快捷芯
KUAIJIEXIN

# KJ100N20D

## N-Channel Enhancement Mode MOSFET

## 1. Product Information

**Features**

SGT Technology
Excellent $R_{DS(ON)}$
Low Gate Charge

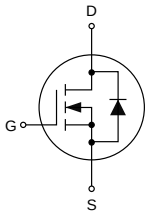
**Applications**

DC/DC Converter
Power Management Switches
BMS
UPS

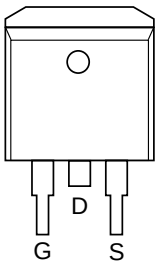
**Quick reference**

$V_{DS}$ = 200 V
$I_D$ = 100 A
$P_D$ = 275 W
$R_{DS(ON)}$ ≦ 11 mΩ @ $V_{GS}$=10V（Type: 8.8 mΩ）

**Schematic Diagram**




**Pin Assignment**




**Top View**
**TO-263**

**Package Marking and Ordering Information**

| Product Name | Package | Marking | Reel Size | Tape Width | Quantity |
|---|---|---|---|---|---|
| KJ100N20D | TO-263 | KJ100N20D | 13 inches | 24 mm | 800 |

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

| Symbol | Parameter | Values | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 200 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Continuous Drain Current, $T_C$=25℃ | 100 | A |
| | Continuous Drain Current, $T_C$=100℃ | 75 | A |
| $I_{DM}$ | Pulsed Drain Current | 550 | A |
| $P_D$ | Power Dissipation | 275 | W |
| $E_{AS}$ | Single Pulse Avalanche Energy | 2000 | mJ |
| $I_{AS}$ | Avalanche Current | 45 | A |
| $T_J$, $T_{STG}$ | Operating Junction and Storage Temperature Range | -55~150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient | 0.45 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 62.5 | ℃/W |

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

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0 V, $I_D$=250 μA | 200 | - | - | V |
| $V_{GS(th)}$ | Gate-Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250 μA | 2.0 | 3.5 | 4.5 | V |
| $I_{GSS}$ | Gate-Source Leakage | $V_{DS}$=0 V, $V_{GS}$=±20 V | - | - | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=160 V, $V_{GS}$=0 V | - | - | 1 | μA |
| $R_{DS(on)}$ | Drain-Source On-Resistance | $V_{GS}$=10 V, $I_D$=20 A | - | 8.8 | 11 | mΩ |
| $R_g$ | Gate Resistance | $V_{GS}$=0 V, $V_{GS}$=0 V, f=1.0 MHz | - | 1.7 | - | Ω |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=50 V, $V_{GS}$=0 V, f=1.0 MHz | - | 10556 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 389 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 16 | - | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=100 V, $V_{GS}$=10 V, $I_D$=55 A | - | 146 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 49 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 24 | - | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=100 V, $V_{GS}$=10 V, $I_D$=55 A, $R_G$=4.7 Ω | - | 23 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 115 | - | |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 45 | - | |
| $t_f$ | Turn-off Fall Time | | - | 102 | - | |
| $V_{SD}$ | Diode Forward Voltage [2] | $V_{GS}$=0V, $I_{SD}$=20 A, $V_{GS}$=0V | - | - | 1.2 | V |
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0 V, Force Current | - | - | 420 | A |
| trr | Reverse Recovery Time | $I_S$=55 A, diF/dt=100 A/μs | - | 181 | - | ns |
| Qrr | Reverse Recovery Charge | | - | 473 | - | μC |

Notes:

1. The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2 OZ copper.
2. The test condition is Pulse Test: Pulse width ≤ 300 μs, Duty Cycle ≤ 2%.
3. The $E_{AS}$ data shows Max. rating. $I_{AS}$=45 A, $V_{DD}$=50 V, L=0.5 mH.
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

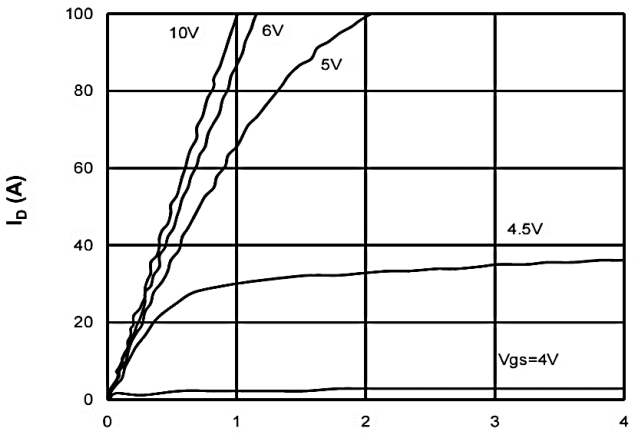



Figure 1: On-Region Characteristics

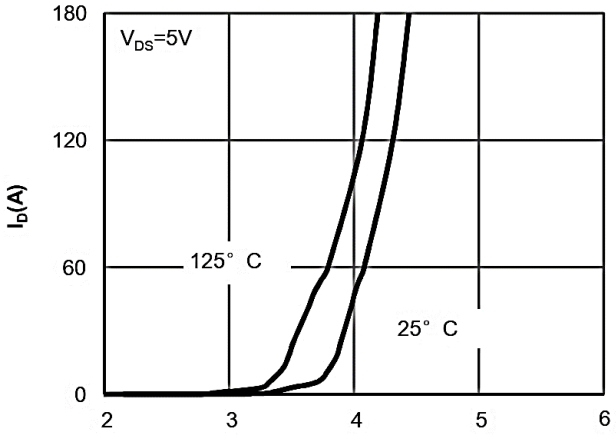



Figure 2: Transfer Characteristics

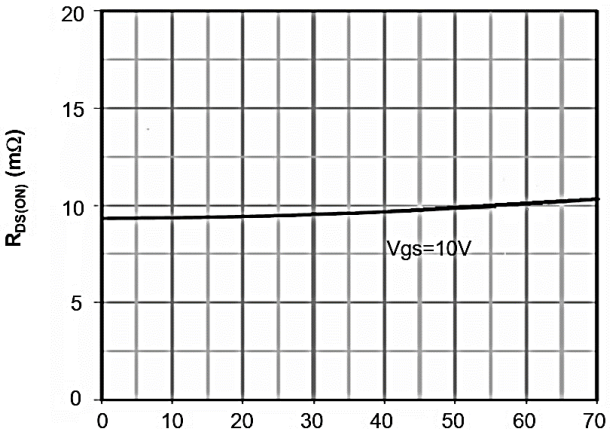



Figure 3: On-Resistance vs. Drain Current and Gate Voltage

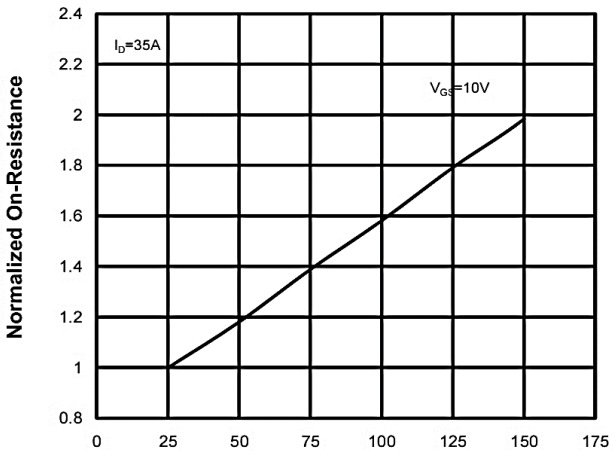



Figure 4: On-Resistance vs. Junction Temperature

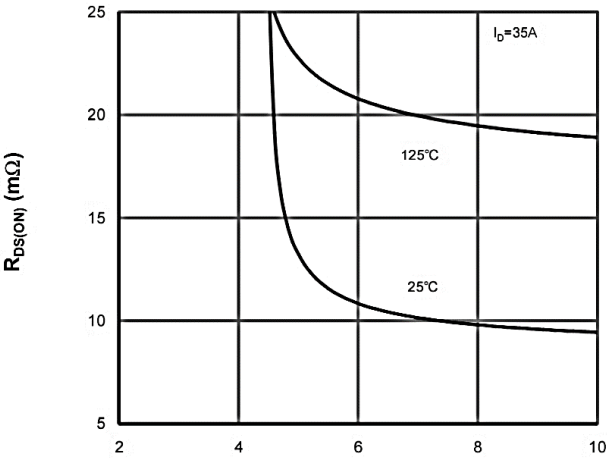



Figure 5: On-Resistance vs. Gate-Source Voltage

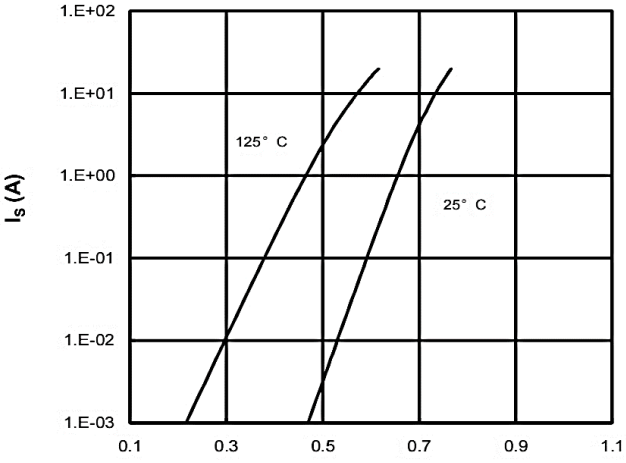



Figure 6: Body-Diode Characteristics

# 4. Typical Characteristics (cont.)

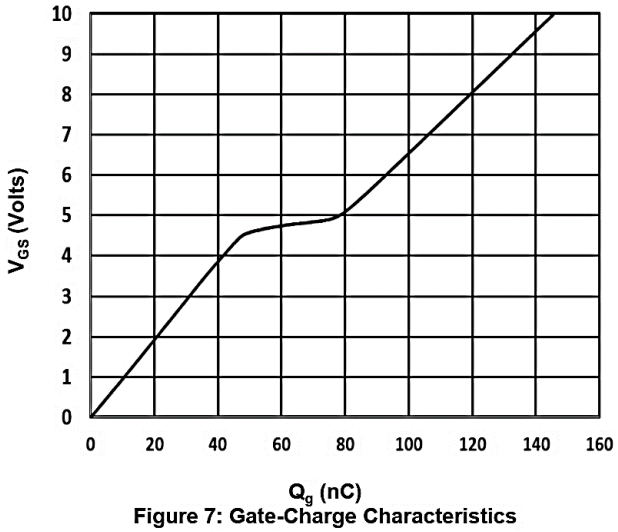



Figure 7: Gate-Charge Characteristics

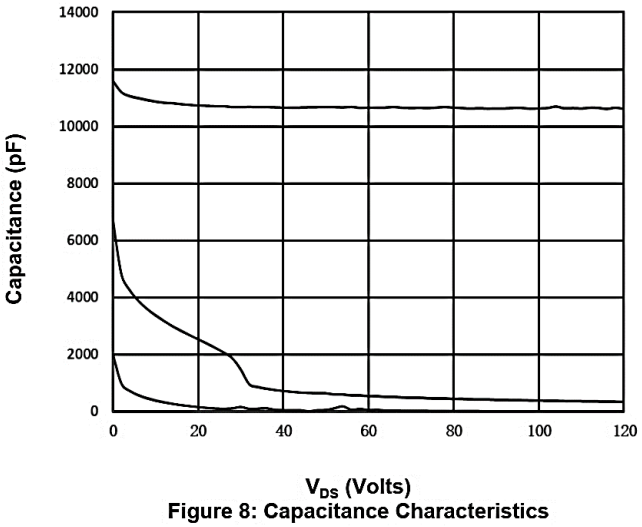



Figure 8: Capacitance Characteristics

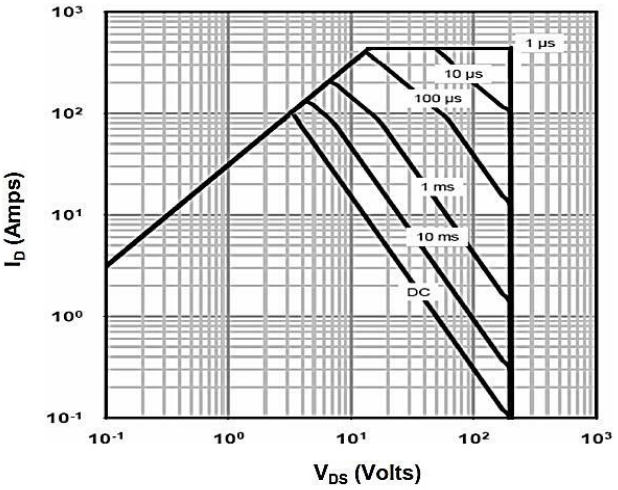
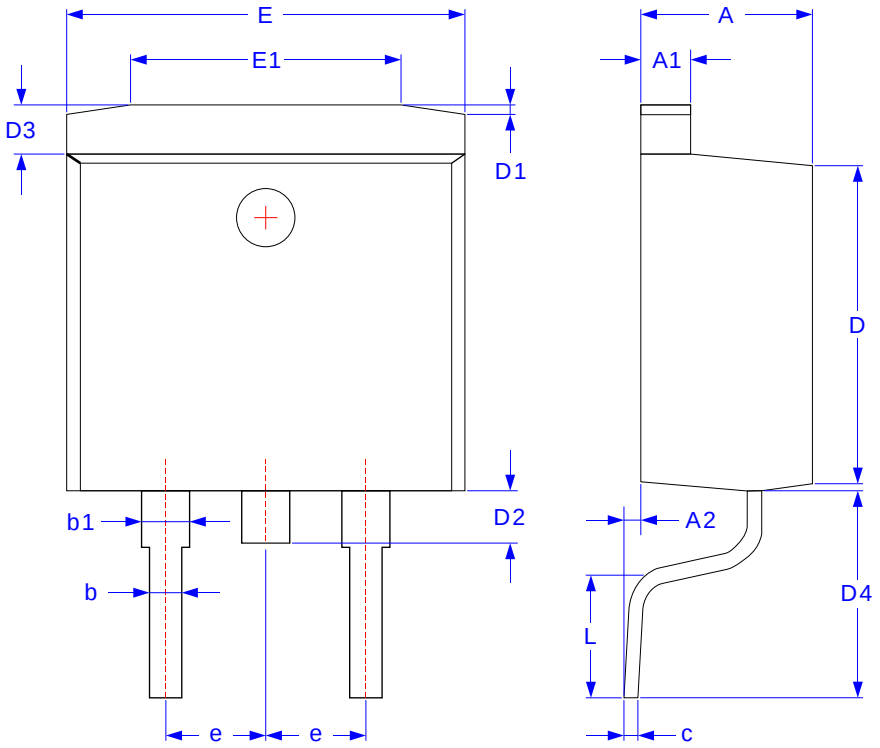



Figure 9: Maximum Forward Biased Safe Operating Area

# 5. Package Mechanical Data

## TO-263 Package




| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 4.30 | 4.70 |
| A1 | 1.25 | 1.35 |
| A2 | 0.02 | 0.23 |
| b | 0.70 | 0.90 |
| b1 | 1.17 | 1.37 |
| c | 0.45 | 0.55 |
| D | 9.00 | 9.20 |
| D1 | 0.50 | 1.00 |
| D2 | 1.40 | 1.60 |
| D3 | 1.10 | 1.40 |
| D4 | 4.60 | 5.00 |
| E | 9.80 | 10.20 |
| E1 | 6.10 | 6.70 |
| e | TYP 2.54 | |
| L | 2.20 | 2.80 |