

## 065-73-2Wx15 series Singlemode Fiber Wave Division Multiplexing Small Form-factor Pluggable (SFP) 155 Mbps Single-Fiber Interface Modules



The Signamax 065-73-2Wx15 series models are Small Form-factor Pluggable (SFP) singlemode fiber modules that support fiber Fast Ethernet or SONET OC-3 / SDH STM-1 over a single strand of singlemode fiber cable at distances up to 20 kilometers. There are two types of models in this series: one transmits at 1310 nm and receives at 1550 nm (model 065-73-2WA15), and the other transmits at 1550 nm and receives at 1310 nm (model 065-73-2WB15). These modules are designed to be used in pairs facing each other across a single stand of singlemode fiber. The "2" in the part number refers to the first digit of the typical distance spanned in kilometers (2 = 20 km). They are a cost-effective method of providing changeable 100Base Fast Ethernet or SONET OC-3 / SDH STM-1 single-fiber singlemode interfaces to switches and media converters equipped with standard 100Base-capable SFP slots.

### Applications

- Metro Access Rings
- Point-to-Point networking
- 1x Fiber Channel
- Fiber Fast Ethernet (100Base)
- Suitable for Fast Ethernet and SONET OC-3 / SDH STM-1 transmission

### Key Features

- RoHS Compliant
- Operating Temperature: 0~+70 °C
- Model 065-73-2WA15: 1310 nm uncooled FP Laser Diode transmitter; 1550 nm Photo Diode receiver
- Model 065-73-2WB15: 1550 nm uncooled FP Laser Diode transmitter; 1310 nm Photo Diode receiver
- Up to 20 Km link distance (indicative only)\*\*
- Hot pluggable
- Metal enclosure, low EMI
- Single 3.3V power supply
- Low Power Dissipation

### Ordering Information

| Part Number  | Description                                                               |
|--------------|---------------------------------------------------------------------------|
| 065-73-2WA15 | WDM 1.25 Gbps SFP Module Tx: 1310 nm / Rx: 1550 nm – SM/LC Simplex, 20 km |
| 065-73-2WB15 | WDM 1.25 Gbps SFP Module Tx: 1550 nm / Rx: 1310 nm – SM/LC Simplex, 20 km |

### Summary Specification

| PART NUMBER                          | Tx / Rx Spectrum           | Light Source | Link Power Budget | Typical Max. Distance** | Supply Voltage | Operating Temp. |
|--------------------------------------|----------------------------|--------------|-------------------|-------------------------|----------------|-----------------|
| <b>065-73-2WA15</b><br>(Blue clasp)  | Tx: 1310 nm<br>Rx: 1550 nm | FP Laser     | 17 dBm            | 20 km                   | 3.3V           | 0 ~ 70 °C       |
| <b>065-73-2WB15</b><br>(Green clasp) | Tx: 1550 nm<br>Rx: 1310 nm | FP Laser     | 17 dBm            | 20 km                   | 3.3V           | 0 ~ 70 °C       |

\*\* Maximum distances attainable on singlemode fiber circuits are dependent upon a circuit's conditions; i.e., the number of splices and patch panels and the number of bends in the circuit path. For comparison with competing products, please use the Link Power Budget for meaningful comparisons.

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**DETAILED SPECIFICATIONS**

• **ABSOLUTE MAXIMUM RATINGS, MODELS 065-73-2WA15 & 065-73-2WB15**

**Storage Temperature:** TS -40 -- 85 °C

**Supply Voltage:** V<sub>CC</sub> -0.5 -- 6.0 V

**Input Voltage:** VIN 0 – 5.5 V

**Operating Humidity:** 0-85 %

• **RECOMMENDED OPERATING CONDITIONS**

| PARAMETER                     | SYMBOL                            | MIN | TYP. | MAX | UNITS | NOTE |
|-------------------------------|-----------------------------------|-----|------|-----|-------|------|
| Ambient Operating Temperature | T <sub>AMB</sub>                  | 0   |      | 70  | °C    |      |
| Supply Voltage                | V <sub>CC</sub>                   | 3.1 | 3.3  | 3.5 | V     |      |
| Supply Current (3.3V)         | I <sub>TX</sub> + I <sub>RX</sub> |     | 200  | 300 | mA    |      |

• **TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS, MODEL 065-73-2WA15**

V<sub>CC</sub> = 3.1 V to 3.5V, T<sub>A</sub> = 0 °C to 70 °C

| PARAMETER                              | SYMBOL                          | MIN             | TYP. | MAX                  | UNITS | NOTE |
|----------------------------------------|---------------------------------|-----------------|------|----------------------|-------|------|
| Transmitter Differential Input Voltage | TD +/-                          | 400             |      | 2000                 | mVp-p | A    |
| Optical Output Power                   | P <sub>O</sub>                  | -15             |      | -5                   | dBm   | A    |
| Optical Extinction Ratio               | E <sub>R</sub>                  | 9               |      |                      | dB    | A    |
| Center Wavelength                      | λ <sub>C</sub>                  | 1270            | 1310 | 1355                 | nm    | A    |
| Spectral Width                         | Δλ                              |                 |      | <4                   | nm    | A    |
| Optical Rise / Fall Time               | t <sub>r</sub> / t <sub>f</sub> |                 |      | 3                    | nsec  | A,B  |
| Tx_Fault - High                        | V <sub>Fault H</sub>            | 2               |      | V <sub>CC</sub>      | V     | A    |
| Tx_Fault - Low                         | V <sub>Fault L</sub>            | V <sub>ee</sub> |      | V <sub>ee</sub> +0.5 | V     | A    |
| Tx_Disable - High                      | V <sub>Disable H</sub>          | 2               |      | V <sub>CC</sub>      | V     | A    |
| Tx_Disable - Low                       | V <sub>Disable L</sub>          | V <sub>ee</sub> |      | V <sub>ee</sub> +0.8 | V     | A    |

**Note A:** All data measured at 155.52 Mbps, PRBS 2<sup>7</sup>-1, NRZ.

**Note B:** 20% to 80%

• **TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS, MODEL 065-73-2WB15**

V<sub>CC</sub> = 3.1 V to 3.5V, T<sub>A</sub> = 0 °C to 70 °C

| PARAMETER                              | SYMBOL                          | MIN             | TYP. | MAX                  | UNITS | NOTE |
|----------------------------------------|---------------------------------|-----------------|------|----------------------|-------|------|
| Transmitter Differential Input Voltage | TD +/-                          | 400             |      | 2000                 | mVp-p | A    |
| Optical Output Power                   | P <sub>O</sub>                  | -15             |      | -5                   | dBm   | A    |
| Optical Extinction Ratio               | E <sub>R</sub>                  | 9               |      |                      | dB    | A    |
| Center Wavelength                      | λ <sub>C</sub>                  | 1520            | 1550 | 1580                 | nm    | A    |
| Spectral Width                         | Δλ                              |                 |      | <4                   | nm    | A    |
| Optical Rise / Fall Time               | t <sub>r</sub> / t <sub>f</sub> |                 |      | 3                    | nsec  | A,B  |
| Tx_Fault - High                        | V <sub>Fault H</sub>            | 2               |      | V <sub>CC</sub>      | V     | A    |
| Tx_Fault - Low                         | V <sub>Fault L</sub>            | V <sub>ee</sub> |      | V <sub>ee</sub> +0.5 | V     | A    |
| Tx_Disable - High                      | V <sub>Disable H</sub>          | 2               |      | V <sub>CC</sub>      | V     | A    |
| Tx_Disable - Low                       | V <sub>Disable L</sub>          | V <sub>ee</sub> |      | V <sub>ee</sub> +0.8 | V     | A    |

**Note A:** All data measured at 1250 Mbps, PRBS 2<sup>7</sup>-1, NRZ.

**Note B:** 20% to 80%

## DETAILED SPECIFICATIONS (continued)

### • RECEIVER ELECTRO-OPTICAL CHARACTERISTICS, MODEL 065-73-2WA15

$V_{cc} = 3.1 \text{ V to } 3.5 \text{ V}$ ,  $T_A = 0 \text{ }^{\circ}\text{C to } 70 \text{ }^{\circ}\text{C}$

| PARAMETER                            | SYMBOL                | MIN  | TYP. | MAX   | UNITS             | NOTE |
|--------------------------------------|-----------------------|------|------|-------|-------------------|------|
| Receiver Differential Output Voltage | RD +/-                | 600  | 800  |       | mV <sub>P-P</sub> |      |
| Receiver Overload                    | P <sub>IN</sub> MAX   | -3   |      |       | dBm               | A,B  |
| Receiver Sensitivity                 | P <sub>IN</sub> MIN   |      |      | -32   | dBm               | A,B  |
| Operating Center Wavelength          | $\lambda_c$           | 1480 |      | 1580  | nm                |      |
| Receiver LOS Assert Level            | P <sub>RX LOS A</sub> | -45  |      |       | dBm               | B    |
| Receiver LOS Deassert Level          | P <sub>RX LOS D</sub> |      |      | -32.5 | dBm               | B    |
| Receiver Loss of Signal Hysteresis   |                       | 0.5  | 2    |       | dB                | B    |

**Note A:** BER better than or equal to  $1 \times 10^{-12}$

**Note B:** Measured in the center of the eye opening with  $2^7 - 1$  PRBS, NRZ

### • RECEIVER ELECTRO-OPTICAL CHARACTERISTICS, MODEL 065-73-2WB15

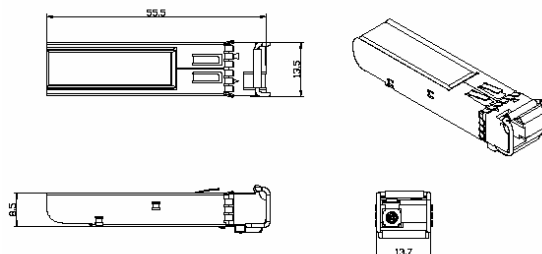
$V_{cc} = 3.1 \text{ V to } 3.5 \text{ V}$ ,  $T_A = 0 \text{ }^{\circ}\text{C to } 70 \text{ }^{\circ}\text{C}$

| PARAMETER                            | SYMBOL                | MIN  | TYP. | MAX   | UNITS             | NOTE |
|--------------------------------------|-----------------------|------|------|-------|-------------------|------|
| Receiver Differential Output Voltage | RD +/-                | 600  | 800  |       | mV <sub>P-P</sub> |      |
| Receiver Overload                    | P <sub>IN</sub> MAX   | -3   |      |       | dBm               | A,B  |
| Receiver Sensitivity                 | P <sub>IN</sub> MIN   |      |      | -32   | dBm               | A,B  |
| Operating Center Wavelength          | $\lambda_c$           | 1260 |      | 1360  | nm                |      |
| Receiver LOS Assert Level            | P <sub>RX LOS A</sub> | -45  |      |       | dBm               | B    |
| Receiver LOS Deassert Level          | P <sub>RX LOS D</sub> |      |      | -32.5 | dBm               | B    |
| Receiver Loss of Signal Hysteresis   |                       | 0.5  | 2    |       | dB                | B    |

**Note A:** BER better than or equal to  $1 \times 10^{-12}$

**Note B:** Measured in the center of the eye opening with  $2^7 - 1$  PRBS, NRZ

### • DIMENSIONS (mm), MODELS 065-73-2WA15 & 065-73-2WB15



### • REGULATORY COMPLIANCE, MODELS 065-73-2WA15 & 065-73-2WB15

| Feature                                            | Test Method                                           | Performance                                                                                                                                |
|----------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Electrostatic Discharge (ESD) to optical connector | Variation of IEC 61000-4-2                            | Typically withstand at least 15kV without damage when port is contacted by Human Body Model probe.                                         |
| Immunity                                           | Variation of IEC 61000-4-3                            | Typically show no measurable effect from a 10 V/m field swept from 27 MHz to 1 GHz applied to the transceiver without a chassis enclosure. |
| Electromagnetic Interference (EMI)                 | FCC Class B<br>CENELEC EN55022<br>Class B (CISPR 22A) | Margins are dependent on customer board and chassis design.                                                                                |
| Laser Eye Safety                                   | FDA21 CFR 1040.10 and 1040.11                         | Class 1 Laser Safety product.                                                                                                              |

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