



# PMEG060T060CLPE

60 V, 2 x 3 A dual common cathode low leakage current  
Trench Schottky barrier rectifier

15 July 2024

Product data sheet

## 1. General description

Trench dual Schottky barrier rectifier in common cathode configuration encapsulated in a CFP15B (SOT1289B) power and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Reverse voltage:  $V_R \leq 60$  V
- Forward current:  $I_F \leq 3$  A (per diode)
- Low forward voltage
- Low leakage current due to Trench Schottky technology
- Power and flat lead SMD plastic package
- Package height typical 0.95 mm
- High power capability due to clip-bond technology

## 3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- Low power consumption applications
- Freewheeling applications

## 4. Quick reference data

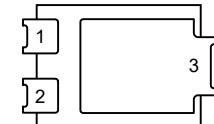
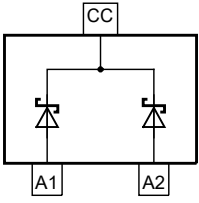
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode (unless otherwise specified)							
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; $f = 20$ kHz; square wave; $T_{sp} \leq 165$ °C		-	-	3	A
$V_R$	reverse voltage	$T_j = 25$ °C		-	-	60	V
$V_F$	forward voltage	$I_F = 3$ A; $T_j = 25$ °C	[1]	-	550	620	mV
$I_R$	reverse current	$V_R = 60$ V; $T_j = 25$ °C	[1]	-	0.3	1.8	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	A1	anode (diode 1)	 CFP15B (SOT1289B)	 006aab034
2	A2	anode (diode 2)		
3	CC	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PMEG060T060CLPE</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
PMEG060T060CLPE	060T L06C

8. Limiting values

Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC60134)

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode (unless otherwise specified)						
V <sub>R</sub>	reverse voltage	T <sub>j</sub> = 25 °C		-	60	V
I <sub>F</sub>	forward current	δ = 1; T <sub>sp</sub> ≤ 162 °C		-	4.2	A
I <sub>F(AV)</sub>	average forward current	δ = 0.5; f = 20 kHz; square wave; T <sub>sp</sub> ≤ 165 °C		-	3	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 8.3 ms; half sine wave; T <sub>j(init)</sub> = 25 °C		-	80	A
		t <sub>p</sub> = 8.3 ms; half sine wave; per device; T <sub>j(init)</sub> = 25 °C		-	150	A
Per device, one diode loaded						
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	1.66	W
			[2]	-	2.15	W
T <sub>j</sub>	junction temperature			-	175	°C
T <sub>amb</sub>	ambient temperature			-55	175	°C
T <sub>stg</sub>	storage temperature			-65	175	°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 cm<sup>2</sup>.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per device, one diode loaded							
$R_{th(j-a)}$	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]	-	-	7	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.

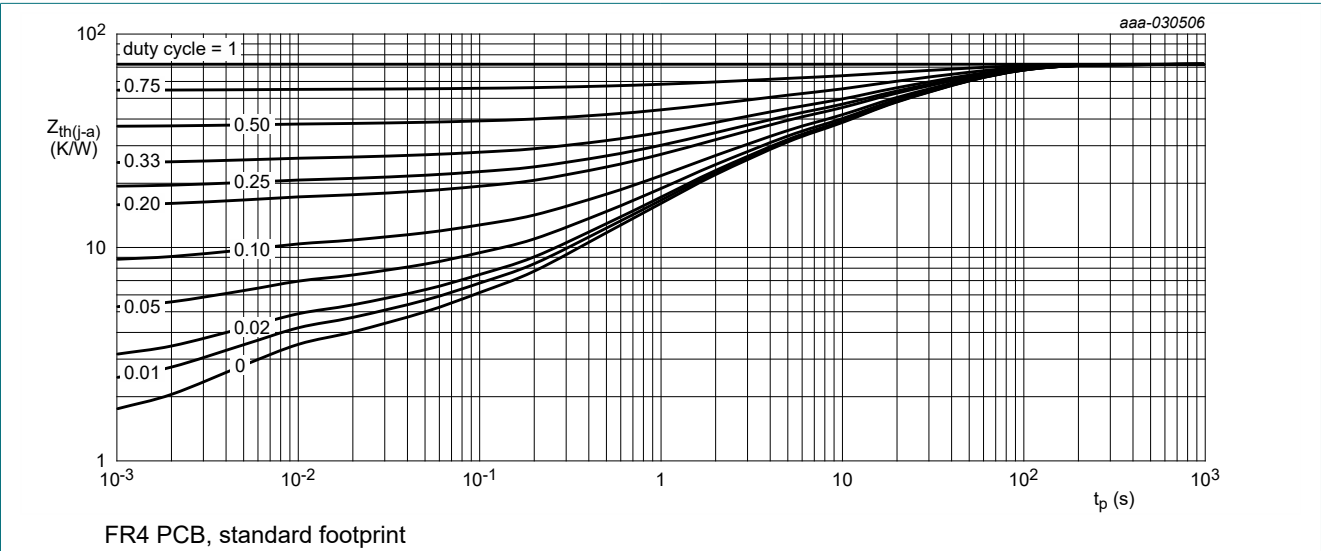


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

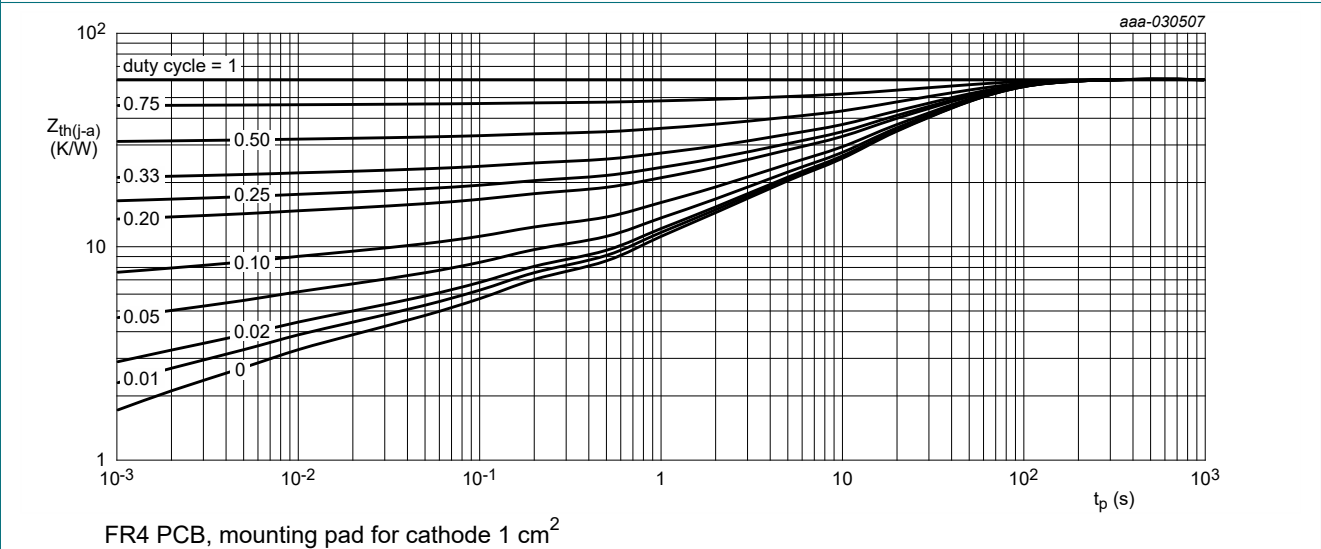


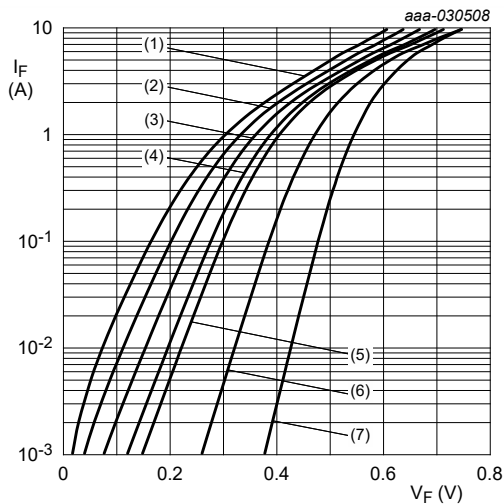
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

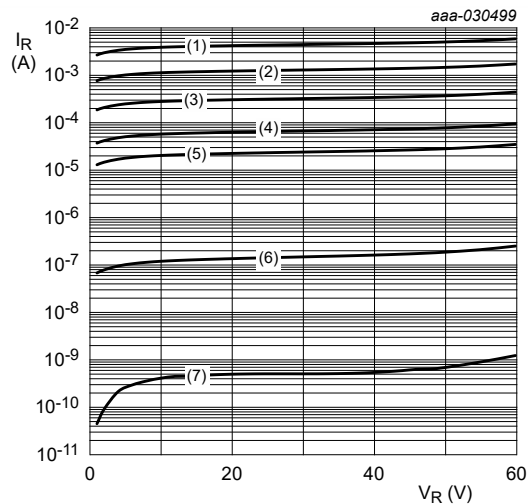
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode (unless otherwise specified)							
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 1\text{ mA}$ ; $T_j = 25\text{ °C}$	[1]	60	-	-	V
$V_F$	forward voltage	$I_F = 0.5\text{ A}$ ; $T_j = 25\text{ °C}$	[1]	-	440	510	mV
		$I_F = 1\text{ A}$ ; $T_j = 25\text{ °C}$	[1]	-	470	540	mV
		$I_F = 3\text{ A}$ ; $T_j = 25\text{ °C}$	[1]	-	550	620	mV
		$I_F = 3\text{ A}$ ; $T_j = -40\text{ °C}$	[1]	-	600	680	mV
		$I_F = 3\text{ A}$ ; $T_j = 125\text{ °C}$	[1]	-	480	570	mV
$I_R$	reverse current	$V_R = 10\text{ V}$ ; $T_j = 25\text{ °C}$	[1]	-	0.14	0.9	μA
		$V_R = 40\text{ V}$ ; $T_j = 25\text{ °C}$	[1]	-	0.18	1.2	μA
		$V_R = 60\text{ V}$ ; $T_j = 25\text{ °C}$	[1]	-	0.3	1.8	μA
		$V_R = 60\text{ V}$ ; $T_j = 125\text{ °C}$	[1]	-	0.5	3	mA
$C_d$	diode capacitance	$V_R = 1\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ °C}$		-	560	-	pF
		$V_R = 10\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ °C}$		-	180	-	pF
$t_{rr}$	reverse recovery time step recovery	$I_F = 0.5\text{ A}$ ; $I_R = 0.5\text{ A}$ ; $I_{R(meas)} = 0.1\text{ A}$ ; $T_j = 25\text{ °C}$		-	17	-	ns
	reverse recovery time ramp recovery	$dI_F/dt = 200\text{ A/μs}$ ; $I_F = 6\text{ A}$ ; $V_R = 26\text{ V}$ ; $T_j = 25\text{ °C}$		-	11	-	ns
$V_{FRM}$	peak forward recovery voltage	$I_F = 0.5\text{ A}$ ; $dI_F/dt = 20\text{ A/μs}$ ; $T_j = 25\text{ °C}$		-	460	-	mV

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



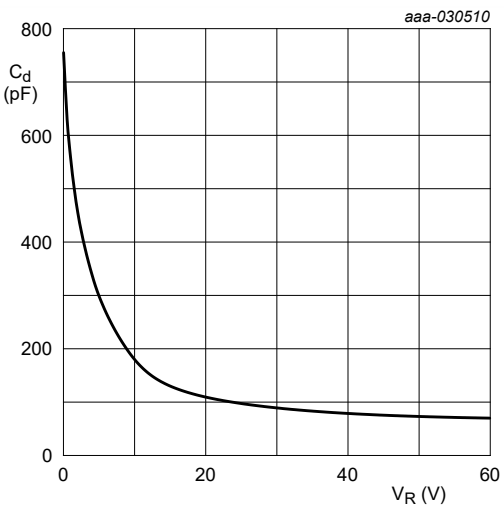
pulsed condition  
(1)  $T_j = 175\text{ }^{\circ}\text{C}$   
(2)  $T_j = 150\text{ }^{\circ}\text{C}$   
(3)  $T_j = 125\text{ }^{\circ}\text{C}$   
(4)  $T_j = 100\text{ }^{\circ}\text{C}$   
(5)  $T_j = 85\text{ }^{\circ}\text{C}$   
(6)  $T_j = 25\text{ }^{\circ}\text{C}$   
(7)  $T_j = -40\text{ }^{\circ}\text{C}$

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



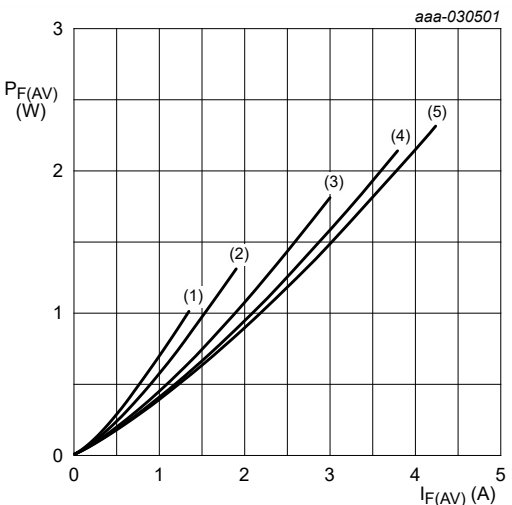
pulsed condition  
(1)  $T_j = 175\text{ }^{\circ}\text{C}$   
(2)  $T_j = 150\text{ }^{\circ}\text{C}$   
(3)  $T_j = 125\text{ }^{\circ}\text{C}$   
(4)  $T_j = 100\text{ }^{\circ}\text{C}$   
(5)  $T_j = 85\text{ }^{\circ}\text{C}$   
(6)  $T_j = 25\text{ }^{\circ}\text{C}$   
(7)  $T_j = -40\text{ }^{\circ}\text{C}$

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



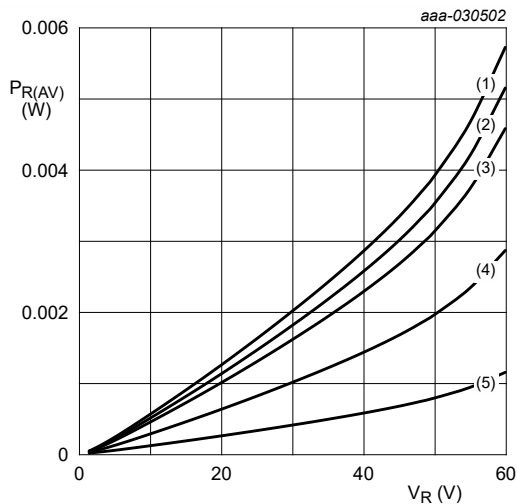
$f = 1\text{ MHz}$ ;  $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$

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



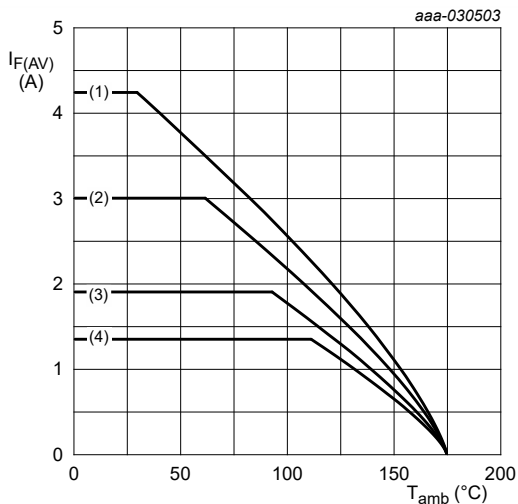
$T_j = 100\text{ }^{\circ}\text{C}$   
(1)  $\delta = 0.1$   
(2)  $\delta = 0.2$   
(3)  $\delta = 0.5$   
(4)  $\delta = 0.8$   
(5)  $\delta = 1$ ; DC

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



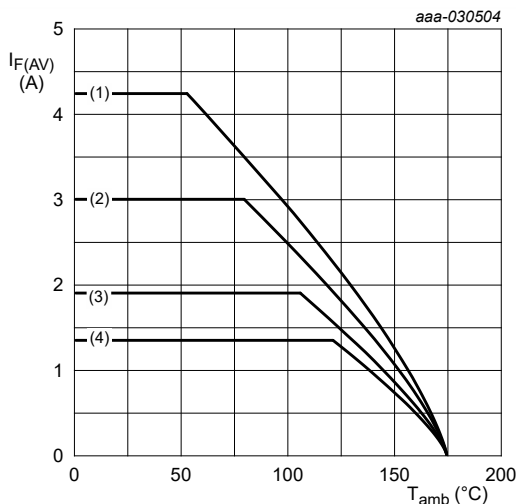
$T_j = 100\text{ }^{\circ}\text{C}$   
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.9$   
(3)  $\delta = 0.8$   
(4)  $\delta = 0.5$   
(5)  $\delta = 0.2$

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



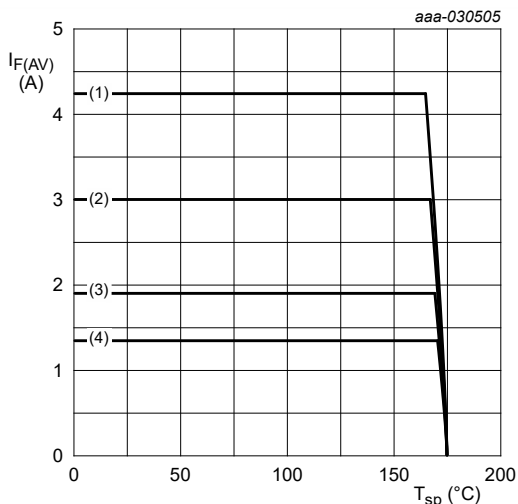
FR4 PCB, standard footprint  
 $T_j = 175\text{ }^{\circ}\text{C}$   
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20\text{ kHz}$   
(3)  $\delta = 0.2$ ;  $f = 20\text{ kHz}$   
(4)  $\delta = 0.1$ ;  $f = 20\text{ kHz}$

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



FR4 PCB, mounting pad for cathode  $1\text{ cm}^2$   
 $T_j = 175\text{ }^{\circ}\text{C}$   
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20\text{ kHz}$   
(3)  $\delta = 0.2$ ;  $f = 20\text{ kHz}$   
(4)  $\delta = 0.1$ ;  $f = 20\text{ kHz}$

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



$T_j = 175\text{ }^{\circ}\text{C}$   
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20\text{ kHz}$   
(3)  $\delta = 0.2$ ;  $f = 20\text{ kHz}$   
(4)  $\delta = 0.1$ ;  $f = 20\text{ kHz}$

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

60 V, 2 x 3 A dual common cathode low leakage current Trench Schottky barrier rectifier

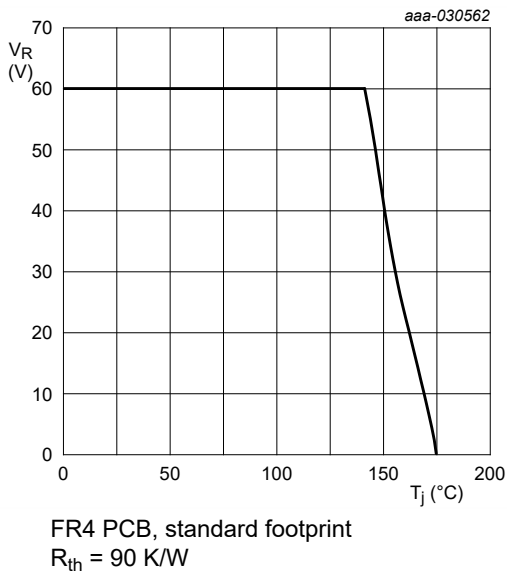


Fig. 11. Derated maximum reverse voltage as a function of junction temperature; typical values

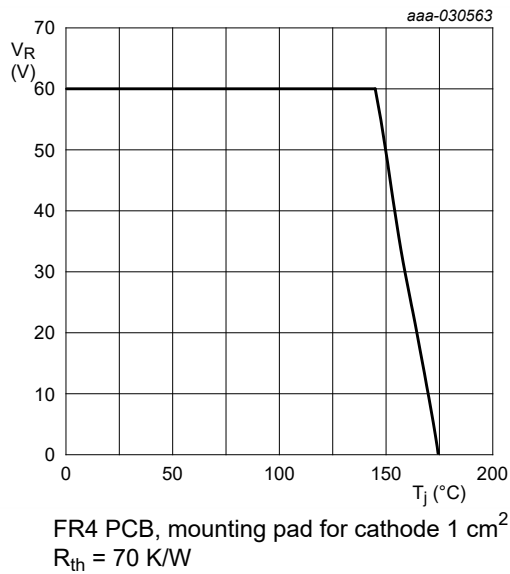


Fig. 12. Derated maximum reverse voltage as a function of junction temperature; typical values

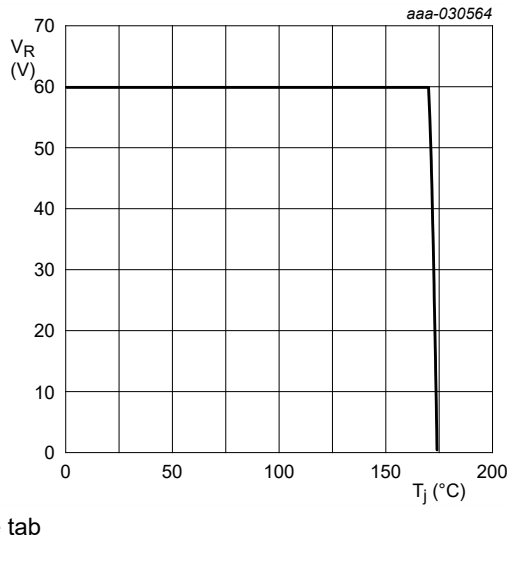


Fig. 13. Derated maximum reverse voltage as a function of junction temperature; typical values



11. Test information

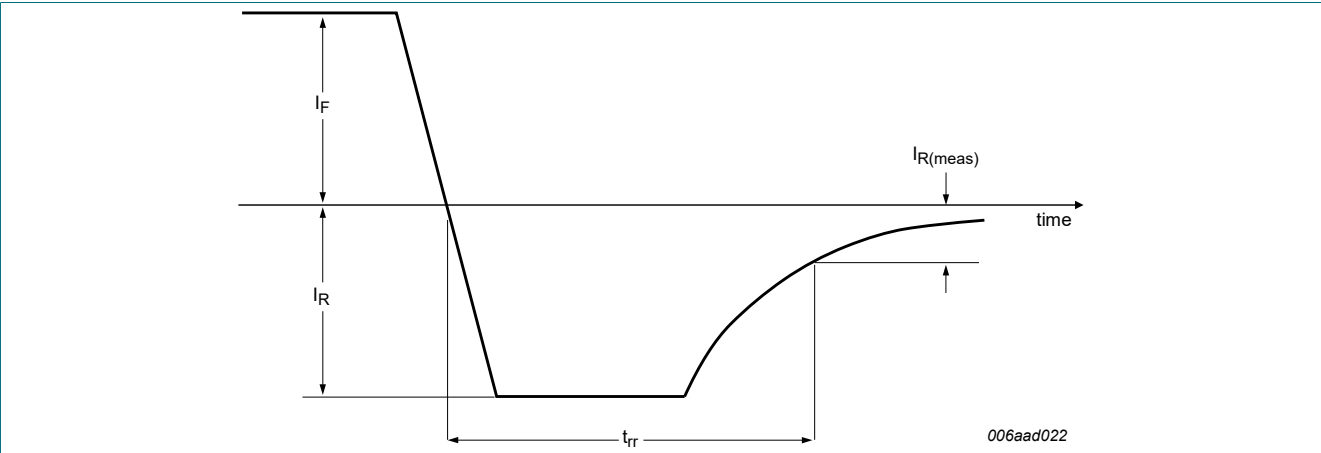


Fig. 14. Reverse recovery definition; step recovery

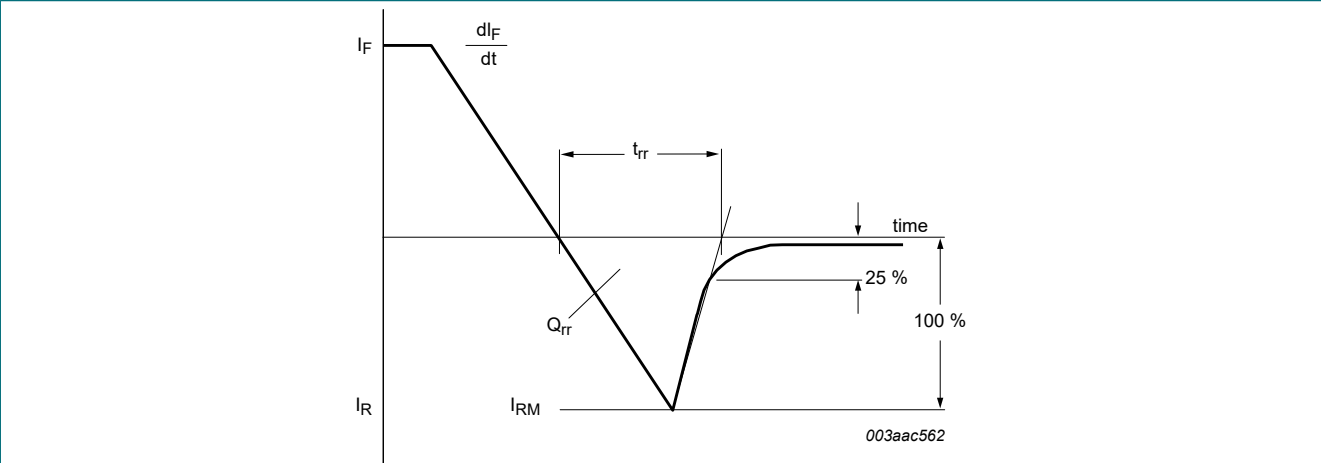


Fig. 15. Reverse recovery definition; ramp recovery

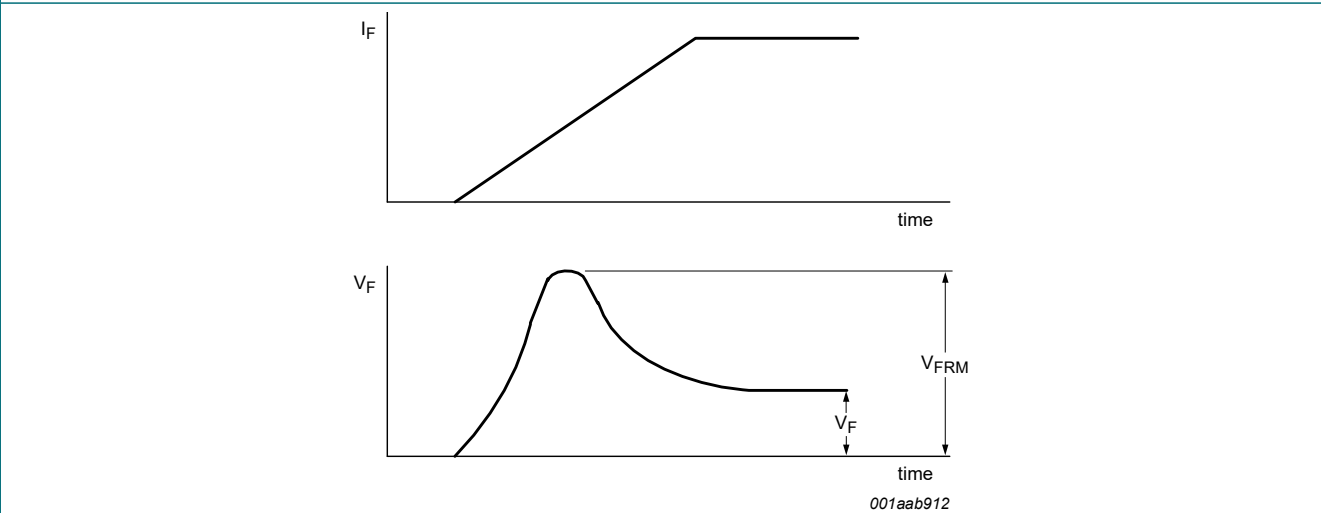


Fig. 16. Forward recovery definition

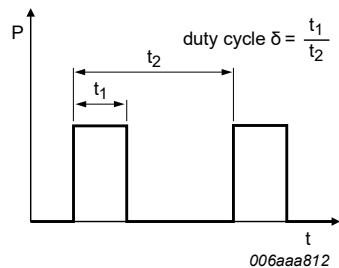


Fig. 17. Duty cycle definition

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

$I_{F(AV)} = I_M \times \delta$  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

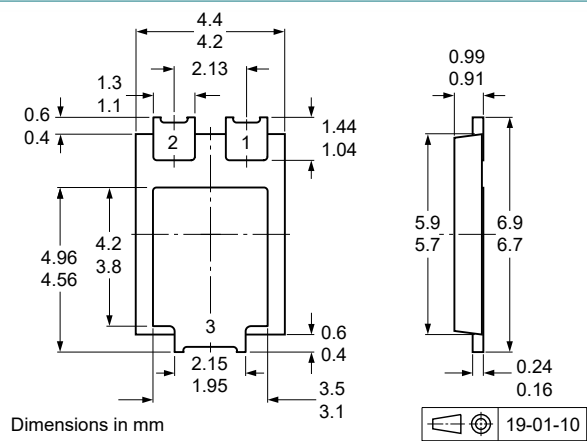


Fig. 18. Package outline CFP15B (SOT1289B)

13. Soldering

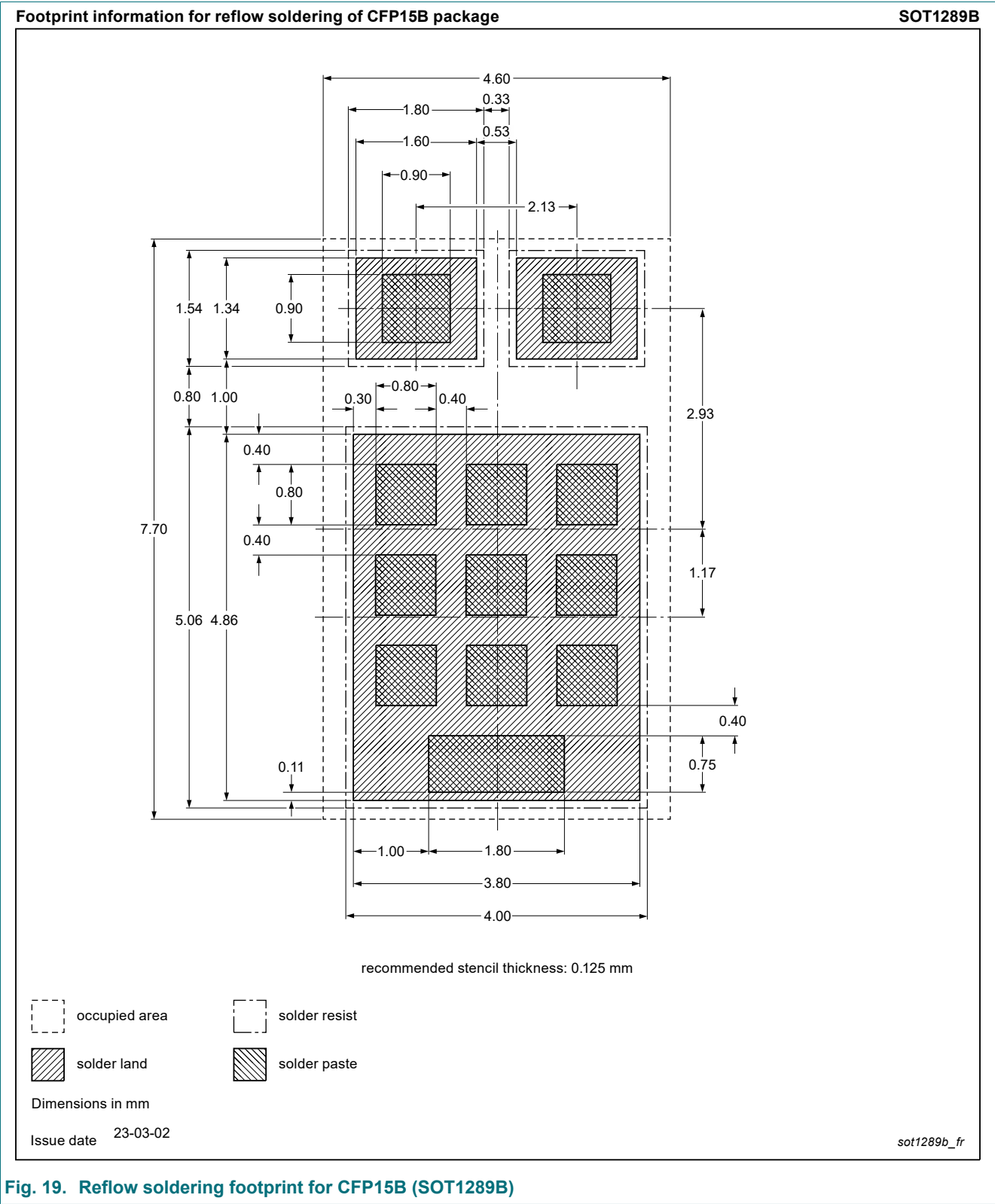


Fig. 19. Reflow soldering footprint for CFP15B (SOT1289B)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG060T060CLPE v.4	20240715	Product data sheet	-	PMEG060T060CLPE v.3
Modifications:	• Reflow soldering footprint: Stencil design for solder paste printing changed.			
PMEG060T060CLPE v.3	20230401	Product data sheet	-	PMEG060T060CLPE v.2
PMEG060T060CLPE v.2	20200427	Product data sheet	-	PMEG060T060CLPE v.1
PMEG060T060CLPE v.1	20200304	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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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