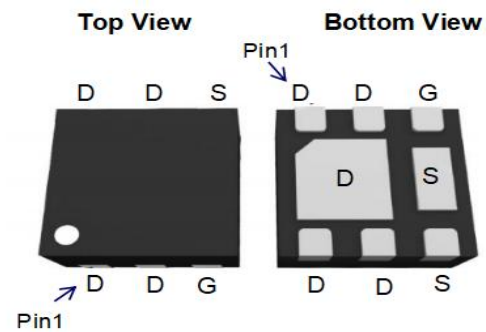


## Features

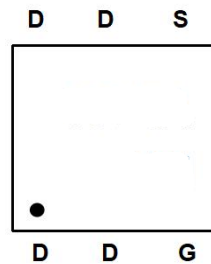
- 30V, 16A  
 $R_{DS(ON)}$  Typ = 10m $\Omega$  @  $V_{GS}$  = 10V  
 $R_{DS(ON)}$  Typ = 15m $\Omega$  @  $V_{GS}$  = 4.5V
- Advanced Split Gate Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free



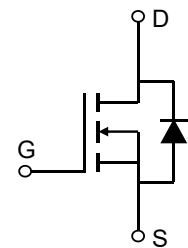
DFN2020-6L

## Application

- Load Switch
- PWM Application
- Power Management



Pin Assignment



Schematic Diagram

## Absolute Maximum Ratings (@ $T_J$ = 25°C unless otherwise specified)

| Symbol                            | Parameter                            | Value                  | Units |   |
|-----------------------------------|--------------------------------------|------------------------|-------|---|
| V <sub>DS</sub>                   | Drain-to-Source Voltage              | 30                     | V     |   |
| V <sub>GS</sub>                   | Gate-to-Source Voltage               | ±20                    | V     |   |
| I <sub>D</sub>                    | Continuous Drain Current             | T <sub>C</sub> = 25°C  | 16    | A |
|                                   |                                      | T <sub>C</sub> = 100°C | 9.6   | A |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>(1)</sup>  | 64                     | A     |   |
| P <sub>D</sub>                    | Power Dissipation                    | T <sub>C</sub> = 25°C  | 6.25  | W |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case | 20                     | °C/W  |   |
| T <sub>J</sub> , T <sub>STG</sub> | Junction & Storage Temperature Range | -55 to 150             | °C    |   |

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

| Symbol                                             | Parameter                                                | Conditions                                                                                 | Min.                                  | Typ. | Max. | Unit |
|----------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------|------|------|------|
| Off Characteristics                                |                                                          |                                                                                            |                                       |      |      |      |
| V <sub>(BR)DSS</sub>                               | Drain-Source Breakdown Voltage                           | I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V                                               | 30                                    | -    | -    | V    |
| I <sub>DSS</sub>                                   | Zero Gate Voltage Drain Current                          | V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V                                                | -                                     | -    | 1.0  | μA   |
| I <sub>GSS</sub>                                   | Gate-Body Leakage Current                                | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V                                               | -                                     | -    | ±100 | nA   |
| On Characteristics                                 |                                                          |                                                                                            |                                       |      |      |      |
| V <sub>GS(th)</sub>                                | Gate Threshold Voltage                                   | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                 | 1                                     | 1.45 | 2    | V    |
| R <sub>DS(ON)</sub>                                | Static Drain-Source ON-Resistance <sup>(2)</sup>         | V <sub>GS</sub> = 10V, I <sub>D</sub> = 8A                                                 | -                                     | 10   | 13.8 | mΩ   |
|                                                    |                                                          | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A                                                | -                                     | 15   | 19.5 | mΩ   |
| Dynamic Characteristics                            |                                                          |                                                                                            |                                       |      |      |      |
| C <sub>iss</sub>                                   | Input Capacitance                                        | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V,<br>f = 1MHz                                   | -                                     | 284  | -    | pF   |
| C <sub>oss</sub>                                   | Output Capacitance                                       |                                                                                            | -                                     | 184  | -    | pF   |
| C <sub>rss</sub>                                   | Reverse Transfer Capacitance                             |                                                                                            | -                                     | 15   | -    | pF   |
| Q <sub>g</sub>                                     | Total Gate Charge                                        | V <sub>GS</sub> = 0 to 10V<br>V <sub>DS</sub> = 15V, I <sub>D</sub> = 5A                   | -                                     | 15   | -    | nC   |
| Q <sub>gs</sub>                                    | Gate Source Charge                                       |                                                                                            | -                                     | 3    | -    | nC   |
| Q <sub>gd</sub>                                    | Gate Drain("Miller") Charge                              |                                                                                            | -                                     | 5.6  | -    | nC   |
| Switching Characteristics                          |                                                          |                                                                                            |                                       |      |      |      |
| t <sub>d(on)</sub>                                 | Turn-On DelayTime                                        | V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V<br>I <sub>D</sub> = 5A, R <sub>GEN</sub> = 3Ω | -                                     | 9    | -    | ns   |
| t <sub>r</sub>                                     | Turn-On Rise Time                                        |                                                                                            | -                                     | 7    | -    | ns   |
| t <sub>d(off)</sub>                                | Turn-Off DelayTime                                       |                                                                                            | -                                     | 19   | -    | ns   |
| t <sub>f</sub>                                     | Turn-Off Fall Time                                       |                                                                                            | -                                     | 4    | -    | ns   |
| Drain-Source Diode Characteristics and Max Ratings |                                                          |                                                                                            |                                       |      |      |      |
| I <sub>S</sub>                                     | Maximum Continuous Drain to Source Diode Forward Current | V <sub>GS</sub> = 0V, I <sub>S</sub> = 8A                                                  | -                                     | -    | 16   | A    |
| I <sub>SM</sub>                                    | Maximum Pulsed Drain to Source Diode Forward Current     |                                                                                            | -                                     | -    | 64   | A    |
| V <sub>SD</sub>                                    | Drain to Source Diode Forward Voltage                    |                                                                                            | -                                     | -    | 1.2  | V    |
| t <sub>rr</sub>                                    | Body Diode Reverse Recovery Time                         |                                                                                            | -                                     | 19   | -    | ns   |
| Q <sub>rr</sub>                                    | Body Diode Reverse Recovery Charge                       |                                                                                            | I <sub>F</sub> = 15A, di/dt = 100A/us | -    | 11   | -    |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

## Test Circuit

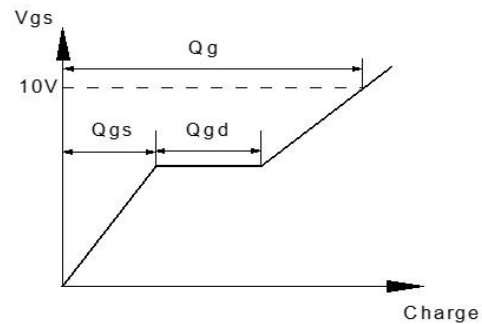
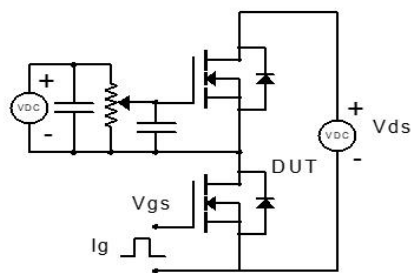


Figure 1: Gate Charge Test Circuit & Waveform

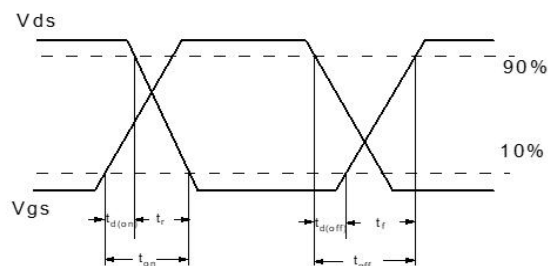
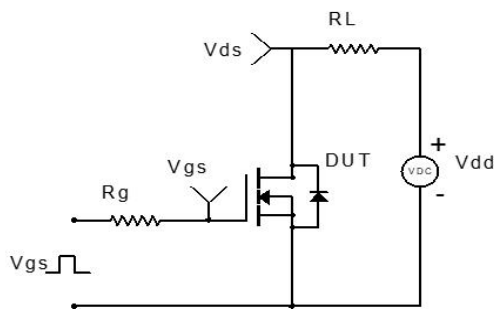


Figure 2: Resistive Switching Test Circuit & Waveform

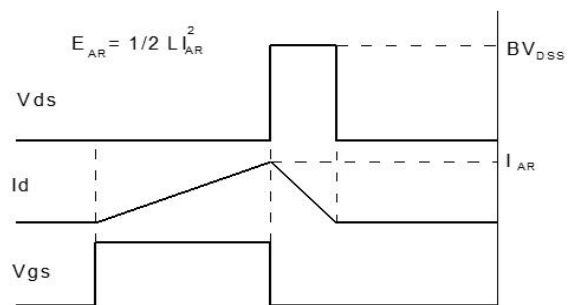
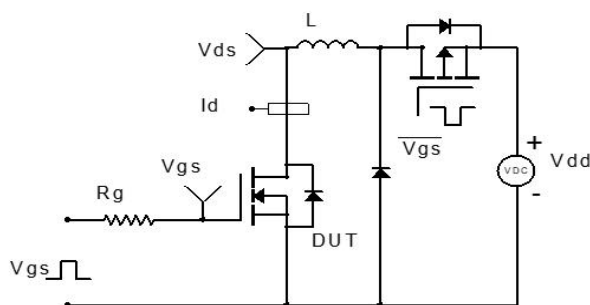


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

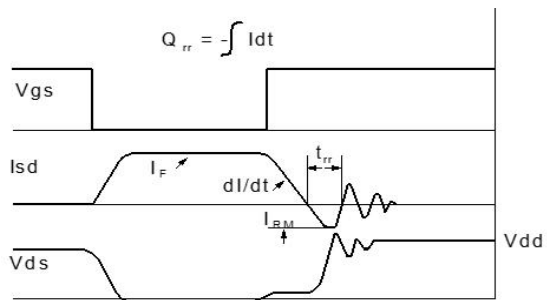
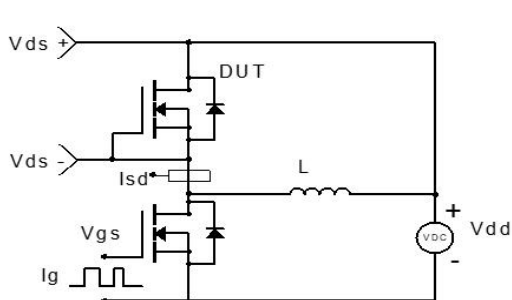
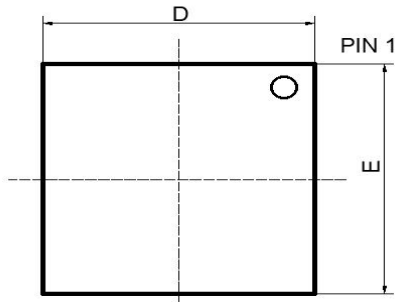
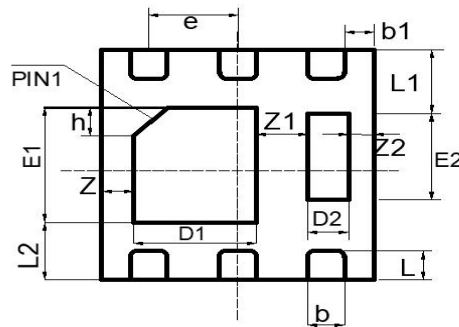


Figure 4: Diode Recovery Test Circuit & Waveform

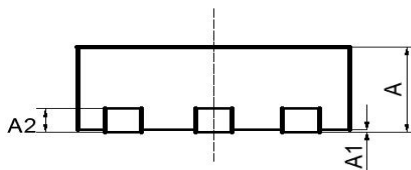
## Package Mechanical Data(DFN2020-6L)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

| SYMBOL | MIN      | NOM  | MAX  |
|--------|----------|------|------|
| A      | 0.70     | 0.75 | 0.80 |
| A1     | NA       | 0.02 | 0.05 |
| A2     | 0.18     | 0.20 | 0.25 |
| b      | 0.20     | 0.27 | 0.34 |
| D      | 1.95     | 2.00 | 2.05 |
| E      | 1.95     | 2.00 | 2.05 |
| D1     | 0.80     | 0.90 | 1.00 |
| E1     | 0.90     | 1.00 | 1.10 |
| D2     | 0.20     | 0.30 | 0.40 |
| E2     | 0.65     | 0.75 | 0.85 |
| L      | 0.20     | 0.25 | 0.35 |
| L1     | 0.50     | 0.55 | 0.60 |
| L2     | 0.45     | 0.50 | 0.55 |
| b1     | 0.17     | 0.22 | 0.27 |
| Z      | 0.20     | 0.25 | 0.30 |
| Z1     | 0.30     | 0.35 | 0.40 |
| Z2     | 0.15     | 0.20 | 0.25 |
| h      | 0.20     | 0.25 | 0.30 |
| e      | 0.65 BSC |      |      |