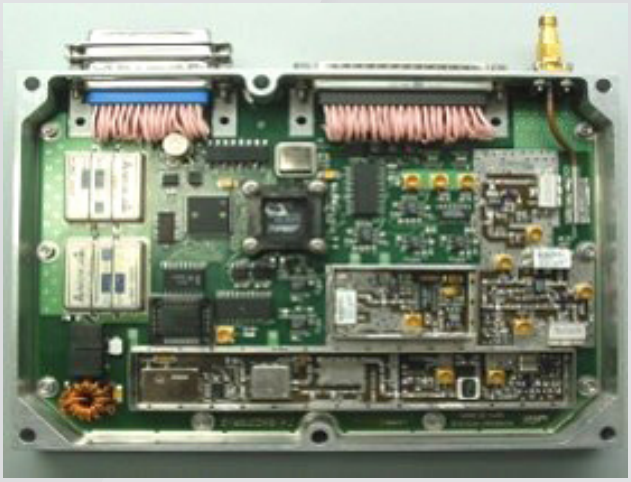
Changing the economics of space

SURREY SATELLITE TECHNOLOGY US

Subsystem

S-Band Transmitter

The S-Band Downlink Transmitter supports high-speed data return for Earth observation and space science missions. Data and clock inputs are fed from either an onboard computer, data storage device, or receiver. Data processing, NRZ-L to NRZ-M differential encoding and ½ rate k=7 convolution encoding are implemented within a FPGA. Baseband root-raised-cosine matched filtering is also implemented.



Features

- Flight heritage
- Manufactured to ECSS standards
- Data rates between 9.6 Kbps – 8.0 Mbps
- Data rate switchable
- BPSK/QPSK modulation
- Convolutional encoding
- 7.5-year design life

Heritage

- AISAT (2003)
- UK-DMC (2003)
- NigeriaSat-1 (2003)
- GIOVE-A (2005)
- DMC+4 (2005)
- RapidEye constellation (2008)
- Deimos-1, UK-DMC2 (2009)
- NigeriaSat-2 (2011)

Applications

- LEO high-speed payload downlink
- Earth observation missions
- Space science missions

Key Specifications

- Up to 4 W RF power using additional power amplifier
- 28 V unregulated supply, <38 W
- 200 x 191 x 80 mm (4 W, 8 Mbps)
- <2 kg

Interfaces

- LVDS I/Q – 8 channels
- TTL – 3 channels
- 50 ohm antenna interface (SMA)
- Dual-redundant CAN TM/TC interface

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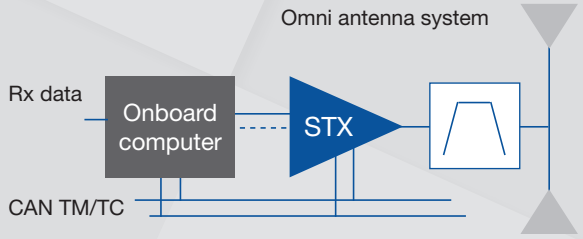
Specifications

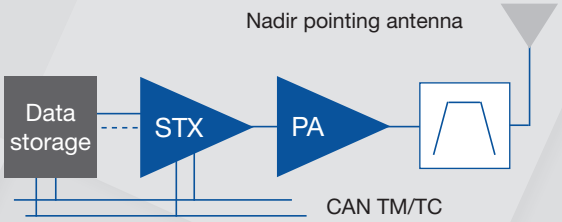
	Low Rate	High Rate
Frequency Range	2.2 to 2.29 GHz <±20 ppm	2.2 to 2.29 GHz <±20 ppm
RF Output Power	250 mW	Up to 4 W at SMA connector (With additional amplifier)
Modulation	BPSK, QPSK	BPSK, QPSK
Mass	0.6 kg	1.8 kg
Dimensions	200 x 191 x 30 mm	200 x 191 x 80 mm
Data Rate	9.6–38.4 kbps	9.6 kpbs–10.0 Mbps
Power	6 W DC	15 to 50 V, <38 W
Operating Temperature	-20 to +50 ºC operating -30 to +60 ºC non-operating	-20 to +50 ºC operating -30 to +60 ºC non-operating
Random Vibration	15 g_{rms} in all axes	15 g_{rms} in all axes
Radiation Tolerance	5 kRad (Si)	5 kRad (Si)

Product specification subject to change without notification

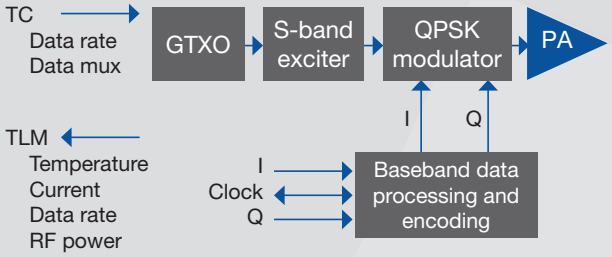
Typical Use



S-band telemetry transmitter



S-band payload downlink transmitter



S-band downlink transmitter block diagram

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The small satellite revolution started 30 years ago with Surrey Satellite Technology—the world's premier provider of operational and commercial satellite programs with over 40 satellites launched successfully and 240 years of on-orbit experience gained.

From its Englewood, Colorado, facilities, Surrey supplies complete in-house design, manufacture, launch, and operation of small satellites, to include remote sensing, navigation, and communications payloads, avionics suites and subsystems, ground infrastructure, and training and consulting services.

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