General Description

SFGMOS®

$R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. The low V_{th} series

Absolute Maximum Ratings at T_j=25°C 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	55	A
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	165	A
Continuous diode forward current[1], T_C=25 °C	I_S	55	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ pulse}$	165	A
Power dissipation[3], T_C=25 °C	P_D	115	W
Single pulsed avalanche energy[5]	E_{AS}	14	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	$R_{\theta\ C}$	1.09	°C/W
Thermal resistance, junction-ambient[4]	R_θ	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}	100			V	V_{GS}=0 V, I_D=250 A
Gate threshold voltage	$V_{GS(th)}$	1.5		2.5	V	V_{DS}=V_{GS}, I_D=250 A
Drain-source on-state resistance	$R_{DS(ON)}$		10	12		V_{GS}=10 V, I_D=30 A
Drain-source on-state resistance	$R_{DS(ON)}$		12	15		V_{GS}=4.5 V, I_D=12 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	A	V_{DS}=100 V, V_{GS}=0 V
Gate resistance	R_G		3			1 ,

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		1575		pF	V_{GS}=0 V, V_{DS}=25 V, 100 kHz
Output capacitance	C_{oss}		683		pF	
Reverse transfer capacitance	C_{rss}		68		pF	
Turn-on delay time	$t_{d(on)}$		16		ns	V_{GS}=10 V, V_{DS}=50 V, R_G 2 , I_D=25 A
Rise time	t_r		4		ns	
Turn-off delay time	$t_{d(off)}$		35.6		ns	
Fall time	t_f		5.8		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		24.6		nC	V_{GS}=10 V, V_{DS}=50 V, I_D=25 A
Gate-source charge	Q_{gs}		4.1		nC	
Gate-drain charge	Q_{gd}		5.8		nC	
Gate plateau voltage	$V_{plateau}$		3.1		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}		53.2		ns	V_R=50 V, I_S=25 A, / 100 /

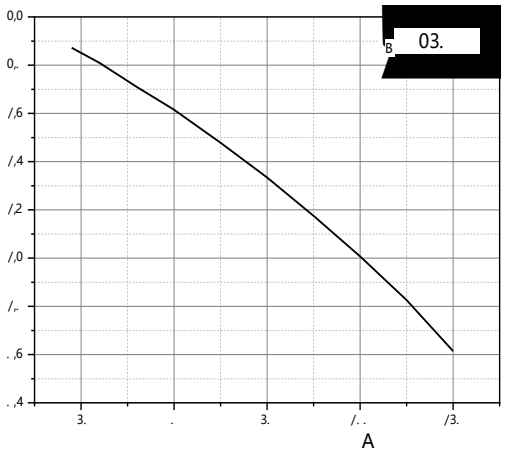


Figure 7. Threshold voltage

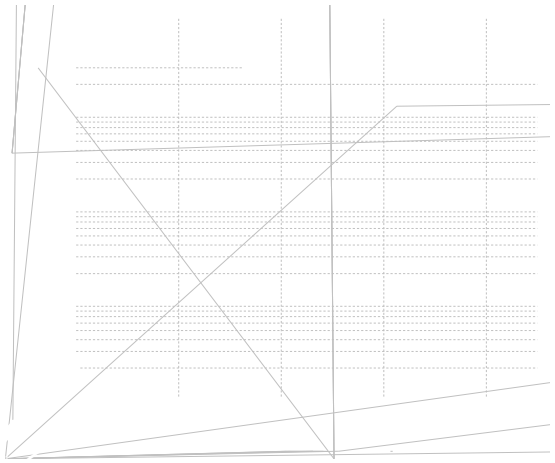


Figure 8. Forward characteristic of body diode

Figure 9. Drain-source on-state resistance

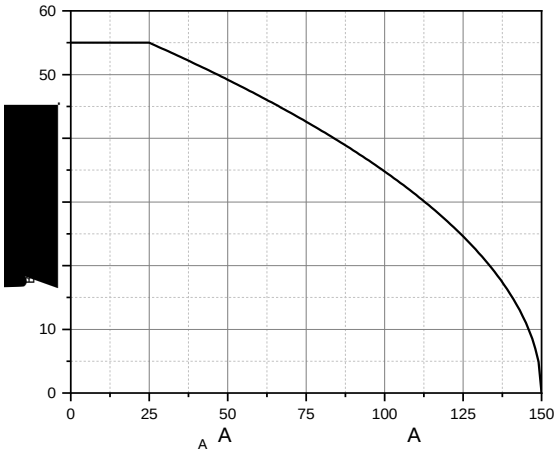


Figure 10. Drain current

Figure 11. Safe operation area T_C=25 °C

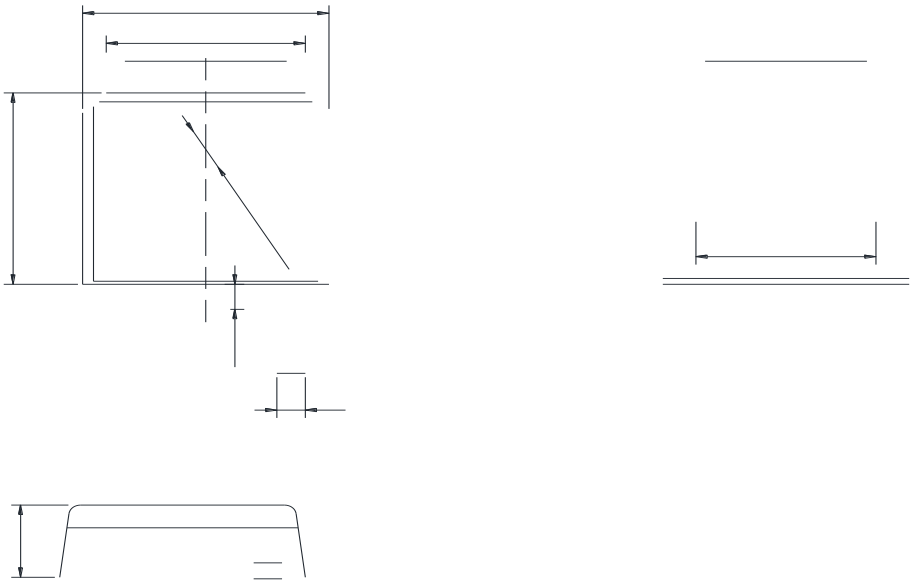
Figure 12. Max transient thermal impedance

Test circuits and waveforms rM7((rMe..584 594.31 0.48 0.48 ref70.584 594.31 ef0.48 ref831 439

Figure 1. Gate charge test circuit & waveform

Figure 2. Switching time 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
E1	4.70	-	-
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90 REF		
L2	0.508 BSC		
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	0.15	-	0.75
L6	1.80 REF		
θ	0	-	
θ1			
θ2			

Version 1:TO252-J package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Box/ Carton Box	Units/ Carton Box
TO252	2500	2	5000	5	25000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
SFG10S12DF	TO252	yes	yes	yes

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