# SI2302A

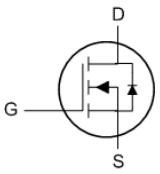
SOT-23-3L Plastic-Encapsulate MOSFETS

## DESCRIPTION

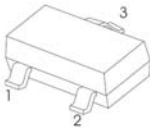
The SI2302A uses advanced trench technology to provide excellent RDS(on).This device is suitable for use as a uni-directional or bi-directional load switch.

N-Channel Enhancement Mode Field Effect Transistor

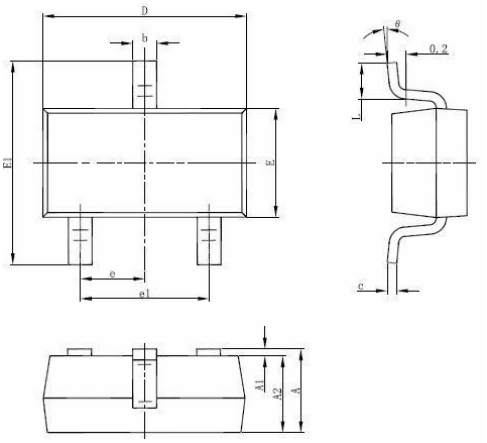
- $V_{DSS}$= 20 V  $I_{D}$= 6.0 A
- $R_{DS(on)}$ < 30mΩ@$V_{GS}$ = 4.5V
- $R_{DS(on)}$ < 40mΩ@$V_{GS}$ = 2.5V
- $R_{DS(on)}$ < 73mΩ@$V_{GS}$ = 1.8V




1. GATE
2. SOURCE
3. DRAIN




**SOT-23-3L**



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

## Maximum ratings ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | |
| Continuous Drain Current | $I_D$ | 6 | A |
| Pulsed Drain Current | $I_{DM}$ | 25 | |
| Maximum Body-Diode Continuous Current | $I_S$ | 2 | |
| Power Dissipation | $P_D$ | 0.35 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 357 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{stg}$ | -55 ~+150 | |

# SI2302A

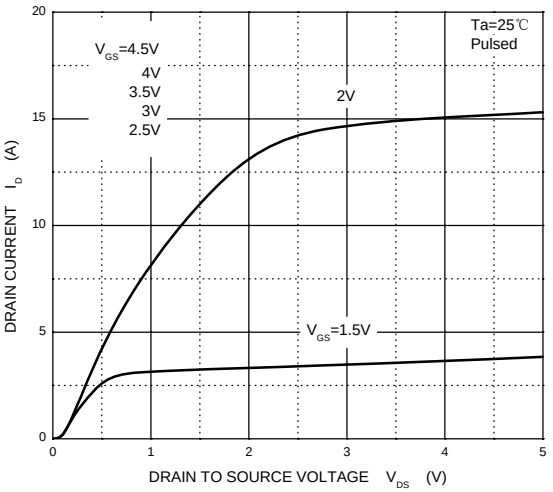
## Electrical Characteristics (Tj=25°C unless otherwise noted )

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC PARAMETERS** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 20 | | | V |
| Gate-source leakage current | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±12V | | | ±100 | nA |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =16V, $V_{GS}$ =0V | | | 1.0 | μA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 0.5 | 0.7 | 1.0 | V |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}$ =4.5V, $I_D$ =5.0A | | 20 | 30 | mΩ |
| | | $V_{GS}$ =2.5V, $I_D$ =4.0A | | 26 | 40 | |
| | | $V_{GS}$ =1.8V, $I_D$ =2.0A | | | 73 | |
| Diode forward voltage | $V_{SD}$ | $V_{GS}$ =0V,$I_S$=1A | | 0.75 | 1 | V |
| Forward transconductance | $g_{fS}$ | $V_{DS}$ =5V, $I_D$ =3.8A | 4 | | | S |
| **DYNAMIC PARAMETERS*** | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{DS}$ =10V,$V_{GS}$ =0V,f =1MHz | | 630 | | pF |
| Output capacitance | $C_{oss}$ | | | 164 | | |
| Reverse transfer capacitance | $C_{rss}$ | | | 137 | | |
| Gate resistance | $R_g$ | $V_{DS}$ =0V,$V_{GS}$ =0V,f =1MHz | | 1.5 | | Ω |
| **SWITCHING PARAMETERS*** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=5V,$V_{DS}$=10V, $R_L$=1.7Ω,$R_{GEN}$=6Ω | | 5.5 | | ns |
| Rise time | $t_r$ | | | 14 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 29 | | |
| Fall time | $t_f$ | | | 10.2 | | |

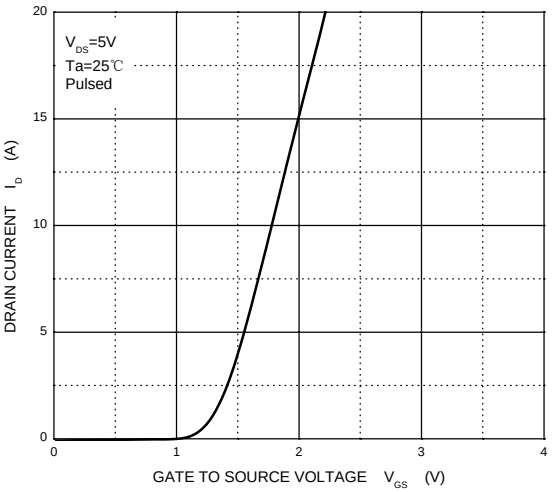
*These parameters have no way to verify.

## RATING AND CHARACTERISTIC CURVES (SI2302A)

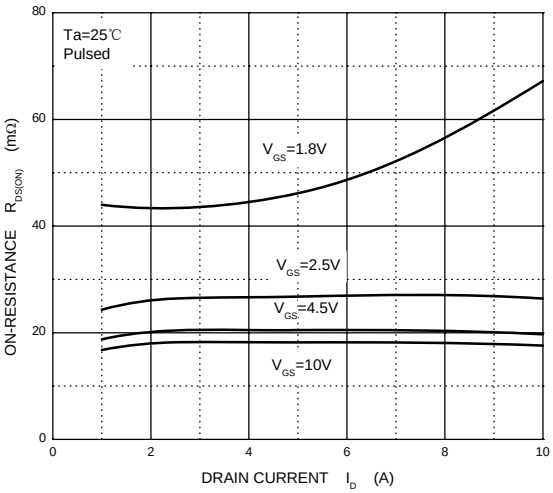
**Output Characteristics**



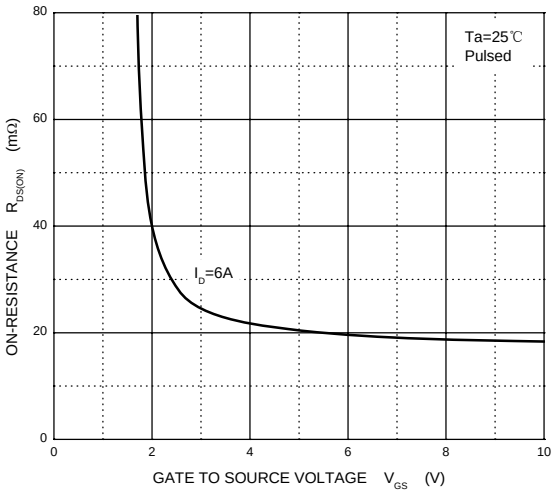

**Transfer Characteristics**



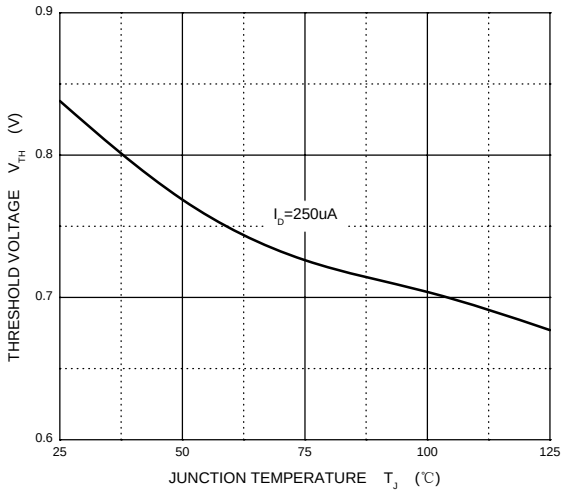

**$R_{DS(ON)}$ —— $I_D$**




**$R_{DS(ON)}$ —— $V_{GS}$**




**Threshold Voltage**




**$I_S$ —— $V_{SD}$**