

High Voltage Transistor

NPN Silicon

MPSA44

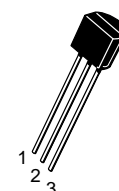
ON Semiconductor Preferred Device

MAXIMUM RATINGS

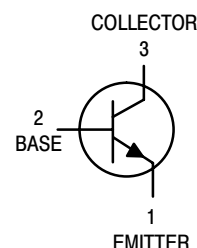
| Rating | Symbol | Value | Unit |
|----------------------------------------------------------------------------------------|----------------|-------------|-------------------------------|
| Collector–Emitter Voltage | V_{CEO} | 400 | Vdc |
| Collector–Base Voltage | V_{CBO} | 500 | Vdc |
| Emitter–Base Voltage | V_{EBO} | 6.0 | Vdc |
| Collector Current — Continuous | I_C | 300 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | Watts mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

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



CASE 29–11, STYLE 1
TO–92 (TO–226AA)



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

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

OFF CHARACTERISTICS

| | | | | |
|------------------------------------------------------------------------------------------------|---------------|-----|-----|-----------------|
| Collector–Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 1.0 \text{ mAdc}$, $I_B = 0$) | $V_{(BR)CEO}$ | 400 | — | Vdc |
| Collector–Emitter Breakdown Voltage ($I_C = 100 \text{ }\mu\text{Adc}$, $V_{BE} = 0$) | $V_{(BR)CES}$ | 500 | — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 100 \text{ }\mu\text{Adc}$, $I_E = 0$) | $V_{(BR)CBO}$ | 500 | — | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 10 \text{ }\mu\text{Adc}$, $I_C = 0$) | $V_{(BR)EBO}$ | 6.0 | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 400 \text{ Vdc}$, $I_E = 0$) | I_{CBO} | — | 0.1 | μAdc |
| Collector Cutoff Current ($V_{CE} = 400 \text{ Vdc}$, $V_{BE} = 0$) | I_{CES} | — | 500 | nAdc |
| Emitter Cutoff Current ($V_{EB} = 4.0 \text{ Vdc}$, $I_C = 0$) | I_{EBO} | — | 0.1 | μAdc |

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

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

MPSA44

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

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

ON CHARACTERISTICS⁽¹⁾

| | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------|--------------------|-----|
| DC Current Gain ⁽¹⁾ ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 100\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) | h_{FE} | 40 50 45 40 | — 200 — — | — |
| Collector–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 1.0\text{ mAdc}$, $I_B = 0.1\text{ mAdc}$) ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) ($I_C = 50\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$) | $V_{CE(sat)}$ | — — — | 0.4 0.5 0.75 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) | $V_{BE(sat)}$ | — | 0.75 | Vdc |

SMALL–SIGNAL CHARACTERISTICS

| | | | | |
|----------------------------------------------------------------------------------------------------------|-----------|-----|-----|----|
| Output Capacitance ($V_{CB} = 20\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | C_{obo} | — | 7.0 | pF |
| Input Capacitance ($V_{EB} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 1.0\text{ MHz}$) | C_{ibo} | — | 130 | pF |
| Small–Signal Current Gain ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 20\text{ MHz}$) | h_{fe} | 1.0 | — | — |

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

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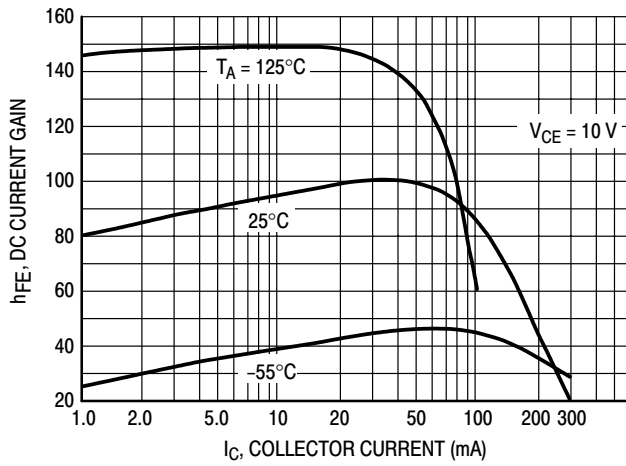


Figure 1. DC Current Gain

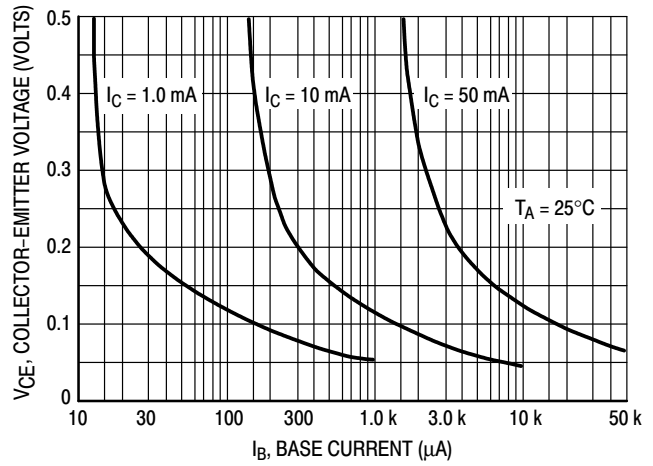


Figure 2. Collector Saturation Region

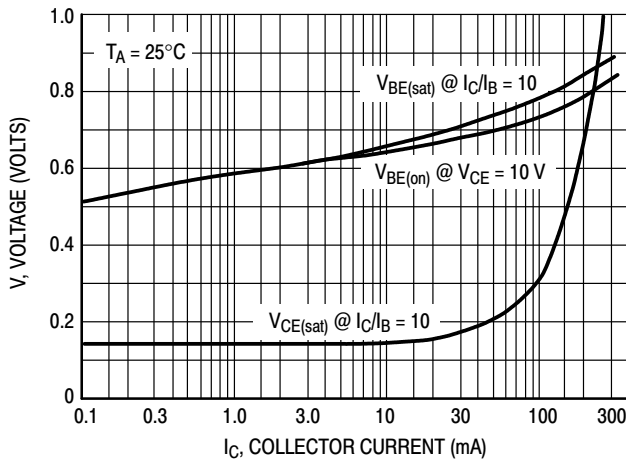


Figure 3. "On" Voltages

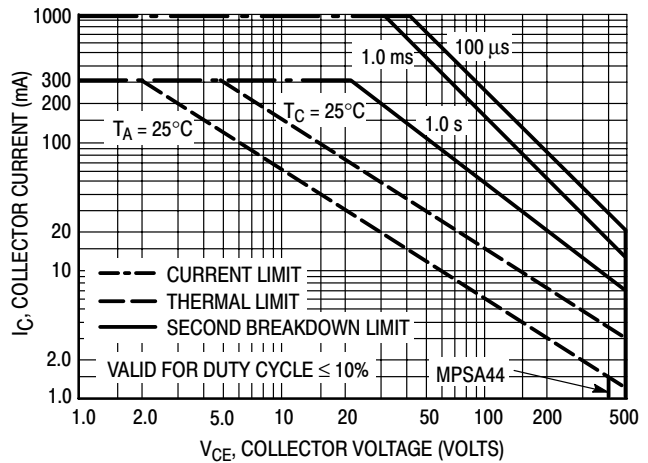


Figure 4. Active Region — Safe Operating Area

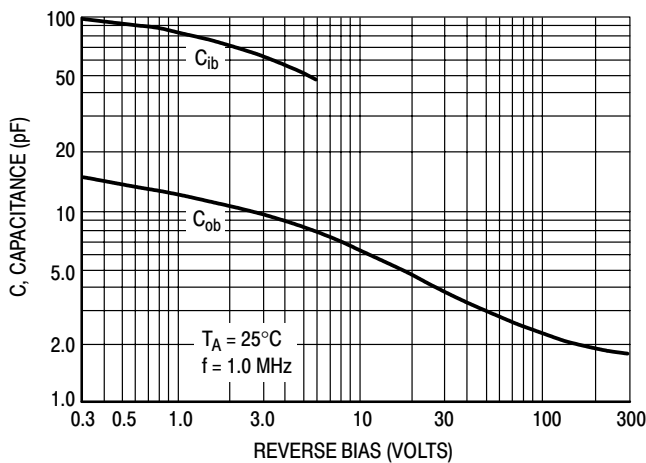


Figure 5. Capacitance

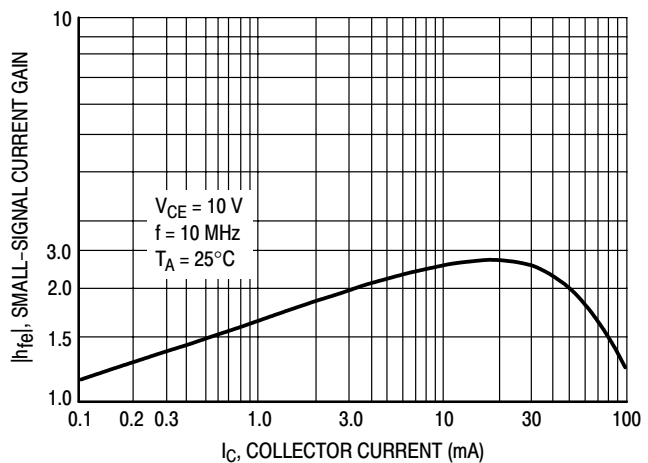


Figure 6. High Frequency Current Gain

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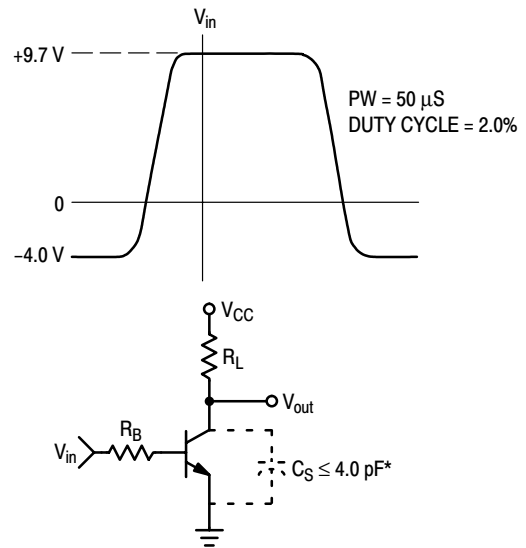
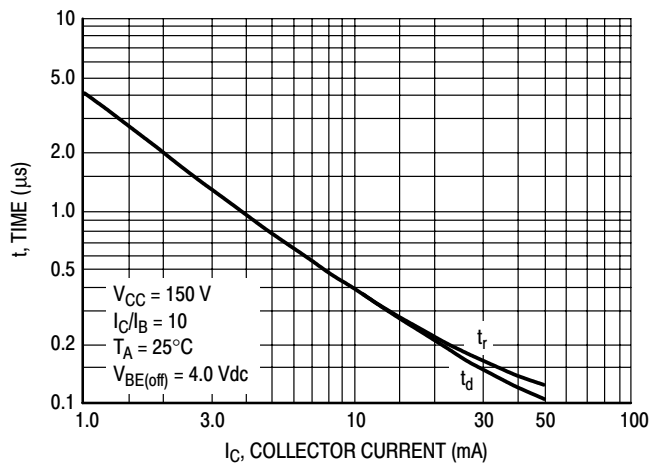


Figure 7. Turn-On Switching Times and Test Circuit

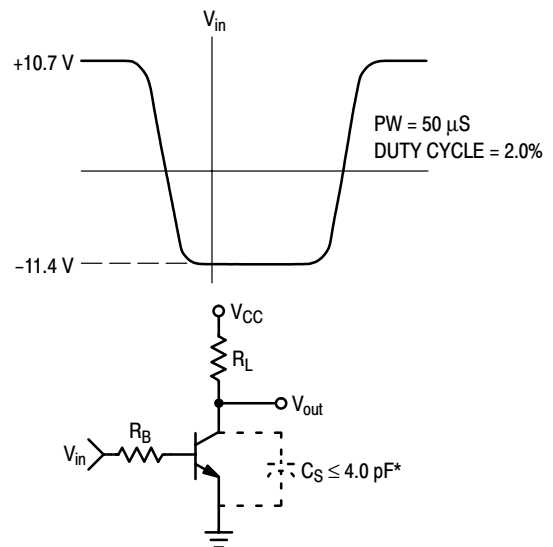
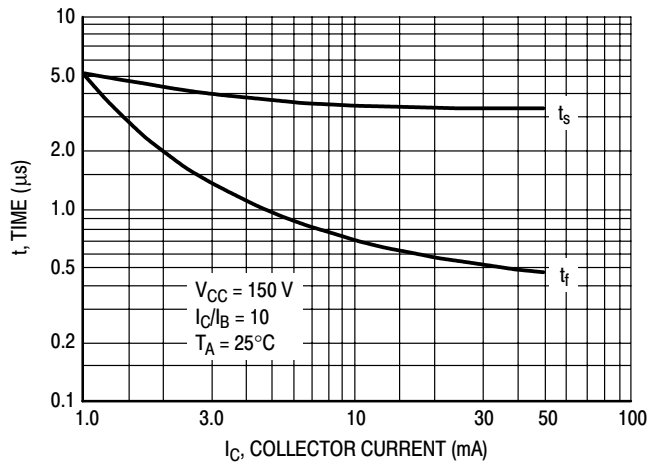


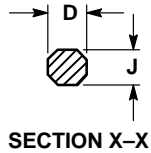
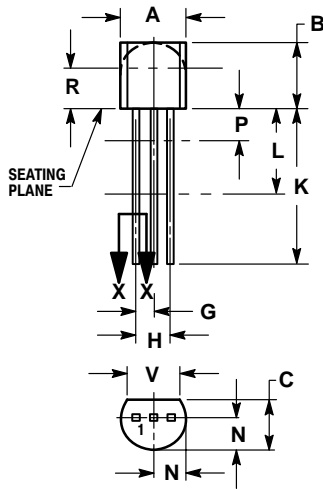
Figure 8. Turn-Off Switching Times and Test Circuit

*Total Shunt Capacitance or Test Jig and Connectors.

MPSA44

PACKAGE DIMENSIONS

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



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 | --- |

STYLE 1:

1. EMITTER
2. BASE
3. COLLECTOR

Notes

Notes

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