

● General Description

The AGM3415E 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

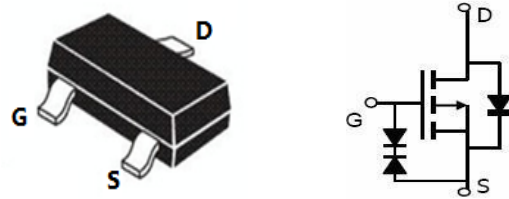
● Application

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

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|-------|
| -20V | 28mΩ | -5.0A |

SOT-23-3 Pin Configuration



Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|----------|----------------|-----------|------------|----------|
| 3415E | AGM3415E | SOT-23-3 | ---- | ---- | 3000 |

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

| Symbol | Parameter | Value | Unit |
|-------------|----------------------------------------------------------|------------|------|
| VDS | Drain-Source Voltage (VGS=0V) | -20 | V |
| VGS | Gate-Source Voltage (VDS=0V) | ±10 | V |
| ID | Drain Current-Continuous(Ta=25°C) (Note 1) | -5.0 | A |
| | Drain Current-Continuous(Ta=70°C) | -3.0 | A |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 2) | -18 | A |
| PD | Maximum Power Dissipation(Ta=25°C) | 1.32 | 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) ¹ | --- | 95 | °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 | -20 | -- | -- | V |
| IDSS | Zero Gate Voltage Drain Current | VDS=-20V, VGS=0V | -- | -- | -1 | μA |
| IGSS | Gate-Body Leakage Current | VGS=±10V, VDS=0V | -- | -- | ±8 | μA |
| VGS(th) | Gate Threshold Voltage | VDS=VGS, ID=-250μA | -0.4 | -0.7 | -1.0 | V |
| gFS | Forward Transconductance | VDS=-10V, ID=-3A | -- | 6 | -- | S |
| RDS(on) | Drain-Source On-State Resistance | VGS=-4.5V, ID=-4A | -- | 28 | 35 | mΩ |
| | | VGS=-2.5V, ID=-3.0A | -- | 38 | 53 | mΩ |
| Dynamic Characteristics | | | | | | |
| Ciss | Input Capacitance | VDS=-10V, VGS=0V, VDS=0V, f=1.0MHz | -- | 830 | -- | pF |
| Coss | Output Capacitance | | -- | 132 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 85 | -- | Ω |
| Rg | Gate resistance | | | | | |
| Switching Times | | | | | | |
| td(on) | Turn-on Delay Time | VGS=-10V, VDS=-4.5V, ID=-3.3A, RG=1Ω | -- | 10 | -- | nS |
| tr | Turn-on Rise Time | | -- | 32 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 50 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 51 | -- | nC |
| Qg | Total Gate Charge | VGS=-10V, VDS=-4.5V, ID=-2.0A | -- | 8.8 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 1.4 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 1.9 | -- | nC |
| Source-Drain Diode Characteristics | | | | | | |
| ISD | Source-Drain Current(Body Diode) | VGS=0V, IS=-4A | -- | -- | -5.0 | V |
| VSD | Forward on Voltage | IF=-4.1A , dI/dt=100A/μs , TJ=25°C | -- | -- | -1.2 | V |
| trr | Reverse Recovery Time | | -- | -- | -- | 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

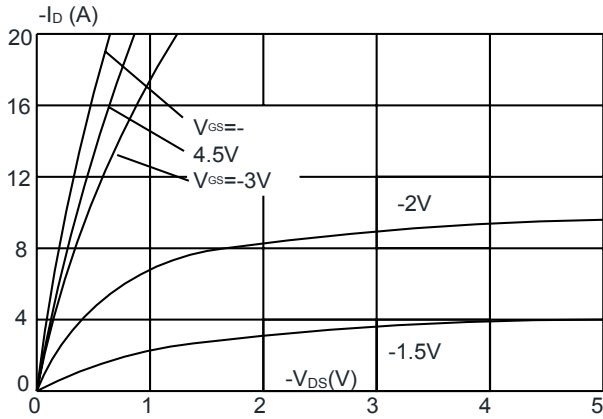


Figure 2: Typical Transfer Characteristics

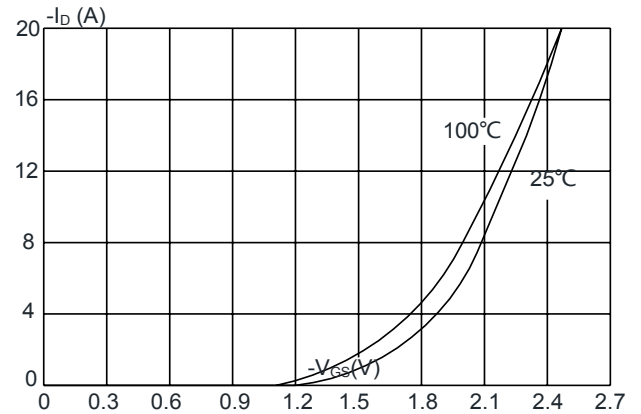


Figure 3: On-resistance vs. Drain Current

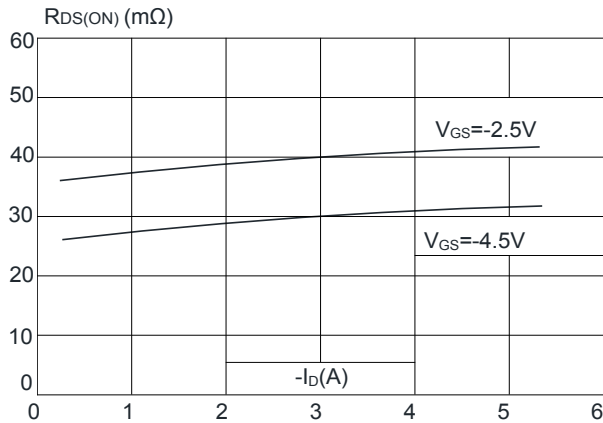


Figure 4: Body Diode Characteristics

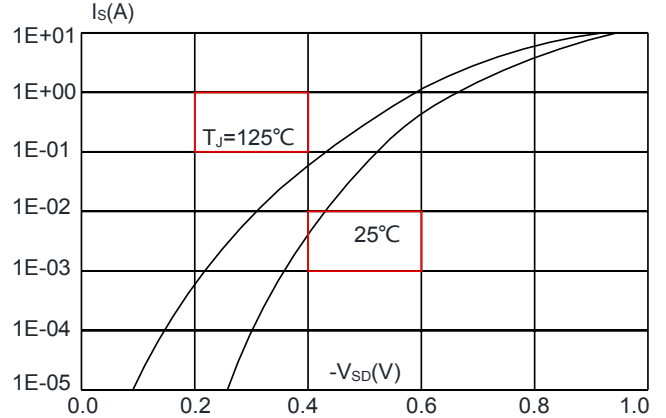


Figure 5: Gate Charge Characteristics

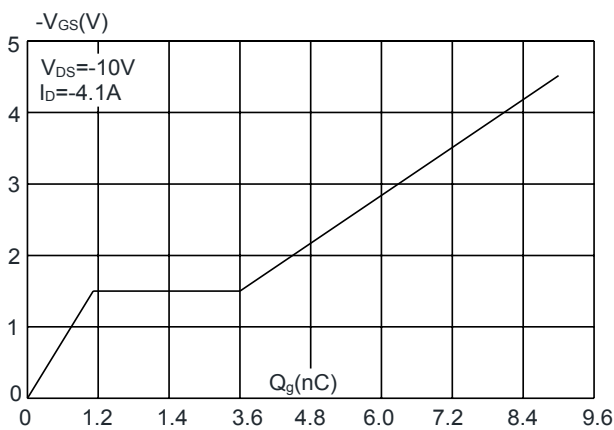


Figure 6: Capacitance Characteristics

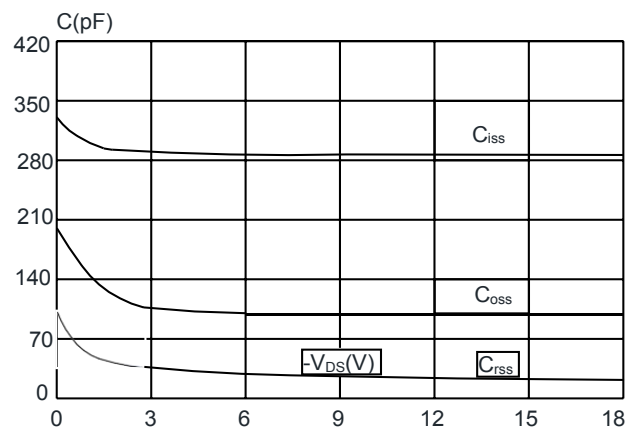
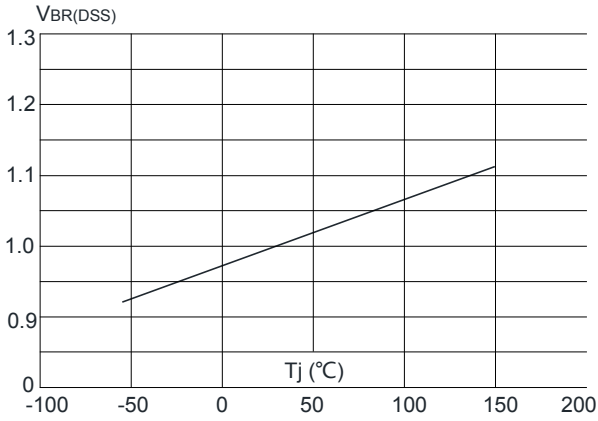
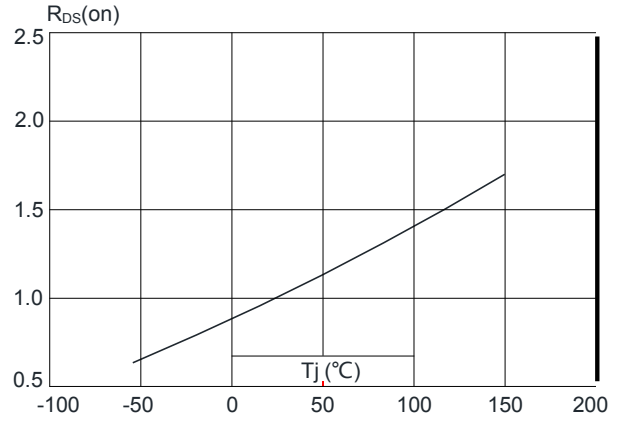
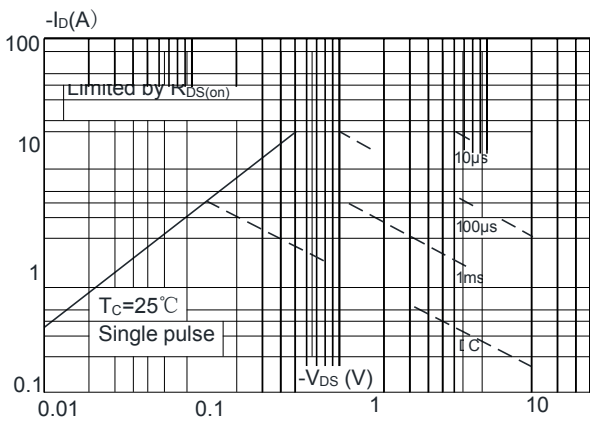
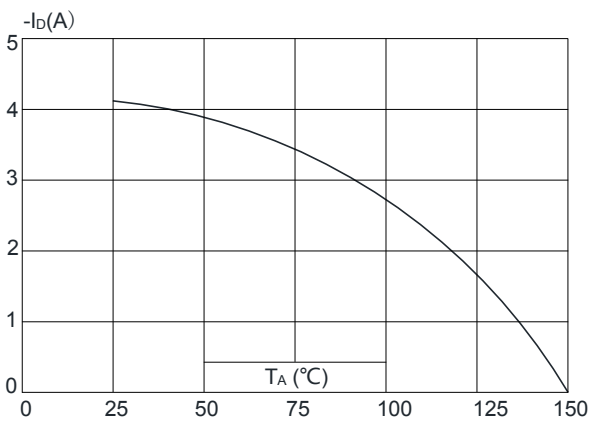
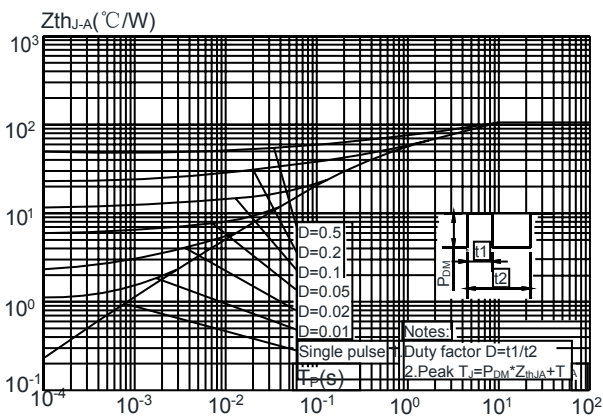
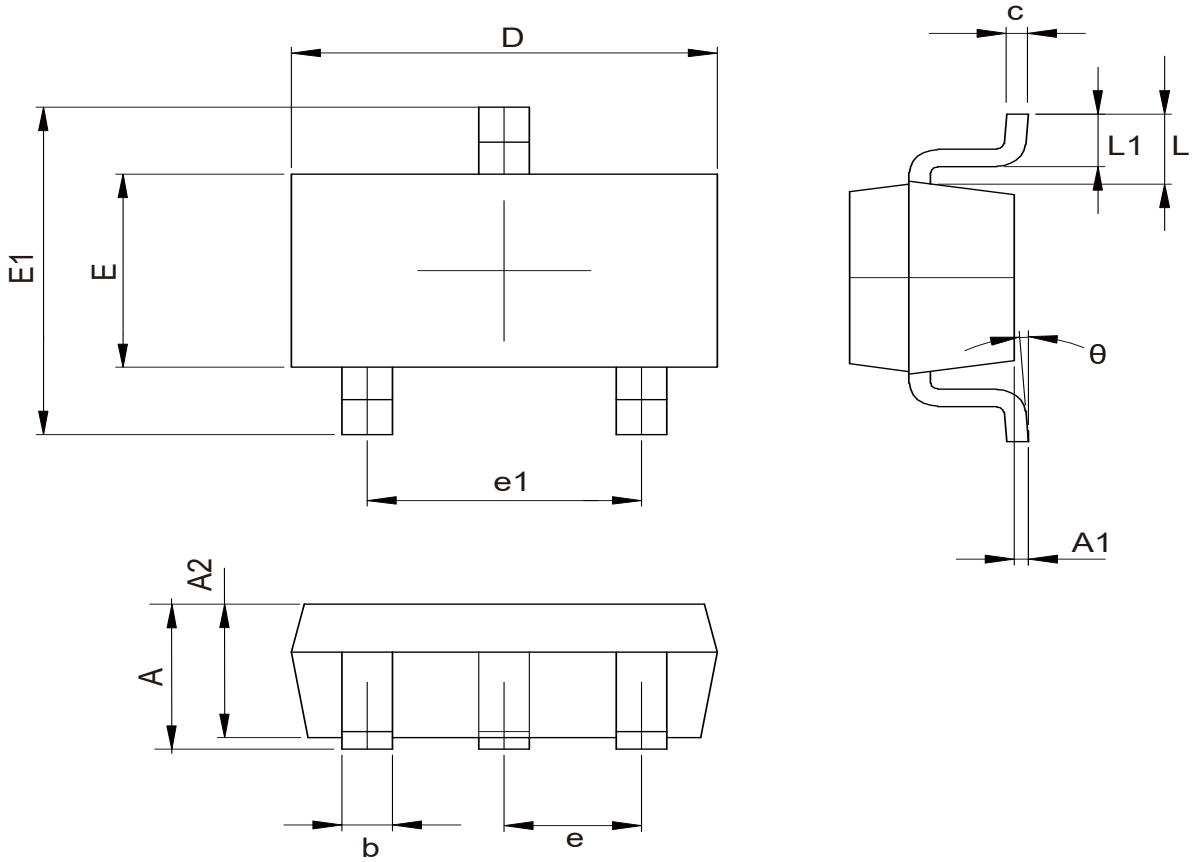


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

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


SOT-23-3L
PACKAGE OUTLINE DIMENSIONS



| COMMON DIMENSIONS | | | |
|---------------------------|----------|-------|-------|
| CUNITS MEASURE=MILLIMETER | | | |
| SYMBOL | MIN | NOM | MAX |
| A | 1.050 | --- | 1.300 |
| A1 | 0.000 | --- | 0.200 |
| A2 | 1.050 | --- | 1.200 |
| b | 0.300 | 0.400 | 0.500 |
| c | 0.100 | --- | 0.200 |
| D | 2.820 | 2.900 | 3.020 |
| E | 1.500 | 1.600 | 1.700 |
| E1 | 2.650 | 2.800 | 2.950 |
| e | 0.950TYP | | |
| e1 | 1.800 | 1.900 | 2.000 |
| L | 0.6REF | | |
| L1 | 0.300 | 0.450 | 0.600 |
| theta | 0° | -- | 8° |

Unit:mm


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