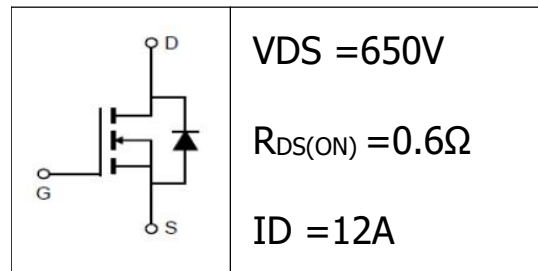


**•General Description**

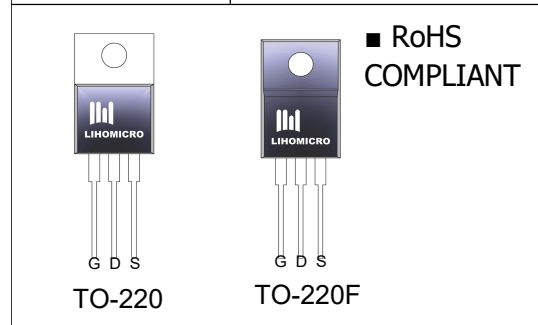
The Power MOSFET LH12N65F which has the low  $R_{DS(on)}$ , low gate charge, fast switching and excellent avalanche characteristics. This device offers extremely fast and robust body diode, and is suitable for telecom and power supplies.


**•Features**

- Low Thermal Resistance
- Fast Switching
- High Input Resistance

**•Application**

- LED/LCD/PDP TV and monitor Lighting
- Power Supplies


**•Ordering Information:**

Part number	LH12N65F	LH12N65F
Package	TO-220F	TO-220
Basic ordering unit (pcs)	1000	1000
Normal Package Material Ordering Code	LH12N65FF-T0220F-TU	LH12N65FT-T0220-TU
Halogen Free Ordering Code	LH12N65FF-T0220F-TU -HF	LH12N65FT-T0220-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	TC = 25°C	$I_D$	12	A
	TC = 100°C		7.5	
Pulsed drain current (TC = 25°C, tp limited by Tjmax) <sup>1</sup>		$I_{DM}$	48	A
Single Pulse Avalanche Energy <sup>2</sup>		$E_{AS}$	720	mJ
Power Dissipation(TC=25°C)		$P_D$	TO-220F: 51      TO-220: 225	W
Junction 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	--	--	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>	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 6A$	--	0.6	0.7	$\Omega$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ C$	--	--	1	$\mu A$
		$V_{DS} = 650V, V_{GS} = 0V, T_J = 125^\circ C$	--	--	10	
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30$	--	--	$\pm 100$	nA
Forward Transconductance <sup>3</sup>	$g_{fs}$	$V_{DS} = 15V, I_D = 6A$	--	--	11	S
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 25V$ $f = 1.0MHz$	1000	1970	2400	pF
Output Capacitance	$C_{oss}$		50	180	250	
Reverse transfer Capacitance	$C_{rss}$		5	16	30	
Turn -Off Delay Time <sup>3</sup>	$T_d(off)$	$V_{DD} = 325V,$ $R_G = 25\Omega$	--	62	--	ns
Total Gate Charge	$Q_g$	$I_D = 12A,$ $V_{DS} = 520V$ $V_{GS} = 10V$ <sub>3</sub>	--	40	---	nC
Gate-to-Source Charge	$Q_{gs}$		--	10.4	--	
Gate-to-Drain Charge	$Q_{gd}$		--	14	---	
Continuous Diode Forward Current	$I_S$		--	--	12.0	A
Pulsed Diode Forward Current	$I_{SM}$		--	--	48.0	A
Diode Forward Voltage	$V_{SD}$	$T_J = 25^\circ C, I_S = 12A$ $V_{GS} = 0V$	--	--	1.4	V
Reverse Recovery Time	$t_{rr}$	$I_f = I_S$ $di_F/dt = 100A/\mu s$ <sub>3</sub>	--	650	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	4.2	--	$\mu C$

**●Thermal Characteristics**

PARAMETER	SYMBOL	MAX		UNIT
		TO-220F	TO-220	
Thermal Resistance Junction-case	$R_{thJC}$	2.5	0.56	$^\circ C/W$
Thermal Resistance Junction-ambient	$R_{thJA}$	62.5	62.5	$^\circ C/W$

Notes:

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

2.  $I_{AS} = 12A, V_{DD} = 50V, R_G = 25\Omega, L = 11mH,$  Starting  $T_J = 25^\circ C$ 

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

• **Typical Characteristics**

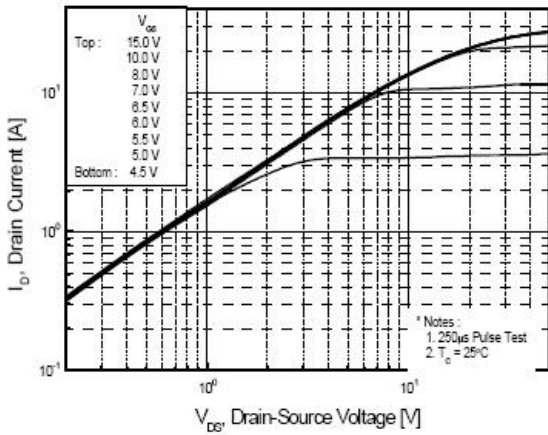


Fig1 Typical Output Characteristics, Tc=25°C

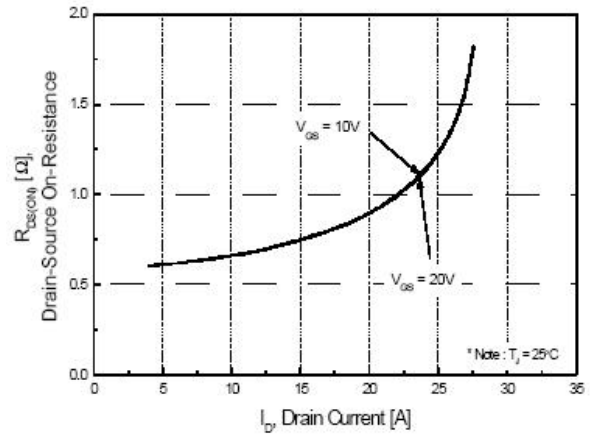


Fig2 On-Resistance Vs. Drain Current and Gate Voltage

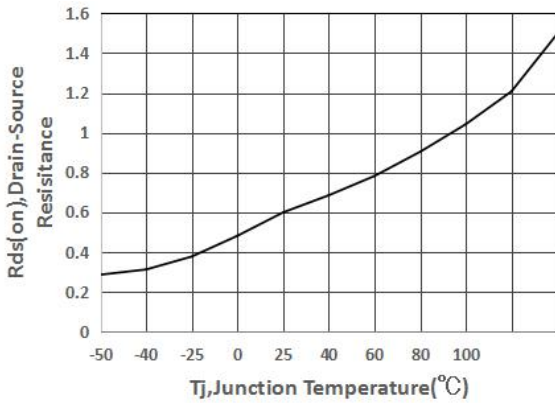


Fig3 Normalized On-Resistance Vs. Temperature

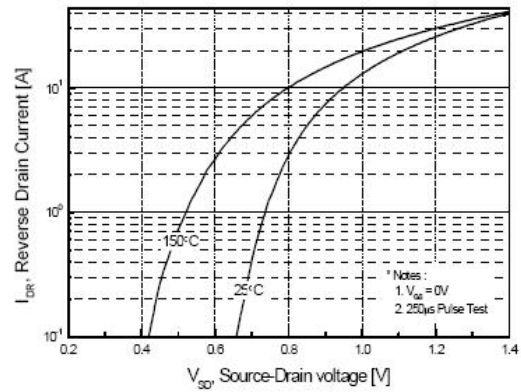


Fig4 Typical Source-Drain Diode Forward Voltage

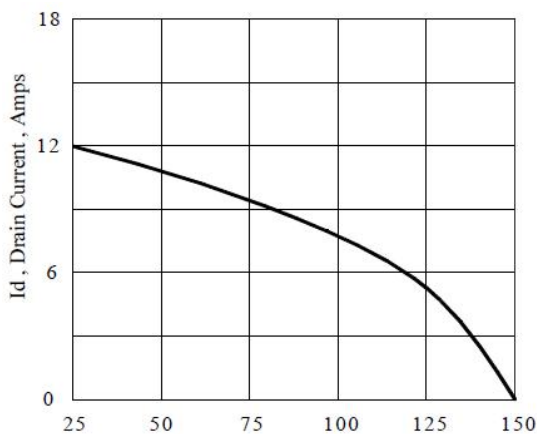


Fig5 Maximum Drain Current Vs. Case Temperature

● **Typical Characteristics**(cont.)

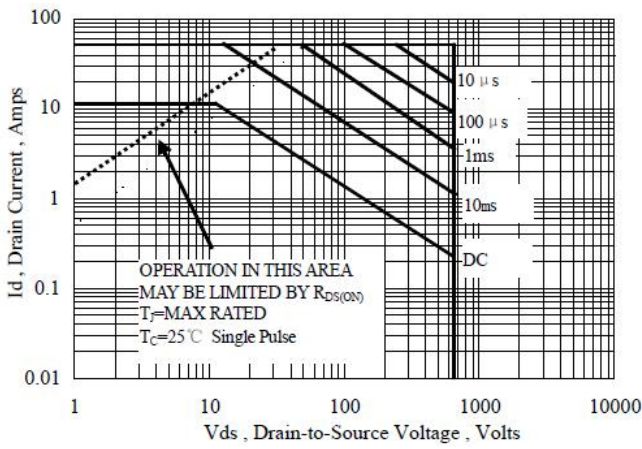


Fig6-1 Maximum Safe Operating Area  
(TO-220)

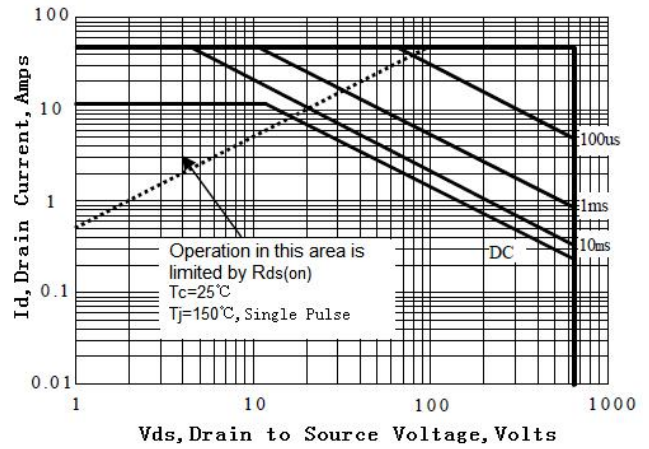
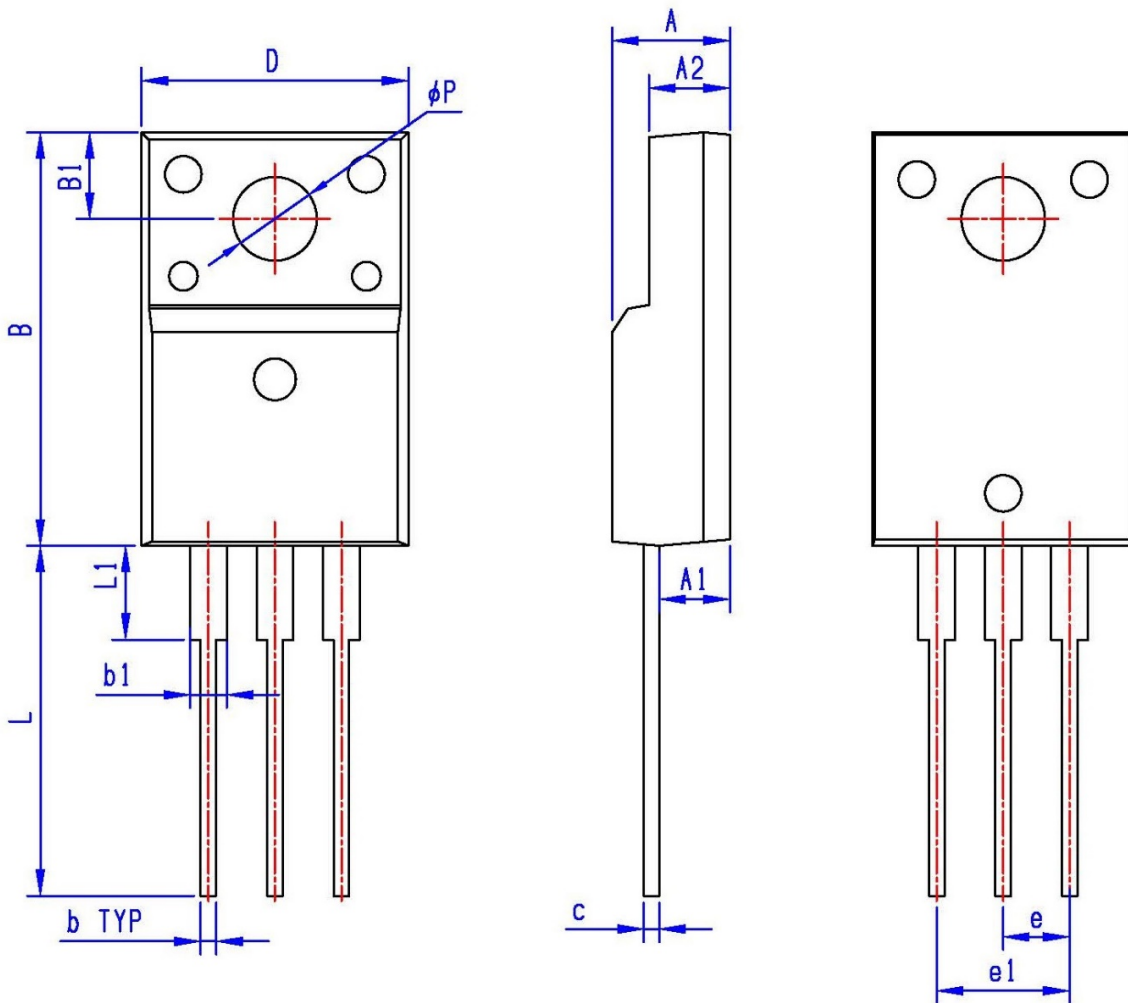


Fig6 -2 Maximum Safe Operating Area  
(TO-220F)

•Dimensions (TO-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			



•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			

