



## SSCV3N500GT8

### N-Channel Enhancement Mode Power MOSFET

#### ➤ Features

| $V_{DS}$ | $V_{GS}$  | $R_{DS(ON)}$ Typ. | $I_D$ |
|----------|-----------|-------------------|-------|
| 500V     | $\pm 30V$ | $2.4\Omega @ 10V$ | 3A    |

#### ➤ Description

- This device is N-Channel enhancement MOSFET.
- Fast Switching.
- Improved dv/dt Capability.

**100% UIS +  $\Delta V_{DS}$  +  $R_g$  Tested!**

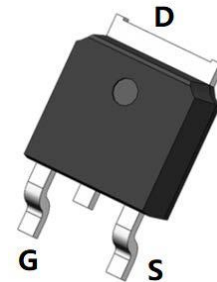
#### ➤ Applications

- Switch Mode Power Supply
- Uninterruptible Power Supply (UPS)
- TV Power

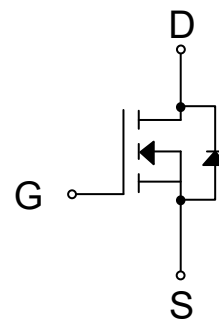
#### ➤ Ordering Information

| Device       | Package | Shipping  |
|--------------|---------|-----------|
| SSCV3N500GT8 | TO-252  | 2500/Reel |

#### ➤ Pin Configuration



**TO-252 (Top View)**



**Pin Configuration**



**Marking**

(XXYY: Internal Traceability Code)



➤ **Absolute Maximum Ratings ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

| Symbol          | Parameter                                   |                           | Ratings    | Unit               |
|-----------------|---------------------------------------------|---------------------------|------------|--------------------|
| $V_{DS}$        | Drain-to-Source Voltage                     |                           | 500        | V                  |
| $V_{GS}$        | Gate-to-Source Voltage                      |                           | $\pm 30$   | V                  |
| $I_D$           | Continuous Drain Current                    | $T_J=25^{\circ}\text{C}$  | 3          | A                  |
|                 |                                             | $T_J=100^{\circ}\text{C}$ | 1.8        |                    |
| $I_{DM}$        | Pulsed Drain Current <sup>a</sup>           |                           | 12         | A                  |
| $E_{AS}$        | Single Pulsed Avalanche Energy              |                           | 61         | mJ                 |
| $P_D$           | Power Dissipation, $T_J=25^{\circ}\text{C}$ |                           | 17.6       | W                  |
| $T_{STG} / T_J$ | Junction & Storage Temperature Range        |                           | -55 to 150 | $^{\circ}\text{C}$ |

➤ **Thermal Resistance Ratings ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

| Symbol          | Parameter                                            | Ratings | Unit                        |
|-----------------|------------------------------------------------------|---------|-----------------------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient <sup>b</sup> | 62      | $^{\circ}\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case                 | 7.1     |                             |

Note:

a. Repetitive Rating: Pulsed width limited by maximum junction temperature.

b.  $R_{\theta JA}$  is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.

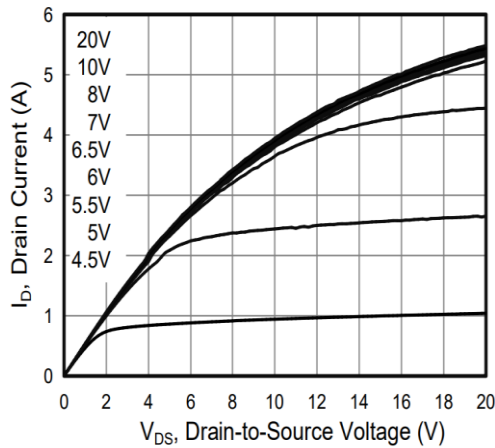


➤ **Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

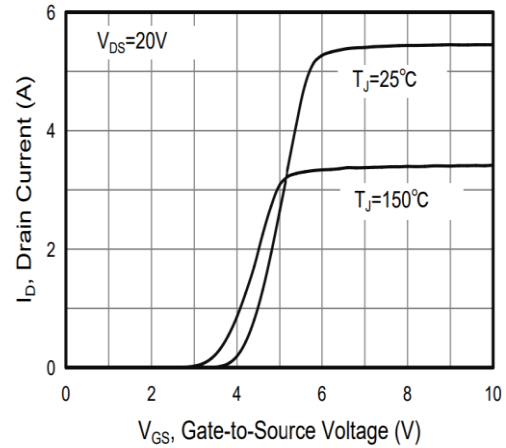
| Parameter                                               | Symbol               | Test Conditions                                                            | Min. | Typ. | Max. | Unit |
|---------------------------------------------------------|----------------------|----------------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage                          | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                               | 500  |      |      | V    |
| Zero Gate Voltage Drain Current                         | I <sub>DSS</sub>     | V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V                               |      |      | 1.0  | μA   |
| Gate-Source Leak Current                                | I <sub>GSS</sub>     | V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V                               |      |      | ±100 | nA   |
| Gate Threshold Voltage                                  | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA                 | 2    |      | 4    | V    |
| Drain-Source On-Resistance                              | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A                               |      | 2.4  | 3    | Ω    |
| Input Capacitance                                       | C <sub>ISS</sub>     | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V,<br>f = 1MHz                   |      | 230  |      | pF   |
| Output Capacitance                                      | C <sub>OSS</sub>     |                                                                            |      | 33   |      |      |
| Reverse Transfer Capacitance                            | C <sub>RSS</sub>     |                                                                            |      | 1.8  |      |      |
| Total Gate Charge                                       | Q <sub>G</sub>       | V <sub>GS</sub> = 0 to 10V, V <sub>DS</sub> = 400V,<br>I <sub>D</sub> = 3A |      | 10.1 |      | nC   |
| Gate to Source Charge                                   | Q <sub>GS</sub>      |                                                                            |      | 3.5  |      |      |
| Gate to Drain Charge                                    | Q <sub>GD</sub>      |                                                                            |      | 2.1  |      |      |
| Turn-on Delay Time                                      | T <sub>D(ON)</sub>   | V <sub>DS</sub> = 250V,<br>I <sub>D</sub> = 3A, R <sub>G</sub> = 25Ω       |      | 11.8 |      | ns   |
| Rise Time                                               | T <sub>r</sub>       |                                                                            |      | 14   |      |      |
| Turn-off Delay Time                                     | T <sub>D(OFF)</sub>  |                                                                            |      | 31   |      |      |
| Fall Time                                               | T <sub>f</sub>       |                                                                            |      | 17   |      |      |
| Maximu Continuous Drain to Source Diode Forward Current | I <sub>S</sub>       |                                                                            |      |      | 3    | A    |
| Drain to Source Diode Forward Voltage                   | V <sub>SD</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> = 3A                                  |      |      | 1.2  | V    |
| Body Diode Reverse Recovery Time                        | T <sub>rr</sub>      | I <sub>F</sub> = 3A, di/dt = 100A/us<br>V <sub>R</sub> =300V               |      | 189  |      | ns   |
| Body Diode Reverse Recovery Charge                      | Q <sub>rr</sub>      |                                                                            |      | 0.4  |      | μC   |



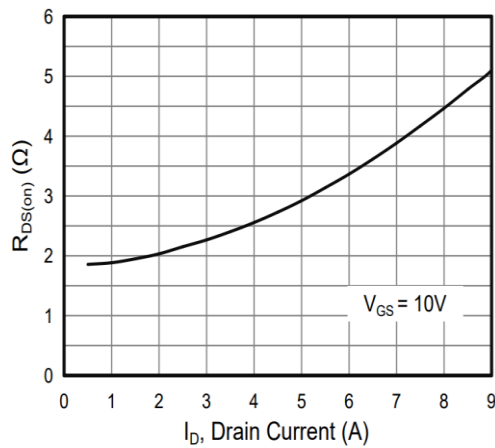
➤ **Typical Performance Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)**



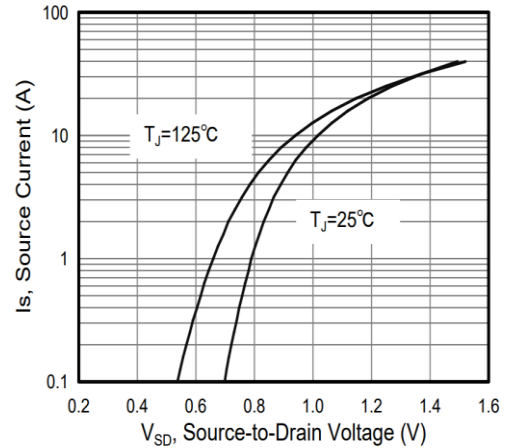
**Figure 1: Output Characteristics**



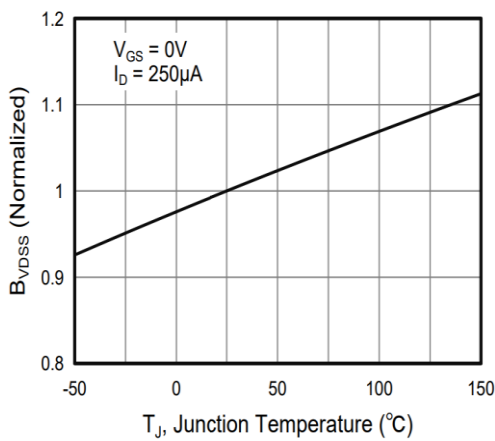
**Figure 2: Typical Transfer Characteristics**



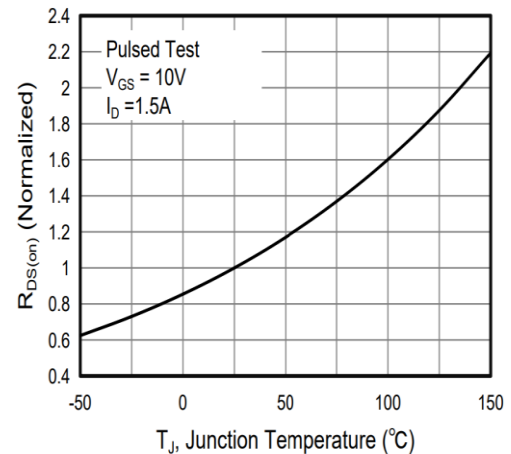
**Figure 3: On-resistance vs. Drain Current**



**Figure 4: Body Diode Characteristics**



**Figure 5: Normalized Breakdown voltage vs. Junction Temperature**



**Figure 6: Normalized on Resistance vs. Junction Temperature**



➤ Typical Performance Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)

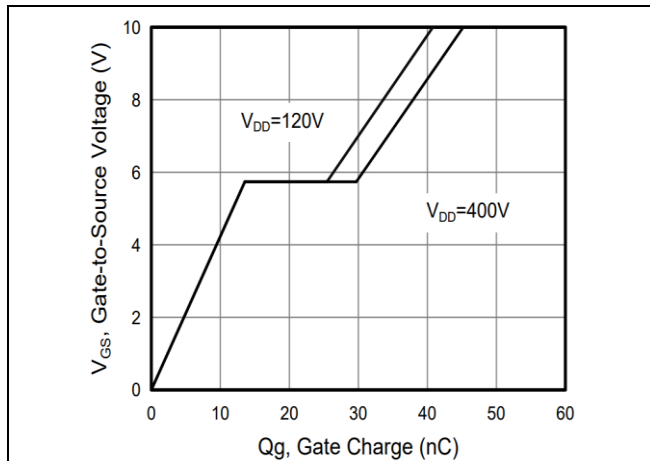


Figure 7: Gate Charge Characteristics

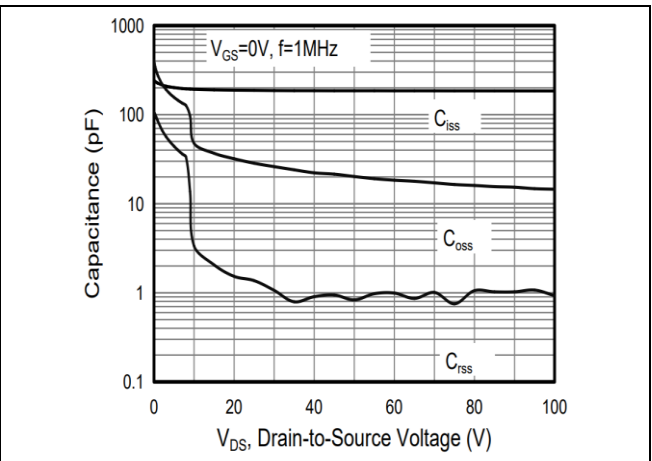


Figure 8: Capacitance Characteristics

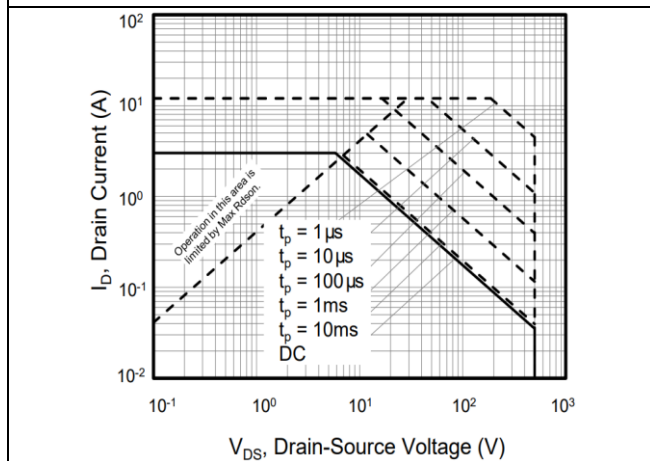


Figure 9: Maximum Safe Operating Area

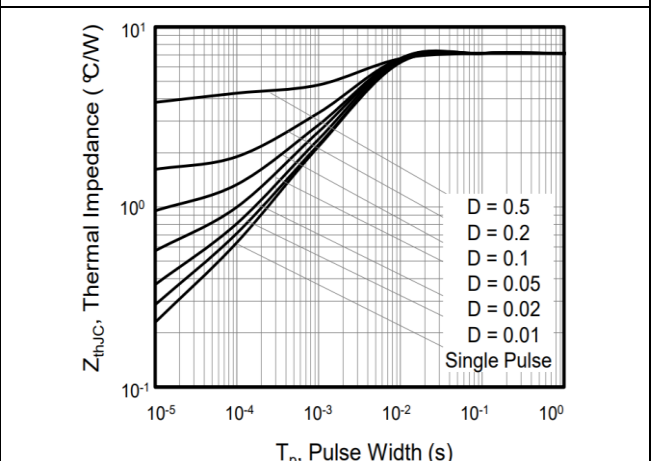
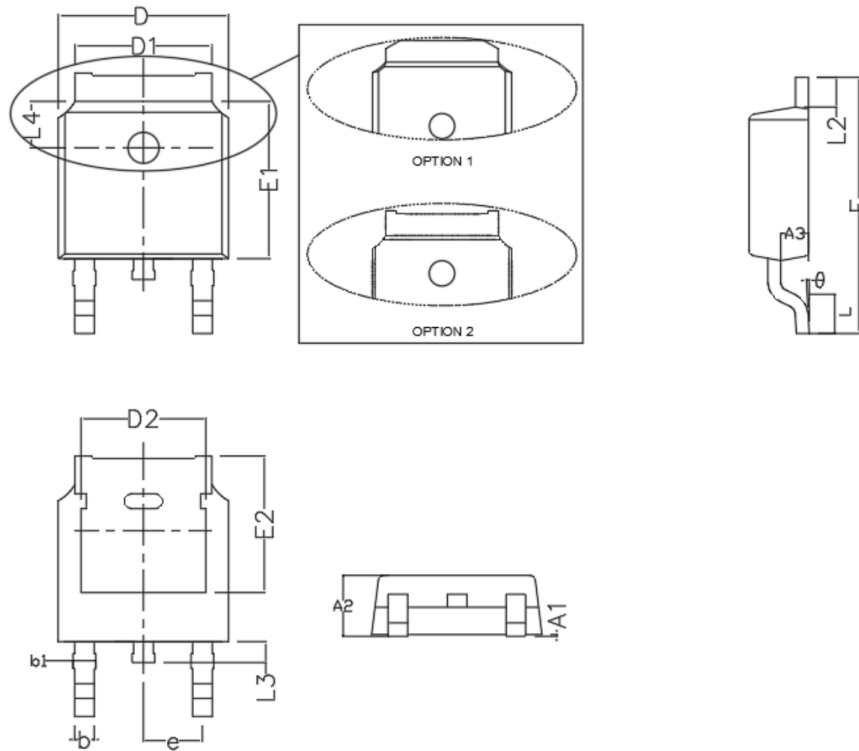


Figure 10: Normalized Maximum Transient Thermal Impedance

## ➤ Package Information

TO252



| Symbol | MILL IMETER |        |        | Symbol | MILL IMETER |       |       |
|--------|-------------|--------|--------|--------|-------------|-------|-------|
|        | Min         | Nom    | Max    |        | Min         | Nom   | Max   |
| A1     | 0.000       | /      | 0.200  | E1     | 5.800       | 6.100 | 6.400 |
| A2     | 2.100       | 2.300  | 2.500  | E2     | 5.100       | 5.450 | 5.600 |
| A3     | 0.900       | 1.040  | 1.170  | e      | 2.286TYP    |       |       |
| b      | 0.600       | 0.762  | 0.910  | L      | 1.270       | 1.500 | 2.032 |
| b1     | 0.680       | 0.840  | 1.145  | L2     | 0.900       | 1.100 | 1.270 |
| D      | 6.300       | 6.600  | 6.900  | L3     | 0.600       | 0.800 | 1.000 |
| D1     | 4.950       | 5.330  | 5.700  | L4     | 1.600       | 1.800 | 2.000 |
| D2     | 4.315       | 4.830  | 5.230  | θ      | 0°          | /     | 10°   |
| E      | 9.395       | 10.100 | 10.700 |        |             |       |       |



---

## DISCLAIMER

SSCSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. SSCSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

THE GRAPHS PROVIDED IN THIS DOCUMENT ARE STATISTICAL SUMMARIES BASED ON A LIMITED NUMBER OF SAMPLES AND ARE PROVIDED FOR INFORMATIONAL PURPOSE ONLY. THE PERFORMANCE CHARACTERISTICS LISTED IN THEM ARE NOT TESTED OR GUARANTEED. IN SOME GRAPHS, THE DATA PRESENTED MAY BE OUTSIDE THE SPECIFIED OPERATING RANGE (E.G. OUTSIDE SPECIFIED POWER SUPPLY RANGE) AND THEREFORE OUTSIDE THE WARRANTED RANGE.

OUR PRODUCT SPECIFICATIONS ARE ONLY VALID IF OBTAINED THROUGH THE COMPANY'S OFFICIAL WEBSITE, CRM SYSTEM, OR OUR SALES PERSONNEL CHANNELS. IF CHANGES OR SPECIAL VERSIONS ARE INVOLVED, THEY MUST BE STAMPED WITH A QUALITY SEAL AND MARKED WITH A SPECIAL VERSION NUMBER TO BE VALID.