

S Band Transceiver for Small Satellites

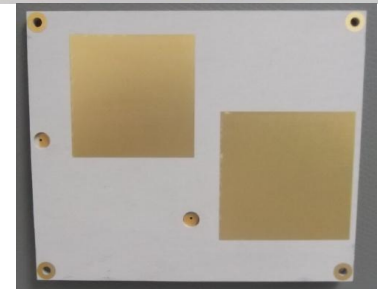
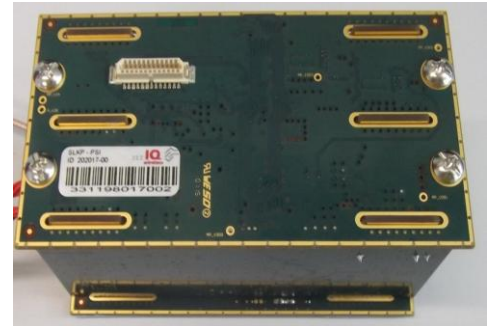
→ physical layer according CCSDS ←

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Applications

- High speed data links from/to LEO
- Micro, nano or pico satellite usage
- bidirectional communication links

Sat2Gnd / Telemetry	3 Mbps
Gnd2Sat / Tele-command	64 kbps



The **Slink-Phy** transceiver system provides a huge payload data downlink for micro, nano or pico satellite applications and the benefit of an additional data uplink for tele-command.

It is designed as highly integrated S Band transceiver system with outstanding technical performance and versatile configuration options. The lifetime goal is for at least two years of operation in Low Earth Orbit (LEO) environment. The radio system can be adjusted in a frequency band between 2,200 and 2,290 MHz for downlink (Sat2Ground) and between 2,025 and 2,110 MHz for uplink communication links (Ground2Sat), e.g. for tele-command purposes. An adaptation for various data rate requirements is possible.

Slink-Phy provides the physical layer (RF link) in an Open Systems Interconnection model (OSI). It is fully transparent to higher layer protocols and according the CCSDS 211.xxx recommendations. For this reason, standard satellite ground station transceiver equipment can be used for a bidirectional radio communication with the satellite.

Features

- Fully featured and transparent bidirectional S band transceiver
- Flight grade tested design
- Compact case and low power consumption
- extra flat patch antenna design matched to customer specific frequencies
- Low cost COTS design
- Short delivery time (typically 4 months)

Key Specifications

- S band operation: 2,025-2,300 MHz
- Operational mode: FDD / Full duplex
- Data rate Sat2Ground: up to 20.0 Mbps
Modulation QPSK
- Data rate Ground2Sat: up to 256 kbps
Modulation BPSK
- Linear RF output power: up to +27 dBm (adjustable)
- automatic Doppler shift compensation in Rx: up to 125 kHz
- Low power consumption 12 W max (Rx+Tx)
3 - 4 W Rx only
- DC supply voltage: 7 - 18 V
- Ultra small volume: 50 x 55 x 94 mm³ (without housing)
- Low mass: < 190 gram
- control and housekeeping interface: I²C
- Sat2Ground /Telemetry interface: TxClk / TxData / TxEnable
- Ground2Sat / Tele-command interface: RxClk / RxData / RxCarrier / RxLock

	Sat2Ground	Ground2Sat
Frequency Range	2,200-2,290 MHz	2,025-2,110 MHz
Frequency stability	±3ppm (w/o crystal ageing)	
RF bandwidth	1.75 MHz (symbol rate 1.5 Msymbols/s)	300 kHz (symbol rate 64 kSymbols/s)
RF (nominal)	(-105 dBm) -95 dBm...-55 dBm input RF dynamic range	up to +27 dBm output RF power @ 50Ohm
Data Rate	up to 20 Mbps (customer specific)	up to 256 kbps (customer specific)
Operational mode	Frequency Division Duplex (FDD) / full-duplex	
Modulation scheme	QPSK (other schemes on request)	BPSK (other schemes on request)
Power supply	7 ... 18 V DC	
Power consumption	8 ... 12 W transmit mode (Rx+Tx) 3 ... 4 W receive mode	
Temperature range	-20 ... +50 °C operating -30 ... +60 °C switch-on -40 ... +65 °C non-operating	
Dimensions	50 x 55 x 94 mm ³ (w/o cables and connectors)	
Mass	< 190 g	
Radiation tolerance	>10 kRad (Si)	
Random Vibration	25 G _{rms} in all axis	
Power Connector	Molex Picoblade 10-pins VBat (7...18V) Pin: 1,3,5,7 Gnd Pin: 2,4,6,8,10 PowerOn Pin: 9	
Data & Control Connector	HIROSE DF9-25S TxClk (+/-): 1/3; TxData (+/-): 2/4; TxEnable: 13 RxClk (+/-): 7/9; RxData (+/-): 8/10; RxCarrier: 14; RxLock: 16 I2C_SDA: 23; I2C_SCL: 25; Gnd: 15,17,18,22,24 Optional HwTxOn: 19; HwPowerOn: 20	
RF connector	50 Ohm, UMP (manufacturer Radiall)	

Slink-Phy Product Specification

Optional available Equipment

- Tx / Rx S band patch antennas for satellite transceiver applications (e.g. RHCP, 82.6 x 96 mm², gain about 6dBi)
- Customer specific designs and turn-key solutions

Product specification may be subject to change without notification