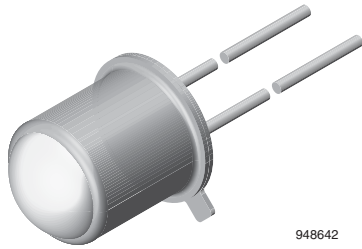


## Silicon PIN Photodiode, RoHS Compliant



948642

### DESCRIPTION

BPW24R is a high sensitive silicon planar photodiode in a standard TO-18 hermetically sealed metal case with a glass lens.

A precise alignment of the chip gives a good coincidence of mechanical and optical axes. The device features a low capacitance and high speed even at low supply voltages.

### FEATURES

- Package type: leaded
- Package form: TO-18
- Dimensions (in mm):  $\varnothing$  4.7
- Radiant sensitive area (in mm<sup>2</sup>): 0.78
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\varphi = \pm 12^\circ$
- Hermetically sealed package
- Cathode connected to package
- Central chip alignment
- Compliant to RoHS Directive 2002/95/EC and in accordance with WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

- High speed photo detector

### PRODUCT SUMMARY

| COMPONENT | $I_{ra}$ ( A ) | $\varphi$ (deg) | $\lambda_{0.1}$ (nm) |
|-----------|----------------|-----------------|----------------------|
| BPW24R    | 60             | $\pm 12$        | 400 to 1100          |

#### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM |
|---------------|-----------|------------------------------|--------------|
| BPW24R        | Bulk      | MOQ: 1000 pcs, 1000 pcs/bulk | TO-18        |

#### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                           | TEST CONDITION                               | SYMBOL     | VALUE         | UNIT             |
|-------------------------------------|--|------------|---------------|------------------|
| Reverse voltage                     |  | $V_R$      | 60            | V                |
| Power dissipation                   | $T_{amb} \leq 25^\circ\text{C}$              | $P_V$      | 210           | 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               | $t \leq 5$ s                                 | $T_{sd}$   | 260           | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm <sup>2</sup> | $R_{thJA}$ | 350           | K/W              |

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |                 |      |          |      |               |
|---|---|-----------------|------|----------|------|---------------|
| PARAMETER   | TEST CONDITION  | SYMBOL          | MIN. | TYP.     | MAX. | UNIT          |
| Breakdown voltage   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                      | $V_{(BR)}$      | 60   | 200      |      | V             |
| Reverse dark current  | $V_R = 50\text{ V}$ , $E = 0$   | $I_{ro}$        |      | 2        | 10   | nA            |
| Diode capacitance   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                             | $C_D$           |      | 11       |      | pF            |
|   | $V_R = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                             | $C_D$           |      | 3.8      |      | pF            |
|   | $V_R = 20\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                            | $C_D$           |      | 2.5      |      | pF            |
| Open circuit voltage  | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                          | $V_o$           |      | 450      |      | mV            |
| Temperature coefficient of $V_o$  | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                          | $TK_{V_o}$      |      | -2       |      | mV/K          |
| Short circuit current   | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                          | $I_k$           |      | 55       |      | $\mu\text{A}$ |
| Temperature coefficient of $I_k$  | $E_A = 1\text{ klx}$  | $TK_{I_k}$      |      | 0.1      |      | %/K           |
| Reverse light current   | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ ,<br>$V_R = 20\text{ V}$ | $I_{ra}$        | 45   | 60       |      | $\mu\text{A}$ |
| Absolute Spectral Sensitivity   | $V_R = 5\text{ V}$ , $\lambda = 870\text{ nm}$                                | $s(\lambda)$    |      | 0.60     |      | A/W           |
|   | $V_R = 5\text{ V}$ , $\lambda = 900\text{ nm}$                                | $s(\lambda)$    |      | 0.55     |      | A/W           |
| Angle of half sensitivity   |   | $\varphi$       |      | $\pm 12$ |      | deg           |
| Wavelength of peak sensitivity  |   | $\lambda_p$     |      | 900      |      | nm            |
| Range of spectral bandwidth   |   | $\lambda_{0.1}$ | 400  |          | 1100 | nm            |
| Rise time   | $V_R = 20\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 820\text{ nm}$    | $t_r$           |      | 7        |      | ns            |
| Fall time   | $V_R = 20\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 820\text{ nm}$    | $t_f$           |      | 7        |      | ns            |

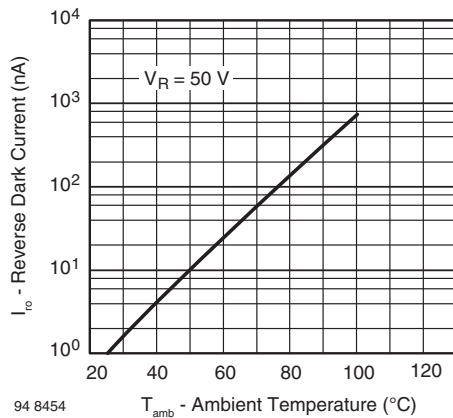
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature



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



Fig. 3 - Reverse Light Current vs. Irradiance

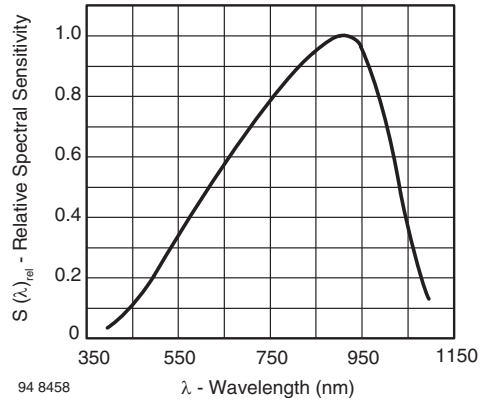


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

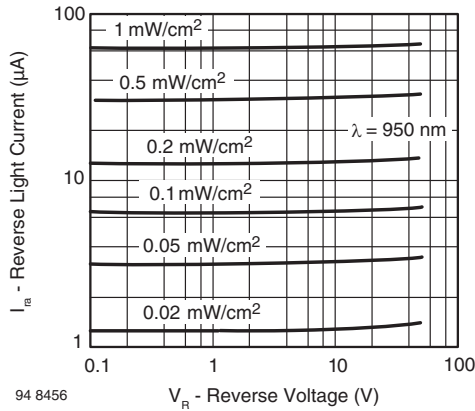


Fig. 4 - Reverse Light Current vs. Reverse Voltage



Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

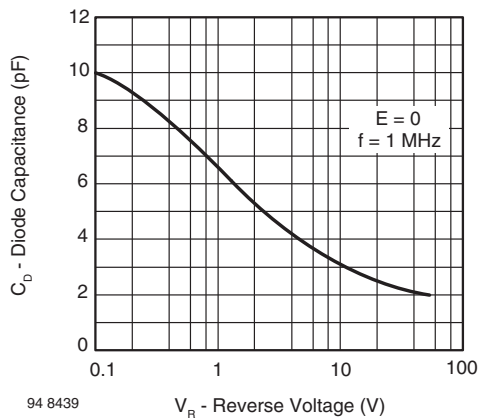


Fig. 5 - Diode Capacitance vs. Reverse Voltage



### PACKAGE DIMENSIONS in millimeters



technical drawings  
according to DIN  
specifications

Drawing-No.: 6.503-5022.02-4

Issue: 1; 24.08.98

14487



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