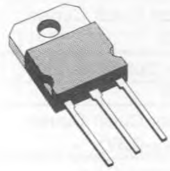
SGS-THOMSON MICROELECTRONICS

SGSD100
SGSD200

HIGH CURRENT DARLINGTONS

DESCRIPTION

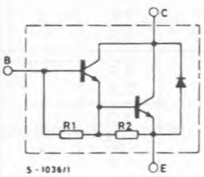
The SGSD100 is a silicon epitaxial-base NPN transistors in TO-218 plastic package, intended for use in general purpose high current amplifier applications. The complementary PNP type is the SGSD200.



TO-218

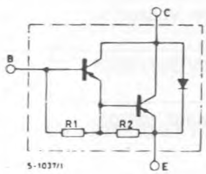
INTERNAL SCHEMATIC DIAGRAM

NPN



$R1 \equiv 8K\Omega$
$R2 \equiv 90\Omega$

PNP



$R1 \equiv 5K\Omega$
$R2 \equiv 50\Omega$

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-emitter Voltage	80	V
V_{CBO}	Collector-base Voltage	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
V_{EBO}	Emitter Base-voltage	10	V
P_{tot}	Total Power Dissipation	130	W
T_j	Junction Temperature	150	°C

For PNP types voltage and current values are negative.

THERMAL DATA

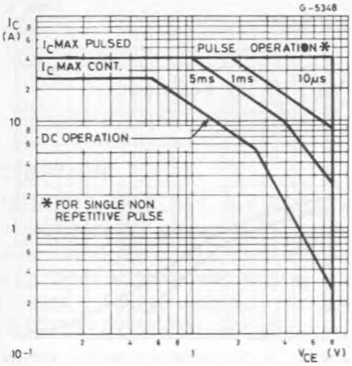
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	0.96	°C/W

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

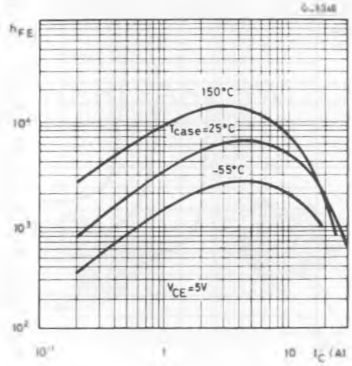
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 50mA		80			V
I_{CEO}	Collector Cutoff Current (I_B = 0)	V_{CE} = 60V T_j = 100°C				500 1.5	µA mA
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CE} = 80V T_j = 100°C				500 1.5	µA mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5V				2	mA
I_{CEV}	Collector Cutoff Current (V_{BE} = – 0.3V)	V_{CE} = 80V T_j = 100°C				100 2	µA mA
h_{FE}*	DC Current Gain	I_C = 5A T_j = 100°C I_C = 10A T_j = 100°C I_C = 20A T_j = 100°C	V_{CE} = 3V V_{CE} = 3V V_{CE} = 3V	600 500 300	5K 8K 4K 8K 2K 2K	15K 10K 5K	
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 5A T_j = 100°C I_C = 10A T_j = 100°C I_C = 20A T_j = 100°C	I_B = 20mA I_B = 40mA I_B = 80mA		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}*	Base-emitter Voltage	I_C = 10A T_j = 100°C	V_{CE} = 3V	1	1.8 1.6	3	V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 20A T_j = 100°C	I_B = 80mA		2.6 2.5	3.3	V V
V_F	Diode Forward Voltage	I_F = 5A T_j = 100°C I_F = 10A T_j = 100°C I_F = 20A T_j = 100°C			1.2 0.85 1.6 1.4 2.3 1.3		V V V V V V
$E_{s/b}$	Second Breakdown Energy	L = 3mH V_{CC} = 30V T_j = 100°C		250 250			mJ mJ
$I_{s/b}$	Second Breakdown Collector Current	V_{CE} = 25V	t = 500ms	6			A

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

Safe Operating Areas.



DC Current Gain (NPN type).



DC Current Gain (PNP type).

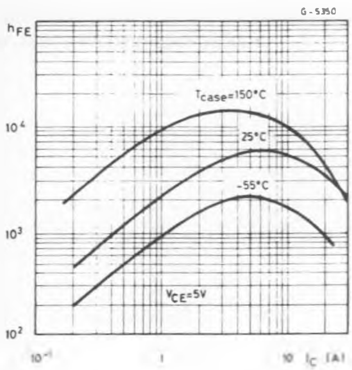
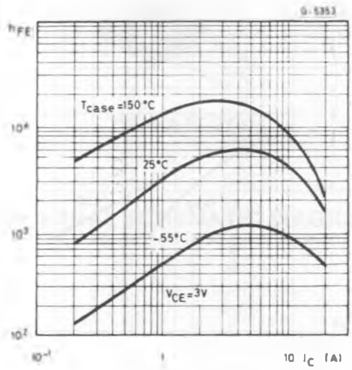


Figure 4 : DC Current Gain (NPN type).



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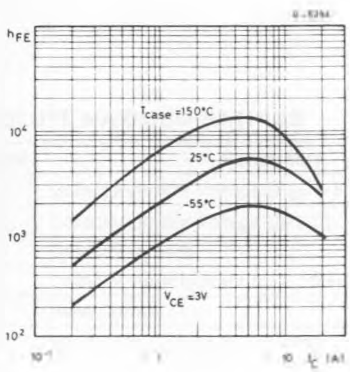
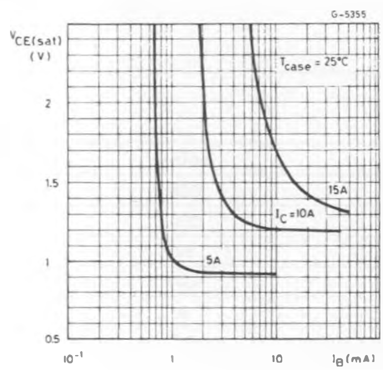


Collector-emitter Saturation Voltage (NPN type).



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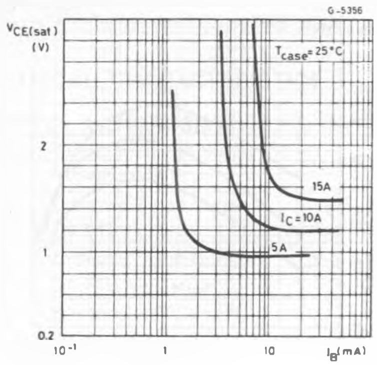
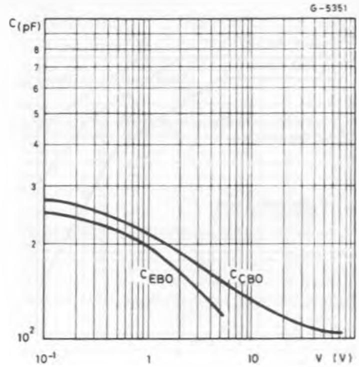


Capacitances (NPN type).



Capacitances (PNP type).