

Transistor, PNP TO-3

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Description:

Complementary silicon power transistors.

The MJ15004 power transistors designed for high power audio, disk head positioners and other linear applications.

Features:

- High safe operating area (100% tested) - 5A at 50V
- For low distortion complementary designs
- High DC current gain = $h_{FE} = 25$ (min.) at $I_C = 5A$ DC
- Pb-free packages

Maximum Ratings

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	140	V DC
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}		
Collector Current-Continuous	I_C	20	A DC
Base Current-Continuous	I_B	5	
Emitter Current-Continuous	I_E	25	
Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	250 1.43	W 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	$R_{\theta JC}$	0.7	$^\circ C/W$
Max. Lead Temperature for Soldering Purposes 1/16 inches from Case for ≤ 10 seconds	T_L	265	$^\circ C$

Max. ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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Electrical Characteristics ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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Off Characteristics

Collector-Emitter Sustaining Voltage (1) ($I_C = 200\text{mA DC}$, $I_B = 0$)	$V_{CEO(sus)}$	140	-	V DC
Collector Cut off Current ($V_{CE} = 140\text{V DC}$, $V_{BE(off)} = 1.5\text{V DC}$) ($V_{CE} = 140\text{V DC}$, $V_{BE(off)} = 1.5\text{V DC}$, $T_C = 150^\circ\text{C}$)	I_{CEX}	-	100 2	$\mu\text{A DC}$ mA DC
Collector Cut off Current ($V_{CE} = 140\text{V DC}$, $I_B = 0$)	I_{CEO}	-	250	$\mu\text{A DC}$
Emitter Cut off Current ($V_{EB} = 5\text{V DC}$, $I_C = 0$)	I_{EBO}	-	100	

Second Breakdown

Second Breakdown Collector Current with Base Forward Biased ($V_{CE} = 50\text{V DC}$, $t = 1\text{s}$ (non repetitive)) ($V_{CE} = 100\text{V DC}$, $t = 1\text{s}$ (non repetitive))	$I_{S/b}$	5 1	- -	A DC
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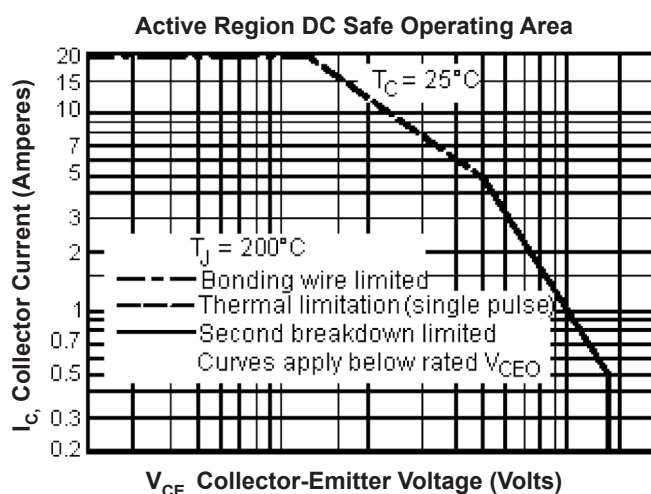
On Characteristics

DC Current Gain ($I_C = 5\text{A DC}$, $V_{CE} = 2\text{V DC}$)	h_{FE}	25	150	-
Collector-Emitter Saturation Voltage ($I_C = 5\text{A DC}$, $I_B = 0.5\text{A DC}$)	$V_{CE(sat)}$	-	1	V DC
Base-Emitter On Voltage ($I_C = 5\text{A DC}$, $V_{CE} = 2\text{V DC}$)	$V_{BE(on)}$	-	2	

Dynamic Characteristics

Current-Gain Bandwidth Product ($I_C = 0.5\text{A DC}$, $V_{CE} = 10\text{V DC}$, $f_{test} = 0.5\text{MHz}$)	f_T	2	-	MHz
Output Capacitance ($V_{CB} = 10\text{V DC}$, $I_E = 0$, $f_{test} = 1\text{MHz}$)	C_{OB}	-	1,000	pF

1. Pulse Test: Pulse Width = $300\mu\text{s}$, Duty Cycle $\leq 2\%$



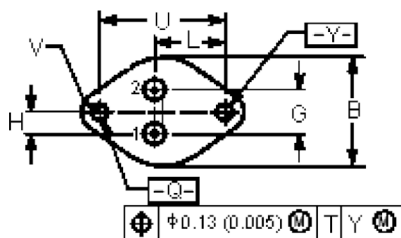
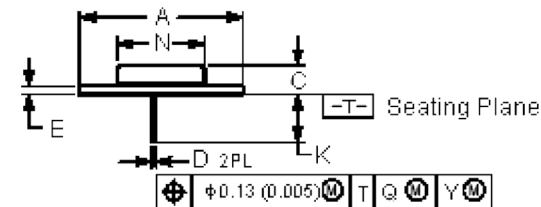
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data is based on $T_{J(pk)} = 200^\circ\text{C}$; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

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Dimensions



Dimensions	Min.	Max.
A	1.55 (39.37)	Reference
B	-	1.05 (26.67)
C	0.25 (6.35)	0.335 (8.51)
D	0.038 (0.97)	0.043 (1.09)
E	0.055 (1.4)	0.07 (1.77)
G	0.43 (10.92)	BSC
H	0.215 (5.46)	BSC
K	0.44 (11.18)	0.48 (12.19)
L	0.665 (16.89)	BSC
N	-	0.83 (21.08)
Q	0.151 (3.84)	0.165 (4.19)
U	1.187 (30.15)	BSC
V	0.131 (3.33)	0.188 (4.77)

Dimensions : Inches (Millimetres)

Pin Configuration:

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

Part Number Table

Description	Part Number
Transistor, PNP, TO-3	MJ15004

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