

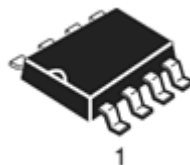
N-Channel MOSFET MEM2306

General Description

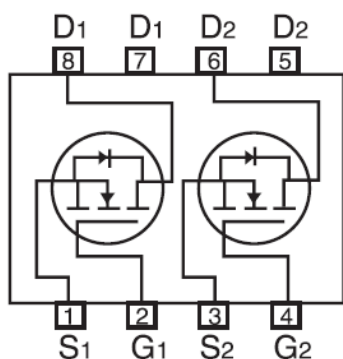
MEM2306SG Series Dual N-channel enhancement mode field-effect transistor produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications, and low power dissipation.

Features

- 20V/5A,
 $R_{DS(ON)}=29m\Omega @ V_{GS}=3.85V, I_D=5A$
- 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	I_D	5	A
Pulsed Drain Current ^{1,2}	I_{DM}	30	A
Total Power Dissipation	P_D	$T_A=25^\circ C$	1.3
		$T_A=70^\circ C$	1.0
Operating Temperature Range	T_{Opr}	150	$^\circ C$
Storage Temperature Range	T_{stg}	-65/150	$^\circ C$

Thermal Characteristics

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

Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	23		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	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	m Ω
		$V_{GS}=3.85V, I_D=5A$			25	m Ω
		$V_{GS}=2.5V, I_D=4A$			35	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=6A$	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	C_{iss}	$V_{DS}=8V, V_{GS}=0V, f=1MHz$		1120	1500	pF
Output Capacitance	C_{oss}			480	630	
Reverse Transfer Capacitance	C_{rss}			110	160	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, RL=10\Omega, I_D=1A, V_{GEN}=4.5V, R_g=6\Omega$		25	60	ns
Rise Time	t_r			60	140	
Turn-Off Delay Time	$t_{d(off)}$			60	140	
Fall-Time	t_f			50	60	
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=6A$		47	60	nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			8		

Typical Performance Characteristics:

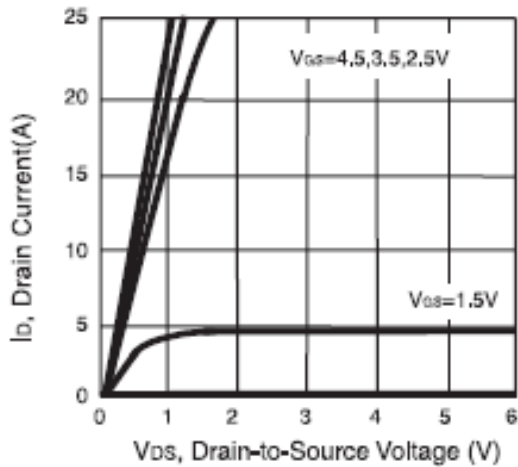


Figure 1. Output Characteristics

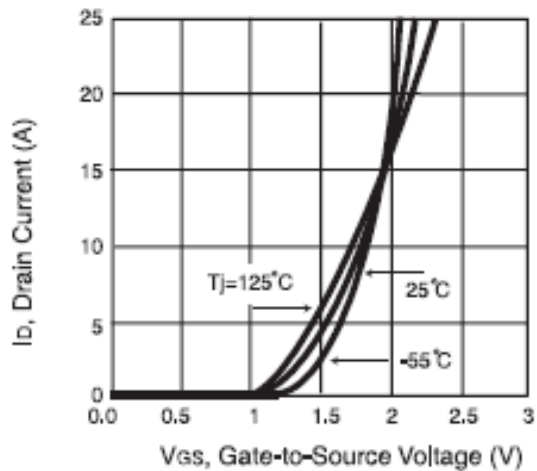


Figure 2. Transfer Characteristics

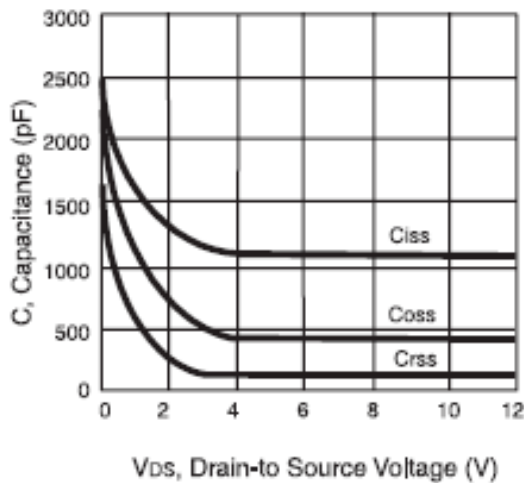


Figure 3. Capacitance

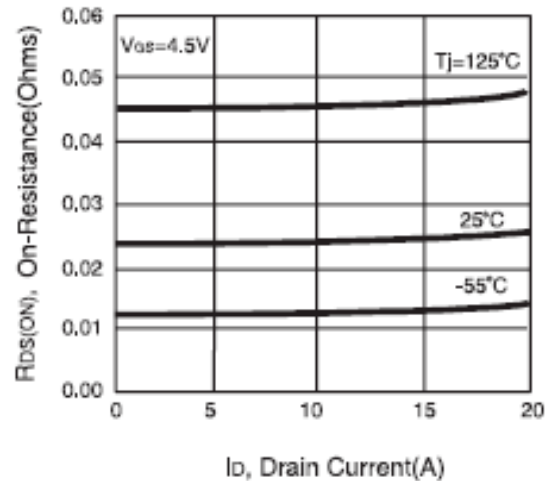


Figure 4. On-Resistance Variation with Drain Current and Temperature

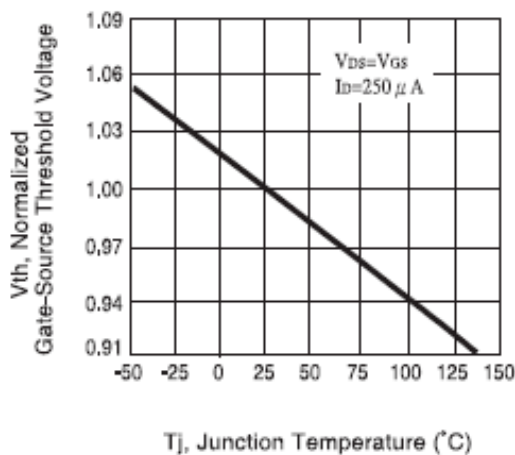


Figure 5. Gate Threshold Variation with Temperature

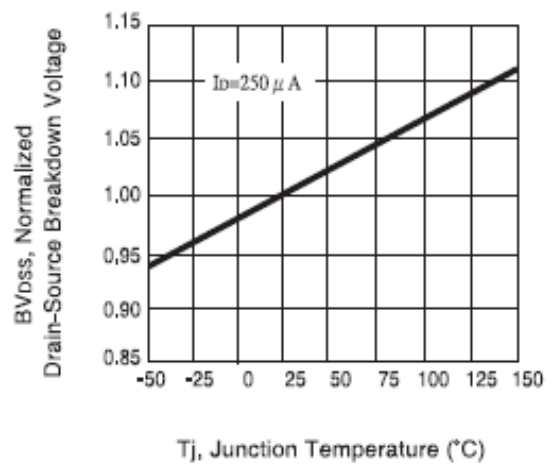


Figure 6. Breakdown Voltage Variation with Temperature

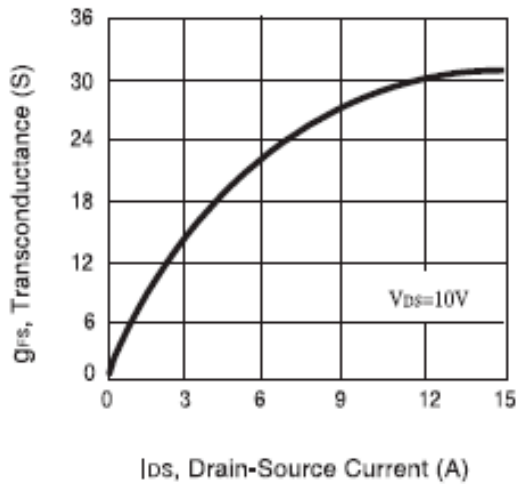


Figure 7. Transconductance Variation with Drain Current

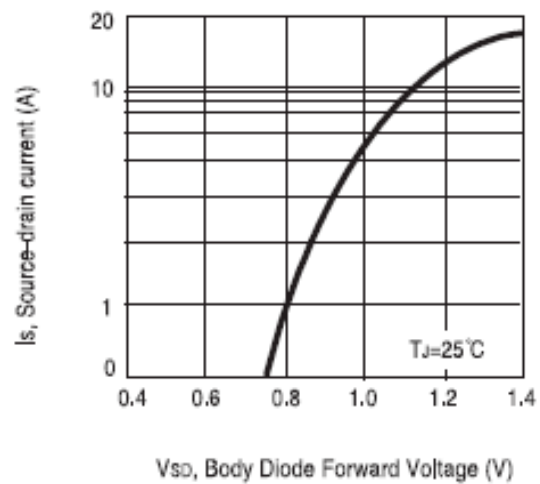


Figure 8. Body Diode Forward Voltage Variation with Source Current

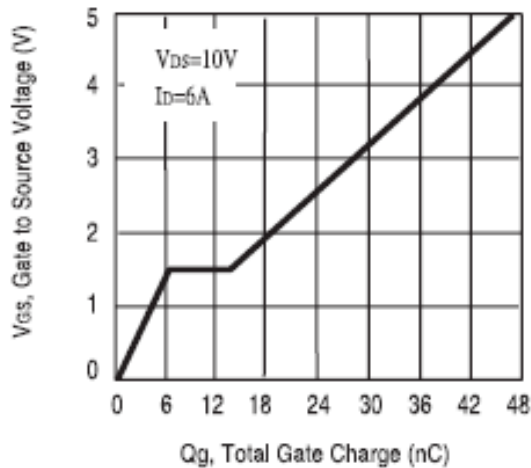


Figure 9. Gate Charge

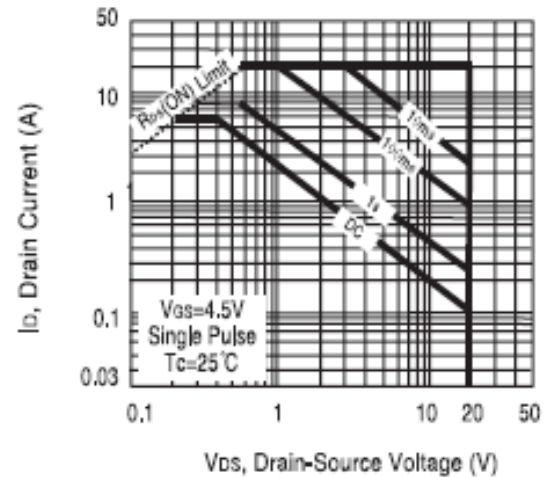


Figure 10. Maximum Safe Operating Area

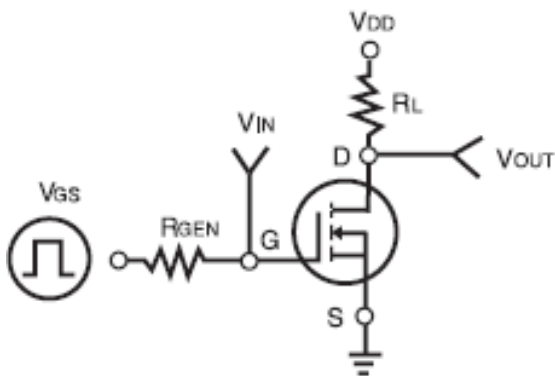


Figure 11. Switching Test Circuit

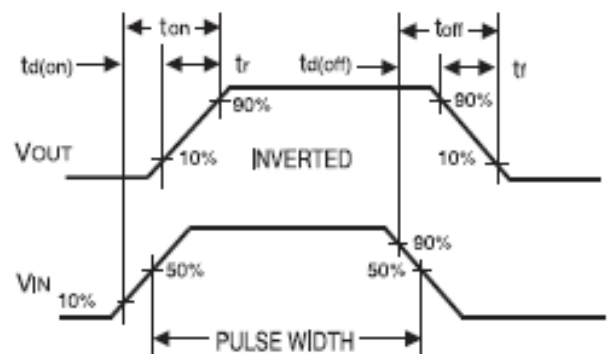


Figure 12. Switching Waveforms

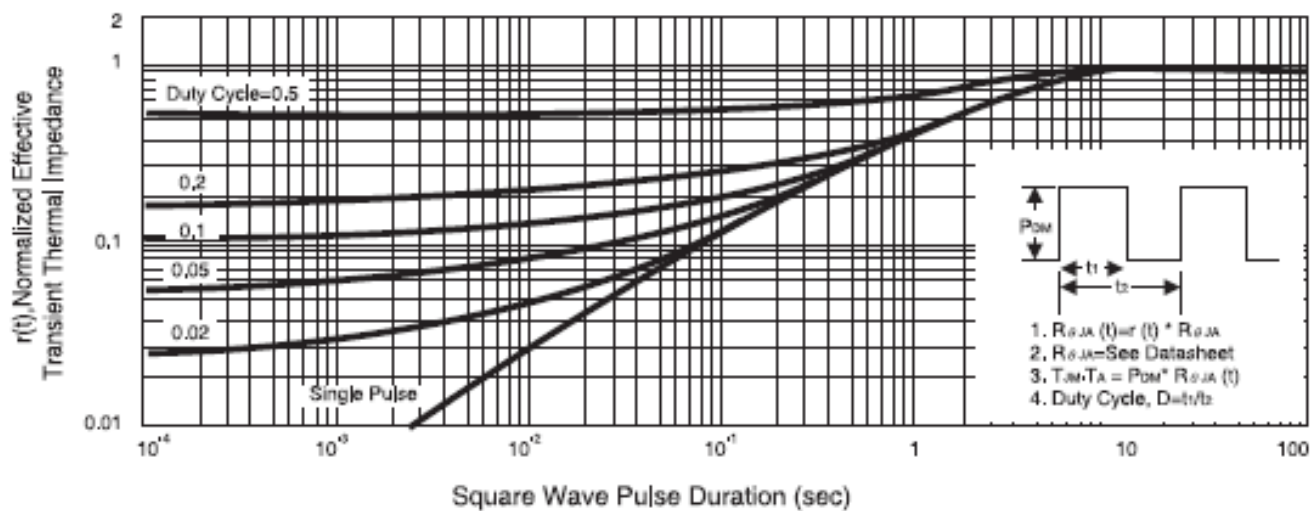
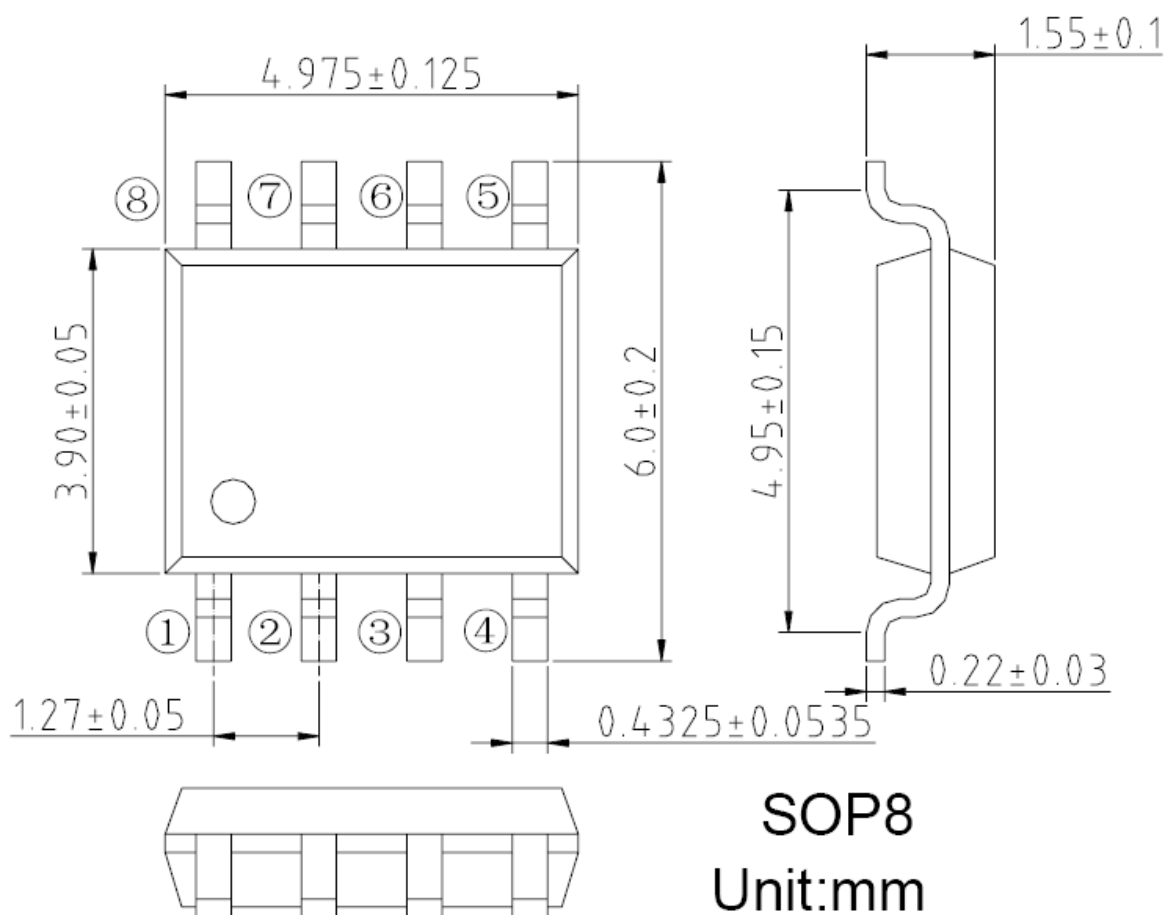


Figure 13. Normalized Thermal Transient Impedance Curve

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