



BD233 BD234
BD235 BD236
BD237 BD238

EPITAXIAL-BASE NPN/PNP

MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

The BD 233, BD 235 and BD 237 are silicon epitaxial-base NPN power transistors in Jedec TO-126 plastic package intended for use in medium power linear and switching applications.

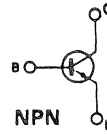
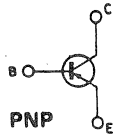
The complementary PNP types are the BD 234, BD 236 and BD 238 respectively.

ABSOLUTE MAXIMUM RATINGS

	NPN PNP*	BD233 BD234	BD235 BD236	BD237 BD238
V_{CBO}	Collector-base voltage ($I_E = 0$)	45V	60V	100V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	45V	60V	80V
V_{CER}	Collector-emitter voltage ($R_{BE} = 1K\Omega$)	45V	60V	100V
V_{EBO}	Emitter-base voltage ($I_C = 0$)		5V	
I_C	Collector current		2A	
I_{CM}	Collector peak current		6A	
P_{tot}	Total power dissipation at $T_{case} \leq 25^\circ C$		25W	
T_{stg}	Storage temperature		-65 to $150^\circ C$	
T_J	Junction temperature		$150^\circ C$	

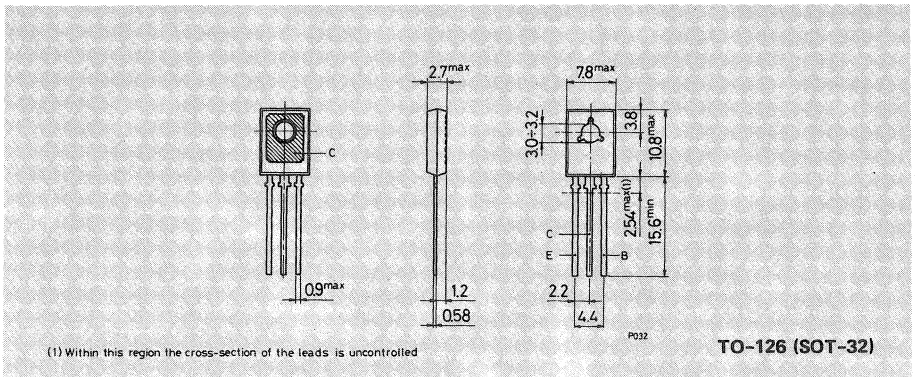
* For PNP types voltage and current values are negative

INTERNAL SCHEMATIC DIAGRAMS



MECHANICAL DATA

Dimensions in mm





BD233 BD234
BD235 BD236
BD237 BD238

THERMAL DATA

$R_{th\ j-case}$	Thermal resistance junction-case	max	5	°C/W
------------------	----------------------------------	-----	---	------

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

Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO} Collector cutoff current ($I_E = 0$)	for BD233/34 $V_{CB} = 45V$			100	μA
	for BD235/36 $V_{CB} = 60V$			100	μA
	for BD326/38 $V_{CB} = 100V$			100	μA
	$T_{case} = 150^{\circ}C$				
	for BD233/34 $V_{CB} = 45V$			2	mA
	for BD235/36 $V_{CB} = 60V$			2	mA
	for BD237/38 $V_{CB} = 100V$			2	mA
I_{EBO} Emitter cutoff current ($I_C = 0$)	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)}$ *Collector-emitter sustaining voltage	$I_C = 100\text{ mA}$ for BD233/34 for BD235/36 for BD237/38	45			V
		60			V
		80			V
$V_{CE(sat)}$ * Collector-emitter saturation voltage	$I_C = 1A$ $I_B = 0.1A$			0.6	V
V_{BE} * Base-emitter voltage	$I_C = 1A$ $V_{CE} = 2V$			1.3	V
h_{FE} * DC current gain	$I_C = 150\text{ mA}$ $V_{CE} = 2V$ $I_C = 1A$ $V_{CE} = 2V$	40			—
		25			—
f_T Transition frequency	$I_C = 250\text{ mA}$ $V_{CE} = 10V$	3			MHz
h_{FE1}/h_{FE2} *Matched pairs BD233/BD234 BD235/BD236 BD237/BD238	$I_C = 150\text{ mA}$ $V_{CE} = 2V$		1.6		—

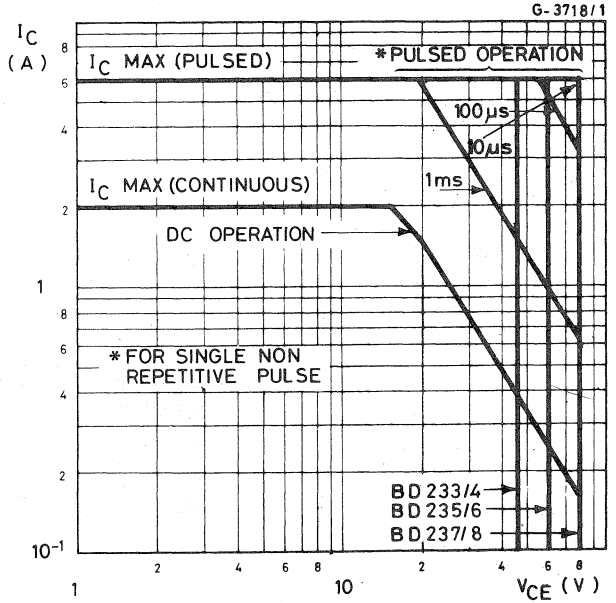
* Pulsed: pulse duration = 300 μs , duty cycle $\leq 1.5\%$

For PNP types voltage and current values are negative

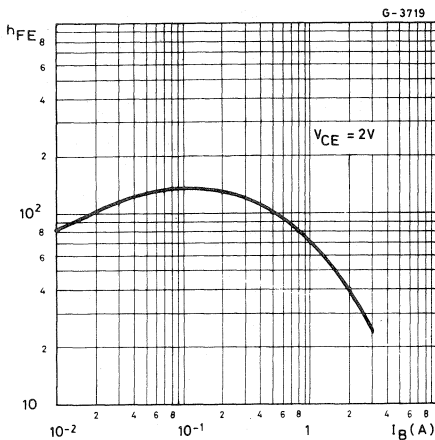


BD233 BD234
BD235 BD236
BD237 BD238

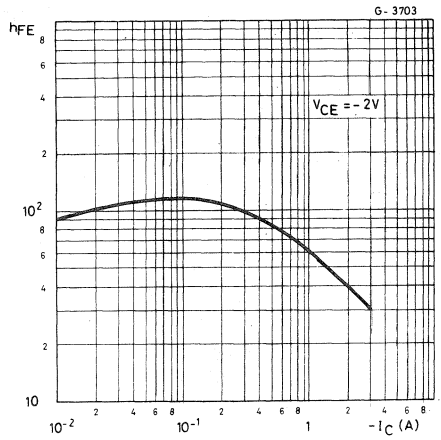
Safe operating areas



DC current gain (NPN types)



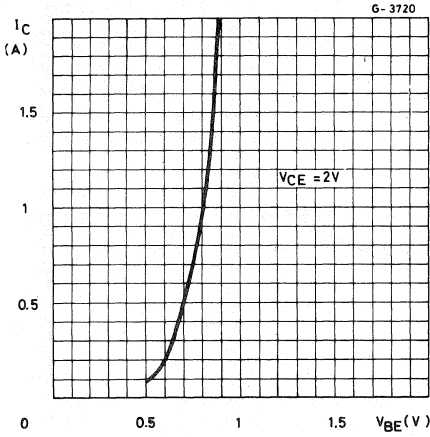
DC current gain (PNP types)



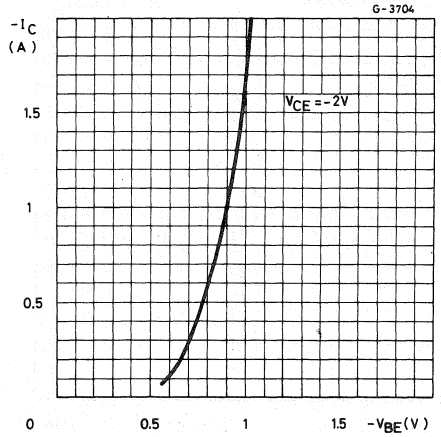


BD233 BD234
BD235 BD236
BD237 BD238

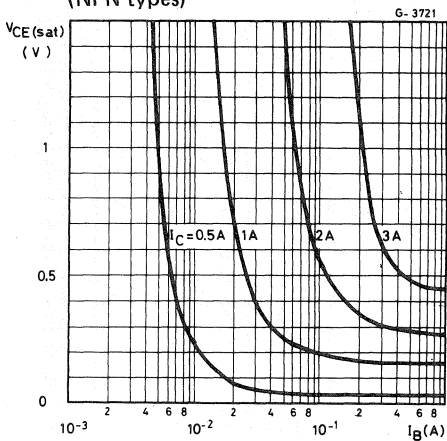
DC transconductance (NPN types)



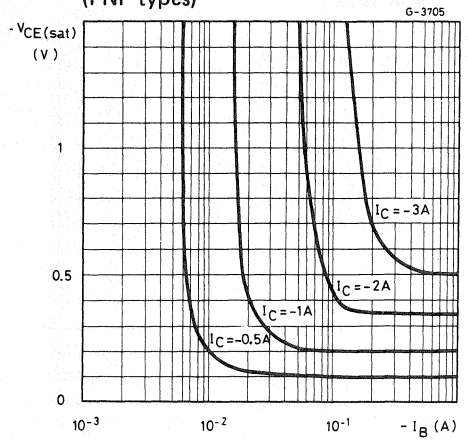
DC transconductance (PNP types)



Collector-emitter saturation voltage (NPN types)



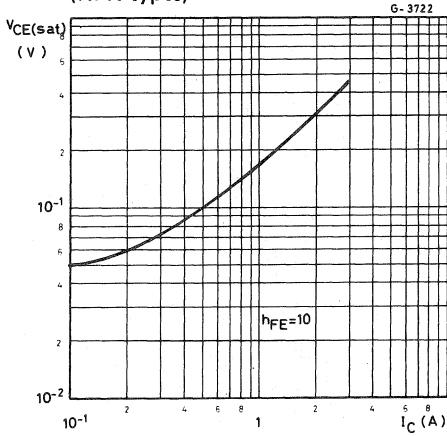
Collector-emitter saturation voltage (PNP types)



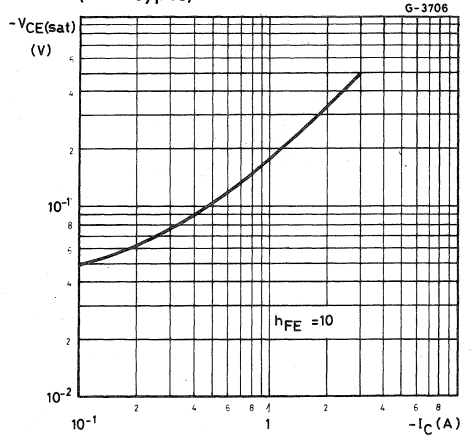


BD233 BD234
BD235 BD236
BD237 BD238

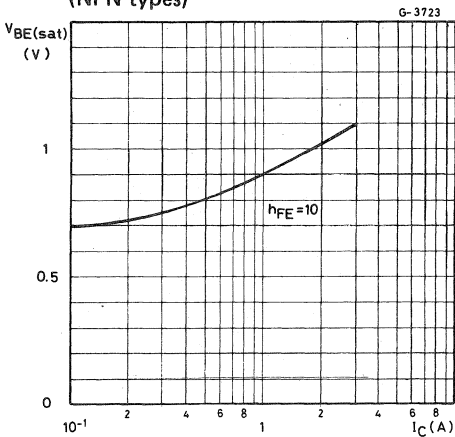
Collector-emitter saturation voltage
(NPN types)



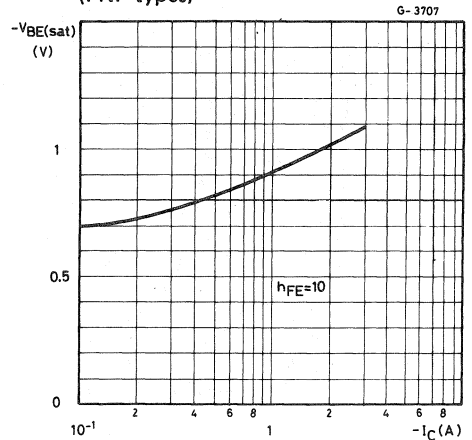
Collector-emitter saturation voltage
(PNP types)



Base-emitter saturation voltage
(NPN types)



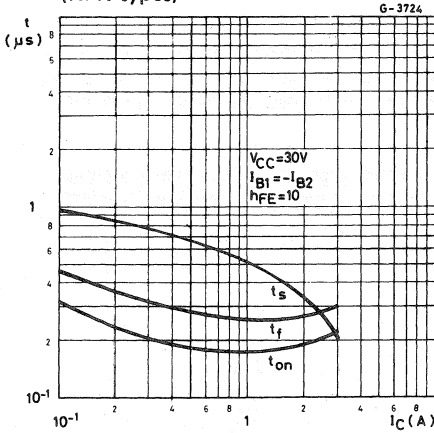
Base-emitter saturation voltage
(PNP types)



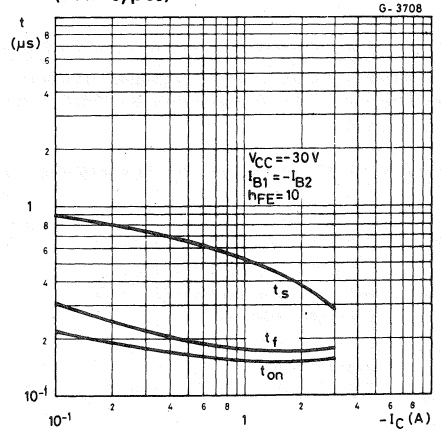


BD233 BD234
BD235 BD236
BD237 BD238

Saturated switching characteristics
(NPN types)



Saturated switching characteristics
(PNP types)



Power derating chart

