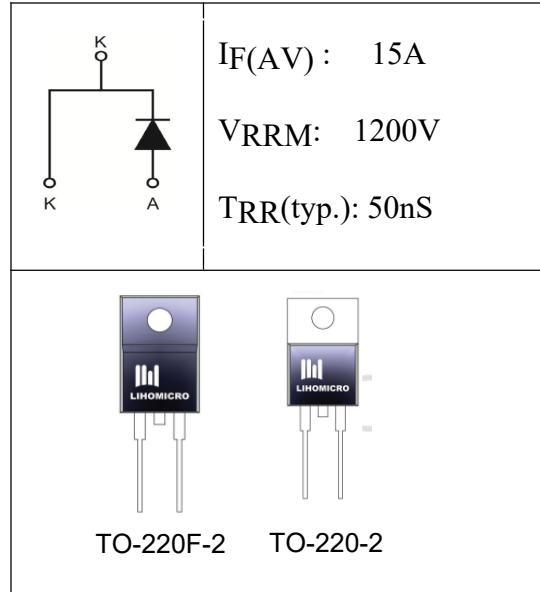


Fast Recovery Epitaxial Diode
●Features

- 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	LHF15U120	LHF15U120
Package	TO-220F-2	TO-220-2
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LHF15U120F2-TO220F-2-TU	LHF15U120T6-TO220-2-TU
Halogen Free Ordering Code	LHF15U120F2-TO220F-2-TU-HF	LHF15U120T6-TO220-2-TU-HF

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

PARAMETER	SYMBOL	Value	UNIT
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
Working Peak Reverse Voltage	V_{RWM}	1200	V
DC blocking Voltage	V_{RM}	1200	V
Average Rectified Forward Current (Rated VR-20KHz Square Wave)-50% duty cycle	$I_{F(AV)}$	15	A
Non-Repetitive Peak Forward surge current (surge applied at rated load conditions half wave,single phase,60Hz)	I_{FSM}	150	A
Power Dissipation($T_C = 25^\circ C$)	P_{tot}	78	W
Maximum Rate of Voltage change(at rate VR)	dV/dt	10000	V/uS
Operating Temperature	T_J	-55~+175	$^\circ C$
Storage Temperature	T_{STG}	-55~+150	$^\circ C$

●Electronic Characteristics-(per leg)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Forward Voltage Drop	VF	$I_F=15A, T_J=25^{\circ}C$	--	--	2.5	V
		$I_F=15A, T_J=150^{\circ}C$	--	--	1.95	
Reverse Current	IR	$V_R=V_{RRM}, T_J=25^{\circ}C$	--	--	250	uA
		$V_R=V_{RRM}, T_J=125^{\circ}C$	--	--	40	
Reverse Recovery Time	T_{RR}	$I_F=1A, V_R=30V, T_A=25^{\circ}C$	--	50	60	nS

●Thermal Characteristics

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

•Ratings and Characteristics Curves

Fig. 1 Forward Current vs V_F

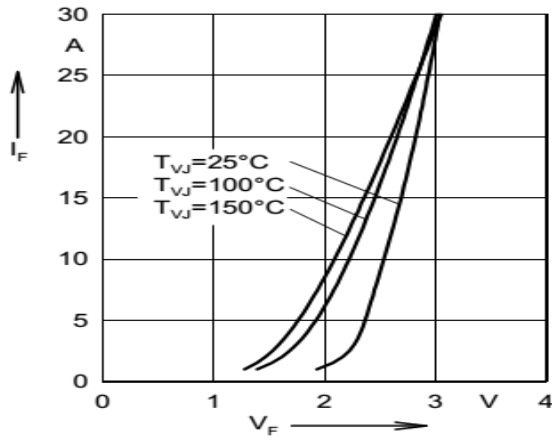


Fig. 2 Recovery Charge vs $-di_F/dt$

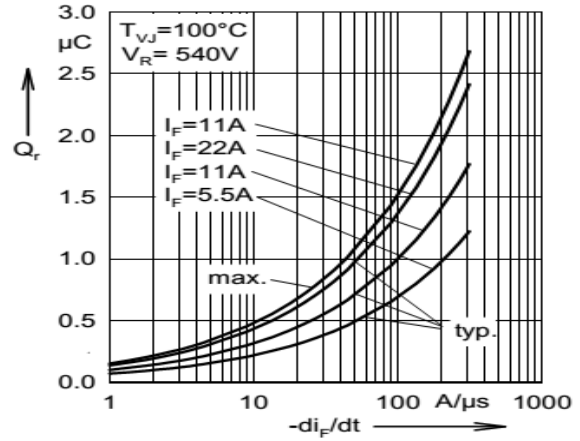


Fig. 3 Peak Reverse Current vs $-di_F/dt$

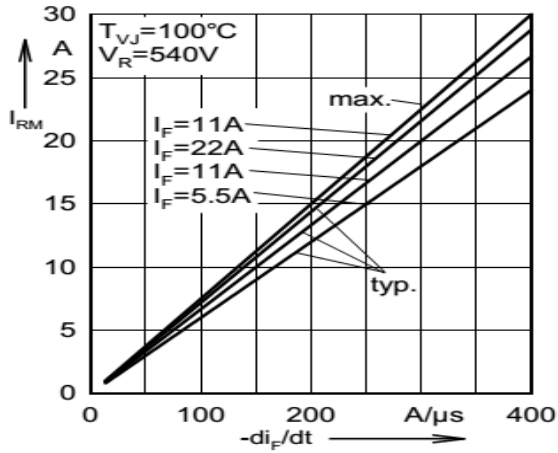


Fig. 4 Dynamic Parameters vs T_J

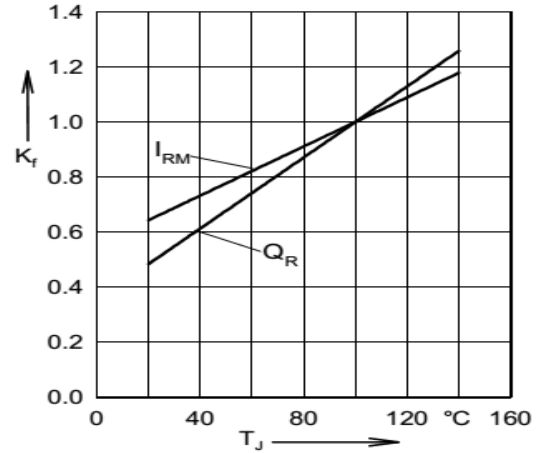


Fig. 5 T_{RR} vs $-di_F/dt$

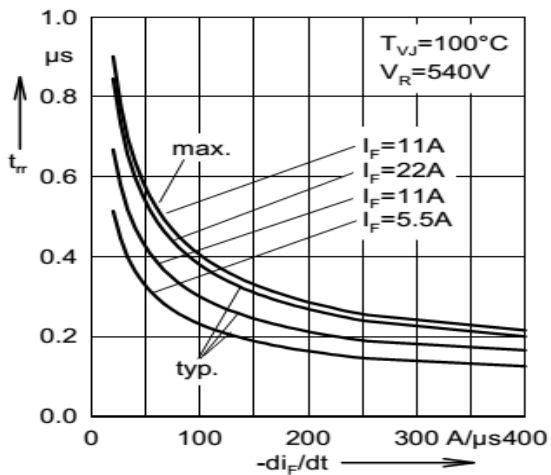
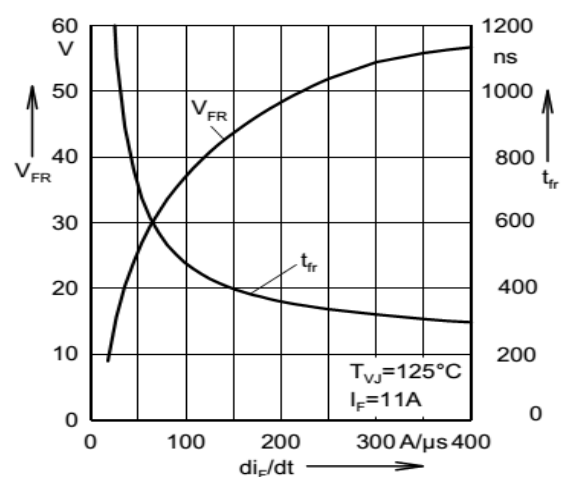


Fig. 6 Peak Forward Voltage vs di_F/dt



● **Ratings and Characteristics Curves**

Fig. 7 Transient Thermal Impedance Junction to Case

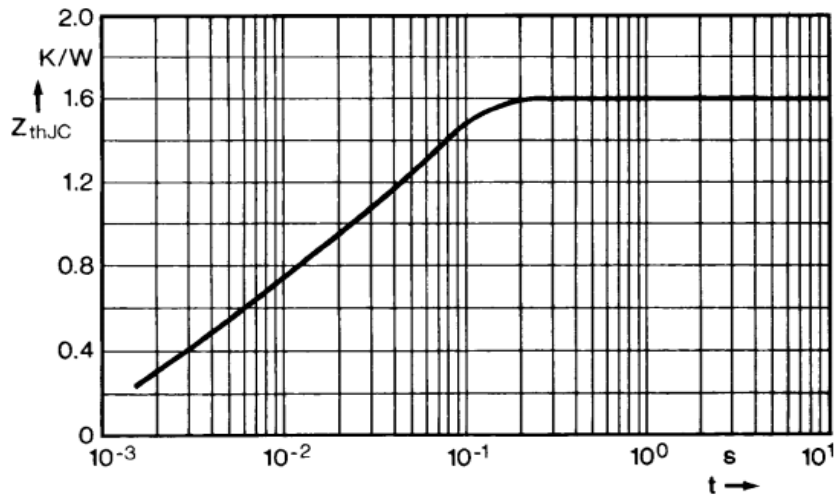
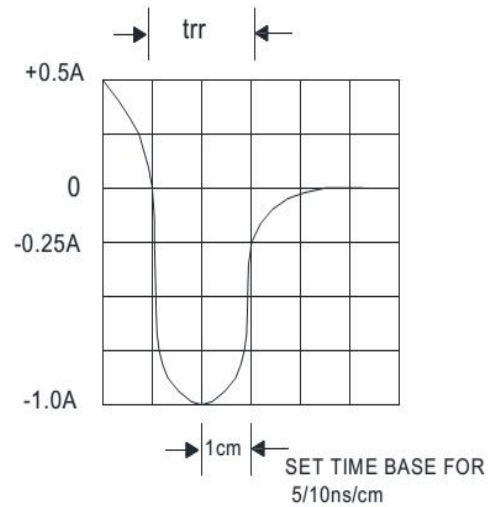
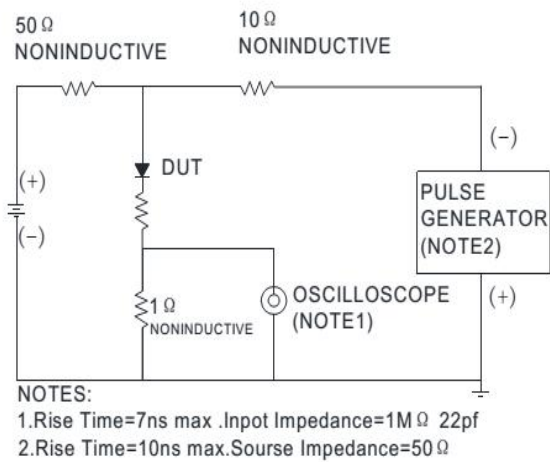


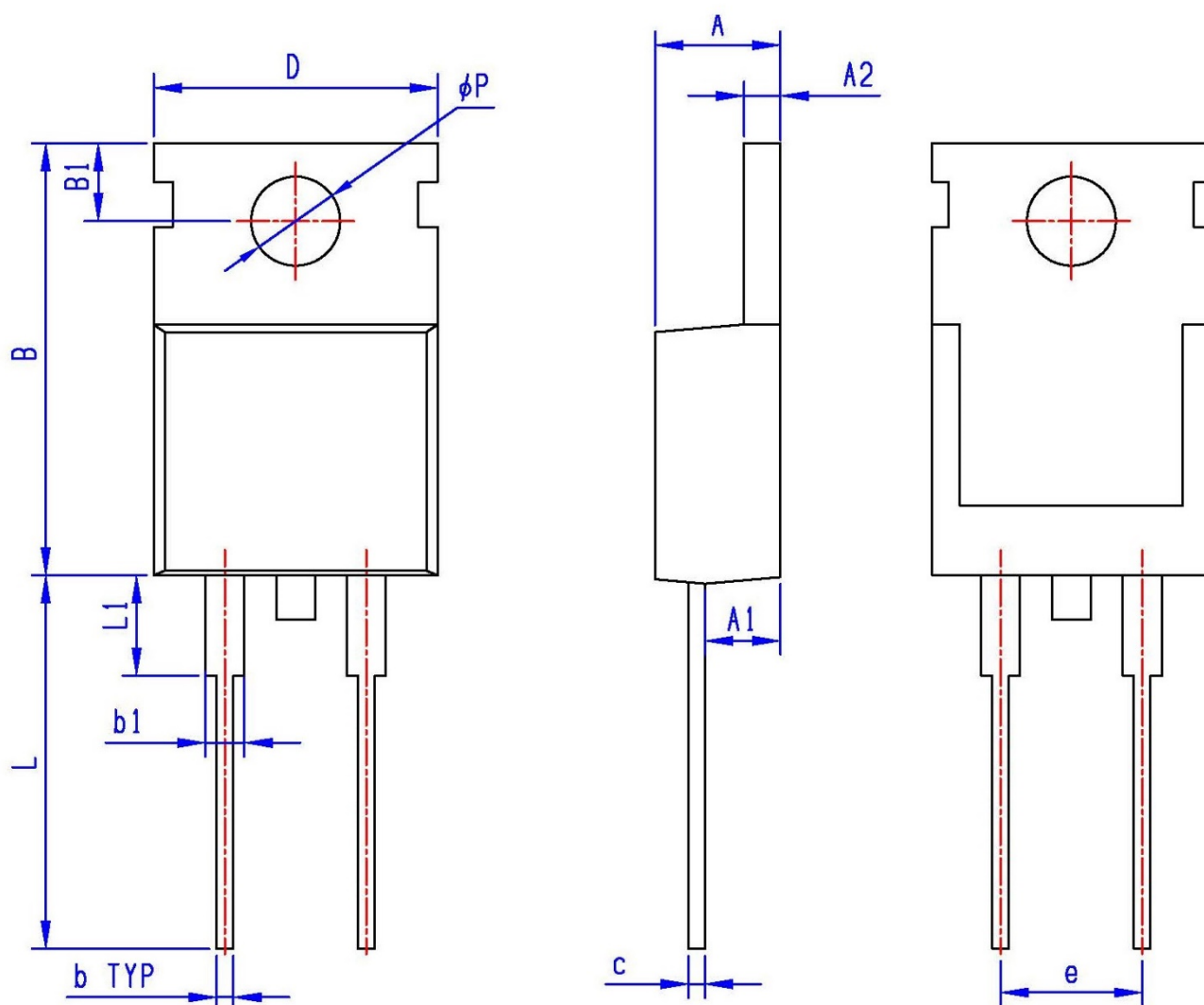
Fig. 8 Diagram of Circuit and Testing Wave Form of Reverse Recovery Time



•Dimensions (TO-220-2)

UNIT:mm

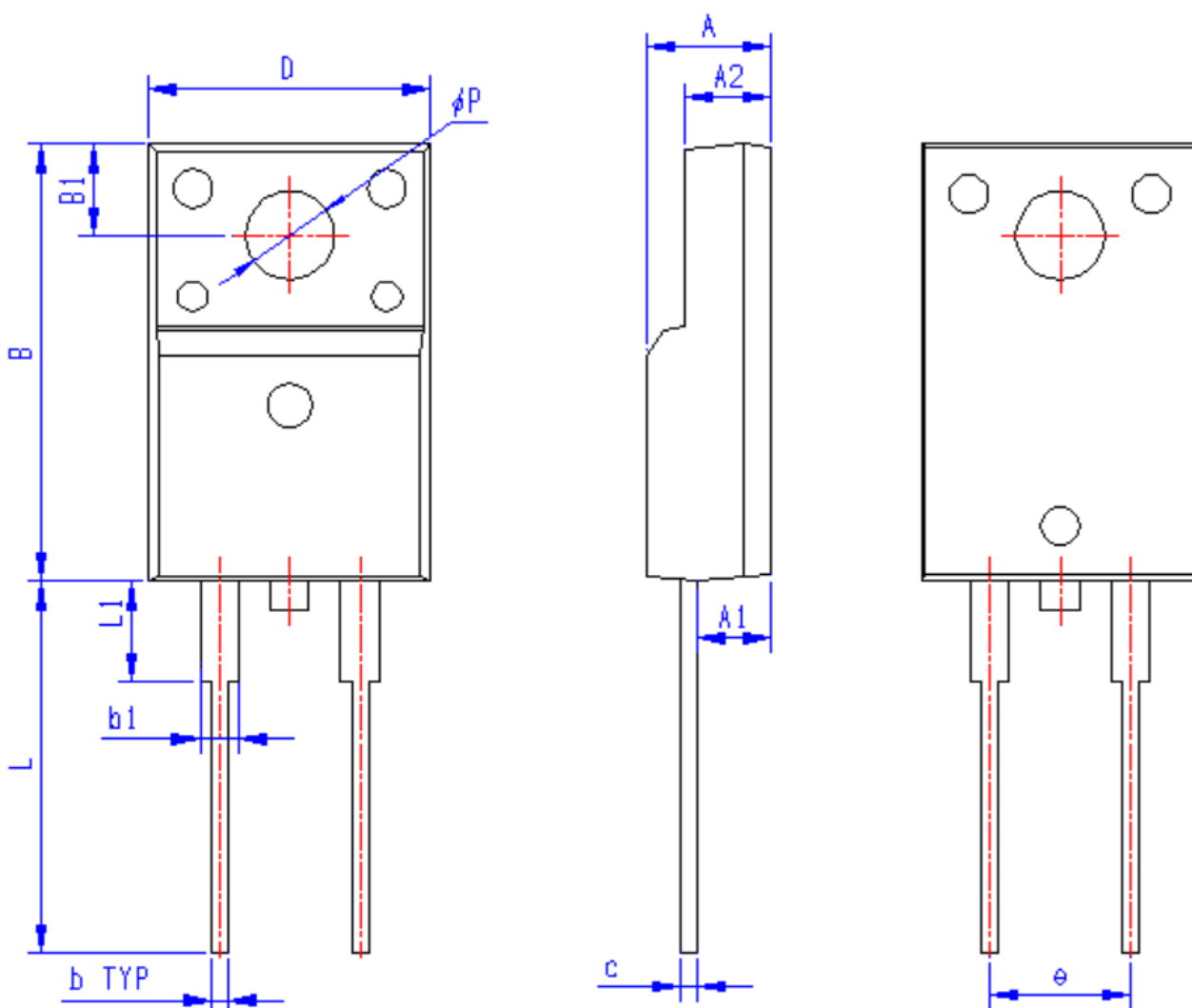
SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	2.60	3.00
A1	2.30	3.00	e	4.95	5.25
A2	1.20	1.40	L	12.40	14.20
b	0.60	0.90	L1	2.40	3.40
b1	1.10	1.70	∅P	3.50	3.90
c	0.40	0.70			
D	9.80	10.60			
B	15.20	16.20			



•Dimensions (TO-220F-2)

Unit: mm

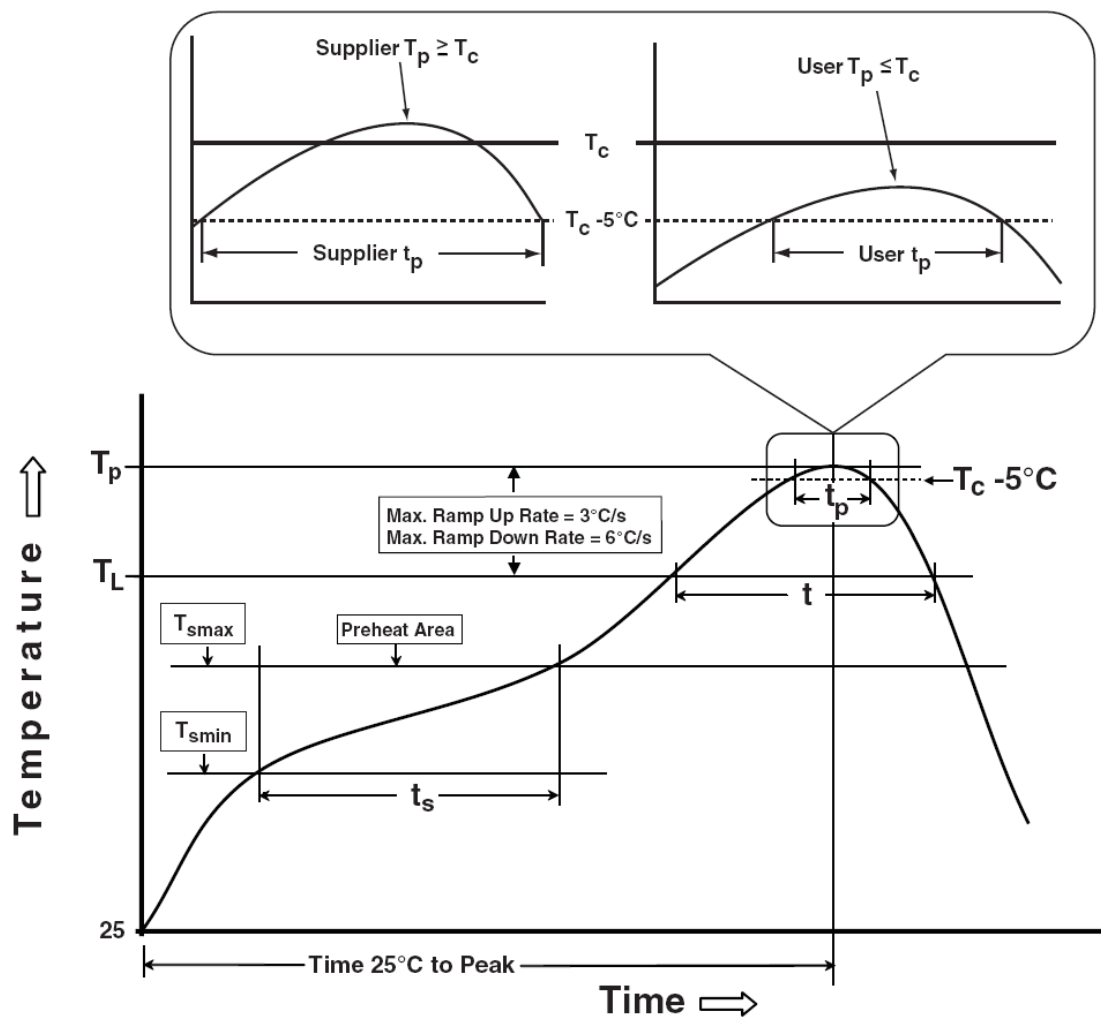
SYMBOL	min	max	SYMBOL	min	max
A	4.40	4.90	B1	2.90	3.70
A1	2.40	3.00	e	4.95	5.25
A2	2.30	3.00	e1		
b	0.60	0.90	L	12.40	14.20
b1	1.10	1.70	L1	2.40	3.40
c	0.40	0.70	∅P	2.90	3.50
D	9.80	10.60			
B	15.40	16.40			



● 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
Preheat & Soak Temperature min (T_{smin}) Temperature max (T_{smax}) Time (T_{smin} to T_{smax}) (t_s)	100 °C 150 °C 60-120 seconds	150 °C 200 °C 60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L) Time at liquidous (t_L)	183 °C 60-150 seconds	217 °C 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