

### Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Applications

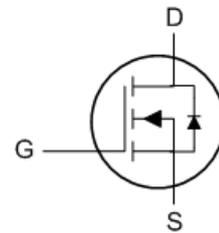
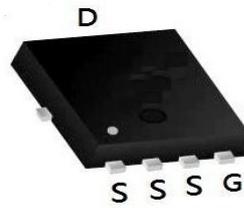
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

### Product Summary



BVDSS	RDSON	ID
100V	4.6mΩ	100A

### PDFN5060-8L Pin Configuration



### Absolute Maximum Ratings (Tc = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		$V_{DS}$	100	V
Gate-Source Voltage		$V_{GS}$	±20	V
Continuous Drain Current <sup>1</sup>	Tc=25°C	$I_D$	100	A
	Tc=100°C		60	
Pulsed Drain Current <sup>4</sup>		$I_{DM}$	380	A
Single Pulse Avalanche Energy <sup>3</sup>		$E_{AS}$	245	mJ
Total Power Dissipation	Tc=25°C	$P_D$	113.6	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>	$R_{\theta JA}$	60	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	1.1	°C/W

## N-Ch100V Fast Switching MOSFETs

### Electrical Characteristics (Tc = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	<b>V<sub>(BR)DSS</sub></b>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V
Gate-body Leakage current	<b>I<sub>GSS</sub></b>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T <sub>J</sub> =25°C	V <sub>DS</sub> =100V, V <sub>GS</sub> = 0V	-	-	1	μA
	T <sub>J</sub> =100°C		-	-	100	
Gate-Threshold Voltage	<b>V<sub>GS(th)</sub></b>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	3	4	V
Drain-Source on-Resistance <sup>2</sup>	<b>R<sub>DS(on)</sub></b>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	4.6	6	mΩ
Forward Transconductance <sup>2</sup>	<b>g<sub>fs</sub></b>	V <sub>DS</sub> =10V, I <sub>D</sub> =20A	-	58	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	<b>C<sub>iss</sub></b>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz	-	5518	-	pF
Output Capacitance	<b>C<sub>oss</sub></b>		-	655	-	
Reverse Transfer Capacitance	<b>C<sub>rss</sub></b>		-	23	-	
<b>Switching Characteristics</b>						
Gate Resistance	<b>R<sub>g</sub></b>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz	-	1.4	-	Ω
Total Gate Charge	<b>Q<sub>g</sub></b>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> =20A	-	81.8	-	nC
Gate-Source Charge	<b>Q<sub>gs</sub></b>		-	23.5	-	
Gate-Drain Charge	<b>Q<sub>gd</sub></b>		-	22.5	-	
Turn-on Delay Time	<b>t<sub>d(on)</sub></b>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = 20A	-	15.4	-	ns
Rise Time	<b>t<sub>r</sub></b>		-	13	-	
Turn-off Delay Time	<b>t<sub>d(off)</sub></b>		-	34	-	
Fall Time	<b>t<sub>f</sub></b>		-	6.2	-	
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>2</sup>	<b>V<sub>SD</sub></b>	I <sub>F</sub> = 20A, V <sub>GS</sub> = 0V	-	-	1.2	V
Continuous Source Current <sup>1,5</sup>	<b>I<sub>S</sub></b>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	-	-	100	A
Body Diode Reverse Recovery Time	<b>t<sub>rr</sub></b>	I <sub>F</sub> = 20A, dI/dt=100A/μs	-	55	-	ns
Body Diode Reverse Recovery Charge	<b>Q<sub>rr</sub></b>		-	101	-	nC

Notes:

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C.
2. The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.4mH, I<sub>AS</sub>=40A
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test..

### Typical Characteristics

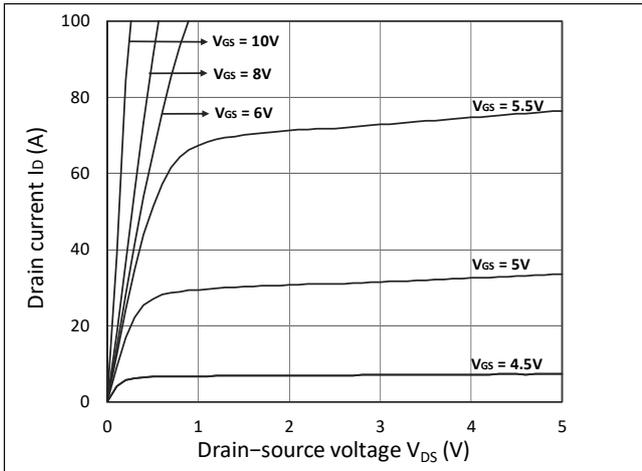


Figure 1. Output Characteristics

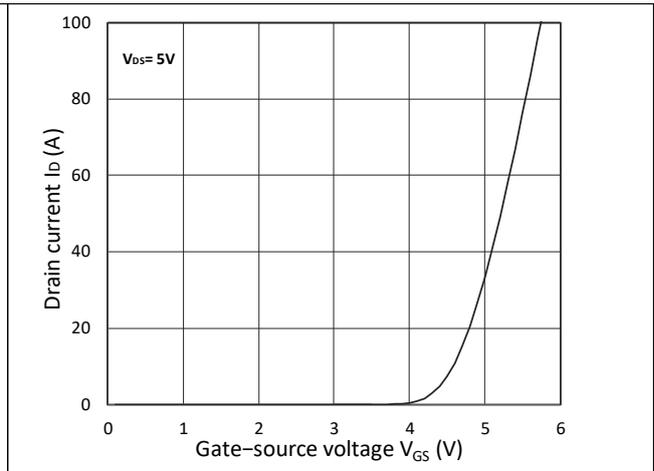


Figure 2. Transfer Characteristics

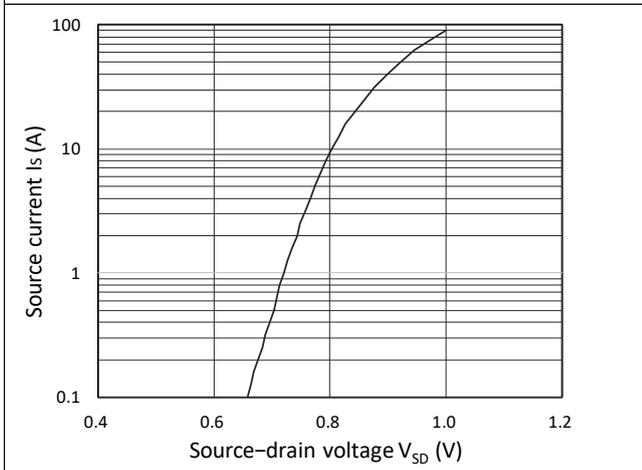


Figure 3. Forward Characteristics of Reverse

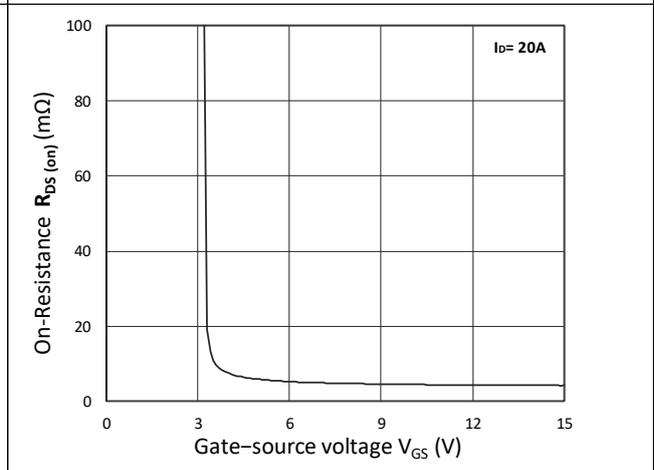


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

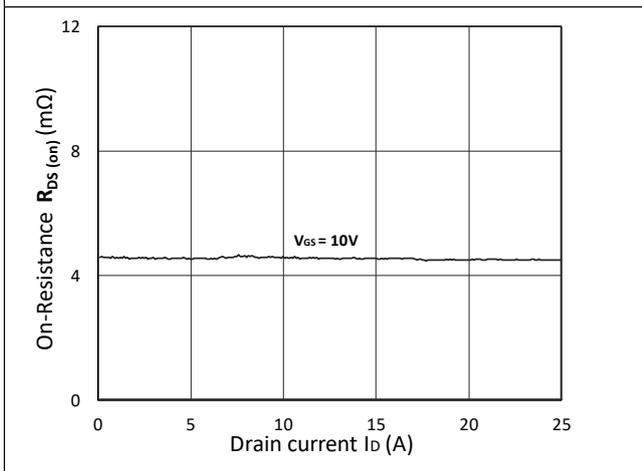


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

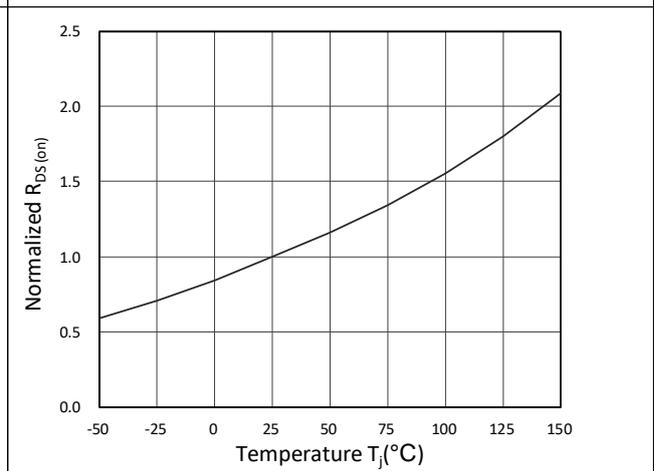


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature

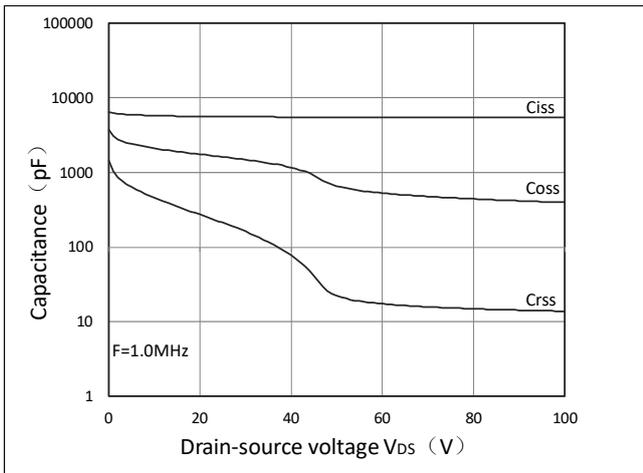


Figure 7. Capacitance Characteristics

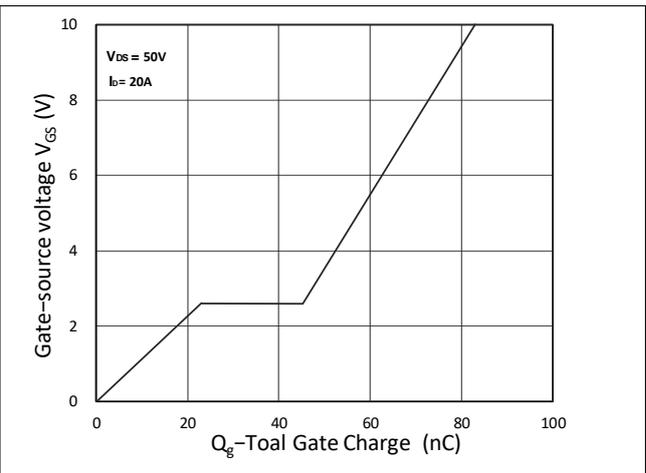


Figure 8. Gate Charge Characteristics

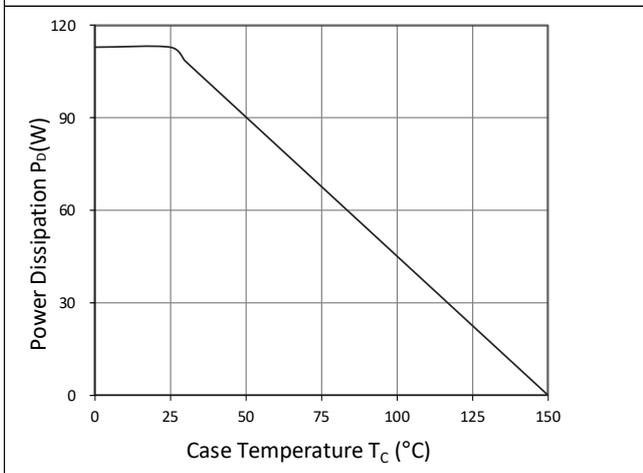


Figure 9. Power Dissipation

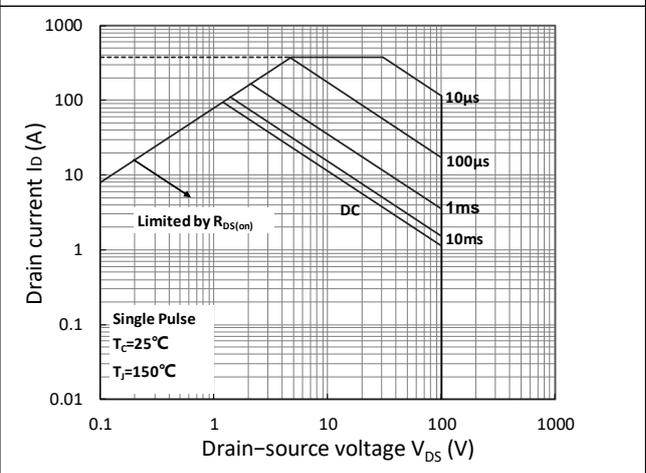


Figure 10. Safe Operating Area

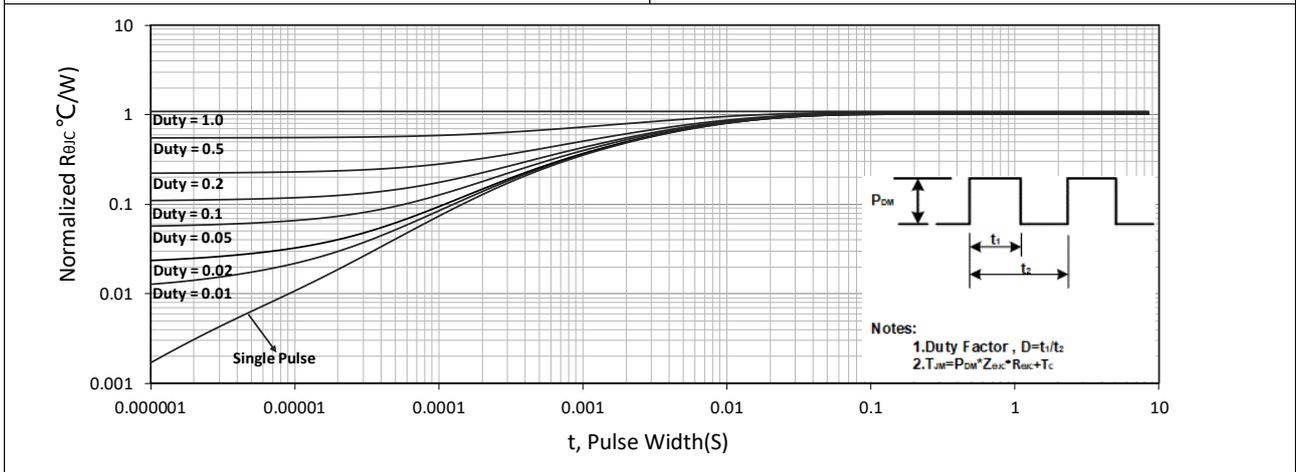


Figure 11. Normalized Maximum Transient Thermal Impedance

### Test circuits and waveforms

#### Test Circuit

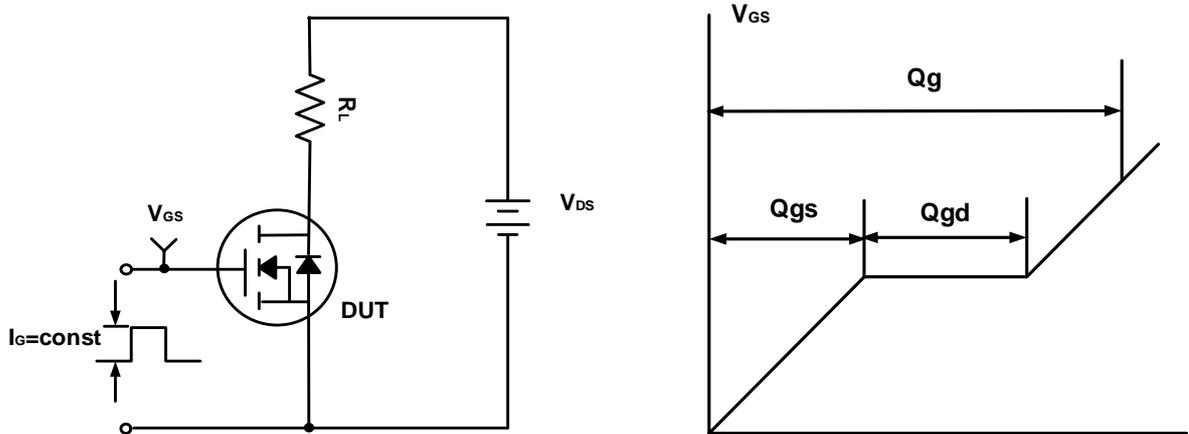


Figure A. Gate Charge Test Circuit & Waveforms

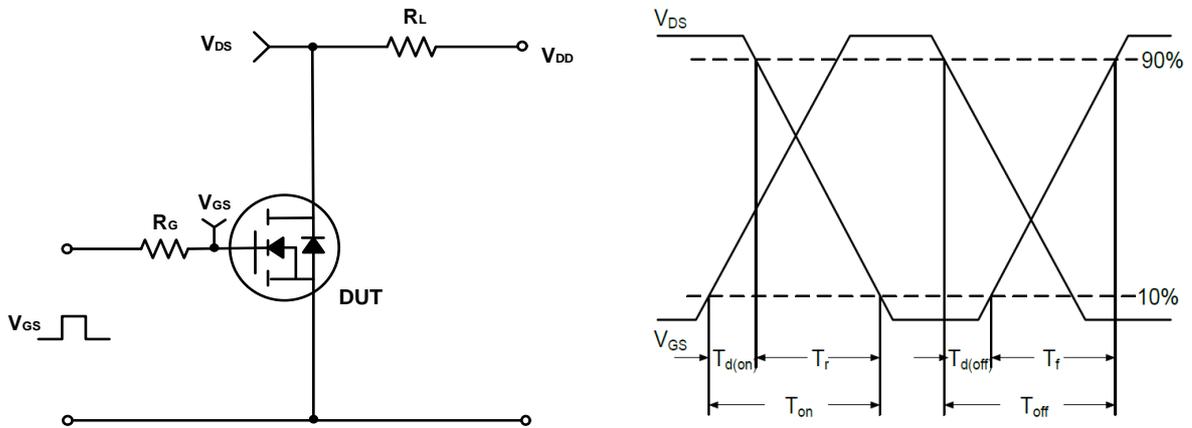


Figure B. Switching Test Circuit & Waveforms

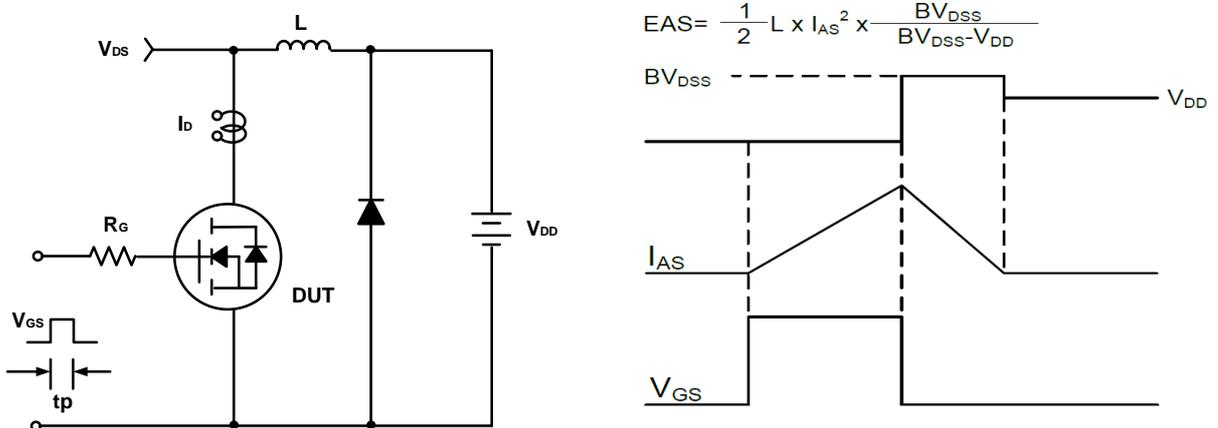
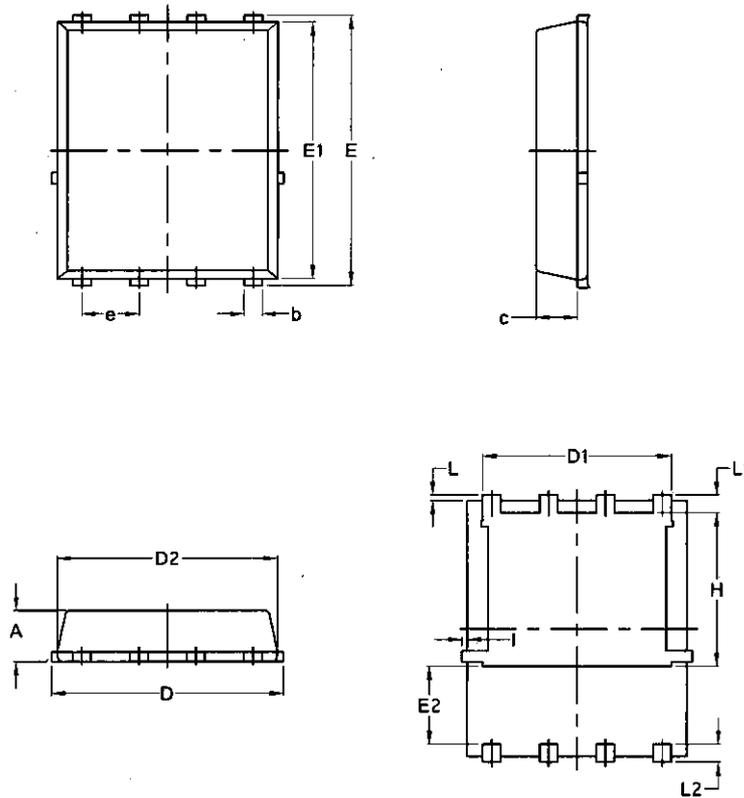


Figure C. Unclamped Inductive Switching Circuit & Waveforms

### Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070