

$V_{RM} = 400\text{ V}$, $I_{F(AV)} = 20\text{ A}$, $t_{rr} = 50\text{ ns}$
Fast Recovery Diode
FMLB-4204S

Description

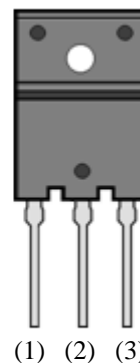
The FMLB-4204S is a fast recovery diode of 400 V / 20 A. The maximum t_{rr} of 50 ns is realized by optimizing a life-time control.

Package

TO3PF-3L

Features

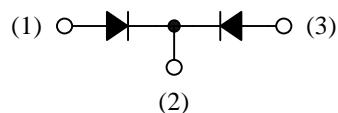
- V_{RM} ----- 400 V
- $I_{F(AV)}$ ----- 20 A
- V_F ----- 1.3 V
- t_{rr1} ----- 50 ns
- Bare lead frame: Pb-free (RoHS compliant)
- Suitable for High Reliability and Automotive Requirement



Applications

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

Not to scale



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

FMLB-4204S

Absolute Maximum Ratings

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

Parameter	Symbol	Rating	Unit	Conditions
Peak Repetitive Reverse Voltage ⁽¹⁾	V_{RSM}	400	V	
Repetitive Reverse Voltage ⁽¹⁾	V_{RM}	400	V	
Average Forward Current	$I_{F(AV)}$	20	A	See Figure 1 and Figure 2
Surge Forward Current ⁽¹⁾	I_{FSM}	100	A	Half cycle sine wave, positive side, 10 ms, 1 shot
I^2t Limiting Value ⁽¹⁾	I^2t	50	A^2s	$1\text{ ms} \leq t \leq 10\text{ ms}$
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	$T_J = 25\text{ }^\circ\text{C}$, $I_F = 10\text{ A}$	—	—	1.3	V
		$T_J = 100\text{ }^\circ\text{C}$, $I_F = 10\text{ A}$	—	0.94	—	V
Reverse Leakage Current ⁽¹⁾	I_R	$V_R = V_{RM}$	—	—	200	μA
Reverse Leakage Current Under High Temperature ⁽¹⁾	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	—	400	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, $T_J = 25\text{ }^\circ\text{C}$	—	—	35	ns
Thermal Resistance ⁽²⁾	$R_{th(J-C)}$		—	—	2.0	$^\circ\text{C/W}$

⁽¹⁾ Specifies a value per chip; the FMLB-4204S 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.

Rating and Characteristic Curves

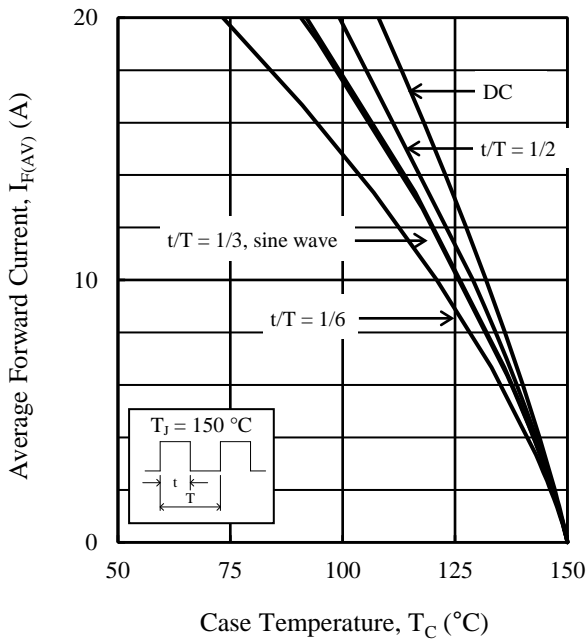


Figure 1. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 0$ V)

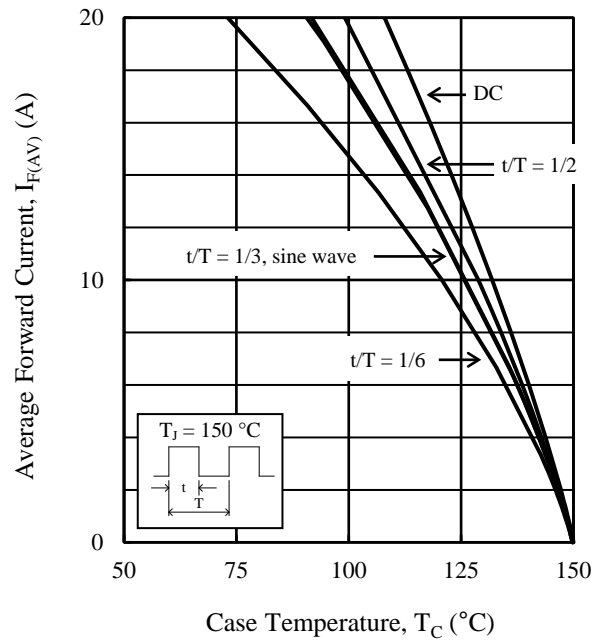


Figure 2. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 400$ V)

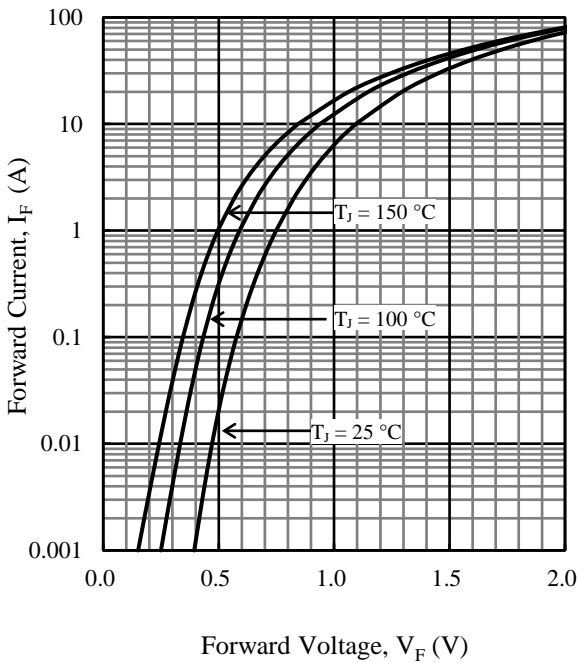


Figure 3. V_F vs. I_F Typical Characteristics

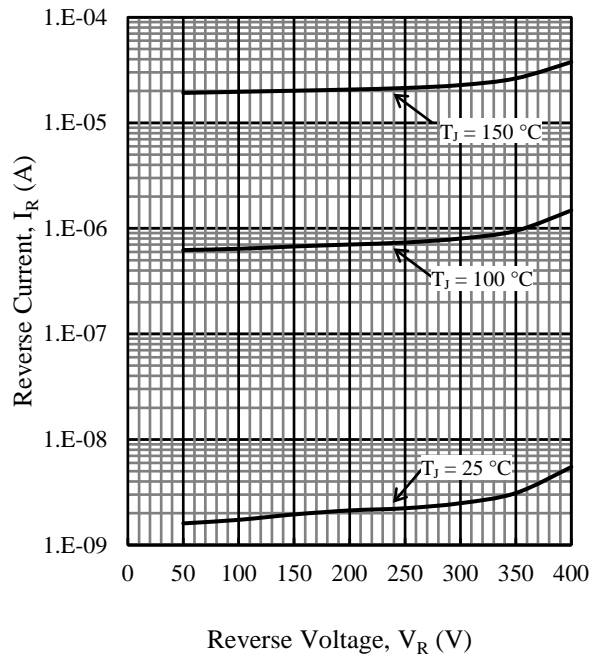
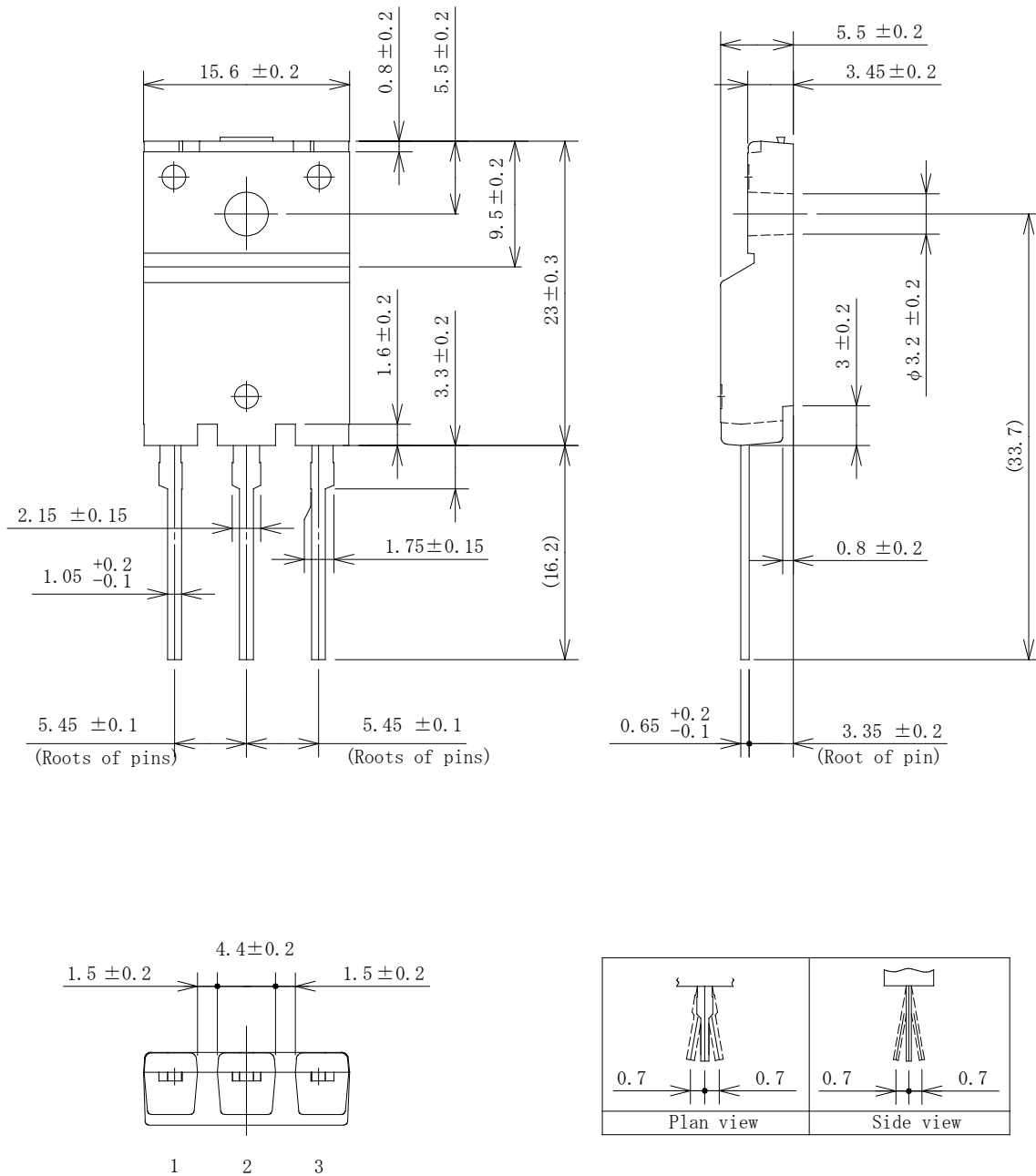


Figure 4. V_R vs. I_R Typical Characteristics

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.
- Recommended screw torque for TO3PF: 0.686 N·m to 0.882 N·m (7 kgf·cm to 9 kgf·cm)

Marking Diagram

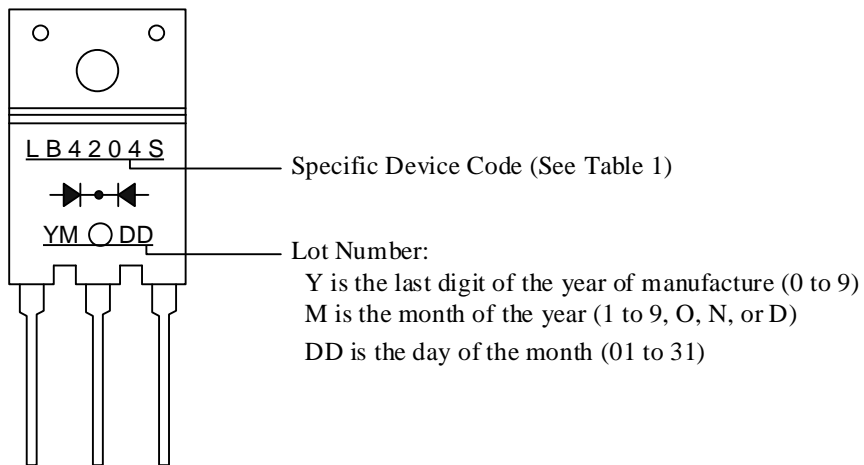


Table 1. Specific Device Code

Specific Device Code	Part Number
LB4204S	FMLB-4204S

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