

Product Specification

Ultra-High Power Photodetector

VPDV2120

PRODUCT FEATURES

- Ultra High RF Output Power of $\geq 22\text{dBm}$ @ 10GHz
- High Linearity (OIP3 > 30dBm @ 10GHz)
- High Responsivity of 0.55A/W
- High Saturation Photocurrent of 150mA @ 10GHz
- No cooling required
- Operational up to 20GHz and beyond



APPLICATIONS

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

The VPDV2120 is a very compact, hermetically packaged, optical detector module with an ultra high RF output power of >22dBm at a frequency of 10GHz. It offers a high responsivity of 0.55A/W (1550nm) and a very high saturation photocurrent of 150mA @ 10GHz. The device exhibits a high linearity with typical OIP3 values above 30dBm at a frequency of 10GHz and doesn't require any cooling. The device is using a modified uni-travelling carrier (MUTC) photodetector chip.

The VPDV2120 is not matched to 50Ω. For applying a bias voltage of -6V, an external bias-Tee is required.

I Ordering Information

VPDV2120-VF-FA

VF = V connector, female
FA = FC/APC connector

II Block Diagram

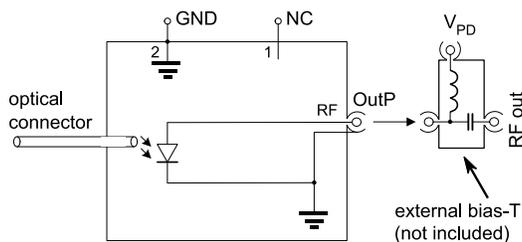


Figure 1: Block Diagram of VPDV2120

III Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode bias voltage	V_{PD}		-6.5		0	V
Optical input power	P_{OPT}	CW			24	dBm
		pulse ≤ 1 ns			27	
Photocurrent	I_{PD}	DC	-120			mA
Electro static discharge	V_{ESD}	C=100pF, R= 1.5k Ω HBM	-250		250	V

IV Environmental Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Storage temperature	$T_{storage}$	non condensing	-40		+85	$^{\circ}$ C
Operating case temperature	T_{case}		0		+50	$^{\circ}$ C
Relative humidity range	RH	non condensing	5		85	%

V Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating wavelength range	λ		1520		1570	nm
Optical input power	P_{OPT}				23.5	dBm
Photodiode bias voltage	V_{PD}		-6	-5	-4	V

VI Electro-Optical Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC responsivity	R	optimum polarization		0.55		A/W
Polarization dependent loss	PDL			0.1	0.3	dB
Optical return loss	ORL		30	40		dB
3dB cut-off frequency	f_{3dB}	$V_{PD} = -6.0V, I_{PD} = 120mA$		12		GHz
RF output power	P_{out}	$V_{PD} = -6.0V, I_{PD} = 120mA, 10GHz$		22		dBm
Output 3 rd order intercept point	OIP3	$V_{PD} = -6.0V, I_{PD} = 120mA, 10GHz$		33		dBm
Photodiode dark current	I_{dark}	$T_{case} = 25^{\circ}C$		10	200	nA

VII Typical Performance

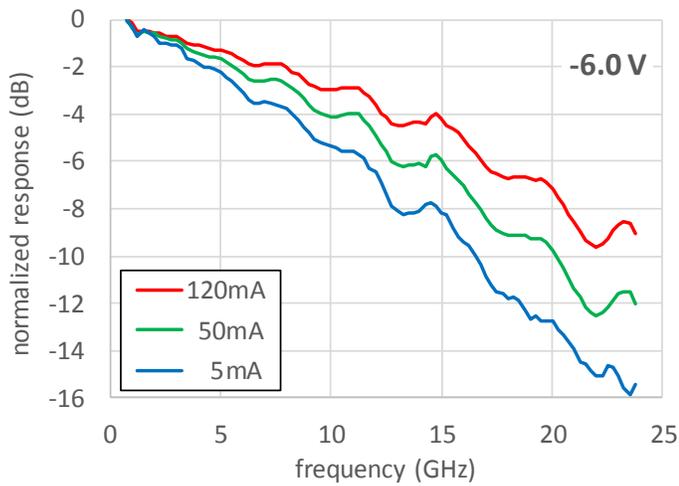


Figure 2: Frequency response of the VPDV2120 measured with a heterodyne signal

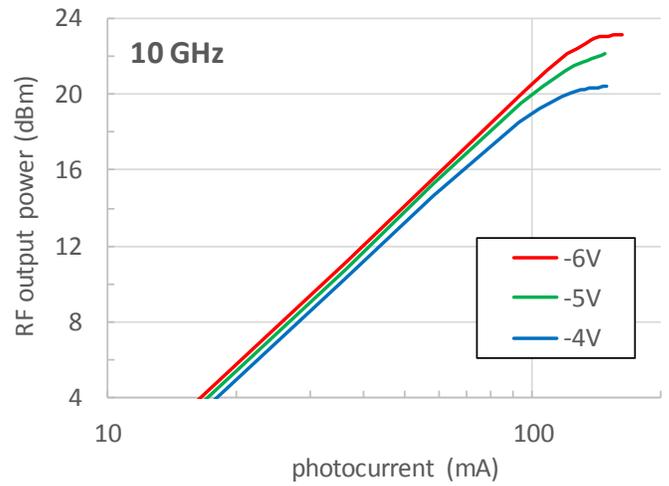


Figure 3: RF output power as a function of the photocurrent

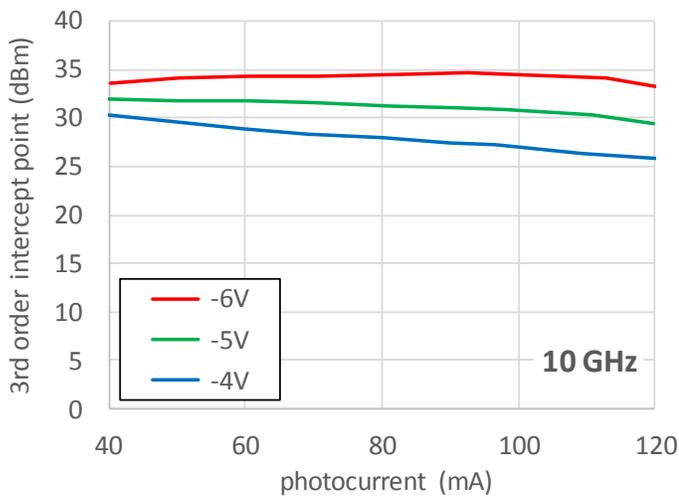


Figure 4: Output IP3 versus photocurrent with $V_{PD} = -6V$

VIII Mechanical Specifications

All dimensions are in mm.

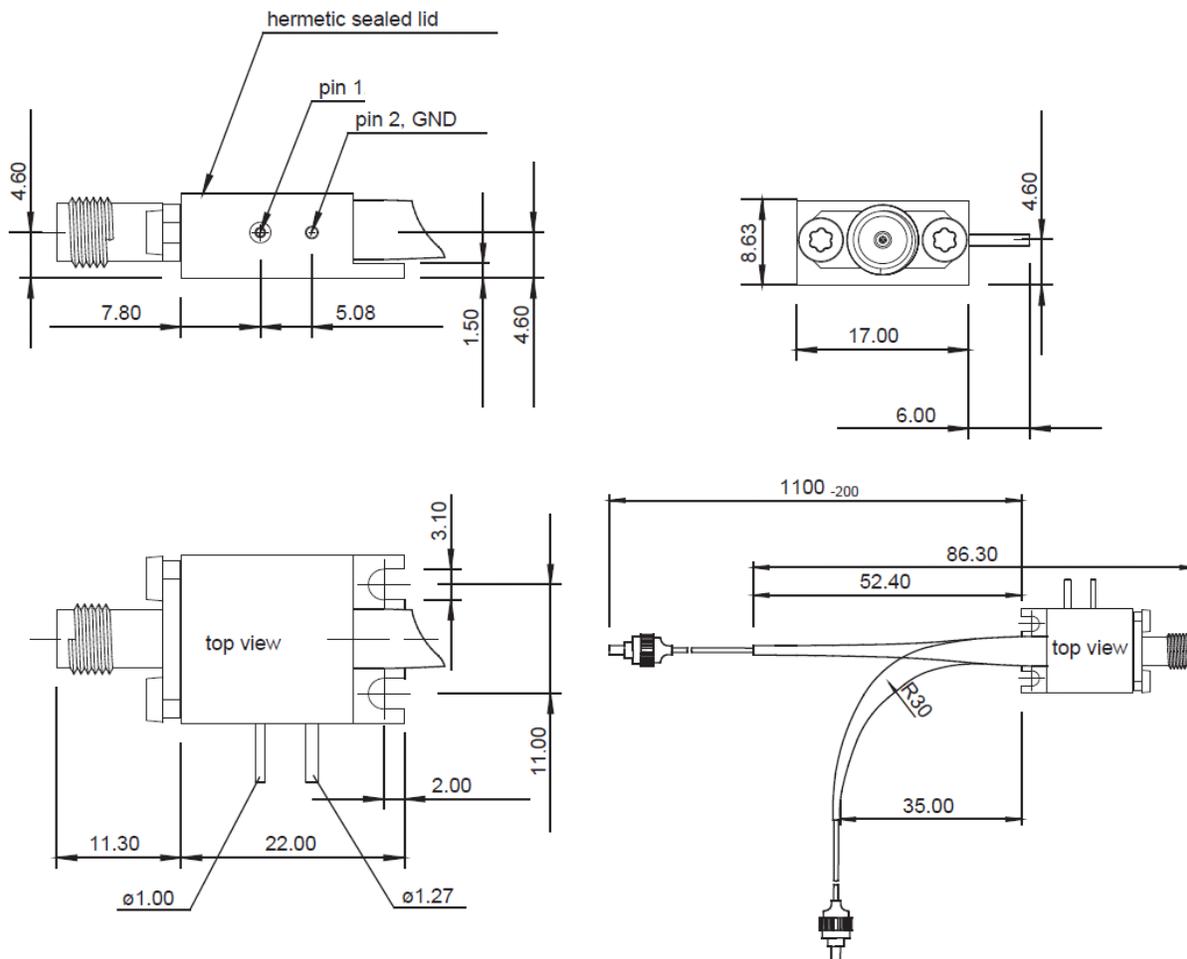


Figure 5: Mechanical dimensions of VPDV2120

IX Accessories

Part Number	Description	Notes
EVAL KIT VPDV2120	Bias-tee for VPDV2120 (including adapter to SMA connector)	Sold separately (see application note for details)