

### • General Description

The AGM30P16D 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

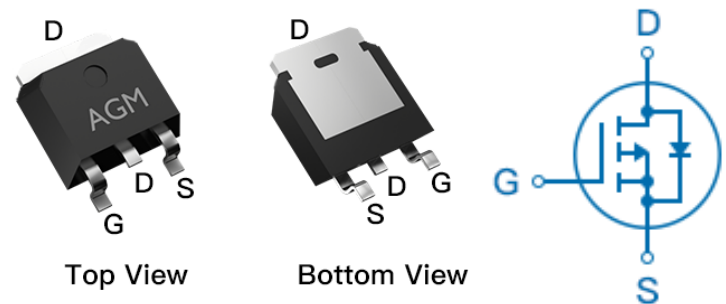
### • Application

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

### Product Summary

| BVDSS | RDSON | ID   |
|-------|-------|------|
| -30V  | 15mΩ  | -25A |

### TO-252 Pin Configuration



### Package Marking and Ordering Information

| Device Marking | Device    | Device Package | Reel Size | Tape width | Quantity |
|----------------|-----------|----------------|-----------|------------|----------|
| AGM30P16D      | AGM30P16D | TO-252         | 330mm     | 16mm       | 2500     |

**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) <b>(Note 1)</b> | -25        | A    |
|             | Drain Current-Continuous(Tc=100°C)                | 15         | A    |
| IDM (pluse) | Drain Current-Pulsed <b>(Note 2)</b>              | -100       | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)                | 30         | w    |
|             | Maximum Power Dissipation(Tc=100°C)               | 12         | w    |
| EAS         | Avalanche energy <b>(Note 3)</b>                  | 110        | 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> | --- | 62  | °C/W |
| RθJC   | Thermal Resistance Junction-Case <sup>1</sup>                   | --- | 3.6 | °C/W |

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

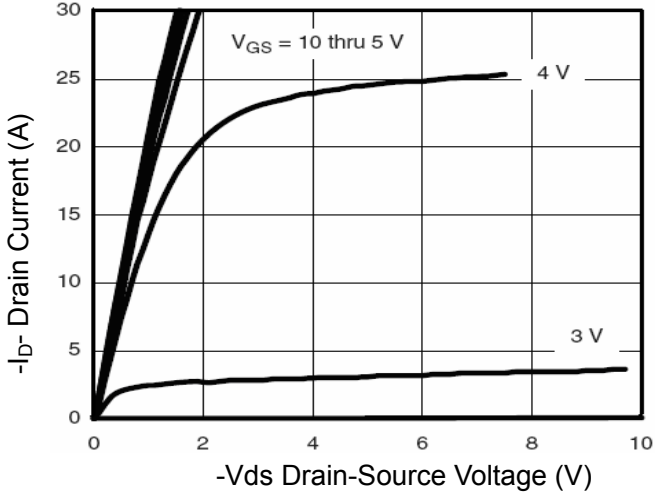
| Symbol                                    | Parameter                        | Conditions                               | Min  | Typ  | Max  | Unit |
|---|----------------------------------|--|------|------|------|------|
| <b>On/Off States</b>                      |                                  |  |      |      |      |      |
| BVDSS                                     | Drain-Source Breakdown Voltage   | VGS=0V ID=250μA                          | -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 | -1.5 | -2.2 | V    |
| gFS                                       | Forward Transconductance         | VDS=-5V,ID=-6A                           | --   | 8    | --   | S    |
| RDS(on)                                   | Drain-Source On-State Resistance | VGS=-10V, ID=-10A                        | --   | 15   | 18   | mΩ   |
|   |                                  | VGS=-4.5V, ID=-6A                        | --   | 20   | 23   | mΩ   |
| <b>Dynamic Characteristics</b>            |                                  |  |      |      |      |      |
| Ciss                                      | Input Capacitance                | VDS=-15V,VGS=0V<br>F=1MHZ                | --   | 1350 | --   | pF   |
| Coss                                      | Output Capacitance               |  | --   | 194  | --   | pF   |
| Crss                                      | Reverse Transfer Capacitance     |  | --   | 158  | --   | pF   |
| Rg  | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz               | --   | 14   | --   | Ω    |
| <b>Switching Times</b>                    |                                  |  |      |      |      |      |
| td(on)                                    | Turn-on Delay Time               | VGS=-10V,VDS=-25V,<br>RL=0.75Ω,RGEN=3.3Ω | --   | 10.5 | --   | nS   |
| tr  | Turn-on Rise Time                |  | --   | 11   | --   | nS   |
| td(off)                                   | Turn-Off Delay Time              |  | --   | 51   | --   | nS   |
| tf  | Turn-Off Fall Time               |  | --   | 28   | --   | nS   |
| Qg  | Total Gate Charge                | VGS=-10V,<br>VDS=-25V, ID=-15A           | --   | 14   | --   | nC   |
| Qgs                                       | Gate-Source Charge               |  | --   | 5.2  | --   | nC   |
| Qgd                                       | Gate-Drain Charge                |  | --   | 5.0  | --   | nC   |
| <b>Source-Drain Diode Characteristics</b> |                                  |  |      |      |      |      |
| ISD                                       | Source-Drain Current(Body Diode) |  | --   | --   | -25  | A    |
| VSD                                       | Forward on Voltage               | VGS=0V,IS=-10A                           | --   | --   | -1.2 | V    |
| trr                                       | Reverse Recovery Time            | IF=-10A , di/dt=100A/μs ,<br>TJ=25°C     | --   | --   | --   | ns   |
| Qrr                                       | Reverse Recovery Charge          |  | --   | --   | --   | nc   |

Notes 1.The maximum current rating is package limited.

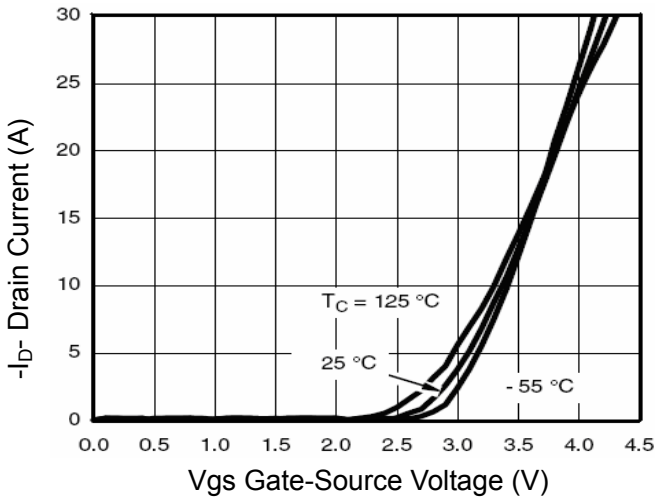
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature Notes

3.EAS condition: T<sub>J</sub>=25°C ,VDD=-15V,Vgs=-10V,ID=-21A,L=0.5mH,RG=25ohm

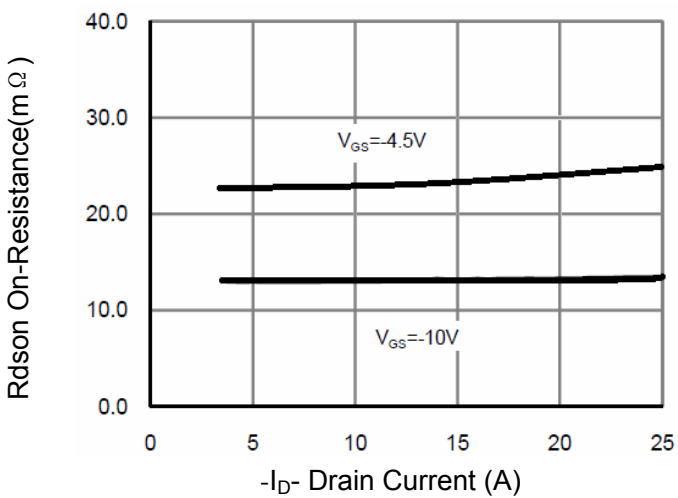
**Typical Electrical and Thermal Characteristics (Curves)**



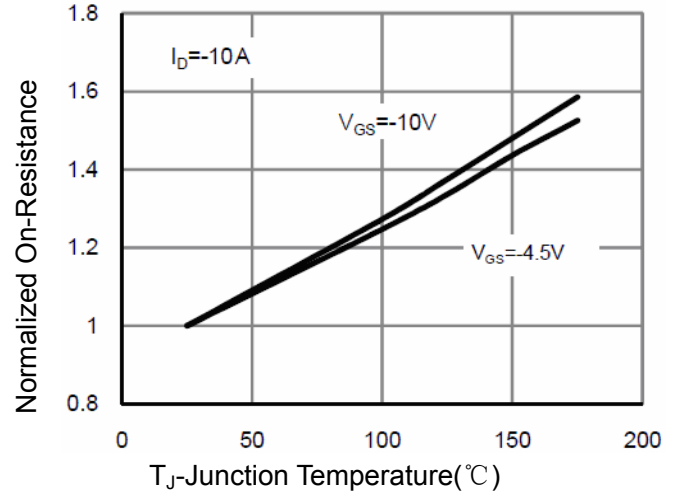
**Figure 1 Output Characteristics**



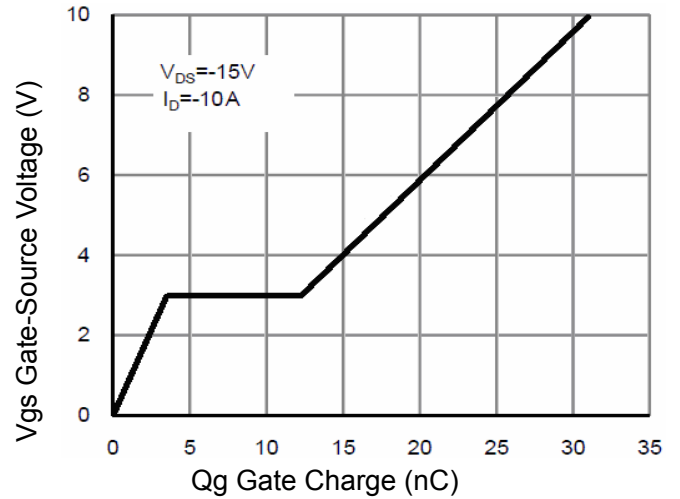
**Figure 2 Transfer Characteristics**



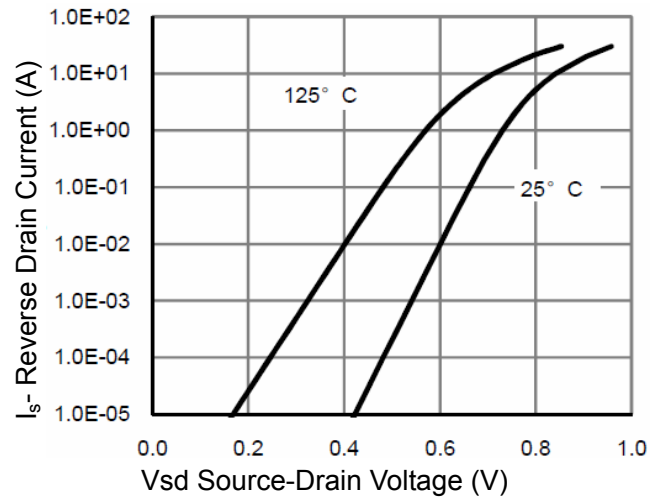
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**



**Figure 5 Gate Charge**



**Figure 6 Source- Drain Diode Forward**

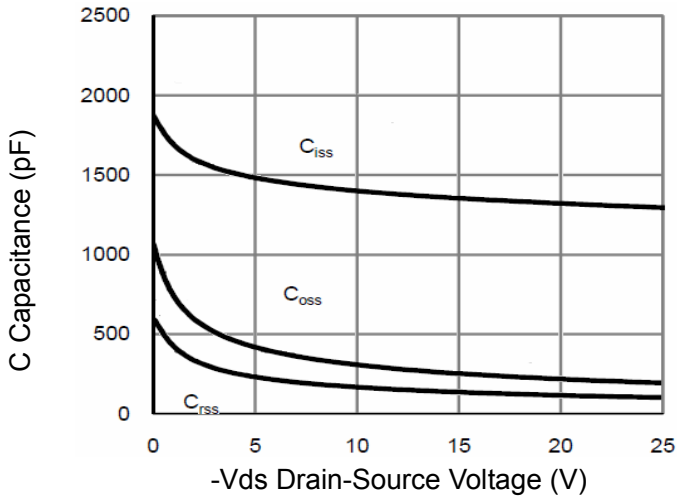


Figure 7 Capacitance vs Vds

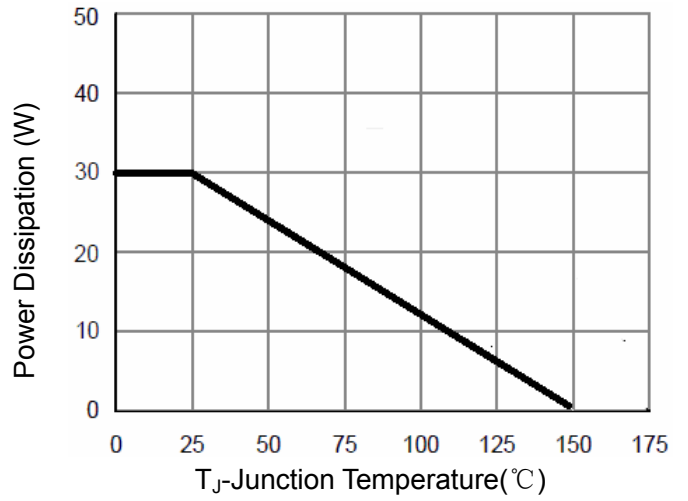


Figure 9 Power De-rating

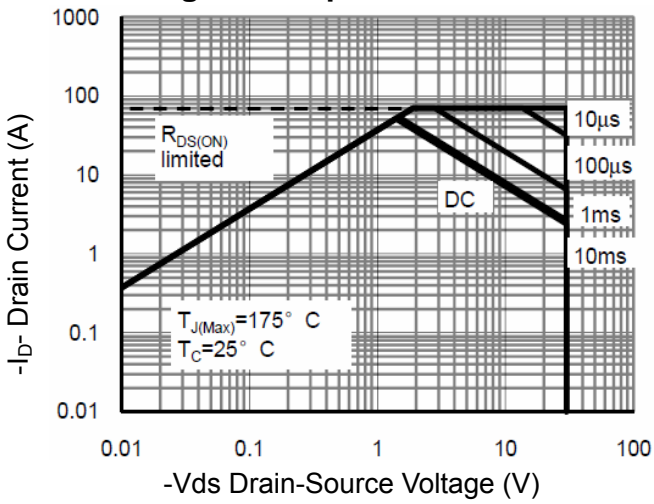


Figure 8 Safe Operation Area

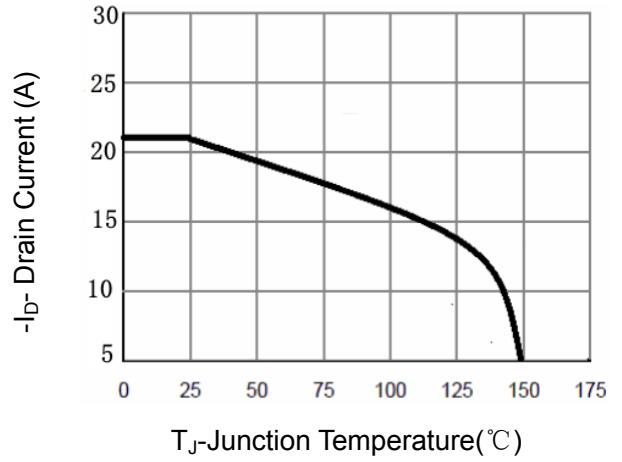


Figure 10 ID Current Derating

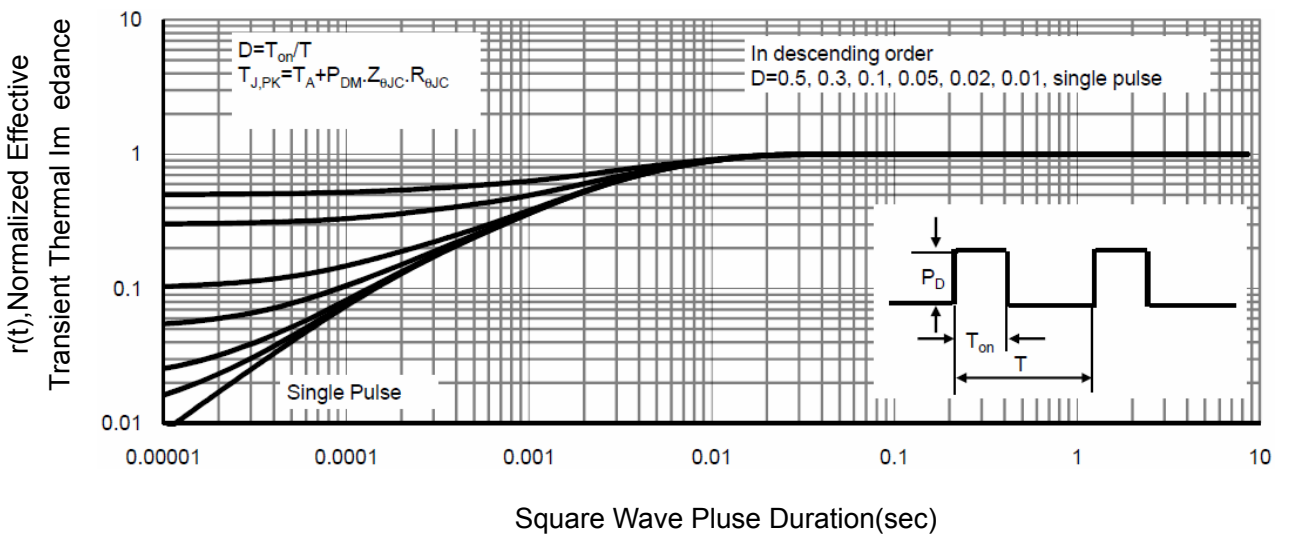
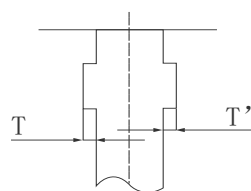
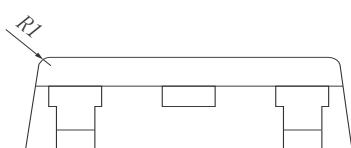
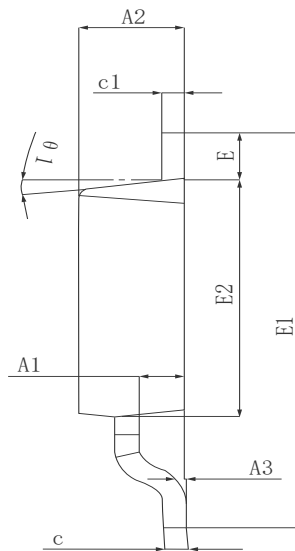
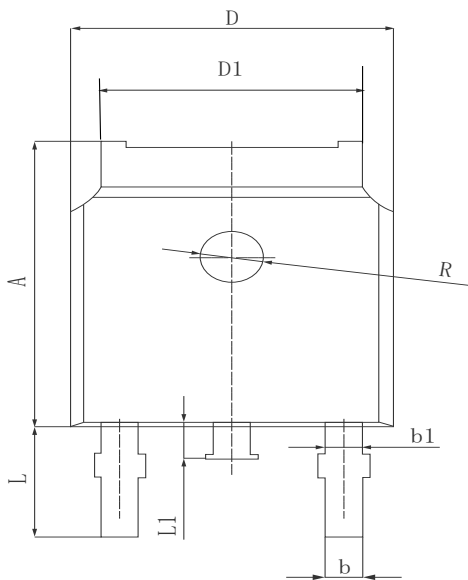
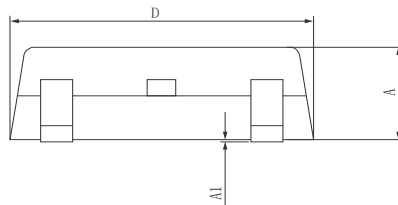
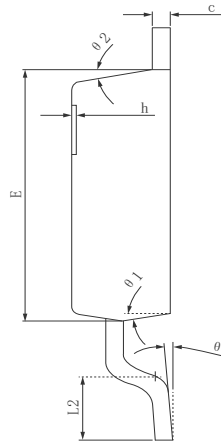
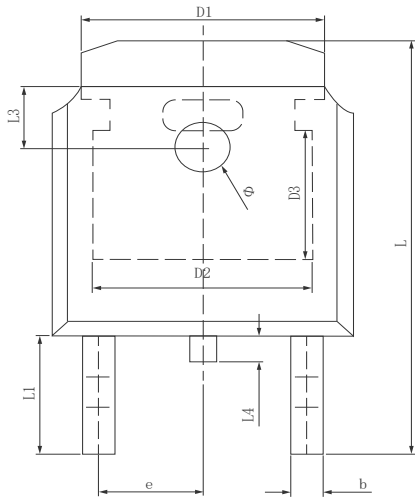


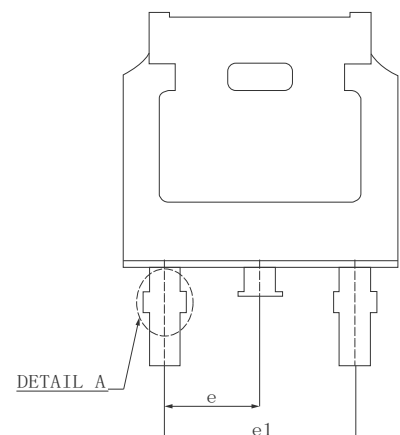
Figure 11 Normalized Maximum Transient Thermal Impedance

**●Dimensions (TO-252)**


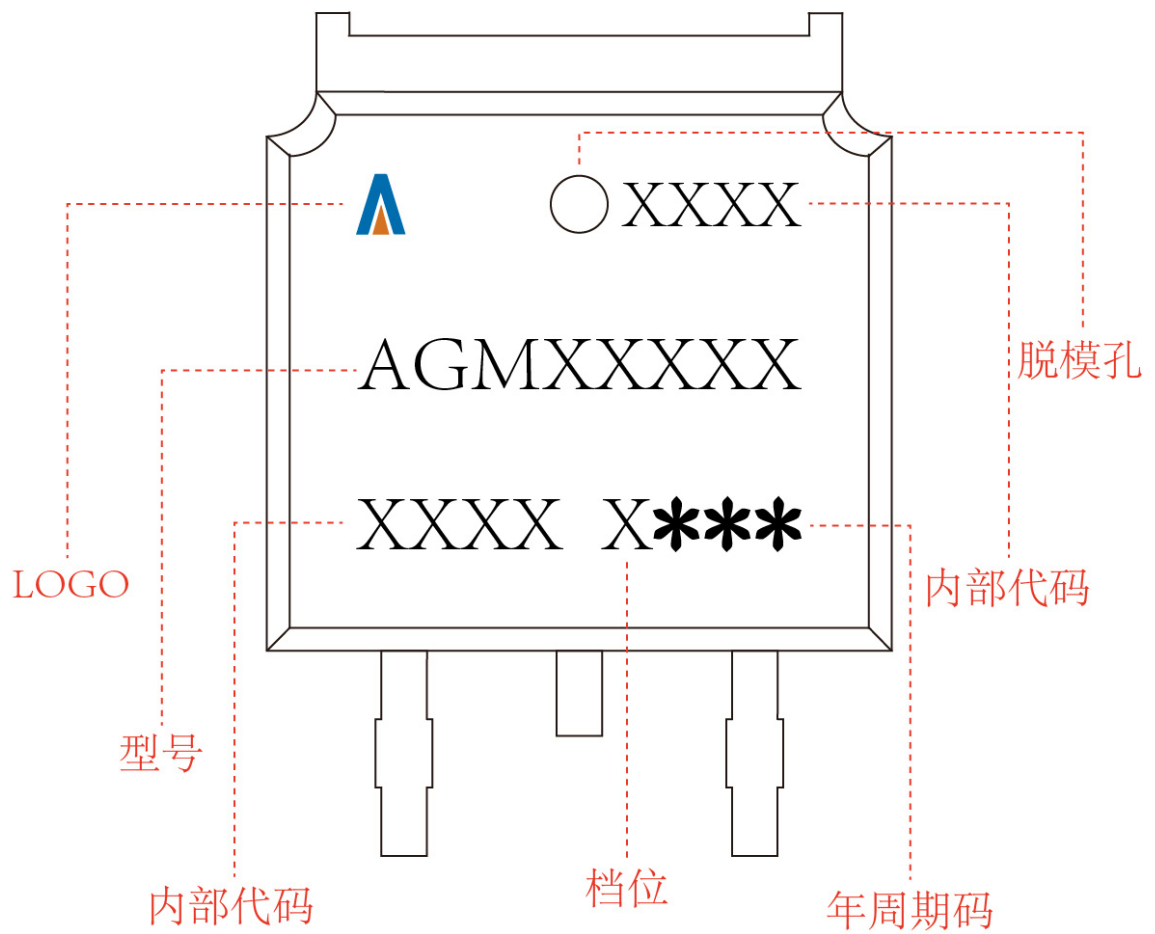
$0 \leq T, T' \leq 0.12$   
**DETAIL A**

| SYMBOL  | MILLIMETER |        |        |
|---------|------------|--------|--------|
|         | MIN        | Typ.   | MAX    |
| A       | 2.200      | 2.300  | 2.400  |
| A1      | 0.000      |        | 0.127  |
| b       | 0.640      | 0.690  | 0.740  |
| e (电镀后) | 0.460      | 0.520  | 0.580  |
| D       | 6.500      | 6.600  | 6.700  |
| D1      | 5.334 REF  |        |        |
| D2      | 4.826 REF  |        |        |
| D3      | 3.166 REF  |        |        |
| E       | 6.000      | 6.100  | 6.200  |
| e       | 2.286 TYP  |        |        |
| h       | 0.000      | 0.100  | 0.200  |
| L       | 9.900      | 10.100 | 10.300 |
| L1      | 2.888 REF  |        |        |
| L2      | 1.400      | 1.550  | 1.700  |
| L3      | 1.600 REF  |        |        |
| L4      | 0.600      | 0.800  | 1.000  |
| Φ       | 1.100      | 1.200  | 1.300  |
| θ       | 0°         |        | 8°     |
| θ 1     | 9° TYP     |        |        |
| θ 2     | 9° TYP     |        |        |

| SYMBOL | MILLIMETER |       |        |
|--------|------------|-------|--------|
|        | MIN        | NOM   | MAX    |
| A      | 7.050      | 7.100 | 7.150  |
| A1     | 0.960      | 1.010 | 1.060  |
| A2     | 2.250      | 2.300 | 2.350  |
| A3     | 0.000      | 0.050 | 0.100  |
| b      | 0.760REF.  |       |        |
| b1     | 1.000REF.  |       |        |
| c      | 0.508REF.  |       |        |
| c1     | 0.508REF.  |       |        |
| D      | 6.550      | 6.600 | 6.650  |
| D1     | 5.220      | 5.320 | 5.420  |
| E      | 0.950      | 1.000 | 1.050  |
| E1     | 9.700      | 9.900 | 10.100 |
| E2     | 6.050      | 6.100 | 6.150  |
| e      | 2.286BSC   |       |        |
| e1     | 4.572REF.  |       |        |
| L      | 2.650      | 2.800 | 2.950  |
| L1     | 0.700      | 0.800 | 0.900  |
| θ 1    | 7° REF.    |       |        |
| R      | 1.300REF.  |       |        |
| R1     | 0.250REF.  |       |        |



TO-252  
Marking Instructions:




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