

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

DESCRIPTION

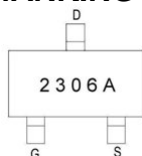
The SMG2306A-C utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SMG2306A-C is universally used for all commercial-industrial applications.

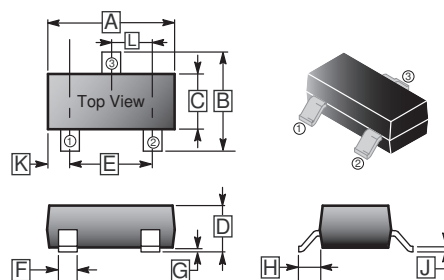
FEATURES

- Capable of 2.5V Gate Drive
- Lower On-Resistance

MARKING



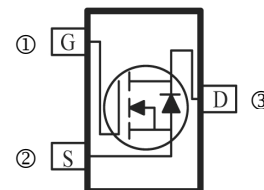
SC-59



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
SMG2306A-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	V_{DS}	30	V	
Gate-Source Voltage	V_{GS}	± 12	V	
Drain Current ³ , @ $V_{GS}=4.5V$	$T_A=25^\circ C$	I_D	5	A
	$T_A=70^\circ C$	I_D	4	A
Pulsed Drain Current ¹	I_{DM}	20	A	
Power Dissipation	$T_A=25^\circ C$	P_D	1.38	W
Linear Derating Factor		0.01	W/ $^\circ C$	
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55~150	$^\circ C$	
Thermal Data				
Thermal Resistance Junction-ambient ³ Max.	$R_{\theta JA}$	90	$^\circ C/W$	

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	$V_{GS}=0, I_D=250\mu A$	
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	-	0.1	-	V/°C	Reference to 25°C, $I_D=1mA$	
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Forward Transconductance	g_{fs}	-	13	-	S	$V_{DS}=5V, I_D=5A$	
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 12V$	
Drain-Source Leakage Current	$T_J=25^\circ C$	I_{DSS}	-	-	1	μA	$V_{DS}=30V, V_{GS}=0$
	$T_J=70^\circ C$		-	-	25	μA	$V_{DS}=24V, V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	30	m Ω	$V_{GS}=10V, I_D=5A$	
		-	-	35		$V_{GS}=4.5V, I_D=5A$	
		-	-	50		$V_{GS}=2.5V, I_D=2.6A$	
		-	-	90		$V_{GS}=1.8V, I_D=1.0A$	
Total Gate Charge ²	Q_g	-	8.5	15	nC	$I_D=5A$ $V_{DS}=16V$ $V_{GS}=4.5V$	
Gate-Source Charge	Q_{gs}	-	1.5	-			
Gate-Drain ("Miller") Charge	Q_{gd}	-	3.2	-			
Turn-on Delay Time ²	$T_{d(on)}$	-	6	-	nS	$V_{DS}=15V$ $I_D=5A$ $V_{GS}=10V$ $R_G=3.3\Omega$ $R_D=3\Omega$	
Rise Time	T_r	-	20	-			
Turn-off Delay Time	$T_{d(off)}$	-	20	-			
Fall Time	T_f	-	3	-			
Input Capacitance	C_{iss}	-	660	1050	pF	$V_{GS}=0$ $V_{DS}=25V$ $f=1.0MHz$	
Output Capacitance	C_{oss}	-	90	-			
Reverse Transfer Capacitance	C_{rss}	-	70	-			
Source-Drain Diode							
Forward on Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1.2A, V_{GS}=0$	
Reverse Recovery Time ²	T_{rr}	-	14	-	nS	$I_S=5A, V_{GS}=0$	
Reverse Recovery Charge	Q_{rr}	-	7	-	nC	$di/dt=100A/\mu s$	

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in² copper pad of FR4 board; 270°C/W when mounted on M in. copper pad.

CHARACTERISTIC CURVE

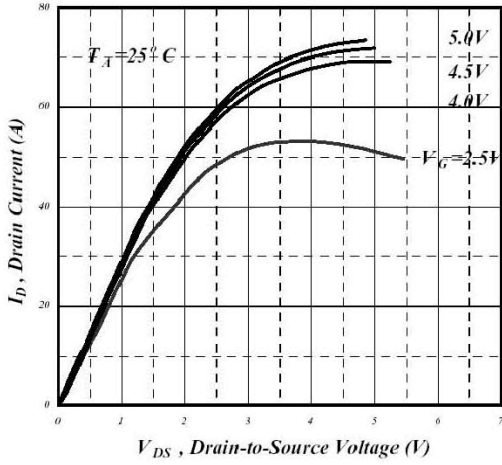


Fig 1. Typical Output Characteristics

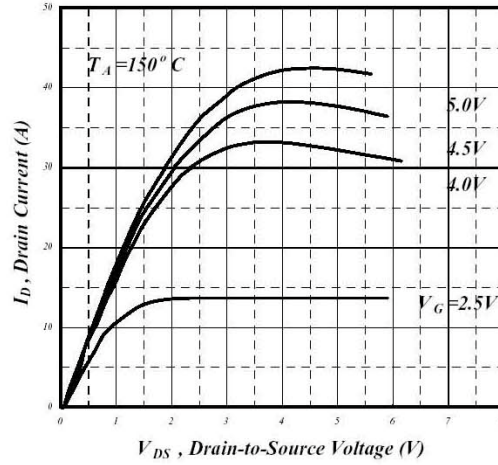


Fig 2. Typical Output Characteristics

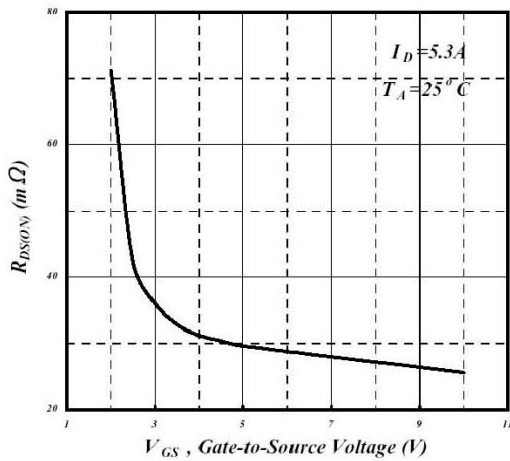


Fig 3. On-Resistance v.s. Gate Voltage

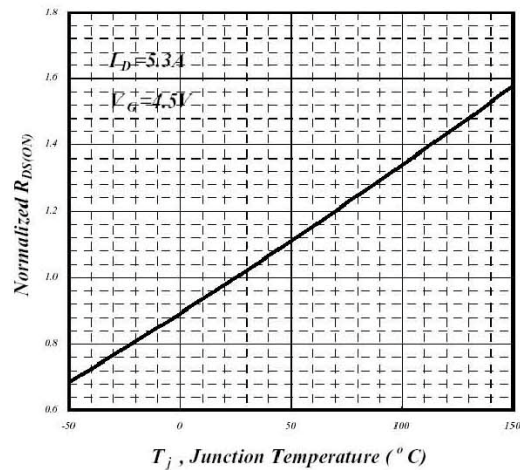


Fig 4. Normalized On-Resistance v.s. Junction Temperature

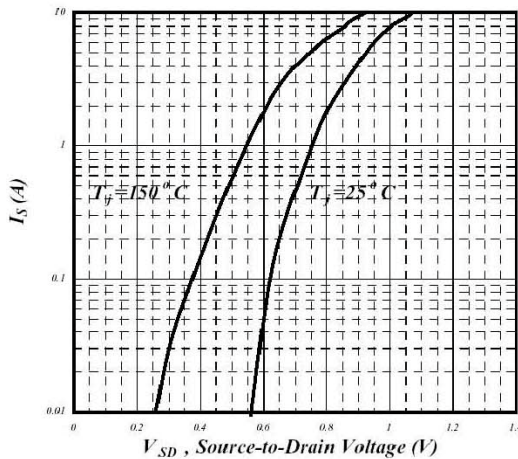


Fig 5. Forward Characteristics of Reverse Diode

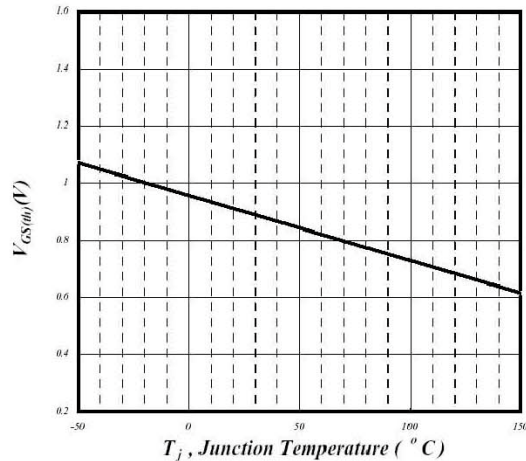


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

CHARACTERISTIC CURVE

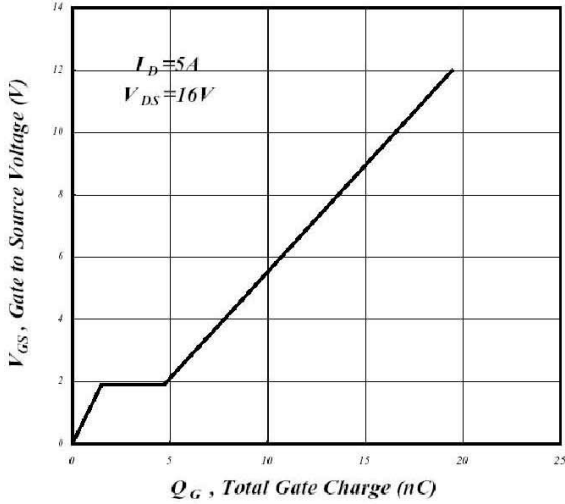


Fig 7. Gate Charge Characteristics

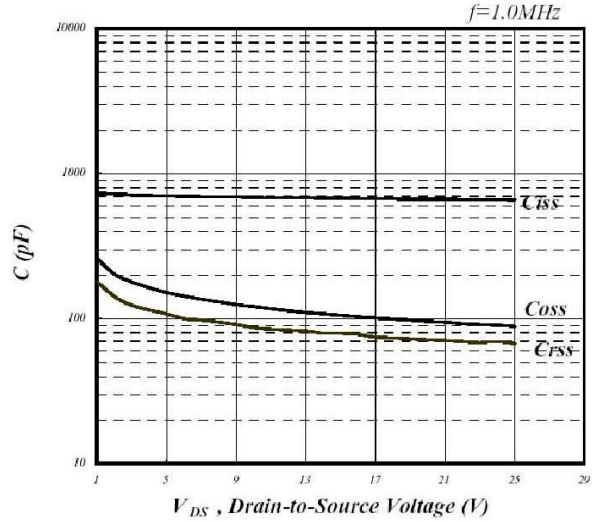


Fig 8. Typical Capacitance Characteristics

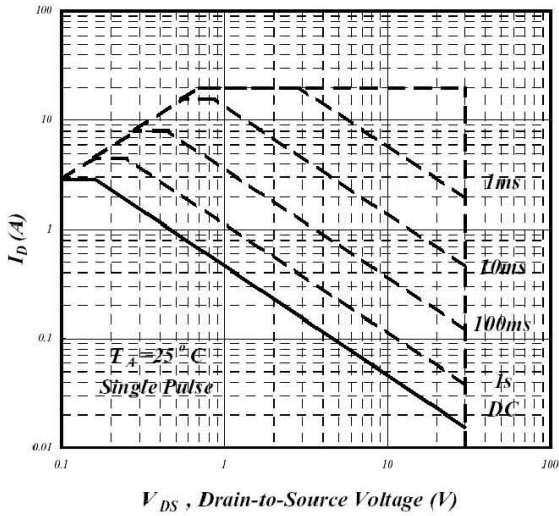


Fig 9. Maximum Safe Operating Area

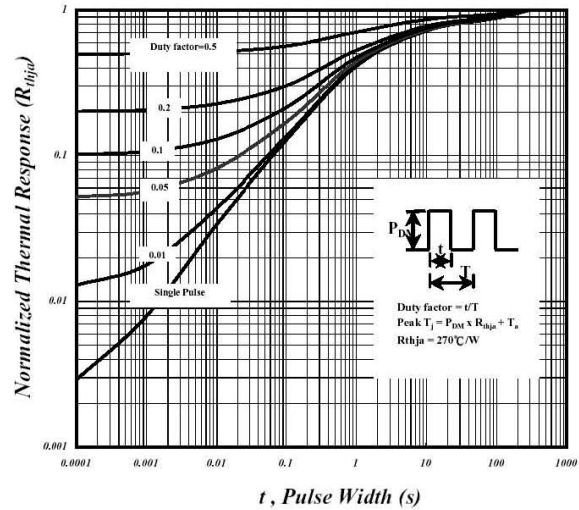


Fig 10. Effective Transient Thermal Impedance

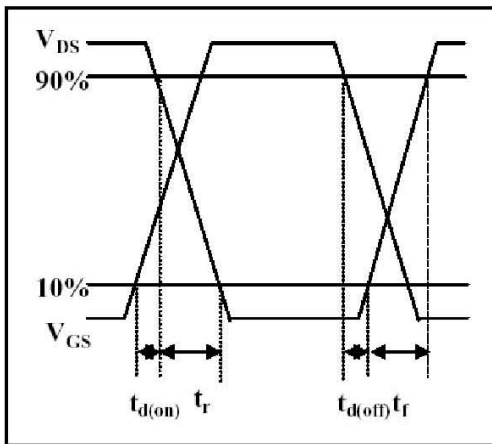


Fig 11. Switching Time Waveform

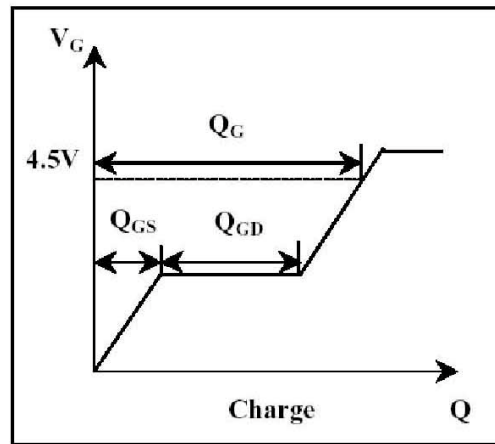


Fig 12. Gate Charge Waveform