

## BU522B

7 AMPERES  
DARLINGTON  
POWER TRANSISTORS  
NPN SILICON  
450 VOLTS  
75 WATTS

# High Voltage Silicon Power Darlington

Power Transistor mainly intended for use as ignition circuit output transistor.

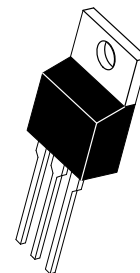
- Specified minimum sustaining voltage:  
 $V_{CE(sus)} = 425 \text{ V}$  at  $I_C = 1 \text{ A}$
- High S.O.A. capability:  
 $V_{CE} = 400 \text{ V}$
- Low  $V_{CE(sat)} = 2.0 \text{ V}$  max. at  $I_C = 4 \text{ A}$

### MAXIMUM RATINGS

| Rating                                                                                 | Symbol         | BU522B     | Unit                         |
|----------------------------------------------------------------------------------------|----------------|------------|------------------------------|
| Collector-Emitter Voltage Sust.                                                        | $V_{CE(sus)}$  | 425        | Vdc                          |
| Collector-Emitter Voltage                                                              | $V_{CE}$       | 450        | Vdc                          |
| Collector-Base Voltage                                                                 | $V_{CBO}$      | 475        | Vdc                          |
| Emitter-Base Voltage                                                                   | $V_{EBO}$      | 5.0        | Vdc                          |
| Collector Current Continuous                                                           | $I_C$          | 7.0        | Adc                          |
| Base Current                                                                           | $I_B$          | 2.0        | Adc                          |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 75<br>0.60 | Watts<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                    | $T_J, T_{stg}$ | -65 to 150 | $^\circ\text{C}$             |

### THERMAL CHARACTERISTICS

| Characteristic                       | Symbol        | Max. | Unit               |
|--------------------------------------|---------------|------|--------------------|
| Thermal Resistance, Junction to Case | $\theta_{JC}$ | 1.67 | $^\circ\text{C/W}$ |



CASE 221A-06  
TO-220AB

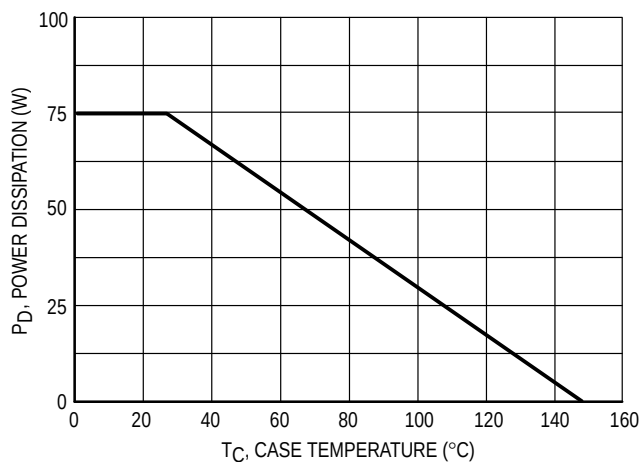


Figure 1. Power Derating



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

| Characteristic                                                                                                           | Symbol        | Min | Typ | Max | Unit |
|--------------------------------------------------------------------------------------------------------------------------|---------------|-----|-----|-----|------|
| <b>OFF CHARACTERISTICS</b>                                                                                               |               |     |     |     |      |
| Collector–Emitter Sustaining Voltage (See Figure 2)<br>( $I_C = 1.0\text{ A}$ ) See Figure 2                             | $V_{CE(sus)}$ | 425 |     |     | Vdc  |
| Collector Cutoff Current<br>(Rated $V_{CE}$ , $R_{BE} = 270\ \Omega$ )                                                   | $I_{CER}$     |     |     | 1.0 | mAdc |
| Collector Cutoff Current<br>(Rated $V_{CBO}$ , $I_E = 0$ )                                                               | $I_{CBO}$     |     |     | 1.0 | mAdc |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{ Vdc}$ , $I_C = 0$ )                                                      | $I_{EBO}$     |     |     | 40  | mAdc |
| <b>ON CHARACTERISTICS</b>                                                                                                |               |     |     |     |      |
| DC Current Gain<br>( $I_C = 2.5\text{ Adc}$ , $V_{CE} = 5\text{ Vdc}$ )                                                  | $h_{FE}$      | 250 |     |     | —    |
| Collector–Emitter Saturation Voltage<br>( $I_C = 4\text{ Adc}$ , $I_B = 80\text{ mAdc}$ )                                | $V_{CE(sat)}$ |     |     | 2   | Vdc  |
| Base–Emitter Saturation Voltage<br>( $I_C = 4\text{ Adc}$ , $I_B = 80\text{ mAdc}$ )                                     | $V_{BE(sat)}$ |     |     | 2.5 | Vdc  |
| <b>DYNAMIC CHARACTERISTICS</b>                                                                                           |               |     |     |     |      |
| Current Gain — Bandwidth Product<br>( $I_C = 0.3\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f_{test} = 10\text{ MHz}$ ) | $f_T$         |     | 7.5 |     | MHz  |
| Output Capacitance<br>( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 0.1\text{ MHz}$ )                                    | $C_{ob}$      |     | 150 |     | pF   |

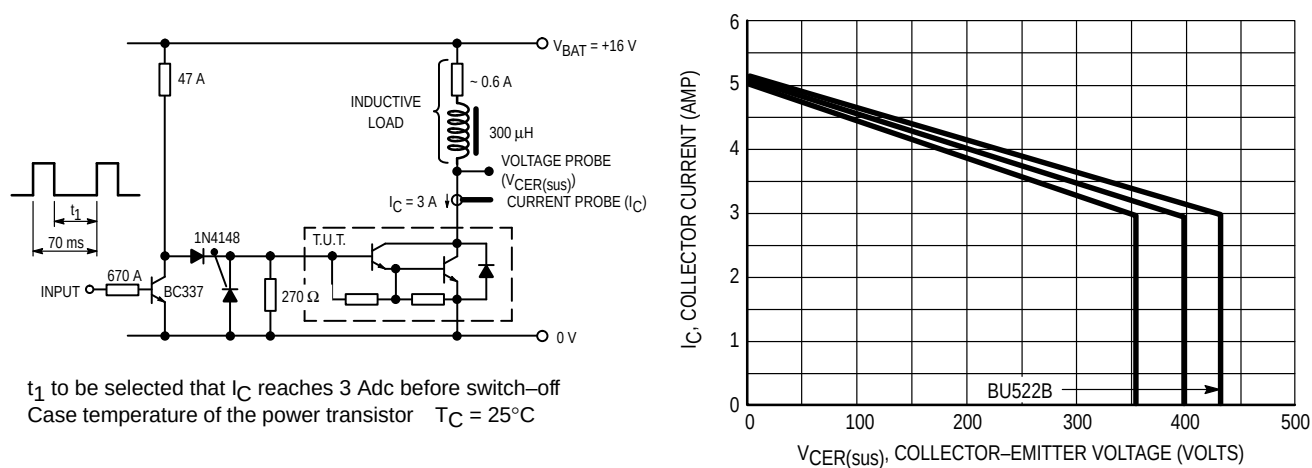
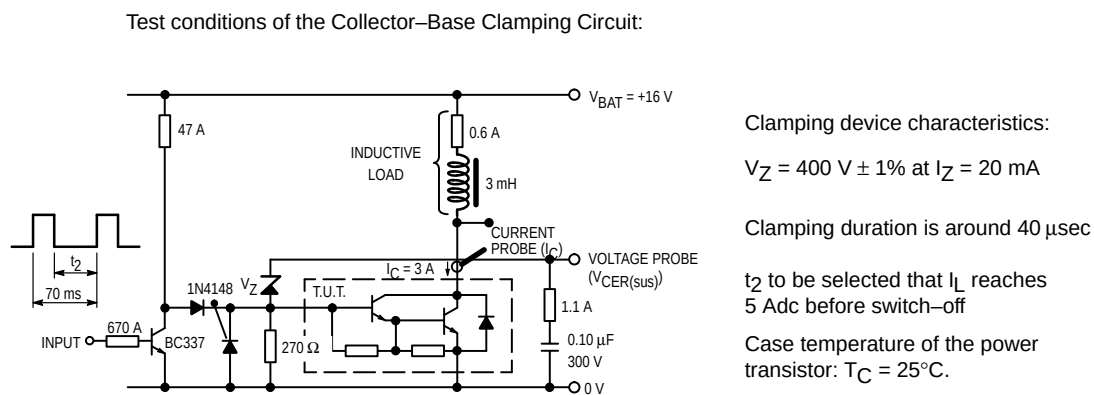
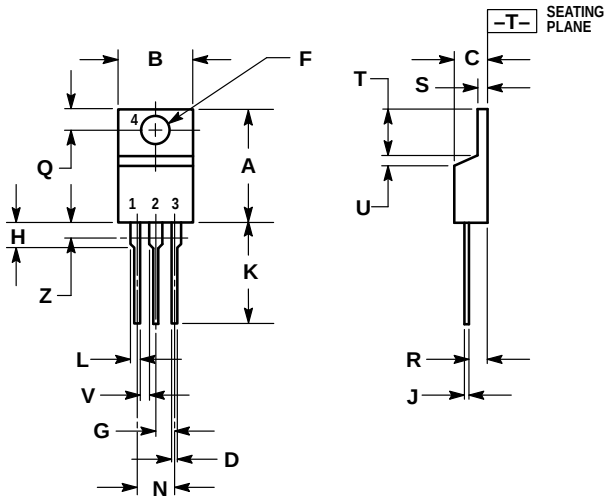
Figure 2. Sustaining Voltage Test  $V_{CER(sus)}$ 

Figure 3. S.O.A. Test

PACKAGE DIMENSIONS



- NOTES:
- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  - 2. CONTROLLING DIMENSION: INCH.
  - 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.570  | 0.620 | 14.48       | 15.75 |
| B   | 0.380  | 0.405 | 9.66        | 10.28 |
| C   | 0.160  | 0.190 | 4.07        | 4.82  |
| D   | 0.025  | 0.035 | 0.64        | 0.88  |
| F   | 0.142  | 0.147 | 3.61        | 3.73  |
| G   | 0.095  | 0.105 | 2.42        | 2.66  |
| H   | 0.110  | 0.155 | 2.80        | 3.93  |
| J   | 0.018  | 0.025 | 0.46        | 0.64  |
| K   | 0.500  | 0.562 | 12.70       | 14.27 |
| L   | 0.045  | 0.060 | 1.15        | 1.52  |
| N   | 0.190  | 0.210 | 4.83        | 5.33  |
| Q   | 0.100  | 0.120 | 2.54        | 3.04  |
| R   | 0.080  | 0.110 | 2.04        | 2.79  |
| S   | 0.045  | 0.055 | 1.15        | 1.39  |
| T   | 0.235  | 0.255 | 5.97        | 6.47  |
| U   | 0.000  | 0.050 | 0.00        | 1.27  |
| V   | 0.045  | —     | 1.15        | —     |
| Z   | —      | 0.080 | —           | 2.04  |

- STYLE 1:
- PIN 1. BASE
  - 2. COLLECTOR
  - 3. EMITTER
  - 4. COLLECTOR

CASE 221A-06  
TO-220AB  
ISSUE Y

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