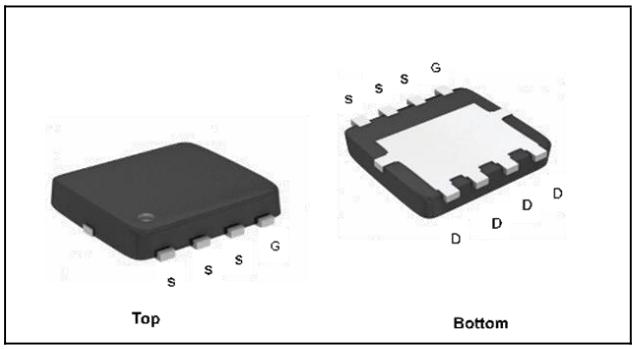
N-Channel 30V MOSFET

E030N2P0HL1

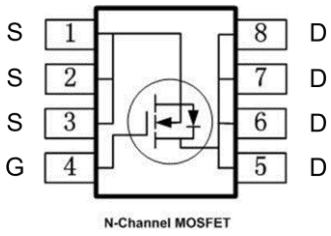
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
30V	2 @ V_{GS} = 10V	180

PDFN5X6



Features

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



Pb-free
RoHS COMPLIANT
HALOGEN FREE

Applications

- DC/DC conversion
- Power switch
- PD charger
- Moto driver

Package And Ordering Information

Ordering code	Package	Marking
E030N2P0HL1	PDFN5x6	E030N2P0HL1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
PDFN5x6	5000	1	5000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	30	V
ID, pulse	720	A
RDS(ON), max @ VGS=10V	2	mΩ
Qg	102	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	180	A
	T_C=100°C		114	
Pulsed drain current		$I_{D,pulse}$	720	
Avalanche energy, single pulse		E_{AS}	361	mJ
Power dissipation	T_C=25°C	P_D	114	W
	T_A=25°C		2.6	
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	$R_{\theta JC}$	1.1	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	48	

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	$V_{GS(th)}$	1.2	1.7	2.3	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	$R_{DS(on)}$		1.6	2	mΩ	V_{GS} = 10 V, I_D = 30 A
Drain-source on-resistance	$R_{DS(on)}$		2.5	3.1	mΩ	V_{GS} = 4.5 V, I_D = 20 A
Forward transconductance	gfs		54		S	V_{DS} = 5 V, I_D = 30 A

Gate resistance	Rg		2.3		Ω	f=1MHz
Gate Charge						
Total gate charge	Qg		102		nC	V_{DS} = 15 V, I_D = 30 A, V_{GS} = 10 V
Gate-source charge	Qgs		15			
Gate-drain charge	Qgd		23			
Dynamic						
Turn-on delay time	$t_{d(on)}$		10		ns	V_{DS} = 15 V, I_D =30 A, V_{GS} = 10 V, R_{GEN} = 3 Ω
Rise time	t_r		81			
Turn-off delay time	$t_{d(off)}$		83			
Fall time	t_f		45			
Input capacitance	C_{iss}		5095		pF	V_{DS} =15 V, V_{GS} = 0 V, f = 100kHz
Output capacitance	C_{oss}		635			
Reverse transfer capacitance	C_{rss}		530			
Body Diode						
Diode forward voltage	V_{SD}		0.8	1	V	V_{GS} = 0 V, I_F = 30 A
Reverse recovery time	t_{rr}		25		ns	V_R= 25 V, I_S =30 A, di/dt = 100 A/μs
Reverse recovery charge	Q_{rr}		16		nC	

Electrical Characteristics Diagrams

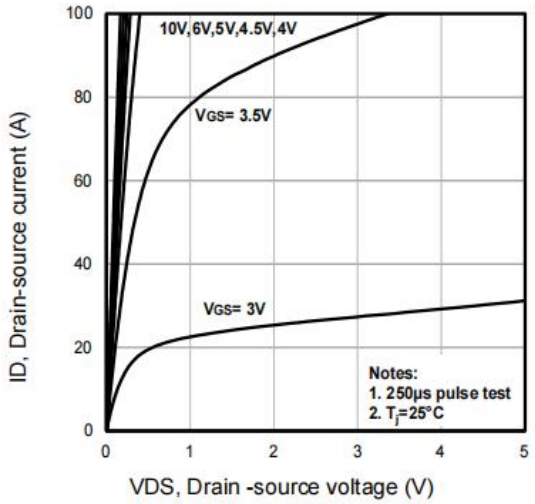


Fig1. Typical output characteristics

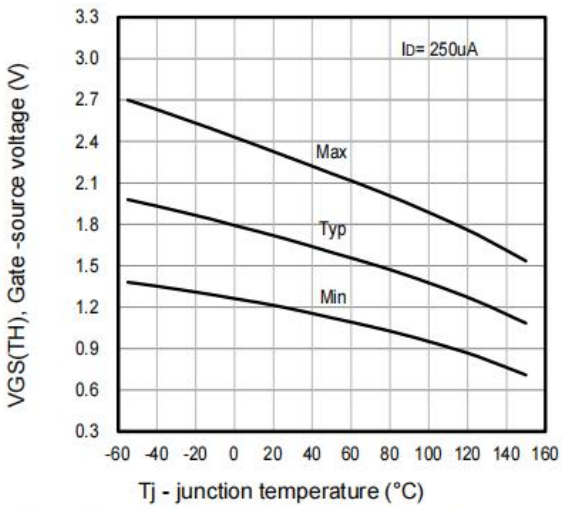


Fig2. Typical $V_{GS(TH)}$ gate -source voltage Vs. Tj

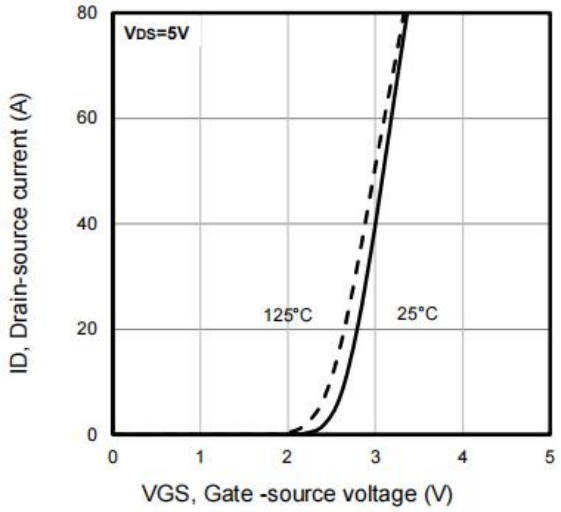


Fig3. Typical transfer characteristics

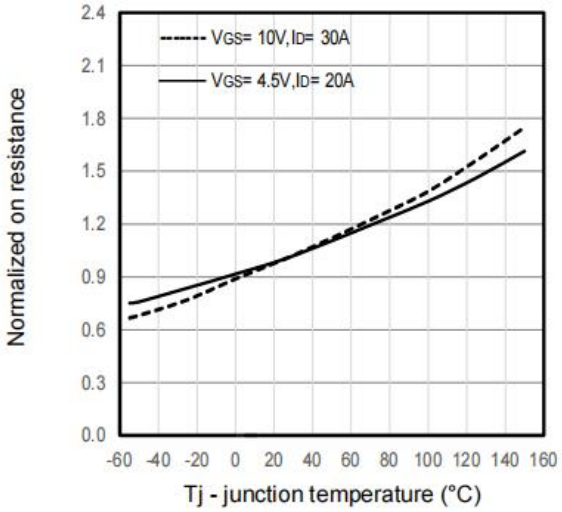


Fig4. Typical normalized on-resistance Vs. Tj

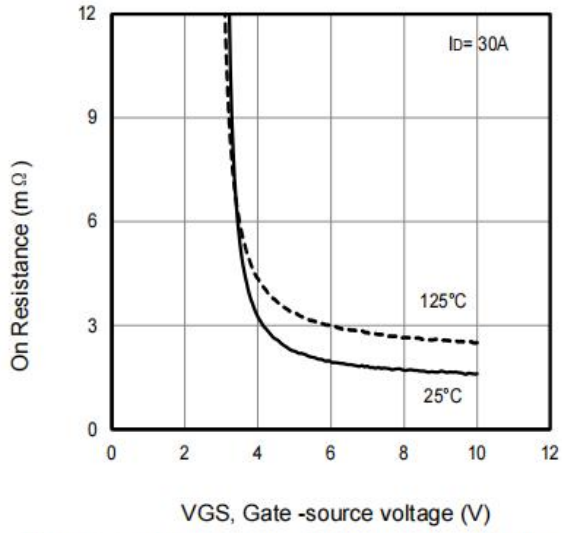


Fig5. Typical on resistance Vs gate -source voltage

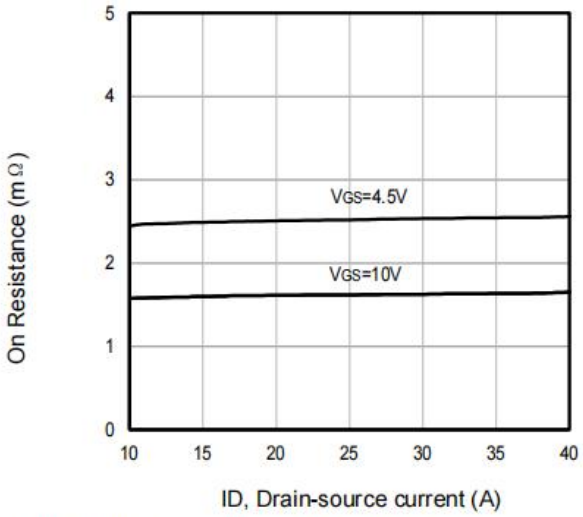


Fig6. Typical on resistance Vs drain current

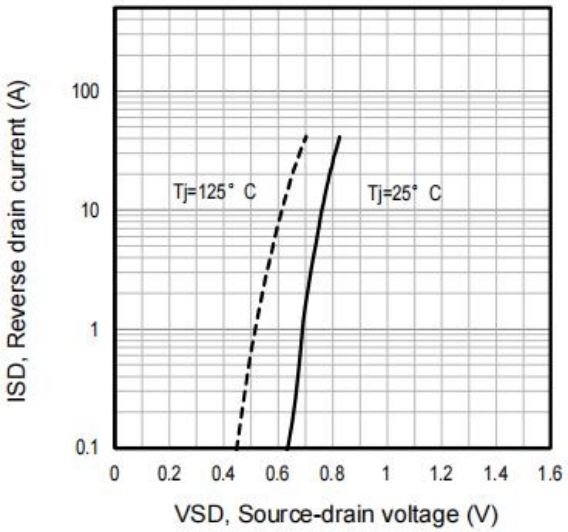


Fig7. Typical source-drain diode forward voltage

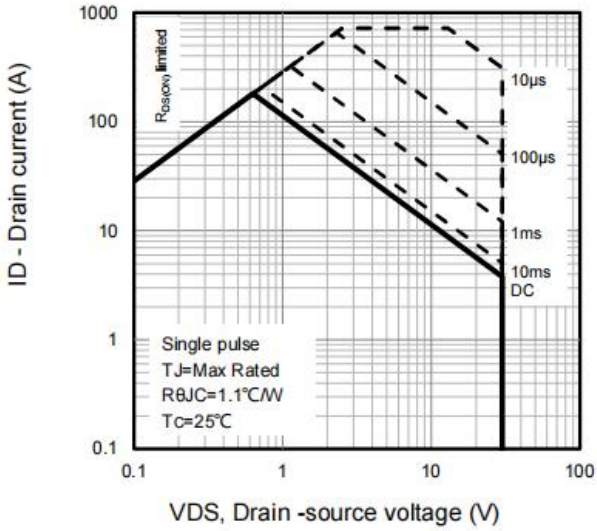


Fig8. Maximum safe operating area

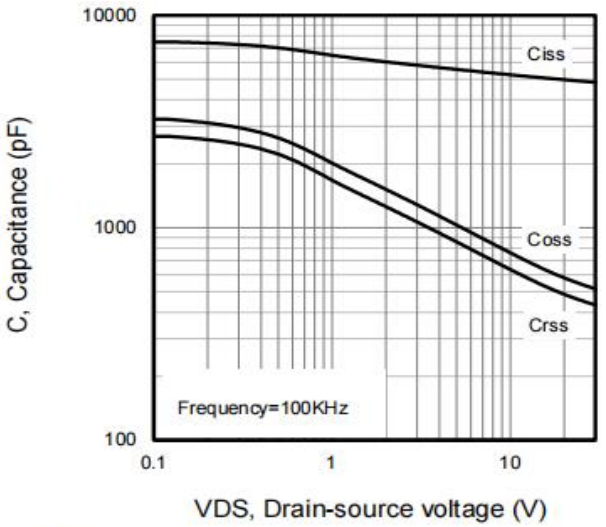


Fig9. Typical capacitance Vs. drain-source voltage

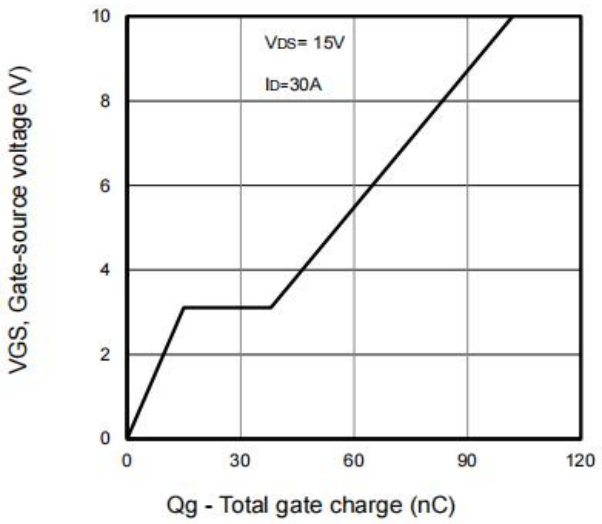


Fig10. Typical gate charge Vs. gate-source voltage

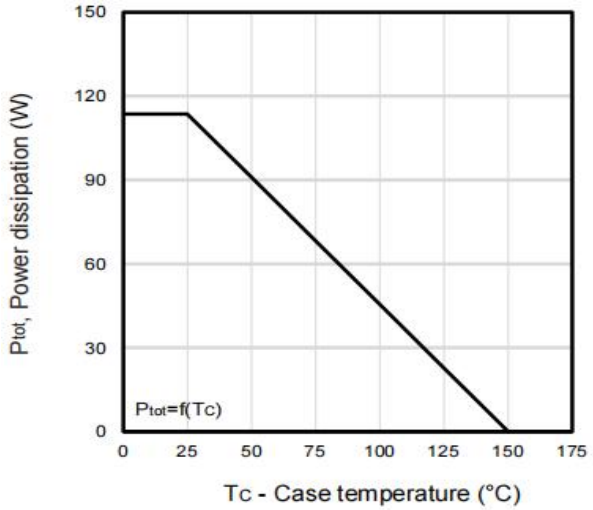


Fig11. Power dissipation Vs. case temperature

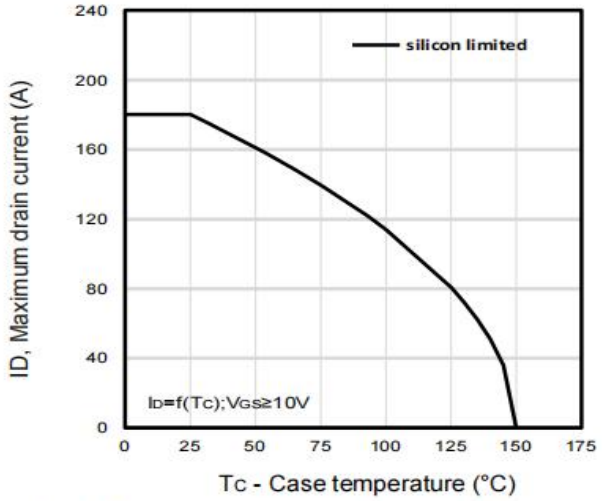


Fig12. Maximum drain current Vs. case temperature

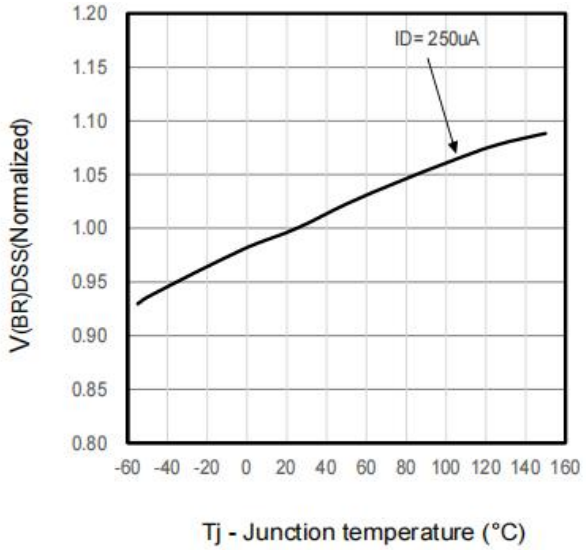


Fig13. Typical V(BR)DSS Vs Tj

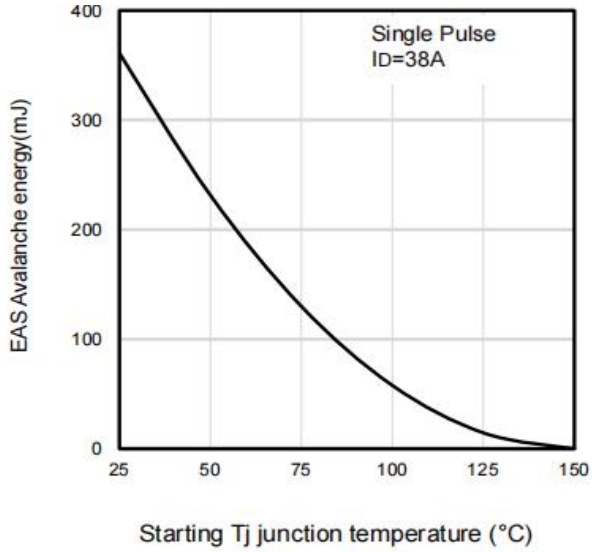


Fig14. Maximum avalanche energy vs temperature (°C)

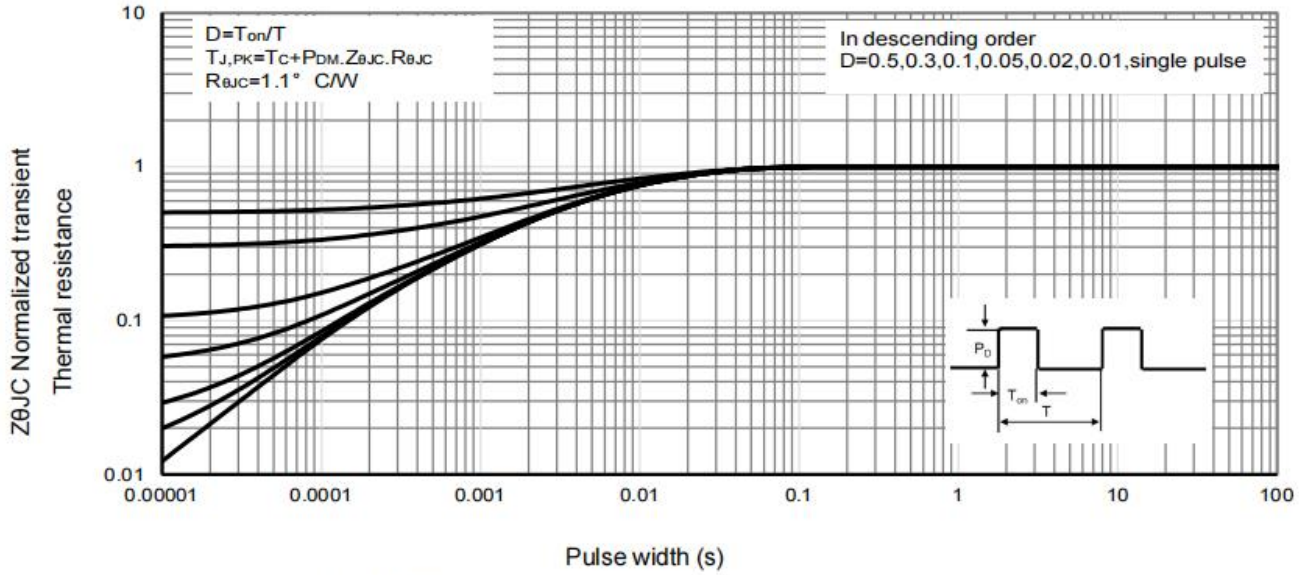


Fig15 . Normalized maximum transient thermal impedance

Test circuits and waveforms

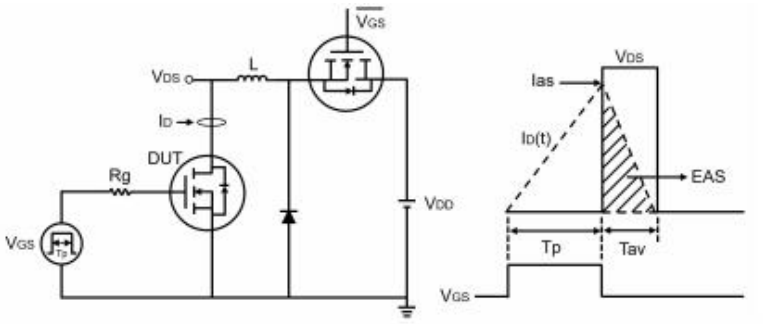


Fig16. Unclamped inductive test circuit and waveforms

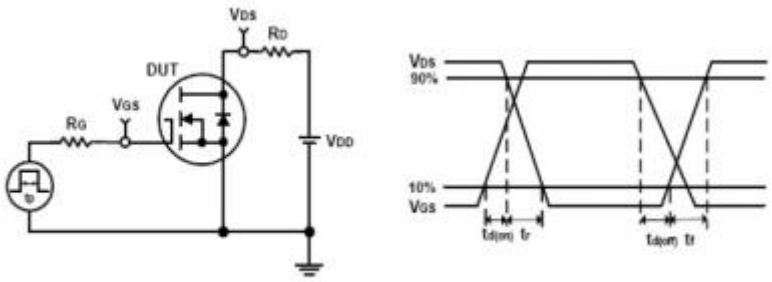
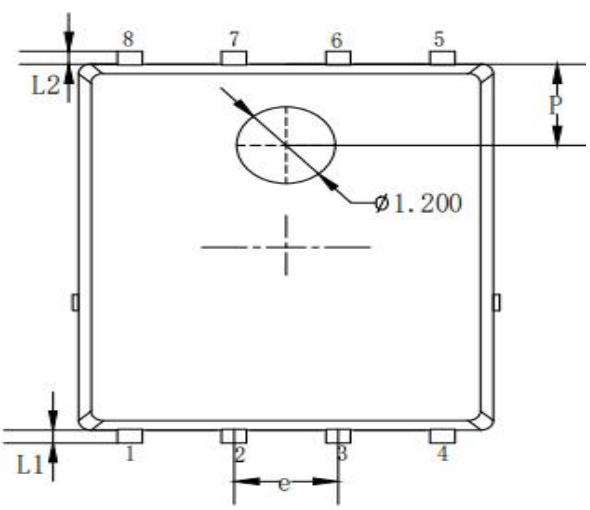
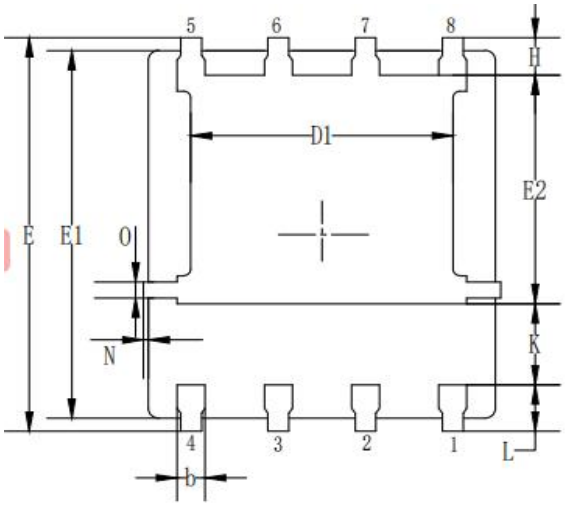


Fig17. Switching time test circuit and waveforms

Package Outline Dimensions





Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.10
D1	3.72	3.82	3.92
E	6.00	6.15	6.25
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.69	0.75
L1/L2	0.10 ~ 0.20		
θ	8°	10°	12°
M	0.08 REF.		
N	0	–	0.15
O	0.25 REF.		
P	1.28 REF.		

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