Elektronische Bauelemente

SMG2306A

5 A, 30 V, $R_{DS(ON)}$ 35 mΩ
N-Channel Enhancement Mode Power Mos.FET

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

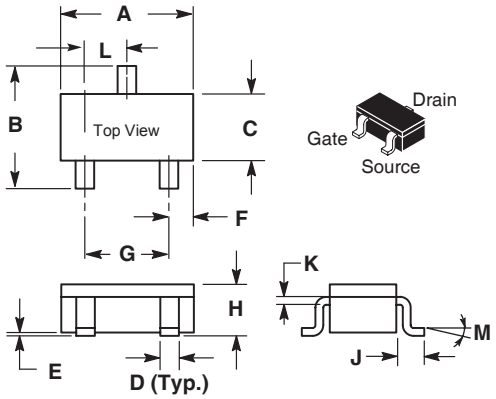
DESCRIPTION

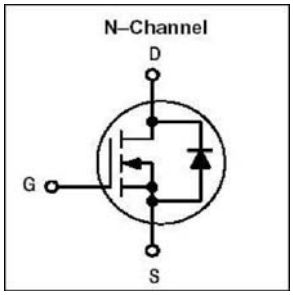
The SMG2306A utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SMG2306A is universally used for all commercial-industrial applications.

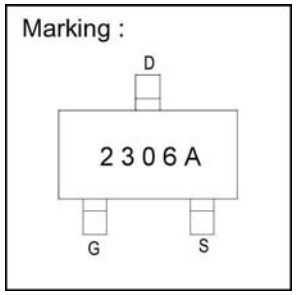
FEATURES

- 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] ,VGS@4.5V	I_D @Ta=25℃	5	A
Drain Current[3] ,VGS@4.5V	I_D @Ta=70℃	4	A
Pulsed Drain Current[1,]	I_{DM}	20	A
Power Dissipation	P_D @Ta=25℃	1.38	W
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150	℃
Linear Derating Factor		0.01	W/℃

THERMAL DATA

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient[3] Max.	Rthj-a	90	℃/W

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.1	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	13	-	S	V_{DS}=5V, I_D=5A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±12V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=30V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	25	uA	V_{DS}=24V, V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	30	mΩ	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”) Change	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=3.3Ω R_D=3Ω
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 Time2	T_{rr}	-	14	-	ns	I_S=5A, V_{GS}=0V dI/dt=100A/us
Reverse Recovery Charge	Q_{rr}	-	7	-	nC	

Notes: 1. Pulse width limited by Max. junction temperature.
2. Pulse width≦300us, duty cycle≦2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board; 270℃/W when mounted on Min. copper pad.

CHARACTERISTIC CURVE

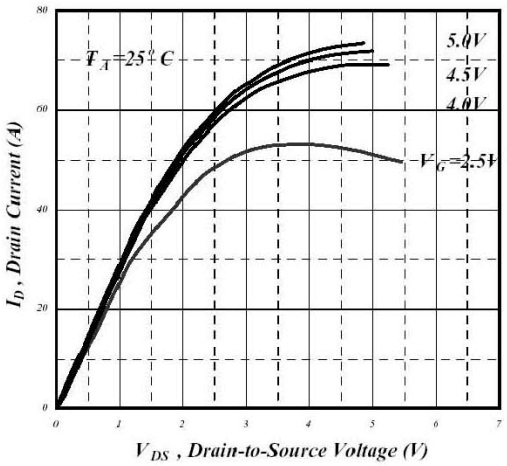


Fig 1. Typical Output Characteristics

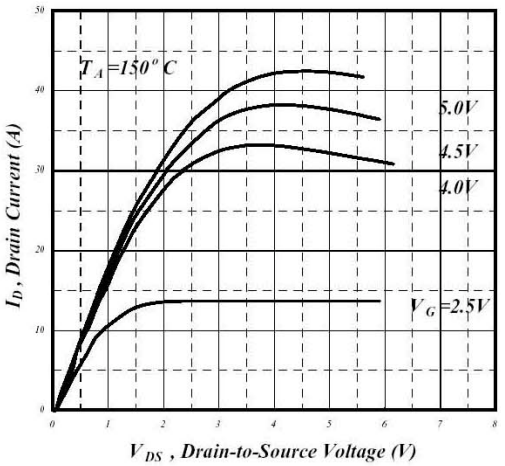


Fig 2. Typical Output Characteristics

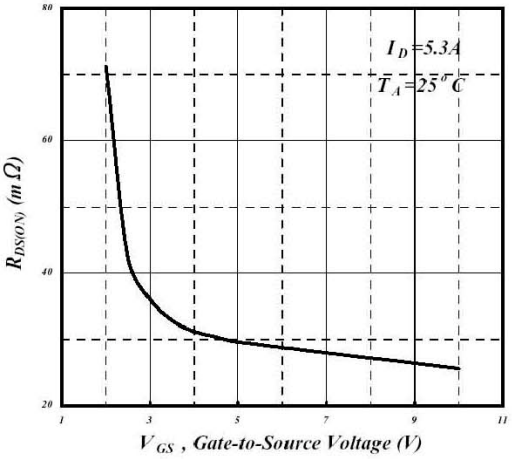


Fig 3. On-Resistance v.s. Gate Voltage

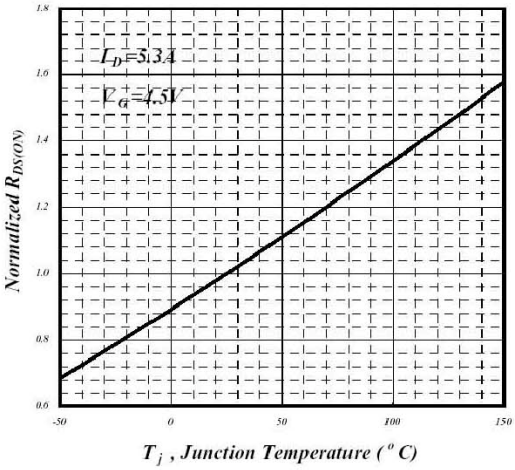


Fig 4. Normalized On-Resistance v.s. Junction Temperature

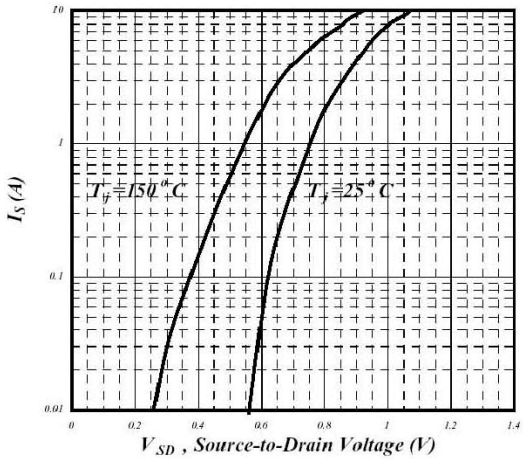


Fig 5. Forward Characteristics of Reverse Diode

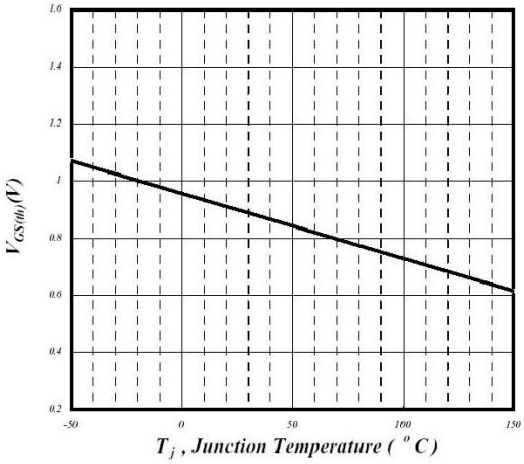


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

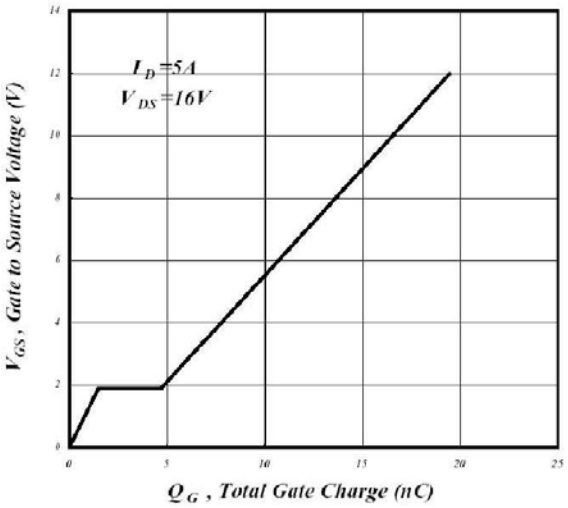


Fig 7. Gate Charge Characteristics

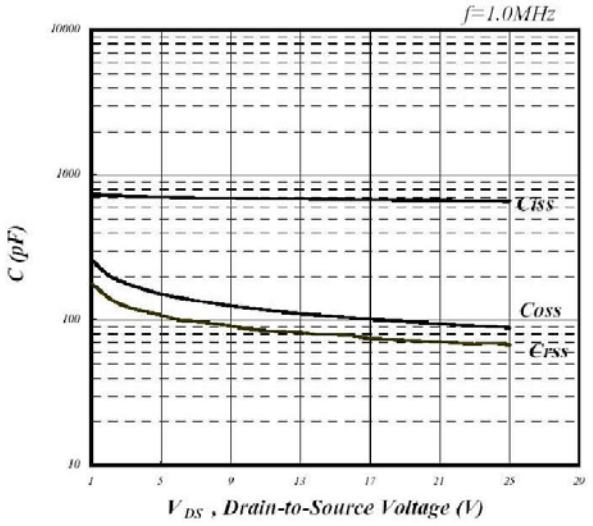


Fig 8. Typical Capacitance Characteristics

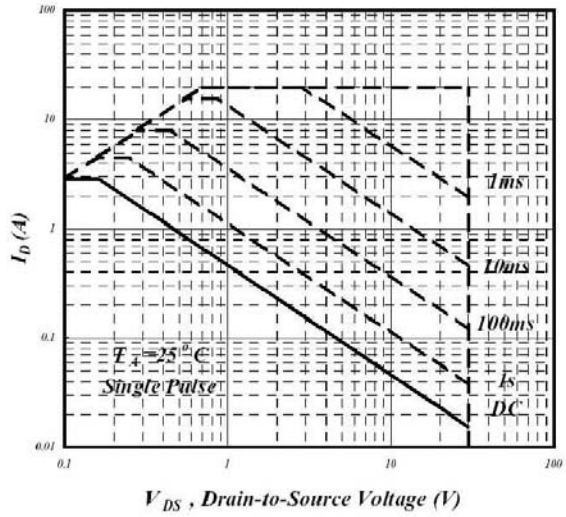


Fig 9. Maximum Safe Operating Area

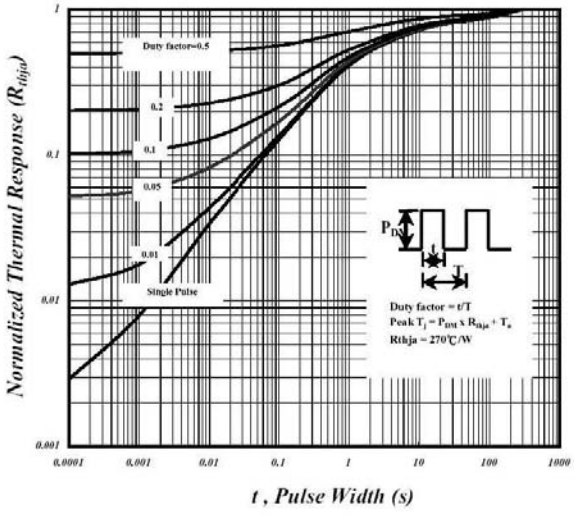


Fig 10. Effective Transient Thermal Impedance

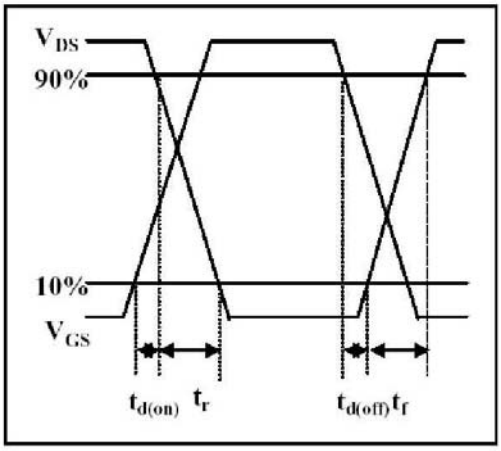


Fig 11. Switching Time Waveform

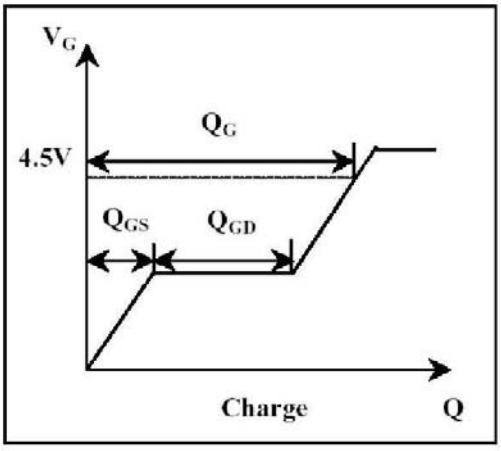


Fig 12. Gate Charge Waveform