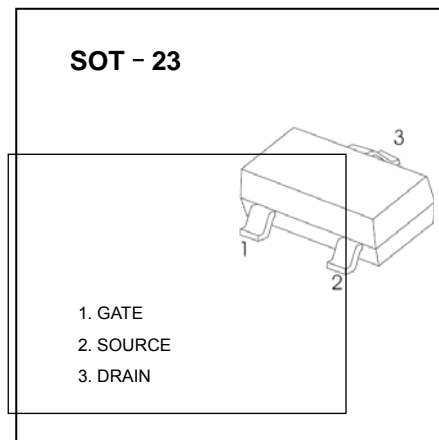


# SOT-23 Plastic-Encapsulate MOSFETS

UMW SI2302B N-Channel 20-V(D-S) MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 20V           | 80mΩ@4.5V       | 2.5A  |
|               | 100mΩ@2.5V      |       |



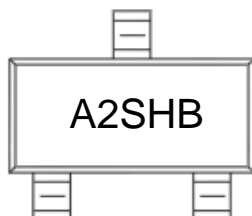
### FEATURE

- TrenchFET Power MOSFET

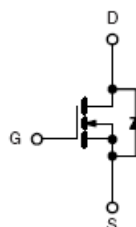
### APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

### MARKING



### Equivalent Circuit



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

| Parameter   | Symbol          | Value      | Unit          |
|---|-----------------|------------|---------------|
| Drain-Source Voltage  | $V_{DS}$        | 20         | V             |
| Gate-Source Voltage   | $V_{GS}$        | ±8         |               |
| Continuous Drain Current                                    | $I_D$           | 2.5        | A             |
| Continuous Source-Drain Current(Diode Conduction)           | $I_S$           | 0.6        |               |
| Power Dissipation   | $P_D$           | 0.4        | W             |
| Thermal Resistance from Junction to Ambient ( $t \leq 5s$ ) | $R_{\theta JA}$ | 312.5      | $^{\circ}C/W$ |
| Operating Junction  | $T_J$           | 150        | $^{\circ}C$   |
| Storage Temperature   | $T_{STG}$       | -55 ~ +150 |               |

**$T_a=25^{\circ}\text{C}$  unless otherwise specified**

| Parameter                                 | Symbol        | Test Condition   | Min  | Typ   | Max       | Units    |
|---|---------------|--|------|-------|-----------|----------|
| <b>Static</b>                             |               |  |      |       |           |          |
| Drain-source breakdown voltage            | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 10\mu A$   | 20   |       |           | V        |
| Gate-threshold voltage                    | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 50\mu A$   | 0.65 | 0.95  | 1.2       |          |
| Gate-body leakage                         | $I_{GSS}$     | $V_{DS} = 0V, V_{GS} = \pm 8V$   |      |       | $\pm 100$ | nA       |
| Zero gate voltage drain current           | $I_{DSS}$     | $V_{DS} = 20V, V_{GS} = 0V$  |      |       | 1         | $\mu A$  |
| Drain-source on-resistance <sup>a</sup>   | $r_{DS(on)}$  | $V_{GS} = 4.5V, I_D = 2.6A$  |      | 0.045 | 0.070     | $\Omega$ |
|   |               | $V_{GS} = 2.5V, I_D = 2.1A$  |      | 0.060 | 0.100     |          |
| Forward transconductance <sup>a</sup>     | $g_{fs}$      | $V_{DS} = 5V, I_D = 3.6A$  |      | 8     |           | S        |
| Diode forward voltage                     | $V_{SD}$      | $I_S = 0.94A, V_{GS} = 0V$   |      | 0.76  | 1.2       | V        |
| <b>Dynamic</b>                            |               |  |      |       |           |          |
| Total gate charge                         | $Q_g$         | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3.6A$  |      | 4.0   | 10        | nC       |
| Gate-source charge                        | $Q_{gs}$      |  |      | 0.65  |           |          |
| Gate-drain charge                         | $Q_{gd}$      |  |      | 1.5   |           |          |
| Input capacitance <sup>b</sup>            | $C_{iss}$     | $V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$  |      | 300   |           | pF       |
| Output capacitance <sup>b</sup>           | $C_{oss}$     |  |      | 120   |           |          |
| Reverse transfer capacitance <sup>b</sup> | $C_{rss}$     |  |      | 80    |           |          |
| <b>Switching<sup>b</sup></b>              |               |  |      |       |           |          |
| Turn-on delay time                        | $t_{d(on)}$   | $V_{DD} = 10V,$<br>$R_L = 5.5\Omega, I_D \approx 3.6A,$<br>$V_{GEN} = 4.5V, R_g = 6\Omega$ |      | 7     | 15        | ns       |
| Rise time                                 | $t_r$         |  |      | 55    | 80        |          |
| Turn-off delay time                       | $t_{d(off)}$  |  |      | 16    | 60        |          |
| Fall time                                 | $t_f$         |  |      | 10    | 25        |          |

**Notes :**

- Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- These parameters have no way to verify.