

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

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

**APPLICATIONS:**

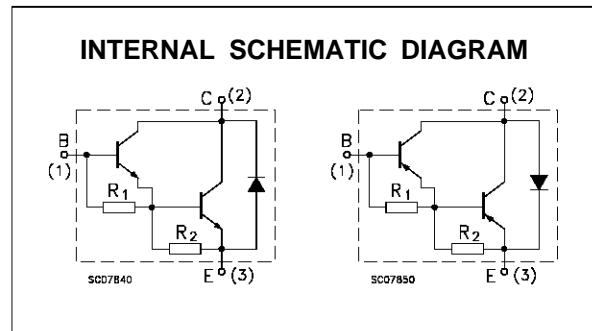
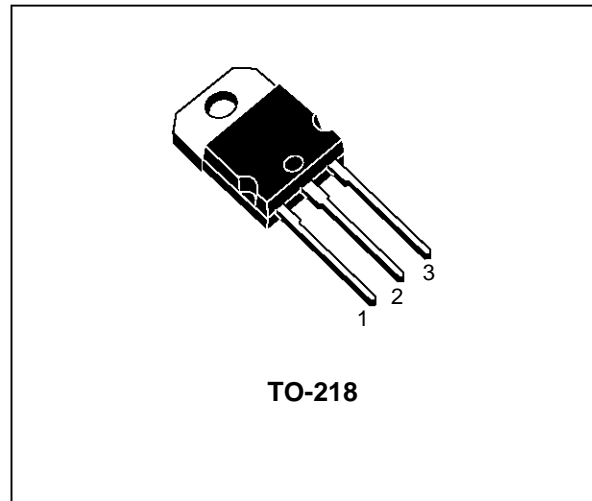
- GENERAL PURPOSE SWITCHING APPLICATION
- GENERAL PURPOSE AMPLIFIERS

**DESCRIPTION**

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

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

The complementary PNP type is the SGSD200.



**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 $T_c \leq 25^\circ C$		130	W
$T_{stg}$	Storage Temperature		-65 to 150	$^\circ C$
$T_j$	Max. Operating Junction Temperature		150	$^\circ C$

For PNP types voltage and current values are negative.

# SGSD100/SGSD200

## THERMAL DATA

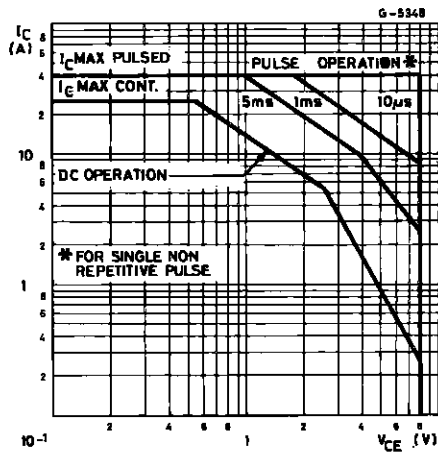
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	0.96	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

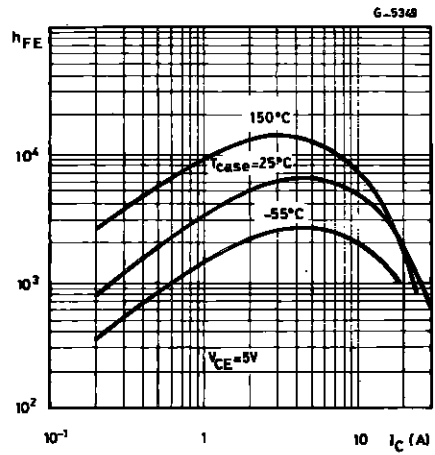
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CE</sub> = 80 V			0.5	mA
		V <sub>CE</sub> = 80 V T <sub>c</sub> = 100 °C			1.5	mA
I <sub>CEV</sub>	Collector Cut-off Current (V <sub>BE</sub> = -0.3V)	V <sub>CE</sub> = 80 V			0.1	mA
		V <sub>CE</sub> = 80 V T <sub>c</sub> = 100 °C			2	mA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = 60 V			0.5	mA
		V <sub>CE</sub> = 60 V T <sub>c</sub> = 100 °C			1.5	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			2	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 50 mA	80			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 5 A I <sub>B</sub> = 20 mA		0.95	1.2	V
		I <sub>C</sub> = 5 A I <sub>B</sub> = 20 mA T <sub>c</sub> = 100 °C		0.8		V
		I <sub>C</sub> = 10 A I <sub>B</sub> = 40 mA		1.2	1.75	V
		I <sub>C</sub> = 10 A I <sub>B</sub> = 40 mA T <sub>c</sub> = 100 °C		1.3		V
		I <sub>C</sub> = 20 A I <sub>B</sub> = 80 mA		2	3.5	V
		I <sub>C</sub> = 20 A I <sub>B</sub> = 80 mA T <sub>c</sub> = 100 °C		2.3		V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 20 A I <sub>B</sub> = 80 mA		2.6	3.3	V
		I <sub>C</sub> = 20 A I <sub>B</sub> = 80 mA T <sub>c</sub> = 100 °C		2.5		V
V <sub>BE*</sub>	Base-Emitter Voltage	I <sub>C</sub> = 10 A V <sub>CE</sub> = 3 V	1	1.8	3	V
		I <sub>C</sub> = 10 A V <sub>CE</sub> = 3 V T <sub>c</sub> = 100 °C		1.6		V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 5 A V <sub>CE</sub> = 3 V	600	5000	15000	
		I <sub>C</sub> = 5 A V <sub>CE</sub> = 3 V T <sub>c</sub> = 100 °C		8000		
		I <sub>C</sub> = 10 A V <sub>CE</sub> = 3 V	500	4000	12000	
		I <sub>C</sub> = 10 A V <sub>CE</sub> = 3 V T <sub>c</sub> = 100 °C		8000		
		I <sub>C</sub> = 20 A V <sub>CE</sub> = 3 V	300	2000	6000	
		I <sub>C</sub> = 20 A V <sub>CE</sub> = 3 V T <sub>c</sub> = 100 °C		2000		
V <sub>F*</sub>	Diode Forward Voltage	I <sub>F</sub> = 5 A		1.2		V
		I <sub>F</sub> = 5 A T <sub>c</sub> = 100 °C		0.85		V
		I <sub>F</sub> = 10 A		1.6		V
		I <sub>F</sub> = 10 A T <sub>c</sub> = 100 °C		1.4		V
		I <sub>F</sub> = 20 A		2.3		V
		I <sub>F</sub> = 20 A T <sub>c</sub> = 100 °C		1.3		V
E <sub>s/b</sub>	Second Breakdown Energy	V <sub>CC</sub> = 30 V L = 3 mH	250			mJ
		V <sub>CC</sub> = 30 V L = 3 mH T <sub>c</sub> = 100 °C	250			mJ
I <sub>s/b</sub>	Second Breakdown Current	V <sub>CE</sub> = 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.

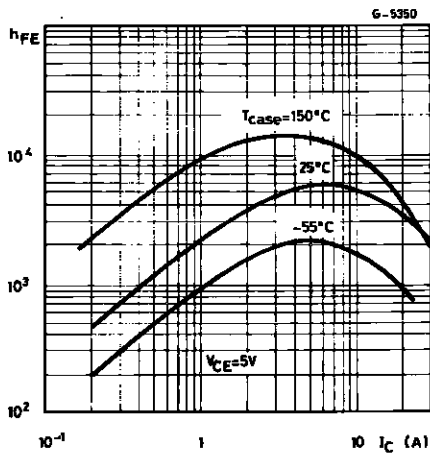
Safe Operating Areas



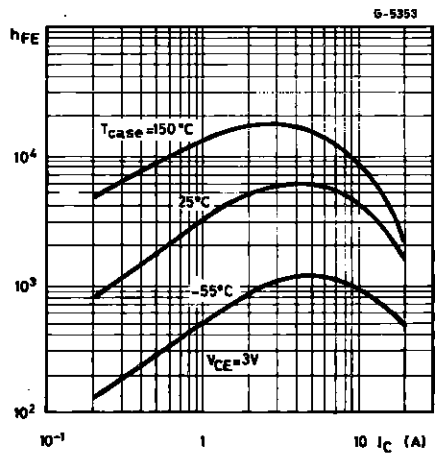
DC Current Gain (NPN type)



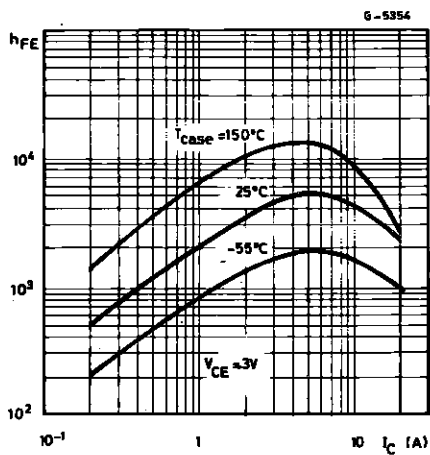
DC Current Gain (PNP type)



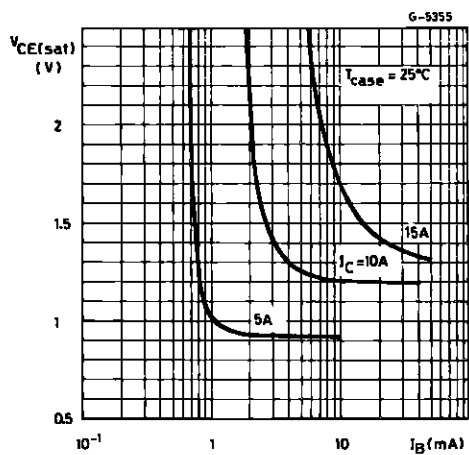
DC Current Gain (NPN type)



DC Current Gain (PNP type)



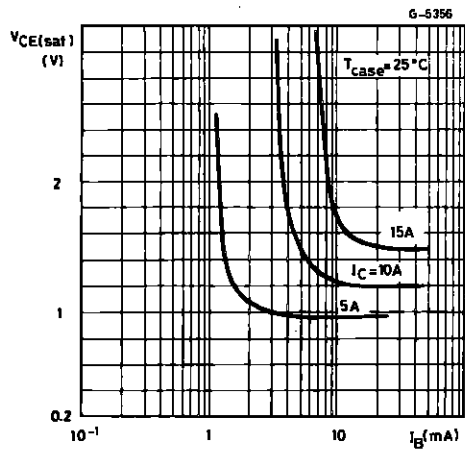
Collector-Emitter Saturation Voltage (NPN type)



# SGSD100/SGSD200

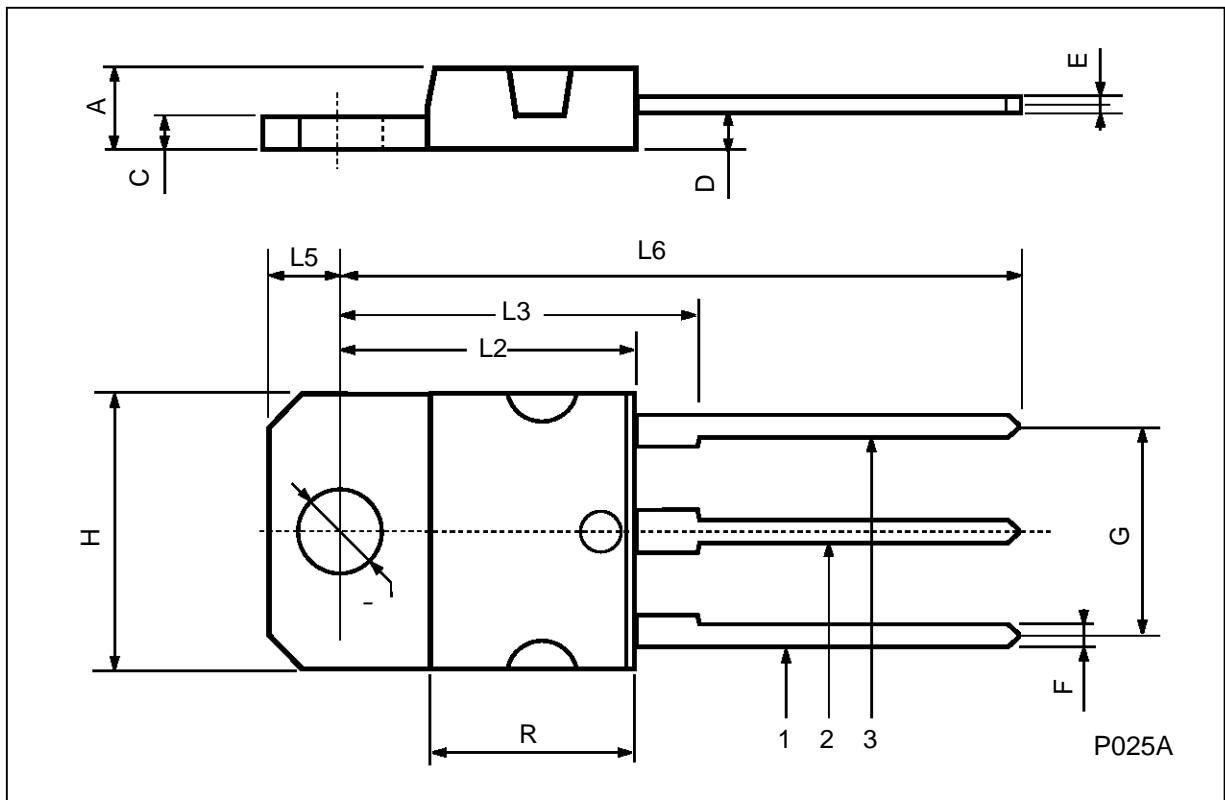
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Collector-Emitter Saturation Voltage (PNP type)



**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



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