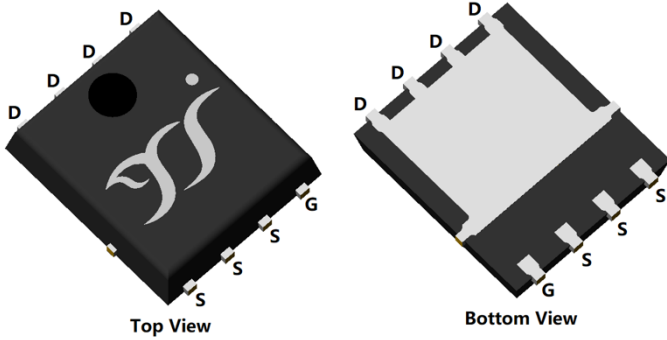
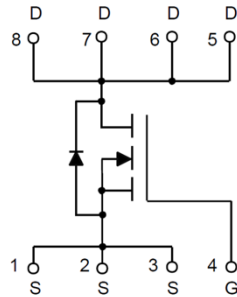


## N-Channel Enhancement Mode Field Effect Transistor



PDFN5060-8L



### Product Summary

- $V_{DS}$  100V
- $I_D$  18A
- $R_{DS(ON)}$  (at  $V_{GS}=10V$ )  $<60m\Omega$
- $R_{DS(ON)}$  (at  $V_{GS}=4.5V$ )  $<70m\Omega$
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

### General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- DC-DC Converters
- Power management functions
- Backlighting

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter                                           |                         | Symbol          | Limit           | Unit                      |
|-----------------------------------------------------|-------------------------|-----------------|-----------------|---------------------------|
| Drain-source Voltage                                |                         | $V_{DS}$        | 100             | V                         |
| Gate-source Voltage                                 |                         | $V_{GS}$        | $\pm 20$        | V                         |
| Drain Current                                       | $T_A=25^\circ\text{C}$  | $I_D$           | 3.5             | A                         |
|                                                     | $T_A=100^\circ\text{C}$ |                 | 2               |                           |
|                                                     | $T_C=25^\circ\text{C}$  |                 | 18              |                           |
|                                                     | $T_C=100^\circ\text{C}$ |                 | 11.4            |                           |
| Pulsed Drain Current <sup>A</sup>                   |                         | $I_{DM}$        | 75              | A                         |
| Total Power Dissipation <sup>B</sup>                | $T_A=25^\circ\text{C}$  | $P_D$           | 2               | W                         |
|                                                     | $T_A=100^\circ\text{C}$ |                 | 0.8             |                           |
|                                                     | $T_C=25^\circ\text{C}$  |                 | 45              |                           |
|                                                     | $T_C=100^\circ\text{C}$ |                 | 18              |                           |
| Single Pulse Avalanche Energy <sup>C</sup>          |                         | $E_{AS}$        | 12.5            | mJ                        |
| Thermal Resistance Junction-to-Case                 |                         | $R_{\theta JC}$ | 2.8             | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction-to-Ambient <sup>D</sup> |                         | $R_{\theta JA}$ | 60              | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range              |                         | $T_J, T_{STG}$  | $-55 \sim +150$ | $^\circ\text{C}$          |

### ■ Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking   | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|-----------|----------------------|-------------------------|----------------------------|---------------|
| YJG18N10A     | F1           | YJG18N10A | 5000                 | 10000                   | 100000                     | 13" reel      |



# YJG18N10A

## ■ Electrical Characteristics (T<sub>J</sub>=25℃ unless otherwise noted)

| Parameter                             | Symbol              | Conditions                                                                             | Min | Typ  | Max   | Units |
|---------------------------------------|---------------------|----------------------------------------------------------------------------------------|-----|------|-------|-------|
| Static Parameter                      |                     |                                                                                        |     |      |       |       |
| Drain-Source Breakdown Voltage        | BV <sub>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                | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                              | 1.1 | 1.8  | 3.0   | V     |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> = 10V, I <sub>D</sub> =8A                                              |     | 49   | 60    | mΩ    |
|                                       |                     | V <sub>GS</sub> = 4.5V, I <sub>D</sub> =8A                                             |     | 52   | 70    |       |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =18A, V <sub>GS</sub> =0V                                               |     | 0.8  | 1.2   | V     |
| Gate resistance                       | R <sub>G</sub>      | f=1MHz, Open drain                                                                     | -   | 1.2  | -     | Ω     |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                        |     |      | 18    | A     |
| Dynamic Parameters                    |                     |                                                                                        |     |      |       |       |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHZ                                      |     | 2071 |       | pF    |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                        |     | 73   |       |       |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                        |     | 54   |       |       |
| Switching Parameters                  |                     |                                                                                        |     |      |       |       |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =10A                        |     | 51.4 |       | nC    |
| Gate-Source Charge                    | Q <sub>gs</sub>     |                                                                                        |     | 9.1  |       |       |
| Gate-Drain Charge                     | Q <sub>gd</sub>     |                                                                                        |     | 11.5 |       |       |
| Reverse Recovery Chrage               | Q <sub>rr</sub>     | I <sub>F</sub> =10A, di/dt=100A/us                                                     |     | 35.3 |       | ns    |
| Reverse Recovery Time                 | t <sub>rr</sub>     |                                                                                        |     | 38   |       |       |
| Turn-on Delay Time                    | t <sub>D(on)</sub>  | V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =2A<br>R <sub>GEN</sub> =3Ω |     | 10   |       |       |
| Turn-on Rise Time                     | t <sub>r</sub>      |                                                                                        |     | 19   |       |       |
| Turn-off Delay Time                   | t <sub>D(off)</sub> |                                                                                        |     | 42   |       |       |
| Turn-off fall Time                    | t <sub>f</sub>      |                                                                                        |     | 26   |       |       |

- A. Repetitive rating; pulse width limited by max. junction temperature.  
 B. P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.  
 C. T<sub>J</sub>=25℃, V<sub>DD</sub>=50V, V<sub>GS</sub>=10V, L=1mH, I<sub>AS</sub>=5A.  
 D. The value of RθJA is measured with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in the still air environment with T<sub>A</sub> =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

## ■ Typical Performance Characteristics

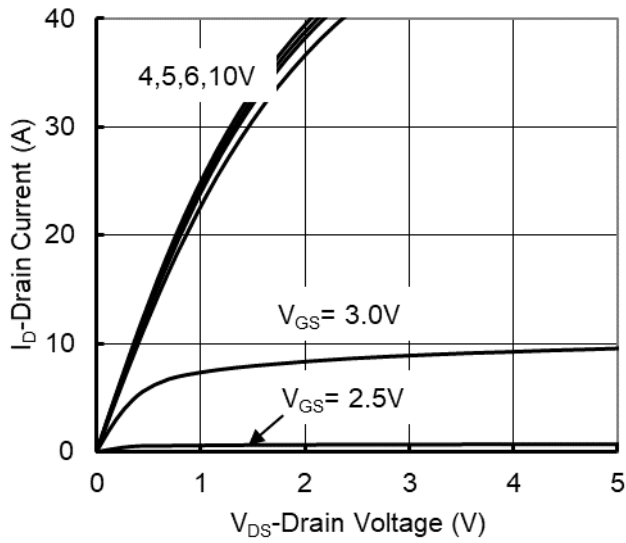


Figure 1. Output Characteristics

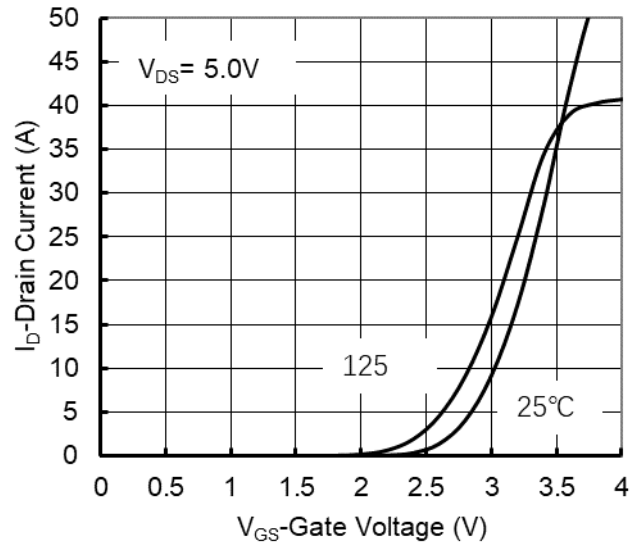


Figure 2. Transfer Characteristics

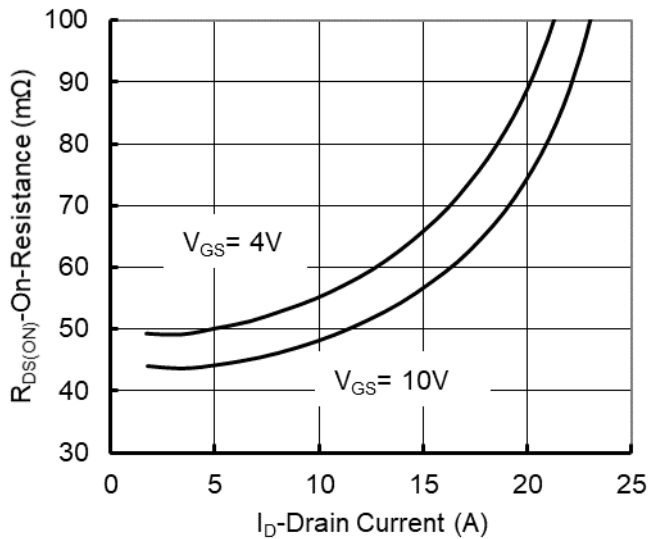


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

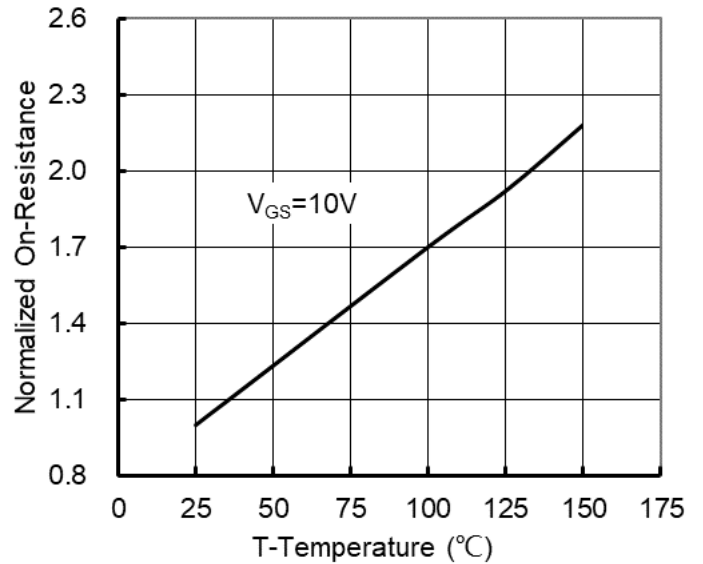


Figure 4. On-Resistance vs. Junction Temperature

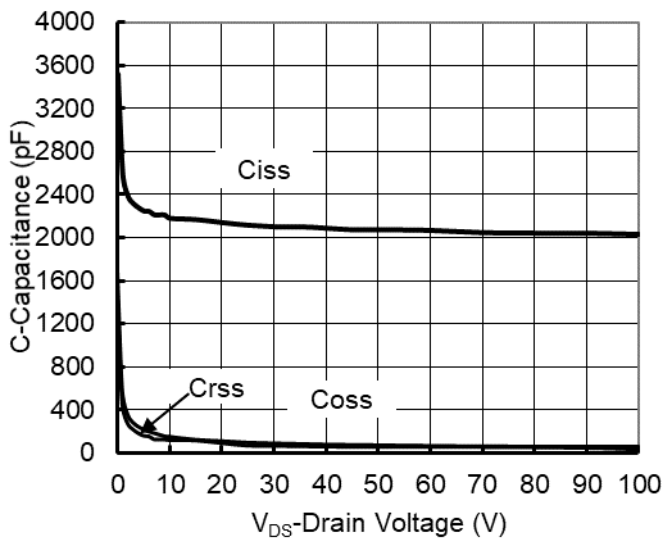


Figure 5. Capacitance Characteristics

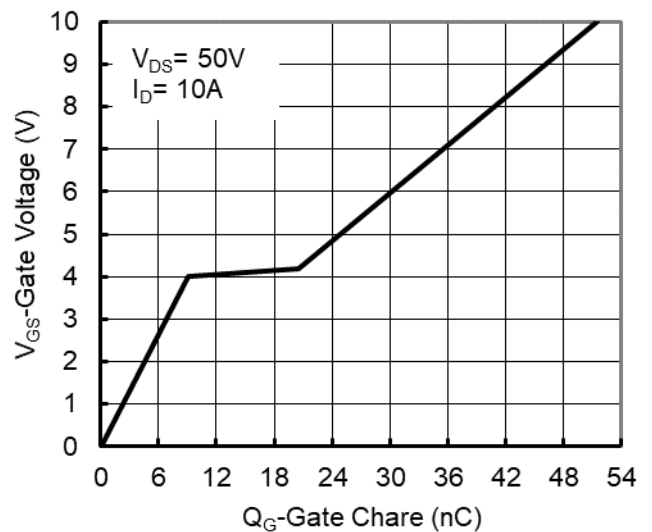


Figure 6. Gate Charge

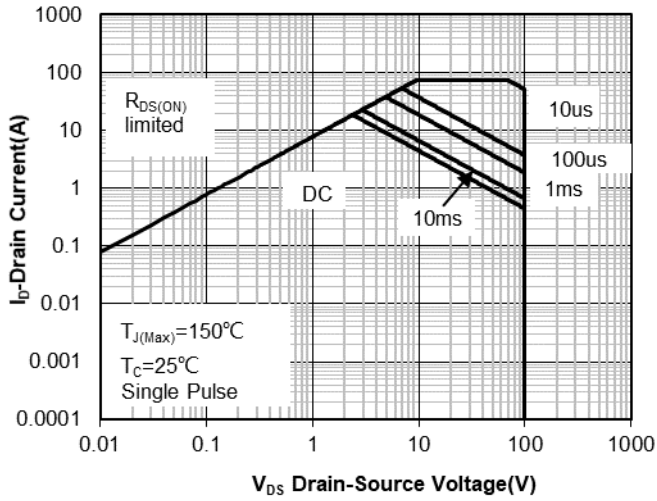


Figure 7. Safe Operation Area

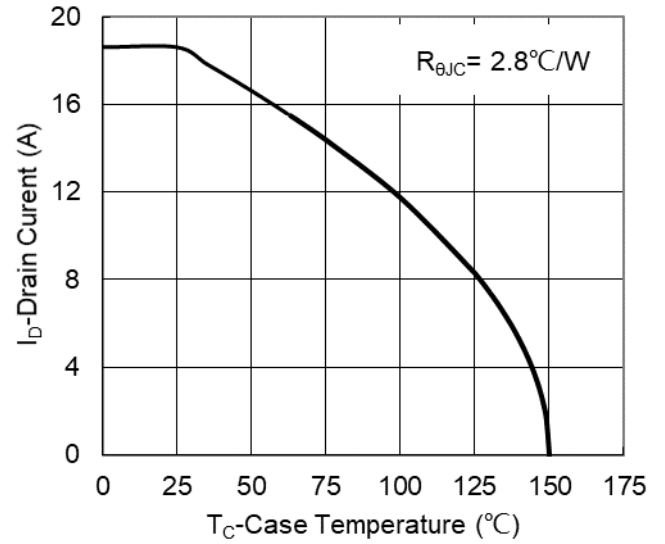


Figure 8. Maximum Continuous Drain Current vs Case Temperature

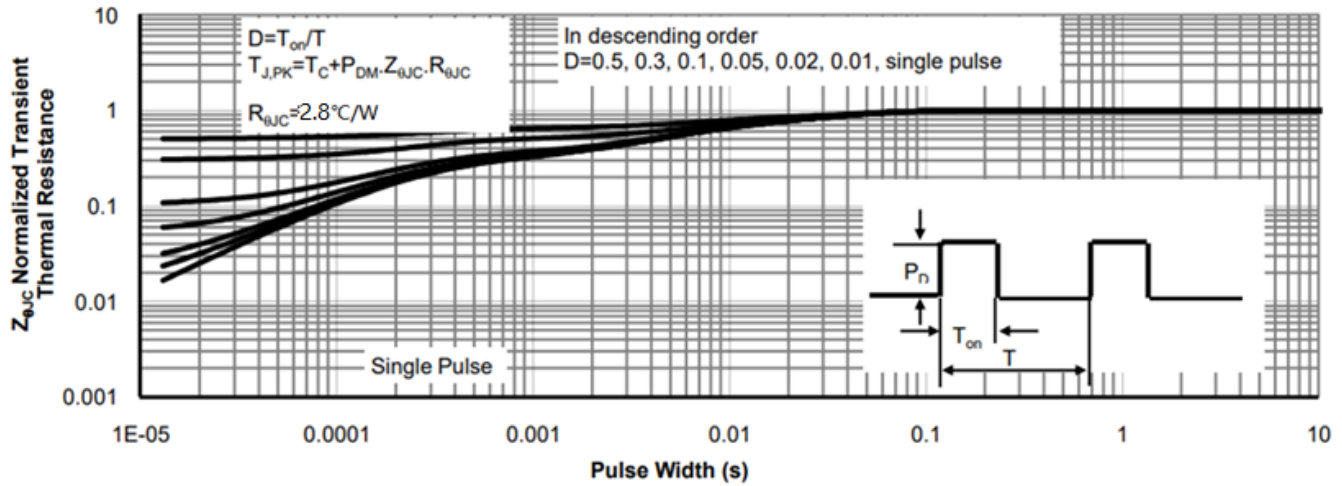
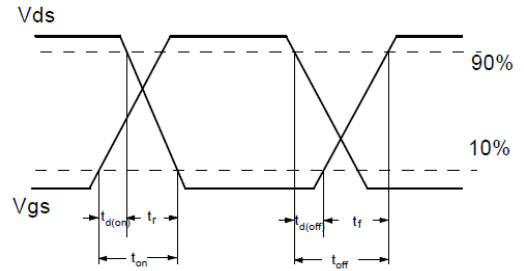
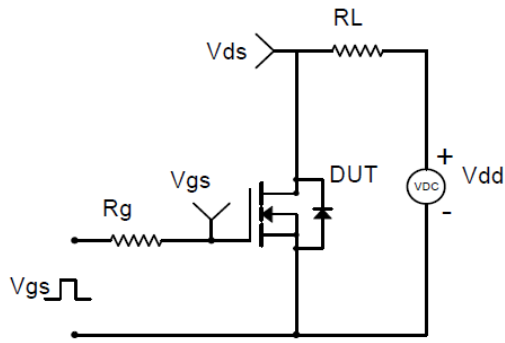
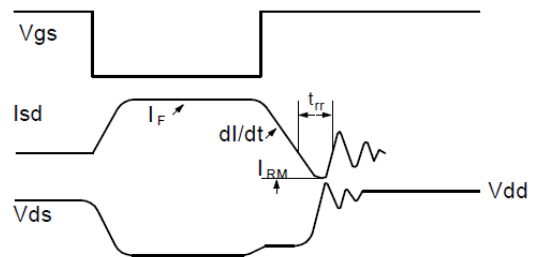
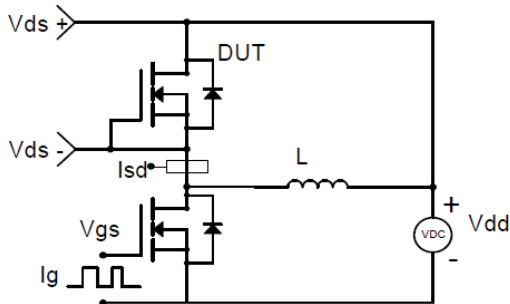


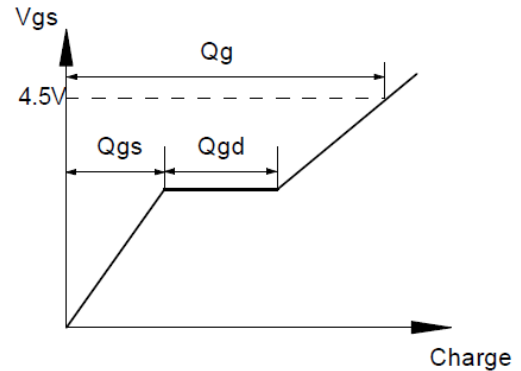
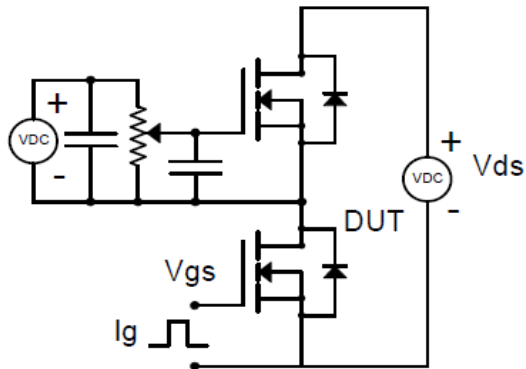
Figure 9. Normalized Maximum Transient Thermal Impedance



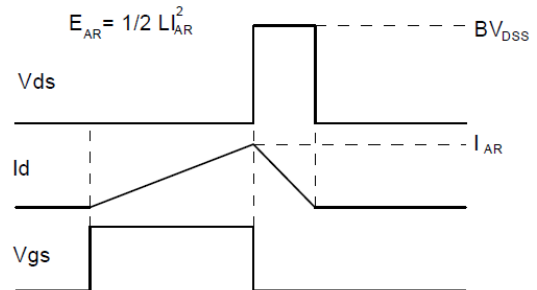
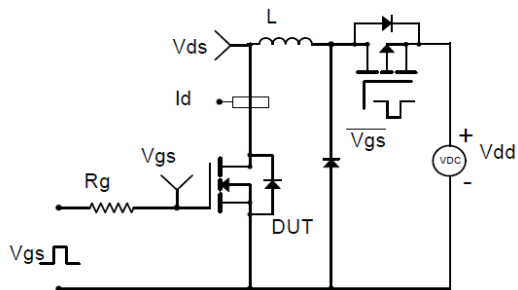
**Resistive Switching Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**



**Gate Charge Test Circuit & Waveform**

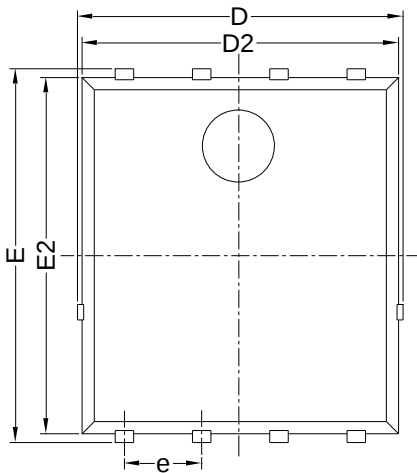


**Unclamped Inductive Switching (UIS) Test Circuit & Waveforms**

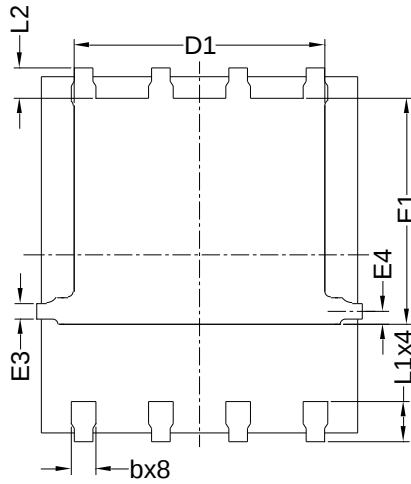


## YJG18N10A

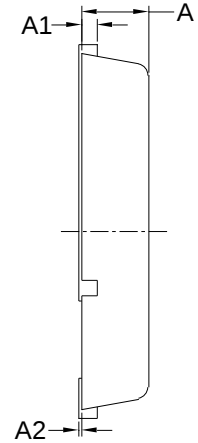
### ■ PDFN5060-8L-B-1.1MM Package Information



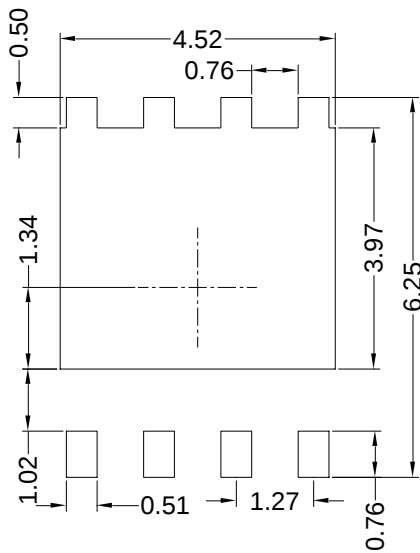
Top View  
正面视图



Bottom View  
背面视图



Side View  
侧面视图



Suggested Solder Pad Layout  
Top View

| SYMBOL | MILLIMETER |      |      |
|--------|------------|------|------|
|        | MIN        | NOM  | MAX  |
| D      | 5.15       | 5.35 | 5.55 |
| E      | 5.95       | 6.15 | 6.35 |
| A      | 1.00       | 1.10 | 1.20 |
| A1     | 0.254 BSC  |      |      |
| A2     |            |      | 0.10 |
| D1     | 3.92       | 4.12 | 4.32 |
| E1     | 3.52       | 3.72 | 3.92 |
| D2     | 5.00       | 5.20 | 5.40 |
| E2     | 5.66       | 5.86 | 6.06 |
| E3     | 0.254 REF  |      |      |
| E4     | 0.21 REF   |      |      |
| L1     | 0.56       | 0.66 | 0.76 |
| L2     | 0.50 BSC   |      |      |
| b      | 0.31       | 0.41 | 0.51 |
| e      | 1.27 BSC   |      |      |

Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.10$  mm.
3. The pad layout is for reference purposes only.



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