

## 2N7002W

### 60V N-Channel MOSFET

115mA 60V;  $R_{DS(ON)typ}=0.9\Omega@10V$ ,  $R_{DS(ON)typ}=1.1\Omega@4.5V$

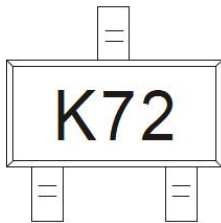
#### FEATURE

- High density cell design for Low RDS(on)
- Voltage controlled small signal switch
- Rugged and reliable

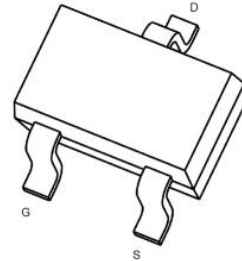
#### Application

- DC/DC Converter
- Load Switch for Portable Devices

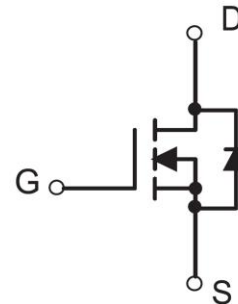
#### MARKING:



SOT-323



Schematic diagram



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	115	mA
Power Dissipation	$P_D$	0.2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

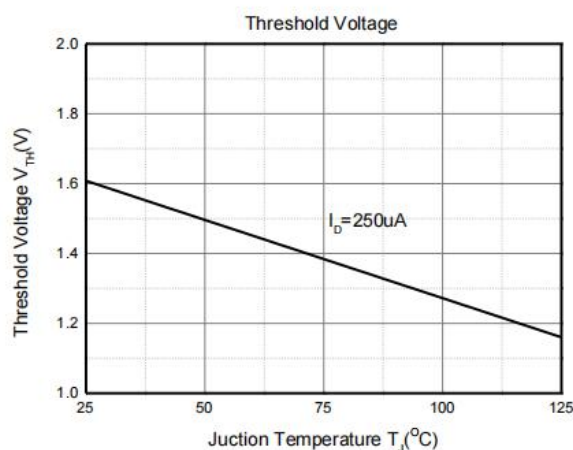
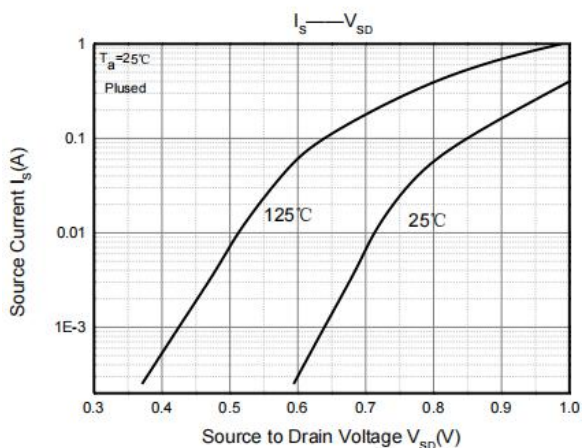
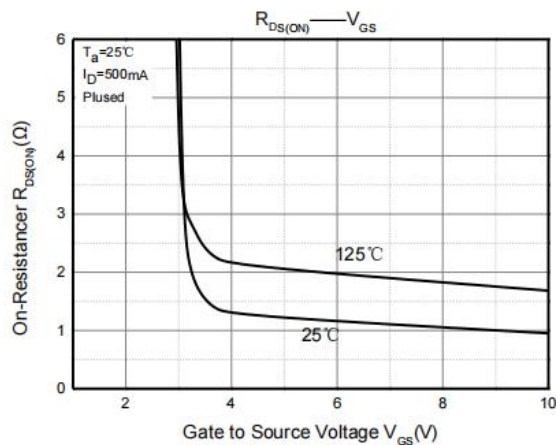
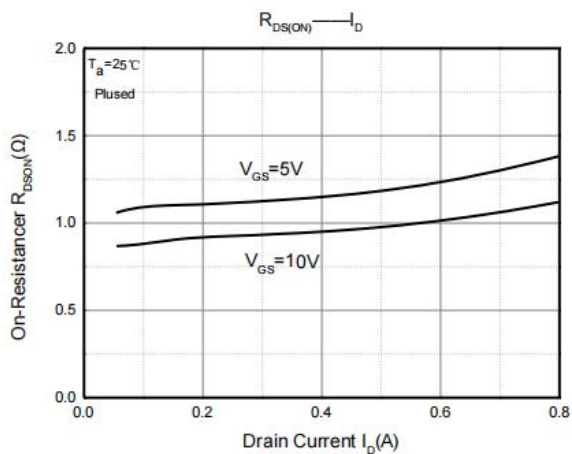
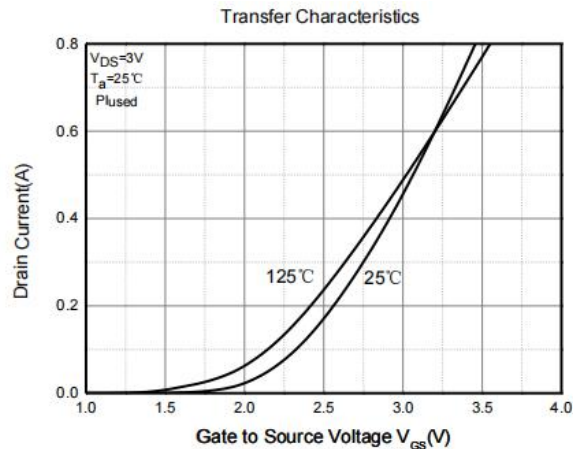
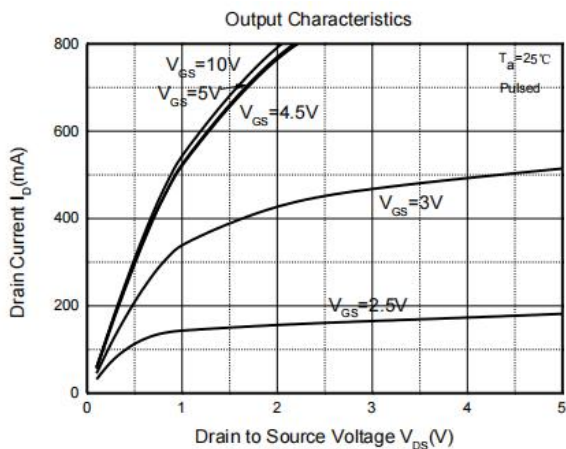
**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	60			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V			80	nA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±80	nA
On-state drain current	I <sub>D(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 7V	500			mA
Gate threshold voltage <sup>2</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.6	2.5	V
Drain-source on-resistance <sup>2</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA		0.9	2.5	Ω
		V <sub>GS</sub> = 5V, I <sub>D</sub> = 50mA		1.1	3.0	
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	
<b>Dynamic characteristics<sup>2</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1MHz		37	50	pF
Output Capacitance	C <sub>oss</sub>			8.7	25	
Reverse Transfer Capacitance	C <sub>rss</sub>			3.1	5	
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz		44		Ω
<b>Switching characteristics<sup>2</sup></b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 25V, R <sub>G</sub> = 25Ω,			20	ns
Turn-off delay time	t <sub>d(off)</sub>	V <sub>GEN</sub> = 10V, I <sub>D</sub> = 500mA, R <sub>L</sub> = 50Ω			40	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>2</sup>	V <sub>SD</sub>	I <sub>S</sub> = 115mA, V <sub>GS</sub> = 0V	0.5		1.2	V

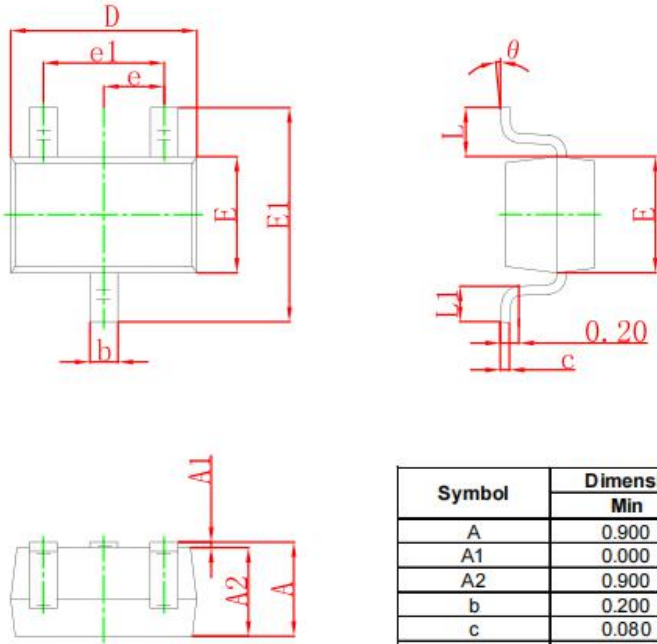
**Notes:**

1. Pulse Test : Pulse width 300μs, duty cycle ≤ %.
2. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics



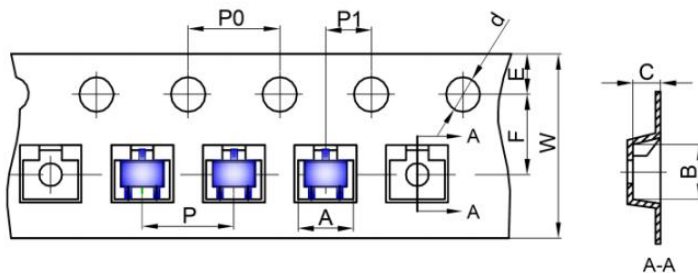
**SOT-323 Package Information**



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°

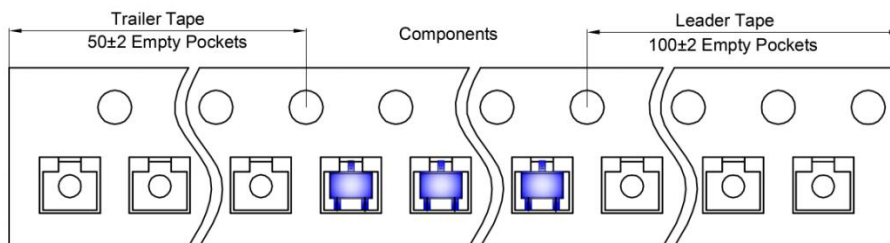
SOT-323 Tape and Reel

SOT-323 Embossed Carrier Tape

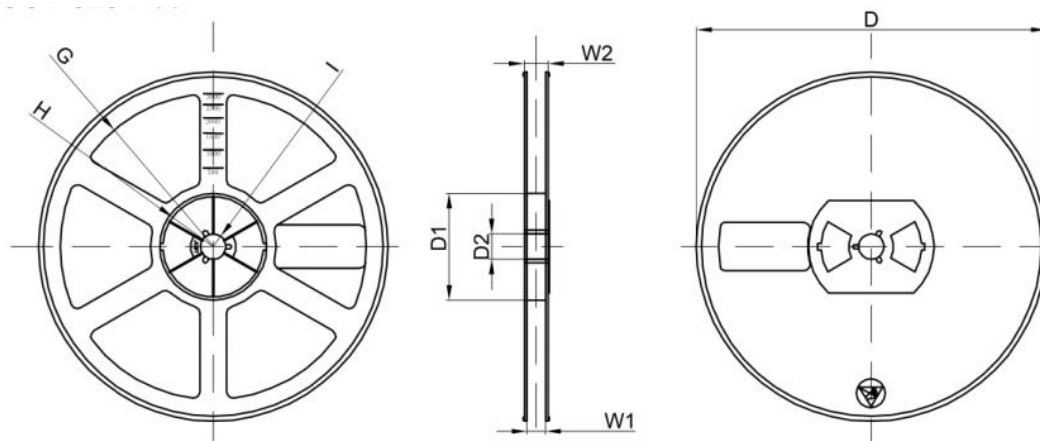


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-323	2.25	2.55	1.19	Ø1.55	1.75	3.50	4.00	4.00	2.00	8.00

SOT-323 Tape Leader and Trailer



SOT-323 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	