

## 2N7002K-0.3A

## N-CHANNEL MOSFET

### 0.3A, 60V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

#### DESCRIPTION

The 2N7002 meet the ROHS and Green Product requirement with full function reliability approved.

#### FEATURES

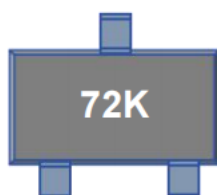
- \* High density cell design for low  $R_{DS(ON)}$
- \* Voltage controlled small signal switch
- \* Rugged and reliable
- \* High saturation current capability

#### APPLICATION

- \* Networking
- \* LED Lighting Application
- \* Power Tools
- \* DC-DC Power Management

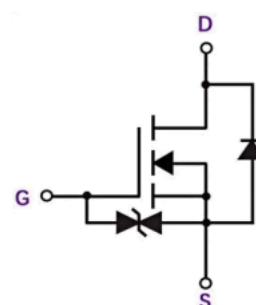
#### MARKING

Type Code: Marking: 72K



1. GATE
2. SOURCE
3. DRAIN

#### Equivalent Circuit



#### ABSOLUTE MAXIMUM RATINGS(TA=25°C, unless otherwise specified.)

| SYMBOL           | PARAMETER                                   | VALUE   | UNIT |
|------------------|---------------------------------------------|---------|------|
| V <sub>DS</sub>  | Drain-Source Voltage                        | 60      | V    |
| V <sub>GS</sub>  | Gate Source Voltage                         | ±20     | V    |
| I <sub>D</sub>   | Continuous Drain Current                    | 0.3     | A    |
| P <sub>D</sub>   | Power Dissipation                           | 0.225   | W    |
| T <sub>J</sub>   | Junction Temperature                        | 150     | °C   |
| T <sub>STG</sub> | Storage Temperature                         | -55~150 | °C   |
| R <sub>θJA</sub> | Thermal Resistance from Junction to Ambient | 556     | °C/W |

Notes: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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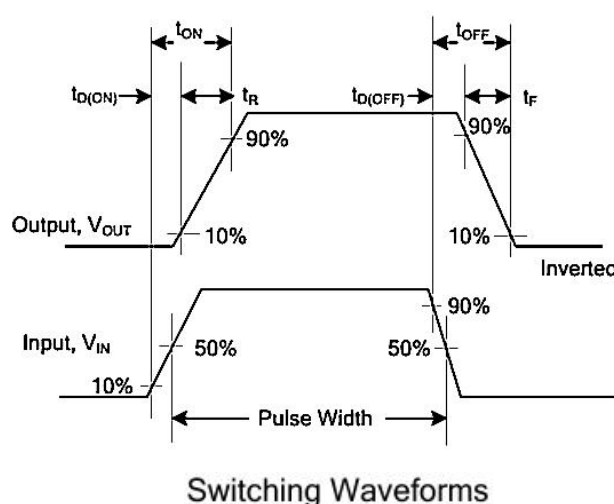
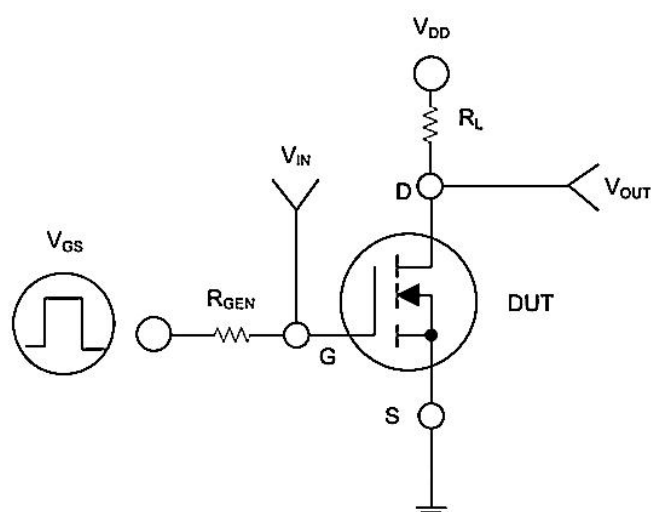
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### ■ ELECTRICAL CHARACTERISTICS (TA=25°C, unless otherwise specified)

| PARAMETER                               | SYMBOL              | TEST CONDITIONS                                                                                                 | MIN  | TYP | MAX | UNIT |
|-----------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------|------|-----|-----|------|
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                                      | 60   |     |     | V    |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA                                                        | 1    | 1.6 | 2.5 | V    |
| Gate-Source Leakage Current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                                                      |      |     | ±10 | μ A  |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =60V                                                                       |      |     | 1   | μ A  |
| On-state Drain Current                  | I <sub>D(ON)</sub>  | V <sub>GS</sub> =10 V, V <sub>DS</sub> =7 V                                                                     | 500  |     |     | mA   |
| Static Drain-Source On-State Resistance | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10 V, I <sub>D</sub> =0.3A                                                                     |      | 2.0 | 3.0 | Ω    |
|                                         |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.2A                                                                     |      | 1.7 | 3.0 | Ω    |
| Forward Trans conductance               | g <sub>fs</sub>     | V <sub>DS</sub> =10 V, I <sub>D</sub> =200mA                                                                    | 80   |     |     | ms   |
| Diode Forward Voltage                   | V <sub>SD</sub>     | I <sub>S</sub> =300mA, 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  | pF   |
| Reverse Transfer Capacitance*           | C <sub>RSS</sub>    |                                                                                                                 |      |     | 5   | pF   |
| SWITCHING TIME                          |                     |                                                                                                                 |      |     |     |      |
| Turn-On Delay Time                      | t <sub>ON</sub>     | V <sub>DD</sub> =25 V R <sub>L</sub> =50Ω<br>I <sub>D</sub> =500mA    V <sub>GEN</sub> =10 V R <sub>G</sub> =25 |      |     | 20  | nS   |
| Turn-Off Delay Time                     | t <sub>OFF</sub>    |                                                                                                                 |      |     | 40  | nS   |

Notes: These parameters have no way to verify.

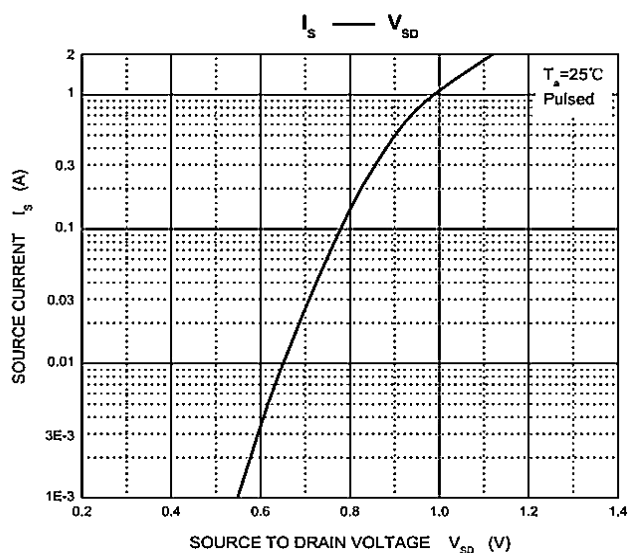
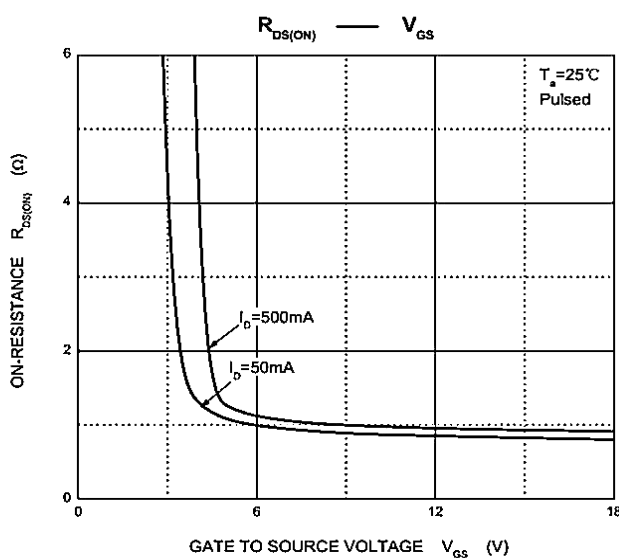
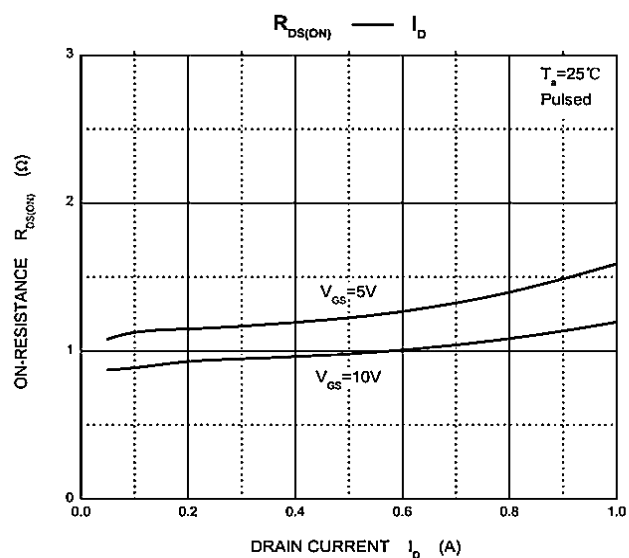
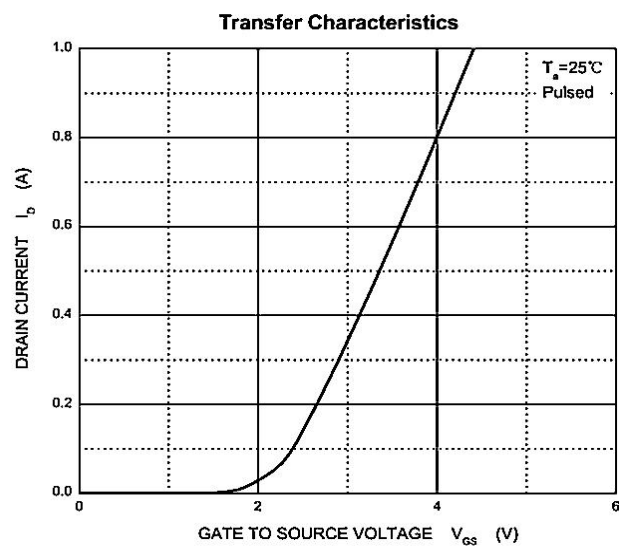
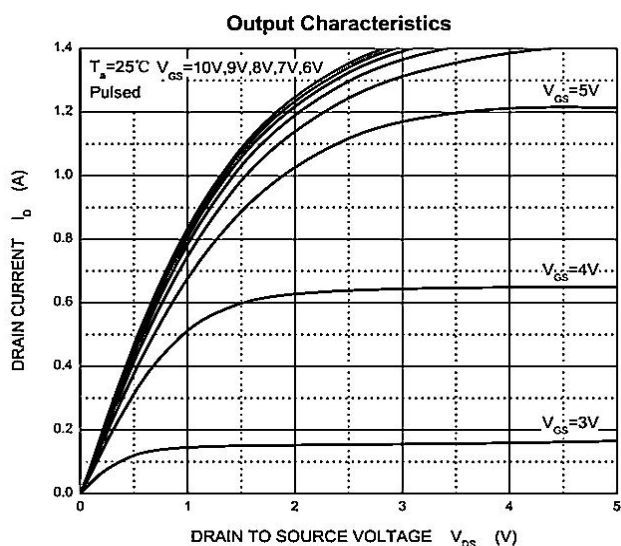
### ■ TEST CIRCUITS AND WAVEFORMS



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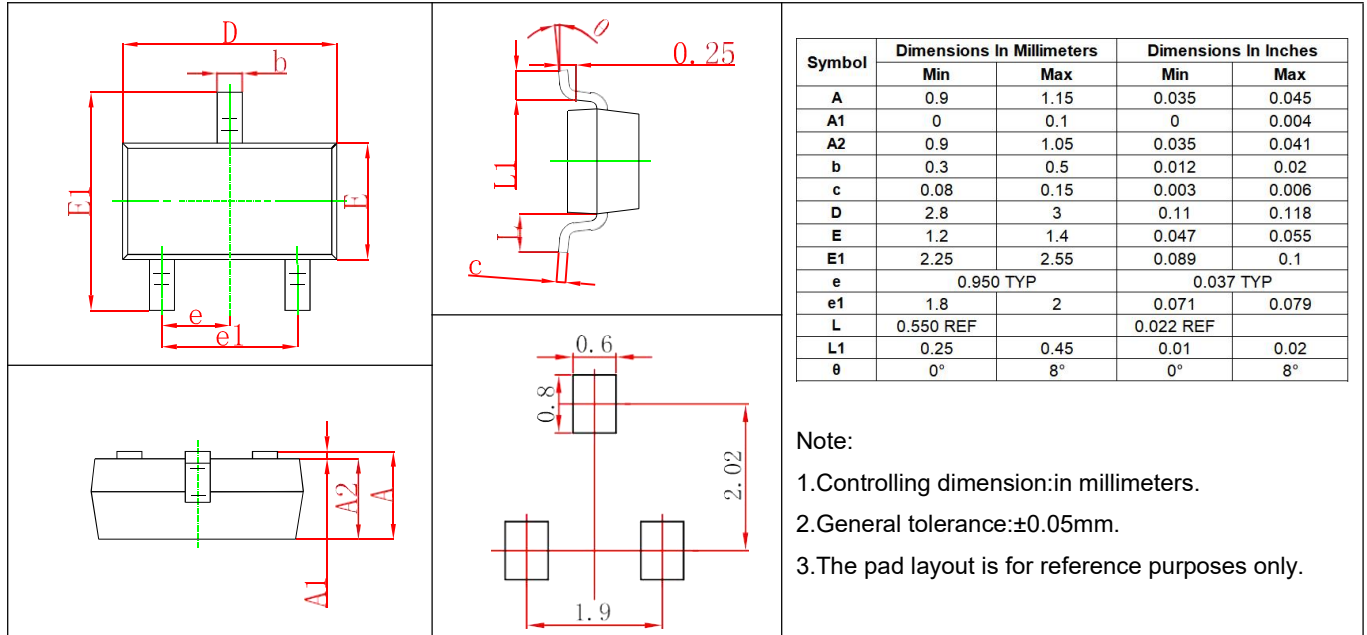
### TYPICAL CHARACTERISTICS



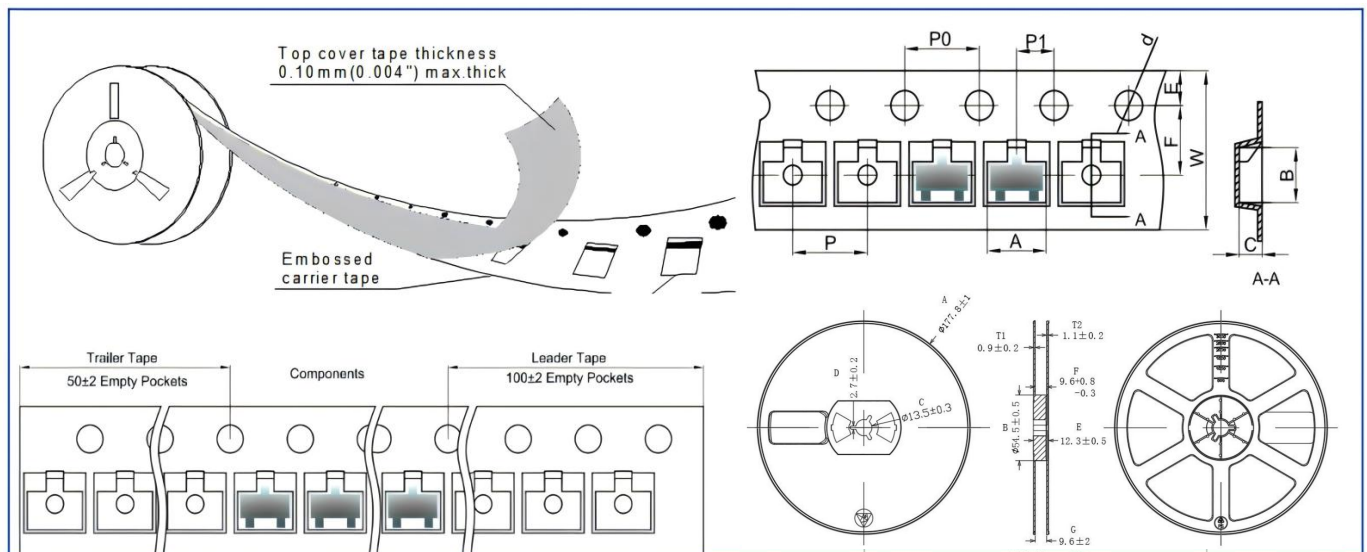
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### ■ SOT23 PACKAGE OUTLINE DIMENSIONS



### ■ REEL PACKING



| Dimensions are in millimeter |        |       |       |       |      |      |      |      |      |               |
|------------------------------|--------|-------|-------|-------|------|------|------|------|------|---------------|
| PKG TYPE                     | A      | B     | C     | d     | E    | F    | Po   | P    | P1   | W             |
| SOT-23                       | 3.17   | 2.77  | 1.22  | Φ1.55 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00          |
| Reel Option                  | A      | B     | C     | D     | E    | F    | G    | T1   | T2   | Q.TY PER REEL |
| 7" Dia                       | Φ177.8 | Φ54.5 | Φ13.5 | 2.7   | 12.3 | 9.6  | 9.6  | 0.9  | 1.1  | 3000PCS       |