

N-Channel Power MOSFET

General Description

- Very low on-resistance $R_{DS(ON)}$
- Low Gate Charge
- Excellent Gate Charge x $R_{DS(ON)}$ Product

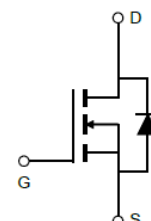
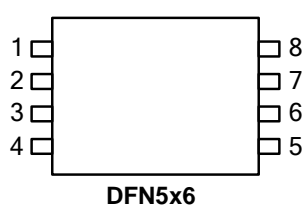
Applications

- High Frequency Switching and Synchronous Rectification

Product Summary

V_{DS}	80V
I_D	48A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 6.5m Ω (Max)
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	< 8.5m Ω (Max)

100% DVDS Tested
 100% UIS Tested
 100% Rg Tested



Part Number	Package Type	Form	Marking
SL48N08Q	DFN5x6	Tape & Reel	SL48N08Q

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	Silicon Limited	48	A
	$T_C = 100^\circ\text{C}$ ^B	42.5	
Pulsed Drain Current ^A	I_{DM}	170	A
Avalanche Current ^A	I_{AS}	34	A
Single Pulse Avalanche Energy	$L = 0.3\text{mH}$ ^A E_{AS}	57.8	mJ
Power Dissipation ^C	$T_C = 25^\circ\text{C}$	56	W
	$T_A = 25^\circ\text{C}$	2	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Case	Steady-State $R_{\theta JC}$	62	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient	Steady-State $R_{\theta JA}$	2.2	

Electrical Characteristics @T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =10mA	80	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =20A	-	4.3	6.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	6.3	8.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	-	2.3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =20A	-	75	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =20V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge	I _D =20A	-	40	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V	-	7.2	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	6.5	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V	-	8.3	-	ns
t _r	Rise Time	I _D =1A	-	4.2	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	36	-	ns
t _f	Fall Time	V _{GS} =10V	-	6.9	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	2860	-	pF
C _{oss}	Output Capacitance	V _{DS} =15V	-	410	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	38	-	pF
R _g	Gate Resistance	f=1.0MHz	-	0.5	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =20A, V _{GS} =0V	-	-	1	V
t _{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V,	-	27	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	30	-	nC

Note :

- 1.The data tested by surface mounted on a 1 inch²FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=34A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 6.The maximum current rating is package limited.

Typical Characteristics

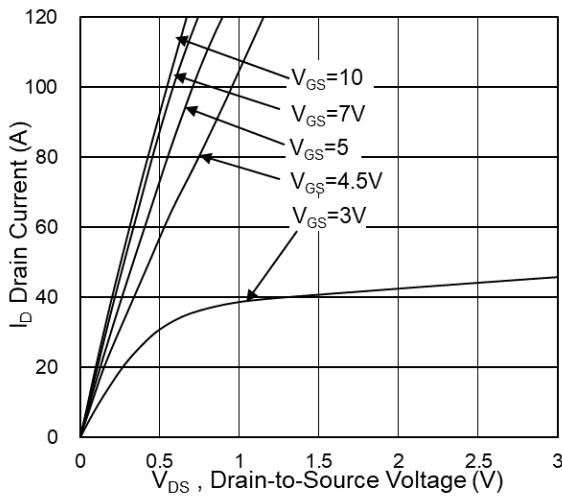


Fig.1 Typical Output Characteristics

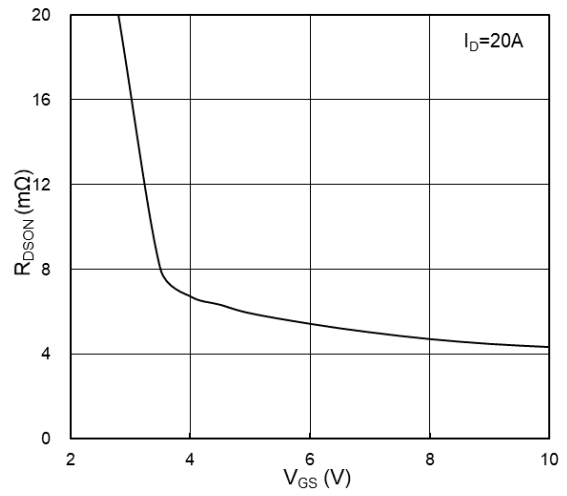


Fig.2 On-Resistance vs G-S Voltage

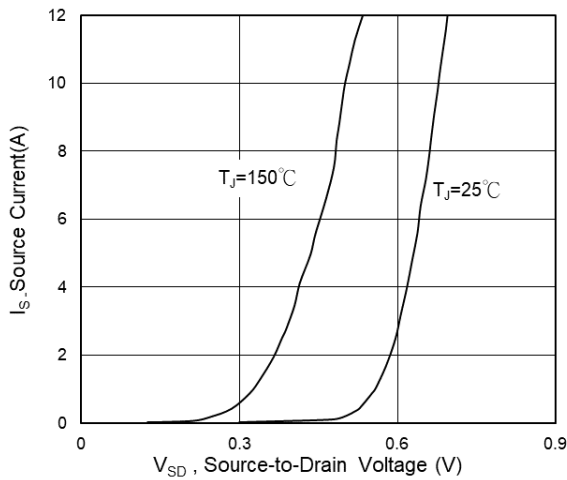


Fig.3 Source Drain Forward Characteristics

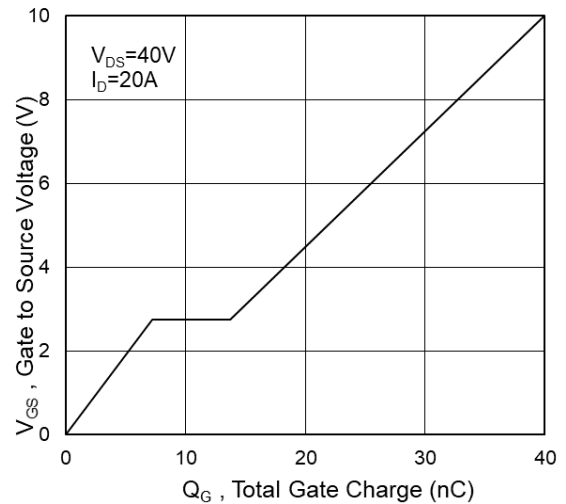


Fig.4 Gate-Charge Characteristics

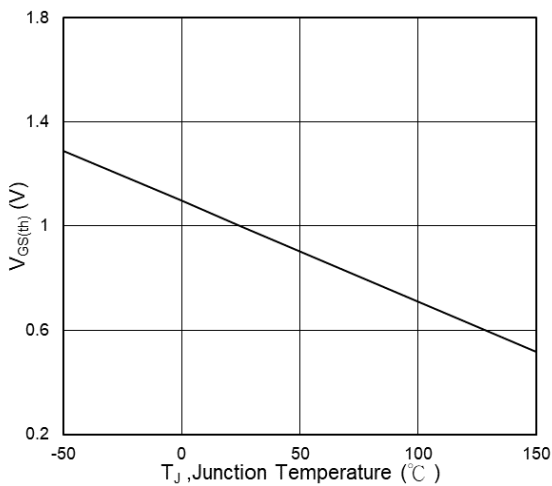


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

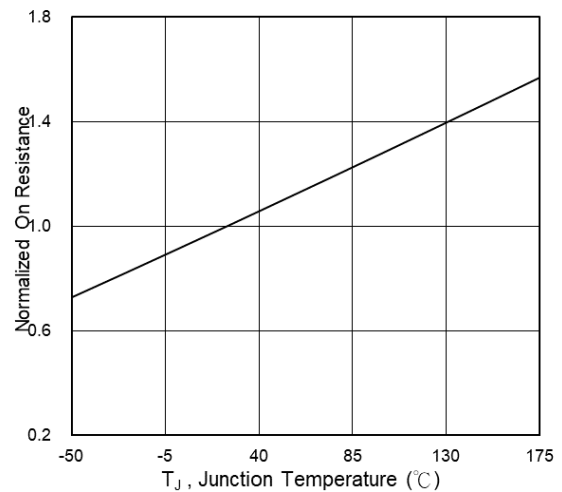


Fig.6 Normalized R_{DSON} vs. T_J

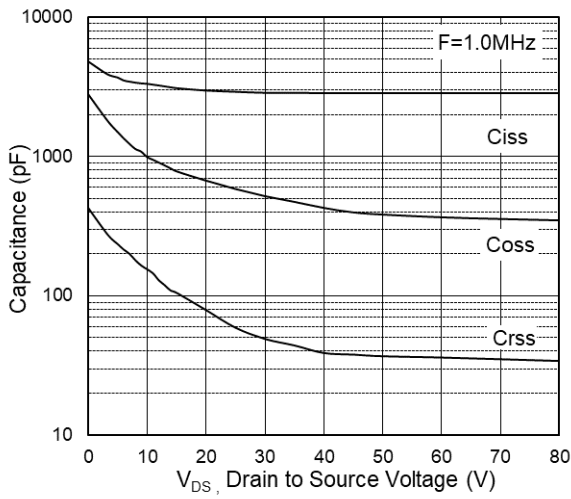


Fig.7 Capacitance

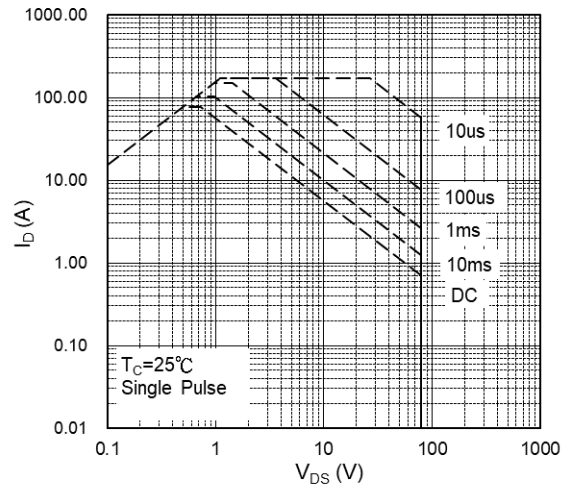


Fig.8 Safe Operating Area

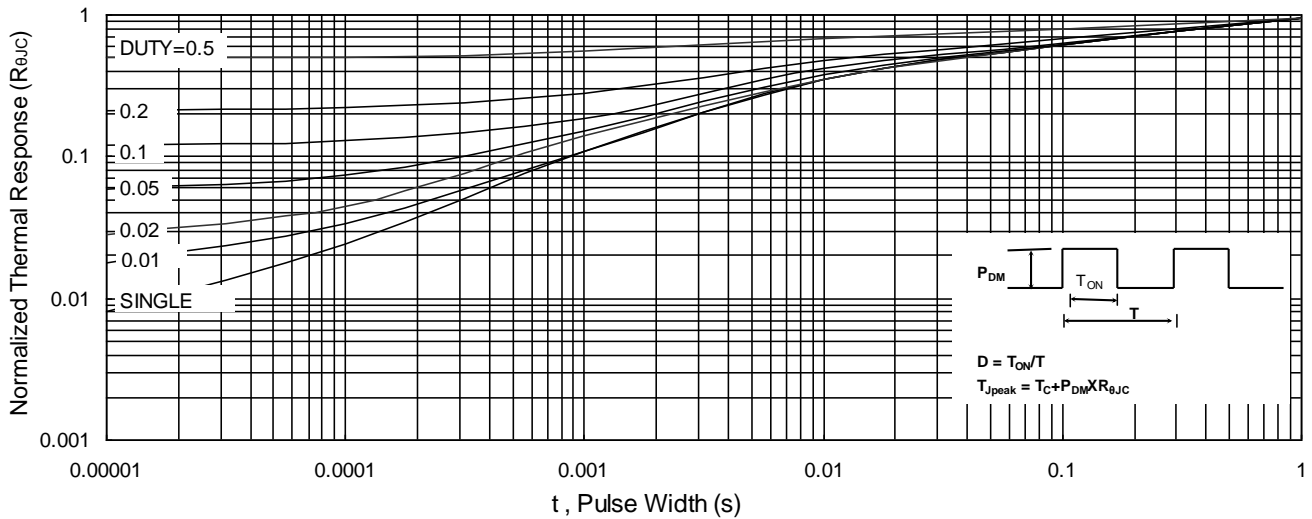


Fig.9 Normalized Maximum Transient Thermal Impedance

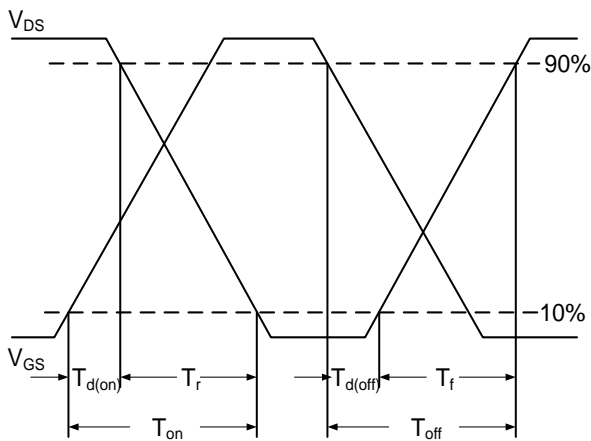


Fig.10 Switching Time Waveform

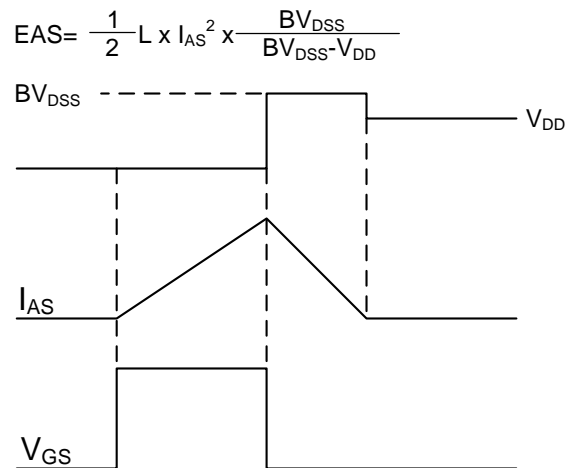
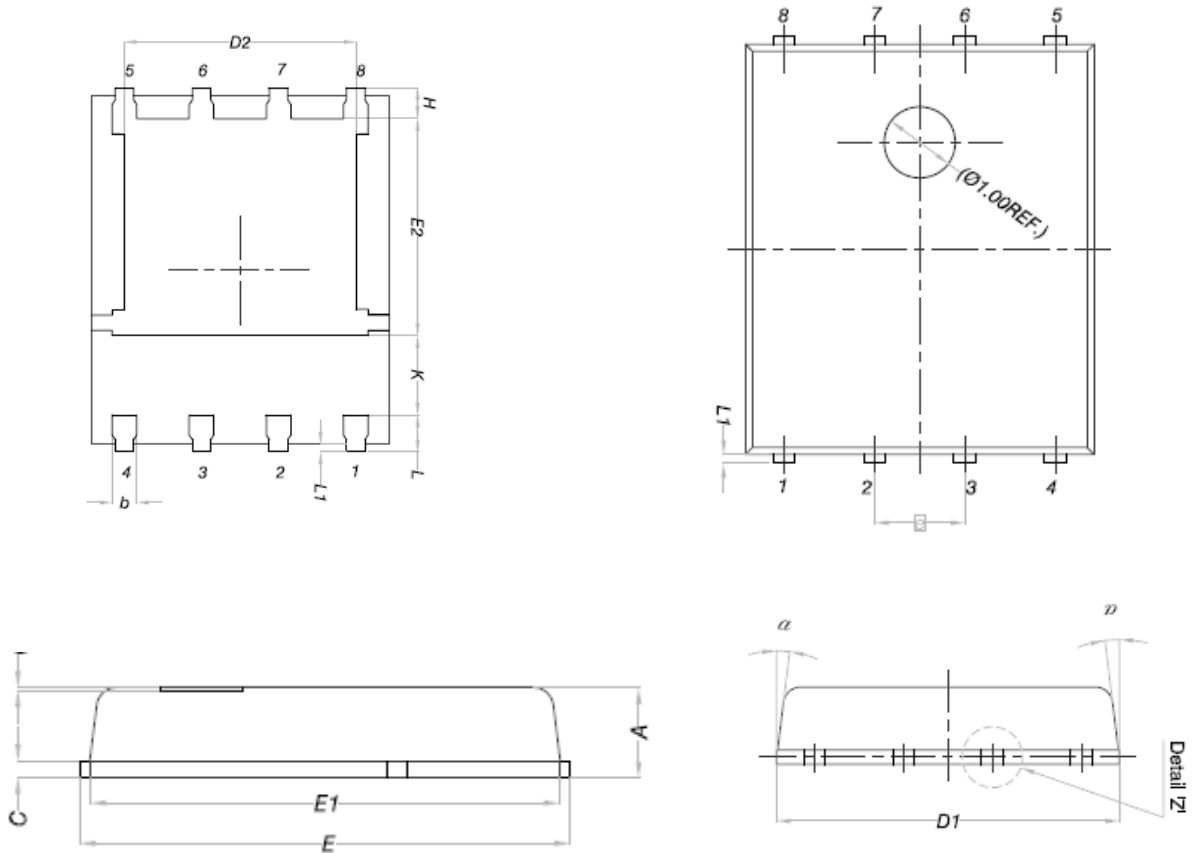


Fig.11 Unclamped Inductive Switching Waveform

DFN5x6


DIM.	MILLIMETERS			DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	0.90	1.00	1.10	E	5.90	6.00	6.10
A1	0	-	0.05	E1	5.70	5.75	5.80
b	0.33	0.41	0.51	E2	3.38	3.58	3.78
C	0.20	0.25	0.30	e	1.27 BSC		
D1	4.80	4.90	5.00	H	0.41	0.51	0.61
D2	3.61	3.81	3.96	K	1.10	-	-
				L	0.51	0.61	0.71
				L1	0.06	0.13	0.20
				α	0°	-	12°