Elektronische Bauelemente

# SSD55N03

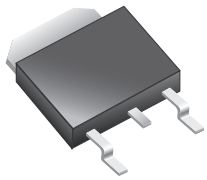
**55A, 25V, $R_{DS(ON)}$ 6mΩ**
**N-Ch Enhancement Mode Power MOSFET**

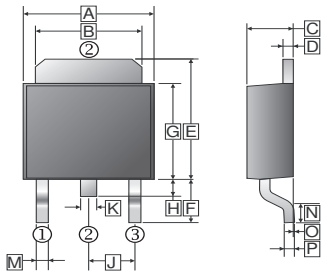
RoHS Compliant Product
A suffix of "-C" specifies halogen free

## DESCRIPTION

The SID55N03 provide the designer with the best combination of fast switching,ruggedized device design, low on-resistance and cost-effectiveness. The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

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

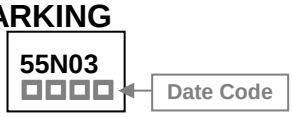


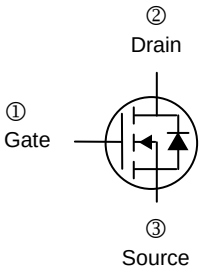



## FEATURES

- Dynamic dv/dt Rating
- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching

## MARKING




| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 6.4 | 6.8 | J | 2.30 REF. | |
| B | 5.20 | 5.50 | K | 0.70 | 0.90 |
| C | 2.20 | 2.40 | M | 0.50 | 1.1 |
| D | 0.45 | 0.58 | N | 0.9 | 1.6 |
| E | 6.8 | 7.3 | O | 0 | 0.15 |
| F | 2.40 | 3.0 | P | 0.43 | 0.58 |
| G | 5.40 | 6.2 | | | |
| H | 0.8 | 1.20 | | | |

## PACKAGE INFORMATION

| Package | MPQ | LeaderSize |
|---|---|---|
| TO-252 | 2.5K | 13' inch |

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

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 25 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25℃ | $I_D$ | 55 | A |
| | $T_C$=100℃ | | 35 | A |
| Pulsed Drain Current [1] | | $I_{DM}$ | 215 | A |
| Total Power Dissipation | | $P_D$ | 62.5 | W |
| Linear Derating Factor | | | 0.5 | W / ℃ |
| Single Pulse Avalanche Energy[2] | | $E_{AS}$ | 240 | mJ |
| Single Pulse Avalanche Current | | $I_{AS}$ | 31 | A |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55~150 | ℃ |
| **Thermal Resistance Rating** | | | | |
| Maximum Thermal Resistance Junction-Ambient | | $R_{\theta JA}$ | 110 | ℃ / W |
| Maximum Thermal Resistance Junction-Case | | $R_{\theta JC}$ | 2.0 | ℃ / W |

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

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Teat Conditions |
|---|---|---|---|---|---|---|---|
| **Static** | | | | | | | |
| Dran-Source Breakdown Voltage | | $BV_{DSS}$ | 25 | - | - | V | $V_{GS}$=0, $I_D$= 250μA |
| Breakdown Voltage Temperature Coefficient | | $\triangle BV_{DSS}$ /$\triangle T_J$ | - | 0.037 | - | V/℃ | Reference to 25℃, $I_D$=1mA |
| Gate-Threshold Voltage | | $V_{GS(th)}$ | 1.0 | - | 3.0 | V | $V_{DS}$=$V_{GS}$, $I_D$=250μA |
| Forward Transconductance | | $g_{fs}$ | - | 30 | - | S | $V_{DS}$=10V, $I_D$=28A |
| Gate-Source Leakage Current | | $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$= ±20V |
| Drain-Source Leakage Current | $T_J$ =25℃ | $I_{DSS}$ | - | - | 1 | μA | $V_{DS}$=25V, $V_{GS}$=0 |
| | $T_J$ =150℃ | | - | - | 25 | μA | $V_{DS}$=20V, $V_{GS}$=0 |
| Static Drain-Source On-Resistance [3] | | $R_{DS(ON)}$ | - | 4.5 | 6 | mΩ | $V_{GS}$=10V, $I_D$=30A |
| | | | - | 7 | 9 | | $V_{GS}$=4.5V, $I_D$=30A |
| Total Gate Charge [3] | | $Q_g$ | - | 16.8 | - | nC | $I_D$=28A<br>$V_{DS}$=20V<br>$V_{GS}$=5V |
| Gate-Source Charge | | $Q_{gs}$ | - | 6.0 | - | | |
| Gate-Drain (“Miller”) Change | | $Q_{gd}$ | - | 4.9 | - | | |
| Turn-on Delay Time[3] | | $T_{d(on)}$ | - | 15.1 | - | nS | $V_{DS}$=15 V<br>$I_D$=28 A<br>$V_{GS}$=10V<br>$R_G$=3.3 Ω<br>$R_D$=0.53Ω |
| Rise Time | | $T_r$ | - | 4 | - | | |
| Turn-off Delay Time | | $T_{d(off)}$ | - | 45.2 | - | | |
| Fall Time | | $T_f$ | - | 7.6 | - | | |
| Input Capacitance | | $C_{ISS}$ | - | 2326 | - | pF | $V_{GS}$ =0<br>$V_{DS}$=25 V<br>f =1.0MHz |
| Output Capacitance | | $C_{OSS}$ | - | 331 | - | | |
| Reverse Transfer Capacitance | | $C_{RSS}$ | - | 174 | - | | |
| **Source-Drain Diode** | | | | | | | |
| Diode Forward Voltage [3] | | $V_{SD}$ | - | - | 1.5 | V | $I_S$=20A, $V_{GS}$=0, $T_J$=25℃ |
| Continuous Source Current (Body Diode) | | $I_S$ | - | - | 55 | A | $V_D$=$V_G$=0, $V_S$=1.5V |

Notes:
1. Pulse width limited by safe operating area.
2. Staring $T_J$=25℃, $V_{DD}$=20V, L=0.1mH, $R_G$=25, $I_{AS}$=10A.
3. Pulse width ≦ 300 μs, duty cycle ≦ 2%.

## CHARACTERISTIC CURVES

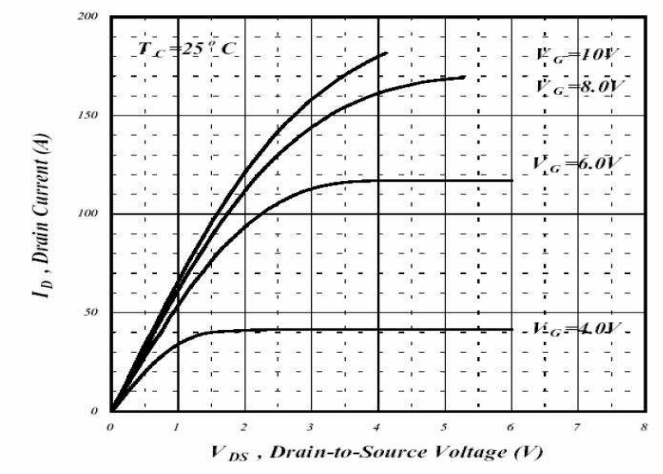



**Fig 1. Typical Output Characteristics**

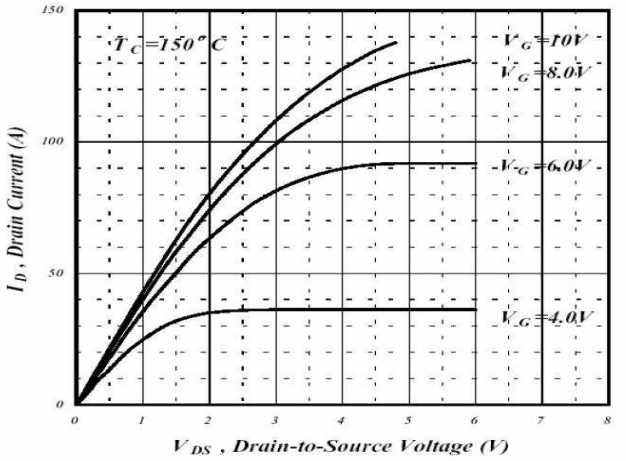



**Fig 2. Typical Output Characteristics**

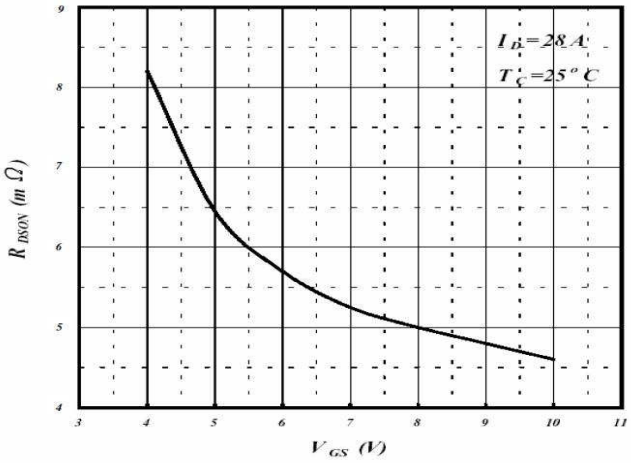



**Fig 3. On-Resistance v.s. Gate Voltage**

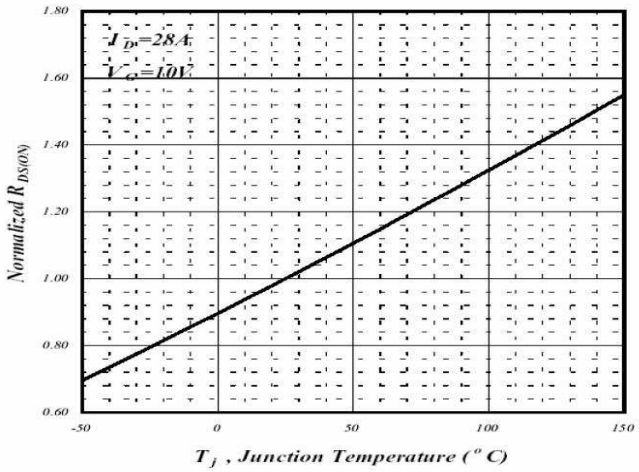



**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

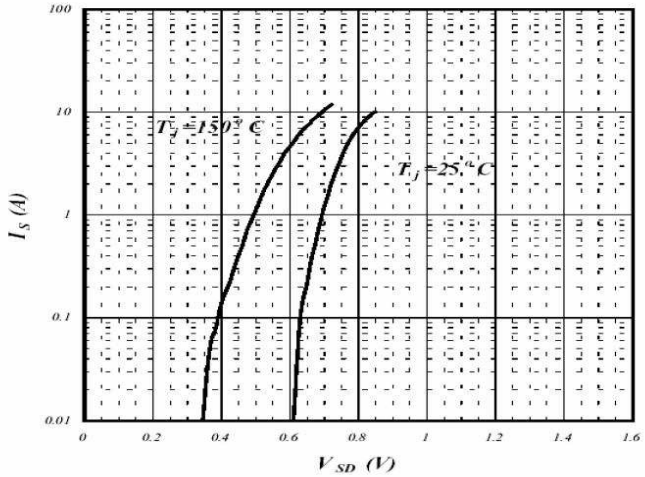



**Fig 5. Forward Characteristics of Reverse Diode**

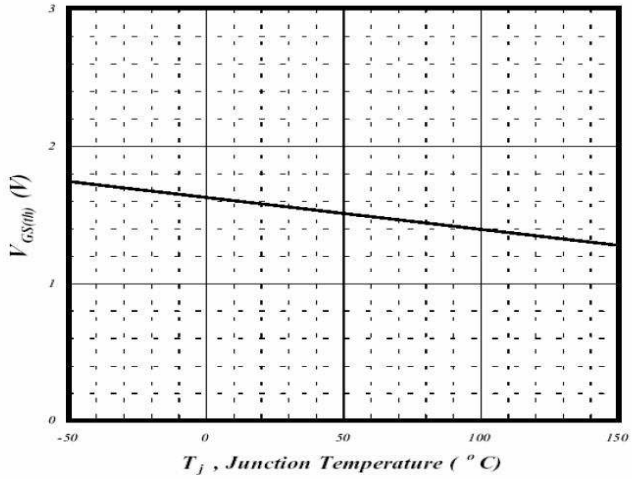



**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**

## CHARACTERISTIC CURVES

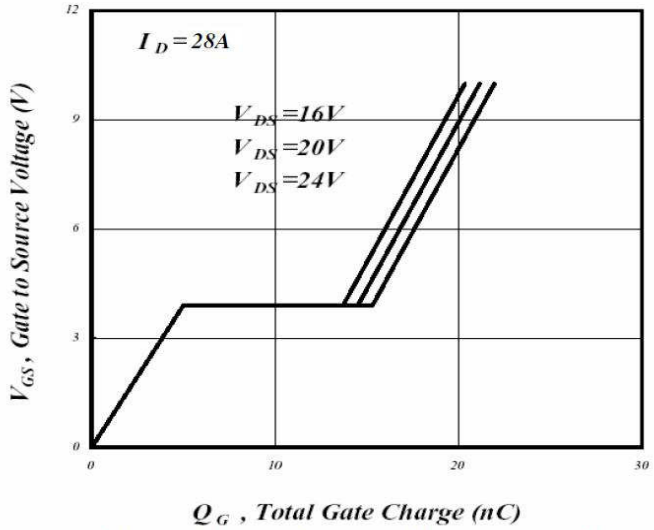



Fig 7. Gate Charge Characteristics

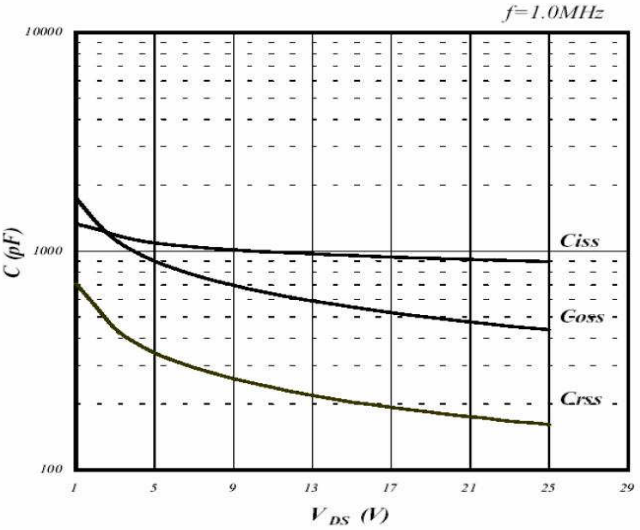



Fig 8. Typical Capacitance Characteristics

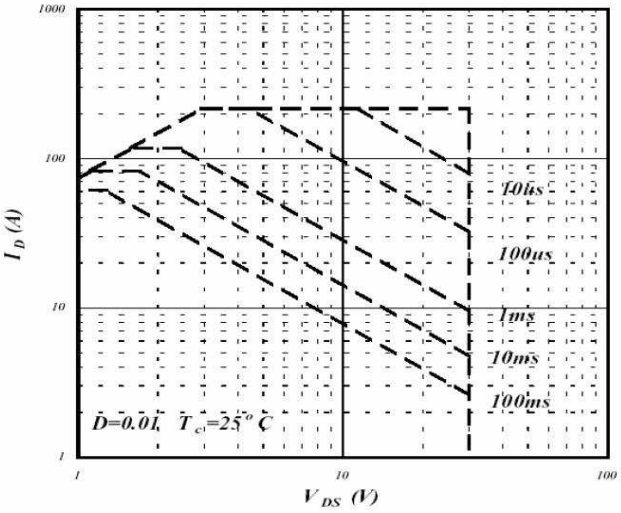



Fig 9. Maximum Safe Operating Area

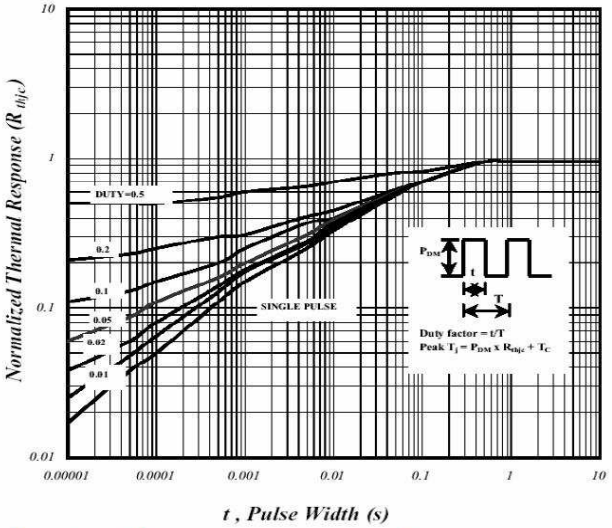



Fig 10. Effective Transient Thermal Impedance

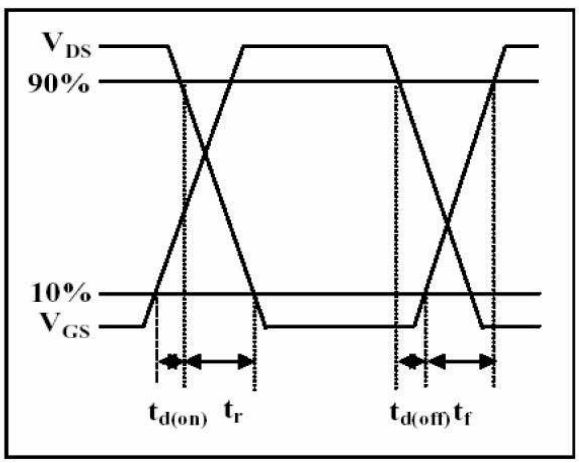



Fig 11. Switching Time Waveform

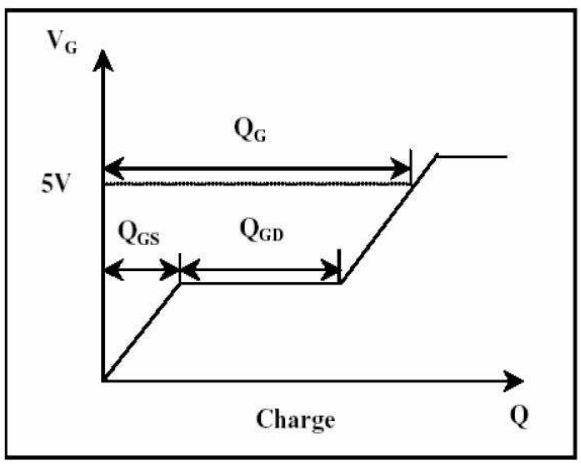



Fig 12. Gate Charge Waveform