

General Description

The AGM1099S 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

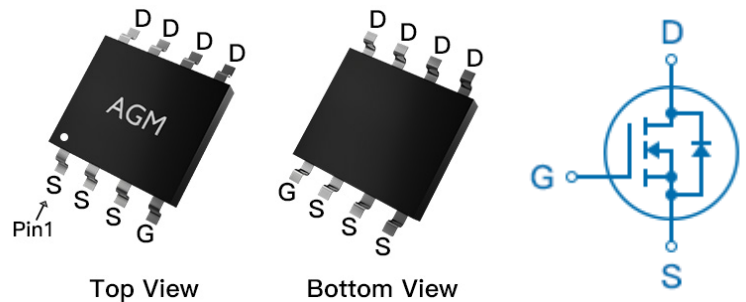
Application

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

Product Summary

| BVDSS | RDS(ON) | ID |
|-------|---------|------|
| 100V | 100mΩ | 7.0A |

SOP8 Pin Configuration



Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|----------|----------------|-----------|------------|----------|
| AGM1099S | AGM1099S | SOP8 | 330mm | 12mm | 3000 |

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(TA=25°C) (Note 1) | 7.0 | A |
| | Drain Current-Continuous(TA=100°C) | 4.5 | A |
| IDM (pluse) | Drain Current-Pulsed (Note 2) | 28 | A |
| PD | Maximum Power Dissipation(TA=25°C) | 2.5 | w |
| | Maximum Power Dissipation(TA=100°C) | 1.0 | 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) ¹ | --- | 50 | °C/W |

Table 3. Electrical Characteristics (T_J=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------------------------|----------------------------------|-----------------------------------|-----|------|------|------|
| On/Off States | | | | | | |
| 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 | 1.8 | 2.2 | V |
| gFS | Forward Transconductance | VDS=5V,ID=5A | -- | 7 | -- | S |
| RDS(on) | Drain-Source On-State Resistance | VGS=10V, ID=6A | -- | 100 | 110 | mΩ |
| | | VGS=4.5V, ID=5A | -- | 110 | 140 | mΩ |
| Dynamic Characteristics | | | | | | |
| Ciss | Input Capacitance | VDS=50V,VGS=0V, F=1MHZ | -- | 182 | -- | pF |
| Coss | Output Capacitance | | -- | 30 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 3.6 | -- | pF |
| Rg | Gate resistance | VGS=0V, VDS=0V,f=1.0MHz | -- | 2.5 | -- | Ω |
| Switching Times | | | | | | |
| td(on) | Turn-on Delay Time | VGS=10V,VDS=50V, ID=5A,RGEN=5Ω | -- | 11 | -- | nS |
| tr | Turn-on Rise Time | | -- | 6.0 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 30 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 4.0 | -- | nS |
| Qg | Total Gate Charge | VGS=10V, VDS=50V, ID=5A | -- | 3.57 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 0.76 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 0.71 | -- | nC |
| Source-Drain Diode Characteristics | | | | | | |
| ISD | Source-Drain Current(Body Diode) | | -- | -- | 7.0 | A |
| VSD | Forward on Voltage | VGS=0V,IS=10A | -- | -- | 1.2 | V |
| trr | Reverse Recovery Time | IF=10A , dl/dt=100A/μs , TJ=25℃ | -- | 50 | -- | ns |
| Qrr | Reverse Recovery Charge | | -- | 102 | -- | nc |

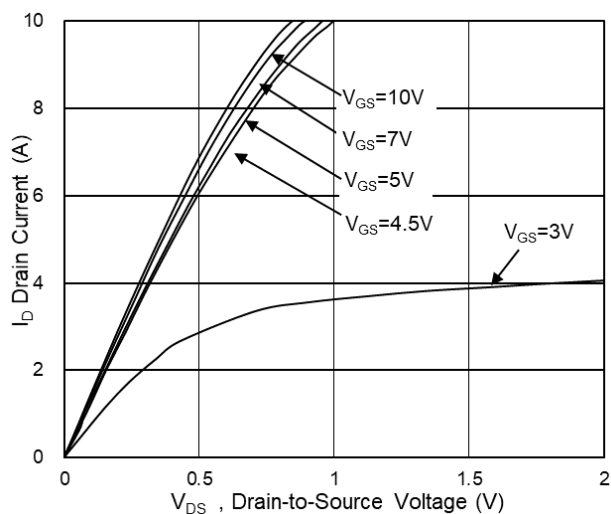
Notes 1.The maximum current rating is package limited.

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

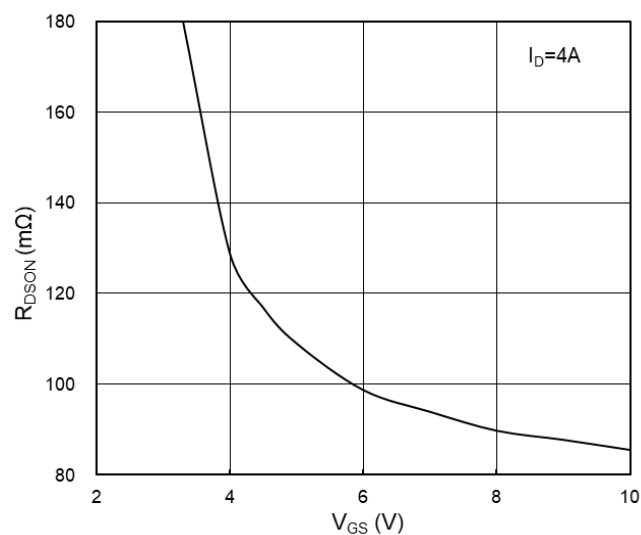
Notes 3.EAS condition: T_J=25°C, V_{DD}=50V, V_{gs}=10V , ID=14A, L=0.5mH, R_G=25ohm

Characteristics Curve:

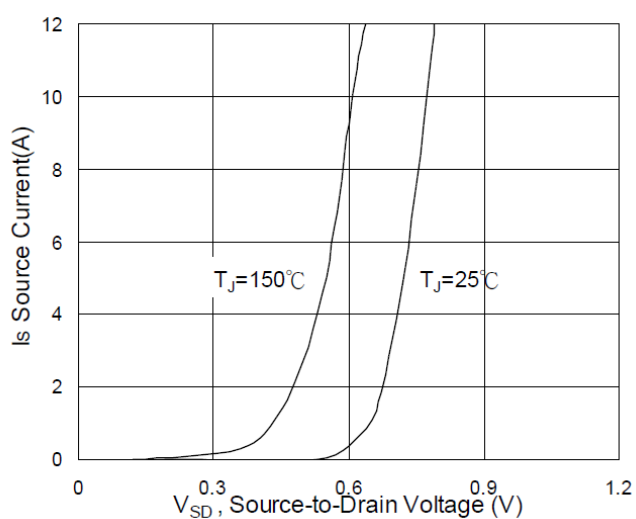
Typ. Output Characteristics



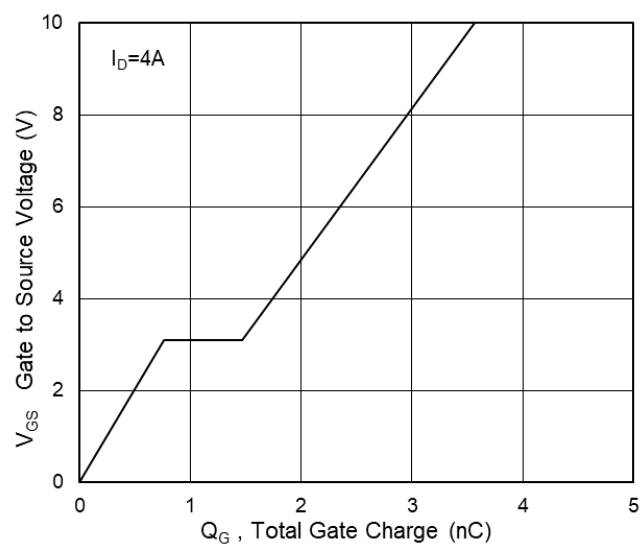
On-Resistance vs G-S Voltage

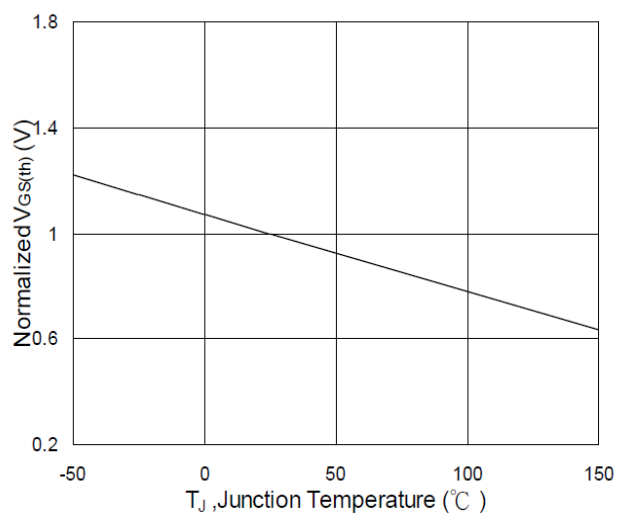
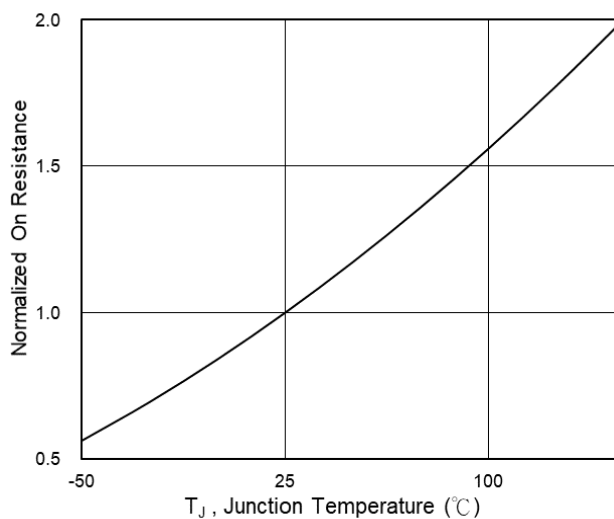
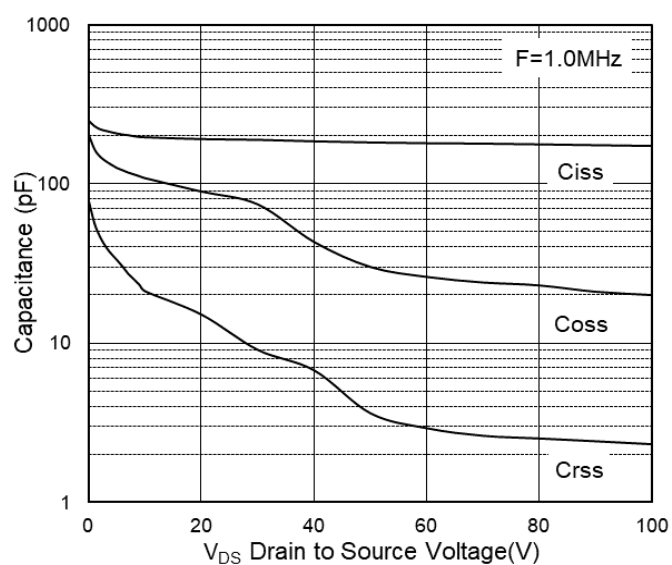
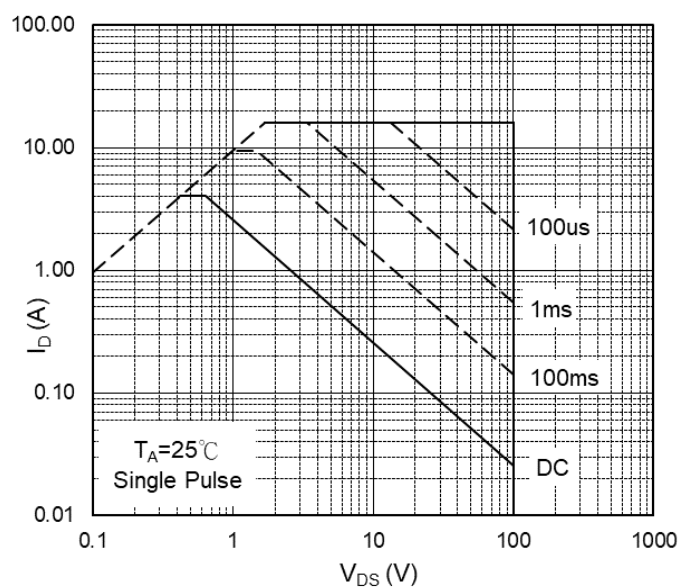


Source Drain Forward Characteristics

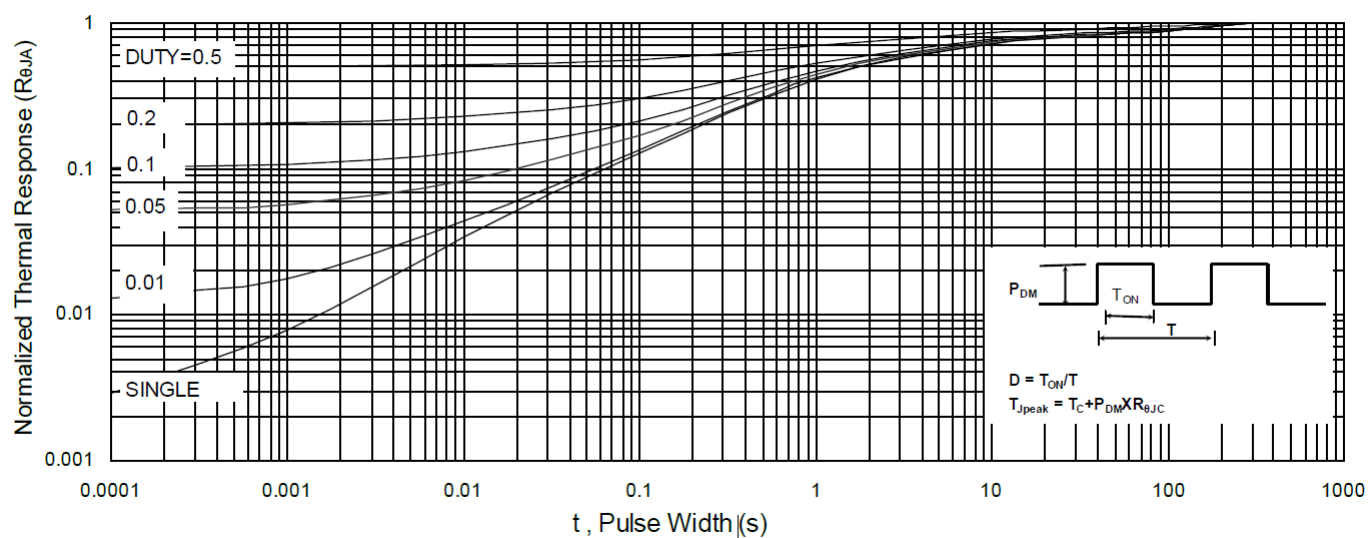


Gate-Charge Characteristics

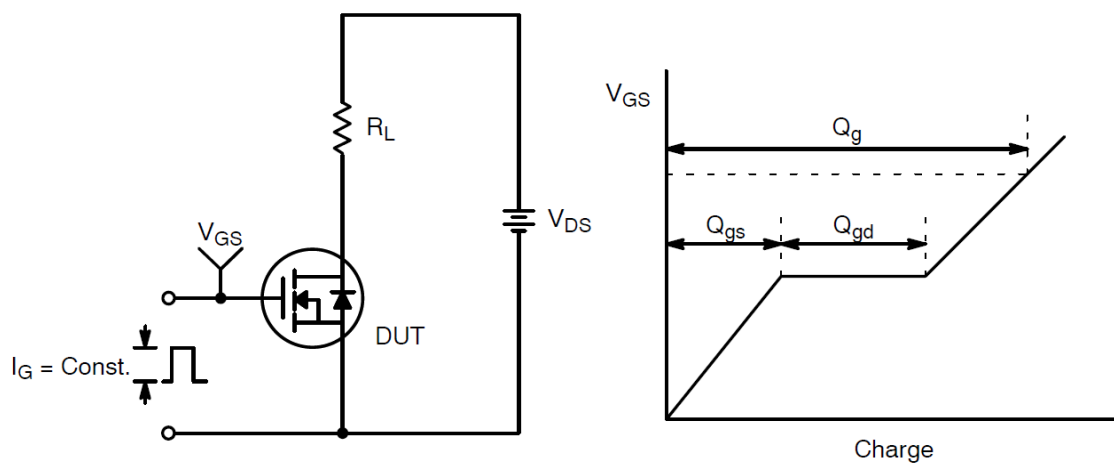


Normalized $V_{GS(th)}$ vs T_J

Normalized $R_{DS(on)}$ vs T_J

Capacitance

Safe Operating Area


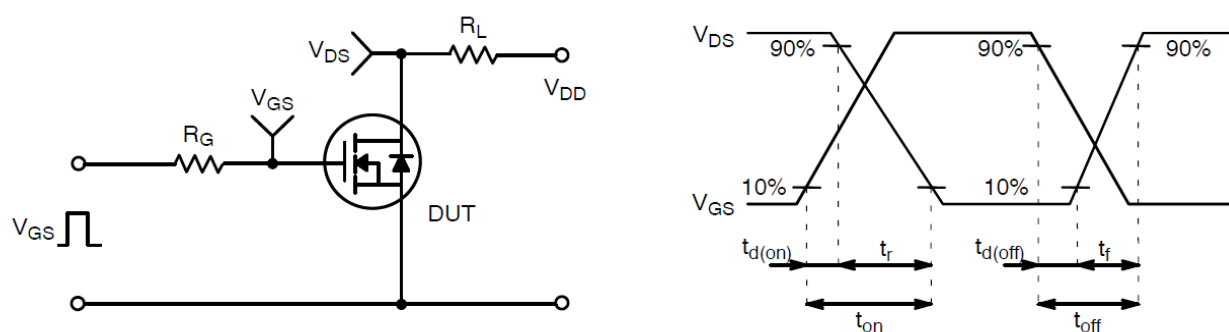
Max. transient thermal impedance



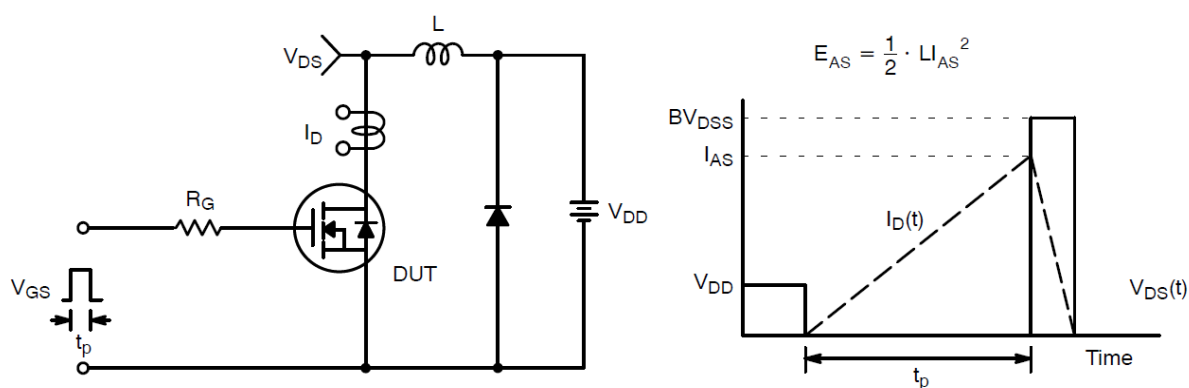
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

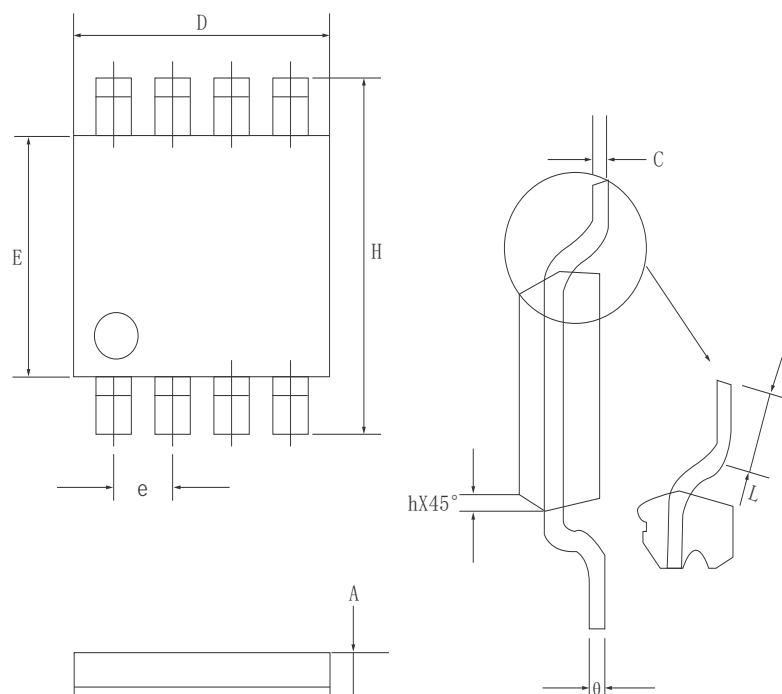


Resistive Switching Test Circuit & Waveforms

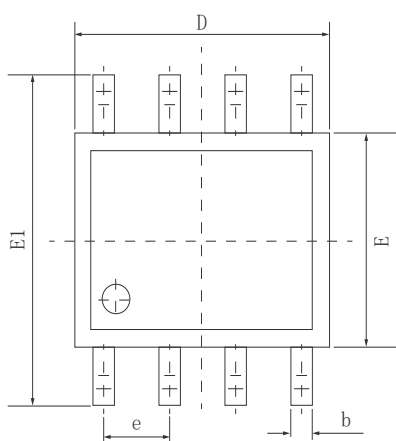
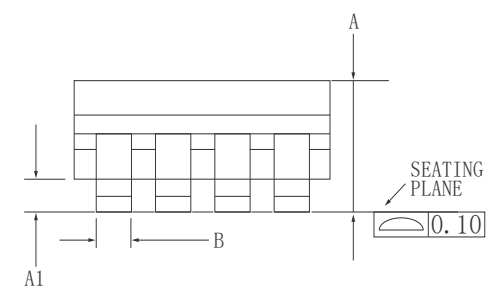


Unclamped Inductive Switching Test Circuit & Waveforms

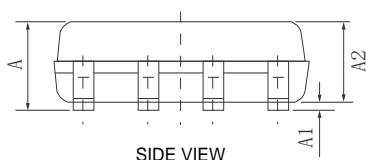
Dimensions (SOP8)



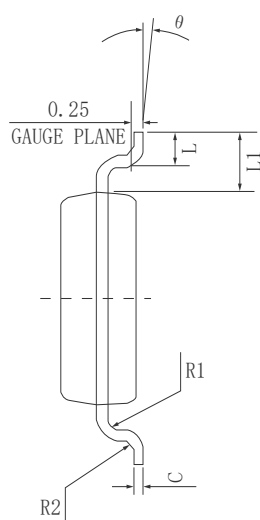
| DIM | MILLIMETERS | |
|-----|-------------|------|
| | MIN | MAX |
| A | 1.35 | 1.75 |
| A1 | 0.02 | 0.15 |
| B | 0.33 | 0.5 |
| C | 0.1 | 0.25 |
| D | 4.8 | 5 |
| E | 3.8 | 4 |
| e | 1.27 (BSC) | |
| H | 5.8 | 6.2 |
| h | 0.25 | 0.5 |
| I | 0.4 | 1.25 |
| θ | 0° | 7° |



TOP VIEW



SIDE VIEW

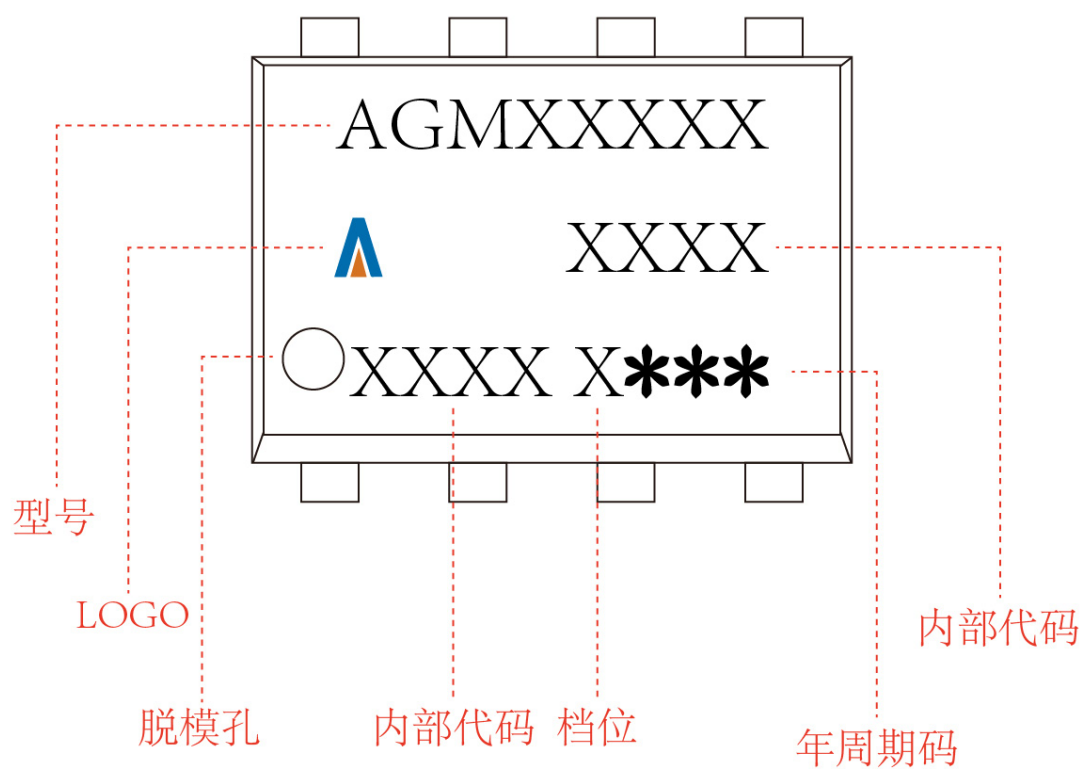


SIDE VIEW

| SYMBOL | MIN | NOM | MAX |
|--------|----------|-------|-------|
| A | 1.40 | 1.60 | 1.80 |
| A1 | 0.05 | 0.15 | 0.25 |
| A2 | 1.35 | 1.45 | 1.55 |
| b | 0.30 | 0.40 | 0.50 |
| c | 0.153 | 0.203 | 0.253 |
| D | 4.80 | 4.90 | 5.00 |
| E | 3.80 | 3.90 | 4.00 |
| E1 | 5.80 | 6.00 | 6.20 |
| L | 0.45 | 0.70 | 1.00 |
| θ | 2° | 4° | 6° |
| L1 | 1.04 REF | | |
| e | 1.27 BSC | | |
| R1 | 0.07 TYP | | |
| R2 | 0.07 TYP | | |

SOP8

Marking Instructions:




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