# KJ1837Q

## N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- ☑ Advanced trench cell design
- ☑ Low Thermal Resistance

### 1.2 Applications

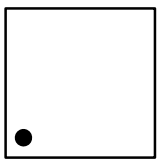
- ☑ Motor drivers
- ☑ DC - DC Converter

### 1.3 Quick reference

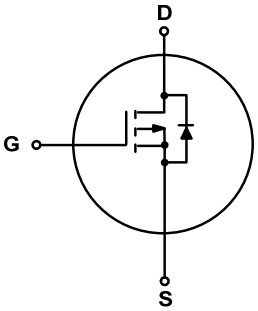
- ☑ BV ≧ 20 V
- ☑ $P_{tot}$ ≦ 41 W
- ☑ $I_D$ ≦ 54 A
- ☑ $R_{DS(ON)}$ ≦ 3.0 mΩ @ $V_{GS}$ = 4.5 V
  $R_{DS(ON)}$ ≦ 4.0 mΩ @ $V_{GS}$ = 2.5 V

## 2. Pin Description

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



Top View
DFN3.3x3.3-8L



# 3. Limiting Values

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | $T_C$ = 25 ℃ | - | 20 | V |
| $V_{GS}$ | Gate-Source Voltage | $T_C$ = 25 ℃ | - | ± 12 | V |
| $I_D$*,*** | Drain Current | $T_C$ = 25 ℃, $V_{GS}$ = 10 V | - | 54 | A |
| $I_{DM}$*,**,*** | Pulsed Source Current | $T_C$ = 25 ℃, $V_{GS}$ = 10 V | - | 108 | A |
| $P_{tot}$* | Total Power Dissipation | $T_C$ = 25 ℃ | - | 41 | W |
| $T_{stg}$ | Storage Temperature | | - 55 | 150 | ℃ |
| $T_J$ | Junction Temperature | | - | 150 | ℃ |
| $I_S$ | Diode Forward Current | $T_C$ = 25 ℃ | - | 54 | A |
| $R_{\theta JA}$* | Thermal Resistance- Junction to Ambient | | - | 62.5 | ℃ / W |
| $R_{\theta JC}$* | Thermal Resistance- Junction to Case | | - | 3 | |

Notes：

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

** Pulse width ≤ 10 μs, duty cycle ≤ 1 %

*** limited by bonding wire

# 4. Marking Information

| Product Name | Marking |
|---|---|
| **KJ1837Q** | **1837**<br>**YWWXXX**<br>**YWW: Date Code** |

# 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|---|---|---|---|---|---|
| **KJ1837Q** | **DFN3*3** | | | **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 | 20 | - | - | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_{DS}$ = 250 µA | 0.5 | - | 1 | V |
| $I_{DSS}$ | Zero Gate Voltage Source Current | $V_{DS}$ = 16 V, $V_{GS}$ = 0 V | - | - | 1 | µA |
| | | $T_J$ = 85 °C | - | - | 30 | µA |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$ = ± 12 V, $V_{DS}$ = 0 V | - | - | ± 100 | nA |
| $R_{DS(ON)}$[a] | Drain-Source On-State Resistance | $V_{GS}$ = 4.5 V, $I_D$ = 15 A | - | 2.5 | 3.0 | mΩ |
| | | $V_{GS}$ = 2.5 V, $I_D$ = 12 A | - | 3.5 | 4.0 | |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$[a] | Diode Forward Voltage | $I_{SD}$ = 15 A, $V_{GS}$ = 0 V | - | - | 1.1 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_{SD}$ = 15 A, $dI_{SD}/dt$ = 100 A/µs | - | 66 | - | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 89 | - | nC |
| **Dynamic Characteristics**[b] | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0 V, $V_{DS}$ = 10 V<br>Frequency = 1 MHz | - | 6175 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 1693 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 1266 | - | |
| $t_d$(on) | Turn-on Delay Time | $V_{DS}$ = 10 V, $V_{GEN}$ = 10 V,<br>$R_G$ = 4.5 Ω, $R_L$ = 0.6 Ω,<br>$I_{DS}$ = 15 A | - | 9.2 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 64 | - | |
| $t_d$(off) | Turn-off Delay Time | | - | 196 | - | |
| $t_f$ | Turn-off Fall Time | | - | 83 | - | |
| **Gate Charge Characteristics**[b] | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$ = 10 V, $V_{GS}$ = 4.5 V,<br>$I_{DS}$ = 15 A | - | 80 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 10 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 24 | - | |

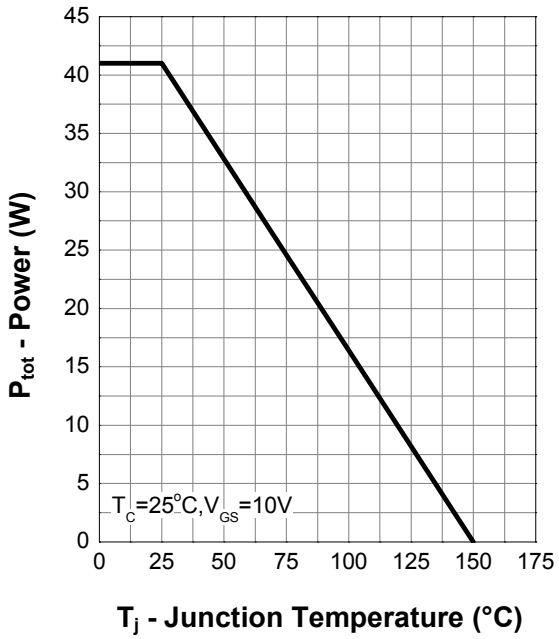
Notes :

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

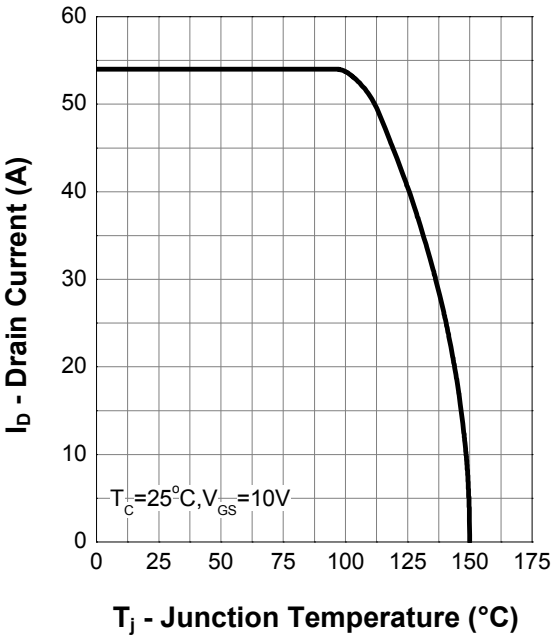
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics (Cont.)

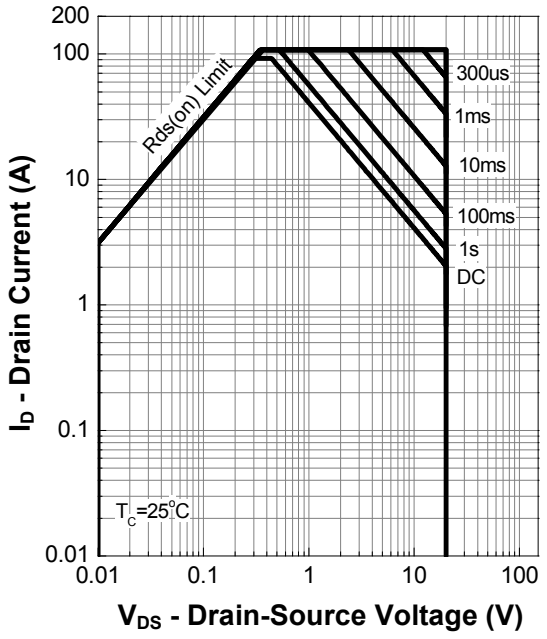
**Power Capability**



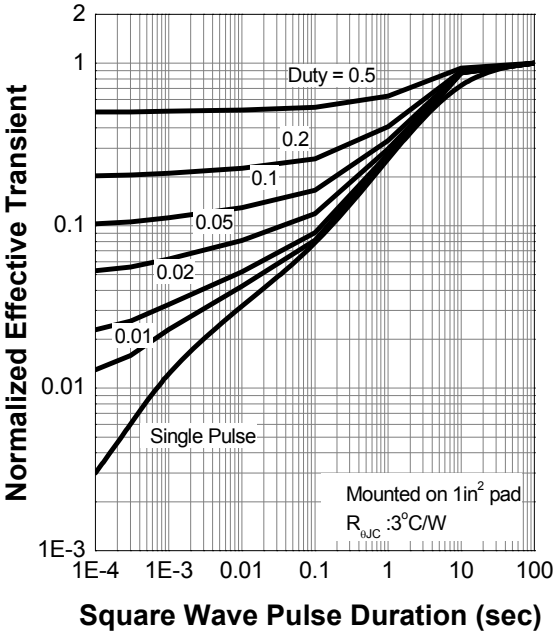

**Current Capability**



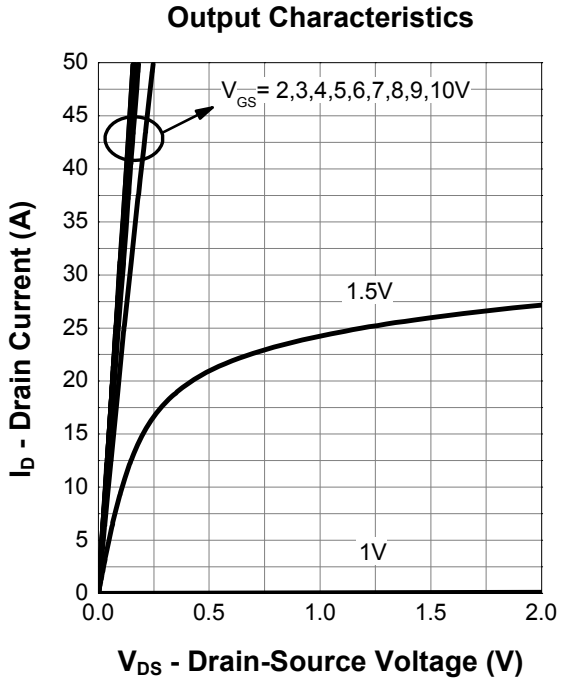

**Safe Operation Area**

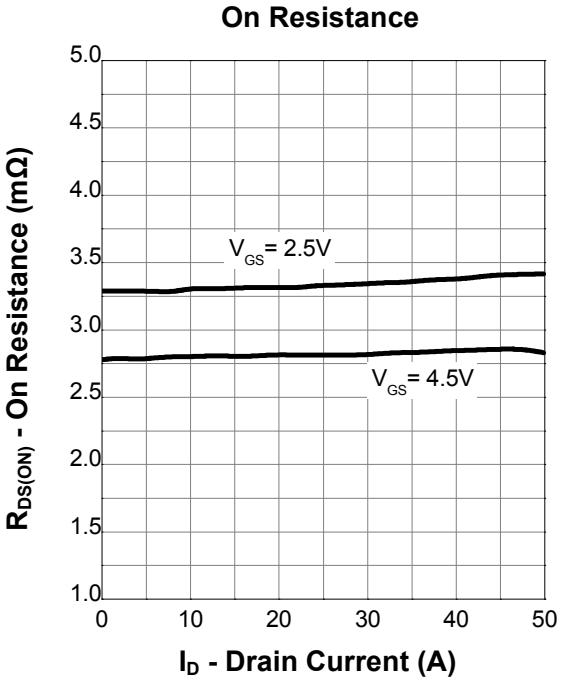


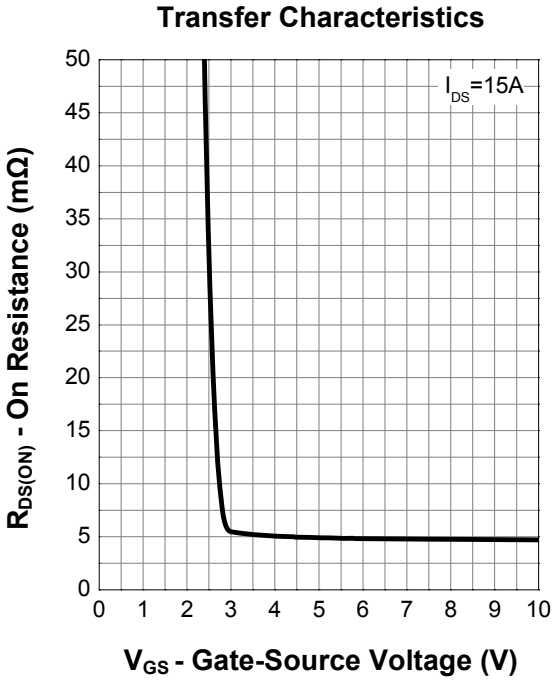

**Transient Thermal Impedance**

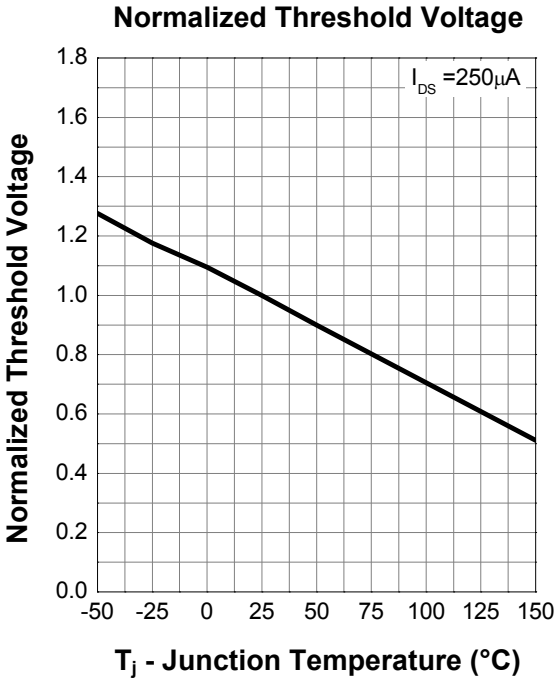


## 7. Typical Characteristics (Cont.)

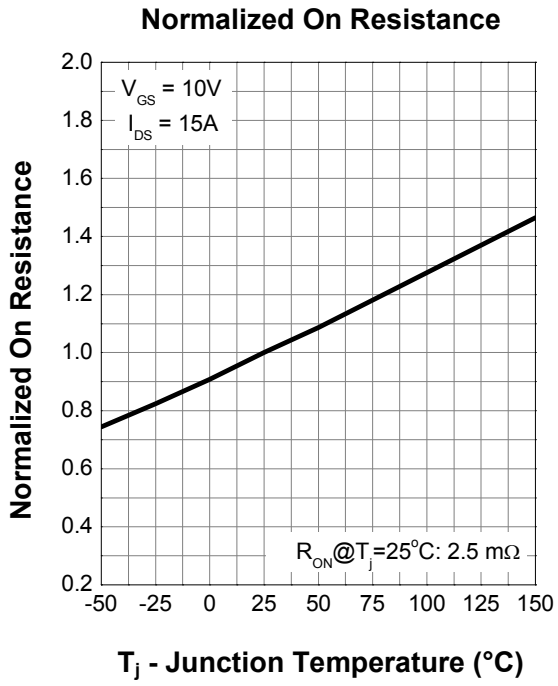


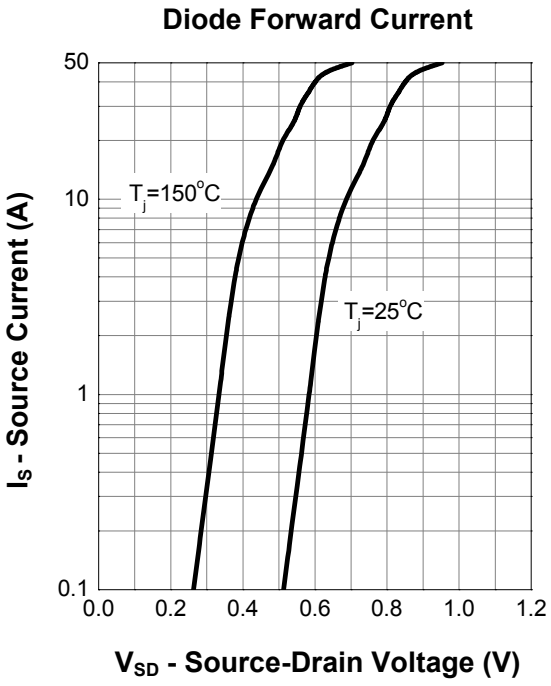



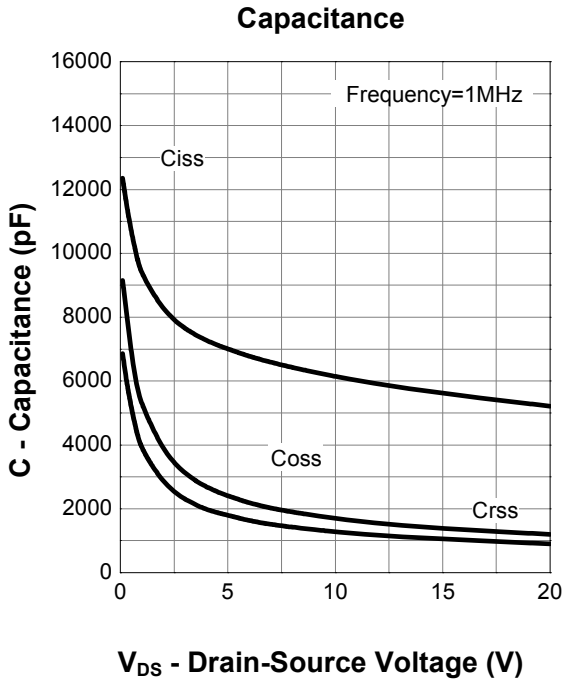



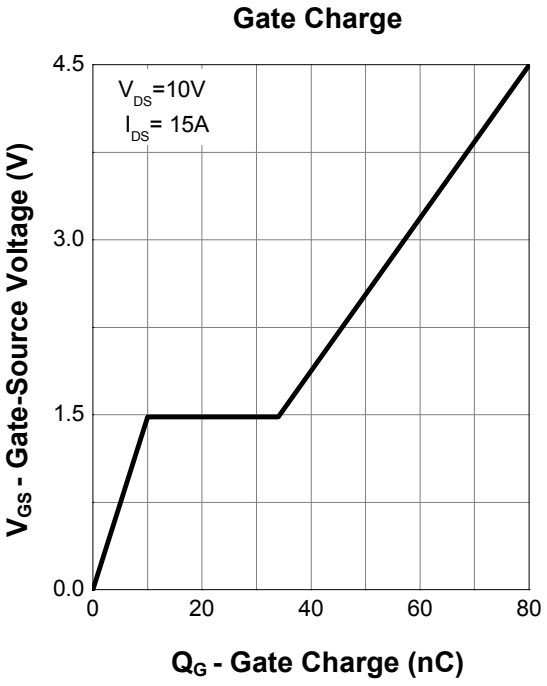



## 7. Typical Characteristics (Cont.)



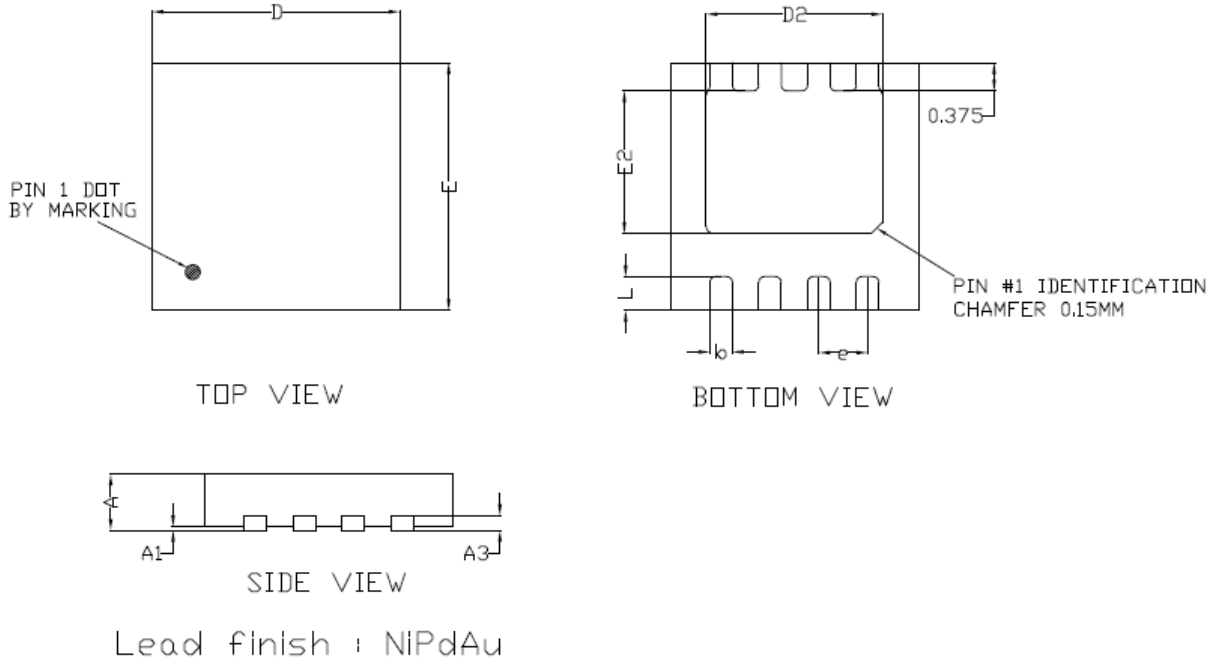



# 8. Package Dimensions

**DFN3.3x3.3 - 8L Package**




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.7 | 0.8 |
| A1 | 0.00 | 0.05 |
| A3 | 0.20 REF | |
| D | 3.25 | 3.35 |
| E | 3.25 | 3.35 |
| D2 | 2.30 | 2.40 |
| E2 | 1.85 | 1.95 |
| b | 0.25 | 0.35 |
| L | 0.35 | 0.55 |
| e | 0.65 BSC | |