

•General Description

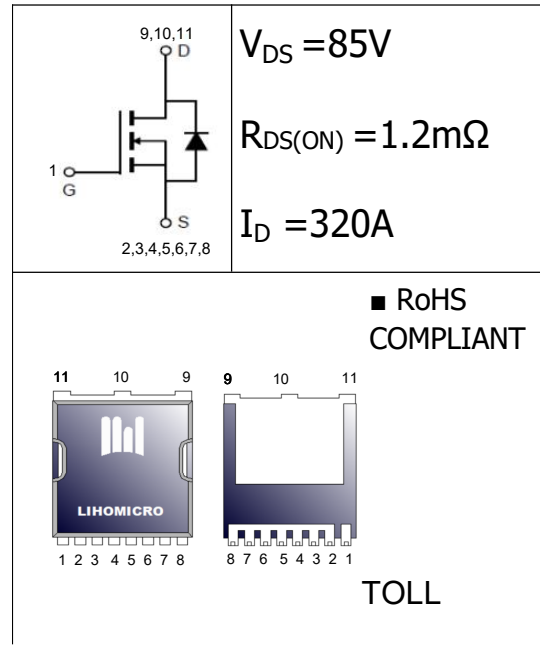
The N-Channel MOSFET LH012N085 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for Power Supplies and Li-Battery.

•Features

- High Efficiency
- Low $R_{DS(on)}$ & FOM
- 100% EAS Guaranteed

•Application

- LED/LCD/PDP TV and monitor Lighting
- Power Supplies
- UPS
- DC-DC Converter


•Ordering Information:

Part Number	LH012N085
Package	TOLL
Basic Ordering Unit (pcs)	2000
Normal Package Material Ordering Code	LH012N085LL-TOLL-TAP
Halogen Free Ordering Code	LH012N085LL-TOLL-TAP-HF

•Absolute Maximum Ratings (TC =25℃)

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_D(TC=25^{\circ}C)$	320	A
	$I_D(TC=100^{\circ}C)$	210	A
Pulsed drain current (TC = 25℃, tp limited by Tjmax) ¹	I_D pulse	640	A
Single Pulse Avalanche Energy ²	E_{AS}	924	mJ
Power Dissipation(TC=25℃)	P_D	330	W
Operating Temperature	T_J	-55~+175	℃
Storage Temperature	T_{STG}	-55~+175	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	--	1.0	1.5	mΩ
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=85^\circ C$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	±100	nA
Gate Resistance	R_g	f=1MHz, Open Drain	--	1.6	--	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=50V$ f = 1.0MHz	--	5500	--	pF
Output Capacitance	C_{oss}		--	3800	--	
Reverse transfer Capacitance	C_{rss}		--	1100	--	
Turn-on delay time	$T_d(on)$	$I_D=20A,$ $V_{DS}=50V$ $V_{GS}=10V$ $V_G=3\Omega$	--	37	--	nS
Rise time	T_r		--	28	--	
Turn -Off Delay Time	$T_d(off)$		--	102	--	
Fall time	T_f		--	38	--	
Total Gate Charge	Q_g	$I_D=20A,$ $V_{DS}=50V$ $V_{GS}=10V$	--	110	---	nC
Gate-to-Source Charge	Q_{gs}		--	31	--	
Gate-to-Drain Charge	Q_{gd}		--	27	---	
Continuous Diode Forward Current	I_S	--	--	--	280	A
Diode Forward Voltage	V_{SD}	$T_J=25^\circ C, I_S=1A$ $V_{GS}=0V$	--	--	1.2	V
Reverse Recovery Time	t_{rr}	$I_f=20A$ $di_F/dt=100A/\mu s$	--	85	--	ns
Reverse Recovery Charge	Q_{rr}		--	180	--	nC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	0.38	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	62	°C/W

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.

2.L= 0.5mH, $V_{DD}=50V$, $R_G=25\Omega$, $I_{AS}=68A$, Starting $T_J=25^\circ C$

3.Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

•Typical Characteristics

Fig1.Output Characteristics

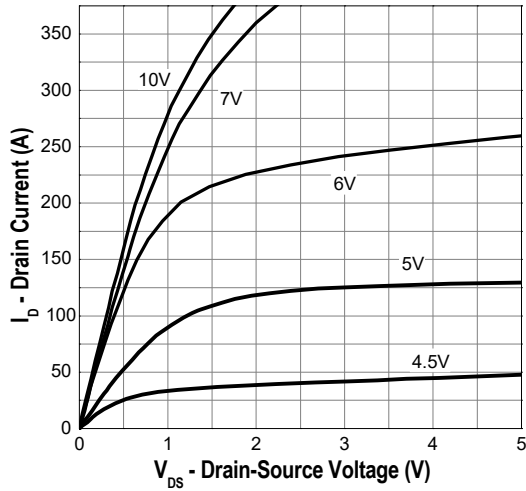


Fig2.Gate Threshold Voltage

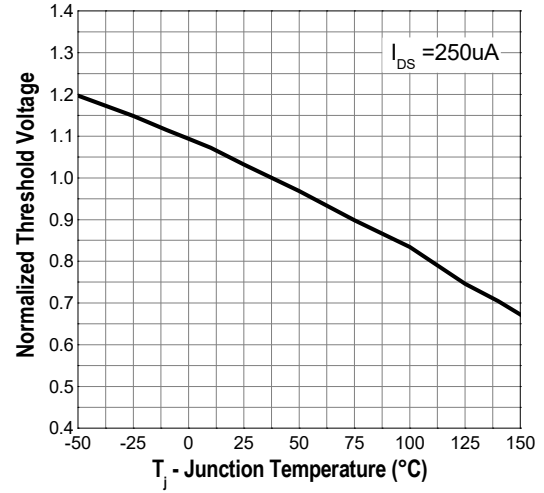


Fig3.Gate-Source On Resistance

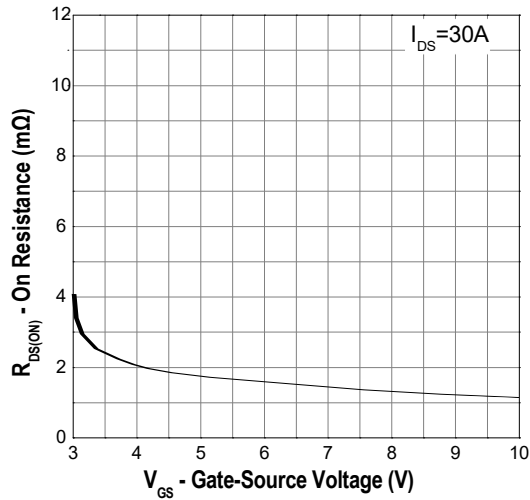


Fig4.Drain-Source On Resistance

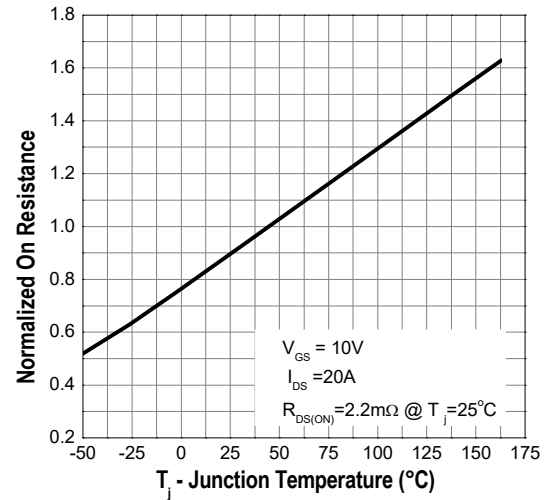


Fig5.Drain-Source On Resistance

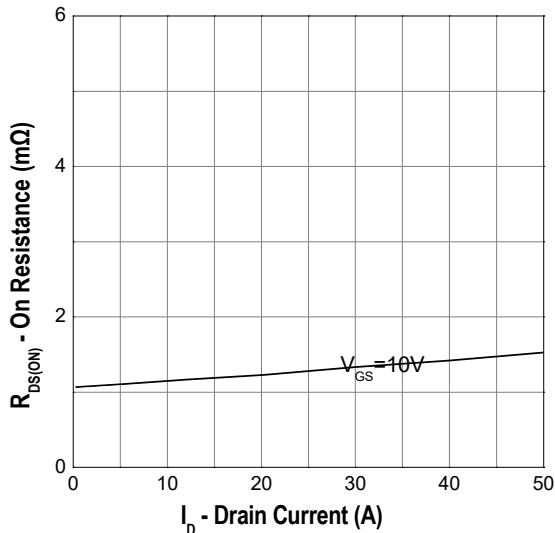
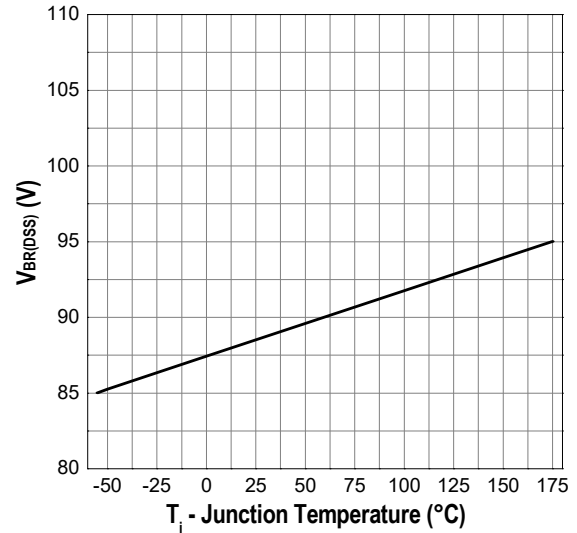


Fig6.Drain-source Breakdown Voltage



•Typical Characteristics(Cont .)

Fig7.Power Dissipation

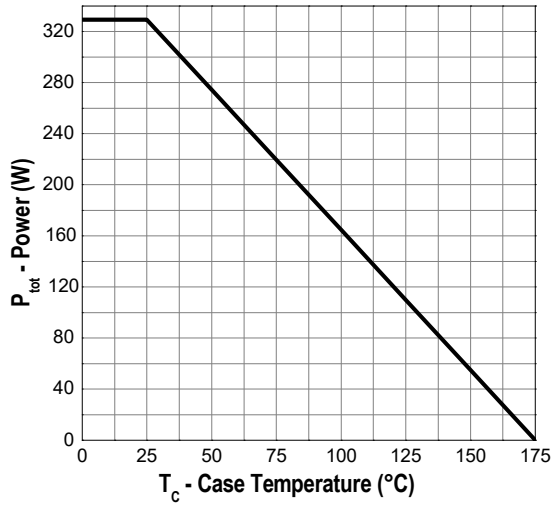


Fig8.Drain Current

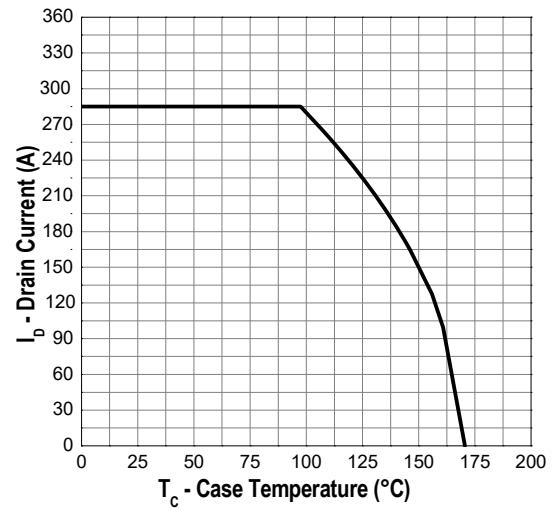


Fig9.Safe Operation Area

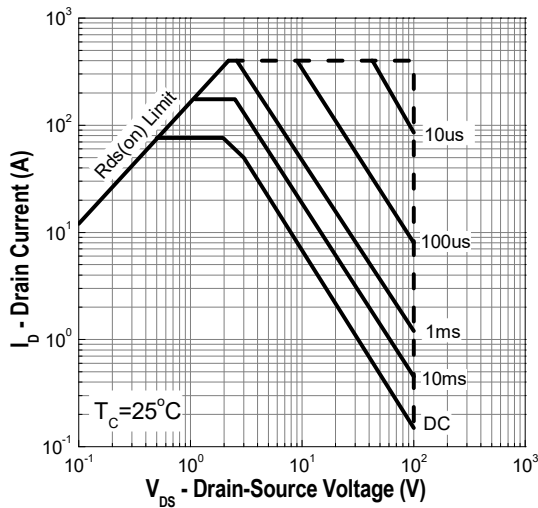


Fig10.Transient Thermal Impedance

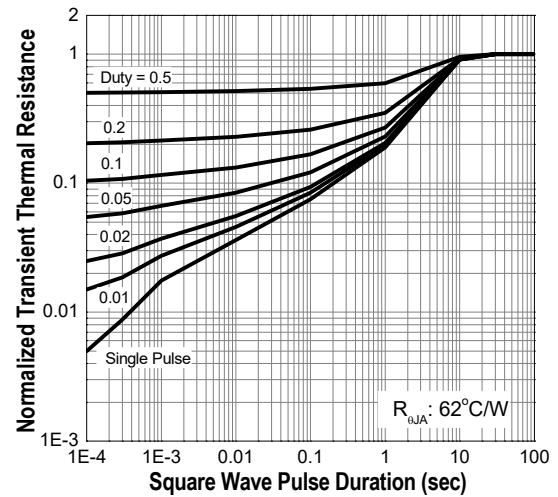


Fig11.Capacitance

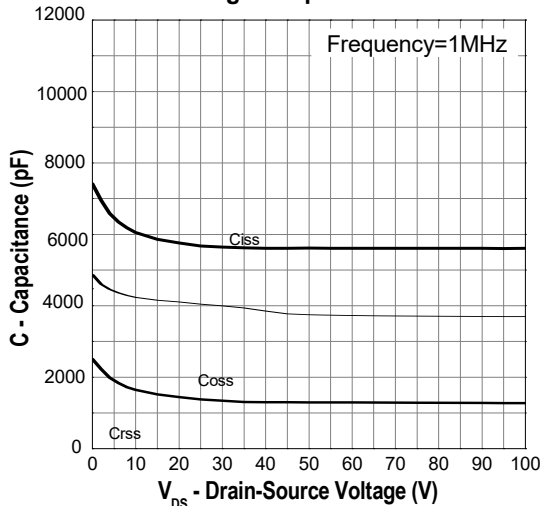
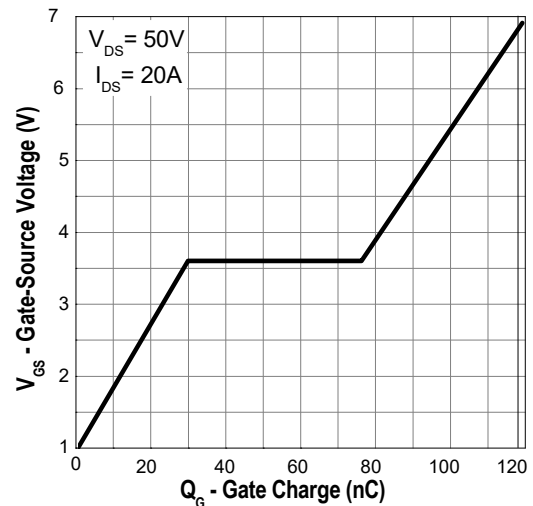


Fig12.Gate Charge



● **Test Circuits & Waveforms**

Fig1. Gate Charge Test Circuit & Waveform

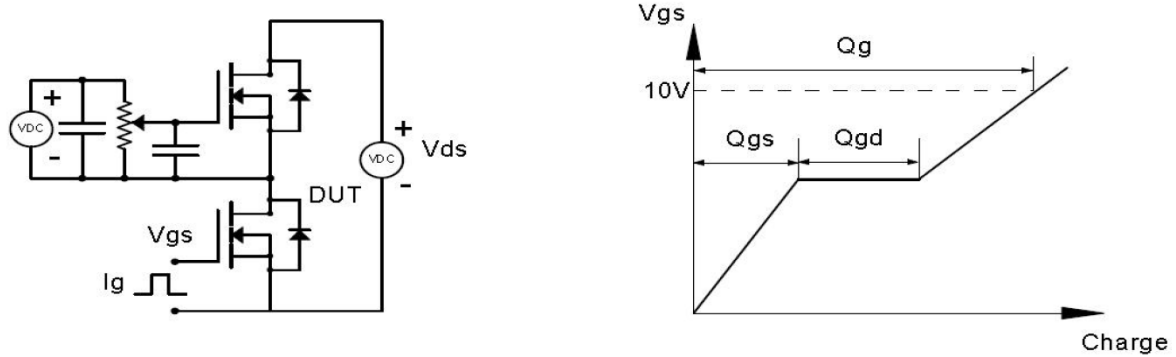


Fig2. Resistive Switching Test Circuit & Waveform

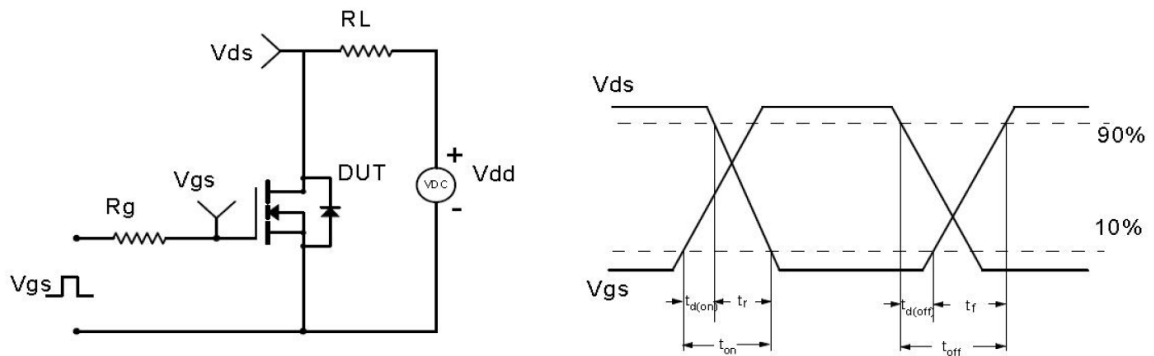


Fig3. Unclamped Inductive Switching Test Circuit & Waveform

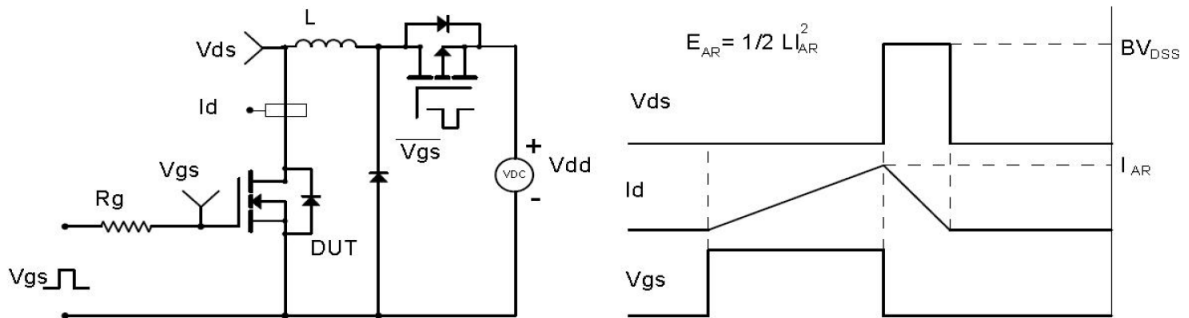
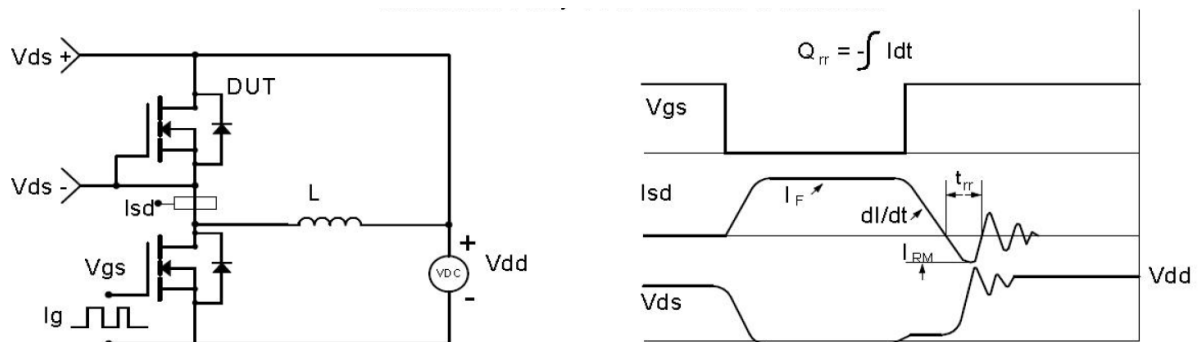


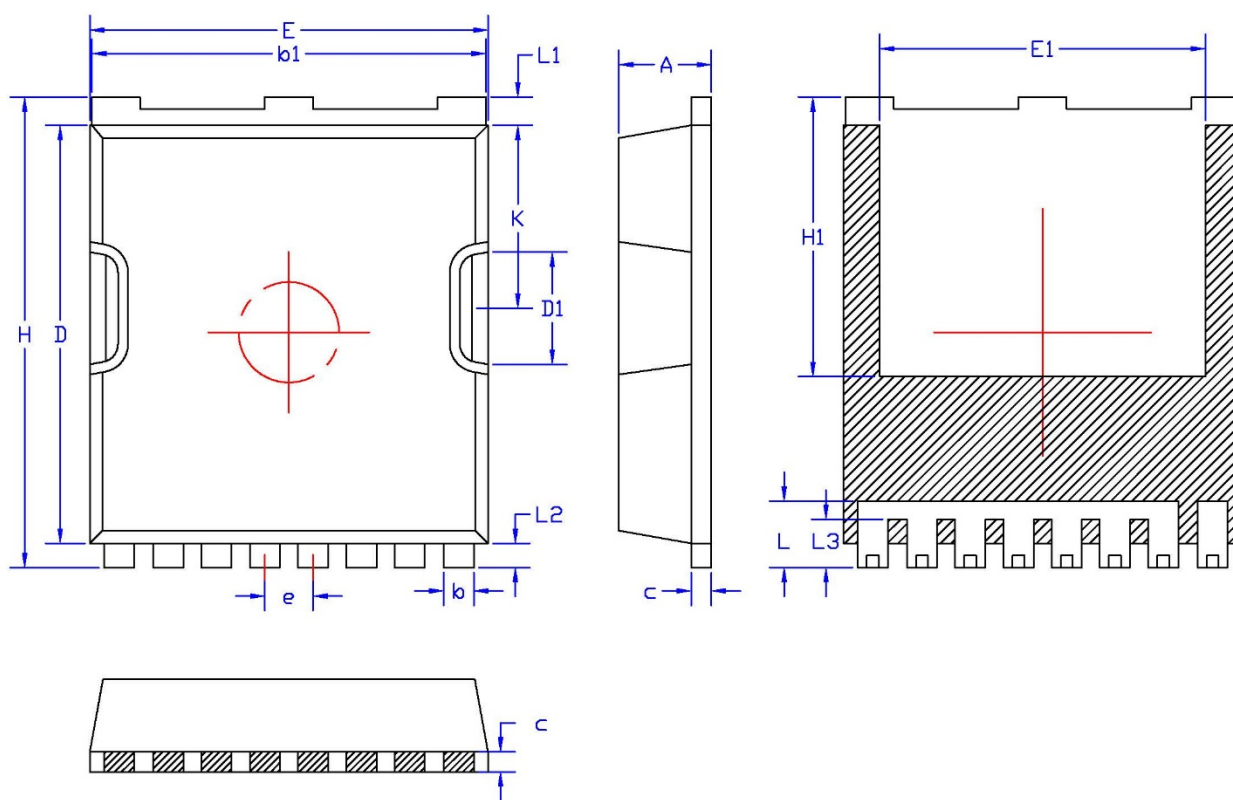
Fig4. Diode Recovery Switching Test Circuit & Waveform



●Dimensions (TOLL)

Unit: mm

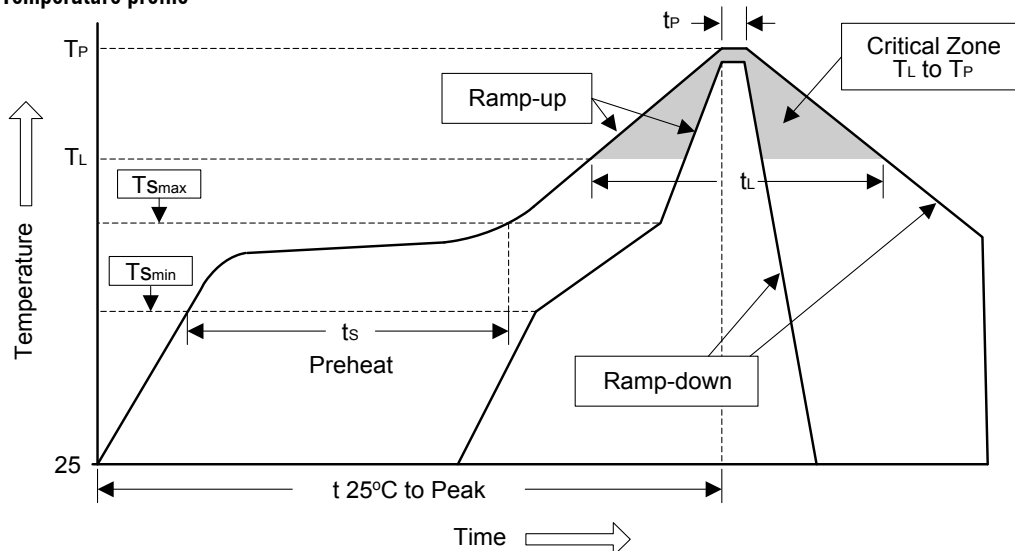
SYMBOL	min	max	SYMBOL	min	max
A	2.15	2.45	e	1.20BSC	
b	0.60	0.80	K	4.40	4.60
b1	9.70	9.90	L	1.50	1.90
c	0.45	0.75	L1	0.60	0.80
D	10.30	10.50	L2	0.50	0.70
D1	3.10	3.50	H	11.60	11.80
E	9.70	10.10	H1	6.80	7.10
E1	8.00	9.00			



• Soldering Methods for Lihomicro's Products

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (T_{Smin})	100°C	150°C
- Temperature Max (T_{Smax})	150°C	200°C
- Time (min to max) (t_s)	60 to 120 sec	60 to 180 sec
T_{Smax} to T_L		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60 to 150 sec	60 to 150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec