

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 designed to use in synchronous rectification power systems with low driving voltage.

Features

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



Applications

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

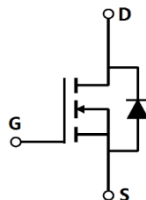
Key Performance Parameters

Parameter	Value	Unit
$V_{DS, min} @ T_{j(max)}$	120	V
$I_D, pulse$	150	A
$R_{DS(ON), max} @ V_{GS}=10V$	12	m
Q_g	33.1	nC

Marking Information

Product Name	Package	Marking
SFG12R12GF	PDFN5*6	SFG12R12G

Package & Pin information



Absolute Maximum Ratings at $T_j=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	120	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current ¹⁾ , $T_C=25^{\circ}\text{C}$	I_D	50	A
Pulsed drain current ²⁾ , $T_C=25^{\circ}\text{C}$	$I_{D, pulse}$	150	A
Continuous diode forward current ¹⁾ , $T_C=25^{\circ}\text{C}$	I_S	50	A
Diode pulsed current ²⁾ , $T_C=25^{\circ}\text{C}$	$I_{S, pulse}$	150	A
Power dissipation ³⁾ , $T_C=25^{\circ}\text{C}$	P_D	140	W
Single pulsed avalanche energy ⁵⁾	E_{AS}	53.8	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R_{JC}	0.89	$^{\circ}\text{C}/\text{W}$
Thermal resistance, junction-ambient ⁴⁾	R_{JA}	62	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics at $T_j=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	120			V	$V_{GS}=0\text{ V}, I_D=250\ \mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	1.5		2.5	V	$V_{DS}=V_{GS}, I_D=250\ \mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		10	12	m	$V_{GS}=10\text{ V}, I_D=30\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		13	15	m	$V_{GS}=4.5\text{ V}, I_D=20\text{ A}$
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=20\text{ V}$
				-100		$V_{GS}=-20\text{ V}$
Drain-source leakage current	I_{DSS}			1	μA	$V_{DS}=120\text{ V}, V_{GS}=0\text{ V}$

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		2640		μF	$V_{GS}=0\text{ V}$, $I_D=0$,

Electrical Characteristics Diagrams

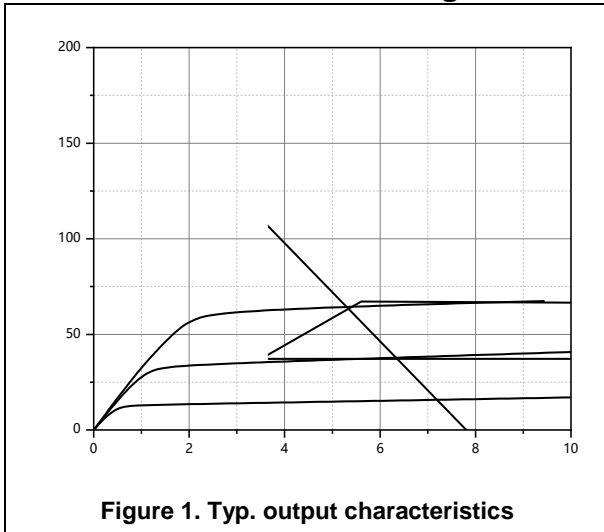


Figure 1. Typ. output characteristics

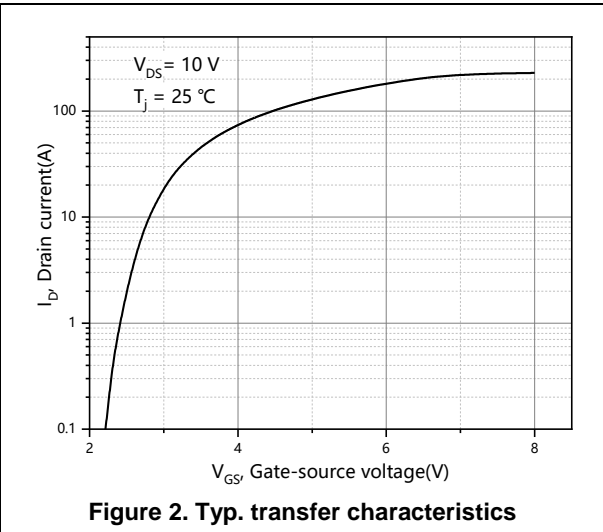


Figure 2. Typ. transfer characteristics

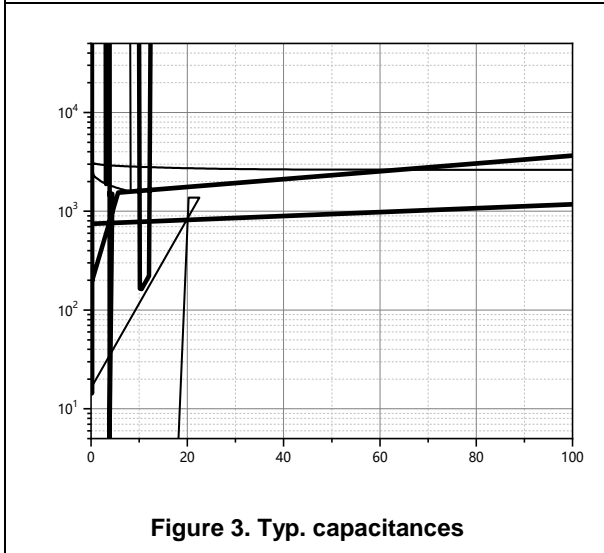


Figure 3. Typ. capacitances

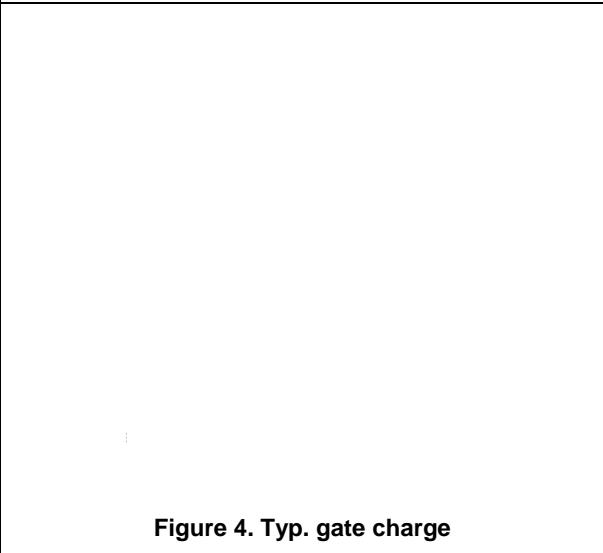


Figure 4. Typ. gate charge

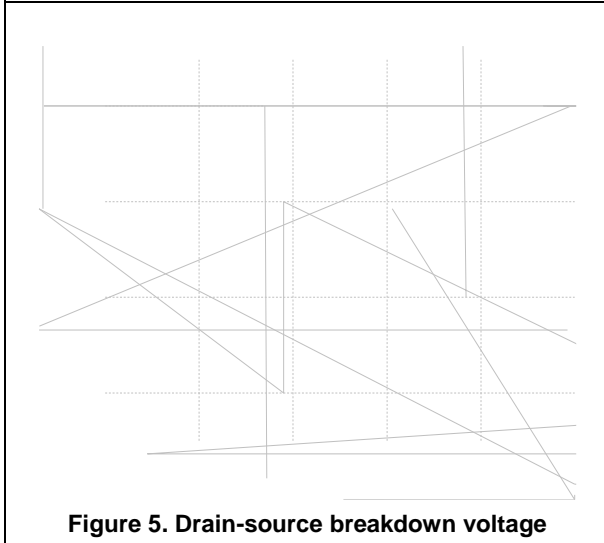


Figure 5. Drain-source breakdown voltage

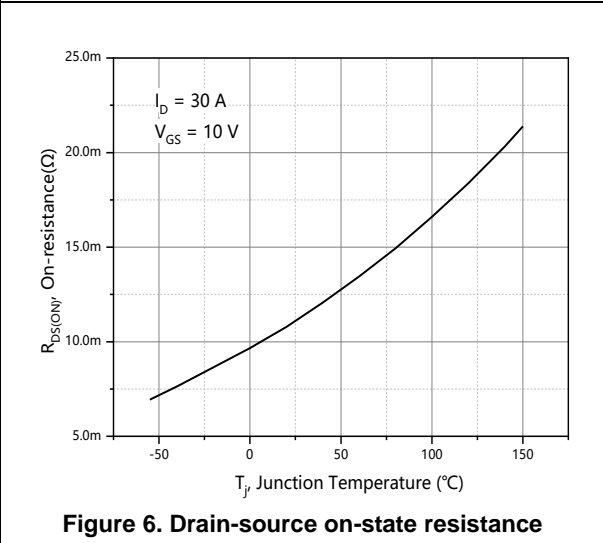
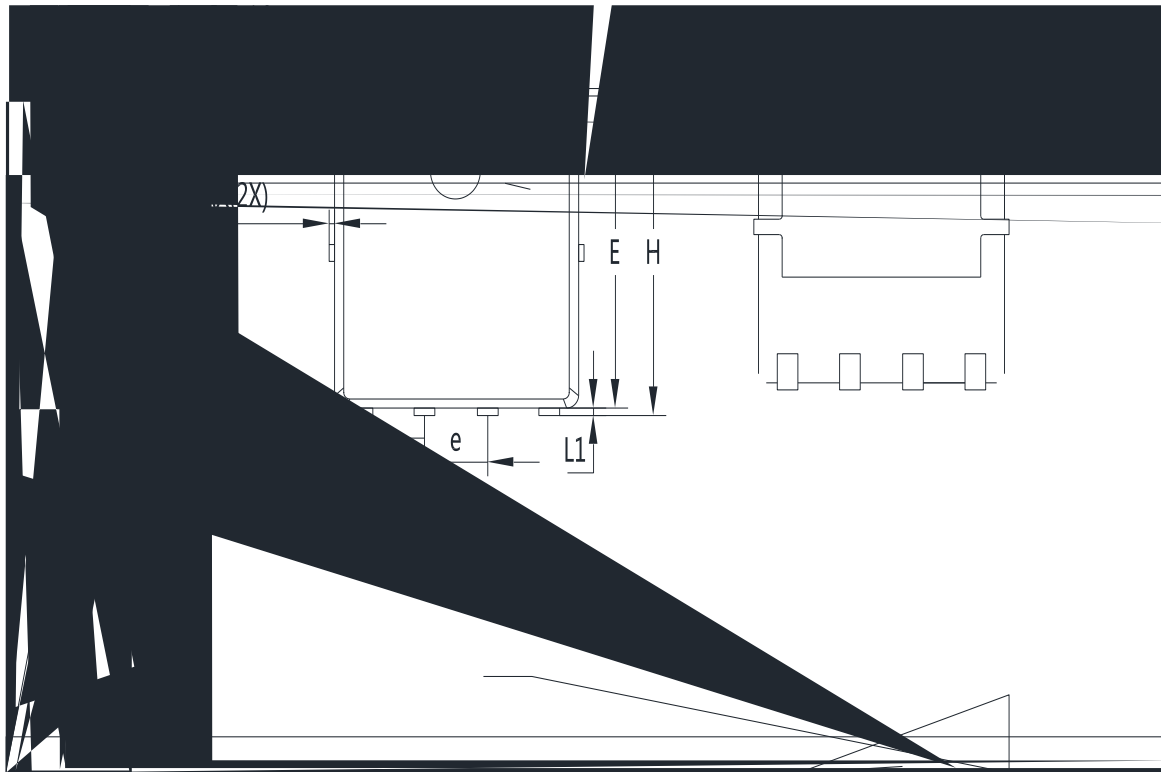


Figure 6. Drain-source on-state resistance

Enhancement Mode N-

Package Information



Symbol	mm		
	Min	Nom	Max
A	0.8	0.9	1.0
A1	0	0.03	0.05
b	0.35	0.42	0.49
c	0.254 REF		
D	4.9	5.0	5.1
F	1.40 REF		
E	5.7	5.8	5.9
e	1.27 BSC		
H	5.95	6.08	6.20
L1	0.10	0.14	0.18
G	0.60 REF		
K	4.00 REF		

Version 1: PDFN5*6-K package outline dimension

Package Information

Symbol	mm		
	Min	Nom	Max
A	0.90	1.00	1.10
A1	0.00	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78

Ordering Information

Package Type	Units/ Reel	Reels / Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
PDFN5*6-K	5000	2	10000	5	50000
PDFN5*6-M	5000	2	10000	5	50000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
SFG12R12GF	PDFN5*6	yes	yes	yes

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