N-Channel MOSFET MEM2302XG-N

General Description

MEM2302XG-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/3A

  RDS(ON), Vgs@2.5V, Ids@2.8A = 42mΩ
  RDS(ON), Vgs@4.5V, Ids@3A =35mΩ
- 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
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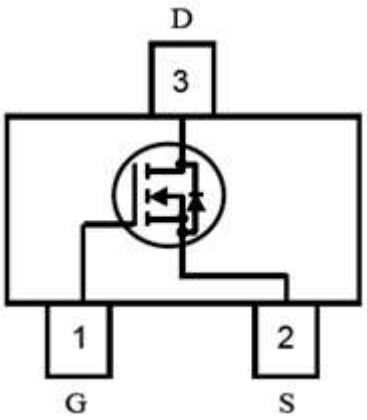
Pin Configuration



Typical Application

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

Absolute Maximum Ratings (TA = 25℃unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	20V	V
Gate-Source Voltage	V_{GSS}	±12	V
Drain Current	I_D	3	A
Pulsed Drain Current[1,2]	I_{DM}	12	A
Total Power Dissipation	Pd	0.8	W
operating junction temperature	T_j	-55~150	℃
Storage Temperature Range	T_{stg}	-55~150	℃

Thermal Characteristics

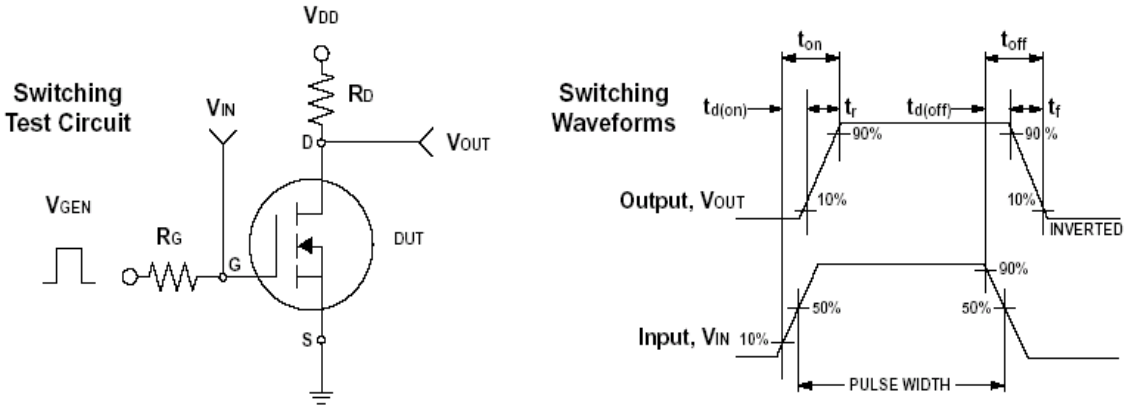
Parameter	Symbol	Ratings	Unit
Thermal Resistance,Junction-to-Ambient	RθJA	100	℃/W

Electrical Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.5	0.75	1.2	V
Gate-Body Leakage	I_{GSS}	V_{DS}=0V，V_{GS}=12V	-	-	100	nA
		V_{DS}=0V，V_{GS}=-12V	-	-	-100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V V_{GS}=0V T_J=25℃	-	-	1	μA
		V_{DS}=20V V_{GS}=0V T_J=55℃	-	-	10	μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=3A	-	35	50	mΩ
		V_{GS}=2.5V, I_D=2.8A	-	42	80	mΩ
Max. Diode Forward Current	I_S		-	-	3	A
Source-drain (diode forward) voltage	V_{SD}	V_{GS}=0V,I_S=3A	-	0.73	1.2	V
Dynamic Characteristics						
Input Capacitance	Ciss	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	-	240	-	pF
Output Capacitance	Coss		-	45	-	
Reverse Transfer Capacitance	Crss		-	23	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	V_{DS} = 10 V, I_D=3A, V_{GS} = 5V, Rg = 6Ω	-	2.3	-	ns
Rise Time	tr		-	3.1	-	
Turn-Off Delay Time	td(off)		-	20	-	
Fall-Time	tf		-	2.5	-	
Total Gate Charge	Qg	V_{DS} = 10V, V_{GS} = 4.5 V, I_D = 3A	-	2.7	5	nc
Gate-Source Charge	Qgs		-	0.4	-	
Gate-Drain Charge	Qgd		-	0.5	-	

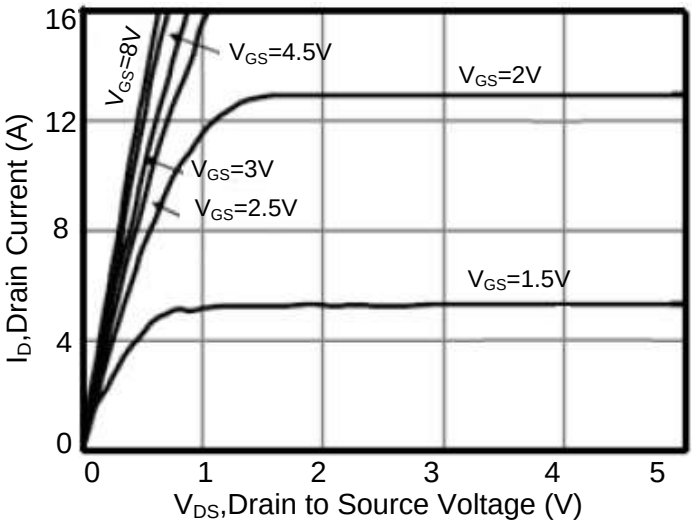
1、Repetitive rating, pulse width limited by junction temperature.

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

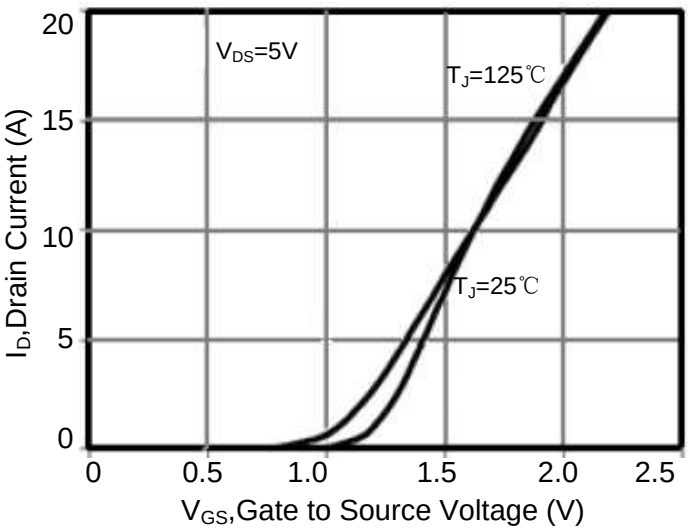


Typical Performance Characteristics

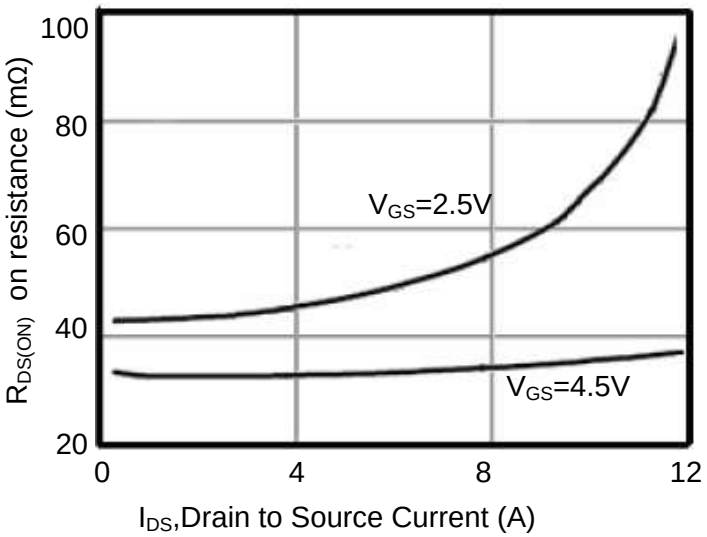
On-state Characteristics



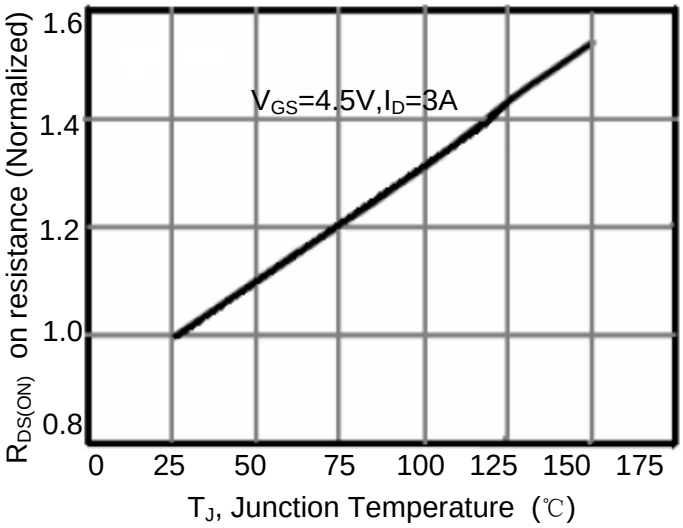
Transfer Characteristics



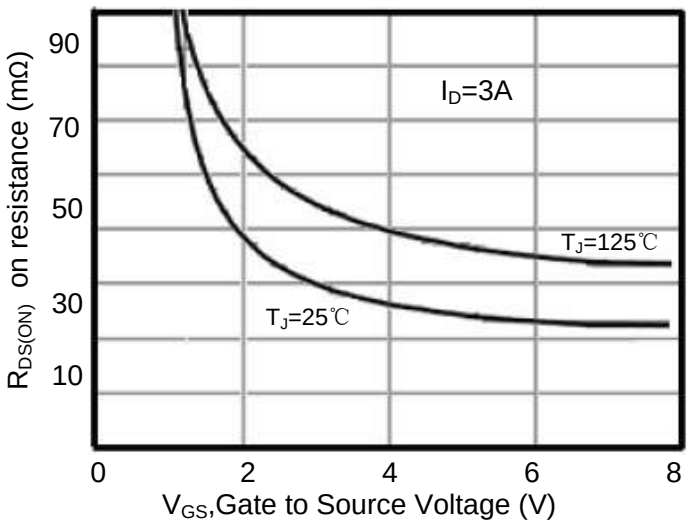
On-Resistance vs. Drain Current



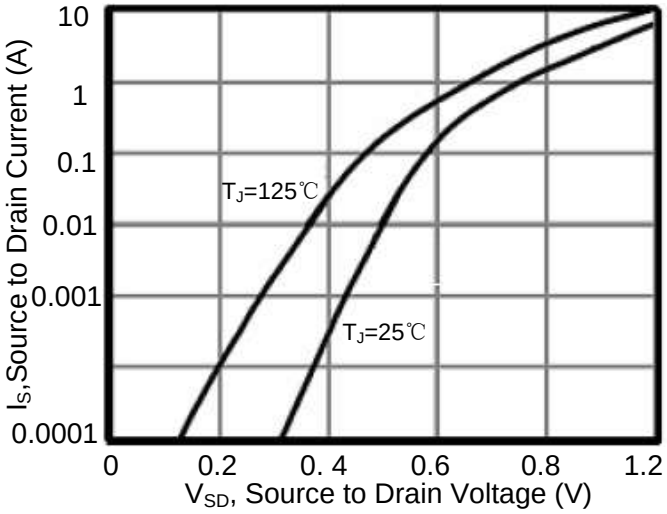
Normalized On-Resistance vs. T_J



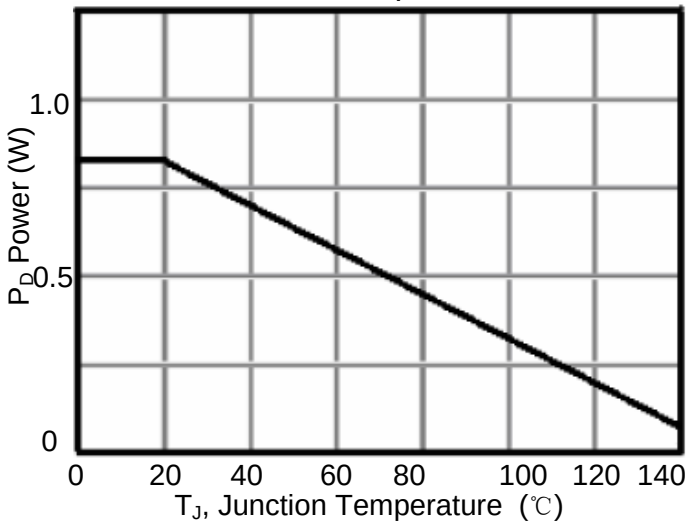
On-Resistance Variation vs. V_{GS}



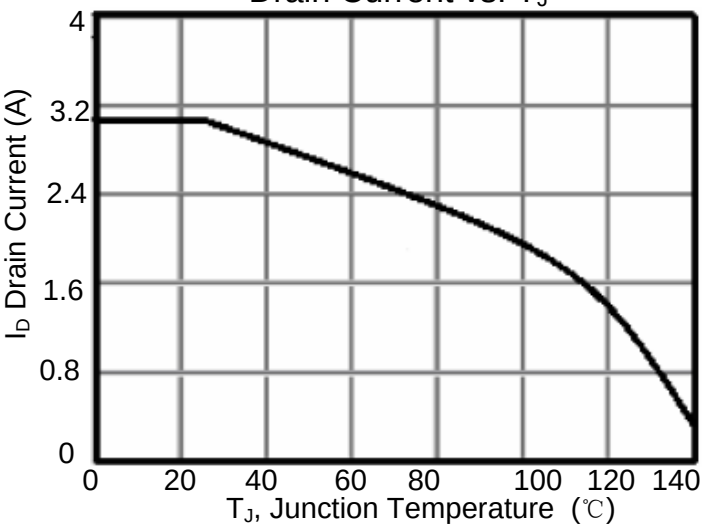
Body Diode Characteristics



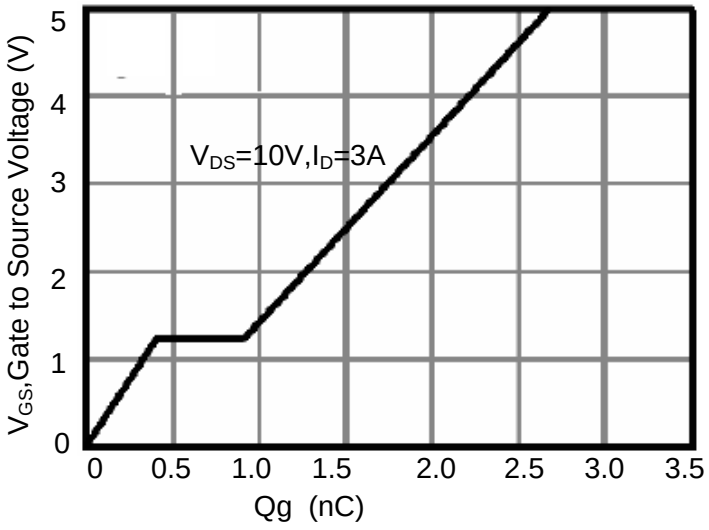
Power Dissipation vs. T_J



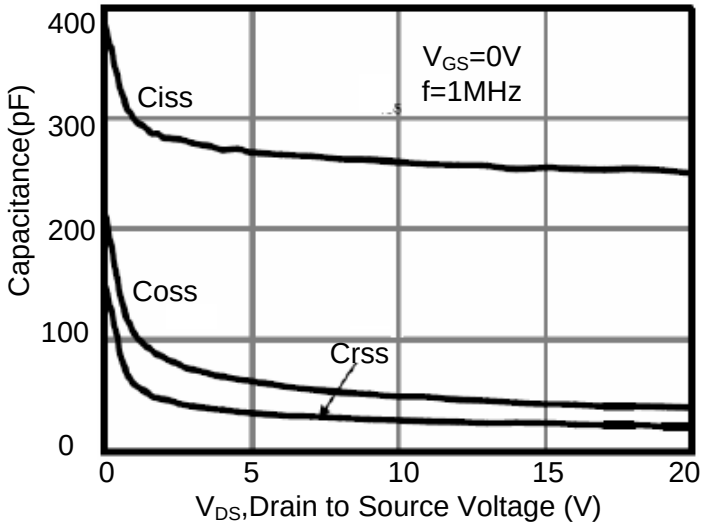
Drain Current vs. T_J

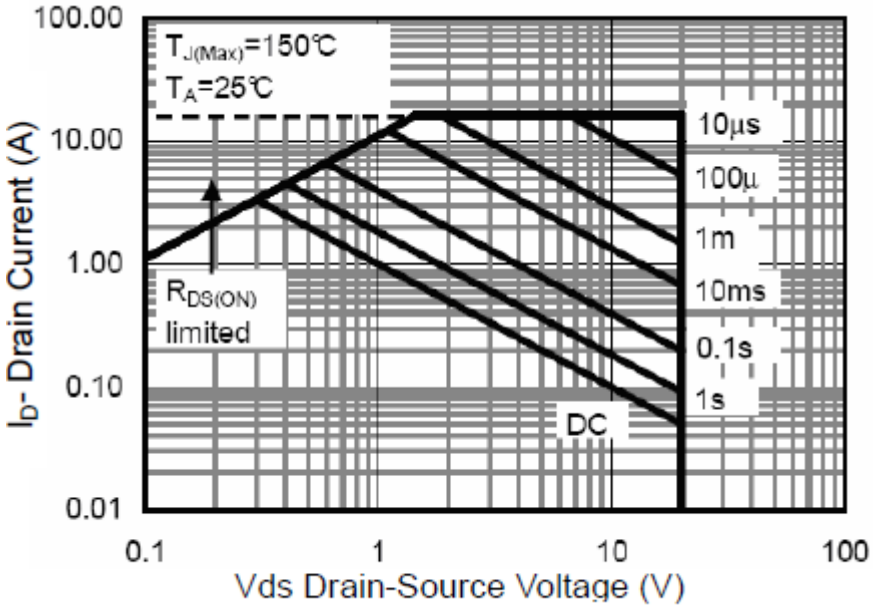


Gate Charge Characteristics

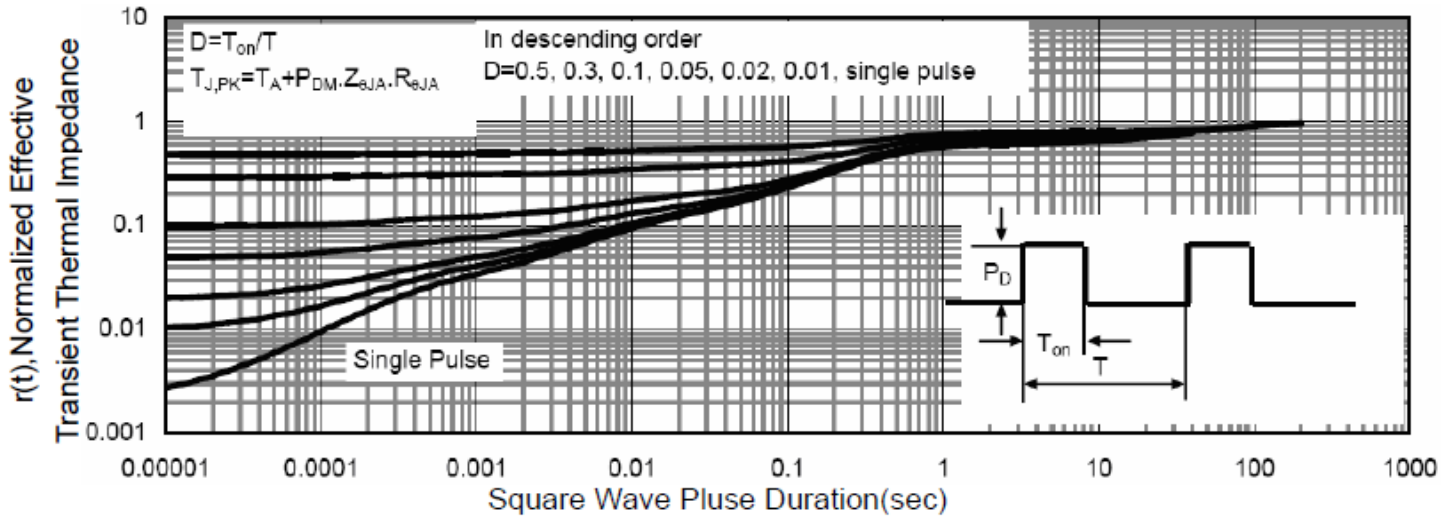


Capacitance vs. Drain-Source Voltage





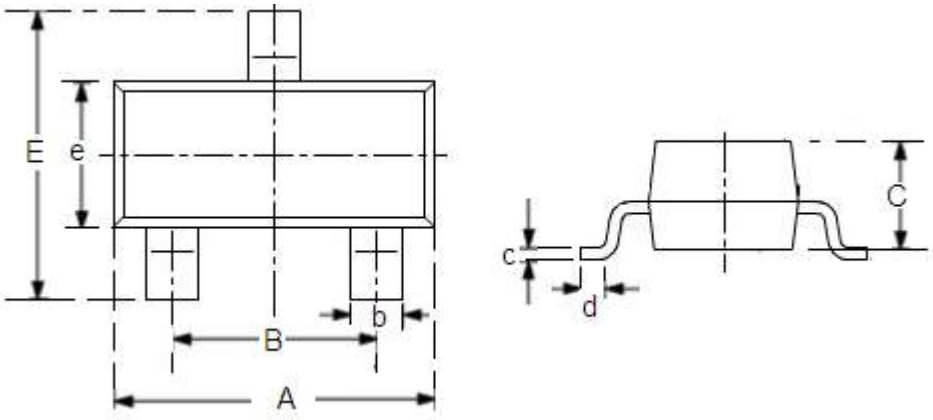
Safe Operation Area



Normalized Maximum Transient Thermal Impedance

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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