

XLINK-X

X-Band Transceiver with SDR for Small Satellites → Physical Layer according to CCSDS

HIGHLIGHTS

- SDR high-speed data links
- CubeSat and Small Satellite usage
- Bidirectional communication links
- Downlink: TM or Payload up to 200 Mbps
- Uplink: TC >56 kbps



XLINK-X is an advanced transceiver system (Software Defined Radio – SDR) for X-Band communication links of small satellites in LEO environment. The mechanical dimensions are compatible with both CubeSats and larger satellites. The radio interface and radio protocol were developed according to standard CCSDS protocols.

The device supports very high downlink data rates of up to 200 Mbps. Supported modulation schemes include BPSK, QPSK and higher order modulations with appropriate FEC coding schemes. Adaptive Modulation and Coding (AMC) schemes are applicable to maximize data throughput.

The satellite receiver (uplink) for telecommand purposes is designed for standard CCSDS BPSK with BCH coding and net data rates of 56 kbps minimum. Alternatively, X-Band or S-Band uplink receive frequencies can be used.

The payload data interface is based on CCSDS transfer frames.

A special feature of the **XLINK-X** transceiver is the optional application of two separate Tx channels. They can be used either for an increase of the transmit power or for redundancy purposes.

FEATURES

- Fully featured and transparent bidirectional X-Band transceiver (SDR)
- CCSDS compliant for physical and synchronisation layer
- Flight grade tested design
- Compact case and low power consumption
- Low-cost COTS design
- Short delivery time
- Additionally available: Extra flat patch antennas tuneable to customer specific frequencies

KEY SPECIFICATIONS

X-Band Tx operation
8.025-8.400 GHz

Data rate Sat2Ground
2kbps ... 200 Mbps

Linear RF output power
up to +30 dBm
(2 x up to +27 dBm)

Operational mode
FDD, Full duplex, Half Duplex

S-Band Rx operation
2.025-2.110 GHz

X-Band Rx operation
7.145 - 7.250 GHz

Data rate Ground2Sat
56 kbps+

Automatic Doppler shift compensation in Rx
up to 200 kHz

DC supply voltage
6 – 18 V / 28 V

Low power consumption
max. 16 W (Tx + Rx),
4 W (Rx-S), 5.5 W (Rx-X)

Low mass
200 grams

Ultra-small volume
< 0.2U

TRL 9

| | Default Configuration | Optional Configuration |
|-----------------------------|--|---|
| Tx Frequency Band | 8.025-8.400 GHz | 7.900-8.500 GHz |
| Data rate (Tx Payload Data) | 500 kbps ... 100 Mbps | 2 kbps ... 200 Mbps |
| Tx RF Bandwidth | Depending on the symbol rate | Maximum 56 MSymbols/s |
| RF Power Output | 2 Tx channels up to +27 dBm (combined up to +30 dBm) | Higher output power on request |
| Tx Modulation Scheme | BPSK, QPSK, OQPSK | GMSK, 8PSK, 16APSK |
| FEC scheme | Convolutional code k = 7 | Reed-Solomon |
| Rx Frequency Bands | X-Band 7.145-7.250 GHz S-Band 2.025-2.110 GHz | |
| Data rate (Rx Payload Data) | 56 kbps | 3.5 kbps ... 896 kbps |
| Doppler shift compensation | +/-200 kHz | |
| Rx Modulation Scheme | BPSK with BCH coding | Convolutional (CCSDS 131.0-B) |
| RF Connector Type | SMP, 50 Ω | |
| Data Interfaces | IEEE 802.3 1000BASE-T | SPI via RS422, UART via RS422 |
| Connector Type | 3 x Nano-D-Sub (Power, Ethernet, I/O) | |
| Applicable CCSDS Standards | CCSDS 231.0-B, 132.0-B, 131.0-B, 401.0-B | DVB-S2 via CCSDS 131.3-B |
| DC supply | 6 – 18 V | 28 V – other on request |
| DC Power Consumption | <16 W Tx + Rx, <4 W Rx-S only, <5.5 W Rx-X | |
| Mechanical Dimensions | 90 x 65 x 25.3 mm ³ | High Radiation Tolerance: 96 x 71 x 32 mm ³ |
| Mass | 200 grams (incl. housing) | High Radiation Tolerance: 365 grams (incl. housing) |
| Temperature Range | -20 ... +60 °C (operating) -40 ... +80 °C (non-operating) | |
| Case | Passivated aluminum | |

Optional equipment

- Tx/Rx X- and S-Band patch antennas for satellite transceiver applications
- Customer-specific designs and turn-key solutions

Product specification may be subject to change without notification.