

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- TIP141, TIP142, TIP145 AND TIP147 ARE SGS-THOMSON PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES
- MONOLITHIC DARLINGTON CONFIGURATION
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

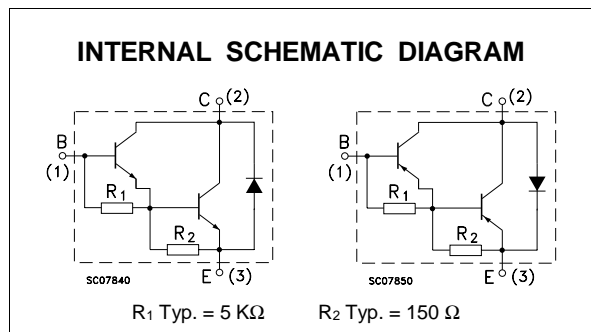
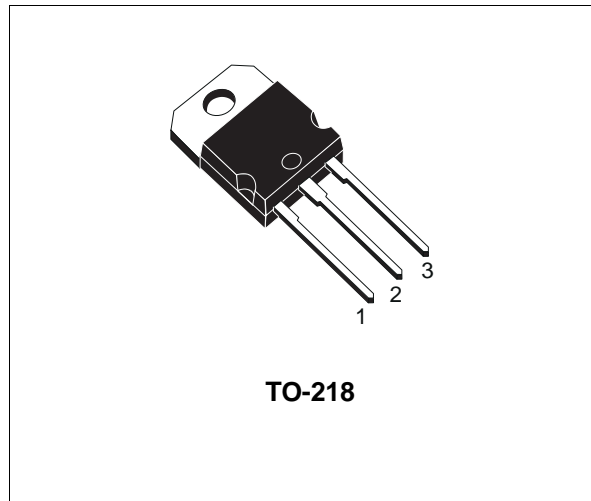
### APPLICATIONS

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

### DESCRIPTION

The TIP140, TIP141 and TIP142 are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration and are mounted in TO-218 plastic package. They are intended for use in power linear and switching applications.

The complementary PNP types are TIP145, TIP146 and TIP147 respectively.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit	
		NPN	TIP140	TIP141		TIP142
		PNP	TIP145	TIP146	TIP147	
V <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)		60	80	100	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)		60	80	100	V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)			5		V
I <sub>C</sub>	Collector Current			10		A
I <sub>CM</sub>	Collector Peak Current			20		A
I <sub>B</sub>	Base Current			0.5		A
P <sub>tot</sub>	Total Dissipation at T <sub>case</sub> ≤ 25 °C			125		W
T <sub>stg</sub>	Storage Temperature			-65 to 150		°C
T <sub>j</sub>	Max. Operating Junction Temperature			150		°C

For PNP types voltage and current values are negative.

## TIP140 / TIP141 / TIP142 / TIP145 / TIP146 / TIP147

### THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	1	°C/W
-----------------------	----------------------------------	-----	---	------

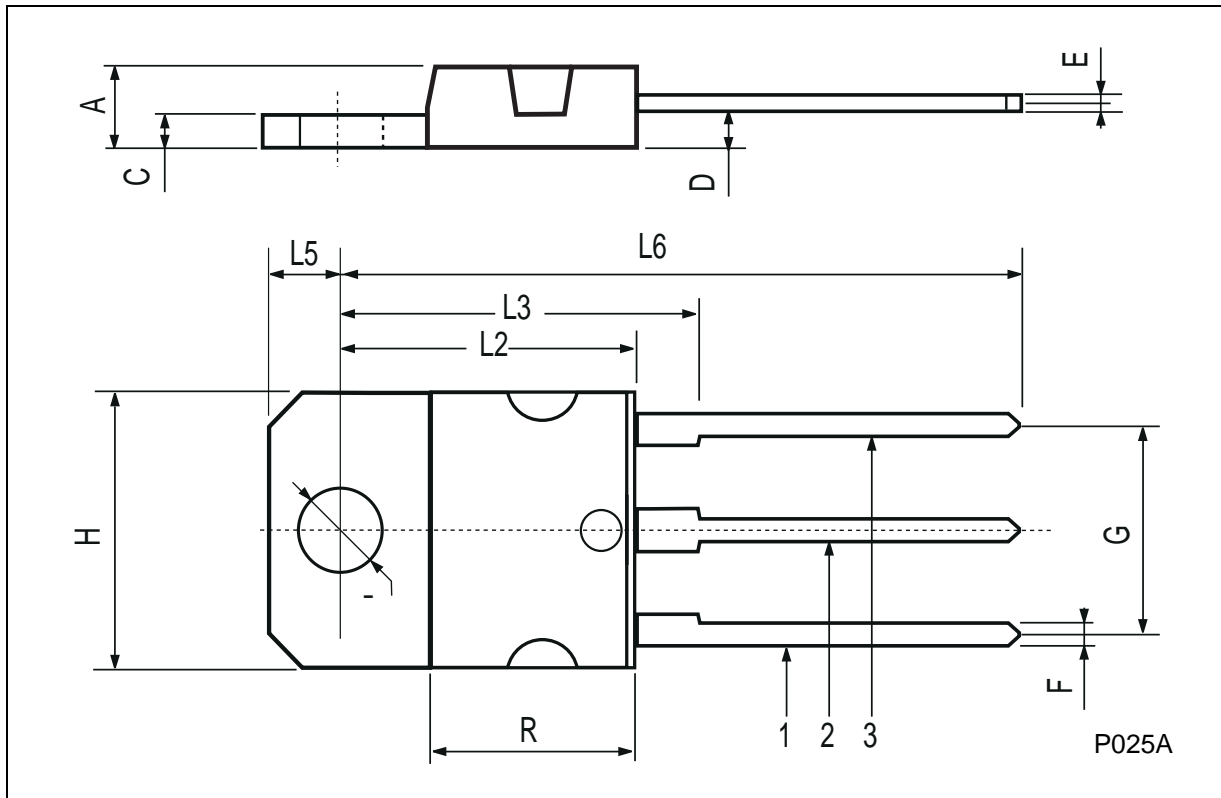
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	for <b>TIP140/145</b> V <sub>CB</sub> = 60 V for <b>TIP141/146</b> V <sub>CB</sub> = 80 V for <b>TIP142/147</b> V <sub>CB</sub> = 100 V			1 1 1	mA mA mA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	for <b>TIP140/145</b> V <sub>CE</sub> = 30 V for <b>TIP141/146</b> V <sub>CE</sub> = 40 V for <b>TIP142/147</b> V <sub>CE</sub> = 50 V			2 2 2	mA mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EBO</sub> = 5 V			2	mA
V <sub>CEO(sus)</sub> *	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 30 mA for <b>TIP140/145</b> for <b>TIP141/146</b> for <b>TIP142/147</b>	60 80 100			V V V
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 5 A I <sub>B</sub> = 10 mA I <sub>C</sub> = 10 A I <sub>B</sub> = 40 mA			2 3	V V
V <sub>BE(on)</sub> *	Base-Emitter Voltage	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> = 5 A V <sub>CE</sub> = 4 V I <sub>C</sub> = 10 A V <sub>CE</sub> = 4 V	1000 500			
t <sub>on</sub>	Turn-on Time	I <sub>C</sub> = 10 A I <sub>B1</sub> = 40 mA		0.9		μs
t <sub>off</sub>	Turn-off Time	I <sub>B2</sub> = -40 mA R <sub>L</sub> = 3 Ω		4		μs

For PNP types voltage and current values are negative.

**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
Ø	4		4.1	0.157		0.161



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1997 SGS-THOMSON Microelectronics - Printed in Italy - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES  
Australia - Brazil - Canada - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -  
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A  
...