

General Description

LX7N80F the silicon N-channel Enhanced VDMOSFETS, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220F, which accords with the RoHS standard.

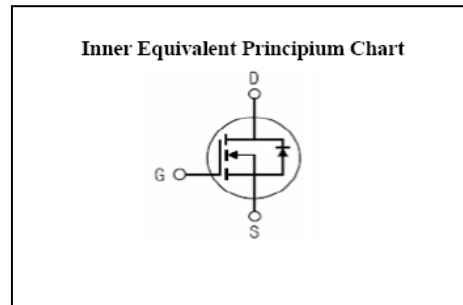
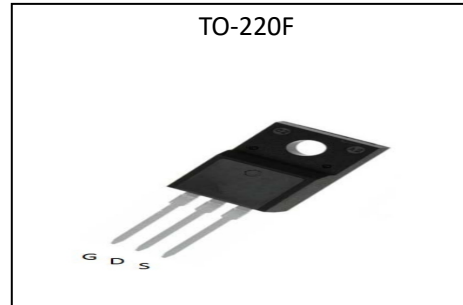
Features

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications

- Power switch circuit of adaptor and charger

V_{DSS}	800	V
I_D	7	A
$P_D(T_C=25^\circ C)$	45	W
$R_{DS(ON)TYP}$	1.3	Ω



Absolute($T_C= 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	800	V
I_D	Continuous Drain Current	7.0	A
	Continuous Drain Current $T_C = 100^\circ C$	5.0	A
I_{DM}^{a1}	Pulsed Drain Current	28	A
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}^{a2}	Single Pulse Avalanche Energy	700	mJ
E_{AR}^{a1}	Avalanche Energy , Repetitive	60	mJ
I_{AR}^{a1}	Avalanche Current	2.4	A
dv/dt^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	45	W
	Derating Factor above $25^\circ C$	0.36	W/ $^\circ C$
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$

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



Electrical Characteristics (T_c= 25°C unless otherwise specified)

OFF Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V _{DSS}	Drain to Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	800	--	--	V
ΔBV _{DSS} /ΔT _J	Bvdss Temperature Coefficient	I _D = 250μA, Reference 25°C	--	0.8	--	V/°C
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 800V, V _{GS} = 0V, T _a = 25°C	--	--	1	μA
		V _{DS} = 640V, V _{GS} = 0V, T _a = 125°C	--	--	250	
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} = +30V	--	--	10	μA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} = -30V	--	--	-10	μA

ON Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} = 10V, I _D = 3.5A	--	1.3	1.5	Ω
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.5	--	4.5	V

Pulse width tp ≤ 380μs, δ ≤ 2%

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g _{fs}	Forward Transconductance	V _{DS} = 15V, I _D = 3A	--	8.0	--	S
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V f = 1.0MHz	--	1460	--	pF
C _{oss}	Output Capacitance		--	130	--	
C _{rss}	Reverse Transfer Capacitance		--	23	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D = 7.0A, V _{DD} = 400V V _{GS} = 10V, R _G = 9.1Ω	--	22	--	ns
t _r	Rise Time		--	45	--	
t _{d(OFF)}	Turn-Off Delay Time		--	33	--	
t _f	Fall Time		--	37	--	
Q _g	Total Gate Charge	I _D = 7.0A, V _{DD} = 400V V _{GS} = 10V	--	37	--	nC
Q _{gs}	Gate to Source Charge		--	8.0	--	
Q _{gd}	Gate to Drain (" Miller ") Charge		--	14	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	7	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	28	A
V_{SD}	Diode Forward Voltage	$I_S = 7.0A, V_{GS} = 0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S = 7.0A, T_J = 25^\circ C$	--	380	--	ns
Q_{rr}	Reverse Recovery Charge	$di_F/dt = 100A/\mu s, V_{GS} = 0V$	--	1400	--	nC

Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	2.78	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient	100	$^\circ C/W$

a1: Repetitive rating; pulse width limited by maximum junction temperature

a2: $L = 10.0mH, I_D = 11.8A$, Start $T_J = 25^\circ C$

a3: $I_{SD} = 7A, di/dt \leq 100A/\mu s, V_{DD} \leq BV_{DS}$, Start $T_J = 25^\circ C$

Test Circuits

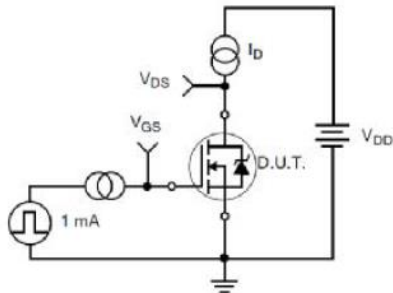


Figure 17. Gate Charge Test Circuit

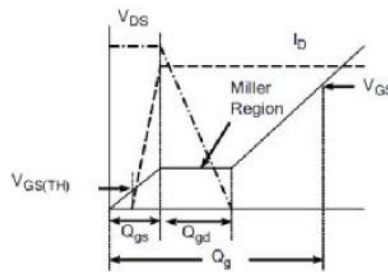


Figure 18. Gate Charge Waveform

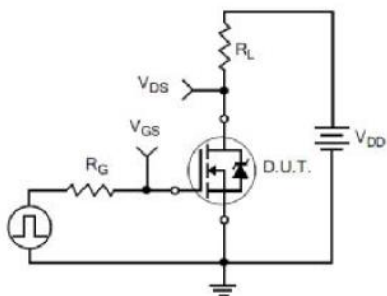


Figure 19. Resistive Switching Test Circuit

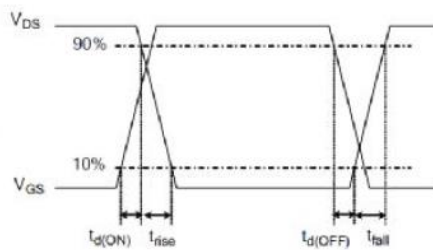


Figure 20. Resistive Switching Waveforms

Characteristics Curves

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

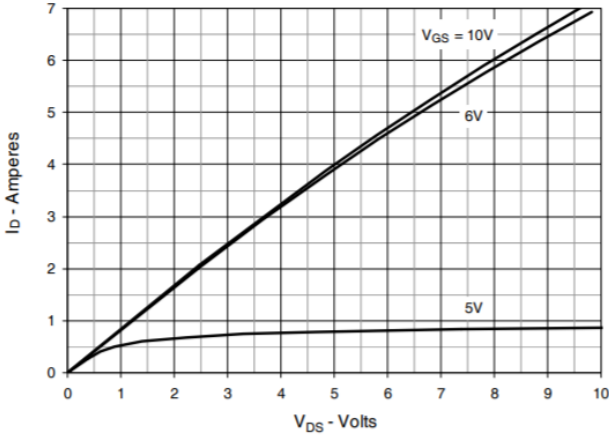


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

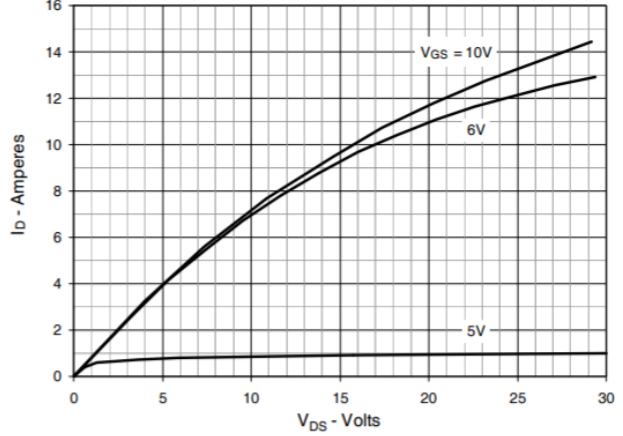


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

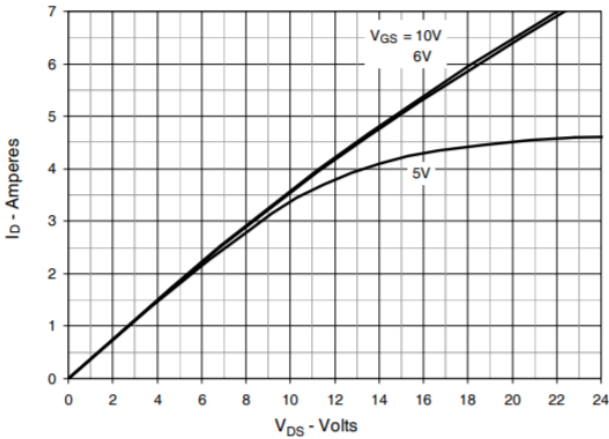


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 3.5\text{A}$ Value vs. Junction Temperature

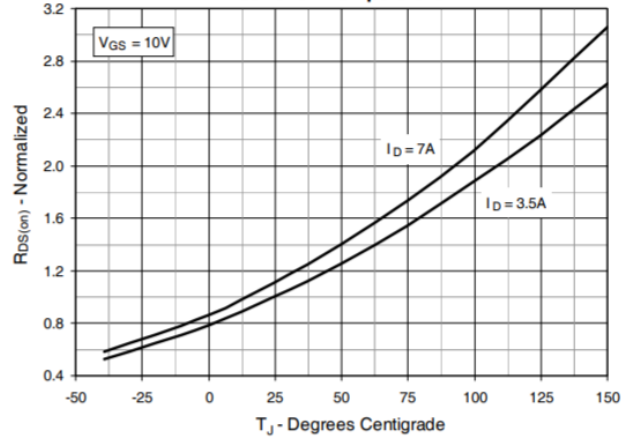


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 3.5\text{A}$ Value vs. Drain Current

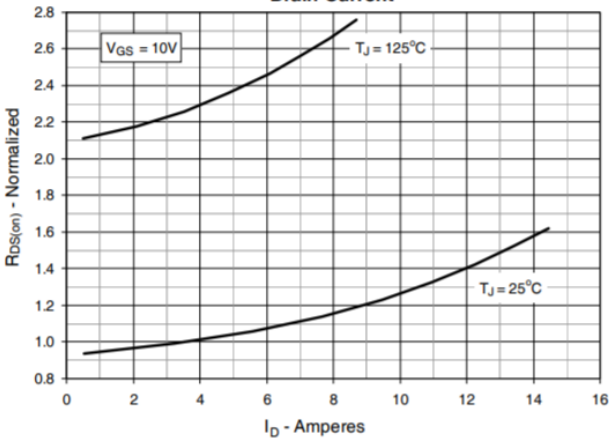


Fig. 6. Maximum Drain Current vs. Case Temperature

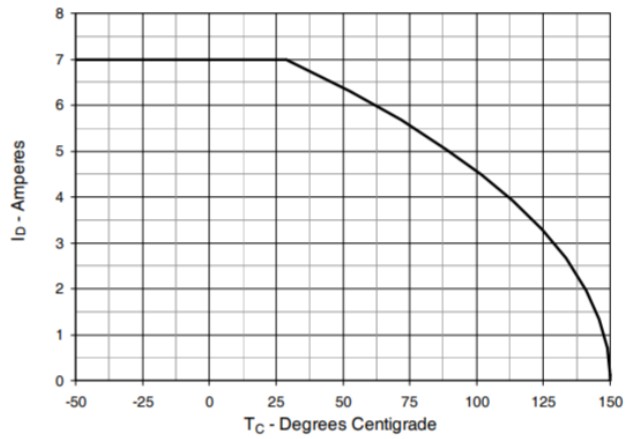


Fig. 7. Input Admittance

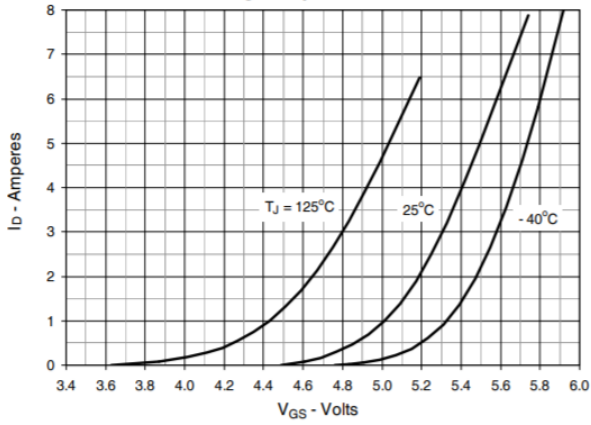


Fig. 8. Transconductance

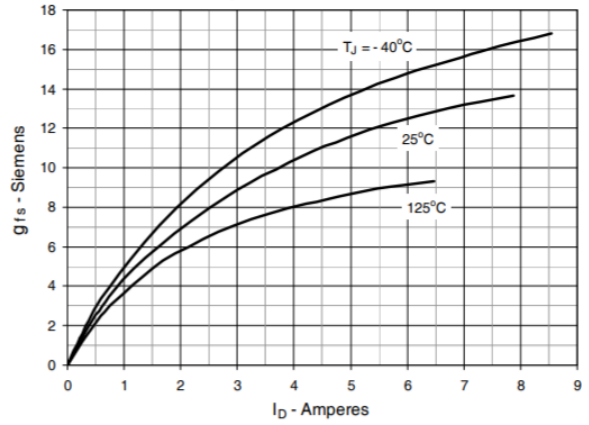


Fig. 9. Forward Voltage Drop of Intrinsic Diode

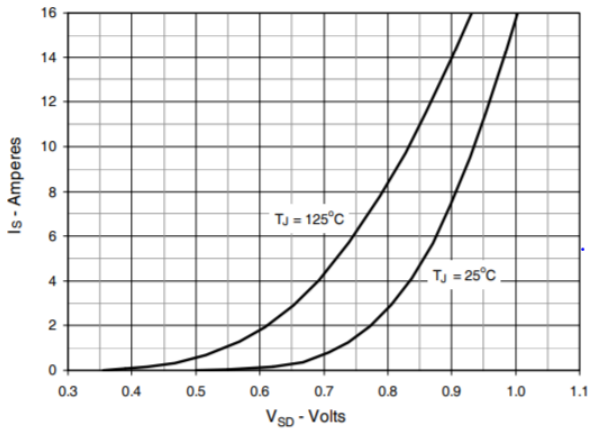


Fig. 10. Gate Charge

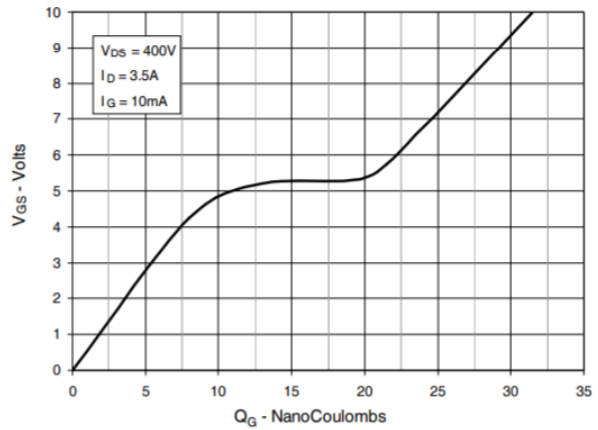


Fig. 11. Capacitance

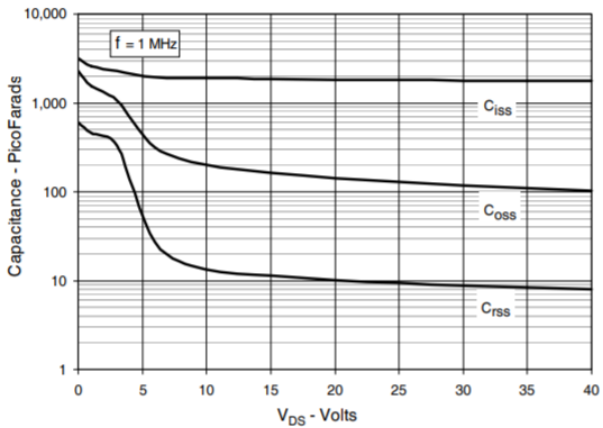


Fig. 12. Maximum Transient Thermal Impedance

