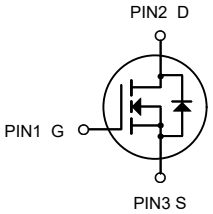
Description

The 18N50F can be used in various power swithching circuit for system miniaturization and higher efficiency.The package form is TO-220/ TO-220F, which accords with the RoHS standard.

TO-220F



N-Channel MOSFET

General Features

V_{DS} = 500V,I_D =18A
$R_{DS(ON)}$ < 0.38Ω@ V_{GS}=10V

Application

● Power switch circuit of adaptor and charger.

Package Marking and Ordering Information

Product ID	Pack	Marking	Units Tube
18N50F	TO-220F	18N50 XXX YYYY	50

Absolute Maximum Ratings@T =25°C(unless otherwise specified)

Symbol	Parameter	Limit	Unit
V_{DSS}	Drain-to-Source Voltage[1]	500	V
V_{GSS}	Gate-to-Source Voltage	±30	
$I_{D\ @\ Tc=100℃}$	Continuous Drain Current @ Tc=100℃	18	A
I_{DM}	Pulsed Drain Current at V_{GS}=10V[2]	72	
E_{AS}	Single Pulse Avalanche Energy	710	mJ
P_D	Power Dissipation	65	W
T_L T_{PAK}	Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	300 260	℃
T_J& T_{STG}	Operating and Storage Temperature Range	-55 to 150	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.92	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Electrical Characteristics T_J =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	500	--	--	V	V_{GS}=0V, I_D=250uA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	uA	V_{DS}=500V, V_{GS}=0V
		--	--	100		V_{DS}=400V, V_{GS}=0V, T_J =125℃
I_{GSS}	Gate-to-Source Leakage Current	--	--	+100	nA	V_{GS}==30V, V_{DS}=0V
		--	--	-100		V_{GS}=-30V, V_{DS}=0V
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	0.30	0.38	Ω	V_{GS}=10V, I_D=6.5A
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	--	4.0	V	V_{DS}=V_{GS}, I_D=250uA
gfs	Forward Transconductance	--	11	--	S	VDS=30V,ID=13A
C_{iss}	Input Capacitance	--	2100	--	pF	V_{GS}=0V, V_{DS}=25V, f=1.0MH_Z
C_{rss}	Reverse Transfer Capacitance	--	190	--		
C_{oss}	Output Capacitance	--	100	--		
Q_g	Total Gate Charge	--	48	--	nC	V_{DD}=400V, I_D=18A, V_{GS}=10V
Q_{gs}	Gate-to-Source Charge	--	11	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	3.1	--		
$td_{(ON)}$	Turn-on Delay Time	--	110	--	ns	V_{DD}=300V, I_D=18A, V_{GS}=10V Rg=25 Ω
t_{rise}	Rise Time	--	70	--		
$td_{(OFF)}$	Turn-Off Delay Time	--	190	--		
t_{fall}	Fall Time	--	100	--		
I_{SD}	Continuous Source Current[2]	--	--	13	A	Integral pn-diode in MOSFET
I_{SM}	Pulsed Source Current[2]	--	--	52		
V_{SD}	Diode Forward Voltage	--	--	1.5	V	I_S=18A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	550	--	ns	V_{GS}=0V I_F=18A, di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge	--	5.5	--	uC	

Note:

[1] T_J=+25℃ to +150℃
[2] Pulse width≤380μs; duty cycle≤2%.

Typical Characteristics

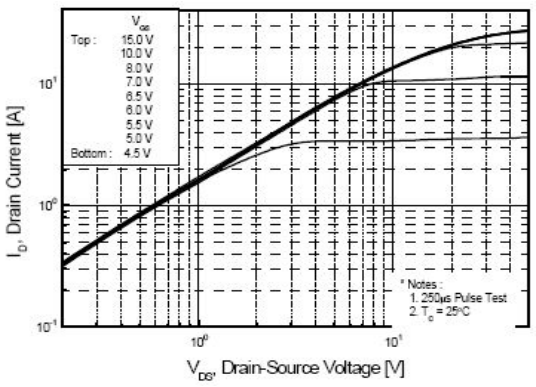


Fig1 Typical Output Characteristics, Tc=25℃

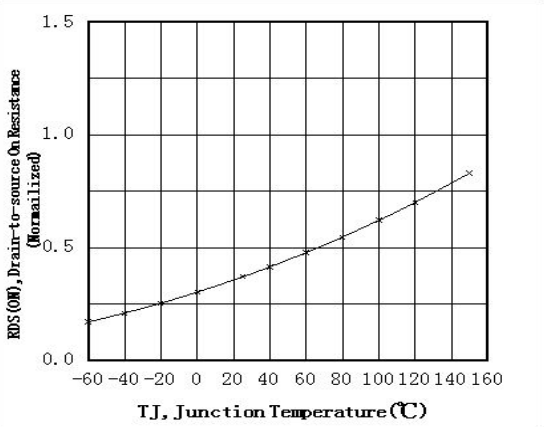


Fig2 On-Resistance Vs.Drain Current and Gate Voltage

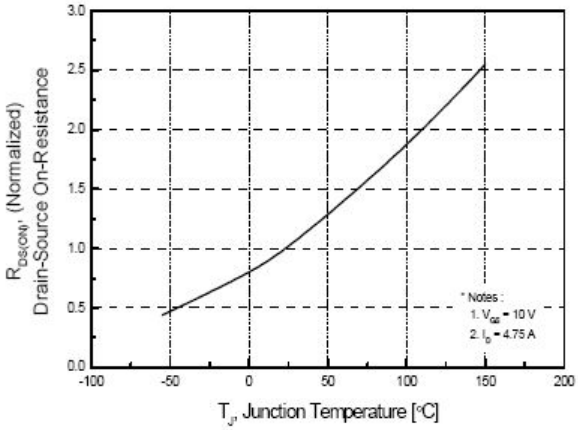


Fig3 Normalized On-Resistance Vs.Temperature

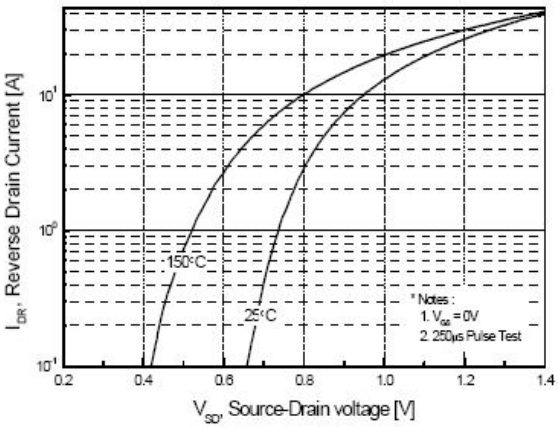


Fig4 Typical Source-Drain Diode Forward Voltage

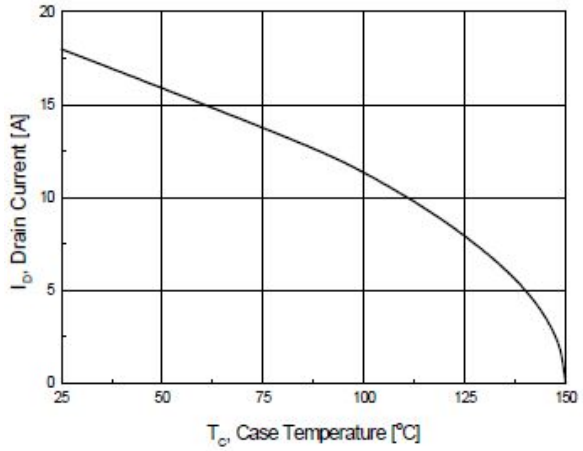


Fig5 Maximum Drain Current Vs.Case Temperature

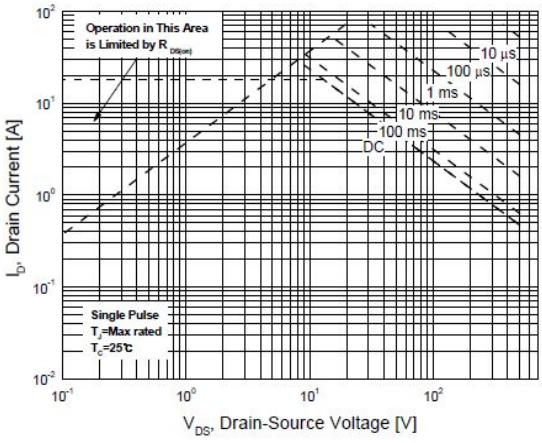
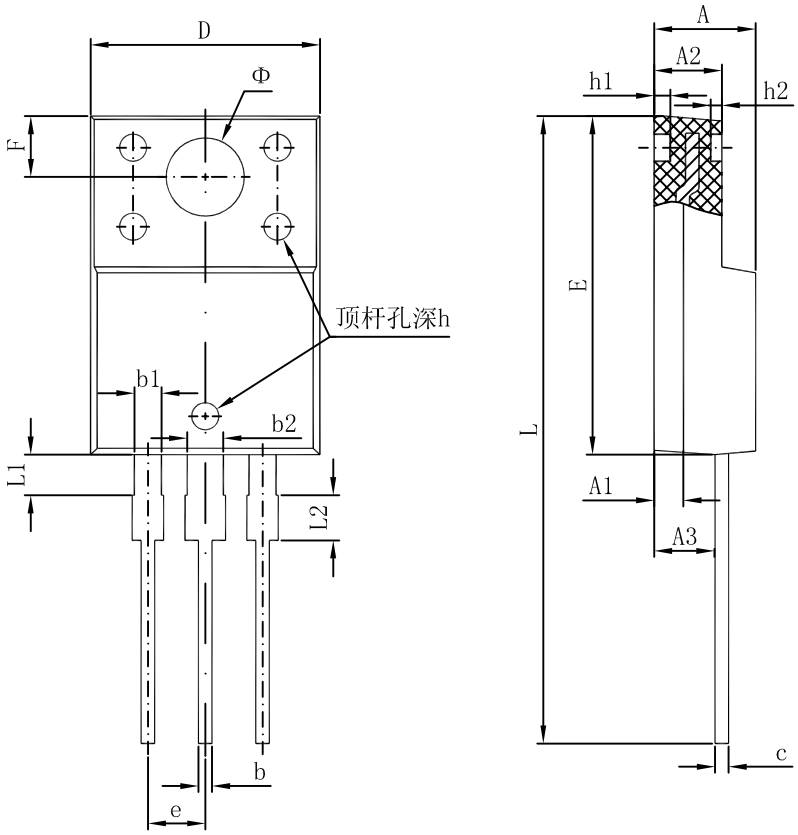


Fig6 Maximum Safe Operating Area

Package Dimension TO-220F



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
A1	1.300 REF.		0.051 REF.	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP.		0.100 TYP.	
F	2.700 REF.		0.106 REF.	
Φ	3.500 REF.		0.138 REF.	
h	0.000	0.300	0.000	0.012
h1	0.800 REF.		0.031 REF.	
h2	0.500 REF.		0.020 REF.	
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	1.900	2.100	0.075	0.083

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