

**RoHS
Compliant**



Description

Complementary silicon power transistor.

The MJ15003 power transistor designed for high power audio, disk head positions and other linear applications.

Features

- High DC Current Gain- $h_{FE} = 1000$ (Min) @ $I_C = 25A$ DC
 $h_{FE} = 400$ (Min) @ $I_C = 50A$ DC
- Curves to 100 A (Pulsed)
- Diode Protection to Rated I_C
- Monolithic Construction with Built-In Base-Emitter Shunt Resistor
- Junction Temperature to $+200^{\circ}C$
- Pb-free package

Absolute Maximum Ratings ($T_a = 25^{\circ}C$)

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 Device 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

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.7	$^{\circ}C / W$
Maximum Lead Temperature for Soldering Purpose 1/6 inches from Case for ≤ 10 Seconds	T_L	265	$^{\circ}C$

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

Characteristic	Symbol	Min.	Max.	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage (Note 1) ($I_C = 200mA$ DC, $I_B = 0$)	$V_{EO(sus)}$	140	-	V DC

Characteristic	Symbol	Min.	Max.	Unit
Collector Cut off Current ($V_{CE} = 140V$ DC, $V_{BE(off)} = 1.5V$ DC) ($V_{CE} = 140V$ DC, $V_{BE(off)} = 1.5V$ DC, $T_C = 150^\circ C$)	I_{CEX}	-	100 2	μA DC mA DC
Collector Cut off Current ($V_{CE} = 140V$ DC, $I_B = 0$)	I_{CEO}	-	250	μA DC
Emitter Cut off Current ($V_{EB} = 5V$ dc $I_C = 0$)	I_{EBO}	-	100	
Second Breakdown				
Second Breakdown Collector Current with Base Forward Biased ($V_{CE} = 50V$ DC, $t = 1s$ (non repetitive)) ($V_{CE} = 100V$ DC, $t = 1s$ (non repetitive))	$I_{S/b}$	5 1	-	A DC
On Characteristic				
DC Current Gain ($I_C = 5A$ DC, $V_{CE} = 2V$ DC)	h_{FE}	25	150	-
Collector-Emitter Saturation Voltage ($I_C = 5A$ DC, $I_B = 0.5A$ DC)	$V_{CE(sat)}$	-	1	V DC
Base-Emitter On Voltage ($I_C = 5A$ DC, $V_{CE} = 2V$ DC)	$V_{BE(on)}$	-	2	
Dynamic Characteristics				
Current-Gain - Bandwidth Product ($I_C = 0.5A$ DC, $V_{CE} = 10V$ DC, $f_{test} = 0.5MHz$)	f_T	2	-	MHz
Output Capacitance ($V_{CB} = 10V$ DC, $I_E = 0$, $f_{test} = 1MHz$)	C_{ob}	-	1,000	pF

1. Pulse Test : Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.

Typical Characteristics Curves

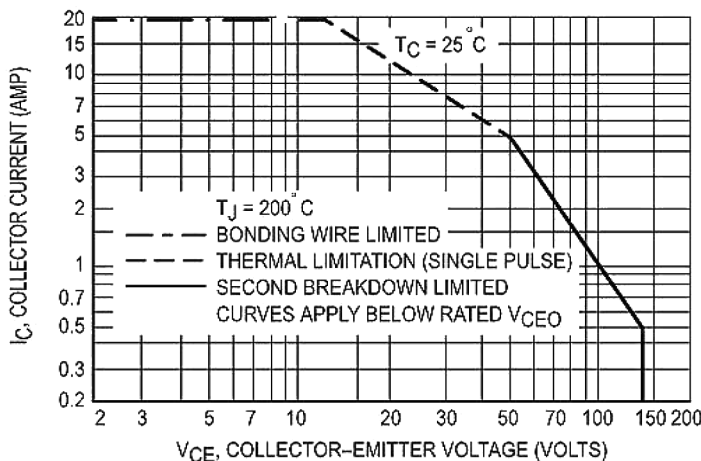
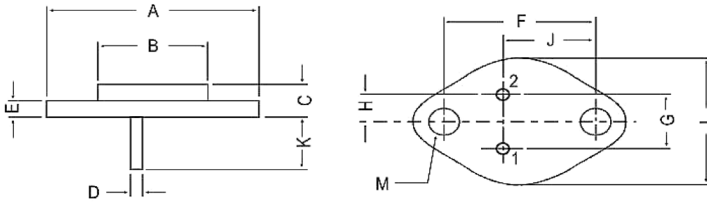


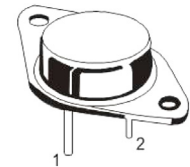
Figure 1. Active-Region Safe Operating Area

Diagram



Dimensions	Minimum	Maximum
A	-	39.37
B	-	22.22
c	6.35	8.5
D	0.96	1.09
E	-	1.77
F	29.9	30.4
rG	10.69	11.18
H	5.2	5.72
J	16.64	17.15
K	11.15	12.25
L	-	26.67
M	3.84	4.19

Dimensions : Millimetres



Pin Configuration

1. Base
2. Emitter
3. Collector

Part Number Table

Description	Part Number
Transistor, NPN, TO-3	MJ15003

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