

## General Description

The AGM30P100A 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

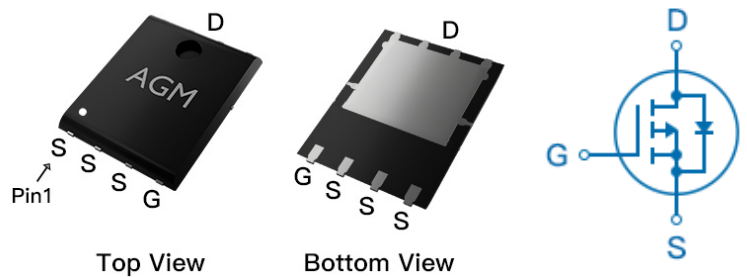
## Application

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

## Product Summary

| BVDSS | RDSON | ID    |
|-------|-------|-------|
| -30V  | 3.7mΩ | -118A |

## PDFN5\*6 Pin Configuration



## Package Marking and Ordering Information

| Device Marking | Device     | Device Package | Reel Size | Tape width | Quantity |
|----------------|------------|----------------|-----------|------------|----------|
| AGM30P100A     | AGM30P100A | PDFN5*6        | 330mm     | 12mm       | 3000     |

**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)       | -118       | A    |
|             | Drain Current-Continuous(Tc=100°C)               | -88        | A    |
| IDM (pulse) | Drain Current-Pulsed (Note 2)                    | -472       | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)               | 100        | w    |
|             | Maximum Power Dissipation(Tc=100°C)              | 40         | w    |
| EAS         | Avalanche energy (Note 3)                        | 484        | 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> | --- | 20   | °C/W |
| RθJC   | Thermal Resistance Junction-Case <sup>1</sup>                   | --- | 1.25 | °C/W |

**Table 3. Electrical Characteristics (TJ=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                         | --   | --   | -1.0 | 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 | -2.2 | V    |
| gFS                                | Forward Transconductance         | VDS=-10V,ID=-10A                        | --   | 25   | --   | S    |
| RDS(on)                            | Drain-Source On-State Resistance | VGS=-10V, ID=-15A                       | --   | 3.7  | 6.0  | mΩ   |
|                                    |                                  | VGS=-4.5V, ID=-10A                      | --   | 5.6  | 7.8  | mΩ   |
| Dynamic Characteristics            |                                  |                                         |      |      |      |      |
| Ciss                               | Input Capacitance                | VDS=-15V,F=1MHZ                         | --   | 5700 | --   | pF   |
| Coss                               | Output Capacitance               |                                         | --   | 915  | --   | pF   |
| Crss                               | Reverse Transfer Capacitance     |                                         | --   | 755  | --   | pF   |
| Rg                                 | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz              | --   | 4.1  | --   | Ω    |
| Switching Times                    |                                  |                                         |      |      |      |      |
| td(on)                             | Turn-on Delay Time               | VGS=-10V,VDS=-15V,<br>ID=-30A,RGEN=3.0Ω | --   | 14   | --   | nS   |
| tr                                 | Turn-on Rise Time                |                                         | --   | 15   | --   | nS   |
| td(off)                            | Turn-Off Delay Time              |                                         | --   | 90   | --   | nS   |
| tf                                 | Turn-Off Fall Time               |                                         | --   | 34   | --   | nS   |
| Qg                                 | Total Gate Charge                | VGS=-10V,<br>VDS=-15V, ID=-30A          | --   | 122  | --   | nC   |
| Qgs                                | Gate-Source Charge               |                                         | --   | 22   | --   | nC   |
| Qgd                                | Gate-Drain Charge                |                                         | --   | 32   | --   | nC   |
| Source-Drain Diode Characteristics |                                  |                                         |      |      |      |      |
| ISD                                | Source-Drain Current(Body Diode) |                                         | --   | --   | -118 | A    |
| VSD                                | Forward on Voltage               | VGS=0V,IS=-15A                          | --   | --   | -1.2 | V    |
| trr                                | Reverse Recovery Time            | IF=-15A ,                               | --   | 19   | --   | ns   |
| Qrr                                | Reverse Recovery Charge          | dI/dt=-100A/μs , TJ=25℃                 | --   | 52   | --   | 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°C , VDD=-20V, Vgs=-10V, ID=-44A, L=0.5mH, RG=25ohm

## Typical Characteristics

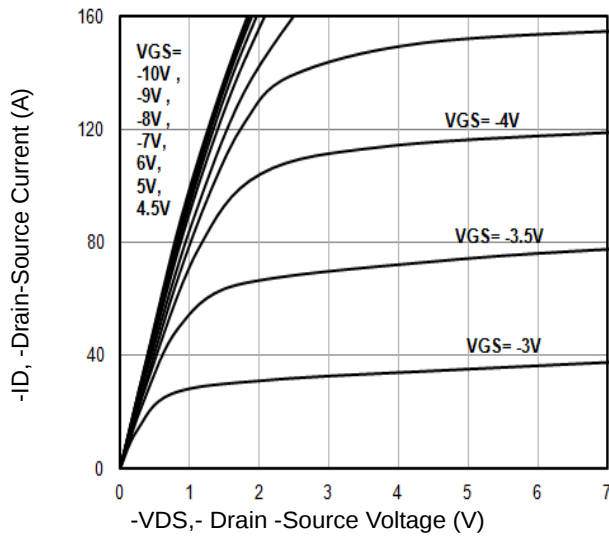


Fig1. Typical Output Characteristics

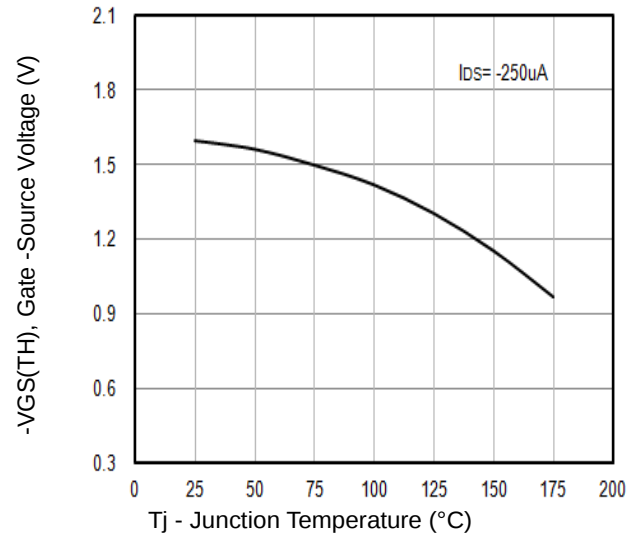


Fig2.  $-V_{GS(TH)}$  Gate -Source Voltage Vs.  $T_j$

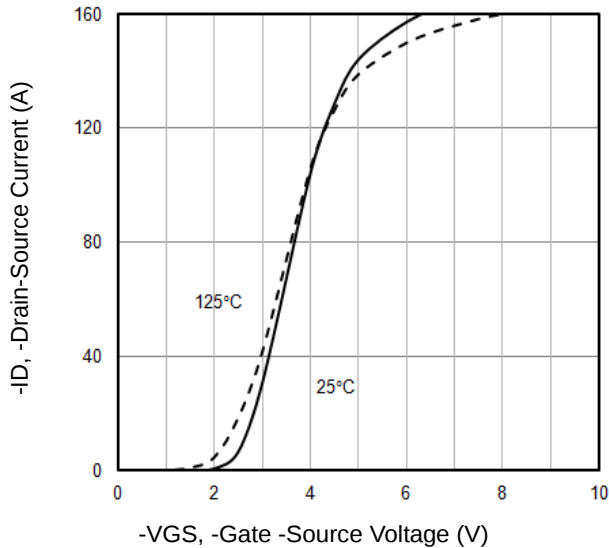


Fig3. Typical Transfer Characteristics

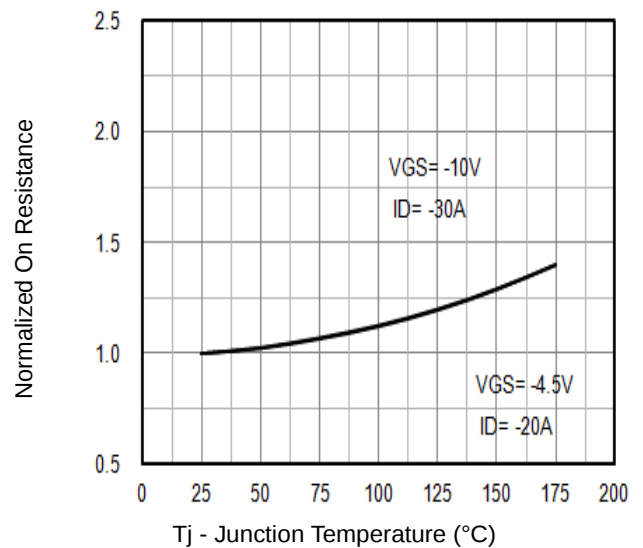


Fig4. Normalized On-Resistance Vs.  $T_j$

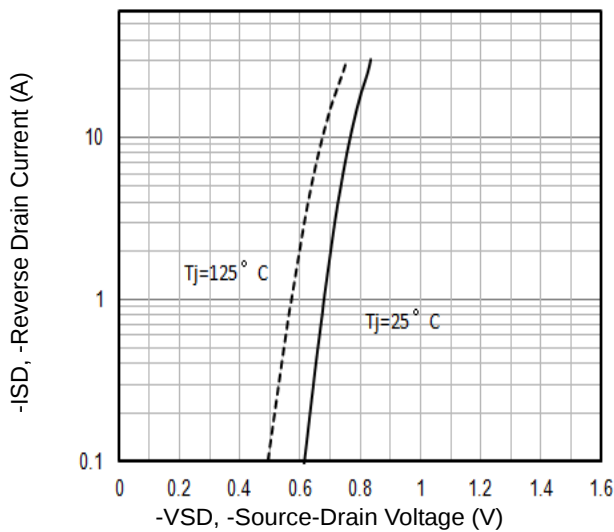


Fig5. Typical Source-Drain Diode Forward Voltage

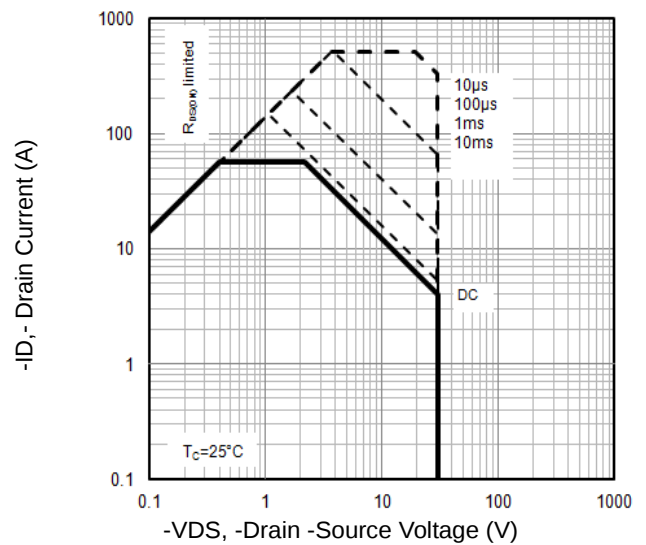


Fig6. Maximum Safe Operating Area

## Typical Characteristics

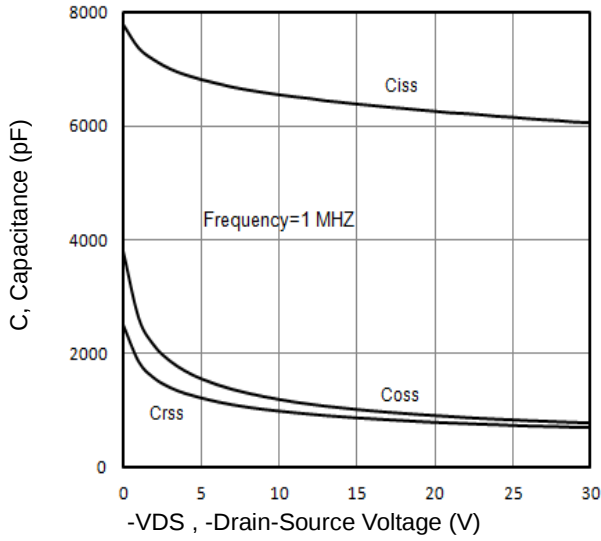


Fig7. Typical Capacitance Vs. Drain-Source Voltage

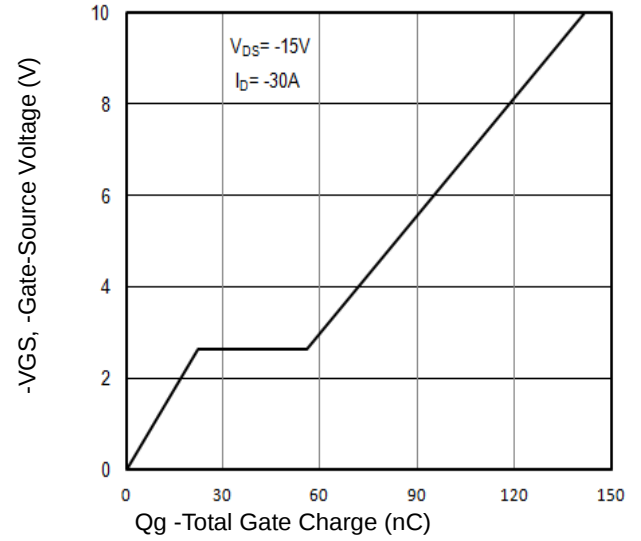


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

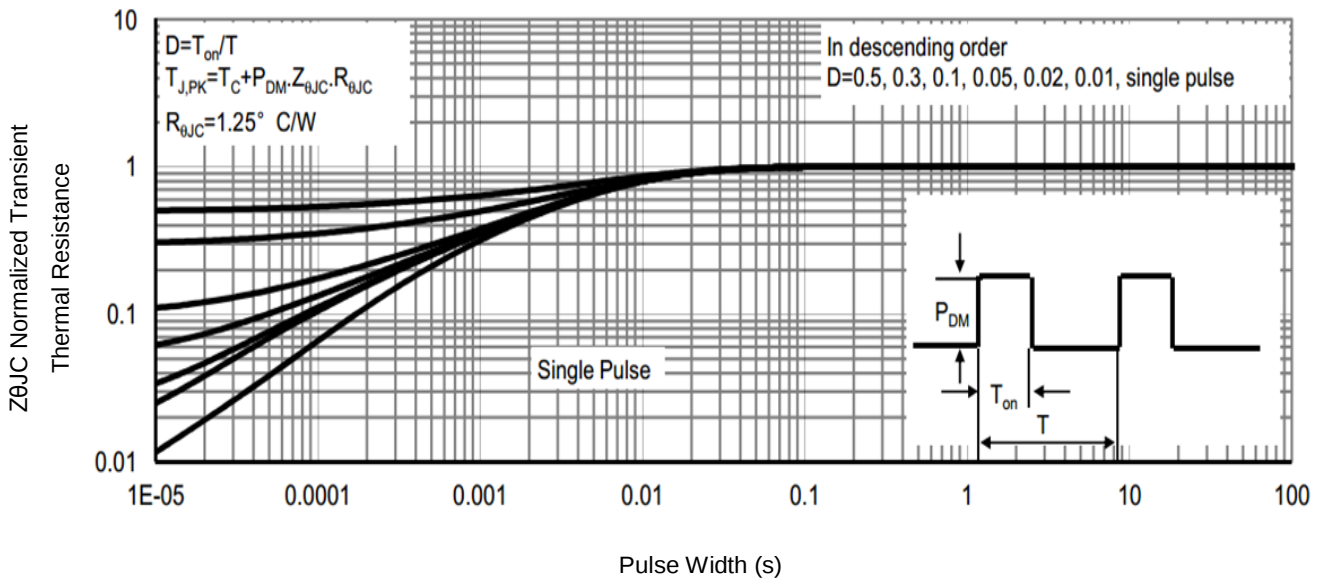


Fig9. Normalized Maximum Transient Thermal Impedance

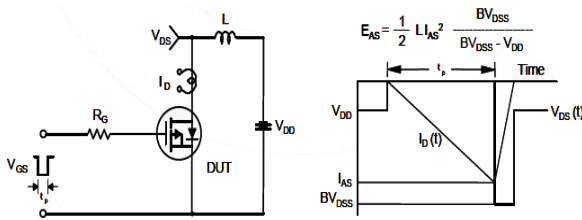


Fig10. Unclamped Inductive Test Circuit and Waveforms

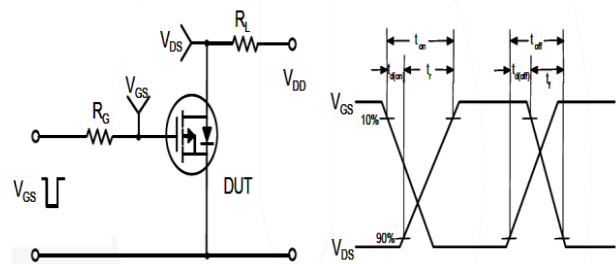
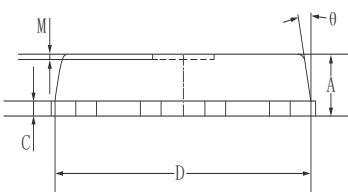
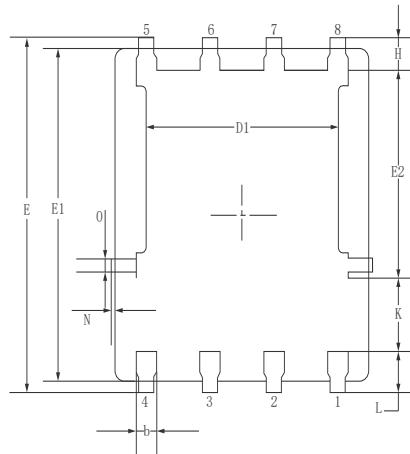
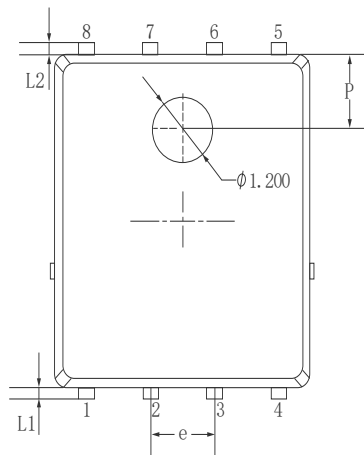
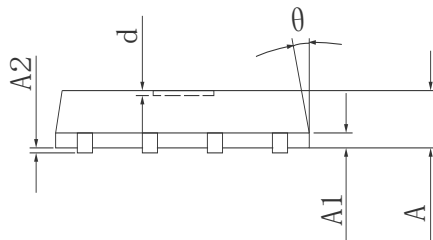
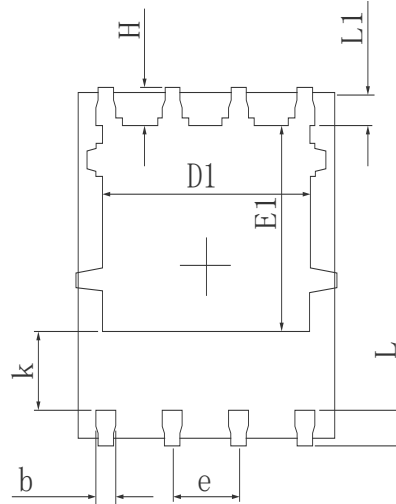
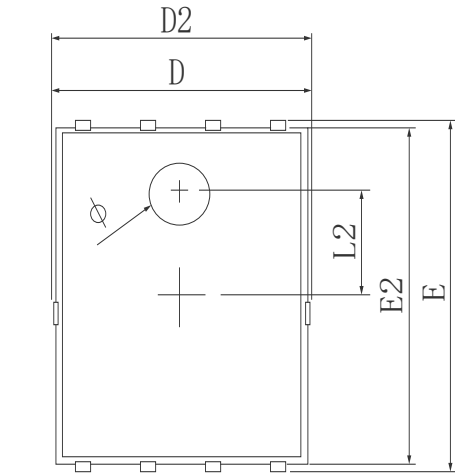


Fig11. Switching Time Test Circuit and waveforms

# Dimensions (PDFN5\*6)



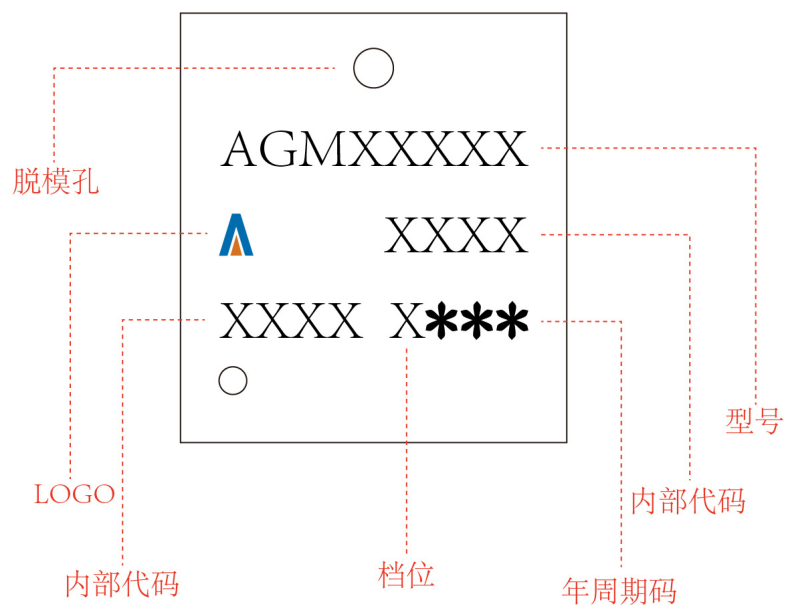
| SYMBOL | MILLIMETER |       |       |
|--------|------------|-------|-------|
|        | MIN        | Typ.  | MAX   |
| A      | 0.900      | 1.000 | 1.100 |
| A1     | 0.254 REF. |       |       |
| A2     | 0°0.05     |       |       |
| D      | 4.824      | 4.900 | 4.976 |
| D1     | 3.910      | 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 |

| Symbol | 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.   |      |      |

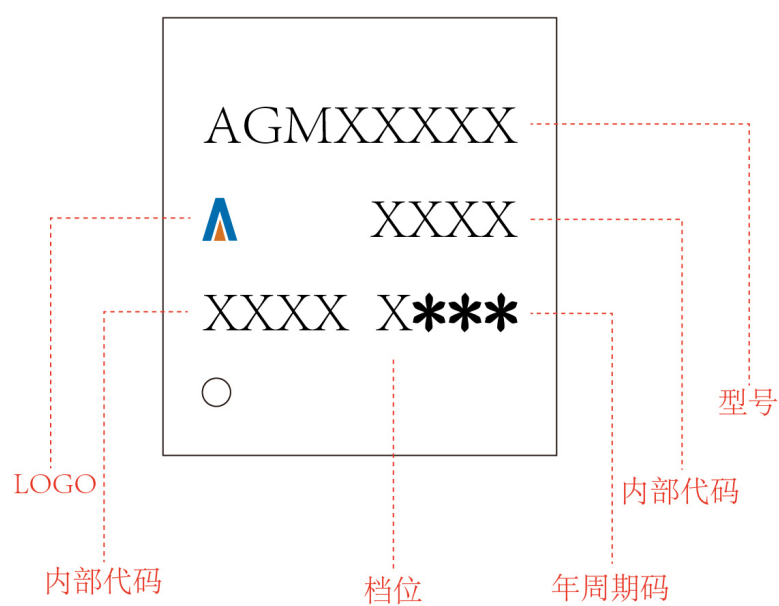
PDFN5\*6

Marking Instructions:

Model1:



Model2:



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