



## SSC7002KGS8

### N-Channel Small Switching MOSFET with ESD Protection

#### ➤ Features

| V <sub>DS</sub> | V <sub>GS</sub> | R <sub>DS(ON)</sub> Typ. | I <sub>D</sub> | ESD |
|-----------------|-----------------|--------------------------|----------------|-----|
| 60V             | ±20V            | 2Ω@10V                   | 0.3A           | 1kV |
|                 |                 | 3Ω@4V5                   |                |     |

#### ➤ Description

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

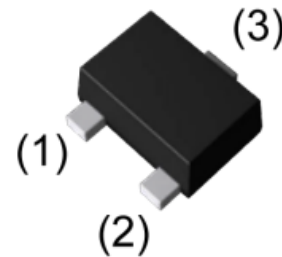
#### ➤ Applications

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

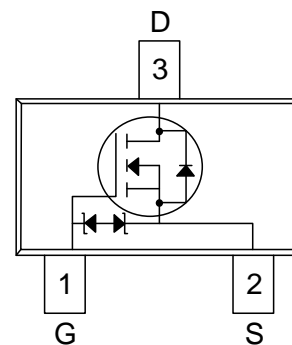
#### ➤ Ordering Information

| Device      | Package | Shipping  |
|-------------|---------|-----------|
| SSC7002KGS8 | SOT-523 | 3000/Reel |

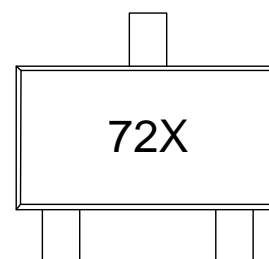
#### ➤ Pin configuration



**SOT-523**



**Pin Configuration (Top View)**



**Marking**



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

| Symbol    | Parameter                             | Ratings  | Unit               |
|-----------|---------------------------------------|----------|--------------------|
| $V_{DSS}$ | Drain-to-Source Voltage               | 60       | V                  |
| $V_{GSS}$ | Gate-to-Source Voltage                | $\pm 20$ | V                  |
| $I_D$     | Continuous Drain Current <sup>a</sup> | 0.3      | A                  |
| $I_{DM}$  | Pulsed Drain Current <sup>b</sup>     | 0.9      | A                  |
| $P_D$     | Power Dissipation <sup>c</sup>        | 0.6      | W                  |
| $T_J$     | Operation junction temperature        | -55~150  | $^{\circ}\text{C}$ |
| $T_{STG}$ | Storage temperature range             | -55~150  | $^{\circ}\text{C}$ |

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

| Symbol          | Parameter   | Maximum | Unit                        |
|-----------------|---|---------|-----------------------------|
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance <sup>a</sup> | 200     | $^{\circ}\text{C}/\text{W}$ |

Note:

- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz.copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user is specific board design. The power dissipation is based on the  $t \leq 10\text{s}$  thermal resistance rating.
- Repetitive rating, pulse width limited by junction temperature.
- The power dissipation  $P_D$  is based on  $T_{J(\text{MAX})}=150^{\circ}\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

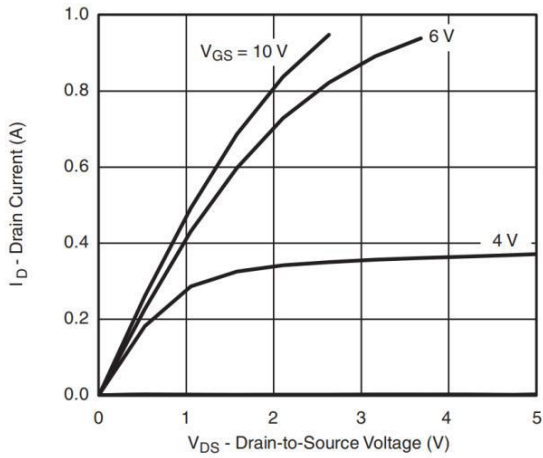


➤ **Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

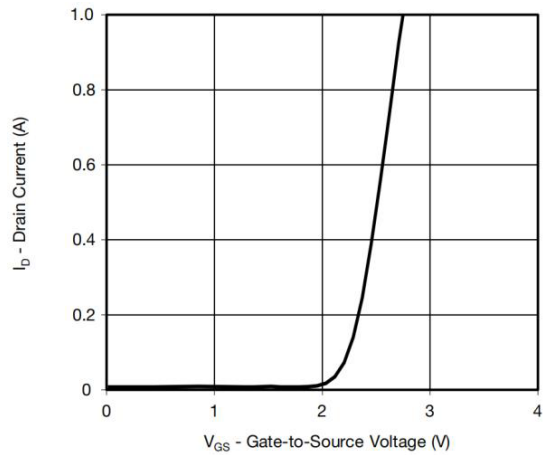
| Parameter                       | Symbol               | Test Conditions  | Min. | Typ. | Max. | Unit |
|---------------------------------|----------------------|--|------|------|------|------|
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA   | 60   |      |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA                                 | 1    | 1.5  | 2.1  | V    |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.2A   |      | 2    | 6    | Ω    |
|                                 |                      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.1A  |      | 3    | 8    |      |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V  |      |      | 1    | μA   |
| Gate-Source Leak Current        | I <sub>GSS</sub>     | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V   |      |      | ±10  | μA   |
| Transconductance                | G <sub>FS</sub>      | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.2A   |      | 0.08 |      | s    |
| Forward Voltage                 | V <sub>SD</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> = 0.2A  |      | 0.7  | 1.3  | V    |
| Input Capacitance               | C <sub>ISS</sub>     | V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V,<br>f = 1MHz                                   |      | 30   |      | pF   |
| Output Capacitance              | C <sub>OSS</sub>     |  |      | 12   |      |      |
| Reverse Transfer Capacitance    | C <sub>RSS</sub>     |  |      | 4.8  |      |      |
| Turn-on Delay Time              | T <sub>D(ON)</sub>   | V <sub>GS</sub> = 10V, R <sub>L</sub> = 60Ω<br>V <sub>DS</sub> = 20V, R <sub>G</sub> = 20Ω |      | 4.6  |      | ns   |
| Rise Time                       | T <sub>r</sub>       |  |      | 4.1  |      |      |
| Turn-off Delay Time             | T <sub>D(OFF)</sub>  |  |      | 24   |      |      |
| Fall Time                       | T <sub>f</sub>       |  |      | 18   |      |      |
| Total Gate Charge               | Q <sub>G</sub>       | V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V,<br>I <sub>D</sub> = 0.2A                     |      | 0.4  |      | nC   |
| Gate to Source Charge           | Q <sub>GS</sub>      |  |      | 0.1  |      |      |
| Gate to Drain Charge            | Q <sub>GD</sub>      |  |      | 0.11 |      |      |



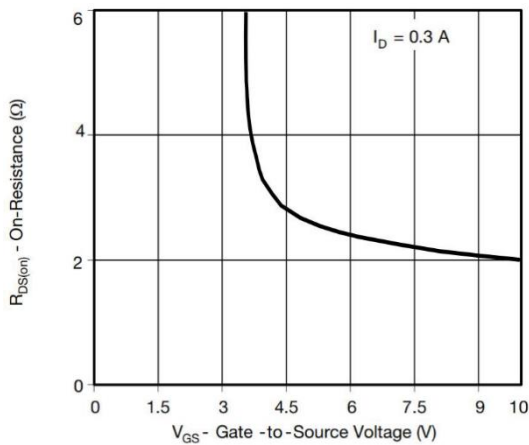
➤ **Typical Performance Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**



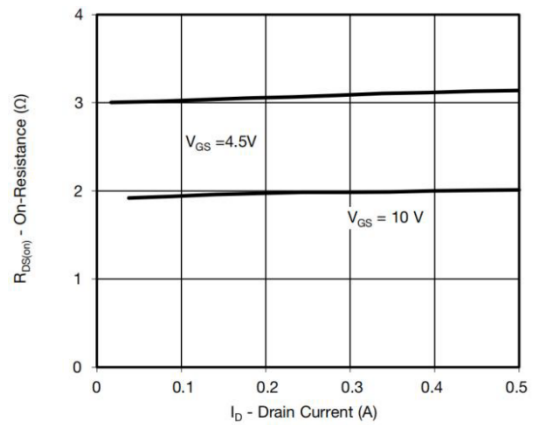
**Output Characteristics**



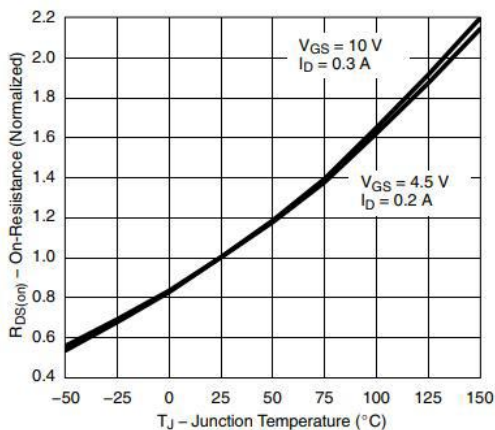
**Transfer Characteristics**



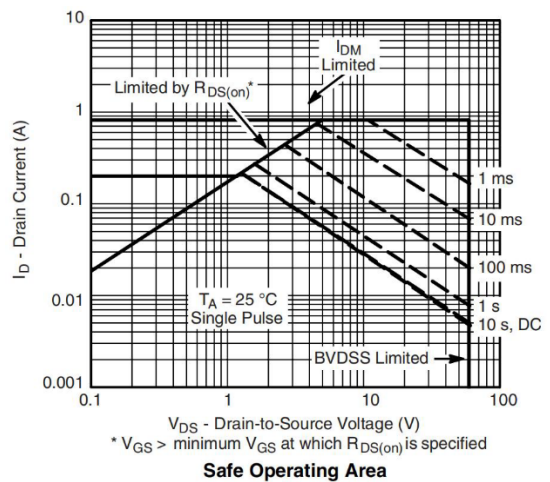
**On-Resistance vs. Gate-to-Source Voltage**



**On-Resistance vs. Drain Current**



**On-Resistance vs. Junction Temperature**

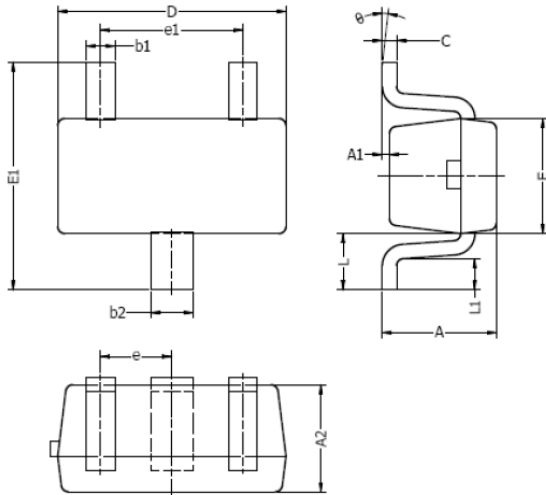


**Safe Operating Area**

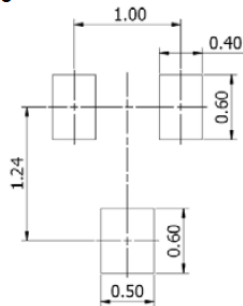


## ➤ Package Information

### SOT-523



Typical Soldering Pattern:



| DIM | MILLIMETERS |      | INCHES     |       |
|-----|-------------|------|------------|-------|
|     | MIN         | MAX  | MIN        | MAX   |
| A   | 0.70        | 0.90 | 0.028      | 0.035 |
| A1  | 0.00        | 0.10 | 0.000      | 0.004 |
| A2  | 0.70        | 0.80 | 0.028      | 0.031 |
| b1  | 0.15        | 0.25 | 0.006      | 0.010 |
| b2  | 0.25        | 0.35 | 0.010      | 0.014 |
| c   | 0.10        | 0.20 | 0.004      | 0.008 |
| D   | 1.50        | 1.70 | 0.059      | 0.067 |
| E   | 0.70        | 0.90 | 0.028      | 0.035 |
| E1  | 1.45        | 1.75 | 0.057      | 0.069 |
| e   | 0.50 TYP.   |      | 0.020 TYP. |       |
| e1  | 0.90        | 1.10 | 0.035      | 0.043 |
| L   | 0.40 REF.   |      | 0.016 REF. |       |
| L1  | 0.10        | 0.30 | 0.004      | 0.012 |
| ϕ   | 0°          | 8°   | 0°         | 8°    |

**NOTES:**

1. Above package outline conforms to JEITA EAIJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.



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