General Description

SFGMOS®

$R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. The high V_{th} series is specially optimized for high systems with gate driving voltage greater than 10V.

Features

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

RoHS compliant

Applications

- Switched mode power supply
- Motor driver
- Battery protection
- DC-DC convertor
- Solar inverter
- UPS and energy inverter

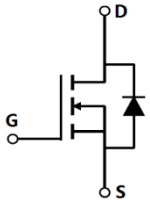
Key Performance Parameters

Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	120	V
$I_{D,\ pulse}$	330	A
$R_{DS(ON),\ max}$ @ V_{GS}=10V	6.5	
Q_g	68.9	nC

Marking Information

Product Name	Package	Marking
SFG110N12KF	TO263	SFG110N12K

Package & Pin information



Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		5823		pF	V_{GS}=0 V, V_{DS}=50 V, 100 kHz
Output capacitance	C_{oss}		779		pF	
Reverse transfer capacitance	C_{rss}		17.5		pF	
Turn-on delay time	$t_{d(on)}$		30.3		ns	V_{GS}=10 V, V_{DS}=50 V, R_G I_D=25 A
Rise time	t_r		33		ns	
Turn-off delay time	$t_{d(off)}$		59.5		ns	
Fall time	t_f		11.7		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		68.9		nC	V_{GS}=10 V, V_{DS}=50 V, I_D=25 A
Gate-source charge	Q_{gs}		18.1		nC	
Gate-drain charge	Q_{gd}		15.9		nC	
Gate plateau voltage	$V_{plateau}$		4.8		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.3	V	I_S=30 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		85		ns	V_R=50 V, I_S=25 A,
Reverse recovery charge	Q_{rr}		240		nC	
Peak reverse recovery current	I_{rrm}		4.6		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 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

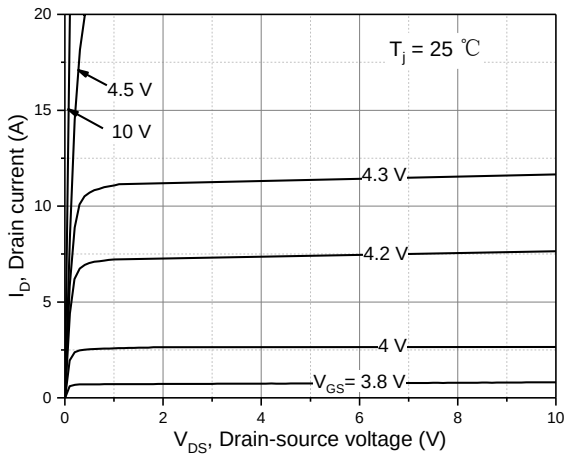


Figure 1. Typ. output characteristics

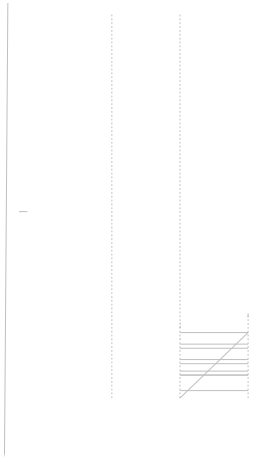


Figure 2. Typ. transfer characteristics

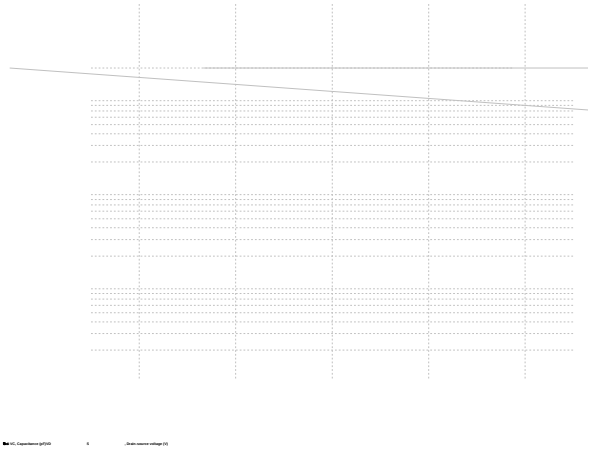


Figure 3. Typ. capacitances

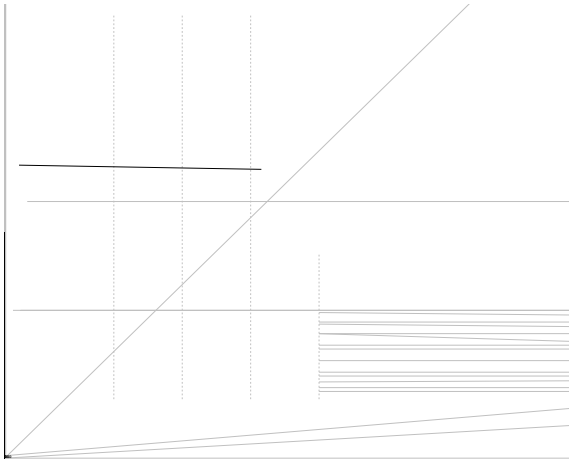


Figure 4. Typ. gate charge

Figure 5. Drain-source breakdown voltage

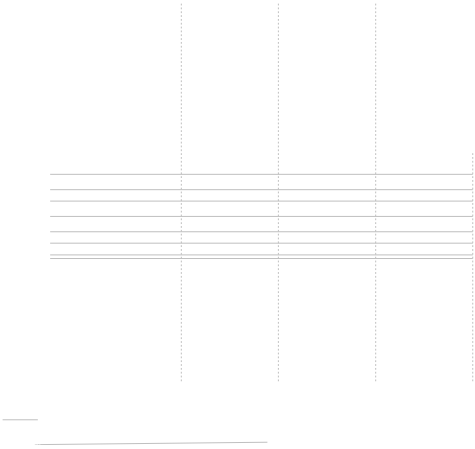


Figure 6. Drain-source on-state resistance

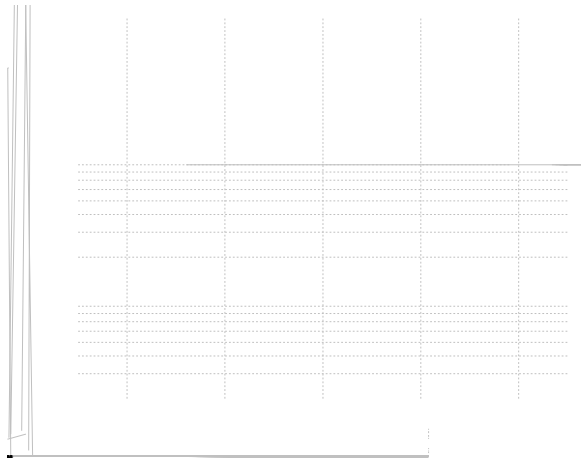


Figure 7. Forward characteristic of body diode

Figure 8. Drain current

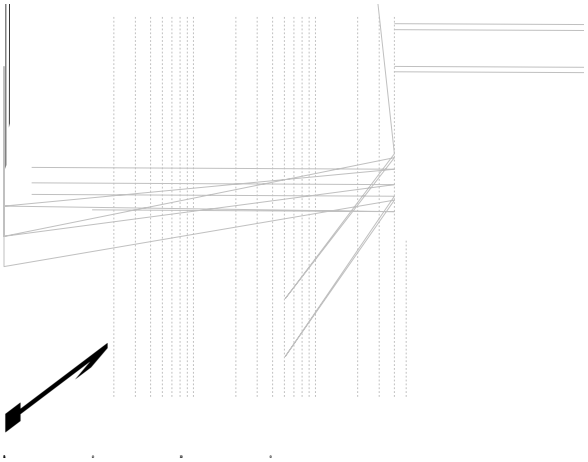


Figure 9. Safe operation area T_C=25 °C

Test circuits and waveforms

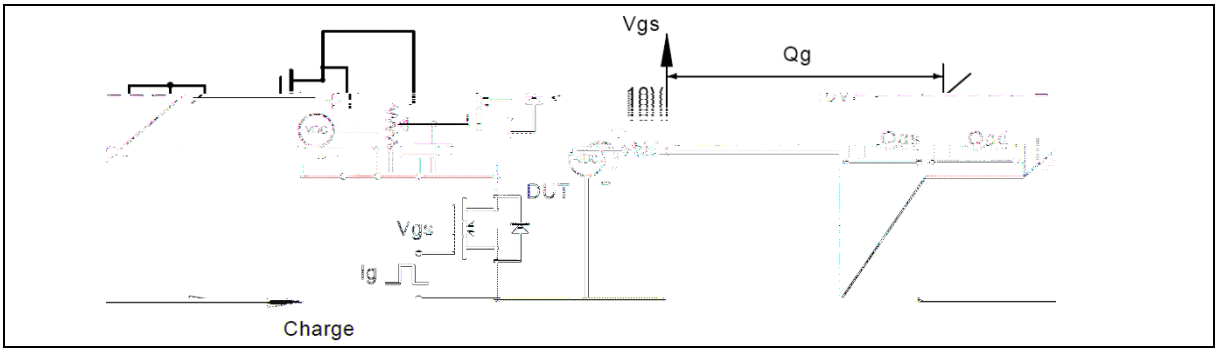


Figure 1. Gate charge test circuit & waveform

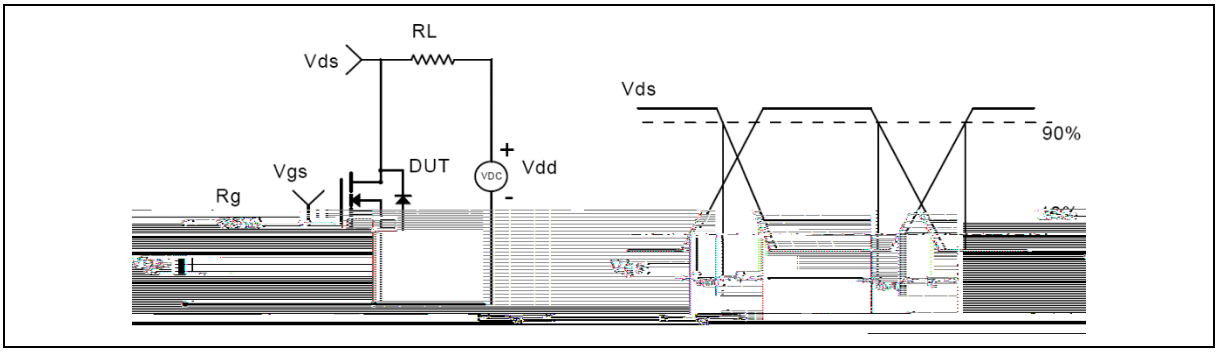


Figure 2. Switching time test circuit & waveforms

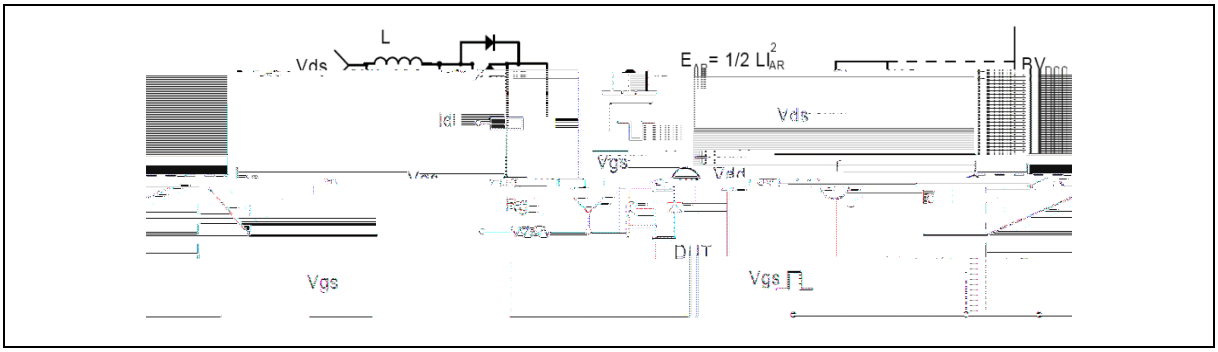


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

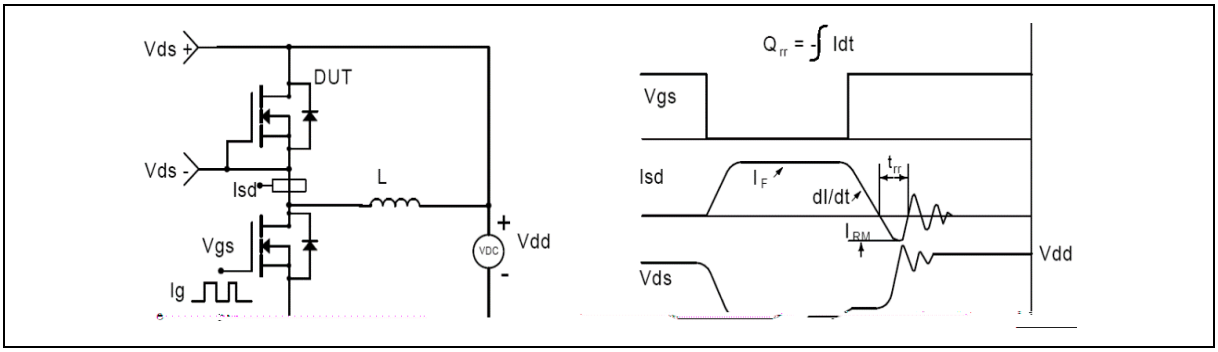
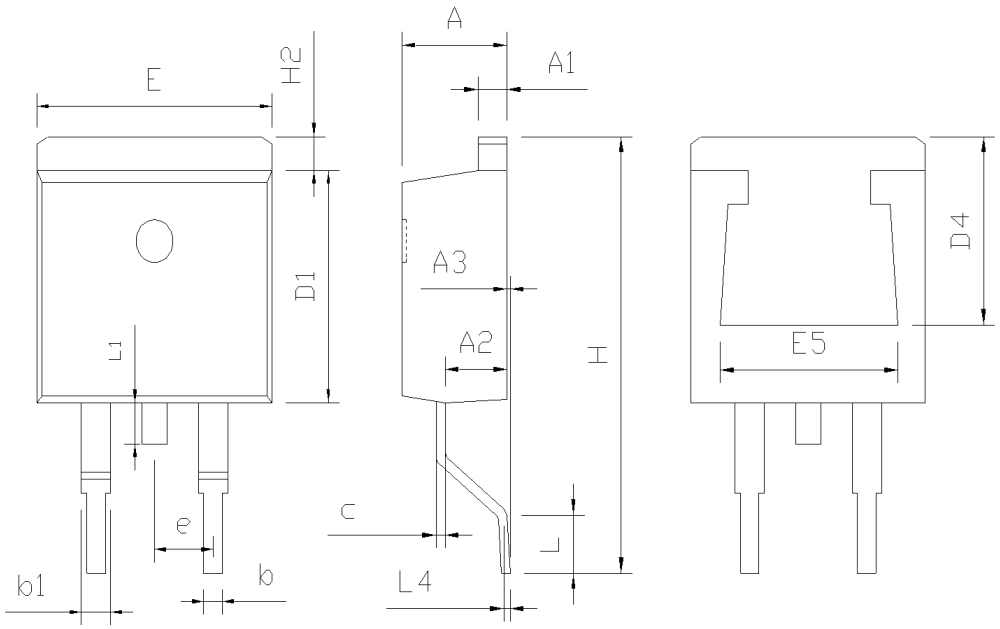


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0.00	0.13	0.25
b	0.70	0.81	0.96
b1	0.17	1.27	1.47
c	0.30	0.38	0.53
D1	8.50	8.70	8.90
D4	6.60	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e	2.54 BSC		
H	14.70	15.10	15.50
H2	1.07	1.27	1.47
L2	2.00	2.30	2.60
L1	1.40	1.55	1.70
L4	0.25 BSC		

Version 1: TO263-C package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels / Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO263-C	800	1	800	5	4000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
SFG110N12KF	TO263	yes	yes	yes

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