

TIP131, TIP132 (NPN), TIP137 (PNP)

Preferred Devices

Darlington Complementary Silicon Power Transistors

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

- High DC Current Gain –
 $h_{FE} = 2500$ (Typ) @ I_C
 $= 4.0$ Adc
- Collector–Emitter Sustaining Voltage – @ 30 mAdc
 $V_{CEO(sus)} = 80$ Vdc (Min) – TIP131
 $= 100$ Vdc (Min) – TIP132, TIP137
- Low Collector–Emitter Saturation Voltage –
 $V_{CE(sat)} = 2.0$ Vdc (Max) @ $I_C = 4.0$ Adc
 $= 3.0$ Vdc (Max) @ $I_C = 6.0$ Adc
- Monolithic Construction with Built–In Base–Emitter Shunt Resistors
- TO–220AB Compact Package

MAXIMUM RATINGS

Rating	Symbol	TIP131	TIP132, TIP137	Unit
Collector–Emitter Voltage	V_{CEO}	80	100	Vdc
Collector–Base Voltage	V_{CB}	80	100	Vdc
Emitter–Base Voltage	V_{EB}	5.0		Vdc
Collector Current – Continuous Peak	I_C	8.0 12		Adc
Base Current	I_B	300		mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	70		Watts
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	2.0		Watts
Operating and Storage Junction, Temperature Range	T_J, T_{stg}	–65 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.78	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	63.5	$^\circ\text{C/W}$

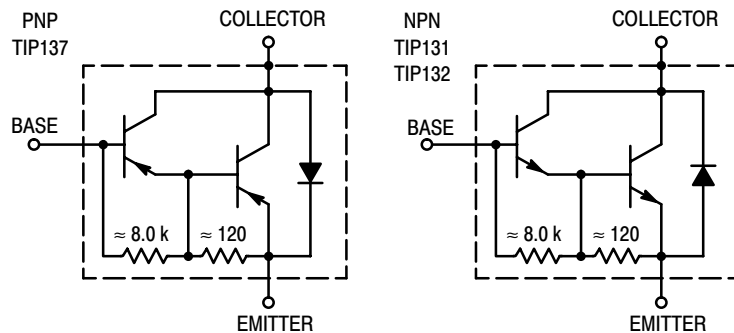


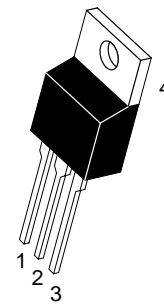
Figure 1. Darlington Circuit Schematic



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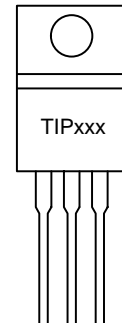
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DARLINGTON 8 AMPERE COMPLEMENTARY SILICON POWER TRANSISTORS 80–100 VOLTS 70 WATTS



CASE 221A
TO–220AB

MARKING DIAGRAM



TIPxxx = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping
TIP131	TO–220	50 Units/Rail
TIP132	TO–220	50 Units/Rail
TIP137	TO–220	50 Units/Rail

Preferred devices are recommended choices for future use and best overall value.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (Note 1) ($I_C = 30\text{ mA}$, $I_B = 0$)	$V_{CEO(sus)}$	80 100	– –	Vdc
Collector Cutoff Current ($V_{CE} = 40\text{ Vdc}$, $I_B = 0$) ($V_{CE} = 50\text{ Vdc}$, $I_B = 0$)	I_{CEO}	– –	0.5 0.5	mAdc
Collector Cutoff Current ($V_{CB} = 80\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 100\text{ Vdc}$, $I_E = 0$)	I_{CBO}	– –	0.2 0.2	mAdc
Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	5.0	mAdc

ON CHARACTERISTICS (Note 1)

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

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

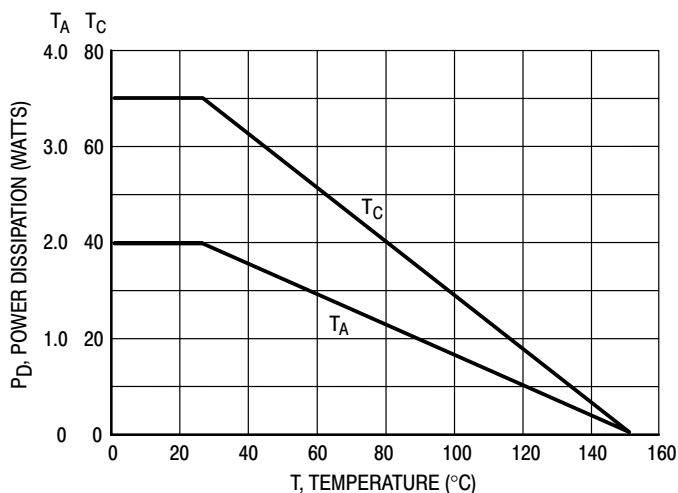


Figure 2. Power Derating

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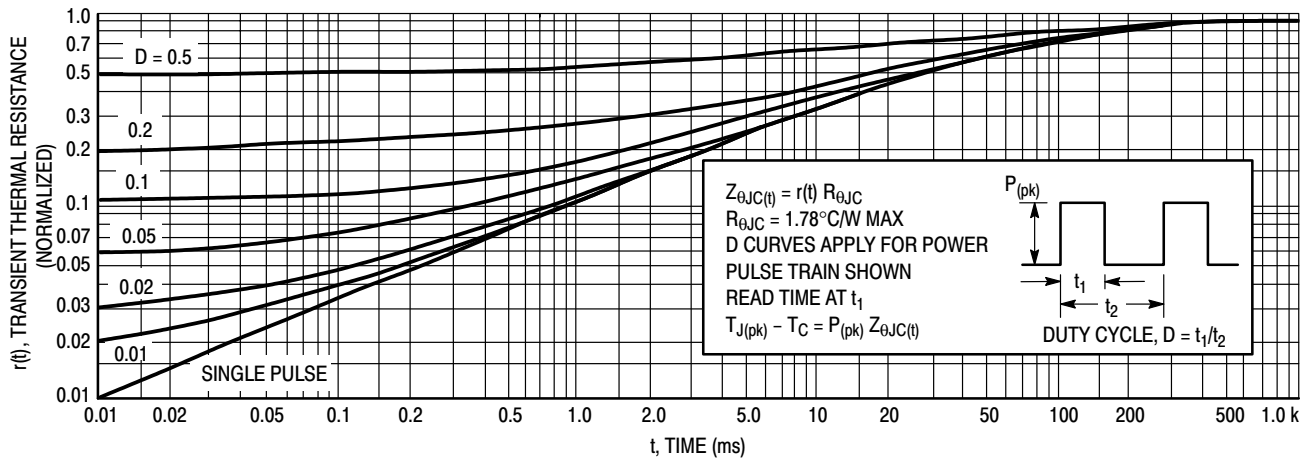
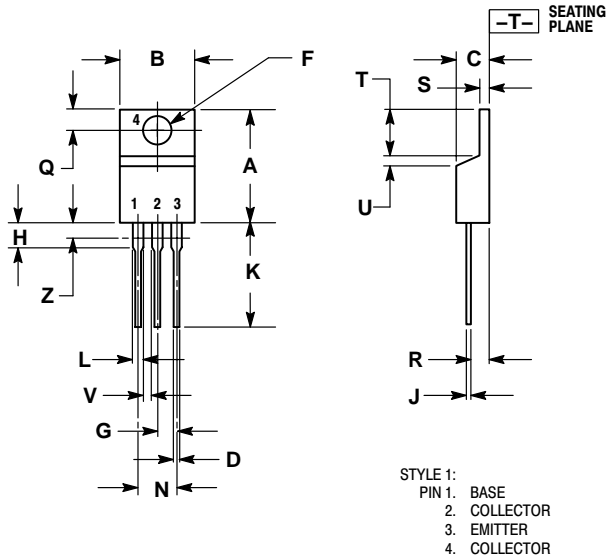


Figure 3. Thermal Response

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PACKAGE DIMENSIONS


TO-220AB CASE 221A-09 ISSUE AA



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

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