

Low voltage fast-switching NPN power transistor

Datasheet - production data

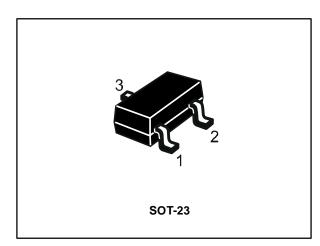
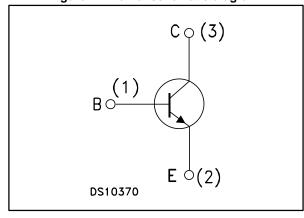


Figure 1: Internal schematic diagram



Features

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

Description

The device in a NPN 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 PNP is the 2STR2160.

Applications

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

Table 1: Device summary

Order code	Marking	Package	Packing
2STR1160	1160	SOT-23	Tape and reel

Electrical ratings 2STR1160

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 (Ic = 0)	5	V
Ic	Collector current	1	Α
I _{CM}	Collector peak current (t _P < 5ms)	2	Α
P _{tot}	Total dissipation at T _{amb} = 25°C	0.5	W
Tstg	Storage temperature	-65 to 150	°C
TJ	Max. operating junction temperature	150	ů

Table 3: Thermal data

Symbol	Parameter	Value	Unit
R _{thj-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)

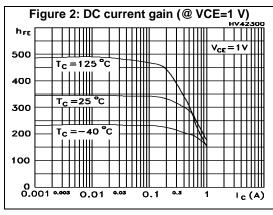
Table 4: Electrical characteristics

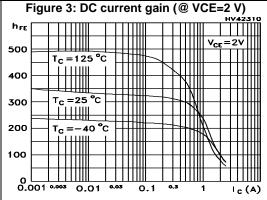
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Ісво	Collector cut-off current (I _E =0)	V _{CB} = 60 V			0.1	μΑ
I _{EBO}	Emitter cut-off current (I _C =0)	V _{EB} = 5 V			0.1	μΑ
V _(BR) CBO	Collector-base breakdown voltage (I _E = 0)	I _C = 100 μA	60			V
V _(BR) CEO ⁽¹⁾	Collector-emitter breakdown voltage (I _B = 0)	I _C = 10 mA	60			٧
V _{(BR)EBO}	Emitter-base breakdown voltage (Ic = 0)	Ι _Ε = 100 μΑ	5			V
V	Collector-emitter	$I_C = 0.5 \text{ A } I_B = 50 \text{ mA}$		130	210	mV
V _{CE(sat)}	saturation voltage	I _C = 1 A I _B = 100 mA		210	430	mV
V _{BE} (sat)	Base-emitter saturation voltage	Ic = 1 A I _B = 100 mA		0.9	1.25	V
		Ic = 0.5 A VcE = 2V	180	250	560	
h _{FE}	DC current gain	I _C = 1 A V _{CE} = 2V	85	130		
		Ic = 2 A VcE = 2V		30		
	Resistive load					
ton	Turn-on time	I _C = 1.5 A V _{CC} = 10 V		220		ns
t off	Turn-off time	$I_{B1} = -I_{B2} = 150 \text{ mA}$ $V_{BB(off)} = -5 \text{ V}$		500		ns

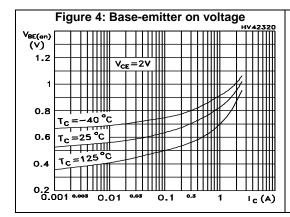
Notes:

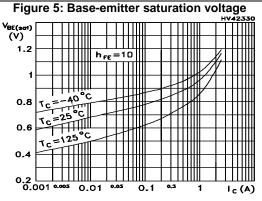
 $^{^{(1)}\}text{Pulse}$ test: pulse duration = 300 $\mu\text{s},$ duty cycle \leq 1.5 %%

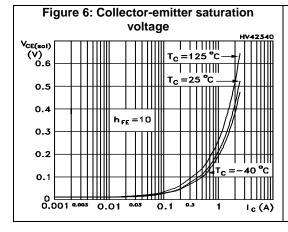
2.1 Typical characteristic (curves)

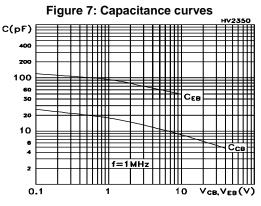


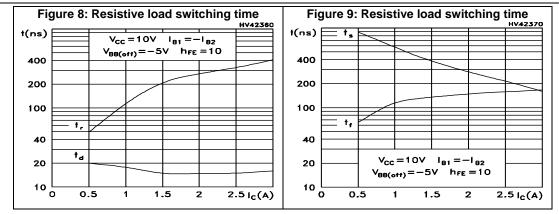












3 Package mechanical data

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3.1 SOT-23 mechanical data

A PART C L H H S GAUGE PLANE

SEATING PLANE

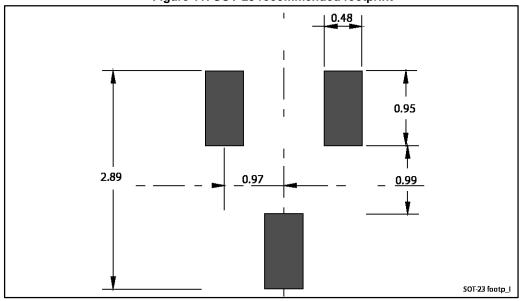
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Figure 10: SOT-23 mechanical drawing

Table 5: SOT-23 mechanical data

Table 5. 551 25 mediamon data				
Dim.	mm			
Dilli.	Min.	Тур.	Max.	
А	0.89		1.40	
A1	0		0.10	
В	0.30		0.51	
С	0.085		0.18	
D	2.75		3.04	
е	0.85		1.05	
e1	1.70		2.10	
Е	1.20		1.75	
Н	2.10		3.00	
L		0.60		
S	0.35		0.65	
L1	0.25		0.55	
а	0°		8°	

Figure 11: SOT-23 recommended footprint





Dimensions are in mm.

Revision history 2STR1160

4 Revision history

Table 6: Document revision history

Date	Revision	Changes
12-Feb-2008	1	Initial release
08-May-2014	2	Updated Section 3: "Package mechanical data".
01-Apr-2015	3	Updated marking in Table 1: "Device summary"

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