Elektronische Bauelemente

SMG2302-C

4.9A, 20V, $R_{DS(ON)}$ 37mΩ
N-Channel Enhancement Mode MOSFET

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

DESCRIPTION

The SMG2302-C 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 small power switching and load switch applications.

The SMG2302-C meet the RoHS and Green Product requirement with full function reliability approved.

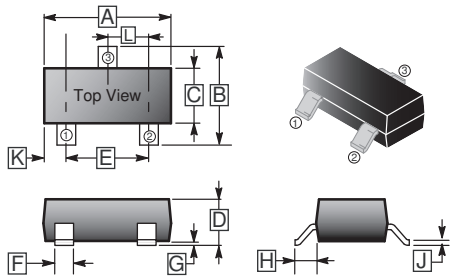
FEATURES

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

MARKING

2302

SC-59

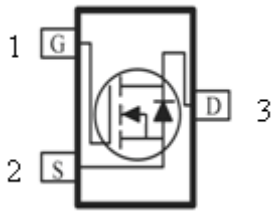


REF.	Millimeter Min.	Millimeter Max.	REF.	Millimeter Min.	Millimeter Max.
A	2.70	3.10	G	0.10 REF.	
B	2.10	3.00	H	0.40 REF.	
C	1.20	1.70	J	0.047	0.207
D	0.89	1.40	K	0.5 REF.	
E	2.00 Typ.		L	0.95 REF.	
F	0.30	0.50			

PACKAGE INFORMATION

Package	MPQ	Leader Size
SC-59	3K	7 inch

TOP VIEW



ORDER INFORMATION

Part Number	Type
SMG2302-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings		Unit
			≦10sec	Steady State	
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	4.9	4.2	A
	T_A=70℃		3.8	3.3	
Pulsed Drain Current [3]		I_{DM}	17		A
Power Dissipation	T_A=25℃	P_D	1.38		W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~150		℃
Thermal Resistance Rating					
Thermal Resistance Junction-ambient [1]		$R_{\theta JA}$	≦10sec, 90		℃/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}	20	-	-	V	V_{GS}=0, I_D=250uA
Gate-Threshold Voltage		$V_{GS(th)}$	0.5	-	1.2	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance		g_{fs}	-	20	-	S	V_{DS}=5V, I_D=4A
Gate-Body 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		V_{DS}=16V, V_{GS}=0
Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	37	mΩ	V_{GS}=4.5V, I_D=3.6A
			-	-	45		V_{GS}=2.5V, I_D=3.1A
Total Gate Charge		Q_g	-	8.6	-	nC	V_{DS}=15V V_{GS}=4.5V I_D=4A
Gate-Source Charge		Q_{gs}	-	1.37	-		
Gate-Drain Charge		Q_{gd}	-	2.3	-		
Turn-on Delay Time		$T_{d(on)}$	-	5.2	-	nS	V_{DS}=10V V_{GS}=4.5V I_D=4A R_G=3.3Ω
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=1.0MHz
Output Capacitance		C_{oss}	-	70	-		
Reverse Transfer Capacitance		C_{rss}	-	63	-		
Source-Drain Diode							
Diode Forward Voltage [4]		V_{SD}	-	-	1.2	V	I_S=1.6A, V_{GS}=0
Continuous Source Current [1]		I_S	-	-	4.2	A	
Pulsed Source Current [3]		I_{SM}	-	-	17	A	
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 FR-4 board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by maximum junction temperature.
4. The data tested by pulsed , pulse width≦300us, duty cycle≦2%.

CHARACTERISTIC CURVES

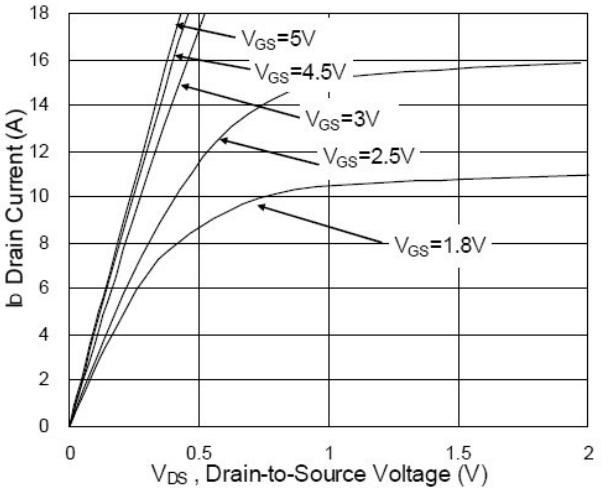


Fig.1 Typical Output Characteristics

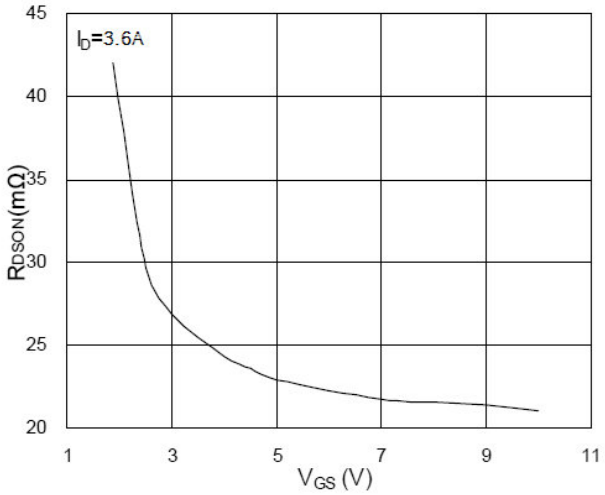


Fig.2 On-Resistance vs. Gate-Source

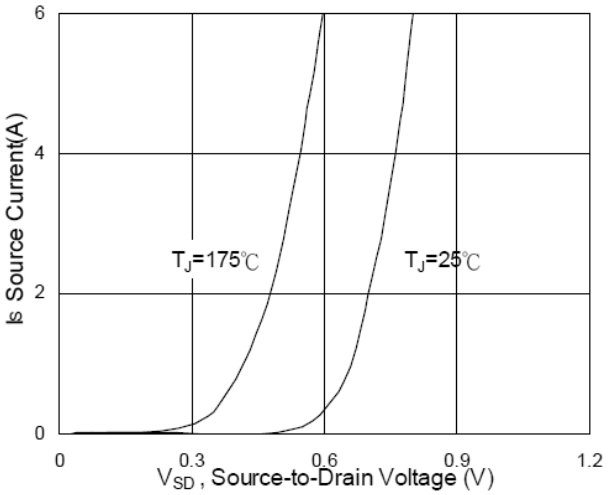


Fig.3 Forward Characteristics Of Reverse

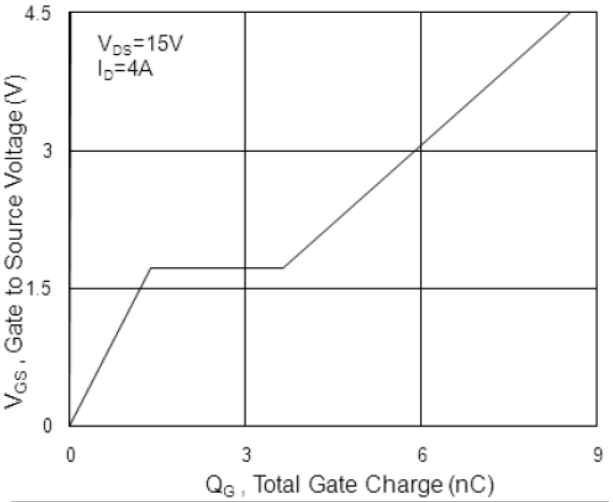


Fig.4 Gate-Charge Characteristics

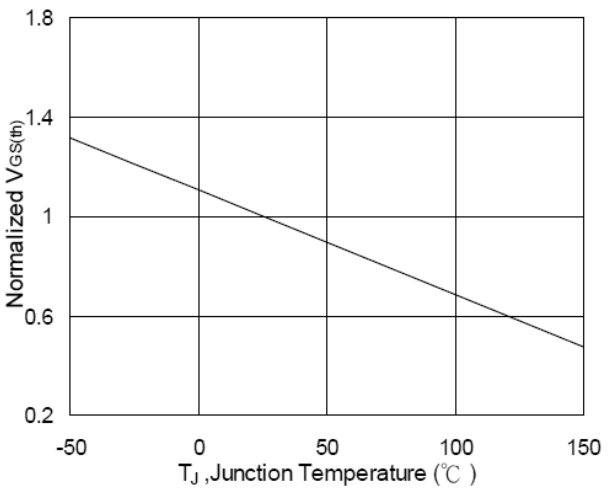


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

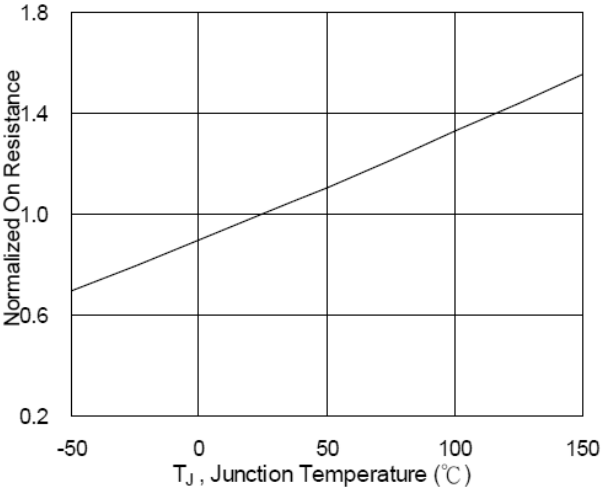


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

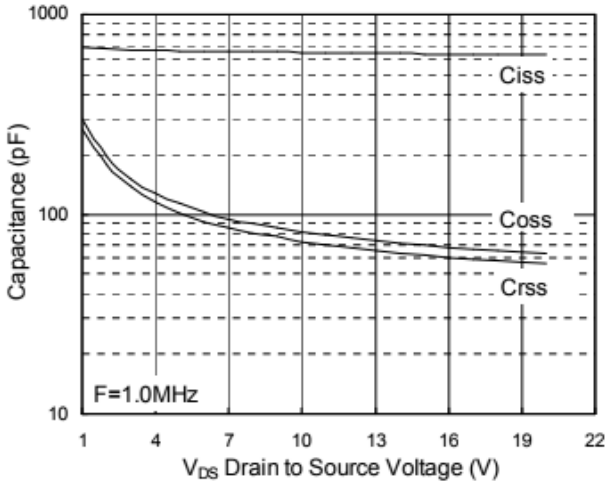


Fig.7 Capacitance

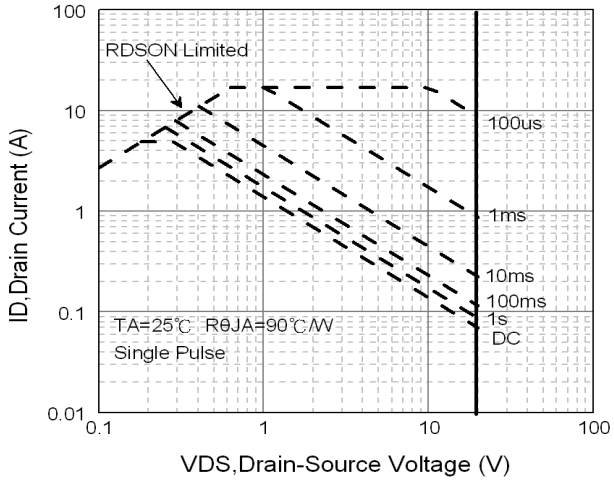


Fig.8 Safe Operating Area

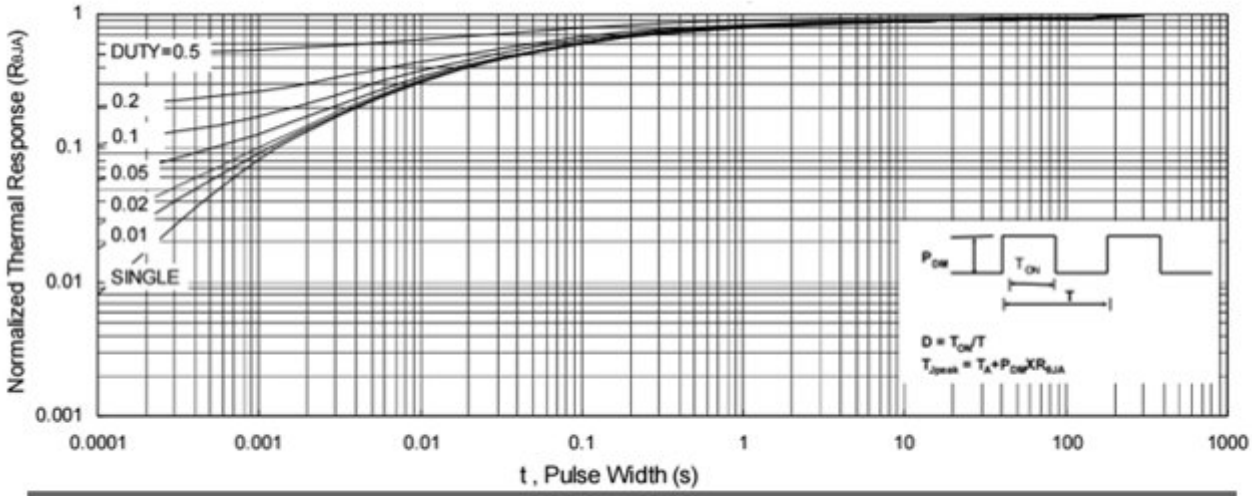


Fig.9 Normalized Maximum Transient Thermal Impedance

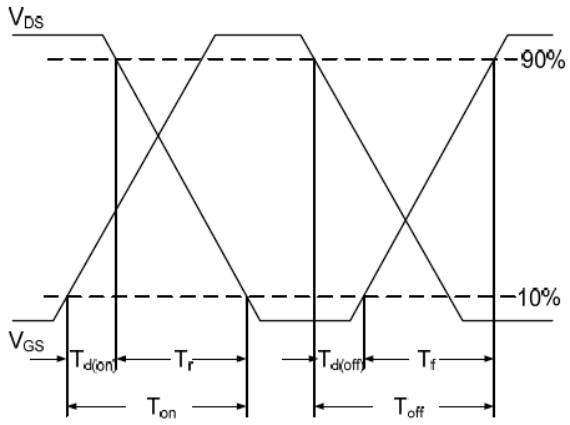


Fig.10 Switching Time Waveform

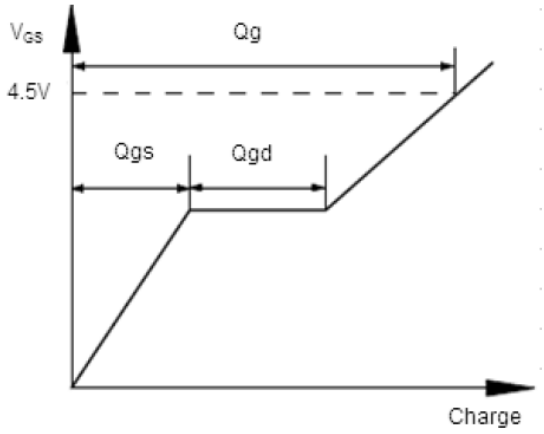


Fig.11 Gate Charge Waveform