

N-Channel MOSFET MEM2302X

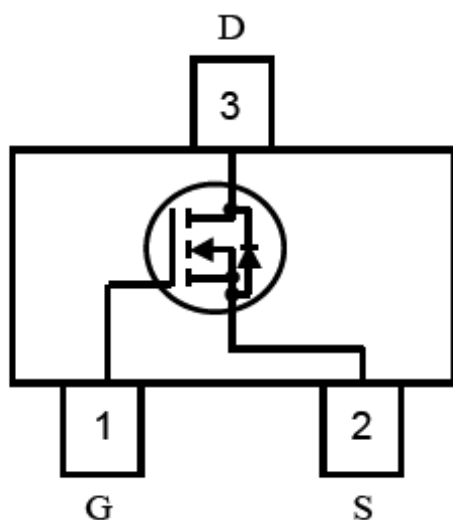
General Description

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
 $R_{DS(ON)} = 29m\Omega @ V_{GS}=4.5V, I_D=3A$
 $R_{DS(ON)} = 36m\Omega @ V_{GS}=2.5V, I_D=2A$
- 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	$T_A=25^\circ C$	I_D	3	A
	$T_A=70^\circ C$		2	
Pulsed Drain Current ^{1,2}		I_{DM}	15	A
Total Power Dissipation	$T_A=25^\circ C$	P_d	0.7	W
	$T_A=70^\circ C$		0.46	
operating junction temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	-65/150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Ratings	Unit
Thermal Resistance,Junction-to-Ambient	R θ JA	140	°C/W

Electrical Characteristics

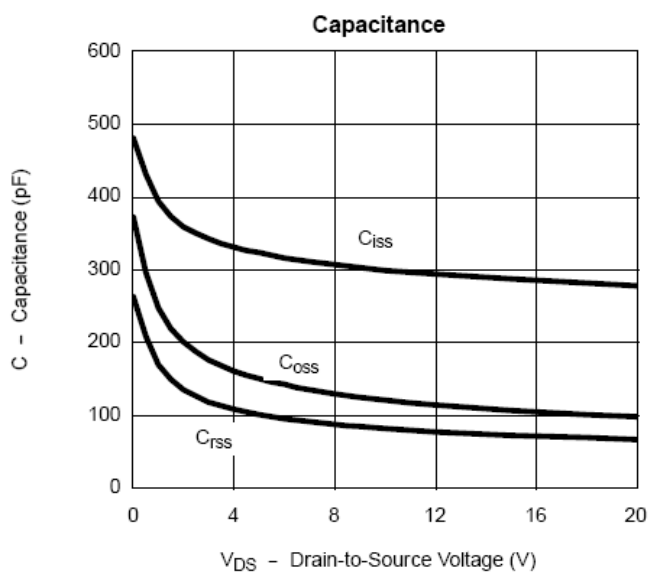
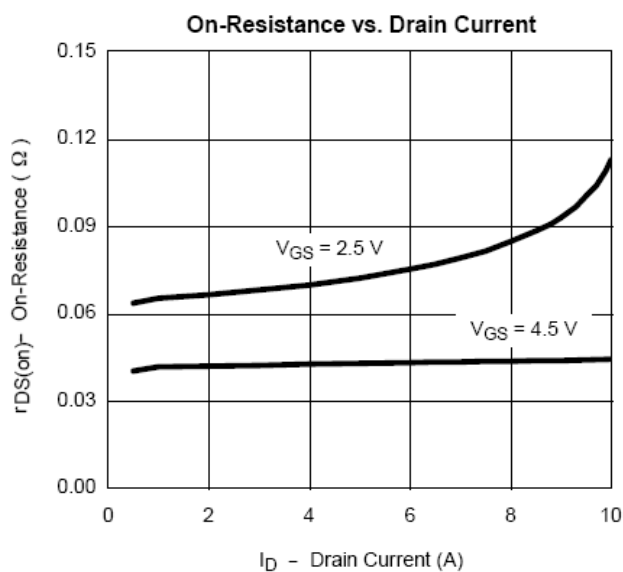
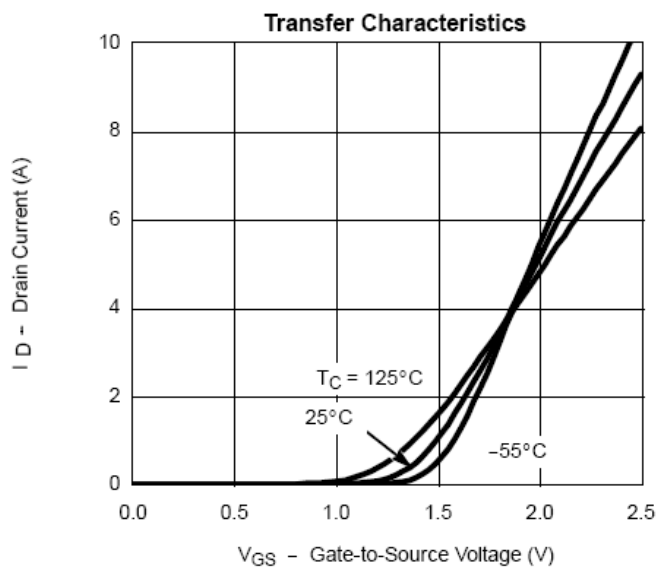
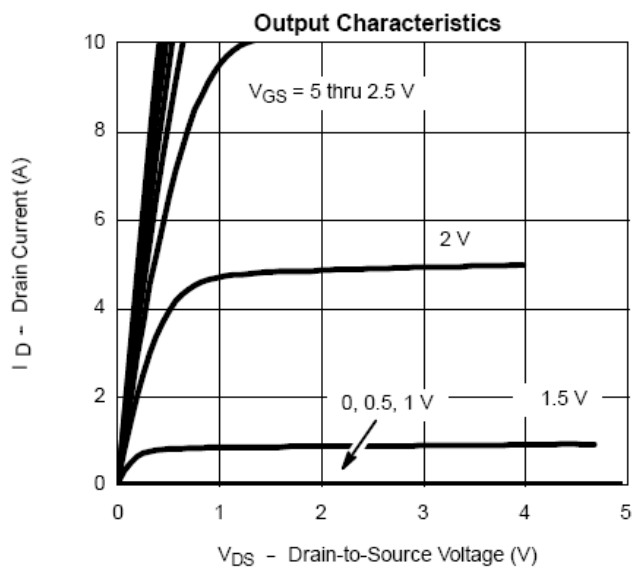
MEM2302X

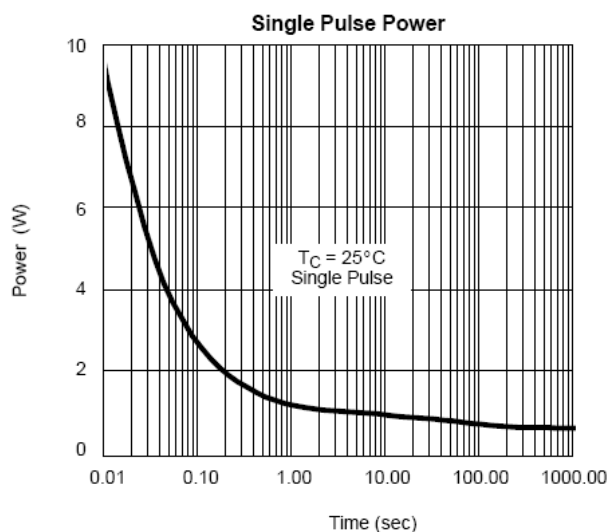
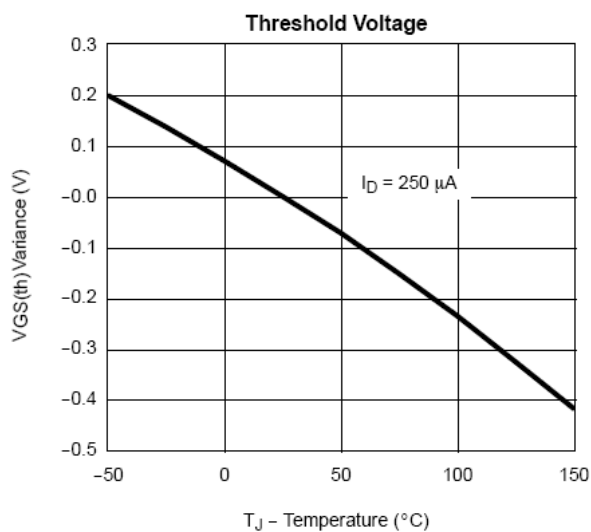
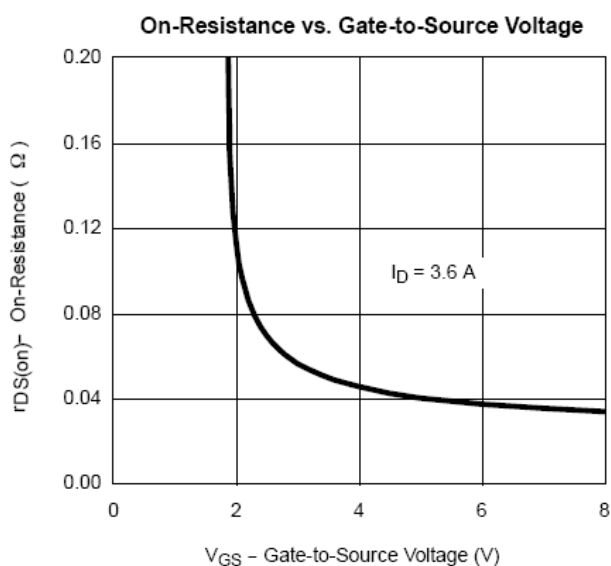
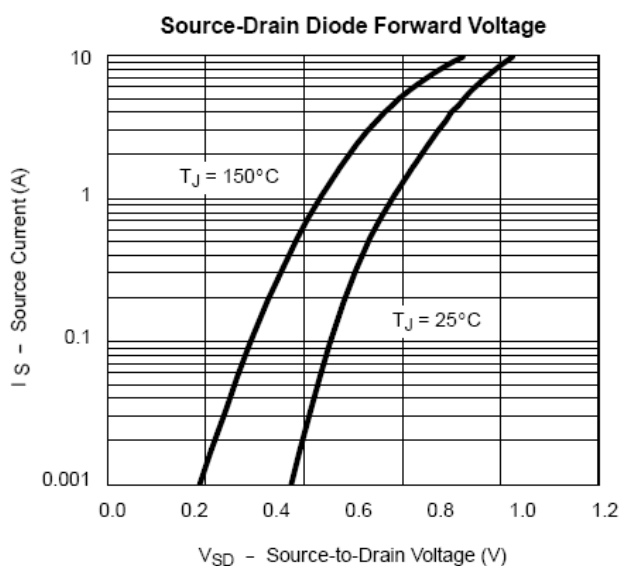
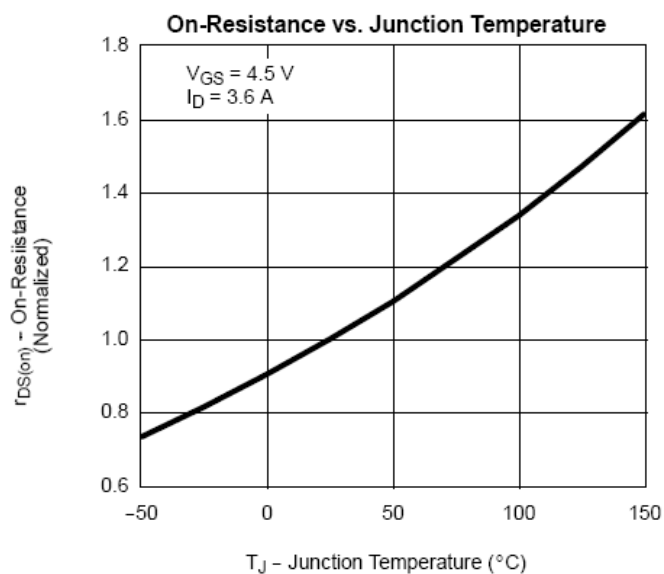
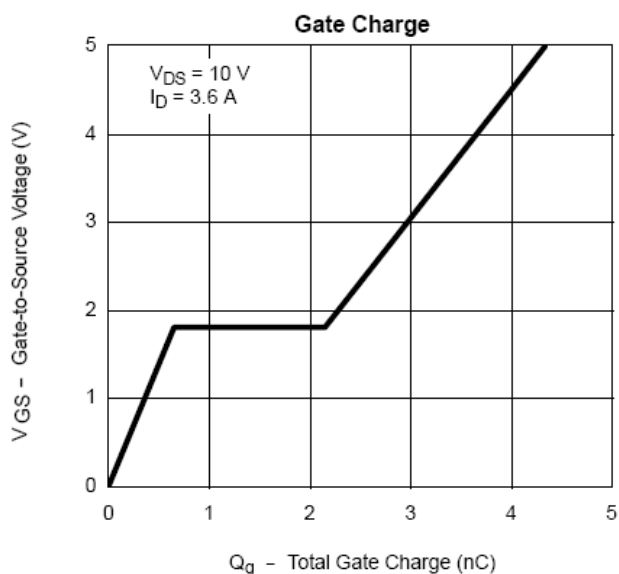
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	23		V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}= V_{GS}, I_D=250\mu A$	0.51	0.53	0.85	V
Gate-Body Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=8V$		1.6	100	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}	$V_{DS} = 5V, I_D = 3.6A$		8		S
Source-drain (diode forward) voltage	V_{SD}	$V_{GS}=0V, I_D=1.25A$	0.4	0.7	1	V
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 10V,$ $V_{GS} = 0V,$ $f = 1MHz$		300		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			80		
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V,$ $R_L = 2.8\Omega$ $I_D=3.6A$ $V_{GEN} = 4.5V,$ $R_g = 36\Omega$		8	15	ns
Rise Time	t_r			50	80	
Turn-Off Delay Time	$t_{d(off)}$			15	60	
Fall-Time	t_f			10	25	
Total Gate Charge	Q_g	$V_{DS} = 10V,$ $V_{GS} = 4.5V,$ $I_D = 3.6A$		4	10	nC
Gate-Source Charge	Q_{gs}			0.65		
Gate-Drain Charge	Q_{gd}			1.5		

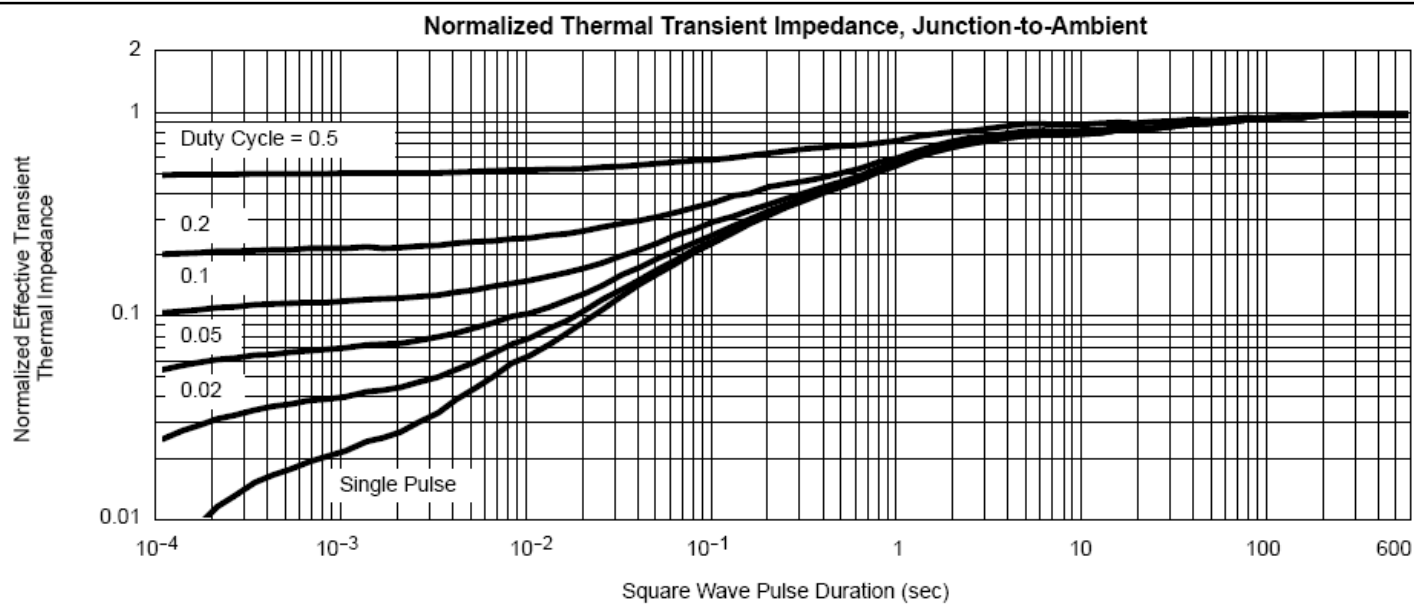
1、 Repetitive rating, pulse width limited by junction temperature.

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

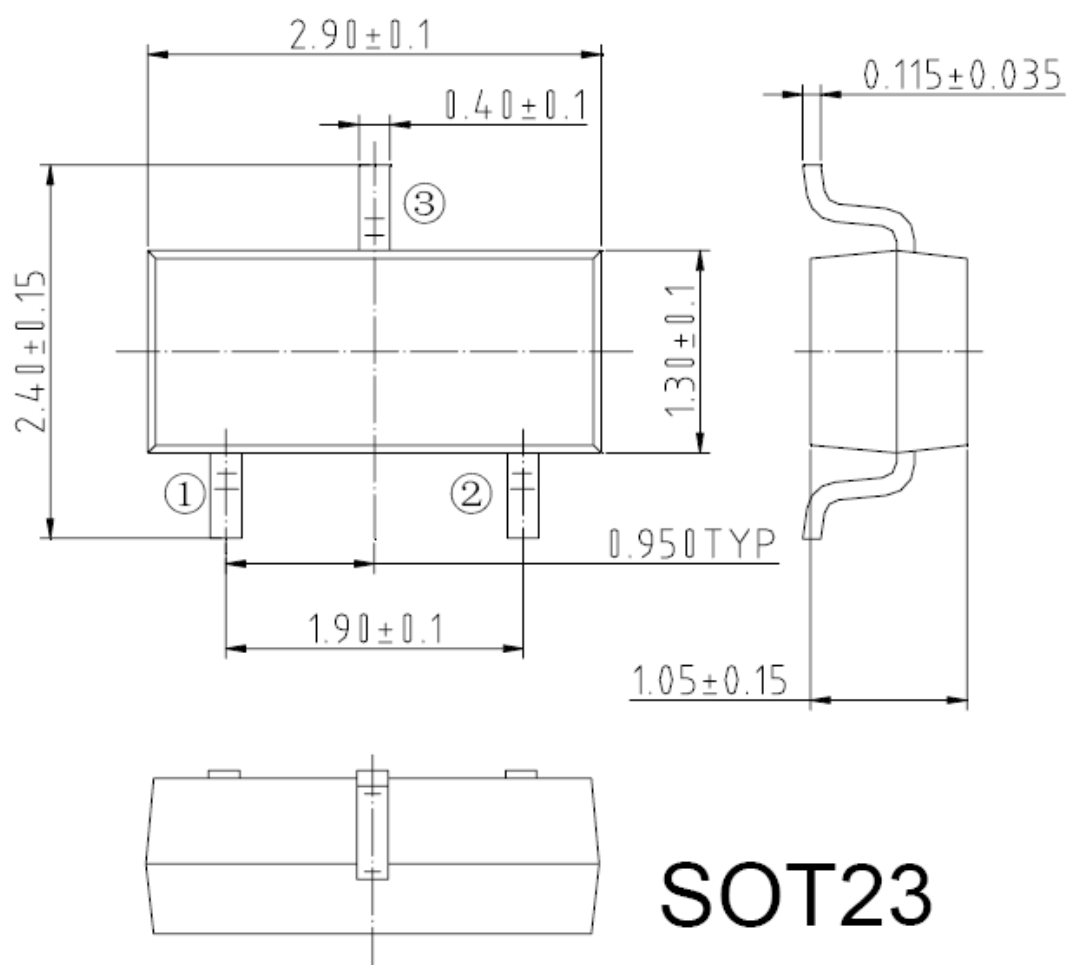
Typical Performance Characteristics







Package Information



SOT23

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