DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MJ10024, MJ10025

NPN SILICON POWER DARLINGTON TRANSISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	MJ10024	MJ10025	Unit
Collector-emitter voltage	V_{CEV}	1000	1200	V
Collector-emitter voltage	$V_{CEO(sus)}$	750	850	V
Emitter-base voltage	V_{EBO}	8.0		V
Collector current **–continuous** **-peak**	I_C I_{CM}	20 40		A
Base current	I_B	10		A
Total power dissipation: **@ T_C = 25°C** **@ T_C = 100°C** **Derate above 25°C**	P_D	250 143 1.43		W W W/°C
Operating and storage junction temperature range	T_J, T_{stg}	-65 to +200		°C
Thermal resistance, junction to case	$R_{\Theta JC}$	0.7		°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-emitter sustaining voltage (I_C = 100mA, I_B = 0)	MJ10024 MJ10025	$V_{CEO(sus)}$	750 850	- -	V
Collector-cutoff current (V_{CEV} = Rated value, $V_{BE(off)}$ = 1.5V) (V_{CEV} = Rated value, $V_{BE(off)}$ = 1.5V, T_C = 150°C)		I_{CEV}	- -	0.25 5.0	mA
Collector cutoff current (V_{CEV} = Rated V_{CEV}, R_{BE} = 50Ω, T_C = 100°C)		I_{CER}	-	5.0	mA
Emitter cutoff current (V_{EB} = 2.0V, I_C = 0)		I_{EBO}	-	175	mA
ON CHARACTERISTICS[1]					
DC current gain (I_C = 5.0A, V_{CE} = 5.0V)		h_{FE}	50	600	-
Collector-emitter saturation voltage (I_C = 10A, I_B = 1.0A) (I_C = 20A, I_B = 5.0A) (I_C = 10A, I_B = 1.0A, T_C = 100°C)		$V_{CE(sat)}$	- - -	2.2 5.0 2.5	V
Base-emitter saturation voltage (I_C = 10A, I_B = 1.0A) (I_C = 10A, I_B = 1.0A, T_C = 100°C)		$V_{BE(sat)}$	- -	2.5 2.5	V
Diode forward voltage (I_F = 10A)		V_F	-	4.0	V

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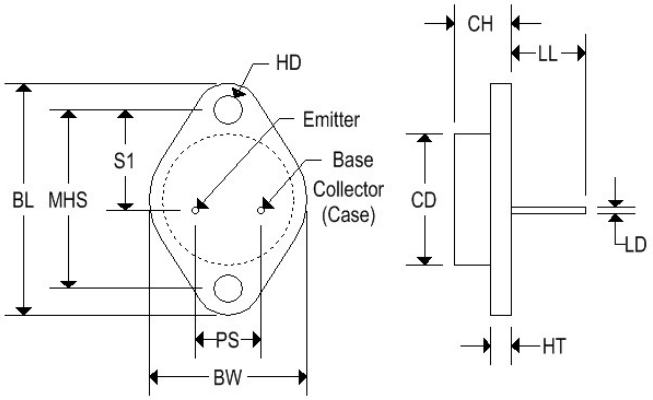
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
DYNAMIC CHARACTERISTICS					
Output capacitance (V_{CB} = 10V, I_E = 0, f = 1.0kHz)		C_{ob}	100	600	pF
SWITCHING CHARACTERISTICS					
Delay time	V_{CC} = 250V, I_C = 10A I_{B1} = 1.0A, $V_{BE(off)}$ = 5.0V t_p = 50µs, duty cycle ≤ 2%	t_d		0.4	µs
Rise time		t_r		1.8	
Storage time		t_s		5.0	
Fall time		t_f		1.8	

Note 1: Pulse test: pulse width = 300µs, duty cycle ≤ 2.0%.

MECHANICAL CHARACTERISTICS

Case	TO-3
Marking	Alpha-numeric
Polarity	Pin out



	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

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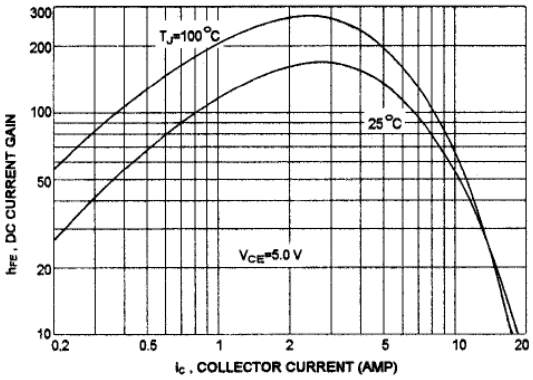
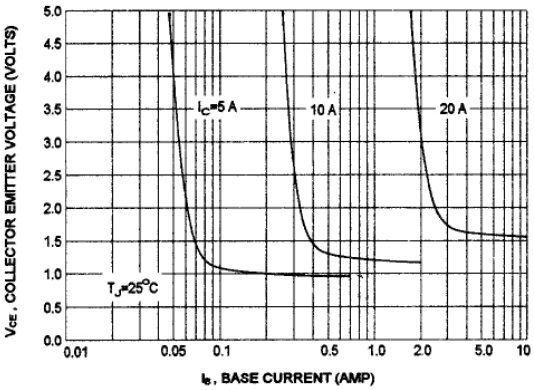
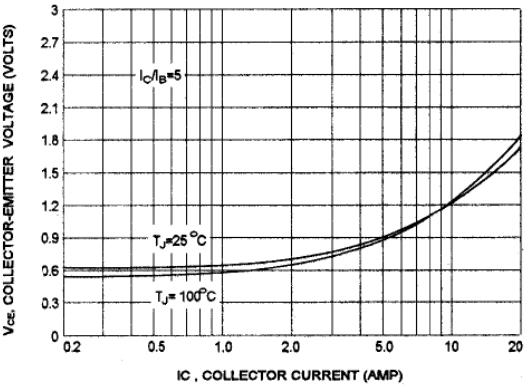
DC CURRENT GAIN



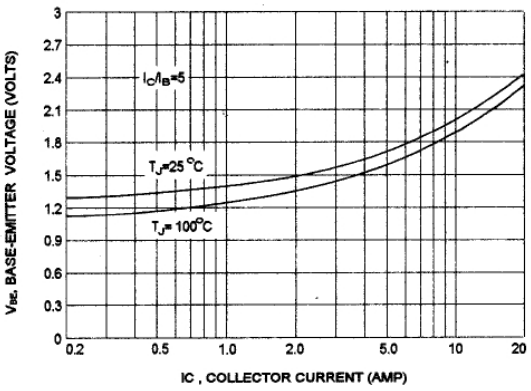
COLLECTOR SATURATION REGION



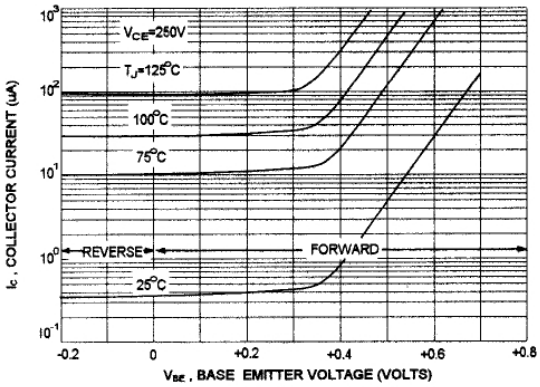
COLLECTOR-EMITTER SATURATION VOLTAGE



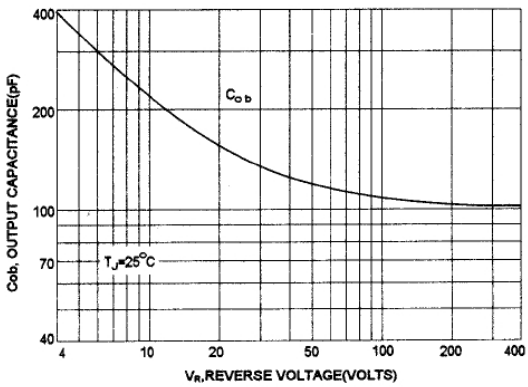
BASE- EMITTER SATURATION VOLTAGE



COLLECTOR CUT-OFF REGION



OUTPUT CAPACITANCES



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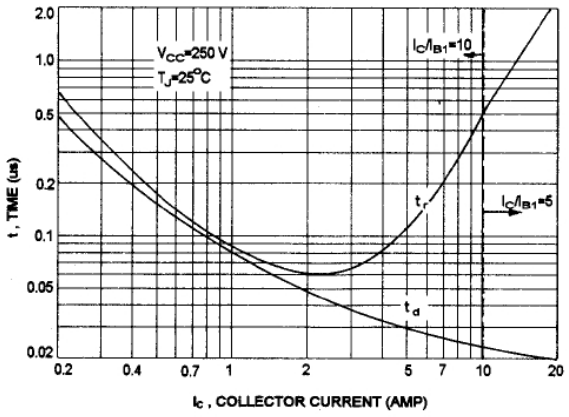
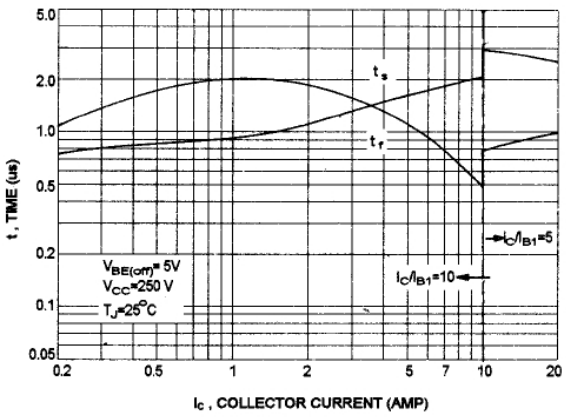
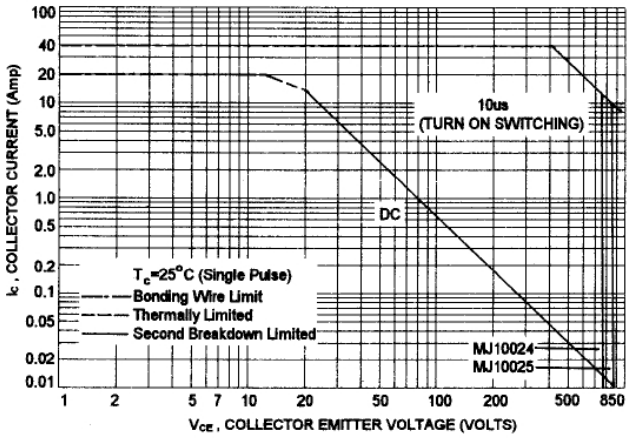
TURN-ON TIME



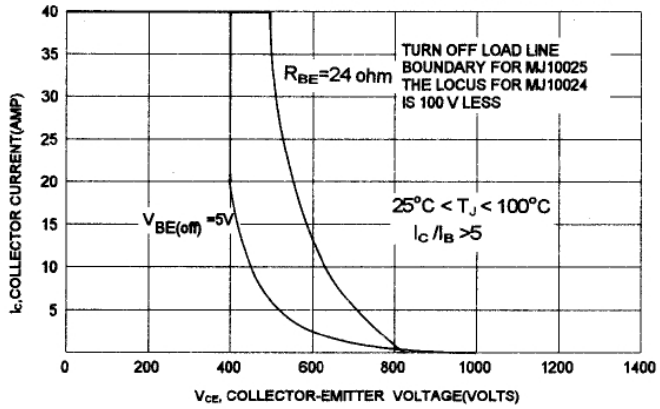
TURN-OFF TIME



ACTIVE REGION SAFE OPERATING AREA



REVERSE BIAS SWITCHING SAFE OPERATING AREA



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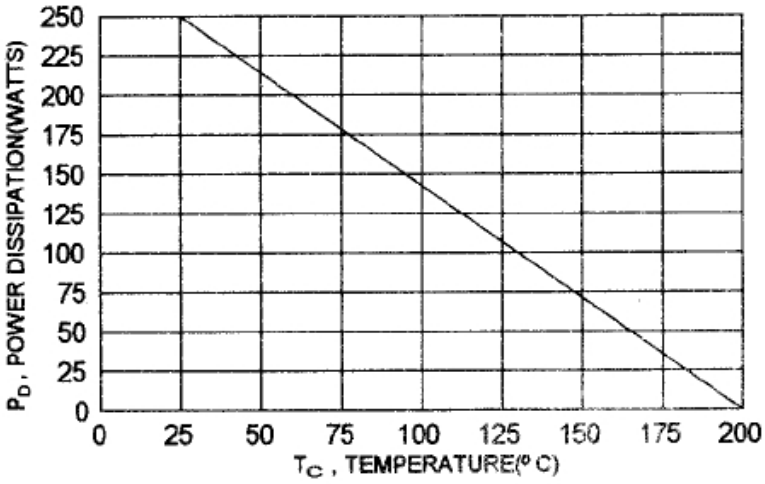

POWER DERATING