## General Description

The AGM30P05A combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$ .

This device is ideal for load switch and battery protection applications.

## Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

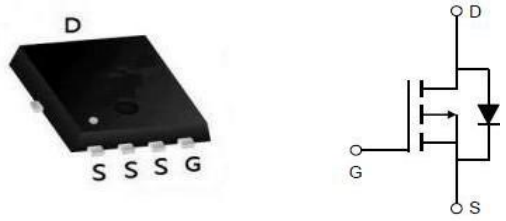
## Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

## Product Summary

| BVDSS | RDSON | ID |
|---|---|---|
| -30V | 5.5mΩ | -75A |

**PDFN5*6 Pin Configuration**




## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| AGM30P05A | AGM30P05A | PDFN5*6 | 330mm | 12mm | 3000 |

**Table 1. Absolute Maximum Ratings (TC=25℃)**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| VDS | Drain-Source Voltage (VGS=0V) | -30 | V |
| VGS | Gate-Source Voltage (VDS=0V) | ±20 | V |
| ID | Drain Current-Continuous(Tc=25℃) **(Note 1)** | -75 | A |
| | Drain Current-Continuous(Tc=100℃) | -50 | A |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed **(Note 2)** | -240 | A |
| PD | Maximum Power Dissipation(Tc=25℃) | 59.5 | w |
| | Maximum Power Dissipation(Tc=100℃) | 24 | w |
| EAS | Avalanche energy **(Note 3)** | 93 | mJ |
| TJ,TSTG | Operating Junction and Storage Temperature Range | -55 To 150 | ℃ |

**Table 2. Thermal Characteristic**

| Symbol | Parameter | Typ | Max | Unit |
|---|---|---|---|---|
| RθJA | Thermal Resistance Junction-ambient (Steady State)[1] | --- | -- | ℃/W |
| RθJC | Thermal Resistance Junction-Case[1] | --- | 2.1 | ℃/W |

**Table 3. Electrical Characteristics (TJ=25℃unless otherwise noted)**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **On/Off States** | | | | | | |
| BVDSS | Drain-Source Breakdown Voltage | VGS=0V ID=250μA | -30 | -- | -- | V |
| IDSS | Zero Gate Voltage Drain Current | VDS=-30V,VGS=0V | -- | -- | -1.0 | μA |
| IGSS | Gate-Body Leakage Current | VGS=±20V,VDS=0V | -- | -- | ±100 | nA |
| VGS(th) | Gate Threshold Voltage | VDS=VGS,ID=-250μA | -1.2 | -1.6 | -2.1 | V |
| gFS | Forward Transconductance | VDS=-10V,ID=-10A | -- | 20 | -- | S |
| RDS(on) | Drain-Source On-State Resistance | VGS=-10V, ID=-15A | -- | 5.5 | 7.0 | mΩ |
| | | VGS=-4.5V, ID=-20A | -- | 8.5 | 11.3 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| Ciss | Input Capacitance | VDS=-30V,F=1MHZ | -- | 2497 | -- | pF |
| Coss | Output Capacitance | | -- | 240 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 230 | -- | pF |
| Rg | Gate resistance | VGS=0V, VDS=0V,f=1.0MHz | -- | -- | -- | Ω |
| **Switching Times** | | | | | | |
| td(on) | Turn-on Delay Time | VGS=-10V,VDS=-15V, ID=-30A,RI=3.0Ω | -- | 14 | -- | nS |
| tr | Turn-on Rise Time | | -- | 20 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 56 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 48 | -- | nS |
| Qg | Total Gate Charge | VGS=-10V, VDS=-15V, ID=-20A | -- | 32 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 6.6 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 8.0 | -- | nC |
| **Source-Drain Diode Characteristics** | | | | | | |
| ISD | Source-Drain Current(Body Diode) | | -- | -- | -75 | A |
| VSD | Forward on Voltage | VGS=0V,IS=-15A | -- | -- | -1.2 | V |
| trr | Reverse Recovery Time | IF=-15A , dI/dt=-500A/μs , TJ=25℃ | -- | -- | -- | ns |
| Qrr | Reverse Recovery Charge | | -- | -- | -- | nc |

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃

## P- Channel Typical Characteristics

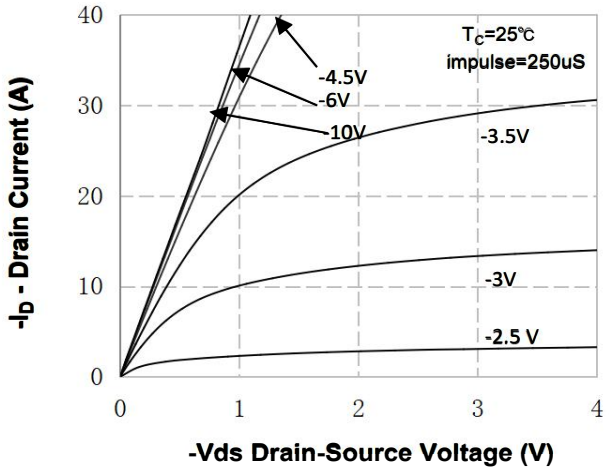



Figure 1. On-Region Characteristics

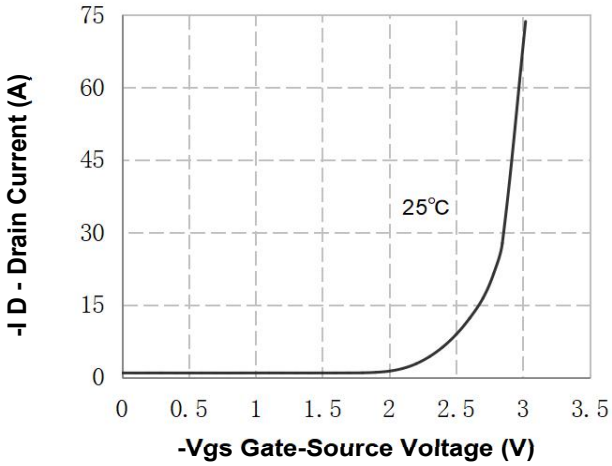



Figure 2. Transfer Characteristics

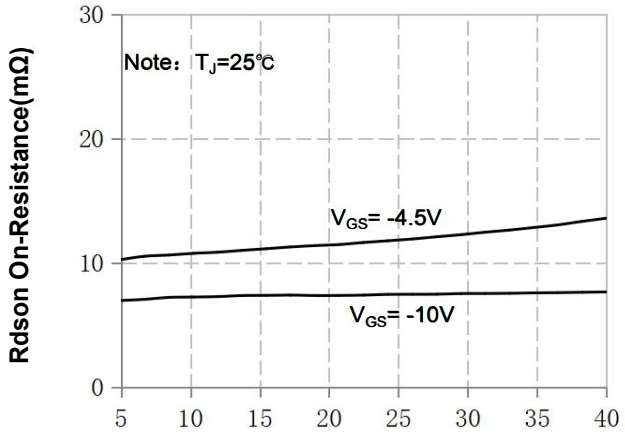



Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

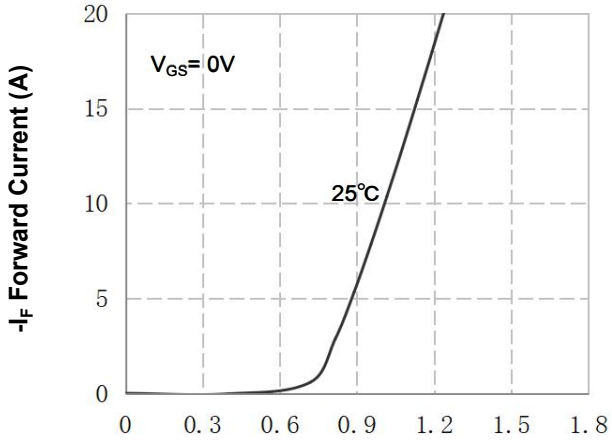



Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

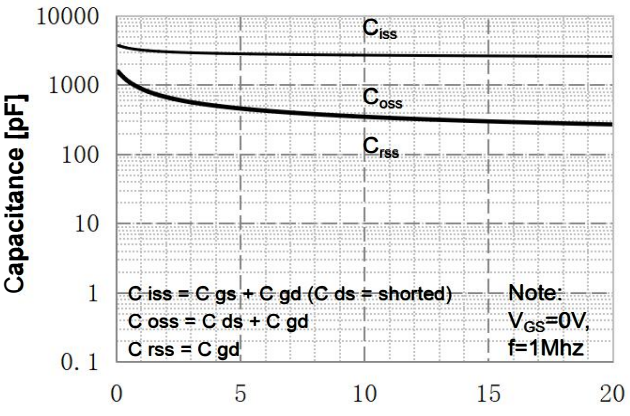



Figure 5. Capacitance Characteristics

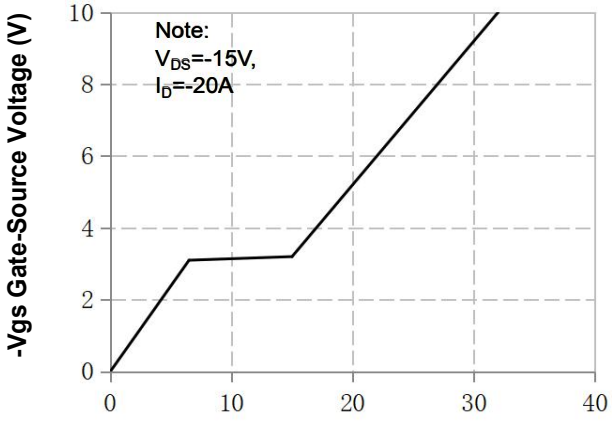



Figure 6. Gate Charge Characteristics

## P- Channel Typical Characteristics (Continued)

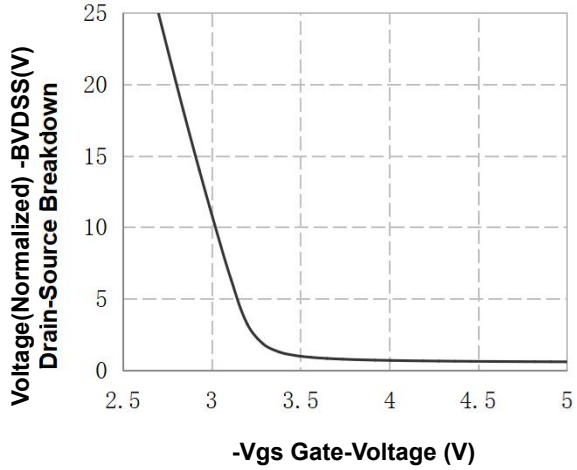



Figure 7. Breakdown Voltage Variation vs Gate-Voltage

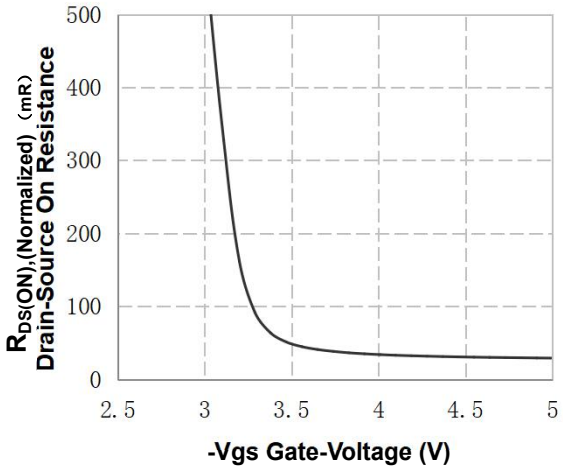



Figure 8. On-Resistance Variation vs Gate Voltage

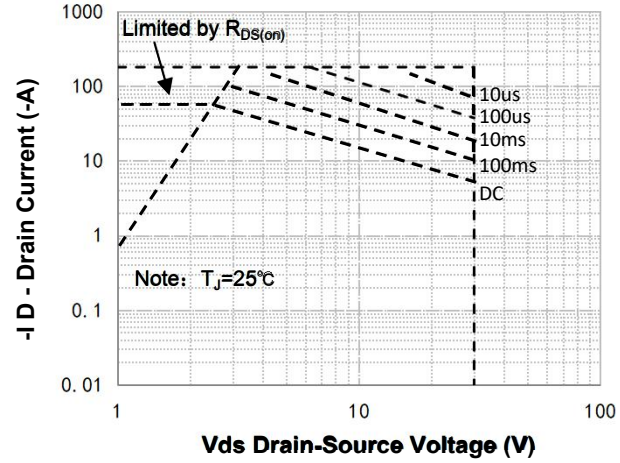



Figure 9. Maximum Safe Operating Area

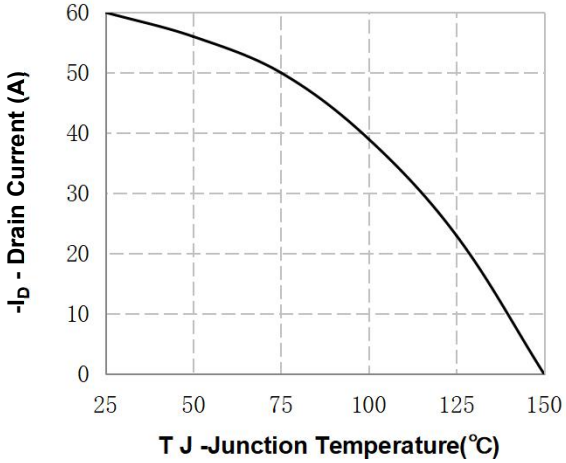



Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

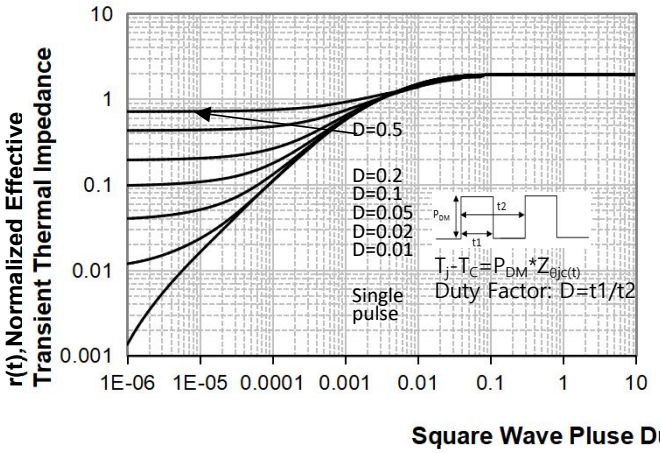
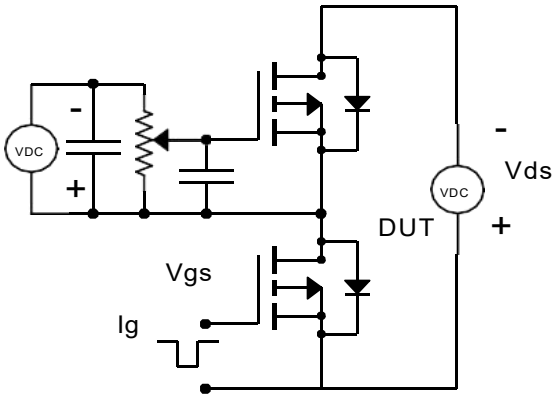
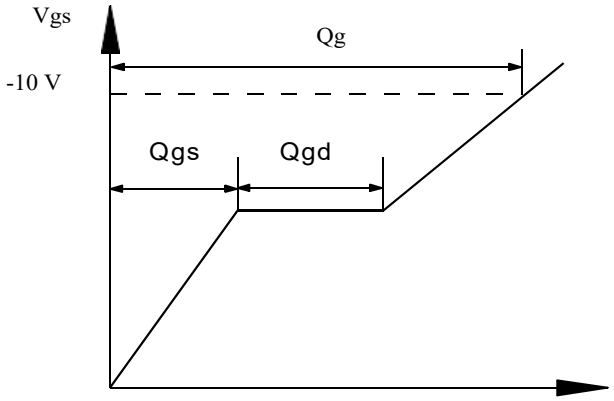


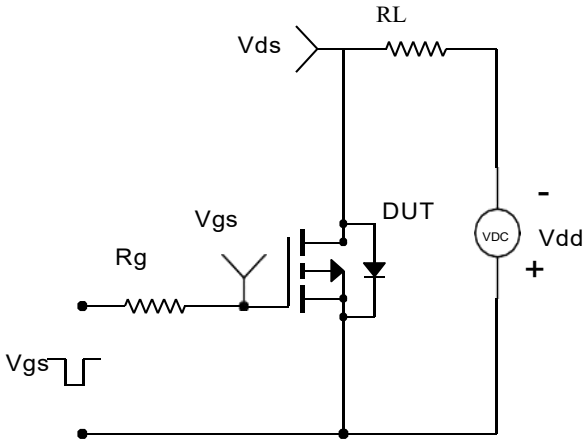

Figure 11. Transient Thermal Response Curve

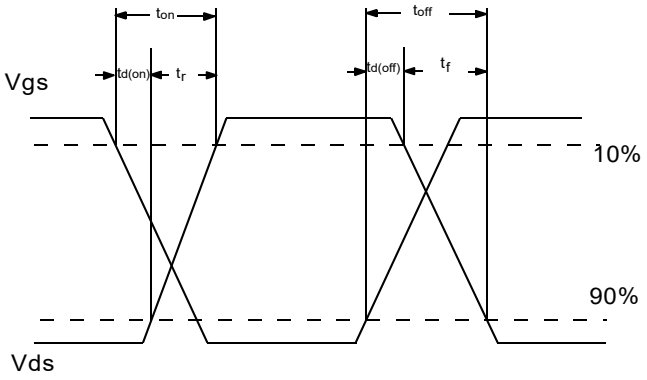
## Gate Charge Test Circuit & Waveform



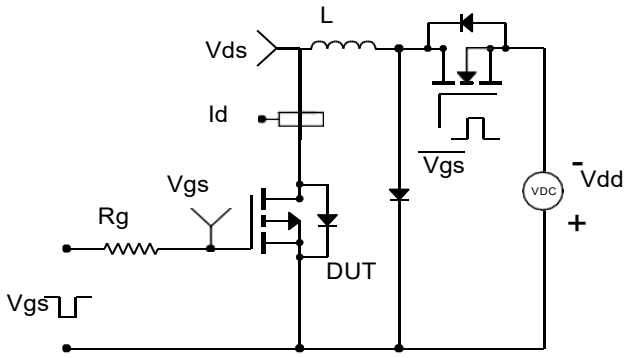



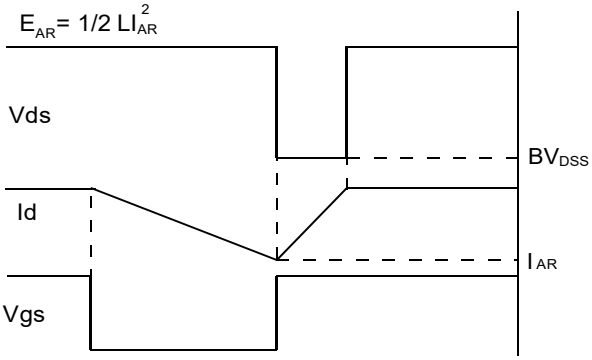

## Resistive Switching Test Circuit & Waveforms



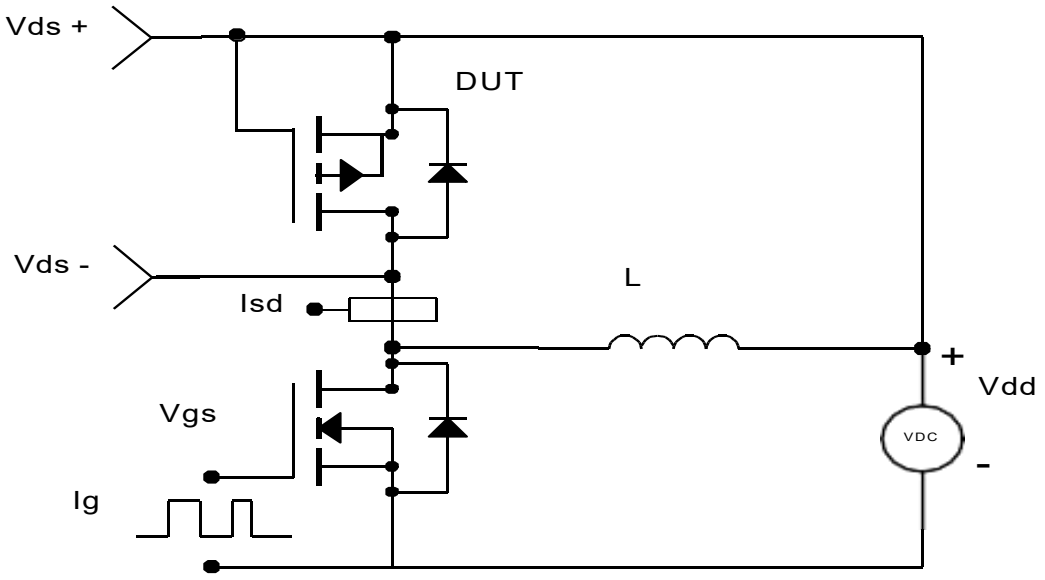




## Unclamped Inductive Switching Test Circuit & Waveforms

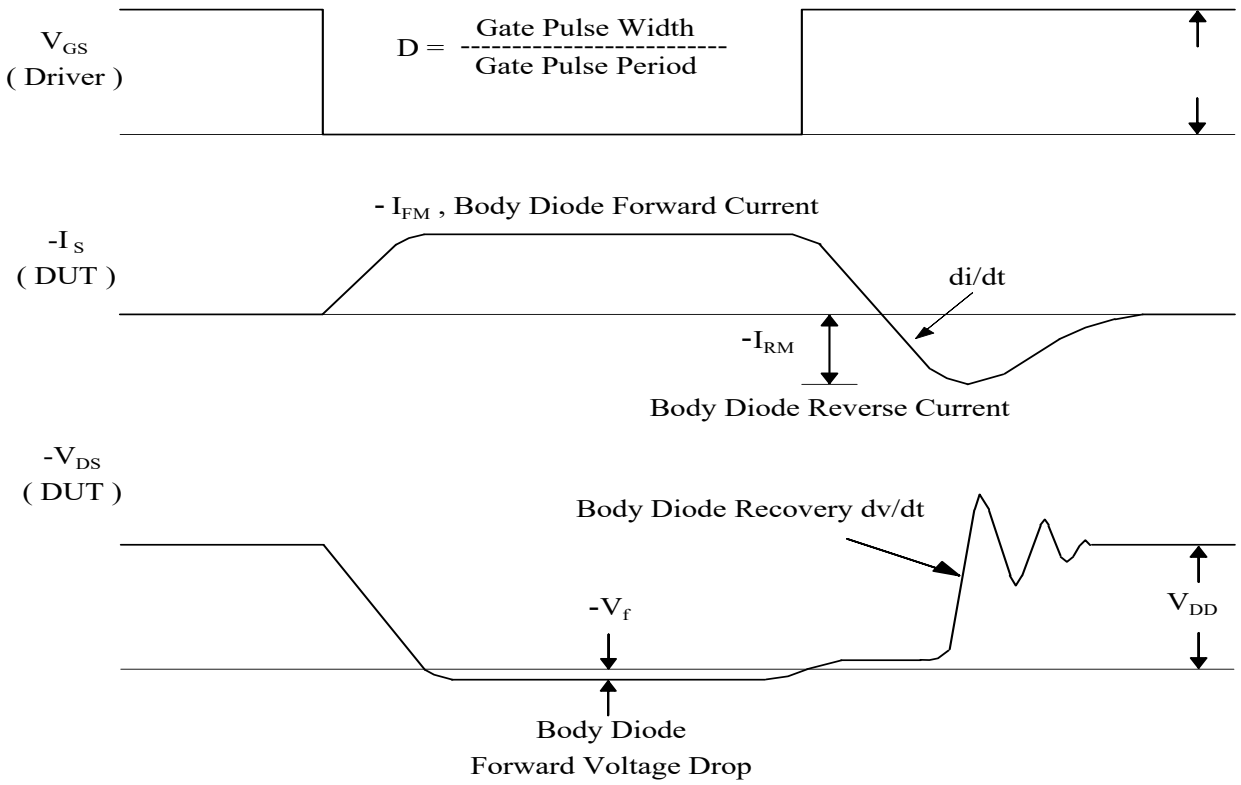


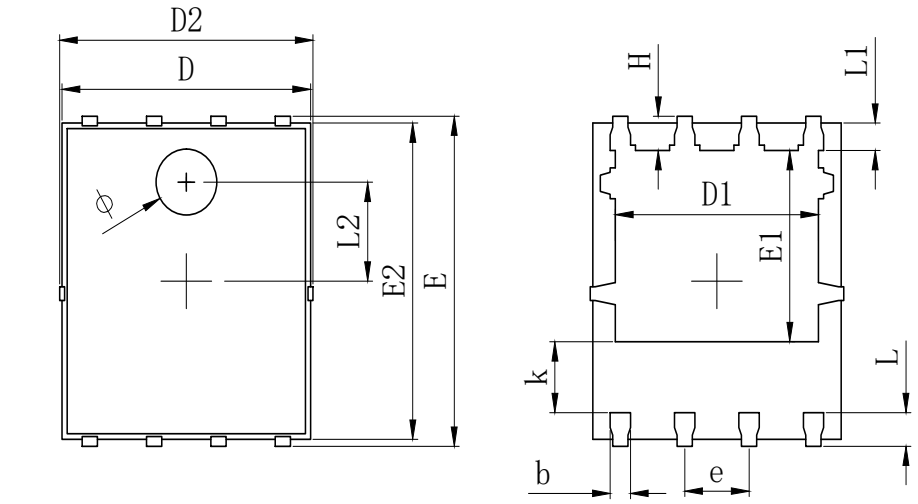
# Peak Diode Recovery dv/dt Test Circuit & Waveforms

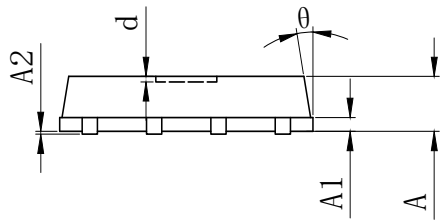



- dv/dt controlled by $R_G$
- $I_{SD}$ controlled by pulse period

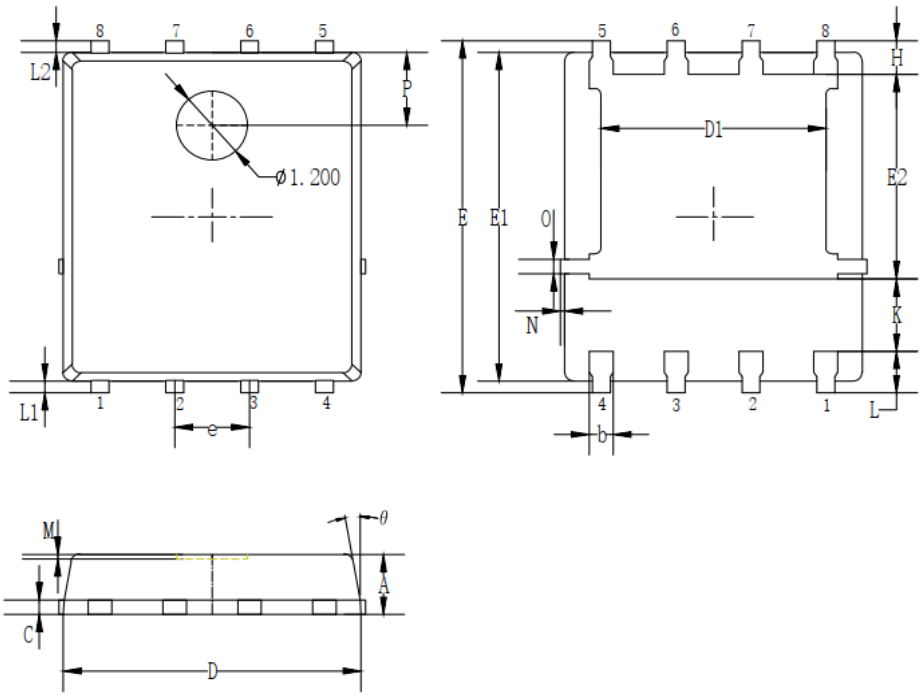


## ●Dimensions（PDFN5*6）




| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | Typ. | MAX |
| A | 0.900 | 1.000 | 1.100 |
| A1 | 0.254 REF. | | |
| A2 | 0~0.05 | | |
| D | 4.824 | 4.900 | 4.976 |
| D1 | 3.910 | 4.010 | 4.110 |
| D2 | 4.924 | 5.000 | 5.076 |
| E | 5.924 | 6.000 | 6.076 |
| E1 | 3.375 | 3.475 | 3.575 |
| E2 | 5.674 | 5.750 | 5.826 |
| b | 0.350 | 0.400 | 0.450 |
| e | 1.270 TYP. | | |
| L | 0.534 | 0.610 | 0.686 |
| L1 | 0.424 | 0.500 | 0.576 |
| L2 | 1.800 REF. | | |
| k | 1.190 | 1.290 | 1.390 |
| H | 0.549 | 0.625 | 0.701 |
| θ | 8° | 10° | 12° |
| ϕ | 1.100 | 1.200 | 1.300 |
| d | | | 0.100 |




| Symbols | Millimeters | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.90 | 1.05 | 1.20 |
| b | 0.35 | 0.40 | 0.50 |
| C | 0.20 | 0.25 | 0.35 |
| D | 4.90 | 5.05 | 5.20 |
| D1 | 3.72 | 3.82 | 3.92 |
| E | 6.00 | 6.15 | 6.30 |
| E1 | 5.60 | 5.75 | 5.90 |
| E2 | 3.47 | 3.57 | 3.67 |
| e | 1.27 BSC. | | |
| H | 0.48 | 0.58 | 0.68 |
| K | 1.17 | 1.27 | 1.37 |
| L | 0.64 | 0.74 | 0.84 |
| L1/L2 | 0.20 REF. | | |
| θ | 8° | 10° | 12° |
| M | 0.08 REF. | | |
| N | 0 | - | 0.15 |
| O | 0.25 REF. | | |
| P | 1.28 REF. | | |

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