BD675A BD676A
BD677A BD678A
BD679A BD680A
BD681 BD682

EPITAXIAL-BASE NPN/PNP

MEDIUM POWER DARLINGTONS

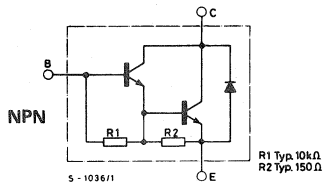
The BD675, BD675A, BD677, BD677A, BD679, BD679A and BD681 are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration and are mounted in Jedec TO-126 plastic package. They are intended for use in medium power linear and switching applications.

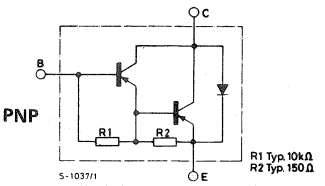
The complementary PNP types (the BD676, BD676A, BD678, BD678A, BD680, BD680A and BD682 respectively) have same characteristics of NPN types but voltage and current values are negative.

ABSOLUTE MAXIMUM RATINGS

		BD675 BD675A	BD677 BD677A	BD679 BD679A	BD681
V_{CBO}	Collector-base voltage ($I_E = 0$)	45V	60V	80V	100V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	45V	60V	80V	100V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5V			
I_C	Collector current	4A			
I_{CM}	Collector peak current (repetitive)	6A			
I_B	Base current	100mA			
P_{tot}	Total power dissipation at $T_{case} \leqslant 25°C$	40W			
T_{stg}	Storage temperature	-65 to 150°C			
T_j	Junction temperature	150°C			

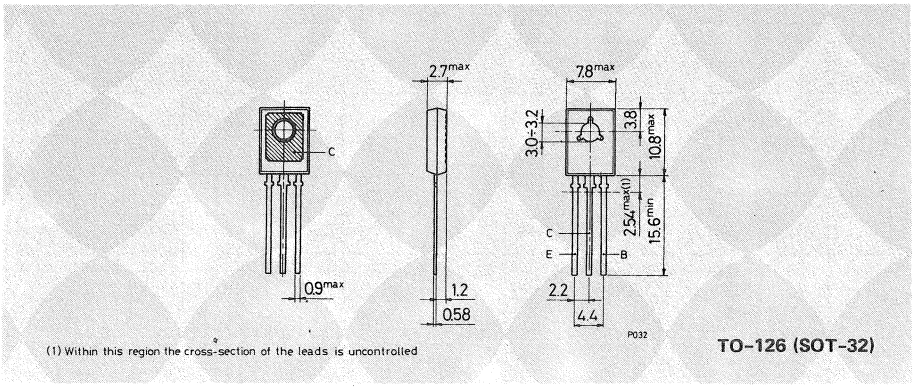
INTERNAL SCHEMATIC DIAGRAMS





MECHANICAL DATA

Dimensions in mm



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

THERMAL DATA

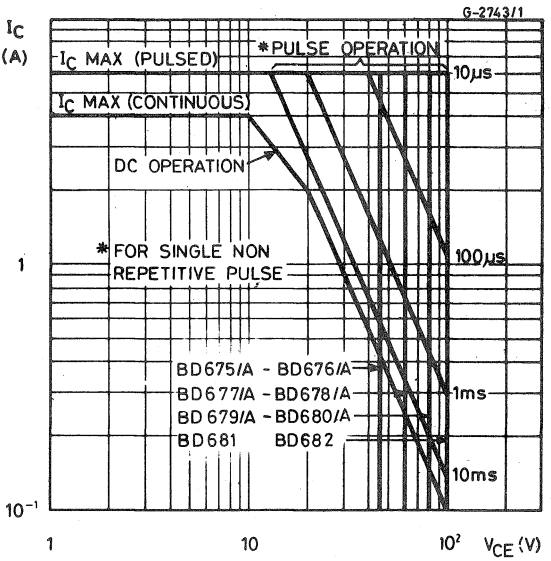
$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max.	3.12	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max.	100	°C/W

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

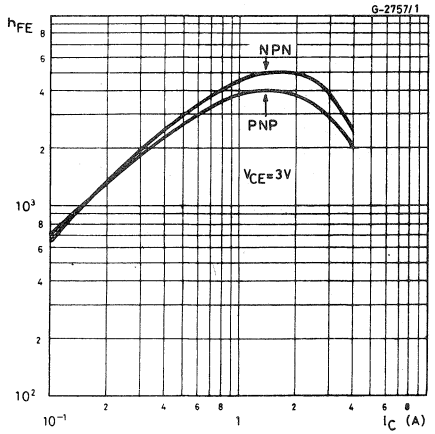
Parameter		Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current ($I_E = 0$)	V_{CB} = rated V_{CBO}			200	μA
		V_{CB} = rated V_{CBO} T_{case} = 100°C			2	mA
I_{CEO}	Collector cutoff current ($I_B = 0$)	V_{CE} = half rated V_{CEO}			500	μA
I_{EBO}	Emitter cutoff current ($I_C = 0$)	V_{EB} = 5V			2	mA
$V_{CEO(sus)}$*	Collector-emitter sustaining voltage ($I_B = 0$)	I_C = 50mA for **BD675/675A**	45			V
		for **BD677/677A**	60			V
		for **BD679/679A**	80			V
		for **BD681**	100			V
$V_{CE(sat)}$*	Collector-emitter saturation voltage	for **BD675/677/679/681** I_C = 1.5A I_B = 30mA			2.5	V
		for **BD675A/677A/679A** I_C = 2A I_B = 40mA			2.8	V
V_{BE}*	Base-emitter voltage	for **BD675/677/679/681** I_C = 1.5A V_{CE} = 3V			2.5	V
		for **BD675A/677A/679A** I_C = 2A V_{CE} = 3V			2.5	V
h_{FE}*	DC current gain	for **BD675/677/679/681** I_C = 1.5A V_{CE} = 3V	750			–
		for **BD675A/677A/679A** I_C = 2A V_{CE} = 3V	750			–
h_{fe}	Small signal current gain	I_C = 1.5A V_{CE} = 3V f = 1MHz	1			–

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

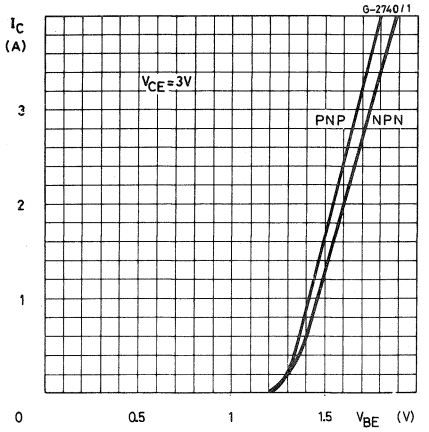
Safe operating areas



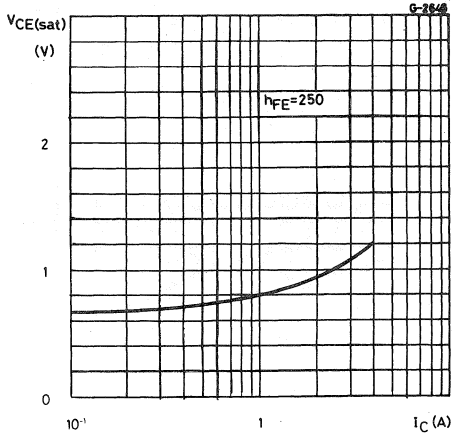
DC current gain



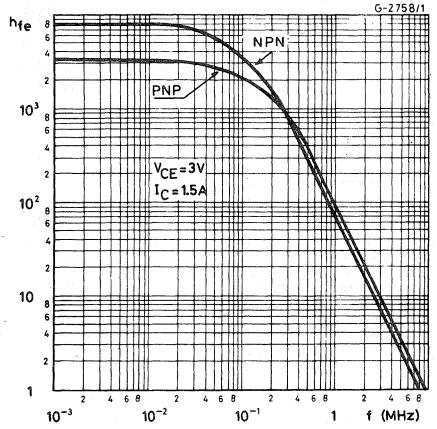
DC transconductance



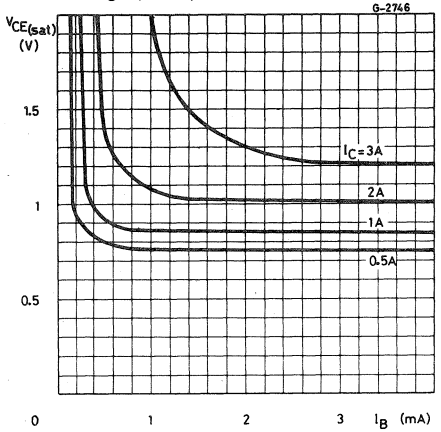
Collector-emitter saturation voltage



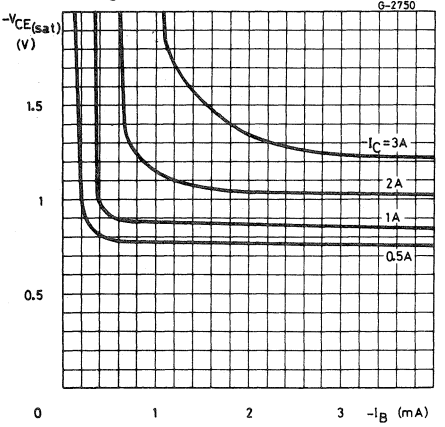
Small signal current gain



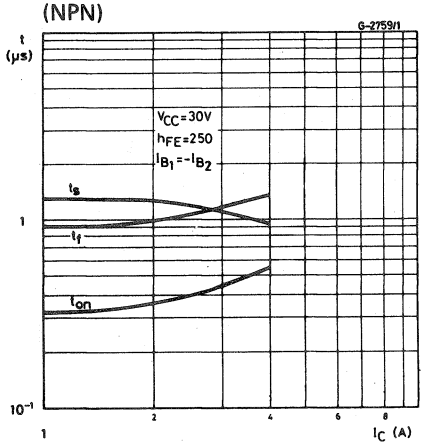
Collector-emitter saturation voltage (NPN)



Collector-emitter saturation voltage (PNP)



Saturated switching characteristics (NPN)



Saturated switching characteristics (PNP)