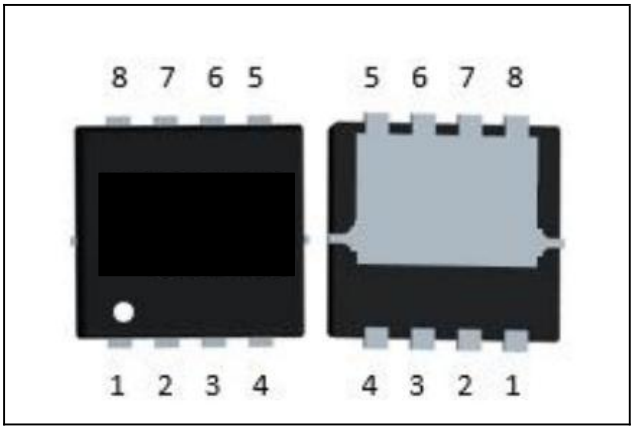
N-Channel 30V MOSFET

E030N6P0ML1

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30V	6 @ V_{GS} = 10V	30

PDFN3.3X3.3

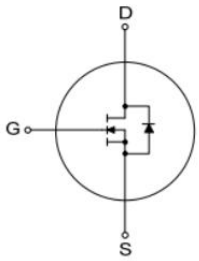


Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Power switch
- Moto driver



N-Channel

Pb-free
RoHS
COMPLIANT
HALOGEN
FREE

Package And Ordering Information

Ordering code	Package	Marking
E030N6P0ML1	PDFN3.3*3.3	EX03N30

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
PDFN3.3*3.3	5000	1	5000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	30	V
ID, pulse	160	A
RDS(ON), max @ VGS=10V	6	mΩ
Qg	27	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	30	A
	T_C=100°C		14	
Pulsed drain current		$I_{D,pulse}$	160	
Avalanche energy, single pulse		E_{AS}	25	mJ
Power dissipation	T_C=25°C	P_D	30	W
	T_A=25°C		3.6	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 150	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	4.9	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	42	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	30			V	V_{GS} = 0, I_D = 250 μA
Gate-source threshold voltage	$V_{GS(th)}$	1.3	1.65	2.4	V	V_{DS} = V_{GS}, I_D = 250 μA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS} = 30 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS(on)}$		5.2	6	mΩ	V_{GS} = 10 V, I_D = 15 A
Drain-source on-resistance	$R_{DS(on)}$		7.8	10	mΩ	V_{GS} = 4.5 V, I_D = 10 A
Gate resistance	Rg	0.2	2	5	Ω	f=1MHz

Gate Charge						
Total gate charge	Qg		27	47	nC	V_{DS} = 15 V, I_D = 15 A, V_{GS} = 10 V
Gate-source charge	Qgs		4.5	7.9		
Gate-drain charge	Qgd		5	8.8		
Dynamic						
Turn-on delay time	$t_{d(on)}$		6.4		ns	V_{DS} = 15 V, I_D =15 A, V_{GS} = 10 V, R_{GEN} = 3 Ω
Rise time	t_r		51			
Turn-off delay time	$t_{d(off)}$		25			
Fall time	t_f		15			
Input capacitance	C_{iss}	415		2430	pF	V_{DS} =15 V, V_{GS} = 0 V, f = 1MHz
Output capacitance	C_{oss}	80		970		
Reverse transfer capacitance	C_{rss}	30		245		
Body Diode						
Diode forward voltage	V_{SD}		0.8	1.2	V	V_{GS} = 0 V, I_F = 15A
Reverse recovery time	t_{rr}		7	28	ns	V_R= 0 V, I_S =15 A, di/dt = 100 A/μs
Reverse recovery charge	Q_{rr}		1.4	6.4	nC	

Electrical Characteristics Diagrams

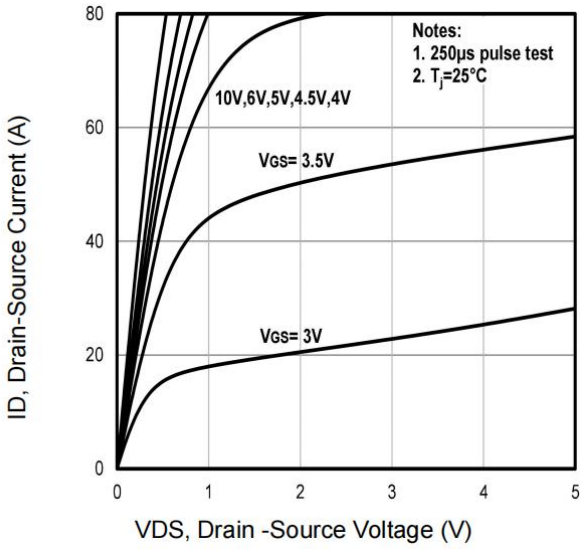


Fig1. Typical Output Characteristics

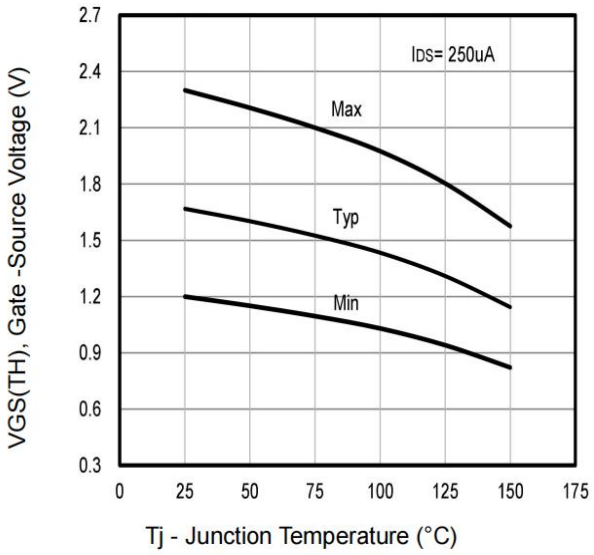


Fig2. Typical $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

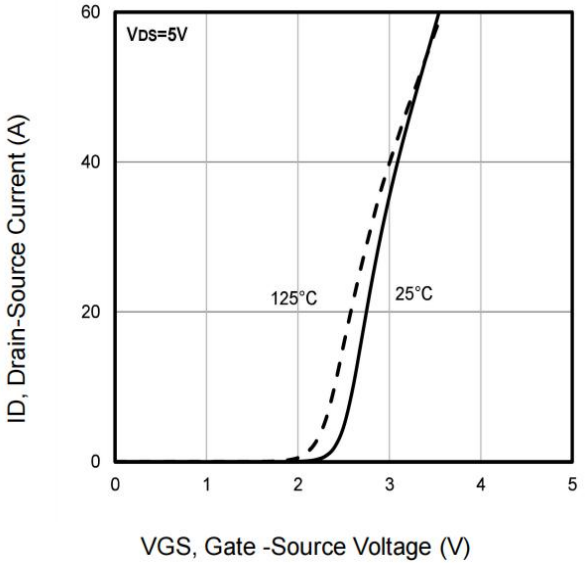


Fig3. Typical Transfer Characteristics

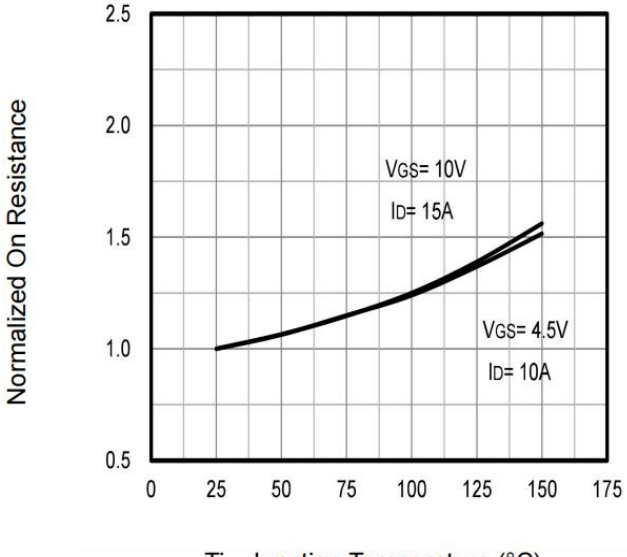


Fig4. Typical Normalized On-Resistance Vs. Tj

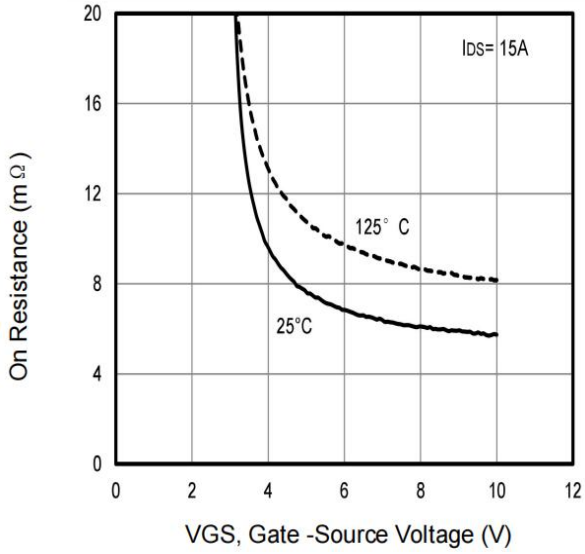


Fig5. Typical On Resistance Vs Gate -Source Voltage

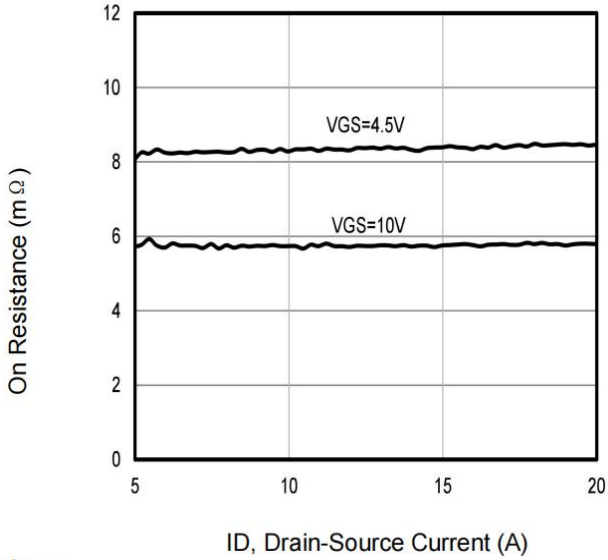


Fig6. Typical On Resistance Vs Drain Current and Gate

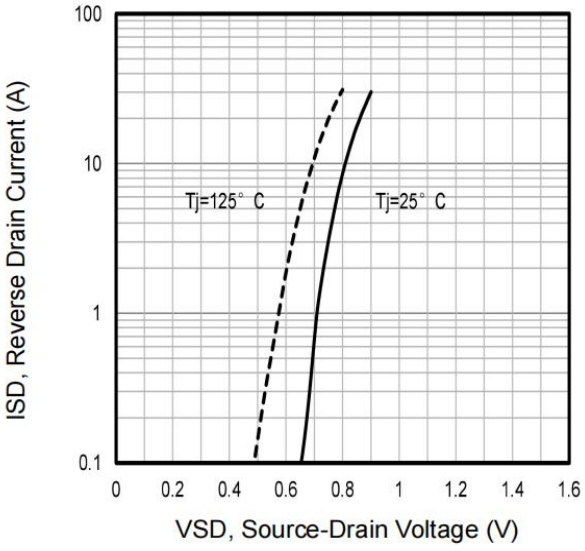


Fig7. Typical Source-Drain Diode Forward Voltage

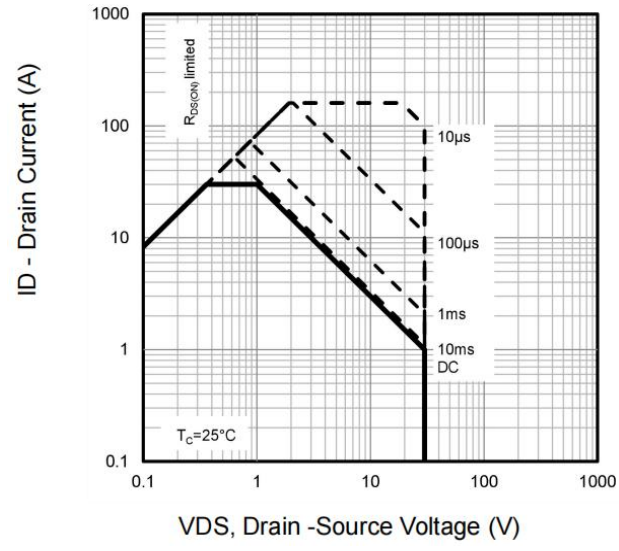


Fig8. Maximum Safe Operating Area

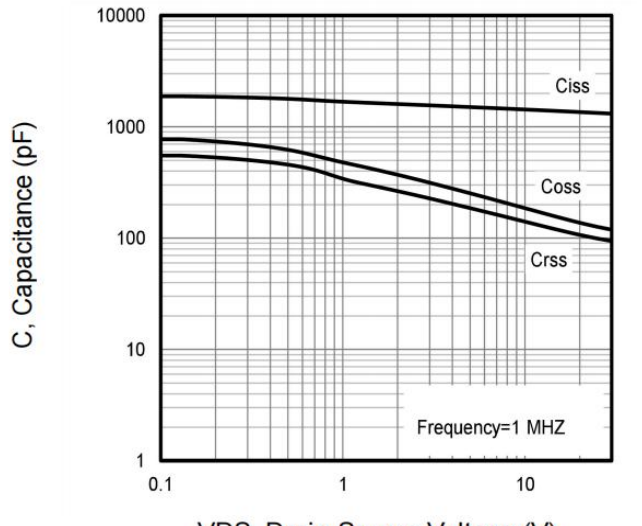


Fig9. Typical Capacitance Vs. Drain-Source Voltage

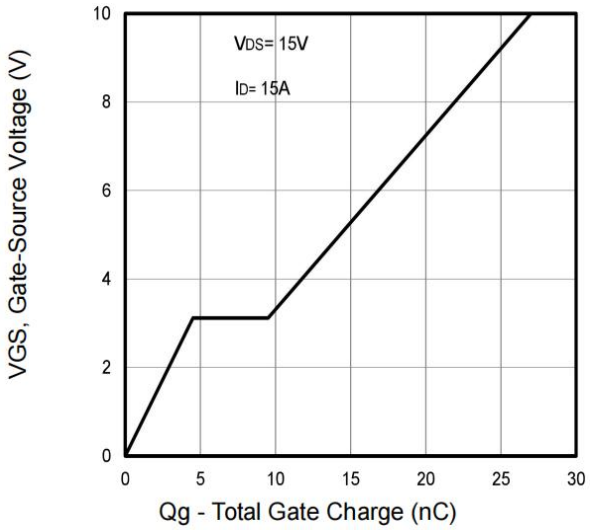


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

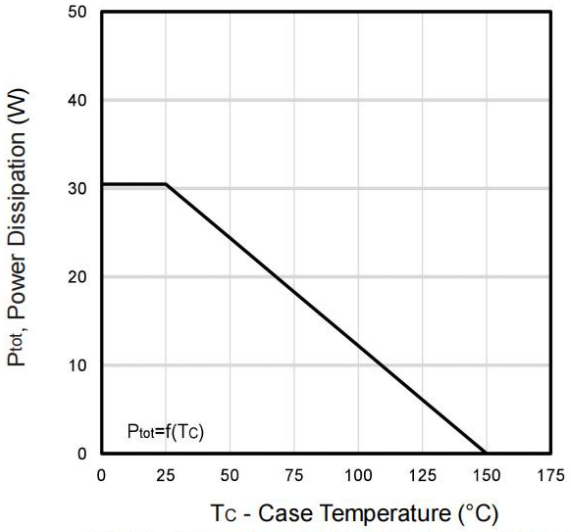


Fig11. Power Dissipation Vs. Case Temperature

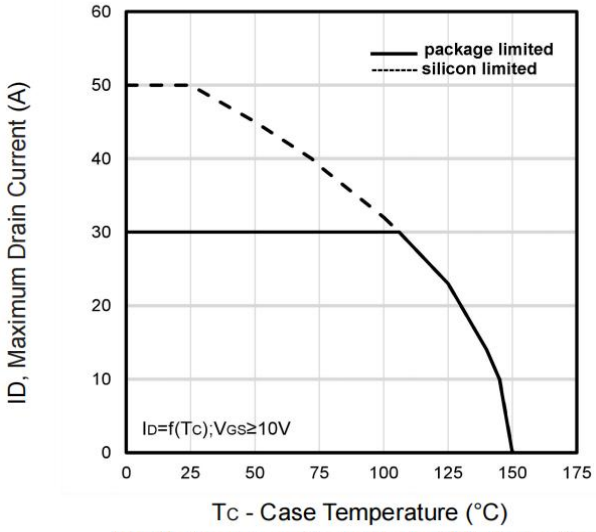


Fig12. Maximum Drain Current Vs. Case Temperature

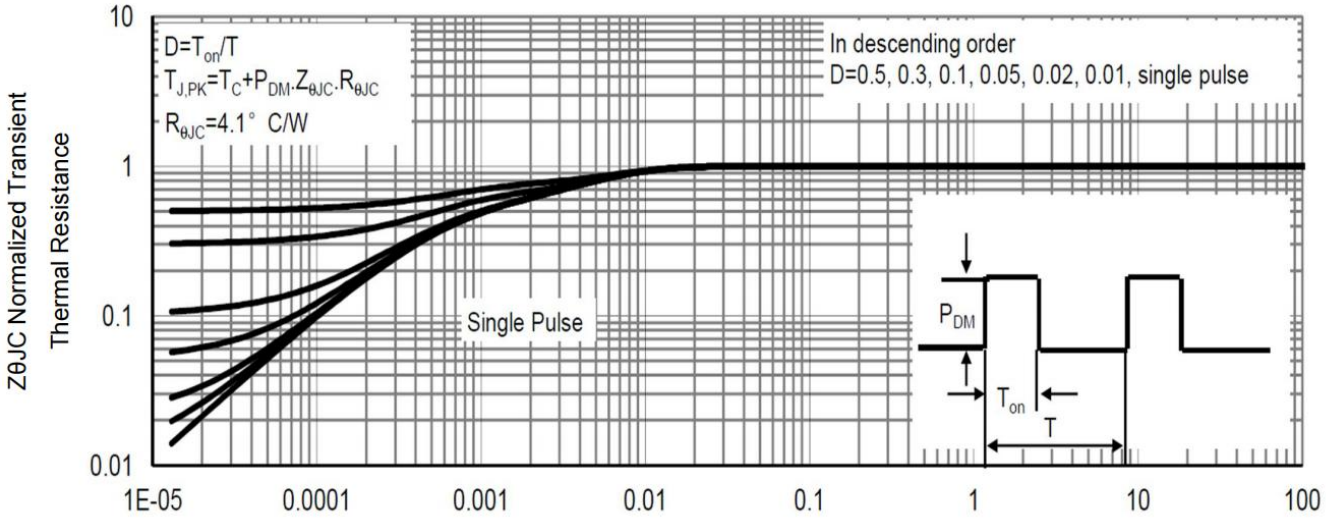


Fig13 . Normalized Maximum Transient Thermal Impedance

Test circuits and waveforms

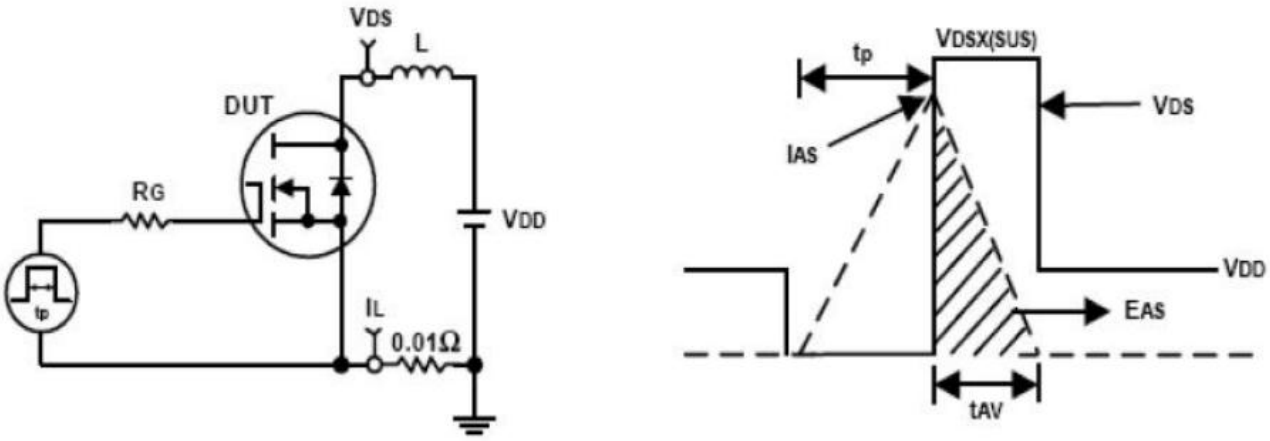


Fig1. Unclamped Inductive Test Circuit and waveforms

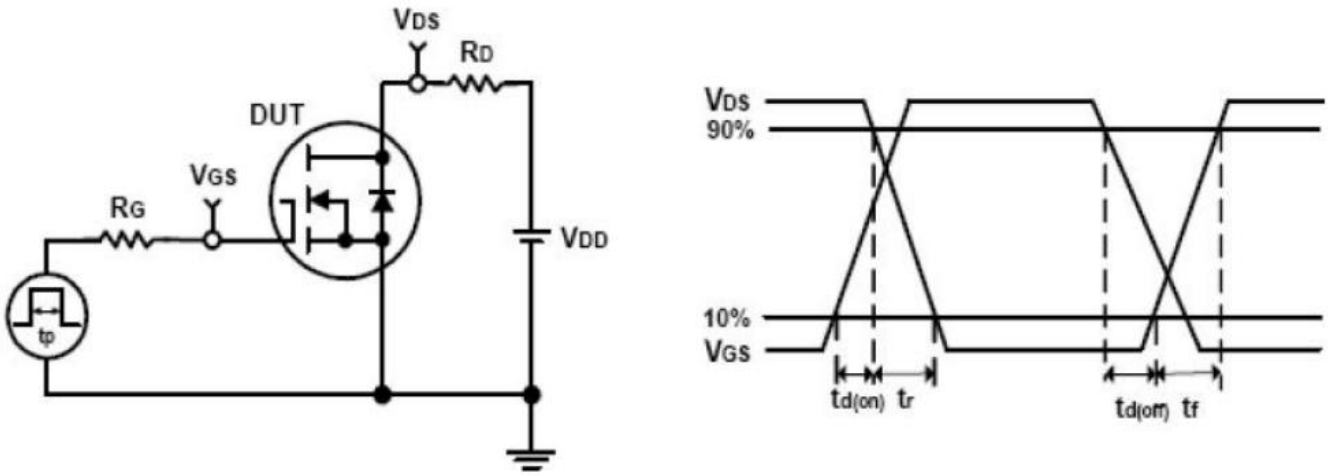
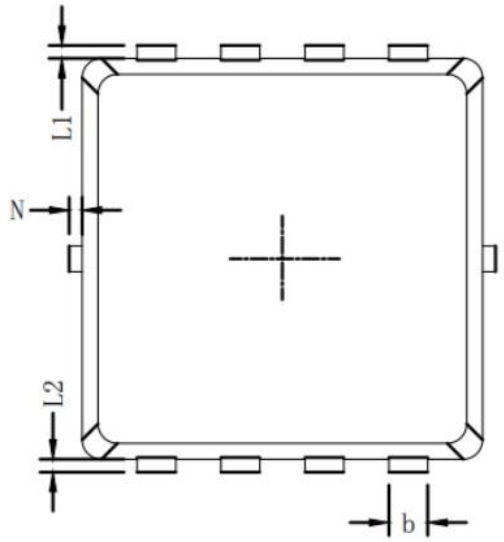
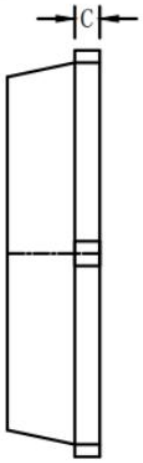


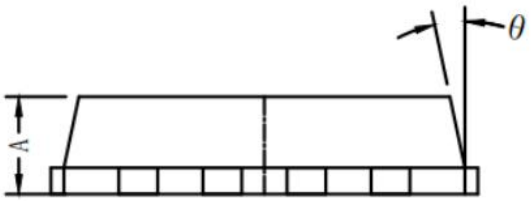
Fig2. Switching Time Test Circuit and waveforms

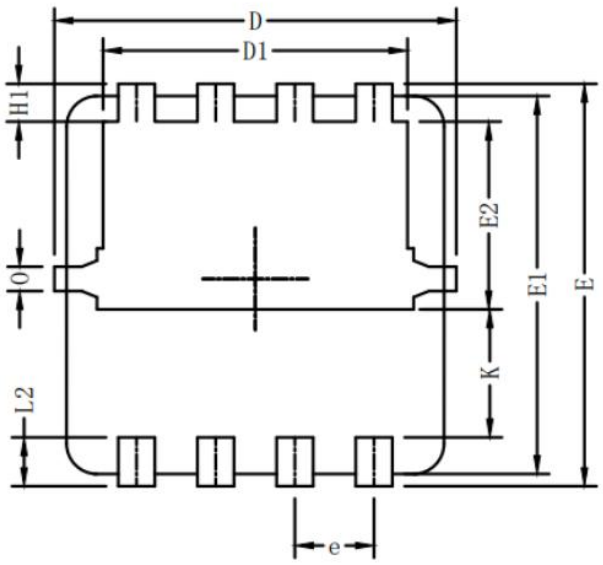
Package Outline Dimensions

PDFN3.3*3.3









Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.95	1.05	1.15
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
O	0.2 REF.		

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