

## Product Specification

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### Ultra-High Power Photodetector

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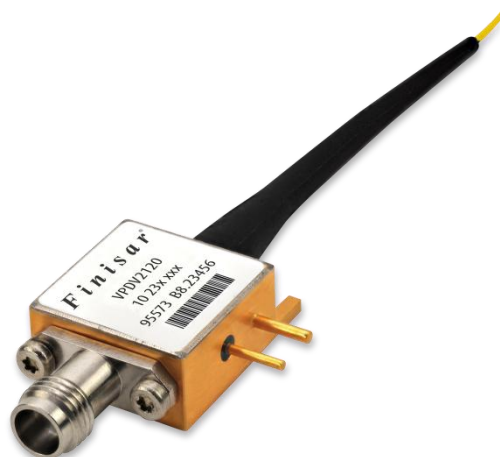
#### VPDV2120

#### PRODUCT FEATURES

- Operational up to 20 GHz
- $\geq 23$  dBm RF output power @ 10 GHz
- High Linearity ( $> 30$  dBm OIP3 @ 10GHz)
- No cooling required

#### APPLICATIONS

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



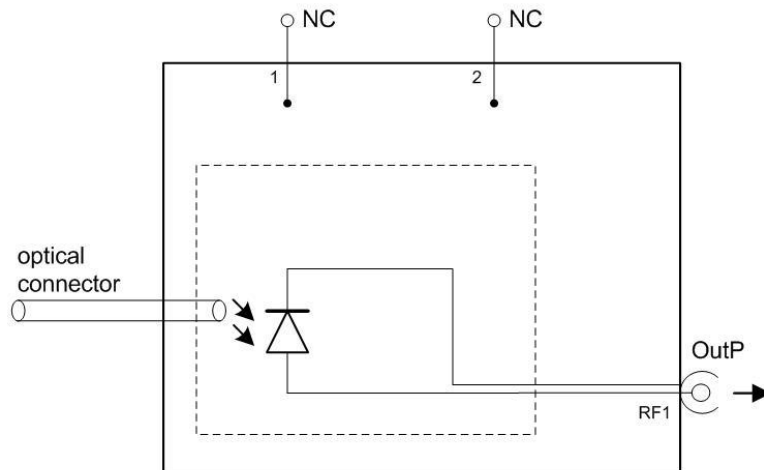
The VPDV2120 is a compact module that is based on a modified uni-travelling carrier (MUTC) photodetector chip. The VPDV2120 is not matched to  $50 \Omega$ . For applying a bias voltage of 6 V, an external bias-Tee is required. It has a responsivity of 0.35 A/W (1550 nm) and a high saturation photocurrent of 150 mA @ 10 GHz. The Ultra-high power PD is capable of delivering  $\geq 23$  dBm RF output power @ 10 GHz. The device exhibits a high linearity with typical OIP3 values above 30 dBm at a frequency of 10 GHz.

#### ORDERING INFORMATION

<b>VPDV2120-VF-FP</b>
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VF:               = V connector, female  
FP:               = FC/PC connector

## I. Block Diagram



## II. Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode Bias Voltage	$V_{PD}$		0		8	V
Maximum Average Optical Input Power	$P_{OPT}$	continuous wave (CW)			28	dBm
Electro Static Discharge	$V_{ESD}$	C=100 pF, R= 1.5 kΩ HBM	-250		250	V



### 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
Storage Temperature	T <sub>storage</sub>	non condensing	-40		+85	°C
Operating Case Temperature Range	T <sub>CASE</sub>		0		+75	°C
Relative Humidity Range	RH	non condensing	5		85	%

**IV. Operating Conditions**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Wavelength Range	$\lambda$		1520		1570	nm
Average Optical Input Power Range	P <sub>OPT</sub>				27	dBm
Photodiode Bias Voltage	V <sub>PD</sub>		5	6	7	V

**V. Electro-Optical Specifications**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity	R	optimum polarization	0.3	0.4		A/W
Polarization Dependent Loss	PDL			0.3	0.7	dB
Optical Return Loss	ORL		27			dB
3dB Cut-off Frequency <sup>1)</sup>	f <sub>3dB</sub>		12	18		GHz
RF Output Power	P <sub>out</sub>	10 GHz, V <sub>PD</sub> = 6.0V		23		dBm
Output 3 <sup>rd</sup> Order Intercept Point	OIP3	10 GHz, V <sub>PD</sub> = 6.0V		30		dBm
Photodiode Dark Current	I <sub>dark</sub>			100	500	nA
Notes:						
1. measured using Agilent 86030A 50GHz Lightwave component analyzer						

## VI. Typical Performance Curves

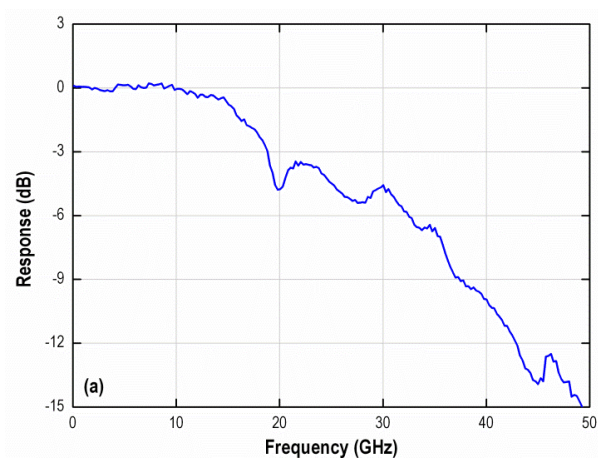


Fig. 1(a): Frequency response of the VPDV2120 measured with a Lightwave Component Analyzer. The device is operational up to 20 GHz.

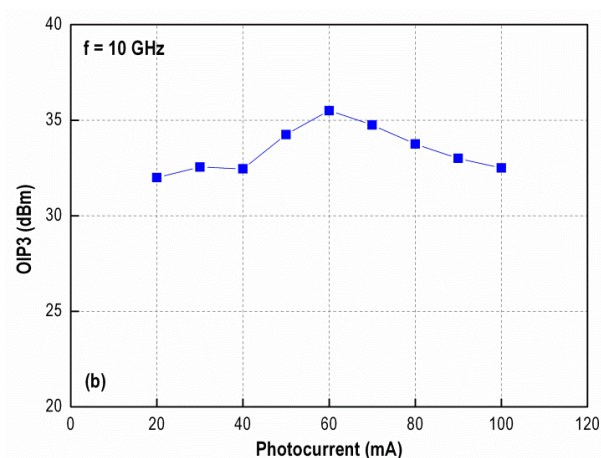


Fig. 1(b): Output IP3 at a frequency of 10 GHz versus photocurrent.

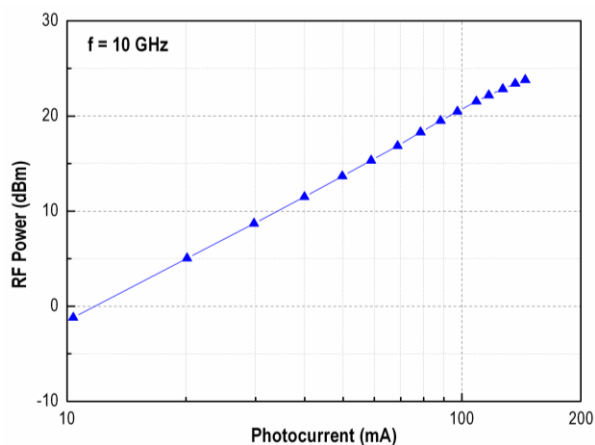


Fig. 2(a): RF output power as a function of the photocurrent at a bias voltage of 6 V and a frequency of 10 GHz.

**VII. Revision History**

Revision	Date	Description
A1	04/09/2014	• Document created.

**Notes**

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- Finisar Corporation reserves the right to make changes without notice.

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