

● General Description

The SGT MOSFET LH070N150 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

● Features

- Extremely low on-resistance $R_{DS(ON)}$
- Excellent On-Resistance
- 100% Avalanche Tested

● Application

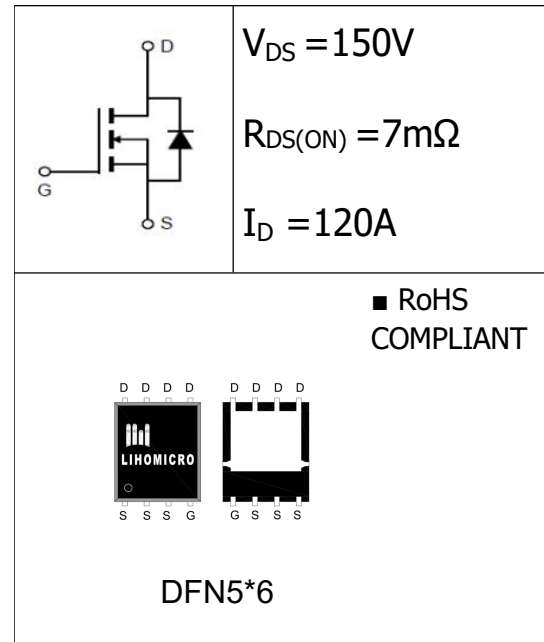
- PD Charger
- Battery management
- UPS

● Ordering Information:

Part number	LH070N150
Package	DFN5*6
Basic ordering unit (pcs)	5000
Normal Package Material Ordering Code	LH070N150N-DFN5*6-TAP
Halogen Free Ordering Code	LH070N150N-DFN5*6-TAP-HF

● Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_{D@T_C = 25^\circ\text{C}}$	120	A
	$I_{D@T_C = 100^\circ\text{C}}$	98	
Pulsed Drain Current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	I_D pulse	480	A
Total Power Dissipation($T_C=25^\circ\text{C}$)	P_{tot}	227	W
Single Pulse Avalanche Energy	E_{AS}^1	562	mJ
Operating Junction Temperature	T_J	$-55...+150$	$^\circ\text{C}$
Storage Temperature	T_{STG}	$-55...+150$	$^\circ\text{C}$



●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	150			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	2	3	4	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=120V, V_{GS}=0V,$ $T_j=25^\circ C,$ $T_j=125^\circ C$			1	uA
					10	
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		6.2	7.0	mΩ
		$V_{GS}=6V, I_D=20A$		7.8	10.5	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=50A$		91.8		s

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=75V$ $F=1MHz$		4217		pF
Output capacitance	C_{oss}			512		
Reverse transfer capacitance	C_{rss}			15		
Turn -Off Delay Time	$T_d(off)$	$V_{DS}=75V, I_D=100A$ $V_{GS}=10V, R_G=2.7\Omega$ (Note 2,3)		54		ns
Turn-on delay time	$T_d(on)$			11		
Rise time	T_r			107		
Fall time	T_f			102		
Total Gate Charge	Q_g	$I_D=50A, V_{DS}=75V$ $V_{GS}=10V$		63		nC
Gate-to-Source Charge	Q_{gs}			21		
Gate-to-Drain Charge	Q_{gd}			15		
Diode Forward Voltage	V_{SD}	$I_{SD}=50A, V_{GS}=0V$		0.86	1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$I_D=100A, V_{GS}=0V,$ $dI/dt=100A/us;$		100		ns
Body Diode Reverse Recovery Charge	Q_{rr}			451		nC

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}			0.55	°C/W
Thermal resistance, junction - ambient	R_{thJA}			60	°C/W

Notes:

- 1.EAS is tested at starting $T_j = 25^{\circ}\text{C}$, $L = 0.5\text{mH}$, $I_{AS} = 50\text{A}$, $V_{GS} = 10\text{V}$.
- 2.Pulse Test : Pulse Width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3.Essentially independent of operating temperature.

• Typical Characteristics

Fig 1: Output Characteristics

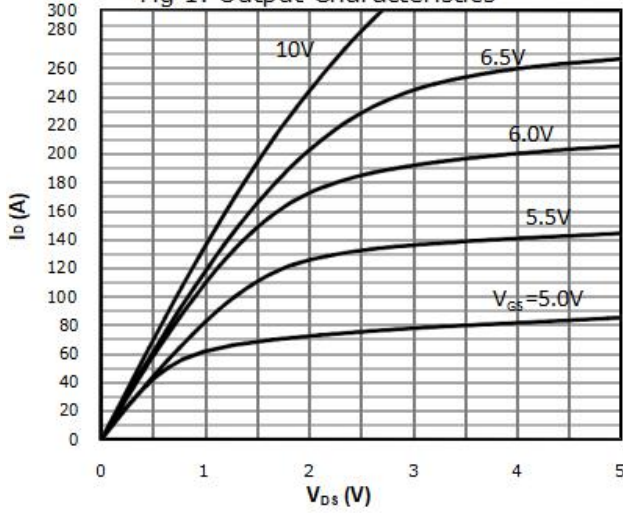


Fig 2: Transfer Characteristics

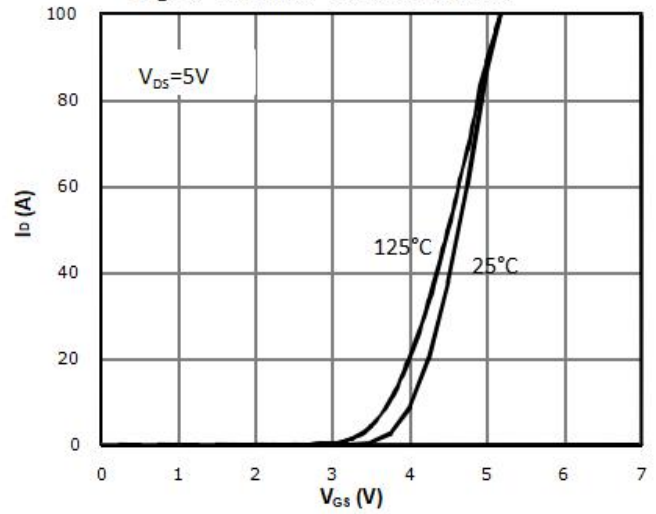


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

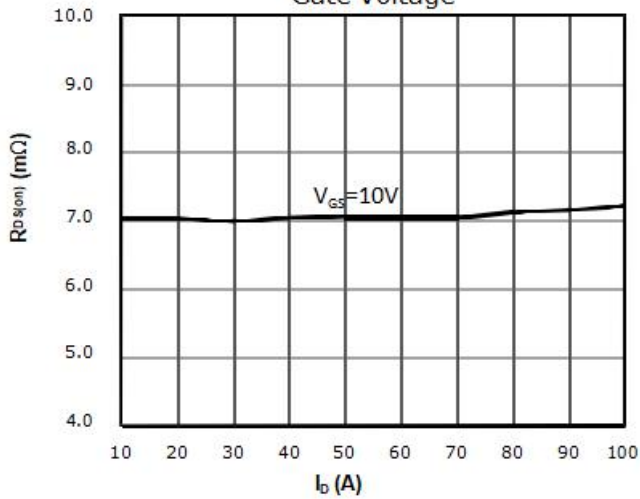


Fig 4: $R_{DS(on)}$ vs Gate Voltage

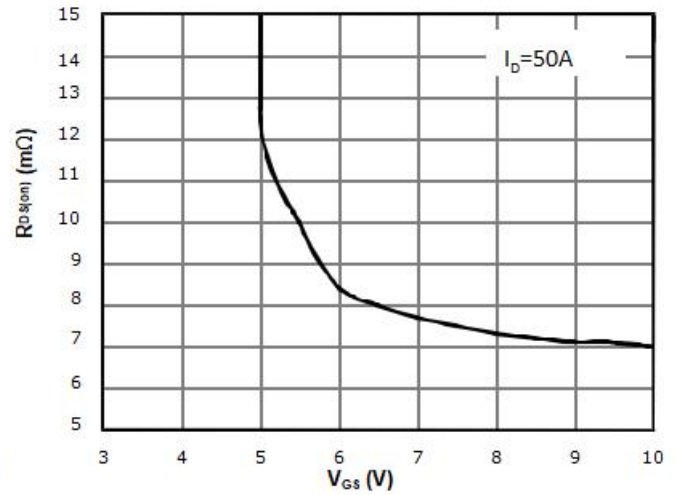


Fig 5: $R_{DS(on)}$ vs. Temperature

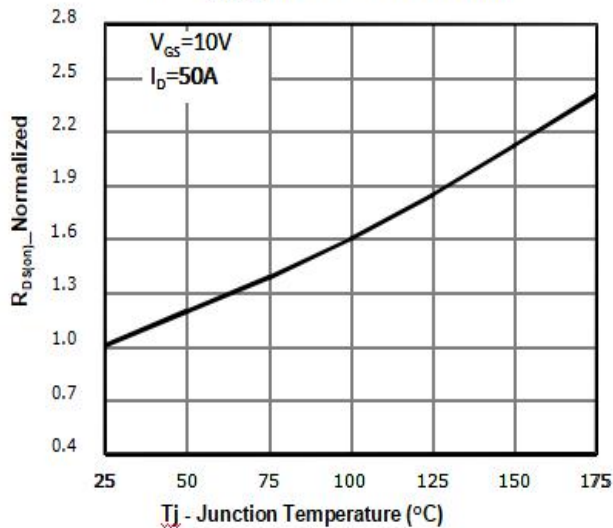
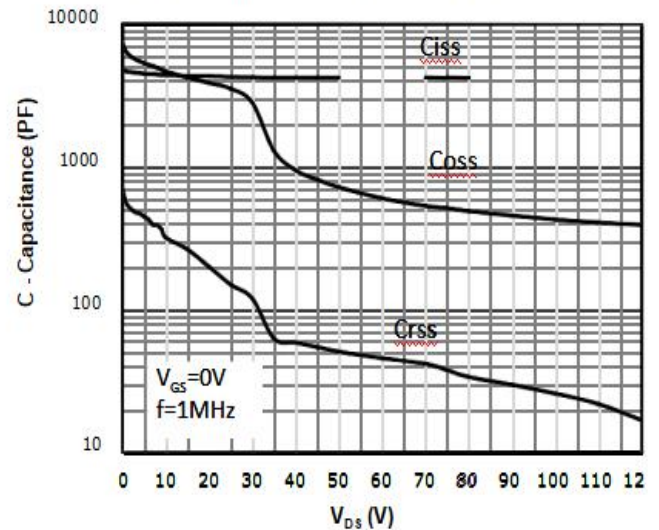


Fig 6: Capacitance Characteristics



● Typical Characteristics(cont.)

Fig 7: Gate Charge Characteristics

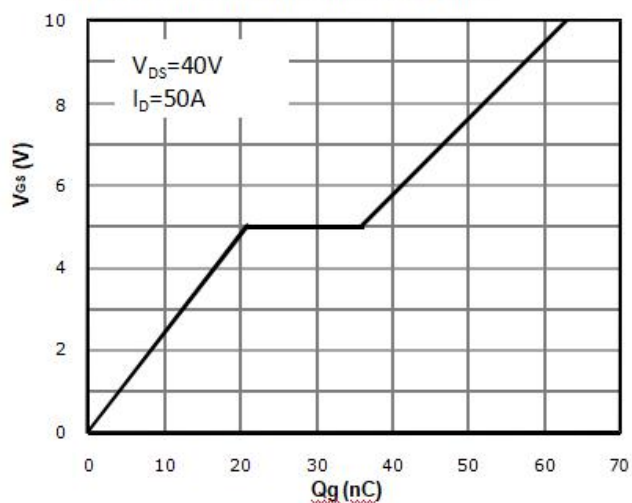


Fig 8: Body-diode Forward Characteristics

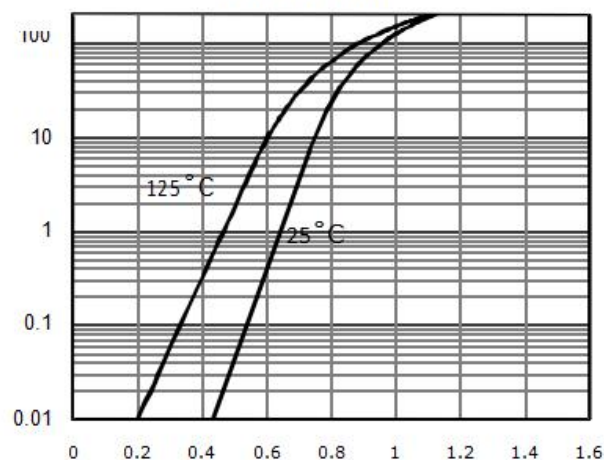


Fig 9: Power Dissipation

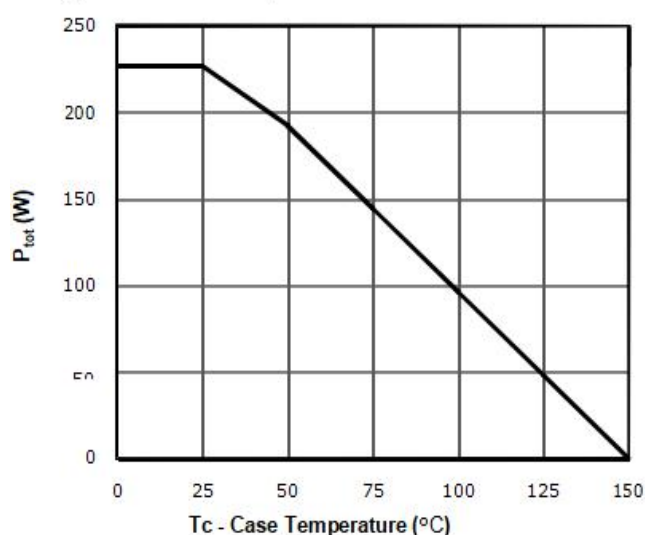


Fig 10: Drain Current Derating

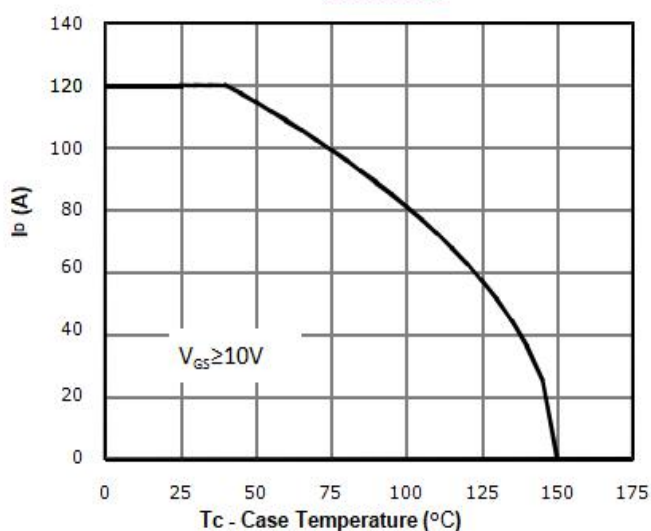
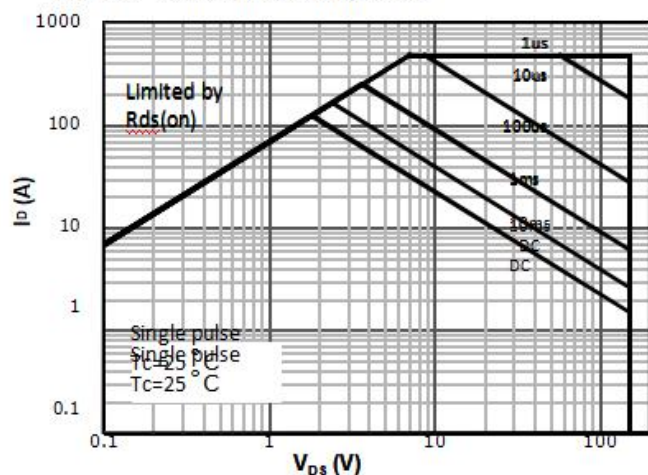
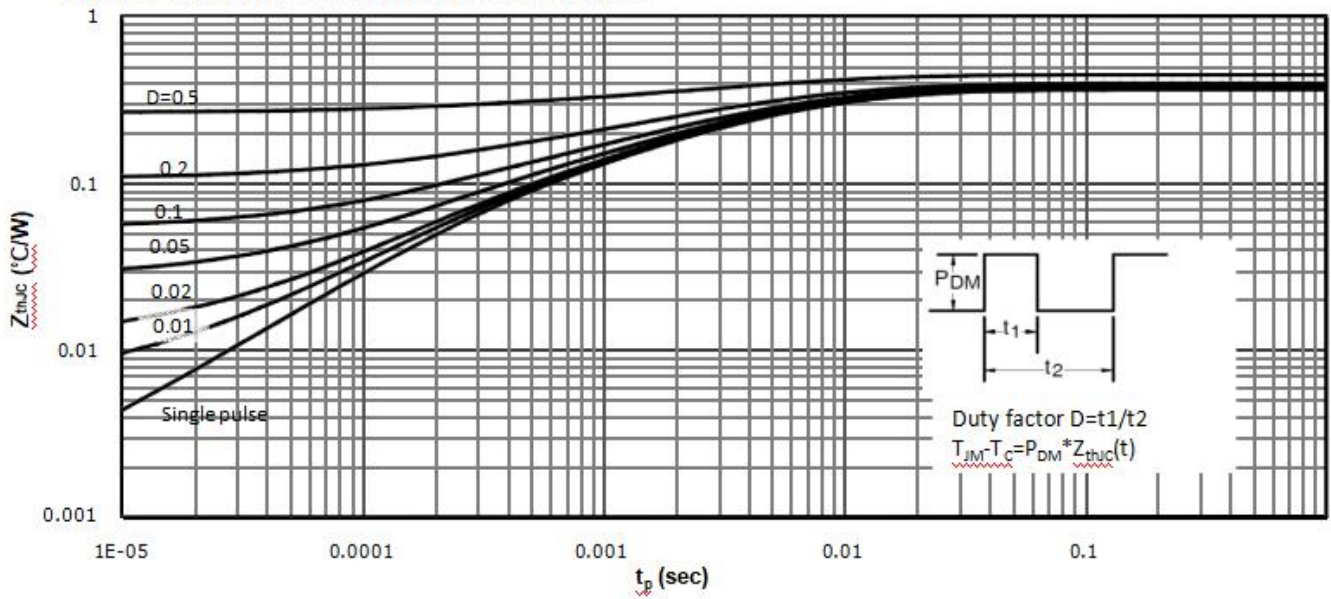


Fig 11: Safe Operating Area



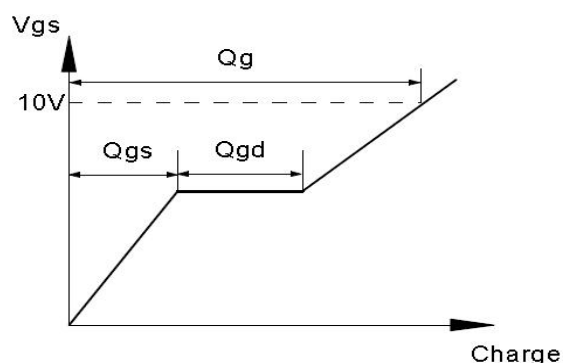
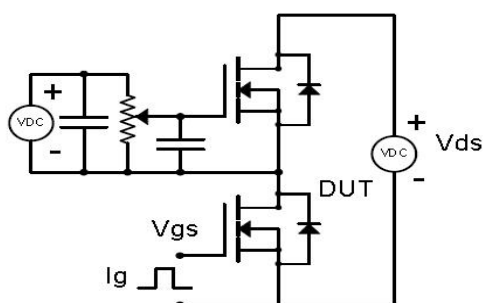
• Typical Characteristics(cont.)

Fig 12: Max. Transient Thermal Impedance

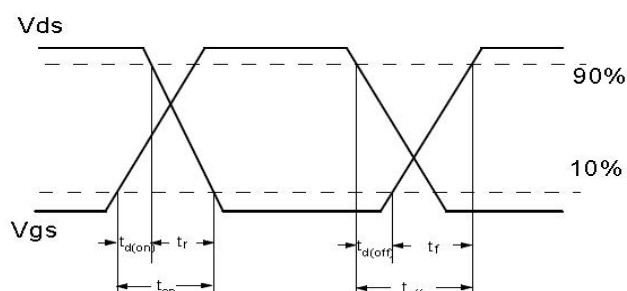
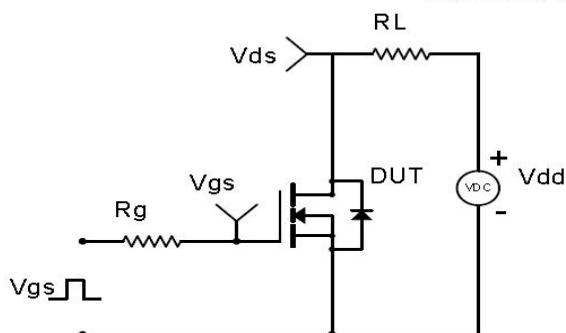


● Test Circuit&Waves

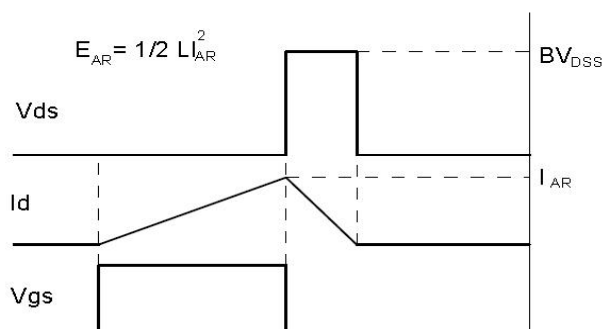
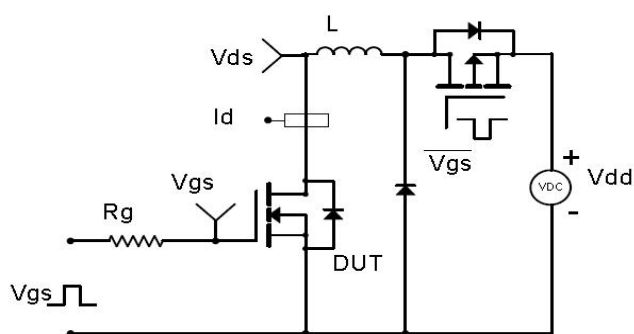
Gate Charge Test Circuit & Waveform



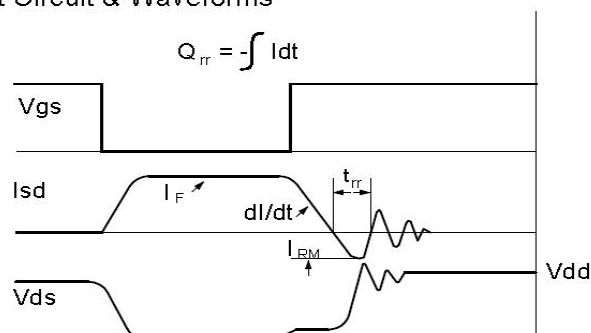
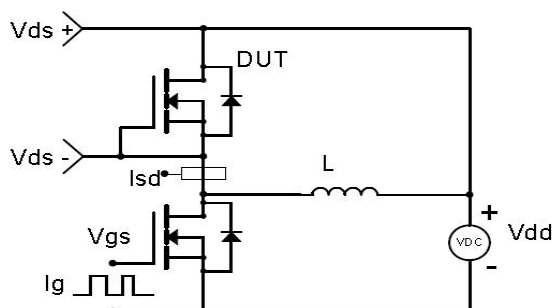
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



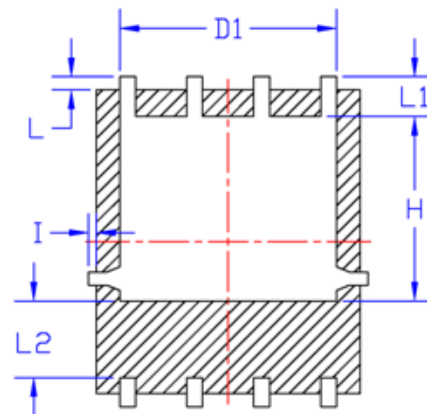
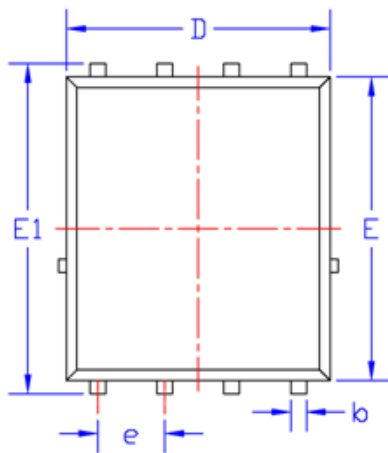
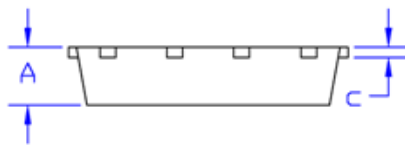
Diode Recovery Test Circuit & Waveforms



• **Dimensions (DFN5*6)**

Unit: mm

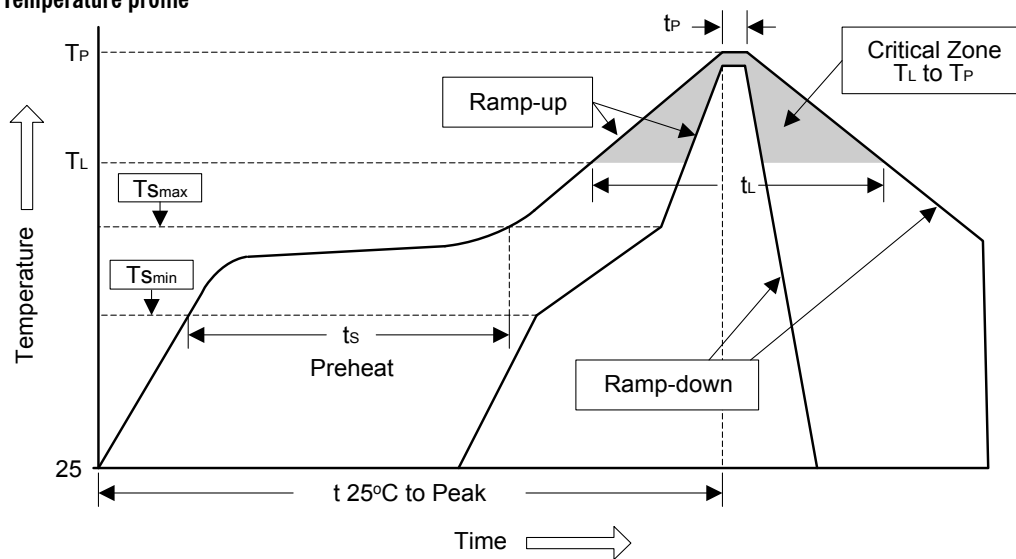
SYMBOL	min	max	SYMBOL	min	max
A	1.00	1.20	e	1.27BSC	
b	0.30	0.50	L	0.05	0.30
c	0.20	0.30	L1	0.40	0.80
D	4.80	5.20	L2	1.20	2.00
D1	3.90	4.30	H	3.30	3.80
E	5.50	5.90	I	—	0.18
E1	5.90	6.40			



• Soldering Methods for Lihomicro's Products

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
2. Molder Plastic: UL Flammability Classification Rating 94V-0
3. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



● Classification Reflow Profiles

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) (ts)	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

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

● Reliability Test Program

Testitem	Method	Description
Solderability	JESD-22,B102	5sec , 245°C
Holt	JESD-22,A108	1000Hrs,Bias@125°C
PCT	JESD-22,A102	168Hrs,100%RH,2atm,121°C
TCT	JESD-22,A104	500Cycles, -65°C ~150°C