

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number: PMEG6002EJ-QX
Manufacturer: Nexperia USA Inc.
Package: SC-90, SOD-323F
Availability: Please confirm with sales

Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/pmeg6002ej-qx.html>

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Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.



PMEG6002EJ-Q

200 mA low Vf MEGA Schottky barrier rectifier

3 May 2022

Product data sheet

1. General description

Planar Maximum Efficiency General Application (MEGA) 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: $I_{F(AV)} \leq 0.2$ A
- Reverse voltage: $V_R \leq 60$ V
- Low forward voltage
- Small and flat lead SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Ultra high-speed switching
- Low power consumption applications

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $f = 20$ kHz; $T_{amb} \leq 130$ °C	[1]	-	-	0.2	A
		square-wave pulse; $\delta = 0.5$; $f = 20$ kHz; $T_{sp} \leq 145$ °C		-	-	0.2	A
V_R	reverse voltage	$T_j = 25$ °C		-	-	60	V
V_F	forward voltage	$I_F = 200$ mA; $T_j = 25$ °C		-	540	600	mV
I_R	reverse current	$V_R = 60$ V; $T_j = 25$ °C		-	20	100	μA

[1] Device mounted on a ceramic PCB, Al_2O_3 , standard footprint.

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
PMEG6002EJ-Q	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
PMEG6002EJ-Q	1P

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	$T_j = 25\text{ °C}$		-	60	V
$I_{F(AV)}$	average forward current	square-wave pulse; $\delta = 0.5$; $f = 20\text{ kHz}$; $T_{amb} \leq 130\text{ °C}$	[1]	-	0.2	A
		square-wave pulse; $\delta = 0.5$; $f = 20\text{ kHz}$; $T_{sp} \leq 145\text{ °C}$		-	0.2	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1\text{ ms}$; $\delta \leq 0.25$		-	2.6	A
I_{FSM}	non-repetitive peak forward current	square-wave pulse; $t_p = 8\text{ ms}$	[2]	-	2.75	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[3] [4]	-	385	mW
			[3] [5]	-	695	mW
			[3] [1]	-	1.045	W
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Device mounted on a ceramic PCB, Al_2O_3 , standard footprint.

[2] $T_j = 25\text{ °C}$ prior to surge.

[3] Reflow soldering is the only recommended soldering method.

[4] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

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

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] [3]	-	-	325	K/W
			[1] [2] [4]	-	-	180	K/W
			[1] [2] [5]	-	-	120	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[6]	-	-	25	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] Reflow soldering is the only recommended soldering method.
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².
- [5] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.
- [6] Soldering point of cathode tab.

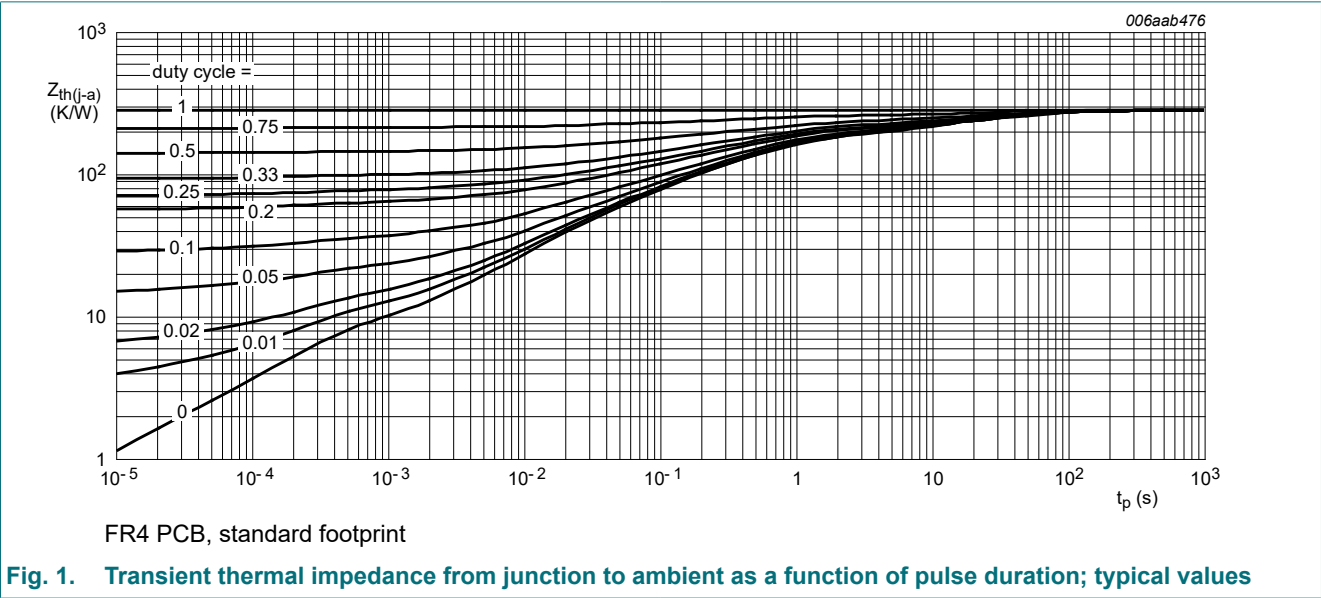


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

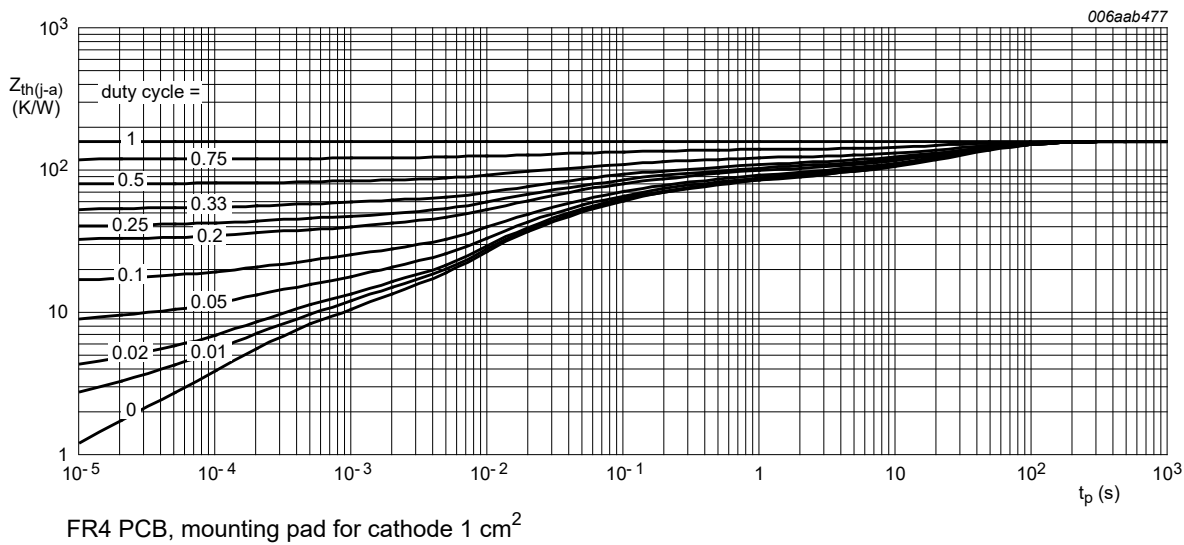


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

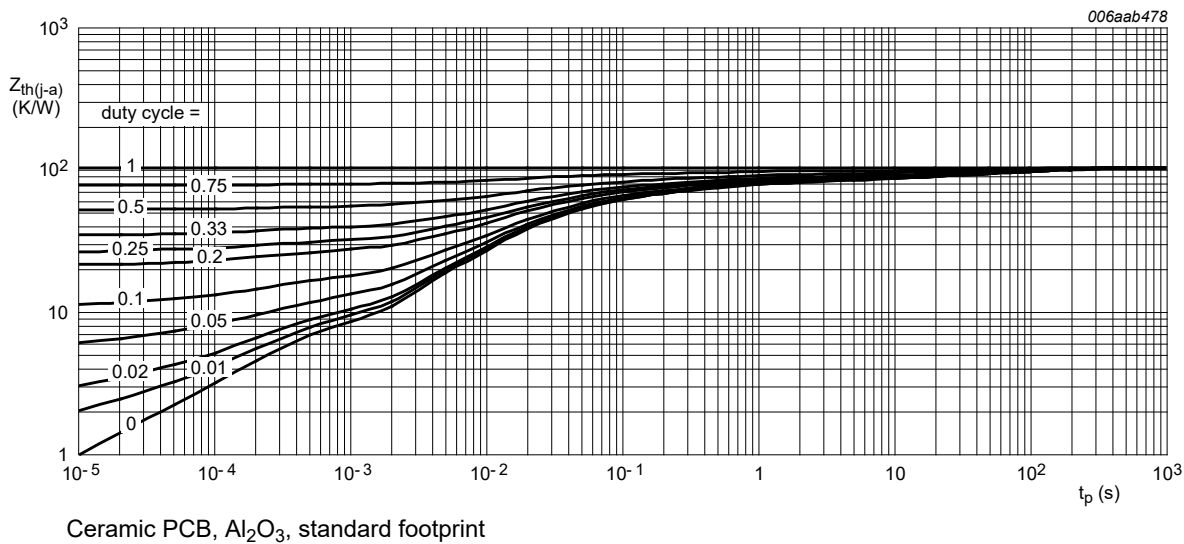
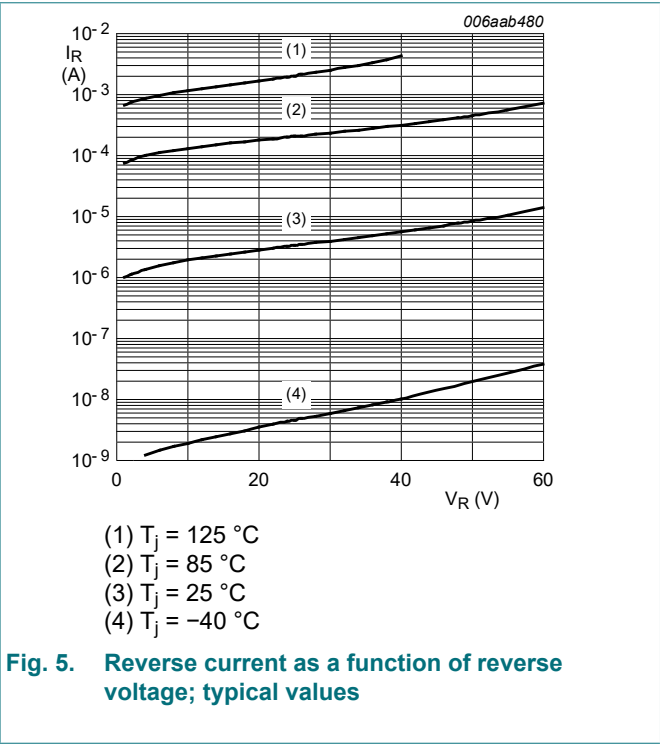
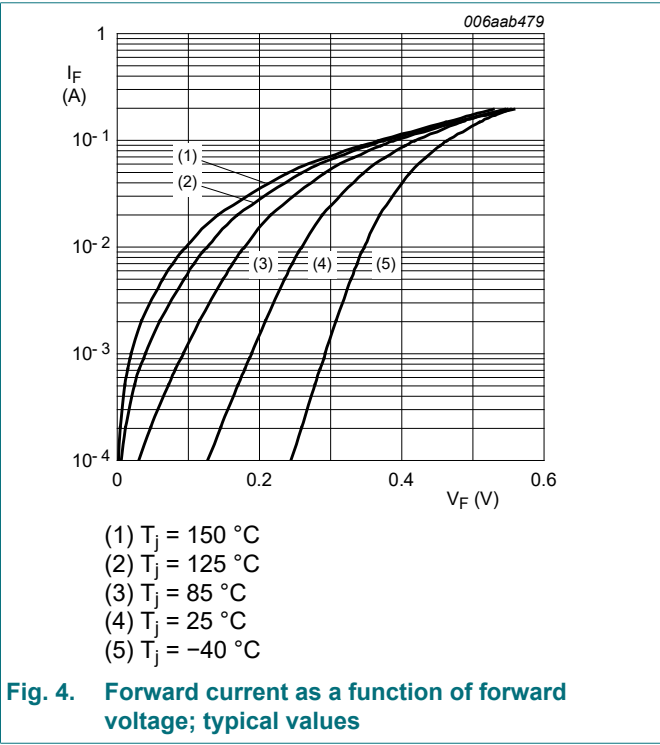


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _F	forward voltage	I _F = 0.1 mA; T _j = 25 °C	-	130	170	mV
		I _F = 1 mA; T _j = 25 °C	-	190	230	mV
		I _F = 10 mA; T _j = 25 °C	-	260	300	mV
		I _F = 100 mA; T _j = 25 °C	-	420	470	mV
		I _F = 200 mA; T _j = 25 °C	-	540	600	mV
I _R	reverse current	V _R = 10 V; T _j = 25 °C	-	2	10	μA
		V _R = 50 V; T _j = 25 °C	-	9	30	μA
		V _R = 60 V; T _j = 25 °C	-	20	100	μA
C _d	diode capacitance	V _R = 1 V; f = 1 MHz; T _j = 25 °C	-	14	-	pF
		V _R = 10 V; f = 1 MHz; T _j = 25 °C	-	6	-	pF
t _{rr}	reverse recovery time	T _j = 25 °C; When switched from I _F = 10 mA to I _R = 10 mA; R _L = 100 Ω; measured at I _R = 1 mA.	-	5	-	ns



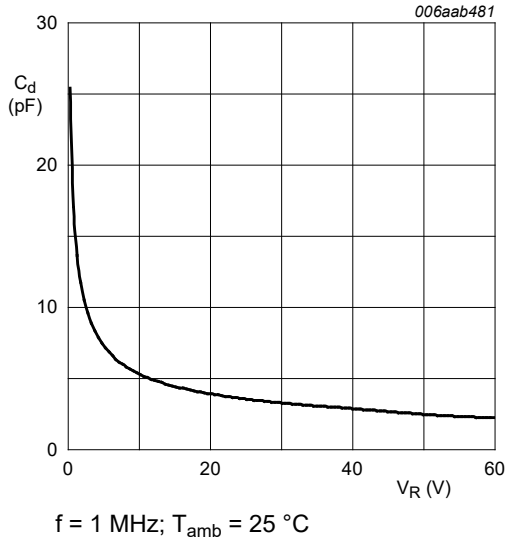


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

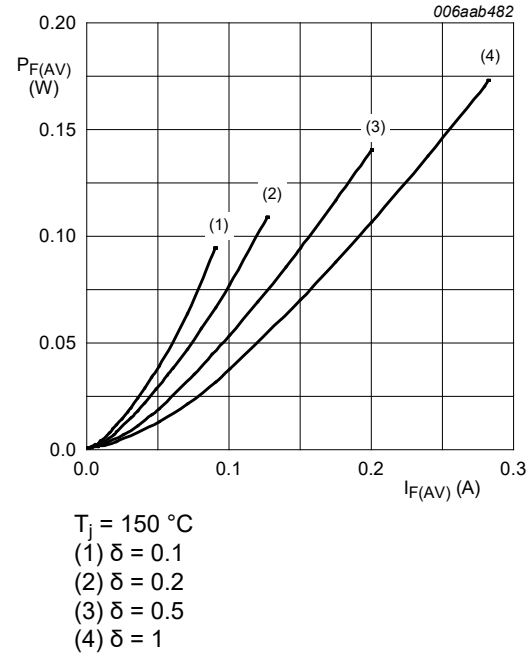


Fig. 7. Average forward power dissipation as a function of average forward current; typical values

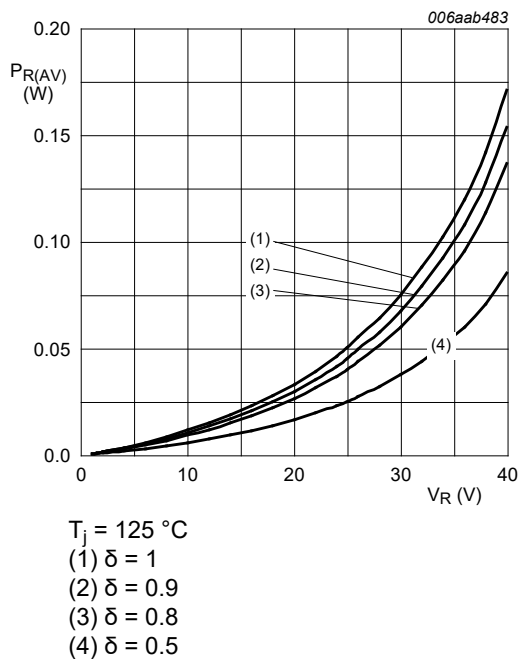


Fig. 8. Average reverse power dissipation as a function of reverse voltage; typical values

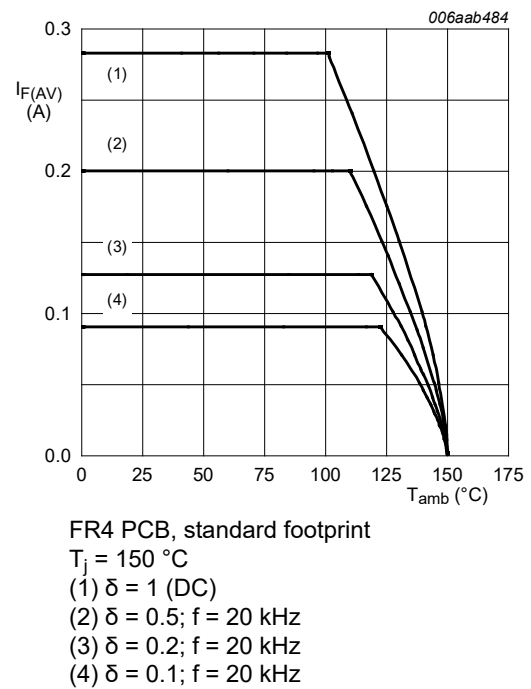
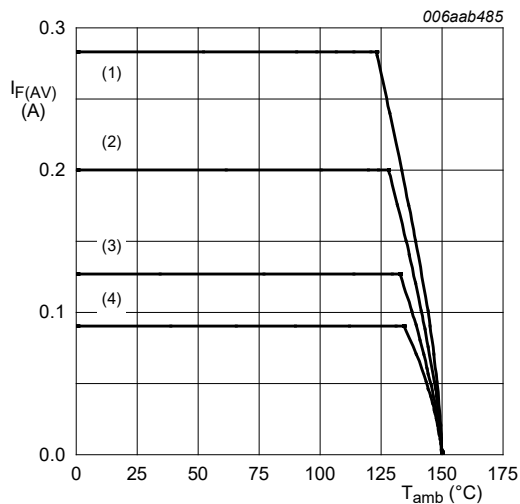
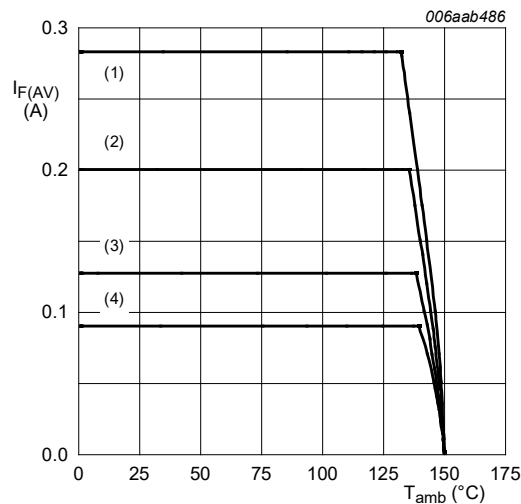


Fig. 9. Average forward current as a function of ambient temperature; typical values



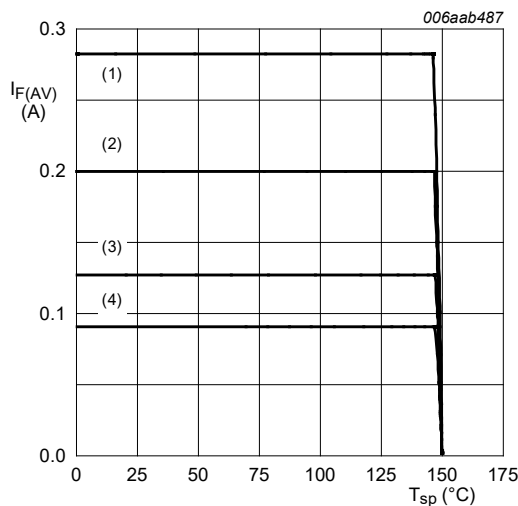
FR4 PCB, mounting pad for cathode 1 cm²
 $T_j = 150$ °C
(1) $\delta = 1$ (DC)
(2) $\delta = 0.5$; $f = 20$ kHz
(3) $\delta = 0.2$; $f = 20$ kHz
(4) $\delta = 0.1$; $f = 20$ kHz

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



Ceramic PCB, Al₂O₃, standard footprint
 $T_j = 150$ °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. 11. Average forward current as a function of ambient temperature; typical values



$T_j = 150$ °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. 12. Average forward current as a function of solder point temperature; typical values

11. Test information

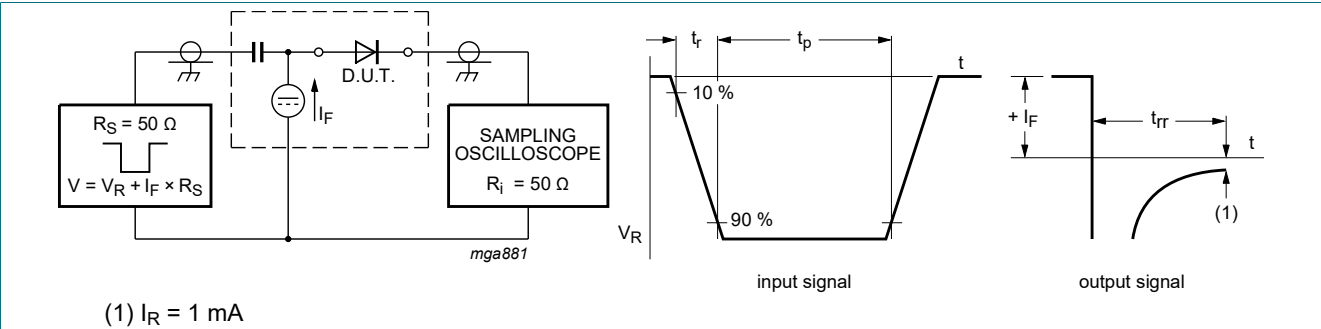


Fig. 13. Reverse recovery time: test circuit and waveforms

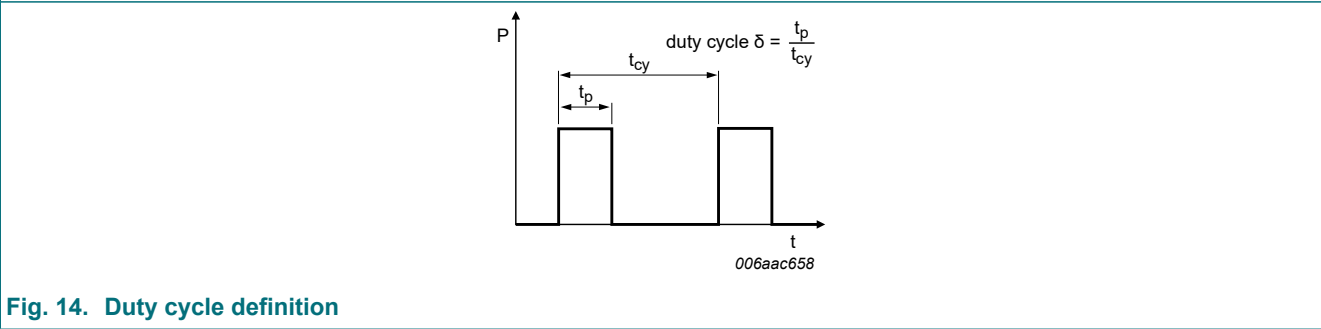


Fig. 14. Duty cycle definition

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.

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

12. Package outline

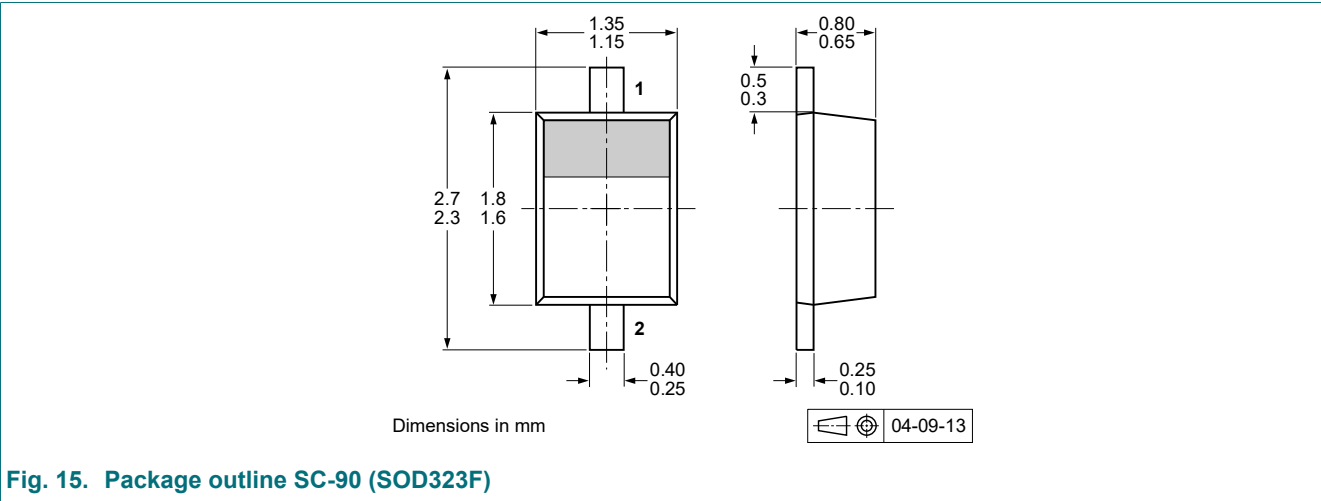
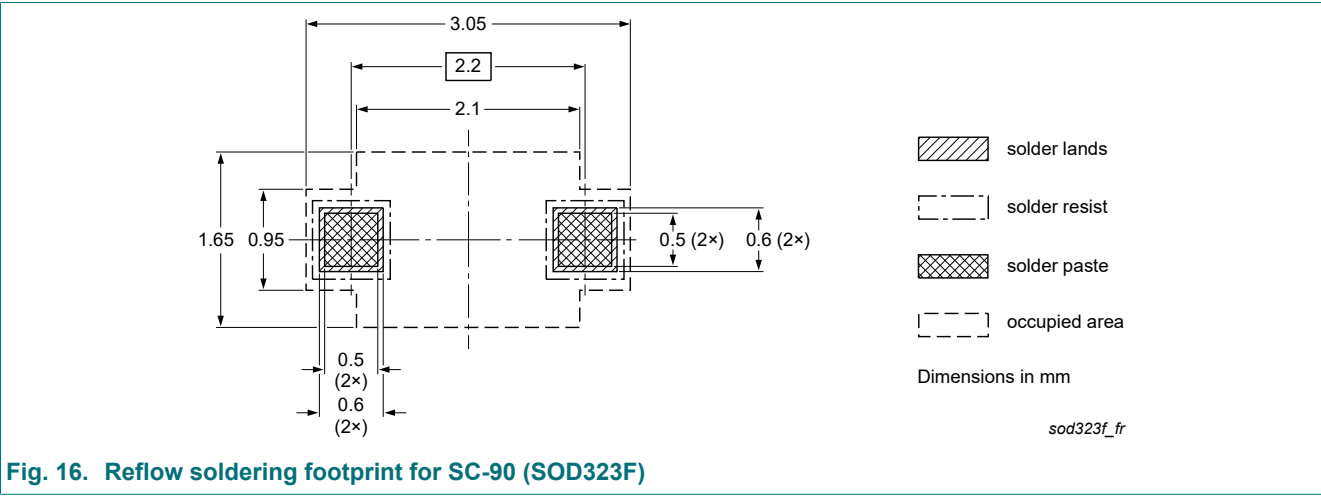


Fig. 15. Package outline SC-90 (SOD323F)

13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG6002EJ-Q v.1	20220503	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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