

Plastic Medium Power NPN Silicon Transistor

BD159

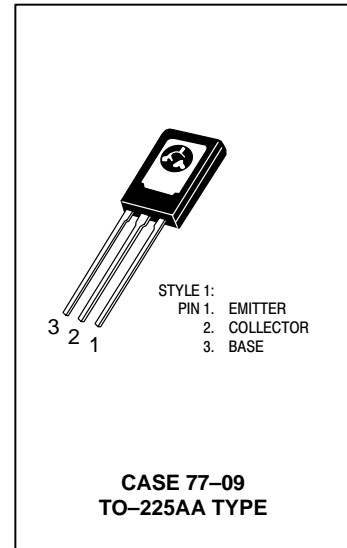
... designed for power output stages for television, radio, phonograph and other consumer product applications.

- Suitable for Transformerless, Line-Operated Equipment
- Thermopad™ Construction Provides High Power Dissipation Rating for High Reliability

**0.5 AMPERE
POWER TRANSISTOR
NPN SILICON
350 VOLTS
20 WATTS**

MAXIMUM RATINGS

| Rating | Symbol | Max | Unit |
|--|----------------|-------------|------------------------------|
| Collector–Emitter Voltage | V_{CEO} | 350 | Vdc |
| Collector–Base Voltage | V_{CB} | 375 | Vdc |
| Emitter–Base Voltage | V_{EB} | 5.0 | Vdc |
| Collector Current — Continuous Peak | I_C | 0.5 1.0 | Adc |
| Base Current | I_B | 0.25 | Adc |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 20 0.16 | 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 | θ_{JC} | 6.25 | $^\circ\text{C}/\text{W}$ |

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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | |
|---|------------|-----|-----|-----------------|
| Collector–Emitter Sustaining Voltage ($I_C = 1.0 \text{ mAdc}, I_B = 0$) | BV_{CEO} | 350 | — | Vdc |
| Collector Cutoff Current (At rated voltage) | I_{CBO} | — | 100 | μAdc |
| Emitter Cutoff Current ($V_{EB} = 5.0 \text{ Vdc}, I_C = 0$) | I_{EBO} | — | 100 | μAdc |

ON CHARACTERISTICS

| | | | | |
|---|----------|----|-----|---|
| DC Current Gain ($I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$) | h_{FE} | 30 | 240 | — |
|---|----------|----|-----|---|

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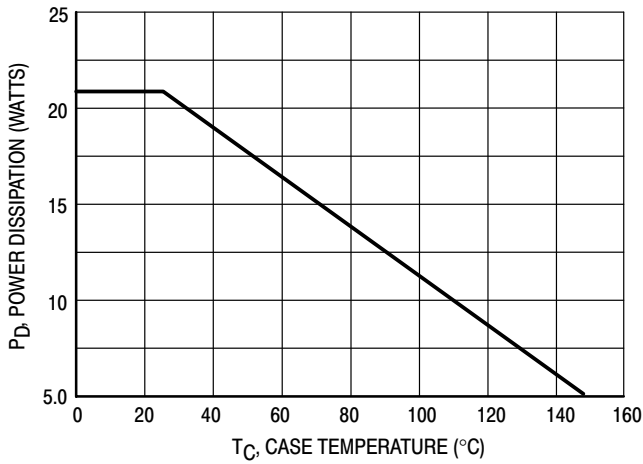


Figure 1. Power-Temperature Derating Curve

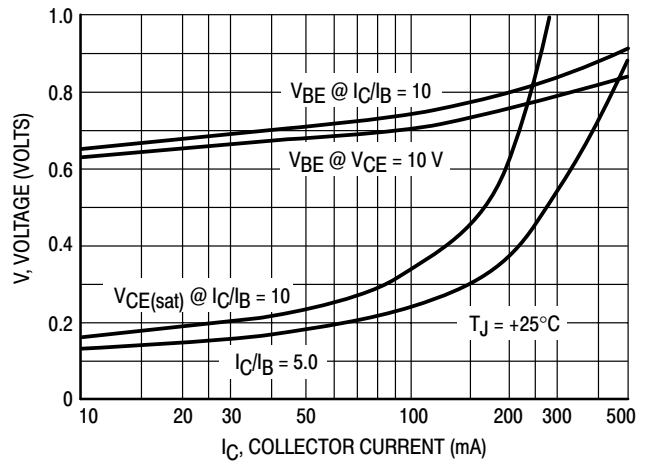


Figure 2. "On" Voltages

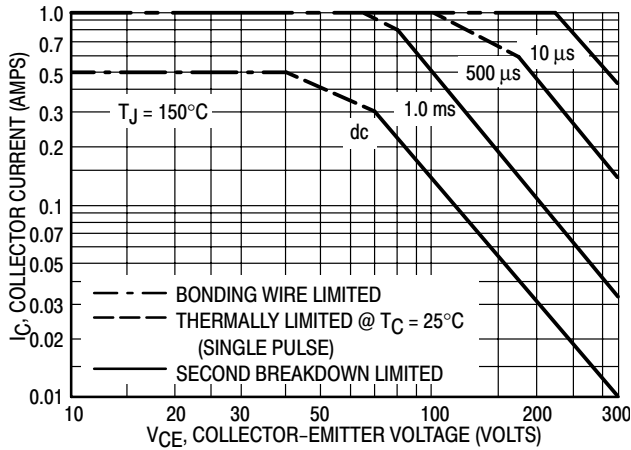


Figure 3. DC Safe Operating Area

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.

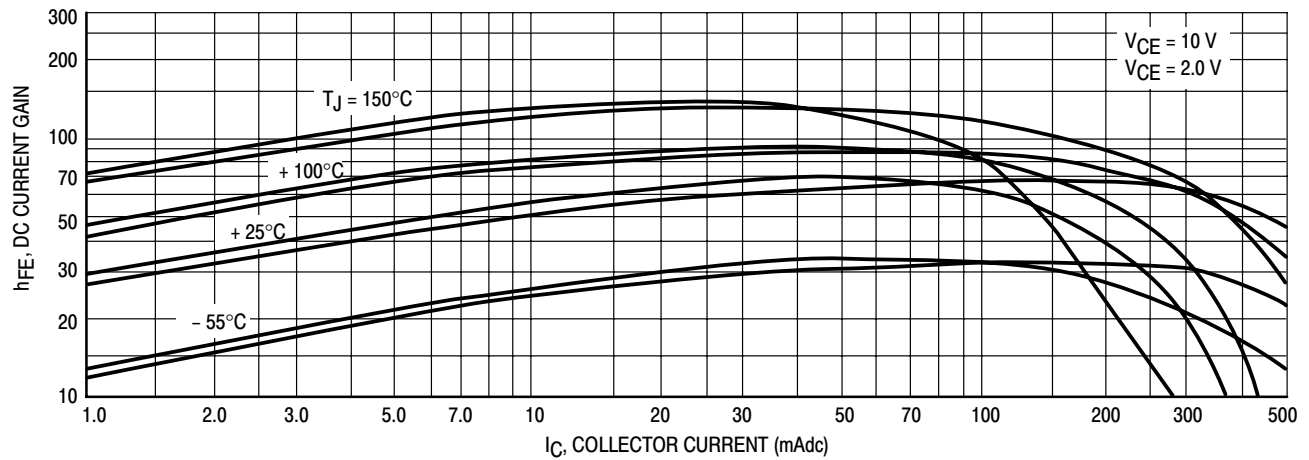
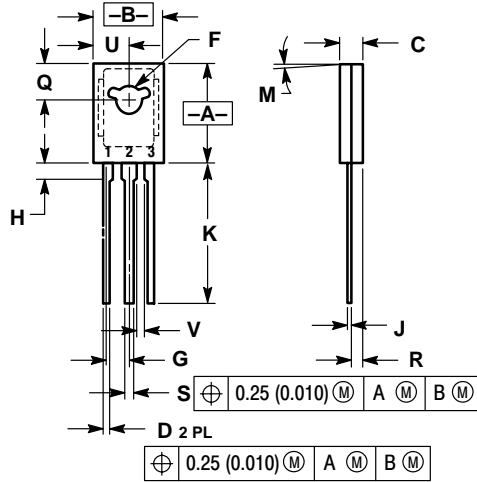


Figure 4. Current Gain

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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
2. COLLECTOR
3. BASE

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