

$V_{RM} = 300\text{ V}$, $I_{F(AV)} = 5.0\text{ A}$, $t_{rr} = 50\text{ ns}$
Fast Recovery Diode
FML-G13S

Description

The FML-G13S is a fast recovery diode of 300 V / 5.0 A. The maximum t_{rr} of 50 ns is realized by optimizing a life-time control.

Features

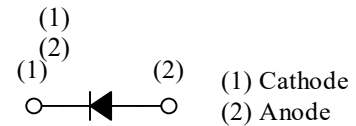
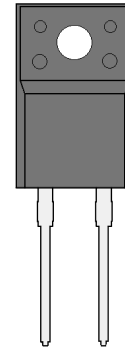
- V_{RM} ----- 300 V
- $I_{F(AV)}$ ----- 5.0 A
- V_F ----- 1.3 V
- t_{rr1} ----- 50 ns
- Bare Leads: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

Applications

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

Package

TO220F-2L



Not to scale

FML-G13S

Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Nonrepetitive Peak Reverse Voltage	V_{RSM}		300	V
Repetitive Peak Reverse Voltage	V_{RM}		300	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 2	5.0	A
Surge Forward Current	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	70	A
I^2t Limiting Value	I^2t	$1\text{ ms} \leq t \leq 10\text{ ms}$	24.5	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	V_F	$T_J = 25\text{ }^\circ\text{C}$, $I_F = 5\text{ A}$	—	—	1.3	V
		$T_J = 100\text{ }^\circ\text{C}$, $I_F = 5\text{ A}$	—	0.95	—	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	100	μA
Reverse Leakage Current under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	—	200	μA
Reverse Recovery Time	t_{rr1}	$I_F = I_{RP} = 100\text{ mA}$, 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	50	ns
	t_{rr2}	$I_F = 100\text{ mA}$, $I_{RP} = 200\text{ mA}$, 75% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	35	ns
Thermal Resistance ⁽¹⁾	$R_{th(J-C)}$		—	—	4.0	$^\circ\text{C/W}$

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Heatsink Mounting Screw Torque		0.490	—	0.686	$\text{N}\cdot\text{m}$
Package Weight		—	1.8	—	g

⁽¹⁾ Refers to thermal resistance between junction and the case. The case temperature is measured at the backside near the screw hole.

Derating Curves

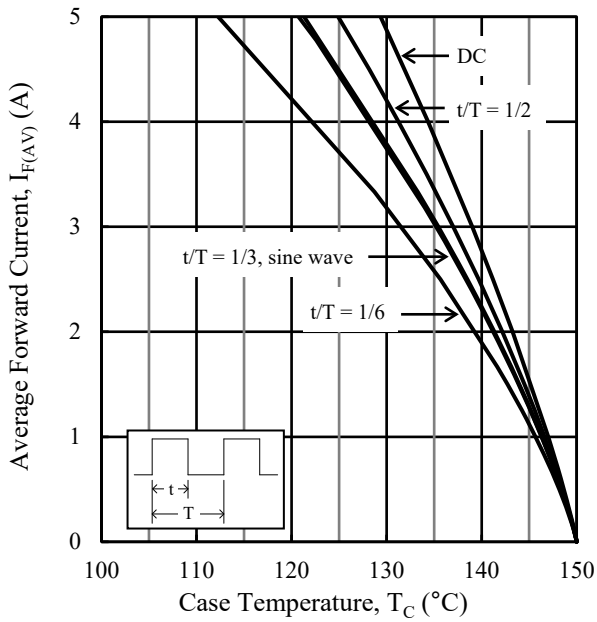


Figure 1. $I_{F(AV)}$ vs. T_C ($T_J = 150\text{ }^\circ\text{C}$, $V_R = 0\text{ V}$)

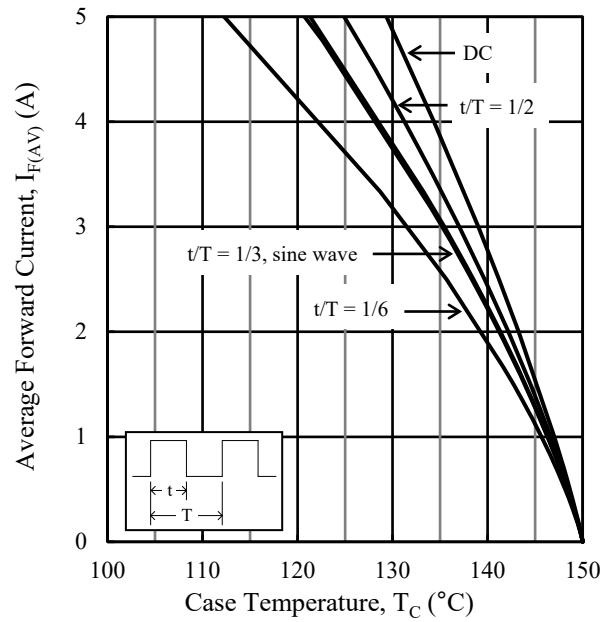


Figure 2. $I_{F(AV)}$ vs. T_C ($T_J = 150\text{ }^\circ\text{C}$, $V_R = 300\text{ V}$)

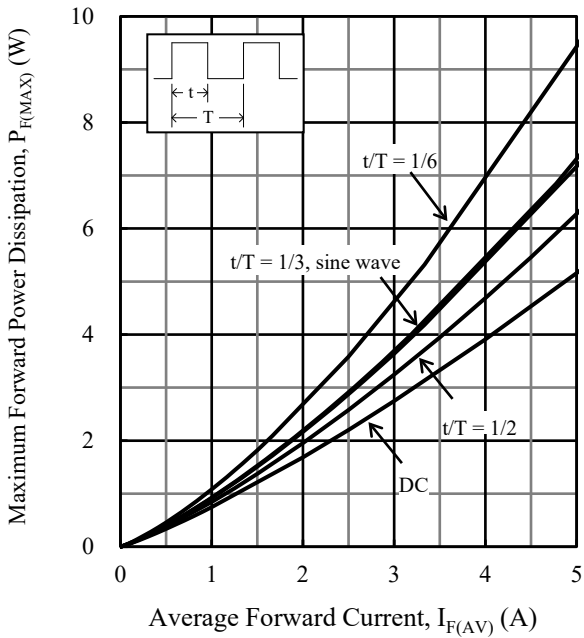


Figure 3. $P_{F(MAX)}$ vs. $I_{F(AV)}$ ($T_J = 150\text{ }^\circ\text{C}$)

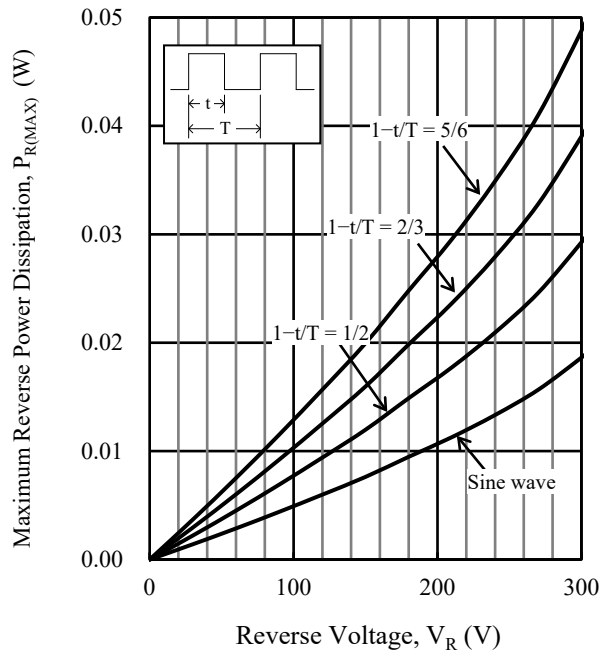


Figure 4. $P_{R(MAX)}$ vs. V_R ($T_J = 150\text{ }^\circ\text{C}$)

Characteristic Curves

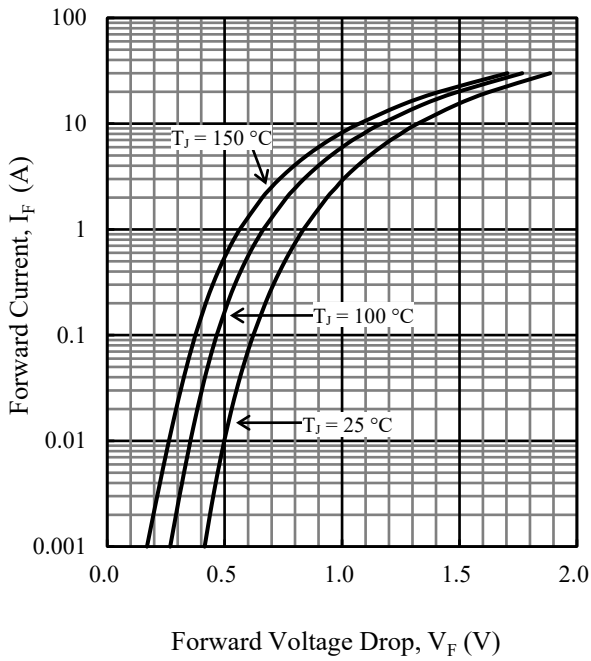


Figure 5. Typical Characteristics: I_F vs. V_F

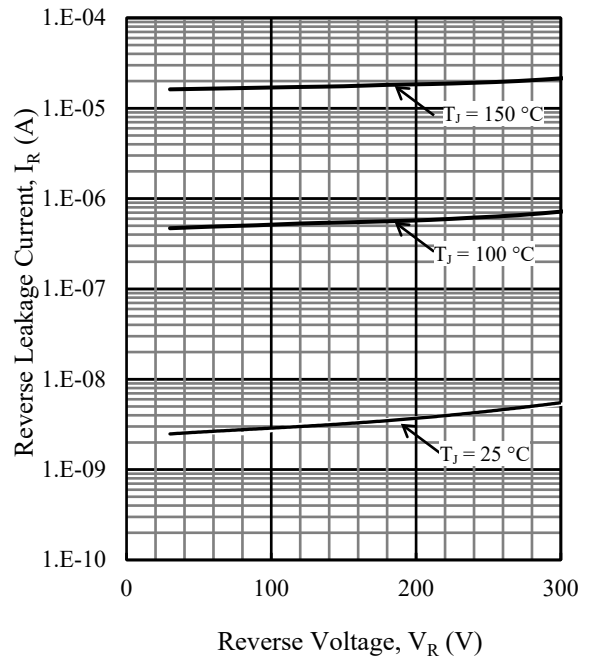


Figure 6. Typical Characteristics: I_R vs. V_R

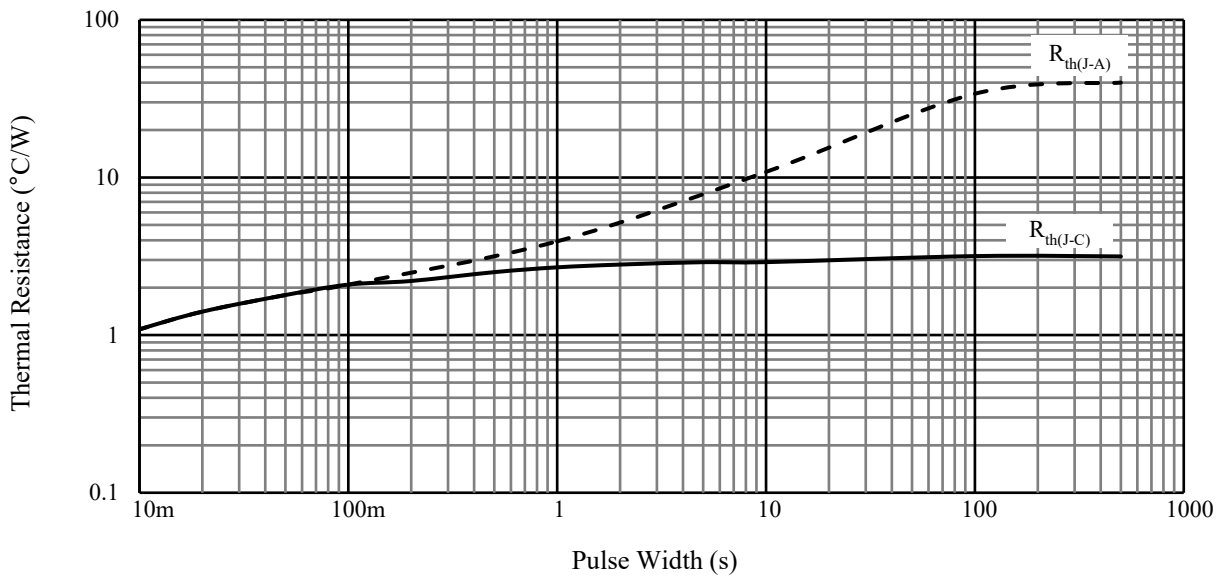
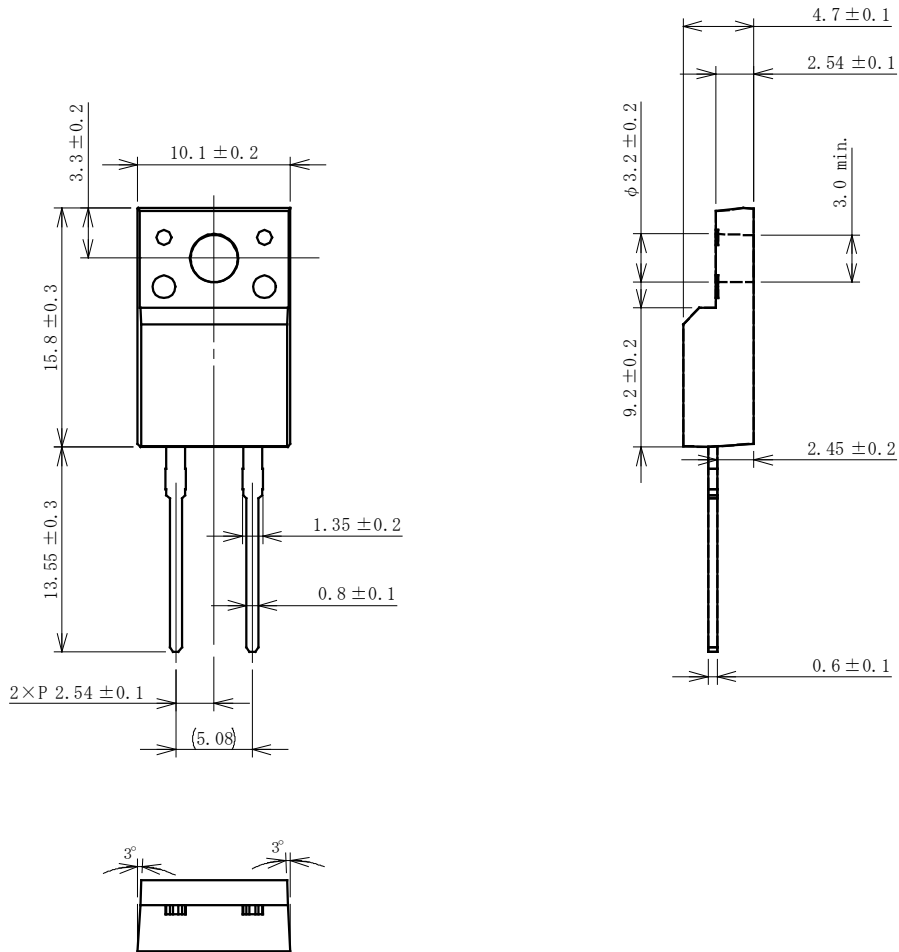


Figure 7. Typical Transient Thermal Resistance Characteristics

FML-G13S

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: $270^\circ\text{C} / 7$ 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.

FML-G13S

Marking Diagram

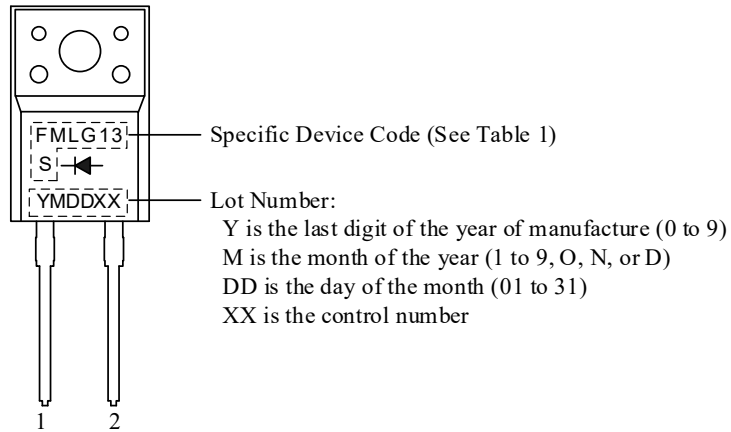


Table 1. Specific Device Code

Specific Device Code	Part Number
FMLG13S	FML-G13S

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