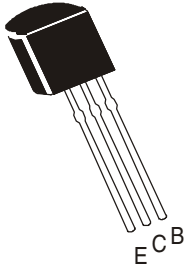


SILICON PLANAR EPITAXIAL TRANSISTORS

BC635, 637, 639 NPN
BC636, 638, 640 PNP

TO-92
Plastic Package

For Lead Free Parts, Device Part #
will be Prefixed with "T"



High Current Transistor

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

| DESCRIPTION | SYMBOL | BC635 | BC637 | BC639 | UNIT |
|---|----------------|--------------|-------|-------|----------------------|
| | | BC636 | BC638 | BC640 | |
| Collector Emitter Voltage | V_{CEO} | 45 | 60 | 80 | V |
| Collector Base Voltage | V_{CBO} | 45 | 60 | 80 | V |
| Emitter Base Voltage | V_{EBO} | 5.0 | | | V |
| Collector Current Continuous | I_C | 1.0 | | | A |
| Total Device Dissipation at $T_a=25^\circ\text{C}$ Derate Above 25°C | P_D | 800 | | | mW |
| | | 6.4 | | | mW/ $^\circ\text{C}$ |
| Total Device Dissipation at $T_a=25^\circ\text{C}$ | ** P_D | 1.0 | | | W |
| Total Device Dissipation at $T_c=25^\circ\text{C}$ Derate Above 25°C | P_D | 2.75 | | | W |
| | | 22 | | | mW/ $^\circ\text{C}$ |
| Operating And Storage Junction Temperature Range | T_j, T_{stg} | - 55 to +150 | | | $^\circ\text{C}$ |

THERMAL RESISTANCE

| | | | |
|---------------------------------|------------------|-----|---------------------------|
| Junction to Case | $R_{th(j-c)}$ | 45 | $^\circ\text{C}/\text{W}$ |
| Junction to Ambient in free air | $R_{th(j-a)}$ | 156 | $^\circ\text{C}/\text{W}$ |
| Junction to Ambient | ** $R_{th(j-a)}$ | 125 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$ unless specified otherwise)

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | MAX | UNIT |
|--------------------------------------|-----------------|---|-----|-----|---------------|
| Collector Emitter Voltage | V_{CEO} | $I_C=1\text{mA}, I_B=0$ | | | |
| | | BC635/BC636 | 45 | | V |
| | | BC637/BC638 | 60 | | V |
| | | BC639/BC640 | 80 | | V |
| Collector Base Voltage | V_{CBO} | $I_C=100\mu\text{A}, I_E=0$ | | | |
| | | BC635/BC636 | 45 | | V |
| | | BC637/BC638 | 60 | | V |
| | | BC639/BC640 | 80 | | V |
| Emitter Base Voltage | V_{EBO} | $I_E=10\mu\text{A}, I_C=0$ | 5.0 | | V |
| Collector Cut Off Current | I_{CBO} | $V_{CB}=30\text{V}, I_E=0$ | | 0.1 | μA |
| | | $V_{CB}=30\text{V}, I_E=0, T_a=125^\circ\text{C}$ | | 10 | μA |
| Base Emitter (On) Voltage | * $V_{BE(on)}$ | $I_C=500\text{mA}, V_{CE}=2\text{V}$ | | 1.0 | V |
| Collector Emitter Saturation Voltage | * $V_{CE(sat)}$ | $I_C=500\text{mA}, I_B=50\text{mA}$ | | 0.5 | V |

*Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle 2%

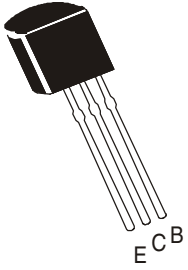
**Transistors mounted on printed circuit board, max Lead Length 4mm, mounting pad for collector lead min 10mm x 10 mm

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SILICON PLANAR EPITAXIAL TRANSISTORS

BC635, 637, 639 NPN

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TO-92

Plastic Package

For Lead Free Parts, Device Part # will be Prefixed with "T"

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

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | MAX | UNIT |
|-----------------|------------------|--|-----|-----|------|
| DC Current Gain | *h _{FE} | V _{CE} =2V, I _C =5mA | 25 | | |
| | | V _{CE} =2V, I _C =150mA | | | |
| | | BC635/BC636 | 40 | 250 | |
| | | BC637/BC638 | 40 | 160 | |
| | | BC639/BC640 | 40 | 160 | |
| | | Group-10 | 63 | 160 | |
| | | Group-16 | 100 | 250 | |
| | | V _{CE} =2V, I _C =500mA | 25 | | |

DYNAMIC CHARACTERISTICS

| DESCRIPTION | SYMBOL | TEST CONDITION | TYP | UNIT | |
|-----------------------|-----------------|---|------------|------|-----|
| Transistors Frequency | f _T | I _C =50mA, V _{CE} =2V, f=100MHz | | | |
| | | | NPN | 200 | MHz |
| | | | PNP | 150 | MHz |
| Output Capacitance | C _{ob} | I _E =0, V _{CB} =10V, f=1MHz | | | |
| | | | NPN | 7 | pF |
| | | | PNP | 9 | pF |
| Input Capacitance | C _{ib} | V _{BE} =0.5V, f=1MHz | | | |
| | | | NPN | 50 | pF |
| | | | PNP | 110 | pF |

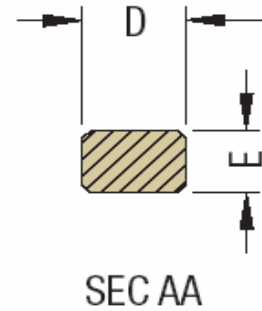
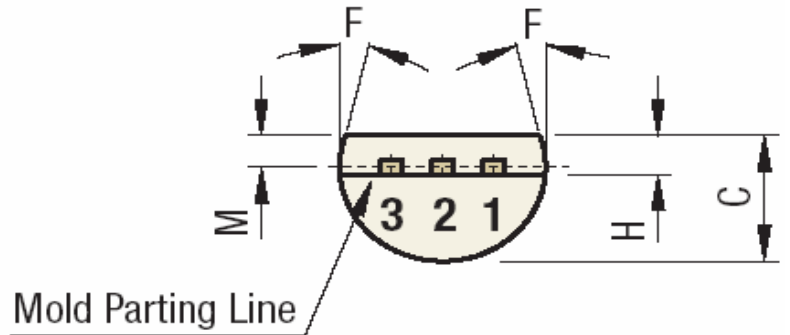
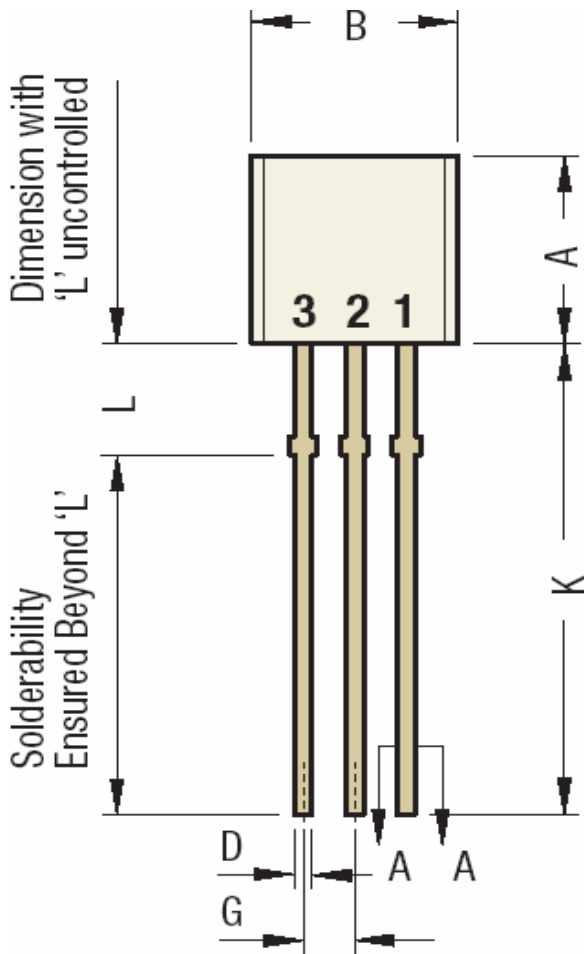
*Pulse Test: Pulse Width ≤ 300μs, Duty Cycle 2%

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TO-92
Plastic Package

For Lead Free Parts, Device Part #
will be Prefixed with "T"

TO-92 Leaded Plastic Package

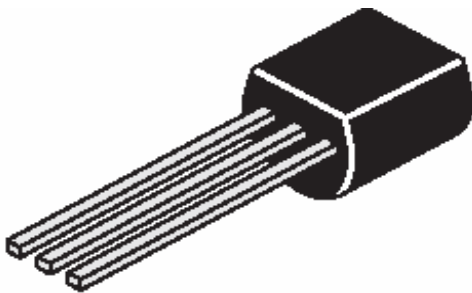


| DIM | Min | Max |
|-----|------|------|
| A | 4.32 | 5.33 |
| B | 4.45 | 5.20 |
| C | 3.18 | 4.19 |
| D | 0.40 | 0.55 |
| E | 0.30 | 0.55 |
| F | 5° | |

All Dimensions are in mm

| DIM | Min | Max |
|-----|-------|-------|
| G | 1.14 | 1.40 |
| H | 1.20 | 1.80 |
| K | 12.5 | |
| L | 1.982 | 2.082 |
| M | 1.03 | 1.53 |

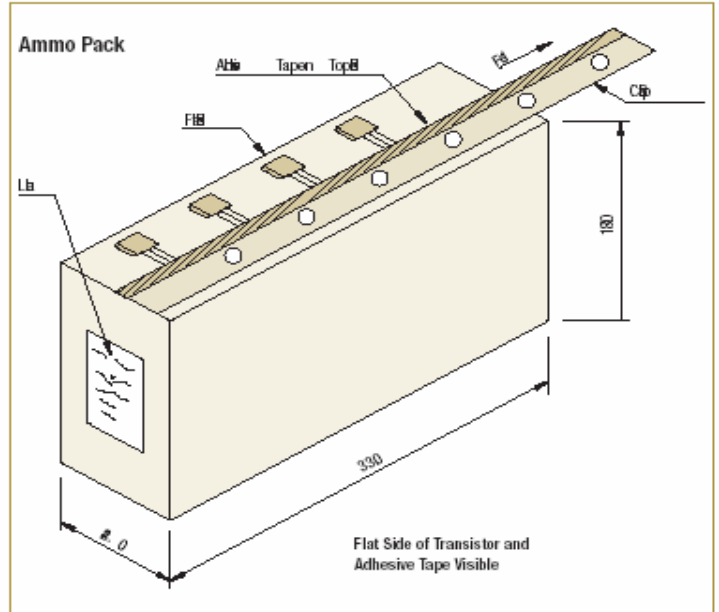
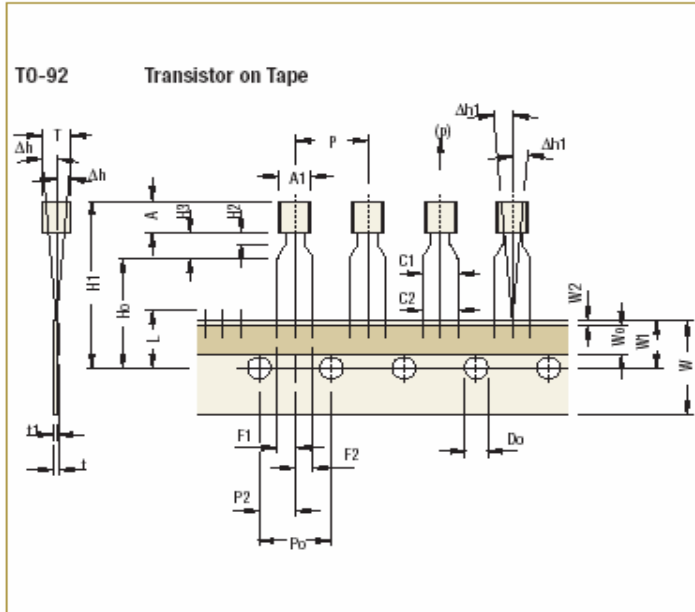
- Pin 1 Base
- Pin 2 Collector
- Pin 3 Emitter



TO-92
Plastic Package

For Lead Free Parts, Device Part # will be Prefixed with "T"

TO-92 Tape and Ammo Packaging



All Dimensions are in mm

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 ^{Cr} | 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 ^{Cr} | W | | 18 | | ±0.5 |
| Hold down tape width ^{Cr} | 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 clipped leads | L | | | 11.0 | |
| Feed hole diameter ^{Cr} | Do | | 4 | | ±0.2 |
| Total tape thickness ^{§4} | t | | | 1.2 | |
| Lead-to-lead distance ^{Cr} | F1, F2 | 2.4 | | 2.7 | |
| Stand off | H2 | 0.45 | | 1.45 | |
| Clinch height | H3 | | | 3.0 | |
| Lead parallelism ^{Cr} | 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.

All Dimensions are in mm

Packaging Information

T & A: Tape and Ammo Pack; T & R: Tape and Red; Bulk: Loose in Poly bags; Tube: Tube and Ammo Pack; k: 1.000

| Package/Case Type | Packaging Type | Std. Packing | | Inner Carton | | Outer Carton | | |
|-------------------|----------------|--------------|-----|---------------------|-------------------|--------------|---------------------|-------------------|
| | | Qty | Qty | Size L x W x H (cm) | Gross Weight (Kg) | Qty | Size L x W x H (cm) | Gross Weight (Kg) |
| TO-92 | Bulk | 1,000 | 5K | 19x19x8 | 1.10 | 80K | 43x40x35 | 20.0 |
| | T&A | 2,000 | 2K | 32x4.5x20 | 0.70 | 40K | 43x40x35 | 15.20 |

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).

Customer Notes

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.



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