

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 20V           | 28mΩ@4.5V       | 3.5A  |
|               | 33mΩ@2.5V       |       |

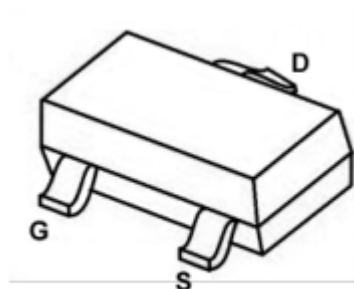
## Feature

- TrenchFET Power MOSFET
- Excellent  $R_{DS(on)}$  and Low Gate Charge

## Applications

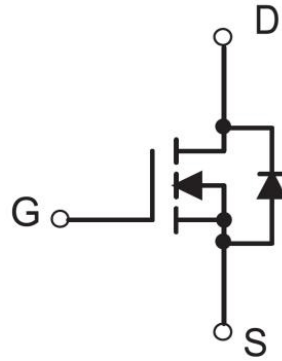
- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

## Package

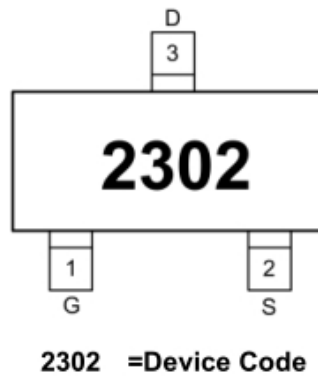


**SOT-23**

## Circuit diagram



## Marking



## Absolute maximum ratings

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

| Parameter                                         | Symbol          | Value     | Unit                        |
|---------------------------------------------------|-----------------|-----------|-----------------------------|
| Drain-Source Voltage                              | $V_{DS}$        | 20        | V                           |
| Gate-Source Voltage                               | $V_{GS}$        | $\pm 8$   | V                           |
| Continuous Drain Current                          | $I_D$           | 3.5       | A                           |
| Plused Drain Current                              | $I_{DM}$        | 14        | A                           |
| Continuous Source-Drain Current(Diode Conduction) | $I_S$           | 0.6       | A                           |
| Power Dissipation                                 | $P_D$           | 0.35      | W                           |
| Thermal Resistance from Junction to Ambient       | $R_{\theta JA}$ | 357       | $^{\circ}\text{C}/\text{W}$ |
| Junction Temperature                              | $T_J$           | 150       | $^{\circ}\text{C}$          |
| Storage Temperature                               | $T_{STG}$       | -55~ +150 | $^{\circ}\text{C}$          |

## Electrical characteristics

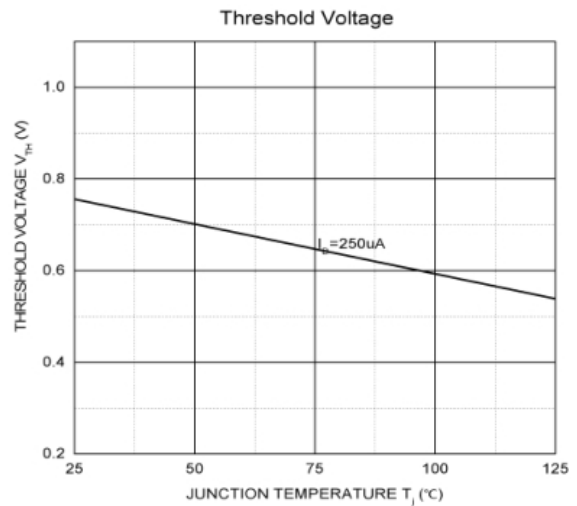
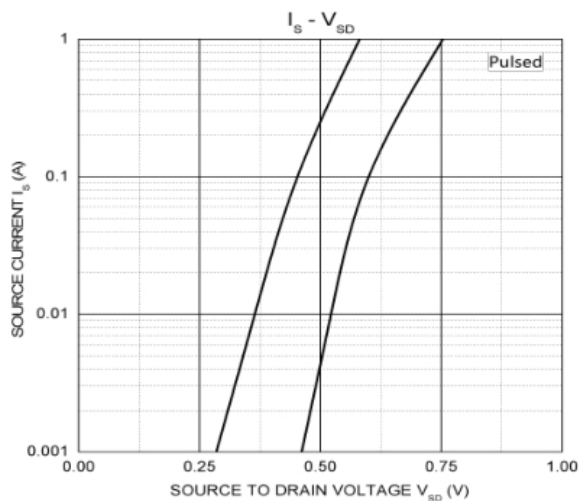
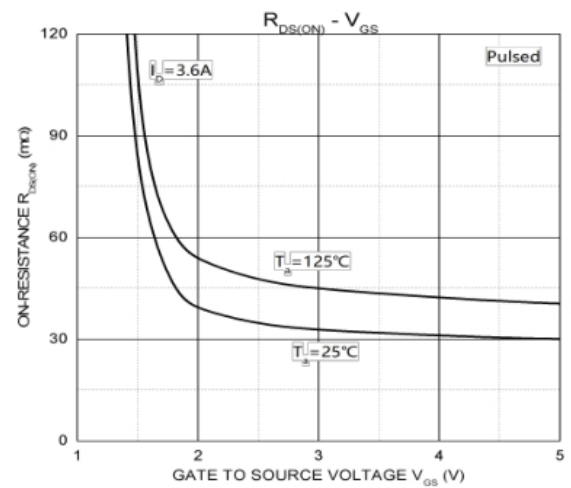
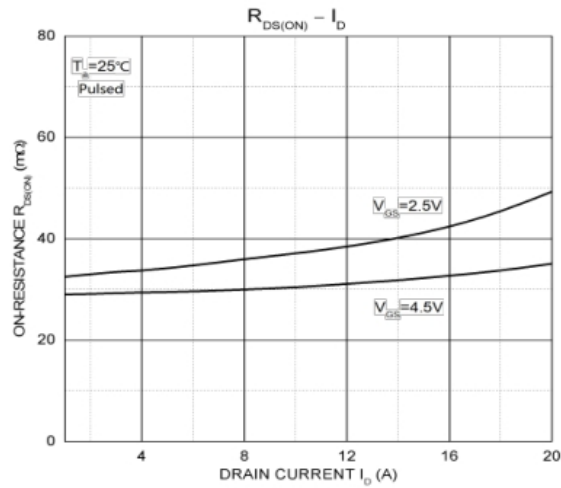
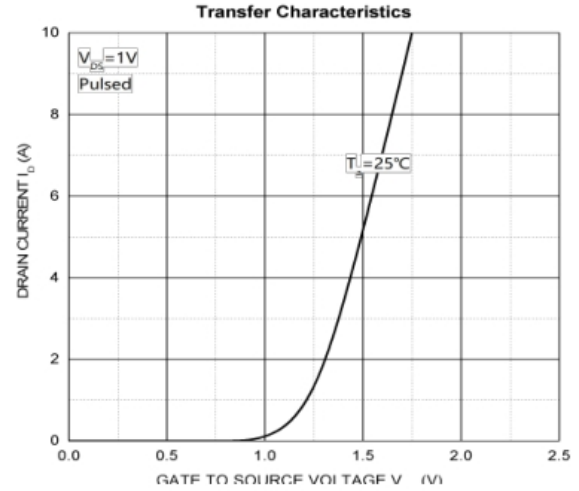
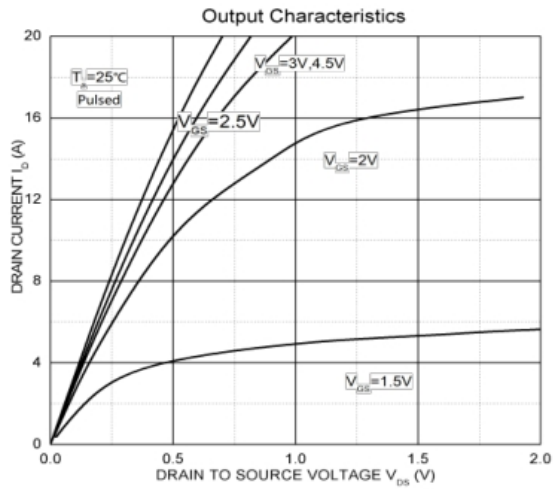
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

| Parameter                                  | Symbol              | Test Condition                                                                                                       | Min. | Typ. | Max. | Unit |
|--------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                     |                     |                                                                                                                      |      |      |      |      |
| Drain-source breakdown voltage             | BV<br>(BR)DSS       | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                                                          | 20   |      |      | V    |
| Zero gate voltage drain current            | I <sub>DSS</sub>    | V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V                                                                           |      |      | 1    | uA   |
| Gate-body leakage current                  | I <sub>GSS</sub>    | V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V                                                                          |      |      | ±0.1 | uA   |
| Gate threshold voltage <sup>(1)</sup>      | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                                             | 0.55 | 0.7  | 1    | V    |
| Drain-source on-resistance                 | R <sub>DS(on)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A                                                                          |      | 28   | 45   | mΩ   |
|                                            |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.1A                                                                          |      | 33   | 60   |      |
| Forward tranconductance1)                  | g <sub>FS</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =3.6A                                                                            | 5    |      |      | S    |
| Dynamic Characteristics                    |                     |                                                                                                                      |      |      |      |      |
| Input capacitance <sup>2)</sup>            | C <sub>iss</sub>    | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V,<br>f=1MHz                                                                 |      | 300  |      | pF   |
| Output capacitance <sup>2)</sup>           | C <sub>oss</sub>    |                                                                                                                      |      | 120  |      |      |
| Reverse transfer capacitance <sup>2)</sup> | C <sub>rss</sub>    |                                                                                                                      |      | 80   |      |      |
| Total Gate Charge                          | Q <sub>g</sub>      | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V,<br>I <sub>D</sub> =3.6A                                                 |      | 4.0  | 10   | nC   |
| Gate-Source Charge                         | Q <sub>gs</sub>     |                                                                                                                      |      | 0.65 |      |      |
| Gate-Drain Charge                          | Q <sub>gd</sub>     |                                                                                                                      |      | 1.5  |      |      |
| Switching Characteristics <sup>2)</sup>    |                     |                                                                                                                      |      |      |      |      |
| Turn-on Delay Time                         | T <sub>d(on)</sub>  | V <sub>DD</sub> =10V, R <sub>L</sub> =5.5Ω,<br>I <sub>D</sub> =3.6A, V <sub>GEN</sub> =4.5V,<br>R <sub>GEN</sub> =6Ω |      | 7    | 15   | nS   |
| Turn-on Rise Time                          | T <sub>r</sub>      |                                                                                                                      |      | 55   | 80   |      |
| Turn-Off Delay Time                        | T <sub>d(off)</sub> |                                                                                                                      |      | 16   | 60   |      |
| Turn-Off Fall Time                         | t <sub>f</sub>      |                                                                                                                      |      | 10   | 25   |      |
| Source-Drain Diode Characteristics         |                     |                                                                                                                      |      |      |      |      |
| Diode Forward voltage                      | V <sub>DS</sub>     | I <sub>S</sub> =1A, V <sub>GS</sub> = 0V                                                                             |      | 0.76 | 1.2  | V    |

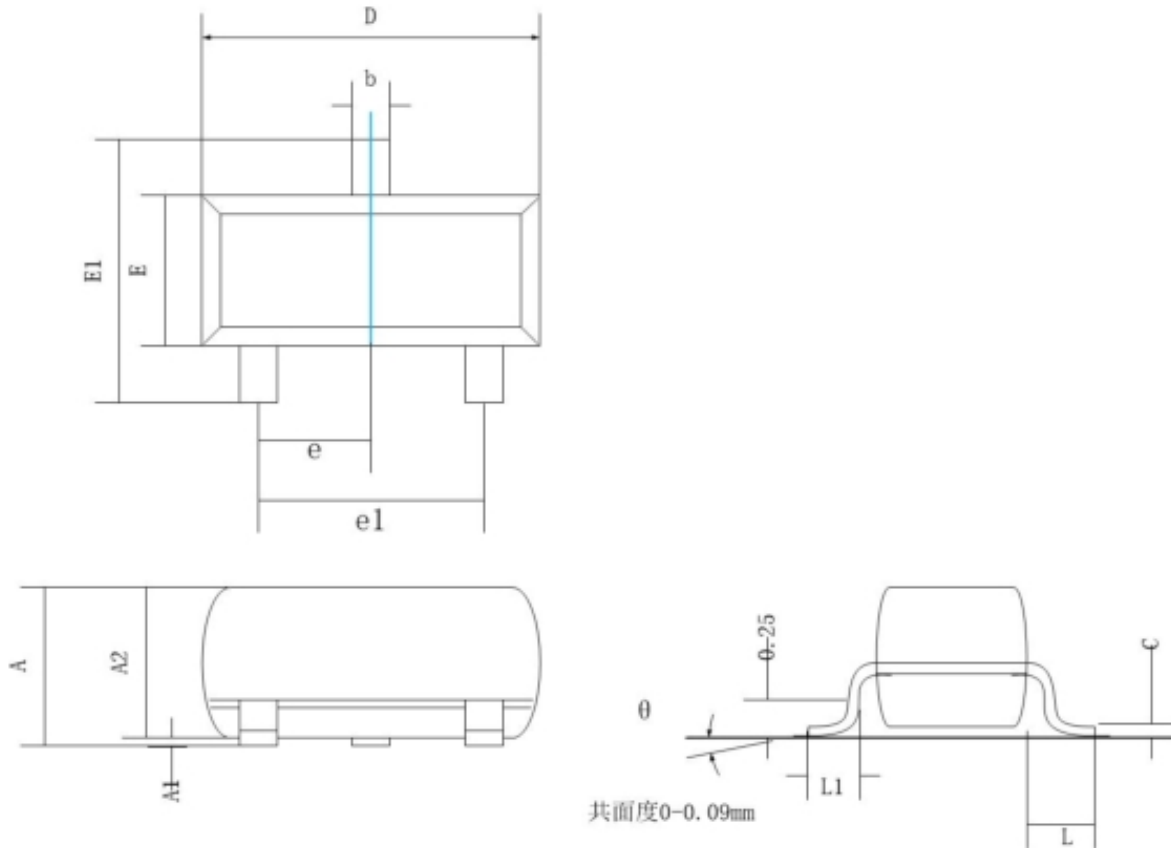
### Notes:

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

## Typical Characteristics



## SOT-23 Package Information



| Symbol   | Dimensions In Millimeters |      |
|----------|---------------------------|------|
|          | Min.                      | Max. |
| A        | 0.90                      | 1.15 |
| A1       | 0.00                      | 0.10 |
| A2       | 0.90                      | 1.05 |
| b        | 0.30                      | 0.50 |
| c        | 0.08                      | 0.15 |
| D        | 2.80                      | 3.00 |
| E        | 1.20                      | 1.40 |
| E1       | 2.25                      | 2.55 |
| e        | 0.95 REF.                 |      |
| e1       | 1.80                      | 2.00 |
| L        | 0.55 REF.                 |      |
| L1       | 0.30                      | 0.50 |
| $\theta$ | 0°                        | 8°   |