

2N7002K

2N7002K N-Channel MOSFET

General description

N-Channel MOSFET

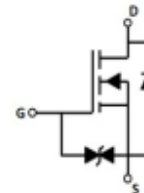
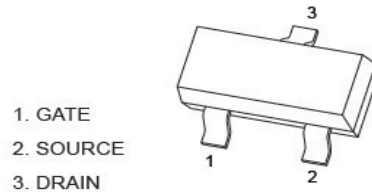
FEATURES

- Voltage controlled small signal switch
- Rugged and reliable
- P-Channel Switch with Low RDS(on)
- High saturation current capability.
- ESD protected
- Load Switch for Portable Devices
- DC/DC Converter.

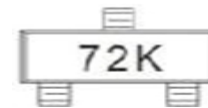
MECHANICAL DATA

- SOT-23 Small Outline Plastic Package.
- Epoxy UL: 94V-0

| V(BR)DSS | RDS(ON)MAX | ID |
|----------|------------|-------|
| 60V | 5Ω@10V | 340mA |
| | 5.3Ω@4.5V | |



MARKING



Maximum Ratings & Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified.)

| Parameters | Symbol | Value | Unit |
|---|------------------|----------|------|
| Drain-Source Voltage | V _{DS} | 60 | V |
| Gate-Source Voltage | V _{GS} | ± 20 | V |
| Continuous Drain Current | I _D | 340 | mA |
| Power Dissipation | P _D | 350 | mW |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{stg} | -50-+150 | °C |
| Thermal Resistance From Junction to Ambient | R _{θJA} | 357 | °C/W |

Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified).

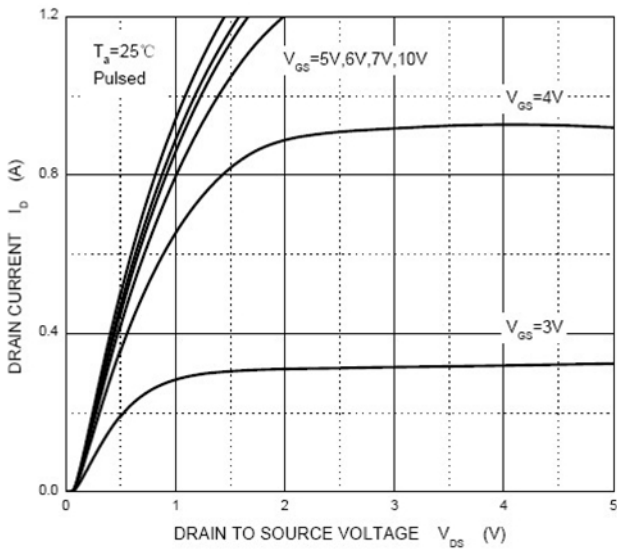
| Parameter | Symbols | Test Condition | Limits | | | Unit |
|---------------------------------|---------------------|---|--------|-----|------|------|
| | | | Min | Typ | Max | |
| Drain-Source Breakdown Voltage | V _{DS} | V _{GS} =0V, I _D =250uA | 60 | | | V |
| Gate-Threshold voltage* | V _{th(GS)} | V _{DS} =V _{GS} , I _D =1mA | 1 | 1.3 | 2.5 | V |
| Gate-body Leakage | I _{GSS1} | V _{DS} =0V, V _{GS} =±20V | | | ±10 | uA |
| | I _{GSS} | V _{DS} =0V, V _{GS} =±10V | | | ±200 | nA |
| | I _{GSS} | V _{DS} =0V, V _{GS} =±5V | | | ±100 | nA |
| Zero Gate Voltage Drain current | I _{DSS} | V _{DS} =48V, V _{GS} =0V | | | 1 | uA |
| Drain-Source On-Resistance* | R _{DS(ON)} | V _{GS} =10V, I _D =500mA | | 0.9 | 5 | Ω |
| | | V _{GS} =4.5V, I _C =200mA | | 1.1 | 5.3 | |
| Diode Forward voltage | V _{SD} | I _S =300mA, V _{GS} =0V | | | 1.50 | V |
| Input capacitance** | C _{iss} | V _{DS} =10V, V _{GS} =0V, f=1MHz | | | 40 | pF |
| Output capacitance** | C _{oss} | | | | 30 | |
| Reverse Transfer capacitance** | C _{rss} | | | | 10 | |
| Turn-on Time** | td(on) | V _{DD} =50V, R _L =250Ω, V _{GS} =10V, R _{GS} =50Ω, R _G =50Ω | | | 10 | ns |
| Turn-off Time** | td(off) | | | | 15 | |
| Reverse recovery Time | trr | V _{GS} =0V, I _S =300mA, V _R =25V, Dis/dt=-100a/uS | | 30 | | ns |
| Gate-Source Breakdown Voltage | BV _{GSO} | I _{GS} =±1mA(Open Drain) | ±21.5 | | ±30 | V |

Notes: * Pulse Test: Pulse Width ≤300us, Duty Cycles≤2%.

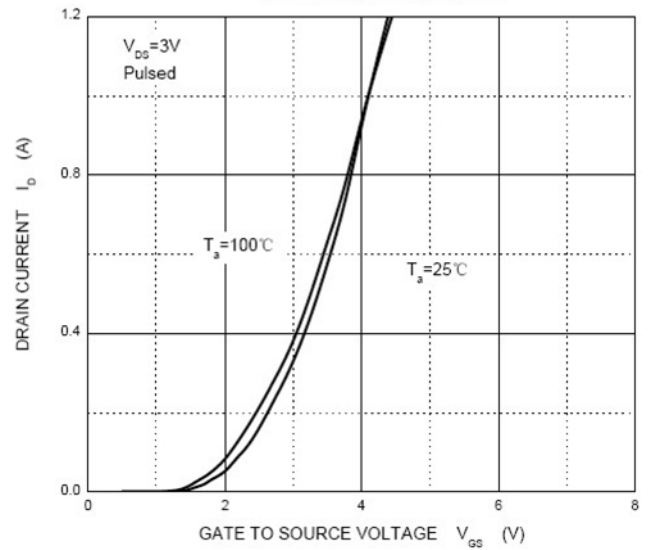
** These parameters have on way to verify.

Typical characteristics

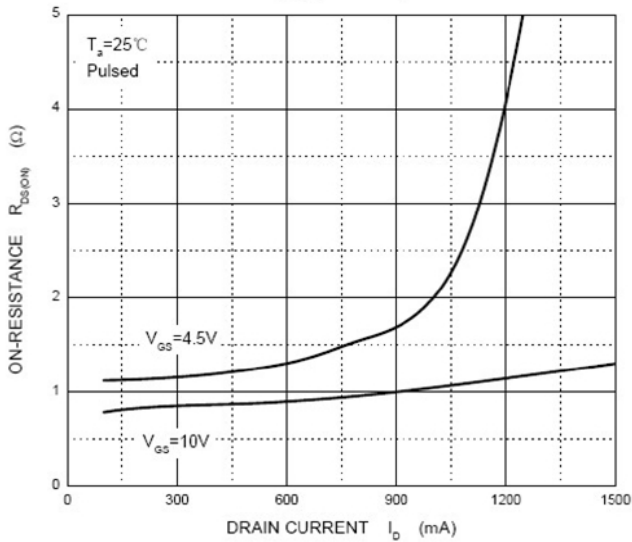
Output Characteristics



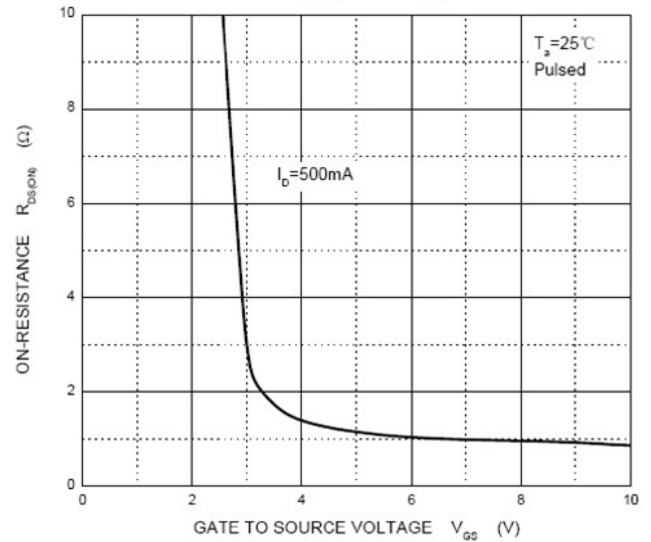
Transfer Characteristics



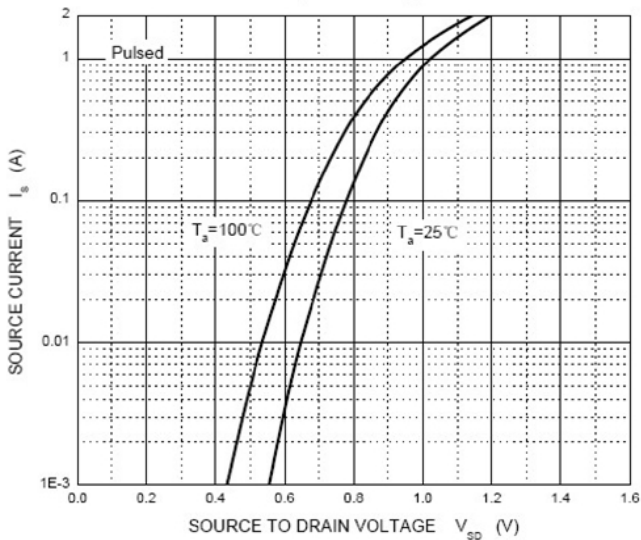
$R_{DS(ON)}$ — I_D



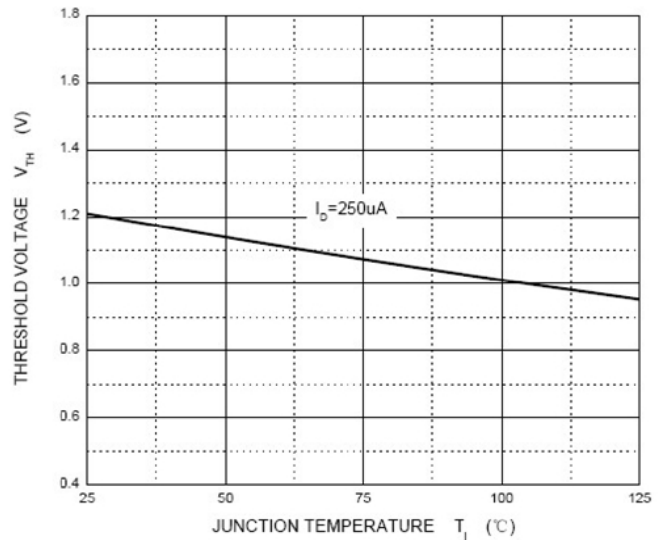
$R_{DS(ON)}$ — V_{GS}



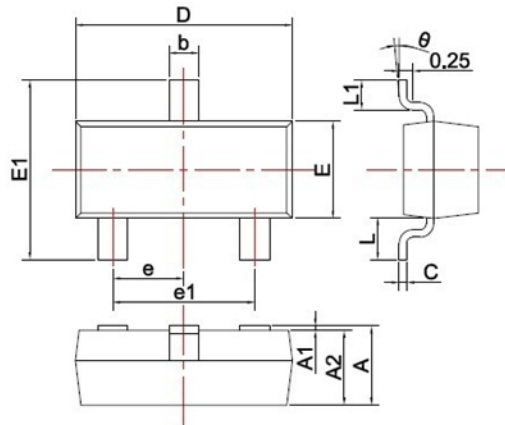
I_S — V_{SD}



Threshold Voltage



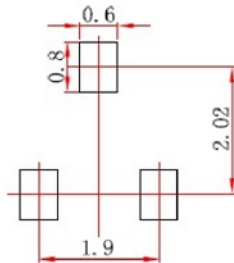
SOT-23 PACKAGE OUTLINE Plastic surface mounted package



| SYMBOL | DIMENSIONS | |
|----------|------------|-------|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |

Unit: mm

Recommended land dimensions for SOT-23 diode. Electrode patterns for PCBs



- Note:
1. Controlling dimension; In millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.

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