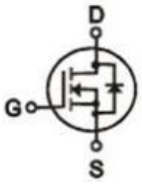
•General Description

The SGT MOSFET LHL40N100 has the low $R_{DS(on)}$, low gate charge,fast switching and excellent avalanche characteristics.This device is suitable for fast charge and lighting.

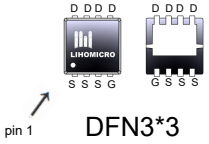


V DS =100V

$R_{DS(ON)}$ =14mΩ

ID =40A

■ RoHS COMPLIANT



DFN3*3

•Features

■Fast switching

■Low $R_{DS(on)}$ & FOM

•Application

■LED/LCD/PDP TV and monitor Lighting

■Power Supplies

•Ordering Information:

Part Number	LHL40N100
Package	DFN3*3
Basic Ordering Unit (pcs)	5000
Normal Package Material Ordering Code	LHL40N100D3-DFN3*3-TAP
Halogen Free Ordering Code	LHL40N100D3-DFN3*3-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 ,T_C = 25°C	I_D	40	A
Pulsed drain current (T_C = 25°C, tp limited by Tjmax)[1]	I_D pulse	120	A
Single Pulse Avalanche Energy[4]	E_{AS}	30	mJ
Power Dissipation(T_C=25℃)[2]	P_D	72	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	100	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	1.0	--	2.5	V
Drain-source On Resistance[3]	$R_{DS(ON)}$	V_{GS} =10V, I_D=20A	--	14	18	mΩ
		V_{GS} =4.5V, I_D=15A	--	19	24	
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=80V,V_{GS}=0V,T_J=85℃	--	--	10	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20,V_{DS}=0V	--	--	±100	nA
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 50V f = 1.0MHz	--	1191	--	pF
Output Capacitance	Coss		--	195	--	
Reverse transfer Capacitance	Crss		--	4.1	--	
Turn-On Delay time	Td(on)	V_{GS} =10V, V_{DS} = 50V, R_G=2.2Ω, I_D=10A	--	17.8	--	nS
Turn -Off Delay Time	Td(off)			33.5		
Turn-On Rise time	Tr		--	3.9	--	
Turn-Off Fall time	Tf		--	3.2	--	
Total Gate Charge	Qg	I_D =10A, V_{DS} = 50V V_{GS} = 10V	--	20	---	nC
Gate-to-Source Charge	Qgs		--	2.4	--	
Gate-to-Drain Charge	Qgd		--	5.3	---	
Continuous Diode Forward Current	I_S	--	--	--	40	A
Pulsed Diode Forward Current	I_{SM}	--	--	--	120	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=8A V_{GS} =0V	--	--	1.3	V
Reverse Recovery Time	Trr	Is=8A, di/dt=100A/uS		51		nS
Reverse Recovery Charge	Qrr			95		nC
Peak Reverse Recovery Current	Irrm			2.5		A

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	1.72	℃/W
Thermal Resistance Junction-ambient[3]	Rth_{JA}	62	℃/W

Notes:

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

2.Pd is based on max. junction temperature,using junction-case thermal resistance.

3.The value of R_{thA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz copper,in a Still air environment with Ta=25°C.

4.V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C.

●Typical Characteristics

Figure 1. Typ. output characteristics

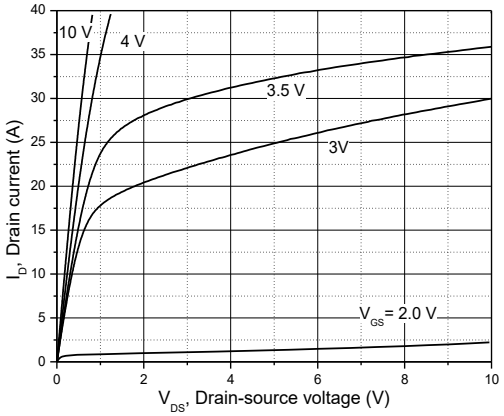


Figure 2. Typ. transfer characteristics

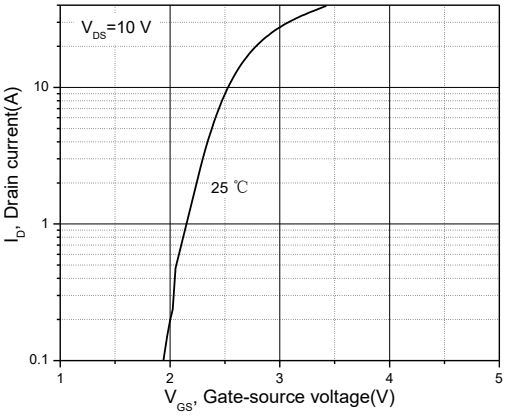


Figure 3. Typ. capacitances

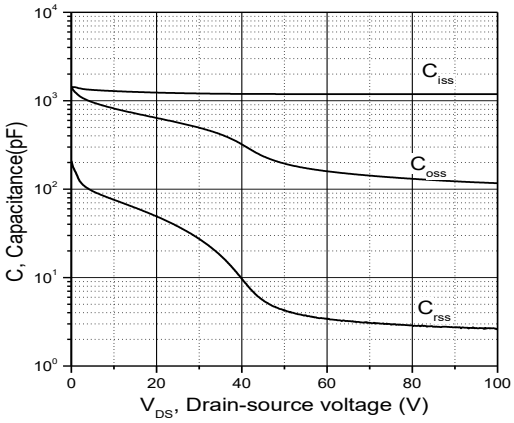


Figure 4.Typ. gate charge

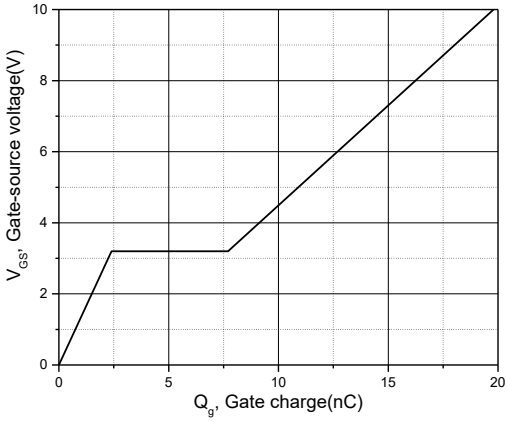


Figure 5. Drain-source breakdown voltage

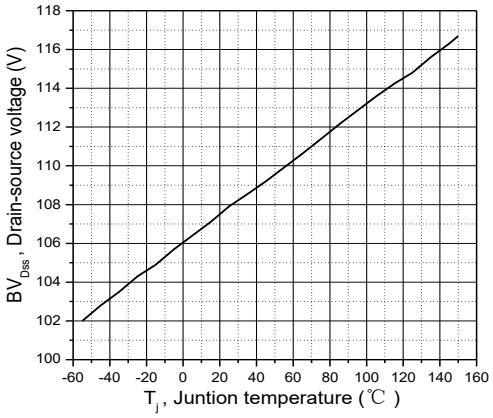
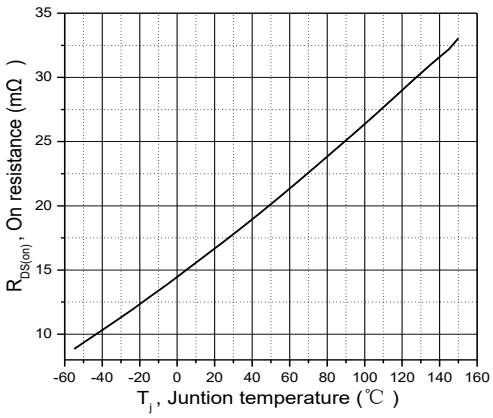


Figure 6. Drain-source on-state resistance



●Typical Characteristics(cont.)

Figure 7. Forward characteristic of body diode

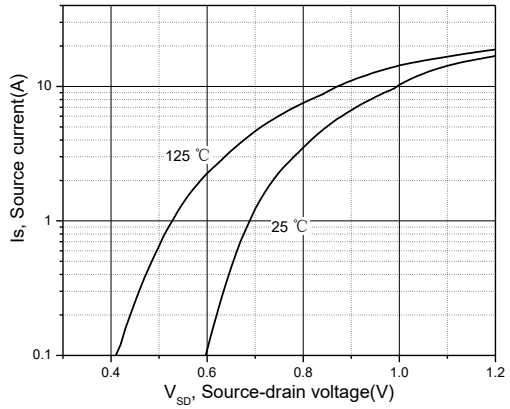


Figure 8. Drain-source on-state resistance

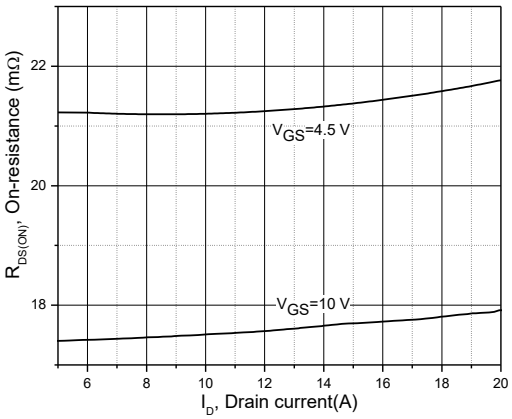
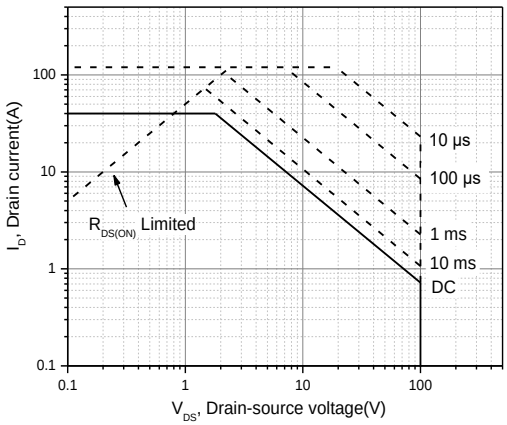


Figure 9. Safe operation area TC=25 ℃



• Test Circiuts & Waveforms

Figure 1. Gate charge test circuit & waveform

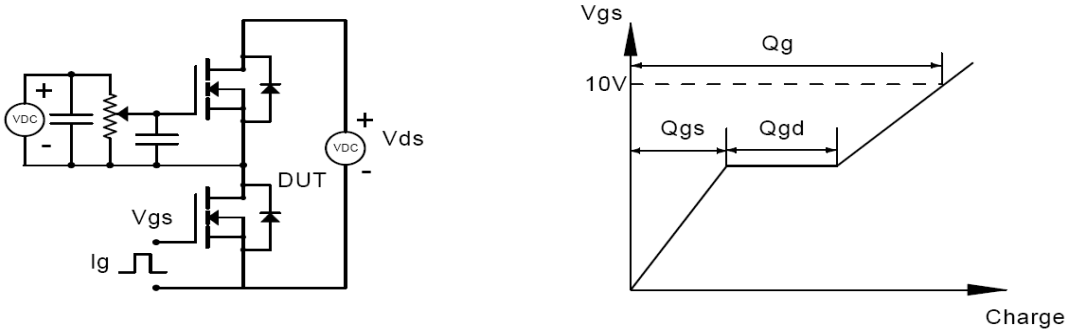


Figure 2. Switching time test circuit & waveforms

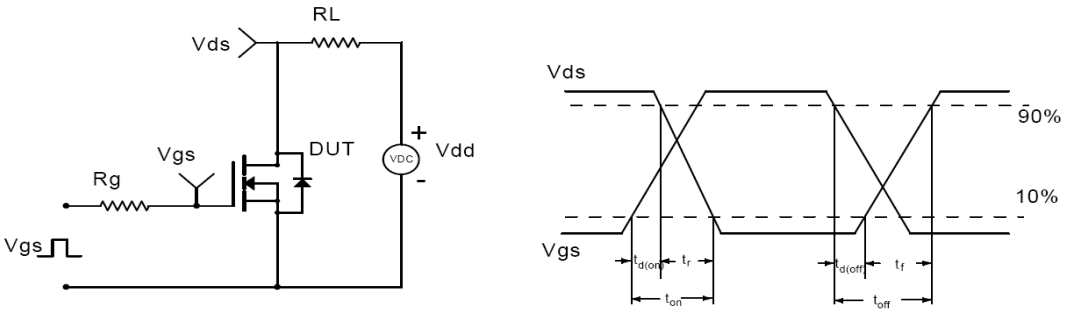


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

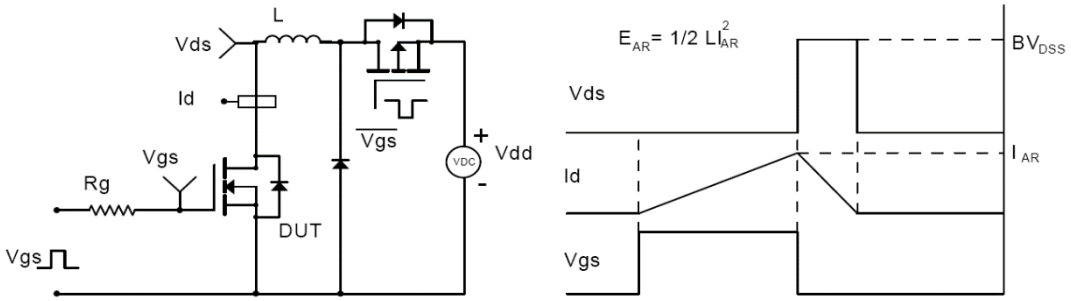
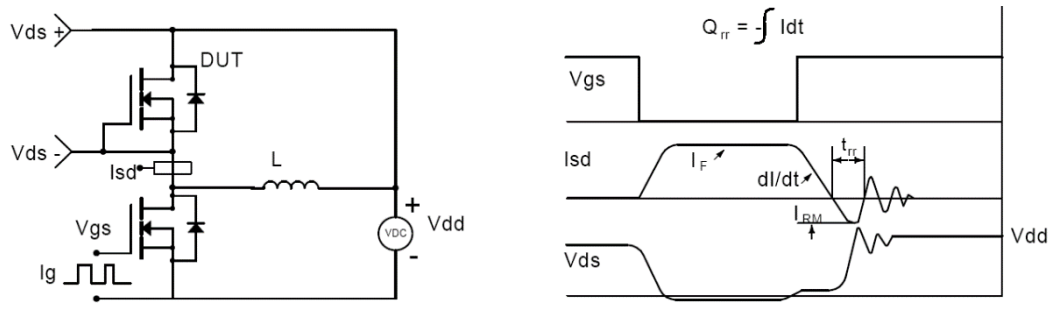


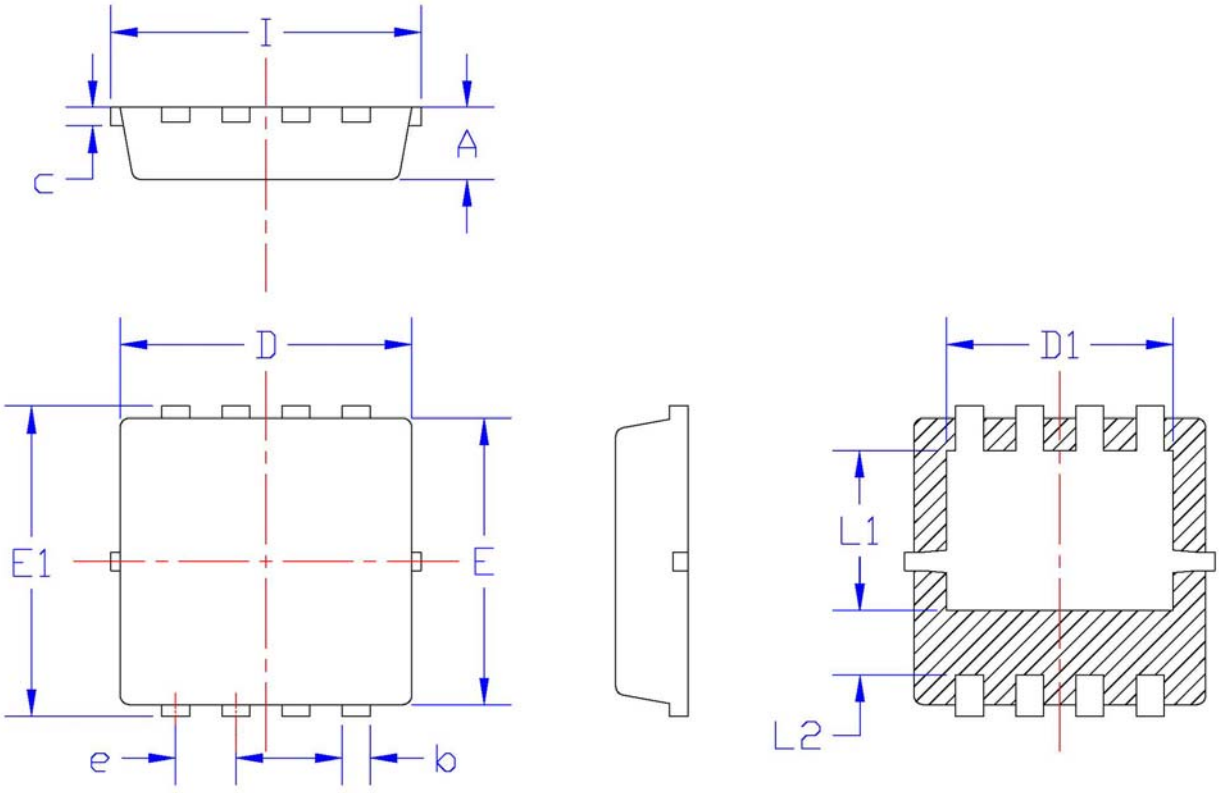
Figure 4. Diode reverse recovery test circuit & waveforms



- **Dimensions（DFN3*3)**

Unit：mm

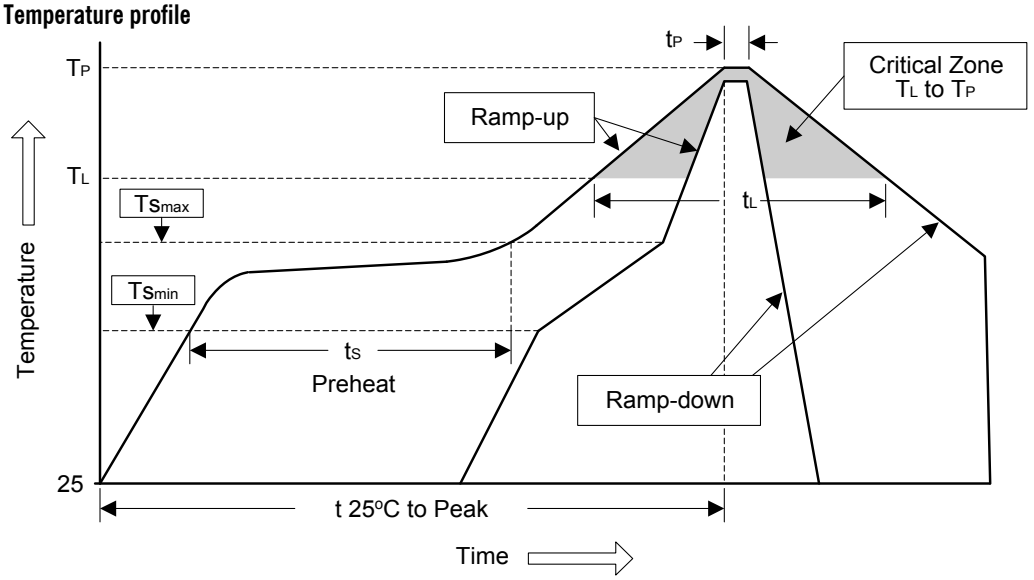
SYMBOL	min	max	SYMBOL	min	max
A	0.68	0.88	e	0.65BSC	
b	0.27	0.47	L1	1.55	1.95
c	0.15	0.35	L2	0.5	0.9
D	3.05	3.25	I	3.10	3.50
D1	2.25	2.65			
E	3.05	3.25			
E1	3.15	3.55			



• Soldering Methods for Silicongear'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 (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

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