# KJ03N10G

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- ☑ Surface-mounted package
- ☑ Super Trench
- ☑ Tj max 175℃
- ☑ Advanced trench cell design
- ☑ MSL1

### 1.2 Applications

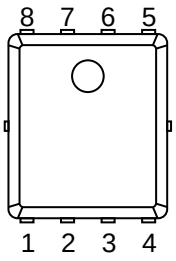
- ☑ Motor drivers
- ☑ DC - DC Converter

### 1.3 Quick reference

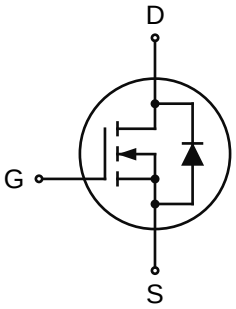
- ☑ BV ≧ 100 V
- ☑ $P_{tot}$ ≦ 35 W
- ☑ $I_D$ ≦ 100 A
- ☑ $R_{DS(ON)}$ ≦ 3.3 mΩ @ $V_{GS}$ = 10 V
  $R_{DS(ON)}$ ≦ 4.5 mΩ @ $V_{GS}$ = 6 V

## 2. Pin Description

| Pin | Description | Simplified Outline | Symbol |
|---|---|---|---|
| 1,2,3 | Source | | |
| 4 | Gate | | |
| 5,6,7,8 | Drain | | |




**Top View**
**PDFN5x6-8L**



## 3. Limiting Values

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | $T_C$ = 25 ℃ | 100 | - | V |
| $V_{GS}$ | Gate-Source Voltage | $T_C$ = 25 ℃ | - | ± 20 | V |
| $I_D$* | Drain Current | $T_C$ = 25 ℃, $V_{GS}$ = 10 V | - | 100 | A |
| $I_{DM}$*,** | Pulsed Source Current | $T_C$ = 25 ℃, $V_{GS}$ = 10 V | - | 280 | A |
| $P_{tot}$* | Total Power Dissipation | $T_C$ = 25 ℃ | - | 35 | W |
| $T_{stg}$ | Storage Temperature | | - 55 | 175 | ℃ |
| $T_J$ | Junction Temperature | | - | 175 | ℃ |
| $I_S$ | Diode Forward Current | $T_C$ = 25 ℃ | - | 100 | A |
| $E_{AS}$* | Single Pulsed Avalanche Energy | $V_{DD}$= 50 V, L= 1.0 mH | - | 420 | mJ |
| $R_{\theta JA}$* | Thermal Resistance- Junction to Ambient | | - | 62.5 | ℃ / W |
| $R_{\theta JC}$* | Thermal Resistance- Junction to Case | | - | 3.5 | |

Notes：

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

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

## 4. Marking Information

| Product Name | Marking |
|---|---|
| KJ03N10G | 03N10<br>YWWXXX<br>YWWXXX: Date Code |

## 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|---|---|---|---|---|---|
| KJ03N10G | PDFN5x6-8L | | | 5000 | |

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, $I_D$ = 250 μA | 100 | - | - | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_{DS}$ = 250 μA | 2 | - | 4 | V |
| $I_{DSS}$ | Zero Gate Voltage Source Current | $V_{DS}$ = 80 V, $V_{GS}$ = 0 V | - | - | 1 | μA |
| | | $T_J$ = 85 ℃ | - | - | 30 | μA |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$ = ± 20 V, $V_{DS}$ = 0 V | - | - | ± 100 | nA |
| $R_{DS(ON)}$[a] | Drain-Source On-State Resistance | $V_{GS}$ = 10 V, $I_D$ = 50 A | - | 2.9 | 3.3 | mΩ |
| | | $V_{GS}$ = 6 V, $I_D$ = 40 A | - | 4 | 4.5 | |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$[a] | Diode Forward Voltage | $I_{SD}$ = 50 A, $V_{GS}$ = 0 V | - | - | 1.3 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_{SD}$ = 50 A, $dI_{SD}/dt$ = 100 A/μs | - | 84 | - | nS |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 162 | - | nC |
| **Dynamic Characteristics**[b] | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0 V, $V_{DS}$ = 50 V<br>Frequency = 1 MHz | - | 5527 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 790 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 44 | - | |
| $t_d$(on) | Turn-on Delay Time | $V_{DS}$ = 50 V, $V_{GEN}$ = 10 V,<br>$R_G$ = 4.5 Ω, $R_L$ = 1 Ω,<br>$I_{DS}$ = 50 A | - | 24 | - | nS |
| $t_r$ | Turn-on Rise Time | | - | 61 | - | |
| $t_d$(off) | Turn-off Delay Time | | - | 63 | - | |
| $t_f$ | Turn-off Fall Time | | - | 42 | - | |
| **Gate Charge Characteristics**[b] | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$ = 50 V, $V_{GS}$ = 10 V,<br>$I_{DS}$ = 50 A | - | 101 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 31 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 27 | - | |

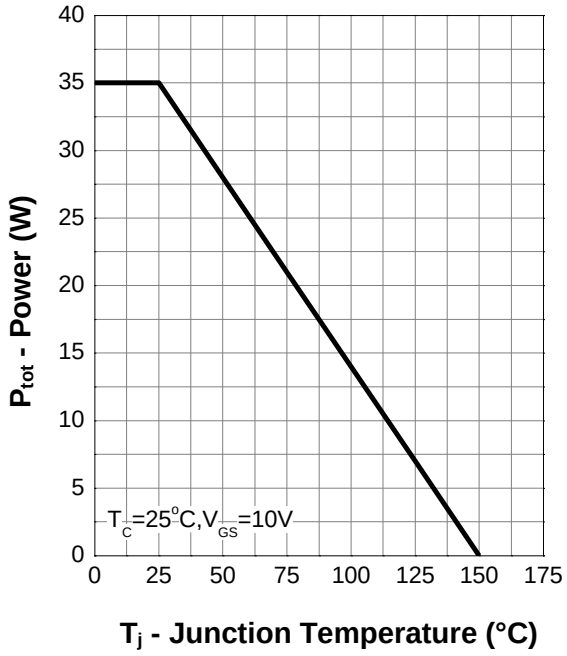
Notes：

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

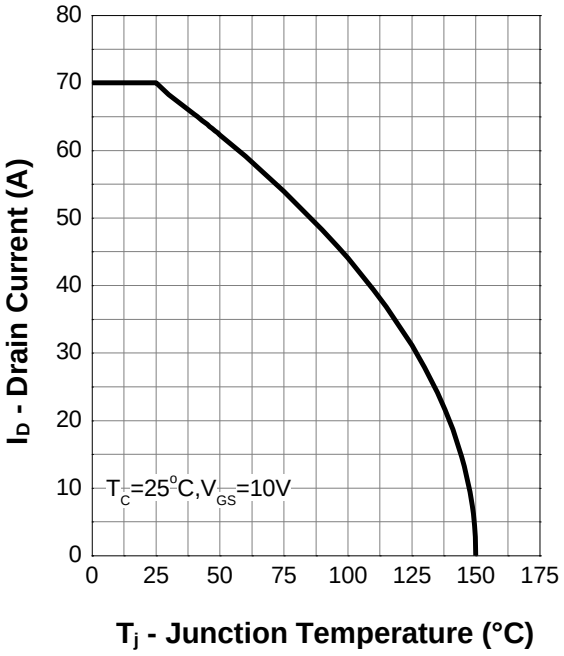
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics (Cont.)

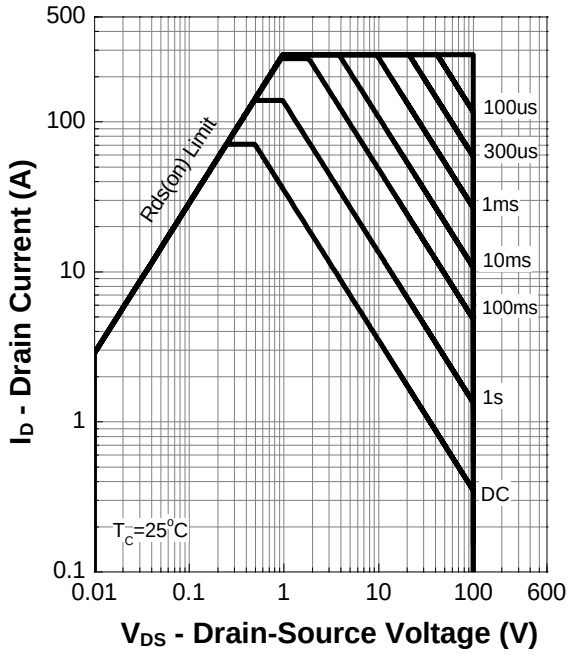
**Power Capability**



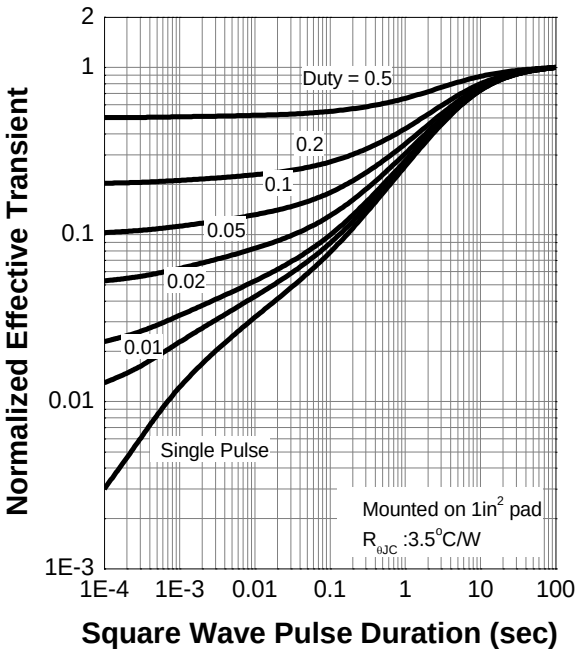

**Current Capability**




**Safe Operation Area**

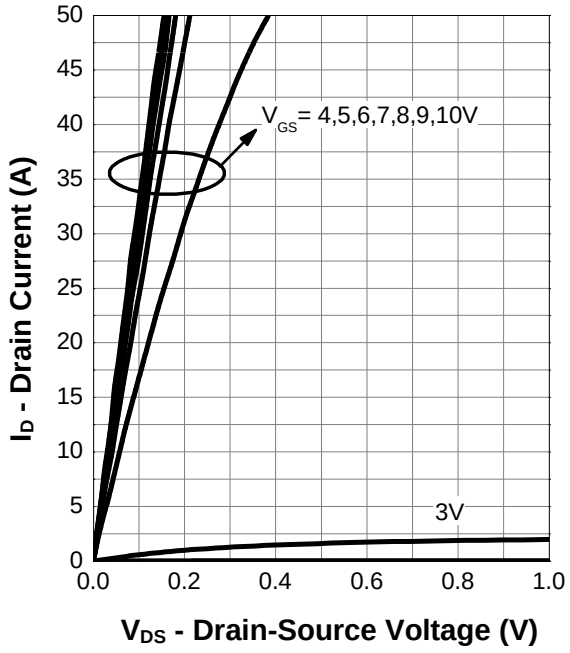



**Transient Thermal Impedance**

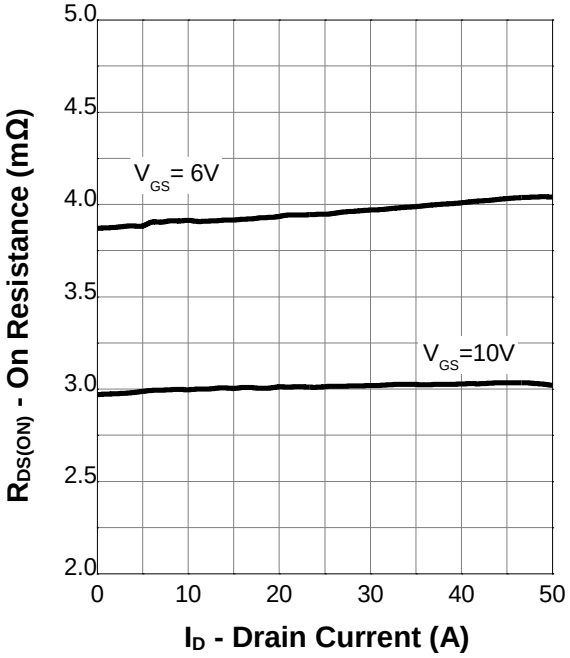


## 7. Typical Characteristics (Cont.)

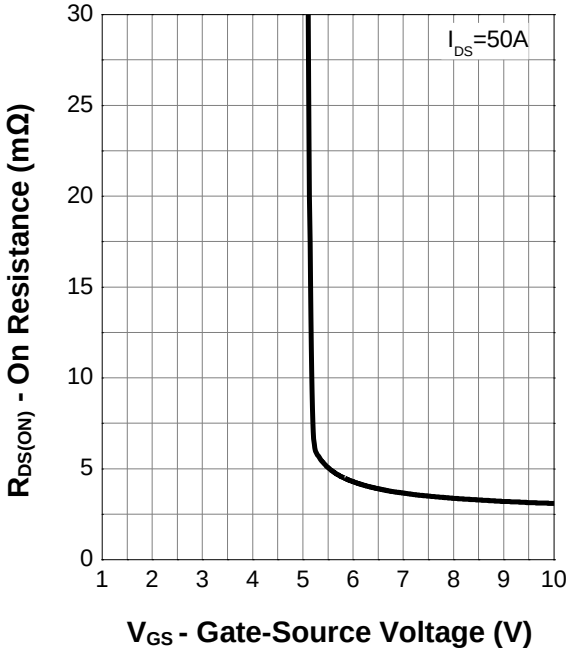
**Output Characteristics**



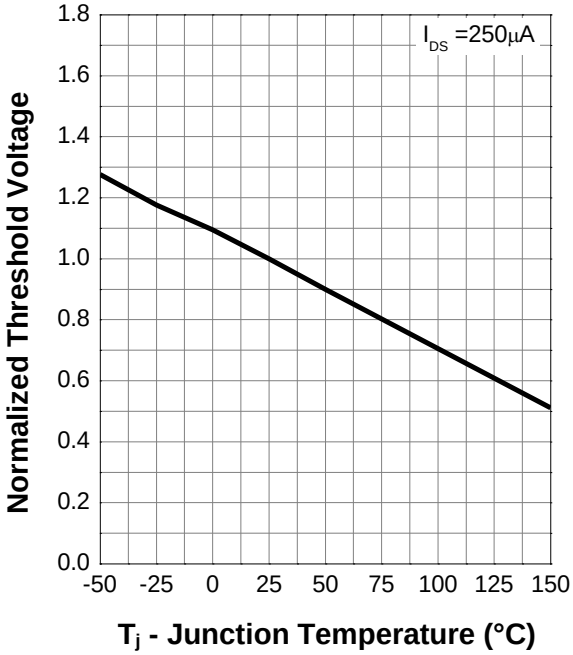

**On Resistance**




**Transfer Characteristics**

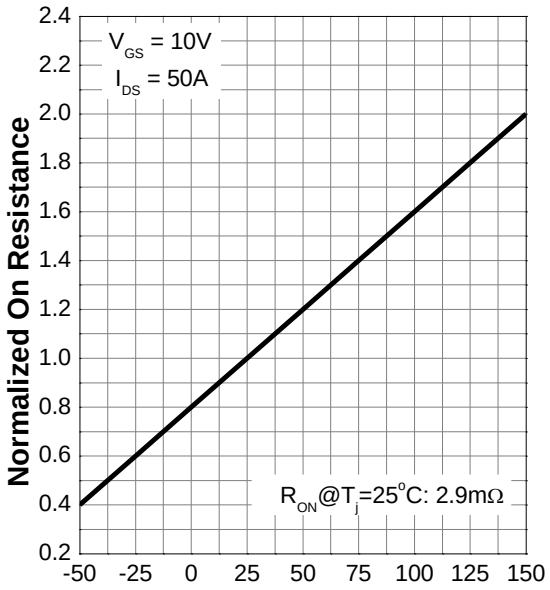



**Normalized Threshold Voltage**



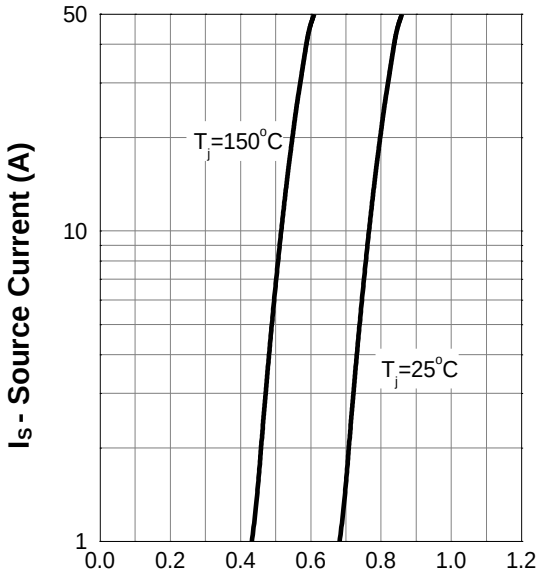
# 7. Typical Characteristics (Cont.)

**Normalized On Resistance**



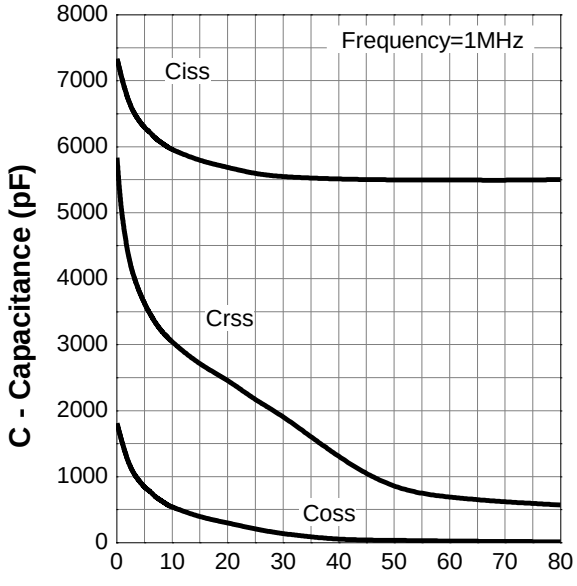

$T_j$ - Junction Temperature (°C)

**Diode Forward Current**



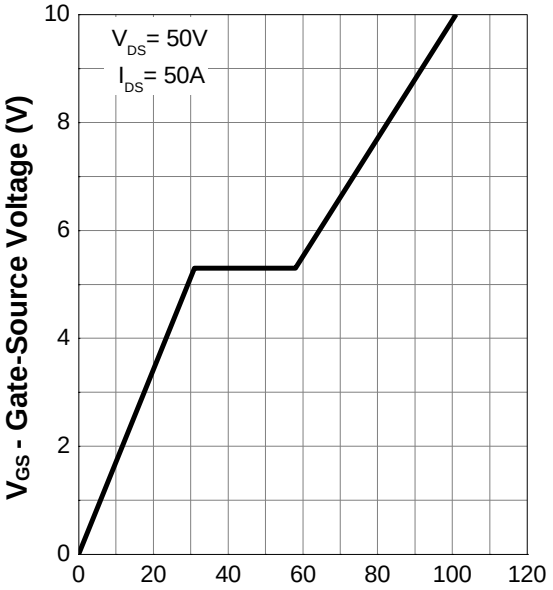

$V_{SD}$ - Source-Drain Voltage (V)

**Capacitance**




$V_{DS}$ - Drain-Source Voltage (V)

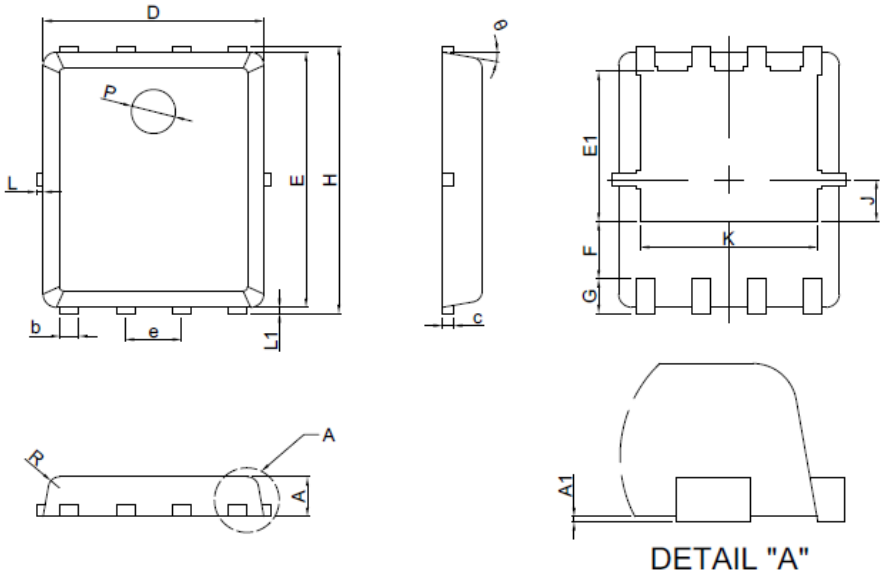
**Gate Charge**




$Q_G$ - Gate Charge (nC)

# 8. Package Dimensions

**PDFN5x6-8L Package**




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.80 | 1.00 |
| A1 | 0.00 | 0.05 |
| b | 0.35 | 0.49 |
| c | 0.254REF | |
| D | 4.90 | 5.10 |
| F | 1.40REF | |
| E | 5.70 | 5.90 |
| e | 1.27BSC | |
| H | 5.95 | 6.20 |
| L1 | 0.10 | 0.18 |
| G | 0.60REF | |
| K | 4.00REF | |
| L | - | 0.15 |
| J | 0.95BSC | |
| P | 1.00REF | |
| E1 | 3.40REF | |
| θ | 6° | 14° |
| R | 0.25REF | |