AAC CLYDE SPACE

Cape Peninsula University of Technology

COMMUNICATIONS

# PULSAR-STX


The PULSAR-STX and PULSAR-STXC are compact S-Band transmitters designed for CubeSat missions operating at amateur and commercial frequencies respectively. The transmitters implement O/QPSK modulation with transmission data rates of up to 2 Mbps. The transmitters are ideal for space missions where a high data rate downlink is required. They implement an open network encoding scheme based on the IntelSAT IESS-308 specification which allows this product to be used with low-cost commercial satellite demodulators.

The PULSAR-STX/C solution is compatible with our S-Band Patch Antenna. A nadir facing S-Band patch antenna can also be incorporated into the CubeSat design. Its small size, low profile, rugged design and high directionality make it an excellent addition to the system. The S-Band patch antenna is designed to be mounted on the nadir facing side of a CubeSat. A wide beamwidth ensures satellite communication through a wide range of elevation angles. It is machined from solid aluminium.

## POWER

The PULSAR-STX and PULSAR-STXC have a low power consumption and total power consumption of < 5 W (for maximum RF power output). With a selection of transmit output power levels from 24 dBm to 30 dBm in 2 dB steps makes the PULSAR-STX/C an attractive solution."

## FREQUENCIES

The PULSAR-STXC and PULSAR-STX supports commercial (2.2 - 2.3 GHz) and amateur (2.4 - 2.45 GHz) bands respectively, and is user programmable within the bands.

## RELIABILITY

The PULSAR-STX/C solution has been tried, tested and trusted on an array of on-orbit missions proving to be not only reliable but efficient. The PULSAR-STX was part of the UKube-1 mission, the UK Space Agency's first national spacecraft.

# TECHNICAL SPECIFICATIONS

| General | |
|---|---|
| Temperature | -25°C to +51°C |
| Power | < 5 W |
| Voltage | 6 V – 12 V (5 V alternative) |
| Mass | < 100 g |
| TX SNR | 20 dB |
| Frequency | 2.2 GHz – 2.3 GHz (PULSAR-STXC)<br>2.4 GHz – 2.45 GHz (PULSAR-STX) |
| RF Power | 24 - 30 dBm (1 W RF) in 2 dB steps |
| Channel Spacing | 500 kHz |
| Spurious Response | < -60 dBc |
| Design Life | 2 years in LEO |

| Performance | |
|---|---|
| Processing | • Low-power Flash-based FPGA<br>• V.35 IntelSAT scrambler<br>• ½ rate convolutional encoding (K=7)<br>• Differential encoding<br>• Pulse shaping filter |
| Interfaces | • Low-speed I2C Bus – 400 kHz (telemetry and control)<br>• High-speed SPI Bus – 4 MHz (payload data)<br>• 50 Ω SMA connector |
| Modulation | • QPSK or OQPSK<br>• IntelSAT IESS-308 |

| Dimensions | |
|---|---|
| Length | 96 mm |
| Width | 90 mm |
| Height | 16.9 mm |

*Height from top PCB to lowest component

To make an enquiry, request a quotation or learn about AAC Clyde Space's other products and services, please contact:
**enquiries@aac-clydespace.com**

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