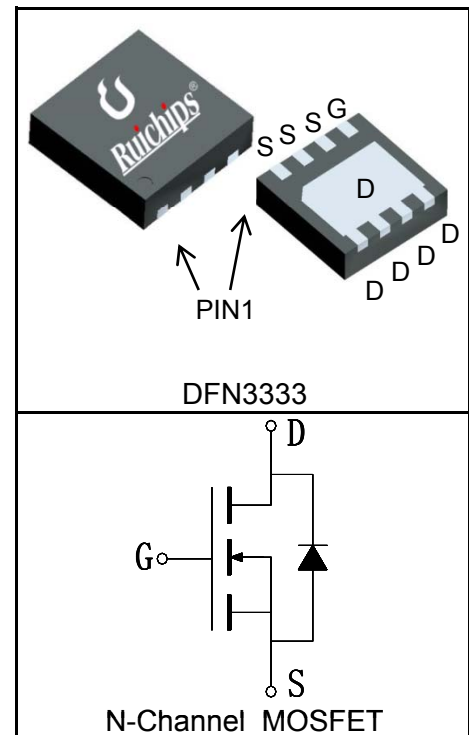


Features

- 30V/40A,
- $R_{DS(ON)} = 5m\Omega(Typ.)@V_{GS}=10V$
- $R_{DS(ON)} = 6.5m\Omega(Typ.)@V_{GS}=4.5V$
- Super High Dense Cell Design
- Fast Switching Speed
- Low gate Charge
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



Applications

- Switching Application Systems
- On Board power for server
- Synchronous rectification

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	$T_C=25^\circ C$	40	A
Mounted on Large Heat Sink				
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ C$	160	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ C$	40	A
		$T_C=100^\circ C$	25	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ C$	13	
		$T_A=70^\circ C$	11	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ C$	31	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	4	°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	90	mJ

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

Symbol	Parameter	Test Condition	RU3040M3			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	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.9		1.8	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=25A$		5	6.5	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=20A$		6.5	8	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=25A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=25A, di_{SD}/dt=100A/\mu s$		17		ns
Q_{rr}	Reverse Recovery Charge			9		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz		680		pF
C_{oss}	Output Capacitance			175		
C_{rss}	Reverse Transfer Capacitance			80		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, I_{DS}=25A,$ $V_{GEN}=10V, R_G=2.4\Omega$		6		ns
t_r	Turn-on Rise Time			10		
$t_{d(OFF)}$	Turn-off Delay Time			16		
t_f	Turn-off Fall Time			4		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=24V, V_{GS}=10V,$ $I_{DS}=25A$		15		nC
Q_{gs}	Gate-Source Charge			3.8		
Q_{gd}	Gate-Drain Charge			5.5		

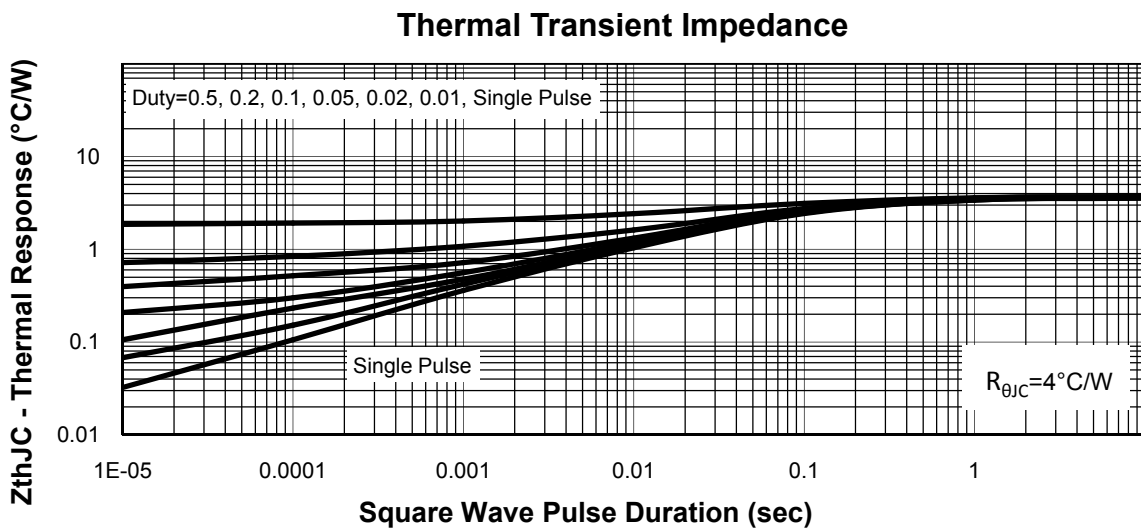
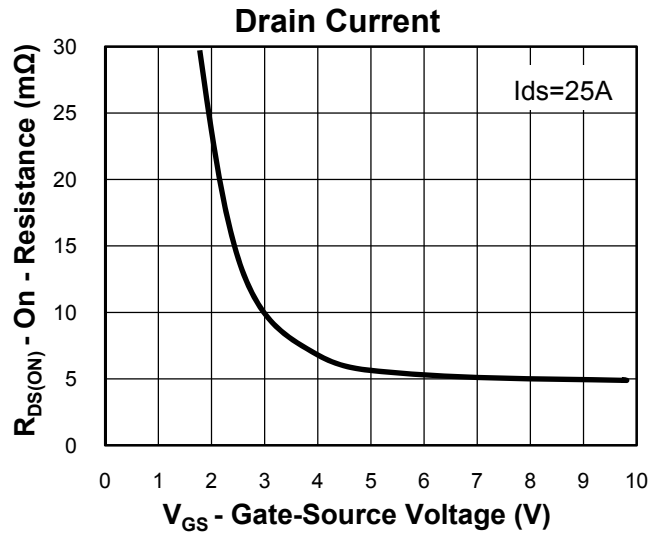
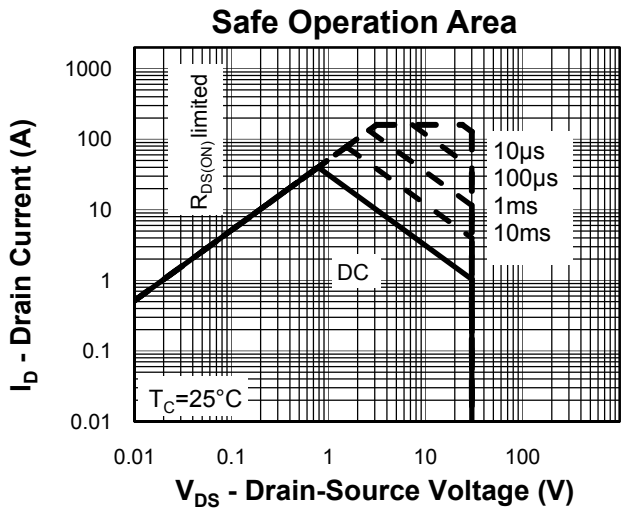
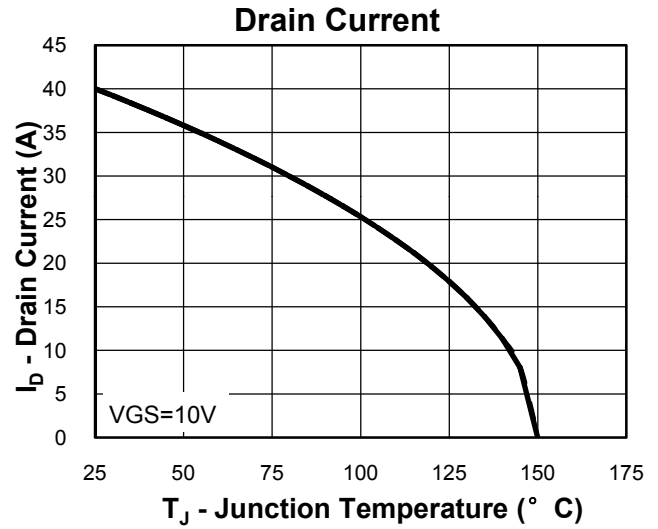
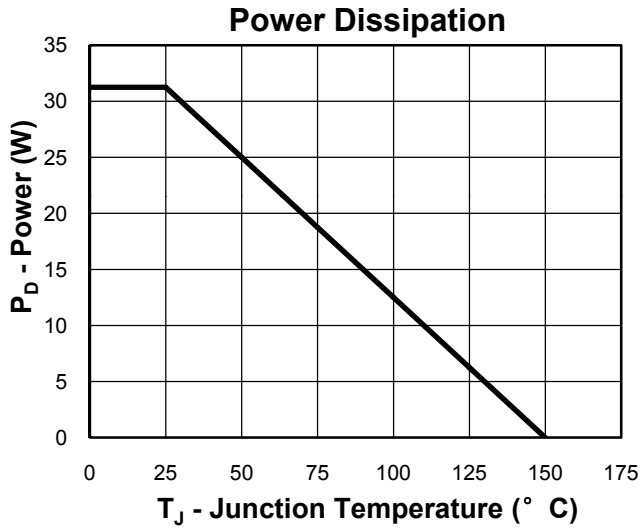
Notes:

- 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 $T_{J\text{max}}$, $I_{AS} = 19\text{A}$, $V_{DD} = 24\text{V}$, $R_G = 50\Omega$, 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.

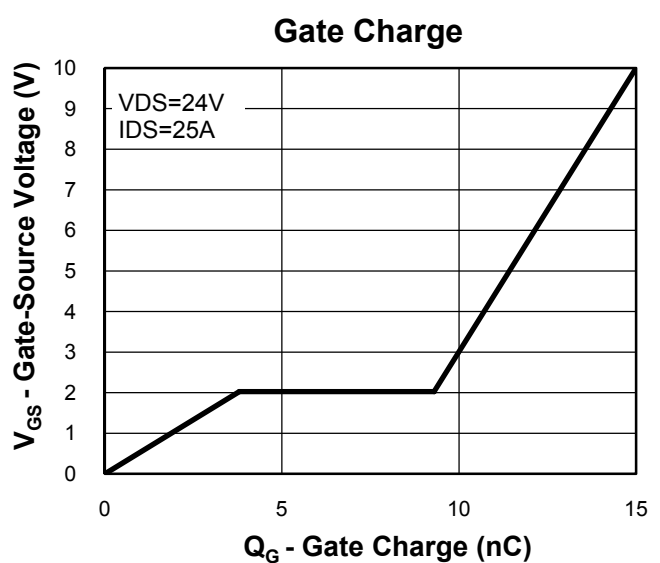
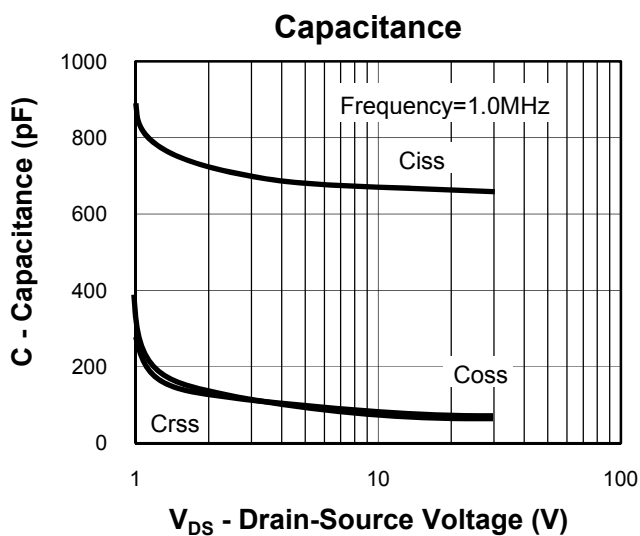
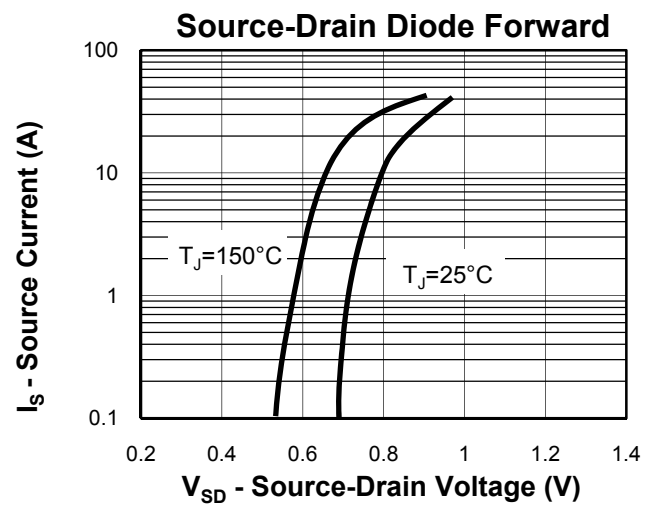
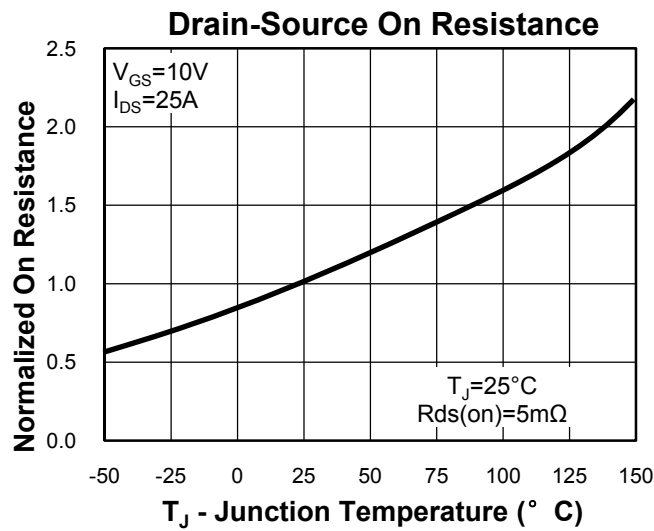
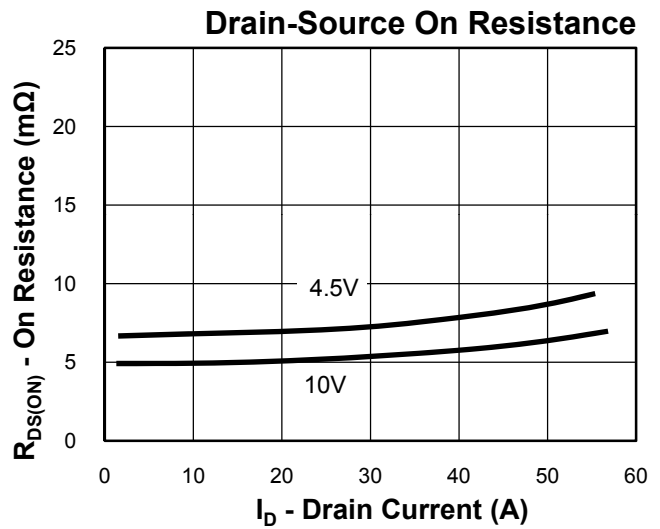
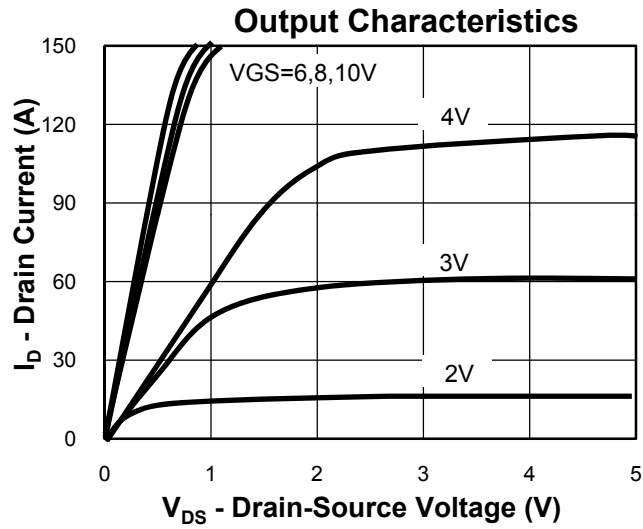
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU3040M3	RU3040	DFN3333	Tape&Reel	5000	13"	12mm

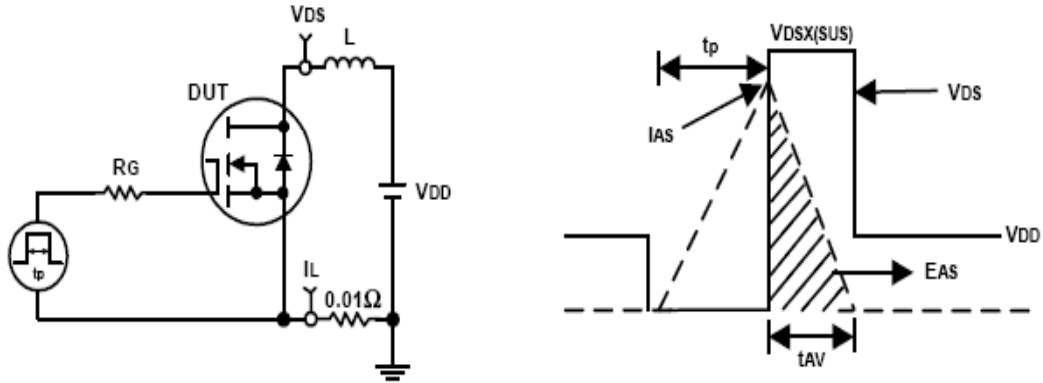
Typical Characteristics



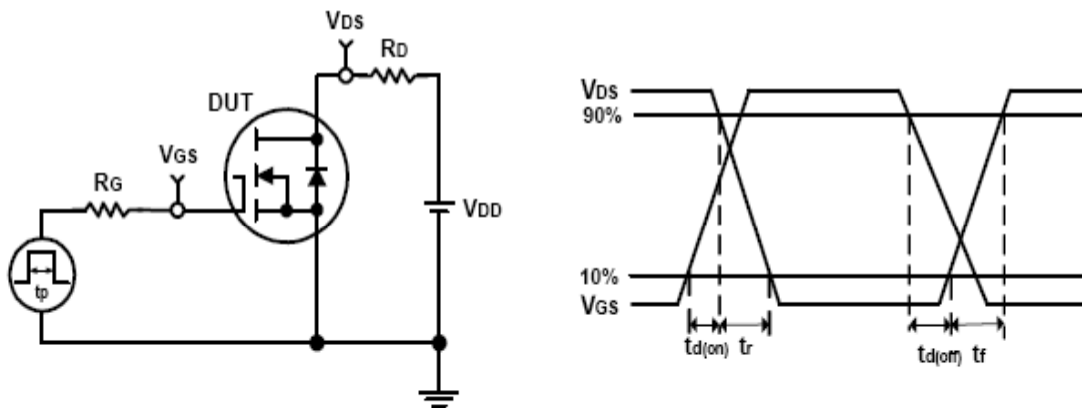
Typical Characteristics



Avalanche Test Circuit and Waveforms

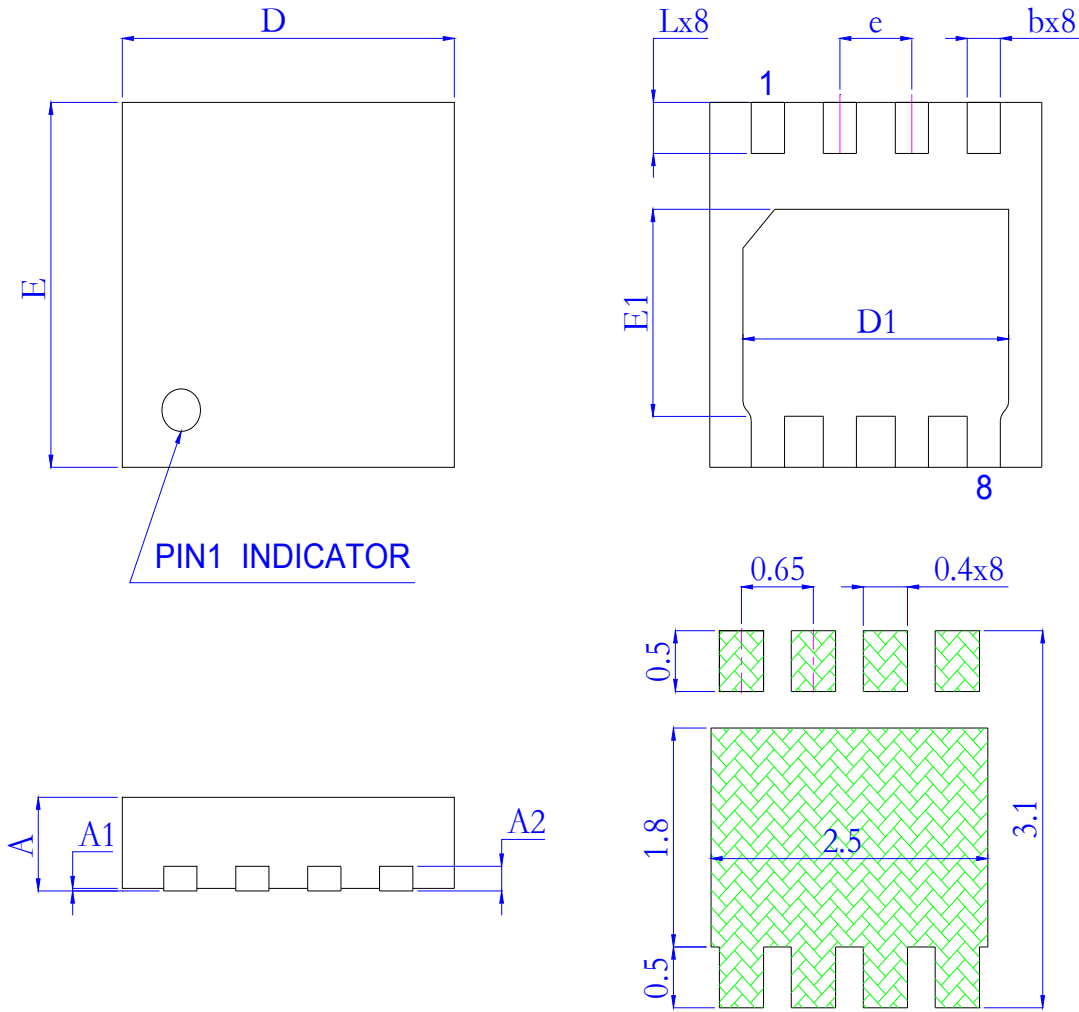


Switching Time Test Circuit and Waveforms



Package Information

DFN3333



**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	3.000	3.150	3.300	0.118	0.124	0.130
D1	2.350	2.400	2.450	0.093	0.094	0.096
E	3.000	3.150	3.300	0.118	0.124	0.130
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