

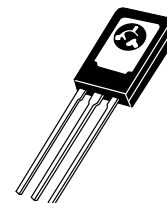
**MJE521**

## Plastic Medium-Power NPN Silicon Transistor

... designed for use in general-purpose amplifier and switching circuits. Recommended for use in 5 to 10 Watt audio amplifiers utilizing complementary symmetry circuitry.

- DC Current Gain —  $h_{FE} = 40$  (Min) @  $I_C = 1.0$  Adc
- Complementary to PNP MJE371

**4 AMPERE  
POWER TRANSISTOR  
NPN SILICON  
40 VOLTS  
40 WATTS**



**CASE 77-08  
TO-225AA TYPE**

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	Vdc
Collector-Base Voltage	$V_{CB}$	40	Vdc
Emitter-Base Voltage	$V_{EB}$	4.0	Vdc
Collector Current — Continuous — Peak	$I_C$	4.0 8.0	Adc
Base Current — Continuous	$I_B$	2.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	40 0.32	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	3.12	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage (1) ( $I_C = 100$ mAdc, $I_B = 0$ )	$V_{CEO(sus)}$	40	—	Vdc
Collector-Base Cutoff Current ( $V_{CB} = 30$ Vdc, $I_E = 0$ )	$I_{CBO}$	—	100	$\mu\text{Adc}$
Emitter-Base Cutoff Current ( $V_{EB} = 4.0$ Vdc, $I_C = 0$ )	$I_{EBO}$	—	100	$\mu\text{Adc}$

### ON CHARACTERISTICS

DC Current Gain (1) ( $I_C = 1.0$ Adc, $V_{CE} = 1.0$ Vdc)	$h_{FE}$	40	—	—
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(1) Pulse Test: Pulse Width  $\leq 300$   $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

REV 1

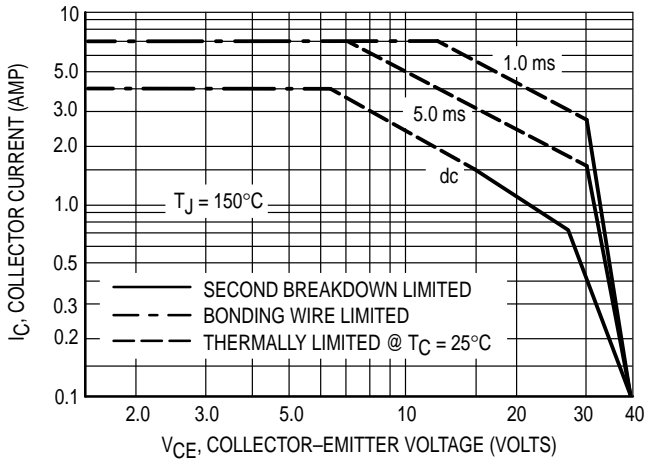


Figure 1. Active-Region Safe Operating Area

The data of Figure 1 based on  $T_{J(pk)} = 150^{\circ}\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $(T_{J(pk)}) \leq 150^{\circ}\text{C}$ . At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

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

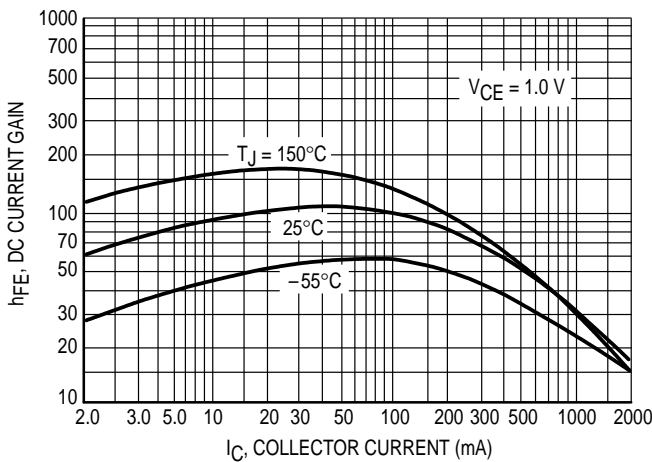


Figure 2. DC Current Gain

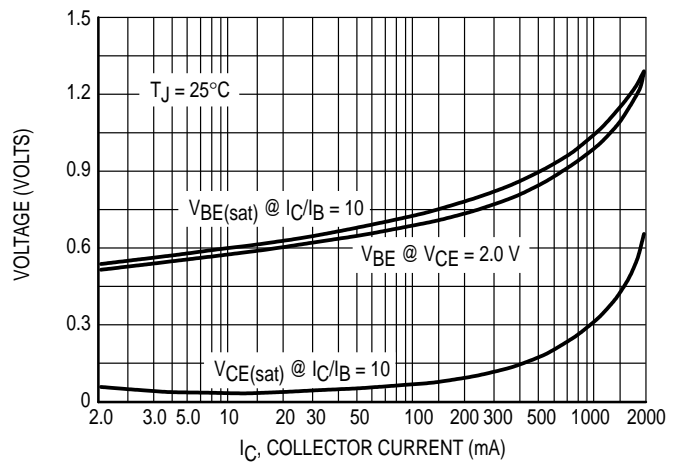


Figure 3. "On" Voltage

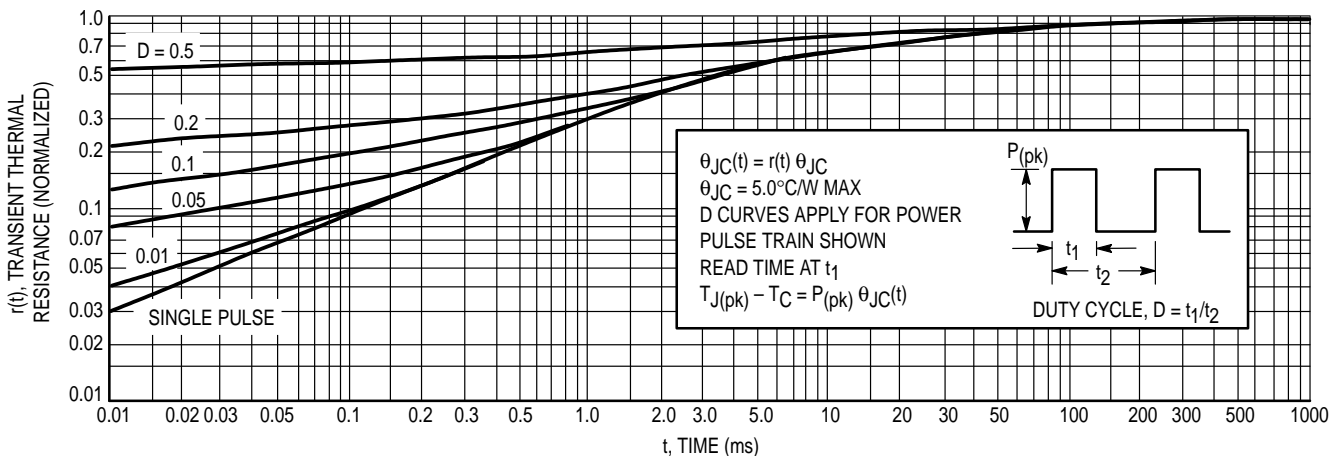
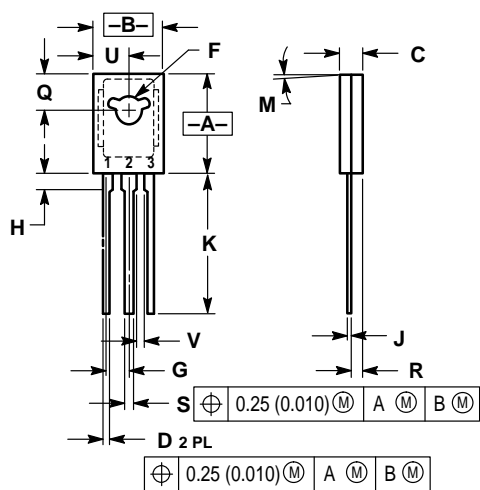


Figure 4. Thermal Response

PACKAGE DIMENSIONS



- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.055	1.15	1.39
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

- STYLE 1:  
 PIN 1. EMITTER  
 2. COLLECTOR  
 3. BASE

CASE 77-08  
 TO-225AA TYPE  
 ISSUE V

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