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MJ10012
NPN Silicon Power Darlington Transistor
TO3 Type Package

Description:

The MJ10012 is high–voltage, high–current Darlington transistor in a TO3 type package designed for automotive ignition, switching regulation and motor control applications.

Features:

- Collector–Emitter Sustaining Voltage: $V_{CEO(sus)}$ = 400Vdc (Min)
- 175 Watts Capability at 50 Volts

Absolute Maximum Ratings:

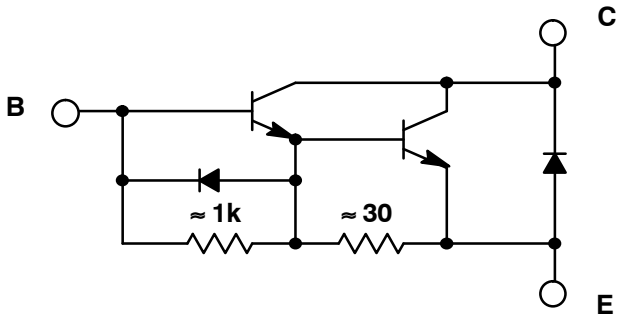
Collector–Emitter Voltage, V_{CEO} 400V
Collector–Emitter Voltage (R_{BE} = 27≤), V_{CER} 550V
Collector–Base Voltage, V_{CBO} 600V
Emitter–Base Voltage, V_{EBO} 8V
Collector Current, I_C
    Continuous 10A
    Peak (Note 1) 15A
Base Current, I_B 2A
Total Power Dissipation, P_D
    T_C = +25°C 175W
    T_C = +100°C 100W
        Derate Above 25°C . . . . . 1.0W/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.0°C/W
Lead Temperature (During Soldering, 1/8” from case, 5 sec), T_L . . . . . +275°C

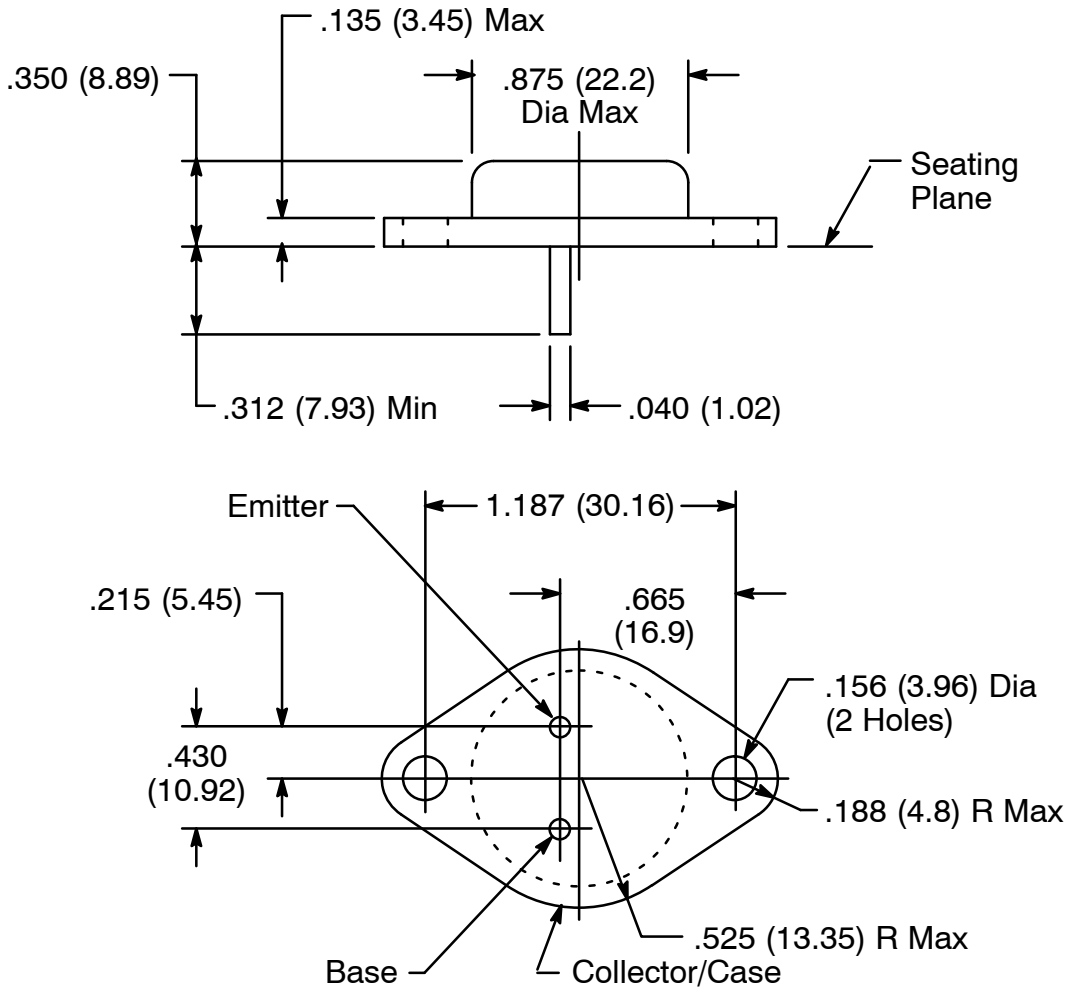
Note 1. Pulse Test: Pulse Width = 5ms, Duty Cycle ≤ 10%.

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics (Note 2)						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	I_C = 200mA, I_B = 0, V_{clamp} = 400V	400	–	–	V
	$V_{CER(sus)}$	I_C = 200mA, R_{BE} = 27≤, V_{clamp} = 400V	425	–	–	V
Collector Cutoff Current	I_{CER}	V_{CER} = 550V, R_{BE} = 27≤	–	–	1.0	mA
	I_{CBO}	V_{CBO}= 600V, I_E = 0	–	–	1.0	mA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 6V, I_C = 0	–	–	40	mA
ON Characteristics (Note 3)						
DC Current Gain	h_{FE}	V_{CE} = 6V, I_C = 3A	300	550	–	
		V_{CE} = 6V, I_C = 6A	100	350	2000	
		V_{CE} = 6V, I_C = 10A	20	150	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 3A, I_B = 600mA	–	–	1.5	V
		I_C = 6A, I_B = 600mA	–	–	2.0	V
		I_C = 10A, I_B = 2A	–	–	2.5	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 6A, I_B = 600mA	–	–	2.5	V
		I_C = 10A, I_B = 2A	–	–	3.0	V
Base–Emitter ON Voltage	$V_{BE(on)}$	I_C = 10A, V_{CE} = 6V	–	–	2.8	V
Diode Forward Voltage	V_F	I_F = 10A	–	2.0	3.5	V
Dynamic Characteristics						
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f_{test} = 100kHz	165	–	350	pF
Switching Characteristics						
Storage Time	t_s	V_{CC} = 12V, I_C = 6A, I_{B1} = I_{B2} = 300mA	–	7.5	15	°s
Fall Time	t_f		–	5.2	15	°s
Functional Tests						
Pulsed Energy Test	$I_C2_L/2$		–	–	180	mJ

Note 2. Pulse Test: Pulse Width = 300° s, Duty Cycle = 2%.




.135 (3.45) Max
.350 (8.89)
.875 (22.2)
Dia Max
Seating
Plane
.312 (7.93) Min
.040 (1.02)
Emitter
1.187 (30.16)
.215 (5.45)
.665
(16.9)
.156 (3.96) Dia
(2 Holes)
.430
(10.92)
.188 (4.8) R Max
.525 (13.35) R Max
Base
Collector/Case

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