# KJ2N7002K

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- ☑ Surface-mounted package
- ☑ Advanced trench cell design
- ☑ Extremely low threshold voltage
- ☑ ESD protected

### 1.2 Applications

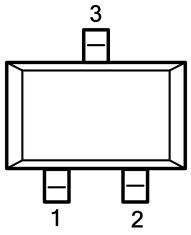
- ☑ Portable appliances

### 1.3 Quick reference

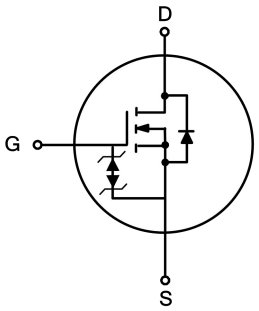
- ☑ BV ≧ 60 V
- ☑ $P_{tot}$ ≦ 0.83 W
- ☑ $I_D$ ≦ 0.5 A
- ☑ $R_{DS(ON)}$ ≦ 2 Ω @ $V_{GS}$ = 10 V
- ☑ $R_{DS(ON)}$ ≦ 2.7Ω @ $V_{GS}$ = 4.5 V

## 2. Pin Description

| Pin | Description | Simplified Outline | Symbol |
|---|---|---|---|
| 1 | Gate(G) | | |
| 2 | Source(S) | | |
| 3 | Drain(D) | | |




Top View
SOT23



# 3. Limiting Values

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | $T_A$ = 25 ℃ | 60 | - | V |
| $V_{GS}$ | Gate-Source Voltage | $T_A$ = 25 ℃ | - | ± 20 | V |
| $I_D$* | Drain Current | $T_A$ = 25 ℃, $V_{GS}$ = 10 V | - | 0.5 | A |
| $I_{DM}$*,** | Pulsed Drain Current | $T_A$ = 25 ℃, $V_{GS}$ = 10 V | - | 2 | A |
| $P_{tot}$* | Total Power Dissipation | $T_A$ = 25 ℃ | - | 0.83 | W |
| $T_{stg}$ | Storage Temperature | | - 55 | 150 | ℃ |
| $T_J$ | Junction Temperature | | - | 150 | ℃ |
| $I_S$* | Diode Forward Current | $T_A$ = 25 ℃ | - | 0.5 | A |
| $R_{\theta JA}$* | Thermal Resistance- Junction to Ambient | | - | 150 | ℃ / W |

Notes：

* Surface Mounted on 1 $in^2$ pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

*** Limited by bonding wire

# 4. Marking Information

| Product Name | Marking |
|---|---|
| KJ2N7002K | 702<br>YWWXXX<br>YWW: Date Code |

# 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|---|---|---|---|---|---|
| KJ2N7002K | SOT23 | | | | |

Note: KUAIJIEXIN defines " Green " as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

## 6. Electrical Characteristics ( $T_A$ = 25 °C Unless Otherwise Noted )

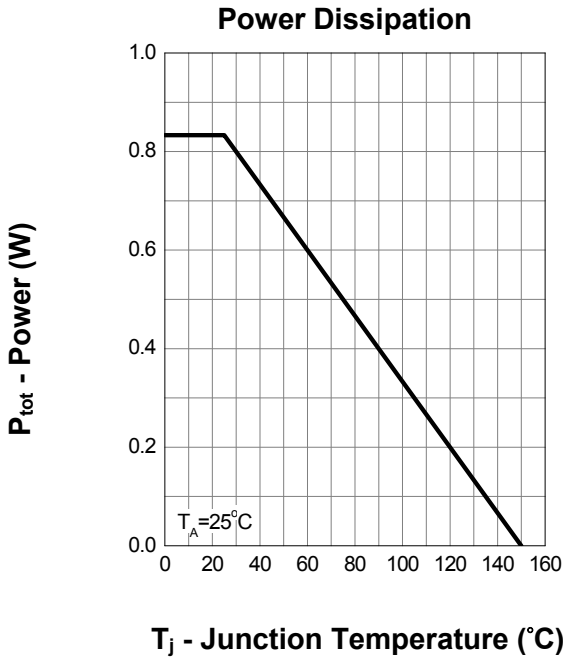
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$ = 0 V, $I_{DS}$ = 250 μA | 60 | – | – | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_{DS}$ = 250 μA | 1 | 1.5 | 2 | V |
| $I_{DSS}$ | Drain Leakage Current | $V_{DS}$ = 48 V, $V_{GS}$ = 0 V | - | - | 1 | μA |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$ = ± 20 V, $V_{DS}$ = 0 V | - | ±0.8 | - | μA |
| $R_{DS(ON)}$[a] | On-State Resistance | $V_{GS}$ = 10 V, $I_{DS}$ = 0.5 A | - | 1.5 | 2 | Ω |
| | | $V_{GS}$ = 4.5 V, $I_{DS}$ = 0.2 A | - | 2.0 | 2.7 | |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$[a] | Diode Forward Voltage | $I_{SD}$ = 0.5 A, $V_{GS}$ = 0 V | - | 0.85 | - | V |
| $t_{rr}$ | Reverse Recovery Time | $I_{SD}$ = 0.5 A, $dI_{SD}$ / dt = 100 A / μs | - | 30 | - | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 29 | - | nC |
| **Dynamic Characteristics**[b] | | | | | | |
| $R_G$ | Gate Resistance | $V_{GS}$ = $V_{DS}$ = 0 V, F = 1 MHz | - | 200 | - | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0 V, $V_{DS}$ = 25 V Frequency = 1 MHz | - | 14.7 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 0.76 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 0.63 | - | |
| $t_{d}$(on) | Turn-on Delay Time | $V_{DS}$ = 30 V, $V_{GEN}$ = 10 V, $R_G$ = 25 Ω, $R_L$ = 60 Ω, $I_{DS}$ = 0.5 A | - | 2.7 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 2.5 | - | |
| $t_{d}$(off) | Turn-off Delay Time | | - | 13 | - | |
| $t_f$ | Turn-off Fall Time | | - | 8 | - | |
| | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{GS}$ = 4.5 V, $V_{DS}$ = 10 V, $I_{DS}$ = 0.5 A | - | 0.44 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 0.2 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 0.1 | - | |

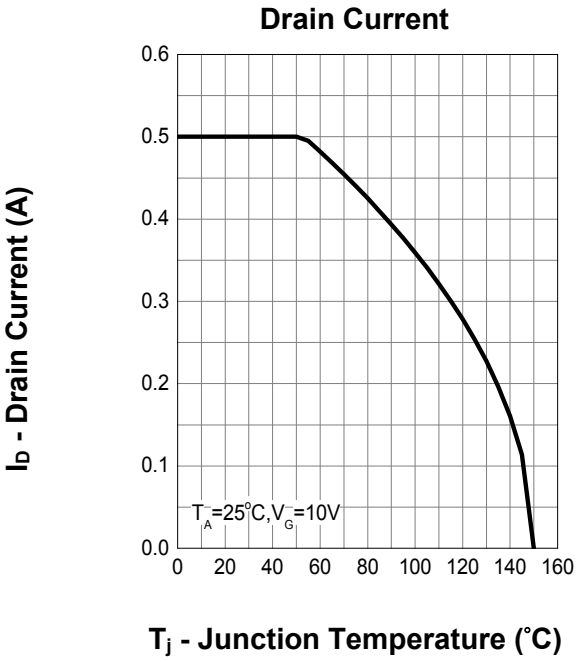
Notes :

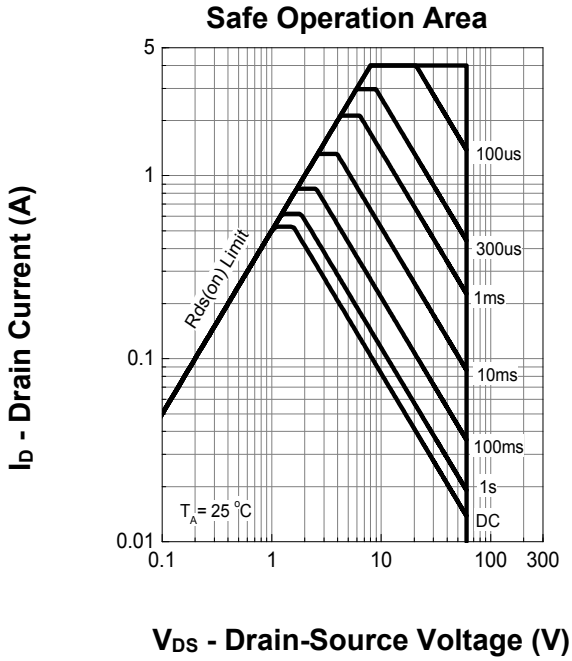
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

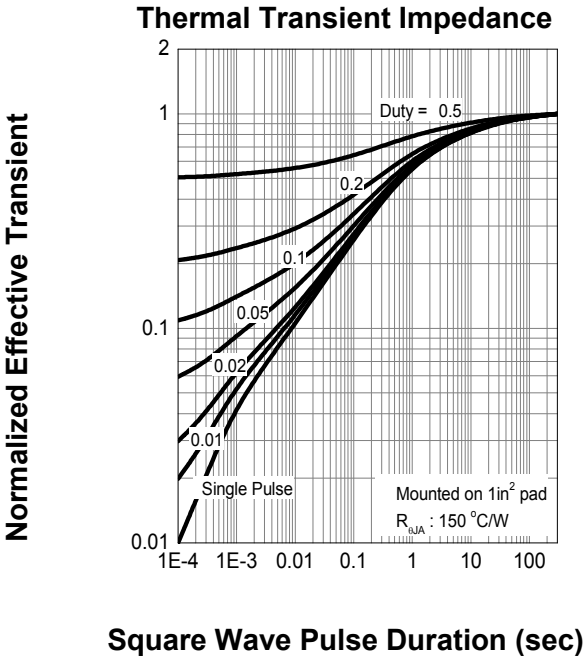
b : Guaranteed by design, not subject to production testing

# 7. Typical Characteristics



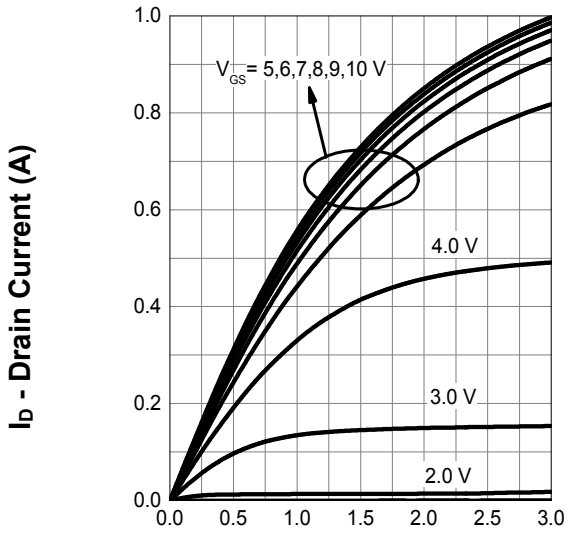



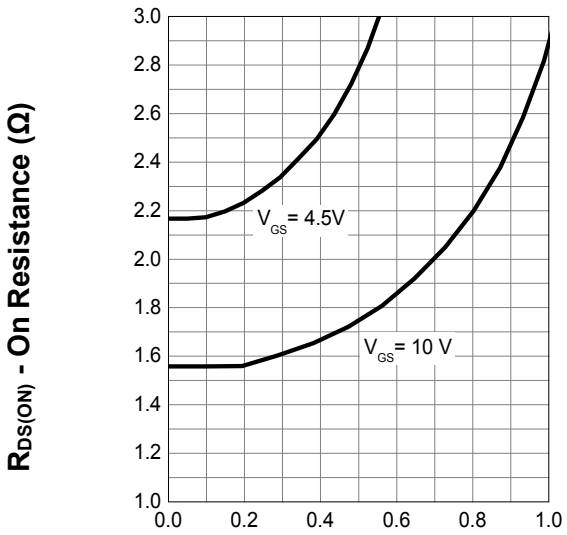



# 7. Typical Characteristics (cont.)

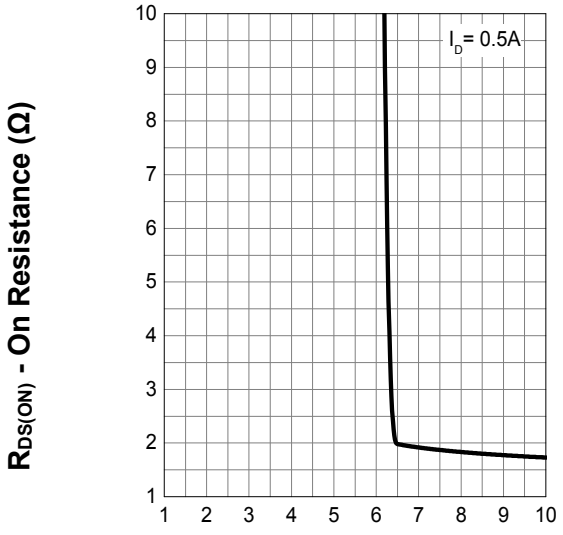
**Output Characteristics**



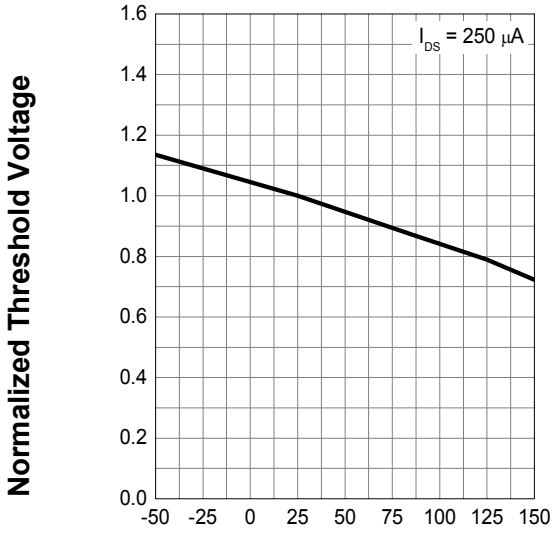

**Drain-Source On Resistance**



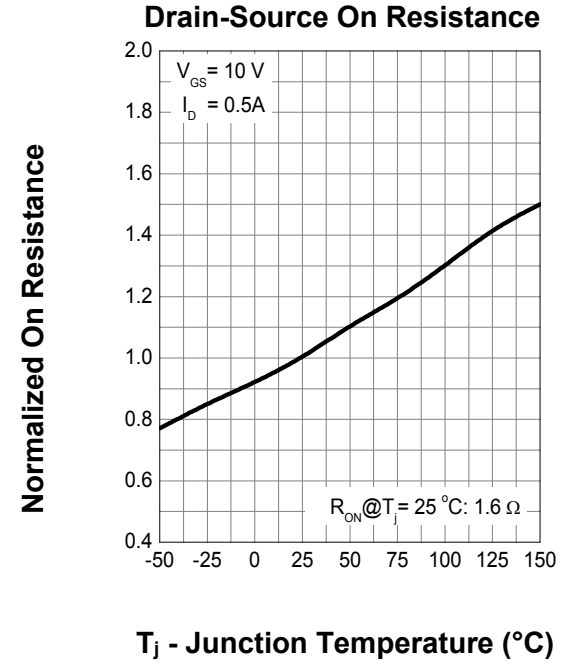

**Transfer Characteristics**

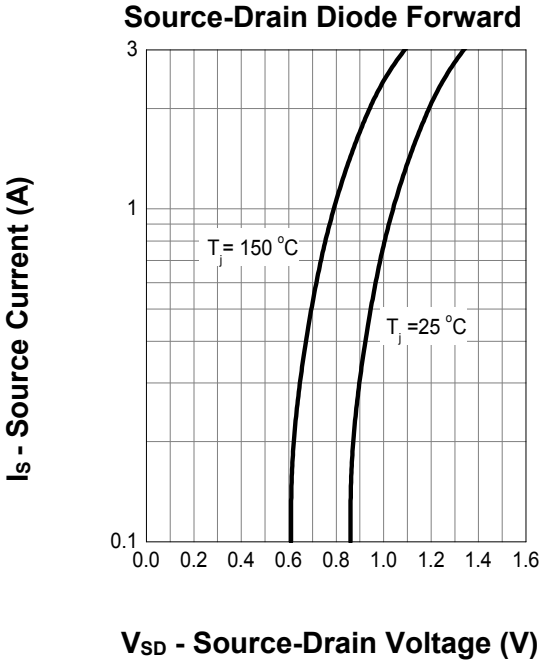


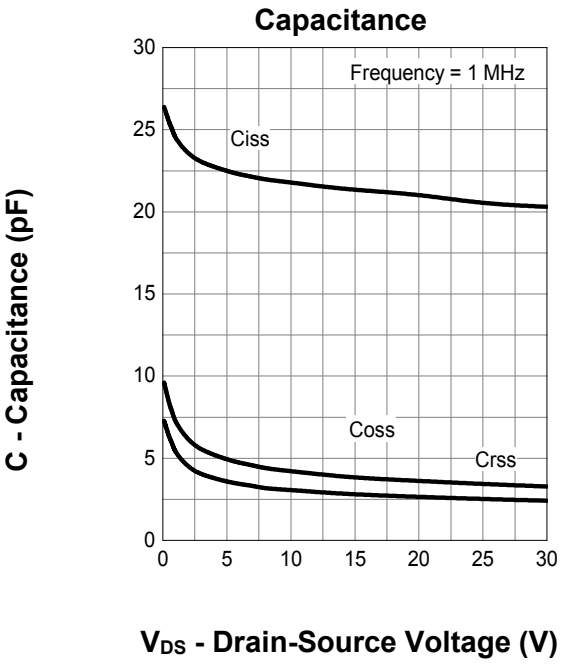

**Gate Threshold Voltage**

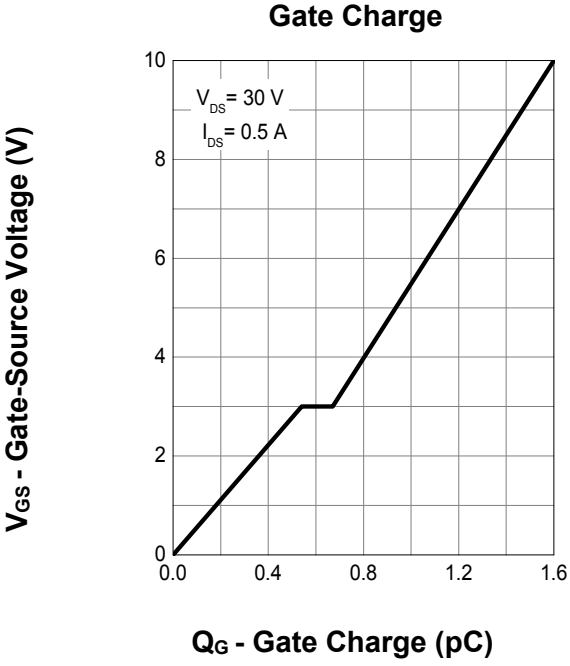


# 7. Typical Characteristics (cont.)



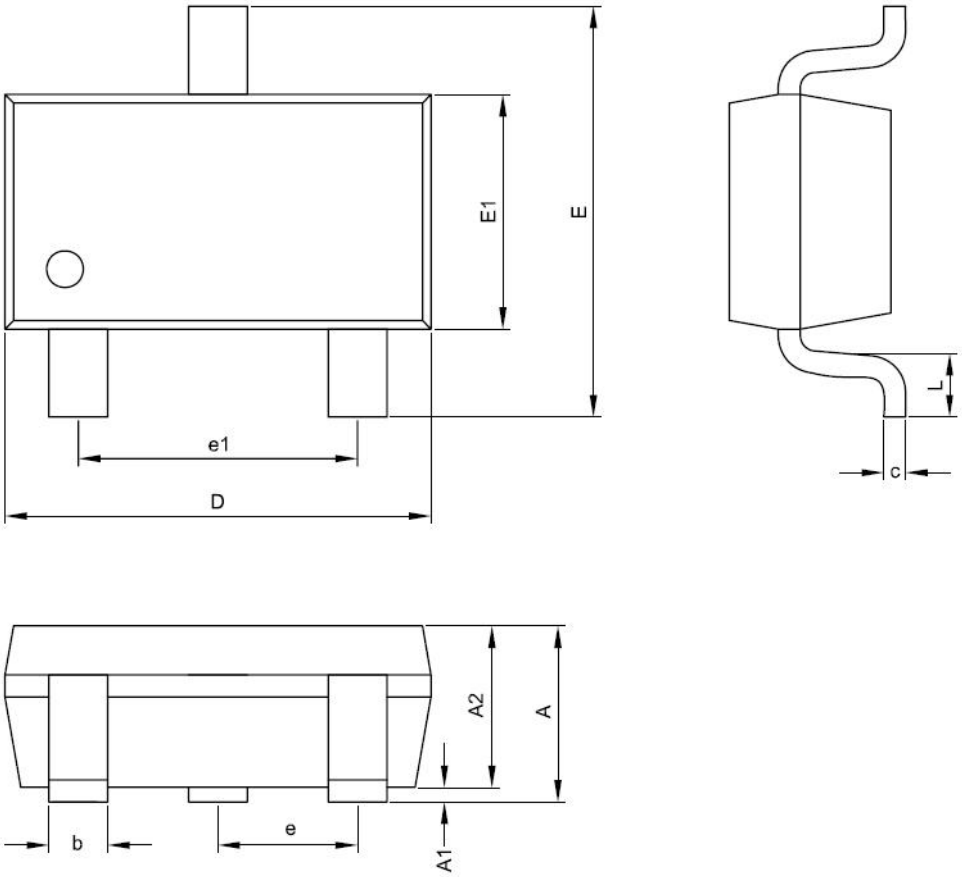



# 8. Package Dimensions

## SOT23S-3L




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | —— | 1.12 |
| A1 | 0.00 | 0.1 |
| A2 | 0.90 | 1.02 |
| D | 2.90 BSC | |
| E | 2.40 BSC | |
| E1 | 1.20 | 1.40 |
| c | 0.08 | 0.25 |
| b | 0.30 | 0.50 |
| e | 0.95 BSC | |
| e1 | 1.90 BSC | |
| L | 0.20 | 0.60 |