

MJ900, MJ901 PNP (SILICON) MJ1000, MJ1001 NPN



MEDIUM-POWER COMPLEMENTARY SILICON TRANSISTORS

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

- High DC Current Gain -- $h_{FE} = 6000$ (Typ) @ $I_C = 3.0$ Adc
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors

8.0 AMPERE DARLINGTON POWER TRANSISTORS COMPLEMENTARY SILICON

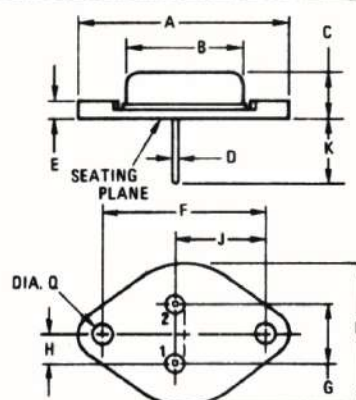
60-80 VOLTS
90 WATTS

MAXIMUM RATINGS

Rating	Symbol	MJ900 MJ1000	MJ901 MJ1001	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	8.0		Adc
Base Current	I_B	0.1		Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	90		Watts
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +200		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.94	$^\circ\text{C/W}$



STYLE 1:

PIN 1. BASE
2. EMITTER
CASE: COLLECTOR

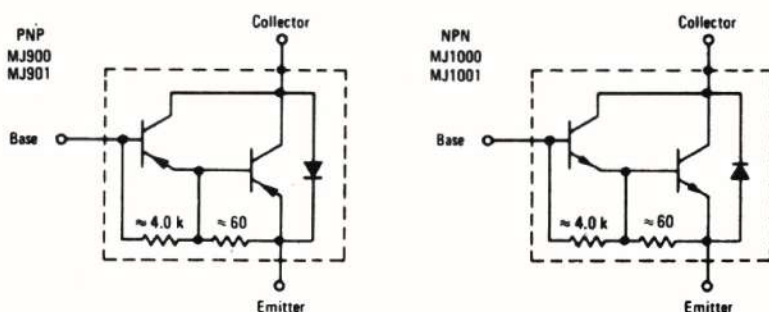
NOTE:
1. DIM "Q" IS DIA.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	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
L	3.84	4.09	0.151	0.161
M	—	26.67	—	1.050

Collector connected to case.

CASE 11-01
(TO-3)

FIGURE 1 — DARLINGTON CIRCUIT SCHEMATIC



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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (1) ($I_C = 100 \text{ mAdc}$, $I_B = 0$)	BV_{CEO}	60 80	— —	Vdc
Collector Emitter Leakage Current ($V_{CB} = 60 \text{ Vdc}$, $R_{BE} = 1.0 \text{ k ohm}$)	I_{CER}	—	1.0	mAdc
($V_{CB} = 80 \text{ Vdc}$, $R_{BE} = 1.0 \text{ k ohm}$)		—	1.0	
($V_{CB} = 60 \text{ Vdc}$, $R_{BE} = 1.0 \text{ k ohm}$, $T_C = 150^\circ\text{C}$)		—	5.0	
($V_{CB} = 80 \text{ Vdc}$, $R_{BE} = 1.0 \text{ k ohm}$, $T_C = 150^\circ\text{C}$)		—	5.0	
Emitter Cutoff Current ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	2.0	mAdc
Collector-Emitter Leakage Current ($V_{CE} = 30 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	500	μAdc
($V_{CE} = 40 \text{ Vdc}$, $I_B = 0$)		—	500	
ON CHARACTERISTICS				
DC Current Gain(1) ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 3.0 \text{ Vdc}$) ($I_C = 4.0 \text{ Adc}$, $V_{CE} = 3.0 \text{ Vdc}$)	h_{FE}	1000 750	— —	—
Collector-Emitter Saturation Voltage(1) ($I_C = 3.0 \text{ Adc}$, $I_B = 12 \text{ mAdc}$) ($I_C = 8.0 \text{ Adc}$, $I_B = 40 \text{ mAdc}$)	$V_{CE(sat)}$	— —	2.0 4.0	Vdc
Base-Emitter Voltage(1) ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 3.0 \text{ Vdc}$)	V_{BE}	—	2.5	Vdc

(1) Pulse Test Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

FIGURE 2 — DC CURRENT GAIN

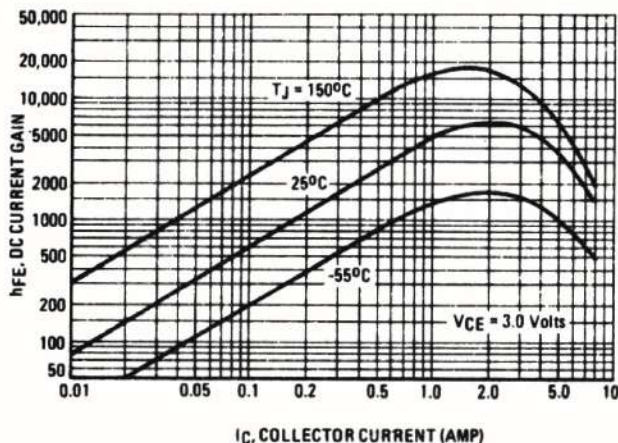


FIGURE 3 — SMALL-SIGNAL CURRENT GAIN

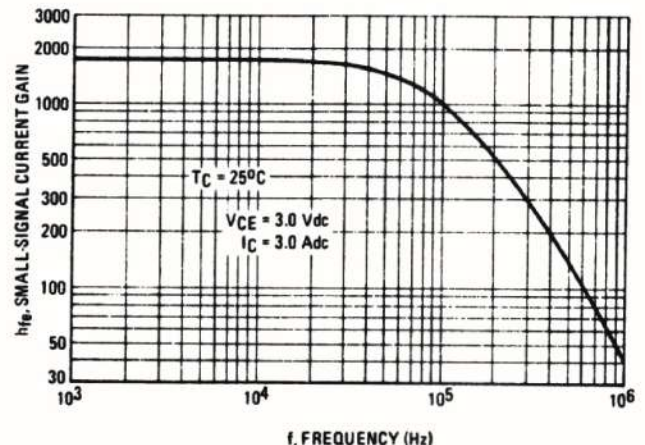
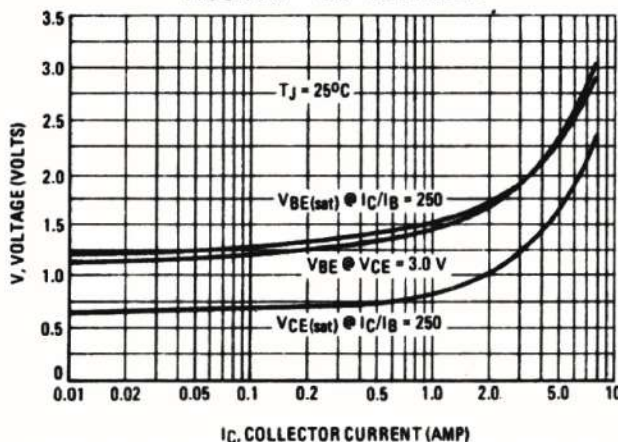
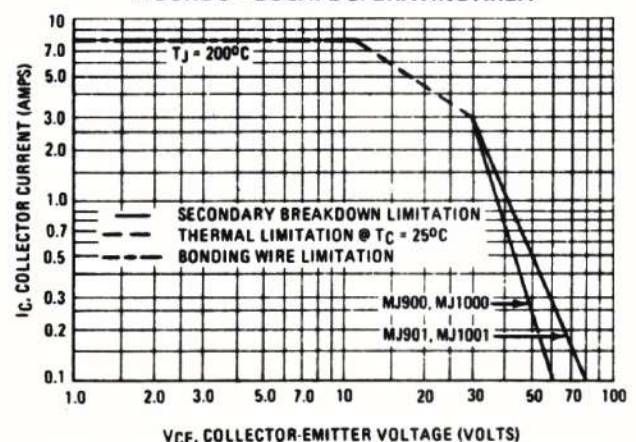


FIGURE 4 — "ON" VOLTAGES



There are two limitations on the power handling ability of a transistor: average 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

FIGURE 5 — DC SAFE OPERATING AREA



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.