STN9360

High voltage fast-switching PNP power transistor

Datasheet — production data

Features

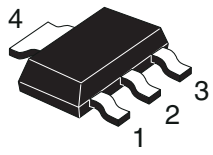
- High voltage capability
- Fast switching speed

Applications

- Lighting
- Switch mode power supply

Description

This device is a high voltage fast-switching PNP power transistor. It is manufactured using high voltage multi epitaxial planar technology for high switching speeds and medium voltage capability. It uses a cellular emitter structure with planar edge termination to enhance switching speeds while maintaining a wide RBSOA. The device is designed for use in lighting applications and low cost switch-mode power supplies.



SOT-223

Figure 1. Internal schematic diagram

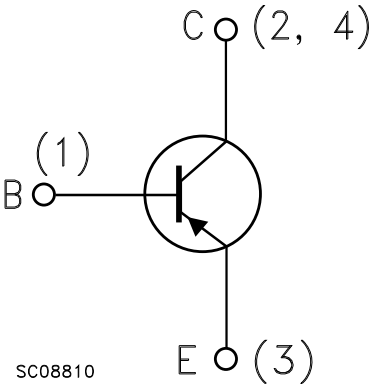


Table 1. Device summary

Part number	Marking	Package	Packaging
STN9360	N9360	SOT-223	Tape and reel

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	-600	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	-600	V
V_{EBO}	Emitter-base voltage (I_C = 0)	-7	V
I_C	Collector current	-0.5	A
I_{CM}	Collector peak current (t_P < 5 ms)	-1	A
I_B	Base current	-0.25	A
I_{BM}	Base peak current (t_P < 5 ms)	-0.5	A
P_{TOT}	Total dissipation at T_a = 25 °C	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	Value	Unit
R_{thJA}	Thermal resistance junction-ambient (1) max	78	°C/W

1. Device mounted on PCB area of 1 cm² .

2 Electrical characteristics

T_{case} = 25 °C unless otherwise specified.

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = -600 V			-10	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = -7 V			-1	µA
$V_{CE(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = -10 mA	-600			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = -100 mA I_B = -10 mA			-0.5	V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = -100 mA I_B = -10 mA			-1	V
h_{FE}	DC current gain	I_C = -1 mA V_{CE} = -5 V I_C = -10 mA V_{CE} = -5 V I_C = -20 mA V_{CE} = -5 V	170 120	200		
 t_r t_s t_f	Resistive load Rise time Storage time Fall time	 V_{CC}=-200 V, I_C=-0.1 A I_{B1}=-10 mA, I_{B2}=20 mA T_p=30 µs		 45 3.15 160		 ns µs ns

1. Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2 %.

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

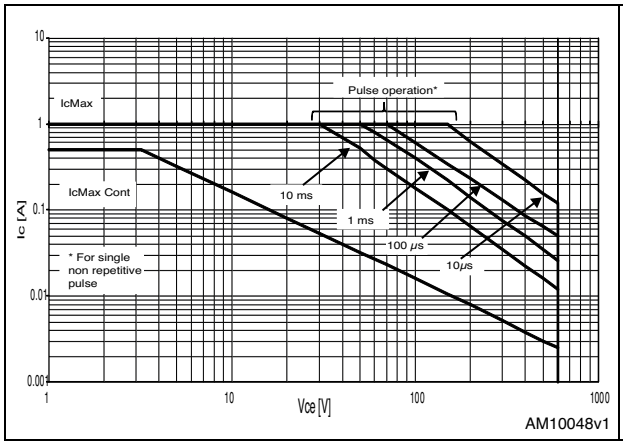


Figure 3. Derating curve

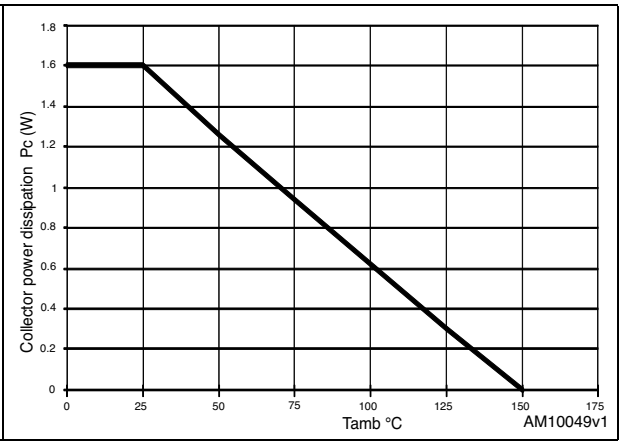


Figure 4. Output curves up to V_{CE}= 0.5 V

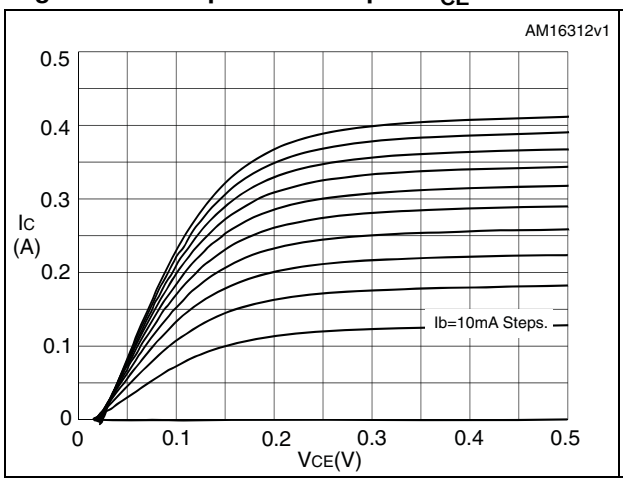


Figure 5. Output curves up to V_{CE}= 5 V

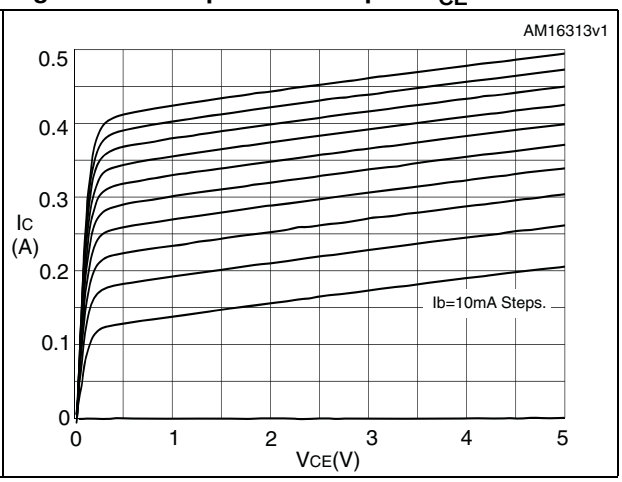


Figure 6. DC current gain (V_{CE} = 1 V)

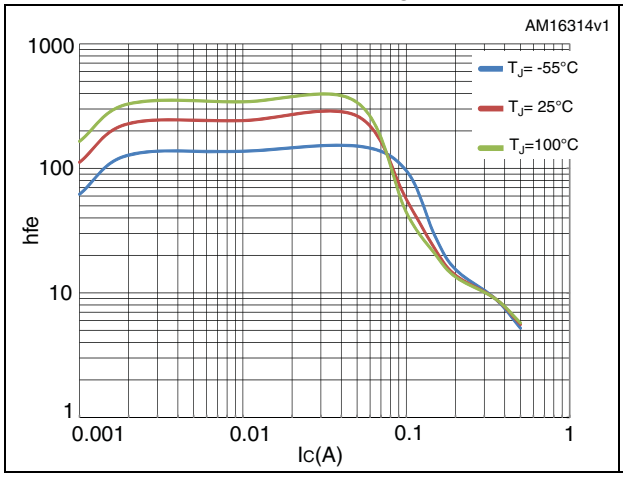


Figure 7. DC current gain (V_{CE} = 5 V)

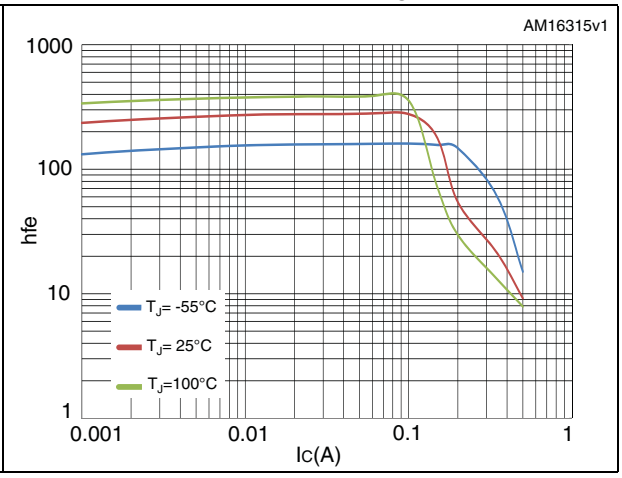


Figure 8. Collector-emitter saturation voltage

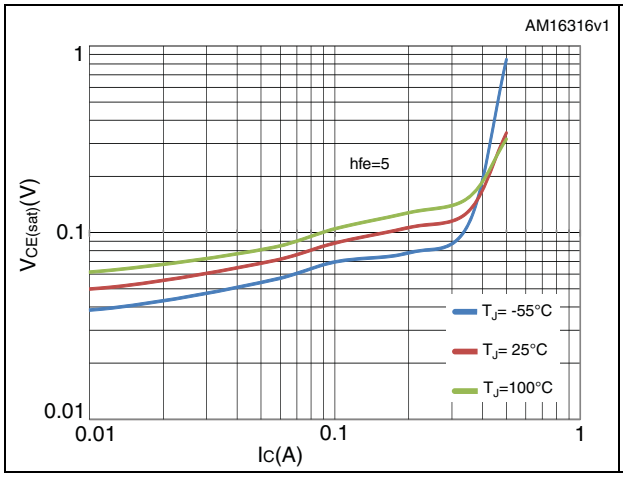


Figure 9. Base-emitter saturation voltage

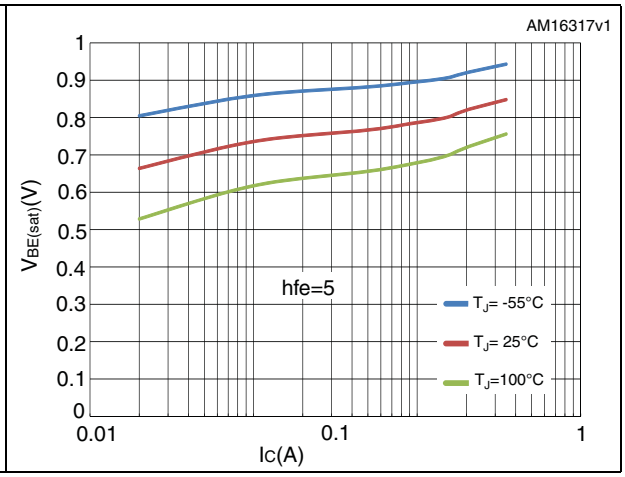


Figure 10. Base-emitter on voltage

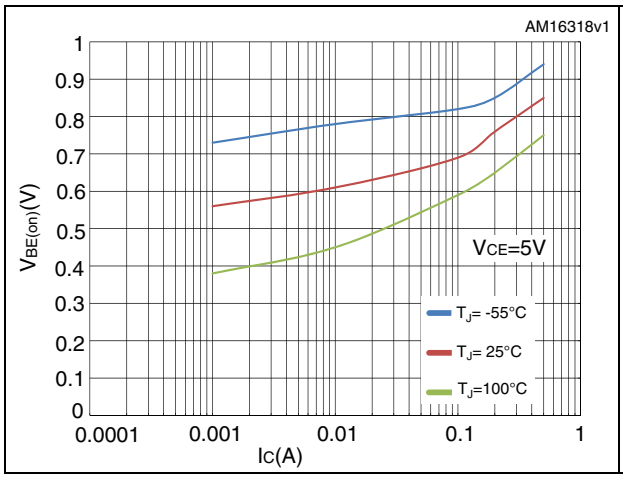


Figure 11. Capacitance variation

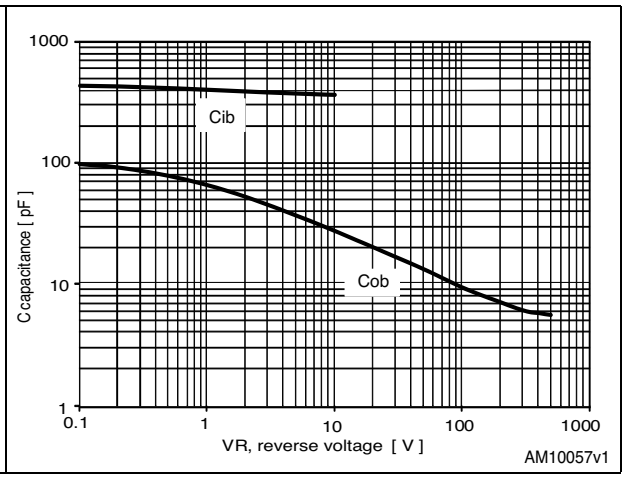
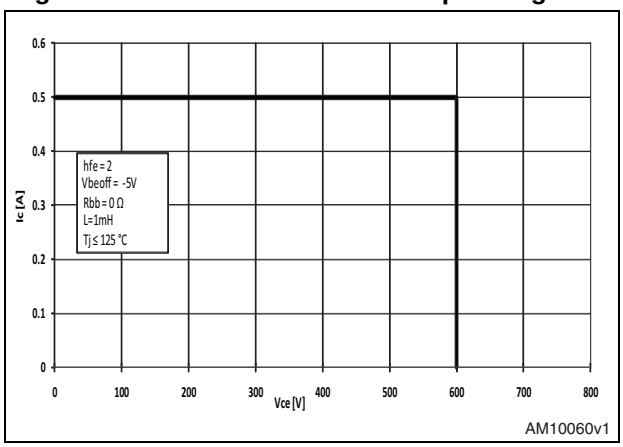
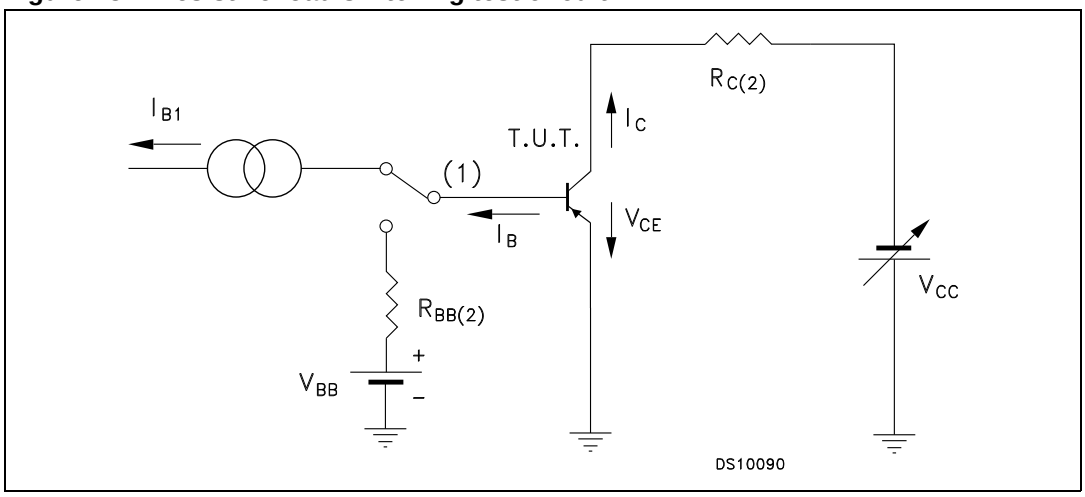


Figure 12. Reverse biased safe operating area



2.2 Test circuits

Figure 13. Resistive load switching test circuit



1. Fast electronic switching
2. Non-inductive resistor

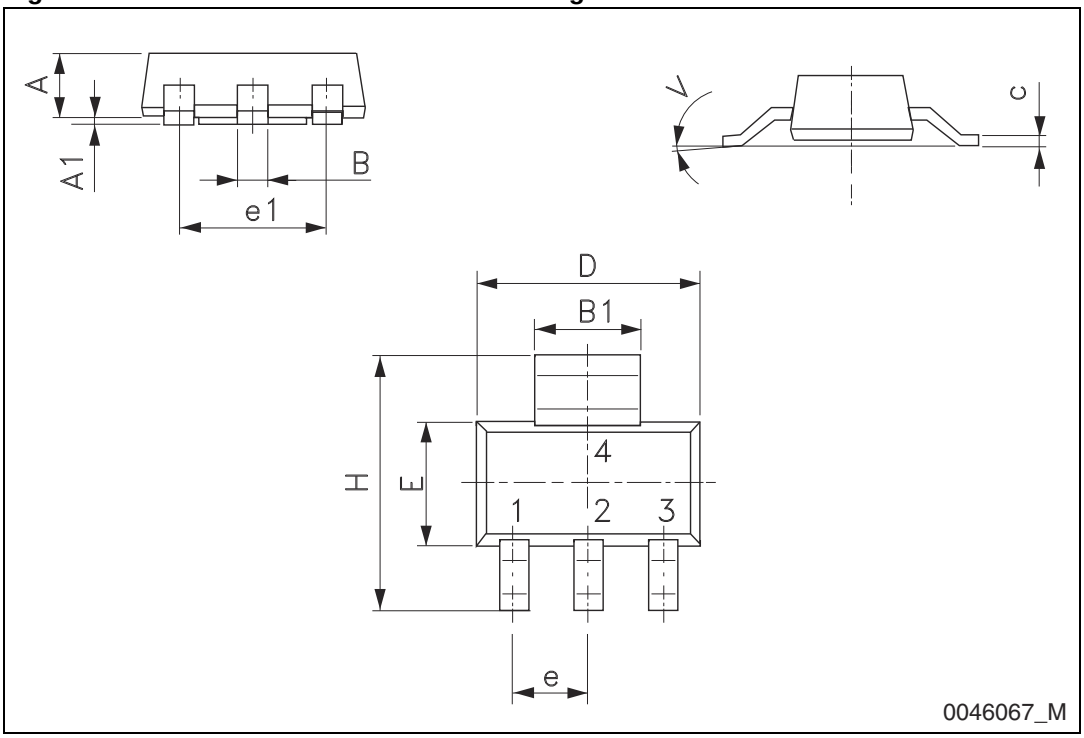
3 Package mechanical data

In order 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.

Table 5. 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°

Figure 14. SOT-223 mechanical data drawing



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
21-May-2012	1	Initial release.
06-Dec-2012	2	Document status promoted from preliminary data to datasheet.

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