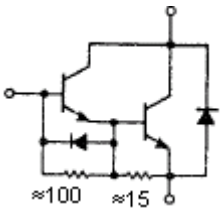
MJ10021

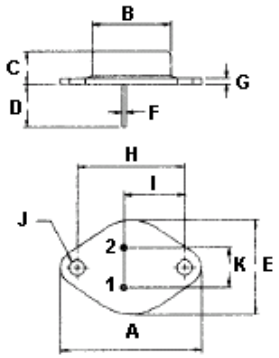
Darlington Power Transistor

NPN silicon power darlington transistors with Base-Emitter speedup diode are designed for high-voltage, high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switchmode applications.

Features:

- Continuous Collector Current - I_C = 60A.
- Switching regulators.
- Inverters.
- Solenoid and relay drivers.
- AC and DC Motor controls.





Pin 1. Base
2. Emitter
Collector(Case)

Dimensions	Minimum	Maximum
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

NPN
MJ10021

60 Ampere
Power Darlington
Transistors
250 Volts
250 Watts

TO-3

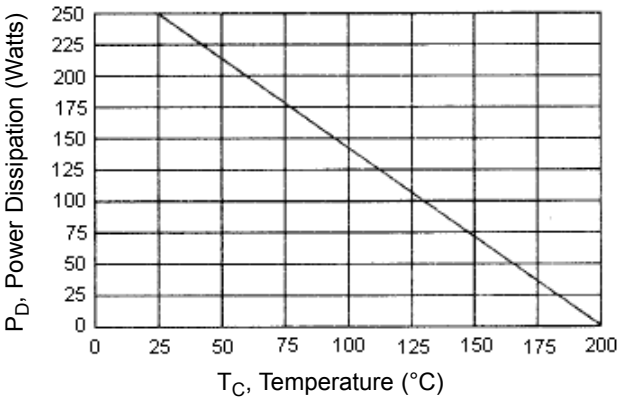
Maximum Ratings

Characteristic	Symbol	MJ10021	Unit
Collector-Emitter Voltage	V_{CEV}	250	V
Collector-Emitter Voltage	$V_{CEO(sus)}$	350	
Emitter-Base Voltage	V_{EBO}	8.0	
Collector Current-Continuous -Peak	I_C I_{CM}	60 100	A
Base Current	I_B	20	
Total Power Dissipation at 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 Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	Rθjc	0.7	°C/W

Figure-1 Power Derating



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

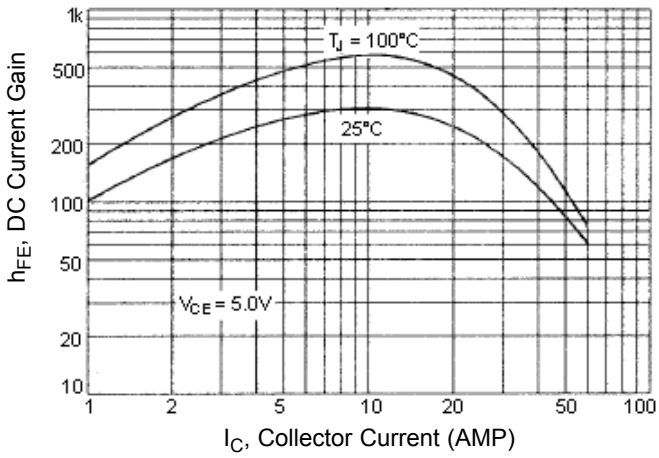
Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) (I_C = 100mA, I_B = 0)	$V_{CEO(sus)}$	250	-	V
Collector Cut off Current (V_{CEV} = Rated Value, $V_{BE(OFF)}$ = 1.5V) (V_{CEV} = Rated Value, $V_{BE(OFF)}$ = 1.5V, T_C = 150°C)	I_{CEV}	-	0.25 5.0	mA
Collector Cut off Current (V_{CE} = Rated V_{CEV}, R_{BE} = 50Ω, T_C = 100°C)	I_{CER}	-	5.0	
Emitter Cut off Current (V_{EB} = 2.0V, I_C = 0)	I_{EBO}	-	175	
ON Characteristics (1)				
DC Current Gain (I_C = 15A, V_{CE} = 5.0V)	h_{FE}	75	1000	-
Collector-Emitter Saturation Voltage (I_C = 30A, I_B = 1.2A) (I_C = 60A, I_B = 4.0A) (I_C = 30A, I_B = 1.2A, T_C =100°C)	$V_{CE(sat)}$	-	2.2 4.0 2.4	V
Base-Emitter Saturation Voltage (I_C = 30A, I_B = 1.2A) (I_C = 30A, I_B = 1.2A, T_C = 100°C)	$V_{BE(sat)}$	-	3.0 3.5	
Diode Forward Voltage (I_F = 30A)	V_F	-	5.0	
Dynamic Characteristics				
Output Capacitance (V_{CB} = 10V, I_E = 0, f = 1.0kHz)	C_{ob}	160	750	pF

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

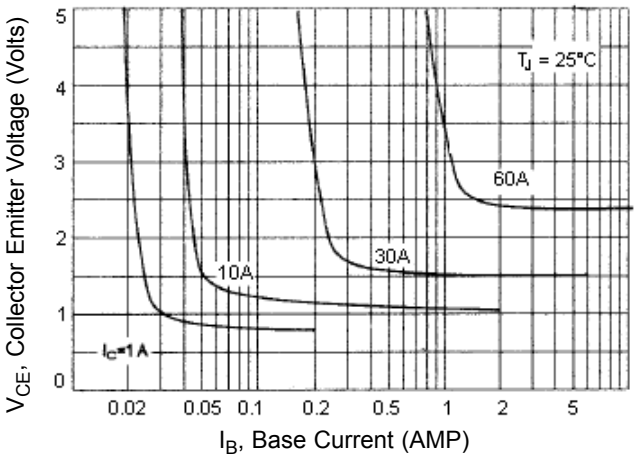
Characteristic		Symbol	Minimum	Maximum	Units
Switching Characteristics					
Delay Time	V_{CC} = 175V, I_C = 30A I_{B1} = 1.2A, $V_{BE(OFF)}$ = 5.0V tp = 25µs, Duty Cycle ≤2%	t_d	-	0.2	µs
Rise time		t_r	-	1.0	
Storage Time		t_s	-	3.5	
Fall Time		t_f	-	0.8	

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

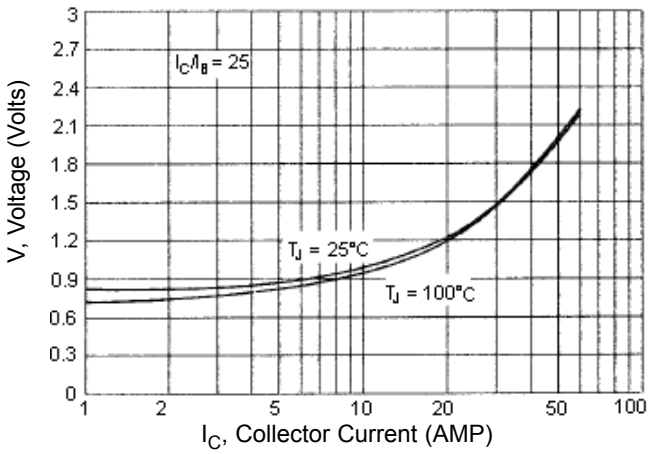
DC Current Gain



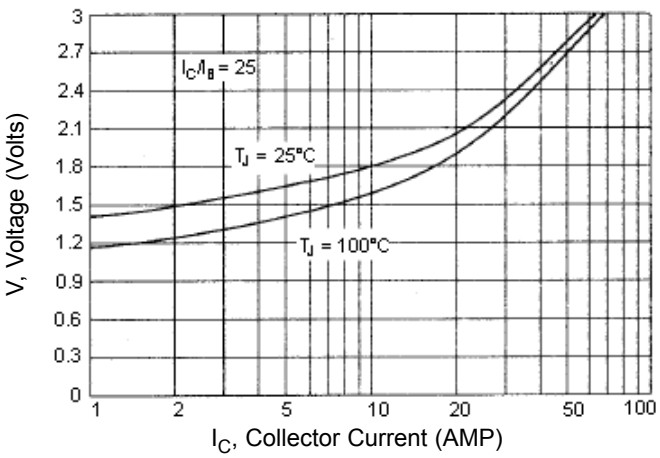
Collector Saturation Region



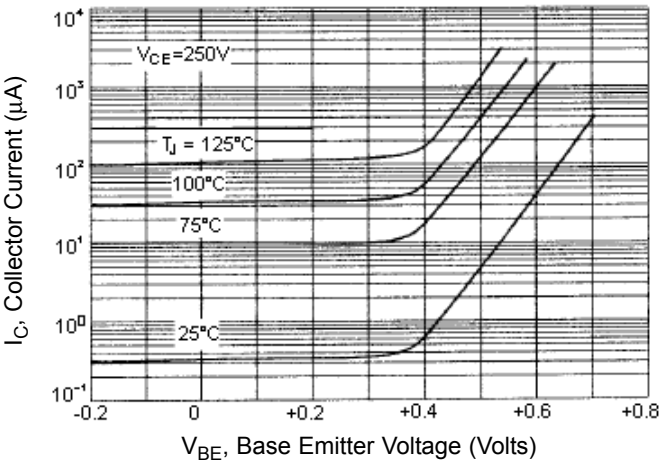
Collector Emitter Saturation Voltage



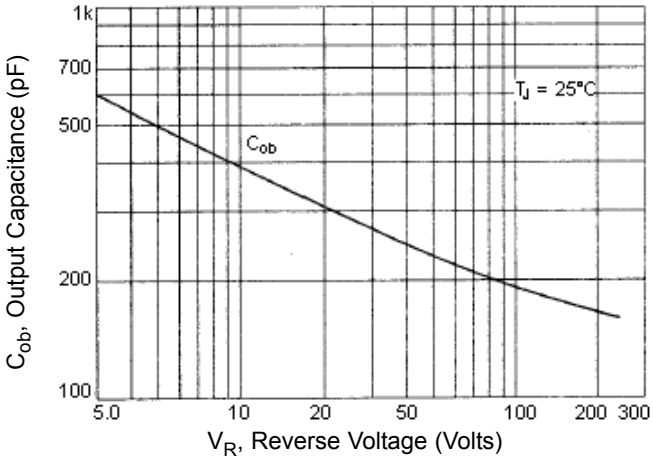
Base-Emitter Voltage



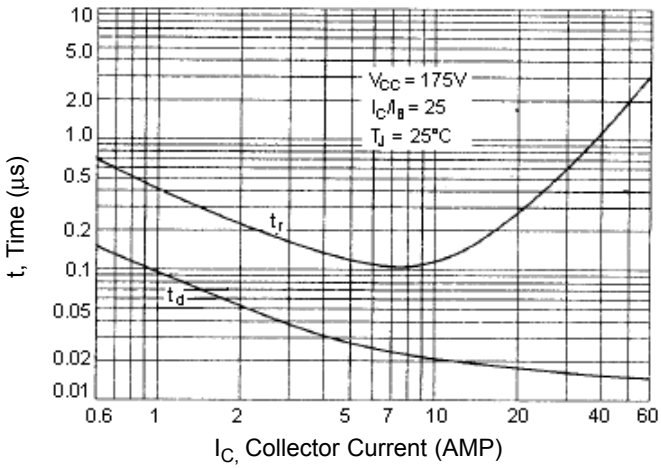
Collector Cut-Off Region



Output Capacitances



Turn-On Time



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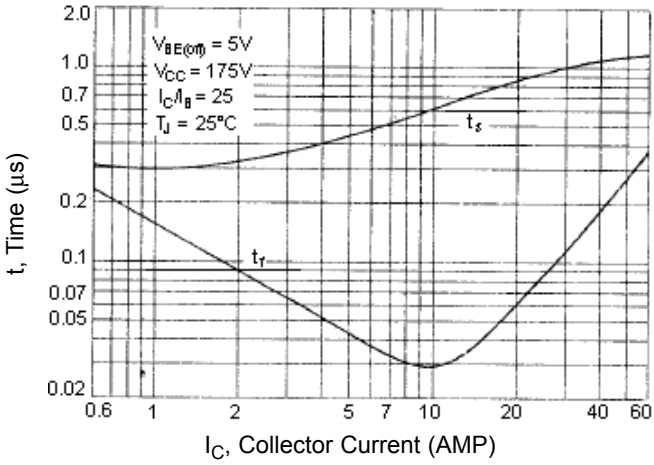
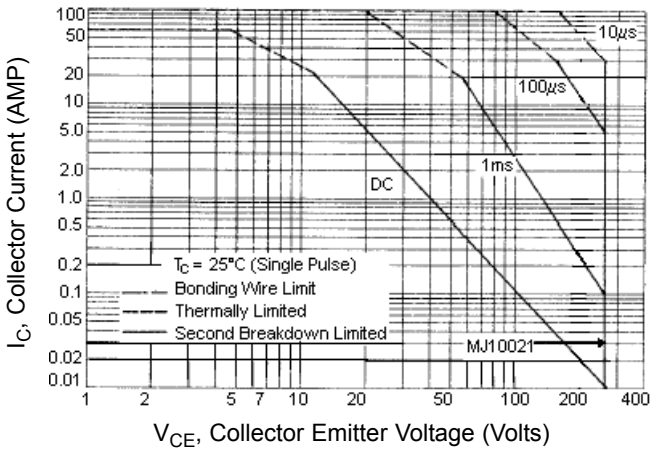
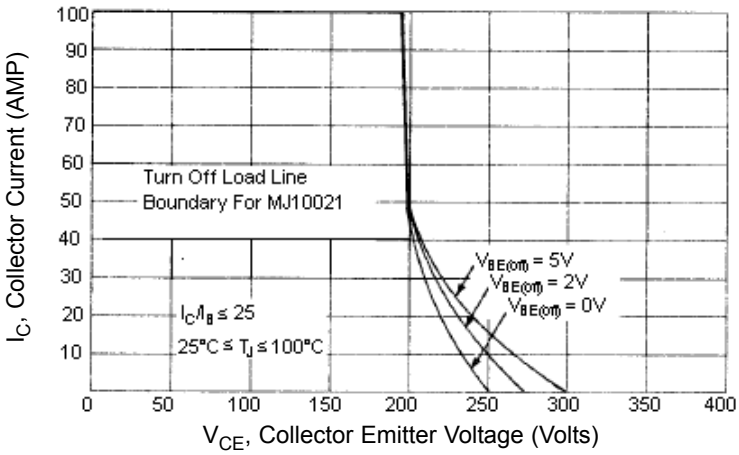


Active Region Safe Operating Area



Reverse Base Switching Safe Operating Area



MJ10021

Darlington Power Transistor

Specifications

$I_{C(av)}$ maximum (A)	V_{CEO} maximum (V)	h_{FE} minimum at I_C = 15A	P_{tot} at 25°C (W)	Package	Type	Part Number
60	350	75	250	TO-3	NPN	MJ10021

Notes:

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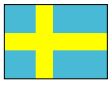

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