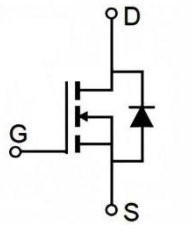
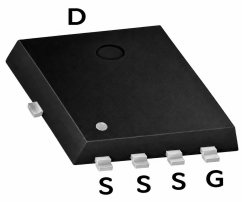
## N-Channel Enhancement Mode MOSFET

| Parameter | Value | Unit |
|---|---|---|
| $V_{DS}$ | 40 | V |
| $R_{DS(on)}$ | 3.8 | mΩ |
| $I_D$ | 100 | A |




PDFN5x6

### Features

- Super Low Gate Charge
- 100% EAS Guaranteed
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

### Applications

- Motor/Body Load Control
- Load Switch
- PWM Application
- DC-DC converters

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

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 40 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current ,$V_{GS}$@10V[1] | $T_C$=25℃ | $I_D$ | 100 | A |
| | $T_C$=100℃ | | 50 | |
| Pulsed Drain Current [2] | | $I_{DM}$ | 320 | A |
| Single Pulse Avalanche Energy [3] | | $E_{AS}$ | 156 | mJ |
| Total Power Dissipation | $T_C$=25℃ | $P_D$ | 142 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 150 | ℃ |

### Thermal Characteristics

| Parameter | Symbol | Typ. | Max. | Unit |
|---|---|---|---|---|
| Thermal Resistance Junction-Ambient [1] | $R_{\theta JA}$ | --- | 31 | ℃/W |
| Thermal Resistance from Junction-to-Case | $R_{\theta JC}$ | --- | 0.88 | ℃/W |

## Electrical Characteristics($T_J$=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 | 40 | - | - | V |
| Gate-body Leakage current | | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±20V | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current | $T_J$=25℃ | $I_{DSS}$ | $V_{DS}$=40V, $V_{GS}$=0V | - | - | 1 | uA |
| | $T_J$=125℃ | | | - | - | 100 | |
| Gate-Threshold Voltage | | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.3 | 1.35 | 2.5 | V |
| Drain-Source On-Resistance[2] | | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=1A | - | 3.8 | 4.9 | mΩ |
| | | | $V_{GS}$=4.5V, $I_D$=1A | - | 5.7 | 7.4 | |
| Forward Transconductance | | $g_{fs}$ | $V_{DS}$=5V, $I_D$=20A | - | - | - | S |
| Input Capacitance | | $C_{iss}$ | $V_{DS}$=20V, $V_{GS}$=0V, f=1MHz | - | 3778 | - | pF |
| Output Capacitance | | $C_{oss}$ | | - | 267 | - | |
| Reverse Transfer Capacitance | | $C_{rss}$ | | - | 224 | - | |
| Total Gate Charge | | $Q_g$ | $V_{GS}$=10V,$V_{DS}$=20V, $I_D$=20A | - | 73 | - | nC |
| Gate-Source Charge | | $Q_{gs}$ | | - | 15 | - | |
| Gate-Drain Charge | | $Q_{gd}$ | | - | 16 | - | |
| Turn-On Delay Time | | $t_{d(on)}$ | $V_{GS}$=10V, $V_{DD}$=20V, $R_G$=3Ω , $I_D$=20A | - | 12 | - | ns |
| Rise Time | | $t_r$ | | - | 29 | - | |
| Turn-Off Delay Time | | $t_{d(off)}$ | | - | 60 | - | |
| Fall Time | | $t_f$ | | - | 16 | - | |
| Body Diode Reverse Recovery Time | | $t_{rr}$ | $I_F$=20A, dI/dt=100A/μs | - | 16 | - | ns |
| Body Diode Reverse Recovery Charge | | $Q_{rr}$ | | - | 10 | - | nC |
| Diode Forward Voltage[2] | | $V_{SD}$ | $V_{GS}$=0V, $I_S$=1A, $T_J$=25℃ | - | | 1.2 | V |
| Continuous Source Current[1,4] | $T_C$=25℃ | $I_S$ | $V_{GS}$=$V_{DS}$=0V | - | - | 100 | A |

Notes:
1.Repetitive Rating: Pulse width limited by maximum junction temperature.
2.EAS condition: TJ=25℃,VDD=20V,VG=10V, Rg=25Ω, L=0.5mH.
3.Repetitive Rating: Pulse width limited by maximum junction temperature.

## Typical Characteristics

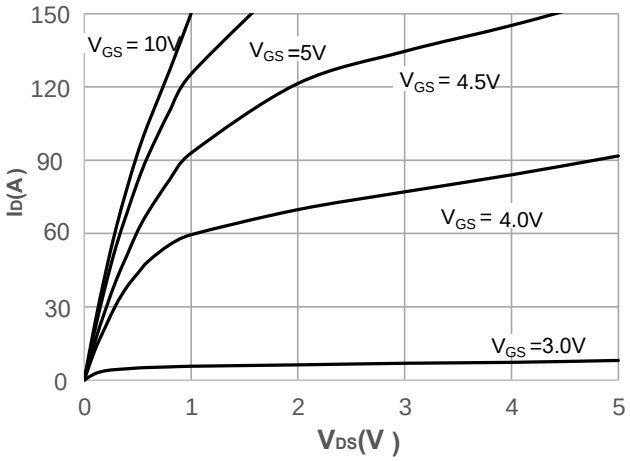



Figure1:OutputCharacteristics

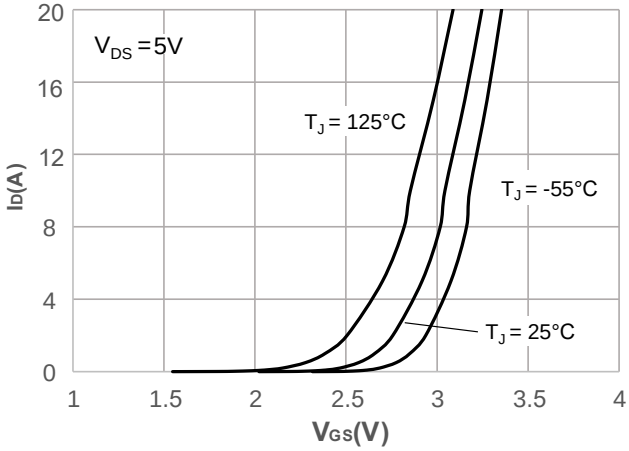



Figure 2: Typical Transfer Characteristics

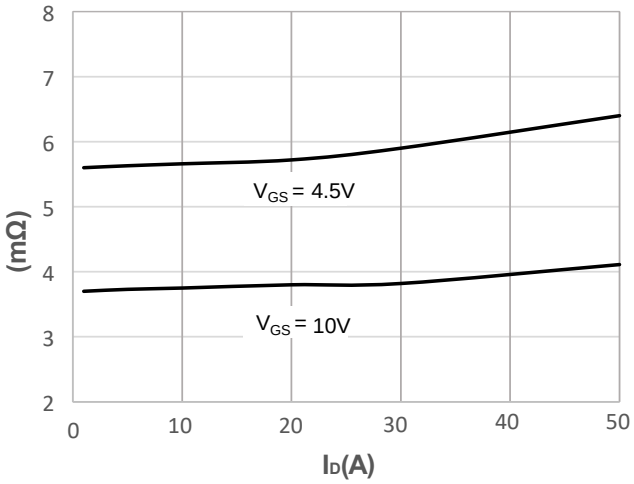



Figure 3: On-resistance vs. Drain Current

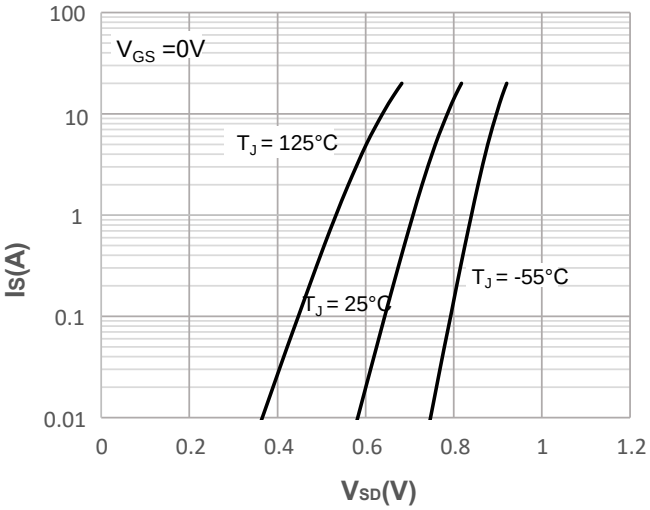



Figure 4: Body Diode Characteristics

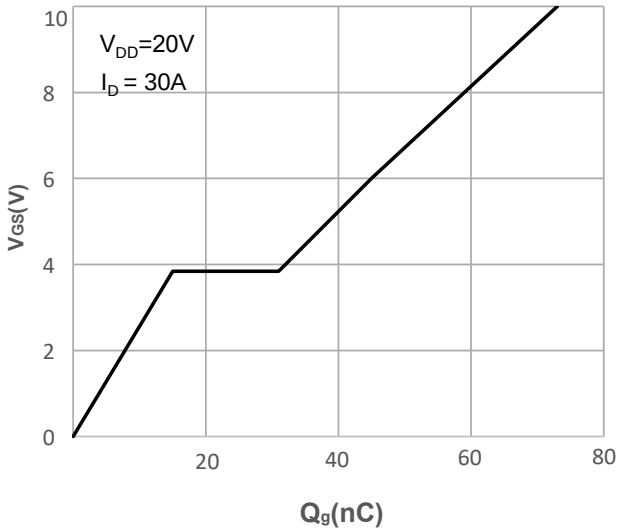



Figure 5: Gate Charge Characteristics

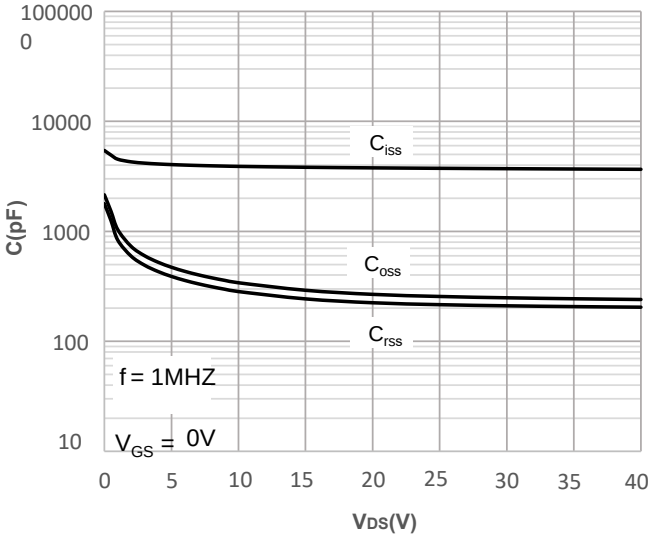



Figure 6: Capacitance Characteristics

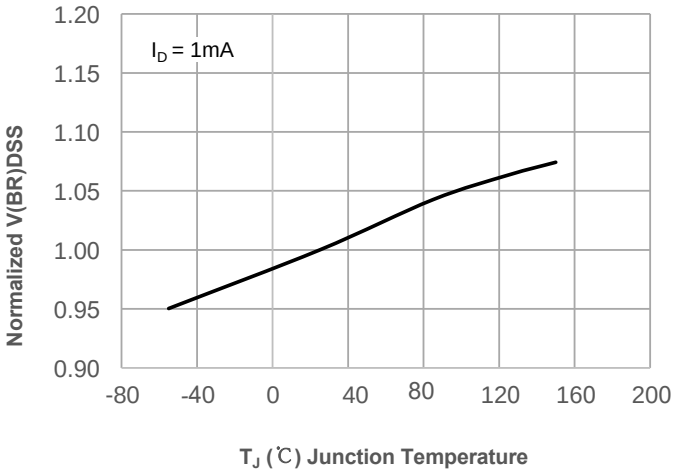



Figure 7: Normalized Breakdown voltage vs. Junction Temperature

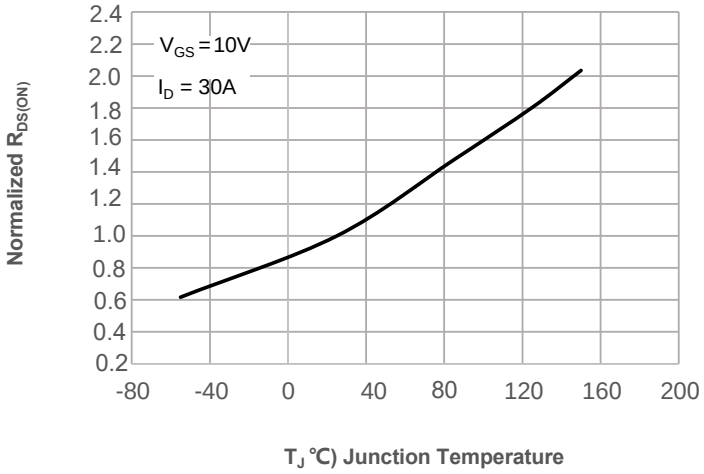



Figure 8: Normalized on Resistance vs. Junction Temperature

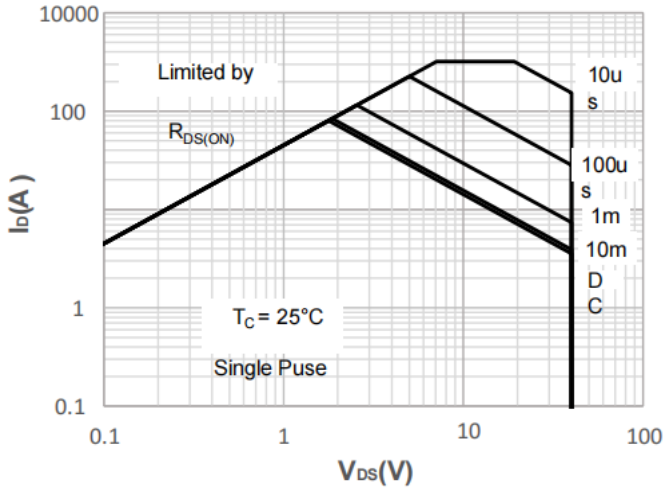



Figure 9: Maximum Safe Operating Area

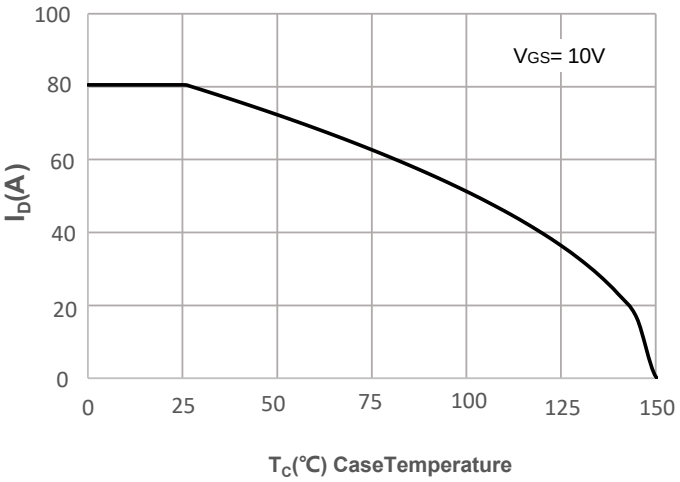



Figure 10: Maximum Continuous Drian Current vs. Case Temperature

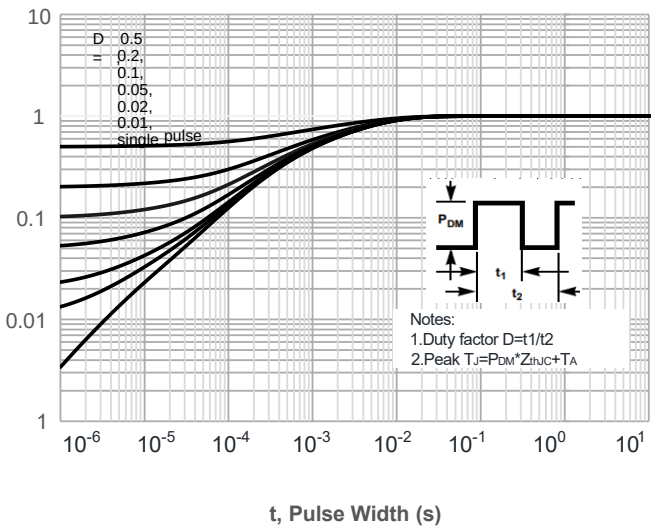



Figure 11: Normalized Maximum Transient Thermal Impedance

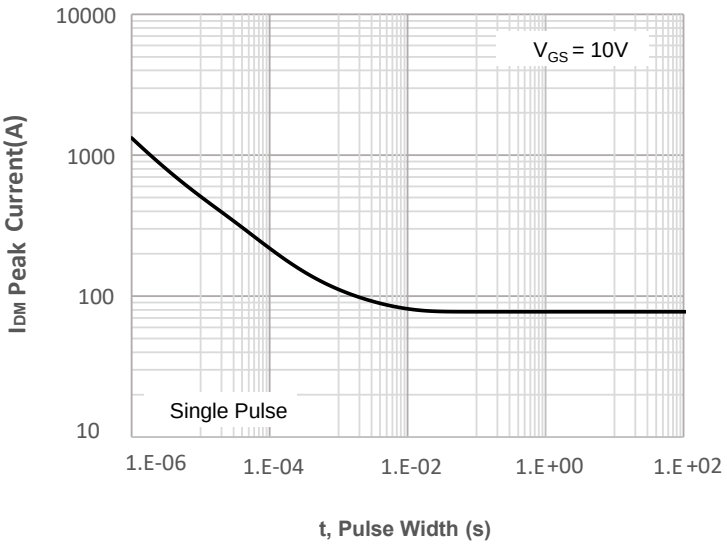
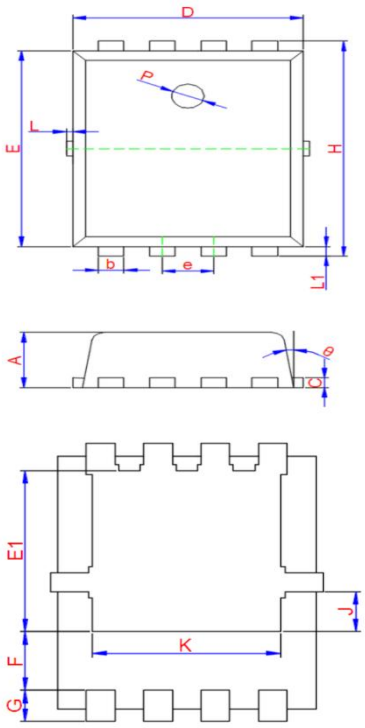



Figure 12: Peak Current Capacity

## Package Outlines




| Symbol | Dimensions in mm | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.800 | 1.050 | 1.200 |
| b | 0.250 | 0.350 | 0.490 |
| c | | 0.254TYP. | |
| D | 4.800 | 5.000 | 5.100 |
| e | | 1.270TYP. | |
| E | 5.650 | 5.800 | 5.900 |
| E1 | | 3.400TYP. | |
| F | | 1.300TYP. | |
| G | | 0.600TYP. | |
| H | 5.950 | 6.080 | 6.200 |
| J | | 0.950TYP. | |
| K | | 4.000TYP | |
| L | - | - | 0.150 |
| L1 | 0.100 | 0.140 | 0.180 |
| P | | 1.180TYP. | |
| θ | 6° | 10° | 14° |

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