MJ2500, MJ2501 PNP (SILICON)
MJ3000, MJ3001 NPN

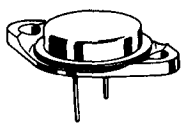
MEDIUM-POWER COMPLEMENTARY SILICON TRANSISTORS

. . . for use as output devices in complementary general purpose *amplifier applications.*

- High DC Current Gain – h_{FE} = 4000 (Typ) @ I_C = 5.0 Adc
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors

10 AMPERE DARLINGTON POWER TRANSISTORS COMPLEMENTARY SILICON

60–80 VOLTS
150 WATTS

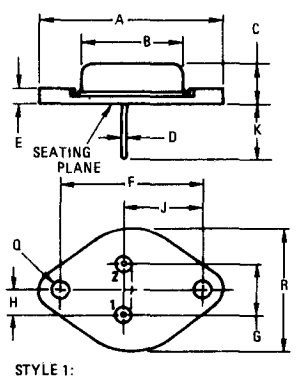


MAXIMUM RATINGS

Rating	Symbol	MJ2500 MJ3000	MJ2501 MJ3001	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CB}	60	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current	I_C	10		Adc
Base Current	I_B	0.2		Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	150 0.857		Watts W/°C
Operating and Storage Junction *Temperature Range*	T_J, T_{stg}	-55 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.17	°C/W



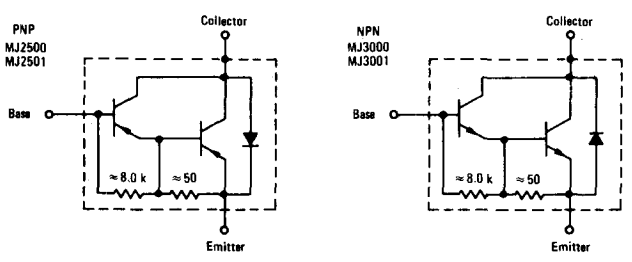
STYLE 1:
PIN 1. BASE
2. EMITTER
CASE: COLLECTOR

NOTE:
1. DIM "Q" IS DIA.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	–	39.37	–	1.550
B	–	21.08	–	0.830
C	6.35	7.62	0.250	0.300
D	0.99	1.09	0.039	0.043
E	–	3.43	–	0.135
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.33	5.59	0.210	0.220
J	16.64	17.15	0.655	0.675
K	11.18	12.19	0.440	0.480
Q	3.84	4.09	0.151	0.161
R	–	26.67	–	1.050

CASE 11

FIGURE 1 – DARLINGTON CIRCUIT SCHEMATIC



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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = 100 mAdc, I_B = 0)	MJ2500, MJ3000	BV_{CEO}	60	–	Vdc
	MJ2501, MJ3001		80	–	
Collector Emitter Leakage Current		I_{CER}			mAdc
(V_{CB} = 60 Vdc, R_{BE} = 1.0 k ohm)	MJ2500, MJ3000		–	1.0	
(V_{CB} = 80 Vdc, R_{BE} = 1.0 k ohm)	MJ2501, MJ3001		–	1.0	
(V_{CB} = 60 Vdc, R_{BE} = 1.0 k ohm, T_C = 150°C)	MJ2500, MJ3000		–	5.0	
(V_{CB} = 80 Vdc, R_{BE} = 1.0 k ohm, T_C = 150°C)	MJ2501, MJ3001		–	5.0	
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	–	2.0	mAdc
Collector-Emitter Leakage Current		I_{CEO}			mAdc
(V_{CE} = 30 Vdc, I_B = 0)	MJ2500, MJ3000		–	1.0	
(V_{CE} = 40 Vdc, I_B = 0)	MJ2501, MJ3001		–	1.0	
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 5.0 Adc, V_{CE} = 3.0 Vdc)		h_{FE}	1000	–	–
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 5.0 Adc, I_B = 20 mAdc)			–	2.0	
(I_C = 10 Adc, I_B = 50 mAdc)			–	4.0	
Base-Emitter Voltage (I_C = 5.0 Adc, V_{CE} = 3.0 Vdc)		V_{BE}	–	3.0	Vdc

(1)Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

FIGURE 2 – DC CURRENT GAIN

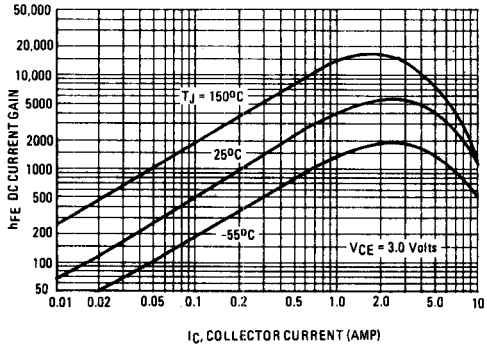


FIGURE 3 – SMALL-SIGNAL CURRENT GAIN

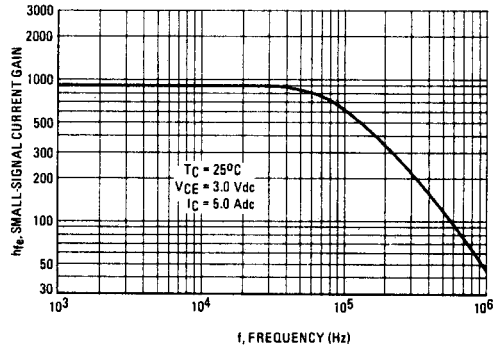


FIGURE 4 – "ON" VOLTAGES

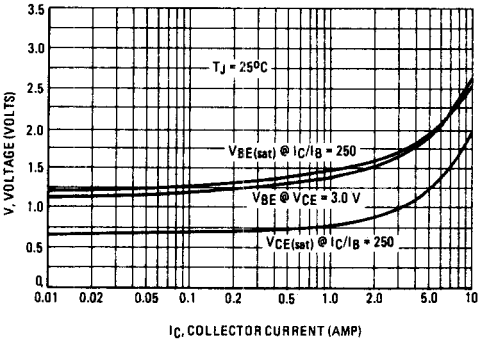
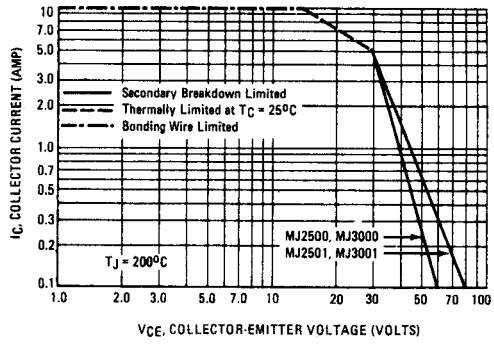


FIGURE 5 – DC SAFE OPERATING AREA



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

At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by secondary breakdown. (See AN-415)