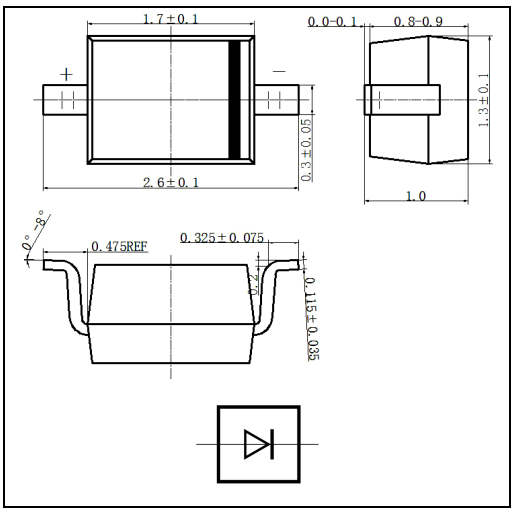
SOD-323 Plastic-Encapsulate Diodes

BAS16J High-speed switching diodes



Features

- High switching speed: t_{rr} ≤ 4 ns
- Low leakage current
- Repetitive peak reverse voltage: V_{RRM}≤100 V
- Low capacitance
- Reverse voltage: V_R ≤ 100V
- Small SMD plastic packages

Applications

- High-speed switching
- General-purpose switching

Description

High-speed switching diodes, encapsulated in small Surface-Mounted Device (SMD) plastic packages.

Maximum Ratings (T_a=25°C unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{RRM}	Peak repetitive reverse voltage		100	V
V_R	Reverse voltage		100	V
I_F	Forward current [1]		250	mA
I_{FRM}	Repetitive peak forward current @ tp≤0.5 ms; δ≤0.25		500	mA
I_{FSM}	Non-repetitive peak forward current square wave; $T_{j(init)}$ = 25 °C	t_p = 1μs	4	A
		t_p = 1ms	1	A
		t_p = 1s	0.5	A
P_{tot}	Total power dissipation T_{amb} ≤ 25 °C [2]		550	mW
T_j	Junction temperature		150	°C
T_{amb}	Ambient temperature		-65 ~ +150	°C
T_{stg}	Storage temperature		-65 ~ +150	°C
$R_{\theta JA}$	Thermal resistance from junction to ambient [2]		230	K/W
$R_{\theta JS}$	Thermal resistance from junction to solder point [3]		55	K/W

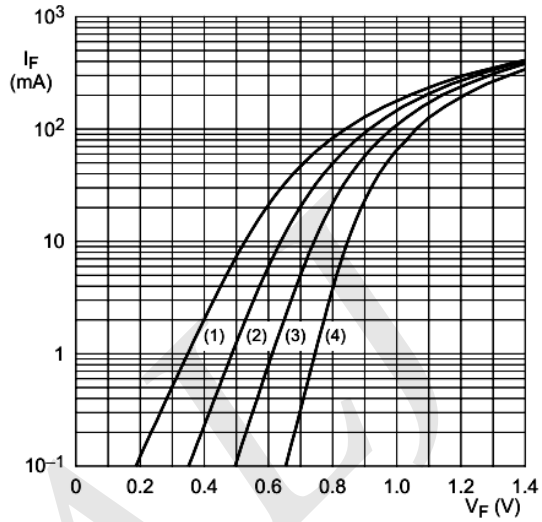
1. Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
2. Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.
3. Soldering point of cathode tab.

Electrical Characteristics (T_a=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_F	Forward voltage [1)]	I_F = 1mA			715	mV
		I_F = 10mA			855	mV
		I_F = 50mA			1	V
		I_F = 150mA			1.25	V
I_R	Reverse current	V_R = 25V			30	nA
		V_R = 80V			0.5	μA
		V_R = 25V; T_j = 150°C			30	μA
		V_R = 80V; T_j = 150°C			50	μA
C_d	Diode capacitance	f = 1MHz; V_R = 0V			1.5	pF
t_{rr}	Reverse recovery time	I_F = 10mA; I_R = 10mA; R_L = 100Ω; $I_{R(meas)}$ = 1mA			4	ns
V_{FR}	Forward recovery voltage	I_F = 10mA; t_r = 20ns			1.75	V

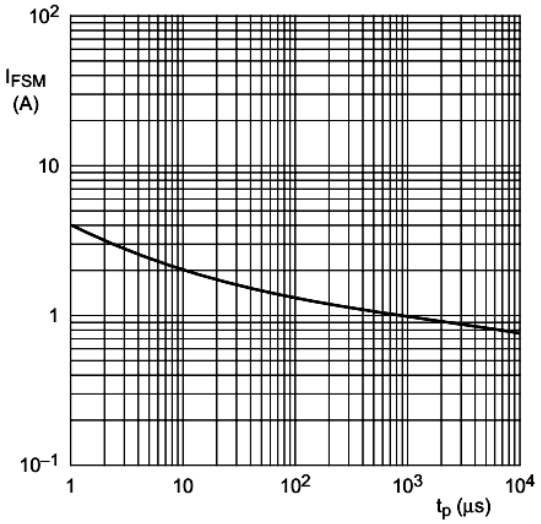
1. Pulse test: tp ≤300μs; δ ≤ 0.02.

Typical Characteristics



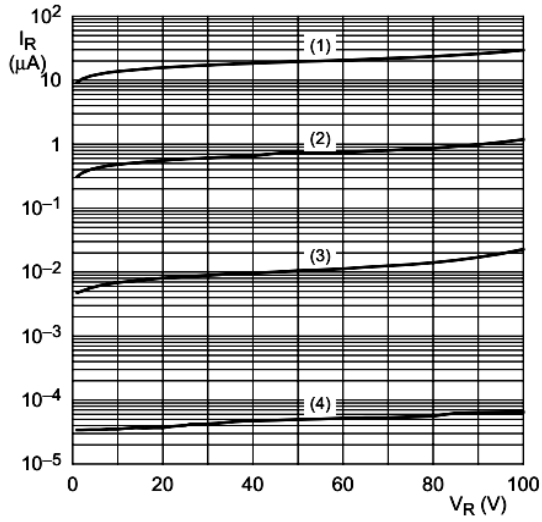
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = –40 °C

Fig 1. Forward current as a function of forward voltage; typical values



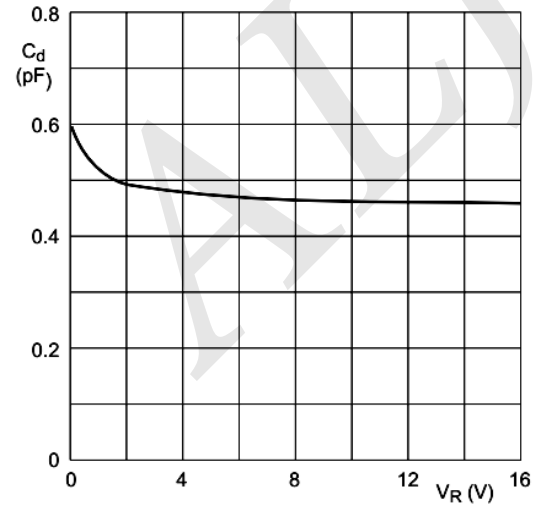
Based on square wave currents.
$T_{j(init)}$ = 25 °C

Fig 2. Non-repetitive peak forward current as a function of pulse duration; maximum values



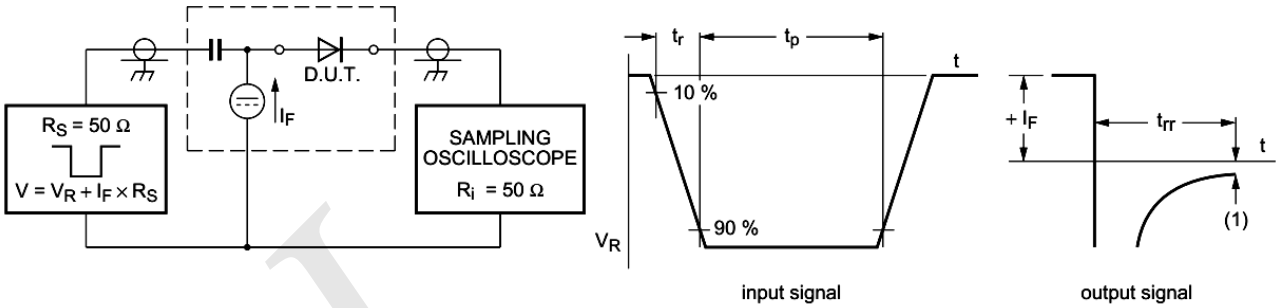
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = –40 °C

Fig 3. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T_{amb} = 25 °C

Fig 4. Diode capacitance as a function of reverse voltage; typical values

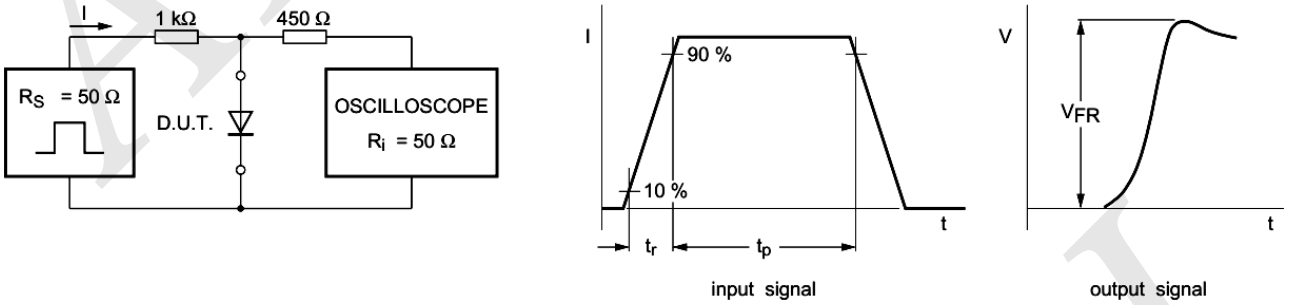


(1) I_R = 1 mA

Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty cycle δ = 0.05

Oscilloscope: rise time t_r = 0.35 ns

Fig 5. Reverse recovery time test circuit and waveforms



Input signal: forward pulse rise time t_r = 20 ns; forward current pulse duration t_p ≥100 ns; duty cycle ≤δ0.005

Fig 6. Forward recovery voltage test circuit and waveforms