

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	MJ2500 MJ3000	MJ2501 MJ3001	Unit
Collector-Emitter voltage	V_{CE0}	60	80	Volts
Collector-Base voltage	V_{CB}	60	80	Volts
Emitter-Base voltage	V_{EB}	5.0		Volts
Collector-Current	I_C	10		Amps
Base Current	I_B	0.2		Amps
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	150 0.857		Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +200		$^\circ\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.17		$^\circ\text{C}/\text{W}$

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

Characteristics	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 100\text{mA}, I_B = 0$)	MJ2500, MJ3000 MJ2501, MJ3001	$V_{(BR)CEO}$	60 80	- -	Volts
Collector-Emitter Leakage Current ($V_{EB} = 60\text{V}, R_{BE} = 1.0\text{k}\Omega$) ($V_{EB} = 80\text{V}, R_{BE} = 1.0\text{k}\Omega$) ($V_{EB} = 60\text{V}, R_{BE} = 1.0\text{k}\Omega, T_C = 150^\circ\text{C}$) ($V_{EB} = 80\text{V}, R_{BE} = 1.0\text{k}\Omega, T_C = 150^\circ\text{C}$)	MJ2500, MJ3000 MJ2501, MJ3001 MJ2500, MJ3000 MJ2501, MJ3001	I_{CER}	- - - -	1.0 1.0 5.0 5.0	mA
Emitter Cutoff Current ($V_{BE} = 5.0\text{V}, I_C = 0$)		I_{EBO}	-	2.0	mA
Collector-Emitter Leakage Current ($V_{CE} = 30\text{V}, I_B = 0$) ($V_{CE} = 40\text{V}, I_B = 0$)	MJ2500, MJ3000 MJ2501, MJ3001	I_{CEO}	- -	1.0 1.0	mA
ON CHARACTERISTICS⁽¹⁾					
DC Current Gain ($I_C = 5.0\text{A}, V_{CE} = 3\text{V}$)		h_{FE}	1000	-	-
Collector-Emitter Saturation Voltage ($I_C = 5.0\text{A}, I_B = 20\text{mA}$) ($I_C = 10\text{A}, I_B = 50\text{mA}$)		$V_{CE(sat)}$	- -	2.0 4.0	Volts
Base Emitter Voltage ($I_C = 5.0\text{A}, V_{CE} = 3.0\text{V}$)		$V_{BE(ON)}$	-	3.0	Volts

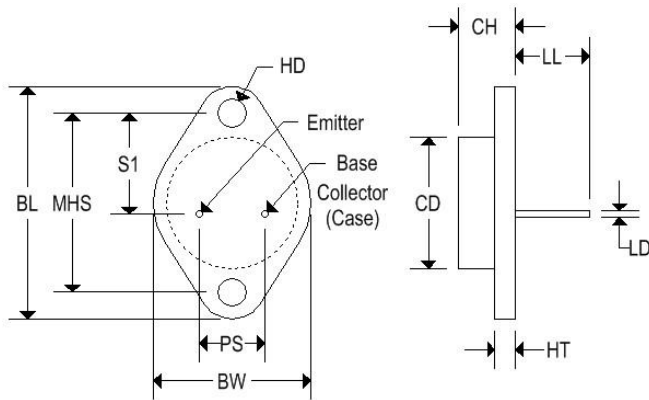
Note 1: Pulse test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$.

MJ2500-MJ2501-PNP MJ3000-MJ3001-NPN

COMPLEMENTARY SILICON DARLINGTON POWER TRANSISTORS

MECHANICAL CHARACTERISTICS

Case	TO-3
Marking	Alpha-numeric
Polarity	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

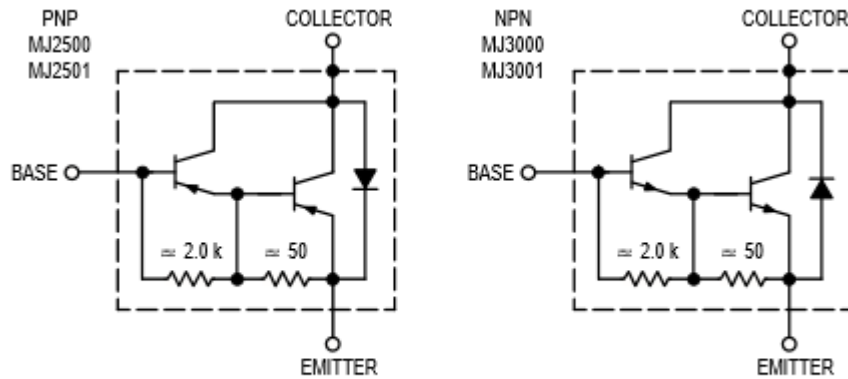


Figure 1. Darlington Circuit Schematic

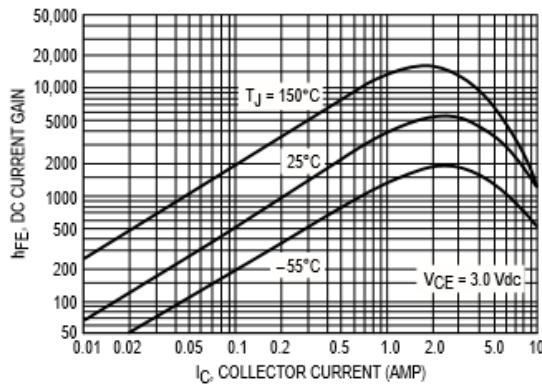


Figure 2. DC Current Gain

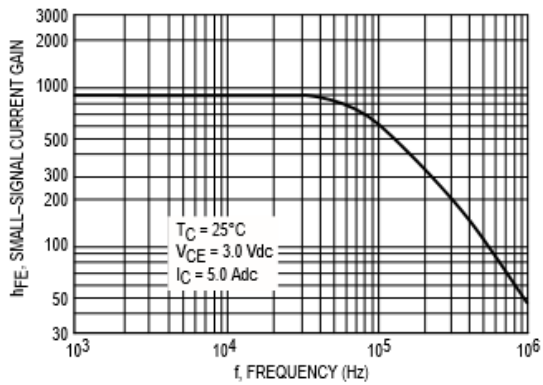


Figure 3. Small-Signal Current Gain

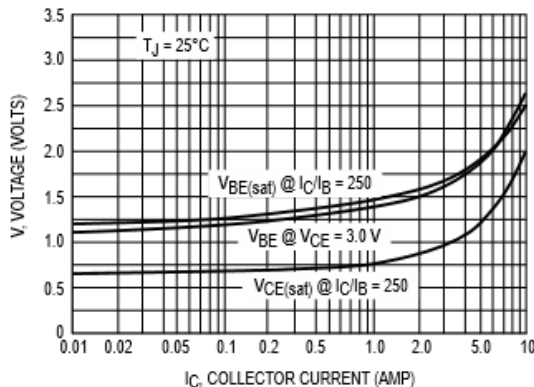


Figure 4. "On" Voltages

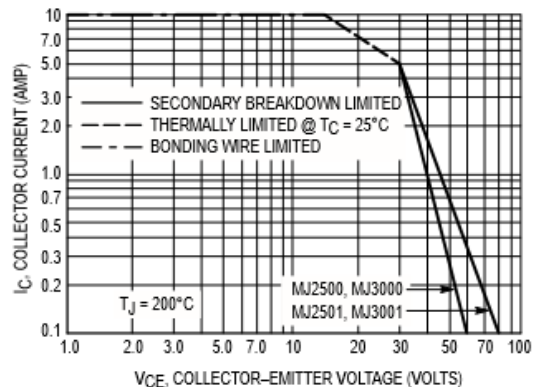


Figure 5. DC Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and secondary breakdown. Safe operating area curves IC-VCE limits of the transistor that must be observed for reliable operation: eg., the transistor must not be subjected to greater dissipation that the curves indicate. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by secondary breakdown.