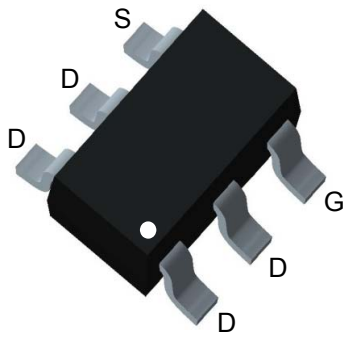
## Features

- -20V/-4A,
  $R_{DS\ (ON)}$ =35mΩ(Typ.)@$V_{GS}$=-4.5V
  $R_{DS\ (ON)}$ =45mΩ(Typ.)@$V_{GS}$=-2.5V
- Low On-Resistance
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

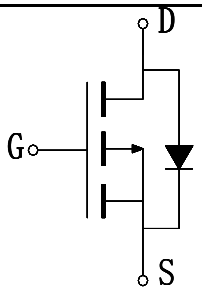
## Applications

- Load Switch
- Power Management
- Battery Protection

## Pin Description




SOT23-6




P-Channel MOSFET

## Absolute Maximum Ratings

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| **Common Ratings** ($T_A$=25°C Unless Otherwise Noted) | | | | |
| $V_{DSS}$ | Drain-Source Voltage | | -20 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±10 | |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current | $T_A$=25°C | -1.2 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DP}$ ① | 300μs Pulse Drain Current Tested | $T_A$=25°C | -16 | A |
| $I_D$ ② | Continuous Drain Current($V_{GS}$=-10V) | $T_A$=25°C | -4 | A |
| | | $T_A$=70°C | -3.2 | |
| $P_D$ | Maximum Power Dissipation | $T_A$=25°C | 1.3 | W |
| | | $T_A$=70°C | 0.8 | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | | - | °C/W |
| $R_{\theta JA}$ ③ | Thermal Resistance-Junction to Ambient | | 100 | °C/W |
| **Drain-Source Avalanche Ratings** | | | | |
| $E_{AS}$ ④ | Avalanche Energy, Single Pulsed | | TBD | mJ |

## Electrical Characteristics ($T_A$=25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Condition | RU20P4C6 | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| **Static Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_{DS}$=-250μA | -20 | | | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-20V, $V_{GS}$=0V | | | -1 | μA |
| | | $T_J$=125°C | | | -30 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_{DS}$=-250μA | -0.4 | | -1.1 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$=±10V, $V_{DS}$=0V | | | ±100 | nA |
| $R_{DS(ON)}$ ⑤ | Drain-Source On-state Resistance | $V_{GS}$=-4.5V, $I_{DS}$=-4A | | 35 | 60 | mΩ |
| | | $V_{GS}$=-2.5V, $I_{DS}$=-3.2A | | 45 | 100 | mΩ |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$ ⑤ | Diode Forward Voltage | $I_{SD}$=-1A, $V_{GS}$=0V | | | -1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_{SD}$=-4A, $dI_{SD}/dt$=100A/μs | | 15 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | | 21 | | nC |
| **Dynamic Characteristics** ⑥ | | | | | | |
| $R_G$ | Gate Resistance | $V_{GS}$=0V,$V_{DS}$=0V,F=1MHz | | 0.9 | | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V, $V_{DS}$=-10V, Frequency=1.0MHz | | 630 | | pF |
| $C_{oss}$ | Output Capacitance | | | 125 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 65 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}$=-10V, $I_{DS}$=-4A, $V_{GEN}$=-4.5V,$R_G$=6Ω | | 9 | | ns |
| $t_r$ | Turn-on Rise Time | | | 16 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 45 | | |
| $t_f$ | Turn-off Fall Time | | | 21 | | |
| **Gate Charge Characteristics** ⑥ | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-16V, $V_{GS}$=-4.5V, $I_{DS}$=-4A | | 10 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 1.8 | | |
| $Q_{gd}$ | Gate-Drain Charge | | | 2.9 | | |

Notes:

①Pulse width limited by safe operating area.

②Calculated continuous current based on maximum allowable junction temperature.

③When mounted on 1 inch square copper board, t≤10sec. The value in any given application depends on the user's specific board design.

④Limited by $T_{Jmax.}$ Starting $T_J$ = 25°C.

⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.

⑥Guaranteed by design, not subject to production testing.

## Ordering and Marking Information

| Device | Marking① | Package | Packaging | Quantity | Reel Size | Tape width |
|---|---|---|---|---|---|---|
| RU20P4C6 | KXYWW | SOT23-6 | Tape&Reel | 3000 | 7'' | 8mm |

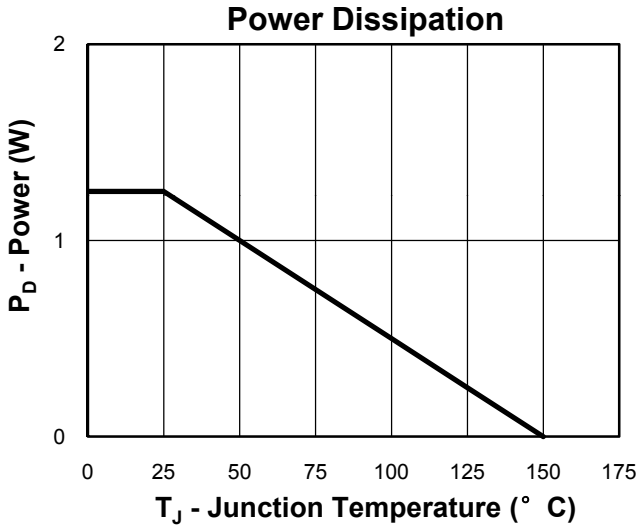
① The following characters could be different and means:

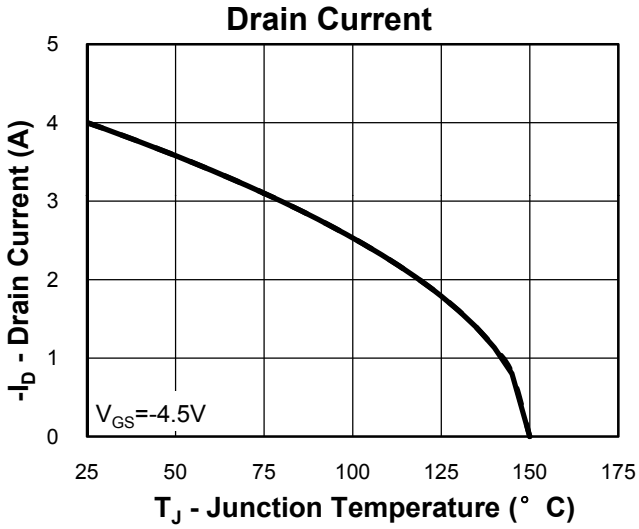
X =Assembly site code

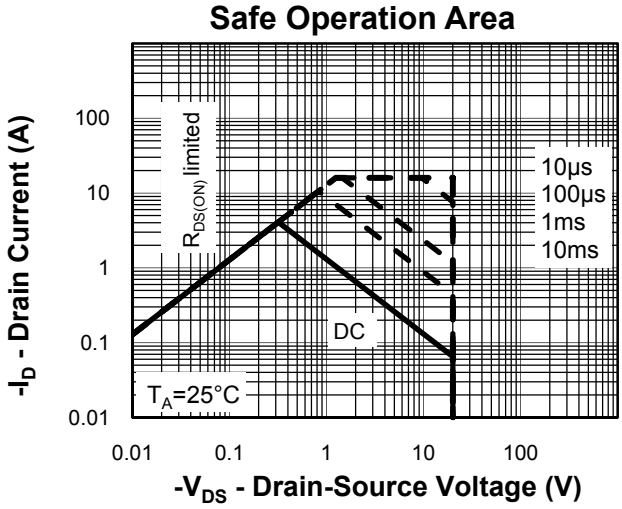
Y =Year

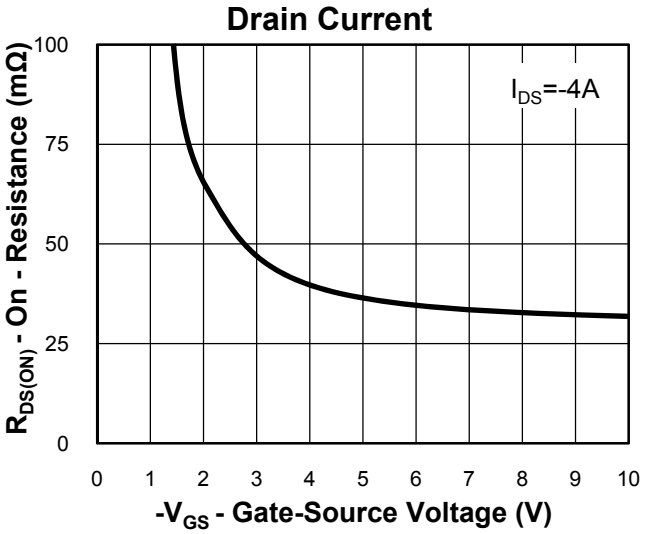
WW =Work Week

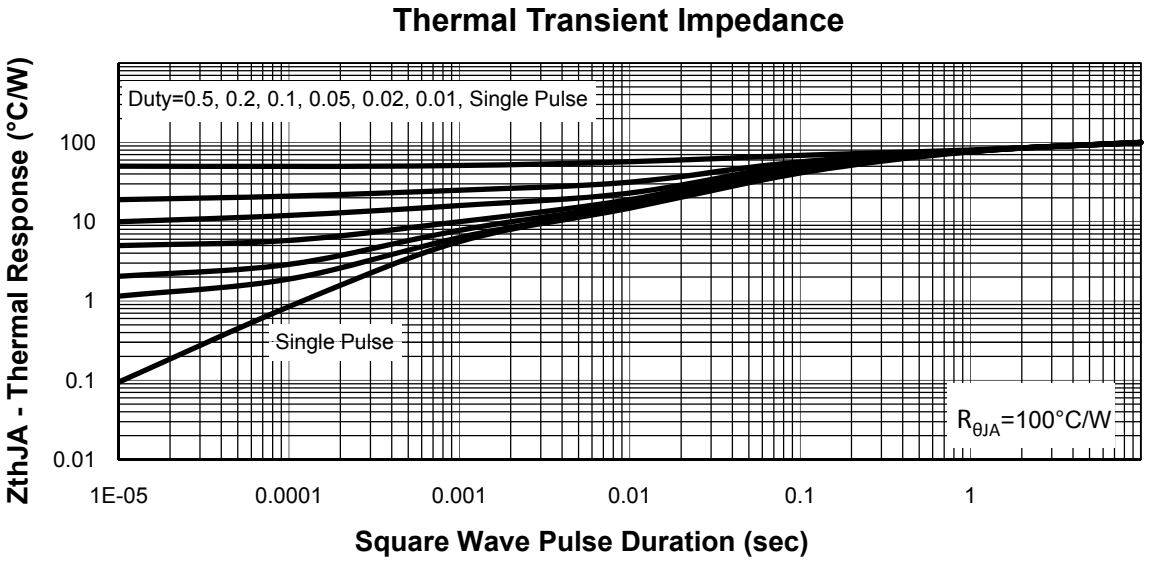
## Typical Characteristics



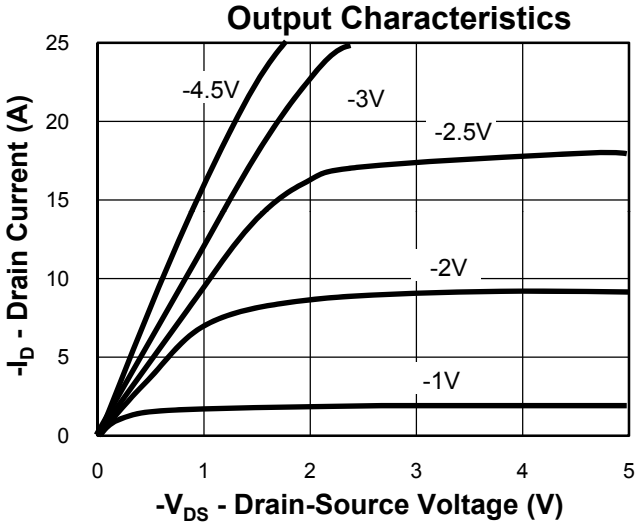



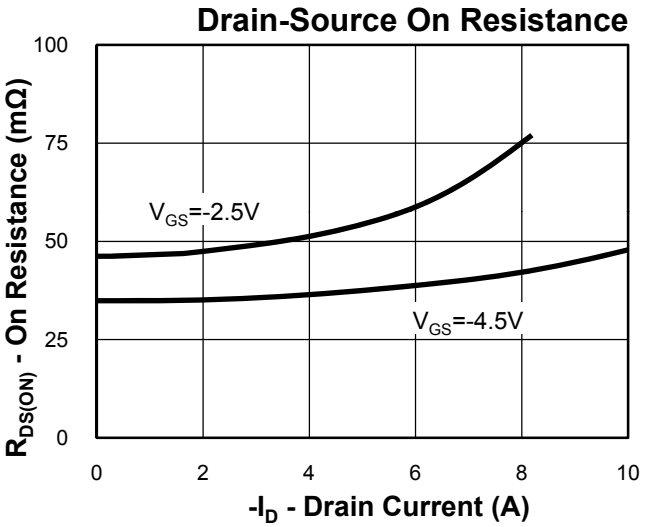



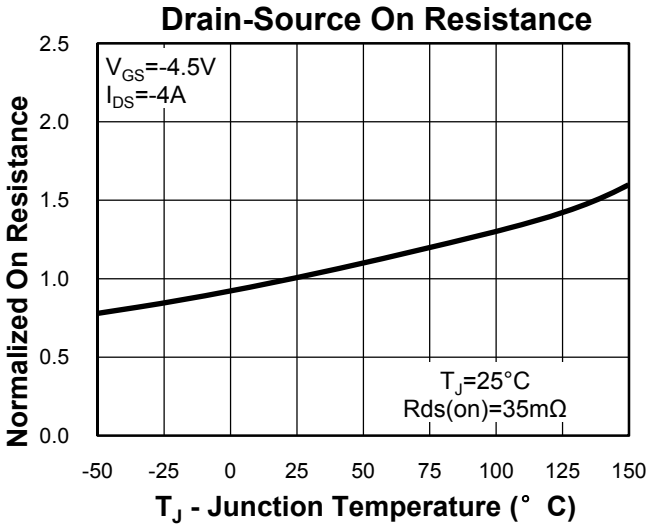



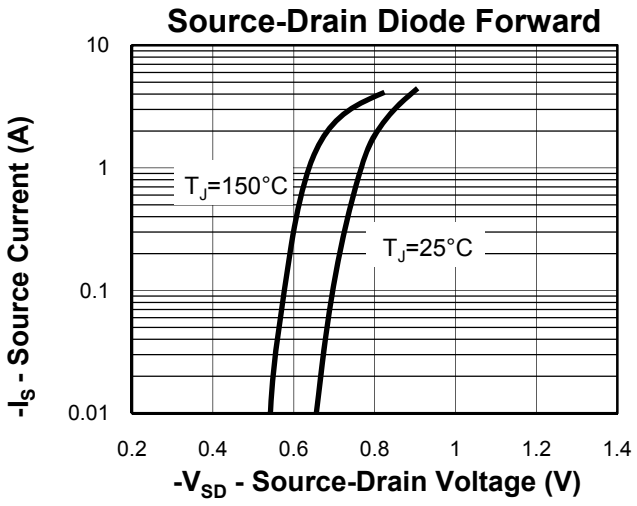



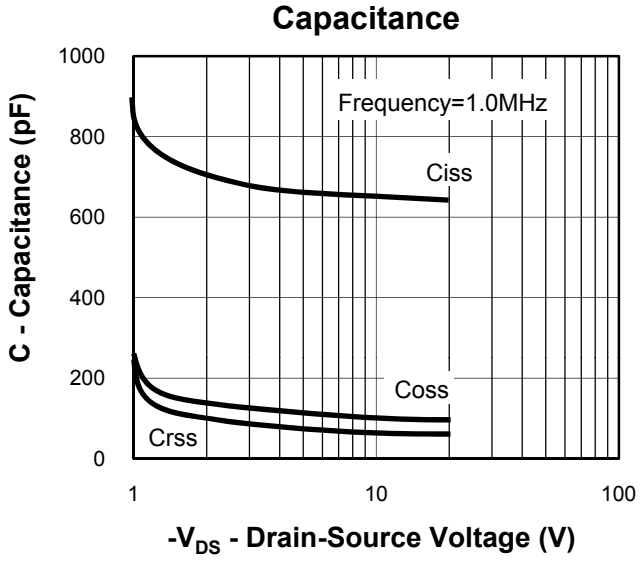
## Typical Characteristics

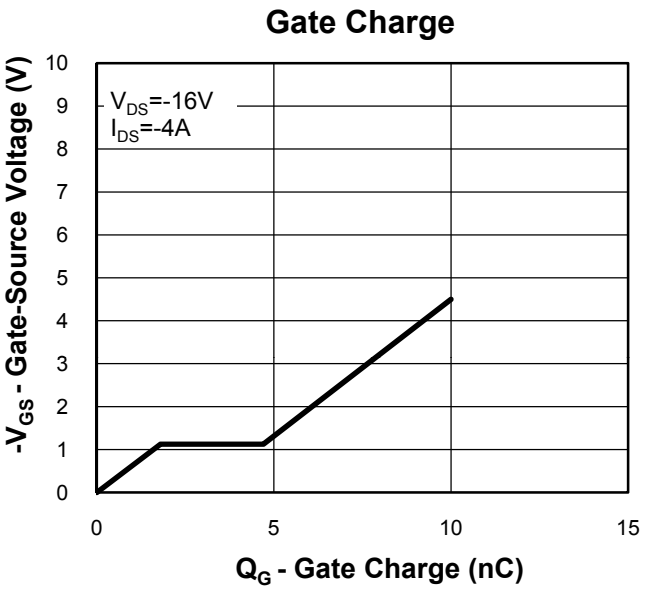


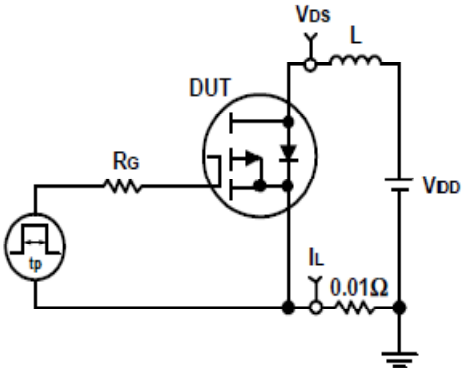



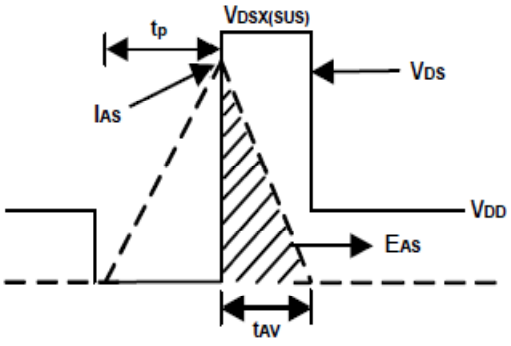



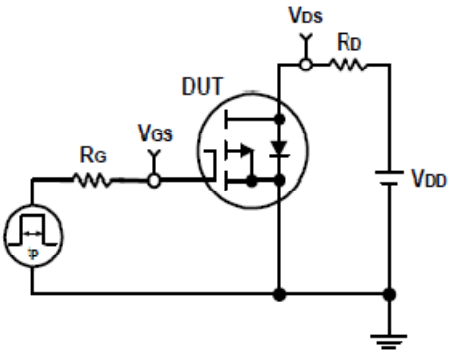



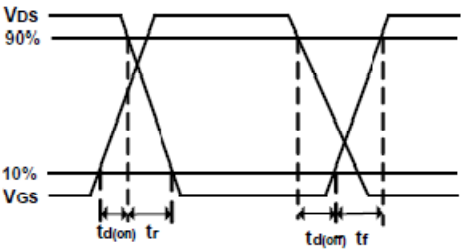
## Avalanche Test Circuit and Waveforms



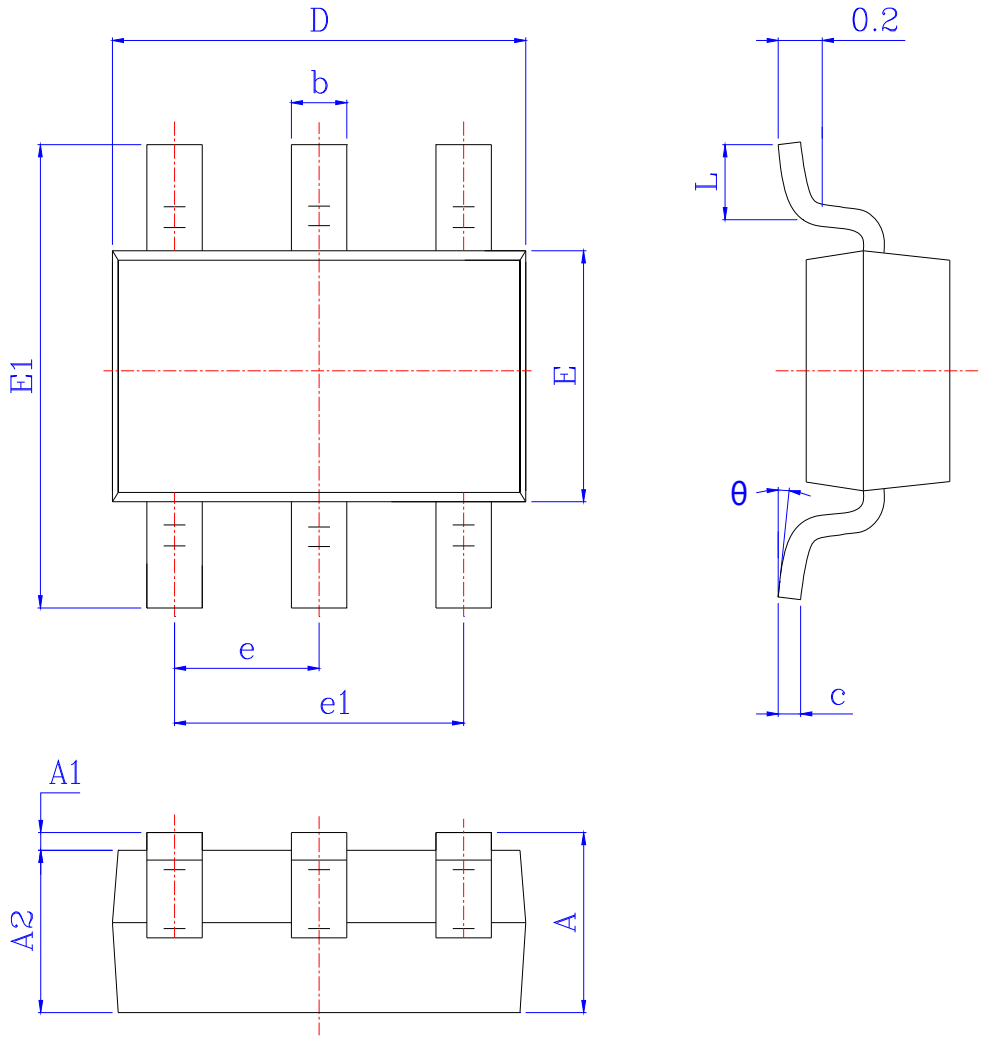

## Switching Time Test Circuit and Waveforms



## Package Information

SOT23-6




| SYMBOL | MM | | | INCH | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.950 | 1.150 | 1.450 | 0.037 | 0.045 | 0.057 |
| A1 | 0.000 | 0.060 | 0.150 | 0.000 | 0.002 | 0.006 |
| A2 | 0.900 | 1.100 | 1.300 | 0.035 | 0.043 | 0.051 |
| b | 0.300 | 0.400 | 0.500 | 0.012 | 0.016 | 0.020 |
| c | 0.080 | 0.140 | 0.200 | 0.003 | 0.006 | 0.008 |
| D | 2.800 | 2.900 | 3.050 | 0.110 | 0.114 | 0.120 |
| E | 1.500 | 1.600 | 1.750 | 0.059 | 0.063 | 0.069 |
| E1 | 2.600 | 2.800 | 3.000 | 0.102 | 0.110 | 0.118 |
| e | 0.950BSC | | | 0.037BSC | | |
| e1 | 1.800 | 1.900 | 2.000 | 0.071 | 0.075 | 0.079 |
| L | 0.300 | 0.450 | 0.600 | 0.012 | 0.018 | 0.024 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

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