

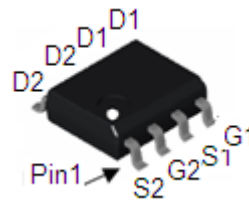
## P-Channel MOSFET MEM2317SG

### General Description

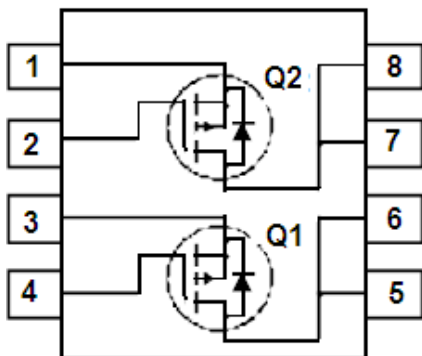
MEM2317SG Series Dual P-channel enhancement mode field-effect transistor, produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications, and low power dissipation.

### Features

- -20V/-6A  
 $R_{DS(ON)} = 75m\Omega @ V_{GS} = -10V, I_D = -6A$   
 $R_{DS(ON)} = 90m\Omega @ V_{GS} = -4.5V, I_D = -4A$
- High Density Cell Design For Ultra Low On-Resistance
- Surface mount package: SOP8



### Pin Configuration



### Typical Application

- Power management
- Load switch
- Battery protection

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units	
Drain-Source Voltage	$V_{DSS}$	-20V	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 8$	V	
Drain Current	$I_D$	$T_A = 25^\circ C$	-6	A
		$T_A = 70^\circ C$	-4	
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	-30	A	
Total Power Dissipation	Pd	$T_A = 25^\circ C$	1.3	W
		$T_A = 70^\circ C$	0.8	
Operating Temperature Range	$T_{Opr}$	125	$^\circ C$	
Storage Temperature Range	$T_{stg}$	-55/+150	$^\circ C$	

## Thermal Characteristics

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

## Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Typ.	Max	Units
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-24		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1.0	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=20V$		0.8	100	nA
		$V_{DS}=0V, V_{GS}=-20V$		-0.8	-100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-24V, V_{GS}=0V$		-3.5	-300	nA
Static Drain-Source On-Resistance	$R_{DS(ON)1}$	$V_{GS}=-10V, I_D=-6A$		62	75	m $\Omega$
	$R_{DS(ON)2}$	$V_{GS}=-4.5V, I_D=-4A$		73	90	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = -4.5 V, I_D = -4 A$		10		S
Drain-Source Diode Forward Current	$I_S$				-1.3	A
Source-drain (diode forward) voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A$		-0.8	-1.2	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -10V,$ $V_{GS} = 0 V,$ $f = 1 MHz$		600		pF
Output Capacitance	$C_{oss}$			175		
Reverse Transfer Capacitance	$C_{rss}$			80		
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -5 V,$ $I_D=-1 A,$ $V_{GEN} = -4.5 V,$ $R_g = 6 \Omega$		6	12	ns
Rise Time	$t_r$			9	18	
Turn-Off Delay Time	$t_{d(off)}$			31	50	
Fall-Time	$t_f$			28	42	
Total Gate Charge	$Q_g$	$V_{DS} = -10 V,$ $V_{GS} = -4.5V,$ $I_D = -4A$		7	10	nC
Gate-Source Charge	$Q_{gs}$			1.3		
Gate-Drain Charge	$Q_{gd}$			2		

- 1、Pulse width limited by Max. junction temperature.
- 2、Pulse width <300us , duty cycle <2%.
- 3、Surface Mounted on FR4 Board, t < 10 sec.

## Typical Performance Characteristics

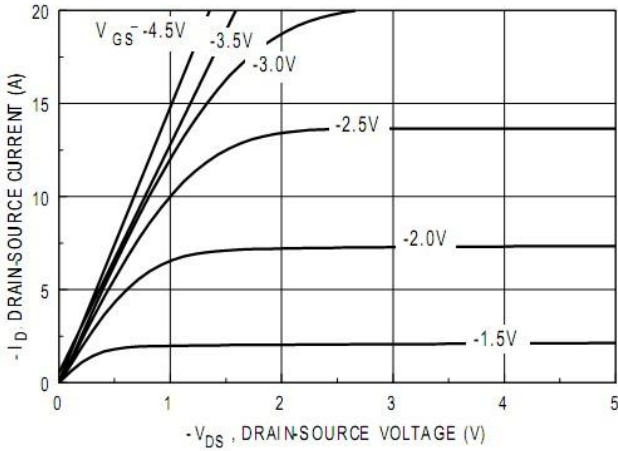


Figure 1. On-Region Characteristics.

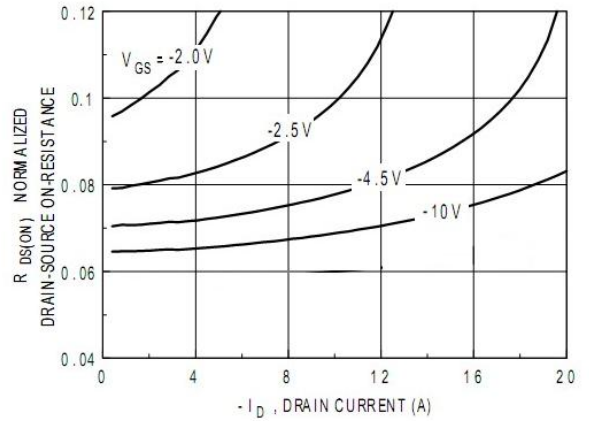


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

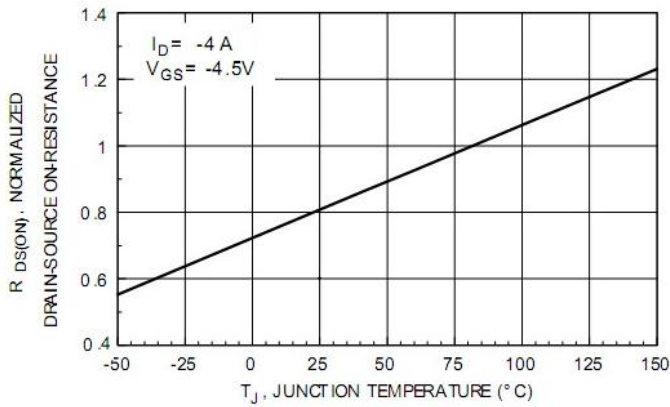


Figure 3. On-Resistance Variation with Temperature.

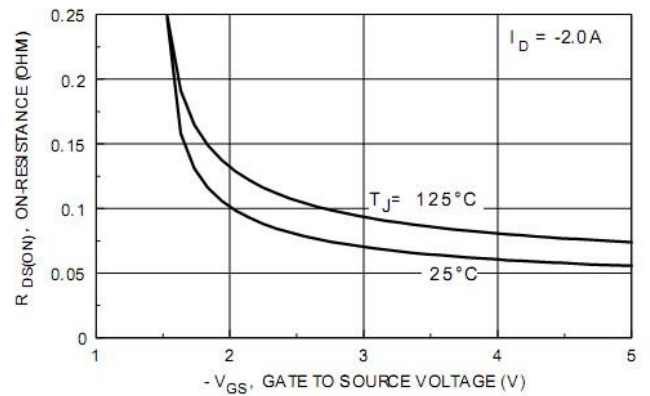


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

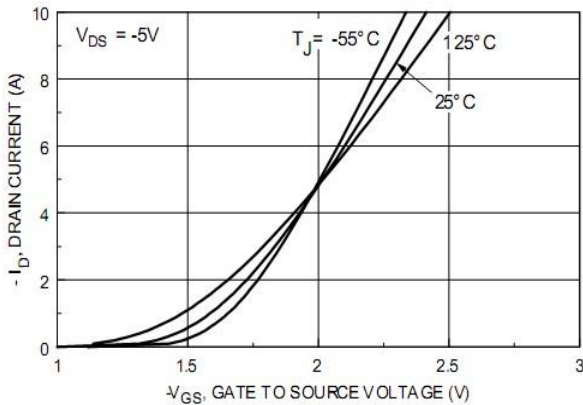


Figure 5. Transfer Characteristics.

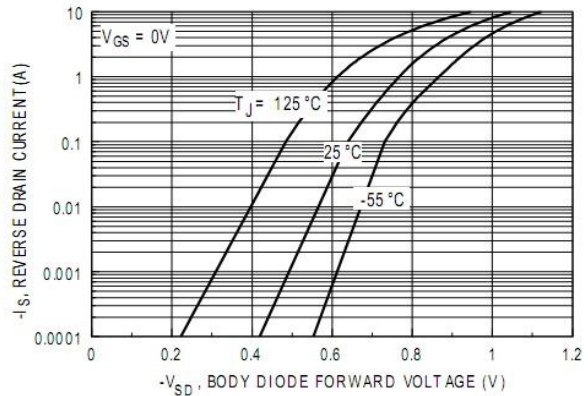


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

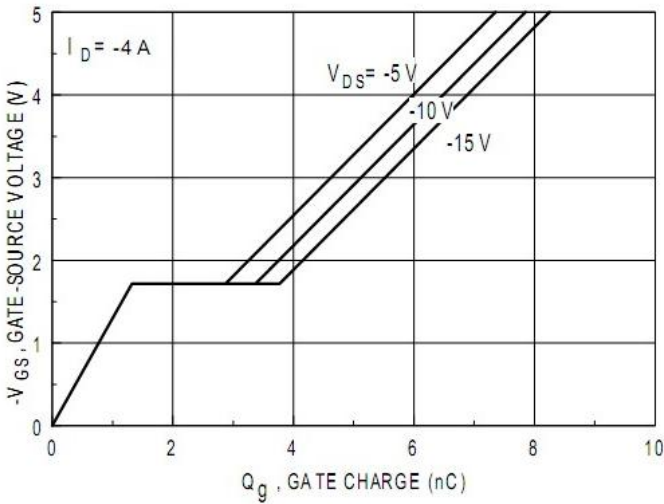


Figure 7. Gate Charge Characteristics.

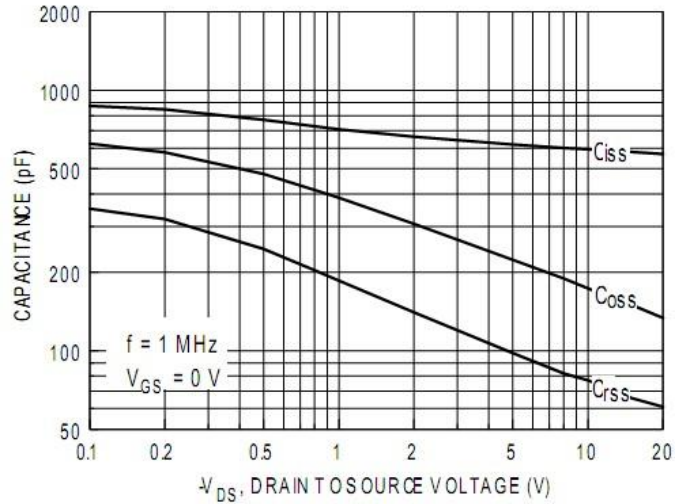


Figure 8. Capacitance Characteristics.

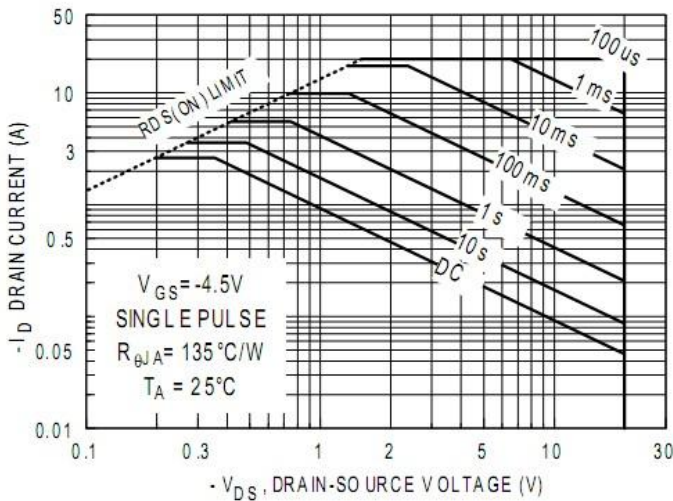


Figure 9. Maximum Safe Operating Area.

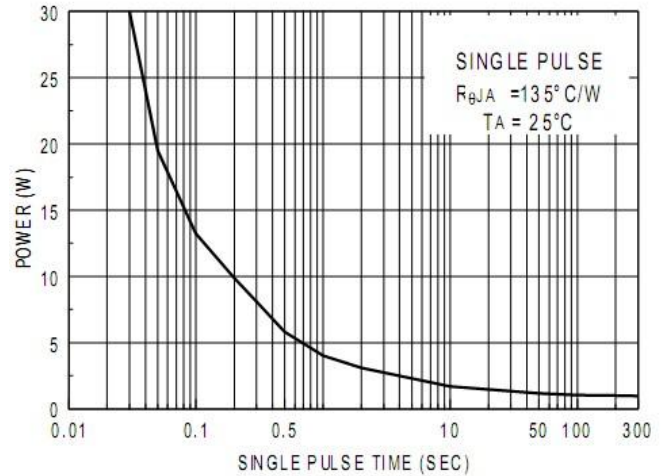


Figure 10. Single Pulse Maximum Power Dissipation.

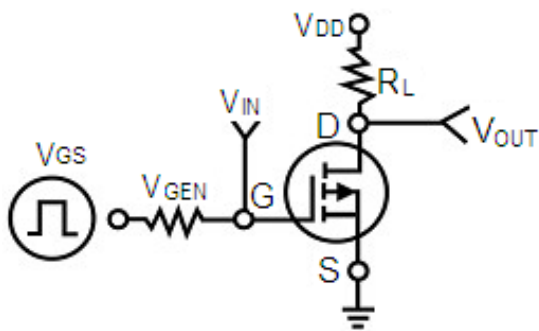


Fig.11 Switching test circuit

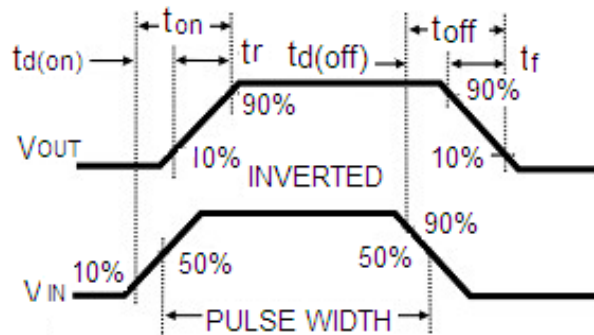
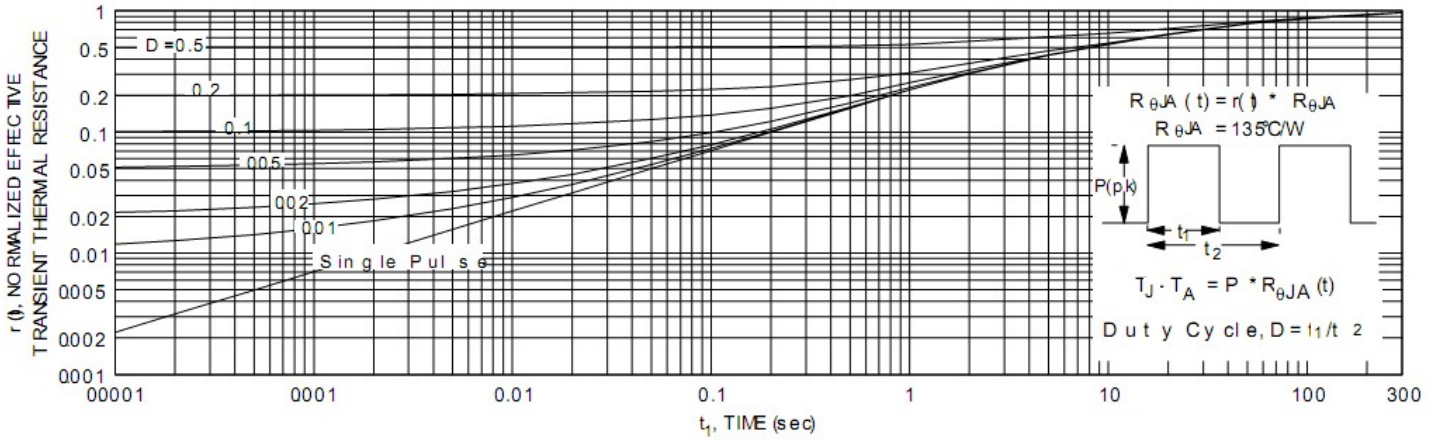


Fig.12 Switching waveforms

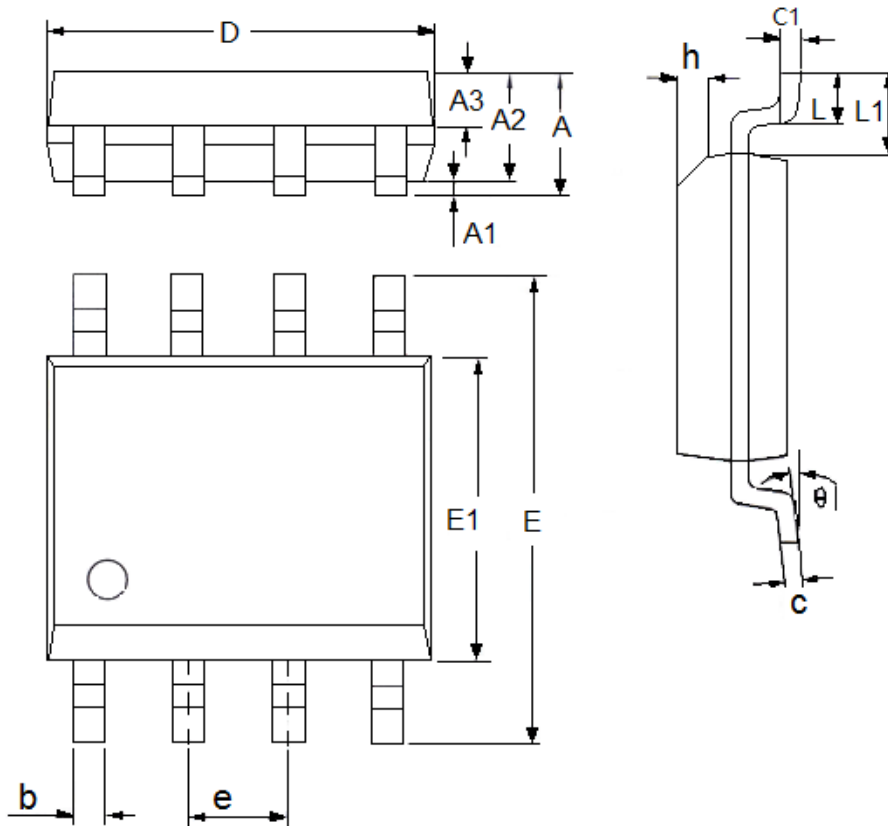


**Figure 13. Transient Thermal Response Curve.**

Thermal characterization performed using the conditions described in Note 1c.  
Transient thermal response will change depending on the circuit board design.

## Package Information

- Package Type:SOP8



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.3	1.8	0.0512	0.0709
A1	0.05	0.25	0.002	0.0098
A2	1.25	1.65	0.0492	0.065
A3	0.5	0.7	0.0197	0.0276
b	0.3	0.51	0.0118	0.0201
c	0.17	0.25	0.0067	0.0098
D	4.7	5.1	0.185	0.2008
E	5.8	6.2	0.2283	0.2441
E1	3.8	4	0.1496	0.1575
e	1.27(TYP)		0.05(TYP)	
h	0.25	0.5	0.0098	0.0197
L	0.4	1.27	0.0157	0.05
L1	1.04(TYP)		0.0409(TYP)	
theta	0	8°	0	8°
c1	0.25(TYP)		0.0098(TYP)	

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