



### SOT-23 Plastic-Encapsulate MOSFETS

P-Channel 8-V(D-S) MOSFET

#### FEATURE

TrenchFET Power MOSFET

#### APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter
- **Pb-Free package is available**

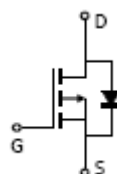
RoHS product for packing code suffix "G"

Halogen free product for packing code suffix "H"

#### SOT-23



#### MARKING: S5



#### Maximum ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                                                   | Symbol          | Value     | Unit                 |
|-------------------------------------------------------------|-----------------|-----------|----------------------|
| Drain-Source Voltage                                        | $V_{DS}$        | -8        | V                    |
| Gate-Source Voltage                                         | $V_{GS}$        | $\pm 8$   |                      |
| Continuous Drain Current                                    | $I_D$           | -4.1      | A                    |
| Continuous Source-Drain Diode Current                       | $I_S$           | -0.8      |                      |
| Maximum Power Dissipation                                   | $P_D$           | 0.35      | W                    |
| Thermal Resistance from Junction to Ambient( $t \leq 10s$ ) | $R_{\theta JA}$ | 357       | $^{\circ}\text{C/W}$ |
| Junction Temperature                                        | $T_J$           | 150       | $^{\circ}\text{C}$   |
| Storage Temperature                                         | $T_{STG}$       | -50 ~+150 |                      |

**SOT-23 Plastic-Encapsulate MOSFETS****Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

| Parameter                                     | Symbol               | Test Condition                                                                                                      | Min  | Typ  | Max   | Units |
|-----------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------|------|------|-------|-------|
| Static                                        |                      |                                                                                                                     |      |      |       |       |
| Drain-source breakdown voltage                | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                                       | -8   |      |       | V     |
| Gate-source threshold voltage                 | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                                           | -0.5 |      | -0.9  |       |
| Gate-source leakage                           | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V                                                                           |      |      | ±100  | nA    |
| Zero gate voltage drain current               | I <sub>DSS</sub>     | V <sub>DS</sub> =-8V, V <sub>GS</sub> =0V                                                                           |      |      | -1    | μA    |
| Drain-source on-state resistance <sup>a</sup> | R <sub>DS(on)</sub>  | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.5A                                                                       |      |      | 0.045 | Ω     |
|                                               |                      | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A                                                                         |      |      | 0.060 |       |
|                                               |                      | V <sub>GS</sub> =-1.8V,I <sub>D</sub> =-2.0A                                                                        |      |      | 0.090 |       |
| Forward transconductance <sup>a</sup>         | g <sub>fs</sub>      | V <sub>DS</sub> =-5V, I <sub>D</sub> =-4.1A                                                                         | 6    |      |       | S     |
| Dynamic                                       |                      |                                                                                                                     |      |      |       |       |
| Input capacitance <sup>b,c</sup>              | C <sub>iss</sub>     | V <sub>DS</sub> =-4V,V <sub>GS</sub> =0V,f =1MHz                                                                    |      | 740  |       | pF    |
| Output capacitance <sup>b,c</sup>             | C <sub>oss</sub>     |                                                                                                                     |      | 290  |       |       |
| Reverse transfer capacitance <sup>b,c</sup>   | C <sub>rss</sub>     |                                                                                                                     |      | 190  |       |       |
| Total gate charge <sup>b</sup>                | Q <sub>g</sub>       | V <sub>DS</sub> =-4V,V <sub>GS</sub> =-4.5V,<br>I <sub>D</sub> =-4.1A                                               |      | 7.8  | 15    | nC    |
|                                               |                      | V <sub>DS</sub> =-4V,V <sub>GS</sub> =-2.5V,<br>I <sub>D</sub> =-4.1A                                               |      | 4.5  | 9     |       |
| Gate-source charge <sup>b</sup>               | Q <sub>gs</sub>      |                                                                                                                     |      | 1.2  |       |       |
| Gate-drain charge <sup>b</sup>                | Q <sub>gd</sub>      |                                                                                                                     |      | 1.6  |       |       |
| Gate resistance <sup>b,c</sup>                | R <sub>g</sub>       | f =1MHz                                                                                                             | 1.4  | 7    | 14    | Ω     |
| Turn-on delay time <sup>b,c</sup>             | t <sub>d(on)</sub>   | V <sub>DD</sub> =-4V,<br>R <sub>L</sub> =1.2Ω, I <sub>D</sub> ≈-3.3A,<br>V <sub>GEN</sub> =-4.5V,R <sub>g</sub> =1Ω |      | 13   | 20    | ns    |
| Rise time <sup>b,c</sup>                      | t <sub>r</sub>       |                                                                                                                     |      | 35   | 53    |       |
| Turn-off Delay time <sup>b,c</sup>            | t <sub>d(off)</sub>  |                                                                                                                     |      | 32   | 48    |       |
| Fall time <sup>b,c</sup>                      | t <sub>f</sub>       |                                                                                                                     |      | 10   | 20    |       |
| Turn-on delay time <sup>b,c</sup>             | t <sub>d(on)</sub>   | V <sub>DD</sub> =-4V,<br>R <sub>L</sub> =1.2Ω, I <sub>D</sub> ≈-3.3A,<br>V <sub>GEN</sub> =-8V,R <sub>g</sub> =1Ω   |      | 5    | 10    |       |
| Rise time <sup>b,c</sup>                      | t <sub>r</sub>       |                                                                                                                     |      | 11   | 17    |       |
| Turn-off delay time <sup>b,c</sup>            | t <sub>d(off)</sub>  |                                                                                                                     |      | 22   | 33    |       |
| Fall time <sup>b,c</sup>                      | t <sub>f</sub>       |                                                                                                                     |      | 16   | 24    |       |
| Drain-source body diode characteristics       |                      |                                                                                                                     |      |      |       |       |
| Continuous source-drain diode current         | I <sub>S</sub>       | T <sub>C</sub> =25°C                                                                                                |      |      | -1.4  | A     |
| Pulse diode forward current <sup>a</sup>      | I <sub>SM</sub>      |                                                                                                                     |      |      | -10   |       |
| Body diode voltage                            | V <sub>SD</sub>      | I <sub>F</sub> =-3.3A                                                                                               |      | -0.8 | -1.2  | V     |

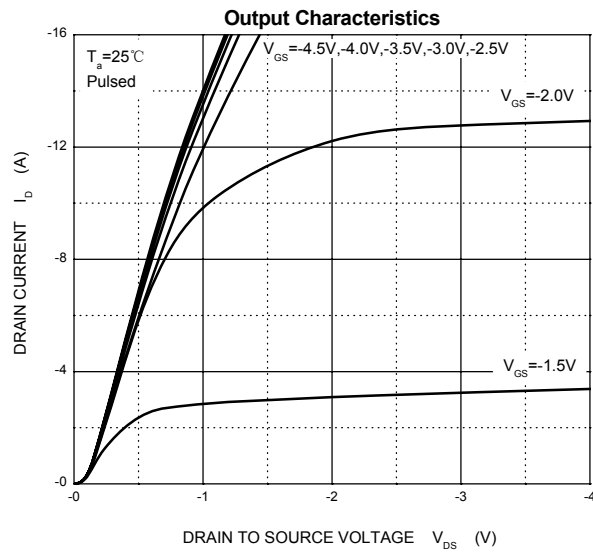
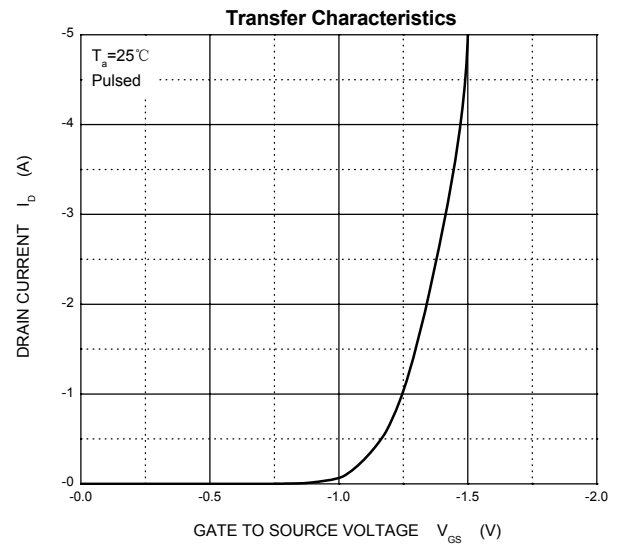
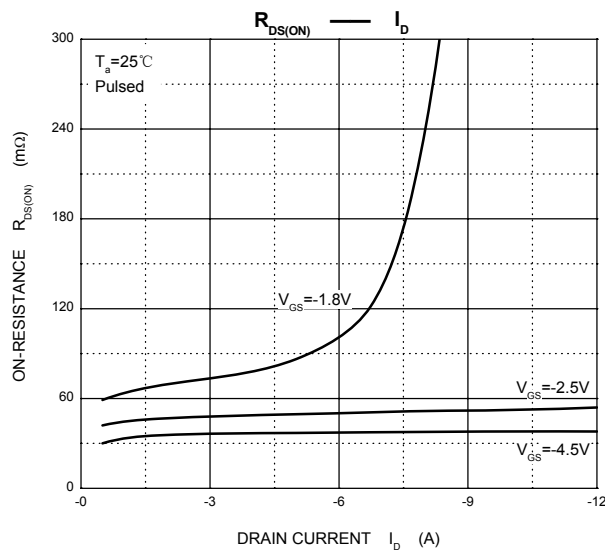
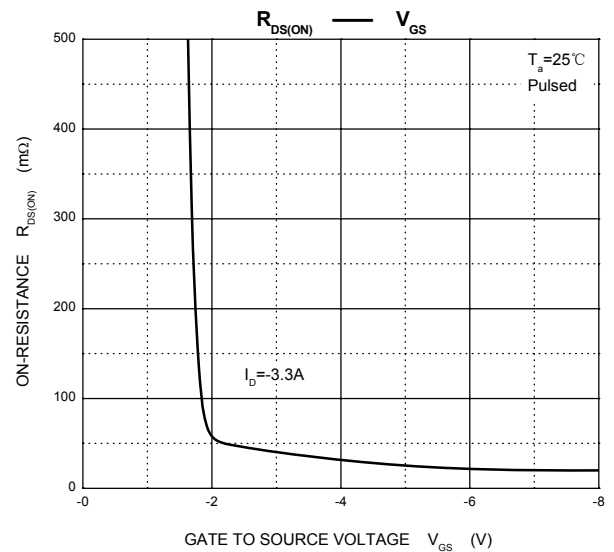
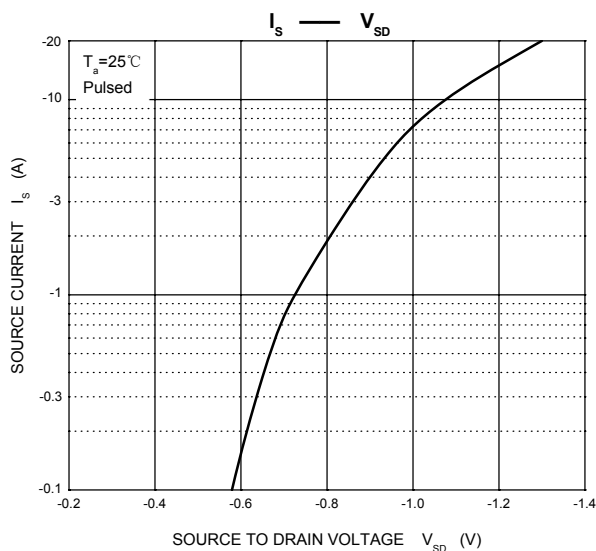
**Note :**

- a. Pulse Test ; Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.
- c. These parameters have no way to verify.



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## Typical Characteristics

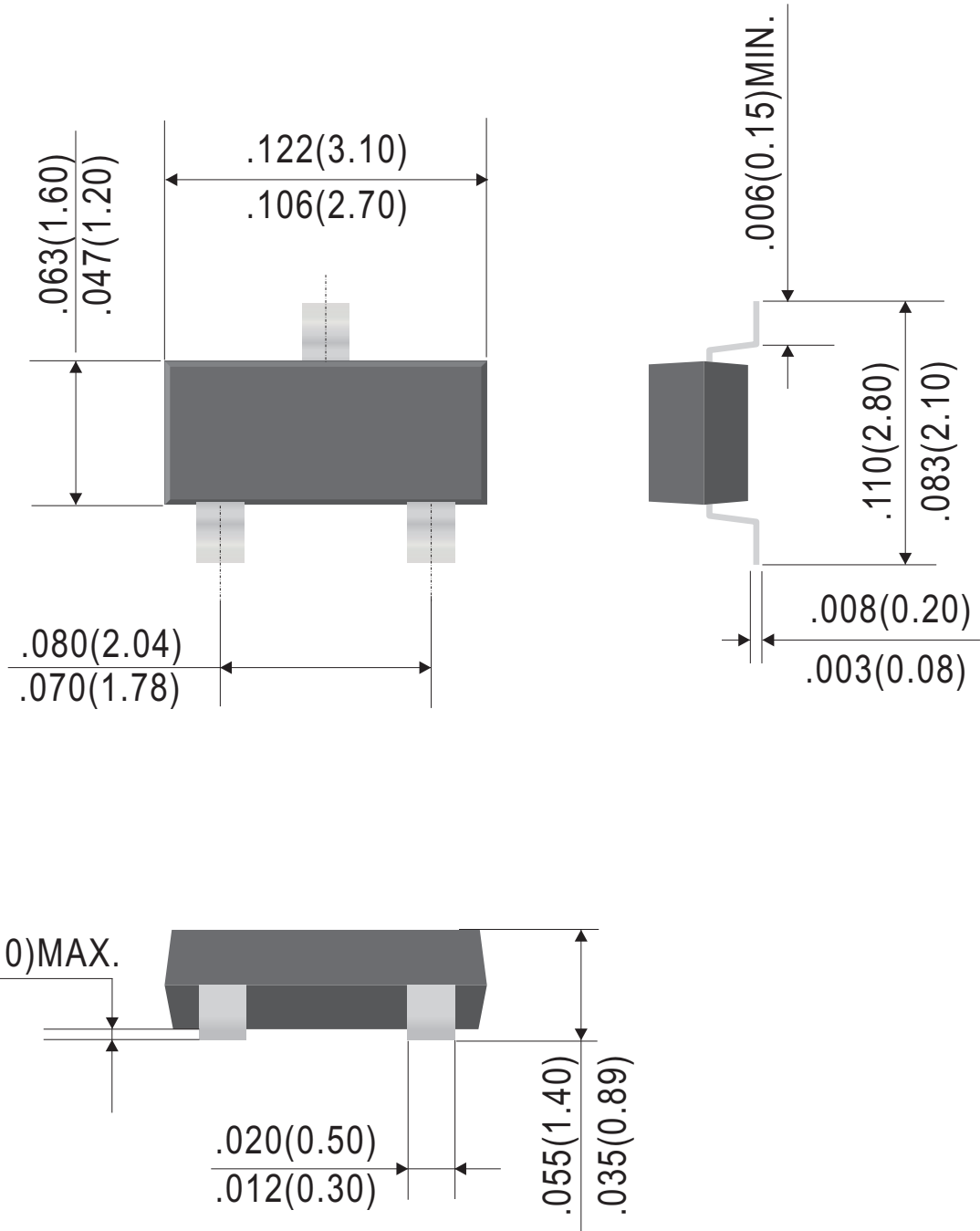




## SOT-23 Plastic-Encapsulate MOSFETS

### Outline Drawing

### SOT-23



Dimensions in inches and (millimeters)

Rev.D