TIP33C
TIP34C

Complementary power transistors

Features

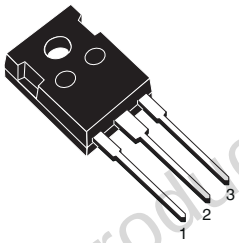
- Low collector-emitter saturation voltage
- Complementary NPN - PNP transistors

Applications

- General purpose

Description

The devices are manufactured in epitaxial-base planar technology and are suitable for power linear and switching applications.



TO-247

Figure 1. Internal schematic diagrams

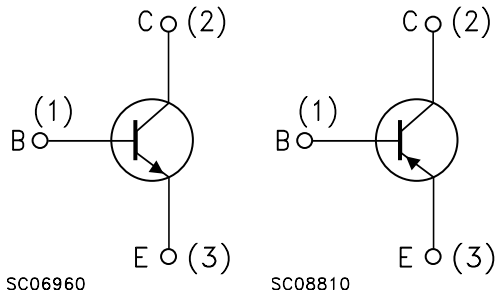


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Table 1. Device summary

Order code	Marking	Package	Packaging
TIP33C	TIP33C	TO-247	Tube
TIP34C	TIP34C		

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter		Value	Unit
		NPN	TIP33C	
		PNP	TIP34C	
V_{CBO}	Collector-base voltage (I_E = 0)		140	V
V_{CES}	Collector-emitter voltage (V_{BE} = 0)		140	V
V_{CEO}	Collector-emitter voltage (I_B = 0)		100	V
V_{EBO}	Emitter-base voltage (I_C = 0)		5	V
I_C	Collector current		10	A
I_{CM}	Collector peak current (t_P < 5 ms)		15	A
I_B	Base current		3	A
P_{TOT}	Total dissipation at T_{case} = 25 °C		80	W
T_{stg}	Storage temperature		-65 to 150	°C
T_J	Max. operating junction temperature		150	°C

For PNP type voltage and current values are negative.

Table 3. Thermal data

Symbol	Parameter		Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	max	1.56	°C/W

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2 Electrical characteristics

(T_{case} = 25 °C; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = 140 V			0.4	mA
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 60 V			0.7	mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 30 mA	100			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 3 A I_B = 0.3 A I_C = 10 A I_B = 2.5 A			1 4	V V
$V_{BE(on)}$ (1)	Base-emitter voltage	I_C = 3 A V_{CE} = 4 V I_C = 10 A V_{CE} = 4 V			1.6 3	V V
h_{FE} (1)	DC current gain	I_C = 1 A V_{CE} = 4 V I_C = 3 A V_{CE} = 4 V	40 20		100	
h_{fe}	Small signal current gain	I_C = 0.5 A V_{CE} = 10 V f = 1 kHz	3			
f_T	Transition frequency	I_C = 0.5 A V_{CE} = 10 V f = 1 MHz	3			MHz
t_{on} t_s t_f	Resistive load Turn-on time Storage time Fall time	V_{CC} = 30 V I_C = 6 A I_{B1} = -I_{B2} = 0.6 A V_{BB} = -6 V tp = 20 µs		0.6 0.4 1		µs µs µs

1. Pulsed duration = 300 ms, duty cycle ≥ 1.5%.

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3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

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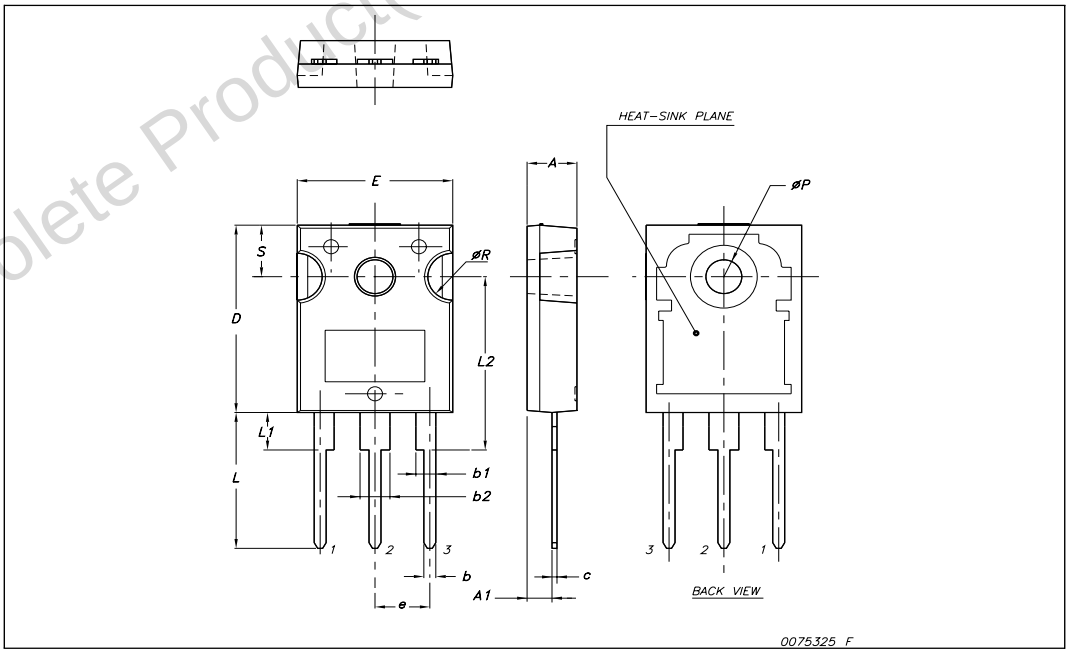
TO-247 Mechanical data

Dim.	mm.		
	Min.	Typ	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e		5.45	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
øP	3.55		3.65
øR	4.50		5.50
S		5.50	



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4 Revision history

Table 5. Document revision history

Date	Revision	Changes
01-Oct-1999	2	
20-Feb-2008	3	Package change from TO-218 to TO-247.

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