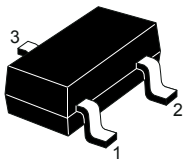
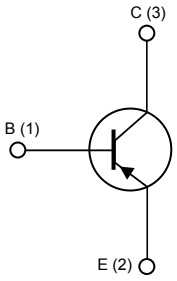
2STR2160

Datasheet

Low voltage fast-switching PNP power transistor



SOT-23



PNPB1C3E2

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.

Product status link
2STR2160

Product summary	
Order code	2STR2160
Marking	2160
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)	-5	V
V_{CBO}	Collector-base voltage (I_E = 0 A)	-60	V
V_{CEO}	Collector-emitter voltage (I_B = 0 A)	-60	V
I_C	Collector current	-1	A
I_{CM}	Collector peak current (t_p < 5 ms)	-2	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} = -60 V, I_E = 0 A			-0.1	µA
I_{EBO}	Emitter cut-off current	V_{EB} = -5 V, I_C = 0 A			-0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage	I_C = -100 µA, I_E = 0 A	-60			V
$V_{(BR)CEO}$(1)	Collector-emitter breakdown voltage	I_B = 0 A, I_C = -10 mA	-60			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_C = 0 A, 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	
$V_{BE(sat)}$	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} = -2 V	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,		220		ns
t_{off}	Turn-off time	I_{B1} = -I_{B2} = -150 mA, $V_{BB(off)}$ = 5 V		500		ns

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

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

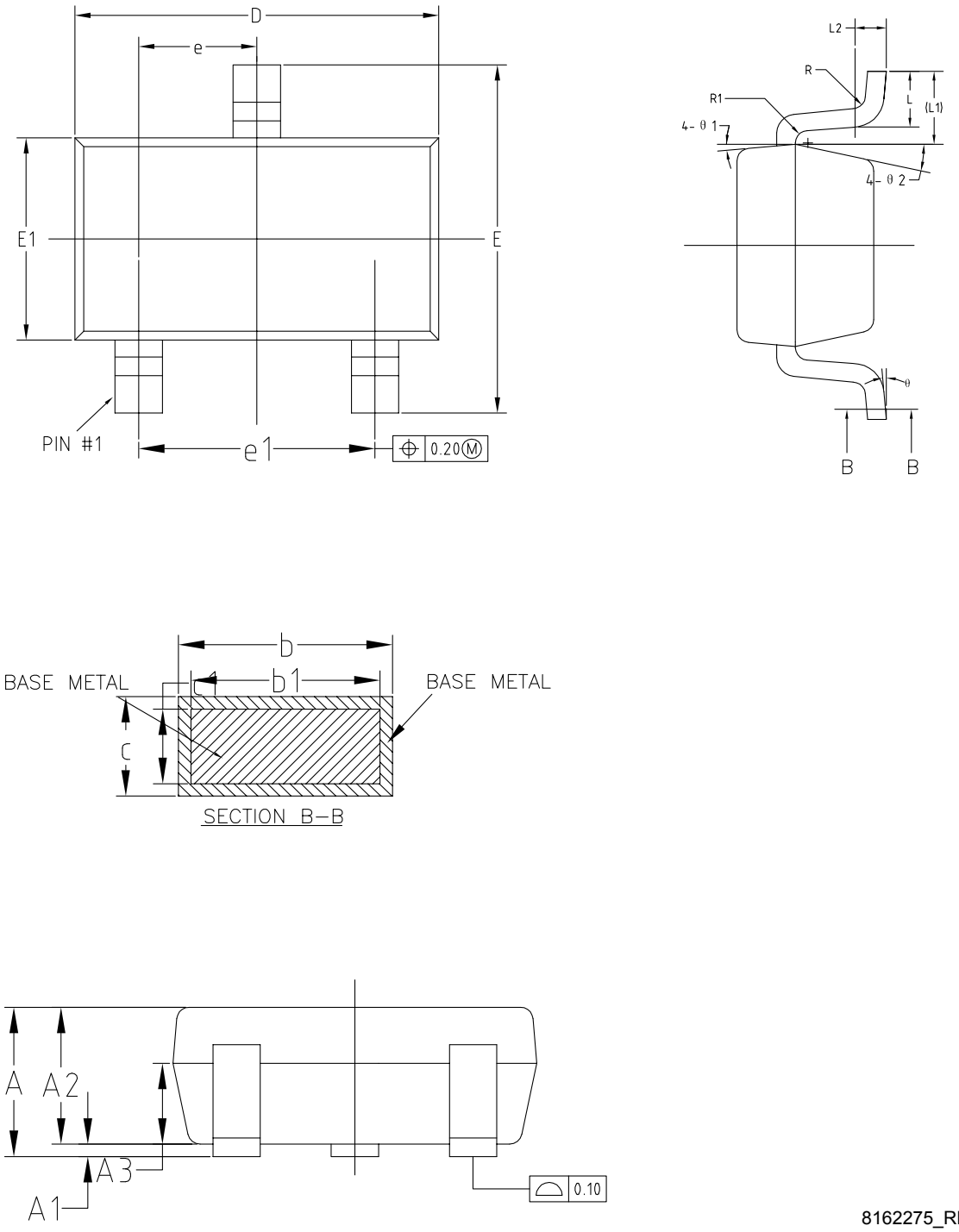


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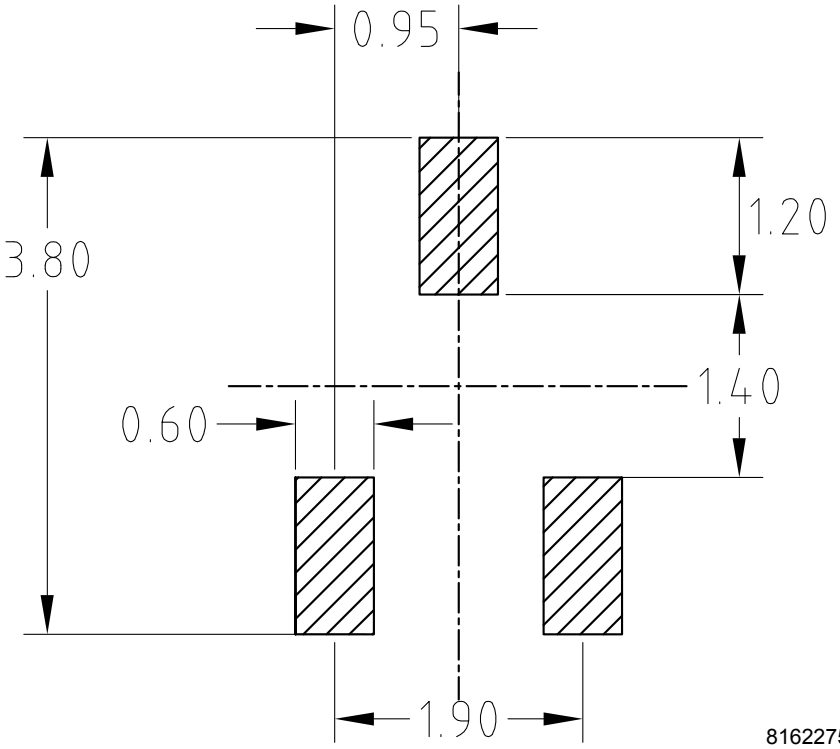
Table 4. **SOT-23 package mechanical data**

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 2. **SOT-23 recommended footprint (dimensions in mm)**



Revision history

Table 5. **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"*
21-Feb-2025	4	Updated Section 3.1: SOT-23 package information. Minor text changes.

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