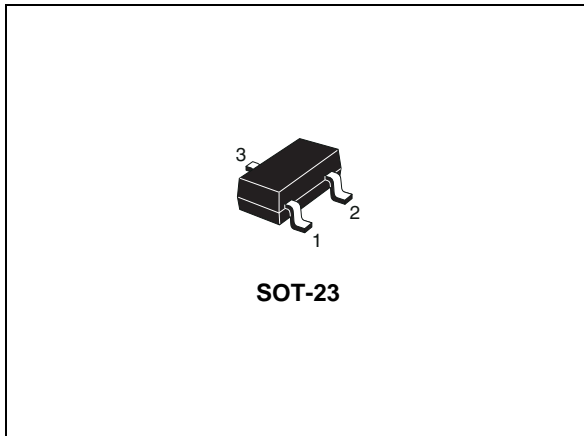


# High voltage fast-switching PNP power transistor

Datasheet - production data



## Features

- Excellent  $h_{FE}$  linearity up to 50 mA
- Miniature SOT-23 plastic package for surface mounting circuits
- Tape and reel packaging
- The NPN complementary type is STR1550

## Applications

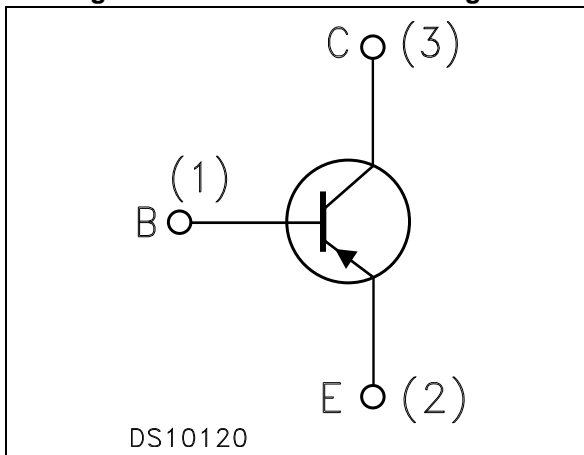
- LED driving

## Description

This device is a high voltage fast-switching PNP power transistor, manufactured using high voltage multi-epitaxial planar technology for high switching speeds.

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

**Figure 1. Internal schematic diagram**



**Table 1. Device summary**

Order code	Marking	Package	Packing
STR2550	2550	SOT-23	Tape and reel

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# 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 ( $I_C = 0$ )	-7	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 cm<sup>2</sup>.

## 2 Electrical characteristics

$T_{\text{case}} = 25\text{ °C}$  unless otherwise specified.

**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = -500\text{ V}$			-10	$\mu\text{A}$
$V_{(\text{BR})\text{CBO}}$	Collector-base breakdown voltage ( $I_{\text{E}} = 0$ )	$I_{\text{C}} = -100\text{ }\mu\text{A}$	-500			V
$V_{(\text{BR})\text{CEO}}^{(1)}$	Collector-emitter breakdown voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = -1\text{ mA}$	-500			V
$V_{(\text{BR})\text{EBO}}$	Emitter-base breakdown voltage ( $I_{\text{C}} = 0$ )	$I_{\text{E}} = -100\text{ }\mu\text{A}$	-7			V
$V_{\text{CE}(\text{sat})}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = -20\text{ mA}$ $I_{\text{B}} = -2\text{ mA}$ $I_{\text{C}} = -50\text{ mA}$ $I_{\text{B}} = -10\text{ mA}$			-0.2 -0.3	V V
$V_{\text{BE}(\text{sat})}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = -50\text{ mA}$ $I_{\text{B}} = -10\text{ mA}$			-1.0	V
$V_{\text{BE}(\text{on})}$	Base-emitter on voltage	$I_{\text{C}} = -50\text{ mA}$ $V_{\text{CE}} = -10\text{ V}$			-1.1	V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = -1\text{ mA}$ $V_{\text{CE}} = -10\text{ V}$ $I_{\text{C}} = -50\text{ mA}$ $V_{\text{CE}} = -10\text{ V}$ $I_{\text{C}} = -100\text{ mA}$ $V_{\text{CE}} = -10\text{ V}$	100 100 10		300	

1. Pulse test: pulse duration  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

## 2.1 Electrical characteristics (curves)

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

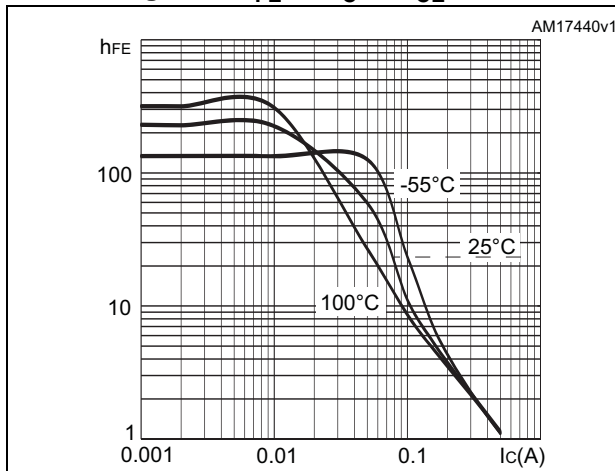


Figure 3.  $h_{FE}$  vs.  $I_C$  @  $V_{CE} = 10\text{ V}$

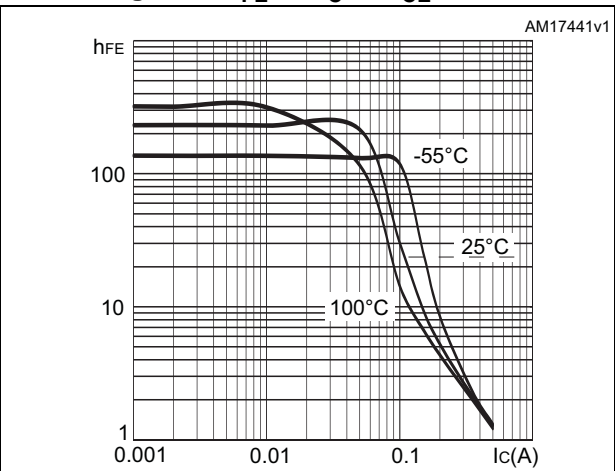


Figure 4.  $V_{CE(sat)}$  vs.  $I_C$  @  $h_{FE} = 5$

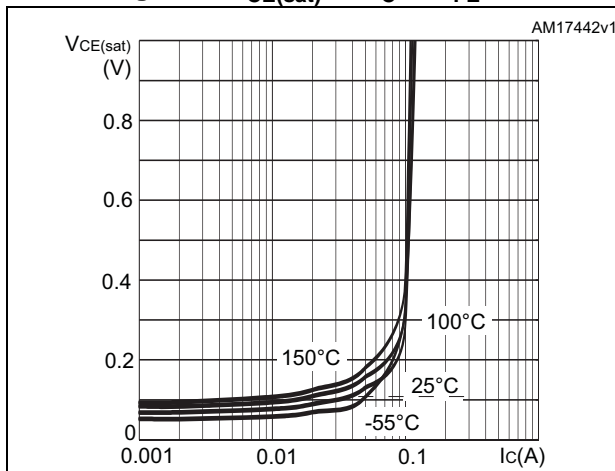


Figure 5.  $V_{CE(sat)}$  vs.  $I_C$  @  $h_{FE} = 10$

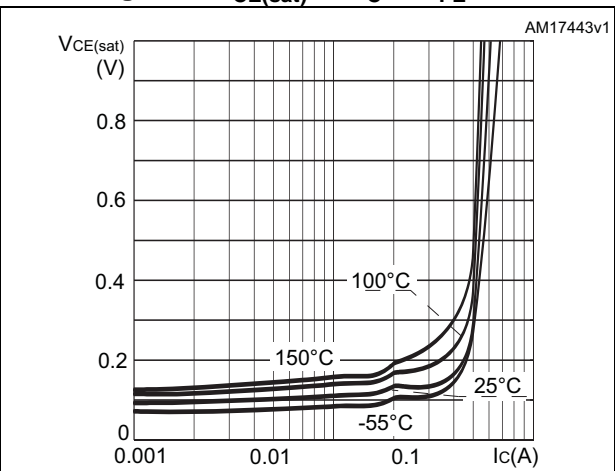


Figure 6.  $V_{BE(sat)}$  vs.  $I_C$  @  $h_{FE} = 5$

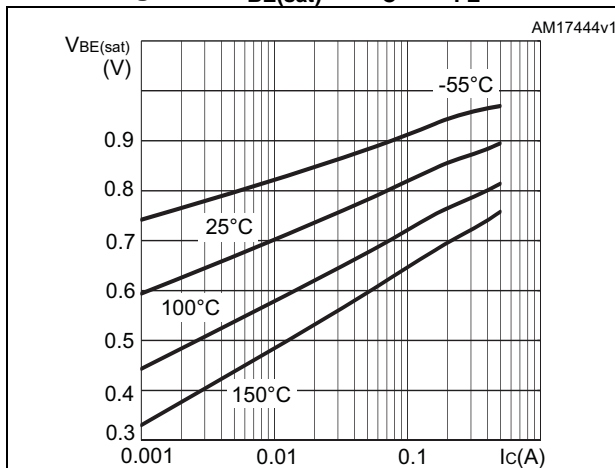


Figure 7.  $V_{BE(sat)}$  vs.  $I_C$  @  $h_{FE} = 10$

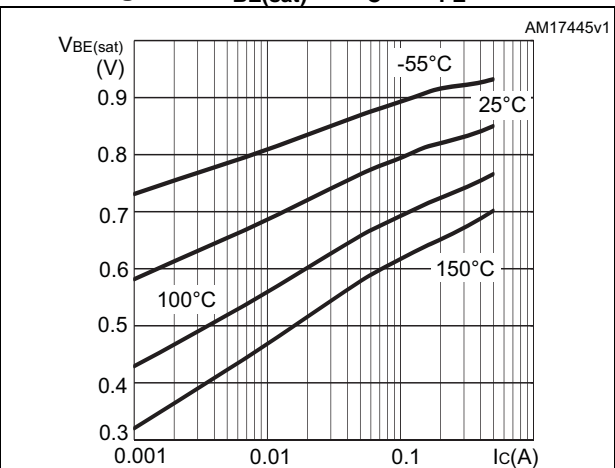
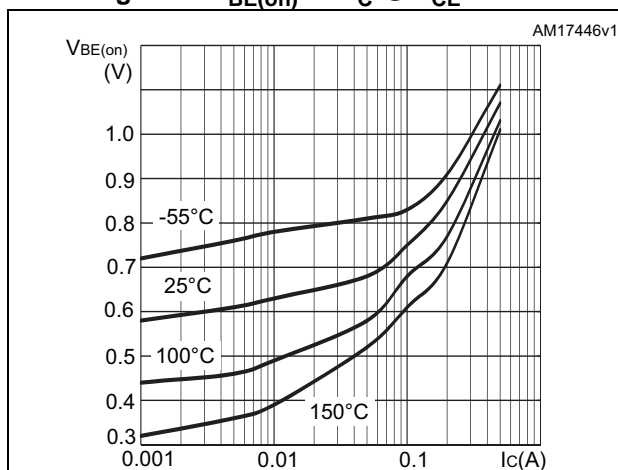


Figure 8.  $V_{BE(on)}$  vs.  $I_C$  @  $V_{CE} = 10\text{ V}$



### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

Figure 9. SOT-23 drawings

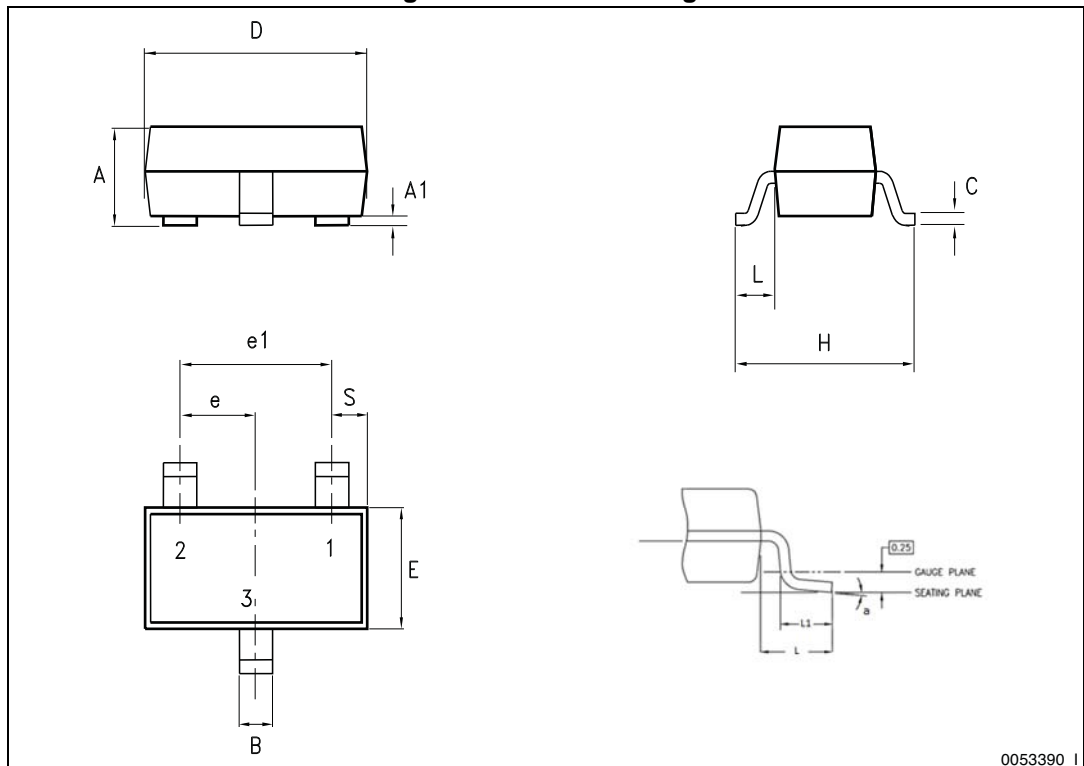
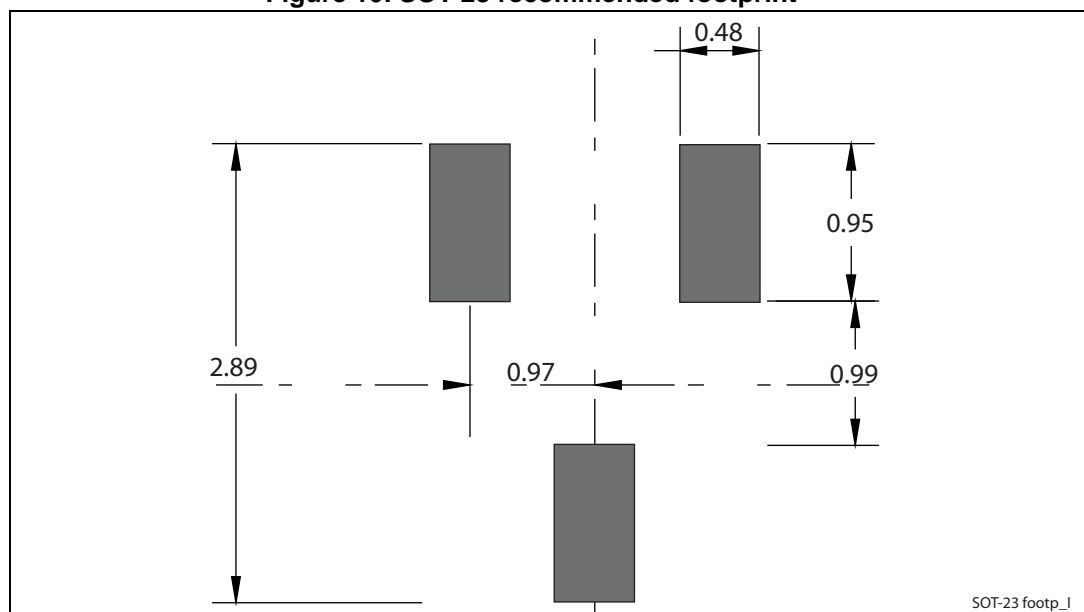


Table 5. SOT-23 mechanical data

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, <a href="#">Table 4</a> ( $V_{CE(sat)}$ values, $h_{FE}$ test conditions and values)
21-May-2013	3	<ul style="list-style-type: none"><li>– Modified: <a href="#">Table 4</a> (<math>V_{BE(sat)}</math> values and <math>h_{FE}</math> max. value</li><li>– Inserted: <math>V_{BE(on)}</math></li><li>– Modified: <a href="#">Table 4</a> (<math>h_{FE}</math> max. value)</li><li>– Added new section: <a href="#">Electrical characteristics (curves)</a></li></ul>
27-May-2013	4	– Document status promoted from preliminary to production data.
09-May-2014	5	– Updated <a href="#">Table 1: Device summary</a> and <a href="#">Section 3: Package mechanical data</a> .

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