

**Product Summary**

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 150V          | 13mΩ@10V        | 50A   |

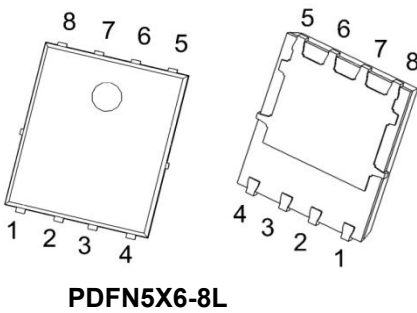
**Feature**

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

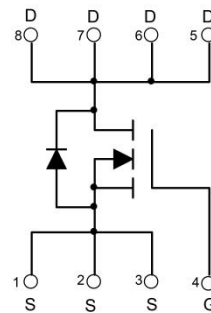
**Applications**

- Consumer electronic power supply
- Motor control Synchronous rectification
- Isolated DC/DC convertor
- Invertors

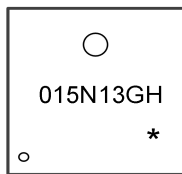
**Package**



**Circuit diagram**



**Marking**



015N13GH : Product code  
\* : Month code

**Absolute maximum ratings (Ta=25°C unless otherwise noted)**

| Parameter   | Symbol          | Value      | Unit |
|---|-----------------|------------|------|
| Drain source voltage                              | $V_{DS}$        | 150        | V    |
| Gate source voltage                               | $V_{GS}$        | $\pm 20$   | V    |
| Continuous drain current <sup>1)</sup> , TC=25 °C | $I_D$           | 50         | A    |
| Pulsed drain current <sup>2)</sup> , TC=25 °C     | $I_{DM}$        | 200        | A    |
| Power dissipation <sup>3)</sup> , TC=25 °C        | $P_D$           | 160        | W    |
| Single pulsed avalanche energy <sup>4)</sup>      | $E_{AS}$        | 480        | mJ   |
| Thermal resistance, junction-case                 | $R_{\theta JC}$ | 0.78       | °C/W |
| Operation and storage temperature                 | $T_{stg}, T_j$  | -55 to 150 | °C   |

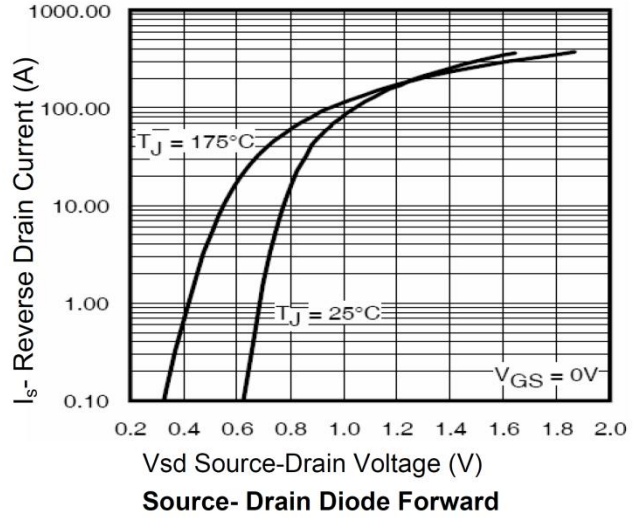
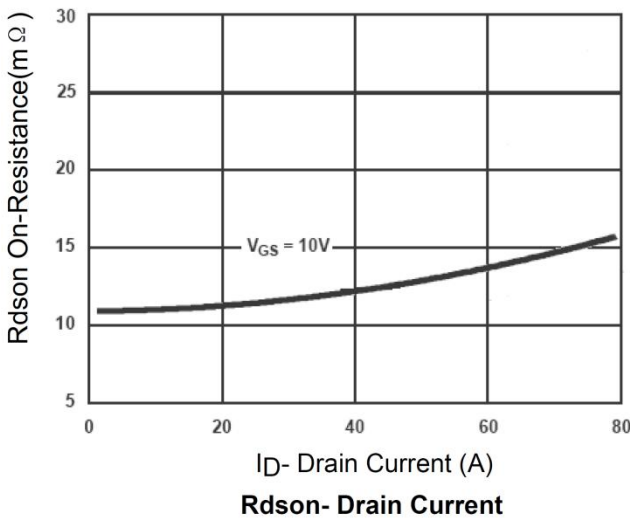
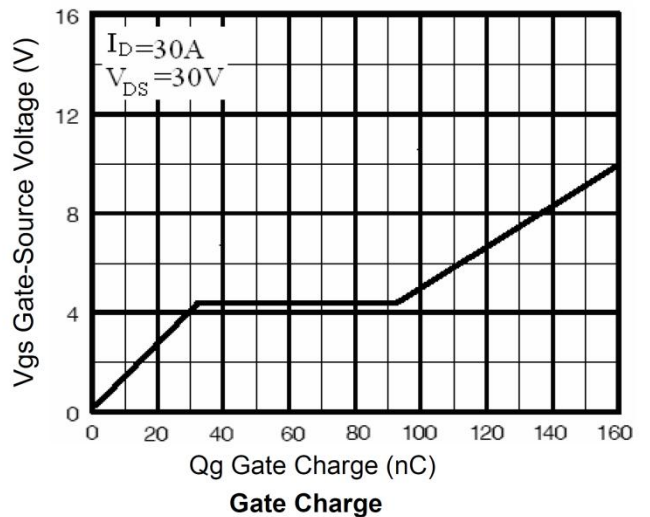
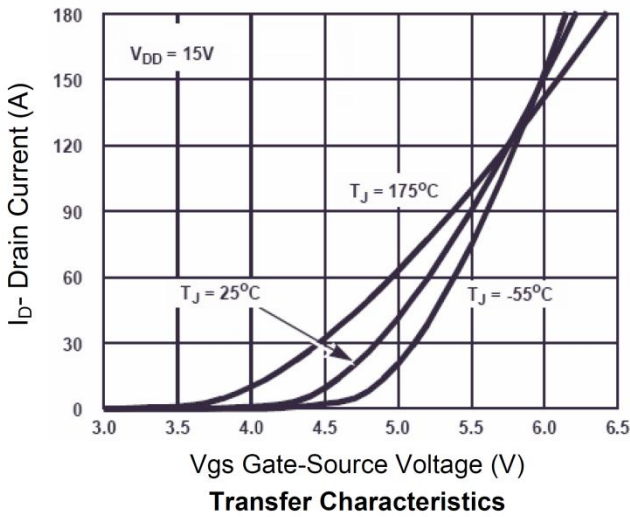
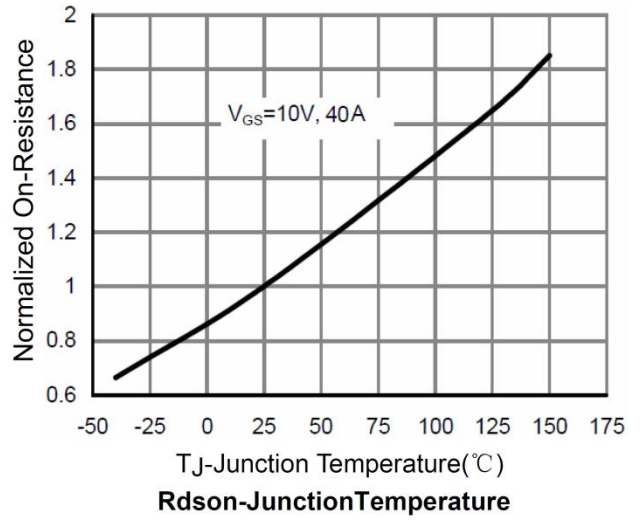
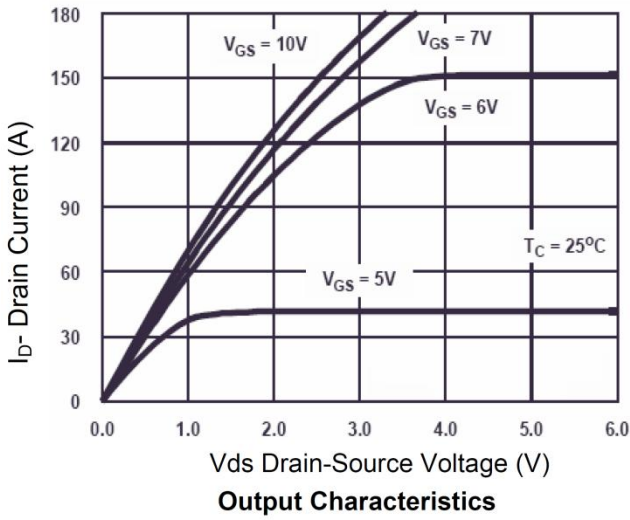
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

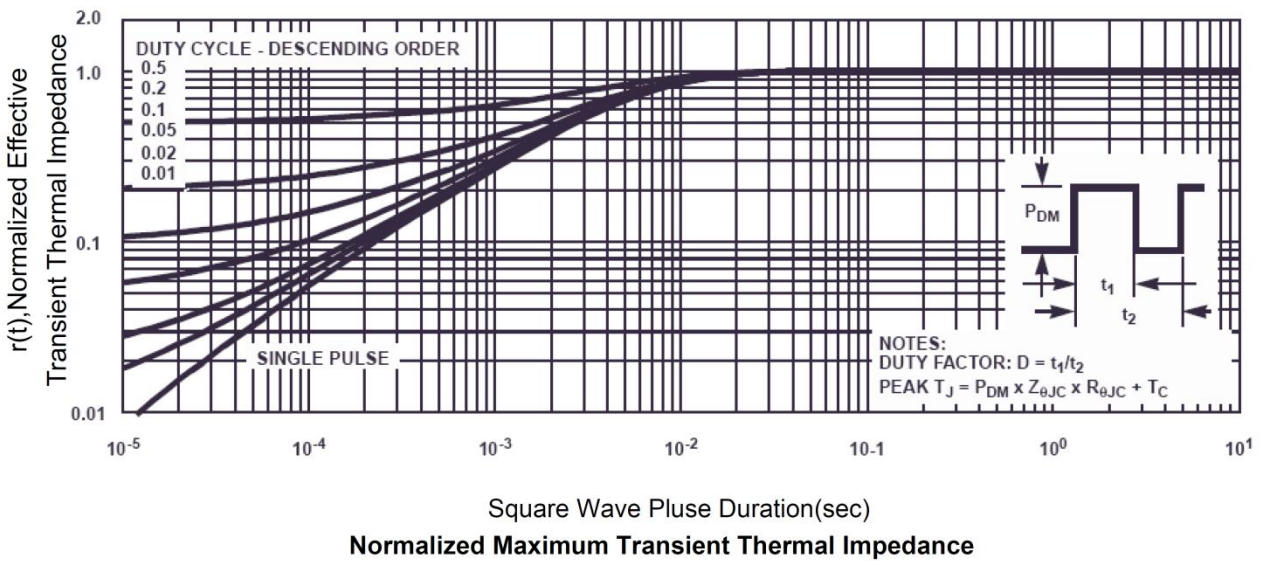
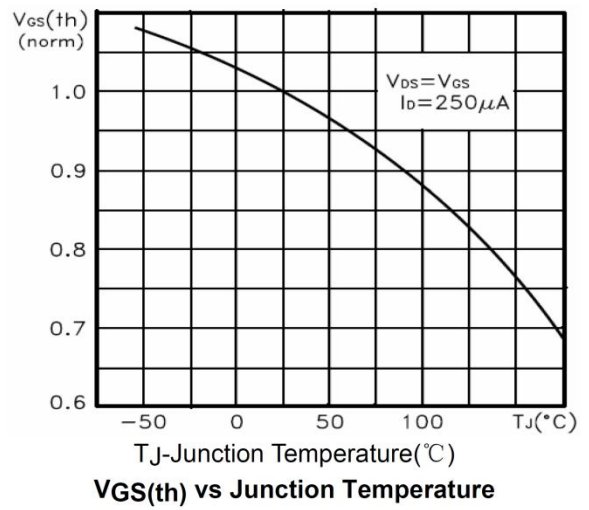
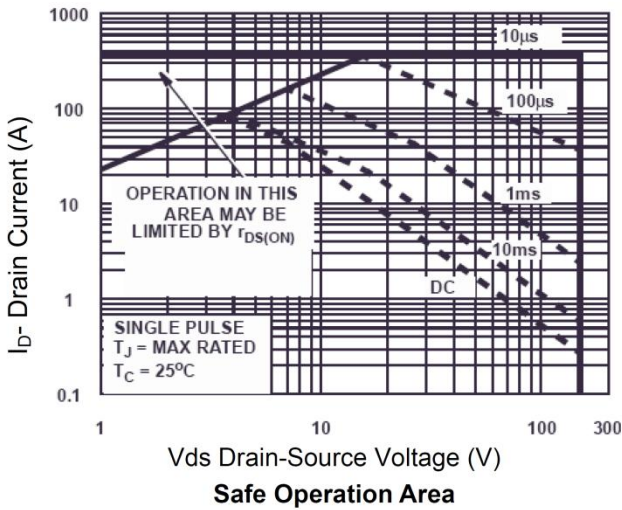
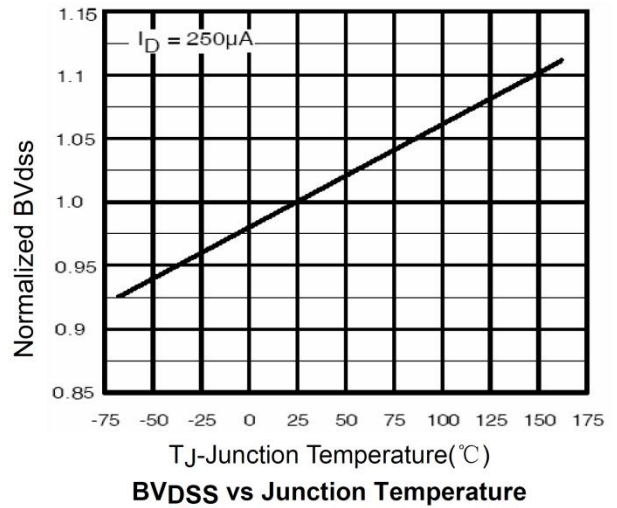
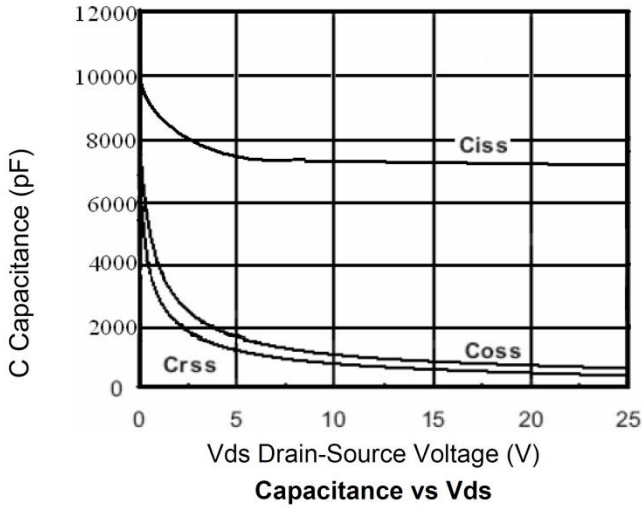
| Parameter                                 | Symbol       | Test condition  | Min. | Typ.  | Max.      | Unit             |
|---|--------------|---|------|-------|-----------|------------------|
| <b>Static Characteristics</b>             |              |   |      |       |           |                  |
| Drain-source breakdown voltage            | $BV_{DSS}$   | $V_{GS}=0\text{ V}, I_D=250\ \mu\text{A}$                                 | 150  |       |           | V                |
| Drain-source leakage current              | $I_{DSS}$    | $V_{DS}=120\text{ V}, V_{GS}=0\text{ V}$                                  |      |       | 1         | $\mu\text{A}$    |
| Gate-source leakage current               | $I_{GSS}$    | $V_{GS}=\pm 20\text{ V}$  |      |       | $\pm 100$ | nA               |
| Gate threshold voltage                    | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\ \mu\text{A}$                                     | 2    | 3     | 4         | V                |
| Drain-source on-state resistance          | $R_{DS(on)}$ | $V_{GS}=10\text{ V}, I_D=20\text{ A}$                                     |      | 13    | 16        | $\text{m}\Omega$ |
| <b>Dynamic Characteristics</b>            |              |   |      |       |           |                  |
| Input capacitance                         | $C_{iss}$    | $V_{GS}=0\text{ V}, V_{DS}=25\text{ V}, f=1\text{ MHz}$                   |      | 6998  |           | pF               |
| Output capacitance                        | $C_{oss}$    |   |      | 422   |           | pF               |
| Reverse transfer capacitance              | $C_{rss}$    |   |      | 22    |           | pF               |
| <b>Switching Characteristics</b>          |              |   |      |       |           |                  |
| Turn-on delay time                        | $t_{d(on)}$  | $V_{GS}=10\text{ V}, V_{DS}=30\text{ V}, R_G=2.5\ \Omega, I_D=2\text{ A}$ |      | 22.1  |           | ns               |
| Rise time                                 | $t_r$        |   |      | 5.2   |           | ns               |
| Turn-off delay time                       | $t_{d(off)}$ |   |      | 44    |           | ns               |
| Fall time                                 | $t_f$        |   |      | 8.4   |           | ns               |
| Total gate charge                         | $Q_g$        | $I_D=30\text{ A}, V_{DS}=30\text{ V}, V_{GS}=10\text{ V}$                 |      | 160   |           | nC               |
| Gate-source charge                        | $Q_{gs}$     |   |      | 36    |           | nC               |
| Gate-drain charge                         | $Q_{gd}$     |   |      | 68    |           | nC               |
| <b>Drain-Source Diode Characteristics</b> |              |   |      |       |           |                  |
| Diode forward voltage                     | $V_{SD}$     | $I_S=1\text{ A}, V_{GS}=0\text{ V}$                                       |      |       | 1.2       | V                |
| Reverse recovery time                     | $t_{rr}$     | $I_S=12\text{ A}, di/dt=100\text{ A}/\mu\text{s}$                         |      | 102.9 |           | ns               |
| Reverse recovery charge                   | $Q_{rr}$     |   |      | 379   |           | nC               |
| Peak reverse recovery current             | $I_{rrm}$    |   |      | 6.4   |           | A                |

**Notes:**

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3)  $P_d$  is based on max. junction temperature, using junction-case thermal resistance.
- 4)  $V_{DD}=50\text{ V}, V_G=10\text{ V}, R_G=25\ \Omega, L=0.5\text{ mH}$ , starting  $T_j=25\text{ }^\circ\text{C}$ .

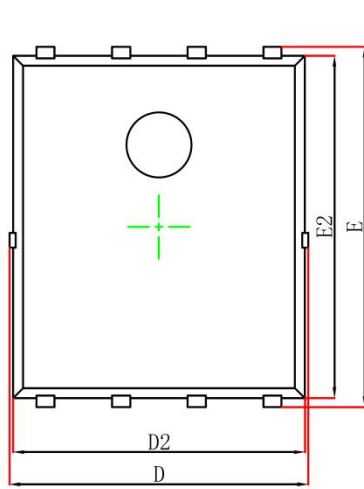
**Typical Characteristics**



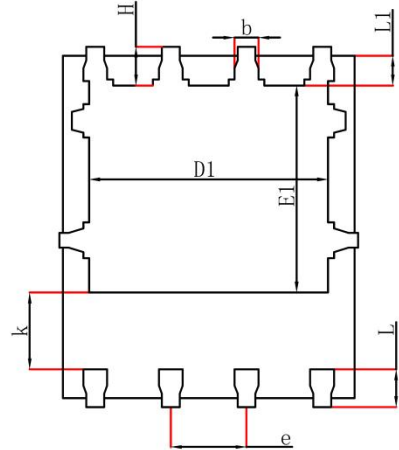




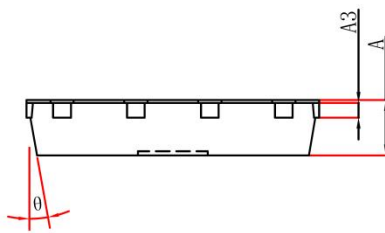
PDFN5X6-8L Package Information



Top View  
[顶视图]



Bottom View  
[背视图]



Side View  
[侧视图]

| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.000 | 0.035                | 0.039 |
| A3     | 0.254REF.                 |       | 0.010REF.            |       |
| D      | 4.944                     | 5.096 | 0.195                | 0.201 |
| E      | 5.974                     | 6.126 | 0.235                | 0.241 |
| D1     | 3.910                     | 4.110 | 0.154                | 0.162 |
| E1     | 3.375                     | 3.575 | 0.133                | 0.141 |
| D2     | 4.824                     | 4.976 | 0.190                | 0.196 |
| E2     | 5.674                     | 5.826 | 0.223                | 0.229 |
| k      | 1.190                     | 1.390 | 0.047                | 0.055 |
| b      | 0.350                     | 0.450 | 0.014                | 0.018 |
| e      | 1.270TYP.                 |       | 0.050TYP.            |       |
| L      | 0.559                     | 0.711 | 0.022                | 0.028 |
| L1     | 0.424                     | 0.576 | 0.017                | 0.023 |
| H      | 0.574                     | 0.726 | 0.023                | 0.029 |
| θ      | 10°                       | 12°   | 10°                  | 12°   |