

$V_{RM} = 600\text{ V}$, $I_{F(AV)} = 20\text{ A}$, $t_{rr} = 50\text{ ns}$
Fast Recovery Diode
FMD-4206S

Description

The FMD-4206S is a fast recovery diode of 600 V / 20 A. The maximum t_{rr} of 50 ns is realized by optimizing a life-time control.

Package

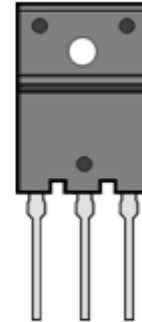
TO3PF-3L

Features

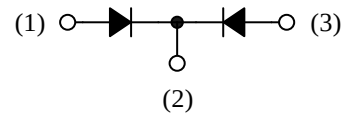
- V_{RM} ----- 600 V
- $I_{F(AV)}$ ----- 20 A
- V_F ----- 1.7 V
- t_{rr1} ----- 50 ns
- Bare Leads: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

Applications

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



(1) (2) (3)



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

Not to scale

Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Nonrepetitive Peak Reverse Voltage ⁽¹⁾	V_{RSM}		600	V
Repetitive Peak Reverse Voltage ⁽¹⁾	V_{RM}		600	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 2	20	A
Surge Forward Current ⁽¹⁾	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	100	A
I^2t Limiting Value ⁽¹⁾	I^2t	$1\text{ ms} \leq t \leq 10\text{ ms}$	50	A^2s
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 ⁽¹⁾	V_F	$T_J = 25\text{ }^{\circ}\text{C}$, $I_F = 10\text{ A}$	—	—	1.7	V
		$T_J = 100\text{ }^{\circ}\text{C}$, $I_F = 10\text{ A}$	—	1.1	—	V
Reverse Leakage Current ⁽¹⁾	I_R	$V_R = V_{RM}$	—	—	100	μA
Reverse Leakage Current under High Temperature ⁽¹⁾	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^{\circ}\text{C}$	—	—	300	μA
Reverse Recovery Time ⁽¹⁾	t_{rr1}	$I_F = I_{RP} = 500\text{ mA}$, 90% recovery point, $T_J = 25\text{ }^{\circ}\text{C}$	—	—	50	ns
	t_{rr2}	$I_F = 500\text{ mA}$, $I_{RP} = 1\text{ A}$, 75% recovery point, $T_J = 25\text{ }^{\circ}\text{C}$	—	—	30	ns
Thermal Resistance ⁽²⁾	$R_{th(J-C)}$		—	—	2.0	$^{\circ}\text{C/W}$

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Heatsink Mounting Screw Torque		0.686	—	0.882	$\text{N}\cdot\text{m}$

⁽¹⁾ Specifies a value per chip; the FMD-4206S consists of two chips.

⁽²⁾ Refers to thermal resistance between junction and the case. The case temperature is measured at the backside near the screw hole.

Rating and Characteristic Curves

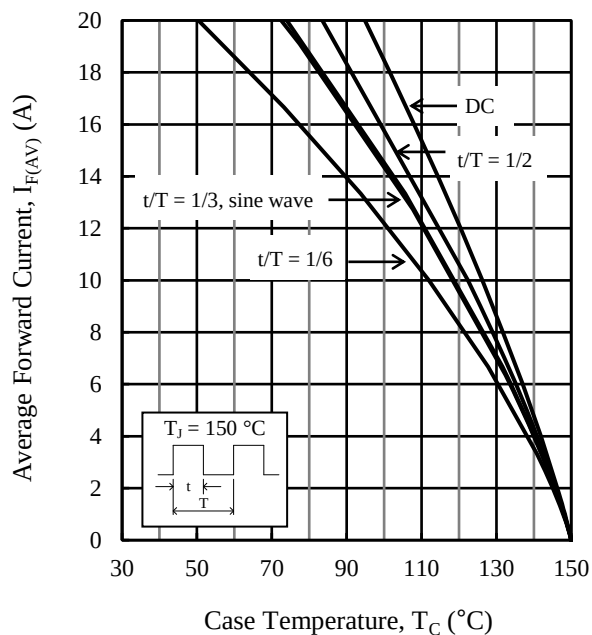


Figure 1. Typical Characteristics: $I_{F(AV)}$ vs. T_C
($V_R = 0$ V)

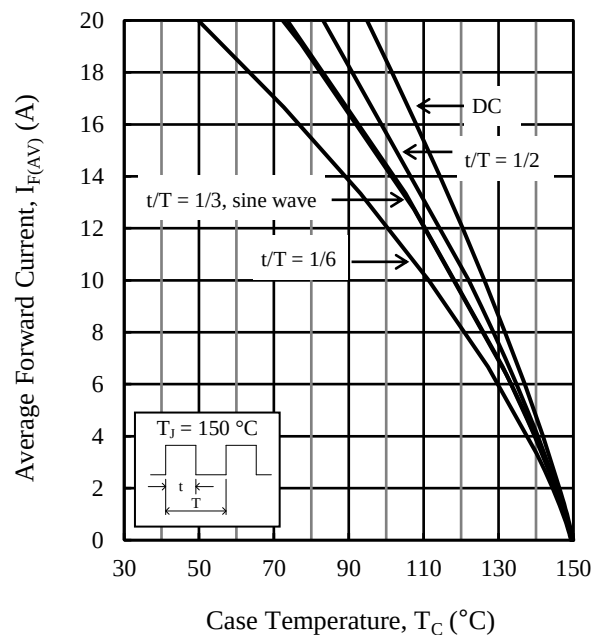


Figure 2. Typical Characteristics: $I_{F(AV)}$ vs. T_C
($V_R = 600$ V)

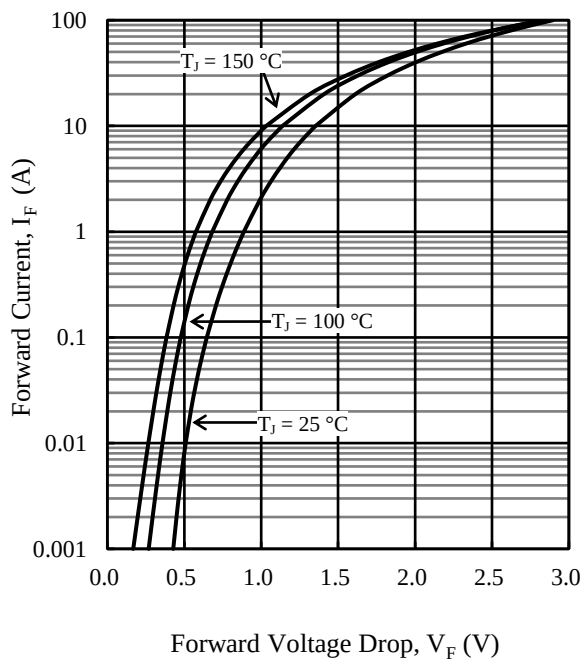


Figure 3. Typical Characteristics: I_F vs. V_F

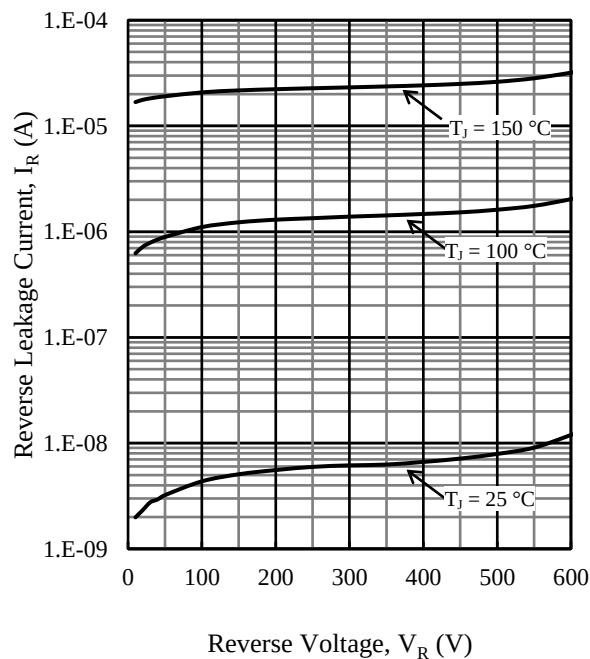
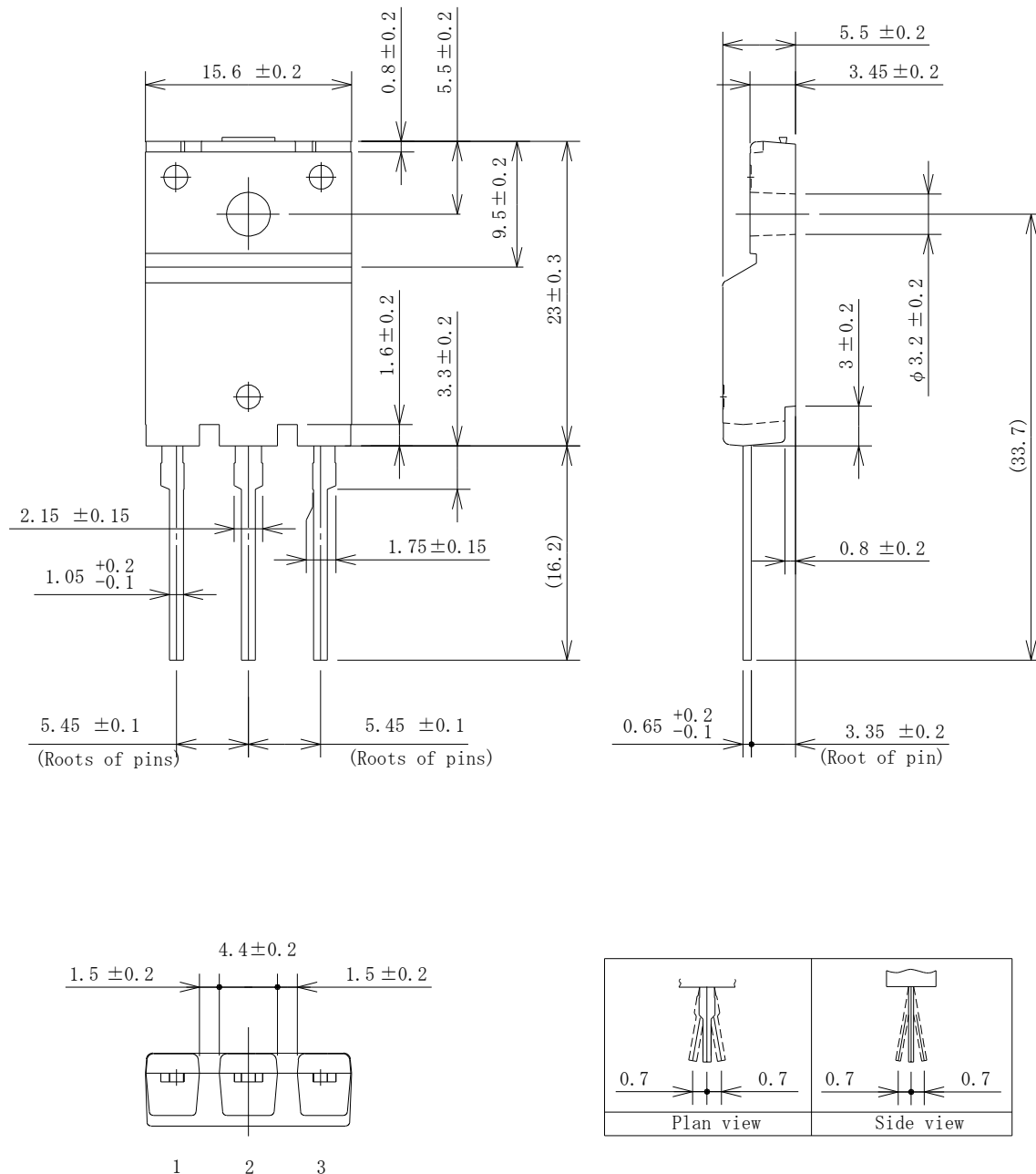


Figure 4. Typical Characteristics: I_R vs. V_R

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: $260 \pm 5 \text{ }^{\circ}\text{C} / 10 \pm 1 \text{ s}$, 2 times
 Soldering Iron: $380 \pm 10 \text{ }^{\circ}\text{C} / 3.5 \pm 0.5 \text{ s}$, 1 time
 Soldering should be at a distance of at least 1.5 mm from the body of the product.

Marking Diagram

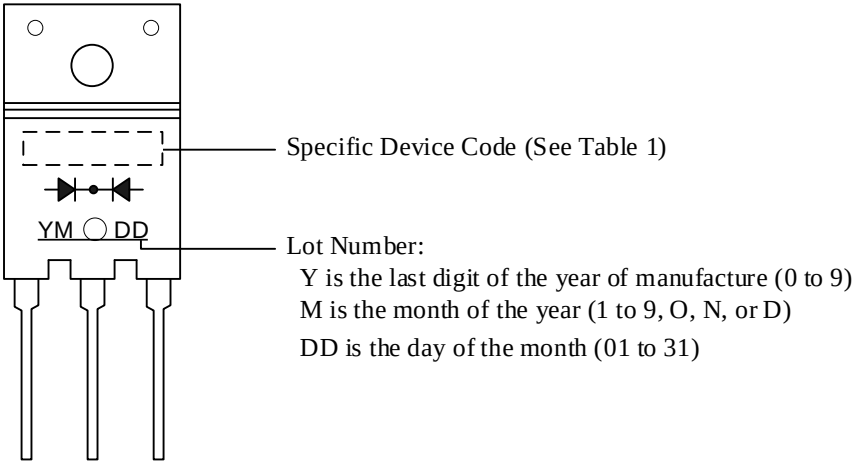


Table 1. Specific Device Code

Specific Device Code	Part Number
D4206S	FMD-4206S

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