## Features

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

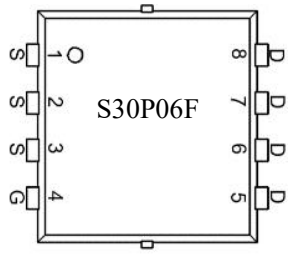
| Bvdss | Rdson | ID |
|---|---|---|
| -60V | 31mΩ | -30A |

## Application

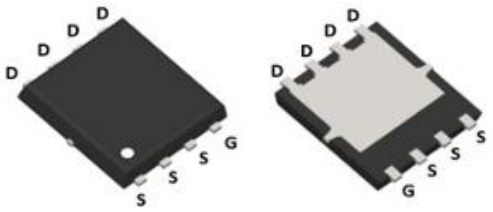
- Battery switching application
- Hard switched and high frequency circuits
- Power management

RoHS

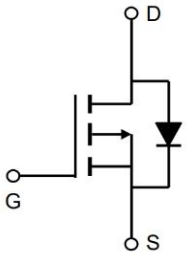
## Package




Marking and pin assignment




PDFN5*6-8L top view




Schematic diagram

## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Quantity |
|---|---|---|---|
| 30P06 | S30P06F | PDFN5*6-8L | 5000 |

## Absolute Maximum Ratings ($T_J$=25℃ unless otherwise specified)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -60 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current, $V_{GS}$@ -4.5V[1] | $T_C$=25° C | $I_D$ | -30 | A |
| | $T_C$=100° C | $I_D$ | -15 | A |
| Pulsed Drain Current[2] | | $I_{DM}$ | -120 | A |
| Power Dissipation[3] | $T_C$ = 25℃ | $P_D$ | 89 | W |
| Operating junction and storage temperature | | $T_J$, $T_{STG}$ | -55 ~ 150 | ℃ |

## Thermal Resistance Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 1.4 | ℃/W |
| Thermal resistance, junction – ambient | $R_{\theta JA^*}$ | 60 | ℃/W |

## Ordering Information

| Ordering Number | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|
| Halogen Free | | G | D | S | |
| HLS30P06F | PDFN5*6-8L | 4 | 5,6,7,8 | 1,2,3 | Tape Reel |

## Electrical Characteristics (Tj=25℃ unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = -250μA | -60 | - | - | V |
| Gate-body Leakage current | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = -60V, $V_{GS}$ = 0V,$T_J$=25℃ | - | - | 1 | μA |
| | | $V_{DS}$ = -60V, $V_{GS}$ = 0V,$T_J$=55℃ | - | - | 5 | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$ , $I_D$ = -250μA | -1.3 | -1.7 | -2.3 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = -10V, $I_D$ = -3A | - | 31 | 38 | mΩ |
| | | $V_{GS}$ = -4.5V, $I_D$ = -2A | - | 40 | 50 | |
| Forward Transconductance | gfs | $V_{DS}$ = -5V, $I_D$ = -3A | - | - | - | S |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$ = -30V,$V_{GS}$ =0V, f =1MHz | - | 862 | - | pF |
| Output Capacitance | $C_{OSS}$ | | - | 163 | - | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | - | 8 | - | |
| Gate Resistance | $R_g$ | $V_{GS}$=0V, $V_{DS}$=0V,f=1MHz | - | 13 | - | Ω |
| Total Gate Charge(-4.5V) | $Q_g$ | $V_{GS}$ = -10V,$V_{DS}$ = -30V, $I_D$ = -10A | - | 13.4 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 3.55 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1.82 | - | |
| Turn-On Delay Time | $T_{d(on)}$ | $V_{GS}$ = -10V, $V_{DD}$= -30V, RG = 5Ω, $I_D$ = -10A | - | 10 | - | ns |
| Rise Time | $T_R$ | | - | 6 | - | |
| Turn-Off Delay Time | $T_{d(off)}$ | | - | 23 | - | |
| Fall Time | $T_F$ | | - | 11 | - | |
| Diode Forward Current[1,5] | $I_S$ | $V_G$=$V_D$=0V , Force Current | - | - | -30 | A |
| Diode Forward Voltage[2] | $V_{SD}$ | $I_S$=-1A, $V_{GS}$=0V,$T_J$=25℃ | - | - | -1.2 | V |
| Reverse Recovery time | $T_{rr}$ | $I_F$=-10A, $T_J$=25℃ dI/dt=100A/μs | - | 18 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 27 | - | nC |

Note :

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is $V_{DD}$=-30V,$V_{GS}$=-10V,L=1mH

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as $I_D$ and $I_{DM}$ , in real applications , should be limited by total power dissipation.

## Typical Performance Characteristics

**Fig1:Typ. output characteristics**

$I_D=f(V_{DS})$

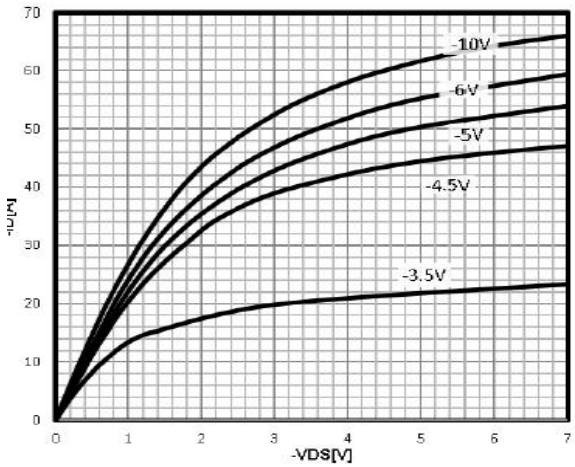



**Fig2:Typ. drain-source on resistance**

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

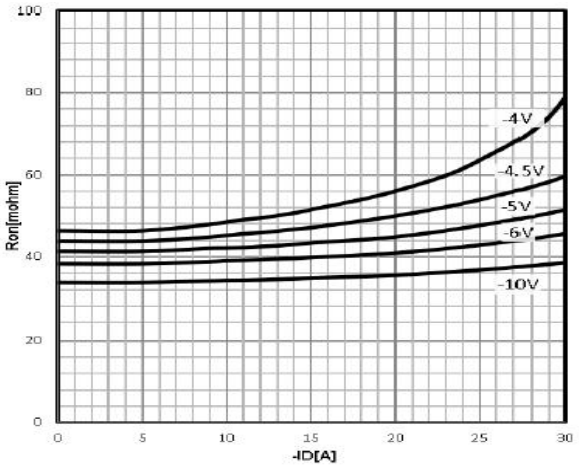



**Fig3:Typ. transfer characteristics**

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

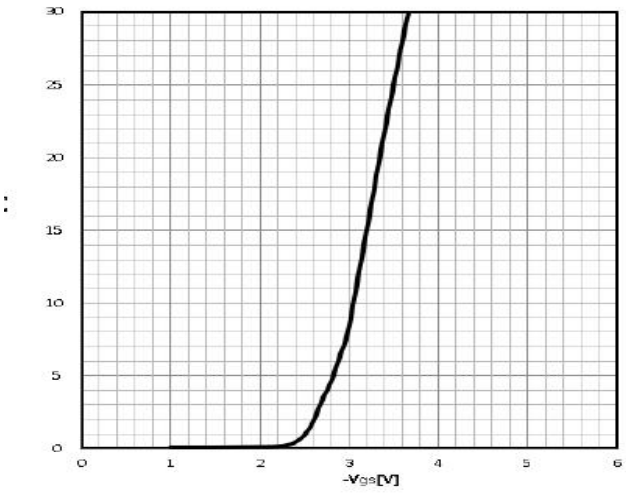



**Fig4:Drain-source on-state resistance**

RDS(on)= f(Tj)$I_D$=-20A; $V_{GS}$=-10V

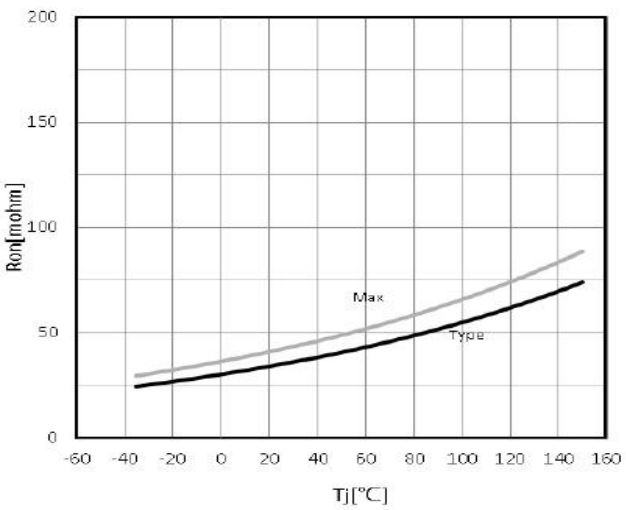


**Fig5:Gate Threshold Voltage**

$-V_{TH}=f(T_j)$; $I_D$=-250uA

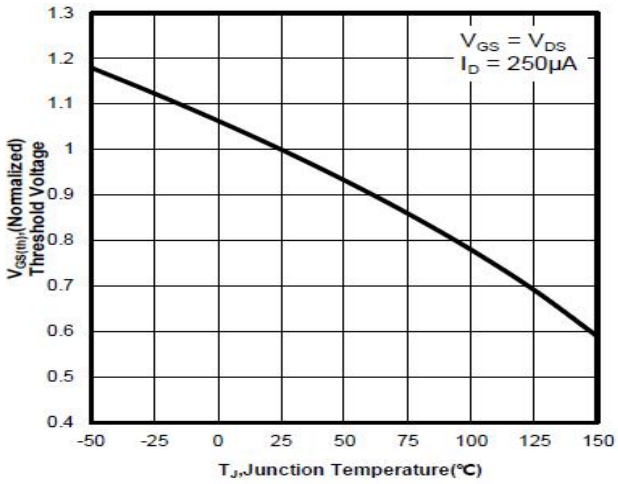



**Fig6:Drain-source breakdown voltage**

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

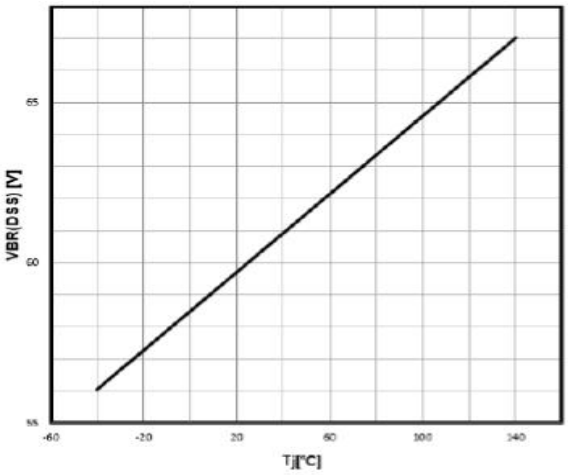



**Fig7:Typ. gate charge**

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

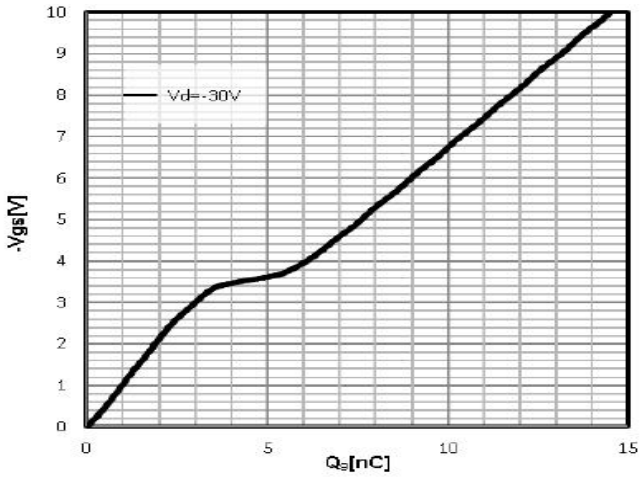



**Fig8:Typ. Capacitances**

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

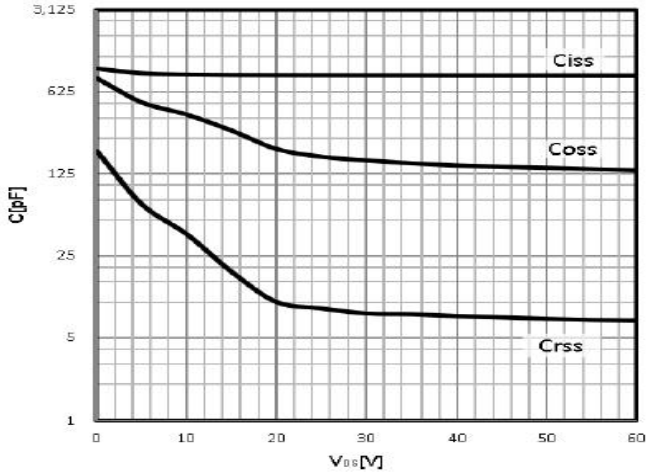



**Fig9:Power Dissipation**

$P_{tot}=f(T_C)$

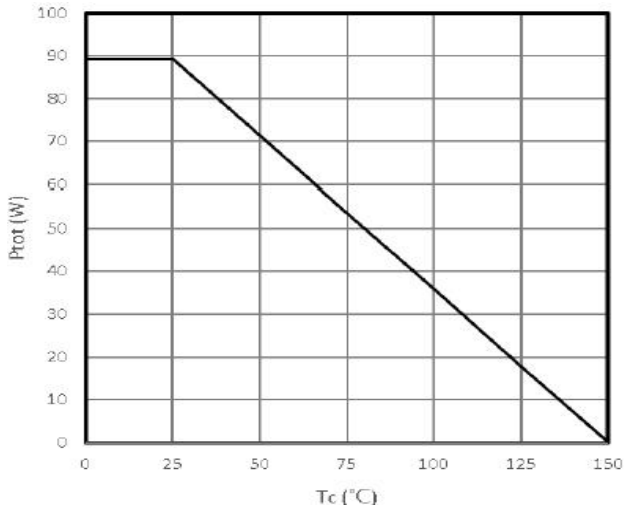



**Fig10:Maximum Drain Current**

$-I_D=f(T_C)$

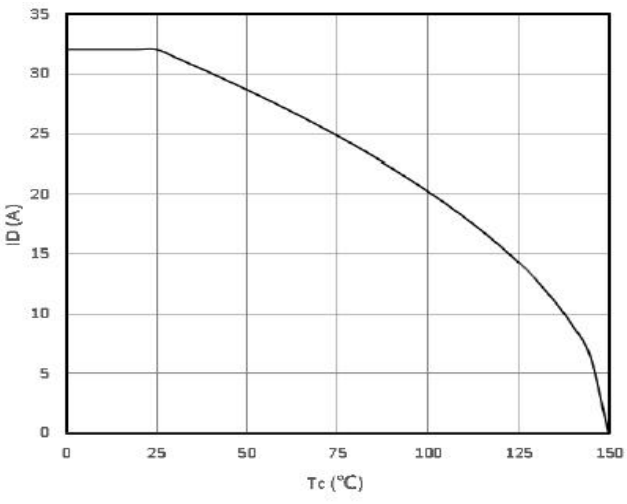


**Fig11:Safe operating area**

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

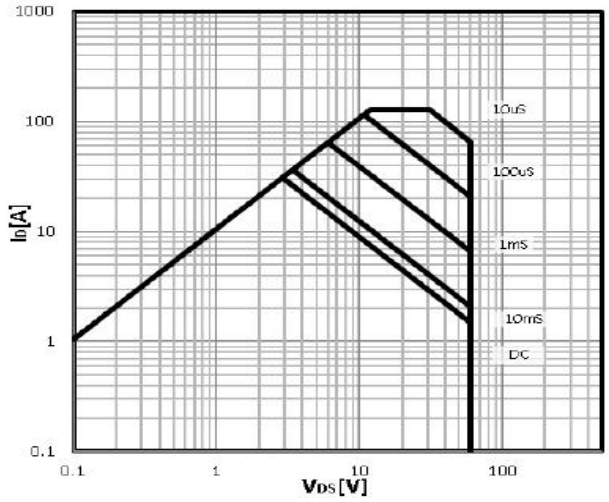



**Fig12:Body Diode Forward Voltage Variation**

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

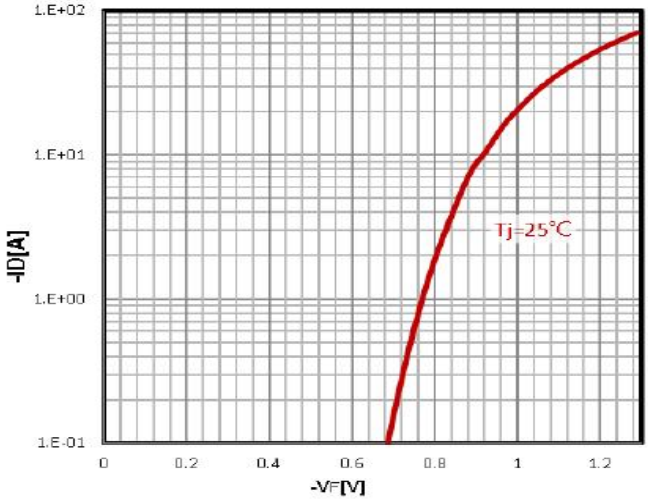
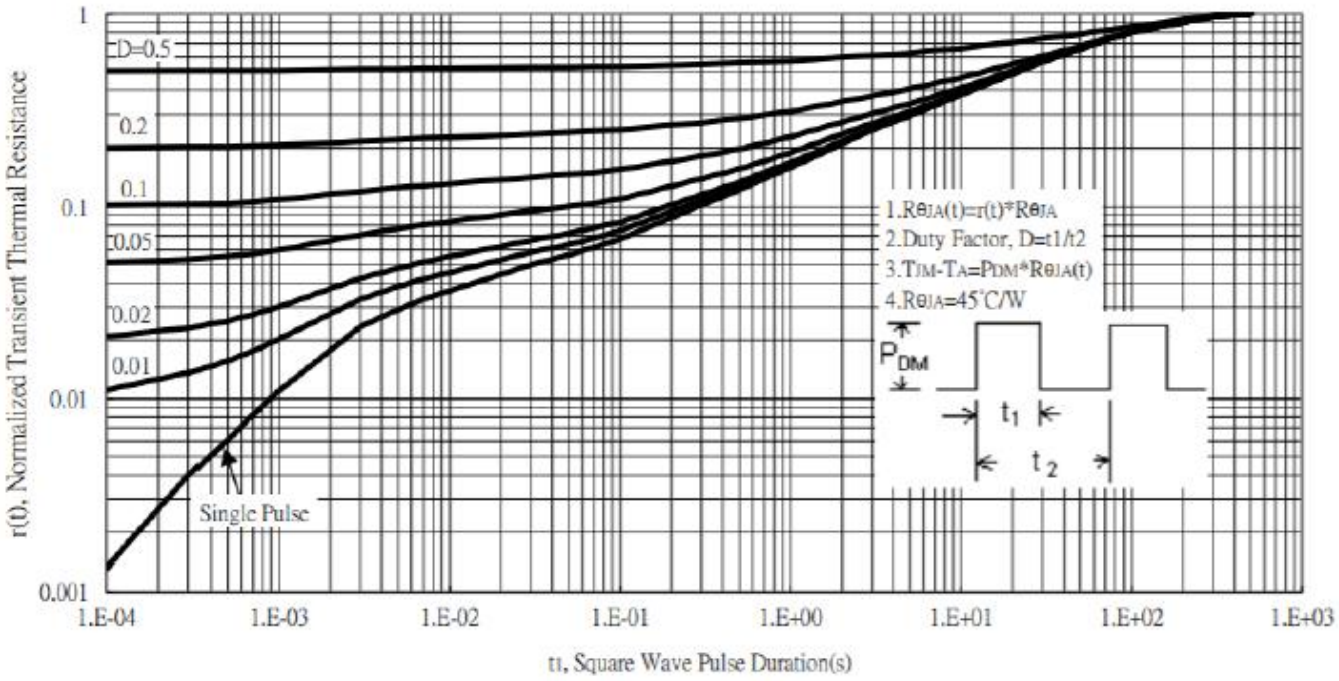
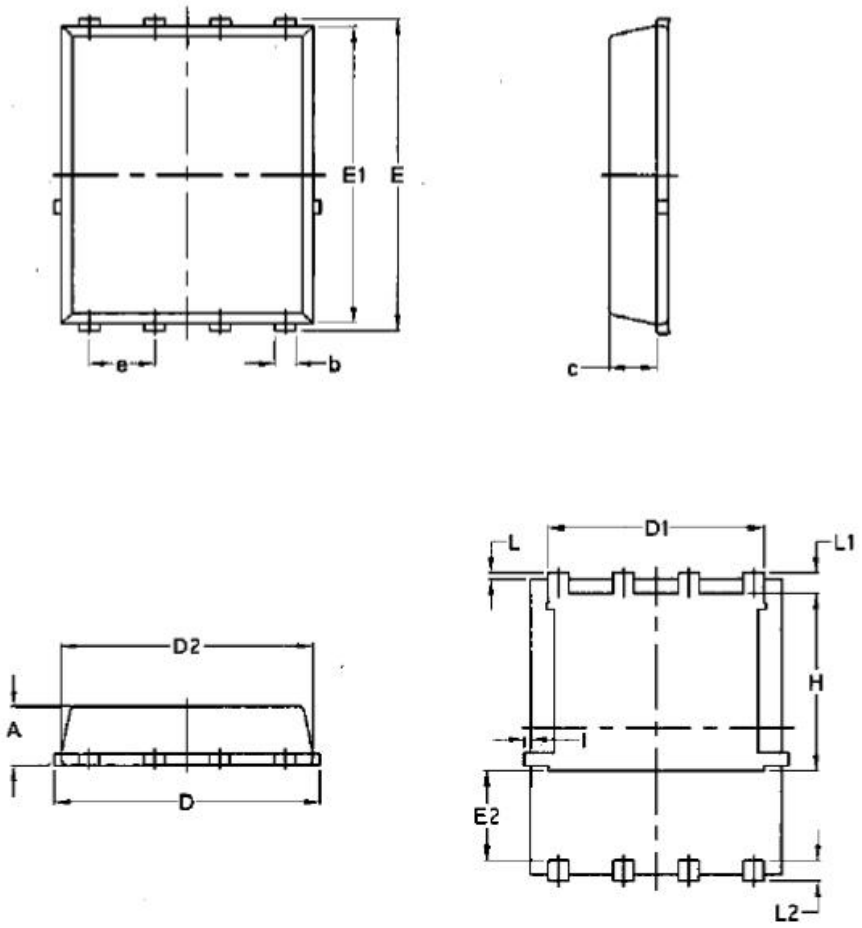



**Fig12:Body Diode Forward Voltage Variation**



## Package Dimensions PDFN5*6-8L




| 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 |

## 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, not 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.