

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	MJ10000	MJ10001	Unit
Collector emitter voltage	V_{CEO}	350	400	V
Collector emitter voltage	V_{CEX}	400	450	V
Collector emitter voltage	V_{CEV}	450	500	V
Emitter base voltage	V_{EB}	8.0		V
Collector current				
-Continuous	I_C	20		A
-Peak ⁽¹⁾	I_{CM}	30		
Base current				
-Continuous	I_B	2.5		A
-Peak ⁽¹⁾	I_{BM}	5.0		
Total power dissipation @ $T_C = 25^\circ\text{C}$		175		W
Total power dissipation @ $T_C = 100^\circ\text{C}$	P_D	100		W
Derate above 25°C		1		W/ $^\circ\text{C}$
Operating and storage temperature range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$
Thermal resistance, junction to case	$R_{\theta JC}$	1.0		$^\circ\text{C}/\text{W}$

Note 1: Pulse test: Pulse width = 5ms, duty cycle \leq 10%.

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

Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS ⁽²⁾					
Collector emitter sustaining voltage ($I_C = 250\text{mA}, I_B = 0, V_{clamp} = \text{Rated } V_{CEO}$)	MJ10000 MJ10001	$V_{CEO(sus)}$	350 400	- -	Vdc
Collector cutoff current ($V_{CE} = \text{Rated } V_{CEV}, R_{BE} = 50\Omega, T_C = 100^\circ\text{C}$)		I_{CER}	-	5.0	mA
Collector cutoff current ($V_{CEV} = \text{Rated } V_{CEV}, V_{BE(off)} = 1.5\text{V}$) ($V_{CEV} = \text{Rated } V_{CEV}, V_{BE(off)} = 1.5\text{V}, T_C = 150^\circ\text{C}$)		I_{CEV}	- -	0.25 5.0	mA
Emitter cutoff current ($V_{EB} = 8.0\text{V}, I_C = 0$)		I_{EBO}	-	150	mA
ON CHARACTERISTICS ⁽²⁾					
DC current gain ($I_C = 5.0\text{A}, V_{CE} = 5.0\text{V}$) ($I_C = 10\text{A}, V_{CE} = 5.0\text{V}$)		h_{FE}	50 40	600 400	-
Collector emitter saturation voltage ($I_C = 10\text{A}, I_B = 400\text{mA}$) ($I_C = 20\text{A}, I_B = 1\text{A}$) ($I_C = 10\text{A}, I_B = 400\text{mA}, T_C = 100^\circ\text{C}$)		$V_{CE(sat)}$	- - -	1.9 3.0 2.0	V

MJ10000, MJ10001

NPN SILICON POWER DARLINGTON TRANSISTORS

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

Characteristic	Symbol	Min	Max	Unit
Base-emitter saturation voltage ($I_C = 10\text{A}$, $I_B = 400\text{mA}$) ($I_C = 10\text{A}$, $I_B = 400\text{mA}$, $T_C = 100^\circ\text{C}$)	$V_{BE(\text{sat})}$	- -	2.5 2.5	V
Diode forward voltage ($I_F = 10\text{A}$)	V_f	-	5.0	V
DYNAMIC CHARACTERISTICS				
Small signal current gain ($I_C = 1.0\text{A}$, $V_{CE} = 10\text{V}$, $f_{\text{test}} = 1\text{MHz}$)	$ h_{fe} $	10	-	-
Output capacitance ($V_{CB} = 10\text{V}$, $I_E = 0$, $f_{\text{test}} = 100\text{kHz}$)	C_{ob}	100	325	pF
SWITCHING CHARACTERISTICS				
Delay time	($V_{CC} = 250\text{V}$, $I_C = 10\text{A}$, $I_{B1} = 400\text{mA}$, $V_{BE(\text{off})} = 5\text{V}$, $t_p = 50\mu\text{s}$, duty cycle $\leq 2\%$)	t_d	-	0.2
Rise time		t_r	-	0.6
Storage time		t_s	-	3.5
Fall time		t_f	-	2.4
				μs

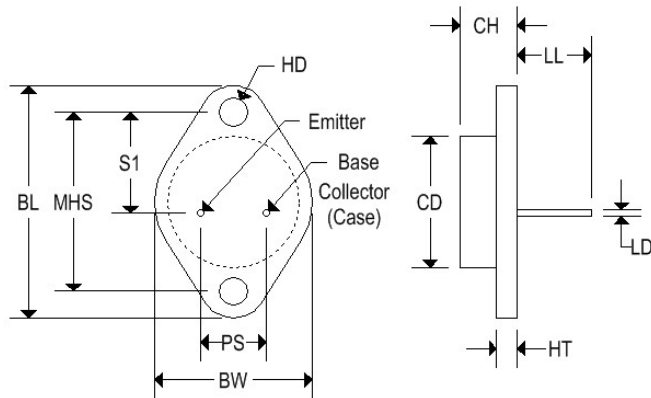
Note 2: Pulse test: pulse width = 5ms, duty cycle $\leq 2\%$.

MJ10000, MJ10001

NPN SILICON POWER DARLINGTON TRANSISTORS

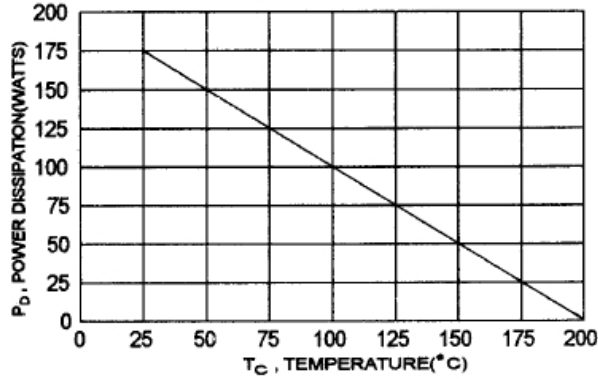
MECHANICAL CHARACTERISTICS

Case	TO-3
Marking	Alpha-numeric
Polarity	See below

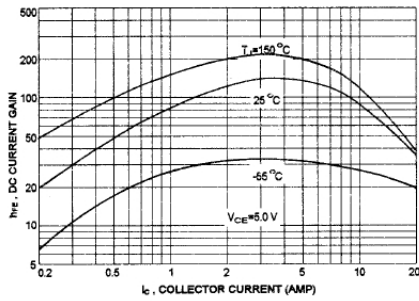


	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670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

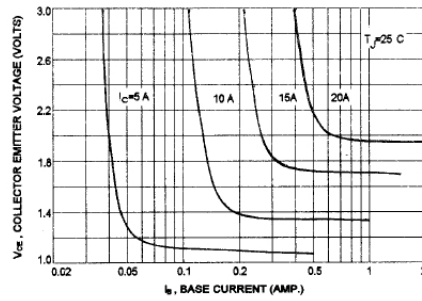
FIGURE -1 POWER DERATING



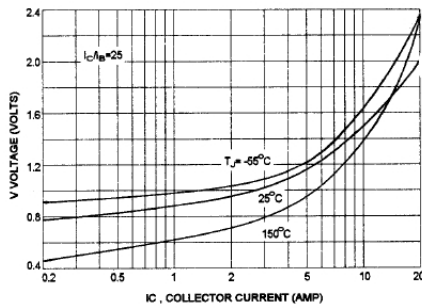
DC CURRENT GAIN



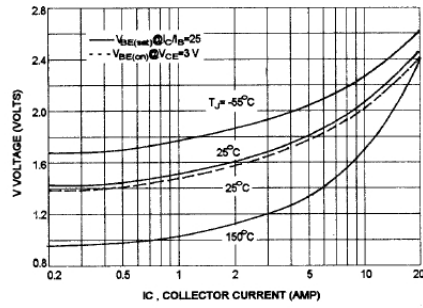
COLLECTOR SATURATION REGION



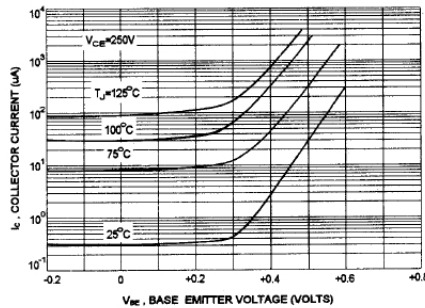
COLLECTOR EMITTER SATURATION VOLTAGE



BASE EMITTER VOLTAGE



COLLECTOR CUT-OFF REGION



OUTPUT CAPACITANCES

