TIP102
TIP105 TIP107

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

APPLICATIONS

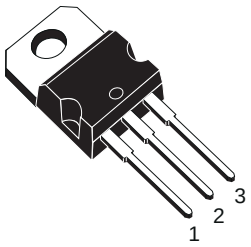
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

DESCRIPTION

The TIP102 is a silicon Epitaxial-Base NPN power transistor in monolithic Darlington configuration mounted in TO-220 plastic package. It is intented for use in power linear and switching applications.

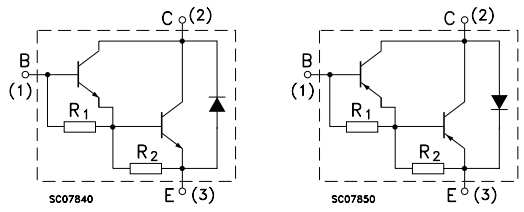
The complementary PNP type is TIP107.

Also TIP105 is a PNP type.



TO-220

INTERNAL SCHEMATIC DIAGRAM



R_1 Typ. = 5 KΩ R_2 Typ. = 150 Ω

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value		Unit
		NPN		TIP102	
		PNP	TIP105	TIP107	
V_{CBO}	Collector-Base Voltage (I_E = 0)		60	100	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		60	100	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)		5		V
I_C	Collector Current		8		A
I_{CM}	Collector Peak Current		15		A
I_B	Base Current		1		A
P_{tot}	Total Dissipation at $T_{case} \leq 25\ ^oC$ $T_{amb} \leq 25\ ^oC$		80 2		W W
T_{stg}	Storage Temperature		-65 to 150		^oC
T_j	Max. Operating Junction Temperature		150		^oC

* For PNP types voltage and current values are negative.

THERMAL DATA

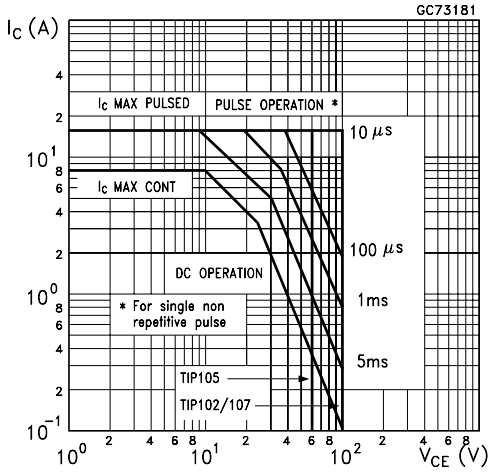
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.56	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cut-off Current (I_B = 0)	for **TIP105** for **TIP102/TIP107**	V_{CE} = 30 V V_{CE} = 50 V			50 50	µA µA
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **TIP105** for **TIP102/TIP107**	V_{CB} = 60 V V_{CB} = 100 V			50 50	µA µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V				8	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 30 mA for **TIP105** for **TIP102/TIP107**		 60 100			 V V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 3 A I_C = 8 A	I_B = 6 mA I_B = 80 mA			2 2.5	V V
V_{BE}*	Base-Emitter Voltage	I_C = 8 A	V_{CE} = 4 V			2.8	V
h_{FE}*	DC Current Gain	I_C = 3 A I_C = 8 A	V_{CE} = 4 V V_{CE} = 4 V	1000 200		20000	
V_F*	Forward Voltage of Commutation Diode (I_B = 0)	I_F = - I_C = 10 A				2.8	V

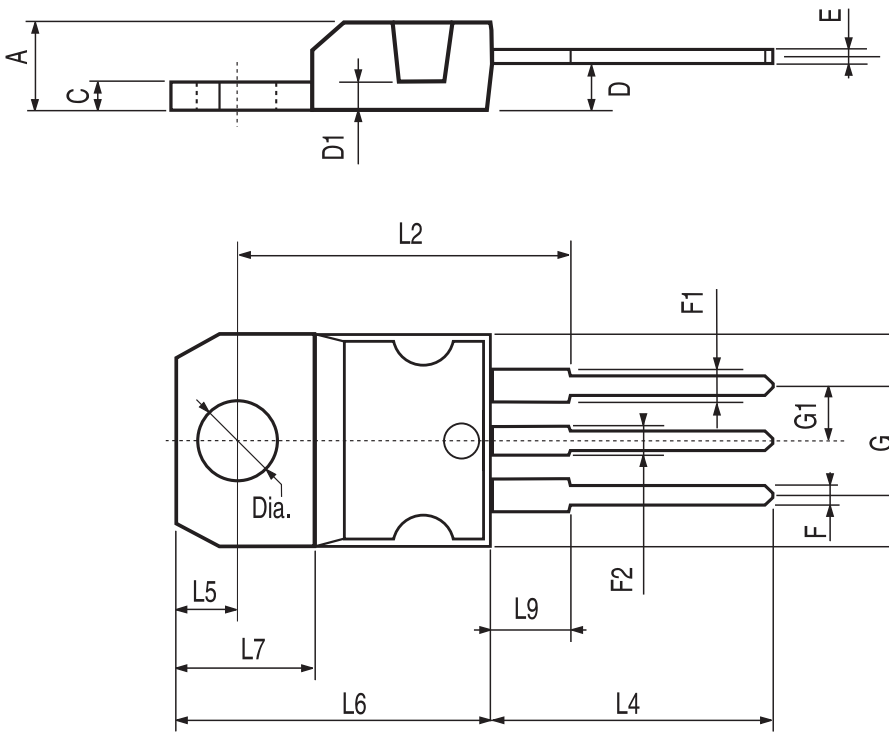
* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
For PNP types voltage and current values are negative.

Safe Operating Area



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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