

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- SGS-THOMSON PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES
- MONOLITHIC DARLINGTON CONFIGURATION
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

APPLICATION

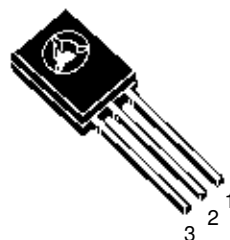
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

DESCRIPTION

The BD677, BD677A, BD679, BD679A and BD681 are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration mounted in Jedec SOT-32 plastic package.

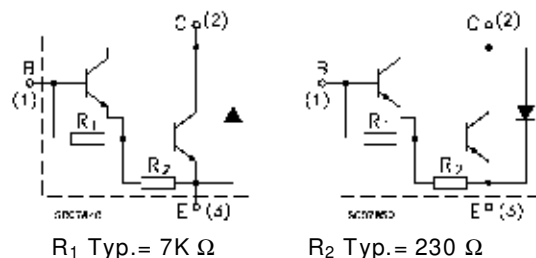
They are intended for use in medium power linear and switching applications

The complementary PNP types are BD678, BD678A, BD680, BD680A and BD682 respectively.



SOT-32

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value				Unit
		NPN	BD677/A	BD679/A	BD681	
		PNP	BD678/A	BD680/A	BD682	
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}	Emitter-Base Voltage (I _C = 0)		5			V
I _C	Collector Current		4			A
I _{CM}	Collector Peak Current		6			A
I _B	Base Current		0.1			A
P _{tot}	Total Dissipation at T _c ≤ 25 °C		40			W
T _{stg}	Storage Temperature		-65 to 150			°C
T _j	Max. Operating Junction Temperature		150			°C

For PNP types voltage and current values are negative.

BD677/677A/678/678A/679/679A/680/680A/681/682

THERMAL DATA

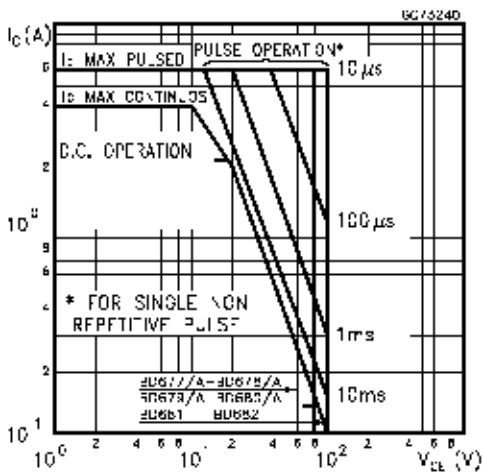
$R_{thj-case}$	Thermal Resistance Junction-case	Max	3.12	$^{\circ}\text{C/W}$
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	100	$^{\circ}\text{C/W}$

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

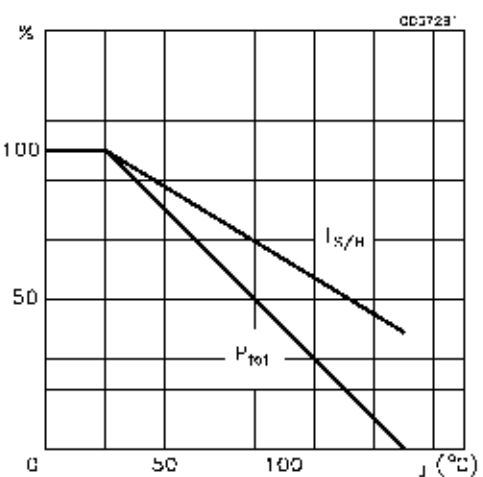
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current ($I_E = 0$)	$V_{CE} = \text{rated } V_{CBO}$ $V_{CE} = \text{rated } V_{CBO} \quad T_C = 100^{\circ}\text{C}$			0.2 2	mA mA
I_{CEO}	Collector Cut-off Current ($I_B = 0$)	$V_{CE} = \text{half rated } V_{CEO}$			0.5	mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5 \text{ V}$			2	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 50 \text{ mA}$ for BD677/677A/678/678A for BD679/679A/680/680A for BD681/682	60 80 100			V V V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	for BD677/678/679/680/681/682 $I_C = 1.5 \text{ A} \quad I_B = 30 \text{ mA}$ for BD677A/678A/679A/680A $I_C = 2 \text{ A} \quad I_B = 40 \text{ mA}$			2.5 2.8	V V
V_{BE*}	Base-Emitter Voltage	for BD677/678/679/680/681/682 $I_C = 1.5 \text{ A} \quad V_{CE} = 3 \text{ V}$ for BD677A/678A/679A/680A $I_C = 2 \text{ A} \quad V_{CE} = 3 \text{ V}$			2.5 2.5	V V
h_{FE*}	DC Current Gain	for BD677/678/679/680/681/682 $I_C = 1.5 \text{ A} \quad V_{CE} = 3 \text{ V}$ for BD677A/678A/679A/680A $I_C = 2 \text{ A} \quad V_{CE} = 3 \text{ V}$	750 750			
h_{fe}	Small Signal Current Gain	$I_C = 1.5 \text{ A} \quad V_{CE} = 3 \text{ V} \quad f = 1 \text{ MHz}$	1			

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

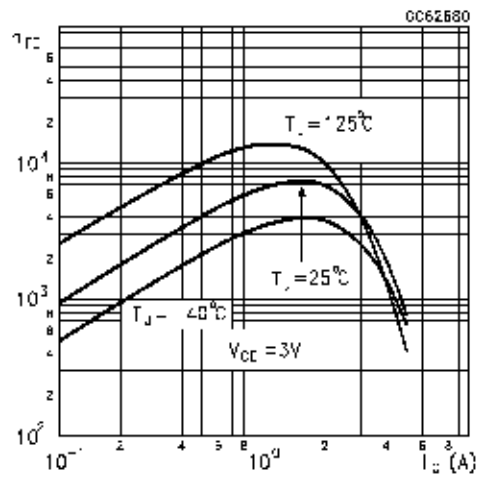
Safe Operating Areas



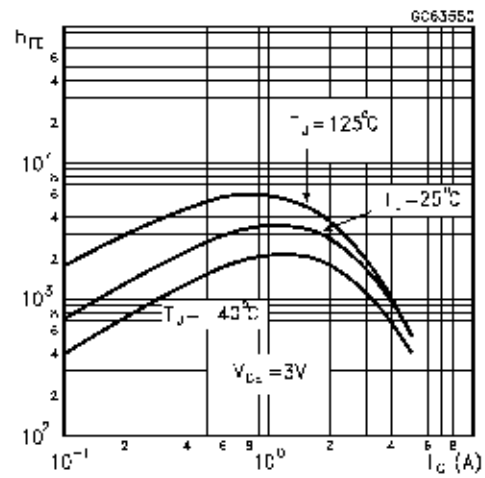
Derating Curve



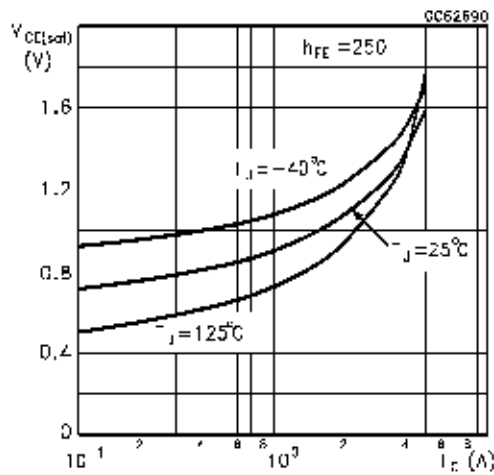
DC Current Gain (NPN type)



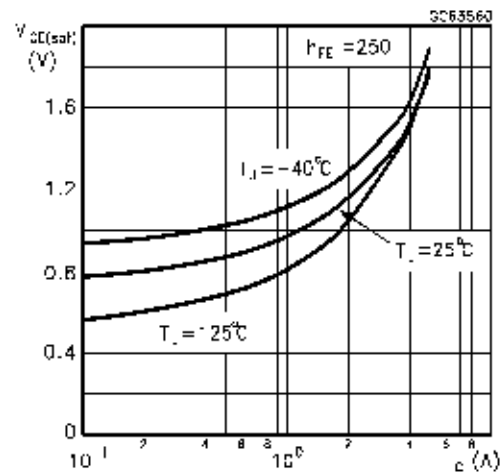
DC Current Gain (PNP type)



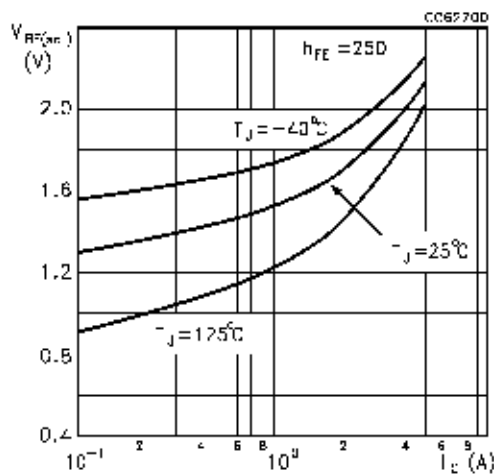
Collector-Emitter Saturation Voltage (NPN type)



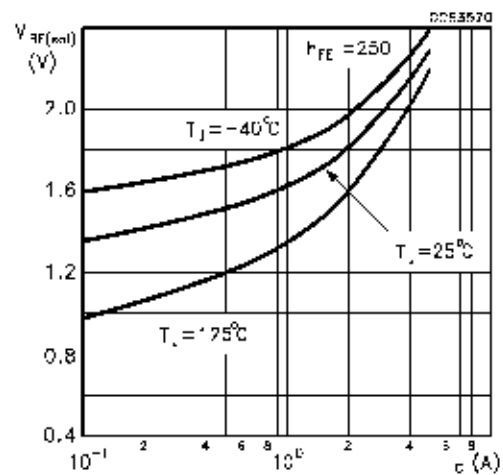
Collector-Emitter Saturation Voltage (PNP type)



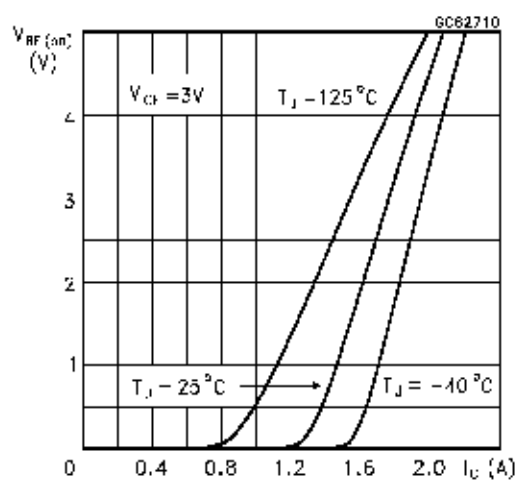
Base-Emitter Saturation Voltage (NPN type)



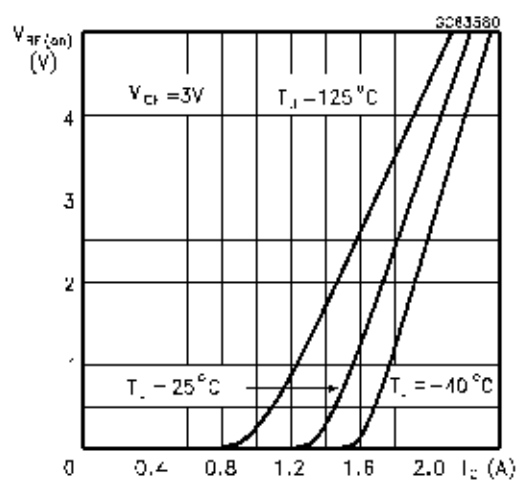
Base-Emitter Saturation Voltage (PNP type)



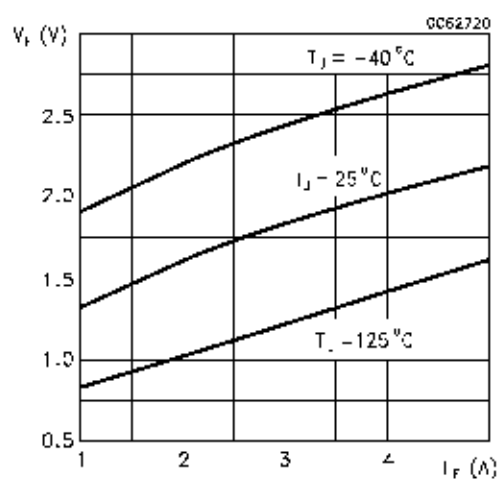
Base-Emitter On Voltage (NPN type)



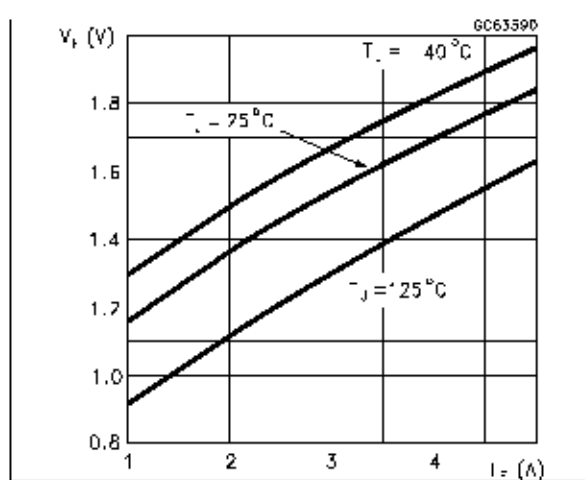
Base-Emitter On Voltage (PNP type)



Freewheel Diode Forward Voltage (NPN types)

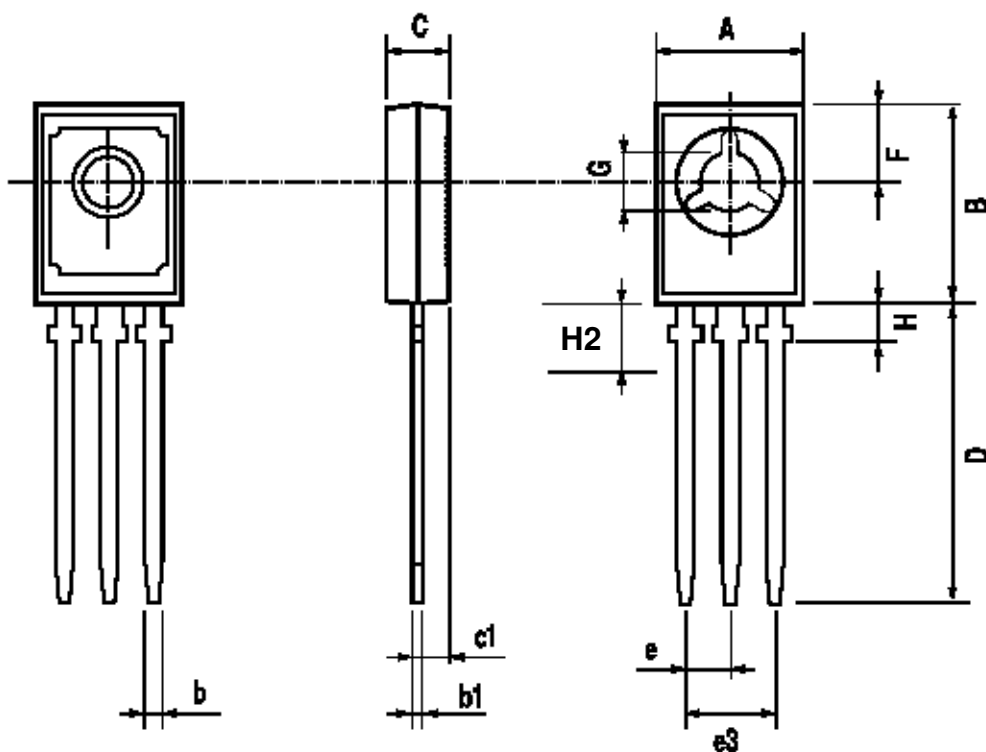


Freewheel Diode Forward Voltage (PNP types)



SOT-32 (TO-126) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.445
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.040		0.106
c1	1.0		1.3	0.039		0.050
D	15.4		16.0	0.606		0.629
e		2.2			0.087	
e3	4.15		4.65	0.163		0.183
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100
H2		2.15			0.084	



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