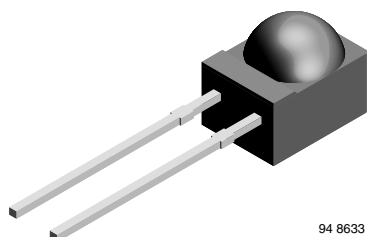


Silicon PIN Photodiode, RoHS Compliant



FEATURES

- Package type: leaded
- Package form: side view
- Dimensions (in mm): 4.5 x 5 x 6
- Radiant sensitive area (in mm²): 4.4
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 60^\circ$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

DESCRIPTION

BPV23NF is a PIN photodiode with high speed and high radiant sensitivity in a black, plastic package with side view lens and daylight blocking filter. Filter bandwidth is matched with 870 nm to 950 nm IR emitters. The lens achieves 80 % of sensitivity improvement in comparison with flat package. BPV23NFL has long leads, other specifications like BPV23NF.

APPLICATIONS

- High speed detector for infrared radiation
- Infrared remote control and free air data transmission systems, e.g. in combination with TSFFxxxx series IR emitters

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	ϕ (deg)	$\lambda_{0.5}$ (nm)
BPV23NF	65	± 60	790 to 1050
BPV23NFL	65	± 60	790 to 1050

Note

Test condition see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
BPV23NF	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	Side view
BPV23NFL	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	Side view, long leads

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	60	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_V	215	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5$ s	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient	Connected with Cu wire, 0.14 mm ²	R_{thJA}	350	K/W

Note

$T_{amb} = 25^\circ\text{C}$, unless otherwise specified

**BASIC CHARACTERISTICS**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50 \text{ mA}$	V_F		1	1.3	V
Breakdown voltage	$I_R = 100 \text{ } \mu\text{A}$, $E = 0$	$V_{(BR)}$	60			V
Reverse dark current	$V_R = 10 \text{ V}$, $E = 0$	I_{ro}		2	30	nA
Diode capacitance	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0$	C_D		48		pF
Serial resistance	$V_R = 12 \text{ V}$, $f = 1 \text{ MHz}$	R_S		900		Ω
Open circuit voltage	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	V_o		390		mV
Temperature coefficient of V_o	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	TK_{V_o}		- 2.6		mV/K
Short circuit current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	I_k		65		μA
Reverse light current	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_R = 5 \text{ V}$	I_{ra}	45	65		μA
Temperature coefficient of I_{ra}	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_R = 10 \text{ V}$	$TK_{I_{ra}}$		0.1		%/K
Absolute spectral sensitivity	$V_R = 5 \text{ V}$, $\lambda = 870 \text{ nm}$	$s(\lambda)$		0.57		A/W
	$V_R = 5 \text{ V}$, $\lambda = 950 \text{ nm}$	$s(\lambda)$		0.60		A/W
Angle of half sensitivity		ϕ		± 60		deg
Wavelength of peak sensitivity		λ_p		940		nm
Range of spectral bandwidth		$\lambda_{0.5}$		790 to 1050		nm
Quantum efficiency	$\lambda = 950 \text{ nm}$	η		90		%
Noise equivalent power	$V_R = 10 \text{ V}$, $\lambda = 950 \text{ nm}$	NEP		4×10^{-14}		W/ $\sqrt{\text{Hz}}$
Detectivity	$V_R = 10 \text{ V}$, $\lambda = 950 \text{ nm}$	D^*		5×10^{12}		$\text{cm}^2/\text{Hz/W}$
Rise time	$V_R = 10 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 820 \text{ nm}$	t_r		70		ns
Fall time	$V_R = 10 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 820 \text{ nm}$	t_f		70		ns
Cut-off frequency	$V_R = 12 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 870 \text{ nm}$	f_c		4		MHz
	$V_R = 12 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 950 \text{ nm}$	f_c		1		MHz

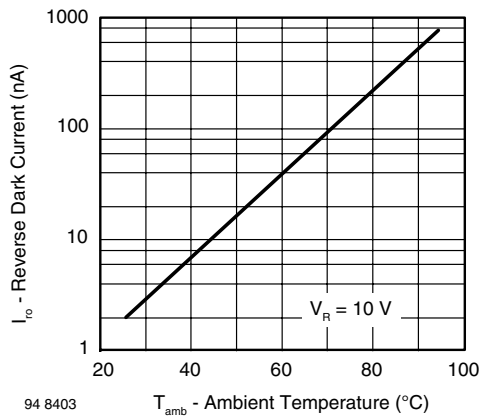
Note $T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified**BASIC CHARACTERISTICS** $T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified

Fig. 1 - Reverse Dark Current vs. Ambient Temperature

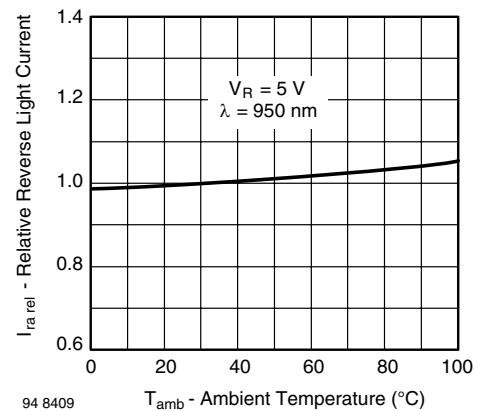
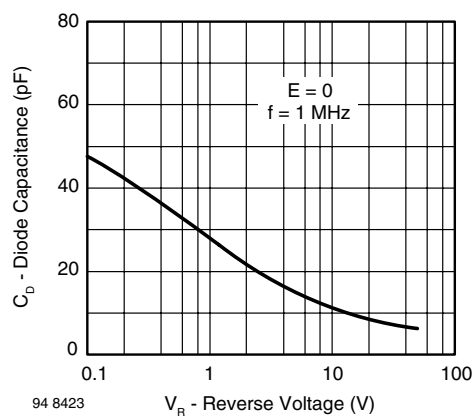
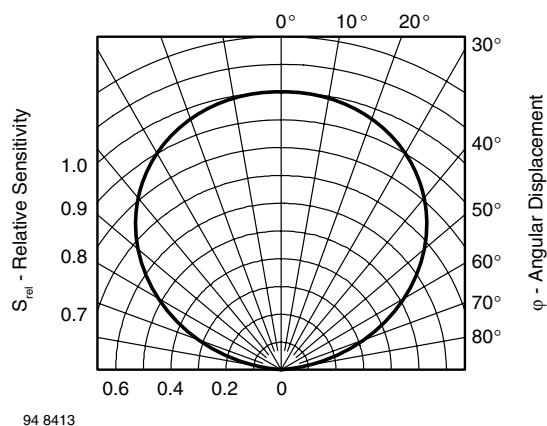
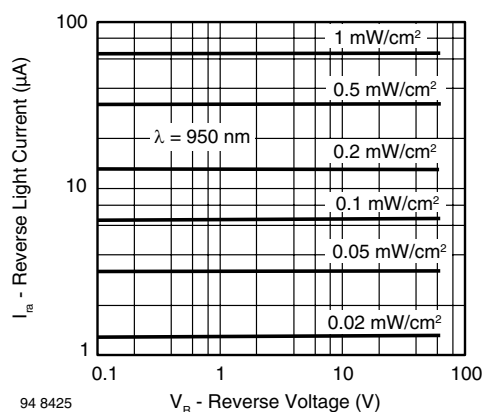
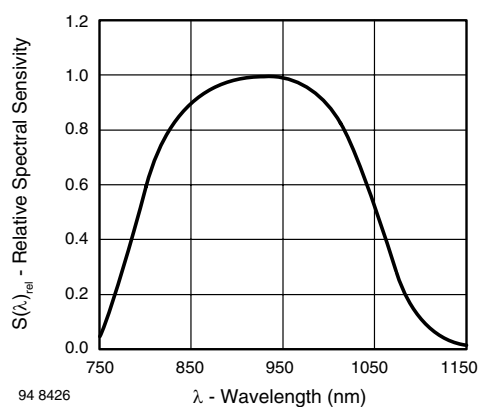
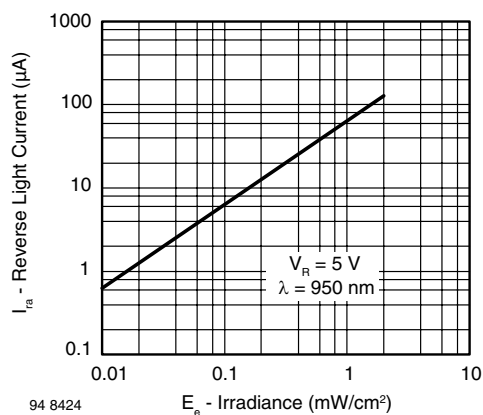
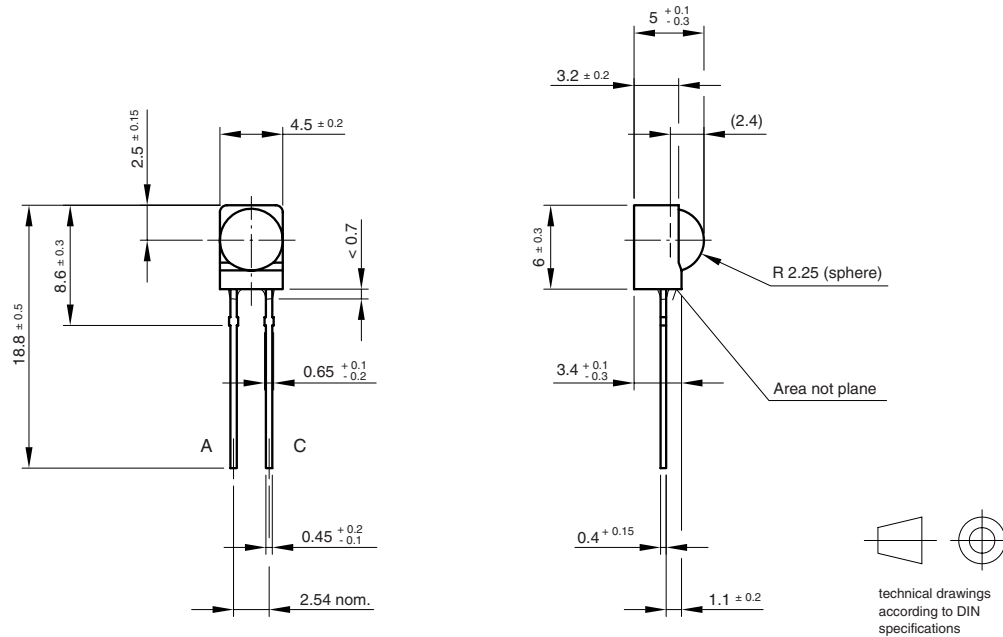
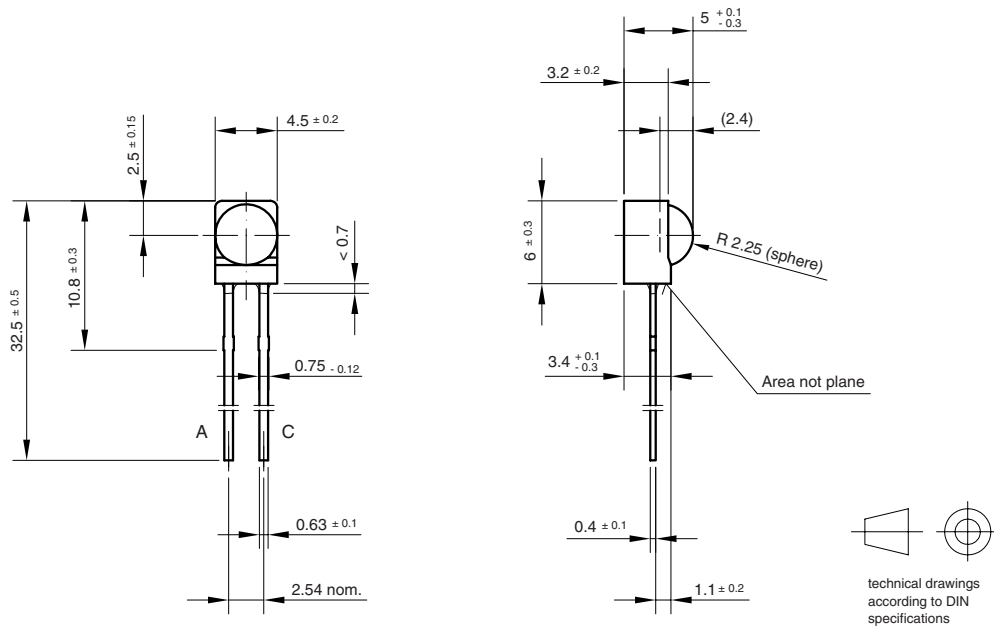


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



**PACKAGE DIMENSIONS** in millimeters: **BPV23NF**

Drawing-No.: 6.544-5199.01-4
Issue: 2; 19.06.01
95 11475

PACKAGE DIMENSIONS in millimeters: **BPV23NFL**

Drawing-No.: 6.544-5236.01-4
Issue: 2; 07.07.97
96 12205



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.