

# MJ480 (SILICON) MJ481

## NPN SILICON POWER TRANSISTORS

... designed for general-purpose and 5 to 20 Watt audio amplifier applications.

- Current-Gain-Bandwidth Product –  
 $f_T = 4.0 \text{ MHz (Min) @ } I_C = 1.0 \text{ Adc}$
- DC Current Gain –  
 $h_{FE} = 30\text{-}200 \text{ @ } I_C = 1.0 \text{ Adc}$
- Complements to PNP MJ490 and MJ491

## 4 AMPERE POWER TRANSISTORS NPN SILICON

40-60 VOLTS  
87.5 WATTS

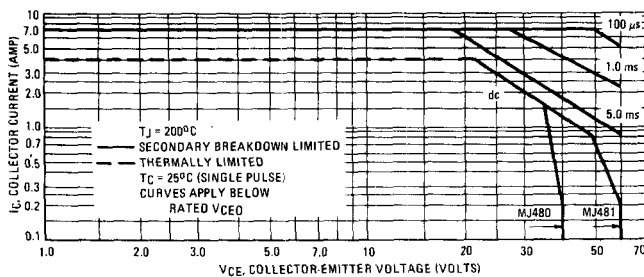
### MAXIMUM RATINGS

Rating	Symbol	MJ480	MJ481	Unit
Collector-Emitter Voltage	$V_{CE0}$	40	60	Vdc
Collector-Base Voltage	$V_{CB}$	40	60	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0		Vdc
Collector Current – Continuous	$I_C$	4.0		A dc
Peak		7.0		
Base Current	$I_B$	1.0		A dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	5.0		Watts
Derate above $25^\circ\text{C}$		28.6		mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$	$P_D$	87.5		Watts
Derate above $25^\circ\text{C}$		500		mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$

### THERMAL CHARACTERISTICS

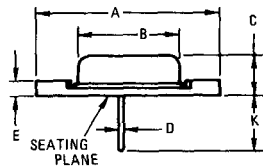
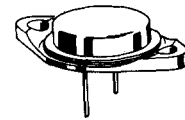
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	2.0	$^\circ\text{C/W}$

FIGURE 1 – ACTIVE-REGION SAFE OPERATING AREA

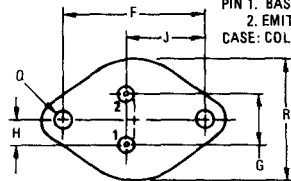


The Safe Operating Area Curves indicate  $I_C$ ,  $V_{CE}$  limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe

Area to avoid causing a catastrophic failure. To insure operation below the maximum  $T_J$ , power-temperature derating must be observed for both steady state and pulse power conditions.



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



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	0.89	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
Q	3.84	4.09	0.151	0.161
R	—	26.67	—	1.050

NOTE:

1. DIM "Q" IS DIA.

CASE 11

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (I <sub>C</sub> = 0.2 Adc, I <sub>B</sub> = 0)	BV <sub>CEO</sub>	40 60	— —	Vdc
Collector Cutoff Current (V <sub>CB</sub> = Rated V <sub>CB</sub> , I <sub>E</sub> = 0) (V <sub>CB</sub> = Rated V <sub>CB</sub> , I <sub>E</sub> = 0, T <sub>C</sub> = 150°C)	I <sub>CBO</sub>	— —	1.0 5.0	mAdc
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	1.0	mAdc

<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = 50 mAdc, V <sub>CE</sub> = 2.0 Vdc) (I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 2.0 Vdc) (I <sub>C</sub> = 3.0 Adc, V <sub>CE</sub> = 2.0 Vdc)	h <sub>FE</sub>	50 30 10	— 200 —	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 1.0 Adc, I <sub>B</sub> = 0.1 Adc) (I <sub>C</sub> = 3.0 Adc, I <sub>B</sub> = 0.3 Adc)	V <sub>CE(sat)</sub>	— —	0.4 1.2	Vdc
Base-Emitter Saturation Voltage (I <sub>C</sub> = 1.0 Adc, I <sub>B</sub> = 0.1 Adc) (I <sub>C</sub> = 3.0 Adc, I <sub>B</sub> = 0.3 Adc)	V <sub>BE(sat)</sub>	— —	1.0 1.5	Vdc
Base-Emitter "On" Voltage (I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 2.0 Vdc) (I <sub>C</sub> = 3.0 Adc, V <sub>CE</sub> = 2.0 Vdc)	V <sub>BE(on)</sub>	— —	1.2 1.5	Vdc

<b>DYNAMIC CHARACTERISTICS</b>				
Current-Gain-Bandwidth Product (I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 10 Vdc, f = 1.0 MHz)	f <sub>T</sub>	4.0	—	MHz
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f = 0.1 MHz)	C <sub>ob</sub>	—	200	pF

FIGURE 2 – NORMALIZED DC CURRENT GAIN

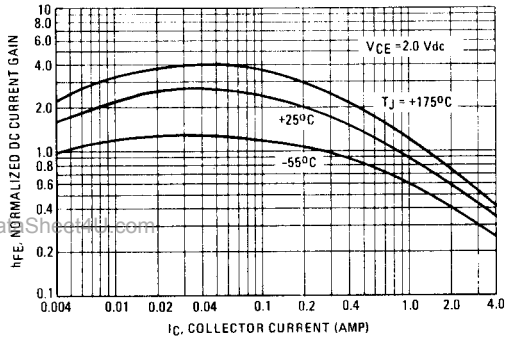


FIGURE 3 – "ON" VOLTAGES

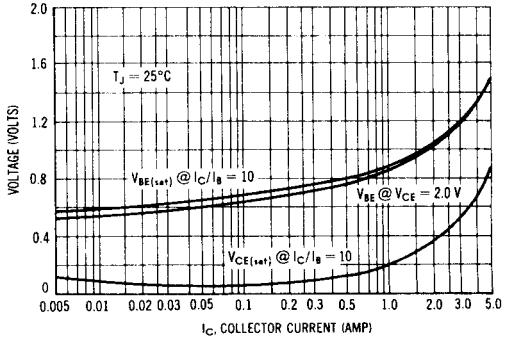


FIGURE 4 – TRANSIENT THERMAL RESISTANCE

