# 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.

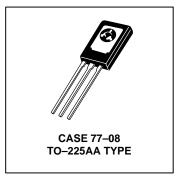
• DC Current Gain —

 $h_{FE} = 40 \text{ (Min) } @ I_{C}$ = 1.0 Adc

• Complementary to PNP MJE371

# **MJE521**

4 AMPERE
POWER TRANSISTOR
NPN SILICON
40 VOLTS
40 WATTS



#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V <sub>CEO</sub>	40	Vdc
Collector-Base Voltage	V <sub>CB</sub>	40	Vdc
Emitter–Base Voltage	V <sub>EB</sub>	4.0	Vdc
Collector Current — Continuous — Peak	I <sub>C</sub>	4.0 8.0	Adc
Base Current — Continuous	I <sub>B</sub>	2.0	Adc
Total Power Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	40 0.32	Watts W/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to +150	°C

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θJC	3.12	°C/W

#### **ELECTRICAL CHARACTERISTICS** (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (1) (I <sub>C</sub> = 100 mAdc, I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	40	_	Vdc	
Collector–Base Cutoff Current $(V_{CB} = 30 \text{ Vdc}, I_E = 0)$	I <sub>CBO</sub>	_	100	μAdc	
Emitter–Base Cutoff Current (V <sub>EB</sub> = 4.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	_	100	μAdc	
ON CHARACTERISTICS					

#### ON CHARACTERISTICS

DC Current Gain (1)	h <sub>FE</sub>	40	_	_
$(I_C = 1.0 \text{ Adc}, V_{CE} = 1.0 \text{ Vdc})$				

<sup>(1)</sup> Pulse Test: Pulse Width  $\leq$  300  $\mu$ s, Duty Cycle  $\leq$  2.0%.

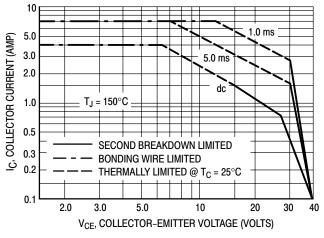


Figure 1. Active-Region Safe Operating Area

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  $(T_{Jpk}) \leq 150^{\circ}\text{C}$ . 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.

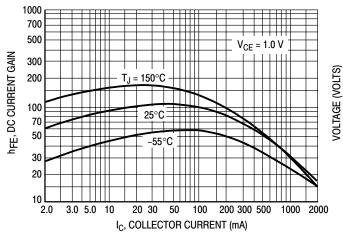


Figure 2. DC Current Gain

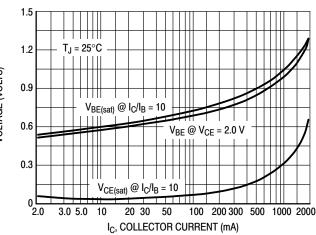


Figure 3. "On" Voltage

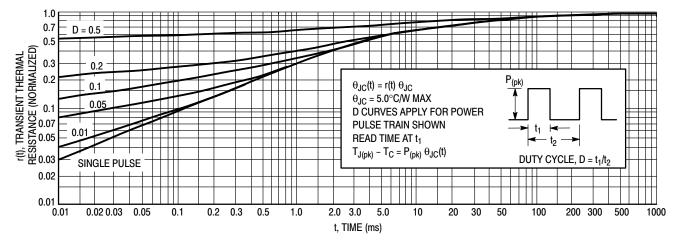
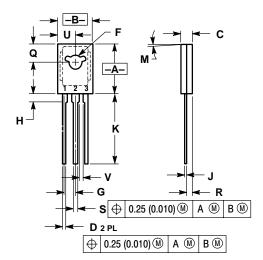


Figure 4. Thermal Response

# **MJE521**

## **PACKAGE DIMENSIONS**

# **CASE 77-08** TO-225AA TYPE **ISSUE V**



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

	INCHES		MILLIMETERS		
DIM	MIN	MAX	MIN	MAX	
Α	0.425	0.435	10.80	11.04	
В	0.295	0.305	7.50	7.74	
С	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	
Н	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	
٧	0.040		1.02		

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

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