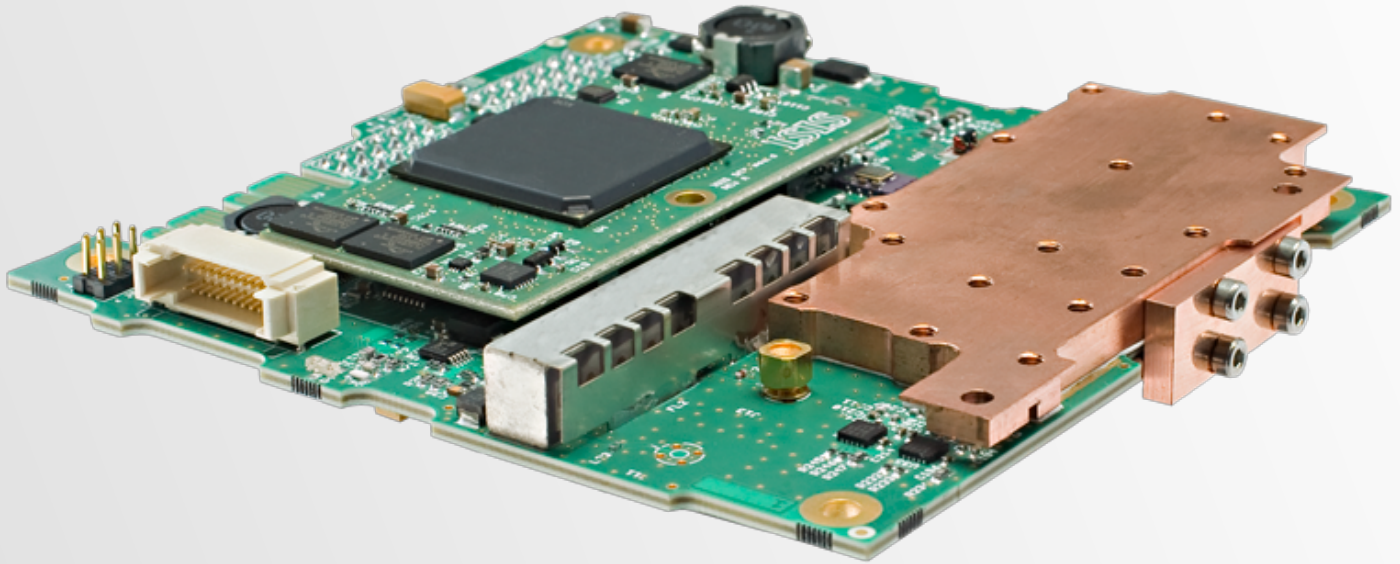


# ISIS High data rate TXS



Flight heritage since 2018



## DESCRIPTION

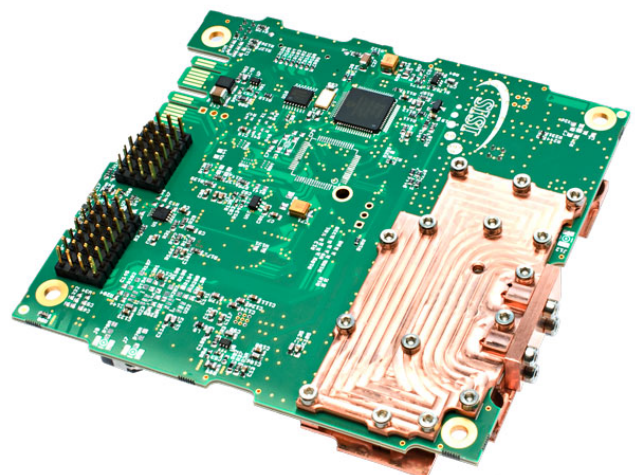
The ISIS High Data-rate S-band Transmitter is a CubeSat compatible Transmitter designed to meet the needs of high data-rate downlinks of up to 4.3 Mbps (usable information bit-rate at CCSDS transfer frame level). The transmitter can be used for both TT&C or PDT downlinks. The S-band transmitter is flexible, implementing CCSDS as data link layer protocol and allowing in-flight configuration of data-rate, modulation scheme, frequency, and RF output power.

## FEATURES

- Operates in EESS/SRS/SOS allocation band
- CCSDS compliant
- Data-rate and RF power re-configurable in-flight
- RF power control loop to maintain constant RF power over the temperature range and Frequency band
- SFCG Spectral mask compliant (Recommendation: SFCG-21-2R4)
- Safety watchdog
- Adjustable RF output power from 27 to 33dBm (0.5dB steps)
- RF output tolerant to full mismatch

## CONFIGURATIONS AND OPTIONS

- Default RF parameters:
  - transmit frequency
  - modulation scheme
  - roll-off
  - symbol rate
  - transmit power
  - CCSDS Spacecraft Identifier
- I<sup>2</sup>C and CAN watchdog implementation
- CSKB-lite connector configuration
- Grounding interface configuration



## PRODUCT PROPERTIES

- Operates in the 2200-2290 MHz EESS/SRS/SOS allocation
- CCSDS compliant channel coding ensures compatibility off-the-shelf demodulators as well as various groundstation networks
- Compatibility with the following demodulators has been verified:
  - Zodiac CORTEX CRT
  - Teledyne Qubeflex
  - Amergint satTRAC
  - RT Logic / KRATOS quantumGND
  - Antwerp Space Omnisat LT
- Compatibility with KSAT-lite groundstation network has been verified
- Strong Forward Error Correction (FEC) to maximize link throughput
- No need for data pre-processing: all channel coding is performed inside the transmitter
- Up to 4.3 Mbit/s useful datarate (at CCSDS TM Transfer Frame level)
- In-flight configurable RF parameters (frequency, data-rate, RF power, FEC parameters)
- Data interfaces: LVDS (payload data), I2C (housekeeping)
- Safety watchdog
- Adjustable RF output power from 27 to 33 dBm
- Power control loop to keep RF output power constant over varying operating conditions
- IPC-A-610 Class 3 assembly

## PERFORMANCE

Frequency range	2200 – 2290 MHz
Frequency step size	1 kHz
Frequency stability	+/-10 ppm
RF output power	27 to 33 dBm (settable) ± 1 dB
Spurious emissions	Less than -60 dBc
Transmitted data rate (on-air)	up to 10 Mbit/s (5 Msym/s, OQPSK)
Useful information bitrate	up to 4.3 Mbit/s (at TM transfer frame level), settable in 4 steps
Modulation scheme	Suppressed carrier: BPSK, OQPSK as per CCSDS 401.0-B
Pulse shaping filter	Root raised cosine Nyquist pulseshaping as per CCSDS 413.0-G. Roll-off: 0.35 / 0.5 selectable
Forward Error Correction	Convolutional (K=7, 1/2) as per CCSDS 131.0-B Reed Solomon (223, 255) as per CCSDS 131.0-B
Pseudorandomization	Pseudorandomization as per CCSDS 131.0-B
Synchronization	32 bit Attached Sync Marker as per CCSDS 131.0-B
Power consumption	13 W (for 33 dBm RF output power)
DC supply voltage	7 to 20 V
Payload data interface	LVDS
Housekeeping data interface	I <sup>2</sup> C
Dimensions	98.81 x 93.26 x 14.52 mm
Mass	120 g
Operating temperature	-40 to +70 °C

## QUALIFICATION AND ACCEPTANCE TESTING

Test	QT	AT
Functional	✓	✓
Vibration	✓	-
Mechanical Shock	✓	-
Thermal Cycling	✓	-
Thermal Vacuum	✓	-

\*QT is performed on the design/qualification model

\*AT is performed on the unit to be shipped

This document is subject to change without notice. Latest information is on [www.isispace.nl](http://www.isispace.nl)



**ISIS - Innovative Solutions In Space B.V.**  
 Motorenweg23, 2623CR, Delft, The Netherlands  
 T: +31 152569018  
 sales@isispace.nl  
 www.isispace.nl

