N-Channel MOSFET MEM2302X

General Description

MEM2302XG 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.

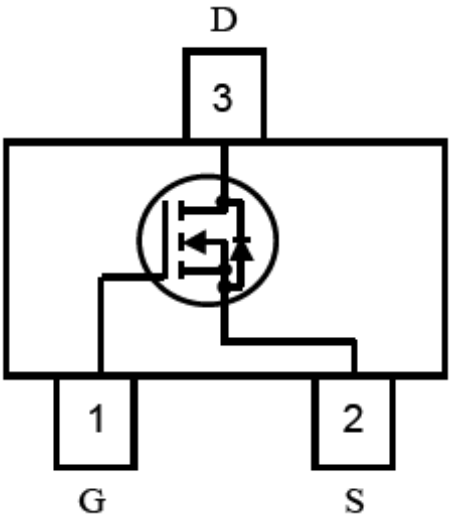
Features

- 20V/3A

  $R_{DS(ON)}$ =29mΩ@ V_{GS}=4.5V, I_D=3A

  $R_{DS(ON)}$ =36mΩ@ V_{GS}=2.5V, I_D=2A
- 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}	20V	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	T_A=25℃	I_D	3	A
	T_A=70℃		2	
Pulsed Drain Current[1,2]		I_{DM}	15	A
Total Power Dissipation	T_A=25℃	Pd	0.7	W
	T_A=70℃		0.46	
operating junction temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-65/150	℃

Thermal Characteristics

Parameter	Symbol	Ratings	Unit
Thermal Resistance,Junction-to-Ambient	RθJA	140	℃/W

Electrical Characteristics

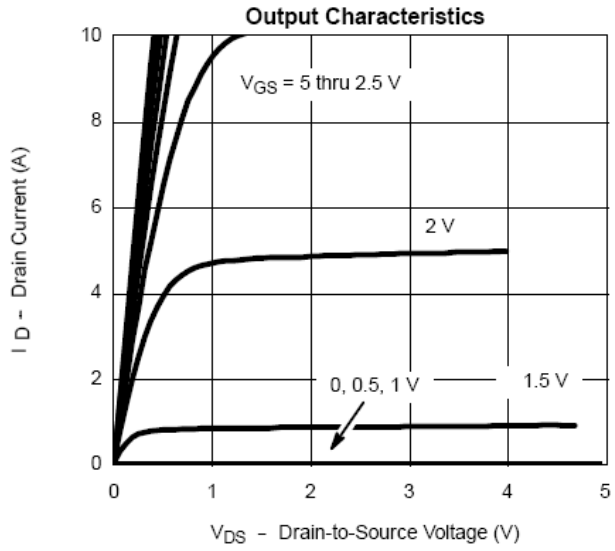
MEM2302X

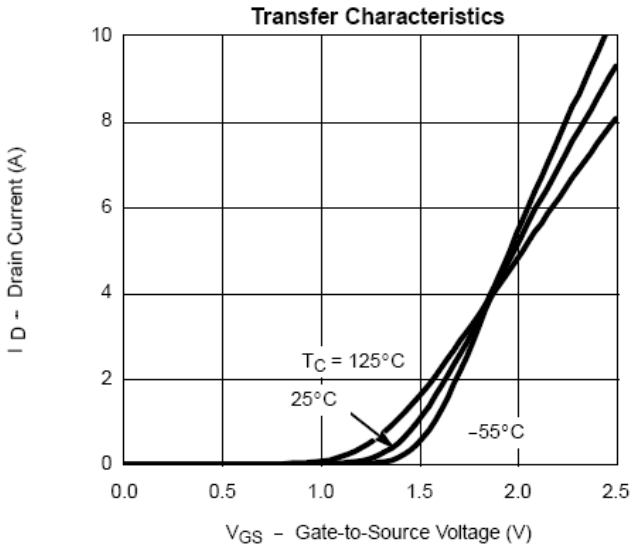
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	20	23		V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	0.51	0.53	0.85	V
Gate-Body Leakage	I_{GSS}	V_{DS}=0V，V_{GS}=8V		1.6	100	nA
		V_{DS}=0V，V_{GS}=-8V		−0.2	−100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V V_{GS}=0V		6.3	1000	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=3A		29	50	mΩ
		V_{GS}=2.5V, I_D=2A		36	65	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 3.6A		8		S
Source-drain (diode forward) voltage	V_{SD}	V_{GS}=0V,I_S=1.25A	0.4	0.7	1	V
Dynamic Characteristics						
Input Capacitance	Ciss	V_{DS} = 10 V,		300		pF
Output Capacitance	Coss	V_{GS} = 0 V,		120		
Reverse Transfer Capacitance	Crss	f = 1 MHz		80		
Switching Characteristics						
Turn-On Delay Time	td(on)	V_{DD} = 15 V, R_L = 2.8Ω		8	15	ns
Rise Time	tr	I_D=3.6A		50	80	
Turn-Off Delay Time	td(off)	V_{GEN} = 4.5V,		15	60	
Fall-Time	tf	Rg = 36Ω		10	25	
Total Gate Charge	Qg	V_{DS} = 10V,		4	10	nc
Gate-Source Charge	Qgs	V_{GS} = 4.5 V,		0.65		
Gate-Drain Charge	Qgd	I_D = 3.6A		1.5		

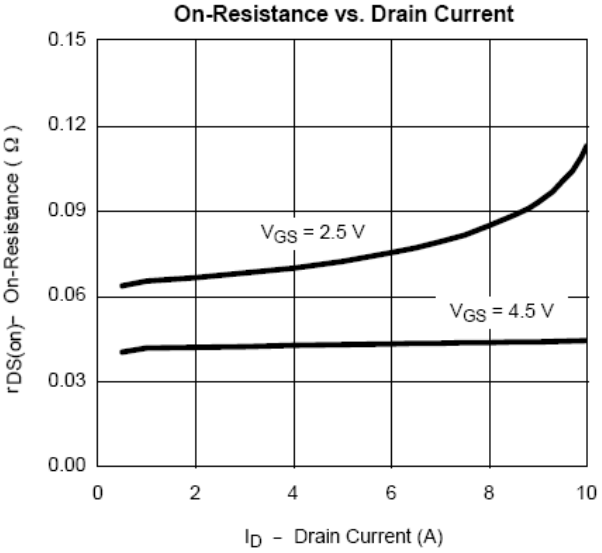
1、Repetitive rating, pulse width limited by junction temperature.

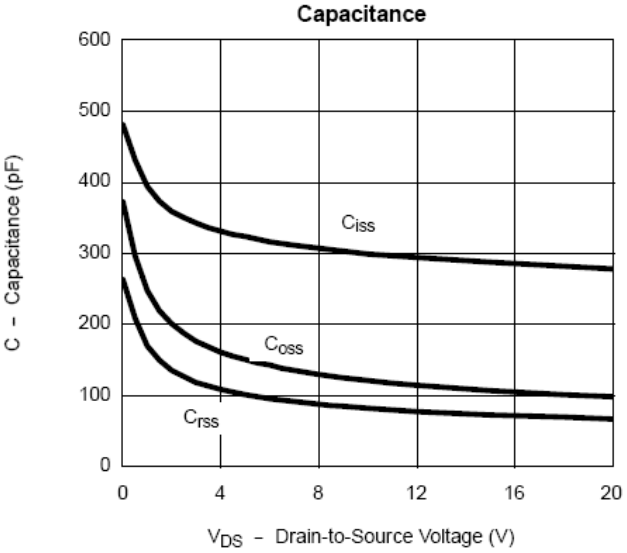
2、Pulse width <300us , duty cycle <0.5%.

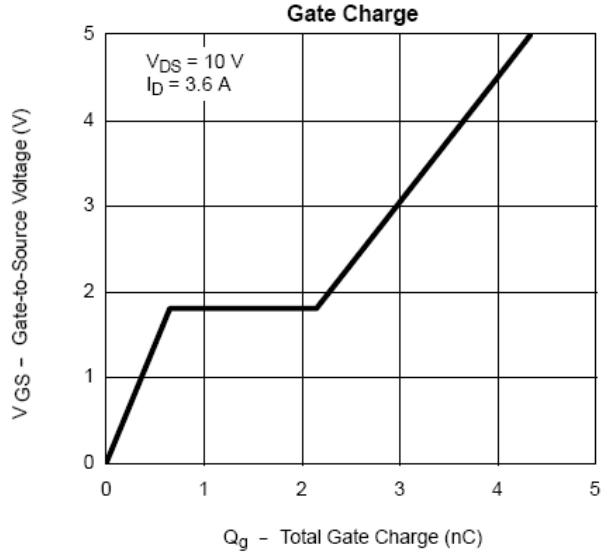
Typical Performance Characteristics

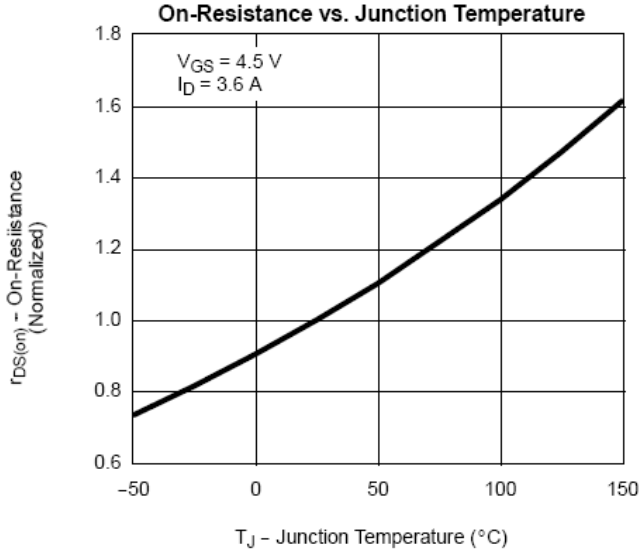




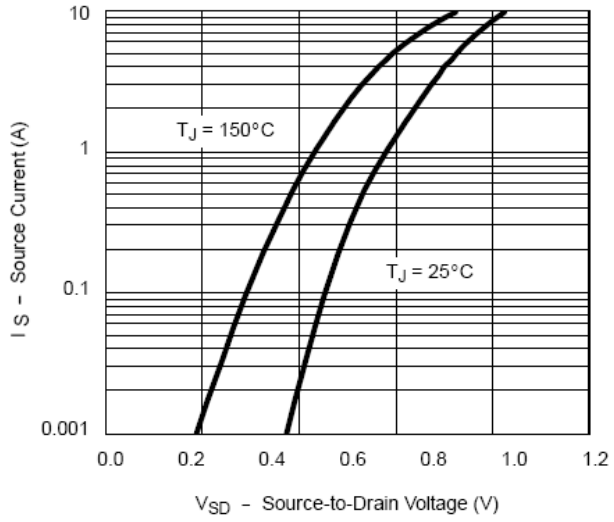




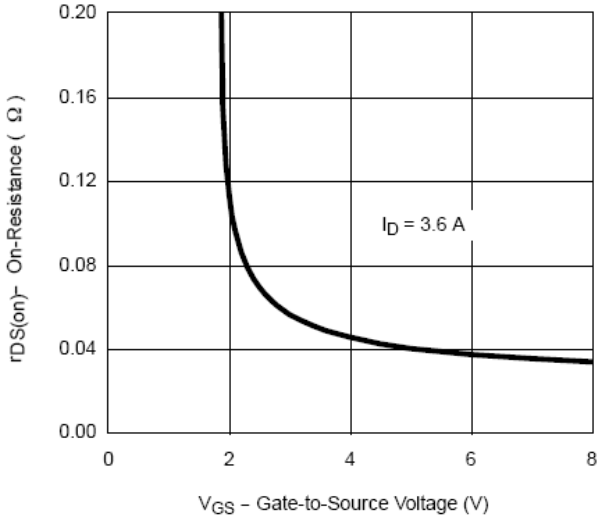




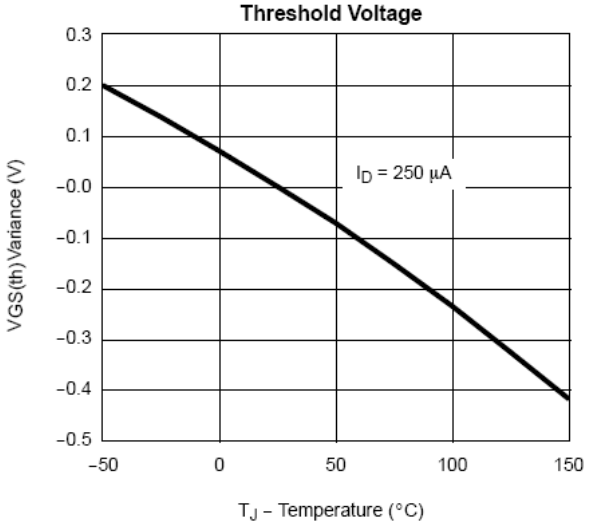
Source-Drain Diode Forward Voltage



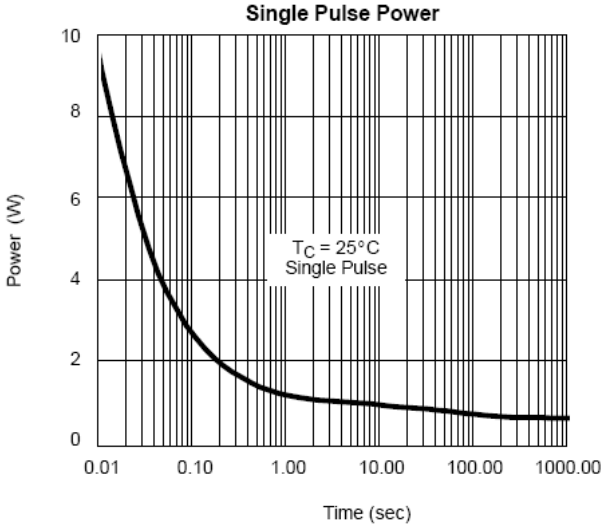
On-Resistance vs. Gate-to-Source Voltage



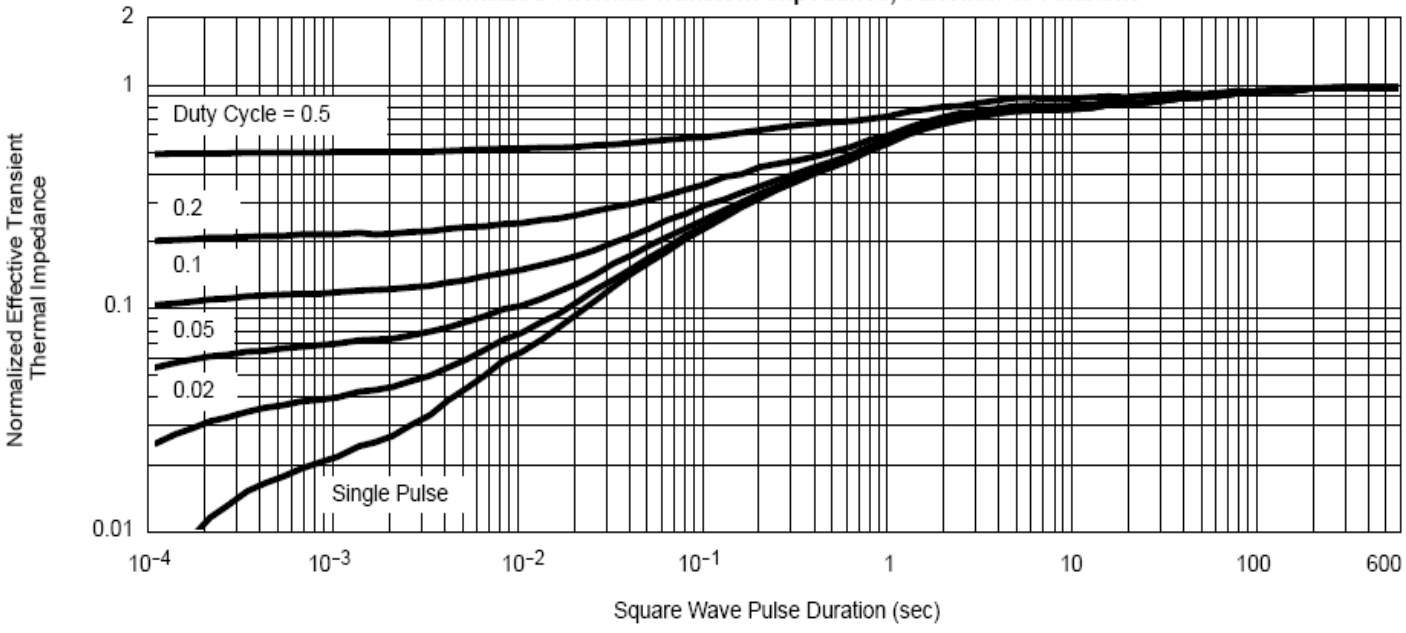
Threshold Voltage



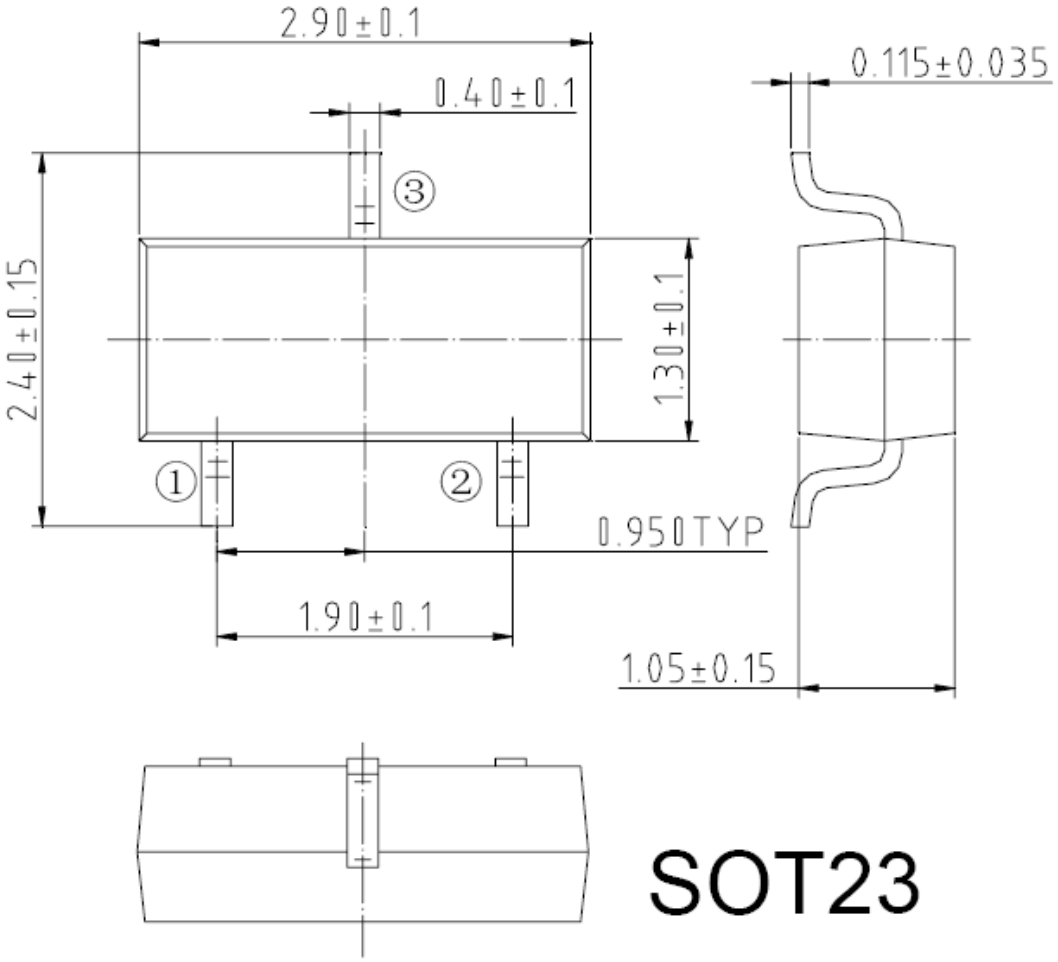
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Package Information



SOT23

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