



Features

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

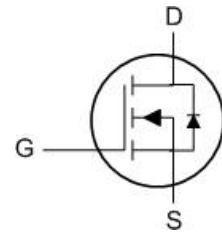
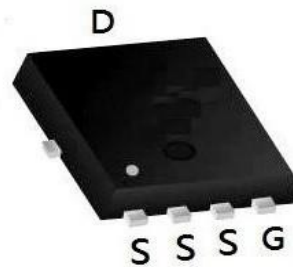
Product Summary

BVDSS	RDSON	ID
30V	2.0mΩ	120A

Applications

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

PDFN5060-8L(CLIP) 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	I_D	$T_C=25^\circ\text{C}$	120
		$T_C=100^\circ\text{C}$	75
Pulsed Drain Current ¹	I_{DM}	380	A
Single Pulse Avalanche Energy ²	E_{AS}	101	mJ
Total Power Dissipation	P_D	69	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 ³	$R_{\theta JA}$	50	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	1.8	°C/W

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

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30	-	-	V
Gate-body Leakage Current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
	T _J =125°C			-	2	-	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.3	-	2.3	V
Drain-Source On-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 22.5A	-	2.0	2.4	mΩ
			V _{GS} = 4.5V, I _D = 22.5A	-	3.0	3.8	
Forward Transconductance ⁴		g _{fs}	V _{DS} = 10V, I _D = 20A	-	130	-	S
Dynamic Characteristics⁵							
Input Capacitance		C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	-	2566	-	pF
Output Capacitance		C _{oss}		-	1419	-	
Reverse Transfer Capacitance		C _{rss}		-	111	-	
Gate Resistance		R _g	f = 1MHz	-	2.5	-	Ω
Switching Characteristics⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 15V, I _D = 20A	-	39	-	nC
Gate-Source Charge		Q _{gs}		-	11	-	
Gate-Drain Charge		Q _{gd}		-	4.5	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} = 10V, V _{DD} = 20V, R _G = 3Ω, I _D = 20A	-	10	-	ns
Rise Time		t _r		-	37	-	
Turn-Off Delay Time		t _{d(off)}		-	45	-	
Fall Time		t _f		-	16	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F = 20A, dI/dt = 100A/μs	-	49	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	35	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 45, V _{GS} = 0V	-	-	1.4	V
Continuous Source Current		I _S	-	-	-	120	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD} = 24, V_{GS} = 10V, L = 0.1mH, R_G = 25Ω
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.

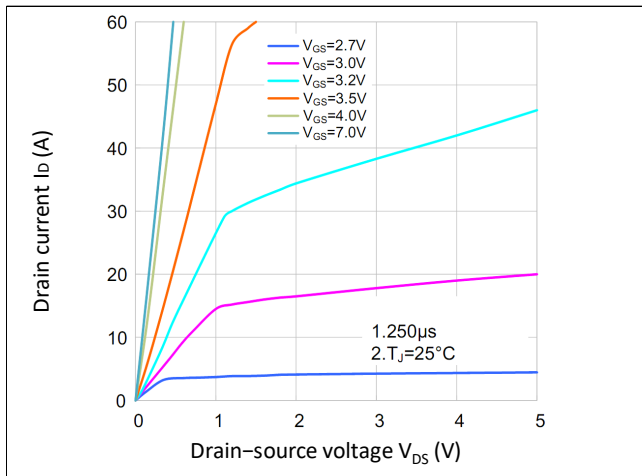
Typical Characteristics


Figure 1. Output Characteristics

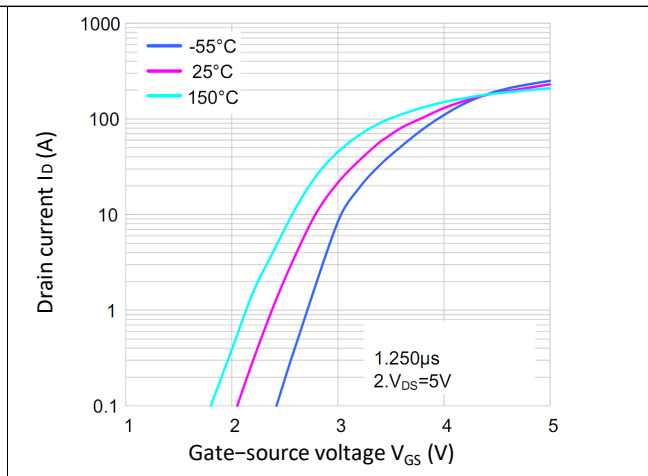
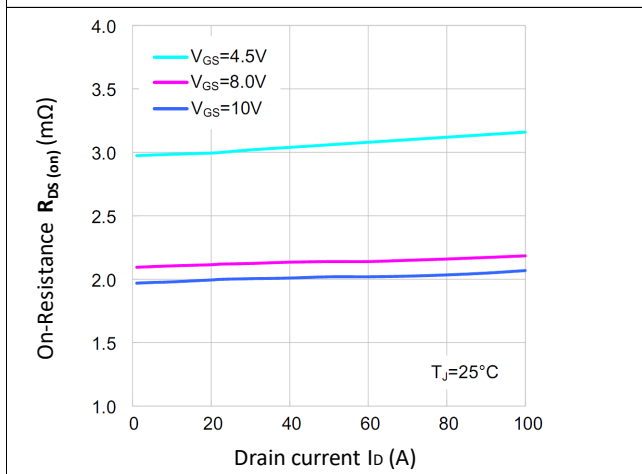
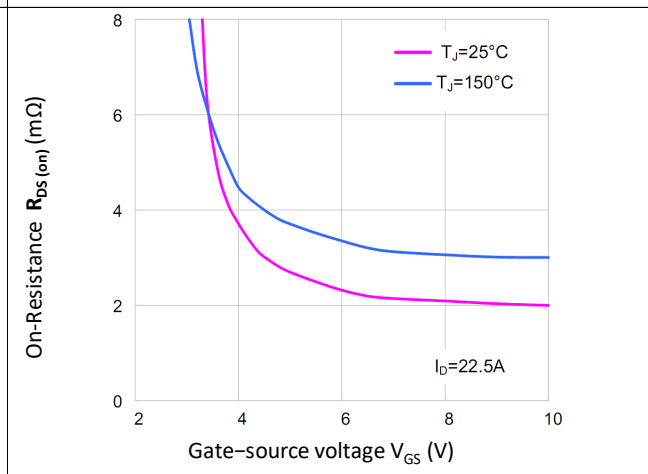
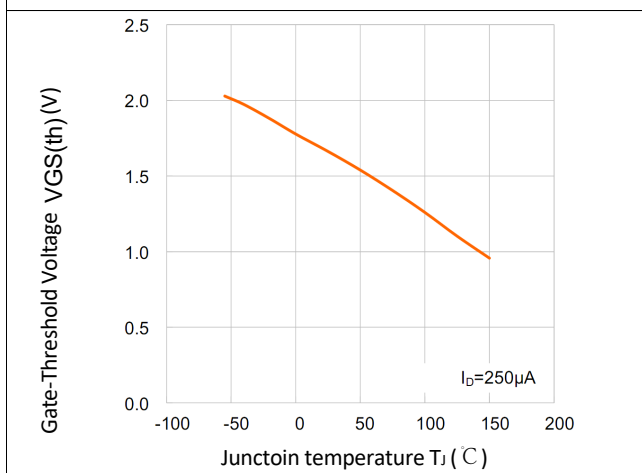
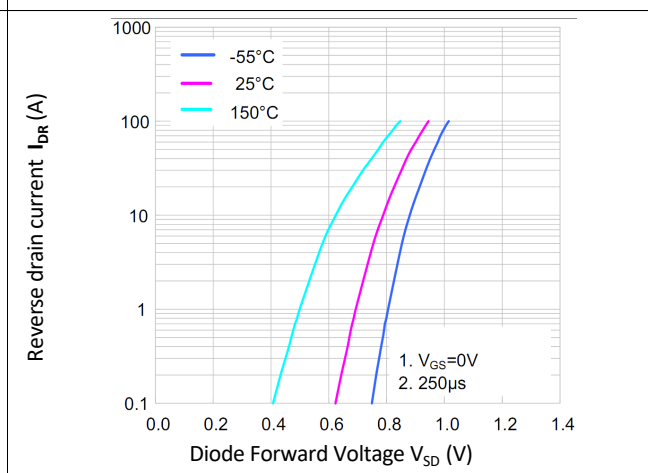


Figure 2. Transfer Characteristics


 Figure 3. $R_{DS(ON)}$ vs. I_D

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

 Figure 5. $V_{GS(th)}$ vs. T_J

 Figure 6. I_{DR} vs. V_{SD}

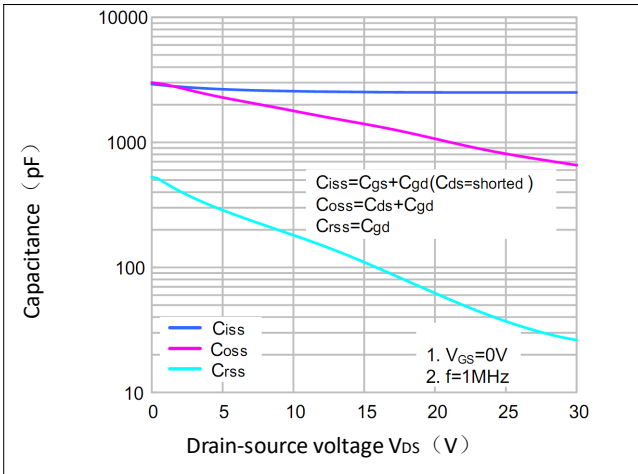


Figure 7. Capacitance Characteristics

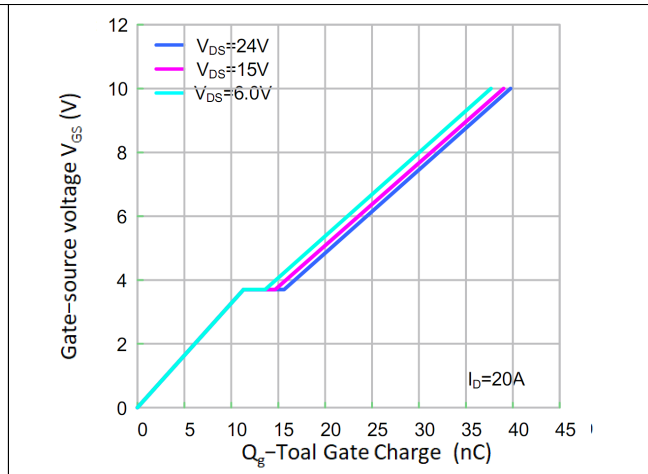


Figure 8 Gate Charge Characteristics

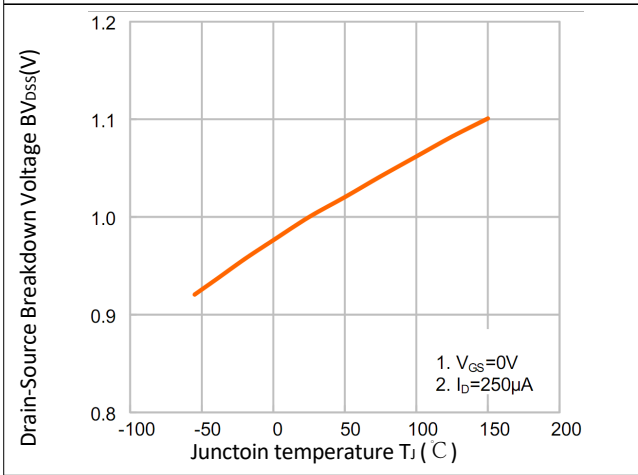


Figure 9. BVdss VS TJ

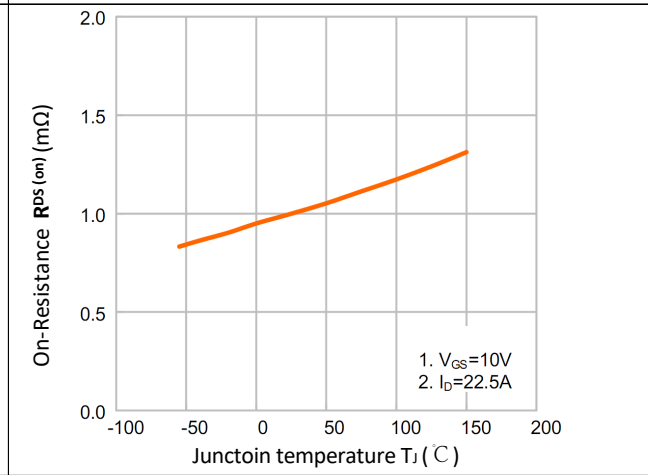


Figure 10. RDS(ON) VS TJ

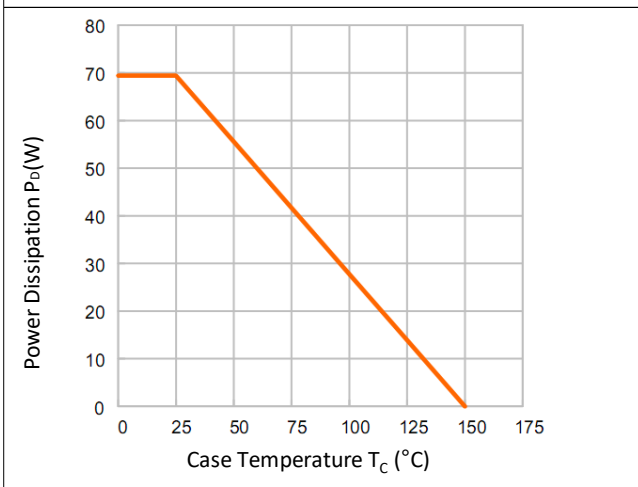


Figure 11. Power Dissipation

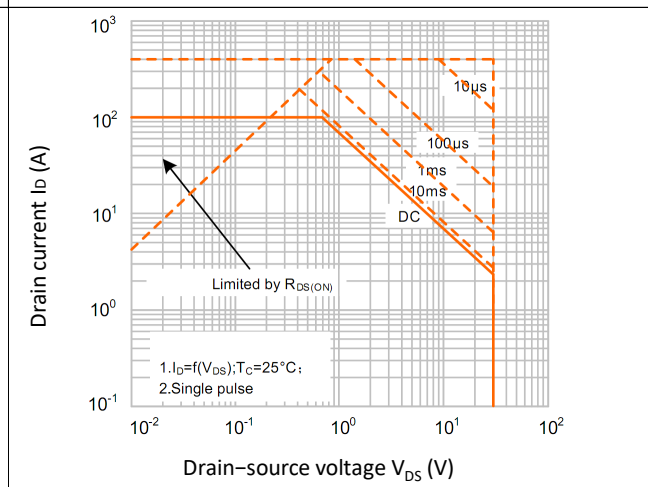


Figure 12. Safe Operating Area

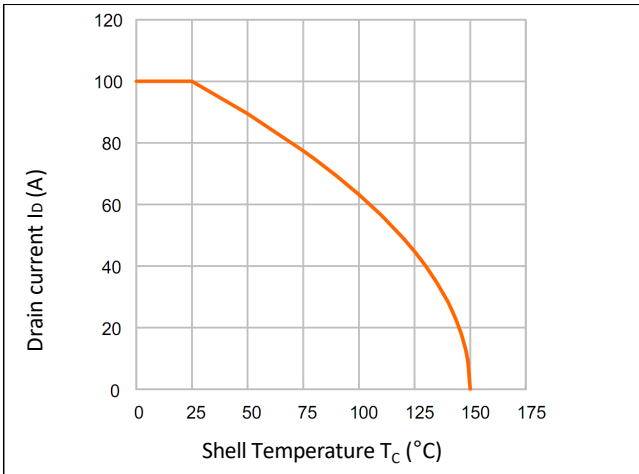


Figure 13. Drain current VS Shell Temperature

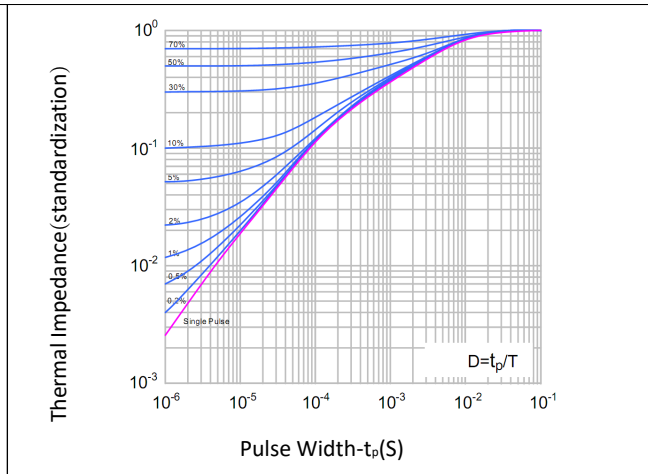


Figure 14 Transient thermal impedance VS Pulse Width

Test Circuit

PDFN5060-8L Package Information

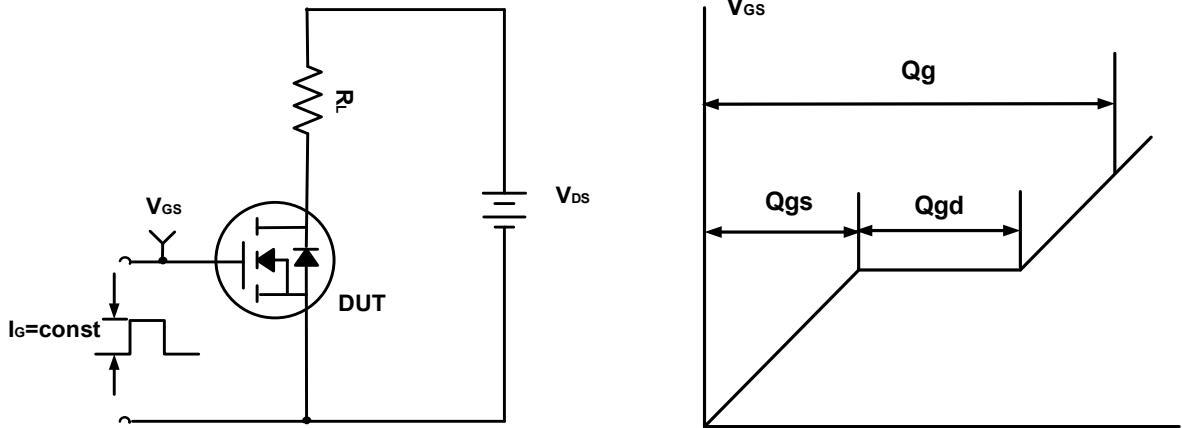


Figure A. Gate Charge Test Circuit & Waveforms

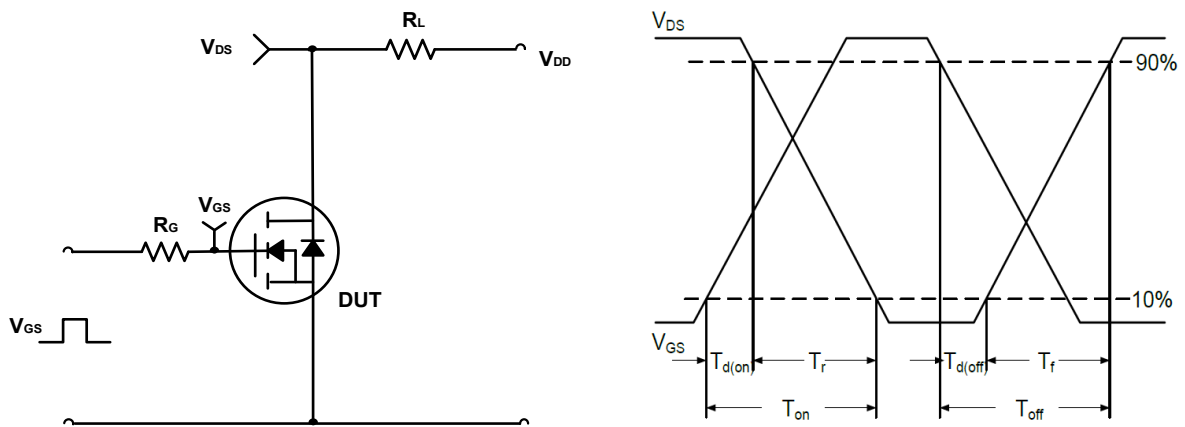


Figure B. Switching Test Circuit & Waveforms

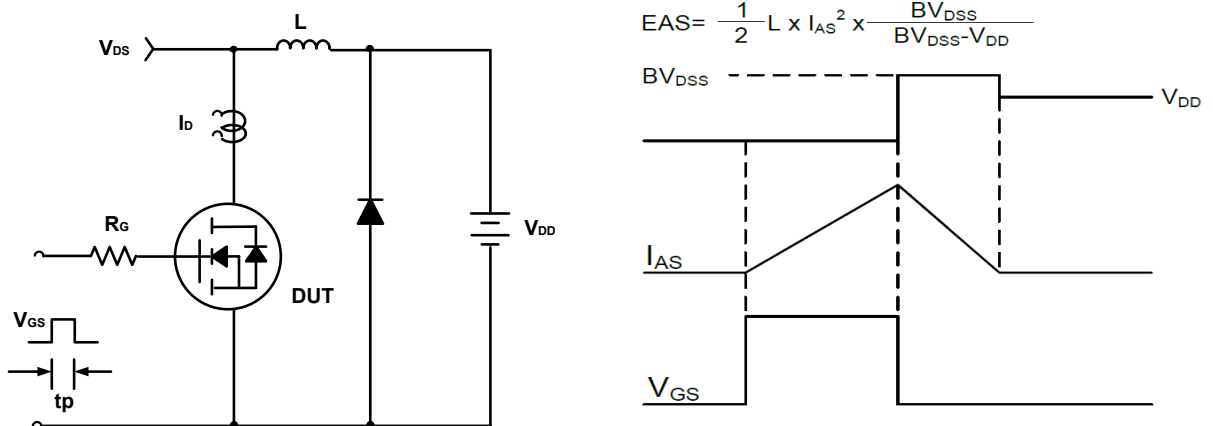
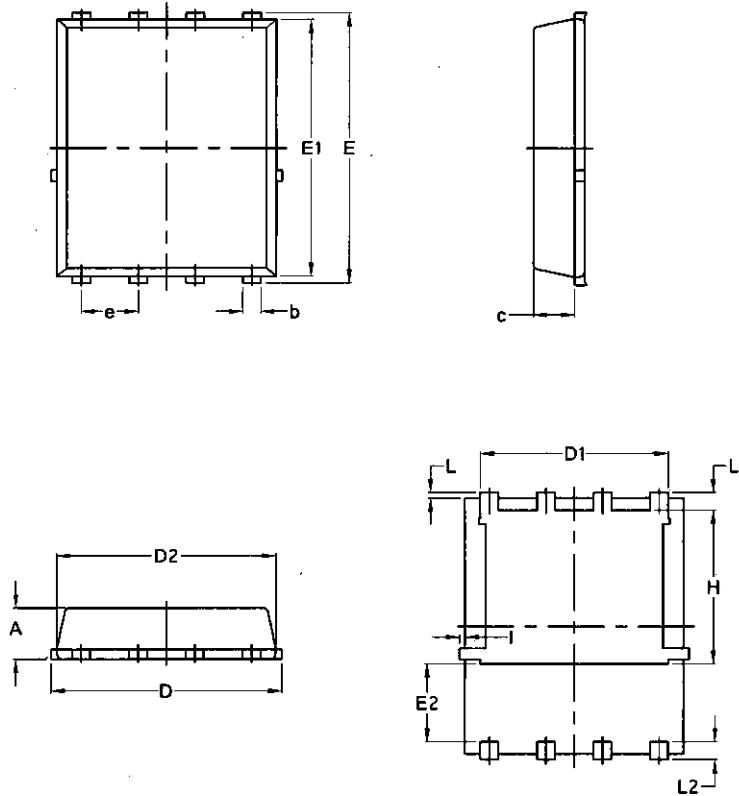


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Package Mechanical Data-PDFN5060-8L(CLIP)- Single


Symbol	Common			
	mm		Inch	
	Mim	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