

# Subminiature Plastic Silicon Infrared Phototransistor

## QSB363

### Description

The QSB363 is a silicon phototransistor encapsulated in a black infrared transparent T-3/4 package.

### Features

- NPN Silicon Phototransistor
- T-3/4 (2 mm) Surface Mount Package
- Medium Wide Beam Angle: 24°
- Black Plastic Package
- Matched Emitters: QEB363 or QEB373
- Daylight Filter
- Lead Form Options: Gullwing, Yoke, Z-Bend
- This is a Pb-Free Device and Halide Free Device

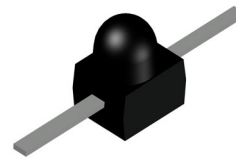
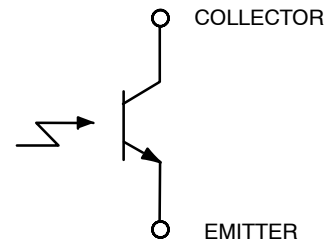
**ABSOLUTE MAXIMUM RATINGS** (Values are at TA = 25°C unless specified otherwise).

| Symbol             | Parameter                                    | Value      | Unit |
|--------------------|----------------------------------------------|------------|------|
| T <sub>OPR</sub>   | Operating Temperature                        | -40 to +85 | °C   |
| T <sub>STG</sub>   | Storage Temperature                          | -40 to +85 | °C   |
| T <sub>SOL-I</sub> | Soldering Temperature (Iron)<br>(Notes 1, 2) | 260        | °C   |
| T <sub>SOL-F</sub> | Soldering Temperature (Flow)<br>(Notes 1, 2) | 260        | °C   |
| V <sub>CEO</sub>   | Collector-Emitter Voltage                    | 30         | V    |
| V <sub>ECO</sub>   | Emitter-Collector Voltage                    | 5          | V    |
| P <sub>C</sub>     | Power Dissipation (Note 3)                   | 75         | mW   |

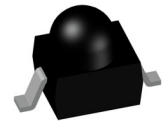
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. RMA flux is recommended.
2. Methanol or isopropyl alcohols are recommended as cleaning agents.
3. Derate power dissipation linearly 1.08 mW/°C above 25°C.

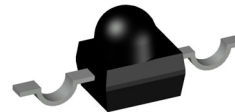
### SCHEMATIC



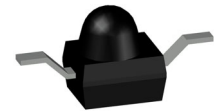
T-3/4 2.50 x 2.00  
CASES 100CB



T-3/4 2.50 x 2.00  
CASES 100EH



T-3/4 2.50 x 2.00  
CASES 100EJ



T-3/4 2.50 x 2.00  
CASES 100EK

### ORDERING INFORMATION

| Device   | Package                                           | Shipping†             |
|----------|---------------------------------------------------|-----------------------|
| QSB363   | T-3/4 2.50 x 2.00 100CB<br>(Pb-Free, Halide Free) | 1000 /<br>Bulk Bag    |
| QSB363GR | T-3/4 2.50 x 2.00 100EH<br>(Pb-Free, Halide Free) | 1000 /<br>Tape & Reel |
| QSB363YR | T-3/4 2.50 x 2.00 100EJ<br>(Pb-Free, Halide Free) | 1000 /<br>Tape & Reel |
| QSB363ZR | T-3/4 2.50 x 2.00 100EK<br>(Pb-Free, Halide Free) | 1000 /<br>Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](#).

## QSB363

### ELECTRICAL/OPTICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless specified otherwise).

| Symbol        | Parameter                            | Test Conditions                                                                      | Min | Typ      | Max | Unit          |
|---------------|--------------------------------------|--------------------------------------------------------------------------------------|-----|----------|-----|---------------|
| $\lambda_P$   | Peak Sensitivity Wavelength          |                                                                                      | –   | 940      | –   | nm            |
| $\Theta$      | Reception Angle                      |                                                                                      | –   | $\pm 12$ |     | °             |
| $I_{CEO}$     | Collector Dark Current               | $V_{CE} = 20\text{ V}$ , $E_e = 0\text{ mW/cm}^2$                                    | –   | –        | 100 | nA            |
| $BV_{CEO}$    | Collector–Emitter Breakdown Voltage  | $I_C = 100\text{ }\mu\text{A}$ , $E_e = 0\text{ mW/cm}^2$                            | 30  | –        | –   | V             |
| $BV_{ECO}$    | Emitter–Collector Breakdown Voltage  | $I_E = 100\text{ }\mu\text{A}$ , $E_e = 0\text{ mW/cm}^2$                            | 5   | –        | –   | V             |
| $I_{C(ON)}$   | On–State Collector Current           | $V_{CE} = 5\text{ V}$ , $E_e = 1\text{ mW/cm}^2$ ,<br>$\lambda = 940\text{ nm GaAs}$ | 1.0 | 1.5      | –   | mA            |
| $V_{CE(SAT)}$ | Collector–Emitter Saturation Voltage | $I_C = 2\text{ mA}$ , $E_e = 1\text{ mW/cm}^2$ ,<br>$\lambda = 940\text{ nm GaAs}$   | –   | –        | 0.4 | V             |
| $t_r$         | Rise Time                            | $V_{CE} = 5\text{ V}$ , $I_C = 1\text{ mA}$ , $R_L = 1000\text{ }\Omega$             | –   | 15       | –   | $\mu\text{s}$ |
| $t_f$         | Fall Time                            |                                                                                      | –   | 15       | –   | $\mu\text{s}$ |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL PERFORMANCE CHARACTERISTICS

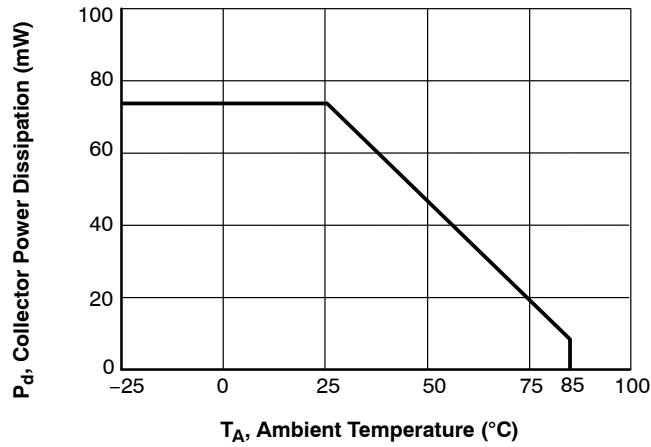


Figure 1. Collector Power Dissipation vs. Ambient Temperature

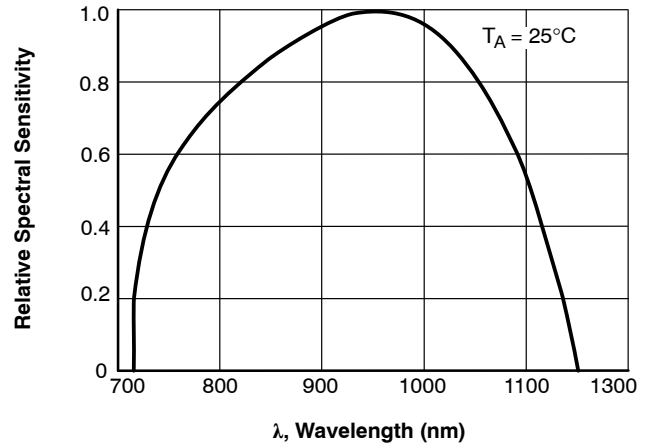


Figure 2. Spectral Sensitivity

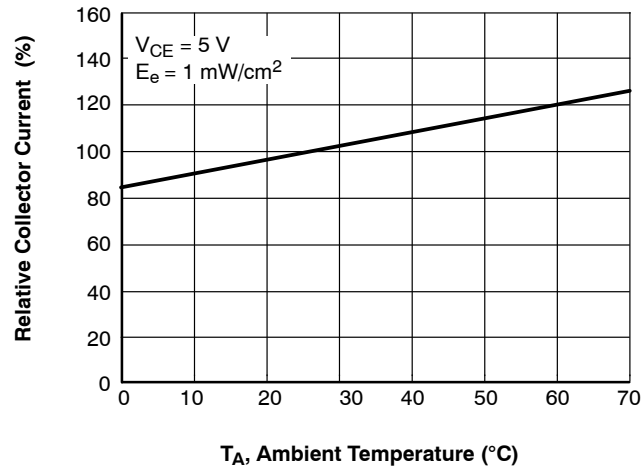


Figure 3. Relative Collector Current vs. Ambient Temperature

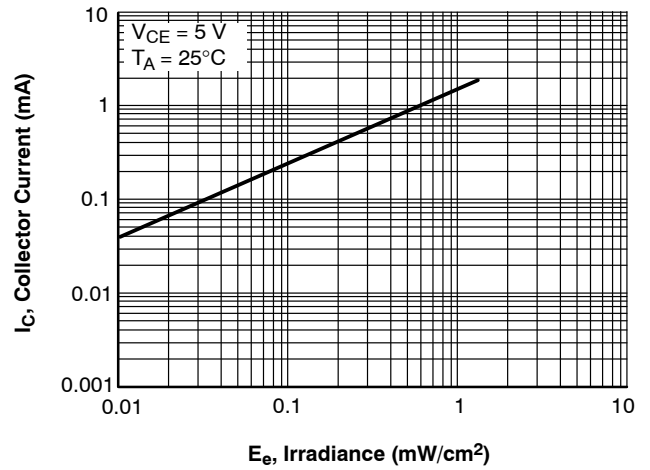


Figure 4. Collector Current vs. Irradiance

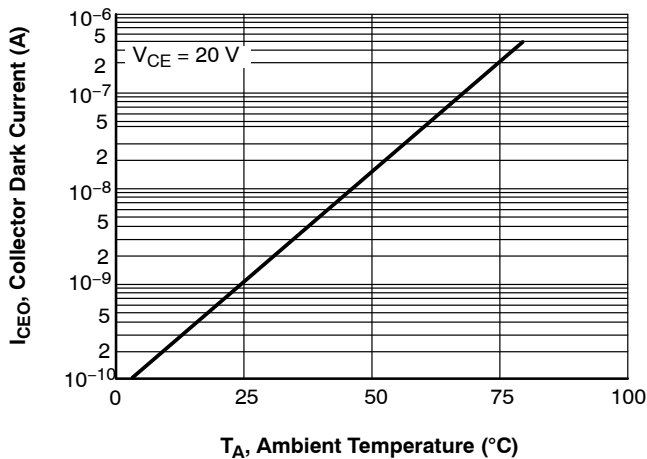


Figure 5. Collector Dark Current vs. Ambient Temperature

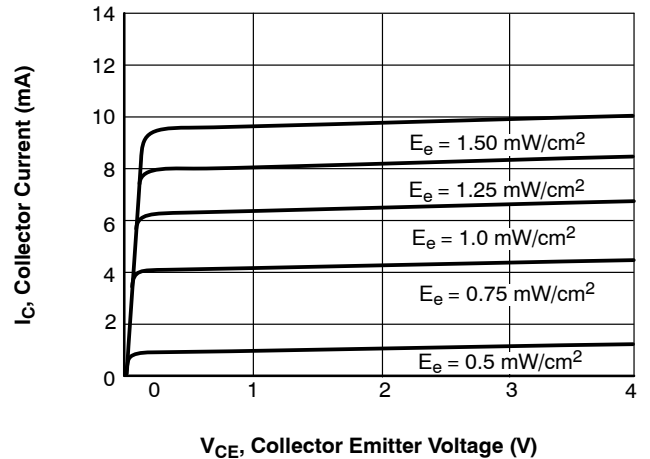
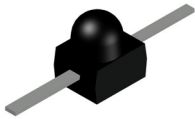


Figure 6. Collector Current vs. Collector Emitter Voltage

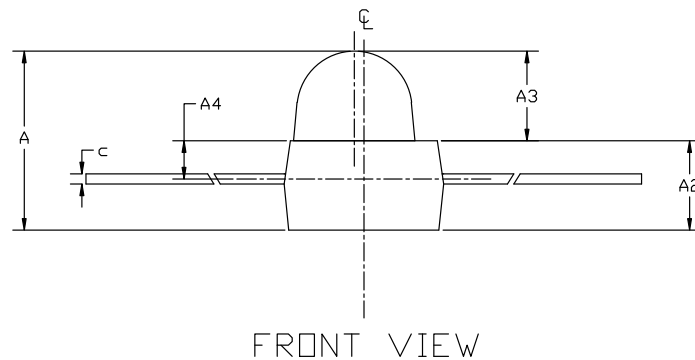
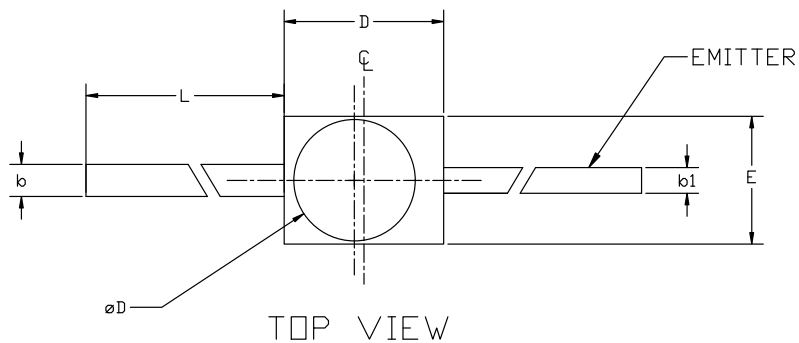


**T-3/4 2.50x2.00**  
**CASE 100CB**  
**ISSUE A**

DATE 14 SEP 2023

NOTES:

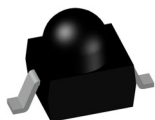
1. CONTROLLING DIMENSIONS: MILLIMETERS
2. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
3. 2MM DETECTOR



| DIM | MILLIMETERS |      |      |
|-----|-------------|------|------|
|     | MIN.        | NOM. | MAX. |
| A   | 2.50        | 2.70 | 2.90 |
| A2  | 1.30        | 1.40 | 1.50 |
| A3  | 1.30        | 1.40 | 1.50 |
| A4  | 0.60 REF    |      |      |
| b   | 0.45        | 0.55 | 0.65 |
| b1  | 0.35        | 0.45 | 0.55 |
| c   | 0.10        | 0.15 | 0.25 |
| D   | 2.30        | 2.50 | 2.70 |
| E   | 1.80        | 2.00 | 2.20 |
| L   | 7.00        | ---  | ---  |
| øD  | 1.70        | 1.90 | 2.10 |

|                         |                        |                                                                                                                                                                                     |
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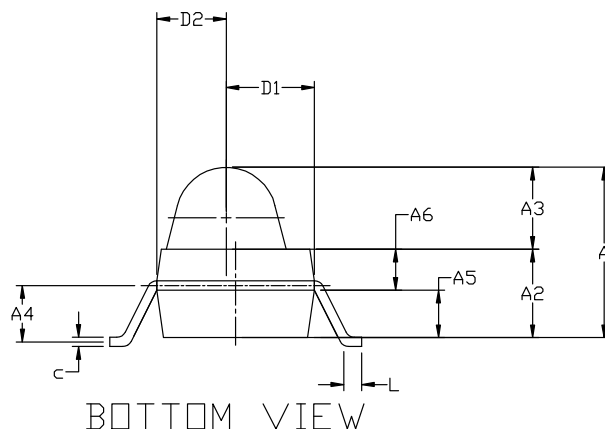
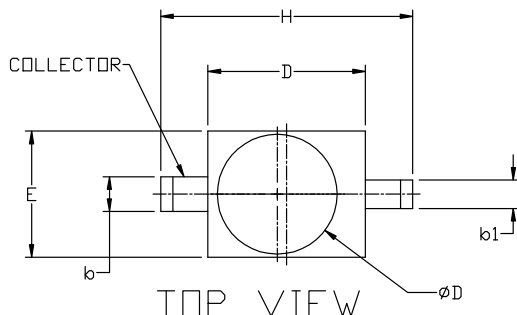


**T-3/4 2.50x2.00**  
**CASE 100EH**  
**ISSUE O**

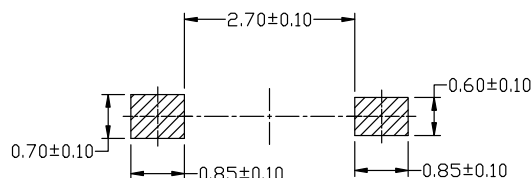
DATE 14 SEP 2023

**NOTES:**

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2. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
3. 2MM GULLWING DETECTOR.



| DIM      | MILLIMETERS |       |       |
|----------|-------------|-------|-------|
|          | MIN.        | NOM.  | MAX.  |
| A        | 2.500       | 2.700 | 2.900 |
| A2       | 1.300       | 1.400 | 1.500 |
| A3       | 1.200       | 1.300 | 1.400 |
| A4       | 0.750       | 0.850 | 0.950 |
| A5       | 0.650       | 0.750 | 0.850 |
| A6       | 0.550       | 0.650 | 0.750 |
| b        | 0.450       | 0.550 | 0.650 |
| b1       | 0.350       | 0.450 | 0.550 |
| c        | 0.100       | 0.150 | 0.200 |
| D        | 2.300       | 2.500 | 2.700 |
| D1       | 1.200       | 1.400 | 1.600 |
| D2       | 0.900       | 1.100 | 1.300 |
| E        | 1.800       | 2.000 | 2.200 |
| H        | 3.800       | 4.000 | 4.200 |
| L        | 0.200       | 0.300 | 0.400 |
| $\phi D$ | 1.700       | 1.900 | 2.100 |
| R1       | 0.700       | 0.800 | 0.900 |

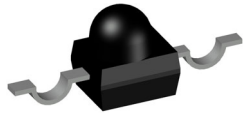


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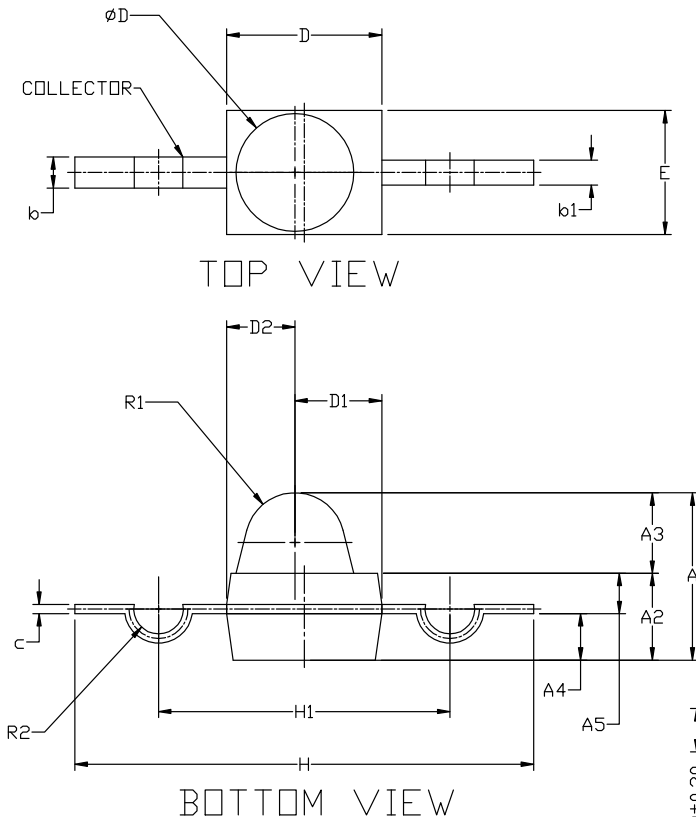


**T-3/4 2.50x2.00**  
**CASE 100EJ**  
**ISSUE O**

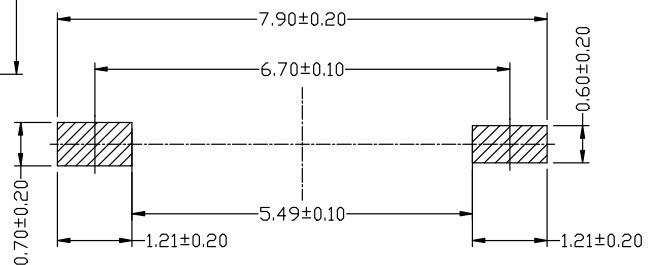
DATE 14 SEP 2023

**NOTES:**

1. CONTROLLING DIMENSIONS: MILLIMETERS
2. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
3. 2MM YOKE DETECTOR.



| DIM | MILLIMETERS |       |       |
|-----|-------------|-------|-------|
|     | MIN.        | NOM.  | MAX.  |
| A   | 2.500       | 2.700 | 2.900 |
| A2  | 1.300       | 1.400 | 1.500 |
| A3  | 1.200       | 1.300 | 1.400 |
| A4  | 0.650       | 0.750 | 0.850 |
| A5  | 0.550       | 0.650 | 0.750 |
| b   | 0.450       | 0.550 | 0.650 |
| b1  | 0.350       | 0.450 | 0.550 |
| c   | 0.100       | 0.150 | 0.200 |
| D   | 2.300       | 2.500 | 2.700 |
| D1  | 1.200       | 1.400 | 1.600 |
| D2  | 0.900       | 1.100 | 1.300 |
| E   | 1.800       | 2.000 | 2.200 |
| H   | 7.200       | 7.400 | 7.600 |
| H1  | 4.500       | 4.700 | 4.900 |
| ØD  | 1.700       | 1.900 | 2.100 |
| R1  | 0.700       | 0.800 | 0.900 |
| R2  | 0.300       | 0.400 | 0.500 |



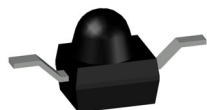
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# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

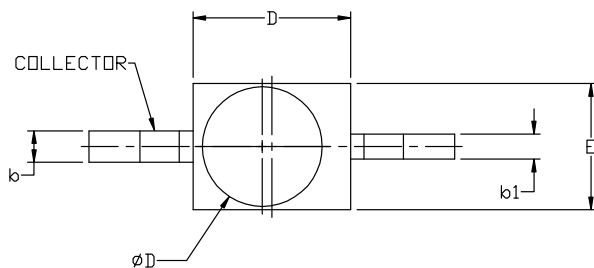


**T-3/4 2.50x2.00**  
**CASE 100EK**  
**ISSUE O**

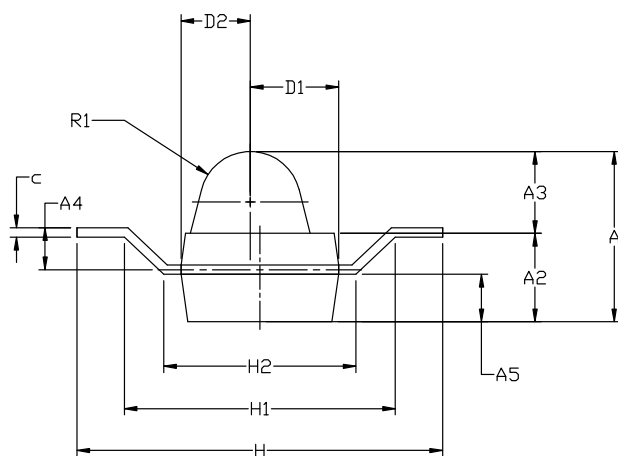
DATE 14 SEP 2023

## NOTES:

1. CONTROLLING DIMENSIONS: MILLIMETERS
2. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
3. 2MM ZBEND DETECTOR.

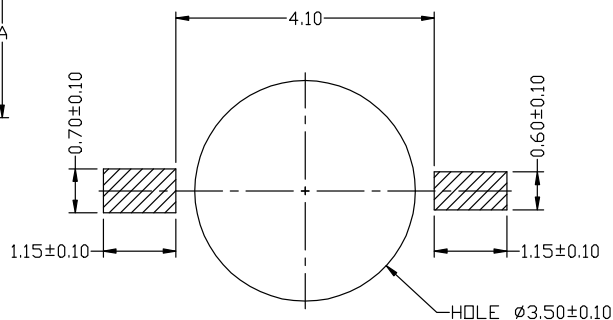


TOP VIEW



BOTTOM VIEW

| DIM   | MILLIMETERS |       |       |
|-------|-------------|-------|-------|
|       | MIN.        | NOM.  | MAX.  |
| A     | 2.500       | 2.700 | 2.900 |
| A2    | 1.300       | 1.400 | 1.500 |
| A3    | 1.200       | 1.300 | 1.400 |
| A4    | 0.550       | 0.650 | 0.750 |
| A5    | 0.650       | 0.750 | 0.850 |
| b     | 0.450       | 0.550 | 0.650 |
| b1    | 0.350       | 0.450 | 0.550 |
| c     | 0.100       | 0.150 | 0.200 |
| D     | 2.300       | 2.500 | 2.700 |
| D1    | 1.200       | 1.400 | 1.600 |
| D2    | 0.900       | 1.100 | 1.300 |
| E     | 1.800       | 2.000 | 2.200 |
| H     | 5.600       | 5.800 | 6.000 |
| H1    | 4.100       | 4.300 | 4.500 |
| H2    | 2.850       | 3.050 | 3.250 |
| phi D | 1.700       | 1.900 | 2.100 |
| R1    | 0.700       | 0.800 | 0.900 |



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