

● General Description

The AGM205D 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

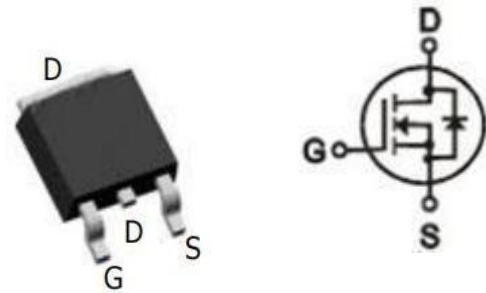
● Application

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

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|-----|
| 20V | 2.8mΩ | 90A |

TO-252 Pin Configuration



Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|---------|----------------|-----------|------------|----------|
| AGM205D | AGM205D | TO-252 | 330mm | 16mm | 2500 |

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

| Symbol | Parameter | Value | Unit |
|-------------|--|------------|------|
| VDS | Drain-Source Voltage (VGS=0V) | 20 | V |
| VGS | Gate-Source Voltage (VDS=0V) | ±12 | V |
| ID | Drain Current-Continuous(Tc=25°C) (Note 1) | 90 | A |
| | Drain Current-Continuous(Tc=100°C) | 59 | A |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 2) | 360 | A |
| PD | Maximum Power Dissipation(Tc=25°C) | 68 | w |
| | Maximum Power Dissipation(Tc=100°C) | 27 | w |
| EAS | Avalanche energy (Note 3) | 340 | 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 | --- | -- | °C/W |
| RθJC | Thermal Resistance Junction-Case ¹ | --- | 1.85 | °C/W |

Table 3. Electrical Characteristics (TC=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 | -- | -- | 1.0 | μA |
| IGSS | Gate-Body Leakage Current | VGS=±12V,VDS=0V | -- | -- | ±100 | nA |
| VGS(th) | Gate Threshold Voltage | VDS=VGS,ID=250μA | 0.4 | 0.7 | 1.1 | V |
| RDS(on) | Drain-Source On-State Resistance | VGS=4.5V, ID=30A | -- | 2.8 | 4.0 | mΩ |
| | | VGS=2.5V, ID=20A | -- | 4.0 | 6.0 | mΩ |
| Dynamic Characteristics | | | | | | |
| Ciss | Input Capacitance | VDS=15V,VGS=0V, F=1MHZ | -- | 3200 | -- | pF |
| Coss | Output Capacitance | | -- | 460 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 445 | -- | pF |
| Rg | Gate resistance | VGS=0V, VDS=0V,f=1.0MHz | -- | 1.1 | -- | Ω |
| Switching Times | | | | | | |
| td(on) | Turn-on Delay Time | VGS=4.5V,VDS=15V RG=17A,RGEN=1.8Ω | -- | 9.7 | -- | nS |
| tr | Turn-on Rise Time | | -- | 37 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 63 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 52 | -- | nS |
| Qg | Total Gate Charge | VGS=4.5V, VDS=15V, ID=17A | -- | 48 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 3.6 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 19 | -- | nC |
| Source-Drain Diode Characteristics | | | | | | |
| ISD | Source-Drain Current(Body Diode) | | -- | -- | 90 | A |
| VSD | Forward on Voltage | VGS=0V,IS=30A | -- | -- | 1.2 | V |
| trr | Reverse Recovery Time | IF=30A , dI/dt=100A/μs , | -- | 23 | -- | ns |
| Qrr | Reverse Recovery Charge | TJ=25°C | -- | 10 | -- | 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

N- Channel Typical Characteristics

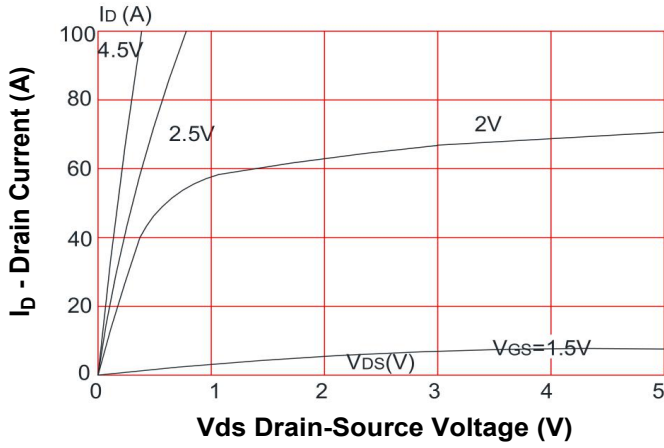


Figure 1. On-Region Characteristics

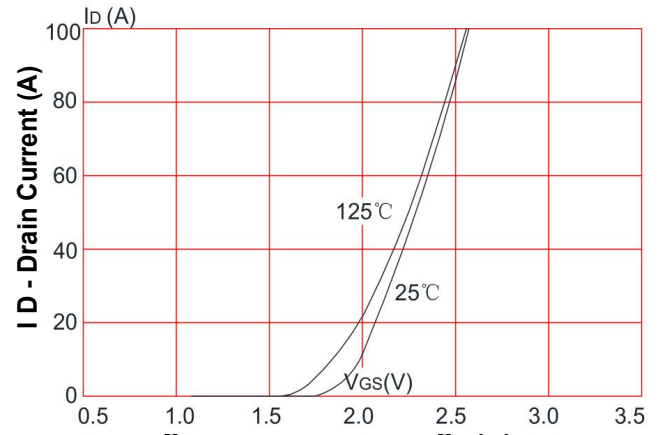


Figure 2. Transfer Characteristics

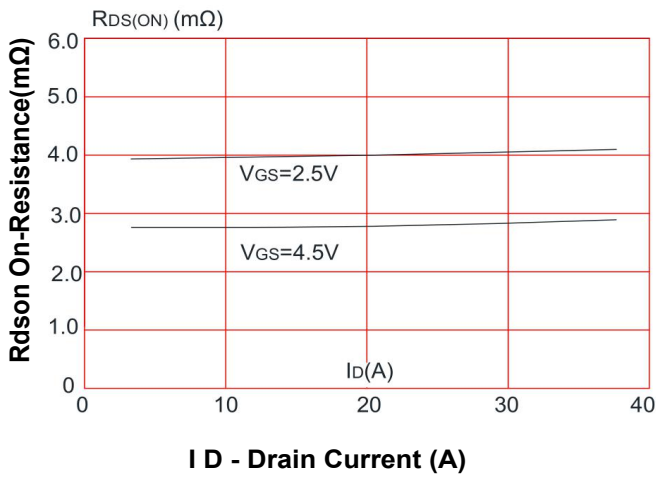


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

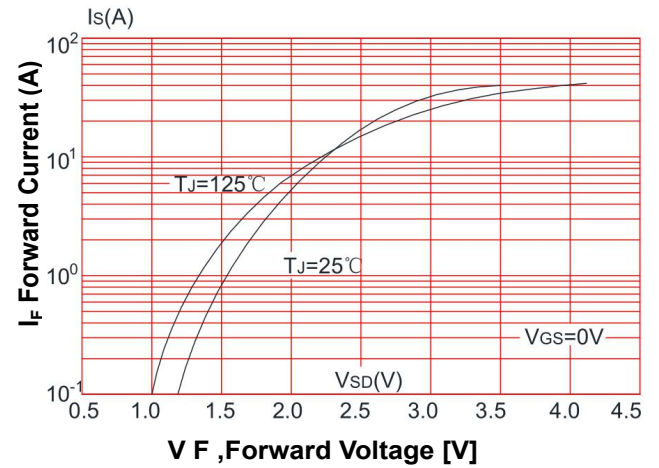


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

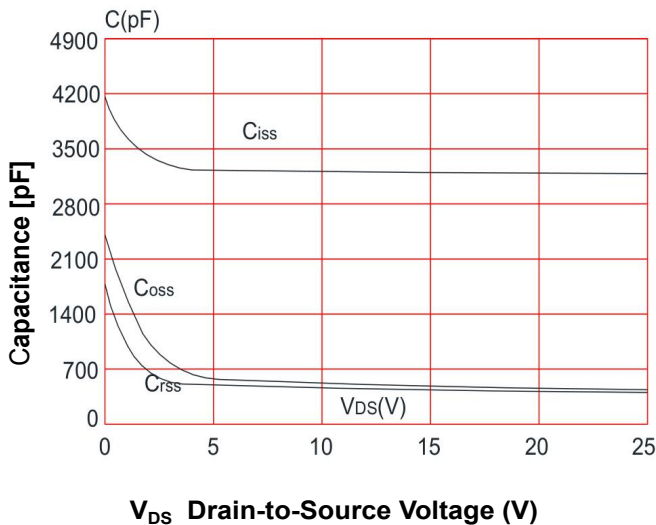


Figure 5. Capacitance Characteristics

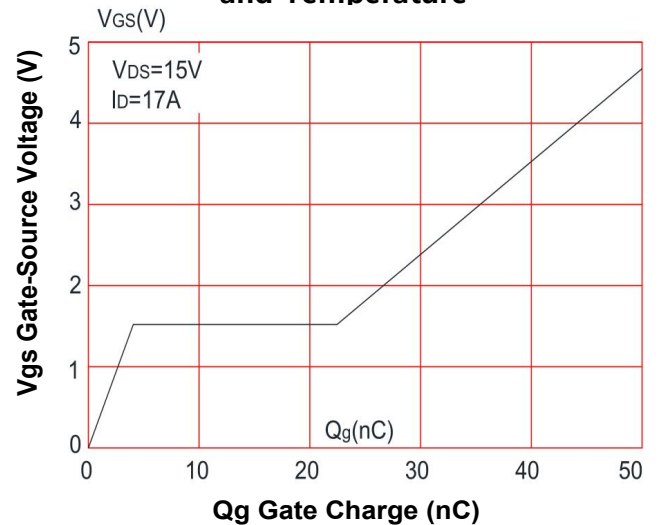
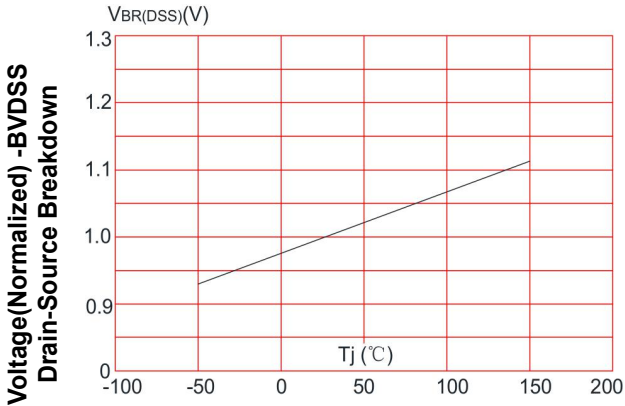
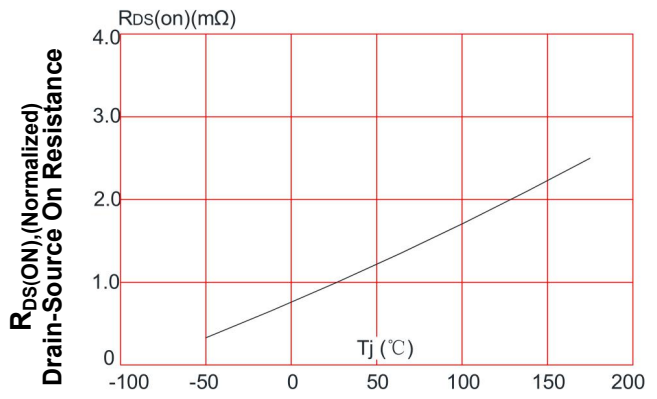


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)



T J , Junction Temperature [°C]
Figure 7. Breakdown Voltage Variation vs Temperature



T J , Junction Temperature [°C]
Figure 8. On-Resistance Variation vs Temperature

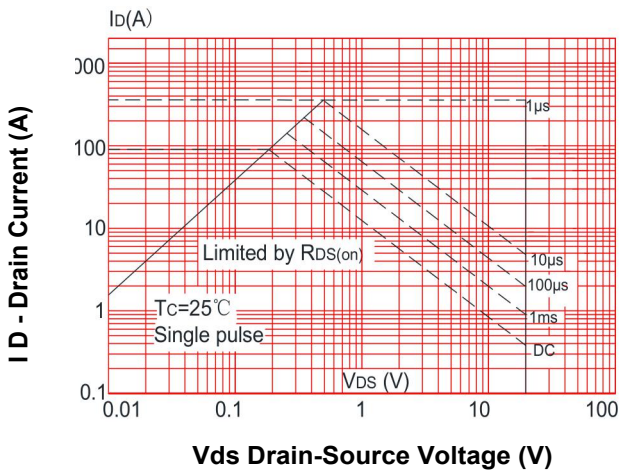
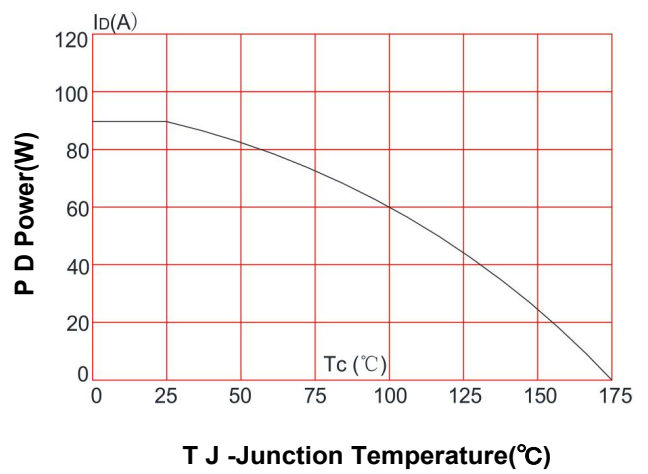


Figure 9. Maximum Safe Operating Area



T J -Junction Temperature(°C)
Figure 10. Maximum Power Dissipation vs Case Temperature

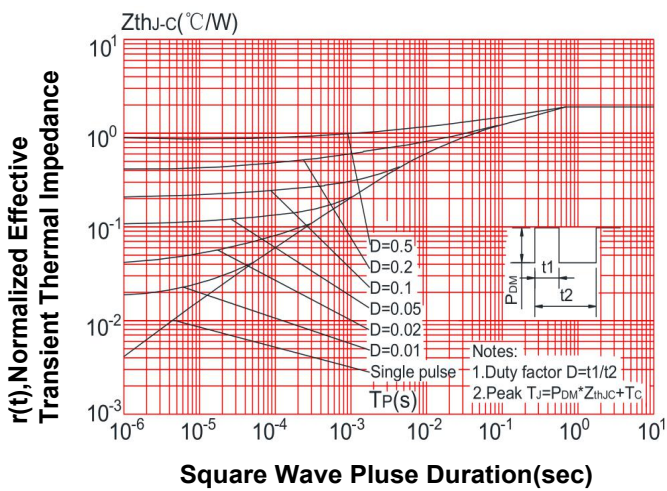
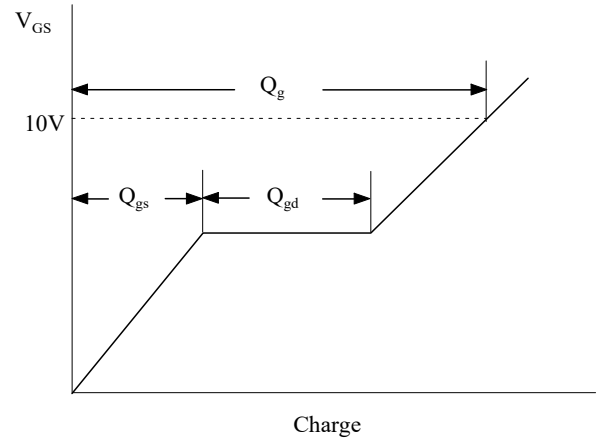
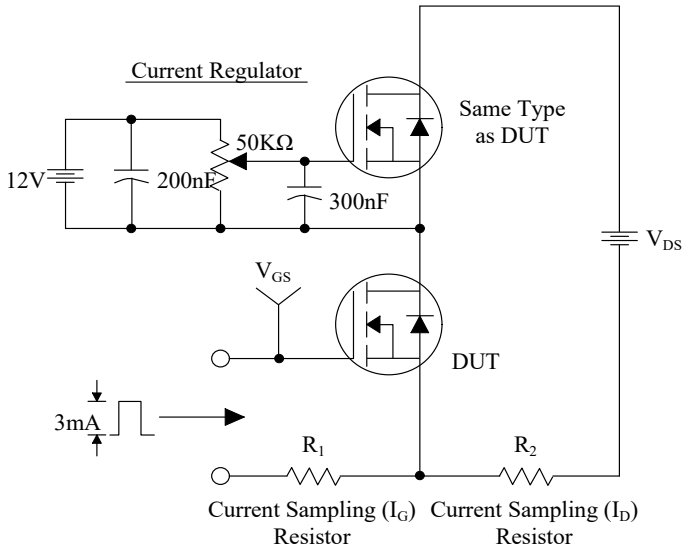
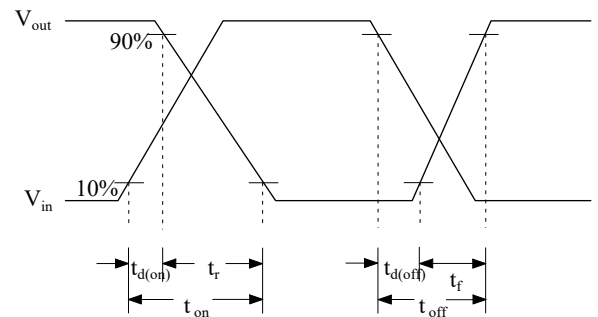
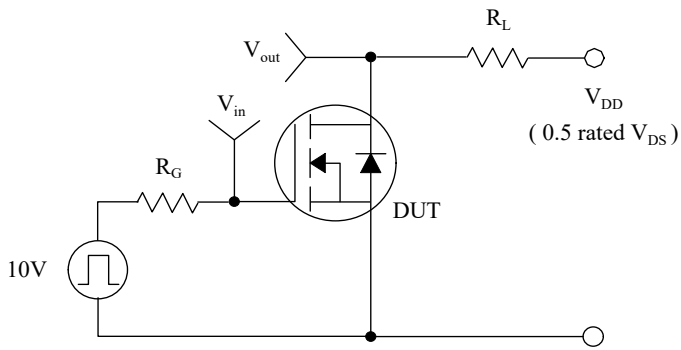


Figure 11. Transient Thermal Response Curve

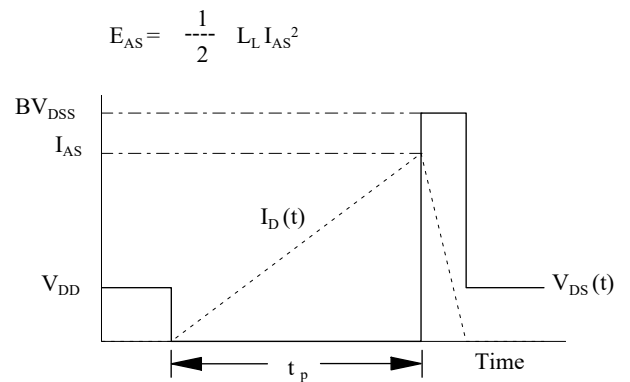
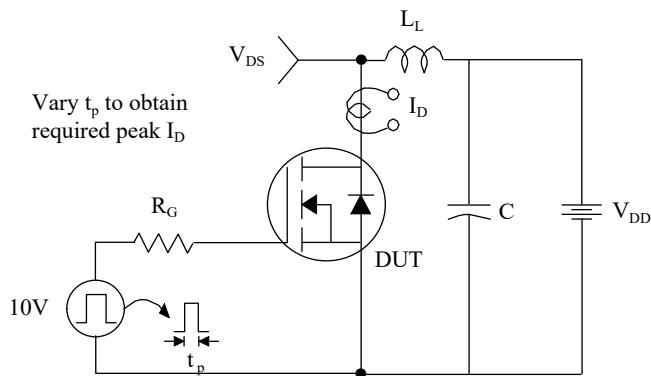
Gate Charge Test Circuit & Waveform



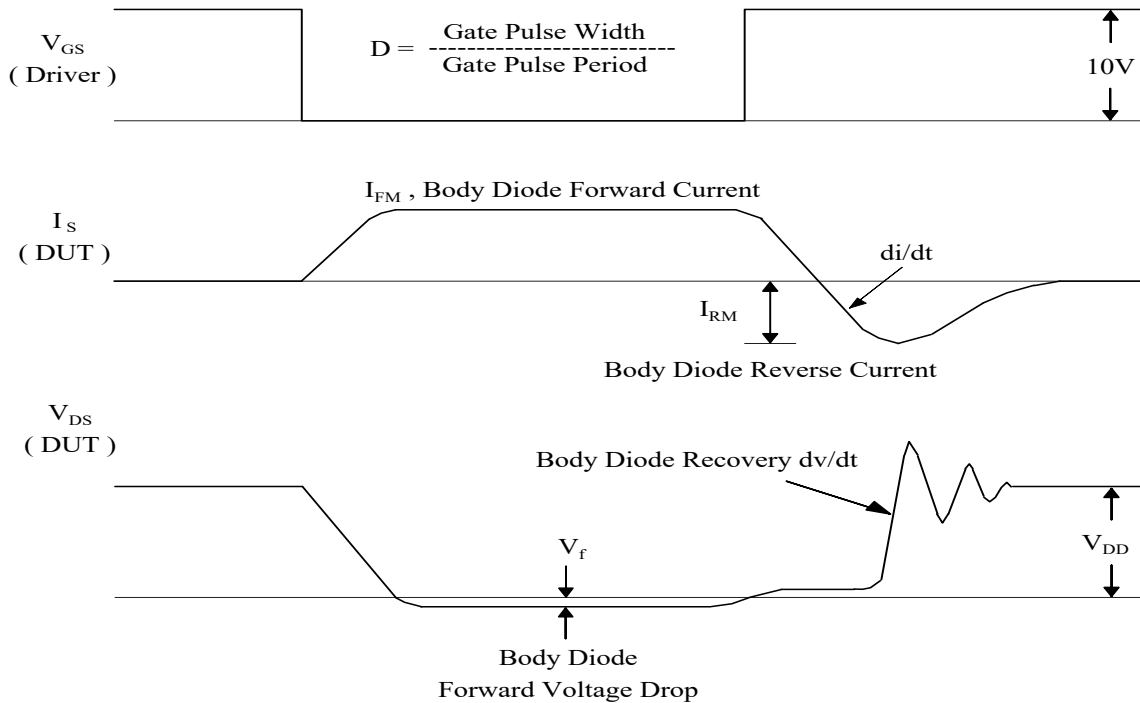
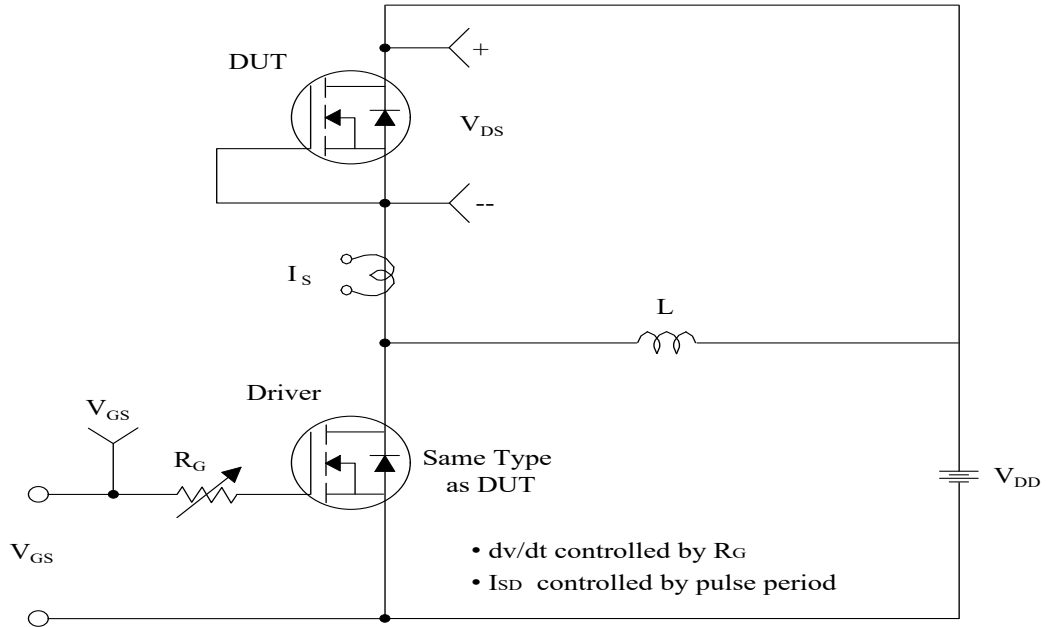
Resistive Switching Test Circuit & Waveforms



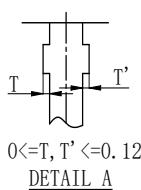
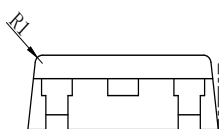
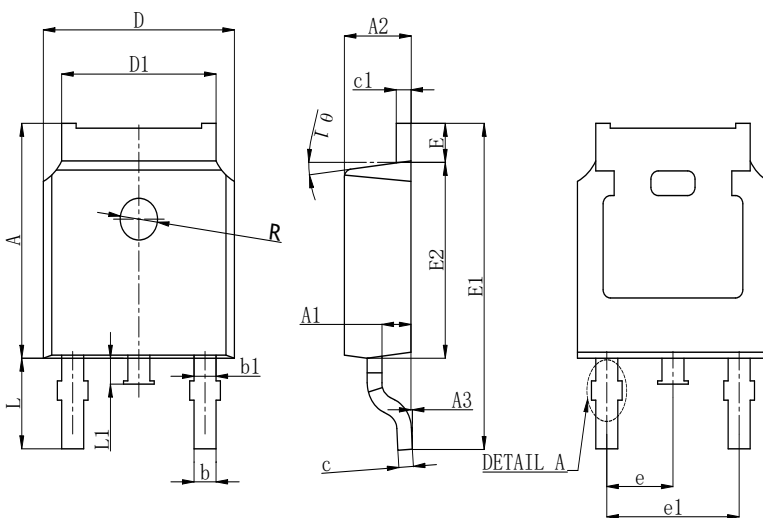
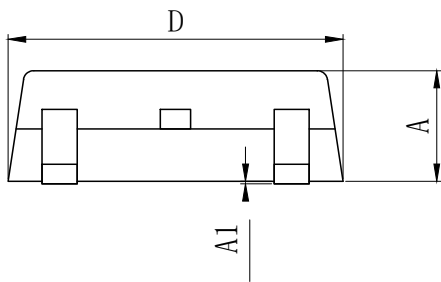
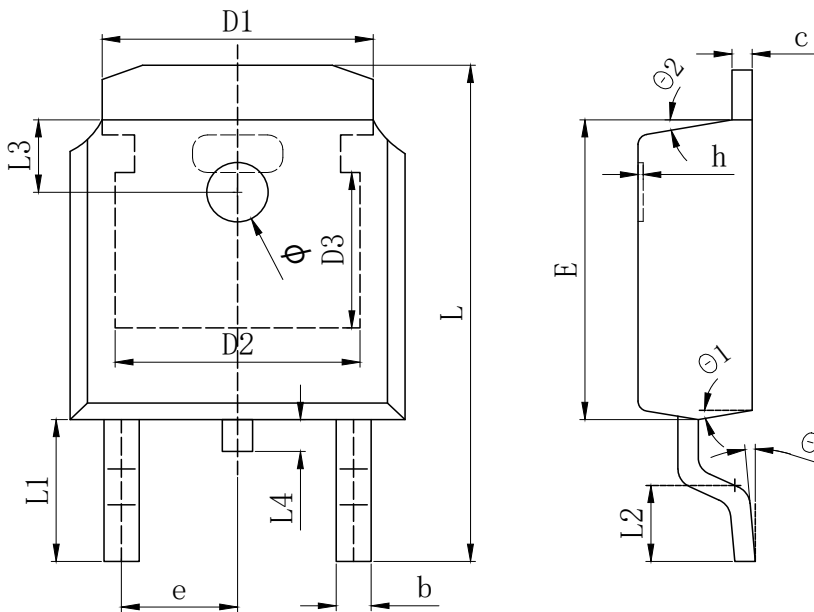
Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms



TO-252 Package Outline Data



$0 \leq T, T' \leq 0.12$
DETAIL A

| SYMBOL | MILLIMETER | | |
|------------|------------|--------|--------|
| | MIN | Typ. | MAX |
| A | 2.200 | 2.300 | 2.400 |
| A1 | 0.000 | | 0.127 |
| b | 0.640 | 0.690 | 0.740 |
| c (电镀后) | 0.460 | 0.520 | 0.580 |
| D | 6.500 | 6.600 | 6.700 |
| D1 | 5.334 REF | | |
| D2 | 4.826 REF | | |
| D3 | 3.166 REF | | |
| E | 6.000 | 6.100 | 6.200 |
| e | 2.286 TYP | | |
| h | 0.000 | 0.100 | 0.200 |
| L | 9.900 | 10.100 | 10.300 |
| L1 | 2.888 REF | | |
| L2 | 1.400 | 1.550 | 1.700 |
| L3 | 1.600 REF | | |
| L4 | 0.600 | 0.800 | 1.000 |
| Φ | 1.100 | 1.200 | 1.300 |
| θ | 0° | | 8° |
| $\theta 1$ | 9° TYP | | |
| $\theta 2$ | 9° TYP | | |

| SYMBOL | MILLIMETER | | |
|------------|------------|-------|--------|
| | MIN | NOM | MAX |
| A | 7.050 | 7.100 | 7.150 |
| A1 | 0.960 | 1.010 | 1.060 |
| A2 | 2.250 | 2.300 | 2.350 |
| A3 | 0.000 | 0.050 | 0.100 |
| b | 0.760REF. | | |
| b1 | 1.000REF. | | |
| c | 0.508REF. | | |
| c1 | 0.508REF. | | |
| D | 6.550 | 6.600 | 6.650 |
| D1 | 5.220 | 5.320 | 5.420 |
| E | 0.950 | 1.000 | 1.050 |
| E1 | 9.700 | 9.900 | 10.100 |
| E2 | 6.050 | 6.100 | 6.150 |
| e | 2.286BSC | | |
| e1 | 4.572REF. | | |
| L | 2.650 | 2.800 | 2.950 |
| L1 | 0.700 | 0.800 | 0.900 |
| $\theta 1$ | 7° REF. | | |
| R | 1.300REF. | | |
| R1 | 0.250REF. | | |


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