SL90P02Q

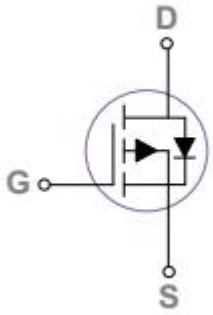
P-Channel Power MOSFET

General Features

- V_{DS} =-20V,I_D =-90A
  $R_{DS(ON)}$ <2.3 mΩ @ V_{GS}=-10V
  $R_{DS(ON)}$ <2.6 mΩ @ V_{GS}=-4.5V
- Improved dv/dt capability
- Fast switching
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Applications

- Power switching application
- Networking
- Notebook



Schematic diagram

DFN5X6-8L top view

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous (T_C=25℃)	I_D(25℃)	-90	A
Drain Current-Continuous (T_C=100℃)	I_D (100℃)	-54	A
Pulsed Drain Current	I_{DM}	-360	A
Maximum Power Dissipation (T_C=25℃)	P_D	41.67	W
Derating factor		0.33	W/℃
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case(Note 2)	$R_{\theta JC}$	3.0	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	-20	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V,TJ = 25°C	-	-	-1	μA
		V_{DS}=-16V,V_{GS}=0V,TJ =125°C	-	-	-30	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±500	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.6	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D= -20A	-	1.8	2.3	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	2.1	2.6	
		V_{GS}=-2.5V, I_D=-20A	-	2.7	3.6	
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-3A	-	30	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	14000	21000	PF
Output Capacitance	C_{oss}		-	1670	2500	PF
Reverse Transfer Capacitance	C_{rss}		-	730	1100	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, I_D=-1A V_{GS}=-4.5V,R_G=25Ω	-	21.2	42	nS
Turn-on Rise Time	t_r		-	20.6	40	nS
Turn-Off Delay Time	$t_{d(off)}$		-	26	52	nS
Turn-Off Fall Time	t_f		-	400	600	nS
Total Gate Charge	Q_g	V_{DS}=-16V,I_D=-5A, V_{GS}=-4.5V	-	149	225	nC
Gate-Source Charge	Q_{gs}		-	14.4	22	nC
Gate-Drain Charge	Q_{gd}		-	42.8	65	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A,TJ = 25°C	-		-1.0	V
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	-	-	-90	A
Pulsed Source Current	I_{SM}		-	-	-180	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics (Curves)

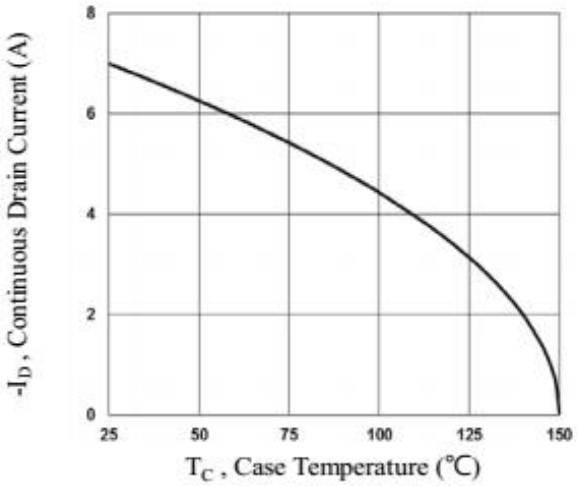


Fig.1 Continuous Drain Current vs. T_C

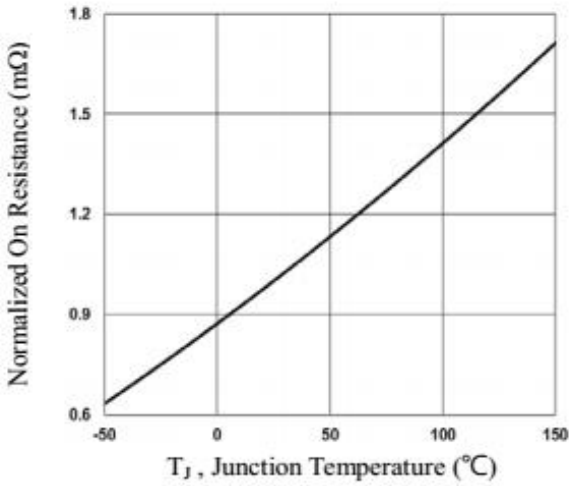


Fig.2 Normalized RDSON vs. T_J

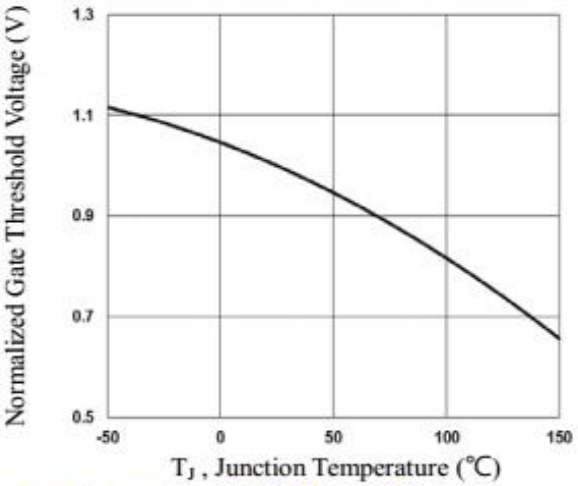


Fig.3 Normalized V_{th} vs. T_J

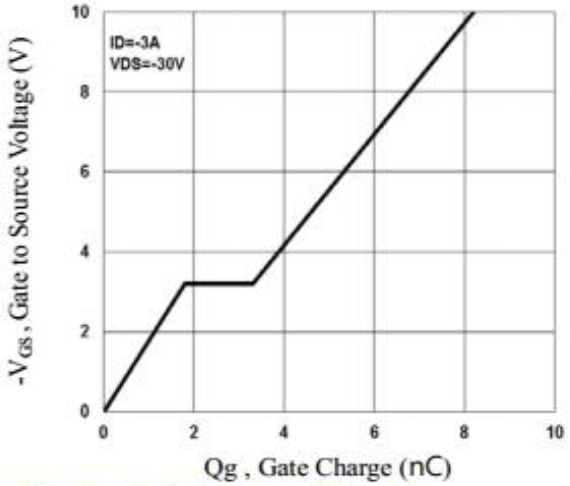


Fig.4 Gate Charge Waveform

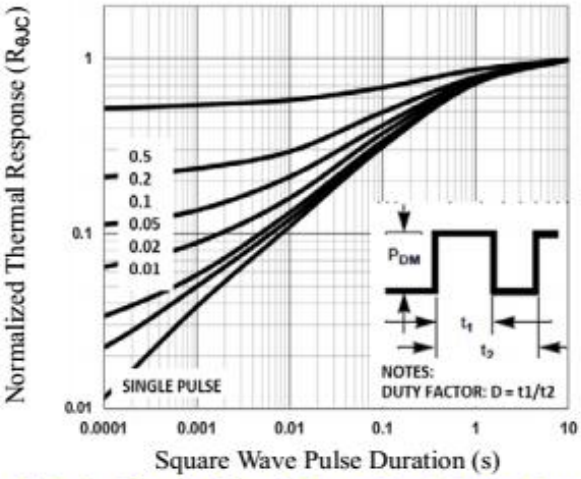


Fig.5 Normalized Transient Impedance

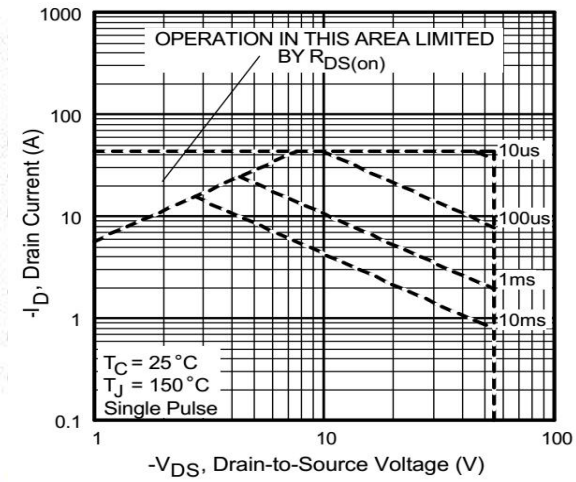


Fig.6 Maximum Safe Operation Area

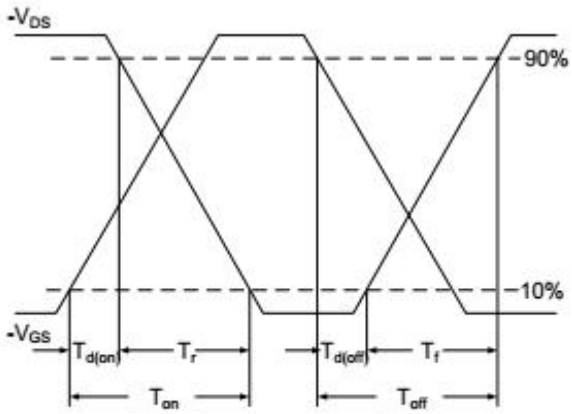


Fig.7 Switching Time Waveform

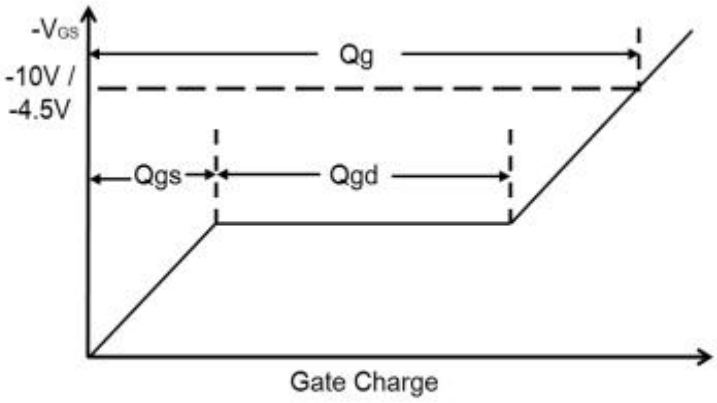
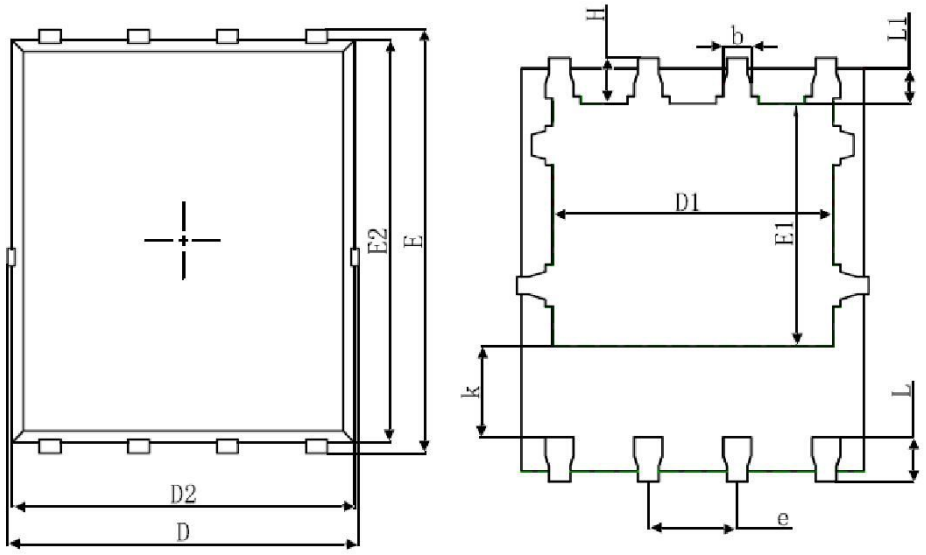


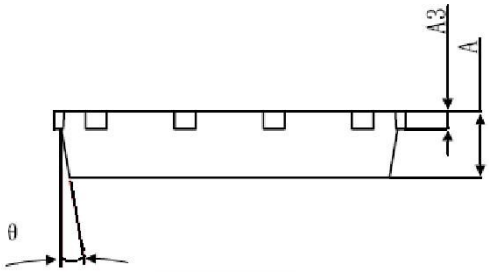
Fig.8 Gate Charge Waveform

DFN5X6-8L Package Information



Top View

Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°