

High power NPN epitaxial planar bipolar transistor

Features

- High breakdown voltage V_{CEO} > 230V
- Complementary to 2STA1943
- Fast-switching speed
- Typical f_T = 30 MHz

Application

■ Audio power amplifier

Description

This device is a NPN transistor manufactured using new BiT-LA (Bipolar Transistor for linear amplifier) technology. The resulting transistor shows good gain linearity behaviour.

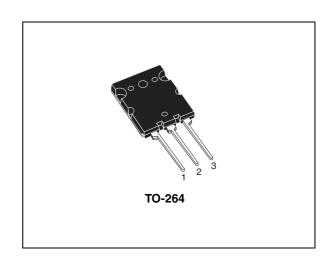


Figure 1. Internal schematic diagram

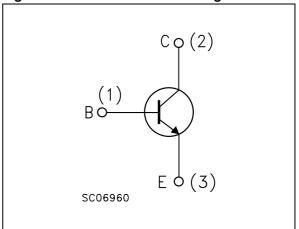


Table 1. Device summary

Order code	Marking	Package	Packaging
2STC5200	2STC5200	TO-264	Tube

Electrical ratings 2STC5200

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage (I _E = 0)	230	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	230	V
V _{EBO}	Emitter-base voltage (I _C = 0)	5	V
I _C	Collector current	15	Α
I _{CM}	Collector peak current	30	Α
P _{tot}	Total dissipation at T _C = 25°C	150	W
T _{stg}	Storage temperature	-55 to 150	°C
TJ	Operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R _{thJ-case}	Thermal resistance junction-case Max	0.83	°C/W

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current (I _E = 0)	V _{CB} = 230 V			5	μΑ
I _{EBO}	Emitter cut-off current (I _C = 0)	V _{EB} = 5 V			5	μA
V _{(BR)CEO} ⁽¹⁾	Collector-emitter breakdown voltage (I _B = 0)	I _C = 50 mA	230			V
V _{(BR)CBO}	Collector-base breakdown voltage (I _E = 0)	Ι _C = 100 μΑ	230			V
V _{(BR)EBO} ⁽¹⁾	Emitter-base breakdown voltage ($I_C = 0$)	I _E = 1 mA	5			V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	$I_C = 8 A$ $I_B = 800 \text{ mA}$			3	V
V _{BE}	Base-emitter voltage	$I_C = 7 \text{ A}$ $V_{CE} = 5 \text{ V}$			1.5	V
h _{FE}	DC current gain	$I_C = 1 \text{ A}$ $V_{CE} = 5 \text{ V}$ $I_C = 7 \text{ A}$ $V_{CE} = 5 \text{ V}$	80 35		160	
	Resistive load					
t _{on}	Turn-on time	$V_{CC} = 60 \text{ V} I_C = 5A$		0.24		μs
t _s	Storage time	$I_{B1} = -I_{B2} = 0.5 \text{ A}$		4.7		μs
t _f	Fall time			0.6		μs
f _T	Transition frequency	I _C = 1 A V _{CE} = 5 V		30		MHz
C _{CBO}	Collector-base capacitance (I _E = 0)	V _{CB} = 10 V f = 1 MHz		150		pF

^{1.} Pulsed: pulse duration = 300 μ s, duty cycle \leq 1.5%

577

Electrical characteristics 2STC5200

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

Figure 3. Derating curve

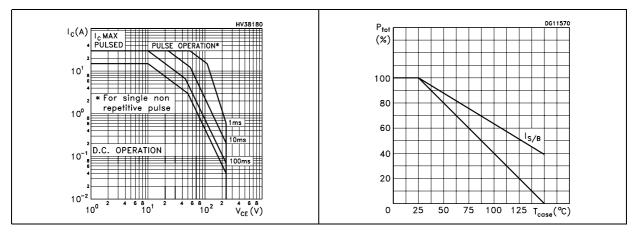


Figure 4. Output characteristics

Figure 5. DC current gain

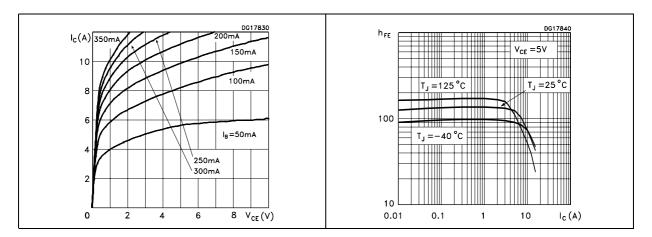
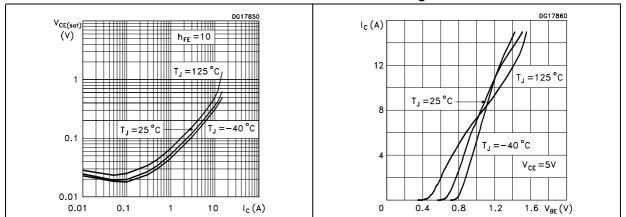


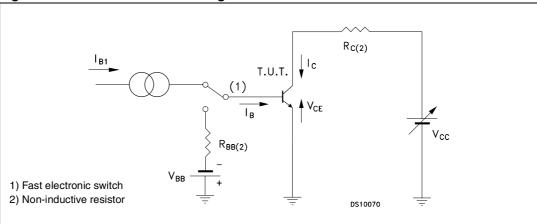
Figure 6. Collector-emitter saturation voltage Figure 7. Collector current vs base-emitter voltage



4/9

2.2 Test circuit

Figure 8. Resistive load switching test circuit

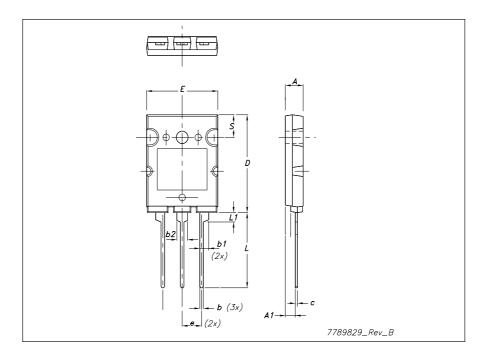


3 Package mechanical data

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-264 Mechanical data

Dim.	mm.			
	Min.	Тур	Max.	
Α	4.80		5.20	
A1	2.50		3.10	
b	0.90	1.0	1.25	
b1		2.5		
b2		2.8		
С	0.50	0.60	0.85	
D	25.6		26.4	
Е	19.80		20.20	
е	5.15		5.75	
L	19.50		20.50	
L1	2.30		2.70	
øΡ	3.55		3.65	



577

Revision history 2STC5200

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
19-Jun-2007	1	Initial release.
11-Dec-2007	2	Document promoted from preliminary data to datasheet.

2STC5200 Revision history

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