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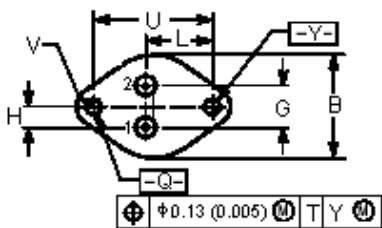
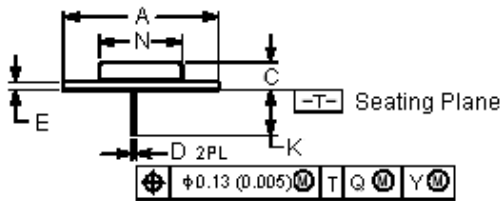
Silicon power transistors.

The MJ15023 powerBase™ power transistors designed for high power audio, disk head positioners and other linear applications.

Features:

- High safe operating area (100% tested) - 2A at 80V.
- High DC current gain = $h_{FE} = 15$ (minimum) at $I_C = 8A$ dc.
- Pb-free packages.

(TO-3)



Style 1:

1. Base
 2. Emitter
- Collector (Case)

Dimensions	Minimum	Maximum
A	1.550 (39.37)	Reference
B	-	1.050 (26.67)
C	0.250 (6.35)	0.335 (8.51)
D	0.038 (0.97)	0.043 (1.09)
E	0.055 (1.40)	0.070 (1.77)
G	0.430 (10.92) BSC	
H	0.215 (5.46) BSC	
K	0.440 (11.18)	0.480 (12.19)
L	0.665 (16.89) BSC	
N	-	0.830 (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)

16 Amperes
Silicon Power Transistors
200 - 250 Volts, 250 Watts



(TO-3)
Case 1-07
Style 1

Maximum Ratings

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	MJ15023	V_{CEO}	200
Collector-Base Voltage	MJ15023	V_{CBO}	350
Emitter-Base Voltage		V_{EBO}	5
Collector-Emitter Voltage		V_{CEX}	400
Collector Current-Continuous -Peak (Note 1)		I_C	16 30
Base Current-Continuous		I_B	5
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C		P_D	250 1.43
Operating and Storage Junction Temperature Range		T_J, T_{stg}	-65 to +200

Thermal Characteristics

Characteristics	Symbol	Maximum	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.70	$^\circ\text{C/W}$

Maximum 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.

1. Pulse Test: Pulse Width = 5ms, Duty Cycle $\leq 10\%$.

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

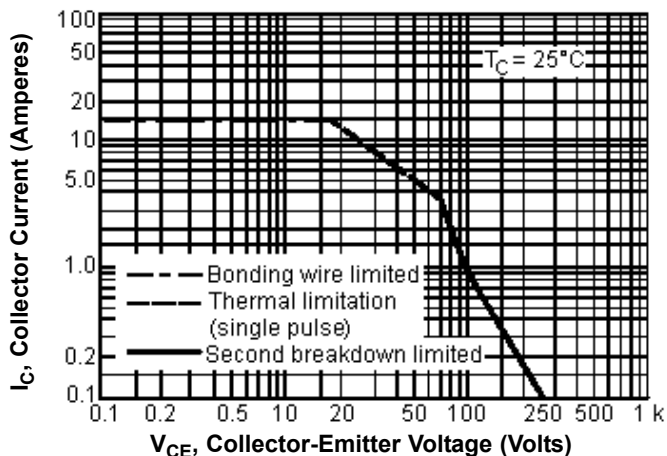
Characteristic	Symbol	Minimum	Maximum	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage (Note 2) ($I_C = 100\text{mA dc}, I_B = 0$)	MJ15023	$V_{CEO(sus)}$	200	-
Collector Cut off Current ($V_{CE} = 200\text{V dc}, V_{BE(off)} = 1.5\text{V dc}$)	MJ15023	I_{CEX}	-	250
Collector Cut off Current ($V_{CE} = 150\text{V dc}, I_B = 0$)	MJ15023	I_{CEO}	-	500
Emitter Cut off Current ($V_{CE} = 5\text{V dc}, I_B = 0$)		I_{EBO}	-	
Second Breakdown				
Second Breakdown Collector Current with Base Forward Biased ($V_{CE} = 50\text{V dc}, t = 0.5\text{s}$ (Non-repetitive)) ($V_{CE} = 80\text{V dc}, t = 0.5\text{s}$ (Non-repetitive))		$I_{S/b}$	5 2	- -

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

On Characteristic				
DC Current Gain ($I_C = 8\text{A dc}, V_{CE} = 4\text{V dc}$) ($I_C = 16\text{A dc}, V_{CE} = 4\text{V dc}$)	h_{FE}	15 5	60 -	-
Collector-Emitter Saturation Voltage ($I_C = 8\text{A dc}, I_B = 0.8\text{A dc}$) ($I_C = 16\text{A dc}, I_B = 3.2\text{A dc}$)	$V_{CE(sat)}$	-	1.4 4.0	V dc
Base-Emitter On Voltage ($I_C = 8\text{A dc}, V_{CE} = 4\text{V dc}$)	$V_{BE(on)}$	-	2.2	
Dynamic Characteristics				
Current-Gain Bandwidth Product ($I_C = 1\text{A dc}, V_{CE} = 10\text{V dc}, f_{test} = 1\text{MHz}$)	f_T	4	-	MHz
Output Capacitance ($V_{CB} = 10\text{V dc}, I_E = 0, f_{test} = 1\text{MHz}$)	C_{ob}	-	600	pF

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

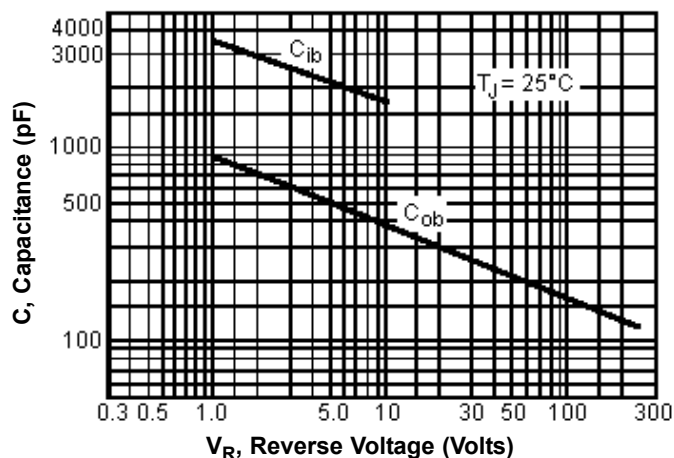
Active Region DC Safe Operating Area



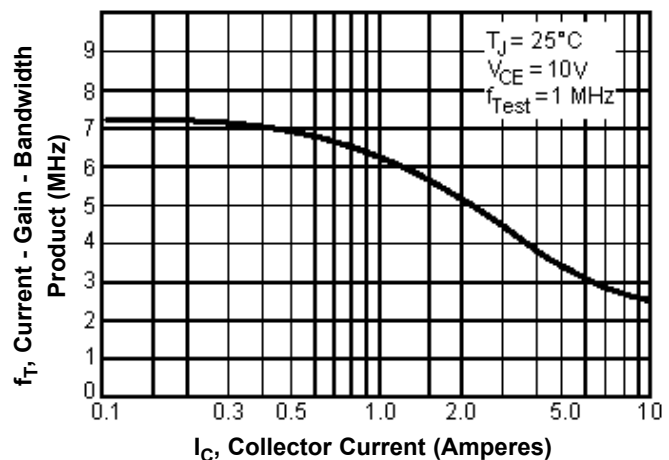
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation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

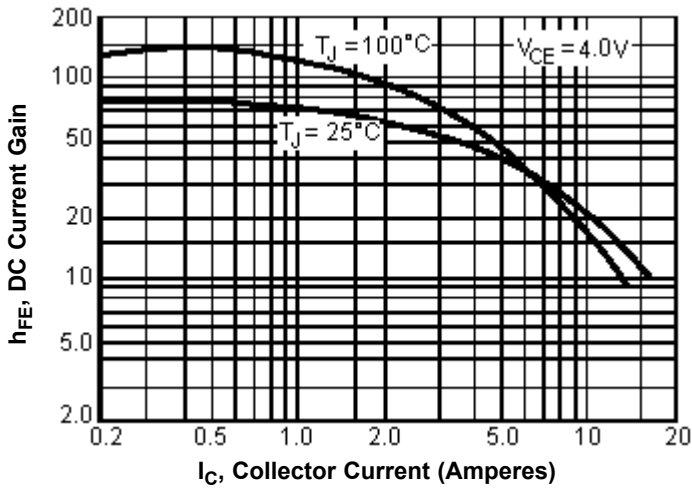
Capacitances



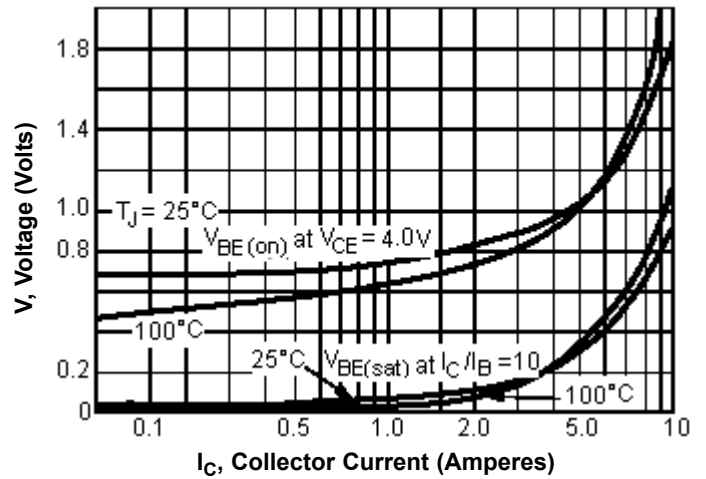
Current - Gain - Bandwidth Product



DC Current Gain



"On" Voltages



Part Number Table

Description	Part Number
Transistor, PNP, TO-3	MJ15023

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