

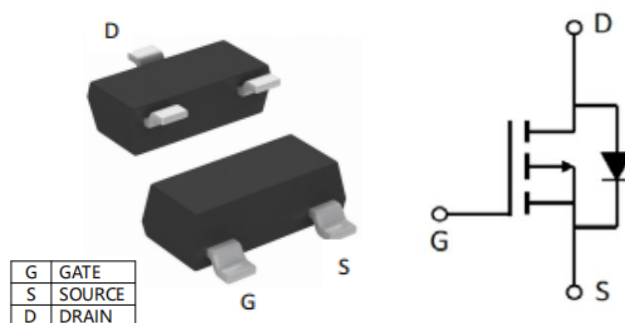
## Features

- ◆ Low  $R_{DS(on)}$  @  $V_{GS} = -10V$
- ◆ -3.3V Logic Level Control
- ◆ RoHS Compliant
- ◆ Pb-Free
- ◆ Halogen Free

|                                                                               |                   |
|-------------------------------------------------------------------------------|-------------------|
| $V_{DS}$                                                                      | -30V              |
| $I_D @ T_A = 25^\circ C$                                                      | -4.2A             |
| $R_{DS(on)} @ V_{GS} = -10V, I_D = -4A$<br>Typ. ~ Max. ( $T_J = 25^\circ C$ ) | 44 ~ 55m $\Omega$ |

## 特征

- ◆ 低导通电阻 @  $V_{GS} = 10V$
- ◆ -3.3V 逻辑电平控制
- ◆ 符合 RoHS 标准
- ◆ 不含铅
- ◆ 不含卤素



## Application 应用

- ◆ Load Switch 负载开关
- ◆ Switching Circuits 开关电路
- ◆ High speed line driver 高速线路驱动器
- ◆ Power Management Functions 电源管理功能

**SOT-23-3L**

## MARKING CONTENT 丝印内容

| Device Type<br>器件型号 | Device Marking<br>器件印字 |
|---------------------|------------------------|
| AO3401A-CN          | A19T                   |

## Ordering information 订购信息

| Device Type<br>器件型号 | Package<br>封装 | Reel Size<br>卷盘尺寸 | SPQ<br>标准包装量 | MPQ<br>最小包装数量 | MOQ<br>最小订购数量   |
|---------------------|---------------|-------------------|--------------|---------------|-----------------|
| AO3401A-CN          | SOT-23-3L     | 7 Inch 英寸         | 3000/Reel 卷  | 45000/Box 盒   | 180000/Carton 箱 |

## 1、Package 封装

Table 1 \_\_ Characteristic values

表 1 \_\_ 特征数值

| Parameter<br>参数                                | Symbol<br>符号     | Note or test condition<br>注释或测试条件 | Values<br>数值 |            |            | Unit<br>单位 |
|------------------------------------------------|------------------|-----------------------------------|--------------|------------|------------|------------|
|                                                |                  |                                   | Min.<br>最小   | Typ.<br>典型 | Max.<br>最大 |            |
| Storage temperature<br>储存温度                    | T <sub>stg</sub> | /                                 | -50          | /          | +150       | °C         |
| Thermal resistance, Junction-Ambient<br>结至环境热阻 | R <sub>θJA</sub> | /                                 | /            | /          | 80         | °C/W       |

## 2、MOSFET

Table 2 \_\_ Maximum Ratings (T<sub>A</sub>= 25°C unless otherwise noted)

表 2 \_\_ 极限参数(如无另外标识, 环境温度=25°C)

| Parameter<br>参数                    | Symbol<br>符号    | Note or test condition<br>注释或测试条件                             | Value<br>数值 | Unit<br>单位 |
|------------------------------------|-----------------|---------------------------------------------------------------|-------------|------------|
| Drain-Source Voltage<br>漏极-源极电压    | V <sub>DS</sub> | /                                                             | -30         | V          |
| Gate-Source Voltage<br>栅极-源极电压     | V <sub>GS</sub> | /                                                             | ±12         | V          |
| Continuous Drain Current<br>持续漏极电流 | I <sub>D</sub>  | T <sub>A</sub> = 25°C                                         | -4.2        | M          |
|                                    |                 | T <sub>A</sub> = 70°C                                         | -3.3        |            |
| Pulse Drain Current<br>脉冲漏极电流      | I <sub>DM</sub> | Pulse width limited by maximum allowable junction temperature | -16.8       | A          |
| Power Dissipation<br>耗散功率          | P <sub>D</sub>  | T <sub>A</sub> = 25°C                                         | 1.2         | W          |
|                                    |                 | T <sub>A</sub> = 70°C                                         | 0.9         |            |

**Table 3 \_ Electrical Characteristic Values(T<sub>A</sub>=25°C,unless otherwise noted)**
**表 3 \_ 电气特性数值(如无另外标识, 环境温度=25°C)**

| Parameter<br>参数                                                                    | Symbol<br>符号 | Note or test condition<br>注释或测试条件 | Limits 限值 |      |      | Unit<br>单位 |
|------------------------------------------------------------------------------------|--------------|-----------------------------------|-----------|------|------|------------|
|                                                                                    |              |                                   | Min.      | Typ. | Max. |            |
| Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)<br>静态电气特性  |              |                                   |           |      |      |            |
| Drain-source<br>breakdown voltage<br>漏源极击穿电压                                       | V(BR)DSS     | VGS=0V<br>ID=-250μA               | -30       | /    | /    | V          |
| Zero Gate Voltage<br>Drain Current<br>零栅压漏极-源极漏电流                                  | IDSS         | VDS=-30V<br>VGS=0V                | /         | /    | -1   | μA         |
|                                                                                    |              | VDS=-24V<br>VGS=0V                | /         | /    | -100 |            |
| Gate-Source Leakage<br>Current<br>栅极驱动漏电流                                          | IGSS         | VGS=±12V<br>VDS=0V                | /         | /    | ±100 | nA         |
| Gate threshold<br>voltage<br>开启电压<br>(阈值电压)                                        | VGS(th)      | VDS=VGS<br>ID=-250μA              | -0.5      | -0.8 | -1.2 | V          |
| Drain-Source on-state<br>resistance<br>导通电阻②                                       | RDS(on)      | VGS=-10V,ID=-4A                   | /         | 44   | 55   | mΩ         |
|                                                                                    |              | VGS=-4.5V,ID=-3A                  | /         | 51   | 60   |            |
|                                                                                    |              | VGS=-3.3V,ID=-3A                  | /         | 58   | 75   |            |
| Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)<br>动态电气特性 |              |                                   |           |      |      |            |
| Input Capacitance<br>输入电容                                                          | Ciss         | VDS=-15V<br>VGS=0V<br>f=1MHz      | /         | 655  | /    | pF         |
| Output Capacitance<br>输出电容                                                         | Coss         |                                   | /         | 65   | /    |            |
| Reverse Transfer<br>Capacitance<br>反向传输电容                                          | Crss         |                                   | /         | 53   | /    |            |

|                                |          |                                                    |   |     |   |    |
|--------------------------------|----------|----------------------------------------------------|---|-----|---|----|
| Total Gate Charge<br>栅极总充电电量   | $Q_g$    | $V_{DS} = -15V$<br>$I_D = -4A$<br>$V_{GS} = -4.5V$ | / | 7.2 | / | nC |
| Gate-Source Charge<br>栅源极总充电电量 | $Q_{gs}$ |                                                    | / | 1.5 | / |    |
| Gate-Drain Charge<br>栅漏极总充电电量  | $Q_{gd}$ |                                                    | / | 2.6 | / |    |

② Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

脉冲测试：脉冲宽度  $\leq 300\mu s$ ，占空比  $\leq 2\%$ 。

**Table 4\_\_Characteristic Values**

**表 4\_\_特征数值**

| Parameter<br>参数                            | Symbol<br>符号 | Note or test condition<br>注释或测试条件                                      | Limits 限值 |      |      | Unit<br>单位 |
|--------------------------------------------|--------------|------------------------------------------------------------------------|-----------|------|------|------------|
|                                            |              |                                                                        | Min.      | Typ. | Max. |            |
| Turn-on delay time<br>漏源极导通延迟时间            | $t_{d(on)}$  | $V_{DD} = -15V$<br>$I_D = -2A$<br>$V_{GS} = -10V$<br>$R_G = 3.3\Omega$ | /         | 7.0  | /    | ns         |
| Rise Time<br>漏源极电流上升时间                     | $t_r$        |                                                                        | /         | 3.8  | /    |            |
| Turn-off delay time<br>漏源极关断延迟时间           | $T_{d(off)}$ |                                                                        | /         | 35   | /    |            |
| Fall time<br>漏源极电流下降时间                     | $t_f$        |                                                                        | /         | 10.5 | /    |            |
| Operating junction<br>temperature<br>工作结温度 | $T_j$        |                                                                        | /         | /    | +150 | °C         |

### 3、Source-Drain Diode characteristics 源极-漏极二极管特性

**Table 5\_\_Maximum rated values** ( $T_A = 25^\circ C$  unless otherwise noted)

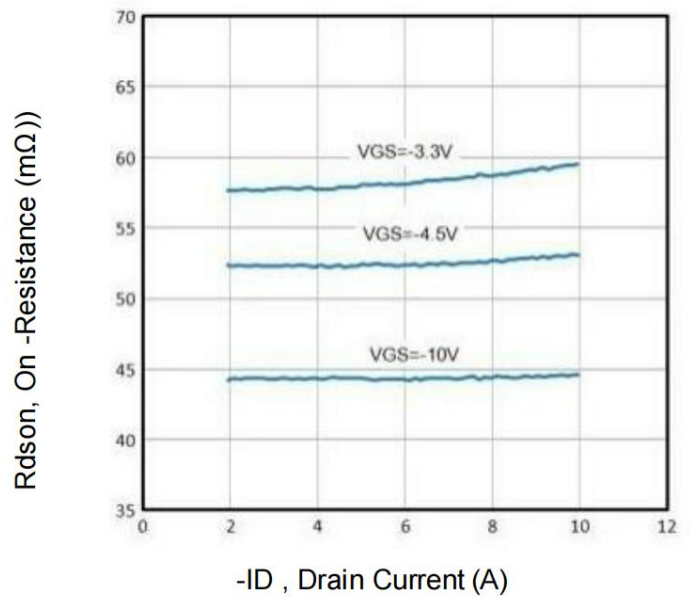
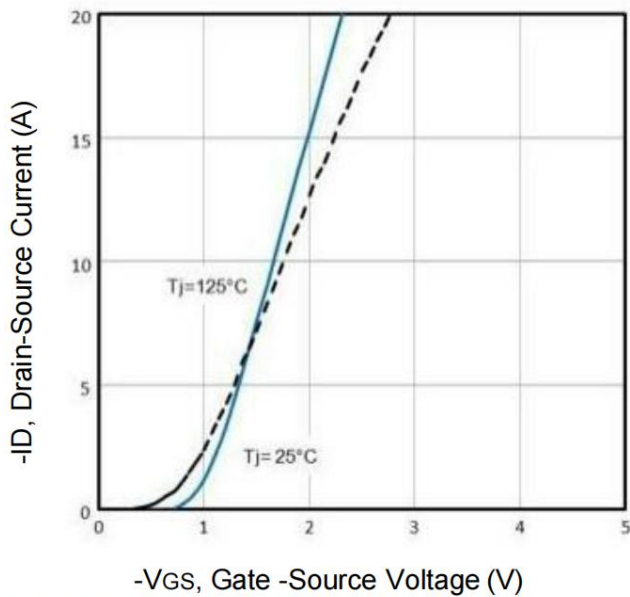
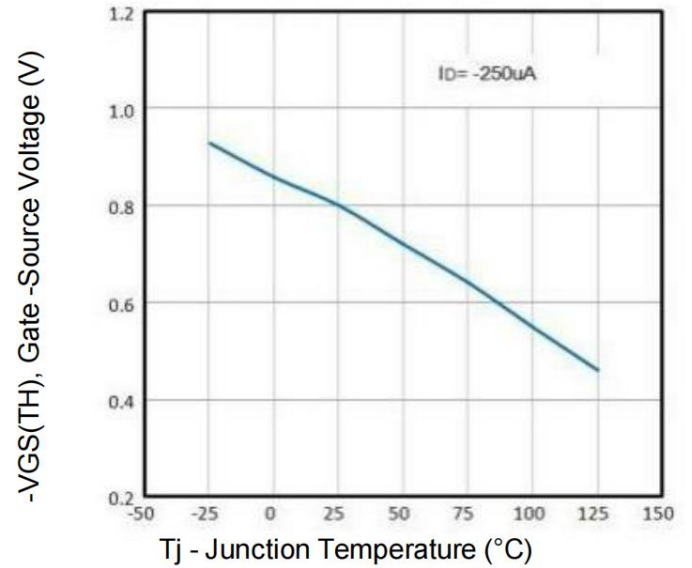
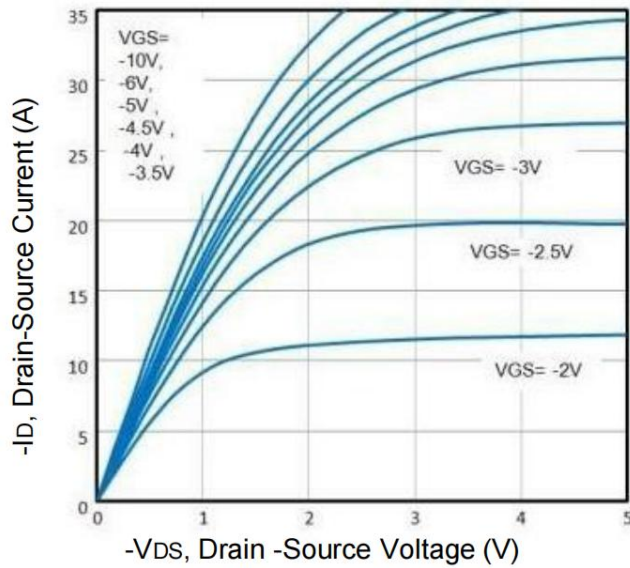
**表 5 最大额定值**(如无另外标识，环境温度  $= 25^\circ C$ )

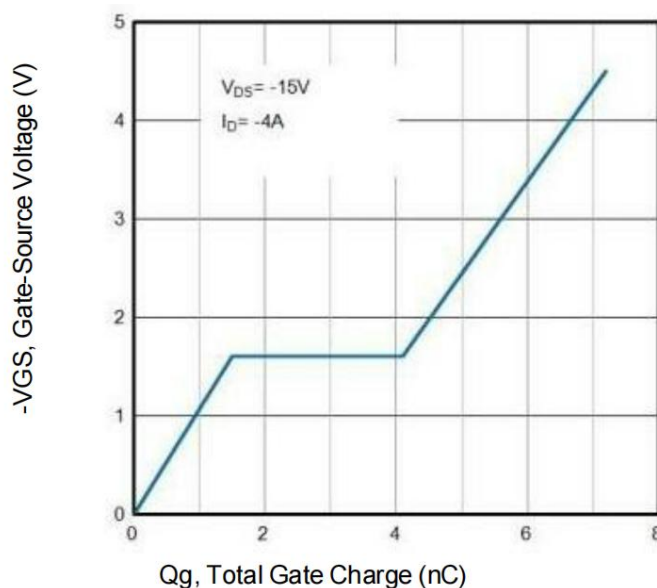
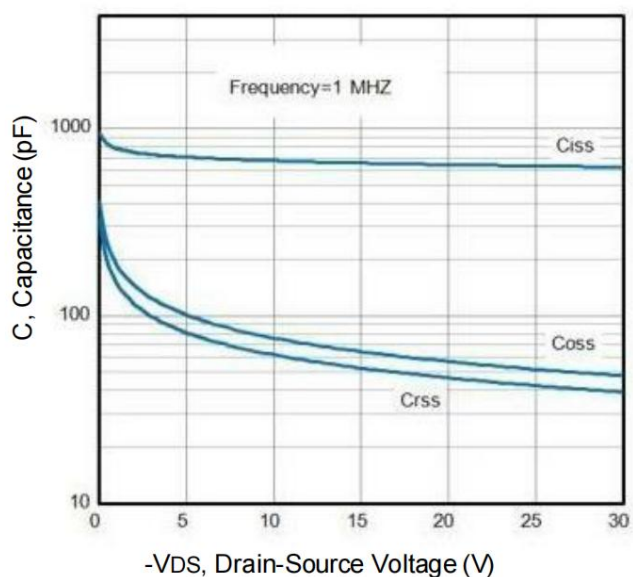
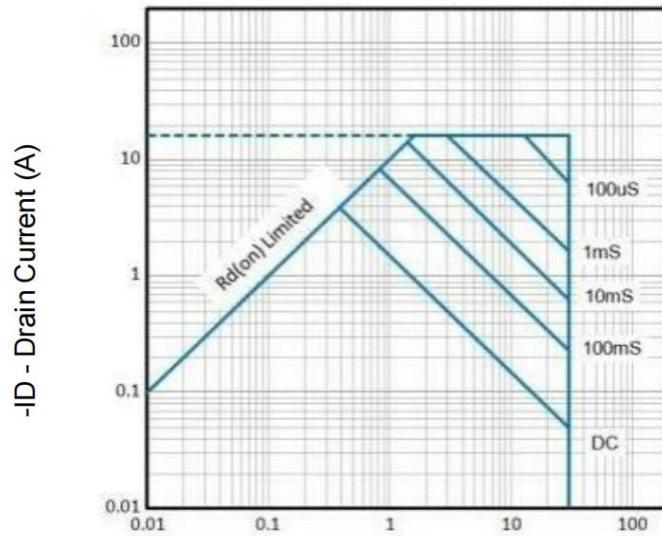
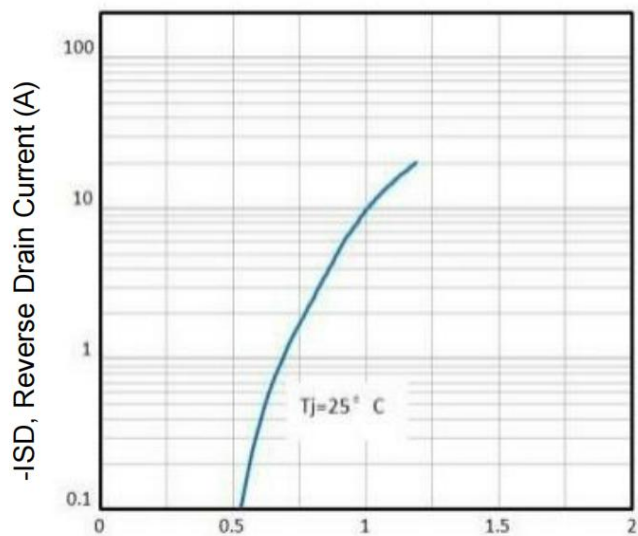
| Parameter<br>参数                                        | Symbol<br>符号 | Note or test condition<br>注释或测试条件                     | Value<br>数值 |      | Unit<br>单位 |
|--------------------------------------------------------|--------------|-------------------------------------------------------|-------------|------|------------|
|                                                        |              |                                                       | Typ.        | Max. |            |
| Diode forward voltage<br>二极管正向导通电压②                    | $V_{SD}$     | $T_j = 25^\circ C$<br>$I_{SD} = -4A$<br>$V_{GS} = 0V$ | -0.88       | -1.2 | V          |
| Source drain current<br>(Body Diode)<br>源漏电流<br>(体二极管) | $I_{SD}$     | /                                                     | /           | -2.0 | A          |

② Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

脉冲测试：脉冲宽度  $\leq 300\mu s$ ，占空比  $\leq 2\%$ 。

#### 4、Characteristics diagrams 特性图







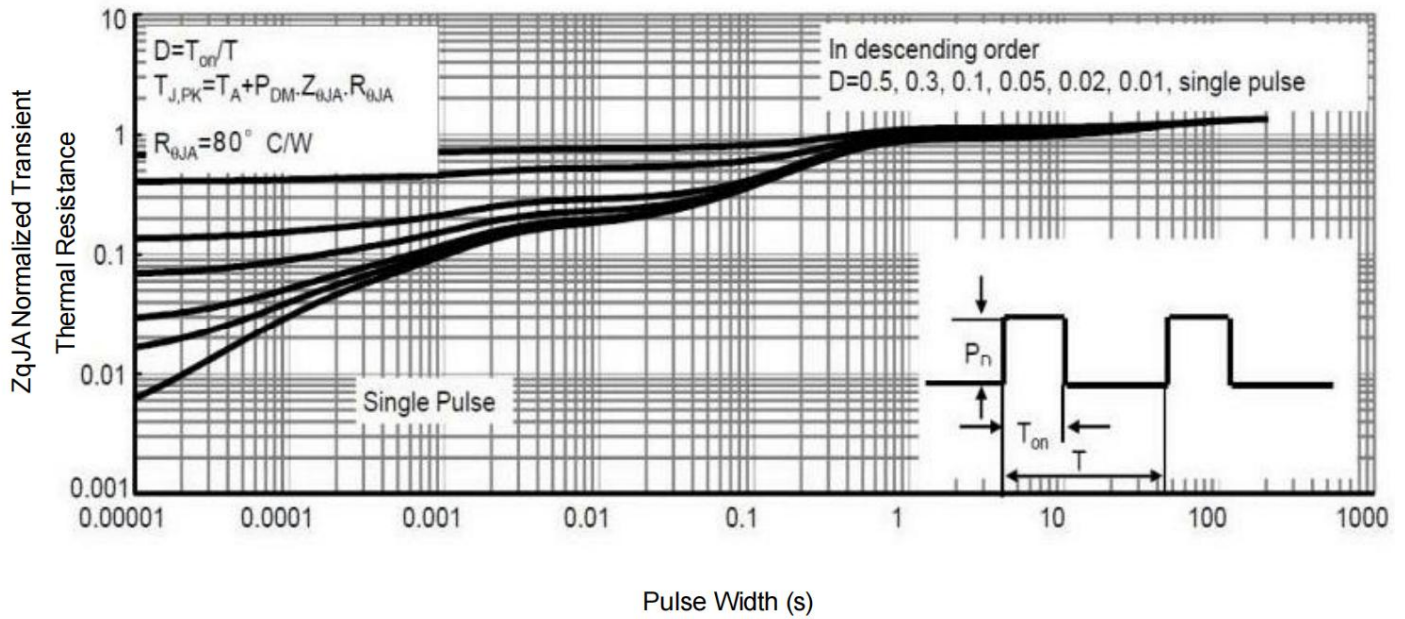


Fig9. Normalized Maximum Transient Thermal Impedance

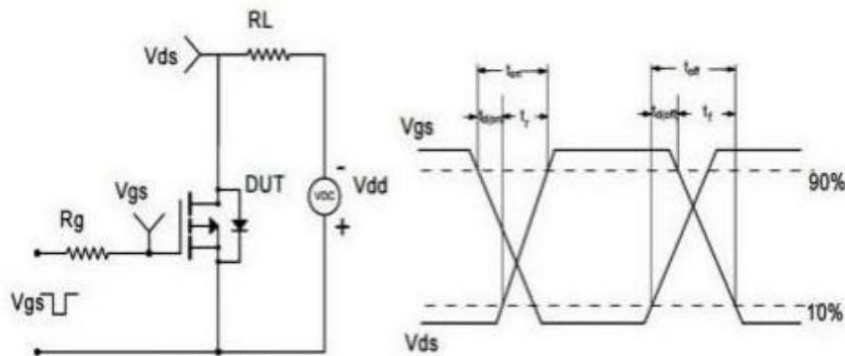
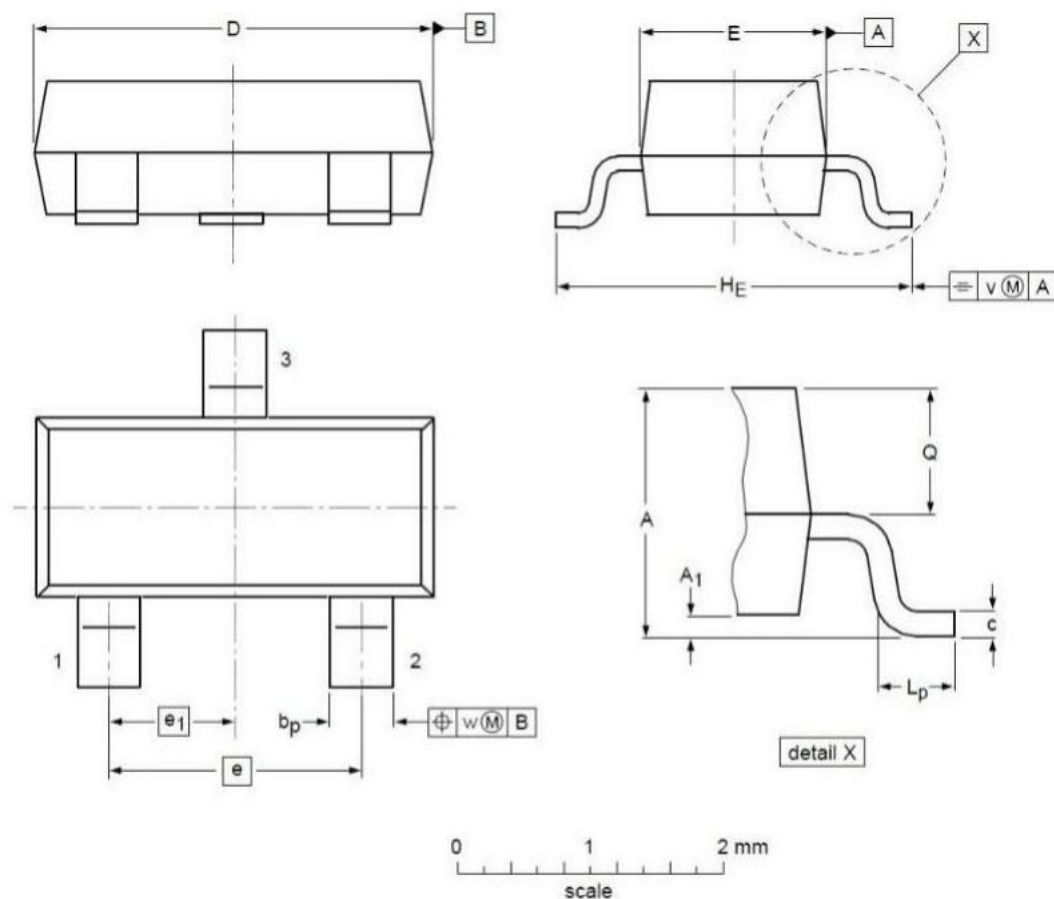


Fig10. Switching Time Test Circuit and waveforms

## 5、Package 封装信息

### SOT-23-3L Package Information



**DIMENSIONS** ( unit : mm )

| Symbol         | Min  | Typ  | Max  | Symbol         | Min  | Typ  | Max  |
|----------------|------|------|------|----------------|------|------|------|
| A              | 1.00 | 1.17 | 1.30 | A <sub>1</sub> | 0.01 | 0.05 | 0.10 |
| b <sub>p</sub> | 0.35 | 0.39 | 0.50 | c              | 0.10 | 0.20 | 0.26 |
| D              | 2.70 | 2.90 | 3.10 | E              | 1.50 | 1.60 | 1.70 |
| e              | --   | 1.90 | --   | e <sub>1</sub> | --   | 0.95 | --   |
| H <sub>E</sub> | 2.50 | 2.78 | 3.00 | L <sub>p</sub> | 0.20 | 0.32 | 0.60 |
| Q              | 0.23 | 0.27 | 0.33 | v              | --   | 0.20 | --   |
| w              | --   | 0.20 | --   |                |      |      |      |



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