

## HIGH VOLTAGE DARLINGTON POWER TRANSISTORS

... designed for use in high-voltage switching igniter application

### FEATURES:

\*Collector-Emitter Sustaining Voltage-

$$V_{CE(sus)} = 300 \text{ V (Min)}$$

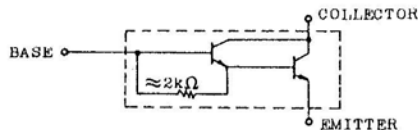
\* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 2.0 \text{ V (Max.) @ } I_C = 4.0 \text{ A, } I_B = 40 \text{ mA}$$

\* High DC current Gain

$$hFE = 1500 \text{ (Min) @ } I_C = 2.0 \text{ A, } V_{CE} = 2.0 \text{ V}$$

EQUIVALENT CIRCUIT



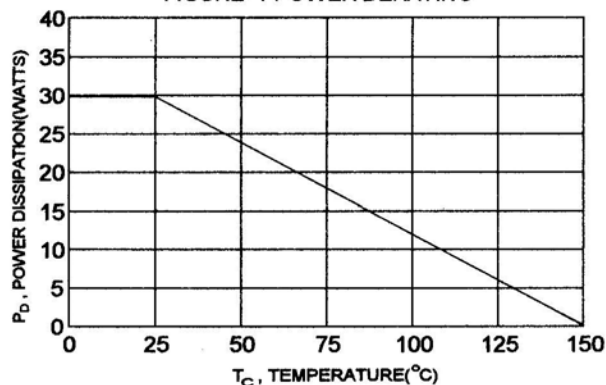
### MAXIMUM RATINGS

| Characteristic                                                                        | Symbol            | 2SD798      | Unit                     |
|---------------------------------------------------------------------------------------|-------------------|-------------|--------------------------|
| Collector-Emitter Voltage                                                             | $V_{CEO}$         | 300         | V                        |
| Collector-Base Voltage                                                                | $V_{CBO}$         | 600         | V                        |
| Emitter-Base Voltage                                                                  | $V_{EBO}$         | 5.0         | V                        |
| Collector Current - Continuous<br>- Peak                                              | $I_C$<br>$I_{CM}$ | 6.0<br>10   | A                        |
| Base current                                                                          | $I_B$             | 1.0         | A                        |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$             | 30<br>0.24  | W<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                   | $T_J, T_{STG}$    | -55 to +150 | $^\circ\text{C}$         |

### THERMAL CHARACTERISTICS

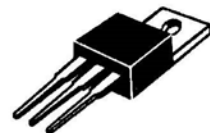
| Characteristic                      | Symbol          | Max  | Unit               |
|-------------------------------------|-----------------|------|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 4.16 | $^\circ\text{C/W}$ |

FIGURE -1 POWER DERATING

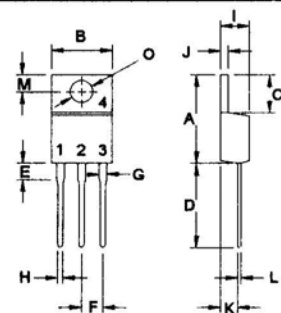


**NPN**  
**2SD798**

**6 AMPERE**  
**POWER DARLINGTON**  
**TRANSISTORS**  
**300 VOLTS**  
**30 WATTS**



**TO-220**



PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | 14.68       | 16.00 |
| B   | 9.78        | 10.42 |
| C   | 5.02        | 6.60  |
| D   | 13.00       | 14.62 |
| E   | 3.10        | 4.19  |
| F   | 2.41        | 2.67  |
| G   | 1.10        | 1.67  |
| H   | 0.69        | 1.01  |
| I   | 3.21        | 4.98  |
| J   | 1.14        | 1.40  |
| K   | 2.20        | 3.30  |
| L   | 0.28        | 0.61  |
| M   | 2.48        | 3.00  |
| O   | 3.50        | 4.00  |

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

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

**OFF CHARACTERISTICS**

|                                                                                       |               |     |     |               |
|---------------------------------------------------------------------------------------|---------------|-----|-----|---------------|
| Collector-Emitter Sustaining Voltage<br>( $I_C = 0.5\text{ A}$ , $L = 40\text{ mH}$ ) | $V_{CE(sus)}$ | 300 |     | V             |
| Collector Cutoff Current<br>( $V_{CB} = 600\text{ V}$ , $I_E = 0$ )                   | $I_{CBO}$     |     | 500 | $\mu\text{A}$ |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )                     | $I_{EBO}$     |     | 500 | $\mu\text{A}$ |

**ON CHARACTERISTICS (1)**

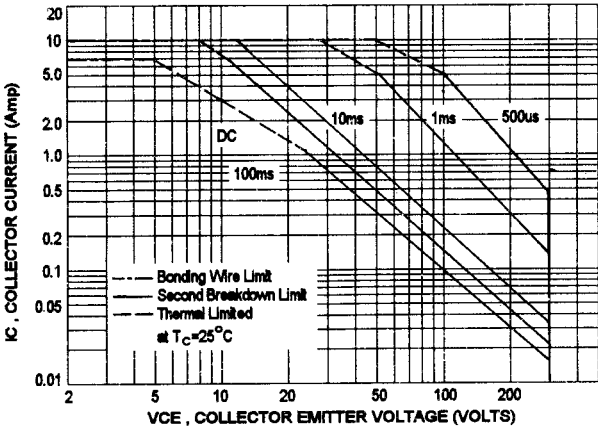
|                                                                                                                             |               |             |     |   |
|-----------------------------------------------------------------------------------------------------------------------------|---------------|-------------|-----|---|
| DC Current Gain<br>( $I_C = 2.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ )<br>( $I_C = 4.0\text{ A}$ , $V_{CE} = 2.0\text{ V}$ ) | $h_{FE}$      | 1500<br>200 |     |   |
| Collector-Emitter Saturation Voltage<br>( $I_C = 4.0\text{ A}$ , $I_B = 40\text{ mA}$ )                                     | $V_{CE(sat)}$ |             | 2.0 | V |
| Base-Emitter Saturation Voltage<br>( $I_C = 4.0\text{ A}$ , $I_B = 40\text{ mA}$ )                                          | $V_{BE(sat)}$ |             | 2.5 | V |

**SWITCHING CHARACTERISTICS**

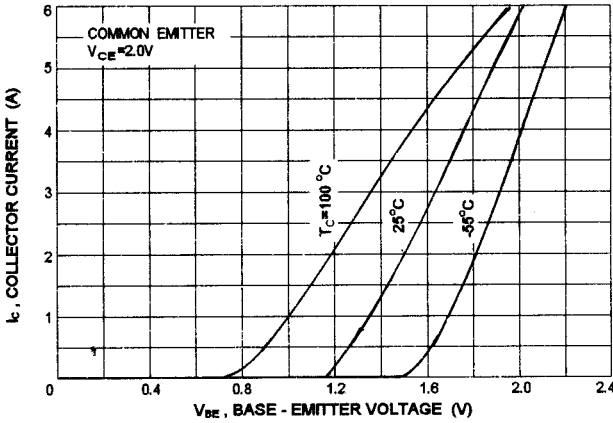
|              |                                                                                                              |          |          |  |               |
|--------------|--------------------------------------------------------------------------------------------------------------|----------|----------|--|---------------|
| On Time      | $V_{CC} = 100\text{ V}$ , $I_C = 4.0\text{ A}$<br>$I_{B1} = -I_{B2} = 40\text{ mA}$<br>$R_L = 25\text{ ohm}$ | $t_{on}$ | 1.0(typ) |  | $\mu\text{s}$ |
| Storage Time |                                                                                                              | $t_s$    | 8.0(typ) |  | $\mu\text{s}$ |
| Fall Time    |                                                                                                              | $t_f$    | 5.0(typ) |  | $\mu\text{s}$ |

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

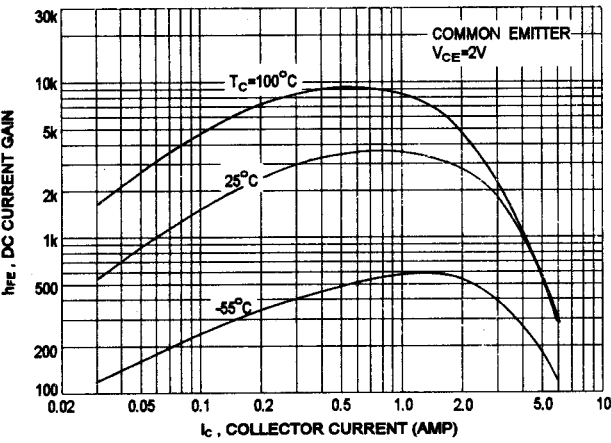
SAFE OPERATING AREA



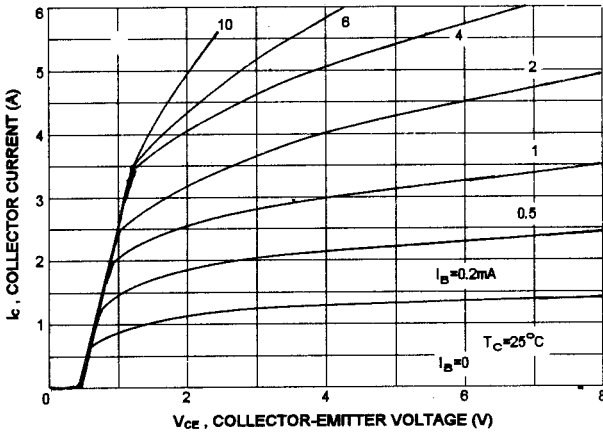
$I_C - V_{BE}$



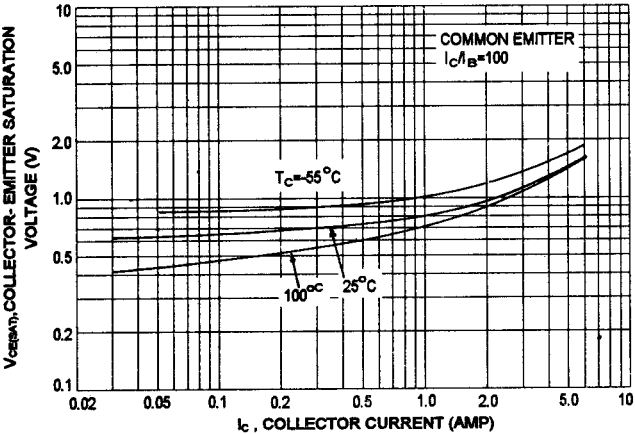
DC CURRENT GAIN



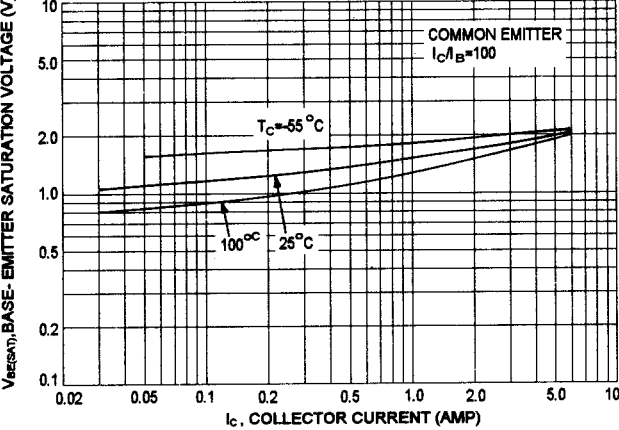
$I_C - V_{CE}$



$V_{CE(sat)} - I_C$



$V_{BE(sat)} - I_C$



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