

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

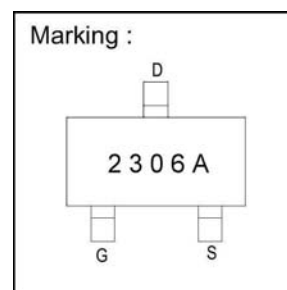
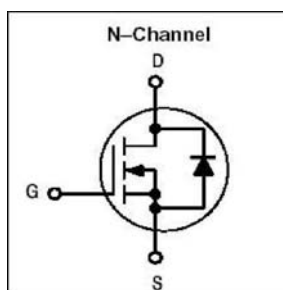
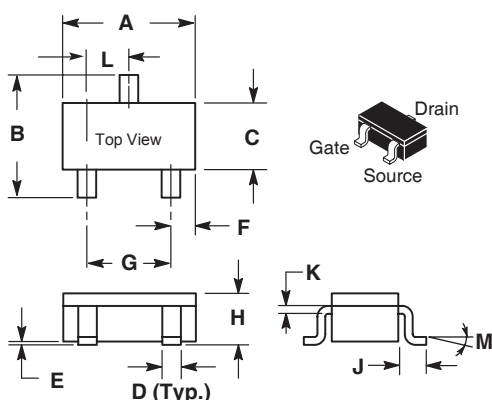
DESCRIPTION

The SMG2306A utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SMG2306A is universally used for all commercial-industrial applications.

FEATURES

- Capable of 2.5V gate drive
- Lower on-resistance

PACKAGE DIMENSIONS



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

ABSOLUTE MAXIMUM RATINGS

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

THERMAL DATA

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	R_{thj-a}	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	$V_{DS}=30V$, $V_{GS}=0$
Drain-Source Leakage Current($T_j=70^\circ C$)		-	-	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	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	90	-		
Reverse Transfer Capacitance	C_{rss}	-	70	-		

SOURCE-DRAIN DIODE

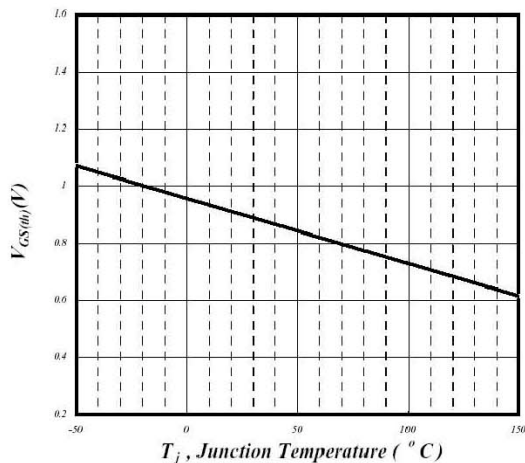
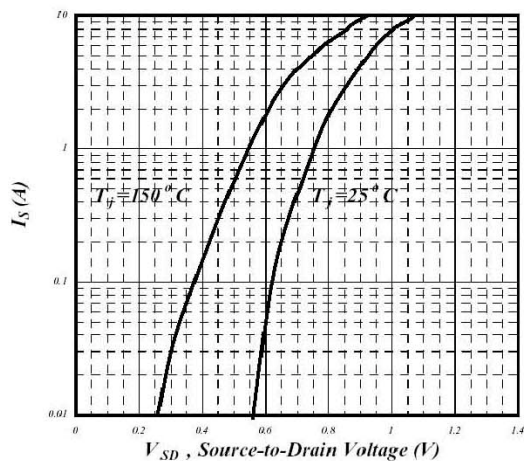
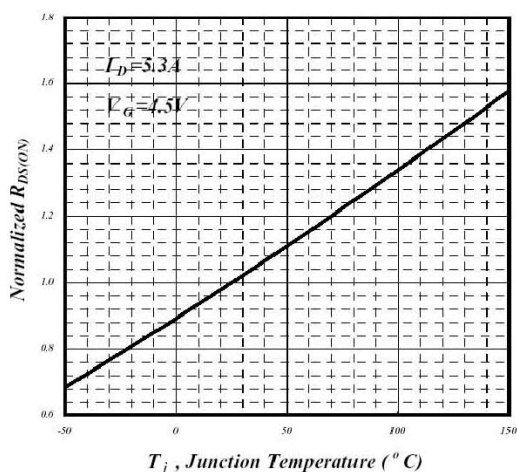
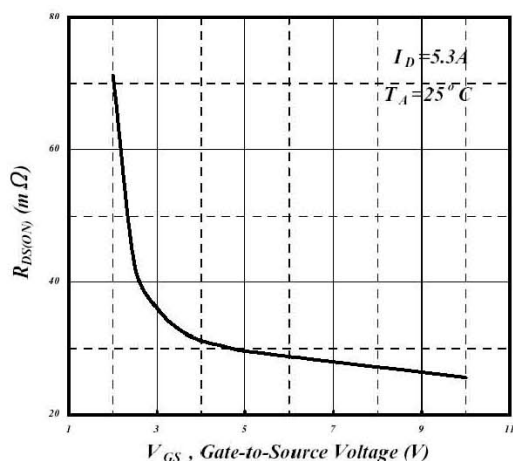
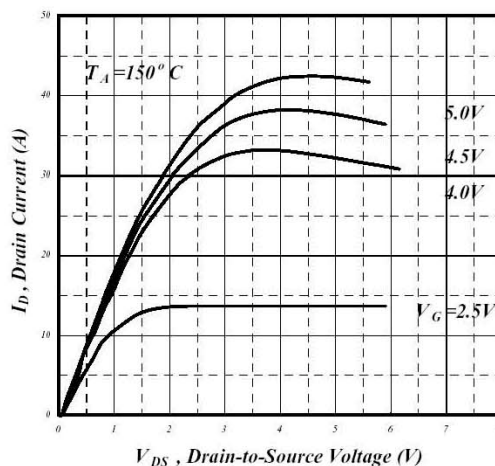
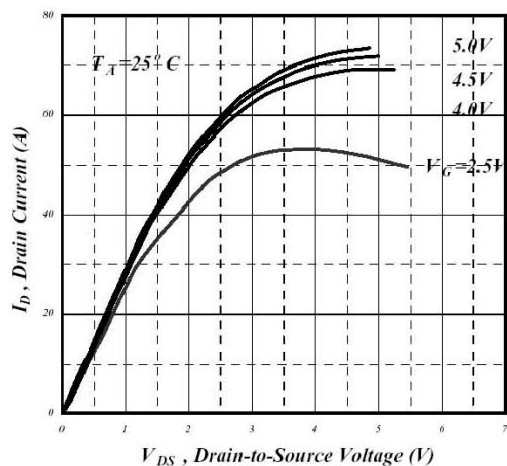
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V_{SD}	-	-	1.2	V	$I_S=1.2A$, $V_{GS}=0$
Reverse Recovery Time ²	T_{rr}	-	14	-	ns	$I_S=5A$, $V_{GS}=0V$ $di/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	7	-	nC	

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 Min. copper pad.

CHARACTERISTIC CURVE



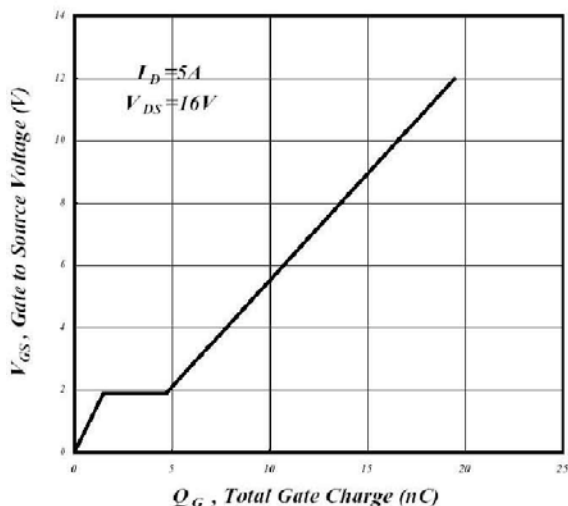


Fig 7. Gate Charge Characteristics

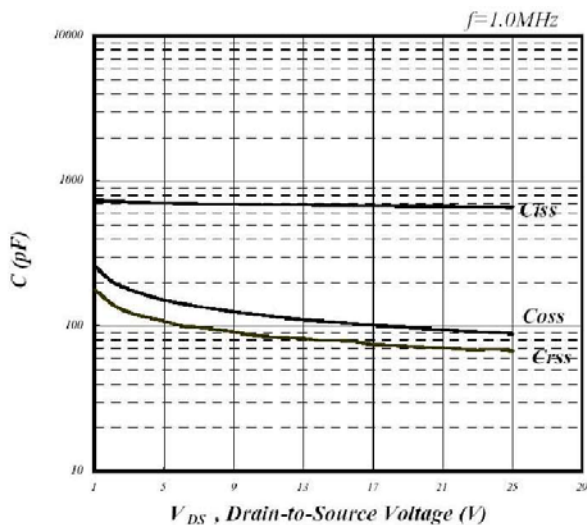


Fig 8. Typical Capacitance Characteristics

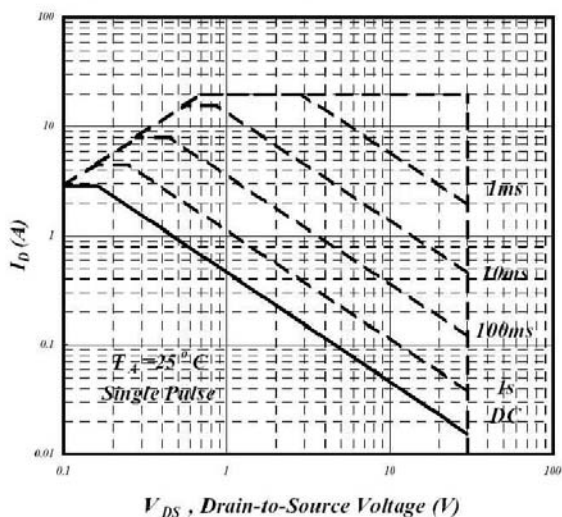


Fig 9. Maximum Safe Operating Area

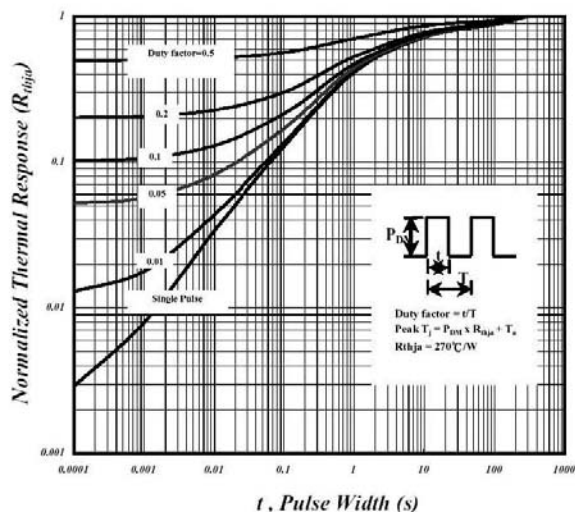


Fig 10. Effective Transient Thermal Impedance

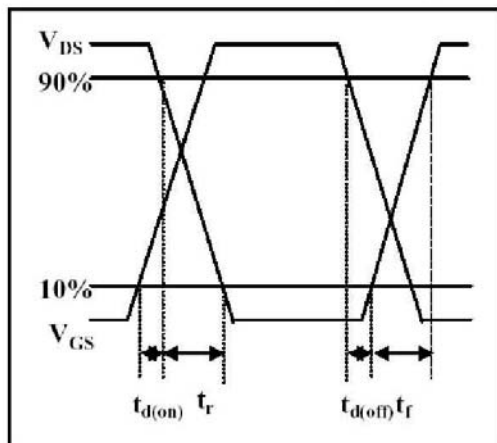


Fig 11. Switching Time Waveform

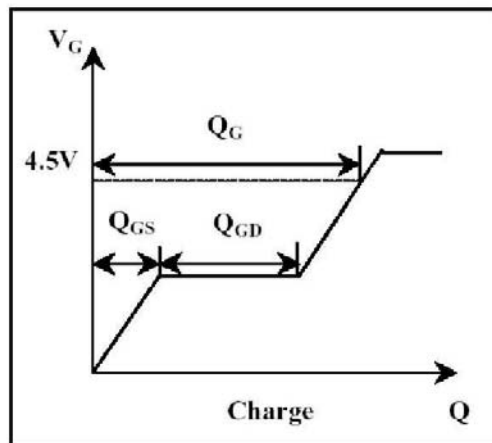


Fig 12. Gate Charge Waveform