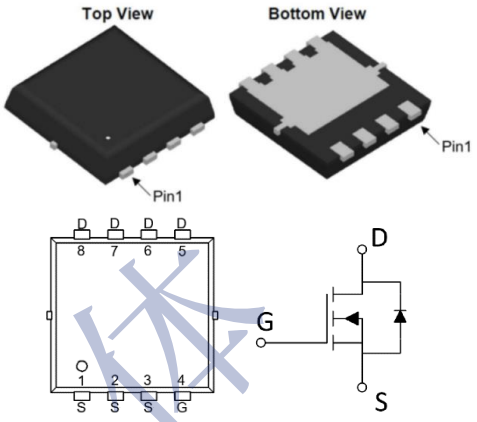
# 30$V_{DS}$/±20$V_{GS}$ N-Channel Enhancement Mode MOSFET

## Features

- $V_{DS}$=30V,$I_D$=40A
- $R_{DS(ON)}$=9mΩ（TYP.）$V_{GS}$=10V,$I_D$=1A
- $R_{DS(ON)}$=11.5mΩ（TYP.）$V_{GS}$=4.5V,$I_D$=1A
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance

**PDFN3030**




## Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

## Ordering Information

| Temperature Range | package | | Orderable Device | Package Qty. |
|---|---|---|---|---|
| -55℃~+125℃ | PDFN3030 | Pb-Free | AET3121BP | 5000pcs/Reel |

## Absolute Maximum Ratings ($T_C$=25℃,unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage ($V_{GS}$=0V) | $V_{DS}$ | 30 | V |
| Gate-Source Voltage ($V_{GS}$=0V,static) | $V_{GS}$ | ±20 | V |
| Continuous Drain Current ($T_C$=25℃) | $I_D$ | 40 | A |
| Continuous Drain Current ($T_C$=100℃) | | 27 | A |
| Pulesd Drain Current | $I_{DM}$ | 160 | A |
| Single Pulsed Avalanche Energy | $E_{AS}$ | 45 | mJ |
| Maximum Power Dissipation ($T_C$=25℃) | $P_D$ | 20 | W |
| Maximum Power Dissipation ($T_C$=100℃) | | 12 | W |
| Operating,Storge Temperature Range | $T_J$,$T_{STG}$ | -55~150 | ℃ |

## Thermal Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Thermal Resistance,Junction-to-Case | $R_{\theta JC}$ | - | 3.4 | - | ℃/ W |
| Thermal Resistance,Junction-to-Ambient | $R_{\theta JA}$ | - | 61 | - | ℃/ W |

## Electrical Characteristics

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 30 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V, $V_{GS}$=0V | - | - | 1 | μA |
| Gate -Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$= $V_{GS}$,$I_D$=250μA | 1.1 | 1.5 | 1.9 | V |
| Drain-Source On-stage Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V,$I_D$=1A | - | 9 | 14 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=1A | - | 11.5 | 18 | |

## Dynamic Characteristics

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input capacitance | $C_{iss}$ | $V_{DS}$=15V | - | 745 | - | pF |
| Output capacitance | $C_{oss}$ | $V_{GS}$=0V | - | 80 | - | |
| Reverse transfer capacitance | $C_{rss}$ | f=1MHz | - | 70 | - | |
| Gate Resistance | $R_g$ | f=1MHz | - | 3.1 | - | Ω |
| Total Gate Charge | $Q_g$ | $V_{DS}$=15V | - | 14.1 | - | nC |
| Gate Source Charge | $Q_{gs}$ | $V_{GS}$=10V | - | 2.3 | - | |
| Gate Drain Charge | $Q_{gd}$ | $I_D$=15A | - | 3.1 | - | |
| Turn-on delay Time | $t_{d(on)}$ | $V_{GS}$=10V | - | 8 | - | ns |
| Rise time | $t_r$ | $V_{DS}$=15V | - | 95 | - | |
| Turn-off delay Time | $t_{d(off)}$ | $I_D$=15A | - | 26 | - | |
| Fall time | $t_f$ | $R_G$=1.8Ω | - | 72 | - | |

## Reverse Diode Characteristics

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Body Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V,$I_{SD}$=1A | - | 0.8 | 1 | V |
| Reverse Recovery Time | $t_{rr}$ | $V_{GS}$=0V,$I_{SD}$=20A | - | 15 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | $d_i/d_t$=100A/μs | - | 26 | - | nC |

# Electrical Characteristics Diagrames

**Figure 1. On-Regin Characteristics**

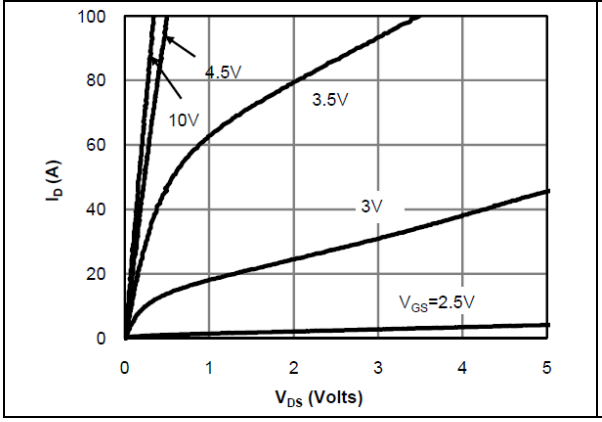



**Figure 2. Transfer Characteristics**

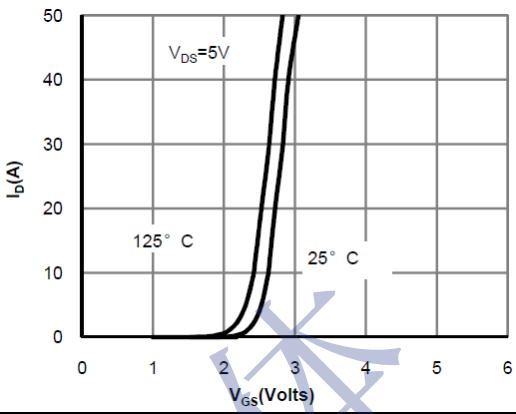



**Figure 3. On-Resistance vs. Drain Current and Gate Voltage**

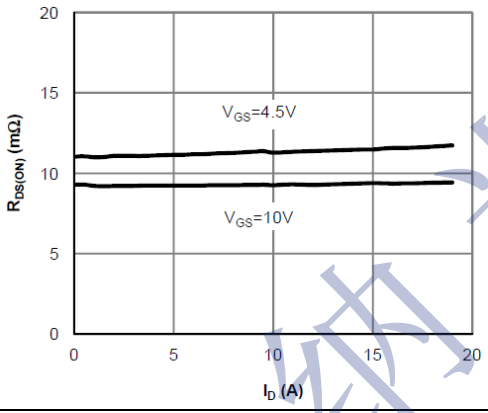



**Figure 4. On-Resistance vs. Junction Temperature**

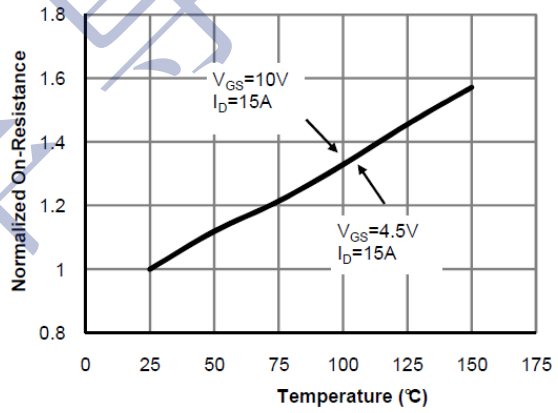



**Figure 5. On-Resistance vs. Gate-Source Voltage**

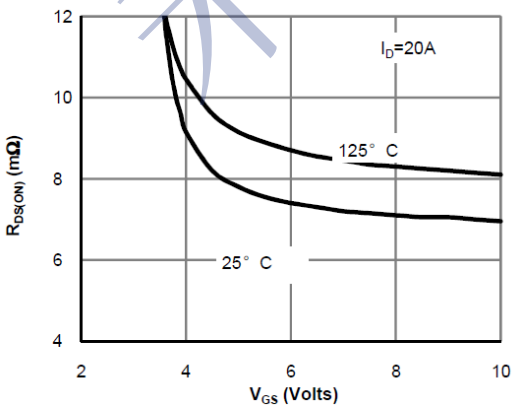



**Figure 6. Body-Diode Characteristics**

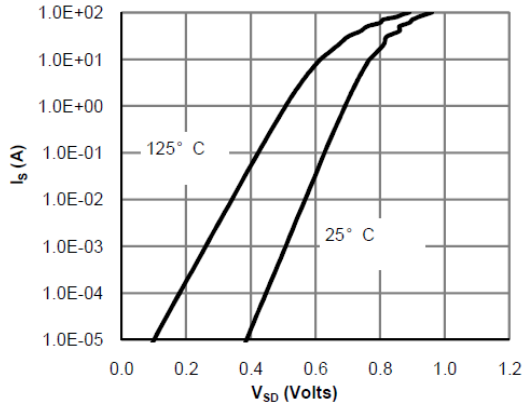


**Figure 7. Gate-Charge Characteristics**

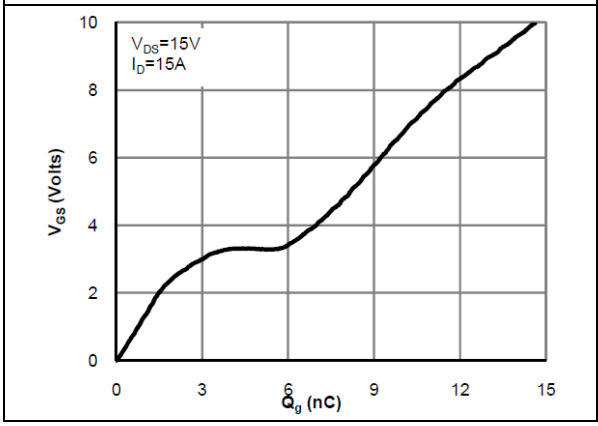



**Figure 8. Capacitance Characteristics**

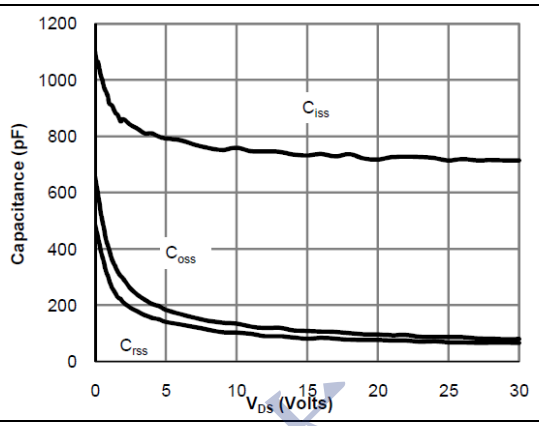



**Figure 9. Maximum Forward Biased Safe Operating Area**

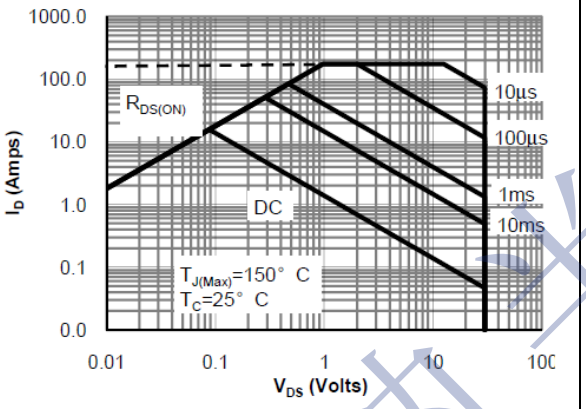



**Figure 10. Single Pulse Power Rating Junction-to-Ambient**

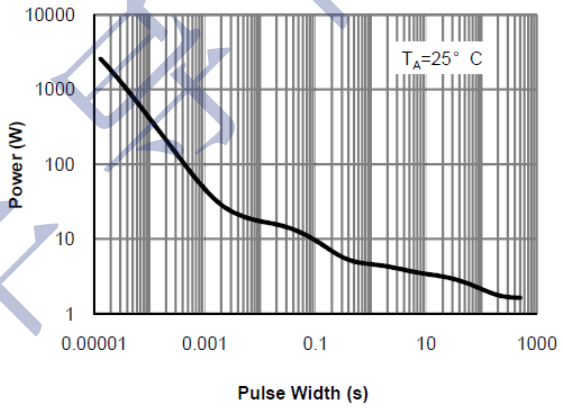
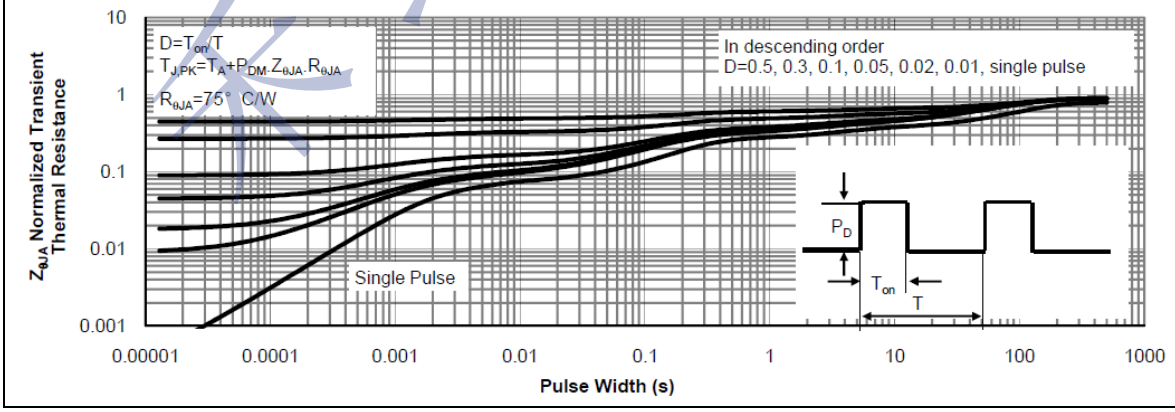
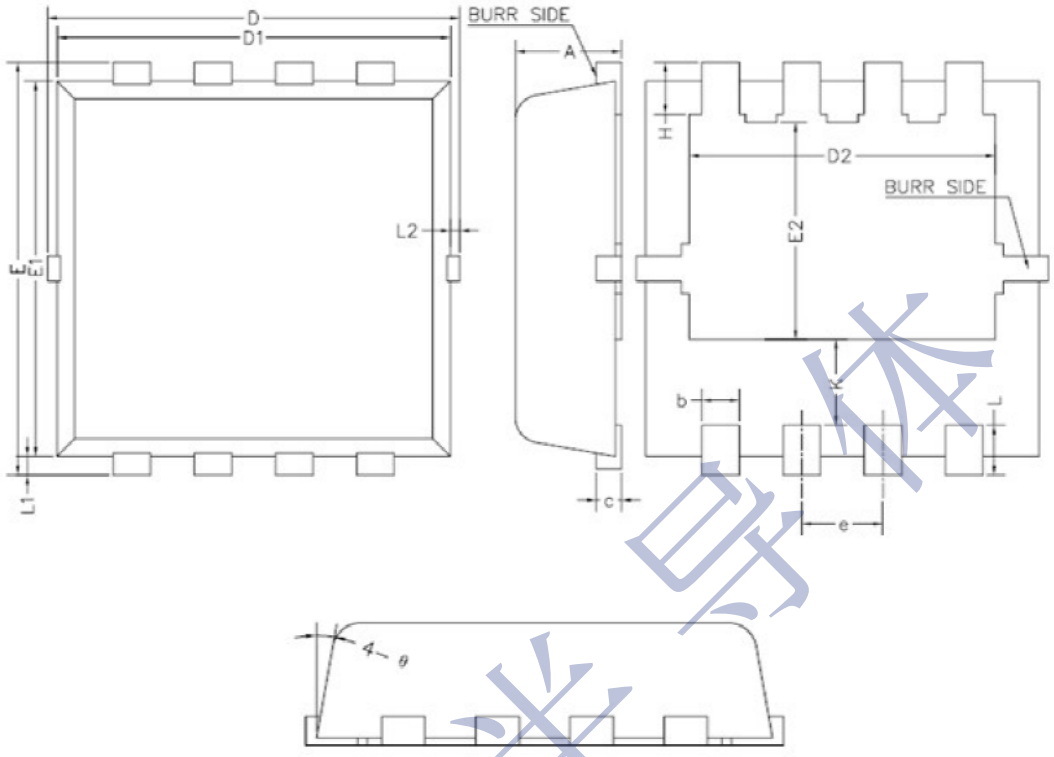



**Figure 11. Normalized Maximum Transient Thermal Impedance**



## Physical Dimensions

### PDFN3030




| 符号 | 尺寸（mm） | | | 符号 | 尺寸（mm） | | |
|---|---|---|---|---|---|---|---|
| | 最小值 | 典型值 | 最大值 | | 最小值 | 典型值 | 最大值 |
| A | 0.70 | 0.80 | 0.90 | E1 | 2.90 | 3.00 | 3.10 |
| b | 0.25 | 0.30 | 0.35 | E2 | 1.64 | 1.74 | 1.84 |
| c | 0.14 | 0.15 | 0.20 | H | 0.32 | 0.42 | 0.52 |
| D | 3.10 | 3.30 | 3.50 | K | 0.59 | 0.69 | 0.79 |
| D1 | 3.05 | 3.15 | 3.25 | L | 0.25 | 0.40 | 0.55 |
| D2 | 2.35 | 2.45 | 2.55 | L1 | 0.10 | 0.15 | 0.20 |
| e | 0.55 | 0.65 | 0.75 | L2 | - | - | 0.15 |
| E | 3.10 | 3.30 | 3.50 | θ | 8° | 10° | 12° |