

RoHS Compliant Product

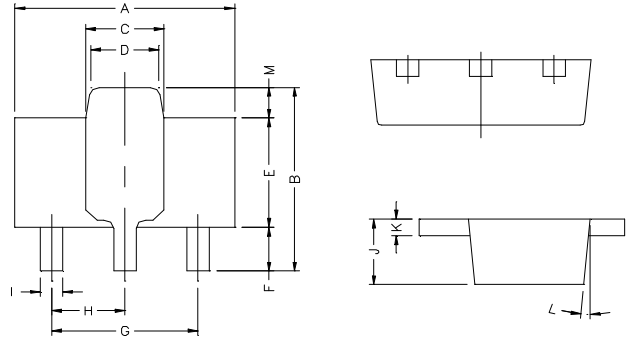
Description

The SGM2306A utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SGM2306A is universally used for all commercial-industrial surface mount applications.

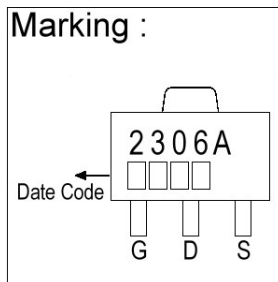
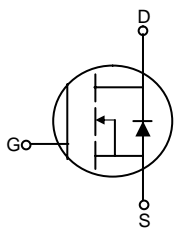
Features

- * Lower On-Resistance
- * Capable Of 2.5V Gate drive

SOT-89



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00	REF.
B	4.05	4.25	H	1.50	REF.
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current ³ , V _{GS} @4.5V	I _D @T _A =25°C	5.0	A
Continuous Drain Current ³ , V _{GS} @4.5V	I _D @T _A =70°C	4.0	A
Pulsed Drain Current ^{1,2}	I _{DM}	20	A
Total Power Dissipation	P _D @T _A =25°C	1.5	W
Linear Derating Factor		0.012	W/°C
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient ³ Max.	R _{thj-a}	83.3	°C/W

Electrical Characteristics($T_j=25^\circ\text{C}$ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DS}/\Delta T_j$	-	0.1	-	$V/^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V$
Drain-Source Leakage Current ($T_j=25^\circ\text{C}$)	I_{DSS}	-	-	1	μA	$V_{DS}=30V, V_{GS}=0$
Drain-Source Leakage Current($T_j=150^\circ\text{C}$)		-	-	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		$V_{GS}=1.8V, I_D=1A$
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	$V_{DD}=15V$ $I_D=5A$ $V_{GS}=10V$ $R_G=3.3\Omega$ $R_D=3\Omega$
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	-		
Forward Transconductance	G_{fs}	-	13	-	S	$V_{DS}=5V, I_D=5A$

Source-Drain Diode

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

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

3. Surface mounted on FR4 board, $t \leq 10sec$.

Characteristics Curve

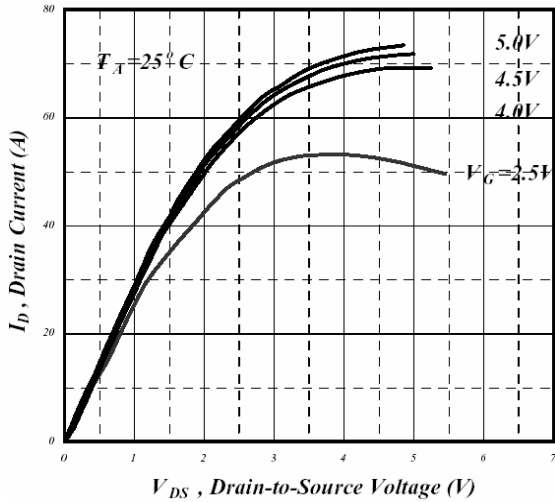


Fig 1. Typical Output Characteristics

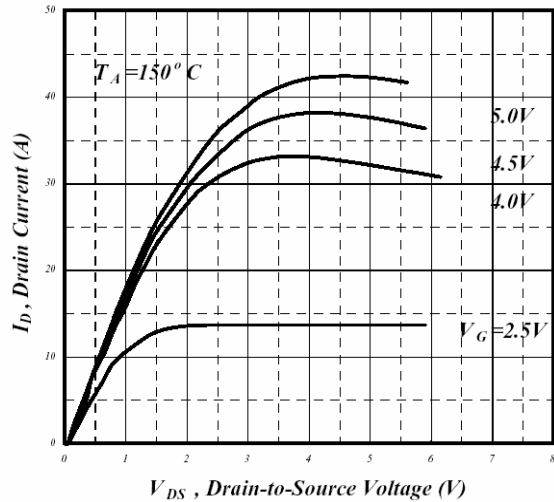


Fig 2. Typical Output Characteristics

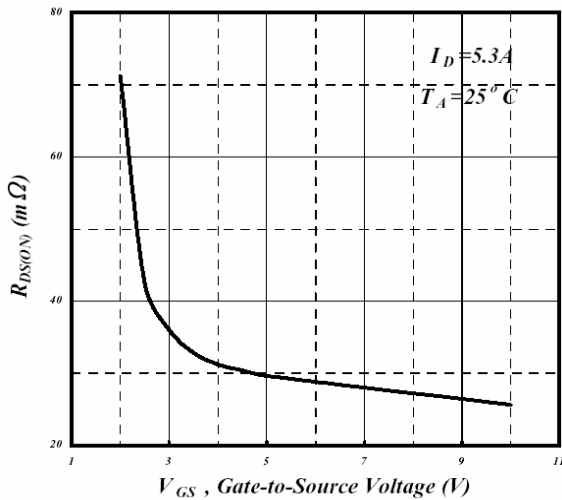


Fig 3. On-Resistance v.s. Gate Voltage

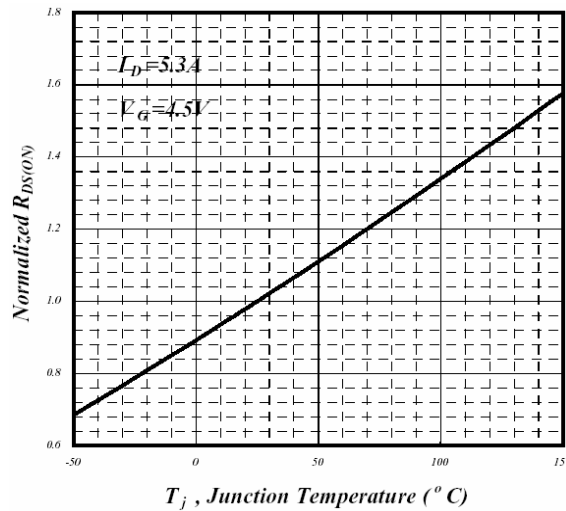


Fig 4. Normalized On-Resistance v.s. Junction Temperature

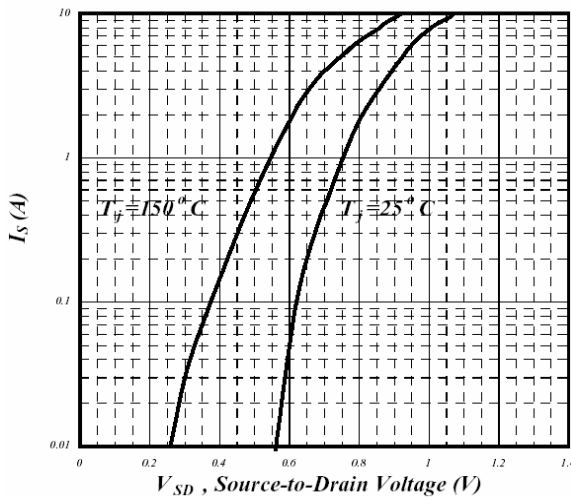


Fig 5. Forward Characteristics of Reverse Diode

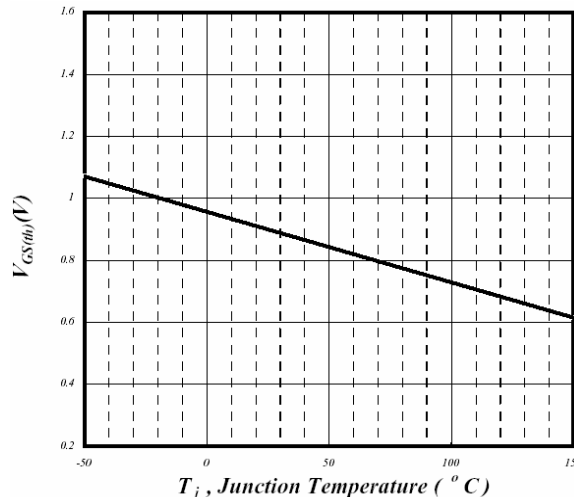


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

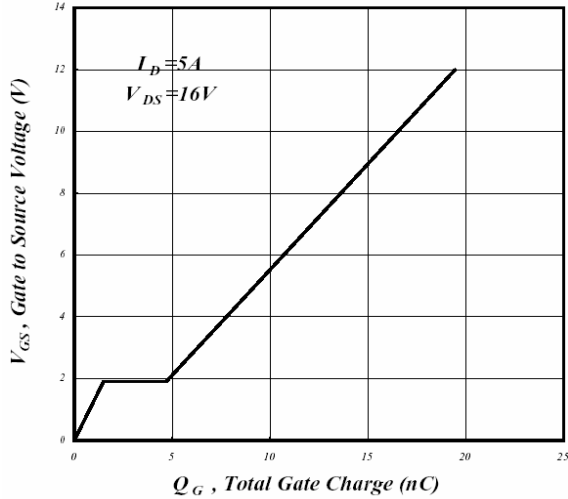


Fig 7. Gate Charge Characteristics

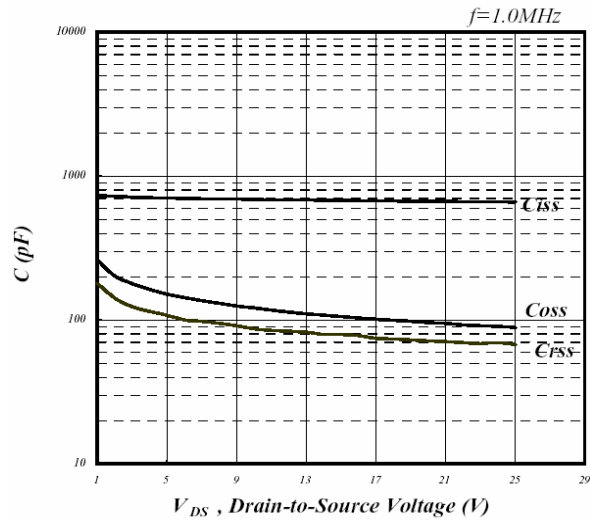


Fig 8. Typical Capacitance Characteristics

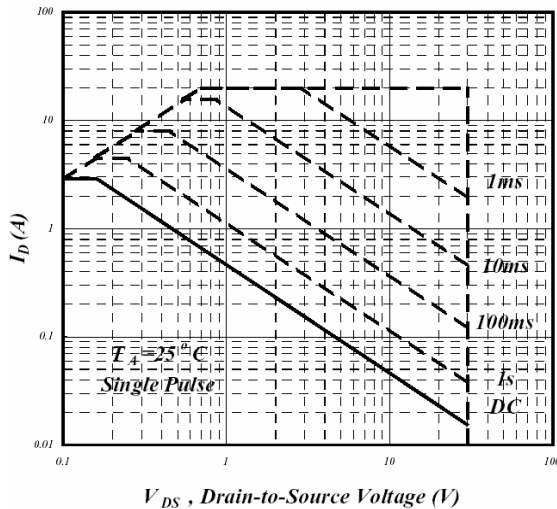


Fig 9. Maximum Safe Operating Area

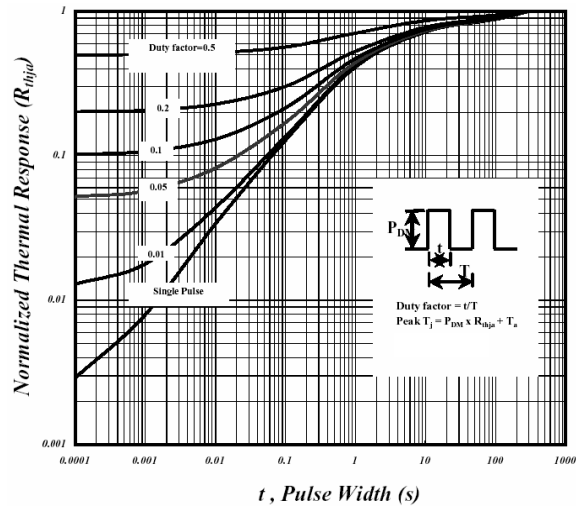


Fig 10. Effective Transient Thermal Impedance

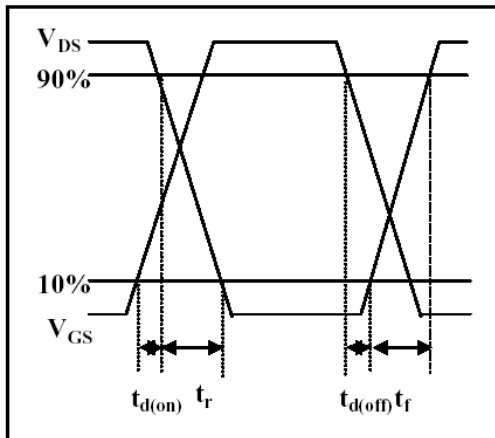


Fig 11. Switching Time Waveform

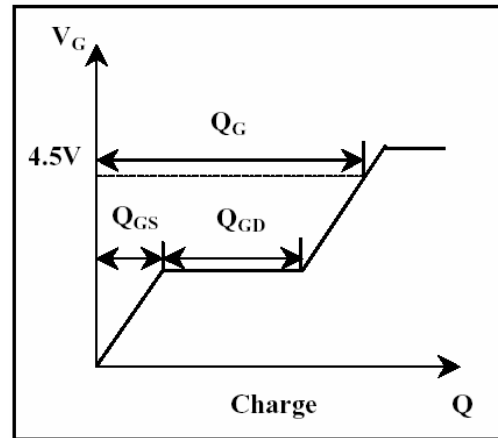


Fig 12. Gate Charge Waveform