



NEC

NEW ENGLAND SEMICONDUCTOR

NPN	PNP
TIP35A	TIP36A
TIP35B	TIP36B
TIP35C	TIP36C

COMPLEMENTARY SILICON HIGH-POWER TRANSISTORS

...FOR GENERAL-PURPOSE POWER AMPLIFIER AND SWITCHING APPLICATIONS

25 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS

60 - 100 VOLTS
125 WATTS

- 25 A Collector Current
- Low Leakage Current — $I_{CEO} = 1.0 \text{ mA @ } 30 \text{ and } 60 \text{ V}$
- Excellent DC Gain — $h_{FE} = 40 \text{ Typ @ } 15 \text{ A}$
- High Current Gain Bandwidth Product — $|h_{fe}| = 3.0 \text{ min @ } I_C = 1.0 \text{ A, } f = 1.0 \text{ MHz}$

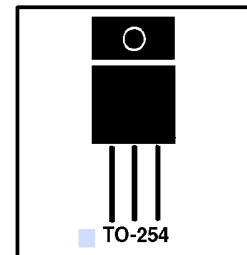
MAXIMUM RATINGS

Rating	Symbol	TIP35A TIP36A	TIP35B TIP36B	TIP35C TIP36C	Unit
Collector-Emitter Voltage	V_{CEO}	60 V	80 V	100 V	Vdc
Collector-Base Voltage	V_{CB}	60 V	80 V	100 V	Vdc
Emitter-Base Voltage	V_{EB}		5.0		Vdc
Collector Current — Continuous Peak (1)	I_C		25 40		Adc
Base Current — Continuous	I_B		5.0		Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D		125 1.0		Watts W/C
Operating and Storage Junction Temperature Range	T_J, T_{stg}		-65 to +150		$^\circ\text{C}$
Unclamped Inductive Load	ESB		90		mJ

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.0	$^\circ\text{C/W}$
Junction-To-Free-Air Thermal Resistance	$R_{\theta JA}$	35.7	$^\circ\text{C/W}$

(1) Pulse Test: Pulse Width = 10 ms, Duty Cycle $\leq 10\%$.



MECHANICAL OUTLINE

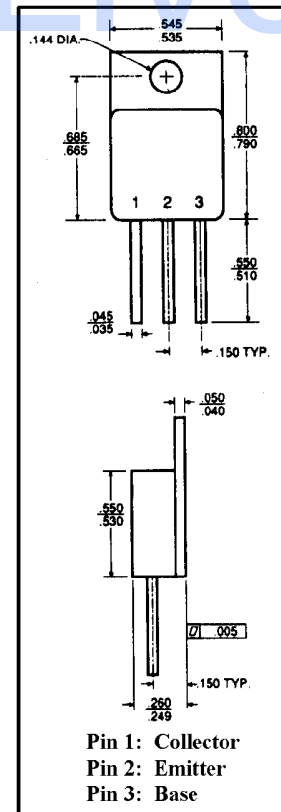
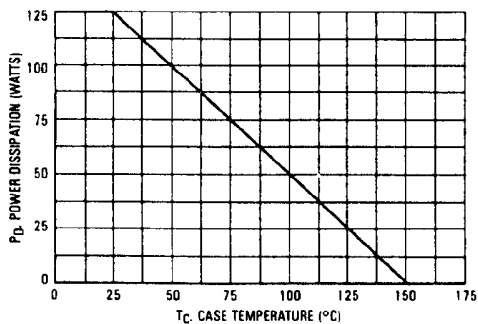


FIGURE 1 — POWER DERATING



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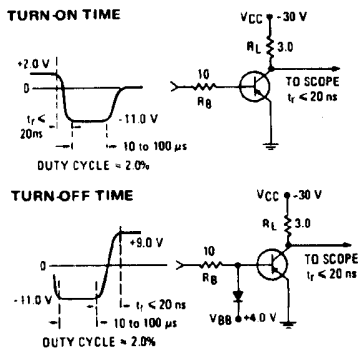
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TIP35C	TIP36C

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (1) ($I_C = 30\text{ A}$, $I_B = 0$)	$V_{CE(sus)}$	60 80 100	—	Vdc
Collector-Emitter Cutoff Current ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 60\text{ V}$, $I_B = 0$)	I_{CEO}	—	1.0 1.0	mA
Collector-Emitter Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}$, $V_{EB} = 0$)	I_{CES}	—	0.7	mA
Emitter-Base Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)	I_{EBO}	—	1.0	mA
ON CHARACTERISTICS (1)				
DC Current Gain ($I_C = 1.5\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_C = 15\text{ A}$, $V_{CE} = 4.0\text{ V}$)	h_{FE}	25 15	— 75	—
Collector-Emitter Saturation Voltage ($I_C = 15\text{ A}$, $I_B = 1.5\text{ A}$) ($I_C = 25\text{ A}$, $I_B = 5.0\text{ A}$)	$V_{CE(sat)}$	—	1.8 4.0	Vdc
Base-Emitter On Voltage ($I_C = 15\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_C = 25\text{ A}$, $V_{CE} = 4.0\text{ V}$)	$V_{BE(on)}$	—	2.0 4.0	Vdc
DYNAMIC CHARACTERISTICS				
Small-Signal Current Gain ($I_C = 1.0\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ kHz}$)	h_{fe}	25	—	—
Current-Gain—Bandwidth Product ($I_C = 1.0\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	f_T	3.0	—	MHz

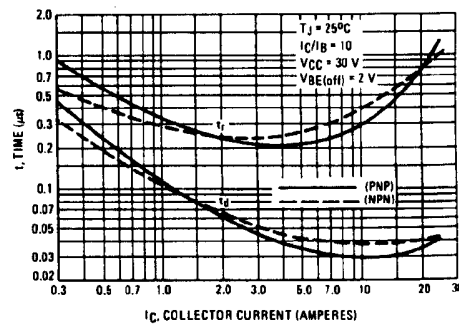
(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

FIGURE 2 — SWITCHING TIME EQUIVALENT TEST CIRCUITS



FOR CURVES OF FIGURES 3 & 4, R_B & R_L ARE VARIED.
INPUT LEVELS ARE APPROXIMATELY AS SHOWN.
FOR NPN, REVERSE ALL POLARITIES.

FIGURE 3 — TURN-ON TIME



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