

## OC-3 Small Form Factor (SFF) Transceiver CF2 Series



### Key Features

- Temperature ranges: 0 to 70 °C, -20 to 85 °C, and -40 to 85 °C
- Single 3.3 V power supply
- LV-PECL data input and receiver output levels
- TTL or PECL signal detect
- Multisource Agreement (MSA)-conforming 2x5 and 2x10 SFF package
- Electromagnetic interference (EMI) meets FCC Class B limit
- Class 1 Laser Safety conformance
- Meets mezzanine height standard of 9.8 mm
- Wave-solderable/aqueous-washable
- Industry-standard duplex-LC optical connector
- Operates with 9/125  $\mu\text{m}$  single-mode optical fibers
- Available in IR1 (15 km)

### Applications

- Metro
- Access
- Wide area networks

### Compliance

- Compliant with SONET OC-3 and ITU-T G.957 SDH STM-1 specifications (155 Mb/s data rate)

The JDSU CF2 Series OC-3 transceiver is a duplex-LC transceiver designed for use in SONET OC-3 and SDH STM-1 applications. It operates with a single 3.3 V power supply. The unit conforms to the industry-standard 2x5 and 2x10 footprints and meets the mezzanine height requirement of 9.8 mm.

Each transceiver consists of an optical subassembly housing both the transmitter and the receiver, and an electrical subassembly. All are packaged together with a top metal cover and bottom shield.

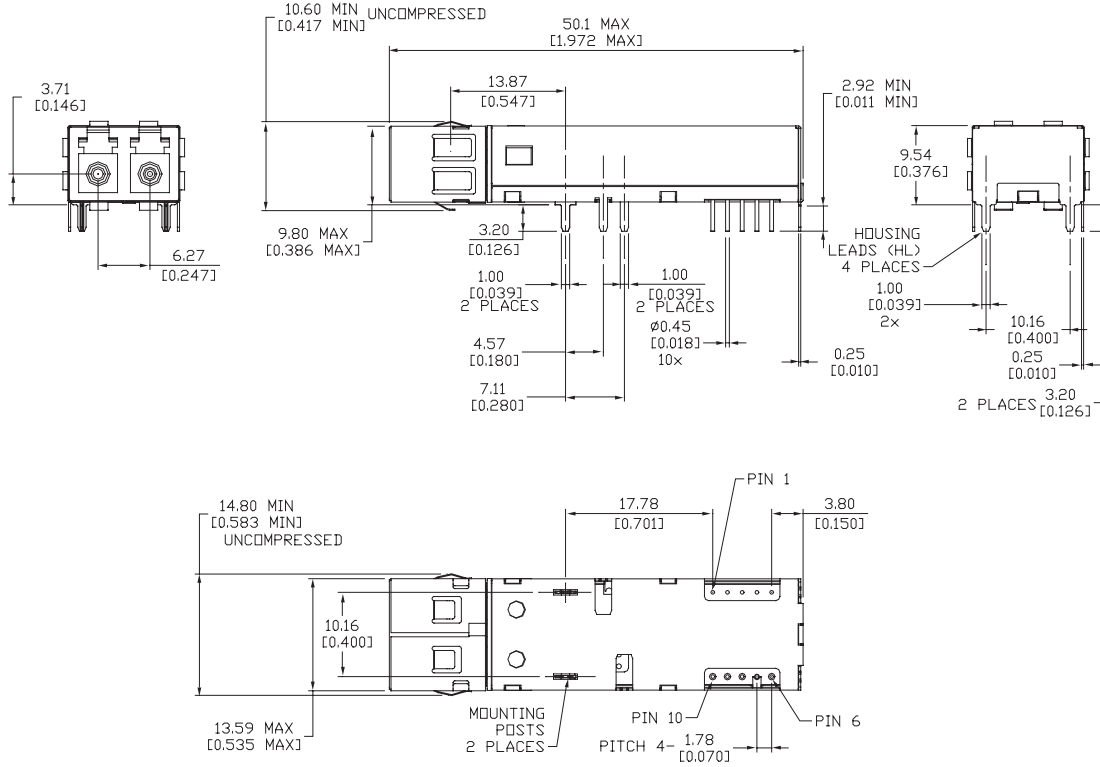
The optical subassembly comprises two parts: the transmitter side has a high-performance 1300 nm Fabry-Perot (FP) or 1550 nm distributed feedback (DFB) laser and back facet monitor. The receiver side has an InGaAs PIN and a preamplifier.

All CF2 Series OC-3 transceivers also include a signal detect circuit, which provides either a Positive Emitter Coupled Logic (PECL) or TTL logic high output when a usable input optical signal level is detected.

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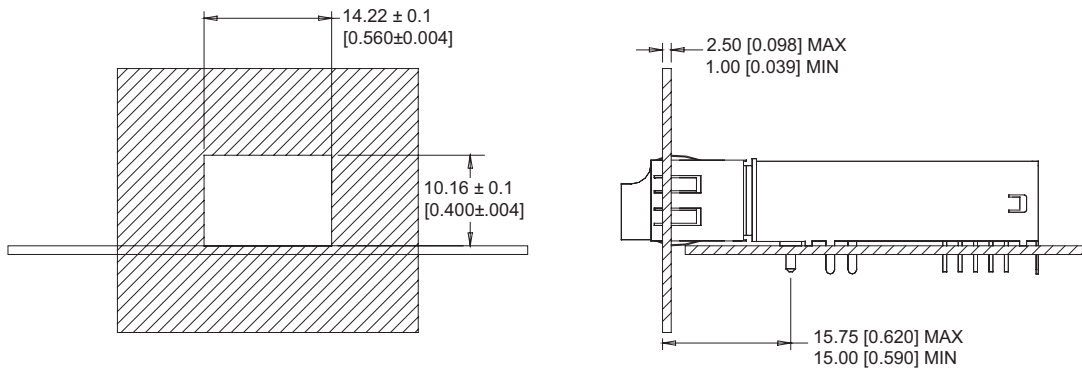
2x5 SFF Transceiver Dimensions Diagram

(Specifications in mm [inches] unless otherwise noted.)



Bezel Opening Dimensions Diagram

(Specifications in mm [inches] unless otherwise noted.)



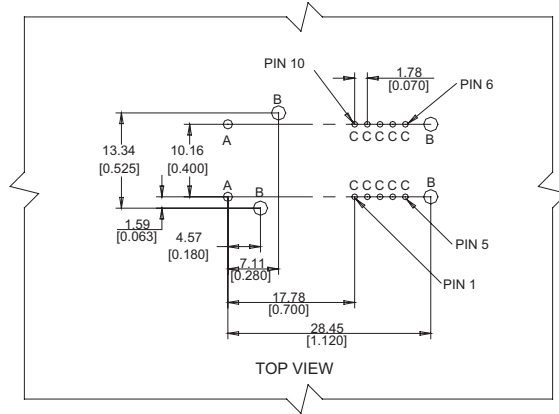
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2x5 PCB Layout

(Specifications in mm [inches] unless otherwise noted.)

Hole Sizes

| Symbol | Quantity | Diameter                            |
|--------|----------|-------------------------------------|
| A      | 2        | 1.40±0.1 mm<br>(0.055±0.004 inches) |
| B      | 4        | 1.40±0.1 mm<br>(0.055±0.004 inches) |
| C      | 10       | 0.81±0.1 mm<br>(0.032±0.004 inches) |



Transceiver Pin Descriptions (2x5 Configuration)

| Pin            | Symbol | Description  |
|----------------|--------|--|
| Mounting posts |        | The mounting posts are provided for transceiver mechanical attachment to the circuit board. They should not be connected to the circuit ground but can be connected to the chassis ground. |
| Housing leads  |        | The housing leads should be connected to the circuit ground.   |
| 1              | VEER   | Receiver signal ground   |
| 2              | VCCR   | 3.3 V receiver power supply  |
| 3              | SD     | Signal detect is a TTL output. A high level indicates a valid optical signal.  |
| 4              | RD-    | Receiver data inverted differential output   |
| 5              | RD+    | Receiver data non-inverted differential output   |
| 6              | VCCT   | 3.3 V transmitter power supply   |
| 7              | VEET   | Transmitter signal ground  |
| 8              | TXdis  | Transmitter disable  |
| 9              | TD+    | Transmitter data non-inverted differential input   |
| 10             | TD-    | Transmitter data inverted differential input   |

Transceiver Pin Descriptions (2x10 Configuration)

| Pin            | Symbol | Description  | Pin | Symbol | Description           |
|----------------|--------|--|-----|--------|-----------------------|
| Mounting posts |        | The mounting posts are provided for transceiver mechanical attachment to the circuit board. They should not be connected to the circuit ground but can be connected to the chassis ground. |     |        |                       |
| Housing leads  |        | The housing leads should be connected to the circuit ground.   |     |        |                       |
| 1              | Vpd    | Rx photo detector bias   | 11  | VCCT   | Tx power              |
| 2              | VEER   | Rx ground  | 12  | VEET   | Tx ground             |
| 3              | VEER   | Rx ground  | 13  | TX_DIS | Transmitter disable   |
| 4              | NA     | Not used   | 14  | TD     | Tx electrical data    |
| 5              | NA     | Not used   | 15  | TDb    | Tx electrical data    |
| 6              | VEER   | Rx ground  | 16  | VEET   | Tx ground             |
| 7              | VCCR   | Rx power   | 17  | Bmon-  | Tx LD bias monitor    |
| 8              | SD     | Signal detect  | 18  | Bmon+  | Tx LD bias monitor    |
| 9              | RDb    | Rx electrical data   | 19  | Pmon-  | Tx rear facet monitor |
| 10             | RD     | Rx electrical data   | 20  | Pmon+  | Tx rear facet monitor |

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**Absolute Maximum Ratings**

| Parameter                               | Symbol          | Minimum | Maximum |
|---|-----------------|---------|---------|
| Storage temperature                     | T <sub>s</sub>  | -40 °C  | 85 °C   |
| Soldering temperature (6 sec. on leads) |                 | -       | 260 °C  |
| Supply voltage                          | V <sub>CC</sub> | -       | 3.6 V   |

**Operating Conditions**

| Parameter                              | Symbol           | Minimum | Maximum |
|--|------------------|---------|---------|
| Case operating temperature             | T <sub>OP</sub>  | -40 °C  | 85 °C   |
| Supply voltage                         | V <sub>CC</sub>  | 3.1 V   | 3.5 V   |
| Transmitter differential input voltage | V <sub>D</sub>   | 0.6 V   | 2.0 V   |
| Transmit disable input volt (low )     | TD <sub>Lo</sub> | -       | 0.3 V   |
| Transmit disable input volt (high)     | TD <sub>Hi</sub> | 2.3 V   | -       |

**Electrical Specifications**(Over specified T<sub>OP</sub> range, V<sub>CC</sub> = 3.1 to 3.5 V)

| Parameter                                    | Symbol                         | Minimum | Maximum         |
|--|--------------------------------|---------|-----------------|
| <b>Transmitter</b>                           |                                |         |                 |
| Supply current                               | I <sub>CC<sub>T</sub></sub>    | -       | 150 mA          |
| <b>Receiver</b>                              |                                |         |                 |
| Supply current                               | I <sub>CC<sub>R</sub></sub>    | -       | 130 mA          |
| Data output voltage swing (differential)     | V <sub>diff</sub>              | 0.5 V   | 1.9 V           |
| Data output rise and fall times (10 to 90% ) | t <sub>r</sub> ,t <sub>f</sub> | -       | 2.2 ns          |
| Total signal detect output (high)            | V <sub>oh,TTL</sub>            | 2.0 V   | V <sub>CC</sub> |
| Total signal detect output (low )            | V <sub>ol,TTL</sub>            | 0.0 V   | 0.8 V           |

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**Optical Specifications**

(Over specified  $T_{OP}$  range,  $V_{CC} = 3.1$  to  $3.5$  V)

| Parameter   | Symbol      | Minimum                                     | Maximum      |
|---|-------------|---|--------------|
| <b>Transmitter</b>  |             |   |              |
| Output optical power 9/125 $\mu\text{m}$ , $n_a = 0.10$ fiber | $P_{OUT}$   | -15 dBm avg.                                | -8 dBm avg.  |
| Optical extinction ratio                                      |             | 8.2 dB                                      | -            |
| Center wavelength   | $\lambda_c$ | 1274 nm                                     | 1356 nm      |
| Spectral width (rms)  | $\sigma$    | -   | 4 nm         |
| Optical rise/fall time (10 to 90%)                            | $t_r/t_f$   | -   | 2.2 ns       |
| Output optical eye  |             | Conforms to eye mask Bellcore TR-NWT-000253 |              |
| <b>Receiver</b>   |             |   |              |
| Minimum optical input power (sensitivity)                     | $P_{IN}$    | -   | -28 dBm avg. |
| Maximum optical input power (saturation)                      | $P_{IN}$    | -8 dBm avg.                                 | -            |
| Operating center wavelength                                   | $\lambda_c$ | 1280 nm                                     | 1580 nm      |
| Signal detect (deasserted)                                    | $P_A$       | -   | -28 dBm avg. |
| Signal detect (asserted)                                      | $P_D$       | -42 dBm avg.                                | -            |
| Signal detect (hysteresis)                                    | $P_A-P_D$   | 1.0 dB                                      | 5.0 dB       |

**Electromagnetic Interference (EMI)**

Most equipment designs utilizing high-speed transceivers will be required to meet the requirements of the FCC in the United States, CENELEC EN55022 (CISPR 22) in Europe, and VCCI in Japan.

The CF2 OC-3 transceivers, with their shielded design, perform to the specified limits to assist the designer in the management of overall equipment EMI performance. They meet the FCC Class B limits.

**Immunity**

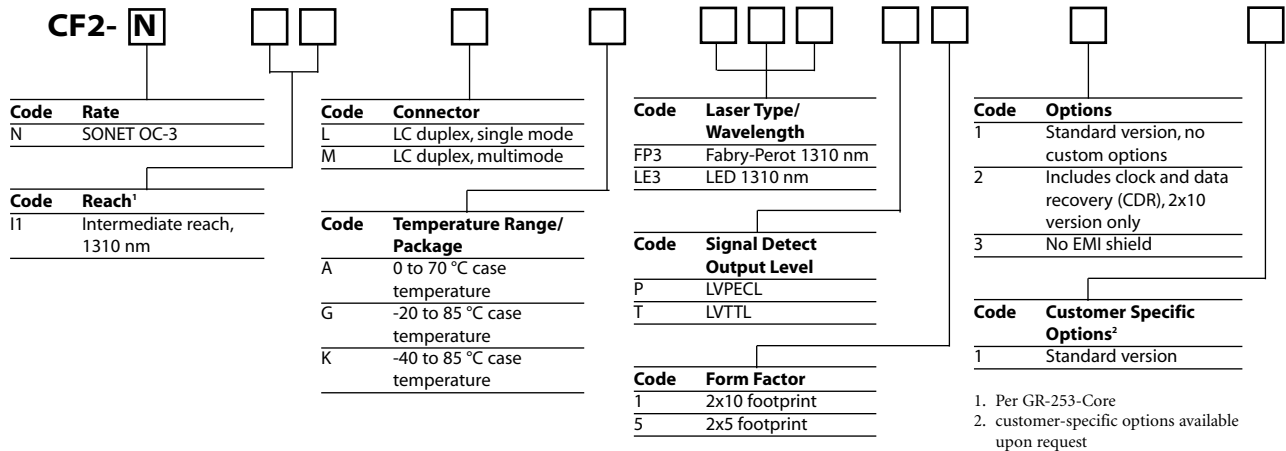
The CF2 OC-3 transceiver has been designed to provide good immunity to radio-frequency electromagnetic fields. The metal cover, chassis, and internal and bottom shields constitute the key components to achieving good electromagnetic performance (EMC).

**Eye Safety**

The CF2 OC-3 1300 nm and 1550 nm laser-based transceivers have been designed to meet Class 1 eye safety. They conform to FDA 21CFR1040.10 and 1040.11 and IEC 60825-1.

**Ordering Information**

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

**Sample: CF2-NI1LAFP3T511**


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