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2STA1943

High power PNP epitaxial planar bipolar transistor

Features

- High breakdown voltage $V_{CEO} > -230V$
- Complementary to 2STC5200
- Fast-switching speed
- Typical $f_T = 30 \text{ MHz}$

Application

- Audio power amplifier

Description

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

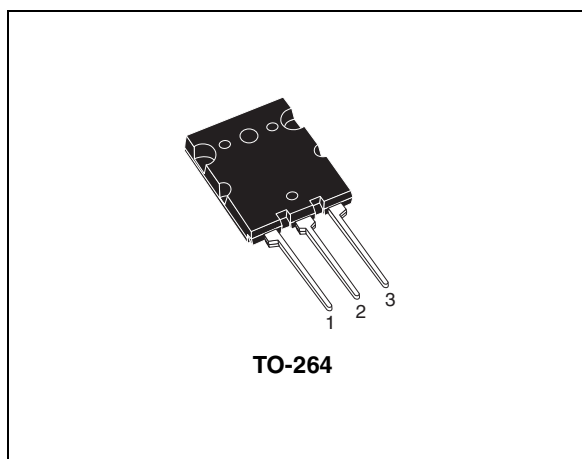


Figure 1. Internal schematic diagram

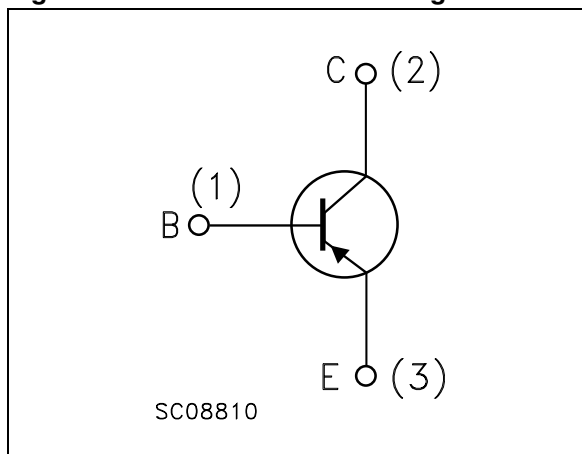


Table 1. Device summary

Order code	Marking	Package	Packaging
2STA1943	2STA1943	TO-264	Tube

Electrical ratings

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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	A
I_{CM}	Collector peak current	-30	A
P_{tot}	Total dissipation at $T_C = 25^\circ\text{C}$	150	W
T_{stg}	Storage temperature	-55 to 150	$^\circ\text{C}$
T_J	Operating junction temperature	150	$^\circ\text{C}$

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thJ-case}$	Thermal resistance junction-case Max	0.83	$^\circ\text{C/W}$

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Electrical characteristics

2 Electrical characteristics

 ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_E = 0$)	$V_{CB} = -230 V$			-5	μA
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 ($I_E = 0$)	$I_C = -100 \mu A$	-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	$I_C = -8 A$ $I_B = -800 mA$			-3	V
V_{BE}	Base-emitter voltage	$I_C = -7 A$ $V_{CE} = -5 V$			-1.5	V
h_{FE}	DC current gain	$I_C = -1 A$ $V_{CE} = -5 V$ $I_C = -7 A$ $V_{CE} = -5 V$	80 35		160	
t_{on} t_s t_f	Resistive load Turn-on time Storage time Fall time	$V_{CC} = -60 V$ $I_C = -5A$ $I_{B1} = -I_{B2} = -0.5 A$		0.24 1.2 0.21		μs μs μs
f_T	Transition frequency	$I_C = -1 A$ $V_{CE} = -5 V$		30		MHz
C_{CBO}	Collector-base capacitance ($I_E = 0$)	$V_{CB} = -10 V$ $f = 1 MHz$		225		pF

 1. Pulsed: pulse duration = 300 μs , duty cycle $\leq 1.5\%$

Electrical characteristics

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2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

Figure 3. Derating curve

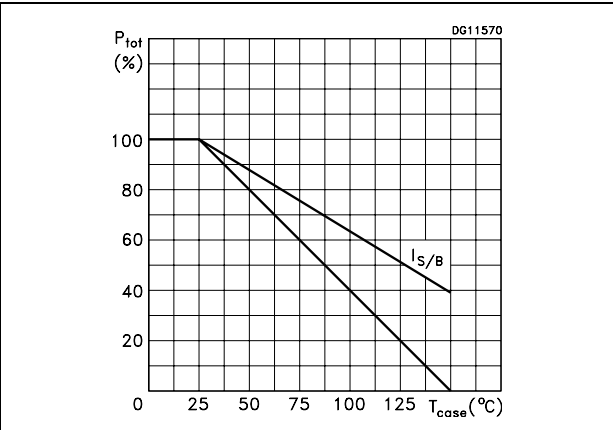
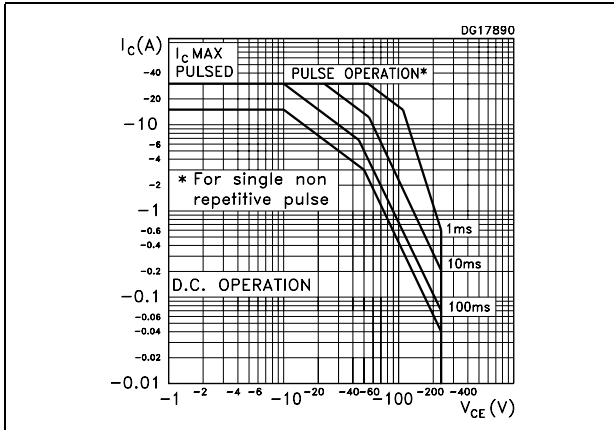


Figure 4. Output characteristics

Figure 5. DC current gain

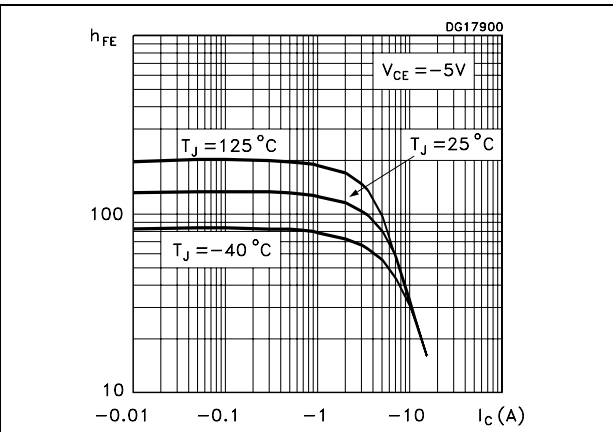
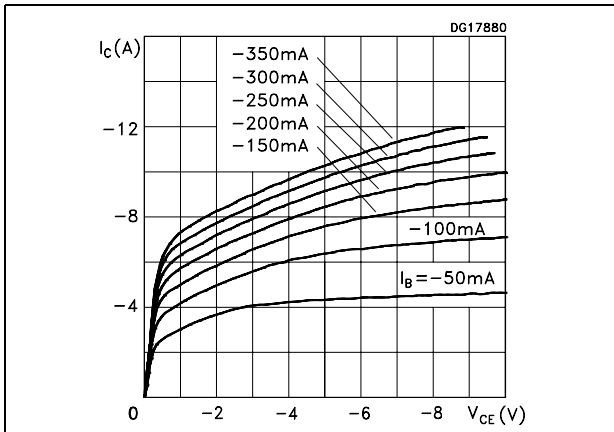
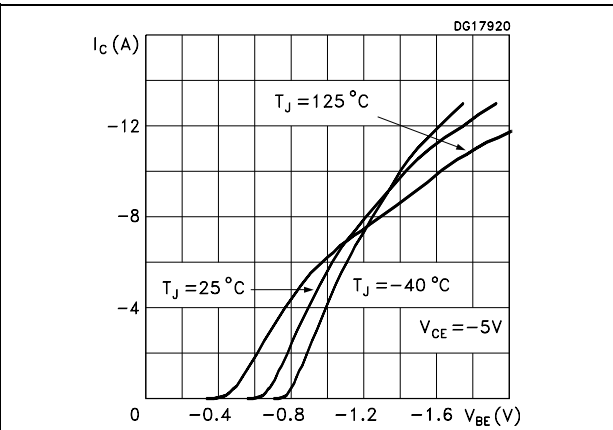
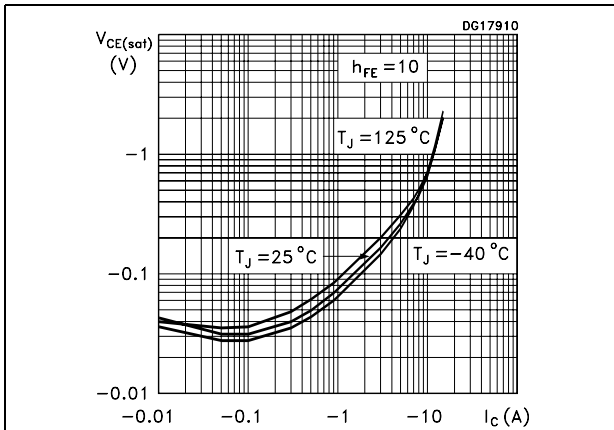


Figure 6. Collector-emitter saturation voltage

Figure 7. Collector current vs base-emitter voltage

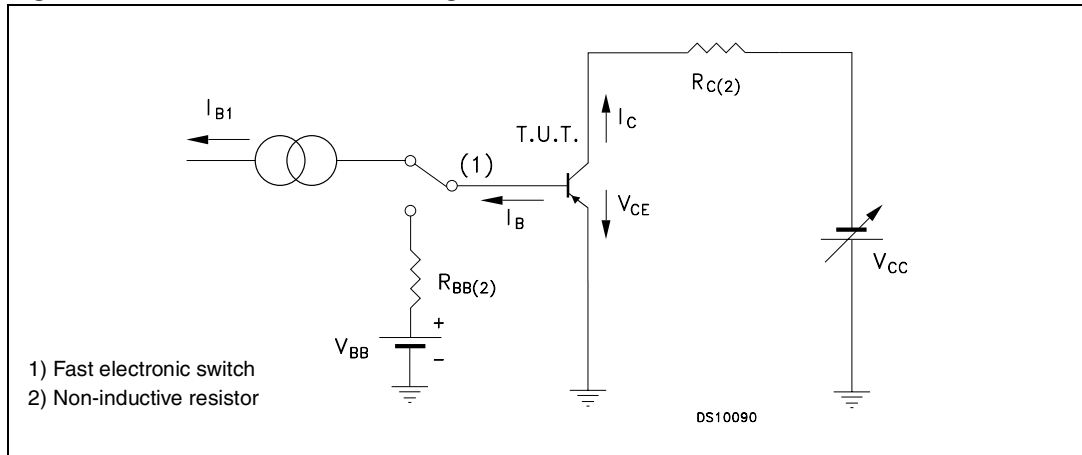


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Electrical characteristics

2.2 Test circuit

Figure 8. Resistive load switching test circuit



3 Package mechanical data

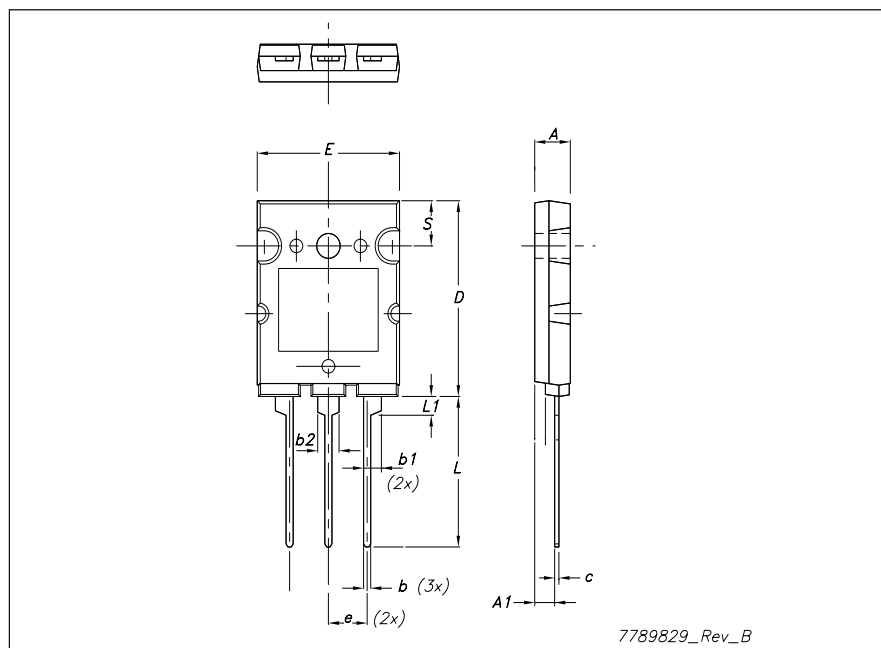
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Package mechanical data

TO-264 Mechanical data

Dim.	mm.		
	Min.	Typ	Max.
A	4.80		5.20
A1	2.50		3.10
b	0.90	1.0	1.25
b1		2.5	
b2		2.8	
c	0.50	0.60	0.85
D	25.6		26.4
E	19.80		20.20
e	5.15		5.75
L	19.50		20.50
L1	2.30		2.70
øP	3.55		3.65



4 Revision history

Table 5. Document revision history

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

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