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## Plastic Darlington Complementary Silicon Power Transistors

... designed for general-purpose amplifier and low-speed switching applications.

- High DC Current Gain —  
h<sub>FE</sub> = 2000 (Typ) @ I<sub>C</sub> = 2.0 Adc
- Monolithic Construction with Built-in Base-Emitter Resistors to Limit Leakage Multiplication
- Choice of Packages —  
MJE700 and MJE800 series  
T0220AB, MJE700T and MJE800T

### MAXIMUM RATINGS

Rating	Symbol	MJE700,T MJE800,T	MJE702 MJE703 MJE802 MJE803	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	60	80	Vdc
Collector-Base Voltage	V <sub>CB</sub>	60	80	Vdc
Emitter-Base Voltage	V <sub>EB</sub>	5.0		Vdc
Collector Current	I <sub>C</sub>	4.0		Adc
Base Current	I <sub>B</sub>	0.1		Adc
Total Power Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	CASE 77	TO-220	Watts W/°C
		40 0.32	50 0.40	
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150		°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case CASE 77 TO-220	R <sub>θJC</sub>	3.13 2.50	°C/W

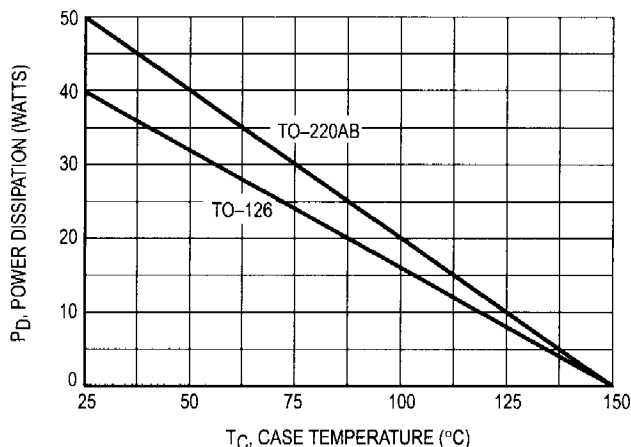
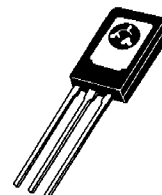


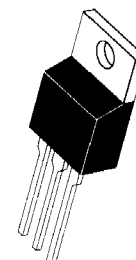
Figure 1. Power Derating

**PNP**  
**MJE700,T**  
**MJE702**  
**MJE703**  
**NPN**  
**MJE800,T**  
**MJE802**  
**MJE803**

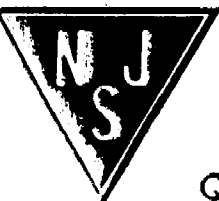
**4.0 AMPERE**  
**DARLINGTON**  
**POWER TRANSISTORS**  
**COMPLEMENTARY**  
**SILICON**  
**40 WATT**  
**50 WATT**



TO-225AA TYPE  
MJE700-703  
MJE800-803



CASE 221A-06  
TO-220AB  
MJE700T  
MJE800T



## MJE700,T MJE702 MJE703 MJE800,T MJE802 MJE803

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

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (1) ( $I_C = 50 \text{ mAdc}$ , $I_B = 0$ )	MJE700,T, MJE800,T MJE702, MJE703, MJE802, MJE803	$V_{(BR)CEO}$	60 80	— —	Vdc
Collector Cutoff Current ( $V_{CE} = 60 \text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 80 \text{ Vdc}$ , $I_B = 0$ )	MJE700,T, MJE800,T MJE702, MJE703, MJE802, MJE803	$I_{CEO}$	— —	100 100	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CB} = \text{Rated } BV_{CEO}$ , $I_E = 0$ ) ( $V_{CB} = \text{Rated } BV_{CEO}$ , $I_E = 0$ , $T_C = 100^\circ\text{C}$ )		$I_{CBO}$	— —	100 500	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{BE} = 5.0 \text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	—	2.0	mAdc
<b>ON CHARACTERISTICS</b>					
DC Current Gain (1) ( $I_C = 1.5 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ ) ( $I_C = 2.0 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ ) ( $I_C = 4.0 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ )	MJE700,T, MJE702, MJE800,T, MJE802 MJE703, MJE803 All devices	$h_{FE}$	750 750 100	— — —	—
Collector-Emitter Saturation Voltage (1) ( $I_C = 1.5 \text{ Adc}$ , $I_B = 30 \text{ mAdc}$ ) ( $I_C = 2.0 \text{ Adc}$ , $I_B = 40 \text{ mAdc}$ ) ( $I_C = 4.0 \text{ Adc}$ , $I_B = 40 \text{ mAdc}$ )	MJE700,T, MJE702, MJE800,T, MJE802 MJE703, MJE803 All devices	$V_{CE(sat)}$	— — —	2.5 2.8 3.0	Vdc
Base-Emitter On Voltage (1) ( $I_C = 1.5 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ ) ( $I_C = 2.0 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ ) ( $I_C = 4.0 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ )	MJE700,T, MJE702, MJE800,T, MJE802 MJE703, MJE803 All devices	$V_{BE(on)}$	— — —	2.5 2.5 3.0	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Small-Signal Current Gain ( $I_C = 1.5 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )		$h_{fe}$	1.0	—	—

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