

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

DESCRIPTION

The SMG2305A-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 SMG2305A-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

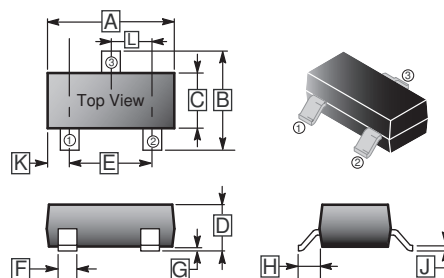
- Advanced High Cell Density Trench Technology
- Super Low Gate Charge

MARKING

2305A

2305

SC-59



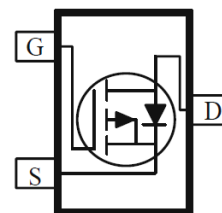
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.10	REF.
B	2.10	3.00	H	0.40	REF.
C	1.20	1.70	J	0.047	0.207
D	0.89	1.40	K	0.5	REF.
E	2.00	TYP.	L	0.95	REF.
F	0.30	0.50			

PACKAGE INFORMATION

Package	MPQ	Leader Size
SC-59	3K	7 inch

ORDER INFORMATION

Part Number	Type
SMG2305A-C	Lead (Pb)-free and Halogen-free



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings		Unit	
		$\leq 10\text{sec}$	Steady State		
Drain-Source Voltage	V_{DS}	-30		V	
Gate-Source Voltage	V_{GS}	± 12		V	
Drain Current ¹ @ $V_{GS} = -10\text{V}$	I_D	$T_A = 25^\circ\text{C}$	-4.2	-3.7	A
		$T_A = 70^\circ\text{C}$	-3.5	-3	
Pulsed Drain Current ³	I_{DM}	-30		A	
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	1.4	W	
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150		$^\circ\text{C}$	
Thermal Resistance Data					
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	90	125	$^\circ\text{C/W}$	
Thermal Resistance Junction-Ambient ²		270			
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	80			

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$	
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-	-1.2	V	$V_{DS}=V_{GS}, I_D = -250\mu\text{A}$	
Forward Transconductance	g_{fs}	-	5.6	-	S	$V_{DS} = -5V, I_D = -3A$	
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 12V$	
Drain-Source Leakage Current	$T_J=25^\circ\text{C}$	I_{DSS}	-	-	-1	μA	$V_{DS} = -24V, V_{GS}=0$
	$T_J=55^\circ\text{C}$		-	-	-5		$V_{DS} = -24V, V_{GS}=0$
Drain-Source On-Resistance ⁴	$R_{DS(ON)}$	-	-	60	m Ω	$V_{GS} = -10V, I_D = -3.2A$	
		-	-	80		$V_{GS} = -4.5V, I_D = -3A$	
		-	-	150		$V_{GS} = -2.5V, I_D = -2A$	
		-	-	250		$V_{GS} = -1.8V, I_D = -1A$	
Total Gate Charge	Q_g	-	11.9	-	nC	$I_D = -3A$	
Gate-Source Charge	Q_{gs}	-	1.8	-		$V_{DS} = -15V$	
Gate-Drain ("Miller") Charge	Q_{gd}	-	3	-		$V_{GS} = -4.5V$	
Turn-on Delay Time	$T_{d(on)}$	-	6.6	-	nS	$V_{DD} = -15V$	
Rise Time	T_r	-	27.8	-		$V_{GS} = -4.5V$	
Turn-off Delay Time	$T_{d(off)}$	-	46.2	-		$I_D = -3A$	
Fall Time	T_f	-	20.6	-		$R_G=3.3\Omega$ $R_L=5\Omega$	
Input Capacitance	C_{iss}	-	920	-	pF	$V_{GS}=0$	
Output Capacitance	C_{oss}	-	73	-		$V_{DS} = -15V$	
Reverse Transfer Capacitance	C_{rss}	-	71	-		$f=1\text{MHz}$	
Source-Drain Diode							
Forward on Voltage ⁴	V_{SD}	-	-	-1.2	V	$I_S = -1.2A, V_{GS}=0$	
Continuous Source Current ¹	I_S	-	-	-3.7	A		
Pulsed Source Current ³	I_{SM}	-	-	-15			

Notes:

- Surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- When mounted on Min. copper pad.
- Pulse width limited by maximum junction temperature.
- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

CHARACTERISTIC CURVE

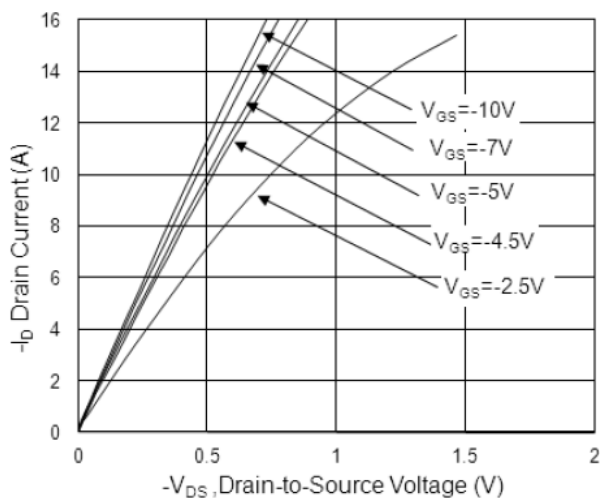


Fig.1 Typical Output Characteristics

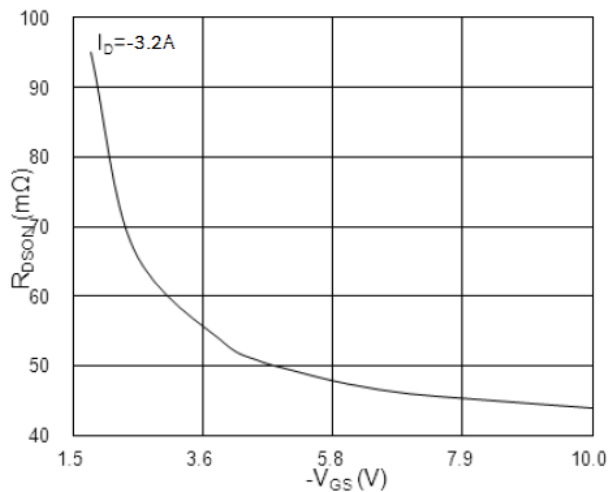


Fig.2 On-Resistance vs. G-S Voltage

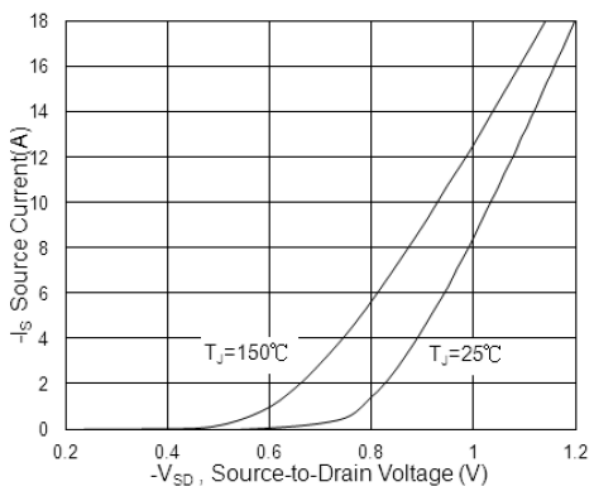


Fig.3 Forward Characteristics Of Reverse

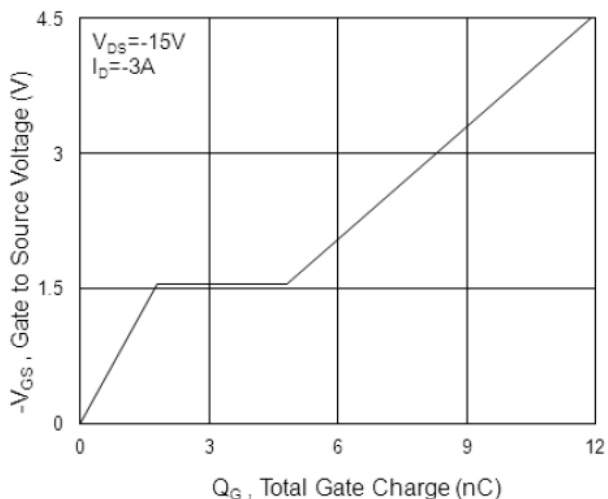


Fig.4 Gate-Charge Characteristics

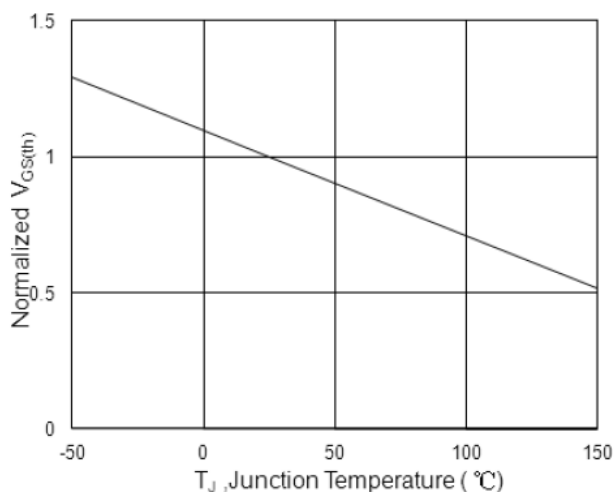


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

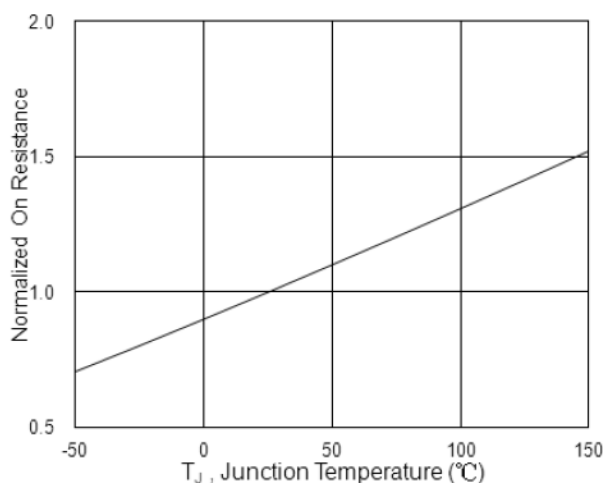


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

CHARACTERISTIC CURVE

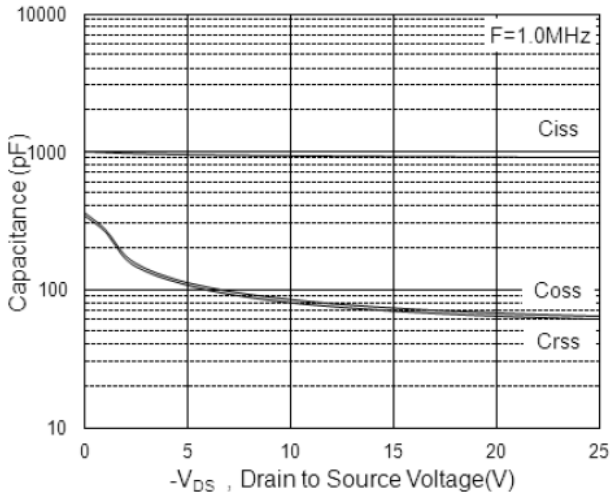


Fig.7 Capacitance

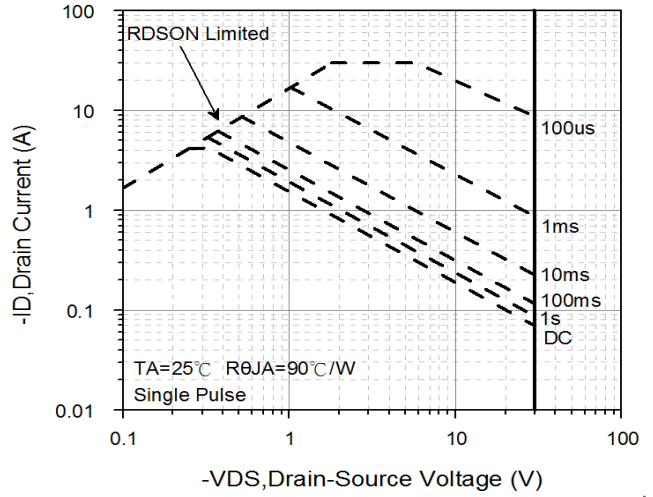


Fig.8 Safe Operating Area

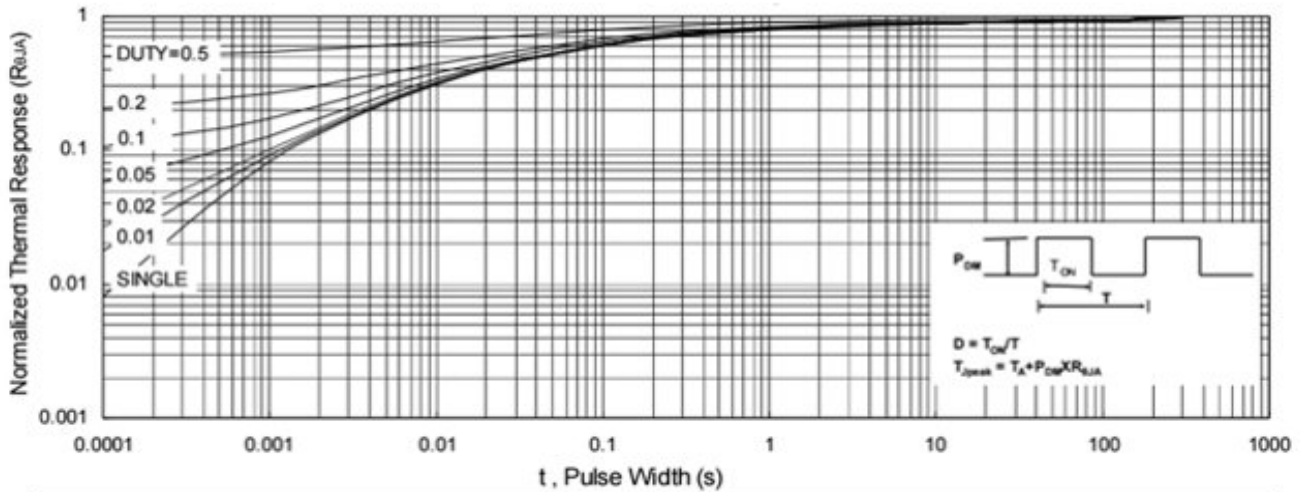


Fig.9 Normalized Maximum Transient Thermal Impedance

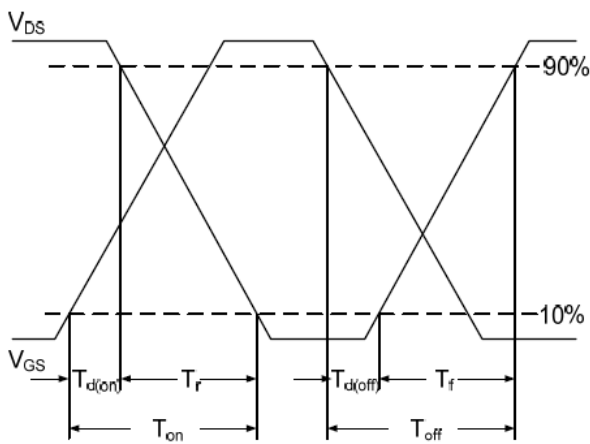


Fig.10 Switching Time Waveform

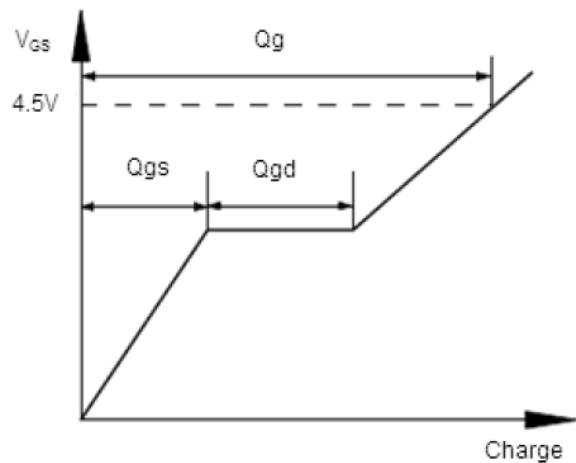


Fig.11 Gate Charge Waveform