SGS-THOMSON MICROELECTRONICS

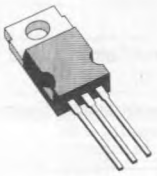
BD533/BD534
BD535/BD536
BD537/BD538

EPITAXIAL-BASE NPN/PNP

DESCRIPTION

The BD533, BD535 and BD537 are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package, intended for use in medium power linear and switching applications.

The complementary PNP types are the BD534, BD536 and BD538 respectively.



TO-220

INTERNAL SCHEMATIC DIAGRAMS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value BD533 BD534	Value BD535 BD536	Value BD537 BD538	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)		45	60	80	V
V_{CES}	Collector-emitter Voltage (V_{BE} = 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, I_E	Collector and Emitter Current		8			A
I_B	Base Current		1			A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		50			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	2.5	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	70	°C/W

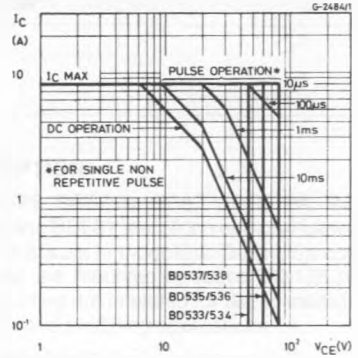
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BD533/34**	V_{CB} = 45 V			100	µA
		for **BD535/36**	V_{CB} = 60 V			100	µA
		for **BD537/38**	V_{CB} = 80 V			100	µA
I_{CES}	Collector Cutoff Current (V_{BE} = 0)	for **BD533/34**	V_{CE} = 45 V			100	µA
		for **BD535/36**	V_{CE} = 60 V			100	µA
		for **BD537/38**	V_{CE} = 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_B = 0)	I_C = 100 mA	for **BD533/34**	45			V
			for **BD535/36**	60			V
			for **BD537/38**	80			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 2 A	I_B = 0.2 A			0.8	V
		I_C = 6 A	I_B = 0.6 A		0.8		V
V_{BE}*	Base-emitter Voltage	I_C = 2 A	V_{CE} = 2 V			1.5	V
h_{FE}*	DC Current Gain	I_C = 10 mA	V_{CE} = 5 V				
			for **BD533/34**	20			
			for **BD535/36**	20			
			for **BD537/38**	15			
		I_C = 500 mA	V_{CE} = 2 V	40			
		I_C = 2 A	V_{CE} = 2 V				
			for **BD533/34**	25			
			for **BD535/36**	25			
			for **BD537/38**	15			
f_T	Transition Frequency	I_C = 500 mA	V_{CE} = 1 V	3	12		MHz
h_{FE} groups** :	J	I_C = 2 A	V_{CE} = 2 V	30		75	
		I_C = 3 A	V_{CE} = 2 V	15			
	K	I_C = 2 A	V_{CE} = 2 V	40		100	
		I_C = 3 A	V_{CE} = 2 V	20			

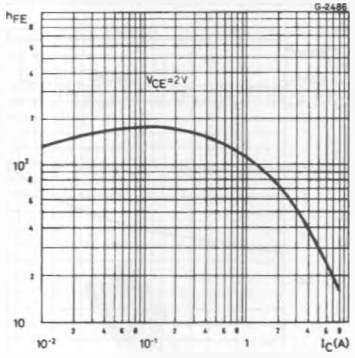
* Pulsed : pulse duration = 300 µs, duty cycle = 1.5 %.

For PNP types voltage and current values are negative.

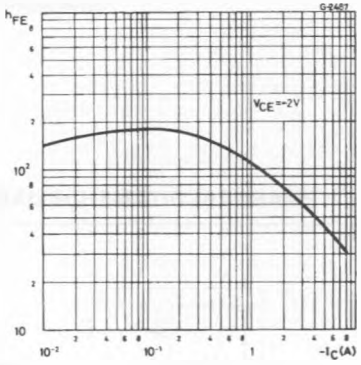
Safe Operating Areas.



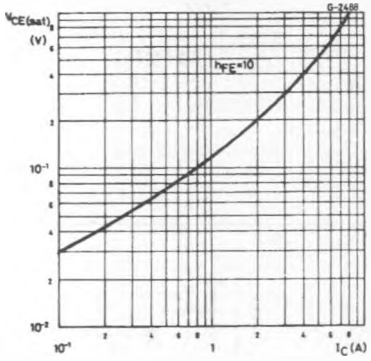
DC Current Gain (NPN types).



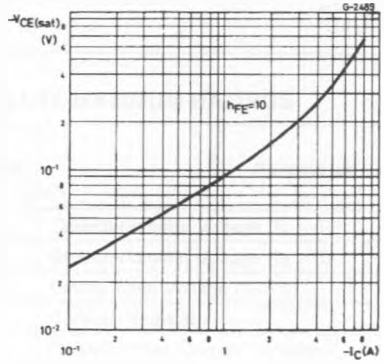
DC Current Gain (PNP types).



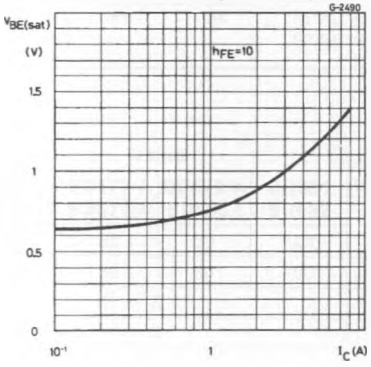
Collector-emitter Saturation Voltage (NPN types).



Collector-emitter Saturation Voltage (PNP types).



Base-emitter Saturation Voltage (NPN types).



Base-emitter Saturation Voltage (PNP types).