# KSF130N85

## 85V N-Channel MOSFET

## General Description

The KSF130N85 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

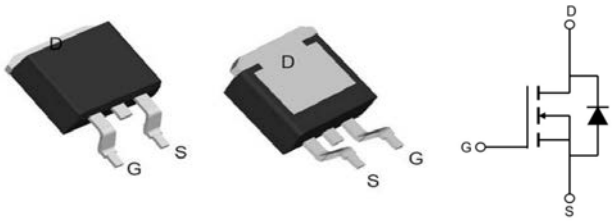
## Product Summary

| $V_{DS}$ (V) | $R_{DS(on)}$ (mΩ) | $I_D$ (A) |
|---|---|---|
| 85 | 4.5 at $V_{GS}$ = 10 V | 130 |

## Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high $E_{AS}$
- Excellent package for good heat dissipation

## TO-263 Pin Configuration




## Applications

- Motor control and drive
- Battery management
- Uninterruptible power supply

## Absolute Maximum Ratings Tc=25℃ unless otherwise noted

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 85 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Drain Current – Continuous ($T_C$=25℃) | 130 | A |
| | Drain Current – Continuous ($T_C$=100℃) | 86 | A |
| $I_{DM}$ | Drain Current – Pulsed[1] | 360 | A |
| $P_D$ | Power Dissipation ($T_C$=25℃) | 155 | W |
| | Power Dissipation ($T_C$=100℃) | 1.2 | W/℃ |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | --- | 62 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | --- | 0.75 | ℃/W |

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

### Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 85 | --- | --- | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=80V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=80V , $V_{GS}$=0V , $T_J$=125℃ | --- | --- | 10 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |

### On Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10V , $I_D$=50A | --- | 4.5 | 5.5 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$ , $I_D$ =250uA | 2.0 | 3.0 | 4.0 | V |
| gfs | Forward Transconductance | $V_{DS}$=5V , $I_S$=50A | --- | 82 | --- | S |

### Dynamic and switching Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| $Q_g$ | Total Gate Charge[2,3] | $V_{DS}$=40V , $V_{GS}$=10V , $I_D$=50A | --- | 55 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge[2,3] | | --- | 16 | --- | |
| $Q_{gd}$ | Gate-Drain Charge[2,3] | | --- | 13 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time[2,3] | $V_{DS}$=40V, $V_{GS}$=10V,$R_G$=3.3Ω | --- | 21 | --- | ns |
| $T_r$ | Rise Time[2,3] | | --- | 39 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time[2,3] | | --- | 45 | --- | |
| $T_f$ | Fall Time[2,3] | | --- | 22 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=40V , $V_{GS}$=0V , F=1MHz | --- | 3280 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 1062 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 26 | --- | |

### Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V , Force Current | --- | --- | 120 | A |
| $I_{SM}$ | Pulsed Source Current | | --- | --- | 200 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=1A , $T_J$=25℃ | --- | --- | 1.2 | V |

Note :

**1.** Repetitive Rating: Pulse width limited by maximum junction temperature.
**2.** Surface Mounted on FR4 Board, t ≤ 10 sec.
**3.** Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
**4.** Guaranteed by design, not subject to production
**5.** EAS condition:Tj=25℃,$V_{DD}$=30V,$V_G$=10V,L=0.5mH,Rg=25Ω

## Typical Electrical and Thermal Characteristics (Curves)

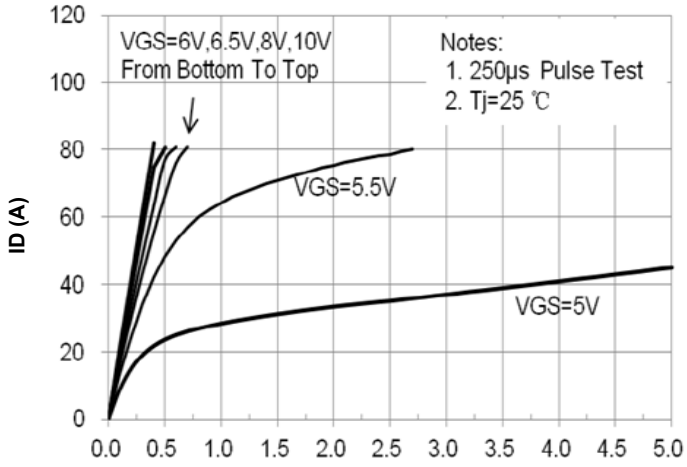



Fig1:Output Characteristics

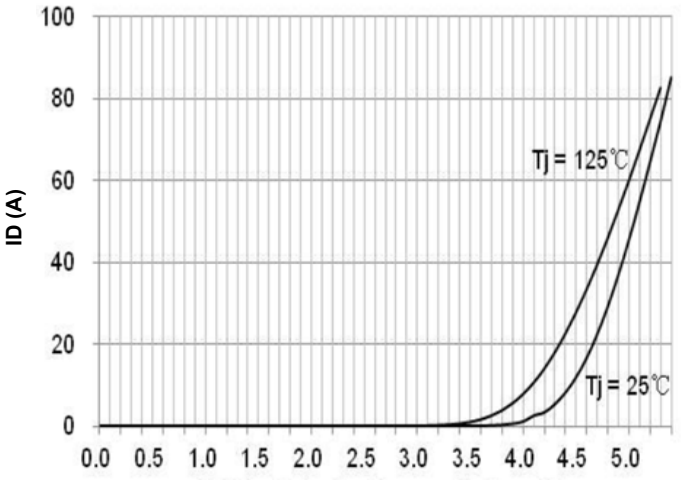



Fig2:Transfer Characteristics

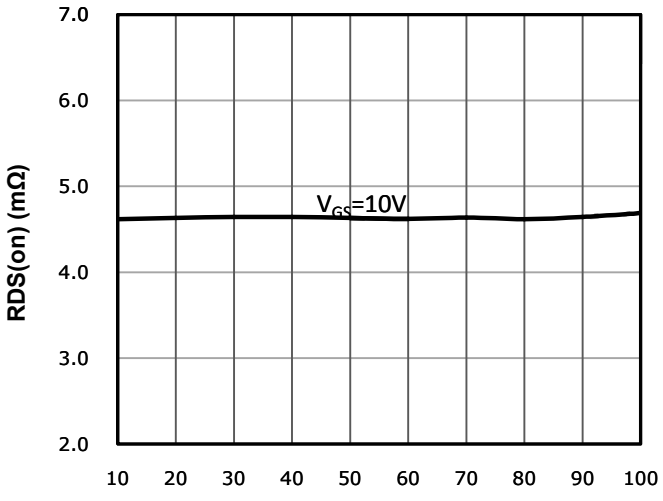



Fig3:Rdson- Drain Current

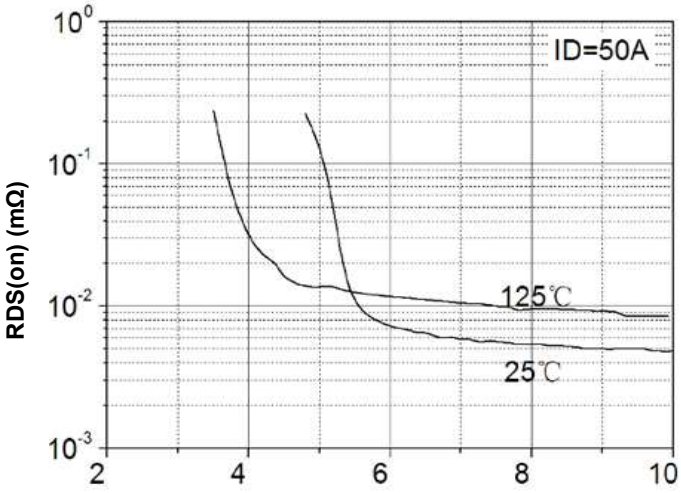



Fig4:Rds(on) vs Gate Voltage

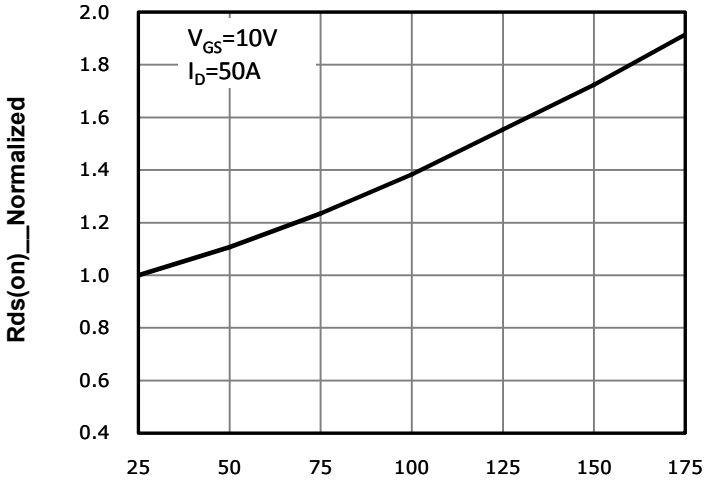



Fig5:Rds(on) vs. Temperature

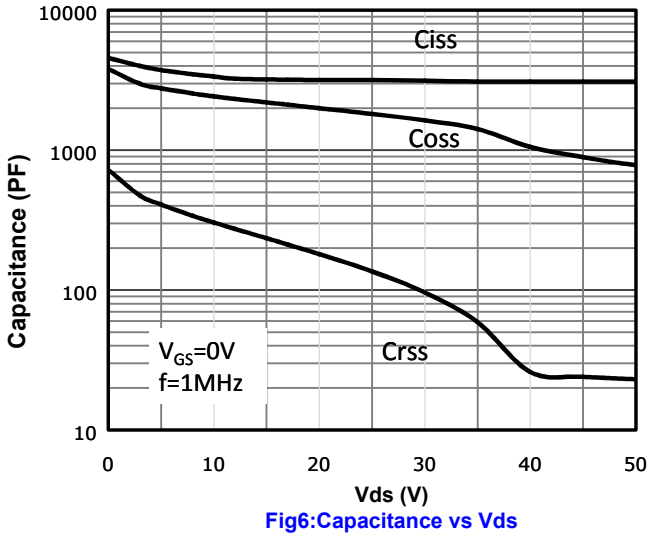



Fig6:Capacitance vs Vds

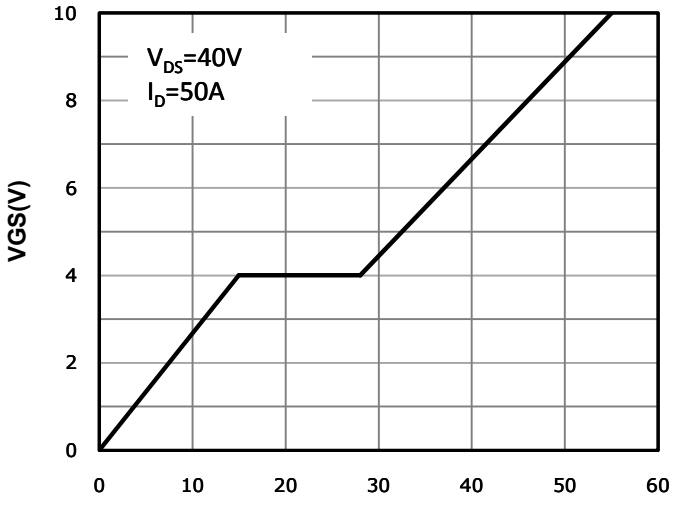



Fig7:Gate Charge

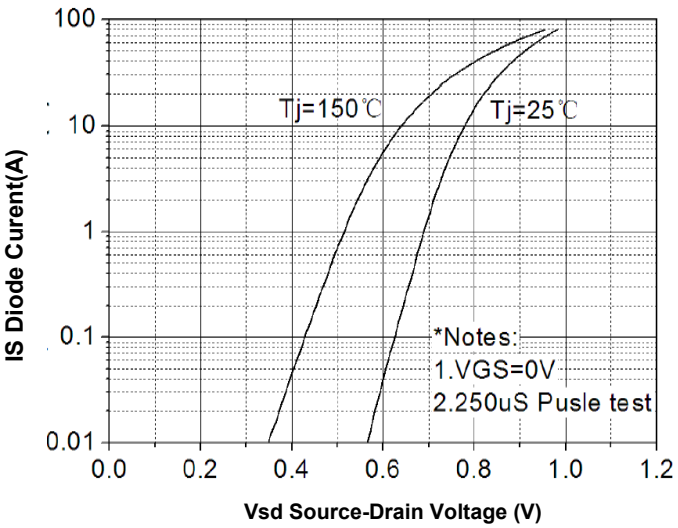



Fig8:Source- Drain Diode Forward

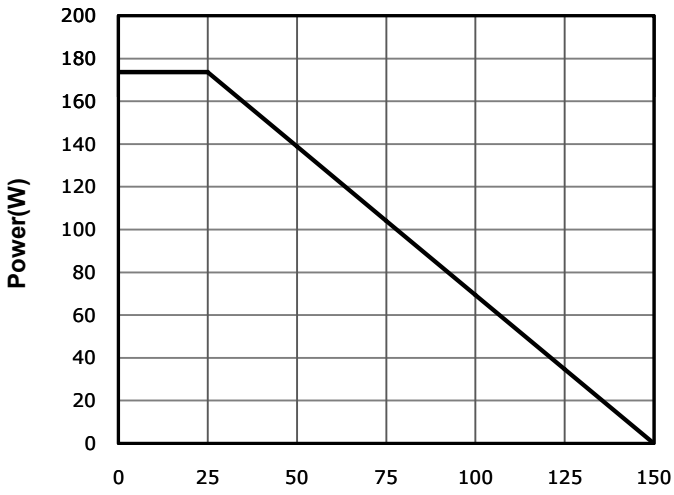



Fig9:Power Disipation

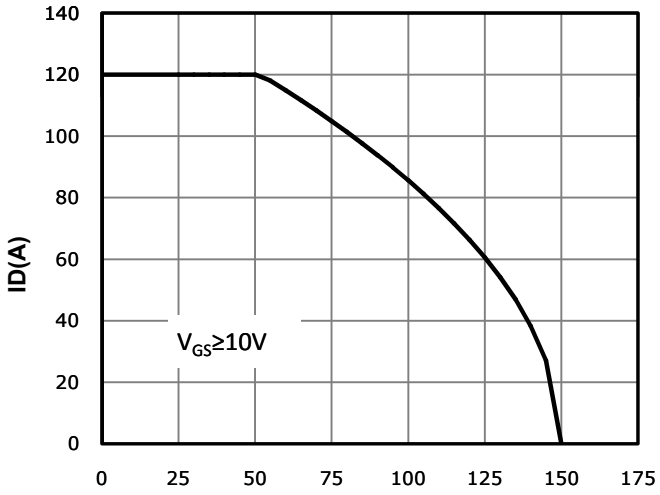



Fig10：ID Current- Junction Temperature

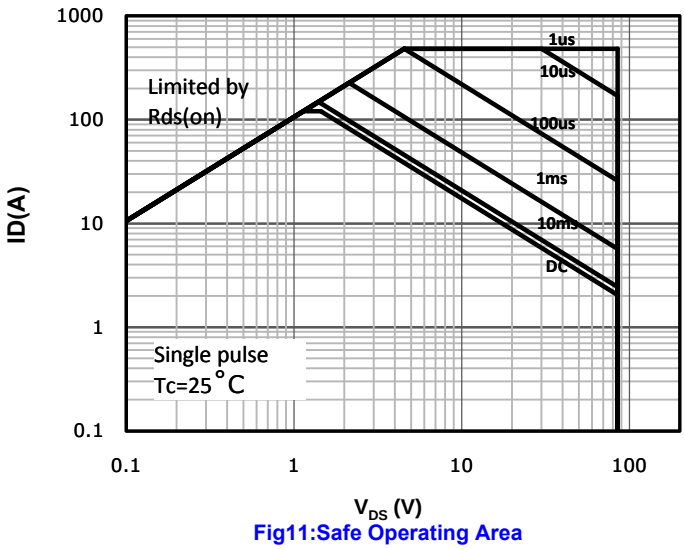



Fig11:Safe Operating Area

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