

•General Description

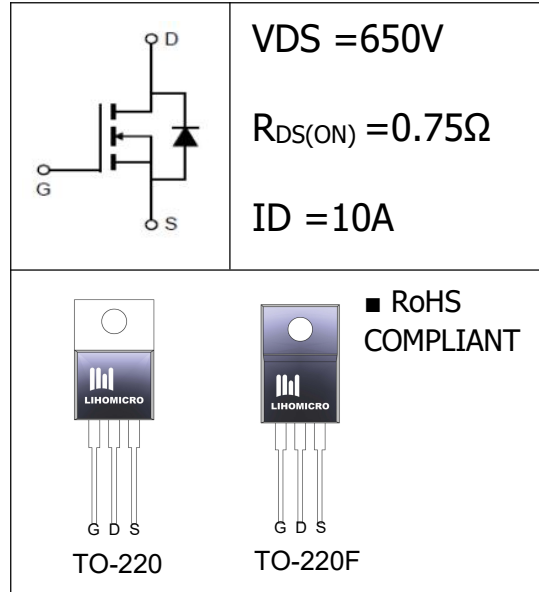
The Power MOSFET LH10N65E has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device offers extremely fast and robust body diode, and is suitable for telecom and power supplies.

•Features

- Low Thermal Resistance
- Fast Switching
- High Input Resistance

•Application

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


•Ordering Information:

Part number	LH10N65E	LH10N65E
Package	TO-220F	TO-220
Basic ordering unit (pcs)	1000	1000
Normal Package Material Ordering Code	LH10N65EF-T0220F-TU	LH10N65ET-T0220-TU
Halogen Free Ordering Code	LH10N65EF-T0220F-TU -HF	LH10N65ET-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	10	A
	TC = 100°C		6	
Pulsed drain current (TC = 25°C, tp limited by Tjmax) ¹		I_{DM}	40	A
Single Pulse Avalanche Energy ²		E_{AS}	720	mJ
Power Dissipation(TC=25°C)		P_D	TO-220F: 50 TO-220: 156	W
Junction Temperature		T_J	-55~+150	°C
Storage Temperature		T_{STG}	-55~+150	°C
Reverse Diode dv/dt($I_{SD} \leq 10A, T_J = 25^\circ C$)		dv/dt	14	mJ

●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 ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6A$	--	0.75	1.0	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}	$V_{GS}=\pm 30$	--	--	± 100	nA
Forward Transconductance ³	g_{fs}	$V_{DS}=40V, I_D=5A$	--	--	8	S
Gate Resistance	R_g		--	7	---	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=25V$ $f=1.0MHz$	--	1500	--	pF
Output Capacitance	C_{oss}		--	120	--	
Reverse transfer Capacitance	C_{rss}		--	12	--	
Turn-Off Delay Time	$T_d(off)$	$V_{DD}=300V, I_D=10A$ $R_G=25\Omega$ 3	--	130	--	ns
Turn-On Delay Time	$T_d(on)$		--	50	--	
Rise Time	T_r		--	37	--	
Fall Time	T_f		--	190	--	
Total Gate Charge	Q_g	$I_D=10A,$ $V_{DS}=480V$ $V_{GS}=10V$ 3	--	45	---	nC
Gate-to-Source Charge	Q_{gs}		--	7.5	--	
Gate-to-Drain Charge	Q_{gd}		--	18.5	---	
Continuous Diode Forward Current	I_S		--	--	10	A
Pulsed Diode Forward Current	I_{SM}		--	--	48.0	A
Diode Forward Voltage ³	V_{SD}	$T_J=25^\circ C, I_S=10A$ $V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$I_f=I_S$ $di_F/dt=100A/\mu s$ 3	--	420	--	ns
Reverse Recovery Charge	Q_{rr}		--	4.2	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
		TO-220F	TO-220	
Thermal Resistance Junction-case	R_{thJC}	2.5	0.8	$^\circ C/W$
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. $I_{AS}=8A, V_{DD}=50V, R_G=25\Omega, L=10Mh$, Starting $T_J=25^\circ C$

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

• **Typical Characteristics**

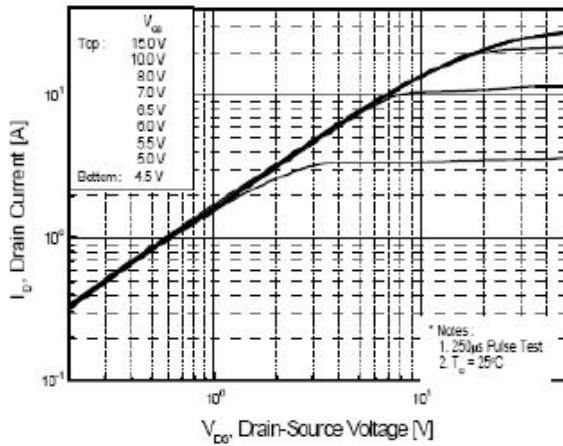


Fig1 Typical Output Characteristics, $T_c=25^\circ\text{C}$

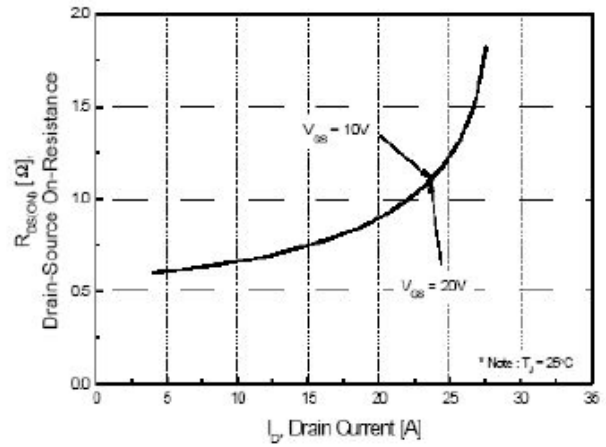


Fig2 On-Resistance Vs. Drain Current and Gate Voltage

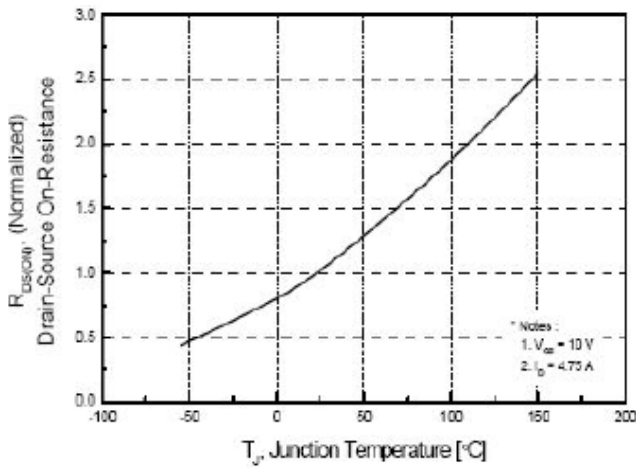


Fig3 Normalized On-Resistance Vs. Temperature

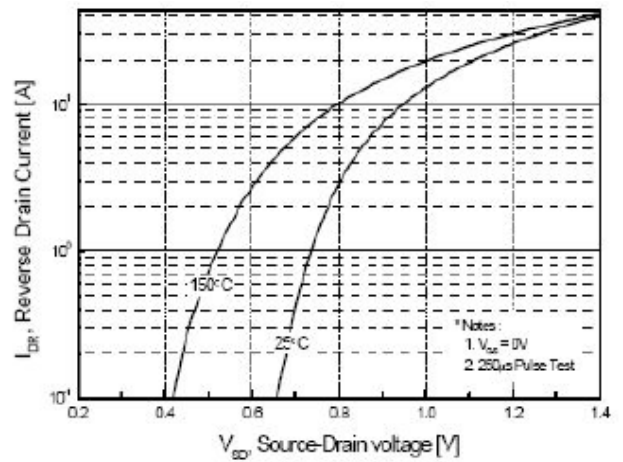


Fig4 Typical Source-Drain Diode Forward Voltage

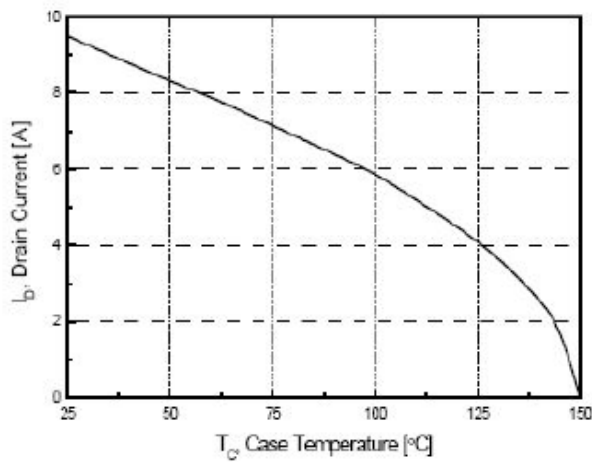


Fig5 Maximum Drain Current Vs. Case Temperature

• **Typical Characteristics**(cont.)

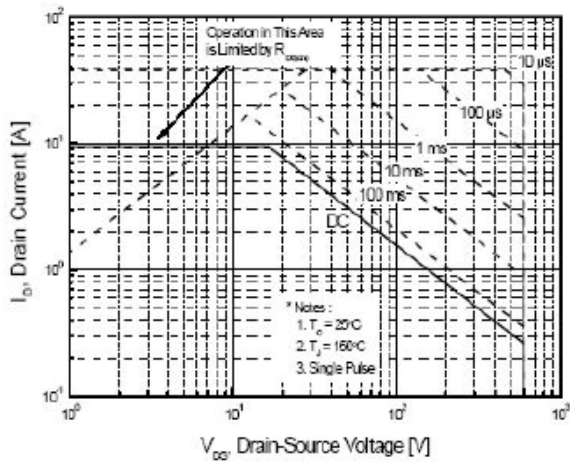


Fig6-1 Maximum Safe Operating Area
TO-220

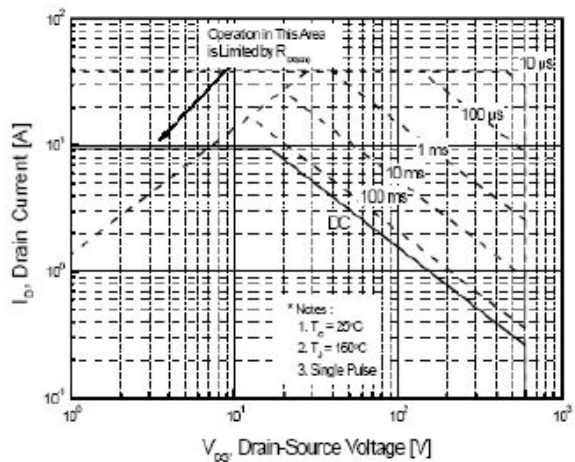
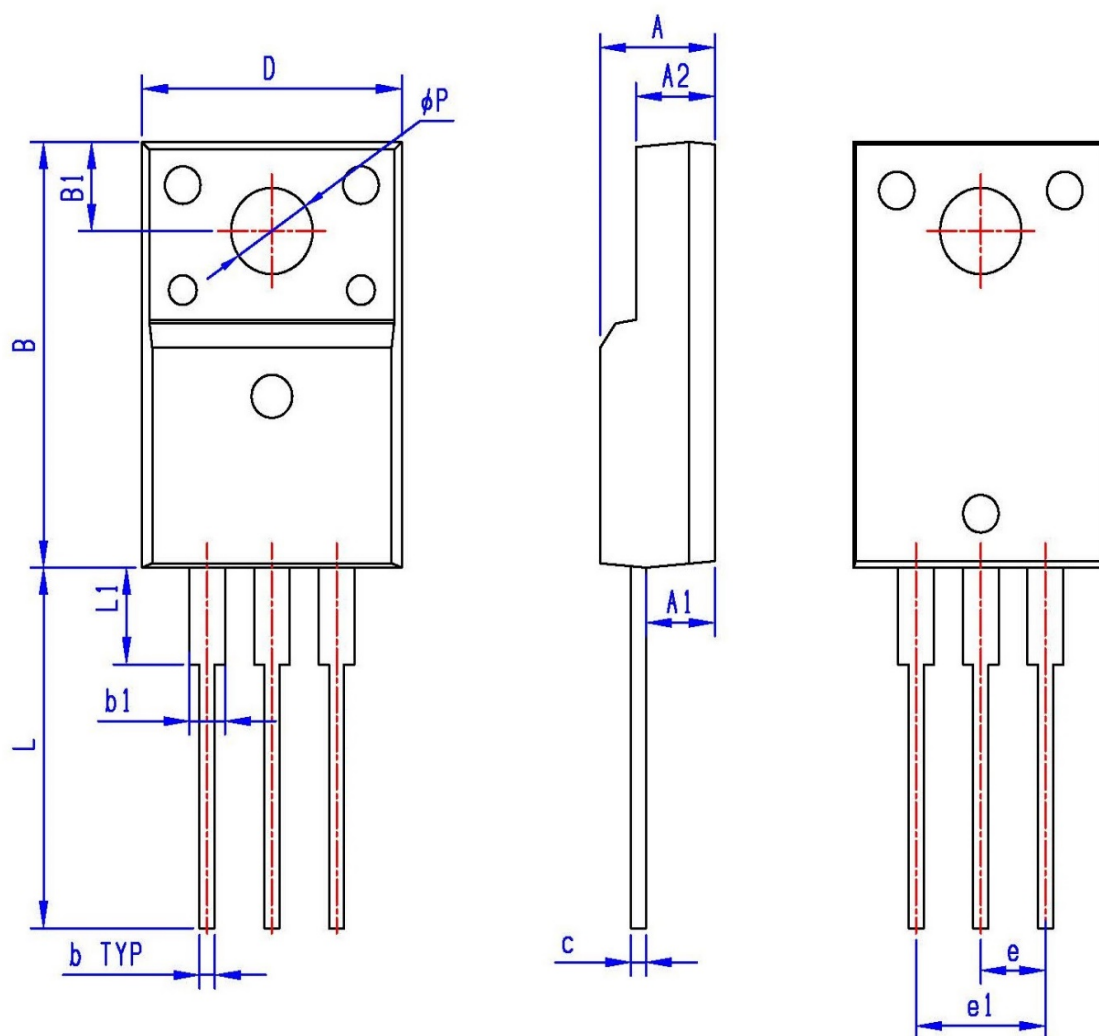


Fig6 -2Maximum Safe Operating Area
TO-220F

●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			

