



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



NPN General Purpose Transistor

PN3565



TO-92

TO-92

Leaded Plastic Package

RoHS compliant

DESCRIPTION:

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300 mA.

APPLICATIONS:

NPN General Purpose Amplifier and switches.

ABSOLUTE MAXIMUM RATINGS* ($T_a = 25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|----------------|-------------|------------------|
| Collector-Emitter Voltage | V_{CEO} | 25 | V |
| Collector-Base Voltage | V_{CBO} | 30 | |
| Emitter-Base Voltage | V_{EBO} | 6.0 | |
| Collector Current - Continuous | I_C | 500 | mA |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

THERMAL CHARACTERISTICS

| Parameter | Symbol | Value (Max.) | Unit |
|---|-----------------|---------------------------------|--------------------------|
| Total Device Dissipation | PD | Derate at 25°C | 625 mW |
| | | Derate above 25°C | 5.0 mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C/W}$ |



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



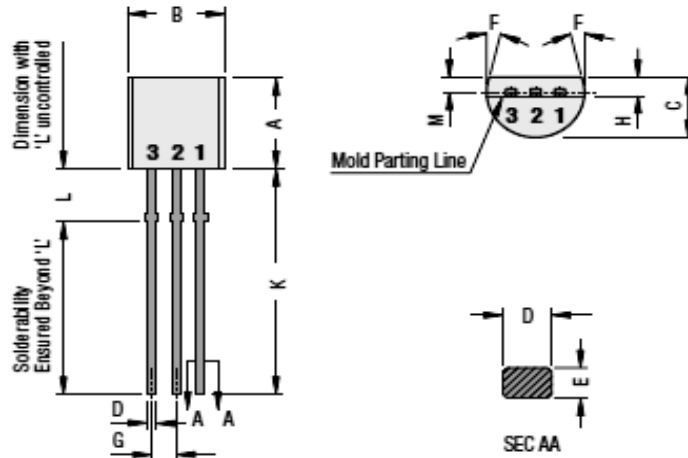
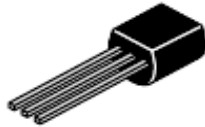
ELECTRICAL CHARACTERISTICS (Ta = 25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Value | | Unit |
|--------------------------------------|---------------|---|-------|------|------|
| | | | Min. | Max. | |
| OFF CHARACTERISTICS | | | | | |
| Collector-Emitter Breakdown Voltage* | $V_{(BR)CEO}$ | $I_C = 2.0 \text{ mA}, I_B = 0$ | 25 | -- | V |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = 100 \text{ mA}, I_E = 0$ | 30 | -- | |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = 10 \text{ mA}, I_C = 0$ | 6 | -- | |
| Collector Cutoff Current | I_{CBO} | $V_{CB} = 25 \text{ V}, I_E = 0$ | -- | 50 | mA |
| ON CHARACTERISTICS* | | | | | |
| DC Current Gain | h_{FE} | $V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}$ | 150 | 600 | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 1.0 \text{ mA}, I_B = 0.1 \text{ mA}$ | -- | 0.35 | V |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C_{ob} | $V_{CB} = 5.0 \text{ V}$ | -- | 4 | pF |

*Pulse Test: Pulse Width $\leq 300 \text{ ms}$, Duty Cycle $\leq 2.0\%$

Package Details

TO-92 Leaded Plastic Package



| DIM | Min | Max |
|-----|------|------|
| A | 4.32 | 5.33 |
| B | 4.45 | 5.20 |
| C | 3.18 | 4.19 |
| D | 0.41 | 0.55 |
| E | 0.35 | 0.55 |
| F | 5° | |

| DIM | Min | Max |
|-----|-------|-------|
| G | 1.14 | 1.40 |
| H | 1.20 | 1.80 |
| K | 12.50 | — |
| L | 1.982 | 2.082 |
| M | 1.03 | 1.53 |

All dimensions are in mm

Pin configuration

| | |
|------|-----------|
| Pin1 | Collector |
| Pin2 | Base |
| Pin3 | Emitter |



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company

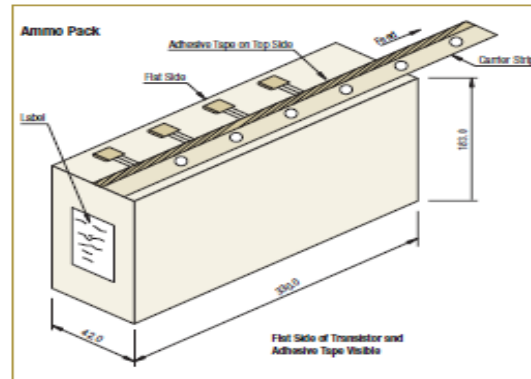
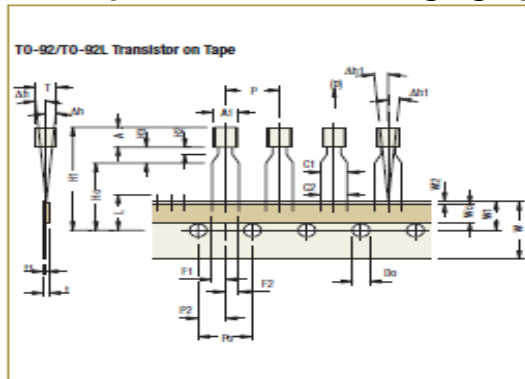


Packaging Specifications ...

T & A: Tape and Ammo Pack; **T & R:** Tape and Reel; **Bulk:** Loose in Poly Bags; **Tube:** Tube and Carton; **K:** 1,000

| Package / Case Type | Packaging Type | Std. Packing Qty. | Inner Carton | | | Outer Carton | | |
|---------------------|----------------|-------------------|--------------|---------------|--------------|--------------|----------------|--------------|
| | | | Qty. | Size LxW xH | Gross Weight | Qty. | Size LxW xH | Gross Weight |
| | | | Nos. | (cm) | (Kg.) | Nos. | (cm) | (Kg.) |
| TO-92 | Bulk | 1000 | 5K | 9 x 19 x 8 1 | 1.1 | 80K | 43 x 40 x 35 | 20.0 |
| | T & A | 2000 | 2K | 32 x 4.5 x 20 | 0.7 | 40K | 43 x 40 x 35 1 | 15.2 |

TO-92 Tape and Ammo Packaging Specifications



Tape Specifications

| Item description | Symbol | TO-92 | | | |
|--|--------|-------|------|------|-----------|
| | | Min | Nom | Max | Tol |
| Body width | A1 | 4.45 | | 5.20 | |
| Body height | A | 4.32 | | 5.33 | |
| Body thickness | T | 3.18 | | 4.19 | |
| Pitch of component ^{§1} | P | | 12.7 | | ±1.0 |
| Feed hole pitch ^{§1} | Po | | 12.7 | | ±0.3 |
| Feed hole center to component centre ^{§2} | P2 | | 6.35 | | ±0.4 |
| Comp. alignment, Side view ^{§3} | Dh | | 0 | 1.0 | |
| Comp. alignment, Front view ^{§3} | Dh1 | | 0 | 1.3 | |
| Tape width ^{§2} | W | | 18 | | ±0.5 |
| Hold down tape width ^{§2} | Wo | | 6 | | ±0.2 |
| Hole position | W1 | | 9 | | +0.7 -0.5 |
| Hold-down tape position | W2 | 0.0 | | 0.7 | |
| Lead wire clinch height | Ho | | 16 | | ±0.5 |
| Component height | H1 | | | 24.0 | |
| Length of snapped leads | L | | | 11.0 | |
| Feed hole diameter ^{§2} | Do | | 4 | | ±0.2 |
| Total tape thickness ^{§4} | t | | | 1.2 | |
| Lead-to-lead distance ^{§2} | F1, F2 | 2.4 | | 2.7 | |
| Stand off | H2 | 0.45 | | 1.45 | |
| Clinch height | H3 | | | 3.0 | |
| Lead parallelism ^{§2} | C1-C2 | | | 0.22 | |
| Pull-out force | (p) | 6N | | | |

Taping Specification

- Maximum alignment deviation between leads not to be greater than 0.20 mm.
- Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
- Hold down tape not to exceed beyond the edge(s) carrier tape and there shall be no exposure of adhesive.
- No more than 3 consecutive missing components is permitted.
- A tape trailer, having at least three feed holes is required after the last component.
- Splices shall not interfere with the sprocket feed holes.

§1 Cumulative pitch error 1.0 mm/20 pitch.

§2 To be measured at bottom of clinch.

§3 At top of body.

§4 t1 = 0.3 - 0.6 mm

Cr Critical Dimension.



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



Recommended Product Storage Environment for Diode and Transistors

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years, the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start. For this the following JEDEC table may be referred:

| JEDEC MSL Level | | |
|-----------------|--------------------|------------------|
| Level | Time | Condition |
| 1 | Unlimited | ≤ 30 °C / 85% RH |
| 2 | 1 Year | ≤ 30 °C / 60% RH |
| 2a | 4 Weeks | ≤ 30 °C / 60% RH |
| 3 | 168 Hours | ≤ 30 °C / 60% RH |
| 4 | 72 Hours | ≤ 30 °C / 60% RH |
| 5 | 48 Hours | ≤ 30 °C / 60% RH |
| 5a | 24 Hours | ≤ 30 °C / 60% RH |
| 6 | Time on Label(TOL) | ≤ 30 °C / 60% RH |

Figure 1 Floor Life according to JEDEC MSL Level



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered Trademark of

Continental Device India Pvt.Limited

C-120 Naraina Industrial Area, New Delhi 110 028, India.

Telephone + 91-11-2579 6150, 4141 1112 Fax + 91-11-2579 5290, 4141 1119

email@cdil.com www.cdil.com

CIN No. - U32109DL1984PTC004291