

N-Channel Power MOSFET
●General Description

The N-Channel MOSFET LH7N65F has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for switch power and lighting.

●Features




- Low Thermal Resistance
- High Input Resistance
- Fast Switching

●Application

- Lighting
- Switch Mode Power Supply
- High Efficiency SMPS

●Ordering Information:

Part Number	LH7N65F	LH7N65F
Package	TO-220	TO-220F
Basic Ordering Unit (pcs)	1000	1000
Normal Package Material Ordering Code	LH7N65FT-TO220-TU	LH7N65FF-TO220F-TU
Halogen Free Ordering Code	LH7N65FT-TO220-TU-HF	LH7N65FF-TO220F-TU-HF

	$V_{DS} = 650V$ $R_{DS(ON)} = 1.1\Omega$ $I_D = 7.0A$
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  TO-220 </div> <div style="text-align: center;">  TO-220F </div> </div> <p style="text-align: right;">■ RoHS COMPLIANT</p>

●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, $T_C = 25^\circ C$	I_D	7.0	A
	$I_D(T_C=100^\circ C)$	3.2	
Drain Current-Pulsed ¹	I_{DM}	28	A
Single Pulse Avalanche Energy ²	E_{AS}	230	mJ
Power Dissipation	P_D	TO-220:142	W
		TO-220F:40	
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	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	--	4.0	V
Drain-source On Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V, I_D=13A$	--	1.1	1.5	Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
		$V_{DS}=520V, V_{GS}=0V, T_J=125^\circ C$	--	--	10	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=+30V, V_{DS}=0V$	--	--	+100	nA
		$V_{GS}=-30V, V_{DS}=0V$	--	--	-100	
Forward Transconductance ³	g_{FS}	$V_{GS}=40V, I_D=3.5A$	--	3.0	--	S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	--	1050	--	pF
Output Capacitance	C_{oss}		--	84	--	
Reverse Transfer Capacitance	C_{rss}		--	12	--	
Turn -Off Delay Time ³	$T_d(off)$	$V_{GS}=10V, V_{DD}=325V, R_G=25\Omega, I_D=7A$	--	50	--	ns
Total Gate Charge(10V) ³	Q_g	$V_{GS}=10V, I_D=7A, V_{DS}=520V$	--	21	--	nC
Gate-to-Source Charge ³	Q_{gs}		--	4.8	--	
Gate-to-Drain Charge ³	Q_{gd}		--	6.5	--	
Continuous Diode Forward Current ^{1,5}	I_S	Integral PN-diode in MOSFET	--	--	7	A
Pulsed Source Current[2]	I_{SM}		--	--	28	
Diode Forward Voltage ³	V_{SD}	$I_S=7A, V_{GS}=0V, T_J=25^\circ C$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ C, I_f=7A, di/dt=100A/\mu s$	--	365	--	ns
Reverse Recovery Charge	Q_{rr}		--	3.4	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
		TO-220	TO-220F	
Thermal Resistance Junction-case	R_{thJC}	0.88	3.13	$^\circ C/W$
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 $T_J=25^\circ C, V_{DD}=50V, L=10mH, R_G=25\Omega, I_{AS}=7A$
3. Pulse width $\leq 380\mu s$, duty cycle $\leq 2\%$.

• **Typical Characteristics**

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

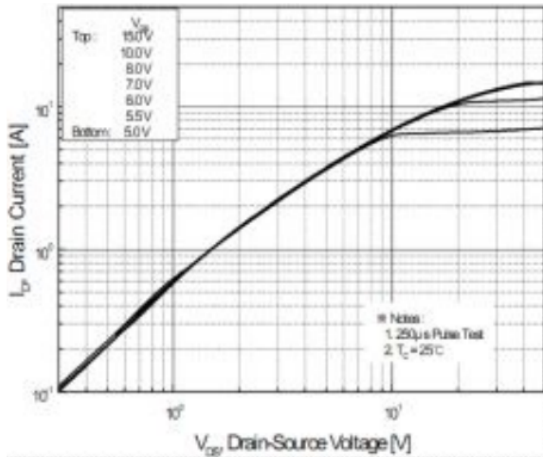


Fig2 On-Resistance Vs. Drain Current and Gate Voltage

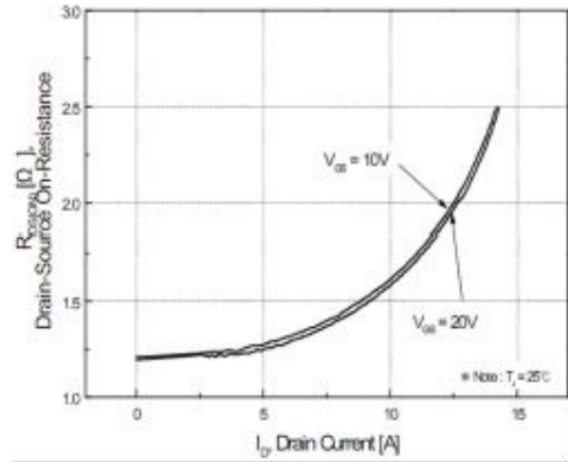


Fig3 Normalized On-Resistance Vs. Temperature

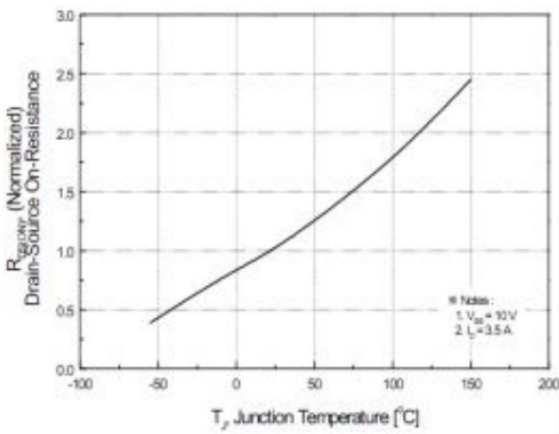


Fig4 Typical Source-Drain Diode Forward Voltage

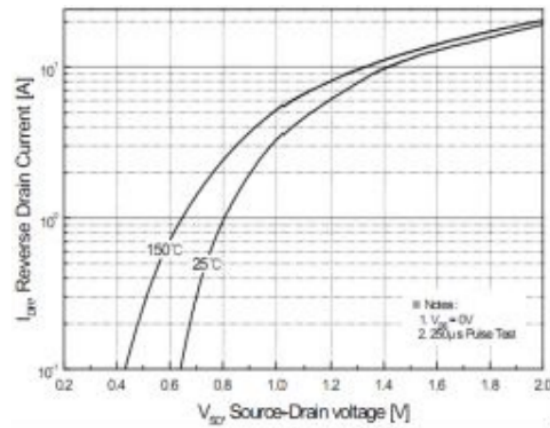
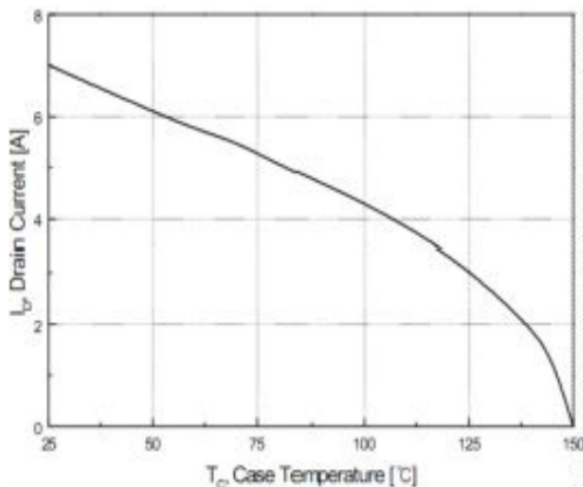


Fig5 Maximum Drain Current Vs. Case Temperature



• **Typical Characteristics(cont.)**

Fig6-1 Maximum Safe Operating Area
TO-220

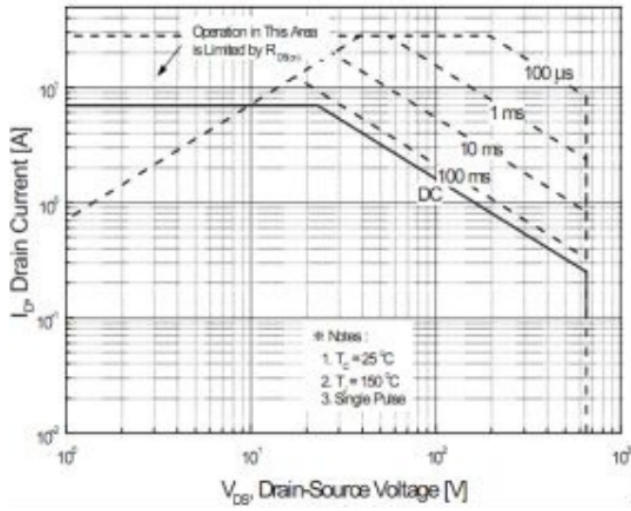
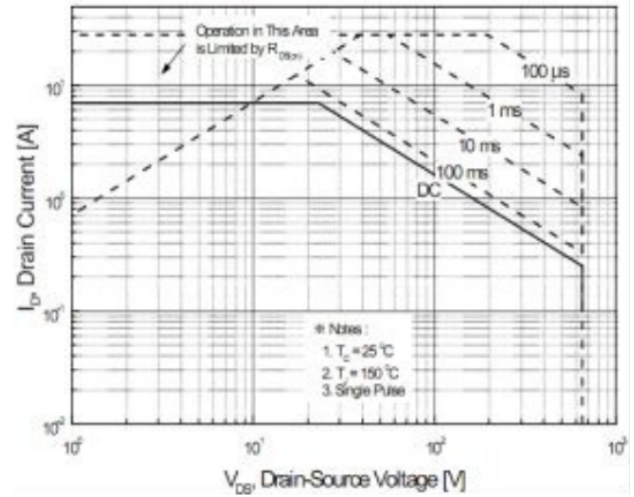


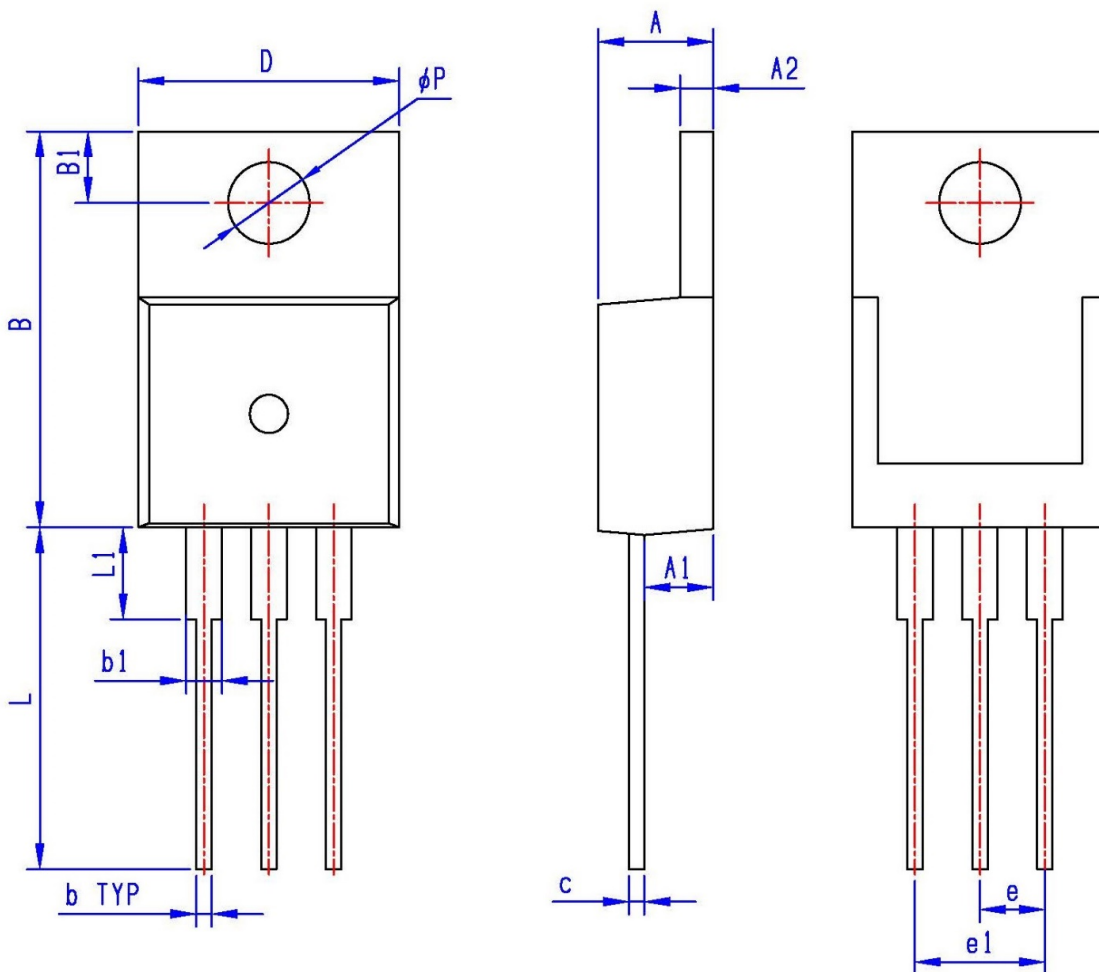
Fig6-2 Maximum Safe Operating Area
TO-220F



•Dimensions (TO-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	12.40	14.20
b1	1.10	1.70	L1	2.40	3.40
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			

