**P-Ch 150V Fast Switching MOSFETs**

### Features

- Advanced Trench MOS Technology
- 100% EAS Guaranteed
- Green Device Available

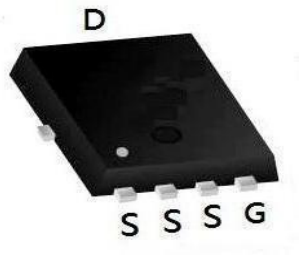
### Product Summary

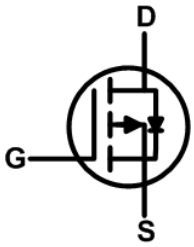
| BVDSS | RDSON | ID |
|---|---|---|
| -150V | 650mΩ | -2.2A |

### Applications

- Load Switch.
- Power Management.
- LED Backlighting.
- Networking Application.

### PDFN3333-8 Pin Configuration




### Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | -150 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current, -$V_{GS}$ @ -10V[1] | -2.2 | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current, -$V_{GS}$ @ -10V[1] | -1.5 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | -8 | A |
| EAS | Single Pulse Avalanche Energy[3] | 12.5 | mJ |
| $I_{AS}$ | Avalanche Current | 5 | A |
| $P_D$@$T_C$=25℃ | Total Power Dissipation[4] | 7.8 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

### Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient [1] | --- | 62 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | 16 | ℃/W |

## Electrical Characteristics ($T_J$=25 ℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=-250uA | -150 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=-10V , $I_D$=-1A | --- | 650 | 780 | mΩ |
| | | $V_{GS}$=-6V , $I_D$=-0.5A | --- | 700 | 980 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =-250uA | -2.0 | -3.0 | -4.0 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=-120V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | 1 | uA |
| | | $V_{DS}$=-120V , $V_{GS}$=0V , $T_J$=85℃ | --- | --- | 30 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | 5 | 12 | 20 | Ω |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-75V , $V_{GS}$=-10V , $I_D$=-1A | 6.5 | 10.8 | 15.2 | nC |
| $Q_{gs}$ | Gate-Source Charge | | 1.6 | 3.1 | 4.7 | |
| $Q_{gd}$ | Gate-Drain Charge | | 1.1 | 2.2 | 3.3 | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=-30V , $V_{GS}$=-10V , $R_G$=6Ω, $I_D$=-1A | --- | 21 | 32 | ns |
| $T_r$ | Rise Time | | --- | 16 | 24 | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 40 | 60 | |
| $T_f$ | Fall Time | | --- | 18 | 27 | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-75V , $V_{GS}$=0V , f=1MHz | 424 | 706 | 988 | pF |
| $C_{oss}$ | Output Capacitance | | 12 | 23 | 35 | |
| $C_{rss}$ | Reverse Transfer Capacitance | | 7 | 13 | 20 | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current[1,5] | $V_G$=$V_D$=0V , Force Current | --- | --- | -2.2 | A |
| $V_{SD}$ | Diode Forward Voltage[2] | $V_{GS}$=0V , $I_S$=-1A , $T_J$=25℃ | --- | --- | -1.2 | V |

Note :
1.The data tested by surface mounted on a 1 inch$^2$ 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 $V_{DD}$=-50V,$V_{GS}$=-10V,L=1mH,$I_{AS}$=-5A
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 Characteristics

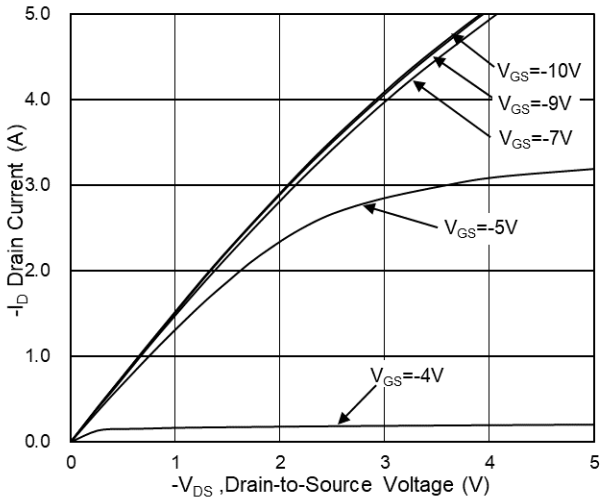



**Fig.1 Typical Output Characteristics**

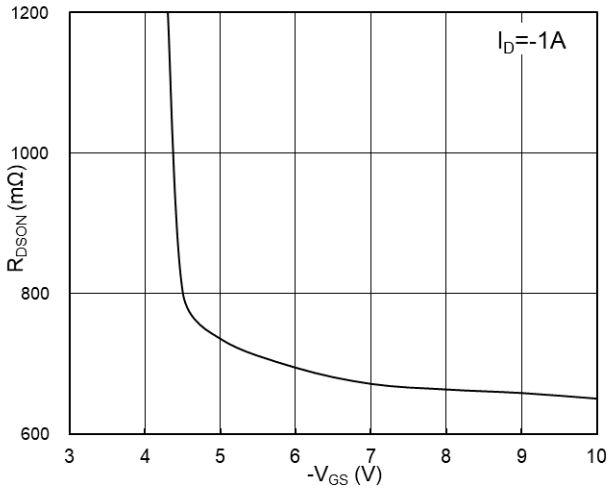



**Fig.2 On-Resistance vs G-S Voltage**

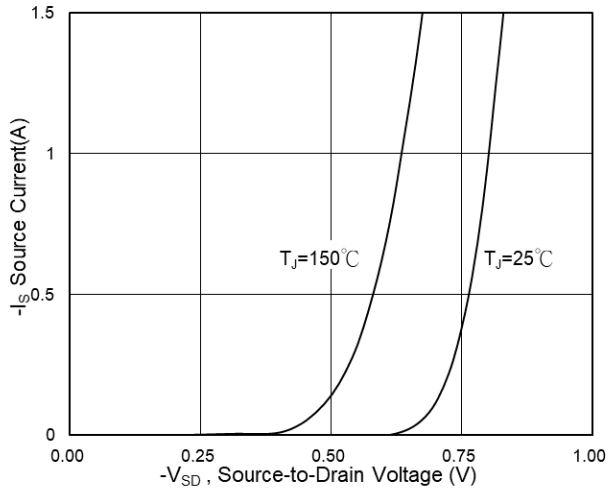



**Fig.3 Source Drain Forward Characteristics**

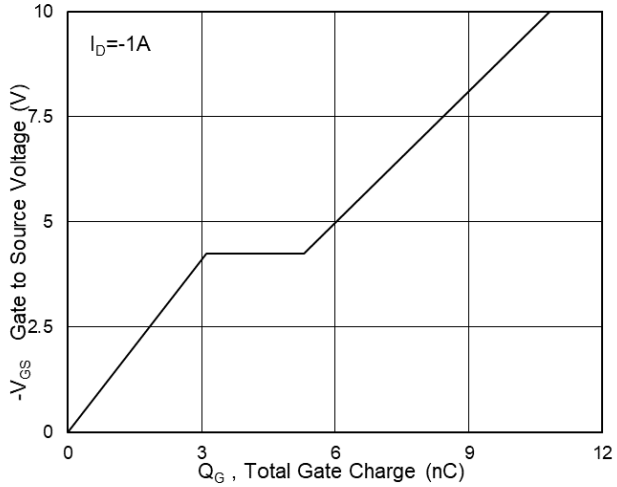



**Fig.4 Gate-Charge Characteristics**

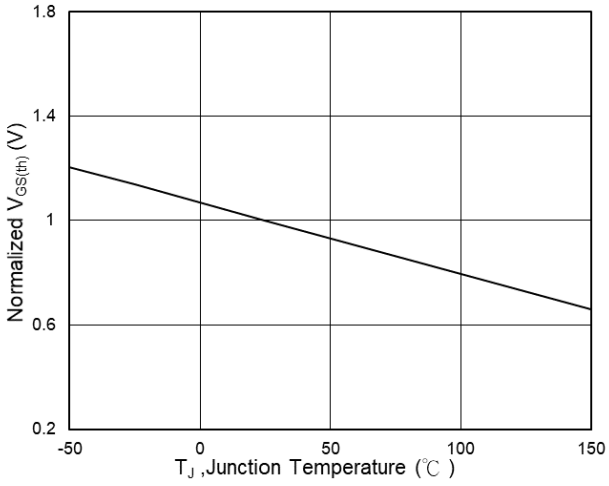



**Fig.5 Normalized $V_{GS(th)}$ vs $T_J$**

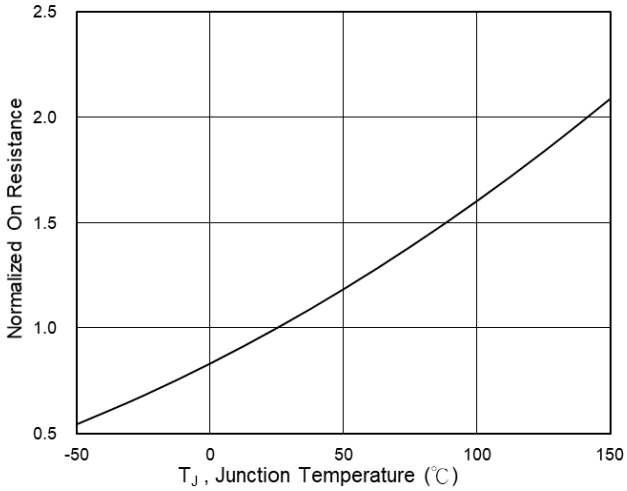



**Fig.6 Normalized $R_{DSON}$ vs $T_J$**

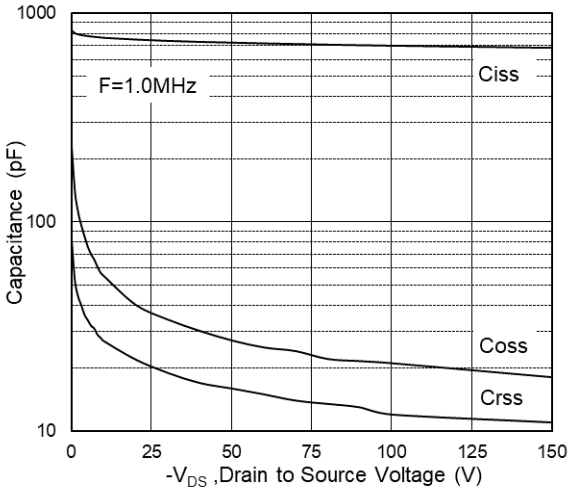



Fig.7 Capacitance

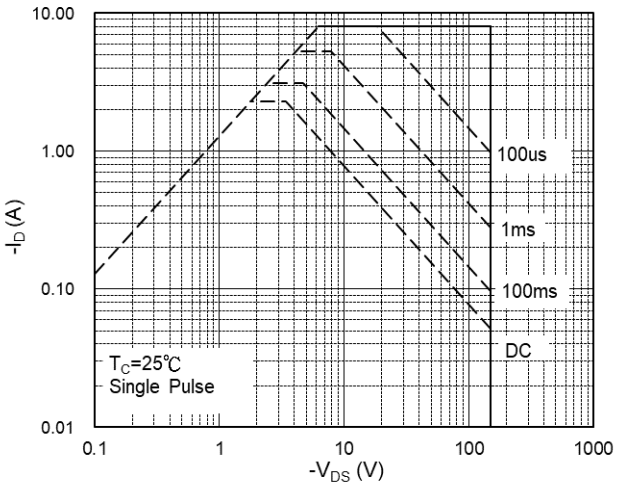



Fig.8 Safe Operating Area

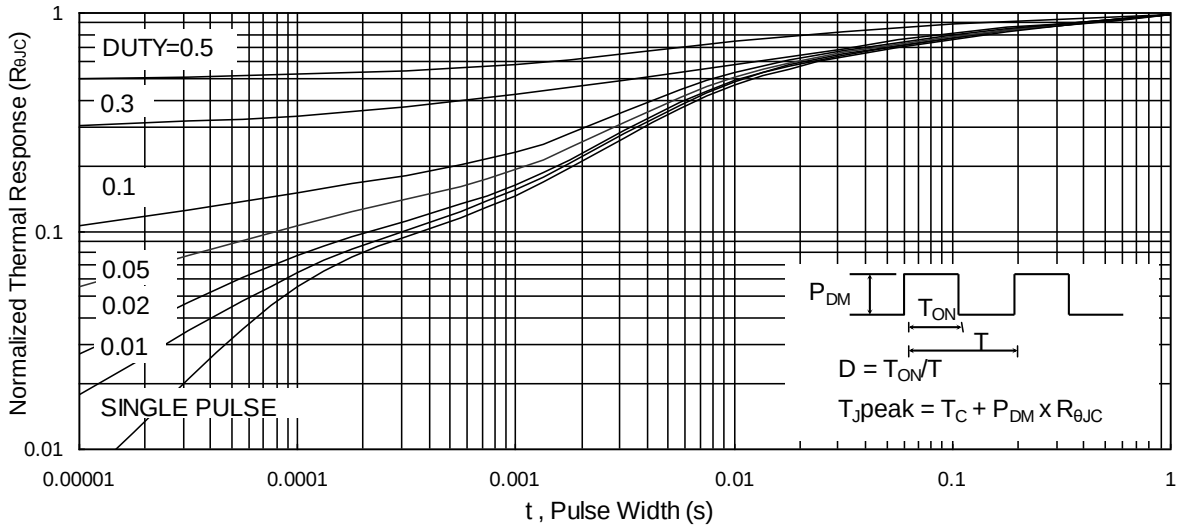



Fig.9 Normalized Maximum Transient Thermal Impedance

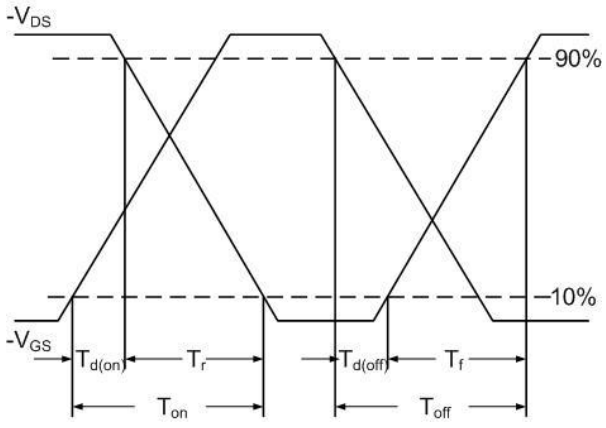



Fig.10 Switching Time Waveform

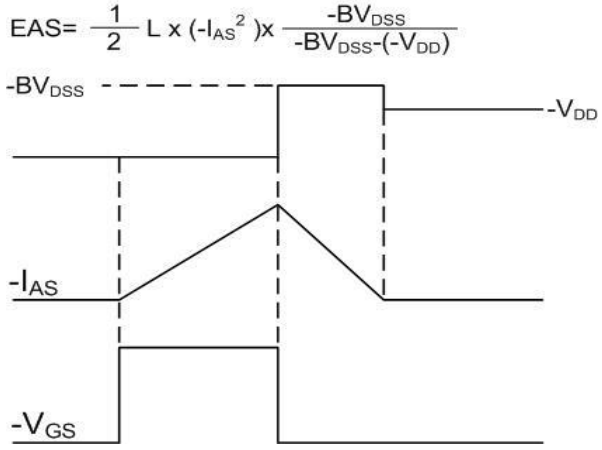
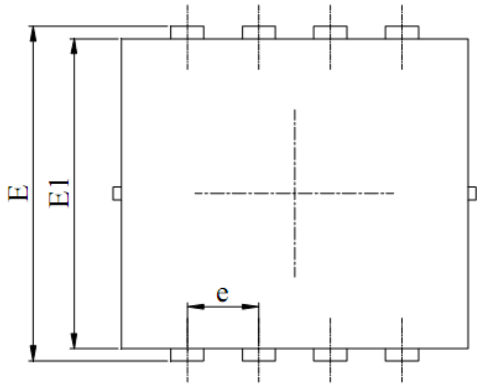
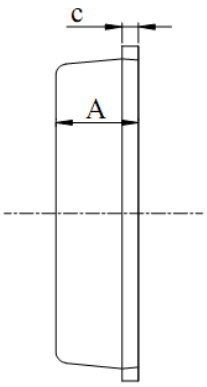



Fig.11 Unclamped Inductive Waveform

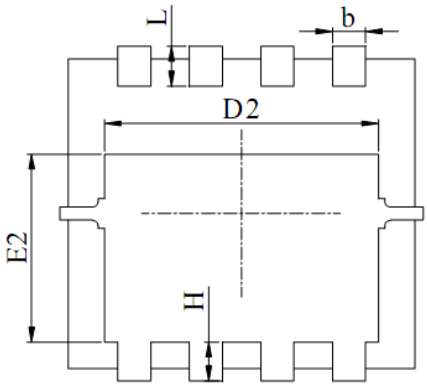
## Package Mechanical Data-PDFN3333-8L-Single



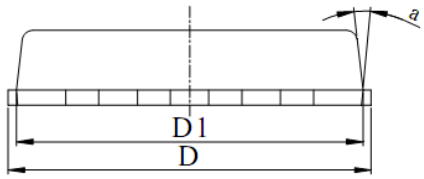

Top View




Side View



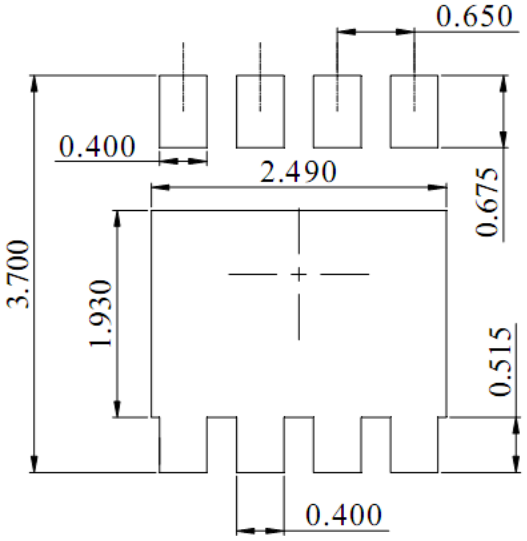

Bottom View




Front View

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| DIM. | MILLIMETER | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.70 | 0.75 | 0.80 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.10 | 0.20 | 0.25 |
| D | 3.00 | 3.15 | 3.25 |
| D1 | 2.95 | 3.05 | 3.15 |
| D2 | 2.39 | 2.49 | 2.59 |
| E | 3.20 | 3.30 | 3.40 |
| E1 | 2.95 | 3.05 | 3.15 |
| E2 | 1.70 | 1.80 | 1.90 |
| e | 0.65 BSC | | |
| H | 0.30 | 0.40 | 0.50 |
| L | 0.25 | 0.40 | 0.50 |
| a | --- | --- | 15° |




DIMENSIONS:MILLIMETERS