Optical Communications

50 GHz HIGH-POWER PHOTODETECTOR

HPDV2120R

The HPDV2120R is a compact module that is based on an advanced waveguide photodetector chip integrated with a Bias-Tee. The HP-PD 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 0.52 A/W at 1550 nm and a high saturation photocurrent of 35 mA at 20 GHz. The HP-PD can deliver 6 dBm RF output power at 20 GHz and 3 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

- 50 GHz typical 3 dB bandwidth
- Up to 4.5 dBm RF output power
- High Linearity (25 dBm OIP3 @ 40 GHz)
- No additional cooling required

APPLICATIONS

- Microwave Photonics
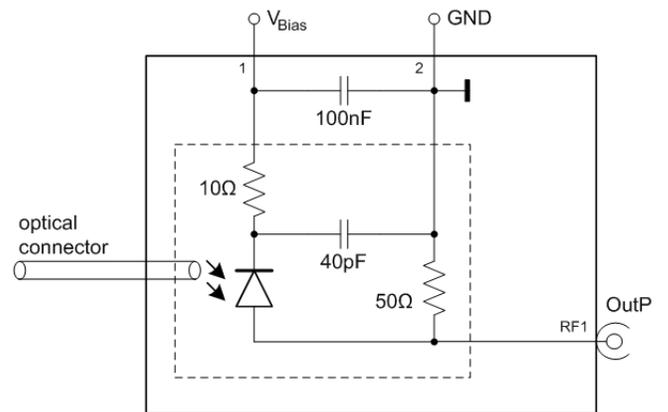- Analog Photonic links
- Radio-over-Fiber

C⊛HERENT

Product Selection

HPDV2120R-VF-zz

VF	VF	= Female V® connector
zz	FP	= FC/PC connector (standard)
	FA	= FC/APC connector

Block Diagram

Key Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Case Temperature	T_{CASE}		0		75	°C
Storage Temperature	T_{STORE}		-40		85	°C
Wavelength Range	λ	C-band		1550		nm
Photodiode Supply Voltage	V_{PD}			4.0		V
Average Optical Input Power	P_{OPT_avg}				10	dBm
Photodiode DC Responsivity	R	Optimum polarization		0.45		A/W
Photodiode Dark Current	I_{DARK}	T_{CASE} = 25 °C		25		nA
3 dB Cut-off Frequency	f_{3dB}			54		GHz
Output 1dB compression	P_{out}	P_{1dB_20GHz}		4.5		dBm
Output 3rd order intercept point	OIP3	50 GHz, V_{PD} = 4.0 V		20		dBm
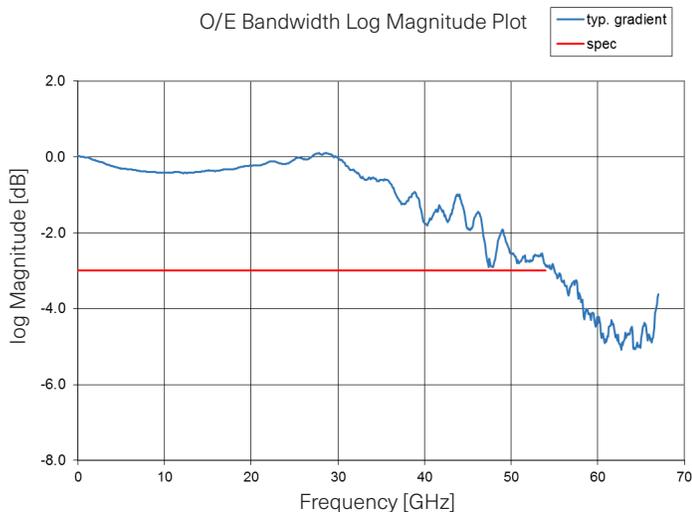
Typical frequency response s21 measured with a heterodyne signal
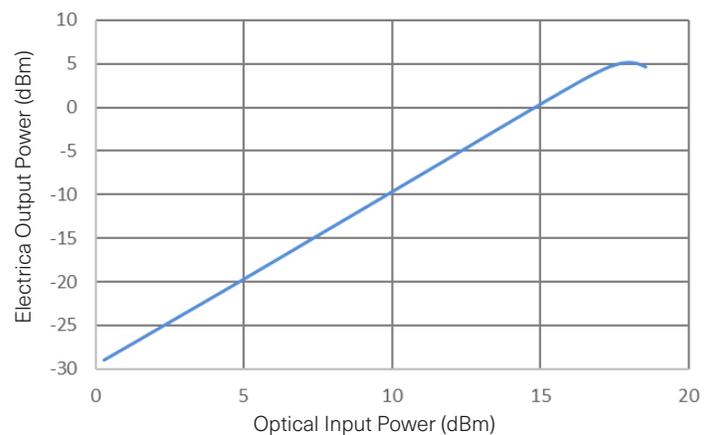
RF output power as a function of the optical input power for a bias voltage of 4 V at a frequency of 20 GHz