

**MJ2955 (See 2N3055)
MJ2955A
(See 2N3055A)**

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

**PNP
MJ2500
MJ2501*
NPN
MJ3000
MJ3001***

*Motorola Preferred Device

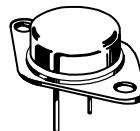
MAXIMUM RATINGS

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 @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D		150 0.857	Watts W/ $^\circ\text{C}$
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	θ_{JC}	1.17	$^\circ\text{C/W}$

**10 AMPERE
DARLINGTON
POWER TRANSISTORS
COMPLEMENTARY
SILICON
60–80 VOLTS
150 WATTS**



**CASE 1-07
TO-204AA
(TO-3)**

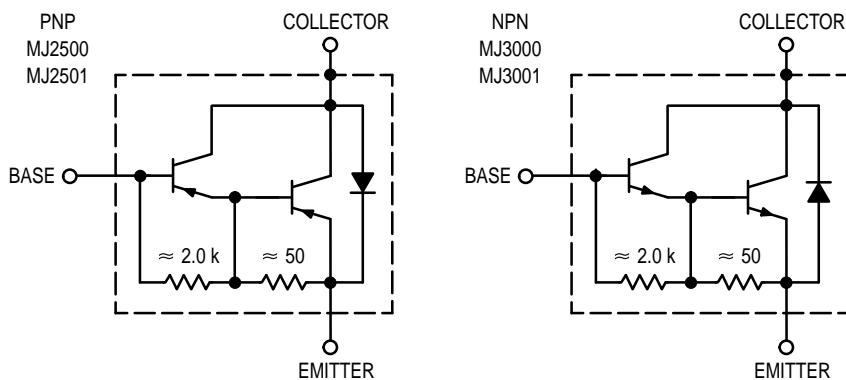


Figure 1. Darlington Circuit Schematic

Preferred devices are Motorola recommended choices for future use and best overall value.

REV 7

MJ2500 MJ2501 MJ3000 MJ3001

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 100 \text{ mA}_\text{dc}$, $I_B = 0$)	$V_{(\text{BR})\text{CEO}}$	60 80	—	Vdc
Collector-Emitter Leakage Current ($V_{\text{EB}} = 60 \text{ Vdc}$, $R_{\text{BE}} = 1.0 \text{ k ohm}$) ($V_{\text{EB}} = 80 \text{ Vdc}$, $R_{\text{BE}} = 1.0 \text{ k ohm}$) ($V_{\text{EB}} = 60 \text{ Vdc}$, $R_{\text{BE}} = 1.0 \text{ k ohm}$, $T_C = 150^\circ\text{C}$) ($V_{\text{EB}} = 80 \text{ Vdc}$, $R_{\text{BE}} = 1.0 \text{ k ohm}$, $T_C = 150^\circ\text{C}$)	I_{CER}	—	1.0 1.0 5.0 5.0	mA_dc
Emitter Cutoff Current ($V_{\text{BE}} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	2.0	mA_dc
Collector Emitter Leakage Current ($V_{\text{CE}} = 30 \text{ Vdc}$, $I_B = 0$) ($V_{\text{CE}} = 40 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	1.0 1.0	mA_dc
ON CHARACTERISTICS⁽¹⁾				
DC Current Gain ($I_C = 5.0 \text{ Adc}$, $V_{\text{CE}} = 3.0 \text{ Vdc}$)	h_{FE}	1000	—	—
Collector-Emitter Saturation Voltage ($I_C = 5.0 \text{ Adc}$, $I_B = 20 \text{ mA}_\text{dc}$) ($I_C = 10 \text{ Adc}$, $I_B = 50 \text{ mA}_\text{dc}$)	$V_{\text{CE}(\text{sat})}$	— —	2.0 4.0	Vdc
Base Emitter Voltage ($I_C = 5.0 \text{ Adc}$, $V_{\text{CE}} = 3.0 \text{ Vdc}$)	$V_{\text{BE}(\text{on})}$	—	3.0	Vdc

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

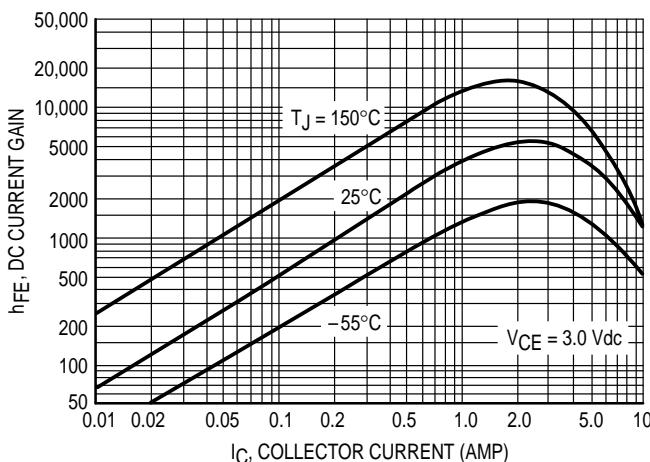


Figure 2. DC Current Gain

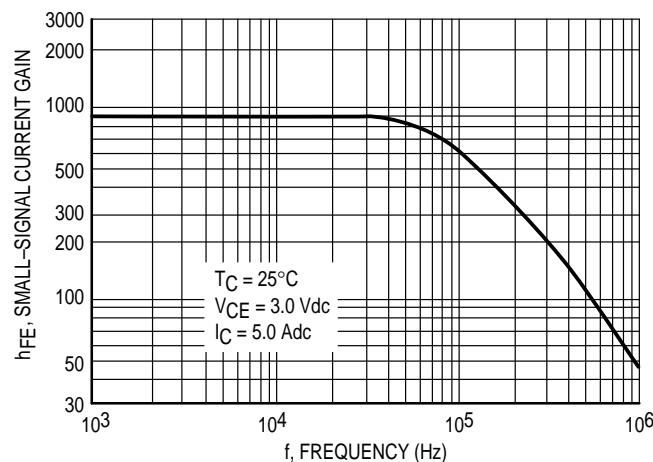


Figure 3. Small-Signal Current Gain

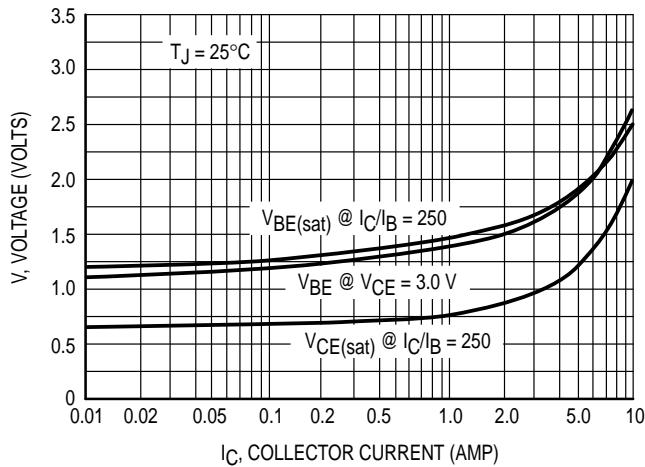


Figure 4. "On" Voltages

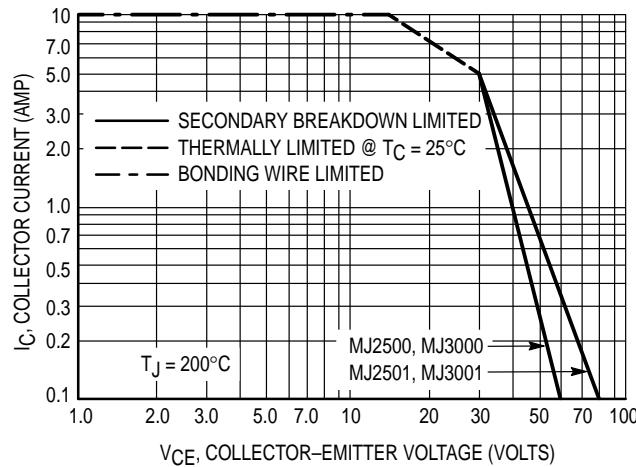


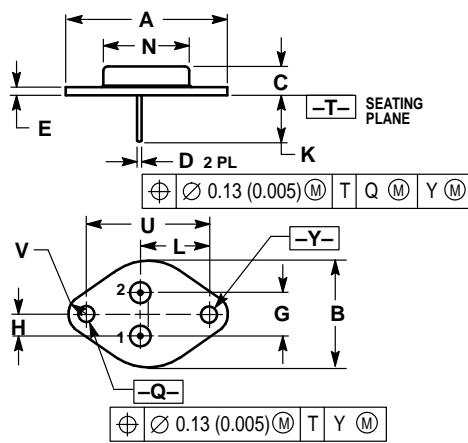
Figure 5. DC Safe Operating Area

There are two limitations on the power handling ability of a transistor: junction temperature and secondary breakdown. Safe operating area curves indicate $I_C - V_{\text{CE}}$ 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.

PACKAGE DIMENSIONS



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	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.550	REF	39.37	REF
B	—	1.050	—	26.67
C	0.250	0.335	6.35	8.51
D	0.038	0.043	0.97	1.09
E	0.055	0.070	1.40	1.77
G	0.430	BSC	10.92	BSC
H	0.215	BSC	5.46	BSC
K	0.440	0.480	11.18	12.19
L	0.665	BSC	16.89	BSC
N	—	0.830	—	21.08
Q	0.151	0.165	3.84	4.19
U	1.187	BSC	30.15	BSC
V	0.131	0.188	3.33	4.77

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

CASE 1-07
 TO-204AA (TO-3)
 ISSUE Z

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com – **TOUCHTONE** (602) 244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



Find price and stock options from leading distributors for MJ3000 on Findchips.com:

<https://findchips.com/search/MJ3000>

Find CAD models and details for this part:

<https://findchips.com/detail/mj3000/Freescale-Semiconductor>