

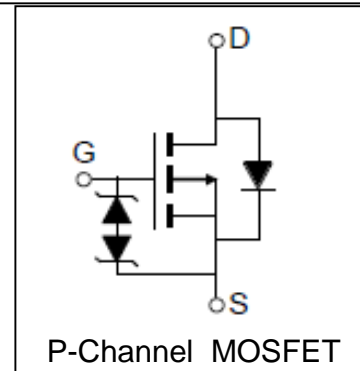
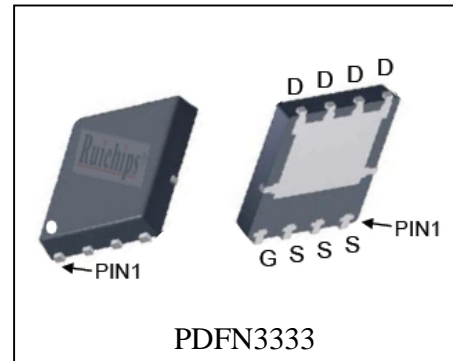
Features

- -30V/-30A,
 $R_{DS(ON)} = 12m$ (Typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 20m$ (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 ^①	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulse Drain Current Tested	$T_C = 25^\circ C$ -96 ^②	A
I_D	Continuous Drain Current ($V_{GS} = -10V$)	$T_C = 25^\circ C$ -30 ^①	A
		$T_C = 100^\circ C$ -19 ^①	
		$T_A = 25^\circ C$ -9.3 ^③	
		$T_A = 70^\circ C$ -7.5 ^③	
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$ 33	W
		$T_C = 100^\circ C$ 13	
		$T_A = 25^\circ C$ 3.5 ^③	
		$T_A = 70^\circ C$ 2.3 ^③	

Mounted on Large Heat Sink			
$R_{\theta JC}$	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)

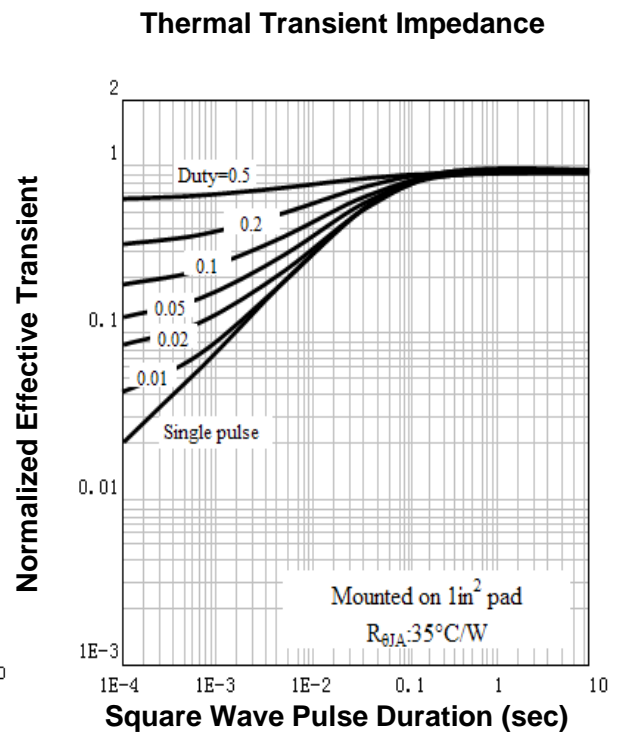
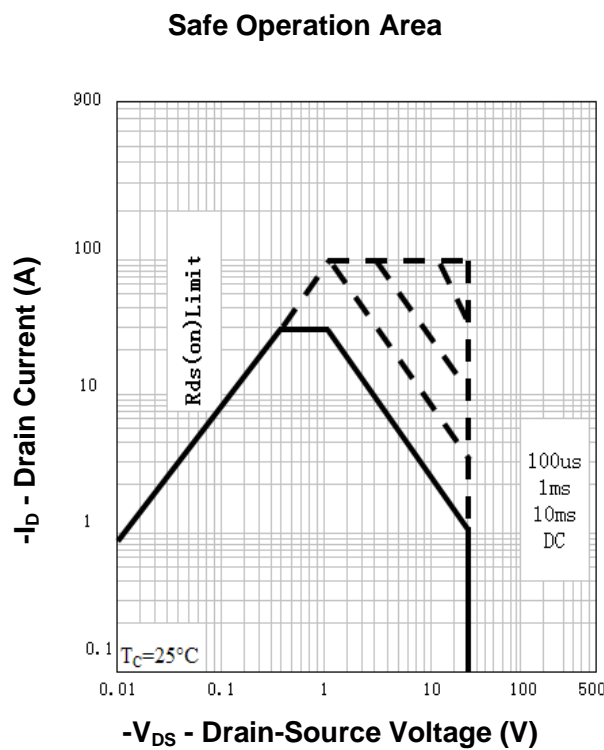
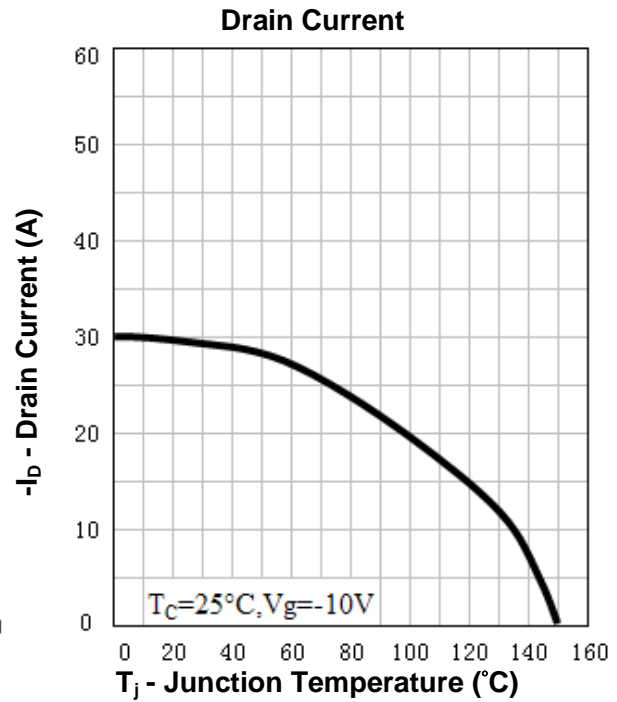
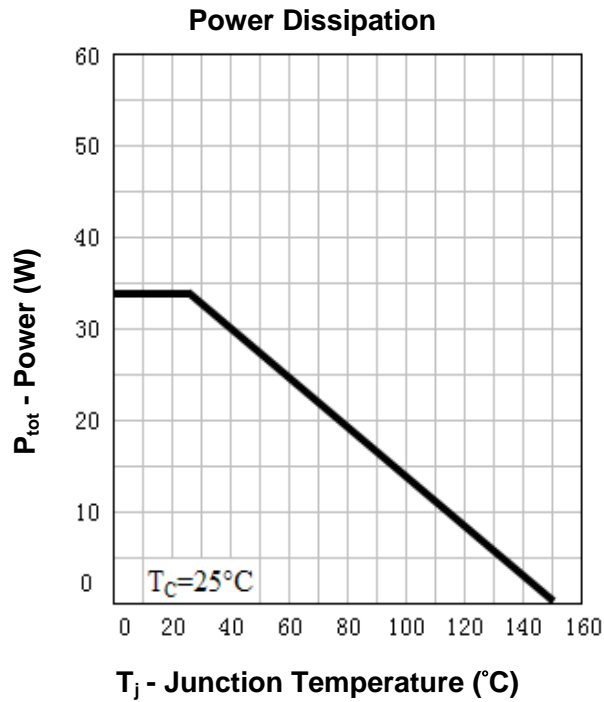
Symbol	Parameter	Test Condition	RU30L30M			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			-1 -30	μA
$V_{GS(th)}$	Gate Threshold 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	$V_{GS}=-10V, I_{DS}=-20A$		12	20	m Ω
		$V_{GS}=-4.5V, I_{DS}=-16A$		20	34	m Ω
Diode Characteristics						
V_{SD} ^⑤	Diode Forward Voltage	$I_{SD}=-1A, V_{GS}=0V$			-1	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			17		ns
t_r	Turn-on Rise Time	$V_{DD}=-15V, R_L=0.75\Omega,$ $I_{DS}=-20A, V_{GEN}=-10V,$ $R_G=6\Omega$		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 Max current is limited by the source bonding.
 - ② Pulse width limited by safe operating area.
 - ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 - ④ Limited by $T_{J\text{max}}$, $I_{AS} = 13\text{A}$, $V_{DD} = -24\text{V}$, $R_G = 50\Omega$, 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

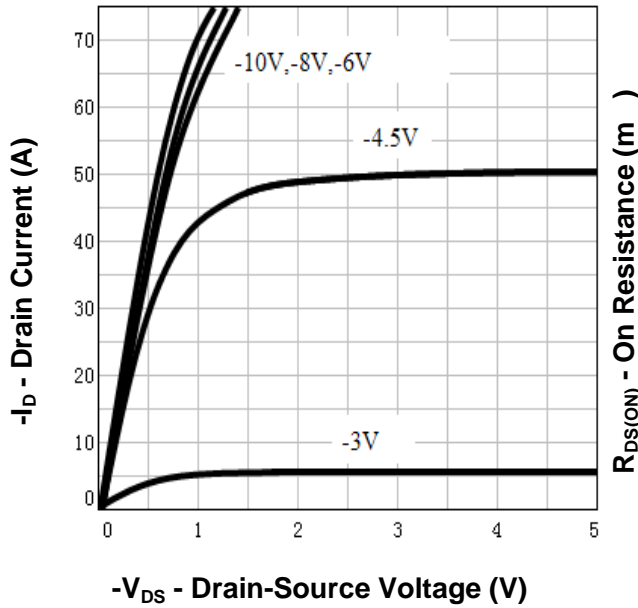
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU30L30M	30L30	PDFN3333	Tape&Reel	5000	13''	12mm

Typical Characteristics

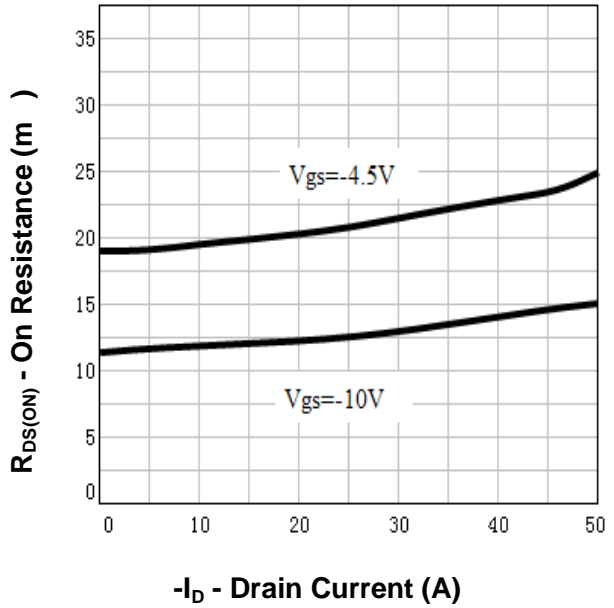


Typical Characteristics

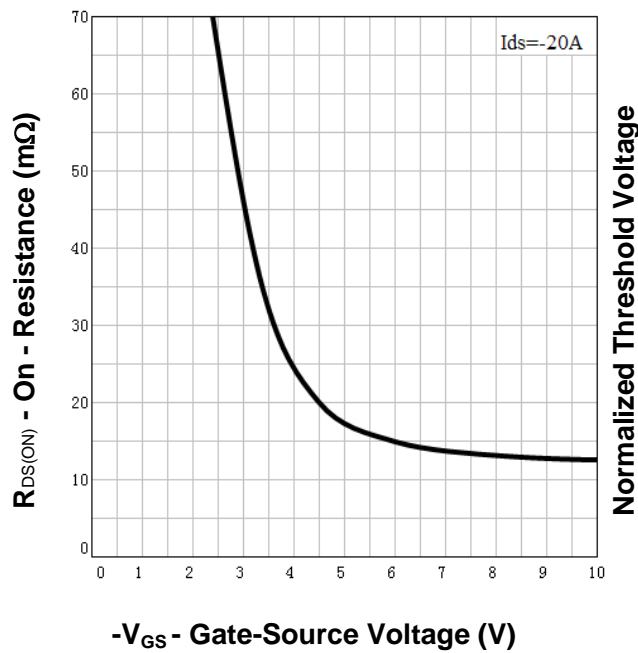
Output Characteristics



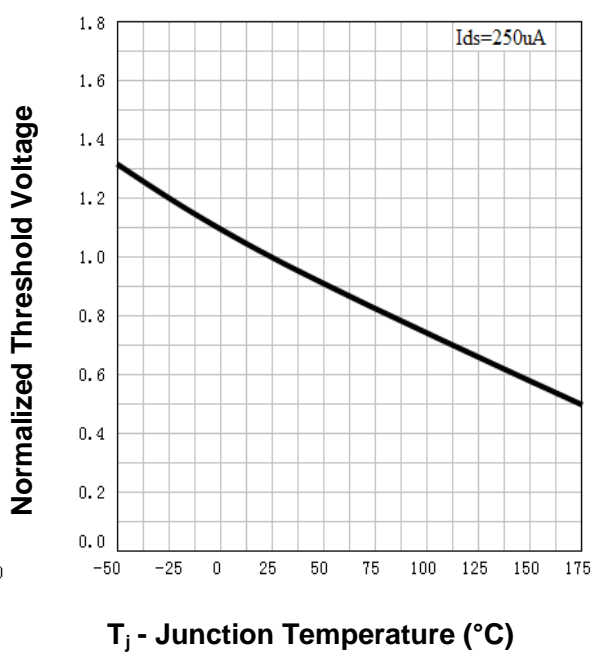
Drain-Source On Resistance



Drain-Source On Resistance

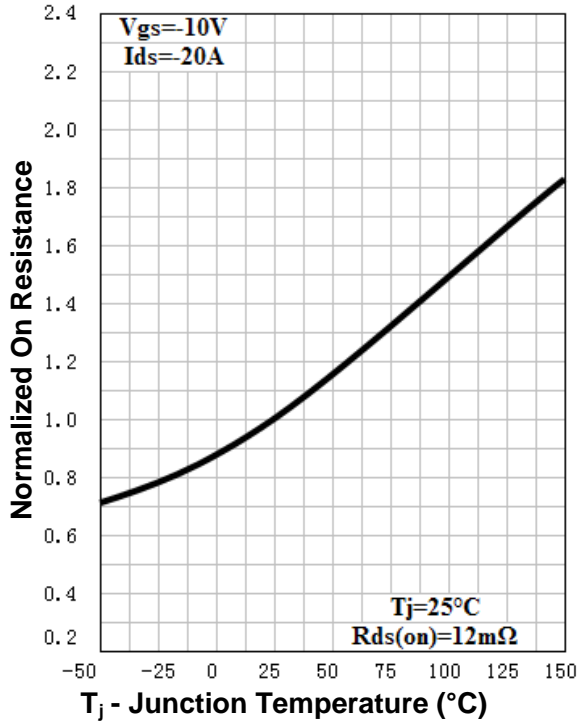


Gate Threshold Voltage

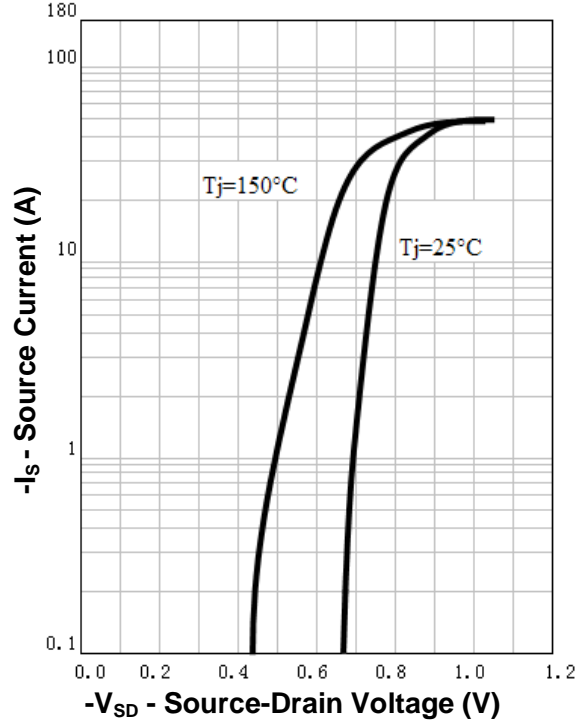


Typical Characteristics

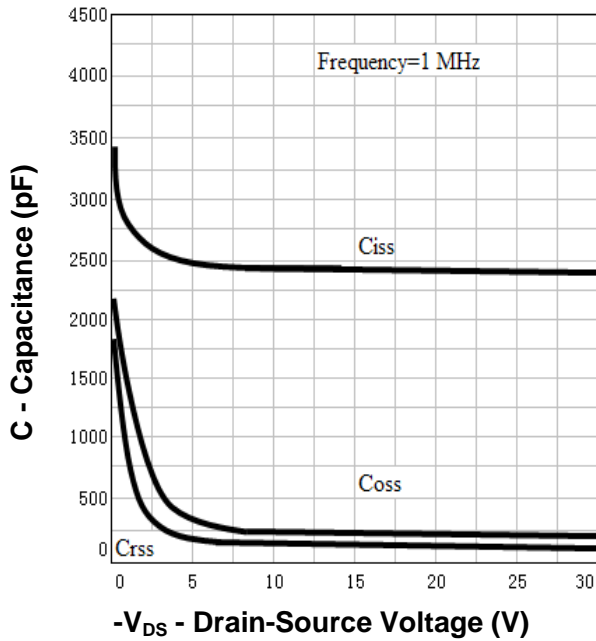
Drain-Source On Resistance



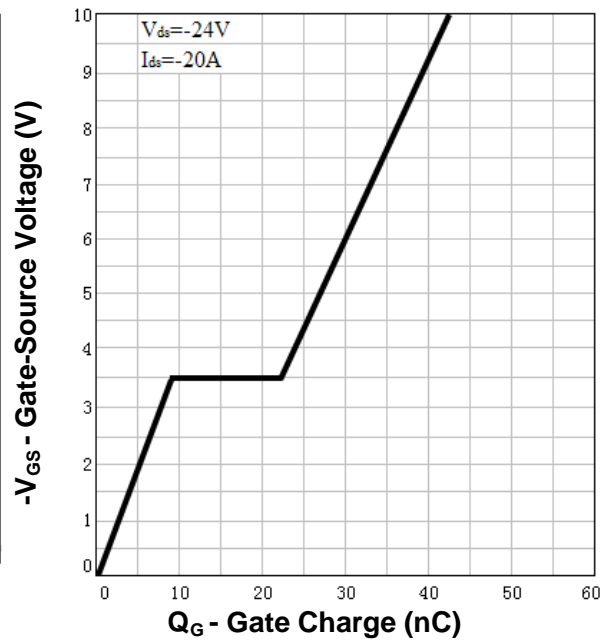
Source-Drain Diode Forward



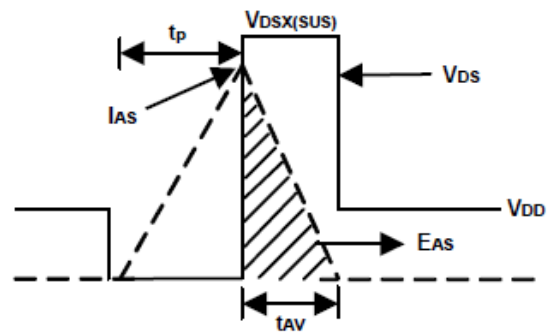
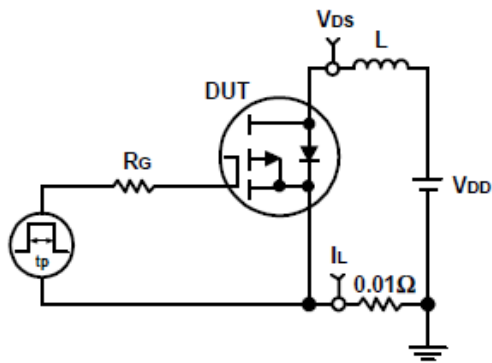
Capacitance



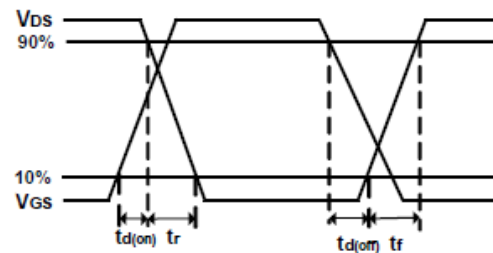
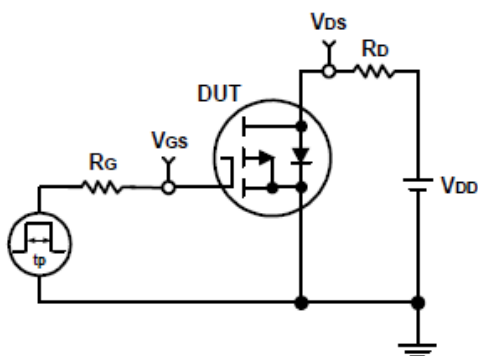
Gate Charge



Avalanche Test Circuit and Waveforms

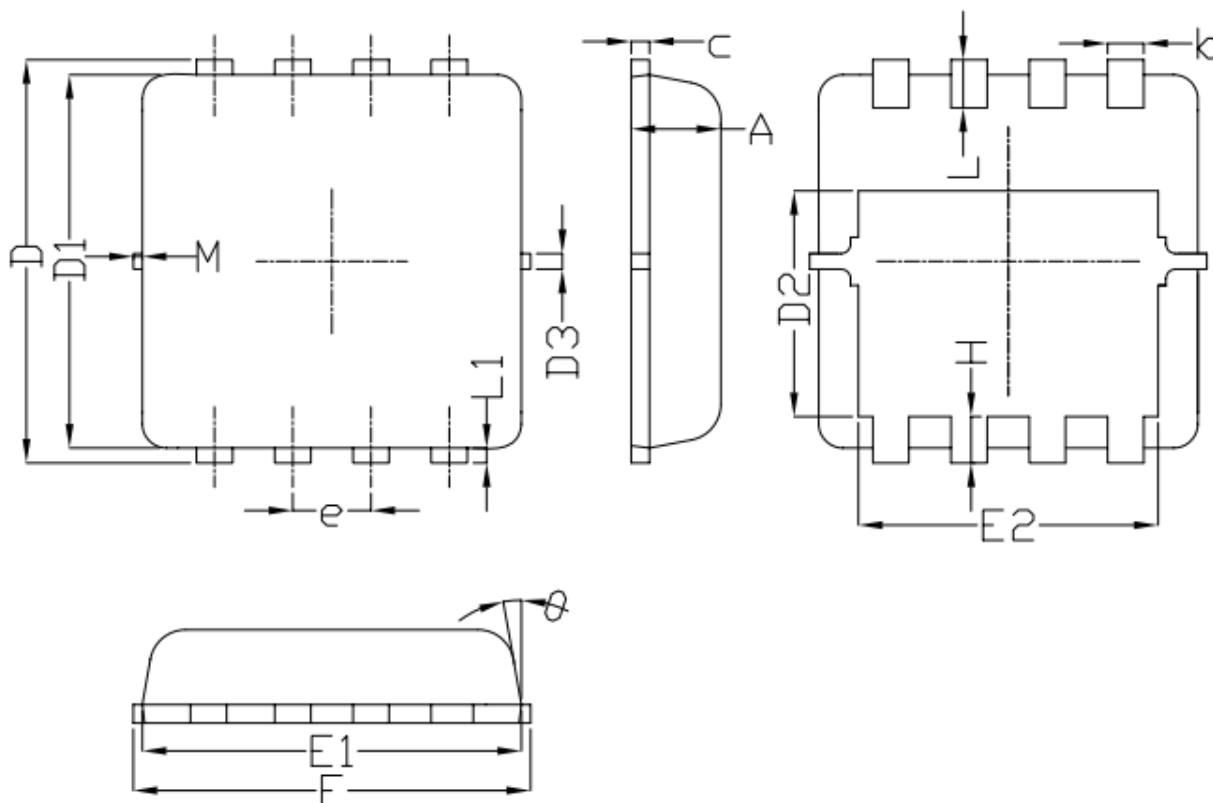


Switching Time Test Circuit and Waveforms



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	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.124	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.006	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.39	0.50	0.012	0.015	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	-	0.13	-	-	0.005	-
D3	-	0.13	-	-	0.005	-		-	10°	12°	-	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	-	-	0.15			0.006

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