

### ● General Description

The AGM1030MBP 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 | RDS(ON) | ID  |
|-------|---------|-----|
| 100V  | 26mΩ    | 20A |

### PDFN3.3\*3.3 Pin Configuration

### Package Marking and Ordering Information

| Device Marking | Device     | Device Package | Reel Size | Tape width | Quantity |
|----------------|------------|----------------|-----------|------------|----------|
| AGM1030MBP     | AGM1030MBP | 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)                     | 100        | V    |
| VGS         | Gate-Source Voltage (VDS=0V)                      | ±20        | V    |
| ID          | Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b> | 20         | A    |
|             | Drain Current-Continuous(Tc=100°C)                | 13         | A    |
| IDM (pluse) | Drain Current-Pulsed <b>(Note 2)</b>              | 80         | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)                | 50         | w    |
|             | Maximum Power Dissipation(Tc=100°C)               | 20         | w    |
| EAS         | Avalanche energy <b>(Note 3)</b>                  | 30         | 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> | --- | 64  | °C/W |
| RθJC   | Thermal Resistance Junction-Case <sup>1</sup>                   | --- | 2.5 | °C/W |

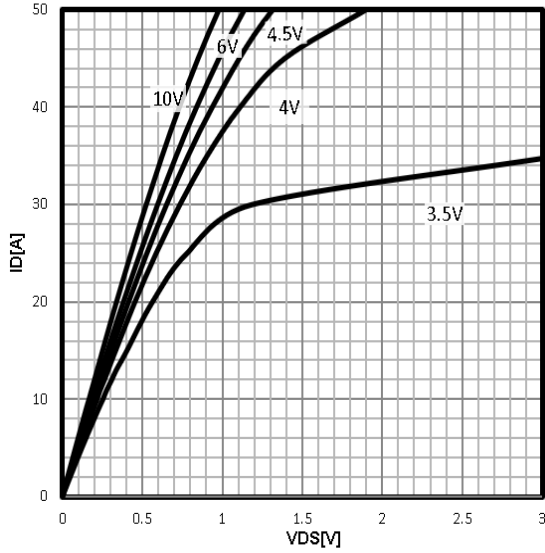
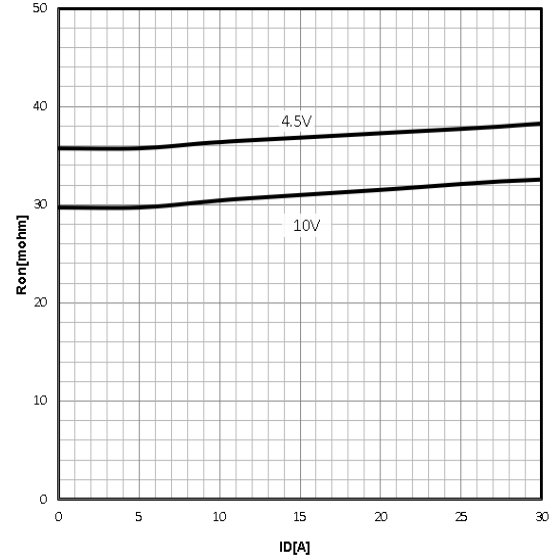
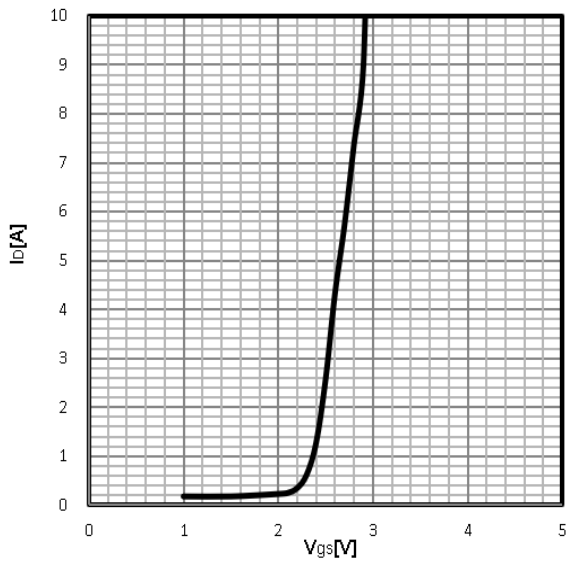
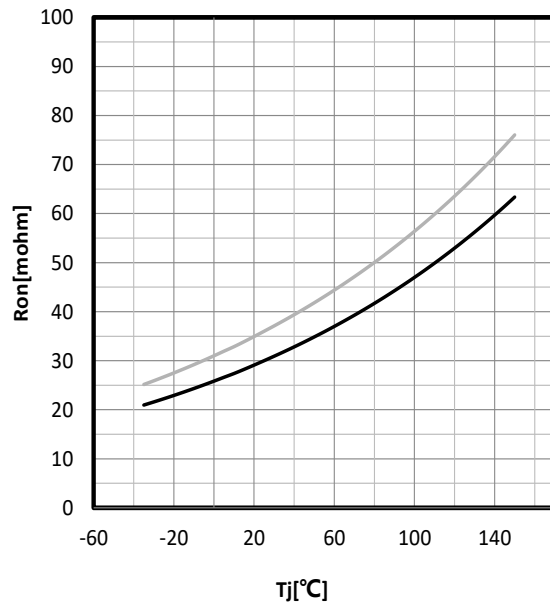
**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

| Symbol                                    | Parameter                        | Conditions                                    | Min | Typ  | Max  | Unit |
|---|----------------------------------|---|-----|------|------|------|
| <b>On/Off States</b>                      |                                  |   |     |      |      |      |
| BVDSS                                     | Drain-Source Breakdown Voltage   | VGS=0V ID=250μA                               | 100 | --   | --   | V    |
| IDSS                                      | Zero Gate Voltage Drain Current  | VDS=100V,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 | --   | 2.2  | V    |
| gFS                                       | Forward Transconductance         | VDS=5V,ID=8A                                  | --  | 5    | --   | S    |
| RDS(on)                                   | Drain-Source On-State Resistance | VGS=10V, ID=10A                               | --  | 26   | 32   | mΩ   |
|   |                                  | VGS=4.5V, ID=8A                               | --  | 31.5 | 40   | mΩ   |
| <b>Dynamic Characteristics</b>            |                                  |   |     |      |      |      |
| Ciss                                      | Input Capacitance                | VDS=50V,VGS=0V,<br>F=1MHZ                     | --  | 445  | --   | pF   |
| Coss                                      | Output Capacitance               |   | --  | 171  | --   | pF   |
| Crss                                      | Reverse Transfer Capacitance     |   | --  | 3.2  | --   | pF   |
| Rg  | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz                    | --  | --   | --   | Ω    |
| <b>Switching Times</b>                    |                                  |   |     |      |      |      |
| td(on)                                    | Turn-on Delay Time               | ID = 10A<br>VDS = 50V<br>VGS = 10V<br>RG = 5Ω | --  | 12   | --   | nS   |
| tr  | Turn-on Rise Time                |   | --  | 15   | --   | nS   |
| td(off)                                   | Turn-Off Delay Time              |   | --  | 20   | --   | nS   |
| tf  | Turn-Off Fall Time               |   | --  | 6    | --   | nS   |
| Qg  | Total Gate Charge                | VGS=10V, VDS=50V,<br>ID=10A                   | --  | 8.07 | --   | nC   |
| Qgs                                       | Gate-Source Charge               |   | --  | 1.38 | --   | nC   |
| Qgd                                       | Gate-Drain Charge                |   | --  | 1.84 | --   | nC   |
| <b>Source-Drain Diode Characteristics</b> |                                  |   |     |      |      |      |
| ISD                                       | Source-Drain Current(Body Diode) |   | --  | --   | 20   | A    |
| VSD                                       | Forward on Voltage               | VGS=0V,IS=10A                                 | --  | --   | 1.2  | V    |
| trr                                       | Reverse Recovery Time            | VDD=50V,Isd=10A ,                             | --  | 37   | --   | ns   |
| Qrr                                       | Reverse Recovery Charge          | dl/dt=100A/μs , TJ=25°C                       | --  | 80   | --   | nc   |

Notes 1.The maximum current rating is package limited.

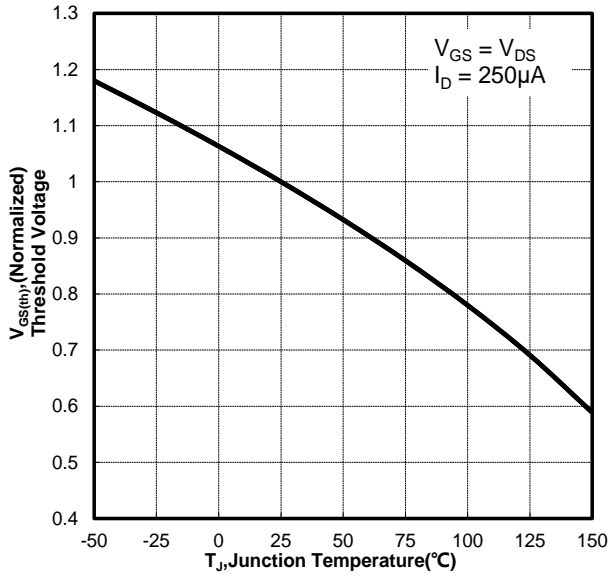
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T<sub>J</sub>=25°C,VDD=50V,Vgs=10V, ID=11A, L=0.5mH,RG=25ohm

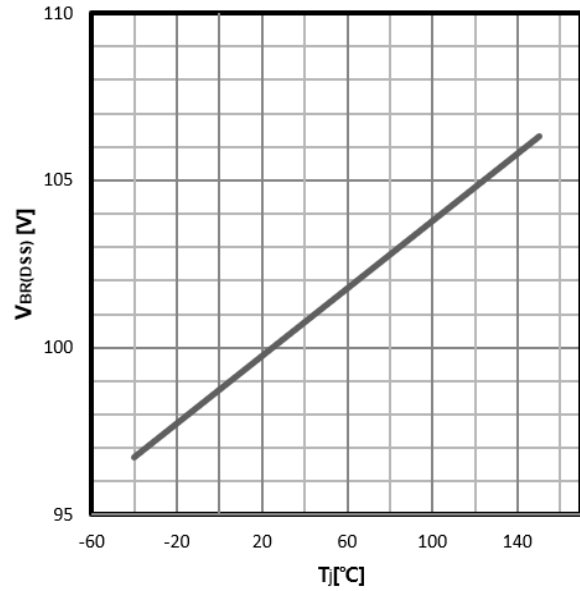
**Characteristics Curve:**
**Typ. output characteristics**  
 $I_D = f(V_{DS})$ 

**Typ. drain-source on resistance**  
 $R_{DS(on)} = f(I_D)$ 

**Typ. transfer characteristics**  
 $I_D = f(V_{GS})$ 

**Drain-source on-state resistance**  
 $R_{DS(on)} = f(T_j); I_D = 10A; V_{GS} = 10V$ 


**Gate Threshold Voltage**

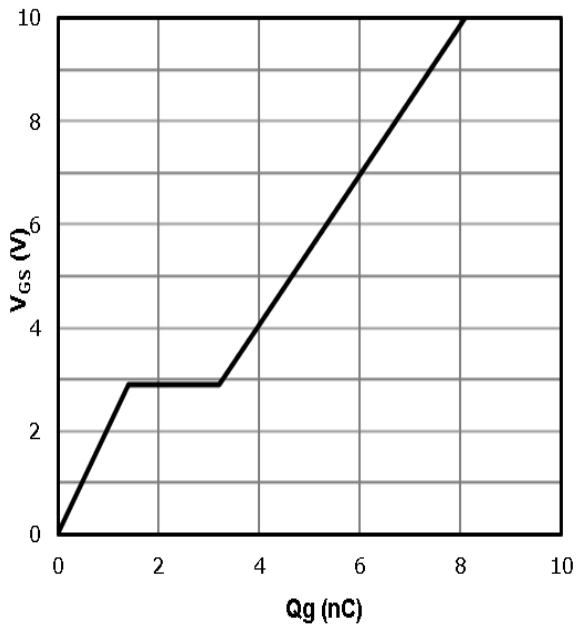
$$V_{TH}=f(T_j); I_D=250\mu A$$


**Drain-source breakdown voltage**

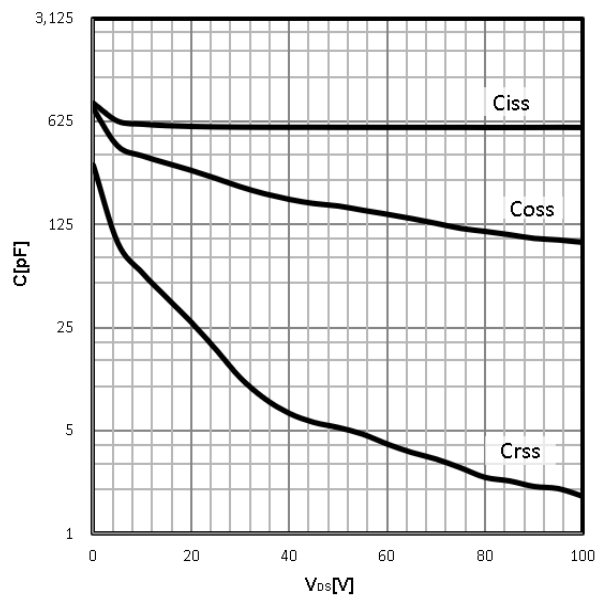
$$V_{BR(DSS)}=f(T_j); I_D=250\mu A$$


**Typ. gate charge**

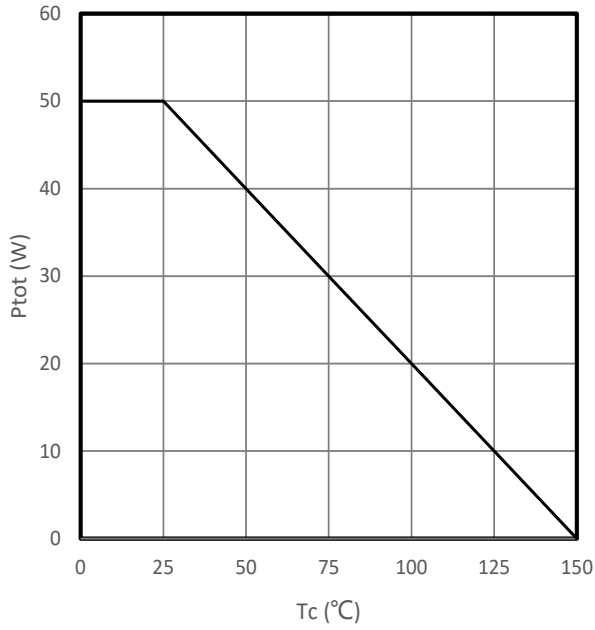
$$V_{GS}=f(Q_g); I_D=10A$$


**Typ. capacitances**

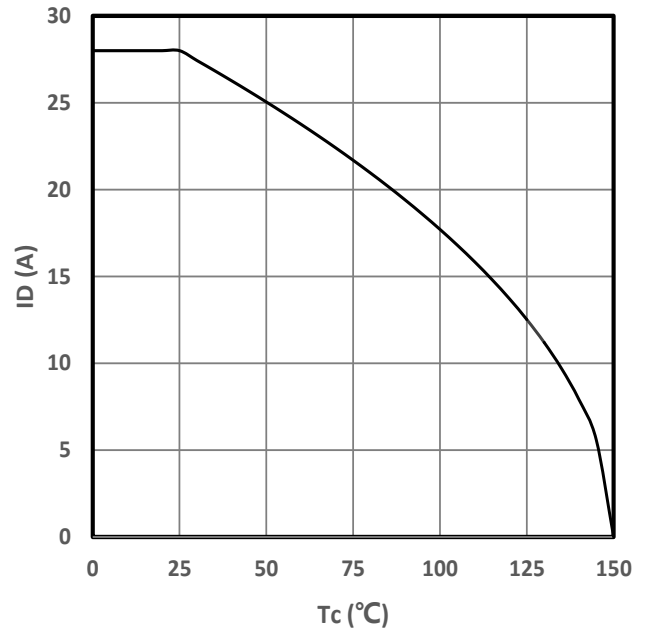
$$C=f(V_{DS}); V_{GS}=0V; f=1MHz$$



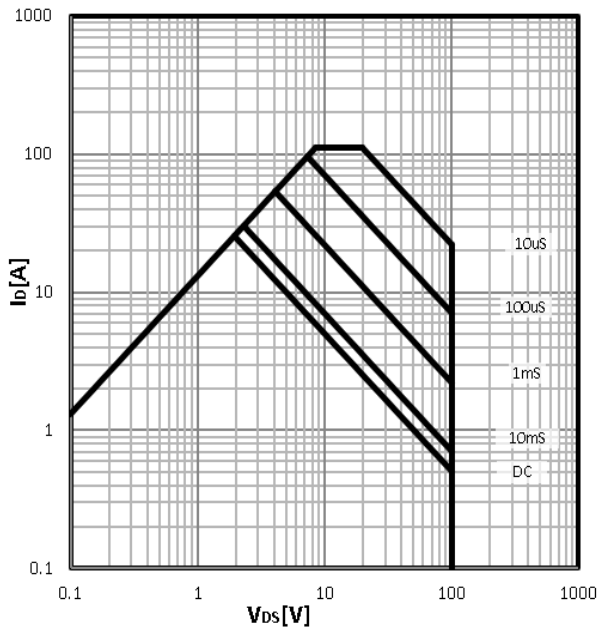
**Power Dissipation**  
 $P_{tot}=f(T_C)$



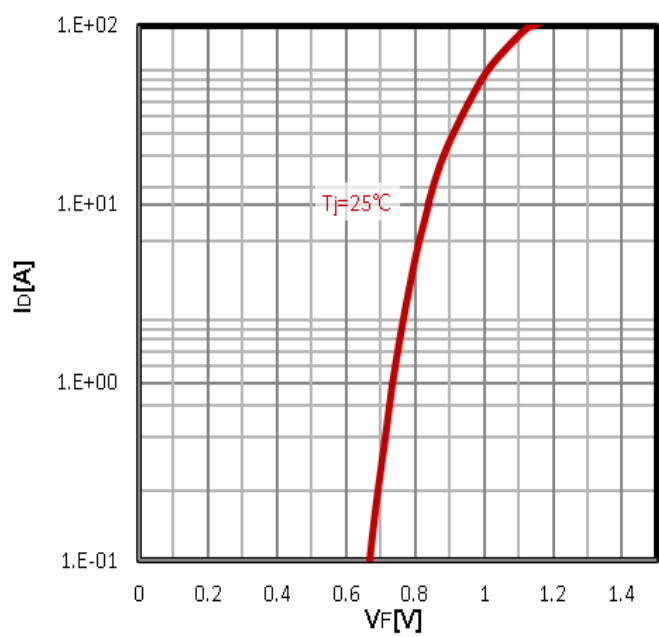
**Maximum Drain Current**  
 $I_D=f(T_C)$



**Safe operating area**  
 $I_D=f(V_{DS})$

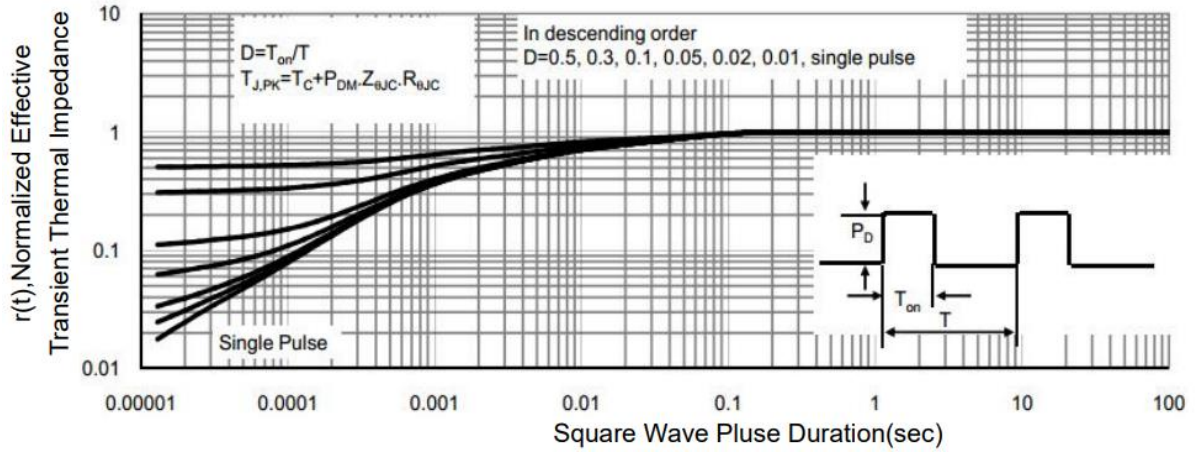


**Body Diode Forward Voltage Variation**  
 $I_F=f(V_{GS})$

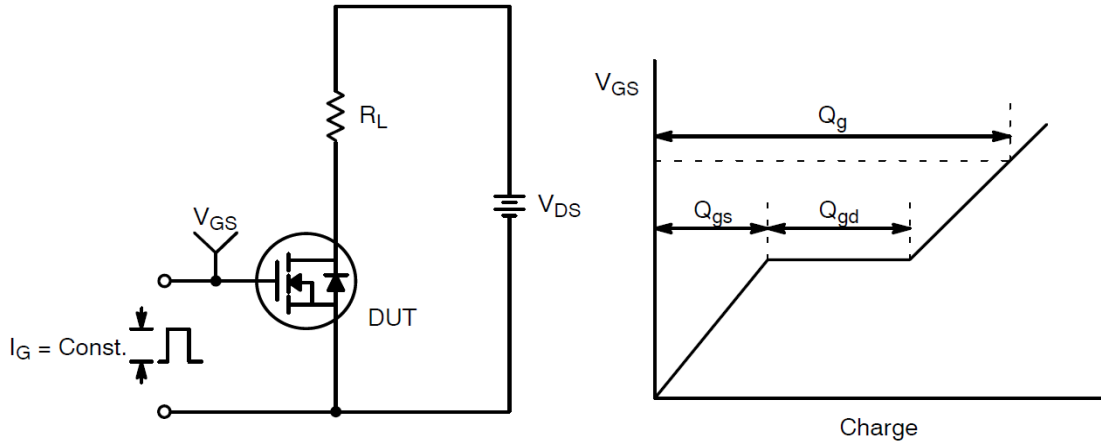


**Max. transient thermal impedance**

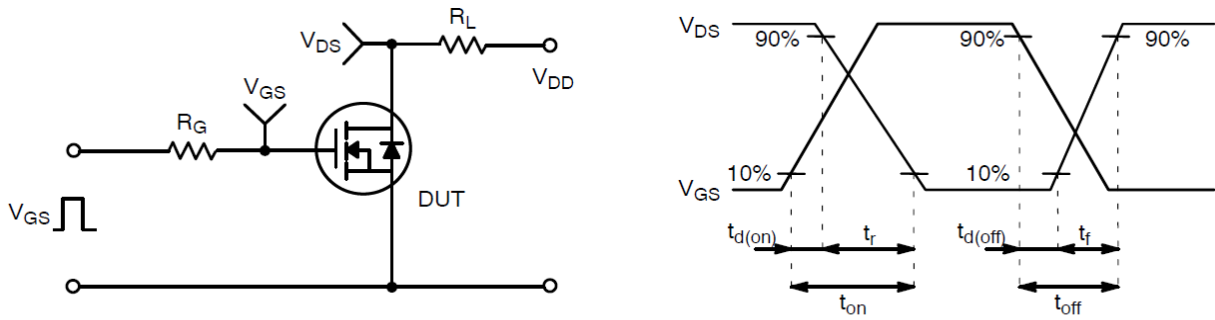
$$Z_{thJC} = f(t_p)$$



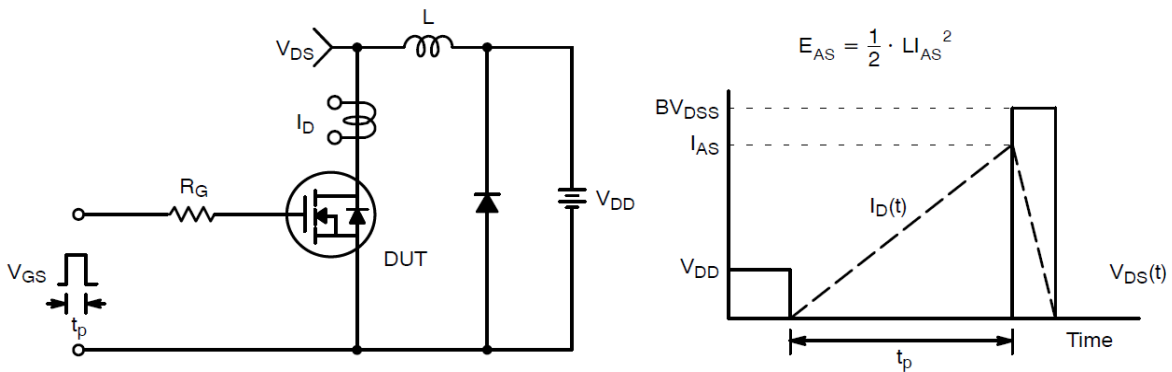
**Test Circuit and Waveform:**



**Gate Charge Test Circuit & Waveform**

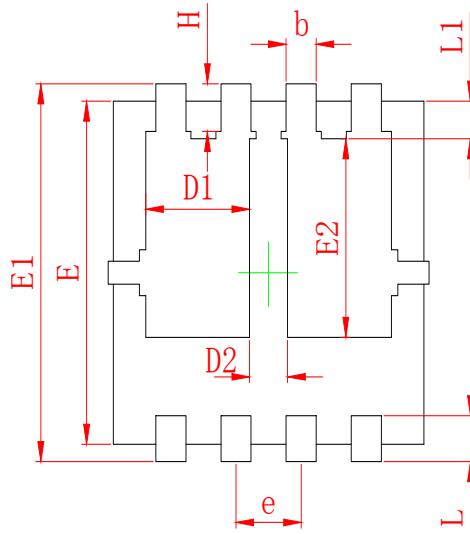
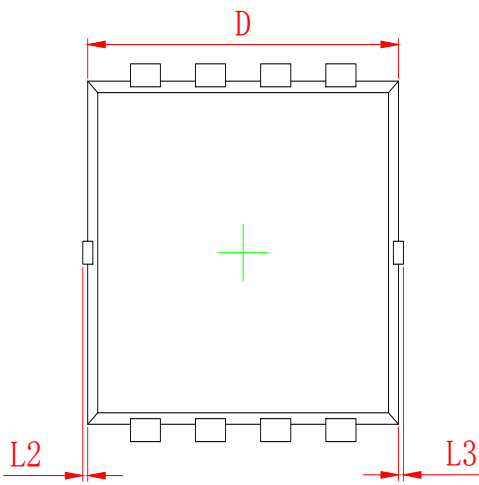


**Resistive Switching Test Circuit & Waveforms**

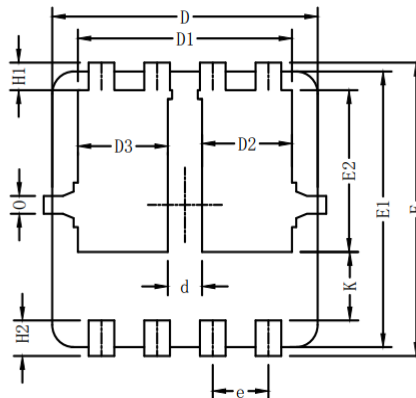
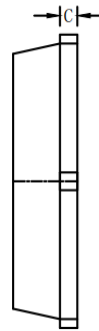
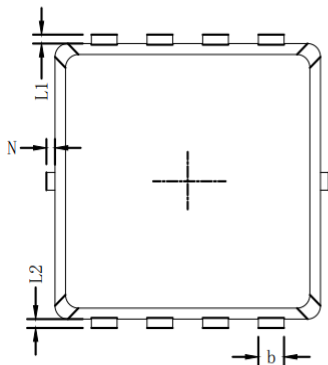
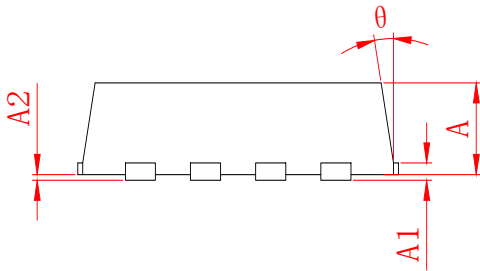


**Unclamped Inductive Switching Test Circuit & Waveforms**

●Dimensions (PDFN3.3×3.3)



| SYMBOL | MILLIMETER |       |
|--------|------------|-------|
|        | MIN        | MAX   |
| A      | 0.700      | 0.900 |
| A1     | 0.152 REF. |       |
| 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.    |      |      |




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