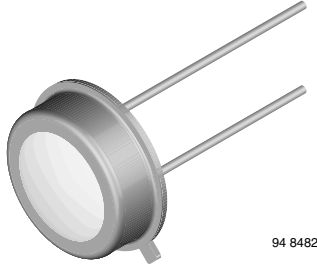


Silicon Photodiode, RoHS Compliant



DESCRIPTION

BPW20RF is a planar Silicon PN photodiode in a hermetically sealed short TO-5 case, especially designed for high precision linear applications.

Due to its extremely high dark resistance, the short circuit photocurrent is linear over seven decades of illumination level.

On the other hand, there is a strictly logarithmic correlation between open circuit voltage and illumination over the same range.

Equipped with a clear, flat glass window, the spectral responsivity reaches from blue to near infrared.

FEATURES

- Package type: leaded
- Package form: TO-5
- Dimensions (in mm): Ø 8.13
- Radiant sensitive area (in mm²): 7.5
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Angle of half sensitivity: $\phi = \pm 50^\circ$
- Hermetically sealed package
- Cathode connected to package
- Flat glass window
- UV enhanced
- Low dark current
- High shunt resistance
- High linearity
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

APPLICATIONS

- Sensor for light measuring techniques in cameras, photometers, color analyzers, exposure meters (e.g. solariums) and other medical and industrial measuring and control applications.

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	ϕ (deg)	$\lambda_{0.5}$ (nm)
BPW20RF	60	± 50	550 to 1040

Note

Test condition see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
BPW20RF	Bulk	MOQ: 500 pcs, 500 pcs/bulk	TO-5

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	10	V
Power dissipation	$T_{amb} \leq 50^\circ\text{C}$	P_V	300	mW
Junction temperature		T_j	125	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 125	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 125	$^\circ\text{C}$
Soldering temperature	$t \leq 5\text{ s}$	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient	Connected with Cu wire, 0.14 mm ²	R_{thJA}	250	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		1.0	1.3	V
Breakdown voltage	$I_R = 20 \text{ }\mu\text{A}$, $E = 0$	$V_{(BR)}$	10			V
Reverse dark current	$V_R = 5 \text{ V}$, $E = 0$	I_{ro}		2	30	nA
Diode capacitance	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0$	C_D		1.2		nF
	$V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0$	C_D		400		pF
Dark resistance	$V_R = 10 \text{ mV}$	R_D		38		$\text{G}\Omega$
Open circuit voltage	$E_A = 1 \text{ klx}$	V_o	330	500		mV
Temperature coefficient of V_o	$E_A = 1 \text{ klx}$	TK_{V_o}		- 2		mV/K
Short circuit current	$E_A = 1 \text{ klx}$	I_k	20	60		μA
Temperature coefficient of I_k	$E_A = 1 \text{ klx}$	TK_{I_k}		0.1		%/K
Reverse light current	$E_A = 1 \text{ klx}$, $V_R = 5 \text{ V}$	I_{ra}	20	60		μA
	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_R = 5 \text{ V}$	I_{ra}		42		μA
Angle of half sensitivity		ϕ		± 50		deg
Wavelength of peak sensitivity		λ_p		920		nm
Range of spectral bandwidth		$\lambda_{0.5}$		550 to 1040		nm
Rise time	$V_R = 0 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 820 \text{ nm}$	t_r		3.4		μs
Fall time	$V_R = 0 \text{ V}$, $R_L = 1 \text{ k}\Omega$, $\lambda = 820 \text{ nm}$	t_f		3.7		μs

Note

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BASIC CHARACTERISTICS

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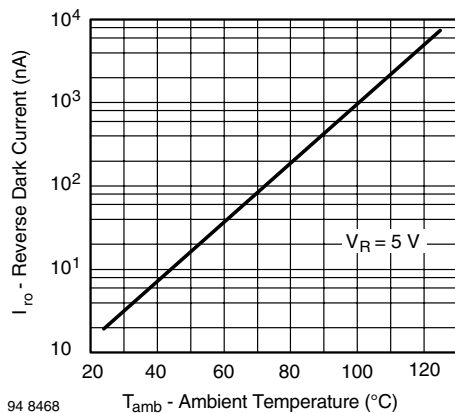


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

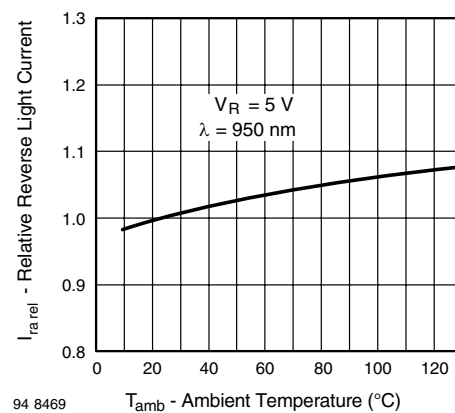


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

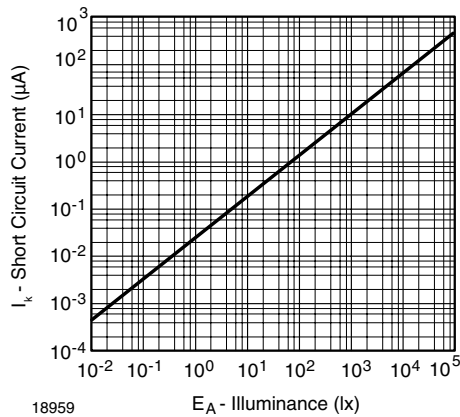


Fig. 3 - Short Circuit Current vs. Illuminance

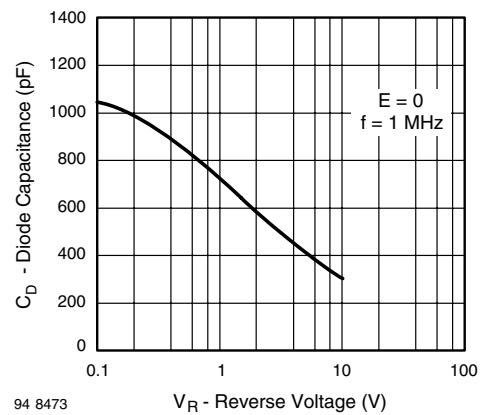


Fig. 6 - Diode Capacitance vs. Reverse Voltage

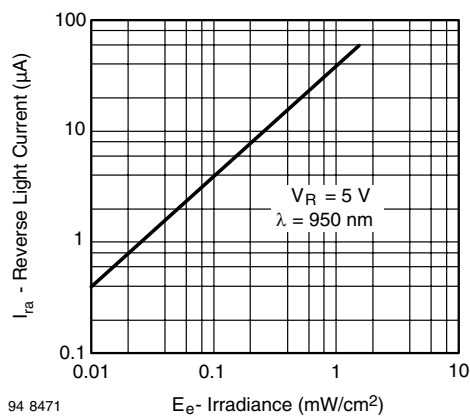


Fig. 4 - Reverse Light Current vs. Irradiance

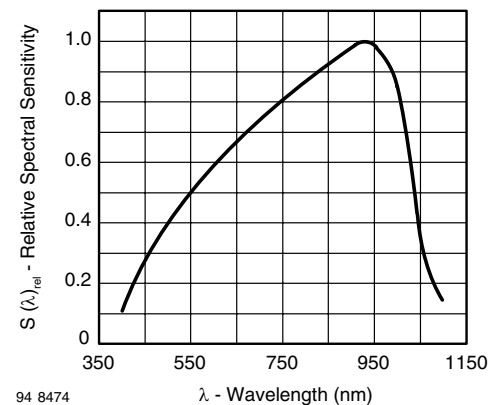


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

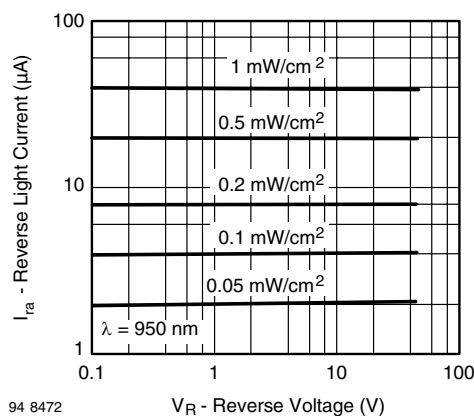


Fig. 5 - Reverse Light Current vs. Reverse Voltage

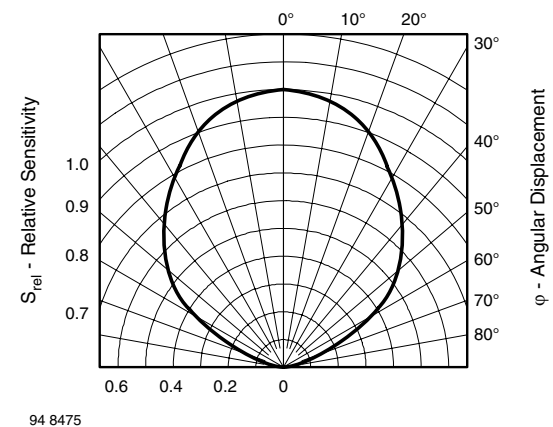
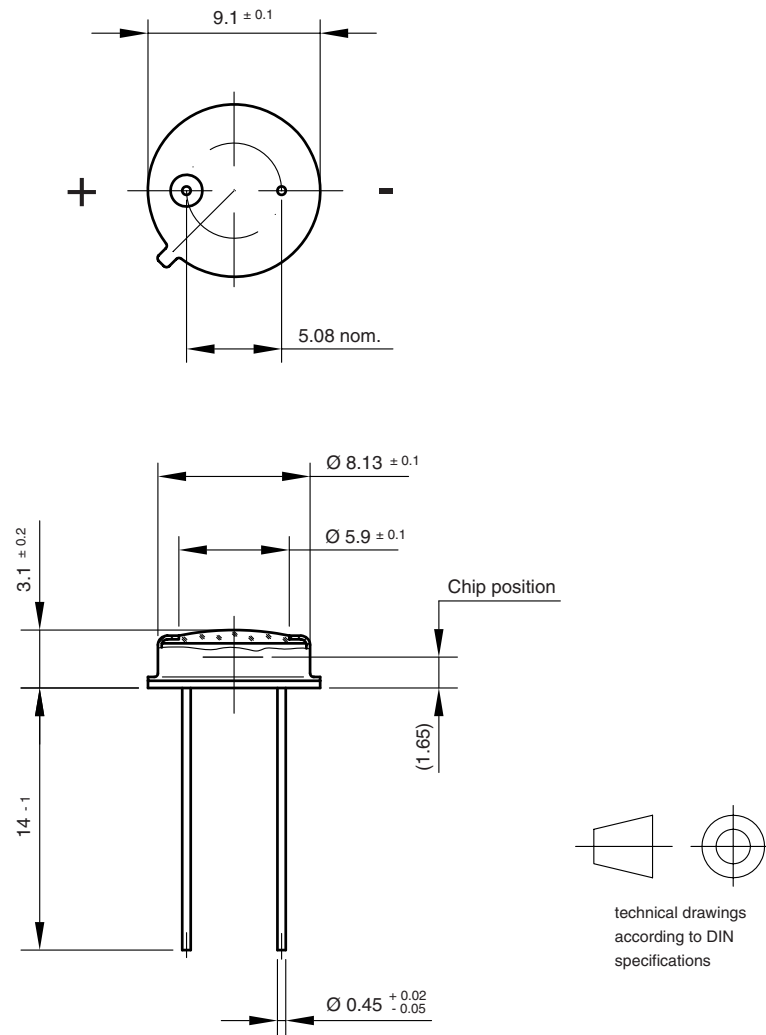


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters

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