



# PMEG4005CEJ

40 V, 0.5 A low VF Schottky barrier rectifier

2 October 2025

Product data sheet

## 1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in an SOD323F (SC-90) very small and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Average forward current:  $I_{F(AV)} \leq 0.5$  A
- Reverse voltage:  $V_R \leq 40$  V
- Low forward voltage typ.  $V_F = 550$  mV
- Low reverse current typ.  $I_R = 1.5$   $\mu$ A
- Very small and flat lead SMD plastic package

## 3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Low power consumption applications
- Automotive 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; square wave; $T_{sp} \leq 135$ °C	-	-	0.5	A
$V_R$	reverse voltage	$T_j = 25$ °C	-	-	40	V
$V_F$	forward voltage	$I_F = 500$ mA; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_j = 25$ °C	-	550	640	mV
$I_R$	reverse current	$V_R = 40$ V; pulsed; $T_j = 25$ °C	-	1.5	8	$\mu$ A
		$V_R = 40$ V; pulsed; $T_j = 125$ °C	-	1	8	mA

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 SC-90 (SOD323F)	 sym001
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4005CEJ	SC-90	plastic, surface-mounted package; 2 leads; 1.7 mm x 1.25 mm x 0.7 mm body	SOD323F

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG4005CEJ	2F

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V <sub>R</sub>	reverse voltage	T <sub>j</sub> = 25 °C		-	40	V
I <sub>F</sub>	forward current	δ = 1; T <sub>sp</sub> ≤ 130 °C		-	0.7	A
I <sub>F(AV)</sub>	average forward current	δ = 0.5; f = 20 kHz; square wave; T <sub>sp</sub> ≤ 135 °C		-	0.5	A
I <sub>FRM</sub>	repetitive peak forward current	t <sub>p</sub> ≤ 1 ms; δ ≤ 0.25		-	2	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 8 ms; square wave; T <sub>j(init)</sub> = 25 °C		-	8	A
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	415	mW
			[2]	-	715	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-55	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°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]	-	-	300	K/W
			[1] [3]	-	-	175	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	45	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.

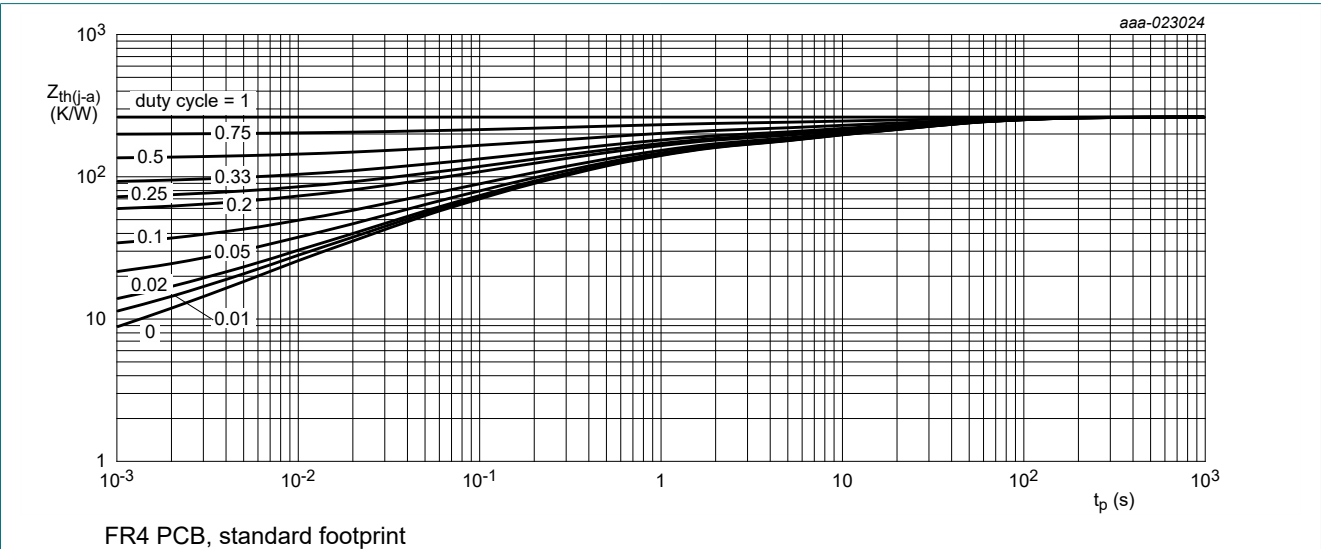


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

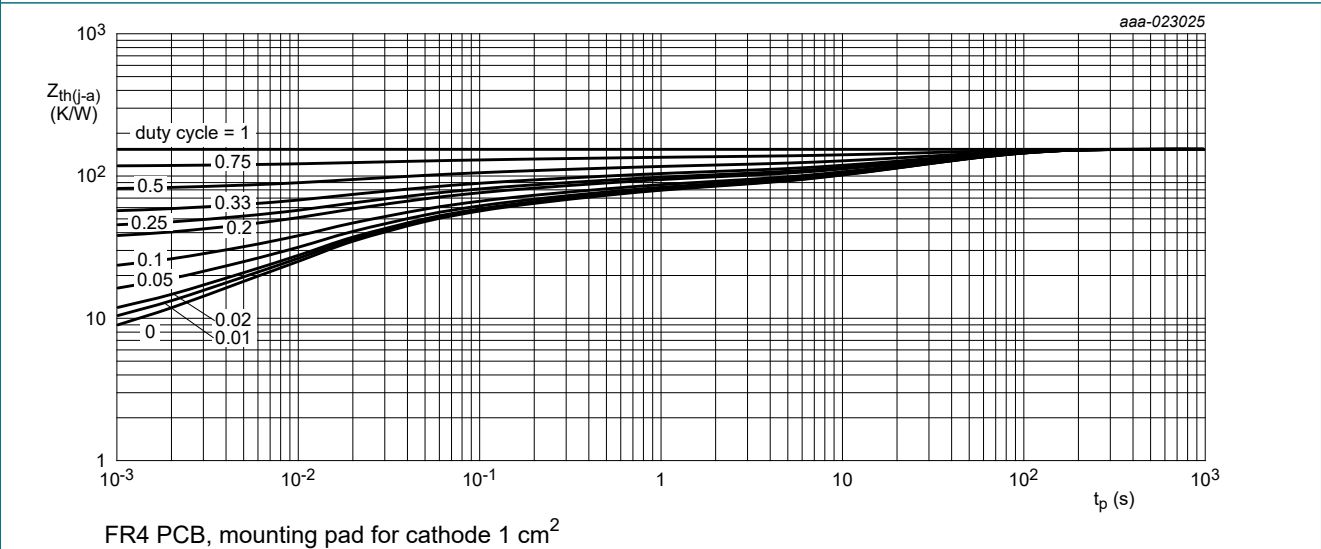


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 1\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		40	-	-	V
$V_F$	forward voltage	$I_F = 10\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		-	300	380	mV
		$I_F = 100\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		-	390	470	mV
		$I_F = 200\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		-	435	510	mV
		$I_F = 300\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		-	475	560	mV
		$I_F = 400\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		-	515	600	mV
		$I_F = 500\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25\text{ }^\circ\text{C}$		-	550	640	mV
		$I_F = 500\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = -40\text{ }^\circ\text{C}$		-	570	670	mV
		$I_F = 500\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 125\text{ }^\circ\text{C}$		-	520	610	mV
$I_R$	reverse current	$V_R = 30\text{ V}$ ; pulsed; $T_j = 25\text{ }^\circ\text{C}$		-	1	5	$\mu\text{A}$
		$V_R = 40\text{ V}$ ; pulsed; $T_j = 25\text{ }^\circ\text{C}$		-	1.5	8	$\mu\text{A}$
		$V_R = 40\text{ V}$ ; pulsed; $T_j = 125\text{ }^\circ\text{C}$		-	1	8	mA
$C_d$	diode capacitance	$V_R = 1\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ }^\circ\text{C}$		-	24	-	pF
		$V_R = 4\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ }^\circ\text{C}$		-	13.5	-	pF
		$V_R = 10\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ }^\circ\text{C}$		-	9	-	pF
$t_{rr}$	reverse recovery time	$I_F = 0.5\text{ A}$ ; $I_R = 0.5\text{ A}$ ; $I_{R(meas)} = 0.1\text{ A}$ ; $T_j = 25\text{ }^\circ\text{C}$		-	1.8	-	ns

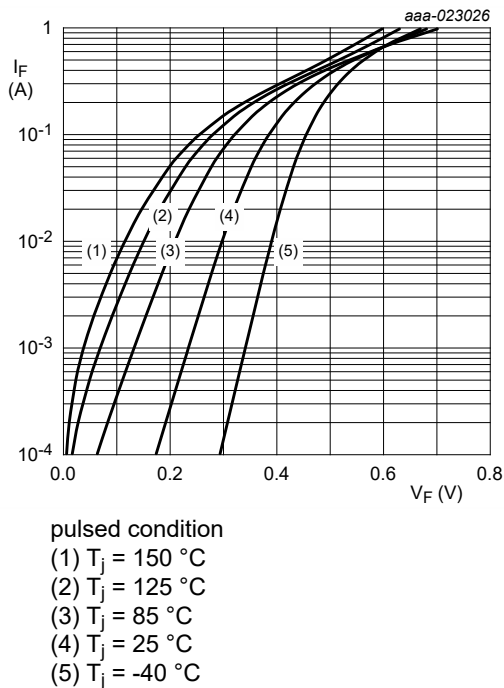


Fig. 3. Forward current as a function of forward voltage; typical values

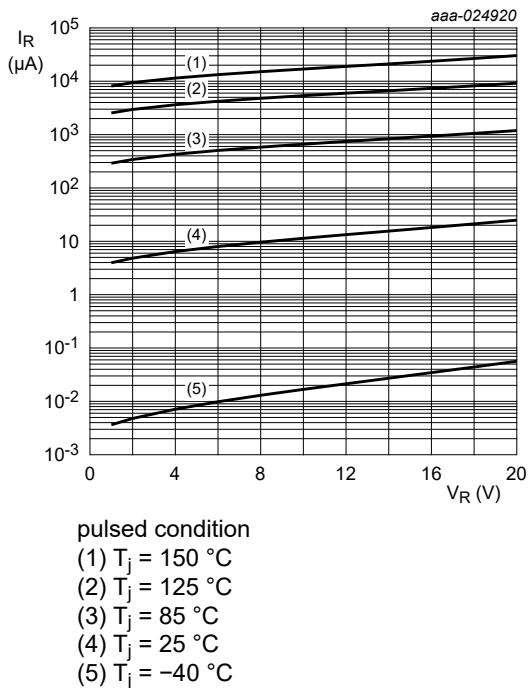


Fig. 4. Reverse current as a function of reverse voltage; typical values

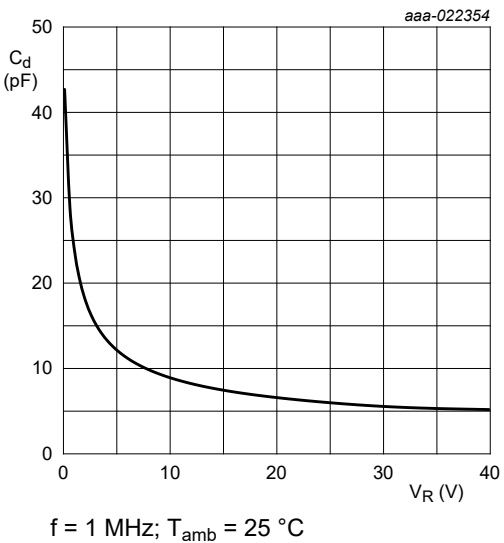


Fig. 5. Diode capacitance as a function of reverse voltage; typical values

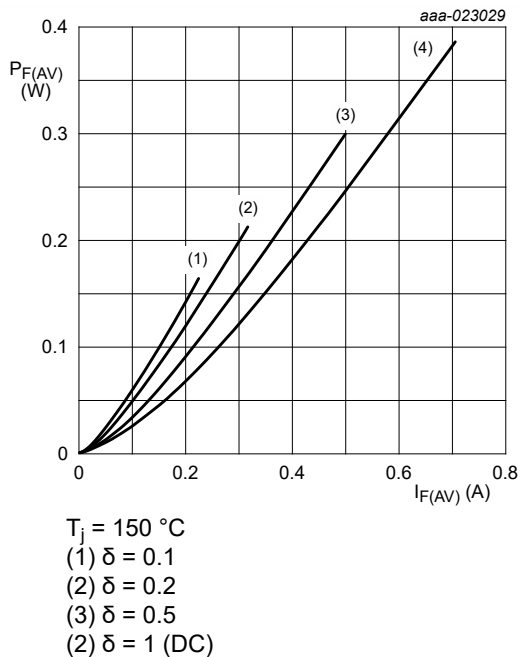
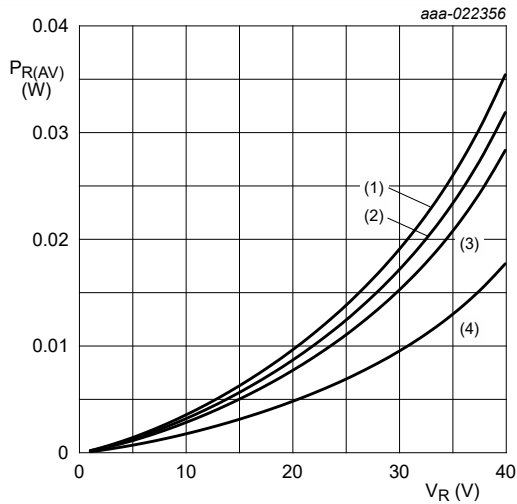


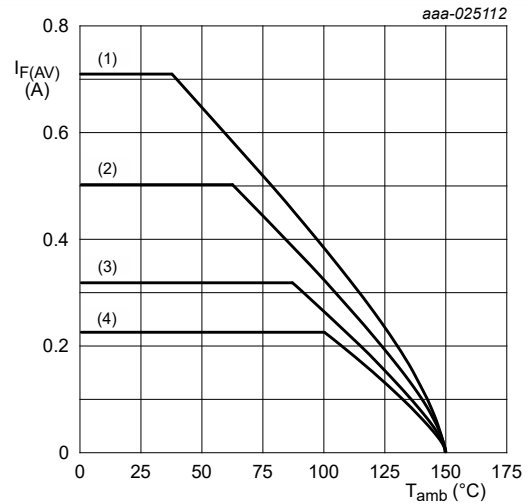
Fig. 6. Average forward power dissipation as a function of average forward current; typical values



$T_j = 125\text{ }^{\circ}\text{C}$

- (1)  $\delta = 1$ ; DC
- (2)  $\delta = 0.9$ ;  $f = 20\text{ kHz}$
- (3)  $\delta = 0.8$ ;  $f = 20\text{ kHz}$
- (4)  $\delta = 0.5$ ;  $f = 20\text{ kHz}$

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

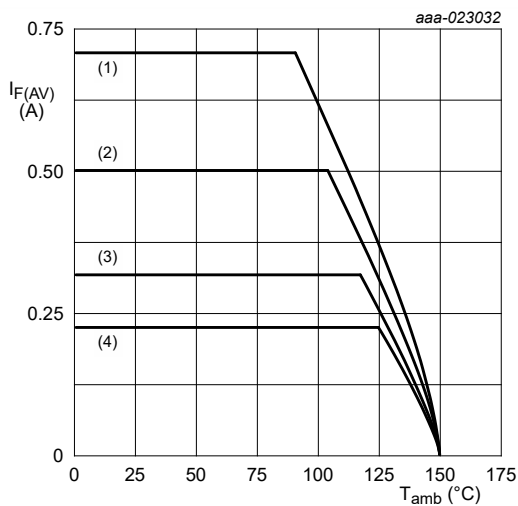


FR4 PCB, standard footprint

$T_j = 150\text{ }^{\circ}\text{C}$

- (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

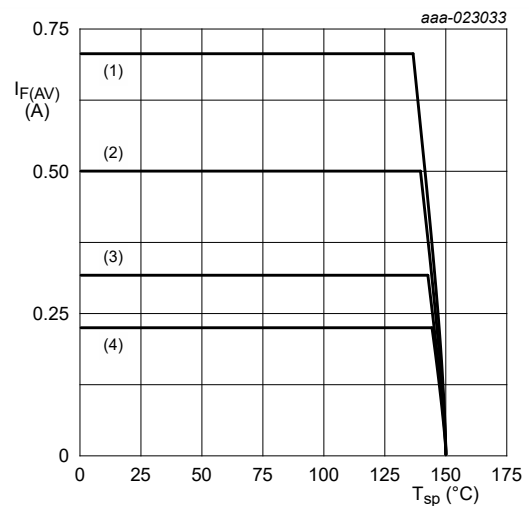


FR4 PCB, mounting pad for cathode  $1\text{ cm}^2$

$T_j = 150\text{ }^{\circ}\text{C}$

- (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



$T_j = 150\text{ }^{\circ}\text{C}$

- (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

11. Test information

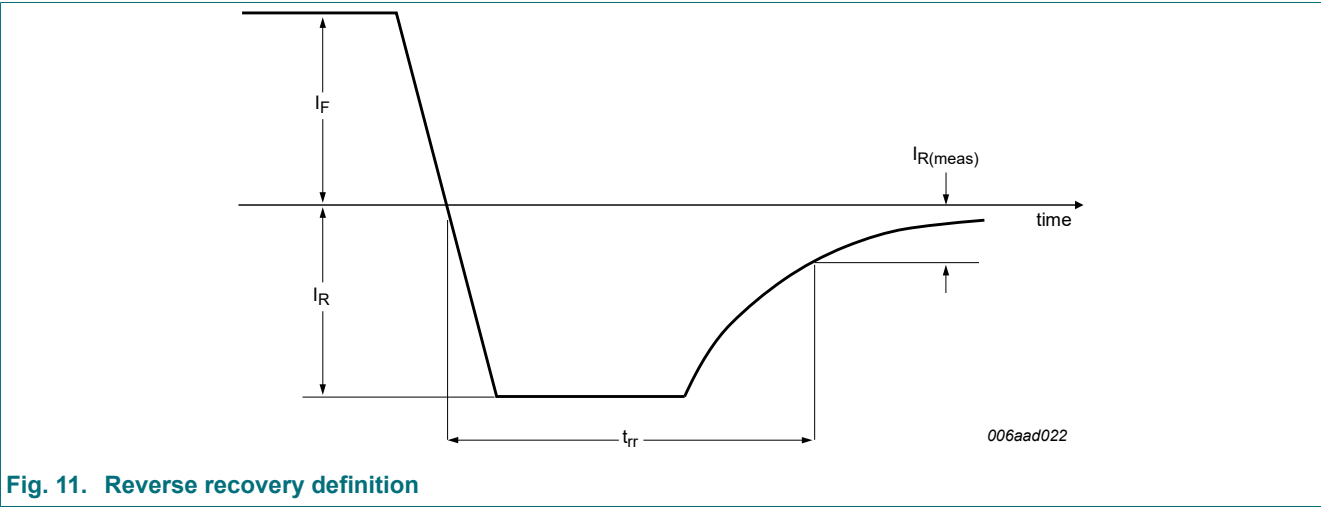


Fig. 11. Reverse recovery definition

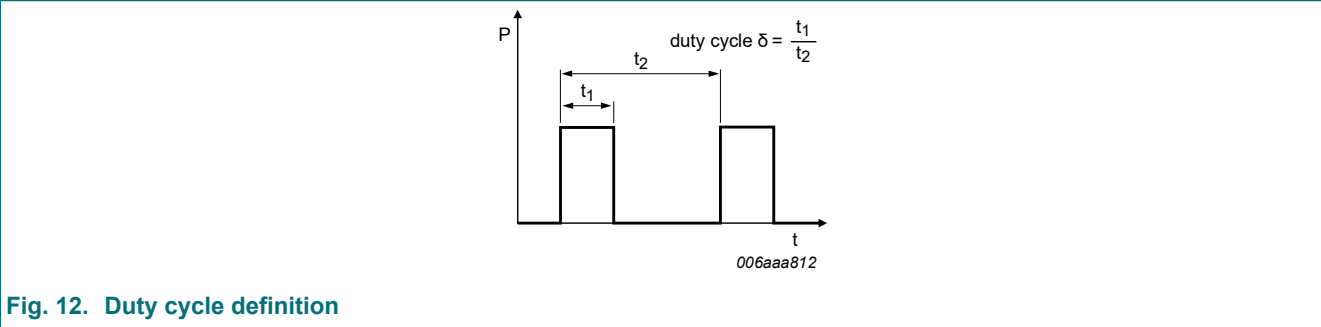


Fig. 12. Duty cycle definition

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  
 $I_{RMS} = I_M \times \sqrt{\delta}$  with  $I_{RMS}$  defined as RMS current.

12. Package outline

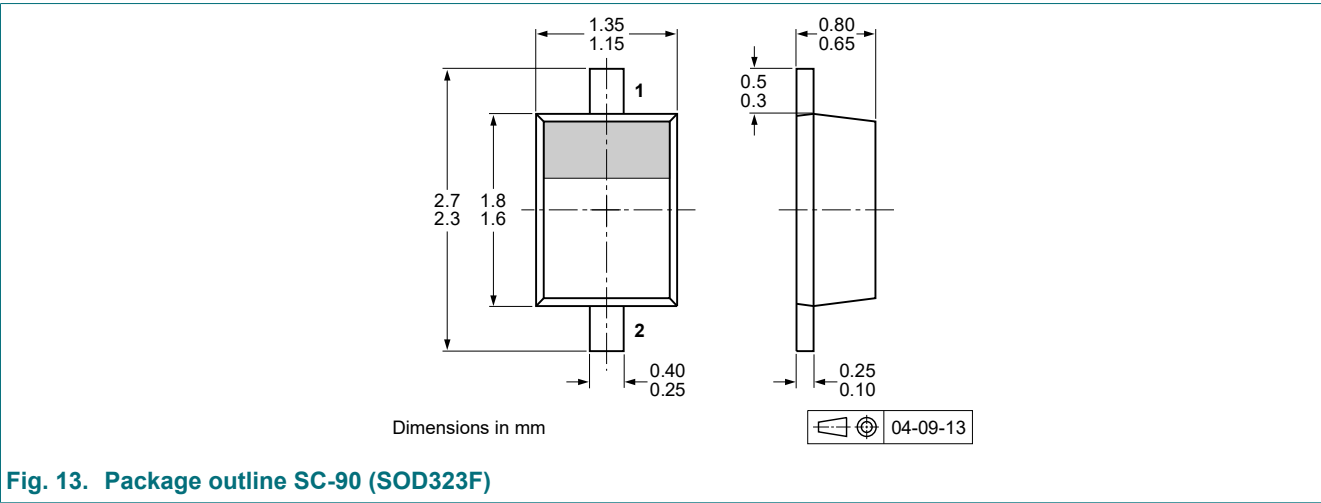
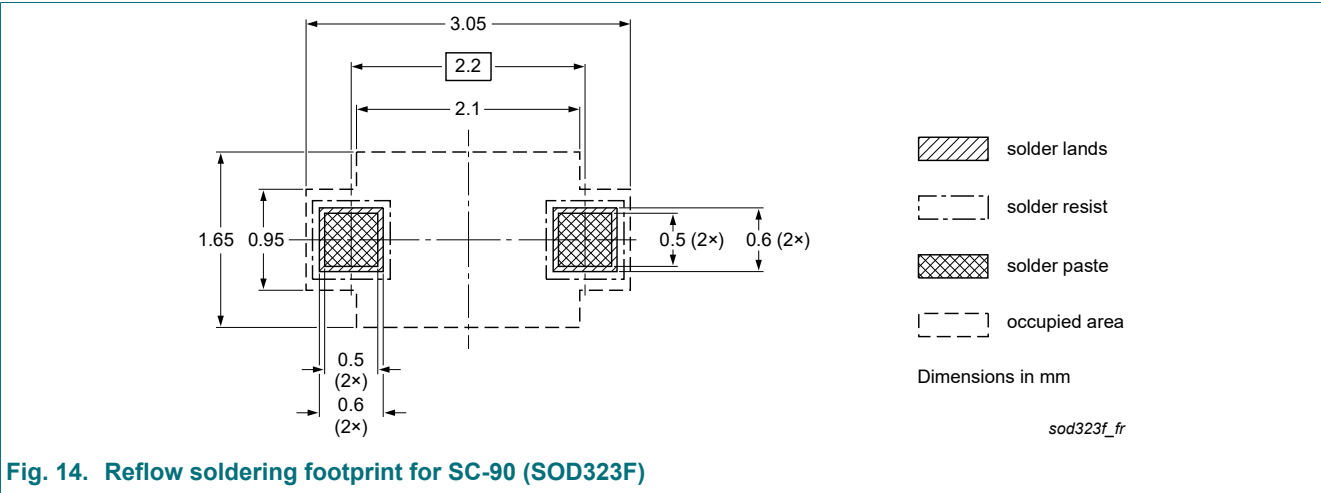


Fig. 13. Package outline SC-90 (SOD323F)

13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4005CEJ v.2	20251002	Product data sheet	-	PMEG4005CEJ v.1
Modifications:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul>			
PMEG4005CEJ v.1	20160512	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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- [2] The term 'short data sheet' is explained in section "Definitions".
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Date of release: 2 October 2025