

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

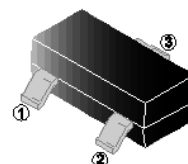
FEATURES

- High Power and Current Handling Capability
- Fast Switching

SOT-23

APPLICATION

- PWM Applications
- Load Switch
- Power Management

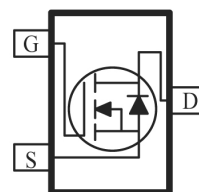


MARKING

A09T

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch



ORDER INFORMATION

Part Number	Type
SMS5A8N03-C	Lead (Pb)-free and Halogen-free

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	5.8	A
Pulsed Drain Current ¹	I_{DM}	30	A
Power Dissipation	P_D	1.4	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	89	$^\circ\text{C/W}$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30	33	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate-Threshold Voltage ²	$V_{GS(th)}$	0.7	0.9	1.4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 12V, V_{DS}=0V$
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	$V_{DS}=24V, V_{GS}=0V$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	28	41	m Ω	$V_{GS}=10V, I_D=5.8A$
		-	31	45		$V_{GS}=4.5V, I_D=5A$
		-	45	59		$V_{GS}=2.5V, I_D=4A$
Forward Transconductance ²	g_{fs}	-	10	-	S	$V_{DS}=5V, I_D=5A$
Total Gate Charge	Q_g	-	9.5	-	nC	$V_{GS}=4.5V$ $V_{DS}=15V$ $I_D=5.8A$
Gate-Source Charge	Q_{gs}	-	1.5	-		
Gate-Drain Charge	Q_{gd}	-	3	-		
Turn-on Delay Time	$T_{d(on)}$	-	3.3	-	nS	$V_{DD}=15V$ $V_{GS}=10V$ $R_L=2.7\Omega$ $R_G=3\Omega$
Rise Time	T_r	-	4.8	-		
Turn-off Delay Time	$T_{d(off)}$	-	26	-		
Fall Time	T_f	-	4	-		
Input Capacitance	C_{iss}	-	820	-	pF	$V_{GS}=0V$ $V_{DS}=15V$ $f=1MHz$
Output Capacitance	C_{oss}	-	99	-		
Reverse Transfer Capacitance	C_{rss}	-	77	-		
Source-Drain Diode						
Continuous Source Current	I_S	-	-	5.8	A	
Diode Forward Voltage ²	V_{SD}	-	-	1.2	V	$I_S=5.8A, V_{GS}=0V$

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

CHARACTERISTIC CURVES

Fig 1: Power Dissipation

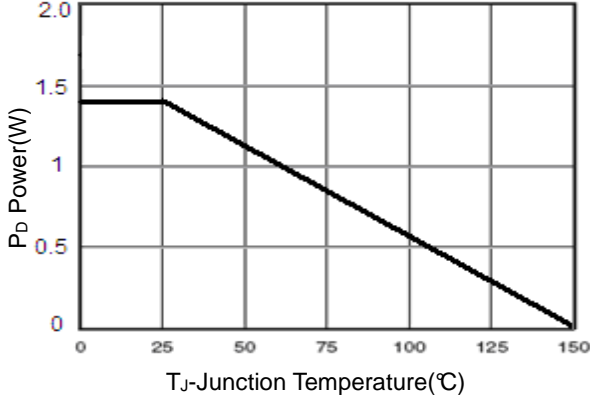


Fig 2: Drain Current

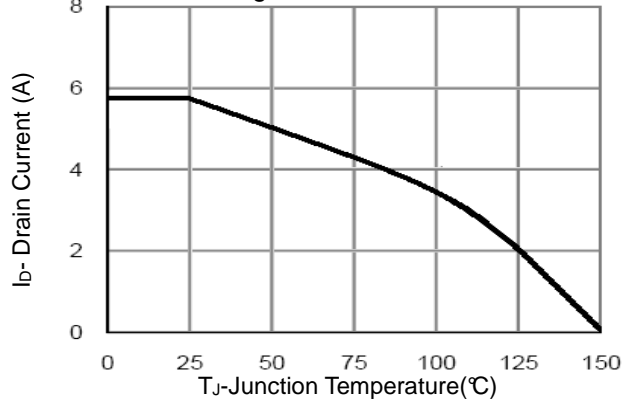


Fig 3: Output Characteristics

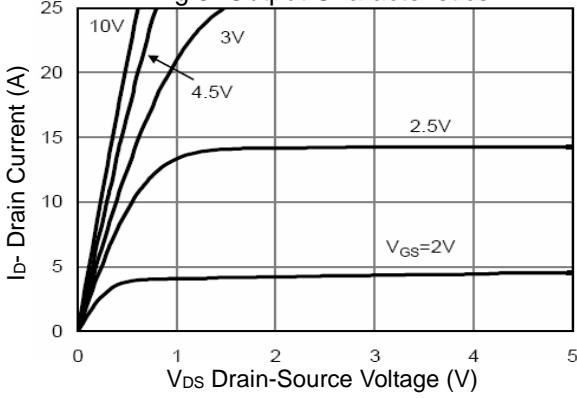


Fig 4: Drain-Source On-Resistance

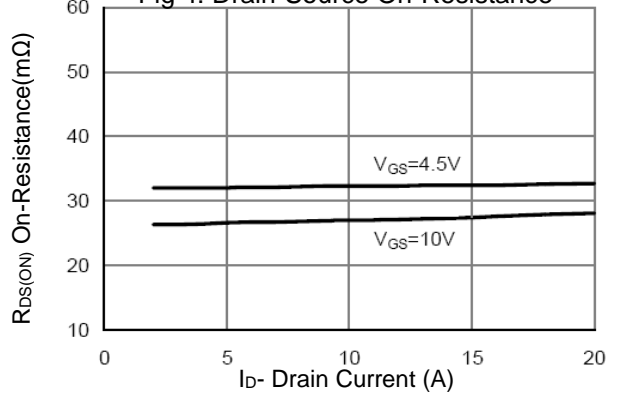


Fig 5: Transfer Characteristics

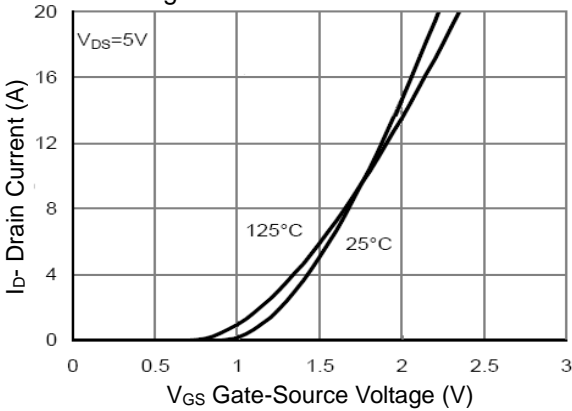


Fig 6: Drain-Source On-Resistance

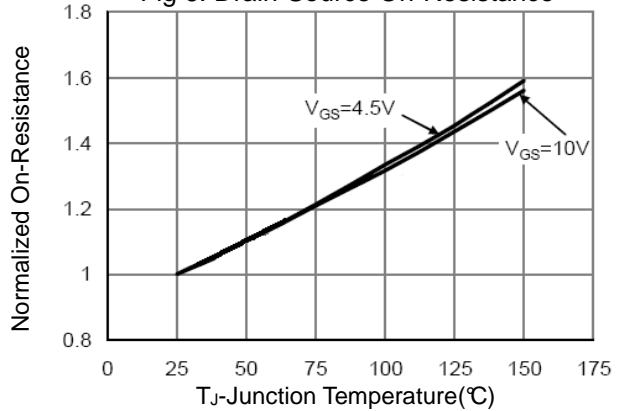


Fig 7: R_{DS(ON)} vs V_{GS}

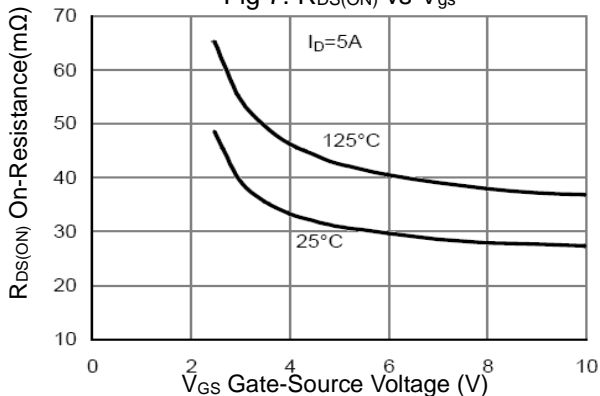
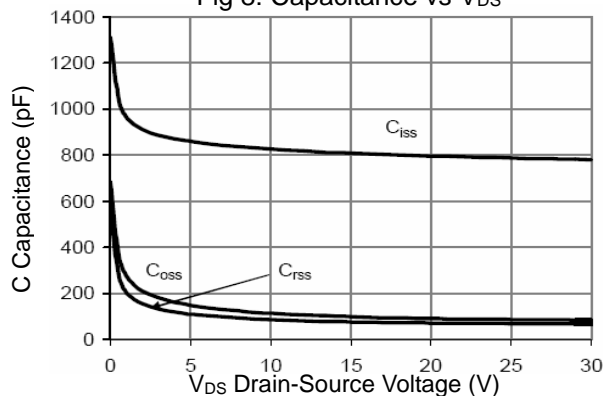


Fig 8: Capacitance vs V_{DS}



CHARACTERISTIC CURVES

Fig 9: Gate Charge

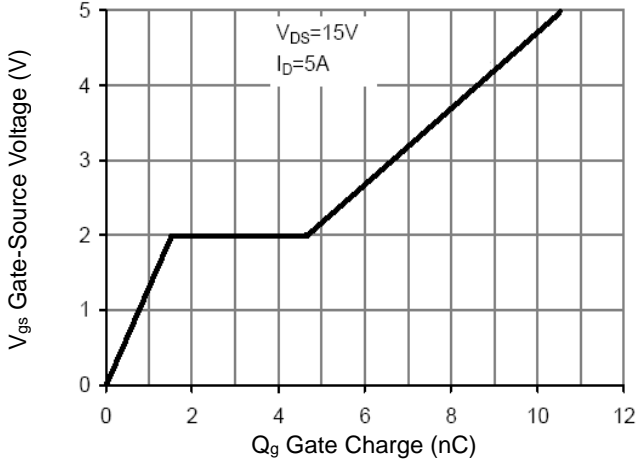


Fig 10: Source- Drain Diode Forward

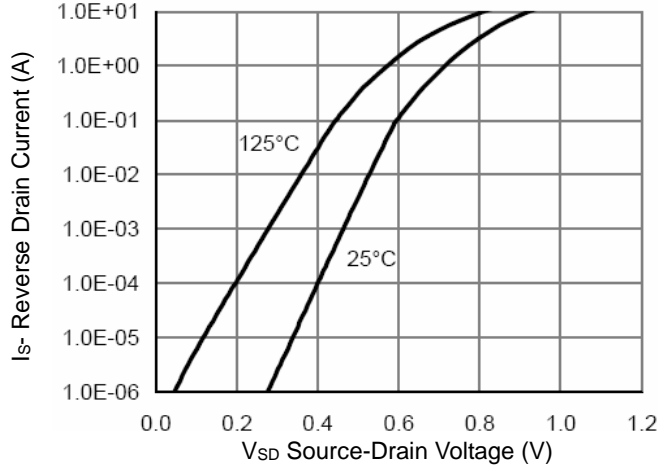


Fig 11: Safe Operation Area

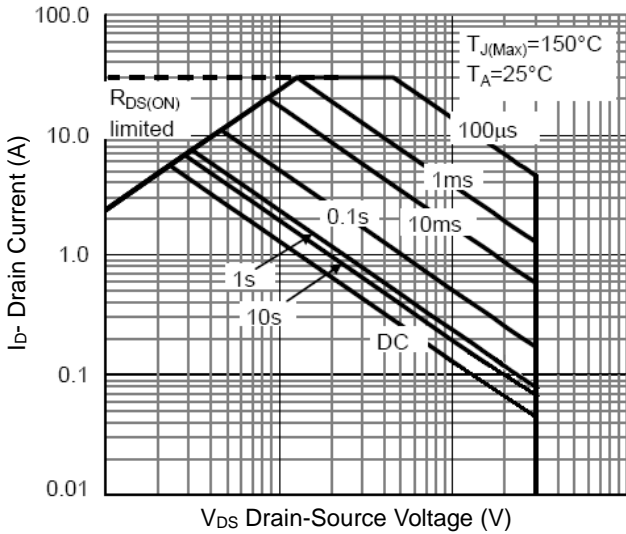


Fig 12: Switching Waveforms

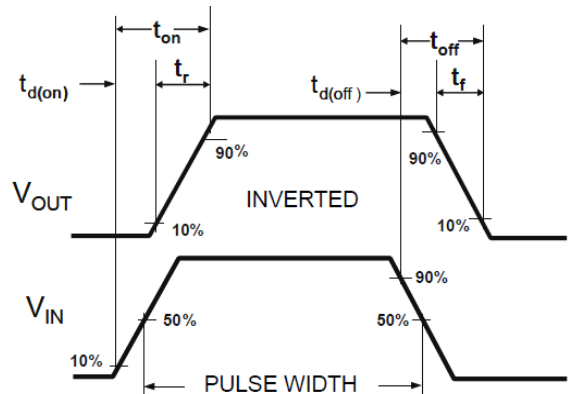
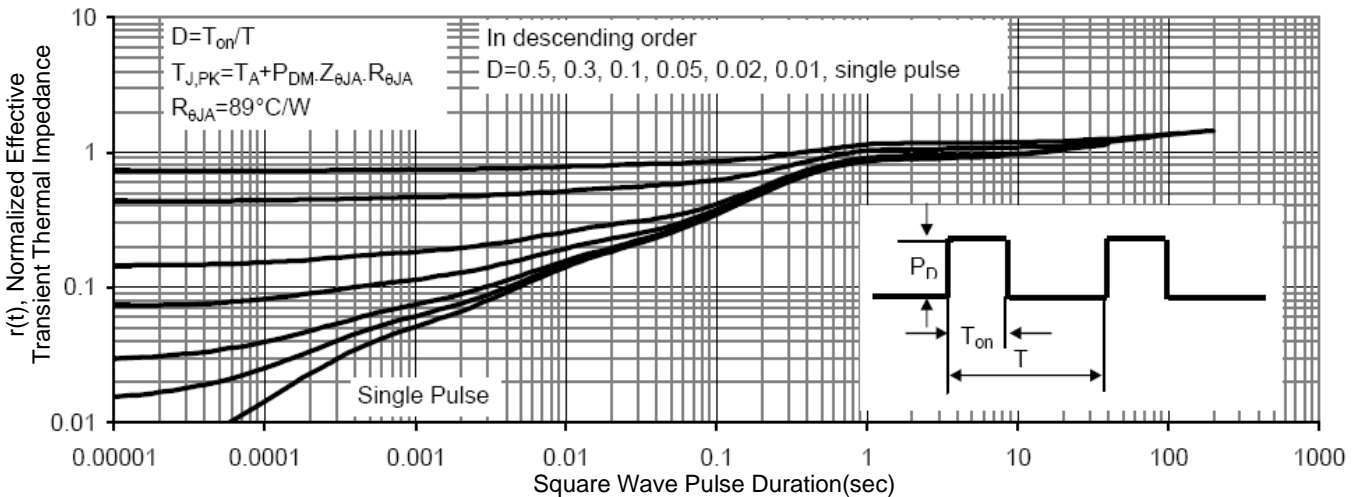
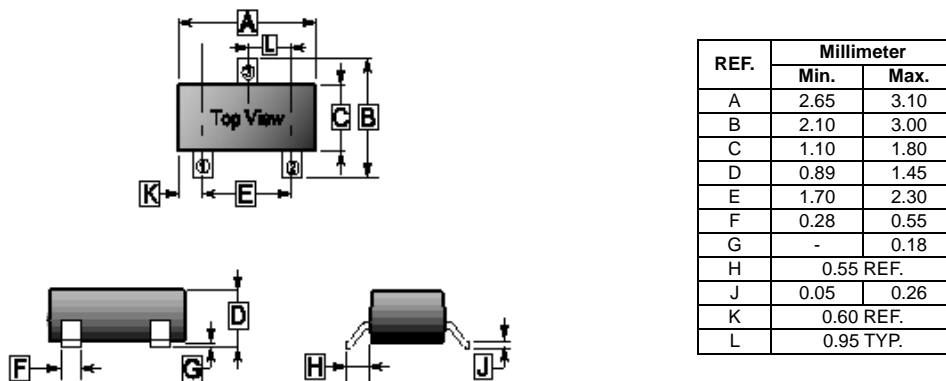


Fig 13: Normalized Maximum Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

SOT-23



MOUNTING PAD LAYOUT

SOT-23

