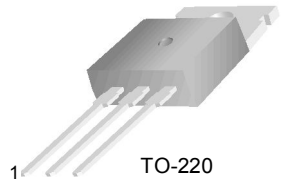


# TIP47/TIP48/TIP49/TIP50

## NPN Silicon Transistor

- High Voltage and Switching Applications
- High Sustaining Voltage :  $V_{CEO(sus)} = 250 - 400V$
- 1A Rated Collector Current



1.Base 2.Collector 3.Emitter

### Absolute Maximum Ratings\* $T_a = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Ratings	Units
$V_{CBO}$	Collector-Base Voltage : TIP47	350	V
	: TIP48	400	V
	: TIP49	450	V
	: TIP50	500	V
$V_{CEO}$	Collector-Emitter Voltage : TIP47	250	V
	: TIP48	300	V
	: TIP49	350	V
	: TIP50	400	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current (DC)	1	A
$I_{CP}$	Collector Current (Pulse)	2	A
$I_B$	Base Current	0.6	A
$P_C$	Collector Dissipation ( $T_C=25^\circ C$ )	40	W
	Collector Dissipation ( $T_a=25^\circ C$ )	2	W
$T_J$	Junction Temperature	150	$^\circ C$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ C$

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**Electrical Characteristics\***  $T_a=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{\text{CEX(sus)}}$	Collector-Emitter Sustaining Voltage	$I_C = 30\text{mA}, I_B = 0$	250			V
	: TIP47					
	: TIP48					
	: TIP49					
: TIP50						
$I_{\text{CEO}}$	Collector Cut-off Current	$V_{\text{CE}} = 150\text{V}, I_B = 0$			1	mA
	: TIP47	$V_{\text{CE}} = 200\text{V}, I_B = 0$			1	mA
	: TIP48	$V_{\text{CE}} = 250\text{V}, I_B = 0$			1	mA
	: TIP49	$V_{\text{CE}} = 300\text{V}, I_B = 0$			1	mA
$I_{\text{CEX}}$	Collector Cut-off Current	$V_{\text{CE}} = 350\text{V}, V_{\text{BE}} = 0$			1	mA
	: TIP47	$V_{\text{CE}} = 400\text{V}, V_{\text{BE}} = 0$			1	mA
	: TIP48	$V_{\text{CE}} = 450\text{V}, V_{\text{BE}} = 0$			1	mA
	: TIP49	$V_{\text{CE}} = 500\text{V}, V_{\text{BE}} = 0$			1	mA
$I_{\text{EBO}}$	Emitter Cut-off Current	$V_{\text{EB}} = 5\text{V}, I_C = 0$			1	mA
$h_{\text{FE}}$	* DC Current Gain	$V_{\text{CE}} = 10\text{V}, I_C = 0.3\text{A}$	30		150	
		$V_{\text{CE}} = 10\text{V}, I_C = 1\text{A}$	10			
$V_{\text{CE(sat)}}$	* Collector-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$			1	V
$V_{\text{BE(sat)}}$	* Base-Emitter Saturation Voltage	$V_{\text{CE}} = 10\text{V}, I_C = 1\text{A}$			1.5	V
$f_T$	Current Gain Bandwidth Product	$V_{\text{CE}} = 10\text{V}, I_C = 0.2\text{A}, f = 1\text{MHz}$	10			MHz

\* Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2\%$

# Typical Characteristics

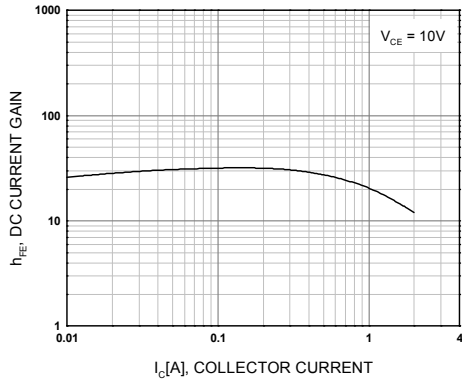


Figure 1. DC current Gain

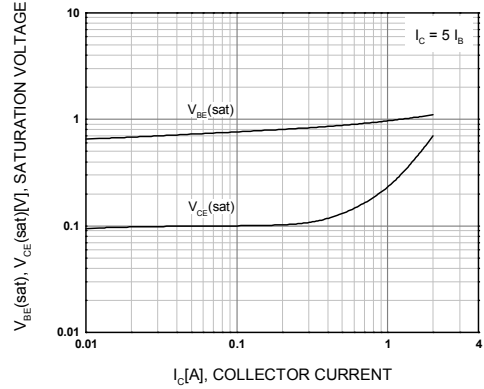


Figure 2. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

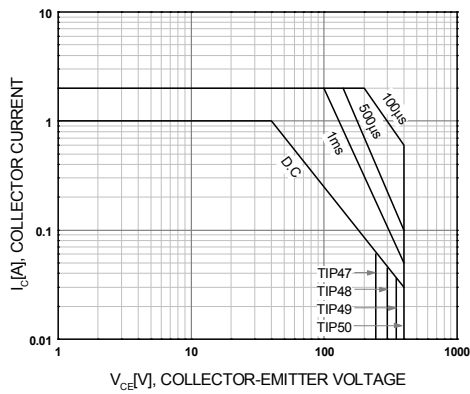


Figure 3. Safe Operating Area

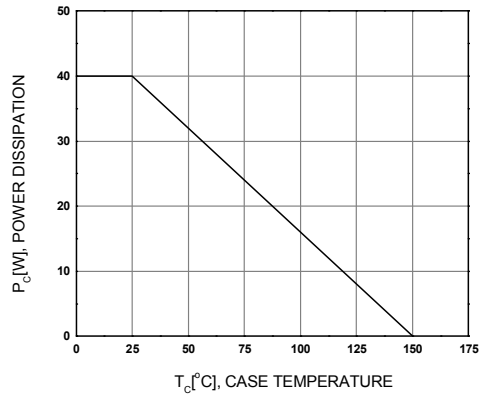
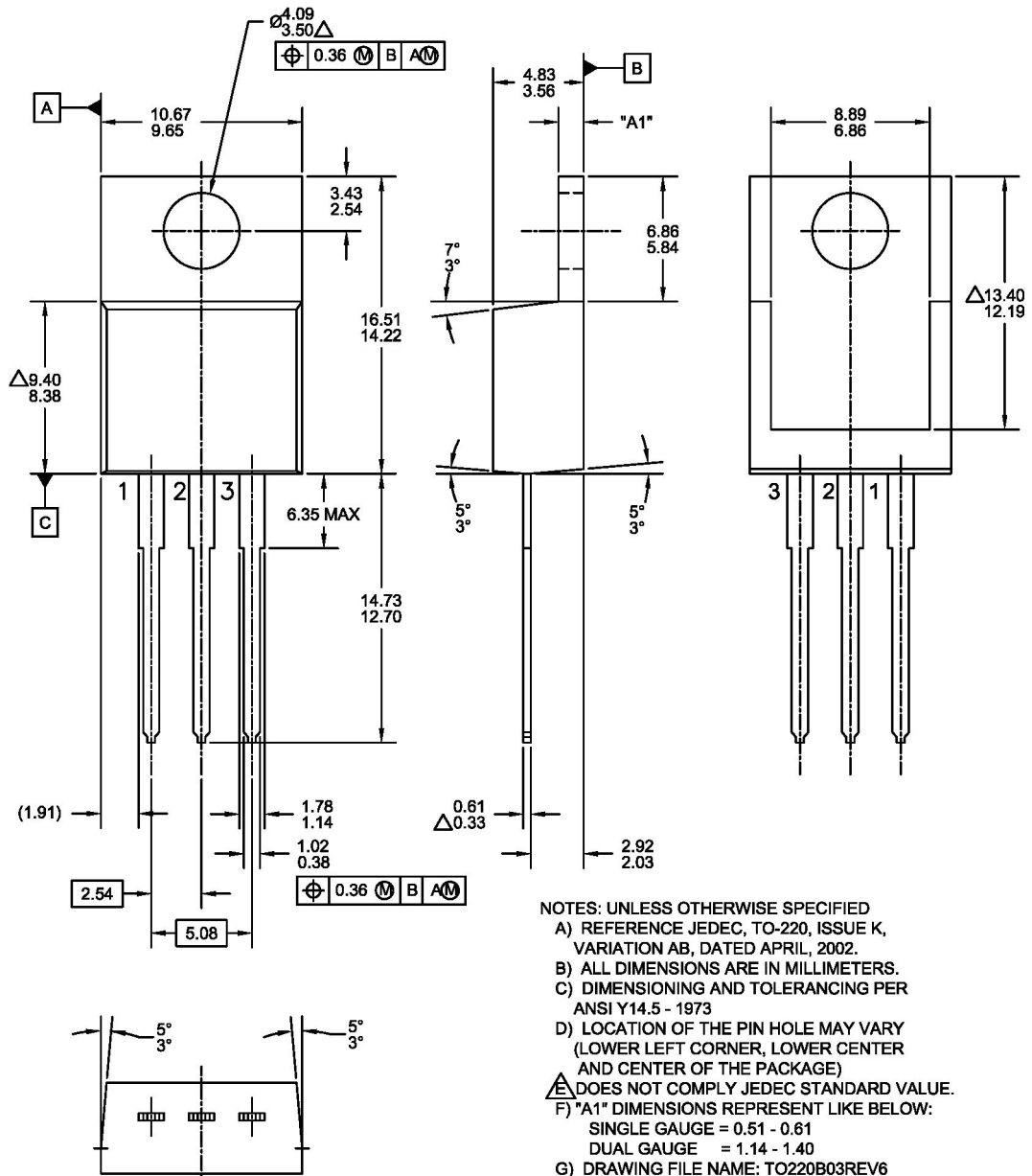


Figure 4. Power Derating

Mechanical Dimensions

TO220





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