2STF2360
2STN2360

Low voltage fast-switching PNP power transistors

Features

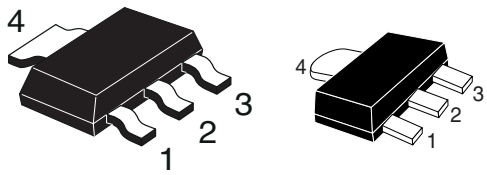
- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast-switching speed
- Surface mounting devices in medium power SOT-223 and SOT-89 packages

Applications

- Emergency lighting
- LED
- CCFL drivers (back lighting)
- Voltage regulation
- Relay driver

Description

The 2STF2360 and 2STN2360 are PNP transistors 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.



SOT-223 SOT-89

Figure 1. Internal schematic diagram

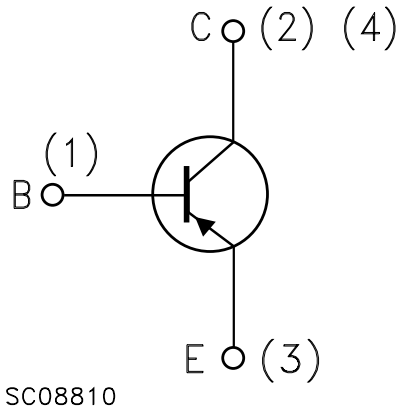


Table 1. Device summary

Part number	Marking	Package	Packaging
2STF2360 2STN2360	2360 N2360	SOT-89 SOT-223	Tape and reel

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		2STF2360	2STN2360	
		SOT-89	SOT-223	
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 < 5ms)	-5		A
I_B	Base current	-0.2		A
I_{BM}	Base peak current (t_P < 5ms)	-0.4		A
P_{TOT}	Total dissipation at T_{amb} = 25°C	1.4	1.6	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	SOT-223	Unit
$R_{thJ\text{-}amb}$ (1)	Thermal resistance junction-ambient	Max	89	78	°C/W

1. Device mounted on a 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} = -60V			-100	nA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = -6V			-100	nA
$V_{BE(on)}$	Base-emitter on voltage	V_{CE} = -2V I_C = -100mA	-630	-670	-730	mV
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = -2A I_B = -100mA I_C = -3A I_B = -150mA		-250 -350	-320 -500	mV mV
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = -2A I_B = -100mA		-0.89	-1.2	V
h_{FE} (1)	DC current gain	I_C = -100mA V_{CE} = -2V I_C = -1A V_{CE} = -2V	80 160	 280	 400	
	Resistive load					
t_d	Delay time			10	15	ns
t_r	Rise time	I_C = -3A V_{CC} = -10V		75	100	ns
t_s	Storage time			250	350	ns
t_f	Fall time			35	50	ns
f_T	Transition frequency	I_C = -0.1A V_{CE} =-10V		130		MHz

1. Pulsed duration = 300 µs, duty cycle ≤ 1.5%

2.1 Typical characteristics (curves)

Figure 2. DC current gain

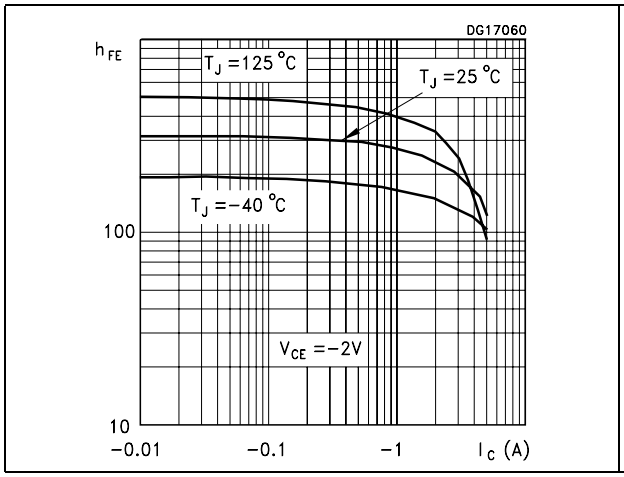


Figure 3. DC current gain

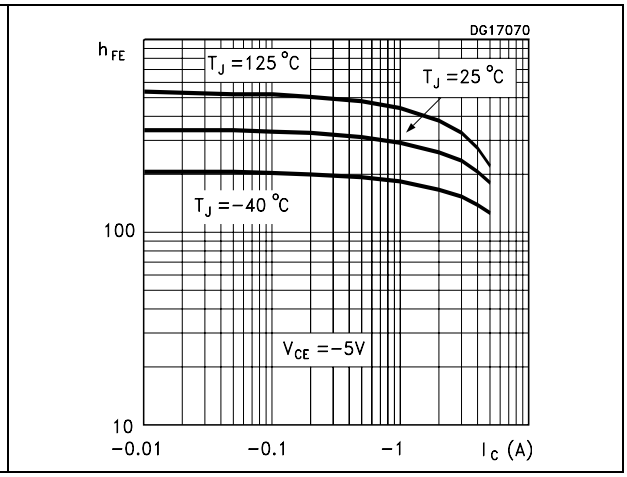


Figure 4. Collector emitter saturation voltage

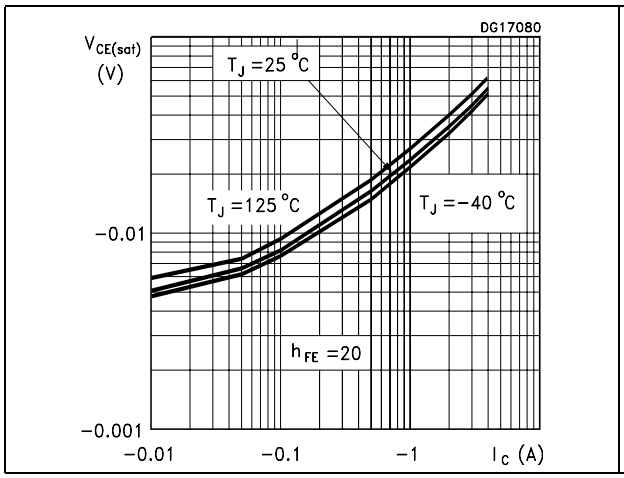


Figure 5. Base emitter saturation voltage

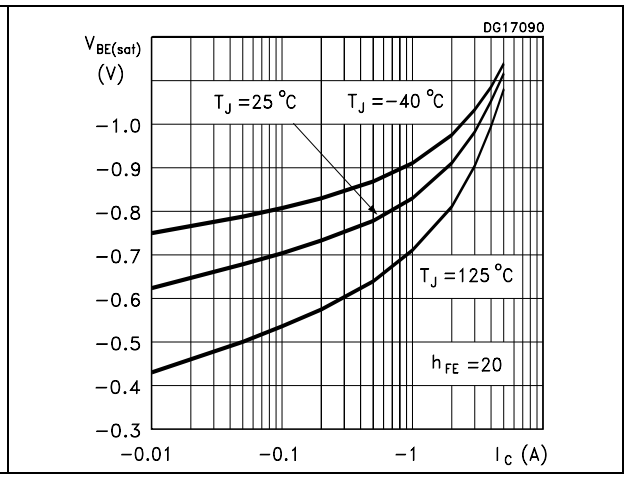


Figure 6. Resistive load switching times

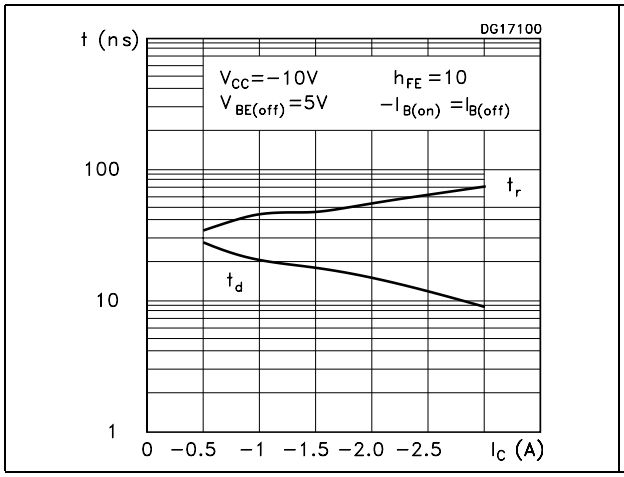


Figure 7. Resistive load switching times

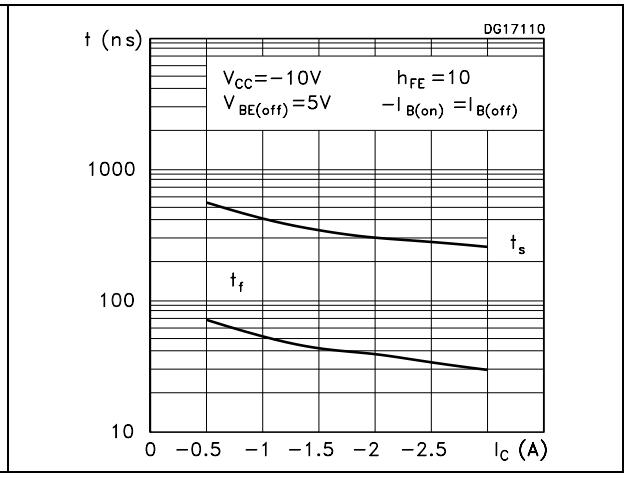
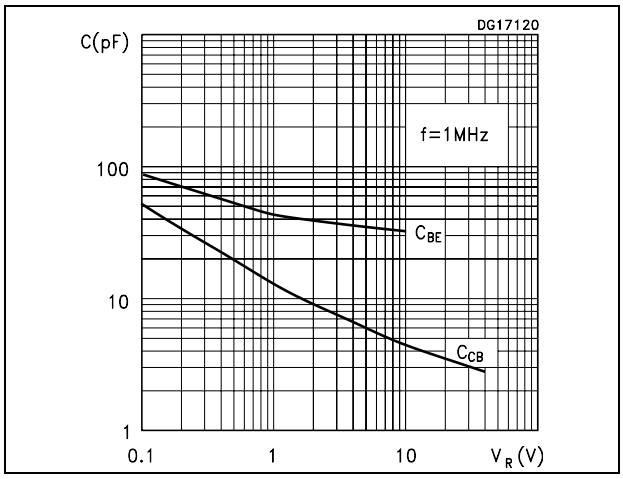


Figure 8. Capacitances



3 Package mechanical data

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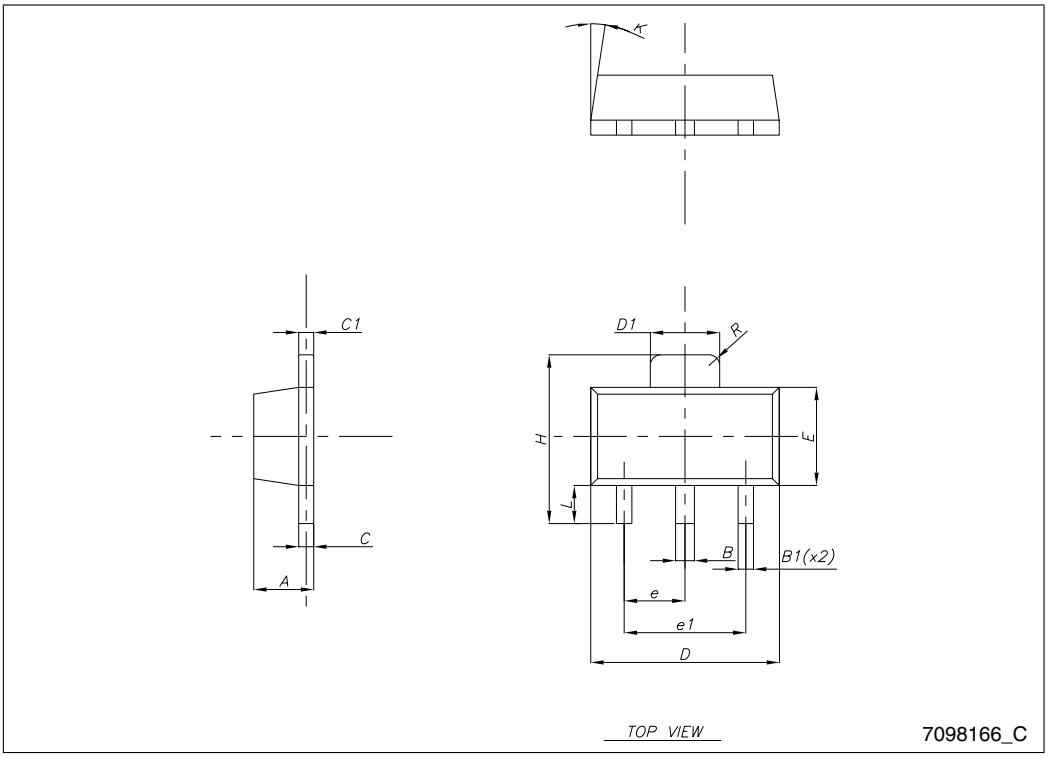
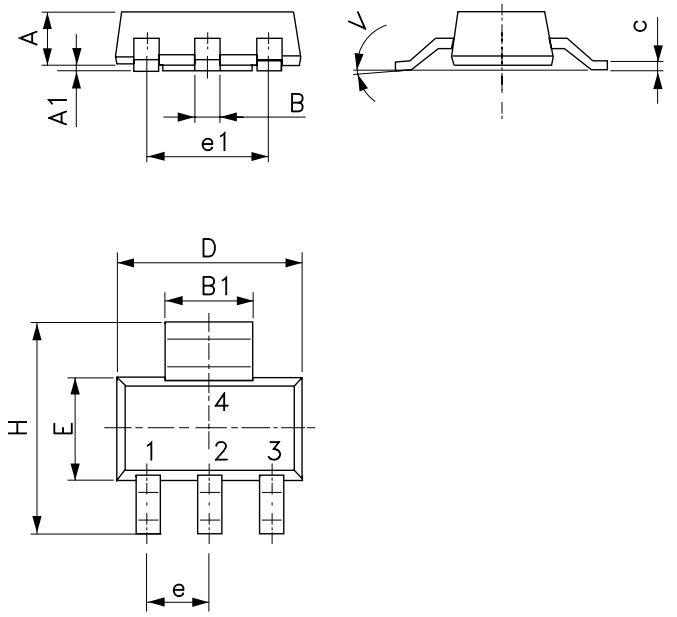
SOT-89 mechanical data

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
E	2.29		2.60
e	1.42		1.57
e1	2.92		3.07
H	3.94		4.25
K	1°		8°
L	0.89		1.20
R		0.25	



SOT-223 mechanical data

DIM.	mm.		
	min.	typ	max.
A			1.80
A1	0.02		0.1
B	0.60	0.70	0.85
B1	2.90	3.00	3.15
c	0.24	0.26	0.35
D	6.30	6.50	6.70
e		2.30	
e1		4.60	
E	3.30	3.50	3.70
H	6.70	7.00	7.30
V			10 °



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4 Revision history

Table 5. 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

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