

FH3060G6

N-Channel Enhancement Mode Power MOSFET

Description

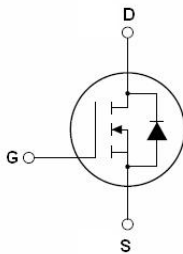
The FH3060G6 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

- Motor drivers
- DC - DC Converter

Features

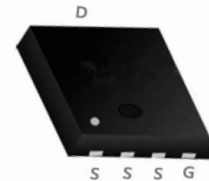
- ◆ $V_{DS} = 30V ; I_D = 60A$
- ◆ $R_{DS(ON)}(MAX) = 4.5m\Omega @V_{GS} = -10V$
- ◆ $R_{DS(ON)}(MAX) = 9.0m\Omega @V_{GS} = -4.5V$
- ◆ LogicLevelCompatible
- ◆ SMDPackage(PDFN3.3x3.3-8L)
- ◆ TrenchTechnology
- ◆ FastSwitching



Schematic diagram



Marking and Pin Assignment



PDFN3.3x3.3-8L top view

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	30	V
Continuous Drain Current	I_D	$T_C = 25^\circ C$	60
		$T_C = 100^\circ C$	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)	P_D	$T_C = 25^\circ C$	25
		$T_C = 100^\circ C$	12
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ C$

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	5.4	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	61	

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	μA
		$V_{DS} = 30V, V_{GS} = 0V, T_J = 100^\circ\text{C}$	--	--	25	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1	1.6	2.5	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$	--	3.6	4.5	$\text{m}\Omega$
		$V_{GS} = 4.5V, I_D = 20A$	--	6.9	9.0	$\text{m}\Omega$
Forward Transconductance (Note3)	g_{fs}	$V_{DS} = 10V, I_D = 20A$	16	--	--	S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 15V,$ $f = 1.0\text{MHz}$	--	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	$t_{d(on)}$	$V_{DD} = 15V, I_D = 30A,$ $V_{GS} = 10V, R_G = 1.8\Omega$	--	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	$T_C = 25^\circ\text{C}$	--	--	85	A
Pulsed Diode Forward Current	I_{SM}		--	--	340	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 30A, V_{GS} = 0V$	--	--	1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 30A, V_{DD} = 15V$ $di_F/dt = 100A/\mu\text{s}$	--	23	--	nS
Reverse Recovery Charge	Q_{rr}		--	48	--	nC

Notes

1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2. $V_{DD} = 25V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

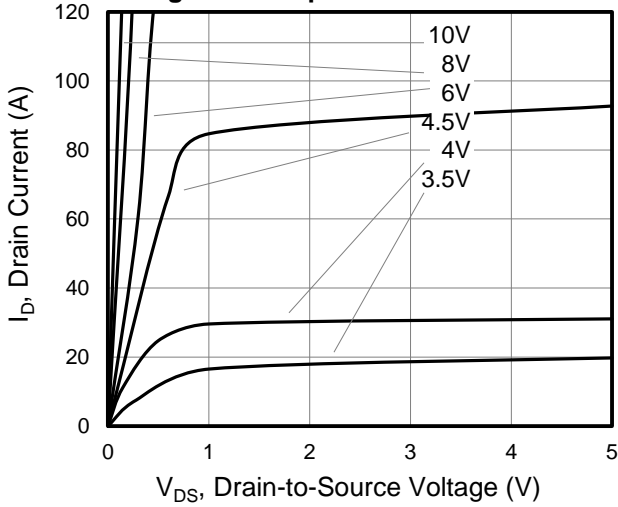


Figure 2. Transfer Characteristics

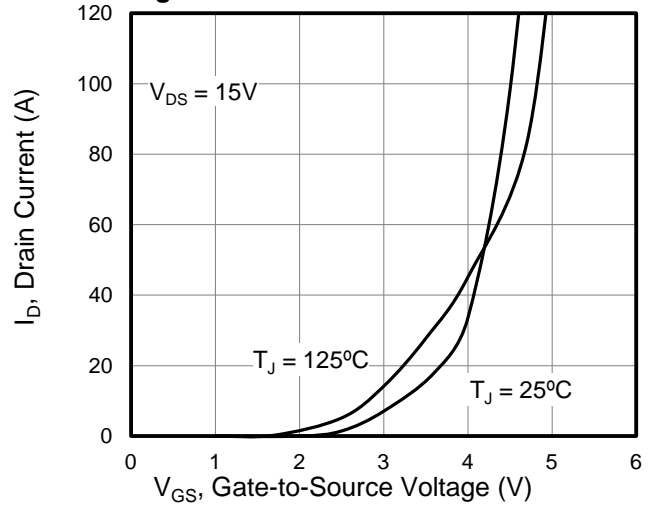


Figure 3. On-Resistance vs. Drain Current

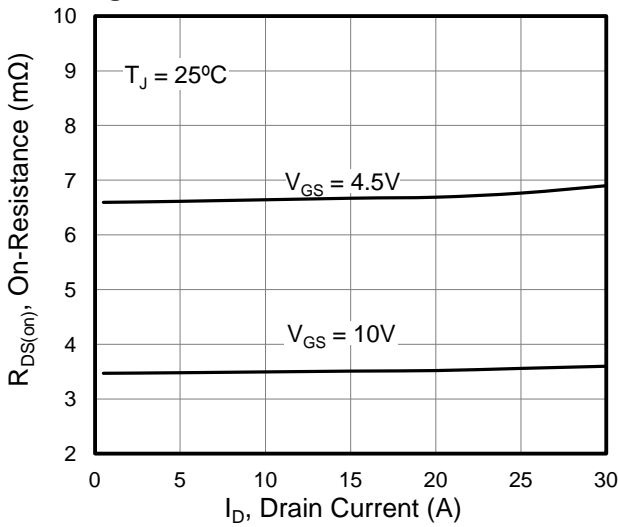


Figure 4. Capacitance

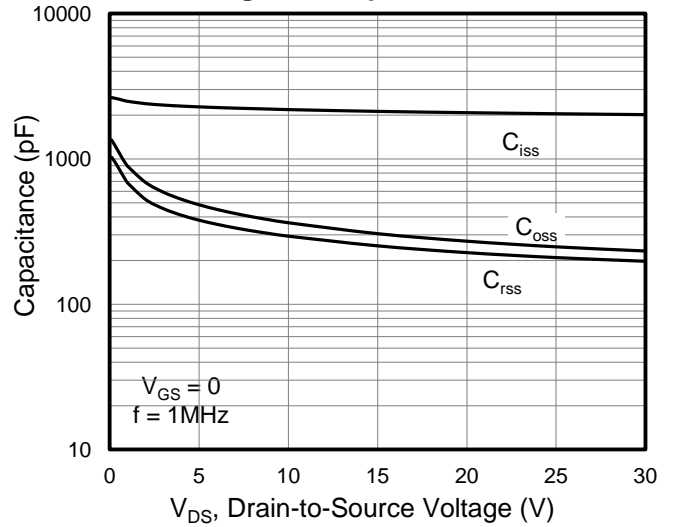


Figure 5. Gate Charge

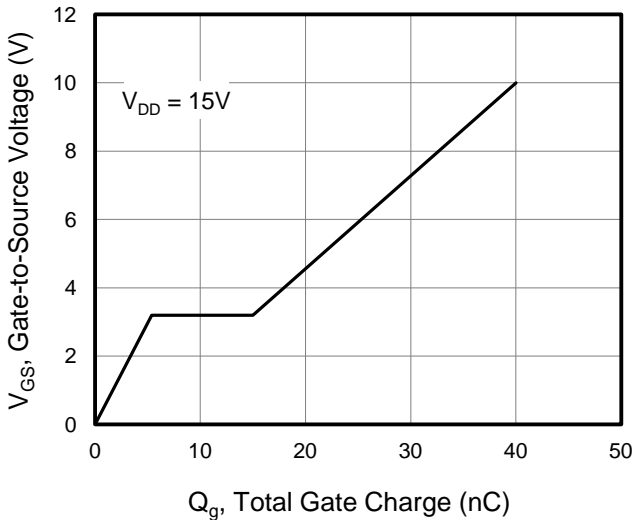
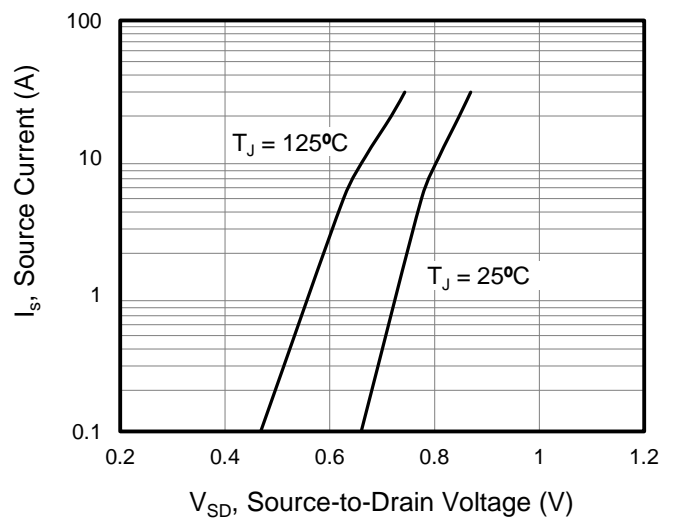


Figure 6. Body Diode Forward Voltage



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. On-Resistance vs. Junction Temperature

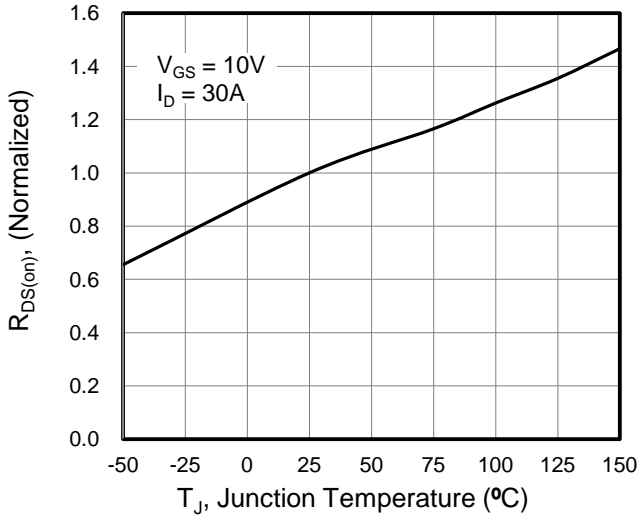


Figure 8. Threshold Voltage vs. Junction Temperature

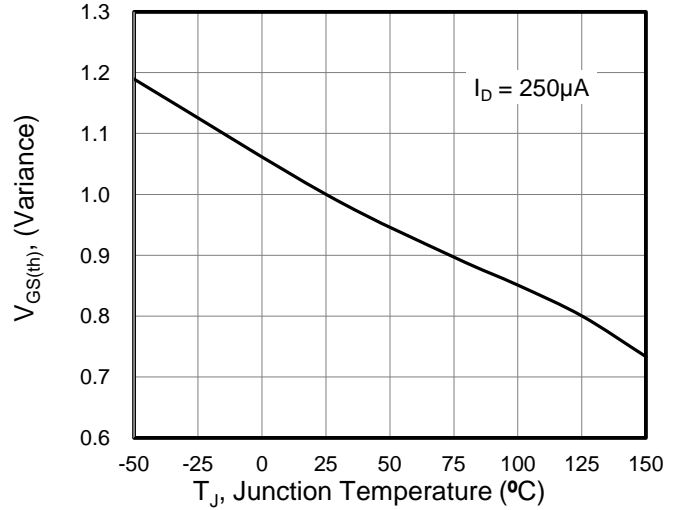


Figure 9. $V_{(BR)DSS}$ vs. Junction Temperature

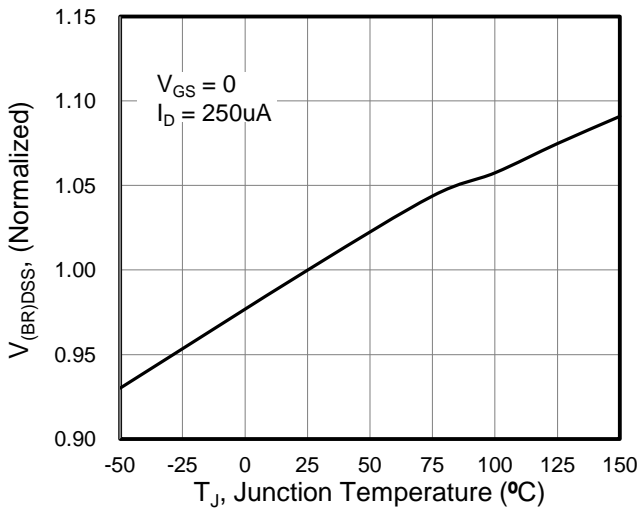


Figure 10. On-Resistance vs. Gate Voltage

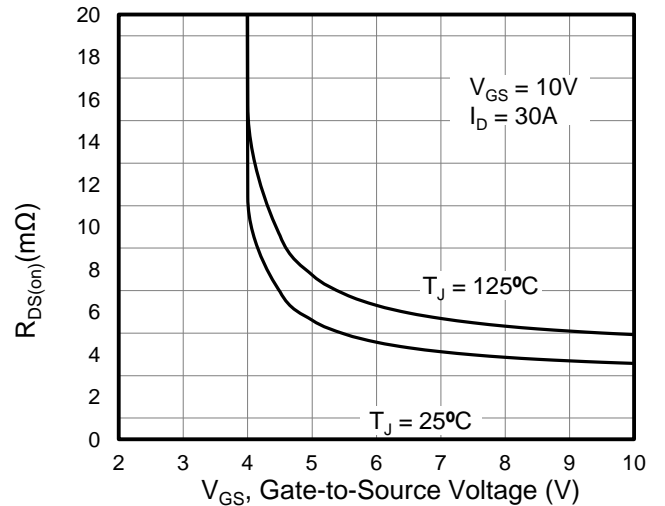


Figure 11. Transient Thermal Impedance

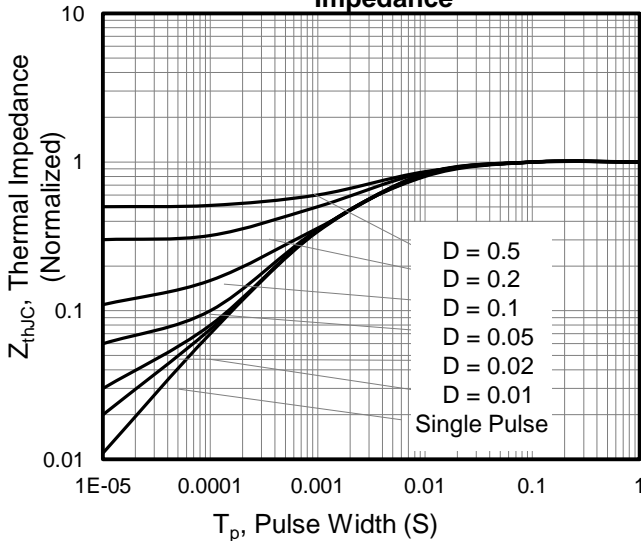


Figure 12. Safe operation area

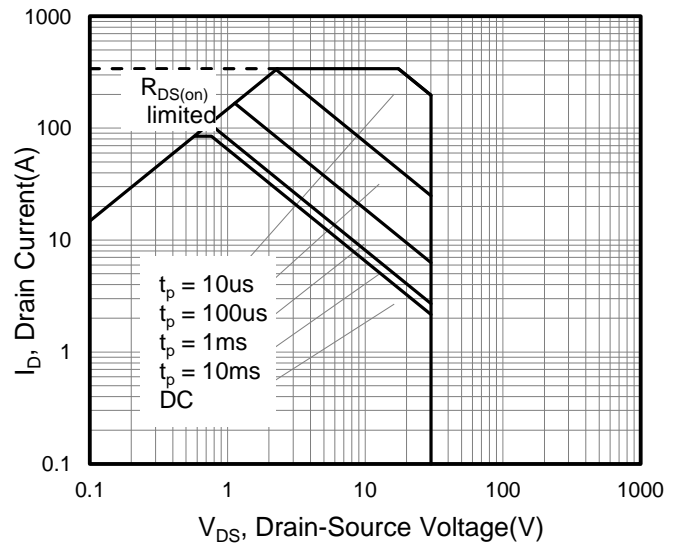


Figure A: Gate Charge Test Circuit and Waveform

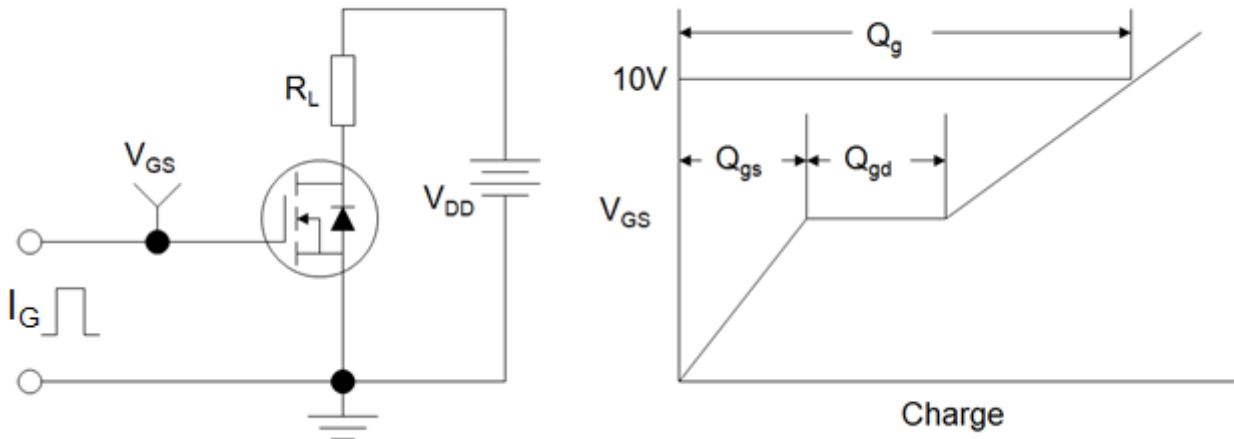


Figure B: Resistive Switching Test Circuit and Waveform

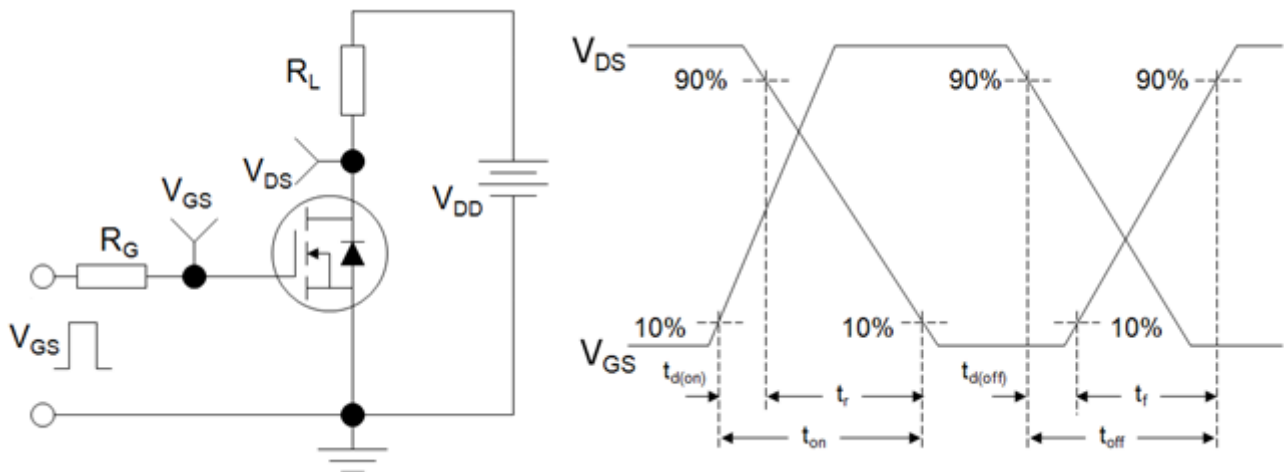
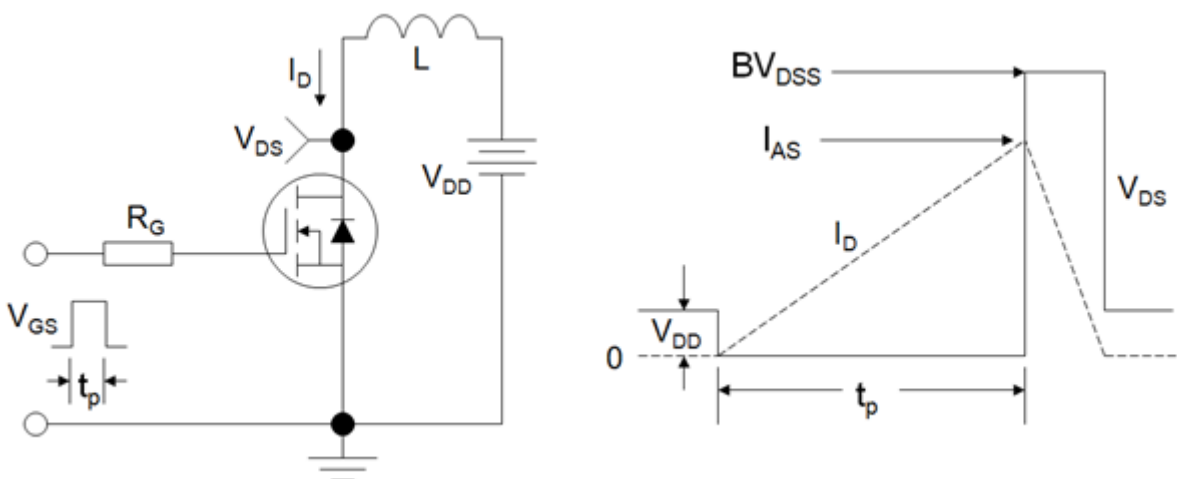
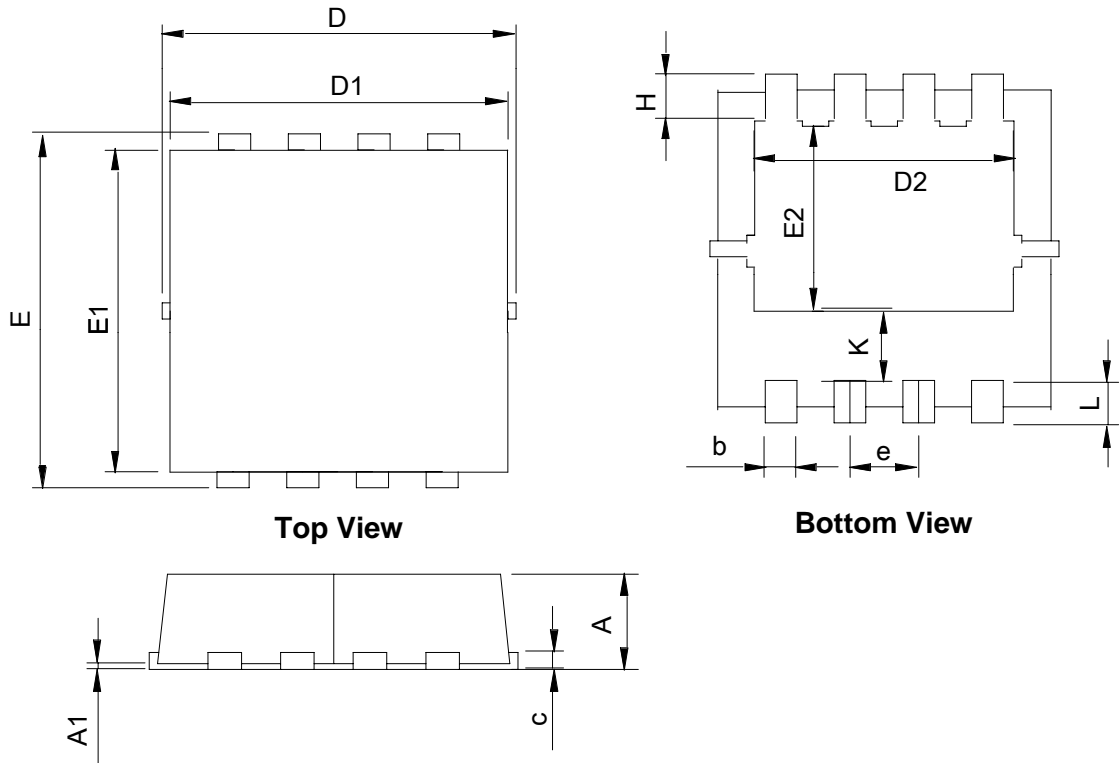


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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



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