

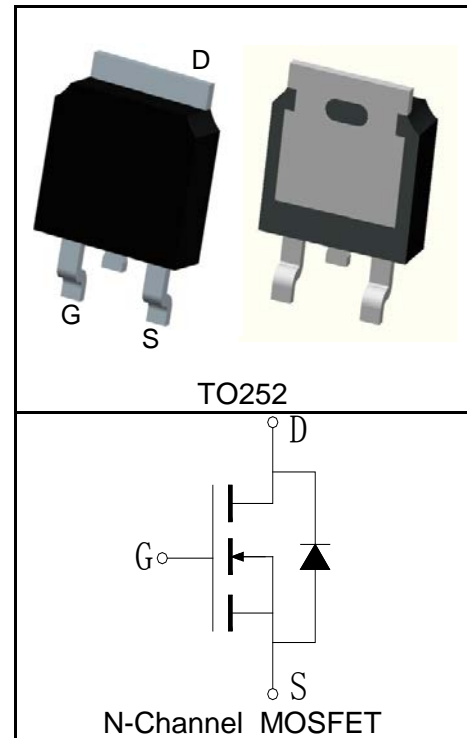
### Features

- 70V/80A,  
 $R_{DS(ON)} = 5.7m\Omega(Typ.)@V_{GS}=10V$
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

### Applications

- Power Supply

### Pin Description



### Absolute Maximum Ratings

| Symbol   | Parameter                                | Rating                    | Unit         |
|--|--|---------------------------|--------------|
| <b>Common Ratings</b> ( $T_C=25^\circ C$ Unless Otherwise Noted) |  |                           |              |
| $V_{DSS}$  | Drain-Source Voltage                     | 70                        | V            |
| $V_{GSS}$  | Gate-Source Voltage                      | $\pm 25$                  |              |
| $T_J$  | Maximum Junction Temperature             | 175                       | $^\circ C$   |
| $T_{STG}$  | Storage Temperature Range                | -55 to 175                | $^\circ C$   |
| $I_S$  | Diode Continuous Forward Current         | $T_C=25^\circ C$<br>80    | A            |
| <b>Mounted on Large Heat Sink</b>                                |  |                           |              |
| $I_{DP}^{①}$   | 300 $\mu s$ Pulse Drain Current Tested   | $T_C=25^\circ C$<br>320   | A            |
| $I_D^{②}$  | Continuous Drain Current( $V_{GS}=10V$ ) | $T_C=25^\circ C$<br>80    | A            |
|  |  | $T_C=100^\circ C$<br>56   |              |
| $P_D$  | Maximum Power Dissipation                | $T_C=25^\circ C$<br>125   | W            |
|  |  | $T_C=100^\circ C$<br>62.5 |              |
| $R_{\theta JC}$  | Thermal Resistance-Junction to Case      | 1.2                       | $^\circ C/W$ |
| $R_{\theta JA}$  | Thermal Resistance-Junction to Ambient   | 100                       | $^\circ C/W$ |
| <b>Drain-Source Avalanche Ratings</b>                            |  |                           |              |
| $E_{AS}^{③}$   | Avalanche Energy, Single Pulsed          | 225                       | mJ           |

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

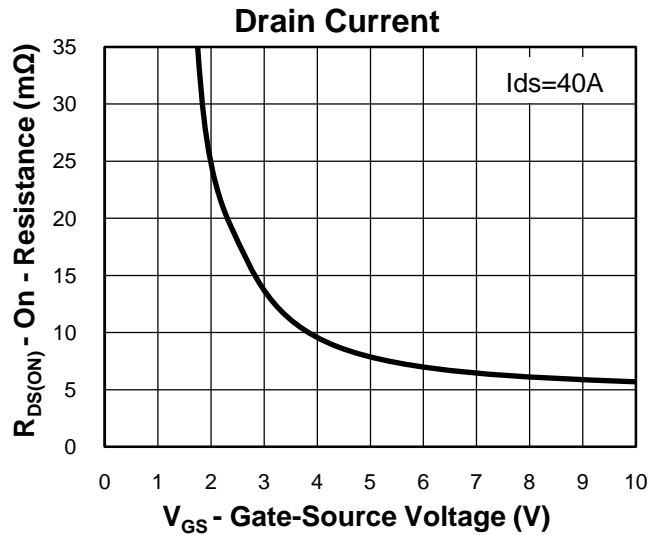
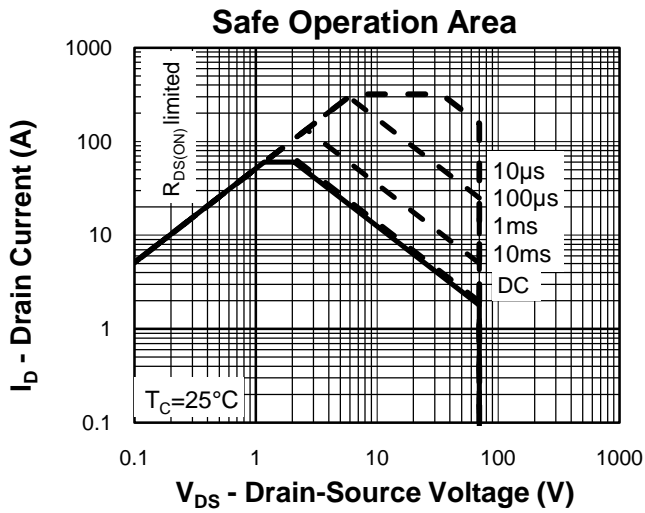
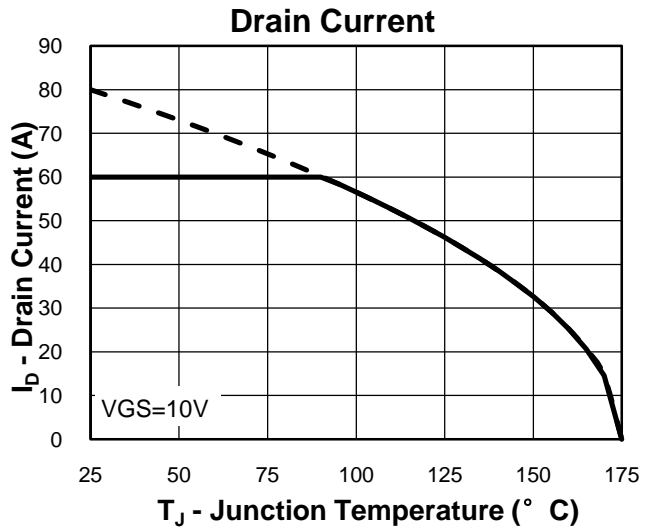
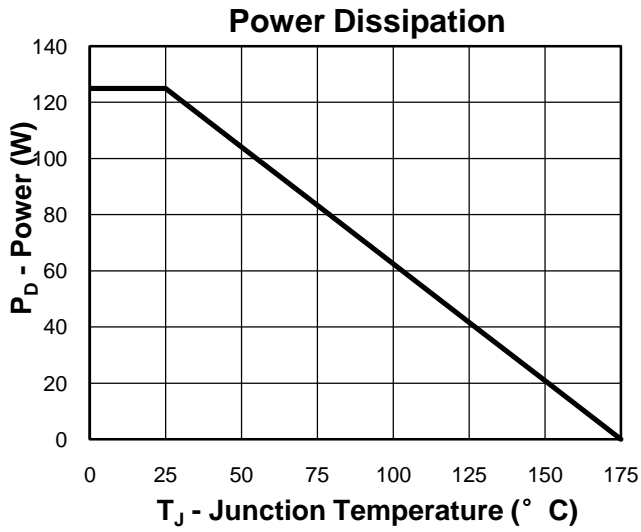
| Symbol  | Parameter                        | Test Condition  | RU7080L |      |           | Unit       |
|---|----------------------------------|---|---------|------|-----------|------------|
|   |                                  |   | Min.    | Typ. | Max.      |            |
| <b>Static Characteristics</b>                     |                                  |   |         |      |           |            |
| $BV_{DSS}$  | Drain-Source Breakdown Voltage   | $V_{GS}=0V, I_{DS}=250\mu A$                              | 70      |      |           | V          |
| $I_{DSS}$   | Zero Gate Voltage Drain Current  | $V_{DS}=70V, V_{GS}=0V$                                   |         |      | 1         | $\mu A$    |
|   |                                  | $T_J=125^\circ\text{C}$                                   |         |      | 30        |            |
| $V_{GS(th)}$                                      | Gate Threshold Voltage           | $V_{DS}=V_{GS}, I_{DS}=250\mu A$                          | 2       | 3    | 4         | V          |
| $I_{GSS}$   | Gate Leakage Current             | $V_{GS}=\pm 25V, V_{DS}=0V$                               |         |      | $\pm 100$ | nA         |
| $R_{DS(ON)}^{(4)}$                                | Drain-Source On-state Resistance | $V_{GS}=10V, I_{DS}=40A$                                  |         | 5.7  | 8         | m $\Omega$ |
| <b>Diode Characteristics</b>                      |                                  |   |         |      |           |            |
| $V_{SD}^{(4)}$                                    | Diode Forward Voltage            | $I_{SD}=40A, V_{GS}=0V$                                   |         |      | 1.2       | V          |
| $t_{rr}$  | Reverse Recovery Time            | $I_{SD}=40A, dI_{SD}/dt=100A/\mu s$                       |         | 45   |           | ns         |
| $Q_{rr}$  | Reverse Recovery Charge          |   |         | 93   |           | nC         |
| <b>Dynamic Characteristics</b> <sup>(5)</sup>     |                                  |   |         |      |           |            |
| $R_G$   | Gate Resistance                  | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$                     |         | 1.5  |           | $\Omega$   |
| $C_{iss}$   | Input Capacitance                | $V_{GS}=0V,$<br>$V_{DS}=35V,$<br>Frequency=1.0MHz         |         | 3450 |           | pF         |
| $C_{oss}$   | Output Capacitance               |   |         | 930  |           |            |
| $C_{riss}$  | Reverse Transfer Capacitance     |   |         | 230  |           |            |
| $t_{d(ON)}$                                       | Turn-on Delay Time               | $V_{DD}=35V, I_{DS}=40A,$<br>$V_{GEN}=10V, R_G=4.7\Omega$ |         | 40   |           | ns         |
| $t_r$   | Turn-on Rise Time                |   |         | 132  |           |            |
| $t_{d(OFF)}$                                      | Turn-off Delay Time              |   |         | 180  |           |            |
| $t_f$   | Turn-off Fall Time               |   |         | 90   |           |            |
| <b>Gate Charge Characteristics</b> <sup>(5)</sup> |                                  |   |         |      |           |            |
| $Q_g$   | Total Gate Charge                | $V_{DS}=56V, V_{GS}=10V,$<br>$I_{DS}=40A$                 |         | 67   |           | nC         |
| $Q_{gs}$  | Gate-Source Charge               |   |         | 14   |           |            |
| $Q_{gd}$  | Gate-Drain Charge                |   |         | 22   |           |            |

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 60A.
  - ③ Limited by  $T_{Jmax}$ ,  $I_{AS}=30A$ ,  $V_{DD}=48V$ ,  $R_G=50\Omega$ , Starting  $T_J=25^\circ\text{C}$ .
  - ④ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

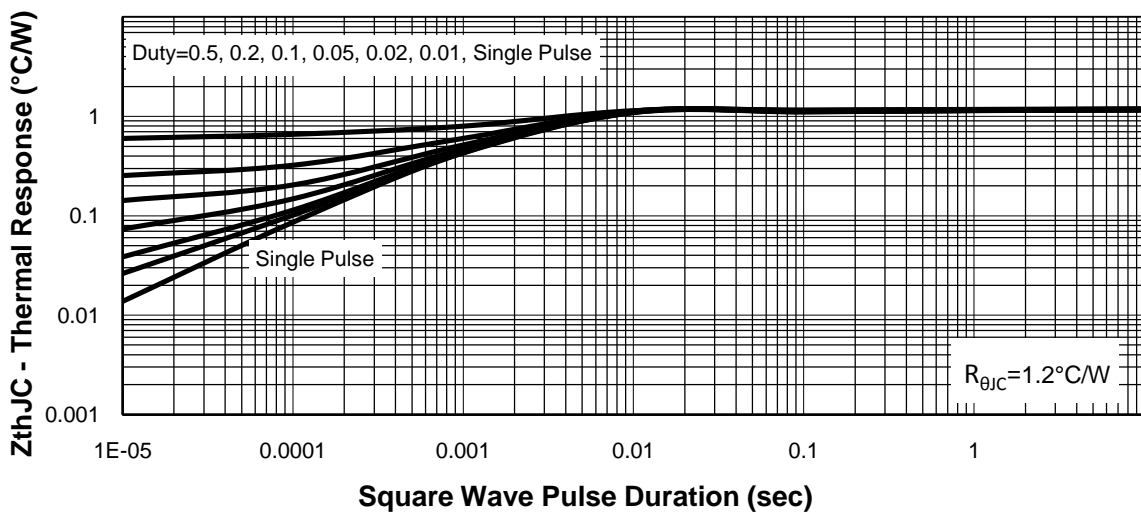
**Ordering and Marking Information**

| <b>Device</b> | <b>Marking</b> | <b>Package</b> | <b>Packaging</b> | <b>Quantity</b> | <b>Reel Size</b> | <b>Tape width</b> |
|---------------|----------------|----------------|------------------|-----------------|------------------|-------------------|
| RU7080L       | RU7080L        | TO252          | Tape&Reel        | 2500            | 13"              | 16mm              |

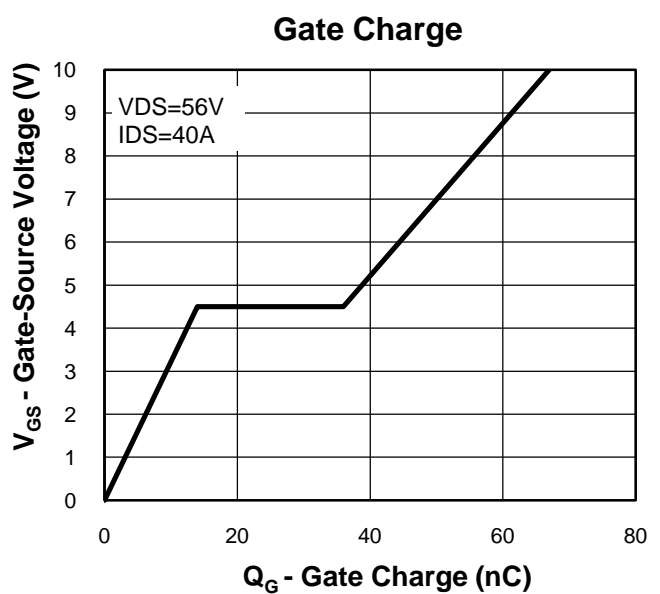
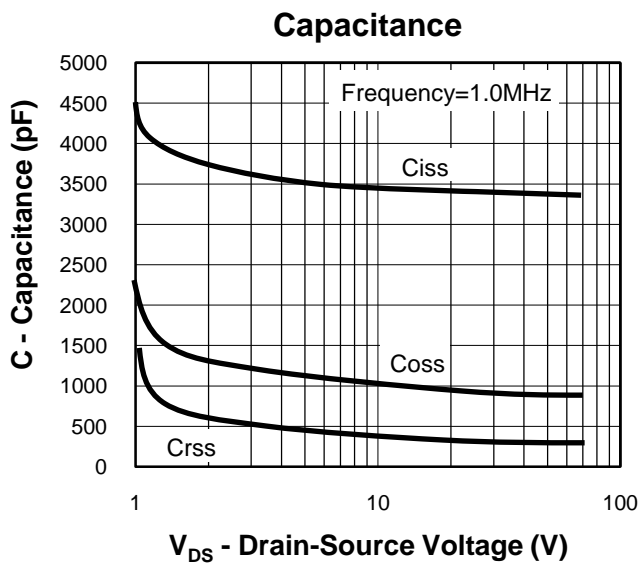
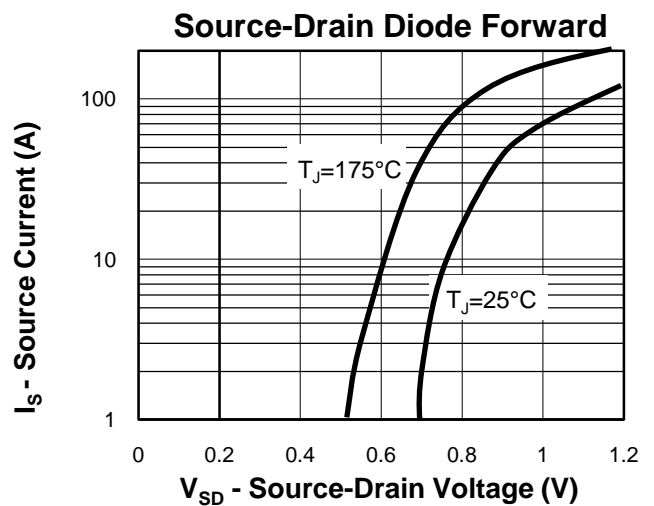
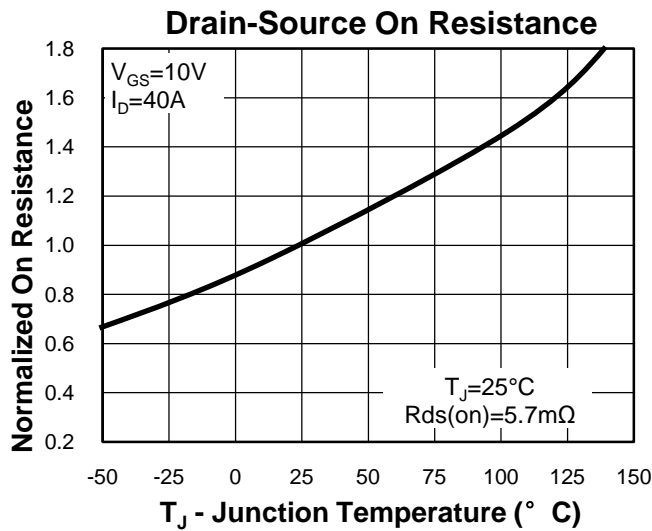
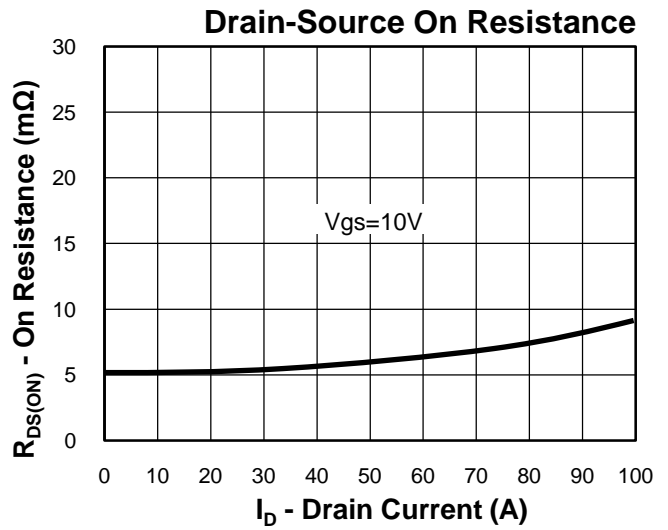
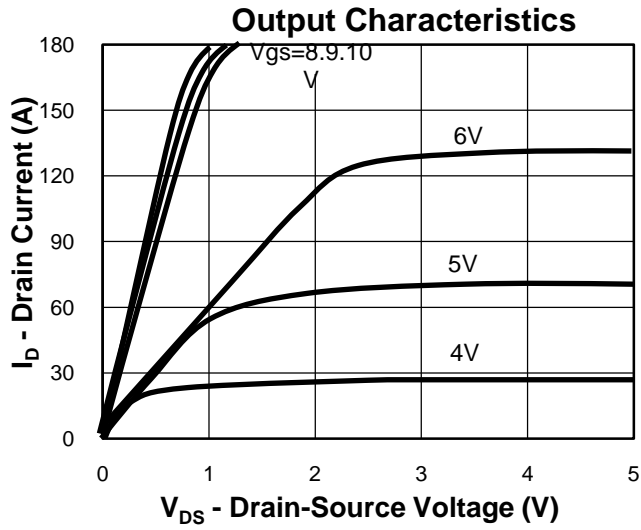
**Typical Characteristics**



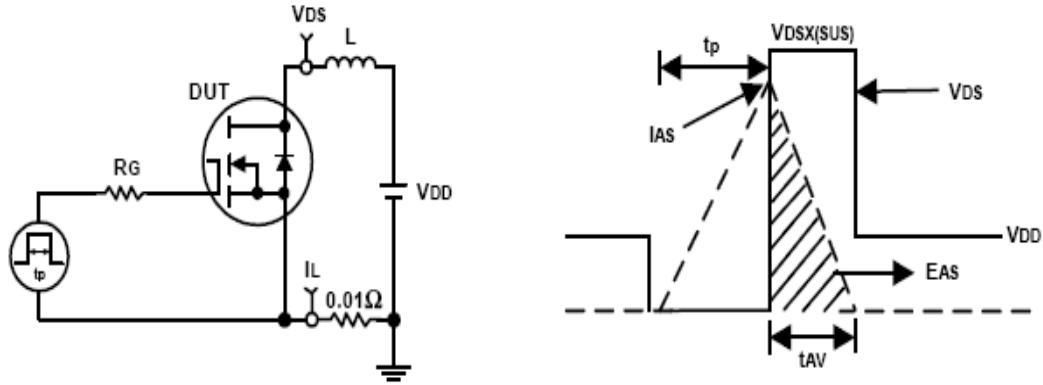
**Thermal Transient Impedance**



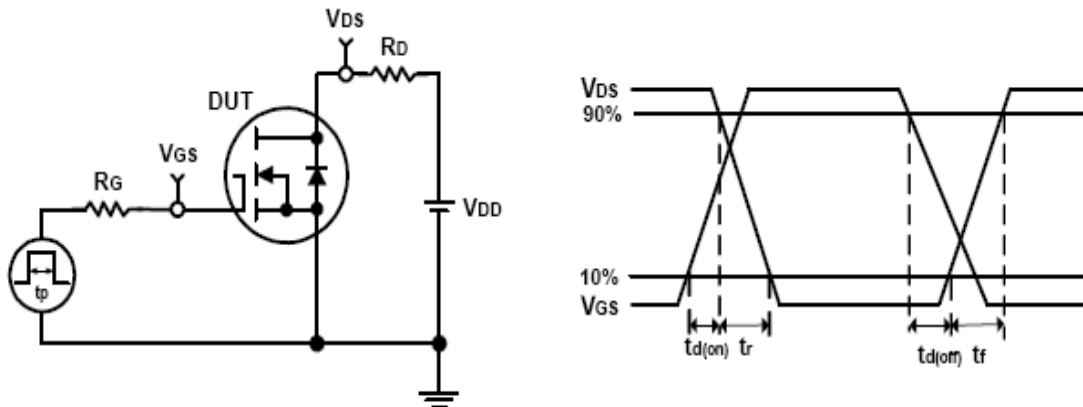
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**

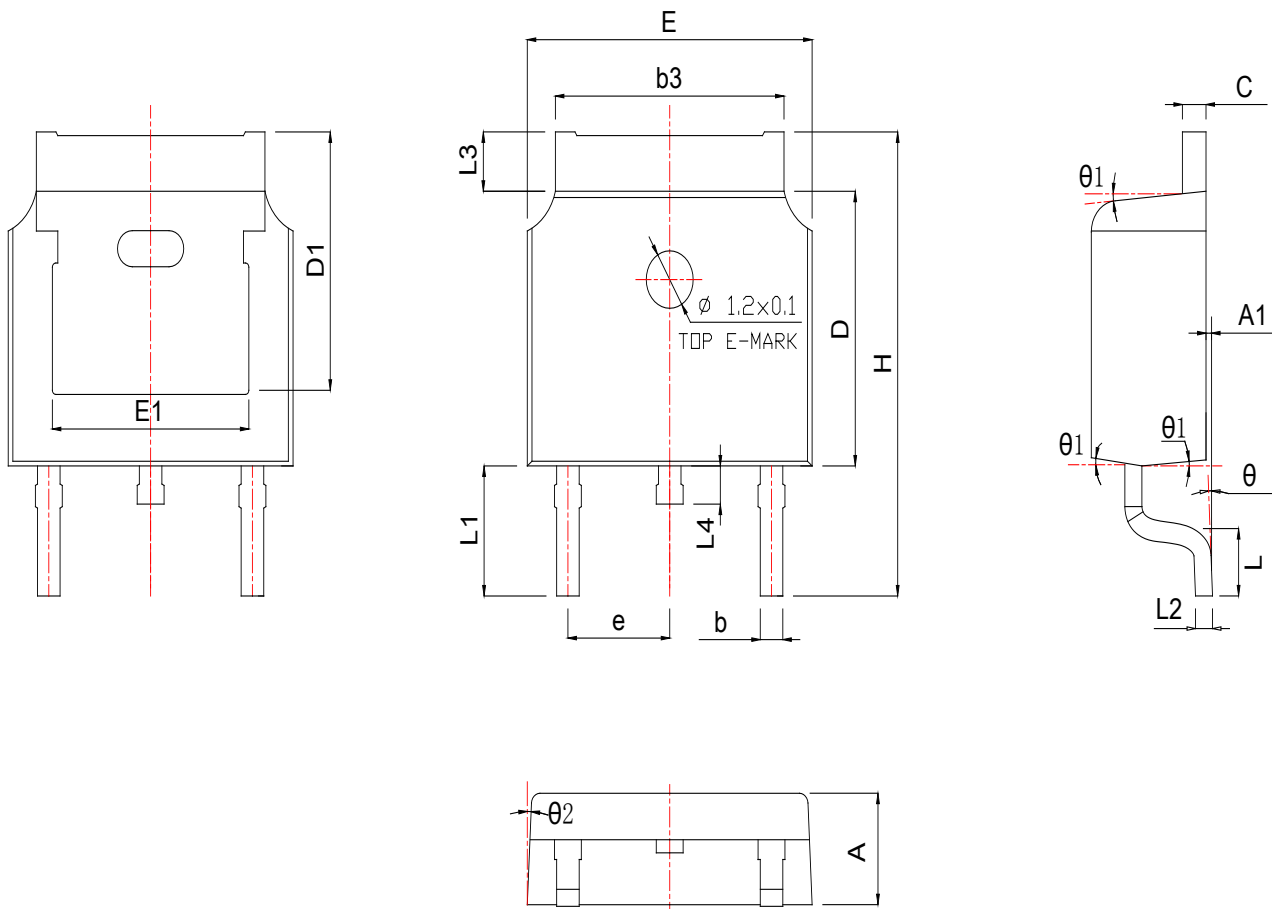


**Switching Time Test Circuit and Waveforms**



**Package Information**

**TO252**



| SYMBOL | MM        |           |        | INCH      |           |       |
|--------|-----------|-----------|--------|-----------|-----------|-------|
|        | MIN       | NOM       | MAX    | MIN       | NOM       | MAX   |
| A      | 2.200     | 2.290     | 2.380  | 0.087     | 0.090     | 0.094 |
| A1     | 0.000     |           | 0.100  | 0.000     |           | 0.004 |
| b      | 0.720     | 0.785     | 0.850  | 0.028     | 0.031     | 0.033 |
| b3     | 5.230     | 5.345     | 5.460  | 0.206     | 0.210     | 0.215 |
| c      | 0.470     | 0.525     | 0.580  | 0.019     | 0.021     | 0.023 |
| D      | 6.000     | 6.100     | 6.200  | 0.236     | 0.240     | 0.244 |
| D1     |           | 5.30 REF  |        |           | 0.20 REF  |       |
| E      | 6.500     | 6.600     | 6.700  | 0.256     | 0.260     | 0.264 |
| E1     | 4.700     | 4.810     | 4.920  | 0.185     | 0.189     | 0.194 |
| e      | 2.28 REF  |           |        | 0.09 REF  |           |       |
| H      | 9.900     | 10.100    | 10.300 | 0.390     | 0.398     | 0.406 |
| L      | 1.400     | 1.550     | 1.700  | 0.055     | 0.061     | 0.067 |
| L1     |           | 2.743 REF |        |           | 0.108 REF |       |
| L2     | 0.510 BSC |           |        | 0.020 BSC |           |       |
| L3     | 0.900     | 1.075     | 1.250  | 0.035     | 0.042     | 0.049 |
| L4     | 0.600     | 0.800     | 1.000  | 0.024     | 0.031     | 0.039 |
| θ      | 0°        |           | 8°     | 0°        |           | 8°    |
| θ 1    | 5°        | 7°        | 9°     | 5°        | 7°        | 9°    |
| θ 2    | 5°        | 7°        | 9°     | 5°        | 7°        | 9°    |

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