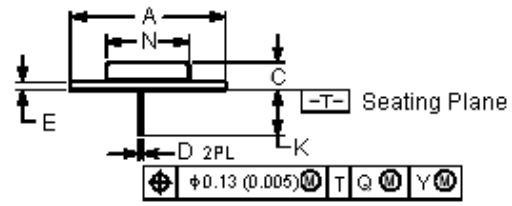
1165922

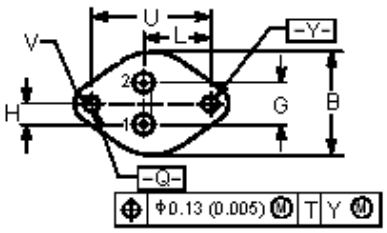
Silicon power transistors.
The MJ15023 powerBase™ power transistors designed for high power audio, disk head positioners and other linear applications.

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)



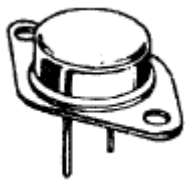


Style 1:
Pin 1. Base
2. Emitter
Collector (Case)

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	V dc
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	A dc
Base Current-Continuous		I_B	5	
Total Power Dissipation at T_C = 25°C Derate above 25°C		P_D	250 1.43	W W/°C
Operating and Storage Junction Temperature Range		T_J, T_{stg}	-65 to +200	°C

Thermal Characteristics

Characteristics	Symbol	Maximum	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.70	°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 ≤10%.

Electrical Characteristics (T_C = 25°C unless otherwise noted)

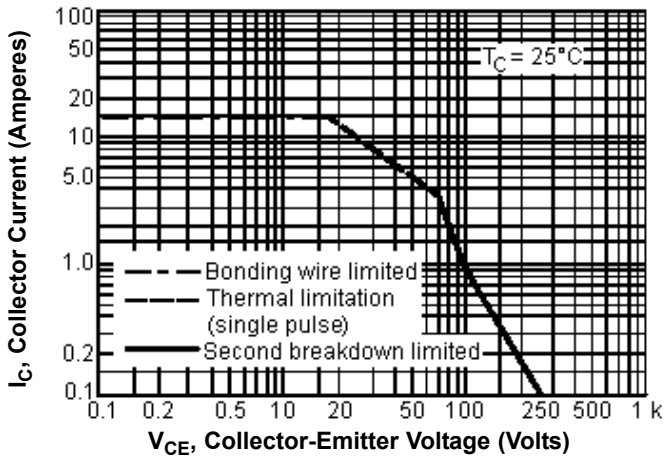
Characteristic		Symbol	Minimum	Maximum	Unit
Off Characteristics					
Collector-Emitter Sustaining Voltage (Note 2) (I_C = 100mA dc, I_B = 0)	**MJ15023**	$V_{CEO\ (sus)}$	200	-	-
Collector Cut off Current (V_{CE} = 200V dc, $V_{BE\ (off)}$ = 1.5V dc)	**MJ15023**	I_{CEX}	-	250	µA dc
Collector Cut off Current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

Electrical Characteristics (T_C = 25°C unless otherwise noted)

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

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

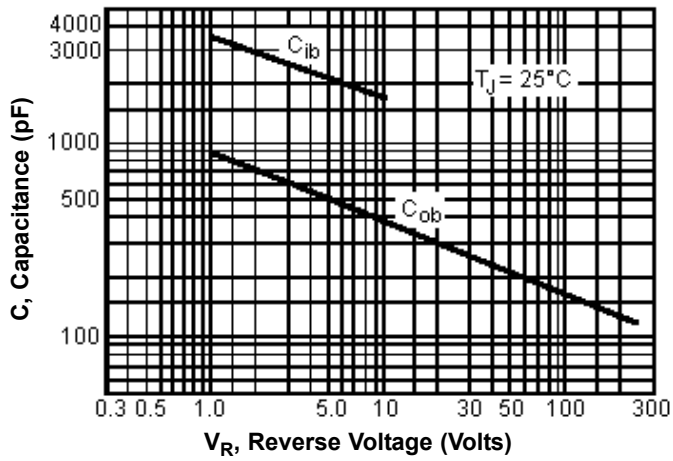
Active Region DC Safe Operating Area



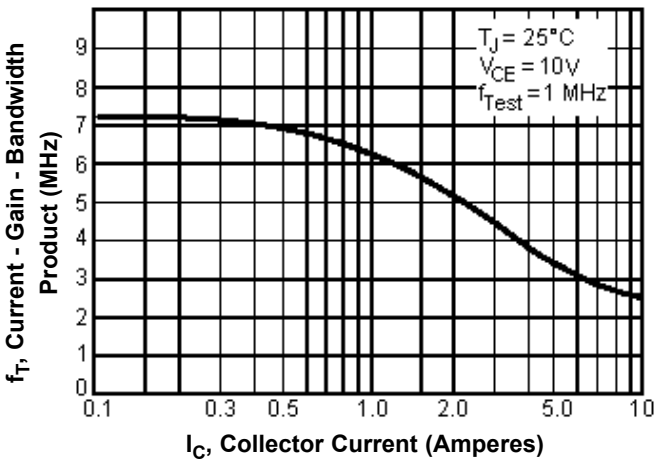
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation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

The data is based on $T_{J\ (pk)}$ = 200°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.

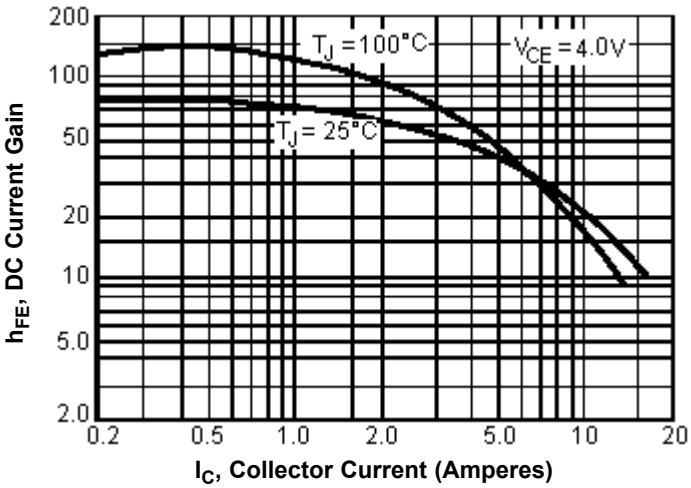
Capacitances



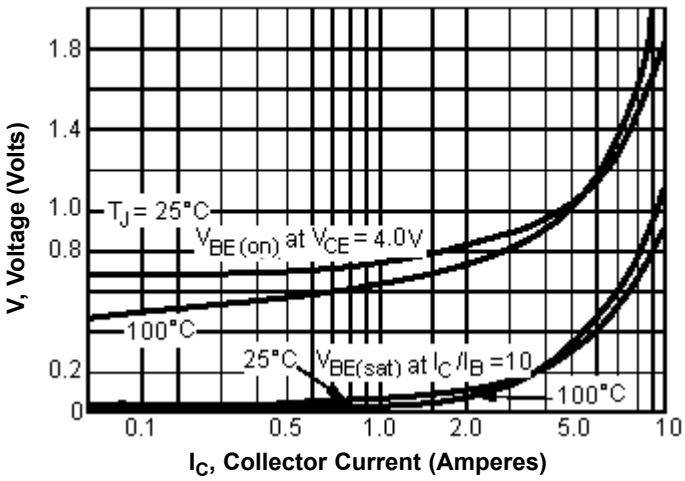
Current - Gain - Bandwidth Product



DC Current Gain



"On" Voltages



Part Number Table

Description	Part Number
Transistor, PNP, TO-3	MJ15023