New Jersey Semi-Conductor Products, Inc.

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Complementary Plastic Silicon Power Transistors

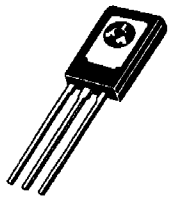
. . . designed for low power audio amplifier and low–current, high speed switching applications.

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

NPN
BD789
BD791*
PNP
BD790
BD792*

*Motorola Preferred Device

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



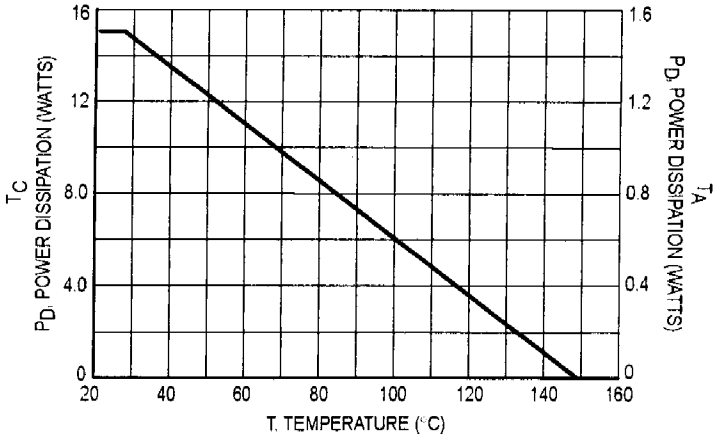
TO–225AA

***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°C Derate above 25°C	P_D	15 0.12		Watts W/°C
Operating and Storage Junction Temperature Range	T_J,T_{stg}	−65 to +150		°C

THERMAL CHARACTERISTICS

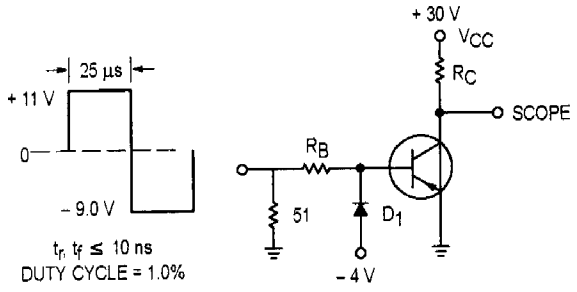
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	8.34	°C/W



***ELECTRICAL CHARACTERISTICS** (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (1) (I_C = 10 mAdc, I_B = 0)	BD789, BD790 BD791, BD792	$V_{CEO(sus)}$	80 100	— —	Vdc
Collector Cutoff Current (V_{CE} = 40 Vdc, I_B = 0) (V_{CE} = 50 Vdc, I_B = 0)	BD789, BD790 BD791, BD792	I_{CEO}	— —	100 100	µAdc
Collector Cutoff Current (V_{CE} = 80 Vdc, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = 100 Vdc, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = 40 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 125°C) (V_{CE} = 50 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 125°C)	BD789, BD790 BD791, BD792 BD789, BD790 BD791, BD792	I_{CEX}	— — — —	1.0 1.0 0.1 0.1	µAdc mAdc
Emitter Cutoff Current (V_{EB} = 6.0 Vdc, I_C = 0)		I_{EBO}	—	1.0	µAdc
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 200 mAdc, V_{CE} = 3.0 Vdc) (I_C = 1.0 Adc, V_{CE} = 3.0 Vdc) (I_C = 2.0 Adc, V_{CE} = 3.0 Vdc) (I_C = 4.0 Adc, V_{CE} = 3.0 Vdc)		h_{FE}	40 20 10 5.0	250 — — —	—
Collector Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 1.0 Adc, I_B = 100 mAdc) (I_C = 2.0 Adc, I_B = 200 mAdc) (I_C = 4.0 Adc, I_B = 800 mAdc)		$V_{CE(sat)}$	— — — —	0.5 1.0 2.5 3.0	Vdc
Base–Emitter Saturation Voltage (I_C = 2.0 Adc, I_B = 200 mAdc)		$V_{BE(sat)}$	—	1.8	Vdc
Base–Emitter On Voltage (I_C = 200 mAdc, V_{CE} = 3.0 Vdc)		$V_{BE(on)}$	—	1.5	Vdc
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product (I_C = 100 mAdc, V_{CE} = 10 Vdc, f = 10 MHz)		f_T	40	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_C = 0, f = 0.1 MHz)	BD789, BD791 BD790, BD792	C_{ob}	— —	50 70	pF
Small–Signal Current Gain (I_C = 200 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{fe}	10	—	—

* Indicates JEDEC Registered Data.
(1) Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%.



R_B AND R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS
D_1 MUST BE FAST RECOVERY TYPE, eg
MBR340 USED ABOVE I_B ≈ 100 mA
MSD6100 USED BELOW I_B ≈ 100 mA
FOR PNP TEST CIRCUIT, REVERSE ALL POLARITIES.

Figure 2. Switching Time Test Circuit

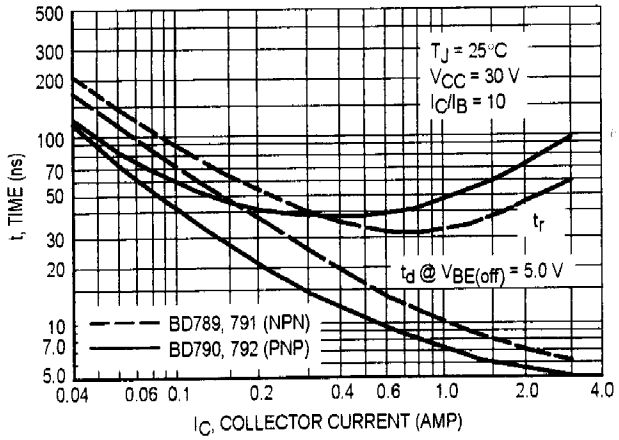


Figure 3. Turn–On Time