SGS-THOMSON MICROELECTRONICS

SGSD100
SGSD200

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- SGS-THOMSON PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES
- MONOLITHIC DARLINGTON CONFIGURATION

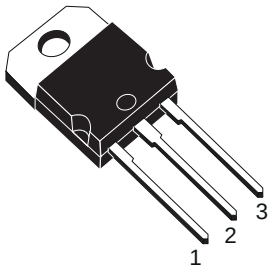
APPLICATIONS:
- GENERAL PURPOSE SWITCHING APPLICATION
- GENERAL PURPOSE AMPLIFIERS

DESCRIPTION

The SGSD100 is silicon epitaxial-base NPN power transistor in monolithic Darlington configuration mounted in TO-218 plastic package.

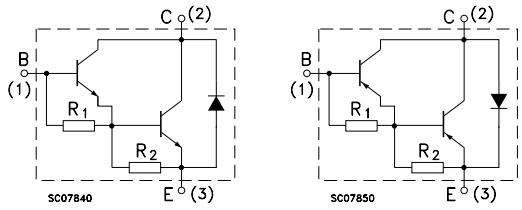
It is inteded for use in general purpose and high current amplifier applications.

The complementary PNP type is the SGSD200.



TO-218

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
		NPN	SGSD100	
		PNP	SGSD200	
V_{CBO}	Collector-Base Voltage (I_E = 0)		80	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		80	V
I_C	Collector Current		25	A
I_{CM}	Collector Peak Current		40	A
I_B	Base Current		6	A
I_{BM}	Base Peak Current		10	A
P_{tot}	Total Dissipation at $T_c \leq 25\ ^oC$		130	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

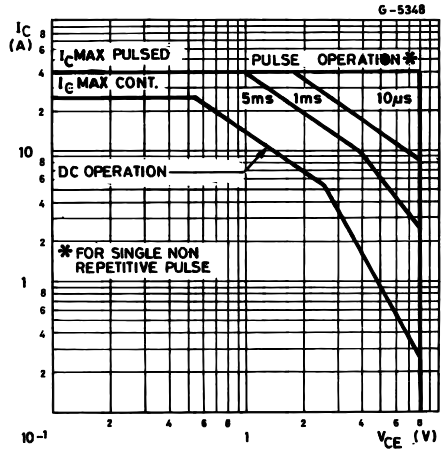
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	0.96	$^oC/W$

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

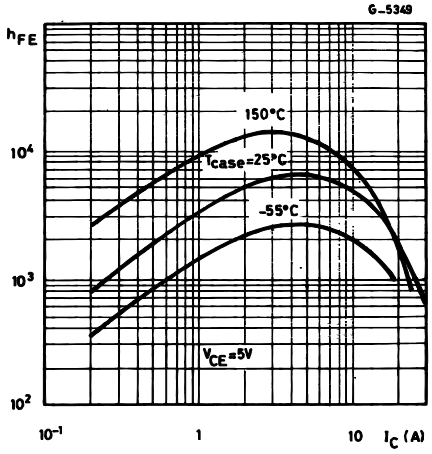
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CE} = 80 V V_{CE} = 80 V T_c = 100 ^oC			0.5 1.5	mA mA
I_{CEV}	Collector Cut-off Current (V_{BE} = -0.3V)	V_{CE} = 80 V V_{CE} = 80 V T_c = 100 ^oC			0.1 2	mA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 60 V V_{CE} = 60 V T_c = 100 ^oC			0.5 1.5	mA 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 = 50 mA	80			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 5 A I_B = 20 mA I_C = 5 A I_B = 20 mA T_c = 100 ^oC I_C = 10 A I_B = 40 mA I_C = 10 A I_B = 40 mA T_c = 100 ^oC I_C = 20 A I_B = 80 mA I_C = 20 A I_B = 80 mA T_c = 100 ^oC		0.95 0.8 1.2 1.3 2 2.3	1.2 1.75 3.5 	V V V V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 20 A I_B = 80 mA I_C = 20 A I_B = 80 mA T_c = 100 ^oC		2.6 2.5	3.3 	V V
V_{BE}*	Base-Emitter Voltage	I_C = 10 A V_{CE} = 3 V I_C = 10 A V_{CE} = 3 V T_c = 100 ^oC	1	1.8 1.6	3 	V V
h_{FE}*	DC Current Gain	I_C = 5 A V_{CE} = 3 V I_C = 5 A V_{CE} = 3 V T_c = 100 ^oC I_C = 10 A V_{CE} = 3 V I_C = 10 A V_{CE} = 3 V T_c = 100 ^oC I_C = 20 A V_{CE} = 3 V I_C = 20 A V_{CE} = 3 V T_c = 100 ^oC	600 500 300 	5000 8000 4000 8000 2000 2000	15000 12000 6000 	
V_F*	Diode Forward Voltage	I_F = 5 A I_F = 5 A T_c = 100 ^oC I_F = 10 A I_F = 10 A T_c = 100 ^oC I_F = 20 A I_F = 20 A T_c = 100 ^oC		1.2 0.85 1.6 1.4 2.3 1.3		V V V V V V
$E_{s/b}$	Second Breakdown Energy	V_{CC} = 30 V L = 3 mH V_{CC} = 30 V L = 3 mH T_c = 100 ^oC	250 250			mJ mJ
$I_{s/b}$	Second Breakdown Current	V_{CE} = 25 V t = 500 ms	6			A

* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
For PNP type voltage and current values are negative.

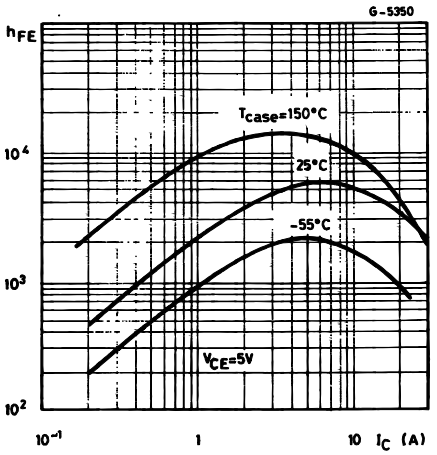
Safe Operating Areas



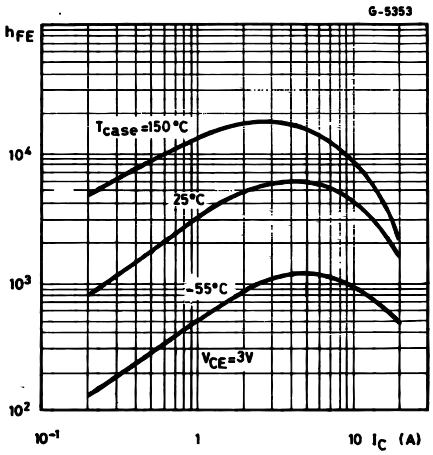
DC Current Gain (NPN type)



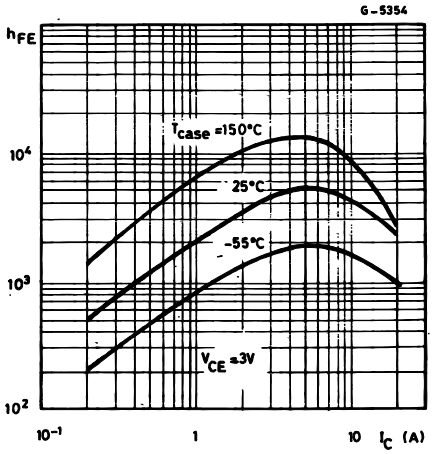
DC Current Gain (PNP type)



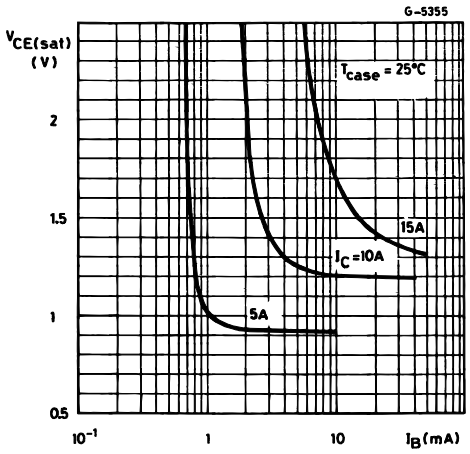
DC Current Gain (NPN type)



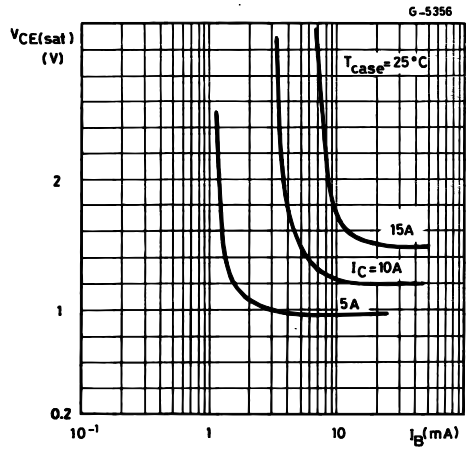
DC Current Gain (PNP type)



Collector-Emitter Saturation Voltage (NPN type)



Collector-Emitter Saturation Voltage (PNP type)



TO-218 (SOT-93) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	–		16.2	–		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	–		12.2	–		0.480
Ø	4		4.1	0.157		0.161