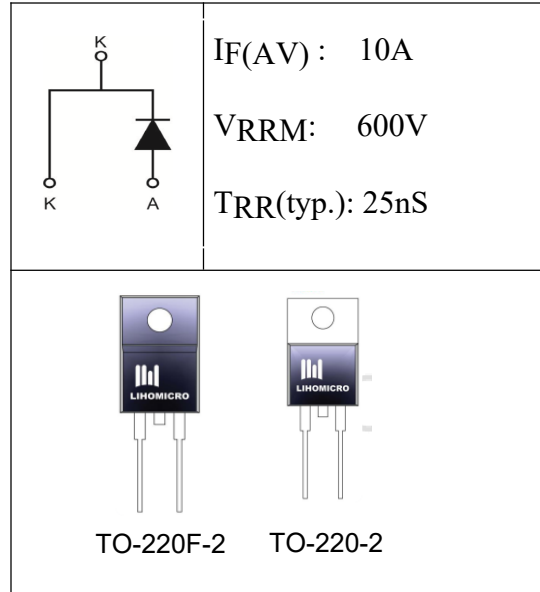


**Fast Recovery Epitaxial Diode**
**●Features**

- Planar Structure With EPI Wafer
- High Current Capability & Low Forward Voltage
- Low Switch Noise & High Sur Capability
- Low Power Loss & High Efficiency
- Guard Ring & Environmental Protection
- High Temperature Application
- Green Molding Compound(No Br,Sb)

**●Application**

- Half-Bridge/Full-Bridge Switched-Mode Power
- PC Power


**●Ordering Information:**

Part Number	LHF10T60	LHF10T60
Package	TO-220F-2	TO-220-2
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LHF10T60F2-TO220F-2-TU	LHF10T60T6-TO220-2-TU
Halogen Free Ordering Code	LHF10T60F2-TO220F-2-TU-HF	LHF10T60T6-TO220-2-TU-HF

**●Maximum Ratings Characteristics** ( $T_A = 25^\circ\text{C}$  Unless otherwise Noted)

PARAMETER	SYMBOL	Value	UNIT
Repetitive Peak Reverse Voltage	VRRM	600	V
Working Peak Reverse Voltage	$V_{RWM}$	600	V
DC blocking Voltage	$V_{RM}$	600	V
Average Rectified Forward Current (Rated VR-20KHz Square Wave)-50% duty cycle	$I_{F(AV)}$	10	A
Non-Repetitive Peak Forward surge current (surge applied at rated load conditions half wave, single phase, 60Hz)	$I_{FSM}$	160	A
Maximum Rate of Voltage change(at rate VR)	dV/dt	10000	V/uS
Operating Temperature	$T_J$	-55~+175	°C
Storage Temperature	$T_{STG}$	-65~+175	°C

**●Electronic Characteristics-(per leg)**

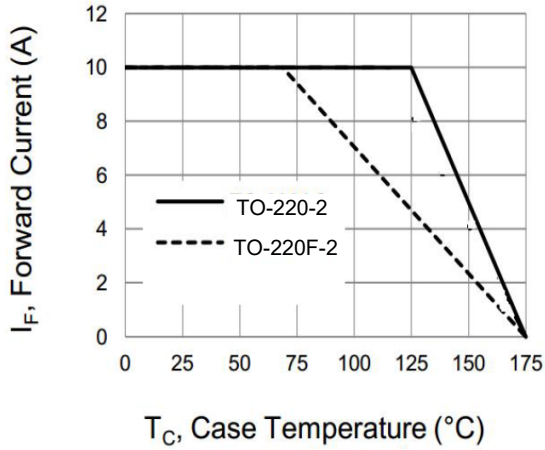
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Forward Voltage Drop	VF	$I_F=10A, T_J=25^{\circ}C$	--	--	1.6	V
		$I_F=10A, T_J=150^{\circ}C$	--	--	1.3	
Reverse Current	IR	$V_R=V_{RRM}, T_J=25^{\circ}C$	--	--	5.0	UA
		$V_R=V_{RRM}, T_J=125^{\circ}C$	--	--	150	
Reverse Recovery Time	$T_{RR}$	$I_F=0.5A, I_R=1A, T_A=25^{\circ}C$	--	25	35	nS

**●Thermal Characteristics**

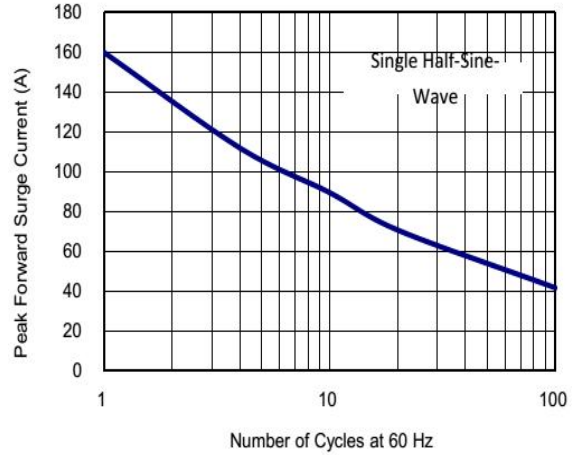
PARAMETER	SYMBOL	MAX		UNIT
		TO-220-2	TO-220F-2	
Thermal Resistance Junction-case	$R_{thJC}$	2.0	4.0	$^{\circ}C/W$

●Ratings and Characteristics Curves

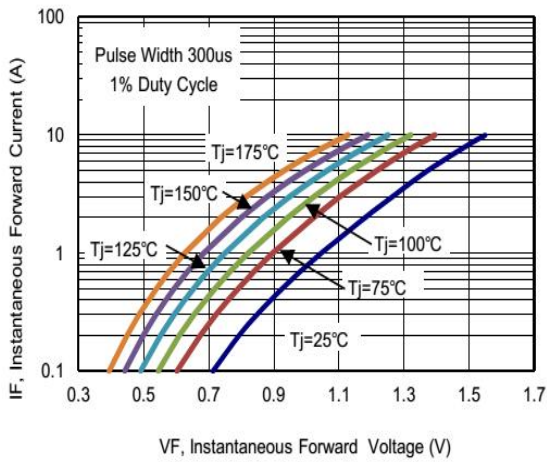
**Fig. 1 Forward Current De-Rating Curve**



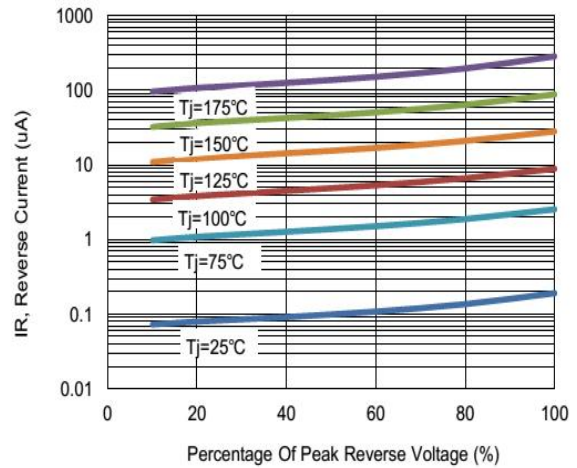
**Fig. 2 Peak Forward Surge Current**



**Fig. 3 Instantaneous Forward Characteristics**

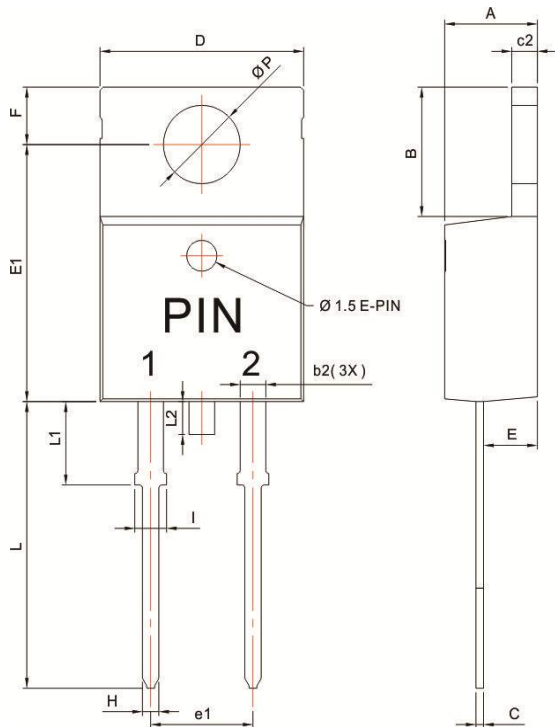


**Fig. 4 Reverse Characteristics**



**●Dimensions (TO-220-2)**

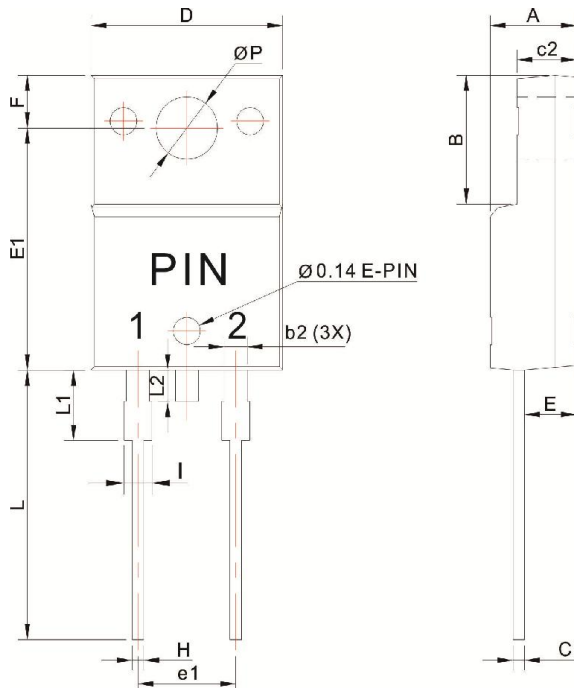
Unit:mm



Symbols	Dimensions in Millimeters	
	Min.	Max.
A	4.45	4.68
B	6.10	6.50
b2	1.17	1.37
C	0.27	0.48
c2	1.16	1.37
D	10.00	10.35
E	2.52	2.82
E1	12.29	12.58
e1	4.98	5.18
F	2.54	2.94
H	0.71	0.91
I	1.50	1.70
L	13.70	14.10
L1	3.98	4.23
L2	-----	1.60
$\varnothing P$	3.77	3.89

**●Dimensions (TO-220F-2)**

Unit:mm

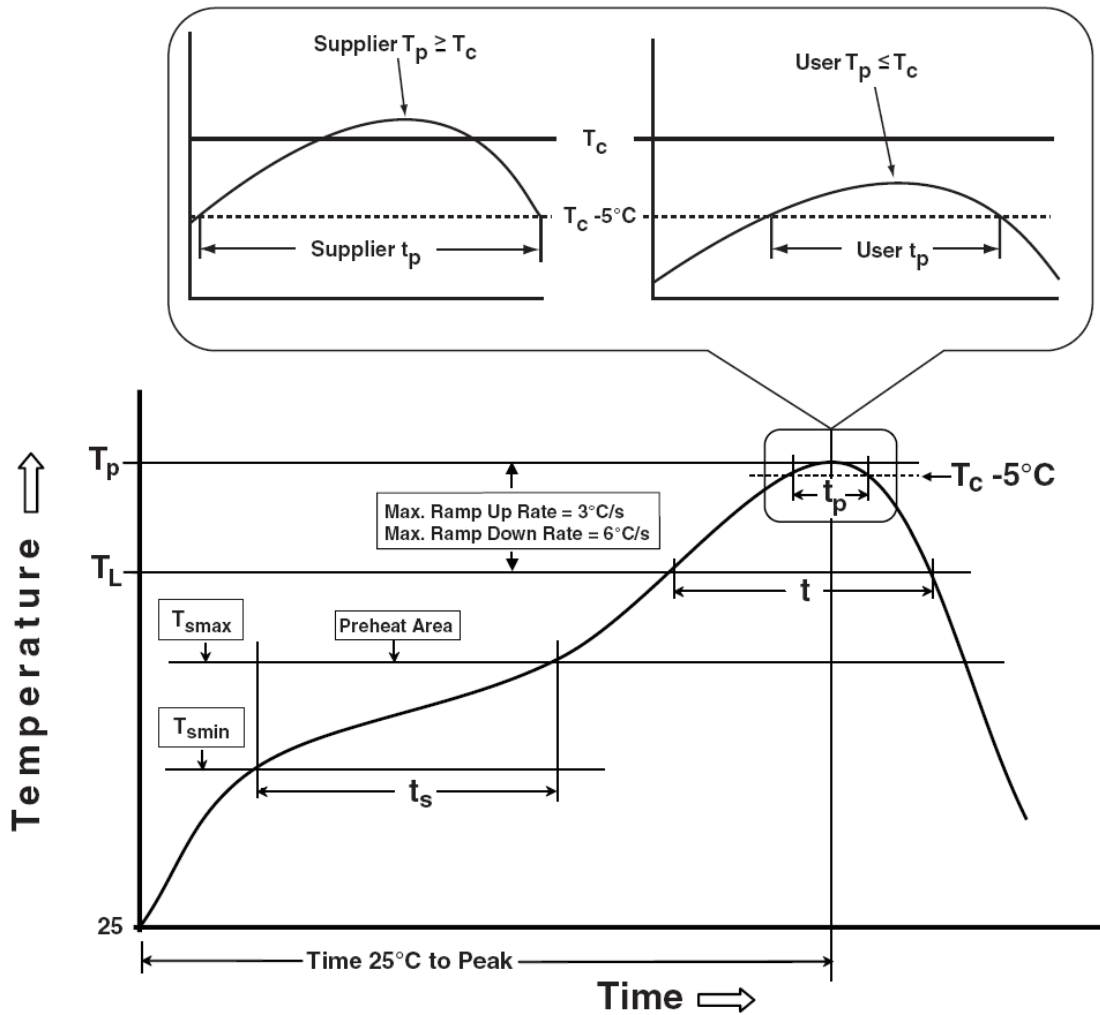


Symbols	Dimensions in Millimeters	
	Min.	Max.
A	4.20	4.80
B	6.40	6.80
b2	1.00	1.40
C	Typ. 0.60	
c2	2.90	3.30
D	9.90	10.10
E	2.50	2.90
E1	14.45	15.05
e1	Typ. 5.10	
F	2.55	2.85
H	0.30	0.90
I	1.13	1.53
L	13.00	13.80
L1	3.45	3.75
L2	-----	1.60
$\varnothing P$	2.90	3.50

● **Mechanical**

- Molder Plastic: UL Flammability Classification Rating 94V-0
- Device Weight: 0.07 ounces(1.96 grams) - TO-220-2  
0.06 ounces(1.74 grams) – TO-220F-2

● **Classification Profile**



## • Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
<b>Preheat &amp; Soak</b>		
Temperature min ( $T_{smin}$ )	100 °C	150 °C
Temperature max ( $T_{smax}$ )	150 °C	200 °C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	60-120 seconds
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3 °C/second max.	3°C/second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time at liquidous ( $t_L$ )	60-150 seconds	60-150 seconds
Peak package body Temperature ( $T_p$ )*	See Classification Temp in table 1	See Classification Temp in table 2
Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_c$ )	20** seconds	30** seconds
Average ramp-down rate ( $T_p$ to $T_{smax}$ )	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile Temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.		
** Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.		

Table 1. SnPb Eutectic Process – Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

## Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HOLT	JESD-22, A108	1000 Hrs, Bias @ 125°C
PCT	JESD-22, A102	168 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	500 Cycles, -65°C~150°C