

**●General Description**

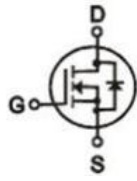

The N-Channel MOSFET LH12N04 has the low  $R_{DS(on)}$ , low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

**●Features**

- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

**●Application**

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- BLDC Motor driver
- POL application

	<b><math>V_{DS} = 40V</math></b>  <b><math>R_{DS(ON)} = 16m\Omega</math></b>  <b><math>I_D = 12A</math></b>
	<b>■ RoHS COMPLIANT</b>
<b>SOP-8</b>	

**●Ordering Information:**

Part Number	LH12N04
Package	SOP-8
Basic Ordering Unit (pcs)	4000
Normal Package Material Ordering Code	LH12N04S-SOP8-TAP
Halogen Free Ordering Code	LH12N04S-SOP8-TAP-HF

**●Absolute Maximum Ratings (TC =25°C)**

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	$BV_{DSS}$	40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current @TA=25°C	$I_D$	12	A
Pulsed drain current <sup>1</sup>	$I_{DM}$	60	A
Avalanche Energy	$E_{AS}$	30	mJ
Power Dissipation <sup>2</sup>	$P_D$	60	W
Power Dissipation @TA=25°C		2.0	
Operating Temperature	$T_J$	-55~+150	°C
Storage Temperature	$T_{STG}$	-55~+150	°C

**●Electronic Characteristics**

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	--	3.0	V
Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7A$	--	13	16	mΩ
		$V_{GS}=4.5V, I_D=6A$	--	18	25	
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=40V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=+20V, V_{DS}=0V$	--	--	+100	nA
Diode Forward Voltage	$V_{sd}$	$V_{DS}=0V, I_{DS}=1.8A$	--	0.8	1.2	V
Input Capacitance	$C_{iss}$	f=1MHz	--	884	--	pF
Output Capacitance	$C_{oss}$		--	124	--	
Reverse Transfer Capacitance	$C_{rss}$		--	39	--	
Total Gate Charge(10V)	$Q_g$	$V_{GS}=4.5V, V_{DS}=20V, I_D=5.7A$	--	11	--	nC
Gate-to-Source Charge	$Q_{gs}$		--	4.9	--	
Gate-to-Drain Charge	$Q_{gd}$		--	4.7	--	

**●Thermal Characteristics**

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case <sup>2</sup>	$R_{thJC}$	1.5	°C/W
Thermal Resistance Junction-ambient	$R_{thJA}$	62.5	°C/W
Soldering temperature, wavesoldering for 10s	$T_{sold}$	265	° C

Notes:

1.Pulse Test : Pulse width  $\leq 300 \mu s$ , Duty cycle  $\leq 2\%$  ;

2.Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

● Typical Characteristics

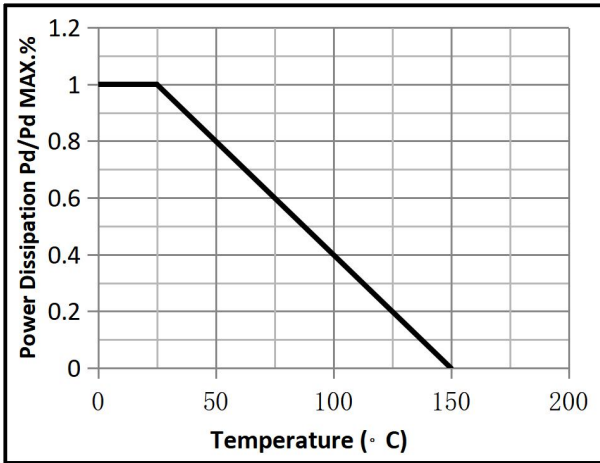


Fig.1 Power Dissipation

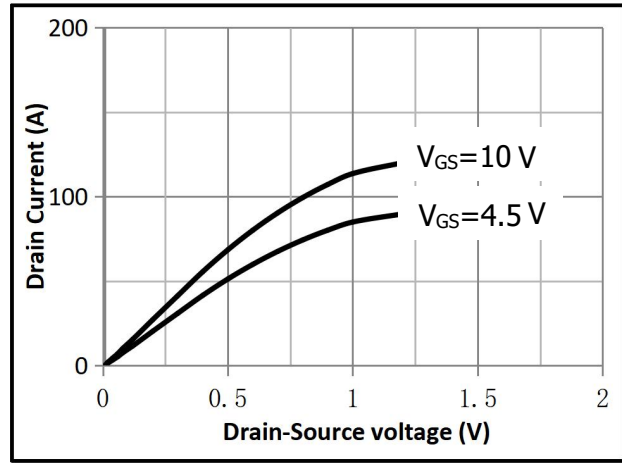


Fig.2 Typical output Characteristics

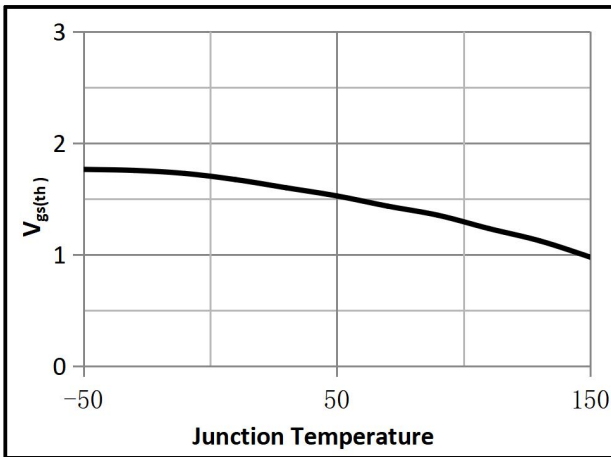


Fig.3 Threshold Voltage V.S Junction Temperature

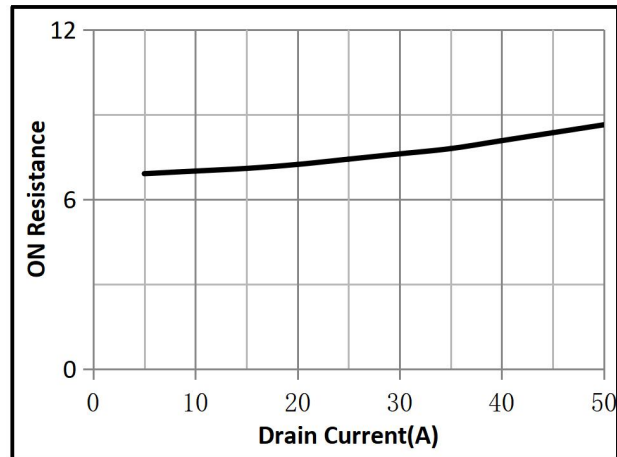


Fig.4 Resistance V.S Drain Current

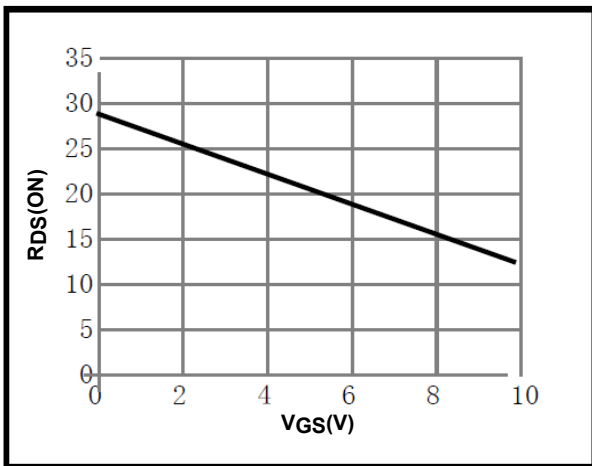


Fig.5 On-Resistance VS Gate Source Voltage

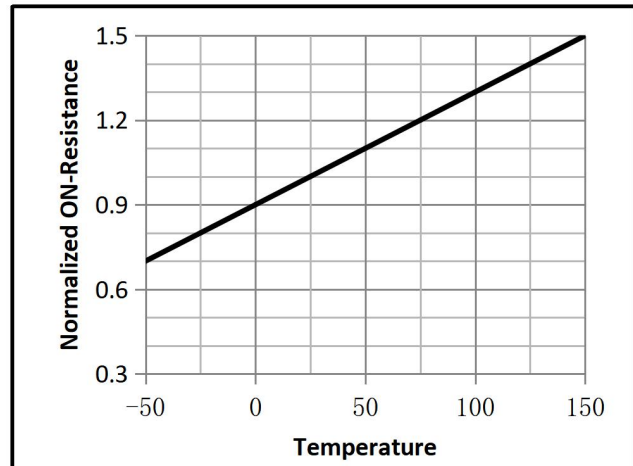


Fig.6 On-Resistance V.S Junction Temperature

• Typical Characteristics(cont.)

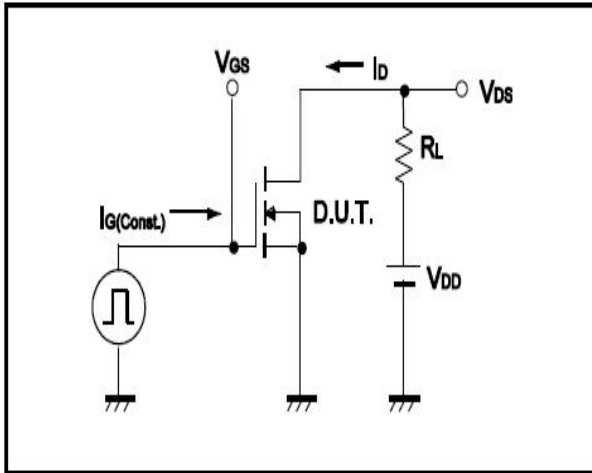


Fig.7 Switching Time Measurement Circuit

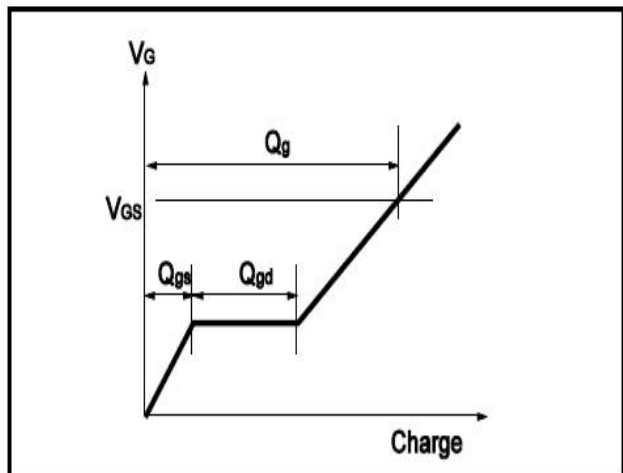


Fig.8 Gate Charge Waveform

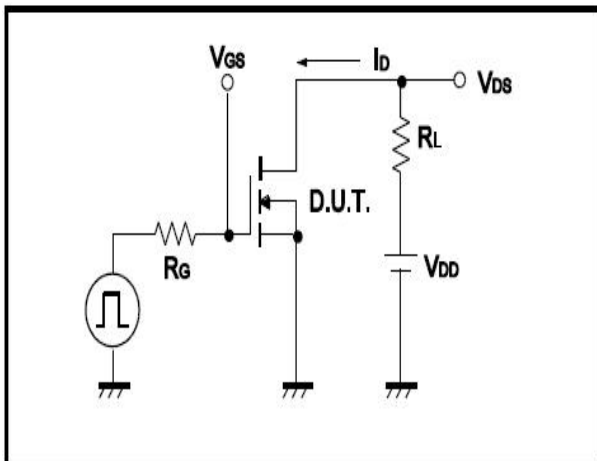


Fig.9 Switching Time Measurement Circuit

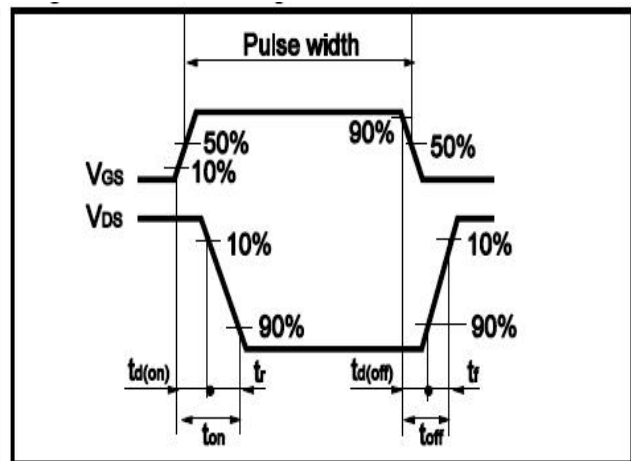


Fig.10 Gate Charge Waveform

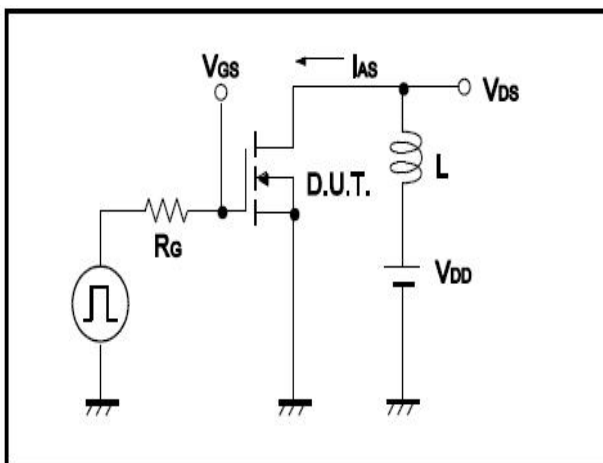


Fig.11 Avalanche Measurement Circuit

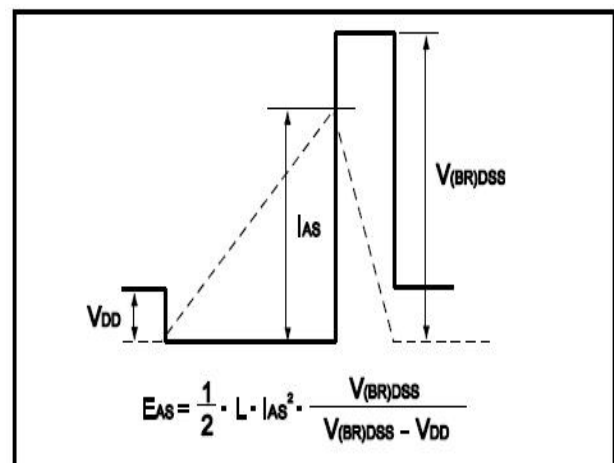


Fig.12 Avalanche Waveform

●Dimensions (SOP-8)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	1.30	1.60	e	1.27BSC	
A1	1.35	1.85	L	0.40	1.30
b	0.30	0.60			
C	0.15	0.35			
D	4.60	5.20			
E	3.70	4.10			
E1	5.70	6.30			

