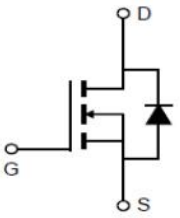
•General Description

The N-Channel MOSFET LH043N150 has the low $R_{DS(on)}$,low gate charge,fast switching and excellent avalanche characteristics.This device is suitable for fast charge and lighting.



VDS =150V

$R_{DS(ON)}$ =4.5mΩ

ID =150A

■ RoHS COMPLIANT

TO-247

•Features

■Extremely low on-resistance RDS(ON)
■Low Switching Charge
■Fully Characterized Capacitance and Avalance

•Application

■BLDC Motor control and drive
■Power Supplies
■DC/DC Converters

•Ordering Information:

Part Number	LH043N150
Package	TO-247
Basic Ordering Unit (pcs)	450
Normal Package Material Ordering Code	LH043N150T2-TO247-TU
Halogen Free Ordering Code	LH043N150T2-TO247-TU-HF

•Absolute Maximum Ratings（TC =25℃）

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current,T_C = 25°C	I_D	150	A
Pulsed drain current (TC = 25°C, tp limited by Tjmax)[1]	I_D pulse	450	A
Single Pulse Avalanche Energy[2]	E_{AS}	1260	mJ
Power Dissipation(TC=25℃)	P_D	220	W
Operating Temperature	T_J	-55~+150	℃
Storage Temperature	T_{STG}	-55~+150	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	150	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	2.0	3.0	4.0	V
Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=20A	--	4.3	5.2	mΩ
		V_{GS} =6V, I_D=20A	--	5.5	6.8	
Drain-Source Leakage Current	I_{DSS}	V_{DS}=132V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=132V,V_{GS}=0V,T_J=125℃	--	--	10	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20,V_{DS}=0V	--	--	±100	nA
Gate Resistance	Rg	f=1MHz,Open Drain	--	2.5	--	Ω
Forward Transconductance	Gfs	V_{DS}=5V,I_{DS}=50A	--	88	--	S
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 60V f = 1.0MHz	--	8240	--	pF
Output Capacitance	Coss		--	520	--	
Reverse transfer Capacitance	Crss		--	18	--	
Turn-on delay time	Td(on)	V_{DS}=60V V_{GS}=10V, I_D =20A	--	15	--	nS
Rise time	Tr		--	105	--	
Turn -Off Delay Time	Td(off)		--	56	--	
Fall time	Tf		--	97	--	
Total Gate Charge	Qg	I_D =20A, V_{DS} = 60V V_{GS} = 10V	--	68	---	nC
Gate-to-Source Charge	Qgs		--	24	--	
Gate-to-Drain Charge	Qgd		--	15	---	
Continuous Diode Forward Current	I_S	--	--	--	150	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=50A V_{GS} =0V	--	--	1.2	V

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	0.56	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	62.5	℃/W

Notes:

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

2. I_{AS} = 50A, V_{DD} = 60V, L=1mH,R_G = 50Ω,Starting T_J = 25°C

●Typical Characteristics

Fig.1 Output Characteristics

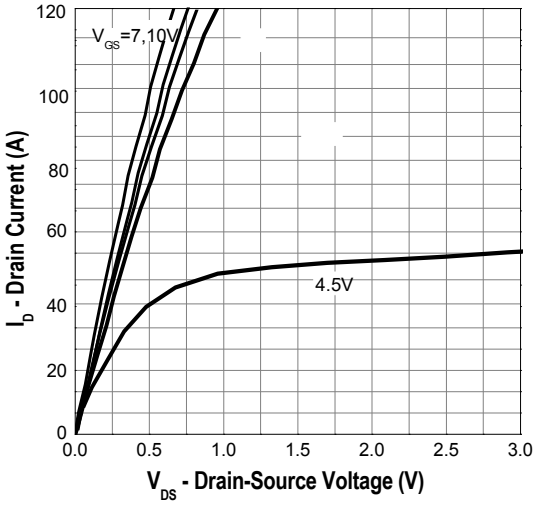


Fig.2 Gate Threshold Voltage

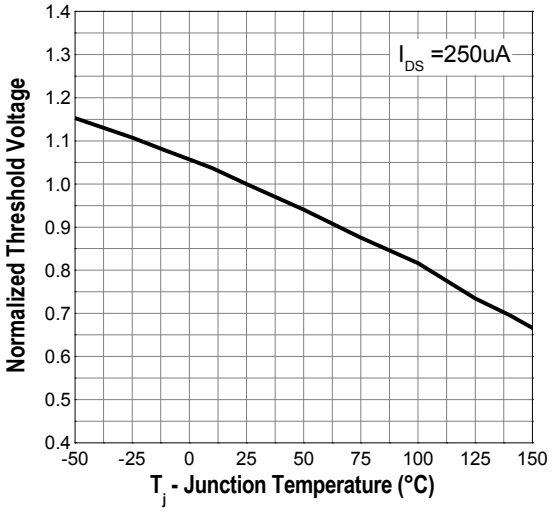


Fig.3 Gate-Source On Resistance

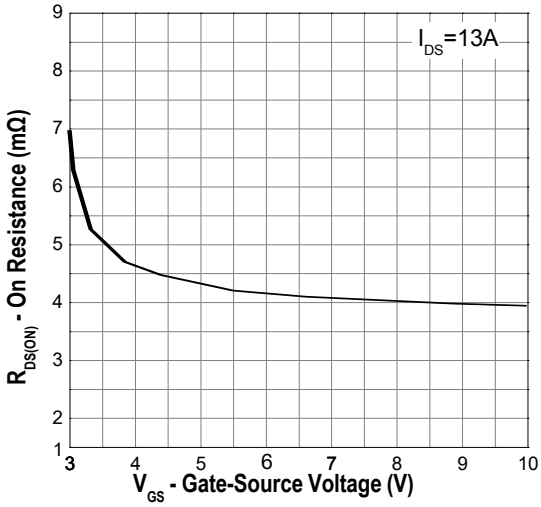


Fig.4 Drain-Source On Resistance

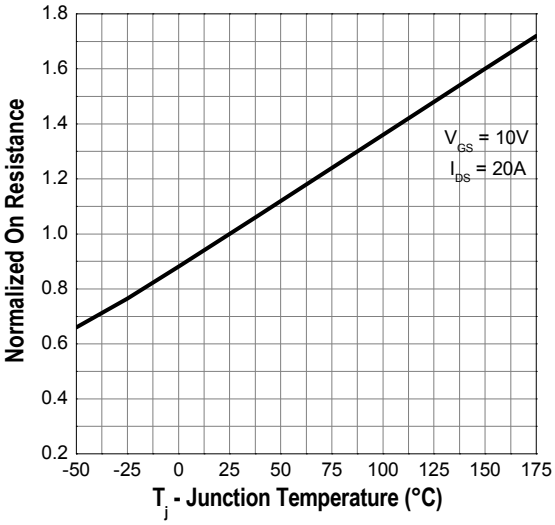


Fig.5 Dource-Drain Forward Characteristics

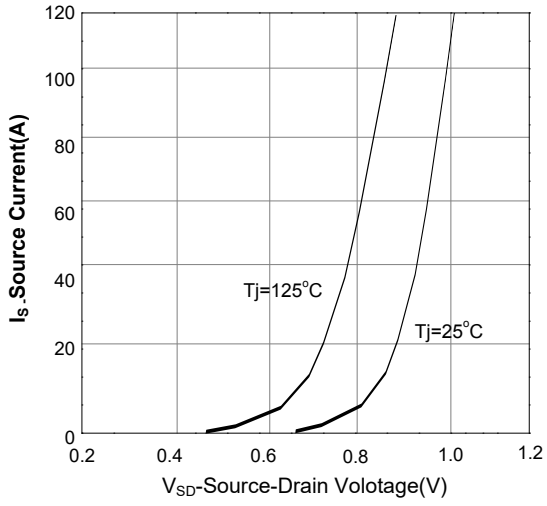
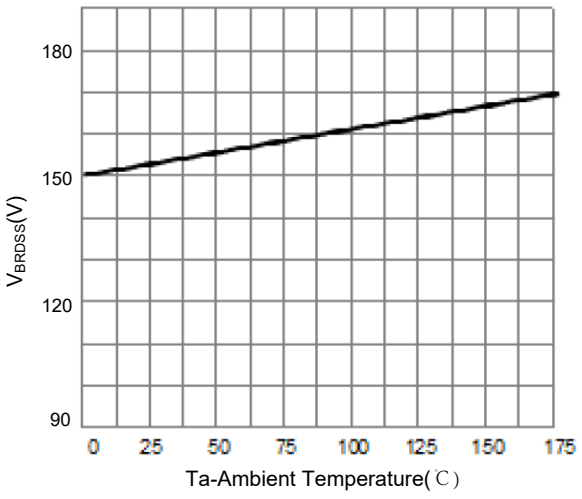


Fig.6 Drain-Source Breakdown Voltage



●Typical Characteristics(cont.)

Fig.7 Power Dissipation

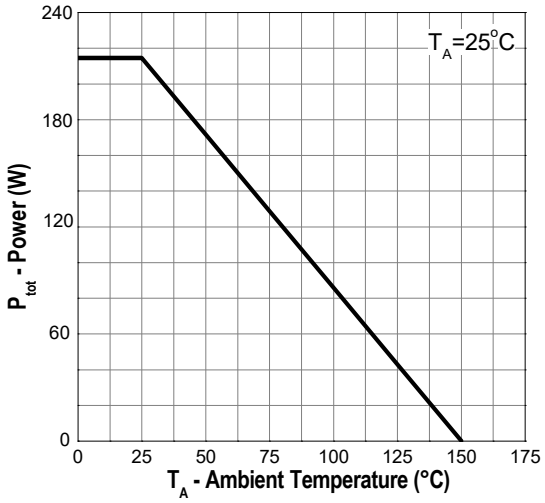


Fig.8 Drain Current

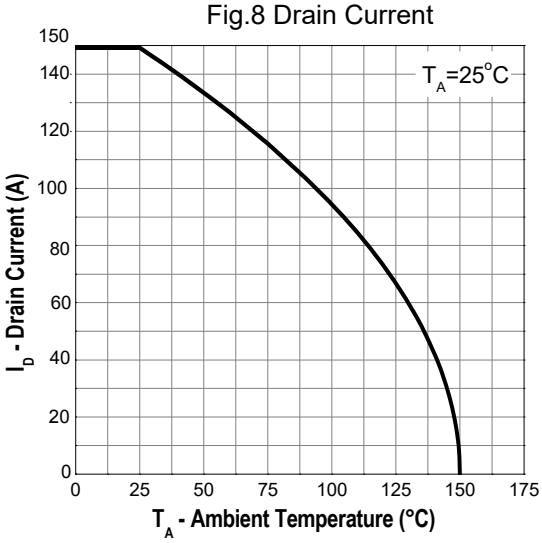


Fig.11 Capacitance

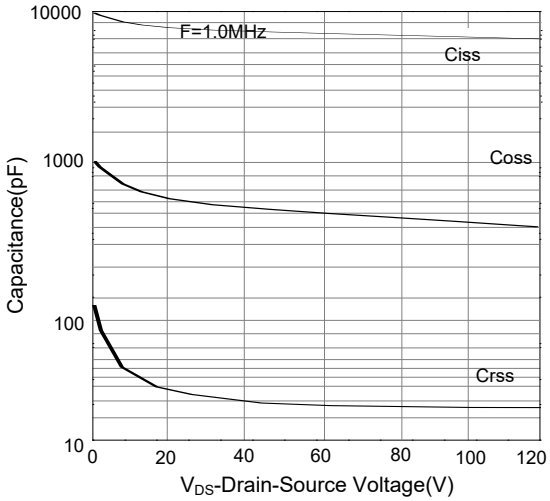


Fig.12 Gate Charge

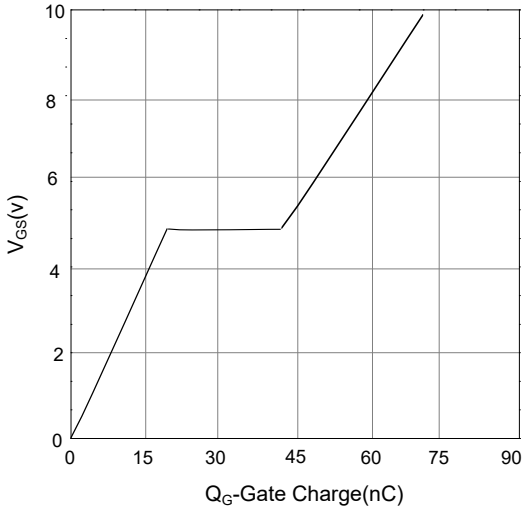


Fig.11 Safe Operation Area

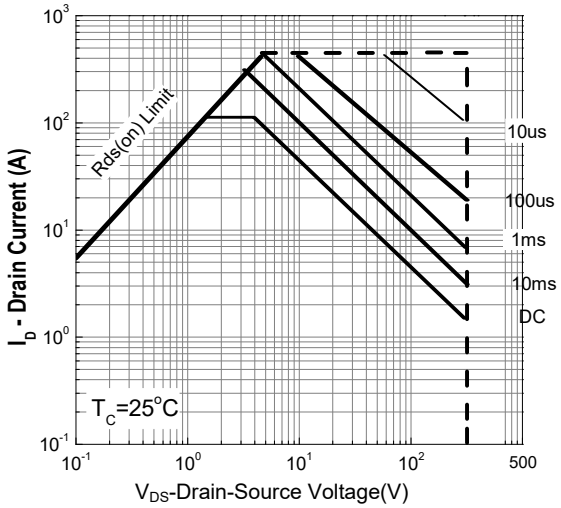
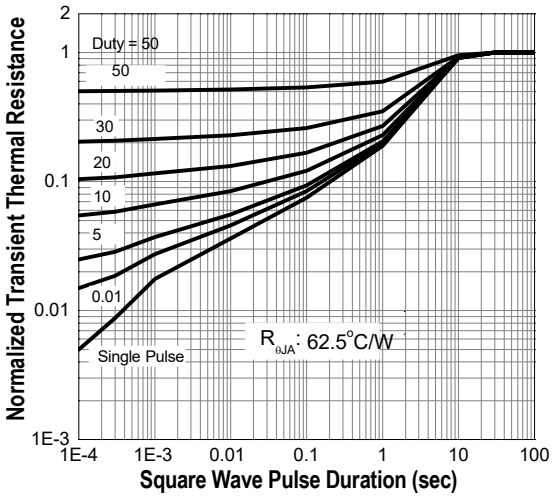
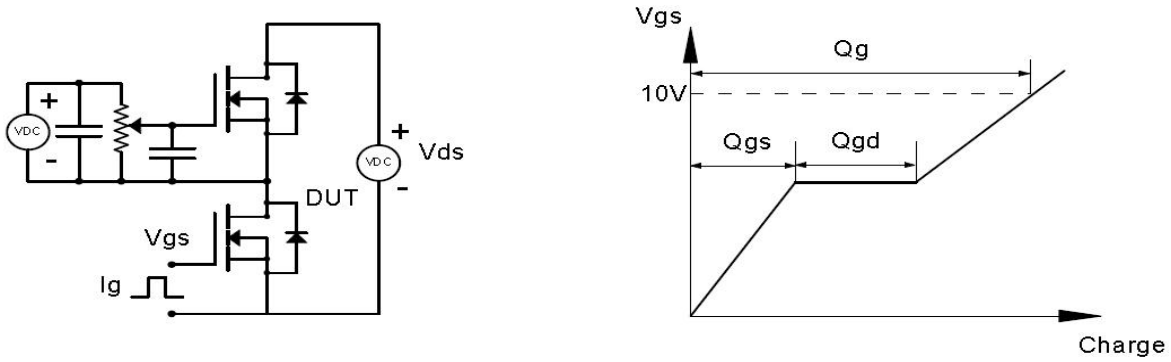


Fig.12 Transient Thermal Impedance

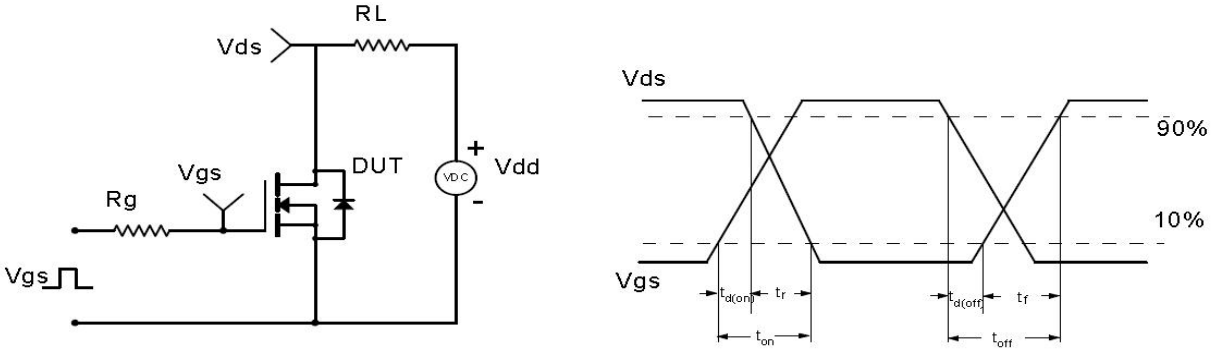


• Test Circuits & Waveforms

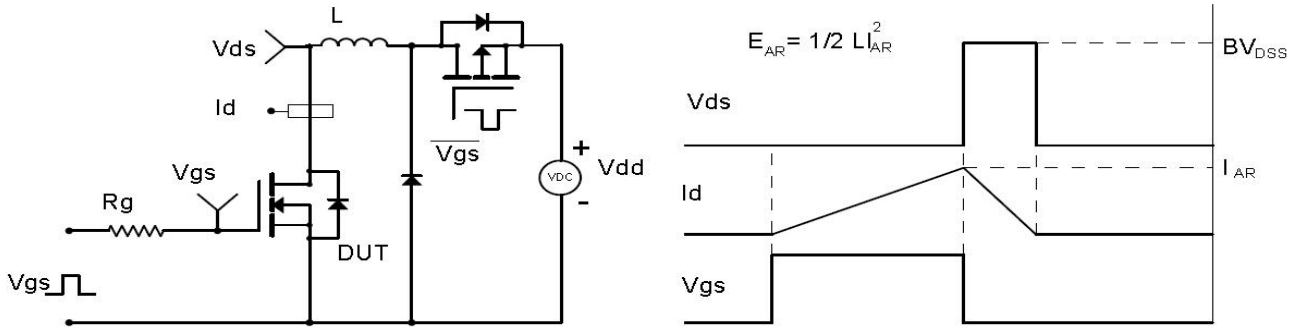
Gate Charge Test Circuit & Waveform



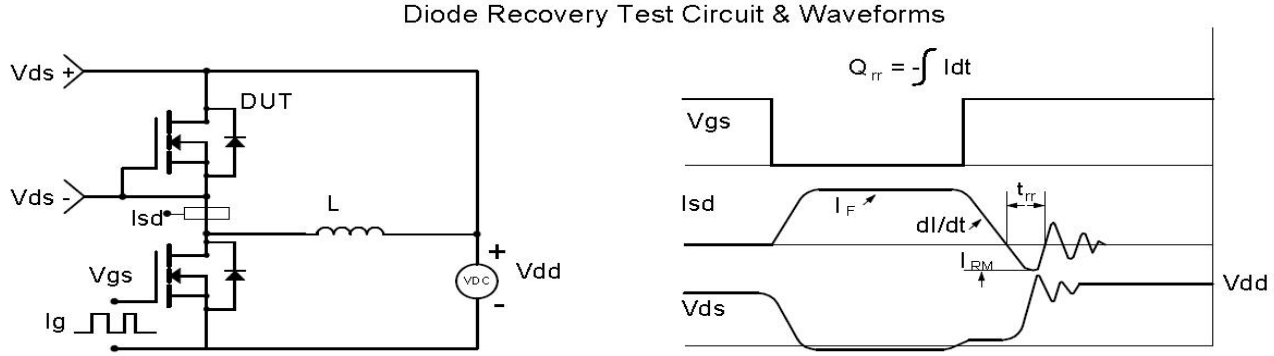
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



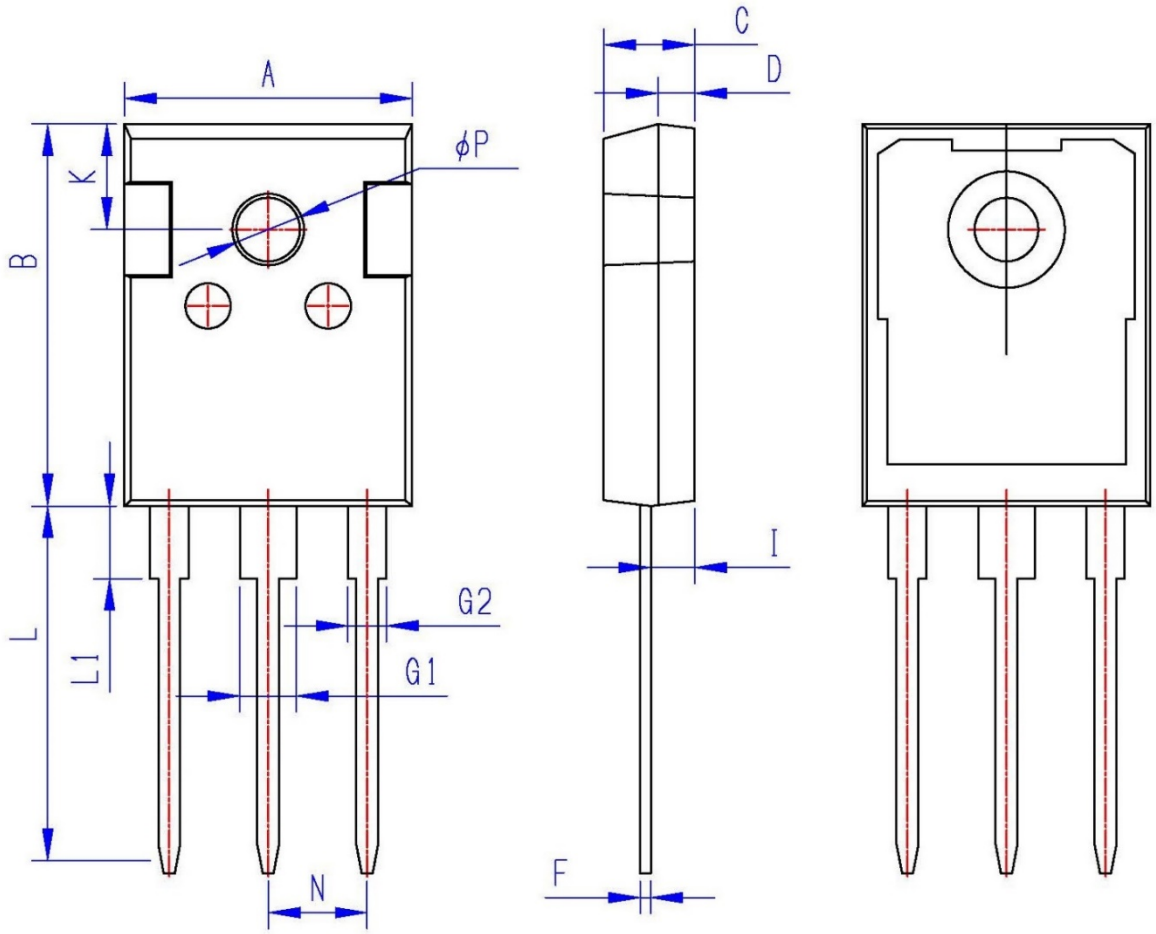
Diode Recovery Test Circuit & Waveforms



●Dimensions (TO-247)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	15.60	16.00	G2	1.95	2.25
B	20.80	21.20	N	5.25	5.65
C	4.85	5.15	L1	4.00	4.30
D	1.85	2.15	L	19.60	20.40
E	1.00	1.40	I	2.30	2.50
F	0.50	0.70	ΦP	3.30	3.70
G1	3.00	3.30			



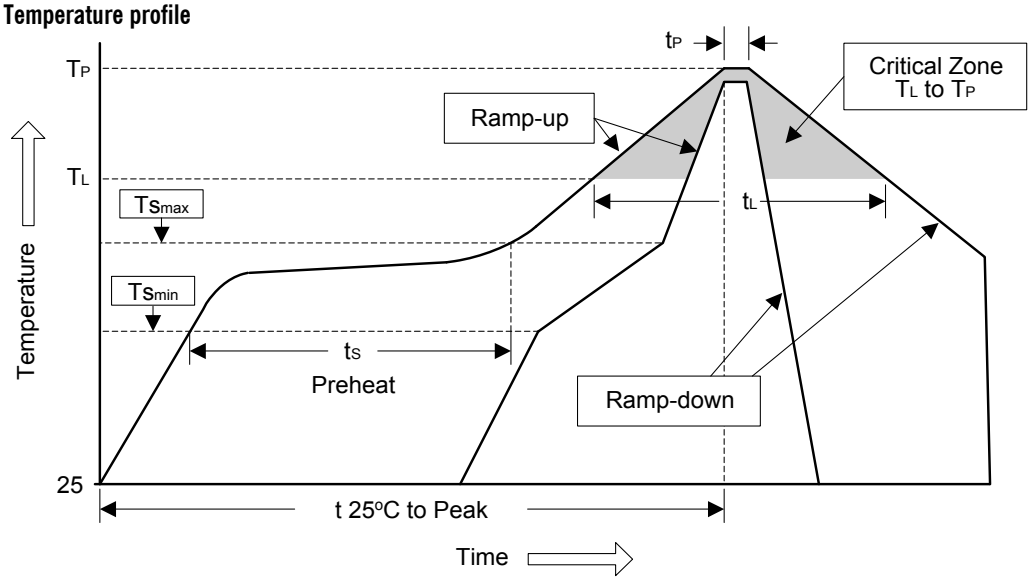
• Soldering Methods for Lihomicro's Products

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 (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60 to 120 sec	 150°C 200°C 60 to 180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60 to 150 sec	 217°C 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
Solderabity	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