

●General Description

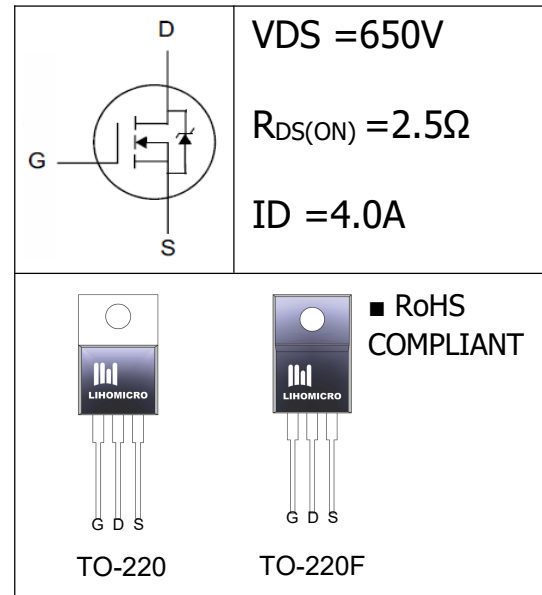
The N-Channel MOSFET LH4N65F has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

●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-220F	TO-220
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LH4N65F-TO220F-TU	LH4N65FT-TO220-TU
Halogen Free Ordering Code	LH4N65F-TO220F-TU-HF	LH4N65FT-TO220-TU-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 ¹	I_{DM}	16	A
Single Pulse Avalanche Energy ²	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 ³	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 2.0A$	--	1.9	2.5	Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ C$	--	--	1	μA
		$V_{DS} = 480V, V_{GS} = 0V, T_J = 125^\circ C$	--	--	10	
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 30V$	--	--	± 100	nA
Forward Transconductance ³	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	μF
Output Capacitance	C_{oss}		--	48	55	
Reverse Transfer Capacitance	C_{rss}		--	5.0	12	
Turn -Off Delay Time ³	$T_d(off)$	$V_{DD} = 30V, I_D = 4A, R_G = 25\Omega$	--	25	--	
Total Gate Charge ³	Q_g	$V_{GS} = 10V, V_{DS} = 520V, I_D = 4.0A,$	--	13.7	--	nC
Gate-to-Source Charge ³	Q_{gs}		--	2.9	--	
Gate-to-Drain Charge ³	Q_{gd}		--	4.6	--	
Continuous Diode Forward Current	I_S		--	--	4.0	A
Diode Forward Voltage ³	V_{SD}	$T_J = 25^\circ C, I_S = 4.0A, V_{GS} = 0V$	--	--	1.4	V
Reverse Recovery Time ³	trr	$T_J = 25^\circ C, I_f = 4.0A, di/dt = 100A/\mu s$	--	390	--	ns
Reverse Recovery Charge ³	Qrr		--	1.5	--	μC

●Thermal Characteristics

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

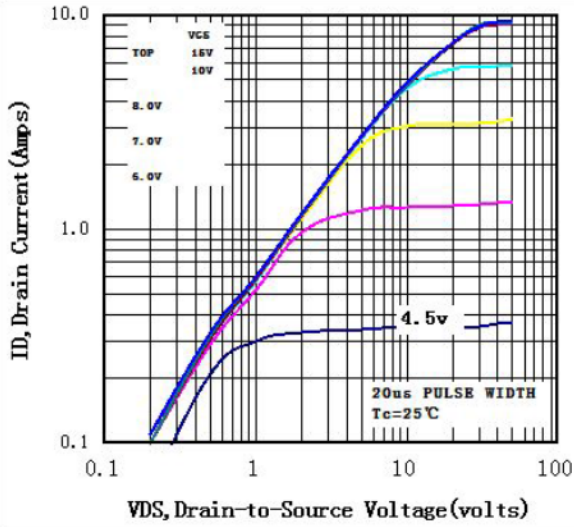


Fig1 Typical Output Characteristics, $T_c=25^\circ\text{C}$

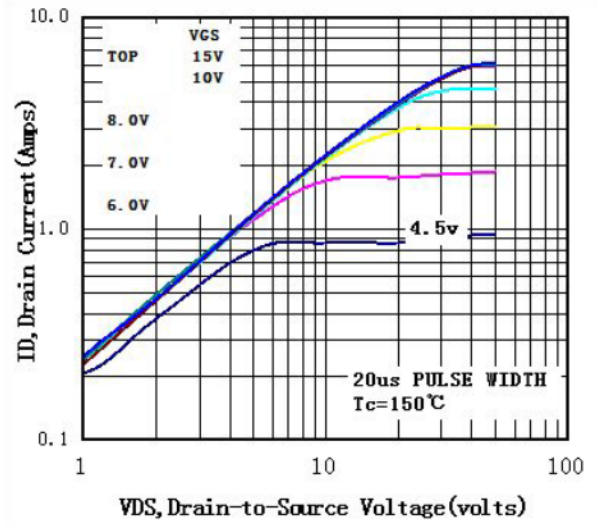


Fig2 Typical Output Characteristics, $T_c=150^\circ\text{C}$

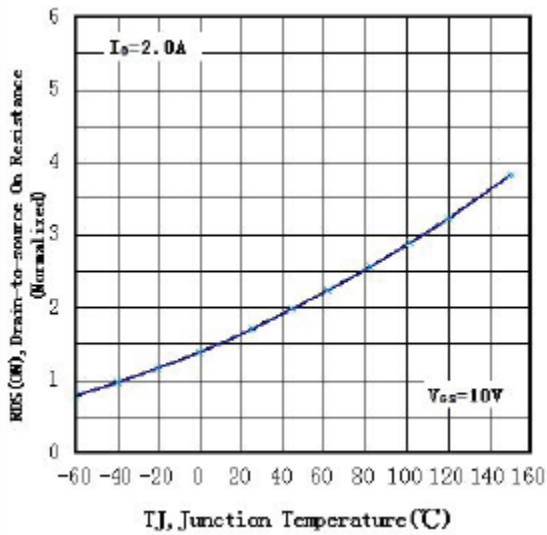


Fig3 Normalized Resistance Vs. Temperature

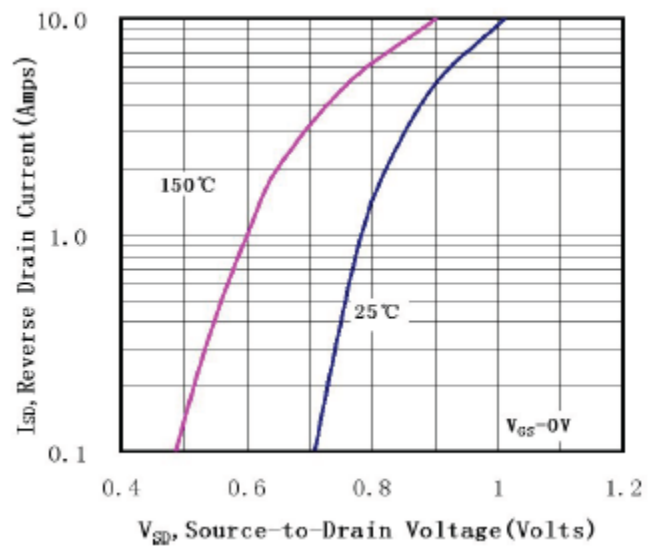


Fig4 Typical Source-Drain Diode Forward Voltage

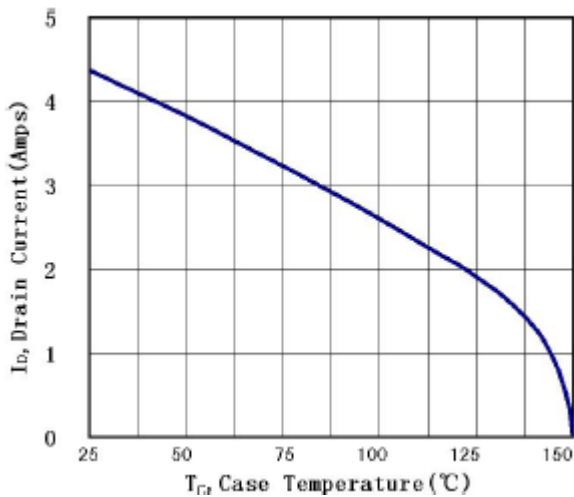


Fig5 Maximum Drain Current Vs. Case Temperature

•Typical Characteristics(cont.)

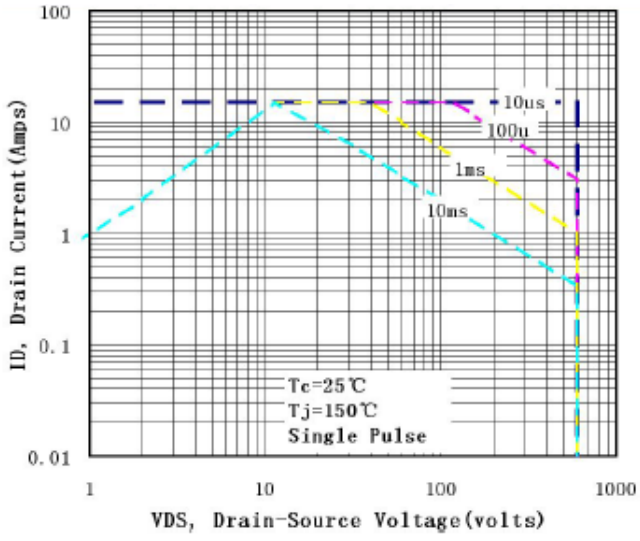


Fig6-1 Maximum Safe Operating Area(TO-220)

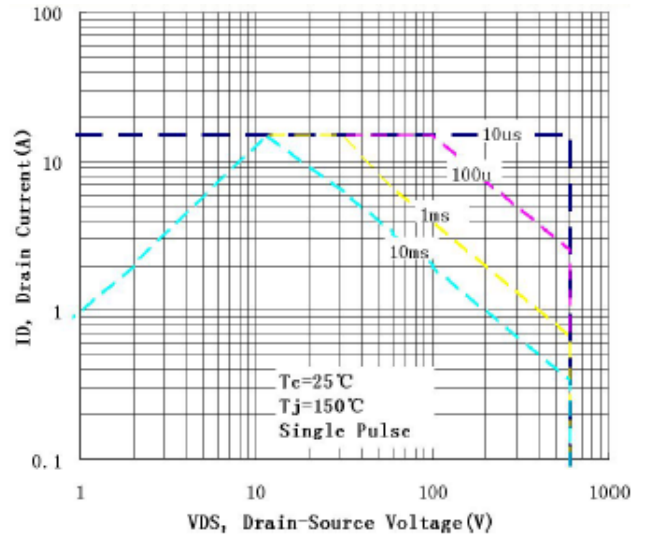
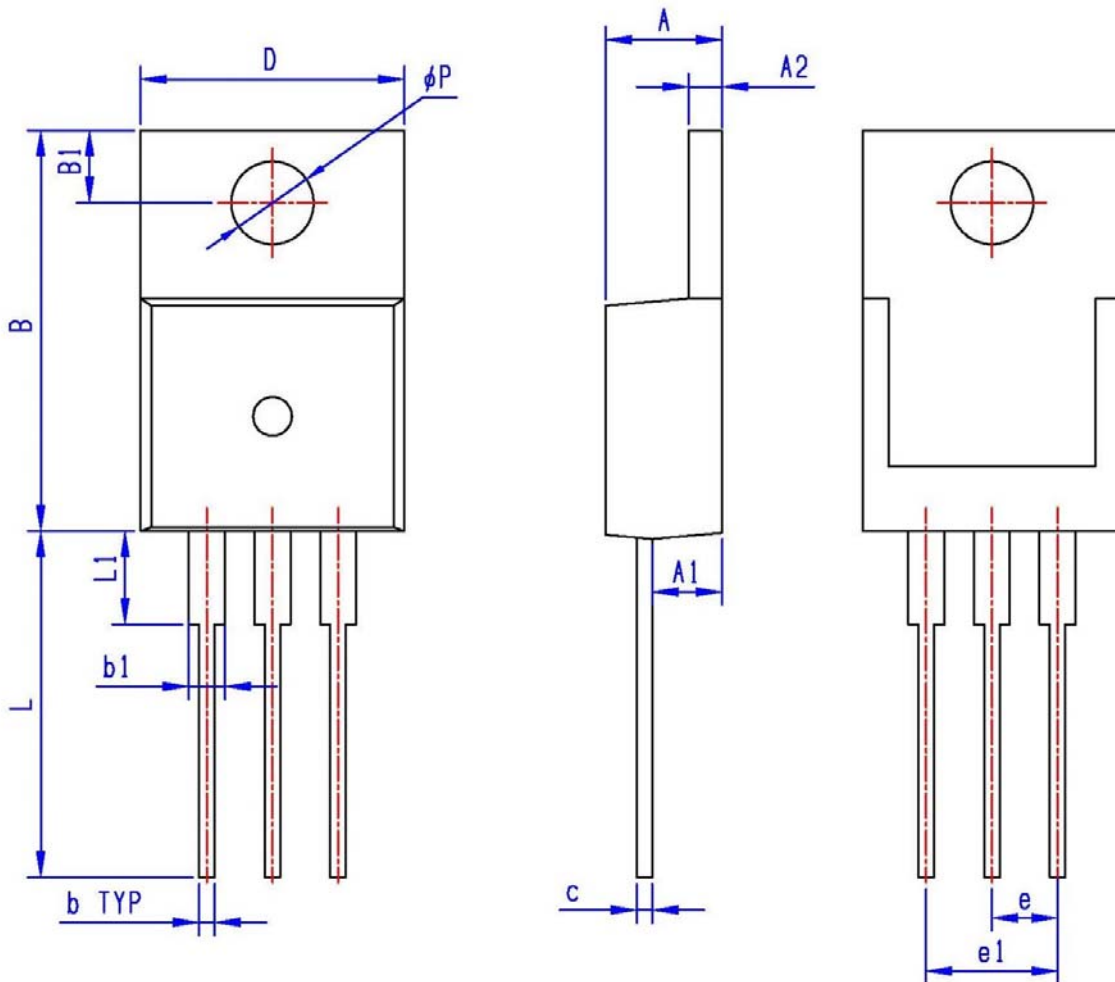


Fig6-2 Maximum Safe Operating Area(TO-220F)

●Dimensions (TO-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			



●

●Dimensions (TO-220F)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	4.40	4.90	B1	2.90	3.70
A1	2.40	3.00	e	2.40	2.70
A2	2.30	3.00	e1	4.95	5.25
b	0.60	0.90	L	12.40	14.20
b1	1.10	1.70	L1	2.40	3.40
c	0.40	0.70	∅P	2.90	3.50
D	9.80	10.60			
B	15.40	16.40			

