

High power PNP epitaxial planar bipolar transistor

Features

- High breakdown voltage $V_{CEO} = -120\text{ V}$
- Complementary to 2STC4467
- Fast-switching speed
- Typical $f_t = 20\text{ MHz}$
- Fully characterized at $125\text{ }^\circ\text{C}$

Applications

- Audio power amplifier

Description

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

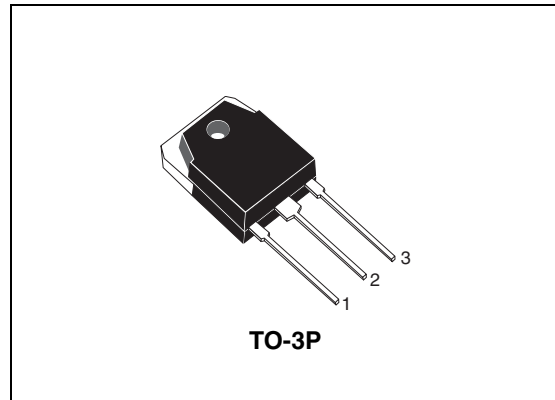


Figure 1. Internal schematic diagram

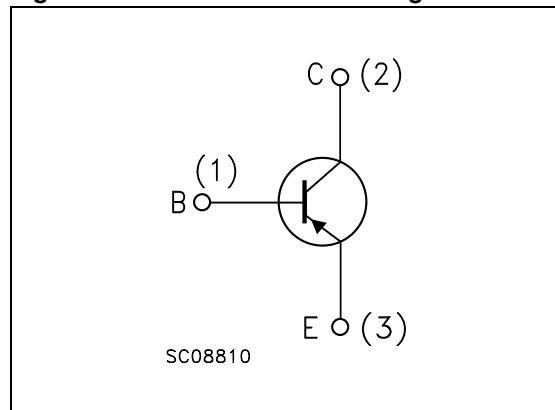


Table 1. Device summary

Order code	Marking	Package	Packaging
2STA1694	2STA1694	TO-3P	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	-120	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	-120	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	-6	V
I_C	Collector current	-8	A
I_{CM}	Collector peak current ($t_p < 5$ ms)	-16	A
P_{TOT}	Total dissipation at $T_c = 25$ °C	80	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max	1.563	°C/W

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CB}} = -120\text{ V}$			-10	μA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = -6\text{ V}$			-10	μA
$V_{(\text{BR})\text{CEO}}^{(1)}$	Collector-emitter breakdown voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = -50\text{ mA}$	-120			V
$V_{(\text{BR})\text{CBO}}$	Collector-base breakdown voltage ($I_{\text{E}} = 0$)	$I_{\text{C}} = -100\text{ }\mu\text{A}$	-120			V
$V_{(\text{BR})\text{EBO}}^{(1)}$	Emitter-base breakdown voltage ($I_{\text{C}} = 0$)	$I_{\text{E}} = -1\text{ mA}$	-6			V
$V_{\text{CE}(\text{sat})}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = -3\text{ A}$ $I_{\text{B}} = -300\text{ mA}$			-1.5	V
h_{FE}	DC current gain	$I_{\text{C}} = -3\text{ A}$ $V_{\text{CE}} = -4\text{ V}$	70		140	
f_{T}	Transition frequency	$I_{\text{C}} = -0.5\text{ A}$ $V_{\text{CE}} = -12\text{ V}$		20		MHz

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

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

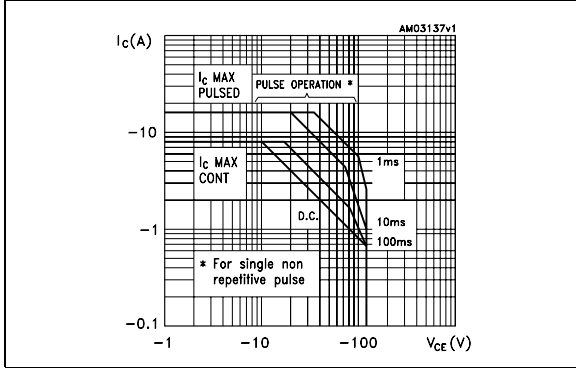


Figure 3. Derating curve

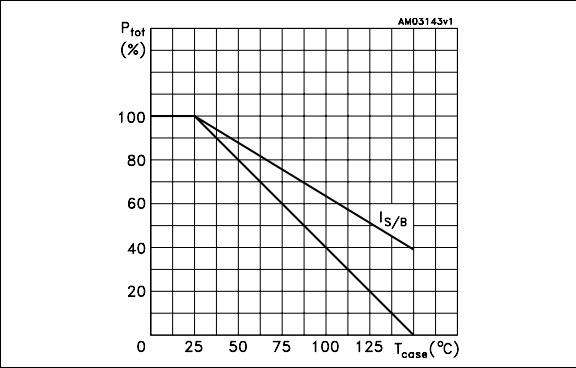


Figure 4. Output characteristics

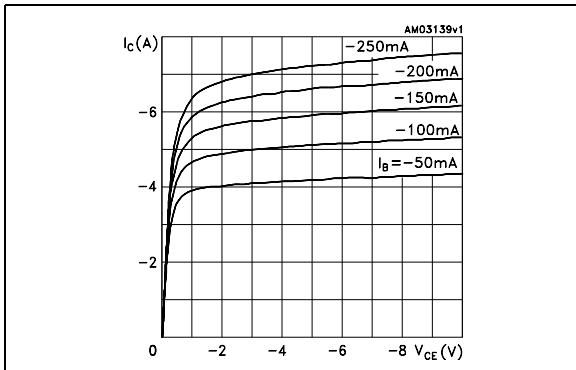


Figure 5. DC current gain

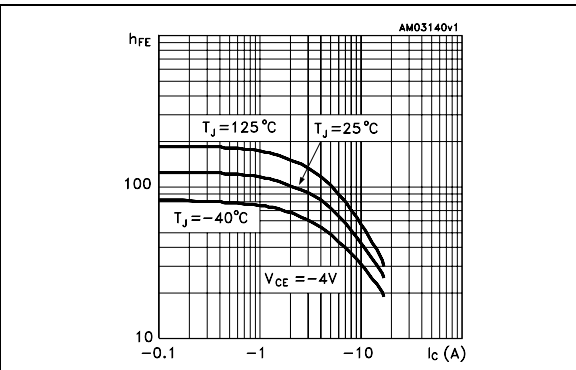


Figure 6. Collector-emitter saturation voltage

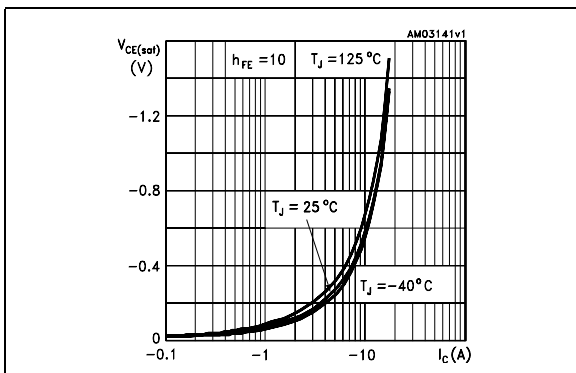
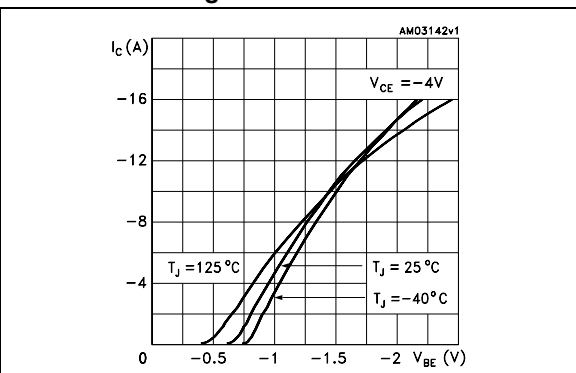


Figure 7. Collector current vs base-emitter voltage

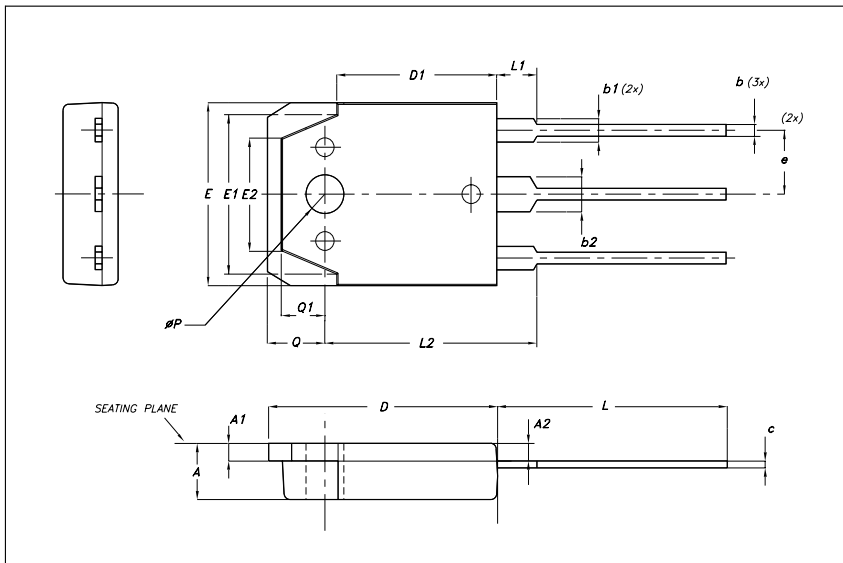


3 Package mechanical data

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TO-3P Mechanical data

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.6		5
A1	1.45	1.50	1.65
A2	1.20	1.40	1.60
b	0.80	1	1.20
b1	1.80		2.20
b2	2.80		3.20
c	0.55	0.60	0.75
D	19.70	19.90	20.10
D1		13.90	
E	15.40		15.80
E1		13.60	
E2		9.60	
e	5.15	5.45	5.75
L	19.50	20	20.50
L1		3.50	
L2	18.20	18.40	18.60
P	3.10		3.30
Q		5	
Q1		3.80	



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
23-Nov-2007	1	Initial release
15-May-2008	2	Document status promoted from preliminary data to datasheet.
09-Feb-2009	3	Added section 2.1: Electrical characteristics (curves) .

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