Elektronische Bauelemente

SGM9452J

4.2A, 20V, $R_{DS(ON)}$ 37mΩ

N-Channel Enhancement Mode Power MOSFET

RoHS Compliant Product

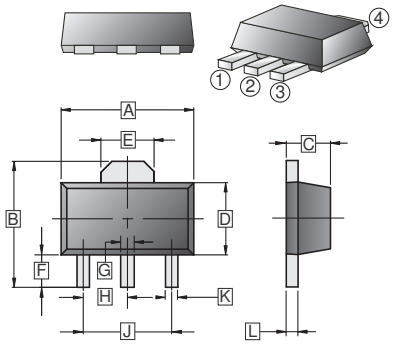
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SGM9452J is the highest performance trench N-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SGM9452J meet the RoHS and Green Product requirement with full function reliability approved.

SOT-89



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.60	G	0.40	0.58
B	3.94	4.25	H	1.50 TYP	
C	1.40	1.60	J	3.00 TYP	
D	2.25	2.60	K	0.32	0.52
E	1.55 TYP.		L	0.35	0.44
F	0.89	1.20			

FEATURES

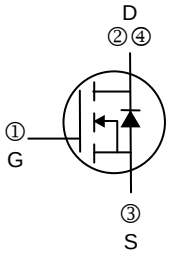
- Advanced High Cell Density Trench Technology
- Super Low Gate Charge
- Green Device Available

MARKING

CJ
A9452

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-89	1K	7 inch



ORDER INFORMATION

Part Number	Type
SGM9452J	Lead (Pb)-free
SGM9452J-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current [1] @V_{GS}=4.5V	T_A=25℃	I_D	4.2	A
	T_A=70℃		3.3	
Pulsed Drain Current [3]		I_{DM}	16.8	A
Power Dissipation @T_A=25℃		P_D	1	W
Operating Junction & Storage Temperature		T_J, T_{STG}	-65~150	℃
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	125	℃/W
Thermal Resistance Junction-Ambient [2]			250	
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	50	

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
Gate Threshold Voltage		$V_{GS(th)}$	0.5	-	1.2	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±12V
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	1	μA	V_{DS}=16V, V_{GS}=0
	T_J=55℃		-	-	5		
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	37	mΩ	V_{GS}=4.5V, I_D=4A
			-	-	45		V_{GS}=2.5V, I_D=3A
Forward transconductance		g_{fs}	-	20	-	S	V_{DS}=5V, I_D=4A
Total Gate Charge		Q_g	-	8.6	-	nC	I_D=4A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	1.37	-		
Gate-Drain Change		Q_{gd}	-	2.3	-		
Turn-on Delay Time		$T_{d(on)}$	-	5.2	-	nS	V_{DD}=10V V_{GS}=4.5V I_D=4A R_G=3.3Ω R_L=2.5Ω
Rise Time		T_r	-	34	-		
Turn-off Delay Time		$T_{d(off)}$	-	23	-		
Fall Time		T_f	-	9.2	-		
Input Capacitance		C_{iss}	-	635	-	pF	V_{GS}=0 V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	70	-		
Reverse Transfer Capacitance		C_{rss}	-	63	-		
Source-Drain Diode							
Continuous Source Current [1]		I_S	-	-	4.2	A	
Pulsed Source Current [3]		I_{SM}	-	-	16.8		
Diode Forward Voltage [4]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0
Reverse Recovery Time		t_{rr}	-	7.5	-	nS	I_F=4A, dI/dt=100A/μs T_J=25℃
Reverse Recovery Charge		Q_{rr}	-	2.1	-	nC	

Notes:
1. Surface mounted on a 1 inch^2 FR4 board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by Max. junction temperature.
4. Pulse width≤300us, duty cycle≤2%.

CHARACTERISTIC CURVES

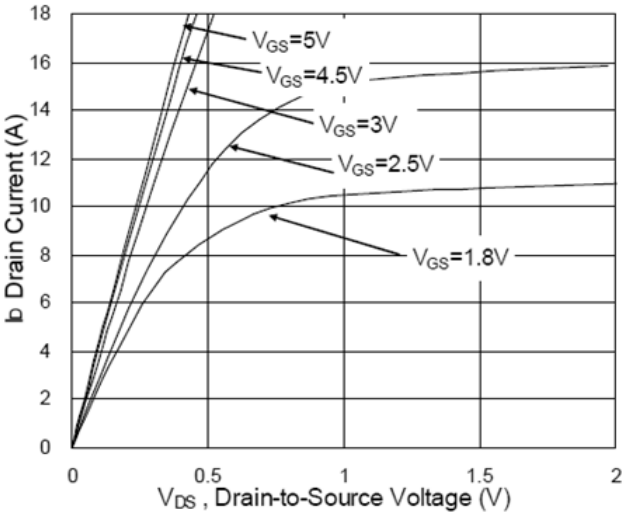


Fig.1 Typical Output Characteristics

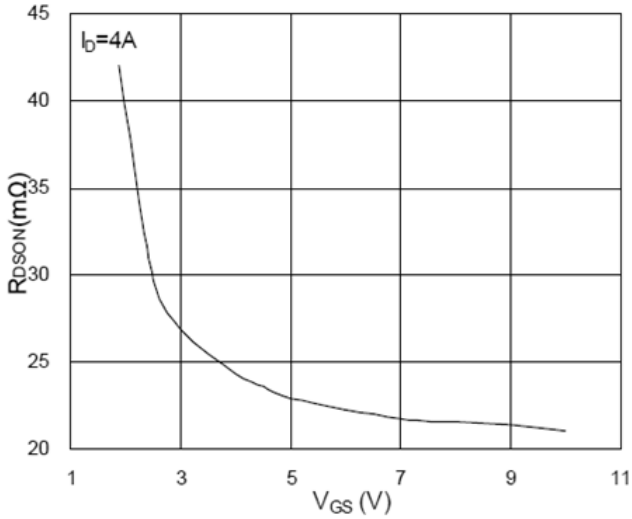


Fig.2 On-Resistance vs. Gate-Source

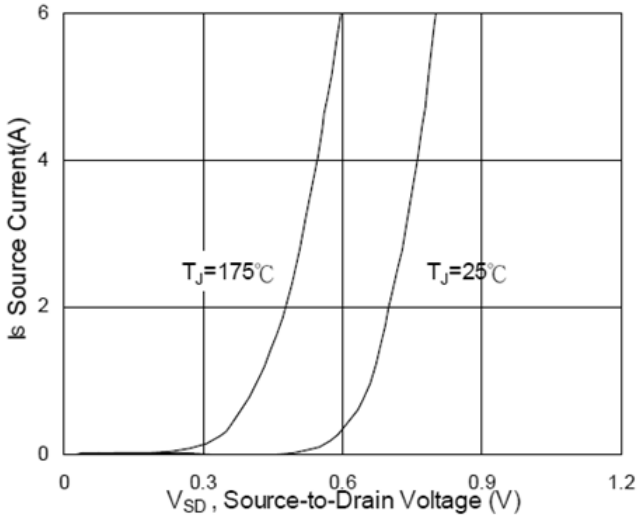


Fig.3 Forward Characteristics of Reverse

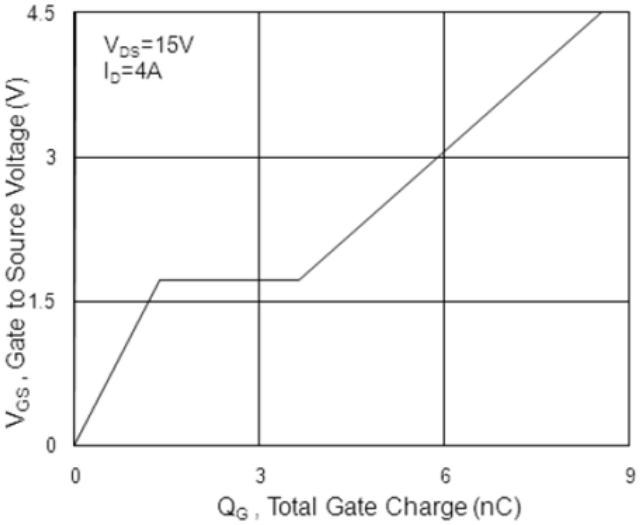


Fig.4 Gate-Charge Characteristics

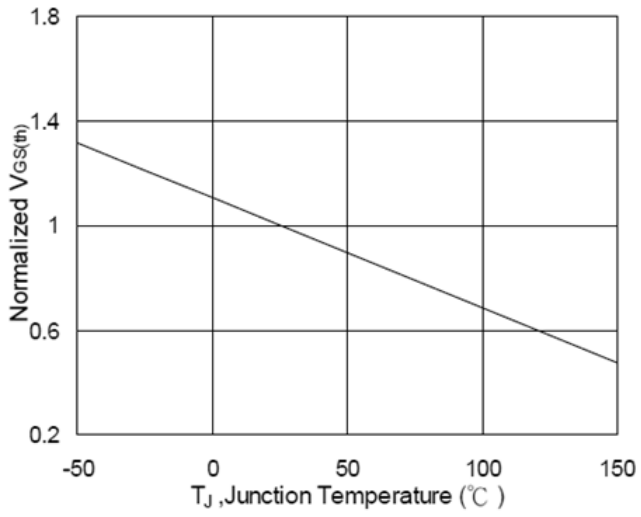


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

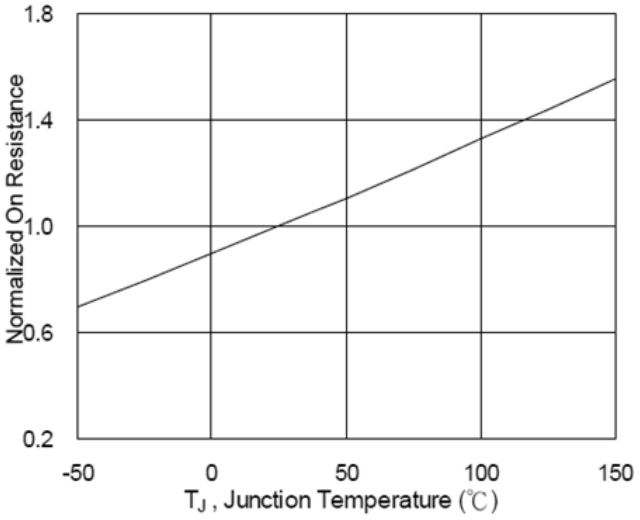


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

CHARACTERISTIC CURVES

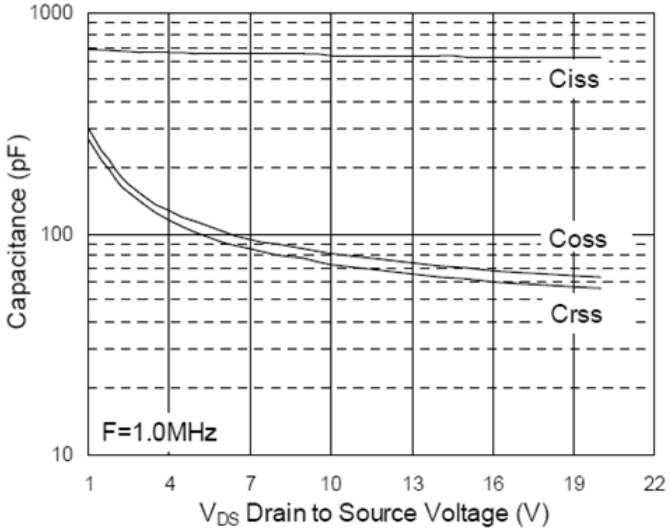


Fig.7 Capacitance

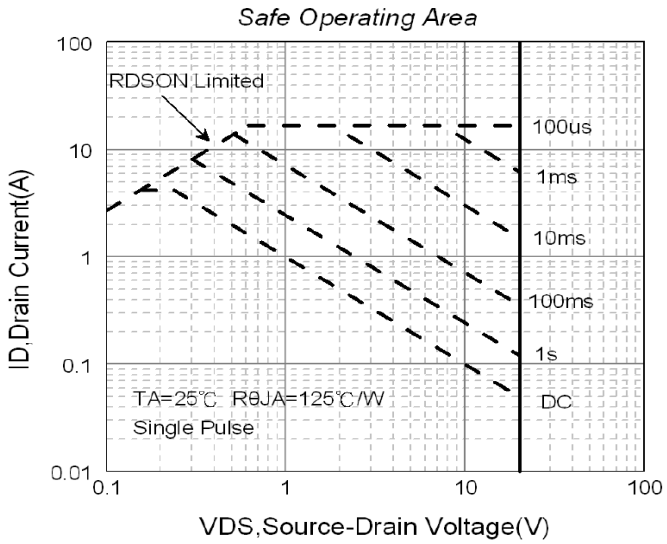


Fig.8 Safe Operating Area

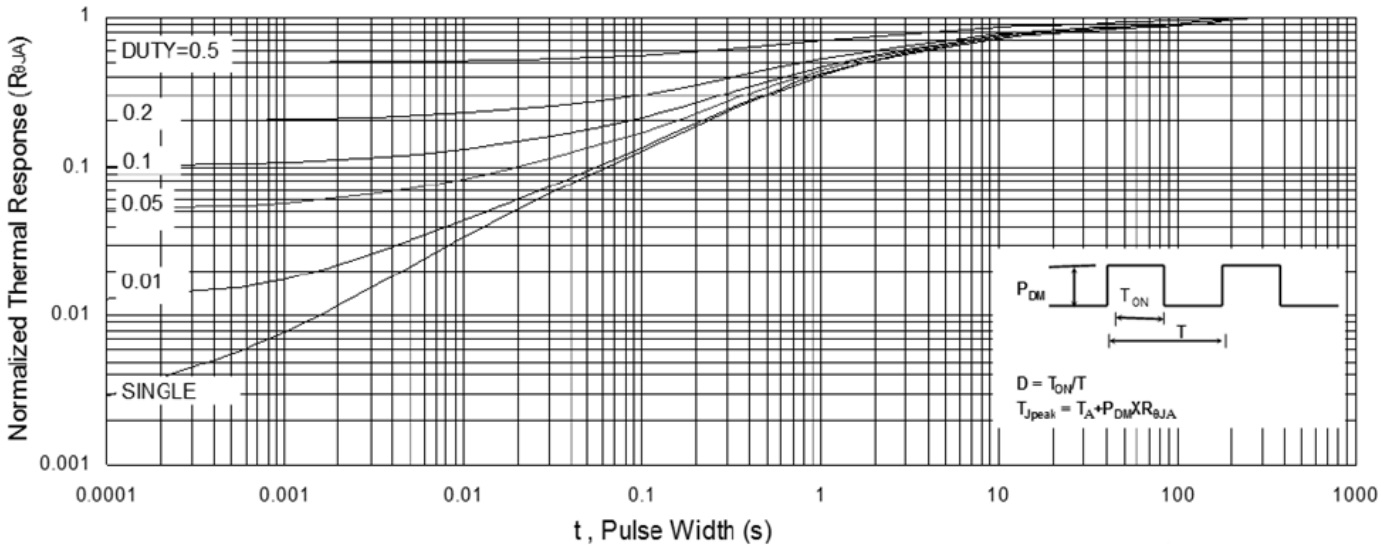


Fig.9 Normalized Maximun Transient Thermal Impedance

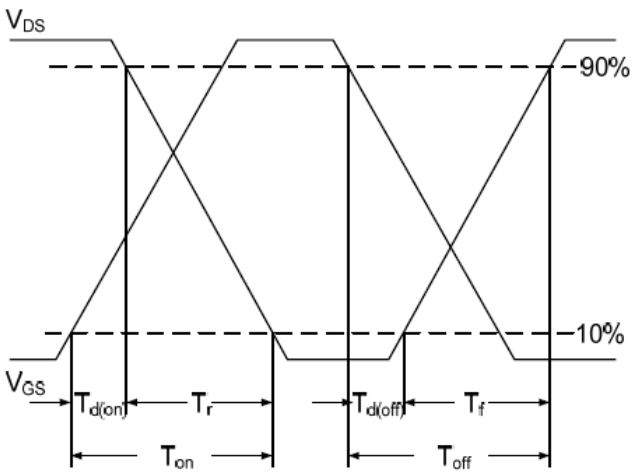


Fig.10 Switching Time Waveform

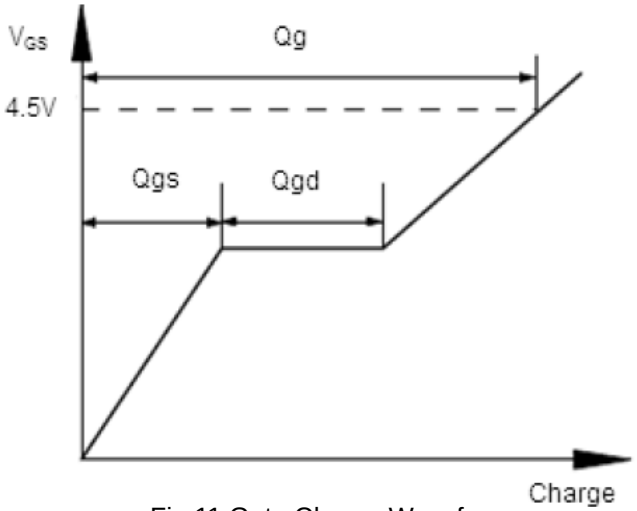


Fig.11 Gate Charge Waveform