

## ● General Description

The AGM40P30A 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

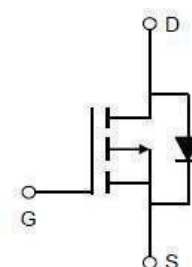
## ● Application

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

## Product Summary

| BVDSS | RDS(ON) | ID   |
|-------|---------|------|
| -40V  | 23mΩ    | -38A |

## PDFN5\*6 Pin Configuration



## Package Marking and Ordering Information

| Device Marking | Device    | Device Package | Reel Size | Tape width | Quantity |
|----------------|-----------|----------------|-----------|------------|----------|
| AGM40P30A      | AGM40P30A | PDFN5*6        | ----      | ----       | 3000     |

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

| Symbol      | Parameter                                                | Value      | Unit |
|-------------|----------------------------------------------------------|------------|------|
| VDS         | Drain-Source Voltage (VGS=0V)                            | -40        | V    |
| VGS         | Gate-Source Voltage (VDS=0V)                             | ±20        | V    |
| ID          | Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>        | -38        | A    |
|             | Drain Current-Continuous(Tc=100°C)                       | -27        | A    |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b> | -99        | A    |
| PD          | Maximum Power Dissipation(Tc=25°C)                       | 59         | w    |
|             | Maximum Power Dissipation(Tc=100°C)                      | 23         | w    |
| EAS         | Avalanche energy <b>(Note 3)</b>                         | 260        | 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> | --- | 60  | °C/W |
| RθJC   | Thermal Resistance Junction-Case <sup>1</sup>                   | --- | 2.1 | °C/W |

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

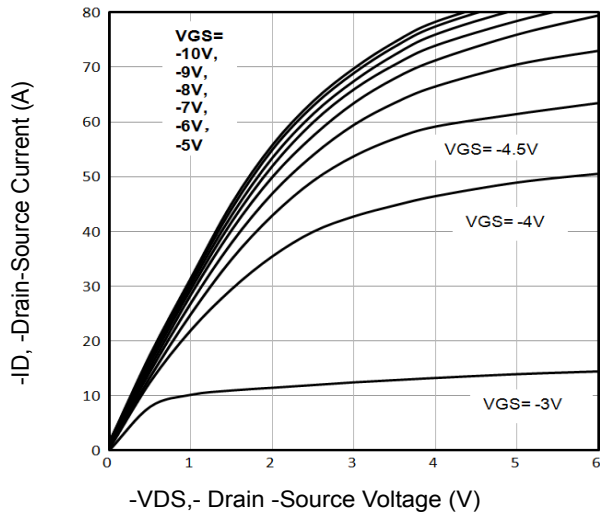
| Symbol                             | Parameter                        | Conditions                              | Min  | Typ  | Max  | Unit |
|------------------------------------|----------------------------------|-----------------------------------------|------|------|------|------|
| On/Off States                      |                                  |                                         |      |      |      |      |
| BVDSS                              | Drain-Source Breakdown Voltage   | VGS=0V ID=-250μA                        | -40  | --   | --   | V    |
| IDSS                               | Zero Gate Voltage Drain Current  | VDS=-40V,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 | -1.6 | -2.5 | V    |
| gFS                                | Forward Transconductance         | VDS=5V,ID=-10A                          | --   | 10   | --   | S    |
| RDS(on)                            | Drain-Source On-State Resistance | VGS=-10V, ID=-20A                       | --   | 23   | 32   | mΩ   |
|                                    |                                  | VGS=-4.5V, ID=-15A                      | --   | 34   | 43   | mΩ   |
| Dynamic Characteristics            |                                  |                                         |      |      |      |      |
| Ciss                               | Input Capacitance                | VDS=-15V,VGS=0V,<br>F=1MHZ              | --   | 1120 | --   | pF   |
| Coss                               | Output Capacitance               |                                         | --   | 120  | --   | pF   |
| Crss                               | Reverse Transfer Capacitance     |                                         | --   | 95   | --   | pF   |
| Rg                                 | Gate resistance                  | f=1.0MHz                                | --   | 1.2  | --   | Ω    |
| Switching Times                    |                                  |                                         |      |      |      |      |
| td(on)                             | Turn-on Delay Time               | VGS=-10V,VDS=-25V,<br>ID=-10A,RGEN=3.3Ω | --   | 13.5 | --   | nS   |
| tr                                 | Turn-on Rise Time                |                                         | --   | 18   | --   | nS   |
| td(off)                            | Turn-Off Delay Time              |                                         | --   | 36   | --   | nS   |
| tf                                 | Turn-Off Fall Time               |                                         | --   | 25   | --   | nS   |
| Qg                                 | Total Gate Charge                | VGS=-10V,<br>VDS=-25V, ID=-12A          | --   | 27   | --   | nC   |
| Qgs                                | Gate-Source Charge               |                                         | --   | 7.3  | --   | nC   |
| Qgd                                | Gate-Drain Charge                |                                         | --   | 5.6  | --   | nC   |
| Source-Drain Diode Characteristics |                                  |                                         |      |      |      |      |
| ISD                                | Source-Drain Current(Body Diode) |                                         | --   | --   | -38  | A    |
| VSD                                | Forward on Voltage               | VGS=0V,IS=-20A                          | --   | --   | -1.2 | V    |
| trr                                | Reverse Recovery Time            | Isd=-20A ,                              | --   | --   | --   | ns   |
| Qrr                                | Reverse Recovery Charge          | dI/dt=100A/μs , TJ=25℃                  | --   | --   | --   | nc   |

Notes 1.The maximum current rating is package limited.

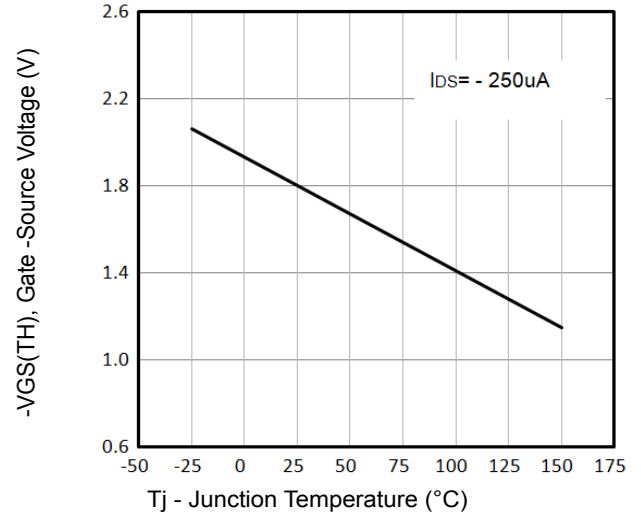
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25°C

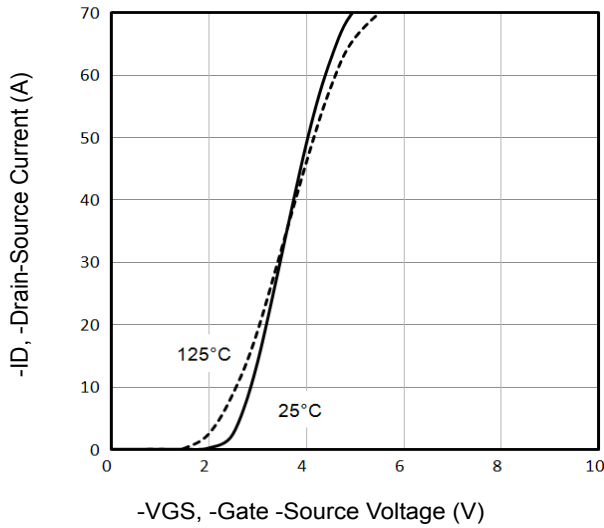
## Typical Characteristics



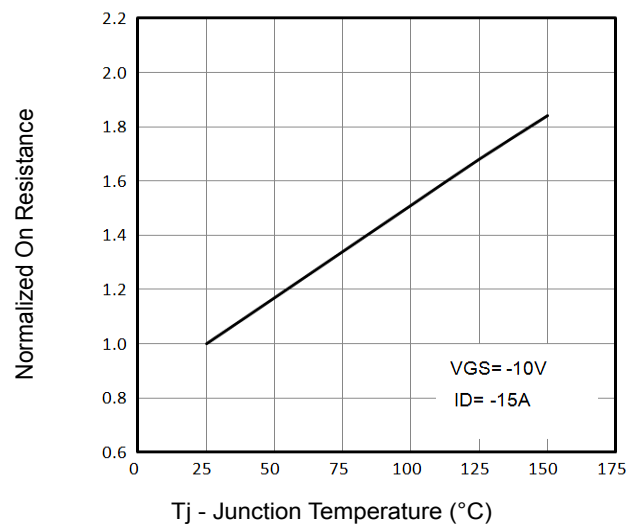
**Fig1.** Typical Output Characteristics



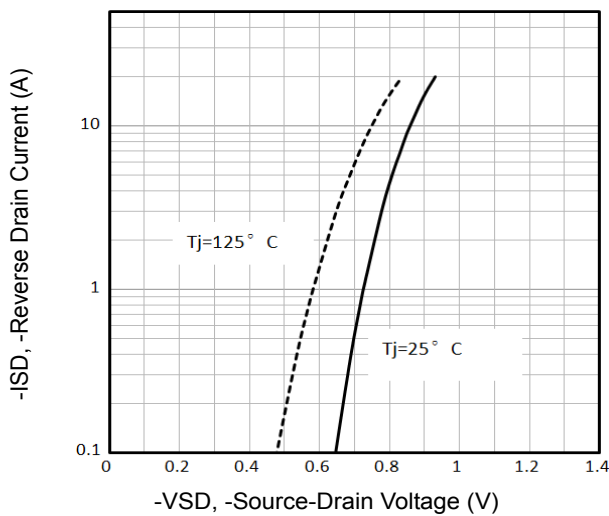
**Fig2.**  $-V_{GS(TH)}$  Gate-Source Voltage Vs.  $T_j$



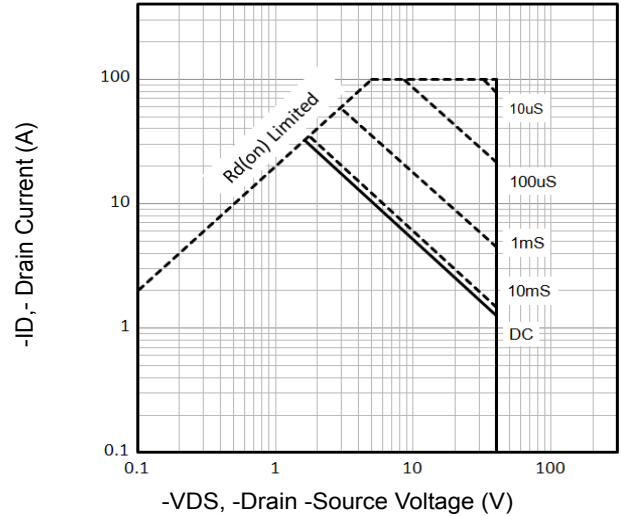
**Fig3.** Typical Transfer Characteristics



**Fig4.** Normalized On-Resistance Vs.  $T_j$

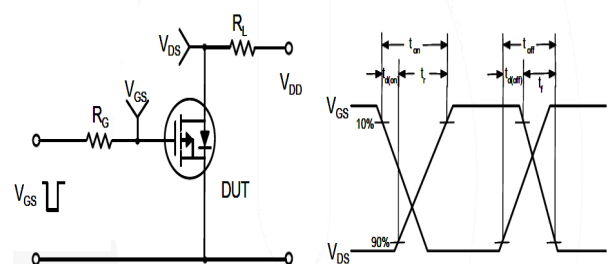
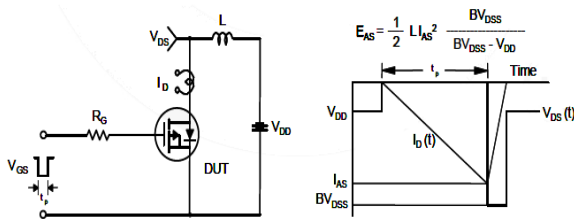
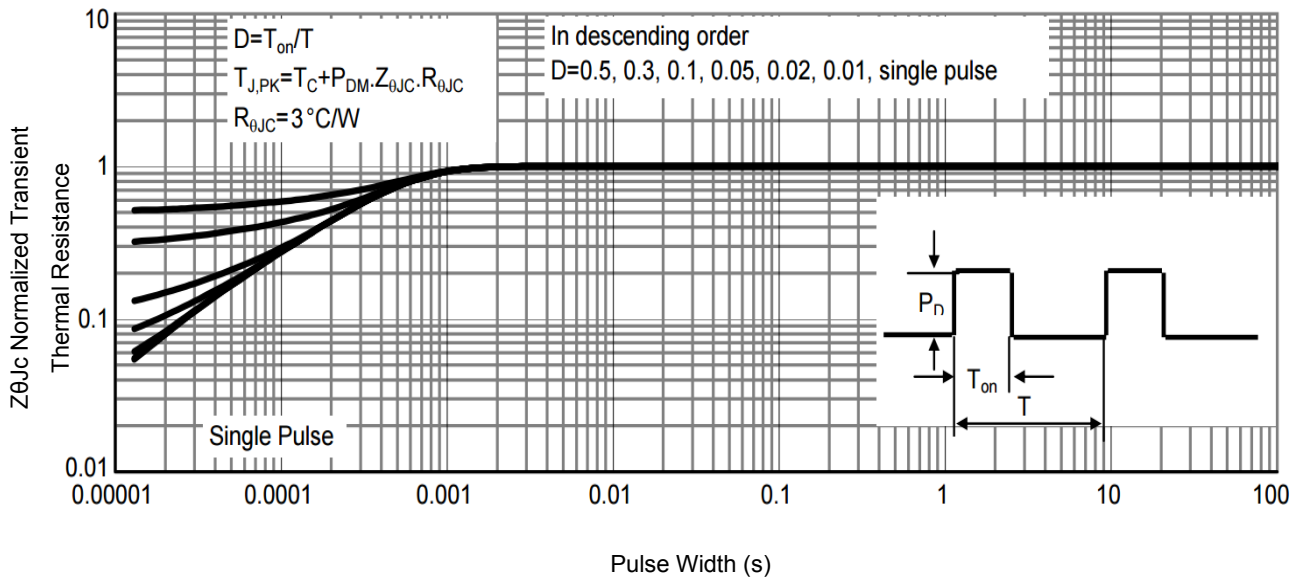
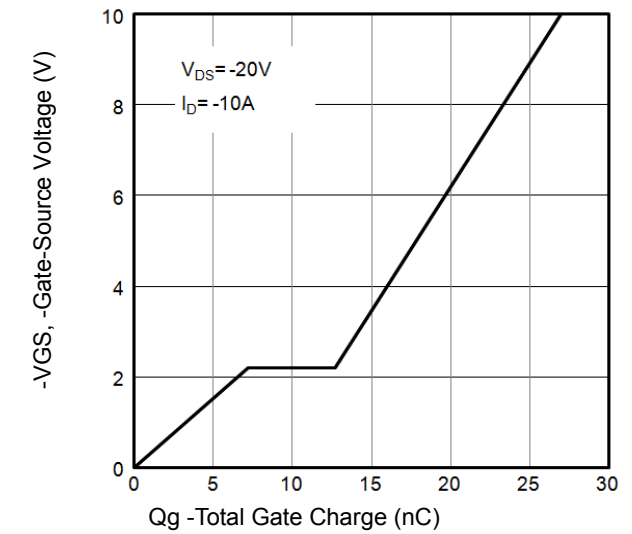
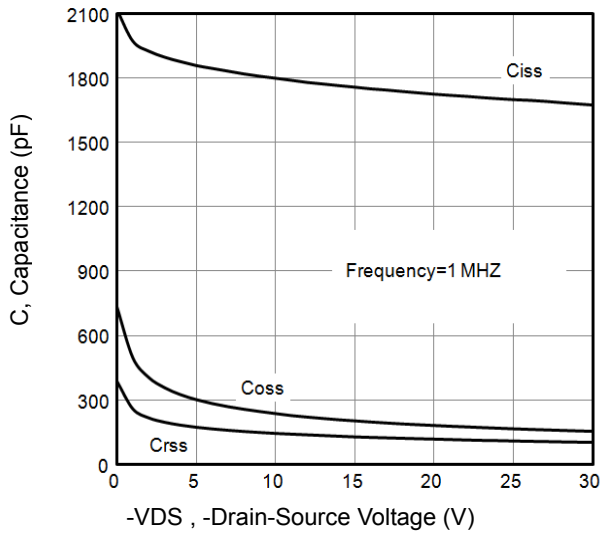


**Fig5.** Typical Source-Drain Diode Forward Voltage

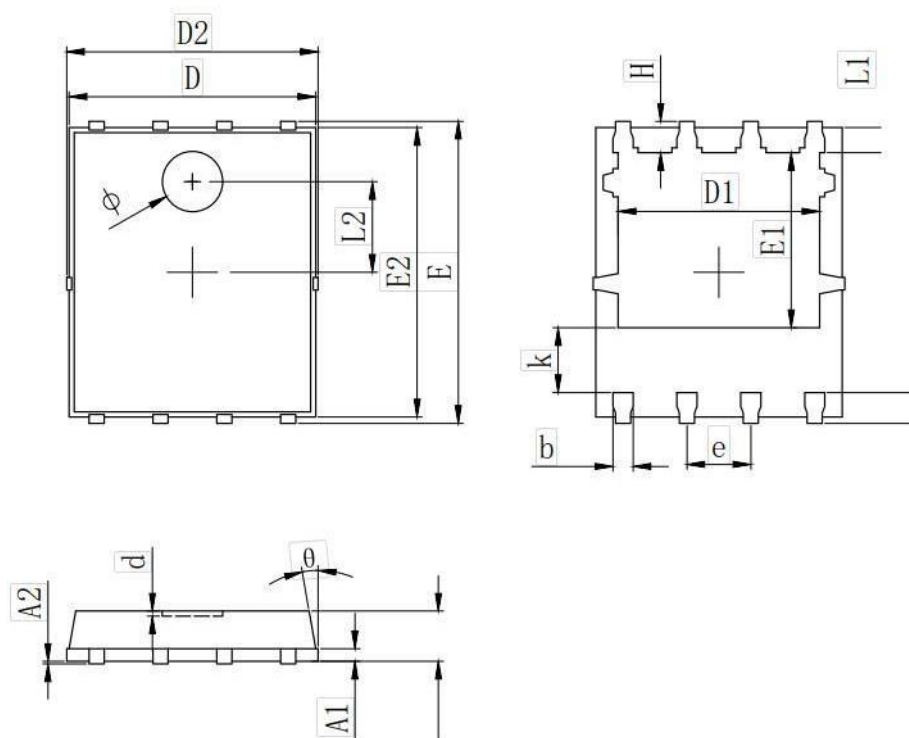


**Fig6.** Maximum Safe Operating Area

## Typical Characteristics



●Dimensions (DFN5×6)



| 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°   |
| Ø      | 1.100      | 1.200 | 1.300 |
| d      |            |       | 0.100 |

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