2STR2160

Low voltage fast-switching PNP power transistor

Datasheet - production data

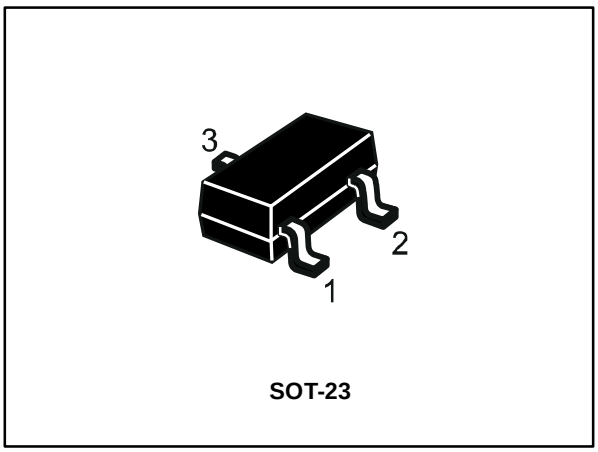
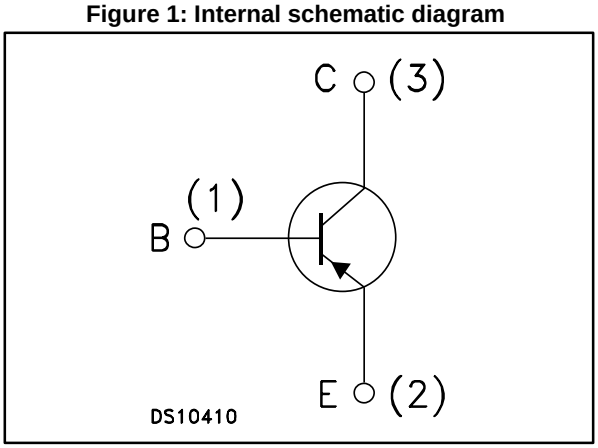


Figure 1: Internal schematic diagram



Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed
- Miniature SOT-23 plastic package for surface mounting circuits

Applications

- LED
- Battery charger
- Motor and relay driver
- Voltage regulation

Description

The device in a PNP transistor manufactured using new “PB-HCD” (power bipolar high current density) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

The complementary NPN is the 2STR1160.

Table 1: Device summary

Order code	Marking	Package	Packing
2STR2160	2160	SOT-23	Tape and reel

Contents

1 Electrical ratings

Table 2: Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	-60	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	-60	V
V_{EBO}	Emitter-base voltage (I_C = 0)	-5	V
I_C	Collector current	-1	A
I_{CM}	Collector peak current (t_P < 5ms)	-2	A
P_{tot}	Total dissipation at T_{amb} = 25°C	0.5	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
$R_{thj\text{-}amb}$ (1)	Thermal resistance junction-amb max	250	°C/W

Notes:

(1)Device mounted on PCB area of 1 cm^2

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} = -60 V			-0.1	µA
I_{EBO}	Emitter cut-off current (I_C =0)	V_{EB} = -5 V			-0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = -100 µA	-60			V
$V_{(BR)CEO}$(1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = -10 mA	-60			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = -100 µA	-5			V
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_C = -0.5 A I_B = -50 mA			260	mV
		I_C = -1 A I_B = -100 mA			480	mV
$V_{BE(sat)}$	Base-emitter saturation voltage	I_C = -1 A I_B = -100 mA			1.3	V
h_{FE}	DC current gain	I_C = -0.5 A V_{CE} = -2V	180		560	
		I_C = -1 A V_{CE} = -2 V	45			
		I_C = -2 A V_{CE} = -2 V		30		
	Resistive load					
t_{on}	Turn-on time	I_C = -1.5 A V_{CC} = -10 V I_{B1} = -I_{B2} = -150 mA $V_{BB(off)}$= 5 V		220		ns
t_{off}	Turn-off time			500		ns

Notes:

(1)Pulse test: pulse duration = 300 µs, duty cycle ≤ 1.5 %

3 Package mechanical data

In order 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 mechanical data

Figure 2: SOT-23 mechanical drawing

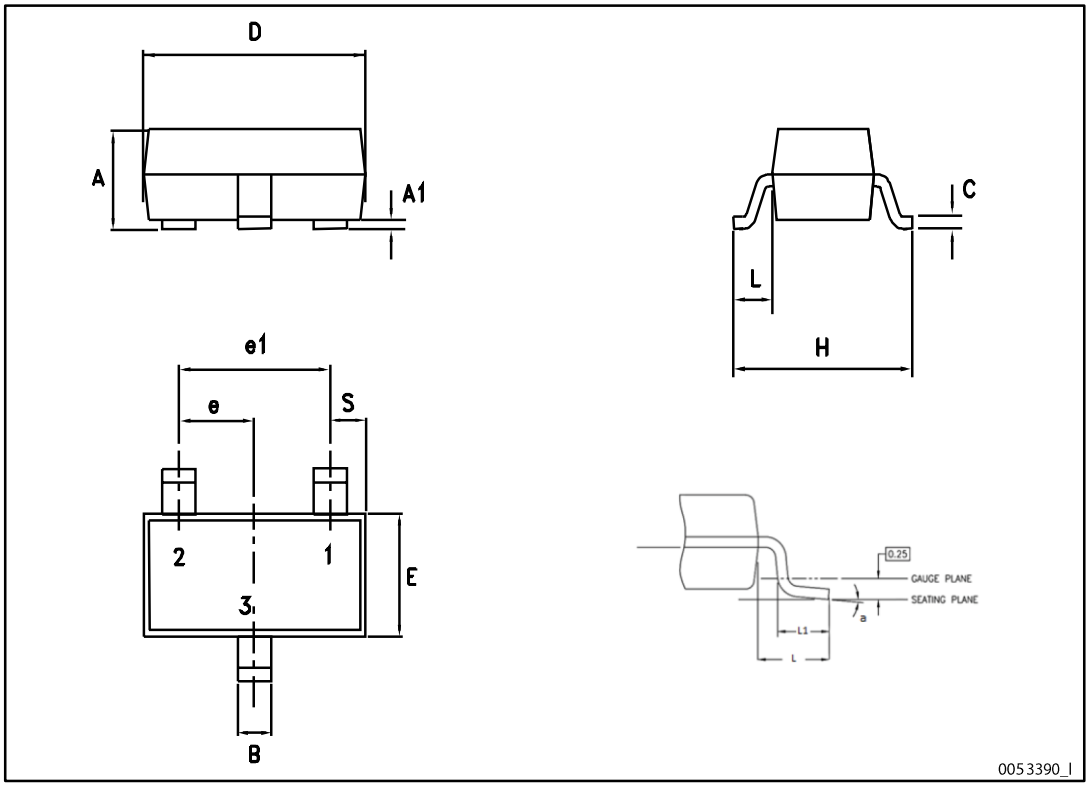
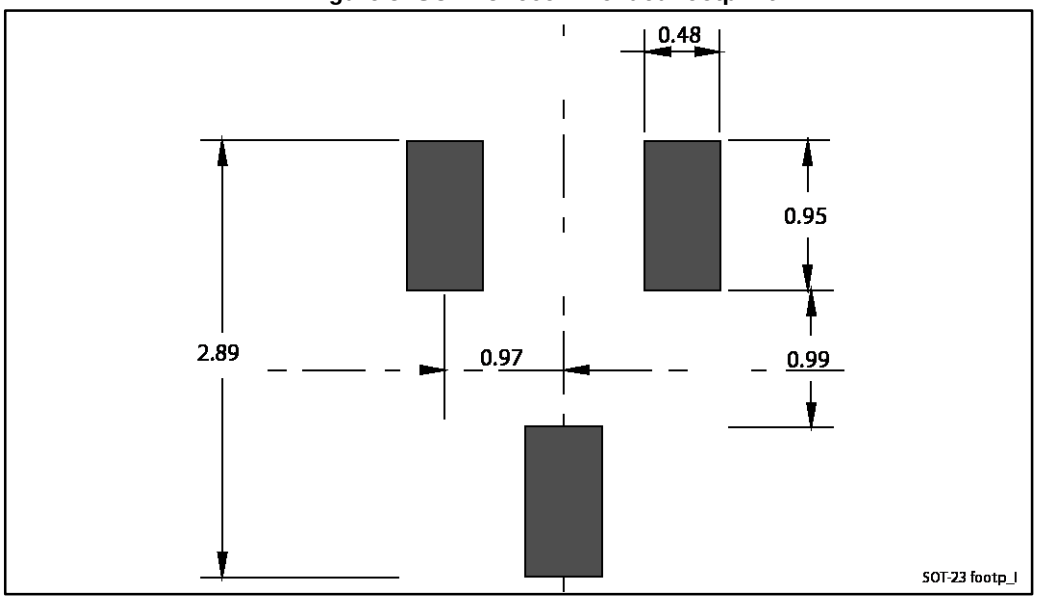


Table 5: SOT-23 mechanical data

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 3: SOT-23 recommended footprint



Dimensions are in mm.

4 Revision history

Table 6: Document revision history

Date	Revision	Changes
18-Jun-2008	1	Initial release
08-May-2014	2	Updated *Section 3: "Package mechanical data"*.
13-Mar-2015	3	Updated marking in *Table 1: "Device summary"*

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.