

## General Description

The AGM30P18E 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

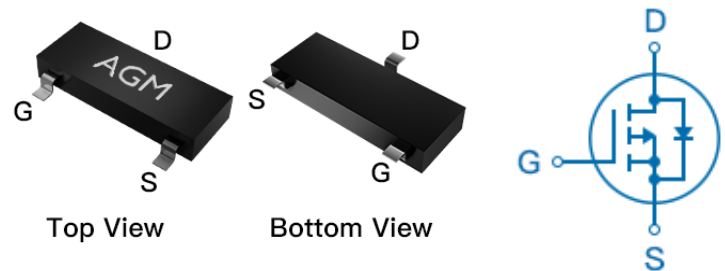
## Application

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

## Product Summary

| BVDSS | RDSON | ID    |
|-------|-------|-------|
| -30V  | 19mΩ  | -9.0A |

## SOT23-3 Pin Configuration



## Package Marking and Ordering Information

| Device Marking | Device    | Device Package | Reel Size | Tape width | Quantity |
|----------------|-----------|----------------|-----------|------------|----------|
| 30P18          | AGM30P18E | SOT23-3        | 178mm     | 8mm        | 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(TA=25°C) (Note 1)       | -9.0       | A    |
|             | Drain Current-Continuous(TA=70°C)                | -5.0       | A    |
| IDM (pluse) | Drain Current-Pulsed (Note 2)                    | -36        | A    |
| PD          | Maximum Power Dissipation(TA=25°C)               | 1.25       | W    |
| 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> | --- | 100 | °C/W |

**Table 3. Electrical Characteristics (TA=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=-5A                       | --   | 3    | --   | S    |
| RDS(on)                            | Drain-Source On-State Resistance | VGS=-10V, ID=-9A                     | --   | 19   | 24   | mΩ   |
|                                    |                                  | VGS=-4.5V, ID=-5A                    | --   | 26.5 | 36   | mΩ   |
| Dynamic Characteristics            |                                  |                                      |      |      |      |      |
| Ciss                               | Input Capacitance                | VDS=-15V,VGS=0V,<br>F=1MHZ           | --   | 900  | --   | pF   |
| Coss                               | Output Capacitance               |                                      | --   | 125  | --   | pF   |
| Crss                               | Reverse Transfer Capacitance     |                                      | --   | 109  | --   | pF   |
| Rg                                 | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz           | --   | --   | --   | Ω    |
| Switching Times                    |                                  |                                      |      |      |      |      |
| td(on)                             | Turn-on Delay Time               | VGS=-10V,VDS=-15V,<br>RGEN=6Ω,ID=-1A | --   | 13   | --   | nS   |
| tr                                 | Turn-on Rise Time                |                                      | --   | 15   | --   | nS   |
| td(off)                            | Turn-Off Delay Time              |                                      | --   | 198  | --   | nS   |
| tf                                 | Turn-Off Fall Time               |                                      | --   | 98   | --   | nS   |
| Qg                                 | Total Gate Charge                | VGS=-10V,<br>VDS=-15V, ID=-8A        | --   | 42   | --   | nC   |
| Qgs                                | Gate-Source Charge               |                                      | --   | 8.8  | --   | nC   |
| Qgd                                | Gate-Drain Charge                |                                      | --   | 7.3  | --   | nC   |
| Source-Drain Diode Characteristics |                                  |                                      |      |      |      |      |
| ISD                                | Source-Drain Current(Body Diode) |                                      | --   | --   | -9.0 | A    |
| VSD                                | Forward on Voltage               | VGS=0V,IS=-9A                        | --   | -0.8 | -1.2 | V    |
| trr                                | Reverse Recovery Time            | IF=-9A , dI/dt=100A/μs ,<br>TJ=25℃   | --   | --   | --   | ns   |
| Qrr                                | Reverse Recovery Charge          |                                      | --   | --   | --   | nc   |

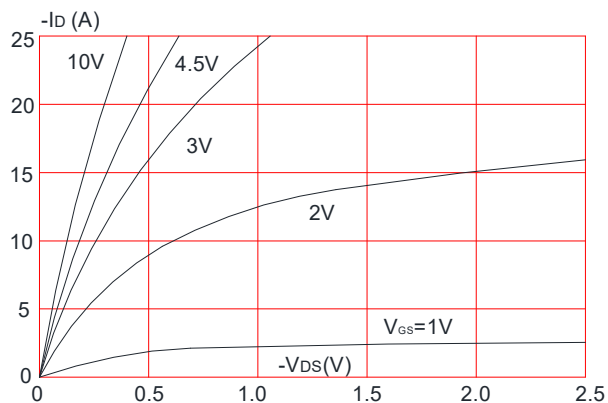
Notes 1.The maximum current rating is package limited.

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

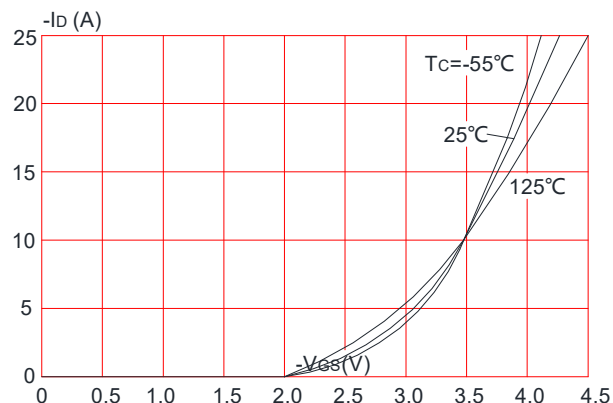
Notes 3.EAS condition: TJ=25°C

## Typical Performance Characteristics

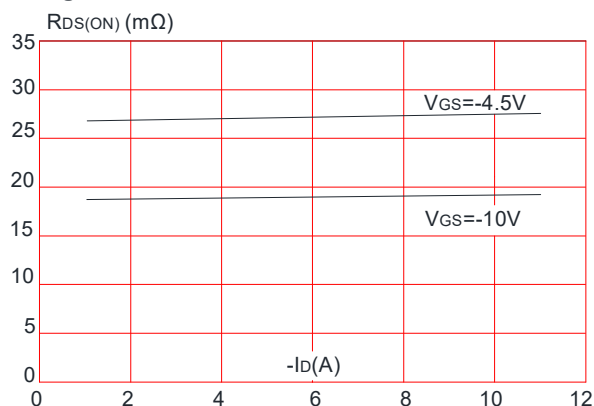
**Figure 1:** Output Characteristics



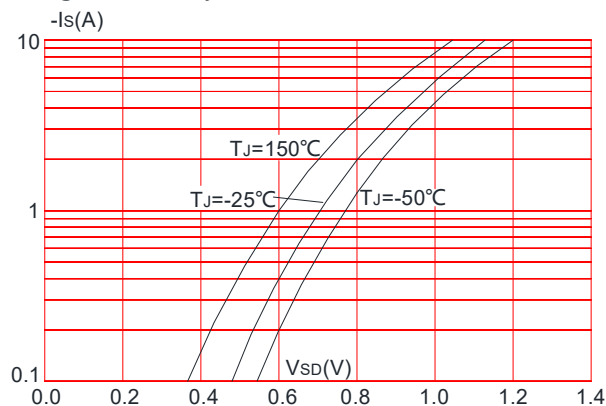
**Figure 2:** Typical Transfer Characteristics



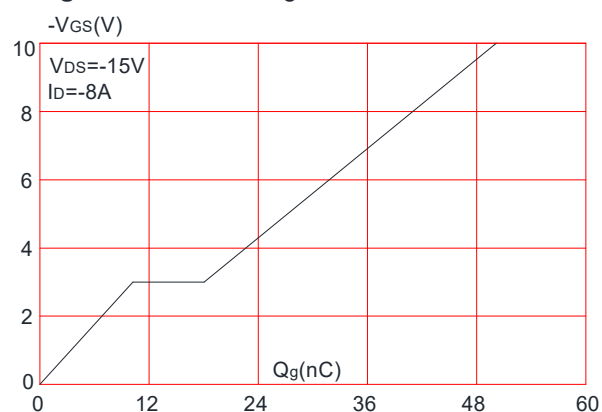
**Figure 3:** On-resistance vs. Drain Current



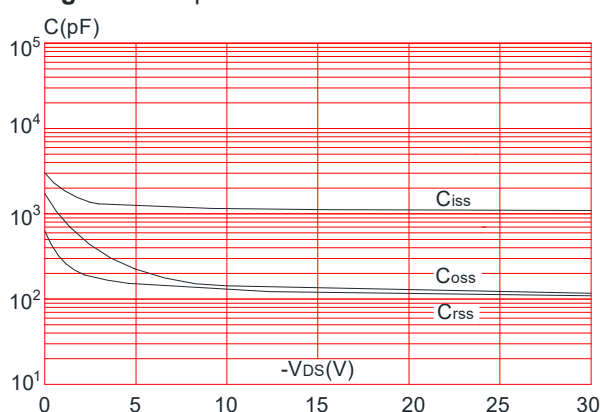
**Figure 4:** Body Diode Characteristics



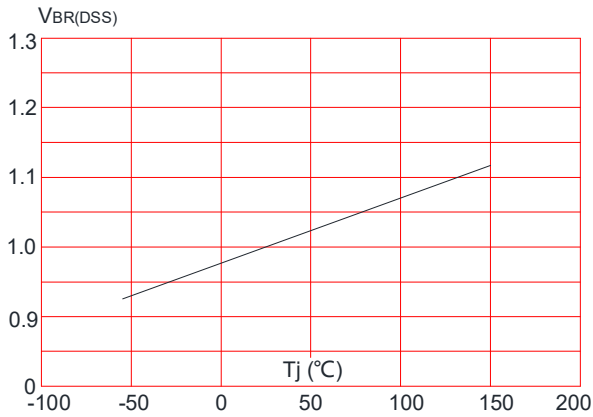
**Figure 5:** Gate Charge Characteristics



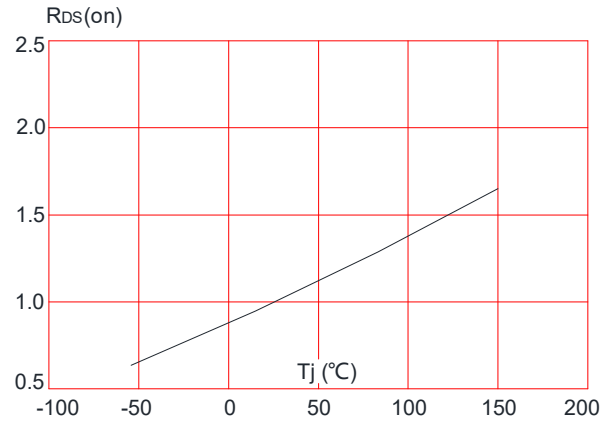
**Figure 6:** Capacitance Characteristics



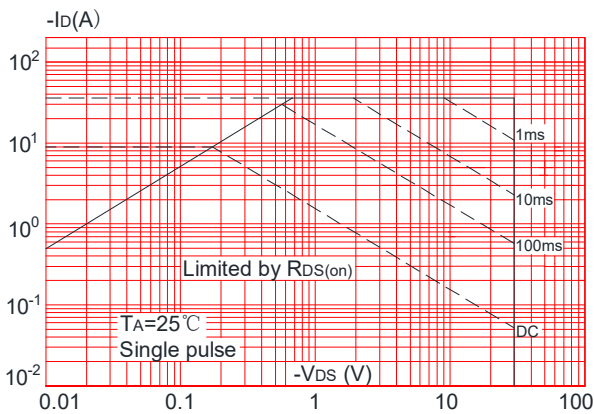
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



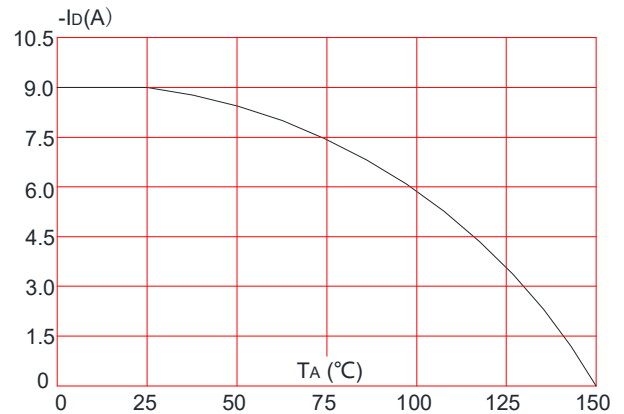
**Figure 8:** Normalized on Resistance vs. Junction Temperature



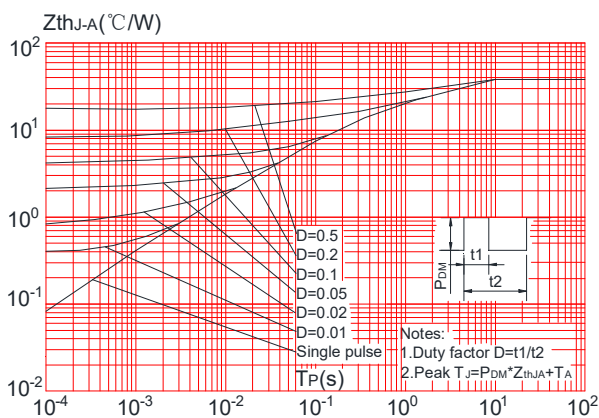
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



## Test Circuit

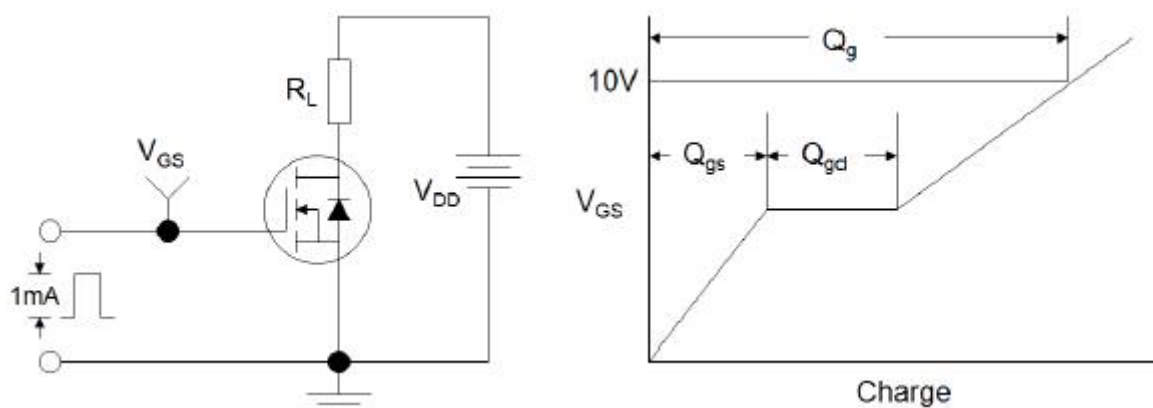


Figure1:Gate Charge Test Circuit & Waveform

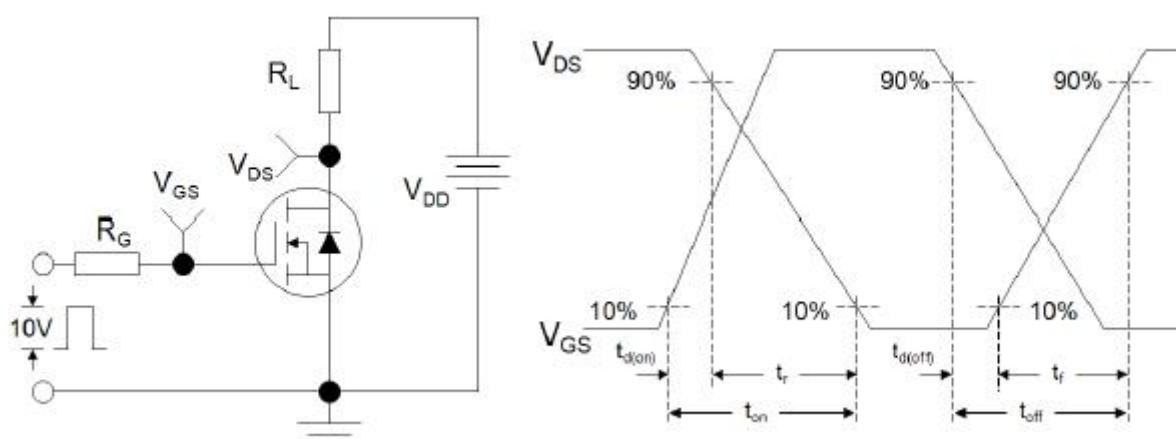


Figure 2: Resistive Switching Test Circuit & Waveforms

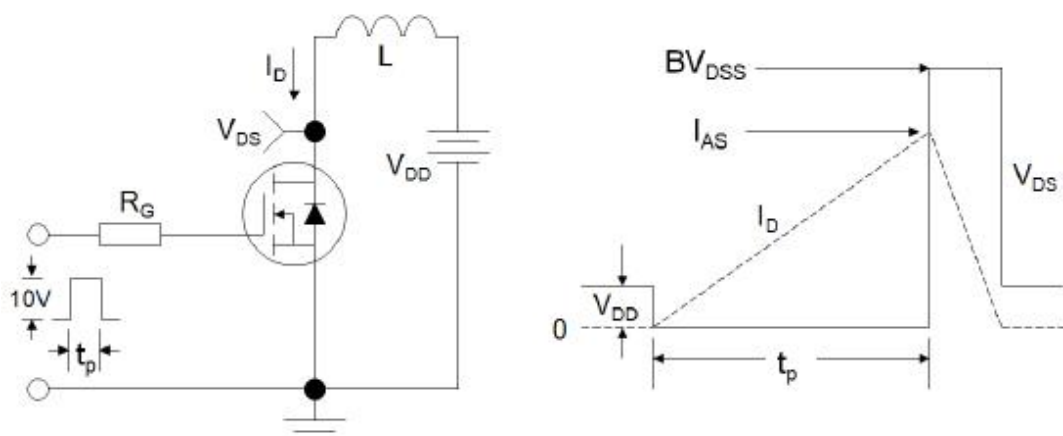
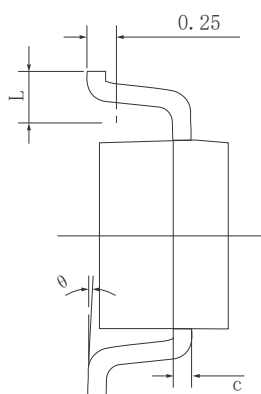
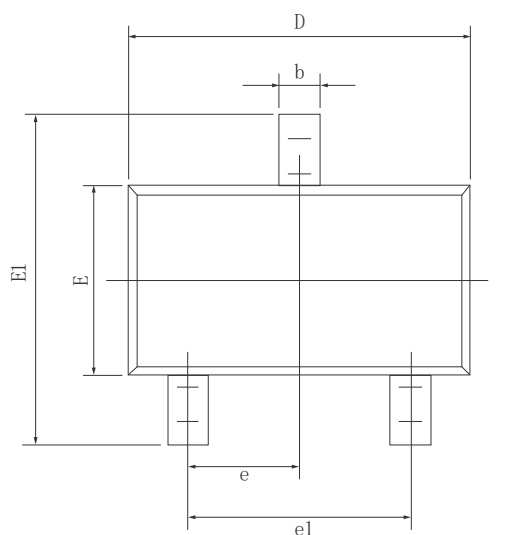
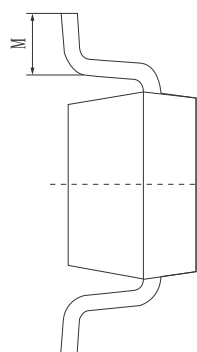
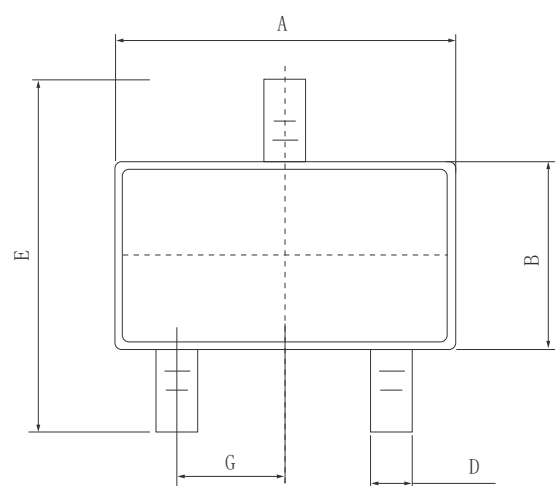
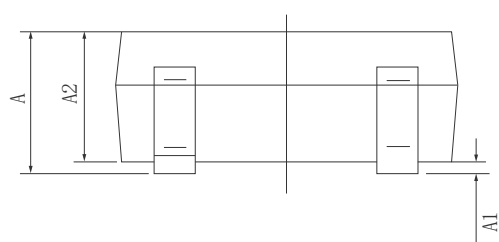


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

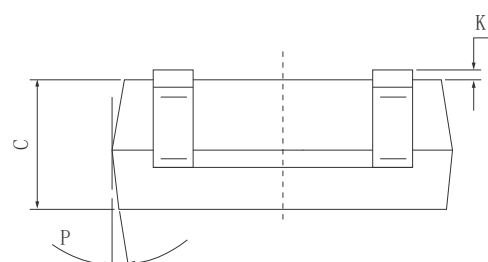
# •Dimensions (SOT23-3)



| SYMBOL | MILLIMETER |      |      |
|--------|------------|------|------|
|        | MIN        | NOM  | MAX  |
| A      | —          | —    | 1.25 |
| A1     | 0.03       | —    | 0.10 |
| A2     | 1.05       | 1.10 | 1.15 |
| b      | 0.30       | 0.35 | 0.40 |
| c      | 0.13       | —    | 0.17 |
| D      | 2.87       | 2.92 | 2.97 |
| E      | 1.55       | 1.60 | 1.65 |
| E1     | 2.70       | 2.85 | 3.00 |
| e      | 0.95 BSC.  |      |      |
| e1     | 1.80       | —    | 2.00 |
| L      | 0.35       | 0.45 | 0.55 |
| θ      | 0°         | —    | 8°   |

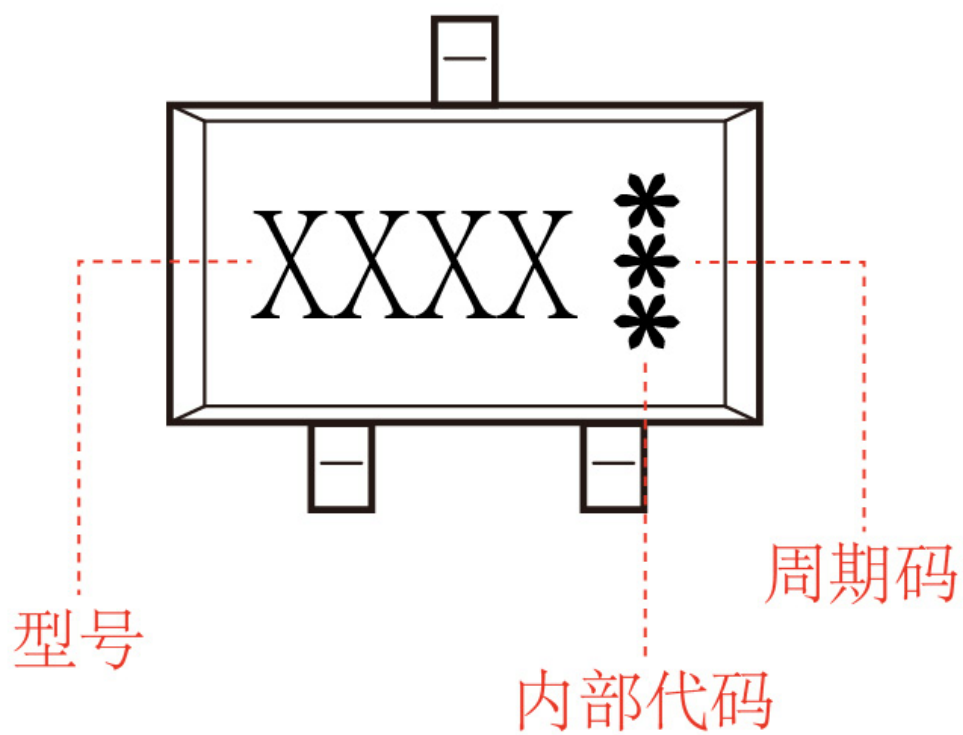


| DIM | MILLIMETERS |
|-----|-------------|
| A   | 2.82~3.02   |
| B   | 1.60±0.10   |
| C   | 1.10±0.05   |
| D   | 0.40±0.10   |
| E   | 2.65~2.95   |
| G   | 0.95typ     |
| K   | 0.00~0.10   |
| M   | 0.20MIN     |
| P   | 9±2°        |



SOT23-3

Marking Instructions:



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