

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 150V          | 56mΩ@10V        | 30A   |

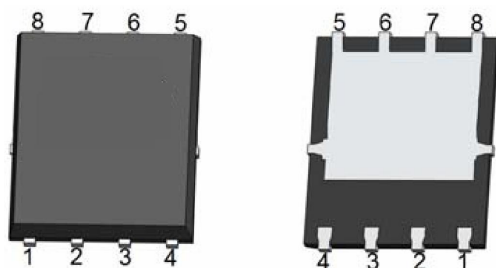
### Feature

- Advanced SGT technology
- Excellent  $R_{DS(on)}$
- Low gate charge

### Application

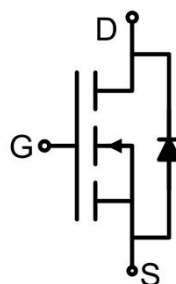
- Automotive lighting
- Load switch
- Uninterruptible power supply

### Package

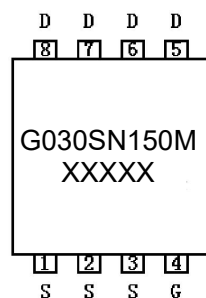


PDFN5\*6-8L

### Circuit diagram



### Marking



### Absolute maximum ratings (T<sub>c</sub>=25°C unless otherwise noted)

| Parameter                                                      | Symbol                 | Value      | Unit |
|----------------------------------------------------------------|------------------------|------------|------|
| Drain-Source Voltage                                           | V <sub>DS</sub>        | 150        | V    |
| Gate-Source Voltage                                            | V <sub>GS</sub>        | ±20        | V    |
| Continuous Drain Current <sup>1)</sup>                         | I <sub>D</sub>         | 30         | A    |
| Continuous Drain Current <sup>1)</sup> (T <sub>c</sub> =100°C) | I <sub>D</sub> (100°C) | 16         | A    |
| Pulsed Drain Current <sup>2)</sup>                             | I <sub>DM</sub>        | 60         | A    |
| Power Dissipation <sup>3)</sup>                                | P <sub>D</sub>         | 72.6       | W    |
| Thermal Resistance,Junction-to-Case <sup>1)</sup>              | R <sub>θJC</sub>       | 2          | °C/W |
| Junction Temperature                                           | T <sub>J</sub>         | 175        | °C   |
| Storage Temperature                                            | T <sub>STG</sub>       | -55 ~ +175 | °C   |

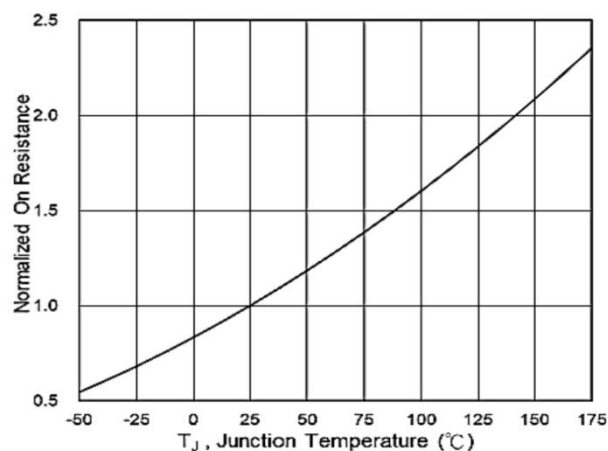
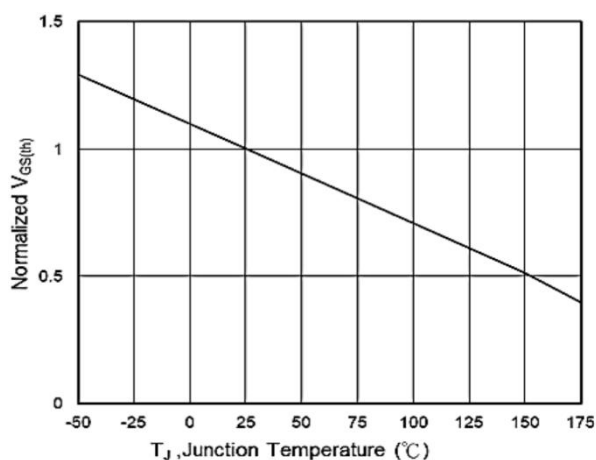
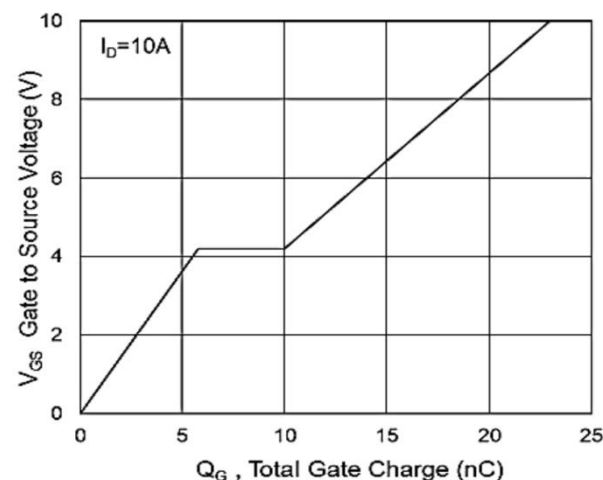
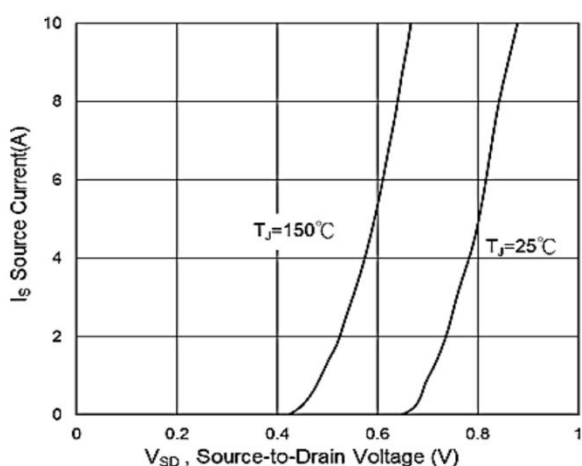
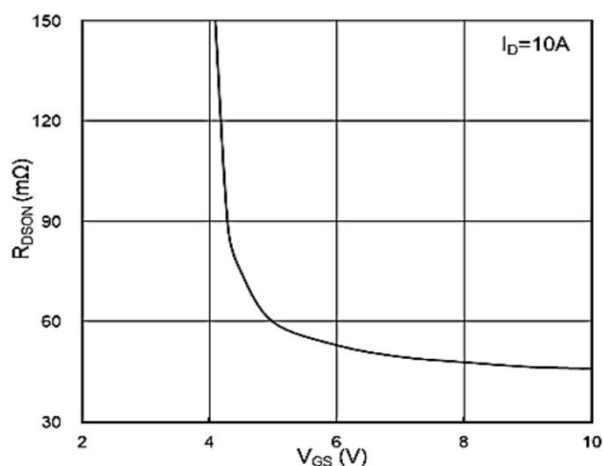
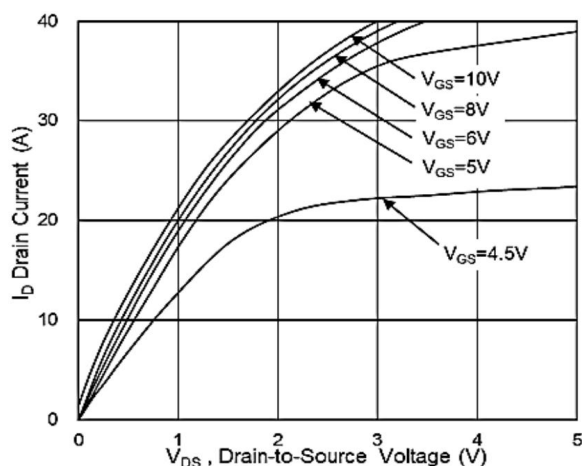
### Electrical characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

| 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                                           | 150  |      |      | V    |
| Zero gate voltage drain current          | I <sub>DSS</sub>     | V <sub>DS</sub> =120V,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                   | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                              | 2    | 2.9  | 4    | V    |
| Drain-source on-resistance <sup>2)</sup> | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =10A                                             |      | 47   | 56   | mΩ   |
| Dynamic characteristics <sup>5)</sup>    |                      |                                                                                       |      |      |      |      |
| Input Capacitance                        | C <sub>iss</sub>     | V <sub>DS</sub> =75V,V <sub>GS</sub> =0V,f =1MHz                                      |      | 1190 |      | pF   |
| Output Capacitance                       | C <sub>oss</sub>     |                                                                                       |      | 73   |      |      |
| Reverse Transfer Capacitance             | C <sub>rss</sub>     |                                                                                       |      | 4    |      |      |
| Total Gate Charge                        | Q <sub>g</sub>       | V <sub>DS</sub> =75V,V <sub>GS</sub> =10V,I <sub>D</sub> =10A                         |      | 23   |      | nC   |
| Gate-Source Charge                       | Q <sub>gs</sub>      |                                                                                       |      | 5.8  |      |      |
| Gate-Drain Charge                        | Q <sub>gd</sub>      |                                                                                       |      | 4.2  |      |      |
| Turn-on delay time                       | t <sub>d(on)</sub>   | V <sub>DD</sub> =75V,V <sub>GS</sub> =10V,I <sub>D</sub> =10A<br>R <sub>G</sub> =3.3Ω |      | 16.2 |      | nS   |
| Turn-on rise time                        | t <sub>r</sub>       |                                                                                       |      | 18.6 |      |      |
| Turn-off delay time                      | t <sub>d(off)</sub>  |                                                                                       |      | 28.5 |      |      |
| Turn-off fall time                       | t <sub>f</sub>       |                                                                                       |      | 6.5  |      |      |
| Source-Drain Diode characteristics       |                      |                                                                                       |      |      |      |      |
| Diode Forward Current <sup>1,4)</sup>    | I <sub>S</sub>       | V <sub>G</sub> =V <sub>D</sub> =0V , Force Current                                    |      |      | 20   | A    |
| Diode Forward voltage <sup>2)</sup>      | V <sub>SD</sub>      | I <sub>S</sub> = 1A,V <sub>GS</sub> =0V                                               |      |      | 1.2  | V    |
| Reverse Recovery Time                    | T <sub>rr</sub>      | I <sub>F</sub> = 10A,di/dt = 100A/μs                                                  |      | 45   |      | nS   |
| Reverse Recovery Charge                  | Q <sub>rr</sub>      |                                                                                       |      | 138  |      | nC   |

Notes:

- 1) The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- 2) The data tested by pulsed , pulse width ≤300us , duty cycle ≤2%.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.
- 5) Guaranteed by design, not subject to production testing.

## Typical Characteristics



## Typical Characteristics

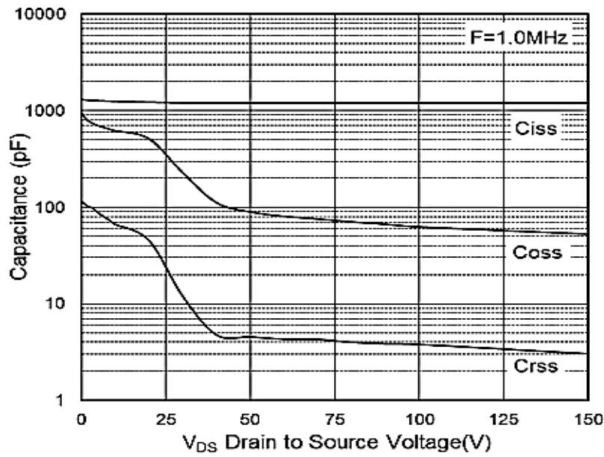


Fig.7 Capacitance

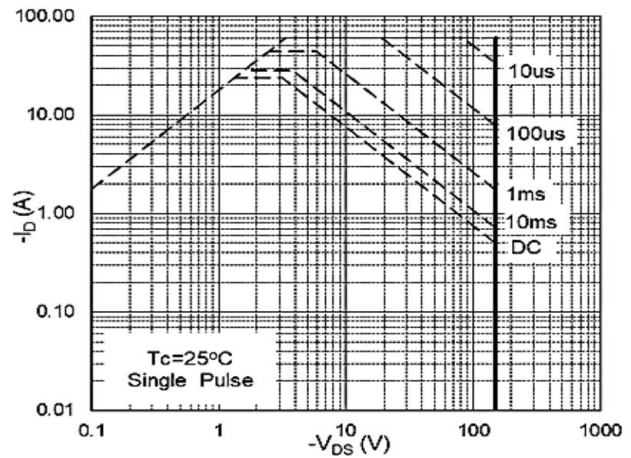


Fig.8 Safe Operating Area

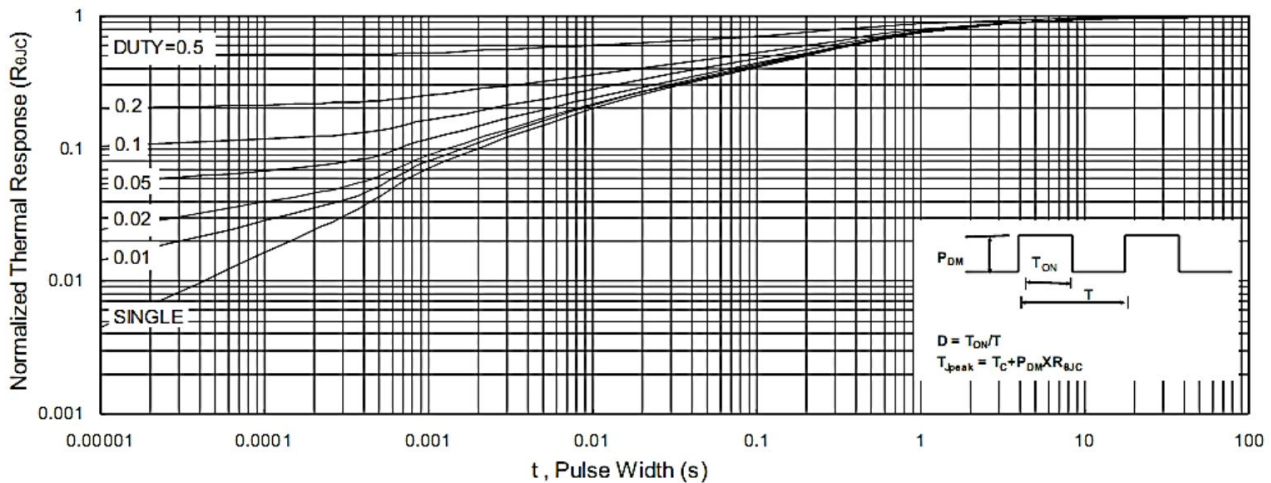


Fig.9 Normalized Maximum Transient Thermal Impedance

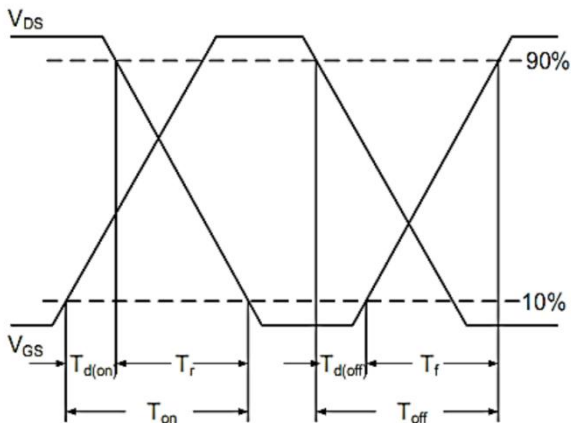


Fig.10 Switching Time Waveform

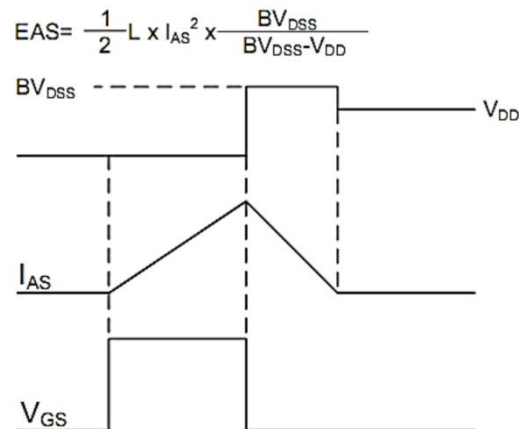
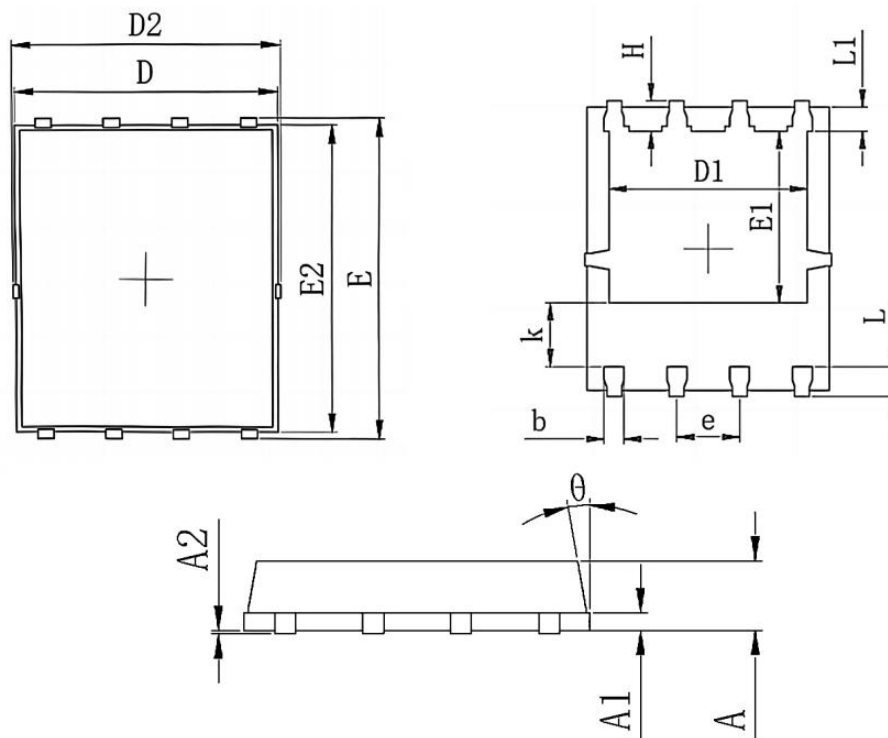


Fig.11 Unclamped Inductive Switching Waveform

### PDFN5\*6-8L Package Information



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.254 REF.                |       | 0.010 REF.           |       |
| A2     | 0.000                     | 0.050 | 0.000                | 0.002 |
| D      | 4.824                     | 4.976 | 0.190                | 0.196 |
| D1     | 3.910                     | 4.110 | 0.154                | 0.162 |
| D2     | 4.944                     | 5.076 | 0.195                | 0.200 |
| E      | 5.924                     | 6.076 | 0.233                | 0.239 |
| E1     | 3.375                     | 3.575 | 0.133                | 0.141 |
| E2     | 5.674                     | 5.826 | 0.223                | 0.229 |
| b      | 0.350                     | 0.450 | 0.014                | 0.018 |
| e      | 1.270 BSC.                |       | 0.050 BSC.           |       |
| L      | 0.534                     | 0.686 | 0.021                | 0.027 |
| L1     | 0.424                     | 0.576 | 0.017                | 0.023 |
| K      | 1.190                     | 1.390 | 0.047                | 0.055 |
| H      | 0.549                     | 0.701 | 0.022                | 0.028 |
| $\phi$ | 8°                        | 12°   | 8°                   | 12°   |