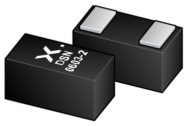


PMEG2002AESF

20 V, 0.2 A low VF MEGA Schottky barrier rectifier

10 March 2017 **Product data sheet**

1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection in a DSN0603-2 (SOD962-2) leadless ultra small Surface-Mounted Device (SMD) package.

2. Features and benefits

- Average forward current $I_{F(AV)} \leq 0.2$ A
- Reverse voltage $V_R \leq 20$ V
- Low forward voltage typ. $V_F = 245$ mV
- Low reverse current typ. $I_R = 5$ µA
- Ultra small and leadless SMD package
- Package height typ. 0.3 mm

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Low power consumption applications
- Ultra high-speed switching
- LED backlight for mobile application

4. Quick reference data

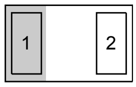
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq$ 120 °C		-	-	0.28	A
V_R	reverse voltage	T_j = 25 °C		-	-	20	V
V_F	forward voltage	I_F = 200 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02 ; pulsed; T_j = 25 °C		-	375	420	mV
I_R	reverse current	V_R = 10 V; T_j = 25 °C		-	5	-	µA

nexperia

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]	 Transparent top view **DSN0603-2 (SOD962-2)**	 *sym001*
2	A	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG2002AESF	DSN0603-2	Leadless ultra small package; 2 terminals; body 0.6 x 0.3 x 0.3 mm	SOD962-2

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG2002AESF	A

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage	T_j = 25 °C		-	20	V
I_F	forward current	$T_{sp} \leq$ 120 °C		-	0.28	A
$I_{F(AV)}$	average forward current	δ = 0.5 ; f = 20 kHz; T_{amb} = 115 °C; square wave	[1]	-	0.2	A
		δ = 0.5 ; f = 20 kHz; T_{sp} = 125 °C; square wave		-	0.2	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 1 ms; δ ≤ 0.25		-	2	A
I_{FSM}	non-repetitive peak forward current	t_p = 8 ms; $T_{j(init)}$ = 25 °C; square wave		-	4.5	A
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[2]	-	325	mW
			[3]	-	525	mW

Symbol	Parameter	Conditions		Min	Max	Unit
			[1]	-	950	mW
T_j	junction temperature			-	125	°C
T_{amb}	ambient temperature			-55	125	°C
T_{stg}	storage temperature			-65	150	°C

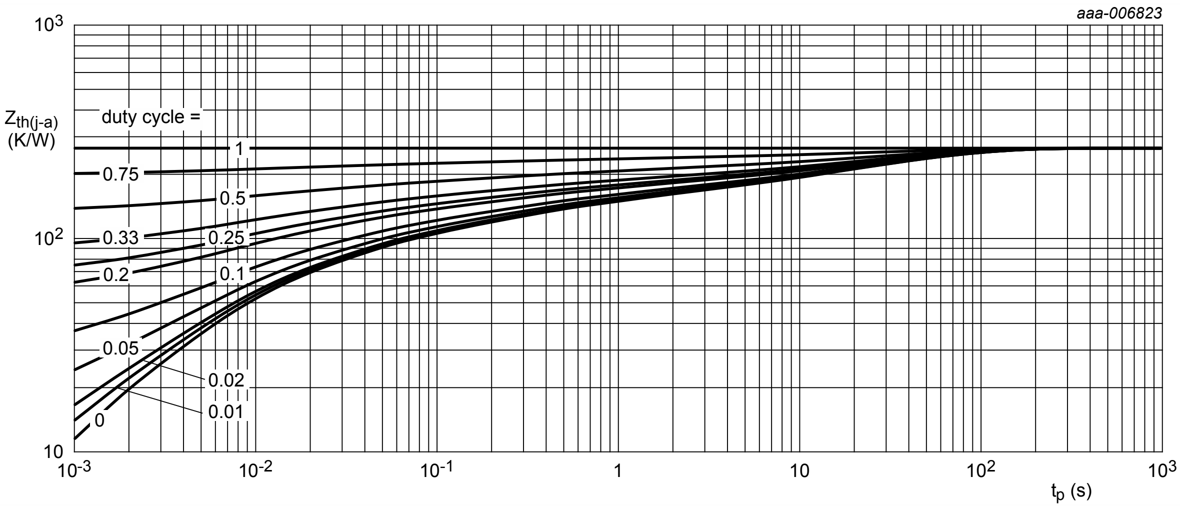
[1] Device mounted on a ceramic Printed-Circuit Board (PCB), Al_2O_3, standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode and cathode 1 cm^2 each.

9. Thermal characteristics

Table 6. Thermal characteristics

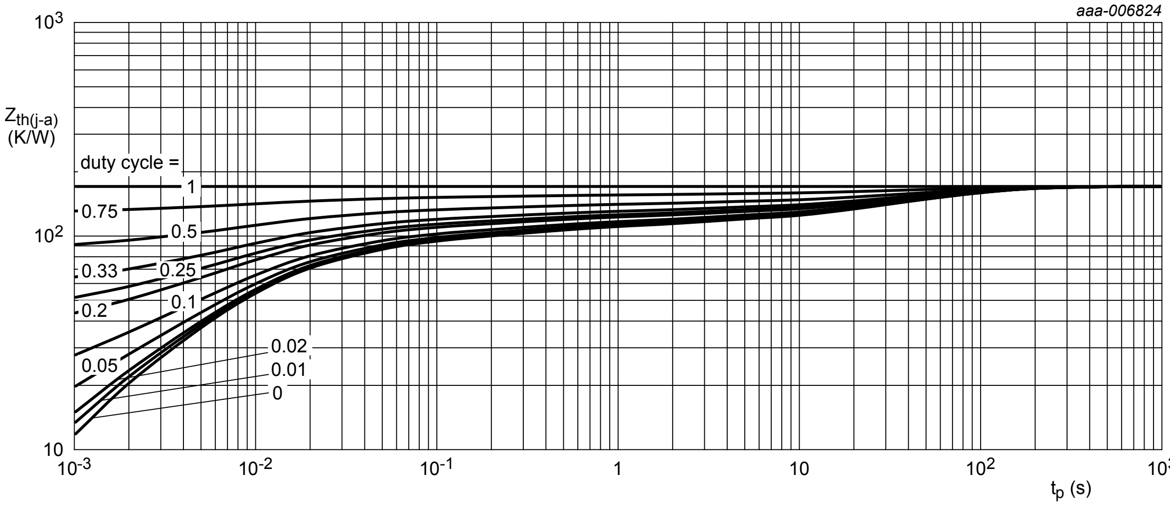
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	310	K/W
			[1] [3]	-	-	190	K/W
			[1] [4]	-	-	105	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[5]	-	-	40	K/W

[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode and cathode 1 cm^2 each.
[4] Device mounted on a ceramic PCB, Al_2O_3, standard footprint.
[5] Soldering point of cathode tab.



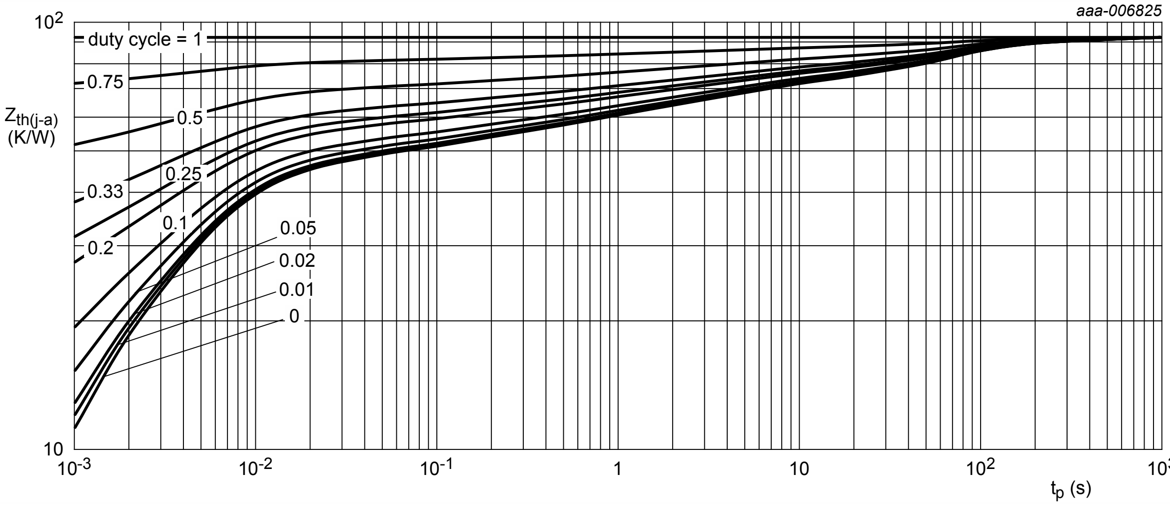
FR4 PCB, standard footprint

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



FR4 PCB, mounting pad for anode and cathode 1 cm^2 each

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



Ceramic PCB, Al_2O_3, standard footprint

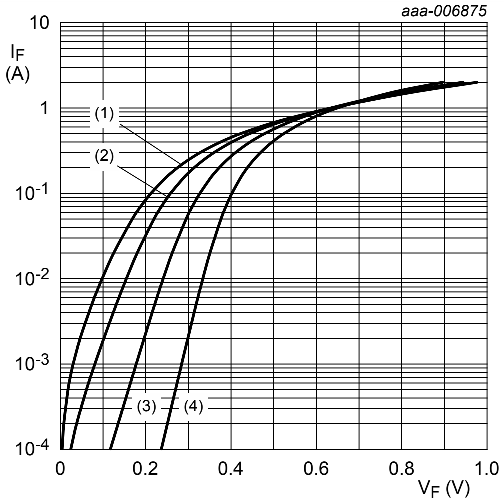
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

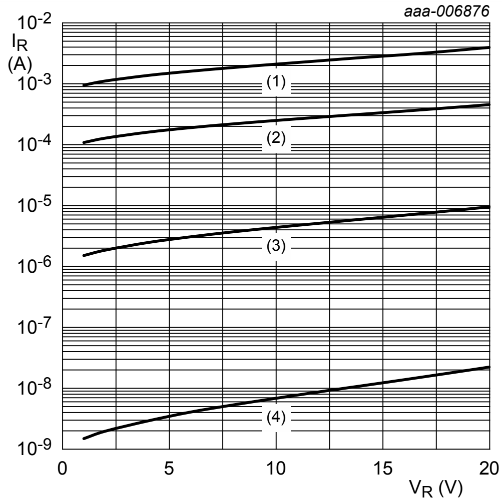
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 0.1 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02 ; pulsed; T_j = 25 °C		-	120	180	mV
		I_F = 1 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02 ; pulsed; T_j = 25 °C		-	180	250	mV
		I_F = 10 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02 ; pulsed; T_j = 25 °C		-	245	310	mV
		I_F = 100 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02 ; pulsed; T_j = 25 °C		-	330	380	mV

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
		I_F = 200 mA; t_p ≤ 300 µs; δ ≤ 0.02 ; pulsed; T_j = 25 °C		-	375	420	mV
I_R	reverse current	V_R = 6 V; T_j = 25 °C		-	3.2	20	µA
		V_R = 10 V; T_j = 25 °C		-	5	-	µA
		V_R = 20 V; T_j = 25 °C		-	10	45	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; T_j = 25 °C		-	25	-	pF
		V_R = 10 V; f = 1 MHz; T_j = 25 °C		-	10	-	pF
t_{rr}	reverse recovery time	I_F = 200 mA; I_R = 200 mA; $I_{R(meas)}$ = 40 mA; T_j = 25 °C		-	1.9	-	ns



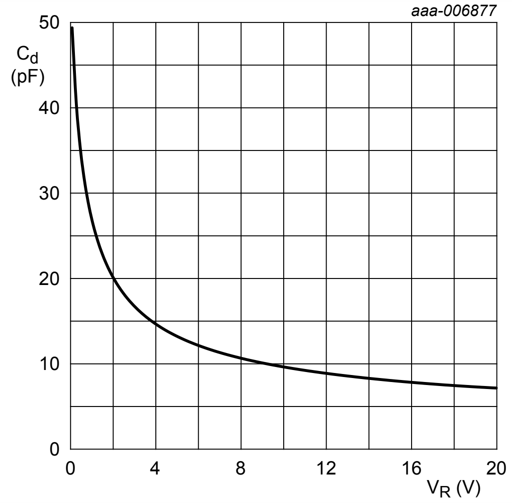
(1) T_j = 125 °C
(2) T_j = 85 °C
(3) T_j = 25 °C
(4) T_j = −40 °C

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



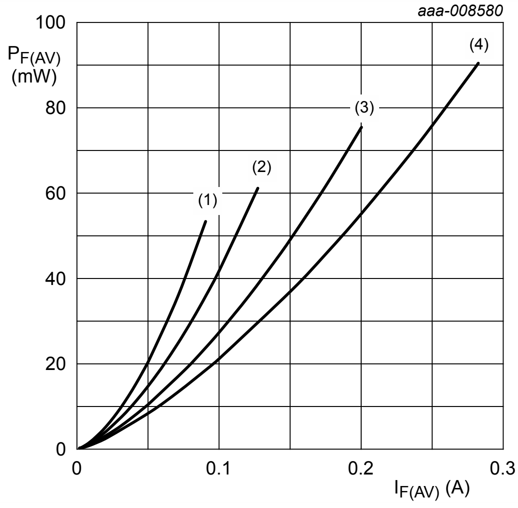
(1) T_j = 125 °C
(2) T_j = 85 °C
(3) T_j = 25 °C
(4) T_j = −40 °C

Fig. 5. Reverse current as a function of reverse voltage; typical values



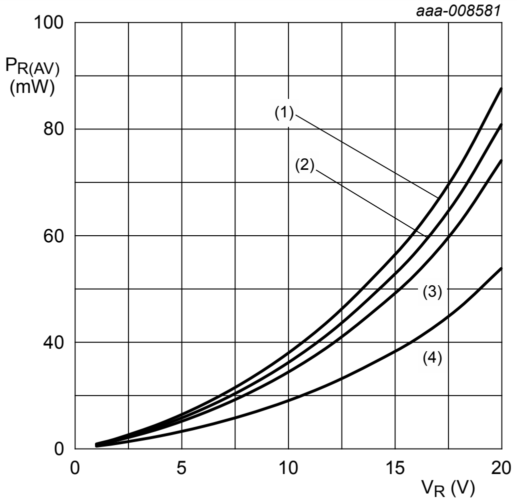
f = 1 MHz; T_{amb} = 25 °C

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



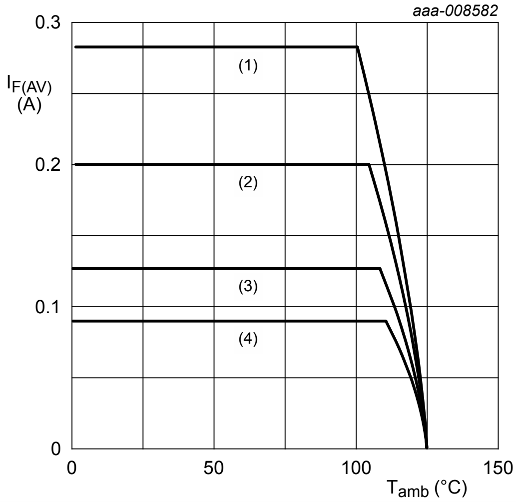
T_j = 125 °C
(1) δ = 0.1
(2) δ = 0.2
(3) δ = 0.5
(4) δ = 1

Fig. 7. Average forward power dissipation as a function of average forward current; typical values



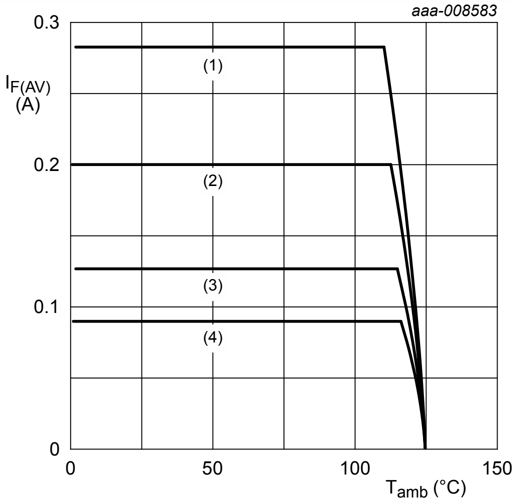
T_j = 125 °C
(1) δ = 1 (DC)
(2) δ = 0.9; f = 20 kHz
(3) δ = 0.8; f = 20 kHz
(4) δ = 0.5; f = 20 kHz

Fig. 8. Average reverse power dissipation as a function of reverse voltage; typical values



FR4 PCB, standard footprint
T_j = 125 °C
(1) δ = 1
(2) δ = 0.5
(3) δ = 0.2
(4) δ = 0.1

Fig. 9. Average forward current as a function of ambient temperature; typical values



FR4 PCB, mounting pad for anode and cathode 1 cm^2 each

T_j = 125 °C

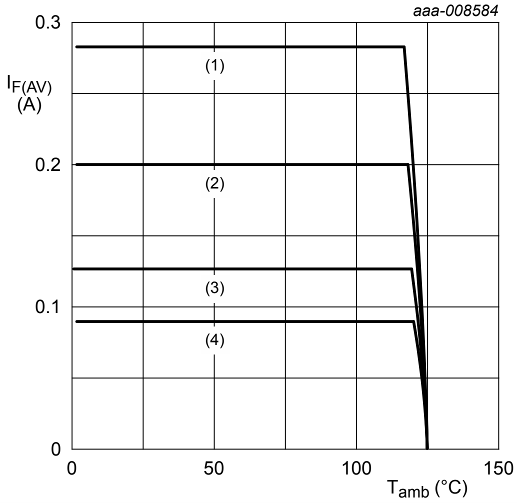
(1) δ = 1

(2) δ = 0.5

(3) δ = 0.2

(4) δ = 0.1

Fig. 10. Average forward current as a function of ambient temperature; typical values



Ceramic PCB, Al_2O_3, standard footprint

T_j = 125 °C

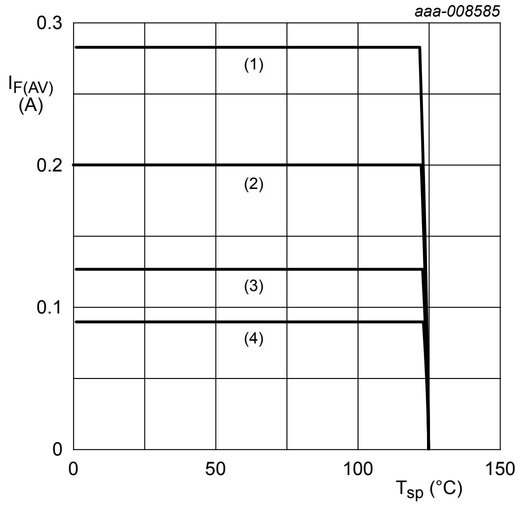
(1) δ = 1

(2) δ = 0.5

(3) δ = 0.2

(4) δ = 0.1

Fig. 11. Average forward current as a function of ambient temperature; typical values



T_j = 125 °C

(1) δ = 1

(2) δ = 0.5

(3) δ = 0.2

(4) δ = 0.1

Fig. 12. Average forward current as a function of solder point temperature; typical values

11. Test information

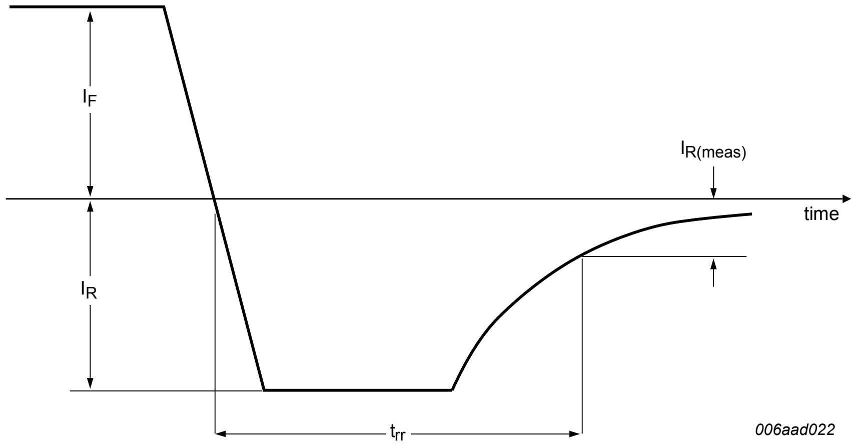


Fig. 13. Reverse recovery definition

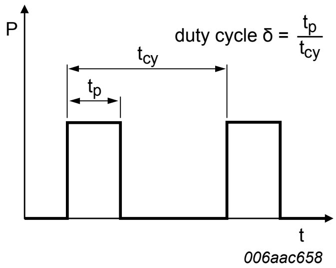
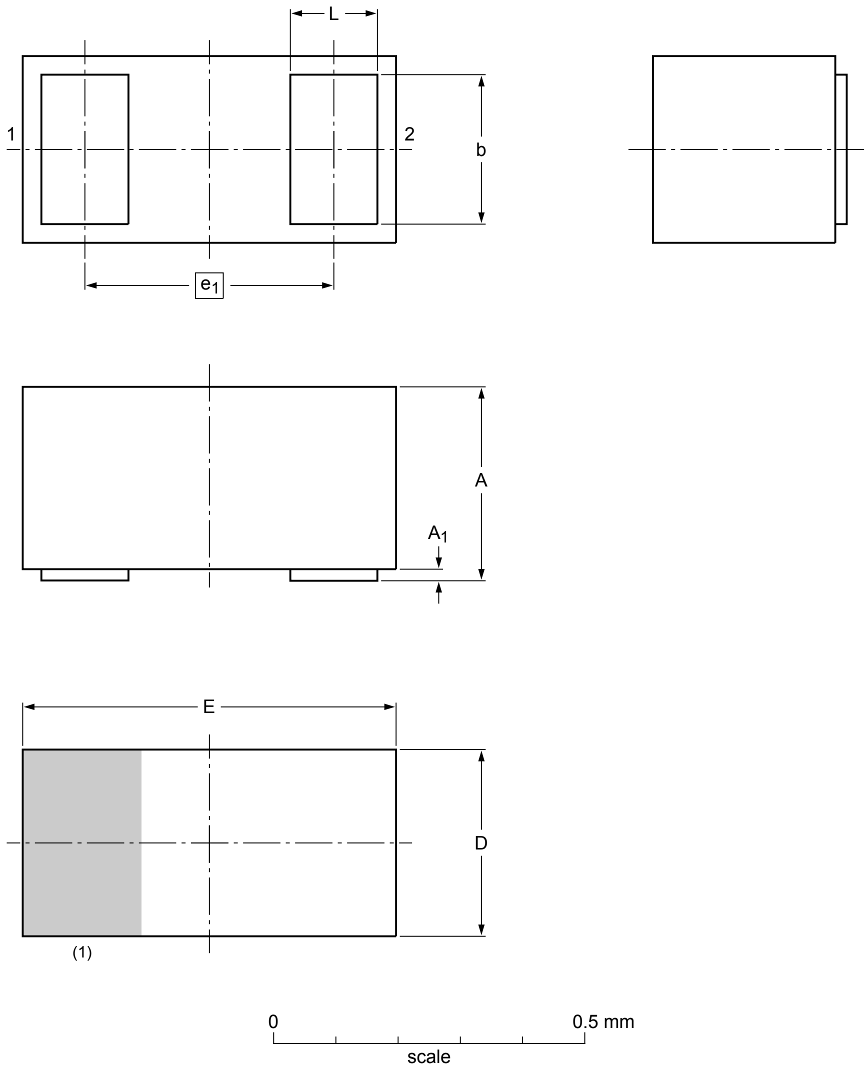


Fig. 14. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations: $I_{F(AV)} = I_M \times \delta$ with I_M defined as peak current, $I_{RMS} = I_{F(AV)}$ at DC, and $I_{RMS} = I_M \times \sqrt{\delta}$ with I_{RMS} defined as RMS current.

12. Package outline

Leadless ultra small package; 2 terminals; body 0.6 x 0.3 x 0.3 mm **SOD962-2**



Dimensions (mm are the original dimensions)

Unit		A	A_1	b	D	E	e_1	L
mm	max	0.32	0.03	0.25	0.325	0.625		0.15
	nom						0.4	
	min	0.28		0.23	0.275	0.575		0.13

Note

1. The marking bar indicates the cathode.

sod962-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD962-2						~~13-07-12~~ 13-07-17

Fig. 15. Package outline DSN0603-2 (SOD962-2)

13. Soldering

Footprint information for reflow soldering of leadless ultra small package; 2 terminals **SOD962-2**

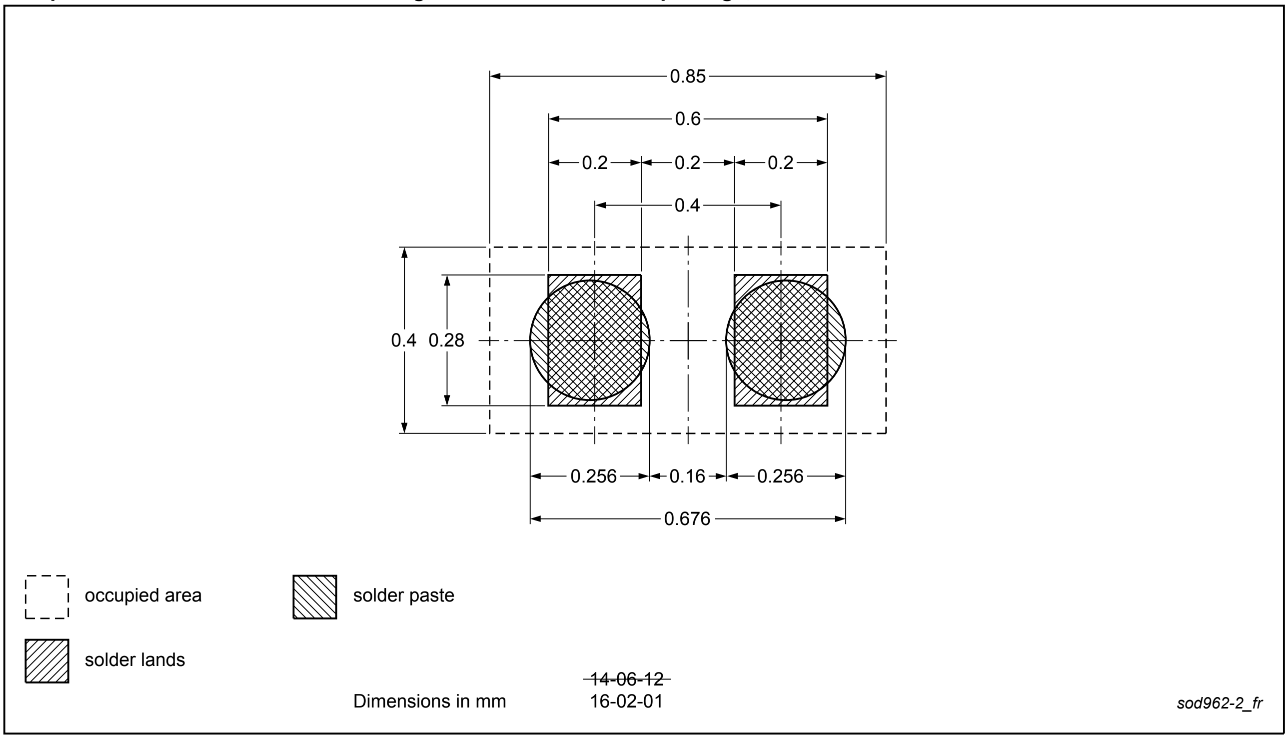


Fig. 16. Reflow soldering footprint for DSN0603-2 (SOD962-2)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2002AESF v.3	20140122	Product data sheet	-	PMEG2002AESF v.2
Modifications:	• Features and benefits: corrected			
PMEG2002AESF v.2	20131008	Product data sheet	-	PMEG2002AESF v.1
PMEG2002AESF v.1	20130301	Objective 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".
[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 URL http://www.nexperia.com.

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