

## N-Channel MOSFET MEM2300XG-N

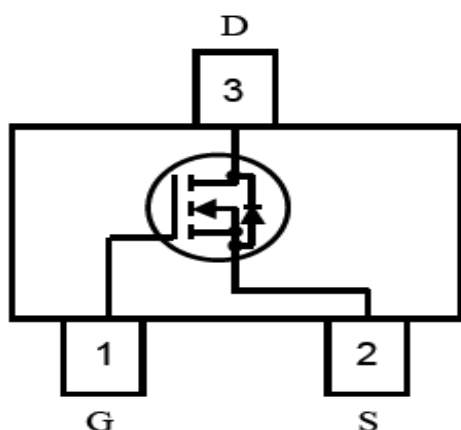
### General Description

MEM2300XG-N Series N-channel enhancement mode field-effect transistor, These miniature surface mount MOSFETs utilize High Cell Density process. Low RDS(ON) assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are DC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

### Features

- 20V/4.1A  
RDS(ON), Vgs@2.5V, Ids@1.5A = 61mΩ  
RDS(ON), Vgs@2.5V, Ids@2.8A = 47mΩ  
RDS(ON), Vgs@4.5V, Ids@4.1A = 37mΩ
- High Density Cell Design For Ultra Low On-Resistance
- High power and current handling capability
- Low side high current DC-DC Converter applications
- Subminiature surface mount package:SOT23

### Pin Configuration



### Typical Application

- Battery management
- High speed switch
- Low power DC to DC converter

### Absolute Maximum Ratings (TA = 25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DSS</sub>	20V	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Drain Current	I <sub>D</sub>	4.1	A
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	16.4	A
Total Power Dissipation	P <sub>d</sub>	1.25	W
operating junction temperature	T <sub>j</sub>	-55~150	°C
Storage Temperature Range	T <sub>stg</sub>	-55~150	°C

### Thermal Characteristics

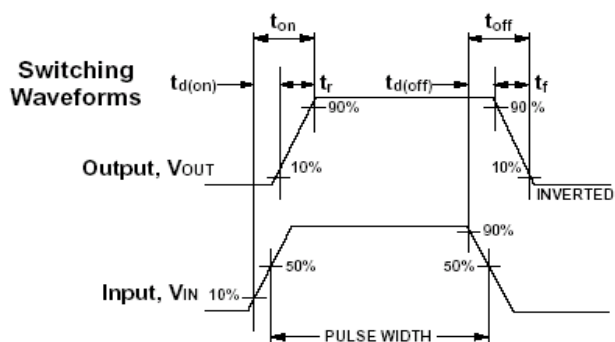
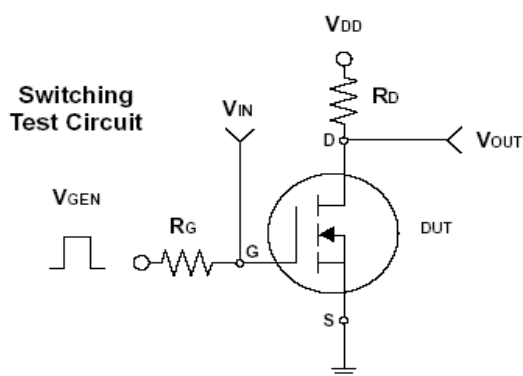
Parameter	Symbol	Ratings	Unit
Thermal Resistance,Junction-to-Ambient	RθJA	100	°C/W

## Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.66	1.2	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=8V$	-	-	100	nA
		$V_{DS}=0V, V_{GS}=-8V$	-	-	-100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$ $T_J=25^\circ C$	-	-	1	$\mu A$
		$V_{DS}=20V, V_{GS}=0V$ $T_J=55^\circ C$	-	-	10	$\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5.2A$	-	37	85	m $\Omega$
		$V_{GS}=2.5V, I_D=3.2A$	-	47	115	m $\Omega$
		$V_{GS}=1.8V, I_D=1.5A$	-	61	130	m $\Omega$
Max. Diode Forward Current	$I_S$		-	-	1.6	A
Source-drain (diode forward) voltage	$V_{SD}$	$V_{GS}=0V, I_S=2.8A$	-	0.72	1.2	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10 V,$ $V_{GS} = 0 V,$ $f = 1 MHz$	-	350	-	pF
Output Capacitance	$C_{oss}$		-	40	-	
Reverse Transfer Capacitance	$C_{rss}$		-	29	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 10 V,$ $I_D=4.1A$ $V_{GS} = 4.5V,$ $R_g = 6\Omega$	-	4	-	ns
Rise Time	$t_r$		-	47	-	
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	
Fall-Time	$t_f$		-	10	-	
Total Gate Charge	$Q_g$	$V_{DS} = 10V,$ $V_{GS} = 4.5 V,$ $I_D = 4.1A$	-	4.6	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.8	-	
Gate-Drain Charge	$Q_{gd}$		-	1	-	

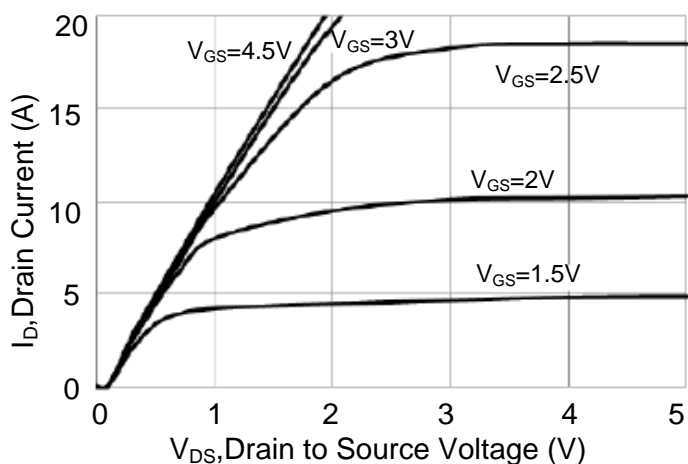
1、Repetitive rating, pulse width limited by junction temperature.

2、Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

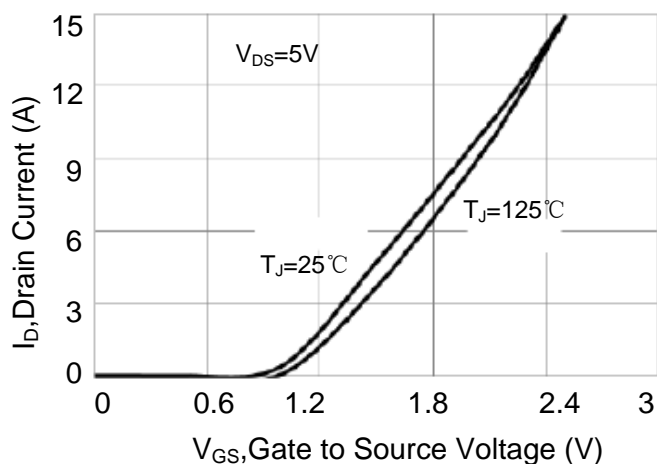


Typical Performance Characteristics

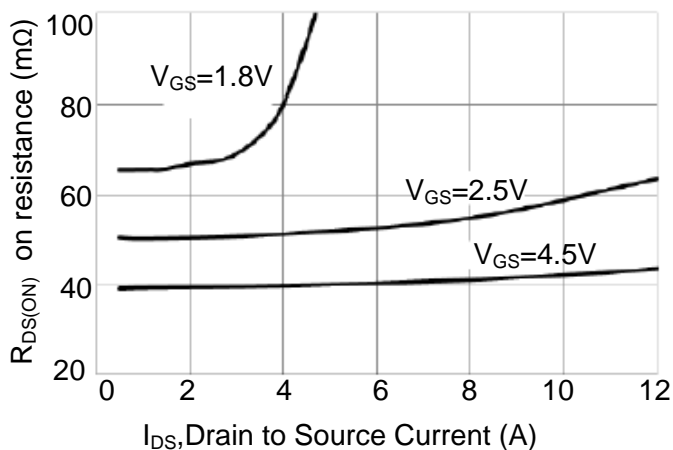
On-state Characteristics



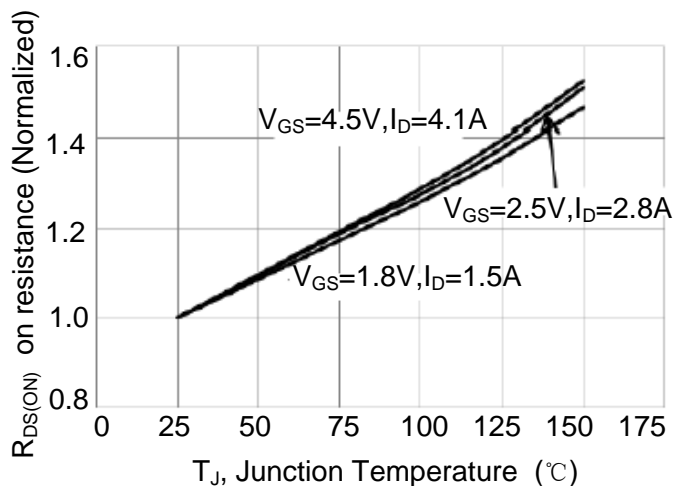
Transfer Characteristics



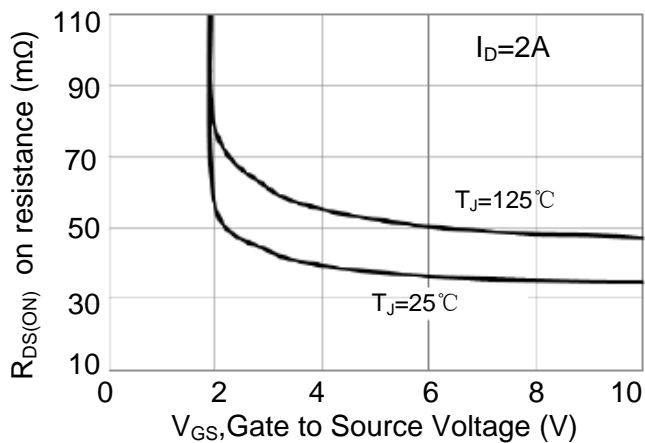
On-Resistance vs. Drain Current



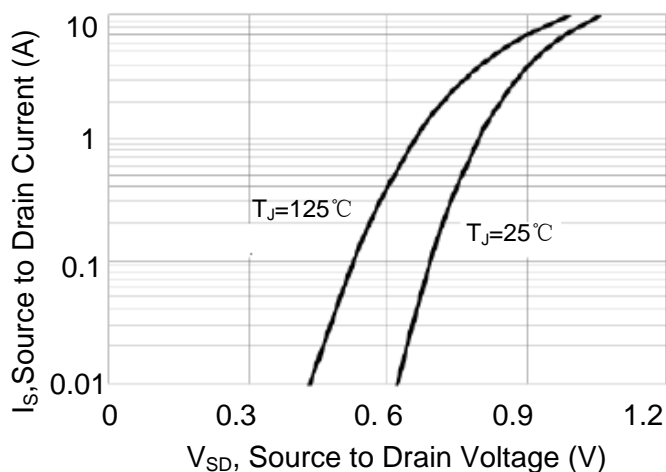
Normalized On-Resistance vs.  $T_J$



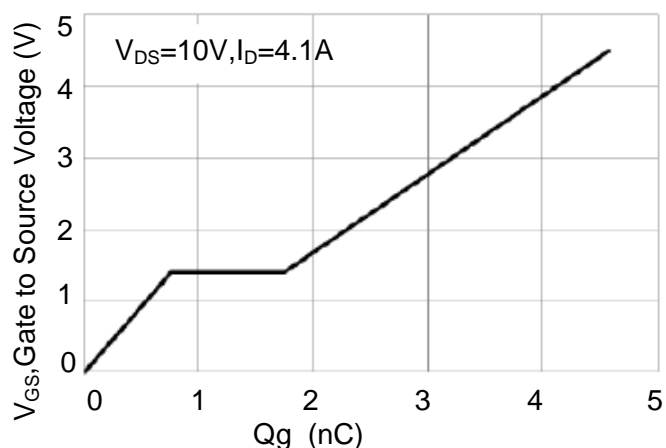
On-Resistance Variation vs.  $V_{GS}$



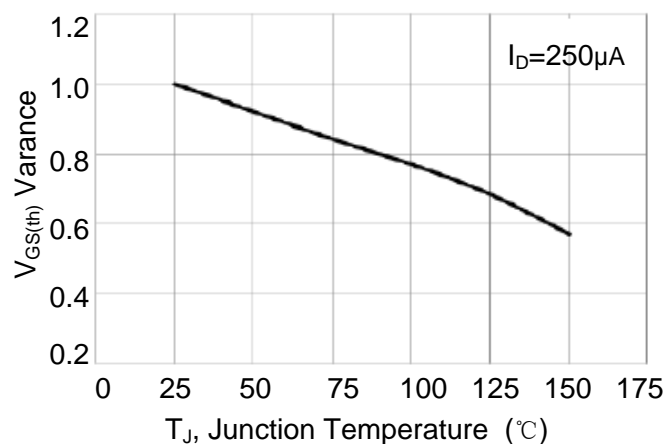
Body Diode Characteristics



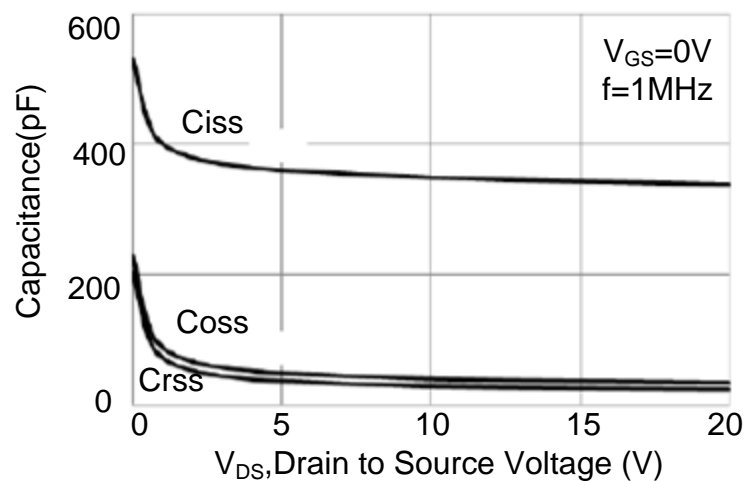
### Gate Charge Characteristics



### Threshold Voltage Variation with Temperature

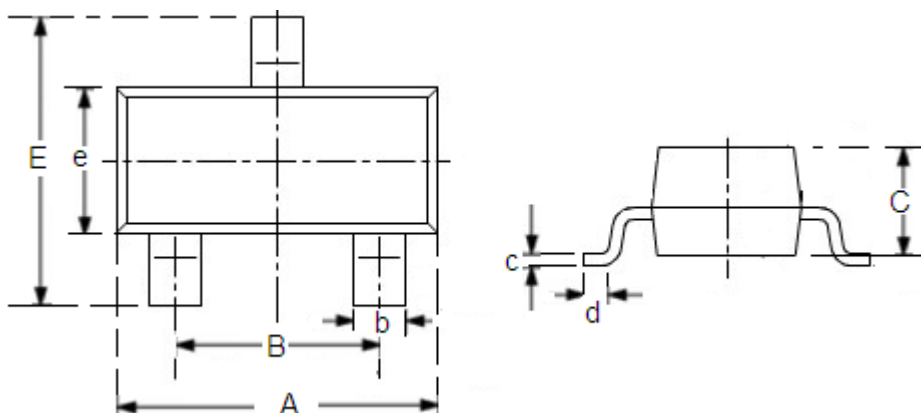


### Capacitance vs. Drain-Source Voltage



## Package Information

Package Type:SOT23 Unit:mm(inch)



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.1	2.64	0.0827	0.1039
e	1.2	1.4	0.0472	0.0551

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