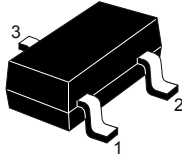
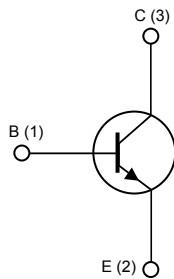


High voltage fast-switching NPN power transistor


SOT-23


NPNB1C3E2

Features

- Excellent h_{FE} linearity up to 50 mA
- Miniature SOT-23 plastic package for surface mounting circuits
- Tape and reel packaging
- The PNP complementary type is STR2550

Applications

- Led driving

Description

This device is a high voltage fast-switching NPN power transistor, manufactured using diffused collector planar technology for high switching speeds.

It employs a base island structure with planar edge termination to enhance switching speeds, while maintaining a wide RBSOA.



Product status link

[STR1550](#)

Product summary

Order code	STR1550
Marking	1550
Package	SOT-23
Packing	Tape and reel

1 Electrical ratings

Table 1. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{EBO}	Emitter-base voltage ($I_C = 0$ A)	9	V
V_{CBO}	Collector-base voltage ($I_E = 0$ A)	500	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$ A)	500	V
I_C	Collector current	0.5	A
I_{CM}	Collector peak current ($t_p < 5$ ms)	1	A
P_{TOT}	Total power dissipation at $T_A = 25$ °C	500	mW
T_{stg}	Storage temperature range	-65 to 150	°C
T_J	Maximum operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{thJA}^{(1)}$	Thermal resistance, junction-to-ambient	250	°C/W

1. Device mounted on a PCB area of 1 cm².

2 Electrical characteristics

$T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current	$V_{CB} = 500\text{ V}$, $I_E = 0\text{ A}$			10	μA
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C = 100\text{ }\mu\text{A}$, $I_E = 0\text{ A}$	500			V
$V_{(BR)CEO}^{(1)}$	Collector-emitter breakdown voltage	$I_B = 0\text{ A}$, $I_C = 1\text{ mA}$	500			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_C = 0\text{ A}$, $I_E = 100\text{ }\mu\text{A}$	12			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 20\text{ mA}$, $I_B = 2\text{ mA}$			0.2	V
		$I_C = 50\text{ mA}$, $I_B = 6\text{ mA}$			0.3	
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 50\text{ mA}$, $I_B = 5\text{ mA}$			0.9	V
$V_{BE(on)}$	Base-emitter on voltage	$I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$			0.9	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$	100			
		$I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$	100		300	
		$I_C = 100\text{ mA}$, $V_{CE} = 10\text{ V}$	10			

1. Pulsed: Pulse duration = 300 μs , duty cycle $\leq 2\%$.

2.1 Electrical characteristics (curves)

Figure 1. DC current gain at $V_{CE} = 5\text{ V}$

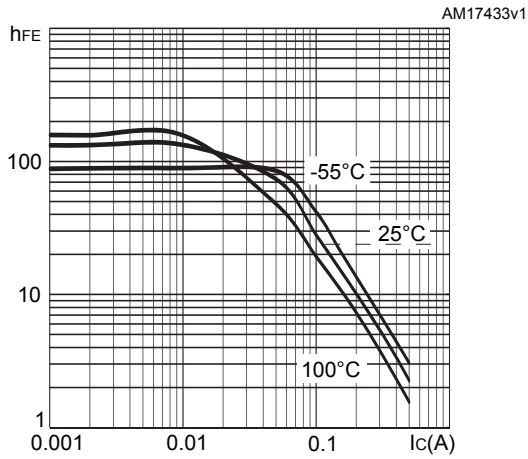


Figure 2. DC current gain at $V_{CE} = 10\text{ V}$

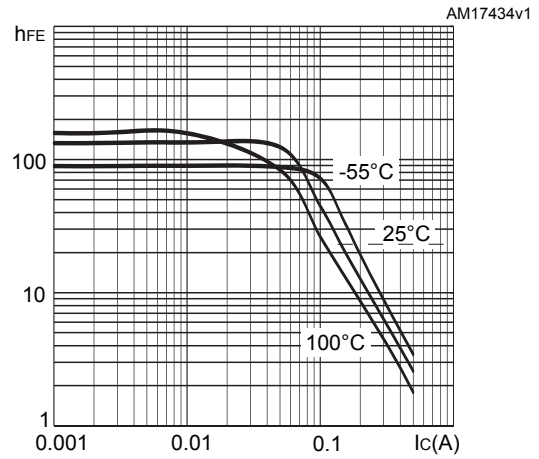


Figure 3. Collector emitter saturation voltage at $h_{FE} = 5$

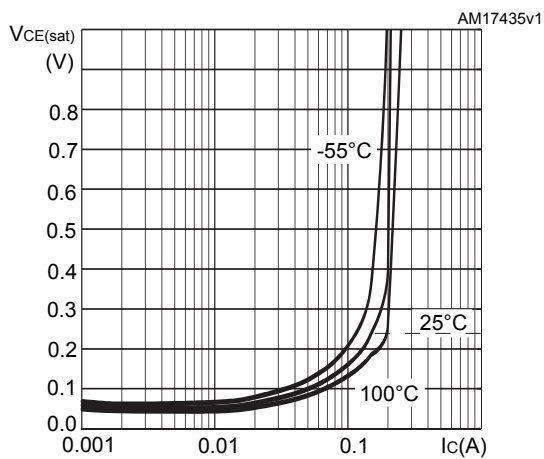


Figure 4. Collector emitter saturation voltage at $h_{FE} = 10$

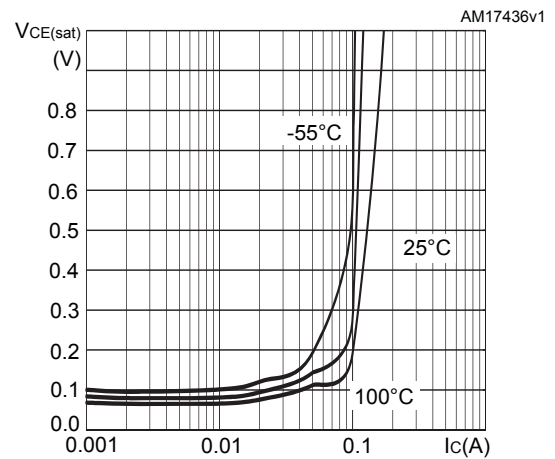


Figure 5. Base-emitter saturation voltage at $h_{FE} = 5$

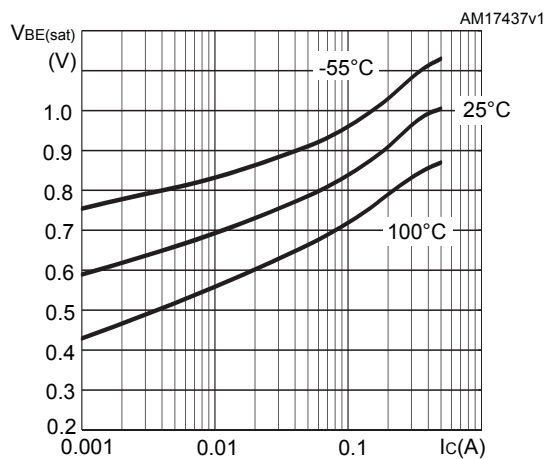
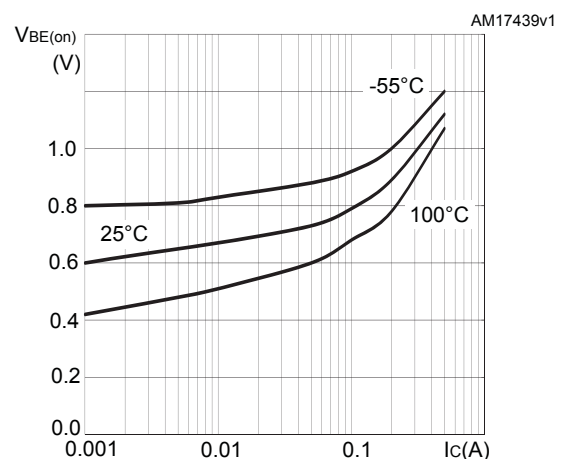


Figure 6. Base-emitter on voltage at $V_{CE} = 10\text{ V}$

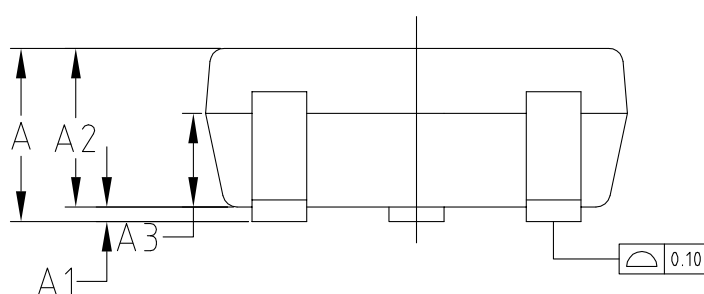
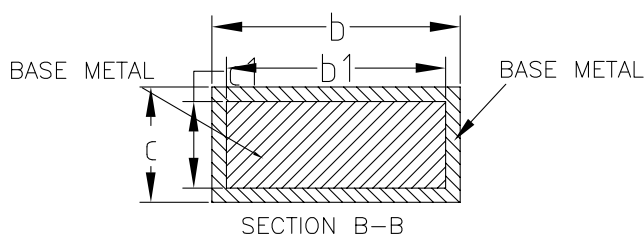
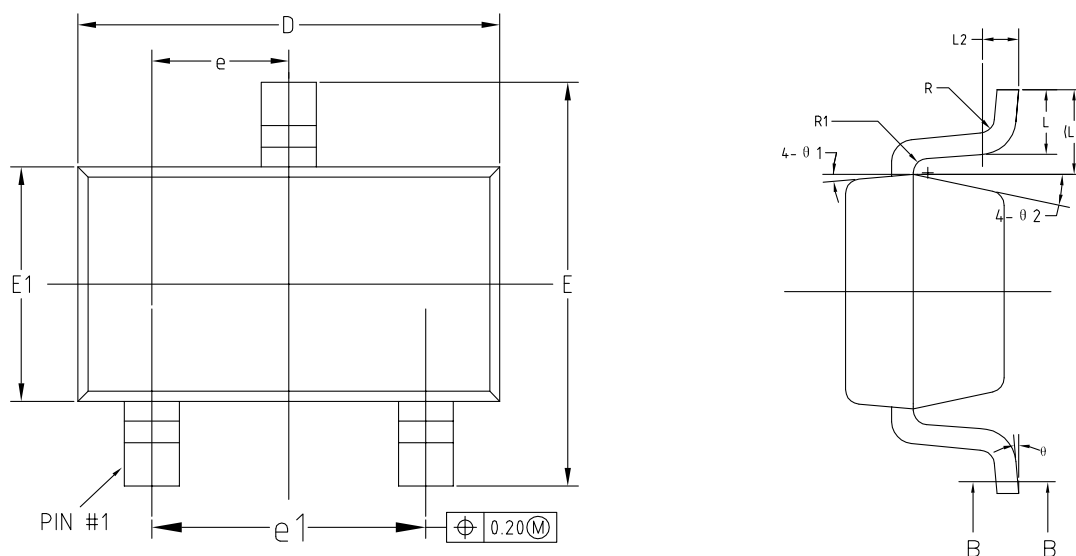


3 Package information

To meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions, and product status are available at: www.st.com. ECOPACK is an ST trademark.

3.1 SOT-23 package information

Figure 7. SOT-23 package outline (dimensions are in mm)

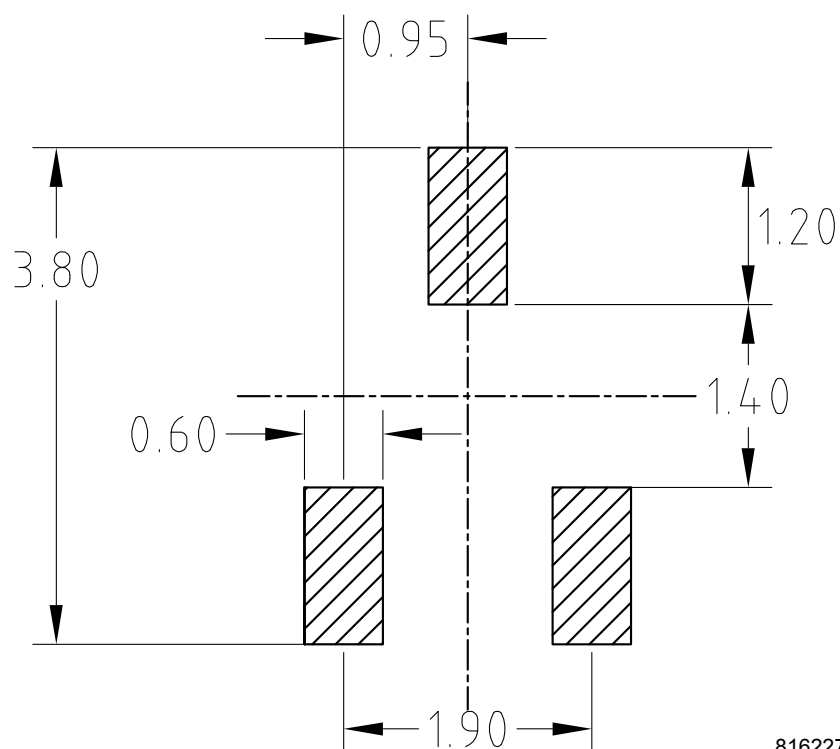


8162275_REV3

Table 4. SOT-23 package mechanical data

Ref.	mm		
	Min.	Typ.	Max.
A			1.25
A1	0		0.15
A2	1	1.10	1.20
A3	0.60	0.65	0.70
b	0.36		0.50
b1	0.36	0.38	0.45
c	0.14		0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59 REF		
L2	0.25 BSC		
R	0.05		
R1	0.05		
θ	0°		8°
θ1	3°	5°	7°
θ2	6°		14°

Figure 8. SOT-23 recommended footprint (dimensions in mm)



8162275_footprint_REV3

Revision history

Table 5. Document revision history

Date	Revision	Changes
17-Oct-2011	1	Initial release.
05-Jun-2012	2	Modified: features, <i>Table 4</i> ($V_{CE(sat)}$ values, h_{FE} test conditions and values)
21-May-2013	3	– Modified: <i>Table 4</i> ($V_{BE(sat)}$ values, h_{FE} max. value and $V_{(BR)EBO}$ min. value – Inserted: $V_{BE(on)}$ – Modified: <i>Table 4</i> (h_{FE} max. value) – Added new section: <i>Electrical characteristics (curves)</i>
27-May-2013	4	– Document status promoted from preliminary to production data
09-May-2014	5	– Updated <i>Table 1: Device summary</i> and <i>Section 3: Package mechanical data</i>
10-Feb-2025	6	Updated <i>Section 3.1: SOT-23 package information</i> . Minor text changes.

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