

## SOT-323 Plastic-Encapsulate MOSFETS

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

### FEATURE

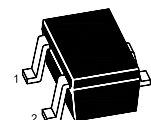
TrenchFET Power MOSFET

### APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter

MARKING: 2302

### SOT-323



1.Base 2.Emitter 3. Collector

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                                         | $V_{GS}$        | $\pm 8$   |                             |
| Continuous Drain Current                                    | $I_D$           | 2.1       | A                           |
| Continuous Source-Drain Current(Diode Conduction)           | $I_S$           | 0.6       |                             |
| Power Dissipation                                           | $P_D$           | 0.35      | W                           |
| Thermal Resistance from Junction to Ambient ( $t \leq 5s$ ) | $R_{\theta JA}$ | 357       | $^{\circ}\text{C}/\text{W}$ |
| Operating Junction                                          | $T_J$           | 150       | $^{\circ}\text{C}$          |
| Storage Temperature                                         | $T_{STG}$       | -55 ~+150 |                             |

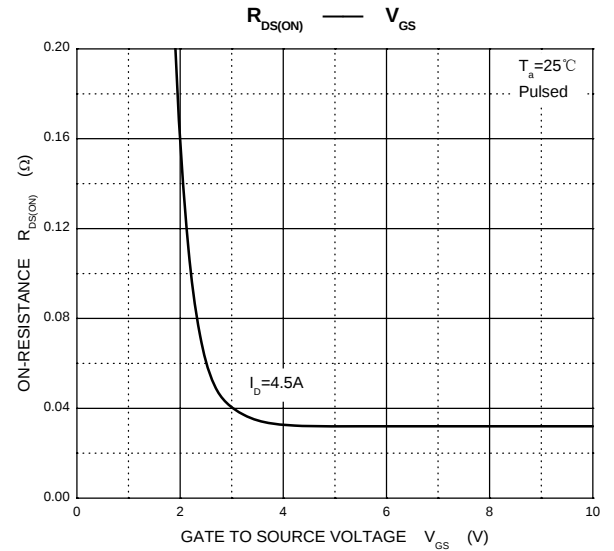
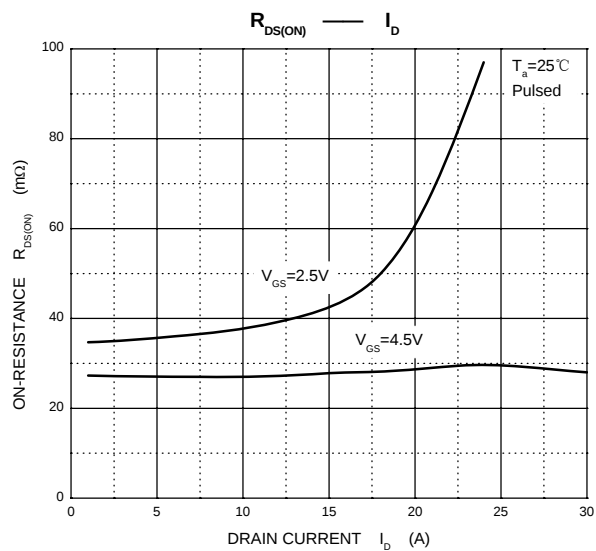
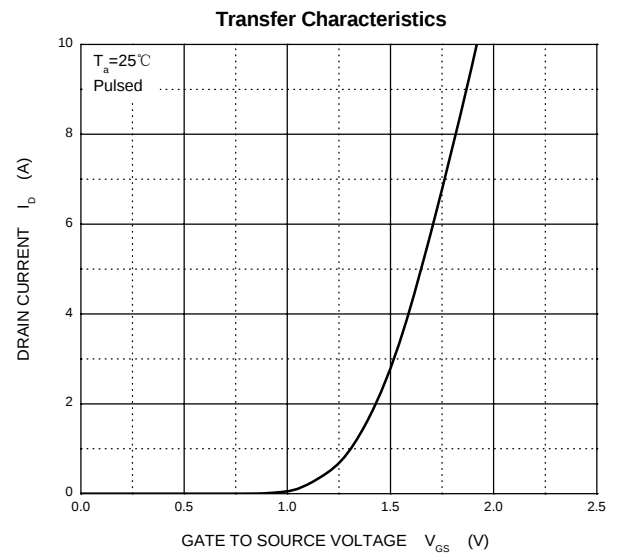
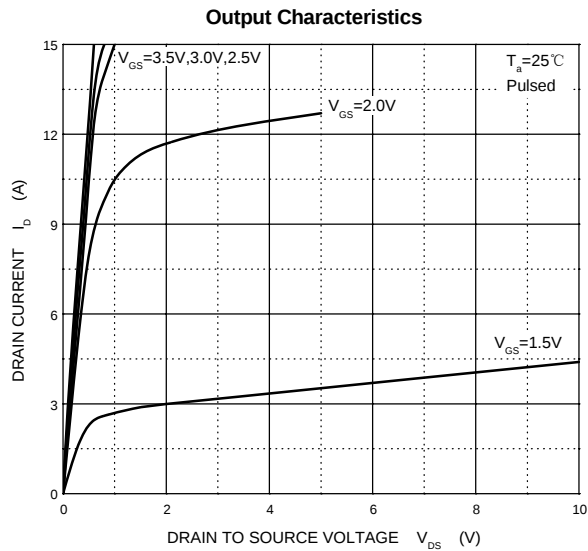
### Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

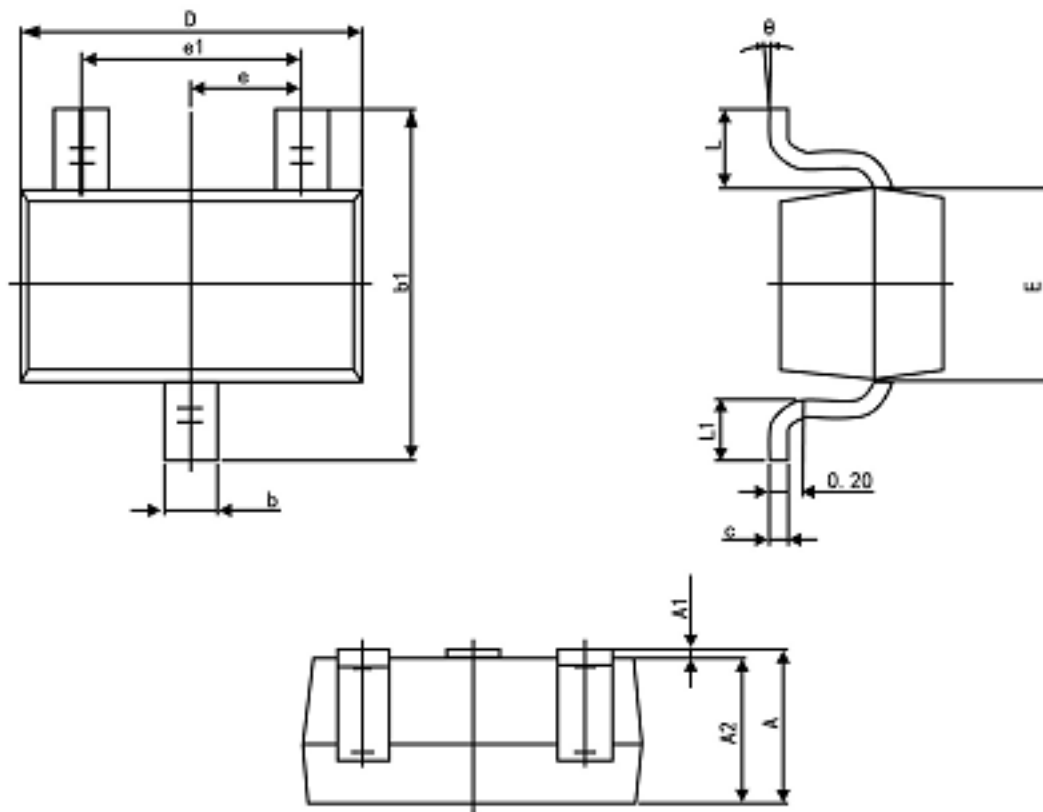
| Parameter                                 | Symbol               | Test Condition                                                                                                    | Min  | Typ   | Max   | Units |
|-------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------|------|-------|-------|-------|
| Static                                    |                      |                                                                                                                   |      |       |       |       |
| Drain-source breakdown voltage            | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =10μA                                                                        | 20   |       |       | V     |
| Gate-threshold voltage                    | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =50μA                                                           | 0.65 | 0.95  | 1.2   |       |
| Gate-body 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> =20V, V <sub>GS</sub> =0V                                                                         |      |       | 1     | μA    |
| Drain-source on-resistance <sup>a</sup>   | r <sub>DS(on)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A                                                                       |      | 0.045 | 0.060 | Ω     |
|                                           |                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.1A                                                                       |      | 0.070 | 0.115 |       |
| Forward transconductance <sup>a</sup>     | g <sub>fs</sub>      | V <sub>DS</sub> =5V, I <sub>D</sub> =3.6A                                                                         |      | 8     |       | S     |
| Diode forward voltage                     | V <sub>SD</sub>      | I <sub>S</sub> =0.94A,V <sub>GS</sub> =0V                                                                         |      | 0.76  | 1.2   | V     |
| Dynamic                                   |                      |                                                                                                                   |      |       |       |       |
| Total gate charge                         | Q <sub>g</sub>       | V <sub>DS</sub> =10V,V <sub>GS</sub> =4.5V,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   |       |       |
| Input capacitance <sup>b</sup>            | C <sub>iSS</sub>     | V <sub>DS</sub> =10V,V <sub>GS</sub> =0V,f=1MHz                                                                   |      | 300   |       | pF    |
| Output capacitance <sup>b</sup>           | C <sub>oSS</sub>     |                                                                                                                   |      | 120   |       |       |
| Reverse transfer capacitance <sup>b</sup> | C <sub>rSS</sub>     |                                                                                                                   |      | 80    |       |       |
| Switching <sup>b</sup>                    |                      |                                                                                                                   |      |       |       |       |
| Turn-on delay time                        | t <sub>d(on)</sub>   | V <sub>DD</sub> =10V,<br>R <sub>L</sub> =5.5Ω, I <sub>D</sub> ≈3.6A,<br>V <sub>GEN</sub> =4.5V,R <sub>g</sub> =6Ω |      | 7     | 15    | ns    |
| Rise time                                 | t <sub>r</sub>       |                                                                                                                   |      | 55    | 80    |       |
| Turn-off delay time                       | t <sub>d(off)</sub>  |                                                                                                                   |      | 16    | 60    |       |
| Fall time                                 | t <sub>f</sub>       |                                                                                                                   |      | 10    | 25    |       |

#### Notes :

- Pulse Test : Pulse width ≤ 300μs, duty cycle ≤ 2%.
- These parameters have no way to verify.

## Typical Characteristics



**SOT-323 PACKAGE OUTLINE DIMENSIONS**


| Symbol   | Dimension in Millimeters |       |
|----------|--------------------------|-------|
|          | Min                      | Max   |
| A        | 0.900                    | 1.100 |
| A1       | 0.000                    | 0.100 |
| A2       | 0.900                    | 1.000 |
| b        | 0.200                    | 0.400 |
| c        | 0.080                    | 0.150 |
| D        | 2.000                    | 2.200 |
| E        | 1.150                    | 1.350 |
| E1       | 2.150                    | 2.450 |
| e        | 0.650 TYP.               |       |
| e1       | 1.200                    | 1.400 |
| L        | 0.525 REF.               |       |
| L1       | 0.260                    | 0.460 |
| $\theta$ | 0°                       | 8°    |