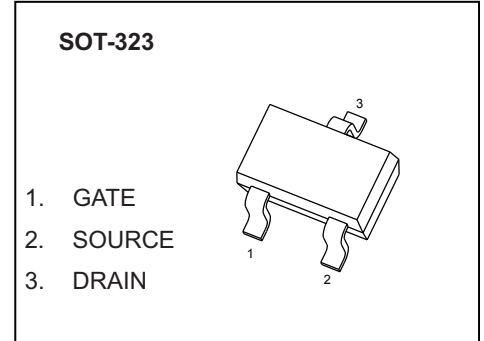


## SOT-323 Plastic-Encapsulate MOSFETS

### 2N7002KW N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
60V	5Ω@10V	340mA
	5.3Ω@4.5V	



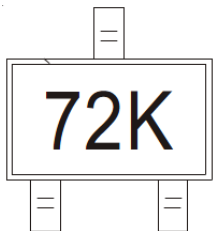
#### FEATURE

- High density cell design for Low  $R_{DS(on)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- ESD protected

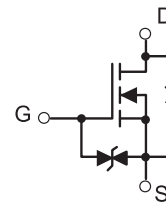
#### APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

#### MARKING



#### Equivalent Circuit



#### MOSFET MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D$	Continuous Drain Current	340	mA
$I_{DM}$	Pulsed Drain Current(note1)	800	mA
$P_D$	Power Dissipation	0.2	W
$T_j$	Junction Temperature	150	°C
$T_{stg}$	Storage Temperature	-55~+150	°C
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	625	°C/W

## MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
GateThreshold Voltage (note 2)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1mA$	1	1.3	2.5	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 48V, V_{GS} = 0V$			1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 10$	$\mu A$
Drain-Source On-Resistance (note 2)	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 200mA$		1.1	5.3	$\Omega$
		$V_{GS} = 10V, I_D = 500mA$		0.9	5	$\Omega$
<b>DYNAMIC PARAMETERS (note 3)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$			40	pF
Output Capacitance	$C_{oss}$				30	pF
Reverse Transfer Capacitance	$C_{rss}$				10	pF
<b>SWITCHING PARAMETERS (note 3)</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 50V, R_G = 50\Omega$ $R_{GS} = 50\Omega, R_L = 250\Omega$			10	ns
Turn-off Delay Time	$t_{d(off)}$				15	ns
Reverse Recovery Time	$t_{rr}$	$V_{GS} = 0V, I_S = 300mA, V_R = 25V,$ $dI_S/dt = -100A/\mu s$		30		ns
Recovered Charge	$Q_r$	$V_{GS} = 0V, I_S = 300mA, V_R = 25V$ $dI_S/dt = -100A/\mu s$		30		nC
<b>GATE-SOURCE ZENER DIODE</b>						
Gate-Source Breakdown Voltage	$BV_{GSO}$	$I_{GS} = \pm 1mA$ (Open Drain)	$\pm 21.5$		$\pm 30$	V
<b>DRAIN-SOURCE DIODE</b>						
Diode Forward Voltage (note 2)	$V_{SD}$	$I_S = 300mA, V_{GS} = 0V$			1.5	V
Continuous Diode Forward Current	$I_S$				0.2	A
Pulsed Diode Forward Current (note 1)	$I_{SM}$				0.53	A

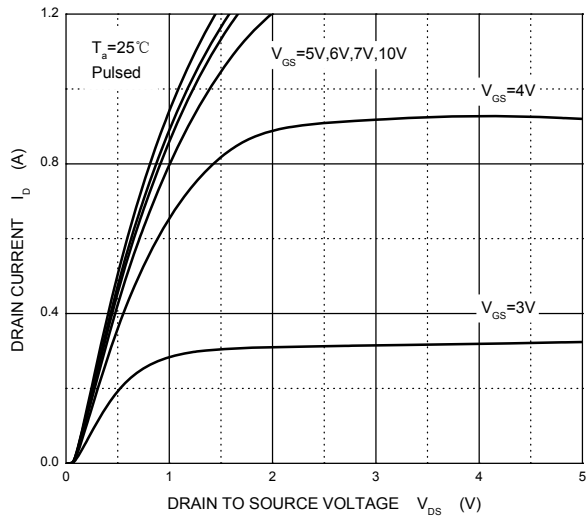
**Notes :**

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.

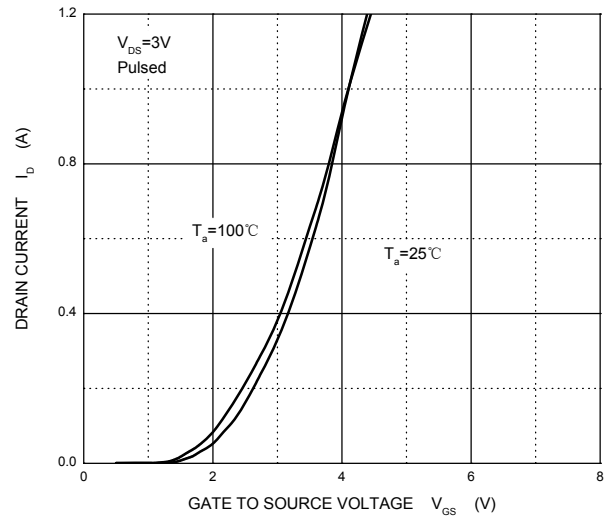


## Typical Characteristics

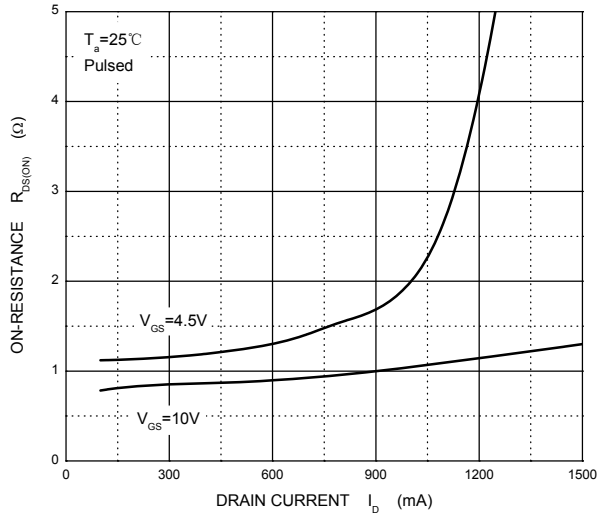
### Output Characteristics



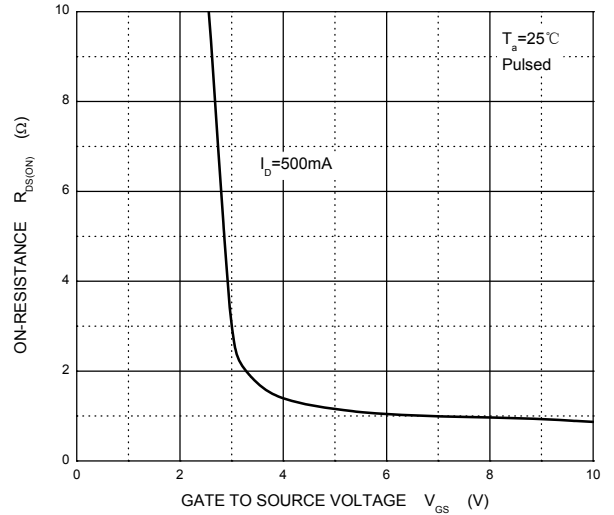
### Transfer Characteristics



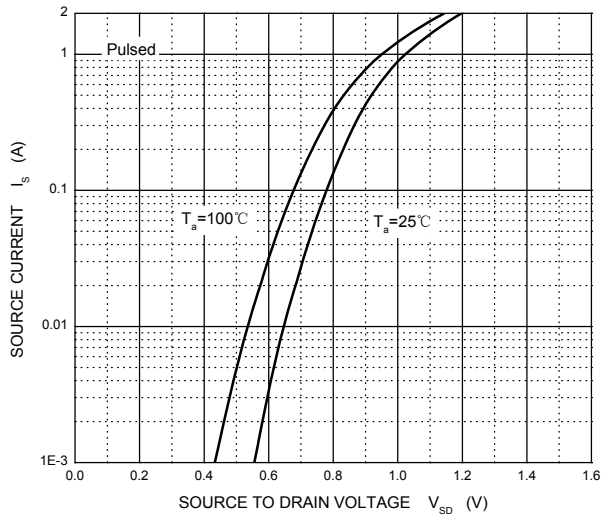
### $R_{DS(ON)}$ — $I_D$



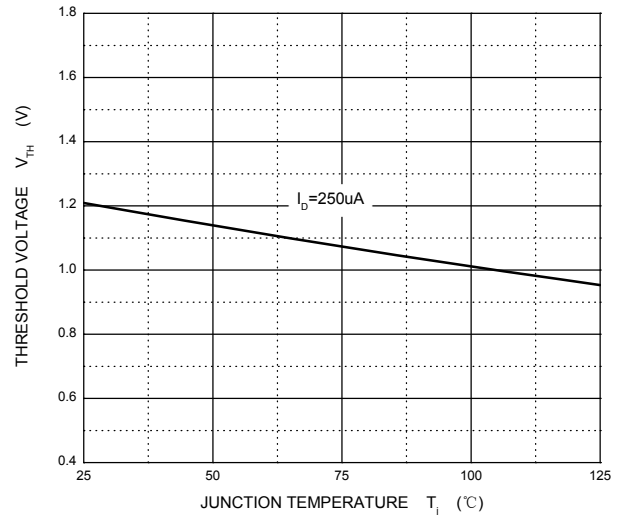
### $R_{DS(ON)}$ — $V_{GS}$



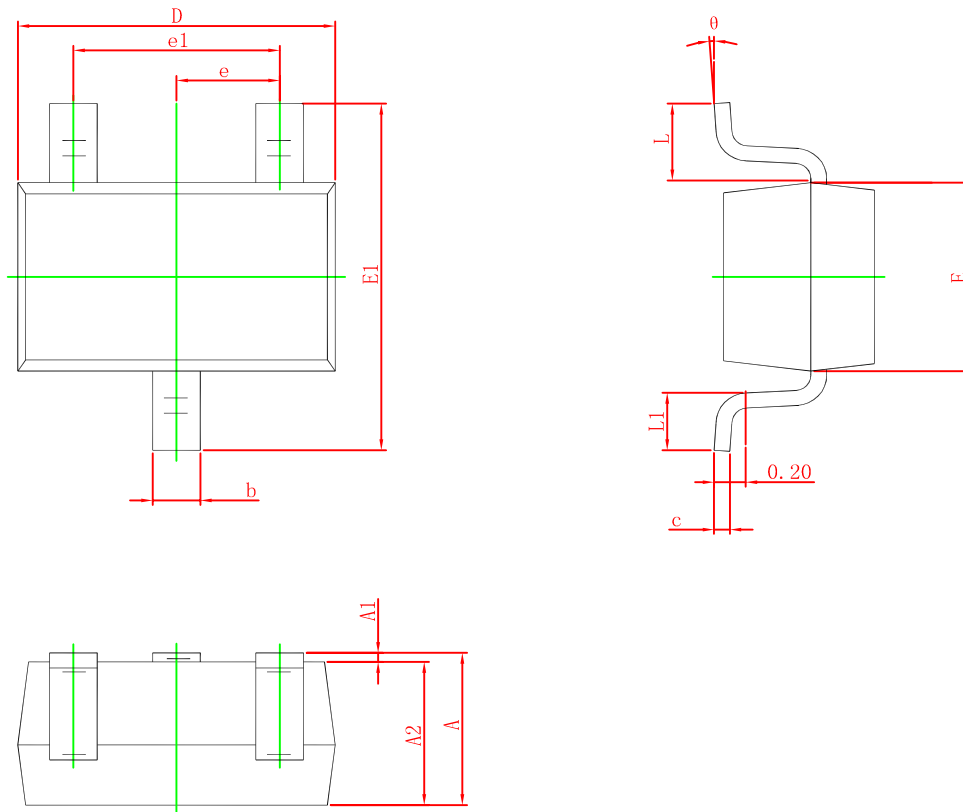
### $I_S$ — $V_{SD}$



### Threshold Voltage



## SOT-323 PACKAGE OUTLINE DIMENSIONS



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
$\theta$	0°	8°	0°	8°

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