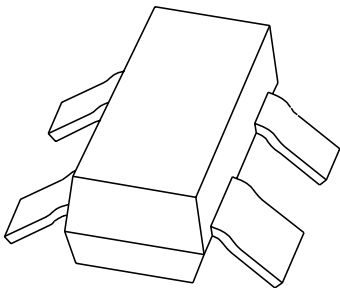


# DATA SHEET



**BRY62**

**Silicon controlled switch**

Product specification  
Supersedes data of September 1994  
File under Discrete Semiconductors, SC04

1997 Jul 21

# Silicon controlled switch

# BRY62

### DESCRIPTION

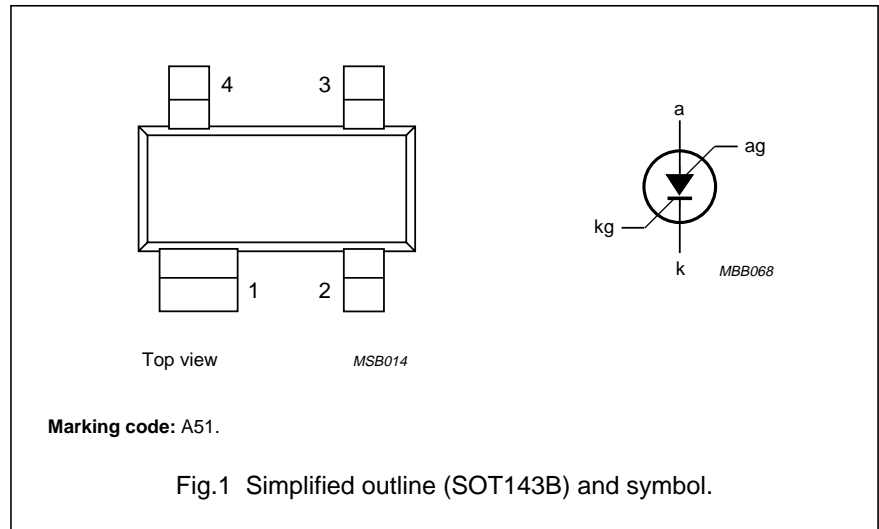
Silicon planar PNP switch in a SOT143B plastic package. It is an integrated PNP/NPN transistor pair, with all electrodes accessible.

### APPLICATIONS

- Switching applications.

### PINNING

PIN	DESCRIPTION
1	anode gate
2	anode
3	cathode
4	cathode gate



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
<b>PNP transistor</b>				
$V_{EBO}$	emitter-base voltage	open collector	-70	V
<b>NPN transistor</b>				
$V_{CBO}$	collector-base voltage		70	V
$I_{ERM}$	repetitive peak emitter current		-2.5	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	250	mW
$T_j$	junction temperature		150	$^{\circ}\text{C}$
$V_{AK}$	forward on-state voltage	$I_A = 50\text{ mA}; I_{AG} = 0; R_{KG-K} = 10\text{ k}\Omega$	1.4	V
$I_H$	holding current	$I_{AG} = 10\text{ mA}; V_{BB} = -2\text{ V}; R_{KG-K} = 10\text{ k}\Omega$	1	mA
$t_{on}$	turn-on time		0.25	$\mu\text{s}$
$t_{off}$	turn-off time		15	$\mu\text{s}$

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**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>NPN transistor</b>					
V <sub>CB0</sub>	collector-base voltage	open emitter	–	70	V
V <sub>CER</sub>	collector-emitter voltage	R <sub>BE</sub> = 10 kΩ	–	70	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	5	V
I <sub>C</sub>	collector current (DC)	note 1	–	175	mA
I <sub>CM</sub>	peak collector current	note 2	–	175	mA
I <sub>E</sub>	emitter current (DC)		–	–175	mA
I <sub>ERM</sub>	repetitive peak emitter current	t <sub>p</sub> = 10 μs; δ = 0.01	–	–2.5	A
<b>PNP transistor</b>					
V <sub>CB0</sub>	collector-base voltage	open emitter	–	–70	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	–70	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	–70	V
I <sub>E</sub>	emitter current (DC)		–	175	mA
I <sub>ERM</sub>	repetitive peak emitter current	t <sub>p</sub> = 10 μs; δ = 0.01	–	2.5	A
<b>Combined device</b>					
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	–	250	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature	see Fig.14	–65	+150	°C

**Notes**

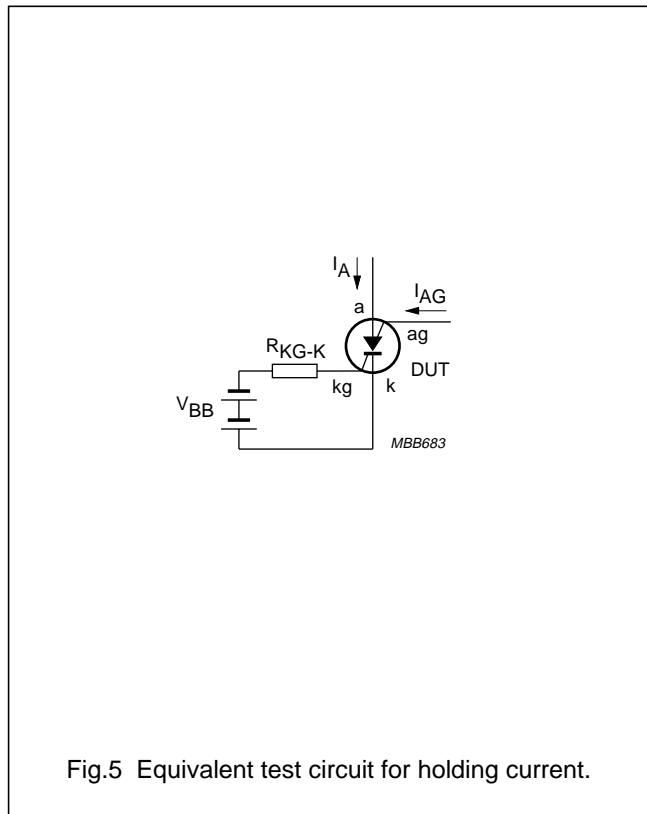
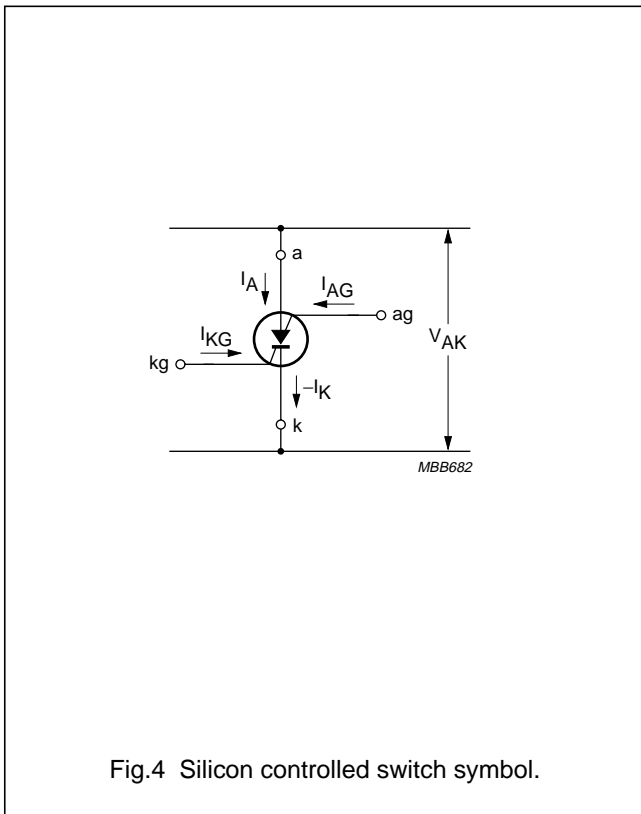
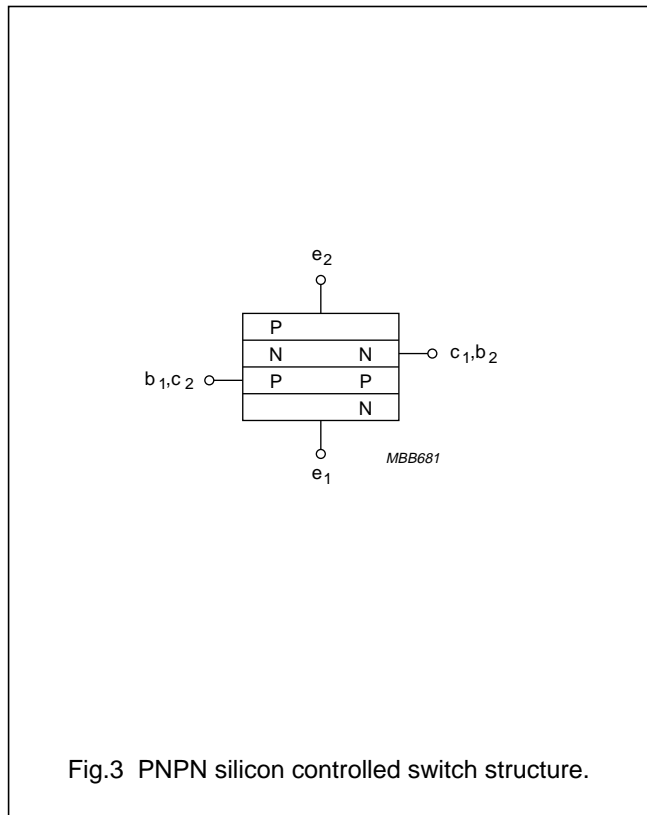
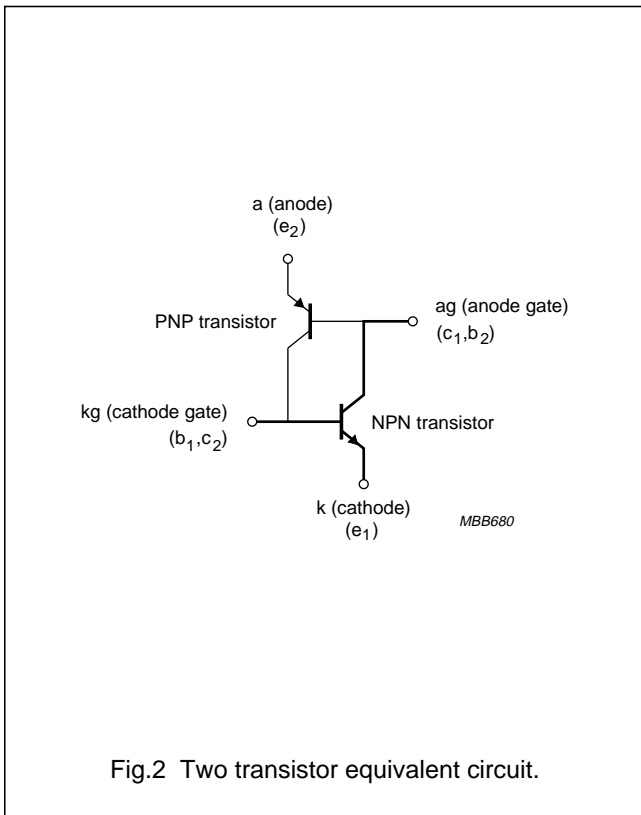
1. Provided the I<sub>E</sub> rating is not exceeded.
2. During switching on, the device can withstand the discharge of a capacitor of a maximum value of 500 pF. This capacitor is charged when the transistor is in cut-off condition, with a collector supply voltage of 160 V and a series resistance of 100 kΩ.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	in free air	500	K/W

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**CHARACTERISTICS**

$T_{amb} = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>NPN transistor</b>					
$I_{CER}$	collector cut-off current	$V_{CE} = 70\text{ V}; R_{BE} = 10\text{ k}\Omega$	–	100	nA
		$V_{CE} = 70\text{ V}; R_{BE} = 10\text{ k}\Omega; T_j = 150\text{ °C}$	–	10	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = 5\text{ V}; T_j = 150\text{ °C}$	–	10	$\mu\text{A}$
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	–	500	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	–	900	mV
$h_{FE}$	DC current gain	$I_C = 10\text{ mA}; V_{CE} = 2\text{ V}$	50	–	
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 2\text{ V}; f = 100\text{ MHz}$	100	–	MHz
$C_c$	collector capacitance	$I_E = I_C = 0; V_{CB} = 20\text{ V}; f = 1\text{ MHz}$	–	5	pF
$C_e$	emitter capacitance	$I_C = I_E = 0; V_{EB} = 1\text{ V}; f = 1\text{ MHz}$	–	25	pF
<b>PNP transistor</b>					
$I_{CEO}$	collector cut-off current	$I_B = 0; V_{CE} = -70\text{ V}; T_j = 150\text{ °C}$	–	-10	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -70\text{ V}; T_j = 150\text{ °C}$	–	-10	$\mu\text{A}$
$h_{FE}$	DC current gain	$I_E = 1\text{ mA}; V_{CB} = -5\text{ V}$	3	15	
<b>Combined device</b>					
$V_{AK}$	forward on-state voltage	$R_{KG-K} = 10\text{ k}\Omega$ $I_A = 50\text{ mA}; I_{AG} = 0$	–	1.4	V
		$I_A = 50\text{ mA}; I_{AG} = 0; T_j = -55\text{ °C}$	–	1.9	V
		$I_A = 1\text{ mA}; I_{AG} = 10\text{ mA}$	–	1.2	V
$I_H$	holding current	$R_{KG-K} = 10\text{ k}\Omega; I_{AG} = 10\text{ mA}; V_{BB} = -2\text{ V};$ see Fig.5	–	1	mA
<b>Switching times</b>					
$t_{on}$	turn-on time	$V_{KG-K} = -0.5\text{ to }4.5\text{ V}; R_{KG-K} = 1\text{ k}\Omega;$ see Figs 6 and 7	–	0.25	$\mu\text{s}$
		$V_{KG-K} = -0.5\text{ to }0.5\text{ V}; R_{KG-K} = 10\text{ k}\Omega$	–	1.5	$\mu\text{s}$
$t_{off}$	turn-off time	$R_{KG-K} = 10\text{ k}\Omega;$ see Figs 8 and 9	–	15	$\mu\text{s}$

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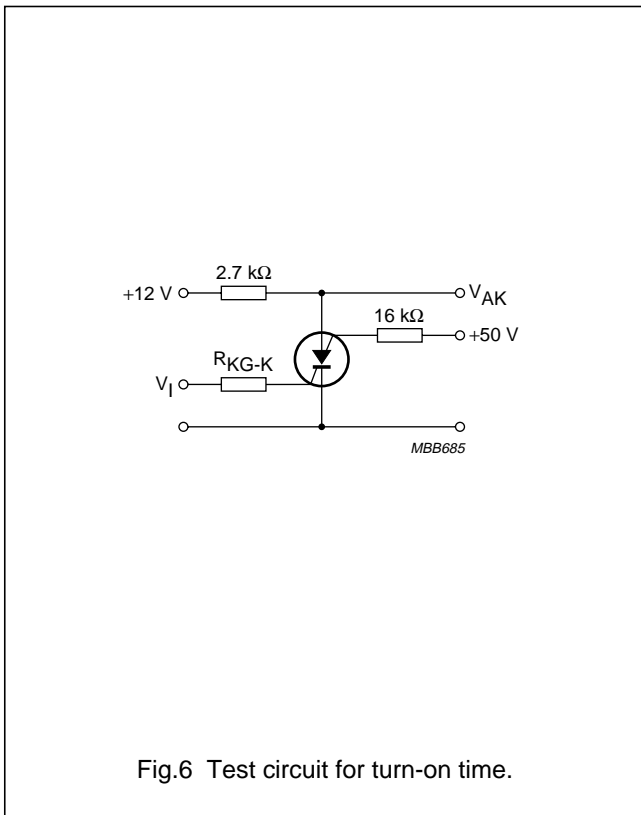


Fig.6 Test circuit for turn-on time.

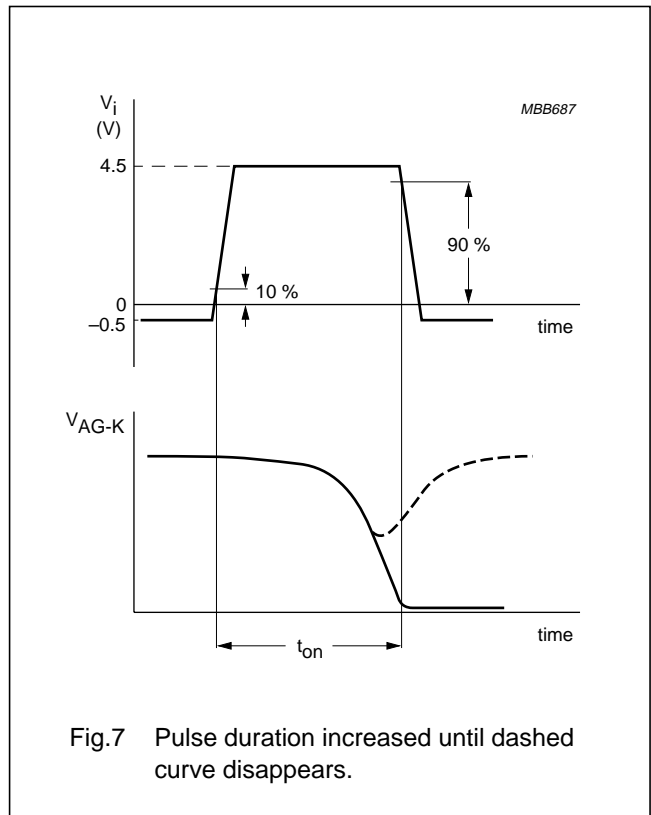


Fig.7 Pulse duration increased until dashed curve disappears.

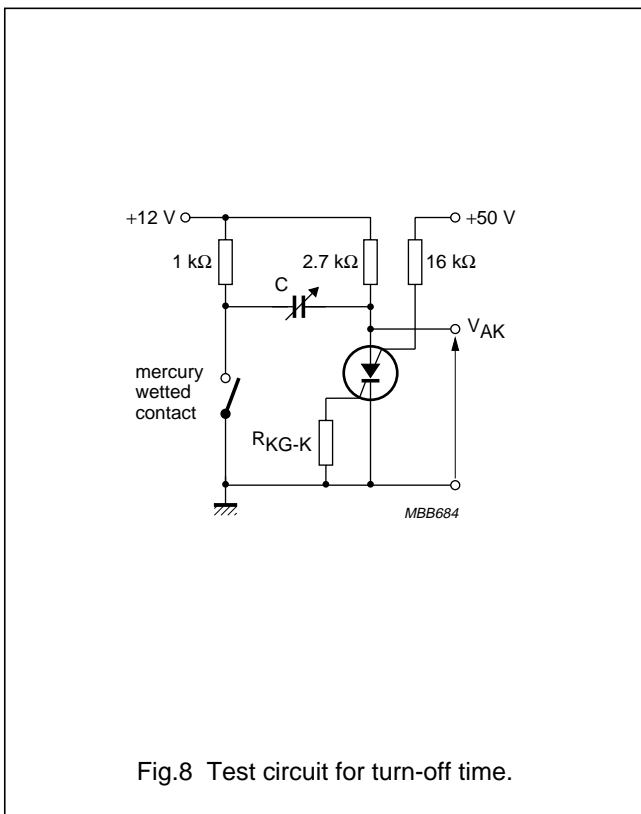


Fig.8 Test circuit for turn-off time.

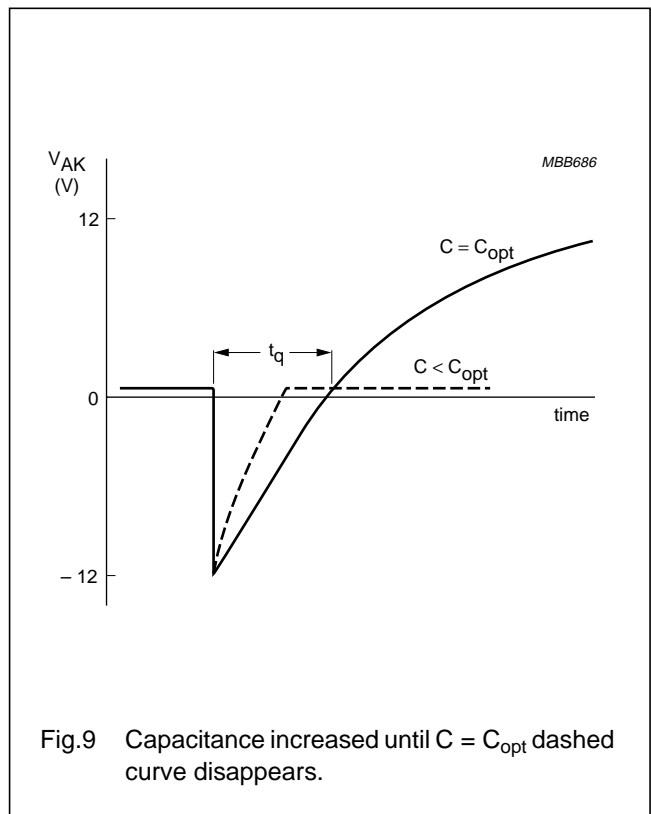
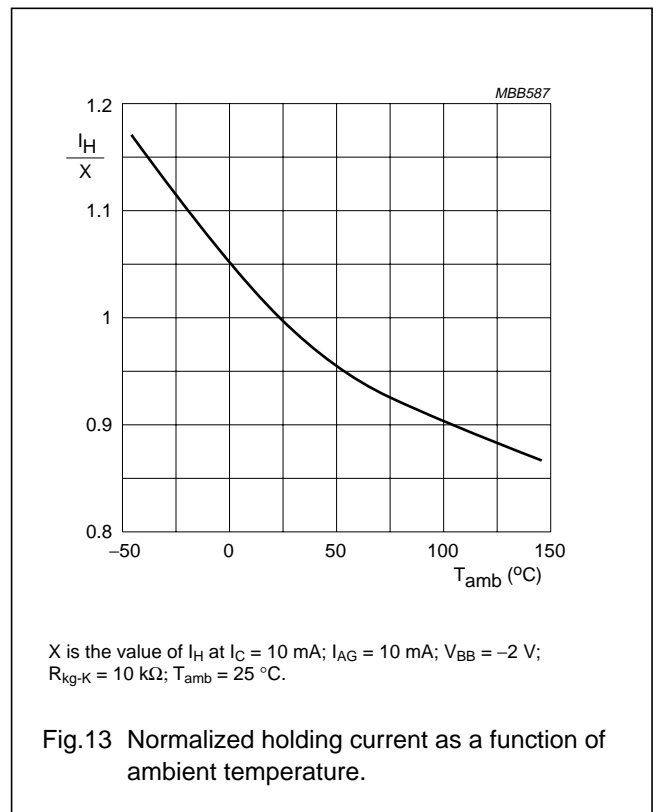
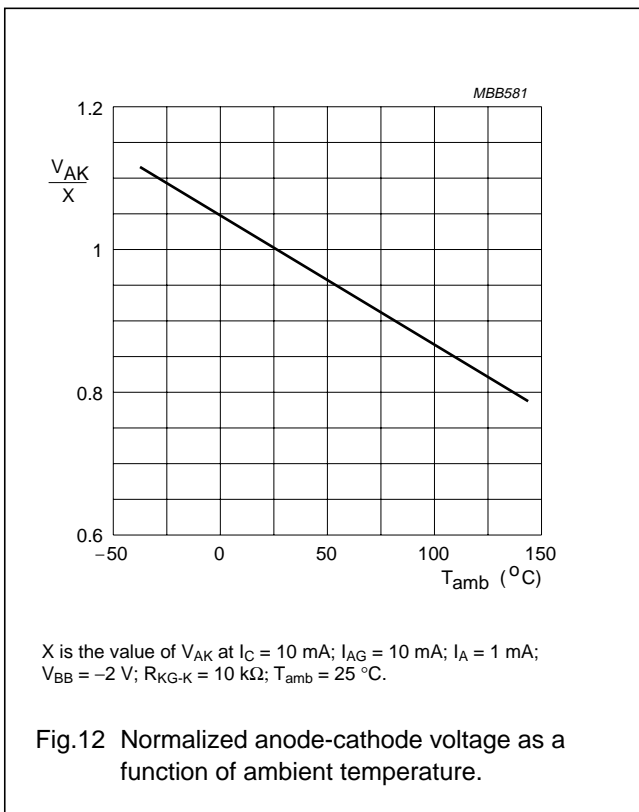
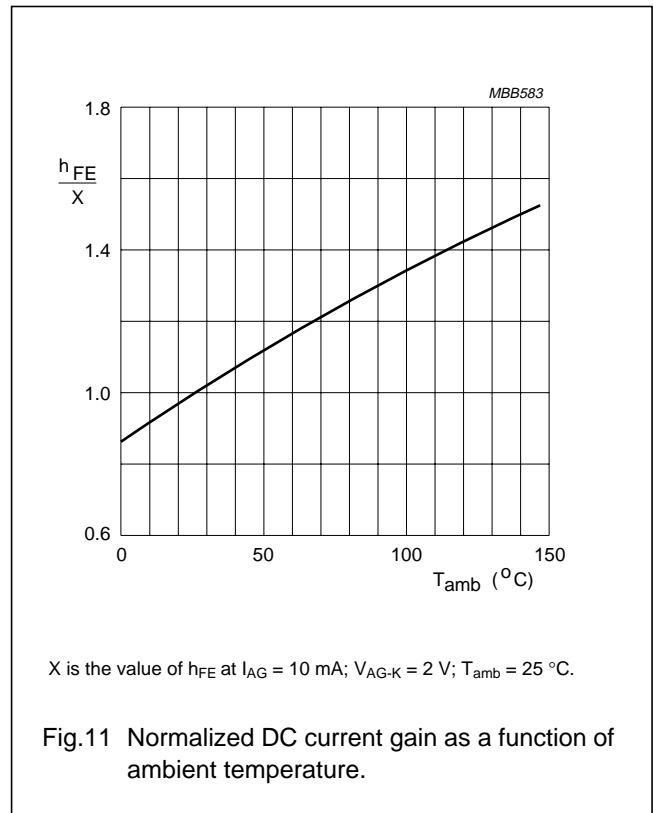
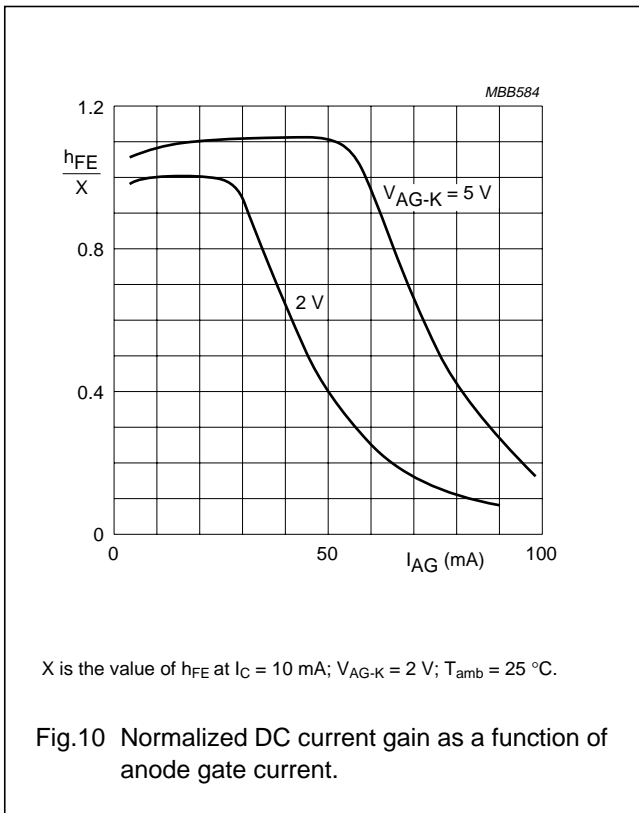


Fig.9 Capacitance increased until C = C<sub>opt</sub> dashed curve disappears.

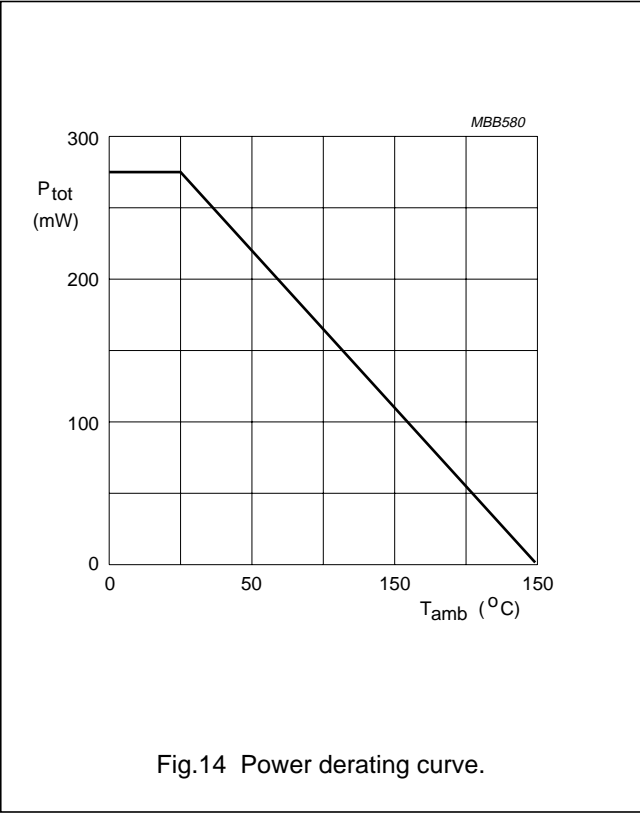
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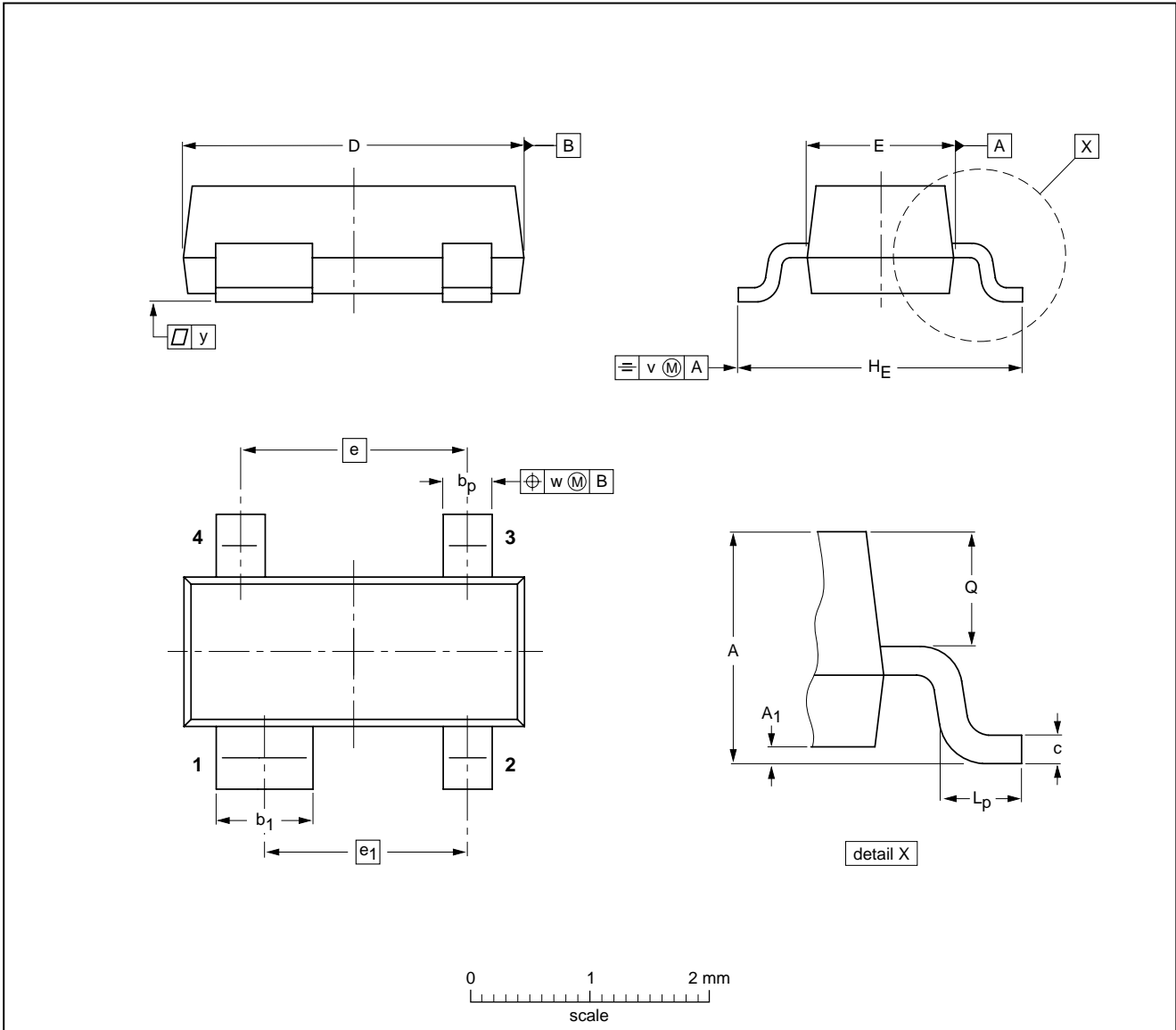
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PACKAGE OUTLINE

Plastic surface mounted package; 4 leads

SOT143B



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	b <sub>1</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.1 0.9	0.1	0.48 0.38	0.88 0.78	0.15 0.09	3.0 2.8	1.4 1.2	1.9	1.7	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT143B						97-02-28

## Silicon controlled switch

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**DEFINITIONS**

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

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