

## N-channel Small Switching MOSFET

### Features

| VDS | VGS  | RDSon TYP | ID    | ESD |
|-----|------|-----------|-------|-----|
| 60V | ±20V | 2R@10V    | 200mA | 3kV |
|     |      | 3R@4V5    |       |     |

### General Description

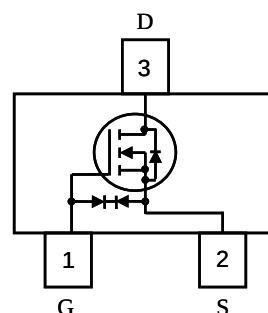
This device is an N-Channel enhancement mode MOSFET, with low on-resistance, fast switching speed and low threshold voltage (2V), it is ideal for portable equipment.

### Applications

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers,
- Display, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

### Pin Configuration

Top View



### Package Information

| Package:SOT523 |      |      |      |
|----------------|------|------|------|
| Unit:mm        |      |      |      |
| Dim            | Min  | Typ  | Max  |
| A              | 0.15 | 0.22 | 0.30 |
| B              | 0.75 | 0.80 | 0.85 |
| C              | 1.45 | 1.60 | 1.75 |
| D              | --   | 0.50 | --   |
| G              | 0.90 | 1.00 | 1.10 |
| H              | 1.50 | 1.60 | 1.70 |
| J              | 0.00 | 0.05 | 0.10 |
| K              | 0.60 | 0.75 | 0.80 |
| L              | 0.10 | 0.22 | 0.30 |
| M              | 0.10 | 0.12 | 0.20 |
| N              | 0.45 | 0.50 | 0.65 |



# SSC8160GS8

## ● Absolute Maximum Ratings @ TA = 25°C unless otherwise specified

| Parameter                         |              | Symbol     | Ratings    | Unit |
|-----------------------------------|--------------|------------|------------|------|
| Drain-source voltage              |              | $V_{DSS}$  | 60         | V    |
| Gate-source voltage               |              | $V_{GSS}$  | $\pm 20$   | V    |
| Drain current                     | - Continuous | $I_D$      | 200        | mA   |
|                                   | - Pulse      | $I_{DM}$   | 800        |      |
| Total power dissipation (Tc=25°C) |              | $P_D^{*1}$ | 175        | mW   |
| Channel temperature               |              | $T_{CH}$   | -55 ~ +150 | °C   |
| Storage temperature               |              | $T_{STG}$  | -55 ~ +150 | °C   |

Note1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inches. The rating is for each chip in the package.

## ● Electrical Characteristics @ TA = 25°C unless otherwise specified

| Parameter                        | Symbol               | Test Conditions                                                                                                       | Min | Typ | Max | Unit |
|----------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------|-----|-----|-----|------|
| OFF CHARACTERISTICS              |                      |                                                                                                                       |     |     |     |      |
| Drain-Source Breakdown Voltage   | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =10uA                                                                            | 60  | --  | --  | V    |
| Drain Cut-off Current            | I <sub>DSS</sub>     | V <sub>DS</sub> = 60 V , V <sub>GS</sub> = 0V                                                                         | --  | --  | 1   | uA   |
| Gate-Source Leakage Current      | I <sub>GSS</sub>     | V <sub>GS</sub> =±20 V , V <sub>DS</sub> = 0V                                                                         | --  | --  | ±10 | uA   |
| ON CHARACTERISTICS               |                      |                                                                                                                       |     |     |     |      |
| Gate Threshold Voltage           | V <sub>GS(TH)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA                                                            | 1   | --  | 2.5 | V    |
| Drain-Source On-state Resistance | R <sub>DS(ON)</sub>  | I <sub>D</sub> = 500mA , V <sub>GS</sub> =10V                                                                         | --  | 2   | 6.6 | R    |
|                                  |                      | I <sub>D</sub> = 50mA , V <sub>GS</sub> = 4.5V                                                                        | --  | 3   | 8.0 |      |
| Forward Transconductance         | G <sub>FS</sub>      | V <sub>DS</sub> = 10V, I <sub>D</sub> = 200mA                                                                         | 80  | --  | --  | ms   |
| Body Diode Forward Voltage       | V <sub>SD</sub>      | I <sub>S</sub> = 200 mA, V <sub>GS</sub> = 0 V                                                                        |     |     | 1.3 | V    |
| DYNAMIC CHARACTERISTICS          |                      |                                                                                                                       |     |     |     |      |
| Input Capacitance                | C <sub>ISS</sub>     | V <sub>DS</sub> = 25V , V <sub>GS</sub> = 0V<br>F= 1 MHz                                                              | --  | 32  | --  | pF   |
| Output Capacitance               | C <sub>OSS</sub>     |                                                                                                                       | --  | 7   | --  |      |
| Feedback Capacitance             | C <sub>RSS</sub>     |                                                                                                                       | --  | 3   | --  |      |
| SWITCHING CHARACTERISTICS        |                      |                                                                                                                       |     |     |     |      |
| Turn-on Delay Time               | T <sub>D (ON)</sub>  | V <sub>GS</sub> = 5V , I <sub>D</sub> = 10mA<br>V <sub>DD</sub> = 5V, R <sub>L</sub> = 500R,<br>R <sub>GS</sub> = 10R | --  | 15  | --  | ns   |
| Rise Time                        | T <sub>R</sub>       |                                                                                                                       | --  | 35  | --  |      |
| Turn-off Delay Time              | T <sub>D(OFF)</sub>  |                                                                                                                       | --  | 35  | --  |      |
| Fall Time                        | T <sub>F</sub>       |                                                                                                                       | --  | 35  | --  |      |

Note 2. Short duration test pulse used to minimize self-heating effect.

## Typical Performance Characteristics

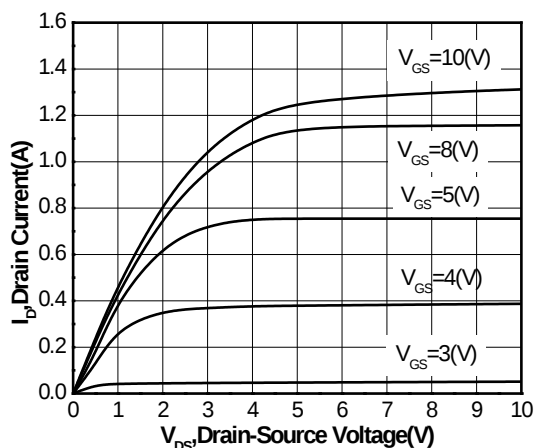


Figure1. Output Characteristics

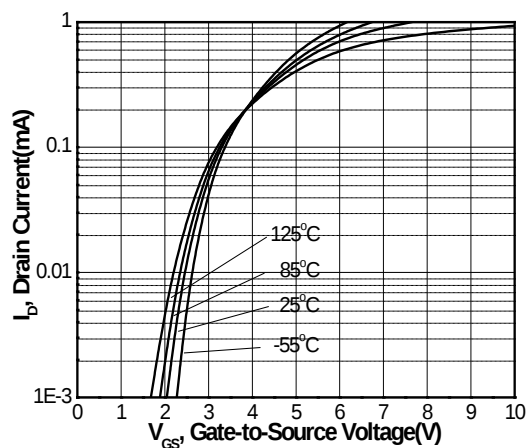


Figure 2. Transfer Characteristics

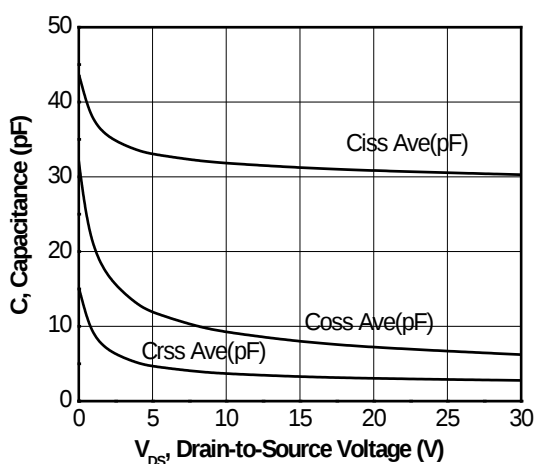


Figure 3. Capacitance

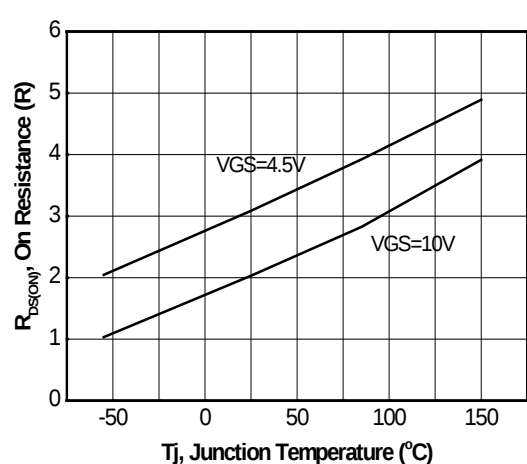


Figure 4. On Resistance Vs. Temperature

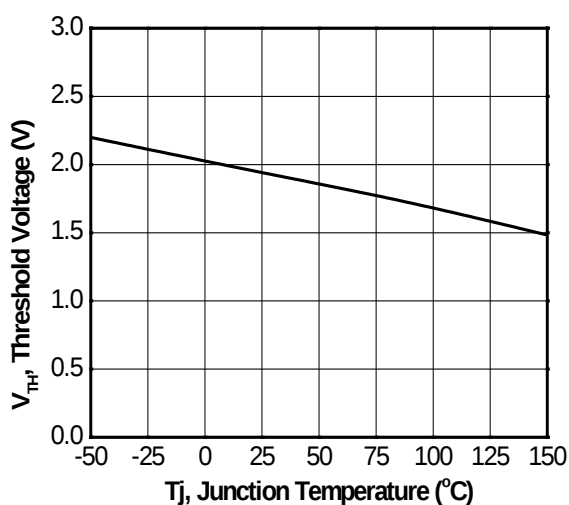


Figure 5. Gate Threshold Vs. Temperature

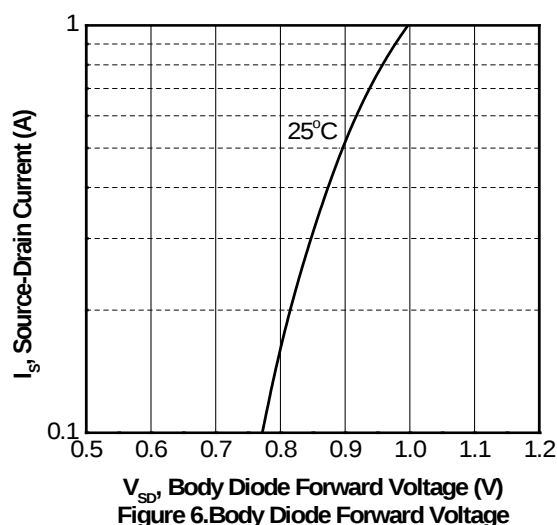


Figure 6. Body Diode Forward Voltage



# SSC8160GS8

---

## DISCLAIMER

AFSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. AFSEMI 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.