

# 2N7002KW

## 2N7002KW N-Channel MOSFET

### General description

N-Channel MOSFET

### SOT-323

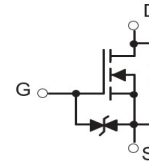
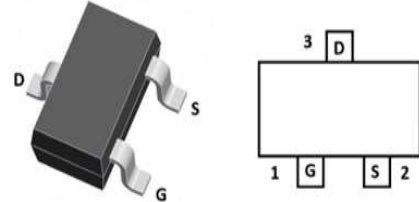
#### FEATURES

- Voltage controlled small signal switch
- High density cell design for Low RDS(on)
- Rugged and reliable
- High saturation current capability
- ESD protected

#### FEATURES

- Load switch for Portable Devices
- DC-DC Converter

V(BR)DSS	RDS(ON)MAX	ID
60V	2.5Ω@10V	340mA
	3Ω@4.5V	



Device Marking : 7002 or 72K

### Maximum Ratings & Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified.)

Parameter	Symbol	Limit	Unit	
Drain-source Voltage	V <sub>DS</sub>	60	V	
Gate-source Voltage	V <sub>GS</sub>	±20	V	
Drain Current	T <sub>A</sub> =25°C @ Steady State	I <sub>D</sub>	340	mA
Pulsed Drain Current <sup>A</sup>	IDM	800	mA	
Total Power Dissipation @ T <sub>A</sub> =25°C	P <sub>D</sub>	0.2	W	
Thermal Resistance Junction-to-Ambient @ Steady State	R <sub>θJA</sub>	625	°C/W	
Junction Temperature	T <sub>J</sub>	150	°C	
Junction and Storage Temperature Range	T <sub>STG</sub>	-55~+150	°C	

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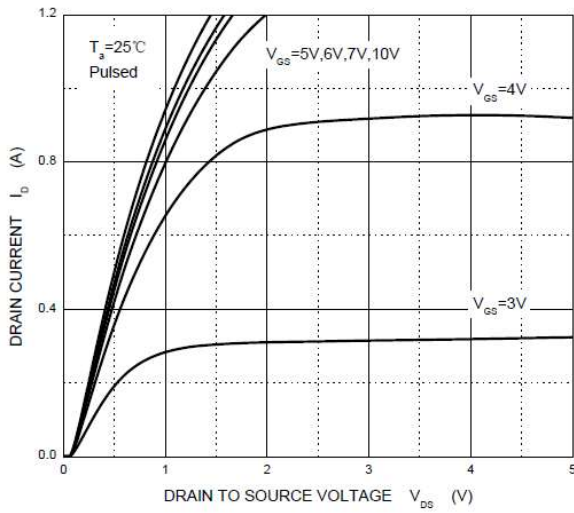
**Electrical Characteristics** (Ratings at 25°C ambient temperature unless otherwise specified).

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$B_{VDSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS1}$	$V_{GS}= \pm 20V, V_{DS}=0V$			$\pm 10$	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}= V_{GS}, I_D=250\mu A$	1.0	1.3	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}= 10V, I_D=500mA$		0.9	2.5	$\Omega$
		$V_{GS}= 4.5V, I_D=200mA$		1.1	3.0	
Diode Forward Voltage (2)	$V_{SD}$	$I_S=300mA, V_{GS}=0V$			1.5	V
Pulsed Diode Forward Voltage (1)	$I_{SM}$				0.53	A
Maximum Diode Continuous Current	$I_S$				0.2	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		40		$\mu F$
Output Capacitance	$C_{oss}$			30		
Reverse Transfer Capacitance	$C_{rss}$			10		
<b>Switching Parameters</b>						
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, R_G=50\Omega$			10	ns
Turn-off Delay Time	$t_{D(off)}$	$R_{GS}=50\Omega, R_L=250\Omega$			15	
Reverse recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=300mA, V_R=25V, di_S/dt=-100A/\mu s$		30		ns
Reverse recovery Time Charge	$Q_r$	$V_{GS}=0V, I_S=300mA, V_R=25V, di_S/dt=-100A/\mu s$		30		nC

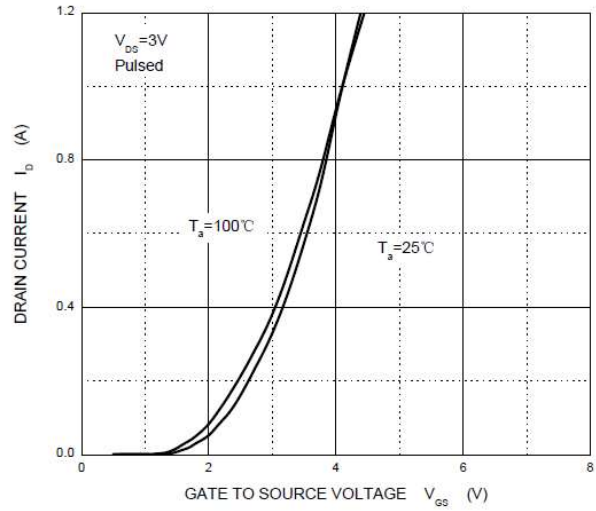
1. Repetitive rating-Pulse width limited by junction temperature.
2. Pulse Test : Pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .
3. Guaranteed by design, not subject to production testing.

## Typical characteristics

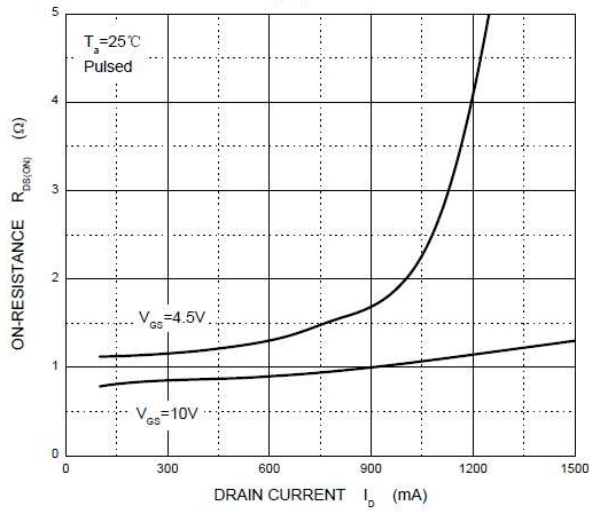
Output Characteristics



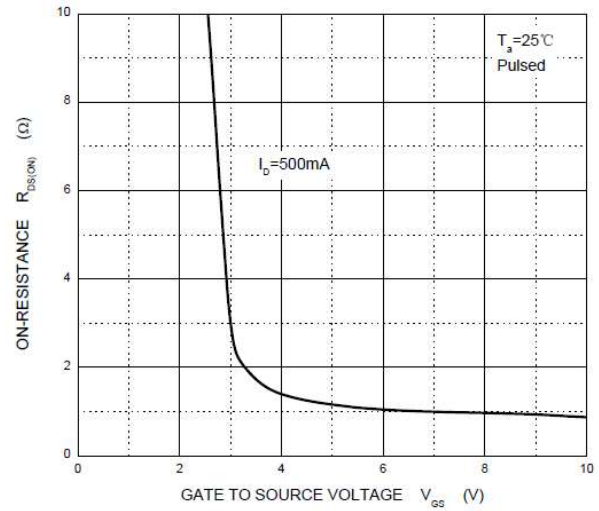
Transfer Characteristics



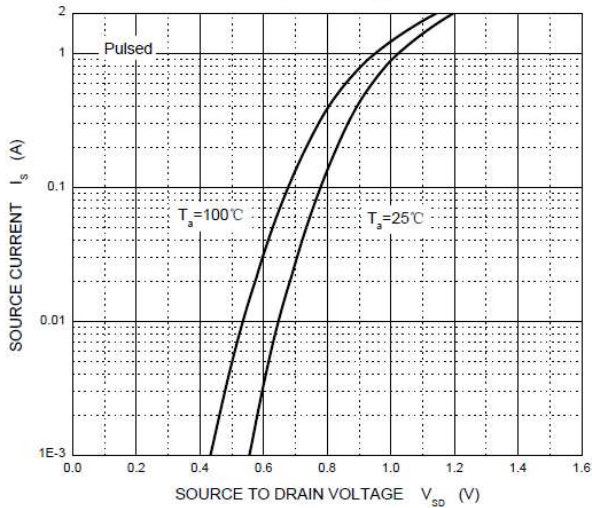
$R_{DS(ON)}$  —  $I_D$



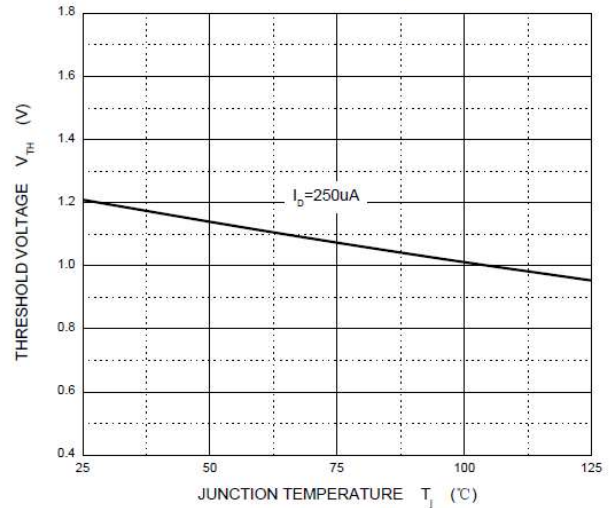
$R_{DS(ON)}$  —  $V_{GS}$



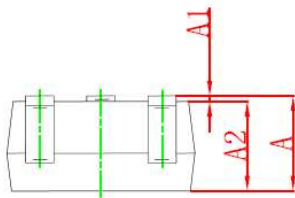
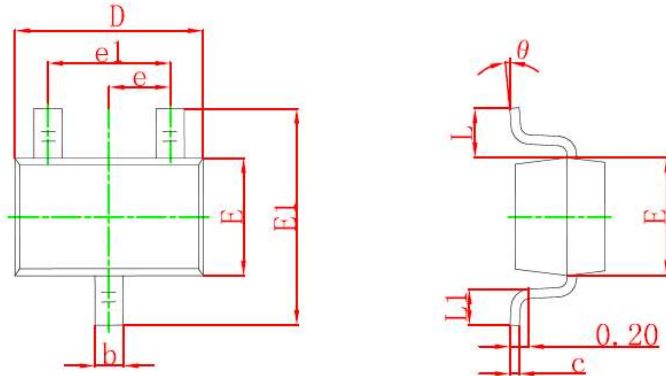
$I_S$  —  $V_{SD}$



Threshold Voltage

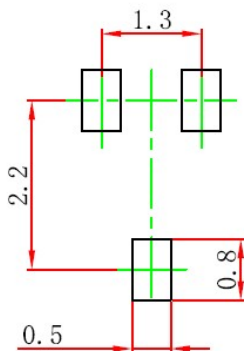


## SOT-323 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

## Suggested Pad Layout



### Note:

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

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