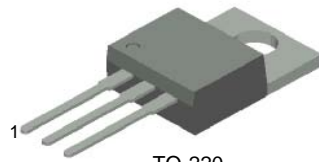


# TIP145T/146T/147T

## PNP Epitaxial Silicon Darlington Transistor

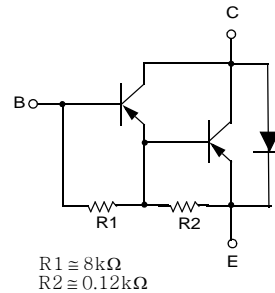
### Monolithic Construction With Built In Base-Emitter Shunt Resistors

- High DC Current Gain :  $h_{FE} = 1000 @ V_{CE} = -4V, I_C = -5A$  (Min.)
- Industrial Use
- Complement to TIP140T/141T/142T



TO-220  
1.Base 2.Collector 3.Emitter

Equivalent Circuit



### Absolute Maximum Ratings \* $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$BV_{CBO}$	Collector-Base Voltage : TIP145T	- 60	V
	: TIP146T	- 80	V
	: TIP147T	- 100	V
$BV_{CEO}$	Collector-Emitter Voltage : TIP145T	- 60	V
	: TIP146T	- 80	V
	: TIP147T	- 100	V
$BV_{EBO}$	Emitter-Base Voltage	- 5	V
$I_C$	Collector Current (DC)	- 10	A
$I_{CP}$	Collector Current (Pulse)	- 15	A
$I_B$	Base Current (DC)	- 0.5	A
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	80	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Junction Temperature Range	- 65 ~ 150	$^\circ\text{C}$

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

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

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
$V_{CE0(sus)}$	Collector-Emitter Sustaining Voltage : TIP145T : TIP146T : TIP147T	$I_C = -30\text{mA}, I_B = 0$	- 60 - 80 - 100			V V V
$I_{CEO}$	Collector Cut-off Current : TIP145T : TIP146T : TIP147T	$V_{CE} = -30\text{V}, I_B = 0$ $V_{CE} = -40\text{V}, I_B = 0$ $V_{CE} = -50\text{V}, I_B = 0$			- 2 - 2 - 2	mA mA mA
$I_{CBO}$	Collector Cut-off Current : TIP145T : TIP146T : TIP147T	$V_{CB} = -60\text{V}, I_E = 0$ $V_{CB} = -80\text{V}, I_E = 0$ $V_{CB} = -100\text{V}, I_E = 0$			- 1 - 1 - 1	mA mA mA
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = -5\text{V}, I_C = 0$			- 2	mA
$h_{FE}$	DC Current Gain	$V_{CE} = -4\text{V}, I_C = -5\text{A}$ $V_{CE} = -4\text{V}, I_C = -10\text{A}$	1000 500			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -5\text{A}, I_B = -10\text{mA}$ $I_C = -10\text{A}, I_B = -40\text{mA}$			- 2 - 3	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -10\text{A}, I_B = -40\text{mA}$			- 3.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = -4\text{V}, I_C = -10\text{A}$			- 3	V
$t_d$	Delay Time	$V_{CC} = -30\text{V}, I_C = -5\text{A}$ $I_{B1} = -20\text{mA}, I_{B2} = 20\text{mA}$ $R_L = 6\Omega$		0.15		$\mu\text{s}$
$t_r$	Rise Time			0.55		$\mu\text{s}$
$t_{stg}$	Storage Time			2.5		$\mu\text{s}$
$t_f$	Fall Time			2.5		$\mu\text{s}$

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

# Typical Characteristics

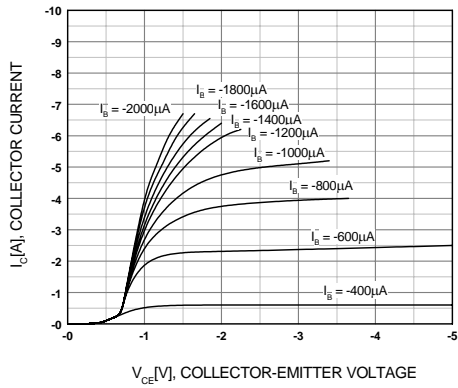


Figure 1. Static Characteristic

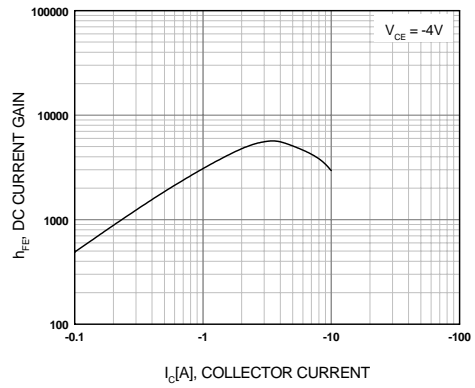


Figure 2. DC current Gain

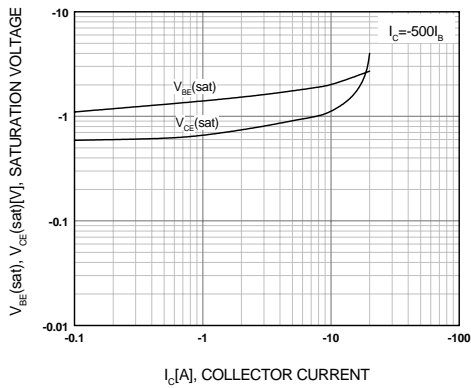


Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

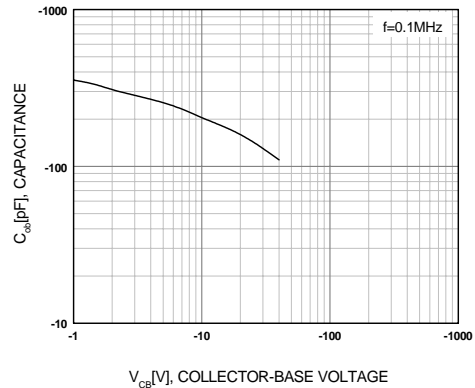


Figure 4. Collector Output Capacitance

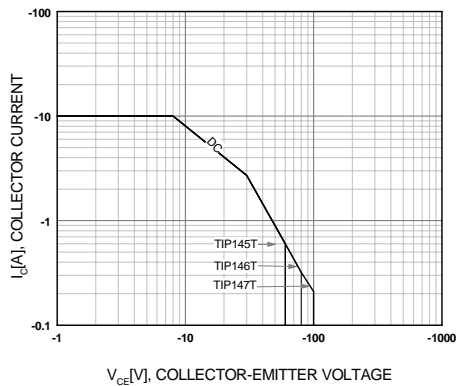


Figure 5. Safe Operating Area

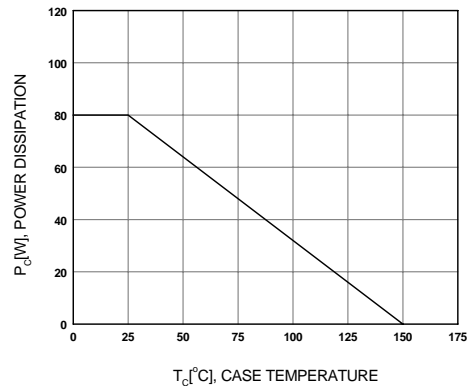
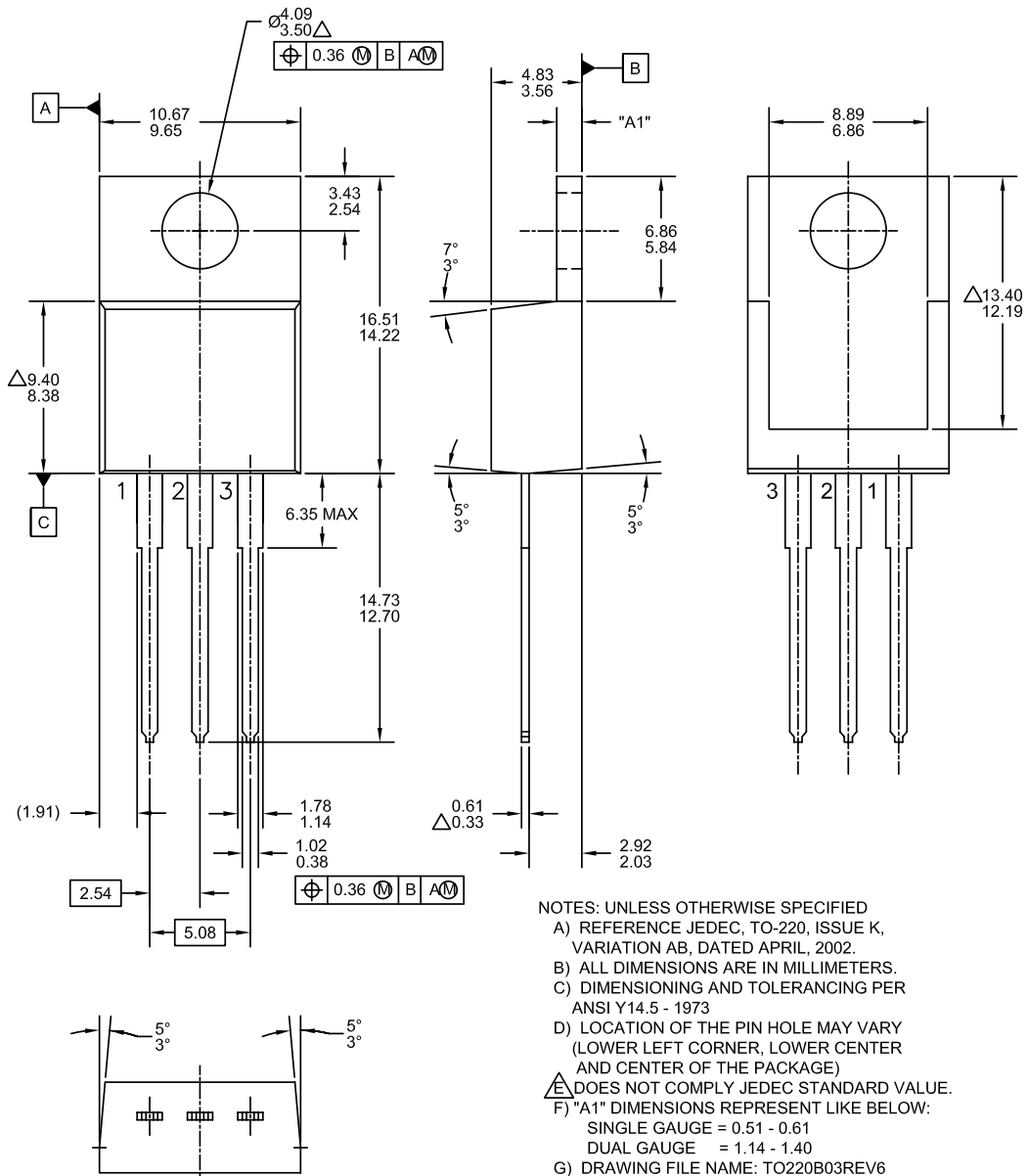


Figure 6. Power Derating

Mechanical Dimensions

TO220





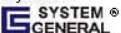


- NOTES: UNLESS OTHERWISE SPECIFIED
- A) REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AB, DATED APRIL, 2002.
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973
  - D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - E) DOES NOT COMPLY JEDEC STANDARD VALUE.
  - F) "A1" DIMENSIONS REPRESENT LIKE BELOW:  
 SINGLE GAUGE = 0.51 - 0.61  
 DUAL GAUGE = 1.14 - 1.40
  - G) DRAWING FILE NAME: TO220B03REV6



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