Elektronische Bauelemente

# SSD45N15SV-C

**45A, 150V, $R_{DS(ON)}$ 19.5mΩ**
**N-Ch Enhancement Mode Power MOSFET**

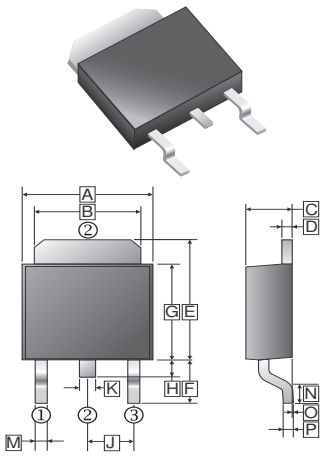
RoHS Compliant Product
A suffix of "-C" specifies halogen free

## DESCRIPTION

The SSD45N15SV-C is the highest performance N-ch MOSFETs with extreme high cell density, which provides excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SSD45N15SV-C meet the RoHS and Green Product requirement with full function reliability approved.

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

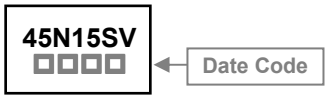



| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 6.30 | 6.90 | J | 2.30 REF. | |
| B | 4.95 | 5.53 | K | 0.89 REF. | |
| C | 2.10 | 2.50 | M | 0.45 | 1.14 |
| D | 0.40 | 0.90 | N | 1.55 Typ. | |
| E | 6.00 | 7.70 | O | 0 | 0.15 |
| F | 2.90 REF | | P | 0.58 REF. | |
| G | 5.40 | 6.40 | | | |
| H | 0.60 | 1.20 | | | |

## FEATURES

- High Speed Power Switching
- Super Low Gate Charge
- Green Device Available

## MARKING

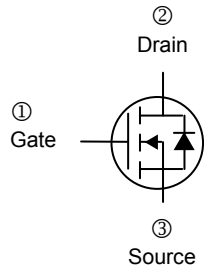



## PACKAGE INFORMATION

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

## ORDER INFORMATION

| Part Number | Type |
|---|---|
| SSD45N15SV-C | Lead (Pb)-free and Halogen-free |




## ABSOLUTE MAXIMUM RATINGS

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 150 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current [1] @$V_{GS}$=10V | $T_C$=25°C | $I_D$ | 45 | A |
| | $T_C$=100°C | | 28 | |
| Pulsed Drain Current [3] | | $I_{DM}$ | 100 | A |
| Total Power Dissipation | $T_C$=25°C | $P_D$ | 52 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55~150 | °C |
| **Thermal Resistance Ratings** | | | | |
| Thermal Resistance Junction-Ambient [1] | | $R_{\theta JA}$ | 62.5 | °C/W |
| Thermal Resistance Junction-Ambient [2] | | | 110 | |
| Thermal Resistance Junction-Case [1] | | $R_{\theta JC}$ | 2.4 | |

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

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | 150 | - | - | V | $V_{GS}$=0V, $I_D$=250μA |
| Gate-Threshold Voltage | | $V_{GS(th)}$ | 2 | - | 4 | V | $V_{DS}$=$V_{GS}$, $I_D$=250μA |
| Gate-Source Leakage Current | | $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$=±20V |
| Drain-Source Leakage Current | $T_J$=25°C | $I_{DSS}$ | - | - | 1 | uA | $V_{DS}$=120V, $V_{GS}$=0 |
| | $T_J$=55°C | | - | - | 100 | | $V_{DS}$=120V, $V_{GS}$=0 |
| Static Drain-Source On-Resistance [4] | | $R_{DS(ON)}$ | - | 16 | 19.5 | mΩ | $V_{GS}$=10V, $I_D$=15A |
| Total Gate Charge | | $Q_g$ | - | 27 | - | nC | $I_D$=15A<br>$V_{DS}$=75V<br>$V_{GS}$=10V |
| Gate-Source Charge | | $Q_{gs}$ | - | 9 | - | | |
| Gate-Drain Change | | $Q_{gd}$ | - | 2 | - | | |
| Turn-on Delay Time | | $T_{d(on)}$ | - | 12 | - | nS | $V_{DD}$=75V<br>$I_D$=15A<br>$V_{GS}$=10V<br>$R_G$=10Ω |
| Rise Time | | $T_r$ | - | 4 | - | | |
| Turn-off Delay Time | | $T_{d(off)}$ | - | 24 | - | | |
| Fall Time | | $T_f$ | - | 5 | - | | |
| Input Capacitance | | $C_{iss}$ | - | 2275 | - | pF | $V_{GS}$=0V<br>$V_{DS}$=75V<br>f=1MHz |
| Output Capacitance | | $C_{oss}$ | - | 165 | - | | |
| Reverse Transfer Capacitance | | $C_{rss}$ | - | 5.5 | - | | |
| **Source-Drain Diode** | | | | | | | |
| Diode Forward Voltage [4] | | $V_{SD}$ | - | - | 1.2 | V | $I_S$=15A, $V_{GS}$=0V |
| Continuous Source Current [1] | | $I_S$ | - | - | 45 | A | |
| Pulsed Source Current [3] | | $I_{SM}$ | - | - | 100 | A | |
| Reverse Recovery Time | | $T_{rr}$ | - | 60 | - | nS | $I_S$=15A, di/dt=100A/us<br>$V_{DD}$=75V |
| Reverse Recovery Charge | | $Q_{rr}$ | - | 120 | - | nC | |

Notes:
1. Surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by maximum junction temperature , pulse width≤300us , duty cycle≤2%
4. The data tested by pulsed, pulse width≤300us, duty cycle≤2%.

## CHARACTERISTIC CURVES

Fig 1. Typical Output Characteristics

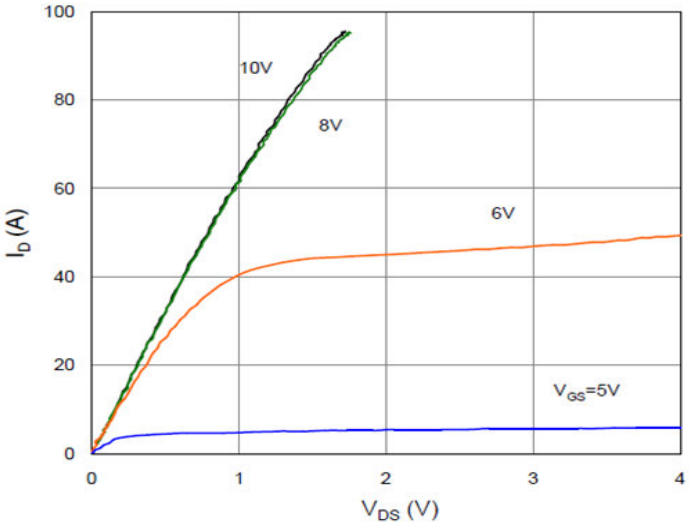



Figure 2. On-Resistance vs. Gate-Source Voltage

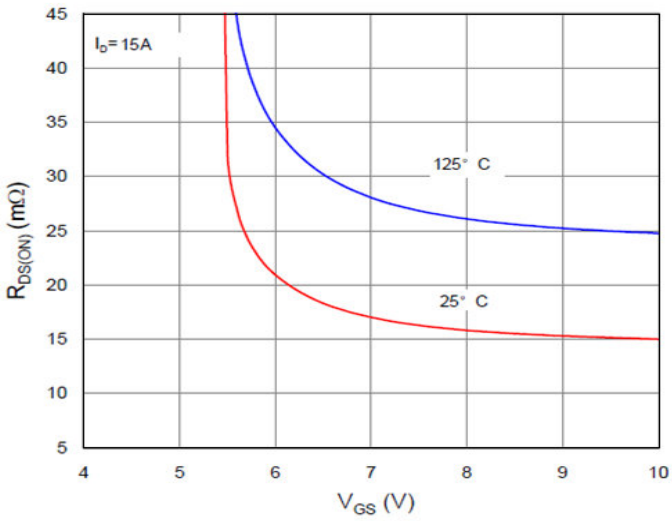



Figure 3. On-Resistance vs. Drain Current and Gate Voltage

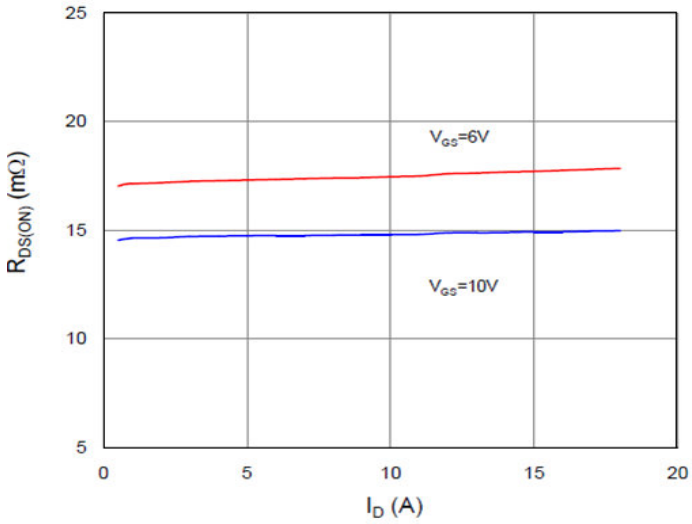



Figure 4. Normalized On-Resistance vs. Junction Temperature

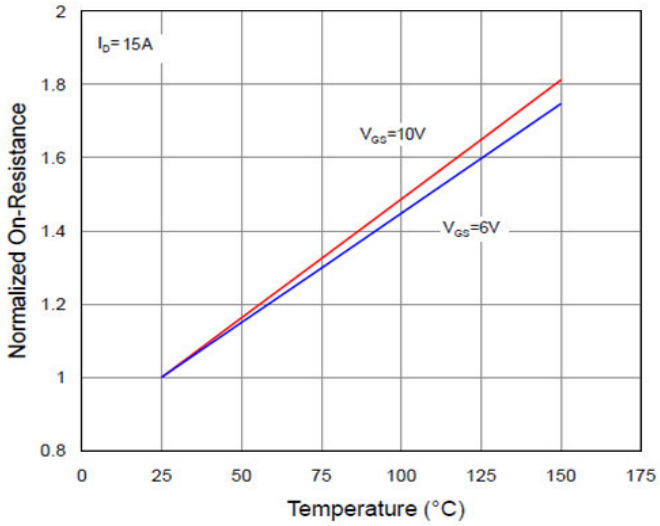



Figure 5. Typical Transfer Characteristics

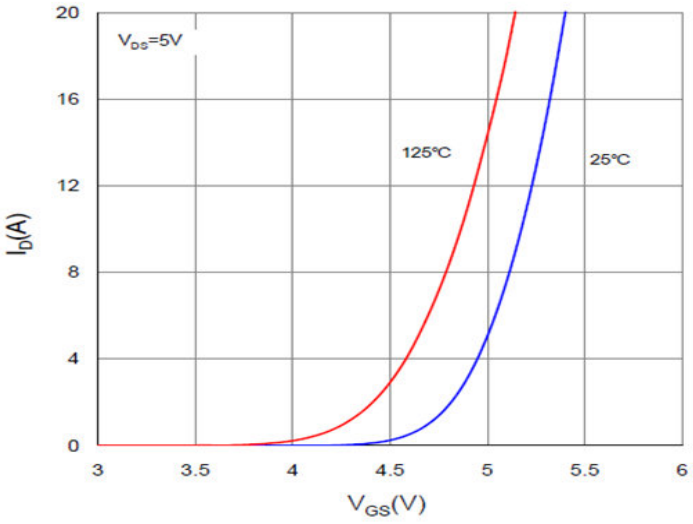
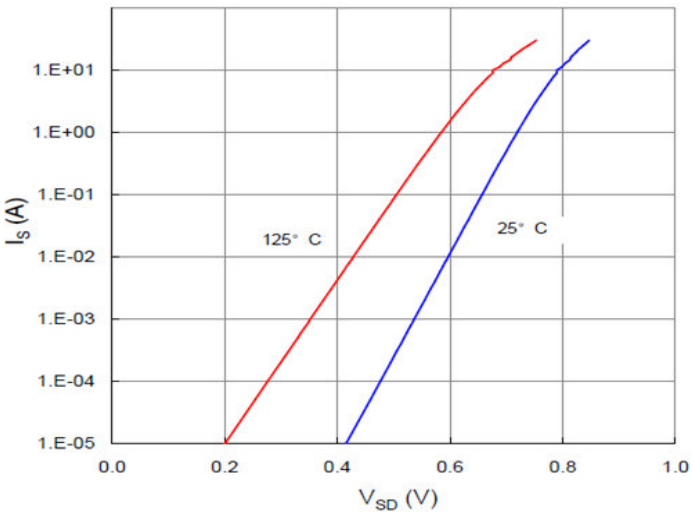



Figure 6. Typical Source-Drain Diode Forward Voltage



## CHARACTERISTIC CURVES

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

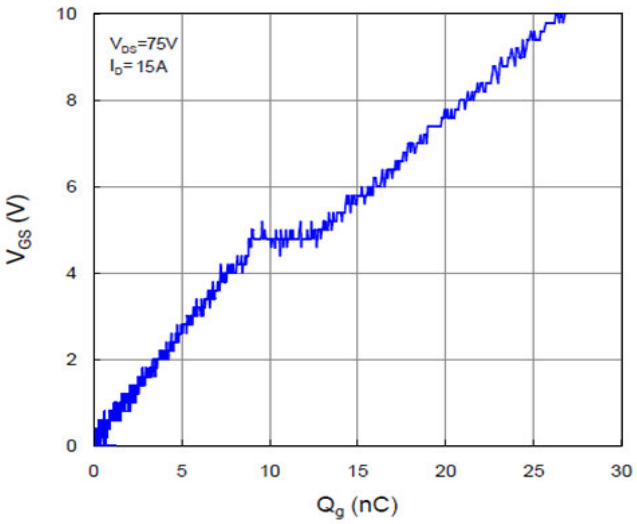



Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

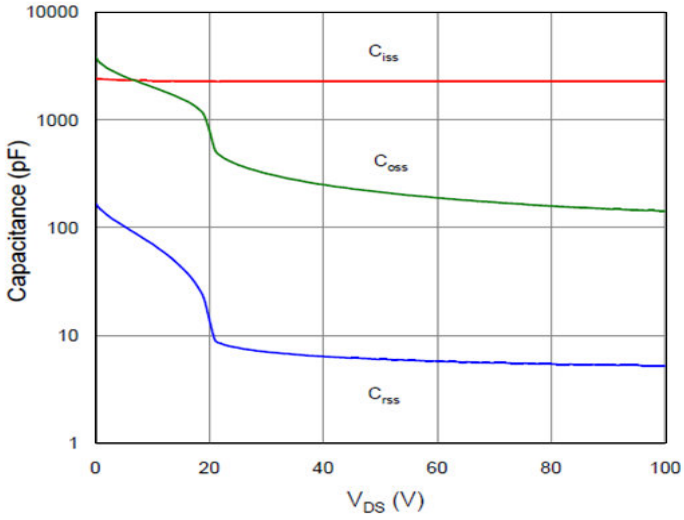



Figure 9. Maximum Safe Operating Area

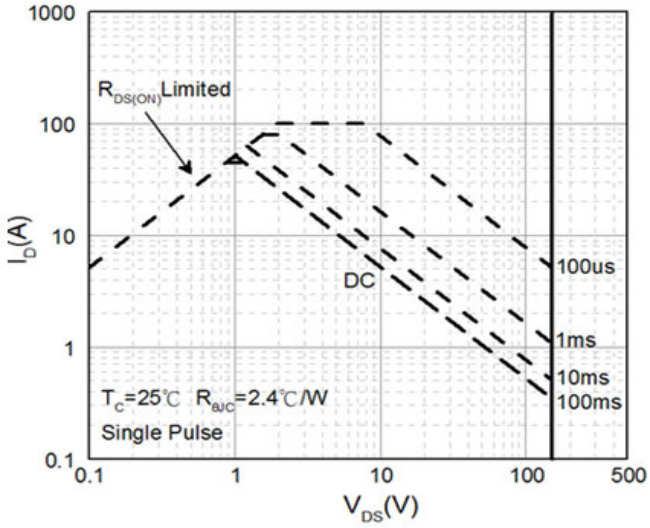



Figure 10. Maximun Drain Current vs. Case Temperature

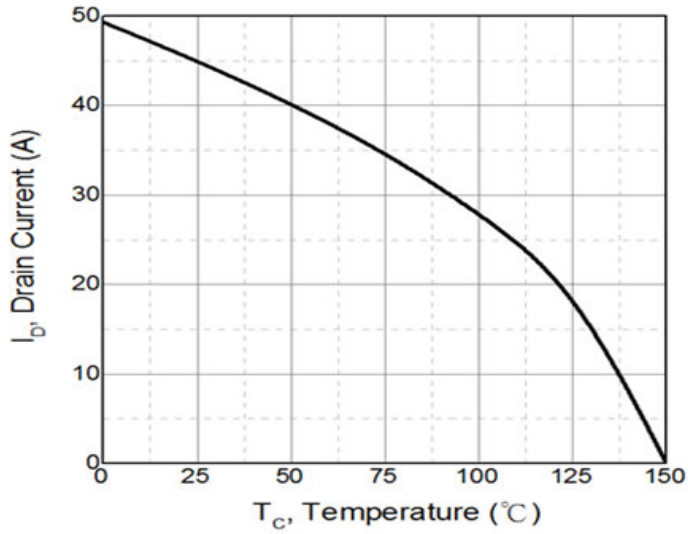



Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case