

N-Channel Power MOSFET

General Description

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

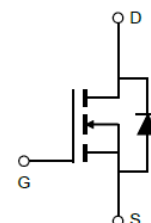
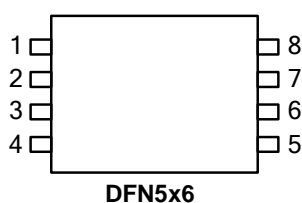
Applications

- 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	I_D	Silicon Limited	48
		$T_C = 100^\circ\text{C}$ ^B	42.5
Pulsed Drain Current ^A	I_{DM}	170	A
Avalanche Current ^A	I_{AS}	34	A
Single Pulse Avalanche Energy	E_{AS}	57.8	mJ
Power Dissipation ^C	P_D	$T_C = 25^\circ\text{C}$	56
		$T_A = 25^\circ\text{C}$	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	$R_{\theta JC}$	62	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient	$R_{\theta JA}$	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 20Z 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

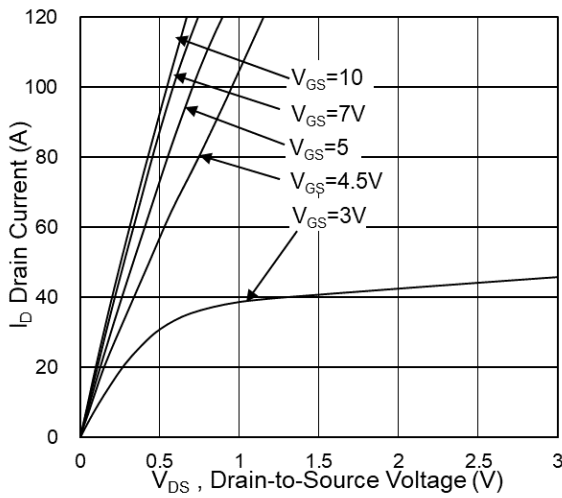


Fig.1 Typical Output Characteristics

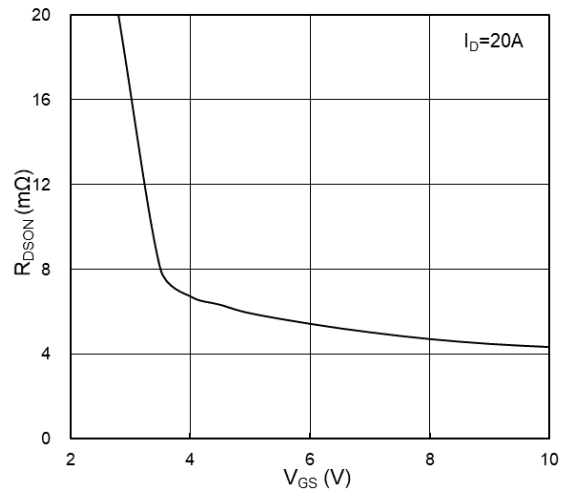


Fig.2 On-Resistance vs G-S Voltage

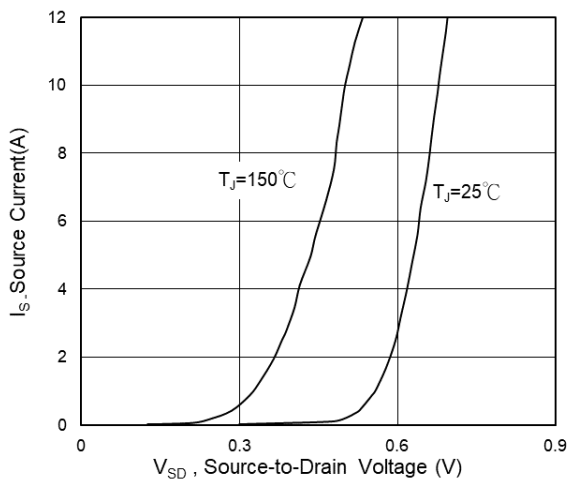


Fig.3 Source Drain Forward Characteristics

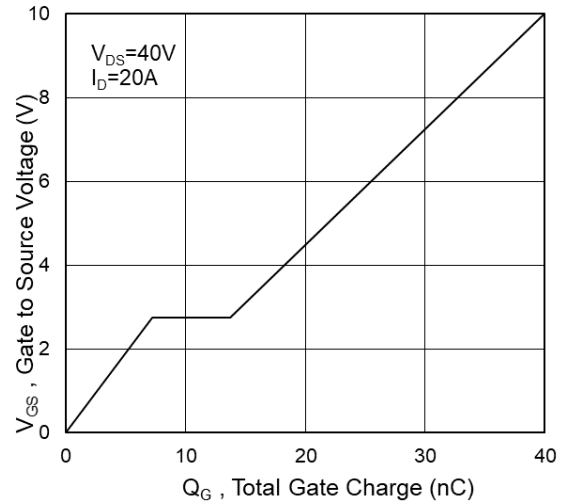


Fig.4 Gate-Charge Characteristics

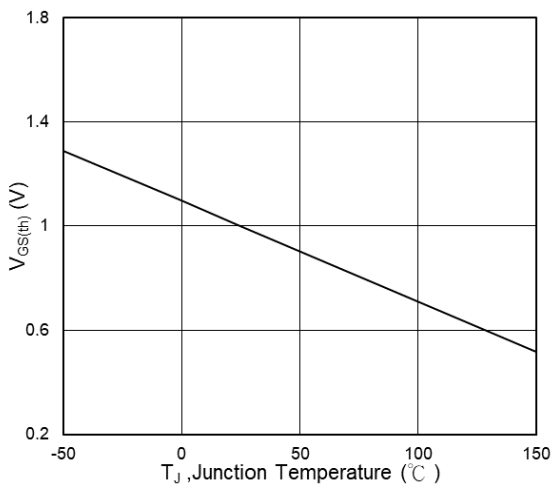


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

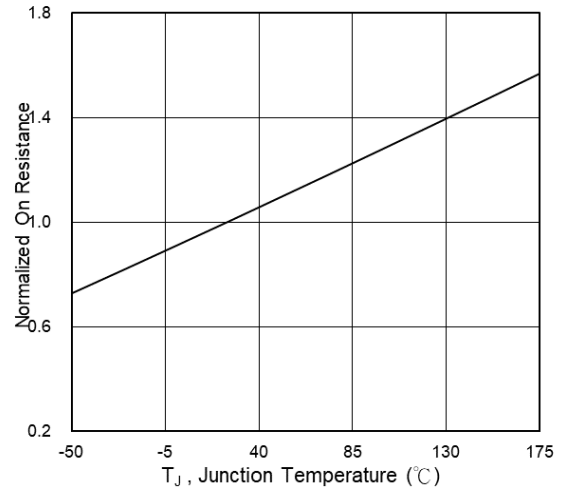


Fig.6 Normalized R_{DSON} vs. T_J

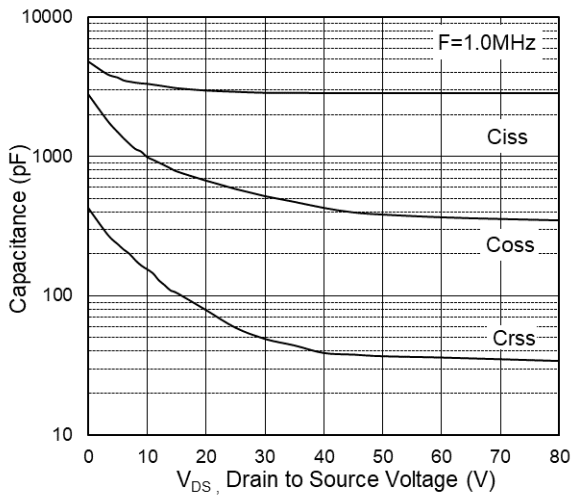


Fig.7 Capacitance

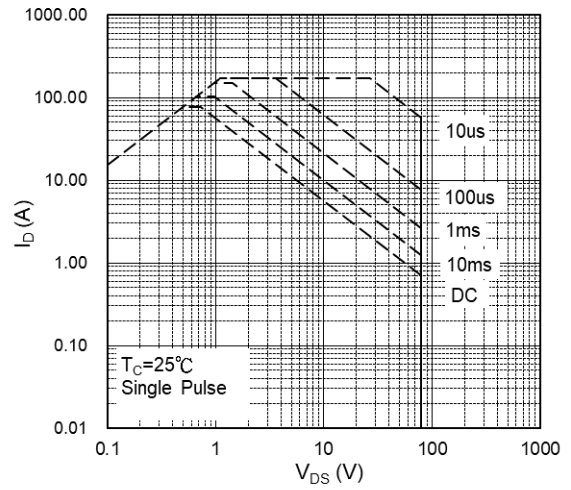


Fig.8 Safe Operating Area

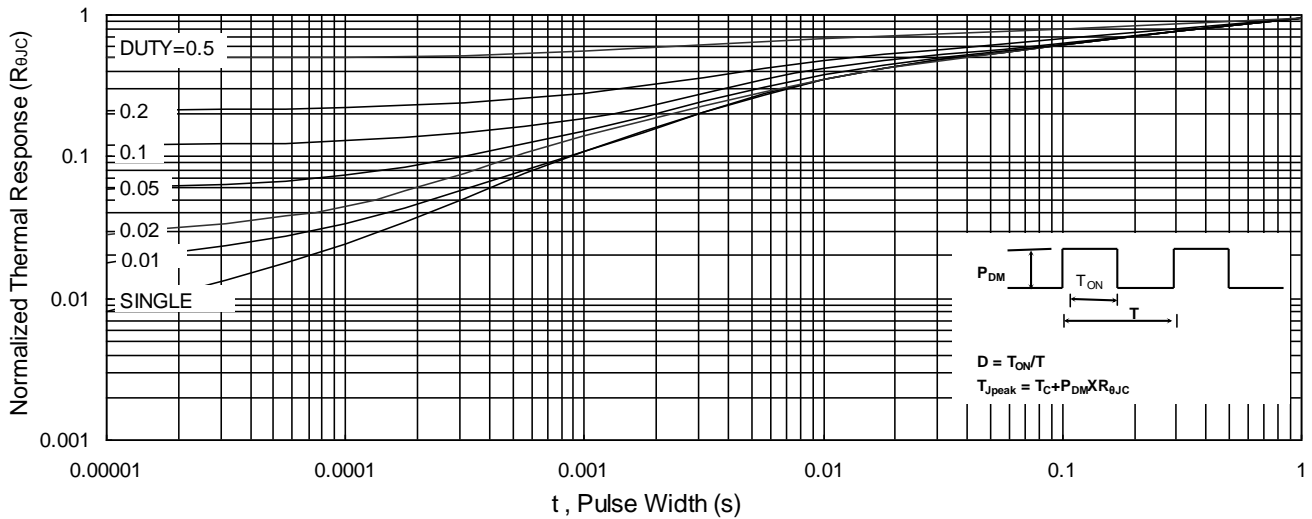


Fig.9 Normalized Maximum Transient Thermal Impedance

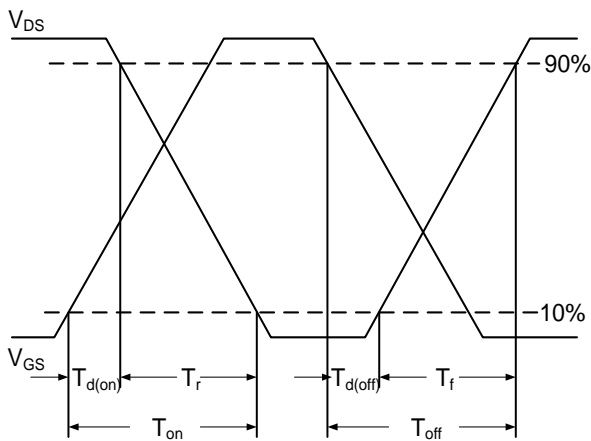


Fig.10 Switching Time Waveform

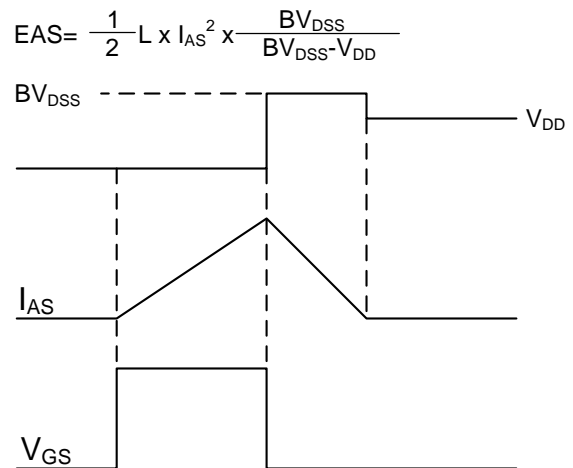
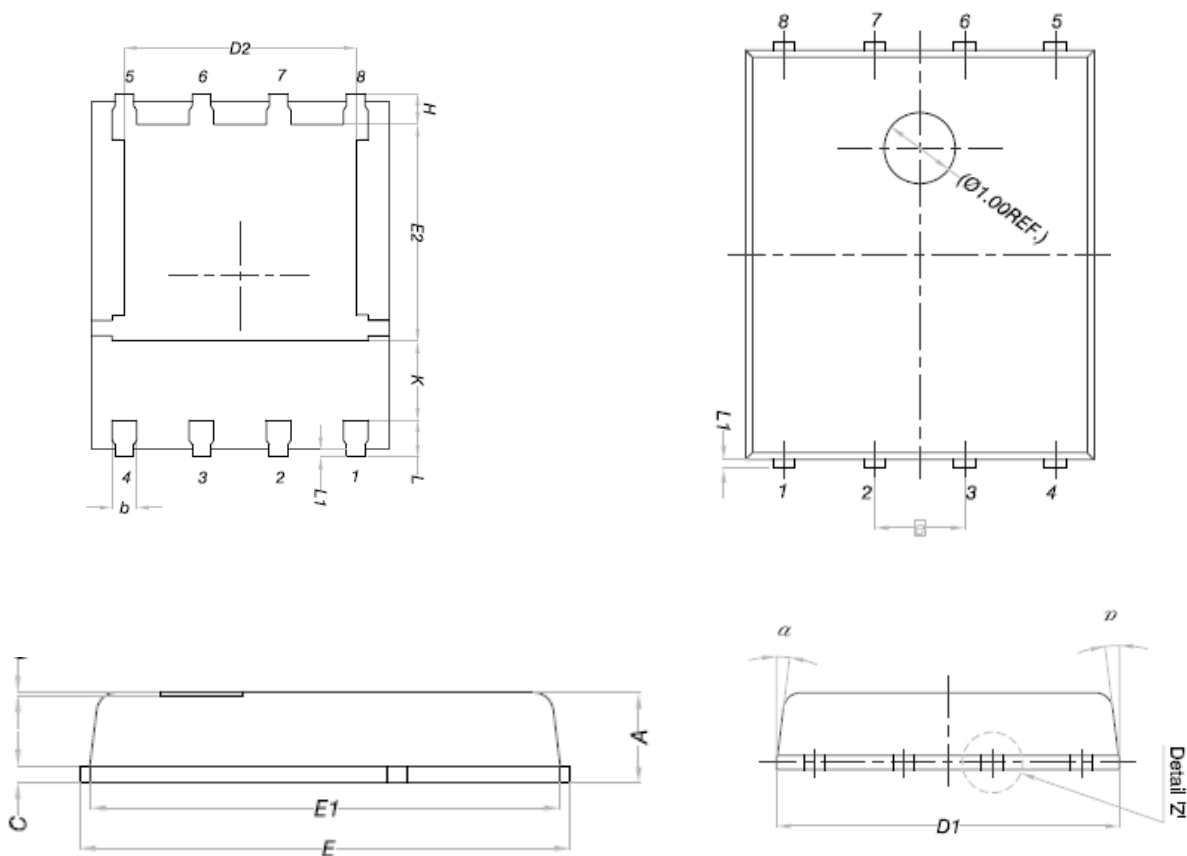


Fig.11 Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

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°

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