



# TIP105

## PNP SILICON POWER DARLINGTON TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- $h_{FE}$  CLASSIFICATION

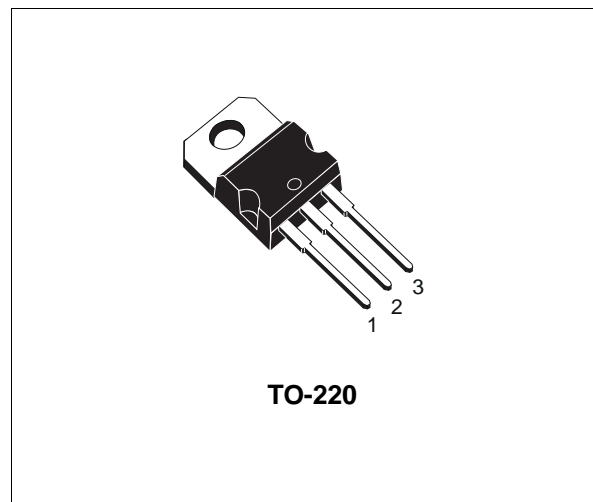
### APPLICATIONS

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT
- AUDIO POWER AMPLIFIER
- GENERAL POWER SWITCHING
- DC-AC CONVERTER
- EASY DRIVER FOR LOW VOLTAGE DC MOTOR

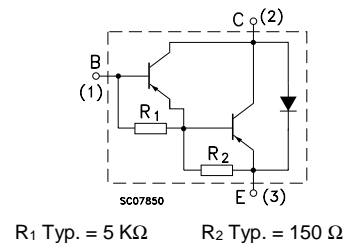
### DESCRIPTION

The TIP105 is a silicon Epitaxial-Base PNP transistor in monolithic Darlington configuration mounted in TO-220 plastic package intended for use in power linear and switching applications.

The preferred complementary NPN type is the TIP102.



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-60	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-60	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 $T_{case} \leq 25^\circ C$ $T_{amb} \leq 25^\circ C$	80 2	W W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ C$
$T_j$	Max. Operating Junction Temperature	150	$^\circ C$

**THERMAL DATA**

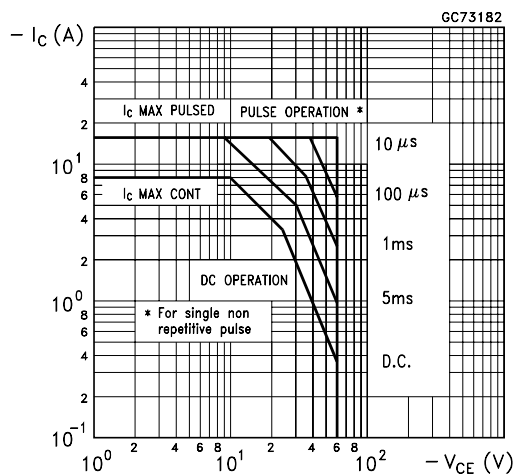
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	1.56	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient	Max	62.5	°C/W

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

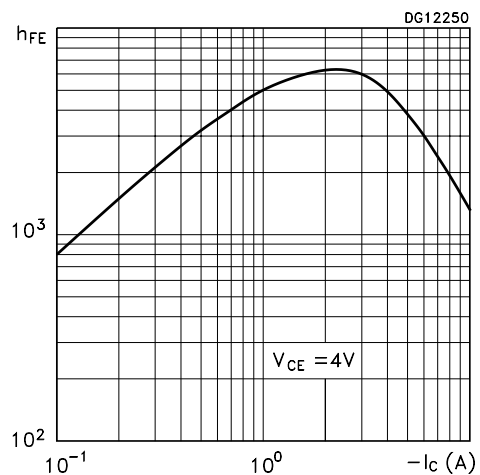
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = -30 V				-50	μA
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CE</sub> = -60 V				-50	μA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = -5 V				-8	mA
V <sub>CEO(sus)</sub> *	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -30 mA		-60			V
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -3 A	I <sub>B</sub> = -6 mA			-2	V
		I <sub>C</sub> = -8 A	I <sub>B</sub> = -80 mA			-2.5	V
V <sub>BE</sub> *	Base-Emitter Voltage	I <sub>C</sub> = -8 A	V <sub>CE</sub> = -4 V			-2.8	V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = -3 A	V <sub>CE</sub> = -4 V	2000		18000	
		I <sub>C</sub> = -8 A	V <sub>CE</sub> = -4 V	200			
		I <sub>C</sub> = -3 A	V <sub>CE</sub> = -4 V	Group R	2000	5000	
				Group O	4000	9000	
Group Y	8000	18000					
V <sub>F</sub> *	Forward Voltage of Commutation Diode (I <sub>B</sub> = 0)	I <sub>F</sub> = - I <sub>C</sub> = 10 A				-2.8	V

The product is pre-selected in DC current gain (Group R, Group O and Group Y). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

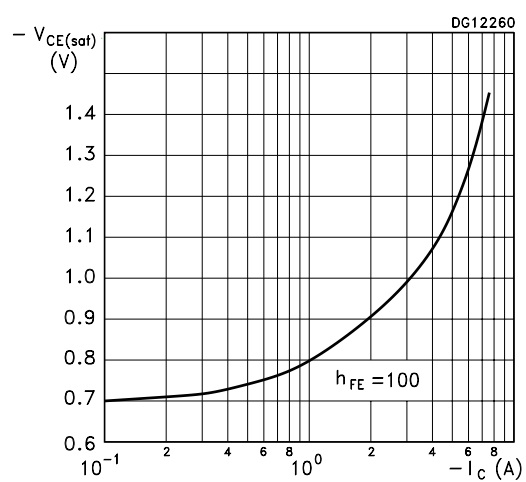
**Safe Operating Area**



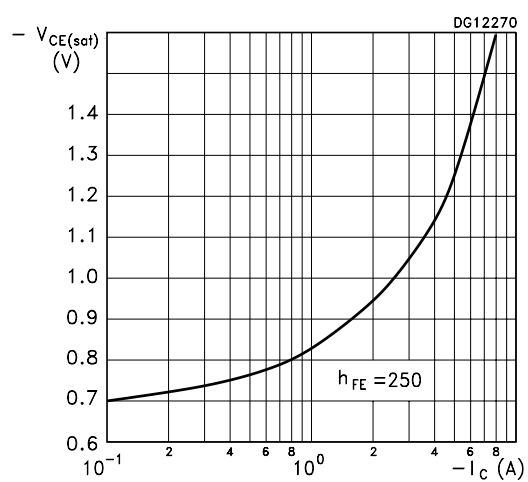
**DC Current Gain**



## Collector-Emitter Saturation Voltage

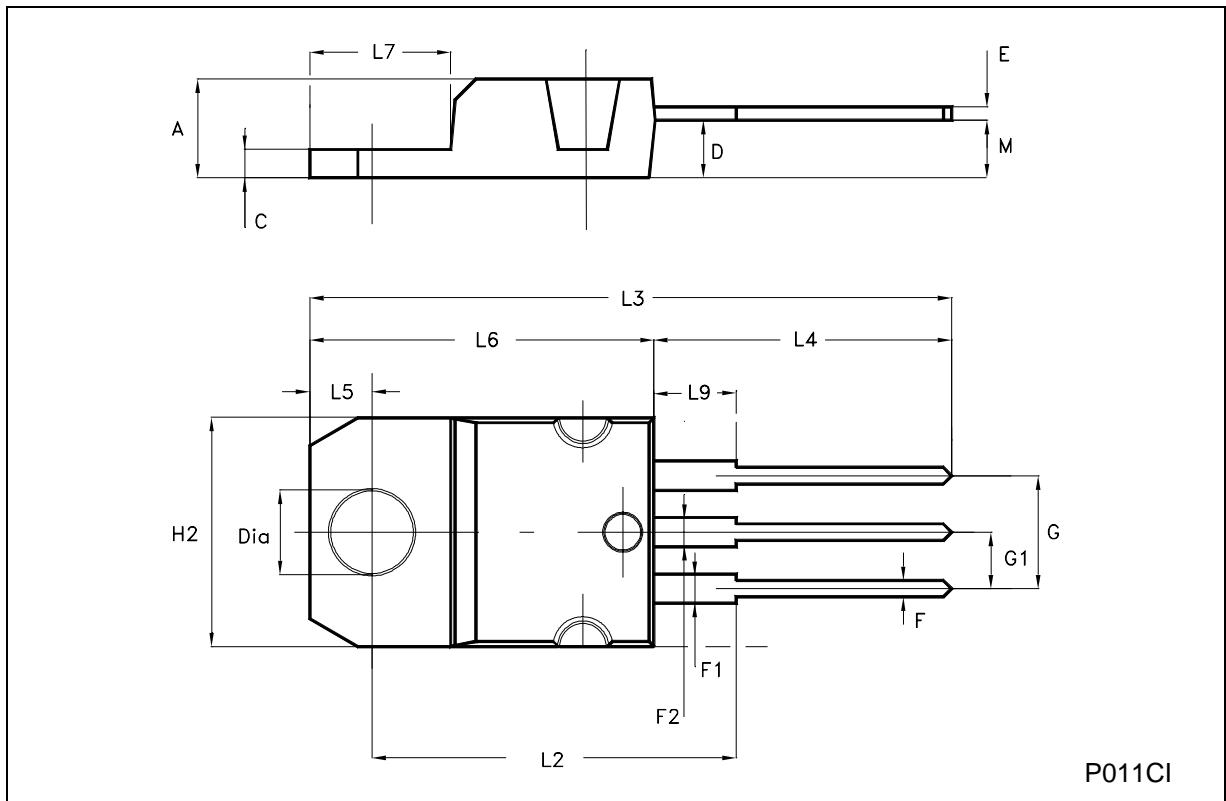


## Collector-Emitter Saturation Voltage



**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		0.052
D	2.40		2.72	0.094		0.107
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		0.202
G1	2.40		2.70	0.094		0.106
H2	10.00		10.40	0.394		0.409
L2		16.40			0.645	
L4	13.00		14.00	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



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