

BAS32L

High-speed switching diode

Rev. 7 — 20 January 2011

Product data sheet

1. Product profile

1.1 General description

Single high-speed switching diode, fabricated in planar technology, and encapsulated in a small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) package.

1.2 Features and benefits

- High switching speed: $t_{rr} \leq 4$ ns
- Reverse voltage: $V_R \leq 75$ V
- Repetitive peak reverse voltage: $V_{RRM} \leq 100$ V
- Repetitive peak forward current: $I_{FRM} \leq 450$ mA
- Small hermetically sealed glass SMD package

1.3 Applications

- High-speed switching
- 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] - | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | | - | - | 450 | mA |
| V_R | reverse voltage | | - | - | 75 | V |
| V_F | forward voltage | $I_F = 100$ mA | - | - | 1000 | mV |
| t_{rr} | reverse recovery time | | [2] - | - | 4 | ns |

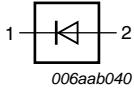

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[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 | cathode | [1] |  |
| 2 | anode |  | |

[1] The marking band indicates the cathode.

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAS32L | - | hermetically sealed glass surface-mounted package; 2 connectors | SOD80C |

4. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAS32L | marking band |

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 | | - | 100 | V |
| V_R | reverse voltage | | - | 75 | V |
| I_F | forward current | [1] | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | | - | 450 | mA |
| I_{FSM} | non-repetitive peak forward current | square wave | [2] | | |
| | | $t_p = 1 \mu\text{s}$ | - | 4 | A |
| | | $t_p = 1 \text{ms}$ | - | 1 | A |
| | | $t_p = 1 \text{s}$ | - | 0.5 | A |

Table 5. Limiting values ...continued

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------|-------------------------|---------------------------------|-------|------|------|
| P_{tot} | total power dissipation | $T_{\text{amb}} = 25\text{ °C}$ | [1] - | 500 | mW |
| T_j | junction temperature | | - | 200 | °C |
| T_{amb} | ambient temperature | | -65 | +200 | °C |
| T_{stg} | storage temperature | | -65 | +200 | °C |

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

[2] $T_j = 25\text{ °C}$ prior to surge.

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------|--|-------------|-------|-----|-----|------|
| $R_{\text{th(j-a)}}$ | thermal resistance from junction to ambient | in free air | [1] - | - | 350 | K/W |
| $R_{\text{th(j-sp)}}$ | thermal resistance from junction to solder point | | - | - | 300 | K/W |

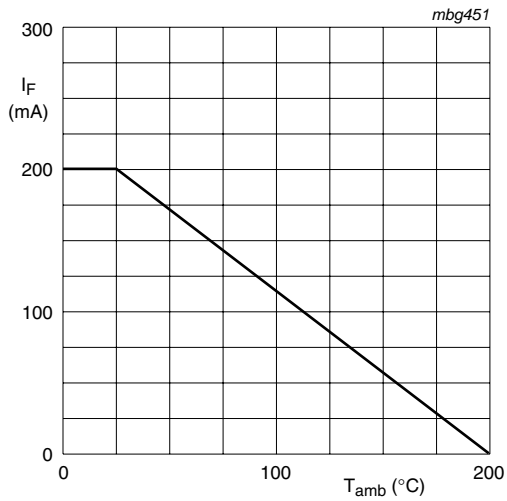
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

7. Characteristics

Table 7. Characteristics $T_{\text{amb}} = 25\text{ °C}$ unless otherwise specified.

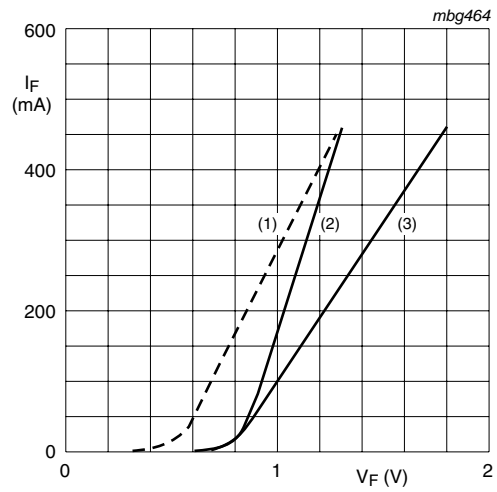
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------|--------------------------|--|-------|-----|------|------|
| V_F | forward voltage | $I_F = 5\text{ mA}$ | 620 | - | 750 | mV |
| | | $I_F = 100\text{ mA}$ | - | - | 1000 | mV |
| | | $I_F = 100\text{ mA}; T_j = 100\text{ °C}$ | - | - | 930 | mV |
| I_R | reverse current | $V_R = 20\text{ V}$ | - | - | 25 | nA |
| | | $V_R = 75\text{ V}$ | - | - | 5 | μA |
| | | $V_R = 20\text{ V}; T_j = 150\text{ °C}$ | - | - | 50 | μA |
| | | $V_R = 75\text{ V}; T_j = 150\text{ °C}$ | - | - | 100 | μA |
| C_d | diode capacitance | $V_R = 0\text{ V}; f = 1\text{ MHz}$ | - | - | 2 | pF |
| t_{rr} | reverse recovery time | | [1] - | - | 4 | ns |
| V_{FR} | forward recovery voltage | | [2] - | - | 2.5 | V |

[1] When switched from $I_F = 10\text{ mA}$ to $I_R = 10\text{ mA}$; $R_L = 100\text{ Ω}$; measured at $I_R = 1\text{ mA}$.[2] When switched from $I_F = 50\text{ mA}$; $t_r = 20\text{ ns}$.



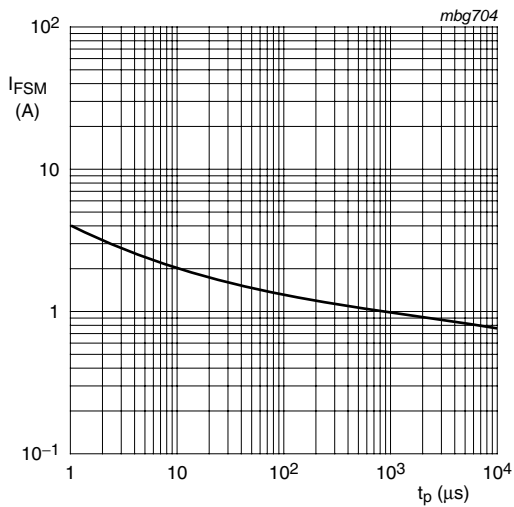
FR4 PCB, standard footprint

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



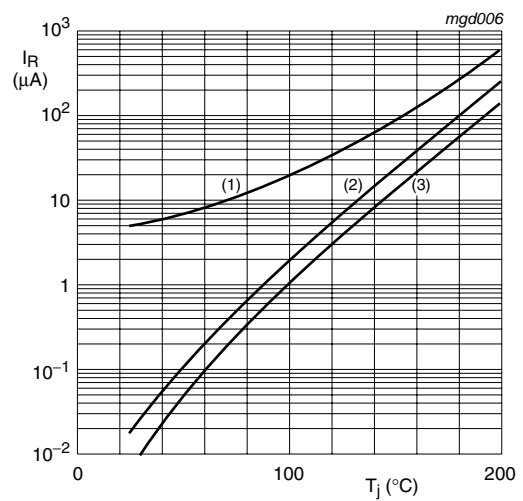
- (1) $T_j = 175\text{ }^\circ\text{C}$; typical values
- (2) $T_j = 25\text{ }^\circ\text{C}$; typical values
- (3) $T_j = 25\text{ }^\circ\text{C}$; maximum values

Fig 2. Forward current as a function of forward voltage



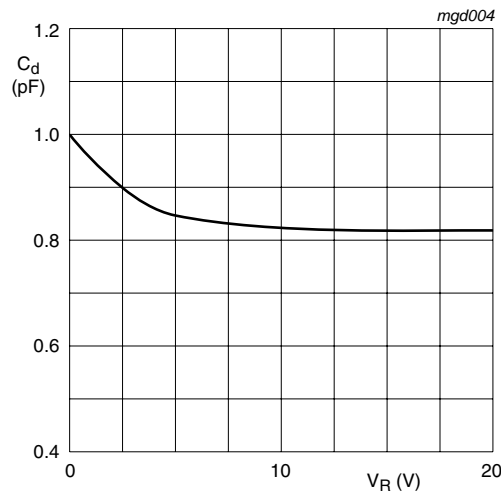
Based on square wave currents.
 $T_j = 25\text{ }^\circ\text{C}$ prior to surge

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



- (1) $V_R = 75\text{ V}$; maximum values
- (2) $V_R = 75\text{ V}$; typical values
- (3) $V_R = 20\text{ V}$; typical values

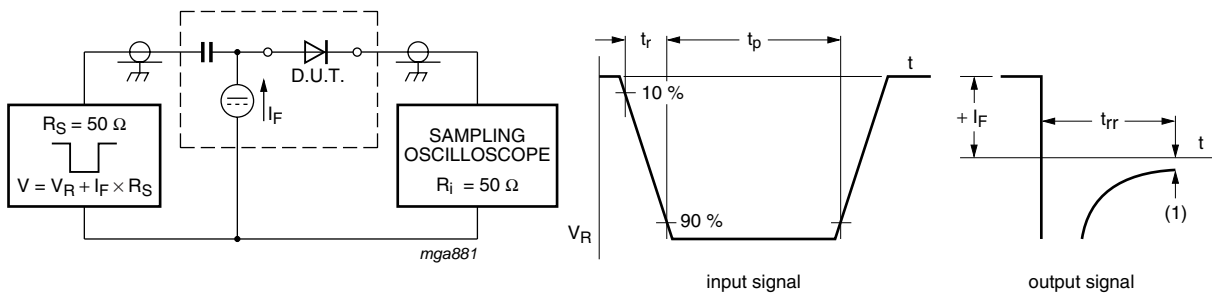
Fig 4. Reverse current as a function of junction temperature



f = 1 MHz; Tj = 25 °C

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

8. Test information

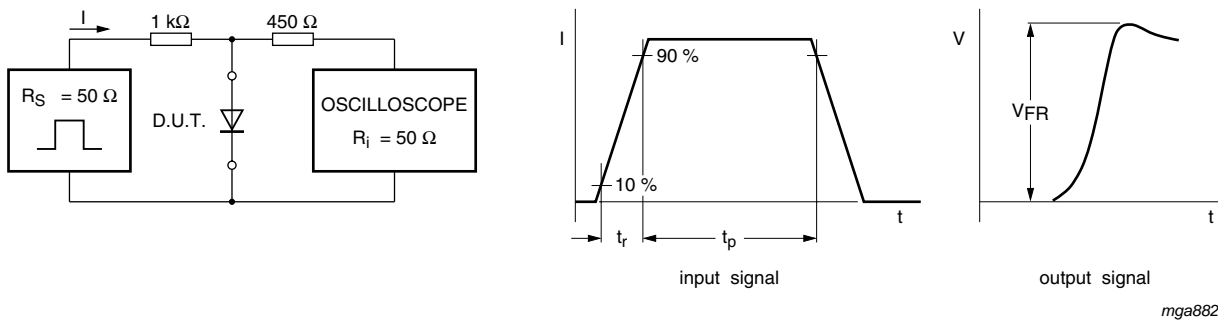


Input signal: Reverse pulse rise time $t_r = 0.6$ ns; reverse voltage pulse duration $t_p = 100$ ns; duty factor $\delta \leq 0.05$

Oscilloscope: Rise time $t_r = 0.35$ ns

(1) $I_R = 1$ mA

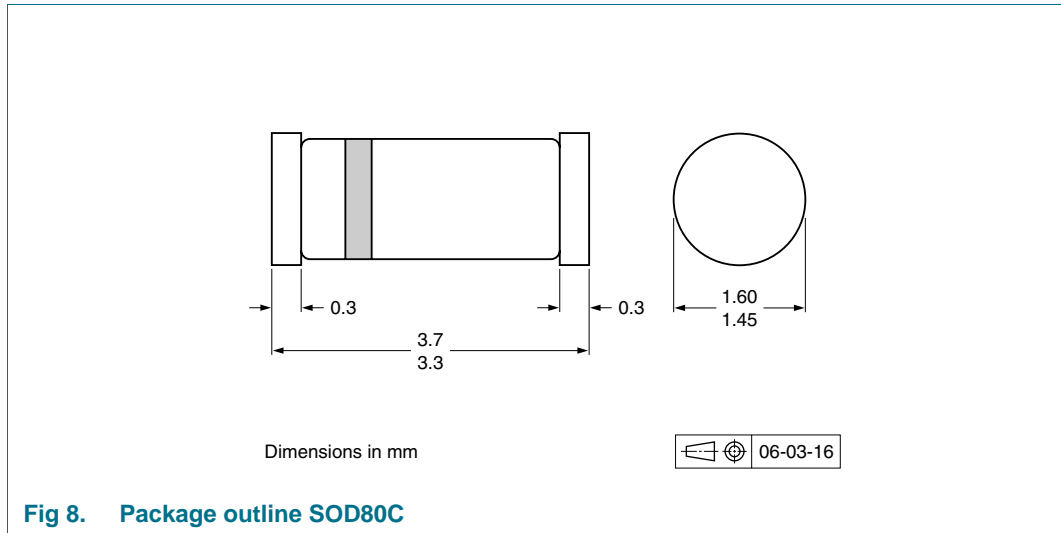
Fig 6. Reverse recovery time test circuit and waveforms



Input signal: Forward pulse rise time $t_r = 20$ ns; forward current pulse duration $t_p \geq 100$ ns; duty factor $\delta \leq 0.005$

Fig 7. Forward recovery voltage test circuit and waveforms

9. Package outline



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 | |
|-------------|---------|--------------------------------|------------------|-------|
| | | | 2500 | 10000 |
| BAS32L | SOD80C | 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

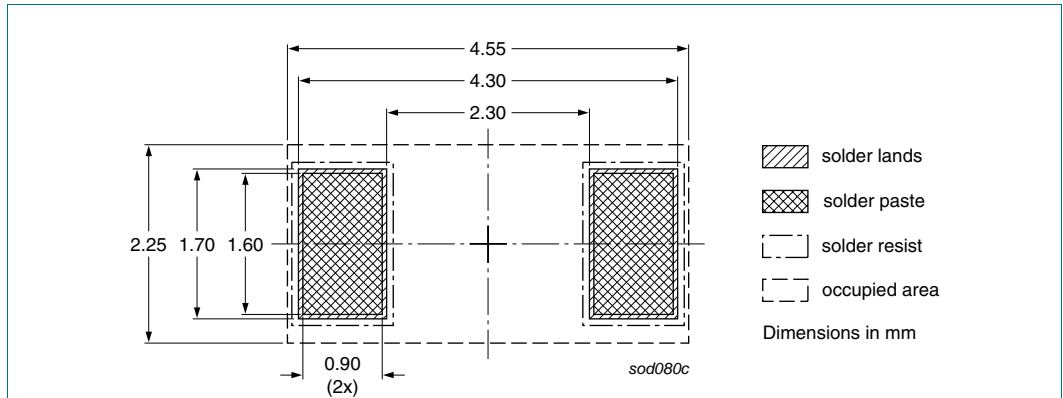


Fig 9. Reflow soldering footprint SOD80C

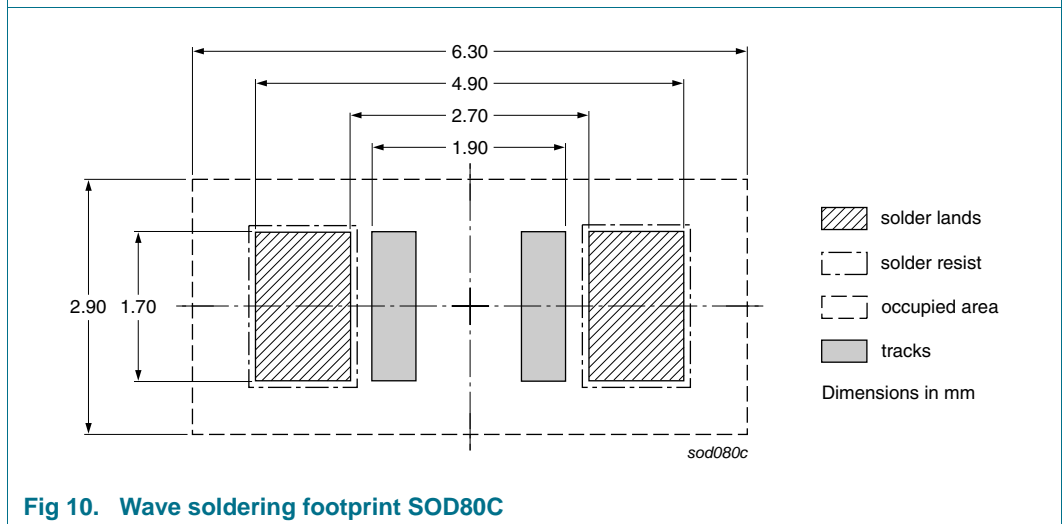


Fig 10. Wave soldering footprint SOD80C

12. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--------------|--|---------------|------------|
| BAS32L v.7 | 20110120 | Product data sheet | - | BAS32L v.6 |
| Modifications: | | <ul style="list-style-type: none">• Table 4 “Marking codes”: amended• Section 13 “Legal information”: updated | | |
| BAS32L v.6 | 20081029 | Product data sheet | - | BAS32L v.5 |
| BAS32L v.5 | 20080103 | Product data sheet | - | BAS32L v.4 |
| BAS32L v.4 | 20050322 | Product data sheet | - | BAS32L v.3 |
| BAS32L v.3 | 20020123 | Product specification | - | BAS32L v.2 |
| BAS32L v.2 | 19960910 | Product specification | - | BAS32L v.1 |
| BAS32L v.1 | 19960423 | Product specification | - | - |

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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