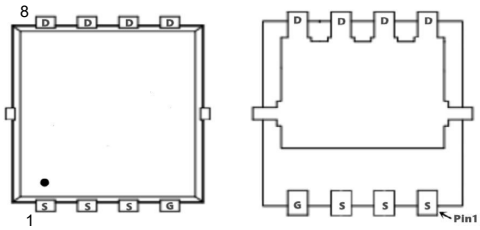
# PJM200N40DN
## N-Channel Enhancement Mode Power MOSFET

### Features

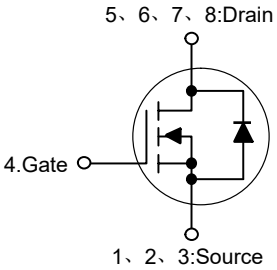
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- $V_{DS}$=40V,$I_D$= 200A

  $R_{DS(on)}$< 1.0mΩ @$V_{GS}$= 10V

### PDFN5x6-8L




### Schematic Diagram




### Applications

- BMS
- BLDC
- UPS

### Absolute Maximum Ratings

Ratings at 25℃ junction temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 40 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous at $V_{GS}$=10V Note1 ($T_C$=25°C) | $I_D$ | 200 | A |
| Drain Current-Pulsed Note2 | $I_{DM}$ | 800 | A |
| Single Pulse Avalanche Energy Note3 | $E_{AS}$ | 420 | mJ |
| Avalanche Current | $I_{AS}$ | 70 | A |
| Maximum Power Dissipation Note4 ($T_C$=25°C) | $P_D$ | 68 | W |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |

### Thermal Characteristics

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient Note1 | $R_{\theta JA}$ | 25 | °C/W |
| Thermal Resistance,Junction-to-Case Note1 | $R_{\theta JC}$ | 1.4 | °C/W |

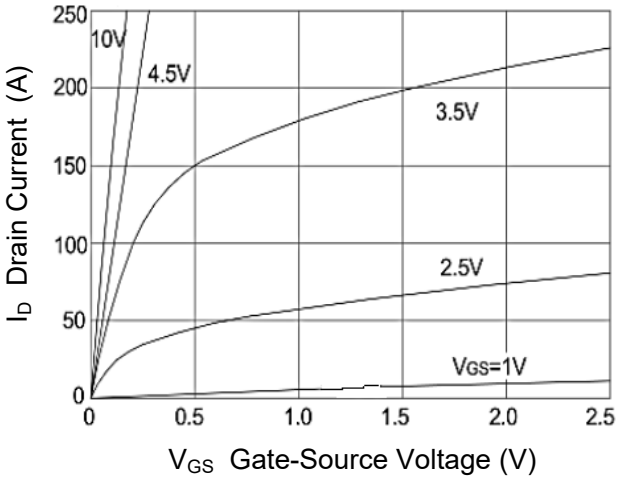
## Electrical Characteristics

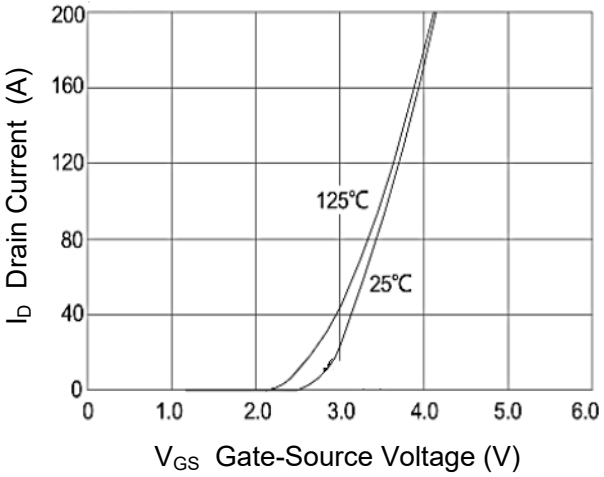
($T_J$=25℃ unless otherwise specified)

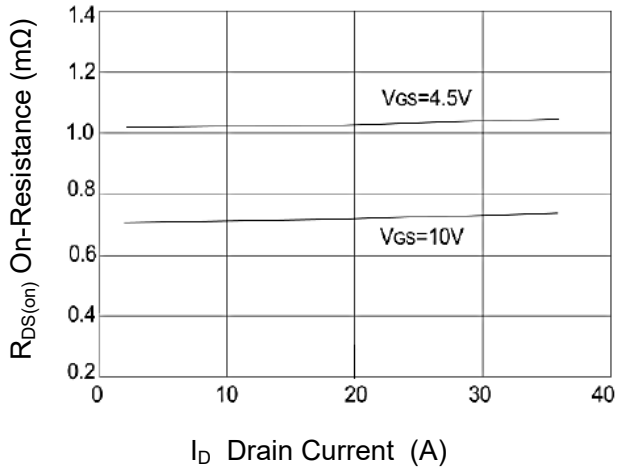
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 40 | 48 | -- | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=40V,$V_{GS}$=0V | -- | -- | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V,$V_{DS}$=0V | -- | -- | ±100 | nA |
| Gate Threshold Voltage Note2 | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 1.2 | 1.5 | 2.5 | V |
| Drain-Source On-Resistance Note2 | $R_{DS(on)}$ | $V_{GS}$=10V,$I_D$=30A | -- | 0.75 | 1.0 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=20A | -- | 1.1 | 1.5 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=20V,$V_{GS}$=0V,f=1MHz | -- | 7400 | -- | pF |
| Output Capacitance | $C_{oss}$ | | -- | 1930 | -- | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | -- | 110 | -- | pF |
| **Switching Characteristics** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=20V, $I_D$=85A, $V_{GS}$=10V,$R_G$=1.6Ω | -- | 14.1 | -- | nS |
| Turn-on Rise Time | $t_r$ | | -- | 7.9 | -- | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 56.5 | -- | nS |
| Turn-off Fall Time | $t_f$ | | -- | 9.6 | -- | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=20V,$I_D$=85A, $V_{GS}$=10V | -- | 125 | -- | nC |
| Gate-Source Charge | $Q_{gs}$ | | -- | 18 | -- | nC |
| Gate-Drain Charge | $Q_{gd}$ | | -- | 13 | -- | nC |
| **Source-Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage Note2 | $V_{SD}$ | $V_{GS}$=0V,$I_S$=30A | -- | -- | 1.2 | V |
| Diode Forward Current Note1,5 | $I_S$ | | -- | -- | 200 | A |

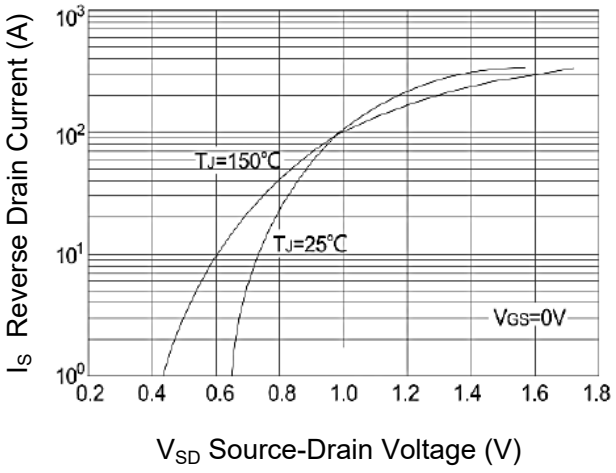
Note :
1.The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width≤ 300us , duty cycle ≤ 2%
3.The $E_{AS}$ data shows Max. rating . The test condition is $V_{DD}$=32V,$V_{GS}$=10V,L=0.1mH,$I_{AS}$=70A
4.The power dissipation is limited by 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.

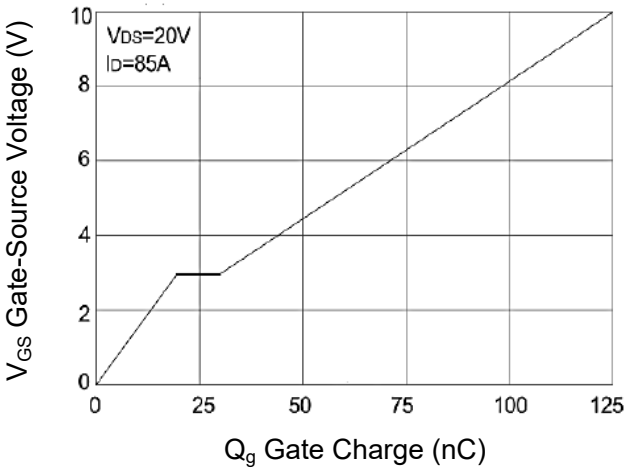
## Typical Characteristic Curves

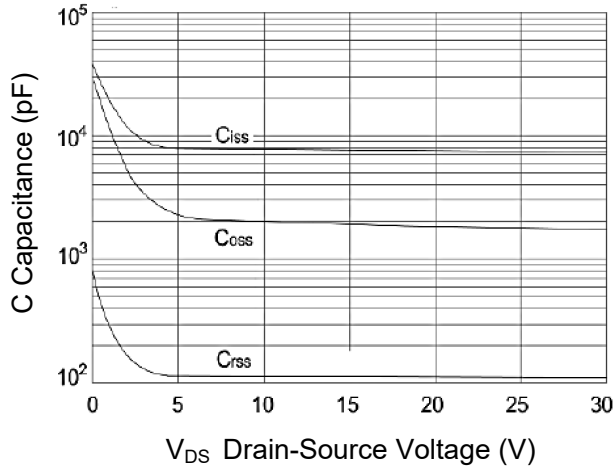


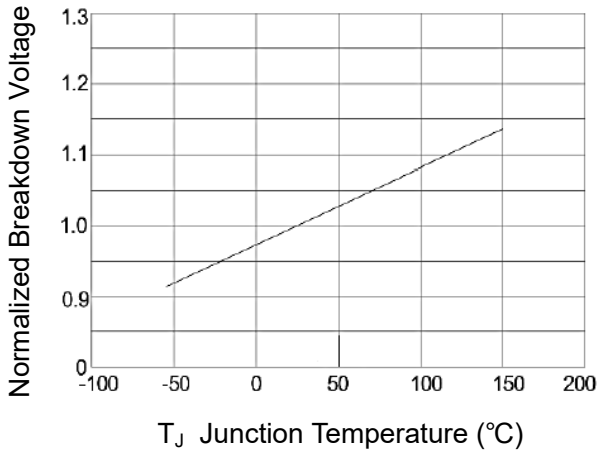



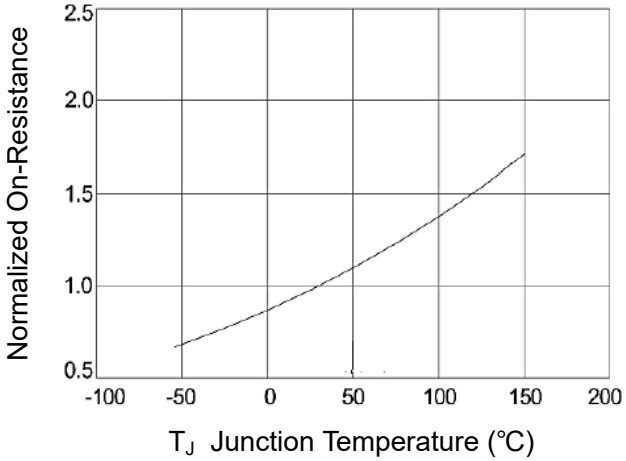



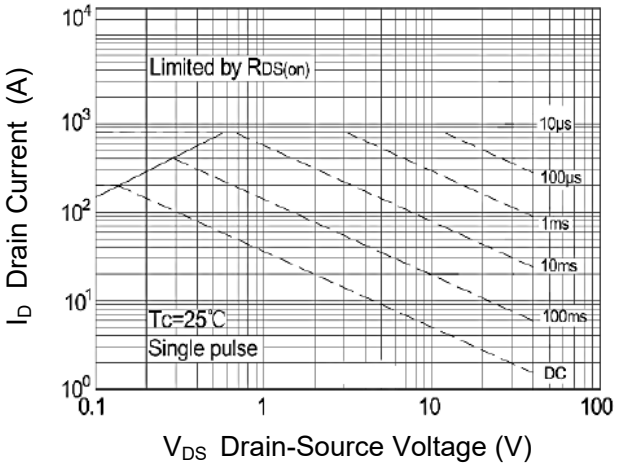



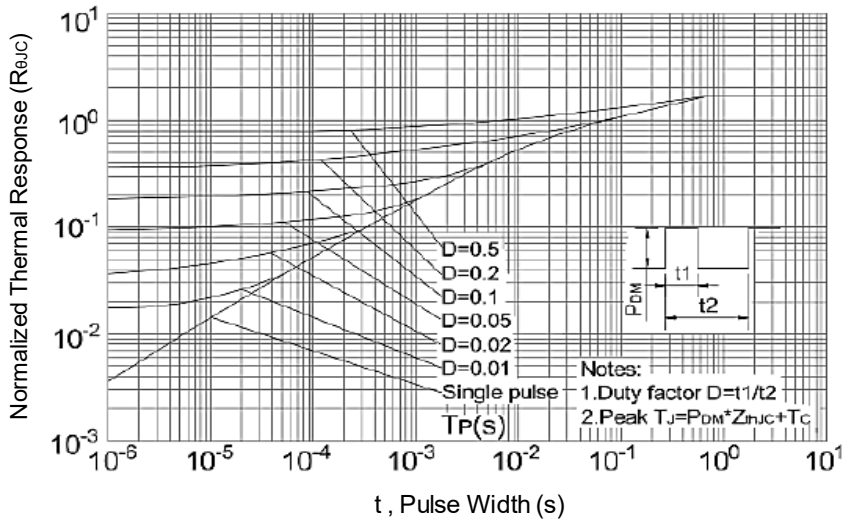




Normalized Breakdown Voltage
1.3
1.2
1.1
1.0
0.9
0
-100
-50
0
50
100
150
200
TJ Junction Temperature (℃)


Normalized On-Resistance
2.5
2.0
1.5
1.0
0.5
-100
-50
0
50
100
150
200
TJ Junction Temperature (℃)

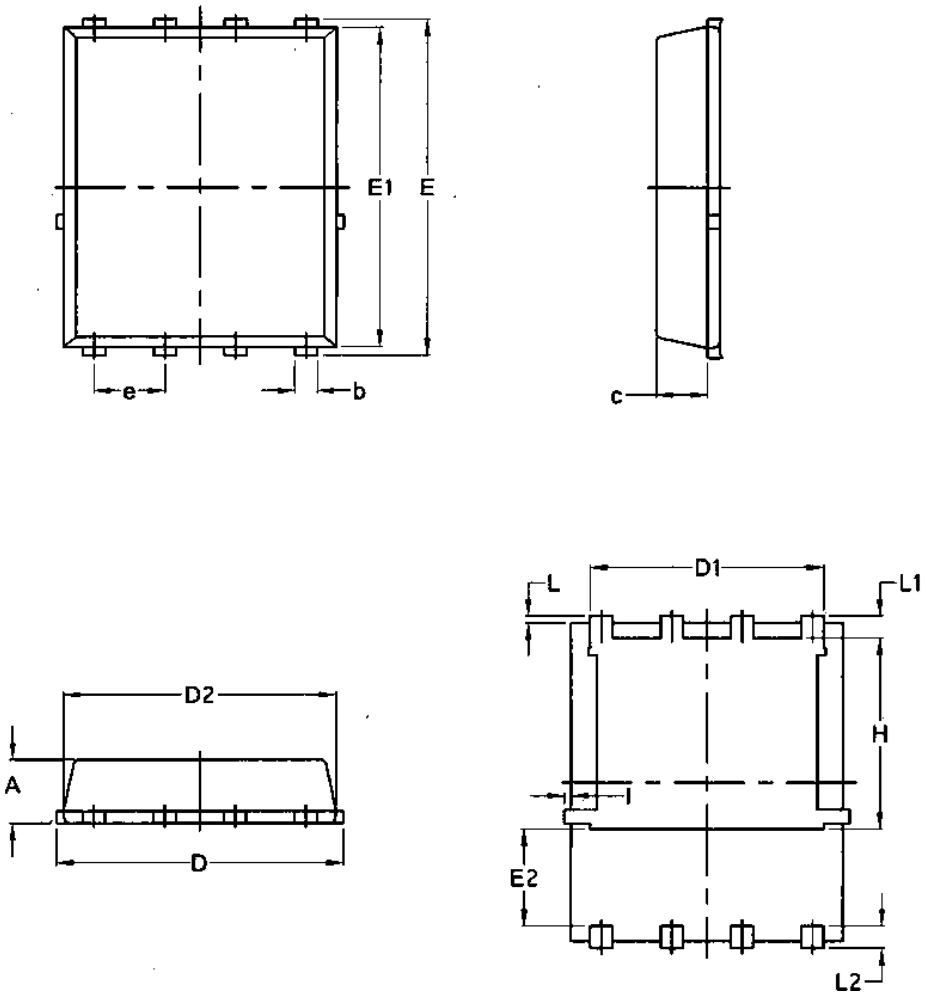

ID Drain Current (A)
Limited by RDS(on)
10μs
100μs
1ms
10ms
100ms
DC
Tc=25℃
Single pulse
0.1
1
10
100
VDS Drain-Source Voltage (V)


Normalized Thermal Response (RθJC)
D=0.5
D=0.2
D=0.1
D=0.05
D=0.02
D=0.01
Single pulse
PDM
t1
t2
Notes:
1.Duty factor D=t1/t2
2.Peak TJ=PDM*ZthJC+TC
TP(s)
t , Pulse Width (s)

## Package Outline

PDFN5x6-8L

Dimensions in mm




| Symbol | Common | | | |
|---|---|---|---|---|
| | mm | | Inch | |
| | Min | Max | Min | Max |
| A | 1.03 | 1.17 | 0.0406 | 0.0461 |
| b | 0.34 | 0.48 | 0.0134 | 0.0189 |
| c | 0.824 | 0.970 | 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 |