

High Speed 840–960 nm Photodetector up to 112 Gbit/s

Product Code:

D35-SWDM-C1 1x1

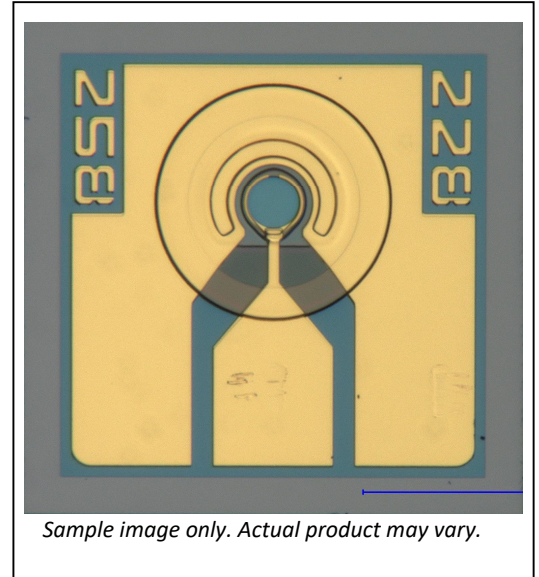
D35-SWDM-C4 4x1

Engineering Samples

Product Description

High-speed 840-960 nm top-illuminated InP-based pin photodetector chip for data rates of up to 112 Gbit/s PAM-4 for application in the next-generation data communication systems. These photodetectors are available as single chip or as 4-channel chip array with a 250 μm pitch, allowing alignment to multi-mode fibers. The chips can be wire bonded.

Active area: 25μm diameter, ~490 μm²



Features

- Single chip or 4-channel chip array
- Up to 112 Gbit/s PAM4 per channel
- High temperature stability

Applications

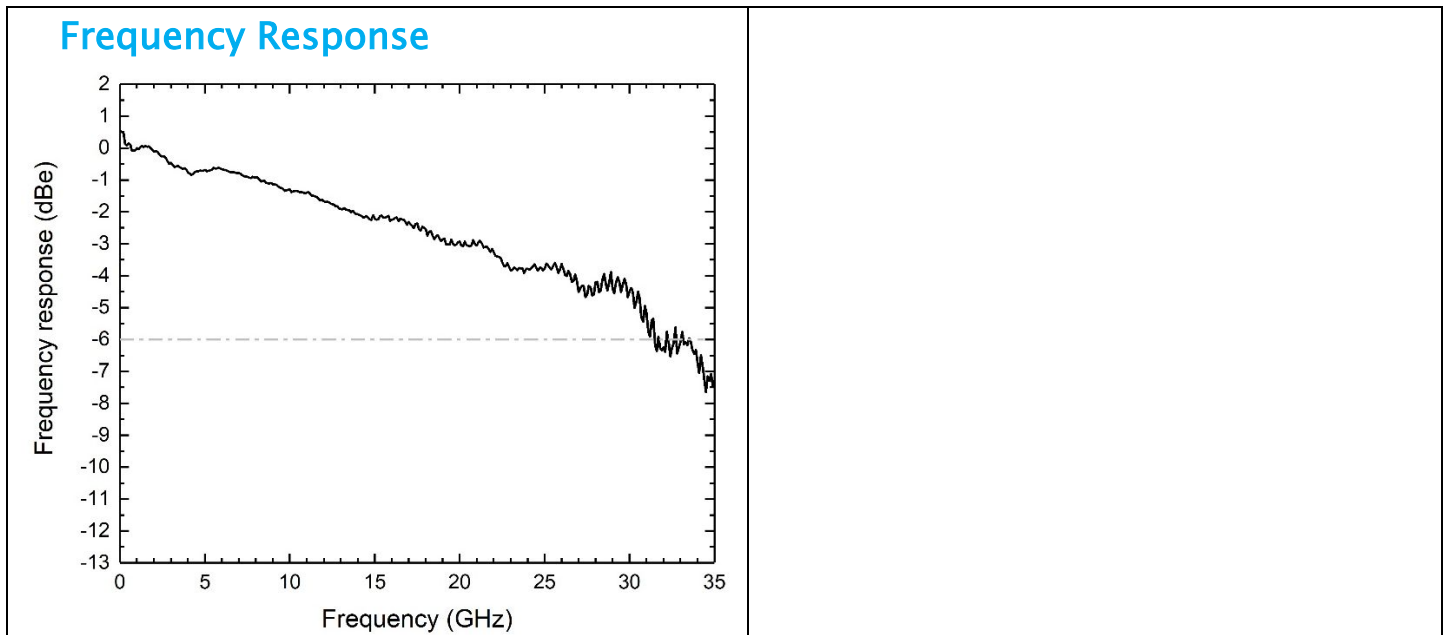
- SWDM Optical Interconnects
- Active Optical Cables
- Chip-to-Chip Interconnects

| Parameter | Typical | Notes |
|------------------------------|---------------------------|-----------|
| Operating Wavelength | 840 - 960 nm | |
| Data Rate | up 112 Gbit/s per channel | PAM-4 |
| Responsivity | min 0.5 A/W | at 850 nm |
| Small signal -3dBo bandwidth | > 30 GHz | typ. |

Electro-Optical Specifications (T = 0 to 85°C)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|-------------------------|----------------|---------------------|------|------|-----|------|
| Dark current | I_d | $V_{Bias} = -2.5 V$ | | | 4 | nA |
| S_{21} 3 dB Bandwidth | $BW_{f_{3dB}}$ | -2.5V 50Ω load | 30 | 35 | | GHz |
| Operating wavelength | λ | | 840 | | 960 | nm |
| Responsivity | R | 850 nm | 0.50 | 0.50 | | A/W |
| | R | 880 nm | 0.50 | 0.52 | | A/W |
| | R | 910 nm | 0.50 | 0.54 | | A/W |
| | R | 940 nm | 0.50 | 0.56 | | A/W |
| | R | 1310 nm* | 0.70 | 0.75 | | A/W |
| | R | 1550 nm* | 0.70 | 0.75 | | A/W |
| Capacitance | C | | | | | pF |
| Series resistance | R_s | | | | | Ohm |

*anti-reflection coating is optimized for <1% reflectivity within the range 840 nm - 960 nm



Test equipment: Keysight VNA

Absolute Maximum Ratings

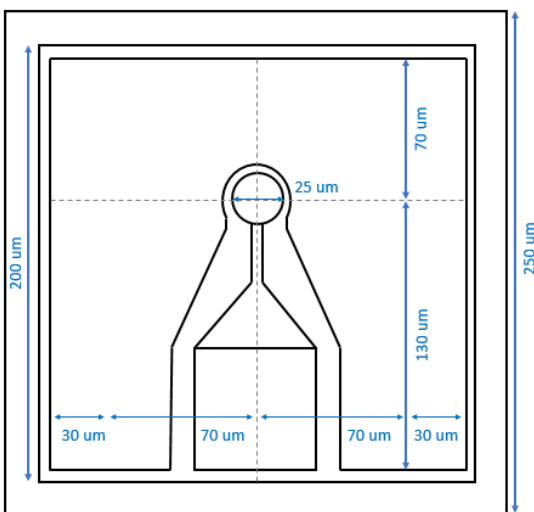
| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|-----------------------|-----------|-----------|-----|-----|-----|------|
| Operating temperature | T_{op} | | 0 | | 85 | °C |
| Storage temperature | T_{st} | | -40 | | 85 | °C |
| Soldering temperature | T_{sl} | 10 sec | | | 260 | °C |
| Forward current | I_{FW} | | | | 10 | mA |
| Reverse Voltage | V_R | | | | 10 | V |
| HBM ESD Threshold | V_{ESD} | | | | 90 | V |

Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate irreversible damage to the component even if all other parameters are within the electro-optical specifications. Exposure to any of the Absolute Maximum Ratings for extended periods can adversely affect the reliability of these chips.

Mechanical Dimensions

| Parameter | Type | Min | Typ | Max | Unit |
|-----------|-------------|-----|------|------|---------------|
| Length | D35-SWDM-C1 | | 250 | 260 | μm |
| | D35-SWDM-C4 | | 1000 | 1040 | μm |
| Height | | | 150 | | μm |
| Width | | | 250 | 260 | |

Dimensions of D35-SWDM-C1

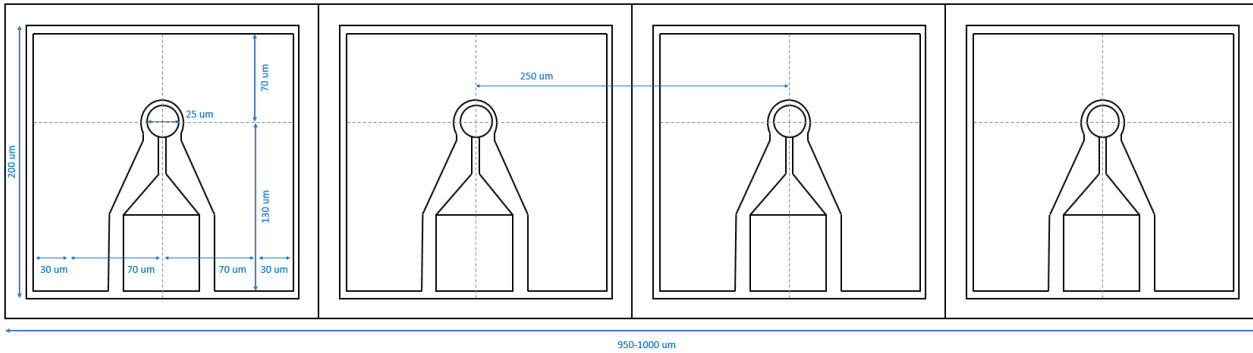


A

Contact shape

Active area: 25 μm diameter, $\sim 490 \mu\text{m}^2$

Dimensions of D35-SWDM-C4



Qualification Notification

The D35-SWDM-Cxx chips have been tested to meet the specifications outlined in this datasheet. A reliability assessment report is available as a separate document upon request.



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