



BAV170M

Dual common cathode low-leakage diode

19 May 2016

Product data sheet

1. General description

Dual common cathode low-leakage diode encapsulated in a leadless ultra small DFN1006-3 (SOT883) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- High switching speed: $t_{rr} = 0.8 \mu s$
- Low leakage current: $I_R = 3 \text{ pA}$
- Repetitive peak reverse voltage $V_{RRM} \leq 85 \text{ V}$
- Low capacitance $C_d = 2 \text{ pF}$
- Ultra small SMD plastic package
- Low package height of 0.48 mm
- AEC-Q101 qualified

3. Applications

- Low-leakage current applications
- General-purpose switching

4. Quick reference data

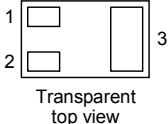
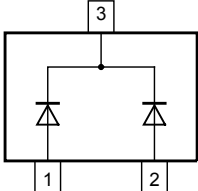
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_F	forward current	$T_{amb} = 25 \text{ }^\circ\text{C}$; single diode loaded	[1]	-	-	320	mA
I_R	reverse current	$V_R = 75 \text{ V}$; $T_j = 25 \text{ }^\circ\text{C}$		-	0.003	5	nA
V_R	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$		-	-	75	V
t_{rr}	reverse recovery time	$I_F = 10 \text{ mA}$; $I_R = 10 \text{ mA}$; $I_{R(meas)} = 1 \text{ mA}$; $R_L = 100 \text{ } \Omega$; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	0.8	3	μs

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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 Transparent top view DFN1006-3 (SOT883)	 006aab034
2	A2	anode (diode 2)		
3	CC	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV170M	DFN1006-3	DFN1006-3: leadless ultra small plastic package; 3 solder lands	SOT883

7. Marking

Table 4. Marking codes

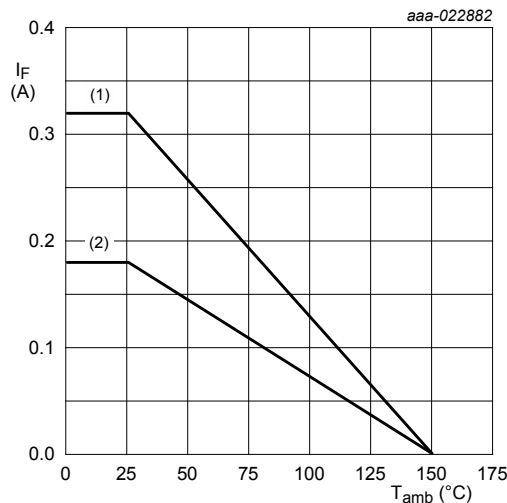
Type number	Marking code
BAV170M	M7

8. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
V _R	reverse voltage	T _j = 25 °C		-	75	V
V _{RRM}	repetitive peak reverse voltage			-	85	V
I _F	forward current	T _{amb} = 25 °C; single diode loaded	[1]	-	320	mA
		T _{amb} = 25 °C; double diode loaded	[1]	-	180	mA
I _{FRM}	repetitive peak forward current	t _p ≤ 0.5 ms; δ ≤ 0.25 ; T _j = 25 °C		-	1	A
I _{FSM}	non-repetitive peak forward current	t _p = 100 μs; T _{j(init)} = 25 °C; square wave		-	4	A
		t _p = 1 ms; T _{j(init)} = 25 °C; square wave		-	1.5	A
		t _p = 1 s; T _{j(init)} = 25 °C; square wave		-	0.5	A
Per device; one diode loaded						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	325	mW
			[2]	-	660	mW
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°C

- [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 cm².



(1) single diode loaded
(2) double diode loaded

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

9. 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]	-	-	385	K/W
			[2]	-	-	190	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	35	K/W

- [1] Device mounted on an FR4 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 cm².
[3] Soldering point of cathode tab.

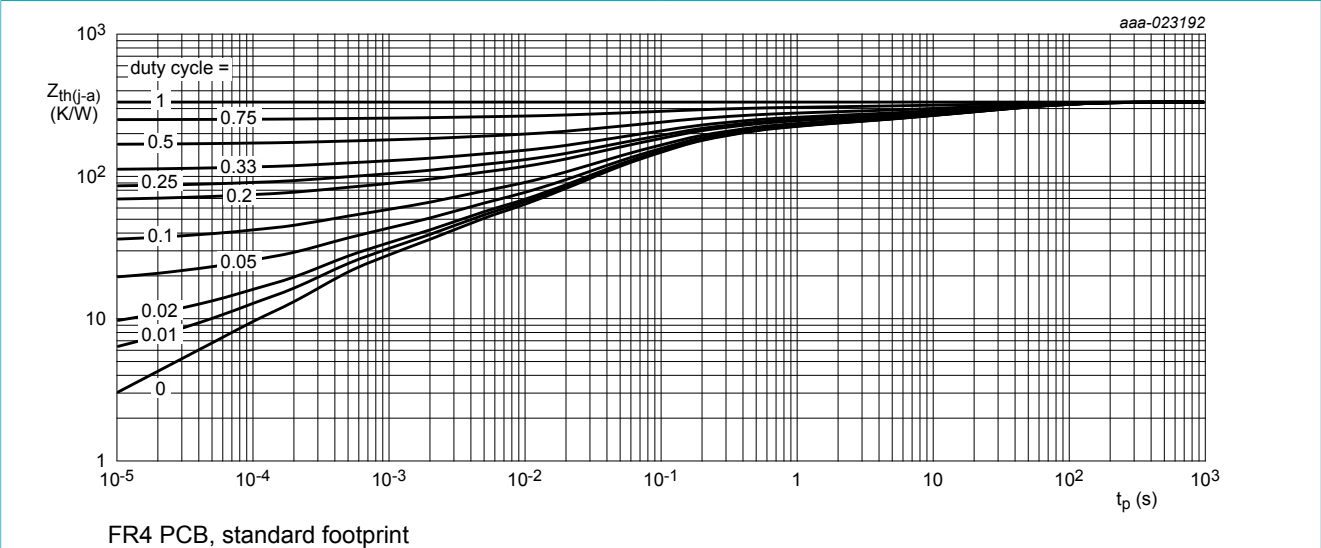


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

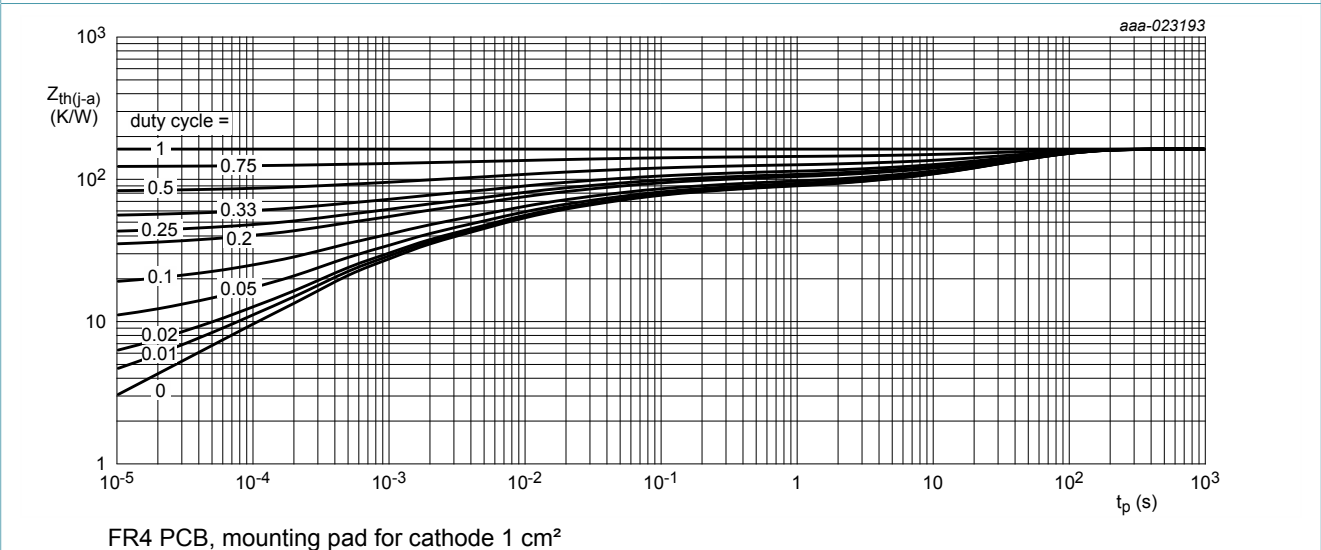


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V _F	forward voltage	I _F = 1 mA; T _j = 25 °C	-	-	0.9	V
		I _F = 10 mA; T _j = 25 °C	-	-	1	V
		I _F = 50 mA; T _j = 25 °C	-	-	1.1	V
		I _F = 150 mA; T _j = 25 °C	-	-	1.25	V
I _R	reverse current	V _R = 75 V; T _j = 25 °C	-	0.003	5	nA
		V _R = 75 V; T _j = 150 °C	-	3	80	nA
C _d	diode capacitance	V _R = 0 V; f = 1 MHz; T _j = 25 °C	-	2	-	pF
t _{rr}	reverse recovery time	I _F = 10 mA; I _R = 10 mA; I _{R(meas)} = 1 mA; R _L = 100 Ω; T _{amb} = 25 °C	-	0.8	3	μs

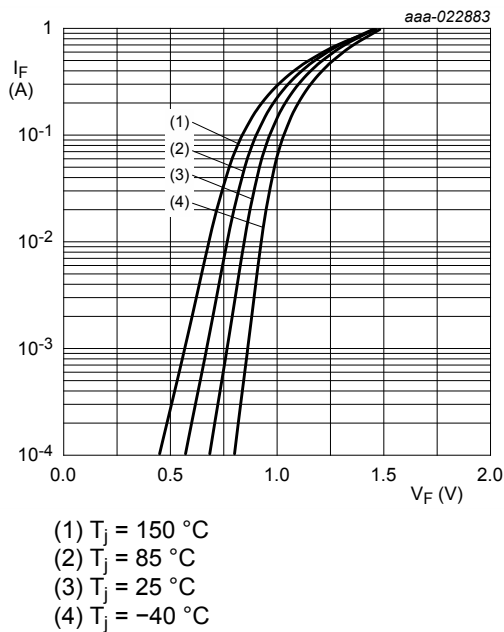


Fig. 4. Forward current as a function of forward voltage; typical values

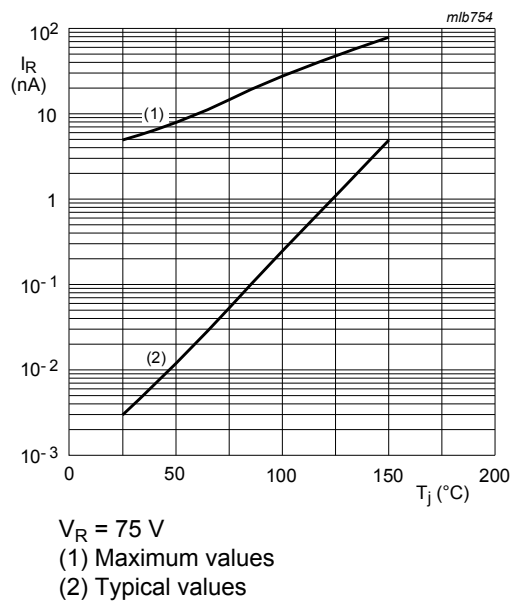


Fig. 5. Reverse current as a function of junction temperature

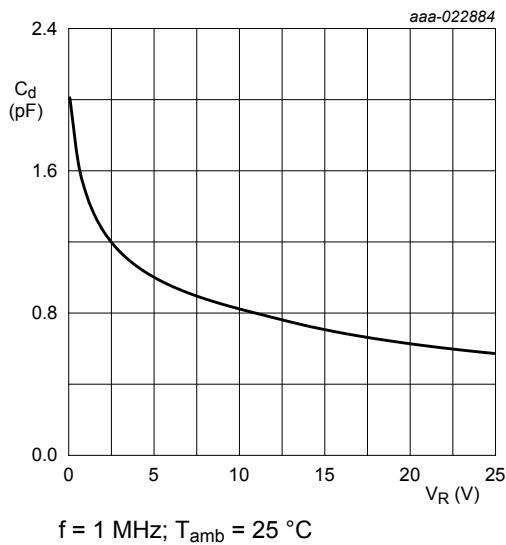


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

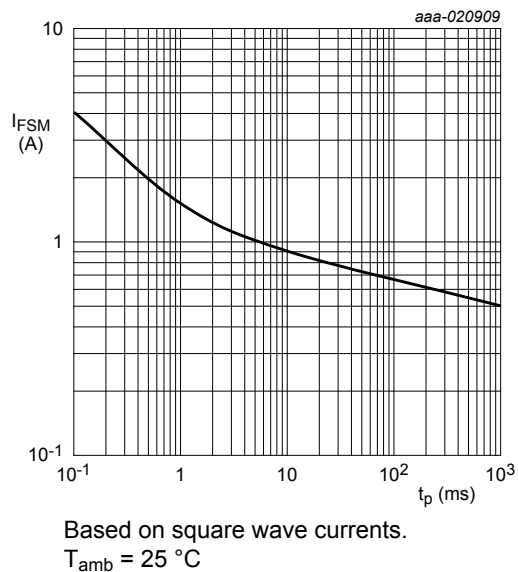


Fig. 7. Non-repetitive forward current as a function of pulse duration; maximum values

11. Test information

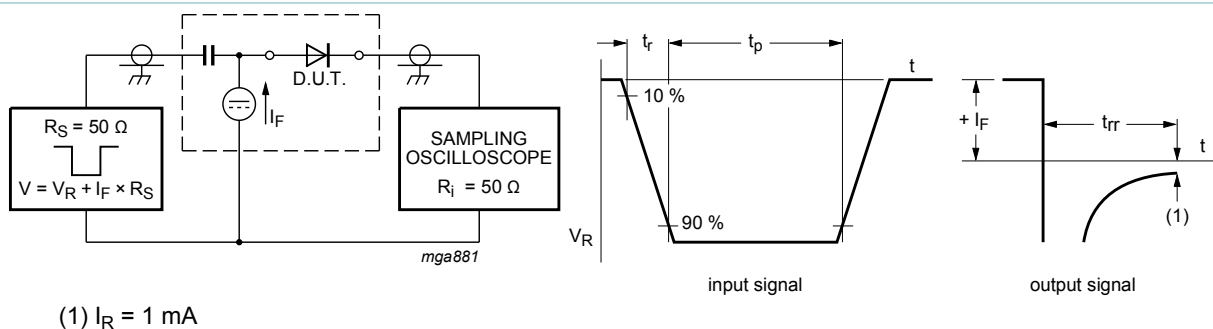
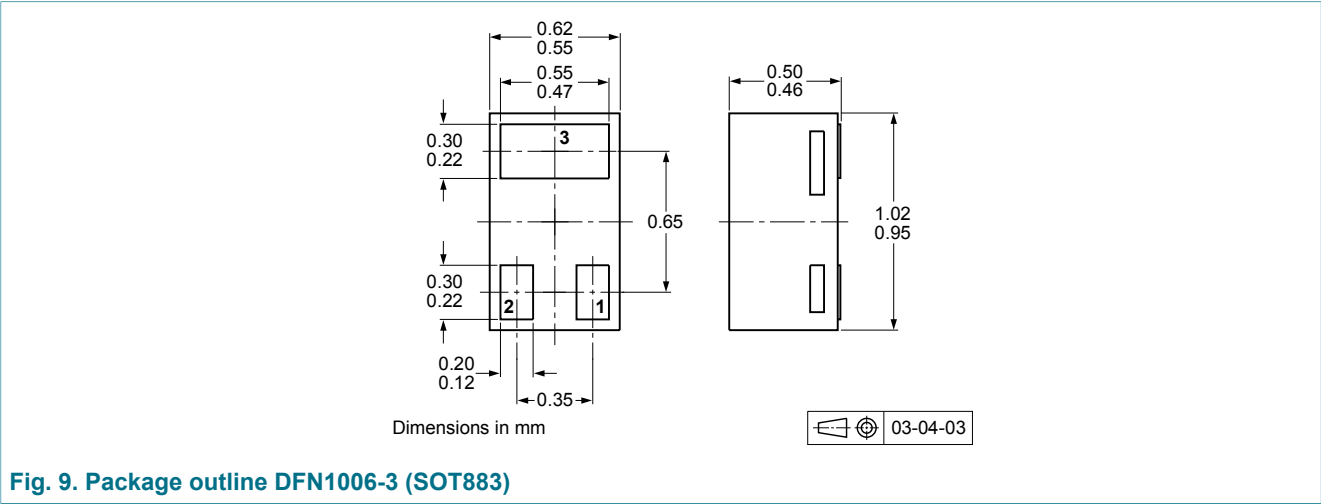


Fig. 8. Reverse recovery time test circuit and waveforms

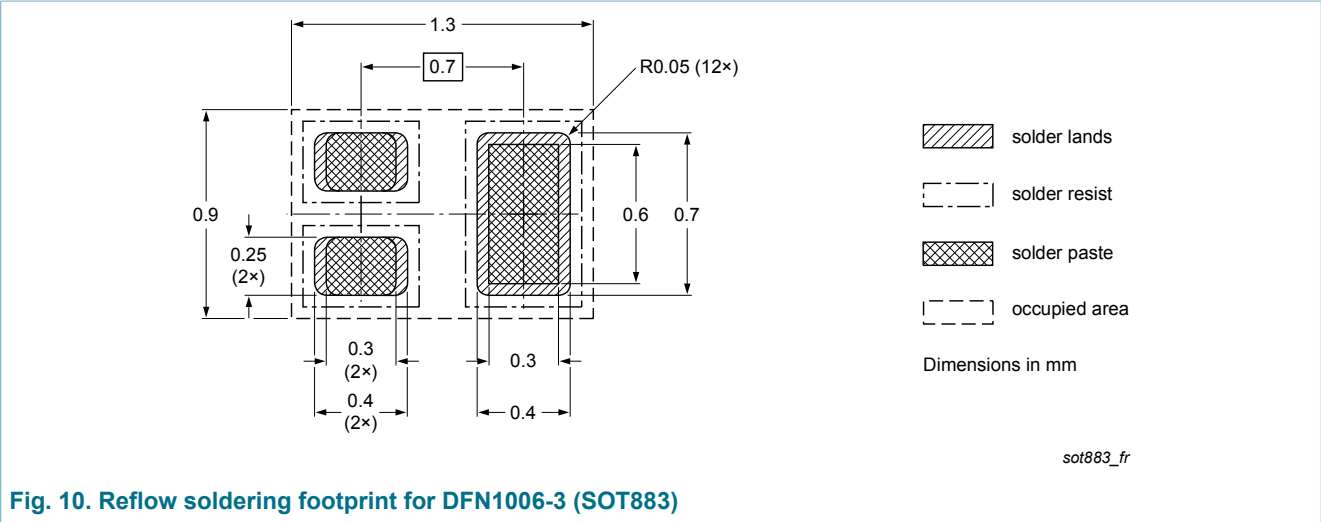
Quality information

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



13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV170M v.1	20160519	Product data sheet	-	-

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.

- [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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