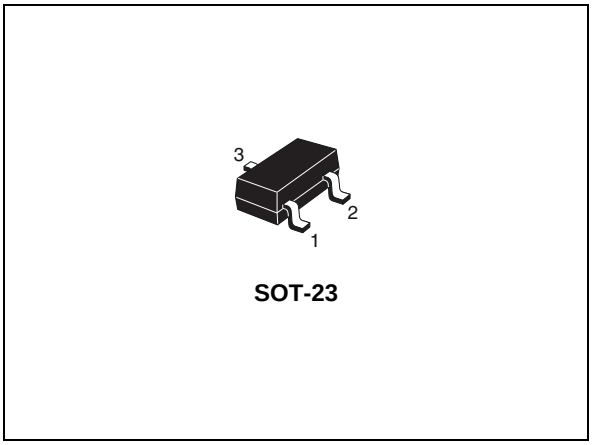
STR1550

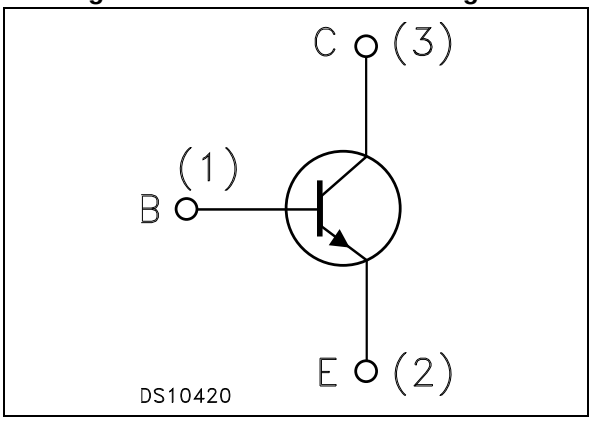
High voltage fast-switching NPN power transistor

Datasheet - production data



SOT-23

Figure 1. Internal schematic diagram



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.

Table 1. Device summary

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

Contents

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	500	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	500	V
V_{EBO}	Emitter-base voltage (I_C = 0)	9	V
I_C	Collector current	0.5	A
I_{CM}	Collector peak current (t_P < 5 ms)	1	A
P_{TOT}	Total dissipation at T_{amb} = 25 °C	500	mW
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_{thJA}(1)	Thermal resistance junction-ambient max	250	°C/W

1. Device mounted on PCB area of 1 cm².

2 Electrical characteristics

T_{case} = 25 °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} = 500 V			10	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 100 µA	500			V
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 1 mA	500			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	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
$V_{BE(sat)}$ (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. Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2%

2.1 Electrical characteristics (curves)

Figure 2. h_{FE} vs. I_C @ V_{CE}= 5 V

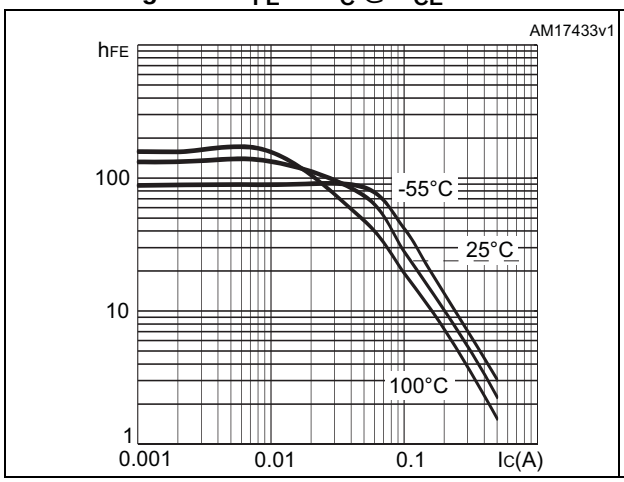


Figure 3. h_{FE} vs. I_C @ V_{CE}= 10 V

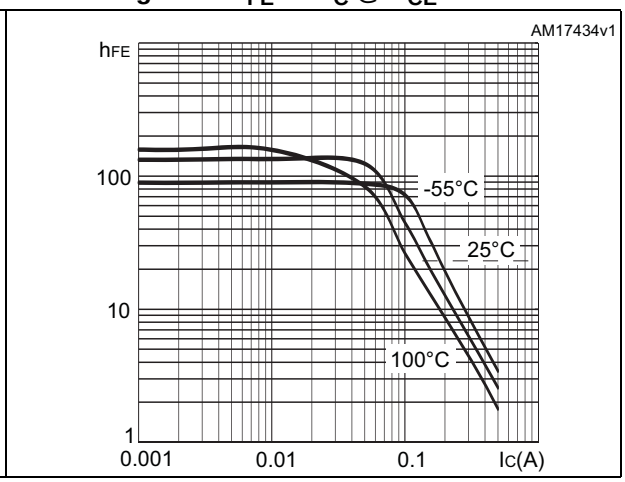


Figure 4. $V_{CE(sat)}$ vs. I_C @ h_{FE}= 5

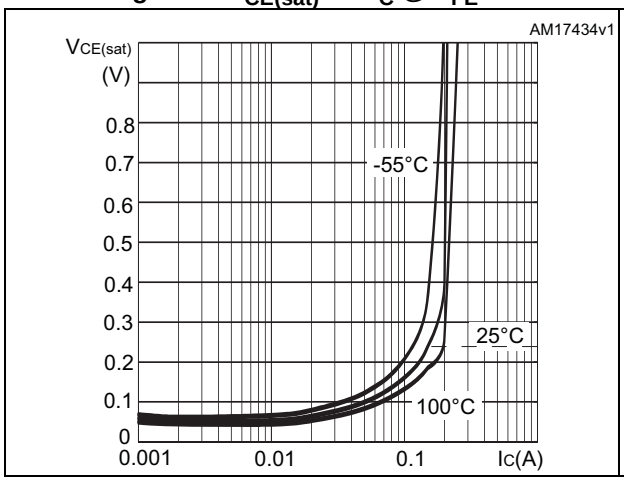


Figure 5. $V_{CE(sat)}$ vs. I_C @ h_{FE}= 10

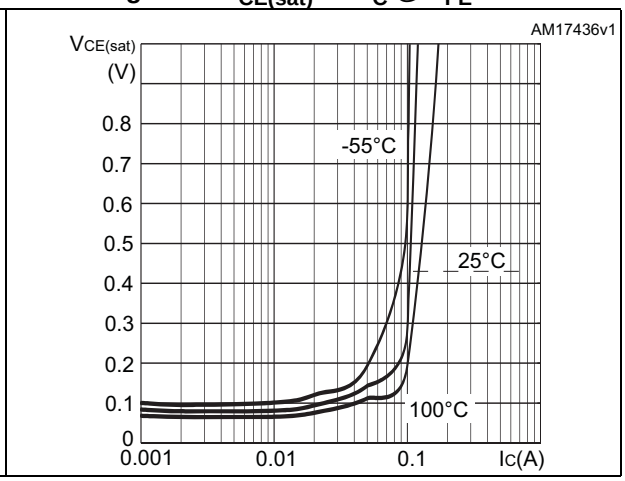


Figure 6. $V_{BE(sat)}$ vs. I_C @ h_{FE}= 5

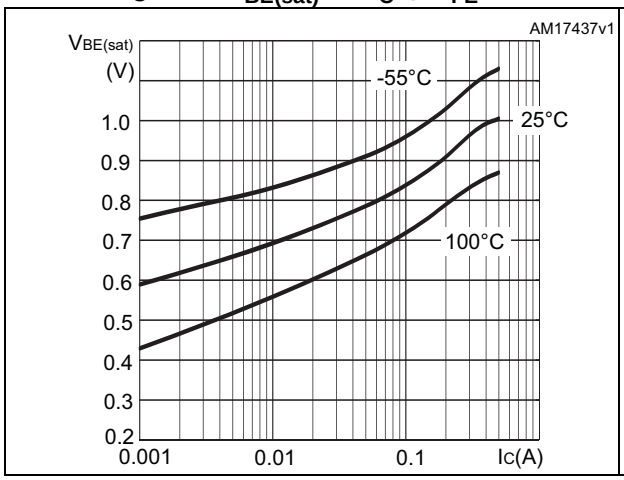


Figure 7. $V_{BE(sat)}$ vs. I_C @ h_{FE}= 10

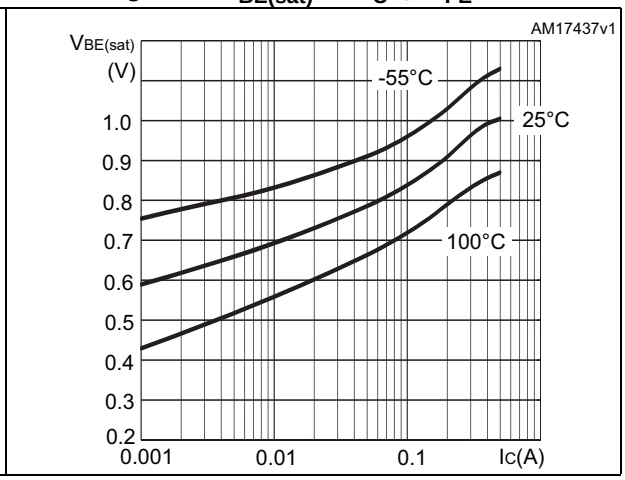
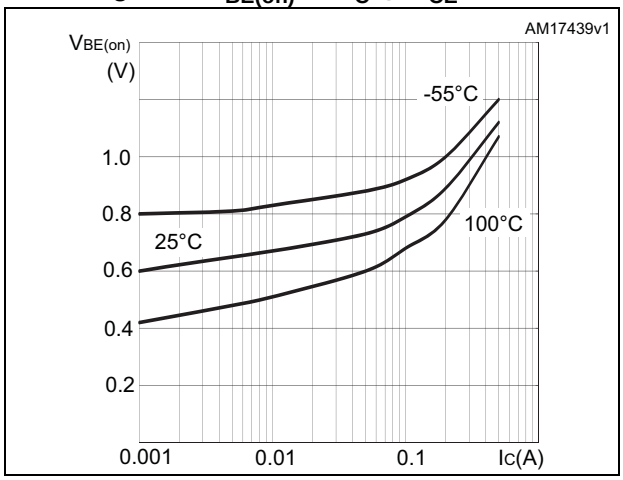


Figure 8. $V_{BE(on)}$ vs. I_C @ V_{CE}= 10 V



3 Package mechanical data

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Figure 9. SOT-23 drawings

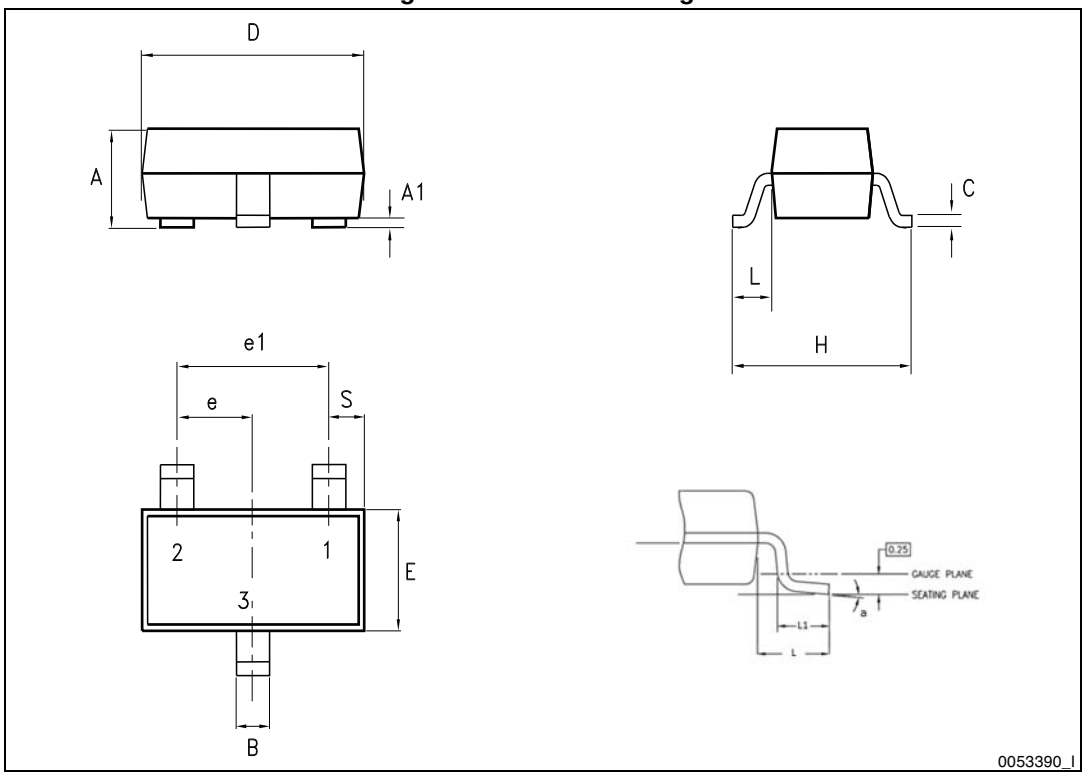
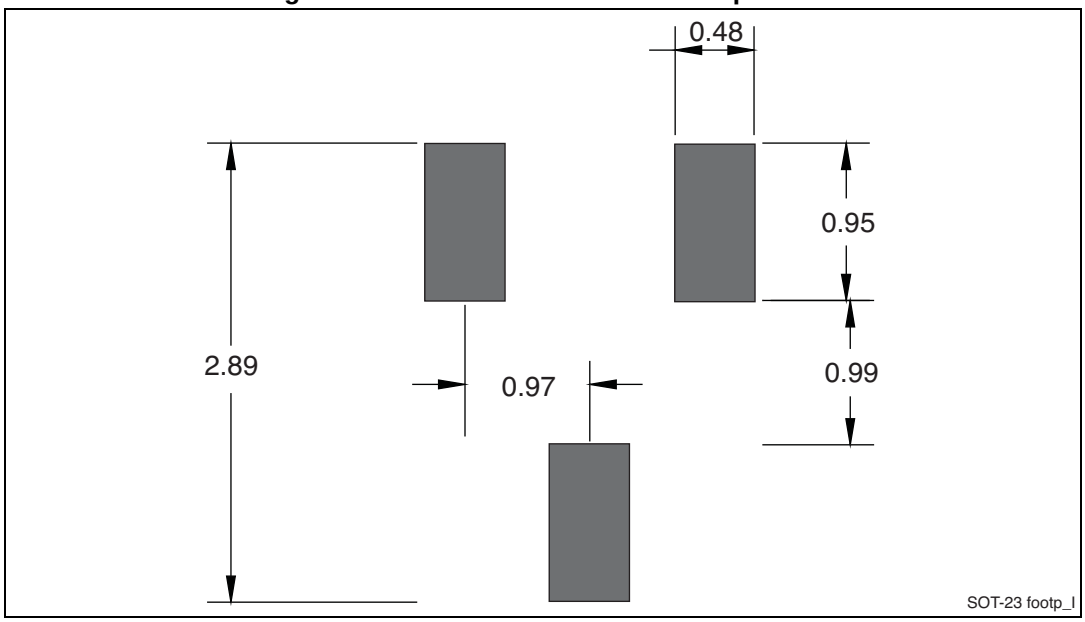


Table 5. SOT-23 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.89		1.40
A1	0		0.10
B	0.30		0.51
C	0.085		0.18
D	2.75		3.04
e	0.85		1.05
e1	1.70		2.10
E	1.20		1.75
H	2.10		3.00
L		0.60	
S	0.35		0.65
L1	0.25		0.55
a	0°		8°

Figure 10. SOT-23 recommended footprint (a)



a. Dimensions are in mm.

4 Revision history

Table 6. 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*

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