



# PJM80N40DN

## N-Channel Enhancement Mode Power MOSFET

### Product Summary

- $V_{DS} = 40V, I_D = 80A$
- $R_{DS(on)} < 5.2m\Omega @ V_{GS} = 10V$
- $R_{DS(on)} < 7.2m\Omega @ V_{GS} = 4.5V$

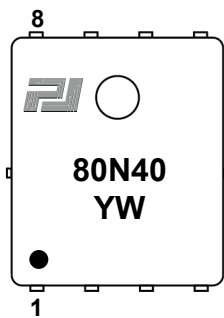
### Features

- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

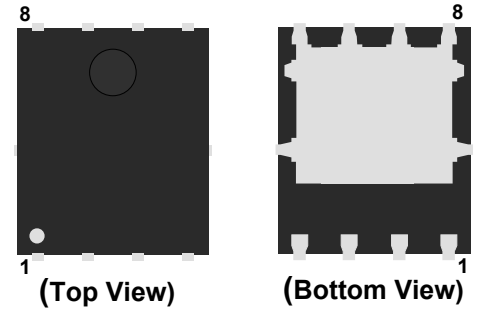
### Application

- Load Switch
- Battery Protection
- Uninterruptible Power Supply

### Marking Code

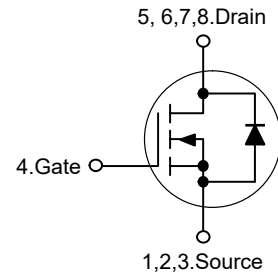


### PDFN5x6-8L



| Pin     | Description |
|---------|-------------|
| 1,2,3   | Source      |
| 4       | Gate        |
| 5,6,7,8 | Drain       |

### Schematic Diagram



### Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

| Parameter                                      | Symbol    | Value       | Unit |
|------------------------------------------------|-----------|-------------|------|
| Drain-Source Voltage                           | $V_{DS}$  | 40          | V    |
| Gate-Source Voltage                            | $V_{GS}$  | $\pm 20$    | V    |
| Drain Current-Continuous                       | $I_D$     | 80          | A    |
| Drain Current-Pulsed <sup>Note1</sup>          | $I_{DM}$  | 300         | A    |
| Maximum Power Dissipation                      | $P_D$     | 50          | W    |
| Single Pulse Avalanche Energy <sup>Note2</sup> | $E_{AS}$  | 121         | mJ   |
| Junction Temperature                           | $T_J$     | 150         | °C   |
| Storage Temperature Range                      | $T_{STG}$ | -55 to +150 | °C   |

### Thermal Characteristics

|                                      |                 |     |      |
|--------------------------------------|-----------------|-----|------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 2.5 | °C/W |
|--------------------------------------|-----------------|-----|------|



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### Electrical Characteristics

(T<sub>J</sub>=25°C unless otherwise specified)

| Parameter                                   | Symbol               | Test Condition                                                                           | Min. | Typ. | Max. | Unit |
|---------------------------------------------|----------------------|------------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                      |                      |                                                                                          |      |      |      |      |
| Drain-Source Breakdown Voltage              | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                               | 40   | --   | --   | V    |
| Zero Gate Voltage Drain Current             | I <sub>DSS</sub>     | V <sub>DS</sub> =40V, V <sub>GS</sub> =0V                                                | --   | --   | 1    | μA   |
| Gate-Body Leakage Current                   | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                               | --   | --   | ±100 | nA   |
| Gate Threshold Voltage <sup>Note3</sup>     | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 1    | --   | 2.5  | V    |
| Drain-Source On-Resistance <sup>Note3</sup> | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =30A                                                | --   | --   | 5.2  | mΩ   |
|                                             |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A                                               | --   | --   | 7.2  | mΩ   |
| Dynamic Characteristics                     |                      |                                                                                          |      |      |      |      |
| Input Capacitance                           | C <sub>iss</sub>     | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz                                        | --   | 3183 | --   | pF   |
| Output Capacitance                          | C <sub>oss</sub>     |                                                                                          | --   | 225  | --   | pF   |
| Reverse Transfer Capacitance                | C <sub>rss</sub>     |                                                                                          | --   | 192  | --   | pF   |
| Total Gate Charge                           | Q <sub>g</sub>       | V <sub>DS</sub> =20V, I <sub>D</sub> =30A,<br>V <sub>GS</sub> =10V                       | --   | 59   | --   | nC   |
| Gate-Source Charge                          | Q <sub>gs</sub>      |                                                                                          | --   | 12   | --   | nC   |
| Gate-Drain Charge                           | Q <sub>gd</sub>      |                                                                                          | --   | 12   | --   | nC   |
| Switching Characteristics                   |                      |                                                                                          |      |      |      |      |
| Turn-on Delay Time                          | t <sub>d(on)</sub>   | V <sub>DD</sub> =20V, I <sub>D</sub> =30A,<br>V <sub>GS</sub> =10V, R <sub>GEN</sub> =3Ω | --   | 11   | --   | nS   |
| Turn-on Rise Time                           | t <sub>r</sub>       |                                                                                          | --   | 32   | --   | nS   |
| Turn-off Delay Time                         | t <sub>d(off)</sub>  |                                                                                          | --   | 52   | --   | nS   |
| Turn-off Fall Time                          | t <sub>f</sub>       |                                                                                          | --   | 13   | --   | nS   |
| Source-Drain Diode Characteristics          |                      |                                                                                          |      |      |      |      |
| Diode Forward Voltage <sup>Note3</sup>      | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =30A                                                 | --   | --   | 1.2  | V    |
| Diode Forward Current                       | I <sub>S</sub>       |                                                                                          | --   | --   | 80   | A    |

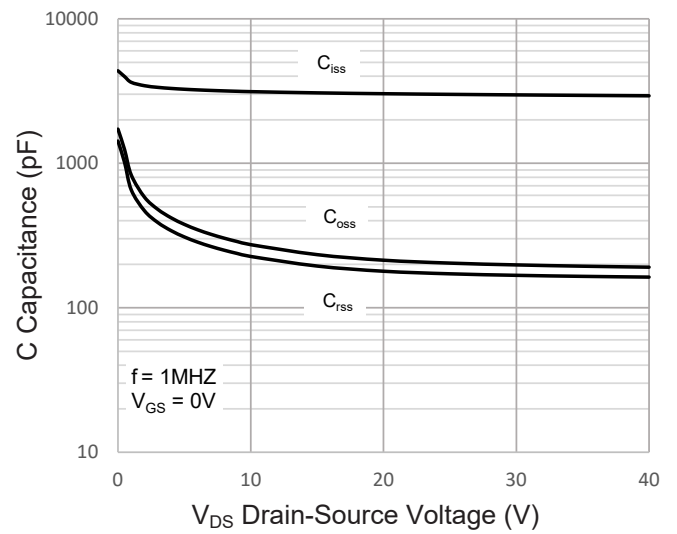
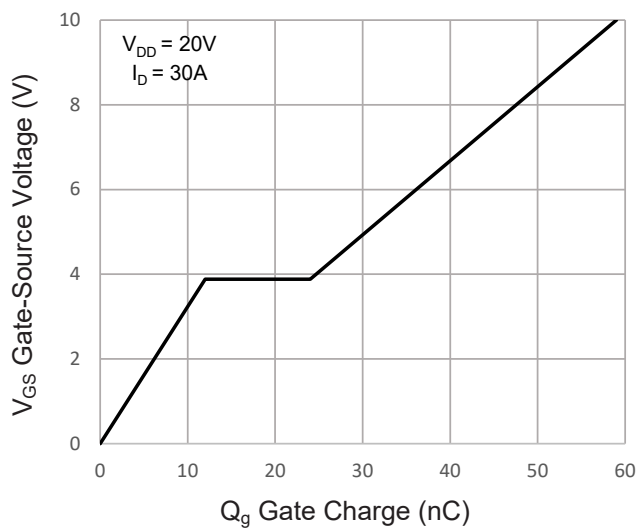
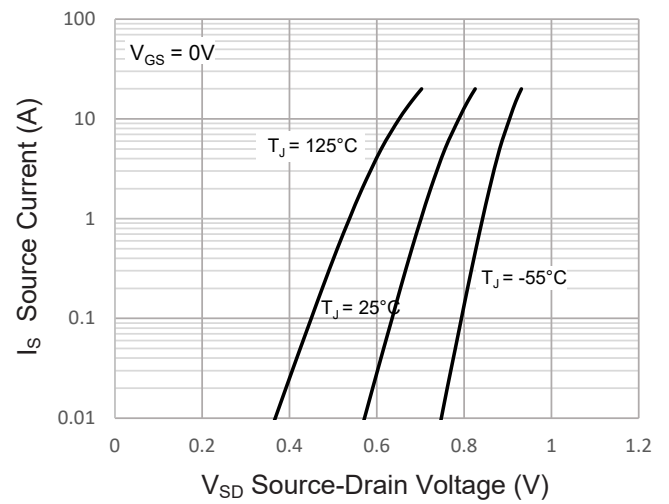
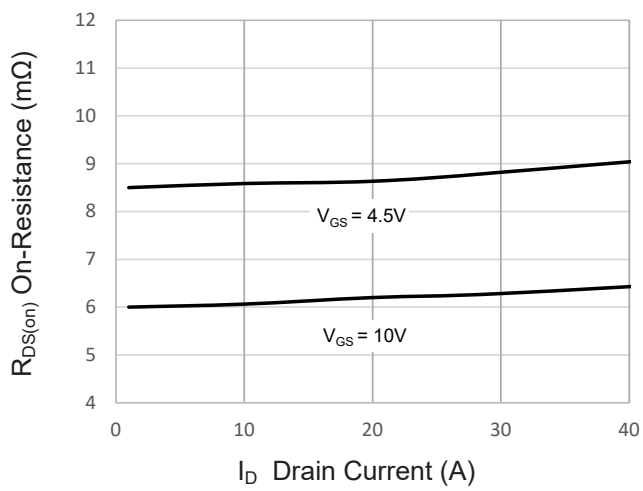
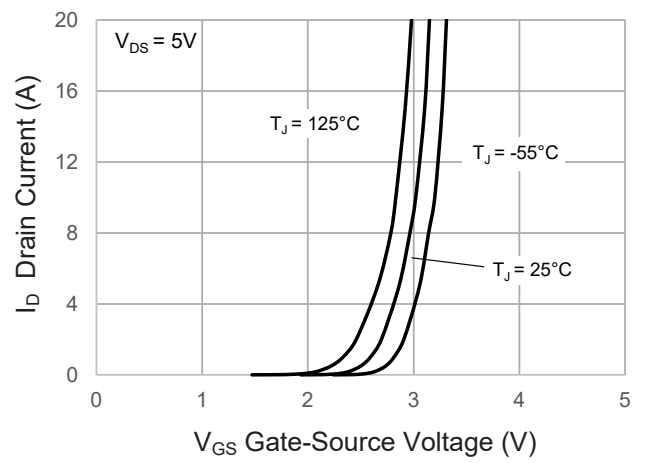
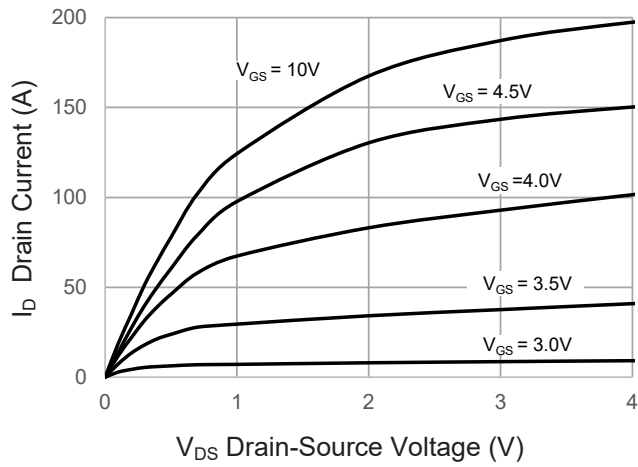
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature  
2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=22A  
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%



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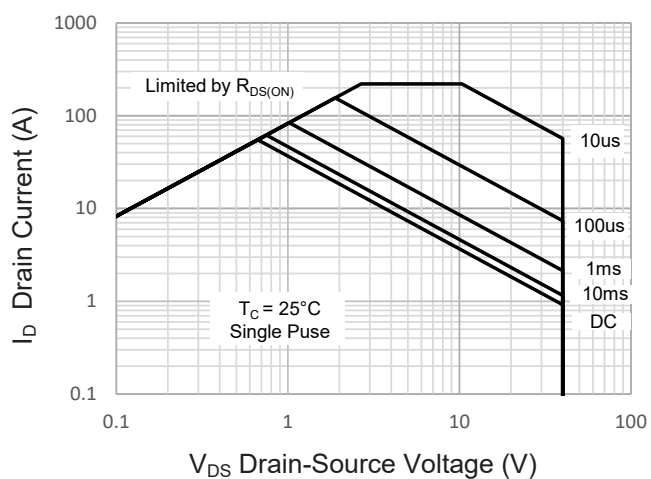
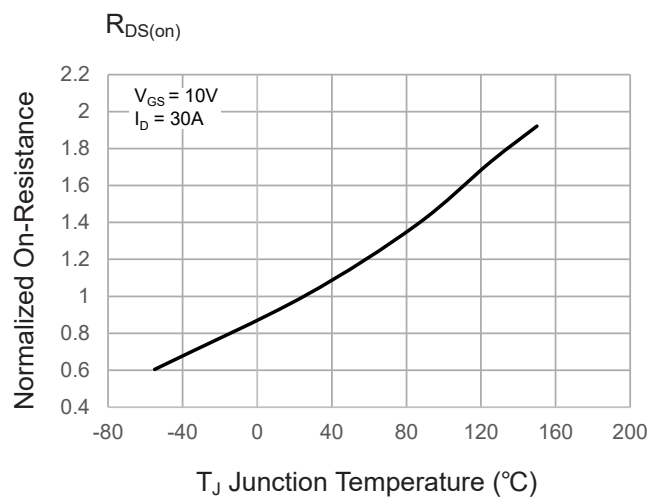
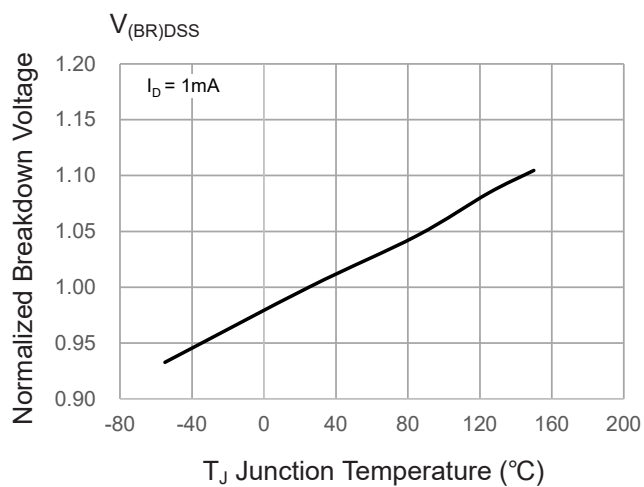
### Typical Characteristic Curves





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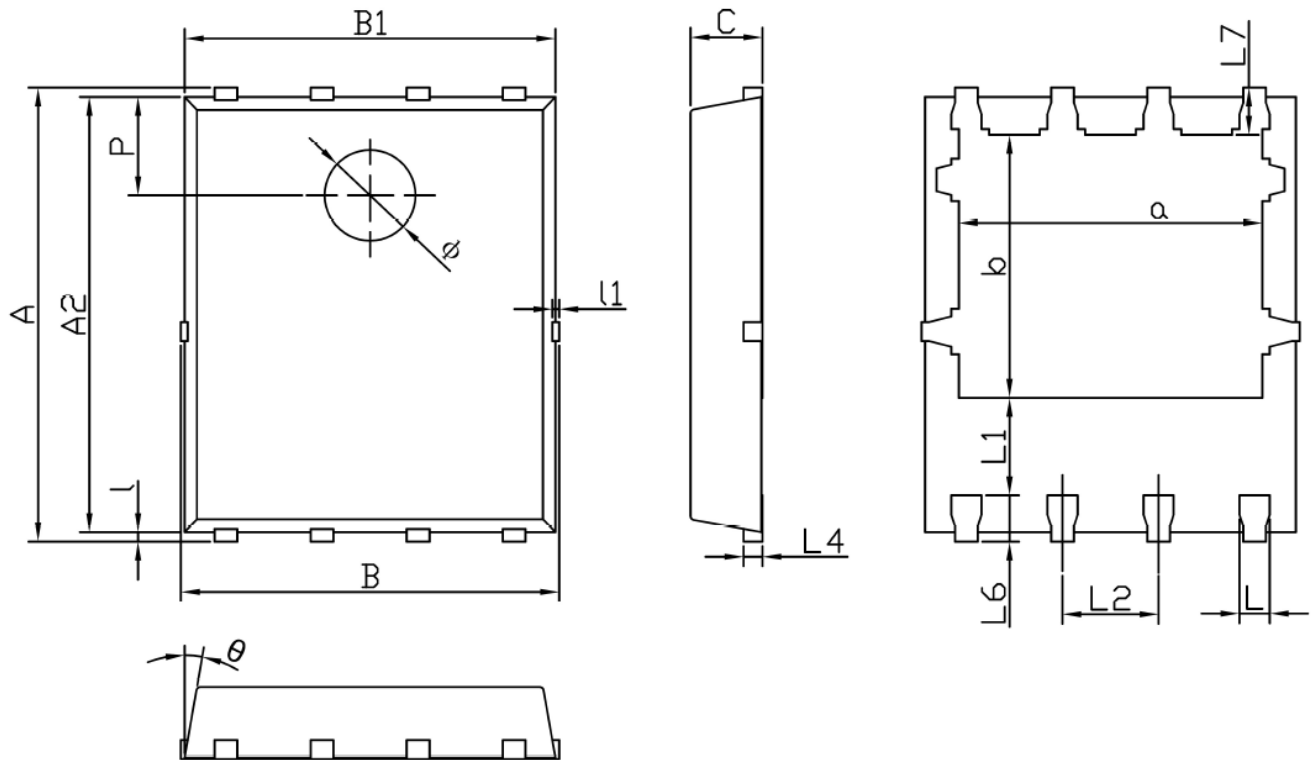
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### Package Outline

PDFN5x6-8L

Dimensions in mm



| Symbol | Dimensions |       | Symbol   | Dimensions |      |
|--------|------------|-------|----------|------------|------|
|        | Min.       | Max.  |          | Min.       | Max. |
| A      | 5.90       | 6.10  | L1       | 1.10       | -    |
| a      | 3.91       | 4.11  | l1       | -          | 0.10 |
| A2     | 5.70       | 5.80  | L2       | 1.17       | 1.37 |
| B      | 4.90       | 5.10  | L4       | 0.21       | 0.34 |
| b      | 3.375      | 3.575 | L6       | 0.51       | 0.71 |
| B1     | 4.80       | 5.00  | L7       | 0.51       | 0.71 |
| C      | 0.90       | 1.00  | P        | 1.15       | 1.45 |
| L      | 0.30       | 0.50  | $\theta$ | 8°         | 12°  |
| l      | 0.06       | 0.20  | $\Phi$   | 1.10       | 1.30 |