

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

DESCRIPTION

The SGM0410 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The SOT-89 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- Lower Gate Charge
- Simple Drive Requirement
- Fast Switching Characteristic

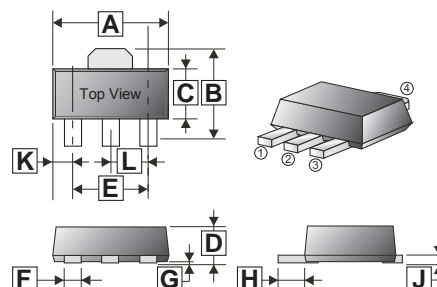
MARKING



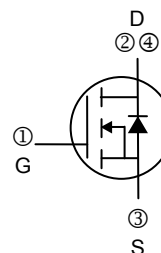
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-89	1K	7 inch

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			



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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V_{DS}	100	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current ³ @	I_D	$V_{GS}=5V, T_A=25^\circ\text{C}$	3.5	A
		$V_{GS}=5V, T_A=70^\circ\text{C}$	2.2	A
Pulsed Drain Current ^{1,2}	I_{DM}	10	A	
Power Dissipation	P_D	2	W	
Linear Derating Factor		0.016	W / $^\circ\text{C}$	
Operating Junction & Storage Temperature	T_J, T_{STG}	-55~150	$^\circ\text{C}$	
Thermal Resistance Rating				
Thermal Resistance Junction-Ambient ³ (Max).	$R_{\theta JA}$	62.5	$^\circ\text{C} / \text{W}$	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	100	-	-	V	$V_{GS}=0, I_D=1\text{mA}$
Gate Threshold Voltage	$V_{GS(th)}$	1	-	2	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Forward Transconductance	g_{fs}	-	4	-	S	$V_{DS}=10\text{V}, I_D=2.5\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20\text{V}$
Drain-Source Leakage Current	I_{DSS}	-	-	10	μA	$V_{DS}=100\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	170	m Ω	$V_{GS}=10\text{V}, I_D=2.6\text{A}$
		-	-	200		$V_{GS}=5\text{V}, I_D=1.7\text{A}$
Total Gate Charge ²	Q_g	-	11.2	-	nC	$I_D=3.5\text{A}$ $V_{DS}=80\text{V}$ $V_{GS}=5\text{V}$
Gate-Source Charge	Q_{gs}	-	4.4	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	3	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	9	-	nS	$V_{DD}=30\text{V}$ $I_D=1\text{A}$ $V_{GS}=10\text{V}$ $R_G=6\Omega$ $R_D=30\Omega$
Rise Time	T_r	-	9.4	-		
Turn-off Delay Time	$T_{d(off)}$	-	26.8	-		
Fall Time	T_f	-	2.6	-		
Input Capacitance	C_{iss}	-	975	-	pF	$V_{GS}=0$ $V_{DS}=25\text{V}$ $f=1.0\text{ MHz}$
Output Capacitance	C_{oss}	-	38	-		
Reverse Transfer Capacitance	C_{rss}	-	27	-		
Source-Drain Diode						
Forward On Voltage ²	V_{SD}	-	-	1.5	V	$I_S=3.5\text{A}, V_{GS}=0$

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test.
3. Surface mounted on 1 in² copper pad of FR4 board; 135°C /w when mounted on Min. copper pad.

CHARACTERISTIC CURVES

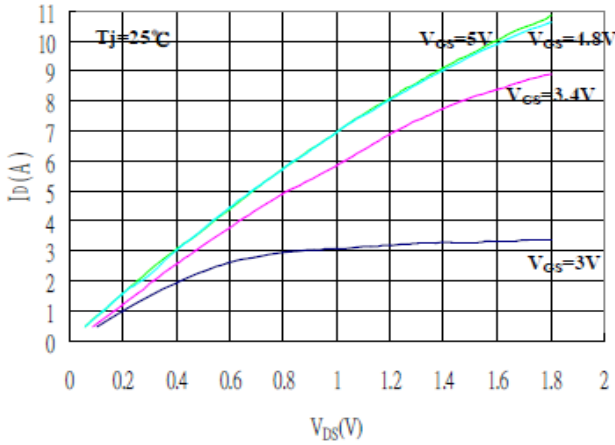


Fig 1. Typical Output Characteristics

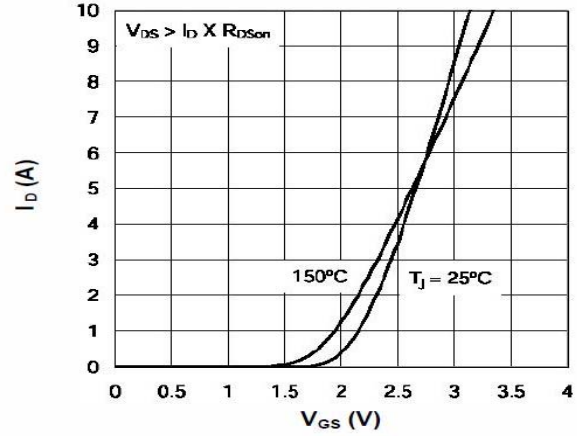


Fig 2. Transfer Characteristics

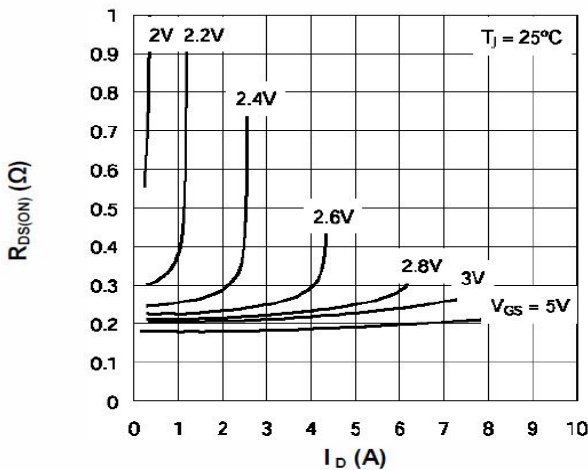


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

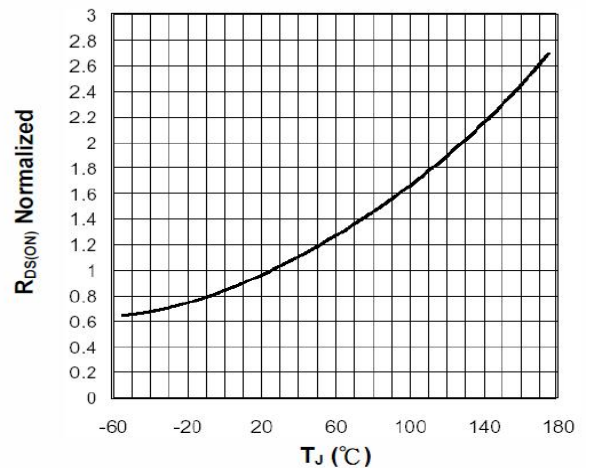


Fig 4. On-Resistance vs. Junction Temperature

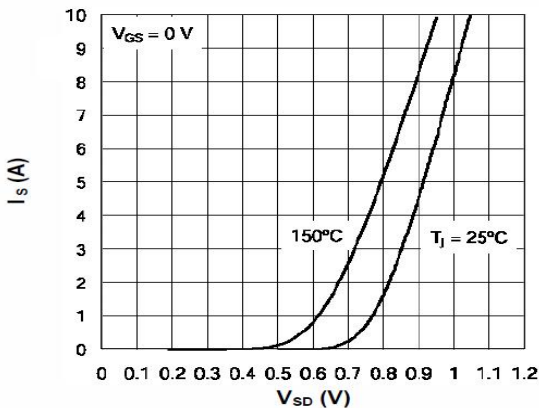


Fig 5. Body Diode Characteristics

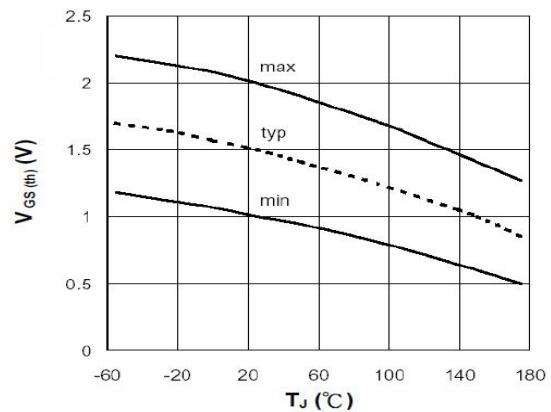


Fig 6. Gate-Source Threshold Voltage vs. Junction Temperature

CHARACTERISTIC CURVES

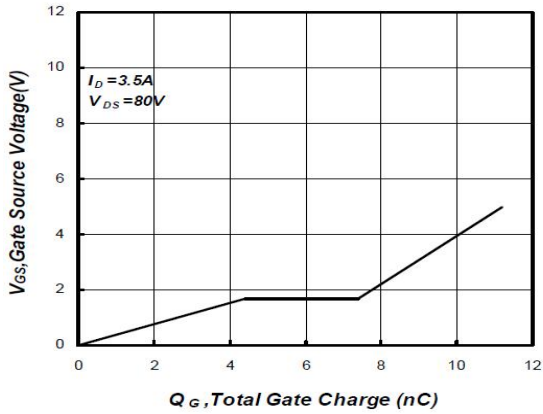


Fig 7. Gate Charge Characteristics

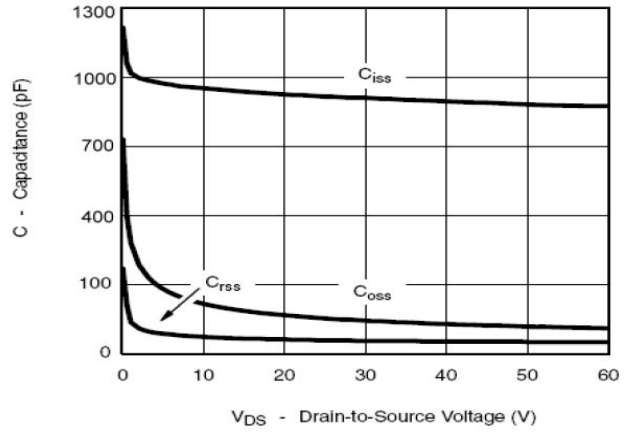


Fig 8. Typical Capacitance Characteristics

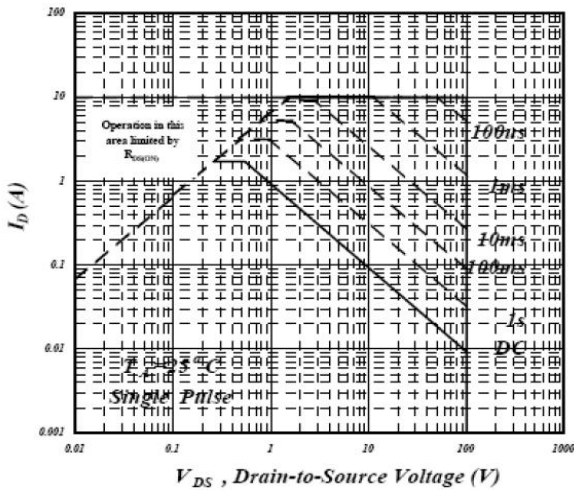


Fig 9. Maximum Safe Operating Area

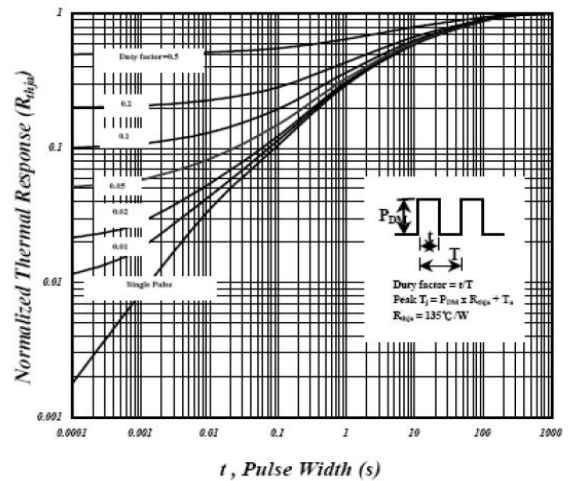


Fig 10. Effective Transient Thermal Impedance

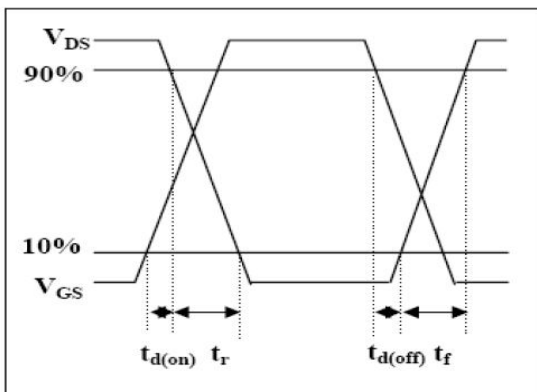


Fig 11. Switching Time Waveform

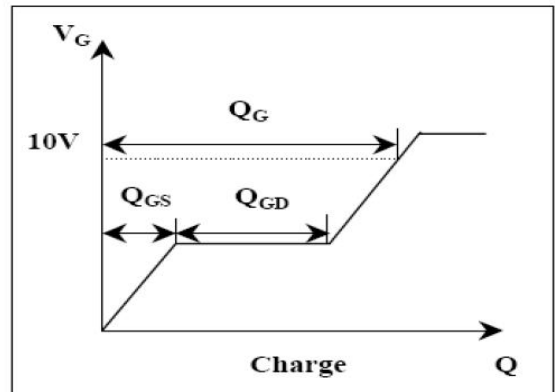


Fig 12. Gate Charge Waveform