

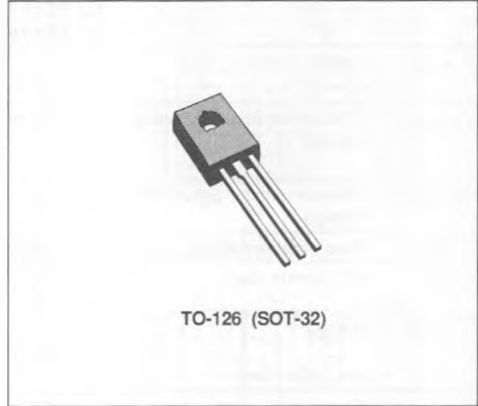


**MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS**

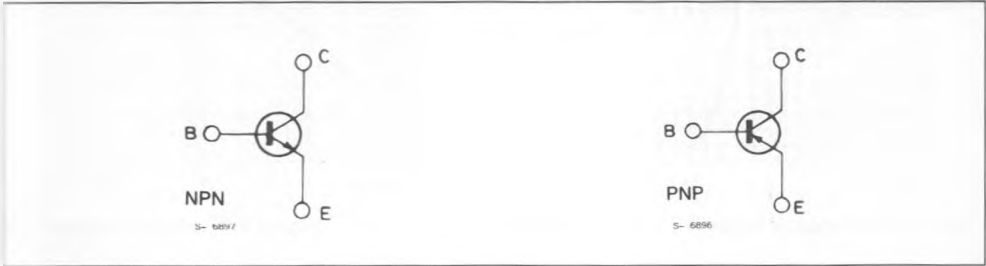
**DESCRIPTION**

The BD175, BD177 and BD179 are silicon epitaxial-base NPN power transistors in Jedec TO-126 plastic package intended for use in medium power linear and switching applications.

The complementary PNP types are the BD176, BD178 and BD180.



**INTERNAL SCHEMATIC DIAGRAMS**



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	NPN PNP*	Value			Unit
			BD175 BD176	BD177 BD178	BD179 BD180	
V <sub>CBO</sub>	Collector-base Voltage (I <sub>E</sub> = 0)		45	60	80	V
V <sub>CEO</sub>	Collector-emitter Voltage (I <sub>B</sub> = 0)		45	60	80	V
V <sub>EBO</sub>	Emitter-base Voltage (I <sub>C</sub> = 0)		5			V
I <sub>C</sub>	Collector Current		3			A
I <sub>CM</sub>	Collector Peak Current		7			A
P <sub>tot</sub>	Total Power Dissipation at T <sub>case</sub> ≤ 25 °C		30			W
T <sub>stg</sub>	Storage Temperature		- 65 to 150			°C
T <sub>j</sub>	Junction Temperature		150			°C

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

**THERMAL DATA**

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	4.16	°C/W
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

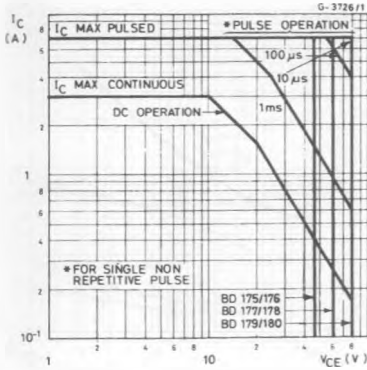
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	for <b>BD175/76</b> $V_{CB} = 45\text{ V}$ for <b>BD177/78</b> $V_{CB} = 60\text{ V}$ for <b>BD179/80</b> $V_{CB} = 80\text{ V}$			100 100 100	$\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			1	mA
$V_{CE(sus)}^*$	Collector-emitter Sustaining Voltage	$I_C = 100\text{ mA}$ for <b>BD175/76</b> for <b>BD177/78</b> for <b>BD179/80</b>	45 60 80			V V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 1\text{ A}$ $I_B = 0.1\text{ A}$			0.8	V
$V_{BE}^*$	Base-emitter Voltage	$I_C = 1\text{ A}$ $V_{CE} = 2\text{ V}$			1.3	V
$h_{FE}^*$	DC Current Gain	$I_C = 150\text{ mA}$ $V_{CE} = 2\text{ V}$ $I_C = 1\text{ A}$ $V_{CE} = 2\text{ V}$	40 15			
$h_{FE}$	Groups** 6 10 (only BD175/6) 16	$I_C = 150\text{ mA}$ $V_{CE} = 2\text{ V}$	40 63 100		100 160 250	
$f_T$	Transition Frequency	$I_C = 250\text{ mA}$ $V_{CE} = 10\text{ V}$	3			MHz

\* Pulsed : pulse duration = 300 $\mu\text{s}$ , duty cycle  $\leq 1.5\%$ .

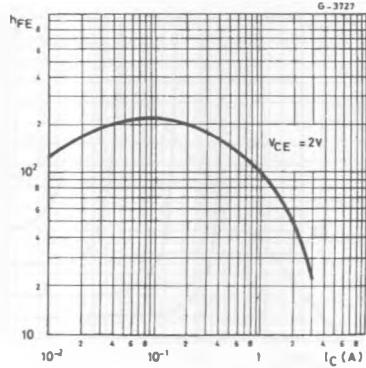
\*\* Only on request.

For PNP types voltage and current values are negative.

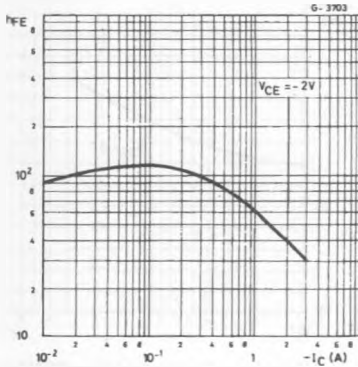
Operating Areas.



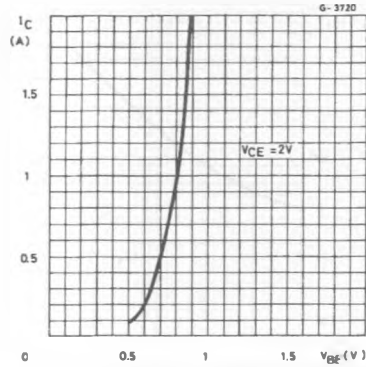
DC Current Gain (NPN types).



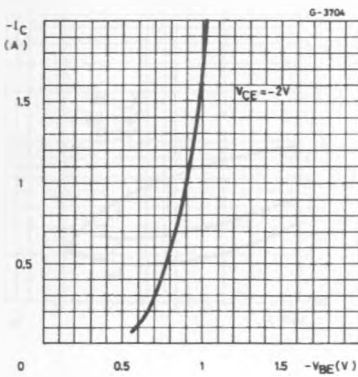
DC Current Gain (PNP types)



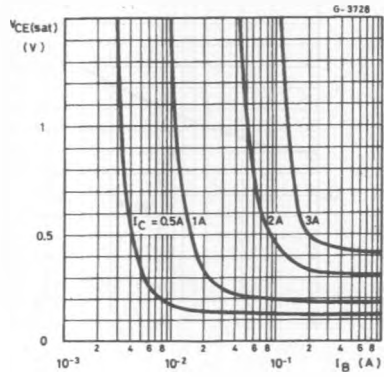
DC Transconductance (NPN types).



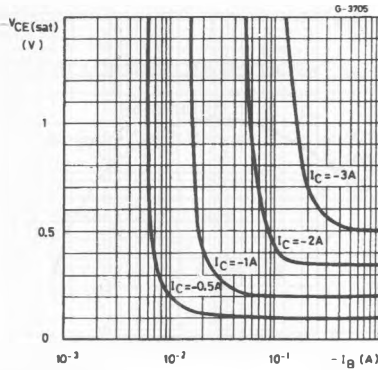
DC Transconductance (PNP types)



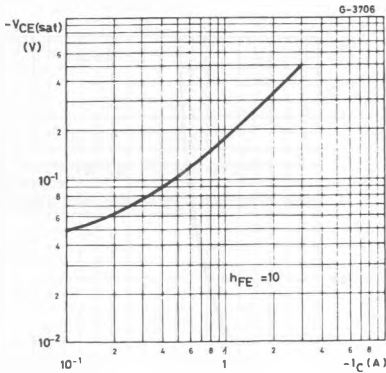
Collector-emitter Saturation Voltage (NPN types).



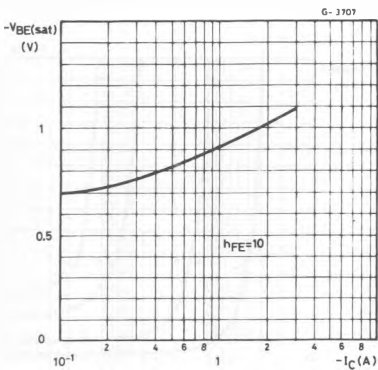
Collector-emitter Saturation Voltage (PNP types).



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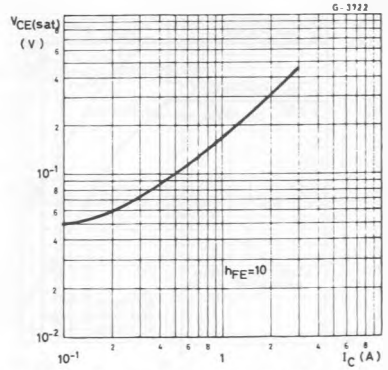


Base-emitter Saturation Voltage (PNP types).

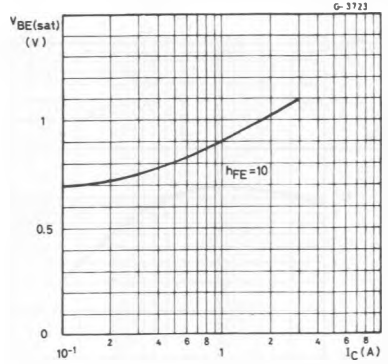


Base-emitter Saturation Voltage (PNP types).

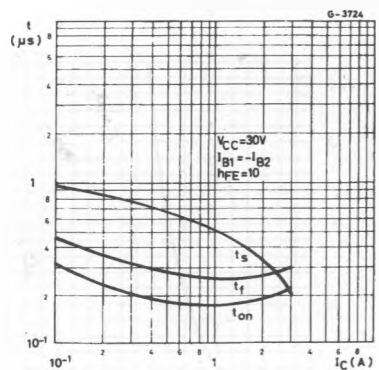
Collector-emitter Saturation Voltage (NPN types).



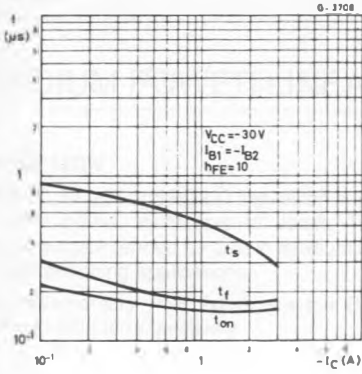
Base-emitter Saturation Voltage (NPN types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).



Power Derating Chart.

