

■ PRODUCT CHARACTERISTICS

VDSS	60V
R <sub>DS(on)</sub> Typ(@V <sub>GS</sub> =10 V)	16mΩ
ID	50A

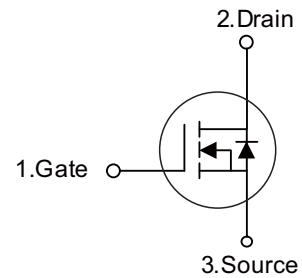
■ APPLICATIONS

- \* Switching applications

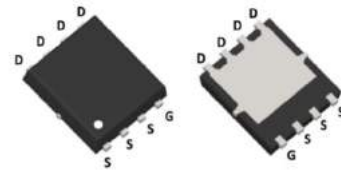
■ FEATURES

- \* High Switching Speed
- \* Improved dv/dt capability

Symbol



PDFN3333-8L



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	60	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Continuous Drain Current		I <sub>D</sub>	50	A
Pulsed Drain Current (Note 2)		I <sub>DM</sub>	150	A
Avalanche Energy	Single Pulsed (Note 3)	E <sub>AS</sub>	92	mJ
Peak Diode Recovery dv/dt		dv/dt	10	V/ns
Power Dissipation		P <sub>D</sub>	46	W
Junction Temperature		T <sub>J</sub>	+150	°C
Operation and Storage Temperature		T <sub>STG</sub>	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. L=43mH, I<sub>AS</sub>=43A, V<sub>DD</sub>=25V, R<sub>G</sub>=20Ω, Starting T<sub>J</sub>=25°C

4. I<sub>SD</sub> ≤ 30A, V<sub>DS</sub>=0V, di/dt ≤ 200A/μs, V<sub>DD</sub> ≤ BV<sub>DSS</sub>, Starting T<sub>J</sub> = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ <sub>JA</sub>	100	°C/W
Junction to Case	θ <sub>JC</sub>	2.7	°C/W

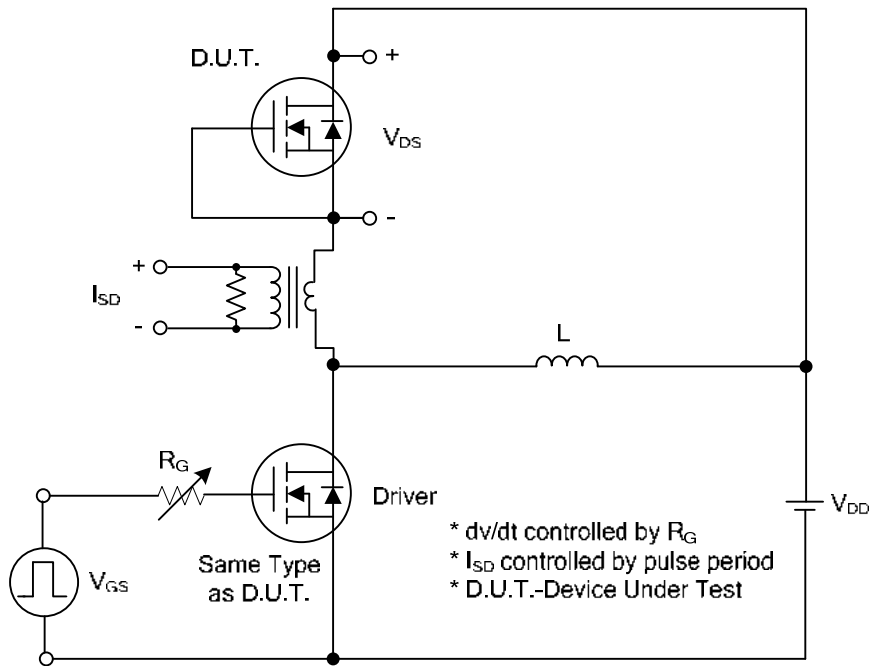
**■ ELECTRICAL CHARACTERISTICS** ( $T_C=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			10	$\mu A$
Gate-Source Leakage Current	Forward	$I_{GSS}$			100	nA
	Reverse					
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=25A$		16	20	m $\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$		2500		pF
Output Capacitance	$C_{OSS}$			230		pF
Reverse Transfer Capacitance	$C_{RSS}$			200		pF
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge	$Q_G$	$V_{DS}=50V, V_{GS}=10V, I_D=1.3A$ $I_G=3\text{mA}$ (Note1,2)		7.2		nC
Gate-Source Charge	$Q_{GS}$			0.4		nC
Gate-Drain Charge	$Q_{GD}$			0.8		nC
Turn-On Delay Time	$t_{D(ON)}$	$V_{DS}=30V, V_{GS}=10V, I_D=50A,$ $R_G=25\Omega$ (Note1,2)		18		ns
Turn-On Rise Time	$t_R$			46		ns
Turn-Off Delay Time	$t_{D(OFF)}$			202		ns
Turn-Off Fall Time	$t_F$			116		ns
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				50	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$				150	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=50A, V_{GS}=0V$			1.5	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_S=30A, V_{GS}=0V,$ $di_S/dt=100A/\mu s$		50		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$				80	

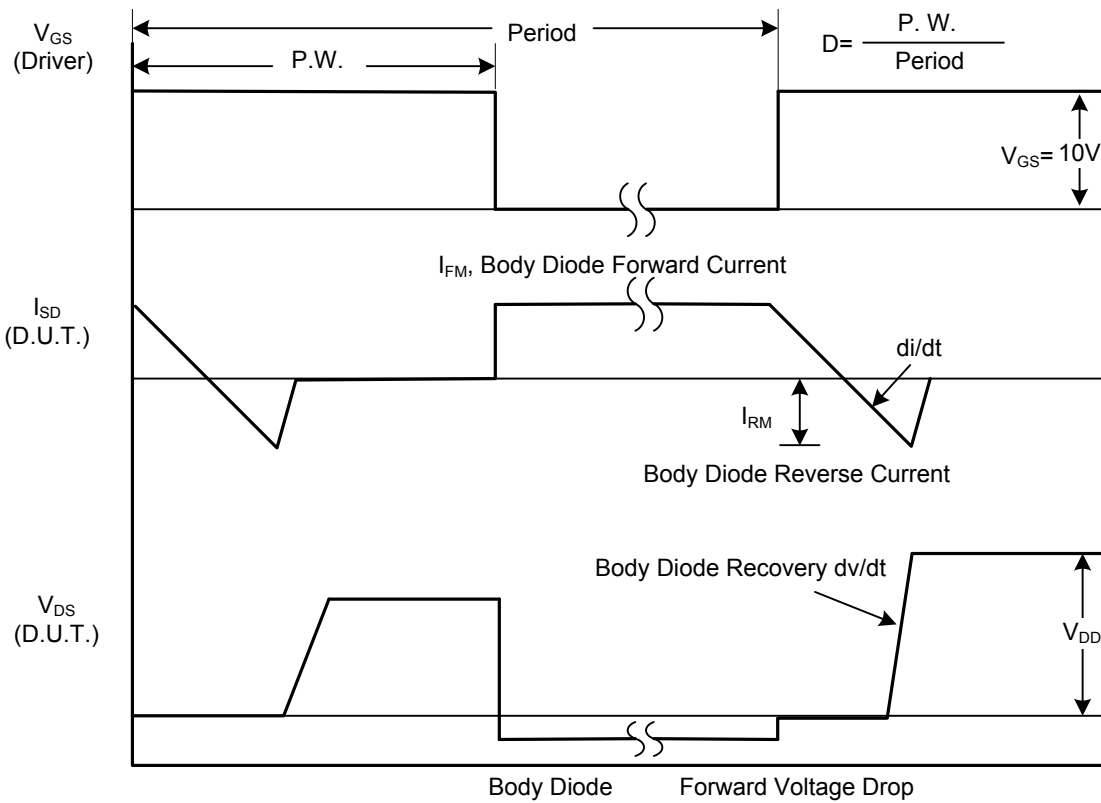
Notes: 1. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)

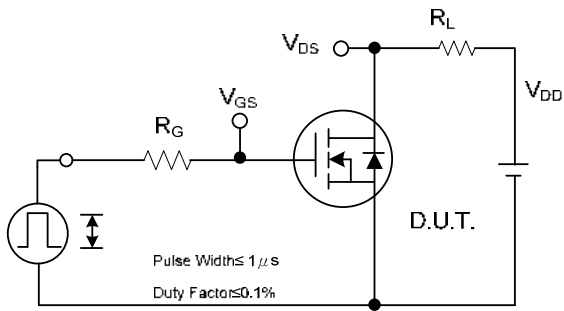


Fig. 2A Switching Test Circuit

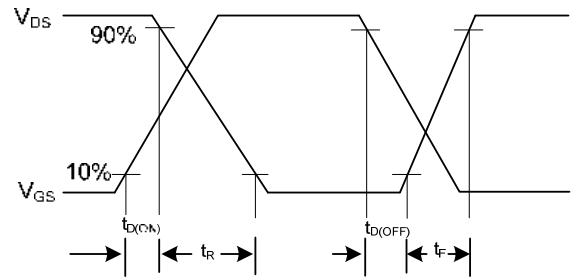


Fig. 2B Switching Waveforms

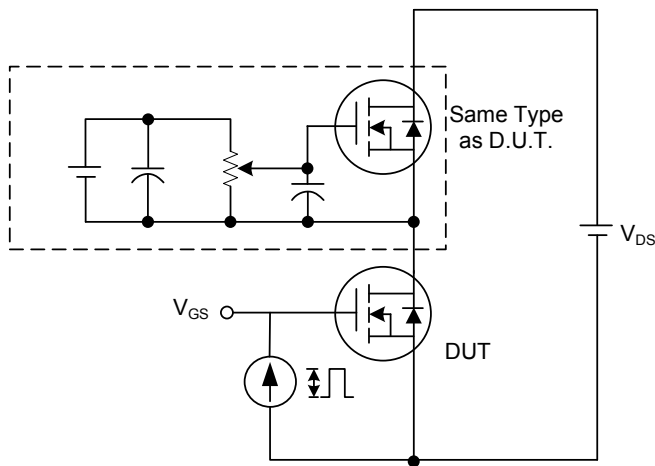


Fig. 3A Gate Charge Test Circuit

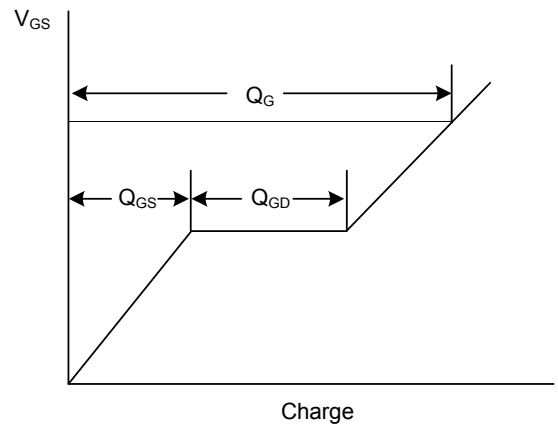


Fig. 3B Gate Charge Waveform

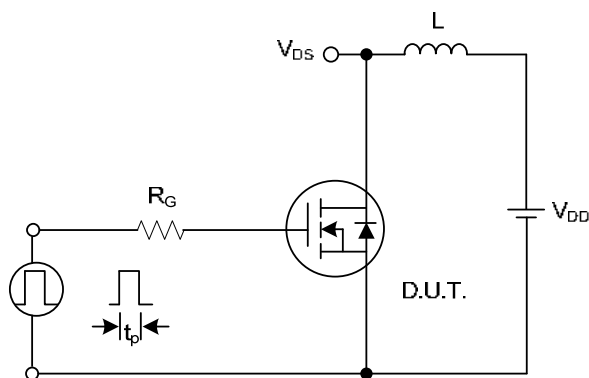


Fig. 4A Unclamped Inductive Switching Test Circuit

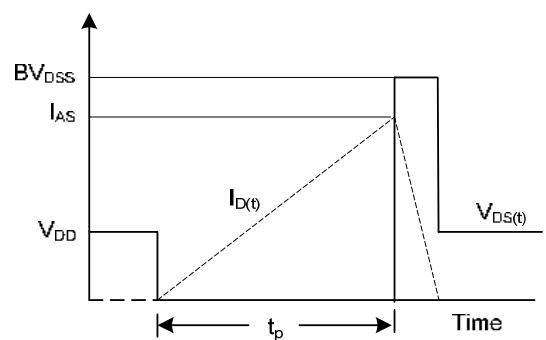
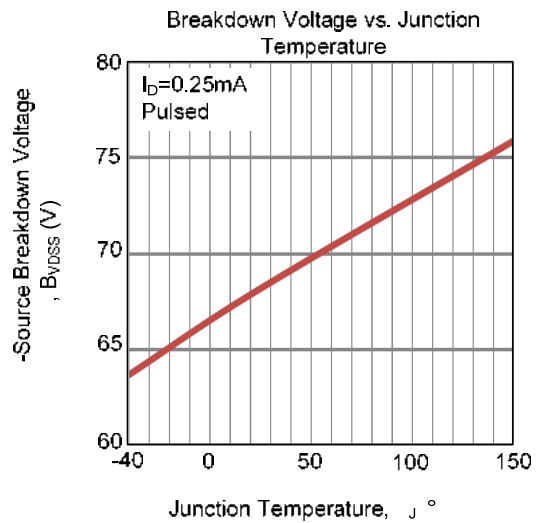
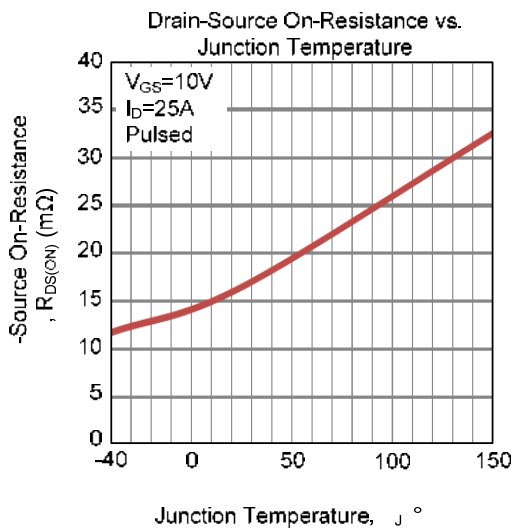
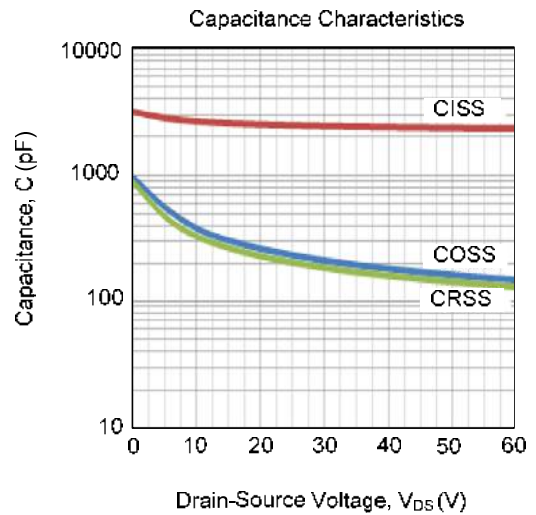
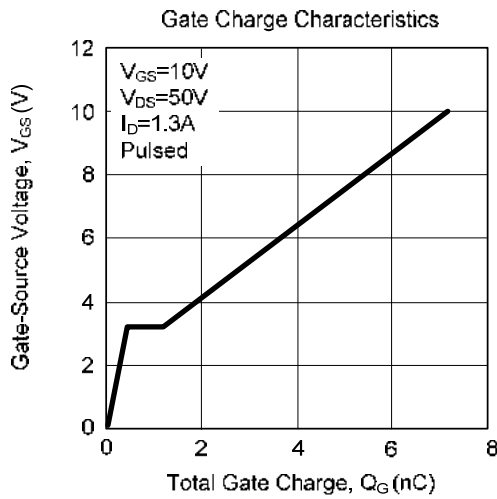
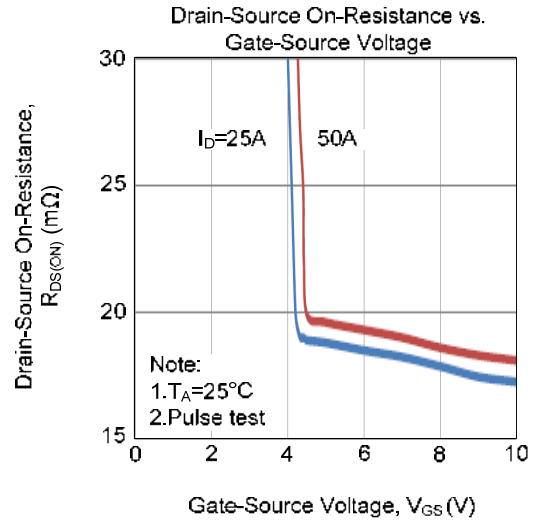
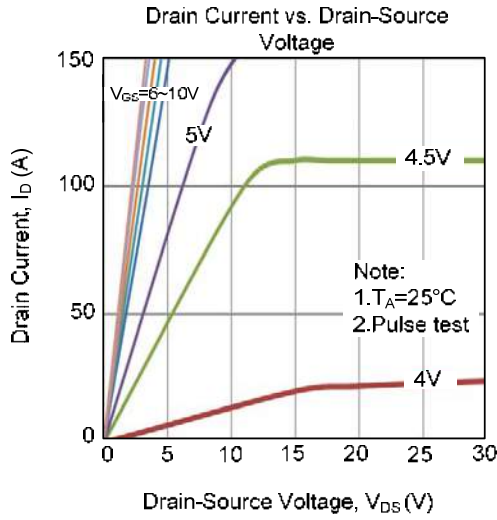
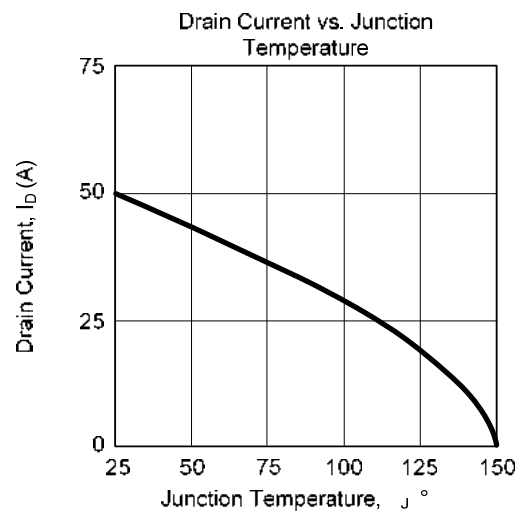
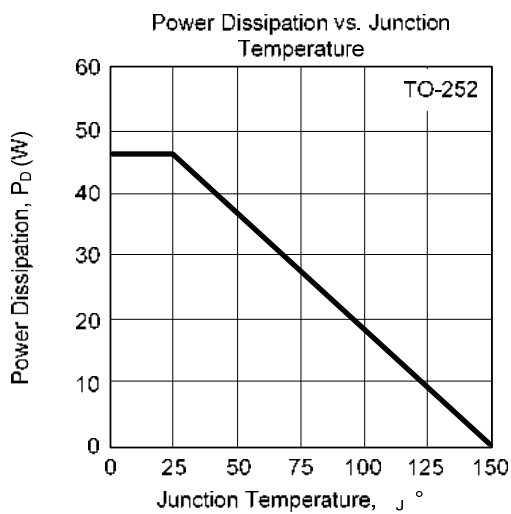
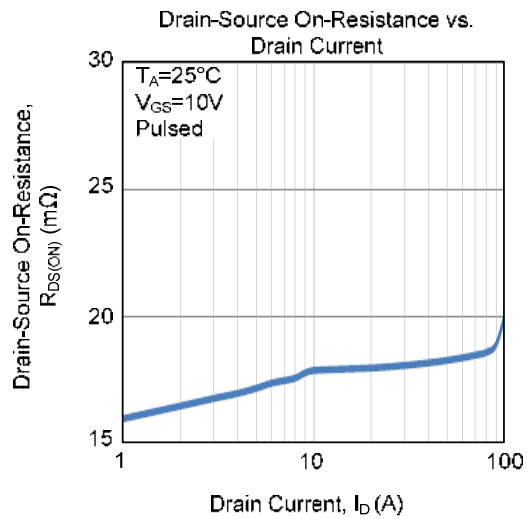
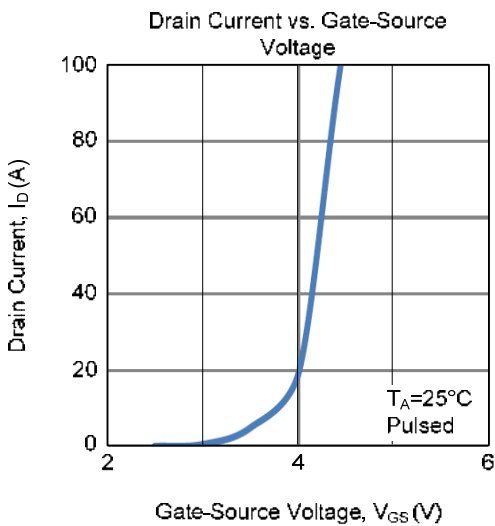
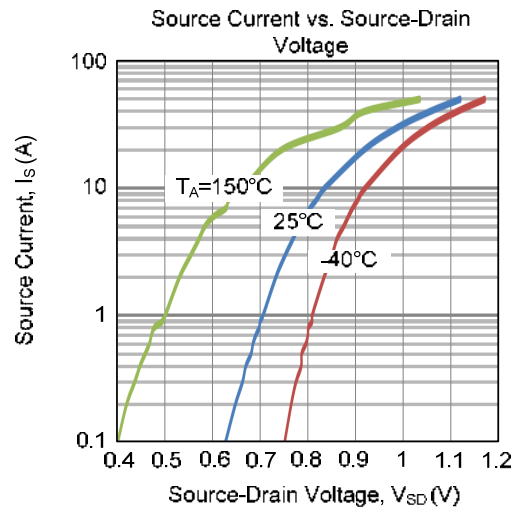
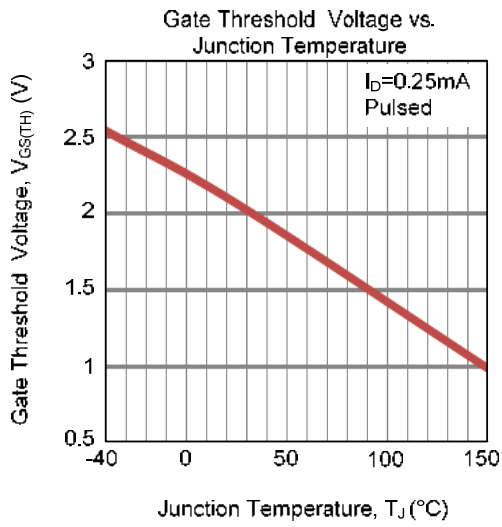


Fig. 4B Unclamped Inductive Switching Waveforms

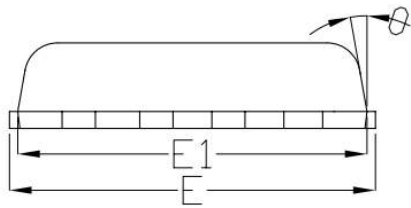
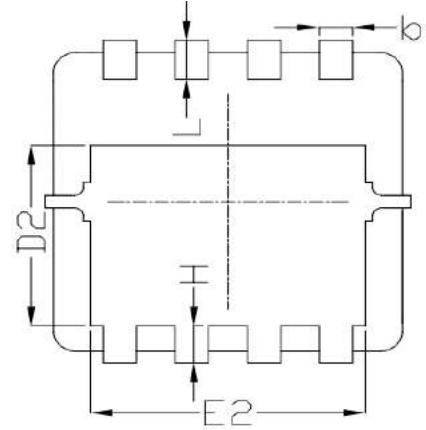
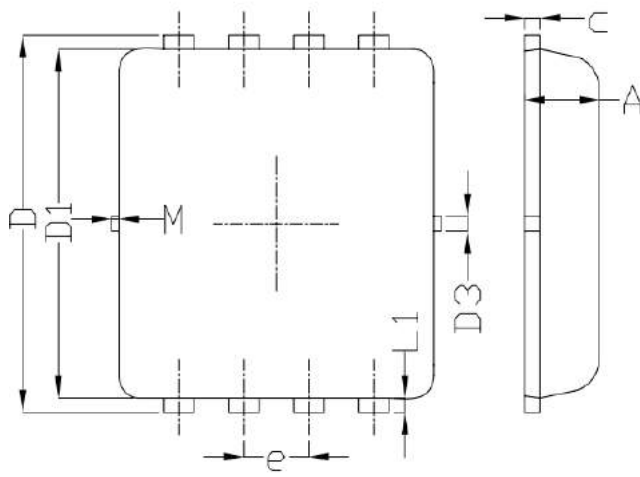
■ TYPICAL CHARACTERISTICS



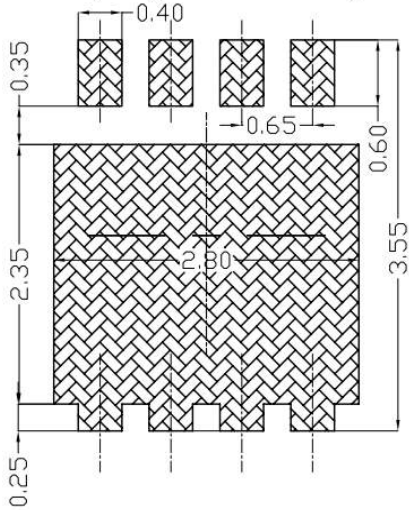
■ TYPICAL CHARACTERISTICS(Cont.)



■ PDFN3333-8L Package Mechanical Data



Land Pattern  
(Only for Reference)



SYMBOL	DIMENSIONAL REOMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			