

P-Channel MOSFET MEM2301X

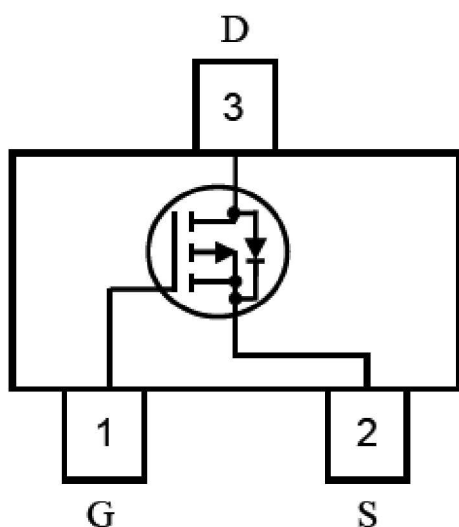
General Description

MEM2301XG Series 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, and low power dissipation in a very small outline surface mount package.

Features

- -20V/-2.8A
 $R_{DS(ON)} = 93m\Omega @ V_{GS} = -4.5V, I_D = -2.8A$
 $R_{DS(ON)} = 113m\Omega @ V_{GS} = -2.5V, I_D = -2A$
- High Density Cell Design For Ultra Low On-Resistance
- Subminiature surface mount package: SOT23

Pin Configuration



Typical Application

- Power management
- Load switch
- Battery protection

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 8	V
Continuous Drain Current	I_D	$T_A = 25^\circ C$	-2.8
		$T_A = 70^\circ C$	-1.8
Pulsed Drain Current ^{1,2}	I_{DM}	-10	A
Total Power Dissipation	P_d	$T_A = 25^\circ C$	0.7
		$T_A = 70^\circ C$	0.45
Operating Temperature Range	T_{Opr}	150	$^\circ C$
Storage Temperature Range	T_{stg}	-65/150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	MAX.	Unit
Thermal Resistance, Junction-to-Ambient ³	R θ JA	145	$^{\circ}$ C/W

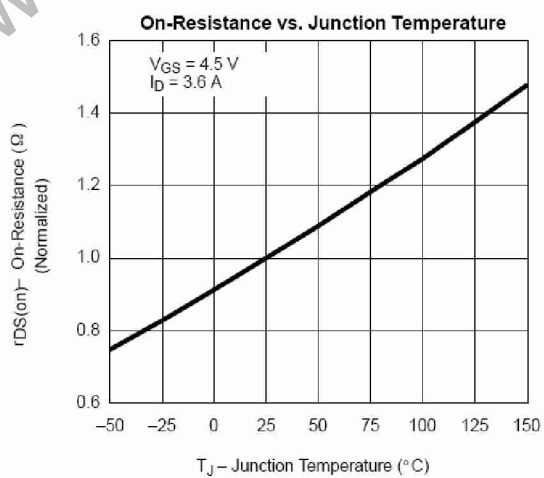
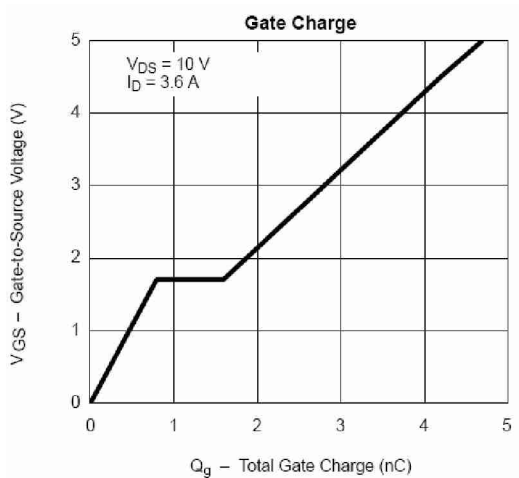
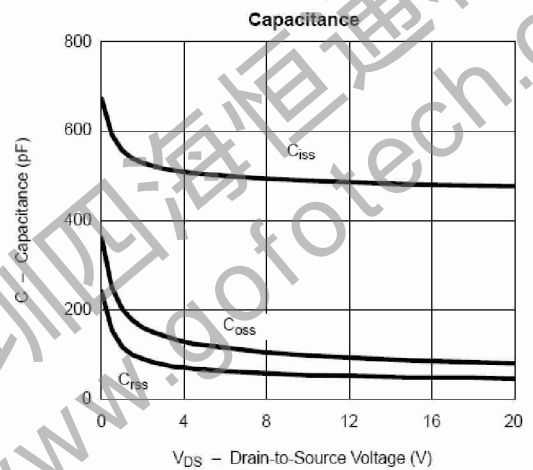
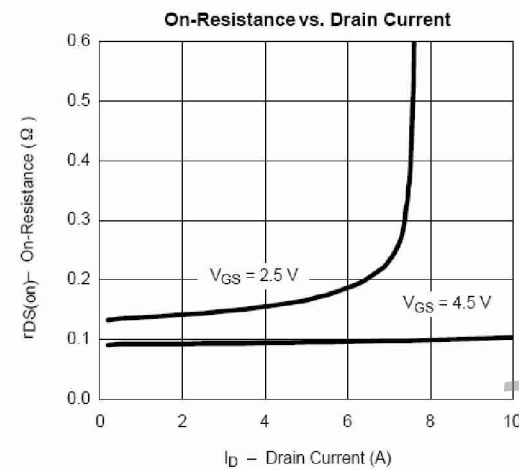
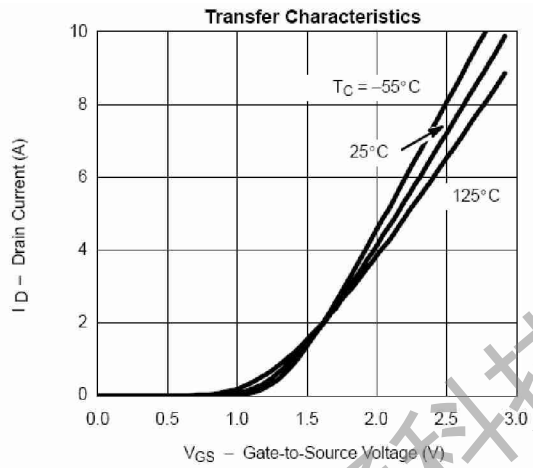
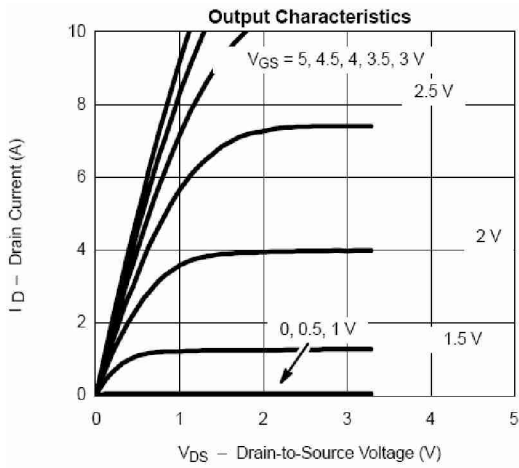
Electrical Characteristics

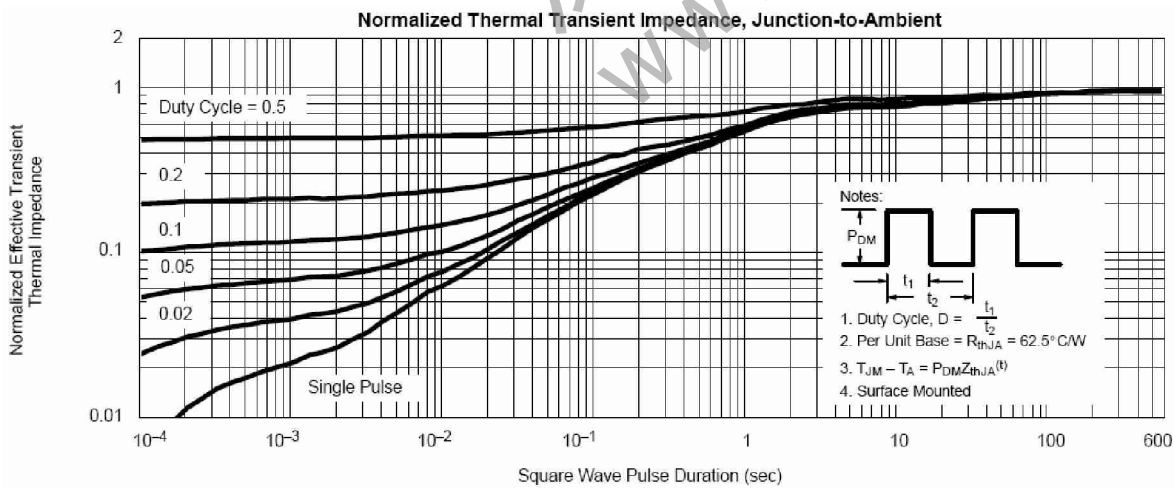
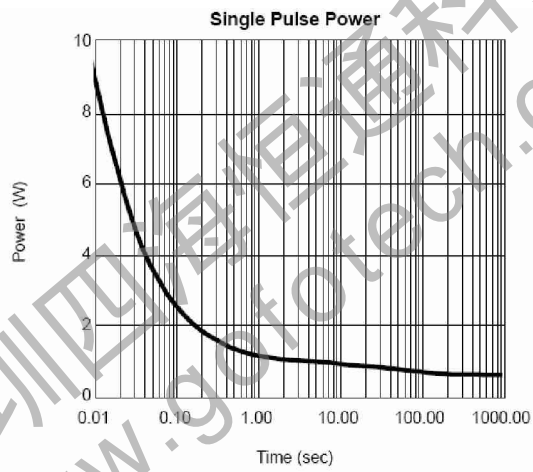
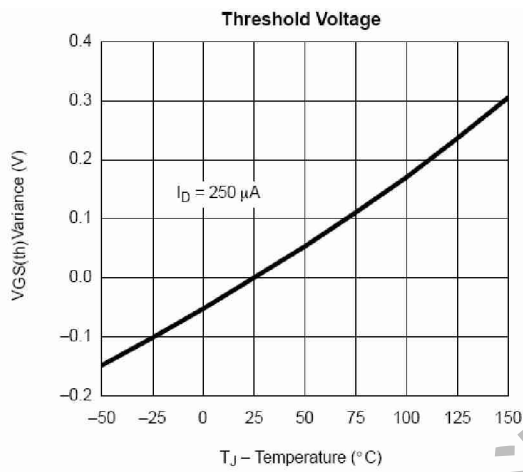
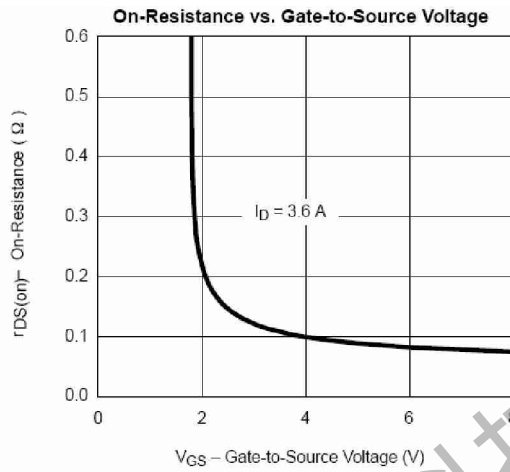
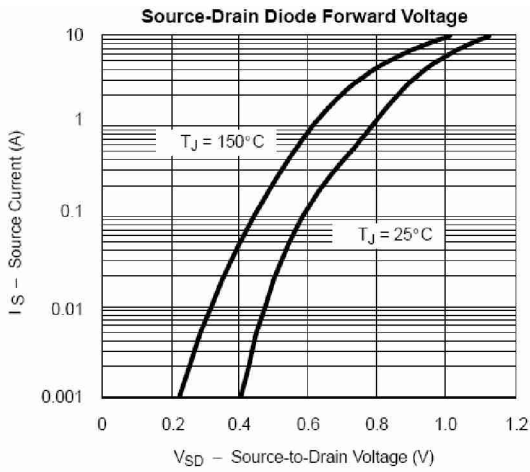
MEM2301XG

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250 μ A	-20	-23		V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250 μ A	-0.4	0.58	-1	V
Gate-Body Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =8V		0.2	100	nA
		V _{DS} =0V, V _{GS} =-8V		-0.2	-100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-16V V _{GS} =0V		-1.5	-100	nA
Static Drain-Source On-Resistance	R _{DS(ON)1}	V _{GS} =-4.5V, I _D =-2.8A		93	110	m Ω
	R _{DS(ON)2}	V _{GS} =-2.5V, I _D =-2A		113	140	m Ω
Forward Transconductance	g _{FS}	V _{DS} = -5 V, I _D = -2.8 A		6.5		S
Source-drain (diode forward) voltage	V _{SD}	V _{GS} =0V, I _D =-1A			-1.2	V
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -6V, V _{GS} = 0 V, f = 1 MHz		500		pF
Output Capacitance	C _{oss}			115		
Reverse Transfer Capacitance	C _{rss}			60		
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -6 V, I _D =-1 A, V _{GEN} = -4.5 V, R _g = 6 Ω		5	25	ns
Rise Time	t _r			30	60	
Turn-Off Delay Time	t _{d(off)}			25	60	
Fall-Time	t _f			10	60	
Total Gate Charge	Q _g	V _{DS} = -6 V, V _{GS} = -4.5 V, I _D = -2.8A		4.0	10	nC
Gate-Source Charge	Q _{gs}			0.8		
Gate-Drain Charge	Q _{gd}			0.8		

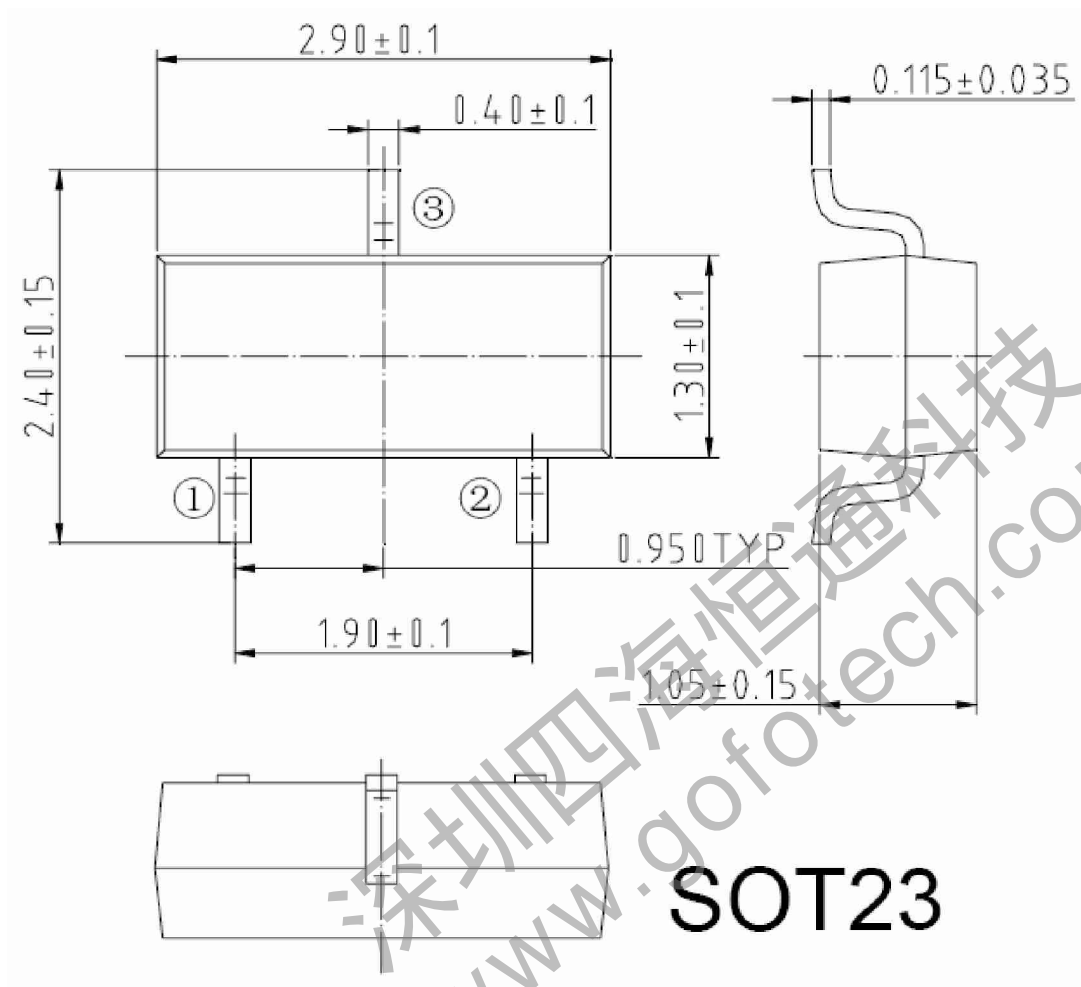
- 1、Pulse width limited by maximum junction temperature.
- 2、Pulse test: PW \leq 300 μ s duty cycle \leq 2%.
- 3、Surface Mounted on FR4 Board, t \leq 5 sec.

Typical Performance Characteristics





Package Information



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