Darlington Power Transistor

Description

The MJ10021 is a darlington transistor in a TO-3 type package designed for high-voltage, high-speed, power switching in inductive circuits where fall time is critical. This device is particularly suited for line operated switchmode applications

Feature

- Continuous collector current - I_C = 60A

Applications

- Switching regulators
- Inverters
- Solenoid and relay drivers
- AC and DC motor controls

Absolute Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-Emitter Voltage	V_{CBS}	250	V
Collector-Emitter Voltage	V_{CEO}	350	
Emitter-Base Voltage	V_{EBO}	8	
Collector Current - Continuous - Peak	I_C I_{CM}	60 100	A
Base Current	I_B	20	
Total Power Dissipation T_C = 25°C T_C = +100°C Derate above +25°C	P_D	250 143 1.43	W W / °C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	65 to +200	°C
Thermal Resistance, Junction-to-Case	R_{THJC}	0.7	°C/W

Electrical Characteristics (T_{CASE} = 25°C unless otherwise specified)

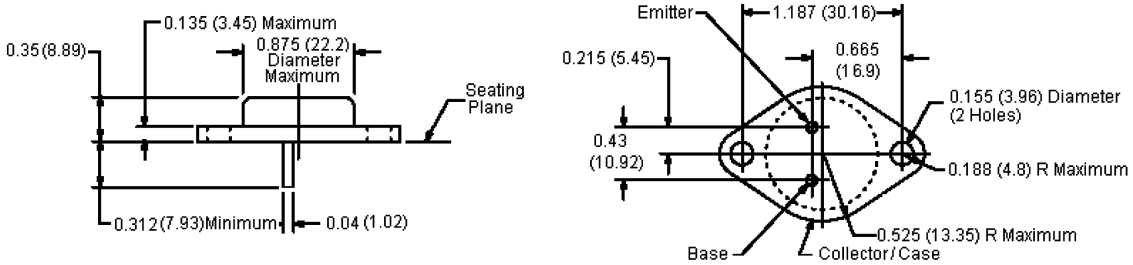
Parameter	Test Conditions		Symbol	Minimum	Maximum	Unit
Off Characteristics						
Collector-Emitter Sustaining Voltage	I_C = 100mA, I_B = 0		$V_{CEO\ (SUS)}$	250	-	V
Collector Cut off Current	V_{CEV} = 250V, $V_{BE\ (OFF)}$ = 1.5V		I_{CEV}	-	0.25	mA
		T_C = 150°C		-	5	
	V_{CEV} = 250V, R_{BE} = 50Ω, T_C = +100°C		I_{CER}	-		
Emitter Cut off Current	V_{EB} = 2V, I_C = 0		I_{EBO}	-	175	

Darlington Power Transistor

Parameter	Test Conditions	Symbol	Minimum	Maximum	Unit
On Characteristics (1)					
DC Current Gain	I_C = 15A, V_{CE} = 5V	h_{FE}	75	1,000	-
Collector-Emitter Saturation Voltage	I_C = 30A, I_B = 1.2A	$V_{CE\ (sat)}$	-	2.2	V
	I_C = 60A, I_B = 4A		-	4	
	I_C = 30A, I_B = 1.2A, T_C = +100°C		-	2.4	
Base-Emitter Saturation Voltage	I_C = 30A, I_B = 1.2A	$V_{BE\ (sat)}$	-	3	
	T_C = +100°C		-	3.5	
Diode Forward Voltage	I_F = 30A	V_F	-	5	
Dynamic Characteristics					
Output Capacitance	V_{CB} = 10V, I_E = 0, f = kHz	Cob	160	750	pF
Switching Characteristics					
Delay Time	V_{CC} = 175V, Ic = 30A, I_{B1} = 1.2A, $V_{BE\ (off)}$ = 5V, tp = 25µs, Duty Cycle ≤ 2%	t_d	-	0.2	µs
Rise Time		t_r	-	1	
Storage Time		t_s	-	3.5	
Fall Time		t_f	-	0.8	

(1) Pulse Test : Pulse Width = 300µs, Duty Cycle ≤2%

Diagram



Dimensions : Inches (Millimetres)

Part Number Table

Description	Part Number
Darlington Transistor, NPN, TO-3	MJ10021