General Description

SFGMOS® MOSFET is based on Oriental Semiconductor's unique device design to achieve low $R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. The low V_{th} series is specially optimized for synchronous rectification systems with low driving voltage.

Features

RoHS compliant

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent reliability and uniformity
- Fast switching and soft recovery

Applications

- PD charger
- Motor driver
- Switching voltage regulator
- DC-DC convertor
- Switched mode power supply

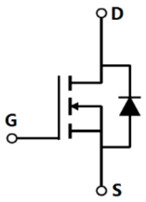
Key Performance Parameters

Parameter	Value	Unit
$V_{DS, min}$ @ $T_{j(max)}$	80	V
$I_{D, pulse}$	300	A
$R_{DS(ON), max}$ @ V_{GS}=10V	5.5	mΩ
Q_g	55.2	nC

Marking Information

Product Name	Package	Marking
SFG08S06GF	PDFN5×6	SFG08S06G

Package & Pin information



Absolute Maximum Ratings at T_j=25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	80	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current1), T_C=25 °C	I_D	100	A
Pulsed drain current2), T_C=25 °C	$I_{D,\ pulse}$	300	A
Continuous diode forward current1), T_C=25 °C	I_S	100	A
Diode pulsed current2), T_C=25 °C	$I_{S,\ pulse}$	300	A
Power dissipation3), T_C=25 °C	P_D	148	W
Single pulsed avalanche energy5)	E_{AS}	101	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	$R_{\theta JC}$	0.84	°C/W
Thermal resistance, junction-ambient4)	$R_{\theta JA}$	62	°C/W

Electrical Characteristics at T_j=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	80			V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	1.0		2.5	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		4.8	5.5	mΩ	V_{GS}=10 V, I_D=50 A
Drain-source on-state resistance	$R_{DS(ON)}$		6.2	9.0	mΩ	V_{GS}=4.5 V, I_D=9 A
Gate-source leakage current	I_{GSS}			100	nA	V_{GS}=20 V
				-100		V_{GS}=-20 V
Drain-source leakage current	I_{DSS}			1	μA	V_{DS}=80 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		3869.9		pF	V_{GS}=0 V, V_{DS}=40 V, ƒ=100 kHz
Output capacitance	C_{oss}		1304.2		pF	
Reverse transfer capacitance	C_{rss}		50.9		pF	
Turn-on delay time	$t_{d(on)}$		22.0		ns	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=25 A
Rise time	t_r		21.5		ns	
Turn-off delay time	$t_{d(off)}$		62.7		ns	
Fall time	t_f		61.4		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		55.2		nC	V_{GS}=10 V, V_{DS}=50 V, I_D=25 A
Gate-source charge	Q_{gs}		7.1		nC	
Gate-drain charge	Q_{gd}		14.6		nC	
Gate plateau voltage	$V_{plateau}$		3.4		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.3	V	I_S=12 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		75.0		ns	I_S=25 A, di/dt=100 A/μs
Reverse recovery charge	Q_{rr}		159.8		nC	
Peak reverse recovery current	I_{rrm}		3.4		A	

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
5) V_{DD}=50 V,V_{GS}=10 V, L=0.3 mH, starting T_j=25 °C.

Electrical Characteristics Diagrams

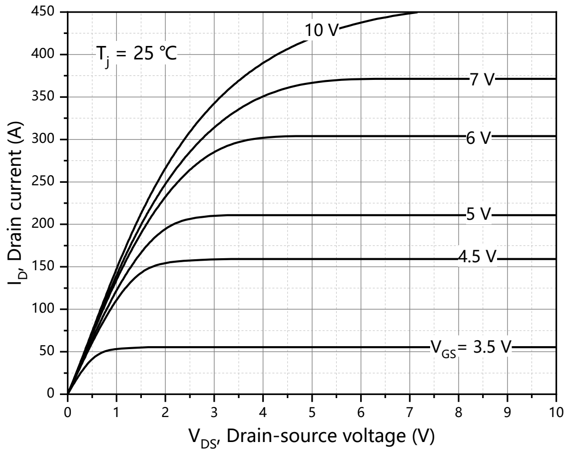


Figure 1. Typ. output characteristics

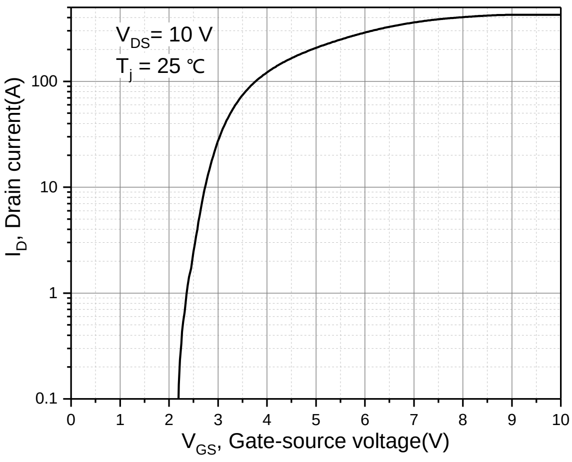


Figure 2. Typ. transfer characteristics

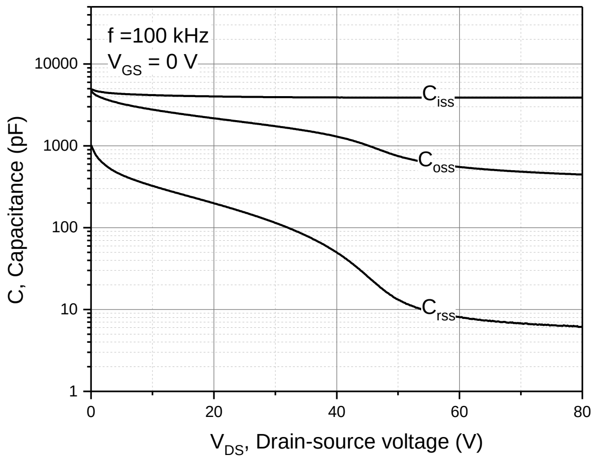


Figure 3. Typ. capacitances

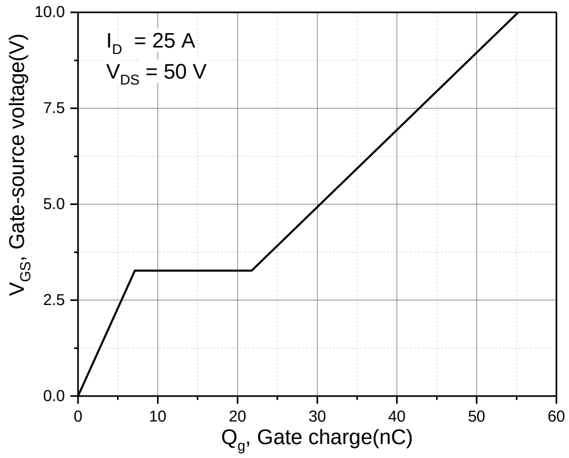


Figure 4. Typ. gate charge

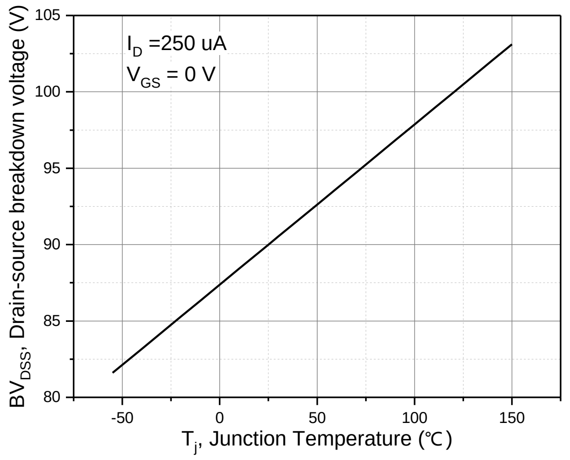


Figure 5. Drain-source breakdown voltage

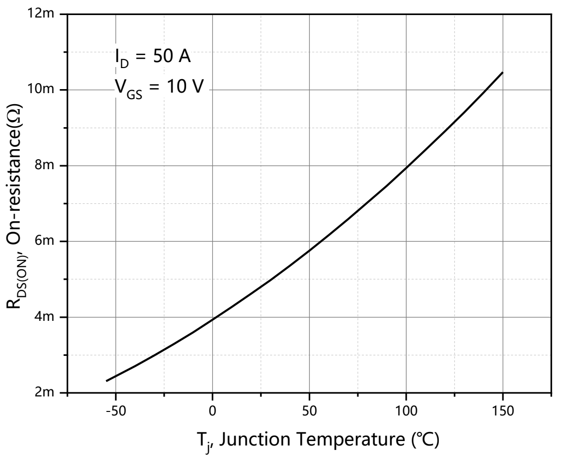


Figure 6. Drain-source on-state resistance

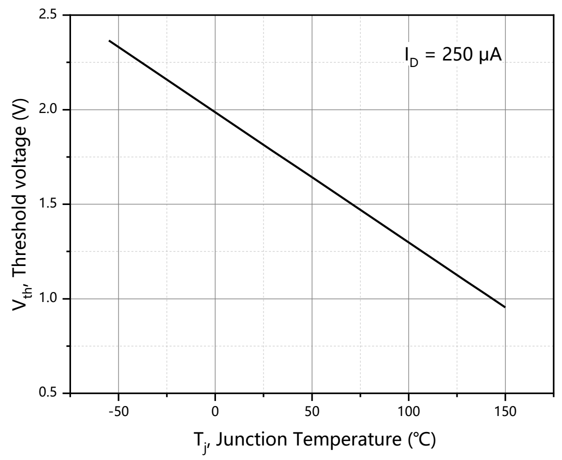


Figure 7. Threshold voltage

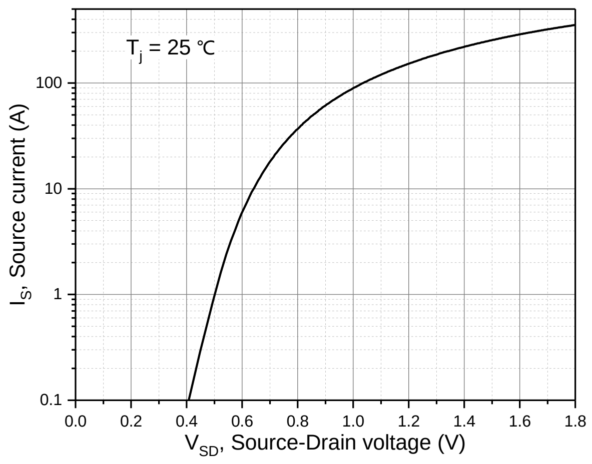


Figure 8. Forward characteristic of body diode

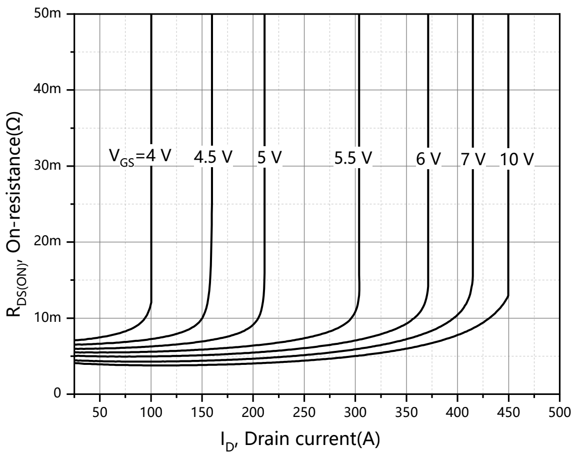


Figure 9. Drain-source on-state resistance

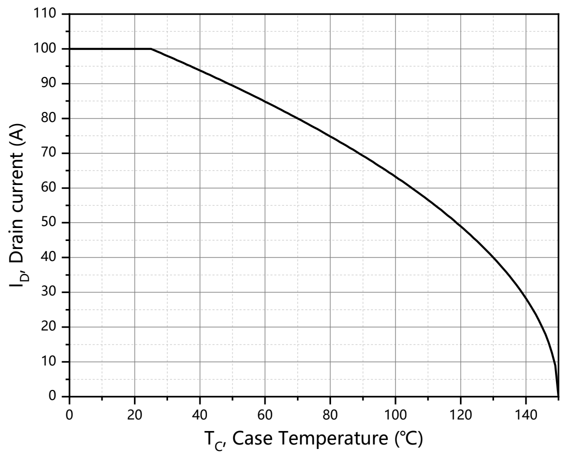


Figure 10. Drain current

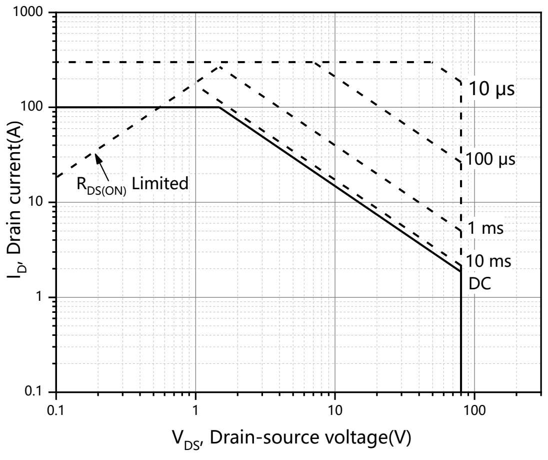


Figure 11. Safe operation area Tc=25 °C

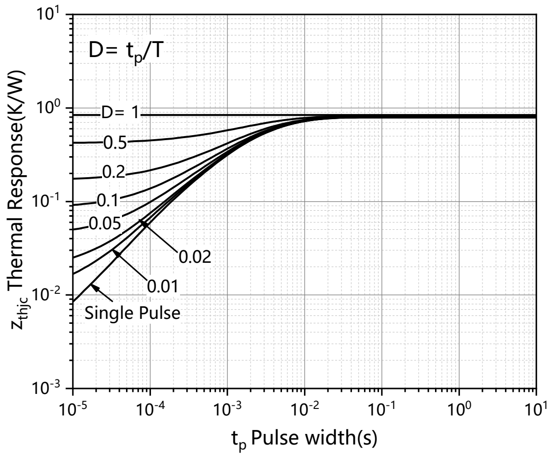


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

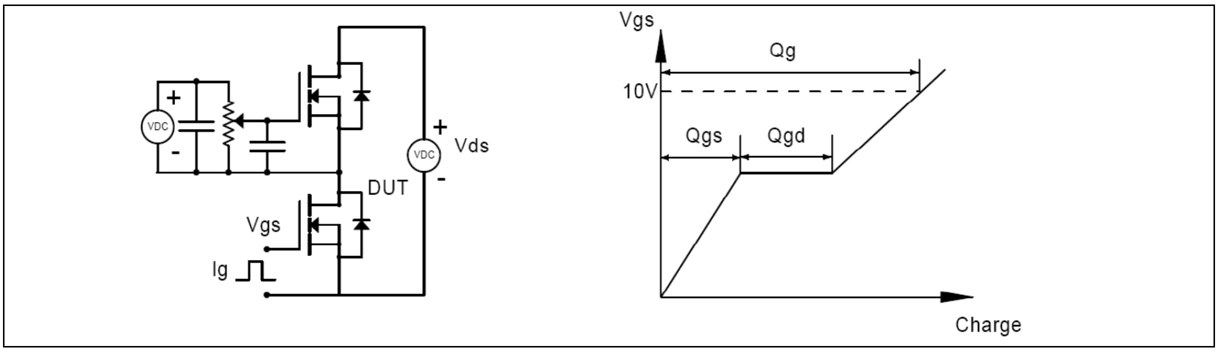


Figure 1. Gate charge test circuit & waveform

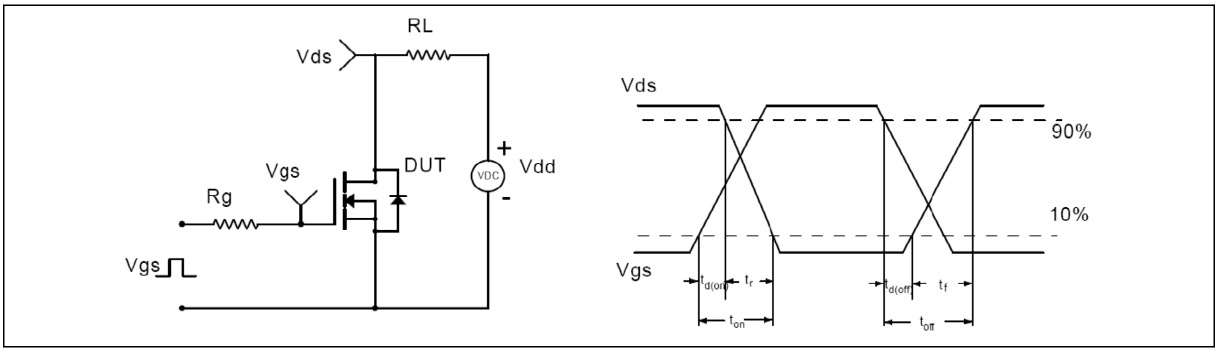


Figure 2. Switching time test circuit & waveforms

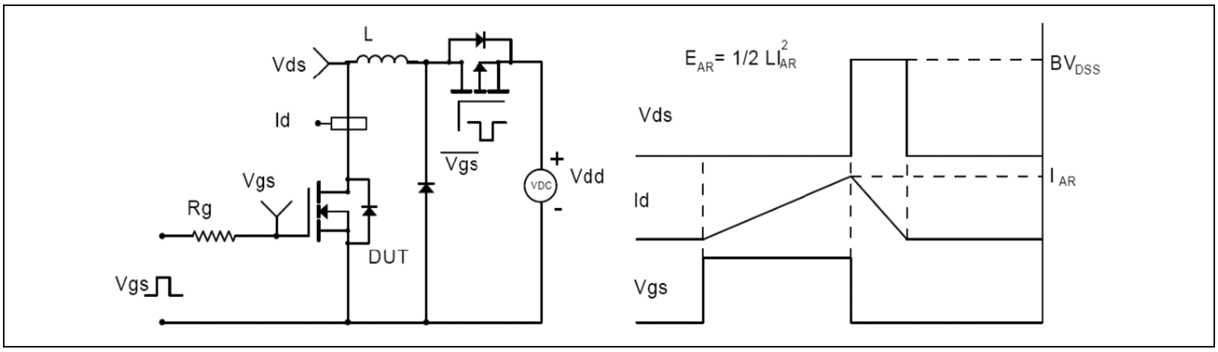


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

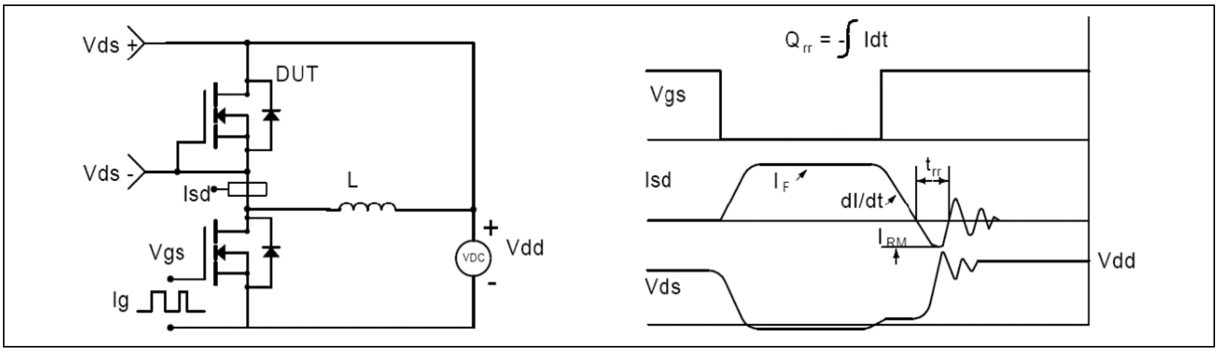
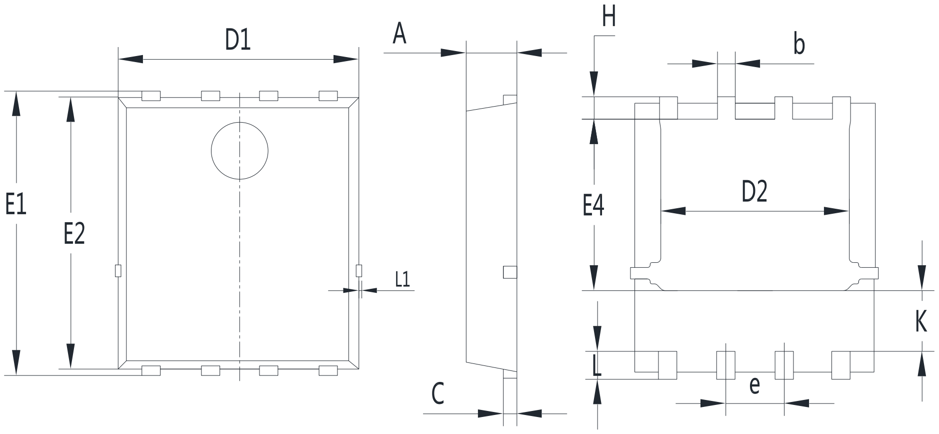


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	1.0	1.1	1.2
b	0.3	0.4	0.5
c	0.154	0.254	0.354
D1	5.0	5.2	5.4
D2	3.8	4.1	4.25
e	1.17	1.27	1.37
E1	5.95	6.15	6.35
E2	5.66	5.86	6.06
E4	3.52	3.72	3.92
H	0.4	0.5	0.6
L	0.3	0.6	0.7
L1	0.12REF		
K	1.15	1.3	1.45

Version 1: PDFN5×6-C package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
PDFN5×6-C	5000	2	10000	5	50000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
SFG08S06GF	PDFN5×6	yes	yes	yes

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Oriental Semiconductor hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

For further information on technology, delivery terms and conditions and prices, please contact the Oriental Semiconductor sales representatives (www.orientalsemi.com).

© Oriental Semiconductor Co.,Ltd. All Rights Reserved

ORIENTAL® SEMICONDUCTOR

A Power Semiconductor Innovator