



## SSCV5N500GT8

### N-Channel Enhancement Mode Power MOSFET

#### ➤ Features

| $V_{DS}$ | $V_{GS}$  | $R_{DS(ON)}$ Typ. | $I_D$ |
|----------|-----------|-------------------|-------|
| 500V     | $\pm 30V$ | $1.4\Omega @ 10V$ | 5A    |

#### ➤ Description

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

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

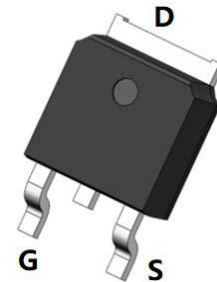
#### ➤ Applications

- Load Switch
- PWM Application
- Power Management

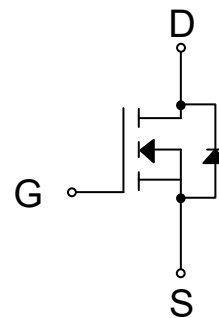
#### ➤ Ordering Information

| Device       | Package | Shipping  |
|--------------|---------|-----------|
| SSCV5N500GT8 | TO252   | 2500/Reel |

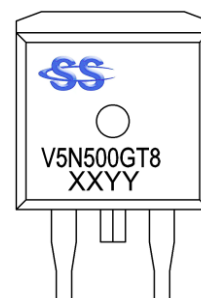
#### ➤ Pin Configuration



**TO252 (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               |
|-----------------|---------------------------------------------|---------------------------|--------------------|
| $V_{DSS}$       | Drain-to-Source Voltage                     | 650                       | V                  |
| $V_{GSS}$       | Gate-to-Source Voltage                      | $\pm 30$                  | V                  |
| $I_D$           | Continuous Drain Current                    | $T_J=25^{\circ}\text{C}$  | A                  |
|                 |                                             | $T_J=100^{\circ}\text{C}$ |                    |
| $I_{DM}$        | Pulsed Drain Current <sup>a</sup>           | 20                        | A                  |
| $E_{AS}$        | Single Pulsed Avalanche Energy              | 137                       | mJ                 |
| $P_D$           | Power Dissipation, $T_J=25^{\circ}\text{C}$ | 83                        | 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> | 33      | $^{\circ}\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case                 | 1.5     |                             |

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> = 250μA                                  | 2    | 3    | 4    | V    |
| Drain-Source On-Resistance                               | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A                                                |      | 1.4  | 1.81 | Ω    |
| Input Capacitance                                        | C <sub>ISS</sub>     | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V,<br>f = 1MHz                                    |      | 615  |      | pF   |
| Output Capacitance                                       | C <sub>OSS</sub>     |                                                                                             |      | 67   |      |      |
| Reverse Transfer Capacitance                             | C <sub>RSS</sub>     |                                                                                             |      | 10   |      |      |
| Total Gate Charge                                        | Q <sub>G</sub>       | V <sub>GS</sub> = 0 to 10V, V <sub>DS</sub> = 250V,<br>I <sub>D</sub> = 2A                  |      | 14   |      | nC   |
| Gate to Source Charge                                    | Q <sub>GS</sub>      |                                                                                             |      | 3.3  |      |      |
| Gate to Drain Charge                                     | Q <sub>GD</sub>      |                                                                                             |      | 4    |      |      |
| Turn-on Delay Time                                       | T <sub>D(ON)</sub>   | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 240V,<br>I <sub>D</sub> = 2A, R <sub>G</sub> = 24Ω |      | 12   |      | ns   |
| Rise Time                                                | T <sub>r</sub>       |                                                                                             |      | 17   |      |      |
| Turn-off Delay Time                                      | T <sub>D(OFF)</sub>  |                                                                                             |      | 45   |      |      |
| Fall Time                                                | T <sub>f</sub>       |                                                                                             |      | 25   |      |      |
| Maximum Continuous Drain to Source Diode Forward Current | I <sub>S</sub>       |                                                                                             |      |      | 5    | A    |
| Maximum Pulsed Drain to Source Diode Forward Current     | I <sub>SM</sub>      |                                                                                             |      |      | 20   | A    |
| Drain to Source Diode Forward Voltage                    | V <sub>SD</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> = 5A                                                   |      |      | 1.2  | V    |
| Body Diode Reverse Recovery Time                         | T <sub>rr</sub>      | I <sub>F</sub> = 5A, di/dt = 100A/us                                                        |      | 340  |      | ns   |
| Body Diode Reverse Recovery Charge                       | Q <sub>rr</sub>      |                                                                                             |      | 2.9  |      | μC   |



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

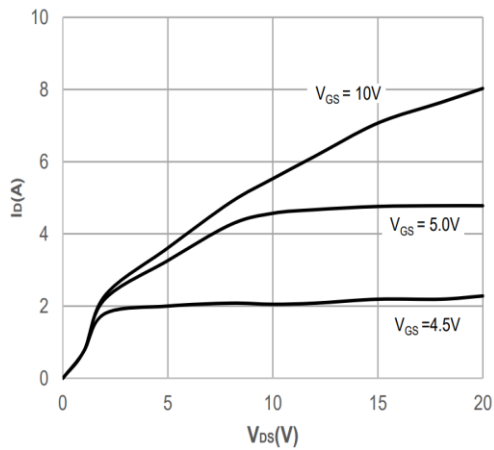


Figure 1: Output Characteristics

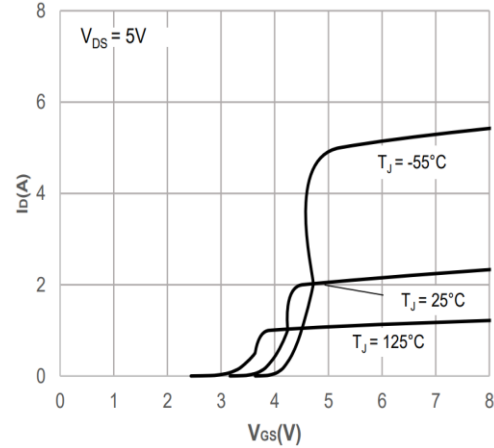


Figure 2: Typical Transfer Characteristics

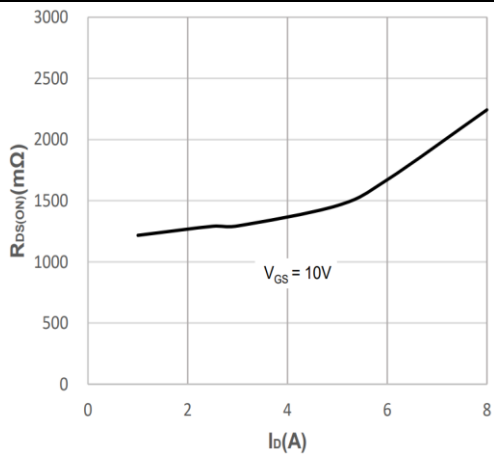


Figure 3: On-resistance vs. Drain Current

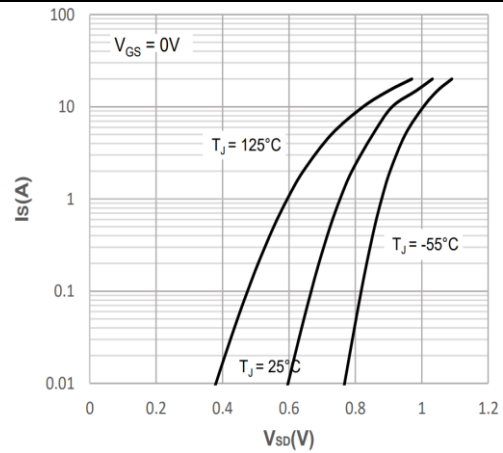


Figure 4: Body Diode Characteristics

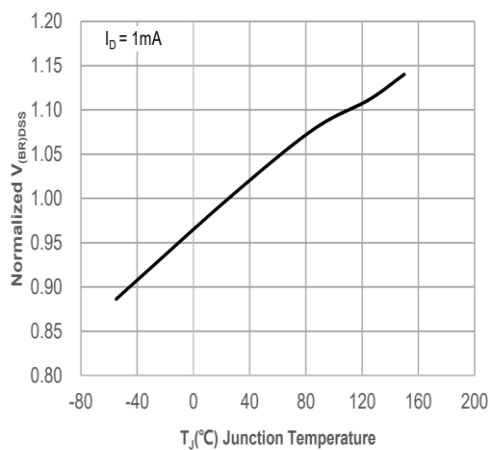


Figure 5: Normalized Breakdown voltage vs. Junction Temperature

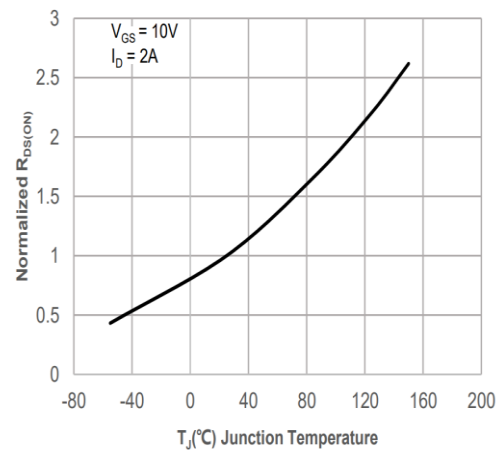
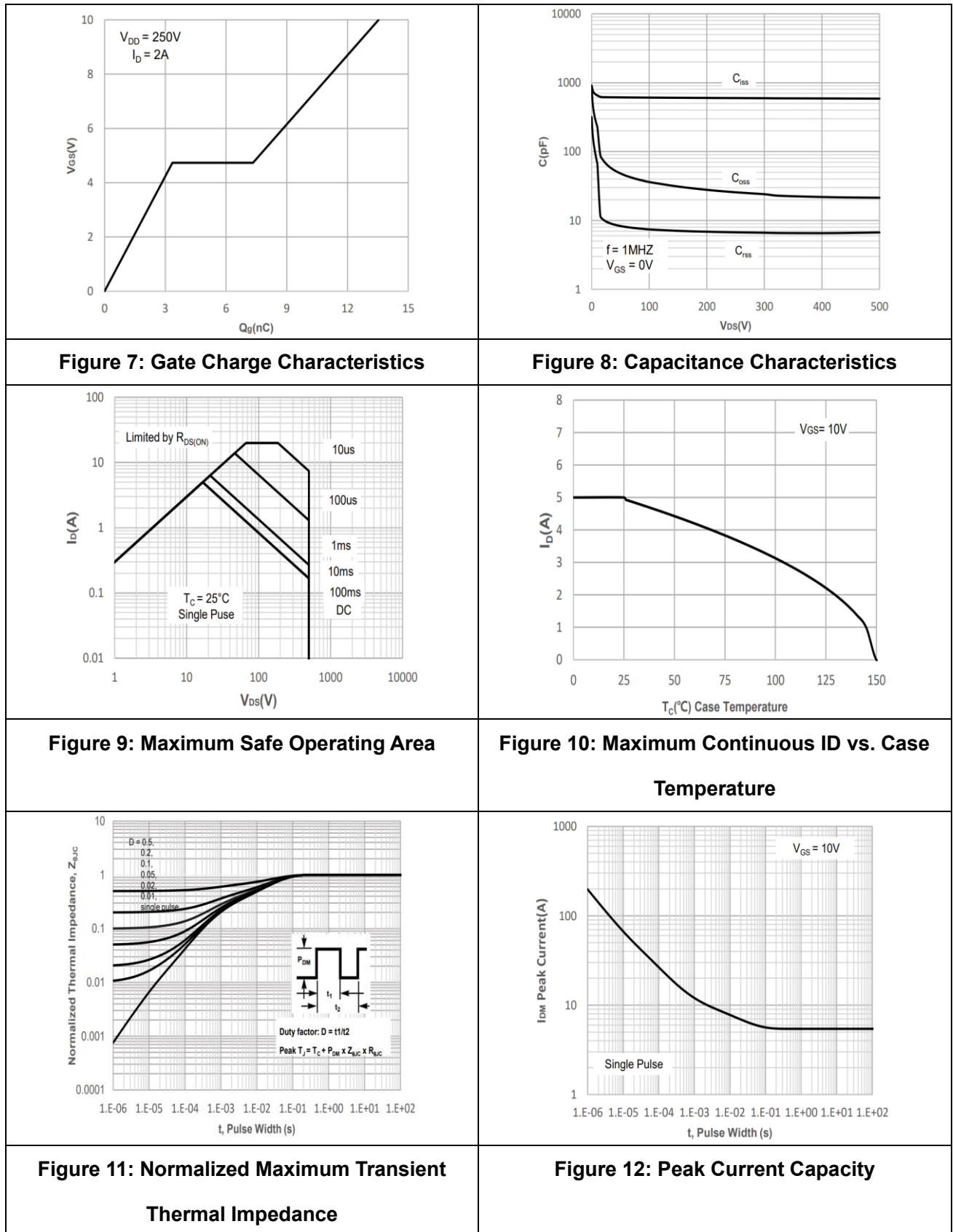


Figure 6: Normalized on Resistance vs. Junction Temperature

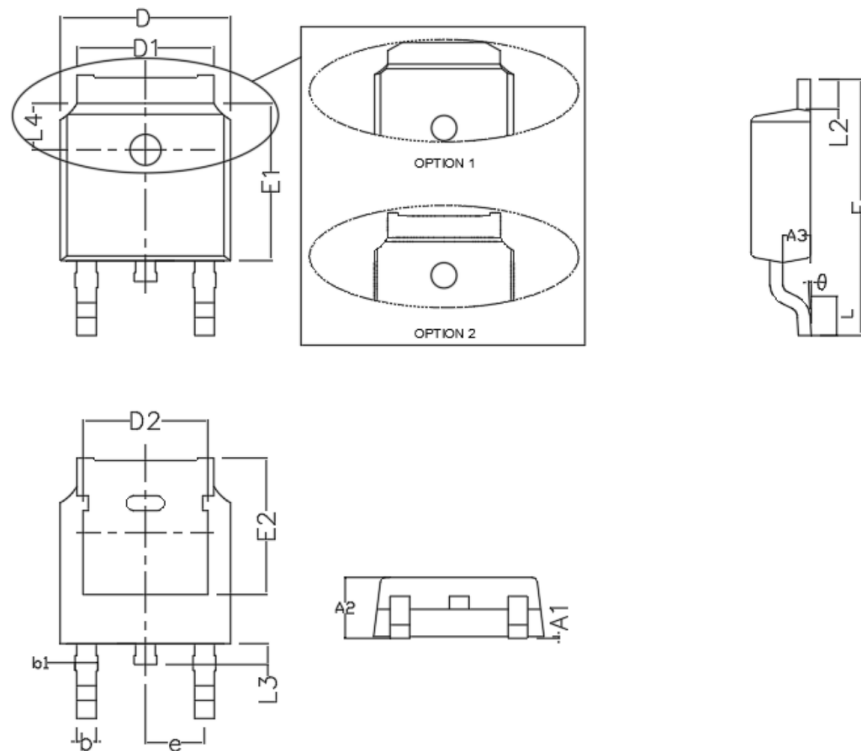


## ➤ Typical Performance Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise noted)



## ➤ 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 |        |             |       |       |



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