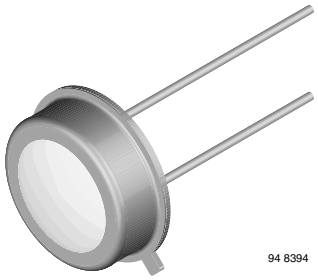
Silicon Photodiode



FEATURES

- Package type: leaded
- Package form: TO-5
- Dimensions (in mm): Ø 8.13
- Radiant sensitive area (in mm^2): 7.5
- High photo sensitivity
- Adapted to human eye responsivity
- Angle of half sensitivity: φ = ± 50°
- Hermetically sealed package
- Cathode connected to package
- Flat glass window
- Low dark current
- High shunt resistance
- High linearity
- Compliant to RoHS Directive 2002/95/EC and in accordance with WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

DESCRIPTION

BPW21R 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.

The device is equipped with a flat glass window with built in color correction filter, giving an approximation to the spectral response of the human eye.

APPLICATIONS

- Sensor in exposure and color measuring purposes

PRODUCT SUMMARY			
COMPONENT	I_{ra} (µA)	φ (deg)	$\lambda_{0.5}$ (nm)
BPW21R	9	± 50	420 to 675

Note

- Test condition see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
BPW21R	Bulk	MOQ: 500 pcs, 500 pcs/bulk	TO-5

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	10	V
Power dissipation	$T_{amb} \leq 50$ °C	P_V	300	mW
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 125	°C
Storage temperature range		T_{stg}	- 40 to + 125	°C
Soldering temperature	t ≤ 5 s	T_{sd}	260	°C
Thermal resistance junction/ambient	Connected with Cu wire, 0.14 mm^2	R_{thJA}	250	K/W

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 50 mA	V_F		1.0	1.3	V
Breakdown voltage	I_R = 20 µA, E = 0	$V_{(BR)}$	10			V
Reverse dark current	V_R = 5 V, E = 0	I_{ro}		2	30	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D		1.2		nF
	V_R = 5 V, f = 1 MHz, E = 0	C_D		400		pF
Dark resistance	V_R = 10 mV	R_D		38		GΩ
Open circuit voltage	E_A = 1 klx	V_o	280	450		mV
Temperature coefficient of V_o	E_A = 1 klx	TK_{Vo}		- 2		mV/K
Short circuit current	E_A = 1 klx	I_k	4.5	9		µA
Temperature coefficient of I_K	E_A = 1 klx	TK_{Ik}		- 0.05		%/K
Reverse light current	E_A = 1 klx, V_R = 5 V	I_{ra}	4.5	9		µA
Sensitivity	V_R = 5 V, E_A = 10^{-2} to 10^5 lx	S		9		nA/lx
Angle of half sensitivity		φ		± 50		deg
Wavelength of peak sensitivity		λ_p		565		nm
Range of spectral bandwidth		$\lambda_{0.5}$		420 to 675		nm
Rise time	V_R = 0 V, R_L = 1 kΩ, λ = 660 nm	t_r		3.1		µs
Fall time	V_R = 0 V, R_L = 1 kΩ, λ = 660 nm	t_f		3.0		µs

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

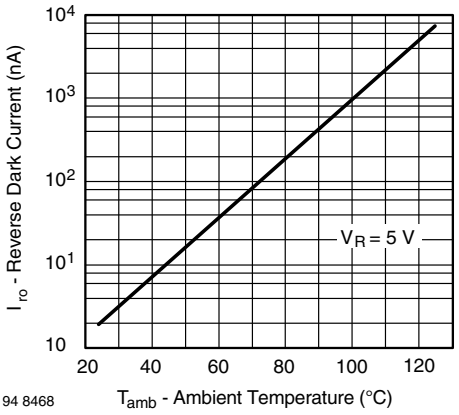


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

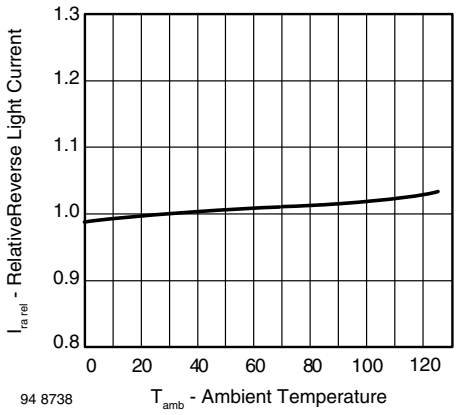


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

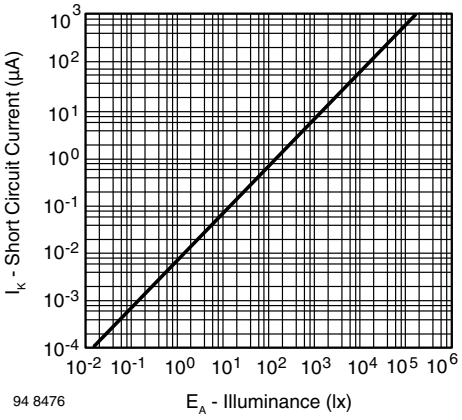


Fig. 3 - Short Circuit Current vs. Illuminance

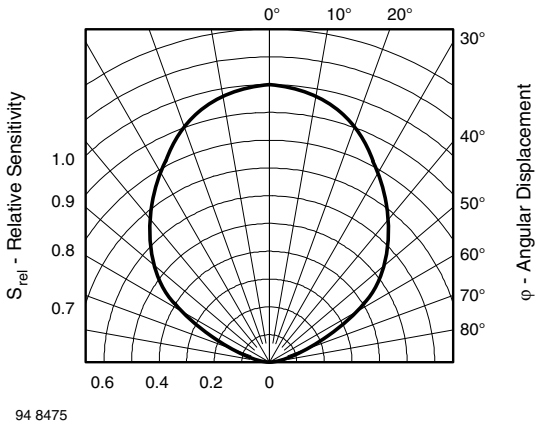


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

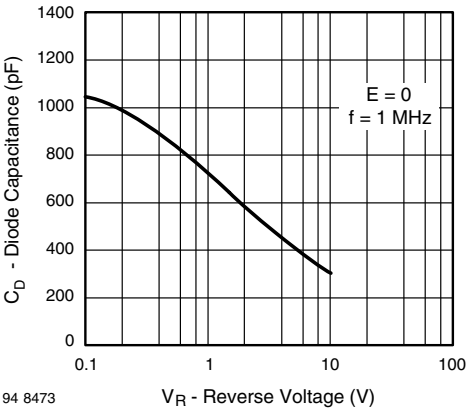


Fig. 4 - Diode Capacitance vs. Reverse Voltage

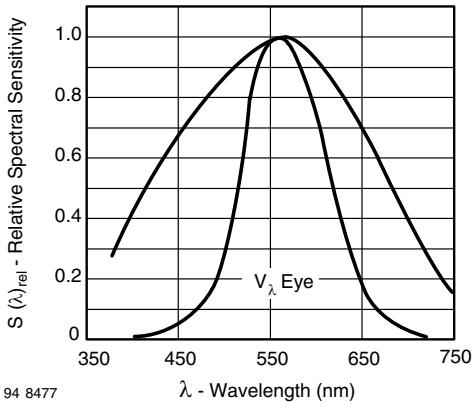
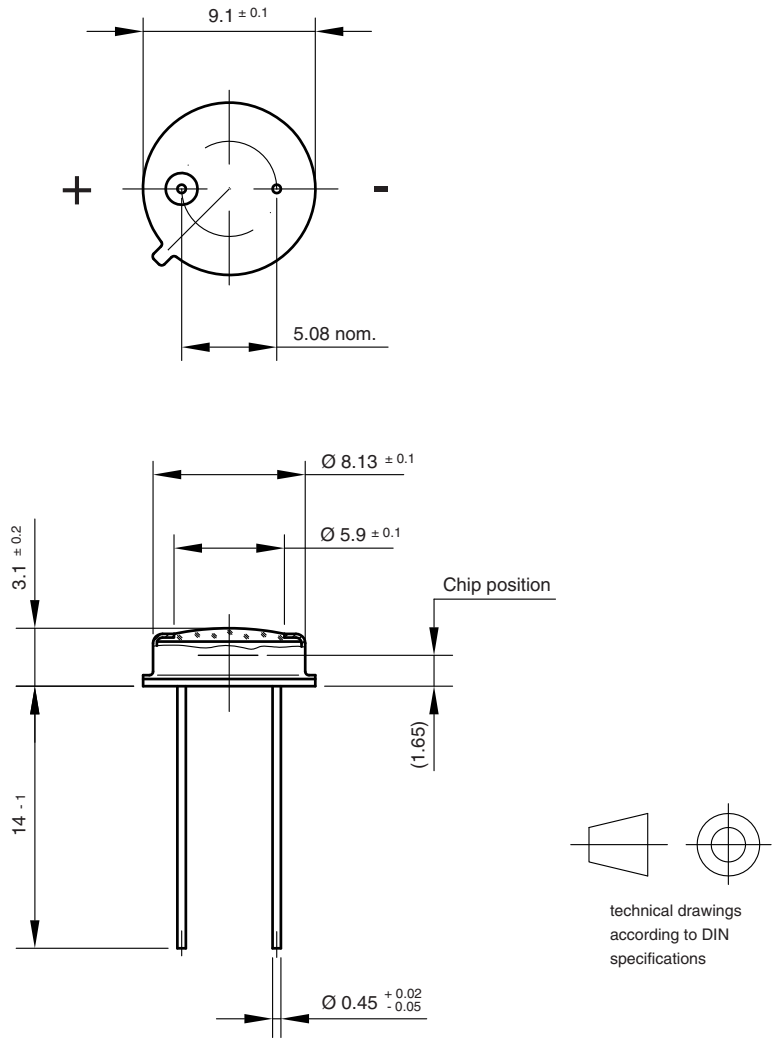


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

PACKAGE DIMENSIONS in millimeters



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