FH3060G6

N-Channel Enhancement Mode Power MOSFET

Description

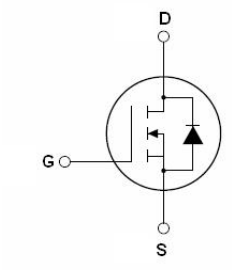
The FH3060G6 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

- Motor drivers
- DC - DC Converter

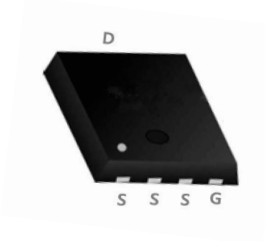
Features

- V_{DS} = 30V ; I_D = 60A
  $R_{DS(ON)}$(MAX)= 4.5mΩ @V_{GS} = -10V
  $R_{DS(ON)}$(MAX)= 9.0mΩ @V_{GS} = -4.5V
- LogicLevelCompatible
- SMDPackage(PDFN3.3x3.3-8L)
- TrenchTechnology
- FastSwitching



Schematic diagram

Marking and Pin Assignment



PDFN3.3x3.3-8L top view

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage (V_{GS} = 0V)		V_{DSS}	30	V
Continuous Drain Current	T_C = 25ºC	I_D	60	A
	T_C = 100ºC		42	
Pulsed Drain Current (note1)		I_{DM}	150	A
Gate-Source Voltage		V_{GSS}	±20	V
Single Pulse Avalanche Energy (note2)		E_{AS}	131	mJ
Avalanche Current		I_{As}	20	A
Power Dissipation (note3)	T_C = 25ºC	P_D	25	W
	T_C = 100ºC	P_D	12	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	ºC

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	5.4	ºC/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	61	

Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
		V_{DS} = 30V, V_{GS} = 0V, T_J = 100ºC	--	--	25	
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.6	2.5	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	3.6	4.5	mΩ
		V_{GS} = 4.5V, I_D = 20A	--	6.9	9.0	mΩ
Forward Transconductance (Note3)	g_{fs}	V_{DS} = 10V, I_D = 20A	16	--	--	S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1.0MHz	--	2120	--	pF
Output Capacitance	C_{oss}		--	307	--	
Reverse Transfer Capacitance	C_{rss}		--	253	--	
Total Gate Charge	Q_g	V_{DD} = 15V, I_D = 30A, V_{GS} = 10V	--	40	--	nC
Gate-Source Charge	Q_{gs}		--	5.4	--	
Gate-Drain Charge	Q_{gd}		--	9.6	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 30A, Vgs=10V,R_G =1.8Ω	--	15	--	nS
Turn-on Rise Time	t_r		--	32	--	
Turn-off Delay Time	$t_{d(off)}$		--	15	--	
Turn-off Fall Time	t_f		--	12	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	85	A
Pulsed Diode Forward Current	I_{SM}		--	--	340	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 30A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 30A, V_{DD}= 15V di_F/dt = 100A/μs	--	23	--	nS
Reverse Recovery Charge	Q_{rr}		--	48	--	nC

Notes

1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2. V_{DD} = 25V, R_G = 25Ω, Starting T_J = 25°C
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

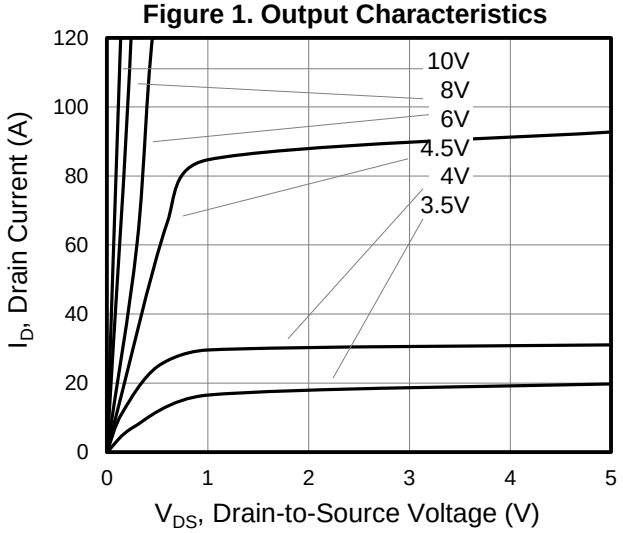


Figure 2. Transfer Characteristics

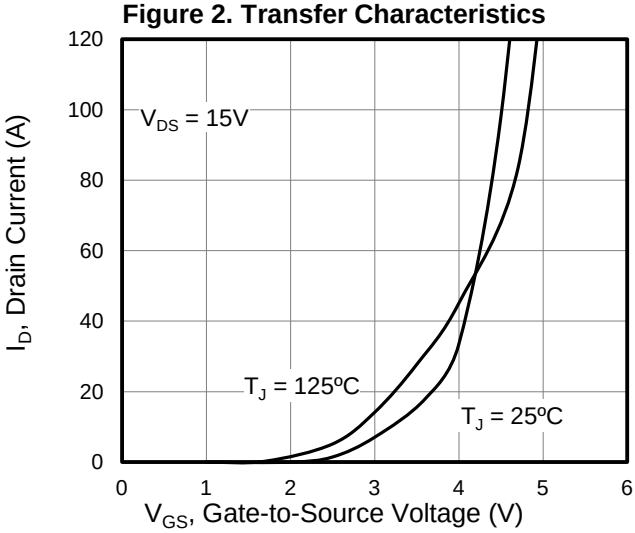


Figure 3. On-Resistance vs. Drain Current

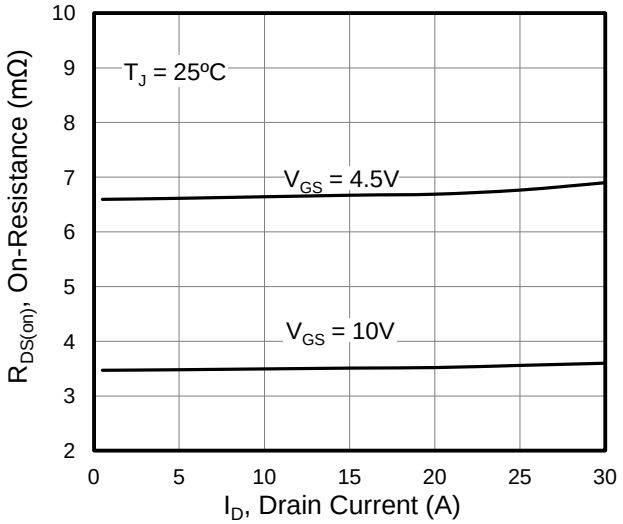


Figure 4. Capacitance

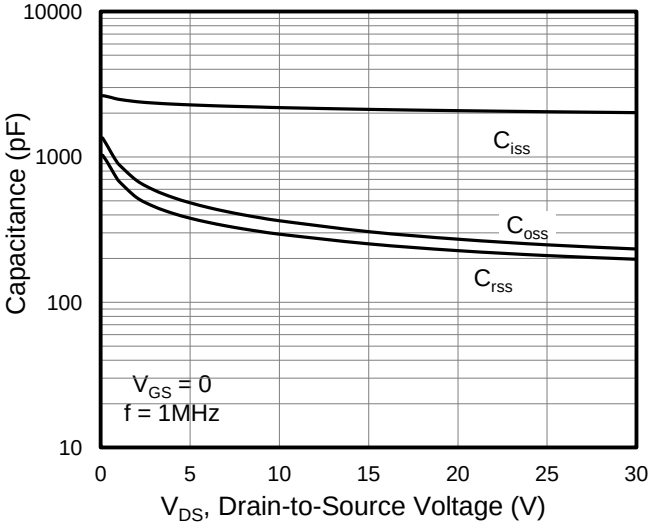


Figure 5. Gate Charge

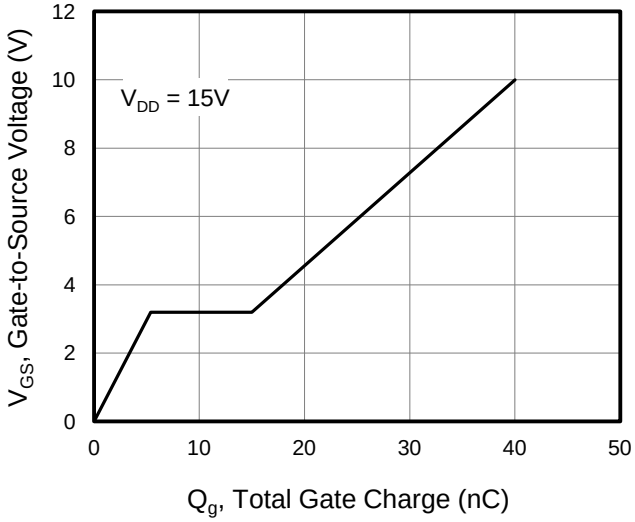
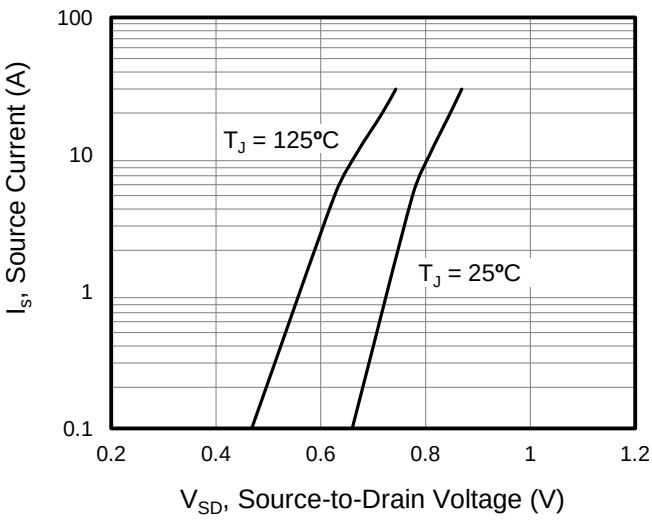


Figure 6. Body Diode Forward Voltage



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. On-Resistance vs. Junction Temperature

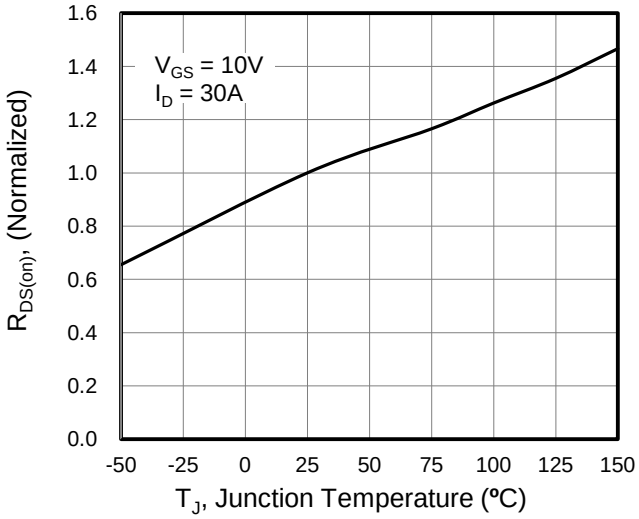


Figure 8. Threshold Voltage vs. Junction Temperature

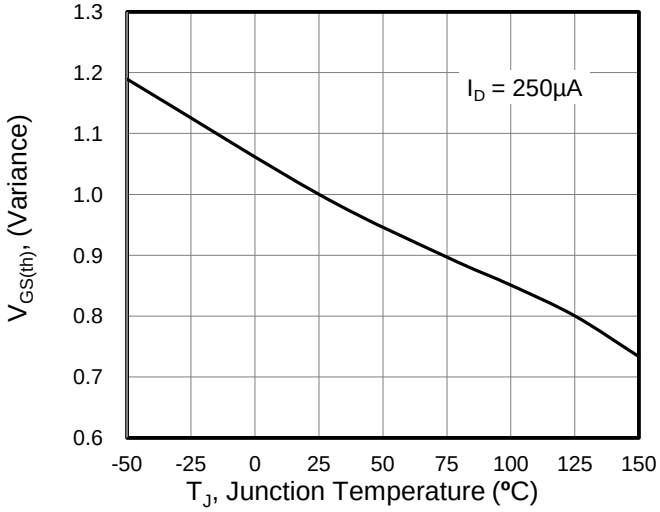


Figure 9. $V_{(BR)DSS}$ vs. Junction Temperature

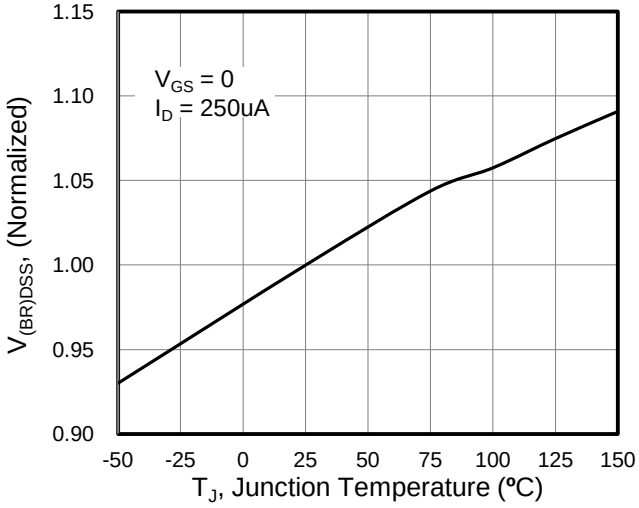


Figure 10. On-Resistance vs. Gate Voltage

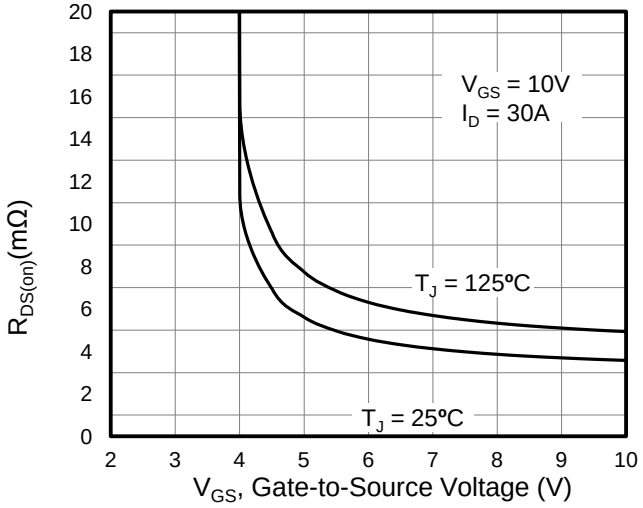


Figure 11. Transient Thermal Impedance

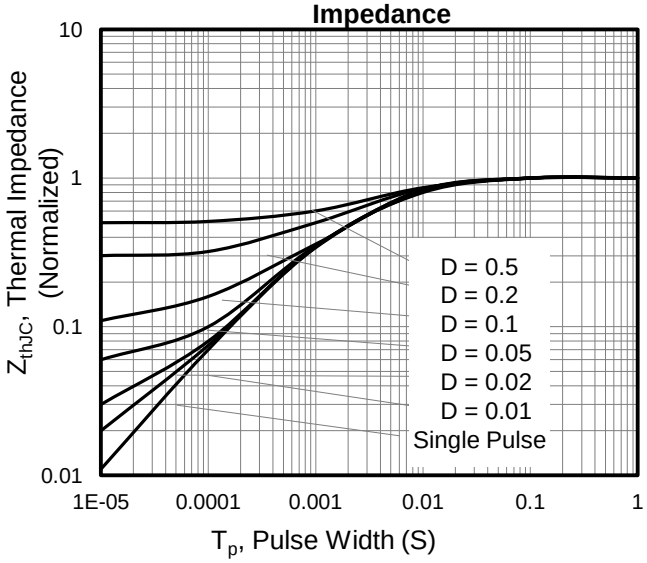


Figure 12. Safe operation area

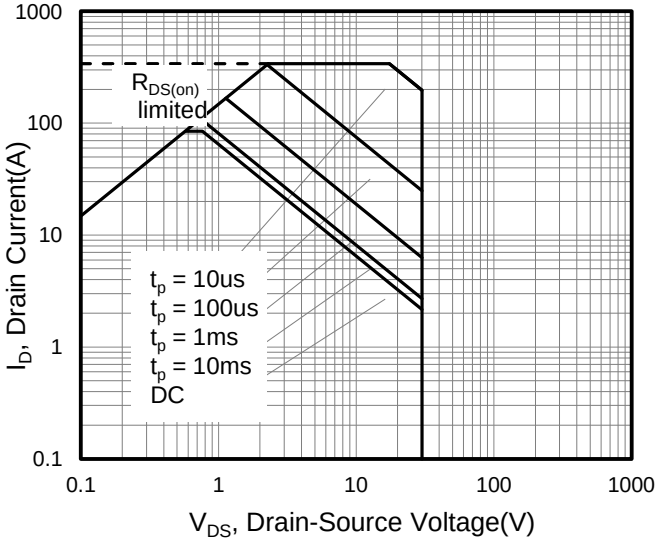


Figure A：Gate Charge Test Circuit and Waveform

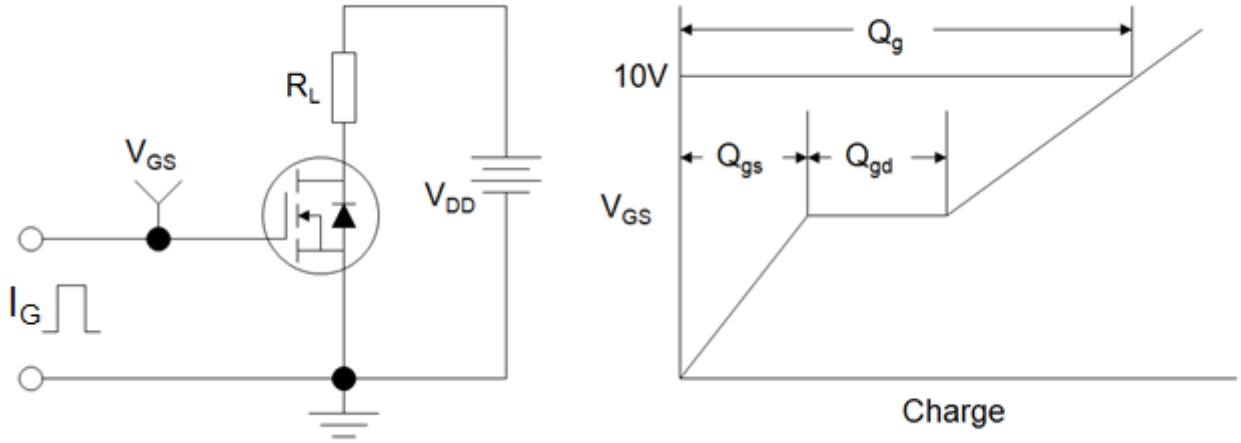


Figure B：Resistive Switching Test Circuit and Waveform

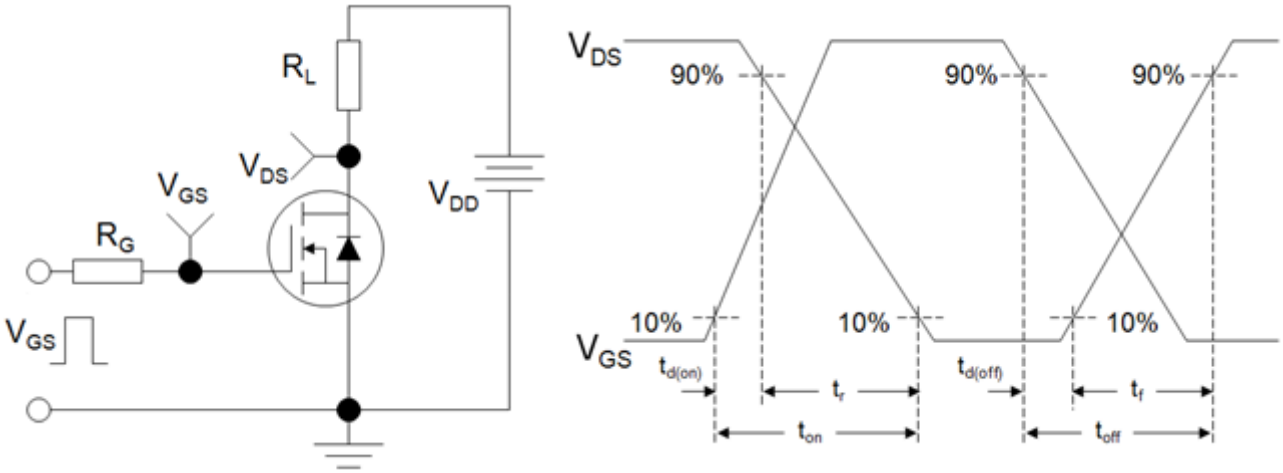
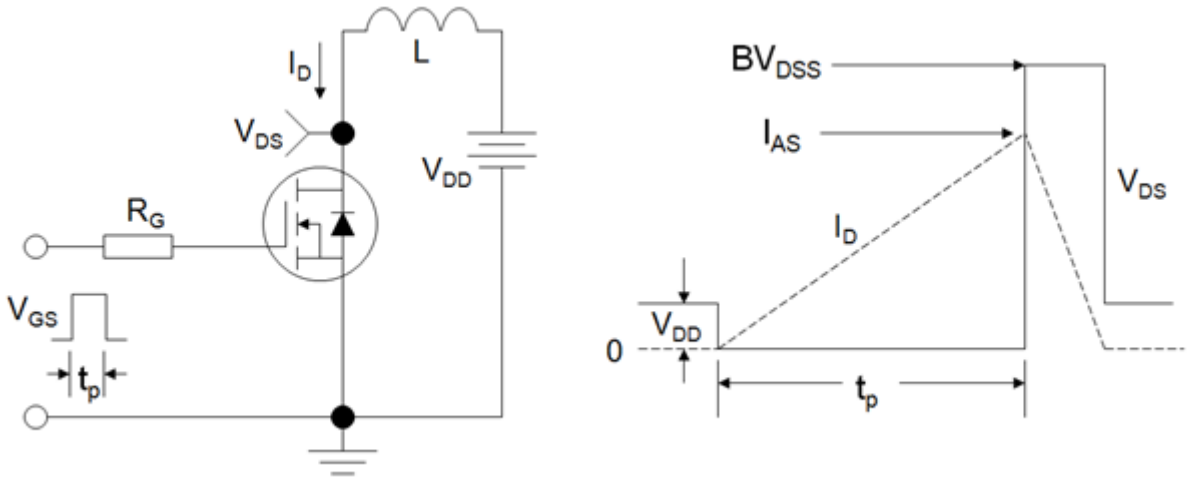
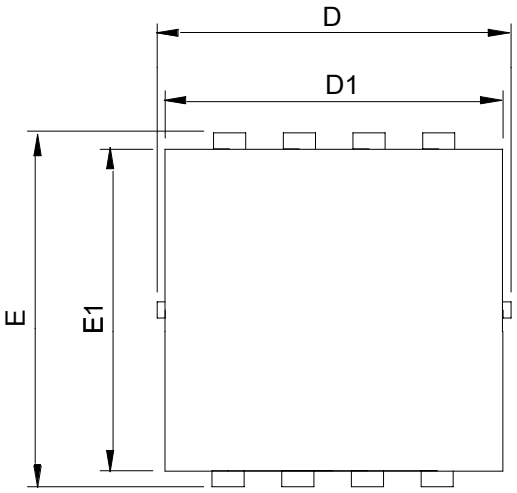


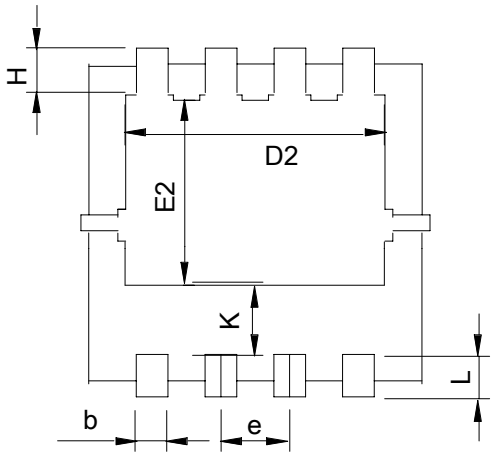
Figure C：Unclamped Inductive Switching Test Circuit and Waveform



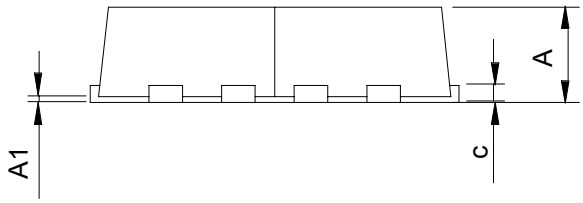
Package Information : PDFN3.3x3.3-8L



Top View



Bottom View



SYMBOL	PDFN3.3x3.3-8L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

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