DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MJ6503

NPN SILICON POWER DARLINGTON TRANSISTOR

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	MJ6503	Unit
Collector emitter voltage	V_{CEO}	400	V
Collector emitter voltage	V_{CEV}	450	V
Emitter base voltage	V_{EBO}	6.0	V
Collector current-continuous **-Peak**[1]	I_C I_{CM}	8.0 16	A
Base current – continuous **Peak**[1]	I_B I_{BM}	4.0 8.0	A
Total power dissipation @ T_C = 25°C **Total power dissipation @ T_C = 100°C** **Derate above 25°C**	P_D	125 71.5 0.714	W W W/°C
Operating and storage temperature range	T_J, T_{stg}	-65 to +200	°C
Thermal resistance, junction to case	$R_{\Theta JC}$	1.4	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector emitter sustaining voltage (I_C = 10mA, I_B = 0)	$V_{CEO(sus)}$	400	-	V
Collector cutoff current (V_{CE} = Rated value, $V_{BE(off)}$ = 1.5V) (V_{CE} = Rated value, $V_{BE(off)}$ = 1.5V, T_C = 150°C)	I_{CEV}	- -	0.5 2.5	mA
Collector cutoff current (V_{CE} = Rated V_{CEV}, R_{BE} = 50Ω, T_C = 100°C)	I_{CER}	-	3.0	mA
Emitter cutoff current (V_{EB} = 6.0V, I_C = 0)	I_{EBO}	-	1.0	mA
ON CHARACTERISTICS [1]				
DC current gain (I_C = 2.0A, V_{CE} = 5.0V)	h_{FE}	15	-	-
Collector emitter saturation voltage (I_C = 4.0A, I_B = 1.0A) (I_C = 8.0A, I_B = 3.0A) (I_C = 4.0A, I_B = 1.0A, T_C = 100°C)	$V_{CE(sat)}$	- - -	1.5 5.0 2.5	V
Base-emitter saturation voltage (I_C = 4.0A, I_B = 1.0A) (I_C = 4.0A, I_B = 1.0A, T_C = 100°C)	$V_{BE(sat)}$	- -	1.5 1.5	V
DYNAMIC CHARACTERISTICS				
Output capacitance (V_{CB} = 10V, I_E = 0, f = 100kHz)	C_{ob}	100	400	pF

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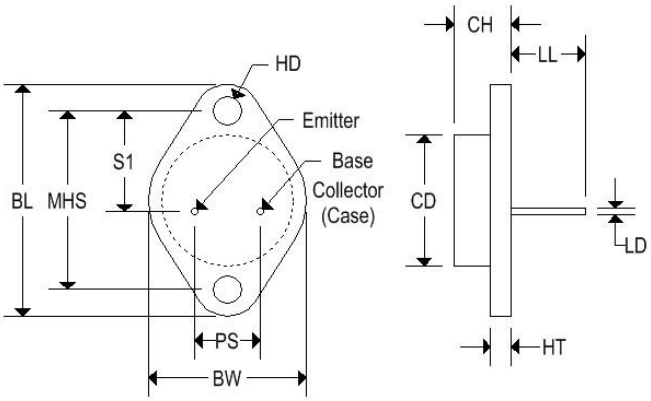
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic		Symbol	Min	Typ.	Max	Unit
SWITCHING CHARACTERISTICS						
Resistive load						
Delay time	(V_{CC} = 250V, I_C = 4.0A, I_{B1} = 1.0A, t_p = 50µs, duty cycle ≤ 2%)	t_d	-	0.025	0.1	µs
Rise time		t_r	-	0.100	0.5	
Storage time	(V_{CC} = 250V, I_C = 4.0A, I_{B1} = 1.0A, t_p = 50µs, $V_{BE(off)}$ = 5V duty cycle ≤ 2%)	t_s	-	0.60	2.0	
Fall time		t_f	-	0.11	0.5	

Note 1: Pulse test: pulse width = 5ms, duty cycle ≤ 10%.
Note 2: $f_T = |h_{fe}| * f_{test}$

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