Elektronische Bauelemente

SMG2304A

2.5A, 30V, $R_{DS(ON)}$ 117mΩ

N-Channel Enhancement Mode Power Mos.FET

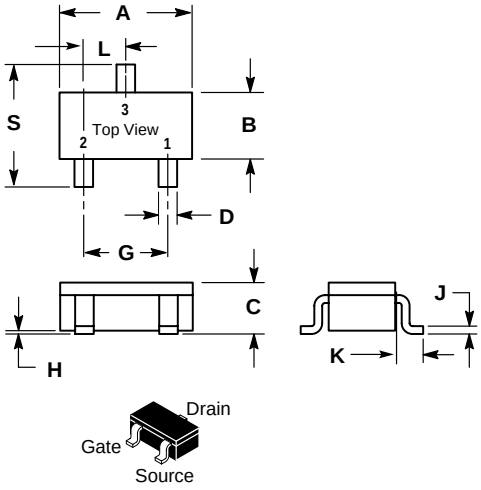
RoHS Compliant Product

Description

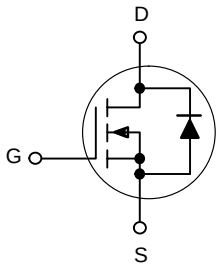
The SMG2304A utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The SMG2304A is universally used for all commercial-industrial applications.

Features

* Small Package Outline
* Simple Drive Requirment



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°C	2.5	A
Continuous Drain Current,[3] V_{GS}@10V	I_D@T_A=70°C	2.0	A
Pulsed Drain Current	I_{DM}	10	A
Total Power Dissipation	P_D@T_A=25°C	1.38	W
Linear Derating Factor		0.01	W/℃
Operating Junction and Storage Temperature Range	Tj, Tstg	-55~+150	°C

Thermal Data

Parameter		Symbol	Ratings	Unit
Thermal Resistance Junction-ambient [3]	Max.	Rthj-a	90	°C/W

Electrical Characteristics(Tj=25℃ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	30	–	–	V	V_{GS}=0V, I_D=250uA
Breakdown Voltage Temp. Coefficient	$\triangle BV_{DS}/\triangle Tj$	–	0.1	–	V/	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	–	3.0	V	V_{DS}=V_{GS}, I_D=250uA
Gate-Source Leakage Current	I_{GSS}	–	–	±100	nA	V_{GS}=±20V
Drain-Source Leakage Current (Tj=25℃)	I_{DSS}	–	–	1	uA	V_{DS}=30V,V_{GS}=0
Drain-Source Leakage Current (Tj=70℃)		–	–	10	uA	V_{DS}=24V,V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	–	–	117	mΩ	V_{GS}=10V, I_D=2.5A
		–	–	190		V_{GS}=4.5V, I_D=2A
Total Gate Charge[2]	Qg	–	3	5	nC	I_D=2.5A V_{DS}=24V V_{GS}=4.5V
Gate-Source Charge	Qgs	–	0.8	–		
Gate-Drain ("Miller") Charge	Qgd	–	1.8	–		
Turn-on Delay Time[2]	$T_{d(ON)}$	–	5	–	nS	V_{DS}=15V I_D=1A V_{GS}=10V R_G=3.3Ω R_D=15Ω
Rise Time	Tr	–	9	–		
Turn-off Delay Time	$T_{d(Off)}$	–	11	–		
Fall Time	T_f	–	2	–		
Input Capacitance	Ciss	–	120	190	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Output Capacitance	Coss	–	62	–		
Reverse Transfer Capacitance	Crss	–	24	–		
Forward Transconductance	Gfs	–	2	–	S	V_{DS}=10V, I_D=2.5A
Gate Resistance	Rg	–	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]	Trr	–	24	–	nS	Is=2A,V_{GS}=0V dI/dt=100A/uS
Reverse Recovery Charge	Qrr	–	23	–	nC	

Notes: 1.Pulse width limited by Max. junction temperature.
2.Pulse width≦300us, dutycycle≦2%.
3.Surface mounted on 1 inch2 copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

Characteristics Curve

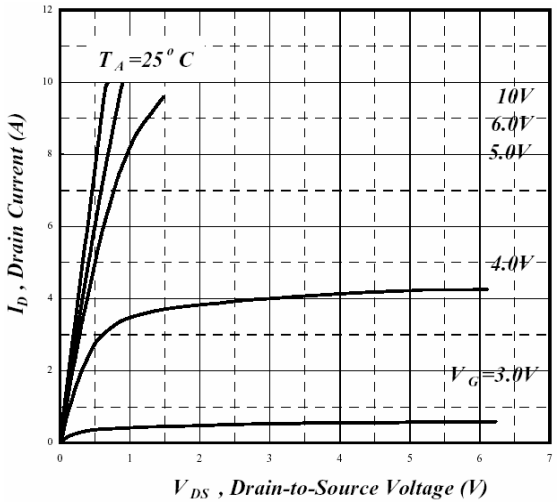


Fig 1. Typical Output Characteristics

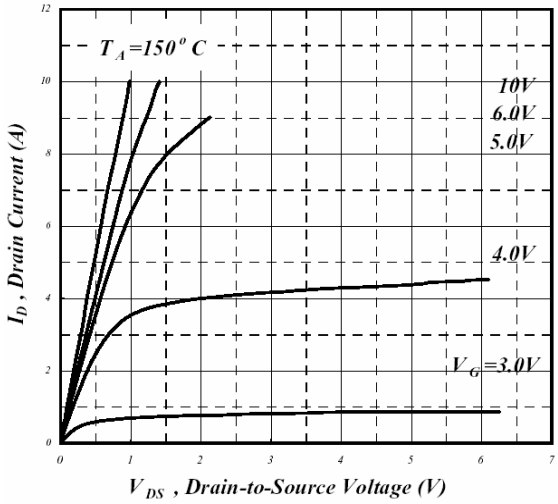


Fig 2. Typical Output Characteristics

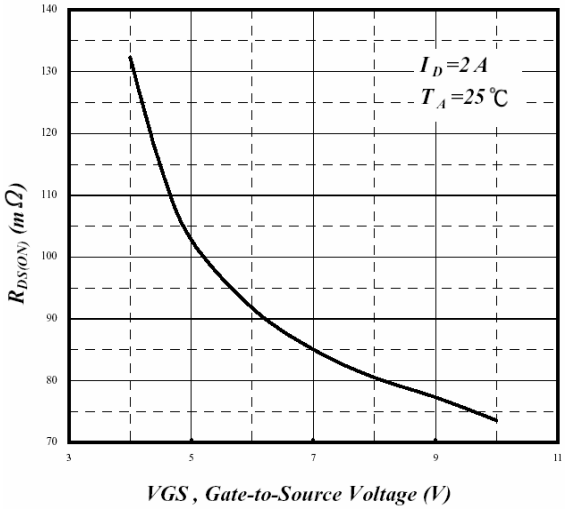


Fig 3. On-Resistance v.s. Gate Voltage

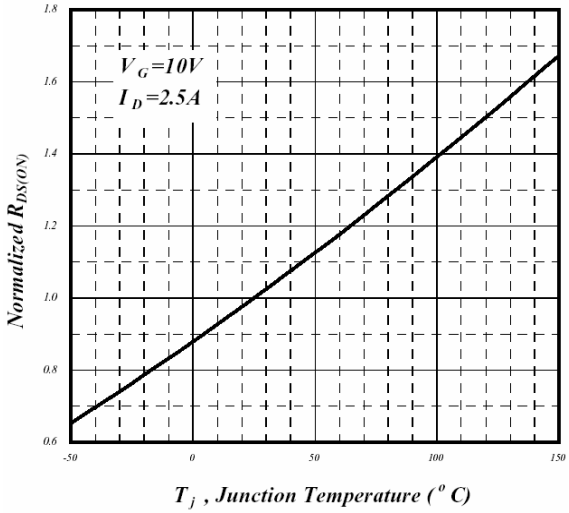


Fig 4. Normalized On-Resistance v.s. Junction Temperature

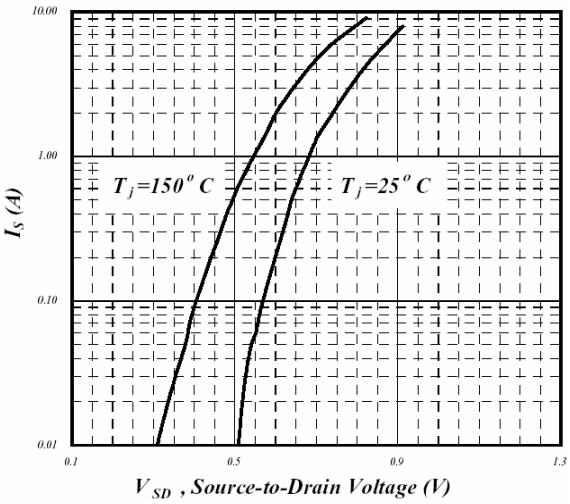


Fig 5. Forward Characteristics of Reverse Diode

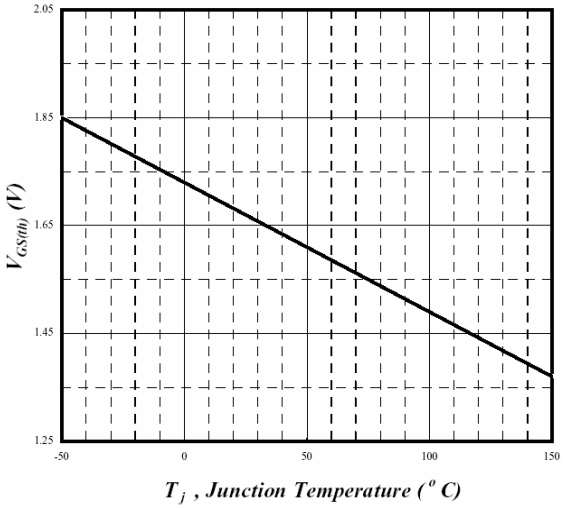


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

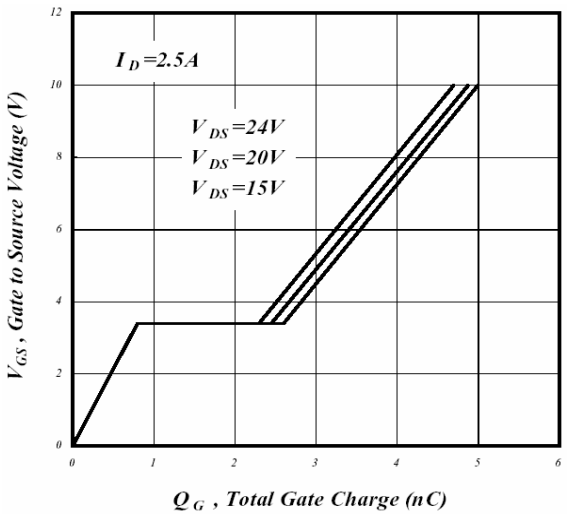


Fig 7. Gate Charge Characteristics

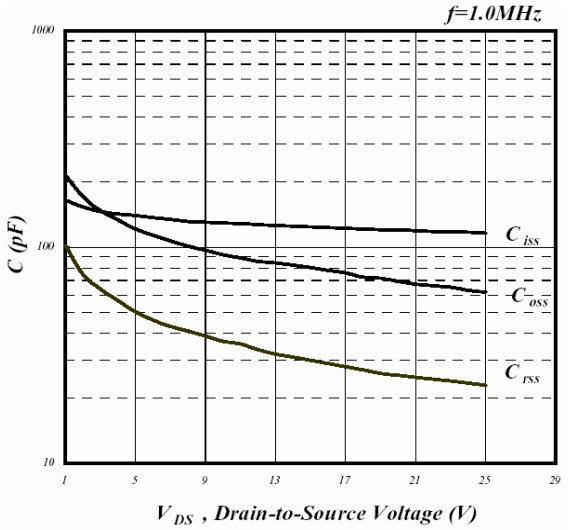


Fig 8. Typical Capacitance Characteristics

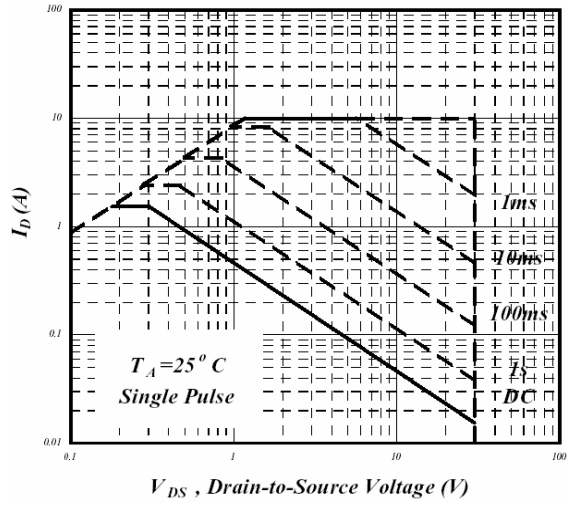


Fig 9. Maximum Safe Operating Area

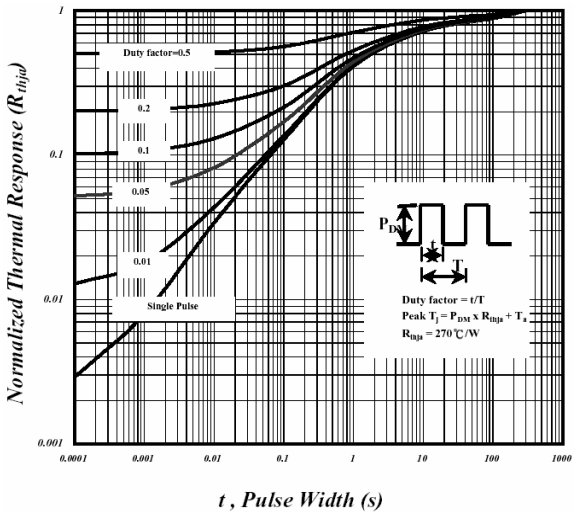


Fig 10. Effective Transient Thermal Impedance

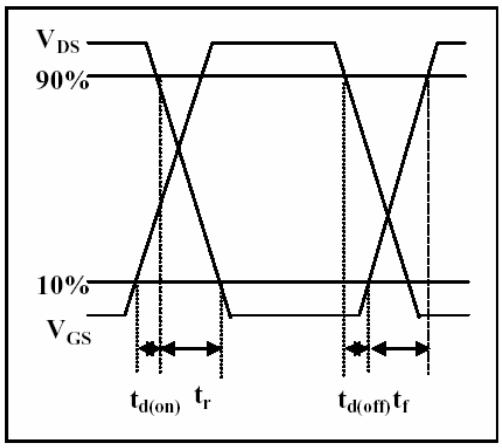


Fig 11. Switching Time Waveform

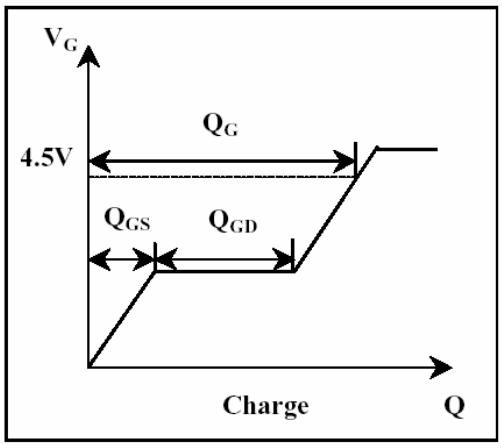


Fig 12. Gate Charge Waveform