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MJ15003 (NPN), MJ15004 (PNP)

Complementary Silicon Power Transistors

20 AMPERE
POWER TRANSISTORS
COMPLEMENTARY SILICON
140 VOLTS, 250 WATTS

MAXIMUM RATINGS

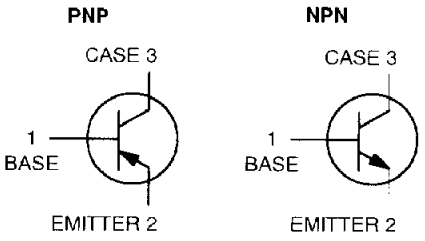
Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	140	Vdc
Collector–Base Voltage	V_{CBO}	140	Vdc
Emitter–Base Voltage	V_{EBO}	5	Vdc
Collector Current – Continuous	I_C	20	Adc
Base Current – Continuous	I_B	5	Adc
Emitter Current – Continuous	I_E	25	Adc
Total Power Dissipation @ T_C = 25°C Derate 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

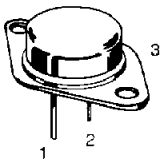
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	0.70	°C/W
Maximum Lead Temperature for Soldering Purposes 1/16″ from Case for ≤ 10 secs	T_L	265	°C

SCHEMATIC





TO–204AA (TO–3)
CASE 1–07
STYLE 1

MARKING DIAGRAM

MJ1500x = Device Code
x = 3 or 4
G = Pb–Free Package
A = Location Code
YY = Year
WW = Work Week
MEX = Country of Orgin

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector Emitter Sustaining Voltage (Note 1) (I_C = 200 mAdc, I_B = 0)	$V_{CEO(sus)}$	140	–	Vdc
Collector Cutoff Current (V_{CE} = 140 Vdc, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = 140 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 150°C)	I_{CEX}	– –	100 2	μAdc mAdc
Collector Cutoff Current (V_{CE} = 140 Vdc, I_B = 0)	I_{CEO}	–	250	μAdc
Emitter Cutoff Current (V_{EB} = 5 Vdc, I_C = 0)	I_{EBO}	–	100	μAdc
SECOND BREAKDOWN				
Second Breakdown Collector Current with Base Forward Biased (V_{CE} = 50 Vdc, t = 1 s (non repetitive)) (V_{CE} = 100 Vdc, t = 1 s (non repetitive))	$I_{S/b}$	 5.0 1.0	 – –	Adc
ON CHARACTERISTICS				
DC Current Gain (I_C = 5 Adc, V_{CE} = 2 Vdc)	h_{FE}	25	150	–
Collector Emitter Saturation Voltage (I_C = 5 Adc, I_B = 0.5 Adc)	$V_{CE(sat)}$	–	1.0	Vdc
Base Emitter On Voltage (I_C = 5 Adc, V_{CE} = 2 Vdc)	$V_{BE(on)}$	–	2.0	Vdc
DYNAMIC CHARACTERISTICS				
Current Gain — Bandwidth Product (I_C = 0.5 Adc, V_{CE} = 10 Vdc, f_{test} = 0.5 MHz)	f_T	2.0	–	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)	C_{ob}	–	1000	pF

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