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Kind regards,

Team Nexperia
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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF</td>
<td>forward current</td>
<td>[1]</td>
<td>200</td>
<td></td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>VR</td>
<td>reverse voltage</td>
<td>-</td>
<td>50</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>VF</td>
<td>forward voltage</td>
<td>IF = 50 mA</td>
<td>740</td>
<td></td>
<td>880</td>
<td>mV</td>
</tr>
</tbody>
</table>


2. Pinning information

Table 2. Pinning

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>cathode</td>
<td>[1]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>anode</td>
<td></td>
<td>[006aab040]</td>
</tr>
</tbody>
</table>

[1] The marking band indicates the cathode.
3. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMLL4153</td>
<td>-</td>
<td>hermetically sealed glass surface-mounted package; 2 connectors</td>
<td>SOD80C</td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMLL4153</td>
<td>marking band</td>
</tr>
</tbody>
</table>

5. Limiting values

Table 5. Limiting values

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{RRM}$</td>
<td>repetitive peak reverse voltage</td>
<td>-</td>
<td>75</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$V_{R}$</td>
<td>reverse voltage</td>
<td>-</td>
<td>50</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$I_{F}$</td>
<td>forward current</td>
<td>-</td>
<td>200</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>$I_{FRM}$</td>
<td>repetitive peak forward current</td>
<td>-</td>
<td>450</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>square wave</td>
<td>-</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 1 \mu s$</td>
<td>-</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 1 ms$</td>
<td>-</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 ^\circ C$</td>
<td>-</td>
<td>500</td>
<td>mW</td>
</tr>
<tr>
<td>$T_{j}$</td>
<td>junction temperature</td>
<td>-</td>
<td>200</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td>-65</td>
<td>+200</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

[1] Device mounted on an FR4 PCB.
[2] $T_{j} = 25 ^\circ C$ prior to surge.

6. Thermal characteristics

Table 6. Thermal characteristics

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

[1] Device mounted on an FR4 PCB.
7. Characteristics

Table 7. Characteristics

$T_j = 25 \, ^\circ C$ unless otherwise specified.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 0.1 , mA$</td>
<td>490</td>
<td>-</td>
<td>550</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 0.25 , mA$</td>
<td>530</td>
<td>-</td>
<td>590</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1 , mA$</td>
<td>590</td>
<td>-</td>
<td>670</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 2 , mA$</td>
<td>620</td>
<td>-</td>
<td>700</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 , mA$</td>
<td>700</td>
<td>-</td>
<td>810</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 50 , mA$</td>
<td>740</td>
<td>-</td>
<td>880</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 50 , V$</td>
<td>-</td>
<td>-</td>
<td>0.05</td>
<td>$\mu A$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 50 , V; , T_j = 150 , ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$V_R = 0 , V; , f = 1 , MHz$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$V_R = 0 , V; , f = 1 , MHz$</td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>-</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>$t_{fr}$</td>
<td>forward recovery time</td>
<td>$V_R = 0 , V; , f = 1 , MHz$</td>
<td>[3]</td>
<td>-</td>
<td>-</td>
<td>10 ns</td>
</tr>
</tbody>
</table>

[1] When switched from $I_F = 10 \, mA$ to $I_R = 10 \, mA$; $R_L = 100 \, \Omega$; measured at $I_R = 1 \, mA$.
[2] When switched from $I_F = 10 \, mA$ to $I_R = 60 \, mA$; $R_L = 100 \, \Omega$; measured at $I_R = 1 \, mA$.
[3] When switched to $I_F = 200 \, mA$; $t_v = 0.4 \, ns$; measured at $V_F = 1 \, V$.

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

Fig 2. Forward current as a function of forward voltage

Device mounted on an FR4 Printed-Circuit Board (PCB).
Based on square wave currents.

\( T_j = 25 \, ^\circ \text{C} \) prior to surge

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

**Fig 4.** Reverse current as a function of junction temperature

(1) \( V_R = 75 \, \text{V} \); maximum values  
(2) \( V_R = 75 \, \text{V} \); typical values  
(3) \( V_R = 20 \, \text{V} \); typical values

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

\( f = 1 \, \text{MHz}; \ T_j = 25 \, ^\circ \text{C} \)
8. Test information

Fig 6. Reverse recovery voltage test circuit and waveforms

![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 $\delta = 0.01$

Fig 7. Forward recovery time test circuit and waveforms

9. Package outline

Fig 8. Package outline SOD80C

![Package outline SOD80C]
10. Packing information

Table 8. Packing methods
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Packing quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMLL4153</td>
<td>SOD80C</td>
<td>4 mm pitch, 8 mm tape and reel</td>
<td>-115 -135</td>
</tr>
</tbody>
</table>

[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>
<thead>
<tr>
<th>Document ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<tbody>
<tr>
<td>PMLL4153 v.3</td>
<td>20100819</td>
<td>Product data sheet</td>
<td>-</td>
<td>PMLL4150_2</td>
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<tr>
<td>PMLL4150_2</td>
<td>19960918</td>
<td>Product specification</td>
<td>-</td>
<td>PMLL4150_1</td>
</tr>
<tr>
<td>PMLL4150_1</td>
<td>19960423</td>
<td>Product specification</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**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**
13. Legal information

13.1 Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective [short] data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

[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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