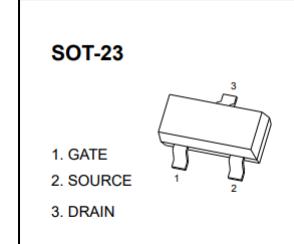



**JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD.**

## AD-2N7002K Plastic-Encapsulated MOSFET

### AD-2N7002K N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ , typ	$I_D$
60V	0.9Ω @ 10V	340mA
	1.1Ω @ 4.5V	



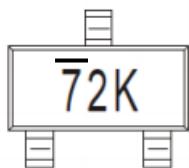
### FEATURES

- High density cell design for low  $R_{DS(ON)}$
- Voltage controlled small signal switch
- High saturation current capability
- AEC-Q101 qualified

### APPLICATIONS

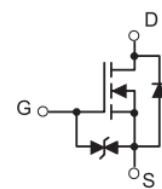
- Battery switch
- Load switch
- Power tools
- LED applications
- DC/DC Converter
- Motor drive applications

### MARKING



72K = Device code

### EQUIVALENT CIRCUIT



**MAXIMUM RATINGS (T<sub>j</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Value	Unit
Drain-source voltage	V <sub>DS</sub>	60	V
Gate-source voltage	V <sub>GS</sub>	±20	V
Continuous drain current	I <sub>D</sub> <sup>1)</sup>	340	mA
Maximum power dissipation	P <sub>D</sub> <sup>1)</sup>	0.35	W
Single pulsed avalanche energy	E <sub>AS</sub> <sup>3)</sup>	500	mJ
Thermal resistance from junction to ambient	R <sub>θJA</sub> <sup>4)</sup>	357	°C/W
Operating junction and storage temperature range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ 150	°C

**ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Test condition	Min	Typ	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> = 48V, V <sub>GS</sub> = 0V	-	-	1.0	µA
Gate-body leakage current	I <sub>GSS1</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±10	µA
	I <sub>GSS2</sub>	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V	-	-	±200	nA
	I <sub>GSS3</sub>	V <sub>GS</sub> = ±5V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>5)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA	1.0	1.3	2.5	V
Drain-source on-state resistance <sup>5)</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> = 4.5V, I <sub>D</sub> = 200mA	-	1.1	3	
<b>Dynamic characteristics<sup>5) 6)</sup></b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1MHz	-	-	40	pF
Output capacitance	C <sub>oss</sub>		-	-	30	
Reverse transfer capacitance	C <sub>rss</sub>		-	-	10	
<b>Switching parameters<sup>5) 6)</sup></b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, R <sub>G</sub> = 50Ω, R <sub>GS</sub> = 50Ω, R <sub>L</sub> = 250Ω	-	-	10	ns
Turn-off delay time	t <sub>d(off)</sub>		-	-	15	
Reverse recovery time	t <sub>rr</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 300mA, V <sub>R</sub> = 25V, dI <sub>S</sub> /dt = -100A/µs		30		ns
<b>Diode characteristics</b>						
Drain-source diode forward voltage	V <sub>SD</sub> <sup>5)</sup>	I <sub>S</sub> = 300mA, V <sub>GS</sub> = 0V	-	-	1.5	V
Recovered charge	Q <sub>r</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 300mA, V <sub>R</sub> = 25V, dI <sub>S</sub> /dt = -100A/µs		30		nC
Gate-source breakdown voltage	BV <sub>GSO</sub>	I <sub>GS</sub> = ±1mA (open drain)	±21.5	-	±30	V

1) Maximum allowed temperature T<sub>j</sub> = 25°C.

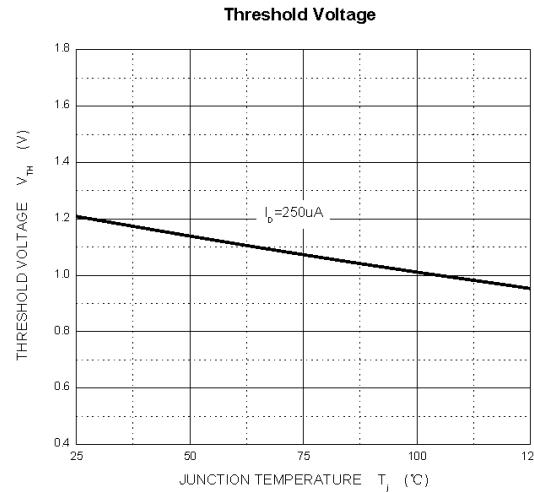
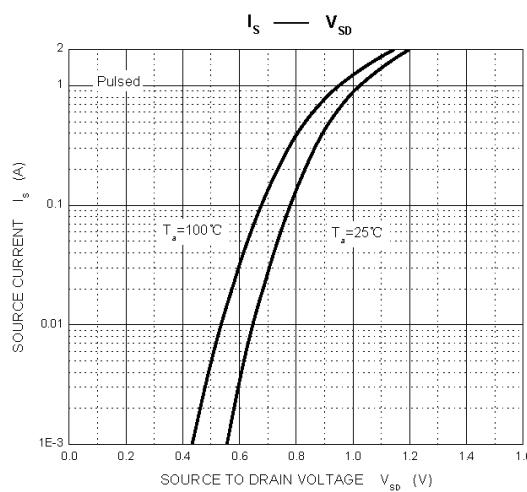
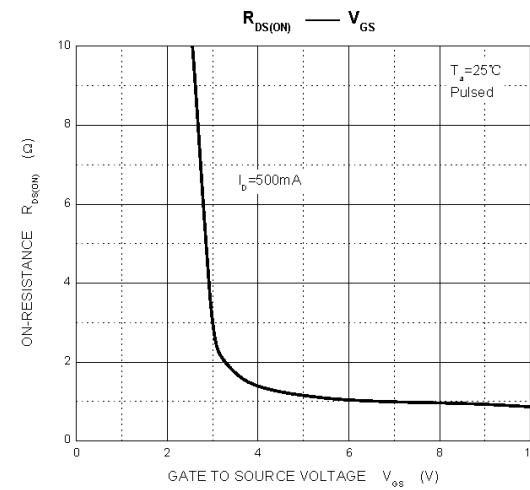
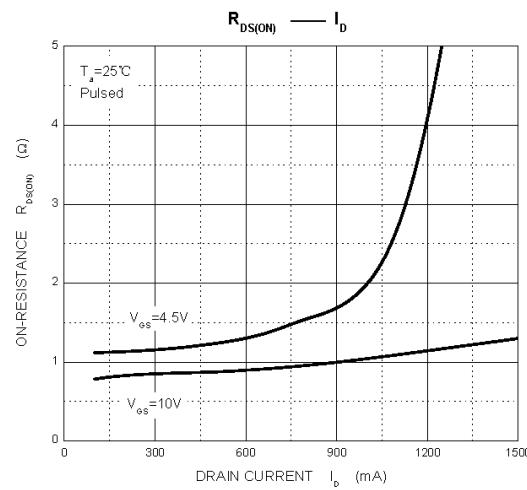
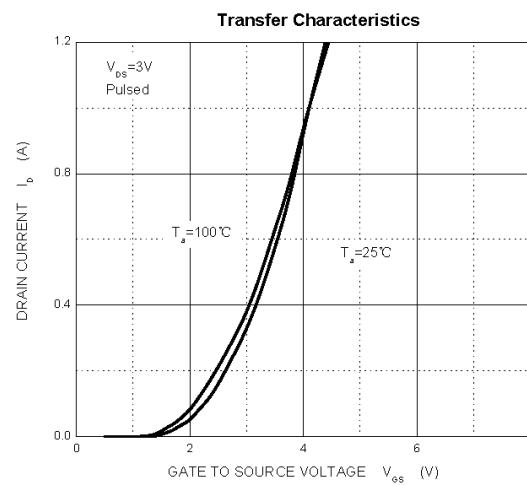
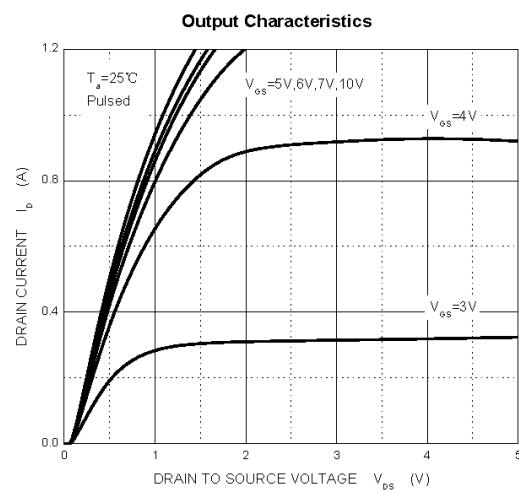
2) Pulse width ≤ 10µs, duty cycle ≤ 1%.

3) Test condition: V<sub>DD</sub> = 25V, V<sub>GS</sub> = 10V, L = 0.5mH, R<sub>G</sub> = 25Ω, starting at T<sub>j</sub> = 25°C.4) Measured with the device mounted on 1 inch<sup>2</sup> FR-4 board with 2oz. copper, in a still air environment with T<sub>a</sub> = 25°C.

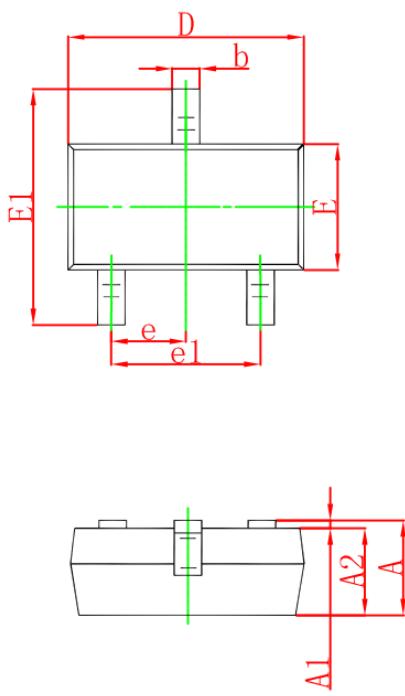
5) Pulse test: Pulse width ≤ 300µs, duty cycle ≤ 2%.

6) Guaranteed by design, not subject to production.

## TYPICAL CHARACTERISTICS

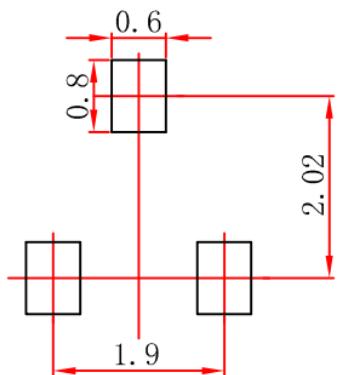


## SOT-23 PACKAGE OUTLINE DIMENSIONS



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°

## SOT-23 SUGGESTED PAD LAYOUT

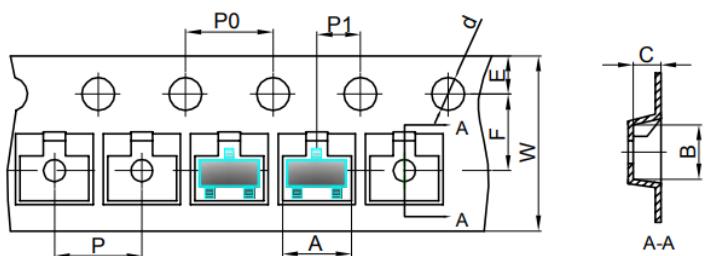


## Note:

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

## SOT-23 TAPE AND REEL

### SOT-23 Embossed Carrier Tape

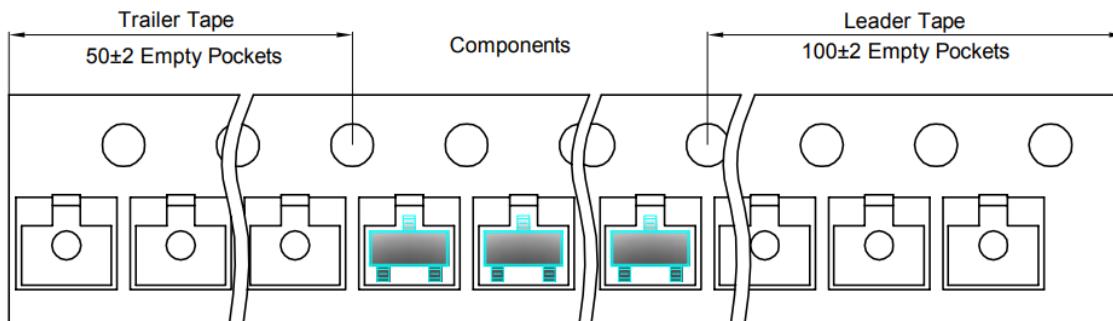


#### Packaging Description:

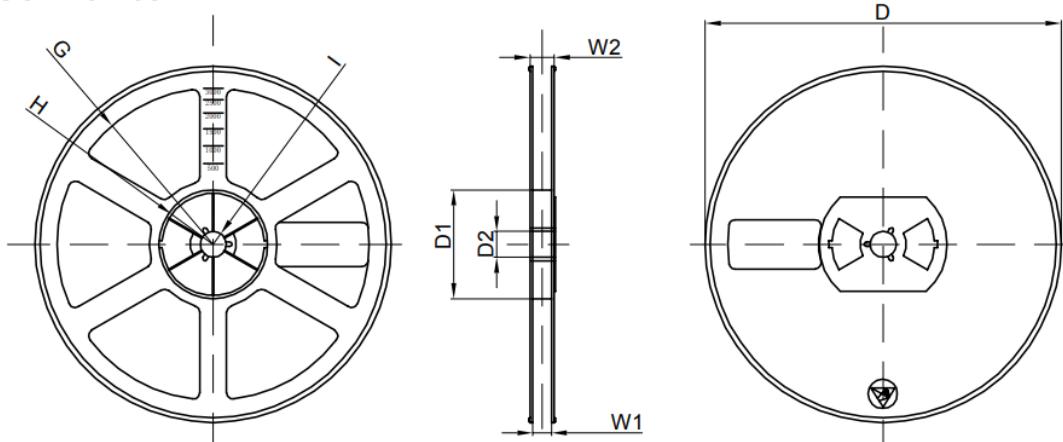
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

### SOT-23 Tape Leader and Trailer



### SOT-23 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	

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