V_{RM} = 600 V, $I_{F(AV)}$ = 20 A, t_{rr} = 60 ns
Fast Recovery Diode

FMXR-1206S

Data Sheet

Description

The FMXR-1206S is a fast recovery diode of 600 V / 20 A. The low Q_{rr} characteristic allows the product to have almost no ringing at turn-off, leading to the realization of low-noise systems. The maximum t_{rr} of 60 ns is realized by optimizing a life-time control.

Features

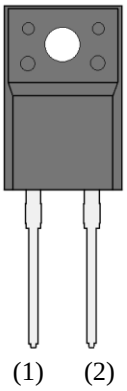
- V_{RM} ---------- 600 V
- $I_{F(AV)}$ ---------- 20 A
- V_F ---------- 2.5 V
- t_{rr} ---------- 60 ns
- Q_{rr} ---------- 145 nC
- Bare lead frame: Pb-free (RoHS compliant)
- Flammability: Equivalent to UL94V-0

Applications

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

Package

TO220F-2L



(1) Cathode
(2) 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 3 and Figure 4	20	A
Surge Forward Current	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	100	A
I^2t Limiting Value	I^2t	1 ms ≤ t ≤ 10 ms	50	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	V_F	T_J = 25 °C, I_F = 20 A	—	—	2.5	V
		T_J = 100 °C, I_F = 20 A	—	2.2	—	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	10	µA
Reverse Leakage Current Under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$, T_J = 150 °C	—	—	1	mA
Reverse Recovery Time	t_{rr}	I_F = 20 A, V_R = 400 V, di/dt = −200 A/µs, 100% recovery point	—	—	60	ns
Reverse Recovery Charge	Q_{rr}	I_F = 20 A, V_R = 400 V, di/dt = −200 A/µs, 100% recovery point	—	—	145	nC
Thermal Resistance	$R_{th(J-F)}$	(1)	—	—	2.8	°C/W
	$R_{th(J-L)}$	(2)	—	—	3.2	°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

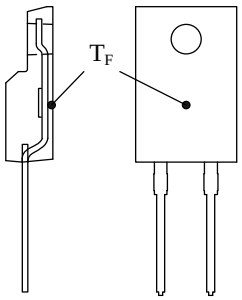


Figure 1. T_F Measurement Point

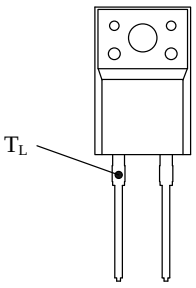


Figure 2. T_L Measurement Point

(1) $R_{th\ (J-F)}$ is thermal resistance between junction and the flame. T_F is the flame temperature (°C), measured at the point defined in Figure 1.

(2) $R_{th\ (J-L)}$ is thermal resistance between junction and the lead. T_L is the cathode lead temperature (°C), measured at the point defined in Figure 2.

Derating Curves

The measurement points of T_F and T_C are defined in Figure 1 and Figure 2.

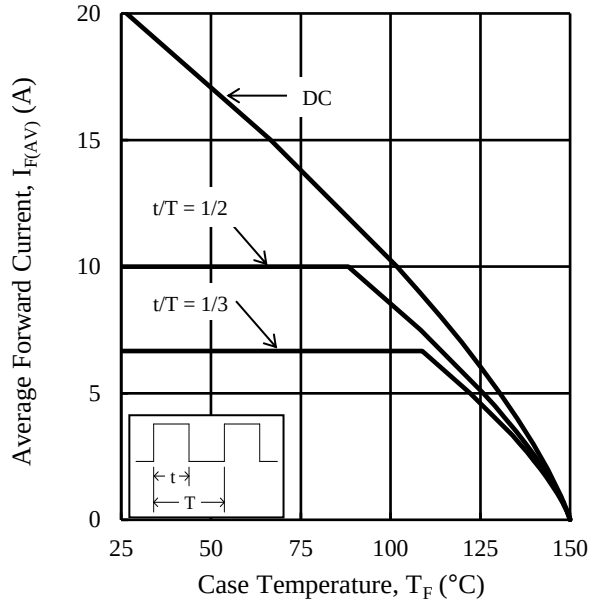


Figure 3. $I_{F(AV)}$ vs. T_F (T_J = 150 °C, V_R = 0 V)

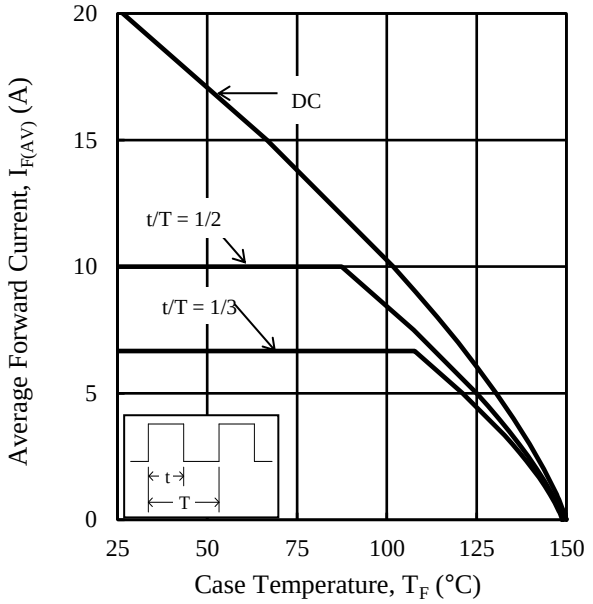


Figure 4. $I_{F(AV)}$ vs. T_F (T_J = 150 °C, V_R = 600 V)

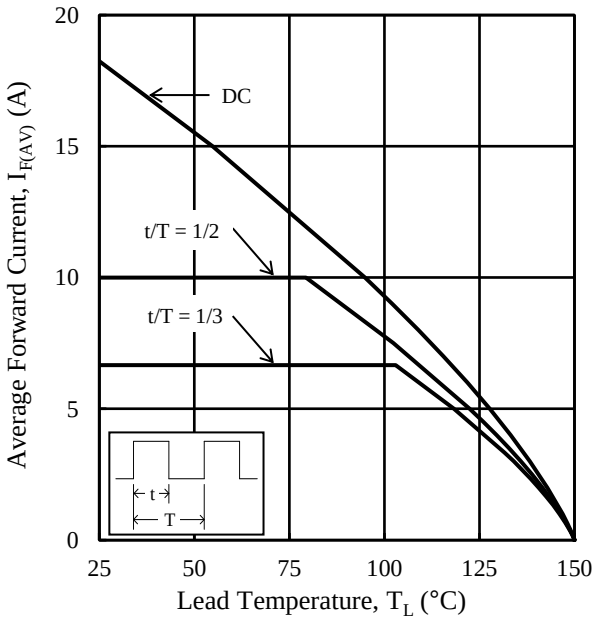


Figure 5. $I_{F(AV)}$ vs. T_L (T_J = 150 °C, V_R = 0 V)

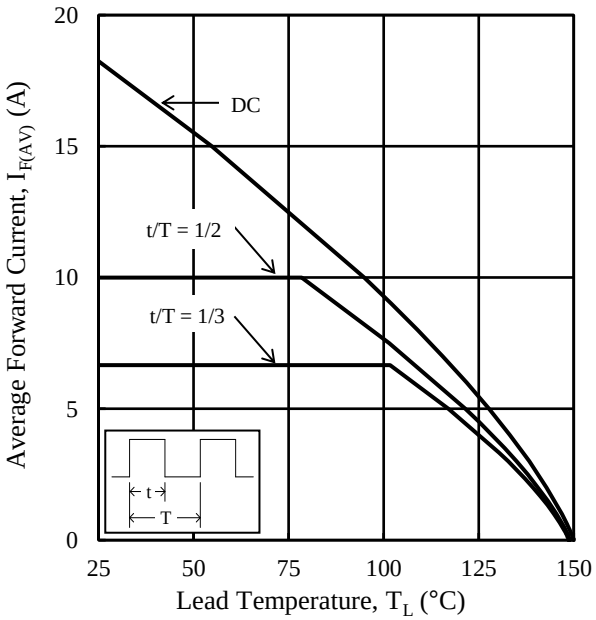


Figure 6. $I_{F(AV)}$ vs. T_L (T_J = 150 °C, V_R = 600 V)

Characteristic Curves

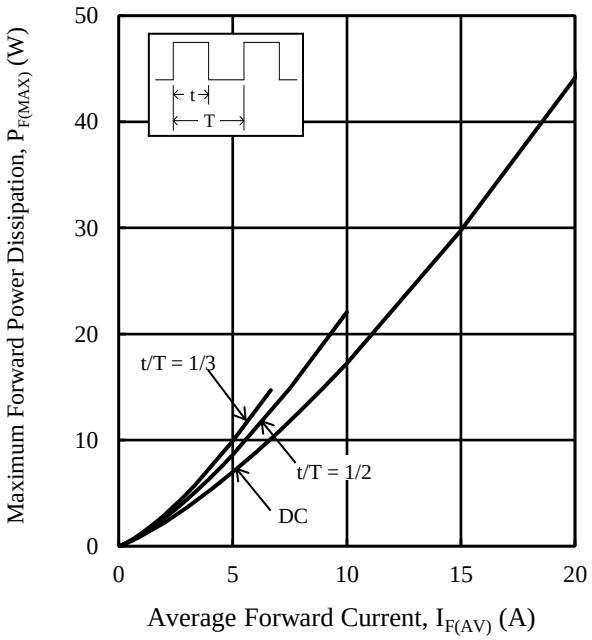


Figure 7. $P_{F(MAX)}$ vs. $I_{F(AV)}$ (T_J = 150 °C)

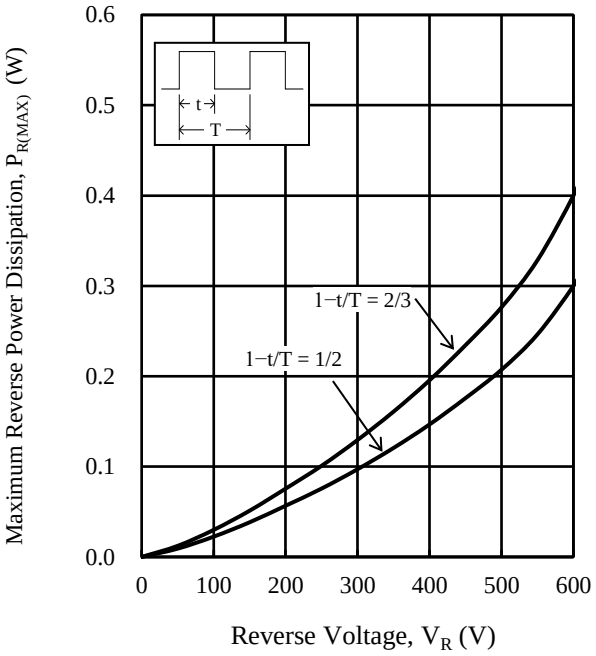


Figure 8. $P_{R(MAX)}$ vs. V_R (T_J = 150 °C)

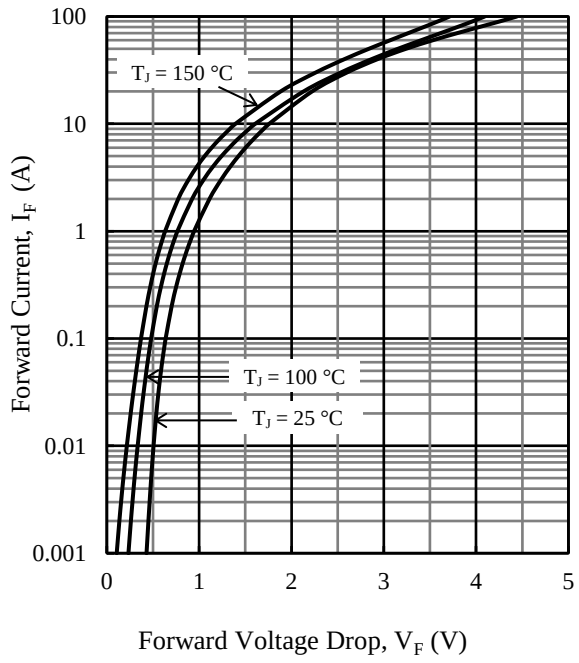


Figure 9. Typical Characteristics: I_F vs. V_F

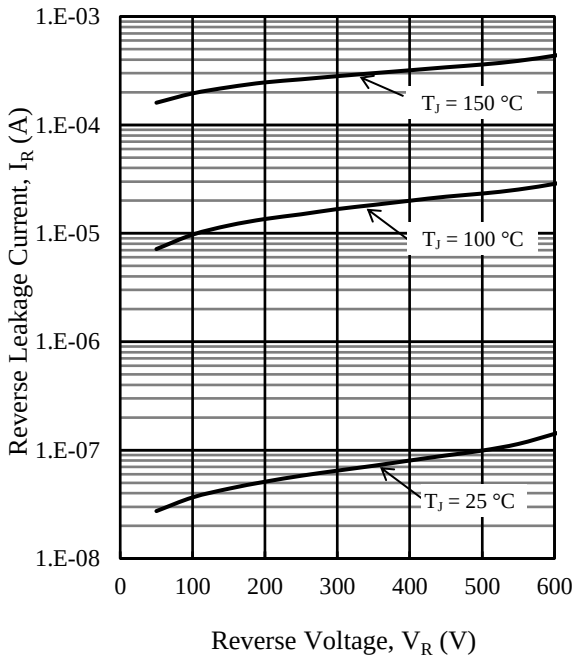


Figure 10. Typical Characteristics: I_R vs. V_R

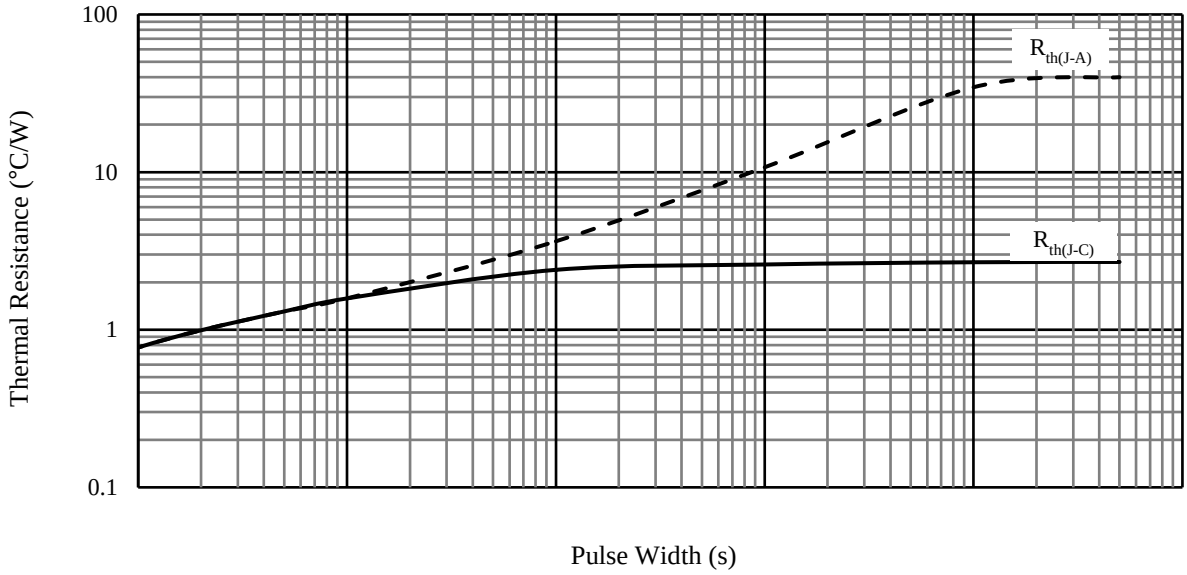
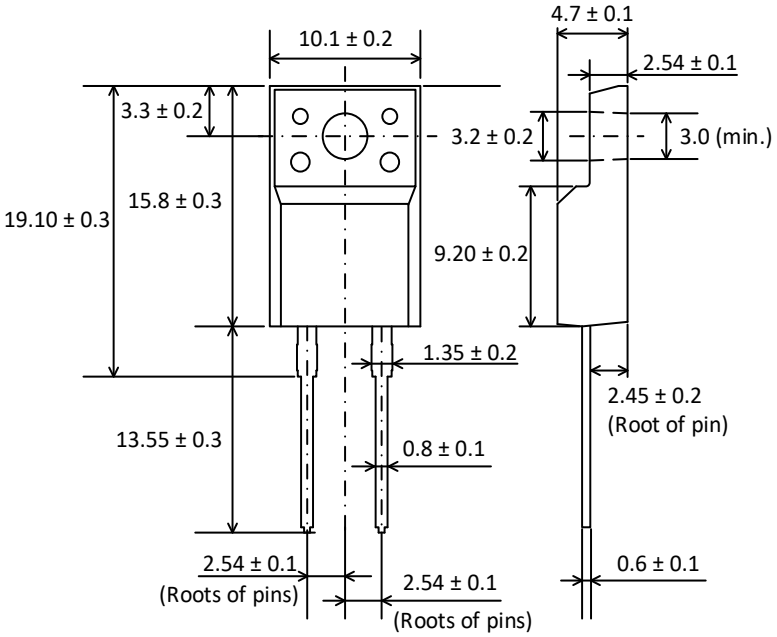


Figure 11. Typical Transient Thermal Resistance

Physical Dimensions

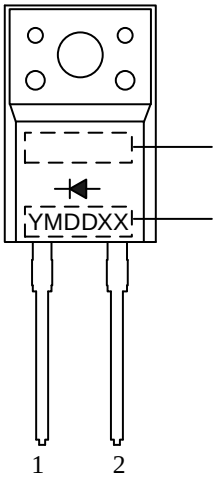
● **TO220F-2L**



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 °C / 10 s, 1 time
  Soldering Iron: 350 °C / 3.5 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 of manufacture (0 to 9)
M is the month of the year (1 to 9, O, N, or D)
DD is the day of the month (01 to 31)
XX is the control number

Table 1. Specific Device Code

Specific Device Code	Part Number
XR1206	FMXR-1206S

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