



# TIP110/112 TIP115/117

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

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

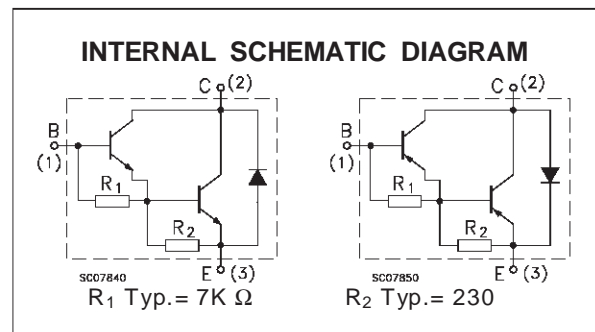
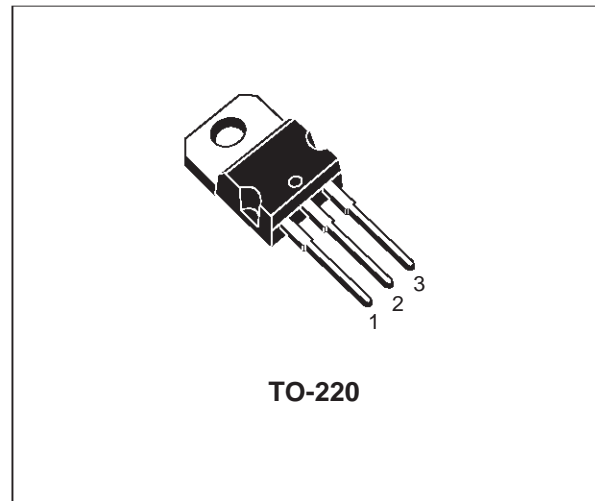
### APPLICATIONS

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

### DESCRIPTION

The TIP110 and TIP112 are silicon Epitaxial-Base NPN transistors in monolithic Darlington configuration mounted in Jedec TO-220 plastic package. They are intended for use in medium power linear and switching applications.

The complementary PNP types are TIP115 and TIP117.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit	
		NPN	TIP110		TIP112
		PNP	TIP115		TIP117
V <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)		60	100	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)		60	100	V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)		5		V
I <sub>C</sub>	Collector Current		2		A
I <sub>CM</sub>	Collector Peak Current		4		A
I <sub>B</sub>	Base Current		50		mA
P <sub>tot</sub>	Total Dissipation at T <sub>case</sub> ≤ 25 °C T <sub>amb</sub> ≤ 25 °C		50		W
			2		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

# TIP110/TIP112/TIP115/TIP117

## THERMAL DATA

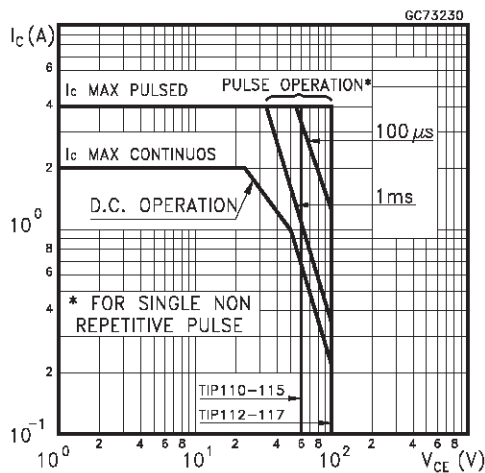
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	2.5	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient	Max	62.5	°C/W

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

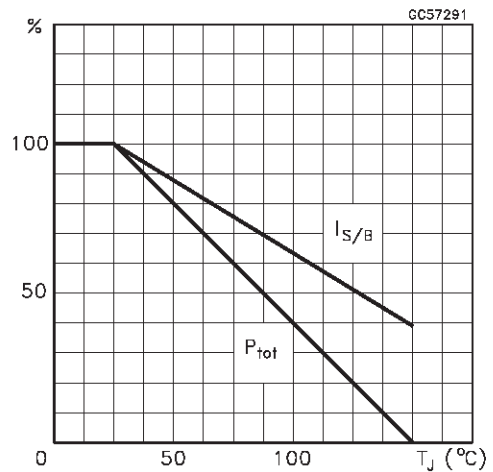
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = Half Rated V <sub>CEO</sub>			2	mA
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = Rated V <sub>CBO</sub>			1	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</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>TIP110/115</b> for <b>TIP112/117</b>	60 100			V V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 2 A    I <sub>B</sub> = 8 mA			2.5	V
V <sub>BE*</sub>	Base-Emitter Voltage	I <sub>C</sub> = 2 A    V <sub>CE</sub> = 4 V			2.8	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 1 A    V <sub>CE</sub> = 4 V I <sub>C</sub> = 2 A    V <sub>CE</sub> = 4 V	1000 500			

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

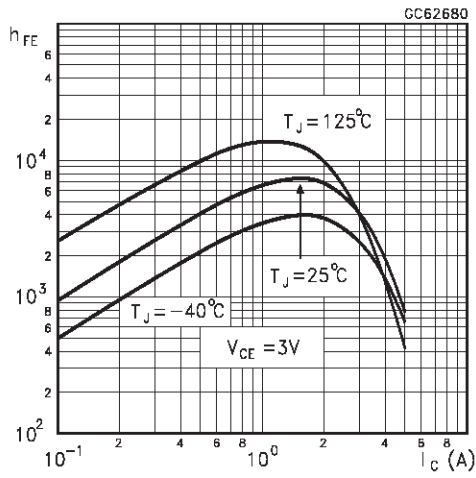
## Safe Operating Areas



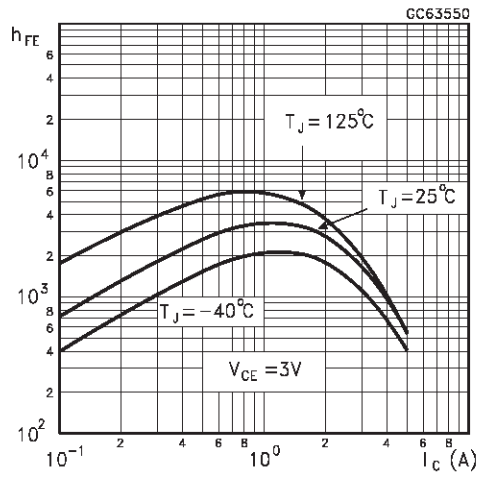
## Derating Curve



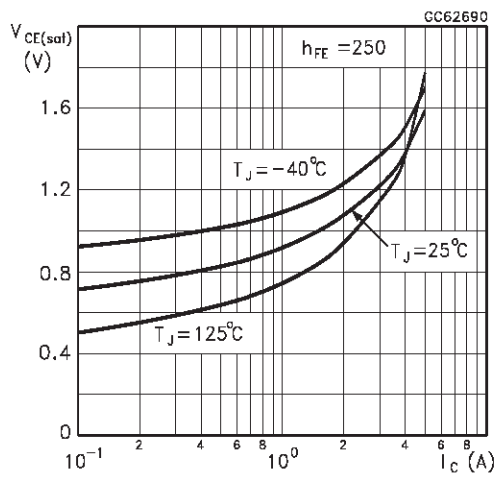
DC Current Gain (NPN type)



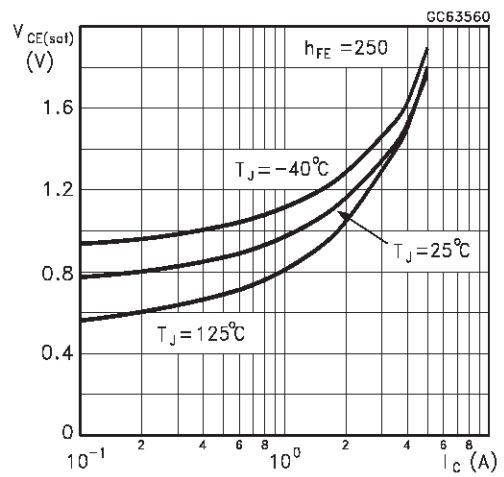
DC Current Gain (PNP type)



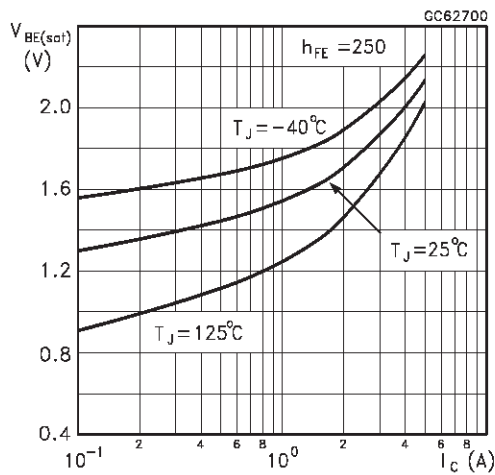
Collector-Emitter Saturation Voltage (NPN type)



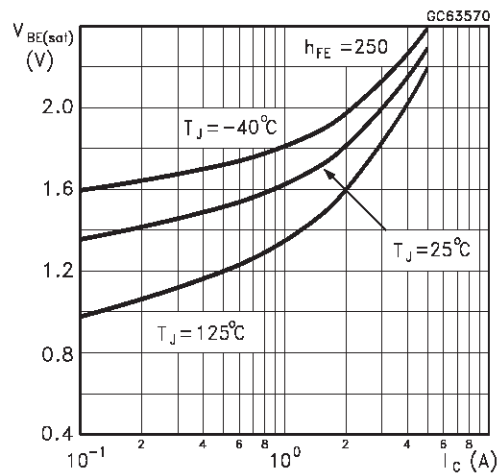
Collector-Emitter Saturation Voltage (PNP type)



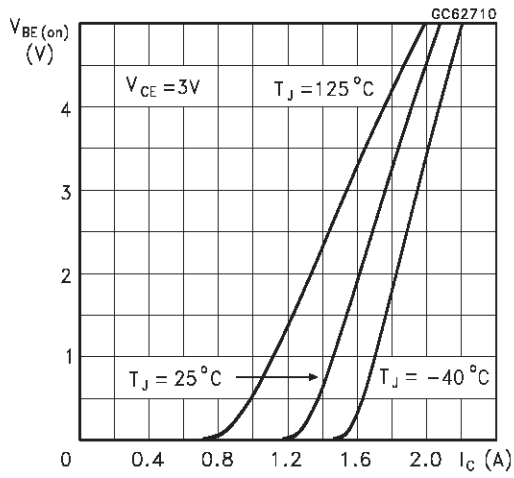
Base-Emitter Saturation Voltage (NPN type)



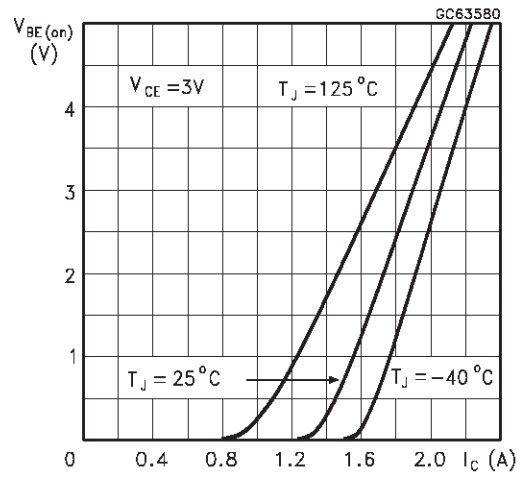
Base-Emitter Saturation Voltage (PNP type)



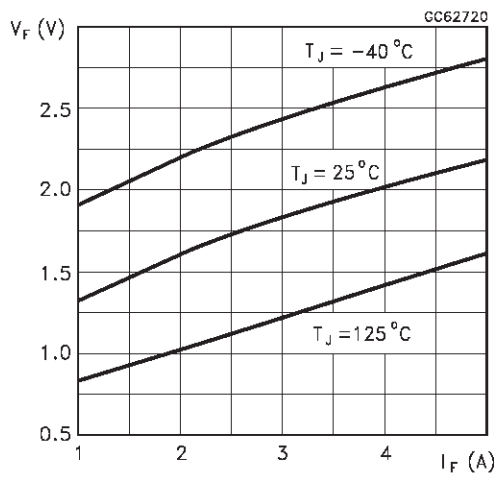
Base-Emitter On Voltage (NPN type)



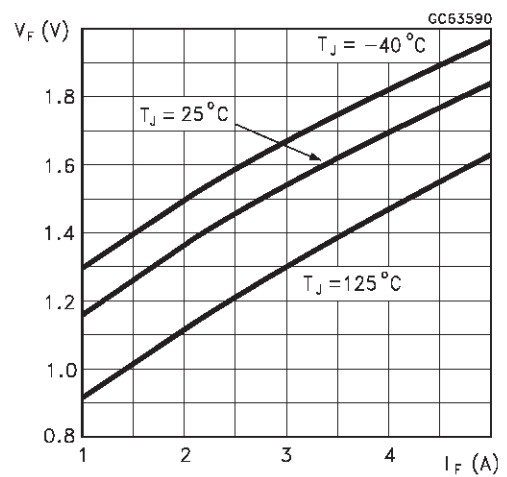
Base-Emitter On Voltage (PNP type)



Freewheel Diode Forward Voltage (NPN types)



Freewheel Diode Forward Voltage (PNP types)





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