

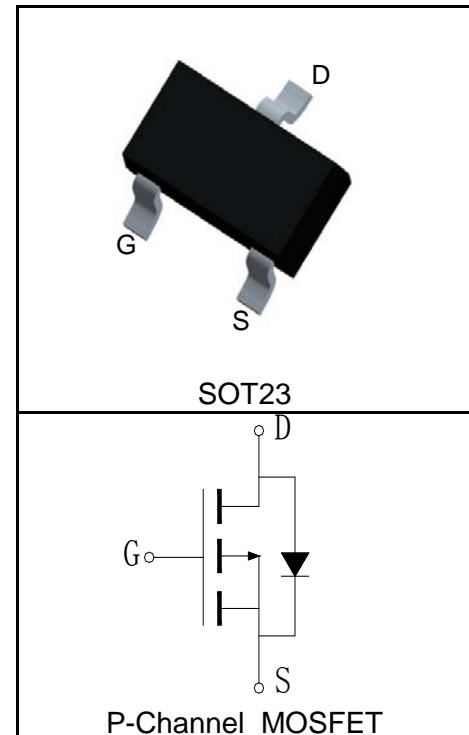
Features

- -30V/-3.5A,
 $R_{DS(ON)} = 50m\Omega(Typ.)@V_{GS}=-10V$
 $R_{DS(ON)} = 80m\Omega(Typ.)@V_{GS}=-4.5V$
- Low On-Resistance
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Load Switch

Pin Description



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|---|--------------------------|--------------|
| Common Ratings ($T_A=25^\circ C$ Unless Otherwise Noted) | | | |
| V_{DSS} | Drain-Source Voltage | -30 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | |
| T_J | Maximum Junction Temperature | 150 | $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| I_S | Diode Continuous Forward Current | $T_A=25^\circ C$ -1 | A |
| Mounted on Large Heat Sink | | | |
| $I_{DP}^{①}$ | 300 μs Pulse Drain Current Tested | $T_A=25^\circ C$ -14 | A |
| $I_D^{②}$ | Continuous Drain Current($V_{GS}=-10V$) | $T_A=25^\circ C$ -3.5 | A |
| | | $T_A=70^\circ C$ -2.8 | |
| P_D | Maximum Power Dissipation | $T_A=25^\circ C$ 1 | W |
| | | $T_A=70^\circ C$ 0.64 | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | - | $^\circ C/W$ |
| $R_{\theta JA}^{③}$ | Thermal Resistance-Junction to Ambient | 125 | $^\circ C/W$ |
| Drain-Source Avalanche Ratings | | | |
| $E_{AS}^{④}$ | Avalanche Energy, Single Pulsed | TBD | mJ |

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

| Symbol | Parameter | Test Condition | RU30P3B | | | Unit |
|---|----------------------------------|--|--|------|-----------|-----------|
| | | | Min. | Typ. | Max. | |
| Static Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_{DS}=-250\mu A$ | -30 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=-30V, V_{GS}=0V$ | | | -1 | μA |
| | | $T_J=125^{\circ}\text{C}$ | | | -30 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=-250\mu A$ | -1 | -1.6 | -2.5 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| $R_{DS(ON)}^{(5)}$ | Drain-Source On-state Resistance | $V_{GS}=-10V, I_{DS}=-3.5A$ | | 50 | 80 | $m\Omega$ |
| | | $V_{GS}=-4.5V, I_{DS}=-2.8A$ | | 80 | 130 | $m\Omega$ |
| Diode Characteristics | | | | | | |
| $V_{SD}^{(5)}$ | Diode Forward Voltage | $I_{SD}=-1A, V_{GS}=0V$ | | | -1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=-3.5A, di_{SD}/dt=100A/\mu s$ | | 7 | | ns |
| Q_{rr} | Reverse Recovery Charge | | | 3 | | nC |
| Dynamic Characteristics ^⑥ | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | | 0.6 | | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V, V_{DS}=-15V, \text{Frequency}=1.0\text{MHz}$ | | 550 | | pF |
| C_{oss} | Output Capacitance | | | 95 | | |
| C_{riss} | Reverse Transfer Capacitance | | | 50 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | | $V_{DD}=-15V, I_{DS}=-3.5A, V_{GEN}=-10V, R_G=6\Omega$ | | 5 | |
| t_r | Turn-on Rise Time | | | 13 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 25 | | |
| t_f | Turn-off Fall Time | | | 9 | | |
| Gate Charge Characteristics ^⑥ | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=-24V, V_{GS}=-10V, I_{DS}=-3.5A$ | | 12 | | nC |
| Q_{gs} | Gate-Source Charge | | | 1.3 | | |
| Q_{gd} | Gate-Drain Charge | | | 2.5 | | |

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
 - ④ Limited by T_{jmax} . Starting $T_j = 25^{\circ}\text{C}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

| Device | Marking^① | Package | Packaging | Quantity | Reel Size | Tape width |
|---------------|----------------------------|----------------|------------------|-----------------|------------------|-------------------|
| RU30P3B | DXYWW | SOT23 | Tape&Reel | 3000 | 7" | 8mm |

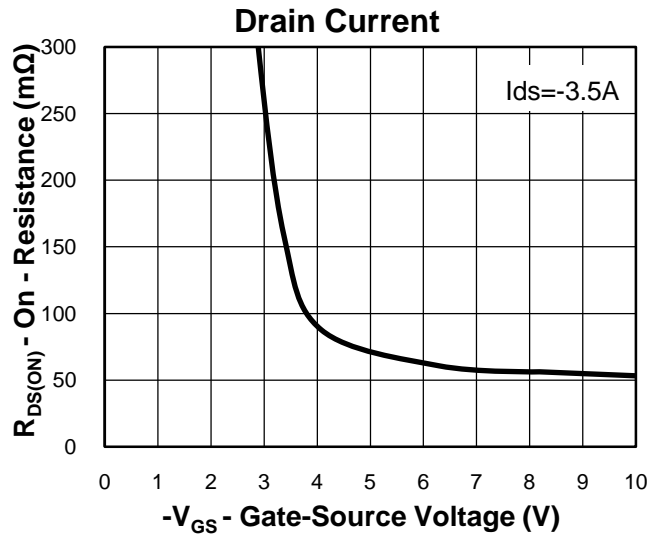
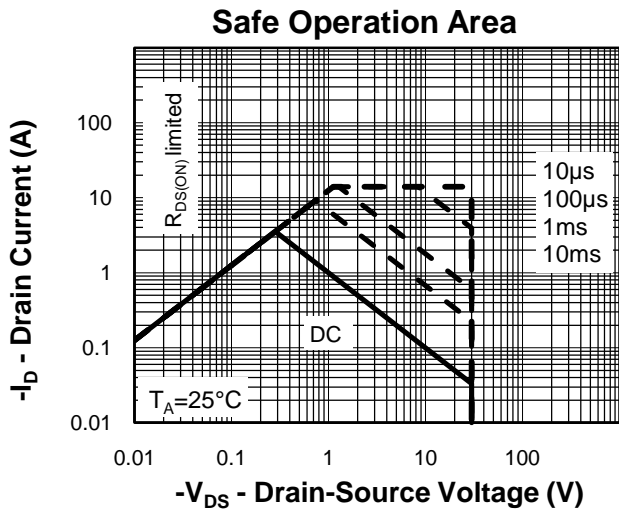
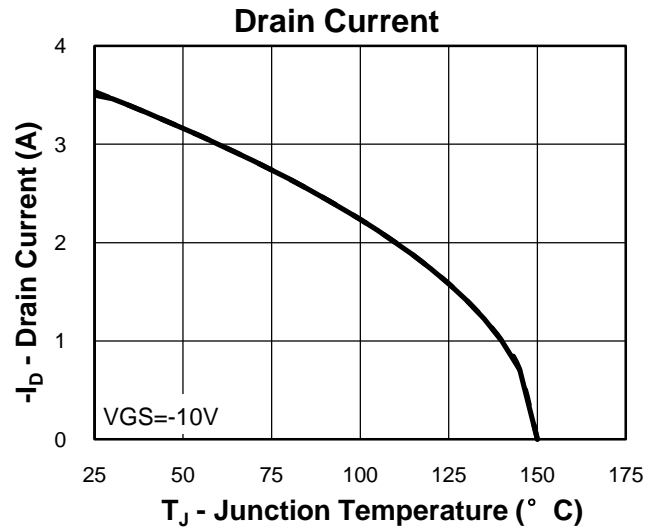
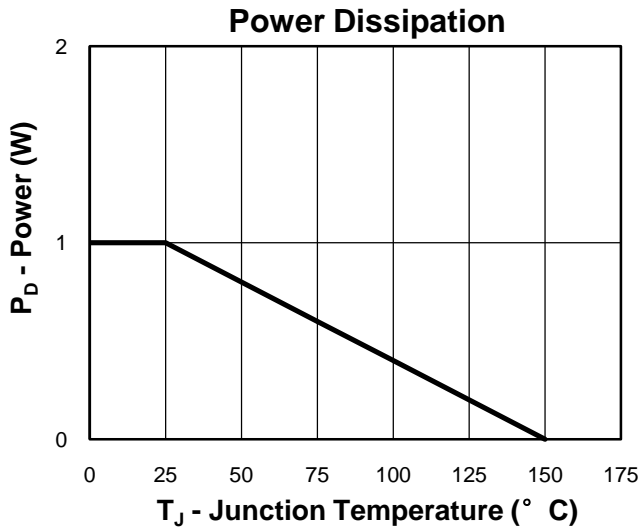
① The following characters could be different and means:

X =Assembly site code

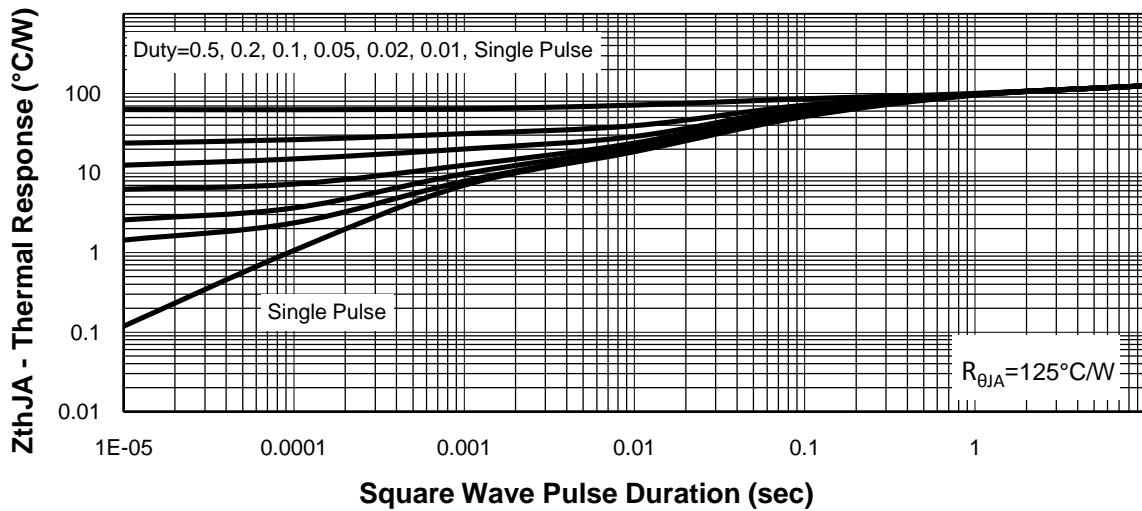
Y =Year

WW =Work Week

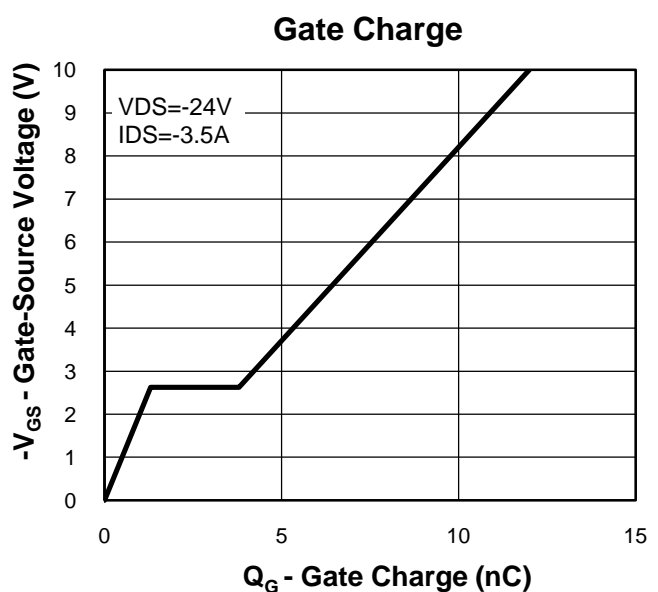
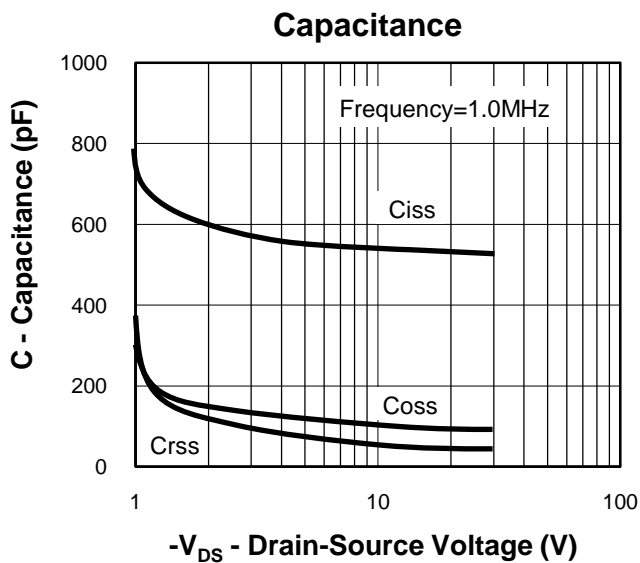
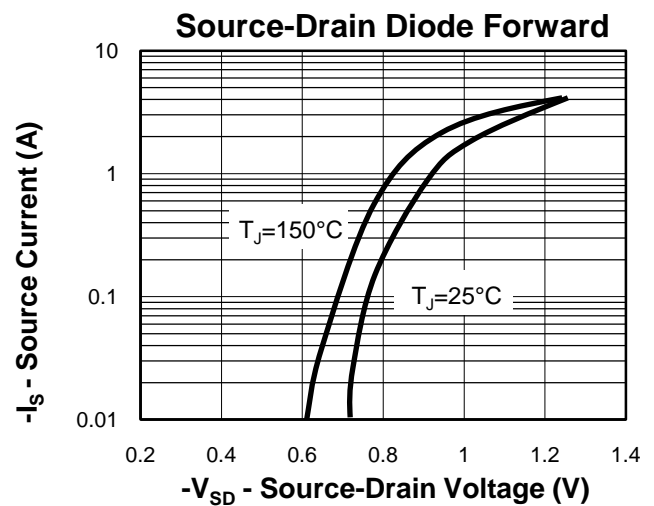
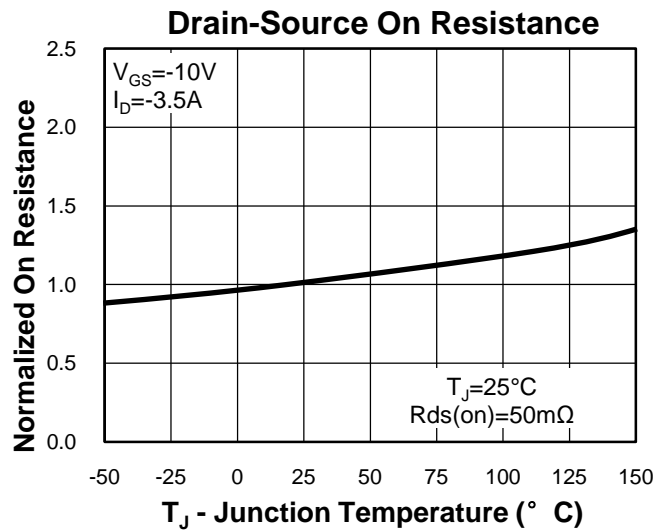
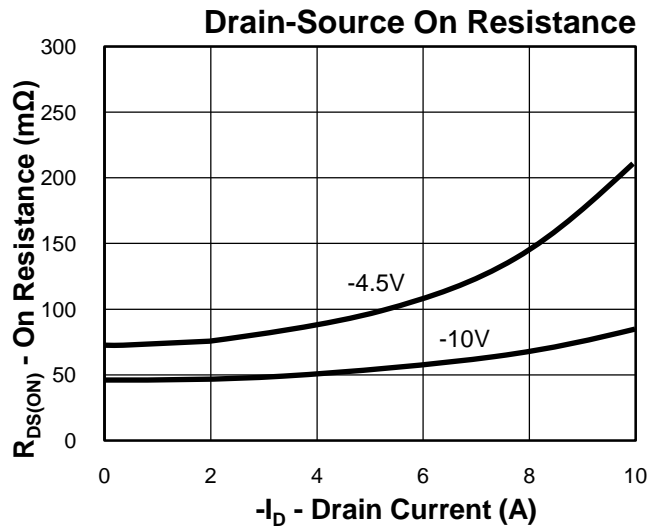
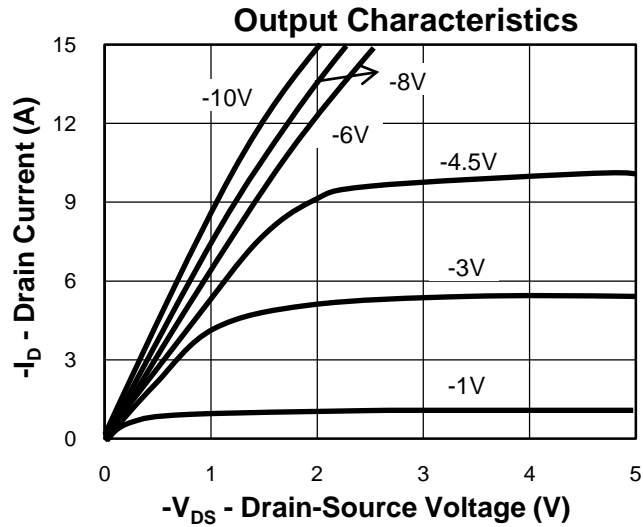
Typical Characteristics



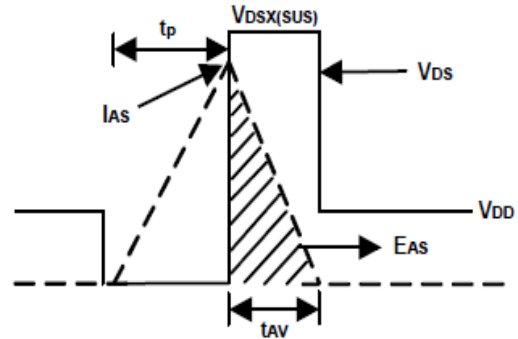
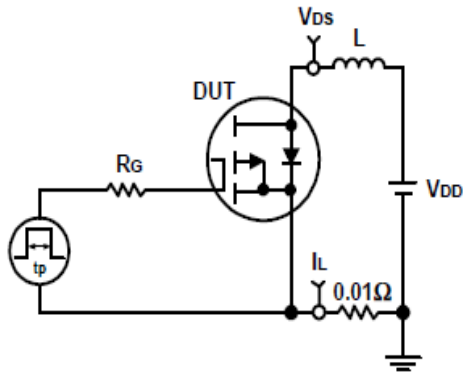
Thermal Transient Impedance



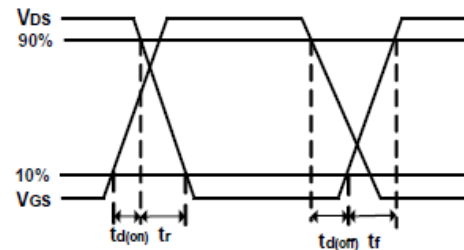
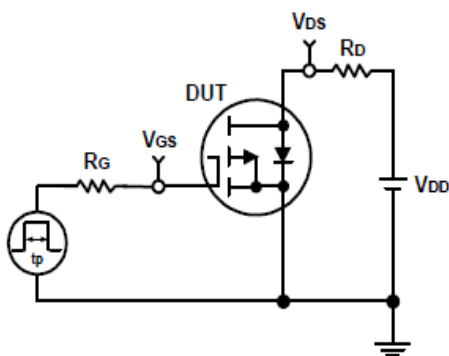
Typical Characteristics



Avalanche Test Circuit and Waveforms

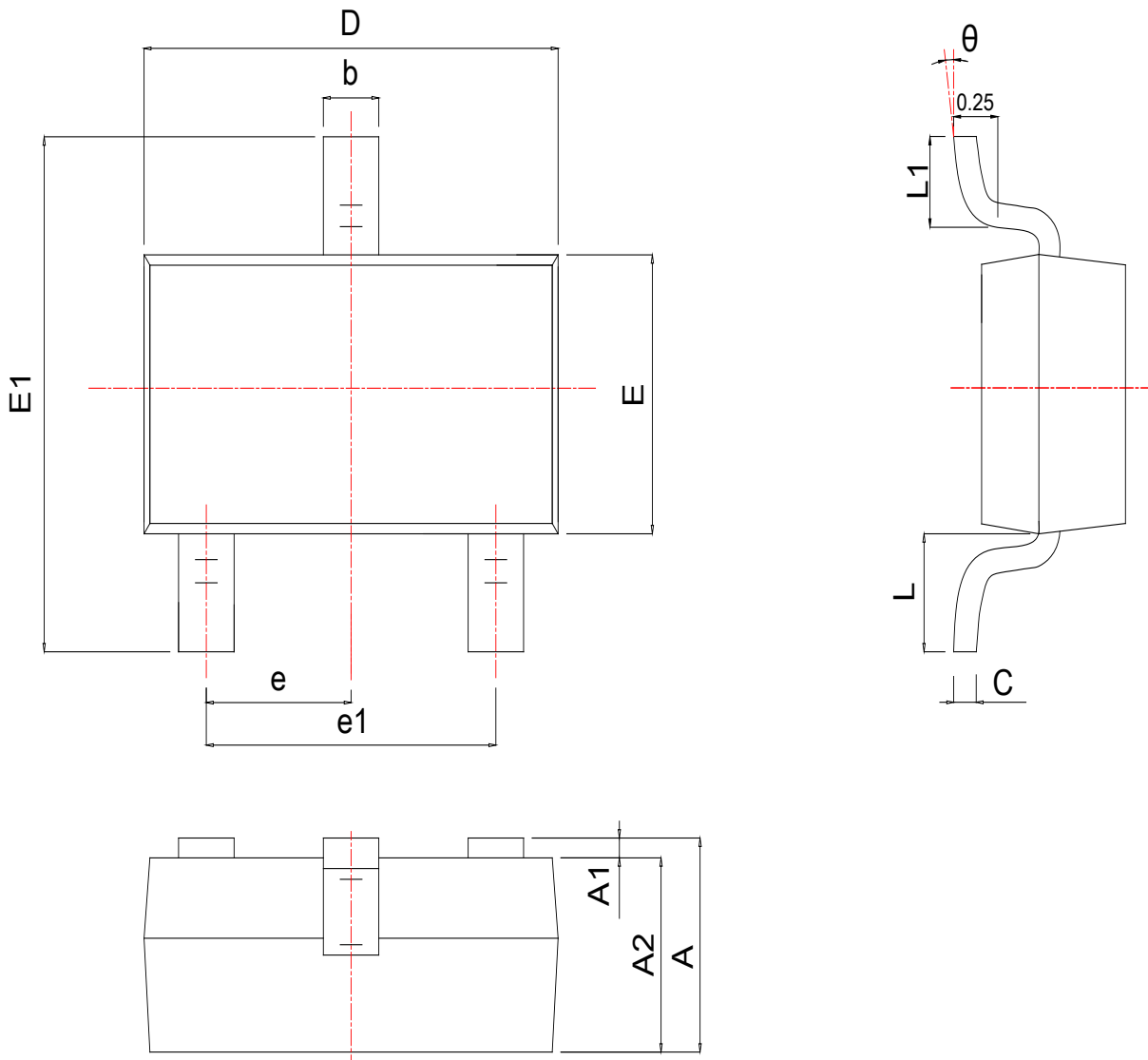


Switching Time Test Circuit and Waveforms



Package Information

SOT23



| SYMBOL | MM | | | INCH | | |
|----------|-----------|-------|-------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.900 | 1.025 | 1.150 | 0.035 | 0.040 | 0.045 |
| A1 | 0.050 | 0.075 | 0.100 | 0.002 | 0.003 | 0.004 |
| A2 | 0.900 | 0.975 | 1.020 | 0.035 | 0.038 | 0.040 |
| b | 0.300 | 0.400 | 0.500 | 0.012 | 0.016 | 0.020 |
| c | 0.080 | 0.115 | 0.150 | 0.003 | 0.005 | 0.006 |
| D | 2.800 | 2.900 | 3.000 | 0.110 | 0.114 | 0.118 |
| E | 1.200 | 1.300 | 1.400 | 0.047 | 0.051 | 0.055 |
| E1 | 2.250 | 2.400 | 2.550 | 0.089 | 0.094 | 0.100 |
| e | 0.950 TYP | | | 0.037 TYP | | |
| e1 | 1.800 | 1.900 | 2.000 | 0.071 | 0.075 | 0.079 |
| L | 0.540 REF | | | 0.021 REF | | |
| L1 | 0.400 | 0.500 | 0.600 | 0.016 | 0.018 | 0.020 |
| θ | 0° | * | 8° | 0° | * | 8° |

Customer Service**Worldwide Sales and Service:**

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.com

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com