

## Complementary Plastic Silicon Power Transistors

... designed for low power audio amplifier and low-current, high speed switching applications.

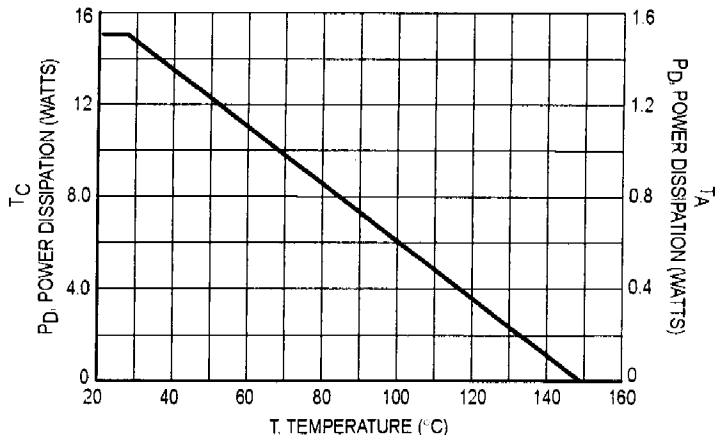
- High Collector-Emitter Sustaining Voltage —  
 $V_{CE(sus)} = 80 \text{ Vdc (Min)} — \text{BD789, BD790}$   
 $= 100 \text{ Vdc (Min)} — \text{BD791, BD792}$
- High DC Current Gain @  $I_C = 200 \text{ mAdc}$   
 $h_{FE} = 40-250$
- Low Collector-Emitter Saturation Voltage —  
 $V_{CE(sat)} = 0.5 \text{ Vdc (Max)} @ I_C = 500 \text{ mAdc}$
- High Current Gain — Bandwidth Product —  
 $f_T = 40 \text{ MHz (Min)} @ I_C = 100 \text{ mAdc}$

### \*MAXIMUM RATINGS

Rating	Symbol	BD789 BD790	BD791 BD792	Unit
Collector-Emitter Voltage	$V_{CEO}$	80	100	Vdc
Collector-Base Voltage	$V_{CB}$	80	100	Vdc
Emitter-Base Voltage	$V_{EBO}$	6.0		Vdc
Collector Current — Continuous — Peak	$I_C$	4.0 8.0		Adc
Base Current	$I_B$	1.0		Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 0.12		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	$R_{\theta JC}$	8.34	$^\circ\text{C/W}$



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**NPN  
BD789**

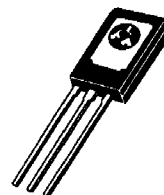
**BD791\***

**PNP  
BD790**

**BD792\***

\*Motorola Preferred Device

**4 AMPERE  
POWER TRANSISTORS  
COMPLEMENTARY  
SILICON  
80, 100 VOLTS  
15 WATTS**



TO-225AA



**Quality Semi-Conductors**

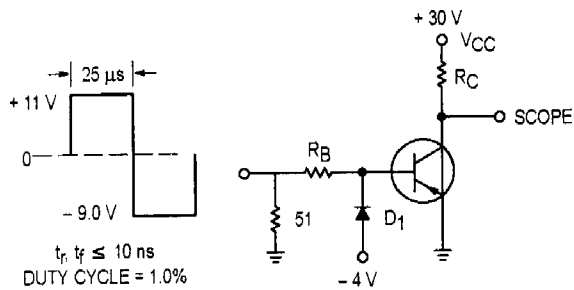
**BD789 BD791 BD790 BD792**

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

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Sustaining Voltage (1) (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0)	BD789, BD790 BD791, BD792	V <sub>CEO(sus)</sub>	80 100	— —	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 40 Vdc, I <sub>B</sub> = 0) (V <sub>CE</sub> = 50 Vdc, I <sub>B</sub> = 0)	BD789, BD790 BD791, BD792	I <sub>CEO</sub>	— —	100 100	μAdc
Collector Cutoff Current (V <sub>CE</sub> = 80 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc) (V <sub>CE</sub> = 100 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc) (V <sub>CE</sub> = 40 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc, T <sub>C</sub> = 125°C) (V <sub>CE</sub> = 50 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc, T <sub>C</sub> = 125°C)	BD789, BD790 BD791, BD792 BD789, BD790 BD791, BD792	I <sub>CEx</sub>	— — — —	1.0 1.0 0.1 0.1	μAdc mAdc
Emitter Cutoff Current (V <sub>EB</sub> = 6.0 Vdc, I <sub>C</sub> = 0)		I <sub>EBO</sub>	—	1.0	μAdc
<b>ON CHARACTERISTICS (1)</b>					
DC Current Gain (I <sub>C</sub> = 200 mA, V <sub>CE</sub> = 3.0 Vdc) (I <sub>C</sub> = 1.0 A, V <sub>CE</sub> = 3.0 Vdc) (I <sub>C</sub> = 2.0 A, V <sub>CE</sub> = 3.0 Vdc) (I <sub>C</sub> = 4.0 A, V <sub>CE</sub> = 3.0 Vdc)		h <sub>FE</sub>	40 20 10 5.0	250 — — —	—
Collector Emitter Saturation Voltage (I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA) (I <sub>C</sub> = 1.0 A, I <sub>B</sub> = 100 mA) (I <sub>C</sub> = 2.0 A, I <sub>B</sub> = 200 mA) (I <sub>C</sub> = 4.0 A, I <sub>B</sub> = 800 mA)		V <sub>CE(sat)</sub>	— — — —	0.5 1.0 2.5 3.0	Vdc
Base-Emitter Saturation Voltage (I <sub>C</sub> = 2.0 A, I <sub>B</sub> = 200 mA)		V <sub>BE(sat)</sub>	—	1.8	Vdc
Base-Emitter On Voltage (I <sub>C</sub> = 200 mA, V <sub>CE</sub> = 3.0 Vdc)		V <sub>BE(on)</sub>	—	1.5	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current-Gain — Bandwidth Product (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 10 Vdc, f = 10 MHz)		f <sub>T</sub>	40	—	MHz
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>C</sub> = 0, f = 0.1 MHz)	BD789, BD791 BD790, BD792	C <sub>ob</sub>	— —	50 70	pF
Small-Signal Current Gain (I <sub>C</sub> = 200 mA, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)		h <sub>fe</sub>	10	—	—

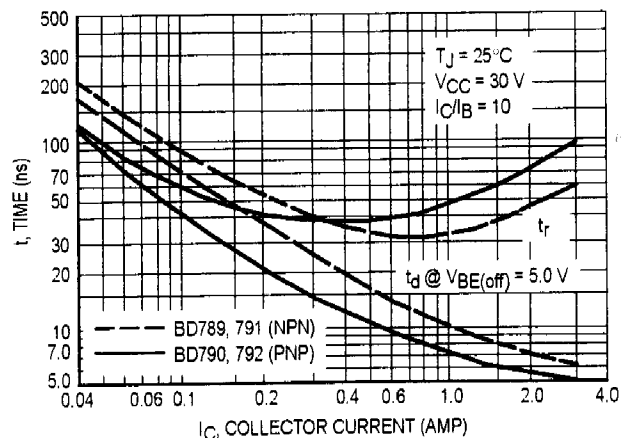
\* Indicates JEDEC Registered Data.

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



R<sub>B</sub> AND R<sub>C</sub> VARIED TO OBTAIN DESIRED CURRENT LEVELS  
 D<sub>1</sub> MUST BE FAST RECOVERY TYPE, eg  
 MBR340 USED ABOVE I<sub>B</sub> ≈ 100 mA  
 MSD6100 USED BELOW I<sub>B</sub> ≈ 100 mA  
 FOR PNP TEST CIRCUIT, REVERSE ALL POLARITIES.

**Figure 2. Switching Time Test Circuit**



**Figure 3. Turn-On Time**