Description

The FMX-G22S is a fast recovery diode of 200 V / 10 A. The maximum \( t_r \) of 30 ns is realized by optimizing a life-time control.

Features

- \( V_{RM} \) : 200 V
- \( I_{F(AV)} \) : 10 A
- \( V_F \) : 0.98 V
- \( t_{rr} \) : 30 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

Applications

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

Package

TO220F-2L

Not to scale
### Absolute Maximum Ratings

Unless otherwise specified, \( T_A = 25 \, ^\circ C \).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonrepetitive Peak Reverse Voltage</td>
<td>( V_{RM} )</td>
<td></td>
<td>200</td>
<td>V</td>
</tr>
<tr>
<td>Repetitive Peak Reverse Voltage</td>
<td>( V_{RM} )</td>
<td></td>
<td>200</td>
<td>V</td>
</tr>
<tr>
<td>Average Forward Current</td>
<td>( I_{F(AV)} )</td>
<td>See Figure 1 and Figure 2</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>Surge Forward Current</td>
<td>( I_{FSM} )</td>
<td>Half cycle sine wave, positive side, 10 ms, 1 shot</td>
<td>150</td>
<td>A</td>
</tr>
<tr>
<td>( \Pi ) Limiting Value</td>
<td>( \Pi_t )</td>
<td>( 1 , ms \leq t \leq 10 , ms )</td>
<td>112.5</td>
<td>A²s</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_J )</td>
<td></td>
<td>−40 to 150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{STG} )</td>
<td></td>
<td>−40 to 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

### Electrical Characteristics

Unless otherwise specified, \( T_A = 25 \, ^\circ C \).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
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<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage Drop</td>
<td>( V_F )</td>
<td>( T_J = 25 , ^\circ C, , I_F = 10 , A )</td>
<td>—</td>
<td>—</td>
<td>0.98</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( T_J = 100 , ^\circ C, , I_F = 10 , A )</td>
<td>—</td>
<td>0.77</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Leakage Current</td>
<td>( I_R )</td>
<td>( V_R = V_{RM} )</td>
<td>—</td>
<td>—</td>
<td>200</td>
<td>µA</td>
</tr>
<tr>
<td>Reverse Leakage Current under High Temperature</td>
<td>( I_{R1} )</td>
<td>( I_R = V_{RM}, , T_J = 150 , ^\circ C )</td>
<td>—</td>
<td>—</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Recovery Time</td>
<td>( I_{R1} )</td>
<td>( I_e = I_{RP} = 500 , mA, , 90% ) recovery point, ( T_{J} = 25 , ^\circ C )</td>
<td>—</td>
<td>—</td>
<td>30</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>( I_{R2} )</td>
<td>( I_e = 500 , mA, , I_{RP} = 1000 , mA, , 75% ) recovery point, ( T_{J} = 25 , ^\circ C )</td>
<td>—</td>
<td>—</td>
<td>25</td>
<td>ns</td>
</tr>
<tr>
<td>Thermal Resistance(^{(1)})</td>
<td>( R_{th(J-C)} )</td>
<td></td>
<td>—</td>
<td>—</td>
<td>4.0</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

### Mechanical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heatsink Mounting Screw Torque</td>
<td></td>
<td>0.490</td>
<td>—</td>
<td>0.686</td>
<td>N-m</td>
</tr>
</tbody>
</table>

\(^{(1)}\) \( R_{th(J-C)} \) 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. Typical Characteristics: $I_{F(AV)}$ vs. $T_C$ ($V_R = 0$ V)

Figure 2. Typical Characteristics: $I_{F(AV)}$ vs. $T_C$ ($V_R = 200$ V)

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

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

- TO220F-2L

NOTES:
- Dimensions in millimeters
- All the dimensions exclude mold flashes.
- 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.

Marking Diagram

Table 1. Specific Device Code

<table>
<thead>
<tr>
<th>Specific Device Code</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMXG22S</td>
<td>FMX-G22S</td>
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</tbody>
</table>
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