

# JDSU JSH-01LWAA1 Datasheet



Genuine JDSU 10GBase-LR SFP+ 1310nm 10km Transceiver Module

JSH-01LWAA1

The lead-free and RoHS-compliant small form factor pluggable (SFP+) transceiver from JDSU improves the performance for 10 Gigabit Ethernet (10 G) applications, and is ideal for high-speed, local area network applications. This transceiver features a highly reliable, 1310 nm, distributed feedback (DFB) laser coupled to an LC optical connector. The transceiver is fully compliant to 10GBASE-LR, 10GBASE-LW and 10G Fibre Channel specifications, with internal AC coupling on both transmit and receive data signals. The all-metal housing design provides low EMI emissions in demanding 10G applications and conforms to IPF specifications. An enhanced digital diagnostic feature set allows for real-time monitoring of transceiver performance and system stability, and the serial ID allows for customer and vendor system information to be stored in the transceiver. Transmit disable, loss-of-signal, and transmitter fault functions are also provided. The small size of the transceiver allows for high-density board designs that, in turn, enable greater total bandwidth.

## Features

- Compliant to 10G link specifications
- Uses a highly reliable, 1310 nm distributed-feedback laser
- Lead-free and RoHS 6/6-compliant, with allowed exemptions
- Commercial case operating temperature of 0 – 70°C; extended temperature operation up to 85°C
- Single 3.3 V power supply
- Low power consumption (typically 695 mW)
- Bit error rate < 1 x 10-12

- Hot pluggable

## Applications

- Inter-data-center connectivity
  - Enterprise backbones
  - Metro access
  - Carrier point of presence
- High-speed local area networks
  - Switches and routers
  - Network interface cards
- High-speed cluster and grid computing aggregation
- Custom high-bandwidth data pipes
- Disaster recovery and backup connectivity

## Compliance

- SFF 8431 Revision 3.2
- SFF 8432 Revision 5.0
- SFF 8472 Revision 10.3
- IEEE 802.3 Clause 52 10GBASE-LR and 10GBASE-LW
- 10 G Fibre Channel
- CDRH and IEC60825-1 Class 1 Laser Eye Safety
- FCC Class B
- ESD Class 2 per MIL-STD 883 Method 3015
- UL 94, V0
- Reliability tested per Telcordia GR-468

The JDSU JSH-01LWAA1 10G SFP+ 1310 nm optical transceiver is designed to transmit and receive 64B/66B scrambled 10G serial optical data over standard single-mode optical fiber.

The transmitter converts 64B/66B scrambled serial PECL or CML electrical data into serial optical data compliant with the 10GBASE-LR, 10GBASE-LW or 10G Fibre channel standard. Transmit data lines (TD+ and TD-) are internally AC coupled, with 100 W differential termination. Transmitter rate select (RS1) pin 9 is assigned to control the SFP+ module transmitter rate. It is connected internally to a 30 kW pull-down resistor. A data signal on this pin does not affect the operation of the transmitter. An open collector-compatible transmit disable (Tx\_Disable) is provided. This pin is internally terminated with a 10 kW resistor to Vcc,T. A logic "1," or no connection, on this pin will disable the laser from transmitting. A logic "0" on this pin provides normal operation. The transmitter has an internal PIN monitor diode that ensures constant optical power output, independent of supply voltage. It is also used to control the laser output power over temperature to ensure reliability at high temperatures. An open collector-compatible transmit fault (Tx\_Fault) is provided. The Tx\_Fault signal must be pulled high on the host board for proper operation. A logic "1" output from this pin indicates that a transmitter fault has occurred or that the part is not fully seated and the transmitter is disabled. A logic "0" on this pin indicates normal operation.

The receiver converts 64B/66B scrambled serial optical data into serial PECL/CML electrical data. Receive data lines (RD+ and RD-) are internally AC coupled with 100 W differential source impedance, and must be terminated with a 100 W differential load. Receiver Rate Select (RS0) pin 7 is assigned to control the SFP+ module receiver rate. It is connected internally to a 30 kW pull-down resistor. A data signal on this pin has no effect on the operation of the receiver. An open collector compatible loss of signal (LOS) is provided. The LOS must be pulled high on the host board for proper operation. A logic "0" indicates that light has been detected at the input to the receiver (see Optical characteristics, Loss of Signal Assert/Deassert Time). A logic "1" output indicates that insufficient light has been detected for proper operation.

## Section 1 Functional Description

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