

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- Advanced trench cell design
- Low thermal impedance
- Fast switching speed
- 100% Avalanche tested

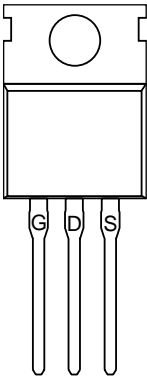
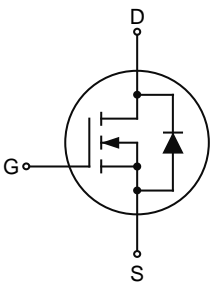
1.2 Applications

- DC/DC conversion
- Power switch
- Motor drives
- Battery management

1.3 Quick reference

- $BV \geq 100\text{ V}$
- $R_{DS(ON)} \leq 2.7\text{ m}\Omega @V_{GS} = 10\text{ V}$
- $P_D \leq 250\text{ W}$
- $I_D \leq 180\text{ A}$

2. Pin Description

| Pin | Description | Simplified Outline | Symbol |
|-----|-------------|--|---|
| 1 | Gate(G) |  <p>Top View TO-220</p> |  |
| 2 | Drain(D) | | |
| 3 | Source(S) | | |

3. Limiting Values

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------------------------------|--|---|-----|-----|------|
| V _{DS} | Drain-Source Voltage | T _C =25°C | 100 | - | V |
| V _{GS} | Gate-Source Voltage | T _C =25°C | - | ±20 | V |
| I _D ^{***} | Drain Current (DC) | T _C =25°C, V _{GS} =10 V | - | 180 | A |
| I _{DM} ^{*,***} | Drain Current (Pulsed) | T _C =25°C, V _{GS} =10 V | - | 720 | A |
| P _D | Drain Power Dissipation | T _C =25°C | - | 250 | W |
| E _{AS} | Single Pulsed Avalanche Energy | V _{DD} =50 V, L=0.3 mH | - | 911 | mJ |
| T _J , T _{stg} | Operating Junction and Storage Temperature Range | | -55 | 150 | °C |
| R _{θJA} ^{**} | Thermal Resistance-Junction to Ambient | | - | 40 | °C/W |
| R _{θJC} ^{**} | Thermal Resistance-Junction to Case | | - | 0.5 | |

Notes:

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

** Surface Mounted on 1 in² pad area, t ≤ 10 sec.

*** Limited by bonding wire.

4. Marking Information

| Product Name | Marking |
|--------------|--|
| KJ028N10CA | <div style="display: inline-block; background-color: black; color: white; padding: 2px;"> KJ028N10CA YWWXXX </div> YWWXXX: Date Code |

5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity(pcs) | Note |
|--------------|---------|-----------|------------|---------------|------|
| KJ028N10CA | TO-220 | N/A | N/A | 1000 | |

Note: KUIJIEXIN 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_J=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|--------------------------------|--|-----|------|------|------|
| Static Characteristics | | | | | | |
| B _V DSS | Drain-Source Breakdown Voltage | V _{GS} =0 V, I _{DS} =250 μA | 100 | - | - | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _{DS} =250 μA | 2 | - | 4 | V |
| I _{DSS} | Drain Leakage Current | V _{DS} =100 V, V _{GS} =0 V | - | - | 1 | μA |
| I _{GSS} | Gate Leakage Current | V _{DS} =0 V, V _{GS} =±20 V | - | - | ±100 | nA |
| R _{DS(ON)} ^a | On-State Resistance | V _{GS} =10 V, I _{DS} =75 A | - | 2.3 | 2.7 | mΩ |
| g _{FS} | Forward Transconductance | V _{GS} =5 V, I _{DS} =75 A | - | 150 | - | S |
| R _g | Gate Resistance | Frequency=1 MHz | - | 1.3 | - | Ω |
| Diode Characteristics | | | | | | |
| V _{SD} ^a | Diode Forward Voltage | V _{GS} =0 V, I _{SD} =75 A, V _{GS} =0 V | - | - | 1.2 | V |
| t _{rr} | Reverse Recovery Time | V _{DD} =50 V, V _{GS} =0 V, I _{SD} =75 A, diF/dt=100 A/μs | - | 66 | - | ns |
| Q _{rr} | Reverse Recovery Charge | | - | 129 | - | nC |
| Dynamic Characteristics^b | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =50 V, V _{GS} =0 V, f=1.0 MHz | - | 8508 | - | pF |
| C _{oss} | Output Capacitance | | - | 1105 | - | |
| C _{rss} | Reverse Transfer Capacitance | | - | 44 | - | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} =50 V, V _{GS} =10 V, I _D =75 A, R _{GEN} =6 Ω | - | 68 | - | ns |
| t _r | Turn-on Rise Time | | - | 74 | - | |
| t _{d(off)} | Turn-off Delay Time | | - | 96 | - | |
| t _f | Turn-off Fall Time | | - | 39 | - | |
| Gate Charge Characteristics^b | | | | | | |
| Q _g | Total Gate Charge | V _{DS} =50 V, V _{GS} =10 V, I _D =75 A | - | 140 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 42 | - | |
| Q _{gd} | Gate-Drain Charge | | - | 41 | - | |

Notes:

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

7. Typical Characteristics

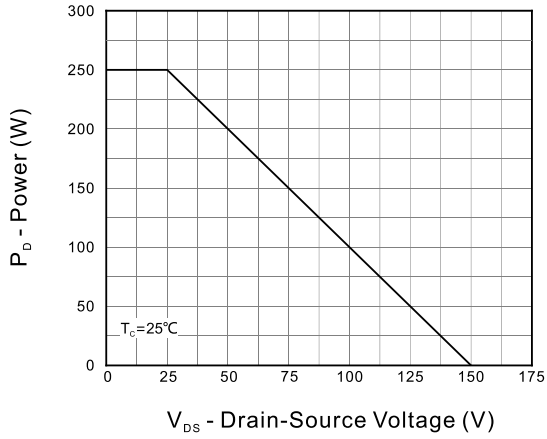


Fig 1. Output Characteristics

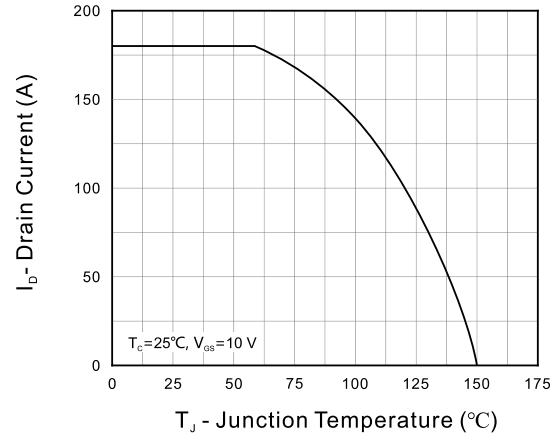


Fig 2. Current Capability

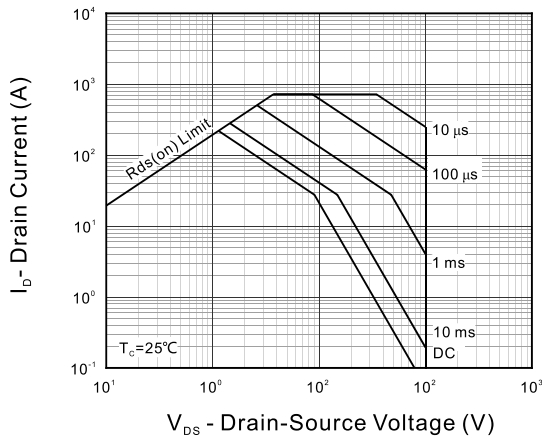


Fig 3. Safe Operation Area

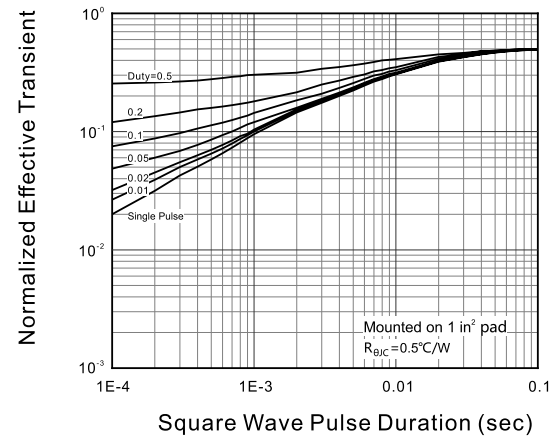


Fig 4. Transient Thermal Impedance

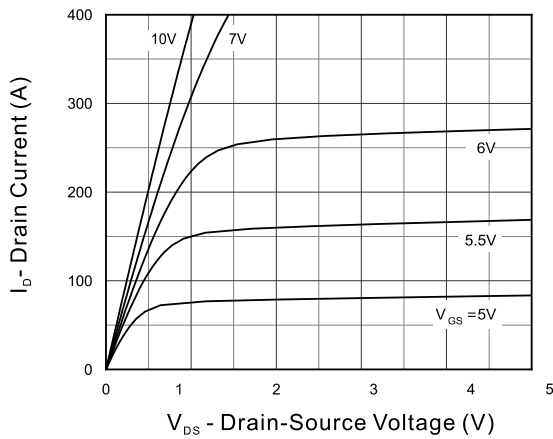


Fig 5. Output Characteristics

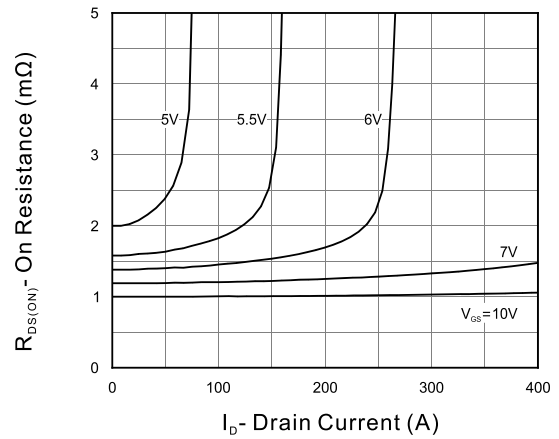


Fig 6. On Resistance

7. Typical Characteristics (cont.)

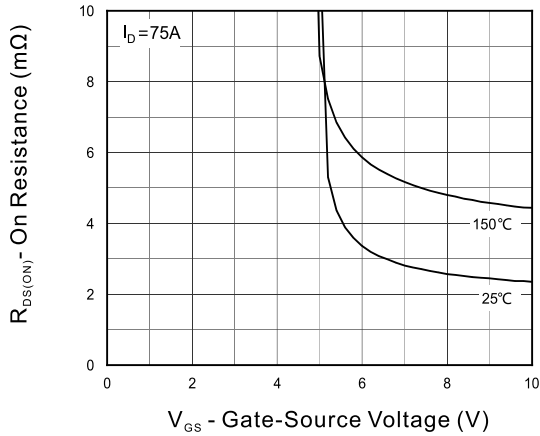


Fig 7. Transfer Characteristics

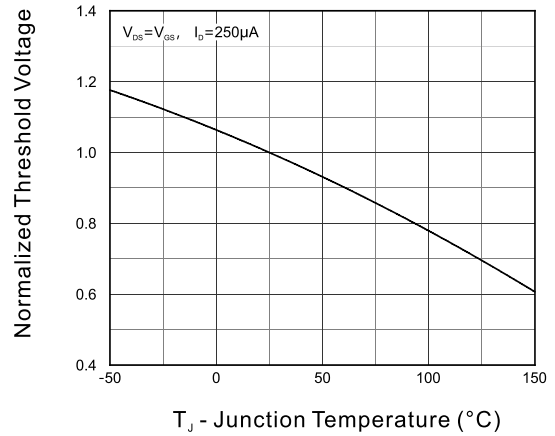


Fig 8. Normalized Threshold Voltage

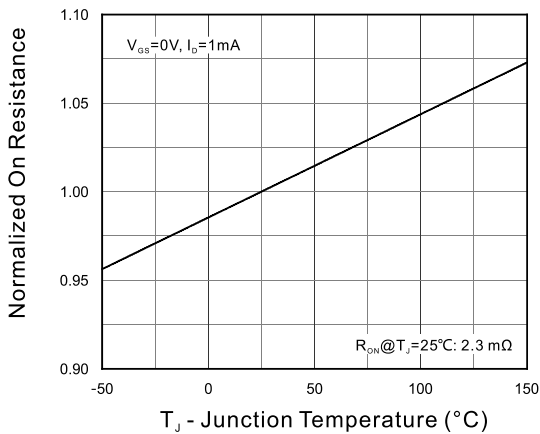


Fig 9. Normalized On Resistance

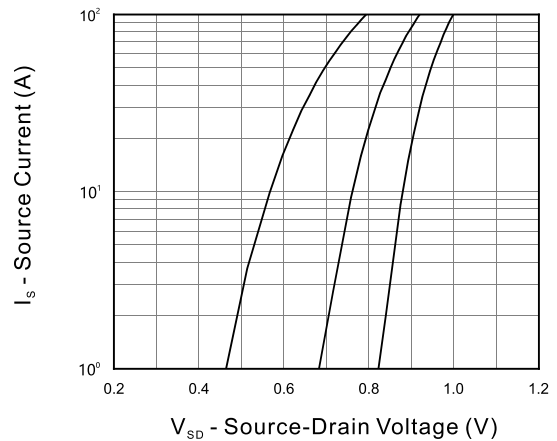


Fig 10. Diode Forward Current

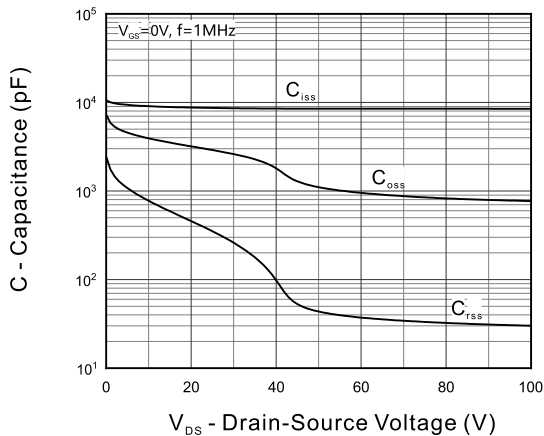


Fig 11. Capacitance

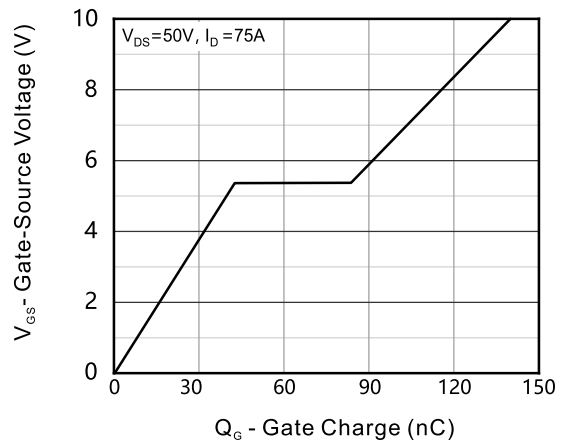
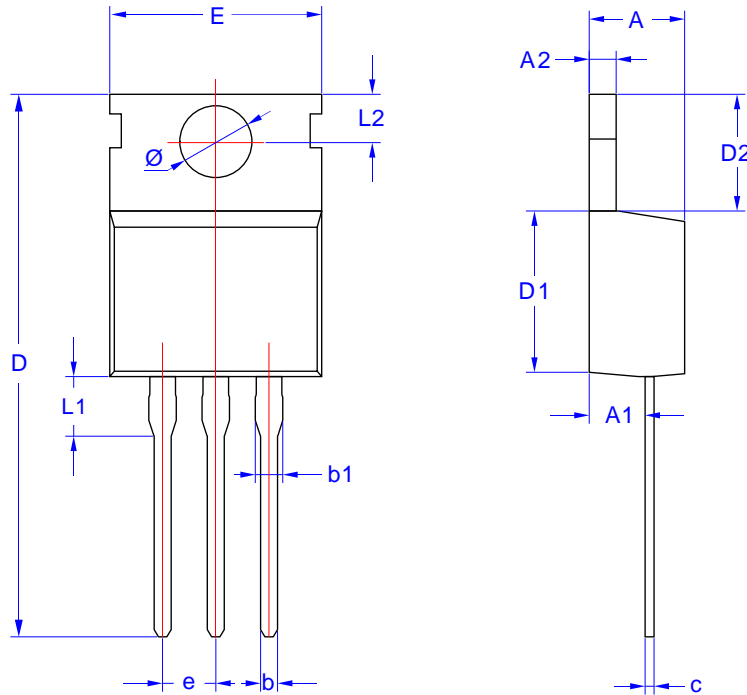


Fig 12. Gate Charge

8. Package Dimensions

TO-220 Package



| Symbol | Dimensions in Millimeters | |
|--------|---------------------------|-------|
| | MIN. | MAX. |
| A | 4.24 | 4.70 |
| A1 | 2.20 | 3.00 |
| A2 | 1.15 | 1.40 |
| b | 0.70 | 0.95 |
| b1 | 1.14 | 1.70 |
| c | 0.40 | 0.60 |
| D | 28.0 | 29.8 |
| D1 | 8.80 | 9.90 |
| D2 | 6.25 | 6.90 |
| E | 9.70 | 10.50 |
| L1 | 3.80 | |
| L2 | 2.40 | 3.00 |
| e | 2.54 BSC | |
| ϕ | 3.60 | |