

PLASTIC MEDIUM-POWER COMPLEMENTARY SILICON TRANSISTORS

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

FEATURES:

- * Collector-Emitter Sustaining Voltage-
 $V_{CE(sus)} = 60\text{ V (Min) - TIP130, TIP135}$
 $= 80\text{ V (Min) - TIP131, TIP136}$
 $= 100\text{ V (Min) - TIP132, TIP137}$
- * Collector-Emitter Saturation Voltage
 $V_{CE(sat)} = 2.0\text{ V (Max.) @ } I_C = 4.0\text{ A}$
- * Monolithic Construction with Built-in Base-Emitter Shunt Resistor

NPN	PNP
TIP130	TIP135
TIP131	TIP136
TIP132	TIP137

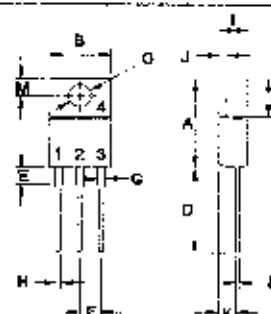
8.0 AMPERE
DARLINGTON
COMPLEMENTARY SILICON
POWER TRANSISTORS
60-100 VOLTS
70 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	TIP130 TIP135	TIP131 TIP136	TIP132 TIP137	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	100	V
Collector-Base Voltage	V_{CBO}	60	80	100	V
Emitter-Base Voltage	V_{EB0}	5.0			V
Collector Current-Continuous -Peak	I_C I_{CM}	8.0 12			A
Base Current	I_B	0.3			mA
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	70 0.56			W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150			$^\circ\text{C}$



TO-220

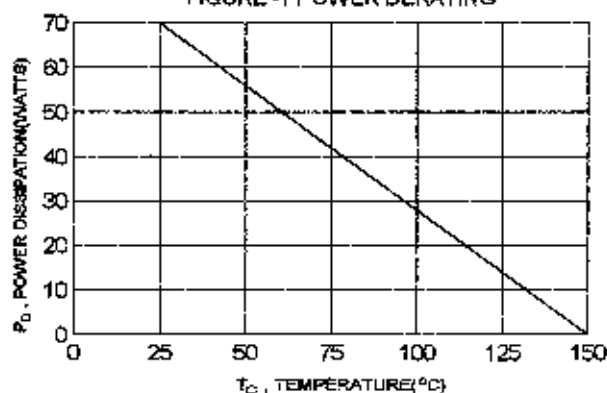


PIN 1: BASE
2: COLLECTOR
3: EMITTER
4: COLLECTOR (CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.785	$^\circ\text{C/W}$

FIGURE -1 POWER DERATING



DIM	MILLIMETERS	
	MIN	MAX
A	14.86	15.31
B	9.76	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.42	2.98
O	3.70	3.80

TIP130, TIP131, TIP132 NPN / TIP135, TIP136, TIP137 PNP

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector - Emitter Sustaining Voltage (1) ($I_C = 30\text{ mA}$, $I_B = 0$)	TIP130, TIP135 TIP131, TIP136 TIP132, TIP137	$V_{CEO(sus)}$	60 80 100	V
Collector Cutoff Current ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 40\text{ V}$, $I_B = 0$) ($V_{CE} = 50\text{ V}$, $I_B = 0$)	TIP130, TIP135 TIP131, TIP136 TIP132, TIP137	I_{CZO}	0.5 0.5 0.5	mA
Collector Cutoff Current ($V_{CB} = 60\text{ V}$, $I_E = 0$) ($V_{CB} = 80\text{ V}$, $I_E = 0$) ($V_{CB} = 100\text{ V}$, $I_E = 0$)	TIP130, TIP135 TIP131, TIP136 TIP132, TIP137	I_{CBO}	0.2 0.2 0.2	mA
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)		I_{EBO}	5.0	mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 1.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_C = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$)	h_{FE}	500 1000	15000	
Collector-Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 16\text{ mA}$) ($I_C = 6.0\text{ A}$, $I_B = 30\text{ mA}$)	$V_{CE(sat)}$		2.0 3.0	V
Base-Emitter On Voltage ($I_C = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$)	$V_{BE(on)}$		2.5	V

DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 0.1\text{ MHz}$)	C_{ob}		250	pF
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(1) Pulse Test: Pulse width $\approx 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$

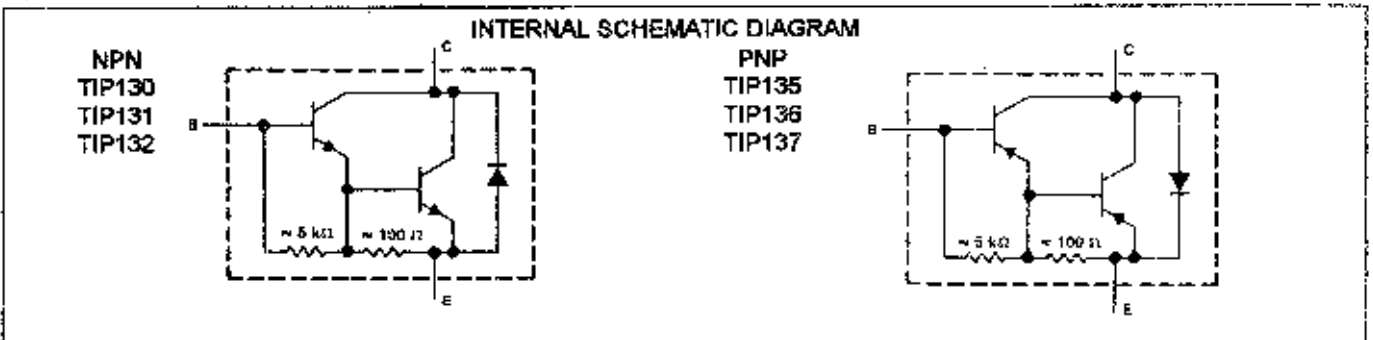


FIG-2 DC CURRENT GAIN

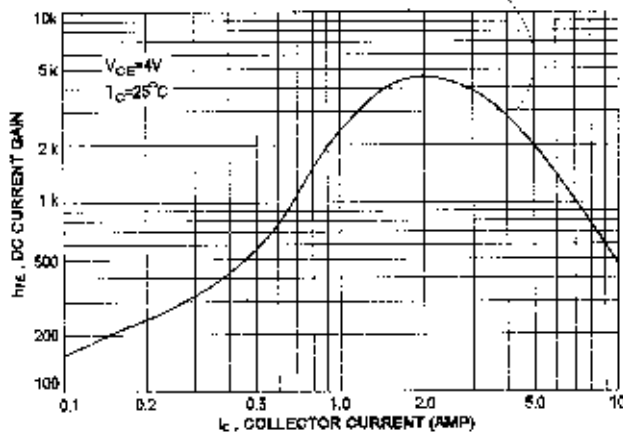


FIG-3 BASE-EMITTER VOLTAGE

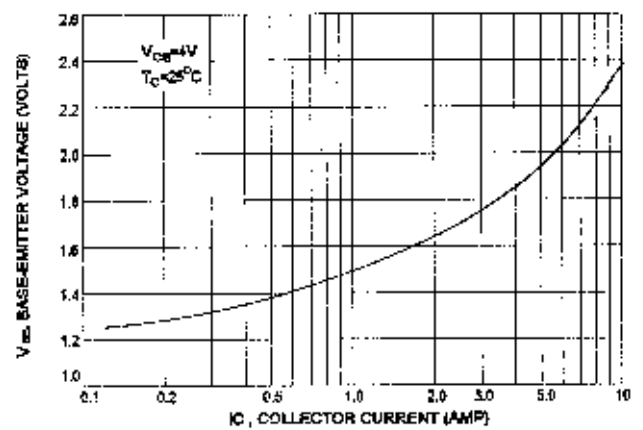


FIG-4 COLLECTOR-EMITTER SATURATION VOLTAGE

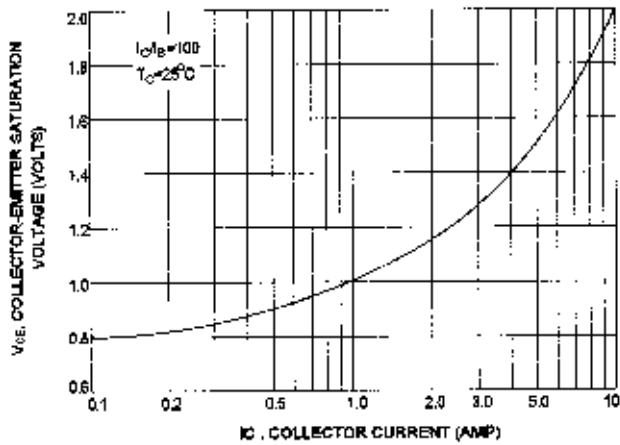


FIG-5 FORWARD VOLTAGE COMMUTATING DIODE

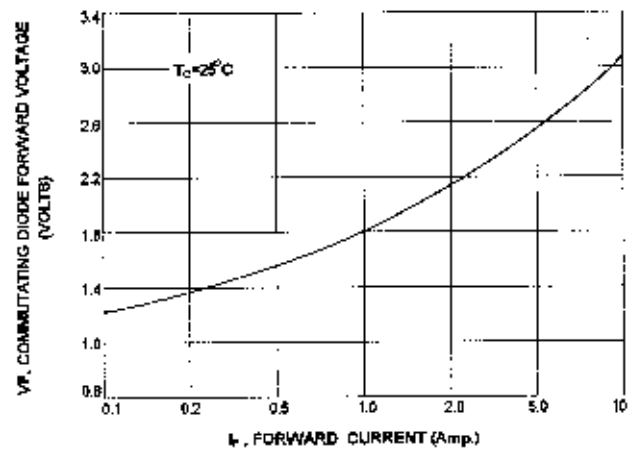
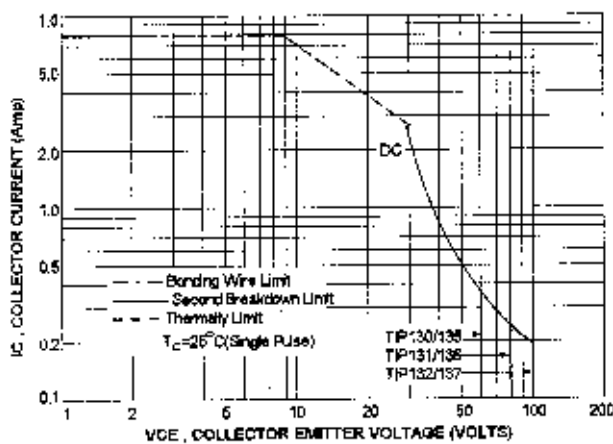


FIG-6 ACTIVE REGION SAFE OPERATING AREA



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{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 curve is base on $T_{JPK} = 150^\circ C$; T_C is variable depending on power level. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{JPK} \leq 150^\circ C$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.