

PLASTIC MEDIUM-POWER COPLEMENTARY SILICON TRANSISTORS

...designed for general-purpose amplifier and low speed switching applications

FEATURES:

* Collector-Emitter Sustaining Voltage-

V_{CEO(SUS)} = 60 V (Min) - TIP120,TIP125 = 80 V (Min) - TIP121,TIP126 = 100 V (Min) - TIP122,TIP127

* Collector-Emitter Saturation Voltage

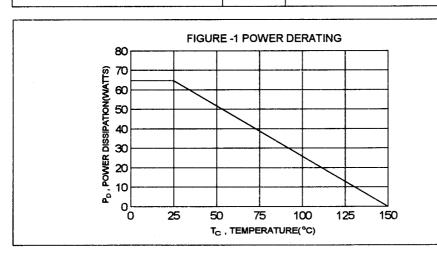
V_{CE(sat)} = 2.0 V (Max.) **②** I_C = 3.0 A * Monolithic Construction with Built-in Base-Emitter Shunt Resistor

MAXIMUM RATINGS

Characteristic	Symbol	TIP120 TIP125	TIP121 TIP126	TIP122 TIP127	Unit
Collector-Emitter Voltage	V _{CEO}	60	80	100	V
COllector-Base Voltage	V _{CBO}	60	80	100	V
Emitter-Base Voltage	V _{EBO}	5.0			٧
Collector Current-Continuous -Peak	I _C	5.0 8.0		A	
Base Current	l _B	120		mA	
Total Power Dissipation @T _C = 25°C Derate above 25°C	P _D	65 0.52		W/°C	
Operating and Storage Junction Temperature Range	T _J ,T _{STG}	- 65 to +150			°C

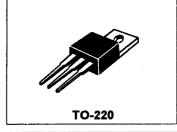
THERMAL CHARACTERISTICS

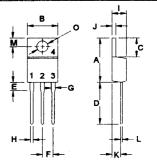
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	R⊕jc	1.92	°C/W



NPN PNP **TIP120 TIP125 TIP121 TIP126 TIP122 TIP127**

5.0 AMPERE **DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS** 60-100 VOLTS 65 WATTS





PIN 1.BASE 2.COLLECTOR 3.EMITTER 4.COLLECTOR(CASE)

DIM	MILLIMETERS			
ואום	MIN	MAX		
Α	14.68	15.31		
В	9.78	10.42		
С	5.01	6.52		
D	13.06	14.62		
E	3.57	4.07		
F	2.42	3.66		
G	1.12	1.36		
Н	0.72	0.96		
1	4.22	4.98		
J	1.14	1.38		
K	2.20	2.97		
L	0.33	0.55		
M	2.48	2.98		
0	3.70	3.90		

ELECTRICAL CHARACTERISTICS (T_c = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit	
OFF CHARACTERISTICS						
Collector - Emitter Sustaining Vol (I _C = 30 mA, I _B = 0)	ltage (1) TIP120,TIP125 TIP121,TIP126 TIP122,TIP127	V _{CEO(sus)}	60 80 100		V	
Collector Cutoff Current ($V_{CE} = 30 \text{ V}, I_{B} = 0$) ($V_{CE} = 40 \text{ V}, I_{B} = 0$) ($V_{CE} = 50 \text{ V}, I_{B} = 0$)	TIP120,TIP125 TIP121,TIP126 TIP122,TIP127	I _{CEO}		0.5 0.5 0.5	mA	
Collector Cutoff Current ($V_{CB} = 60 \text{ V}, I_{E} = 0$) ($V_{CB} = 80 \text{ V}, I_{E} = 0$) ($V_{CB} = 100 \text{ V}, I_{E} = 0$)	TIP120,TIP125 TIP121,TIP126 TIP122,TIP127	Ісво		0.2 0.2 0.2	mA	
Emitter Cutoff Current (V _{EB} = 5.0 V,I _C = 0)		I _{EBO}		2.0	mA	

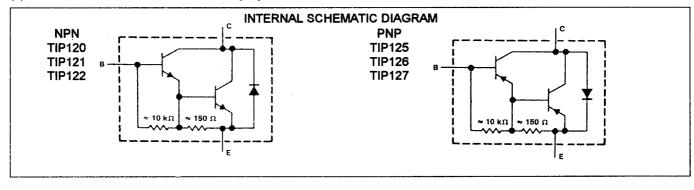
ON CHARACTERISTICS (1)

DC Current Gain (I _C = 0.5 A, V _{CE} = 3.0 V) (I _C = 3.0 A, V _{CE} = 3.0 V)	hFE	1000 1000		
Collector-Emitter Saturation Voltage (I _C = 3.0 A, I _B = 12 mA) (I _C = 5.0 A, I _B = 20 mA)	V _{CE(sat)}		2.0 4.0	V
Base-Emitter On Voltage (I _C = 3.0 A, V _{CE} = 3.0 V)	V _{BE(on)}		2.5	V

DYNAMIC CHARACTERISTICS

Small-Signal Current Gain (I _C = 3.0 A,V _{CE} = 4.0 V, f = 1.0 MHz)	h _{fe}	4.0		
Output Capacitance (V _{CB} = 10 V, I _E = 0 , f = 0.1 MHz)	TIP120,TIP121,TIP122 TIP125,TIP126,TIP127	Сов		300 250	pF

(1) Pulse Test: Pulse width = 300 us , Duty Cycle \leq 2.0%



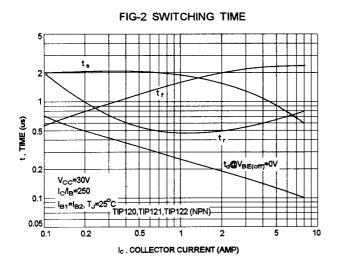


FIG-4 SMALL-SIGNAL CURRENT GAIN

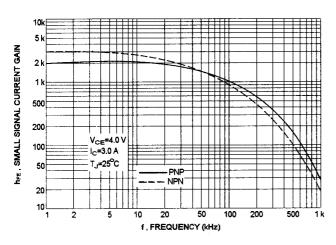


FIG-6 ACTIVE REGION SAFE OPERATING AREA

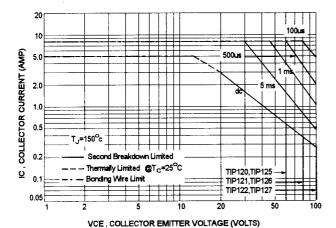


FIG-3 SWITCHING TIME

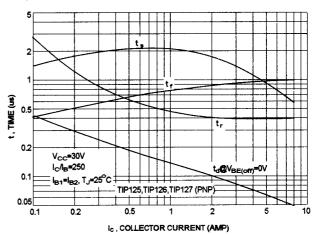
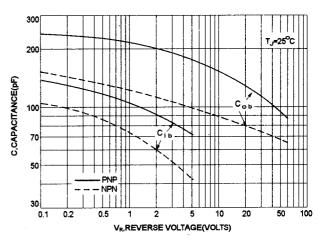


FIG-5 CAPACITANCES



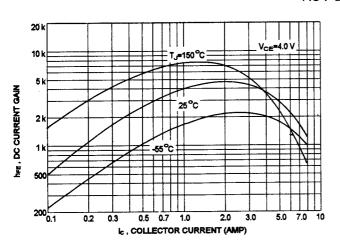
There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate $I_{\text{C}^-}V_{\text{CE}}$ limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of FIG-6 is base on $T_{J(PK)}$ =150 °C; T_c is variable depending on power level.second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \le 150$ °C ,At high case temperatures,thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

NPN TIP120,TIP121,TIP122

PNP TIP125, TIP126, TIP127

FIG-7 DC CURRENT GAIN



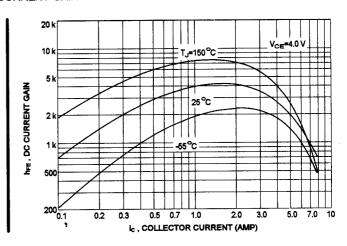
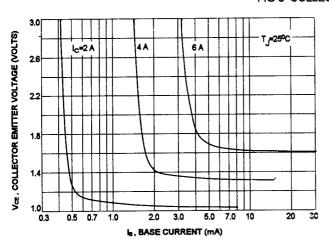


FIG-8 COLLECTOR SATURATION REGION



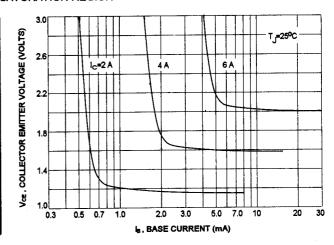


FIG-9 "ON" VOLTAGES

