

SGSD100 SGSD200

Complementary power Darlington transistors

Features

- Complementary NPN PNP transistors
- Monolithic Darlington configuration

Applications

- Audio power amplifier
- DC-AC converter
- Easy driver for low voltage DC motor
- General purpose switching applications

Description

The SGSD100 is an epitaxial-base NPN power transistor in monolithic Darlington configuration mounted in TO-247 plastic package. It is inteded for use in general purpose and high current amplifier applications. The complementary PNP type is the SGSD200.

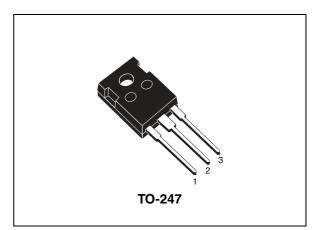


Figure 1. Internal schematic diagrams

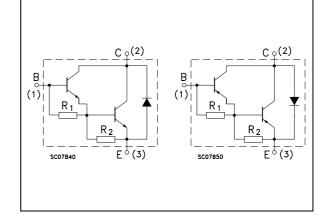


Table 1.Device summary

Order code	Marking	Package	Packaging
SGSD100	SGSD100	TO-247	Tube
SGSD200	SGSD200	10-247	Tube

1 Absolute maximun rating

Table 2.	Absolute maximum rating
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Symbol	Parameter		Value	Unit	
		NPN	SGSD100		
		PNP	SGSD200		
V _{CBO}	Collector-emitter voltage (I _E = 0)	Collector-emitter voltage (I _E = 0)			
V _{CEO}	Collector-emitter voltage (I _B = 0)		80	V	
۱ _C	Collector current		25	А	
I _{CM}	Collector peak current (t _P < 5ms)		40	А	
Ι _Β	Base current		6	А	
I _{BM}	Base peak current (t _P < 5ms)		10	А	
P _{TOT}	Total dissipation at $T_c \le 25^{\circ}C$		130	W	
T _{stg}	Storage temperature		-65 to 150	°C	
Т _Ј	Max. operating junction temperature		150	°C	

Note: For PNP type voltage and current values are negative

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R _{thj-case}	Thermal resistance junction-case max	0.96	°C/W

2 Electrical characteristics

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

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current (I _E = 0)	$V_{CE} = 80 V$ $V_{CE} = 80 V$ $T_{C} = 100 {}^{o}C$			0.5 1.5	mA mA
I _{CEV}	Collector cut-off current (V _{BE} = -0.3V)	$V_{CE} = 80 V$ $V_{CE} = 80 V$ $T_{C} = 100 \text{ °C}$			0.1 2	mA mA
I _{CEO}	Collector cut-off current (I _B = 0)	$V_{CE} = 60 V$ $V_{CE} = 60 V$ $T_{C} = 100 {}^{o}C$			0.5 1.5	mA mA
I _{EBO}	Emitter cut-off current (I _C = 0)	V _{EB} = 5 V			2	mA
V _{CEO(sus)} ⁽¹⁾	Collector-emitter sustaining voltage (I _B = 0)	I _C = 50 mA	80			V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	$\begin{split} I_{C} &= 5 \text{ A} & I_{B} &= 20 \text{ mA} \\ I_{C} &= 5 \text{ A} & I_{B} &= 20 \text{ mA} & T_{C} &= 100 ^{\circ}\text{C} \\ I_{C} &= 10 \text{ A} & I_{B} &= 40 \text{ mA} \\ I_{C} &= 10 \text{ A} & I_{B} &= 40 \text{ mA} & T_{C} &= 100 ^{\circ}\text{C} \\ I_{C} &= 20 \text{ A} & I_{B} &= 80 \text{ mA} \\ I_{C} &= 20 \text{ A} & I_{B} &= 80 \text{ mA} & T_{C} &= 100 ^{\circ}\text{C} \end{split}$		0.95 0.8 1.2 1.3 2 2.3	1.2 1.75 3.5	V V V V V
V _{BE(sat)} ⁽¹⁾	Base-emitter saturation voltage	$I_{C} = 20 \text{ A}$ $I_{B} = 80 \text{ mA}$ $I_{C} = 20 \text{ A}$ $I_{B} = 80 \text{ mA}$ $T_{C} = 100 ^{\circ}\text{C}$		2.6 2.5	3.3	V V
V _{BE} ⁽¹⁾	Base-emitter voltage	$I_{C} = 10 \text{ A}$ $V_{CE} = 3 \text{ V}$ $I_{C} = 10 \text{ A}$ $V_{CE} = 3 \text{ V}$ $T_{C} = 100 ^{\circ}\text{C}$	1	1.8 1.6	3	V V
h _{FE} ⁽¹⁾	DC current gain	$\begin{split} & I_{C} = 5 \text{ A} \qquad V_{CE} = 3 \text{ V} \\ & I_{C} = 5 \text{ A} \qquad V_{CE} = 3 \text{ V} \qquad T_{C} = 100 ^{\circ}\text{C} \\ & I_{C} = 10 \text{ A} \qquad V_{CE} = 3 \text{ V} \qquad \\ & I_{C} = 10 \text{ A} \qquad V_{CE} = 3 \text{ V} \qquad T_{C} = 100 ^{\circ}\text{C} \\ & I_{C} = 20 \text{ A} \qquad V_{CE} = 3 \text{ V} \qquad \\ & I_{C} = 20 \text{ A} \qquad V_{CE} = 3 \text{ V} \qquad T_{C} = 100 ^{\circ}\text{C} \end{split}$	600 500 300	5000 8000 4000 8000 2000 2000	15000 12000 6000	
V _F ⁽¹⁾	Diode forward voltage	$\begin{split} I_F &= 5 \text{ A} \\ I_F &= 5 \text{ A} \\ I_F &= 10 \text{ A} \\ I_F &= 10 \text{ A} \\ I_F &= 10 \text{ A} \\ T_C &= 100 ^{\circ}\text{C} \\ I_F &= 20 \text{ A} \\ I_F &= 20 \text{ A} \\ T_C &= 100 ^{\circ}\text{C} \end{split}$		1.2 0.85 1.6 1.4 2.3 1.3		V V V V V

Table 4. Electrical characteristics



Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
E _{s/b}		V _{CC} = 30 V L = 3 mH	250			mJ
E _{s/b} Second breakdown energy	$V_{CC} = 30 V L = 3 mH T_{C} = 100 °C$	250			mJ	
I _{s/b}	Second breakdown current	V _{CE} = 25 V t = 500 ms	6			А

1. Pulsed : Pulse duration = 300 μ s, duty cycle \leq 1.5%

Note: For PNP type voltage and current values are negative



2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

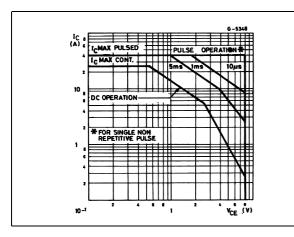
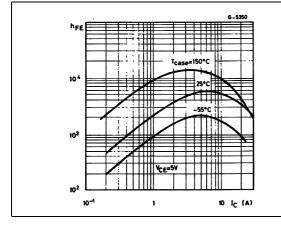


Figure 4. DC current gain (PNP type)





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Figure 7. Collector-emitter saturation voltage (NPN type)

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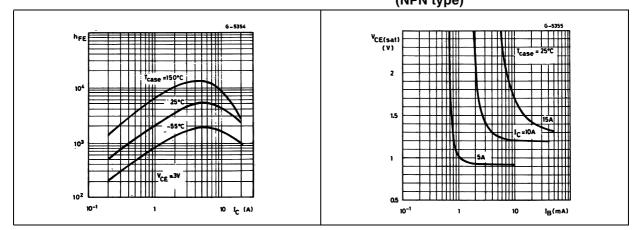
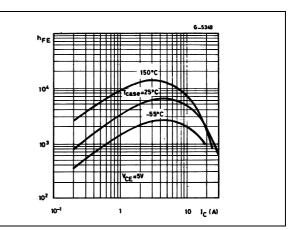


Figure 3. DC current gain (NPN type)



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10 I_C (A)



hre

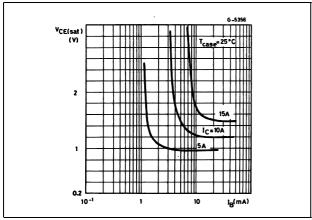
104

103

10²

10*

Figure 8. Base-emitter saturation voltage (PNP type)



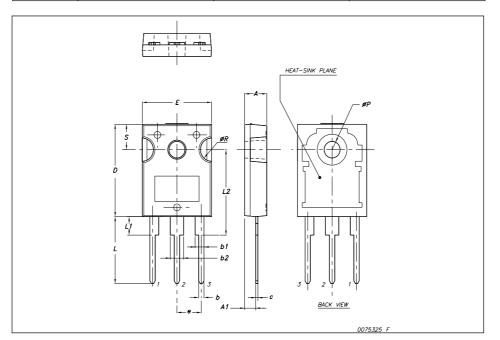


3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com



	TO-247 Mechanical data				
Dim.	mm				
	Min.	Тур	Max.		
А	4.85		5.15		
A1	2.20		2.60		
b	1.0		1.40		
b1	2.0		2.40		
b2	3.0		3.40		
С	0.40		0.80		
D	19.85		20.15		
E	15.45		15.75		
е		5.45			
L	14.20		14.80		
L1	3.70		4.30		
L2		18.50			
øР	3.55		3.65		
øR	4.50		5.50		
S		5.50			





4 Revision history

 Table 5.
 Document revision history

Date	Revision	Changes
11-Oct-2003	3	
24-Jan-2007	4	Package change from TO-218 to TO-247.



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