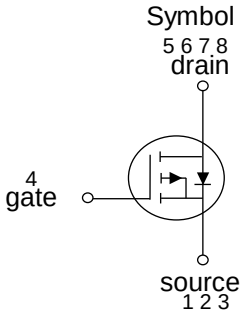
## PRODUCT CHARACTERISTICS

| | |
|---|---|
| $V_{DSS}$ | -20V |
| $R_{DS(on)}$Typ(@$V_{GS}$=-2.5V) | 7.5mΩ |
| $R_{DS(on)}$Typ(@$V_{GS}$=-4.5V) | 5.8mΩ |
| $I_D$ | -45A |

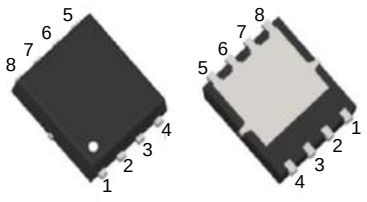



## APPLICATIONS

PWM applications
Load switch
Power management

## FEATURES

High power and current handing capability
Led free product is acqired
Surface mount package




PDFN3X3-8L

## ORDER INFORMATION

| Order codes | | Package | Packing |
|---|---|---|---|
| Halogen-free | Halogen | | |
| N/A | MOT2378J | PDFN3X3-8L | 5000pieces/Reel |

## ABSOLUTE MAXIMUM RATINGS($T_C$=25℃ ,unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-source voltage | $V_{DSS}$ | -20 | V |
| Gate-source voltage | $V_{GSS}$ | ±10 | V |
| Continuous drain current | $I_D$ | -45 | A |
| Continuous drain current($T_C$=100℃) | $I_D$ | -635 | A |
| Pulsed drain current | $I_{DM}$ | 200 | A |
| Single pulsed avalanche energy | $E_{AS}$ | 320 | mJ |
| Power dissipation | $P_D$ | 80 | W |
| Thermal resistance ,junction to case | $R_{\theta JC}$ | 1.6 | ℃/W |
| Junction temperature | $T_J$ | +150 | ℃ |
| Storage temperature | $T_{STG}$ | -55~+150 | ℃ |

■ ELECTRICAL CHARACTERISTICS ($T_C$=25℃,unless otherwise specified)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Off characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=-250μA | -20 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-16V,$V_{GS}$=0V | - | - | -1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±10V,$V_{DS}$=0V | - | - | ±100 | nA |
| On characteristics | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -0.4 | - | -1 | V |
| Drain-Source On-State Resistance | $_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-20A | - | 5.8 | 7.8 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-20A | - | 7.5 | 11 | mΩ |
| | | $V_{GS}$=-1.8V, $I_D$=-20A | - | 9 | 12 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-5V,$I_D$=-20A | -10 | - | - | S |
| Dynamic characteristics | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=-10V,$V_{GS}$=0V, F=1.0MHz | - | 7177 | - | PF |
| Output Capacitance | $C_{oss}$ | | - | 863 | - | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 656 | - | PF |
| Switching characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=-10V, $R_{GEN}$=3Ω $V_{GS}$=-4.5V,$R_L$=0.5Ω | - | 20 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 55 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 100 | - | nS |
| Turn-Off Fall Time | $t_f$ | | - | 35 | - | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-10V,$I_D$=-20A, $V_{GS}$=-4.5V | - | 63.5 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 10 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 18 | - | nC |
| Drain-source diode characteristics | | | | | | |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-20A | - | - | -1.2 | V |
| Diode Forward Current | $I_S$ | | - | - | -45 | A |
| Reverse Recovery Time | $t_{rr}$ | $T_J$ = 25°C, $I_F$ = -20A di/dt = 100A/μs | - | 70 | - | nS |
| Reverse Recovery Charge | Qrr | | - | 60 | - | nC |

■TYPICAL CHARACTERISTICS

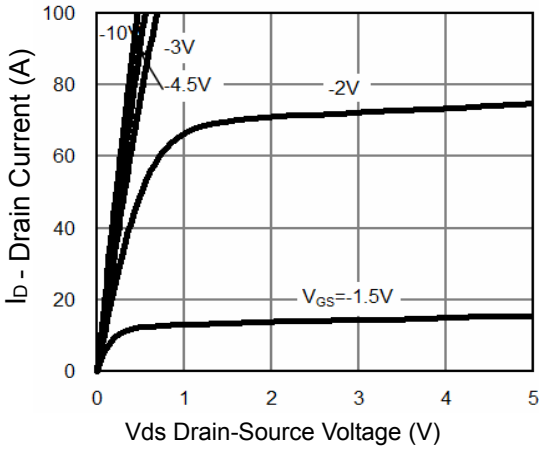



Figure 1 output characteristics

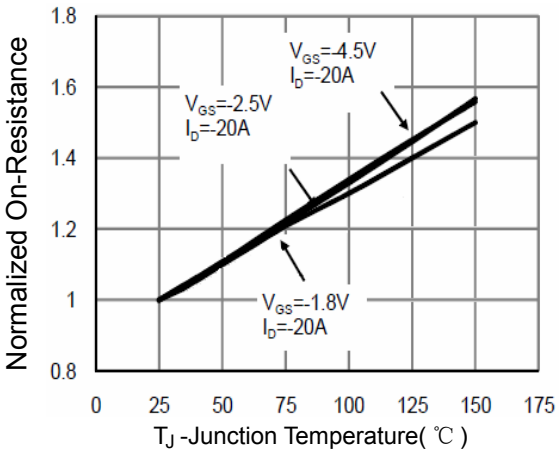



Figure 2 rdson-junction temperature

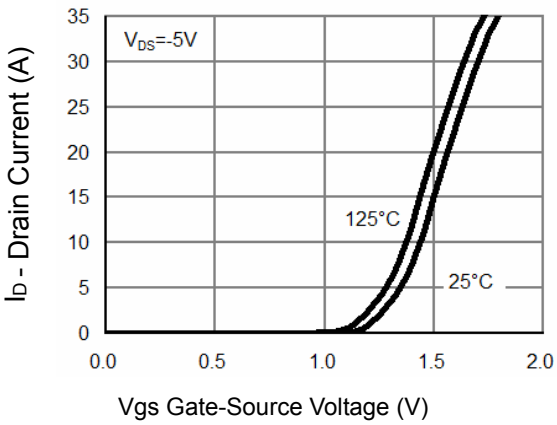



Figure 3 transfer characteristics

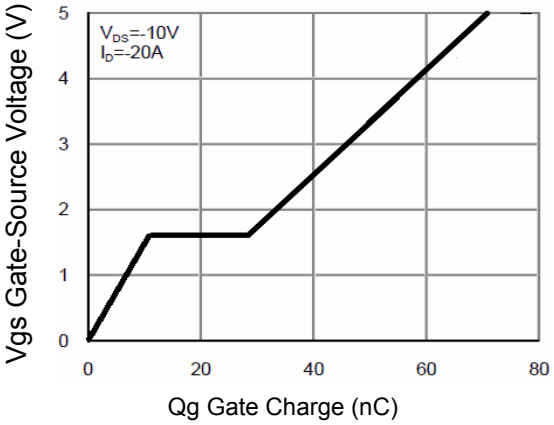



Figure 4 gate charge

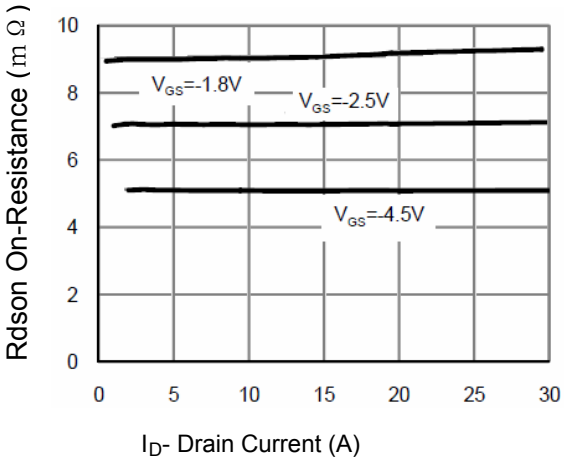



Figure 5 rdson-drain current

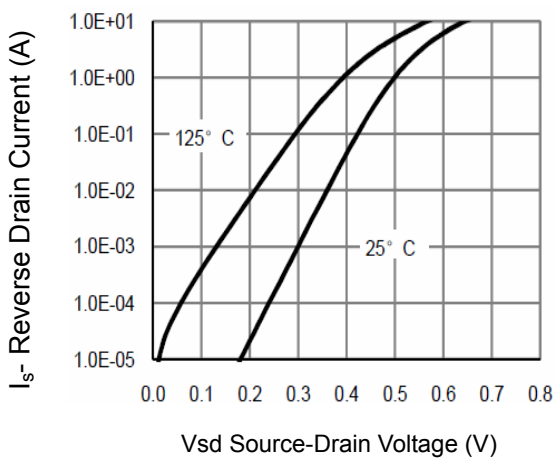



Figure 6 source-drain diode forward

■TYPICAL CHARACTERISTICS(Cont.)

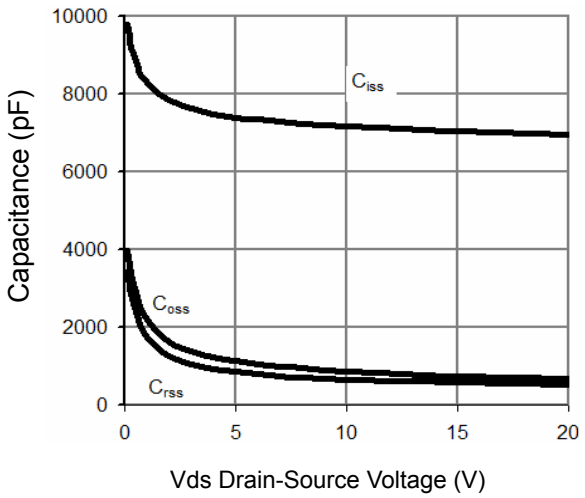



Figure 7 capacitance vs vds

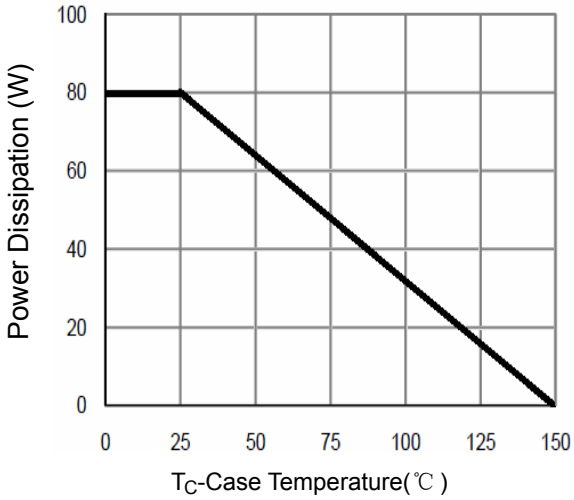



Figure 8 power de-rating

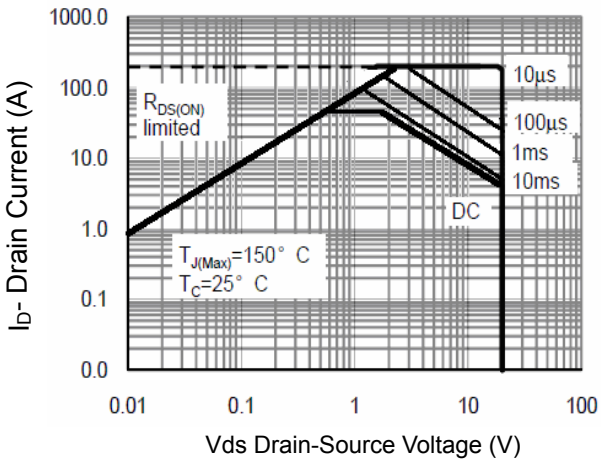



Figure 9 safe operation area

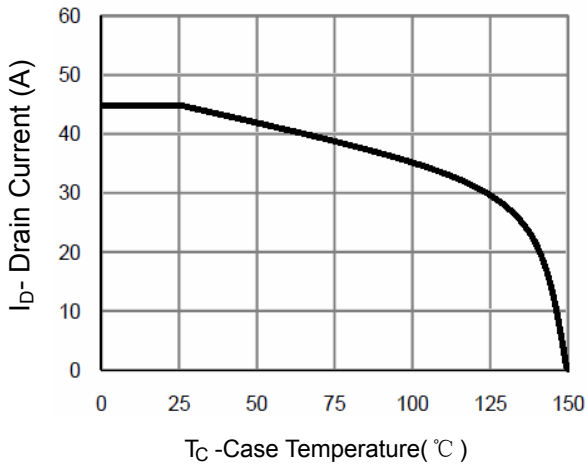



Figure 10 current de-rating

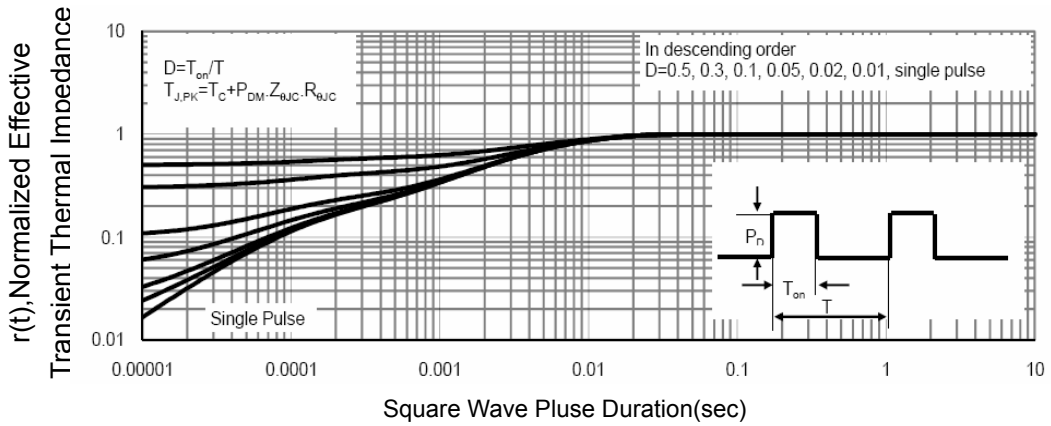
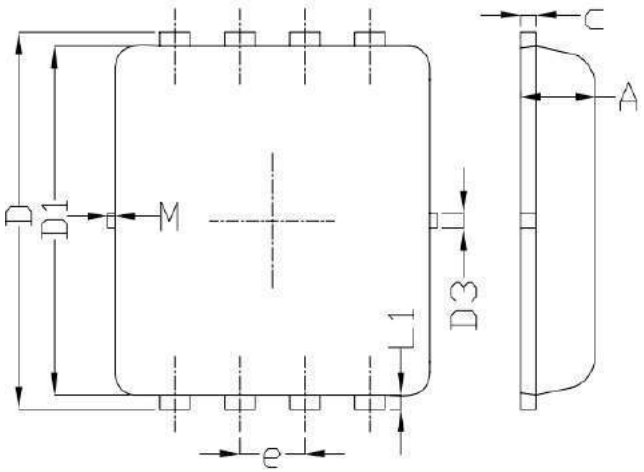
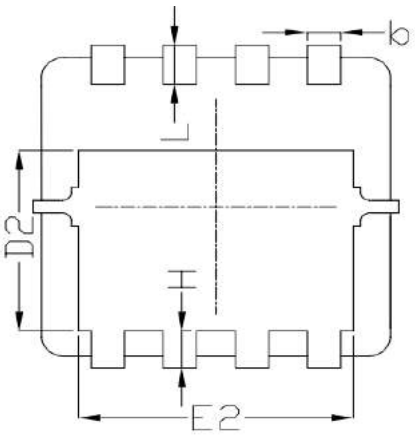
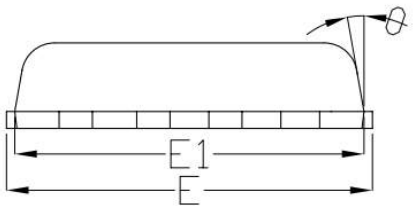



Figure 11 normalized maximum transient thermal impedance

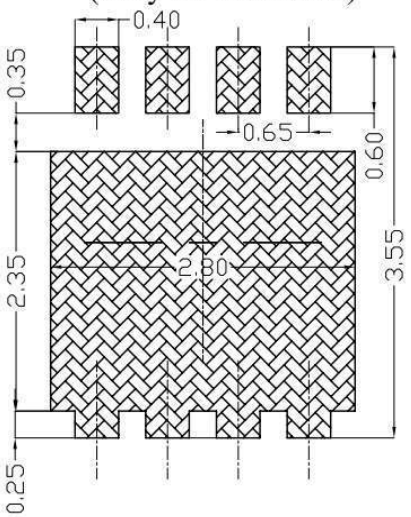
■ PDFN3X3-8L PACKAGE MECHANICAL DATA




Land Pattern
(Only for Reference)




| SYMBOL | DIMENSIONAL REQMTS | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 0.70 | 0.75 | 0.80 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.10 | 0.15 | 0.25 |
| D | 3.25 | 3.35 | 3.45 |
| D1 | 3.00 | 3.10 | 3.20 |
| D2 | 1.78 | 1.88 | 1.98 |
| D3 | --- | 0.13 | --- |
| E | 3.20 | 3.30 | 3.40 |
| E1 | 3.00 | 3.15 | 3.20 |
| E2 | 2.39 | 2.49 | 2.59 |
| e | 0.65BSC | | |
| H | 0.30 | 0.39 | 0.50 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | --- | 0.13 | --- |
| θ | --- | 10° | 12° |
| M | * | * | 0.15 |
| * Not specified | | | |