

General Description

13N50F, the silicon N-channel Enhanced VDMOSFET, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy.

Features

- Fast switching
- Low on-resistance
- Low gate charge
- 100% Single Pulse avalanche energy tested

Mechanical Data

- Case: ITO-220 Package

Application

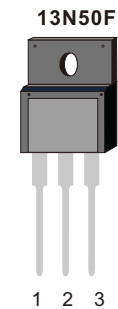
- Power switch circuit of adaptor and charger

Ordering Information

Part No.	Package Type	Package	Quality(box)
13N50F	ITO-220	Tube	1000

Product Summary			
V _{DS}	R _{DS(on)} (Ω) Typ	I _D (A)	Q _g (Typ)
500V	0.52@10V	13	39nc

ITO-220



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

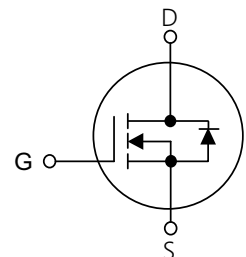


Table1 Absolute Maximum Ratings (T_c=25°C, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V _{DS}	500	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current T _c =25°C	I _D	13	A
Pulsed Drain Current (Note 1)	I _{DM}	42	A
Single Pulse Avalanche Energy(Note 2)	E _{AS}	700	mJ
Power Dissipation T _c =25°C	P _D	48	W
Operating Junction and Storage Temperature	T _J /T _{STG}	-55 ~ +150	°C
Maximum Temperature for soldering	T _L	300	°C

Table 2. Thermal Characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62.5	$^{\circ}C/W$
Thermal resistance Junction to Case	$R_{\theta JC}$	2.58	$^{\circ}C/W$

Table 3. Electrical Characteristics ($T_J=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	500	--	--	V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V$	--	--	10	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=30V, V_{DS}=0V$	--	--	100	nA
	Reverse		$V_{GS}=-30V, V_{DS}=0V$	--	--	-100	nA
On Characteristics(Note 4)							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	--	4	V	
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6.5A$	--	0.42	0.52	Ω	
Dynamic Characteristics(Note 5)							
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	--	1800	2300	pF	
Output Capacitance	C_{OSS}		--	245	320	pF	
Reverse Transfer Capacitance	C_{RSS}		--	25	35	pF	
Switching Characteristics (Note 5)							
Turn-On Delay Time	$t_d(on)$	$V_{DD}=250V, I_D=13A,$ $V_{GS}=10V, R_G=25\Omega$	--	40	90	ns	
Turn-On Rise Time	t_r		--	140	290	ns	
Turn-Off Delay Time	$t_d(off)$		--	100	210	ns	
Turn-Off Fall Time	t_f		--	85	180	ns	
Total Gate Charge	Q_G	$V_{DS}=400V, I_D=13A,$ $V_{GS}=10V$	--	39	60	nC	
Gate-Source Charge	Q_{GS}		--	12	--	nC	
Gate-Drain Charge	Q_{GD}		--	11	--	nC	
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=13A$	--	--	1.4	V	
Maximum Continuous Drain-Source Diode Forward Current	I_S		--	--	13	A	
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_F=13A$	--	290	--	ns	
Reverse Recovery Charge	Q_{RR}	$di_F/dt=100A/\mu s$ (Note 1)	--	2.6	--	μC	

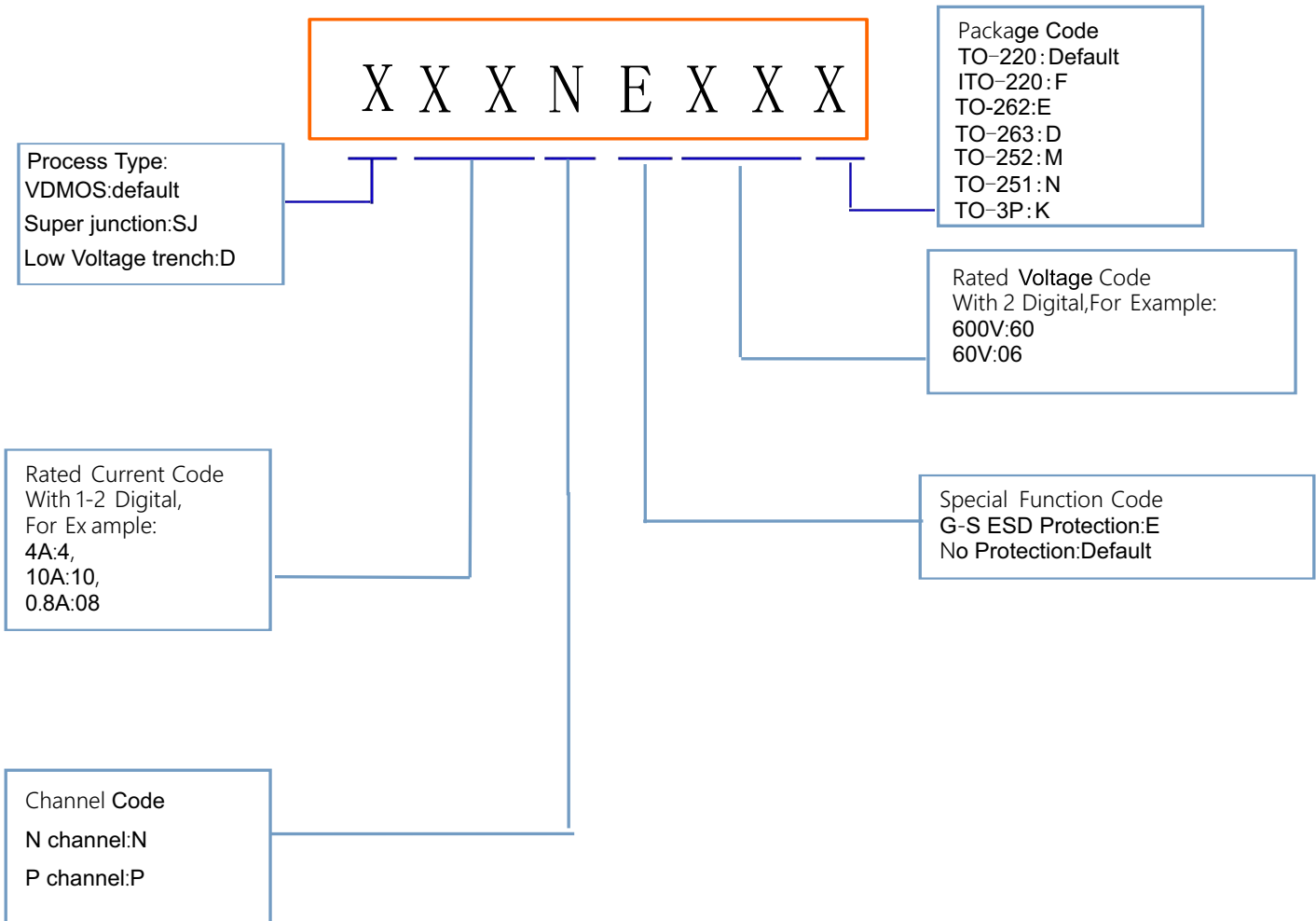
Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature

2 $L=8mH, I_D=13A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$

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

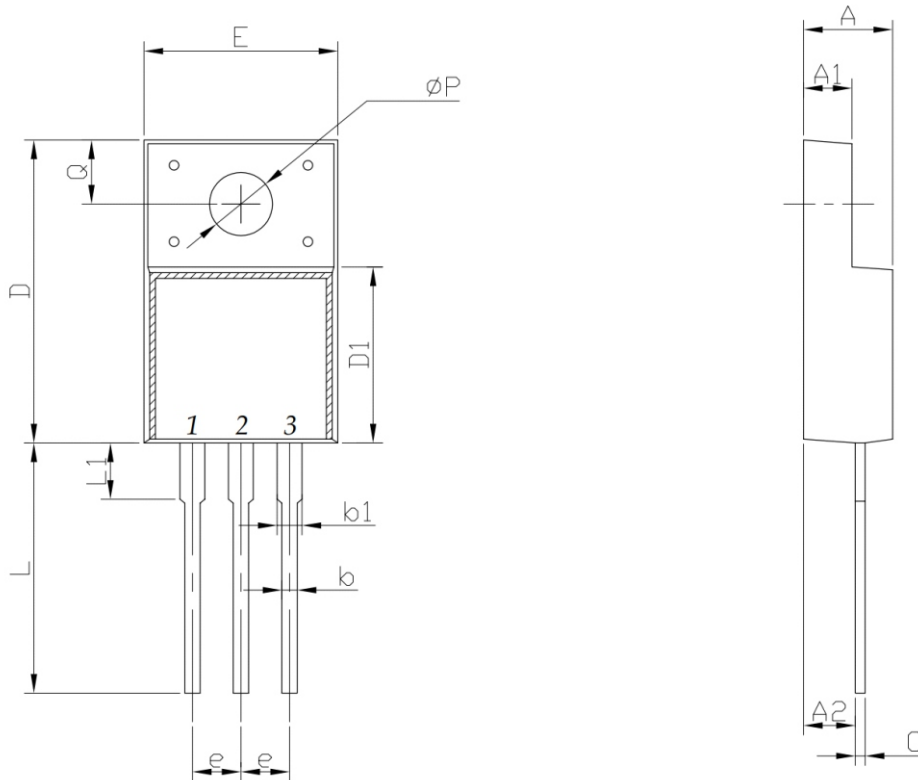
5 Guaranteed by design, not subject to production

Product Names Rules



Dimensions

ITO-220 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.24	4.9	0.167	0.193
A1	2.3	2.92	0.091	0.115
A2	2.61	2.81	0.103	0.111
b	0.3	1	0.012	0.039
b1	0.9	1.55	0.035	0.061
C	0.3	0.7	0.012	0.028
D	14.5	16.36	0.571	0.644
D1	8.8	9.41	0.346	0.370
E	9.5	10.5	0.374	0.413
e	2.3	2.75	0.091	0.108
L	12.6	14	0.496	0.551
L1	2.45	4.3	0.096	0.169
P	2.9	3.8	0.114	0.150
Q	2.5	3.55	0.098	0.140

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