

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

DESCRIPTION

The SMS3024A-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 small power switching and load switch applications.

The SMS3024A-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available

MARKING

3024A

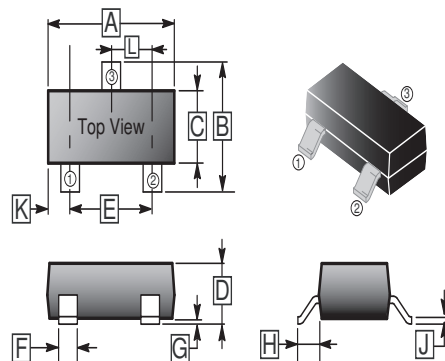
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

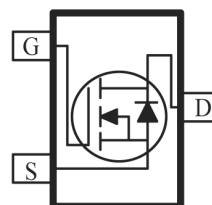
ORDER INFORMATION

Part Number	Type
SMS3024A-C	Lead (Pb)-free and Halogen-free

SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.80	3.00	G	0	0.10
B	2.25	2.55	H	0.55	REF
C	1.20	1.40	J	0.80	0.15
D	0.90	1.15	K	0.6	REF.
E	1.80	2.0	L	0.95	TYP
F	0.30	0.50			



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}	± 20	V
Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$	I_D	$T_A=25^\circ\text{C}$	4.5
		$T_A=70^\circ\text{C}$	3.6
Pulsed Drain Current ³	I_{DM}	30	A
Total Power Dissipation	P_D	1	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	$t \leq 5\text{sec}, 125$	$^\circ\text{C} / \text{W}$
		Steady State, 250	
Thermal Resistance Junction-Ambient ²		313	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V$	
Drain-Source Leakage Current	I_{DSS}	$T_J=25^\circ\text{C}$	-	-	1	μA	$V_{DS}=24V, V_{GS}=0V$
		$T_J=55^\circ\text{C}$	-	-	5		$V_{DS}=24V, V_{GS}=0V$
Static Drain-Source On-Resistance ⁴	$R_{DS(ON)}$	-	-	30	m Ω	$V_{GS}=10V, I_D=4.5A$	
		-	-	42		$V_{GS}=4.5V, I_D=4A$	
Forward Transconductance	g_{fs}	-	5	-	S	$V_{DS}=5V, I_D=4.5A$	
Total Gate Charge	Q_g	-	6	-	nC	$V_{GS}=4.5V$ $V_{DS}=15V$ $I_D=4.5A$	
Gate Source Charge	Q_{gs}	-	2.5	-			
Gate Drain Charge	Q_{gd}	-	2.1	-			
Turn-on Delay Time	$T_{d(on)}$	-	2.4	-	nS	$V_{DS}=15V$ $V_{GS}=10V$ $R_G=3.3\Omega$ $I_D=4.5A$	
Rise Time	T_r	-	7.8	-			
Turn-off Delay Time	$T_{d(off)}$	-	22	-			
Fall Time	T_f	-	4	-			
Input Capacitance	C_{iss}	-	572	-	pF	$V_{GS}=0V$ $V_{DS}=15V$ $f=1MHz$	
Output Capacitance	C_{oss}	-	81	-			
Reverse Transfer Capacitance	C_{rss}	-	65	-			
Source-Drain Diode							
Continuous Source Current ¹	I_S	-	-	4.5	A		
Pulsed Source Current ³	I_{SM}	-	-	30	A		
Forward On Voltage ⁴	V_{SD}	-	-	1.2	V	$I_S=1A, V_{GS}=0, T_J=25^\circ\text{C}$	
Reverse Recovery Time	t_{rr}	-	19	-	nS	$I_F=4A, dI/dt=100A/\mu s$	
Reverse Recovery Charge	Q_{rr}	-	1.04	-	nC	$T_J=25^\circ\text{C}$	

Notes:

- Surface Mounted on 1" x 1" FR4 Board with 20Z copper.
- When mounted on Min. copper pad.
- Pulse width limited by maximum junction temperature, Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$.
- Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$.

CHARACTERISTIC CURVES

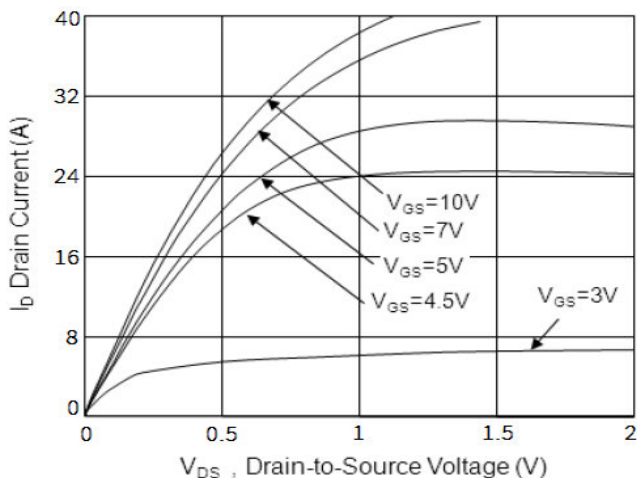


Fig.1 Typical Output Characteristics

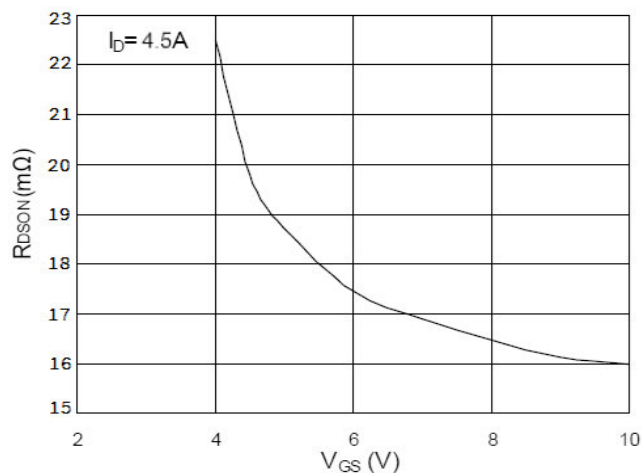


Fig.2 On-Resistance vs. Gate-Source

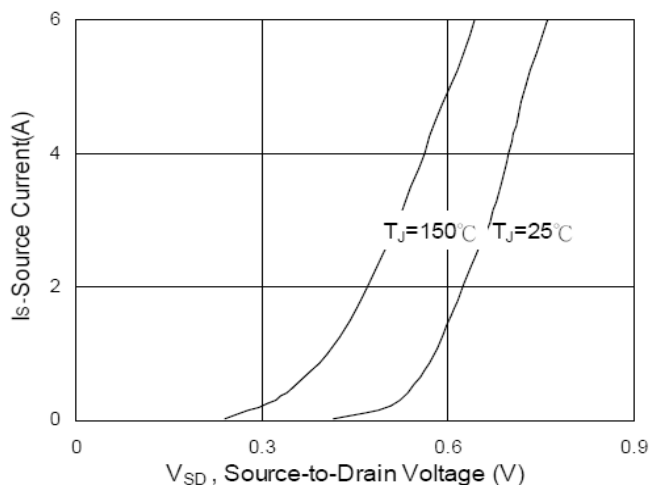


Fig.3 Forward Characteristics of Reverse

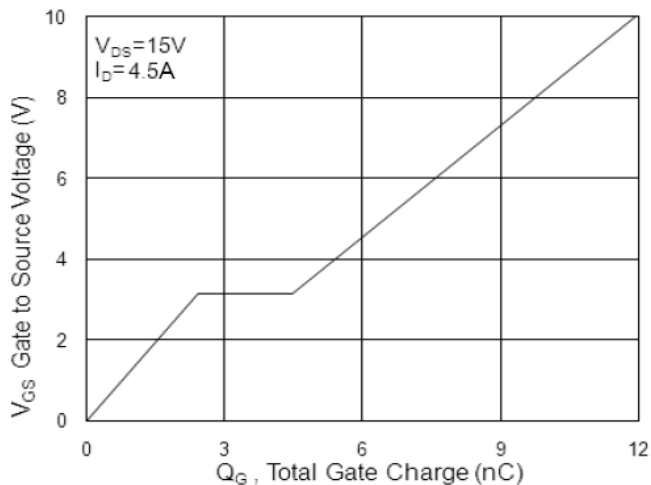


Fig.4 Gate-Charge Characteristics

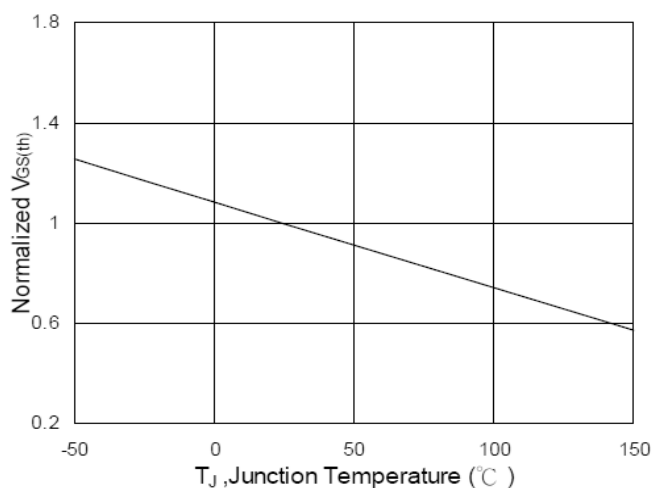


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

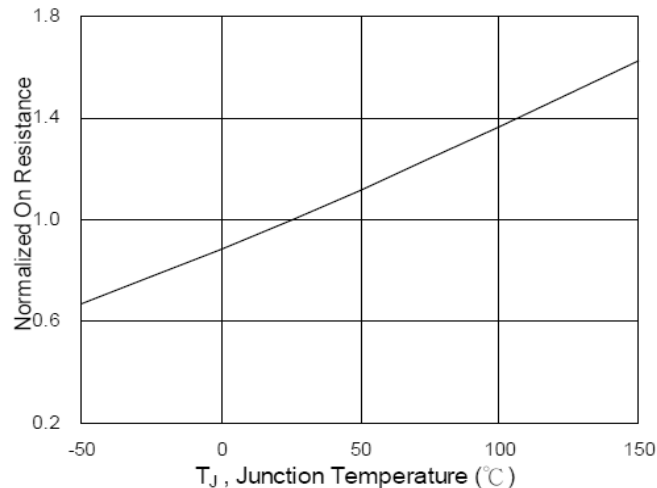


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

CHARACTERISTIC CURVES

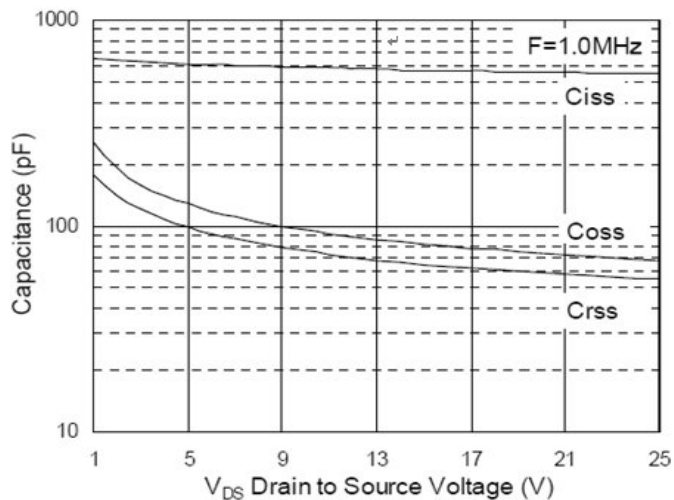


Fig.7 Capacitance

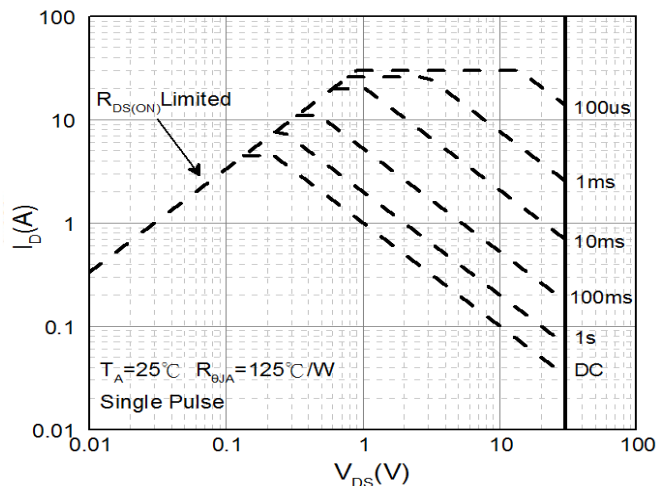


Fig.8 Safe Operating Area

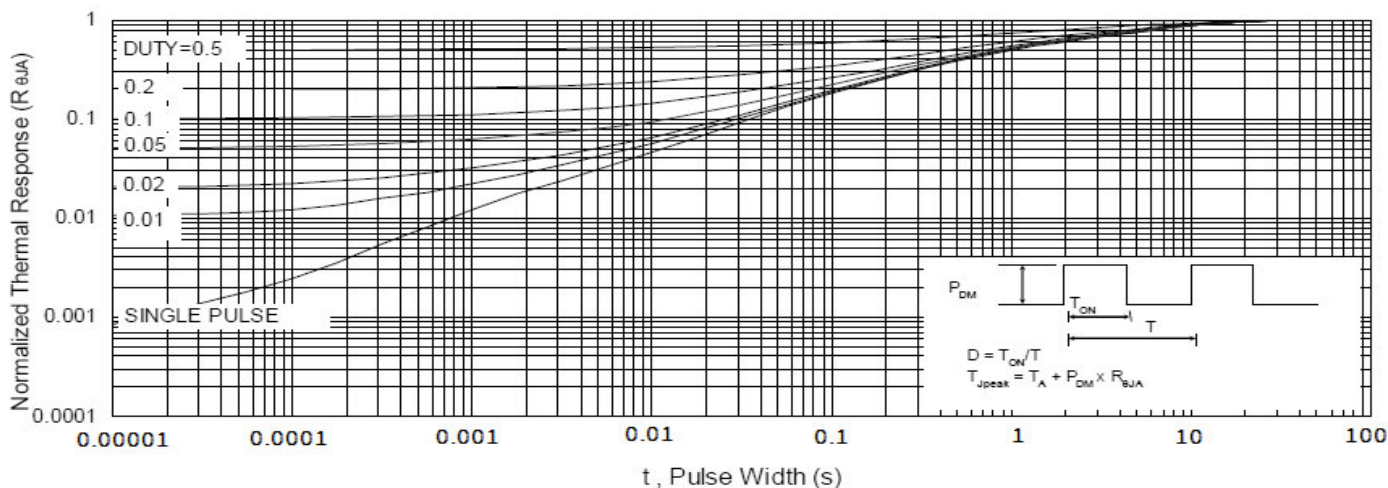


Fig.9 Normalized Maximum Transient Thermal Impedance

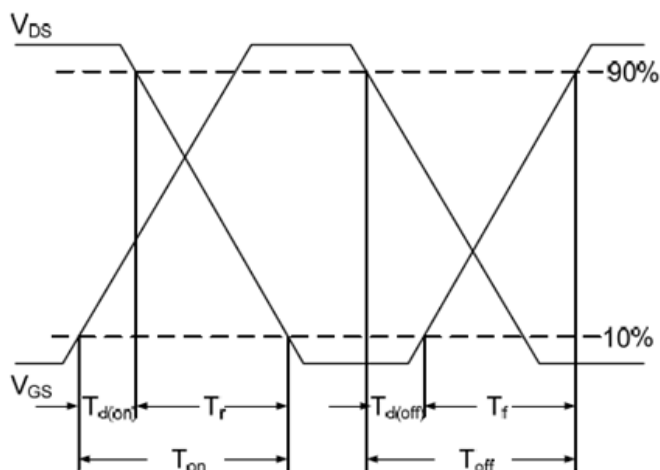


Fig.10 Switching Time Waveform

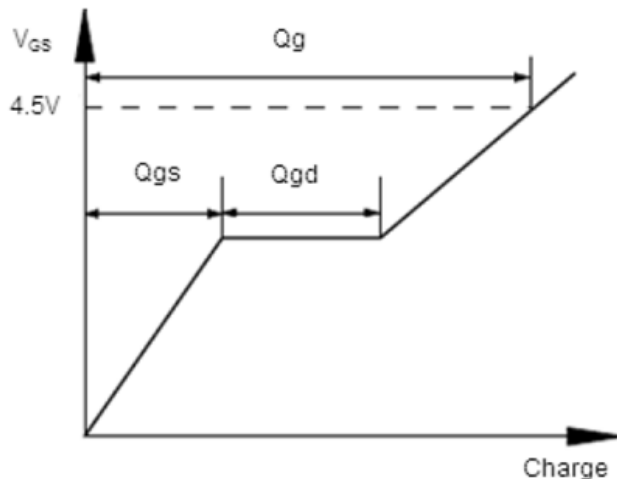


Fig.11 Gate Charge Waveform