1. General description

High-speed switching diode, encapsulated in a leadless ultra small DFN1006BD-2 (SOD882BD) Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

2. Features and benefits

- High switching speed: $t_{rr} \leq 4$ ns
- Low leakage current
- Repetitive peak reverse voltage $V_{RRM} \leq 100$ V
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- Low capacitance
- Reverse voltage $V_R \leq 100$ V
- Ultra small and leadless SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- High-speed switching
- General-purpose switching

4. Quick reference data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td>$T_j = 25 , ^\circ$C</td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>215  mA</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 80 , V; \ T_j = 25 , ^\circ$C</td>
<td>-</td>
<td>-</td>
<td>0.5</td>
<td>$\mu$A</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>$T_j = 25 , ^\circ$C</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$I_F = 10 , mA; I_R = 10 , mA; R_L = 100 , \Omega; I_{R(meas)} = 1 , mA; T_{amb} = 25 , ^\circ$C</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>ns</td>
</tr>
</tbody>
</table>

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 $\mu$m single-sided copper, tin-plated and standard footprint.
5. Pinning information

Table 2. Pinning information

<table>
<thead>
<tr>
<th>Pin</th>
<th>Symbol</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>K</td>
<td>cathode</td>
<td><img src="DFN1006BD-2" alt="Simplified outline" title="SOD882BD" /></td>
<td>K-A</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
<td></td>
<td></td>
</tr>
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6. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
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</thead>
<tbody>
<tr>
<td>BAS16LS-Q</td>
<td>DFN1006BD-2</td>
<td>Leadless ultra small plastic package with side-wettable flanks (SWF); 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.47 mm body</td>
<td>SOD882BD</td>
<td></td>
</tr>
</tbody>
</table>

7. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BAS16LS-Q</td>
<td>M8</td>
<td></td>
</tr>
</tbody>
</table>

8. Limiting values

Table 5. Limiting values
*In accordance with the Absolute Maximum Rating System (IEC 60134).*

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{RRM}$</td>
<td>repetitive peak reverse voltage</td>
<td>$T_j = 25 ^\circ C$</td>
<td>-</td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td></td>
<td>-</td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td></td>
<td>-</td>
<td>1.25</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 1 \mu s; square wave; T_{j(init)} = 25 ^\circ C$</td>
<td>-</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 1 ms; square wave; T_{j(init)} = 25 ^\circ C$</td>
<td>-</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 1 s; square wave; T_{j(init)} = 25 ^\circ C$</td>
<td>-</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FRM}$</td>
<td>repetitive peak forward current</td>
<td>$t_p \leq 0.5 ms; \delta \leq 0.25$</td>
<td>-</td>
<td>500</td>
<td>mA</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 ^\circ C$</td>
<td>[1]</td>
<td>345</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>645</td>
<td>mW</td>
</tr>
<tr>
<td>$T_j$</td>
<td>junction temperature</td>
<td></td>
<td>-</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>ambient temperature</td>
<td></td>
<td>-55</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 μm single-sided copper, tin-plated mounting pad for cathode 1cm².
9. Thermal characteristics

Table 6. Thermal characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&lt;sub&gt;th(j-a)&lt;/sub&gt;</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>360</td>
<td>K/W</td>
</tr>
</tbody>
</table>

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 μm single-sided copper, tin-plated mounting pad for cathode 1cm<sup>2</sup>.

Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
10. Characteristics

Table 7. Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 1$ mA; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>715</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10$ mA; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>855</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 50$ mA; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 150$ mA; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>1.25</td>
<td>V</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 25$ V; $T_j = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 80$ V; $T_j = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>0.5</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 25$ V; $T_j = 150$ °C</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 80$ V; $T_j = 150$ °C</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>µA</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$V_R = 0$ V; $f = 1$ MHz; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>1.5</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$I_F = 10$ mA; $I_R = 10$ mA; $R_L = 100$ Ω; $I_{R(meas)} = 1$ mA; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>ns</td>
</tr>
<tr>
<td>$V_{FRM}$</td>
<td>peak forward recovery voltage</td>
<td>$I_F = 10$ mA; $t_p = 20$ ns; $T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>1.75</td>
<td>V</td>
</tr>
</tbody>
</table>

*Fig. 3. Forward current as a function of forward voltage; typical values

*Fig. 4. Non-repetitive peak forward current as a function of pulse duration; typical values
Fig. 5. Reverse current as a function of reverse voltage; typical values

- (1) $T_{\text{amb}} = 150$ °C
- (2) $T_{\text{amb}} = 85$ °C
- (3) $T_{\text{amb}} = 25$ °C
- (4) $T_{\text{amb}} = -40$ °C

Fig. 6. Diode capacitance as a function of reverse voltage; typical values

- $f = 1$ MHz; $T_{\text{amb}} = 25$ °C
11. Test information

Fig. 7. Reverse recovery time test circuit and waveforms

Reverse pulse rise time $t_r = 0.6$ ns; reverse voltage pulse duration $t_p = 100$ ns; duty cycle $\delta = 0.05$

Oscilloscope: rise time $t_r = 0.35$ ns

Input signal: $V_i = V_R + I_F \times R_S$

$R_S = 50 \Omega$

$V = V_R + I_F \times R_S$

$R_i = 50 \Omega$

$V_R$

$10 \%$

$90 \%$

$I_F$

$R_S = 50 \Omega$

$Oscilloscope$

$R_i = 50 \Omega$

$V_F R$

$10 \%$

$90 \%$

$V_F R$ $I_F$

$R_S = 50 \Omega$

$D.U.T.$

$D.U.T.$

$450 \Omega$

$1 \kOmega$

$(1)$ $I_R = 1 \ mA$

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

Oscilloscope: rise time $t_r = 0.35$ ns

Fig. 8. Forward recovery voltage test circuit and waveforms

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

Input signal: $V_i = V_F R + I_F \times R_S$

$R_S = 50 \Omega$

$V = V_F R + I_F \times R_S$

$R_i = 50 \Omega$

$V_F R$

$10 \%$

$90 \%$

$V_F R$

$10 \%$

$90 \%$

$V_F R$ $I_F$

$R_S = 50 \Omega$

$D.U.T.$

$D.U.T.$

$450 \Omega$

$1 \kOmega$

$V_F R$

$10 \%$

$90 \%$

$V_F R$ $I_F$

$R_S = 50 \Omega$

$Oscilloscope$

$R_i = 50 \Omega$

$V_F R$

$10 \%$

$90 \%$

$V_F R$ $I_F$

$R_S = 50 \Omega$

$D.U.T.$

$D.U.T.$

$450 \Omega$

$1 \kOmega$

$1 \kOmega$

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.
12. Package outline

DFN1006BD-2  Leadless ultra small plastic package with side-wettable flanks (SWF); 2 terminals;
0.65 mm pitch; 1 mm x 0.6 mm x 0.47 mm body

Dimensions

<table>
<thead>
<tr>
<th>Unit</th>
<th>A(1)</th>
<th>A1(1)</th>
<th>b(1)</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>L</th>
<th>l(1)</th>
<th>u</th>
<th>v</th>
<th>w</th>
<th>y</th>
<th>y1</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>max</td>
<td>0.50</td>
<td>0.04</td>
<td>0.55</td>
<td>1.00</td>
<td>0.65</td>
<td>0.25</td>
<td>0.30</td>
<td>0.22</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>0.47</td>
<td>0.50</td>
<td>0.60</td>
<td>1.00</td>
<td>0.65</td>
<td>0.25</td>
<td>0.16</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
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<td></td>
</tr>
<tr>
<td>min</td>
<td>0.44</td>
<td>0.20</td>
<td>0.46</td>
<td>0.65</td>
<td>0.46</td>
<td>0.25</td>
<td>0.16</td>
<td>0.05</td>
<td>0.10</td>
<td>0.05</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note
1. Dimension including plating thickness.
2. The marking bar indicates the cathode.
3. Solderable lead end, protrusion max. 0.02 mm.

Fig. 9. Package outline DFN1006BD-2 (SOD882BD)
13. Soldering

Footprint information for reflow soldering of DFN1006BD-2 package

Fig. 10. Reflow soldering footprint for DFN1006BD-2 (SOD882BD)
14. Revision history

Table 8. Revision history

<table>
<thead>
<tr>
<th>Data sheet ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<tr>
<td>BAS16LS-Q v.3</td>
<td>20210518</td>
<td>Product data sheet</td>
<td>-</td>
<td>BAS16LS-Q v.2</td>
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<td>Modifications:</td>
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<tr>
<td>BAS16LS-Q v.2</td>
<td>20210222</td>
<td>Product data sheet</td>
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<td>BAS16LS-Q v.1</td>
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<td>BAS16LS-Q v.1</td>
<td>20210209</td>
<td>Product data sheet</td>
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15. Legal information

Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
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<tr>
<td>Objective [short]</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary [short]</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short]</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
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</table>

[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".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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