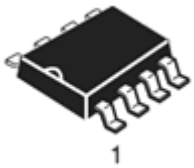
N-Channel MOSFET MEM2306

General Description

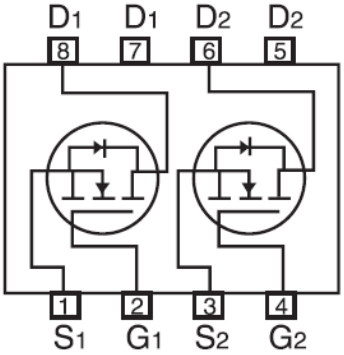
MEM2306SG Series Dual N-channel enhancement mode field-effect transistor produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications, and low power dissipation.

Features

- 20V/5A，
  $R_{DS(ON)}$ =29mΩ@ V_{GS}=3.85V,I_D=5A
- High Density Cell Design For Ultra Low On-Resistance
- surface mount package：SOP8



Pin Configuration



Typical Application

- Battery management
- power management
- Portable equipment
- Low power DC to DC converter.
- Load switch
- LCD adapter

Absolute Maximum Ratings

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current	T_A=25℃	I_D	5	A
Pulsed Drain Current[1,2]		I_{DM}	30	A
Total Power Dissipation	T_A=25℃	P_D	1.3	W
	T_A=70℃		1.0	
Operating Temperature Range		T_{Opr}	150	℃
Storage Temperature Range		T_{stg}	−65/150	℃

Thermal Characteristics

Parameter		Symbol	Ratings	Unit
Thermal Resistance, Junction-to-Ambient[3]	Steady-State	$R_{\theta JA}$	62.5	℃/W

Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20	23		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.5	0.72	1	V
Gate-Body Leakage	I_{GSS}	V_{DS}=0V， V_{GS}=12V		5	100	nA
		V_{DS}=0V，V_{GS}=-12V		-7	-100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V V_{GS}=0V		1.8	1000	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=6A			23	mΩ
		V_{GS}=3.85V,I_D=5A			25	mΩ
		V_{GS}=2.5V,I_D=4A			35	mΩ
Forward Transconductance	g_{FS}	V_{DS} =10 V, I_D = 6A	6	20		S
Source-drain (diode forward) voltage	V_{SD}	V_{GS}=0V,I_S=1.5A		0.8	1	V
Dynamic Characteristics						
Input Capacitance	Ciss	V_{DS} = 8 V, V_{GS} = 0 V, f = 1 MHz		1120	1500	pF
Output Capacitance	Coss			480	630	
Reverse Transfer Capacitance	Crss			110	160	
Switching Characteristics						
Turn-On Delay Time	td(on)	V_{DD} = 10 V, RL = 10Ω I_D =1 A, V_{GEN} = 4.5 V, Rg = 6 Ω		25	60	ns
Rise Time	tr			60	140	
Turn-Off Delay Time	td(off)			60	140	
Fall-Time	tf			50	60	
Total Gate Charge	Qg	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 6 A		47	60	nc
Gate-Source Charge	Qgs			6		
Gate-Drain Charge	Qgd			8		

Typical Performance Characteristics：

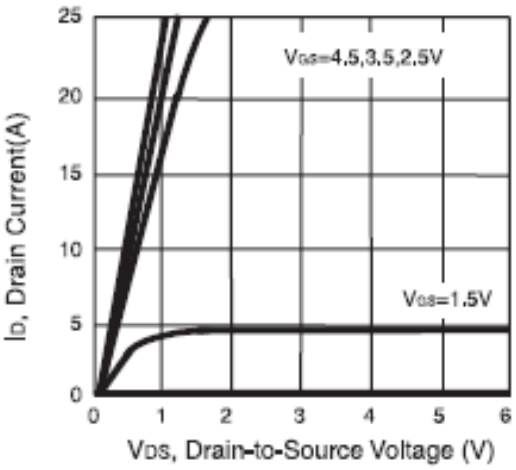


Figure 1. Output Characteristics

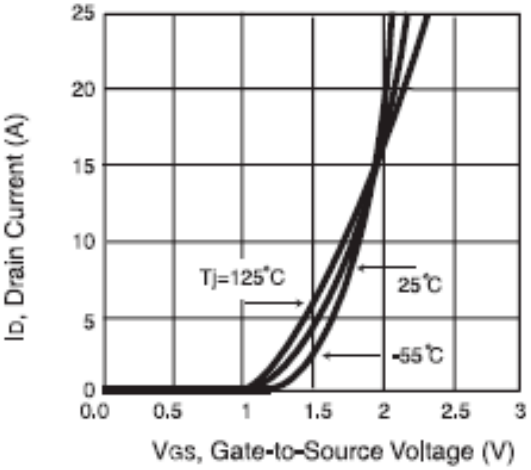


Figure 2. Transfer Characteristics

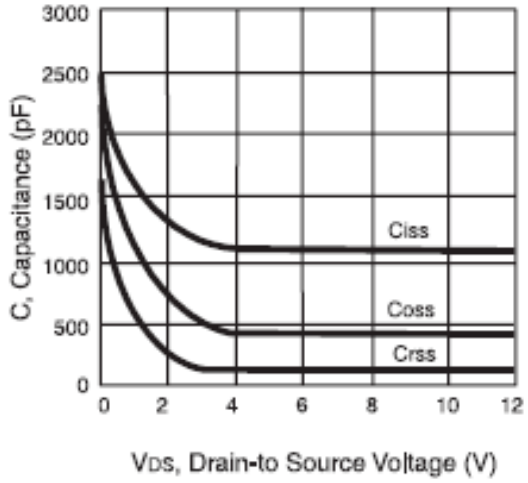


Figure 3. Capacitance

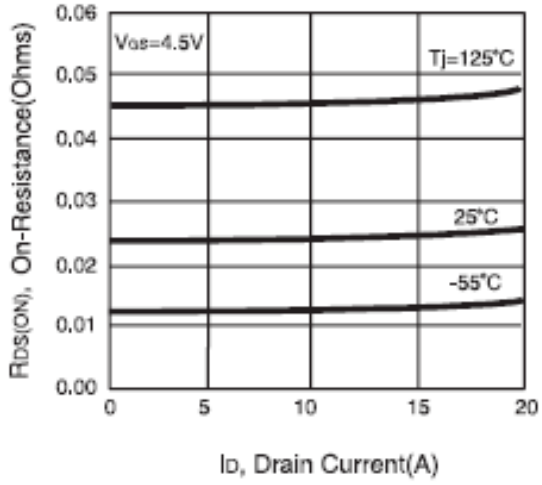


Figure 4. On-Resistance Variation with Drain Current and Temperature

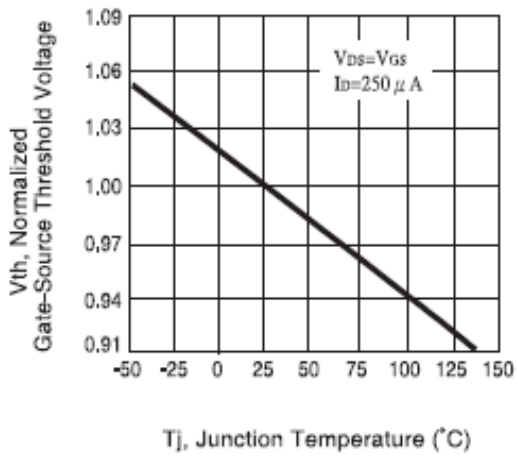


Figure 5. Gate Threshold Variation with Temperature

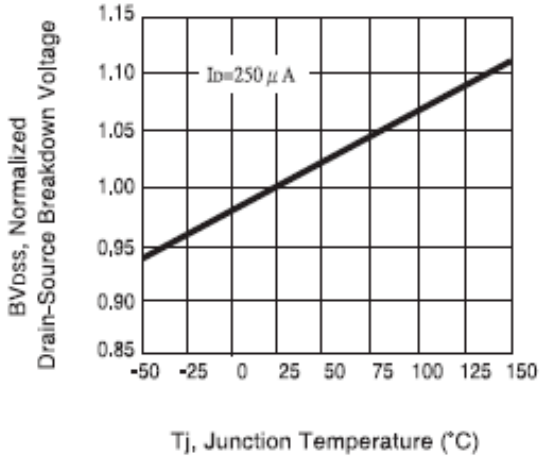


Figure 6. Breakdown Voltage Variation with Temperature

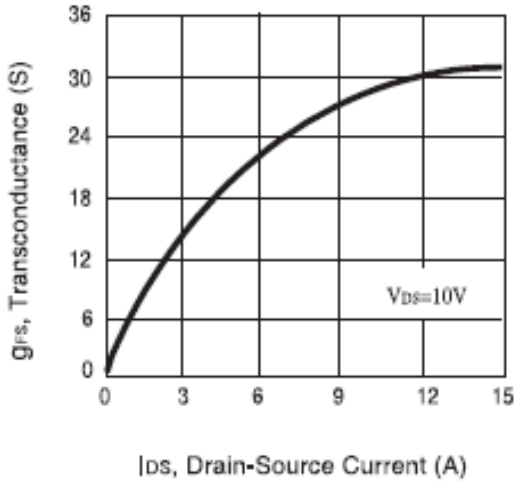


Figure 7. Transconductance Variation with Drain Current

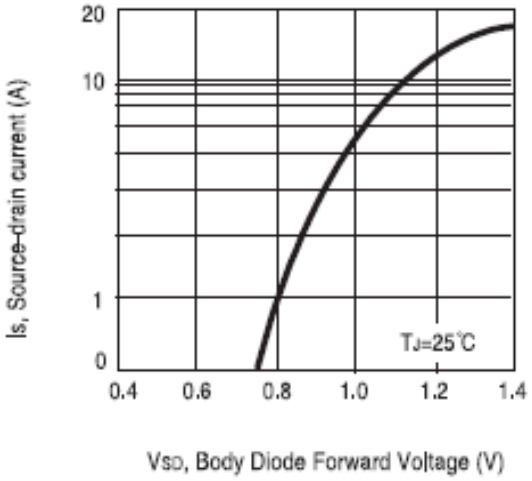


Figure 8. Body Diode Forward Voltage Variation with Source Current

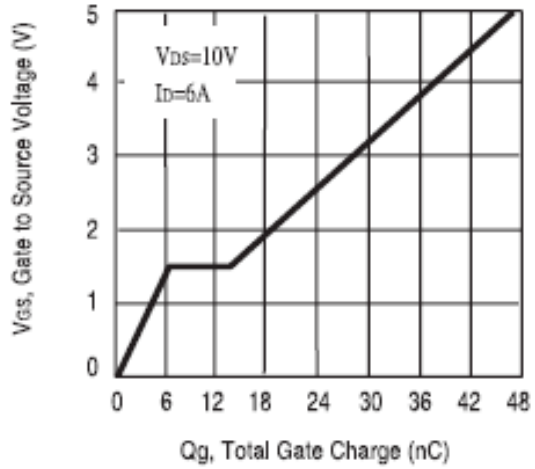


Figure 9. Gate Charge

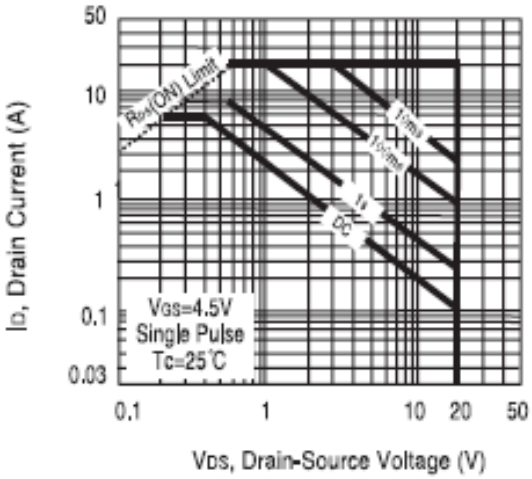


Figure 10. Maximum Safe Operating Area

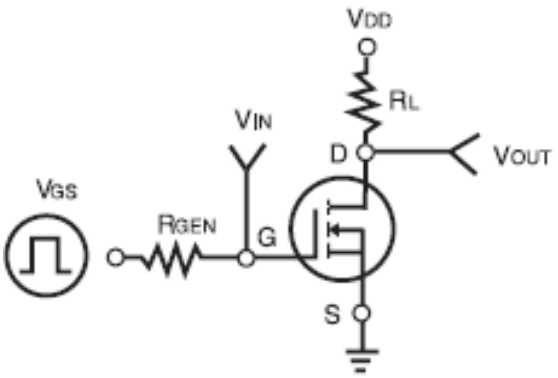


Figure 11. Switching Test Circuit

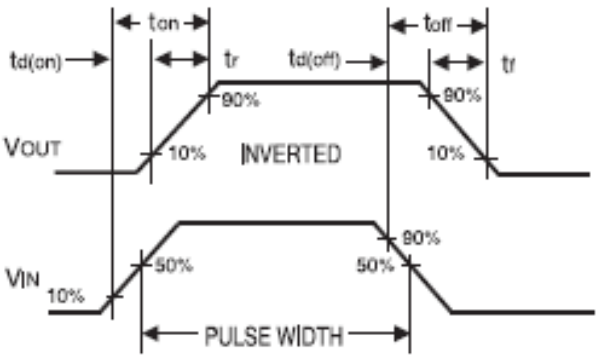


Figure 12. Switching Waveforms

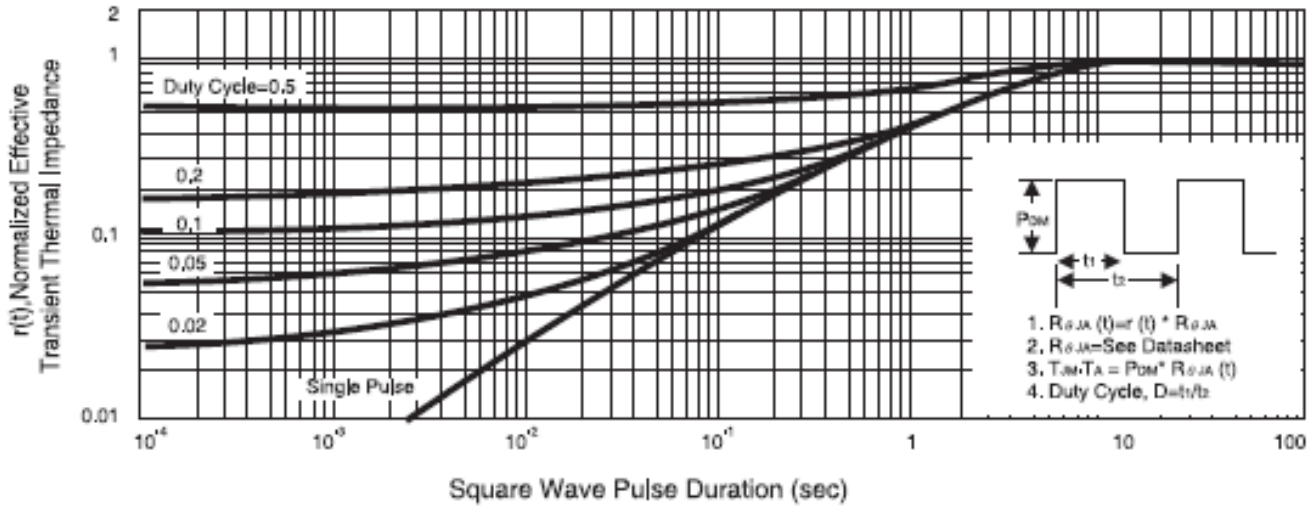
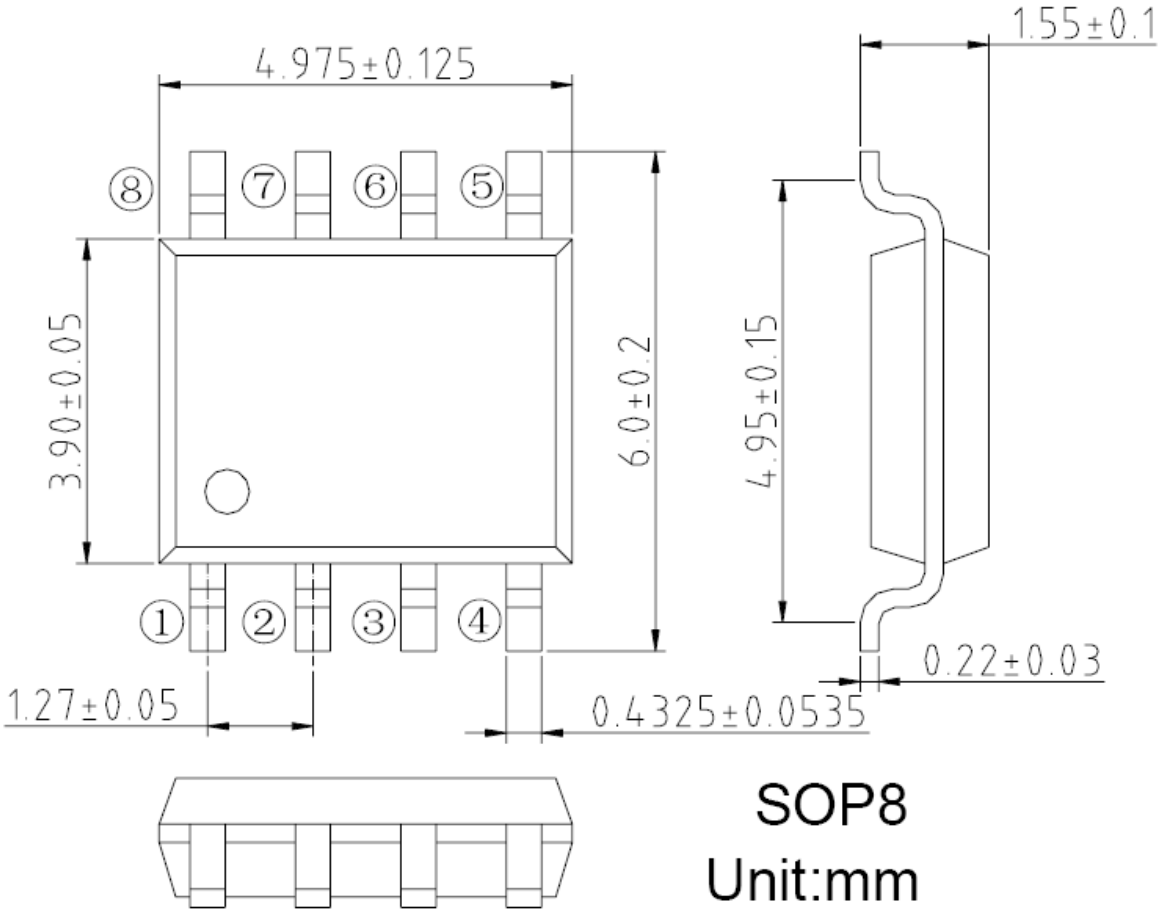


Figure 13. Normalized Thermal Transient Impedance Curve

Package Information：



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