

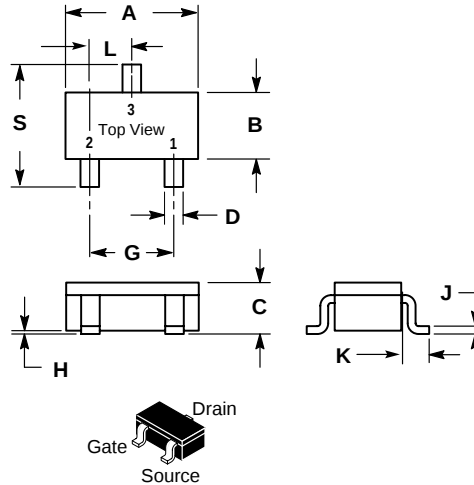
RoHS Compliant Product

Description

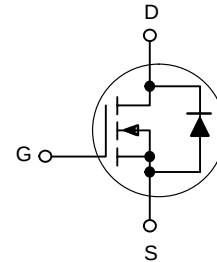
The SMG2304A utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SMG2304A is universally used for all commercial-industrial applications.

Features

- * Small Package Outline
- * Simple Drive Requirement



SC-59		
Dim	Min	Max
A	2.70	3.10
B	1.40	1.60
C	1.00	1.30
D	0.35	0.50
G	1.70	2.10
H	0.00	0.10
J	0.10	0.26
K	0.20	0.60
L	0.85	1.15
S	2.40	2.80
All Dimension in mm		



Marking : 2304A

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, ³ $V_{GS}@10V$	$I_D@T_A=25^\circ C$	2.5	A
Continuous Drain Current, ³ $V_{GS}@10V$	$I_D@T_A=70^\circ C$	2.0	A
Pulsed Drain Current	I_{DM}	10	A
Total Power Dissipation	$P_D@T_A=25^\circ C$	1.38	W
Linear Derating Factor		0.01	W/ $^\circ C$
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55~+150	$^\circ C$

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient ³ Max.	R_{thj-a}	90	$^\circ C/W$

Electrical Characteristics($T_j=25^{\circ}\text{C}$ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	30	–	–	V	$V_{GS}=0V, I_D=250\mu A$
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DS}/\Delta T_j$	–	0.1	–	V/	Reference to 25°C , $I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	1.0	–	3.0	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 ($T_j=25^{\circ}\text{C}$)	I_{DSS}	–	–	1	μA	$V_{DS}=30V, V_{GS}=0$
Drain-Source Leakage Current ($T_j=70^{\circ}\text{C}$)		–	–	10	μA	$V_{DS}=24V, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	–	–	117	m Ω	$V_{GS}=10V, I_D=2.5A$
		–	–	190		$V_{GS}=4.5V, I_D=2A$
Total Gate Charge ²	Q_g	–	3	5	nC	$I_D=2.5A$ $V_{DS}=24V$ $V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	–	0.8	–		
Gate-Drain ("Miller") Charge	Q_{gd}	–	1.8	–		
Turn-on Delay Time ²	$T_{d(ON)}$	–	5	–	nS	$V_{DS}=15V$ $I_D=1A$ $V_{GS}=10V$ $R_G=3.3\Omega$ $R_D=15\Omega$
Rise Time	T_r	–	9	–		
Turn-off Delay Time	$T_{d(OFF)}$	–	11	–		
Fall Time	T_f	–	2	–		
Input Capacitance	C_{iss}	–	120	190	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
Output Capacitance	C_{oss}	–	62	–		
Reverse Transfer Capacitance	C_{rss}	–	24	–		
Forward Transconductance	G_{fs}	–	2	–	S	$V_{DS}=10V, I_D=2.5A$
Gate Resistance	R_g	–	1.67	–	Ω	$f=1.0MHz$

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage ²	V_{SD}	–	–	1.2	V	$I_S=1.2A, V_{GS}=0V$
Reverse Recovery Time ²	T_{rr}	–	24	–	nS	$I_S=2A, V_{GS}=0V$ $dI/dt=100A/\mu S$
Reverse Recovery Charge	Q_{rr}	–	23	–	nC	

Notes: 1.Pulse width limited by Max. junction temperature.

2.Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

3.Surface mounted on 1 inch² copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

Characteristics Curve

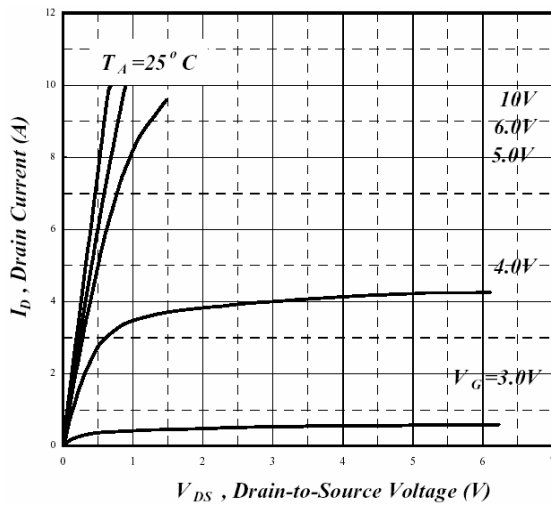


Fig 1. Typical Output Characteristics

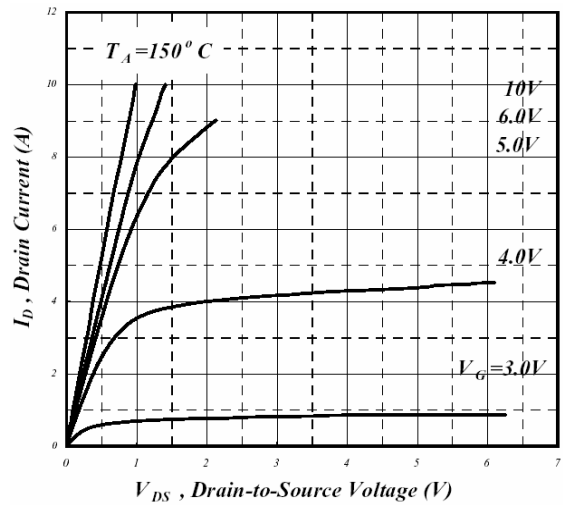


Fig 2. Typical Output Characteristics

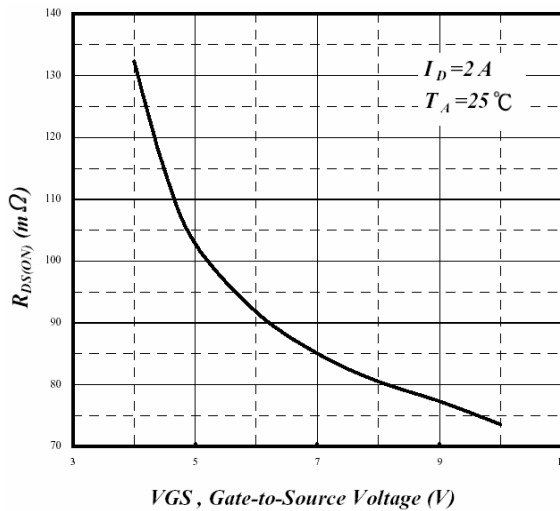


Fig 3. On-Resistance v.s. Gate Voltage

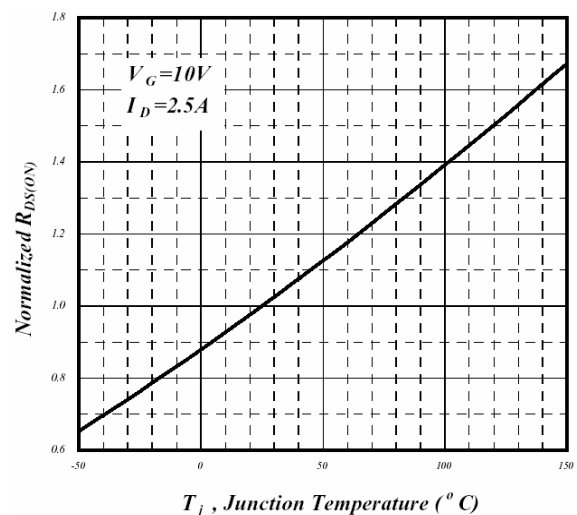


Fig 4. Normalized On-Resistance v.s. Junction Temperature

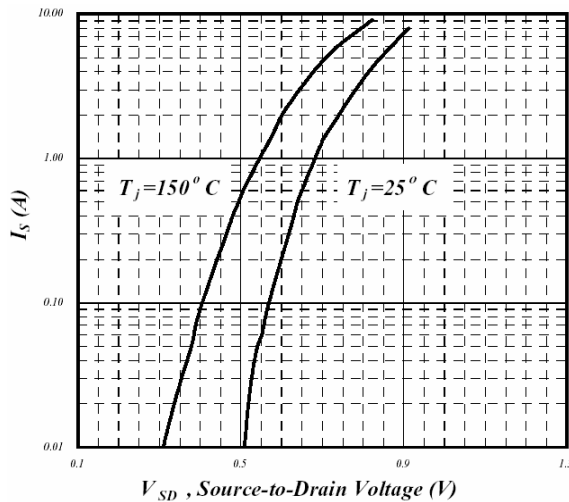


Fig 5. Forward Characteristics of Reverse Diode

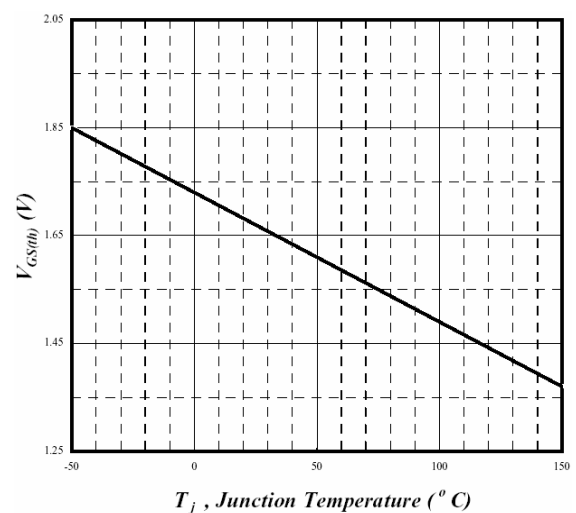


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

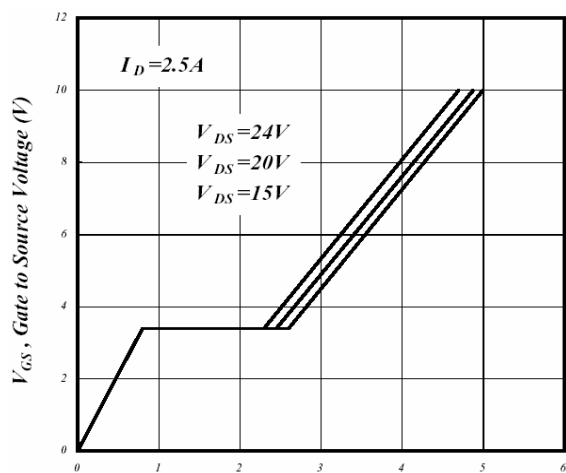


Fig 7. Gate Charge Characteristics

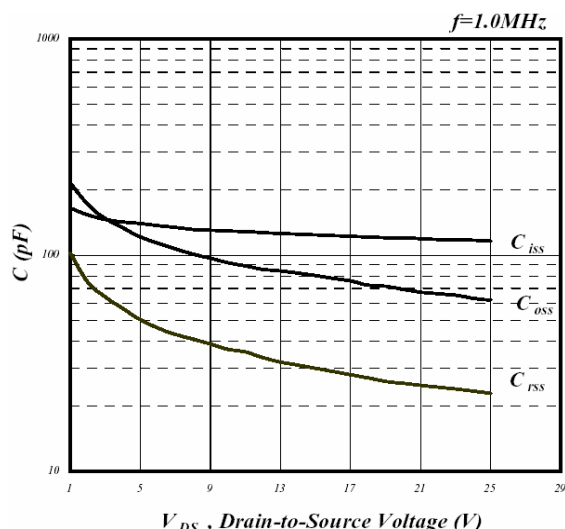


Fig 8. Typical Capacitance Characteristics

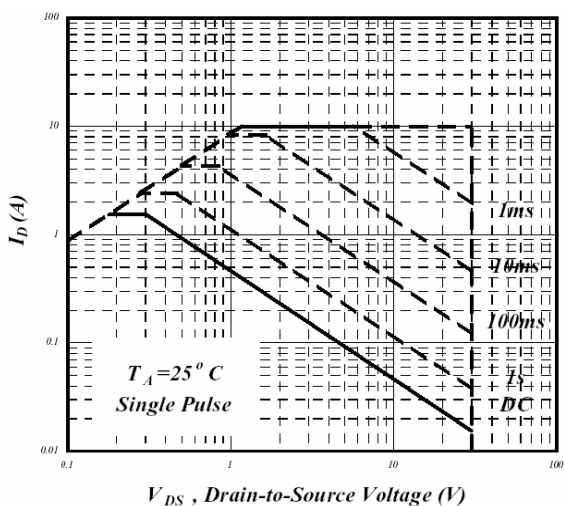


Fig 9. Maximum Safe Operating Area

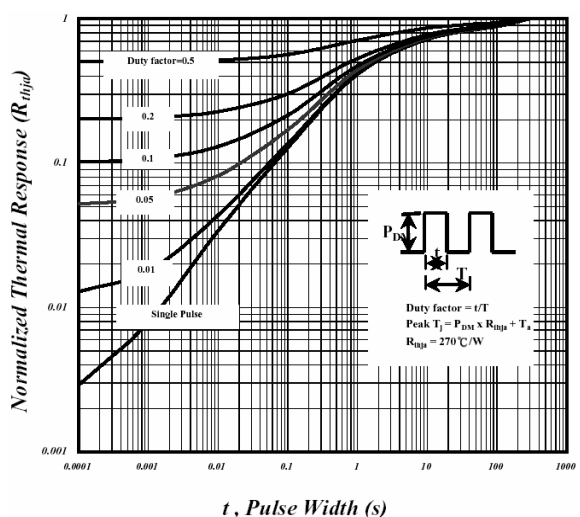


Fig 10. Effective Transient Thermal Impedance

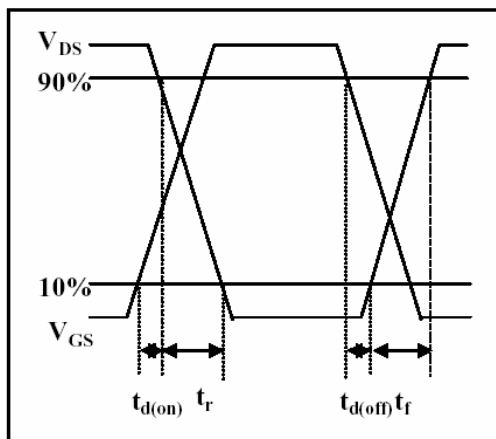


Fig 11. Switching Time Waveform

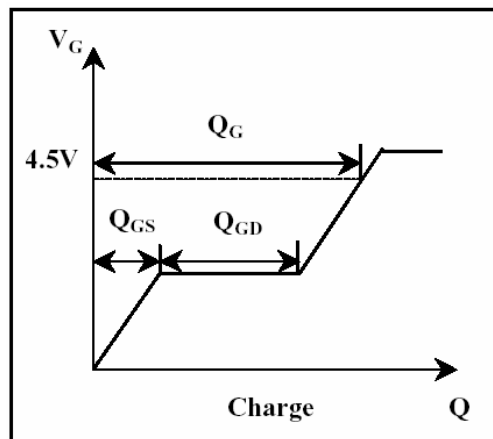


Fig 12. Gate Charge Waveform