

**$V_{RM} = 600\text{ V}$ ,  $I_{F(AV)} = 10\text{ A}$ ,  $t_{rr} = 100\text{ ns}$**   
**Fast Recovery Diode**  
**FMNS-1106S**

**Description**

The FMNS-1106S is a fast recovery diode of 600 V / 10 A, and has a low forward voltage drop characteristic. The maximum  $t_{rr}$  of 100 ns is realized by optimizing a life-time control.

**Features**

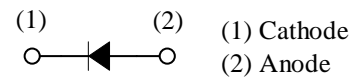
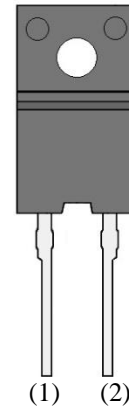
- $V_{RM}$ ----- 600 V
- $I_{F(AV)}$ ----- 10 A
- $V_F$ ----- 1.3 V
- $t_{rr1}$ ----- 100 ns
- Bare lead frame: Pb-free (RoHS compliant)

**Applications**

- PFC circuit
- Freewheel Diode  
(Offline Buck and Buck-boost Converter)

**Package**

TO220F-2L



Not to scale

**Absolute Maximum Ratings**

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

| Parameter                       | Symbol      | Rating     | Unit             | Conditions   |
|---------------------------------|-------------|------------|------------------|--|
| Peak Repetitive Reverse Voltage | $V_{RSM}$   | 600        | V                |  |
| Repetitive Reverse Voltage      | $V_{RM}$    | 600        | V                |  |
| Average Forward Current         | $I_{F(AV)}$ | 10         | A                | See Figure 1 and Figure 2                          |
| Surge Forward Current           | $I_{FSM}$   | 100        | A                | Half cycle sine wave, positive side, 10 ms, 1 shot |
| $I^2t$ Limiting Value           | $I^2t$      | 50         | $A^2s$           | $1\text{ ms} \leq t \leq 10\text{ ms}$             |
| Junction Temperature            | $T_J$       | -40 to 150 | $^\circ\text{C}$ |  |
| Storage Temperature             | $T_{STG}$   | -40 to 150 | $^\circ\text{C}$ |  |

**Electrical Characteristics**

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

| Parameter                                      | Symbol        | Conditions   | Min. | Typ. | Max. | Unit               |
|--|---------------|--|------|------|------|--------------------|
| Forward Voltage Drop                           | $V_F$         | $T_J = 25\text{ }^\circ\text{C}, I_F = 10\text{ A}$  | —    | —    | 1.3  | V                  |
|  |               | $T_J = 100\text{ }^\circ\text{C}, I_F = 10\text{ A}$   | —    | 1.1  | —    | V                  |
| Reverse Leakage Current                        | $I_R$         | $V_R = V_{RM}$   | —    | —    | 100  | $\mu\text{A}$      |
| Reverse Leakage Current Under High Temperature | $H \cdot I_R$ | $V_R = V_{RM}, T_J = 150\text{ }^\circ\text{C}$  | —    | —    | 10   | mA                 |
| Reverse Recovery Time                          | $t_{rr1}$     | $I_F = I_{RP} = 100\text{ mA}$<br>90% recovery point,<br>$T_J = 25\text{ }^\circ\text{C}$                      | —    | —    | 100  | ns                 |
|  | $t_{rr2}$     | $I_F = 100\text{ mA},$<br>$I_{RP} = 200\text{ mA},$<br>75% recovery point,<br>$T_J = 25\text{ }^\circ\text{C}$ | —    | —    | 50   | ns                 |
| Thermal Resistance <sup>(1)</sup>              | $R_{th(J-C)}$ |  | —    | —    | 4.0  | $^\circ\text{C/W}$ |

<sup>(1)</sup>  $R_{th(J-C)}$  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

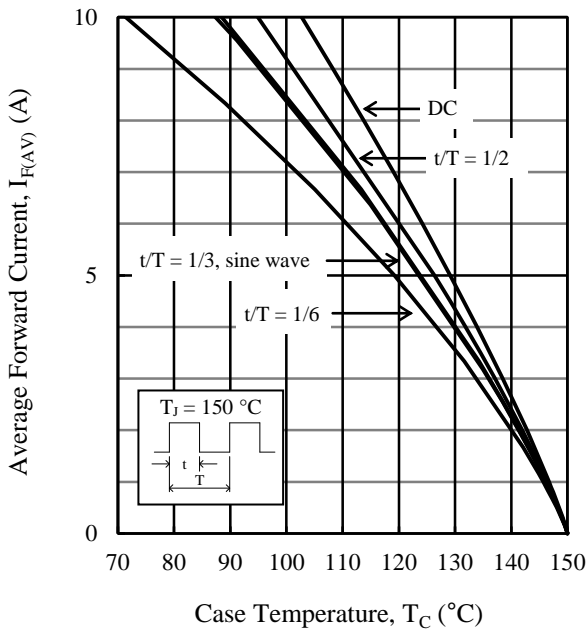


Figure 1.  $I_{F(AV)}$  vs.  $T_C$  Typical Characteristics ( $V_R = 0\text{ V}$ )

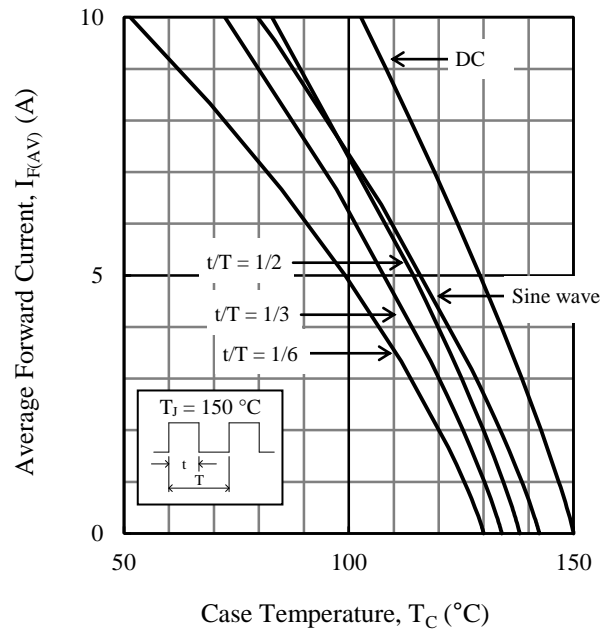


Figure 2.  $I_{F(AV)}$  vs.  $T_C$  Typical Characteristics ( $V_R = 600\text{ V}$ )

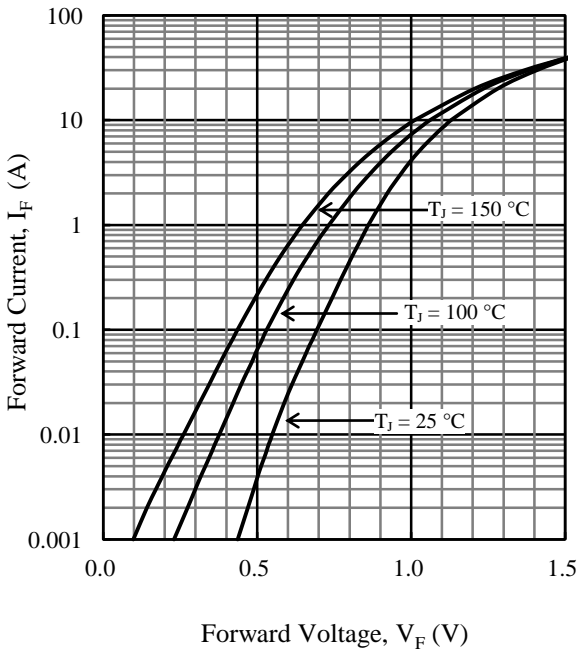


Figure 3.  $V_F$  vs.  $I_F$  Typical Characteristics

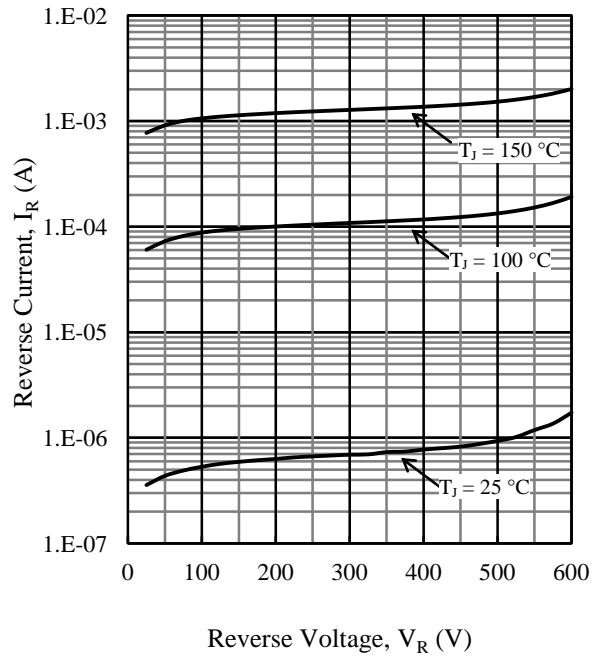
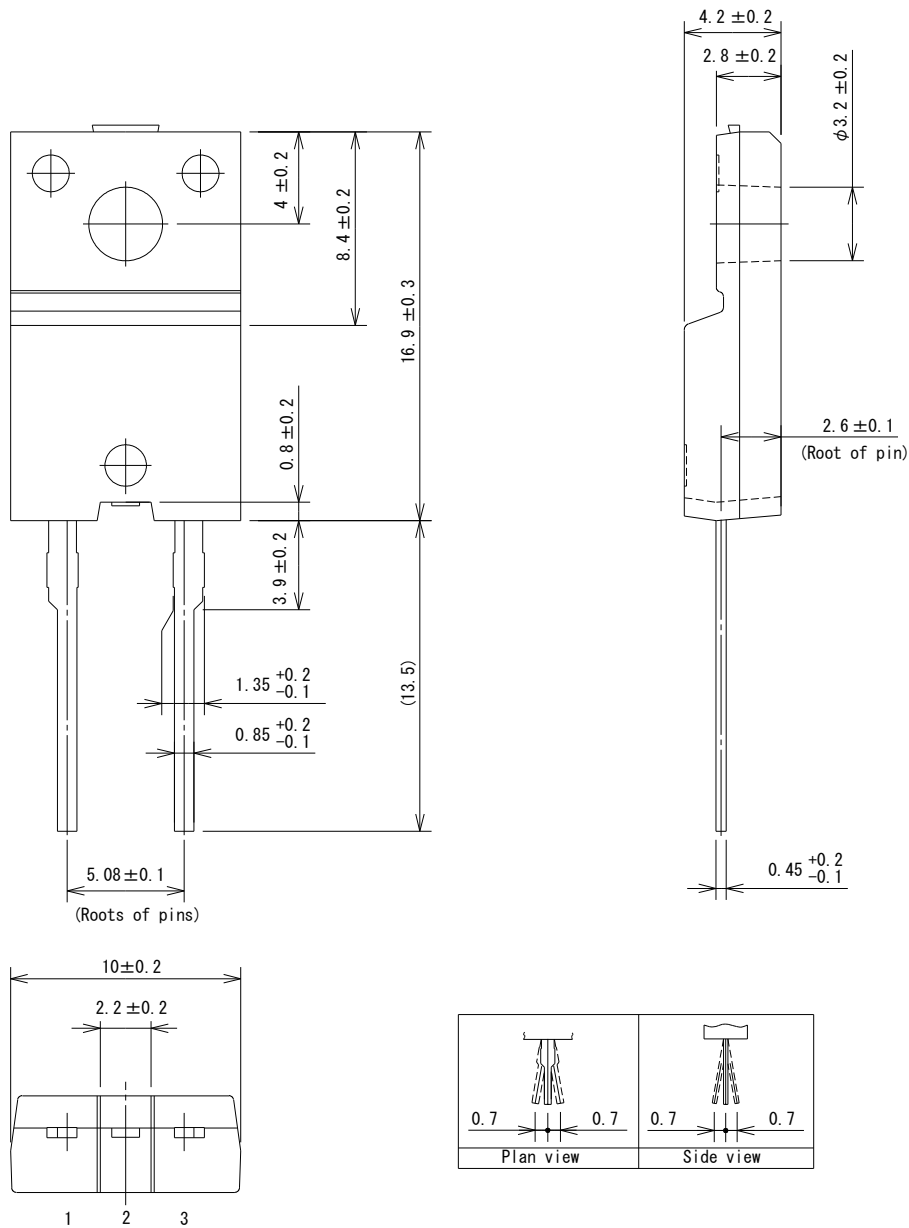


Figure 4.  $V_R$  vs.  $I_R$  Typical Characteristics

Physical Dimensions

• TO220F-3L



NOTES:

- Dimensions in millimeters
- Maximum gate burr height is 0.3 mm.
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, it is required to minimize the working time, within the following limits:  
 Flow:  $260 \pm 5$  °C /  $10 \pm 1$  s, 2 times  
 Soldering Iron:  $380 \pm 10$  °C /  $3.5 \pm 0.5$  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 TO220F: 0.490 N·m to 0.686 N·m (5 kgf·cm to 7 kgf·cm)

**Marking Diagram**

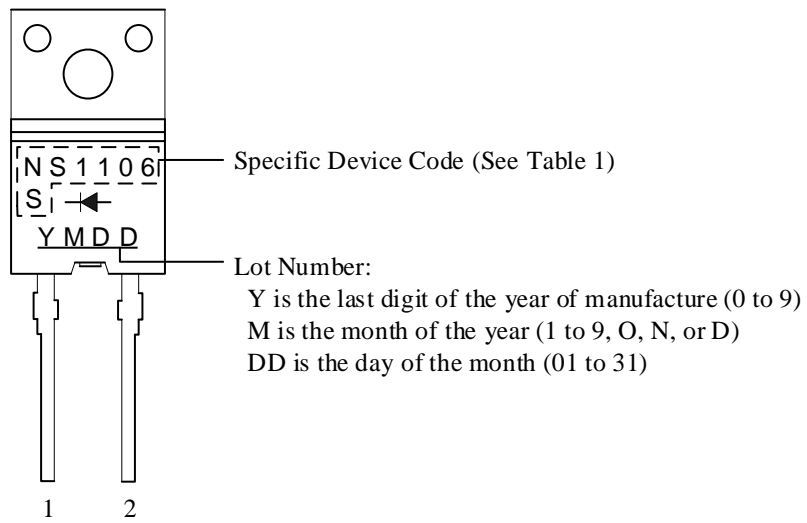


Table 1. Specific Device Code

| Specific Device Code | Part Number |
|----------------------|-------------|
| NS1106S              | FMNS-1106S  |



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