

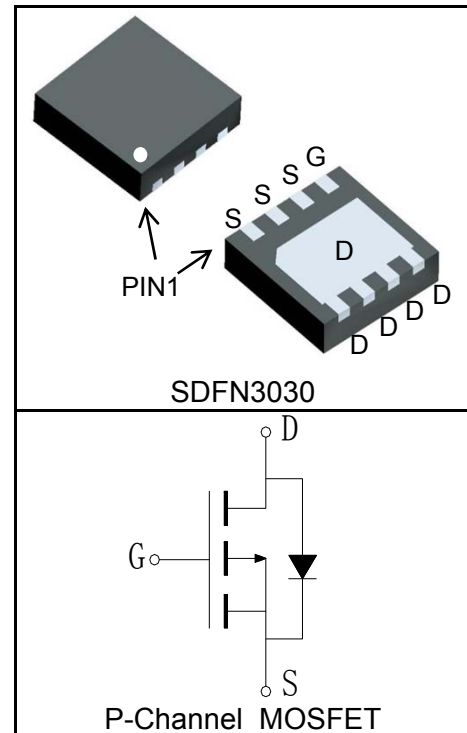
Features

- -30V/-30A,
 $R_{DS(ON)} = 10m\Omega(Typ.)@V_{GS}=-10V$
 $R_{DS(ON)} = 18m\Omega(Typ.)@V_{GS}=-4.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- 100% Avalanche Tested
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Power Management
- Load Switching

Pin Description



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit | |
|--|--|-------------------|------------|---|
| Common Ratings ($T_C=25^\circ C$ 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 | $T_C=25^\circ C$ | -30 | A |
| Mounted on Large Heat Sink | | | | |
| $I_{DP}^{①}$ | 300 μs Pulse Drain Current Tested | $T_C=25^\circ C$ | -96 | A |
| $I_D^{②}$ | Continuous Drain Current@ $T_C(V_{GS}=-10V)$ | $T_C=25^\circ C$ | -30 | A |
| | | $T_C=100^\circ C$ | -19 | |
| | Continuous Drain Current@ $T_A(V_{GS}=-10V)^{③}$ | $T_A=25^\circ C$ | -9.3 | |
| | | $T_A=70^\circ C$ | -7.5 | |
| P_D | Maximum Power Dissipation@ T_C | $T_C=25^\circ C$ | 33 | W |
| | | $T_C=100^\circ C$ | 13 | |
| | Maximum Power Dissipation@ $T_A^{③}$ | $T_A=25^\circ C$ | 3.5 | |
| | | $T_A=70^\circ C$ | 2.3 | |

| Symbol | Parameter | Rating | Unit |
|---------------------------------------|--|--------|------|
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 3.8 | °C/W |
| $R_{\theta JA}^{③}$ | Thermal Resistance-Junction to Ambient | 35 | °C/W |
| Drain-Source Avalanche Ratings | | | |
| $E_{AS}^{④}$ | Avalanche Energy, Single Pulsed | 42 | mJ |

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

| Symbol | Parameter | Test Condition | RU30L30M3 | | | 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 | | -2.5 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 10 | μa |
| $R_{DS(ON)}^{⑤}$ | Drain-Source On-state Resistance | $V_{GS}=-10V, I_{DS}=-20A$ | | 10 | 12 | $m\Omega$ |
| | | $V_{GS}=-4.5V, I_{DS}=-16A$ | | 18 | 20 | $m\Omega$ |
| Diode Characteristics | | | | | | |
| $V_{SD}^{⑤}$ | Diode Forward Voltage | $I_{SD}=-20A, V_{GS}=0V$ | | | -1.5 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=-20A, dI_{SD}/dt=100A/\mu s$ | | 45 | | ns |
| Q_{rr} | Reverse Recovery Charge | | | 26 | | nC |
| Dynamic Characteristics ⑥ | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | | 1.8 | | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=-15V,$ Frequency=1.0MHz | | 2300 | | pF |
| C_{oss} | Output Capacitance | | | 250 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 160 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=-15V, I_{DS}=-20A,$ $V_{GEN}=-10V, R_G=6\Omega$ | | 17 | | ns |
| t_r | Turn-on Rise Time | | | 32 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 37 | | |
| t_f | Turn-off Fall Time | | | 15 | | |
| Gate Charge Characteristics ⑥ | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=-24V, V_{GS}=-10V,$ $I_{DS}=-20A$ | | 42 | | nC |
| Q_{gs} | Gate-Source Charge | | | 9 | | |
| Q_{gd} | Gate-Drain Charge | | | 13 | | |

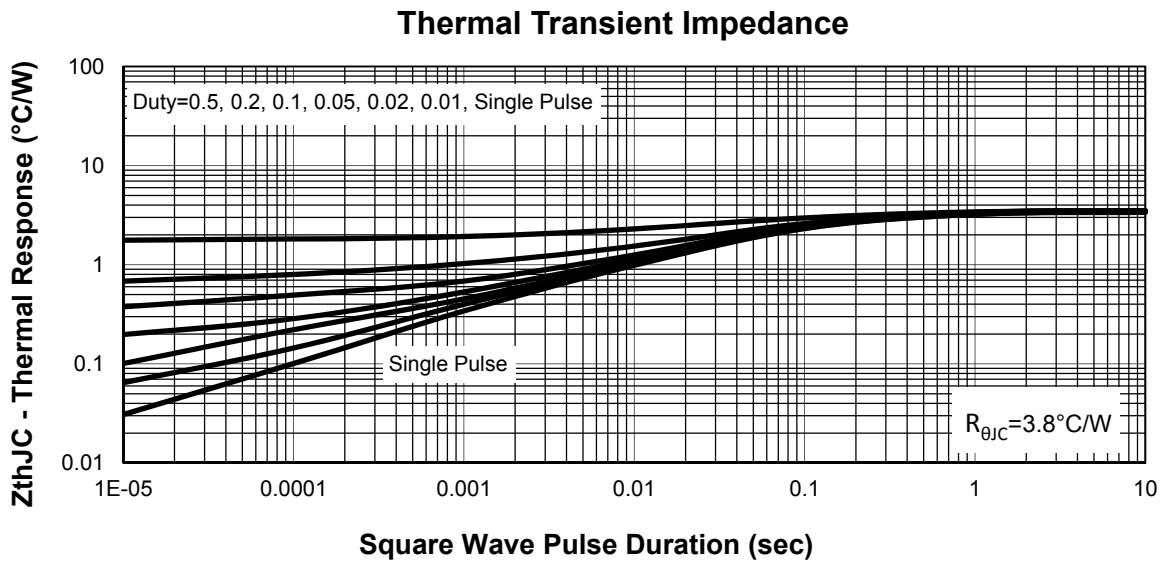
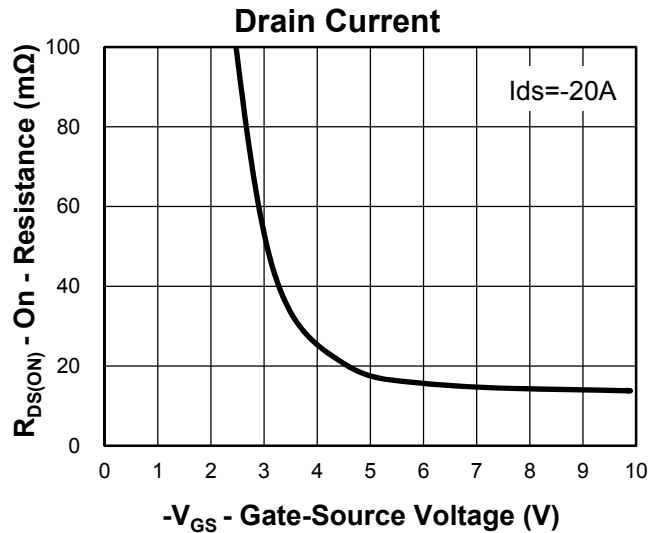
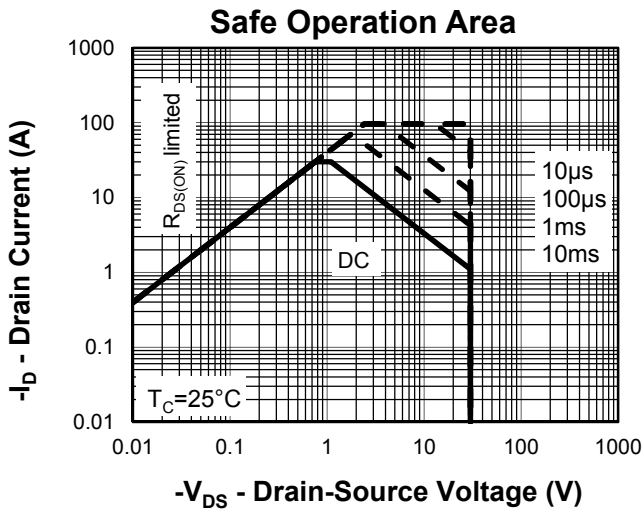
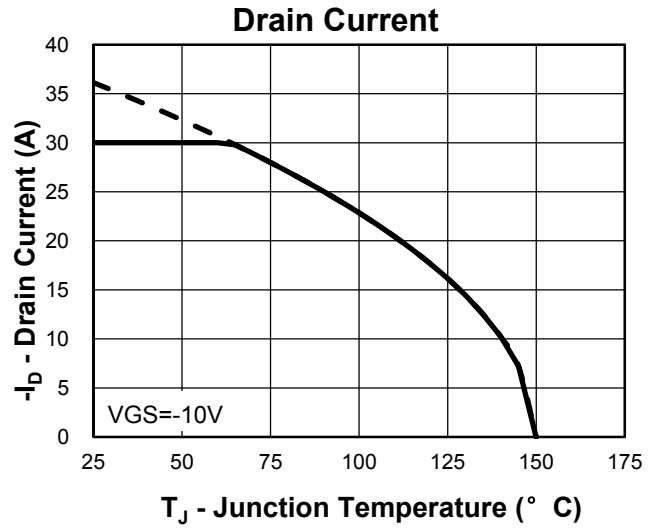
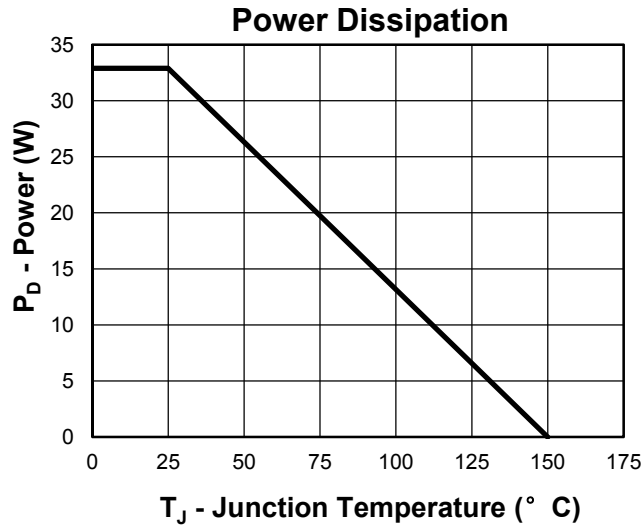
Notes:

- 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 $T_{J\text{max}}$, $I_{AS} = -12\text{A}$, $V_{DD} = -24\text{V}$, $R_G = 50\Omega$, Starting $T_J = 25^\circ\text{C}$.
- ⑤ Pulse test; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥ Guaranteed by design, not subject to production testing.

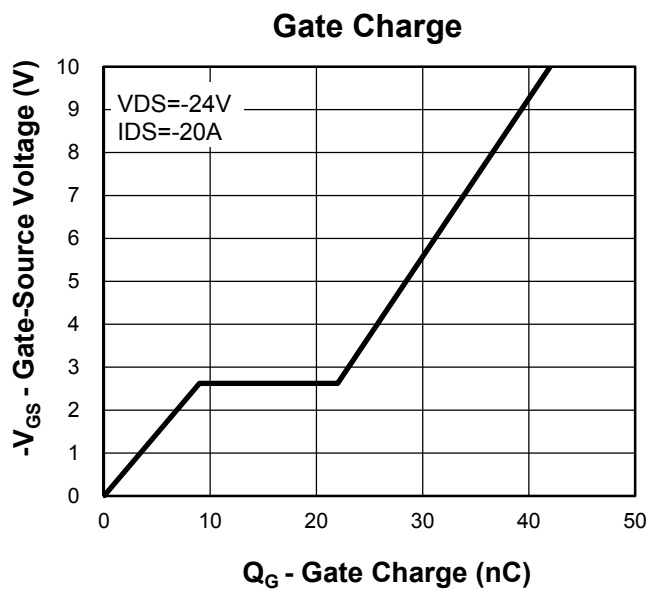
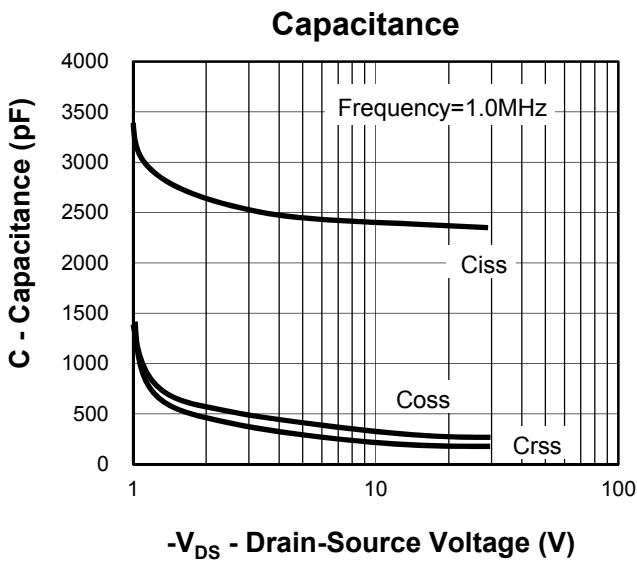
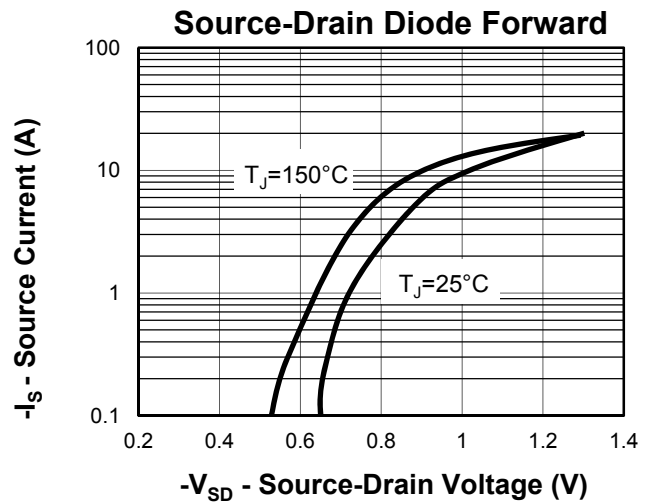
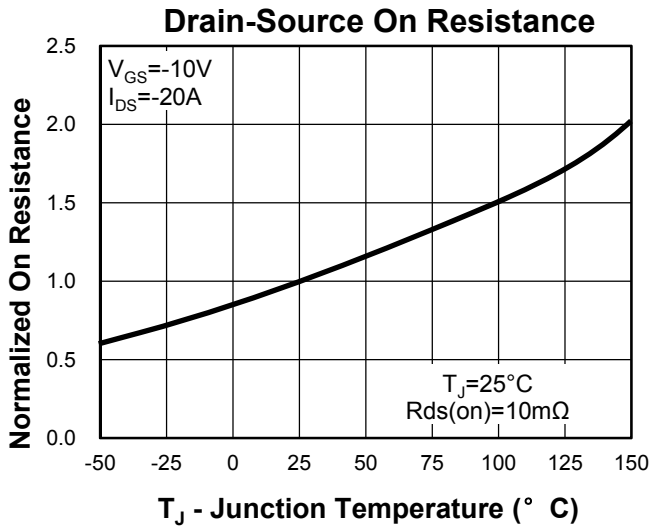
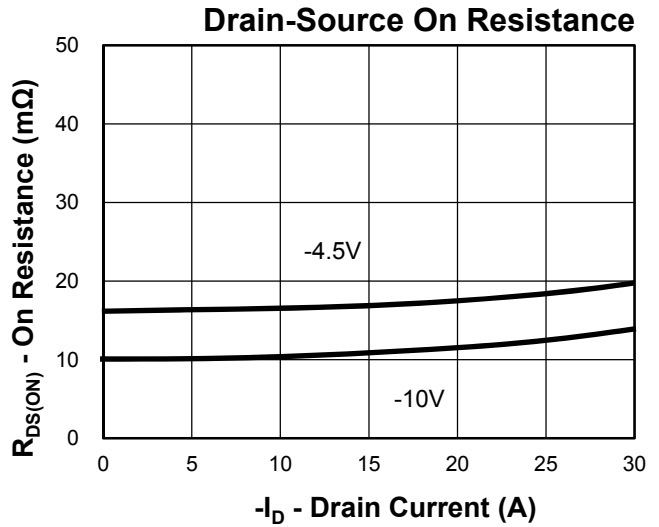
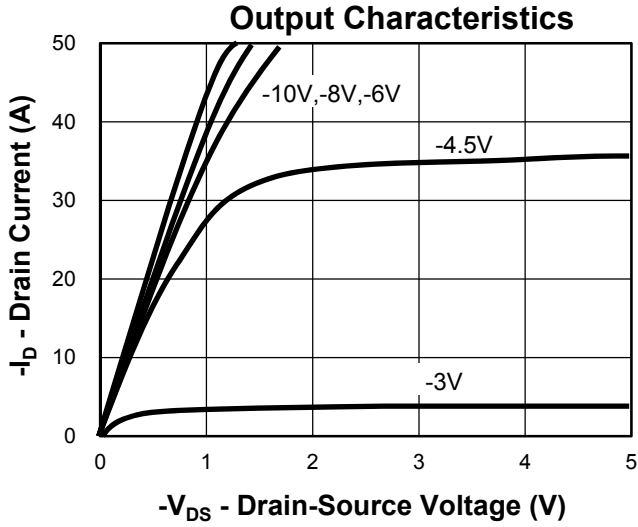
Ordering and Marking Information

| Device | Marking | Package | Packaging | Quantity | Reel Size | Tape width |
|-----------|---------|----------|-----------|----------|-----------|------------|
| RU30L30M3 | 30L30 | SDFN3030 | Tape&Reel | 3000 | 7" | 8mm |

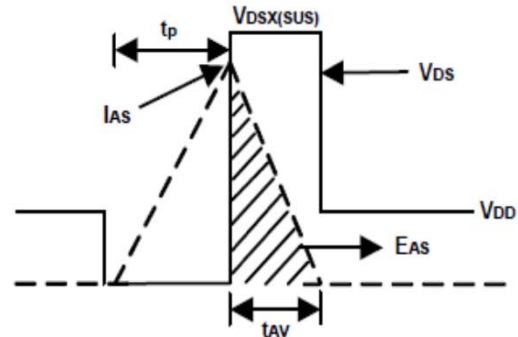
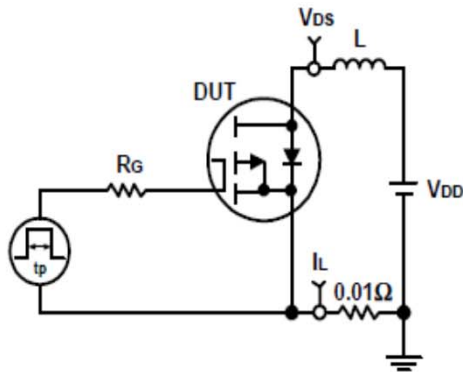
Typical Characteristics



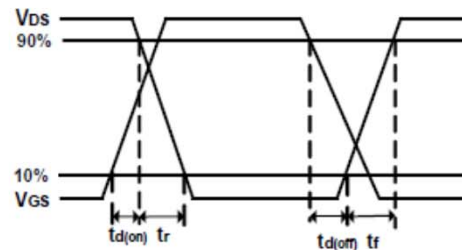
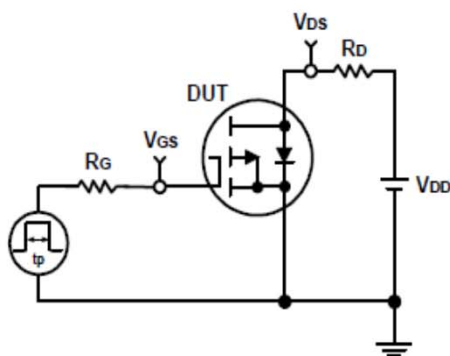
Typical Characteristics



Avalanche Test Circuit and Waveforms

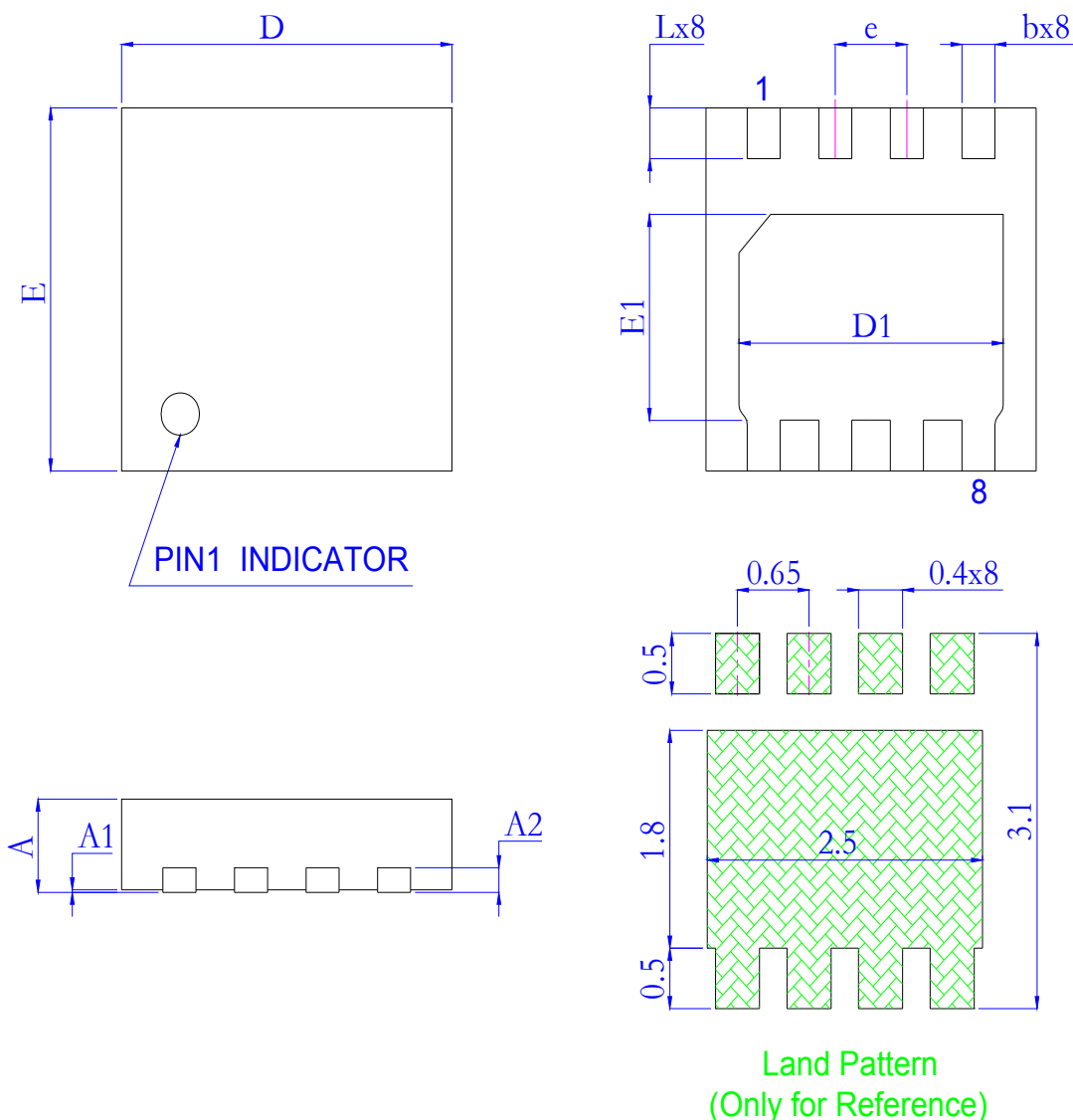


Switching Time Test Circuit and Waveforms



Package Information

SDFN3030



| SYMBOL | MM | | | INCH | | |
|--------|------------|-------|-------|------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.700 | 0.750 | 0.800 | 0.028 | 0.030 | 0.031 |
| A1 | 0.000 | 0.020 | 0.050 | 0.000 | 0.001 | 0.002 |
| A2 | 0.203 REF. | | | 0.008 REF. | | |
| b | 0.250 | 0.300 | 0.350 | 0.010 | 0.012 | 0.014 |
| D | 2.900 | 3.000 | 3.100 | 0.114 | 0.118 | 0.122 |
| D1 | 2.350 | 2.400 | 2.450 | 0.093 | 0.094 | 0.096 |
| E | 2.900 | 3.000 | 3.100 | 0.114 | 0.118 | 0.122 |
| E1 | 1.650 | 1.700 | 1.750 | 0.065 | 0.067 | 0.069 |
| e | 0.650BSC | | | 0.026BSC | | |
| L | 0.370 | 0.420 | 0.470 | 0.015 | 0.017 | 0.019 |

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