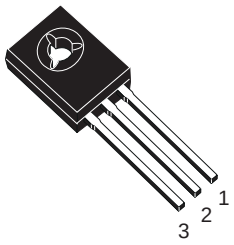
2N6036
2N6039

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- 2N6036 IS A STMicroelectronics PREFERRED SALESTYPE
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

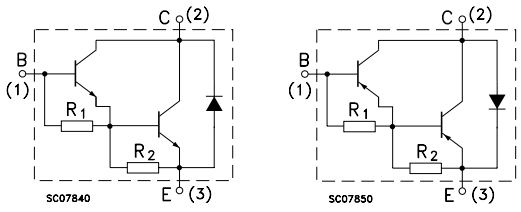
APPLICATIONS
- GENERAL PURPOSE SWITCHING
- GENERAL PURPOSE AMPLIFIER

DESCRIPTION
The 2N6036 and 2N6039 are complementary silicon power Darlington transistors mounted in Jedec SOT-32 plastic package.



SOT-32

INTERNAL SCHEMATIC DIAGRAM



R_1 Typ. = 7 KΩ R_2 Typ. = 230 Ω

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
		PNP	2N6036	
		NPN	2N6039	
V_{CBO}	Collector-Base Voltage (I_E = 0)		80	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		80	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)		5	V
I_C	Collector Current		4	A
I_{CM}	Collector Peak Current		8	A
I_B	Base Current		0.1	A
P_{tot}	Total Dissipation at $T_c \leq 25\ ^oC$		40	W
T_{stg}	Storage Temperature		-65 to 150	^oC
T_j	Max. Operating Junction Temperature		150	^oC

For PNP types voltage and current values are negative.

THERMAL DATA

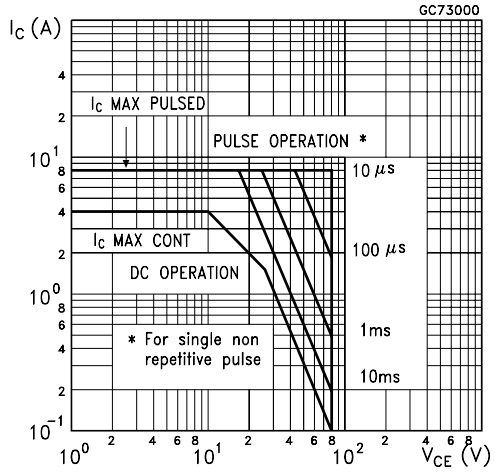
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3.12	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	83.3	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

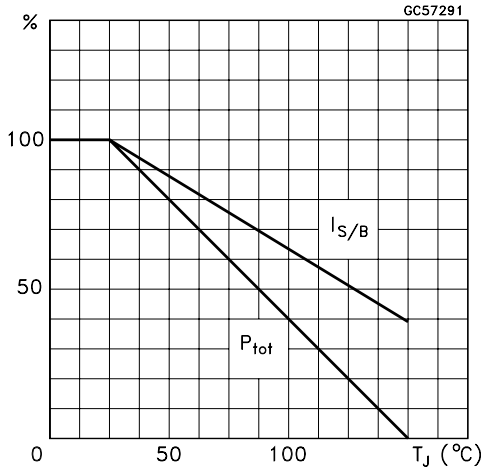
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEX}	Collector Cut-off Current (V_{BE} = -1.5V)	V_{CE} = rated V_{CEO} V_{CE} = rated V_{CEO} T_c = 125 ^oC			0.1 0.5	mA mA
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CE} = rated V_{CBO}			0.1	mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = rated V_{CEO}			0.1	mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			2	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage	I_C = 100 mA	80			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 2 A I_B = 8 mA I_C = 4 A I_B = 40 mA			2 3	V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 4 A I_B = 40 mA			4	V
V_{BE}*	Base-Emitter Voltage	I_C = 2 A V_{CE} = 3 V			2.8	V
h_{FE}*	DC Current Gain	I_C = 0.5 A V_{CE} = 3 V I_C = 2 A V_{CE} = 3 V I_C = 4 A V_{CE} = 3 V	500 750 100		 15000	
h_{fe}	Small Signal Current Gain	I_C = 0.75 A V_{CE} = 10 V f = 1KHz	25			
C_{CBO}	Collector Base Capacitance	I_E = 0 V_{CB} = 10 V f = 1MHz for **NPN types** for **PNP types**			 100 200	 pF pF

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

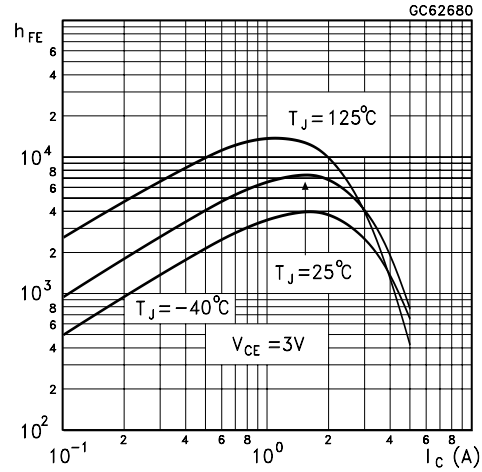
Safe Operating Area



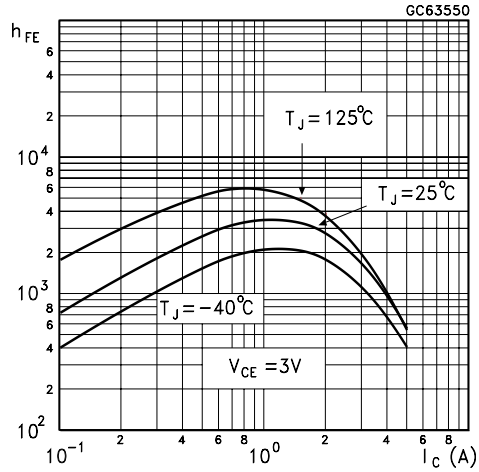
Derating Curve



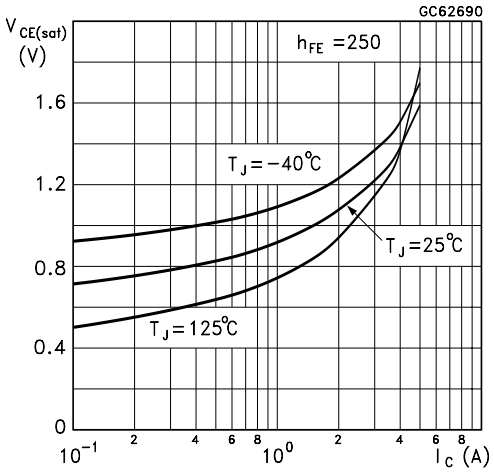
DC Current Gain (NPN type)



DC Current Gain (PNP type)



Collector Emitter Saturation Voltage (NPN type)



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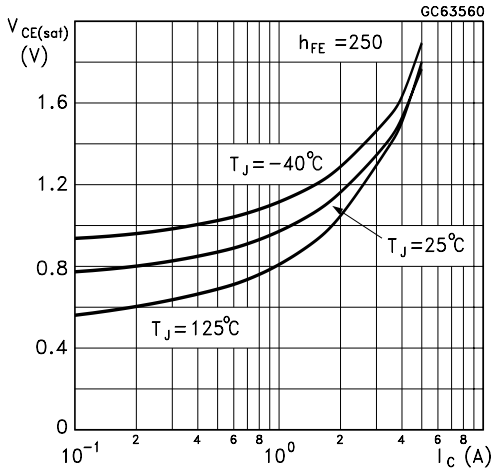
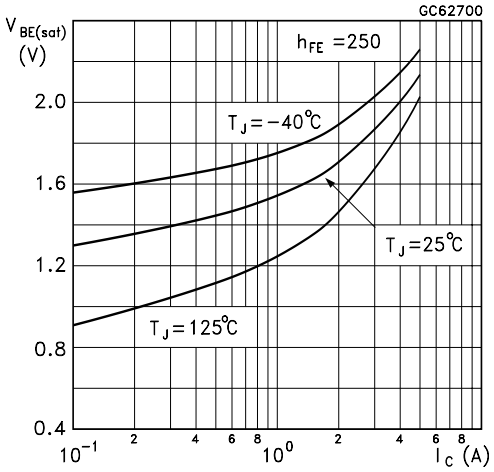


Base Emitter Saturation Voltage (NPN type)



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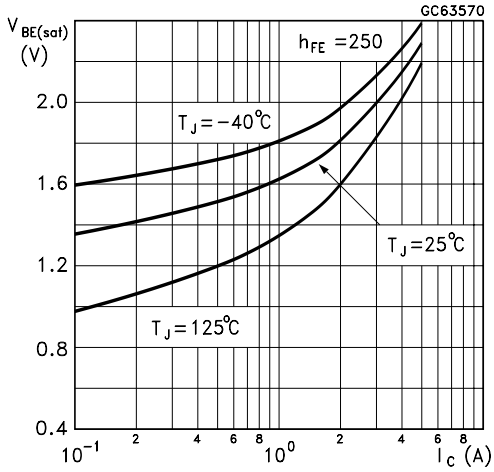
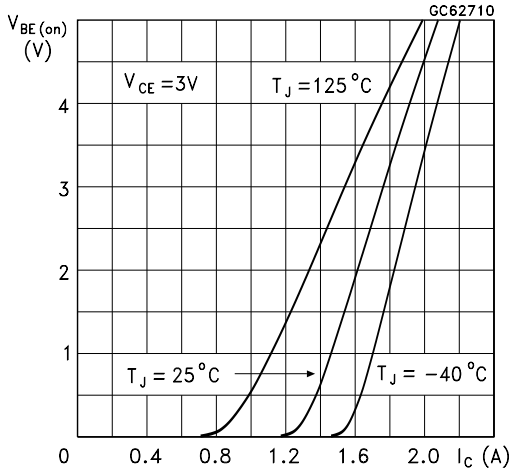


Base-Emitter On Voltage (NPN type)



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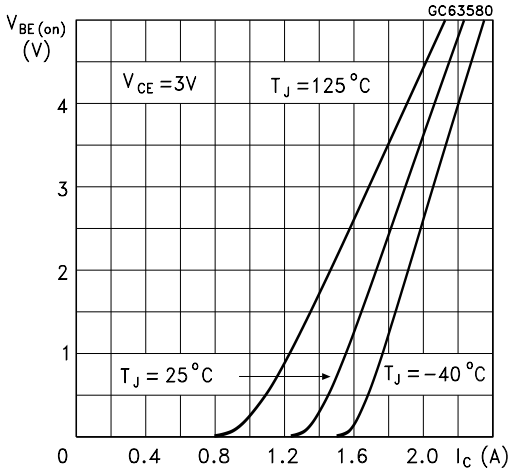
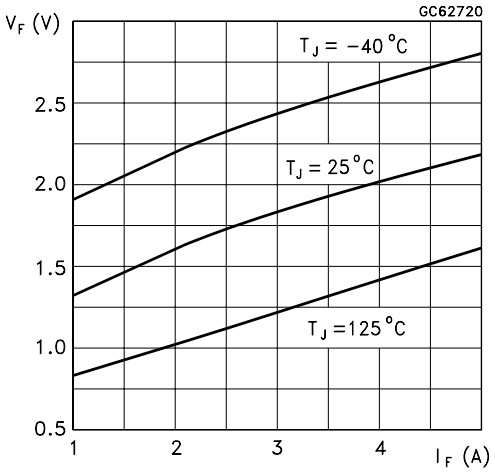


Freewheel Diode Forward Voltage (NPN type)



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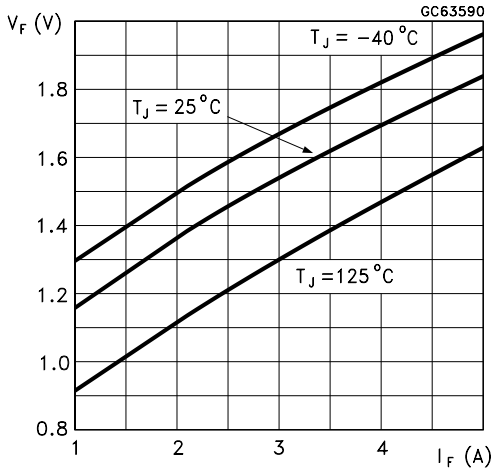

SOT-32 (TO-126) MECHANICAL DATA

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