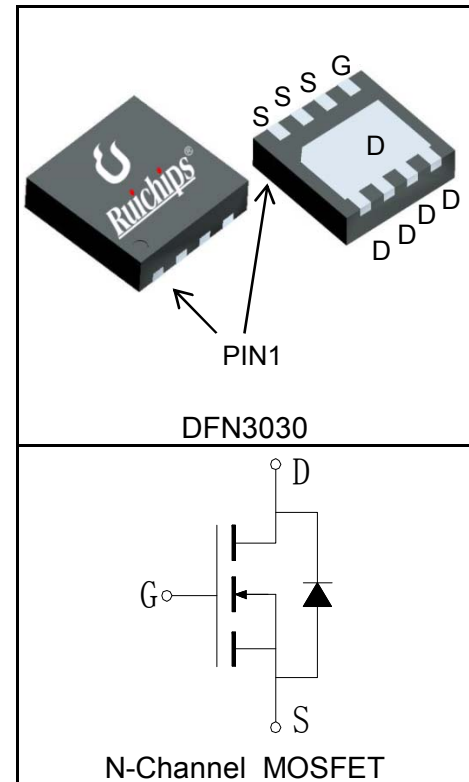


Features

- 60V/35A,
 $R_{DS(ON)} = 18m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 20m\Omega(Typ.)@V_{GS}=4.5V$
- Uses Ruichips advanced Trench™ technology
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Reliable and Rugged
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



Applications

- DC/DC Converters
- Switching Application Systems
- Li-battery protection
- Synchronous rectification

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|---|-------------------------|------------|
| Common Ratings ($T_C=25^\circ C$ Unless Otherwise Noted) | | | |
| V_{DSS} | Drain-Source Voltage | 65 | 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 | $T_C=25^\circ C$ 35 | A |
| Mounted on Large Heat Sink | | | |
| $I_{DP}^{①}$ | 300 μs Pulse Drain Current Tested | $T_C=25^\circ C$ 120 | A |
| $I_D^{②}$ | Continuous Drain Current@ $T_C(V_{GS}=10V)$ | $T_C=25^\circ C$ 35 | A |
| | | $T_C=100^\circ C$ 22 | |
| | Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$ | $T_A=25^\circ C$ 14 | |
| | | $T_A=70^\circ C$ 10 | |
| P_D | Maximum Power Dissipation@ T_C | $T_C=25^\circ C$ 32 | W |
| | | $T_C=100^\circ C$ 13 | |
| | Maximum Power Dissipation@ $T_A^{③}$ | $T_A=25^\circ C$ 2.5 | |
| | | $T_A=70^\circ C$ 1.6 | |

| Symbol | Parameter | Rating | Unit |
|---------------------------------------|--|--------|------|
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 4 | °C/W |
| $R_{\theta JA}$ ^③ | Thermal Resistance-Junction to Ambient | 50 | °C/W |
| Drain-Source Avalanche Ratings | | | |
| E_{AS} ^④ | Avalanche Energy, Single Pulsed | 80 | mJ |

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

| Symbol | Parameter | Test Condition | RU6035M3 | | | Unit |
|---|----------------------------------|---|----------|------|---------|-----------|
| | | | Min. | Typ. | Max. | |
| Static Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_{DS}=250\mu A$ | 60 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=60V, V_{GS}=0V$ | | | 1 | μA |
| | | $T_J=125^\circ C$ | | | 30 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=250\mu A$ | 1 | | 2.5 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 1 | μA |
| $R_{DS(ON)}$ ^⑤ | Drain-Source On-state Resistance | $V_{GS}=4.5V, I_{DS}=20A$ | | 20 | 25 | $m\Omega$ |
| | | $V_{GS}=10V, I_{DS}=30A$ | | 18 | 22 | $m\Omega$ |
| Diode Characteristics | | | | | | |
| V_{SD} ^⑤ | Diode Forward Voltage | $I_{SD}=30A, V_{GS}=0V$ | | | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=30A, di_{SD}/dt=100A/\mu s$ | | 14 | | ns |
| Q_{rr} | Reverse Recovery Charge | | | 9 | | nC |
| Dynamic Characteristics ^⑥ | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1MHz$ | | 1.2 | | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz | | 1350 | | pF |
| C_{oss} | Output Capacitance | | | 115 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 65 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=30V, I_{DS}=30A,$ $V_{GEN}=10V, R_G=4.7\Omega$ | | 9 | | ns |
| t_r | Turn-on Rise Time | | | 41 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 21 | | |
| t_f | Turn-off Fall Time | | | 16 | | |
| Gate Charge Characteristics ^⑥ | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=48V, V_{GS}=10V,$ $I_{DS}=30A$ | | 19 | | nC |
| Q_{gs} | Gate-Source Charge | | | 5.5 | | |
| Q_{gd} | Gate-Drain Charge | | | 7 | | |

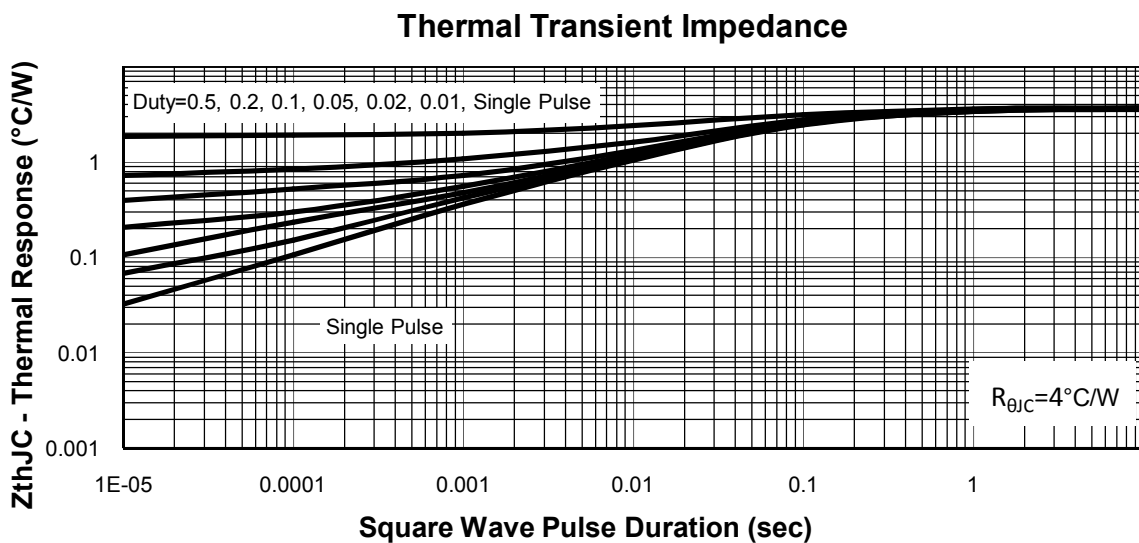
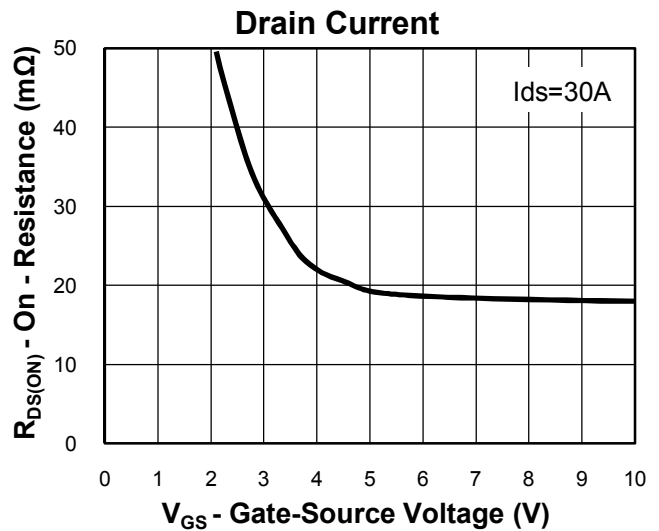
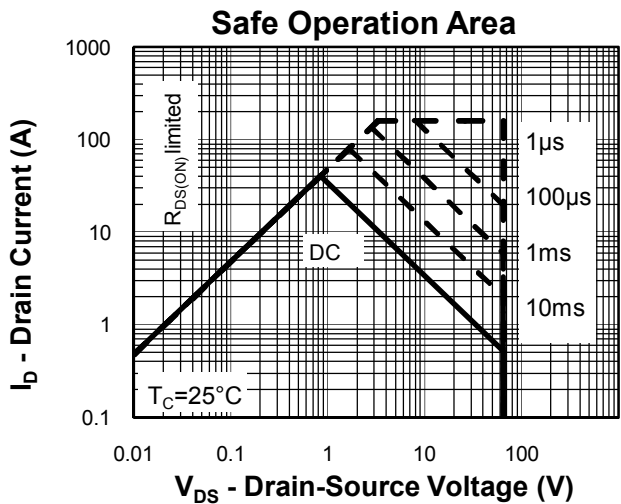
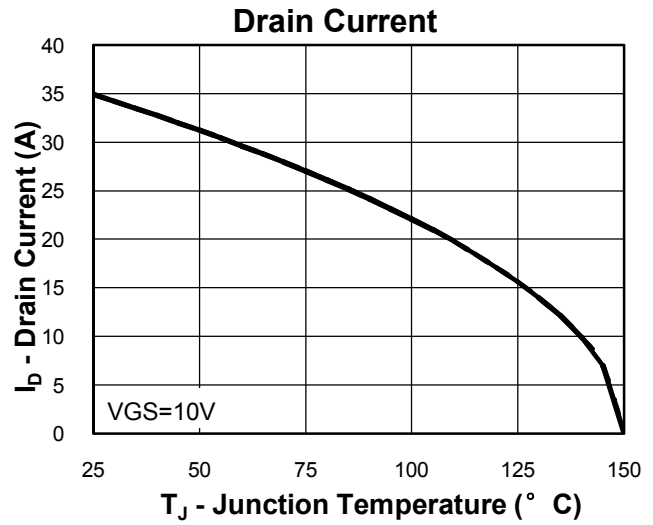
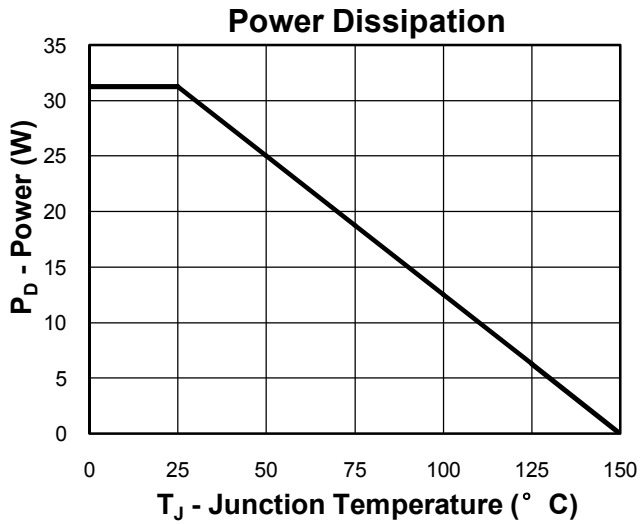
Notes:

- 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, $t \leq 10\text{sec}$.
- ④ Limited by T_{Jmax} , $I_{AS} = 18\text{A}$, $V_{DD} = 48\text{V}$, $R_G = 50\Omega$, Starting $T_J = 25^\circ\text{C}$.
- ⑤ Pulse test ; Pulse width 300s, duty cycle 2%.
- ⑥ Guaranteed by design, not subject to production testing.

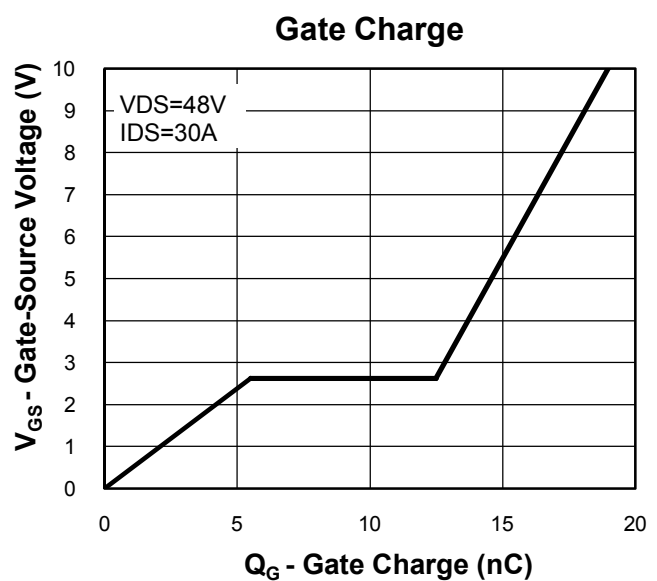
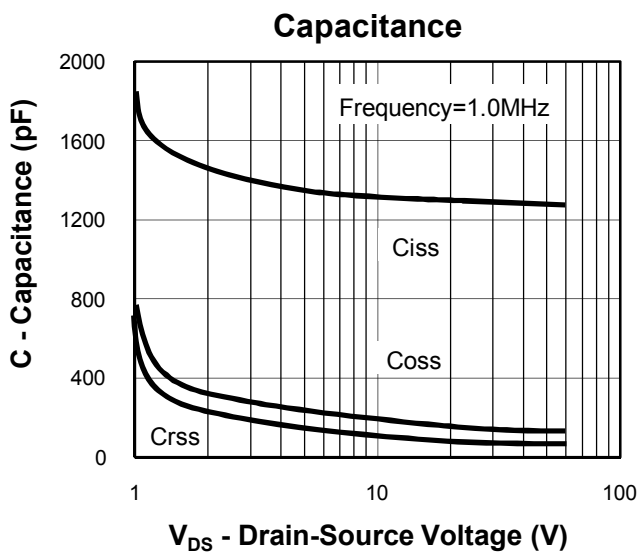
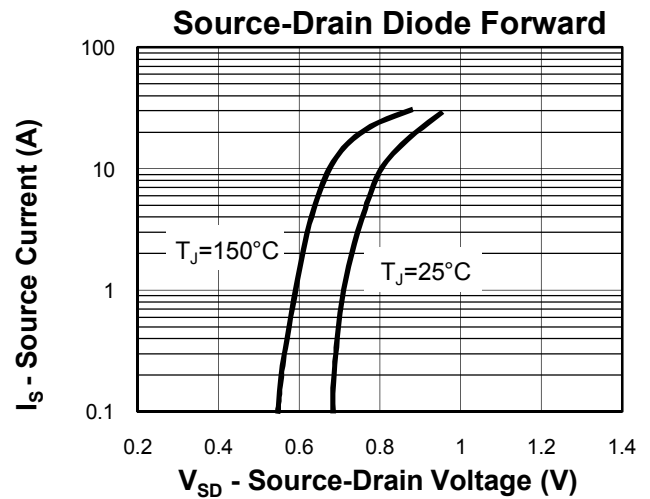
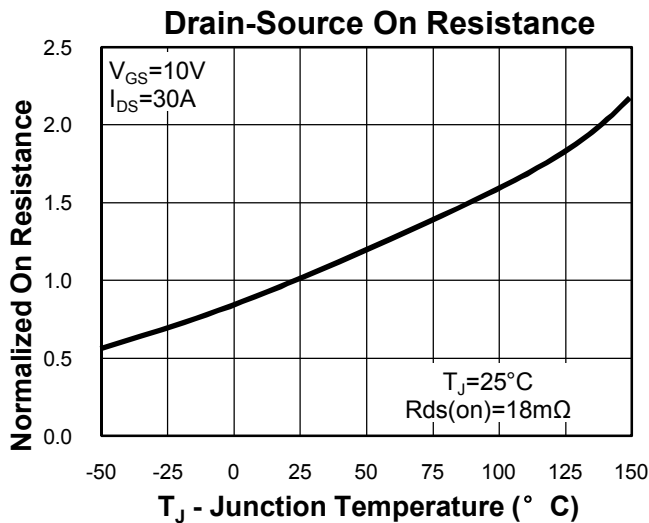
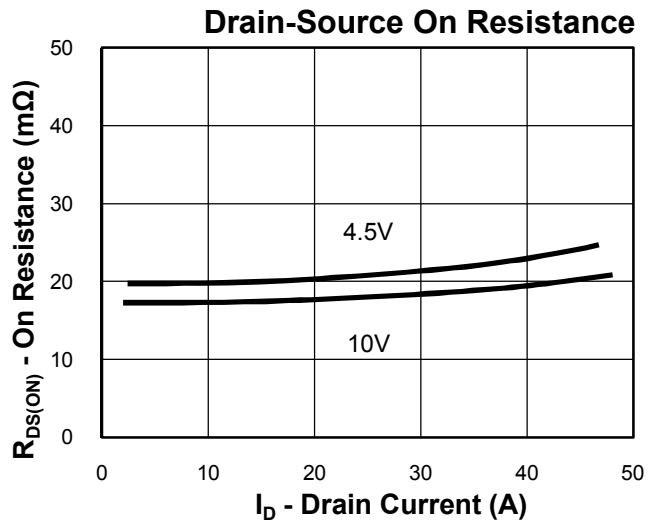
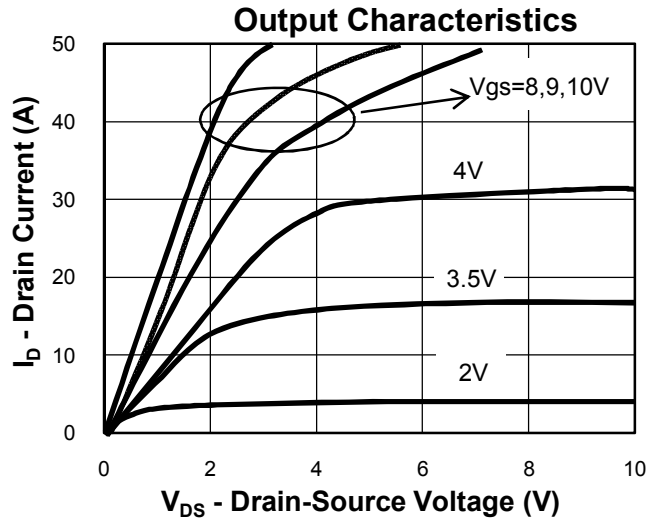
Ordering and Marking Information

| Device | Marking | Package | Packaging | Quantity | Reel Size | Tape width |
|---------------|----------------|----------------|------------------|-----------------|------------------|-------------------|
| RU6035M3 | RU6035 | DFN3030 | Tape&Reel | 5000 | 13" | 12mm |

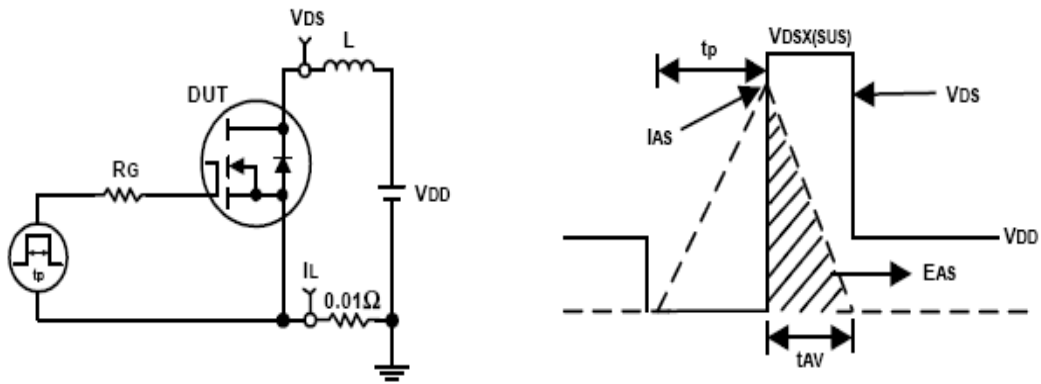
Typical Characteristics



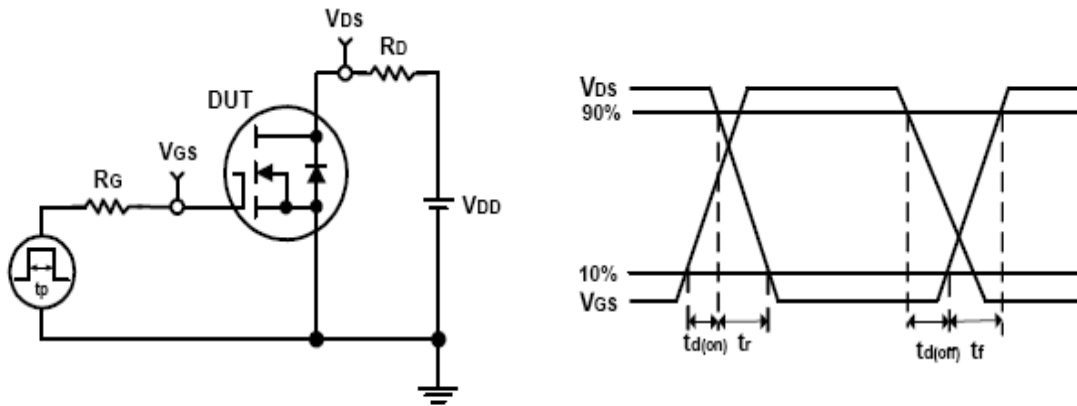
Typical Characteristics



Avalanche Test Circuit and Waveforms

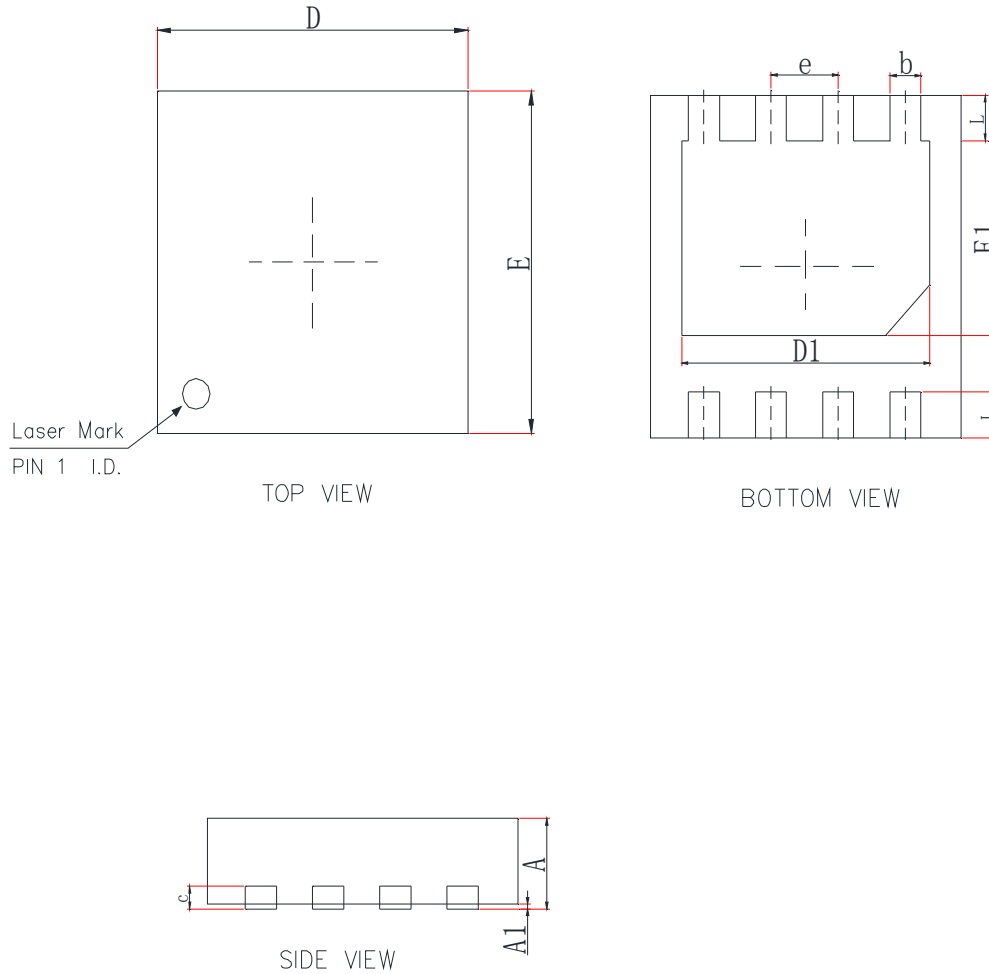


Switching Time Test Circuit and Waveforms



Package Information

DFN3030



NOTE:

- 1: ALL UNITS ARE IN MILLIMETER.
- 2: EJECTOR PIN MARK POSITION MAY VARY FROM DIFFERENT MOLD.
- 3: ALL DIMENSIONS REFER TO JEDEC.DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

| SYMBOL | MM | | | INCH | | |
|--------|----------|------|------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.70 | 0.75 | 0.80 | 0.028 | 0.030 | 0.031 |
| A1 | | | 0.05 | | | 0.002 |
| b | 0.25 | 0.30 | 0.35 | 0.010 | 0.012 | 0.014 |
| c | 0.18 | 0.20 | 0.30 | 0.007 | 0.008 | 0.012 |
| D | 2.95 | 3.00 | 3.15 | 0.116 | 0.118 | 0.124 |
| E | 2.95 | 3.00 | 3.15 | 0.116 | 0.118 | 0.124 |
| D1 | 2.30 | 2.40 | 2.50 | 0.091 | 0.094 | 0.098 |
| E1 | 1.70 | 1.80 | 1.90 | 0.067 | 0.071 | 0.075 |
| L | 0.30 | 0.40 | 0.50 | 0.012 | 0.016 | 0.020 |
| e | 0.65 BSC | | | 0.026 BSC | | |

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[C3M0021120D](#) [DMN6022SSD-13](#)