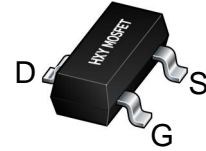




## Description

The 2N7002W uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



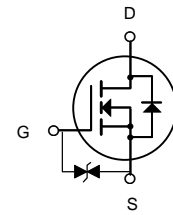
SOT-323

## General Features

$V_{DS} = 60V$   $I_D = 0.115A$

$R_{DS(ON)} < 3\Omega @ V_{GS} = 10V$

ESD Rating: HBM  $\geq 2000V$



N-Channel MOSFET

## Application

Battery protection  
Load switch  
Uninterruptible power supply

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
2N7002W	SOT-323		3000

## Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current-Continuous	0.115	A
$P_D$	Maximum Power Dissipation	0.2	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	625	$^\circ C/W$



**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA	60			V
Gate-Threshold Voltage	V <sub>(GS)th</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	1	1.6	2.5	
Gate-body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0 V, V <sub>GS</sub> =±20 V			±80	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60 V, V <sub>GS</sub> =0 V			80	nA
On-state Drain Current	I <sub>D(on)</sub>	V <sub>GS</sub> =10 V, V <sub>DS</sub> =7 V	500			mA
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10 V, I <sub>D</sub> =115mA		1.3	3	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =50mA		2	5	
Forward Trans conductance	g <sub>fs</sub>	V <sub>DS</sub> =10 V, I <sub>D</sub> =200mA	80			ms
Drain-source on-voltage	V <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =500mA			3.75	V
		V <sub>GS</sub> =5V, I <sub>D</sub> =50mA			0.375	V
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =115mA, V <sub>GS</sub> =0 V	0.55		1.2	V
Input Capacitance *	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz			50	pF
Output Capacitance *	C <sub>oss</sub>				25	
Reverse Transfer Capacitance*	C <sub>rss</sub>				5	

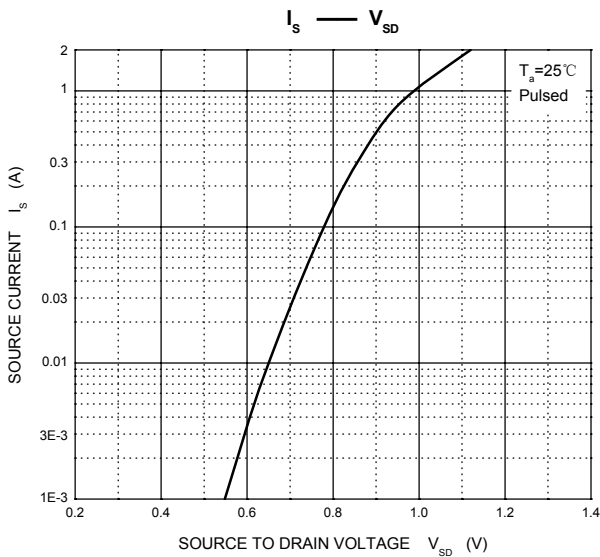
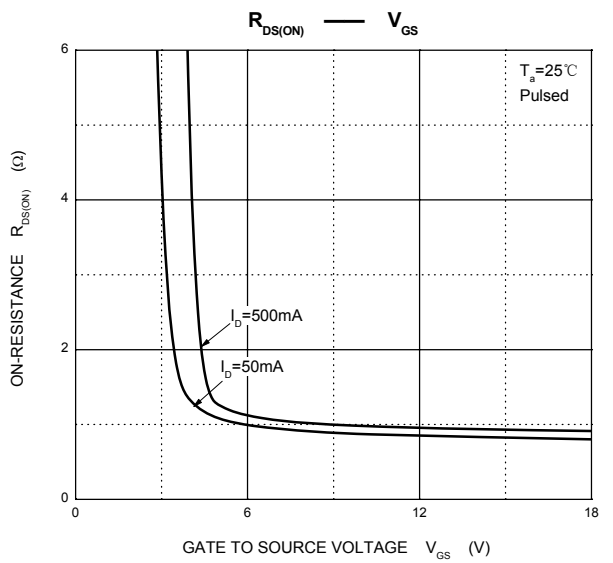
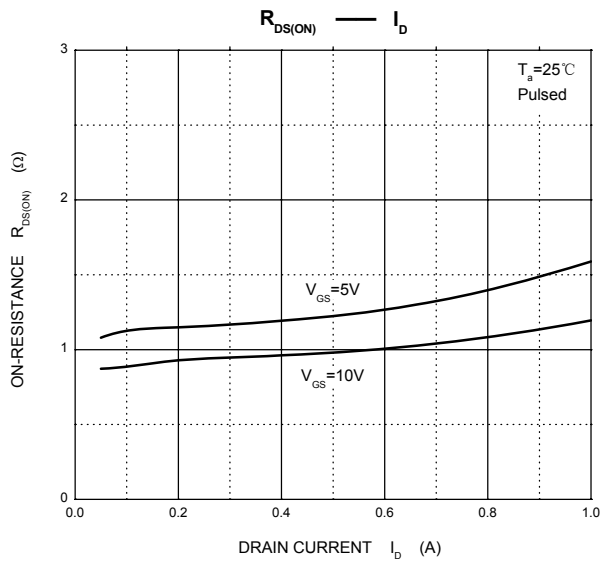
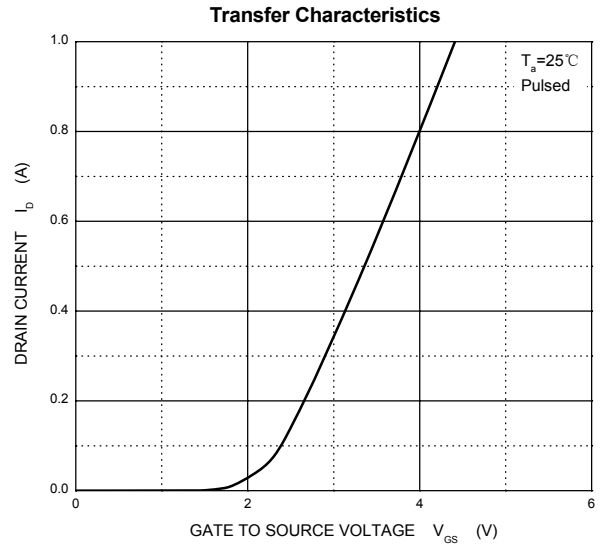
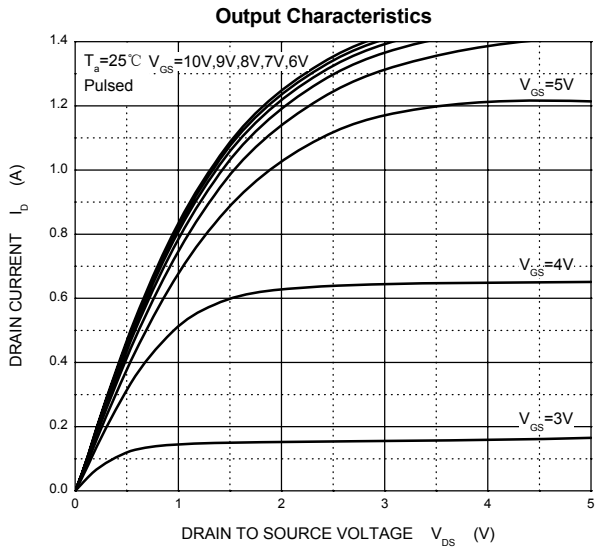
**SWITCHING TIME**

Turn-on Time*	t <sub>d(on)</sub>	V <sub>DD</sub> =25 V, R <sub>L</sub> =50Ω, I <sub>D</sub> =500mA, V <sub>GEN</sub> =10 V R <sub>G</sub> =25Ω			20	ns
Turn-off Time*	t <sub>d(off)</sub>				40	

\*These parameters have no way to verify.

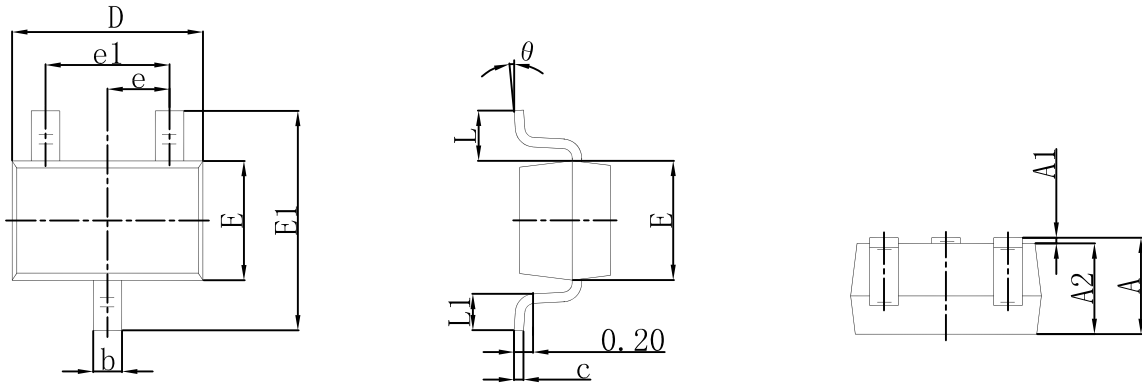


### Typical Characteristics





### 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
K	0°	8°	0°	8°



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