



## SSC8164GS6

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

#### ➤ Features

| $V_{DS}$ | $V_{GS}$  | $R_{DS(ON)}$ Typ.  | $I_D$ | ESD  |
|----------|-----------|--------------------|-------|------|
| 60V      | $\pm 20V$ | 1.1 $\Omega$ @10V  | 0.5A  | 500V |
|          |           | 1.5 $\Omega$ @4.5V |       |      |

#### ➤ Description

This device is an N-Channel enhancement mode MOSFET which is produced with high cell density and DMOS trench technology. This device particularly suits low voltage applications, especially for battery powered circuits, the tiny and thin outline saves PCB consumption.

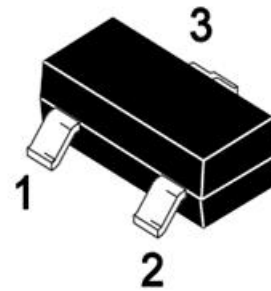
#### ➤ Applications

- Load Switch
- Portable Devices
- DCDC Conversion

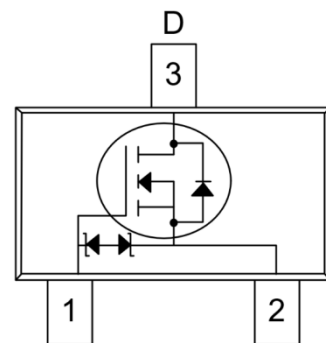
#### ➤ Ordering Information

| Device     | Package | Shipping  | MSL |
|------------|---------|-----------|-----|
| SSC8164GS6 | SOT-23  | 3000/Reel | 3   |

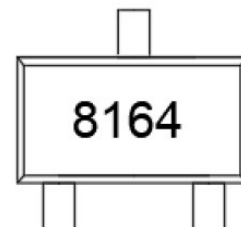
#### ➤ Pin configuration



SOT-23



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> | 0.5      | A                  |
| $I_{DM}$  | Pulsed Drain Current <sup>b</sup>     | 1        | A                  |
| $P_D$     | Power Dissipation <sup>c</sup>        | 0.85     | W                  |
| $P_{DSM}$ | Power Dissipation <sup>a</sup>        | 0.36     | 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                                           | Typical | Maximum | Unit                        |
|-----------------|-----------------------------------------------------|---------|---------|-----------------------------|
| $R_{\theta JA}$ | Junction-to-Ambient Thermal Resistance <sup>a</sup> |         | 360     | $^{\circ}\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Junction-to-Case Thermal Resistance                 |         | 155     |                             |

Note:

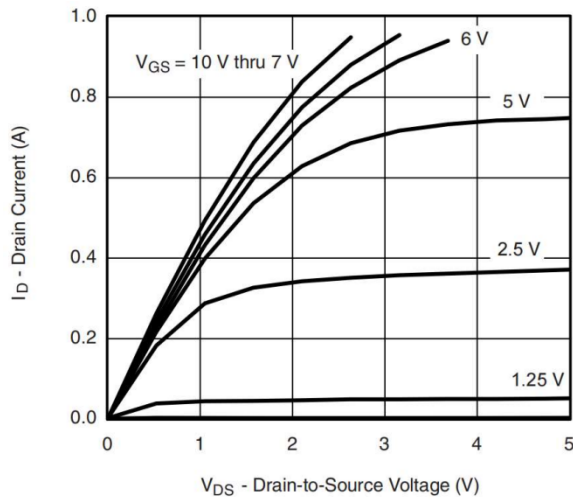
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz.copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user is specific board design. The power dissipation is based on the  $t \leq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

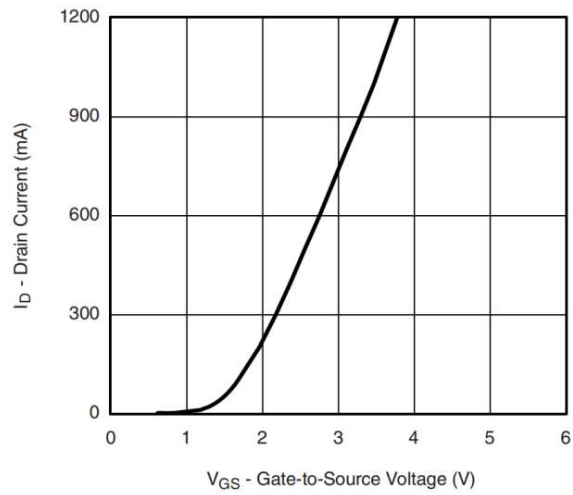
| Parameter                       | Symbol               | Test Conditions                                                         | Min. | Typ. | Max. | Unit |
|---------------------------------|----------------------|-------------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA                            | 60   |      |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA              | 0.75 | 1    | 1.25 | V    |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5A                            |      | 1.1  | 2.5  | Ω    |
|                                 |                      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.5A                           |      | 1.5  | 3.5  |      |
|                                 |                      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.1A                           |      | 1.7  | 4    |      |
| 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> = ±15V, V <sub>DS</sub> = 0V                            |      |      | ±10  | μA   |
| Transconductance                | G <sub>FS</sub>      | V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.2A                            |      | 0.1  |      | S    |
| Forward Voltage                 | V <sub>SD</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> = 0.2A                             |      |      | 1.3  | V    |
| Input Capacitance               | C <sub>ISS</sub>     | V <sub>DS</sub> = 25V,<br>V <sub>GS</sub> = 0V, f = 1MHz                |      | 30   |      | pF   |
| Output Capacitance              | C <sub>OSS</sub>     |                                                                         |      | 6    |      |      |
| Reverse Transfer Capacitance    | C <sub>RSS</sub>     |                                                                         |      | 2.9  |      |      |
| Turn-on Delay Time              | T <sub>D(ON)</sub>   | V <sub>GS</sub> = 10V,<br>V <sub>DS</sub> = 10V, I <sub>D</sub> = 100mA |      | 25   |      | ns   |
| Rise Time                       | Tr                   |                                                                         |      | 10   |      |      |
| Turn-off Delay Time             | T <sub>D(OFF)</sub>  |                                                                         |      | 35   |      |      |
| Fall Time                       | Tf                   |                                                                         |      | 20   |      |      |
| Total Gate Charge               | QG                   | V <sub>GS</sub> =10V,<br>V <sub>DS</sub> =15V, I <sub>D</sub> =0.2A     |      | 0.4  |      | nC   |
| Gate Source Charge              | QGS                  |                                                                         |      | 0.1  |      |      |
| Gate Drain Charge               | QGD                  |                                                                         |      | 0.11 |      |      |



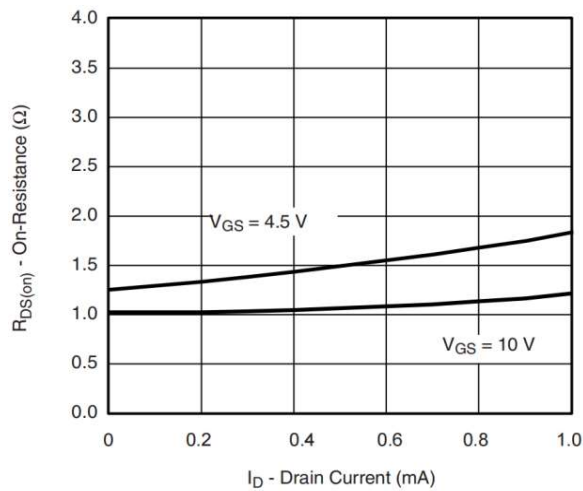
## ➤ Typical Performance Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)



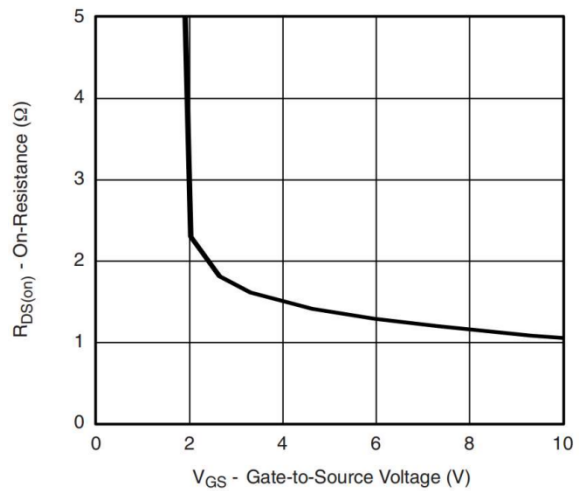
**Output Characteristics**



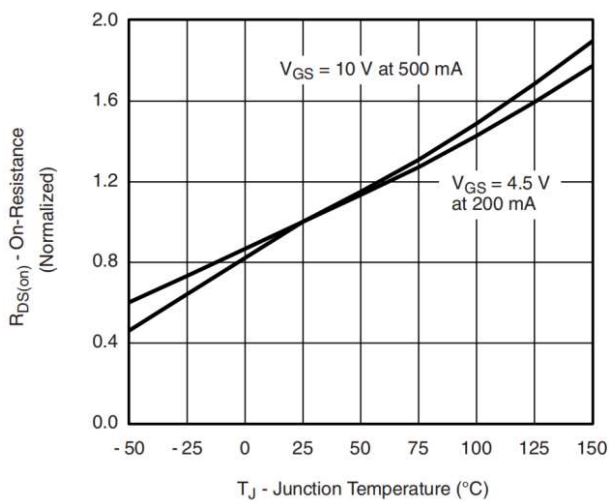
**Transfer Characteristics**



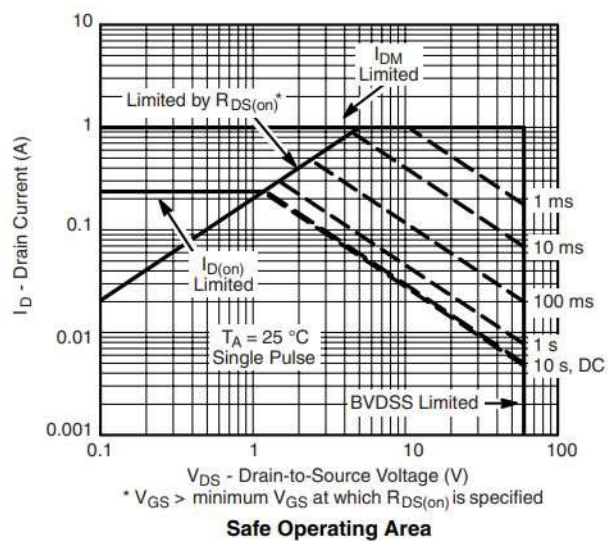
**On-Resistance vs. Drain Current**



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

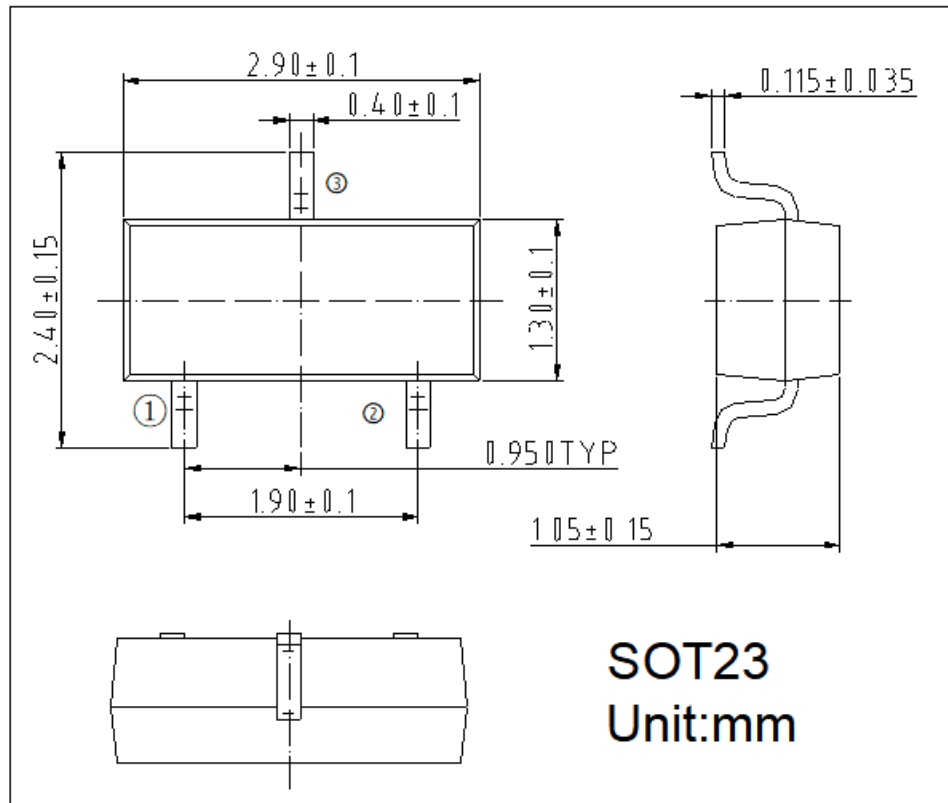


**On-Resistance vs. Junction Temperature**



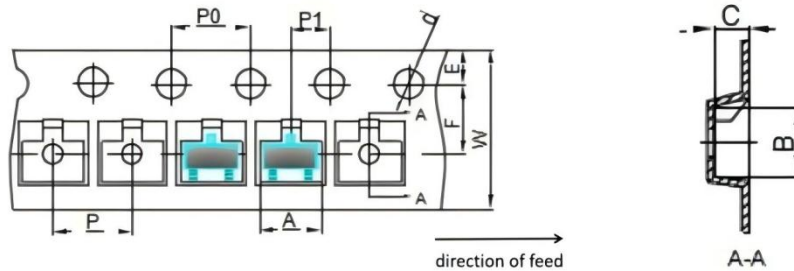
**Safe Operating Area**

## ➤ Package Information



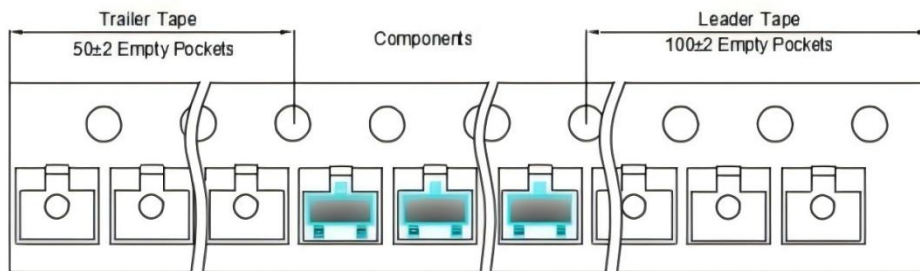
## ➤ SOT-23 Tape and reel

### SOT-23 Embossed Carrier Tape



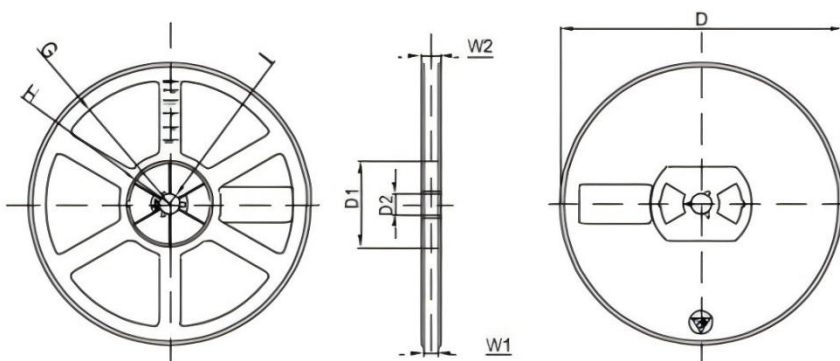
| Dimensions are in millimeter |          |          |          |       |          |          |         |         |        |       |
|------------------------------|----------|----------|----------|-------|----------|----------|---------|---------|--------|-------|
| Pkg type                     | A        | B        | C        | d     | E        | F        | P0      | P       | P1     | W     |
| SOT-23                       | 3.15±0.1 | 2.77±0.1 | 1.22±0.1 | Ø1.50 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 4.0±0.1 | 2±0.05 | 8±0.1 |

### SOT-23 Tape Leader and Trailer



SOT23 带尾(空封 40 格)、带头 (空封 100 格) 空封数

### SOT-23 Reel



| Dimensions are in millimeter |         |         |          |        |        |           |       |        |
|------------------------------|---------|---------|----------|--------|--------|-----------|-------|--------|
| Reel Option                  | D       | D1      | D2       | G      | H      | I         | W1    | W2     |
| 7"Dia                        | Ø178.00 | Ø54±0.2 | 13.3±0.2 | R79.00 | R26.00 | R6.50±0.2 | 9±0.5 | 12±0.5 |



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