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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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## Product Specification

### 50 GHz High-Power Photodetector

#### HPDV2120R

#### PRODUCT FEATURES

- 50 GHz 3 dB bandwidth
- 3 dBm RF output power @ 50 GHz
- 6 dBm RF output power @ 20 GHz
- High Linearity  
( $>25$  dBm OIP3 @ 40 GHz)
- No cooling required

#### APPLICATIONS

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



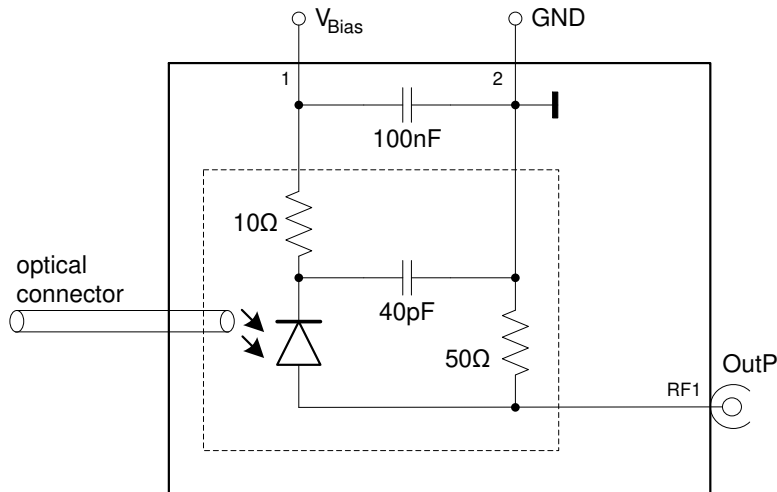
The HPDV is a compact module that is based on an advanced waveguide photodetector chip integrated with a Bias-Tee. The HP-PD utilizes a mode-converting tapered waveguide for efficient fiber-to-chip coupling and a 1x4 Multi-Mode Interference (MMI) Coupler. The optical signal is split by the MMI coupler 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 @ 1550 nm and a high saturation photocurrent of 35 mA @ 20 GHz. The HP-PD is capable of delivering 6 dBm RF output power @ 20 GHz and 3 dBm @ 50 GHz. The device exhibits a high linearity with typical OIP3 values above 20 dBm at a frequency of 40 GHz.

#### ORDERING INFORMATION

##### HPDV2120R-VF-zz

R:	R	= internal 50 $\Omega$ termination
VF:	VF	= V-connector, female
zz:	FC	= FC/PC connector
	FA	= FC/APC connector

## I. Block Diagram



## II. Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Storage Temperature	$T_{\text{STORAGE}}$	non condensing	-40		+85	°C
Photodiode Bias Voltage	$V_{\text{PD}}$		0		5.2	V
Maximum Average Optical Input Power	$P_{\text{OPT}}$	continuous wave (CW) or 40 Gb/s NRZ			18.5	dBm
Maximum Peak Optical Input Power	$P_{\text{peak}}$	pulse width $\leq 25$ ps or 40 Gb/s RZ			24	dBm
Electrostatic Discharge	$V_{\text{ESD}}$	100pF, 1.5kΩ HBM	-250		+250	V
Fiber Bend Radius	$r_{\text{bend}}$		16			mm



### Notice

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product.



### III. Environmental Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Relative Humidity Range	RH	non condensing	5		85	%

### IV. Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Case Temperature Range	$T_{CASE}$		0		+50	°C
Wavelength Range	$\lambda$		1520		1570	nm
Average Optical Input Power	$P_{OPT}$				18	dBm
Photodiode Bias Voltage	$V_{PD}$		2.8	4.0	5.0	V

### V. Electro-Optical Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
DC responsivity	R	optimum polarization	0.4	0.5		A/W
Polarization dependent loss	PDL			0.3	0.7	dB
Optical return loss	ORL		27			dB
3dB cut-off frequency	$f_{3dB}$		48	54		GHz
Output reflection coefficient	$S_{22}$	0...15 GHz 15...50 GHz		-15 -3	-10 -1	dB
Output 1dB compression	$P_{1dB}$	50 GHz, $V_{PD} = 4.0V$		3		dBm
Output 3 <sup>rd</sup> order intercept point	OIP3	50 GHz, $V_{PD} = 4.0V$		20		dBm
Dark current	$I_{dark}$			25	200	nA

### VI. Typical Performance Curves

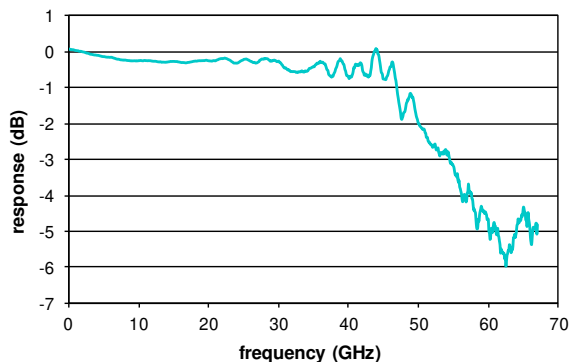


Fig. 1: Frequency response measured with a Lightwave Component Analyzer.

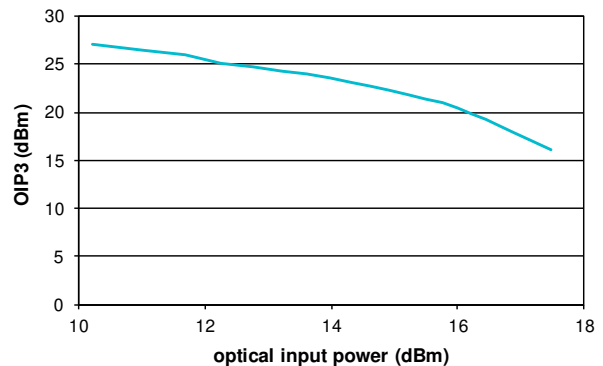


Fig. 2: Output IP3 at a frequency of 20 GHz and at a bias voltage of 4 V.

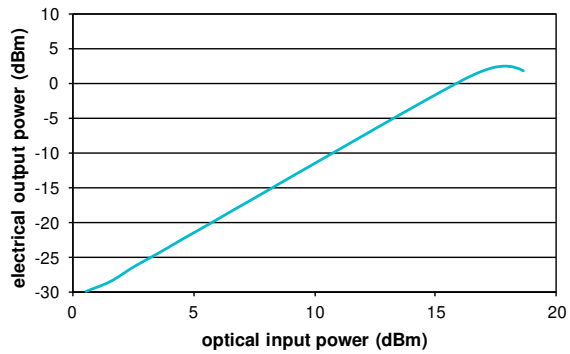


Fig. 3(a): RF output power as a function of the optical input power for a bias voltage of 4 V at a frequency of 50 GHz.

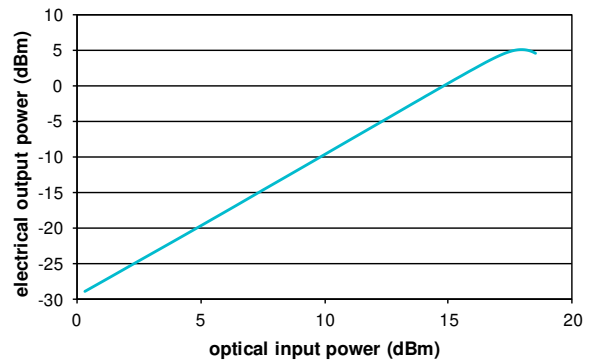


Fig. 3(b): RF output power as a function of the optical input power for a bias voltage of 4 V at a frequency of 20 GHz.

## VII. Revision History

Revision	Date	Description
A1	04/09/2014	• Document created.
A2	06/27/2014	• Data and design update according M4

## Notes

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