PMEG2002AESFB

20 V, 0.2 A low VF MEGA Schottky barrier rectifier

17 August 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 DSN0603B-2 (SOD962B) 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
- Low leakage current
- Ultra small and leadless SMD package
- Package height typ. 0.2 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
- Smartcard-embedded applications

4. Quick reference data

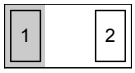
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $f = 20$ kHz; $T_{sp} \leq 125$ °C; square wave		-	-	0.2	A
V_R	reverse voltage	$T_j = 25$ °C		-	-	20	V
V_F	forward voltage	$I_F = 200$ mA; $T_j = 25$ °C; pulsed	[1]	-	375	420	mV
I_R	reverse current	$V_R = 10$ V; $T_j = 25$ °C; pulsed	[1]	-	5	25	µA
		$V_R = 20$ V; $T_j = 25$ °C; pulsed	[1]	-	10	45	µA

[1] Very short pulse, in order to maintain a stable junction temperature.

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]	 Transparent top view **DSN0603B-2 (SOD962B)**	 *sym001*
2	A	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG2002AESFB	DSN0603B-2	silicon, leadless ultra small package; 2 terminals; 0.4 mm pitch; 0.6 x 0.3 x 0.2 mm body	SOD962B

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG2002AESFB	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; δ = 1		-	0.28	A
$I_{F(AV)}$	average forward current	δ = 0.5 ; f = 20 kHz; $T_{amb} \leq$ 115 °C; square wave		-	0.2	A
		δ = 0.5 ; f = 20 kHz; $T_{sp} \leq$ 125 °C; square wave		-	0.2	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 1 ms; δ ≤ 0.25		-	1.7	A
I_{FSM}	non-repetitive peak forward current	t_p = 8 ms; $T_{j(init)}$ = 25 °C; square wave		-	4	A
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[1]	-	325	mW
			[2]	-	525	mW
T_j	junction temperature			-	125	°C
T_{amb}	ambient temperature			-40	125	°C
T_{stg}	storage temperature			-40	125	°C

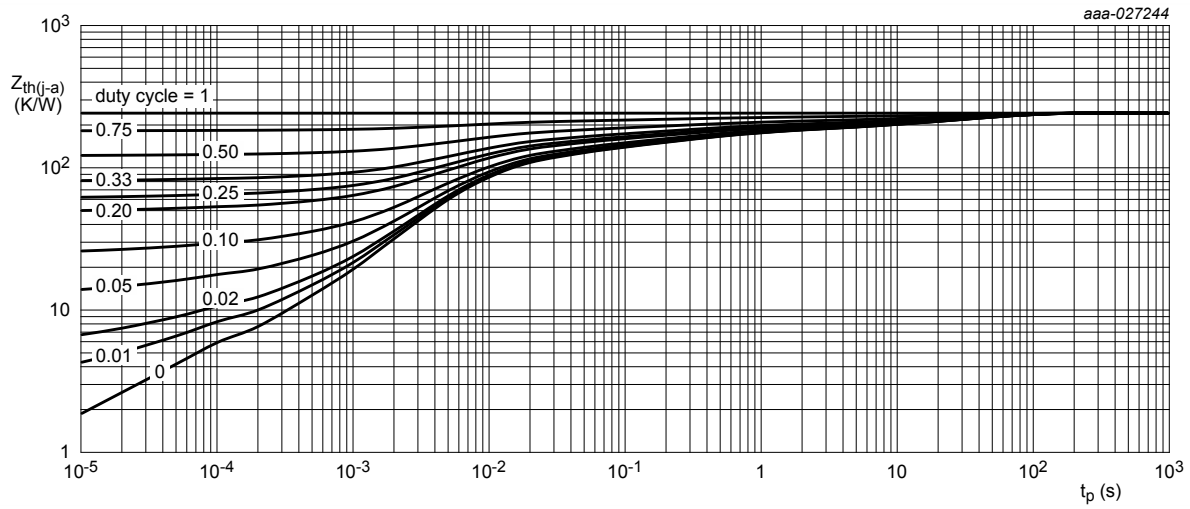
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode and cathode 1 cm^2 each.

9. Thermal characteristics

Table 6. Thermal characteristics

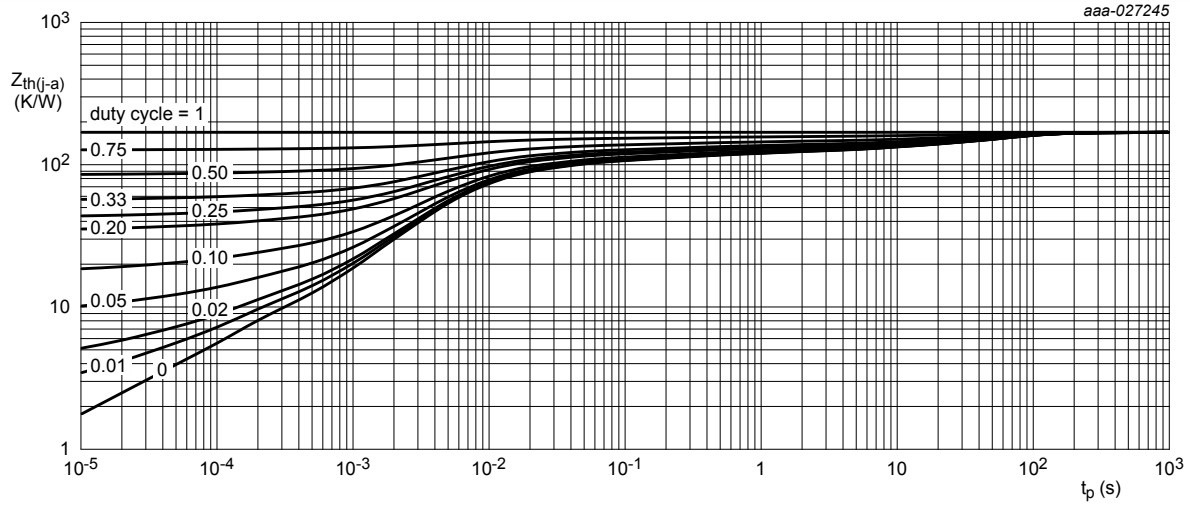
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	310	K/W
			[1] [3]	-	-	190	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	40	K/W

[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] Soldering point of anode 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

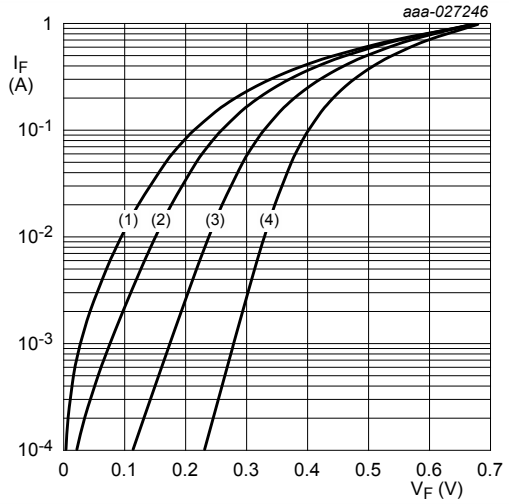
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

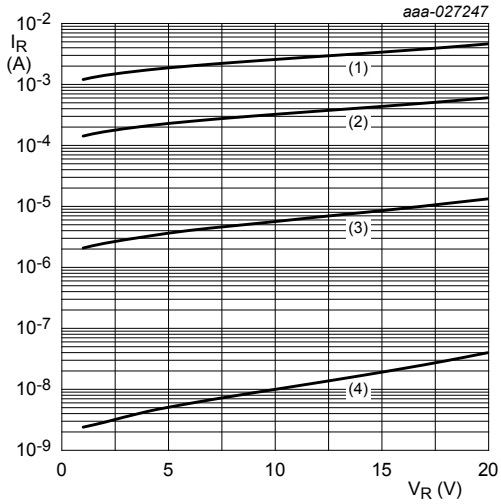
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)R}$	reverse breakdown voltage	I_R = 0.1 mA; T_j = 25 °C; pulsed	[1]	20	-	-	V
V_F	forward voltage	I_F = 0.1 mA; T_j = 25 °C; pulsed	[1]	-	120	180	mV
		I_F = 1 mA; T_j = 25 °C; pulsed	[1]	-	180	250	mV
		I_F = 10 mA; T_j = 25 °C; pulsed	[1]	-	245	310	mV
		I_F = 100 mA; T_j = 25 °C; pulsed	[1]	-	330	380	mV
		I_F = 200 mA; T_j = 25 °C; pulsed	[1]	-	375	420	mV
I_R	reverse current	V_R = 6 V; T_j = 25 °C; pulsed	[1]	-	3.2	20	µA
		V_R = 10 V; T_j = 25 °C; pulsed	[1]	-	5	25	µA
		V_R = 20 V; T_j = 25 °C; pulsed	[1]	-	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] Very short pulse, in order to maintain a stable junction temperature.



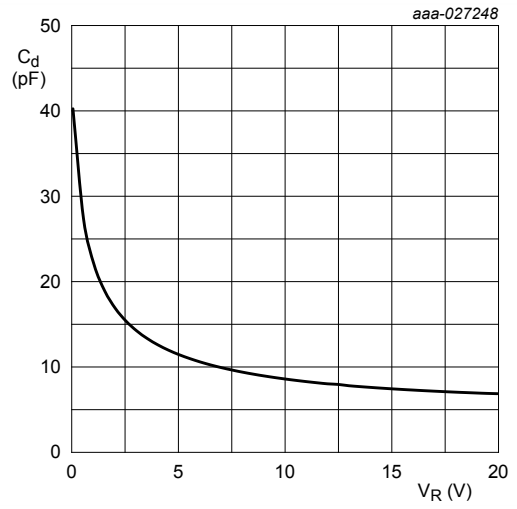
(1) T_j = 125 °C
(2) T_j = 85 °C
(3) T_j = 25 °C
(4) T_j = −40 °C

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



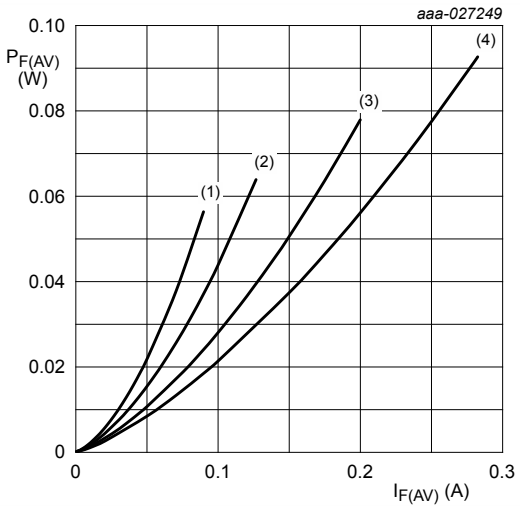
(1) T_j = 125 °C
(2) T_j = 85 °C
(3) T_j = 25 °C
(4) T_j = −40 °C

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



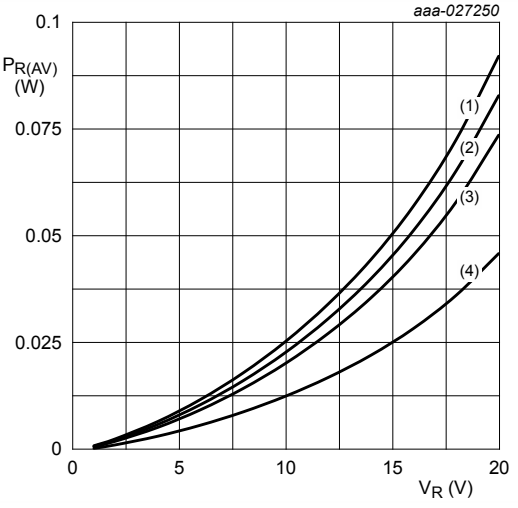
f = 1 MHz; T_{amb} = 25 °C

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



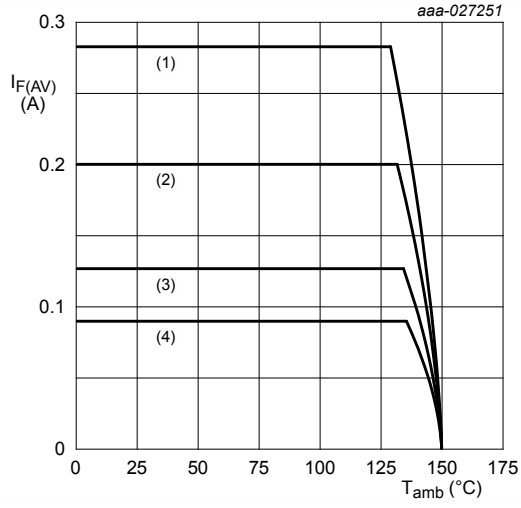
T_j = 125 °C
(1) δ = 0.1
(2) δ = 0.2
(3) δ = 0.5
(4) δ = 1; DC

Fig. 6. Average forward power dissipation as a function of average forward current; typical values



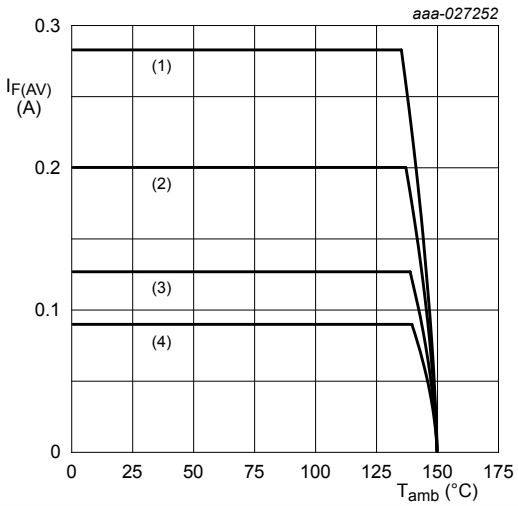
T_j = 125 °C
(1) δ = 1; DC
(2) δ = 0.9; f = 20 kHz
(3) δ = 0.8; f = 20 kHz
(4) δ = 0.5; f = 20 kHz

Fig. 7. Average reverse power dissipation as a function of reverse voltage; typical values



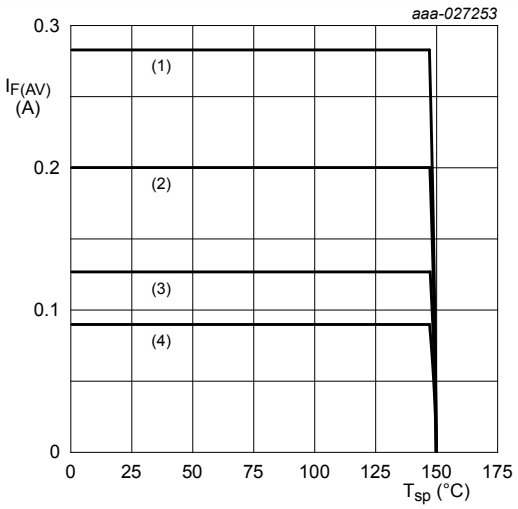
FR4 PCB, standard footprint
T_j = 125 °C
(1) δ = 1; DC
(2) δ = 0.5; f = 20 kHz
(3) δ = 0.2; f = 20 kHz
(4) δ = 0.1; f = 20 kHz

Fig. 8. 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; DC
(2) δ = 0.5; f = 20 kHz
(3) δ = 0.2; f = 20 kHz
(4) δ = 0.1; f = 20 kHz

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



T_j = 125 °C
(1) δ = 1; DC
(2) δ = 0.5; f = 20 kHz
(3) δ = 0.2; f = 20 kHz
(4) δ = 0.1; f = 20 kHz

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

11. Test information

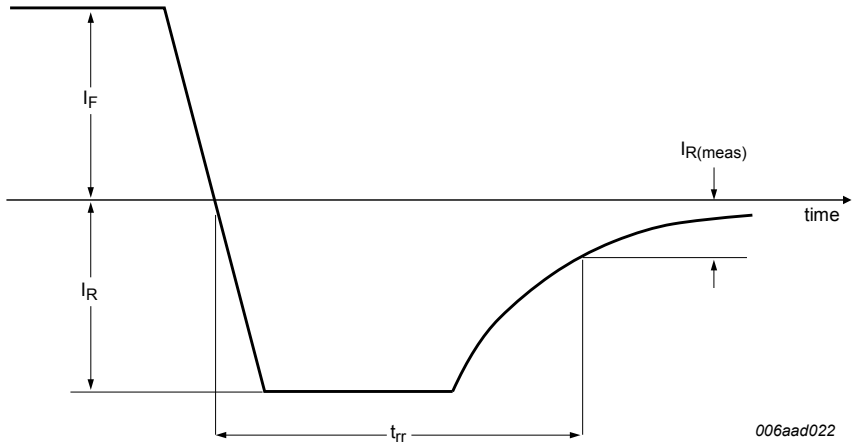


Fig. 11. Reverse recovery definition

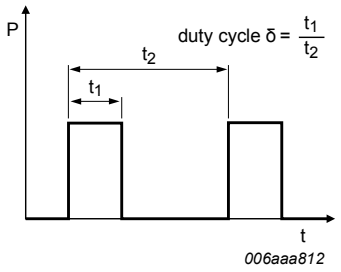


Fig. 12. Duty cycle definition

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

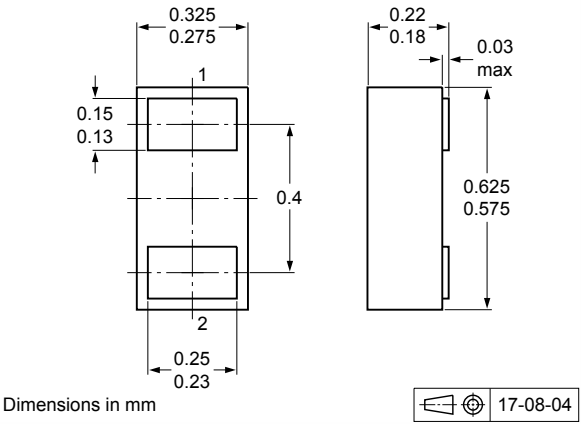


Fig. 13. Package outline DSN0603B-2 (SOD962B)

13. Soldering

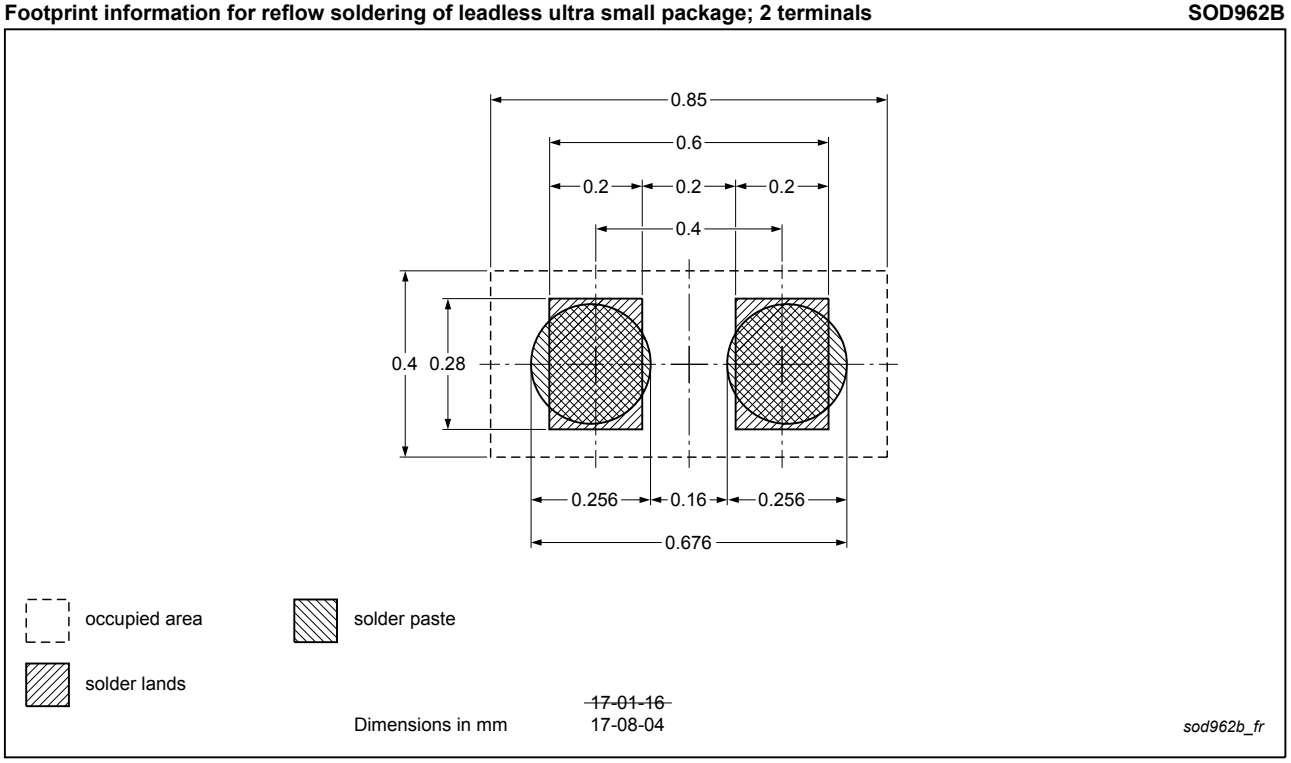


Fig. 14. Reflow soldering footprint for DSN0603B-2 (SOD962B)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2002AESFB v.1	20170817	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.

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Date of release: 17 August 2017