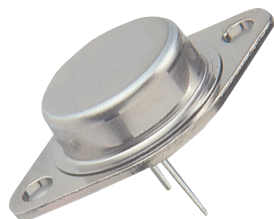


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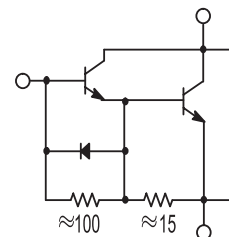


Description

The MJ10004 and MJ10005 darlington transistors are designed for high-voltage, high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switch-mode applications.

Features

- Continuous collector current - $I_C = 20A$
- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls



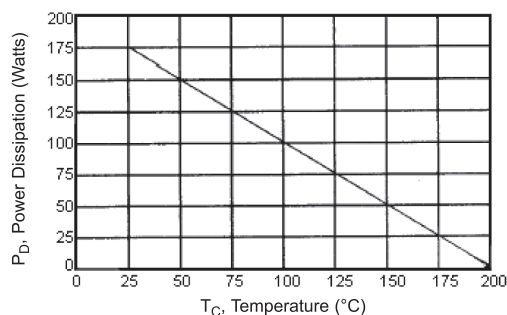
Maximum Ratings

Characteristic	Symbol	MJ10004	MJ10005	Unit
Collector - Emitter Voltage	V_{CEV}	450	500	V
	$V_{CEX(SUS)}$	400	450	
	$V_{CEO(SUS)}$	350	400	
Emitter - Base Voltage	V_{EBO}	8		
Collector Current - Continuous - Peak	I_C	20		A
	I_{CM}	30		
Base Current	I_B	2.5		
Total Power Dissipation @ $T_C = 25^\circ C$ @ $T_C = 100^\circ C$ Derate above $25^\circ C$	P_D	175		W
		100		W
		1		W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +200		$^\circ C$

Thermal Characteristics

Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to case	$R_{\theta jc}$	1	$^\circ C/W$

Figure - 1 Power Derating



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Electrical Characteristics (T_c = 25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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OFF Characteristics

Collector - Emitter Sustaining Voltage (I _c = 250mA, I _B = 0, V _{clamp} = Rated V _{CEO}) MJ10004 MJ10005	V _{CEO(SUS)}	350 400	-	V
Collector Cutoff Current (V _{CE} = Rated V _{CEV} , R _{BE} = 50Ω, T _C = 100°C)	I _{CER}	-	5.0	mA
Collector Cutoff Current (V _{CEV} = Rated Value, V _{BE(OFF)} = 1.5V) (V _{CEV} = Rated Value, V _{BE(OFF)} = 1.5V, T _C = 100°C)	I _{CEV}	-	0.25 5.0	
Emitter Cutoff Current (V _{EB} = 2.0V, I _C = 0)	I _{EBO}	-	175	

ON Characteristics (1)

DC Current Gain (I _C = 5.0A, V _{CE} = 5.0V) (I _C = 10A, V _{CE} = 5.0V)	h _{FE}	50 40	600 400	-
Collector - Emitter Saturation Voltage (I _C = 10A, I _B = 400mA) (I _C = 20A, I _B = 2.0A) (I _C = 10A, I _B = 400mA, T _C = 100°C)	V _{CE(SAT)}	-	1.9 3.0 2.0	V
Base-Emitter Saturation Voltage (I _C = 10A, I _B = 400mA) (I _C = 10A, I _B = 400mA, T _C = 100°C)	V _{BE(SAT)}	-	2.5 2.5	
Diode Forward Voltage (I _F = 10A)	V _F	-	5.0	

Dynamic Characteristics

Small-Signal Current Gain (2) (I _C = 1.0A, V _{CE} = 10V, f = 1.0MHz)	h _{FE}	10	-	-
Output Capacitance (V _{CB} = 10V, I _E = 0, f = 100KHz)	C _{OB}	100	-	pF

Switching Characteristics

Delay Time	V _{CC} = 250V, I _C = 10A I _{B1} = 400mA, V _{BE(OFF)} = 5.0V t _P = 50μs, Duty Cycle < 2%	t _D	-	0.2	μs
Rise Time		t _R	-	0.6	
Storage Time		t _S	-	1.5	
Fall Time		t _F	-	0.5	

(1) Pulse Test: Pulse Width = 300μs, Duty Cycle < 2.0%.

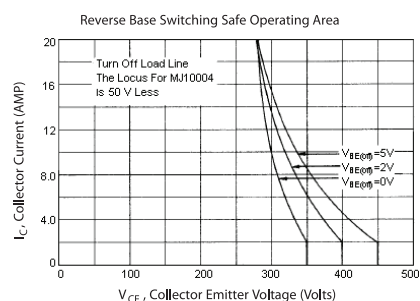
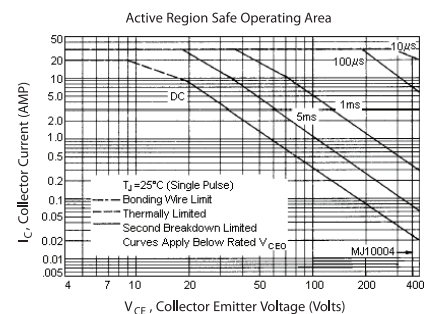
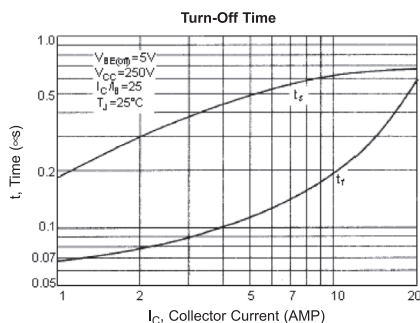
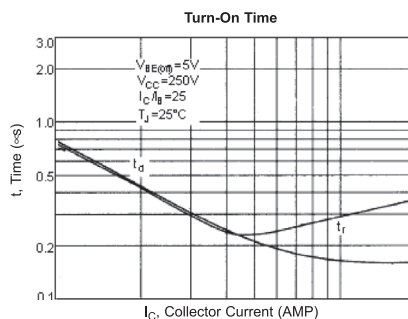
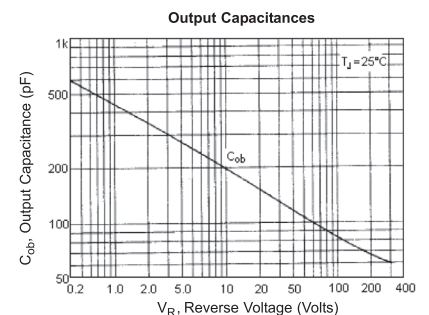
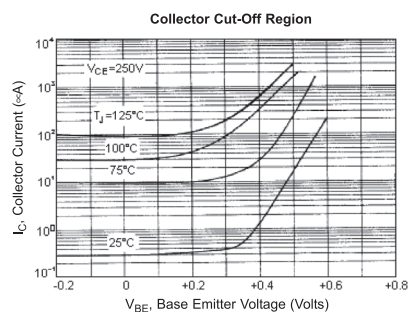
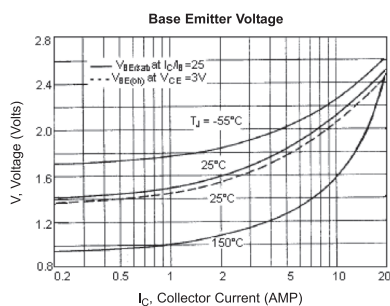
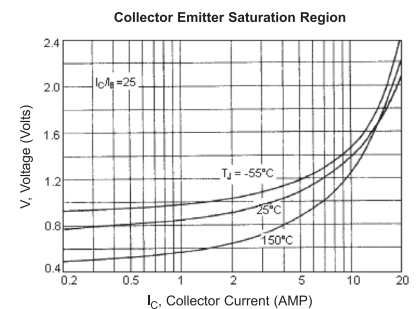
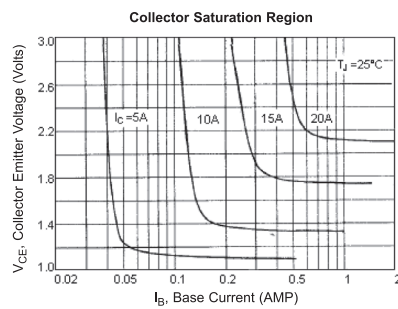
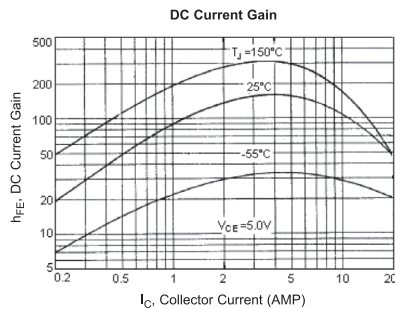
(2) f_T = |h_{FE}| • f_{TEST}

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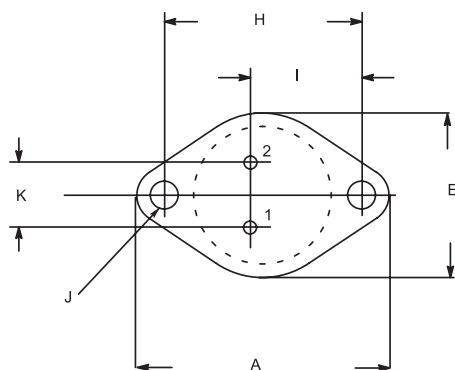
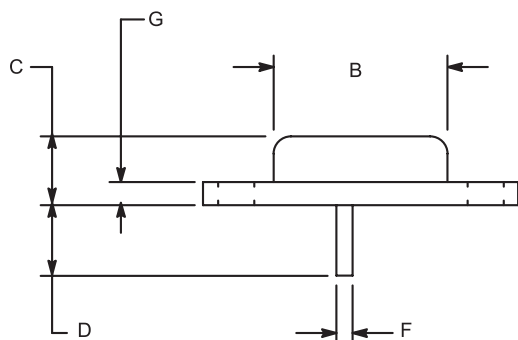
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Pin 1. Base
Pin 2. Emitter
Pin 3. Collector (Case)

DIM.	Min.	Max.
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

Dimensions : Millimetres

Part Number Table

Description	Part Number
Darlington Transistor, TO-3	MJ10004
Darlington Transistor, TO-3	MJ10005

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