

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## DMG2302UK-7-MS

Product specification

## Description

The DMG2302UK-7-MS is the high cell density trench N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The DMG2302UK-7-MS meet the RoHS and Green Product requirement with full function reliability approved.

## General Features

$V_{DS} = 20V, I_D = 3.2A$

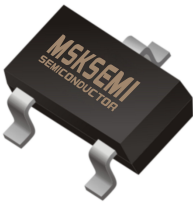
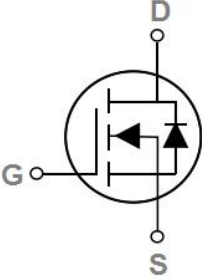

$R_{DS(ON)} < 45m\Omega @ V_{GS} = -4.5V$

$R_{DS(ON)} < 57m\Omega @ V_{GS} = -2.5V$

## Application

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology

## Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
		
SOT-23		

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_{D@T_A=25^{\circ}C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	3.2	A
$I_{D@T_A=70^{\circ}C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	2.0	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	12	A
$P_{D@T_A=25^{\circ}C}$	Total Power Dissipation <sup>3</sup>	1.05	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	112	°C/ W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	---	°C/ W

### Electrical Characteristics

$T_C = 25^{\circ}C$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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### On Characteristics

$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	20	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 20 V, V_{GS} = 0 V$	—	—	1	$\mu A$
		$V_{DS} = 16V, T_C = 125^{\circ}C$	—	—	10	$\mu A$
$I_{GSSF}$	Gate-Body Leakage Current, Forward	$V_{GS} = 10V, V_{DS} = 0 V$	—	—	100	nA
$I_{GSSR}$	Gate-Body Leakage Current, Reverse	$V_{GS} = -10 V, V_{DS} = 0 V$	—	—	-100	nA

### On Characteristics

VGS(th)	Gate Threshold Voltage	VDS = VGS , ID = 250 uA	0.45	0.7	1.1	V
RDS(on)	Static Drain- Source On- Resistance	VGS = 4.5 V, ID =3.0A	--	35	45	$\Omega$
		VGS = 2.5 V, ID =2.0A	-	46	57	

### Dynamic Characteristics

Ciss	Input Capacitance	VDS = 10V, VGS = 0 V, f = 1.0 MHz	--	180	-	F
Coss	Output Capacitance		--	37	-	F
Crss	Reverse Transfer Capacitance		--	34	-	F

### Switching Characteristics

td(on)	Turn-On Delay Time	VGS=5 V, VDS=10V, ID =3A, RG = 6 $\Omega$ ,RL = 2.7 $\Omega$	--	4 5	--	ns
tr	Turn-On Rise Time		--	31	--	ns
td(off)	Turn-Off Delay Time		--	12	--	ns
tf	Turn-Off Fall Time		--	4.0	--	ns
Qg	Total Gate Charge	VDS = 10 V, ID =3A, VGS = 5V	--	6 23	--	nC
Qgs	Gate- Source Charge		--	6	--	nC
Qgd	Gate-Drain Charge		--	0.5	--	nC

### Drain-Source Diode Characteristics and Maximum Ratings

IS	Maximum Continuous Drain-Source Diode Forward Current	--	--	3.2	A
ISM	Maximum Pulsed Drain-Source Diode Forward Current	--	--	10.5	A
VSD	Drain to Source Diode Forward Voltage,V GS = 0V, I SD =3.2A,T J = 25℃	--	--	1.2	V

#### Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Device mounted on FR-4 PCB, 1inch x 0 .85inch x 0 .062 inch
3. Pulse Test: Pulse Width $\leq$ 300 $\mu$ s, Duty Cycles $\leq$ 0.5%

## Typical Performance Characteristics

### N- Channel Typical Characteristics

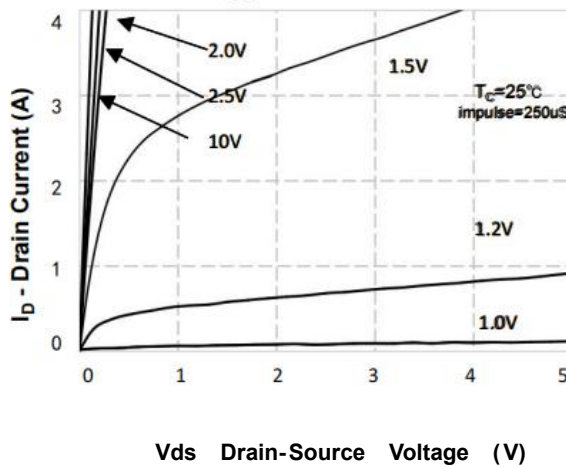


Figure1. On-Region Characteristics

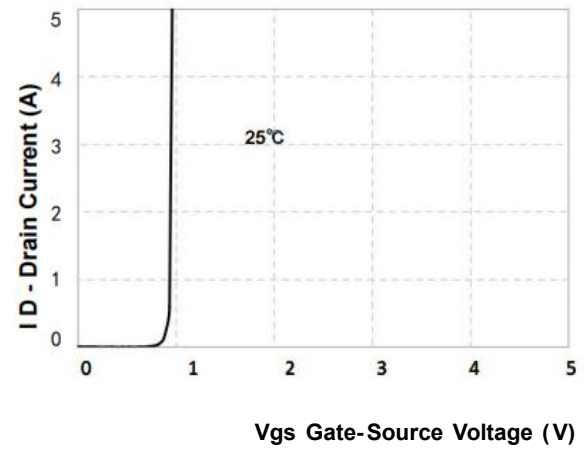


Figure 2. Transfer Characteristics

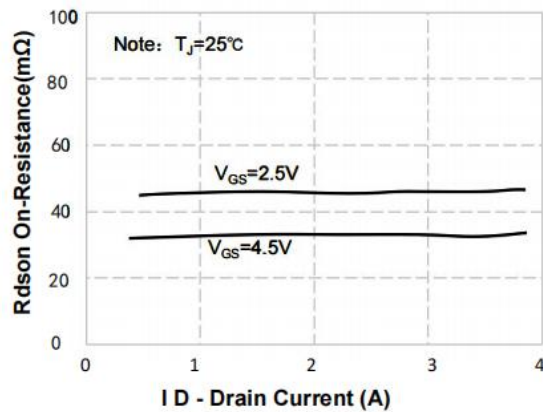


Figure3. On-Resistance Variation vs Drain Current and Gate

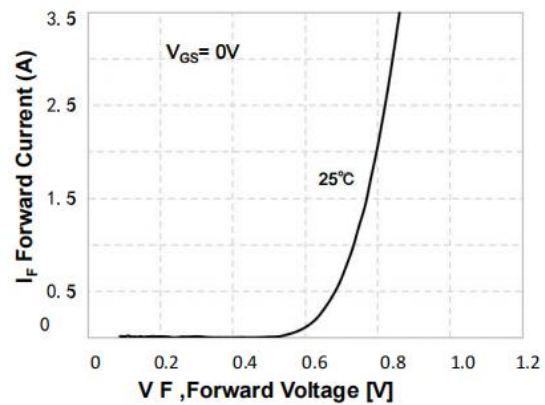


Figure4. Body Diode Forward Voltage Variation with Source Current and Temperature

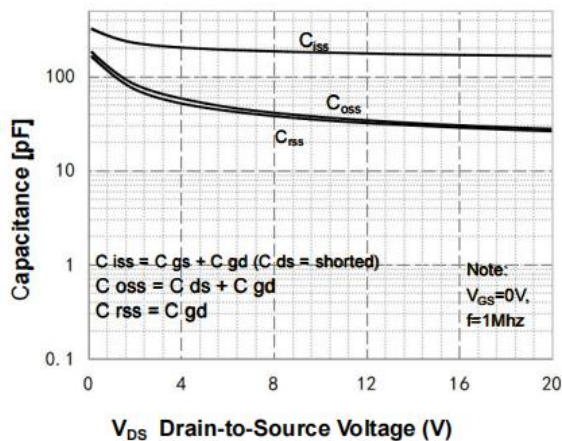


Figure 5. Capacitance Characteristics

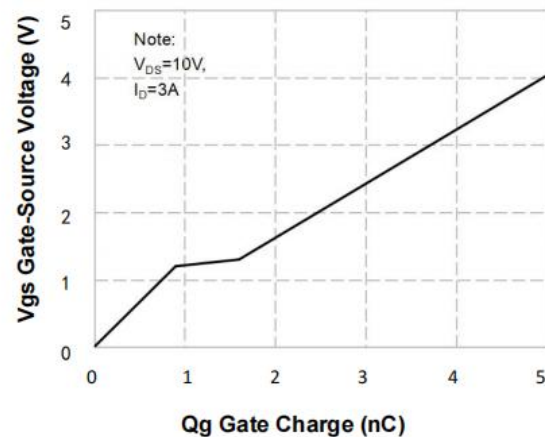


Figure 6. Gate Charge Characteristics

## N- Channel Typical Characteristics (Continued)

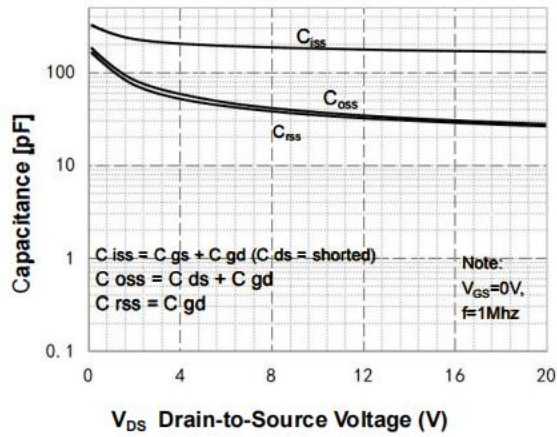


Figure 5. Capacitance Characteristics

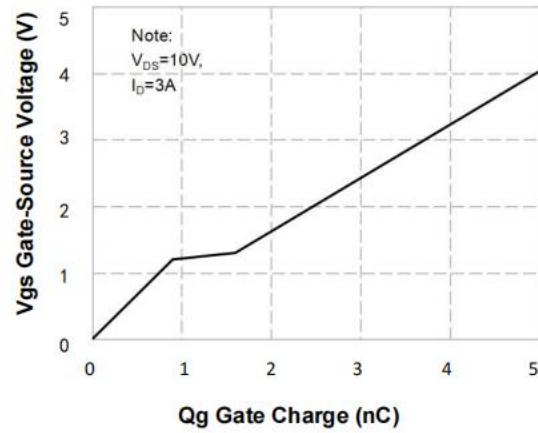


Figure 6. Gate Charge Characteristics

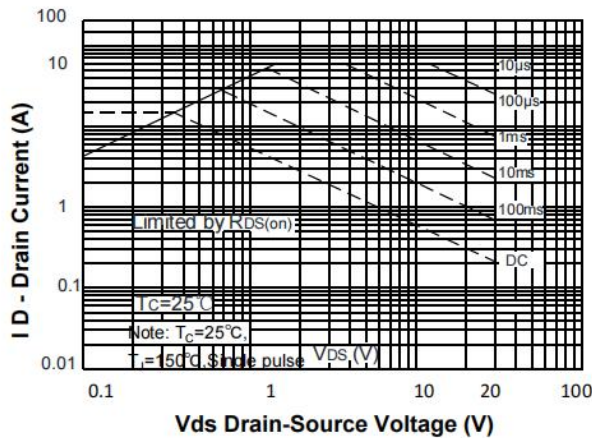


Figure 9. Maximum Safe Operating Area

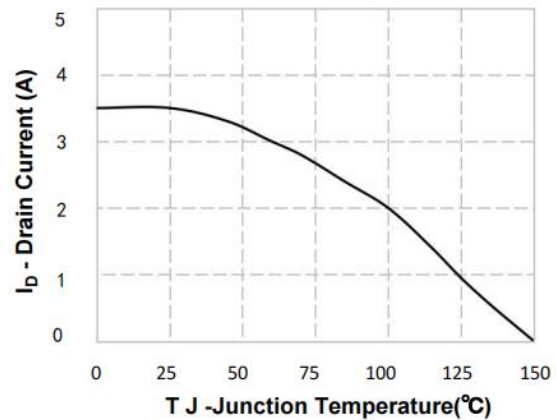


Figure 10. Maximum PContinuous Drain Current vs Case Temperature

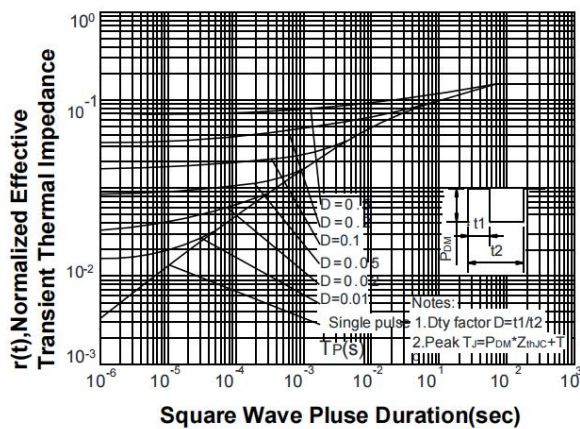
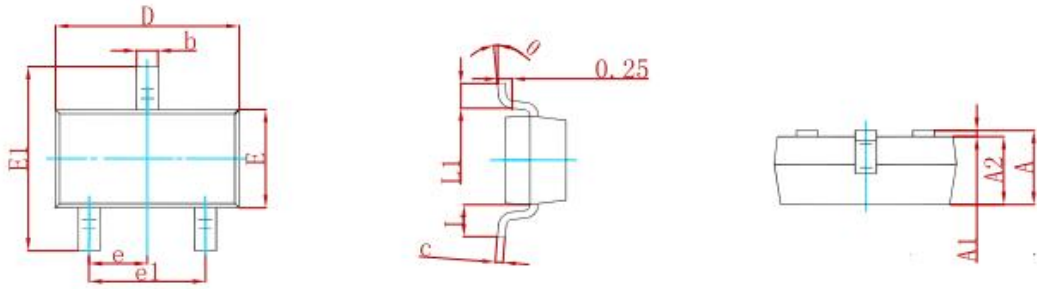


Figure 11. Transient Thermal Response Curve

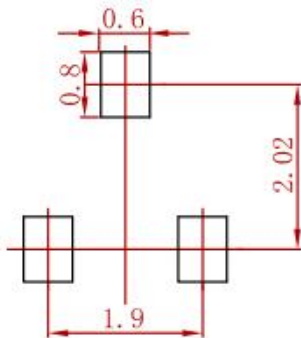


## PACKAGE MECHANICAL DATA



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

## Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

## REEL SPECIFICATION

P/N	PKG	QTY
DMG2302UK-7-MS	SOT-23	3000

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