

**●General Description**

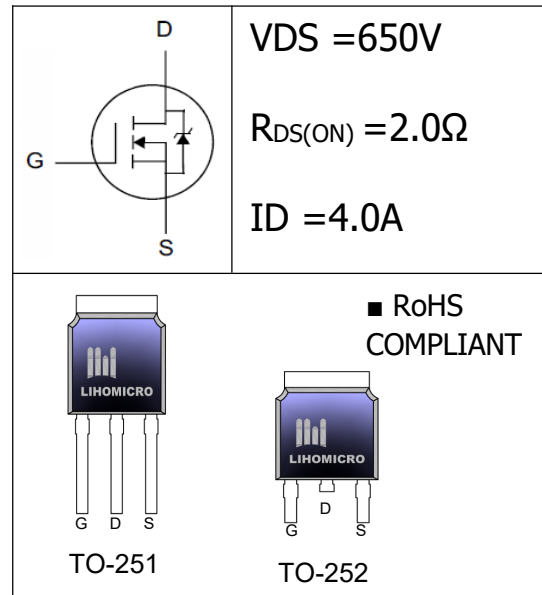
The N-Channel MOSFET LH4N65F has the low  $R_{DS(on)}$ , low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

**●Features**

- Low on-resistance
- Fast switching
- High input resistance
- RoHS compliant

**●Application**

- Electronic ballast
- Electronic transformer
- Switch mode power supply


**●Ordering Information:**

Part Number	LH4N65F	LH4N65F
Package	TO-251	TO-252
Basic Ordering Unit (pcs)	4000	2500
Normal Package Material Ordering Code	LH4N65FT1-TO251-TU	LH4N65FT5-TO252-TAP
Halogen Free Ordering Code	LH4N65FT1-TO251-TU-HF	LH4N65FT5-TO252-TAP-HF

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

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	$BV_{DSS}$	650	V
Gate-Source Voltage	$V_{GS}$	±30	V
Continuous Drain Current	$I_D(T_C=25^\circ C)$	4.0	A
	$I_D(T_C=100^\circ C)$	2.5	
Pulsed drain current <sup>1</sup>	$I_{DM}$	16	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	128	mJ
Power Dissipation( $T_C=25^\circ C$ )	$P_D$	TO-220:104	W
		TO-220F:36	
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	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	650	680	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	--	4.0	V
Drain-source On Resistance <sup>3</sup>	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 2.0A$	--	1.9	2.0	$\Omega$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ C$	--	--	1	$\mu A$
		$V_{DS} = 480V, V_{GS} = 0V, T_J = 125^\circ C$	--	--	10	
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V$	--	--	$\pm 100$	nA
Forward Transconductance <sup>3</sup>	$g_{fs}$	$V_{DS} = 40V, I_D = 2.0A$	--	2.5	--	S
Reverse Diode dv/dt	dv/dt	$I_{SD} \leq 4A, T_J = 25^\circ C$	--	5.5	--	V/ns
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$	--	590	650	$\mu F$
Output Capacitance	$C_{oss}$		--	48	55	
Reverse Transfer Capacitance	$C_{rss}$		--	5.0	12	
Turn -Off Delay Time <sup>3</sup>	$T_d(off)$	$V_{DD} = 30V, I_D = 4A, R_G = 25\Omega$	--	25	--	
Total Gate Charge <sup>3</sup>	$Q_g$	$V_{GS} = 10V, V_{DS} = 520V, I_D = 4.0A,$	--	13.7	--	nC
Gate-to-Source Charge <sup>3</sup>	$Q_{gs}$		--	2.9	--	
Gate-to-Drain Charge <sup>3</sup>	$Q_{gd}$		--	4.6	--	
Continuous Diode Forward Current	$I_S$		--	--	4.0	A
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$T_J = 25^\circ C, I_S = 4.0A, V_{GS} = 0V$	--	--	1.4	V
Reverse Recovery Time <sup>3</sup>	trr	$T_J = 25^\circ C, I_f = 4.0A, di/dt = 100A/\mu s$	--	390	--	ns
Reverse Recovery Charge <sup>3</sup>	Qrr		--	1.5	--	$\mu C$

**●Thermal Characteristics**

PARAMETER	SYMBOL	MAX		UNIT
		TO-220	TO-220F	
Thermal Resistance Junction-case <sup>1</sup>	$R_{thJC}$	1.20	3.47	$^\circ C/W$
Thermal Resistance Junction-ambient <sup>1</sup>	$R_{thJA}$	62.5	62.5	$^\circ C/W$

Notes:

1. Repetitive rating: Pulse width limited by maximum junction temperature;
2. Starting  $T_J = 25^\circ C, V_{DD} = 50V, L = 25mH, R_G = 25\Omega, I_{AS} = 4.0A$ ;
3. Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

• Typical Characteristics

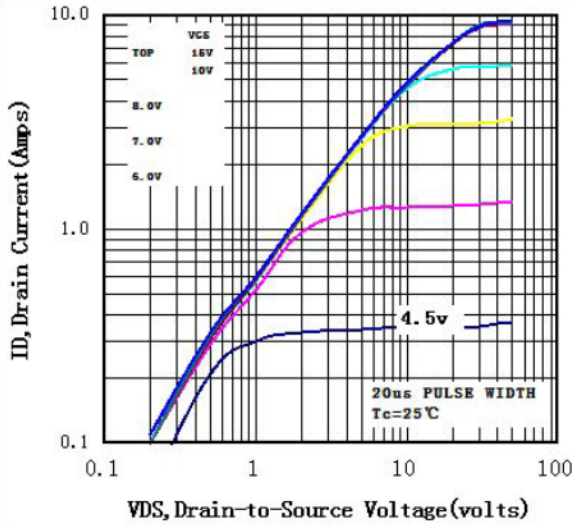


Fig1 Typical Output Characteristics,  $T_c=25^\circ\text{C}$

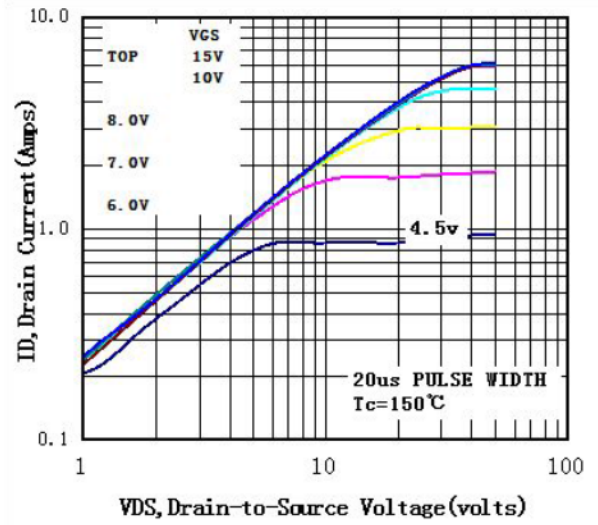


Fig2 Typical Output Characteristics,  $T_c=150^\circ\text{C}$

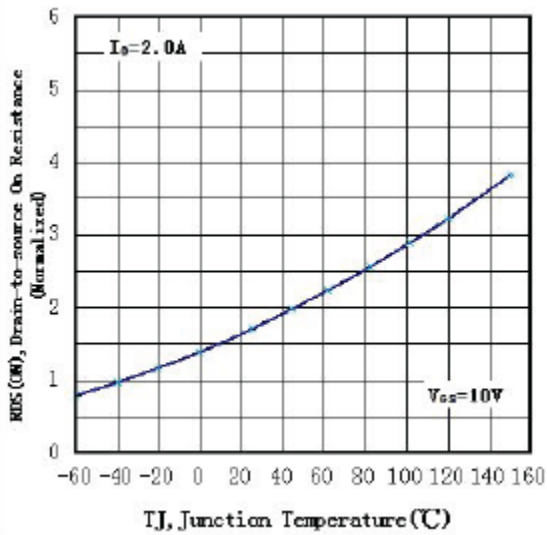


Fig3 Normalized Resistance Vs. Temperature

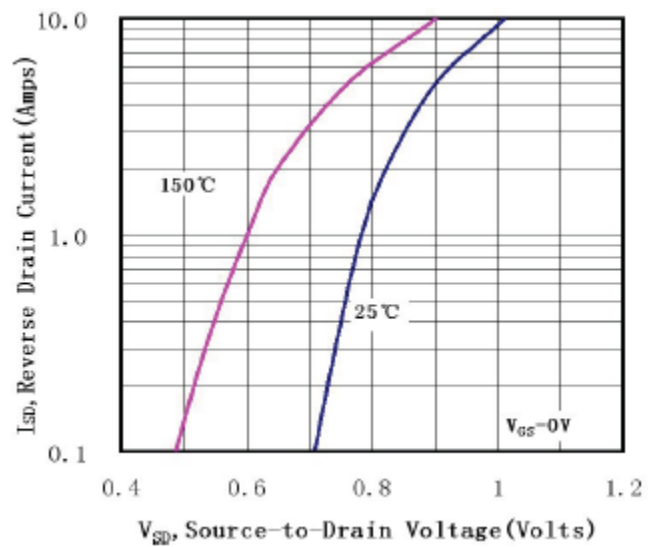


Fig4 Typical Source-Drain Diode Forward Voltage

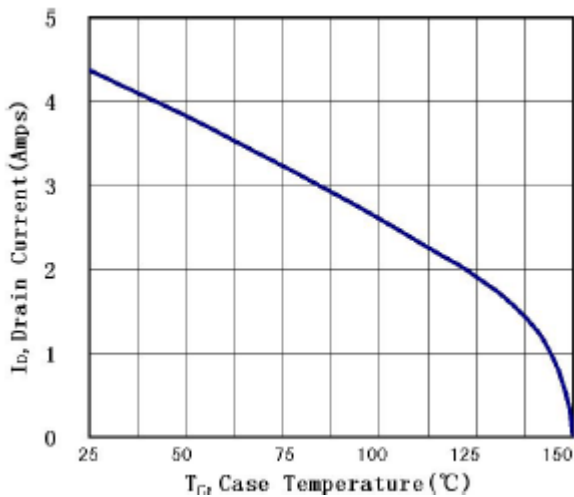


Fig5 Maximum Drain Current Vs. Case Temperature

•Typical Characteristics(cont.)

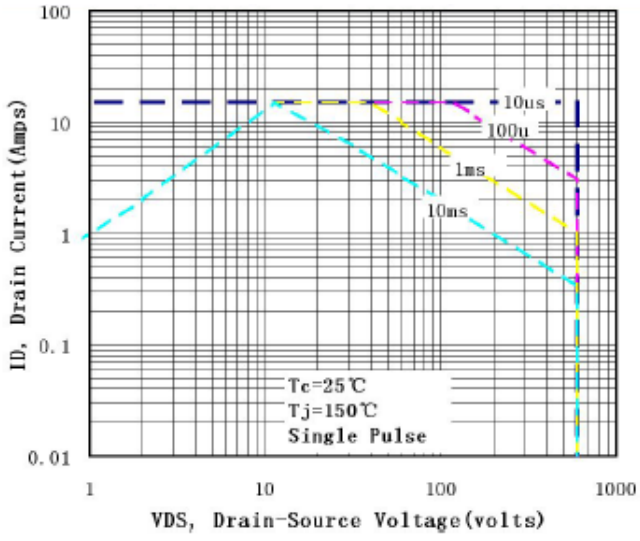


Fig6-1 Maximum Safe Operating Area(TO-220)

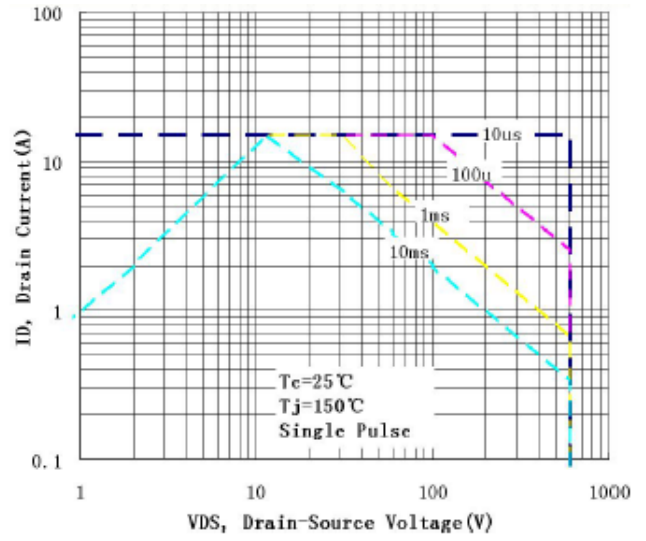
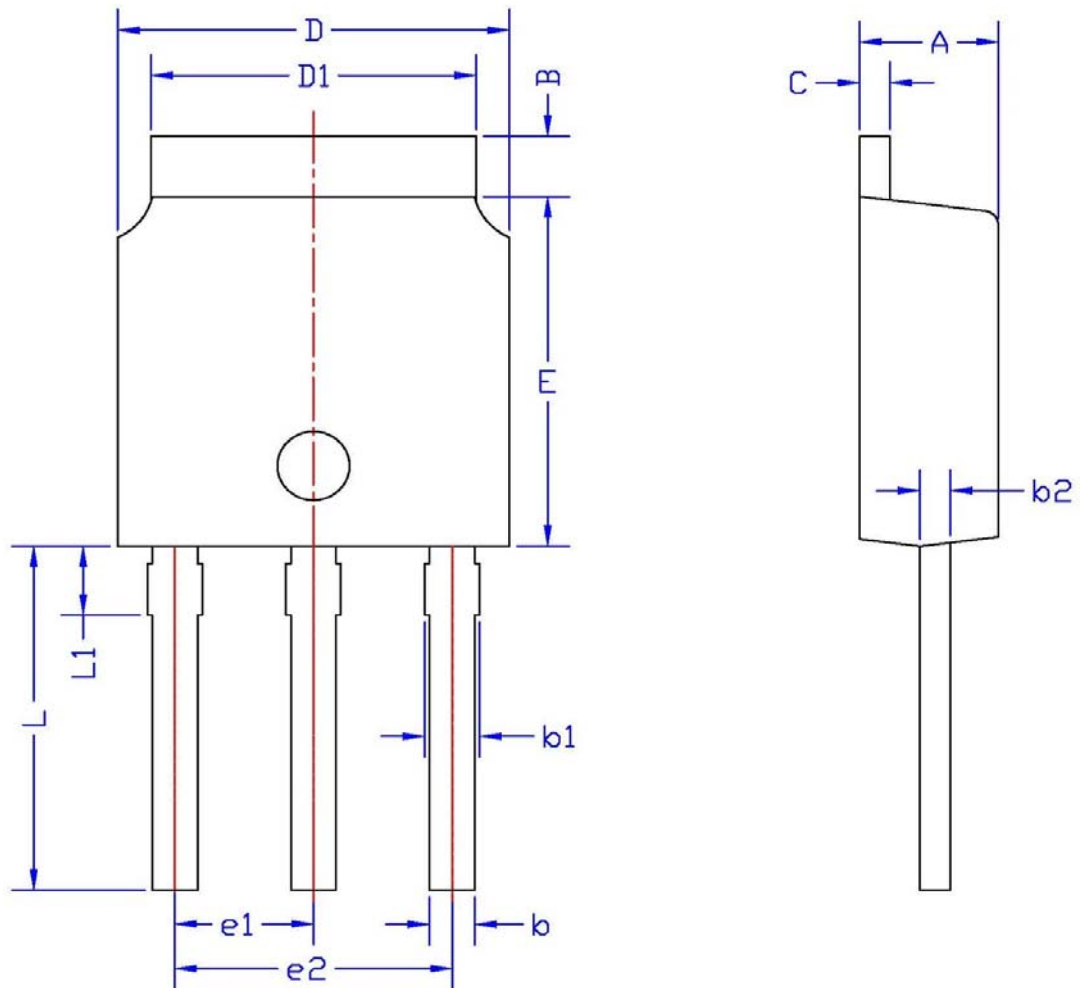


Fig6-2 Maximum Safe Operating Area(TO-220F)

•Dimensions (TO-251)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.80	1.30
b	0.50	0.90	C	0.40	0.70
b1	0.70	1.20	D1	5.10	5.60
b2	0.40	0.70	e1	2.10	2.45
D	6.20	6.80	e2	4.40	4.80
E	5.80	6.40			
L	3.60	9.80			
L1	0.80	1.60			



●Dimensions (TO-252)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	L2	0.60	1.20
b	0.50	0.90	L3	1.20	1.80
b1	0.70	1.20	B	0.80	1.30
b2	0.40	0.70	C	0.40	0.70
D	6.20	6.80	D1	5.10	5.60
E	5.80	6.40	e1	2.10	2.45
L	3.60	4.60	e2	4.40	4.80
L1	0.80	1.60			

