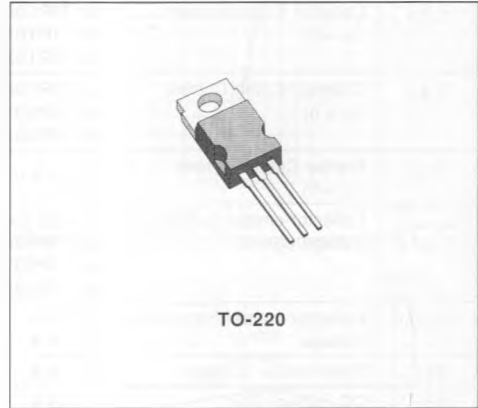


**POWER DARLINGTONS**
**DESCRIPTION**

The TIP100, TIP101 and TIP102 are silicon epitaxial-base NPN transistors in monolithic Darlington configuration mounted in Jedec TO-220 plastic package, intended for use in power linear and switching applications. The complementary PNP types are the TIP105, TIP106 and TIP107 respectively.


**INTERNAL SCHEMATIC DIAGRAMS**

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	NPN PNP*	Value			Unit
			TIP100 TIP105	TIP101 TIP106	TIP101 TIP107	
$V_{CBO}$	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			8		A
$I_{CM}$	Collector Peak Current			15		A
$I_B$	Base Current			1		A
$P_{tot}$	Total Power Dissipation at $T_{case} \leq 25^\circ\text{C}$ $T_{amb} \leq 25^\circ\text{C}$			80		W
				2		W
$T_{stg}$	Storage Temperature			- 65 to 150		$^\circ\text{C}$
$T_j$	Junction Temperature			150		$^\circ\text{C}$

\* For PNP types voltage and current values are negative.

**THERMAL DATA**

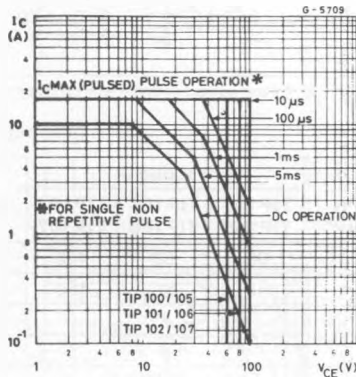
$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	1.56	°C/W
$R_{th(j-amb)}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W

**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

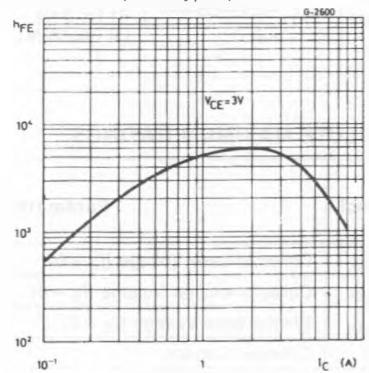
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CEO}$	Collector Cutoff Current ( $I_B = 0$ )	for <b>TIP100/105</b> $V_{CE} = 30\text{ V}$ for <b>TIP101/106</b> $V_{CE} = 40\text{ V}$ for <b>TIP102/107</b> $V_{CE} = 50\text{ V}$			50 50 50	$\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	for <b>TIP100/105</b> $V_{CB} = 60\text{ V}$ for <b>TIP101/106</b> $V_{CB} = 80\text{ V}$ for <b>TIP102/107</b> $V_{CB} = 100\text{ V}$			50 50 50	$\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			8	mA
$V_{CE0(sus)}^*$	Collector-emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 30\text{ mA}$ for <b>TIP100/105</b> for <b>TIP101/106</b> for <b>TIP102/107</b>	60 80 100			V V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 3\text{ A}$ $I_B = 6\text{ mA}$ $I_C = 8\text{ A}$ $I_B = 80\text{ mA}$			2 2.5	V V
$V_{BE}^*$	Base-emitter Voltage	$I_C = 8\text{ A}$ $V_{CE} = 4\text{ V}$			2.8	V
$h_{FE}^*$	DC current Gain	$I_C = 3\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 8\text{ A}$ $V_{CE} = 4\text{ V}$	1000 200		20000	
$V_F^*$	Forward Voltage of Commutation Diode ( $I_B = 0$ )	$I_F = -I_C = 10\text{ A}$			2.8	V

\* Pulsed : pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
For PNP types voltage and current values are negative.

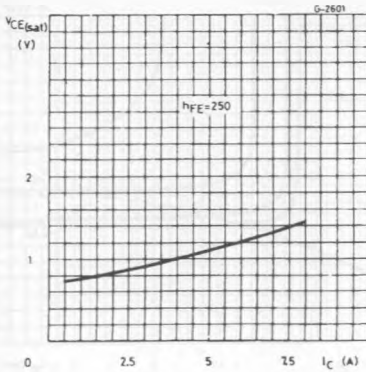
**Safe Operating Areas.**



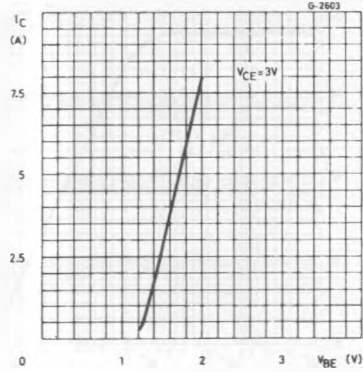
**DC Current Gain (NPN types).**



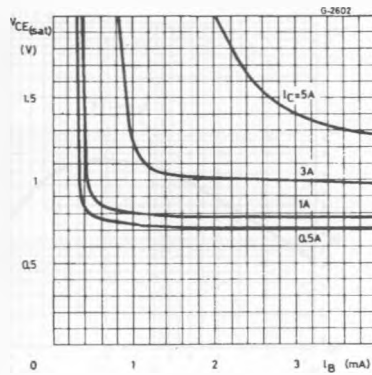
Collector-emitter Saturation Voltage (NPN types).



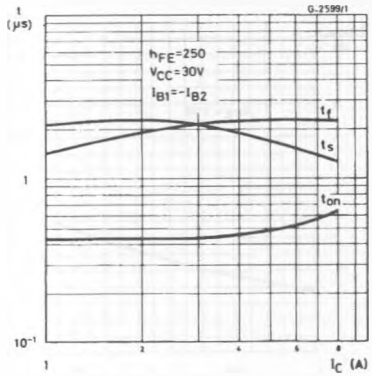
DC Transconductance (NPN types).



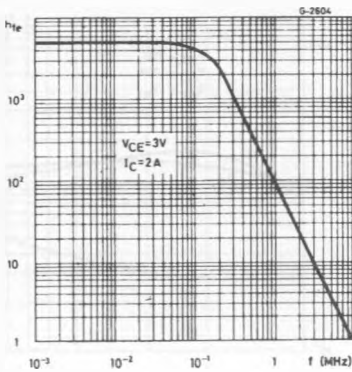
Collector-emitter Saturation Voltage (NPN types).



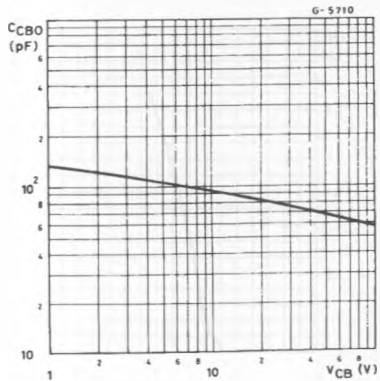
Saturated Switching Characteristics (NPN types).



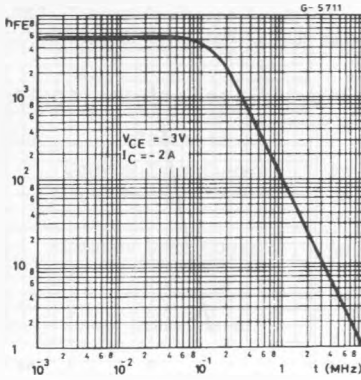
Small Signal Current Gain (NPN types).



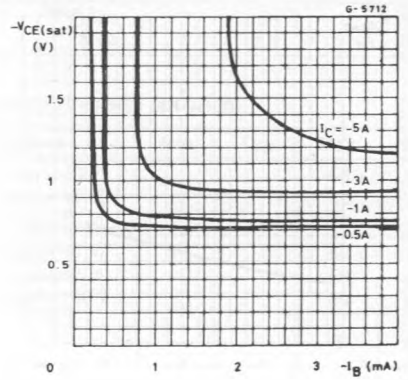
Collector-base Capacitance (PNP types).



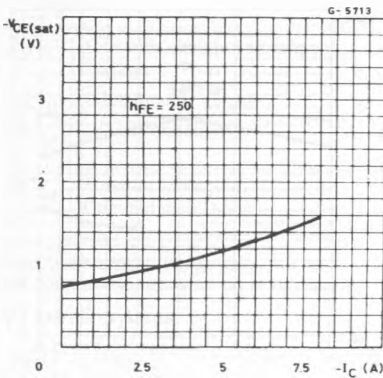
Small Signal Current Gain (PNP types).



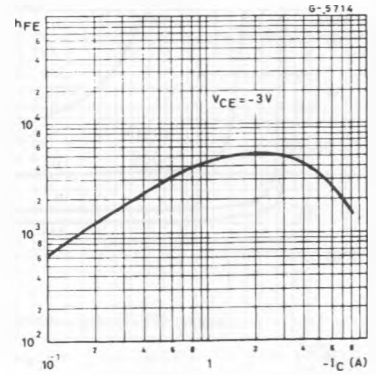
Collector-emitter Saturation Voltage (PNP types).



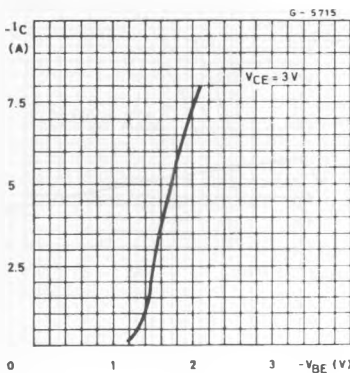
Collector-emitter Saturation Voltage (PNP types).



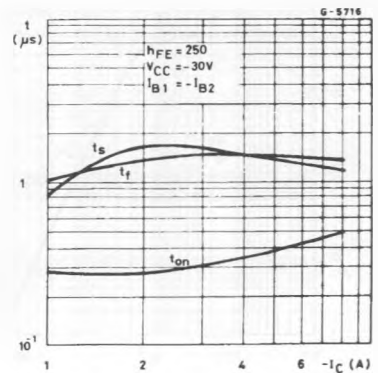
DC Current Gain (PNP types).



DC Transconductance (PNP types).



Saturated Switching Characteristics (PNP types).



Collector-base Capacitance (NPN types).

