

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

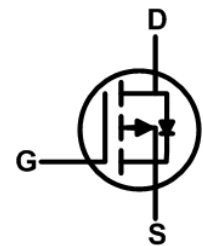
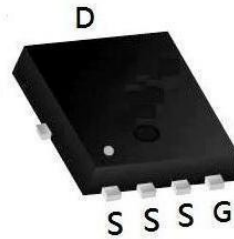

**Product Summary**

BVDSS	RDSON	ID
-30V	6.5mΩ	-70A

**Description**

The XXW70P03D is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XXW70P03D meet the RoHS and Gree Product requirement 100% EAS guaranteed with full function reliability approved.

**PDFN3333-8L Pin Configuration**

**Absolute Maximum Ratings**

Parameter		Symbol	Value	Unit
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	±20	V
Continuous Drain Current@-10V <sup>1</sup>	$T_C=25^{\circ}C$	$I_D$	-70	A
	$T_C=75^{\circ}C$		-35	
Pulsed Drain Current <sup>2</sup>		$I_{DM}$	-175	A
Single Pulse Avalanche Energy <sup>3</sup>		<b>EAS</b>	31	mJ
Avalanche Current		$I_{AS}$	-70	A
Total Power Dissipation <sup>4</sup>	$T_C=25^{\circ}C$	<b>P<sub>D</sub></b>	31.2	W
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to+150	°C

**Thermal Characteristics**

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient <sup>1</sup>	$R_{\theta JA}$	61	°C/W
Thermal Resistance from Junction-to-Case <sup>1</sup>	$R_{\theta JC}$	4	°C/W

**P-Ch 30V Fast Switching MOSFETs**
**Electrical Characteristics**  $T_c = 25^\circ\text{C}$ , unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
Gate-body Leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$T_J=25^\circ\text{C}$	$V_{DS} = -24V, V_{GS} = 0V$	-	-	-1	$\mu A$
	$T_J=55^\circ\text{C}$		-	-	-5	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.6	-2.5	V
Drain-Source On-Resistance <sup>2</sup>	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -12A$	-	6.5	9.3	m $\Omega$
		$V_{GS} = -4.5V, I_D = -8A$	-	9.5	14.5	
Forward Transconductance	$g_{fs}$	$V_{DS} = -5V, I_D = -20A$	-	28	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1\text{MHz}$	-	4320	-	pF
Output Capacitance	$C_{oss}$		-	529	-	
Reverse Transfer Capacitance	$C_{rss}$		-	487	-	
<b>Switching Characteristics</b>						
Gate Resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0\text{MHz}$	-	4.0	-	$\Omega$
Total Gate Charge	$Q_g$	$V_{GS} = -10V, V_{DS} = -15V, I_D = -15A$	-	45	-	nC
Gate-Source Charge	$Q_{gs}$		-	8.5	-	
Gate-Drain Charge	$Q_{gd}$		-	12.8	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -10V, V_{DD} = -15V, R_G = 2.5\Omega, I_D = -15A$	-	18.9	-	nS
Rise Time	$t_r$		-	15.7	-	
Turn-Off Delay Time	$t_{d(off)}$		-	64.8	-	
Fall Time	$t_f$		-	36.5	-	
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$I_S = -1A, V_{GS} = 0V$	-	-	-1	V
Continuous Source Current <sup>1,5</sup>	$I_S$	$V_G = V_D = 0V$ , Force Current	-	-	-65	A

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD} = -25V, V_{GS} = -10V, L = 0.1\text{mH}, I_{AS} = -25A$
- 4.The power dissipation is limited by 150 $^\circ\text{C}$  junction temperature
- 5.The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

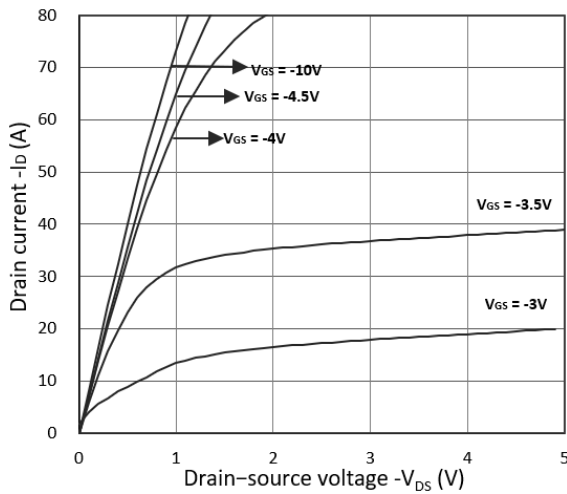
**P-Ch 30V Fast Switching MOSFETs**


Figure 1. Output Characteristics

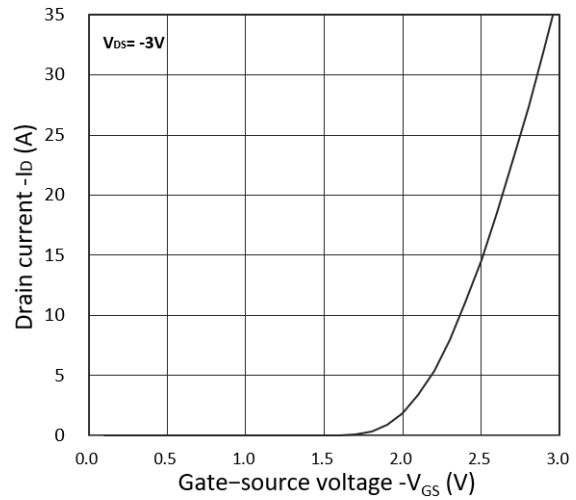


Figure 2. Transfer Characteristics

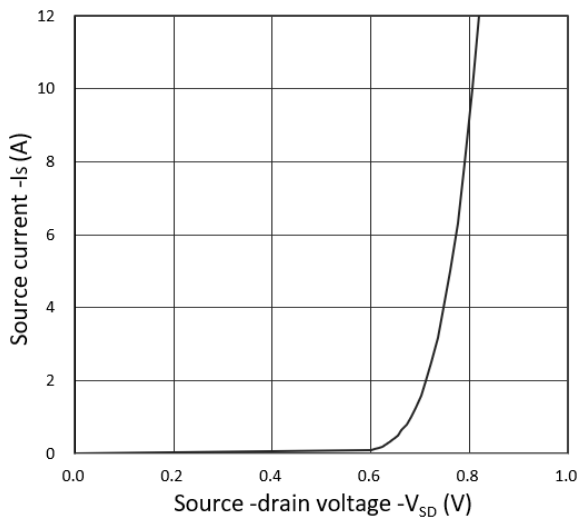


Figure 3. Forward Characteristics of Reverse

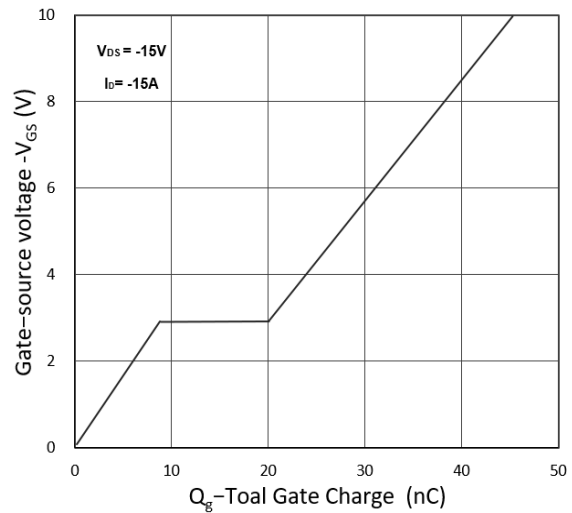
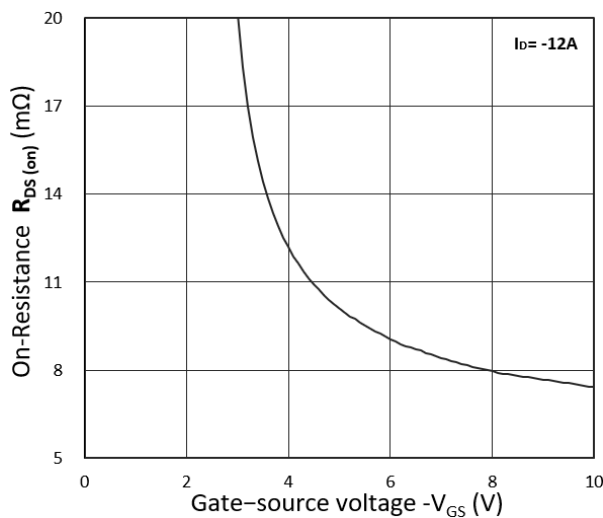
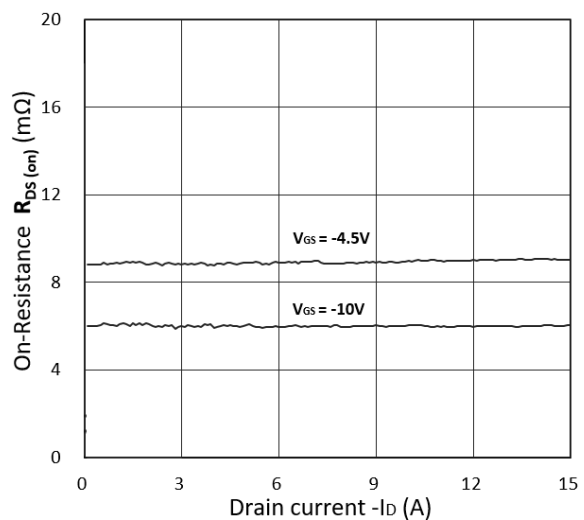


Figure 4. Gate Charge Characteristics


 Figure 5.  $R_{DS(on)}$  vs.  $V_{GS}$ 

 Figure 6.  $R_{DS(on)}$  vs.  $I_D$

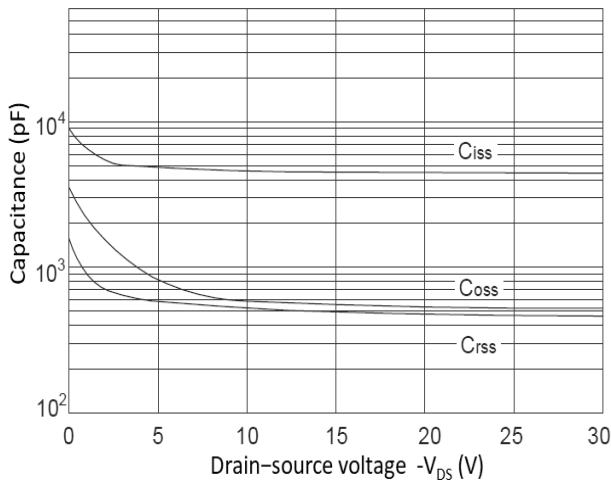
**P-Ch 30V Fast Switching MOSFETs**


Figure 7. Capacitance Characteristics

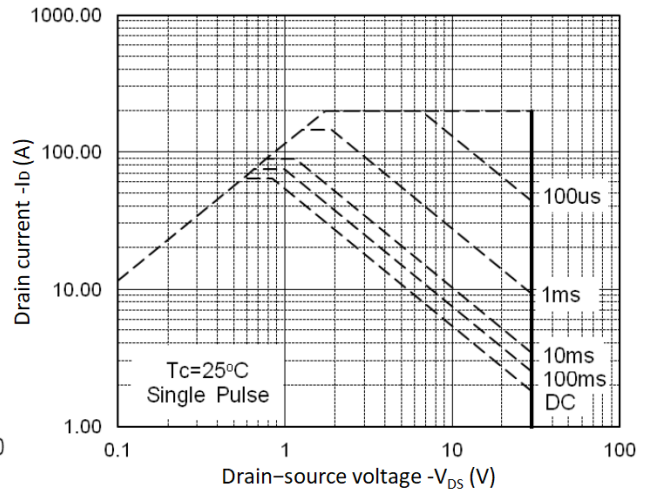


Figure 8. Safe Operating Area

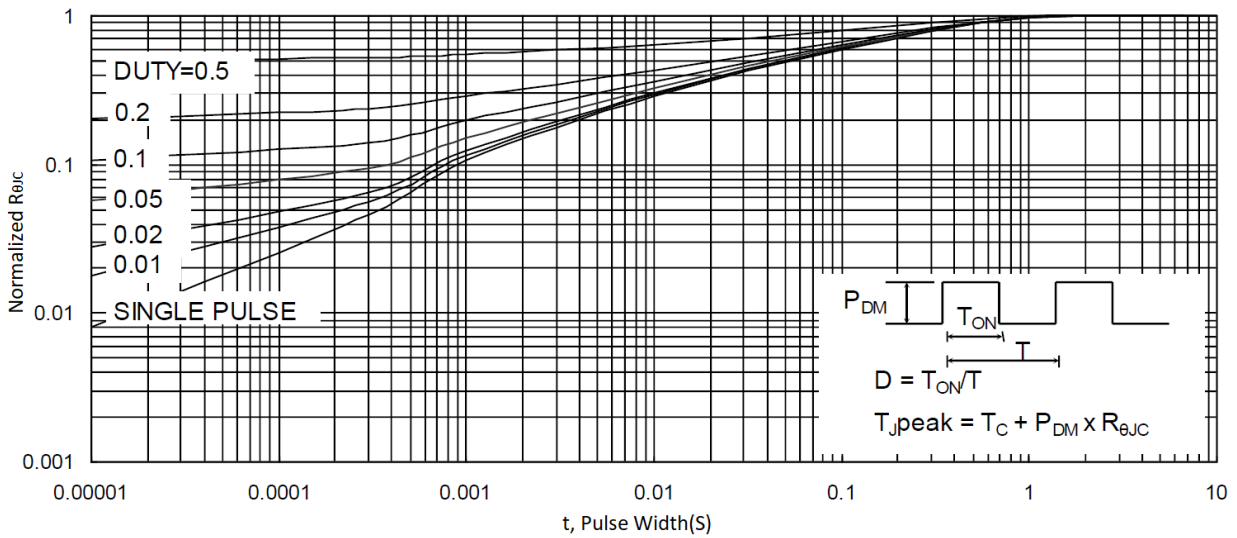


Figure 9. Normalized Maximum Transient Thermal Impedance

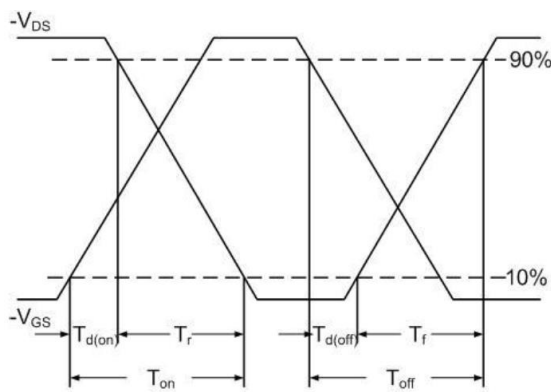


Figure 10. Switching Time Waveform

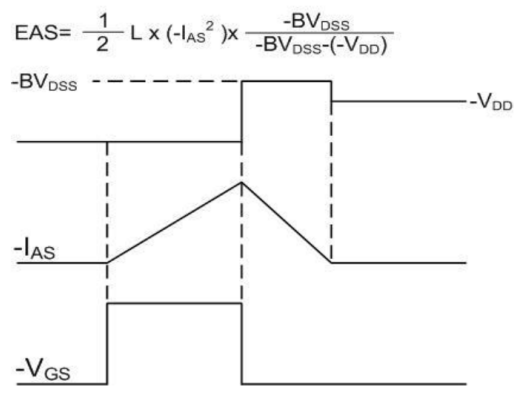
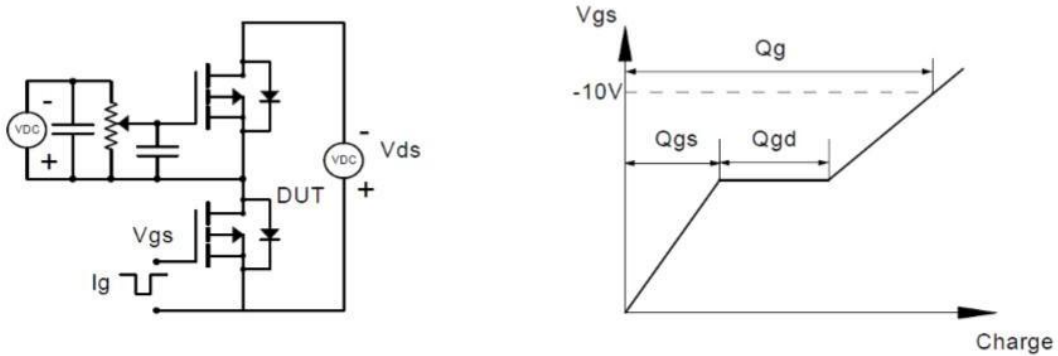


Figure 11. Unclamped Inductive Switching

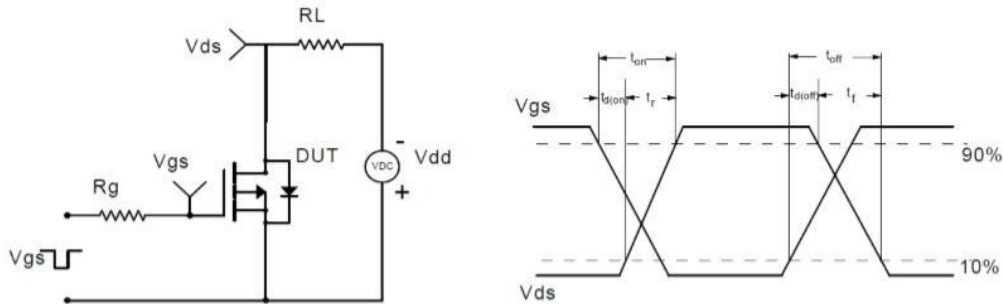
Waveform

**Test Circuit**

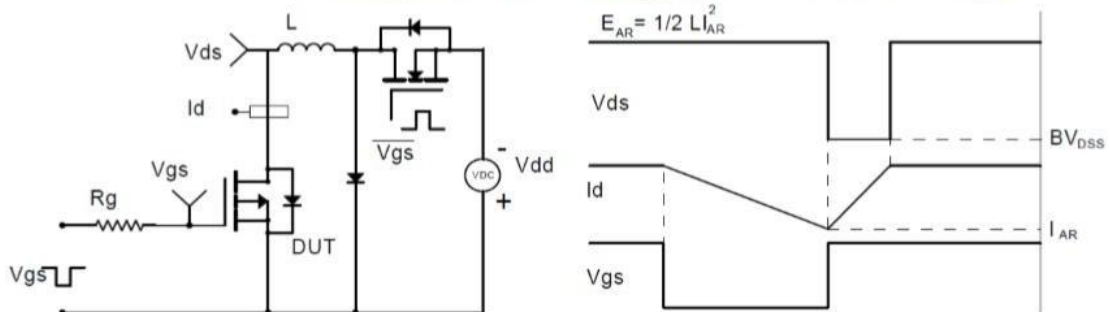
Gate Charge Test Circuit & Waveform



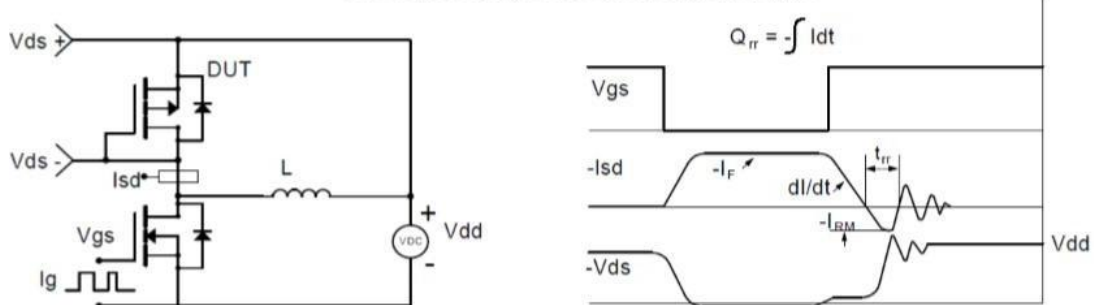
Resistive Switching Test Circuit & Waveforms

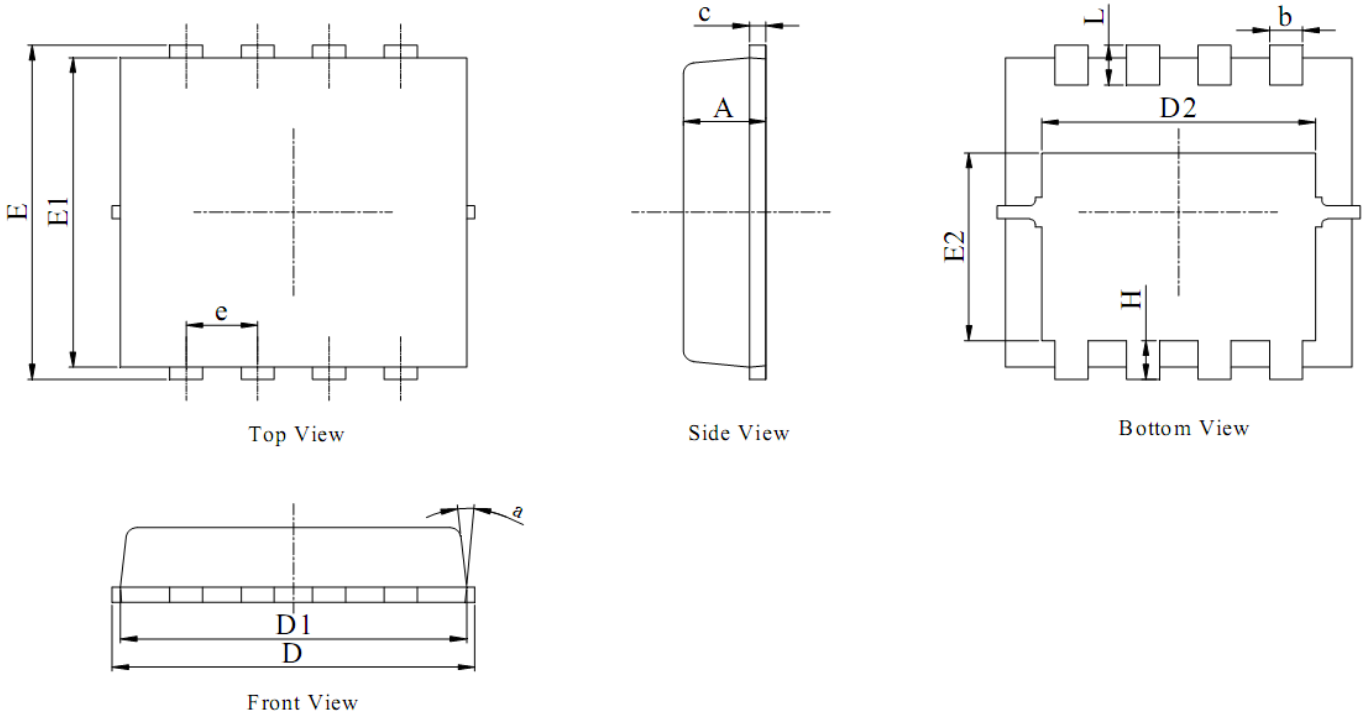


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



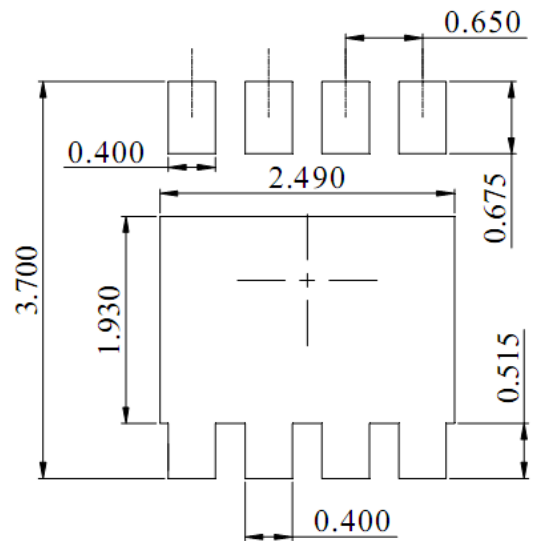
Diode Recovery Test Circuit & Waveforms



**Package Mechanical Data-PDFN3333-8L-Single**

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMENSIONS IN MILLIMETER (ANGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.20	0.25
D	3.00	3.15	3.25
D1	2.95	3.05	3.15
D2	2.39	2.49	2.59
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.70	1.80	1.90
e	0.65 BSC		
H	0.30	0.40	0.50
L	0.25	0.40	0.50
a	---	---	15°



DIMENSIONS: MILLIMETERS