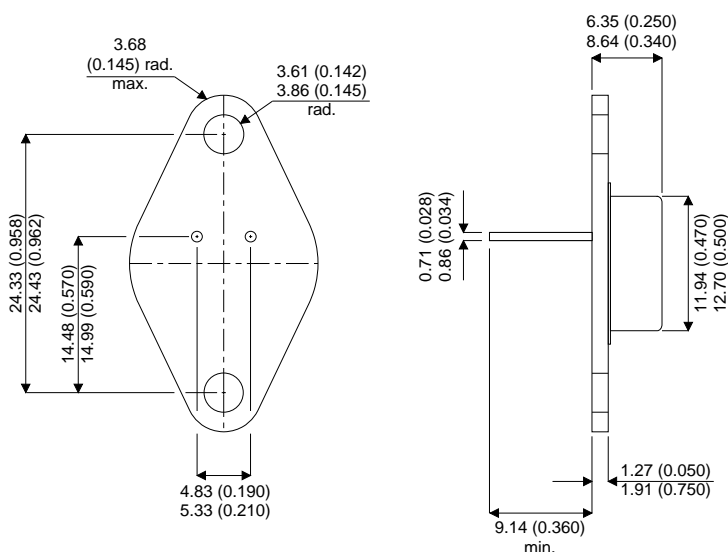


MECHANICAL DATA

Dimensions in mm

**NPN TRANSISTOR
MEDIUM POWER
HIGH VOLTAGE**



APPLICATIONS

Designed for switching regulator applications where high frequency and high voltage swings are required.

TO66 Package.

ABSOLUTE MAXIMUM RATINGS ($T_{case} = -25^{\circ}C$ unless otherwise stated)

| | | |
|-----------------|--|---------------|
| V_{CEO} | Collector – Emitter Voltage | 300V |
| V_{CB} | Collector – Base Voltage | 500V |
| V_{EB} | Emitter – Base Voltage | 6V |
| I_C | Collector Current | Continuous |
| I_C | Peak (1) | 2A |
| I_B | Base Current | 5A |
| P_D | Total Power Dissipation | 1A |
| | Derate above 25 °C | 35W |
| T_J, T_{stg} | Operating and Storage Junction Temperature Range | 0.2W / °C |
| $R_{\theta JC}$ | Thermal Resistance , Junction To Case | -65 to 200 °C |
| | | 5.0°C / W |

NOTES:

(1) Pulse Test: Pulse Width = 5.0 ms , Duty Cycle \leq 10%.

ELECTRICAL CHARACTERISTICS ($T_{\text{case}} = 25^{\circ}\text{C}$, unless otherwise stated)

OFF CHARACTERISTICS

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit. |
|-----------------------|---|------|------|------|-------|
| $V_{\text{CEO(sus)}}$ | Collector – Emitter Sustaining Voltage $I_{\text{C}} = 200\text{mA}$, $I_{\text{B}} = 0$ | 300 | | | V |
| I_{CEO} | Collector Cutoff Current $V_{\text{CE}} = 150\text{V}$, $I_{\text{B}} = 0$ | | | 5.0 | mA |
| I_{CEX} | Collector Cutoff Current $V_{\text{CE}} = 450\text{V}$, $V_{\text{BE(off)}} = 1.5\text{V}$ | | | 2.0 | mA |
| | $V_{\text{CE}} = 450\text{V}$, $V_{\text{BE(off)}} = 1.5\text{V}$, $T_{\text{C}} = 150^{\circ}\text{C}$ | | | 5.0 | |
| I_{EBO} | Emitter Cutoff Current $V_{\text{BE}} = 6\text{V}$, $I_{\text{C}} = 0$ | | | 0.5 | mA |

ON CHARACTERISTICS (1)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit. |
|----------------------|--|------|------|------|-------|
| h_{FE} | Current Gain $I_{\text{C}} = 0.1\text{A}$, $V_{\text{CE}} = 10\text{V}$ | 40 | | | — |
| | $I_{\text{C}} = 0.75\text{A}$, $V_{\text{CE}} = 2\text{V}$ | 10 | | 100 | |
| | $I_{\text{C}} = 0.75\text{A}$, $V_{\text{CE}} = 10\text{V}$ | 30 | | 150 | |
| $V_{\text{CE(sat)}}$ | Collector – Emitter Saturation Voltage $I_{\text{C}} = 0.75\text{A}$, $I_{\text{B}} = 75\text{mA}$ | | | 1.0 | V |
| $V_{\text{BE(sat)}}$ | Base – Emitter Saturation Voltage $I_{\text{C}} = 0.75\text{A}$, $I_{\text{B}} = 75\text{mA}$ | | | 1.8 | V |
| $V_{\text{BE(on)}}$ | Base – Emitter On Voltage $I_{\text{C}} = 0.1\text{A}$, $V_{\text{CE}} = 10\text{V}$ | | | 1.4 | V |
| $I_{\text{s/b}}$ | Second Breakdown Collector Current ($V_{\text{CC}} = 100\text{V}$) | 350 | | | mA |

DYNAMIC CHARACTERISTICS

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit. |
|-----------------|---|------|------|------|-------|
| f_{T} | Current Gain – Bandwidth Product (2) $I_{\text{C}} = 200\text{mA}$, $V_{\text{CE}} = 10\text{V}$ $f_{\text{test}} = 5.0\text{MHz}$ | 15 | | | MHz |
| C_{ob} | Output Capacitance $V_{\text{CB}} = 10\text{V}$, $I_{\text{E}} = 0$, $f = 1.0\text{MHz}$ | | | 120 | pF |

SWITCHING CHARACTERISTICS

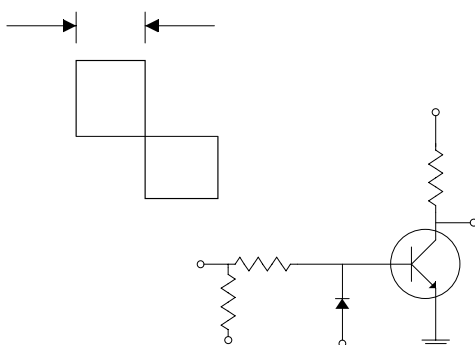
| Parameter | Test Conditions | Min. | Typ. | Max. | Unit. |
|----------------|---|------|------|------|---------------|
| t_{r} | Rise Time $V_{\text{CC}} = 200\text{V}$, $I_{\text{C}} = 0.75\text{A}$ $R_{\text{L}} = 200\Omega$, $I_{\text{B1}} = 100\text{mA}$ | | | 0.5 | μs |
| t_{s} | Storage Time $V_{\text{CC}} = 200\text{V}$, $I_{\text{C}} = 0.75\text{A}$ $I_{\text{B1}} = I_{\text{B2}} = 75\text{mA}$ | | | 6.0 | μs |
| t_{f} | Fall Time $V_{\text{CC}} = 200\text{V}$, $I_{\text{C}} = 0.75\text{A}$ $I_{\text{B1}} = I_{\text{B2}} = 75\text{mA}$ | | | 3.0 | μs |

NOTES:

(1) Pulse Test: Pulse Width = $300\mu\text{s}$, Duty Cycle $\leq 2\%$

(2) $f_{\text{T}} = |h_{\text{fe}}| \cdot f_{\text{test}}$

FIGURE 1 – SWITCHING TIME TEST CIRCUIT



R_{B} AND R_{C} varied to obtain desired current levels.

D_1 must be fast recovery type.

For t_{d} and t_{r} , D_1 is disconnected and $V_2 = 0$.