Elektronische Bauelemente

SGM6014-C

5A, 60V, $R_{DS(ON)}$ 50mΩ

N-Channel Enhancement Mode Power MOSFET

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

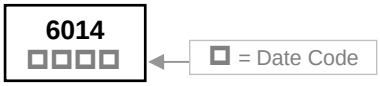
The SGM6014-C is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SGM6014-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

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

MARKING



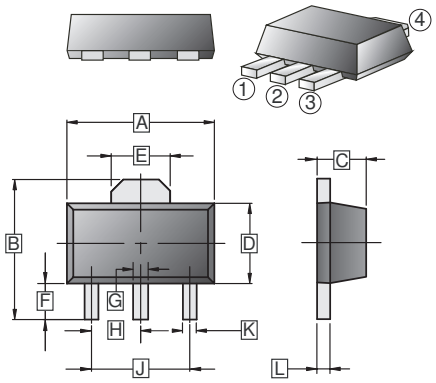
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-89	1K	7 inch

ORDER INFORMATION

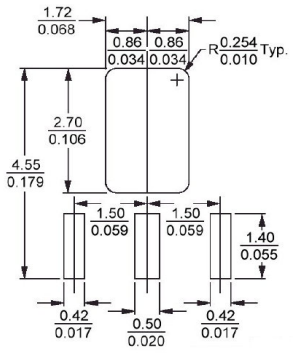
Part Number	Type
SGM6014-C	Lead (Pb)-free and Halogen-free

SOT-89

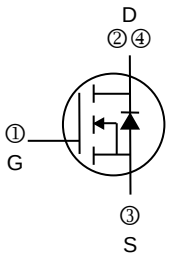


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.60	G	0.40	0.58
B	3.94	4.25	H	1.50 TYP.	
C	1.40	1.60	J	3.00 TYP.	
D	2.25	2.60	K	0.32	0.52
E	1.55 TYP.		L	0.35	0.44
F	0.89	1.20			

Mounting Pad Layout



*Dimensions in millimeters



ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_A=25℃	I_D	5	A
	T_A=70℃		3.5	A
Pulsed Drain Current [2]		I_{DM}	20	A
Power Dissipation [3]	T_A=25℃	P_D	2	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Thermal Resistance Rating				
Maximum Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62.5	℃/W

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	60	-	-	V	V_{GS}=0, I_D= 250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transconductance		g_{fs}	-	28.3	-	S	V_{DS}=5V, I_D=4A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V, V_{DS}=0
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	1	μA	V_{DS}=48V, V_{GS}=0
	T_J=55℃		-	-	5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	40	50	mΩ	V_{GS}=10V, I_D=4A
			-	45	60		V_{GS}=4.5V, I_D=3A
Total Gate Charge		Q_g	-	19	-	nC	I_D=4A V_{DS}=48V V_{GS}=10V
Gate-Source Charge		Q_{gs}	-	2.6	-		
Gate-Drain Change		Q_{gd}	-	4.1	-		
Turn-on Delay Time [2]		$T_{d(on)}$	-	3	-	nS	V_{DD}=30V I_D=4A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	34	-		
Turn-off Delay Time		$T_{d(off)}$	-	23	-		
Fall Time		T_f	-	6	-		
Input Capacitance		C_{iss}	-	1027	-	pF	V_{GS}=0 V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	65	-		
Reverse Transfer Capacitance		C_{rss}	-	46	-		
Source-Drain Diode							
Diode Forward Voltage [2]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0, T_J=25℃
Continuous Source Current [1,4]		I_S	-	-	5	A	V_D=V_G=0, Force Current
Reverse Recovery Time		T_{rr}	-	12.1	-	nS	I_F=4A, dI/dt=100A/μs, T_J=25℃
Reverse Recovery Charge		Q_{rr}	-	6.7	-	nC	

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width≦ 300μs, duty cycle≦ 2%.
3. The power dissipation is limited by 150℃, junct ion temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

CHARACTERISTIC CURVES

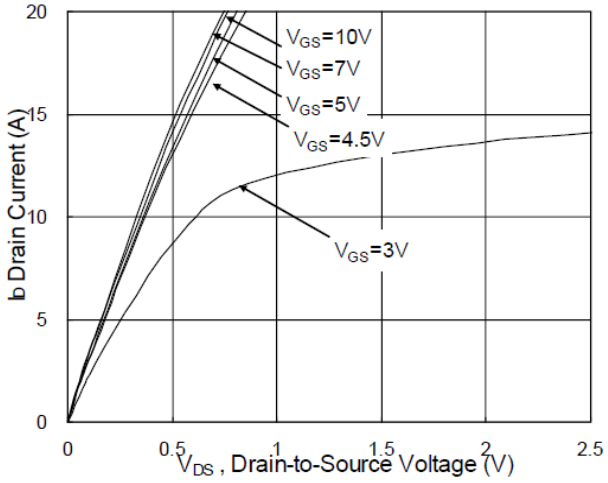


Fig.1 Typical Output Characteristics

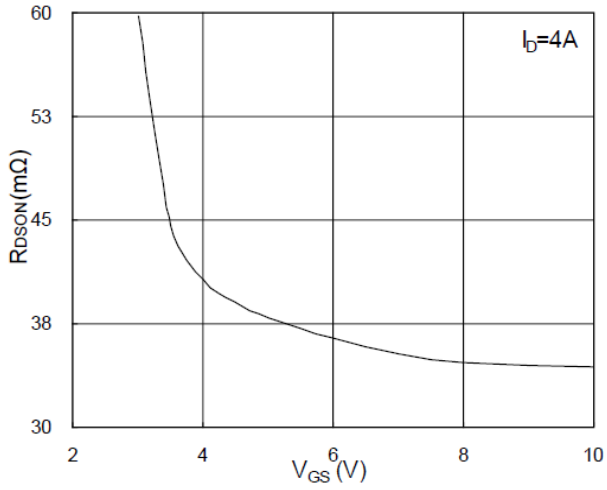


Fig.2 On-Resistance vs G-S Voltage

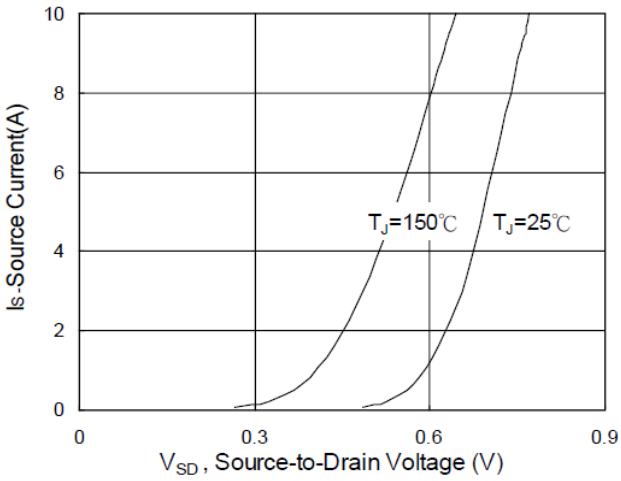


Fig.3 Source Drain Forward Characteristics

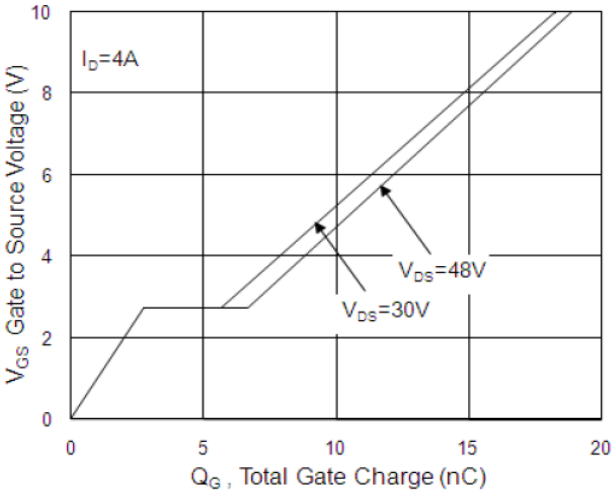


Fig.4 Gate-Charge Characteristics

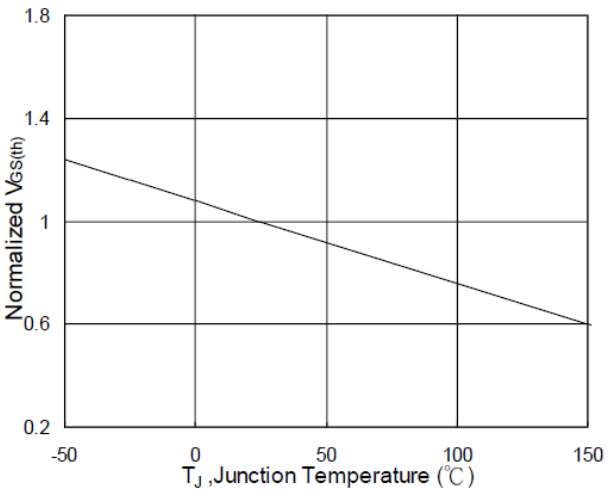


Fig.5 Normalized $V_{GS(th)}$ vs T_J

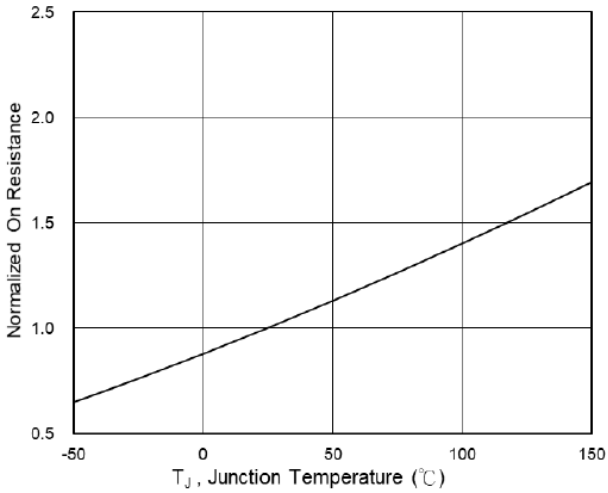


Fig.6 Normalized R_{DSON} vs T_J

CHARACTERISTIC CURVES

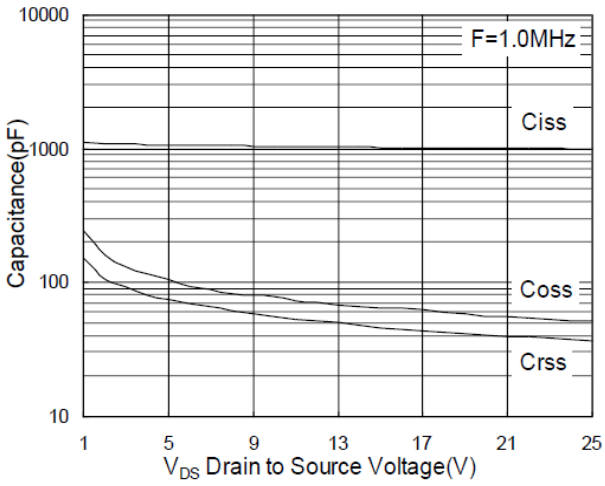


Fig.7 Capacitance

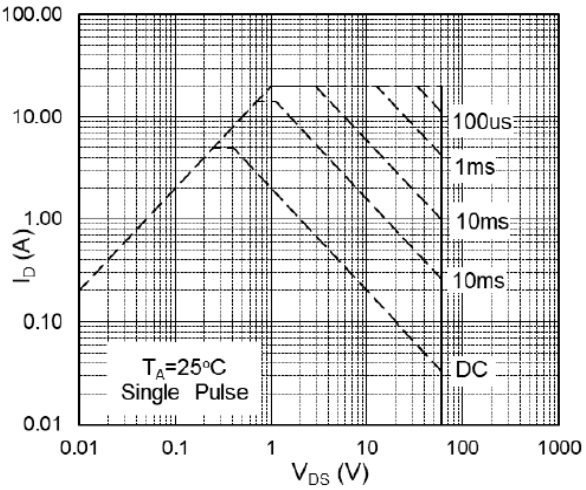


Fig.8 Safe Operating Area

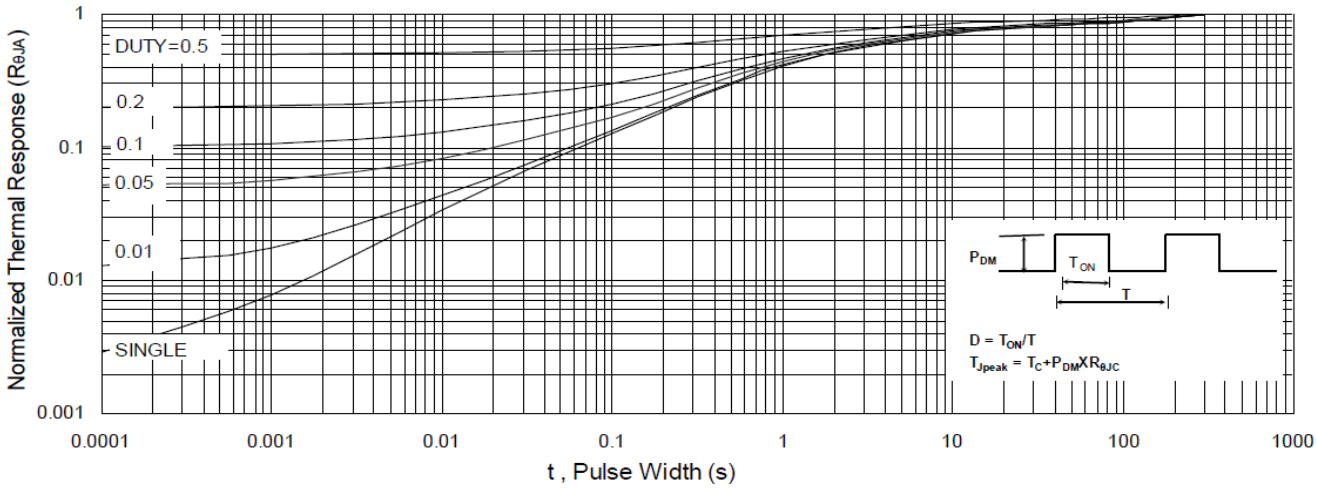


Fig.9 Normalized Maximum Transient Thermal Impedance

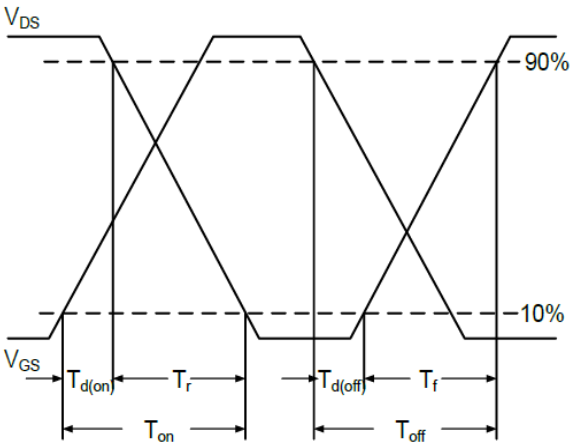


Fig.10 Switching Time Waveform

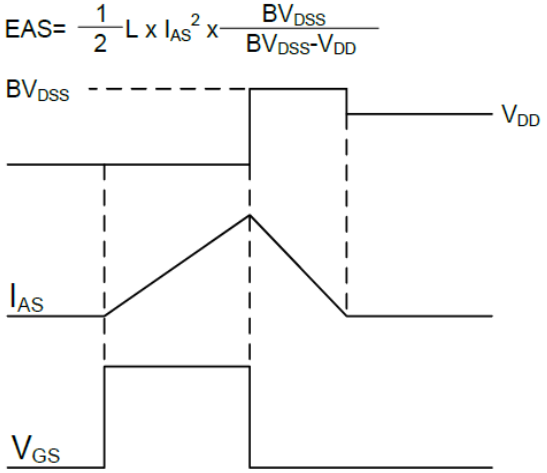


Fig.11 Unclamped Inductive Switching Waveform