

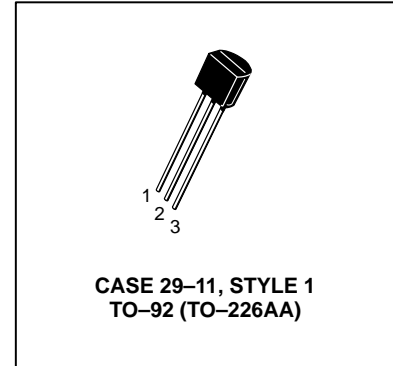
Amplifier Transistor

PNP Silicon

MPSL51

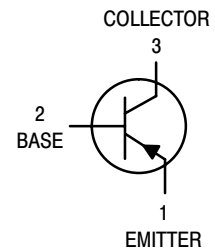
MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|----------------|
| Collector–Emitter Voltage | V_{CEO} | -100 | Vdc |
| Collector–Base Voltage | V_{CBO} | -100 | Vdc |
| Emitter–Base Voltage | V_{EBO} | -4.0 | Vdc |
| Collector Current — Continuous | I_C | -600 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | mW mW/°C |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | Watts mW/°C |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | °C |



THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|------|------|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | °C/W |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | °C/W |



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

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

OFF CHARACTERISTICS

| | | | | |
|--|---------------|------|------|-----------------|
| Collector–Emitter Breakdown Voltage ⁽¹⁾ ($I_C = -1.0 \text{ mAdc}, I_B = 0$) | $V_{(BR)CEO}$ | -100 | — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = -100 \mu\text{Adc}, I_E = 0$) | $V_{(BR)CBO}$ | -100 | — | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = -10 \mu\text{Adc}, I_C = 0$) | $V_{(BR)EBO}$ | -4.0 | — | Vdc |
| Collector Cutoff Current ($V_{CB} = -50 \text{ Vdc}, I_E = 0$) | I_{CBO} | — | -1.0 | μAdc |
| Emitter Cutoff Current ($V_{EB} = -3.0 \text{ Vdc}, I_C = 0$) | I_{EBO} | — | -100 | nAdc |

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.

MPSL51

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

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

ON CHARACTERISTICS⁽¹⁾

| | | | | |
|--|---------------|--------|----------------|-----|
| DC Current Gain ⁽¹⁾ ($I_C = -50\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$) | h_{FE} | 40 | 250 | — |
| Collector–Emitter Saturation Voltage ($I_C = -10\text{ mAdc}$, $I_B = -1.0\text{ mAdc}$) ($I_C = -50\text{ mAdc}$, $I_B = -5.0\text{ mAdc}$) | $V_{CE(sat)}$ | — — | -0.25 -0.30 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = -10\text{ mAdc}$, $I_B = -1.0\text{ mAdc}$) ($I_C = -50\text{ mAdc}$, $I_B = -5.0\text{ mAdc}$) | $V_{BE(sat)}$ | — — | -1.2 -1.2 | Vdc |

SMALL–SIGNAL CHARACTERISTICS

| | | | | |
|---|-----------|----|-----|-----|
| Current–Gain — Bandwidth Product ($I_C = -10\text{ mAdc}$, $V_{CE} = -10\text{ Vdc}$, $f = 20\text{ MHz}$) | f_T | 60 | — | MHz |
| Output Capacitance ($V_{CB} = -10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | C_{obo} | — | 8.0 | pF |
| Small–Signal Current Gain ($I_C = -1.0\text{ mAdc}$, $V_{CE} = -10\text{ Vdc}$, $f = 1.0\text{ kHz}$) | h_{fe} | 20 | — | — |

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.

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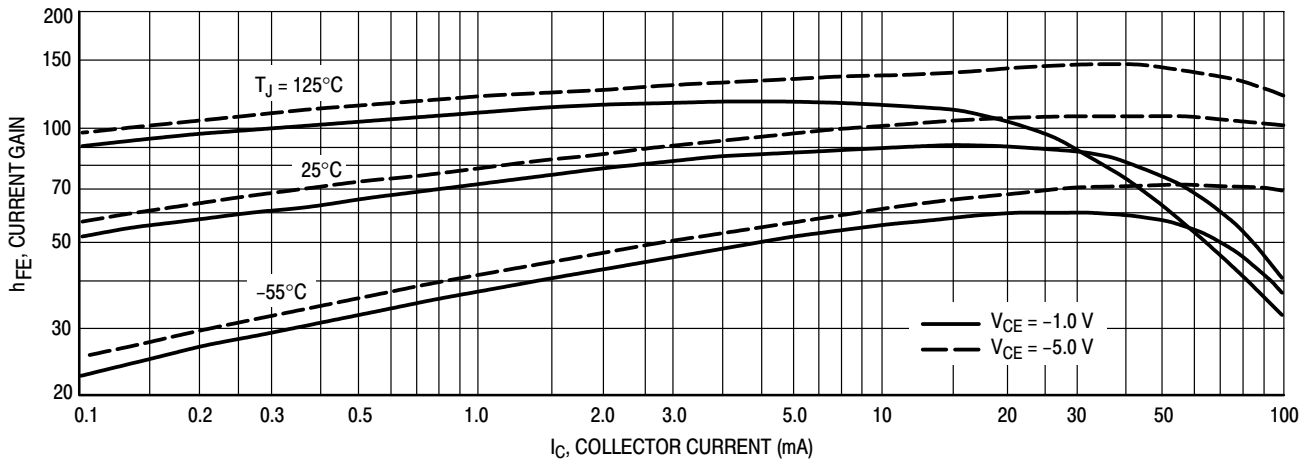


Figure 1. DC Current Gain

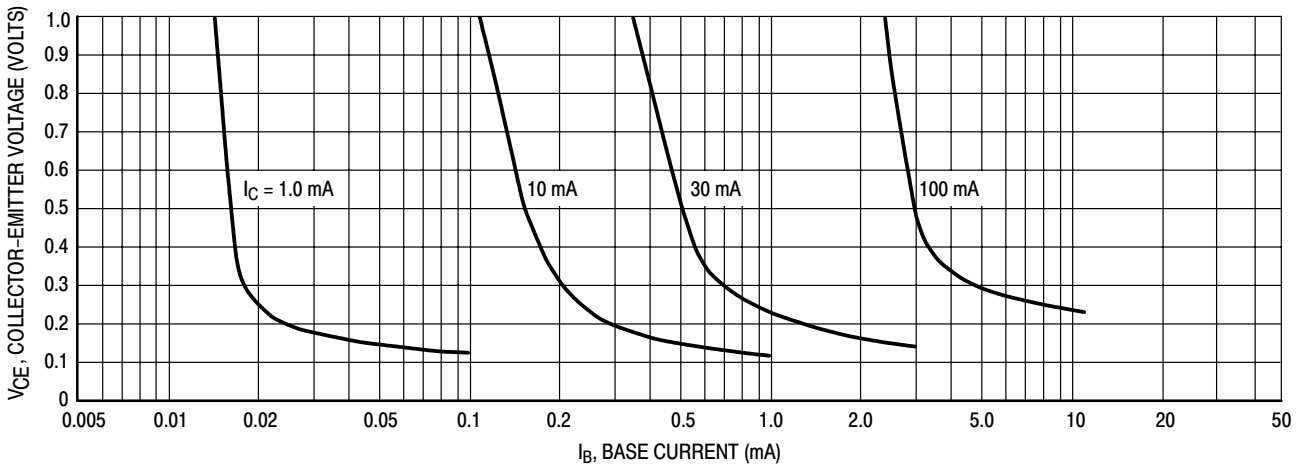


Figure 2. Collector Saturation Region

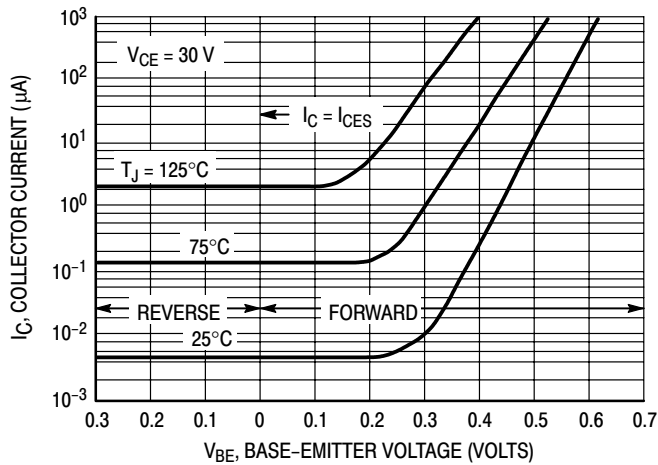


Figure 3. Collector Cut-Off Region

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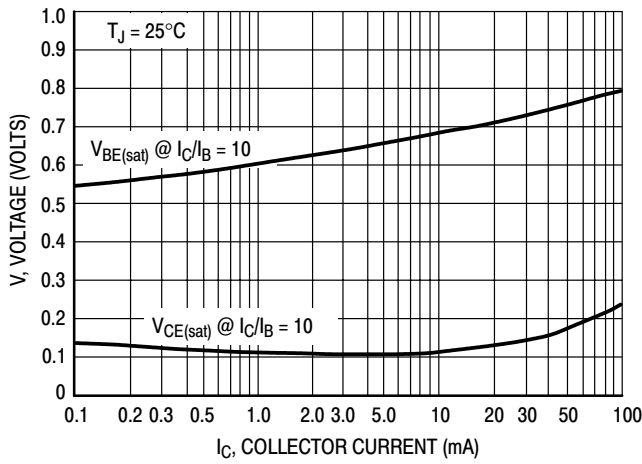


Figure 4. "On" Voltages

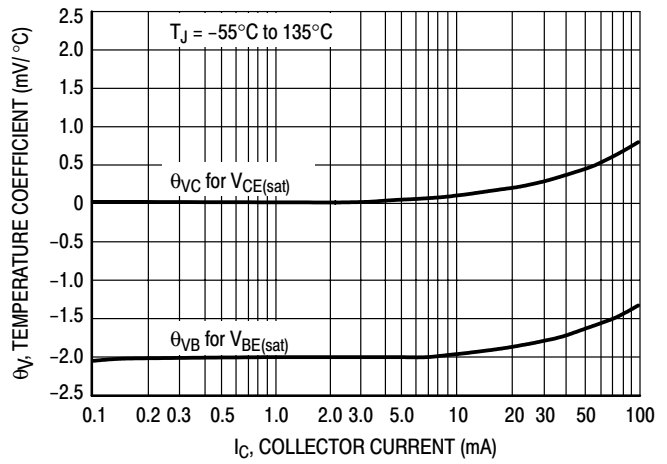


Figure 5. Temperature Coefficients

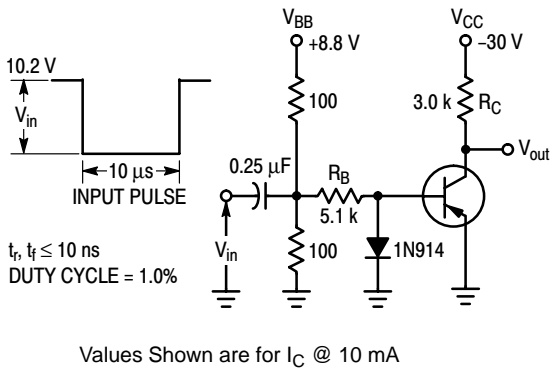


Figure 6. Switching Time Test Circuit

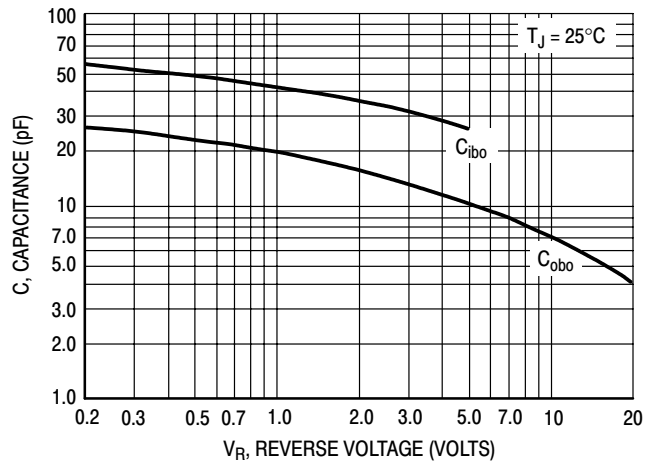


Figure 7. Capacitances

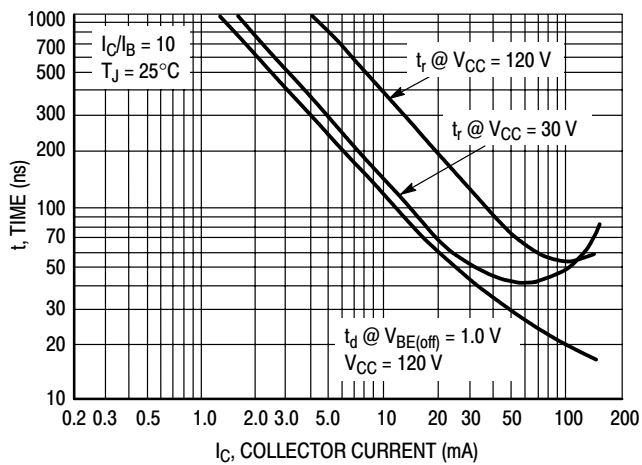


Figure 8. Turn-On Time

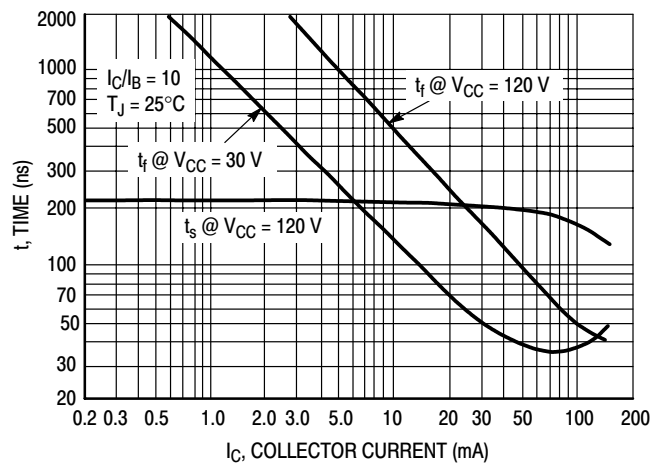
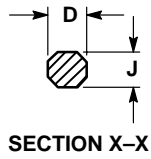
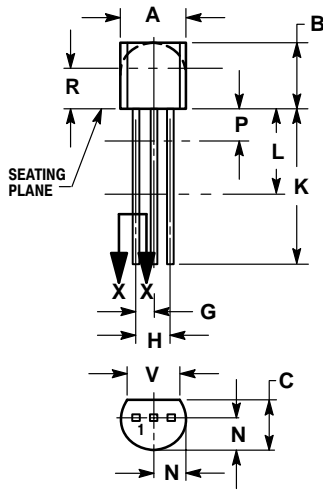


Figure 9. Turn-Off Time

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PACKAGE DIMENSIONS

TO-92 (TO-226AA)
CASE 29-11
ISSUE AL



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

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.021 | 0.407 | 0.533 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.115 | --- | 2.93 | --- |
| V | 0.135 | --- | 3.43 | --- |

Notes

Notes

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