Please read this data sheet before purchasing and keep it on file for future reference. It contains important information on the product specifications.

Optocom
Optoelectronics Group
OPT1255-3.3
OC-12 Optical Receiver

Data Sheet
2004/5

210 Andover Street, Wilmington, MA 01887
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General

Description
The OPT1255-3.3 is a 20-pin DIP fiber optic receiver module which converts lightwaves in the 1310/1550 nm band to electrical data signals at a data rate of 20 to 650 Mbps. The receiver has a hermetically sealed InGaAs photodiode aligned to a multimode fiber.

Applications
The device is designed for data communication systems and telecommunication transmission systems over singlemode or multimode fiber.

Standards Met
The specifications met are the SONET/SDH STS-12/STM-4 interface, the Long Reach OC-12 Optical Parameters (LR1, LR2 & LR3) of Bellcore GR-253-CORE, the Long-haul Recommendation (L-4.1, L-4.2 & L-4.3) of ITU-T G.957, and the monitor alarm requirements of Bellcore GR-253-CORE & ITU-T G.783 and G.958.

Features

Operation
The OPT1255-3.3 optical receiver operates using a single +3 V power supply. The device maintains electrical and optical stability over the specified temperature and voltage ratings.

User Options and Assurance
Operator can measure the photocurrent generated in response to the incoming optical signal. The photocurrent can be calculated based on the voltage drop across an external resistor connected between the monitoring pin 10 and +3 V. If photocurrent measurement is not required, pin 10 should be connected to a +3 V power supply directly.

Every device is optically and electrically tested to ensure highest performance and reliability.

Ratings

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>Vcc</td>
<td>0</td>
<td>40</td>
<td>V</td>
</tr>
<tr>
<td>Operating Case Temperature Range</td>
<td>Ta</td>
<td>-40</td>
<td>85</td>
<td>°C</td>
</tr>
<tr>
<td>Operating Relative Humidity (non-condensing)</td>
<td>Hr</td>
<td></td>
<td>85</td>
<td>%</td>
</tr>
<tr>
<td>Lead Soldering Temperature/Time</td>
<td>Tt</td>
<td>250</td>
<td>10</td>
<td>°C/5s</td>
</tr>
<tr>
<td>Minimum Fiber Bend Radius</td>
<td>Rf</td>
<td>30/12.5</td>
<td></td>
<td>mm/in.</td>
</tr>
<tr>
<td>Storage Case Temperature Range</td>
<td>Ts</td>
<td>-40</td>
<td>85</td>
<td>°C</td>
</tr>
</tbody>
</table>
### Operating Characteristics

#### Optical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Wavelength</td>
<td>( \lambda )</td>
<td>1260</td>
<td>---</td>
<td>1580</td>
<td>nm</td>
</tr>
<tr>
<td>Measured Average Sensitivity(^1)</td>
<td>( P_{RL} )</td>
<td>-29</td>
<td>-31</td>
<td>---</td>
<td>dBm</td>
</tr>
<tr>
<td>Maximum Input Power</td>
<td>( P_{RH} )</td>
<td>-50</td>
<td>-15</td>
<td>---</td>
<td>dBm</td>
</tr>
</tbody>
</table>

#### Signal Detect Threshold:

- Decreasing Light Input
  \( SDT_{D} \) | -45 | -35 | -32 | dBm |
- Increasing Light Input
  \( SDT_{I} \) | -52 | -33 | -32 | dBm |

Photodiode Responsivity\(^2\)

\( PD_R \) | 06 | 08 | 10 | A/W |

1. At a BER of \( 1 \times 10^{-10} \) and an extinction ratio of 10 dB or more
2. Photocurrent \( 1 = \text{Responsivity} \times \text{Mean Power} \)

#### Electrical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc Power Supply Voltage</td>
<td>( V_C )</td>
<td>31</td>
<td>33</td>
<td>35</td>
<td>V</td>
</tr>
<tr>
<td>dc Power Supply Current</td>
<td>( I_C )</td>
<td>---</td>
<td>110</td>
<td>160</td>
<td>mA</td>
</tr>
<tr>
<td>Output Voltage(^3)</td>
<td>( V_{OL} )</td>
<td>-1.84</td>
<td>-1.8</td>
<td>-1.62</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>( V_{OH} )</td>
<td>-1.10</td>
<td>-0.9</td>
<td>-0.90</td>
<td>V</td>
</tr>
<tr>
<td>Output Rise/Fall Time</td>
<td>( t_r/t_f )</td>
<td>---</td>
<td>350</td>
<td>400</td>
<td>ps</td>
</tr>
<tr>
<td>Output Flag Voltage</td>
<td>( V_{L} )</td>
<td>-1.84</td>
<td>---</td>
<td>-1.62</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>( V_{H} )</td>
<td>-1.10</td>
<td>---</td>
<td>-0.90</td>
<td>V</td>
</tr>
<tr>
<td>Output Data Current:</td>
<td>( I_{OL} )</td>
<td>---</td>
<td>5</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Low</td>
<td>( I_{OH} )</td>
<td>---</td>
<td>20</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Output Flag Current:</td>
<td>( I_{L} )</td>
<td>---</td>
<td>10</td>
<td>15</td>
<td>mA</td>
</tr>
<tr>
<td>Low</td>
<td>( I_{H} )</td>
<td>---</td>
<td>10</td>
<td>15</td>
<td>mA</td>
</tr>
</tbody>
</table>

\(^1\) At a BER of \( 1 \times 10^{-10} \) and an extinction ratio of 10 dB or more
\(^2\) Photocurrent \( 1 = \text{Responsivity} \times \text{Mean Power} \)
\(^3\) Refer to the manufacturer's specifications for more details.
Operating Characteristics - continued

1 Output measured from \( V_C \) with 50\( \Omega \) load to \( [V_C - 2.0] \) V

Physical

The device package conforms to the 20 pin DIP outline shown below.
Physical - continued

Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Inches</th>
<th>Metric (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.300</td>
<td>33.0</td>
</tr>
<tr>
<td>B</td>
<td>0.635</td>
<td>16.13</td>
</tr>
<tr>
<td>C</td>
<td>1.22</td>
<td>30.99</td>
</tr>
<tr>
<td>D</td>
<td>0.365</td>
<td>9.27</td>
</tr>
<tr>
<td>E</td>
<td>0.100</td>
<td>2.54</td>
</tr>
<tr>
<td>F</td>
<td>0.110</td>
<td>2.79</td>
</tr>
<tr>
<td>Ø G</td>
<td>0.018</td>
<td>0.46</td>
</tr>
<tr>
<td>H</td>
<td>0.400</td>
<td>10.16</td>
</tr>
<tr>
<td>Ø I</td>
<td>0.236</td>
<td>6.00</td>
</tr>
</tbody>
</table>

An assigned serial number in both barcode and human readable formats appear on the device.

All markings and labels are permanent and meet the requirements of MIL-STD-883C 2015.7.

Connections

The pigtail consists of a multimode (MM) fiber with a 50 μm core. The outer jacket has a nominal 900 μm diameter and is terminated with an ST®, FC, or SC connector. The minimal pigtail length is 1 meter (39.4 inches) long.

*ST® is a registered trademark of AT&T
Physical - continued

Pin Designations

<table>
<thead>
<tr>
<th>Pin</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GND</td>
<td>GND</td>
<td>GND</td>
<td>NC</td>
<td>GND</td>
<td>GND</td>
<td>DATA(+)</td>
<td>GND</td>
<td>DATA(-)</td>
<td>PD Bias</td>
</tr>
<tr>
<td>Pin</td>
<td>20</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
<td>GND</td>
<td>GND</td>
<td>GND</td>
<td>FLAG(-)</td>
<td>GND</td>
<td>FLAG(+)</td>
<td>V</td>
</tr>
</tbody>
</table>

Safety

Please embrace all customary precautions & discretion while handling this device.

Optical
- Avoid direct eye exposure to laser beam projection area or a broken fiber under operation

Electrical
- Warning against excessive overvoltages or current surges as these may cause failure or electrical shock
  - Solder leads to electronics entirely so as to eschew short circuits
  - Solder or plug in device while power is turned off

Other
- Avoid storage above maximum temperature rating & other extreme conditions
  - Avoid device disassembly as damages may be incurred
  - Avoid excessive force to fiber pigtail and bending beyond a 30 mm radius
  - Take normal handling precautions as for all electrostatic sensitive devices

Appendix

Terms
BER Bit Error Rate
SD indicates the presence of an incoming signal level that has a workable BER
GND Ground
NC not connected
Additional Information

Contact
For additional information, product specifications, or information about Optocom:

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