

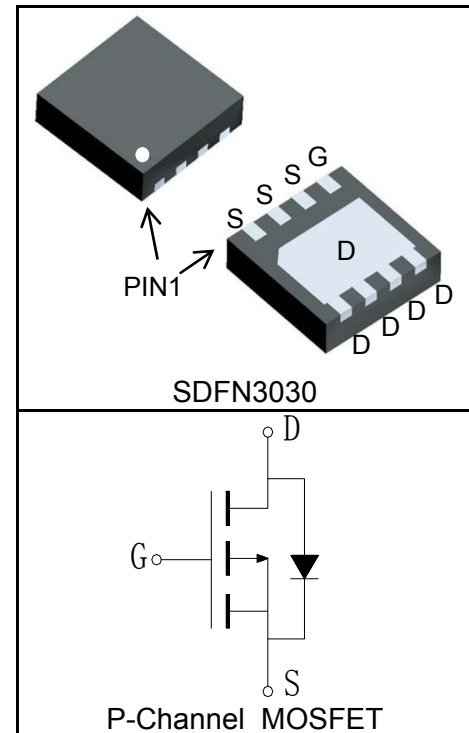
### Features

- -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	
<b>Common Ratings</b> ( $T_C=25^\circ C$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	-30	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	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
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{①}$	300 $\mu s$ 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
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	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.	
<b>Static Characteristics</b>						
$BV_{DSS}$	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	$\mu A$
		$T_J=125^\circ\text{C}$			-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	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 10$	$\mu a$
$R_{DS(ON)}^{⑤}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-20A$		10	12	$m\Omega$
		$V_{GS}=-4.5V, I_{DS}=-16A$		18	20	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{⑤}$	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
<b>Dynamic Characteristics</b> ⑥						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.8		$\Omega$
$C_{iss}$	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		
<b>Gate Charge Characteristics</b> 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		

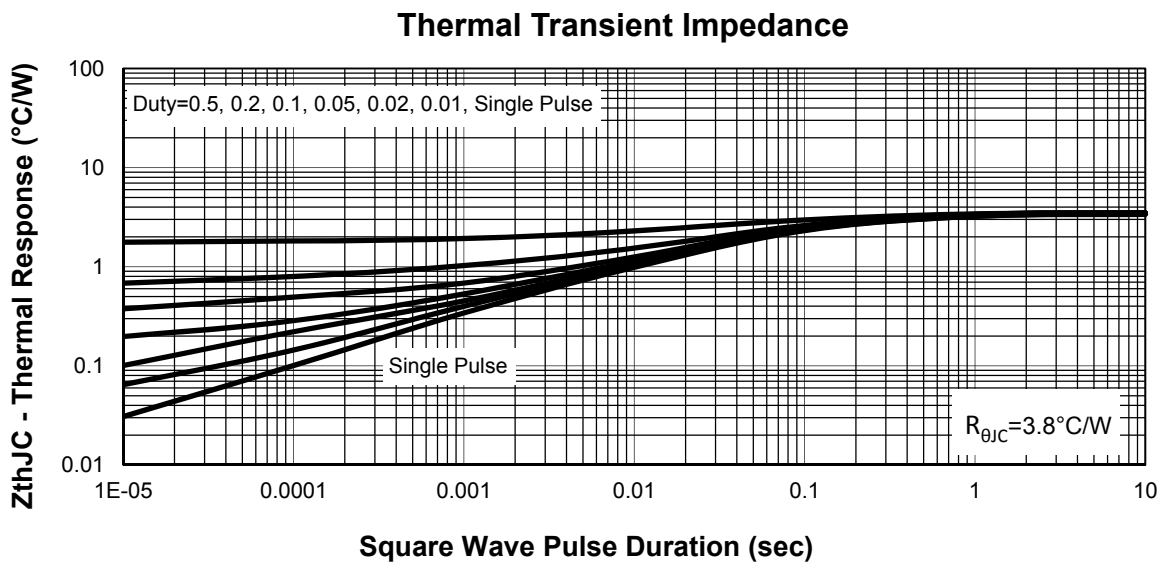
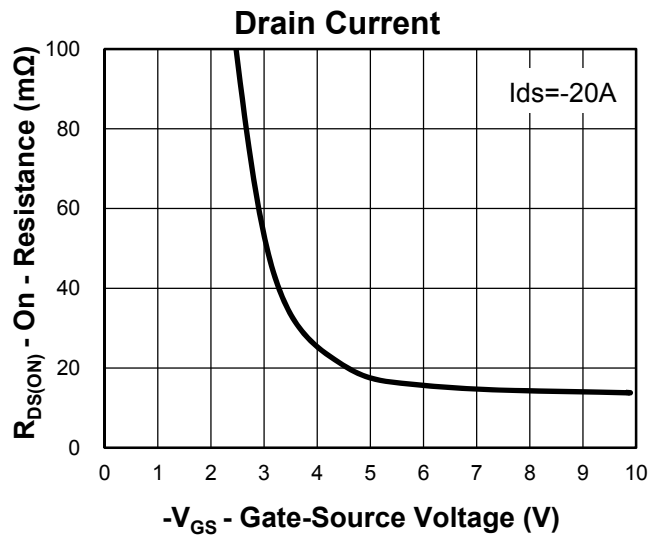
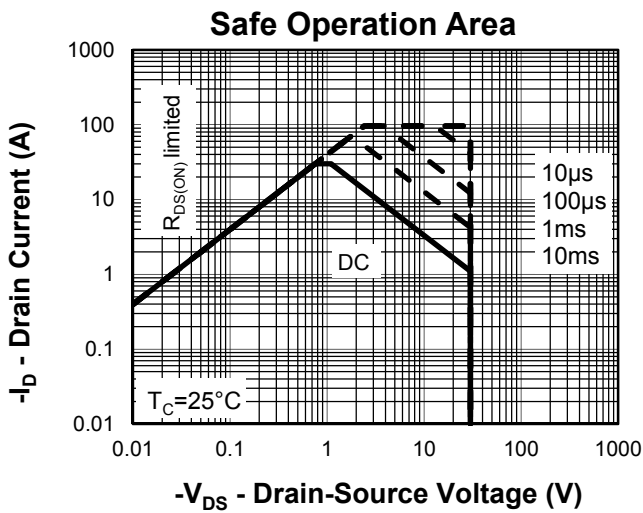
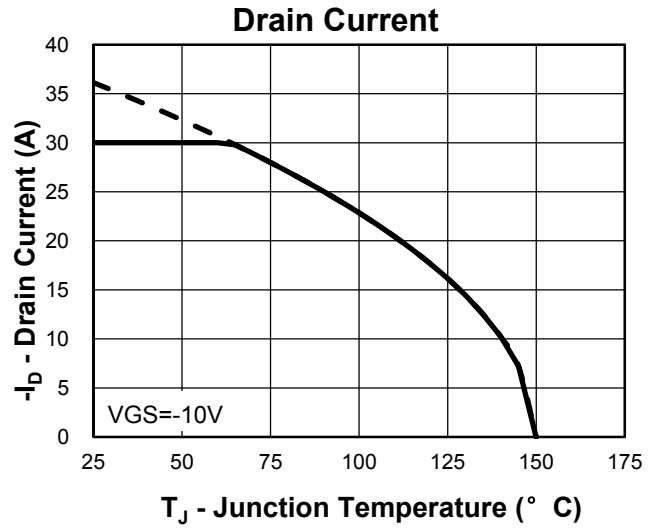
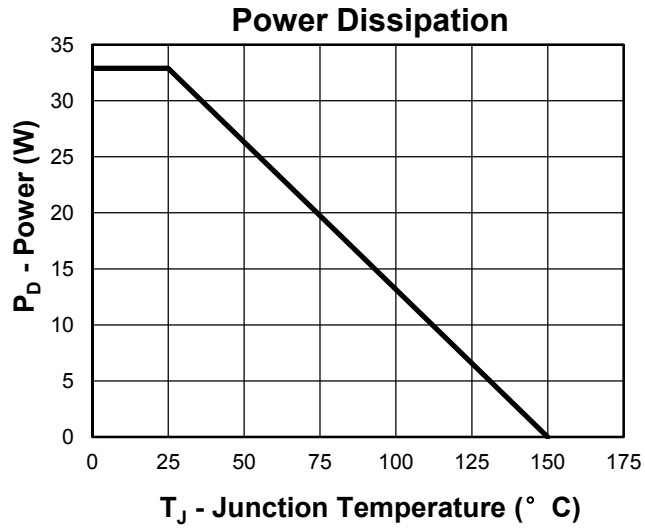
**Notes:**

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature.
- ③When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ .
- ④Limited by  $T_{J\text{max}}$ ,  $I_{AS} = -12\text{A}$ ,  $V_{DD} = -24\text{V}$ ,  $R_G = 50\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .
- ⑤Pulse test; Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- ⑥Guaranteed by design, not subject to production testing.

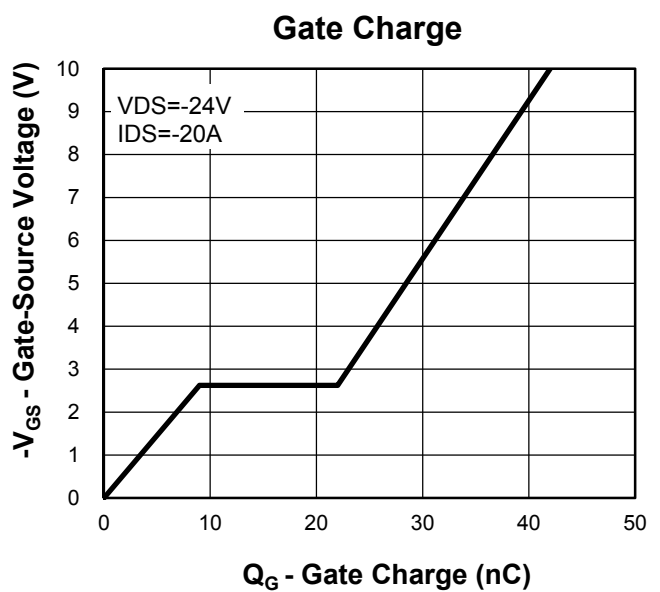
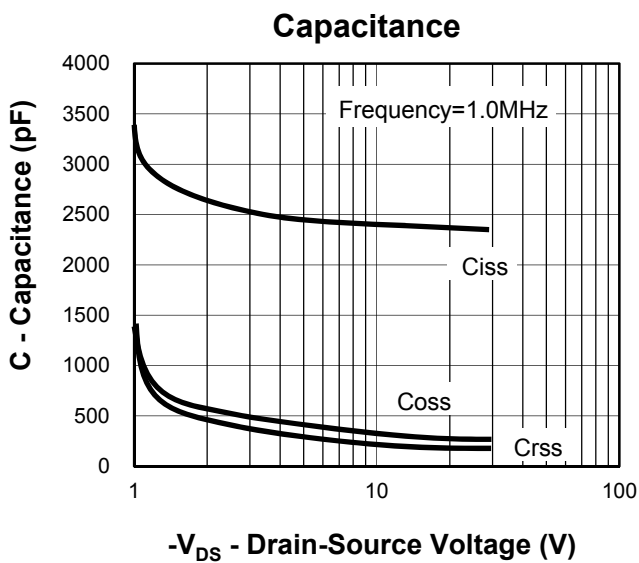
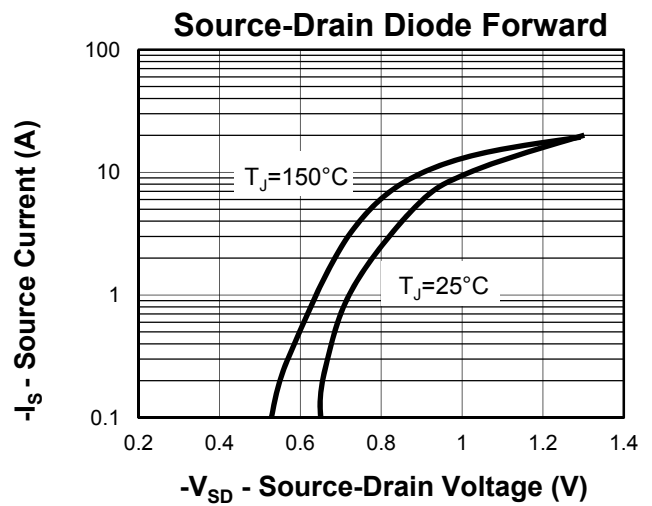
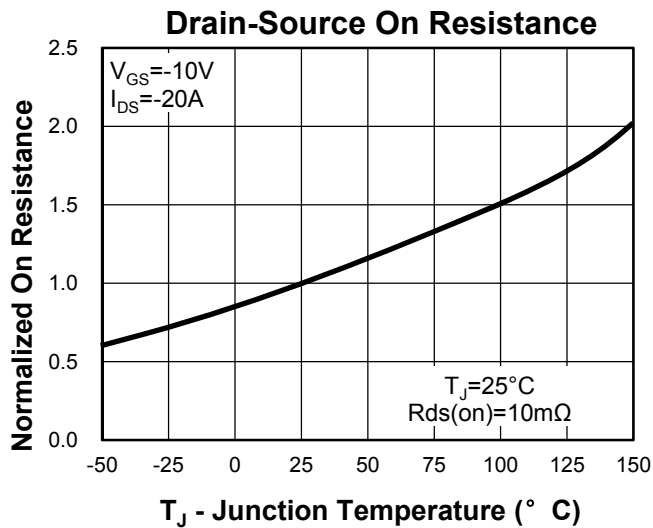
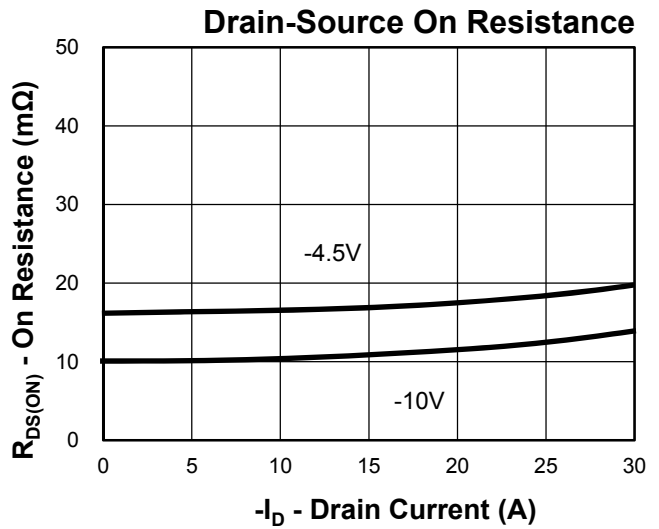
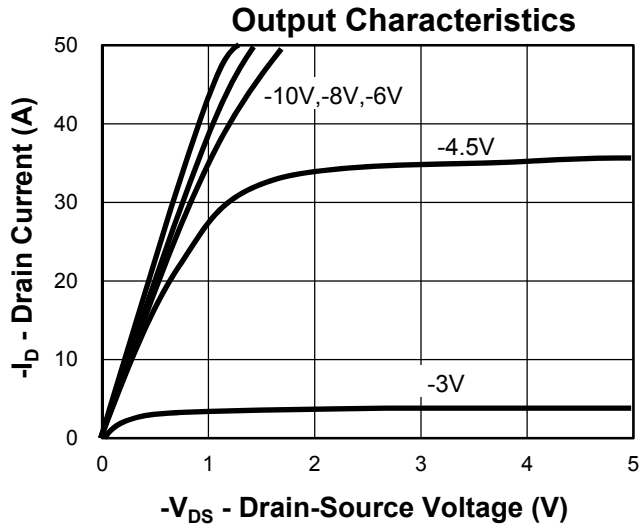
**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU30L30M3	30L30	SDFN3030	Tape&Reel	3000	7"	8mm

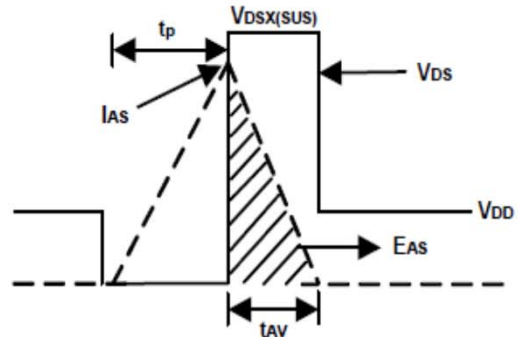
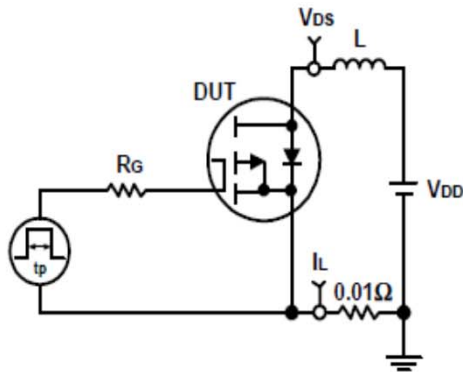
**Typical Characteristics**



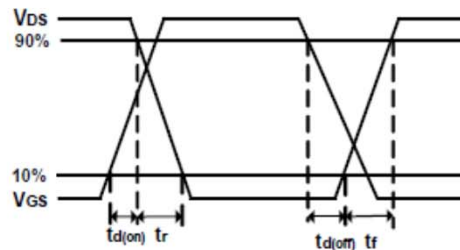
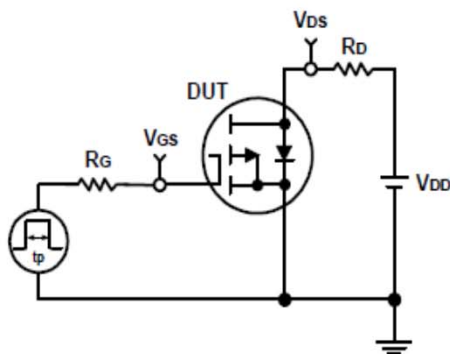
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**

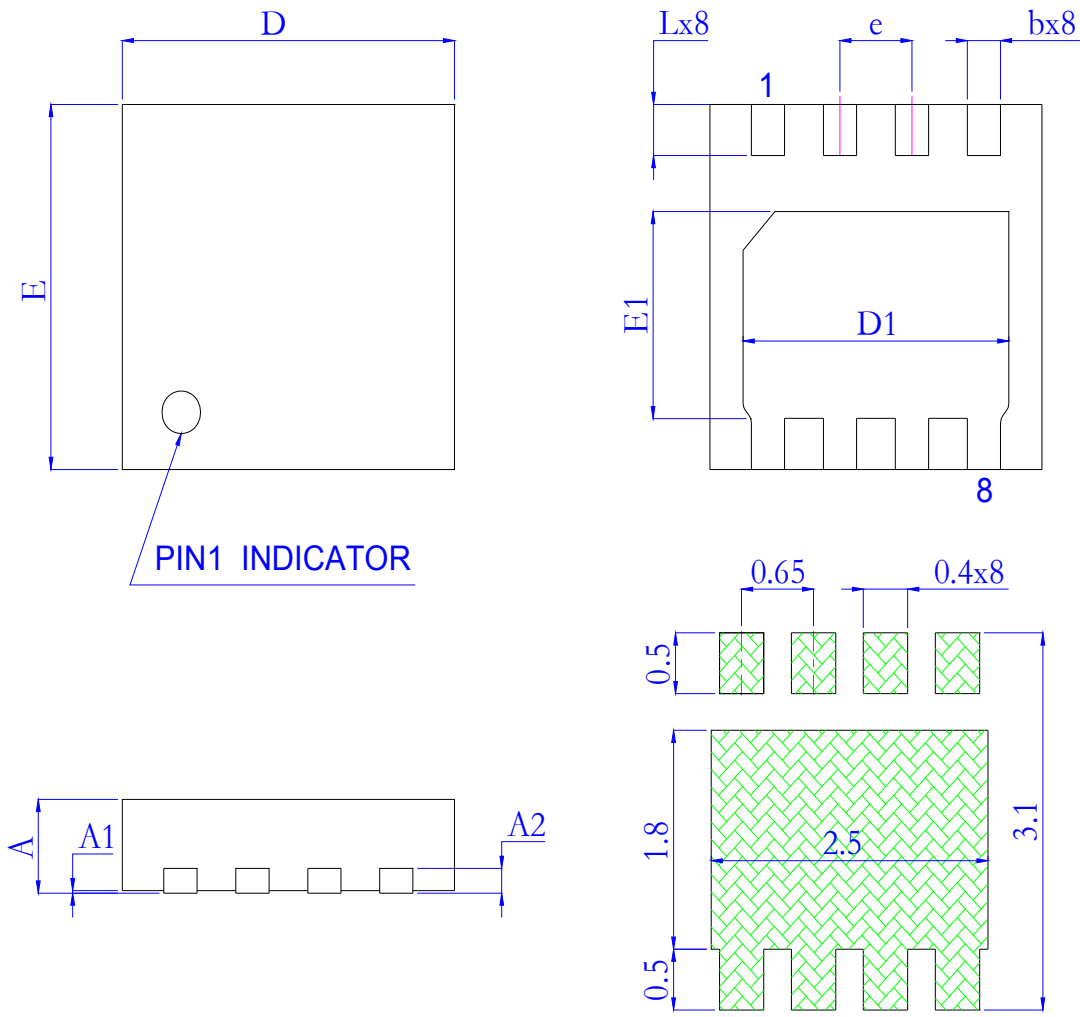


**Switching Time Test Circuit and Waveforms**



**Package Information**

**SDFN3030**



Land Pattern  
(Only for Reference)

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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