Leading Circuit Protection
Products and Solutions

LX56F90N10

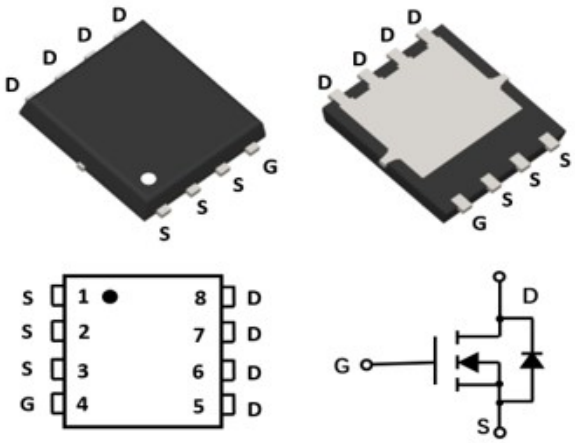
N-Channel Enhancement Mode Field Effect Transistor

Product Summary

- V_{DS} 100V
- I_D 90A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜5.0mohm
- 100% UIS Tested
- 100% ▽V_{DS} Tested

Package

PDFN 5X6



General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	Tc=25℃	I_D	90	A
	Tc=100℃		57	
Pulsed Drain Current [A]		I_{DM}	360	A
Avalanche energy [B]		E_{AS}	400	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	120	W
	Tc=100℃		48	
Junction and Storage Temperature Range		T_J,T_{STG}	-55～+150	℃

Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	t≤10S	$R_{\theta JA}$	15	20	℃/W
Thermal Resistance Junction-to-Ambient [D]	Steady-State		40	50	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.84	1.04	

Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
LX56F90N10	F1	90G10B	5000	10000	100000	13“ reel

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		4.1	5.0	mΩ
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				90	A
Gate resistance	R_G	f=1MHz, Open drain		0.9		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V,f=1MHZ		3927		pF
Output Capacitance	C_{oss}			1658		
Reverse Transfer Capacitance	C_{rss}			36		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V,I_D=20A		66		nC
Gate-Source Charge	Q_{gs}			15.4		
Gate-Drain Charge	Q_{gd}			10.6		
Reverse Recovery Chrage	Q_{rr}	I_F=20A, di/dt=100A/us		82		
Reverse Recovery Time	t_{rr}			64		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=50V,I_D=20A R_{GEN}=2.2Ω		17.6		
Turn-on Rise Time	t_r			34.7		
Turn-off Delay Time	$t_{D(off)}$			43.8		
Turn-off fall Time	t_f			61.4		

A. Repetitive rating; pulse width limited by max. junction temperature.

B. V_{DD}=50V, R_G=25Ω, L=2Mh, I_{AS}=31A.

C. Pd is based on max. junction temperature, using junction-case thermal resistance.

D. The value of RθJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation PDSM is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

Typical Performance Characteristics

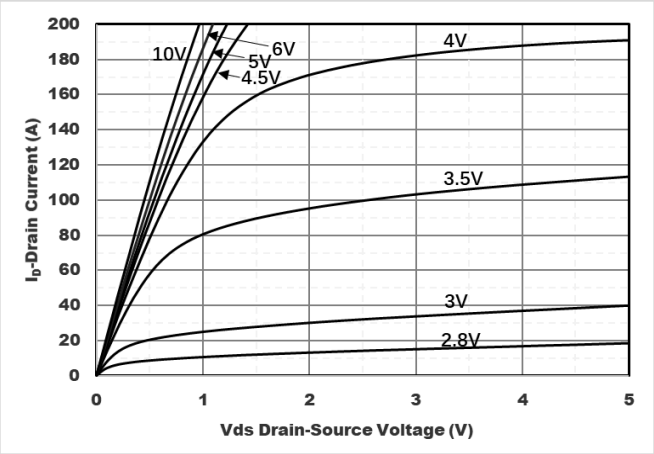


Figure1. Output Characteristics

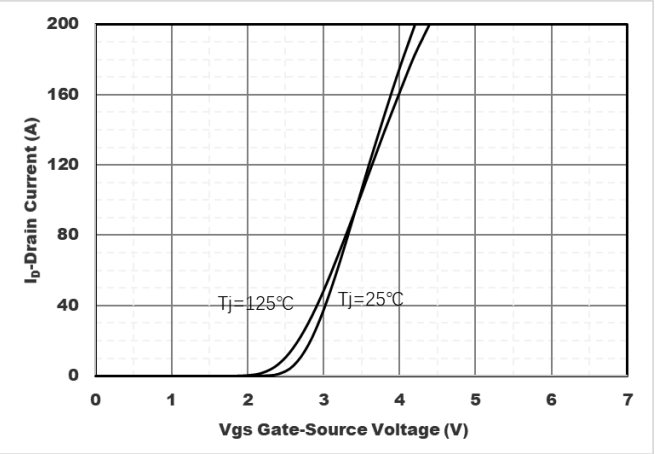


Figure2. Transfer Characteristics

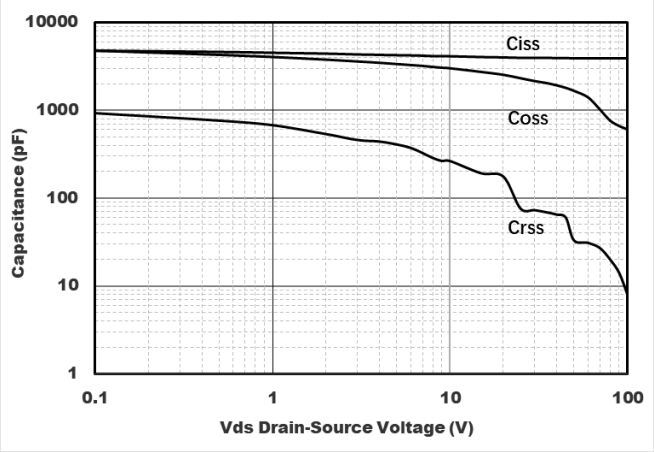


Figure3. Capacitance Characteristics

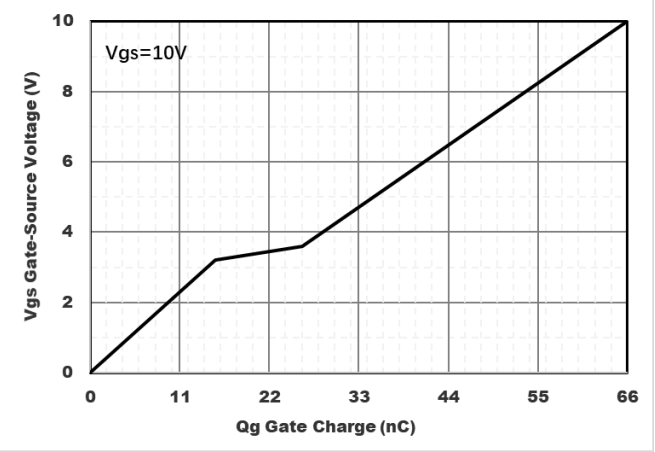


Figure4. Gate Charge

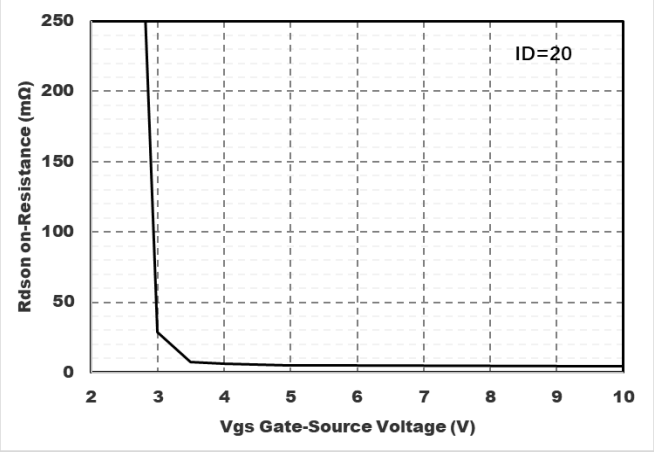


Figure5. : On-Resistance vs. Gate to Source Voltage

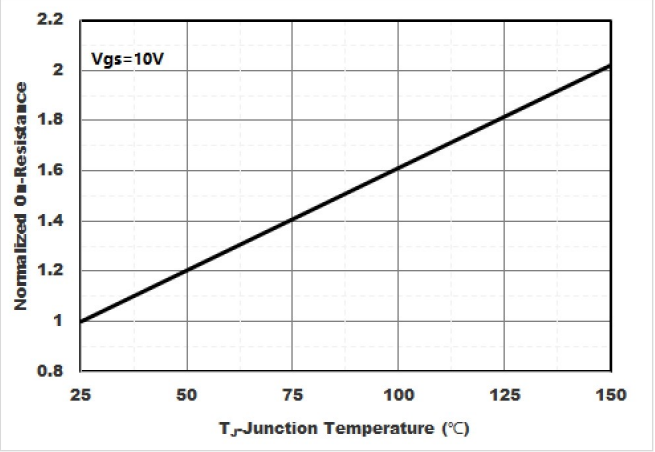


Figure6.Normalized On-Resistance

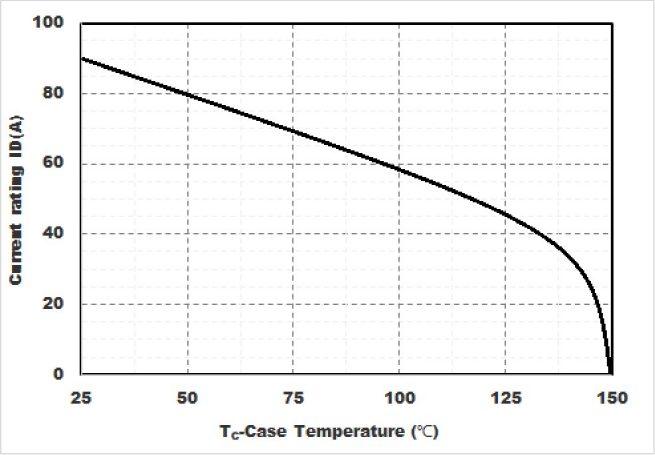


Figure7. Drain current

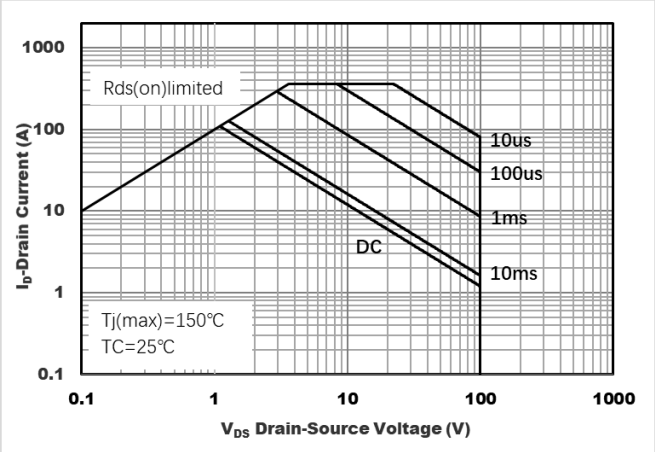


Figure8.Safe Operation Area

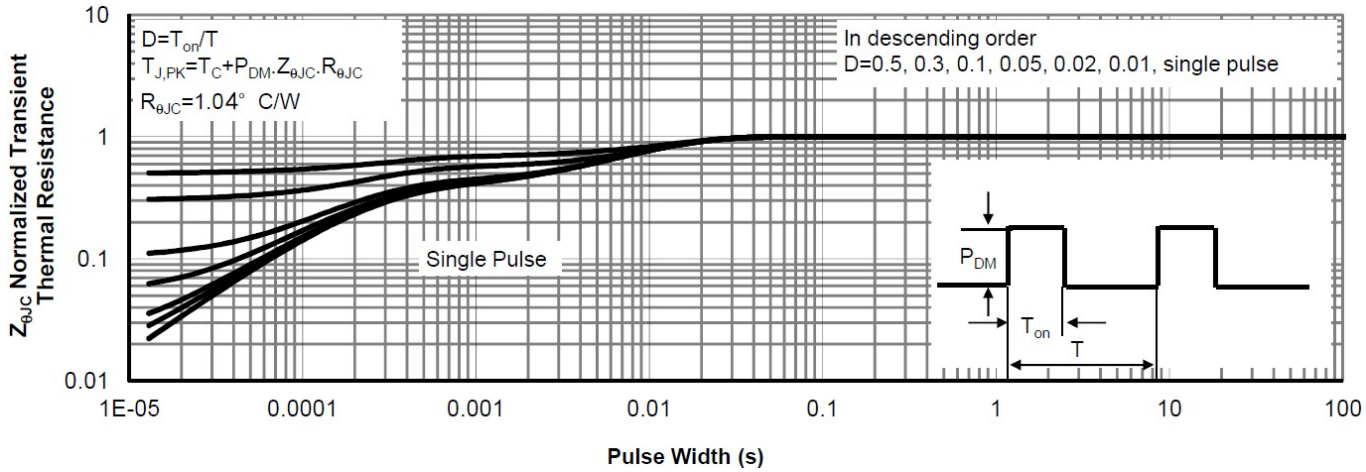


Figure9.Normalized Maximum Transient thermal impedance

PDFN5x6 Package information