

# ON Semiconductor

## Is Now



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# NPN Plastic Silicon Power Transistor

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

- High Collector–Emitter Sustaining Voltage —  
 $V_{CEO(sus)} = 100 \text{ Vdc (Min)}$
- High DC Current Gain @  $I_C = 200 \text{ mAdc}$   
 $h_{FE} = 40\text{--}250$
- 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	Max	Unit
Collector–Emitter Voltage	$V_{CEO}$	100	Vdc
Collector–Base Voltage	$V_{CB}$	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	$T_J, T_{stg}$	$-65 \text{ to } +150$	$^\circ\text{C}$

## THERMAL CHARACTERISTICS

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

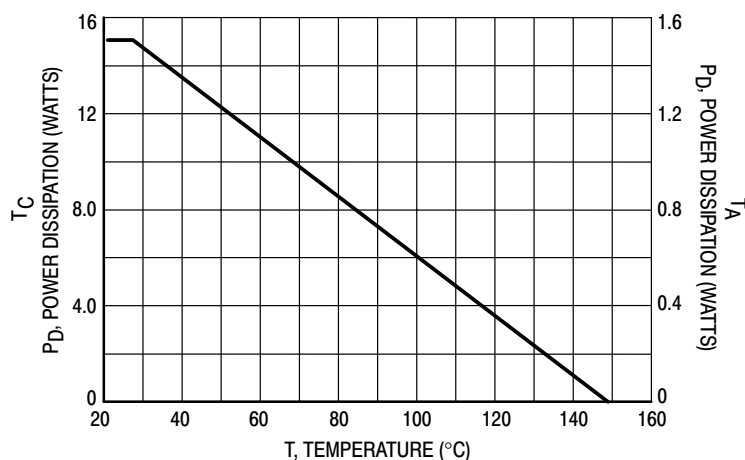
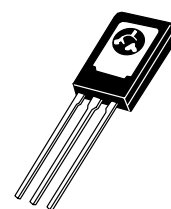


Figure 1. Power Derating

# BD791

ON Semiconductor Preferred Device

**4 AMPERE  
POWER TRANSISTOR  
SILICON  
100 VOLTS  
15 WATTS**



**CASE 77-09  
TO-225AA TYPE**

Preferred devices are ON Semiconductor recommended choices for future use and best overall value.

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (1) ( $I_C = 10\text{ mAdc}$ , $I_B = 0$ )	$V_{CEO(sus)}$	100	—	Vdc
Collector Cutoff Current ( $V_{CE} = 50\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	—	100	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CE} = 100\text{ Vdc}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 50\text{ Vdc}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ , $T_C = 125^\circ\text{C}$ )	$I_{CEX}$	— —	1.0 0.1	$\mu\text{Adc}$ mAdc
Emitter Cutoff Current ( $V_{EB} = 6.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	1.0	$\mu\text{Adc}$

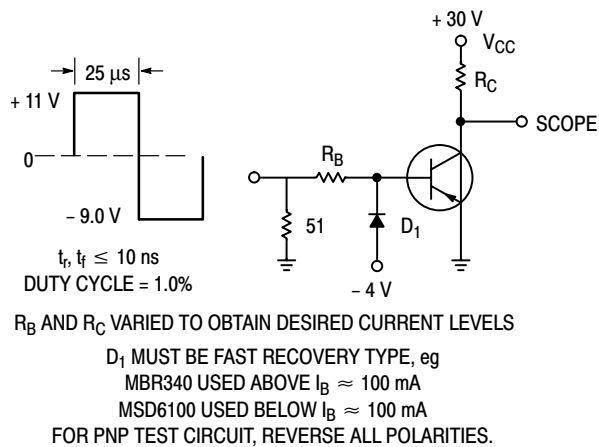
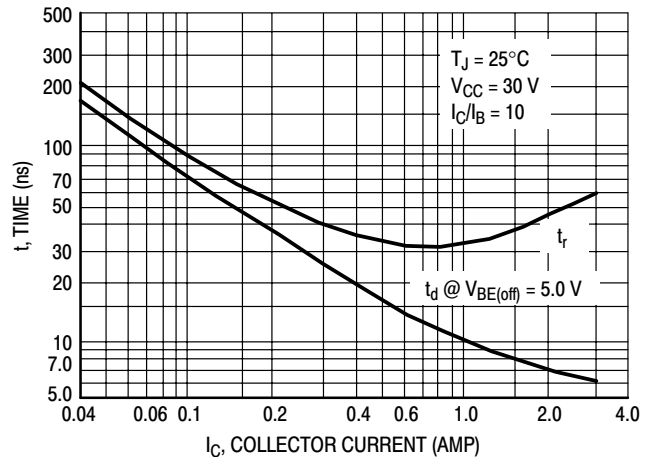
**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_C = 200\text{ mAdc}$ , $V_{CE} = 3.0\text{ Vdc}$ ) ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ ) ( $I_C = 2.0\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ ) ( $I_C = 4.0\text{ Adc}$ , $V_{CE} = 3.0\text{ Vdc}$ )	$h_{FE}$	40 20 10 5.0	250 — — —	—
Collector Emitter Saturation Voltage ( $I_C = 500\text{ mAdc}$ , $I_B = 50\text{ mAdc}$ ) ( $I_C = 1.0\text{ Adc}$ , $I_B = 100\text{ mAdc}$ ) ( $I_C = 2.0\text{ Adc}$ , $I_B = 200\text{ mAdc}$ ) ( $I_C = 4.0\text{ Adc}$ , $I_B = 800\text{ mAdc}$ )	$V_{CE(sat)}$	— — — —	0.5 1.0 2.5 3.0	Vdc
Base–Emitter Saturation Voltage ( $I_C = 2.0\text{ Adc}$ , $I_B = 200\text{ mAdc}$ )	$V_{BE(sat)}$	—	1.8	Vdc
Base–Emitter On Voltage ( $I_C = 200\text{ mAdc}$ , $V_{CE} = 3.0\text{ Vdc}$ )	$V_{BE(on)}$	—	1.5	Vdc

**DYNAMIC CHARACTERISTICS**

Current–Gain — Bandwidth Product ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 10\text{ MHz}$ )	$f_T$	40	—	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_C = 0$ , $f = 0.1\text{ MHz}$ )	$C_{ob}$	—	50	pF
Small–Signal Current Gain ( $I_C = 200\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	10	—	—

\*Indicates JEDEC Registered Data.

(1) Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .**Figure 2. Switching Time Test Circuit****Figure 3. Turn–On Time**

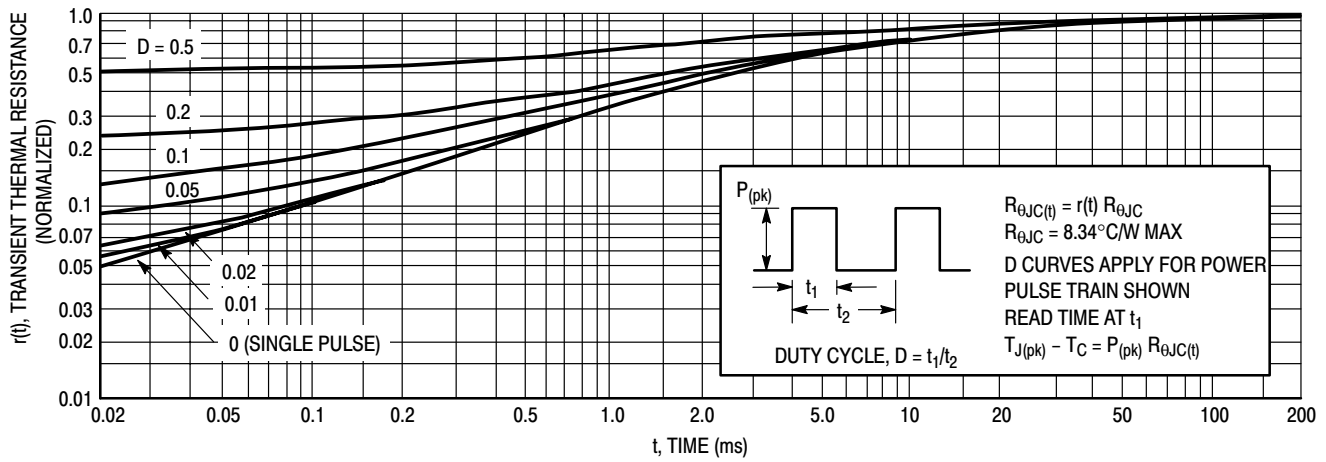


Figure 4. Thermal Response

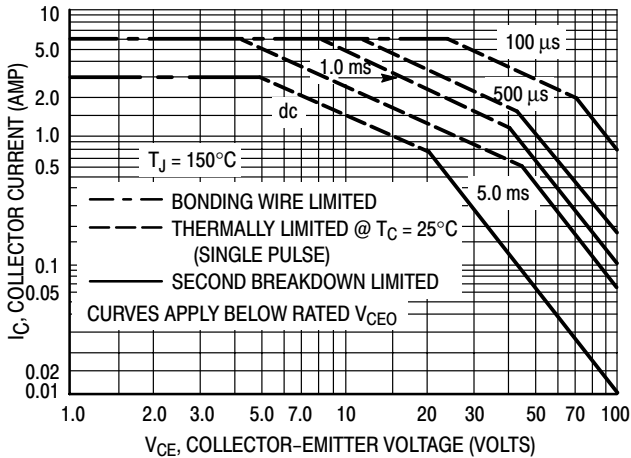


Figure 5. Active Region Safe Operating Area

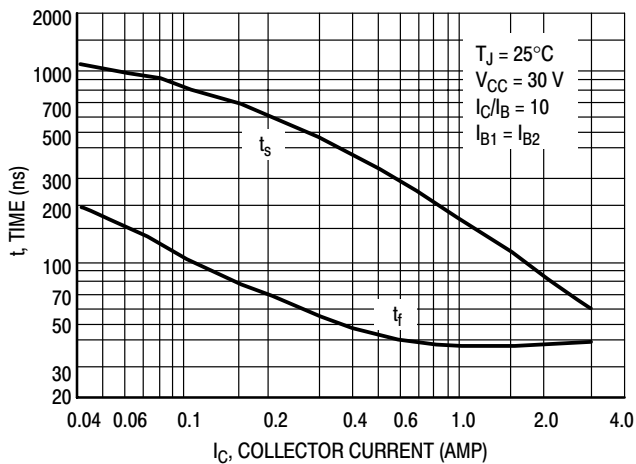


Figure 6. Turn-Off Time

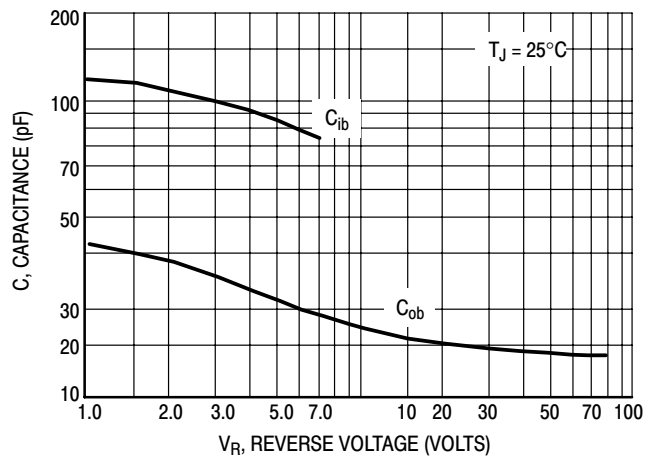


Figure 7. Capacitance

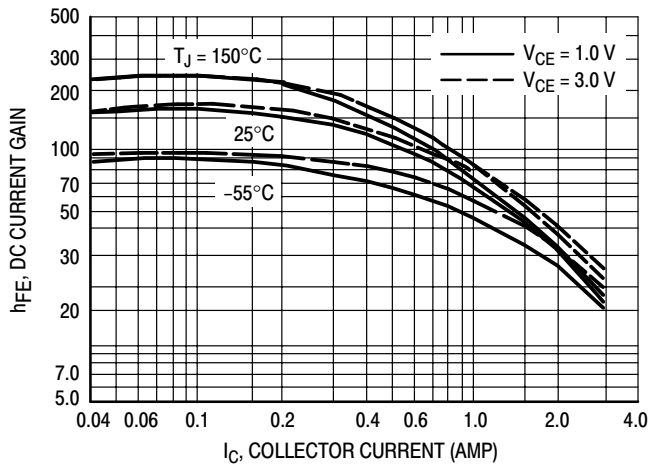


Figure 8. DC Current Gain

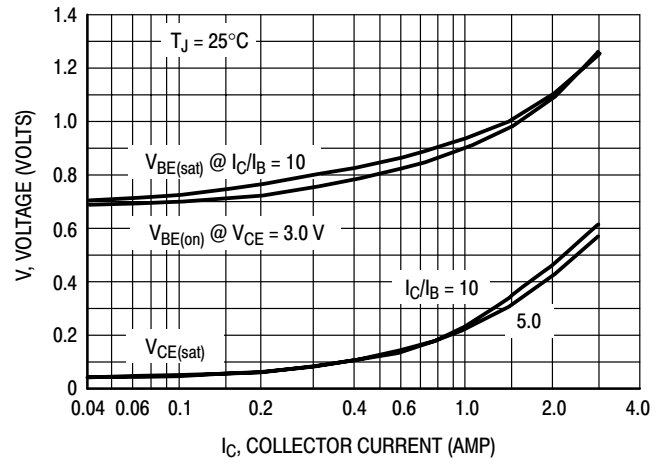


Figure 9. "On" Voltage

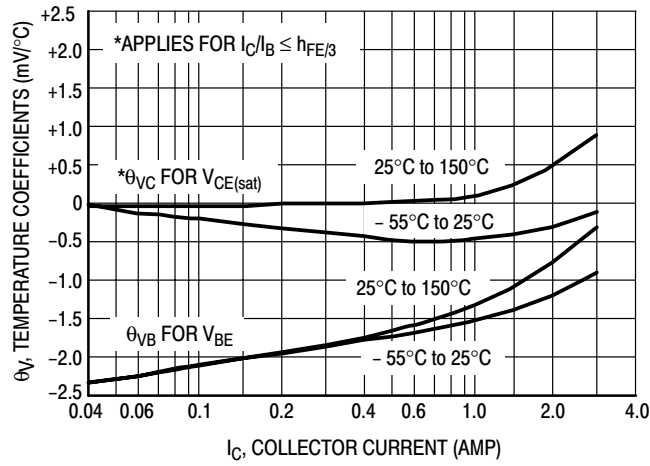
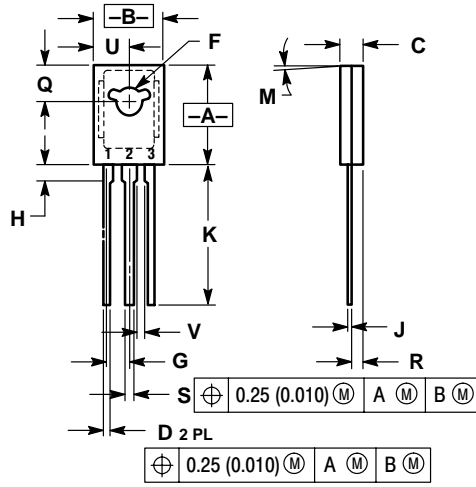


Figure 10. Temperature Coefficient

# BD791

## PACKAGE DIMENSIONS

### CASE 77-09 TO-225AA TYPE ISSUE W




- 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	0.065	1.15	1.65
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
  - COLLECTOR
  - BASE

## **Notes**

## **Notes**

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