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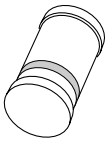


PMLL4153

High-speed diode

Rev. 3 — 19 August 2010 Product data sheet

1. Product profile

1.1 General description

High-speed switching diode fabricated in planar technology, and encapsulated in a small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) package.

1.2 Features and benefits

- High switching speed: max. 4 ns
- General application
- Reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA
- Small hermetically sealed glass SMD package

1.3 Applications

- High-speed switching
- Military and industrial applications

1.4 Quick reference data

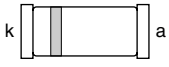
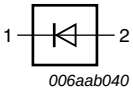
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current		[1]	-	-	200	mA
V_R	reverse voltage			-	-	50	V
V_F	forward voltage	I_F = 50 mA		740	-	880	mV

[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

2. Pinning information

Table 2. Pinning

Pin	Description		Simplified outline	Graphic symbol
1	cathode	[1]		 006aab040
2	anode			

[1] The marking band indicates the cathode.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMLL4153	-	hermetically sealed glass surface-mounted package; 2 connectors	SOD80C

4. Marking

Table 4. Marking codes

Type number	Marking code
PMLL4153	marking band

5. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	75	V
V_R	reverse voltage			-	50	V
I_F	forward current		[1]	-	200	mA
I_{FRM}	repetitive peak forward current			-	450	mA
I_{FSM}	non-repetitive peak forward current	square wave	[2]			
		t_p = 1 µs		-	4	A
		t_p = 1 ms		-	1	A
		t_p = 1 s		-	0.5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	500	mW
T_j	junction temperature			-	200	°C
T_{stg}	storage temperature			–65	+200	°C

[1] Device mounted on an FR4 PCB.

[2] T_j = 25 °C prior to surge.

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-t)}$	thermal resistance from junction to tie-point			-	-	300	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	350	K/W

[1] Device mounted on an FR4 PCB.

7. Characteristics

Table 7. Characteristics

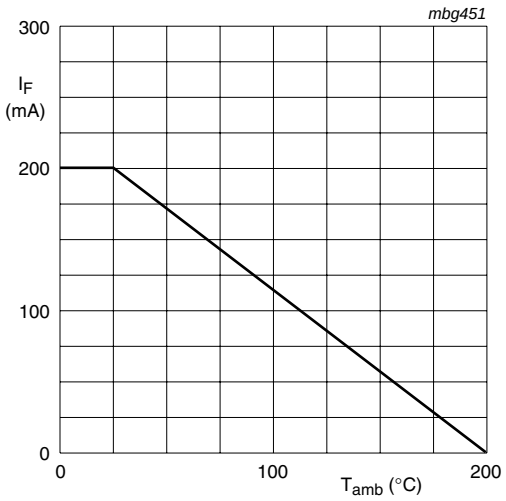
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 0.1 mA		490	-	550	mV
		I_F = 0.25 mA		530	-	590	mV
		I_F = 1 mA		590	-	670	mV
		I_F = 2 mA		620	-	700	mV
		I_F = 10 mA		700	-	810	mV
		I_F = 50 mA		740	-	880	mV
I_R	reverse current	V_R = 50 V		-	-	0.05	µA
		V_R = 50 V; T_j = 150 °C		-	-	50	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	-	2	pF
t_{rr}	reverse recovery time		[1]	-	-	4	ns
			[2]	-	-	2	ns
t_{fr}	forward recovery time		[3]	-	-	10	ns

[1] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.

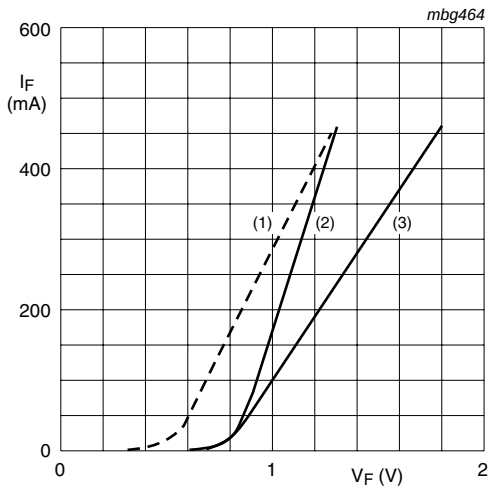
[2] When switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA.

[3] When switched to I_F = 200 mA; t_r = 0.4 ns; measured at V_F = 1 V.



Device mounted on an FR4 Printed-Circuit Board (PCB).

Fig 1. Forward current as a function of ambient temperature; derating curve

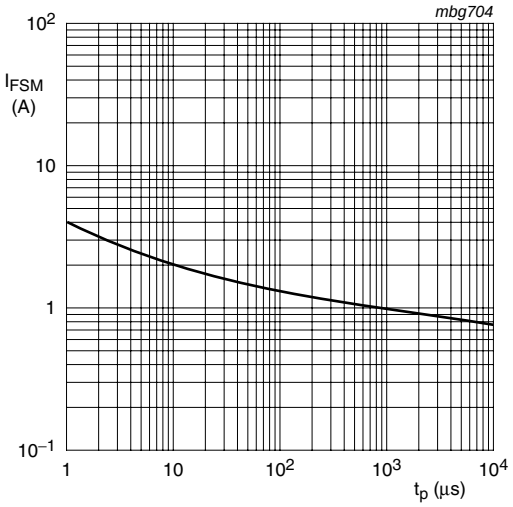


(1) T_j = 175 °C; typical values

(2) T_j = 25 °C; typical values

(3) T_j = 25 °C; maximum values

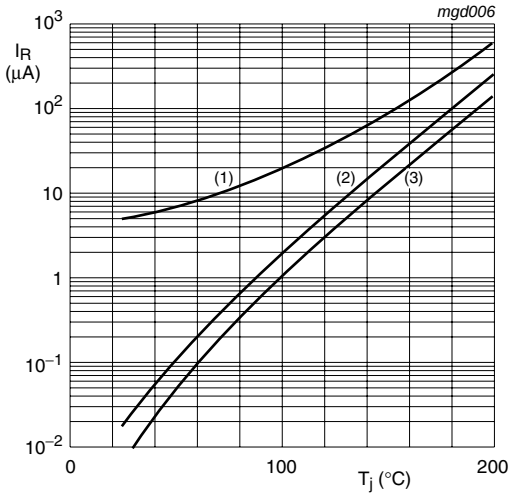
Fig 2. Forward current as a function of forward voltage



Based on square wave currents.

T_j = 25 °C prior to surge

Fig 3. Non-repetitive peak forward current as a function of pulse duration; maximum values

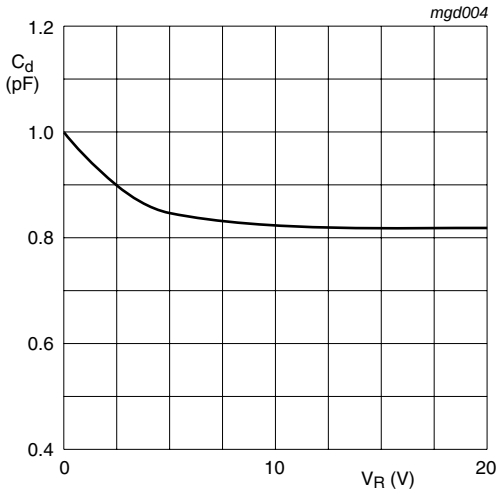


(1) V_R = 75 V; maximum values

(2) V_R = 75 V; typical values

(3) V_R = 20 V; typical values

Fig 4. Reverse current as a function of junction temperature



f = 1 MHz; T_j = 25 °C

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

8. Test information

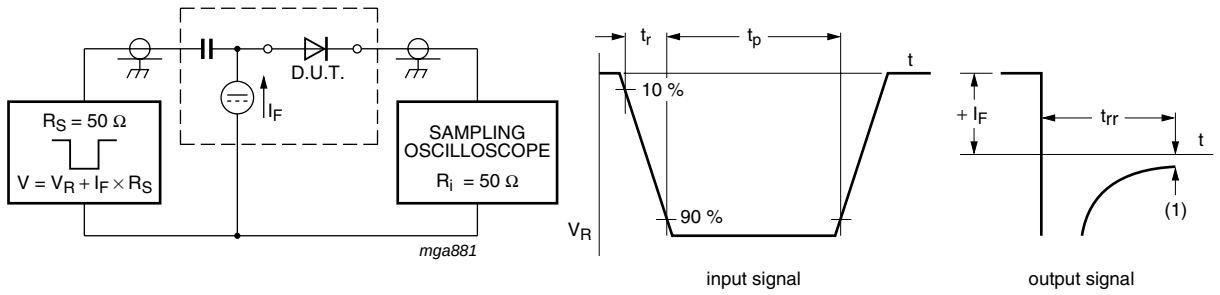
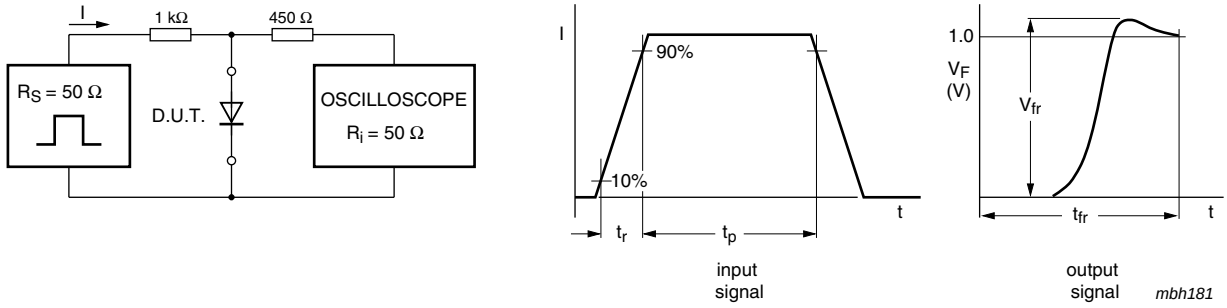


Fig 6. Reverse recovery voltage test circuit and waveforms



Input signal: forward pulse rise time t_r = 0.4 ns; forward pulse duration t_p = 100 ns; duty factor δ = 0.01

Fig 7. Forward recovery time test circuit and waveforms

9. Package outline

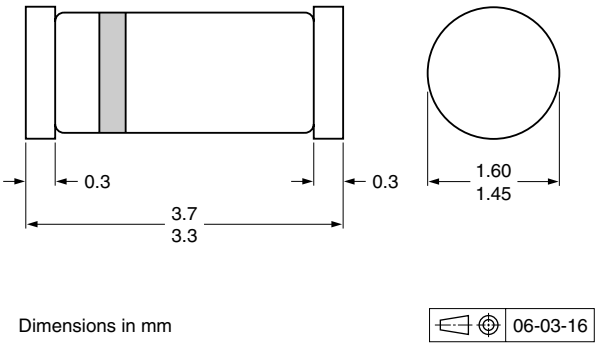


Fig 8. Package outline SOD80C

10. Packing information

Table 8. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			2500	10000
PMLL4153	SOD80C	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see Section 14.

11. Soldering

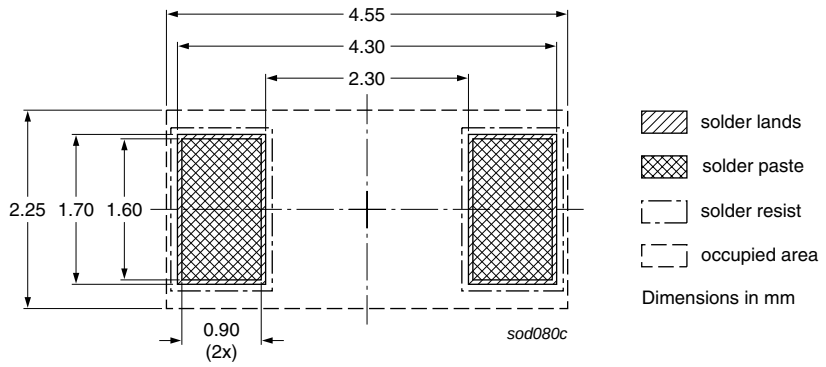


Fig 9. Reflow soldering footprint SOD80C

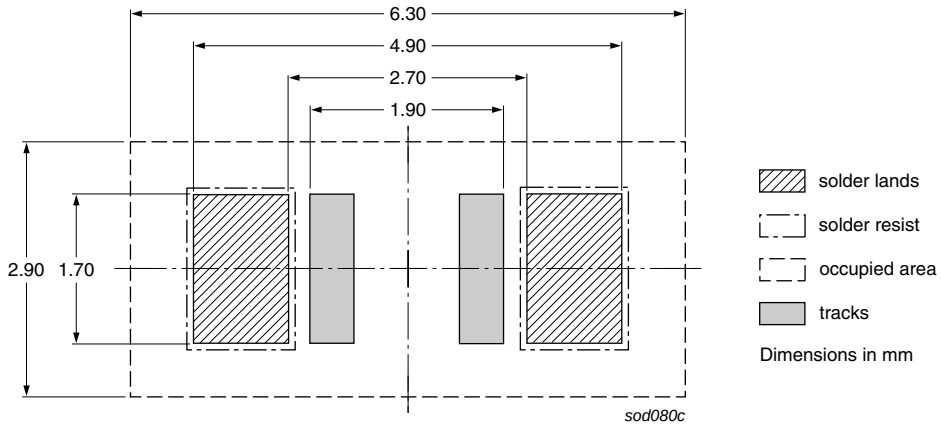


Fig 10. Wave soldering footprint SOD80C

12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMLL4153 v.3	20100819	Product data sheet	-	PMLL4150_2
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Type numbers PMLL4150 and PMLL4151 removed. • Legal texts have been adapted to the new company name where appropriate. • Table 1 “Quick reference data”: added • Section 4 “Marking”: added • Figure 1: updated • Figure 8: superseded by minimized package outline drawing • Section 10 “Packing information”: added • Section 11 “Soldering”: added • Section 13 “Legal information”: updated			
PMLL4150_2	19960918	Product specification	-	PMLL4150_1
PMLL4150_1	19960423	Product specification	-	-

13. Legal information

13.1 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.

[1] Please consult the most recently issued document before initiating or completing a design.

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

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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