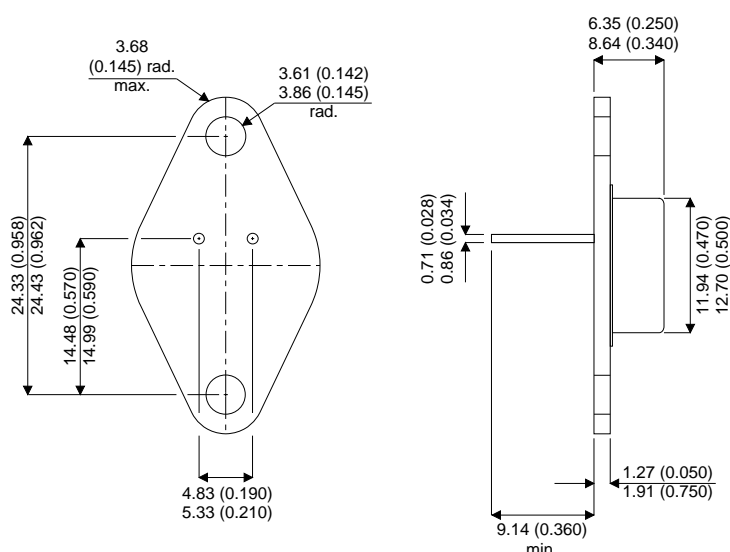


**MECHANICAL DATA**

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
$I_{\text{CEO}}$	Collector Cutoff Current $V_{\text{CE}} = 150\text{V}$ , $I_{\text{B}} = 0$			5.0	mA
$I_{\text{CEX}}$	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	
$I_{\text{EBO}}$	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.
$h_{\text{FE}}$	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.
$f_{\text{T}}$	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
$C_{\text{ob}}$	Output Capacitance $V_{\text{CB}} = 10\text{V}$ , $I_{\text{E}} = 0$ , $f = 1.0\text{MHz}$			120	pF

### SWITCHING CHARACTERISTICS

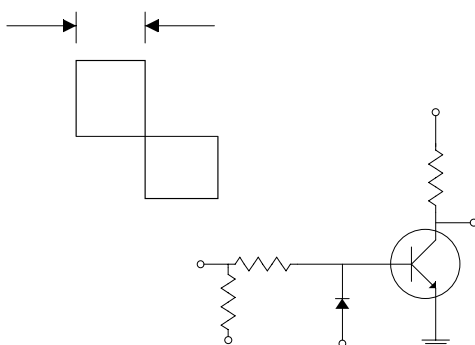
Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
$t_{\text{r}}$	Rise Time $V_{\text{CC}} = 200\text{V}$ , $I_{\text{C}} = 0.75\text{A}$ $R_{\text{L}} = 200\Omega$ , $I_{\text{B1}} = 100\text{mA}$			0.5	$\mu\text{s}$
$t_{\text{s}}$	Storage Time $V_{\text{CC}} = 200\text{V}$ , $I_{\text{C}} = 0.75\text{A}$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

### 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**



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

$D_1$  must be fast recovery type.

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