

## COMPLEMENTARY SILICON POWER TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES

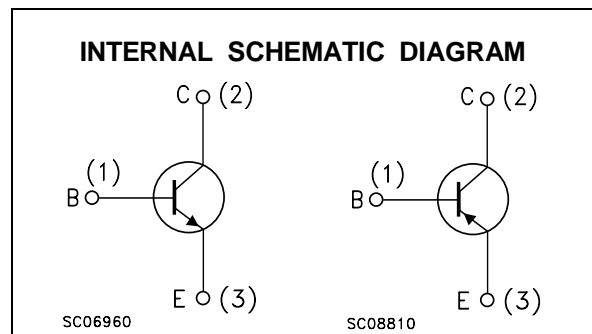
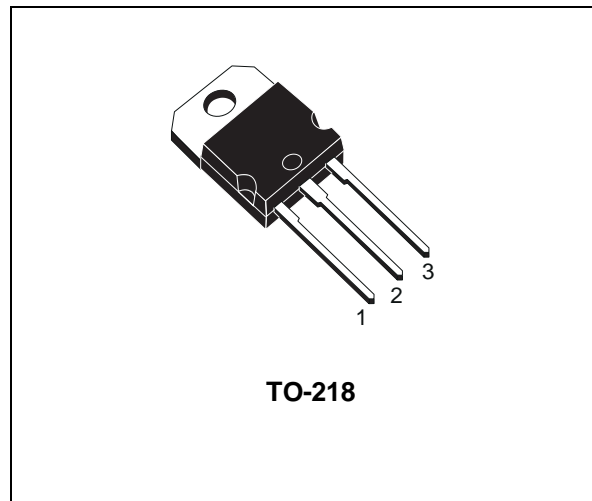
### APPLICATIONS

- GENERAL PURPOSE SWITCHING

### DESCRIPTION

The TIP33C is a silicon Epitaxial-Base NPN power transistor mounted in TO-218 plastic package. It is intended for use in linear and switching applications.

The complementary PNP type is TIP34C.



### 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 ( $I_C = 0$ )		7	V
$I_C$	Collector Current		10	A
$I_{CM}$	Collector Peak Current		12	A
$I_B$	Base Current		3	A
$P_{tot}$	Total Dissipation at $T_c \leq 25^\circ\text{C}$		80	W
$T_{stg}$	Storage Temperature		-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature		150	$^\circ\text{C}$

For PNP types voltage and current values are negative.

## TIP33C / TIP34C

### THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	1.56	°C/W
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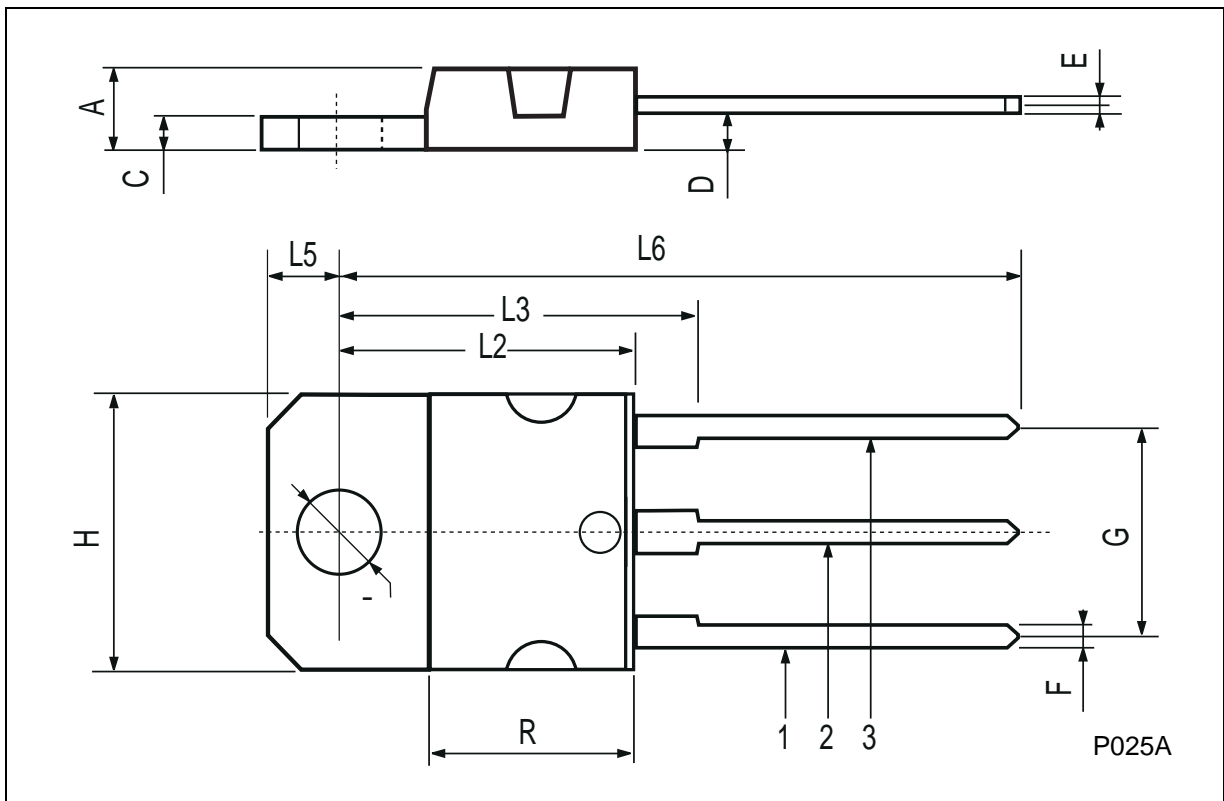
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I <sub>CEs</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 140 V				400	μA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = 60 V				0.7	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V				1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 30 mA		100			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 3 A	I <sub>B</sub> = 0.3 A			1	V
		I <sub>C</sub> = 10 A	I <sub>B</sub> = 2.5 A			4	V
V <sub>BE(on)*</sub>	Base-Emitter Voltage	I <sub>C</sub> = 3 A	V <sub>CE</sub> = 4 V			1.6	V
		I <sub>C</sub> = 10 A	V <sub>CE</sub> = 4 V			3	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 1 A	V <sub>CE</sub> = 4 V	40			
		I <sub>C</sub> = 3 A	V <sub>CE</sub> = 4 V	20		100	
h <sub>fe</sub>	Small Signal Current Gain	I <sub>C</sub> = 0.5 A f = 1 KHz	V <sub>CE</sub> = 10 V	20			
f <sub>T</sub>	Transition frequency	I <sub>C</sub> = 0.5 A f = 1 MHz	V <sub>CE</sub> = 10 V	3			MHz
t <sub>on</sub> t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Turn-on Time Storage Time Fall Time	V <sub>CC</sub> = 30V V <sub>BB</sub> = - 6 V t <sub>p</sub> = 20 μs	I <sub>C</sub> = 6 A I <sub>B1</sub> = - I <sub>B2</sub> = 0.6 A		0.6 0.4 1		μs μs μs

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

**TO-218 (SOT-93) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	-		16.2	-		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	-		12.2	-		0.480
∅	4		4.1	0.157		0.161



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