

$V_{RM} = 200\text{ V}$, $I_{F(AV)} = 5\text{ A}$, $t_{rr} = 30\text{ ns}$
Fast Recovery Diode
FMX-12S

Description

The FMX-12S is a fast recovery diode of 200 V / 5 A. The maximum t_{rr} of 30 ns is realized by optimizing a life-time control.

Features

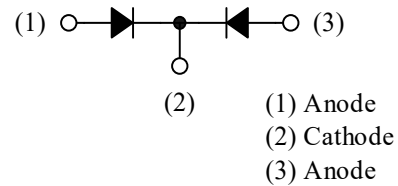
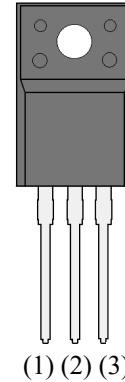
- V_{RM} ----- 200 V
- $I_{F(AV)}$ ----- 5 A
- V_F ----- 0.98 V
- t_{rr1} ----- 30 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

Applications

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

Package

TO220F-3L



Not to scale

FMX-12S

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}		200	V
Repetitive Peak Reverse Voltage ⁽¹⁾	V_{RM}		200	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 2	5	A
Surge Forward Current ⁽¹⁾	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	35	A
I^2t Limiting Value ⁽¹⁾	I^2t	$1\text{ ms} \leq t \leq 10\text{ ms}$	6.1	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	$T_J = 25\text{ }^\circ\text{C}$, $I_F = 2.5\text{ A}$	—	—	0.98	V
		$T_J = 100\text{ }^\circ\text{C}$, $I_F = 2.5\text{ A}$	—	0.74	—	V
Reverse Leakage Current ⁽¹⁾	I_R	$V_R = V_{RM}$	—	—	50	μA
Reverse Leakage Current under High Temperature ⁽¹⁾	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	—	10	mA
Reverse Recovery Time ⁽¹⁾	t_{rr1}	$I_F = I_{RP} = 100\text{ mA}$, 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	30	ns
	t_{rr2}	$I_F = 100\text{ mA}$, $I_{RP} = 200\text{ mA}$, 75% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	25	ns
Thermal Resistance ⁽²⁾	$R_{th(J-C)}$		—	—	4.0	$^\circ\text{C/W}$

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Heatsink Mounting Screw Torque		0.490	—	0.686	N·m
Package Weight		—	1.8	—	g

⁽¹⁾ Specifies a value per chip; the FMX-12S consists of two chips.

⁽²⁾ $R_{th(J-C)}$ is thermal resistance between junction and the case. The case temperature is measured at the back side near the screw hole.

Derating Curves

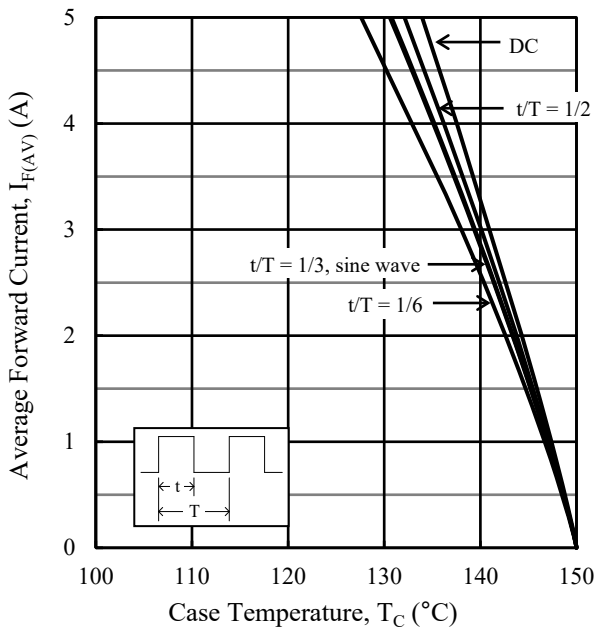


Figure 1. $I_{F(AV)}$ vs. T_C ($T_J = 150\text{ }^\circ\text{C}$, $V_R = 0\text{ V}$)

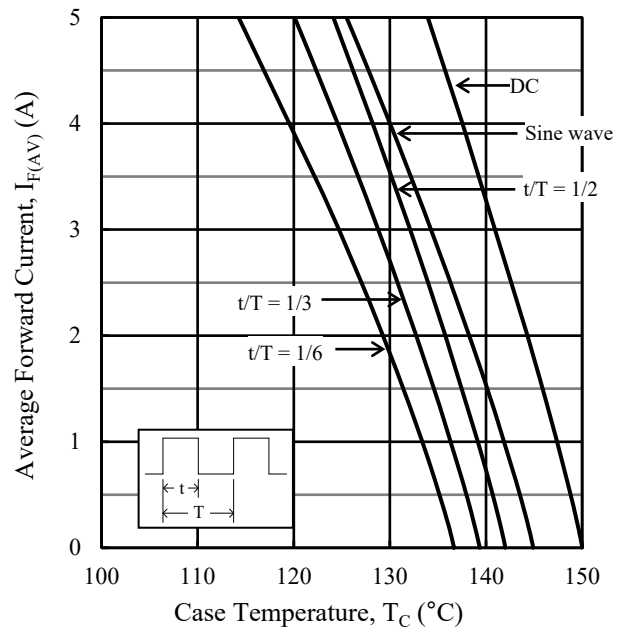


Figure 2. $I_{F(AV)}$ vs. T_C ($T_J = 150\text{ }^\circ\text{C}$, $V_R = 200\text{ V}$)

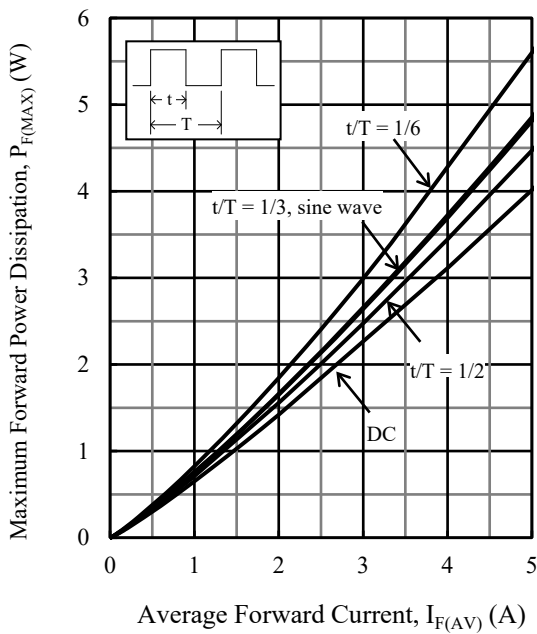


Figure 3. $P_{F(MAX)}$ vs. $I_{F(AV)}$ ($T_J = 150\text{ }^\circ\text{C}$)

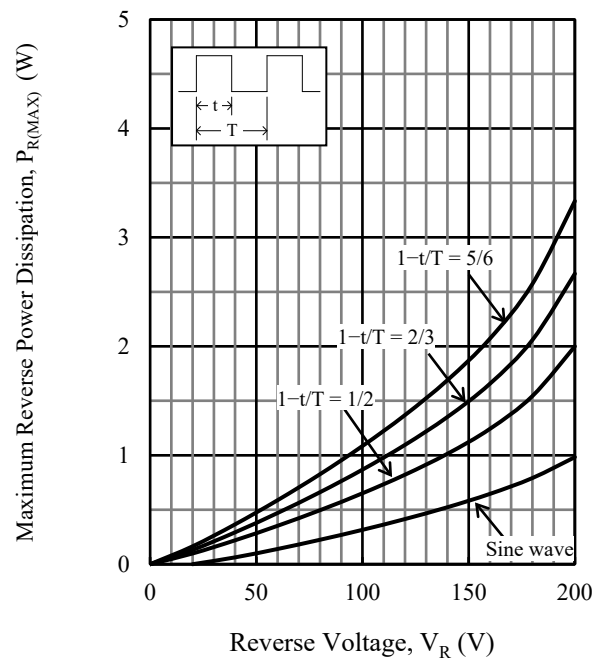


Figure 4. $P_{R(MAX)}$ vs. V_R ($T_J = 150\text{ }^\circ\text{C}$)

Characteristic Curves

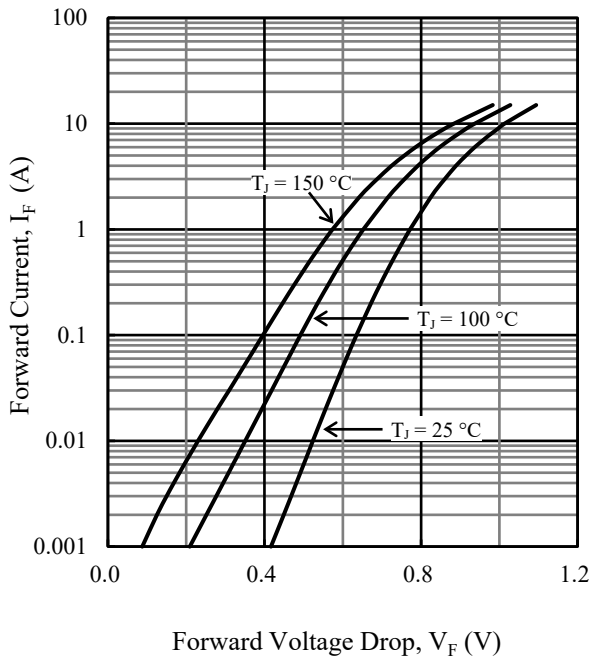


Figure 5. Typical Characteristics: I_F vs. V_F

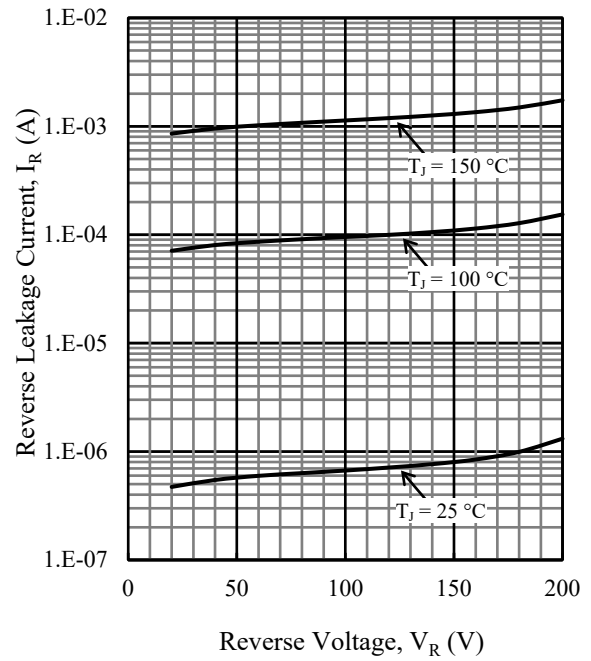


Figure 6. Typical Characteristics: I_R vs. V_R

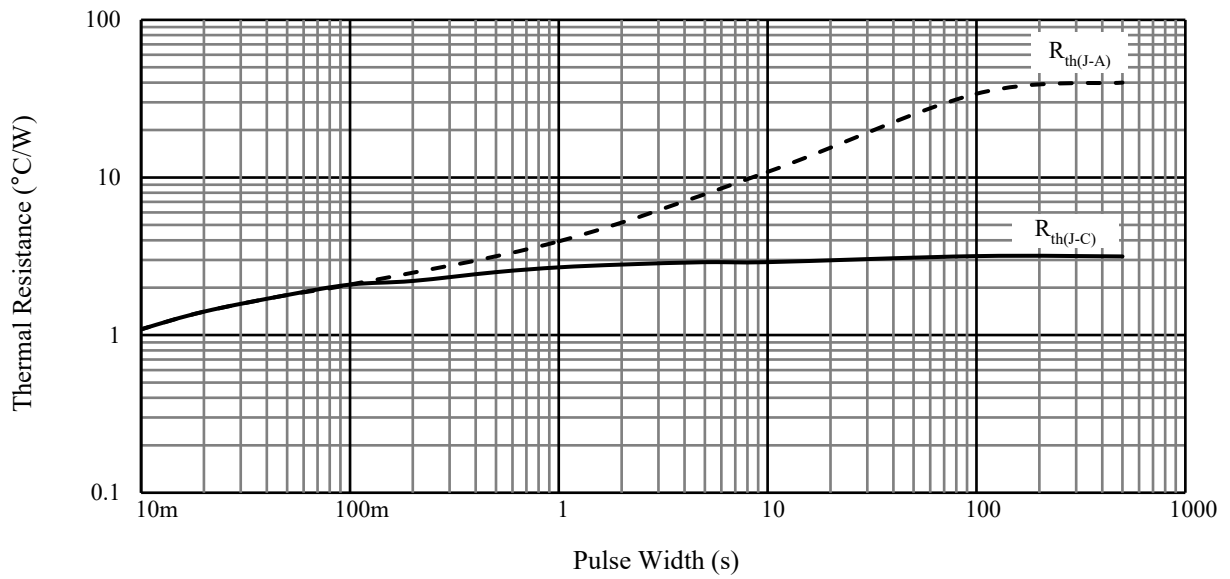
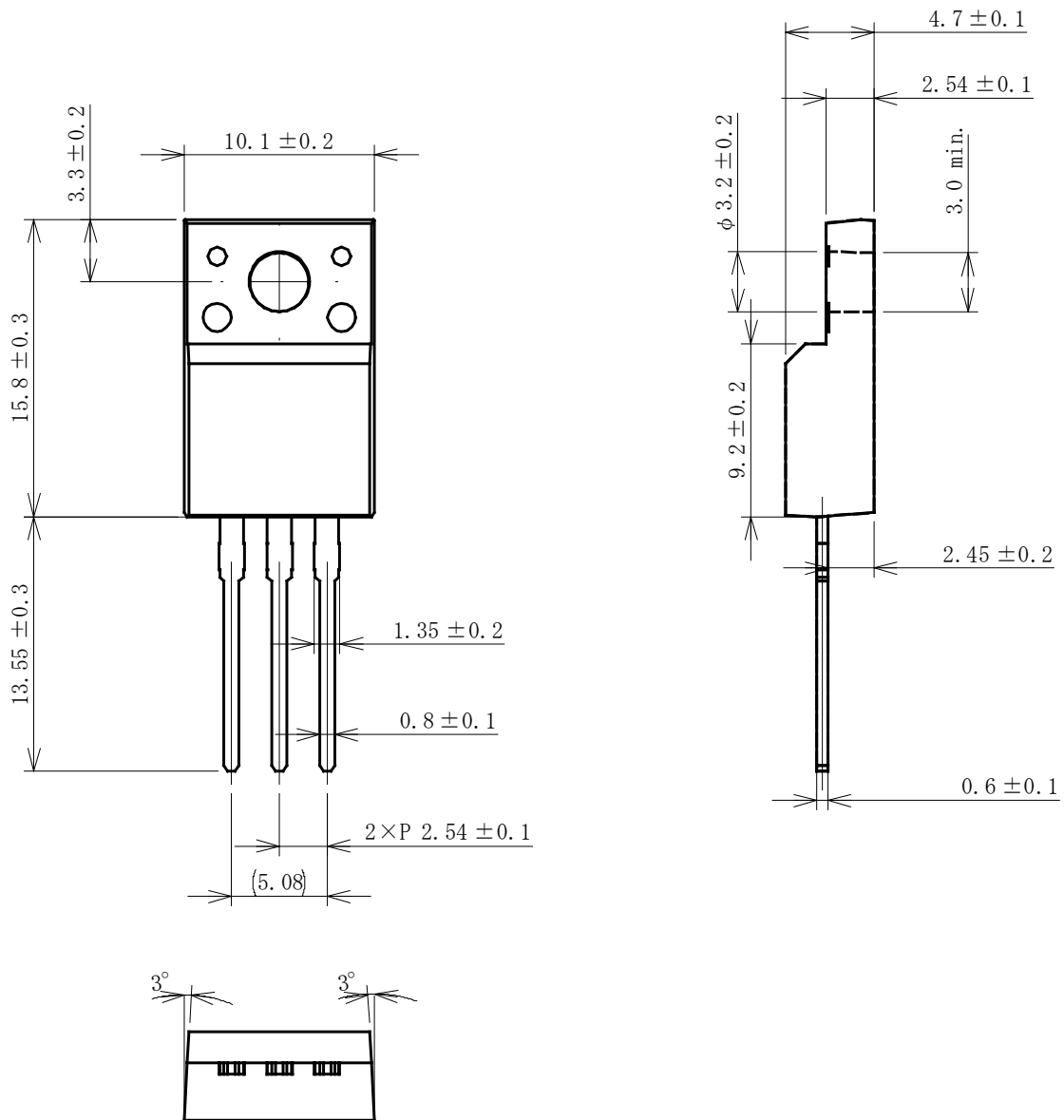


Figure 7. Typical Transient Thermal Resistance Characteristics

FMX-12S

Physical Dimensions

• TO220F-3L



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: $270^\circ\text{C} / 7$ s, 1 time
 - Soldering Iron: $350^\circ\text{C} / 3.5$ s, 1 time
 - Soldering should be at a distance of at least 1.5 mm from the body of the product.

FMX-12S

Marking Diagram

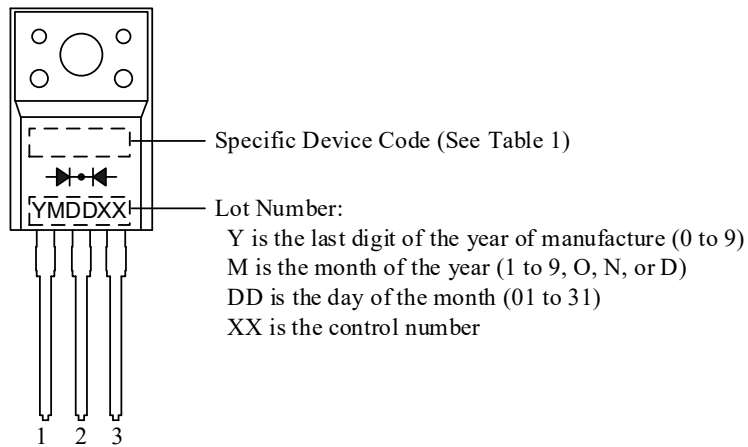


Table 1. Specific Device Code

Specific Device Code	Part Number
FMX12S	FMX-12S

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