

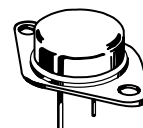
Silicon PNP Power Transistors

... designed for medium-speed switching and amplifier applications. These devices feature:

- Total Switching Time @ 3.0 A \approx 1.0 μ s (typ)
- h_{FE} (min) = 50 @ 1.0 A
- Low $V_{CE(sat)}$ = 0.5 V (typ) @ I_C = 5.0 A, I_B = 0.5 A
- Excellent Safe Area Limits
- Complementary NPN available — 2N3716

2N3791
2N3792

10 AMPERE
POWER TRANSISTORS
PNP SILICON
60–80 VOLTS
150 WATTS



CASE 1-07
TO-204AA
(TO-3)

MAXIMUM RATINGS

| Rating | Symbol | 2N3791 | 2N3792 | Unit |
|--|----------------|-------------|--------|-----------------------------|
| Collector–Base Voltage | V_{CB} | 60 | 80 | Volts |
| Collector–Emitter Voltage | V_{CEO} | 60 | 80 | Volts |
| Emitter–Base Voltage | V_{EB} | 7.0 | 7.0 | Volts |
| Collector Current (Continuous) | I_C | 10 | 10 | Amps |
| Base Current (Continuous) | I_B | 4.0 | 4.0 | Amps |
| Power Dissipation | P_D | 150 | 150 | Watts |
| Thermal Resistance | θ_{JC} | 1.17 | 1.17 | $^{\circ}\text{C}/\text{W}$ |
| Junction Operating and Storage Temperature Range | T_J, T_{stg} | –65 to +200 | | $^{\circ}\text{C}$ |

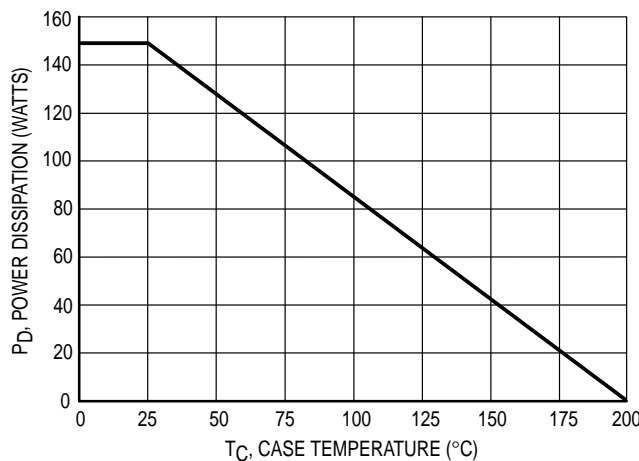


Figure 1. Power–Temperature Derating Curve

Safe Area Limits are indicated by Figures 15, 16. Both limits are applicable and must be observed.

REV 7

2N3791 2N3792

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

| Characteristic | Symbol | Min | Max | Unit |
|--|----------------|------------------|--------------------------|------|
| Collector-Emitter Sustaining Voltage (1) ($I_C = 200\text{ mA}$, $I_B = 0$) | $V_{CEO(sus)}$ | 60 80 | — — | Vdc |
| Collector-Emitter Cutoff Current ($V_{CE} = 60\text{ Vdc}$, $V_{BE} = -1.5\text{ Vdc}$) ($V_{CE} = 80\text{ Vdc}$, $V_{BE} = -1.5\text{ Vdc}$) ($V_{CE} = 60\text{ Vdc}$, $V_{BE} = -1.5\text{ Vdc}$, $T_C = 150^\circ\text{C}$) ($V_{CE} = 80\text{ Vdc}$, $V_{BE} = -1.5\text{ Vdc}$, $T_C = 150^\circ\text{C}$) | I_{CEX} | — — — — | 1.0 1.0 5.0 5.0 | mAdc |
| Emitter-Base Cutoff Current ($V_{EB} = 7.0\text{ Vdc}$) | I_{EBO} | — | 5.0 | mAdc |
| DC Current Gain (1) ($I_C = 1.0\text{ Adc}$, $V_{CE} = 2.0\text{ Vdc}$) ($I_C = 3.0\text{ Adc}$, $V_{CE} = 2.0\text{ Vdc}$) | h_{FE} | 50 30 | 180 — | — |
| Collector-Emitter Saturation Voltage (1) ($I_C = 5.0\text{ Adc}$, $I_B = 0.5\text{ Adc}$) | $V_{CE(sat)}$ | — | 1.0 | Vdc |
| Base-Emitter On Voltage (1) ($I_C = 5.0\text{ A}$, $V_{CE} = 2.0\text{ Vdc}$) ($I_C = 10\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$) | $V_{BE(on)}$ | — — | 1.8 4.0 | Vdc |
| Current-Gain — Bandwidth Product ($V_{CE} = 10\text{ Vdc}$, $I_C = 0.5\text{ Adc}$, $f = 1.0\text{ MHz}$) | f_T | 4.0 | — | MHz |

(1) Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

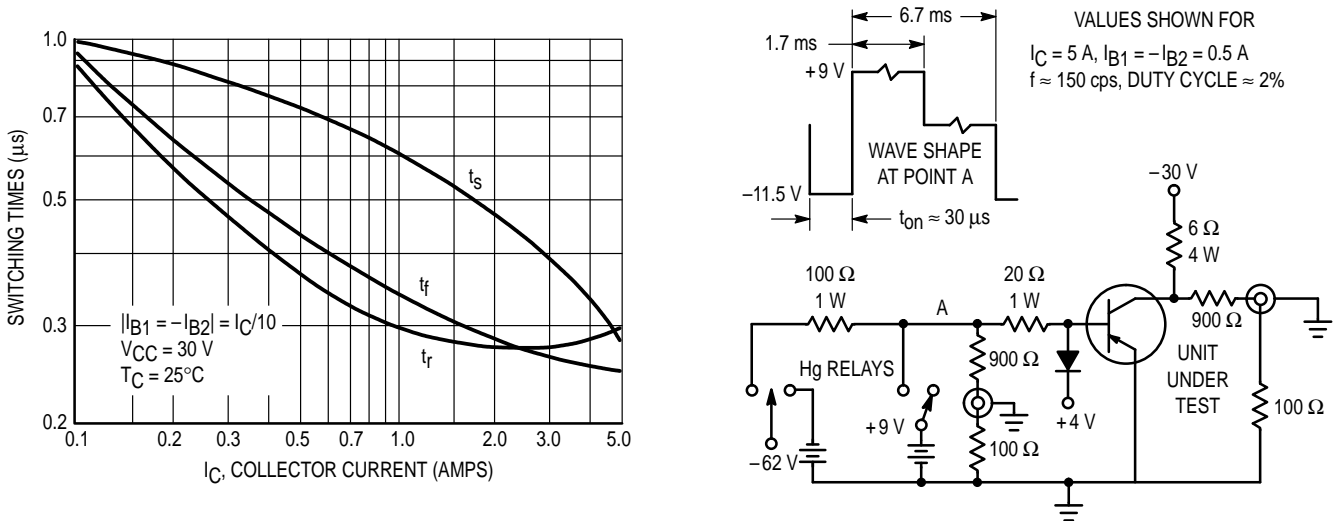


Figure 2. Typical Switching Times and Test Circuit

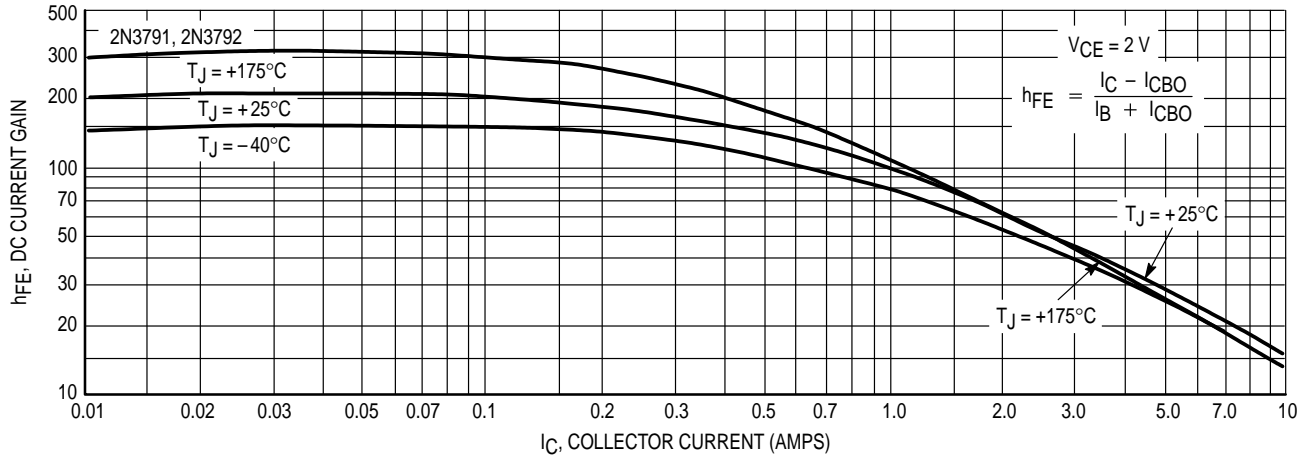


Figure 3. Current Gain Variations

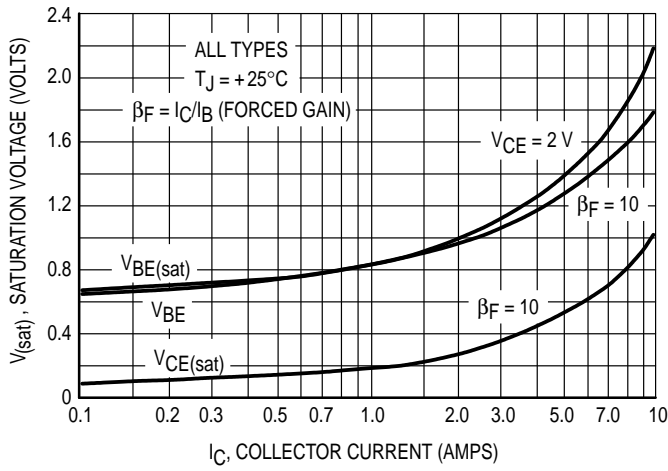


Figure 4. Saturation Voltages

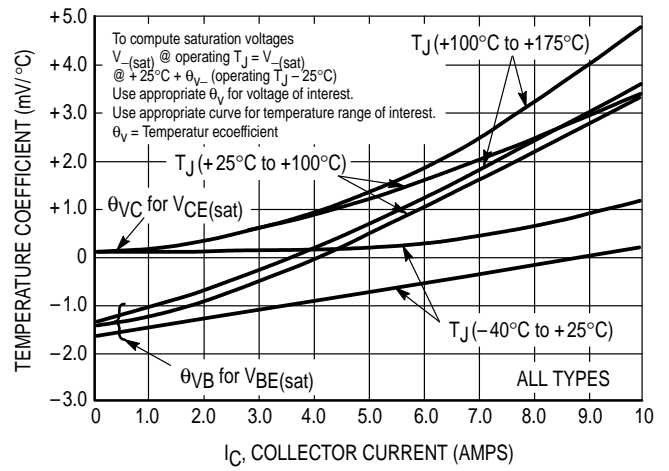


Figure 5. Temperature Coefficients

SAFE OPERATING AREAS

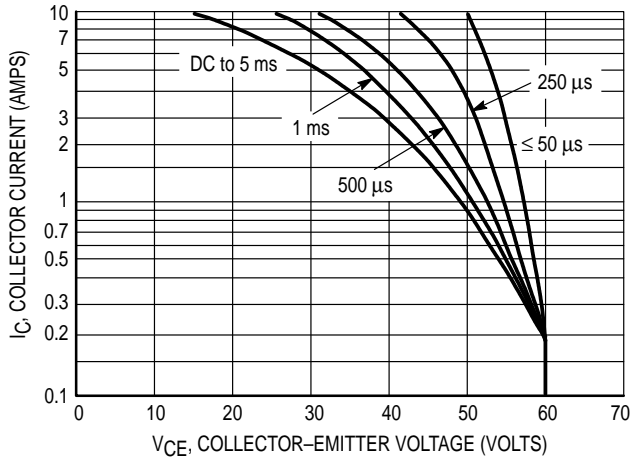


Figure 6. 2N3789, 2N3791

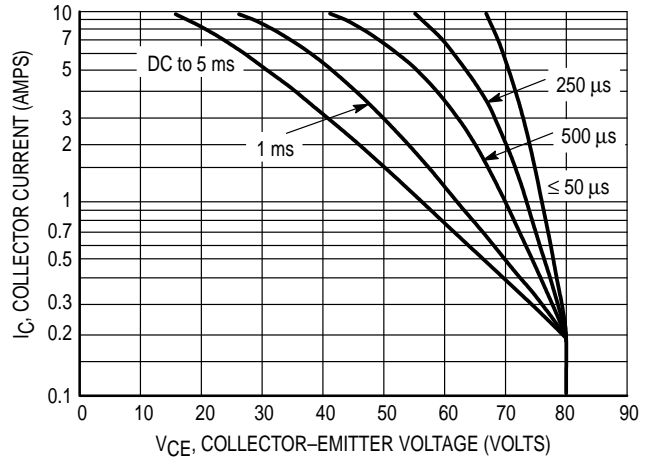


Figure 7. 2N3790, 2N3792

The Safe Operating Area Curves indicate $I_C - V_{CE}$ limits below which the device will not go into secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a collector-emitter

short. (Duty cycle of the excursions make no significant change in these safe areas.) To insure operation below the maximum T_J , the power-temperature derating curve must be observed for both steady state and pulse power conditions.

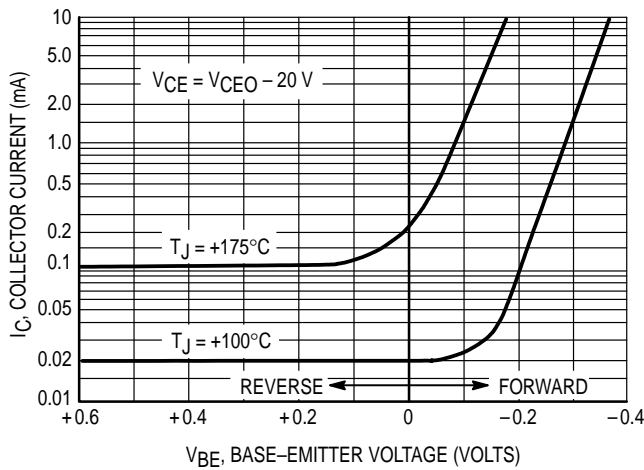


Figure 8. Cut-Off Region Transconductance

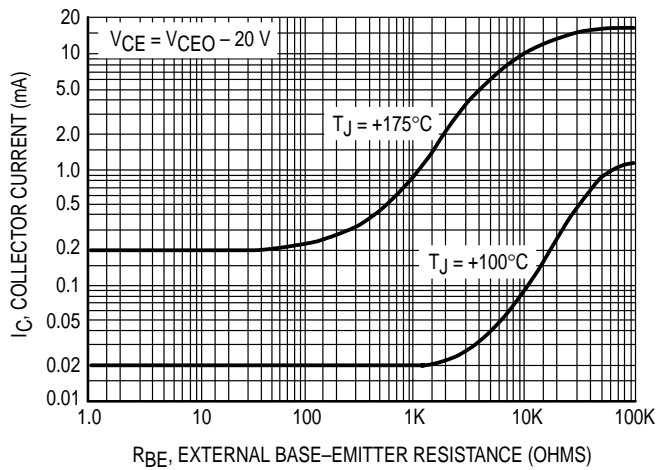
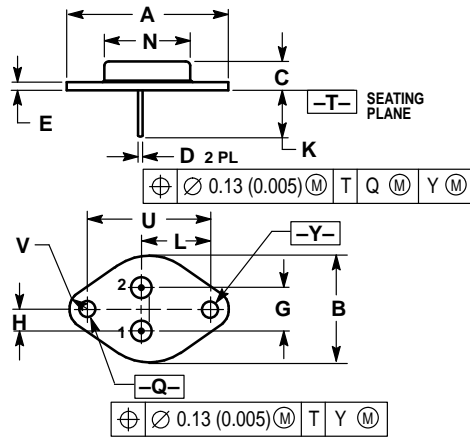


Figure 9. Collector Cut-Off Current versus Base-Emitter Resistance

PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.550 REF | | 39.37 REF | |
| B | — | 1.050 | — | 26.67 |
| C | 0.250 | 0.335 | 6.35 | 8.51 |
| D | 0.038 | 0.043 | 0.97 | 1.09 |
| E | 0.055 | 0.070 | 1.40 | 1.77 |
| G | 0.430 BSC | | 10.92 BSC | |
| H | 0.215 BSC | | 5.46 BSC | |
| K | 0.440 | 0.480 | 11.18 | 12.19 |
| L | 0.665 BSC | | 16.89 BSC | |
| N | — | 0.830 | — | 21.08 |
| Q | 0.151 | 0.165 | 3.84 | 4.19 |
| U | 1.187 BSC | | 30.15 BSC | |
| V | 0.131 | 0.188 | 3.33 | 4.77 |

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

CASE 1-07
TO-204AA (TO-3)
ISSUE Z

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