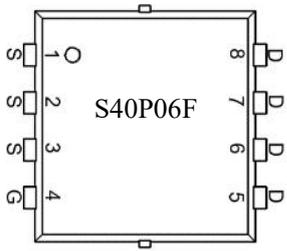
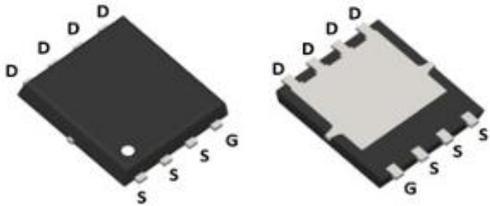
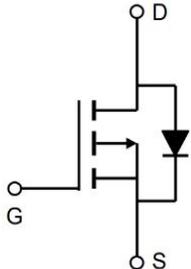


Features <ul style="list-style-type: none"> ➤ Split Gate Trench MOSFET technology ➤ Excellent package for heat dissipation ➤ High density cell design for low $R_{DS(ON)}$ 	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	-60V	19mΩ	-40A
Package  <p style="text-align: center;">Marking and pin assignment</p>		Application <ul style="list-style-type: none"> ➤ Battery switching application ➤ Hard switched and high frequency circuits ➤ Power management <div style="text-align: right; border: 1px solid green; border-radius: 50%; padding: 2px 5px; color: white; font-weight: bold;">RoHS</div>	
 <p style="text-align: center;">PDFN5*6-8L top view</p>		 <p style="text-align: center;">Schematic diagram</p>	

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
40P06	S40P06F	PDFN5*6-8L	5000

Absolute Maximum Ratings ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DS}	-60	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current	$T_C=25^{\circ}\text{C}$	I_D	-40	A
	$T_C=100^{\circ}\text{C}$	I_D	-25	A
Pulsed Drain Current	I_{DM}^1	-150	A	
Single Pulse Avalanche Energy	E_{AS}^2	200	mJ	
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_D	95	W
Operating junction and storage temperature	T_J, T_{STG}	150, -55 ~ 150	$^{\circ}\text{C}$	
Maximum Temperature for Soldering	T_L	260	$^{\circ}\text{C}$	



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	1.32	$^{\circ}C/W$
Thermal resistance, junction – ambient	$R_{\theta JA}^*$	60	$^{\circ}C/W$

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS60P06F	PDFN5*6-8L	4	5,6,7,8	1,2,3	Tape Reel

Electrical Characteristics ($T_j=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60V, V_{GS} = 0V$	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.3	-1.8	-2.3	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$	-	19	24	m Ω
		$V_{GS} = -4.5V, I_D = -8A$	-	24.5	31	
Forward Transconductance	gfs	$V_{DS} = -5V, I_D = -5A$	-	20	-	S
Input Capacitance	C_{ISS}	$V_{DS} = -30V, V_{GS} = 0V,$ $f = 1MHz$	-	1500	-	pF
Output Capacitance	C_{OSS}		-	248	-	
Reverse Transfer Capacitance	C_{RSS}		-	12	-	
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} \text{ Open}$	-	8	-	Ω
Total Gate Charge	Q_g	$V_{GS} = -10V, V_{DS} = -30V, I_D = -10A$	-	22	-	nC
Gate-Source Charge	Q_{gs}		-	3.7	-	
Gate-Drain Charge	Q_{gd}		-	3	-	
Turn-On Delay Time	$T_{d(on)}$	$V_{GS} = -10V, V_{DS} = -30V,$ $RG = 3\Omega, I_D = -10A$ $R_L = 3\Omega$	-	15	-	ns
Rise Time	T_R		-	17	-	
Turn-Off Delay Time	$T_{d(off)}$		-	40	-	
Fall Time	T_F		-	45	-	
Diode Forward Current	I_S	$T_C = 25^{\circ}C$	-	-	-40	A
Diode Pulse Current	I_{SM}		-	-	-150	A
Diode Forward Voltage	V_{SD}	$I_S = -5.0A, V_{GS} = 0V$	-	-	-1.2	V



Reverse Recovery time	T_{rr}	$I_S = -10A, V_{DD} = -30V$ $dI/dt = 100A/\mu s$	-	60	-	ns
Reverse Recovery Charge	Q_{rr}		-	105	-	nC

Note :

- 1.Repetitive rating; pulse width limited by maximum junction temperature
- 2. $V_{DD} = 30V, L = 0.3mH, R_G = 25\Omega$, Starting $T_j = 25^\circ C$

Typical Performance Characteristics

Fig1:Typ. output characteristics

$$I_D = f(V_{DS})$$

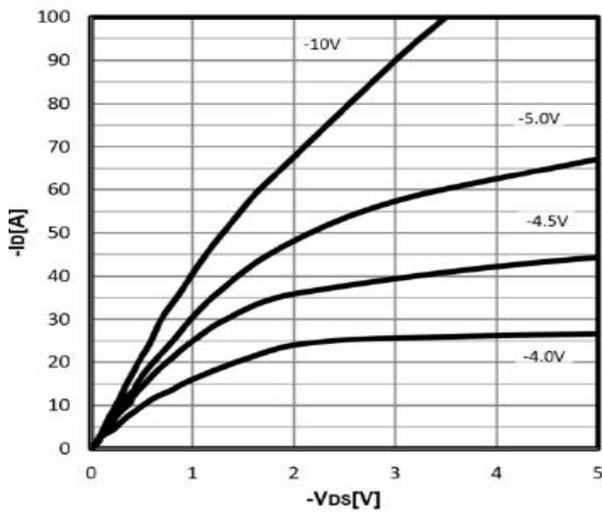


Fig2:Typ. drain-source on resistance

$$R_{DS(on)} = f(I_D)$$

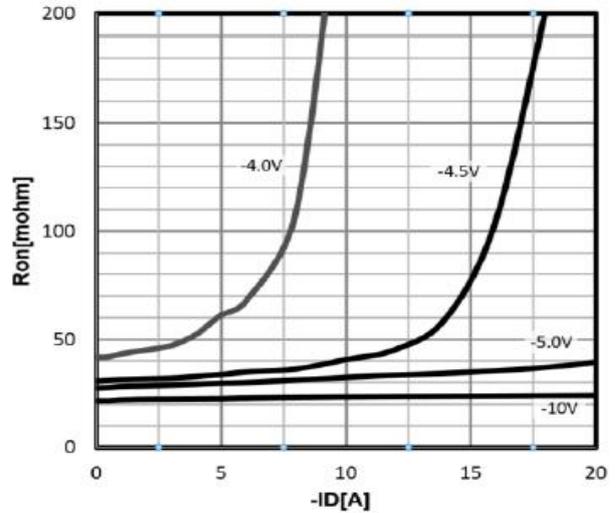


Fig3:Typ. transfer characteristics

$$-I_D = f(-V_{GS})$$

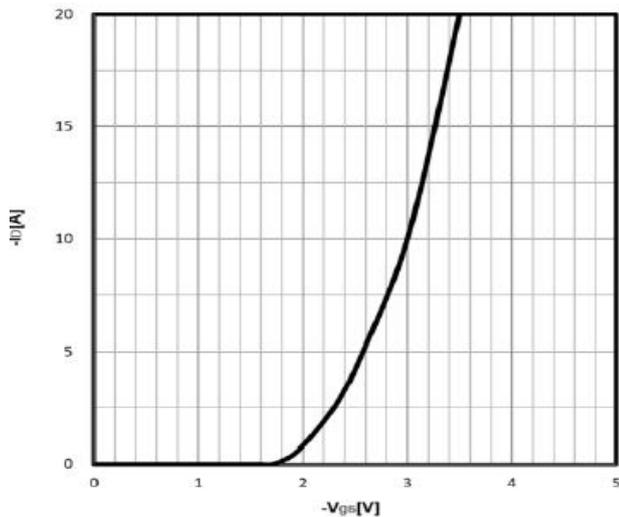


Fig4:Drain-source on-state resistance

$$R_{DS(on)} = f(T_j) | I_D = -10A; V_{GS} = -10V$$

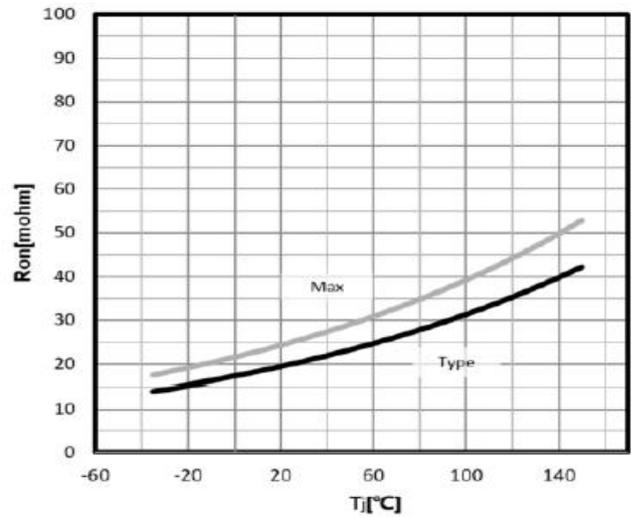




Fig5:Gate Threshold Voltage

$-V_{TH}=f(T_j); I_D=-250\mu A$

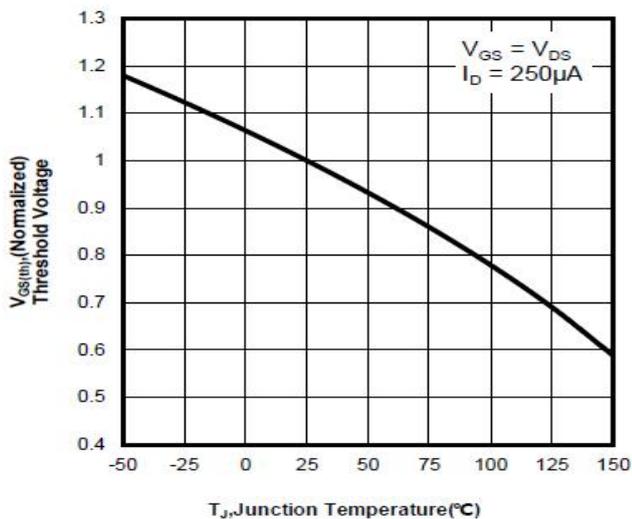


Fig6:Drain-source breakdown voltage

$-V_{BR(DSS)}=f(T_j); I_D=-250\mu A$

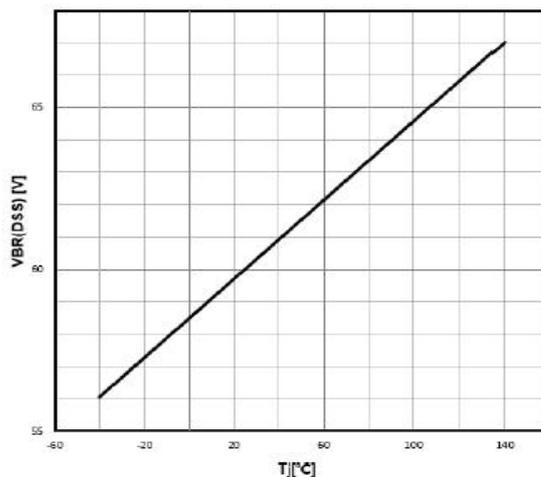


Fig7:Typ. gate charge

$V_{GS}=f(Q_{gate}); I_D=-10A$

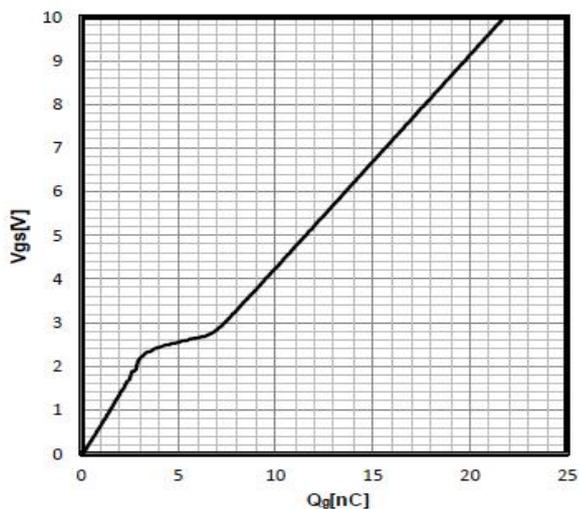


Fig8:Typ. Capacitances

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

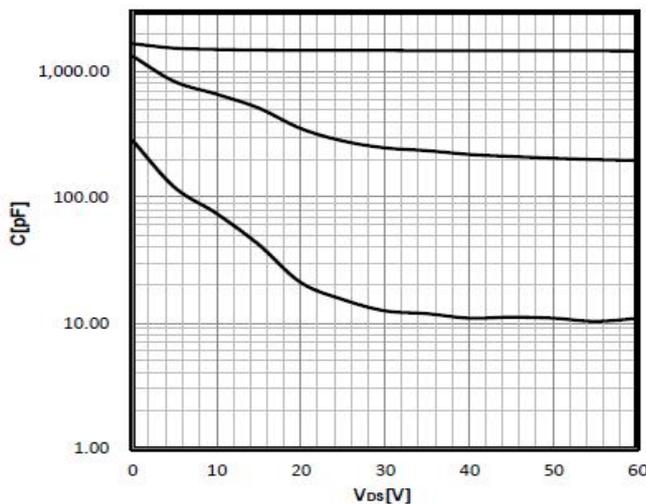


Fig9:Power Dissipation

$P_{tot}=f(T_c)$

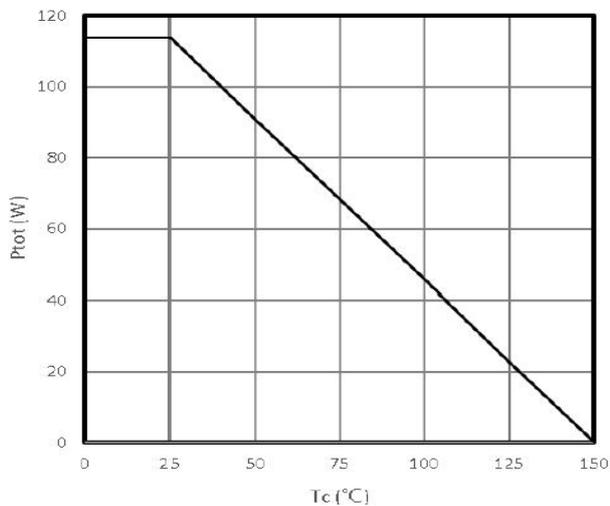


Fig10:Maximum Drain Current

$-I_D=f(T_c)$

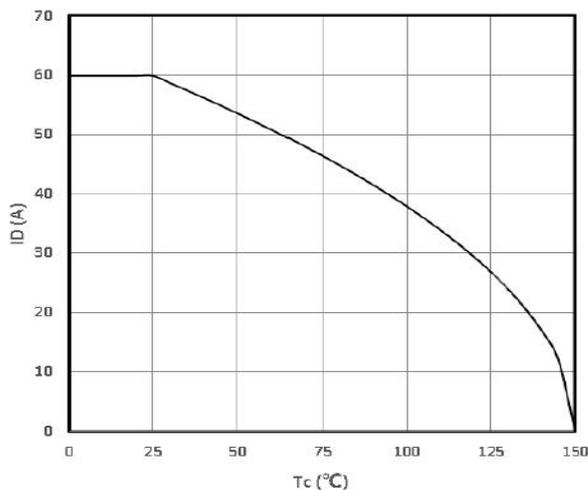


Fig11: Safe operating area

$$-I_D = f(-V_{DS})$$

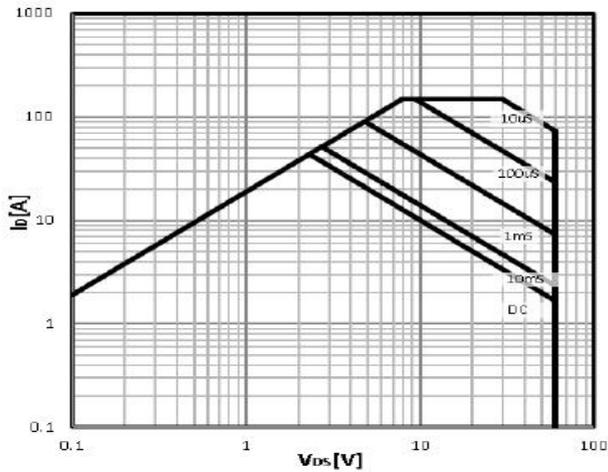


Fig12: Body Diode Forward Voltage Variation

$$-I_F = f(-V_{DS})$$

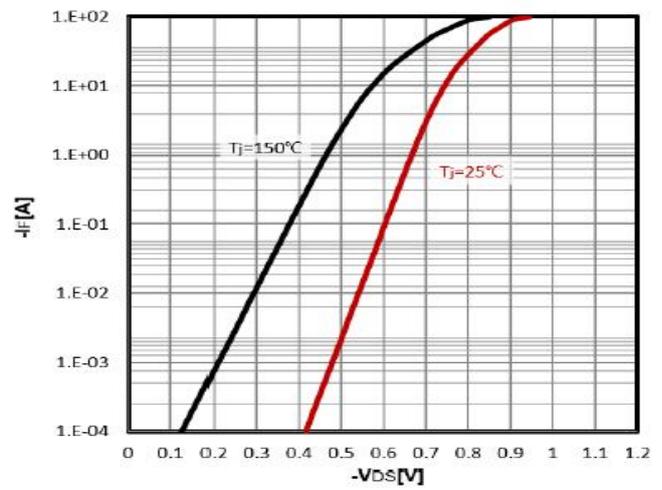
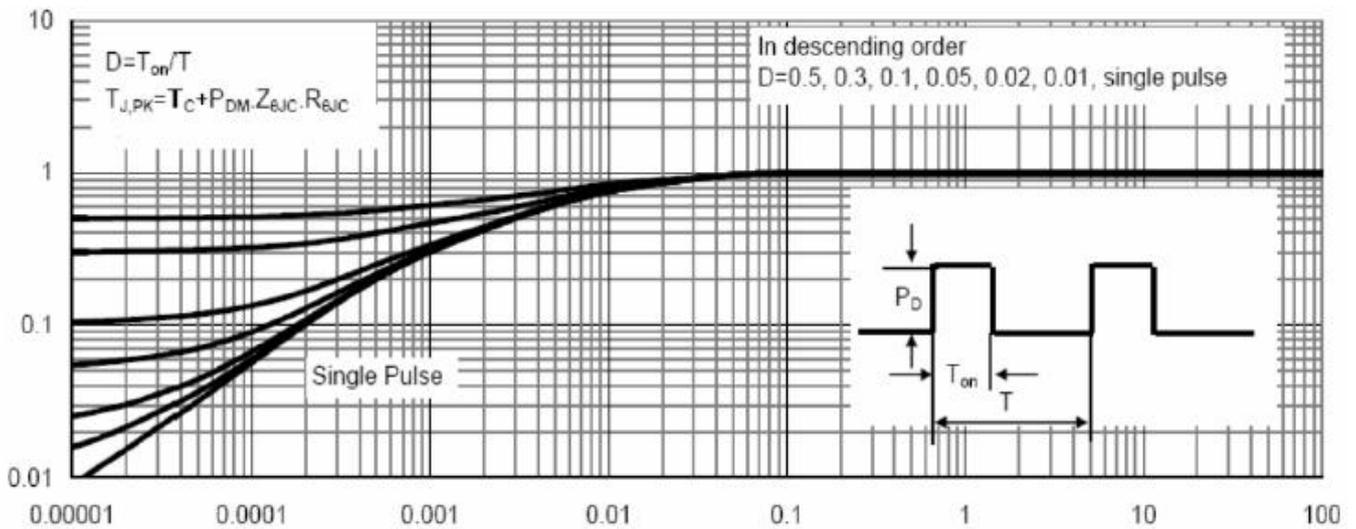


Fig12: Body Diode Forward Voltage Variation



Test Circuit and Waveform

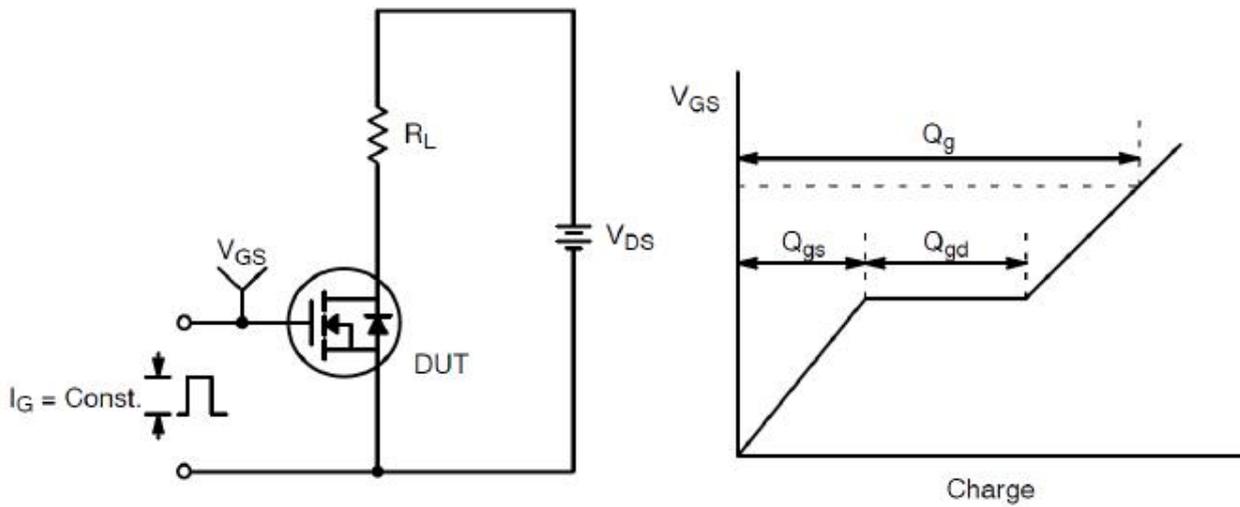


Fig-1: Gate Charge Test Circuit & Waveform

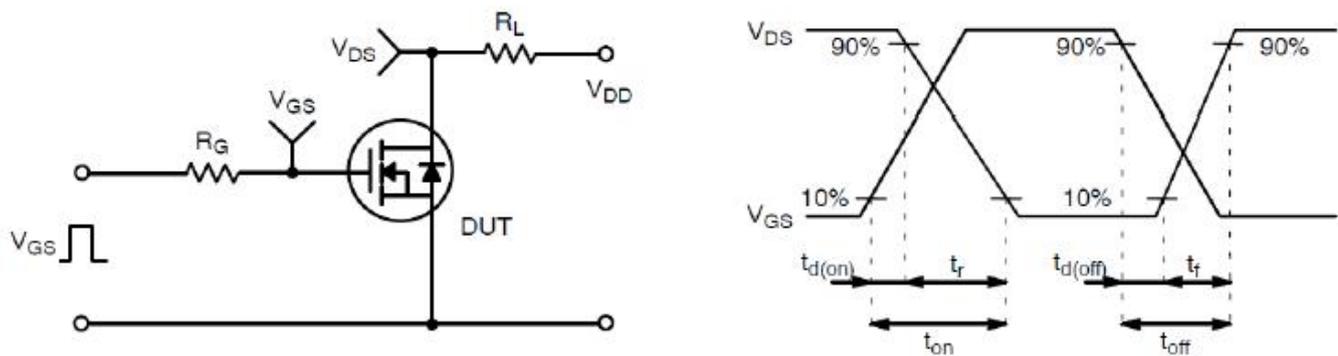


Fig-2: Resistive Switching Test Circuit & Waveforms

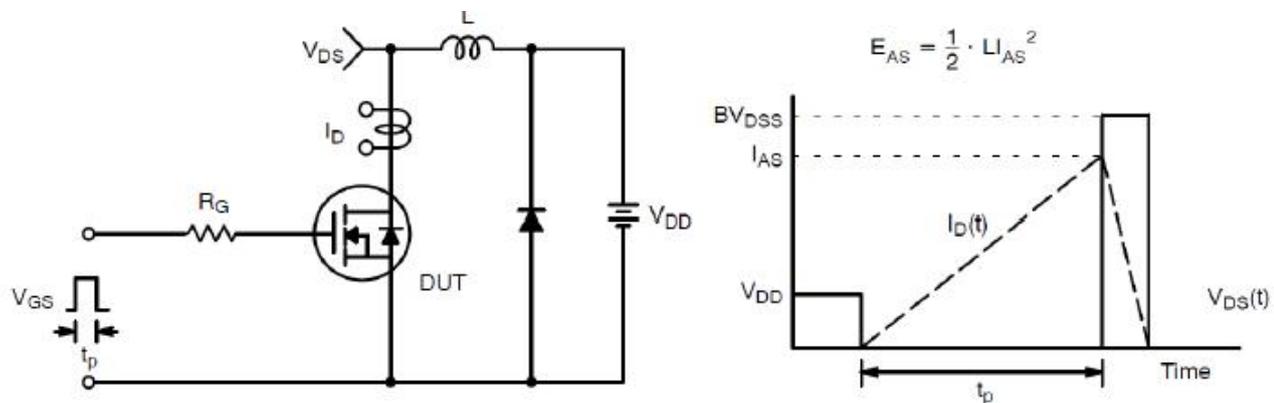
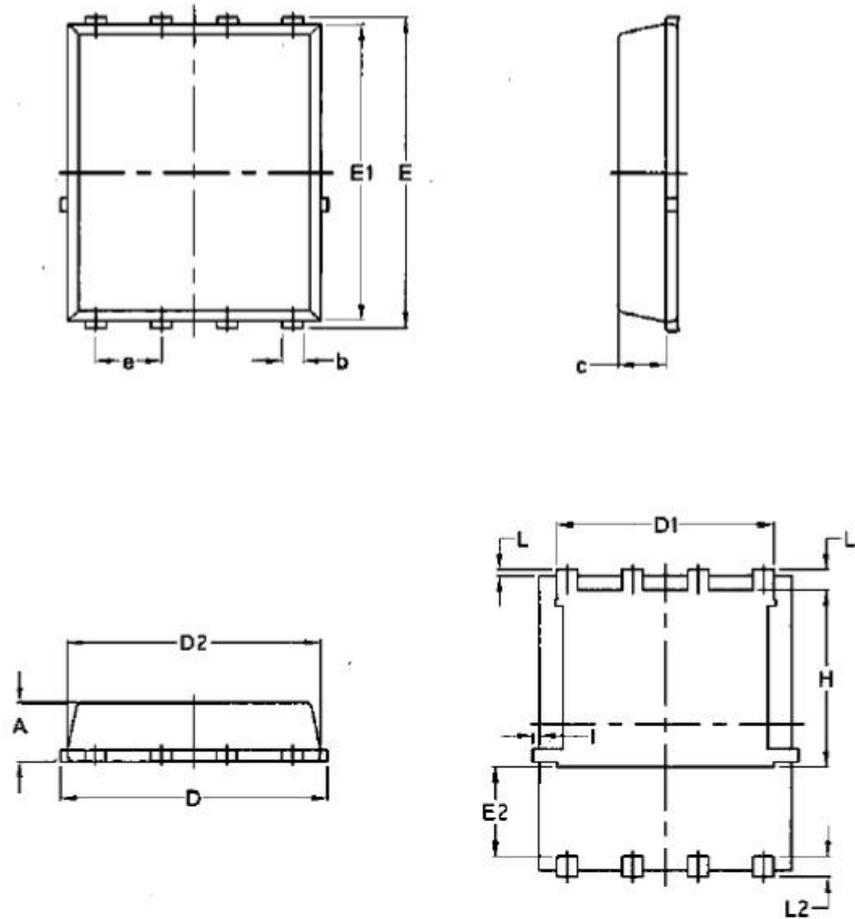


Fig-3: Unclamped Inductive Switching Test Circuit & Waveforms

Package Dimensions PDFN5*6-8L


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



Important Notice and Disclaimer

HL Microelectronics reserves the right to make changes to this document and its products and specifications at any time without notice.

Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

HL Microelectronics makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does HL Microelectronics assume any liability for application assistance or customer product design.

HL Microelectronics does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of HL Microelectronics.

HL Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of HL Microelectronics.