



# PMEG100V100ELPE

100 V, 10 A low leakage current Schottky barrier rectifier

20 July 2022

Product data sheet

## 1. General description

Low leakage current Schottky barrier rectifier encapsulated in a CFP15B (SOT1289B) power and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Low forward voltage
- Low leakage current
- High thermal stability and large Safe Operation Area
- High power capability due to clip-bonding technology
- Small and flat lead SMD plastic package

## 3. Applications

- High efficiency DC-to-DC conversion
- LED lighting
- Switch mode power supply
- Freewheeling application
- Reverse polarity protection
- OR-ing

## 4. Quick reference data

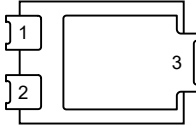
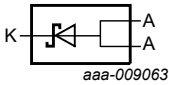
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; $f = 20$ kHz; square wave; $T_{amb} \leq 168$ °C		-	-	10	A
$V_R$	reverse voltage	$T_j = 25$ °C		-	-	100	V
$V_F$	forward voltage	$I_F = 10$ A; pulsed; $T_j = 25$ °C	[1]	-	770	850	mV
$I_R$	reverse current	$V_R = 100$ V; pulsed; $T_j = 25$ °C	[1]	-	0.2	0.8	$\mu$ A
		$V_R = 100$ V; pulsed; $T_j = 125$ °C	[1]	-	0.4	2.5	mA

[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	A	anode	 CFP15B (SOT1289B)	 aaa-009063
2	A	anode		
3	K	cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PMEG100V100ELPE</a>	CFP15B	plastic, thermal enhanced ultra thin SMD package; 3 leads; 2.13 mm pitch; 5.8 x 4.3 x 0.95 mm body	<a href="#">SOT1289B</a>

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG100V100ELPE	100V L10E

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	$T_j = 25\text{ }^{\circ}\text{C}$		-	100	V
$I_F$	forward current	$\delta = 1; T_{sp} \leq 167\text{ }^{\circ}\text{C}$		-	14	A
$I_{F(AV)}$	average forward current	$\delta = 0.5; f = 20\text{ kHz}; \text{square wave}; T_{amb} \leq 168\text{ }^{\circ}\text{C}$		-	10	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8.3\text{ ms}; \text{square wave}; T_{j(init)} = 25\text{ }^{\circ}\text{C}$		-	210	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	[1]	-	1.66	W
			[2]	-	2.15	W
$T_j$	junction temperature			-	175	$^{\circ}\text{C}$
$T_{amb}$	ambient temperature			-55	175	$^{\circ}\text{C}$
$T_{stg}$	storage temperature			-65	175	$^{\circ}\text{C}$

[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 cathode 1 cm<sup>2</sup>.

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]	-	-	90	K/W
			[1] [3]	-	-	70	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	3	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 cathode 1 cm<sup>2</sup>.
- [4] Soldering point of cathode tab.

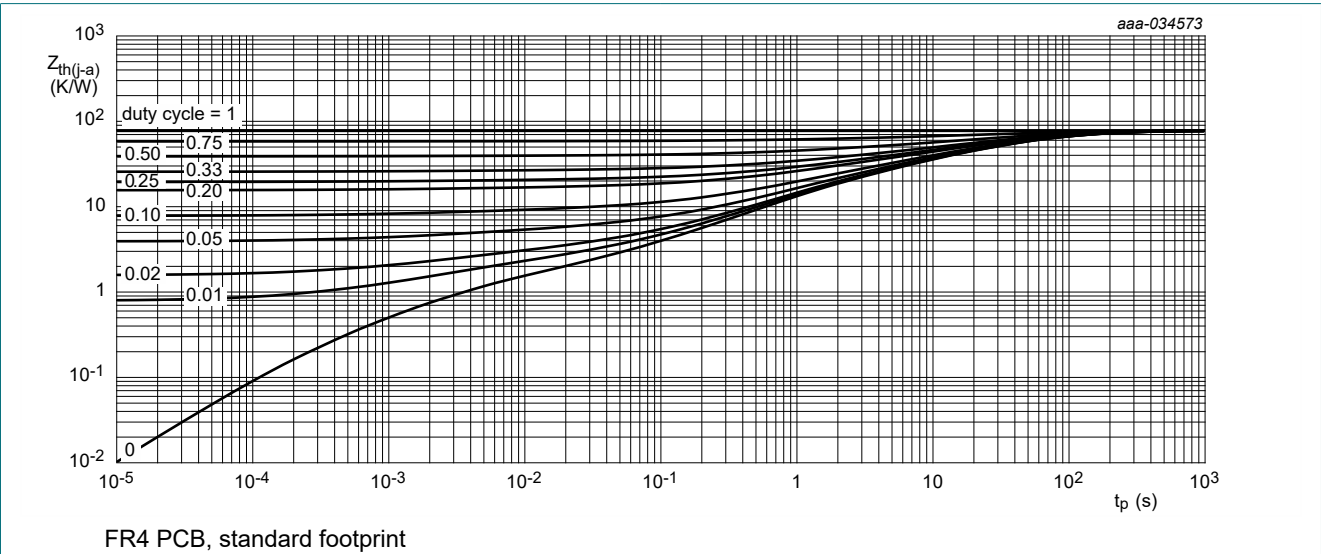


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

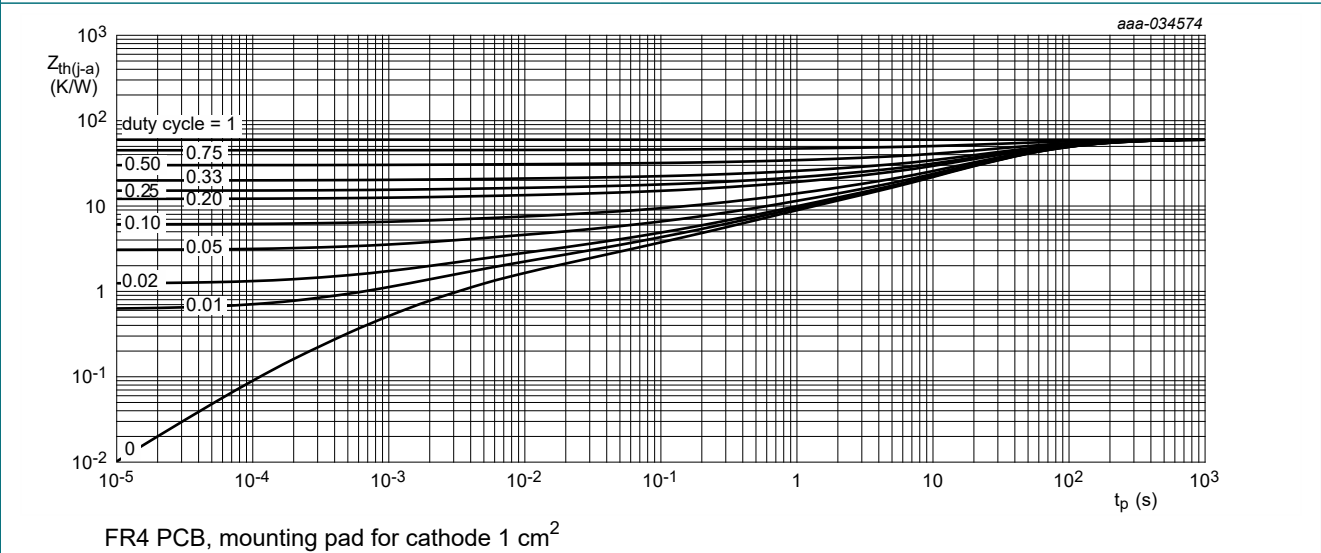


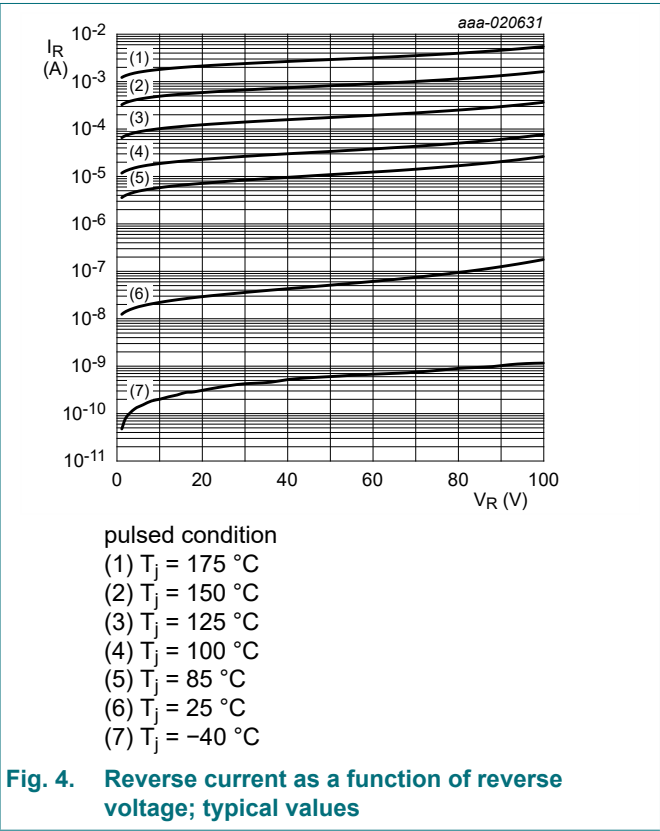
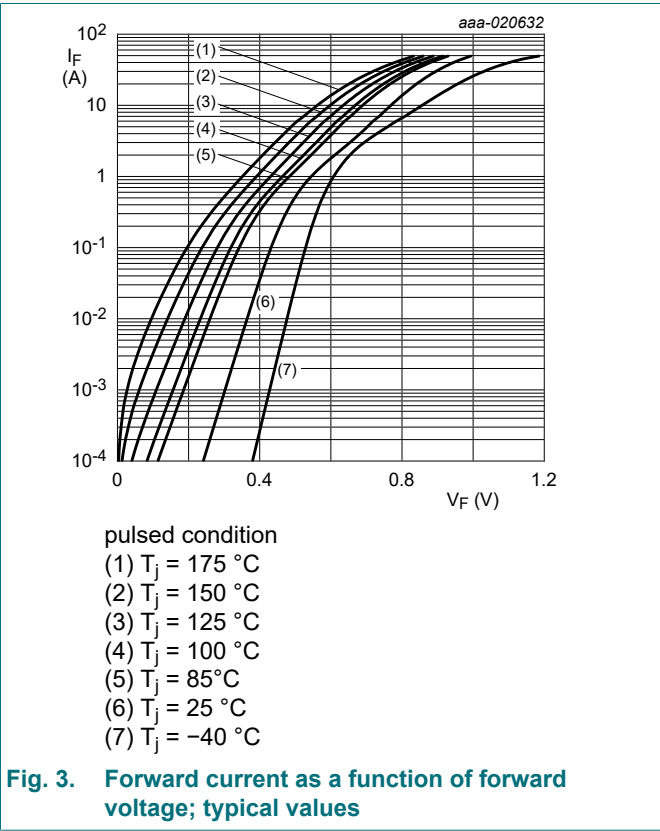
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

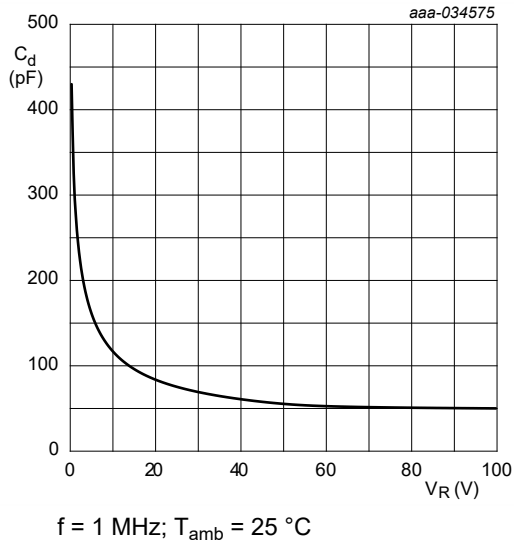
10. Characteristics

Table 7. Characteristics

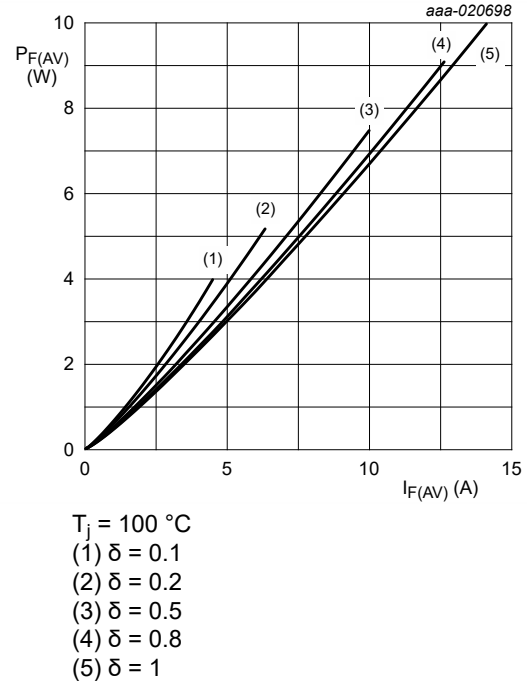
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 1\text{ mA}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$		100	-	-	V
$V_F$	forward voltage	$I_F = 1\text{ A}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$	[1]	-	545	650	mV
		$I_F = 5\text{ A}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$	[1]	-	700	790	mV
		$I_F = 10\text{ A}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$	[1]	-	770	850	mV
		$I_F = 10\text{ A}$ ; pulsed; $T_j = -40\text{ }^{\circ}\text{C}$	[1]	-	870	960	mV
		$I_F = 10\text{ A}$ ; pulsed; $T_j = 125\text{ }^{\circ}\text{C}$	[1]	-	635	730	mV
$I_R$	reverse current	$V_R = 100\text{ V}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$	[1]	-	0.2	0.8	$\mu\text{A}$
		$V_R = 100\text{ V}$ ; pulsed; $T_j = 125\text{ }^{\circ}\text{C}$	[1]	-	0.4	2.5	mA
		$V_R = 100\text{ V}$ ; pulsed; $T_j = 150\text{ }^{\circ}\text{C}$	[1]	-	1.5	7.5	mA
$C_d$	diode capacitance	$V_R = 1\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ }^{\circ}\text{C}$		-	276	-	pF
		$V_R = 10\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ }^{\circ}\text{C}$		-	115	-	pF
$t_{rr}$	reverse recovery time	$I_F = 0.5\text{ A}$ ; $I_R = 0.5\text{ A}$ ; $I_{R(\text{meas})} = 0.1\text{ A}$ ; $T_j = 25\text{ }^{\circ}\text{C}$		-	11	-	ns
$V_{FRM}$	peak forward recovery voltage	$I_F = 0.5\text{ A}$ ; $dI_F/dt = 20\text{ A}/\mu\text{s}$ ; $T_j = 25\text{ }^{\circ}\text{C}$		-	510	-	mV

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

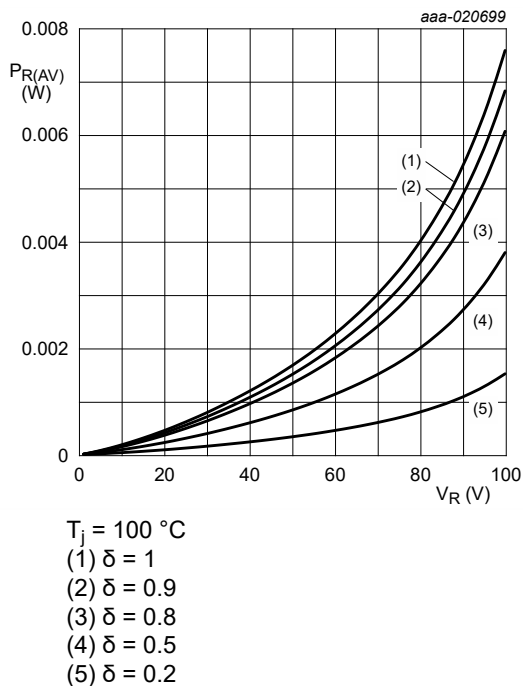




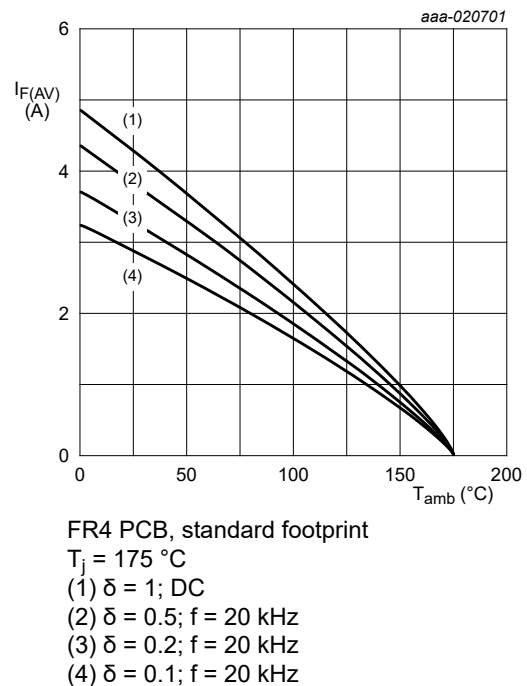
**Fig. 5.** Diode capacitance as a function of reverse voltage; typical values



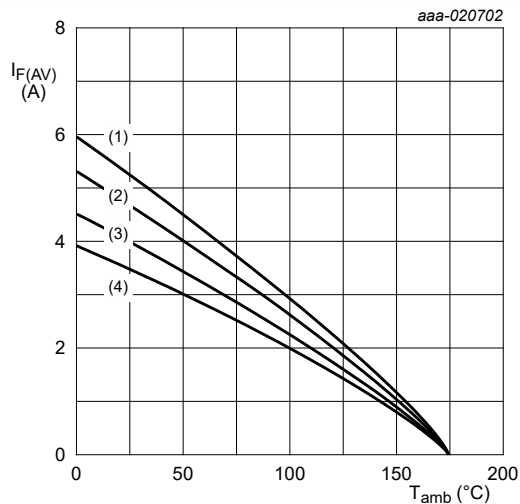
**Fig. 6.** Average forward power dissipation as a function of average forward current; typical values



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

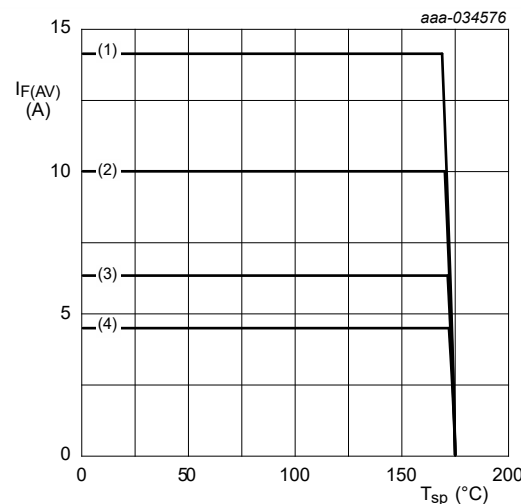


**Fig. 8.** Average forward current as a function of ambient temperature; typical values



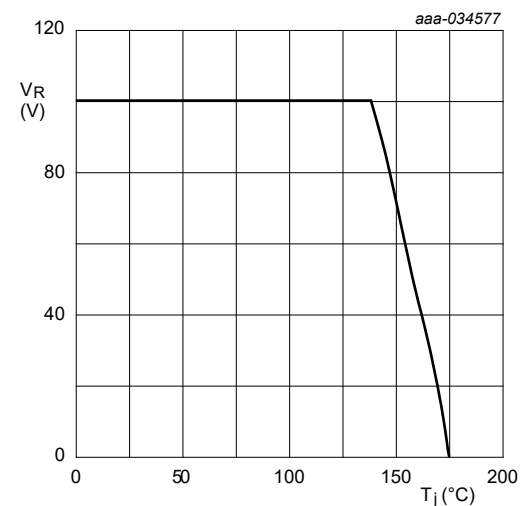
FR4 PCB, mounting pad for cathode 1 cm<sup>2</sup>  
 $T_j = 175$  °C  
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20$  kHz  
(3)  $\delta = 0.2$ ;  $f = 20$  kHz  
(4)  $\delta = 0.1$ ;  $f = 20$  kHz

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



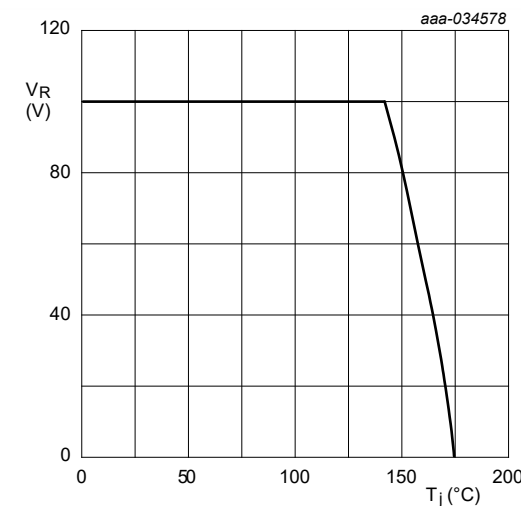
$T_j = 175$  °C  
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20$  kHz  
(3)  $\delta = 0.2$ ;  $f = 20$  kHz  
(4)  $\delta = 0.1$ ;  $f = 20$  kHz

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



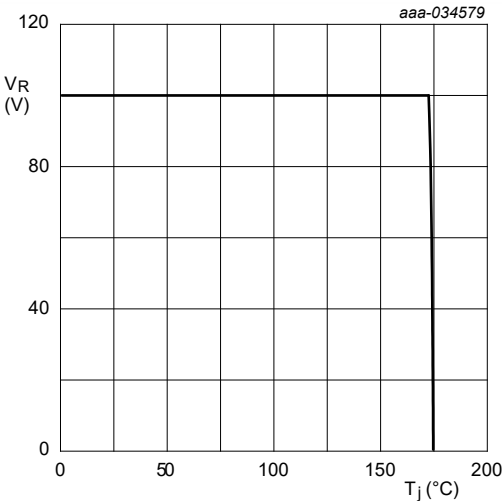
FR4 PCB, standard footprint  
 $R_{th} = 90$  K/W

Fig. 11. Derated maximum reverse voltage as a function of junction temperature; typical values



FR4 PCB, mounting pad for cathode 1 cm<sup>2</sup>  
 $R_{th} = 70$  K/W

Fig. 12. Derated maximum reverse voltage as a function of junction temperature; typical values



Soldering point of cathode tab  
 $R_{th} = 3 \text{ K/W}$

Fig. 13. Derated maximum reverse voltage as a function of junction temperature; typical values

11. Test information

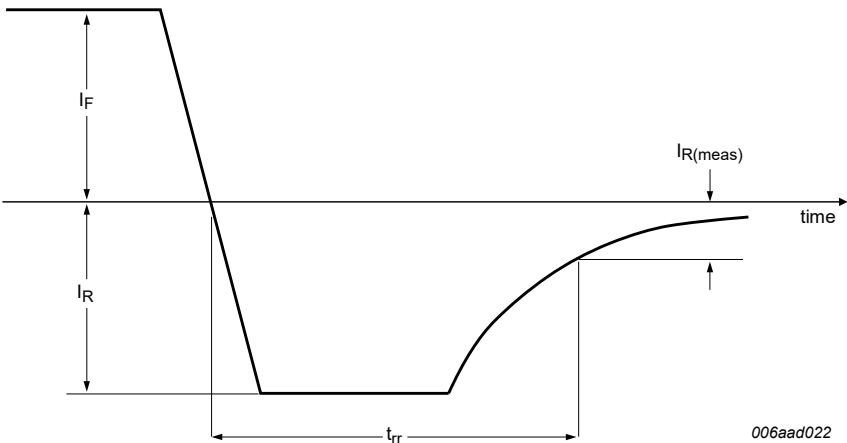


Fig. 14. Reverse recovery definition; step recovery

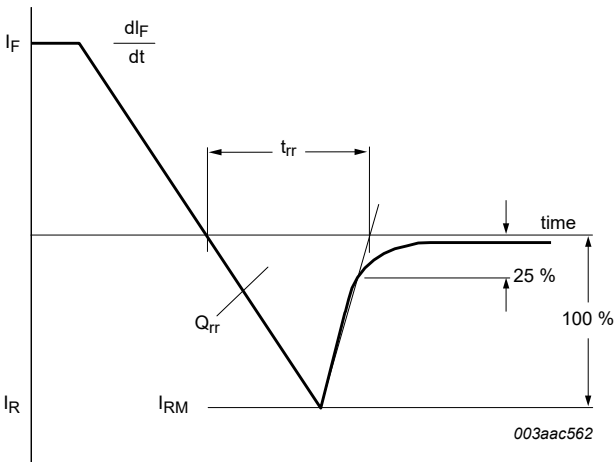


Fig. 15. Reverse recovery definition; ramp recovery

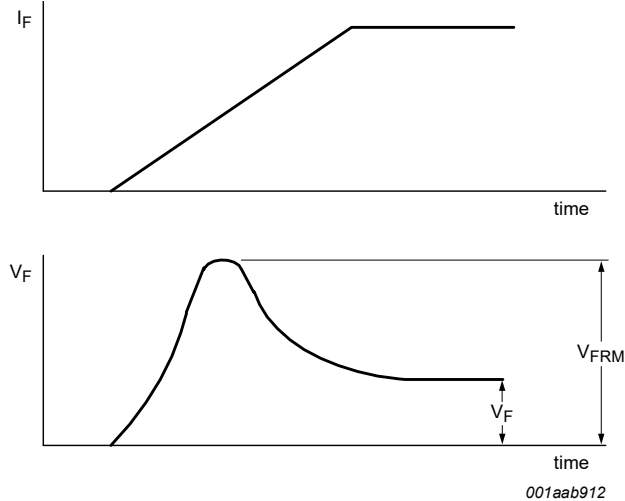


Fig. 16. Forward recovery definition

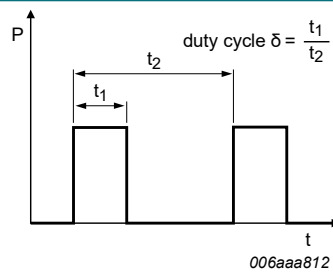


Fig. 17. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations:

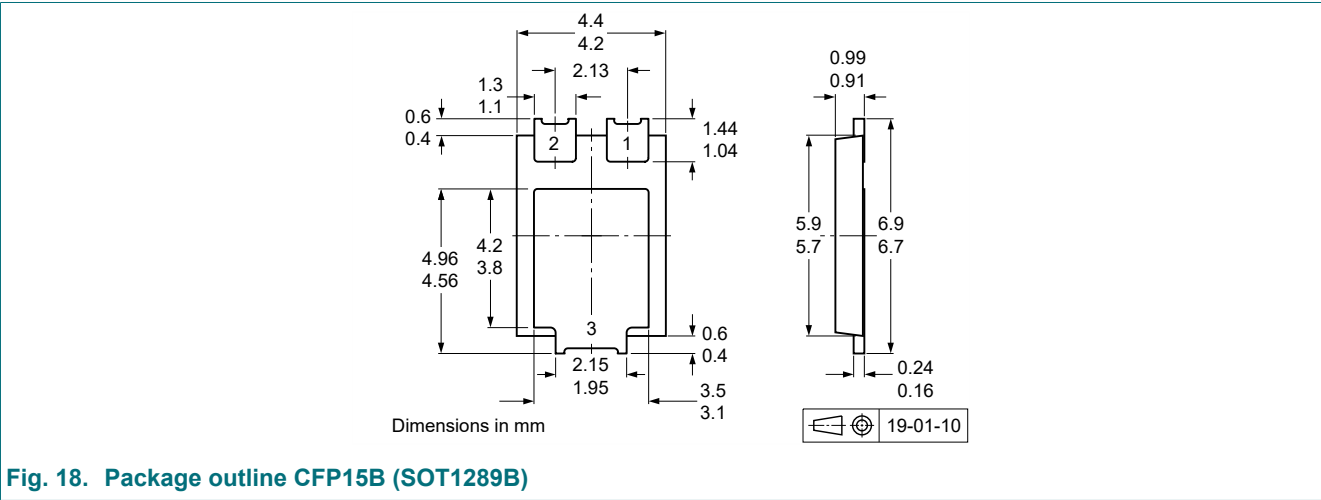
$$I_{F(AV)} = I_M \times \delta \text{ with } I_M \text{ defined as peak current}$$

$$I_{RMS} = I_{F(AV)} \text{ at DC, and } I_{RMS} = I_M \times \sqrt{\delta}$$

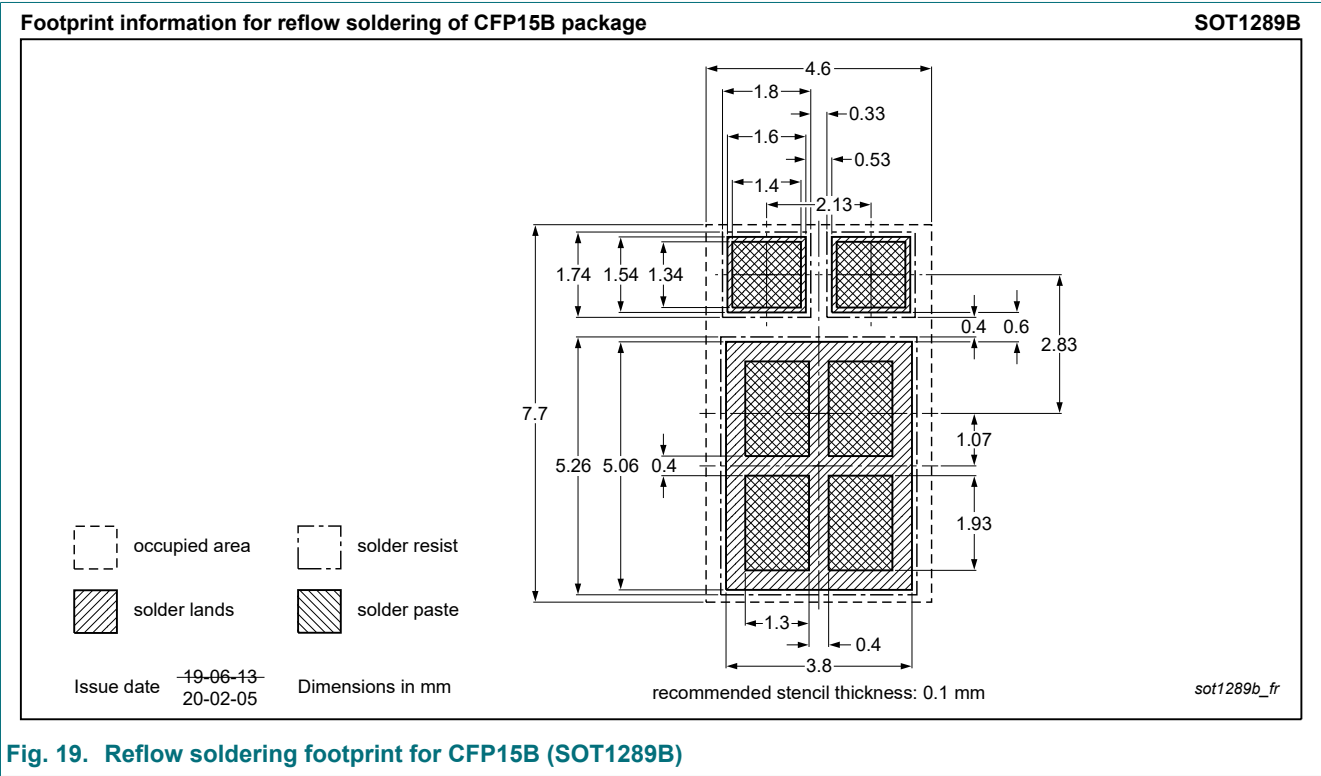
with  $I_{RMS}$  defined as RMS current.



12. Package outline



13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG100V100ELPE v.1	20220720	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.
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