# KJ130N06C/D

## N-Channel Enhancement Mode MOSFET

## 1. Product Information

### Features

Advanced Technology

Excellent $R_{DS(ON)}$, Low gate charge

### Applications

Battery protection

Load switch

Uninterruptible power supply

### Quick reference

$B_V$ = 60V

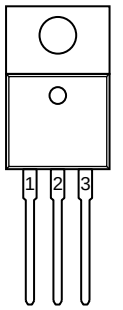
$I_D$ = 130A

$R_{DS(ON)} \leqq$ 3.5mΩ@$V_{GS}$=10V(Type:2.8 mΩ)

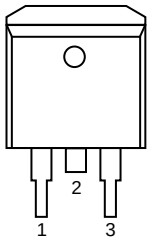
**Pin Description**

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

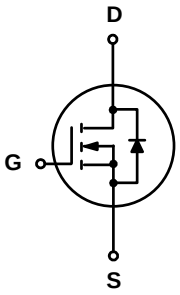
| Simplified Outline | Symbol |
|---|---|




Top View
TO-220




Top View
TO-263




**Package Marking and Ordering Information**

| Product Name | Package | Marking | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| KJ130N06C | TO-220 | 130N06<br>YWWXXX<br>YWWXXX: Date Code | | | 800 |
| KJ130N06D | TO-263 | | | | 1000 |

## 2. Absolute Maximum Ratings (TC=25℃ unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| VDS | Drain-Source Voltage | 60 | V |
| VGS | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current[1,6] | 130 | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current[1,6] | 66 | A |
| IDM | Pulsed Drain Current[2] | 240 | A |
| EAS | Single Pulse Avalanche Energy[3] | 101 | mJ |
| IAS | Avalanche Current | 130 | A |
| $P_D$@$T_C$=25℃ | Total Power Dissipation[4] | 168 | W |
| TSTG | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient [1] | 60 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | 1.5 | ℃/W |

## 3. Electrical Characteristics ($T_J$=25℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$= 0V, $I_D$=250μA | 60 | 67 | | V |
| IDSS | Zero Gate Voltage Drain Current | $V_{DS}$=60V,$V_{GS}$=0V | | | 1 | μA |
| IGSS | Gate-Body Leakage Current | $V_{GS}$= ±20V, $V_{DS}$=0V | | | ±100 | nA |
| VGS(th) | Gate Threshold Voltage | $V_{DS}$= $V_{GS}$, $I_D$=250μA | 1.2 | 1.8 | 2.5 | V |
| RDS(ON) | Static Drain-Source On-Resistance | $V_{GS}$= 10V, $I_D$=20A | | 2.8 | 3.5 | mΩ |
| | | $V_{GS}$= 4.5V, $I_D$=15A | | 3.2 | 4.0 | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=25V,$V_{GS}$=0V,f=100KHZ | | 5950 | | pF |
| $C_{oss}$ | Output Capacitance | | | 1250 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 85 | | |
| $Q_g$ | Total Gate Charge | $V_{GS}$=10V,$V_{DS}$=50V,$I_D$=50A | | 93 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 17 | | |
| $Q_{gd}$ | Gate-Drain Charge | | | 14 | | |
| $Q_{rr}$ | Reverse Recovery Chrage | $I_F$=25A, di/dt=100A/us | | 73 | | |
| $t_{rr}$ | Reverse Recovery Time | | | 68 | | ns |
| td(on) | Turn-on Delay Time | $V_{GS}$=10V,$V_{DD}$=30V,$I_D$=25A $R_{GEN}$=2Ω | | 22.5 | | |
| $t_r$ | Turn-on Rise Time | | | 6.7 | | |
| td(off) | Turn-off Delay Time | | | 80.3 | | |
| $t_f$ | Turn-off fall Time | | | 26.9 | | |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=20A,$V_{GS}$=0V | | | 1.2 | V |
| $I_S$ | Maximum Body-Diode Continuous Current | | | | 200 | A |

Note :

1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、 The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、 The EAS data shows Max. rating . The test condition is VDD=48V,VGS=10V, L=0.1mH IAS=130A

4、 The power dissipation is limited by 150℃ junction temperature

5、 The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation

# 4.Typical Characteristics

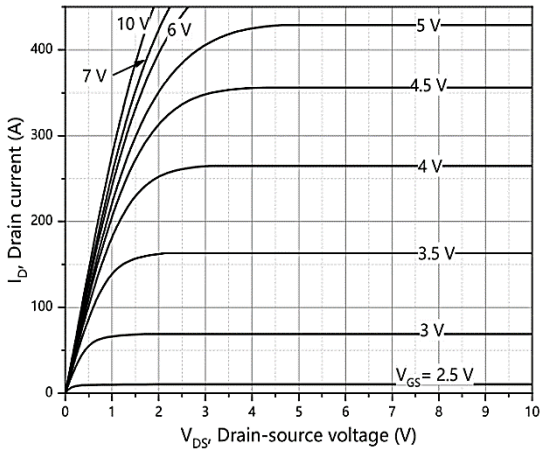



**Figure 1. Typ. output characteristics**

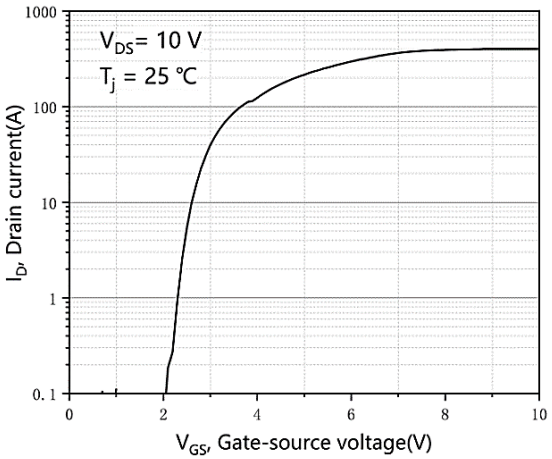



**Figure 2. Typ. transfer characteristics**

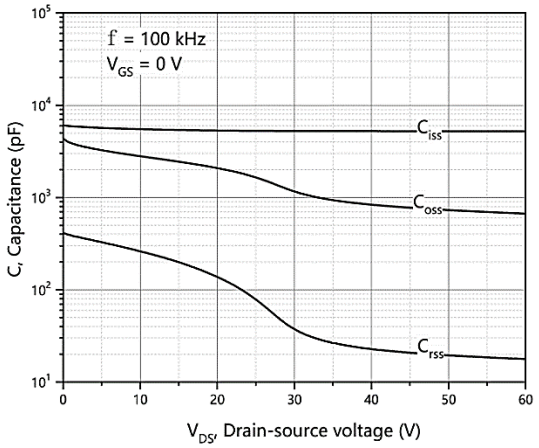



**Figure 3. Typ. capacitances**

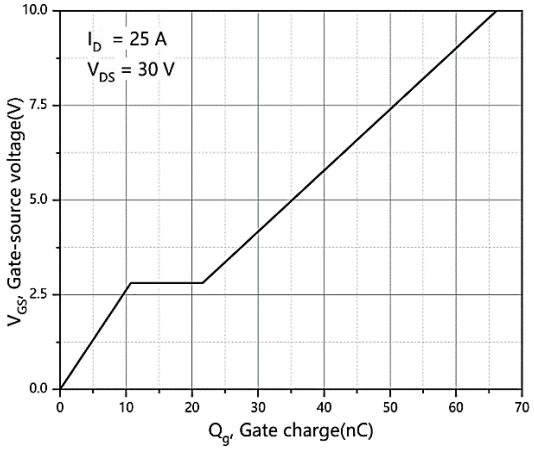



**Figure 4. Typ. gate charge**

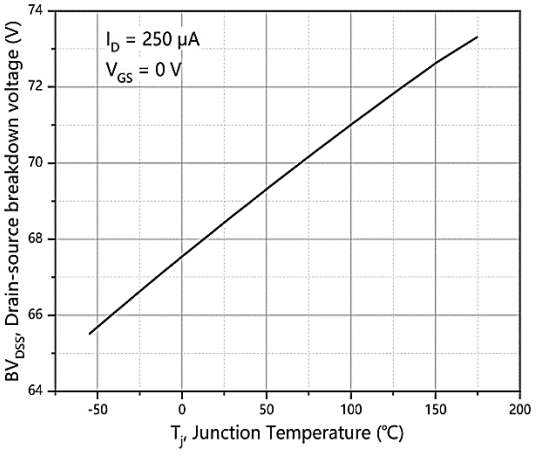



**Figure 5. Drain-source breakdown voltage**

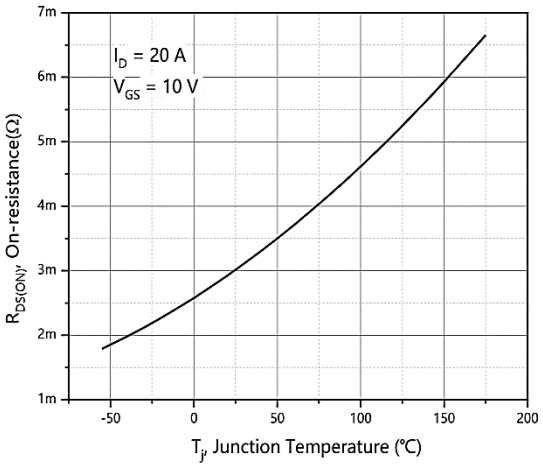



**Figure 6. Drain-source on-state resistance**

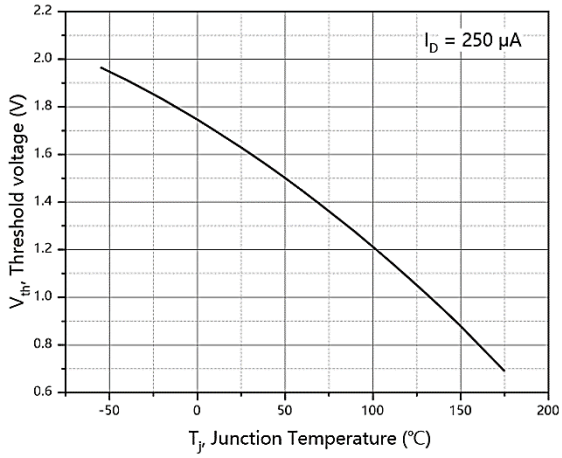



**Figure 7. Threshold voltage**

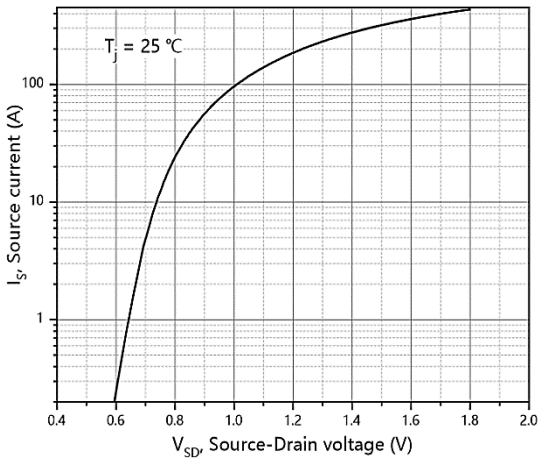



**Figure 8. Forward characteristic of body diode**

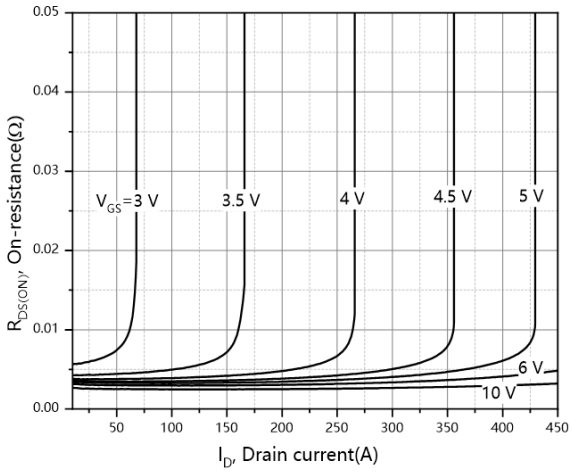



**Figure 9. Drain-source on-state resistance**

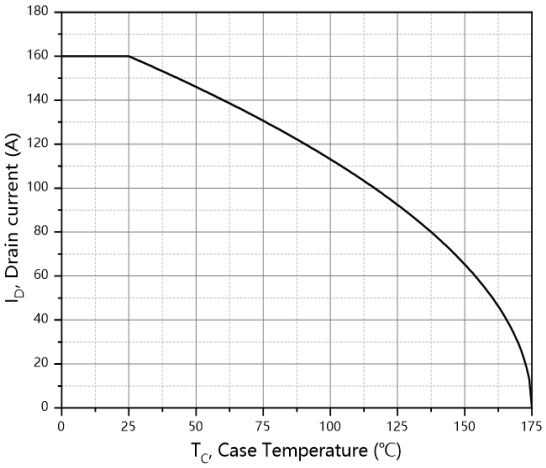



**Figure 10. Drain current**

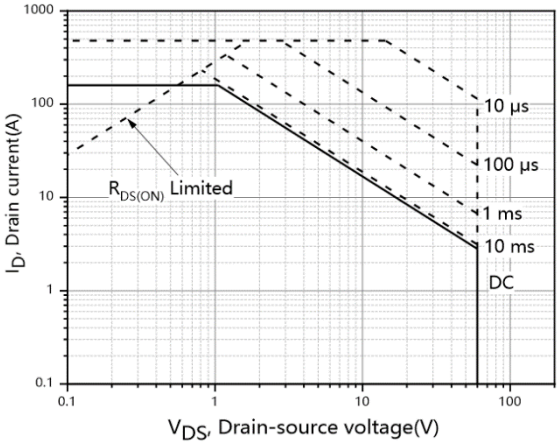



**Figure 11. Safe operation area $T_C$=25 °C**

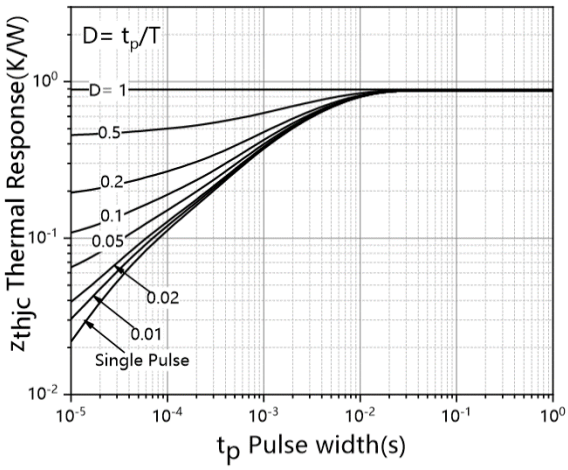
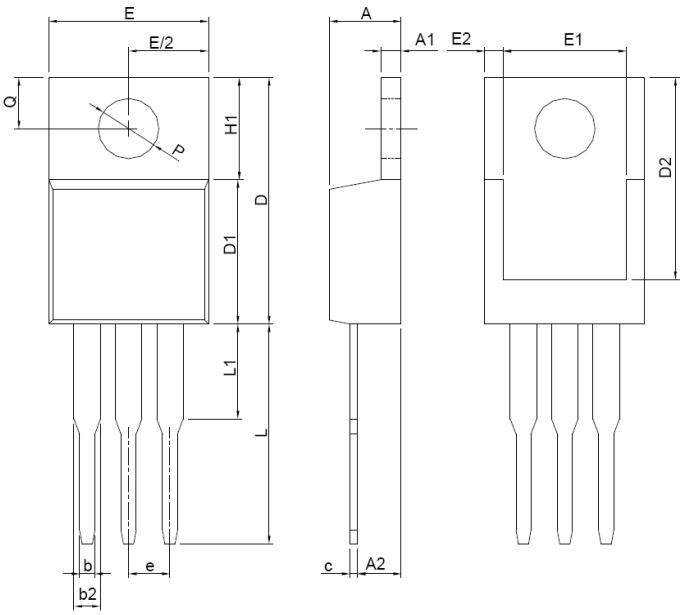



**Figure 12. Max. transient thermal impedance**

# 5.Package Mechanical Data

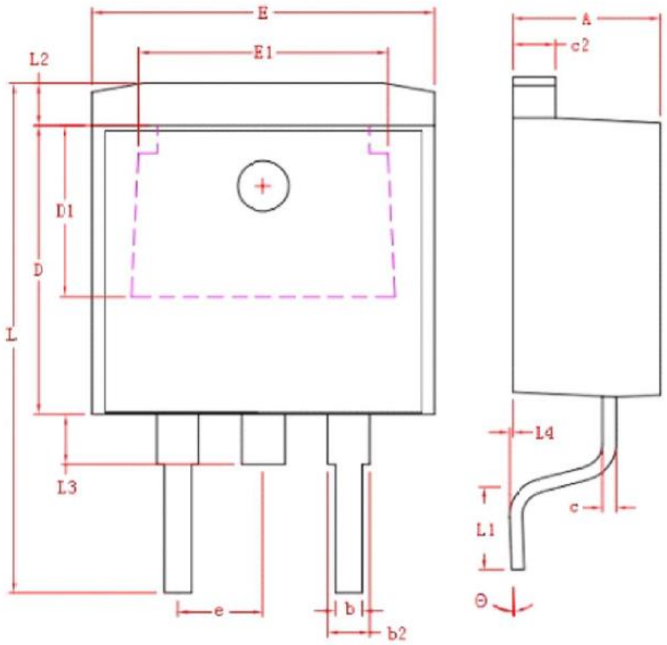
## TO-220




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 3.56 | 4.83 |
| A1 | 0.51 | 1.40 |
| A2 | 2.03 | 2.92 |
| b | 0.38 | 1.02 |
| b2 | 1.14 | 1.78 |
| c | 0.36 | 0.61 |
| D | 14.22 | 16.51 |
| D1 | 8.38 | 9.02 |
| D2 | 12.19 | 12.88 |
| E | 9.65 | 10.67 |
| E1 | 6.86 | 8.89 |
| E2 | 0.76BSC | |
| e | 2.54BSC | |
| H1 | 5.84 | 6.86 |
| L | 12.70 | 14.73 |
| L1 | 6.35BSC | |
| P | 3.53 | 4.09 |
| Q | 2.54 | 3.43 |

# 5.Package Mechanical Data

**TO-263**




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 4.40 | 4.80 |
| b | 0.76 | 1.00 |
| L4 | 0.00 | 0.25 |
| C | 0.36 | 0.50 |
| L3 | 1.50 REF | |
| L1 | 2.29 | 2.79 |
| E | 9.80 | 10.40 |
| E1 | 7.40 REF | |
| c2 | 1.25 | 1.45 |
| b2 | 1.17 | 1.47 |
| D | 8.60 | 9.00 |
| D1 | 5.10 REF | |
| e | 2.54 REF | |
| L | 14.6 | 15.8 |
| $\theta$ | $0^\circ \pm 3^\circ$ | |
| L2 | 1.27 REF | |