FH18P06G   -60V P-Channel MOSFET

Description

The FH18P06G uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge . It can be used in a wide variety of applications. The package form is PDFN5x6-8L which accords with the RoHS standard and Halogen Free standard.
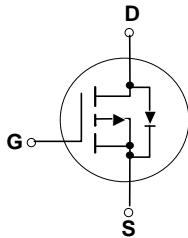
General Features

◆ V_{DSS}=-60V , ID=-80A

◆ $R_{DS(ON)}$ = 8.5 mΩ (Typ) @V_{GS}=-10V
   $R_{DS(ON)}$ =10.5mΩ Typ) @V_{GS}=-4.5V

◆ Fast Switching

◆ Low Gate Charge and $R_{DS(on)}$

◆ Low Reverse transfer capacitances

Applications

◆ Вattery switching application

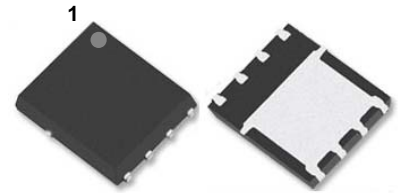◆ Hard switched and high frequency circuits

◆ Power management

P-Channel MOSFET

Schematic diagram   **Marking and pin assignment**   **PDFN5x6-8L top and bottom view**

Absolute Maximum Ra tings (Tc= 25 ℃ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DSS}	Drain‑to‑Source Voltage		-60	V
I_D	Continuous Drain Current	T_C = 25 °C	-80	A
	Continuous Drain Current	T_C = 100 °C	- 50	A
I_{DM} [a1]	Pulsed Drain Current		-320	A
V_{GS}	Gate‑to‑Source Voltage		± 20	V
P_D	Power Dissipation		35	W
E_{AS} [a2]	Single pulse avalanche energy		450	mJ
T_J，T_{stg}	Operating Junction and Storage Temperature Range		150，−55 to 150	℃
T_L	Maximum Temperature for Soldering		300	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction‑to-Case	2.8	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction‑to‑Ambient	60	℃/W

Electrical Characteristics （Tj= 25 ℃ unless otherwise specified ）

Static Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min .	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=- 250µA	-60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = -60 V, V_{GS}= 0V	--	--	1	µA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =- 20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =+ 20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=- 250µA	-1.2	-1.7	-2.5	V
$R_{DS(ON)}$	Drain - to - Source On - Resistance	V_{GS}=- 10V, I_D=- 20A	--	8.5	11.0	mΩ
$R_{DS(ON)}$	Drain - to - Source On - Resistance	V_{GS}=- 4.5V, I_D=- 20A	--	10.5	13.0	mΩ
g_{FS}	Forward Transconductance	V_{DS}=- 10V, I_D=- 20A	50	--	--	S

Dynamic Char acteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V	--	3300	--	pF
C_{oss}	Output Capacitance	V_{DS}=- 30V	--	700	--	
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	--	19	--	
R_g	Gate resistance	V_{GS}=0V, V_{DS} Open	--	2.0	--	Ω

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn - on Delay Time	I_D=- 20A, R_L= 0.75Ω	--	4.5	--	ns
tr	Rise Time	V_{DS}= -30V	--	2.5	--	
$t_{d(OFF)}$	Turn - Off Delay Time	V_{GS}= -10V	--	14.5	--	
t_f	Fall Time	R_G= 3Ω	--	3.5	--	
Q_g	Total Gate Charge	V_{GS}=- 10V	--	47.5	--	nC
Q_{gs}	Gate Source Charge	V_{DS}=- 30V	--	14.0	--	
Q_{gd}	Gate Drain Charge	I_D=- 20A	--	7.6	--	

Source - Drain D iode Characteristics

| Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C=25 °C	--	--	-80	A
I_{SM}	Diode Pulse Current		--	--	-320	A
V_{SD}	Diode Forward Voltage	I_S=- 6.0A, V_{GS}=0V	--	--	-1.2	V
t_{rr}	Reverse Recovery time	I_S=- 20A, V_{DD}=- 30V	--	60	--	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/ µs	--	105	--	nC

[a1] : Repetitive rating; pulse width limited by maximum junction temperature

[a2] : V_{DD} =30 V, L=0.3mH, R_G =25Ω, Starting T_j=25℃
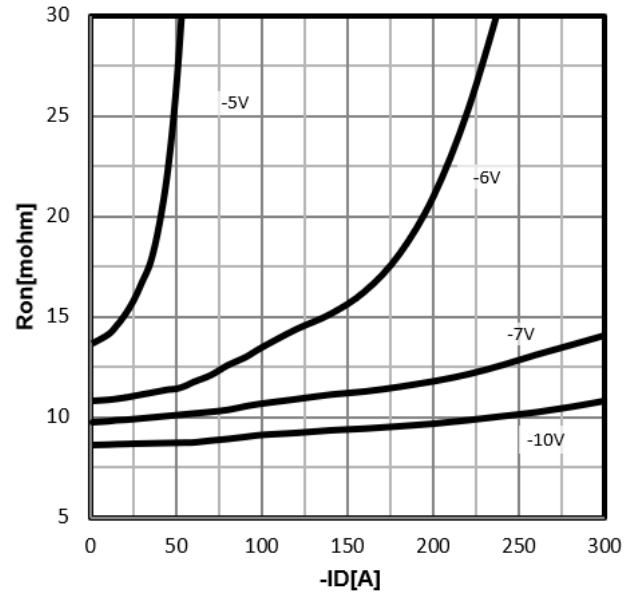
Characteristics Curve：
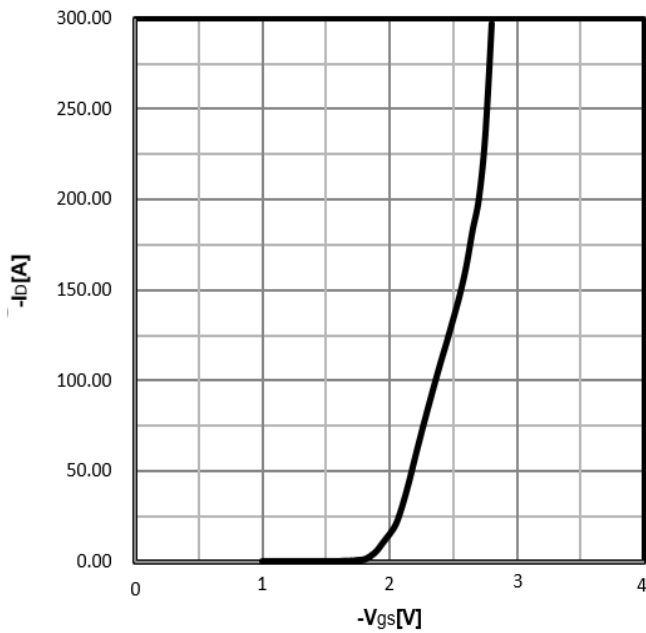
Typ. output characteristics
$I_D=f(V_{DS})$
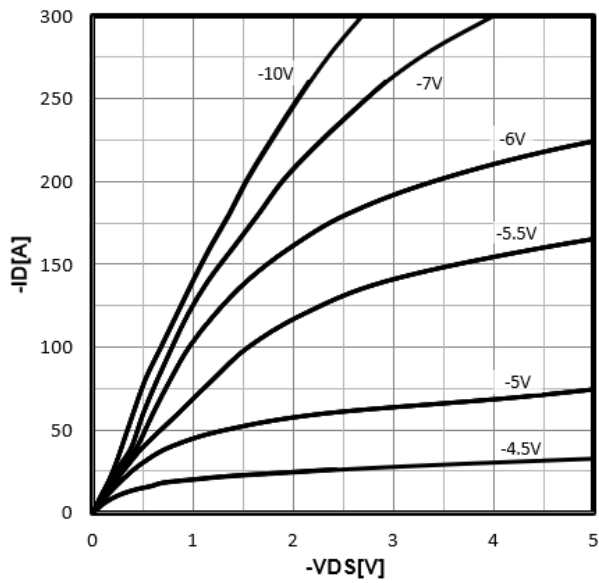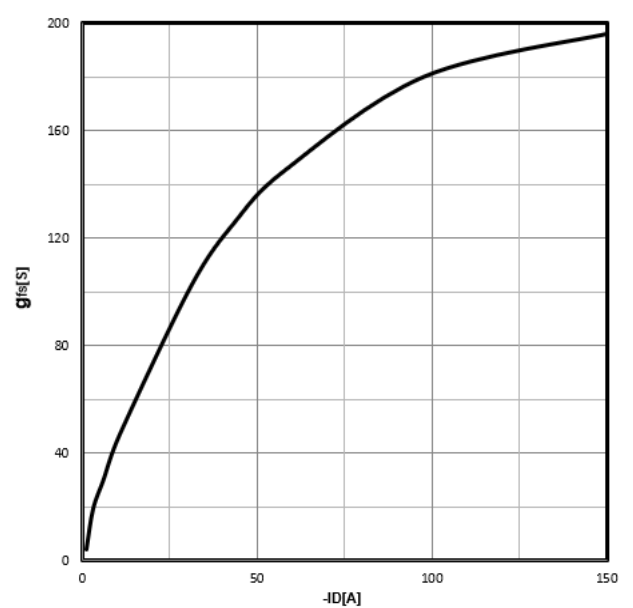
Typ. drain-source on resistance
$R_{DS(on)}=f(I_D)$

Typ. transfer characteristics
$I_D=f(V_{GS})$

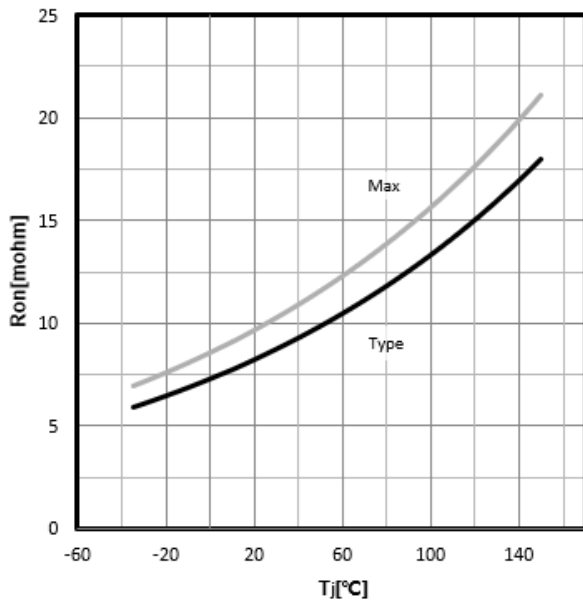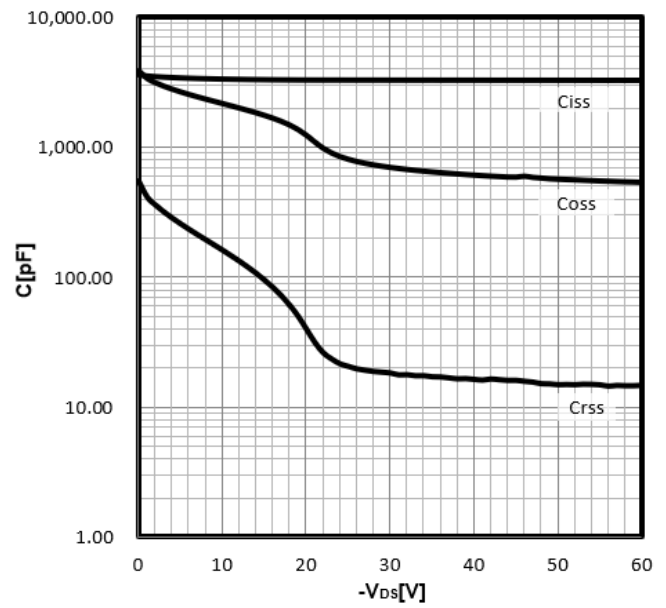**Typ. forward transconductance**
$g_{fs}=f(I_D)$

Drain-source on-state resistance
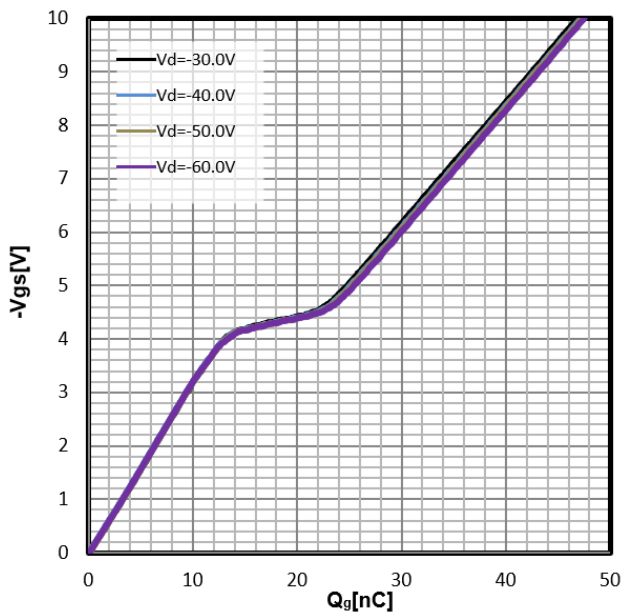$R_{DS(on)}=f(T_j)$; I_D=-20A; V_{GS}=-10V

Typ. capacitances
$C =f(V_{DS})$; V_{GS}=0V; f =1MHz
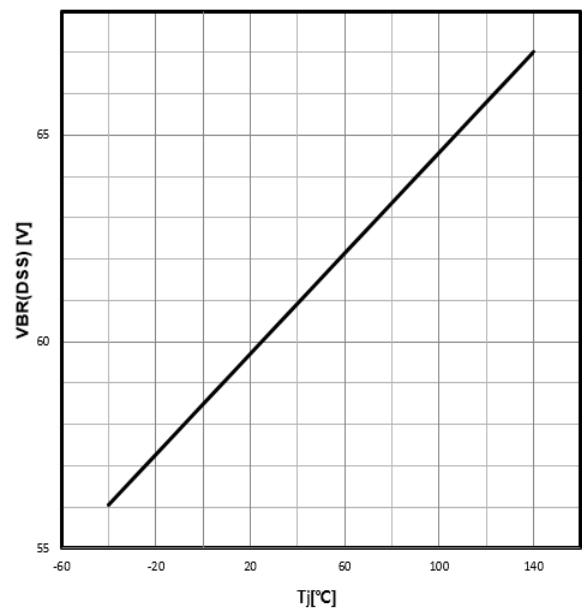

Typ. gate charge
$V_{GS}=f(Q_{gate})$; I_D=-20A
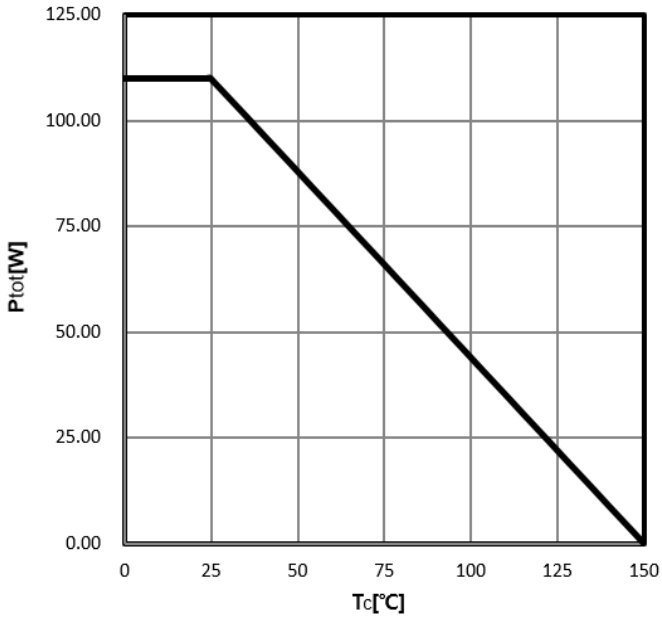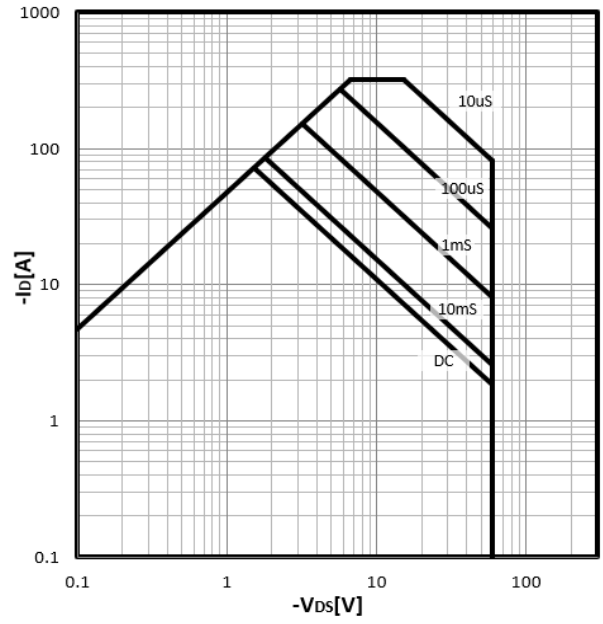

Drain-source breakdown voltage
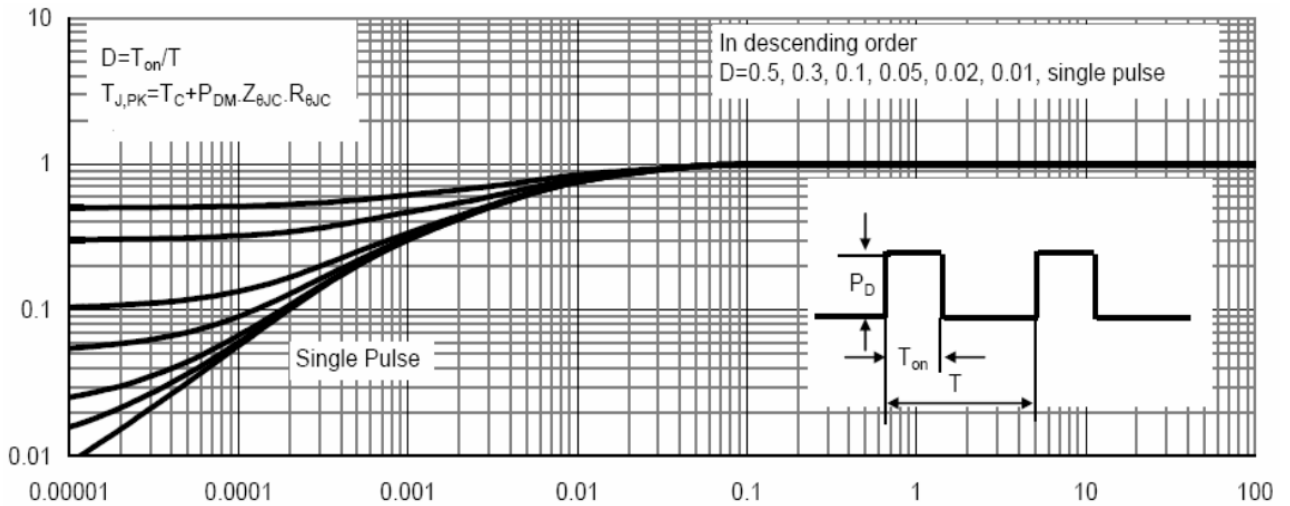$V_{BR(DSS)}=f(T_j)$; I_D=-250uA

Power Dissipation
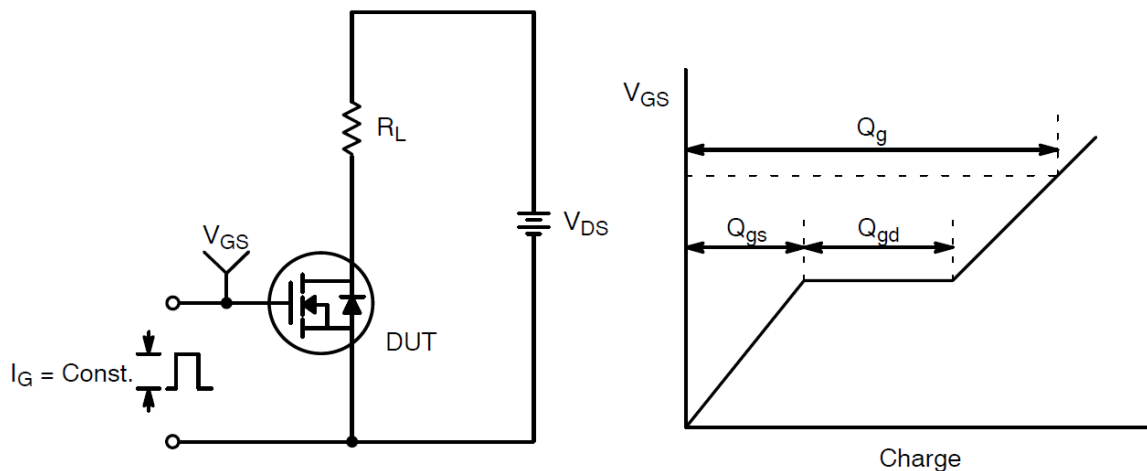$P_{tot}=f(T_C)$

Safe operating area
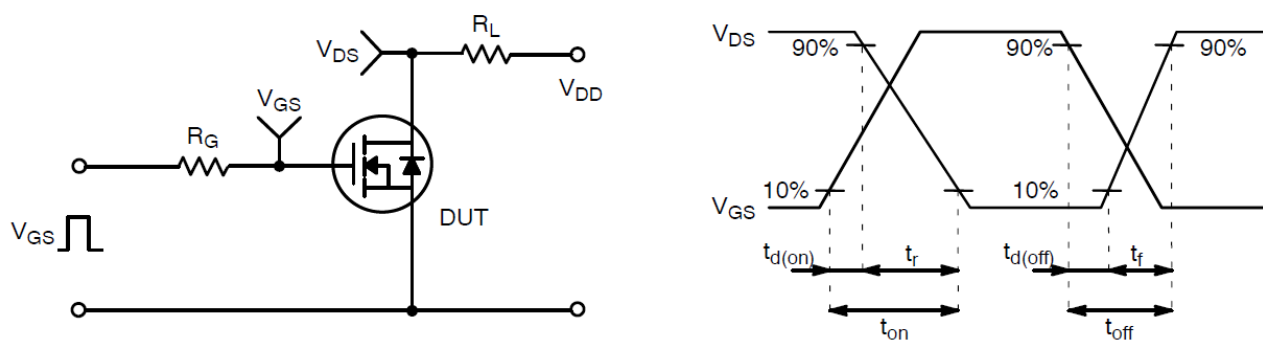$I_D=f(V_{DS})$

Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

Test Circuit and Waveform:

Gate Charge Test Circuit & Waveform

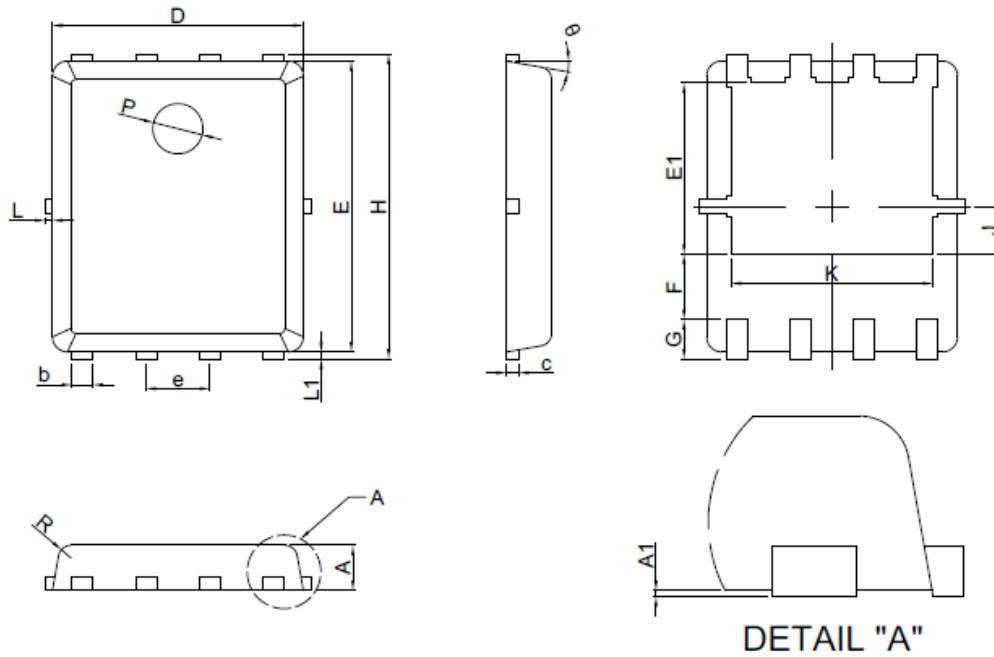**Resistive Switching Test Circuit & Waveforms**

$$E_{AS} = \frac{1}{2} \cdot LI_{AS}^2$$
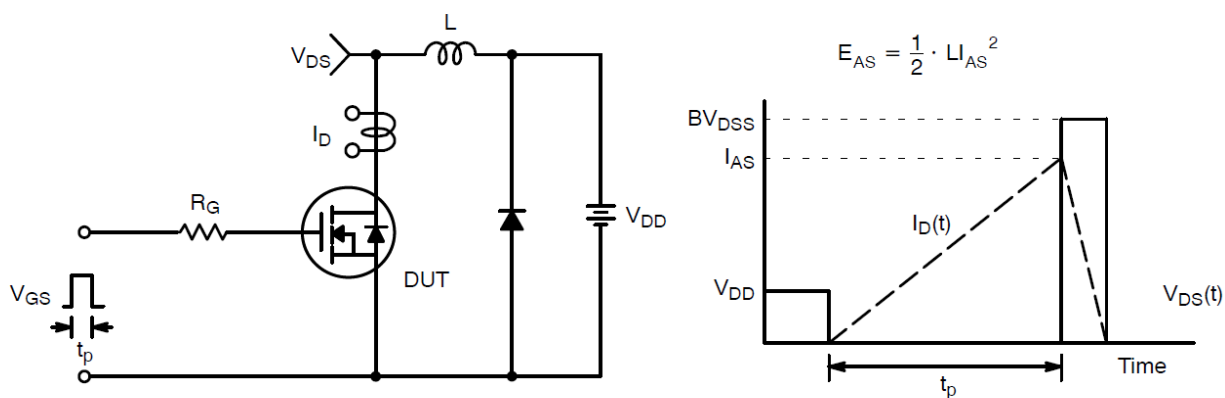
Unclamped Inductive Switching Test Circuit & Waveforms

Package Information：PDFN5x6-8L

DETAIL "A"

Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
b	0.35	0.49
c	0.254REF	
D	4.80	5.20
F	1.40REF	
E	5.60	5.90
e	1.27BSC	
H	5.80	6.20
L1	0.10	0.18
G	0.60REF	
K	4.00REF	
L	-	0.15
J	0.95BSC	
P	1.00REF	
E1	3.40REF	
θ	6°	14°
R	0.25REF	