Product data sheet

1. General description

High-voltage switching diode, encapsulated in an ultra small DFN1110D-3 (SOT8015, JEDEC MO340-BA) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

2. Features and benefits

- High switching speed: t_{rr} ≤ 50 ns
- Low leakage current
- High reverse voltage: V_R ≤ 200 V
- Low capacitance: C_d ≤ 5 pF
- · Leadless ultra small SMD plastic package
- Low package height of 0.5 mm
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- AEC-Q101 qualified

3. Applications

- · High-speed switching
- General-purpose switching
- Voltage clamping
- Reverse polarity protection

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
I _F	forward current	T _j = 25 °C	[1]	-	-	250	mA
V _R	reverse voltage			-	-	200	V
V _F	forward voltage	I _F = 200 mA; T _j = 25 °C		-	-	1.25	V
V _{RRM}	repetitive peak reverse voltage	T _j = 25 °C		-	-	250	V
I _R	reverse current	V _R = 200 V; T _j = 25 °C		-	-	100	nA
t _{rr}	reverse recovery time	I_F = 30 mA; I_R = 30 mA; R_L = 100 Ω; $I_{R(meas)}$ = 3 mA; T_{amb} = 25 °C		-	-	50	ns

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70 µm copper, tin-plated and standard footprint.



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5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode		
2	n.c.	not connected		A
3	К	cathode	DFN1110D-3 (SOT8015)	n.cK

6. Ordering information

Table 3. Ordering information

Type number	Package				
	Name	Description	Version		
BAS21QB	DFN1110D-3	plastic, leadless extremely thin small outline package with sidewettable flanks (SWF); 3 terminals; 0.65 mm pitch; 1.1 mm x 1 mm x 0.48 mm body	SOT8015		

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS21QB	В6

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8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating Sytem (IEC 60134)

Parameter	Conditions		Min	Max	Unit
repetitive peak reverse voltage	T _j = 25 °C		-	250	V
reverse voltage			-	200	V
forward current	_	[1]	-	250	mA
non-repetitive peak	t _p = 1 μs; square wave; T _{j(init)} = 25 °C		-	9	Α
forward current	t _p = 100 μs; square wave; T _{j(init)} = 25 °C		-	3	Α
	t _p = 10 ms; square wave; T _{j(init)} = 25 °C		-	1.7	Α
repetitive peak forward current	$t_p \le 1 \text{ ms}; \delta \le 0.25$		-	625	mA
total power dissipation	T _{amb} ≤ 25 °C	[1]	-	425	mW
		[2]	-	745	mW
junction temperature			-	150	°C
ambient temperature			-55	150	°C
storage temperature			-65	150	°C
	repetitive peak reverse voltage reverse voltage forward current non-repetitive peak forward current repetitive peak forward current total power dissipation junction temperature ambient temperature	$ \begin{array}{c} \text{repetitive peak reverse} \\ \text{voltage} \\ \text{reverse voltage} \\ \text{forward current} \\ \text{non-repetitive peak} \\ \text{forward current} \\ \end{array} \begin{array}{c} t_p = 1 \; \mu \text{s; square wave; } T_{j(\text{init})} = 25 \; ^{\circ}\text{C} \\ \hline t_p = 100 \; \mu \text{s; square wave; } T_{j(\text{init})} = 25 \; ^{\circ}\text{C} \\ \hline t_p = 10 \; \text{ms; square wave; } T_{j(\text{init})} = 25 \; ^{\circ}\text{C} \\ \hline \text{repetitive peak forward} \\ \text{current} \\ \hline \\ \text{total power dissipation} \\ \hline T_{amb} \leq \; 25 \; ^{\circ}\text{C} \\ \hline \\ \text{junction temperature} \\ \hline \\ \text{ambient temperature} \\ \end{array} $	$ \begin{array}{c} \text{repetitive peak reverse} \\ \text{voltage} \\ \\ \text{reverse voltage} \\ \text{forward current} \\ \\ \text{non-repetitive peak} \\ \text{forward current} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	$ \begin{array}{c} \text{repetitive peak reverse} \\ \text{voltage} \\ \\ \text{reverse voltage} \\ \text{forward current} \\ \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

^[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70 µm copper, tin-plated and standard footprint.

Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70 µm copper, tin-plated and mounting pad for cathode 1 cm².

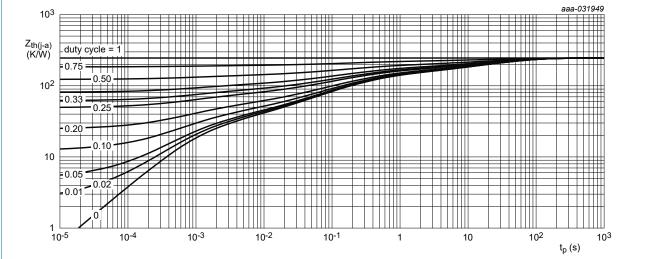
High-voltage switching diode

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
uiy-a)	thermal resistance from	In free air	[1]	-	-	295	K/W
	junction to ambient		[2]	-	-	165	K/W

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



FR4 PCB, single-sided 70 µm copper, standard footprint

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

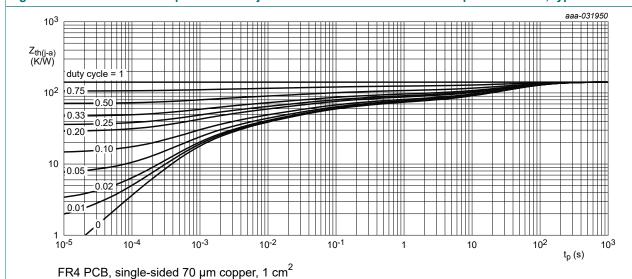


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

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10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _F	forward voltage	I _F = 100 mA; T _j = 25 °C	-	-	1	V
		I _F = 200 mA; T _j = 25 °C	-	-	1.25	V
I _R	reverse current	V _R = 200 V; T _j = 25 °C	-	-	100	nA
		V _R = 200 V; T _j = 150 °C	-	-	100	μΑ
C _d	diode capacitance	V _R = 0 V; f = 1 MHz; T _{amb} = 25 °C	-	-	5	pF
t _{rr}	reverse recovery time	I_F = 30 mA; I_R = 30 mA; R_L = 100 Ω; $I_{R(meas)}$ = 3 mA; T_{amb} = 25 °C	-	-	50	ns

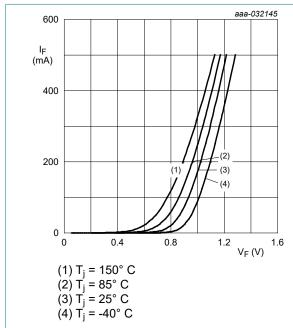


Fig. 3. Forward current as a function of forward voltage; typical values

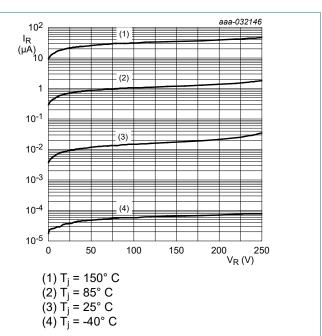


Fig. 4. Reverse current as a function of reverse voltage; typical values

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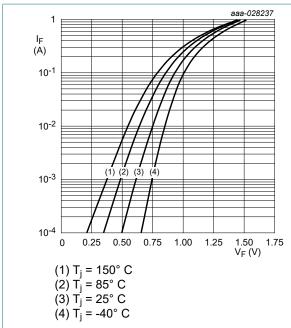


Fig. 5. Forward current as a function of forward voltage; typical values; (logarithmic scale)

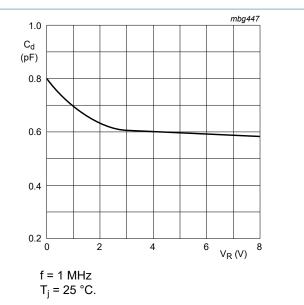
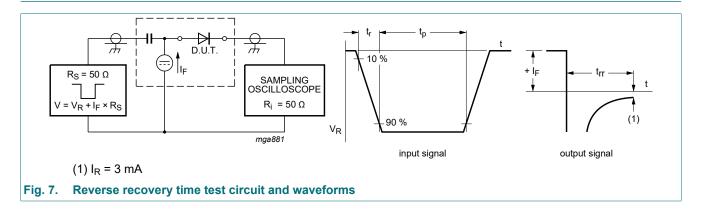


Fig. 6. Diode capacitance as a function of reverse voltage; typical values.

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11. Test information

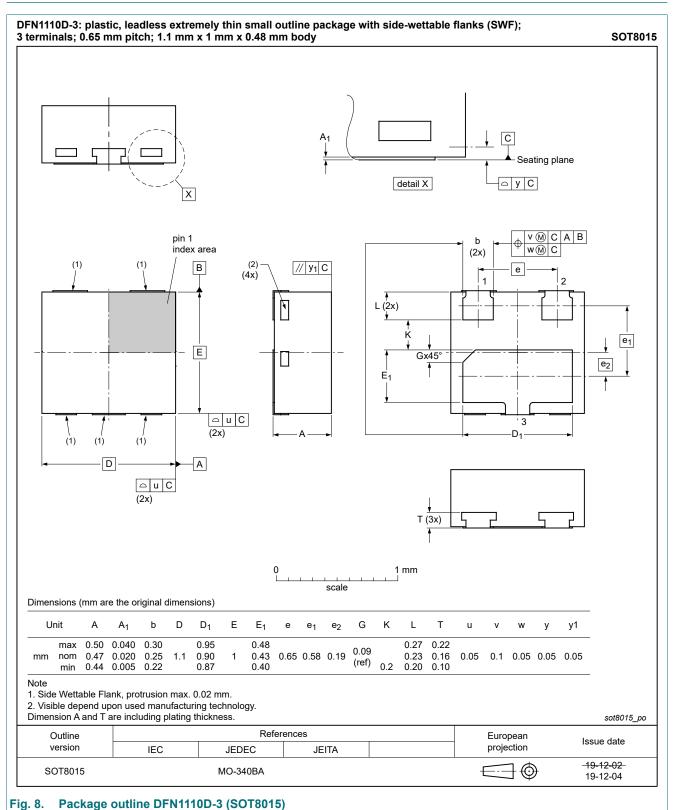


Quality information

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.

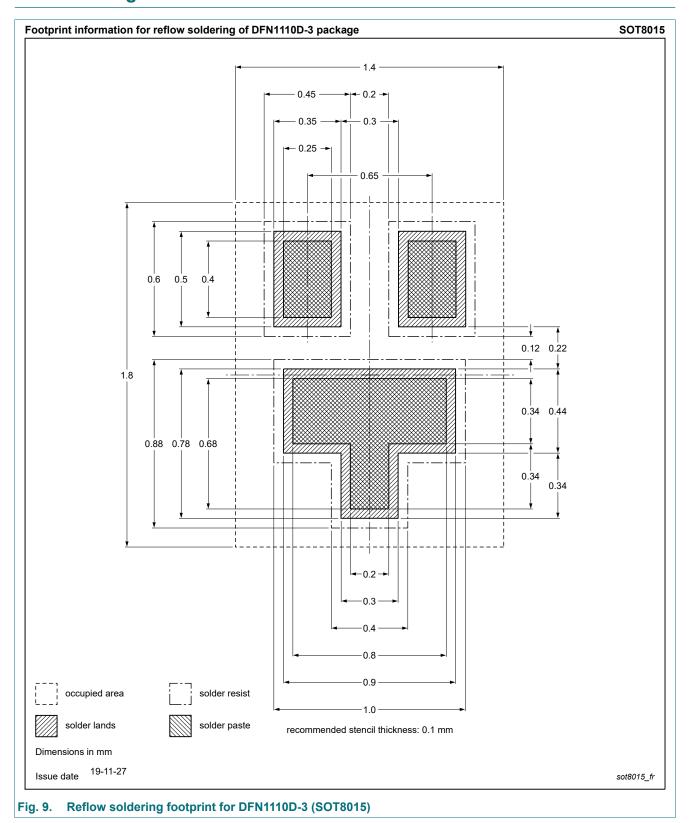
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12. Package outline



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13. Soldering



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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS21QB v.1	20201127	Product data sheet	-	-

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15. Legal information

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.

- Please consult the most recently issued document before initiating or completing a design.
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