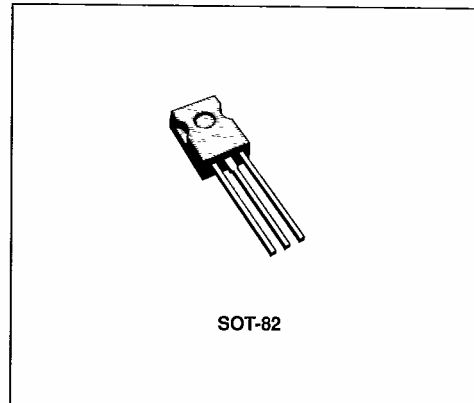


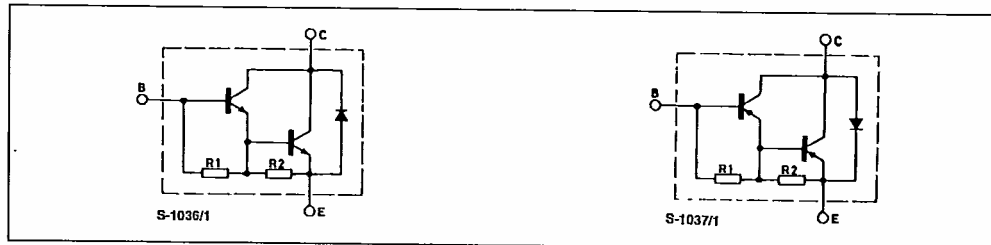
COMPLEMENTARY POWER DARLINGTONS

DESCRIPTION

The BD331, BD333, BD335 (NPN types) and BD332, BD334, BD336 (PNP types) are complementary epitaxial-base Darlingtonts in SOT-82 plastic package. They are intended for use in audio output stages, general amplifier and switching applications.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP	Value			Unit
			BD331 BD332	BD333 BD334	BD335 BD336	
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}	Base-emitter Voltage ($I_C = 0$)		5			V
I_C	Collector Current		6			A
I_{CM}	Collector Peak Current ($t_p < 10$ ms)		10			A
I_B	Base Current		0.15			A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		60			W
T_{stg}	Storage Temperature		- 65 to 150			°C
T_j	Junction Temperature		150			°C

For PNP types voltage and current values are negative.

$R_{th J-case}$	Thermal Resistance Junction-case	Max	2.08	°C/W
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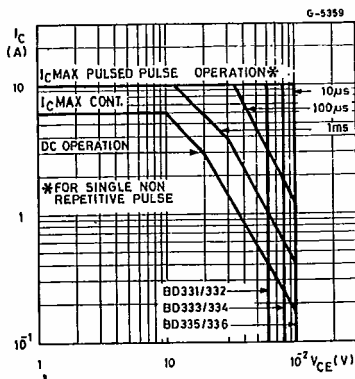
T-33-29

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

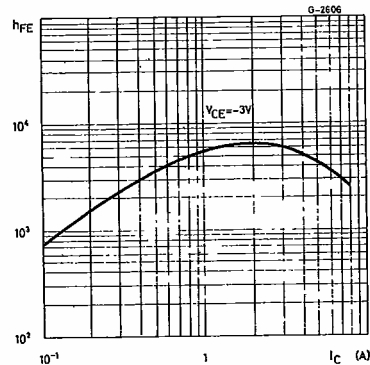
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	$V_{CB} = \text{rated } V_{CBO}$ $T_{case} = 150\text{ °C}$			0.2 2	mA mA
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	$V_{CE} = 1/2 V_{CEO\text{ max}}$			0.5	mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			5	mA
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 3\text{ A}$ $I_B = 12\text{ mA}$			2	V
V_{BE}^*	Base-emitter Voltage	$I_C = 3\text{ A}$ $V_{CE} = 3\text{ V}$			2.5	V
h_{FE}^*	DC Current Gain	$I_C = 0.5\text{ A}$ $V_{CE} = 3\text{ V}$ for BD331, BD333, BD335 for BD332, BD334, BD336 $I_C = 3\text{ A}$ $V_{CE} = 3\text{ V}$ for BD331, BD333, BD335 for BD332, BD334, BD336 $I_C = 6\text{ A}$ $V_{CE} = 3\text{ V}$ for BD331, BD333, BD335 for BD332, BD334, BD336		1900 2700 750 750 3000 400		
V_F^*	Parallel Diode Forward Voltage	$I_F = 3\text{ A}$		1.8		V
h_{fe}	Small Signal Current Gain	$I_C = 3\text{ A}$ $V_{CE} = 3\text{ V}$ $f = 1\text{ MHz}$ for BD331, BD333, BD335 for BD332, BD334, BD336		50 150		
t_{on}	Turn-on Time	$I_C = 3\text{ A}$ $V_{CC} = 30\text{ V}$		1	2	μs
t_{off}	Turn-off Time	$I_{B1} = -I_{B2} = 12\text{ mA}$		5	10	μs

* Pulsed : pulse duration = 300 μs , duty cycle $\leq 1.5\%$.
For PNP types voltage and current values are negative.

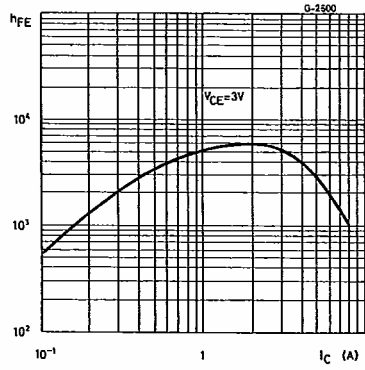
Safe Operating Areas.



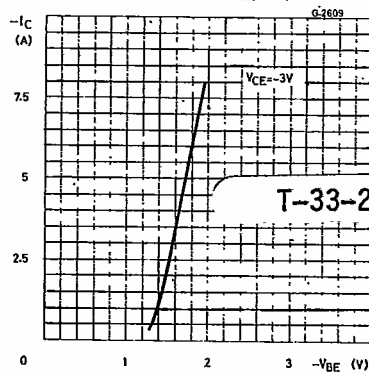
DC Current Gain (NPN types).



DC Current gain (PNP types).

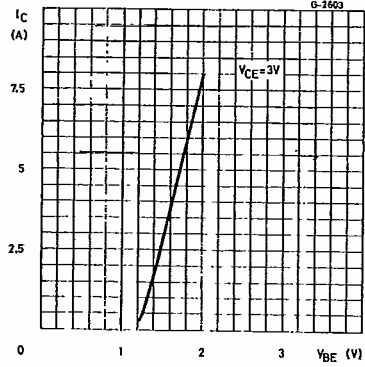


DC Transconductance (NPN types).

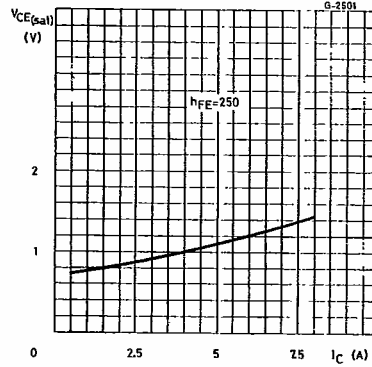


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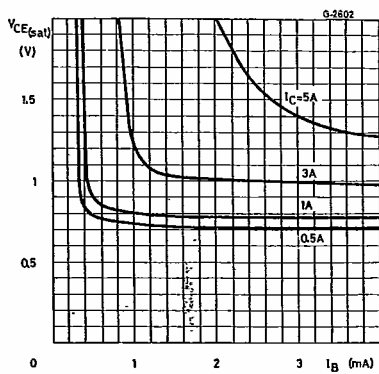
DC Transconductance (PNP types).



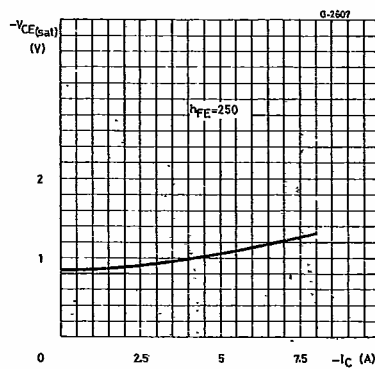
Collector-emitter Saturation Voltage (NPN types).



Collector-emitter Saturation Voltage (NPN types).



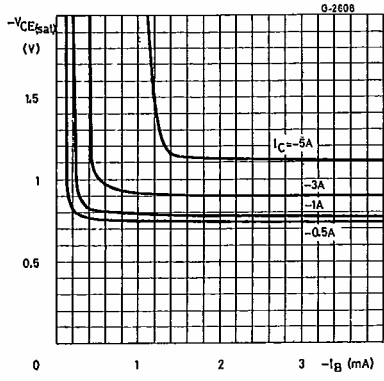
Collector-emitter Saturation Voltage (PNP types).



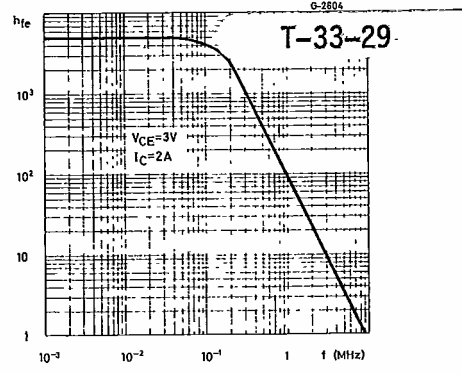
S G S-THOMSON

30E D

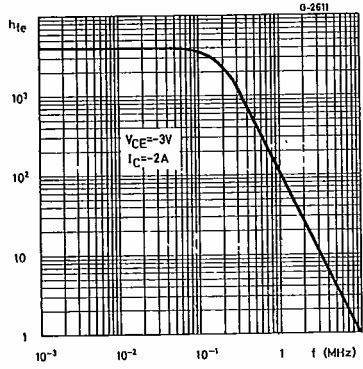
Collector-emitter Saturation Voltage (PNP types).



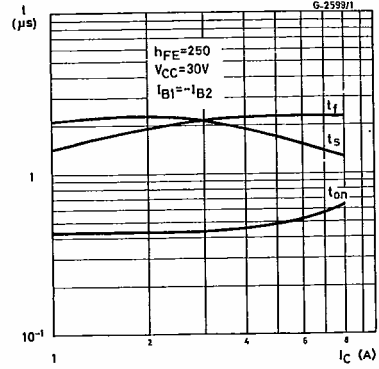
Small Signal Current Gain (NPN types).



Small Signal Current Gain (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).

