



P-Channel Enhancement Mode Power Mos.FET

Description

The SMG2305L provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The SMG2305L is universally preferred for all commercial industrial surface mount application and suited for low voltage applications such as DC/DC converters.

Features

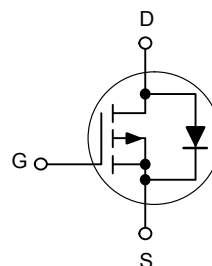
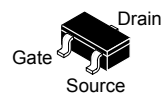
- * Super high dense cell design for extremely low $R_{DS(ON)}$
- * Reliable and rugged

Applications

- * Power Management in Notebook Computer
- * Portable Equipment
- * Battery Powered System

Marking : 2305 / 2305A / 3415

SOT-23



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ³	$I_D@T_A=25^\circ\text{C}$	-4.2	A
Continuous Drain Current ³	$I_D@T_A=70^\circ\text{C}$	-3.4	A
Pulsed Drain Current	I_{DM}	-10	A
Total Power Dissipation	$P_D@T_A=25^\circ\text{C}$	1.38	W
Linear Derating Factor		0.01	W/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient ³	R_{thj-a}	90	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-Case ³	R_{thj-c}	68	$^\circ\text{C}/\text{W}$



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Electrical Characteristics(Tj=25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} =0V, I _D =-250uA
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)}	-0.5	—	—	V	V _{DS} =V _{GS} , I _D =-250uA
Gate-Source Leakage Current	I _{GSS}	—	—	±100	nA	V _{GS} =±12V
Drain-Source Leakage Current (Tj=25°C)	I _{DSS}	—	—	-1	uA	V _{DS} =-20V, V _{GS} =0
Drain-Source Leakage Current (Tj=70°C)		—	—	-10	uA	V _{DS} =-16V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	—	30	35	mΩ	V _{GS} =-4.5V, I _D =-4.0A
		—	36	42		V _{GS} =-2.5V, I _D =-4.0A
		—	46	55		V _{GS} =-1.8V, I _D =-2A
		—	60	—		V _{GS} =-1.5V, I _D =-1A
Total Gate Charge ²	Q _g	—	10.6	—	nC	I _D =-4.2A V _{DS} =-16V V _{GS} =-4.5V
Gate-Source Charge	Q _{gs}	—	2.32	—		
Gate-Drain ("Miller") Charge	Q _{gd}	—	3.68	—		
Turn-on Delay Time ²	T _{d(ON)}	—	5.9	—	nS	V _{DS} =-15V I _D =-4.2A V _{GS} =-10V R _G =6Ω R _D =3.6Ω
Rise Time	T _r	—	3.6	—		
Turn-off Delay Time	T _{d(OFF)}	—	32.4	—		
Fall Time	T _f	—	2.6	—		
Input Capacitance	C _{iss}	—	740	—	pF	V _{GS} =0V V _{DS} =-15V f=1.0MHz
Output Capacitance	C _{oss}	—	167	—		
Reverse Transfer Capacitance	C _{rss}	—	126	—		
Forward Transconductance	G _{fs}	—	9	—	S	V _{DS} =-5V, I _D =-2.8A

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	T _{rr}	—	27.7	—	nS	I _S =-4.2A, V _{GS} =0V dI/dt=100A/uS
Reverse Recovery Charge	Q _{rr}	—	22	—	nC	

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

2.Pulse Test : Pulse Width < 300μs, Duty Cycle ≤2%

3.Surface mounted on 1 inch² copper pad of FR4, ≤10S



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Characteristics Curve

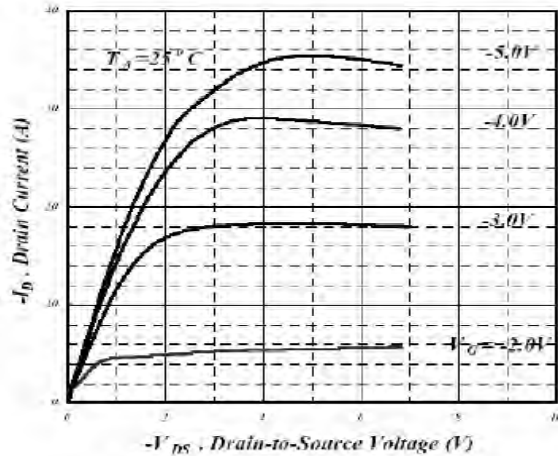


Fig 1. Typical Output Characteristics

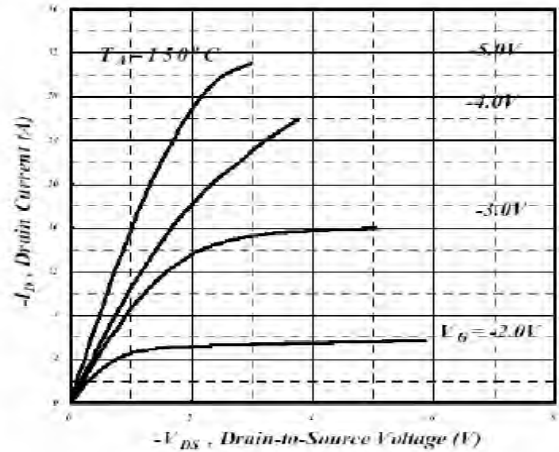


Fig 2. Typical Output Characteristics

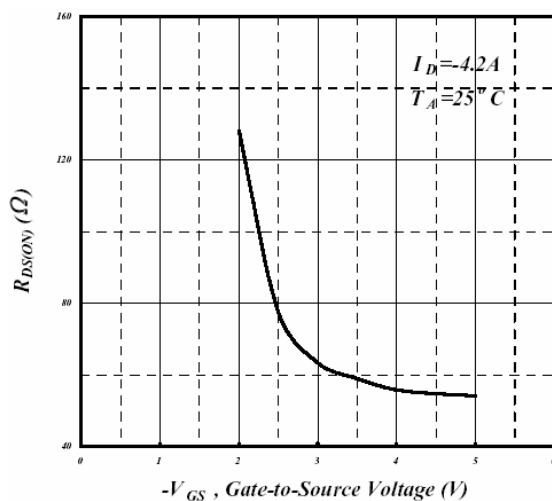


Fig 3. On-Resistance v.s. Gate Voltage

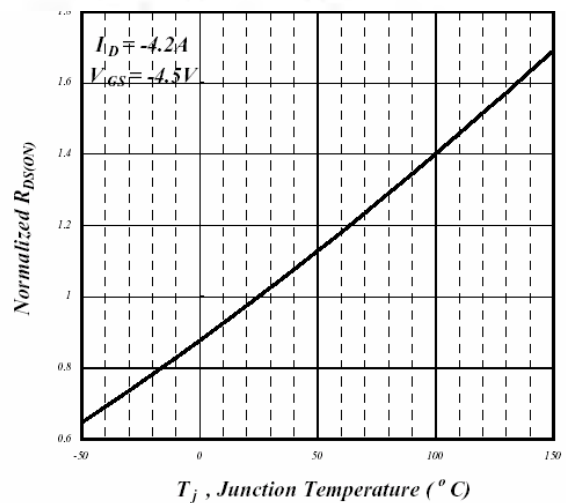


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

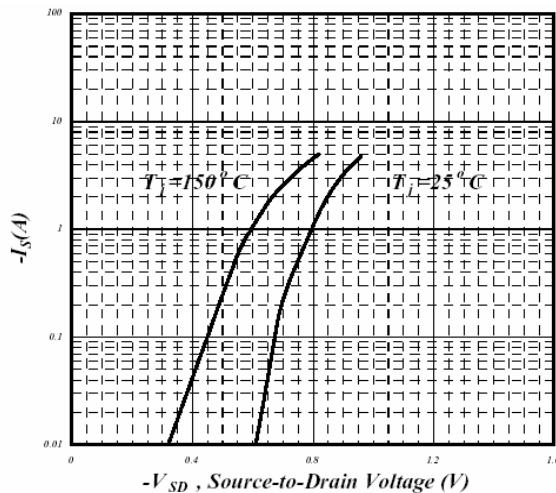


Fig 5. Forward Characteristic of
Reverse Diode

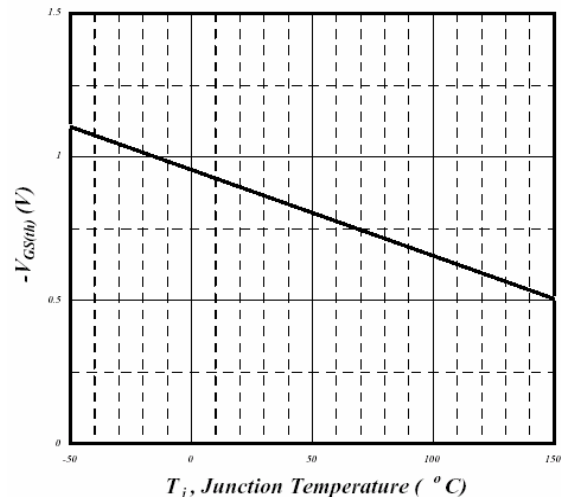


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature



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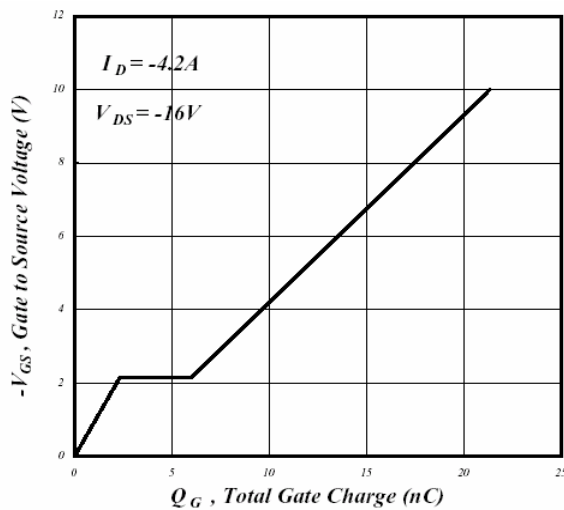


Fig 7. Gate Charge Characteristics

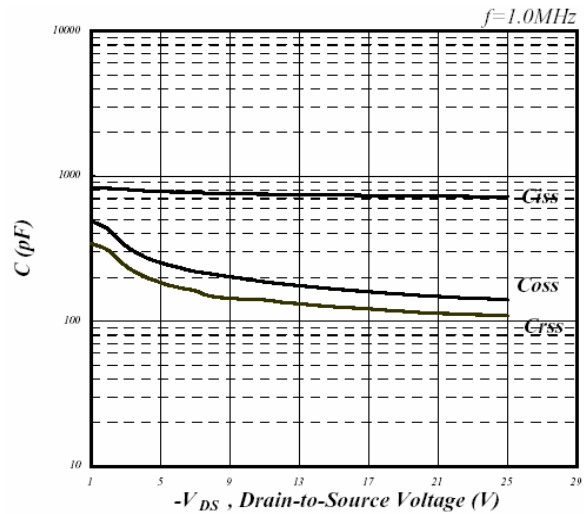


Fig 8. Typical Capacitance Characteristics

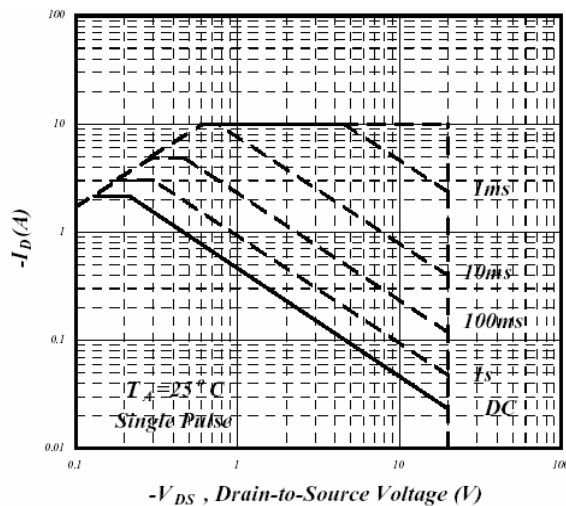


Fig 9. Maximum Safe Operating Area

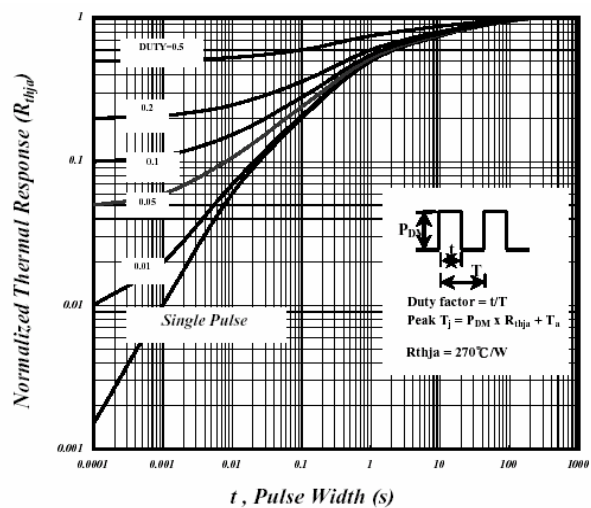


Fig 10. Effective Transient Thermal Impedance

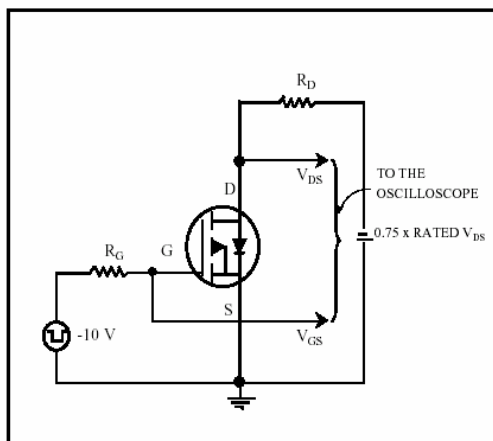


Fig 11. Switching Time Circuit

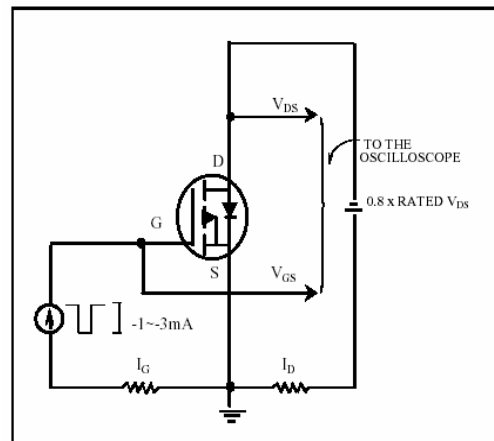
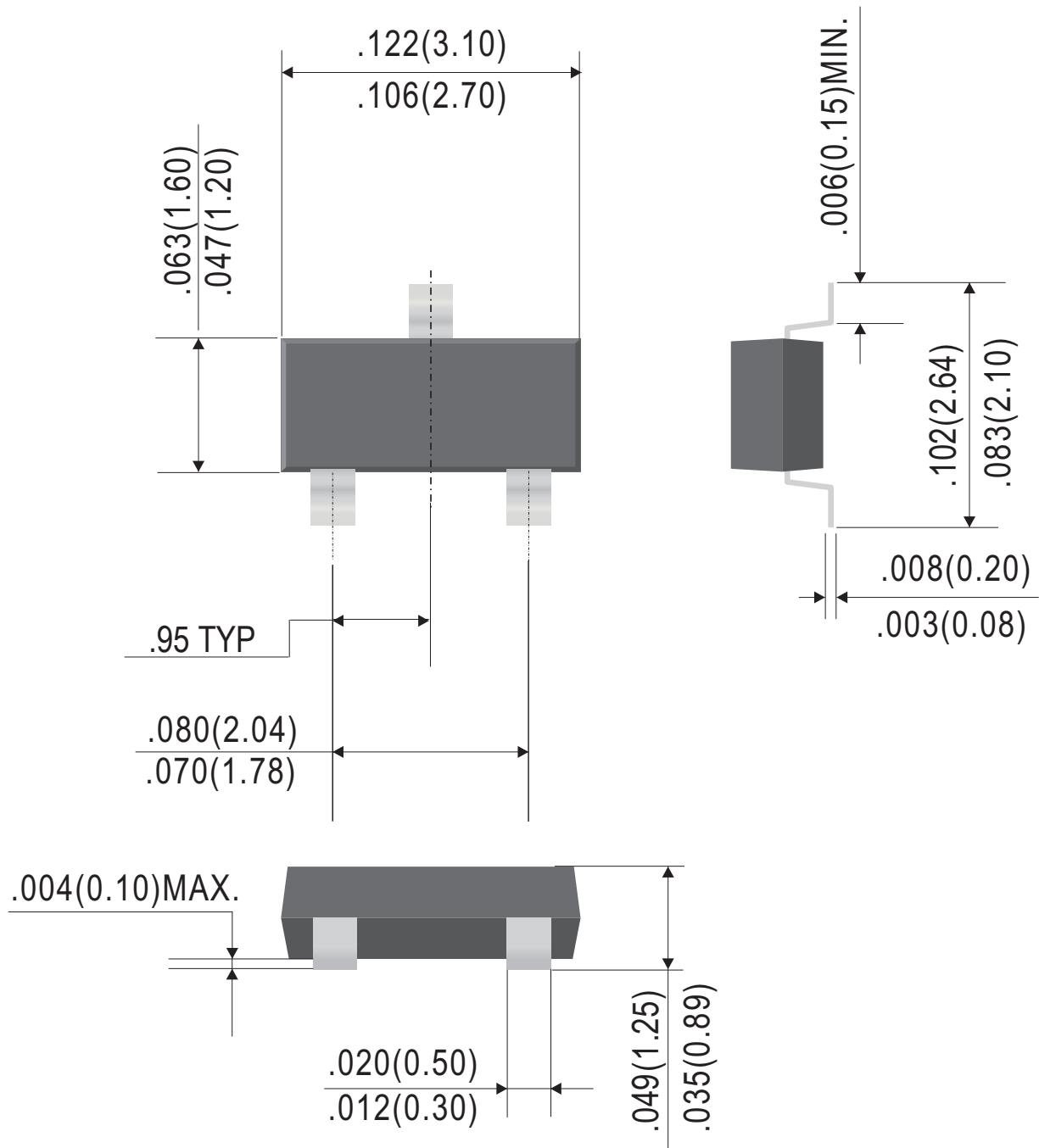


Fig 12. Gate Charge Circuit



Outline Drawing

SOT-23



Dimensions in inches and (millimeters)

Rev.E



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Ordering Information:

Device PN	Packing
SMG2305L-T ⁽¹⁾ G ⁽²⁾ -WS	Tape&Reel: 3 Kpcs/Reel

Note: (1) Packing code, Tape & Reel

(2) RoHS product for packing code suffix "G" ; Halogen free product for packing code suffix "H"

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