

•General Description

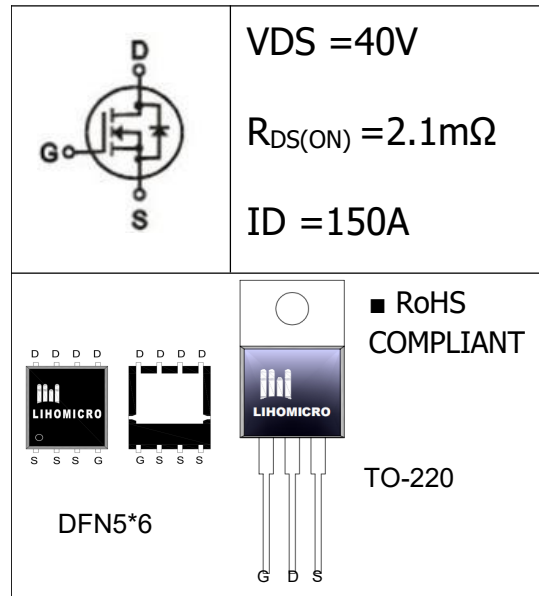
The MOSFET LH021N04 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

•Features

- Fast switching
- Low On-Resistance
- Low Miller Charge
- Low Input Capacitance

•Application

- Lighting
- Power Supplies
- PD Fast Charging


•Ordering Information:

Part Number	LH021N04	LH021N04
Package	DFN5*6	TO-220
Basic Ordering Unit (pcs)	5000	1000
Normal Package Material Ordering Code	LH021N04D-DFN5*6-TAP	LH021N04T-TO220-TU
Halogen Free Ordering Code	LH021N04D-DFN5*6-TAP-HF	LH021N04T-TO220-TU-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 , $T_C = 25^\circ C$	I_D	150		A
Pulsed drain current ($T_C = 25^\circ C$, tp limited by T_{jmax}) ¹	I_D pulse	480		A
Avalanche Current	I_{AS}	63.5		A
Single Pulse Avalanche Energy ²	E_{AS}	280		mJ
Maximum Power Dissipation	$P_D(TC=25^\circ C)$	DFN5*6: 37	TO-220: 53	W
	$P_D(TC=70^\circ C)$	DFN5*6: 58	TO-220: 83	
Operating Temperature	T_J	$-55 \sim +150$		$^\circ C$
Storage Temperature	T_{STG}	$-55 \sim +150$		$^\circ C$

●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	--	2.5	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	--	1.7	2.1	mΩ
		$V_{GS}=4.5V, I_D=15A$	--	2.2	3.0	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	uA
		$V_{DS}=40V, V_{GS}=0V, T_J=85^\circ C$	--	--	10	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=20V$ $f=1.0MHz$	--	4264	--	pF
Output Capacitance	C_{oss}		--	897	--	
Reverse transfer Capacitance	C_{rss}		--	401	--	
Turn-on Delay Time	$T_d(on)$	$V_{DD}=20V$ $V_{GS}=10V,$ $I_D=30A$ $R_G=3.0\Omega$	--	22	--	ns
Turn-on Rise Time	T_R		--	7	--	
Turn -Off Delay Time	$T_d(off)$		--	99	--	
Fall Time	T_f		--	18	--	
Total Gate Charge	Q_g	$I_D=30A,$ $V_{DS}=20V$ $V_{GS}=10V$	--	79.5	---	nC
Gate-to-Source Charge	Q_{gs}		--	23.2	--	
Gate-to-Drain Charge	Q_{gd}		--	4.89	---	
Continuous Diode Forward Current	I_S	--	--	--	150	A
Diode Forward Voltage	V_{SD}	$T_J=25^\circ C, I_S=1A$ $V_{GS}=0V$	--	--	1.3	V
Reverse Recovery Time	t_{rr}	$I_f=30A$ $di_F/dt=100A/\mu s$	--	33	--	nS
Reverse Recovery Charge	Q_{rr}		--	122	--	nC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	1.5	$^\circ C/W$
Thermal Resistance Junction-ambient	R_{thJA}	62	$^\circ C/W$

Notes:

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

2. $I_{AS}=63.5A$, $V_{DD}=20V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

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

• **Typical Characteristics**

Fig1.Output Characteristics

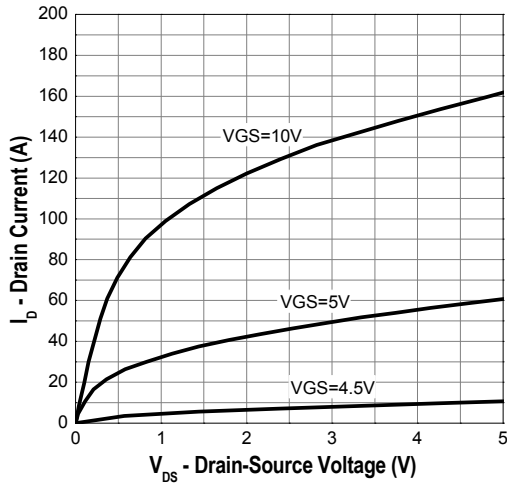


Fig2.Threshold Voltage

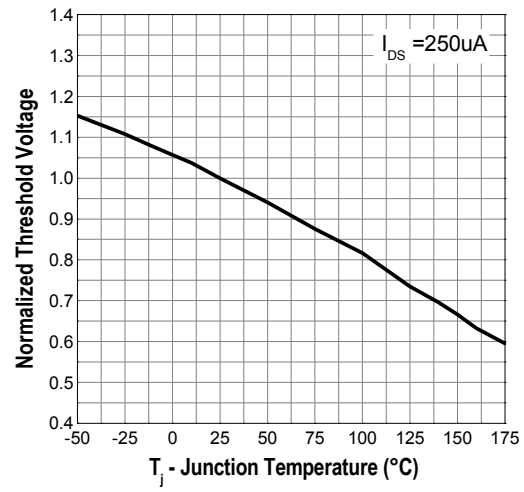


Fig3.Gate-Source On Resistance

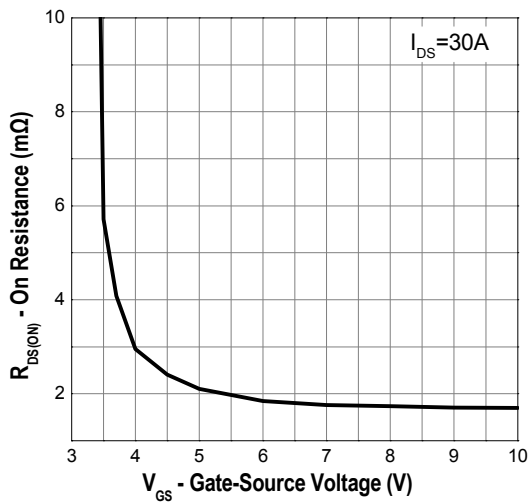


Fig4.Drain-Source On Resistance

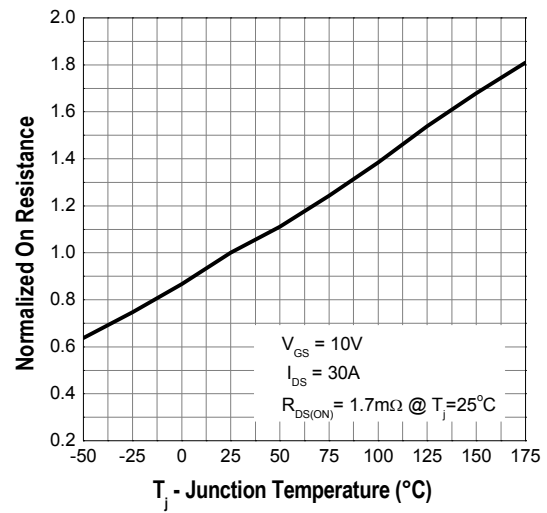


Fig5.Drain-Source On Resistance

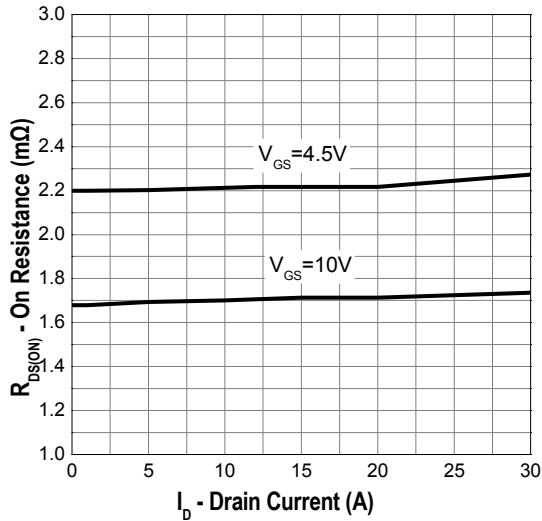
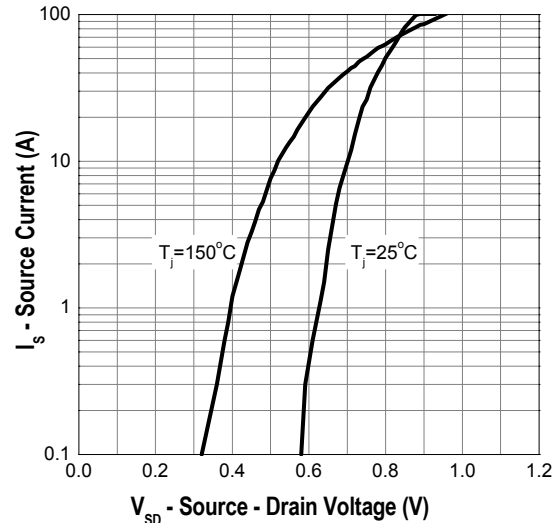


Fig6.Source-Drain Diode Forward



● **Typical Characteristics(cont.)**

Fig7.Power Dissipation

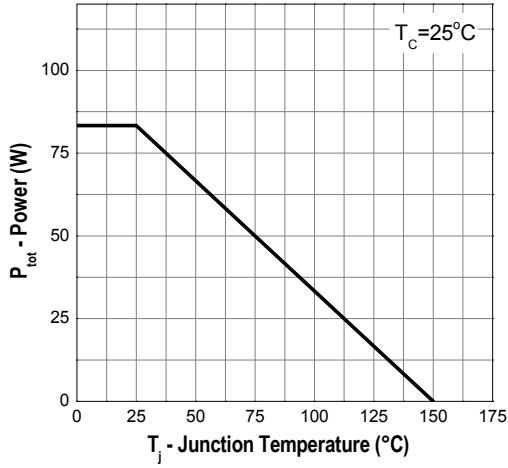


Fig8.Drain Current

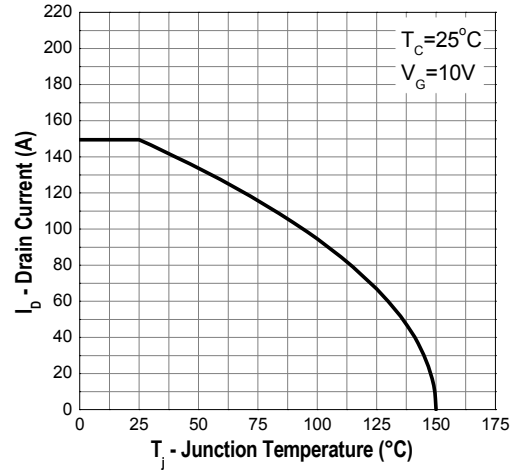


Fig9.Safe Operation Area

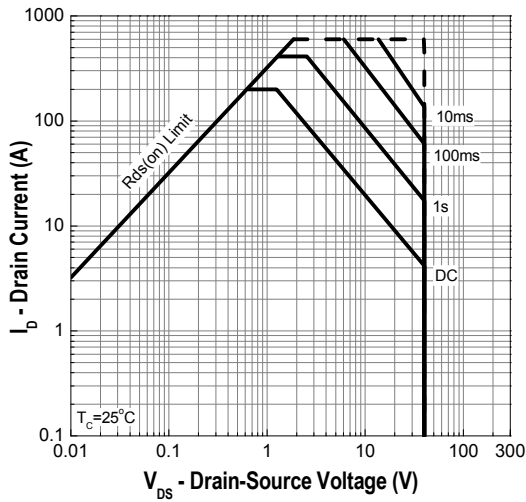


Fig10.Transient Thermal Impedance

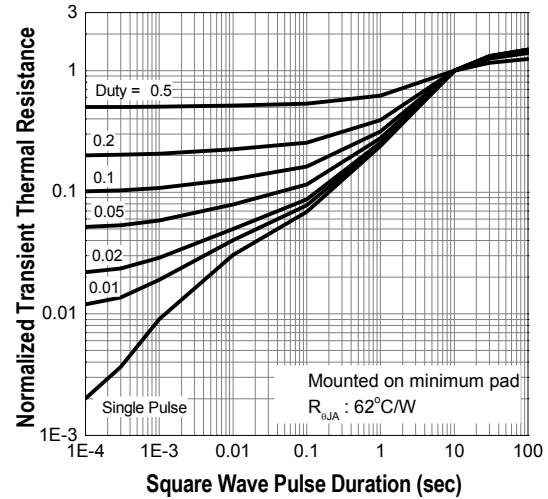


Fig11.Capacitance

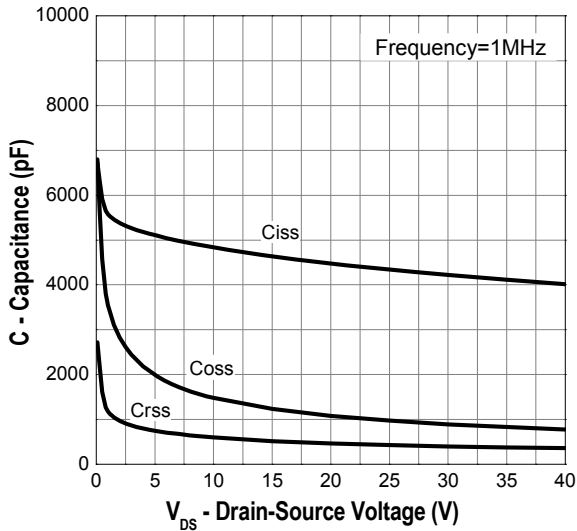
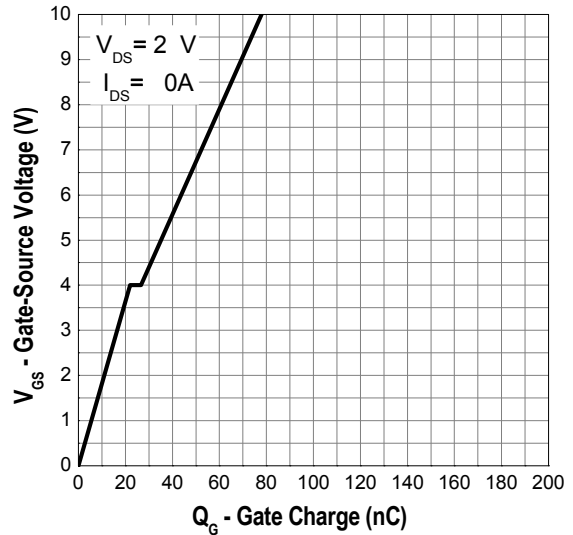


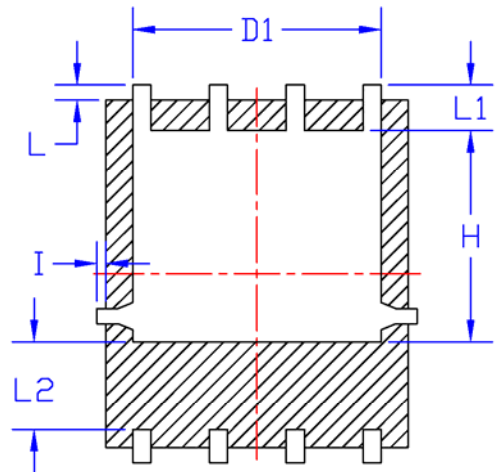
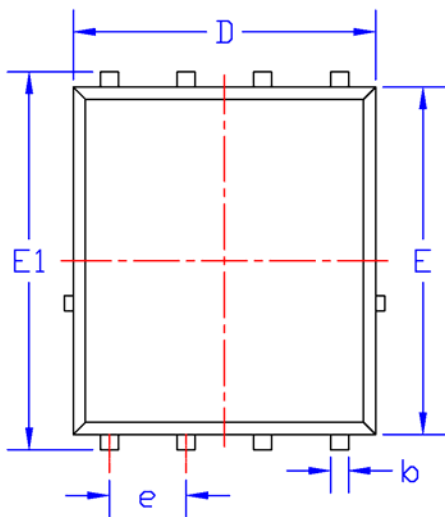
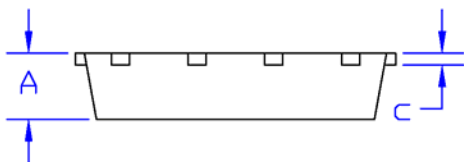
Fig12.Gate Charge



●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			



• Dimensions (TO-220)

UNIT: mm

SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	2.60	3.00
A1	2.30	3.00	e	2.40	2.70
A2	1.20	1.40	e1	4.95	5.25
b	0.60	0.90	L	12.60	14.40
b1	1.10	1.70	L1	2.40	4.00
c	0.40	0.70	∅P	3.50	3.90
D	9.80	10.60			
B	15.20	16.20			

