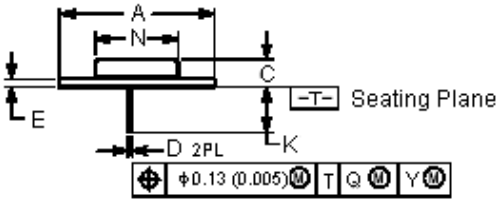
1165921

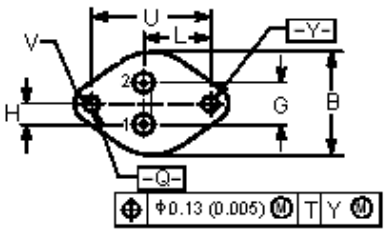
Complementary silicon power transistors.
The MJ15004 powerBase™ power transistors designed for high power audio, disk head positioners and other linear applications.

Features:

- High safe operating area (100% tested) - 5.0A at 50V.
- For low distortion complementary designs.
- High DC current gain = h_{FE} = 25 (minimum) at I_C = 5A dc.
- Pb-free packages.

(TO-3)



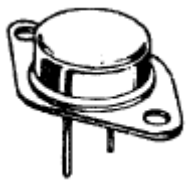


Style 1:
Pin 1. Base
2. Emitter
Collector (Case)

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)

20 Ampere Darlington
Power Transistors
Complementary Silicon
140 Volts, 250 Watts



(TO-3)
Case 1-07
Style 1

Maximum Ratings

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	140	V dc
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5	
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°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 Lead Temperature for Soldering Purposes 1/16 inches from Case for ≤10 seconds	T_L	265	°C

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.

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

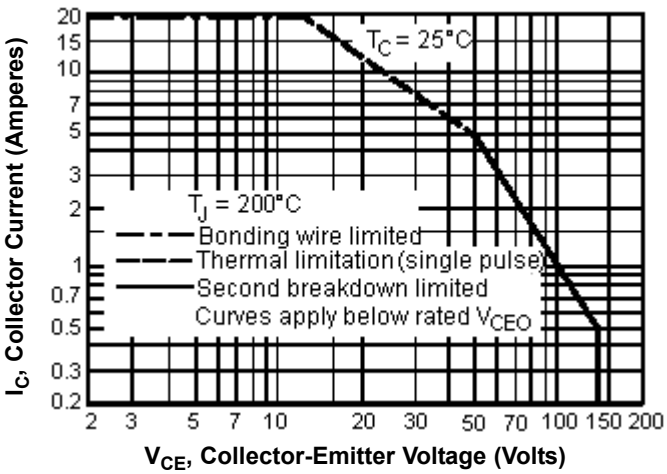
Characteristic	Symbol	Minimum	Maximum	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage (1) (I_C = 200mA dc, I_B = 0)	$V_{CEO\ (sus)}$	140	-	V dc
Collector Cut off Current (V_{CE} = 140V dc, $V_{BE\ (off)}$ = 1.5V dc) (V_{CE} = 140V dc, $V_{BE\ (off)}$ = 1.5V dc, T_C = 150°C)	I_{CEX}	-	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	

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

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)	$I_{S/b}$	5.0 1.0	- -	A dc
On Characteristics				
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)	$V_{CE\ (sat)}$	-	1.0	V dc
Base-Emitter On Voltage (I_C = 5A dc, V_{CE} = 2V dc)	$V_{BE\ (on)}$	-	2.0	
Dynamic Characteristics				
Current-Gain Bandwidth Product (I_C = 0.5A dc, V_{CE} = 10V dc, f_{test} = 0.5MHz)	f_T	2.0	-	MHz
Output Capacitance (V_{CB} = 10V dc, I_E = 0, f_{test} = 1MHz)	C_{ob}	-	1000	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.

Part Number Table

Description	Part Number
Transistor, PNP, TO-3	MJ15004