V_{RM} = 600 V, $I_{F(AV)}$ = 60 A, t_{rr} = 100 ns
Fast Recovery Diode

FMNS-4606S

Data Sheet

Description

The FMNS-4606S is a 600 V, 60 A, fast recovery diode. The maximum V_F of 1.3 V and the maximum t_{rr} of 100 ns (I_F : I_{RP} = 1 : 2) are realized by optimizing the trade-off relationship between V_F and t_{rr}. The low thermal resistance package achieves high performance in terms of heat dissipation.

Features

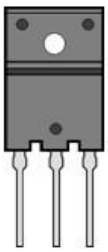
- V_{RM} ---------- 600 V
- $I_{F(AV)}$ ---------- 60 A
- V_F ---------- 1.3 V
- t_{rr1} (I_F = I_{RP}) ---------- 150 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

Applications

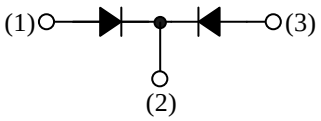
- PFC Crcuit
- Inverter Circuit
- Secondary-side Rectifier Diode
  (Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
  (Offline Buck Converter, Offline Buck-boost Converter, etc.)

Package

TO3PF-3L



(1) (2)(3)



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

Not to scale

Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Rating	Unit
Nonrepetitive Peak Reverse Voltage	V_{RSM}		600	V
Repetitive Peak Reverse Voltage	V_{RM}		600	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 2	60	A
Surge Forward Current	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	200	A
I^2t Limiting Value	I^2t	1 ms ≤ t ≤ 10 ms	200	A^2s
Junction Temperature	T_J		−40 to 150	°C
Storage Temperature	T_{STG}		−40 to 150	°C

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop [1]	V_F	T_J = 25 °C, I_F = 30 A	—	—	1.3	V
Reverse Leakage Current[1]	I_R	$V_R = V_{RM}$	—	—	200	μA
Reverse Leakage Current under High Temperature[1]	$H \cdot I_R$	$V_R = V_{RM}$, T_J = 150 °C	—	—	20	mA
Reverse Recovery Time[1]	t_{rr1}	$I_F = I_{RP}$ = 500 mA, 90% recovery point, T_J = 25 °C	—	—	150	ns
	t_{rr2}	I_F = 500 mA, I_{RP} = 1 A, 75% recovery point, T_J = 25 °C	—	—	100	ns
Thermal Resistance[2]	$R_{th(J-C)}$		—	—	1.7	°C/W

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Heatsink Mounting Screw Torque		0.686	—	0.882	N·m

[1] The rating of one chip.
[2] $R_{th\ (J-C)}$ is thermal resistance between junction and case.

Rating and Characteristic Curves

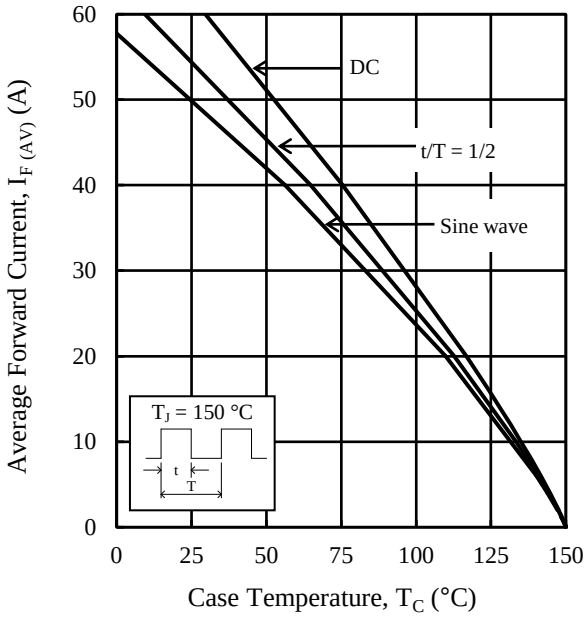


Figure 1. Typical Characteristics: $I_{F(AV)}$ vs. T_C (V_R = 0 V)

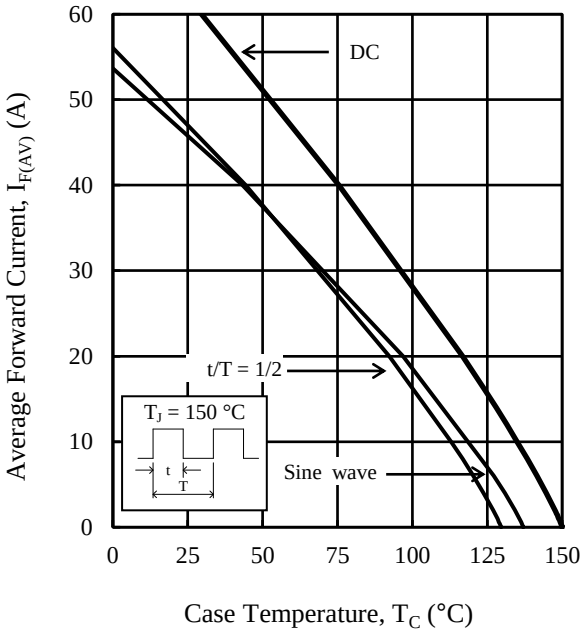


Figure 2. Typical Characteristics: $I_{F(AV)}$ vs. T_C (V_R = 600 V)

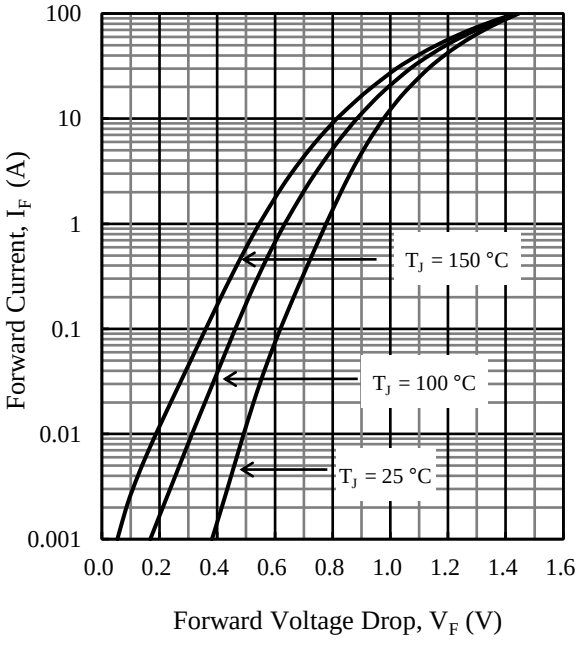


Figure 3. Typical Characteristics: I_F vs. V_F

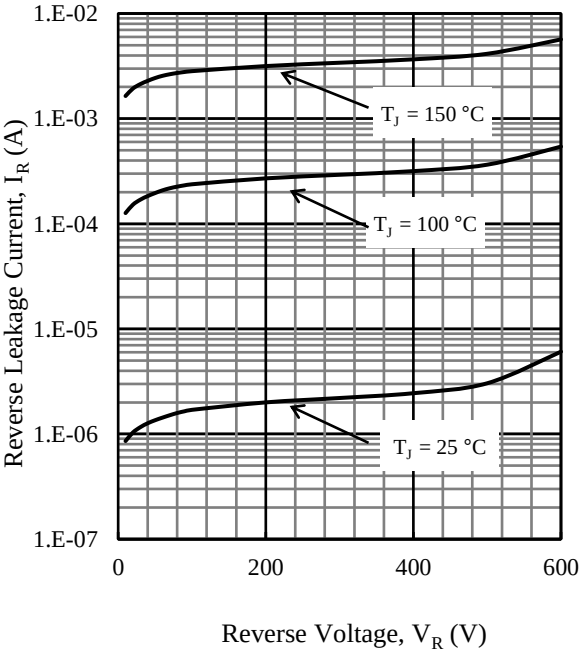
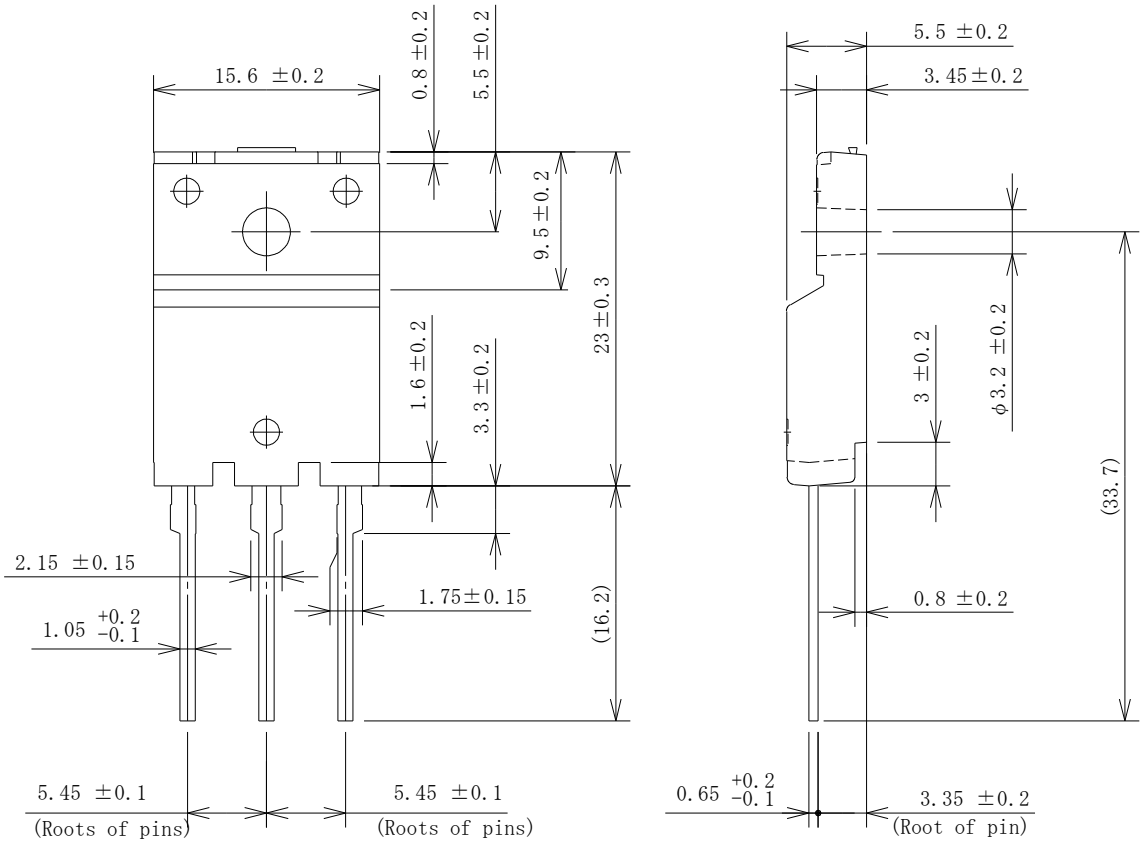
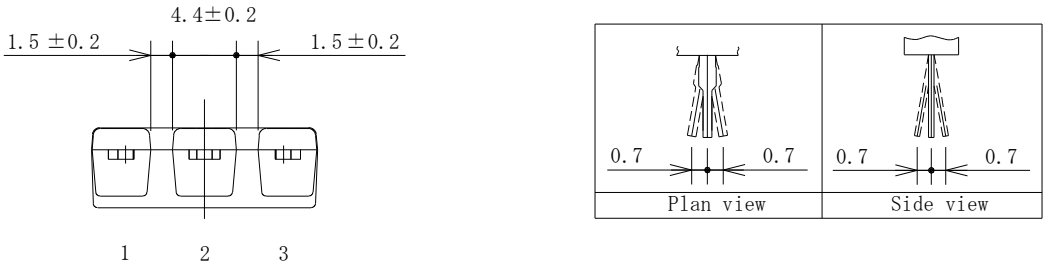


Figure 4. Typical Characteristics: I_R vs. V_R

Physical Dimensions

● **TO3PF-3L**

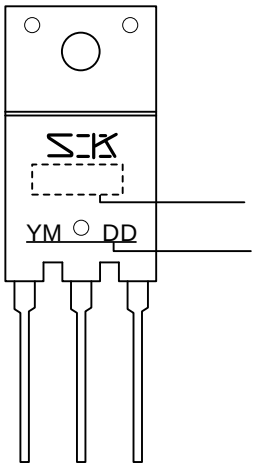




NOTES:

- 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 ± 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



Specific Device Code (see Table 1)

Lot Number

Y is the last digit of the year (0 to 9)

M is the month (1 to 9, O, N or D)

DD is the day of the month (01 to 31)

Table 1. Specific Device Code

Specific Device Code	Part Number
NS4606	FMNS-4606S

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