

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

## DESCRIPTION

The SGM2310B utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SGM2310B is universally used for all commercial-industrial applications.

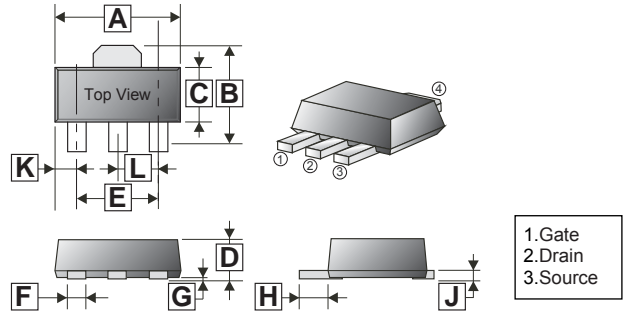
## FEATURES

- Simple Drive Requirement
- Small Package Outline

## MARKING



## SOT-89

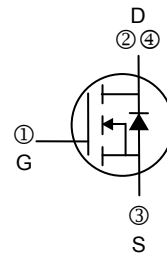


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.60	G	-	-
B	4.05	4.25	H	0.89	1.20
C	2.40	2.60	J	0.35	0.41
D	1.40	1.60	K	0.70	0.80
E	3.00 REF.		L	1.50 REF.	
F	0.40	0.52			

## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-89	3K	7 inch

## TOP VIEW



## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup> , $V_{GS}@10V$	$I_D$	$T_A=25^\circ\text{C}$	2.7
		$T_A=70^\circ\text{C}$	2.2
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	10	A
Power Dissipation <sup>3</sup>	$P_D$	1.25	W
Linear Derating Factor		0.01	$^\circ\text{C} / \text{W}$
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55~150	$^\circ\text{C}$
<b>Thermal Resistance Rating</b>			
Maximum Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	100	$^\circ\text{C} / \text{W}$

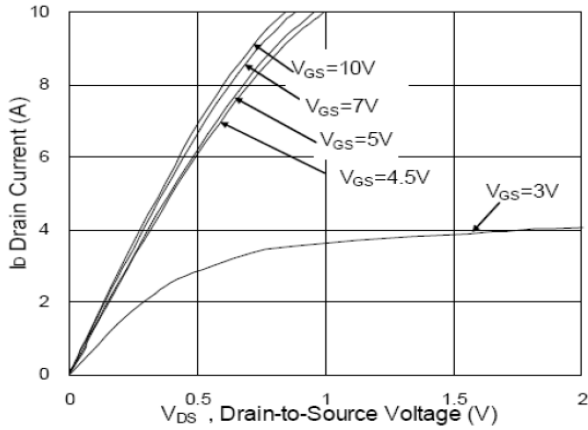
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
<b>Static</b>							
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$	
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	
Forward Transconductance	$g_{fs}$	-	13	-	S	$V_{DS}=5\text{V}, I_D=2\text{A}$	
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20\text{V}$	
Drain-Source Leakage Current	$I_{DSS}$	$T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$	$V_{DS}=48\text{V}, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	5		$V_{DS}=48\text{V}, V_{GS}=0$
Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	-	100	m $\Omega$	$V_{GS}=10\text{V}, I_D=2.5\text{A}$	
		-	-	110		$V_{GS}=4.5\text{V}, I_D=1.5\text{A}$	
Total Gate Charge	$Q_g$	-	5	-	nC	$V_{DS}=48\text{V},$ $V_{GS}=4.5\text{V},$ $I_D=2\text{A}$	
Gate-Source Charge	$Q_{gs}$	-	1.68	-			
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	1.9	-			
Turn-on Delay Time <sup>2</sup>	$T_{d(on)}$	-	1.6	-	nS	$V_{DD}=30\text{V},$ $V_{GS}=10\text{V},$ $R_G=3.3\Omega,$ $I_D=2\text{A}$	
Rise Time	$T_r$	-	7.2	-			
Turn-off Delay Time	$T_{d(off)}$	-	25	-			
Fall Time	$T_f$	-	14.4	-			
Input Capacitance	$C_{iss}$	-	511	-	pF	$V_{GS}=0,$ $V_{DS}=15\text{V},$ $f=1.0\text{MHz}$	
Output Capacitance	$C_{oss}$	-	38	-			
Reverse Transfer Capacitance	$C_{rss}$	-	25	-			
<b>Source-Drain Diode</b>							
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$I_S=1\text{A}, V_{GS}=0$	
Continuous Source Current <sup>1,4</sup>	$I_S$	-	-	2.7	A	$V_G=V_D=0, \text{Force Current}$	
Pulsed Source Current <sup>2,4</sup>	$I_{SM}$	-	-	10			
Reverse Recovery Time	$T_{RR}$	-	9.7	-	nS	$I_S=2\text{A}, di/dt=100\text{A}/\mu\text{s}$	
Reverse Recovery Charge	$Q_{RR}$	-	5.8	-	nC	$V_{GS}=0$	

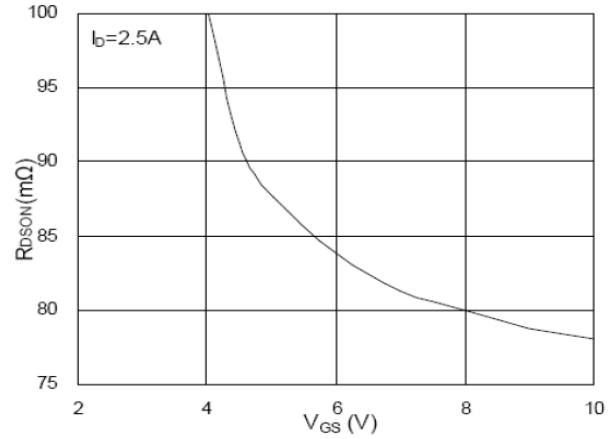
Notes:

- Surface mounted on FR4 board ,  $t \leq 10\text{sec}$ .
- The data tested by pulsed , pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$
- The power dissipation is limited by  $150^\circ\text{C}$  junction temperature
- The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation

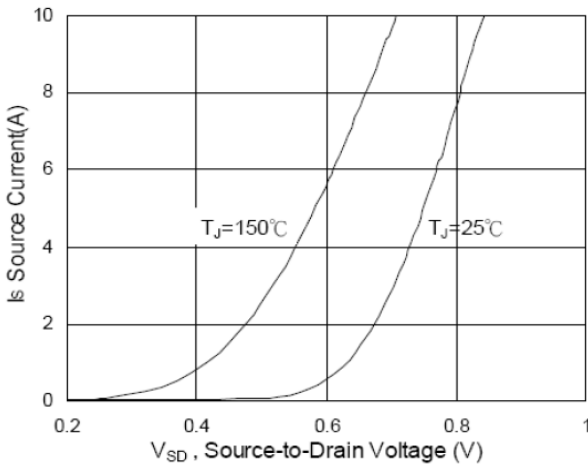
**CHARACTERISTIC CURVES**



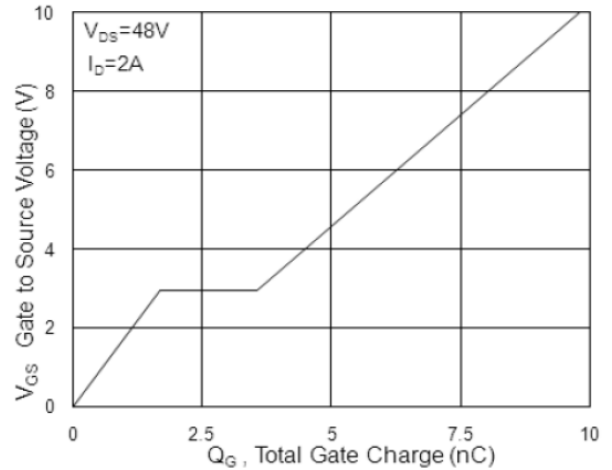
**Fig.1 Typical Output Characteristics**



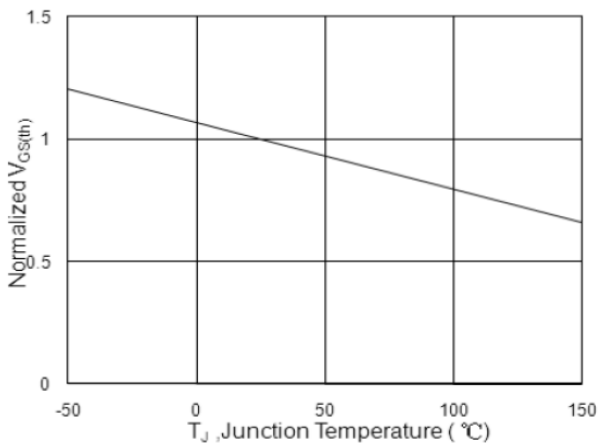
**Fig.2 On-Resistance v.s Gate-Source**



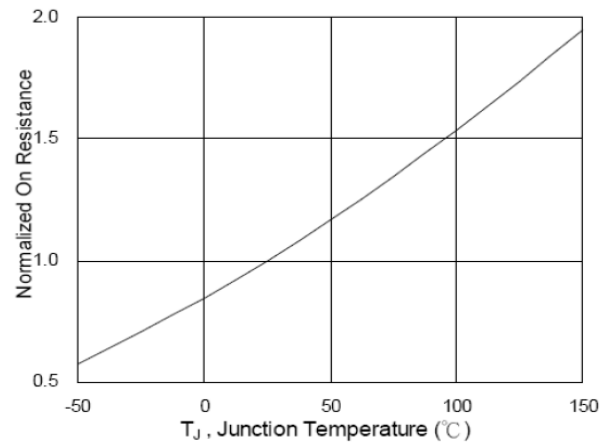
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate-Charge Characteristics**

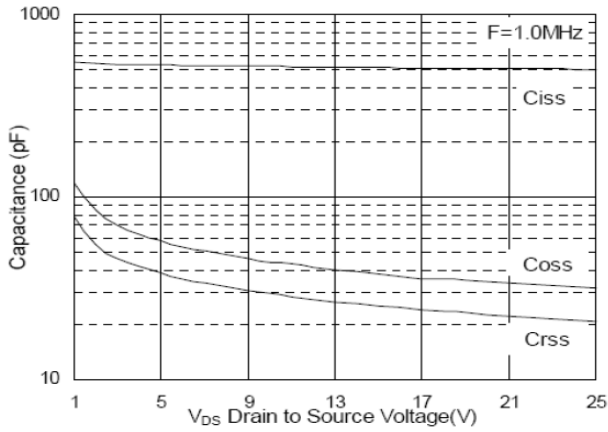


**Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$**

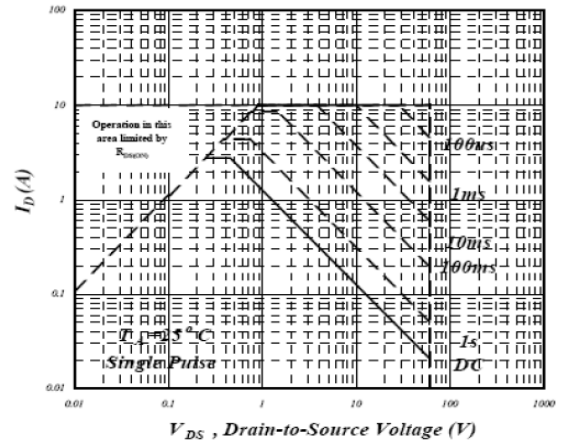


**Fig.6 Normalized  $R_{DS(ON)}$  v.s  $T_J$**

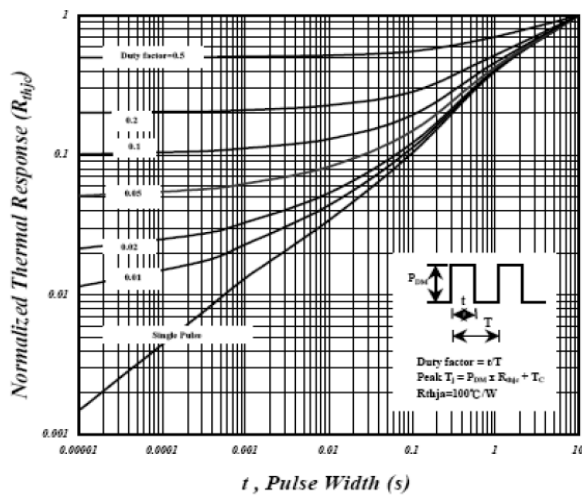
**CHARACTERISTIC CURVES**



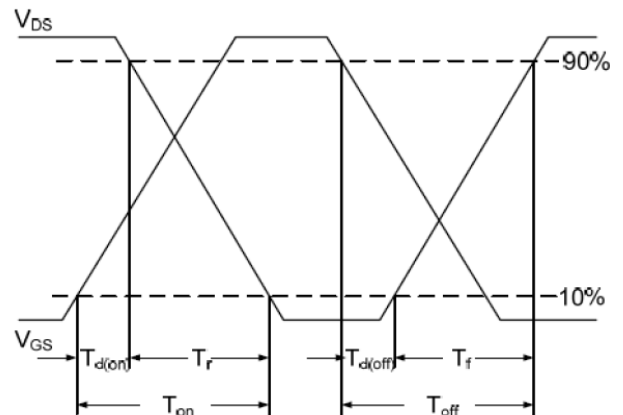
**Fig.7 Capacitance**



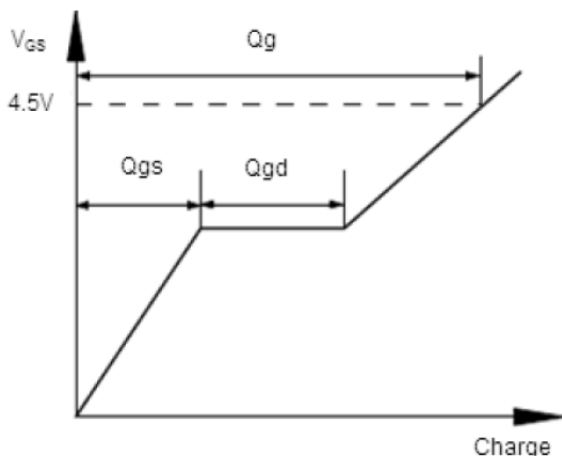
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



**Fig.11 Gate Charge Waveform**