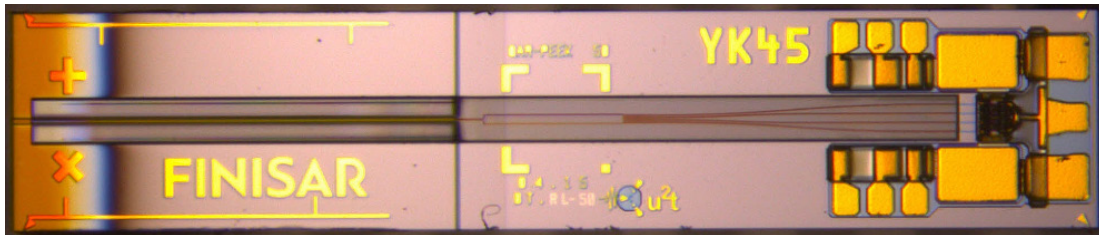


# 50 GHz HIGH POWER PHOTODIODE

## CHPDV21x0R

The CHPDV21x0R is an advanced waveguide photodetector chip integrated with a Bias-Tee. The High-Power Photodiode utilizes a mode-converting tapered waveguide for efficient fiber-to-chip coupling and a 1×4 Multi-Mode Interference (MMI) Coupler. The optical signal is split by the MMI coupler into 4 equal parts and then it is fed into an array of 4 photodiodes which are connected in-parallel.

It has a responsivity of 0.5 A/W at 1550 nm and a high saturation photocurrent of 30 mA at 20 GHz. The CHPDV21x0R can deliver 4.5 dBm RF output power at 20 GHz and 1.5 dBm at 50 GHz. The device exhibits a high linearity with typical OIP3 values above 20 dBm at a frequency of 40 GHz.



Picture shows product example, actual product might differ

## FEATURES

- High 3dB bandwidth of 50 GHz
- Optical window at 1550 nm
- Excellent linearity
- High responsivity of >0.45 A/W (typ.)
- Low PDL of < 0.5 dB (typ.)
- 4.5 dBm RF output power at 20 GHz
- High Linearity (25 dBm OIP3 at 40 GHz)

## APPLICATIONS

- Microwave Photonics
- Analog Photonics
- Radio over Fiber

# 50 GHz HIGH POWER PHOTODIODE

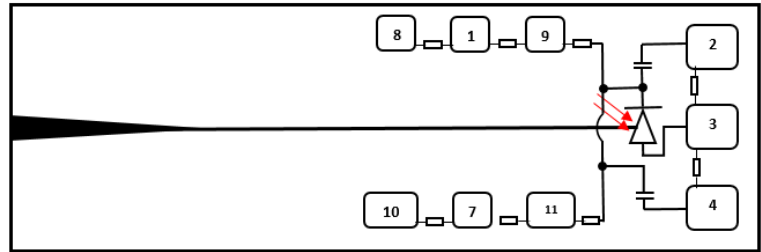
## Product Selection

### CHPDV21x0R

|   |   |                              |
|---|---|------------------------------|
| x | 2 | = Standard version           |
|   | 3 | = Low reflection coefficient |

## Block Diagram

Bias Pads incl. R<sub>Bias</sub> | MIM Capacitors

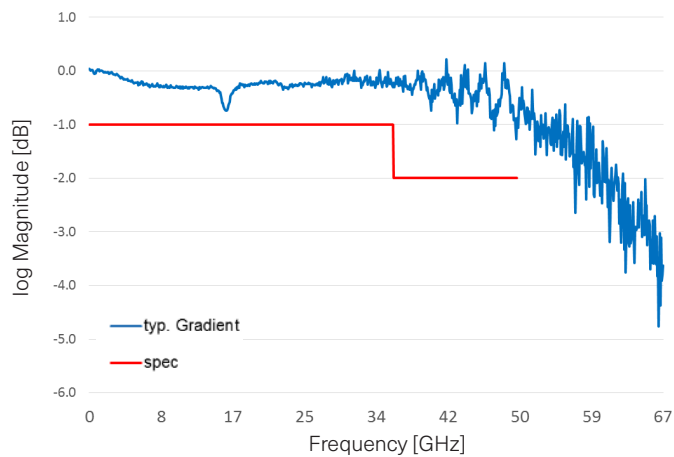


Spot-size converter | optical waveguide | Pin PD | RF out - CPW  
incl. 2x 100Ω  
(eff. 50 Ω)

## Key Specifications

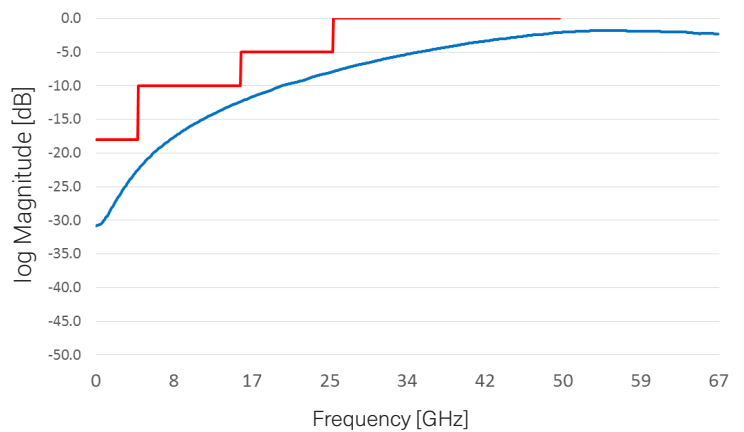
| Parameter                     | Symbol         | Condition                 | Min. | Typ. | Max.    | Unit |
|-------------------------------|----------------|---------------------------|------|------|---------|------|
| Operating Case Temperature    | $T_{CASE}$     |                           | 0    |      | 75      | °C   |
| Storage Temperature           | $T_{STORE}$    |                           | -40  |      | 125     | °C   |
| Wavelength Range              | $\lambda$      |                           |      | 1550 |         | nm   |
| Photodiode Supply Voltage     | $V_{PD}$       |                           |      | 4.0  |         | V    |
| Average Optical Input Power   | $P_{OPT\_avg}$ | At facet                  |      |      | 18      | dBm  |
| Photodiode DC Responsivity    | R              |                           | 0.4  |      |         | A/W  |
| Polarization-Dependent Loss   | PDL            |                           |      |      | 0.5     | dB   |
| Photodiode Dark Current       | $I_{DARK}$     | $T_{CASE} = 25\text{ °C}$ |      | 5    |         | nA   |
| 3 dB Cut-off Frequency        | $f_{3dB}$      |                           | 50   |      |         | GHz  |
| Output Reflection Coefficient | $s_{22}$       | CHPDV2120R<br>CHPDV2130R  |      |      | 0<br>-8 | dB   |

S21 Log Magnitude Plot



Typical frequency response  $s_{21}$

S22 Log Magnitude Plot



Typical backreflection  $s_{22}$  for standard version