MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MJ900, MJ901
NPN
MJ1000, MJ1001

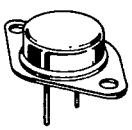
MEDIUM-POWER COMPLEMENTARY SILICON TRANSISTORS

. . . 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



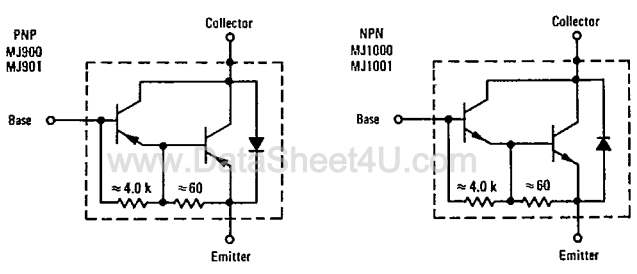
MAXIMUM RATINGS

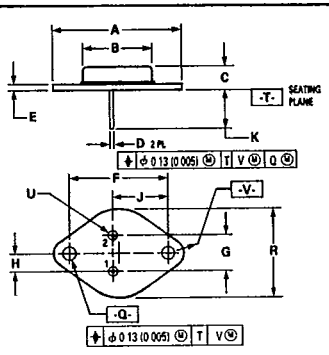
Rating	Symbol	MJ900 MJ1000	MJ901 MJ1001	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CB}	60	80	Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current	I_C	8.0		Adc
Base Current	I_B	0.1		Adc
Total Device Dissipation @ $T_C = 25^oC$ Derate above 25^oC	P_D	90 0.515		Watts W/^oC
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +200		^oC

THERMAL CHARACTERISTICS

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

FIGURE 1 — DARLINGTON CIRCUIT SCHEMATIC





NOTES.
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO 204AA OUTLINE SHALL APPLY.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	—	39.37	—	1.550
B	—	21.08	—	0.830
C	6.35	8.25	0.250	0.325
D	0.97	1.09	0.038	0.043
E	1.40	1.77	0.055	0.070
F	30.15 BSC		1.187 BSC	
G	10.92 BSC		0.430 BSC	
H	5.46 BSC		0.215 BSC	
J	16.89 BSC		0.665 BSC	
K	11.18	12.19	0.440	0.480
Q	3.84	4.19	0.151	0.165
R	—	26.67	—	1.050
U	4.83	5.33	0.190	0.210
V	3.84	4.19	0.151	0.165

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

CASE 1-06
TO-204AA
(TO-3)

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)	MJ900, MJ1000	$V_{(BR)CEO}$	60	–	Vdc
	MJ901, MJ1001		80	–	
Collector Emitter Leakage Current		I_{CER}			mAdc
(V_{CB} = 60 Vdc, R_{BE} = 1.0 k ohm)	MJ900, MJ1000		–	1.0	
(V_{CB} = 80 Vdc, R_{BE} = 1.0 k ohm)	MJ901, MJ1001		–	1.0	
(V_{CB} = 60 Vdc, R_{BE} = 1.0 k ohm, T_C = 150°C)	MJ900, MJ1000		–	5.0	
(V_{CB} = 80 Vdc, R_{BE} = 1.0 k ohm, T_C = 150°C)	MJ901, MJ1001		–	5.0	
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	–	2.0	mAdc
Collector-Emitter Leakage Current		I_{CEO}			μAdc
(V_{CE} = 30 Vdc, I_B = 0)	MJ900, MJ1000		–	500	
(V_{CE} = 40 Vdc, I_B = 0)	MJ901, MJ1001		–	500	
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 3.0 Adc, V_{CE} = 3.0 Vdc)		h_{FE}	1000	–	–
(I_C = 4.0 Adc, V_{CE} = 3.0 Vdc)			750	–	
Collector-Emitter Saturation Voltage(1) (I_C = 3.0 Adc, I_B = 12 mAdc)		$V_{CE(sat)}$	–	2.0	Vdc
(I_C = 8.0 Adc, I_B = 40 mAdc)			–	4.0	
Base-Emitter Voltage(1) (I_C = 3.0 Adc, V_{CE} = 3.0 Vdc)		V_{BE}	–	2.5	Vdc

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

FIGURE 2 – DC CURRENT GAIN

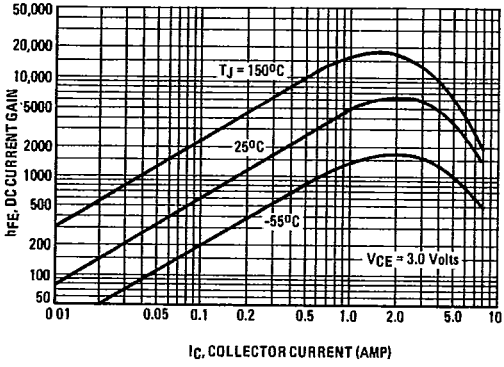


FIGURE 3 – SMALL-SIGNAL CURRENT GAIN

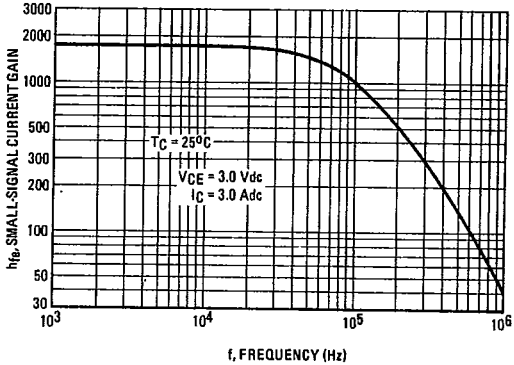


FIGURE 4 – "ON" VOLTAGES

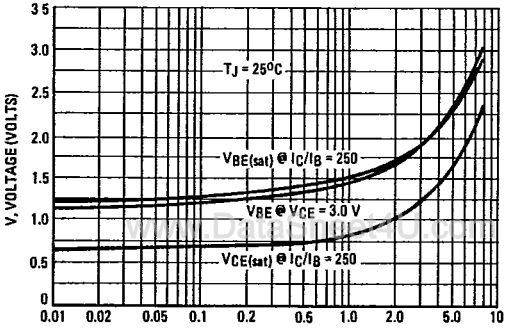
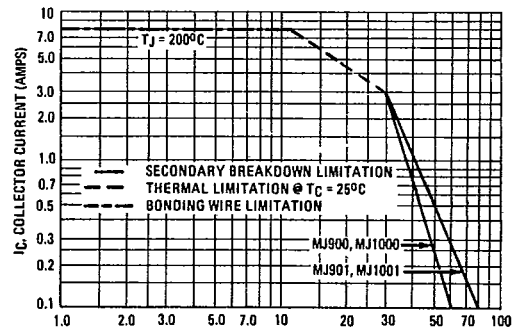


FIGURE 5 – DC SAFE OPERATING AREA



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