$V_{RM} = 300\, V$, $I_{F(AV)} = 20\, A$, $t_{rr} = 25\, \text{ns}$

Fast Recovery Diode

**FMXA-4203S**

**Description**

The FMXA-4203S is a fast recovery diode of $300\, V$ / $20\, A$. The maximum $t_{rr}$ of $25\, \text{ns}$ is realized by optimizing a life-time control.

**Features**

- $V_{RM} = 300\, V$
- $I_{F(AV)} = 20\, A$
- $V_F = 1.30\, V$
- $t_{rr} = 25\, \text{ns}$
- Bare lead frame: Pb-free (RoHS compliant)

**Applications**

- Secondary Side Rectifier Diode
  (Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
  (Offline Buck and Buck-boost Converter)

**Package**

TO3PF-3L

Not to scale

(1) Anode
(2) Cathode
(3) Anode

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http://www.sanken-ele.co.jp/en

Jan. 31, 2018

FMXA-4203S-DSE Rev.1.0
### Absolute Maximum Ratings

Unless otherwise specified, $T_A = 25 \, ^\circ C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Repetitive Reverse Voltage$^{(1)}$</td>
<td>$V_{RSM}$</td>
<td>300</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Repetitive Reverse Voltage$^{(1)}$</td>
<td>$V_{RM}$</td>
<td>300</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Average Forward Current</td>
<td>$I_{F(AV)}$</td>
<td>20</td>
<td>A</td>
<td>See Figure 1 and Figure 2</td>
</tr>
<tr>
<td>Surge Forward Current$^{(1)}$</td>
<td>$I_{FSM}$</td>
<td>100</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>$t^1$ Limiting Value$^{(1)}$</td>
<td>$t^1$</td>
<td>50</td>
<td>A$^2$</td>
<td>$1 , ms \leq t \leq 10 , ms$</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>$T_J$</td>
<td>−40 to 150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{STG}$</td>
<td>−40 to 150</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

### Electrical Characteristics

Unless otherwise specified, $T_A = 25 \, ^\circ C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage Drop$^{(1)}$</td>
<td>$V_F$</td>
<td>$T_J = 25 , ^\circ C, I_F = 10 , A$</td>
<td>—</td>
<td>—</td>
<td>1.30</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$T_J = 100 , ^\circ C, I_F = 10 , A$</td>
<td>—</td>
<td>1.03</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Leakage Current$^{(1)}$</td>
<td>$I_R$</td>
<td>$V_R = V_{RM}$</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>Reverse Leakage Current Under High Temperature$^{(1)}$</td>
<td>$H_I_R$</td>
<td>$V_R = V_{RM}, T_J = 150 , ^\circ C$</td>
<td>—</td>
<td>—</td>
<td>30</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Recovery Time$^{(1)}$</td>
<td>$t_{rr}$</td>
<td>$I_F = I_{RF} = 500 , mA$ 90% recovery point, $T_J = 25 , ^\circ C$</td>
<td>—</td>
<td>—</td>
<td>25</td>
<td>ns</td>
</tr>
<tr>
<td>Thermal Resistance$^{(2)}$</td>
<td>$R_{th(J\rightarrow C)}$</td>
<td>—</td>
<td>—</td>
<td>2.0</td>
<td>°C/W</td>
<td></td>
</tr>
</tbody>
</table>

$^{(1)}$ Specifies a value per chip; the FMXA-4203S consists of two chips.

$^{(2)}$ $R_{th(J\rightarrow C)}$ is thermal resistance between junction and the case. The case temperature is measured at the back side near the screw hole.
**Rating and Characteristic Curves**

**Figure 1.** $I_{F(AV)}$ vs. $T_C$ Typical Characteristics ($V_R = 0$ V)

**Figure 2.** $I_{F(AV)}$ vs. $T_C$ Typical Characteristics ($V_R = 300$ V)

**Figure 3.** $V_F$ vs. $I_F$ Typical Characteristics

**Figure 4.** $V_R$ vs. $I_R$ Typical Characteristics
Physical Dimensions

- **TO3PF-3L**

![Diagram of TO3PF-3L dimensions]

**NOTES:**

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, it is required to minimize the working time, within the following limits:
  - Flow: 260 ± 5 °C / 10 ± 1 s, 2 times
  - Soldering Iron: 380 ± 10 °C / 3.5 ± 0.5 s, 1 time
  - Soldering should be at a distance of at least 1.5 mm from the body of the product.
- Recommended screw torque for TO3PF: 0.686 N·m to 0.882 N·m (7 kgf-cm to 9 kgf-cm)
FMXA-4203S

Marking Diagram

Specific Device Code (See Table 1)

Lot Number:
- Y is the last digit of the year of manufacture (0 to 9)
- M is the month of the year (1 to 9, O, N, or D)
- DD is the day of the month (01 to 31)

Table 1. Specific Device Code

<table>
<thead>
<tr>
<th>Specific Device Code</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMXA4203</td>
<td>FMXA-4203S</td>
</tr>
</tbody>
</table>
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