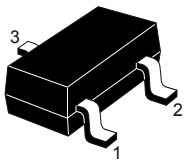
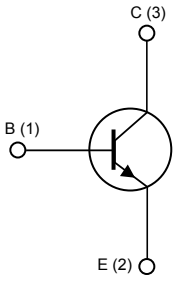
STR1550

Datasheet

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 °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 V, I_E = 0 A			10	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage	I_C = 100 µA, I_E = 0 A	500			V
$V_{(BR)CEO}$(1)	Collector-emitter breakdown voltage	I_B = 0 A, I_C = 1 mA	500			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_C = 0 A, I_E = 100 µA	12			V
$V_{CE(sat)}$(1)	Collector-emitter saturation voltage	I_C = 20 mA, I_B = 2 mA			0.2	V
		I_C = 50 mA, I_B = 6 mA			0.3	
$V_{BE(sat)}$(1)	Base-emitter saturation voltage	I_C = 50 mA, I_B = 5 mA			0.9	V
$V_{BE(on)}$	Base-emitter on voltage	I_C = 50 mA, V_{CE} = 10 V			0.9	V
h_{FE} (1)	DC current gain	I_C = 1 mA, V_{CE} = 10 V	100			
		I_C = 50 mA, V_{CE} = 10 V	100		300	
		I_C = 100 mA, V_{CE} = 10 V	10			

1. *Pulsed: Pulse duration = 300 µs, duty cycle ≤2%.*

2.1 Electrical characteristics (curves)

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

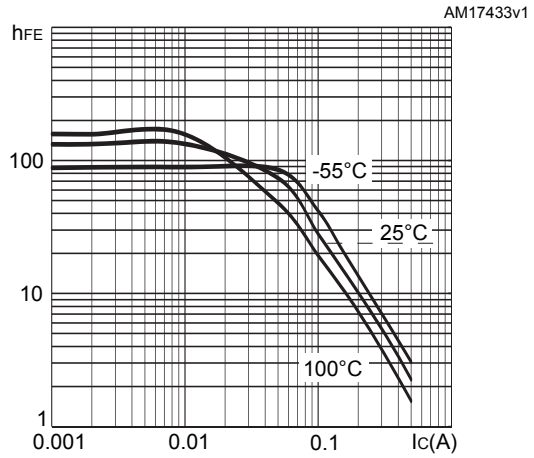


Figure 2. DC current gain at V_{CE} = 10 V

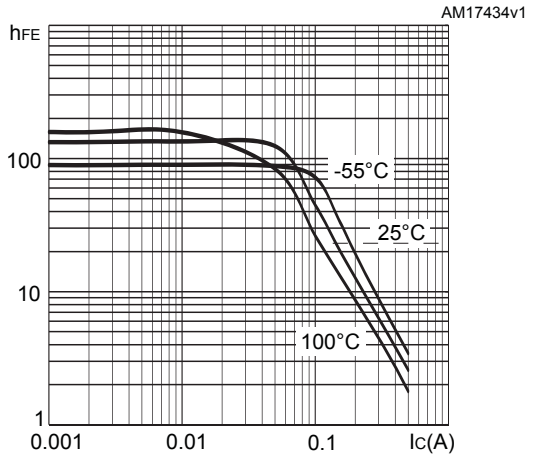


Figure 3. Collector emitter saturation voltage at h_{FE} = 5

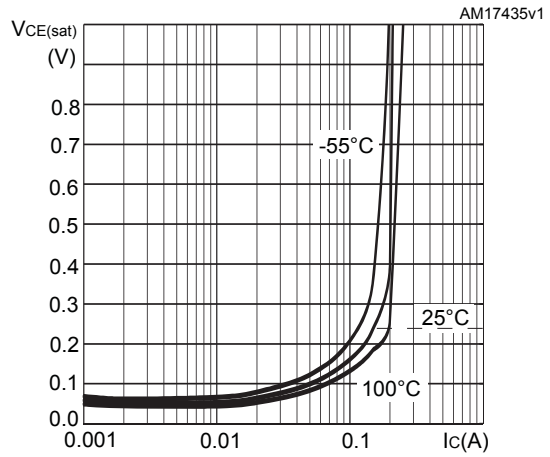


Figure 4. Collector emitter saturation voltage at h_{FE} = 10

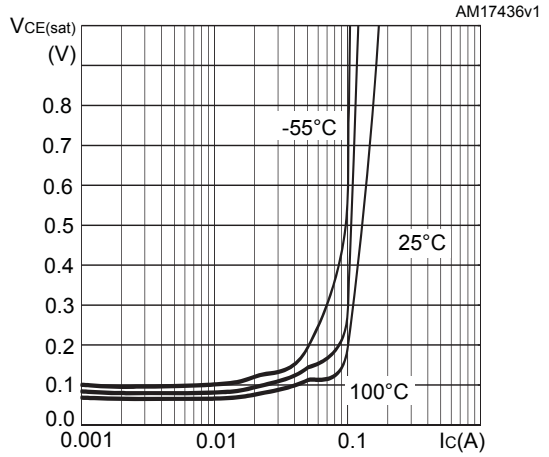


Figure 5. Base-emitter saturation voltage at h_{FE} = 5

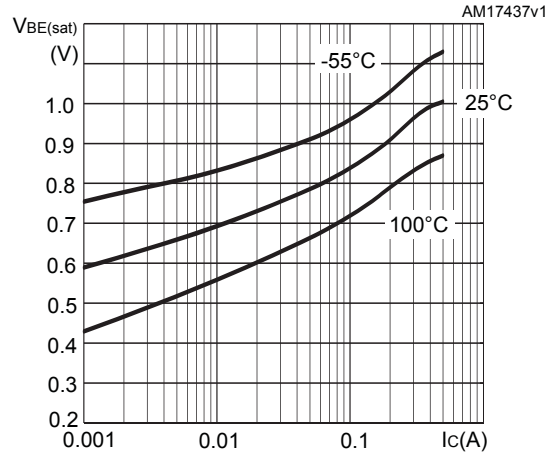
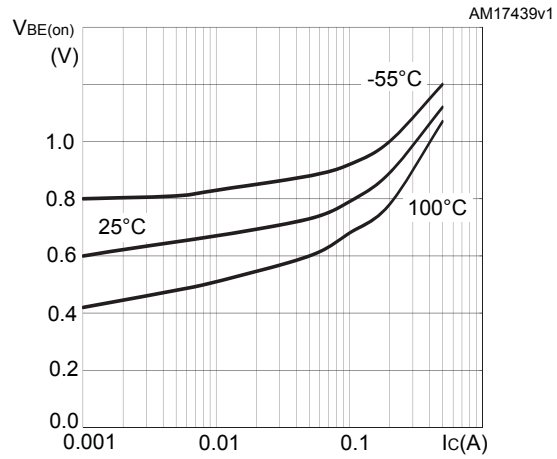


Figure 6. Base-emitter on voltage at V_{CE} = 10 V

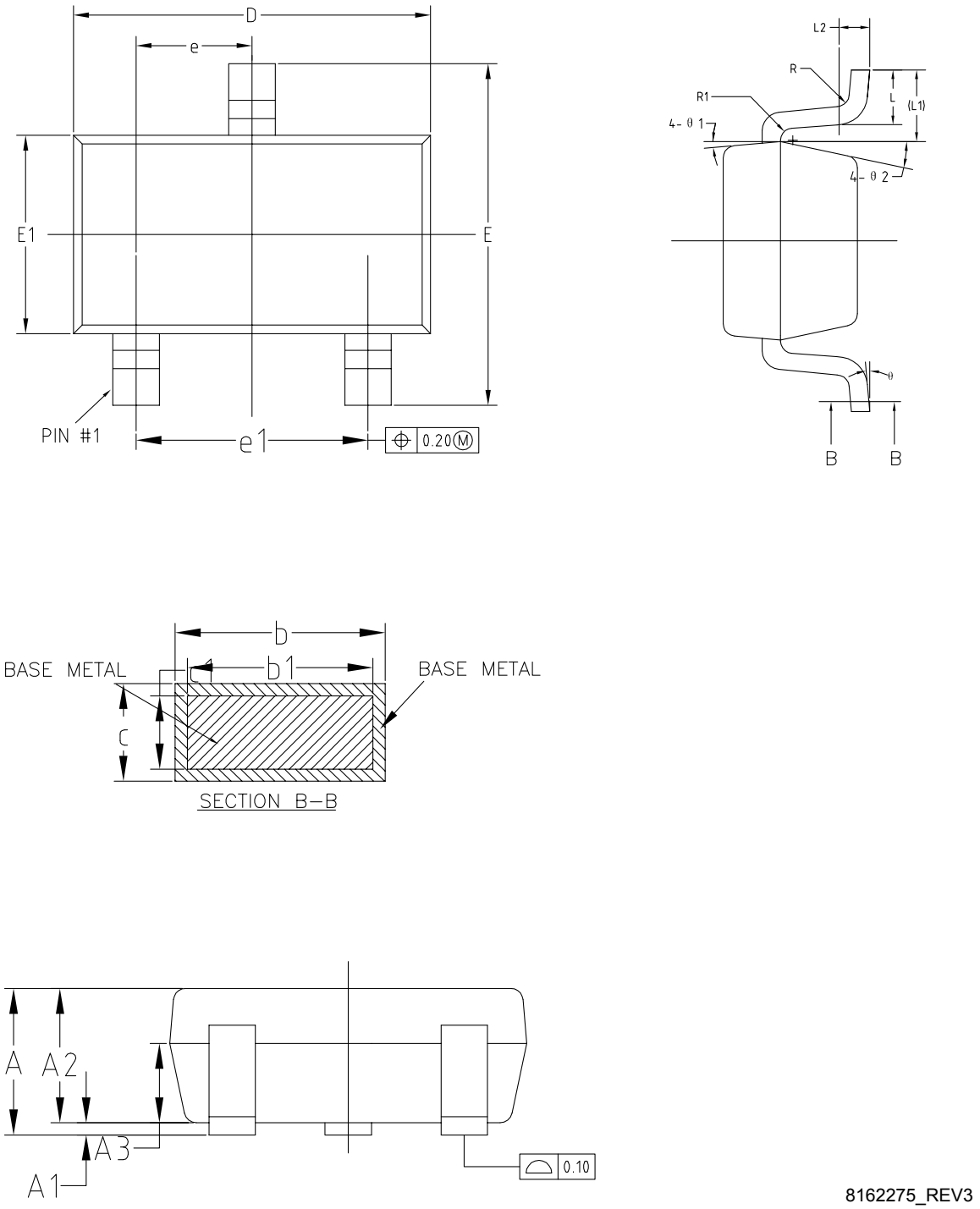


3 Package information

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)

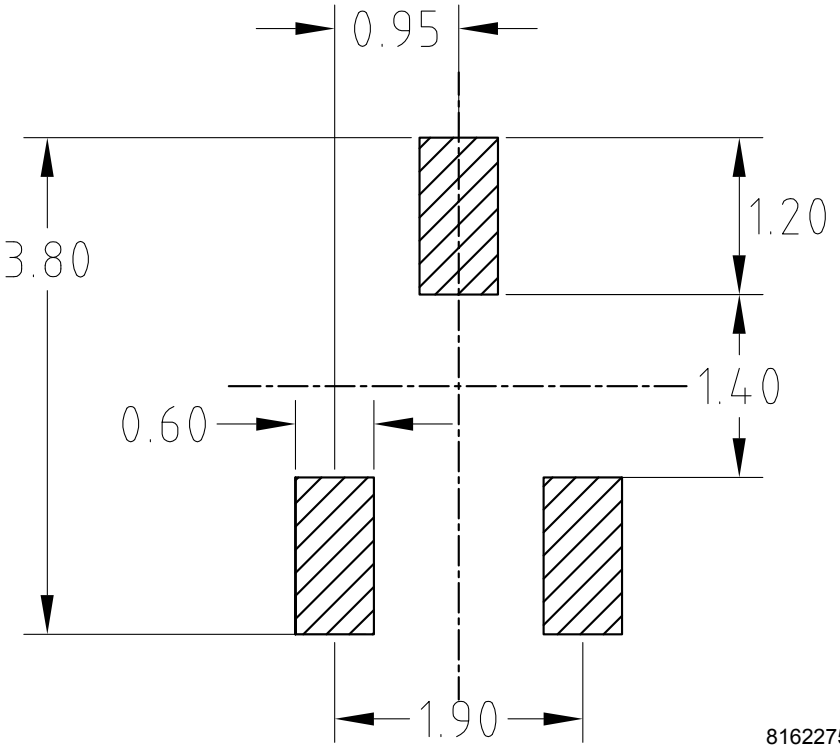


8162275_REV3

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)**



Revision history

Table 5. **Document revision history**

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

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