

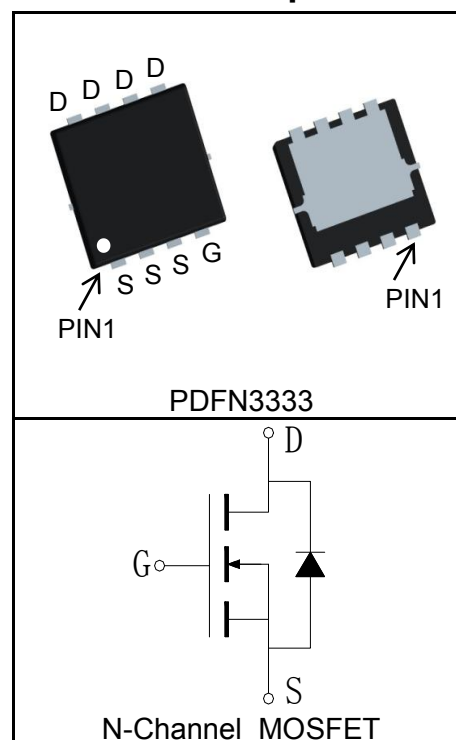
### Features

- 30V/70A,
- $R_{DS(ON)} = 3m\Omega(Typ.)@V_{GS}=10V$
- $R_{DS(ON)} = 3.6m\Omega(Typ.)@V_{GS}=4.5V$
- Fast Switching Speed
- Low gate Charge
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

### Applications

- Switching Application Systems

### 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	$T_C=25^\circ C$	20	A
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_C=25^\circ C$	250	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ C$	70	A
		$T_C=100^\circ C$	45	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ C$	20	
		$T_A=70^\circ C$	16	
$P_D$	Maximum Power Dissipation@ $T_C$	$T_C=25^\circ C$	45	W
		$T_C=100^\circ C$	18	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ C$	3.6	
		$T_A=70^\circ C$	2.3	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.8	$^{\circ}\text{C/W}$
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	35	$^{\circ}\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	156	mJ

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

Symbol	Parameter	Test Condition	RU3070M2			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu\text{A}$	30			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$			1	$\mu\text{A}$
		$T_J=125^{\circ}\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu\text{A}$	1		2	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$		3	3.6	$\text{m}\Omega$
		$V_{GS}=4.5V, I_{DS}=16A$		3.6	4.2	$\text{m}\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=20A, di_{SD}/dt=100A/\mu\text{s}$		30		ns
$Q_{rr}$	Reverse Recovery Charge			34		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	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		3270		pF
$C_{oss}$	Output Capacitance			580		
$C_{rss}$	Reverse Transfer Capacitance			285		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=3\Omega$		8		ns
$t_r$	Turn-on Rise Time			12		
$t_{d(OFF)}$	Turn-off Delay Time			35		
$t_f$	Turn-off Fall Time			9		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=24V, V_{GS}=10V,$ $I_{DS}=20A$		60		nC
$Q_{gs}$	Gate-Source Charge			15		
$Q_{gd}$	Gate-Drain Charge			22		

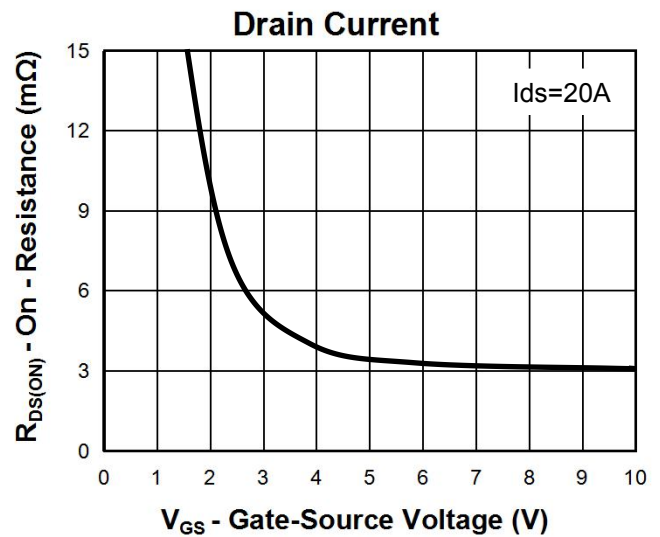
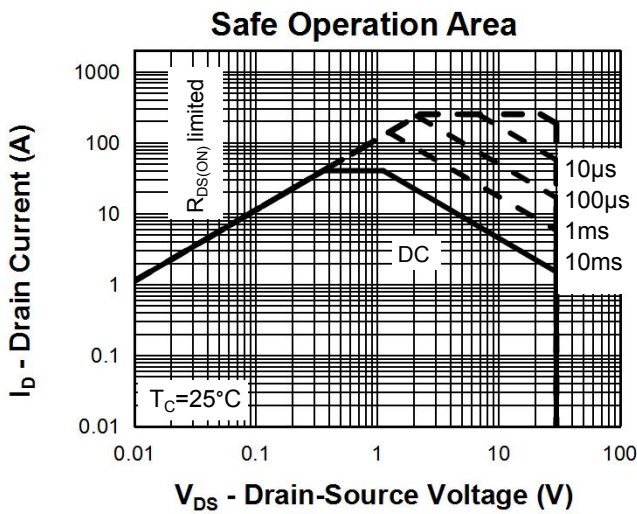
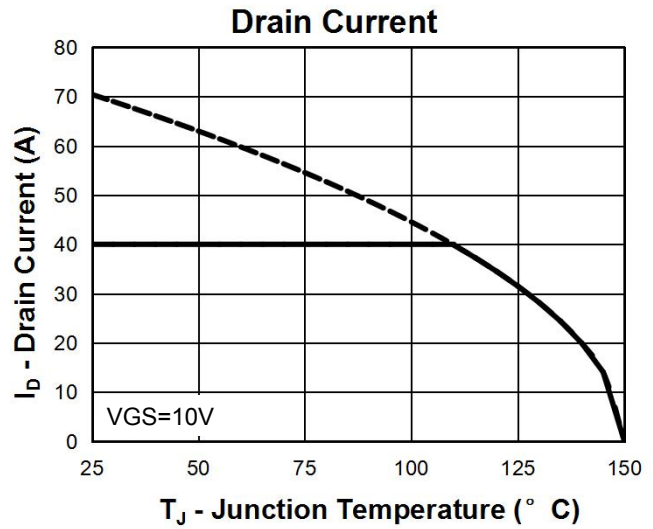
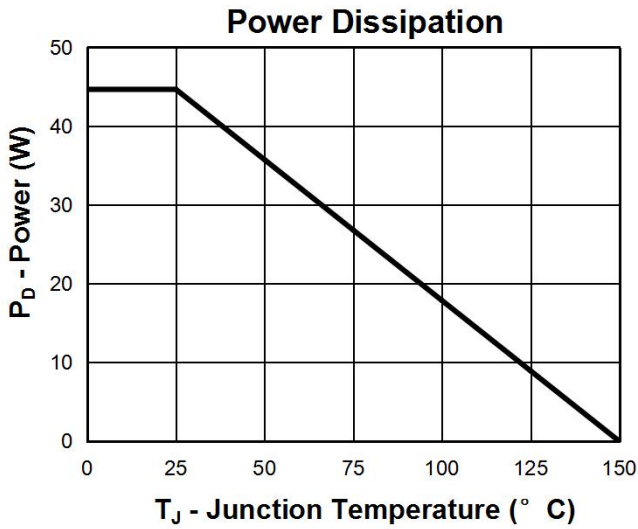
**Notes:**

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 40A.
- ③When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ .
- ④Limited by  $T_{J\text{max}}$ ,  $I_{AS} = 25\text{A}$ ,  $V_{DD} = 24\text{V}$ ,  $R_G = 50\Omega$ , 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.

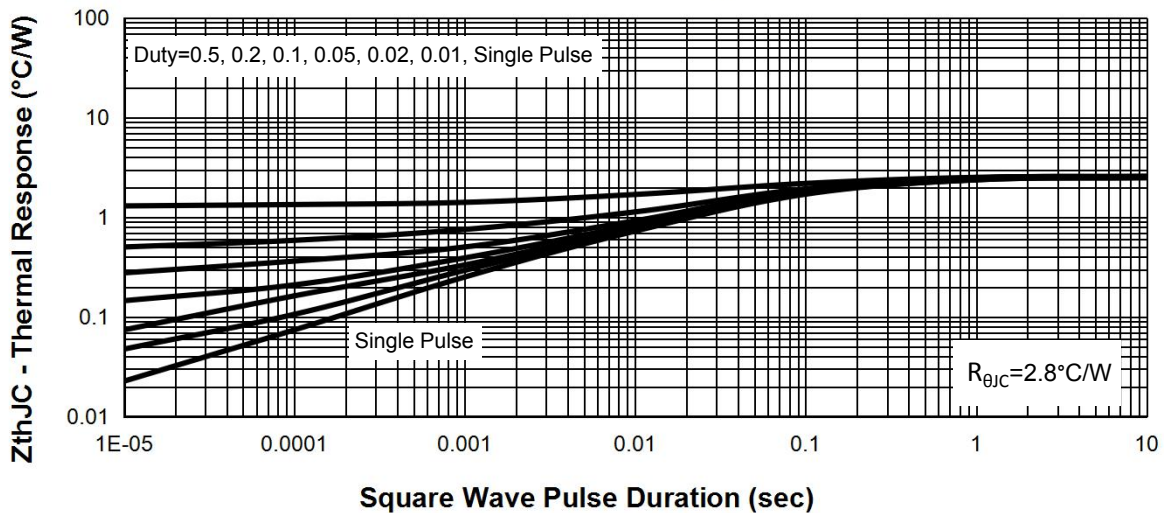
**Ordering and Marking Information**

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU3070M2	RU3070	PDFN3333	Tape&Reel	5000	13"	12mm

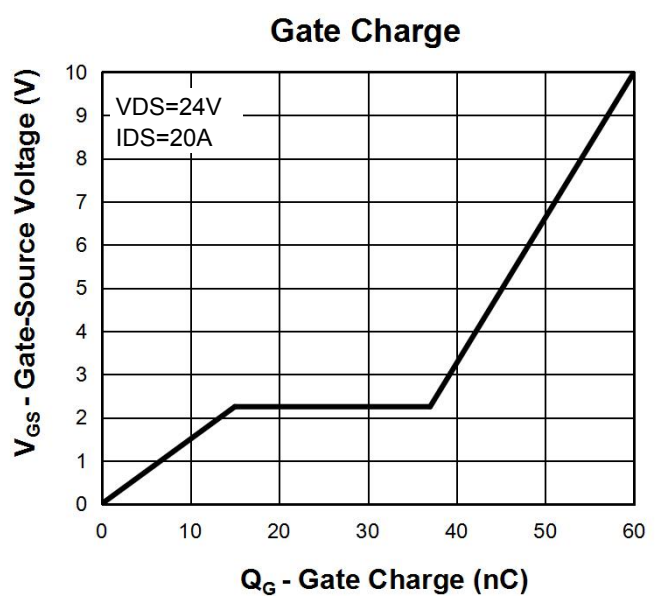
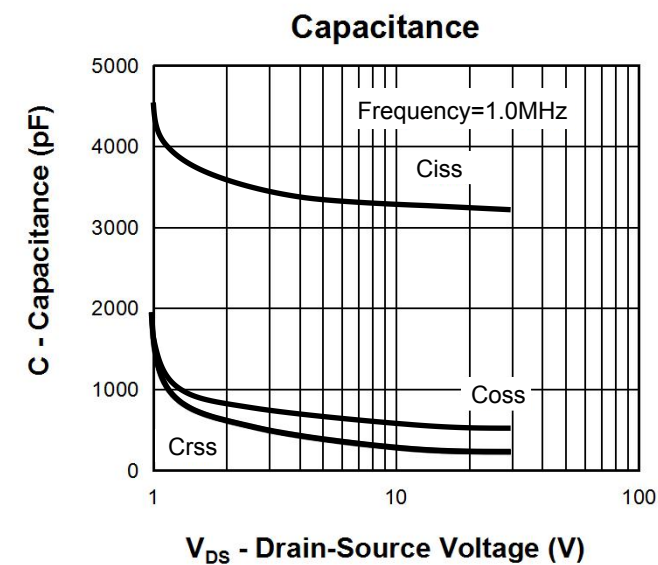
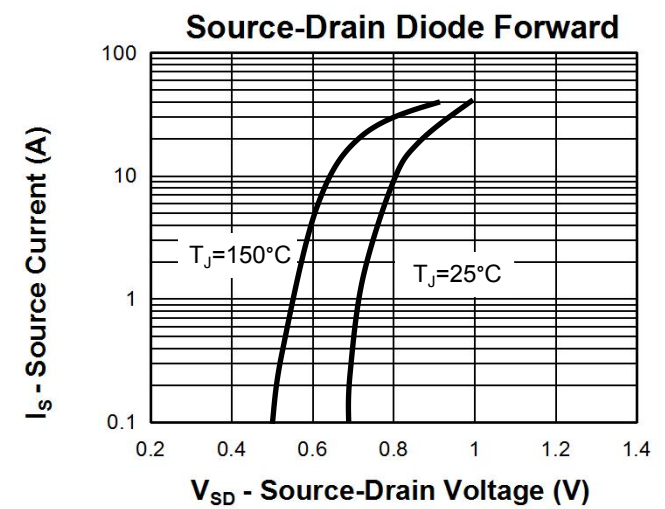
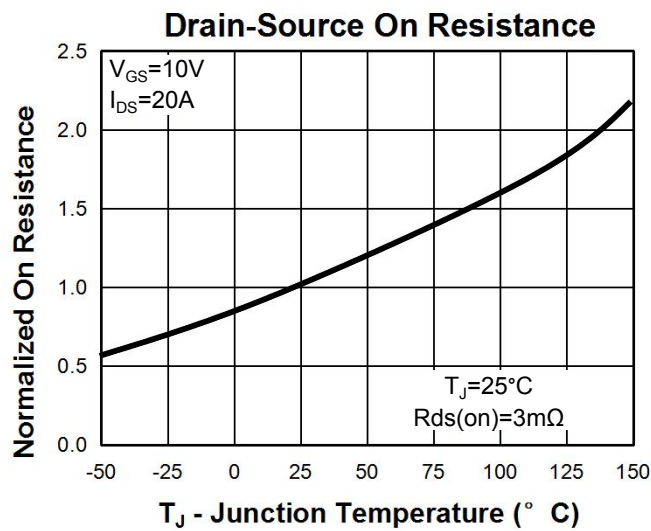
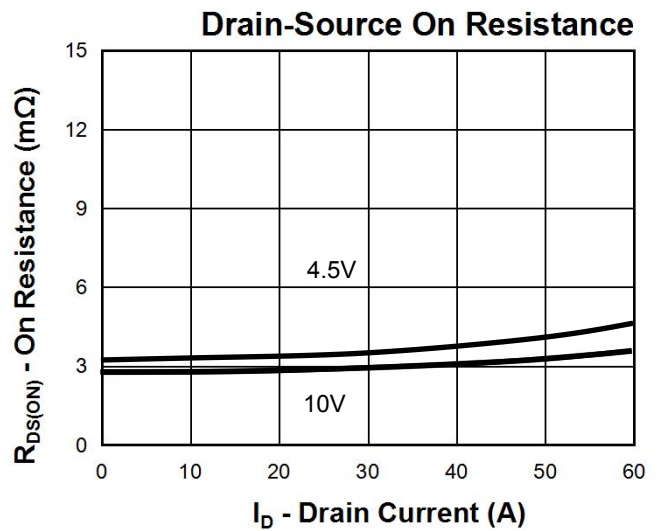
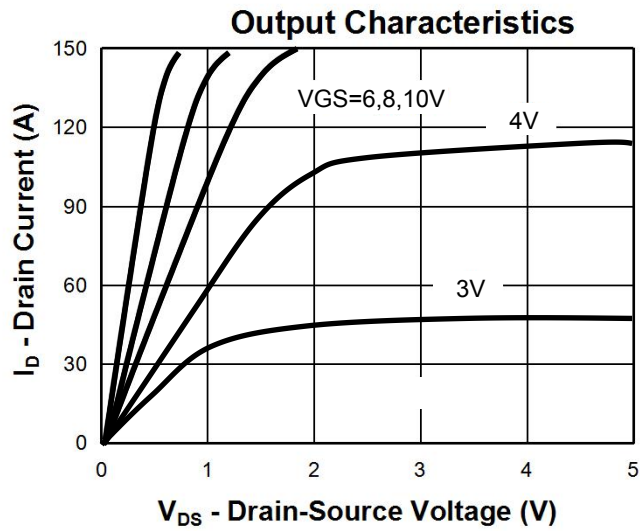
**Typical Characteristics**



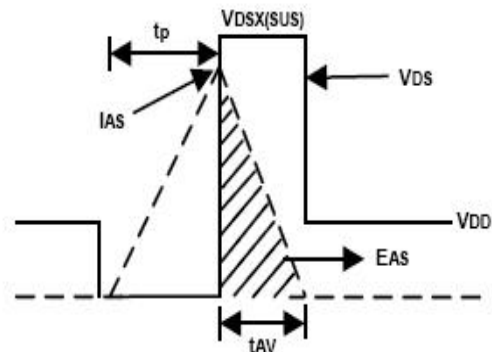
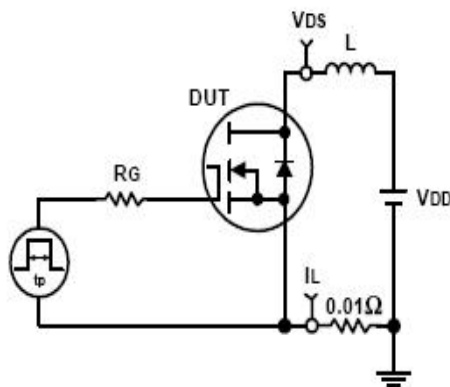
**Thermal Transient Impedance**



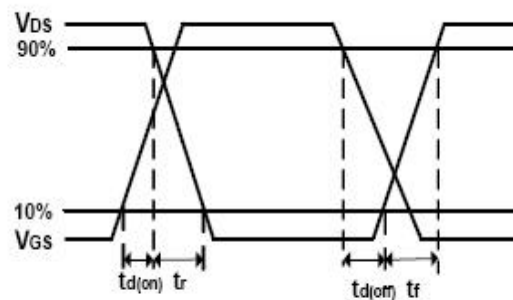
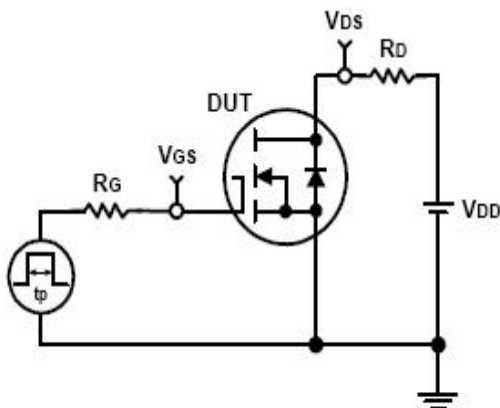
**Typical Characteristics**



**Avalanche Test Circuit and Waveforms**

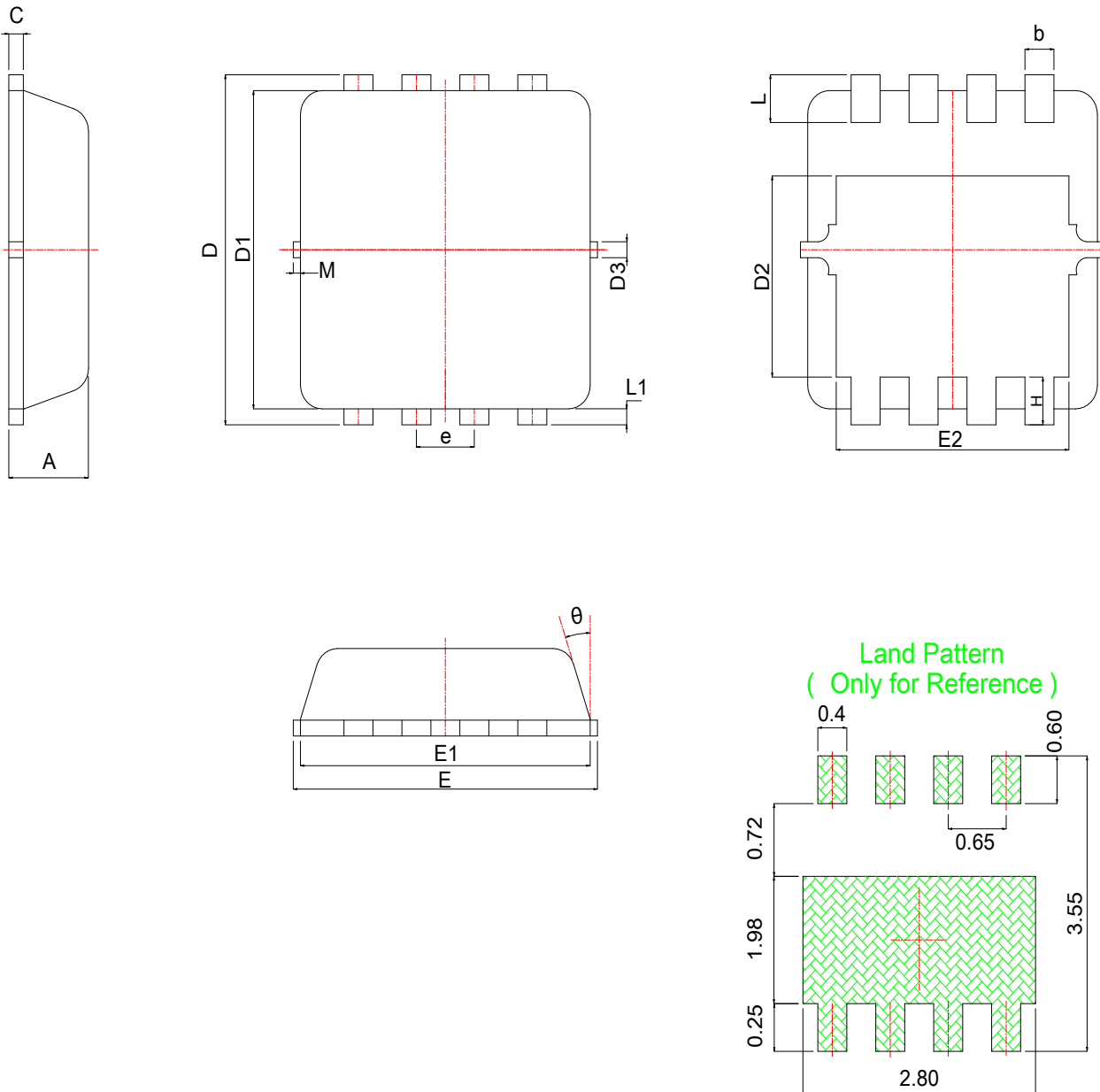


**Switching Time Test Circuit and Waveforms**



**Package Information**

**PDFN3333**



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.90	0.028	0.030	0.035	E1	3.00	3.15	3.30	0.118	0.122	0.130
b	0.20	0.30	0.40	0.008	0.012	0.016	E2	2.25	2.49	2.65	0.089	0.098	0.104
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.15	3.35	3.45	0.124	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	2.90	3.10	3.20	0.114	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.48	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	0.10	0.20	0.30	0.004	0.005	0.012	theta	*	10°	12°	*	10°	12°
E	3.15	3.30	3.45	0.124	0.130	0.136	M	*	*	0.15	*	*	0.006