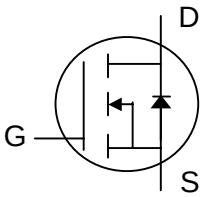
# N-CHANNEL ENHANCEMENT-MODE POWER MOSFET

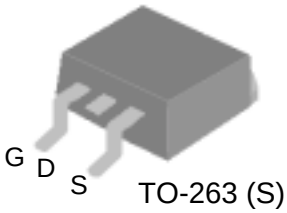
Low gate-charge
Simple drive requirement
Fast switching



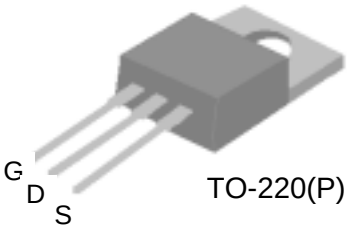

| | |
|---|---|
| $BV_{DSS}$ | 60V |
| $R_{DS(ON)}$ | 8.5mΩ |
| $I_D$ | 75A |

## Description

The SSM95T06S is in a TO-263 package, which is widely used for commercial and industrial surface mount applications, and is well suited for low voltage applications such as DC/DC converters. The through-hole version, the SSM95T06P in TO-220, is available for low-footprint vertical mounting. These devices are manufactured with an advanced process, providing improved on-resistance and switching performance.



TO-263 (S)



TO-220(P)

**Pb-free lead finish (second-level interconnect)**

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 60 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ @ $T_C$=25°C | Continuous Drain Current, $V_{GS}$ @ 10V[3] | 75 | A |
| $I_D$ @ $T_C$=100°C | Continuous Drain Current, $V_{GS}$ @ 10V | 66 | A |
| $I_{DM}$ | Pulsed Drain Current[1] | 260 | A |
| $P_D$ @ $T_C$=25°C | Total Power Dissipation | 138 | W |
| | Linear Derating Factor | 1.11 | W/°C |
| $E_{AS}$ | Single Pulse Avalanche Energy[4] | 450 | mJ |
| $I_{AR}$ | Avalanche Current | 30 | A |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | °C |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | °C |

## Thermal Data

| Symbol | Parameter | | Value | Units |
|---|---|---|---|---|
| Rthj-c | Thermal Resistance Junction-case | Max. | 0.9 | °C/W |
| Rthj-a | Thermal Resistance Junction-ambient | Max. | 62 | °C/W |

## Electrical Characteristics @ $T_j$=25°C (unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=1mA | 60 | - | - | V |
| $\Delta BV_{DSS}/\Delta Tj$ | Breakdown Voltage Temperature Coefficient | Reference to 25°C, $I_D$=1mA | - | 0.05 | - | V/°C |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=10V, $I_D$=45A | - | - | 8.5 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=20A | - | - | 12 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 1 | - | 3 | V |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=10V, $I_D$=45A | - | 72 | - | S |
| $I_{DSS}$ | Drain-Source Leakage Current ($T_j$=25°C) | $V_{DS}$=60V, $V_{GS}$=0V | - | - | 10 | uA |
| | Drain-Source Leakage Current ($T_j$=150°C) | $V_{DS}$=48V ,$V_{GS}$=0V | - | - | 100 | uA |
| $I_{GSS}$ | Gate-Source Leakage | $V_{GS}$= ±20V | - | - | ±100 | nA |
| $Q_g$ | Total Gate Charge[2] | $I_D$=45A | - | 72 | 115 | nC |
| $Q_{gs}$ | Gate-Source Charge | $V_{DS}$=48V | - | 16 | - | nC |
| $Q_{gd}$ | Gate-Drain ("Miller") Charge | $V_{GS}$=4.5V | - | 53 | - | nC |
| $t_{d(on)}$ | Turn-on Delay Time[2] | $V_{DS}$=30V | - | 20 | - | ns |
| $t_r$ | Rise Time | $I_D$=45A | - | 76 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | $R_G$=3.3Ω , $V_{GS}$=10V | - | 67 | - | ns |
| $t_f$ | Fall Time | $R_D$=0.67Ω | - | 109 | - | ns |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V | - | 5700 | 9200 | pF |
| $C_{oss}$ | Output Capacitance | $V_{DS}$=25V | - | 900 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | f=1.0MHz | - | 560 | - | pF |
| $R_g$ | Gate Resistance | f=1.0MHz | - | 1.1 | 1.7 | Ω |

## Source-Drain Diode

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $V_{SD}$ | Forward On Voltage[2] | $I_S$=45A, $V_{GS}$=0V | - | - | 1.3 | V |
| $t_{rr}$ | Reverse Recovery Time[2] | $I_S$=20A, $V_{GS}$=0V | - | 40 | - | ns |
| $Q_{rr}$ | Reverse Recovery Charge | dI/dt=100A/μs | - | 60 | - | nC |

### Notes:

1.Pulse width limited by safe operating area.

2.Pulse width ≤300us , duty cycle ≤2%.

3.The maximum current is limited by the package to 75A .

4.Starting $T_j$=25°C , $V_{DD}$=30V , L=1mH , $R_G$=25Ω , $I_{AS}$=30A.

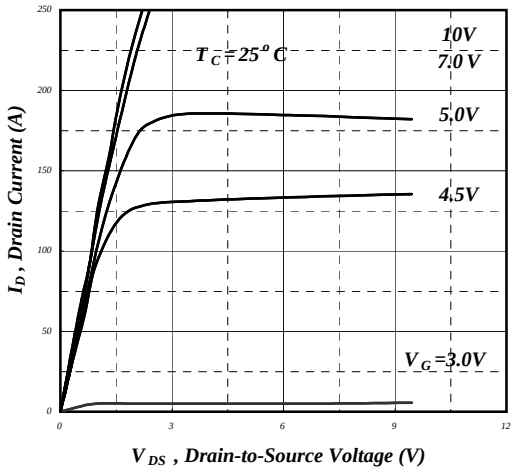



Fig 1. Typical Output Characteristics

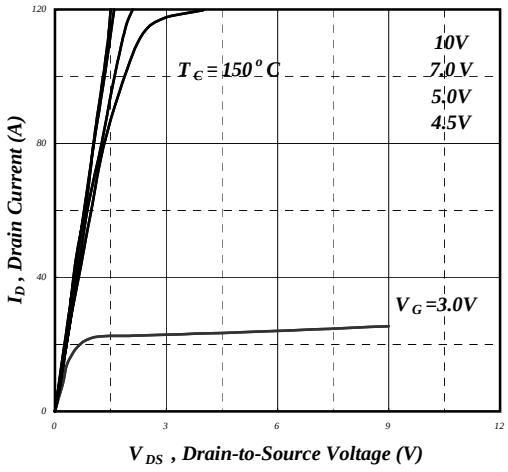



Fig 2. Typical Output Characteristics

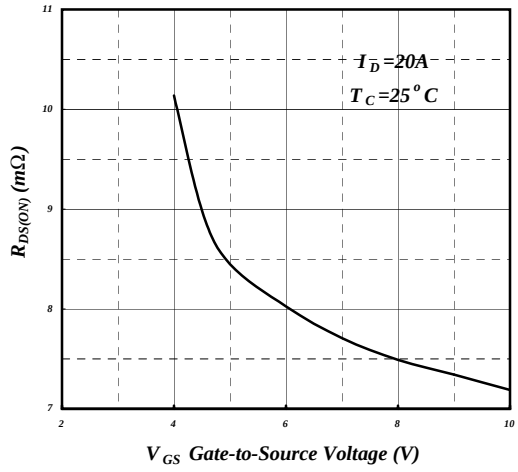



Fig 3. On-Resistance vs. Gate Voltage

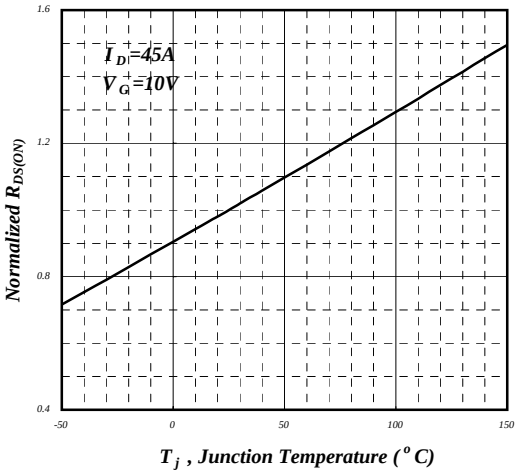



Fig 4. Normalized On-Resistance vs. Junction Temperature

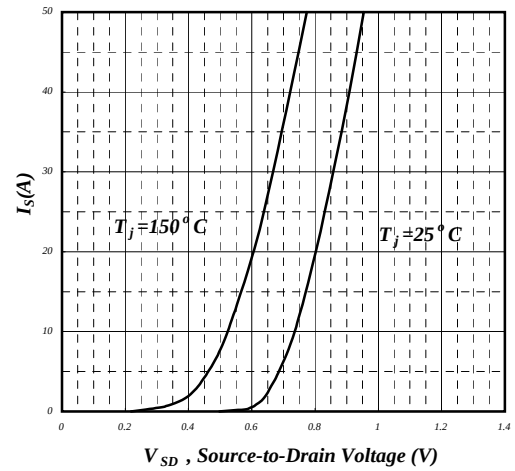



Fig 5. Forward Characteristic of Reverse Diode

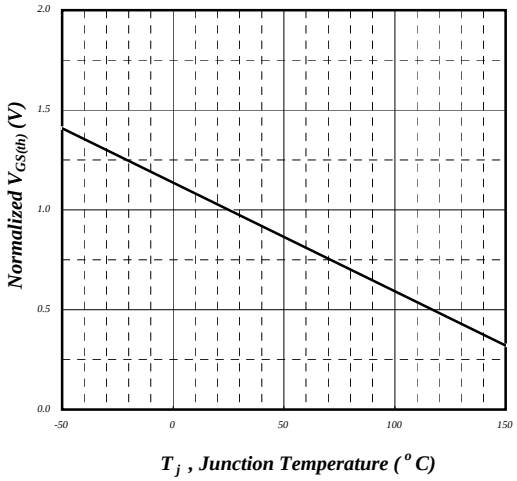



Fig 6. Gate Threshold Voltage vs. Junction Temperature

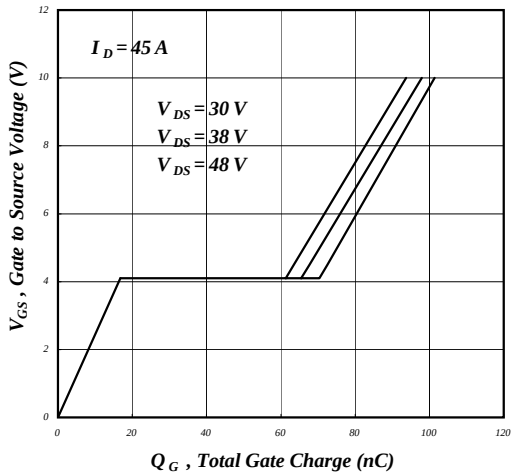



Fig 7. Gate Charge Characteristics

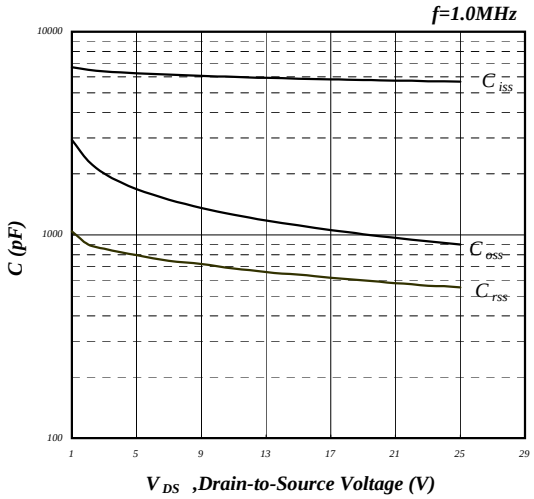



Fig 8. Typical Capacitance Characteristics

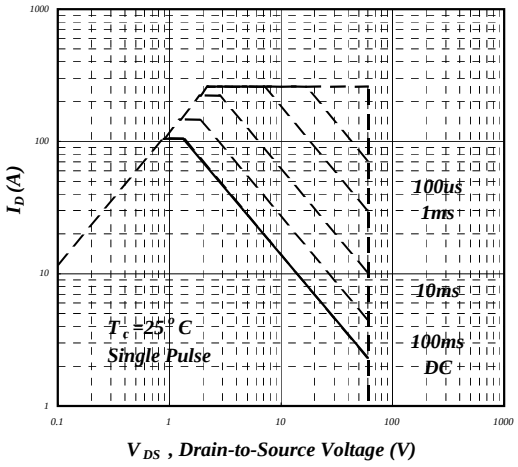



Fig 9. Maximum Safe Operating Area

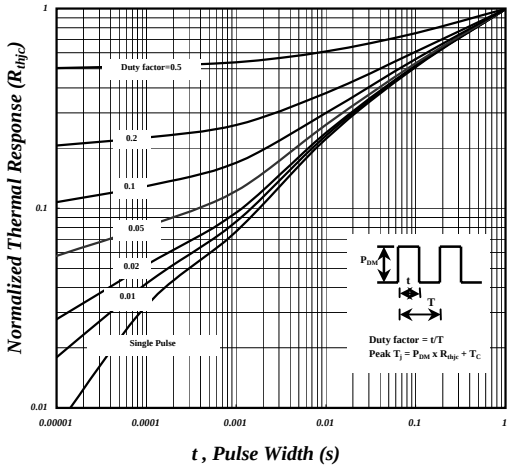



Fig 10. Effective Transient Thermal Impedance

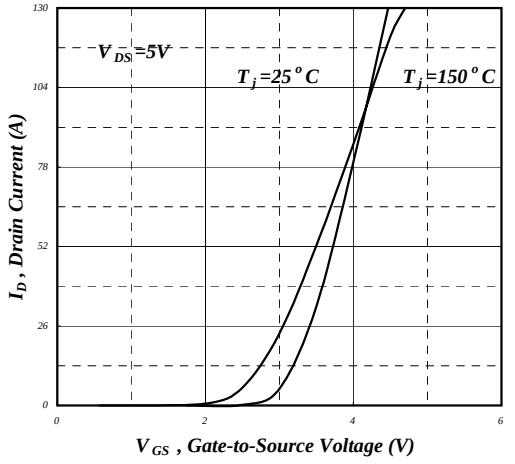



Fig 11. Transfer Characteristics

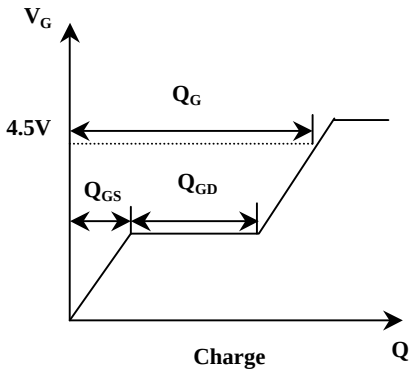



Fig 12. Gate Charge Waveform