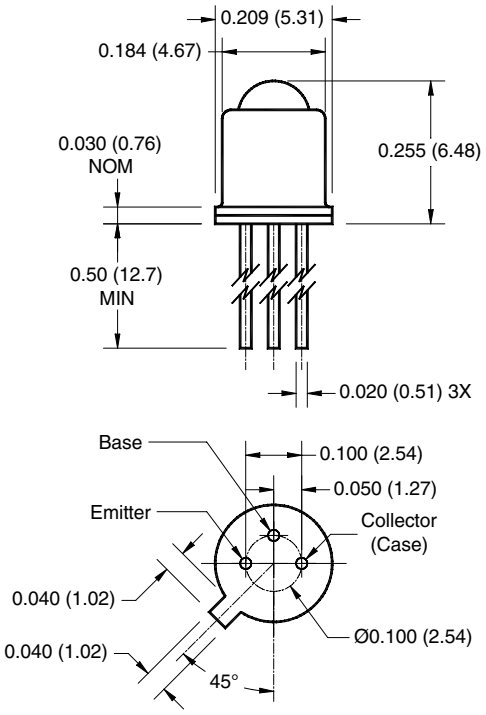
FAIRCHILD
SEMICONDUCTOR®

# BPW38
# HERMETIC SILICON PHOTODARLINGTON

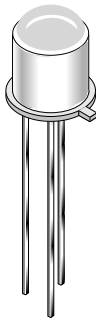
## PACKAGE DIMENSIONS




NOTES:

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of ± .010 (.25) on all non-nominal dimensions unless otherwise specified.

## FEATURES

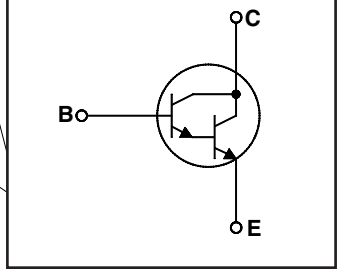


- Hermetically sealed package
- Narrow reception angle
- European “Pro Electron” registered

## DESCRIPTION

- The BPW38 is a silicon photodarlington mounted in narrow angle TO-18 package.

## SCHEMATIC




1. Derate power dissipation linearly 3.00 mW/°C above 25°C ambient.
2. Derate power dissipation linearly 6.00 mW/°C above 25°C case.
3. RMA flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.
5. Soldering iron tip 1/16” (1.6mm) minimum from housing.
6. As long as leads are not under any stress or spring tension.
7. Light source is a GaAs LED emitting light at a peak wavelength of 940 nm.

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Operating Temperature | $T_{OPR}$ | -65 to +125 | °C |
| Storage Temperature | $T_{STG}$ | -65 to +150 | °C |
| Soldering Temperature (Iron)(3,4,5 and 6) | $T_{SOL-I}$ | 240 for 5 sec | °C |
| Soldering Temperature (Flow)(3,4 and 6) | $T_{SOL-F}$ | 260 for 10 sec | °C |
| Collector-Emitter Voltage | $V_{CEO}$ | 25 | V |
| Collector-Base Voltage | $V_{CBO}$ | 25 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 12 | V |
| Power Dissipation ($T_A$ = 25°C)(1) | $P_D$ | 300 | mW |
| Power Dissipation ($T_C$ = 25°C)(2) | $P_D$ | 600 | mW |

## ELECTRICAL / OPTICAL CHARACTERISTICS ($T_A$ =25°C) (All measurements made under pulse conditions)

| PARAMETER | TEST CONDITIONS | SYMBOL | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown | $I_C$ = 10 mA, Ee = 0 | $BV_{CEO}$ | 25 | — | — | V |
| Emitter-Base Breakdown | $I_E$ = 100 µA, Ee = 0 | $BV_{EBO}$ | 12 | — | — | V |
| Collector-Base Breakdown | $I_C$ = 100 µA, Ee = 0 | $BV_{CBO}$ | 25 | — | — | V |
| Collector-Emitter Leakage | $V_{CE}$ = 12 V, Ee = 0 | $I_{CEO}$ | — | — | 100 | nA |
| Reception Angle at 1/2 Sensitivity | | Θ | — | ±8 | — | Deg. |
| On-State Collector Current | Ee = 0.125 mW/cm$^2$<br>$V_{CE}$ = 5 V(7) | $I_{C(ON)}$ | 7.5 | — | — | mA |
| Rise Time | $I_C$ = 10 mA, $V_{CC}$ = 10 V<br>$R_L$ = 100 Ω | $t_r$ | — | 300 | — | µs |
| Fall Time | $I_C$ = 10 mA, $V_{CC}$ = 10 V<br>$R_L$ = 100 Ω | $t_f$ | — | 250 | — | µs |

## TYPICAL PERFORMANCE CURVES

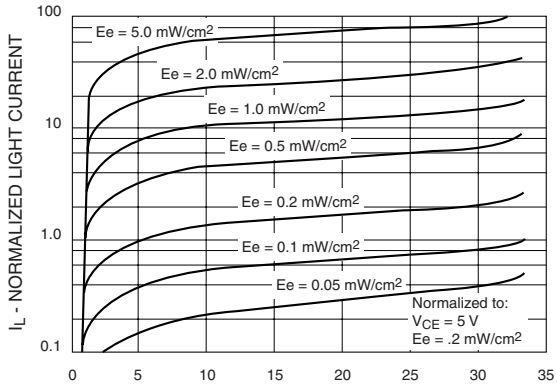



**Fig. 1 Light Current vs. Collector to Emitter Voltage**

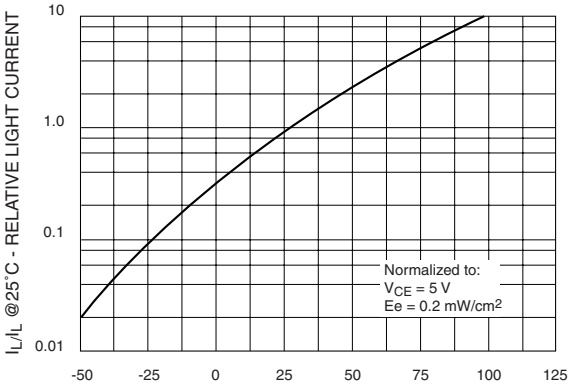



**Fig. 2 Relative Light Current vs. Ambient Temperature**

## TYPICAL PERFORMANCE CURVES

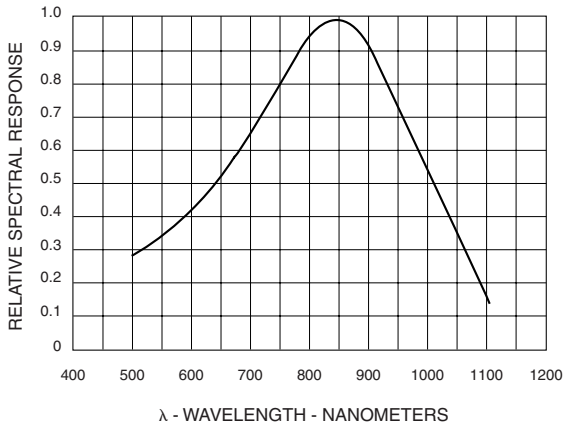



**Fig. 3 Spectral Response Curve**

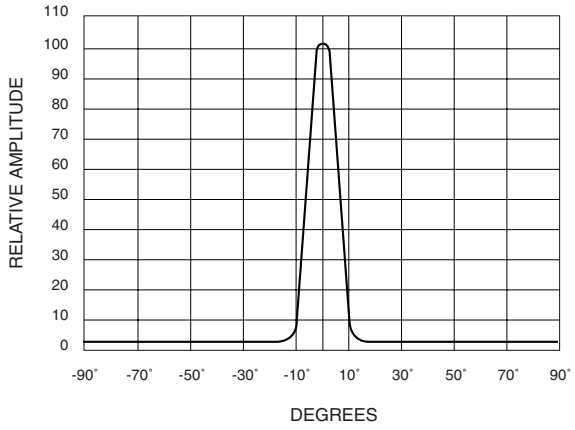



**Fig. 4 Angular Response**

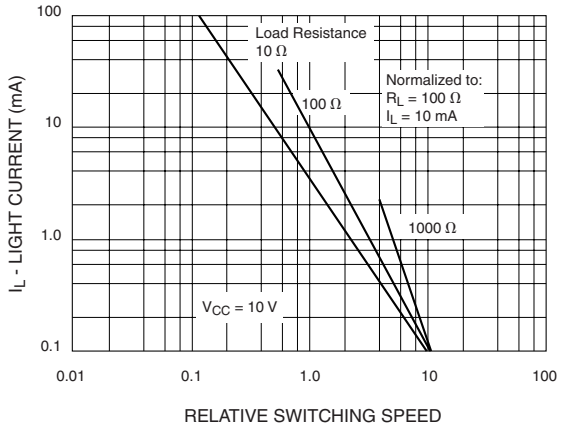



**Fig. 5 Light Current vs. Relative Switching Speed**

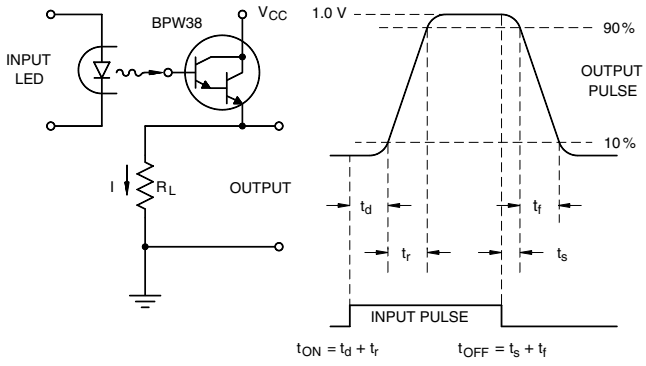



**Fig. 6 Test Circuit and Voltage Waveforms**

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.