

# SFP Transceivers – 2.5 Gbps

## Description:

The 2.5 Gbps series are hot pluggable Small-Form-Factor (SFP) duplex, bidirectional and CWDM and DWDM transceiver modules expressly designed for high speed communication applications that requiring rates of up to 2.5 Gbps. The transceivers are manufactured with LC receptacle that is compatible with the industry LC connector standard. All SFP transceivers have the digital diagnostic monitor feature.



|                                  | Unit | SX          | LRM       | LX       | HX                       | ZX         | UX         |
|----------------------------------|------|-------------|-----------|----------|--------------------------|------------|------------|
| Average output power (min / max) | dBm  | -10 / -3    | -9 / -3   | -5 / 0   | -2 / 3                   | 0 / 5      | 0 / 5      |
| Receiver sensitivity             | dBm  | -18         | -18       | -19      | -19                      | -26        | -30        |
| Overload                         | dBm  | -3          | -3        | 0        | 0                        | -9         | -10        |
| Maximum distance                 | km   | 0.550       | 2         | 20       | 40                       | 80         | 120        |
| Fiber type                       | -    | MMF         | SMF       | SMF      | SMF                      | SMF        | SMF        |
| Optical link budget              | dBm  | 8           | 9         | 14       | 17                       | 26         | 30         |
| Wavelength / laser type          | nm   | 850 / VCSEL | 1310 / FP | 1310/DFB | 1310 / DFB<br>1550 / DFB | 1550 / DFB | 1550 / DFB |

Table 1: Basic technical specifications according to distance.

## Temperature:

OPTOKON is always trying to satisfy as much market demand as possible and with this in mind, almost all OPTOKON SFP transceivers are manufactured in the Commercial, Extended and Industrial temperature ranges to provide you all possibilities you need for your application.

| Code | Temperature      |
|------|------------------|
| D    | 0 °C to + 70 °C  |
| E    | -10°C to + 80 °C |
| I    | -40°C to + 85 °C |

Table 2: Temperature specifications.

## Safety and regulatory compliance

|                                    |                                                  |
|------------------------------------|--------------------------------------------------|
| Electrostatic discharge (ESD)      | IEC/EN 61000-4-2                                 |
| Electromagnetic Interference (EMI) | FCC Part 15 Class B EN 55022 Class B (CISPR 22A) |
| Laser Eye Safety                   | Class 1 laser product                            |
| Component Recognition              | IEC/EN 60950, UL                                 |
| ROHS                               | 2002/95/EC                                       |
| EMC                                | EN 61000-3                                       |

## Digital diagnostics:

All OPTOKON SFP transceivers are assembled with digital diagnostic feature as a standard.

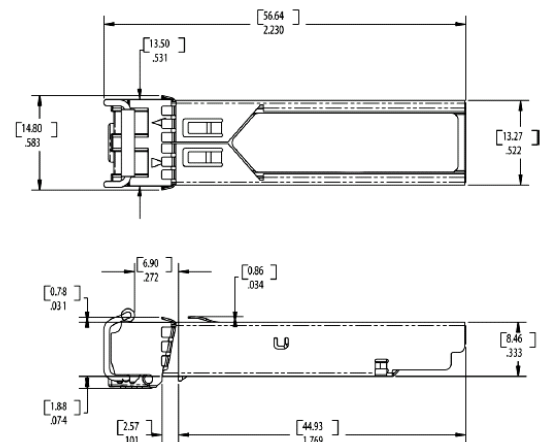
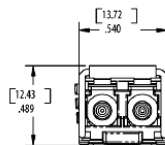


Figure 1: Transceiver dimensions schema.



## Ordering codes for 2.5 Gbps SFP transceivers:

### Standard series:

| Part number:        | Speed<br>[Gbps] | Distance dd<br>[-] | Wavelength<br>[nm] | Temperature<br>[-] | Fiber type<br>[-] | Connector<br>[-] |
|---------------------|-----------------|--------------------|--------------------|--------------------|-------------------|------------------|
| M250-V85-LP-dd-D-XX | 2.5             | SX                 | 850                | D, E, I            | MMF               | LC               |
| M250-F31-LP-dd-D-XX | 2.5             | LRM                | 1310               | D, E, I            | SMF               | LC               |
| S250-D55-LP-dd-D-XX | 2.5             | ZX, UX             | 1550               | D                  | SMF               | LC               |
| S250-D31-LP-dd-D-XX | 2.5             | LX, HX             | 1310               | D, E, I            | SMF               | LC               |
| S250-D55-LP-dd-D-XX | 2.5             | LX, HX             | 1550               | D, E, I            | SMF               | LC               |

### Bidirectional & CWDM Bidirectional series:

| Part number:           | Speed<br>[Gbps] | Distance - dd<br>[-] | TX wavelength<br>[nm] | Rx wavelength<br>[nm] | Temperature<br>[-] | Fiber<br>[-] | Connector<br>[-] |
|------------------------|-----------------|----------------------|-----------------------|-----------------------|--------------------|--------------|------------------|
| S250-W31/55-LP-dd-D-XX | 2.5             | LX, HX               | 1310                  | 1550                  | D, E, I            | SMF          | LC               |
| S250-W55/31-LP-dd-D-XX | 2.5             | LX, HX               | 1550                  | 1310                  | D, E, I            | SMF          | LC               |
| S250-Dyy/zz-LP-dd-D-XX | 2.5             | HX                   | CWDM yy               | CWDM zz               | I                  | SMF          | LC               |
| S250-Dyy/zz-LP-dd-D-XX | 2.5             | ZX                   | CWDM yy               | CWDM zz               | D, I               | SMF          | LC               |

### CWDM series:

| Part number:        | Speed<br>[Gbps] | Distance dd<br>[-] | Wavelength<br>[-] | Temperature<br>[-] | Fiber type<br>[-] | Connector<br>[-] |
|---------------------|-----------------|--------------------|-------------------|--------------------|-------------------|------------------|
| S250-Cyy-LP-dd-D-XX | 2.5             | ZX, HX             | CWDM              | D, E, I            | SMF               | LC               |

### DWDM series:

| Part number <sup>1)</sup> : | Speed<br>[Gbps] | Distance dd<br>[-] | Wavelength<br>[-] | Temperature<br>[-] | Fiber type<br>[-] | Connector<br>[-] |
|-----------------------------|-----------------|--------------------|-------------------|--------------------|-------------------|------------------|
| S250-xxxx-LP-dd-D-XX        | 2.5             | UX, ZX             | DWDM              | D                  | SMF               | LC               |

1) xxxx means last 4 digits in DWDM wavelength. Example: For channel C17 of DWDM use 6386 in ordering code.

### CWDM & DWDM laser code:

| yy/zz<br>[-] | Wavelength<br>[nm] | Clasp Color<br>[-] | yy/zz<br>[-] | Wavelength<br>[nm] | Clasp Color<br>[-] |
|--------------|--------------------|--------------------|--------------|--------------------|--------------------|
| 27           | 1270               | Gray               | 45           | 1450               | Brown              |
| 29           | 1290               | Gray               | 47           | 1470               | Gray               |
| 31           | 1310               | Gray               | 49           | 1490               | Purple             |
| 33           | 1330               | Purple             | 51           | 1510               | Blue               |
| 35           | 1350               | Blue               | 53           | 1530               | Green              |
| 37           | 1370               | Green              | 55           | 1550               | Yellow             |
| 39           | 1390               | Yellow             | 57           | 1570               | Orange             |
| 41           | 1410               | Orange             | 59           | 1590               | Red                |
| 43           | 1430               | Red                | 61           | 1610               | Brown              |

Table 3: CWDM ordering code.

### Distance & temperature codes

| dd code<br>[-] | Distance<br>[km] |
|----------------|------------------|
| SX             | 0.550            |
| LRM            | 2                |
| LX             | 20               |
| HX             | 40               |
| ZX             | 80               |
| UX             | 120              |

Table 5: Distance codes.

| Code | Temperature      |
|------|------------------|
| D    | 0 °C to + 70 °C  |
| E    | -10°C to + 80 °C |
| I    | -40°C to + 85 °C |

Table 6: Temperature codes.

| ch<br>[-] | Frequency<br>[THz] | Wavelength<br>[nm] | ch<br>[-] | Frequency<br>[THz] | Wavelength<br>[nm] |
|-----------|--------------------|--------------------|-----------|--------------------|--------------------|
| C17       | 191,7              | 1563,86            | C40       | 194,0              | 1545,32            |
| C18       | 191,8              | 1563,05            | C41       | 194,1              | 1544,53            |
| C19       | 191,9              | 1562,23            | C42       | 194,2              | 1543,73            |
| C20       | 192,0              | 1561,42            | C43       | 194,3              | 1542,94            |
| C21       | 192,1              | 1560,61            | C44       | 194,4              | 1542,14            |
| C22       | 192,2              | 1559,79            | C45       | 194,5              | 1541,35            |
| C23       | 192,3              | 1558,98            | C46       | 194,6              | 1540,56            |
| C24       | 192,4              | 1558,17            | C47       | 194,7              | 1539,77            |
| C25       | 192,5              | 1557,36            | C48       | 194,8              | 1538,98            |
| C26       | 192,6              | 1556,55            | C49       | 194,9              | 1538,19            |
| C27       | 192,7              | 1555,75            | C50       | 195,0              | 1537,40            |
| C28       | 192,8              | 1554,94            | C51       | 195,1              | 1536,61            |
| C29       | 192,9              | 1554,13            | C52       | 195,2              | 1535,82            |
| C30       | 193,0              | 1553,33            | C53       | 195,3              | 1535,04            |
| C31       | 193,1              | 1552,52            | C54       | 195,4              | 1534,25            |
| C32       | 193,2              | 1551,72            | C55       | 195,5              | 1533,47            |
| C33       | 193,3              | 1550,92            | C56       | 195,6              | 1532,68            |
| C34       | 193,4              | 1550,12            | C57       | 195,7              | 1531,90            |
| C35       | 193,5              | 1549,32            | C58       | 195,8              | 1531,12            |
| C36       | 193,6              | 1548,51            | C59       | 195,9              | 1530,33            |
| C37       | 193,7              | 1547,72            | C60       | 196,0              | 1529,55            |
| C38       | 193,8              | 1546,92            | C61       | 196,1              | 1528,77            |
| C39       | 193,9              | 1546,12            |           |                    |                    |

Table 4: DWDM orderign code.

### Temperature code examples:

| Code                | Description                                                           |
|---------------------|-----------------------------------------------------------------------|
| S250-D55-LP-HX-E-XX | Standard series, 1550nm, 40km, -10°C to +70°C operational temperature |
| S250-D31-LP-HX-I-XX | Standard series, 1310nm, 40km, -40°C to +85°C operational temperature |