N-Channel MOSFET MEM2310X

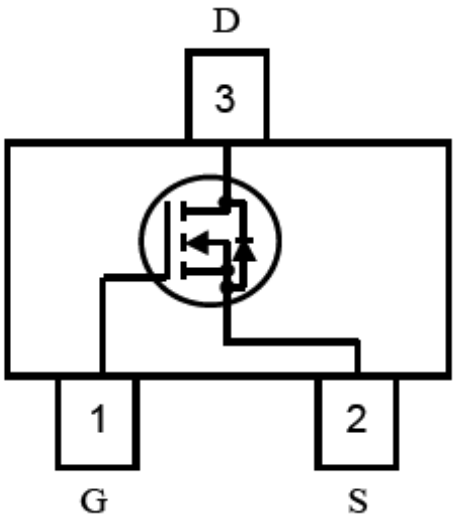
General Description

MEM2310XG Series 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 in a very small outline surface mount package.

Features

- 30V/5.8A
  $R_{DS(ON)}$ =25mΩ@ V_{GS}=10V, I_D=5.8A
  $R_{DS(ON)}$ =28mΩ@ V_{GS}=4.5V, I_D=5A
  $R_{DS(ON)}$ =37mΩ@ V_{GS}=2.5V, I_D=4A
- High Density Cell Design For Ultra Low On-Resistance
- Subminiature surface mount package:SOT23

Pin Configuration



Typical Application

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

Absolute Maximum Ratings

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	30V	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current	T_A=25℃	I_D	5.8	A
	T_A=70℃		4.9	
Pulsed Drain Current[1,2]		I_{DM}	30	A
Total Power Dissipation	T_A=25℃	Pd	1.4	W
	T_A=70℃		1	
operating junction temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-65/150	℃

Thermal Characteristics

Parameter		Symbol	TYP.	MAX.	Unit
Thermal Resistance,Junction-to-Ambient	t≤10s	RθJA	65	90	℃/W
Thermal Resistance, Junction-to-Ambient	Steady-State	RθJA	85	125	℃/W
Thermal Resistance,Junction-to-Lead	Steady-State	RθJL	43	60	℃/W

Electrical Characteristics

MEM2310X

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	30	35		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	0.7	0.88	1.4	V
Gate-Body Leakage	I_{GSS}	V_{DS}=0V，V_{GS}=12V		0.5	100	nA
		V_{DS}=0V，V_{GS}=-12V		-0.2	-100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V V_{GS}=0V			1000	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.8A		25	30	mΩ
		V_{GS}=4.5V, I_D=5A		28	33	mΩ
		V_{GS}=2.5V, I_D=4A		37	50	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 5A	10	15		S
Maximum Body-Diode Continuous Current	Is				2.5	A
Source-drain (diode forward) voltage	V_{SD}	V_{GS}=0V,I_D=1A		0.72	1.0	V
Dynamic Characteristics						
Input Capacitance	Ciss	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		823	1030	pF
Output Capacitance	Coss			99		
Reverse Transfer Capacitance	Crss			77		
Gate resistance	Rg	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.2	3.6	Ω
Switching Characteristics						
Turn-On Delay Time	td(on)	V_{DD} = 15 V, R_L = 2.7Ω V_{GEN} = 10V, Rg = 3 Ω		7	14	ns
Rise Time	tr			15	30	
Turn-Off Delay Time	td(off)			38	76	
Fall-Time	tf			3	6	
Total Gate Charge	Qg	V_{DS} = 15 V, V_{GS} = 4.5 V, I_D = 5.8A		11	14.3	nc
Gate-Source Charge	Qgs			1.6	2.08	
Gate-Drain Charge	Qgd			2.8	3.64	

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

2、Pulse width <300us , duty cycle <0.5%.

Typical Performance Characteristics

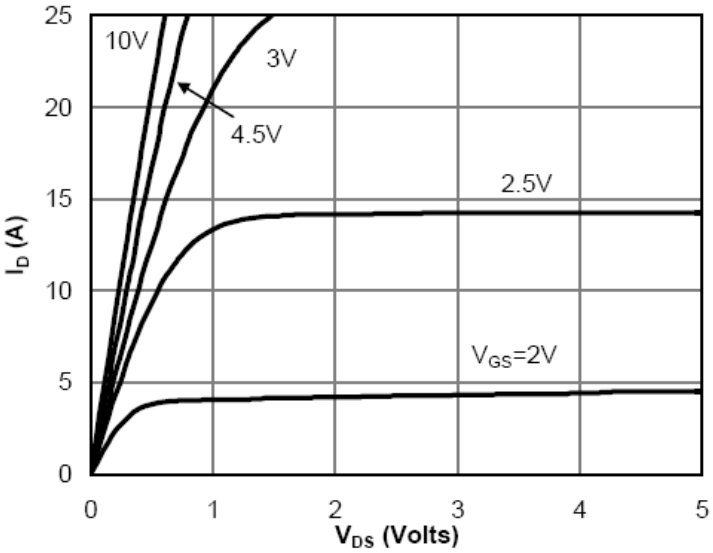


Fig 1: On-Region Characteristics

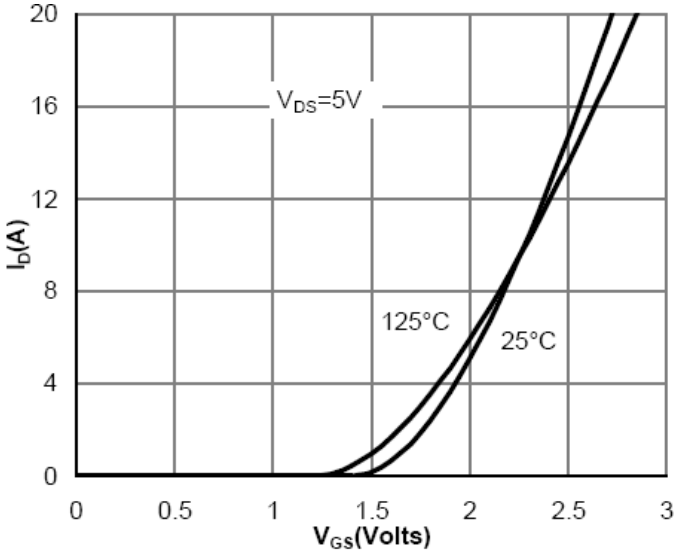


Figure 2: Transfer Characteristics

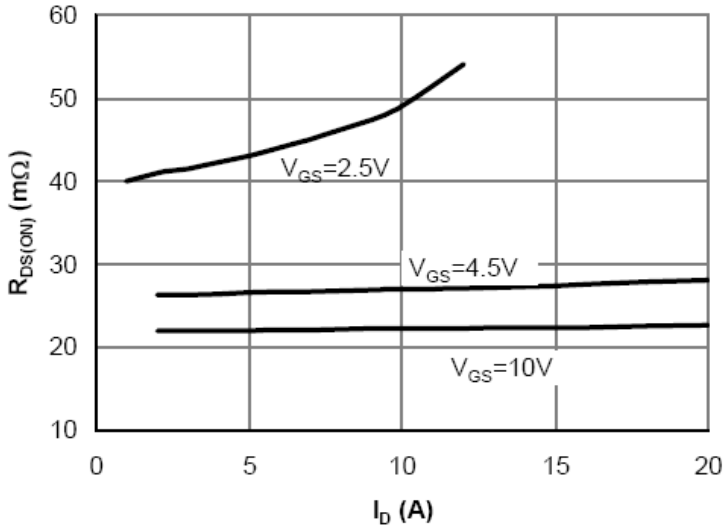


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

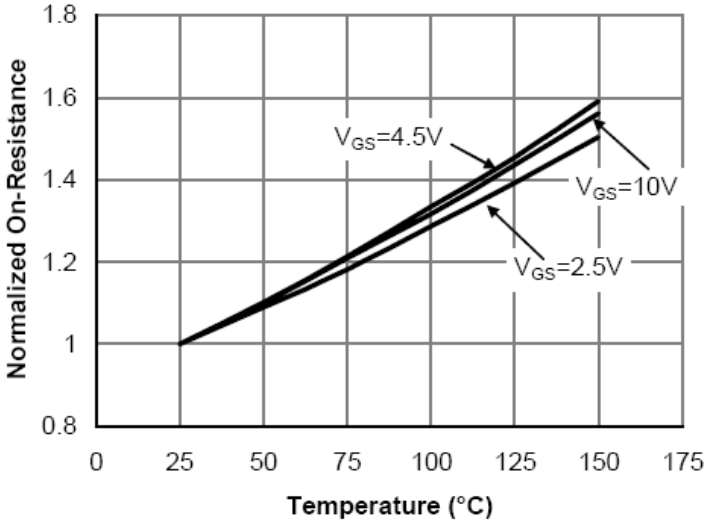


Figure 4: On-Resistance vs. Junction Temperature

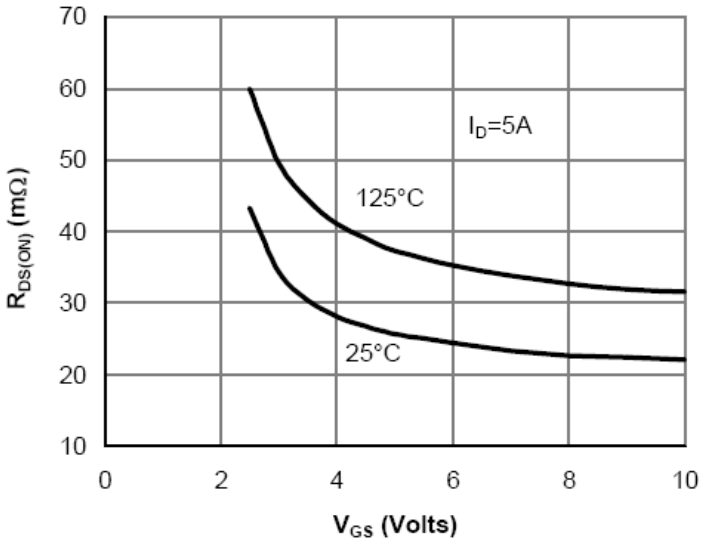


Figure 5: On-Resistance vs. Gate-Source Voltage

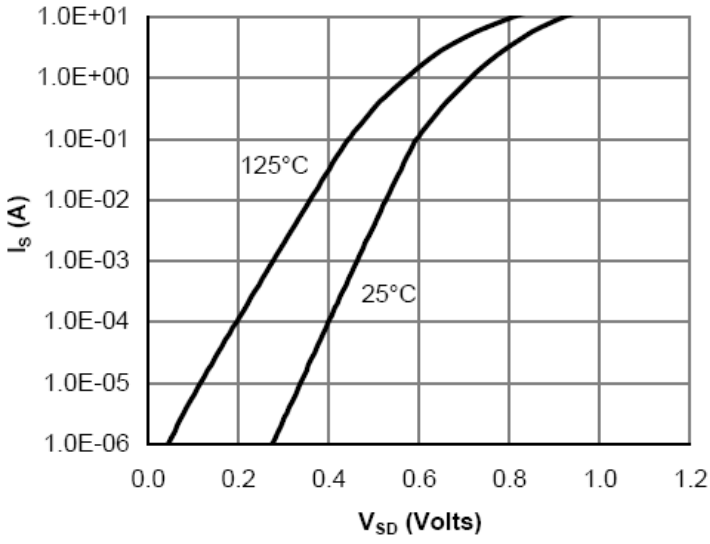


Figure 6: Body-Diode Characteristics

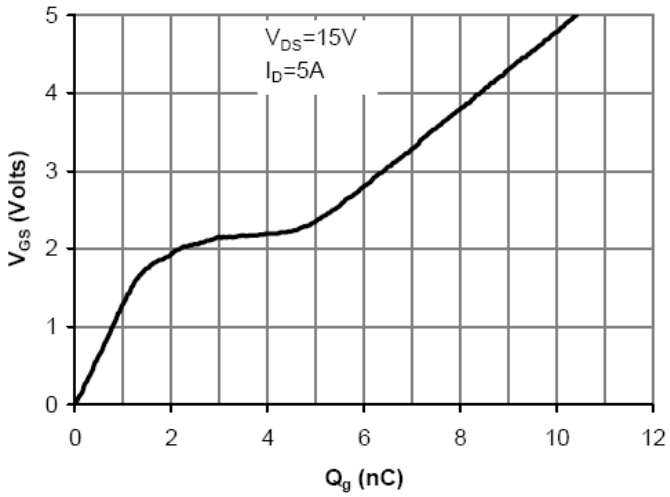


Figure 7: Gate-Charge Characteristics

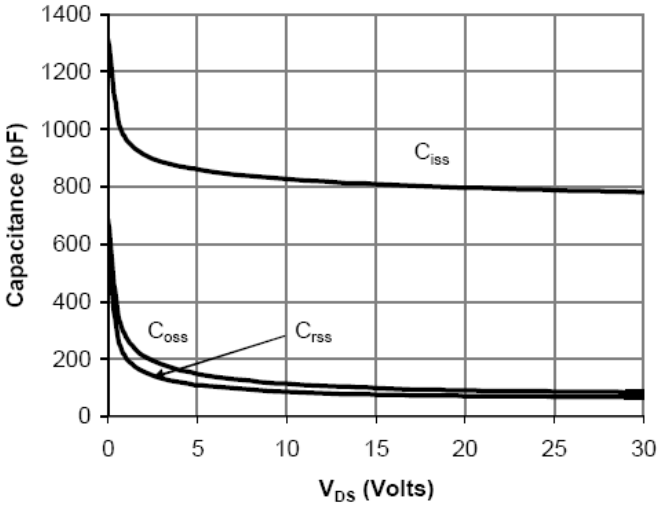


Figure 8: Capacitance Characteristics

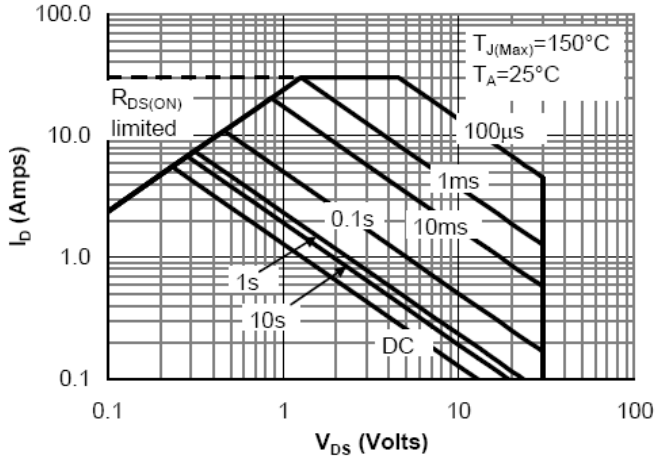


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

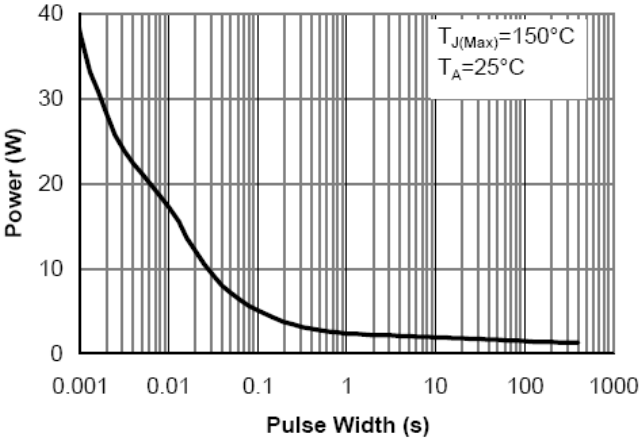


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

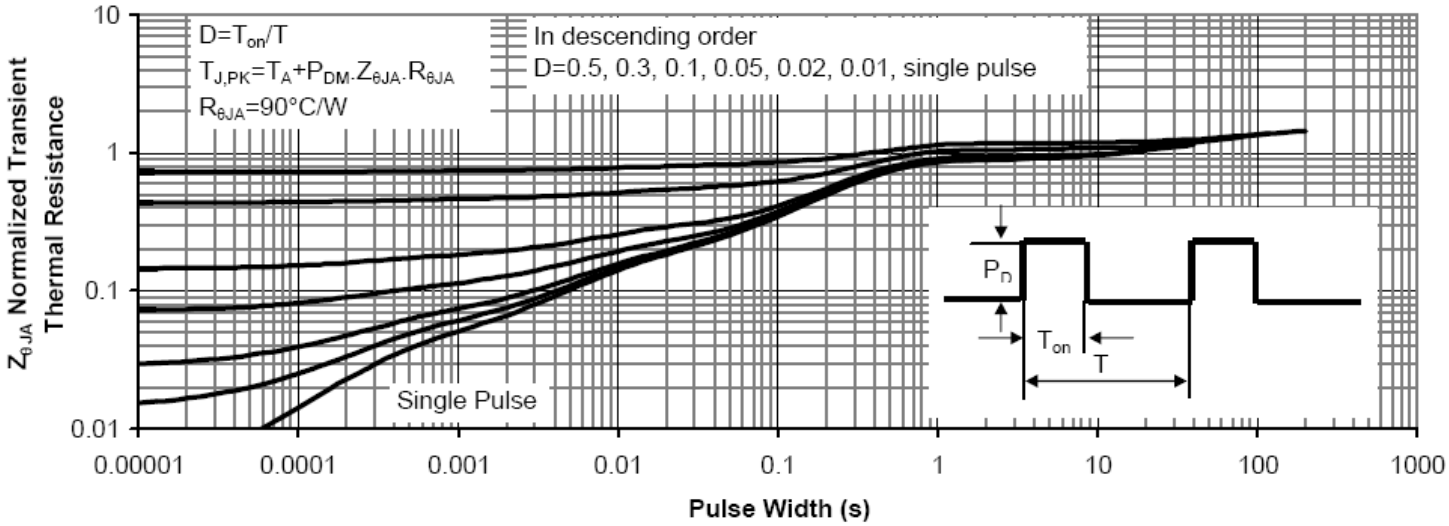
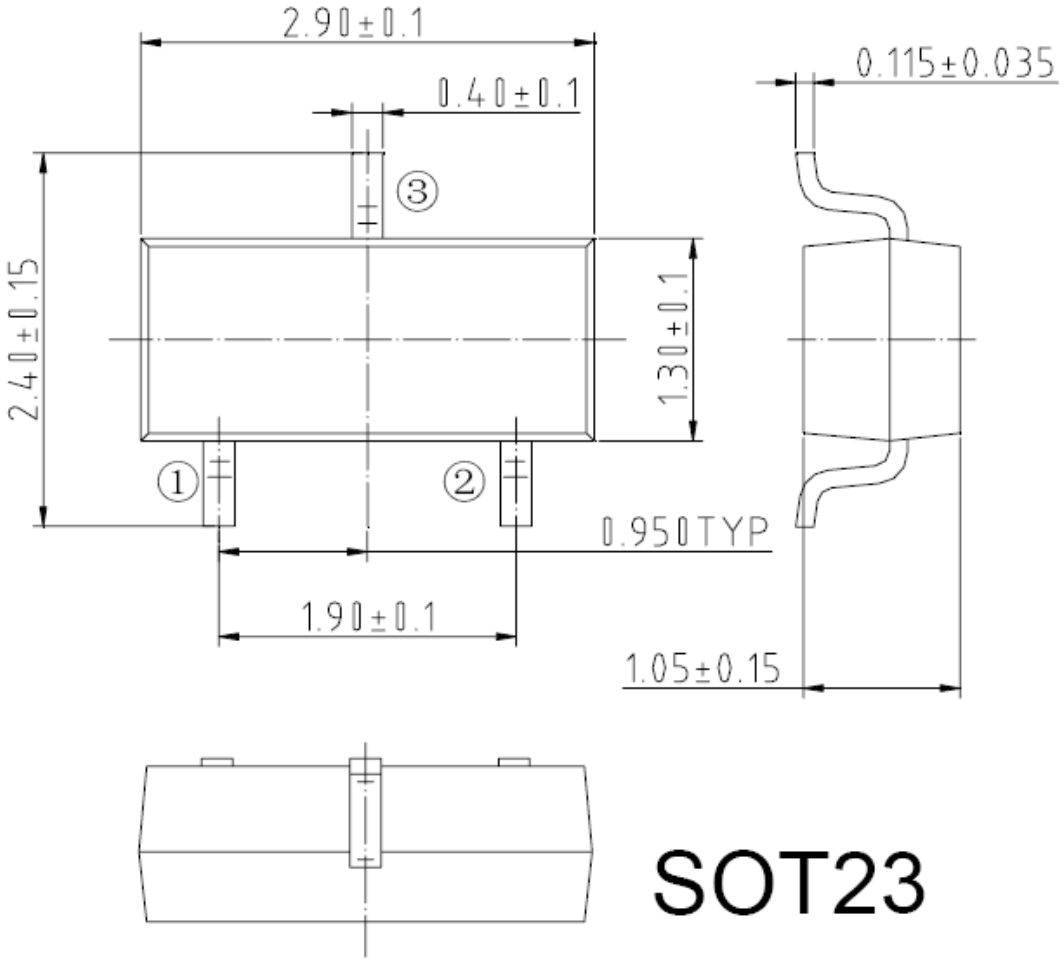


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Information



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