BAS116T

Single low leakage current switching diode

Rev. 2 — 9 July 2012 Product data sheet

1. Product profile

1.1 General description

Single low leakage current switching diode, encapsulated in an ultra small SOT416 (SC-75) Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- High switching speed: t_{rr} = 0.8 µs
- Low leakage current: 3 pA
- Repetitive peak reverse voltage: $V_{RRM} \leq 85$ V
- AEC-Q101 qualified
- Low capacitance: C_d = 2 pF
- Reverse voltage: $V_R \leq 75$ V
- Ultra small SMD plastic package

1.3 Applications

- Low leakage current applications
- General-purpose switching
- Voltage clamping
- Reverse polarity protection

1.4 Quick reference data

Table 1. Quick reference data

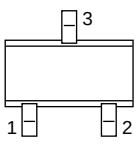
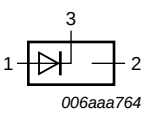
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current		[1]	-	-	215	mA
I_R	reverse current	V_R = 75 V		-	-	5	nA
V_R	reverse voltage			-	-	75	V
t_{rr}	reverse recovery time		[2]	-	-	3	µs

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

[2] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode		
2	not connected		
3	cathode		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS116T	SC-75	plastic surface-mounted package; 3 leads	SOT416

4. Marking

Table 4. Marking codes

Type number	Marking code
BAS116T	ZY

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	85	V
V_R	reverse voltage			-	75	V
I_F	forward current		[1]	-	215	mA
I_{FRM}	repetitive peak forward current			-	500	mA
I_{FSM}	non-repetitive peak forward current	square wave	[2]			
		t_p = 1 μs		-	4	A
		t_p = 1 ms		-	1	A
		t_p = 1 s		-	0.5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[3]	-	150	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−55	+150	°C
T_{stg}	storage temperature			−65	+150	°C

[1] Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.

[2] T_j = 25 °C before surge.

[3] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	833	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	350	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Soldering point of cathode tab.

7. Characteristics

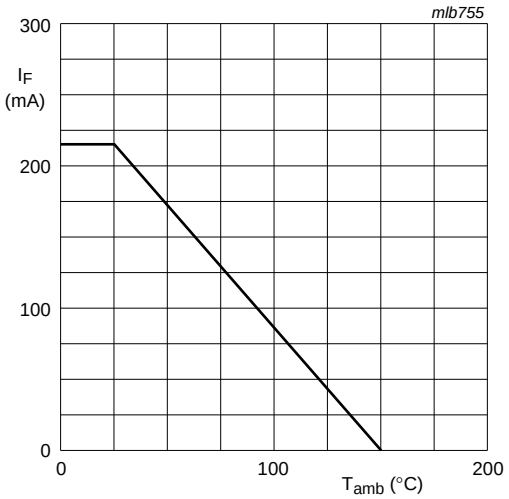
Table 7. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage		[1]				
		I_F = 1 mA		-	-	0.9	V
		I_F = 10 mA		-	-	1	V
		I_F = 50 mA		-	-	1.1	V
		I_F = 150 mA		-	-	1.25	V
I_R	reverse current	V_R = 75 V		-	0.003	5	nA
		V_R = 75 V; T_j = 150 °C		-	3	80	nA
t_{rr}	reverse recovery time		[2]	-	0.8	3	µs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	2	-	pF

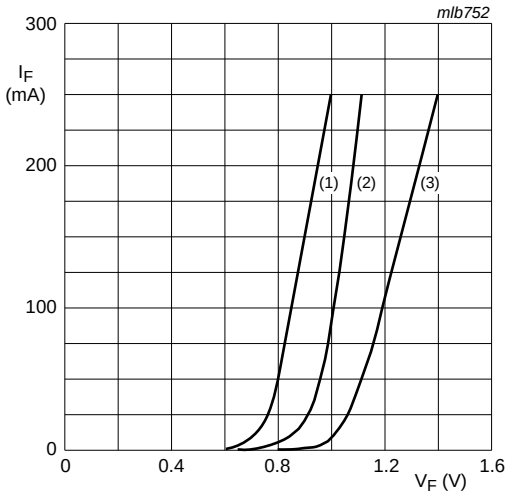
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

[2] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.



FR4 PCB, standard footprint

Fig 1. Forward current as a function of ambient temperature; derating curve

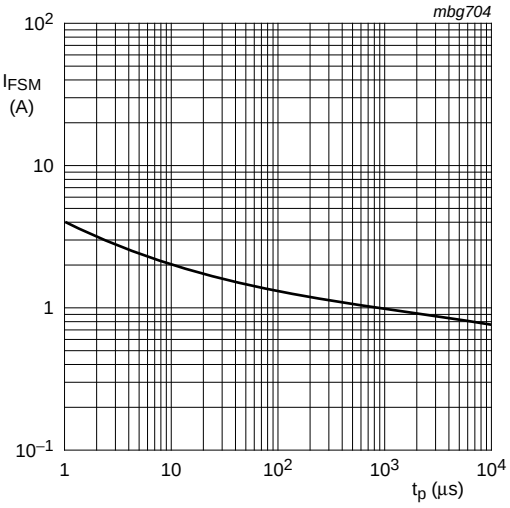


(1) T_{amb} = 150 °C; typical values

(2) T_{amb} = 25 °C; typical values

(3) T_{amb} = 25 °C; maximum values

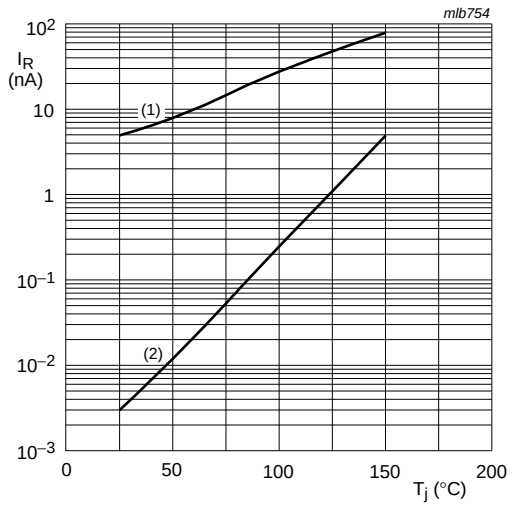
Fig 2. Forward current as a function of forward voltage



Based on square wave currents.

T_j = 25 °C before surge

Fig 3. Non-repetitive peak forward current as a function of pulse duration; maximum values

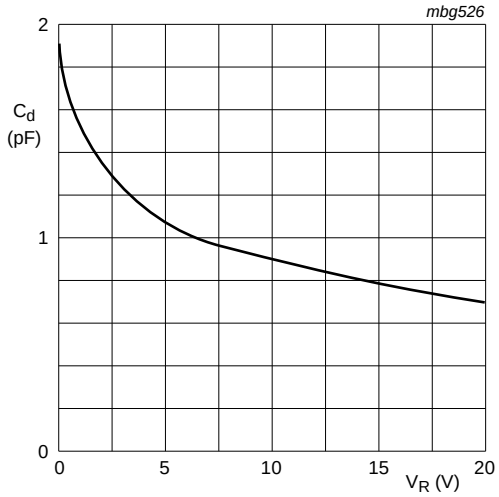


V_R = 75 V

(1) Maximum values

(2) Typical values

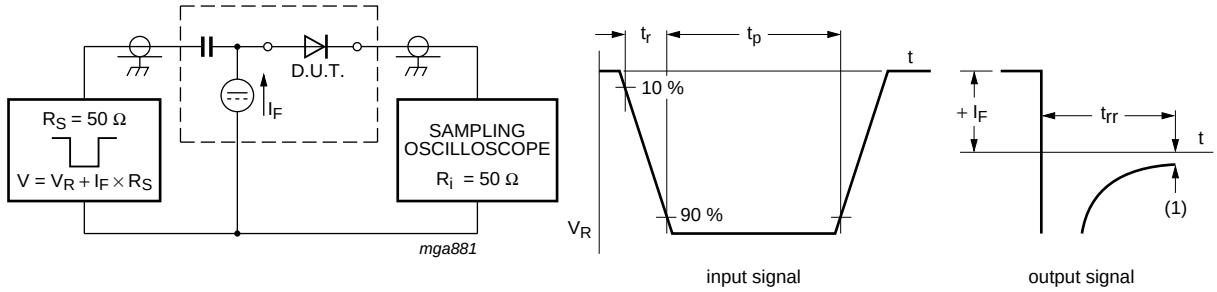
Fig 4. Reverse current as a function of junction temperature



f = 1 MHz; T_{amb} = 25 °C

Fig 5. Diode capacitance as a function of reverse voltage; typical values

8. Test information



(1) I_R = 1 mA

Fig 6. Reverse recovery time test circuit and waveforms

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

9. Package outline

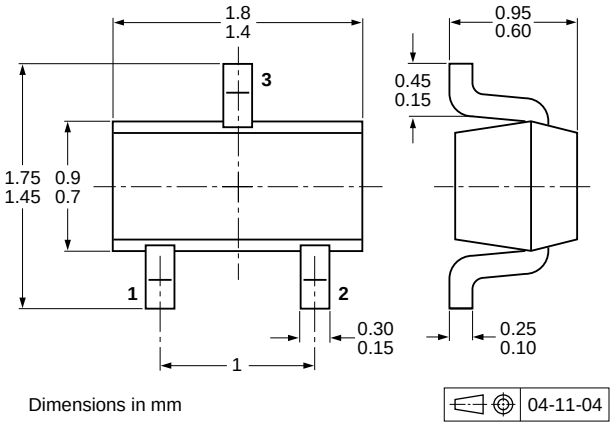


Fig 7. Package outline SOT416 (SC-75)

10. Packing information

Table 8. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			3000	10000
BAS116T	SOT416	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see Section 14.

11. Soldering

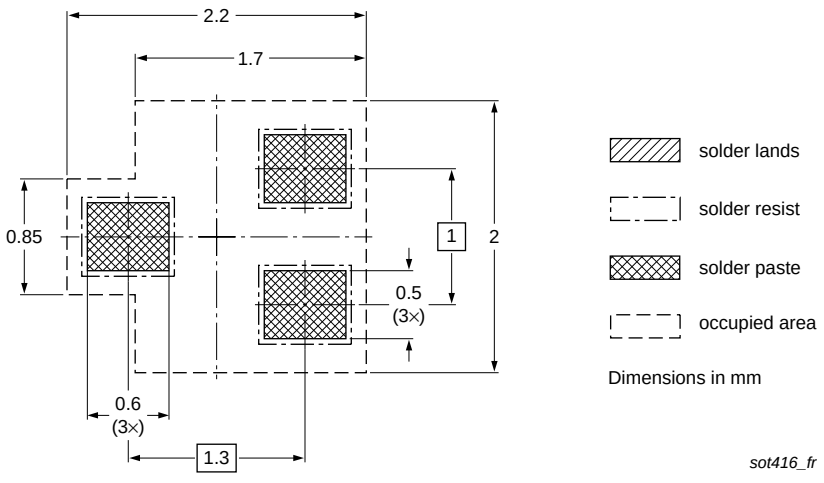


Fig 8. Reflow soldering footprint SOT416 (SC-75)

12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS116T v.2	20120709	Product data sheet	-	BAS116T v.1
Modifications:	• Section 2 “Pinning information”: corrected graphic symbol • Section 8.1 “Quality information”: added • Section 13 “Legal information”: updated			
BAS116T v.1	20091214	Product data sheet	-	-

13. Legal information

13.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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15. Contents

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