

Low voltage fast-switching PNP power transistors

Datasheet - production data

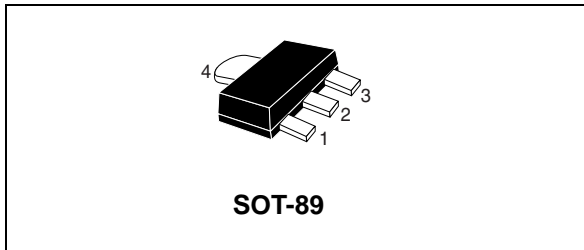
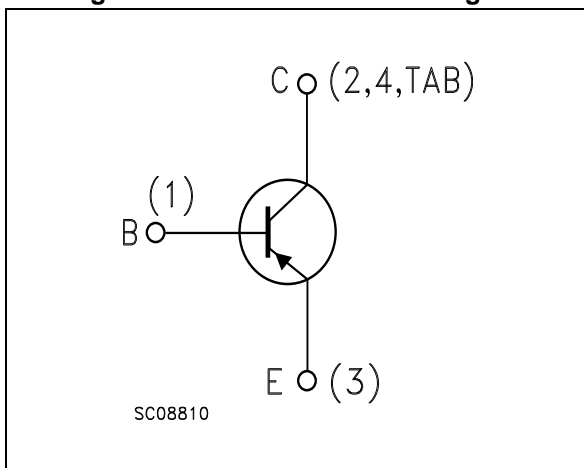


Figure 1. Internal schematic diagram



Applications

- Emergency lighting
- LED
- Voltage regulation
- Relay drive

Description

The device is PNP transistor manufactured using new "PB-HDC" (power bipolar high density current) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast-switching speed

Table 1. Device summary

Order code	Marking	Package	Packaging
2STF2360	2360	SOT-89	Tape and reel

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1 Absolute maximum ratings

Table 2. Absolute maximum ratings

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 ($I_C = 0$)	-6	V
I_C	Collector current	-3	A
I_{CM}	Collector peak current ($t_p < 5$ ms)	-5	A
I_B	Base current	-0.2	A
I_{BM}	Base peak current ($t_p < 5$ ms)	-0.4	A
P_{TOT}	Total dissipation at $T_{amb} = 25$ °C	1.4	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	SOT-89	Unit
$R_{thJA}^{(1)}$	Thermal resistance junction-ambient Max	89	°C/W

1. Device mounted on a PCB area of 1 cm²

2 Electrical characteristics

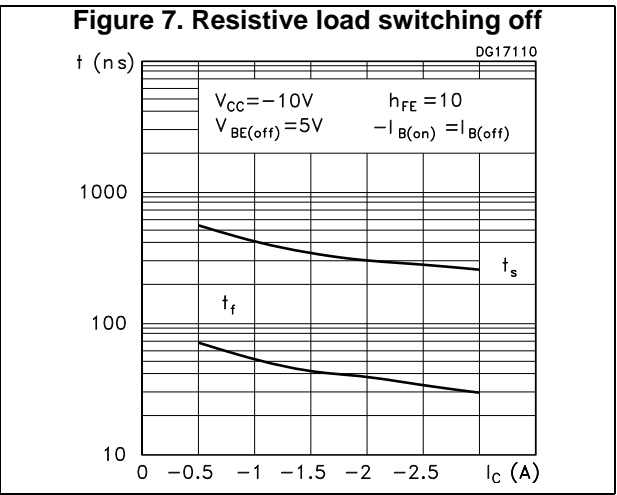
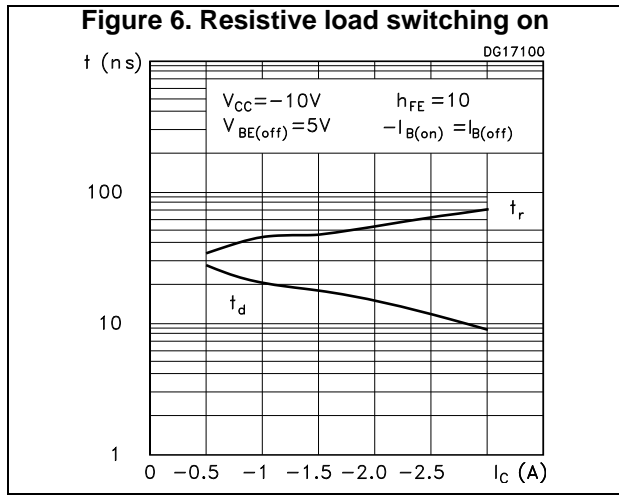
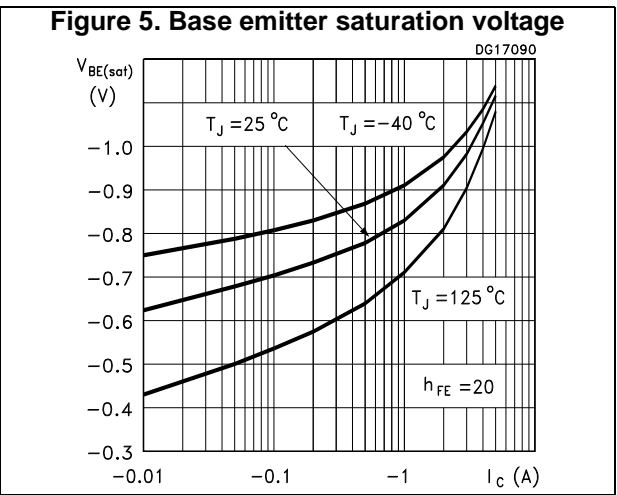
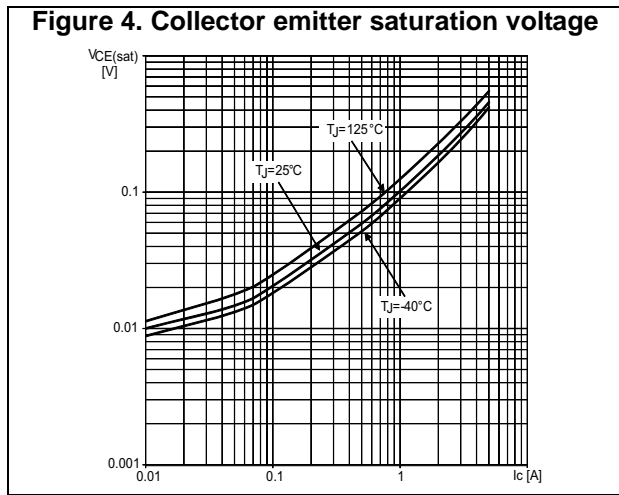
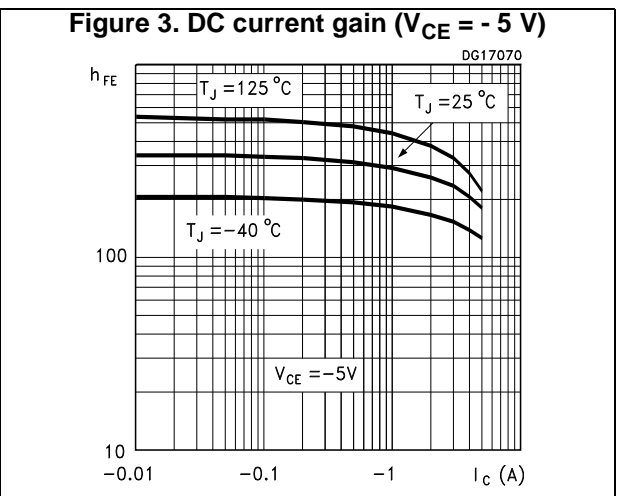
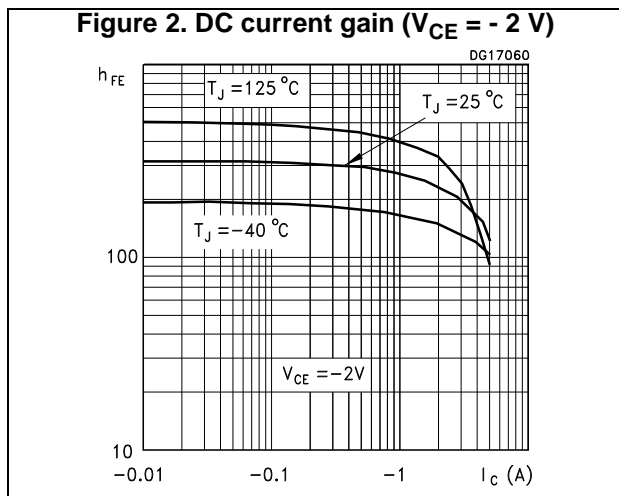
$T_{CASE} = 25^{\circ}C$; unless otherwise specified.

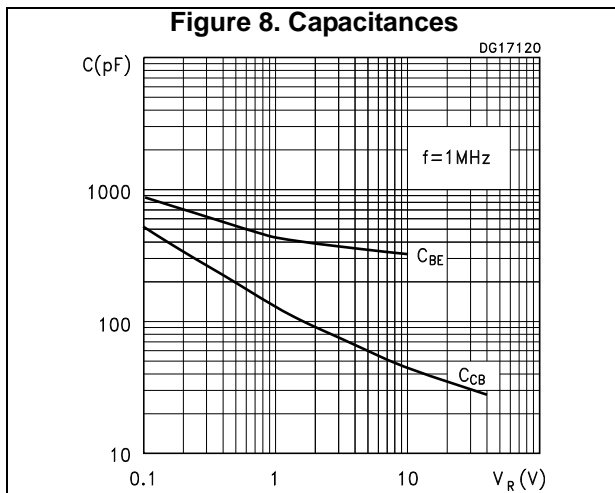
Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_E = 0$)	$V_{CB} = -60\text{ V}$			-100	nA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = -6\text{ V}$			-100	nA
$V_{BE(on)}$	Base-emitter on voltage	$V_{CE} = -2\text{ V}$ $I_C = -100\text{ mA}$	-630	-650	-730	mV
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = -2\text{ A}$ $I_B = -100\text{ mA}$ $I_C = -3\text{ A}$ $I_B = -150\text{ mA}$		-200 -300	-320 -500	mV mV
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = -2\text{ A}$ $I_B = -100\text{ mA}$		-0.9	-1.2	V
$h_{FE}^{(1)}$	DC current gain	$I_C = -100\text{ mA}$ $V_{CE} = -2\text{ V}$ $I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$	200 160		400	
t_d	Resistive load Delay time	$I_C = -3\text{ A}$ $V_{CC} = -10\text{ V}$ $I_{B(on)} = -I_{B(off)} = -300\text{ mA}$ $V_{BE(off)} = 5\text{ V}$		10	15	ns
t_r	Rise time			75	100	ns
t_s	Storage time			250	350	ns
t_f	Fall time			35	50	ns
f_T	Transition frequency	$I_C = -0.1\text{ A}$ $V_{CE} = -10\text{ V}$		130		MHz

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

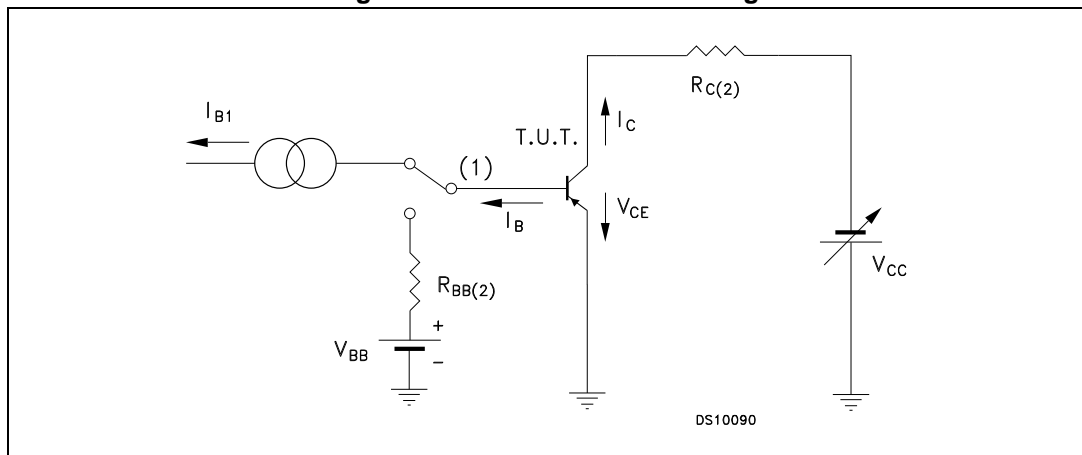
2.1 Typical characteristics (curves)





2.2 Test circuits

Figure 9. Resistive load switching



1. Fast electronic switch
2. Non-inductive resistor

3 Package mechanical data

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3.1 SOT-89

Figure 10. SOT-89 package outline

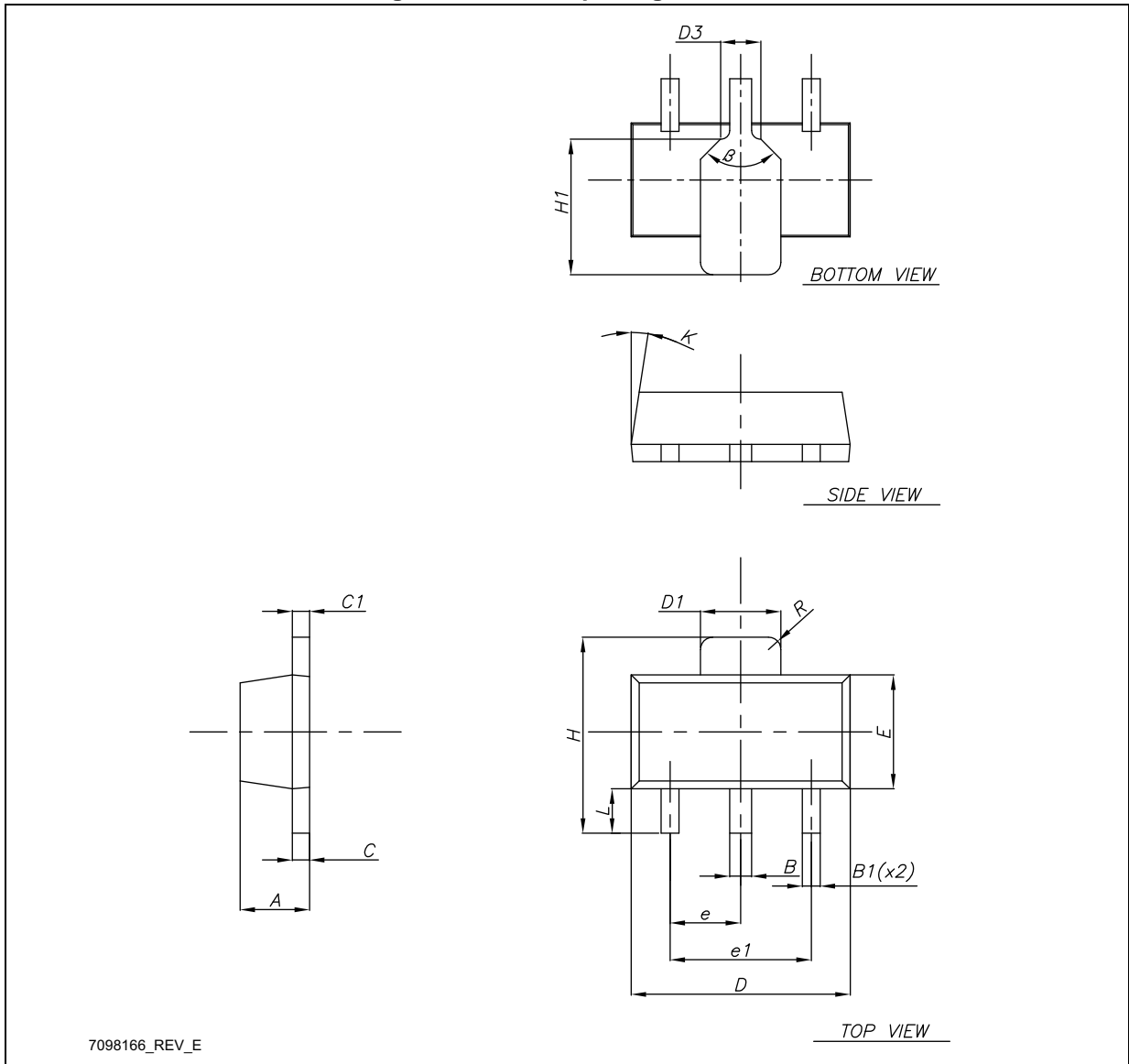
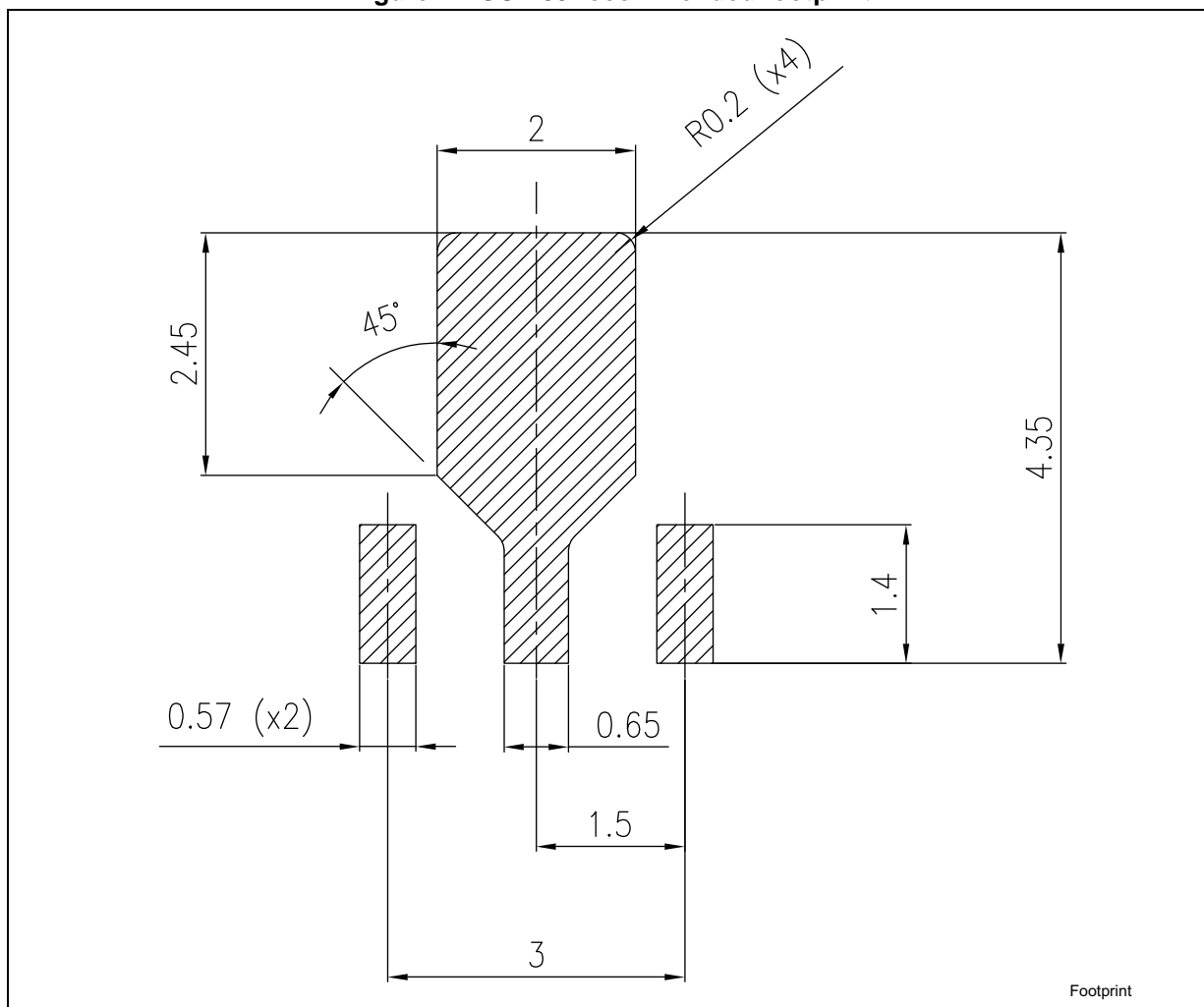


Table 5. SOT-89 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	1.40		1.60
B	0.44		0.56
B1	0.36		0.48
C	0.35		0.44
C1	0.35		0.44
D	4.40		4.60
D1	1.62		1.83
D3		0.90	
E	2.29		2.60
e	1.42		1.57
e1	2.92		3.07
H	3.94		4.25
H1	2.70		3.10
K	1°		8°
L	0.89		1.20
R		0.25	
b		90°	

Figure 11. SOT-89 recommended footprint



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
13-Sep-2006	1	Initial release
02-Mar-2007	2	New graphics have been added
23-Jan-2009	3	Updated mechanical data
09-Oct-2009	4	Added 2STD2360T4 in TO-252 (DPAK) package
14-Oct-2009	5	Modified Table 1 on page 1 .
05-Dec-2014	6	Removed SOT-223 and TO-250 (DPAK) packages. Update description in cover page, Table 1: Device summary , Section 1: Absolute maximum ratings , Table 4: Electrical characteristics , Section 2.1: Typical characteristics (curves) and Section 3: Package mechanical data . Minor text changes.

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