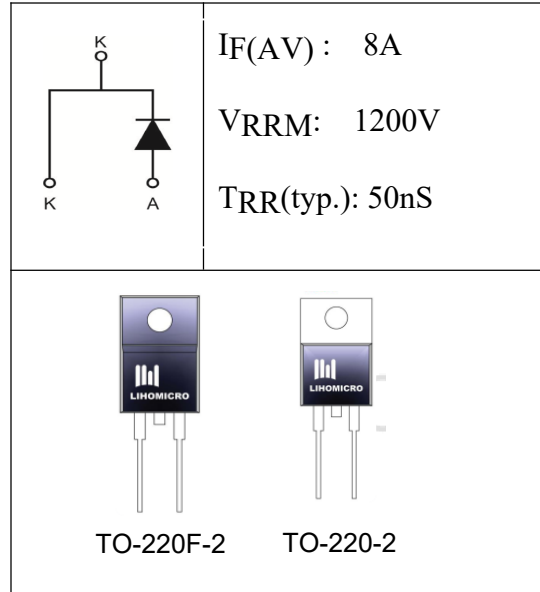


Fast Recovery Epitaxial Diode
●Features

- 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
- UPS


●Ordering Information:

Part Number	LHF8U120	LHF8U120
Package	TO-220F-2	TO-220-2
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LHF8U120F2-TO220F-2-TU	LHF8U120T6-TO220-2-TU
Halogen Free Ordering Code	LHF8U120F2-TO220F-2-TU-HF	LHF8U120T6-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	$I_{F(AV)}$	8	A
Non-Repetitive Peak Forward surge current (surge applied at rated load conditions half wave,single phase,60Hz)	I_{FSM}	100	A
Maximum Rate of Voltage change(at rate VR)	dV/dt	10000	V/uS
Operating Temperature	T_J	-40~+175	°C
Storage Temperature	T_{STG}	-55~+150	°C

●Electronic Characteristics-(per leg)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Forward Voltage Drop	V_F	$I_F=15A, T_J=25^{\circ}C$	--	--	2.5	V
		$I_F=15A, T_J=150^{\circ}C$	--	1.25	1.9	
Reverse Current	I_R	$V_R=V_{RRM}, T_J=25^{\circ}C$	--	14	21	uA
		$V_R=V_{RRM}, T_J=125^{\circ}C$	--	--	1.5	mA
Reverse Recovery Time	T_{RR}	$I_F=8A, V_R=30V, T_A=25^{\circ}C$	--	50	70	nS

●Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
Thermal Resistance Junction-case	R_{thJC}	TO-220-2	TO-220F-2	$^{\circ}C/W$
		2.0	5.4	

●Ratings and Characteristics Curves

Fig. 1 Forward Current I_F vs. V_F

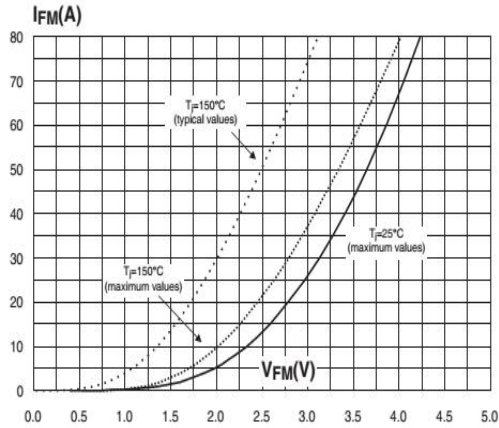


Fig. 2 Reverse Recovery Q_{rr} vs. $-di_F/dt$

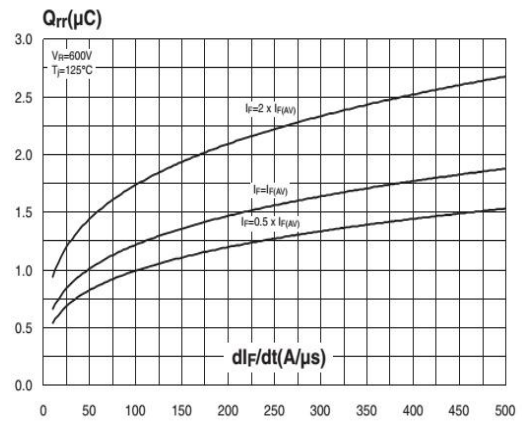


Fig. 3 Peak Reverse I_{RM} vs. $-di_F/dt$

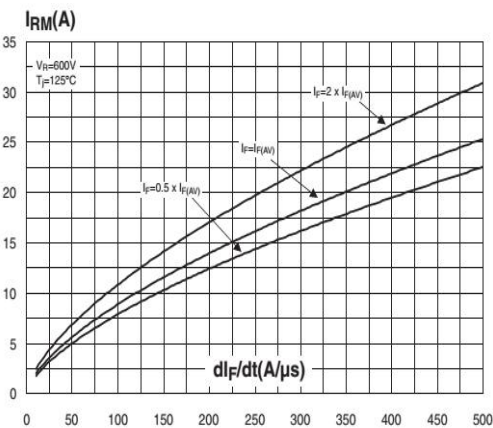


Fig. 4 Dynamic Parameter Q_r I_{RM} , T_j

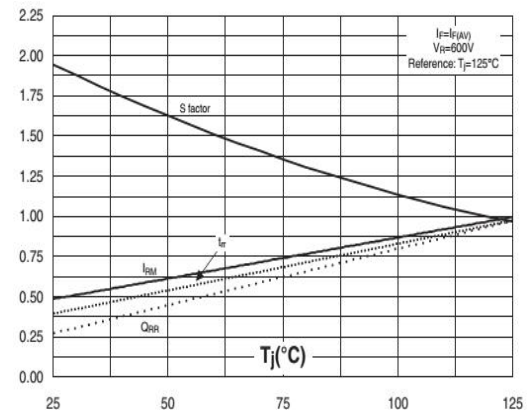


Fig. 5 Recovery Time vs. $-di_F/dt$

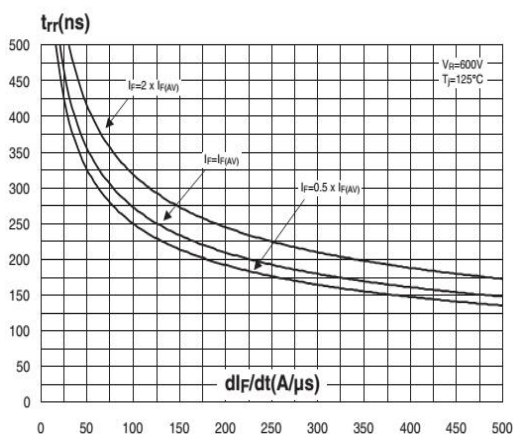
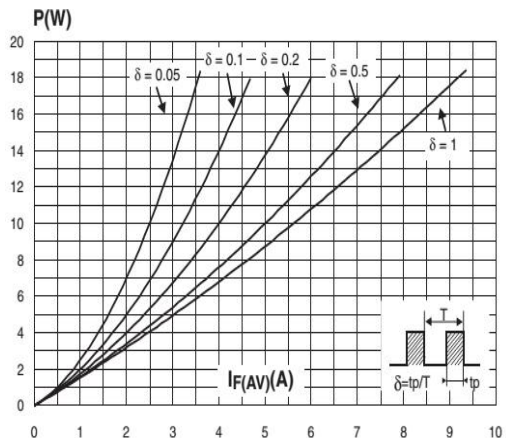


Fig. 6 Conduction losses vs. Average Current



● **Ratings and Characteristics Curves**

Fig. 7 Transient factory vs dI_F/dt

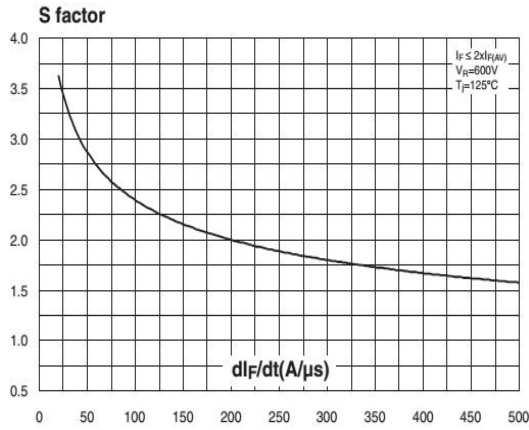


Fig. 8 Transient peak forward voltage vs dI_F/dt

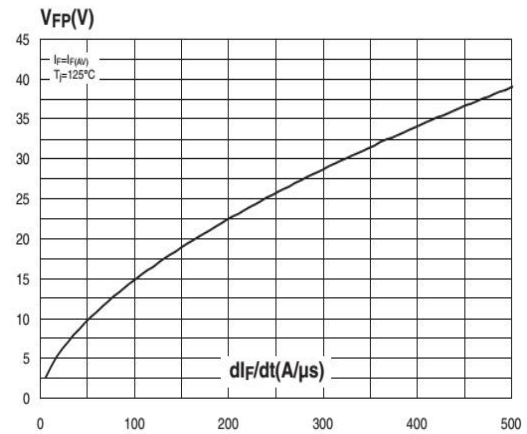


Fig. 9 Forward recovery time vs. $-dI_F/dt$

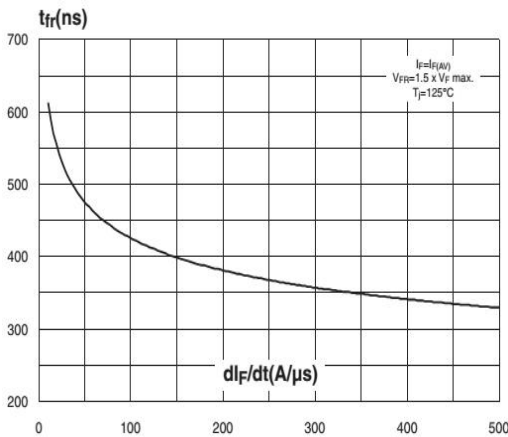


Fig. 10 Junction capacitance vs reverse voltage applied

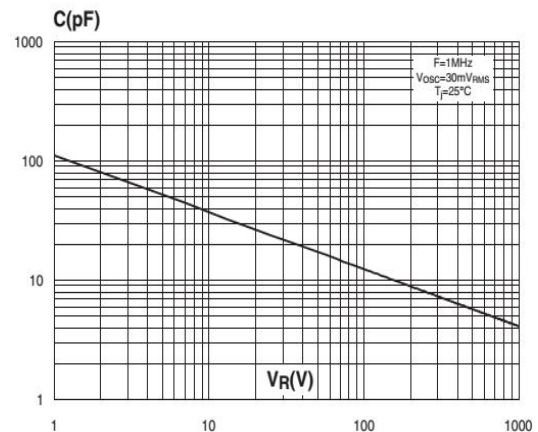


Fig. 11 Relative variation of thermal Impedance junction to case vs duration

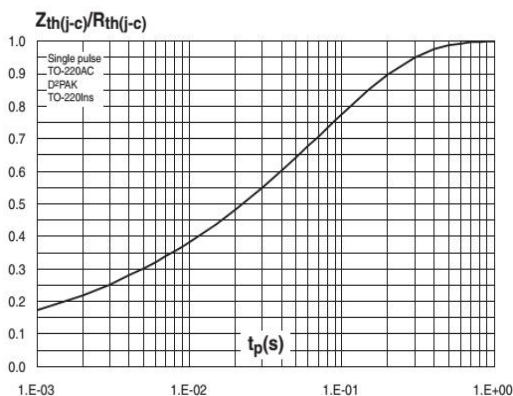
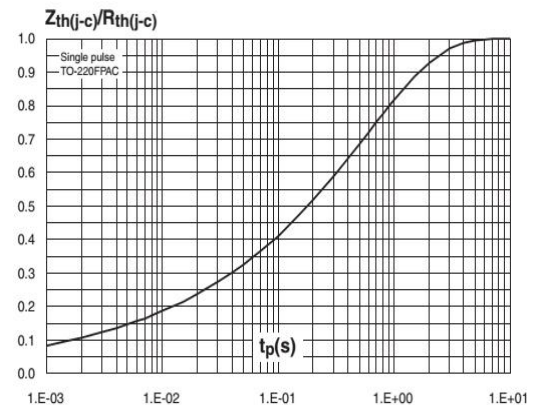
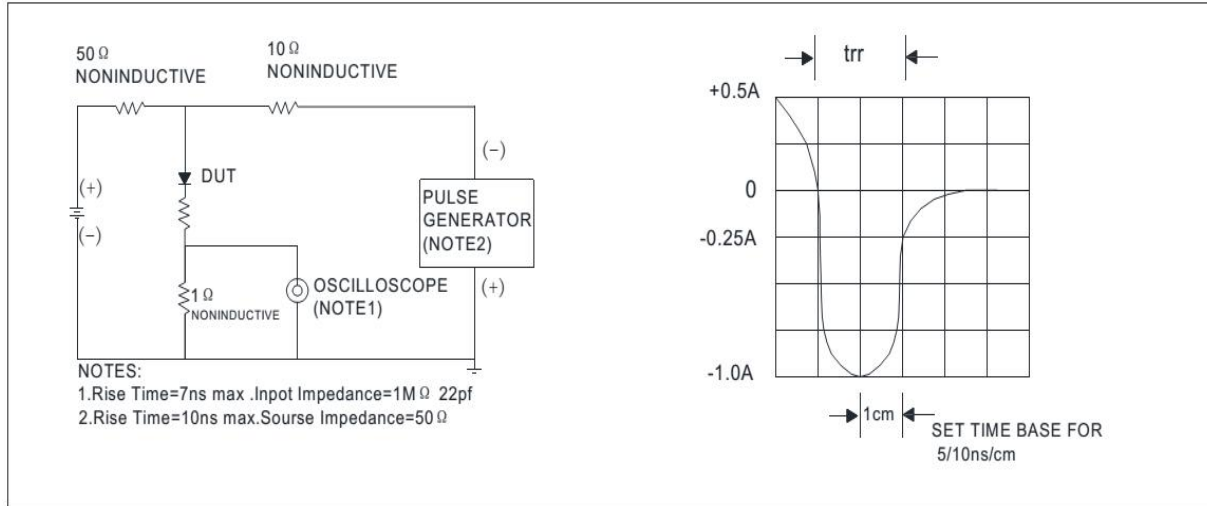


Fig. 12 Relative variation of thermal Impedance junction to case vs pulse duration



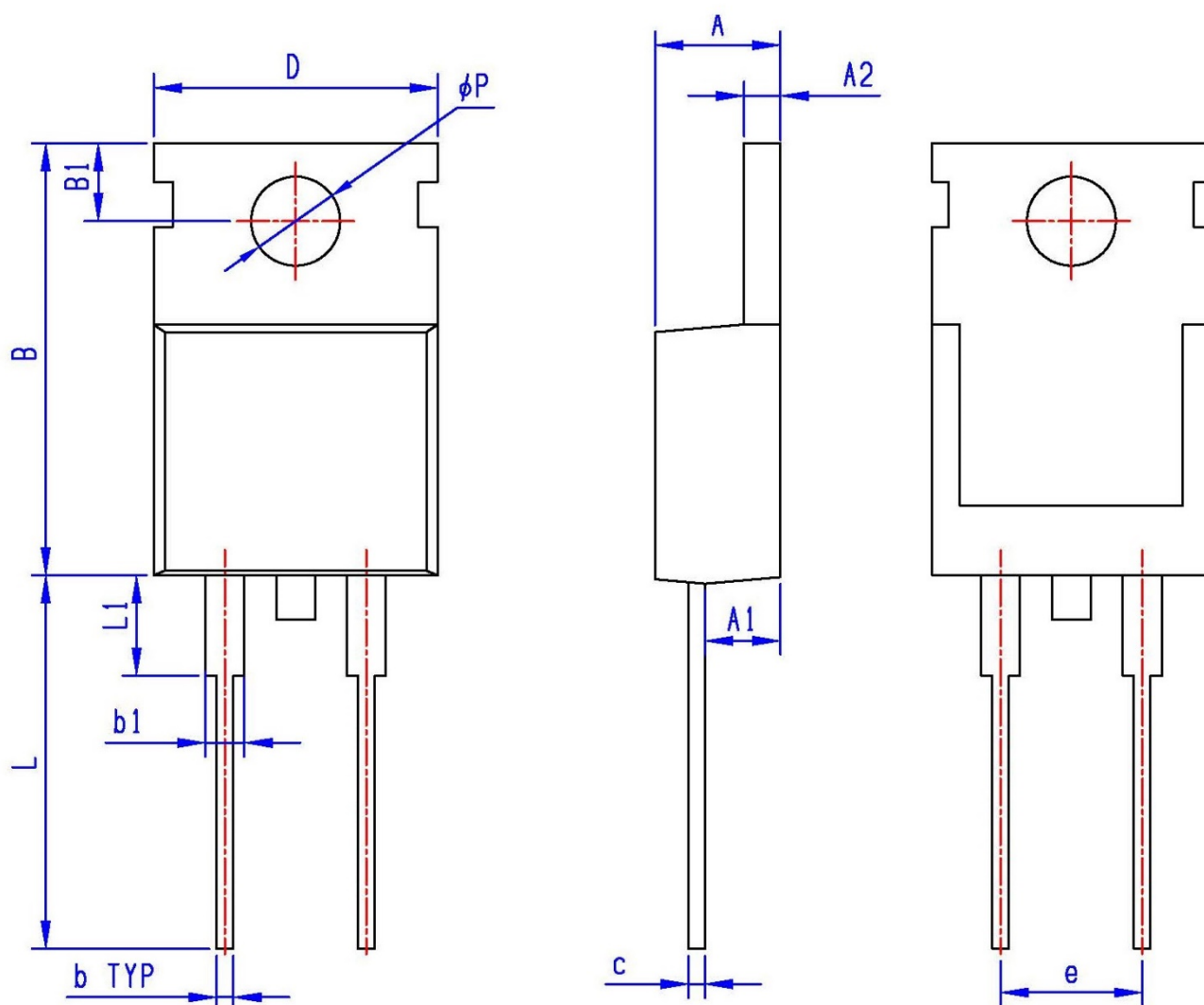
• **Diagram of Circuit and Testing Wave From of Reverse Recovery Time.**



•Dimensions (TO-220-2)

UNIT:mm

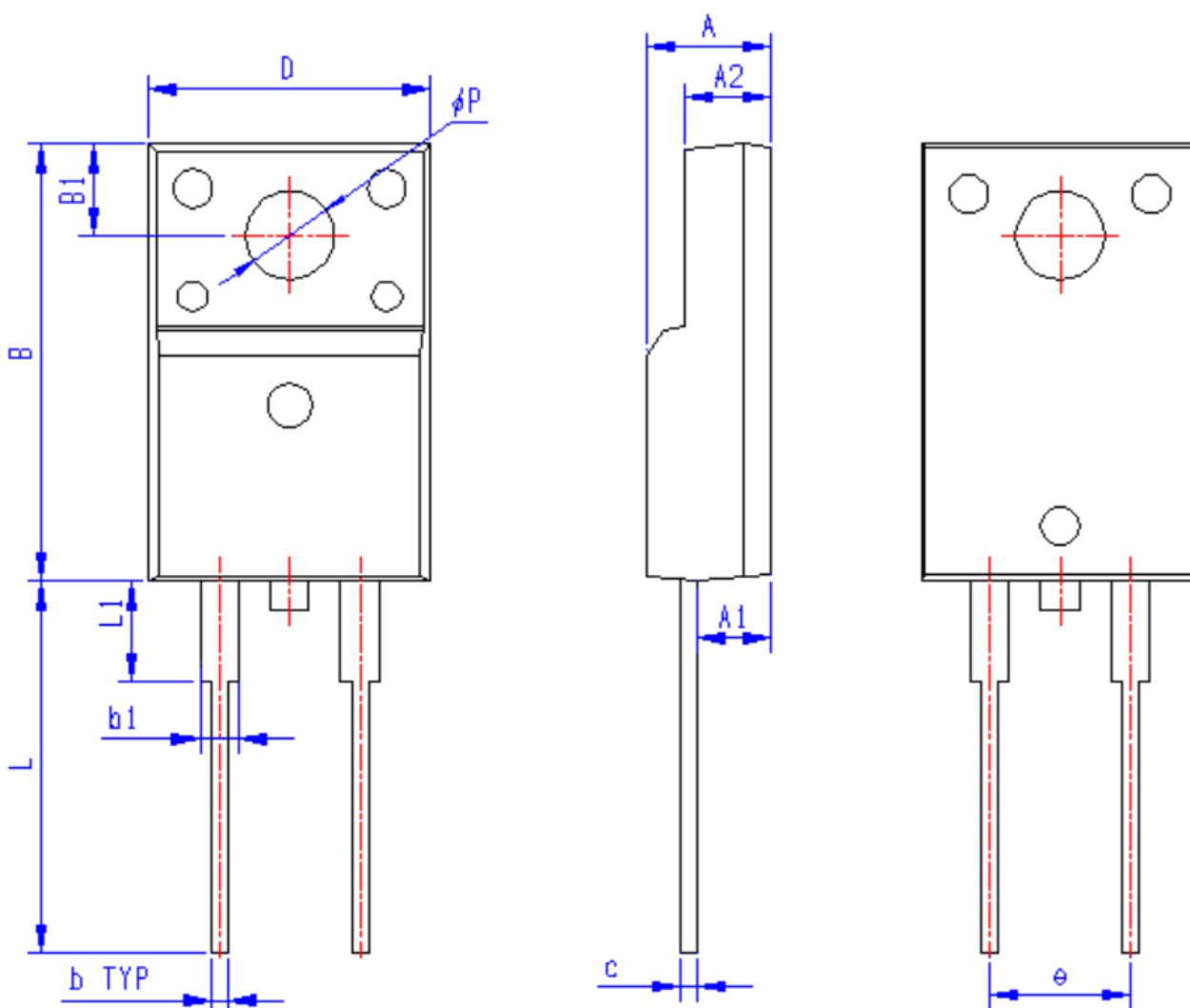
SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	2.60	3.00
A1	2.30	3.00	e	4.95	5.25
A2	1.20	1.40	L	12.40	14.20
b	0.60	0.90	L1	2.40	3.40
b1	1.10	1.70	∅P	3.50	3.90
c	0.40	0.70			
D	9.80	10.60			
B	15.20	16.20			



•Dimensions (TO-220F-2)

Unit: mm

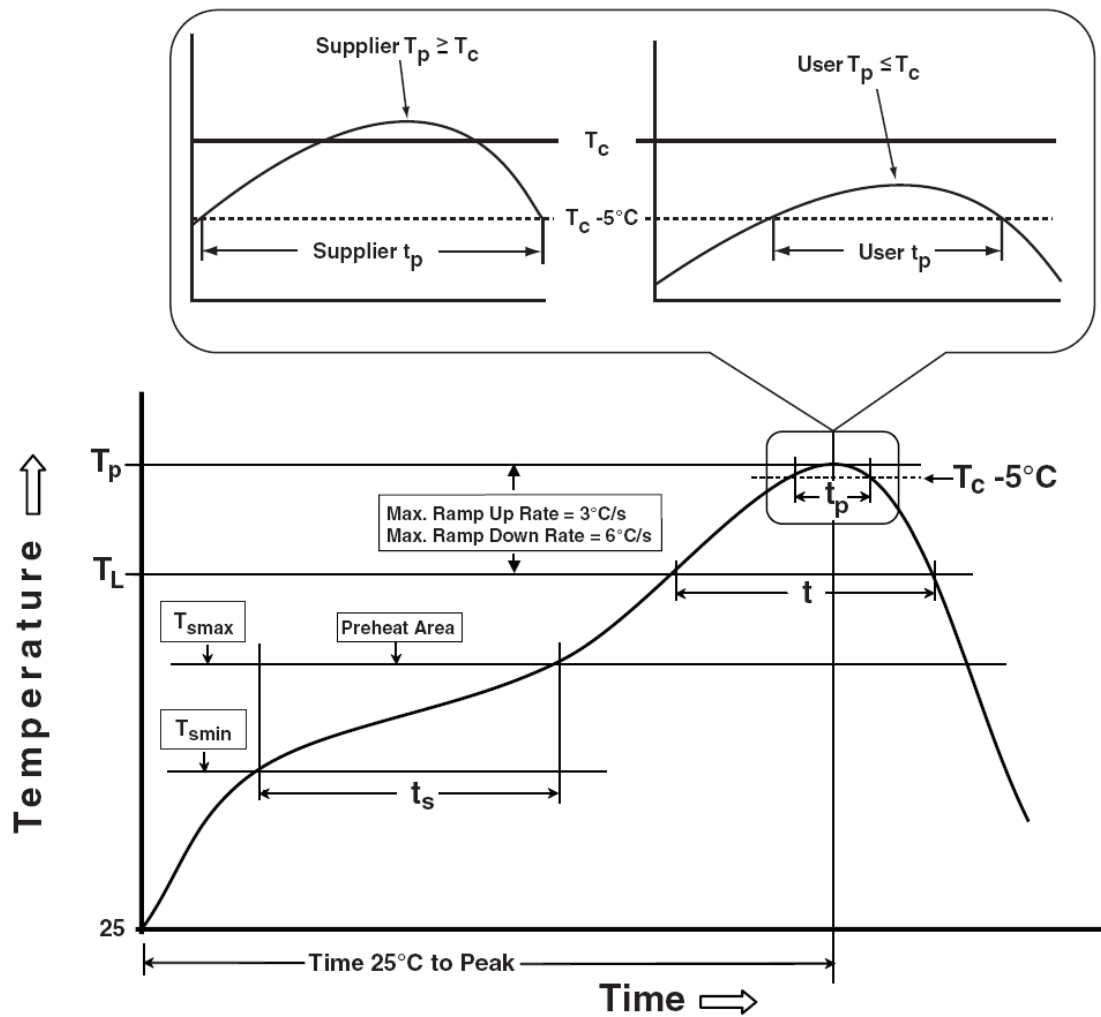
SYMBOL	min	max	SYMBOL	min	max
A	4.40	4.90	B1	2.90	3.70
A1	2.40	3.00	e	4.95	5.25
A2	2.30	3.00	e1		
b	0.60	0.90	L	12.40	14.20
b1	1.10	1.70	L1	2.40	3.40
c	0.40	0.70	∅P	2.90	3.50
D	9.80	10.60			
B	15.40	16.40			



● 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