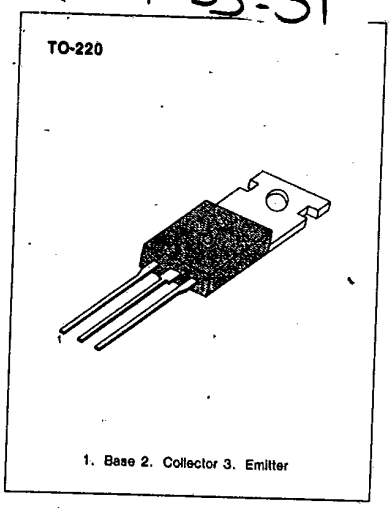
TIP126

PNP EPITAXIAL SILICON DARLINGTON TRANSISTOR

T-33-31

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

- Complement to TIP121



3

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

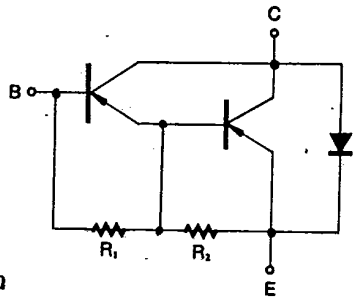
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	−80	V
Collector-Emitter Voltage	V_{CEO}	−80	V
Emitter-Base Voltage	V_{EBO}	−5	V
Base Current	I_B	−120	mA
Collector Current (DC)	I_C	−5	A
Collector Current (Pulse)	I_C	−8	A
Collector Dissipation (T_a=25°C)	P_C	2	W
Collector Dissipation (T_C=25°C)	P_C	65	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−65~150	°C

* Refer to TIP125 for graphs

ELECTRICAL CHARACTERISTICS (T_C=25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
*Collector-Emitter Sustaining Voltage	BV_{CEO} (sus)	I_C=−100mA, I_B=0	−80		V
Collector Cutoff Current	I_{CBO}	V_{CB}=−80V, I_E=0		−0.2	mA
Collector Cutoff Current	I_{CEO}	V_{CE}=−40V, I_B=0		−0.5	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=−5V, I_C=0		−2	mA
*DC Current Gain	h_{FE}	V_{CE}=−3V, I_C=−0.5A	1000		
		V_{CE}=−3V, I_C=−3A	1000		
*Collector Emitter Saturation Voltage	V_{CE} (sat)	I_C=−3A, I_B=−12mA		−2	V
		I_C=−5A, I_B=−20mA		−4	V
*Base-Emitter On Voltage	V_{BE}(on)	V_{CE}=−3V, I_C=−3A		−2.5	V
Collector Output Capacitance	Cob	V_{CB}=−10V, I_E=0, f=0.1MHz		300	pF

* Pulse test : PW ≤ 300μs, duty cycle ≤ 2%



R_1≒8KΩ
R_2≒120Ω

TIP127

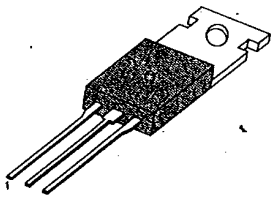
PNP EPITAXIAL SILICON DARLINGTON TRANSISTOR

T-33-31

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

- **Complement to TIP122**

TO-220



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a =25°C)

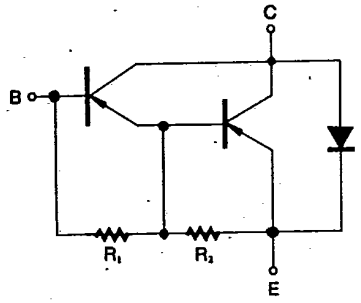
Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	−100	V
Collector-Emitter Voltage	V_{CEO}	−100	V
Emitter-Base Voltage	V_{EBO}	−5	V
Base Current	I_B	−120	mA
Collector Current (DC)	I_C	−5	A
Collector Current (Pulse)	I_C	−8	A
Collector Dissipation (T_a=25°C)	P_C	2	W
Collector Dissipation (T_C=25°C)	P_C	65	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−65~150	°C

* Refer to TIP125 for graphs

ELECTRICAL CHARACTERISTICS (T_C=25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
*Collector-Emitter Sustaining Voltage	BV_{CEO} (sus)	I_C=−100mA, I_B=0	−100		V
Collector Cutoff Current	I_{CBO}	V_{CB}=−100V, I_E=0		−0.2	mA
Collector Cutoff Current	I_{CEO}	V_{CE}=−50V, I_B=0		−0.5	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=−5V, I_C=0		−2	mA
*DC Current Gain	h_{FE}	V_{CE}=−3V, I_C=−0.5A	1000		
		V_{CE}=−3V, I_C=−3A	1000		
*Collector Emitter Saturation Voltage	V_{CE} (sat)	I_C=−3A, I_B=−12mA		−2	V
		I_C=−5A, I_B=−20mA		−4	V
*Base-Emitter On Voltage	V_{BE}(on)	V_{CE}=−3V, I_C=−3A		−2.5	V
Collector Output Capacitance	Cob	V_{CB}=−10V, I_E=0, f=0.1MHz		300	pF

* Pulse test : PW ≤ 300μs, duty cycle ≤ 2%



R_1≒8KΩ
R_2≒120Ω

PN EPITAXIAL SILICON DARLINGTON TRANSISTOR

TIP140F/141F/142F

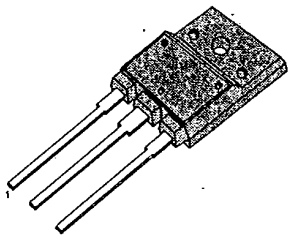
SAMSUNG SEMICONDUCTOR INC

T-33-29

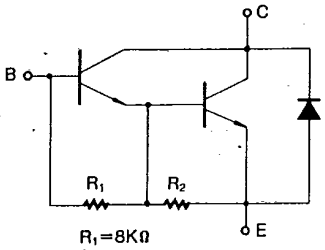
HIGH DC CURRENT GAIN
MIN h_{FE}=1000 @ V_{CE}=−4V, I_C=−5A
MONOLITHIC CONSTRUCTION WITH BUILT IN BASE-EMITTER SHUNT RESISTORS
INDUSTRIAL USE

Complementary to TIP145F/146F/147F

TO-3P(F)



1. Base 2. Collector 3. Emitter



R_1=8KΩ
R_2=120Ω

3

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}		
: TIP140F		60	V
: TIP141F		80	V
: TIP142F		100	V
Collector Emitter Voltage	V_{CEO}		
: TIP140F		60	V
: TIP141F		80	V
: TIP142F		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	60	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−65~150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Emitter Sustaining Voltage	$V_{CEO(SUS)}$					
: TIP140F		I_C=30mA, I_B=0	60			V
: TIP141F			80			V
: TIP142F			100			V
Collector Cutoff Current : TIP140F	I_{CEO}	V_{CE}=30V, I_B=0			2	mA
: TIP141F		V_{CE}=40V, I_B=0			2	mA
: TIP142F		V_{CE}=50V, I_B=0			2	mA
Collector Cutoff Current : TIP140F	I_{CBO}	V_{CB}=60V, I_E=0			1	mA
: TIP141F		V_{CB}=80V, I_E=0			1	mA
: TIP142F		V_{CB}=100V, I_E=0			1	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		μS
Rise Time	t_r	I_B=20mA, I_{B1}=I_{B2}		0.55		μS
Storage Time	t_S			2.5		μS
Fall Time	t_f			2.5		μS

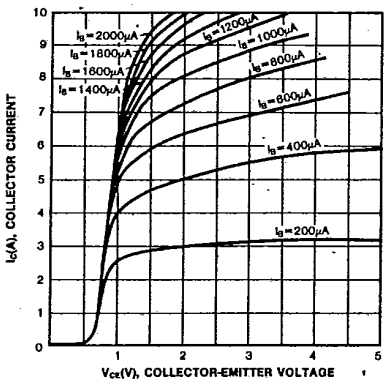
TIP140F/141F/142F

NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

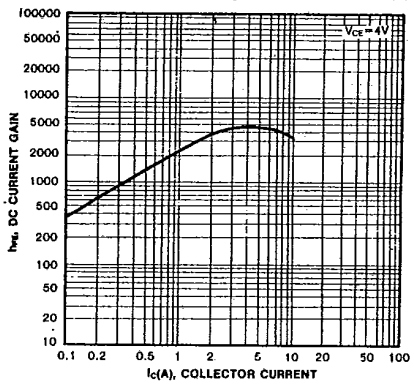
SAMSUNG SEMICONDUCTOR INC

T-33-29

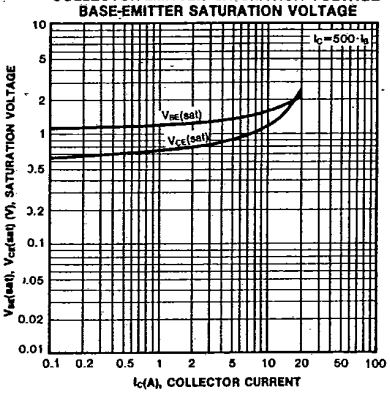
STATIC CHARACTERISTIC



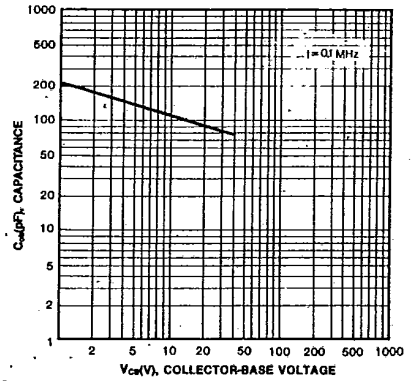
DC CURRENT GAIN



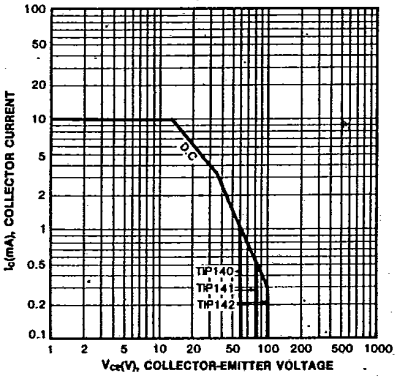
COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE



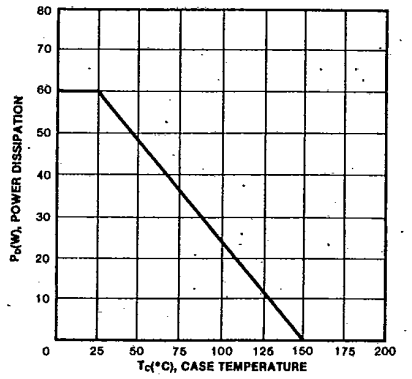
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING



TIP140T/141T/142T

NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

SAMSUNG SEMICONDUCTOR INC

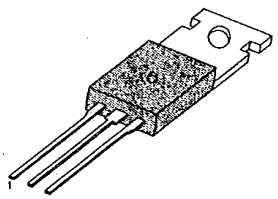
T-33-29

HIGH DC CURRENT GAIN-MIN hFE=1000 @ Vce=4V, Ic=5A

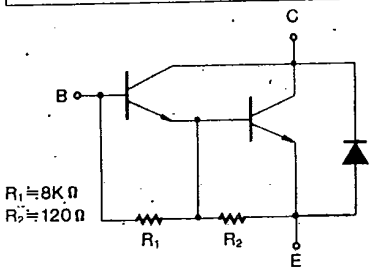
MONOLITHIC CONSTRUCTION WITH BUILT IN BASE-EMITTER SHUNT RESISTORS DINDUSTRIAL USE

Complementary to TIP145T/146T/147T

TO-220



1. Base 2. Collector 3. Emitter



ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage : TIP140T	V_{CBO}	60	V
: TIP141T		80	V
: TIP142T		100	V
Collector-Emitter Voltage	V_{CEO}		
: TIP140T		60	V
: TIP141T		80	V
: TIP142T		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	Tj	150	°C
Storage Temperature	Tstg	−65~150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

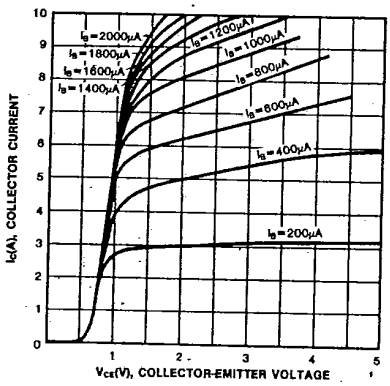
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Emitter Sustaining Voltage	V_{CEO}(sus)					
: TIP140T		I_C=30mA, I_B=0	60			V
: TIP141T			80			V
: TIP142T			100			V
Collector Cutoff Current : TIP140T	I_{CEO}	V_{CE}=30V, I_B=0			2	mA
: TIP141T		V_{CE}=40V, I_B=0			2	mA
: TIP142T		V_{CE}=50V, I_B=0			2	mA
Collector Cutoff Current : TIP140T	I_{CBO}	V_{CB}=60V, I_E=0			1	mA
: TIP141T		V_{CB}=80V, I_E=0			1	mA
: TIP142T		V_{CB}=100V, I_E=0			1	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	td	V_{CC}=30V, I_C=5A		0.15		μS
Rise Time	t_r	I_B=20mA, I_{B1}=I_{B2}		0.55		μS
Storage Time	t_s			2.5		μS
Fall Time	t_f			2.5		μS

TIP140T/141T/142T

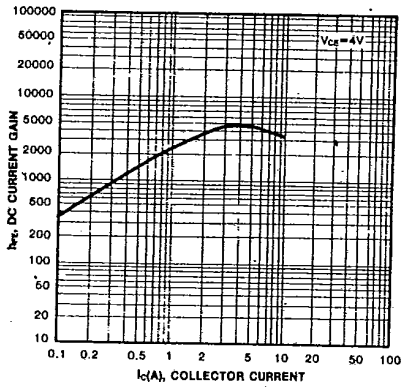
NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

T-33-29

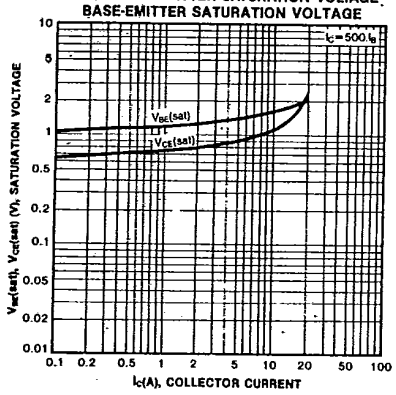
STATIC CHARACTERISTIC



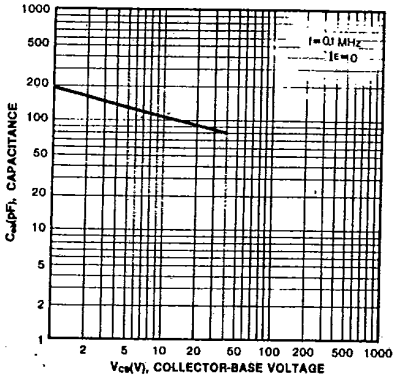
DC CURRENT GAIN



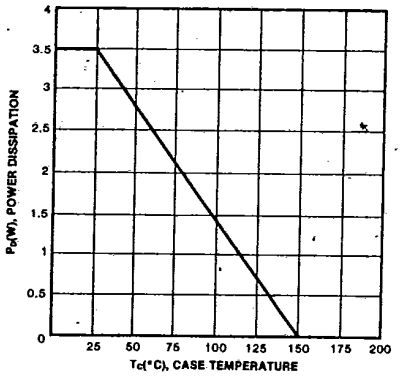
COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE



COLLECTOR OUTPUT CAPACITANCE



POWER DERATING



SAFE OPERATING AREA