

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

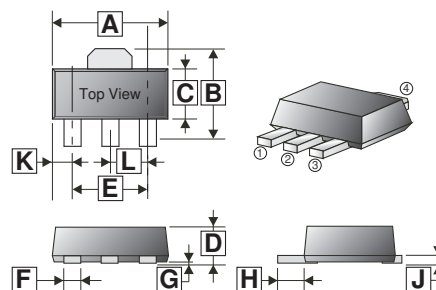
**SOT-89**

## DESCRIPTION

The SGM2310A utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SGM2310A is universally used for all commercial-industrial applications.

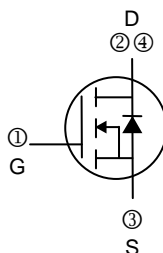
## FEATURES

- Simple drive requirement
- Super high density cell design for extremely low  $R_{DS(ON)}$



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			

## MARKING



## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>3</sup>	$I_D @ T_A = 25^\circ\text{C}$	5.0	A
Continuous Drain Current <sup>3</sup>	$I_D @ T_A = 70^\circ\text{C}$	4.0	A
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	10	A
Power Dissipation	$P_D @ T_A = 25^\circ\text{C}$	1.5	W
Linear Derating Factor		0.01	W / $^\circ\text{C}$
Operating Junction & Storage Temperature	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$

## THERMAL DATA

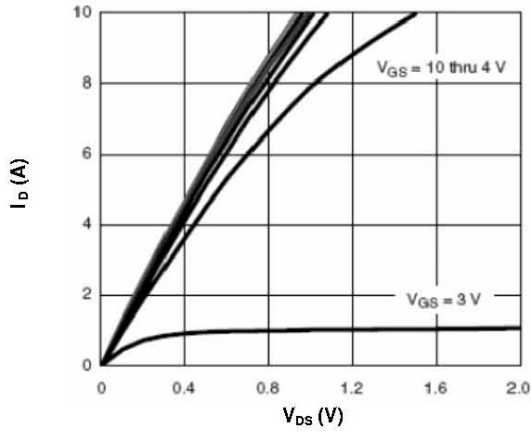
PARAMETER	SYMBOL	VALUE	UNIT
Thermal Resistance Junction-Ambient <sup>3</sup> (Max).	$R_{\theta JA}$	83.3	$^\circ\text{C} / \text{W}$

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

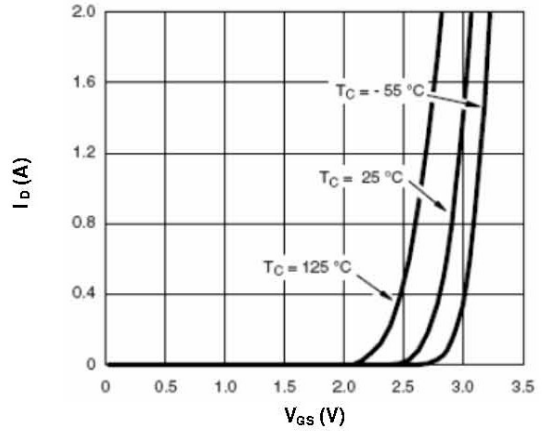
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	-	-	V	$V_{GS} = 0, I_D = 250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.5	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Forward Transconductance	$g_{fs}$	-	12	-	S	$V_{DS} = 15\text{V}, I_D = 4\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}$
Drain-Source Leakage Current ( $T_J=25^\circ\text{C}$ )	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS} = 60\text{V}, V_{GS} = 0$
Drain-Source Leakage Current ( $T_J=70^\circ\text{C}$ )		-	-	10		$V_{DS} = 60\text{V}, V_{GS} = 0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	115	m $\Omega$	$V_{GS}=10\text{V}, I_D=5.0\text{A}$
		-	-	125		$V_{GS}=4.5\text{V}, I_D=4.5\text{A}$
Total Gate Charge <sup>2</sup>	$Q_g$	-	4.0	-	nC	$I_D = 4\text{A}$
Gate-Source Charge	$Q_{gs}$	-	1.2	-		$V_{DS} = 30\text{V}$
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	1.0	-		$V_{GS} = 4.5\text{V}$
Turn-on Delay Time <sup>2</sup>	$T_{d(on)}$	-	6	-	nS	$V_{DD} = 30\text{V}$
Rise Time	$T_r$	-	12	-		$I_D = 2.5\text{A}$
Turn-off Delay Time	$T_{d(off)}$	-	18	-		$V_{GS} = 10\text{V}$
Fall Time	$T_f$	-	10	-		$R_G = 6\Omega, R_L = 12\Omega$
Input Capacitance	$C_{iss}$	-	320	-	pF	$V_{GS} = 0\text{V}$
Output Capacitance	$C_{oss}$	-	42	-		$V_{DS} = 30\text{V}$
Reverse Transfer Capacitance	$C_{rss}$	-	20	-		$f = 1.0\text{MHz}$
<b>SOURCE-DRAIN DIODE</b>						
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$I_S=2.5\text{A}, V_{GS}=0\text{V}$

- Notes:
1. Pulse width limited by Max. junction temperature.
  2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
  3. Surface mounted on FR4 board,  $t \leq 10\text{sec}$ .

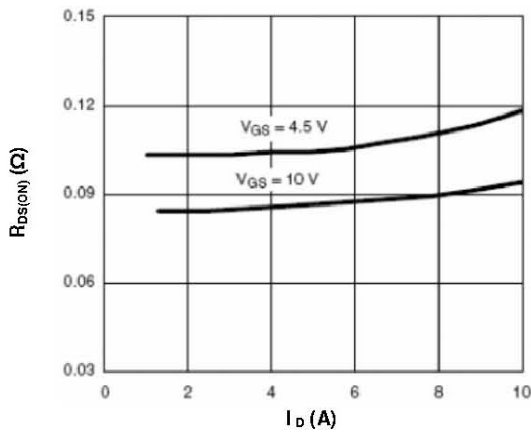
**CHARACTERISTIC CURVES**



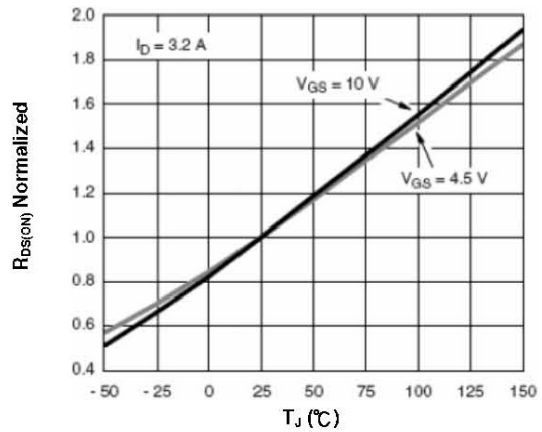
**Fig 1. Typical Output Characteristics**



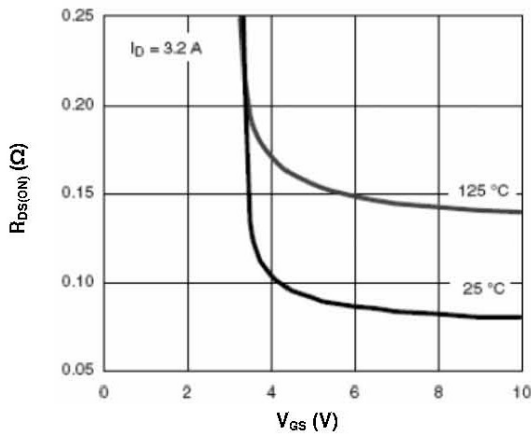
**Fig 2. Transfer Characteristics**



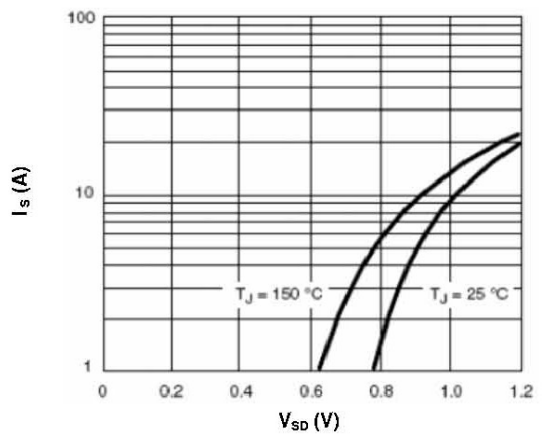
**Fig 3. On-Resistance vs. Drain Current and Gate Voltage**



**Fig 4. On-Resistance vs. Junction Temperature**



**Fig 5. On-Resistance vs. Gate-Source Voltage**



**Fig 6. Body Diode Characteristics**

**CHARACTERISTIC CURVES**

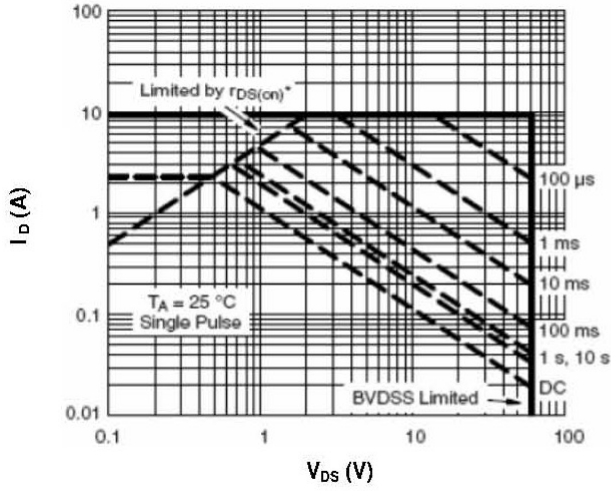


Fig 7. Maximum Safe Operating Area

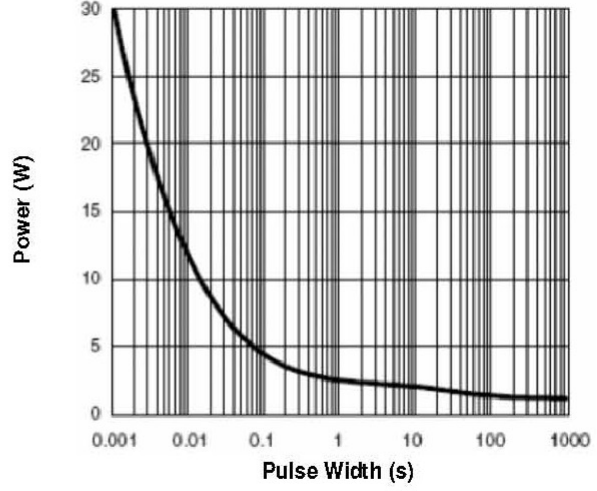


Fig 8. Single Pulse Maximum Power Dissipation

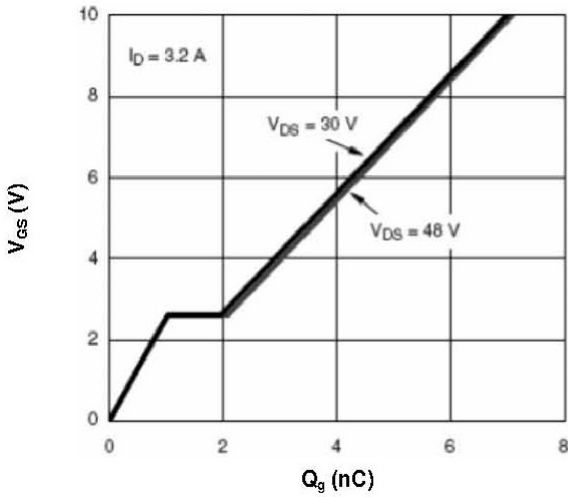


Fig 9. Gate Charge Characteristics

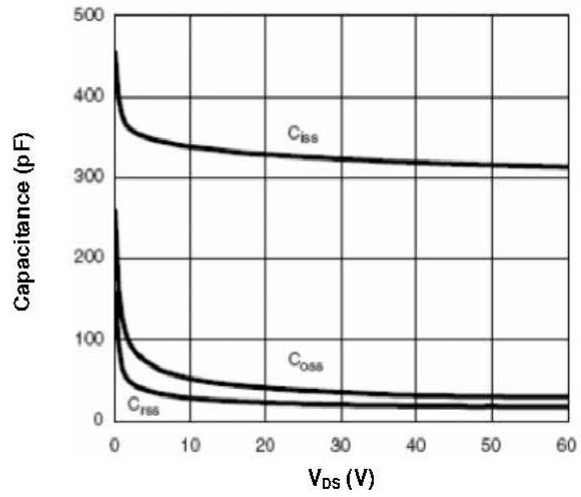


Fig 10. Typical Capacitance Characteristics

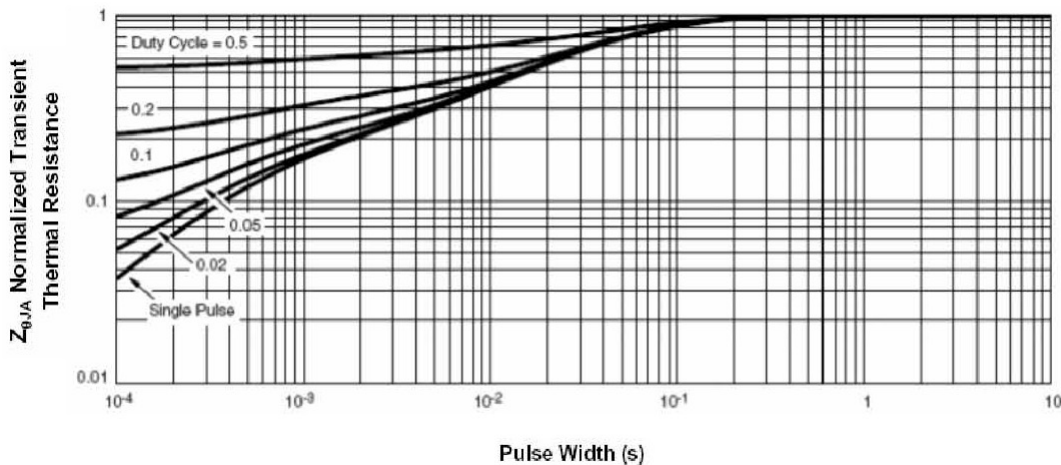


Fig 11. Normalized Maximum Transient Thermal Impedance