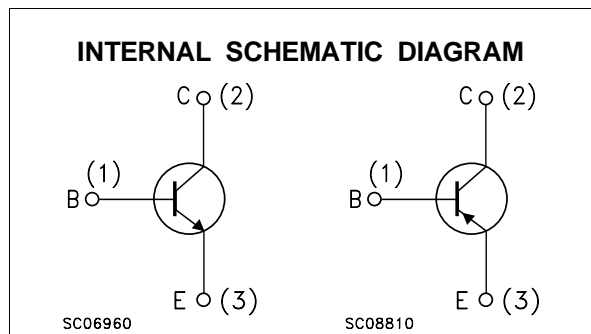
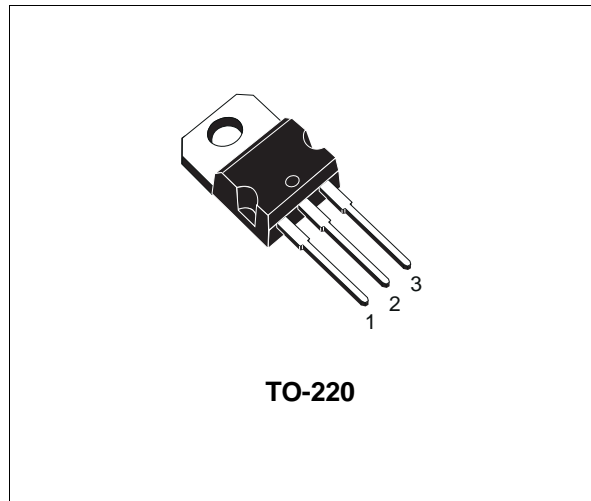


## COMPLEMENTARY SILICON POWER TRANSISTORS

- TIP31A, TIP31C, TIP32A AND TIP32C ARE SGS-THOMSON PREFERRED SALESTYPES

### DESCRIPTION

The TIP31A, TIP31B and TIP31C are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package, intended for use in medium power linear and switching applications. The complementary PNP types are TIP32A, TIP32B and TIP32C.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit	
		NPN	TIP29A	TIP29B		TIP29C
		PNP	TIP30A	TIP30B	TIP30C	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )		60	80	100	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )		60	80	100	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )		5			V
$I_C$	Collector Current		1			A
$I_{CM}$	Collector Peak Current		3			A
$I_B$	Base Current		0.4			A
$P_{tot}$	Total Dissipation at $T_{case} \leq 25^\circ C$ $T_{amb} \leq 25^\circ C$		30			W
			2			W
$T_{stg}$	Storage Temperature		-65 to 150			$^\circ C$
$T_j$	Max. Operating Junction Temperature		150			$^\circ C$

For PNP types voltage and current values are negative.

## TIP29A/TIP29B/TIP29C/TIP30A/TIP30B/TIP30C

### THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	4.17	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient	Max	62.5	°C/W

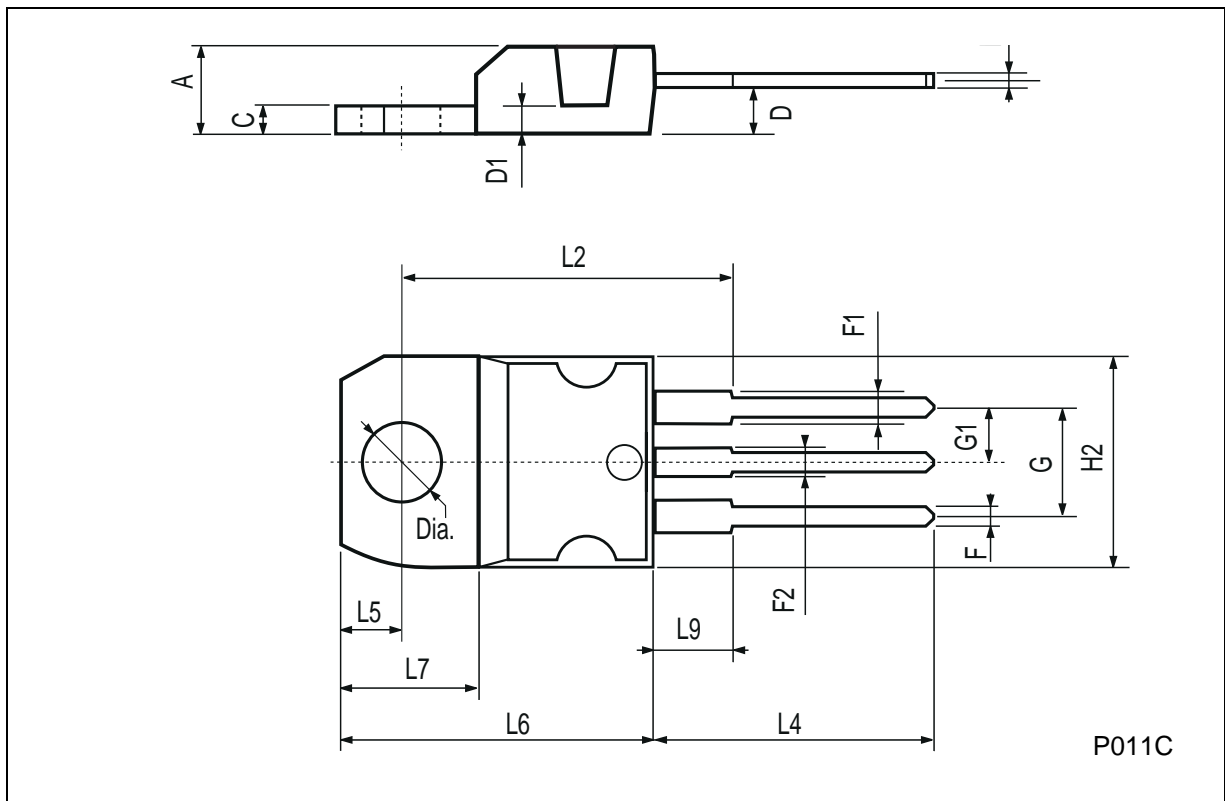
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	for <b>TIP29A/30A</b> V <sub>CE</sub> = 30 V for <b>TIP29B/29C/30B/30C</b> V <sub>CB</sub> = 60 V			0.3	mA
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	for <b>TIP29A/30A</b> V <sub>CE</sub> = 60 V for <b>TIP29B/30B</b> V <sub>CE</sub> = 80 V for <b>TIP29C/30C</b> V <sub>CE</sub> = 100 V			0.2	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 for <b>TIP29A/30A</b> for <b>TIP29B/30B</b> for <b>TIP29C/30C</b>	60 80 100			V V V
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 1 A I <sub>B</sub> = 125 mA			0.7	V
V <sub>BE(on)</sub> *	Base-Emitter Voltage	I <sub>C</sub> = 1 A V <sub>CE</sub> = 4 V			1.3	V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = 0.2 A V <sub>CE</sub> = 4 V I <sub>C</sub> = 1 A V <sub>CE</sub> = 4 V	40 15		75	
h <sub>fe</sub>	Small Signal Current Gain	I <sub>C</sub> = 0.2 A V <sub>CE</sub> = 10 V f = 1 KHz I <sub>C</sub> = 0.2 A V <sub>CE</sub> = 10 V f = 1 MHz	20 3			

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2 %  
For PNP types voltage and current values are negative.

**TO-220 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



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