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

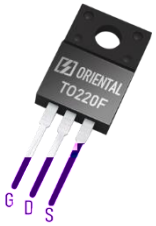
Key Performance Parameters

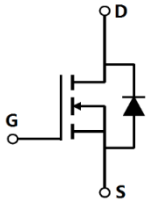
Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	120	V
$I_{D,\ pulse}$	330	A
$R_{DS(ON),\ max}$ @ V_{GS}=10V	6.5	
Q_g	68.9	nC

Marking Information

Product Name	Package	Marking
SFG110N12FF	TO220F	SFG110N12F

Package & Pin information





Absolute Maximum Ratings at T_j=25°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 °C	I_D	110	A
Pulsed drain current[2], T_C=25 °C	$I_{D, pulse}$	330	A
Continuous diode forward current[1], T_C=25 °C	I_S	110	A
Diode pulsed current[2], T_C=25 °C	$I_{S, pulse}$	330	A
Power dissipation[3], T_C=25 °C	P_D	34	W
Single pulsed avalanche energy[5]	E_{AS}	400	mJ
Operation and storage temperature	T_{stg} T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R	3.68	°C/W
Thermal resistance, junction-ambient[4]	R	62.5	°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}	120				

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					

Electrical Characteristics Diagrams

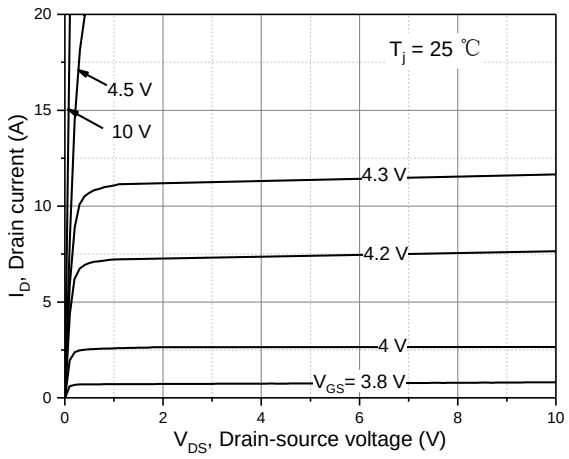


Figure 1. Typ. output characteristics

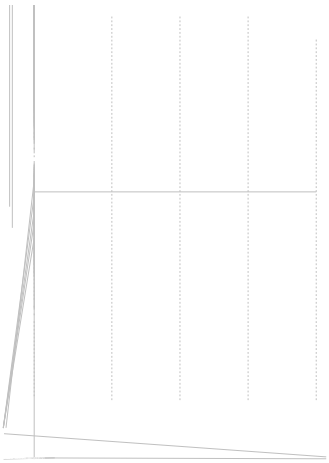


Figure 2. Typ. transfer characteristics

Figure 3. Typ. capacitances

Figure 4. Typ. gate charge

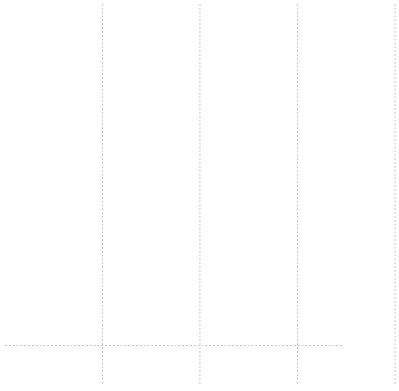


Figure 5. Drain-source breakdown voltage

Figure 6. Drain-source on-state resistance

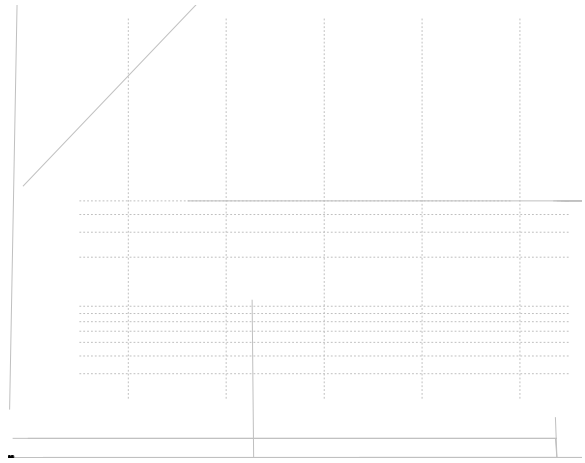


Figure 7. Forward characteristic of body diode

Figure 8. Drain current

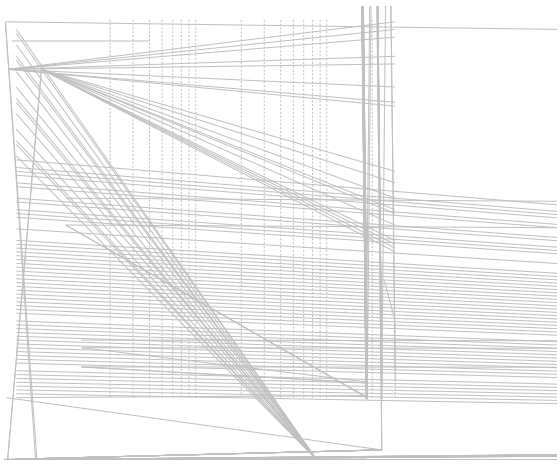


Figure 9. Safe operation area T_C=25 °C

Test circuits and waveforms

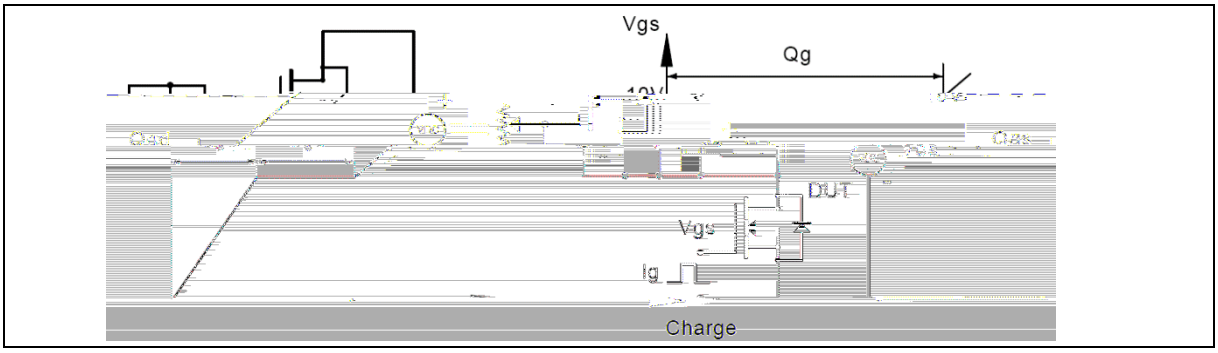


Figure 1. Gate charge test circuit & waveform

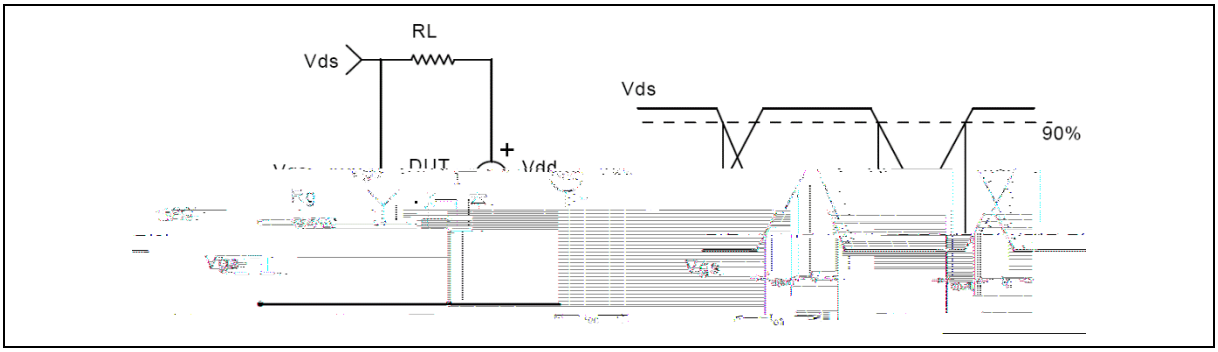


Figure 2. Switching time test circuit & waveforms

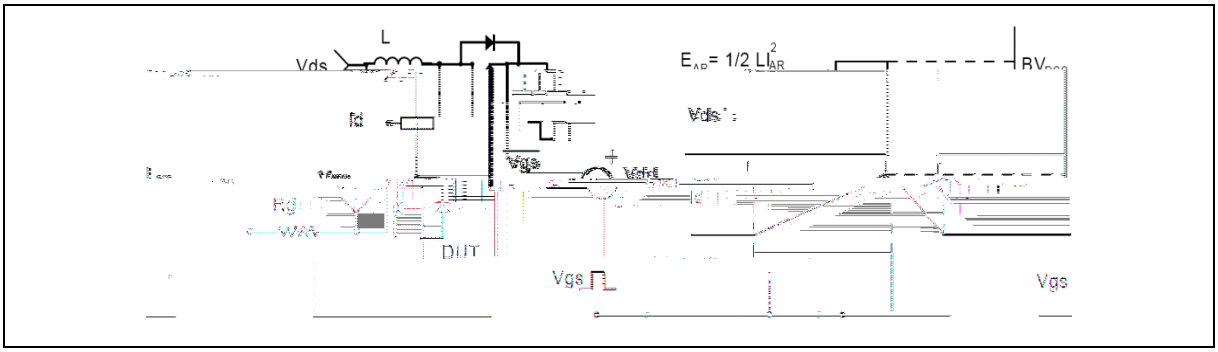


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

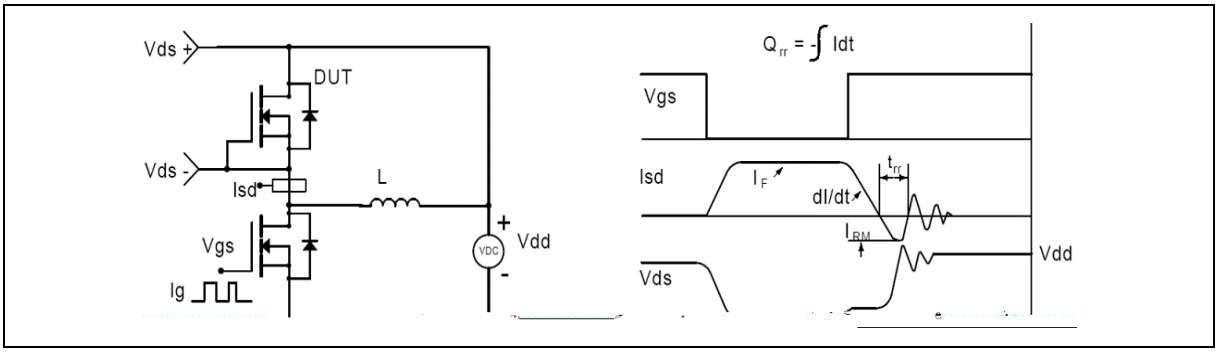
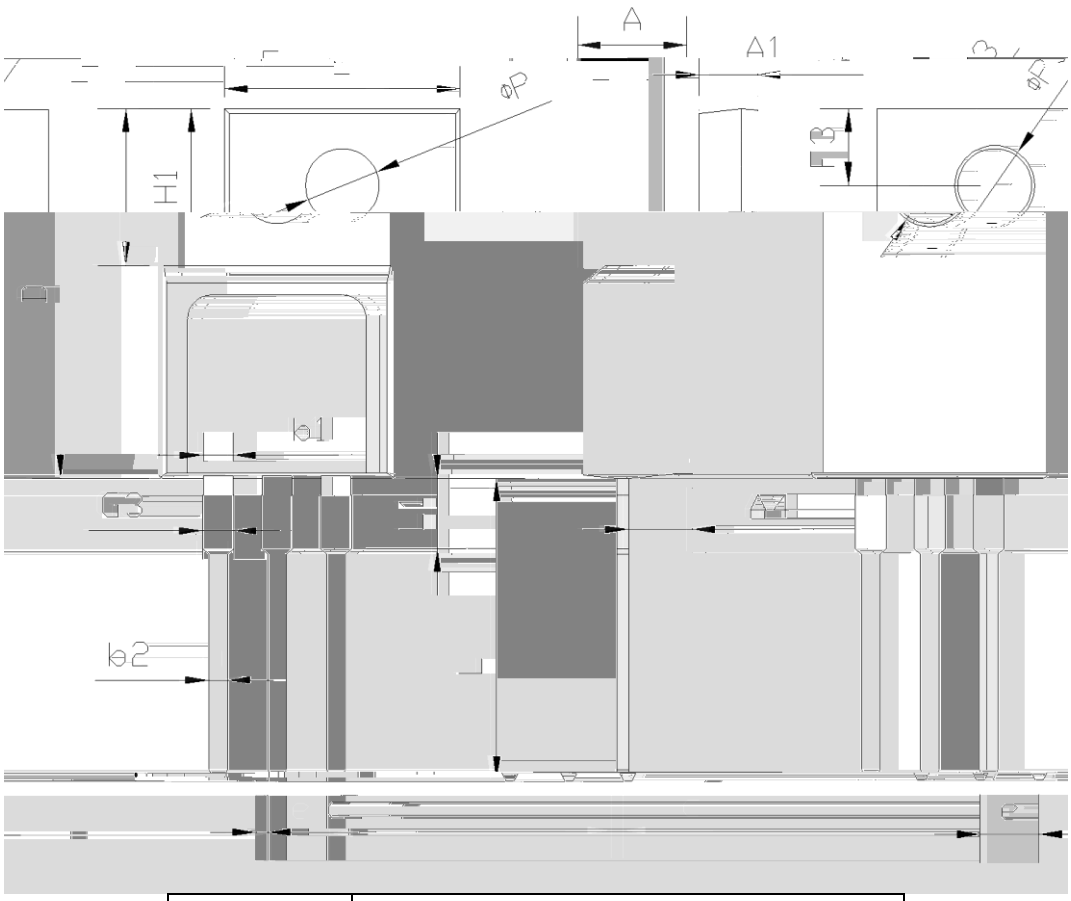


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1	6.70 REF		
e	2.54 BSC		
L	12.68	12.98	13.28
L1	2.88	3.03	3.18
	3.03	3.18	3.38
	3.15	3.45	3.65
F3	3.15	3.30	3.45
G3	1.25	1.35	1.55
b1	1.18	1.28	1.43
b2	0.70	0.80	0.95

Version 1: TO220F-C package outline dimension

Ordering Information

Package Type	Units/ Tube	Tubes / Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO220F-C	50	20	1000	6	6000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free