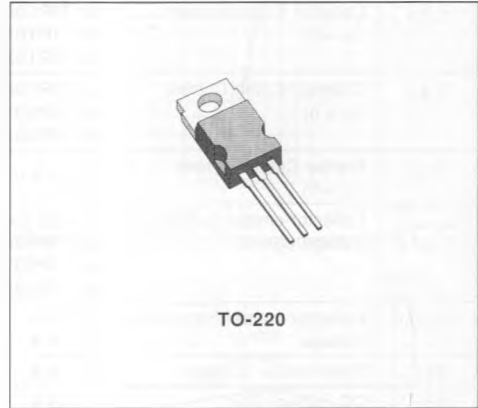


POWER DARLINGTONS
DESCRIPTION

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

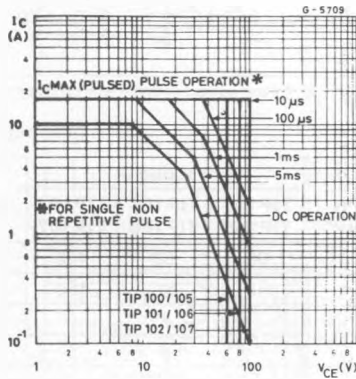
$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	1.56	°C/W
$R_{th(j-amb)}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W

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

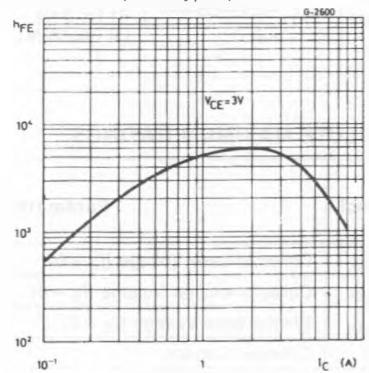
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for TIP100/105 $V_{CE} = 30\text{ V}$ for TIP101/106 $V_{CE} = 40\text{ V}$ for TIP102/107 $V_{CE} = 50\text{ V}$			50 50 50	μA μA μA
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for TIP100/105 $V_{CB} = 60\text{ V}$ for TIP101/106 $V_{CB} = 80\text{ V}$ for TIP102/107 $V_{CB} = 100\text{ V}$			50 50 50	μA μA μA
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 TIP100/105 for TIP101/106 for TIP102/107	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 μs , duty cycle $\leq 2\%$.
For PNP types voltage and current values are negative.

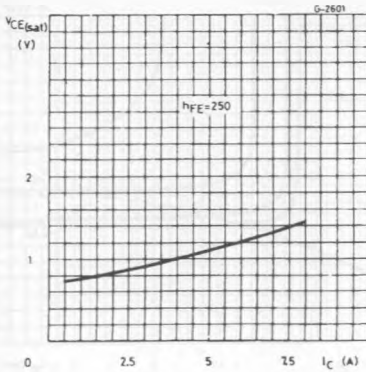
Safe Operating Areas.



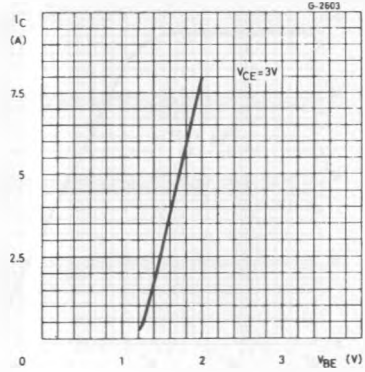
DC Current Gain (NPN types).



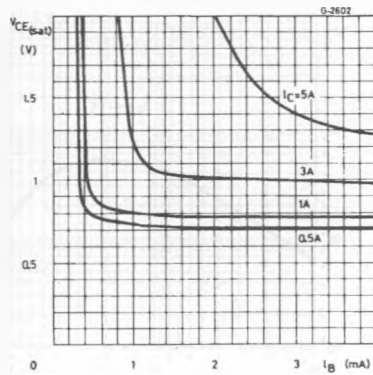
Collector-emitter Saturation Voltage (NPN types).



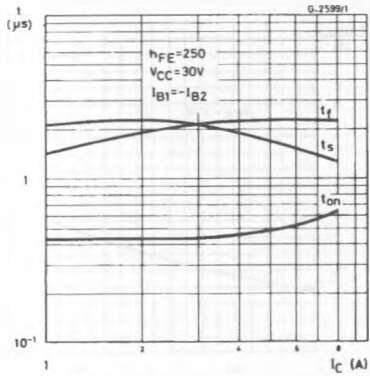
DC Transconductance (NPN types).



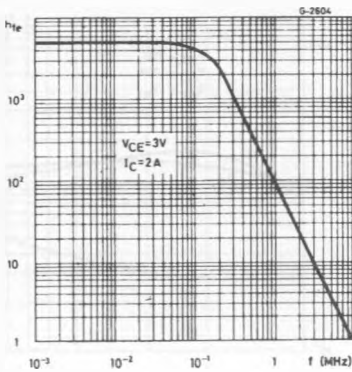
Collector-emitter Saturation Voltage (NPN types).



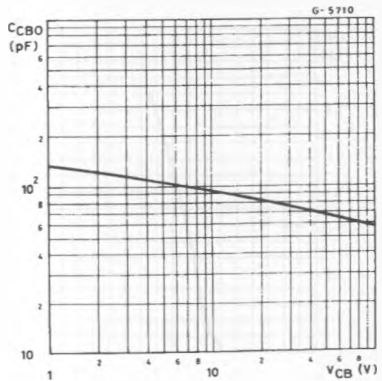
Saturated Switching Characteristics (NPN types).



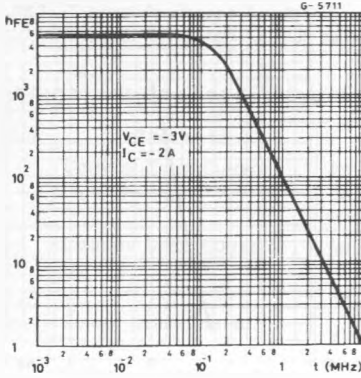
Small Signal Current Gain (NPN types).



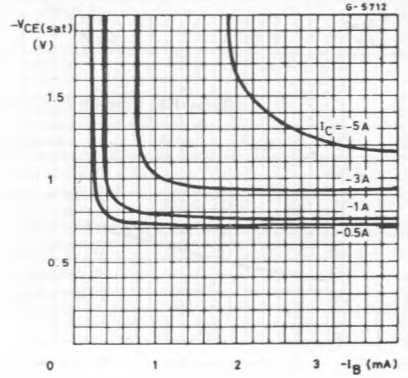
Collector-base Capacitance (PNP types).



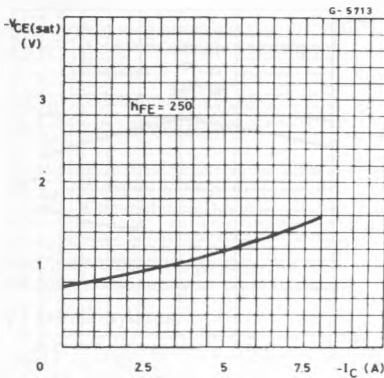
Small Signal Current Gain (PNP types).



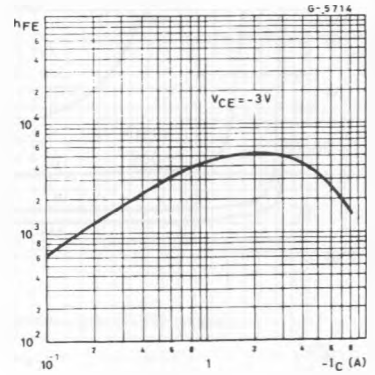
Collector-emitter Saturation Voltage (PNP types).



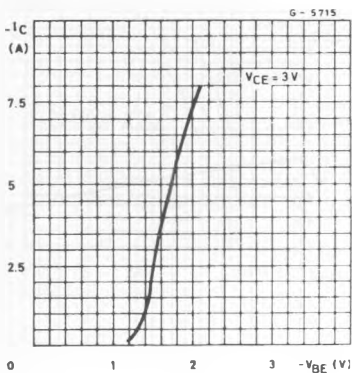
Collector-emitter Saturation Voltage (PNP types).



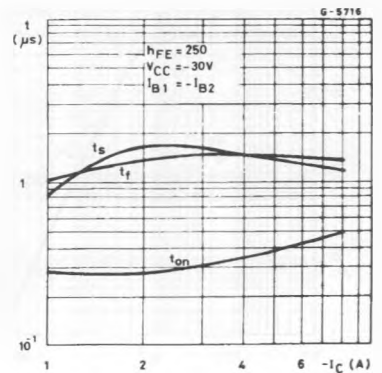
DC Current Gain (PNP types).



DC Transconductance (PNP types).



Saturated Switching Characteristics (PNP types).



Collector-base Capacitance (NPN types).

