

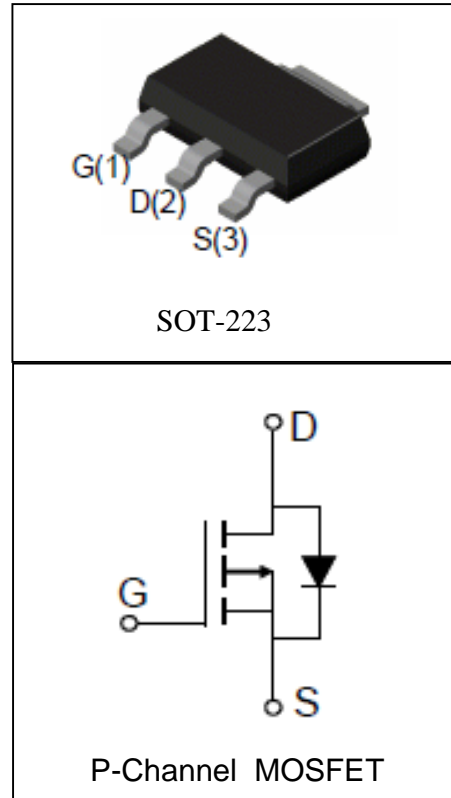
Features

- -30V/-5.5A,
 $R_{DS(ON)} = 38m\Omega$ (Typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 55m\Omega$ (Typ.) @ $V_{GS} = -4.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Available

Applications

- Power Management.

Pin Description



Absolute Maximum Ratings

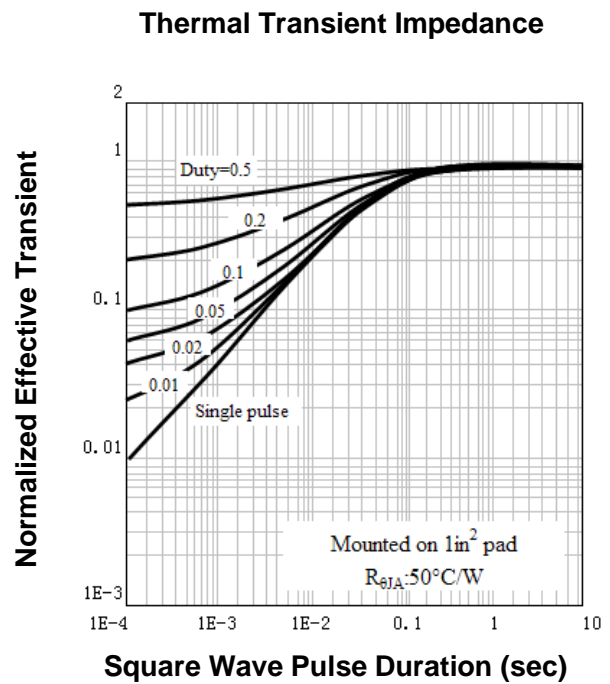
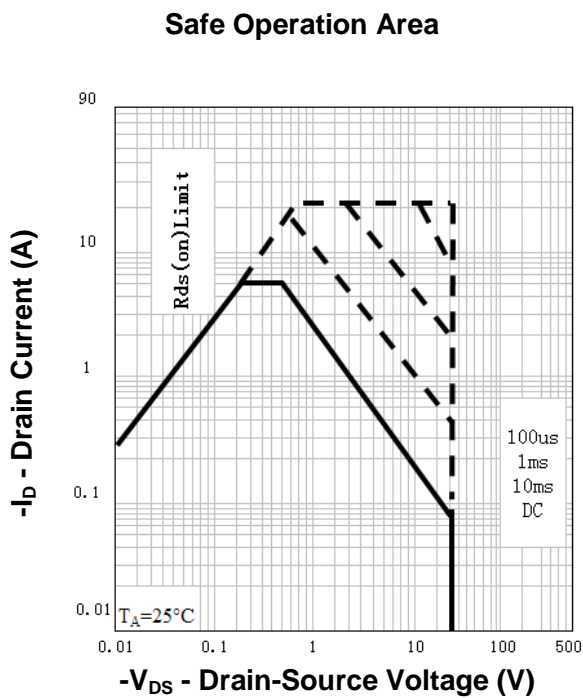
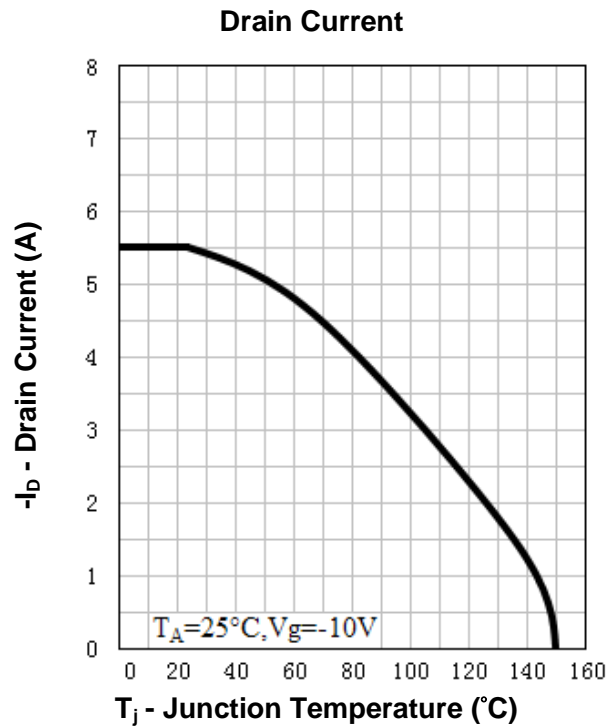
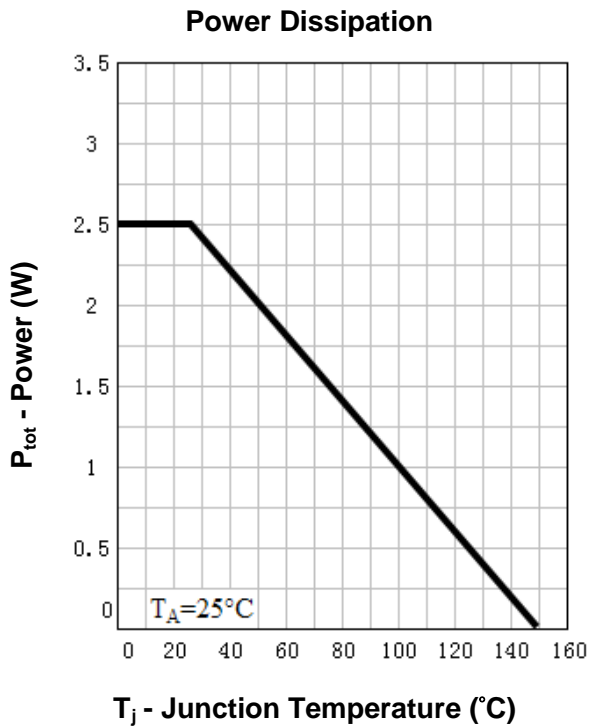
| Symbol | Parameter | Rating | Unit |
|--|--|--|--------------|
| Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted) | | | |
| V_{DSS} | Drain-Source Voltage | -30 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | |
| T_J | Maximum Junction Temperature | 150 | $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| I_S | Diode Continuous Forward Current | $T_A = 25^\circ C$ -3.1 | A |
| Mounted on Large Heat Sink | | | |
| I_{DP} | 300 μs Pulse Drain Current Tested | $T_A = 25^\circ C$ -22 ^① | A |
| I_D | Continuous Drain Current ($V_{GS} = -10V$) | $T_A = 25^\circ C$ | A |
| | | $T_A = 70^\circ C$ | |
| P_D | Maximum Power Dissipation | $T_A = 25^\circ C$ | W |
| | | $T_A = 70^\circ C$ | |
| $R_{\theta JA}$ ^② | Thermal Resistance-Junction to Ambient | 50 | $^\circ C/W$ |

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

| Symbol | Parameter | Test Condition | RU30P5D | | | 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 | $V_{DS}=-30V, V_{GS}=0V$ $T_J=85^\circ\text{C}$ | | | -1 -30 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=-250\mu A$ | -1 | -1.8 | -2.5 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| $R_{DS(on)}^{(3)}$ | Drain-Source On-state Resistance | $V_{GS}=-10V, I_{DS}=-5.2A$ | | 38 | 50 | m Ω |
| | | $V_{GS}=-4.5V, I_{DS}=-2A$ | | 55 | 90 | m Ω |
| Diode Characteristics | | | | | | |
| $V_{SD}^{(3)}$ | Diode Forward Voltage | $I_{SD}=-2A, V_{GS}=0V$ | | | -1 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=-5.5A, dI_{SD}/dt=100A/\mu s$ | | 12 | | ns |
| Q_{rr} | Reverse Recovery Charge | | | 7 | | nC |
| Dynamic Characteristics ⁽⁴⁾ | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | | 1.1 | | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=-15V,$ Frequency=1.0MHz | | 550 | | pF |
| C_{oss} | Output Capacitance | | | 90 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 50 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=-15V, R_L=2.7\Omega,$ $I_{DS}=-5.5A, V_{GEN}=-10V,$ $R_G=6\Omega$ | | 8 | | ns |
| t_r | Turn-on Rise Time | | | 10 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 28 | | |
| t_f | Turn-off Fall Time | | | 10 | | |
| Gate Charge Characteristics ⁽⁴⁾ | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=-24V, V_{GS}=-10V,$ $I_{DS}=-5.5A$ | | 11 | 14 | nC |
| Q_{gs} | Gate-Source Charge | | | 2 | | |
| Q_{gd} | Gate-Drain Charge | | | 3 | | |

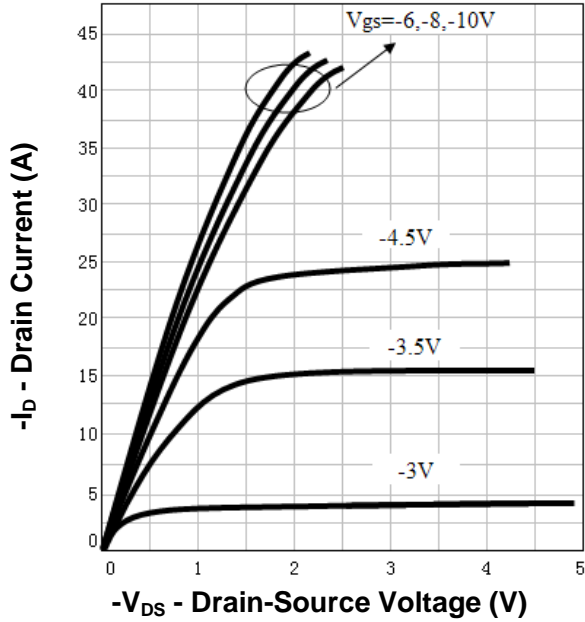
- Notes: ① Pulse width limited by safe operating area.
 ② When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
 ③ Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 ④ Guaranteed by design, not subject to production testing.

Typical Characteristics

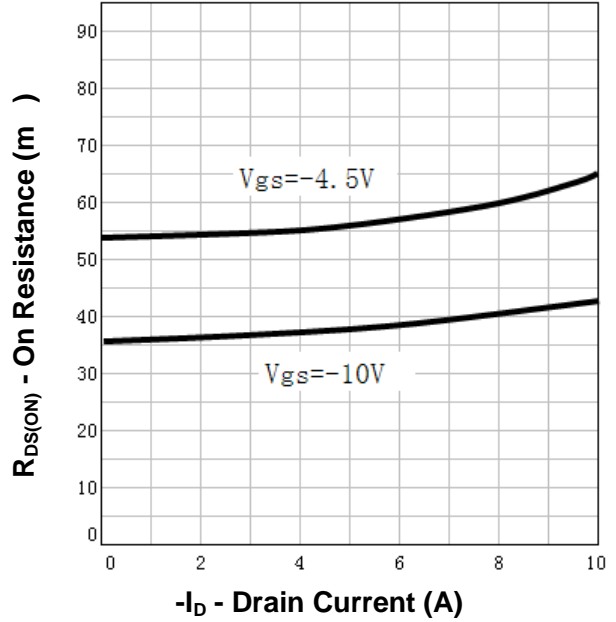


Typical Characteristics

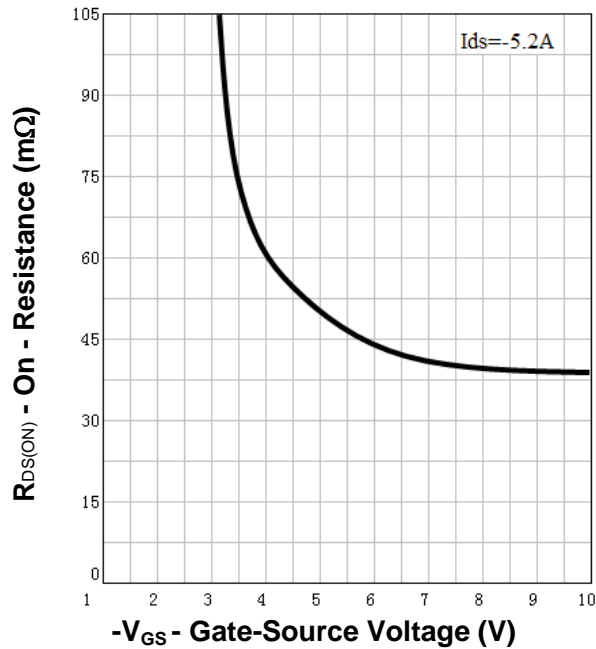
Output Characteristics



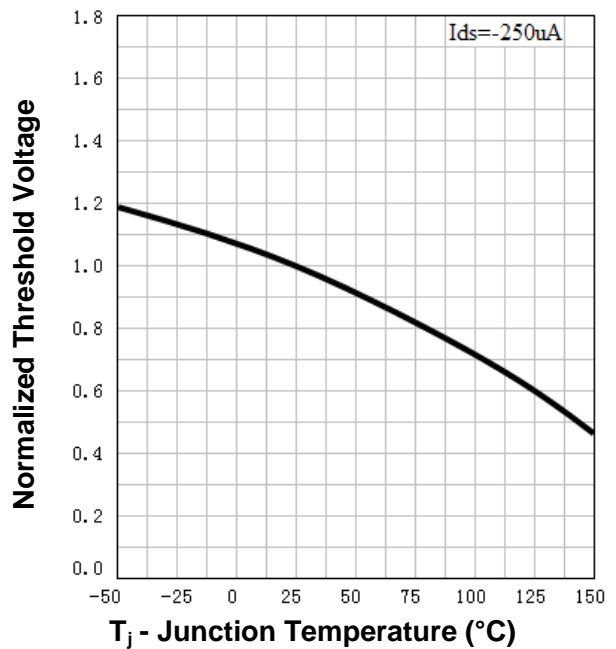
Drain-Source On Resistance



Drain-Source On Resistance

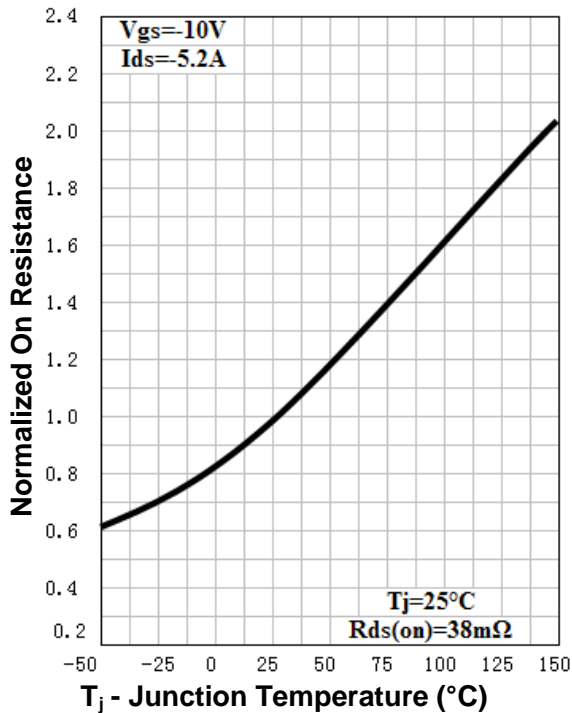


Gate Threshold Voltage

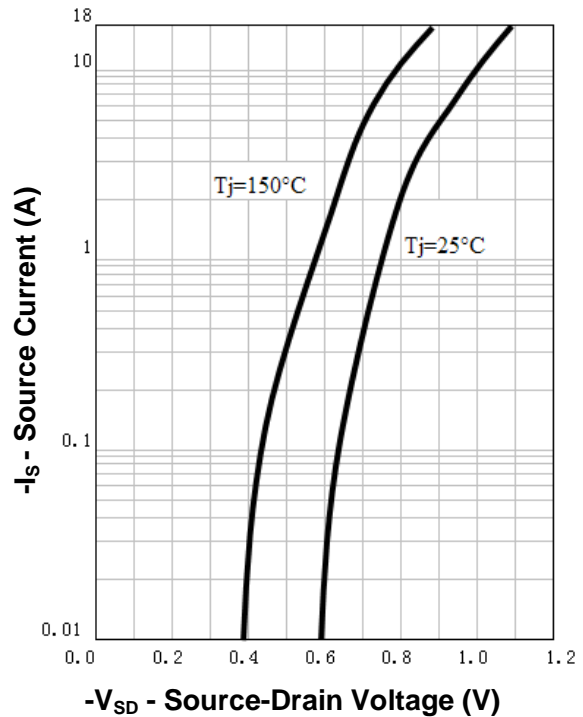


Typical Characteristics

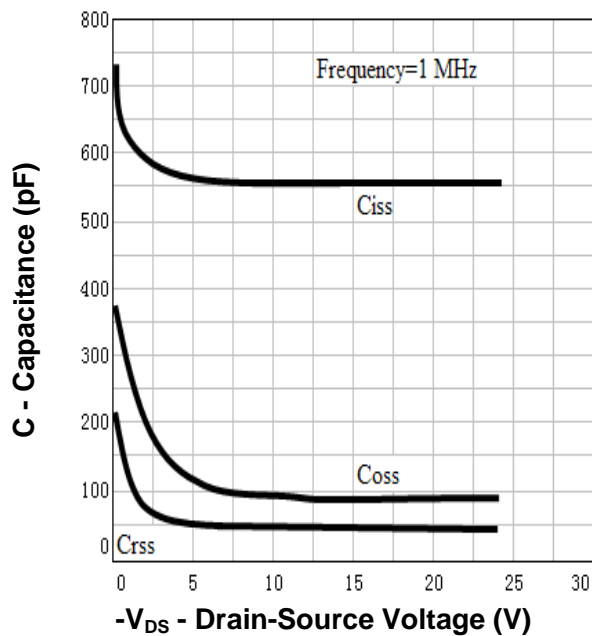
Drain-Source On Resistance



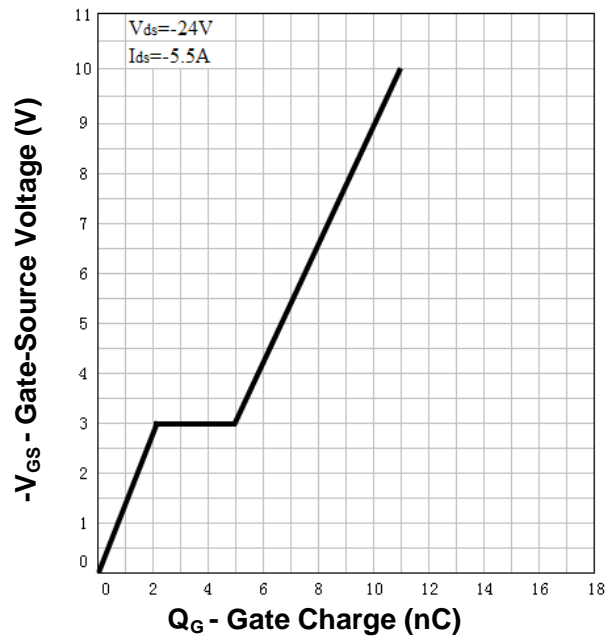
Source-Drain Diode Forward



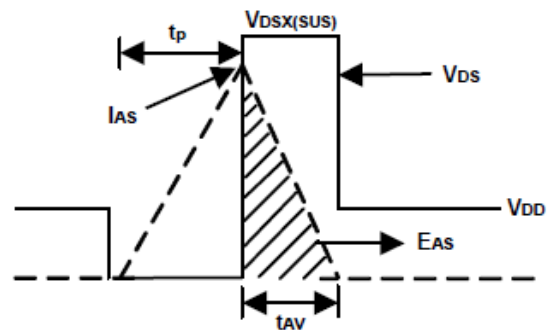
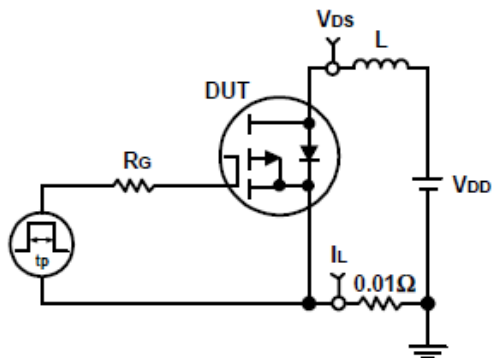
Capacitance



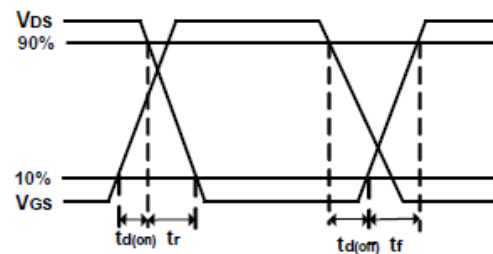
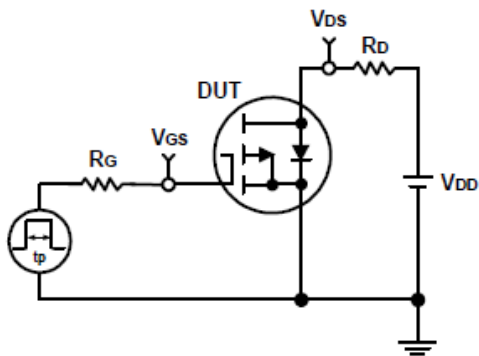
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

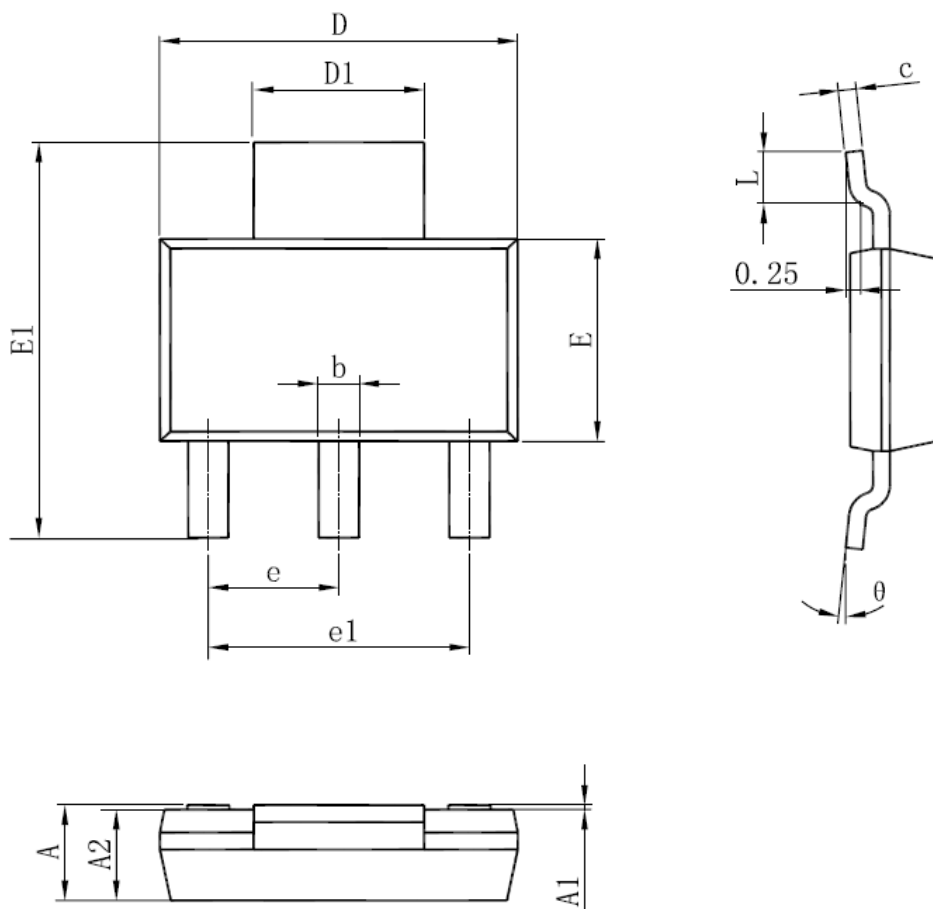


Ordering and Marking Information

| Device | Marking | Package | Packaging | Quantity | Reel Size | Tape width |
|---------------|----------------|----------------|------------------|-----------------|------------------|-------------------|
| RU30P5D | RU30P5D | SOT-223 | Tape&Reel | 2500 | 13'' | 12mm |

Package Information

SOT-223



| SYMBOL | MM | | INCH | | SYMBOL | MM | | INCH | |
|--------|-------|-------|-------|-------|----------|------------|-------|------------|-------|
| | MIN | MAX | MIN | MAX | | MIN | MAX | MIN | MAX |
| A | 1.520 | 1.800 | 0.060 | 0.071 | E | 3.300 | 3.700 | 0.130 | 0.146 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 | E1 | 6.830 | 7.070 | 0.269 | 0.278 |
| A2 | 1.500 | 1.700 | 0.059 | 0.067 | e | 2.300(BSC) | | 0.091(BSC) | |
| b | 0.660 | 0.820 | 0.026 | 0.032 | e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| c | 0.250 | 0.350 | 0.010 | 0.014 | L | 0.900 | 1.150 | 0.035 | 0.045 |
| D | 6.200 | 6.400 | 0.244 | 0.252 | θ | 0° | 10° | 0° | 10° |
| D1 | 2.900 | 3.100 | 0.114 | 0.122 | | | | | |

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

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