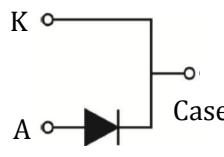
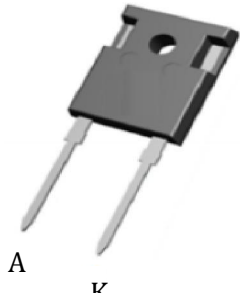


Fast Recovery Epitaxial Diode
● Feature

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

● Application

- Continuous Current Mode(CCM) Power Factory Mode(PFC).
- Half-Bridge/Full-Bridge Switching-Mode Power Supply.
- Industrial High Power Rectifier

	$I_F(AV): 40A$ $V_{RRM}: 1200V$ $T_{RR}(typ.): 55nS$
	RoHs COMPLIANT TO-247-2

Ordering Information

Part Number	LHF40U120
Package	TO-247-2
Basic Ordering Unit (PCS)	330 PCS
Normal Package Material Ordering Code	LHF40U120T22-TO247-2-TU
Halogen Free Ordering Code	LHF40U120T22-TO247-2-TU-HF

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

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)			
V_{RRM}	Peak repetitive reverse voltage	1200	V
V_{RWM}	Working peak reverse voltage	1200	V
V_{RM}	DC blocking voltage	1200	V
$I_{F(AV)}$	Average Rectified Forward Current (Rated VR-20Khz Square Wave) - 50% duty cycle	40	A
I_{FSM}	Non-Repetitive Peak Forward Surge Current (Surge applied at rated load conditions half wave, single phase, 60Hz)	320	A
$R_{\theta JC}$	Typical Thermal Resistance	0.44	$^{\circ}\text{C/W}$
P_{tot}	Power Dissipation	$T_c = 25^{\circ}\text{C}$ 272	W
dv/dt	Maximum rate of voltage change(at rate VR)	10000	V/uS
T_J	Operating temperature	-55 to +175	$^{\circ}\text{C}$
T_{STG}	Storage temperature	-55 to +175	

Electrical Characteristics – (per leg)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_F	Forward voltage drop	$I_F=40.0\text{A}, T_J=25^{\circ}\text{C}$	-	2.0	2.6	V
		$I_F=40.0\text{A}, T_J=150^{\circ}\text{C}$	-	1.8	2.5	
I_R	Reverse current	$V_R=V_{RRM}, T_J=25^{\circ}\text{C}$	-	-	30.0	uA
		$V_R=V_{RRM}, T_J=125^{\circ}\text{C}$	-	-	300.0	
T_{RR}	Reverse recovery time	$I_F=1.0\text{A}, V_R=30\text{V}, -di/dt=200\text{A/uS}$	-	--	55	nS

Ratings and Characteristics Curves

Fig. 1 Forward Current De-Rating Curve

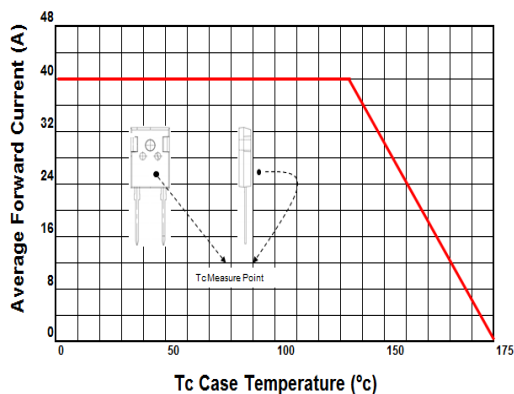


Fig. 2 Peak Forward Surge Current

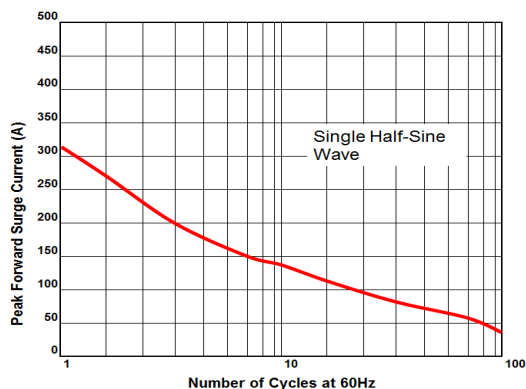


Fig. 3 Reverse Characteristics

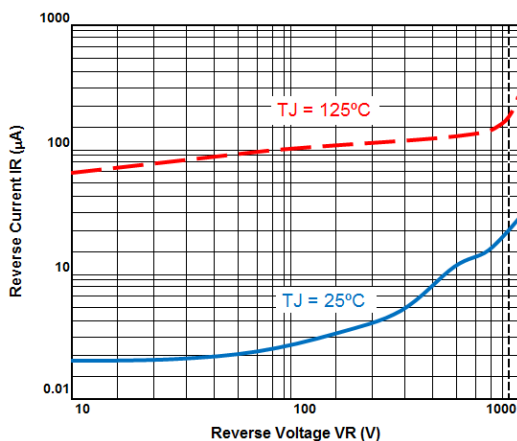


Fig. 4 Instantaneous Forward Characteristics

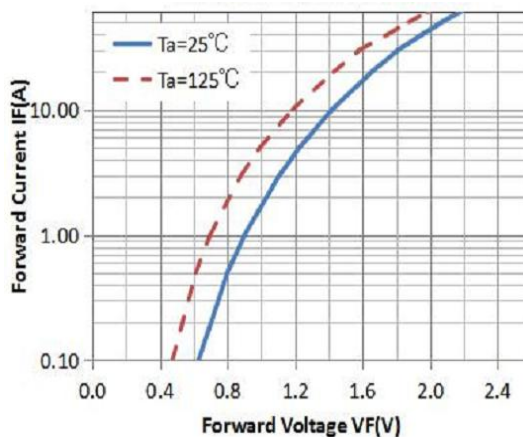
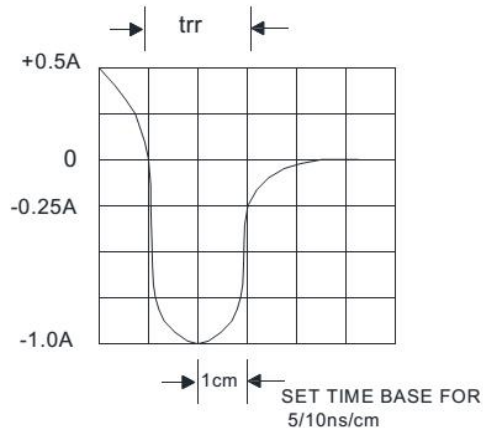
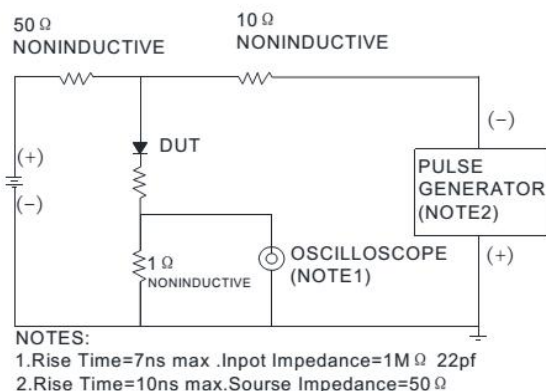
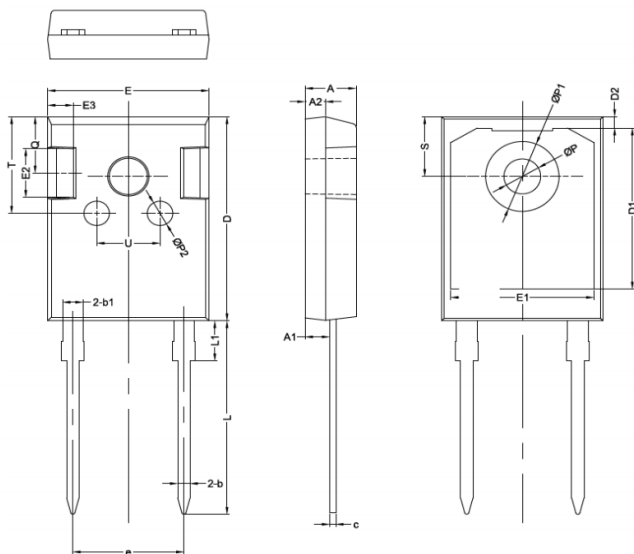


Fig. 8 Diagram of Circuit and Testing Wave Form of Reverse Recovery Time



Package Information

TO-247AC (TO-247-2)



Dimensions in millimeter

Symbol	mm		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.35
b1	--	2.00	--
c	0.55	1.60	0.75
D	20.80	21.00	21.20
D1	--	16.58	--
D2	--	1.17	--
E	15.60	15.80	16.00
E1	--	14.02	--
E2	--	5.00	--
E3	--	2.50	--
e	--	10.88	--
L	19.42	19.92	20.42
L1	--	4.13	--
P	3.50	3.60	3.70
P1	--	7.19	--
P2	--	2.50	--
Q	--	5.80	--
S	6.05	6.15	6.25
T	--	10.00	--
U	--	6.20	--

[illegible]

Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
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 ³ <350	Volume mm ³ ≥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 ³ <350	Volume mm ³ 350-2000	Volume mm ³ >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