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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.

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- Switched mode power supply

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Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	100	V
$I_{D,\ pulse}$	45	A
$R_{DS(ON)\ max}$ @ V_{GS}=10V	75	
Q_g	6.5	nC

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Product Name	Package	Marking
SFG15N10DF	TO252	SFG15N10D

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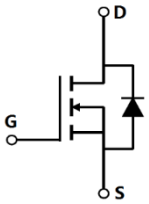

Absolute Maximum Ratings at T_j=25 unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	100	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current[1], T_C=25 °C	I_D	15	A
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	45	A
Continuous diode forward current[1], T_C=25 °C	I_S	15	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ Pulse}$	45	A
Power dissipation[3], T_C=25 °C	P_D	36	W
Single pulsed avalanche energy[5]	E_{AS}	5.5	mJ
Operation and storage temperature	T_{stg} T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R	3.5	°C/W
Thermal resistance, junction-ambient[4]	R	62	°C/W

Electrical Characteristics at T_j=25 unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	100			V	V_{GS}=0 V, I_D=250 A
Gate threshold voltage	$V_{GS(th)}$	1.2		2.5	V	V_{DS}=V_{GS}, I_D=250

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		310		pF	V_{GS}=0 V, V_{DS}=25 V, kHz
Output capacitance	C_{oss}		171		pF	
Reverse transfer capacitance	C_{rss}		16.7		pF	
Turn-on delay time	$t_{d(on)}$		14		ns	V_{GS}=10 V, V_{DS}=50 V, R_G I_D=5 A
Rise time	t_r		3.2		ns	
Turn-off delay time	$t_{d(off)}$		36		ns	
Fall time	t_f		14		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		6.5		nC	V_{GS}=10 V, V_{DS}=50 V, I_D=5 A
Gate-source charge	Q_{gs}		1.4		nC	
Gate-drain charge	Q_{gd}		1.4		nC	
Gate plateau voltage	$V_{plateau}$		3.3			

Electrical Characteristics Diagrams

Figure 1. Typ. output characteristics

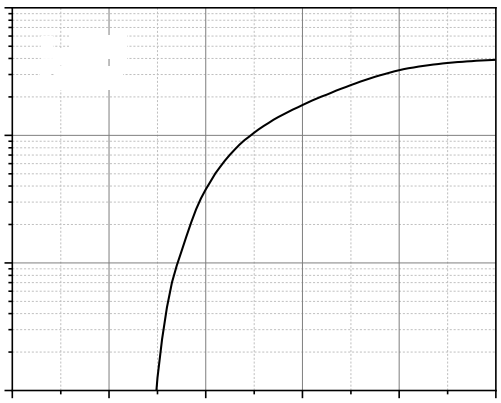

Figure 2. Typ. transfer characteristics

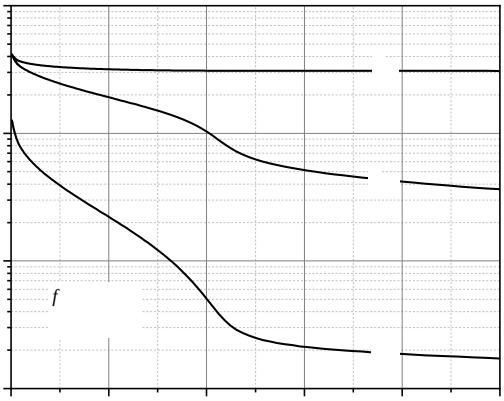

Figure 3. Typ. capacitances

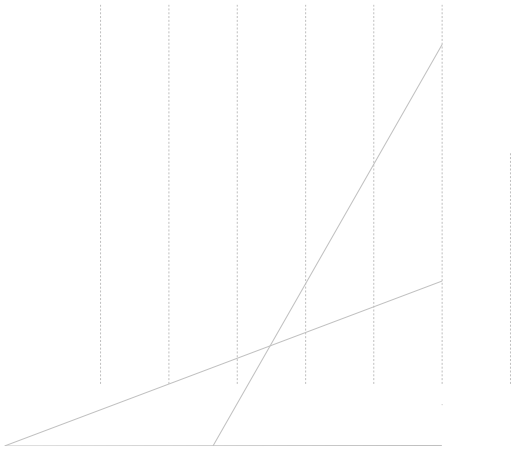

Figure 4. Typ. gate charge

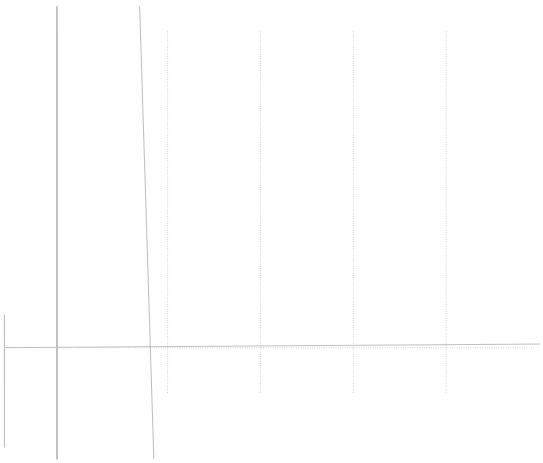

Figure 5. Drain-source breakdown voltage

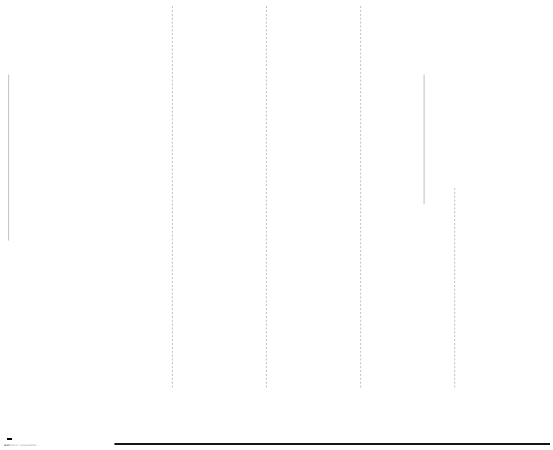

Figure 6. Drain-source on-state resistance

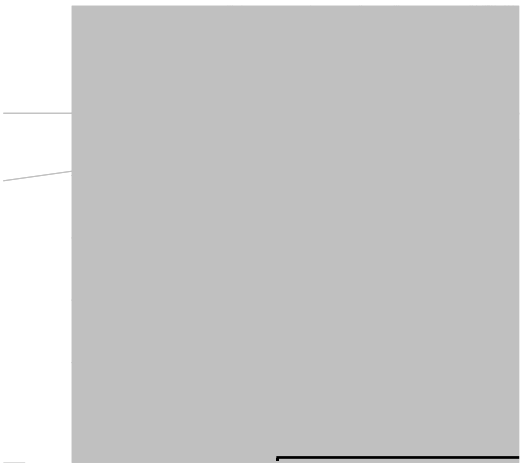

Figure 7. Threshold voltage

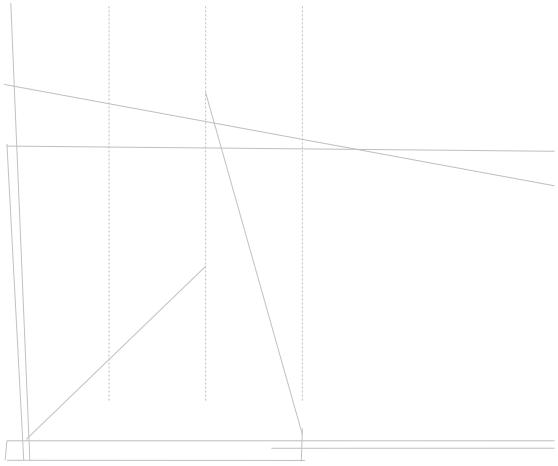

Figure 8. Forward characteristic of body diode

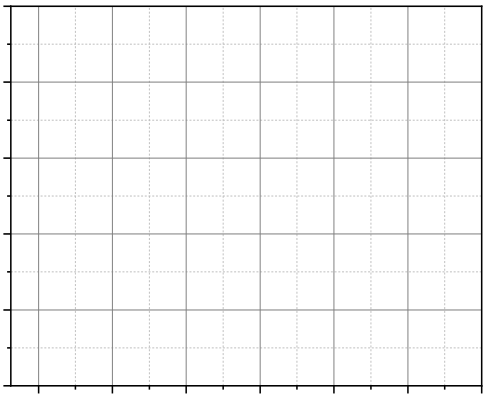

Figure 9. Drain-source on-state resistance

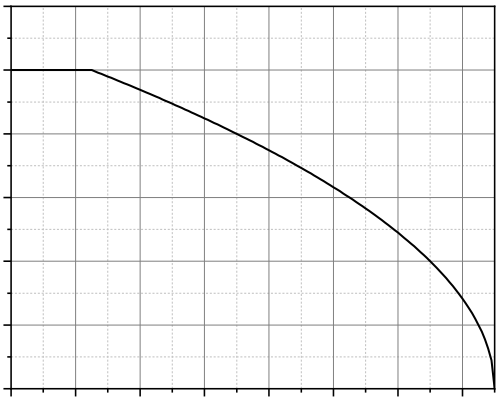

Figure 10. Drain current

Figure 11. Safe operation area T_C=25 °C

Figure 12. Max. transient thermal impedance

Test circuits and waveforms

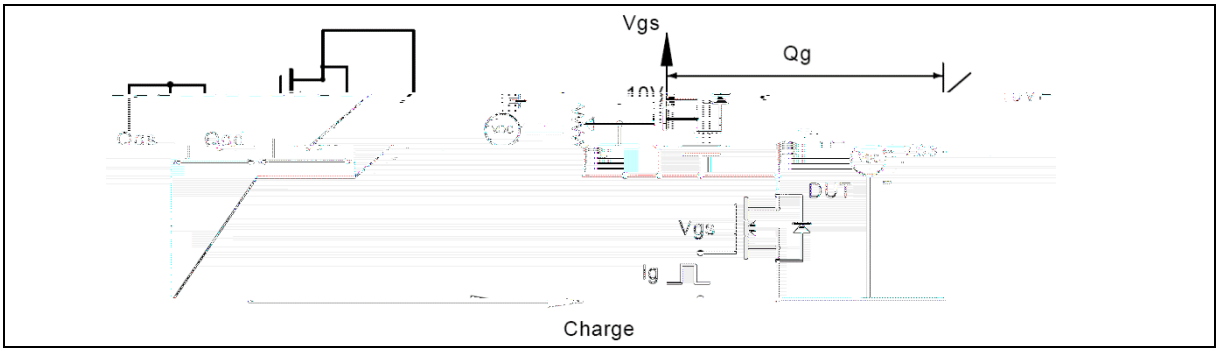

Figure 1. Gate charge test circuit & waveform

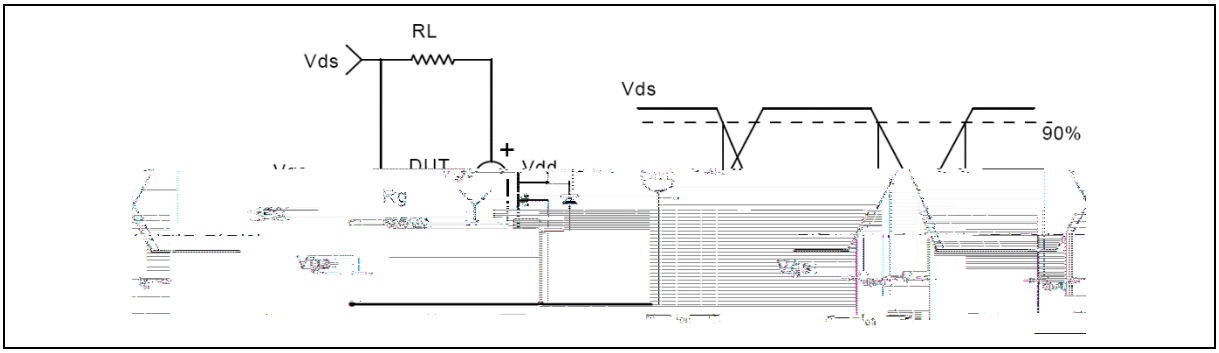

Figure 2. Switching time test circuit & waveforms

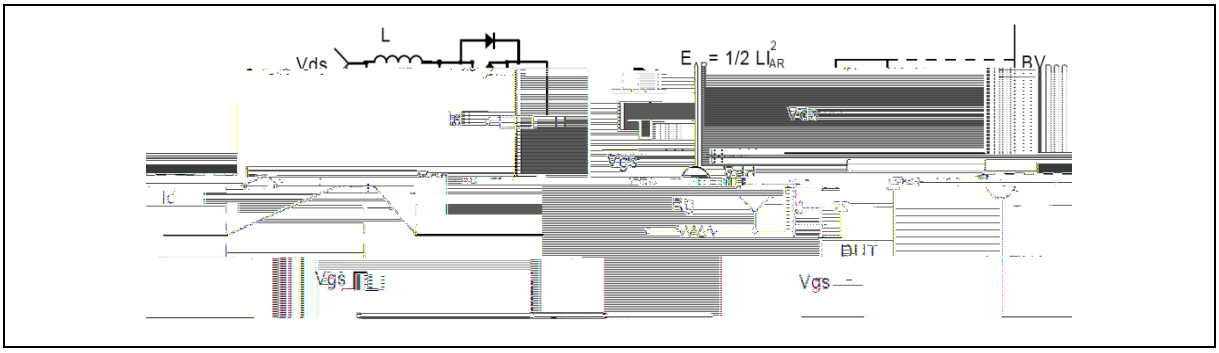

Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

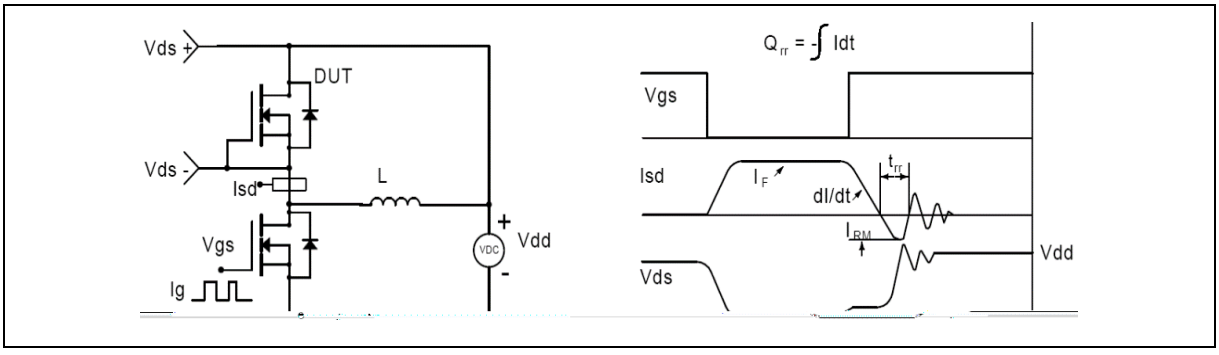

Figure 4. Diode reverse recovery test circuit & waveforms

Package Information

Symbol	mm		
	Min	Nom	Max
A	2.20	2.30	2.38
A1	0.00	-	0.10
A2	0.90	1.01	1.10
b	0.72	-	0.85
b1	0.71	0.76	0.81
b2	0.72	-	0.90
b3	5.13	5.33	5.46
c	0.47	-	0.60
c1	0.46	0.51	0.56
c2	0.47	-	0.60
D	6.00	6.10	6.20
D1	5.25	-	-
E	6.50	6.60	6.70
E			

Ordering Information

Package Type	Units/ Reel	Reels / Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO252-P	2500	2	5000	5	25000
TO252-J	2500	2	5000	5	25000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
SFG15N10DF	TO252	yes	yes	yes

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