

## ● General Description

The AGMH70N90H 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  |
|-------|-------|-----|
| 65V   | 4.3mΩ | 91A |

## TO-263 Pin Configuration

## Package Marking and Ordering Information

| Device Marking | Device     | Device Package | Reel Size | Tape width | Quantity |
|----------------|------------|----------------|-----------|------------|----------|
| AGMH70N90H     | AGMH70N90H | TO-263         | 330mm     | 25mm       | 800      |

**Table 1. Absolute Maximum Ratings (TA=25°C)**

| Symbol      | Parameter                                         | Value      | Unit |
|-------------|---------------------------------------------------|------------|------|
| VDS         | Drain-Source Voltage (VGS=0V)                     | 65         | V    |
| VGS         | Gate-Source Voltage (VDS=0V)                      | ±20        | V    |
| ID          | Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b> | 91         | A    |
|             | Drain Current-Continuous(Tc=100°C)                | 64         | A    |
| IDM (pluse) | Drain Current-Pulsed <b>(Note 2)</b>              | 364        | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)                | 89         | w    |
|             | Maximum Power Dissipation(Tc=100°C)               | 36         | w    |
| EAS         | Avalanche energy <b>(Note 3)</b>                  | 441        | 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> | --- | 40  | °C/W |
| RθJC   | Thermal Resistance Junction-Case <sup>1</sup>                   | --- | 1.4 | °C/W |

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

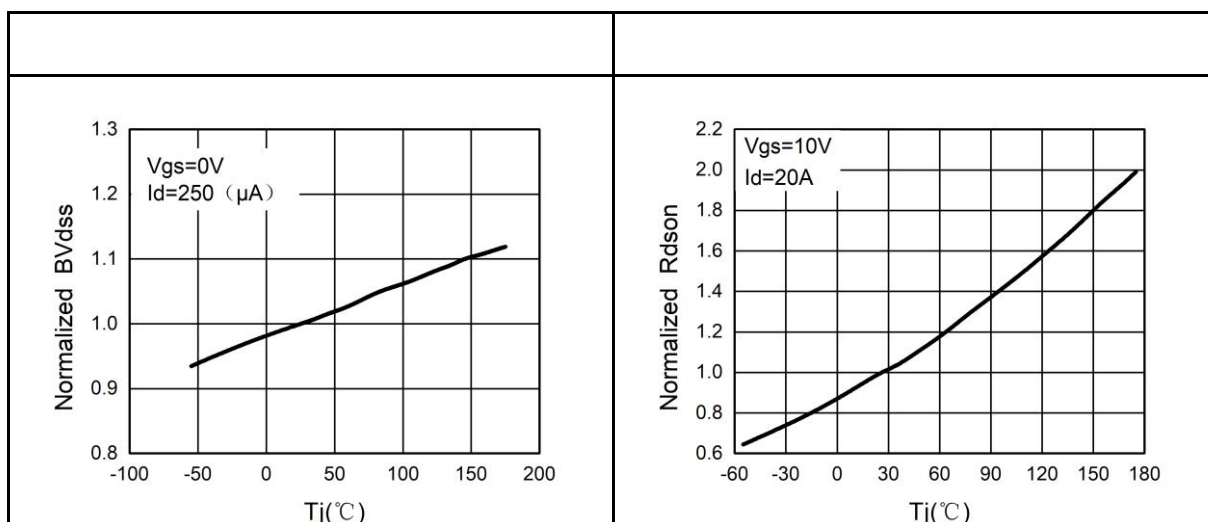
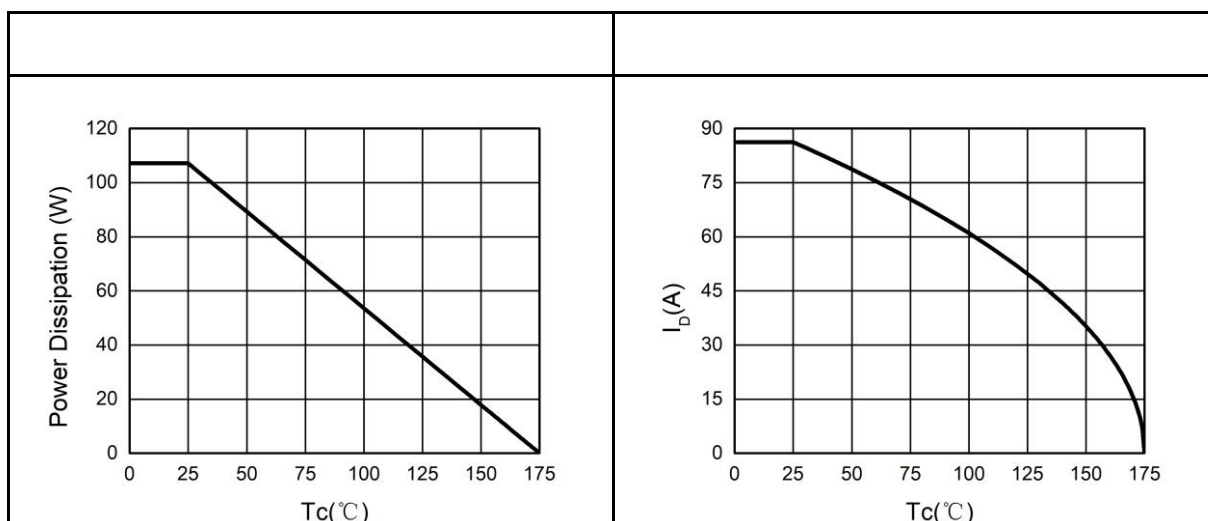
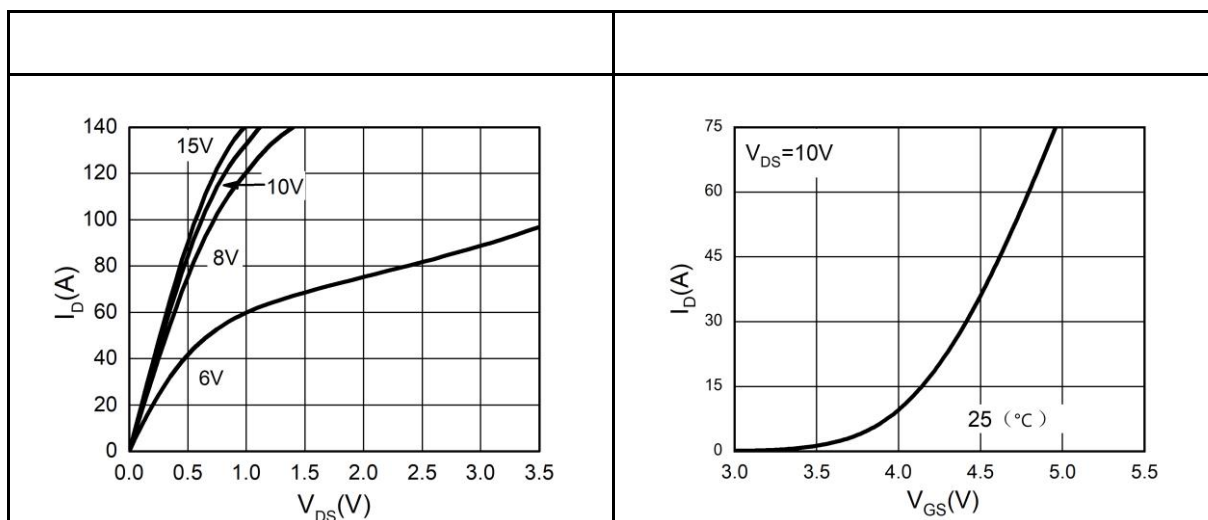
| Symbol                             | Parameter                        | Conditions                             | Min | Typ  | Max  | Unit |
|------------------------------------|----------------------------------|----------------------------------------|-----|------|------|------|
| On/Off States                      |                                  |                                        |     |      |      |      |
| BVDSS                              | Drain-Source Breakdown Voltage   | VGS=0V ID=250μA                        | 65  | --   | --   | V    |
| IDSS                               | Zero Gate Voltage Drain Current  | VDS=60V,VGS=0V                         | --  | --   | 1    | μA   |
| IGSS                               | Gate-Body Leakage Current        | VGS=±20V,VDS=0V                        | --  | --   | ±100 | nA   |
| VGS(th)                            | Gate Threshold Voltage           | VDS=VGS,ID=250μA                       | 2.0 | --   | 4.0  | V    |
| gFS                                | Forward Transconductance         | VDS=5V,ID=20A                          | --  | 20   | --   | S    |
| RDS(on)                            | Drain-Source On-State Resistance | VGS=10V, ID=40A                        | --  | 4.3  | 6.5  | mΩ   |
| Dynamic Characteristics            |                                  |                                        |     |      |      |      |
| Ciss                               | Input Capacitance                | VDS=30V,VGS=0V,<br>F=1MHZ              | --  | 5624 | --   | pF   |
| Coss                               | Output Capacitance               |                                        | --  | 303  | --   | pF   |
| Crss                               | Reverse Transfer Capacitance     |                                        | --  | 237  | --   | pF   |
| Rg                                 | Gate resistance                  | VGS=0V,<br>VDS=0V,f=1.0MHz             | --  | 0.9  | --   | Ω    |
| Switching Times                    |                                  |                                        |     |      |      |      |
| td(on)                             | Turn-on Delay Time               | VGS=10V,VDS=30V,<br>RL=0.75Ω,RGEN=3.0Ω | --  | 30   | --   | nS   |
| tr                                 | Turn-on Rise Time                |                                        | --  | 101  | --   | nS   |
| td(off)                            | Turn-Off Delay Time              |                                        | --  | 50   | --   | nS   |
| tf                                 | Turn-Off Fall Time               |                                        | --  | 11   | --   | nS   |
| Qg                                 | Total Gate Charge                | VGS=10V, VDS=30V,<br>ID=20A            | --  | 91   | --   | nC   |
| Qgs                                | Gate-Source Charge               |                                        | --  | 26   | --   | nC   |
| Qgd                                | Gate-Drain Charge                |                                        | --  | 26.2 | --   | nC   |
| Source-Drain Diode Characteristics |                                  |                                        |     |      |      |      |
| ISD                                | Source-Drain Current(Body Diode) |                                        | --  | --   | 91   | A    |
| VSD                                | Forward on Voltage               | VGS=0V,IS=20A                          | --  | --   | 1.2  | V    |
| trr                                | Reverse Recovery Time            | IF=20A , dI/dt=100A/μs ,               | --  | 34   | --   | ns   |
| Qrr                                | Reverse Recovery Charge          | TJ=25℃                                 | --  | 40.3 | --   | nc   |

Notes 1.The maximum current rating is package limited.

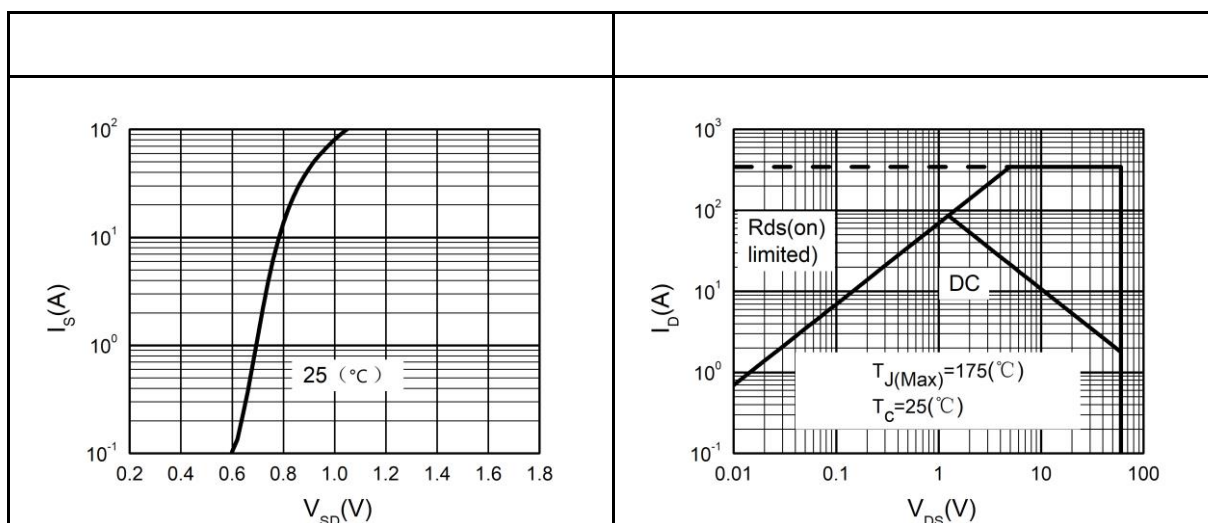
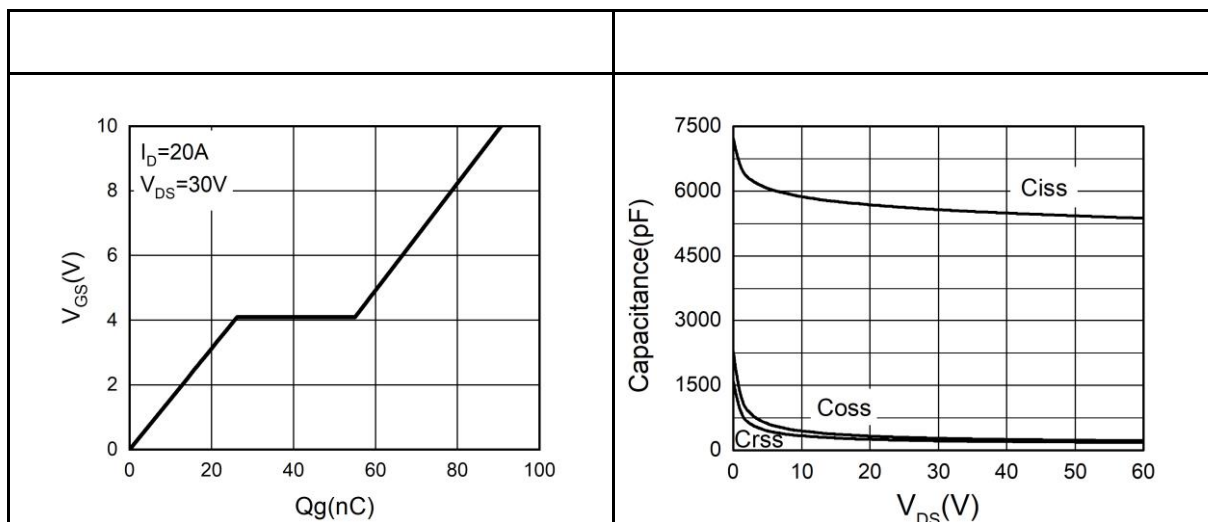
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>gs</sub>=10V, I<sub>D</sub>=42A, L=0.5mH, R<sub>G</sub>=25ohm

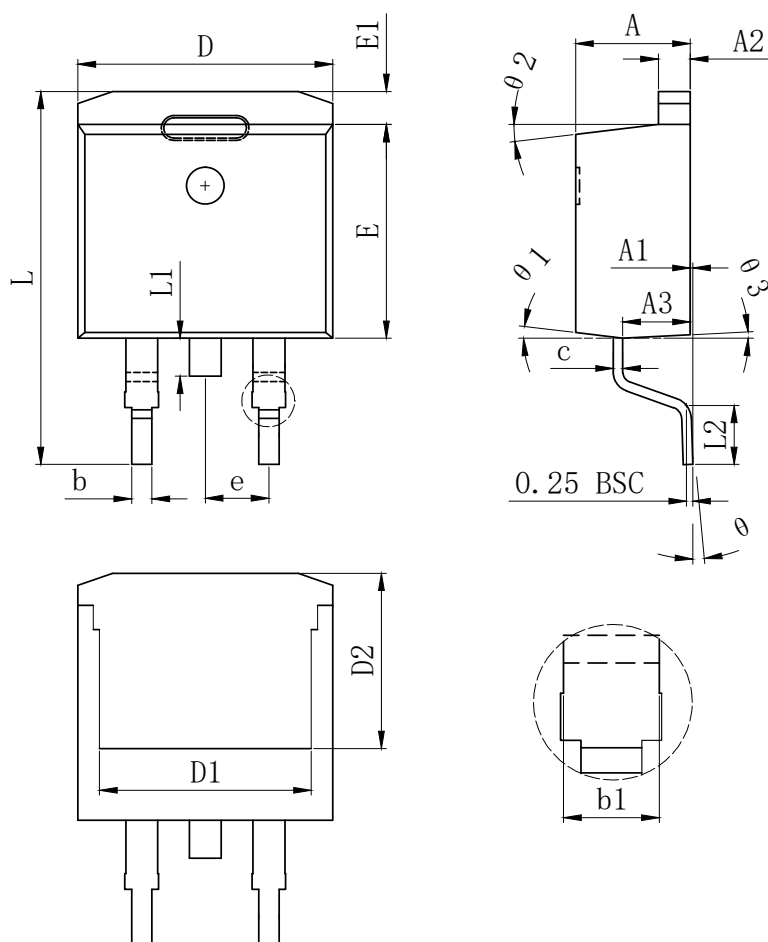
# Typical Electrical And Thermal Characteristics (Curves)



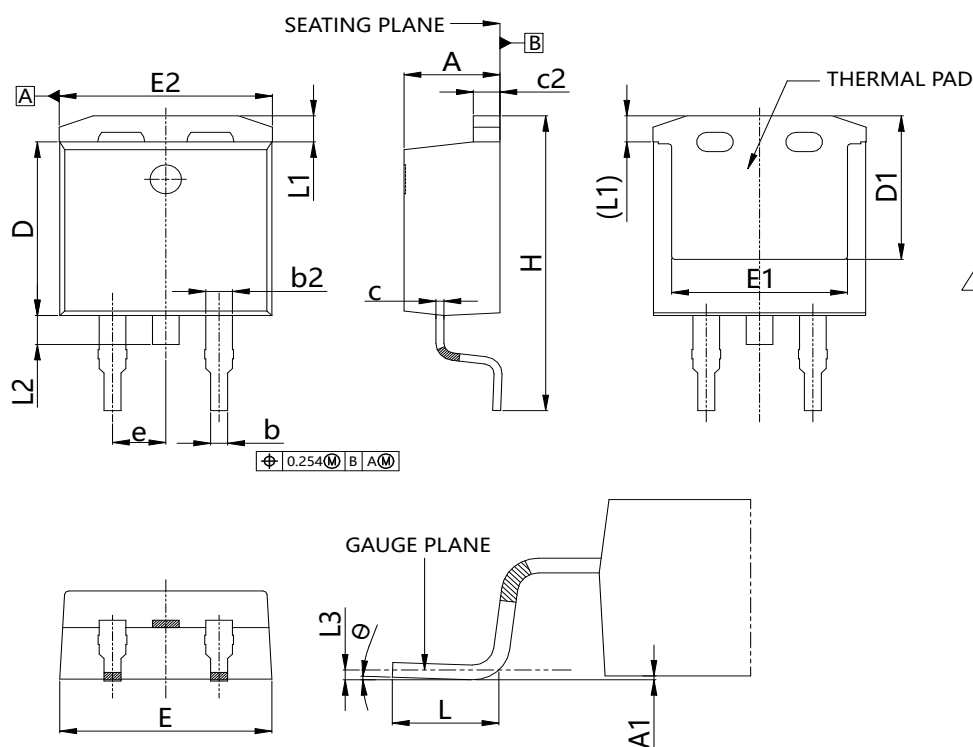
## Typical Electrical And Thermal Characteristics (Curves)



# TO-263 PACKAGE INFORMATION



| SYMBOL     | MILLIMETER |        |        |
|------------|------------|--------|--------|
|            | MIN        | Typ.   | MAX    |
| A          | 4.370      | 4.570  | 4.770  |
| A1         | 0.000      |        | 0.250  |
| A2         | 1.220      | 1.270  | 1.420  |
| A3         | 2.490      | 2.690  | 2.890  |
| b          | 0.700      | 0.810  | 0.960  |
| b1         | 1.170      | 1.270  | 1.470  |
| c          | 0.300      | 0.380  | 0.530  |
| D          | 9.860      | 10.160 | 10.360 |
| D1         | 8.400 REF  |        |        |
| D2         | 7.073 REF  |        |        |
| E          | 8.500      | 8.700  | 8.900  |
| E1         | 1.070      | 1.270  | 1.470  |
| e          | 2.540 TYP  |        |        |
| L          | 14.700     | 15.100 | 15.500 |
| L1         | 1.400      | 1.550  | 1.700  |
| L2         | 2.000      | 2.300  | 2.600  |
| $\theta$   | 0°         |        | 9°     |
| $\theta_1$ | 7° TYP     |        |        |
| $\theta_2$ | 7° TYP     |        |        |
| $\theta_3$ | 3° TYP     |        |        |



| SYMBOL   | MILLIMETER |         |       |
|----------|------------|---------|-------|
|          | MIN.       | NOMINAL | MAX.  |
| A        | 4.47       | 4.57    | 4.67  |
| A1       | 0.00       | 0.10    | 0.25  |
| b        | 0.71       | 0.81    | 0.91  |
| b2       | 1.17       | 1.27    | 1.37  |
| c        | 0.360      | 0.381   | 0.500 |
| c2       | 1.17       | 1.27    | 1.37  |
| D        | 8.70       | 9.00    | 9.30  |
| D1       | 7.10       | 7.44    | 7.80  |
| E        | 9.90       | 10.11   | 10.30 |
| E1       | 8.08       | 8.38    | 8.68  |
| E2       | 10.00      | 10.16   | 10.30 |
| e        | 2.44       | 2.54    | 2.64  |
| H        | 15.00      | 15.28   | 15.60 |
| L        | 2.25       | 2.54    | 2.80  |
| L1       | 1.10       | 1.35    | 1.60  |
| L2       | ---        | ---     | 1.78  |
| L3       | 0.254 BSC  |         |       |
| $\theta$ | 0°         | ---     | 8°    |

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