Elektronische Bauelemente

# SSD13N10-C

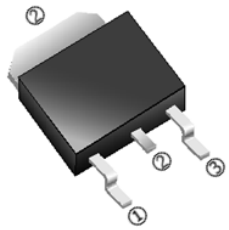
**13A, 100V, $R_{DS(ON)}$ 130mΩ**
**N-Ch Enhancement Mode Power MOSFET**

RoHS Compliant Product
A suffix of "-C" specifies halogen free

## DESCRIPTION

These N-Channel enhancement mode power field effect transistors are using advanced trench technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.
These devices are well suited for high efficiency fast switching applications.

**TO-252(D-Pack)**



## FEATURES

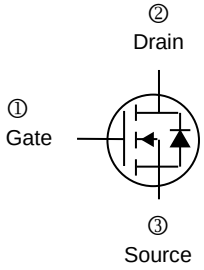
- Fast Switching
- Green Device Available

## PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---|---|---|
| TO-252 | 2.5K | 13 inch |

## ORDER INFORMATION

| Part Number | Type |
|---|---|
| SSD13N10-C | Lead (Pb)-free and Halogen-free |




## ABSOLUTE MAXIMUM RATINGS ($T_A$=25℃ unless otherwise specified)

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25℃ | $I_D$ | 13 | A |
| Pulsed Drain Current [1] | | $I_{DM}$ | 52 | A |
| Power Dissipation | $T_C$=25℃ | $P_D$ | 39 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55~150 | ℃ |
| **Thermal Resistance Rating** | | | | |
| Thermal Resistance Junction-Ambient | | $R_{\theta JA}$ | 52 | ℃/W |
| Thermal Resistance Junction-Case | | $R_{\theta JC}$ | 3.2 | |

## ELECTRICAL CHARACTERISTICS ($T_J$=25℃ unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 100 | - | - | V | $V_{GS}$=0, $I_D$=250μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | 1 | - | 2.5 | V | $V_{DS}$=$V_{GS}$, $I_D$=250μA |
| Gate-Source Leakage Current | $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$= ±20V, $V_{DS}$=0V |
| Drain-Source Leakage Current | $I_{DSS}$ | - | - | 1 | μA | $V_{DS}$=100V, $V_{GS}$=0 |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | - | - | 130 | mΩ | $V_{GS}$=10V, $I_D$=6A |
| | | - | - | 190 | | $V_{GS}$=4.5V, $I_D$=3A |
| Gate Resistance | $R_g$ | - | 7.2 | - | Ω | $V_{DS}$= $V_{GS}$=0, f=1MHz |
| Total Gate Charge | $Q_g$ | - | 4 | - | nC | $V_{DS}$=50V<br>$V_{GS}$=10V<br>$I_D$=6A |
| Gate-Source Charge | $Q_{gs}$ | - | 0.9 | - | | |
| Gate-Drain Change | $Q_{gd}$ | - | 1.1 | - | | |
| Turn-on Delay Time | $T_{d(on)}$ | - | 12.6 | - | nS | $V_{DD}$=50V<br>$V_{GS}$=10V<br>$I_D$=6A<br>$R_G$=3Ω |
| Rise Time | $T_r$ | - | 19 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 20 | - | | |
| Fall Time | $T_f$ | - | 27.8 | - | | |
| Input Capacitance | $C_{iss}$ | - | 195 | - | pF | $V_{DS}$=50V<br>$V_{GS}$=0<br>f=1MHz |
| Output Capacitance | $C_{oss}$ | - | 31 | - | | |
| Reverse Transfer Capacitance | $C_{rss}$ | - | 2.5 | - | | |
| **Source-Drain Diode** | | | | | | |
| Continuous Source Current | $I_S$ | - | - | 13 | A | |
| Diode Forward Voltage [2] | $V_{SD}$ | - | - | 1.2 | V | $I_S$=10A, $V_{GS}$=0 |

Notes:
1. Repetitive rating：pulse width limited by max. junction temperature.
2. The data tested by pulsed, pulse width≦300μs, duty cycle≦2%.

## CHARACTERISTIC CURVES

FIG. 1-Transfer Characteristics

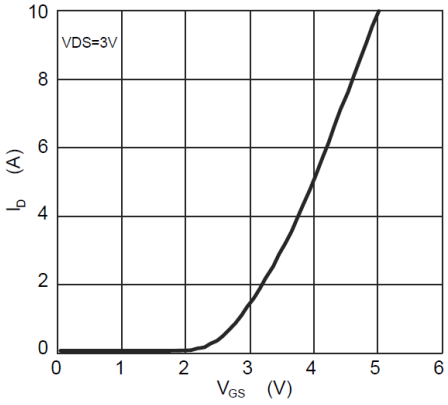



FIG. 2-$I_S$ vs. $V_{SD}$

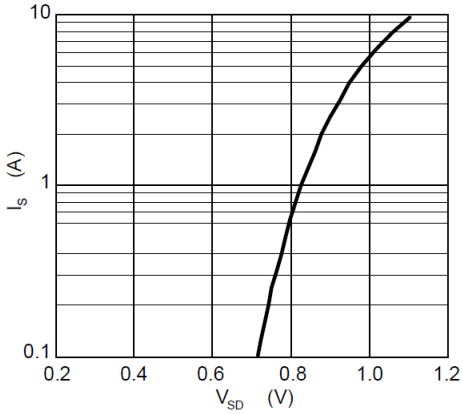



FIG. 3-$R_{DS(ON)}$ vs. $I_D$

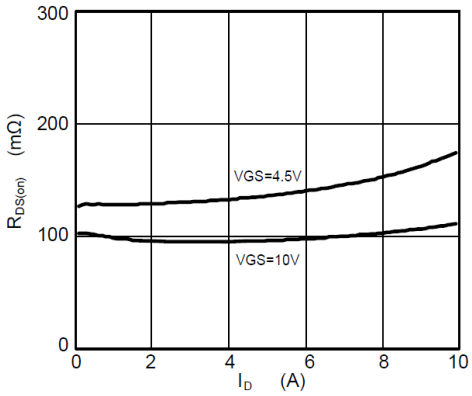



FIG. 4-Normalized $R_{DS(ON)}$ vs. $T_J$

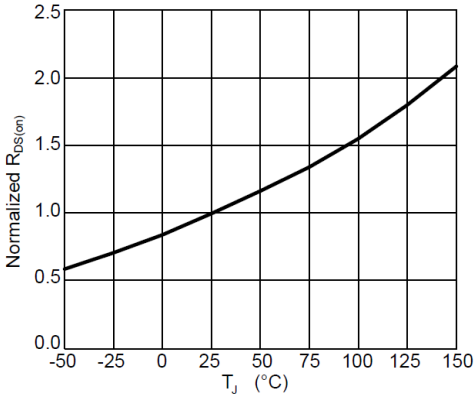



FIG. 5-Gate Charge Characteristics

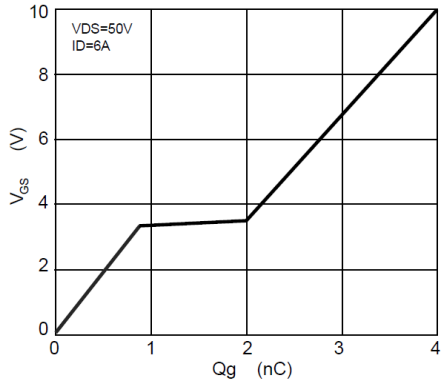



FIG. 6-$P_D$ vs. $T_C$

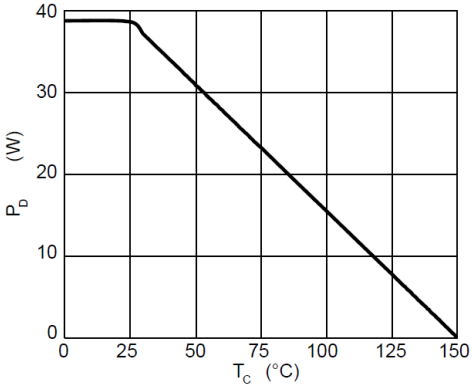
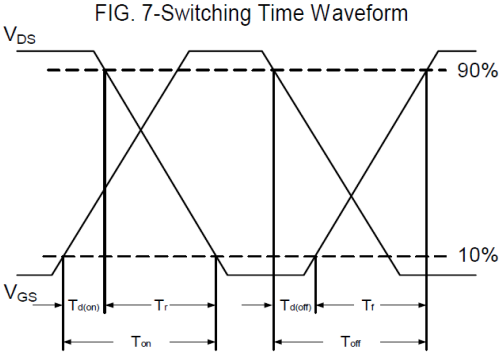
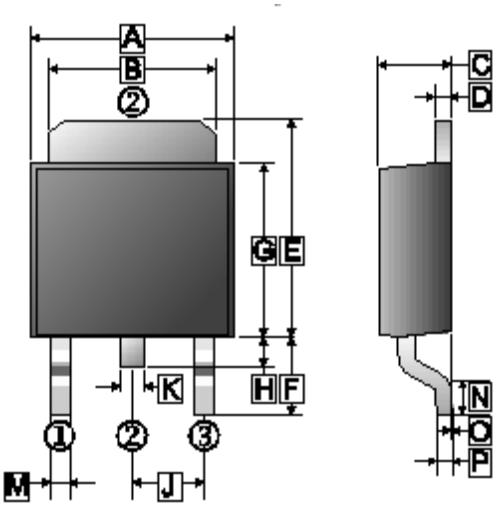



FIG. 7-Switching Time Waveform



## PACKAGE OUTLINE DIMENSIONS

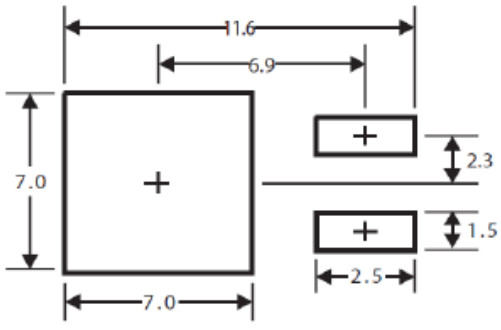
**TO-252**




| REF. | Millimeter | |
|---|---|---|
| | Min. | Max. |
| A | 6.30 | 6.90 |
| B | 4.95 | 5.53 |
| C | 2.10 | 2.50 |
| D | 0.35 | 0.90 |
| E | 6.00 | 7.70 |
| F | 2.90 REF. | |
| G | 5.30 | 6.40 |
| H | 0.60 | 1.20 |
| J | 2.30 REF. | |
| K | 0.89 REF. | |
| M | 0.45 | 1.14 |
| N | 1.55 TYP. | |
| O | 0 | 0.15 |
| P | 0.58 REF. | |

## MOUNTING PAD LAYOUT

**TO-252**




*Dimensions in millimeters