EPITAXIAL-BASE NPN/PNP

BD331 BD332
BD333 BD334
BD335 BD336

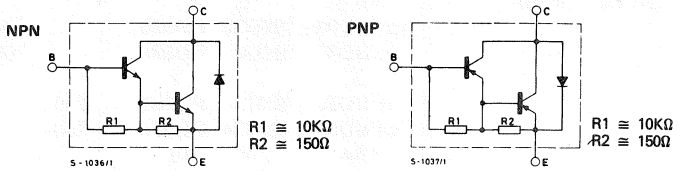
COMPLEMENTARY POWER DARLINGTONS

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

ABSOLUTE MAXIMUM RATINGS		NPN BD331 BD333 BD335 / PNP BD332 BD334 BD336		
V_{CBO}	Collector-base voltage ($I_E = 0$)	60V	80V	100V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	60V	80V	100V
V_{EBO}	Base-emitter voltage ($I_C = 0$)	5V		
I_C	Collector current	6A		
I_{CM}	Collector peak current ($t_p < 10$ ms)	10A		
I_B	Base current	0.15A		
P_{tot}	Total power dissipation at $T_{case} \leqslant 25°C$	60W		
T_{stg}	Storage temperature	−65 to 150°C		
T_j	Junction temperature	150°C		

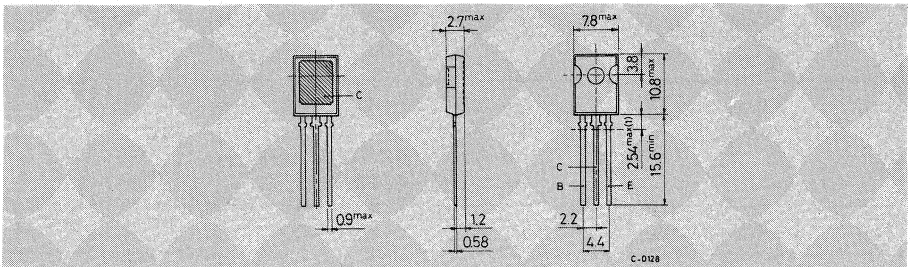
For PNP types voltage and current values are negative

INTERNAL SCHEMATIC DIAGRAMS



MECHANICAL DATA

Dimensions in mm



(1) Within this region the cross-section of the leads is uncontrolled

SOT-82

THERMAL DATA

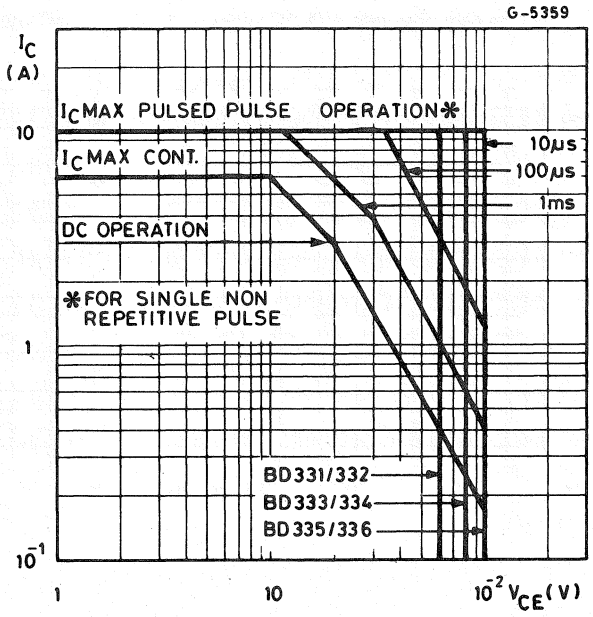
$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	2.08	°C/W

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

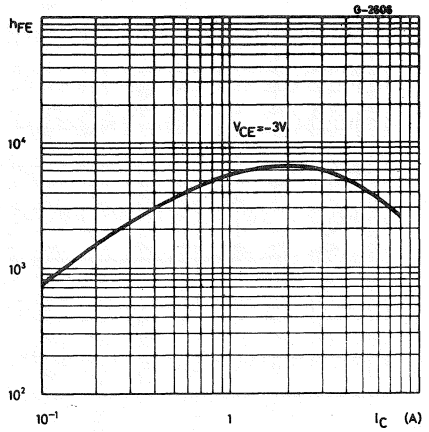
Parameter		Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current (I_E = 0)	V_{CB} = rated V_{CBO} T_{case} = 150°C			0.2 2	mA mA
I_{CEO}	Collector cutoff current (I_B = 0)	V_{CE} = 1/2 V_{CEO} max			0.5	mA
I_{EBO}	Emitter cutoff current (I_C = 0)	V_{EB} = 5V			5	mA
$V_{CE(sat)}$*	Collector-emitter saturation voltage	I_C = 3A I_B = 12mA			2	V
V_{BE}*	Base-emitter voltage	I_C = 3A V_{CE} = 3V			2.5	V
h_{FE}*	DC current gain	I_C = 0.5A V_{CE}3V for **BD331, BD333, BD335** for **BD332, BD334, BD336** I_C = 3A V_{CE} = 3V for **BD331, BD333, BD335** for **BD332, BD334, BD336** I_C = 6A V_{CE} = 3V for **BD331, BD333, BD335** for **BD332, BD334, BD336**		1900 2700 750 750 3000 400		— — — — — —
V_F*	Parallel diode forward voltage	I_F = 3A		1.8		V
h_{fe}	Small signal current gain	I_C = 3A V_{CE} = 3V f = 1MHz for **BD331, BD333, BD335** for **BD332, BD334, BD336**		50 150		— —
t_{on}	Turn-on time	I_C = 3A V_{CC} = 30V		1	2	μs
t_{off}	Turn-off time	I_{B1} = $-I_{B2}$ = 12mA		5	10	μs

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

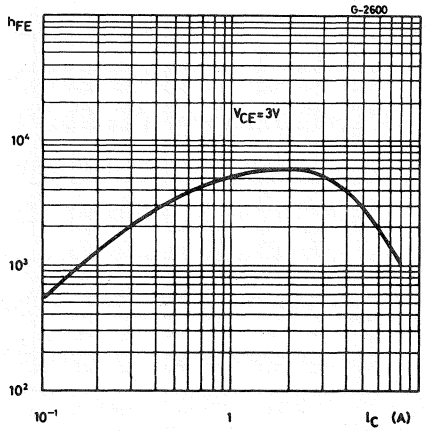
Safe operating areas



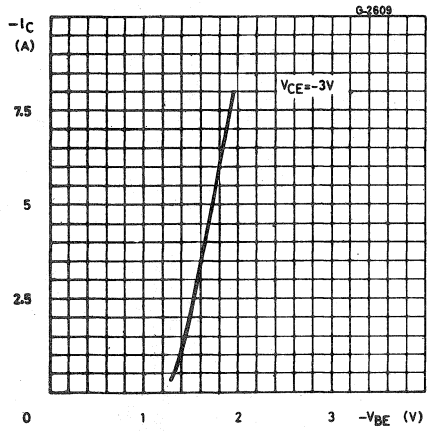
DC current gain (NPN types)



DC current gain (PNP types)



DC transconductance (NPN types)



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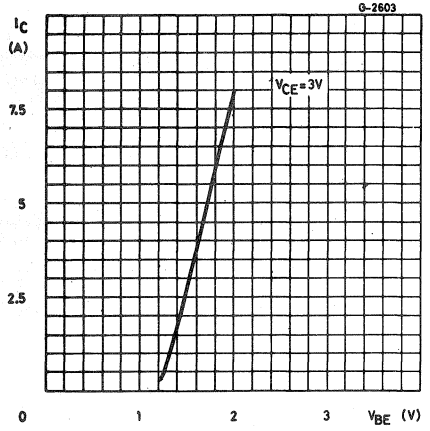
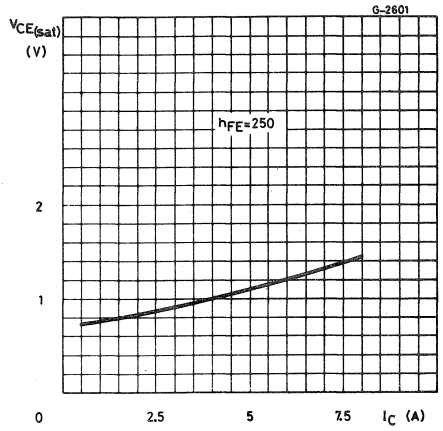
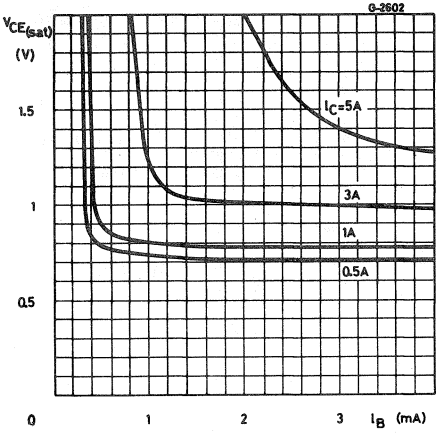


Collector-emitter saturation voltage (NPN types)



Collector-emitter saturation voltage (NPN types)



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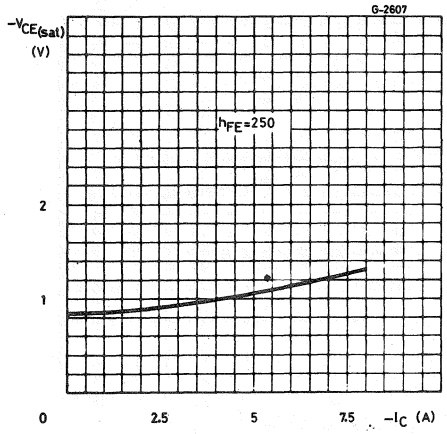

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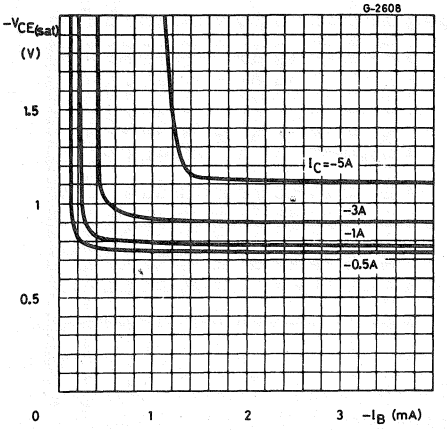
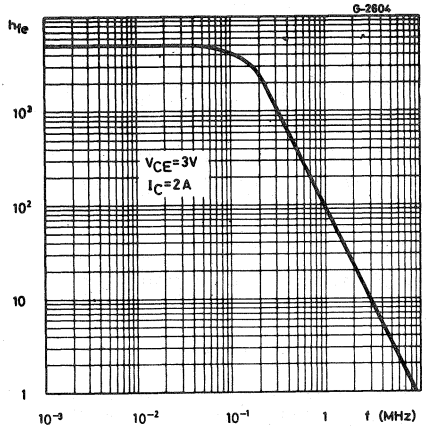


Small signal current gain (NPN types)



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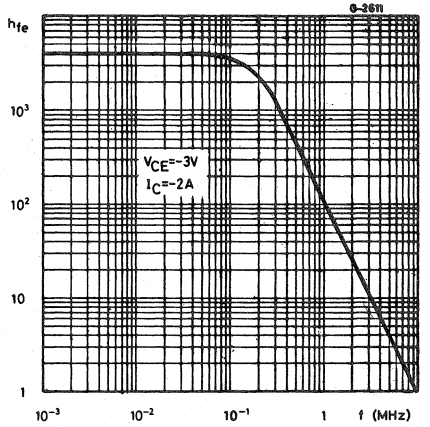
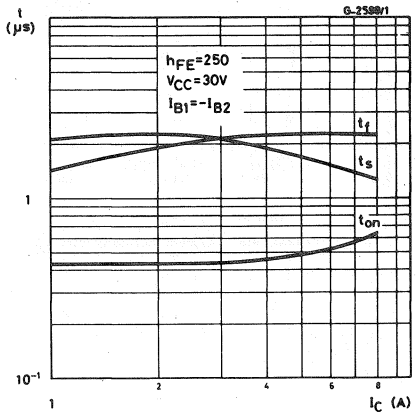


Saturated switching characteristics (NPN types)



Saturated switching characteristics (PNP types)