Elektronische Bauelemente

SMG5409-C

-2.6A, -30V, $R_{DS(ON)}$ 120mΩ
P-Channel Enhancement Mode MOSFET

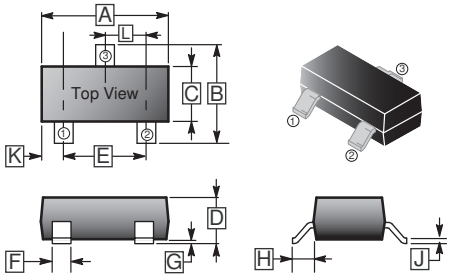
RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

DESCRIPTION

The SMG5409-C is the highest performance trench P-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the small power switching and load switch applications.

The SMG5409-C meet the RoHS and Green Product requirement with full function reliability approved.

SC-59



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.10 REF.	
B	2.10	3.00	H	0.40 REF.	
C	1.20	1.70	J	0.047	0.207
D	0.89	1.40	K	0.5 REF.	
E	2.00 Typ.		L	0.95 REF.	
F	0.30	0.50			

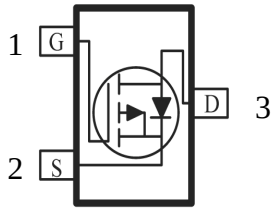
FEATURES

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge

MARKING

5409

TOP VIEW



PACKAGE INFORMATION

Package	MPQ	Leader Size
SC-59	3K	7 inch

ORDER INFORMATION

Part Number	Type
SMG5409-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings		Unit
			t≦10sec	Steady State	
Drain-Source Voltage		V_{DS}	-30		V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current [1], @V_{GS}= -10V	T_A=25℃	I_D	-2.6	-2.3	A
	T_A=70℃		-2.1	-1.8	
Pulsed Drain Current [3]		I_{DM}	-4.6		A
Total Power Dissipation	T_A=25℃	P_D	1.32	1	W
Operating Junction and Storage Temperature Range		T_j, T_{stg}	-55~150		℃
Thermal Resistance Ratings					
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	t≦10sec, 95		℃/W
			Steady State, 125		
Thermal Resistance Junction-Ambient [2]			270		
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	80		

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	-30	-	-	V	V_{GS}=0, I_D= -250uA
Gate Threshold Voltage		$V_{GS(th)}$	-1	-	-2.5	V	V_{DS}=V_{GS}, I_D= -250uA
Forward Transconductance		g_{fs}	-	3.8	-	S	V_{DS}= -5V, I_D= -2A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	-1	μA	V_{DS}= -24V, V_{GS}=0
	T_J=55℃		-	-	-5		V_{DS}= -24V, V_{GS}=0
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	120	mΩ	V_{GS}= -10V, I_D= -2A
			-	-	170		V_{GS}= -4.5V, I_D= -1A
Total Gate Charge		Q_g	-	2.6	-	nC	I_D= -2A V_{DS}= -15V V_{GS}= -4.5V
Gate-Source Charge		Q_{gs}	-	0.93	-		
Gate-Drain Charge		Q_{gd}	-	0.95	-		
Turn-on Delay Time		$T_{d(on)}$	-	1.5	-	nS	V_{DS}= -15V V_{GS}= -10V I_D= -2A R_G=3.3Ω
Rise Time		T_r	-	25	-		
Turn-off Delay Time		$T_{d(off)}$	-	11	-		
Fall Time		T_f	-	5.2	-		
Input Capacitance		C_{iss}	-	203	-	pF	V_{GS}=0 V_{DS}= -15V f=1MHz
Output Capacitance		C_{oss}	-	42	-		
Reverse Transfer Capacitance		C_{rss}	-	34	-		
Source-Drain Diode							
Continuous Source Current [1]		I_S	-	-	-2.3	A	
Pulsed Source Current [3]		I_{SM}	-	-	-4.6		
Forward on Voltage [4]		V_{SD}	-	-	-1.2	V	I_S= -1A, V_{GS}=0
Reverse Recovery Time		t_{rr}	-	8.3	-	nS	I_F= -2A, dI/dt=100A/μs T_J=25℃
Reverse Recovery Charge		Q_{rr}	-	2	-	nC	

Notes:
1. Surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. When mounted on Min. Copper pad.
3. Pulse width limited by maximum junction temperature, pulse width≦300μs, duty cycle≦2%.
4. The data tested by pulsed, pulse width≦300μs, duty cycle≦2%.

CHARACTERISTIC CURVES

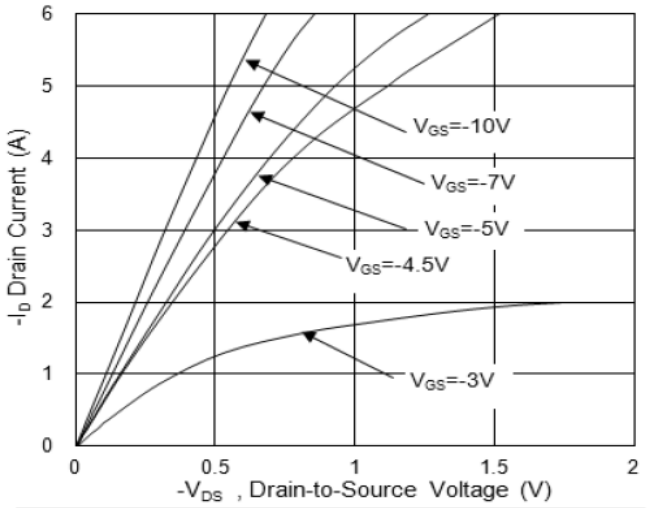


Fig.1 Typical Output Characteristics

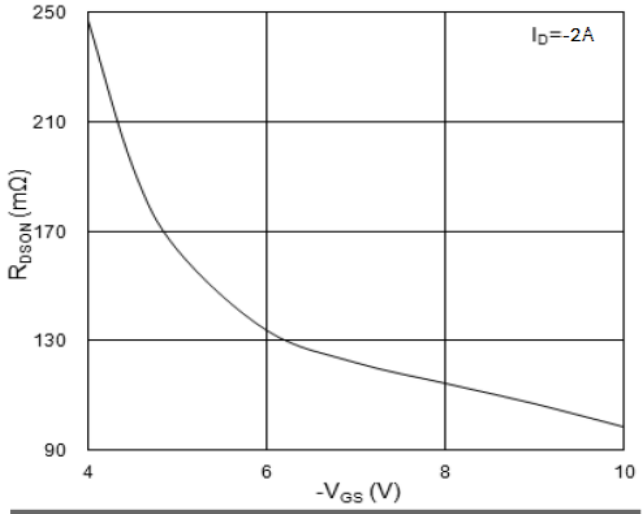


Fig.2 On-Resistance v.s Gate-Source

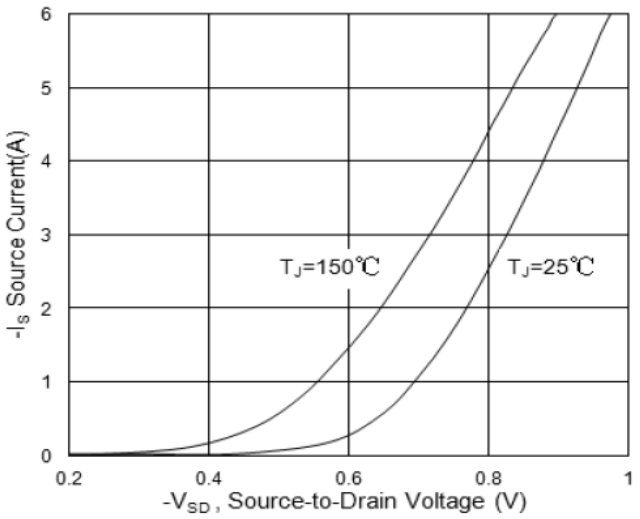


Fig.3 Forward Characteristics of Reverse

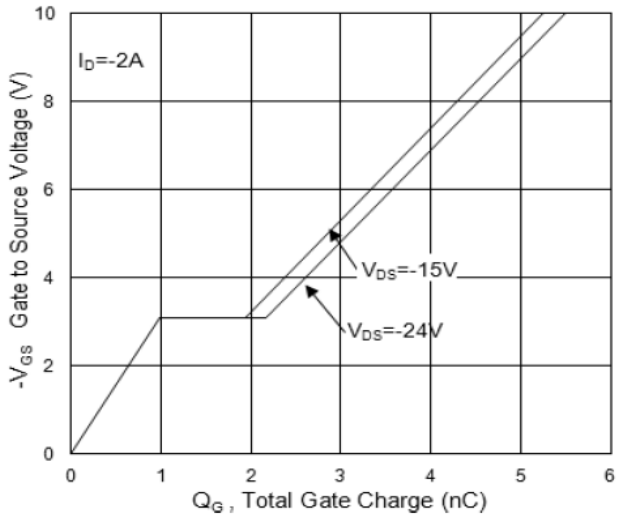


Fig.4 Gate-Charge Characteristics

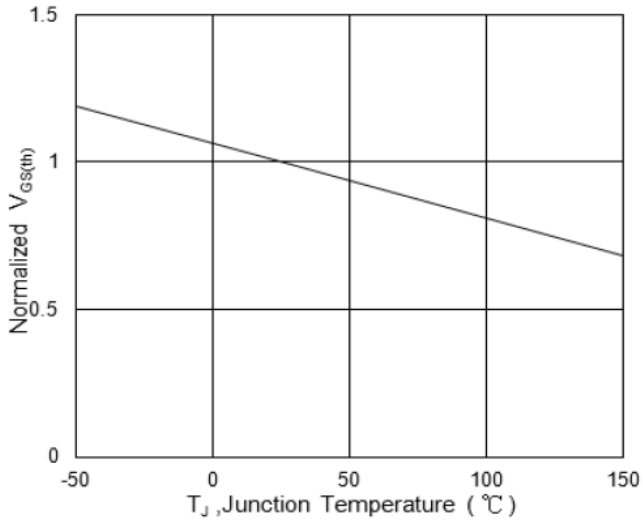


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

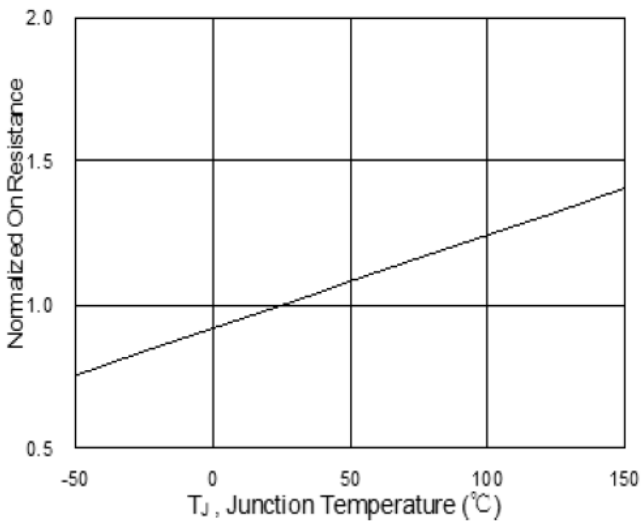


Fig.6 Normalized R_{DSON} v.s T_J

CHARACTERISTIC CURVES

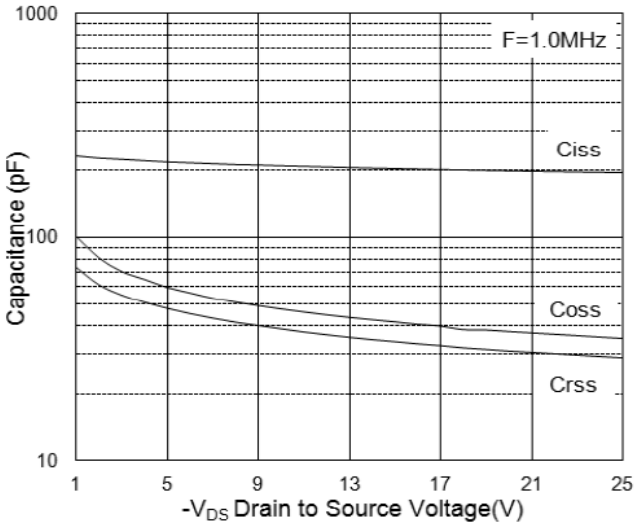


Fig.7 Capacitance

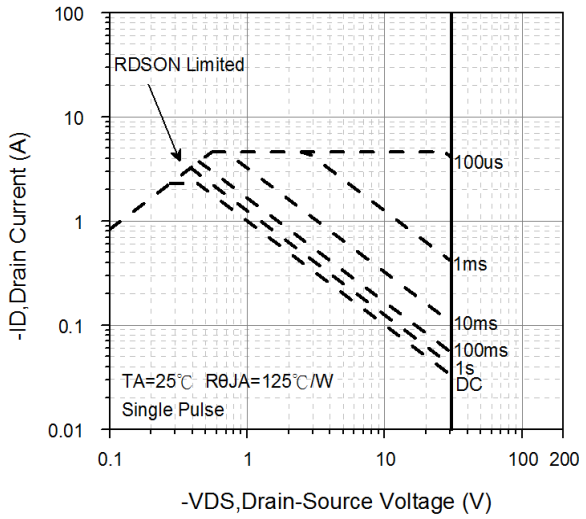


Fig.8 Safe Operating Area

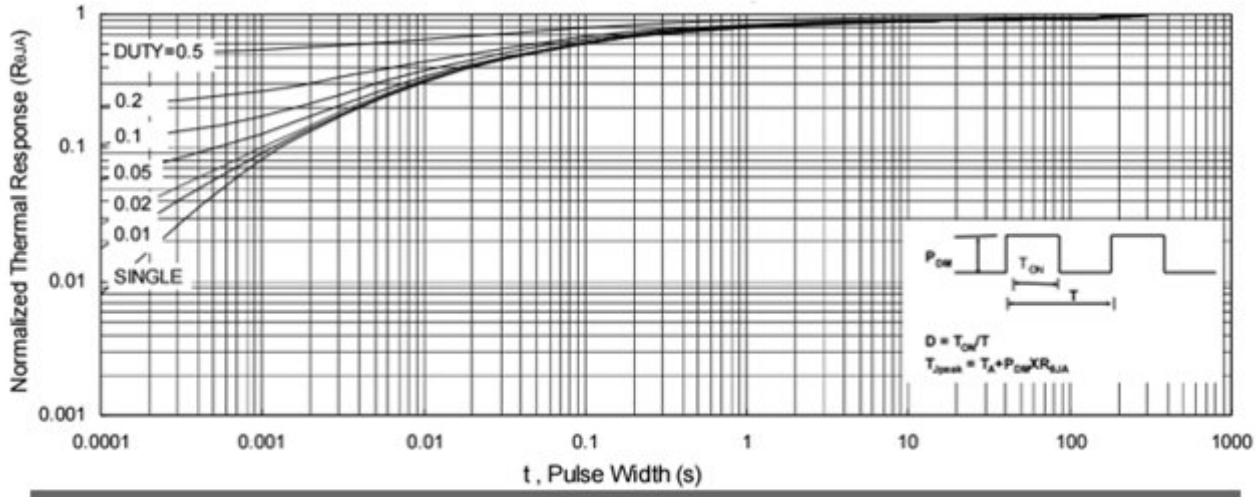


Fig.9 Normalized Maximum Transient Thermal Impedance

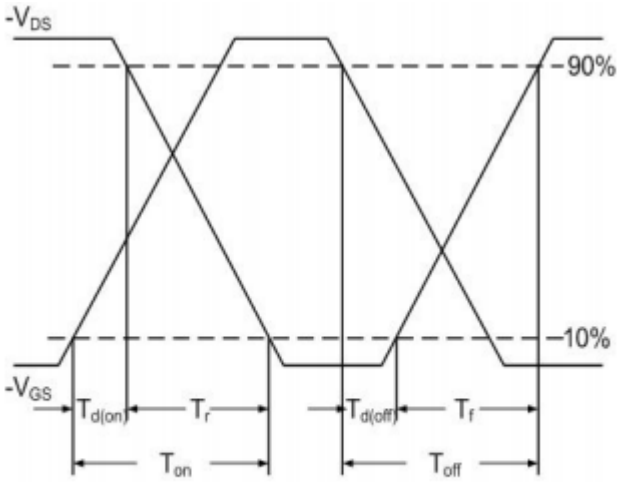


Fig.10 Switching Time Waveform

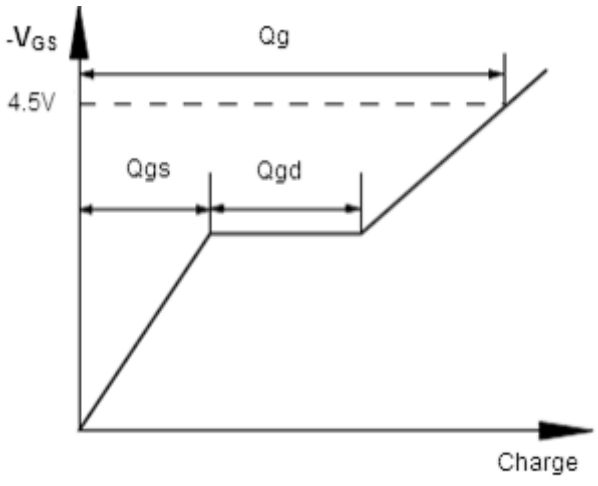


Fig.11 Gate Charge Waveform