SILICON PLANAR EPITAXIAL HIGH-SPEED DIODE

Silicon epitaxial high-speed diode in a microminiature plastic envelope. It is intended for high-speed switching in hybrid thick and thin-film circuits.

QUICK REFERENCE DATA

Continuous reverse voltage	V_R	max.	75	V
Repetitive peak reverse voltage	V_{RRM}	max.	85	V
Repetitive peak forward current	I_{FRM}	max.	500	mA
Junction temperature	T_j	max.	150	°C
Forward voltage at I_F = 50 mA	V_F	<	1,0	V
Reverse recovery time when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA	t_{rr}	<	6	ns
Recovery charge when switched from I_F = 10 mA to V_R = 5 V; R_L = 500 Ω	Q_s	<	45	pC

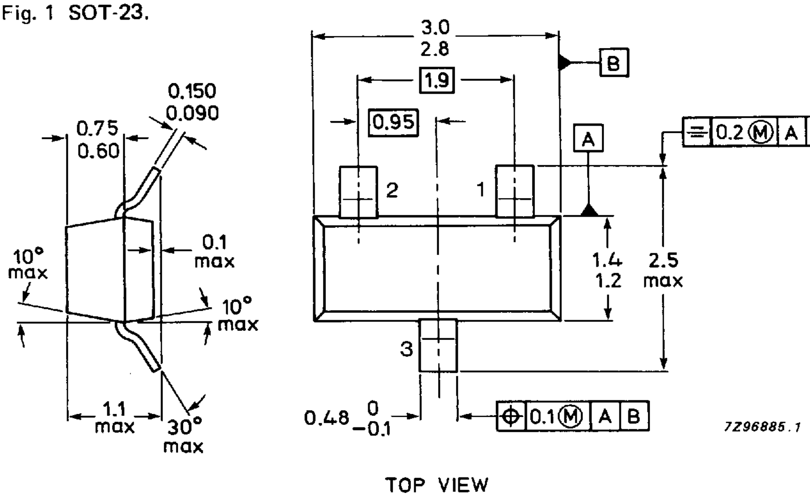
MECHANICAL DATA

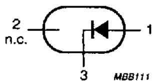
Dimensions in mm

Marking code

BAS16 = A6p

Fig. 1 SOT-23.





See also *Soldering recommendations*.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Continuous reverse voltage	V_R	max.	75	V
Repetitive peak reverse voltage	V_{RRM}	max.	85	V
Average rectified forward current* (averaged over any 20 ms period) up to $T_{amb} = 25\ ^oC$	$I_{F(AV)}$	max.	250	mA
Forward current (DC)	I_F	max.	250	mA
Repetitive peak froward current	I_{FRM}	max.	500	mA
Non-repetitive peak forward current (per crystal)				
$t = 1\ \mu s$	I_{FSM}	max.	2	A
$t = 1$ ms	I_{FSM}	max.	1	A
$t = 1$ s	I_{FSM}	max.	0,5	A
Storage temperature range	T_{stg}	−65 to + 150		^oC
Junction temperature	T_j	max.	150	^oC

THERMAL RESISTANCE**

From junction to ambient▲	$R_{th\ j\text{-}a}$	=	430	K/W

CHARACTERISTICS

$T_j = 25\ ^oC$ unless otherwise specified.

Forward voltage				
$I_F = 1$ mA	V_F	<	715	mV
$I_F = 10$ mA	V_F	<	855	mV
$I_F = 50$ mA	V_F	<	1000	mV
$I_F = 150$ mA	V_F	<	1250	mV
Reverse current				
$V_R = 25$ V; $T_j = 150\ ^oC$	I_R	<	30	μA
$V_R = 75$ V	I_R	<	1	μA
$V_R = 75$ V; $T_j = 150\ ^oC$	I_R	<	50	μA
Diode capacitance $V_R = 0$; f = 1 MHz	C_d	<	2	pF
Forward recovery voltage (see also Fig. 2) when switched to $I_F = 10$ mA; $t_p = 20$ ns	V_{fr}	<	1,75	V
Reverse recovery time (see also Fig. 3) when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA	t_{rr}	<	6	ns
Recovery charge (see also Fig. 4) when switched from $I_F = 10$ mA to $V_R = 5$ V; $R_L = 500\ \Omega$	Q_s	<	45	pC

* Measured under pulse conditions. $t_p \leqslant 0,5$ ms. $I_{F(AV)} = 150$ mA, $t_{(AV)} \leqslant 1$ ms, for sinusoidal operation.

** See *Thermal characteristics.*

▲ Mounted on a ceramic substrate of 8 mm x 10 mm x 0,7 mm.

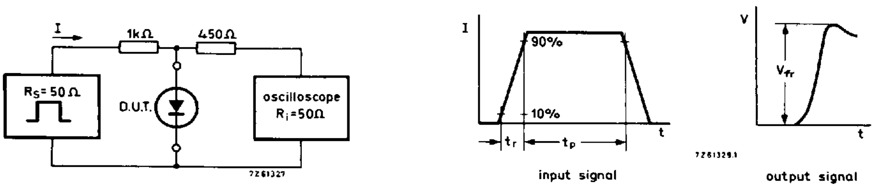


Fig. 2 Forward recovery voltage test circuit and waveforms.

Input signal: forward pulse rise time = t_r = 20 ns; forward current pulse duration t_p = 120 ns; duty factor = δ = 0,01.

Oscilloscope: rise time = t_r = 0,35 ns.

Circuit capacitance C ⩽ 1 pF (C = oscilloscope input capacitance + parasitic capacitance).

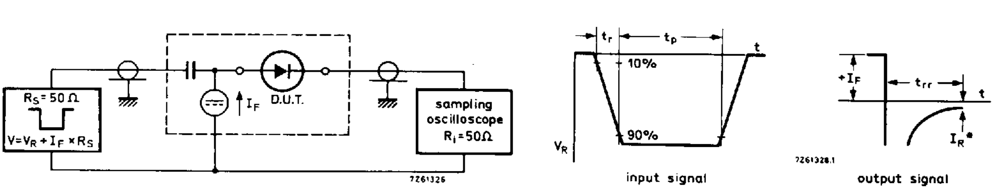


Fig. 3 Reverse recovery time test circuit and waveforms.

Input signal: reverse pulse rise time = t_r = 0,6 ns; reverse pulse duration = t_p = 100 ns; duty factor = δ = 0,05. * t_{rr} up to I_R = 1 mA.

Oscilloscope: rise time = t_r = 0,35 ns.

Circuit capacitance C ⩽ 1 pF (C = oscilloscope input capacitance + parasitic capacitance).

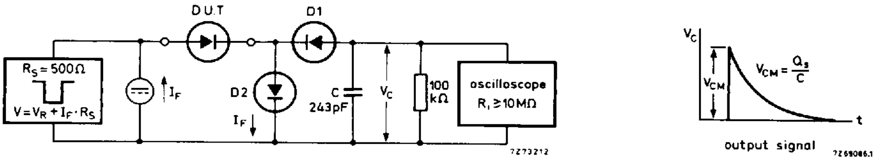


Fig. 4 Recovery charge test circuit and waveform.

D1 = BAW62; D2 = diode with minority carrier life time at 10 mA: < 200 ps

Input signal

Rise time of the reverse pulse	t_r	=	2	ns
Reverse pulse duration	t_p	=	400	ns
Duty factor	δ	=	0,02	

Circuit capacitance C ⩽ 7 pF (C = oscilloscope input capacitance + parasitic capacitance).

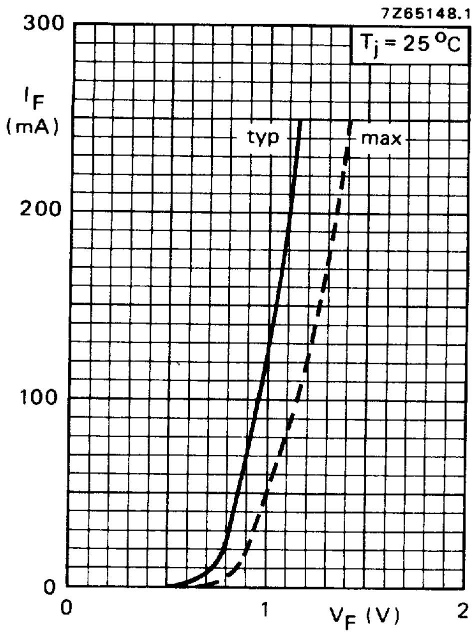


Fig. 5.

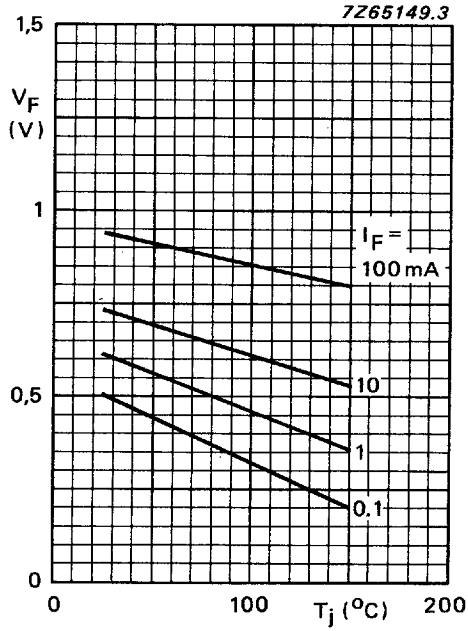


Fig. 6 Typical values.

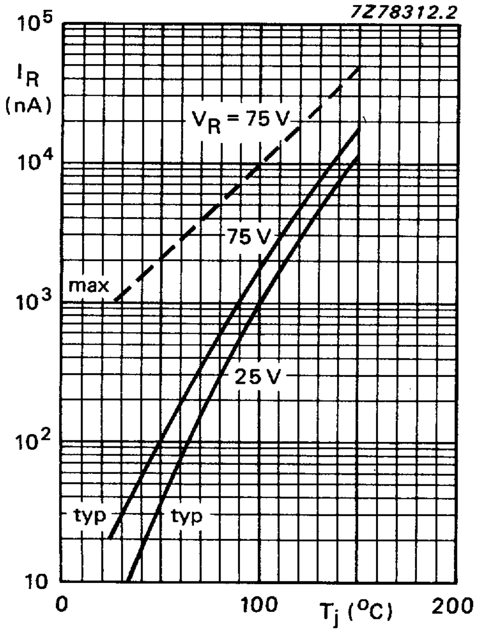


Fig. 7

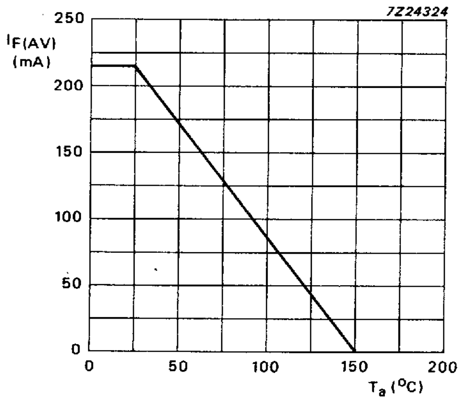


Fig. 8 Current derating curve.