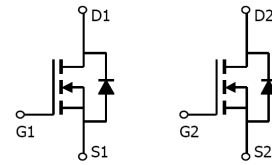


## Feature

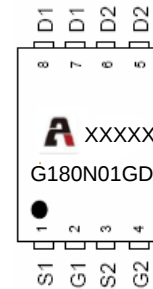
- 100V,25A  
 $R_{DS(ON)} < 18m\Omega @ V_{GS}=10V$  TYP:15 m $\Omega$   
 $R_{DS(ON)} < 24m\Omega @ V_{GS}=4.5V$  TYP:20 m $\Omega$
- Advanced Trench Technology
- Lead free product is acquired
- Excellent  $R_{DS(ON)}$  and Low Gate Charge



Schematic Diagram

## Application

- PWM applications
- Load Switch
- Power management



Marking and pin assignment

## Package Marking and Ordering Information

| Device Marking | Device      | Device Package | Reel Size | Tape width | Quantity (PCS) |
|----------------|-------------|----------------|-----------|------------|----------------|
| G180N01GD      | APG180N01GD | PDFN5X6-8L     | 13 inch   | -          | 5000           |

## ABSOLUTE MAXIMUM RATINGS ( $T_a=25^{\circ}C$ unless otherwise noted)

| Parameter                                               | Symbol          | Value     | Unit          |
|---------------------------------------------------------|-----------------|-----------|---------------|
| Drain-Source Voltage                                    | $V_{DS}$        | 100       | V             |
| Gate-Source Voltage                                     | $V_{GS}$        | $\pm 20$  | V             |
| Continuous Drain Current ( $T_a=25^{\circ}C$ )          | $I_D$           | 25        | A             |
| Continuous Drain Current ( $T_a=100^{\circ}C$ )         | $I_D$           | 17        | A             |
| Pulsed Drain Current <sup>(1)</sup>                     | $I_{DM}$        | 75        | A             |
| Singel Pulsed Avalanche Energy <sup>(2)</sup>           | $E_{AS}$        | 28        | mJ            |
| Power Dissipation                                       | $P_D$           | 65        | W             |
| Thermal Resistance from Junction to Case <sup>(4)</sup> | $R_{\theta JC}$ | 1.45      | $^{\circ}C/W$ |
| Junction Temperature                                    | $T_J$           | 150       | $^{\circ}C$   |
| Storage Temperature                                     | $T_{STG}$       | -55~ +150 | $^{\circ}C$   |

**MOSFET ELECTRICAL CHARACTERISTICS**( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

| Parameter                                 | Symbol               | Test Condition                                                                                            | Min | Type | Max  | Unit |
|-------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------|-----|------|------|------|
| Static Characteristics                    |                      |                                                                                                           |     |      |      |      |
| Drain-source breakdown voltage            | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                                               | 100 | -    | -    | V    |
| Zero gate voltage drain current           | I <sub>DSS</sub>     | V <sub>DS</sub> =100V, 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>(3)</sup>     | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                                  | 1   | 1.8  | 2.5  | V    |
| Drain-source on-resistance <sup>(3)</sup> | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                                                 | -   | 15   | 18   | mΩ   |
|                                           |                      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A                                                                | -   | 20   | 24   |      |
| Dynamic characteristics                   |                      |                                                                                                           |     |      |      |      |
| Input Capacitance                         | C <sub>iss</sub>     | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz                                                        | -   | 1130 | -    | pF   |
| Output Capacitance                        | C <sub>oss</sub>     |                                                                                                           | -   | 496  | -    |      |
| Reverse Transfer Capacitance              | C <sub>rss</sub>     |                                                                                                           | -   | 60   | -    |      |
| Switching characteristics                 |                      |                                                                                                           |     |      |      |      |
| Turn-on delay time                        | t <sub>d(on)</sub>   | V <sub>DD</sub> =50V, I <sub>D</sub> =20A, R <sub>L</sub> =6Ω<br>V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω | -   | 46   | -    | ns   |
| Turn-on rise time                         | t <sub>r</sub>       |                                                                                                           | -   | 55   | -    |      |
| Turn-off delay time                       | t <sub>d(off)</sub>  |                                                                                                           | -   | 249  | -    |      |
| Turn-off fall time                        | t <sub>f</sub>       |                                                                                                           | -   | 105  | -    |      |
| Total Gate Charge                         | Q <sub>g</sub>       | V <sub>DS</sub> =50V, I <sub>D</sub> =20A,<br>V <sub>GS</sub> =10V                                        | -   | 30   | -    | nC   |
| Gate-Source Charge                        | Q <sub>gs</sub>      |                                                                                                           | -   | 6    | -    |      |
| Gate-Drain Charge                         | Q <sub>gd</sub>      |                                                                                                           | -   | 8.2  | -    |      |
| Source-Drain Diode characteristics        |                      |                                                                                                           |     |      |      |      |
| Diode Forward voltage <sup>(3)</sup>      | V <sub>DS</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =10A                                                                  | -   | -    | 1.2  | V    |
| Diode Forward current <sup>(4)</sup>      | I <sub>S</sub>       |                                                                                                           | -   | -    | 25   | A    |

**Notes:**

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:  $T_J = 25^{\circ}\text{C}, V_{DD} = 20V, R_G = 25\Omega, L = 0.5mH$
3. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
4. Surface Mounted on FR4 Board,  $t \leq 10\text{ sec}$

## Typical Performance Characteristics

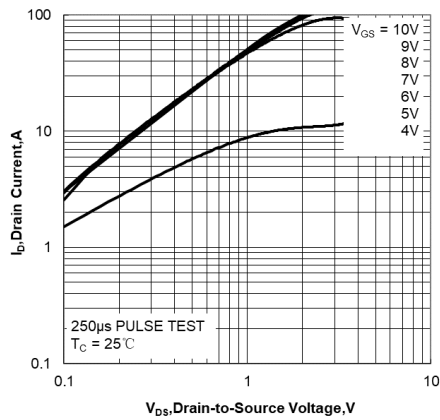


Figure 1. Output Characteristics

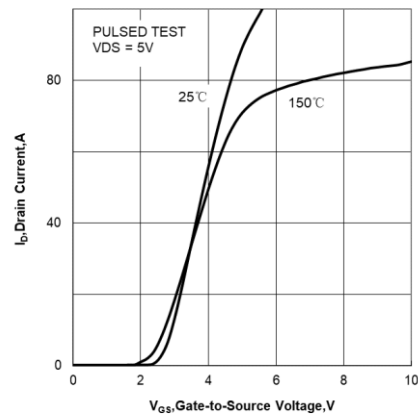


Figure 2. Transfer Characteristics

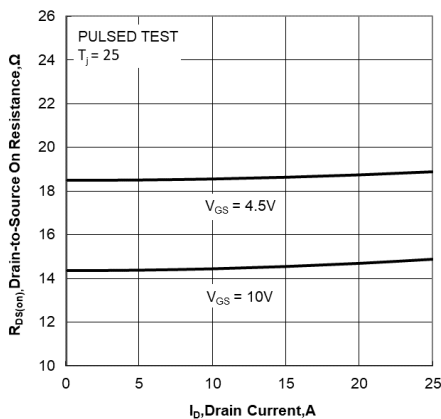


Figure 3. Drain-to-Source On Resistance  
vs Drain Current

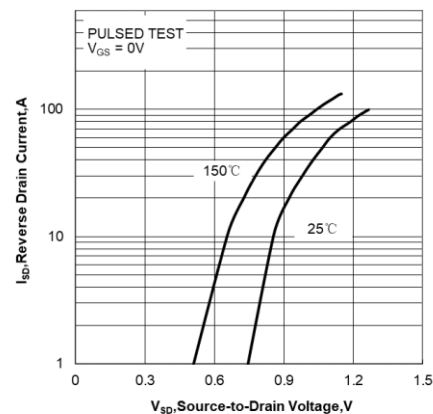


Figure 4. Body Diode Forward Voltage  
vs Source Current and Temperature

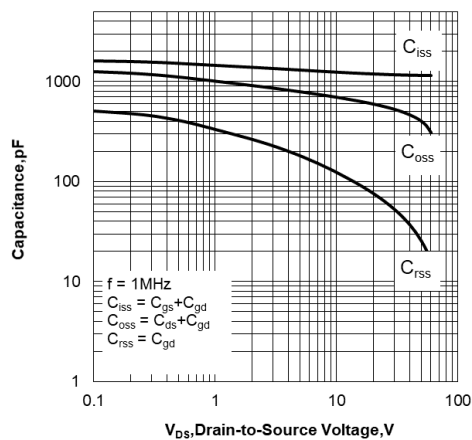


Figure 5. Capacitance Characteristics

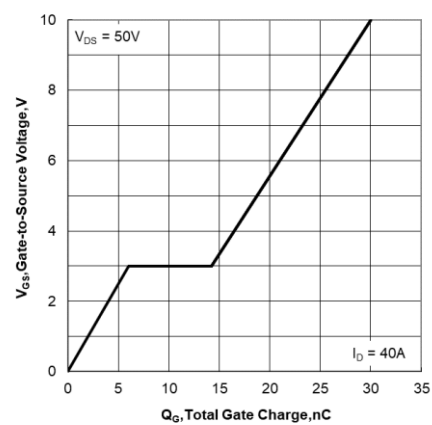
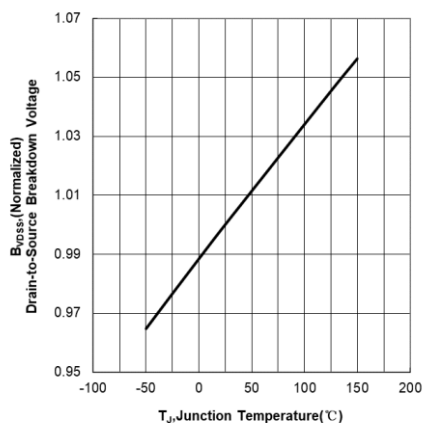
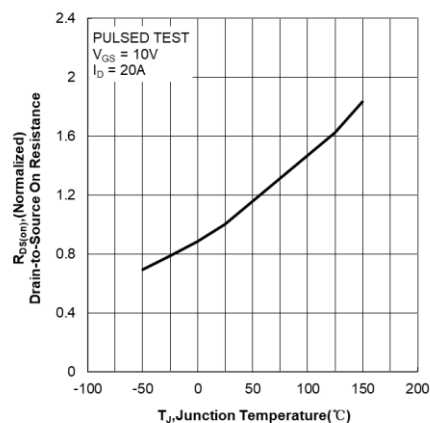


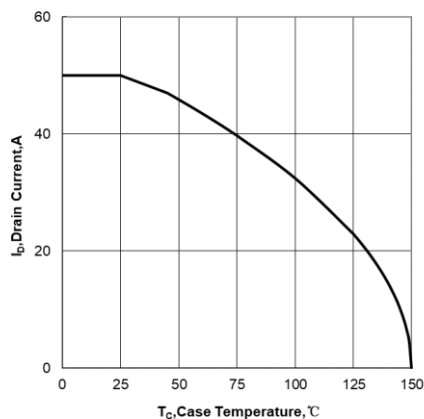
Figure 6. Gate Charge Characteristics



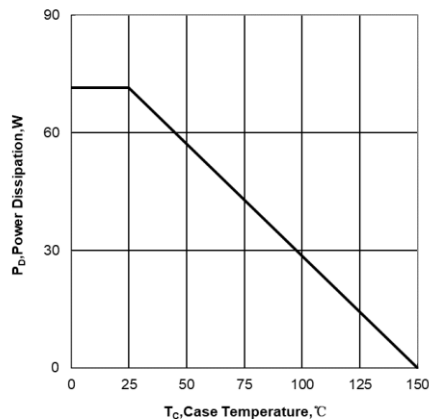
**Figure 7. Normalized Breakdown Voltage vs Junction Temperature**



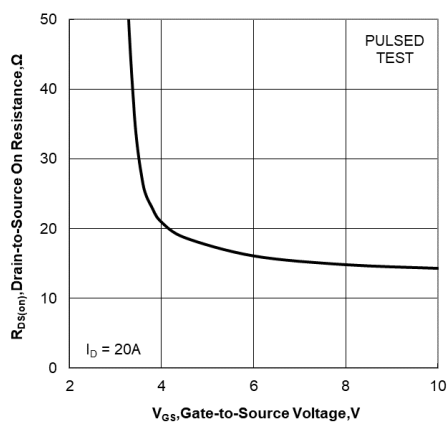
**Figure 8. Normalized On Resistance vs Junction Temperature**



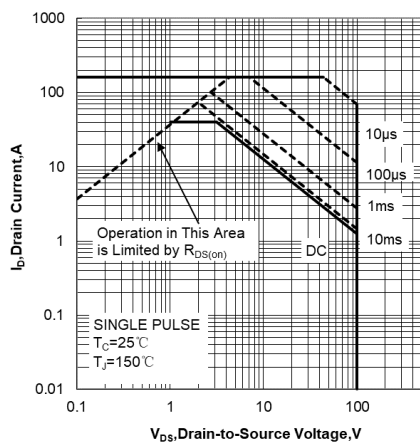
**Figure 9. Maximum Continuous Drain Current vs Case Temperature**



**Figure 10. Maximum Power Dissipation vs Case Temperature**



**Figure11. Drain-to-Source On Resistance vs Gate Voltage and Drain Current**



**Figure 12. Maximum Safe Operating Area**

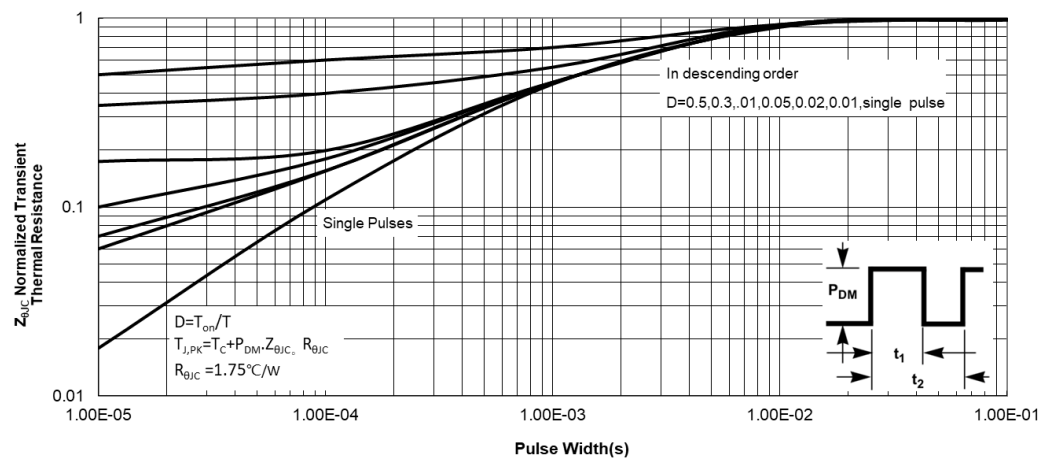
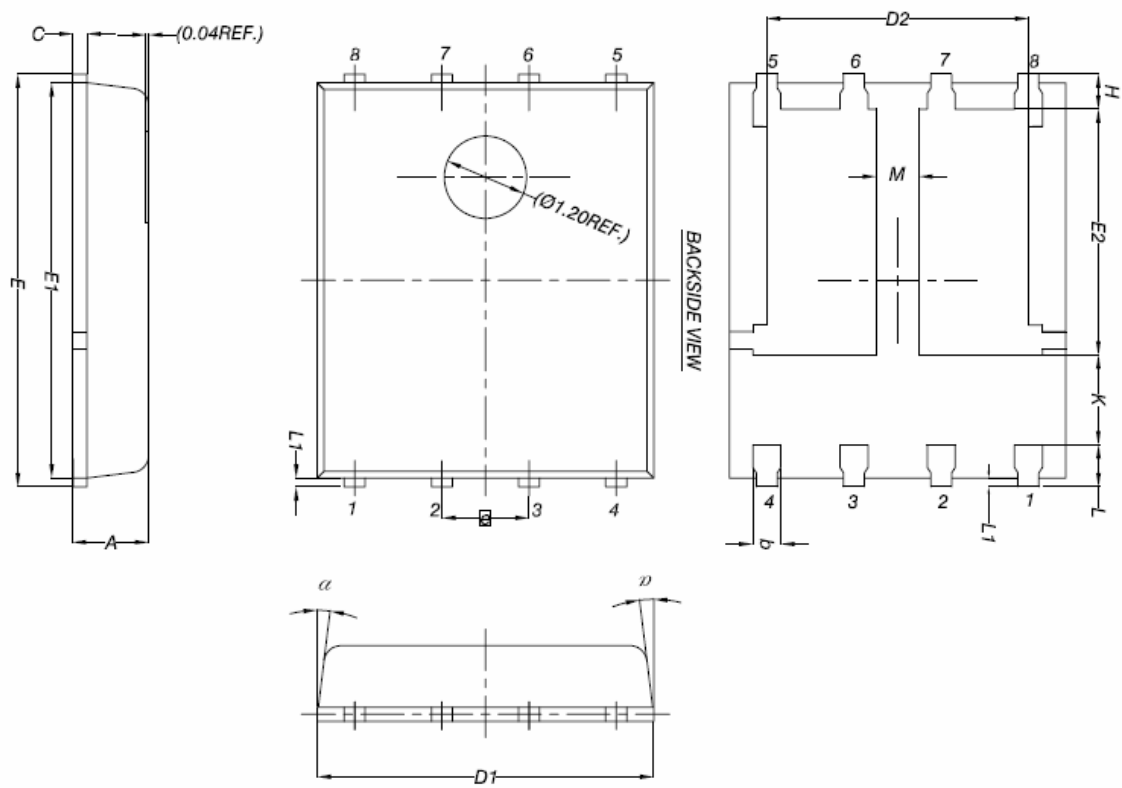


Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case

PDFN5X6-8L Package Information



| DIM. | MILLIMETERS |      |      |
|------|-------------|------|------|
|      | MIN.        | NOM. | MAX. |
| A    | 0.90        | 1.00 | 1.10 |
| b    | 0.33        | 0.41 | 0.51 |
| C    | 0.20        | 0.25 | 0.30 |
| D1   | 4.80        | 4.90 | 5.00 |
| D2   | 3.61        | 3.81 | 3.96 |
| E    | 5.90        | 6.00 | 6.10 |
| E1   | 5.70        | 5.75 | 5.80 |
| E2   | 3.38        | 3.58 | 3.78 |
| e    | 1.27 BSC    |      |      |
| H    | 0.41        | 0.51 | 0.61 |
| K    | 1.10        | -    | -    |
| L    | 0.51        | 0.61 | 0.71 |
| L1   | 0.06        | 0.13 | 0.20 |
| M    | 0.50        | -    | -    |
| α    | 0°          | -    | 12°  |