

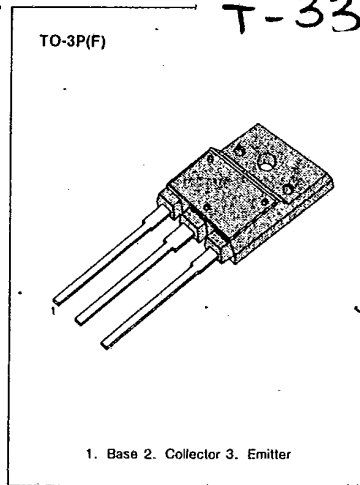
**PNP EPITAXIAL SILICON DARLINGTON TRANSISTOR**  
**TIP145F/146F/147F**

**HIGH DC CURRENT GAIN<sup>1</sup>**  
**MIN  $h_{FE} = 1000$  @  $V_{CE} = -4V, I_C = -5A$**   
**MONOLITHIC CONSTRUCTION WITH BUILT**  
**IN BASE-EMITTER SHUNT RESISTORS**  
**INDUSTRIAL USE**

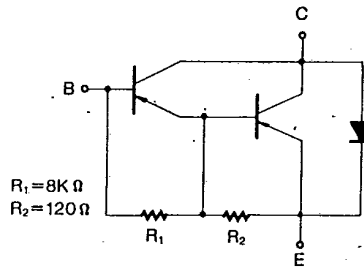
Complementary to TIP140F/141F/142F

**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ C$ )**

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	-60	V
: TIP145F		-80	V
: TIP146F		-100	V
: TIP147F			
Collector Emitter Voltage	$V_{CEO}$	-60	V
: TIP145F		-80	V
: TIP146F		-100	V
: TIP147F			
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current (DC)	$I_C$	-10	A
Collector Current (Pulse)	$I_C$	-15	A
Base Current (DC)	$I_B$	-0.5	A
Collector Dissipation	$P_C$	60	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-65~150	$^\circ C$



1. Base 2. Collector 3. Emitter



3

**ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )**

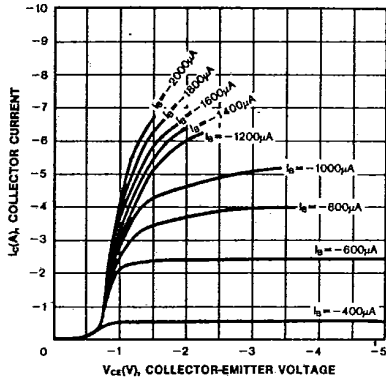
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = -30mA, I_B = 0$	-60			V
: TIP145F			-80			V
: TIP146F			-100			V
: TIP147F						
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = -30V, I_B = 0$			-2	mA
: TIP145F		$V_{CE} = -40V, I_B = 0$			-2	mA
: TIP146F		$V_{CE} = -50V, I_B = 0$			-2	mA
: TIP147F						
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = -60V, I_E = 0$			-1	mA
: TIP145F		$V_{CB} = -80V, I_E = 0$			-1	mA
: TIP146F		$V_{CB} = -100V, I_E = 0$			-1	mA
: TIP147F						
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = -5V, I_C = 0$			-2	mA
DC Current Gain	$h_{FE}$	$V_{CE} = -4V, I_C = -5A$	1000			
		$V_{CE} = -4V, I_C = -10A$	500			
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -5A, I_B = -10mA$			-2	V
		$I_C = -10A, I_B = -40mA$			-3	V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -10A, I_B = -40mA$			-3.5	V
Base Emitter On Voltage	$V_{BE(on)}$	$V_{CE} = -4V, I_C = -10A$			-3	V
Delay Time	$t_d$	$V_{CC} = -30V, I_C = -5A$		0.15		$\mu S$
Rise Time	$t_r$	$I_B = -20mA, I_{B1} = I_{B2}$		0.55		$\mu S$
Storage Time	$t_s$			2.5		$\mu S$
Fall Time	$t_f$			2.5		$\mu S$

TIP145F/146F/147F

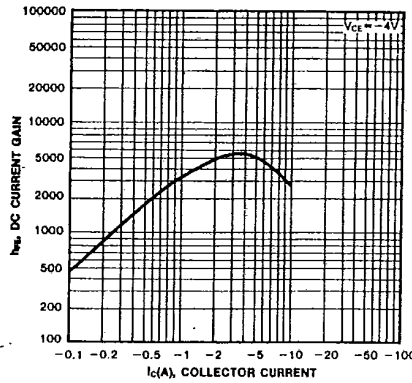
PNP EPITAXIAL SILICON DARLINGTON TRANSISTOR

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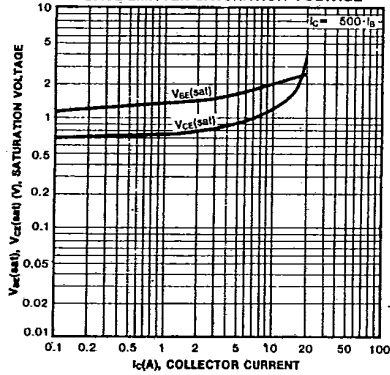
STATIC CHARACTERISTIC



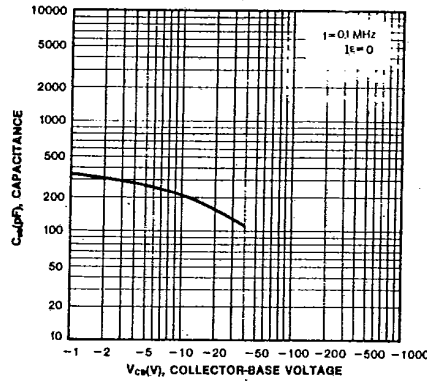
DC CURRENT GAIN



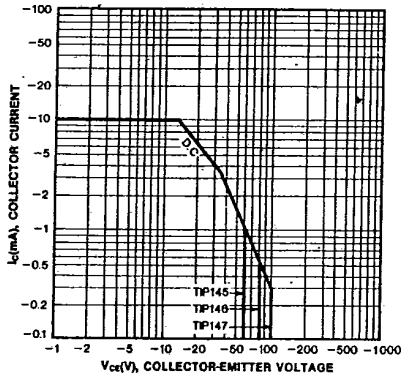
COLLECTOR-EMITTER SATURATION VOLTAGE  
BASE-EMITTER SATURATION VOLTAGE



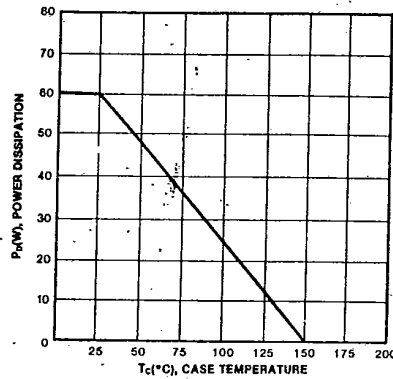
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING



TIP145T/146T/147T

PNP EPITAXIAL SILICON  
DARLINGTON TRANSISTOR

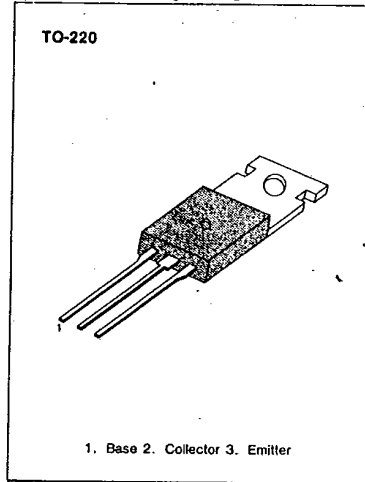
T-33-31

HIGH DC CURRENT GAIN-MIN  $h_{FE}=1000$   
@  $V_{CE}=-4V, I_C=-5A$

MONOLITHIC CONSTRUCTION WITH BUILT IN BASE-EMITTER  
SHUNT RESISTORS INDUSTRIAL USE  
Complementary to TIP140T/141T/142T

ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ C$ )

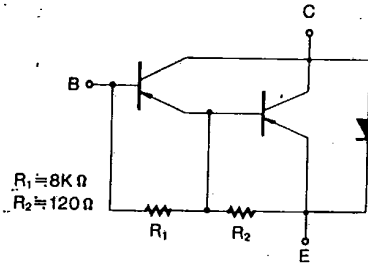
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage : TIP145T	$V_{CBO}$	-60	V
: TIP146T		-80	V
: TIP147T		-100	V
Collector-Emitter Voltage	$V_{CEO}$		
: TIP145T		-60	V
: TIP146T		-80	V
: TIP147T		-100	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current (DC)	$I_C$	-10	A
Collector Current (Pulse)	$I_C$	-15	A
Base Current (DC)	$I_B$	-0.5	A
Collector Dissipation	$P_C$	80	W
Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-65~150	$^\circ C$



1. Base 2. Collector 3. Emitter

3

ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ C$ )

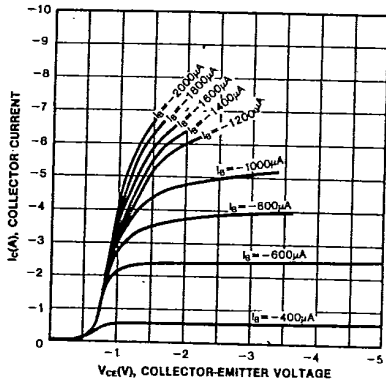


Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Emitter Sustaining Voltage	$V_{CEO(SUS)}$					
: TIP145T		$I_C=-30mA, I_B=0$	-60			V
: TIP146T			-80			V
: TIP147T			-100			V
Collector Cutoff Current	$I_{CEO}$	$V_{CE}=-30V, I_B=0$			-2	mA
: TIP145T		$V_{CE}=-40V, I_B=0$			-2	mA
: TIP146T		$V_{CE}=-50V, I_B=0$			-2	mA
: TIP147T		$V_{CB}=-60V, I_E=0$			-1	mA
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-80V, I_E=0$			-1	mA
: TIP145T		$V_{CB}=-100V, I_E=0$			-1	mA
: TIP146T					-2	mA
: TIP147T					-2	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE}=-5V, I_C=0$			-2	mA
DC Current Gain	$h_{FE}$	$V_{CE}=-4V, I_C=-5A$	1000			
		$V_{CE}=-4V, I_C=-10A$	500			
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-5A, I_B=-10mA$			-2	V
		$I_C=-10A, I_B=-40mA$			-3	V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-10A, I_B=-40mA$			-3.5	V
Base Emitter On Voltage	$V_{BE(on)}$	$V_{CE}=-4V, I_C=-10A$			-3	V
Delay Time	$t_d$	$V_{CC}=-30V, I_C=-5A$		0.15		$\mu S$
Rise Time	$t_r$	$I_B=-20mA, I_{B1}=1B2$		0.55		$\mu S$
Storage Time	$t_s$			2.5		$\mu S$
Fall Time	$t_f$			2.5		$\mu S$

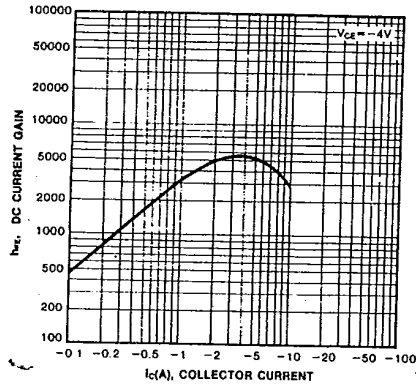
**TIP140T/141T/142T**

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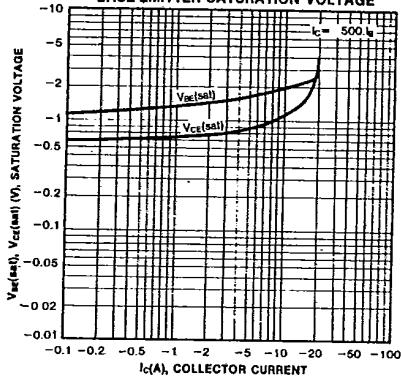
**STATIC CHARACTERISTIC**



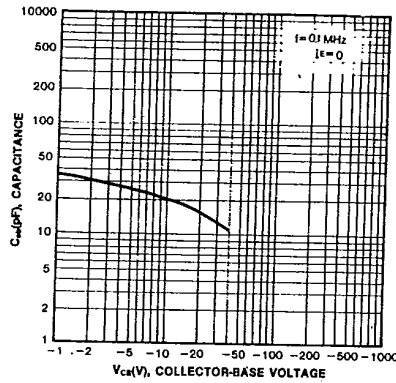
**DC CURRENT GAIN**



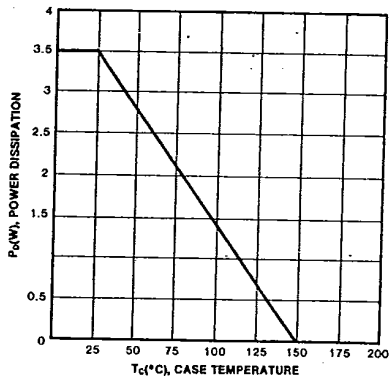
**COLLECTOR-EMITTER SATURATION VOLTAGE  
 BASE-EMITTER SATURATION VOLTAGE**



**COLLECTOR OUTPUT CAPACITANCE**



**POWER DERATING**



**SAFE OPERATING AREA**

