

Low voltage fast-switching PNP power transistors

Datasheet - production data

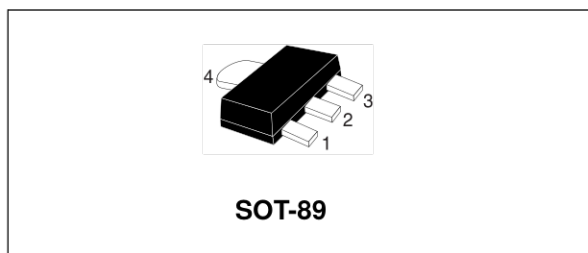
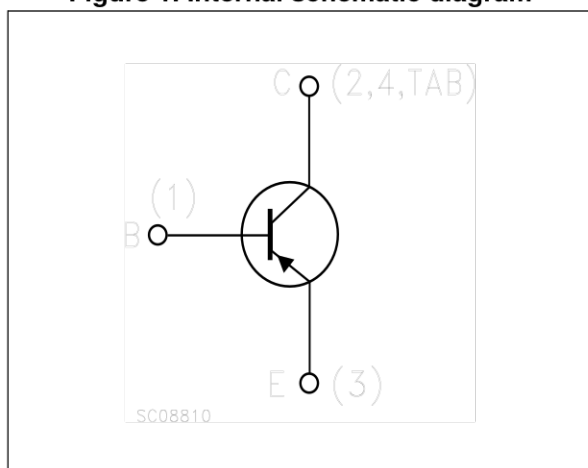


Figure 1. Internal schematic diagram



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

$T_{CASE} = 25^{\circ}\text{C}$; 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	$I_C = -2\text{ A}$ $I_B = -100\text{ mA}$		-200	-320	mV
		$I_C = -3\text{ A}$ $I_B = -150\text{ mA}$		-300	-500	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	$I_C = -100\text{ mA}$ $V_{CE} = -2\text{ V}$	200			
		$I_C = -1\text{ A}$ $V_{CE} = -2\text{ V}$	160		400	
t_d	Resistive load Delay time	$I_C = -3\text{ A}$ $V_{CC} = -10\text{ V}$		10	15	ns
t_r	Rise time	$I_{B(on)} = -I_{B(off)} = -300\text{ mA}$		75	100	ns
t_s	Storage time	$V_{BE(off)} = 5\text{ V}$		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)

Figure 2. DC current gain ($V_{CE} = -2\text{ V}$)

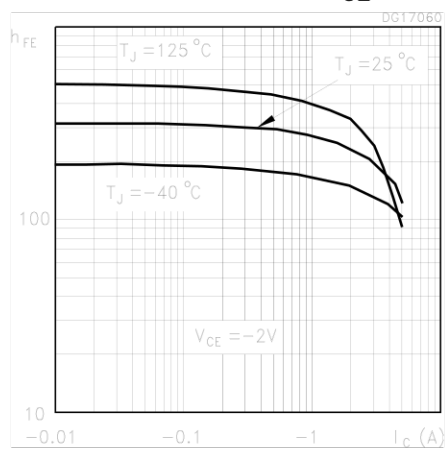


Figure 3. DC current gain ($V_{CE} = -5\text{ V}$)

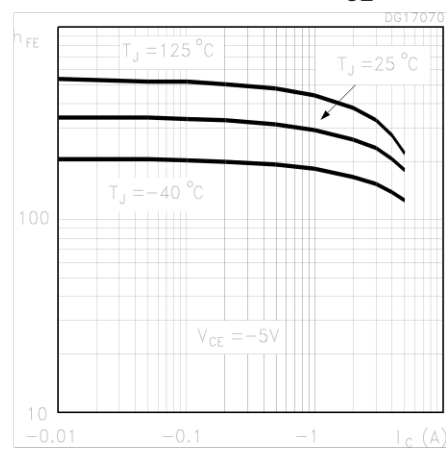


Figure 4. Collector emitter saturation voltage

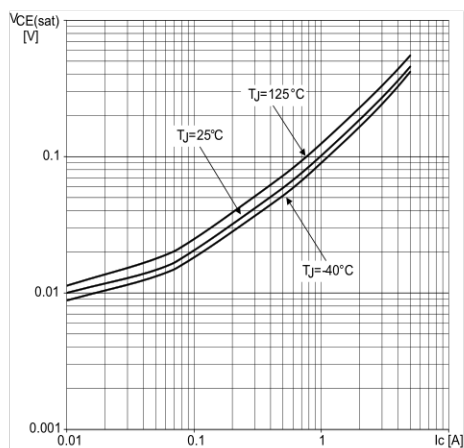


Figure 5. Base emitter saturation voltage

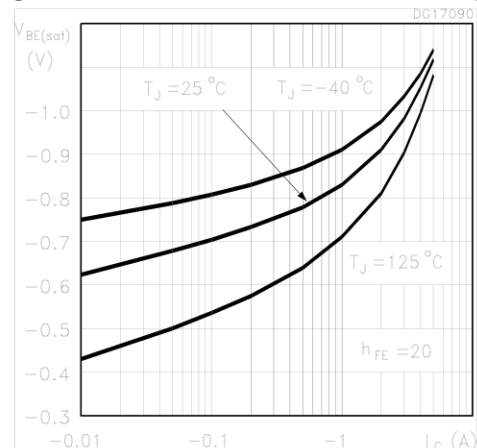


Figure 6. Resistive load switching on

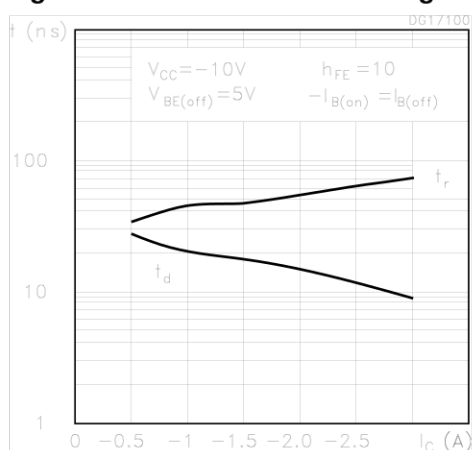
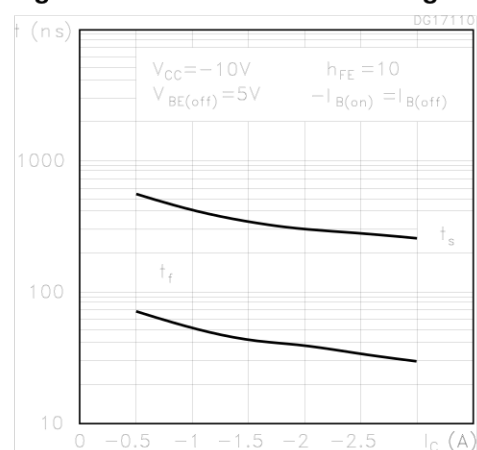
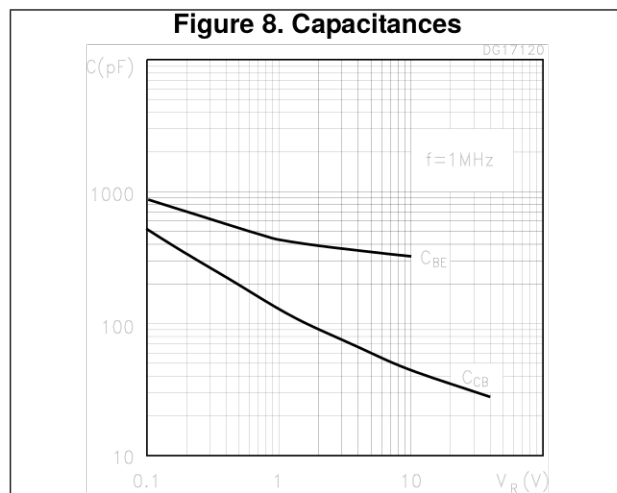


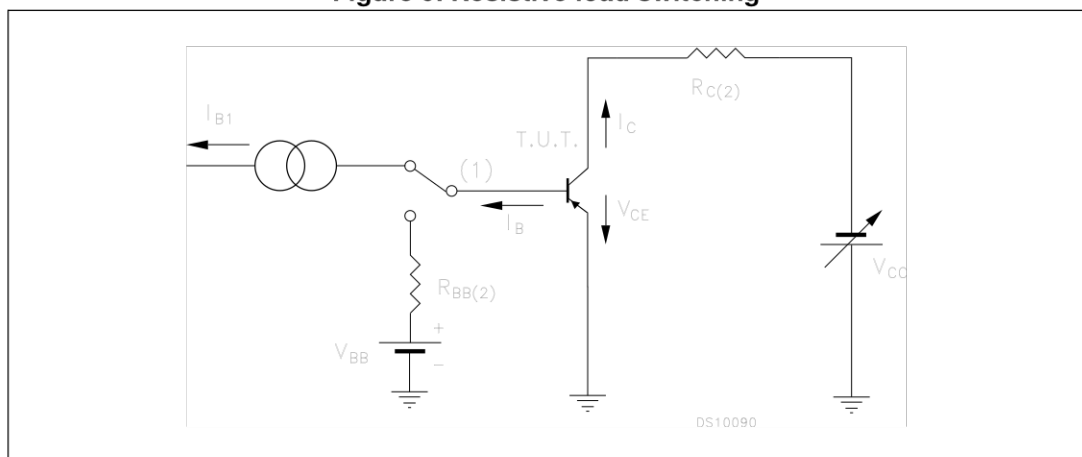
Figure 7. Resistive load switching off





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

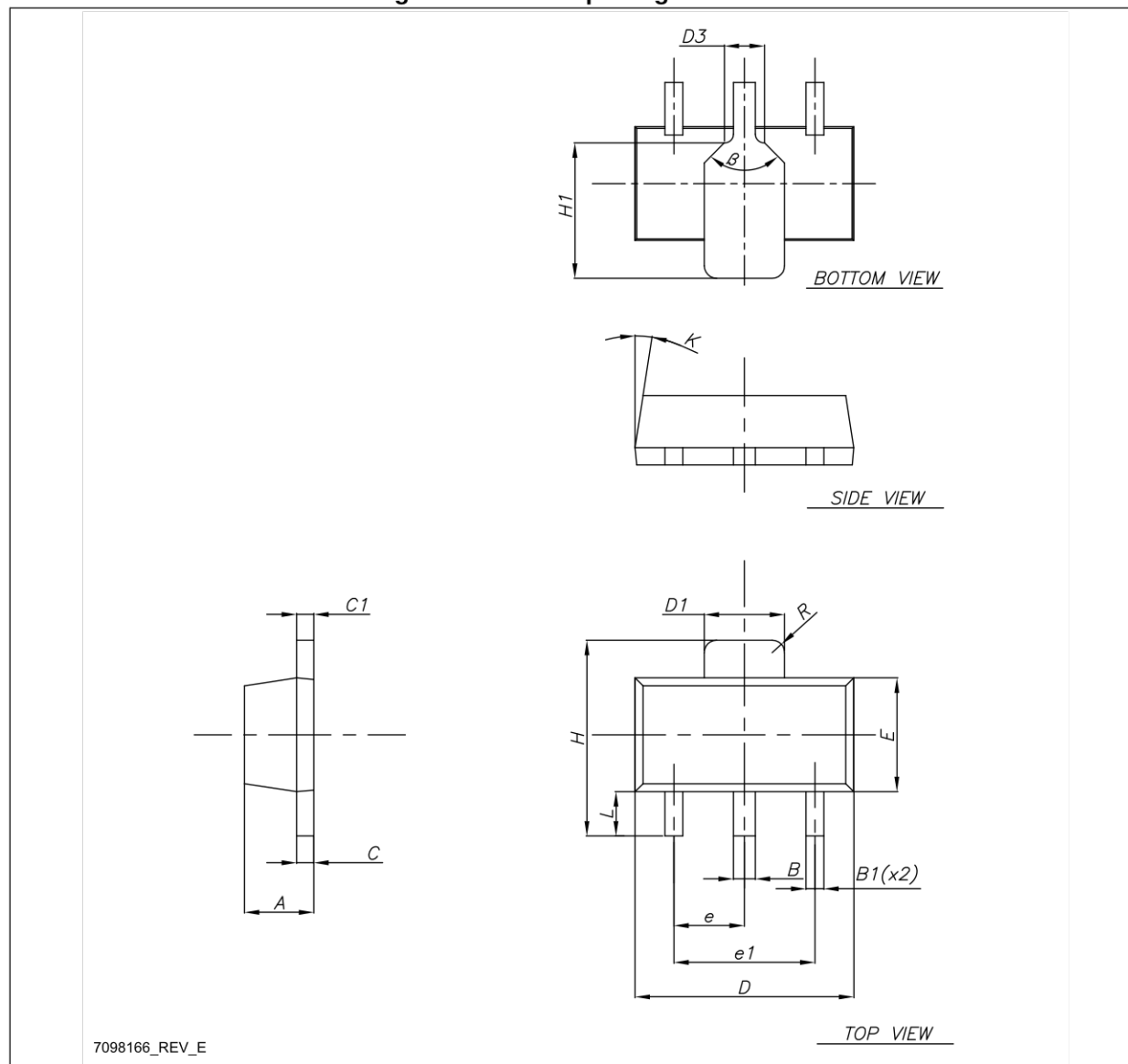
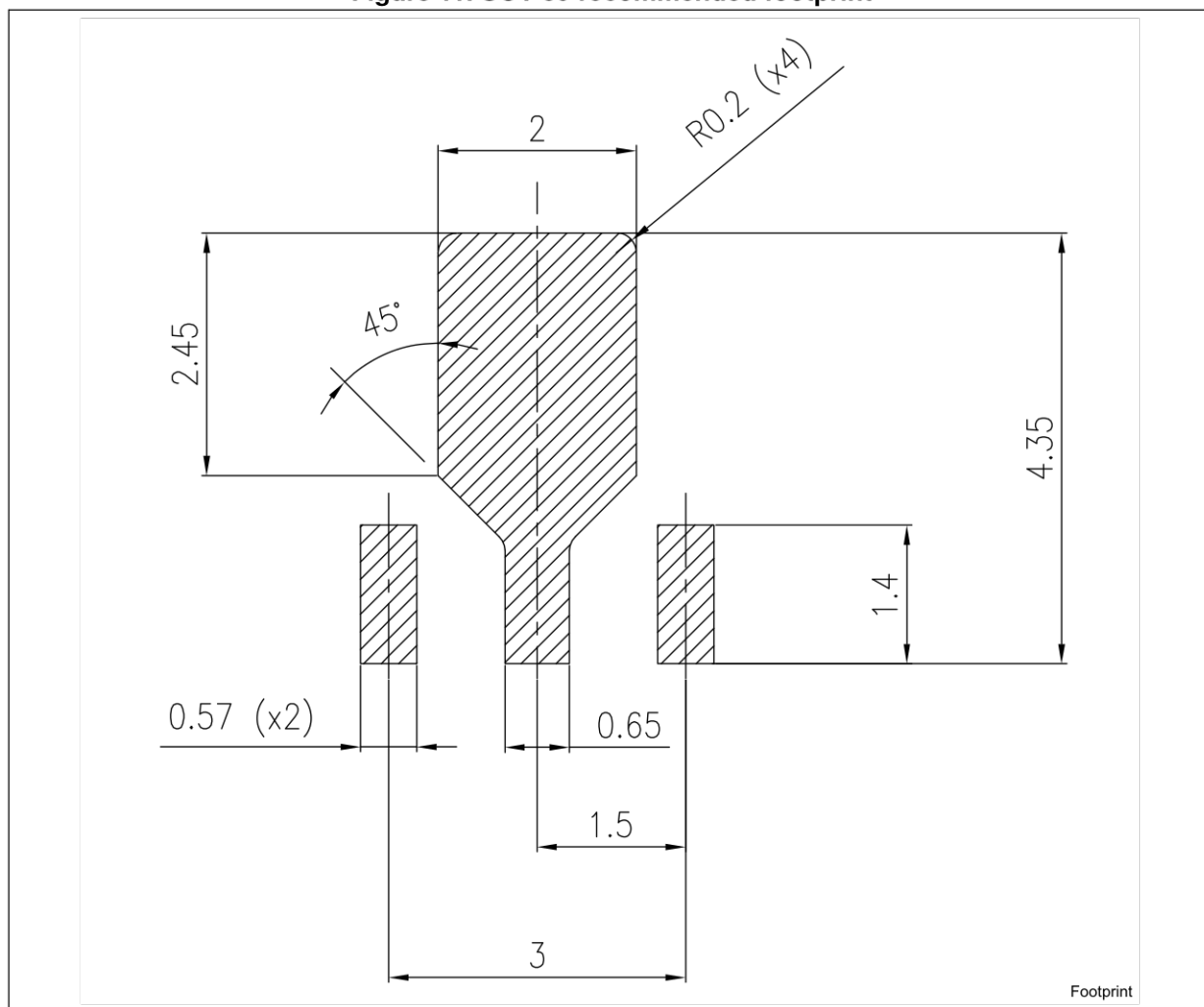


Table 5. SOT-89 mechanical data

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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