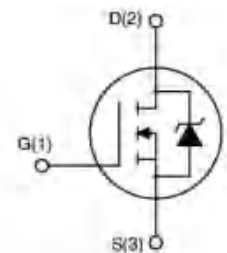


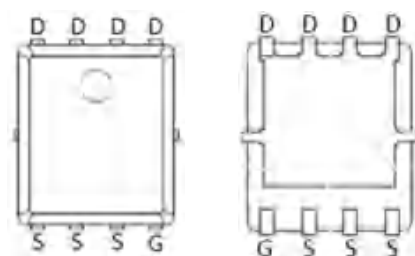
## Feature

- 150V,60A  
 $R_{DS(ON)} < 18m\Omega @ V_{GS}=10V$  (TYP:15m $\Omega$ )  
 $R_{DS(ON)} < 22m\Omega @ V_{GS}=6V$  (TYP:18m $\Omega$ )
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent  $R_{DS(ON)}$  and Low Gate Charge



## Application

- PWM applications
- Load Switch
- Power management



PDFN5X6

## Package Marking and Ordering Information

| Device Marking | Device     | Device Package | Reel Size | Tape width | Quantity (PCS) |
|----------------|------------|----------------|-----------|------------|----------------|
| G018N15G       | APG018N15G | PDFN5X6        | -         | -          | 5000           |

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

| Parameter                                              | Symbol          | Value     | Unit                 |
|--------------------------------------------------------|-----------------|-----------|----------------------|
| Drain-Source Voltage                                   | $V_{DS}$        | 150       | V                    |
| Gate-Source Voltage                                    | $V_{GS}$        | $\pm 25$  | V                    |
| Continuous Drain Current ( $T_a=25^{\circ}\text{C}$ )  | $I_D$           | 60        | A                    |
| Continuous Drain Current ( $T_a=100^{\circ}\text{C}$ ) | $I_D$           | 38.4      | A                    |
| Pulsed Drain Current <sup>(1)</sup>                    | $I_{DM}$        | 120       | A                    |
| Single Pulsed Avalanche Energy <sup>(2)</sup>          | $E_{AS}$        | 580       | mJ                   |
| Power Dissipation                                      | $P_D$           | 140       | W                    |
| Thermal Resistance from Junction to Case               | $R_{\theta JC}$ | 0.89      | $^{\circ}\text{C/W}$ |
| Thermal Resistance from Junction to Ambient            | $R_{\theta JA}$ | 62.5      | $^{\circ}\text{C/W}$ |
| Junction Temperature                                   | $T_J$           | 175       | $^{\circ}\text{C}$   |
| Storage Temperature                                    | $T_{STG}$       | -55~ +175 | $^{\circ}\text{C}$   |

**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                                              | 150 | -    | -    | V    |
| Zero gate voltage drain current           | I <sub>DSS</sub>     | V <sub>DS</sub> =150V, V <sub>GS</sub> = 0V                                              | -   | -    | 1    | μA   |
| Gate-body leakage current                 | I <sub>GSS</sub>     | V <sub>GS</sub> = ± 25V, 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                                 | 2.0 | -    | 4.0  | 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> =6V, I <sub>D</sub> =10A                                                 | -   | 18   | 22   | mΩ   |
| Dynamic characteristics                   |                      |                                                                                          |     |      |      |      |
| Input Capacitance                         | C <sub>iss</sub>     | V <sub>DS</sub> =75V, V <sub>GS</sub> =0V, f =1MHz                                       | -   | 2881 | -    | pF   |
| Output Capacitance                        | C <sub>oss</sub>     |                                                                                          | -   | 207  | -    |      |
| Reverse Transfer Capacitance              | C <sub>rss</sub>     |                                                                                          | -   | 23   | -    |      |
| Switching characteristics                 |                      |                                                                                          |     |      |      |      |
| Turn-on delay time                        | t <sub>d(on)</sub>   | V <sub>DD</sub> =75V, I <sub>D</sub> =20A,<br>V <sub>GS</sub> =10V, R <sub>G</sub> =4.5Ω | -   | 15   | -    | ns   |
| Turn-on rise time                         | t <sub>r</sub>       |                                                                                          | -   | 34   | -    |      |
| Turn-off delay time                       | t <sub>d(off)</sub>  |                                                                                          | -   | 30   | -    |      |
| Turn-off fall time                        | t <sub>f</sub>       |                                                                                          | -   | 26   | -    |      |
| Total Gate Charge                         | Q <sub>g</sub>       | V <sub>D</sub> S=75V, I <sub>D</sub> =20A,<br>V <sub>G</sub> S=10V                       | -   | 30.5 | -    | nC   |
| Gate-Source Charge                        | Q <sub>gs</sub>      |                                                                                          | -   | 16.1 | -    |      |
| Gate-Drain Charge                         | Q <sub>gd</sub>      |                                                                                          | -   | 10.8 | -    |      |
| Reverse Recovery Chrage                   | Q <sub>rr</sub>      | I <sub>F</sub> =20A,di/dt=100A/us                                                        |     | 310  |      | nC   |
| Reverse Recovery Time                     | T <sub>rr</sub>      | I <sub>F</sub> =20A,di/dt=100A/us                                                        |     | 86   |      | ns   |
| Source-Drain Diode characteristics        |                      |                                                                                          |     |      |      |      |
| Diode Forward voltage <sup>(3)</sup>      | V <sub>DS</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =40A                                                 | -   | -    | 1.3  | V    |
| Diode Forward current <sup>(4)</sup>      | I <sub>S</sub>       |                                                                                          | -   | -    | 60   | A    |

**Notes:**

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:  $T_J = 25^{\circ}\text{C}, V_{DD} = 50V, R_G = 25\Omega, L = 0.5mH$
3. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
4. Surface Mounted on FR4 Board,  $t \leq 10\text{ sec}$

■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

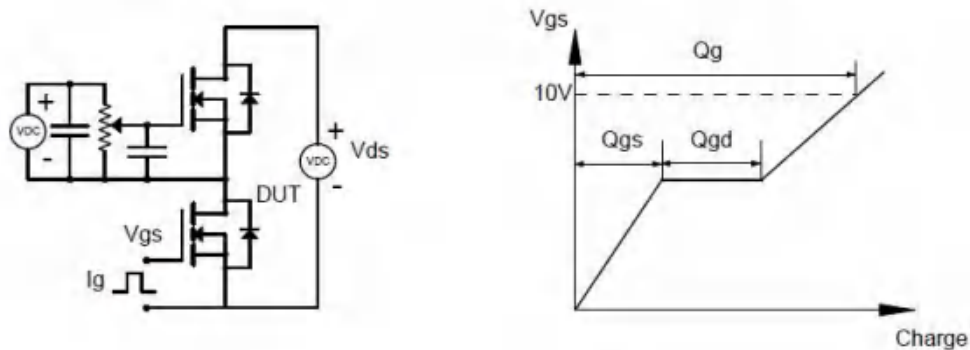


Figure B: Resistive Switching Test Circuit & Waveforms

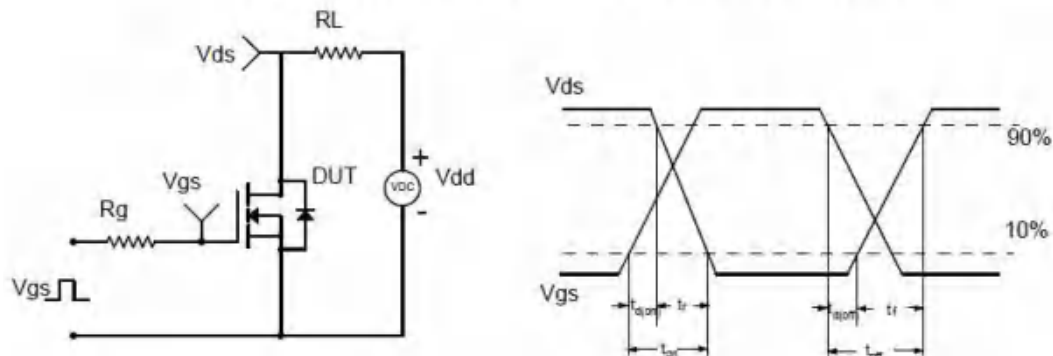


Figure C: Unclamped Inductive Switching (UIS) Test

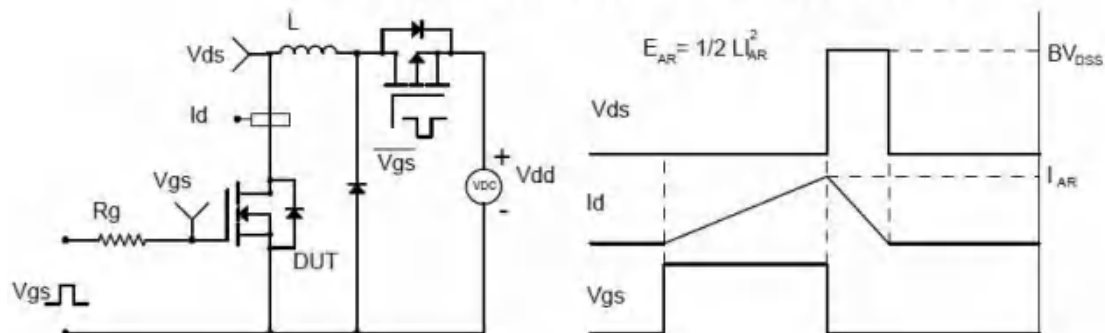
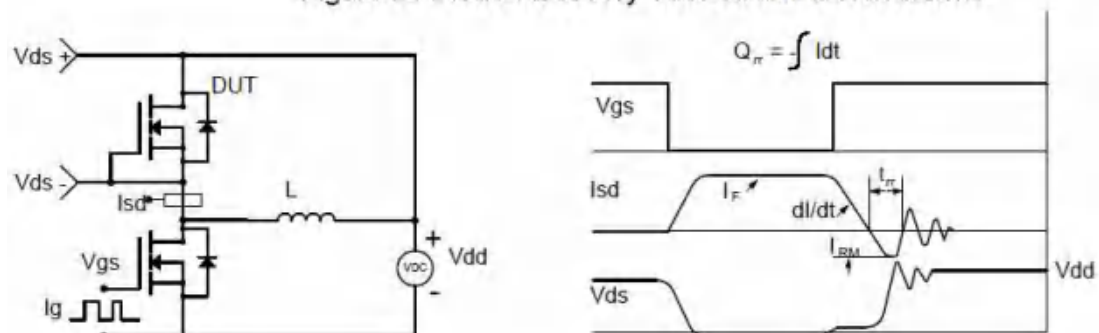
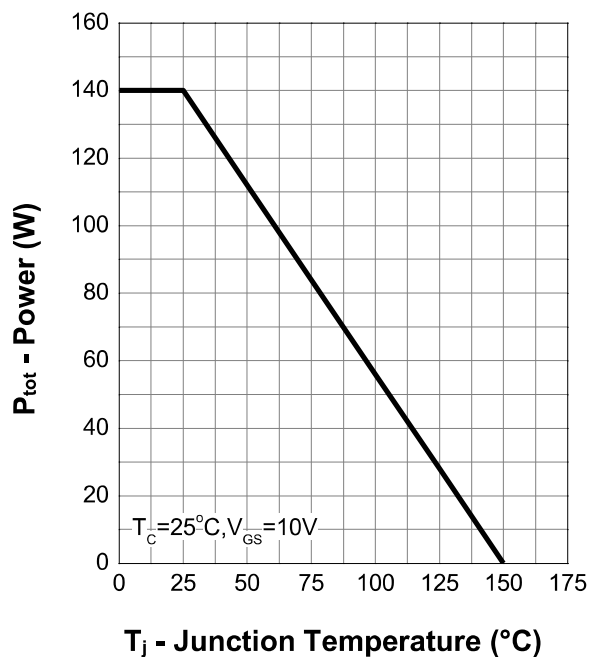


Figure D: Diode Recovery Test Circuit & Waveforms

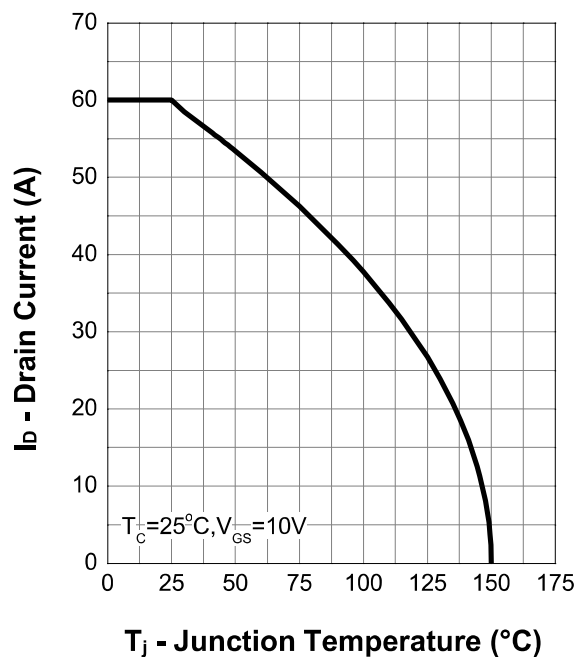


## Typical Characteristics (Cont.)

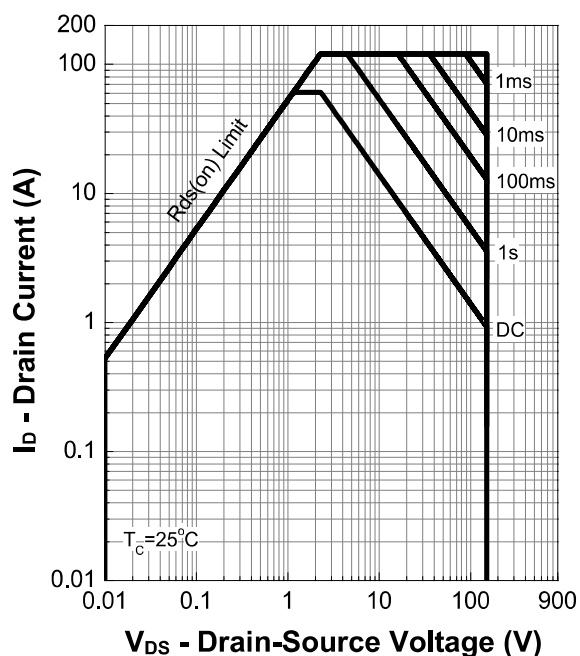
Power Capability



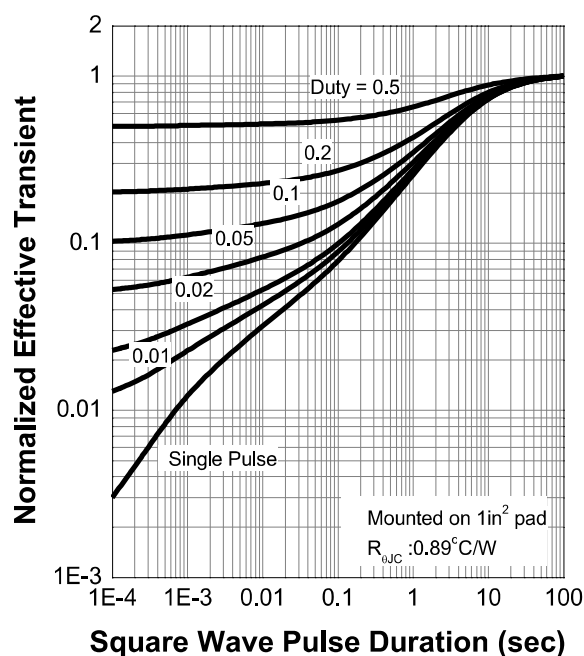
Current Capability



Safe Operating Area

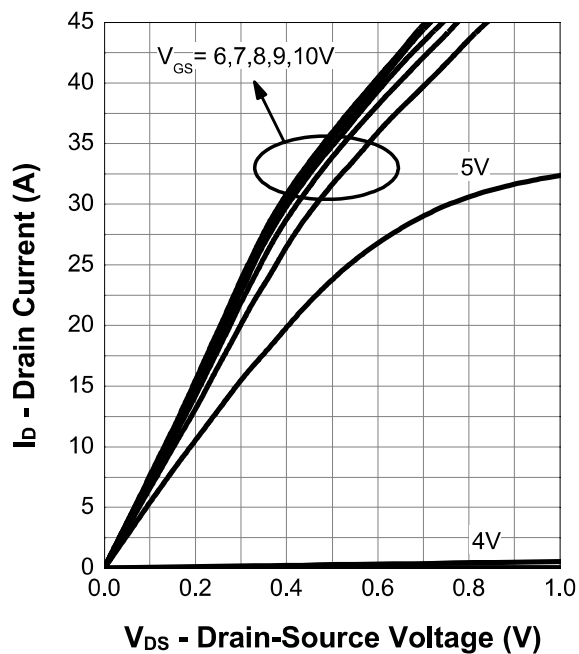


Transient Thermal Impedance

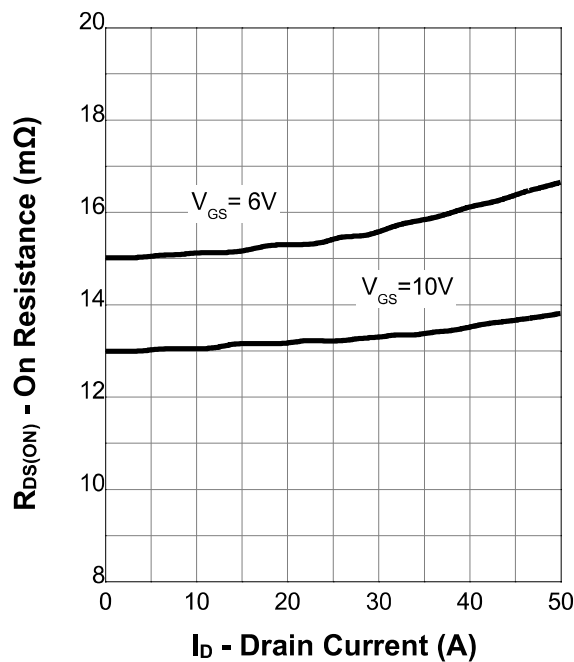


## Typical Characteristics (Cont.)

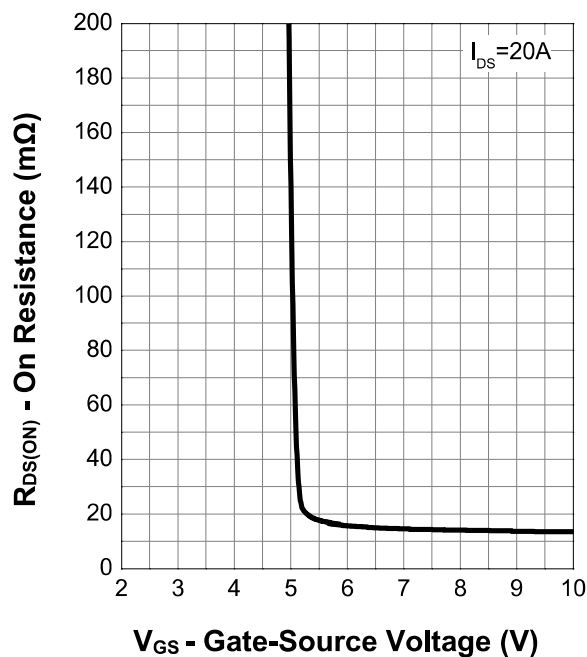
Output Characteristics



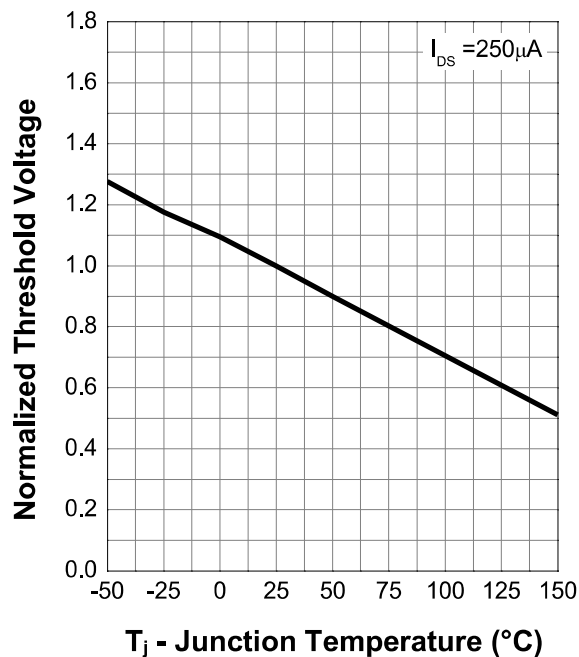
On Resistance



Transfer Characteristics

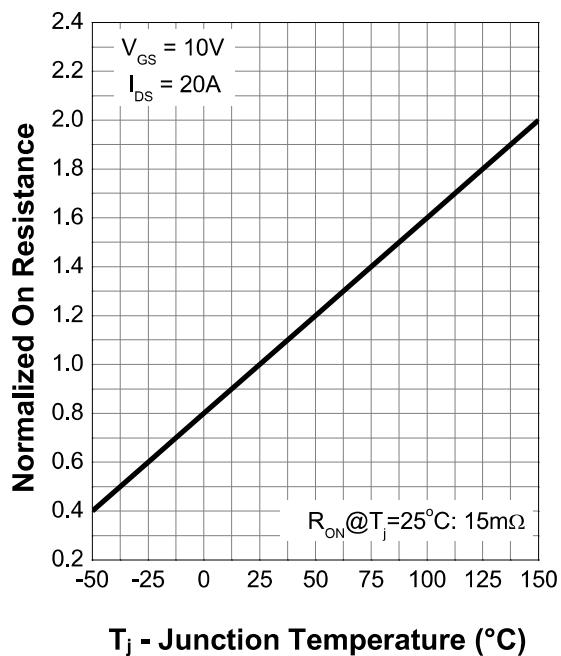


Normalized Threshold Voltage

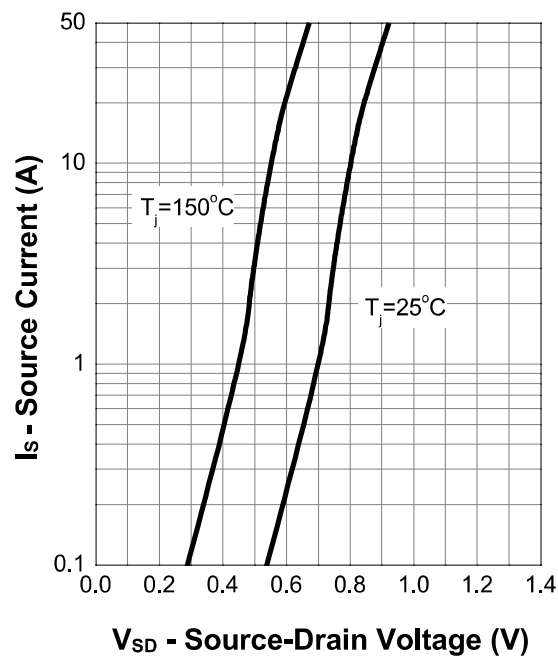


## Typical Characteristics (Cont.)

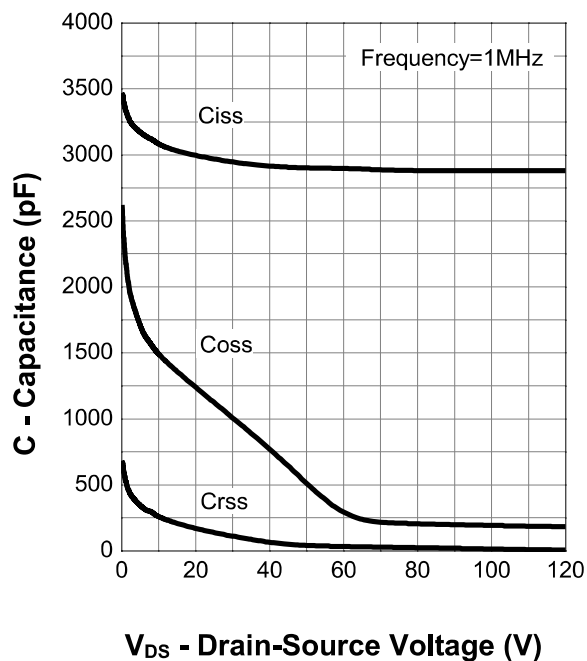
Normalized On Resistance



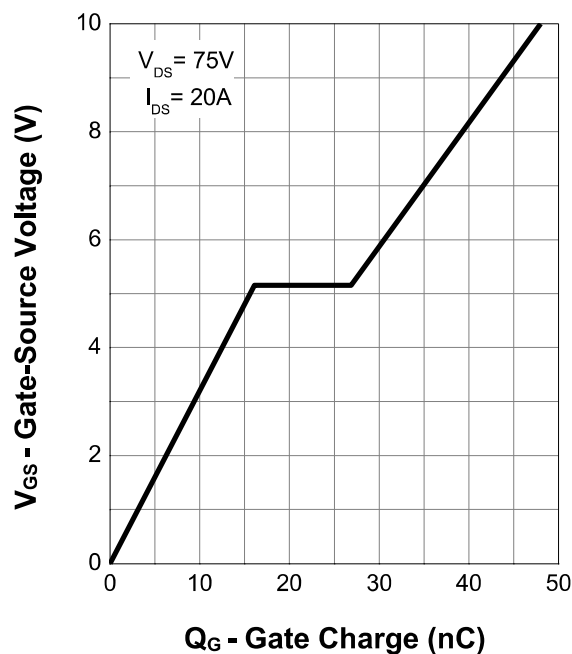
Diode Forward Current



Capacitance

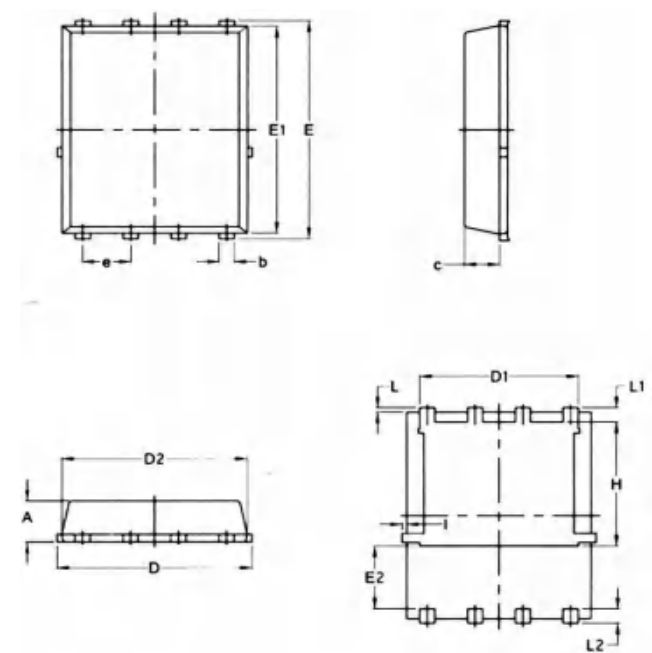


Gate Charge



APG018N15G  
N-Channel Enhancement Mosfet

PDFN5X6 Package Information



PDFN5X6

| 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   | 0.0382 |
| 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 |