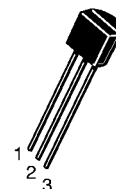
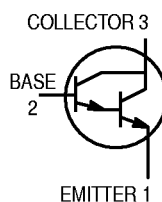


# High Voltage Darlington Transistors

## NPN Silicon

**BC372**  
**BC373**



CASE 29-04, STYLE 1  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

| Rating                                                                                 | Symbol         | BC372       | BC373 | Unit                         |
|----------------------------------------------------------------------------------------|----------------|-------------|-------|------------------------------|
| Collector–Emitter Voltage                                                              | $V_{CES}$      | 100         | 80    | Vdc                          |
| Collector–Base Voltage                                                                 | $V_{CBO}$      | 100         | 80    | Vdc                          |
| Emitter–Base Voltage                                                                   | $V_{EBO}$      | 12          |       | Vdc                          |
| Collector Current — Continuous                                                         | $I_C$          | 1.0         |       | Adc                          |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 625         | 5.0   | mW<br>mW/ $^\circ\text{C}$   |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.5         | 12    | Watt<br>mW/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                    | $T_J, T_{stg}$ | –55 to +150 |       | $^\circ\text{C}$             |

### THERMAL CHARACTERISTICS

| Characteristic                          | Symbol          | Max  | Unit                      |
|-----------------------------------------|-----------------|------|---------------------------|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200  | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case    | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

### OFF CHARACTERISTICS

|                                                                                                                    |                |               |           |        |            |      |
|--------------------------------------------------------------------------------------------------------------------|----------------|---------------|-----------|--------|------------|------|
| Collector–Emitter Breakdown Voltage <sup>(1)</sup><br>( $I_C = 100 \mu\text{Adc}$ , $I_B = 0$ )                    | BC372<br>BC373 | $V_{(BR)CES}$ | 100<br>80 | —<br>— | —<br>—     | Vdc  |
| Collector–Base Breakdown Voltage<br>( $I_C = 100 \mu\text{Adc}$ , $I_E = 0$ )                                      | BC372<br>BC373 | $V_{(BR)CBO}$ | 100<br>80 | —<br>— | —<br>—     | Vdc  |
| Emitter–Base Breakdown Voltage<br>( $I_E = 10 \mu\text{Adc}$ , $I_C = 0$ )                                         |                | $V_{(BR)EBO}$ | 12        | —      | —          | Vdc  |
| Collector Cutoff Current<br>( $V_{CB} = 80 \text{ Vdc}$ , $I_E = 0$ )<br>( $V_{CB} = 60 \text{ Vdc}$ , $I_E = 0$ ) | BC372<br>BC373 | $I_{CBO}$     | —<br>—    | —<br>— | 100<br>100 | nAdc |
| Emitter Cutoff Current<br>( $V_{EB} = 10 \text{ V}$ , $I_C = 0$ )                                                  |                | $I_{EBO}$     | —         | —      | 100        | nAdc |

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle 2.0%.



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

| Characteristic                                                                                                                    | Symbol        | Min       | Typ    | Max      | Unit |
|-----------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------|----------|------|
| <b>ON CHARACTERISTICS(1)</b>                                                                                                      |               |           |        |          |      |
| DC Current Gain<br>( $I_C = 250\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ ) | $h_{FE}$      | 8.0<br>10 | —<br>— | —<br>160 | K    |
| Collector–Emitter Saturation Voltage<br>( $I_C = 250\text{ mA}$ , $I_B = 0.25\text{ mA}$ )                                        | $V_{CE(sat)}$ | —         | 1.0    | 1.1      | Vdc  |
| Base–Emitter Saturation Voltage<br>( $I_C = 250\text{ mA}$ , $I_B = 0.25\text{ mA}$ )                                             | $V_{BE(sat)}$ | —         | 1.4    | 2.0      | Vdc  |

**DYNAMIC CHARACTERISTICS**

|                                                                                                                         |          |     |     |    |     |
|-------------------------------------------------------------------------------------------------------------------------|----------|-----|-----|----|-----|
| Current–Gain Bandwidth Product<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )          | $f_T$    | 100 | 200 | —  | MHz |
| Output Capacitance<br>( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )                                   | $C_{ob}$ | —   | 10  | 25 | pF  |
| Noise Figure<br>( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $R_g = 100\text{ k ohm}$ , $f = 1.0\text{ kHz}$ ) | NF       | —   | 2.0 | —  | dB  |

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle 2.0%.

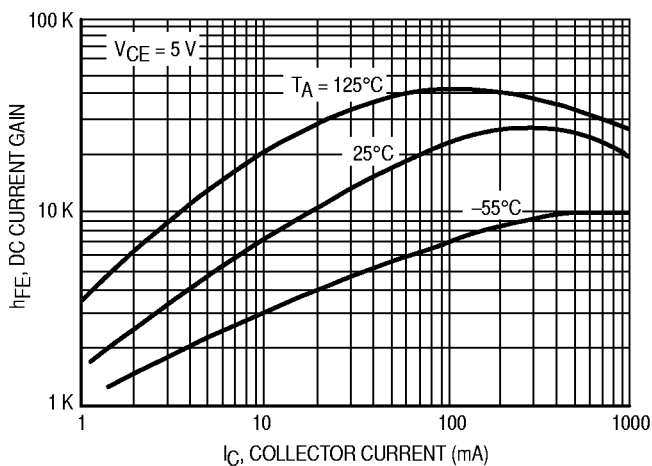


Figure 1. DC Current Gain

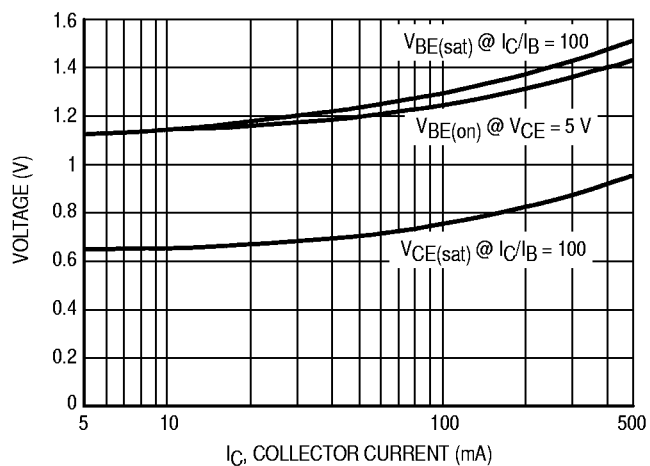


Figure 2. "Saturation" and "On" Voltages

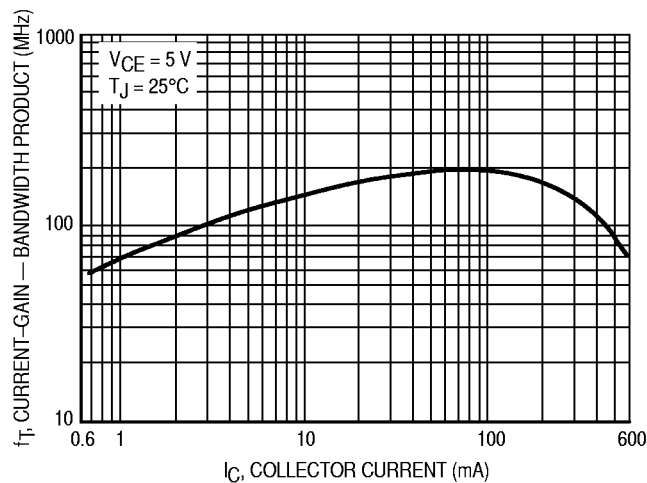


Figure 3. Current–Gain — Bandwidth Product

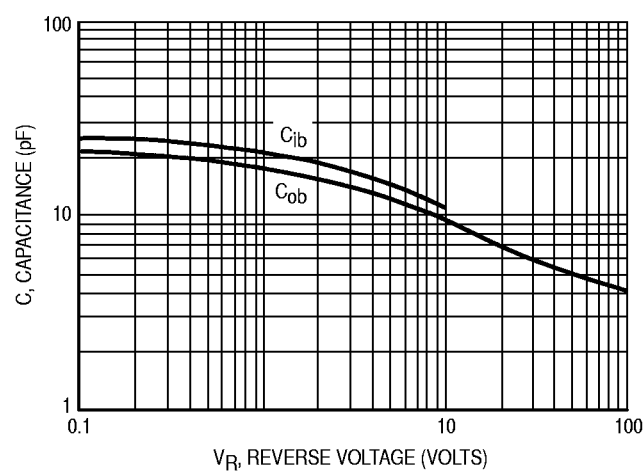
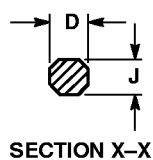
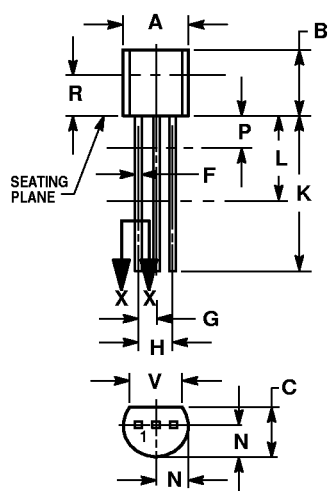


Figure 4. Capacitances

## PACKAGE DIMENSIONS



**CASE 029-04  
(TO-226AA)  
ISSUE AD**

## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.175  | 0.205 | 4.45        | 5.20 |
| B   | 0.170  | 0.210 | 4.32        | 5.33 |
| C   | 0.125  | 0.165 | 3.18        | 4.19 |
| D   | 0.016  | 0.022 | 0.41        | 0.55 |
| F   | 0.016  | 0.019 | 0.41        | 0.48 |
| G   | 0.045  | 0.055 | 1.15        | 1.39 |
| H   | 0.095  | 0.105 | 2.42        | 2.66 |
| J   | 0.015  | 0.020 | 0.39        | 0.50 |
| K   | 0.500  | —     | 12.70       | —    |
| L   | 0.250  | —     | 6.35        | —    |
| N   | 0.080  | 0.105 | 2.04        | 2.66 |
| P   | —      | 0.100 | —           | 2.54 |
| R   | 0.115  | —     | 2.93        | —    |
| V   | 0.135  | —     | 3.43        | —    |

## STYLE 1:

- PIN 1. EMITTER
- BASE
- COLLECTOR