SGS-THOMSON MICROELECTRONICS

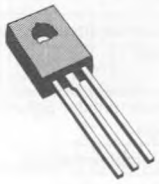
BD175/77/79
BD176/78/80

MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

DESCRIPTION

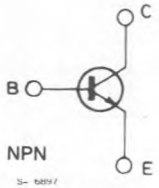
The BD175, BD177 and BD179 are silicon epitaxial-base NPN power transistors in Jedec TO-126 plastic package intended for use in medium power linear and switching applications.

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

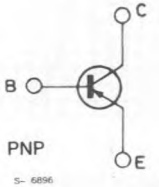


TO-126 (SOT-32)

INTERNAL SCHEMATIC DIAGRAMS



NPN



PNP

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value BD175 BD176	Value BD177 BD178	Value BD179 BD180	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)		45	60	80	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)		45	60	80	V
V_{EBO}	Emitter-base Voltage (I_C = 0)		5			V
I_C	Collector Current		3			A
I_{CM}	Collector Peak Current		7			A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		30			W
T_{stg}	Storage Temperature		– 65 to 150			°C
T_j	Junction Temperature		150			°C

* For PNP types voltage and current values are negative.

THERMAL DATA

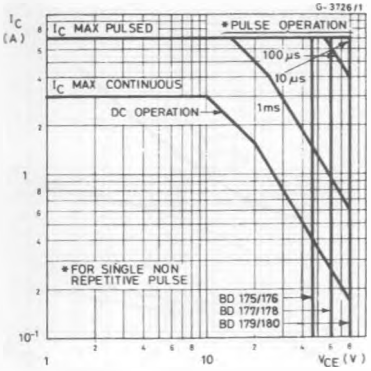
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	4.16	°C/W

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

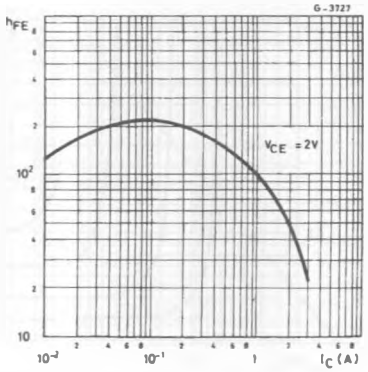
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BD175/76**	V_{CB} = 45 V			100	µA
		for **BD177/78**	V_{CB} = 60 V			100	µA
		for **BD179/80**	V_{CB} = 80 V			100	µA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V				1	mA
$V_{CEO(sus)}$*	Collector-emitter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

* Pulsed : pulse duration = 300µs, duty cycle ≤1.5%.
** Only on request.
For PNP types voltage and current values are negative.

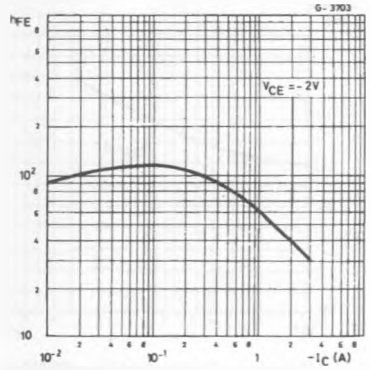
Safe Operating Areas.



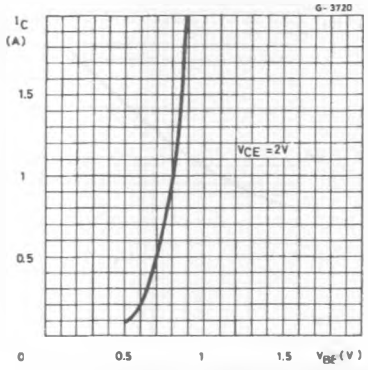
DC Current Gain (NPN types).



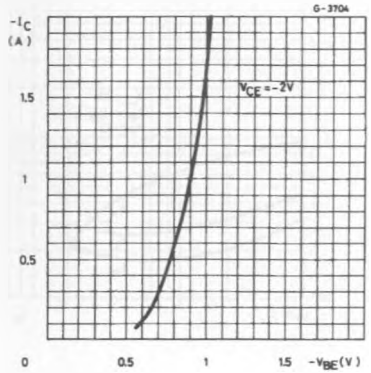
DC Current Gain (PNP types)



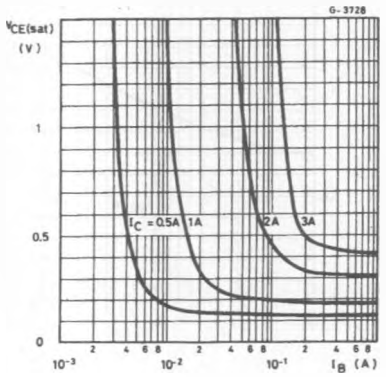
DC Transconductance (NPN types).



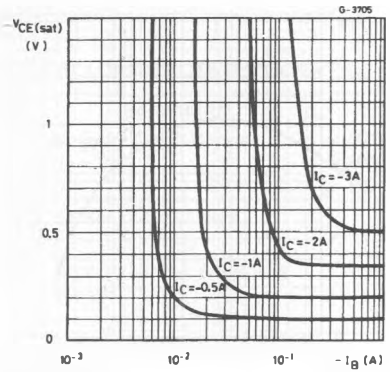
DC Transconductance(PNP types)



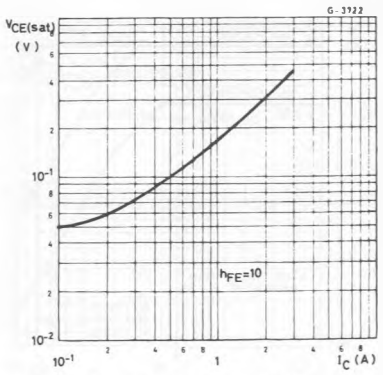
Collector-emitter Saturation Voltage (NPN types).



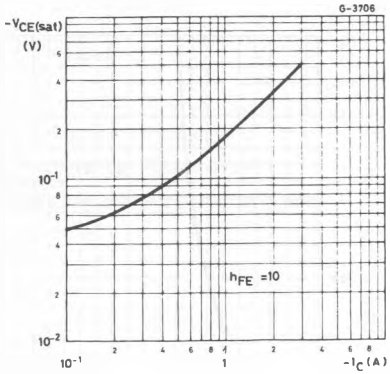
Collector-emitter Saturation Voltage (PNP types).



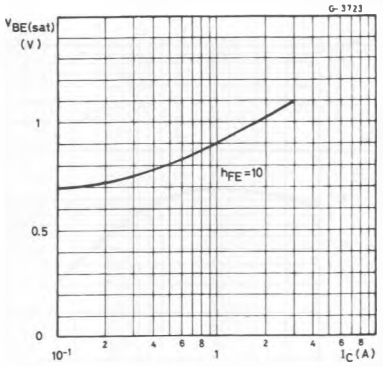
Collector-emitter Saturation Voltage (NPN types).



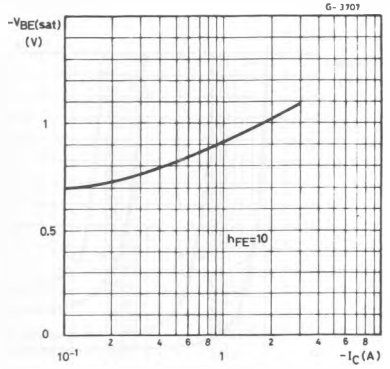
Collector-emitter Saturation Voltage (PNP types).



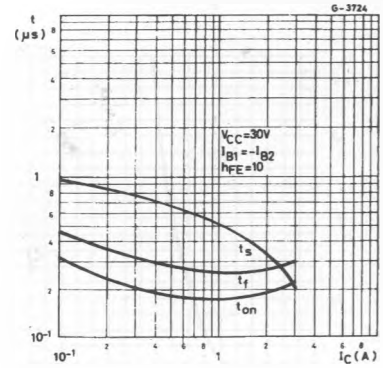
Basc-emitter Saturation Voltage (NPN types).



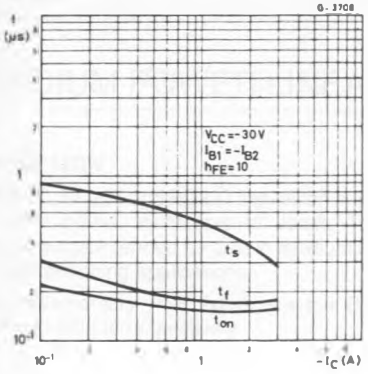
Basc-emitter Saturation Voltage (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).



Power Derating Chart.