

## General Description

The AGM30P25MBP 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
- 100% Avalanche tested
- 100% DVDS tested

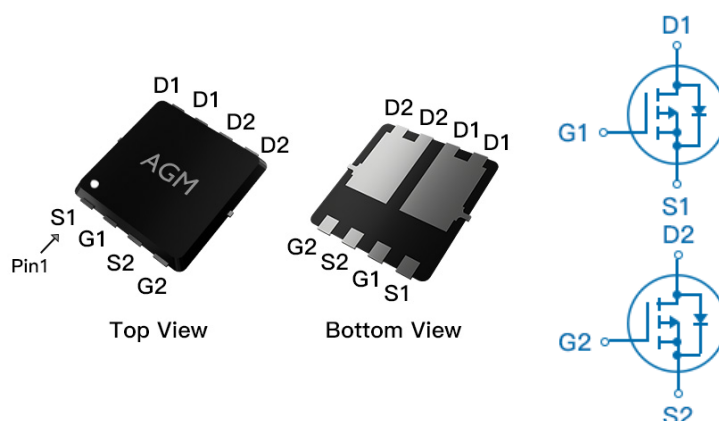
## Application

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

## Product Summary

| BVDSS | RDSON | ID  |
|-------|-------|-----|
| -30V  | 20mΩ  | -8A |

## PDFN3\*3 Pin Configuration



## Package Marking and Ordering Information

| Device Marking | Device      | Device Package | Reel Size | Tape width | Quantity |
|----------------|-------------|----------------|-----------|------------|----------|
| AGM30P25MB     | AGM30P25MBP | PDFN3.3*3.3    | 330mm     | 12mm       | 5000     |

Table 1. Absolute Maximum Ratings (TA=25°C)

| 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°C) (Note 1)       | -8         | A    |
|             | Drain Current-Continuous(Tc=100°C)               | -4.8       | A    |
| IDM (pluse) | Drain Current-Pulsed (Note 2)                    | -32        | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)               | 28         | w    |
|             | Maximum Power Dissipation(Tc=100°C)              | 11         | w    |
| EAS         | Avalanche energy (Note 3)                        | 49         | mJ   |
| TJ,TSTG     | Operating Junction and Storage Temperature Range | -55 To 150 | °C   |

Table 2. Thermal Characteristic

| Symbol | Parameter                                                       | Typ | Max | Unit |
|--------|-----------------------------------------------------------------|-----|-----|------|
| RθJA   | Thermal Resistance Junction-ambient (Steady State) <sup>1</sup> | --- | 50  | °C/W |
| RθJC   | Thermal Resistance Junction-Case <sup>1</sup>                   | --- | 4.4 | °C/W |

**Table 2. P-Channel Electrical Characteristics (T<sub>J</sub>=25°C 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   | μA   |
| IGSS                               | Gate-Body Leakage Current        | VGS=±20V,VDS=0V                                  | --   | --   | ±100 | nA   |
| VGS(th)                            | Gate Threshold Voltage           | VDS=VGS,ID=-250μA                                | -1.2 | -1.5 | -2.2 | V    |
| gFS                                | Forward Transconductance         | VDS=-5V,ID=-4A                                   | --   | 6    | --   | S    |
| RDS(on)                            | Drain-Source On-State Resistance | VGS=-10V, ID=-5A                                 | --   | 20   | 24   | mΩ   |
|                                    |                                  | VGS=-4.5V, ID=-4A                                | --   | 29   | 34   | mΩ   |
| Dynamic Characteristics            |                                  |                                                  |      |      |      |      |
| Ciss                               | Input Capacitance                | VDS=-15V,VGS=0V,<br>F=1MHZ                       | --   | 652  | --   | pF   |
| Coss                               | Output Capacitance               |                                                  | --   | 95   | --   | pF   |
| Crss                               | Reverse Transfer Capacitance     |                                                  | --   | 85.7 | --   | pF   |
| Switching Times                    |                                  |                                                  |      |      |      |      |
| td(on)                             | Turn-on Delay Time               | VGS=-10V,VDS=-15V,<br>ID=-4A,RGEN=3Ω,<br>RL=3.6Ω | --   | 8    | --   | nS   |
| tr                                 | Turn-on Rise Time                |                                                  | --   | 4    | --   | nS   |
| td(off)                            | Turn-Off Delay Time              |                                                  | --   | 26   | --   | nS   |
| tf                                 | Turn-Off Fall Time               |                                                  | --   | 12.5 | --   | nS   |
| Qg                                 | Total Gate Charge                | VGS=-10V,<br>VDS=-15V, ID=-1A                    | --   | 14   | --   | nC   |
| Qgs                                | Gate-Source Charge               |                                                  | --   | 1.34 | --   | nC   |
| Qgd                                | Gate-Drain Charge                |                                                  | --   | 2.99 | --   | nC   |
| Source-Drain Diode Characteristics |                                  |                                                  |      |      |      |      |
| ISD                                | Source-Drain Current(Body Diode) |                                                  | --   | --   | -8.0 | A    |
| VSD                                | Forward on Voltage               | VGS=0V,IS=-5A                                    | --   | --   | -1.2 | V    |
| trr                                | Reverse Recovery Time            | IF=-5A , dI/dt=100A/μs ,                         | --   | --   | --   | ns   |
| Qrr                                | Reverse Recovery Charge          | TJ=25℃                                           | --   | --   | --   | nc   |

Notes 1.The maximum current rating is package limited.

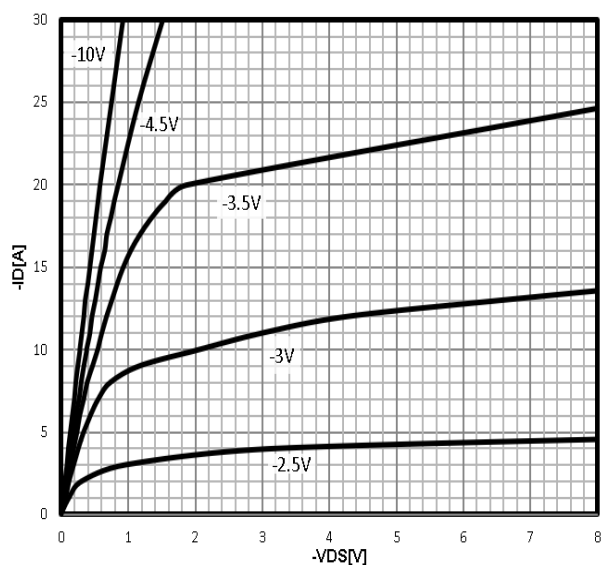
Notes2.Repetitive Rating: Pulse width limited by maximum junction temperature Notes

3.EAS condition: T<sub>J</sub>=25°C , V<sub>DD</sub>=-15V, V<sub>gs</sub>=-10V, I<sub>D</sub>=-14A, L=0.5mH, R<sub>G</sub>=25ohm

## Characteristics Curve:

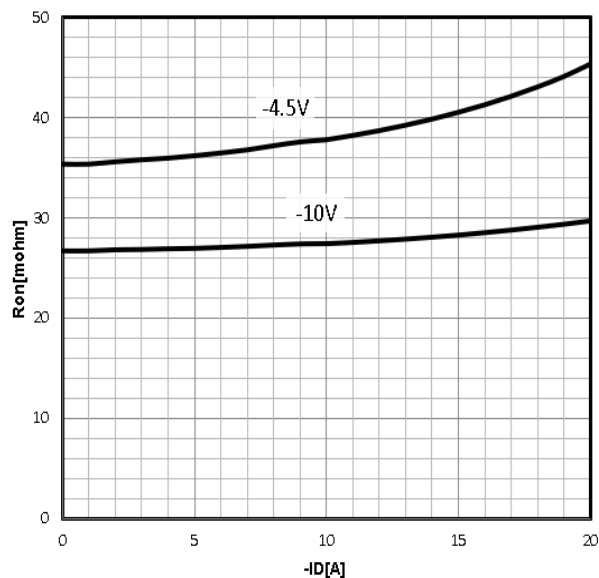
Typ. output characteristics

$$I_D = f(V_{DS})$$



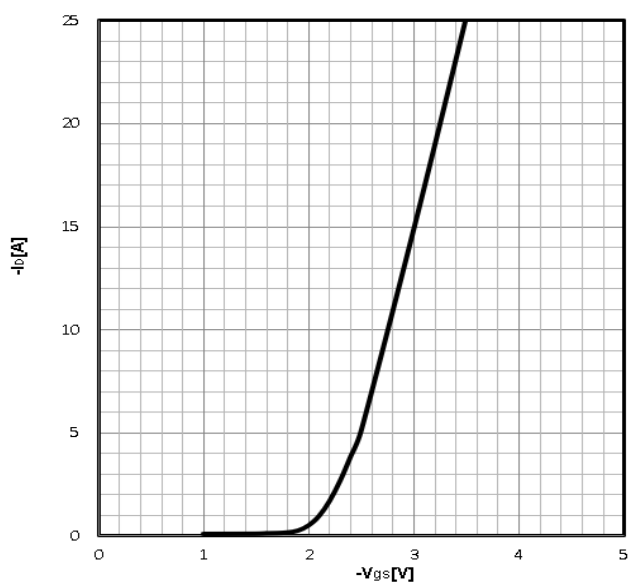
Typ. drain-source on resistance

$$R_{DS(on)} = f(I_D)$$



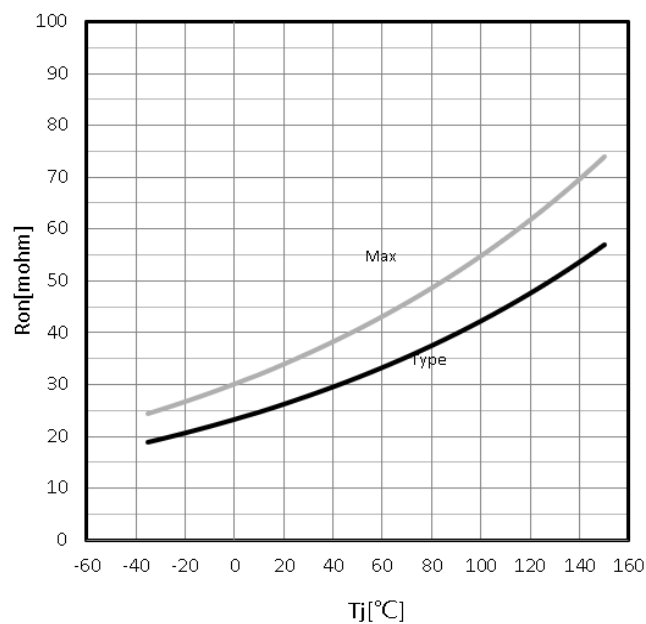
Typ. transfer characteristics

$$I_D = f(V_{GS})$$

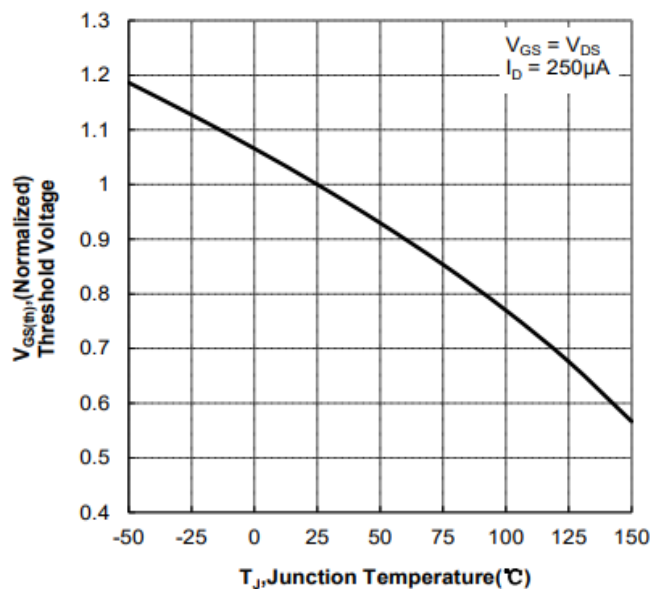


Drain-source on-state resistance

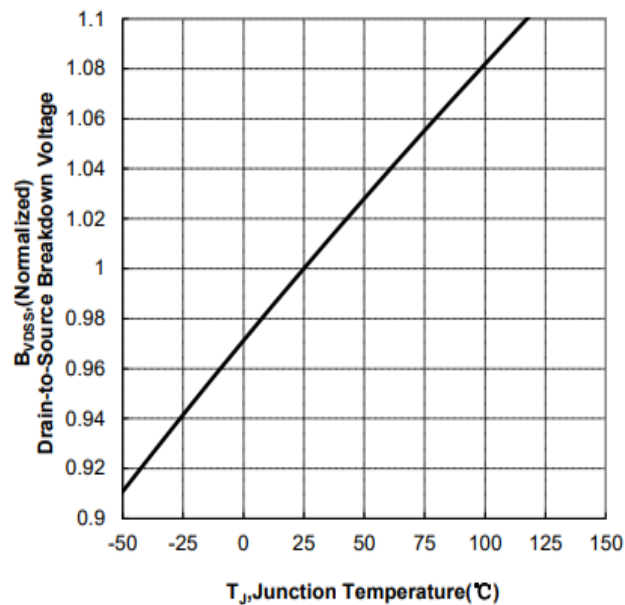
$$R_{DS(on)} = f(T_j); I_D = -5A; V_{GS} = -10V$$



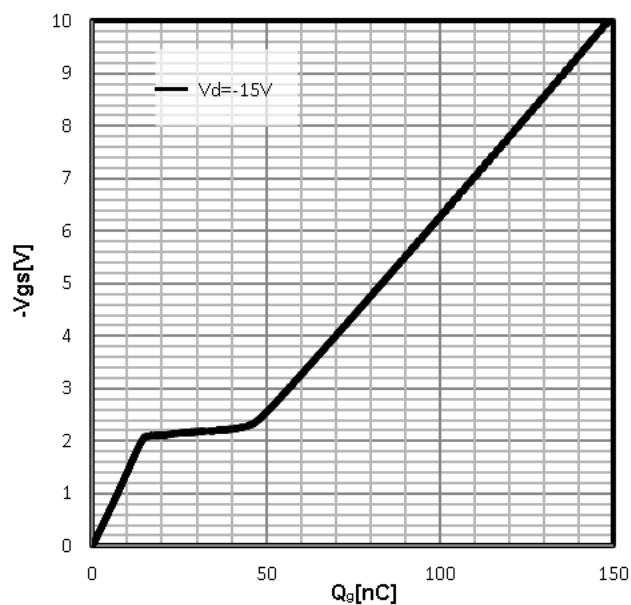
**Gate Threshold Voltage**  
 $-V_{TH}=f(T_j); I_D=-250\mu A$



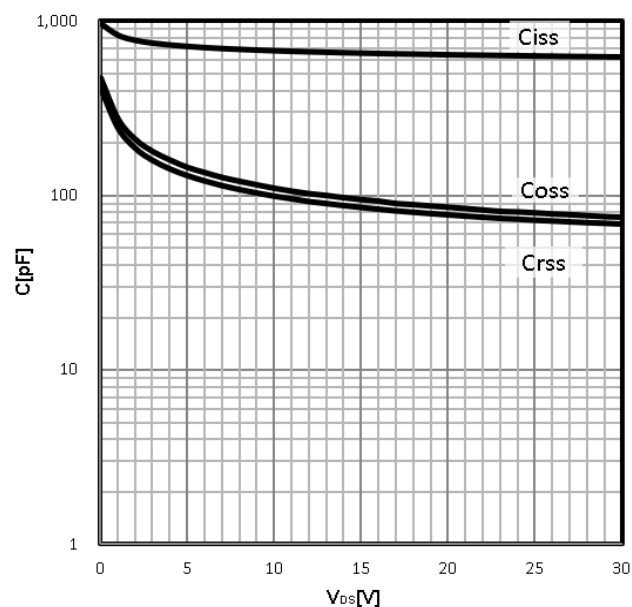
**Drain-source breakdown voltage**  
 $V_{BR(DSS)}=f(T_j); I_D=-250\mu A$



**Typ. gate charge**  
 $V_{GS}=f(Q_{gate}); I_D=-1A$

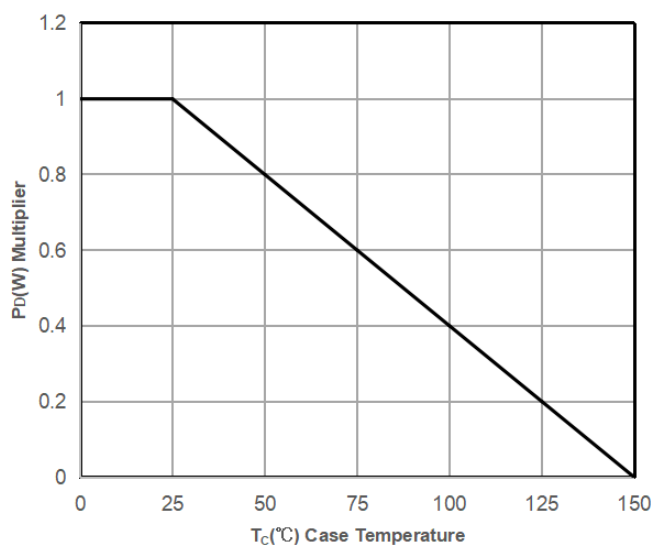


**Typ. capacitances**  
 $C=f(V_{DS}); V_{GS}=0V; f=1MHz$



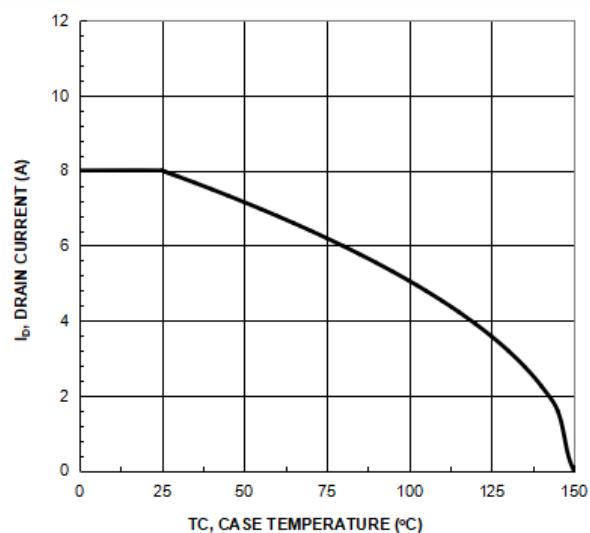
### Power Dissipation

$$P_{tot}=f(T_C)$$



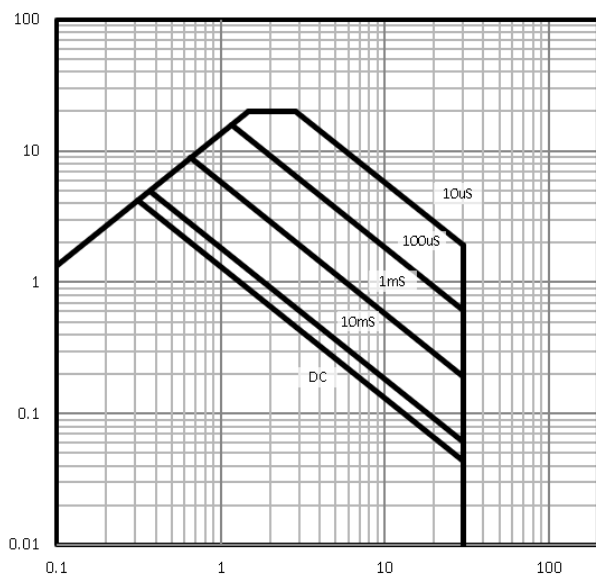
### Maximum Drain Current

$$-I_D=f(T_C)$$



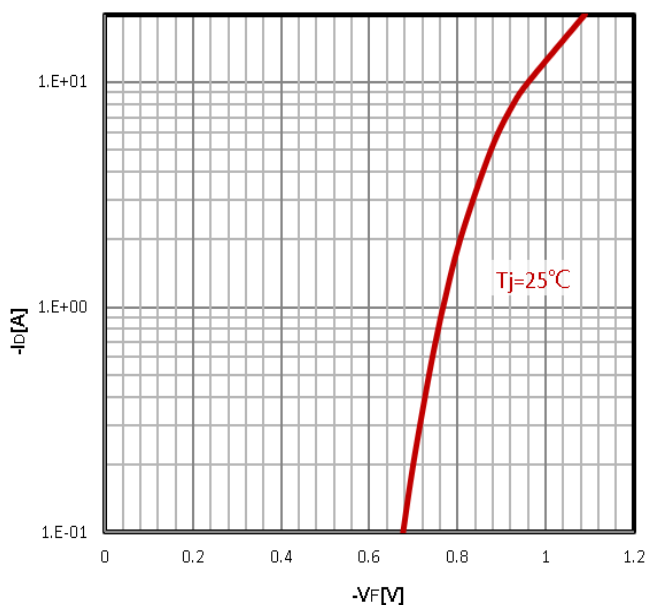
### Safe operating area

$$-I_D=f(-V_{DS})$$



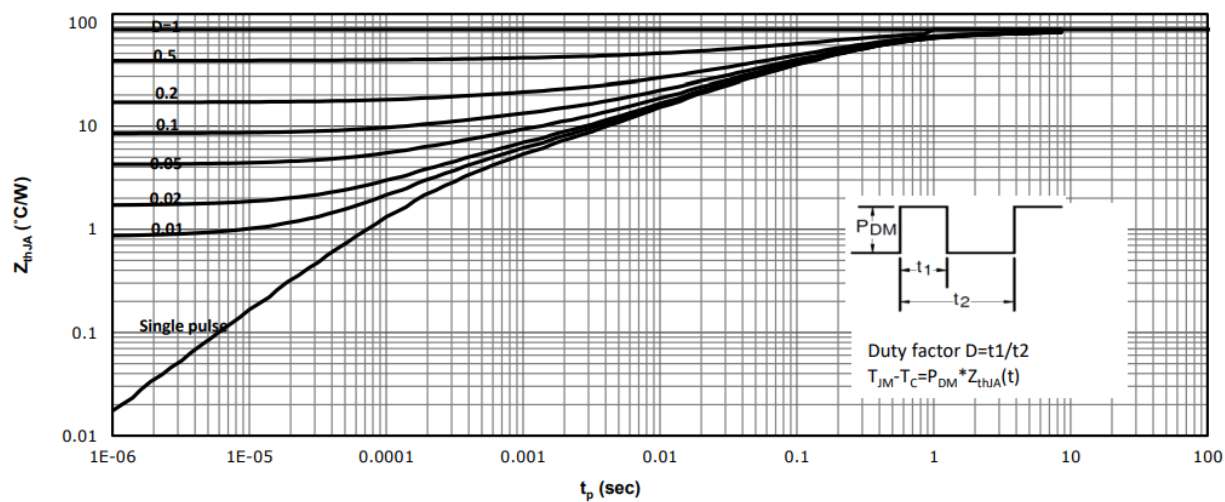
### Body Diode Forward Voltage Variation

$$-I_F=f(-V_{DS})$$

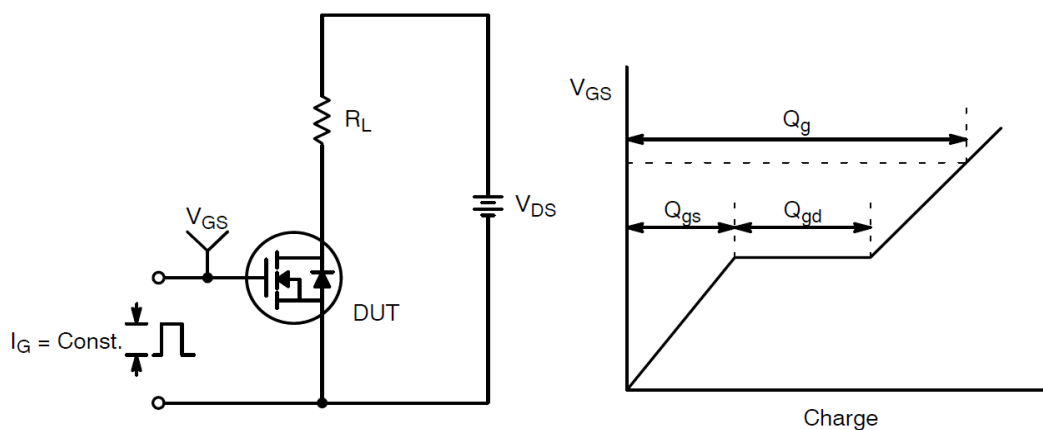


# Max. transient thermal impedance

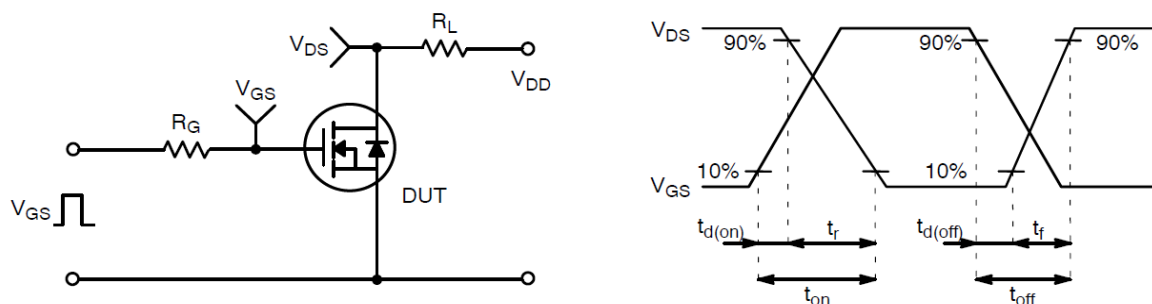
$$Z_{thJC}=f(t_p)$$



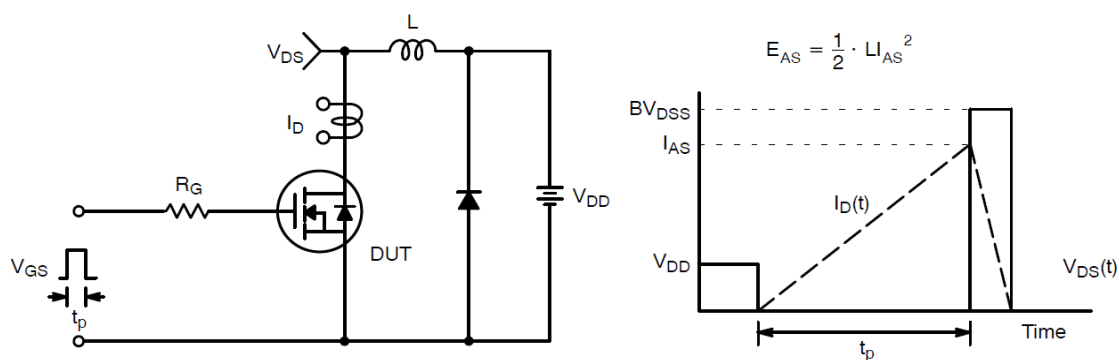
## Test Circuit and Waveform:



**Gate Charge Test Circuit & Waveform**

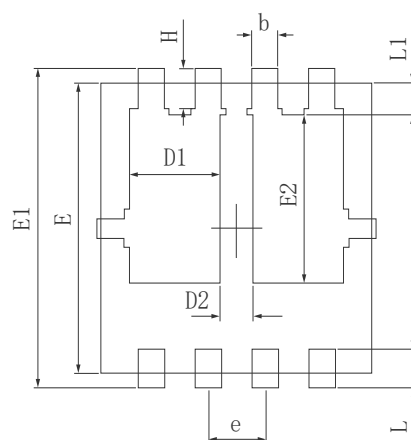
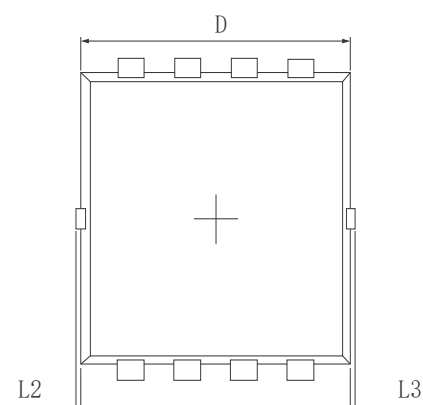


**Resistive Switching Test Circuit & Waveforms**

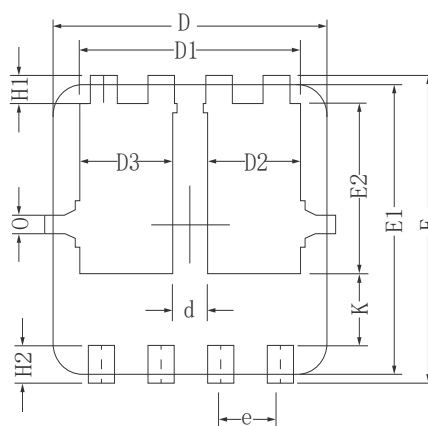
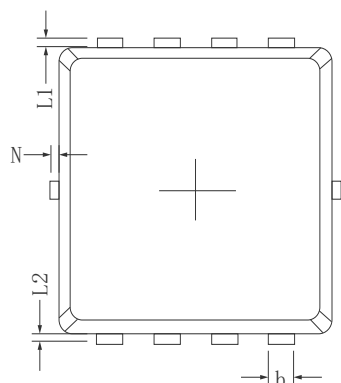
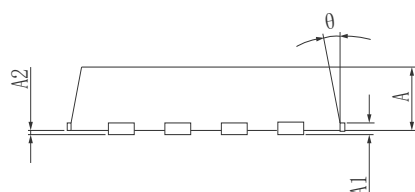


**Unclamped Inductive Switching Test Circuit & Waveforms**

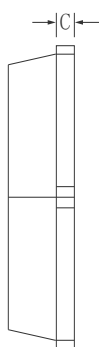
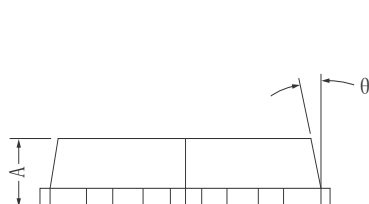
# Dimensions (PDFN3.3\*3.3)



| SYMBOL | MILLIMETER |       |
|--------|------------|-------|
|        | MIN        | MAX   |
| A      | 0.700      | 0.900 |
| A1     | 0.152REF.  |       |
| A2     | 0~0.05     |       |
| D      | 3.000      | 3.200 |
| D1     | 0.935      | 1.135 |
| D2     | 0.280      | 0.480 |
| E      | 2.900      | 3.100 |
| E1     | 3.150      | 3.450 |
| E2     | 1.535      | 1.935 |
| b      | 0.200      | 0.400 |
| e      | 0.550      | 0.750 |
| L      | 0.300      | 0.500 |
| L1     | 0.180      | 0.480 |
| L2     | 0~0.100    |       |
| L3     | 0~0.100    |       |
| H      | 0.315      | 0.515 |
| θ      | 8°         | 12°   |



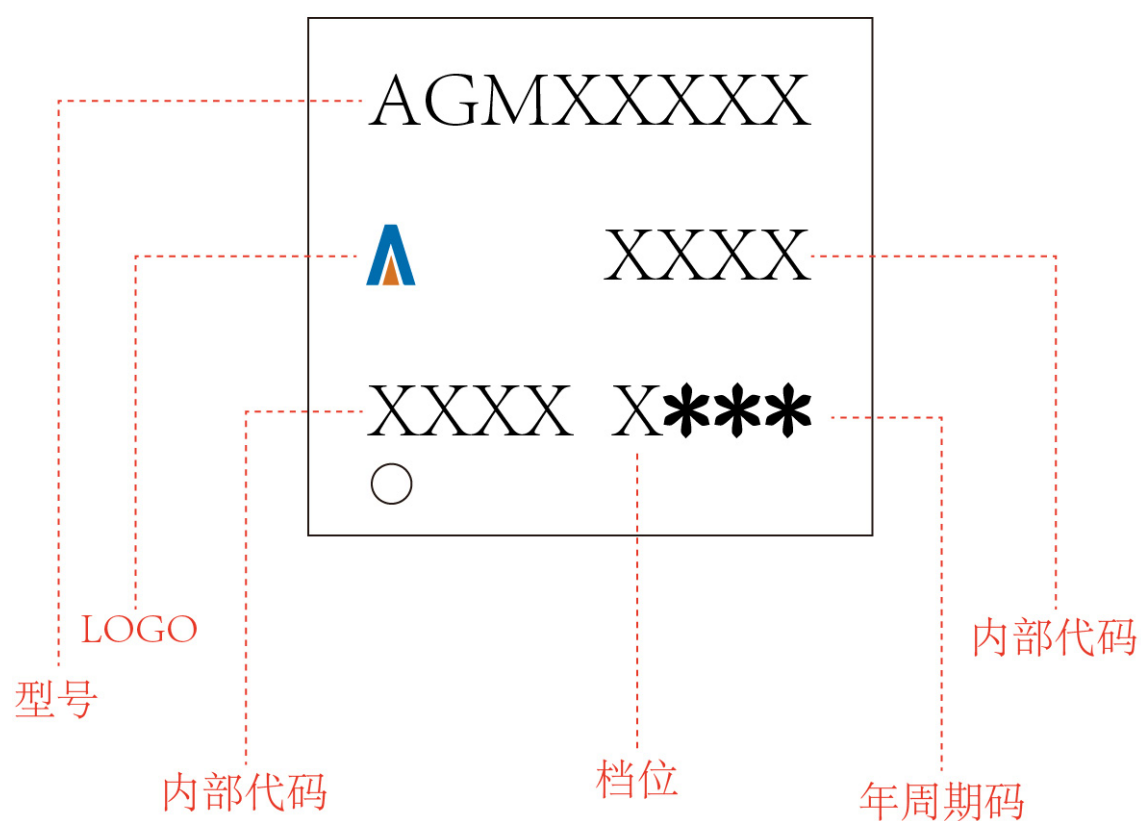
| Symbols | Millimeters |      |      |
|---------|-------------|------|------|
|         | MIN.        | NOM. | MAX. |
| A       | 0.65        | 0.75 | 0.85 |
| b       | 0.25        | 0.30 | 0.35 |
| C       | 0.15        | 0.20 | 0.25 |
| D       | 3.00        | 3.10 | 3.20 |
| D1      | 2.40        | 2.50 | 2.60 |
| D2/D3   | 1.00        | 1.05 | 1.10 |
| d       | 0.30        | 0.40 | 0.50 |
| E       | 3.20        | 3.30 | 3.40 |
| E1      | 3.00        | 3.10 | 3.20 |
| E2      | 1.72        | 1.82 | 1.92 |
| e       | 0.65 BSC.   |      |      |
| H1      | 0.21        | 0.31 | 0.41 |
| H2      | 0.30        | 0.40 | 0.50 |
| K       | 0.67        | 0.77 | 0.87 |
| L1/L2   | 0.10 REF.   |      |      |
| θ       | 11°         | 12°  | 13°  |
| N       | 0           | -    | 0.15 |
| O       | 0.2 REF.    |      |      |





# PDFN3.3\*3.3

## Marking Instructions:



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