

● General Description

The AGM60P130H 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

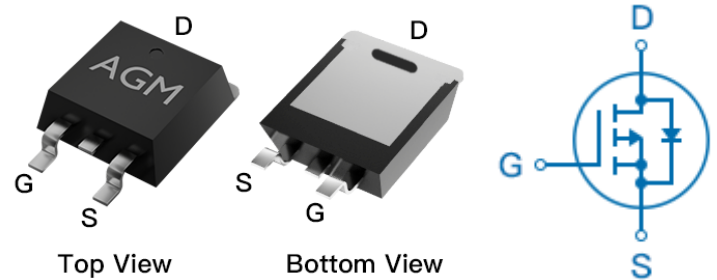
● Application

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

Product Summary

| BVDS | RDSON | ID |
|------|-------|-------|
| -60V | 5.5mΩ | -130A |

TO-263 Pin Configuration



Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|------------|----------------|-----------|------------|----------|
| AGM60P130H | AGM60P130H | TO-263 | 330mm | 25mm | 800 |

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

| Symbol | Parameter | Value | Unit |
|-------------|---|------------|------|
| VDS | Drain-Source Voltage (VGS=0V) | -60 | V |
| VGS | Gate-Source Voltage (VDS=0V) | ±20 | V |
| ID | Drain Current-Continuous(Tc=25°C) (Note 1) | -130 | A |
| | Drain Current-Continuous(Tc=100°C) | -78 | A |
| IDM (pulse) | Drain Current-Pulsed (Note 2) | -520 | A |
| PD | Maximum Power Dissipation(Tc=25°C) | 180 | w |
| | Maximum Power Dissipation(Tc=100°C) | 72.5 | w |
| EAS | Avalanche energy (Note 3) | 870 | 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 | --- | 60 | °C/W |
| RθJC | Thermal Resistance Junction-Case ¹ | --- | 0.69 | °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 | -60 | -- | -- | 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 | -1.6 | -2.0 | -2.4 | V |
| gFS | Forward Transconductance | VDS=5V, ID=-10A | -- | 45 | -- | S |
| RDS(on) | Drain-Source On-State Resistance | VGS=-5V, ID=-15A | -- | 5.5 | 7.0 | mΩ |
| | | VGS=-4.5V, ID=-10A | -- | 7.0 | 9.0 | mΩ |
| Dynamic Characteristics | | | | | | |
| Ciss | Input Capacitance | VDS=-30V, VGS=0V, F=1MHZ | -- | 5550 | -- | pF |
| Coss | Output Capacitance | | -- | 872 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 65 | -- | pF |
| Rg | Gate resistance | VGS=0V, VDS=0V, f=1.0MHz | -- | 2.0 | -- | Ω |
| Switching Times | | | | | | |
| td(on) | Turn-on Delay Time | VGS=-10V, VDS=-30V, ID=15A, R _L =0.75Ω, RGEN=3Ω | -- | 4.5 | -- | nS |
| tr | Turn-on Rise Time | | -- | 2.5 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 14.5 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 3.5 | -- | nS |
| Qg | Total Gate Charge | VGS=-10V, VDS=-30V, ID=-15A | -- | 85.6 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 18 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 12.4 | -- | nC |
| Source-Drain Diode Characteristics | | | | | | |
| ISD | Source-Drain Current(Body Diode) | TC=25 °C | -- | -- | -130 | A |
| VSD | Forward on Voltage | VGS=0V, IS=-15A | -- | -- | -1.2 | V |
| trr | Reverse Recovery Time | Is=-15A , V _{DD} =-30V, dI/dt=100A/μs , T _J =25 °C | -- | 60 | -- | ns |
| Qrr | Reverse Recovery Charge | | -- | 105 | -- | nc |

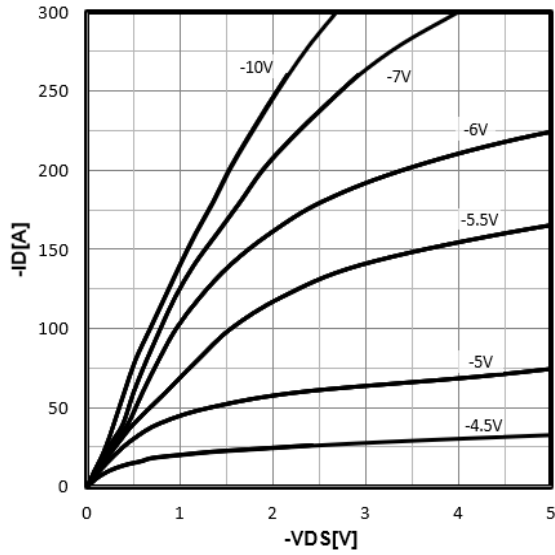
Notes 1.The maximum current rating is package limited.

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

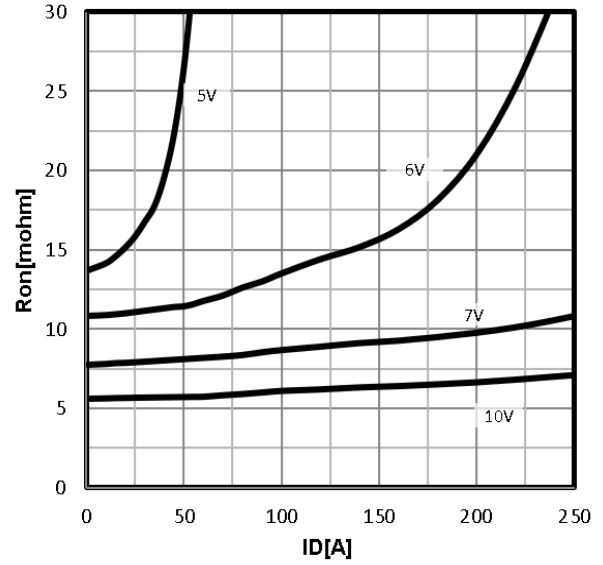
Notes 3.EAS condition: T_J=25°C, V_{DD}=-30V, V_{gs}=-10V, ID=-59A, L=0.5mH, R_G=25ohm.

Characteristics Curve:

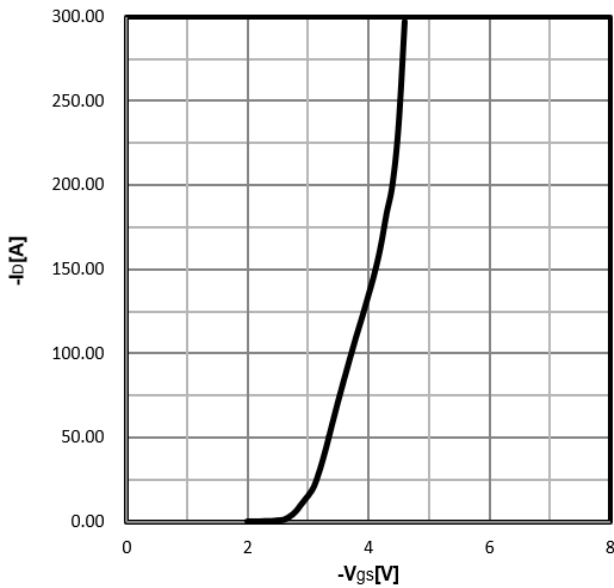
Typ. output characteristics
 $I_D = f(V_{DS})$



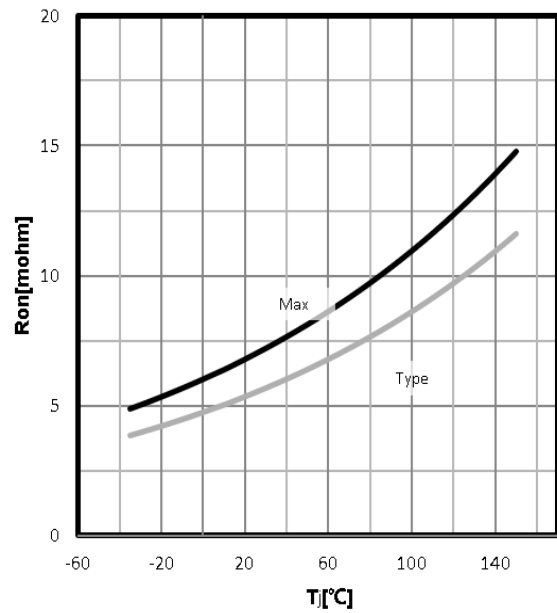
Typ. drain-source on resistance
 $R_{DS(on)} = f(I_D)$



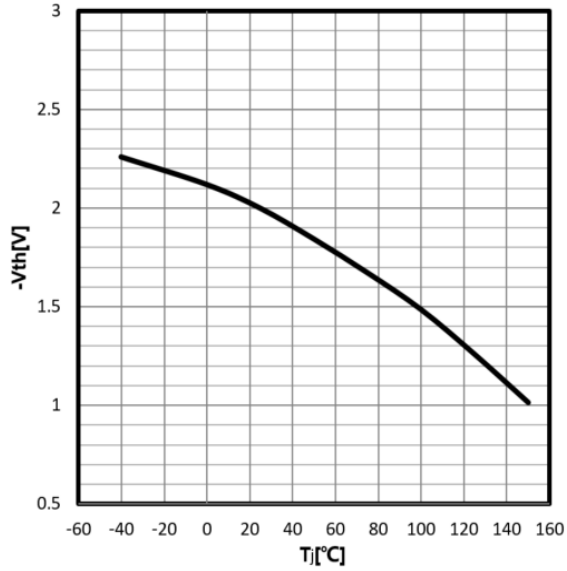
Typ. transfer characteristics
 $I_D = f(V_{GS})$



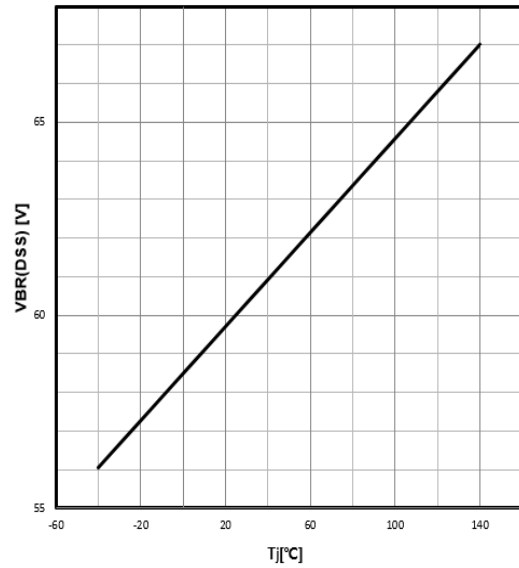
Drain-source on-state resistance
 $R_{DS(on)} = f(T_j); I_D = -15A; V_{GS} = -10V$



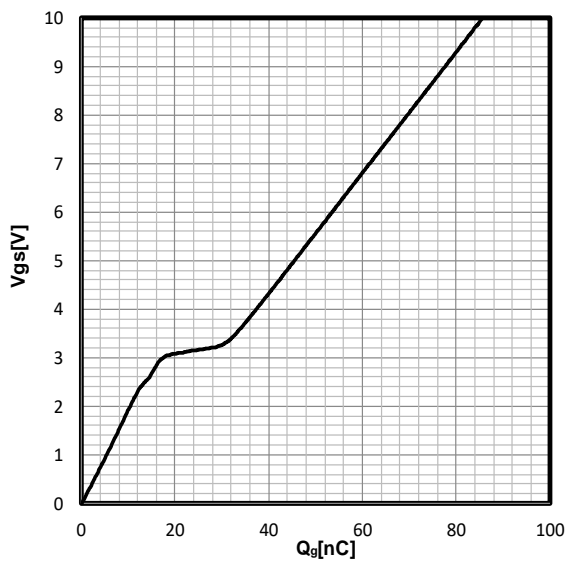
Gate Threshold Voltage
 $-V_{TH}=f(T_j); I_D=-250\mu A$



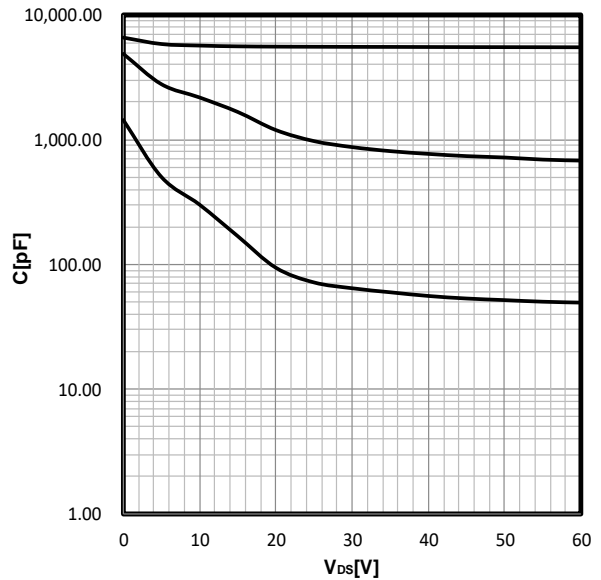
Drain-source breakdown voltage
 $V_{BR(DSS)}=f(T_j); I_D=-250\mu A$



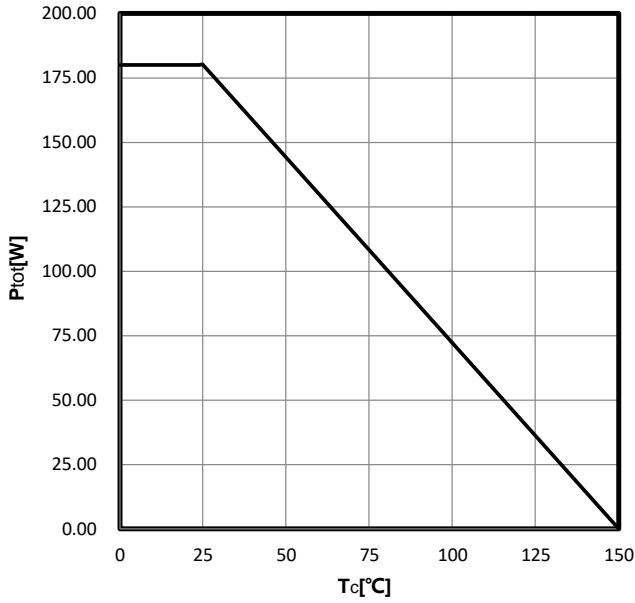
Typ. gate charge
 $V_{GS}=f(Q_{gate}); I_D=-15A$



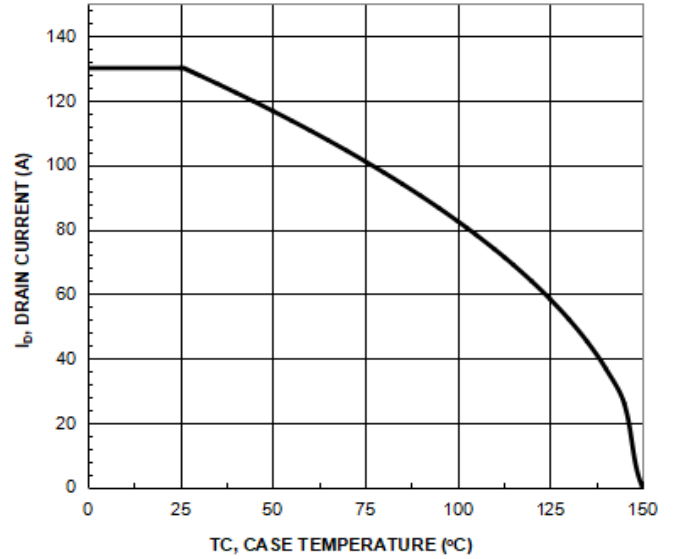
Typ. capacitances
 $C=f(V_{DS}); V_{GS}=0V; f=1MHz$



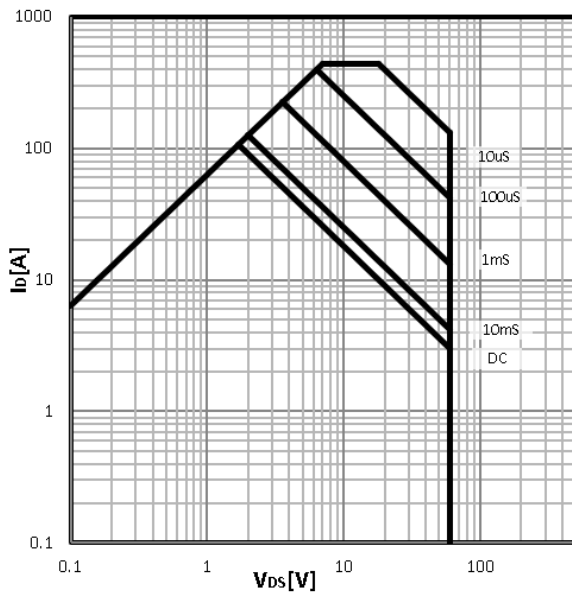
Power Dissipation
 $P_{tot}=f(T_C)$



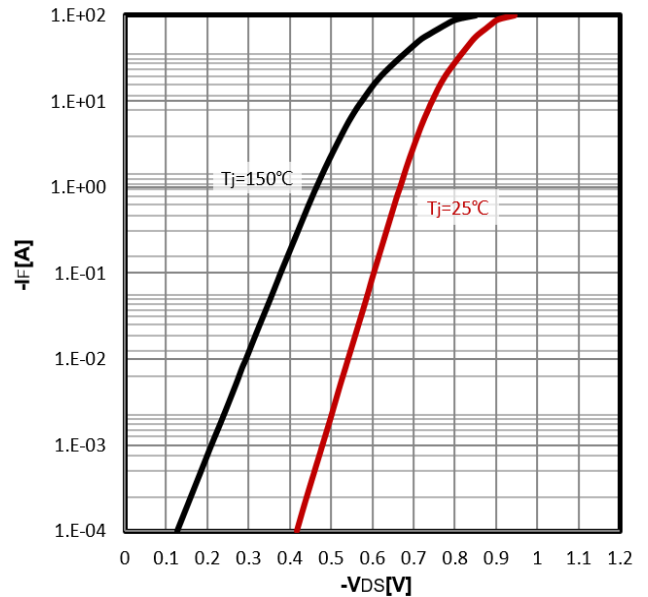
Maximum Drain Current
 $-I_D=f(T_C)$



Safe operating area
 $-I_D=f(-V_{DS})$

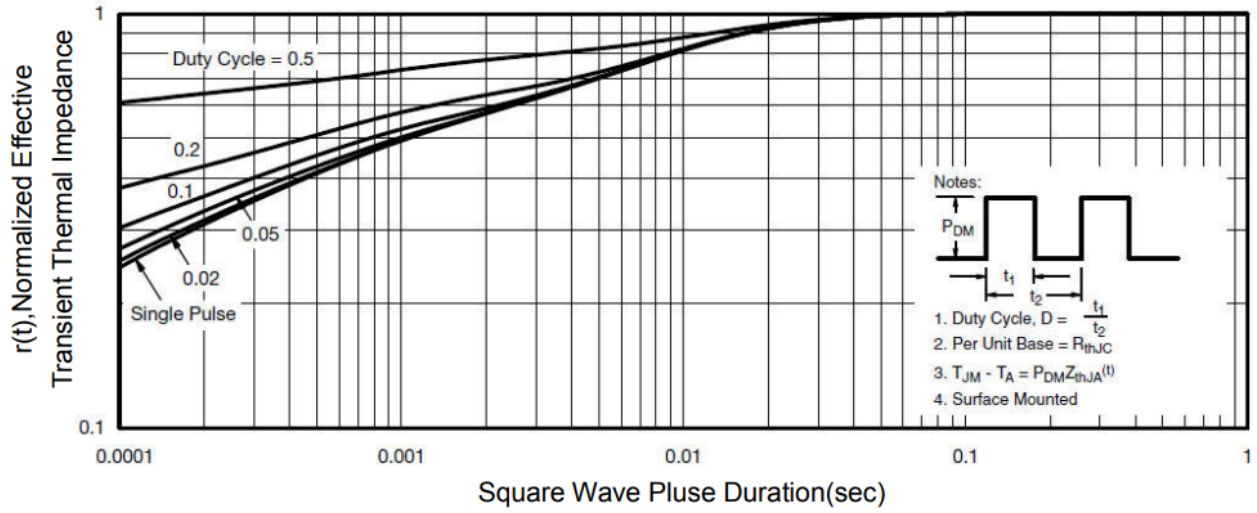


Body Diode Forward Voltage Variation
 $-I_F=f(-V_{DS})$

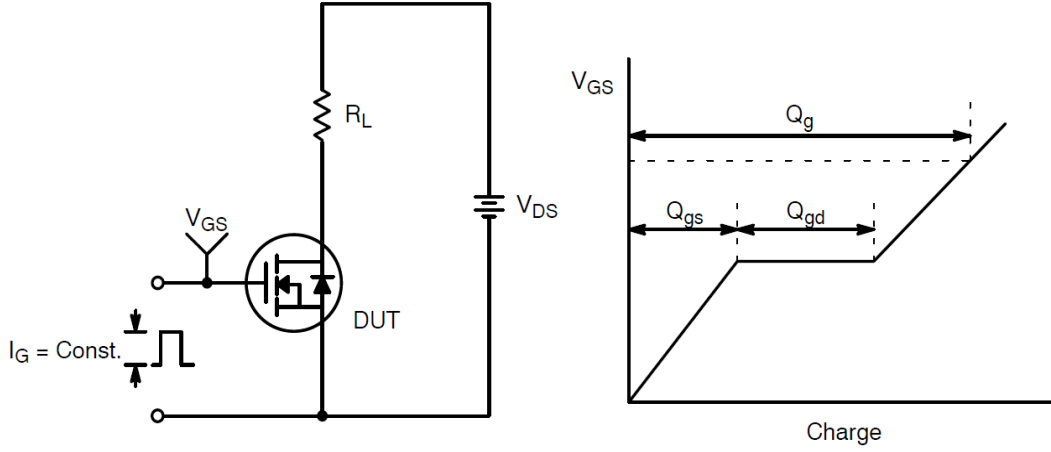


Max. transient thermal impedance

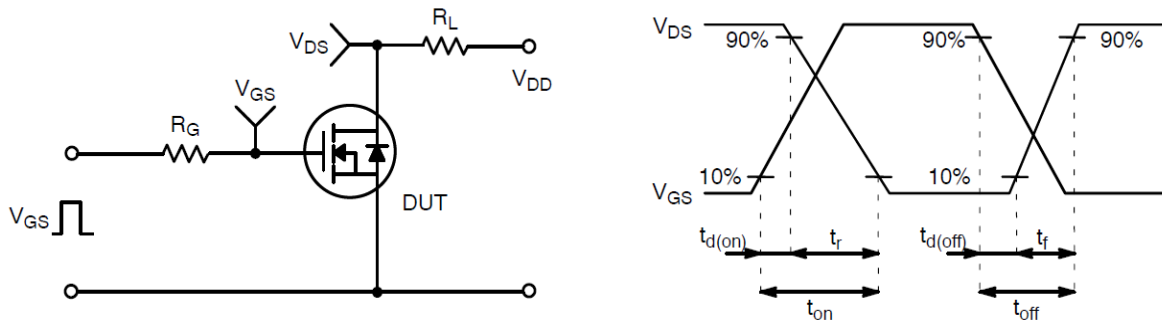
$$Z_{thJC} = f(t_p)$$



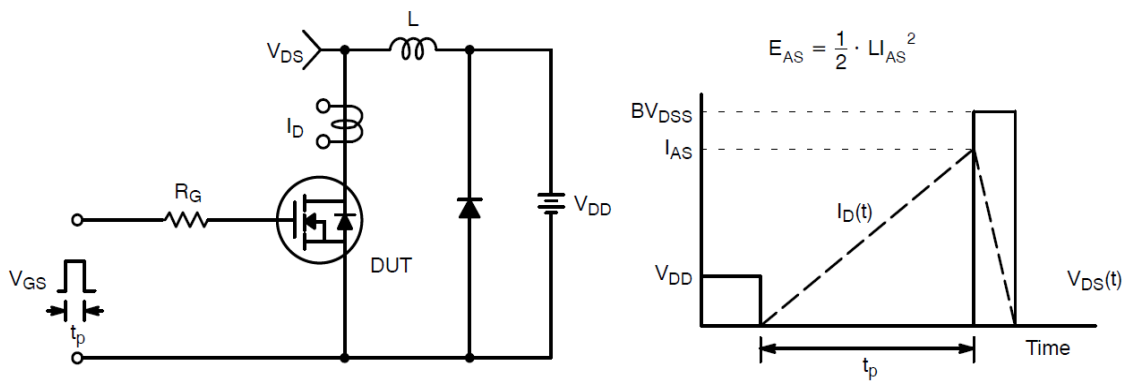
Test Circuit and Waveform:



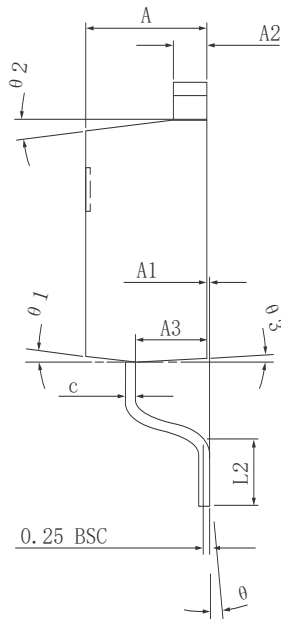
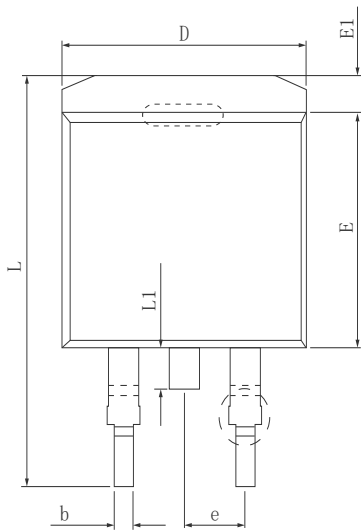
Gate Charge Test Circuit & Waveform



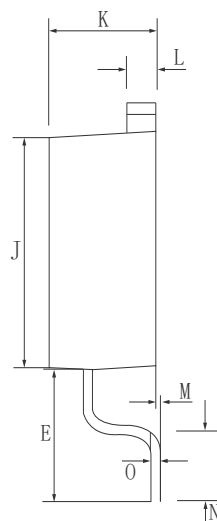
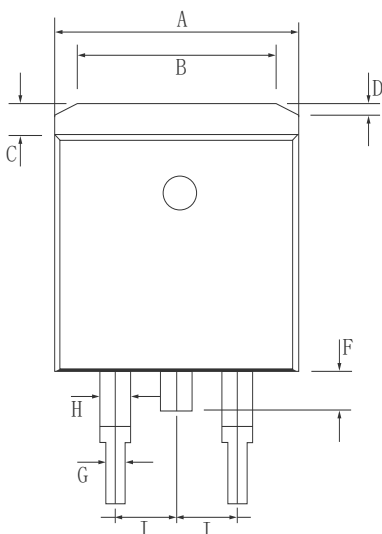
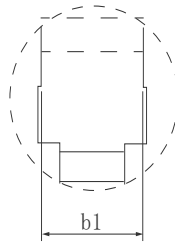
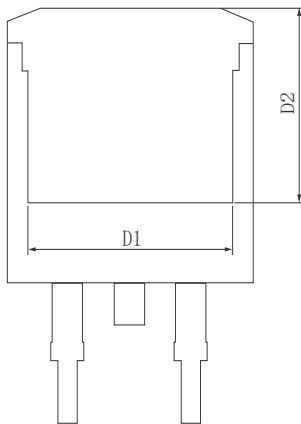
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

•Dimensions (TO-263)


| 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 |
| θ | 0° | | 9° |
| θ 1 | 7° TYP | | |
| θ 2 | 7° TYP | | |
| θ 3 | 3° TYP | | |

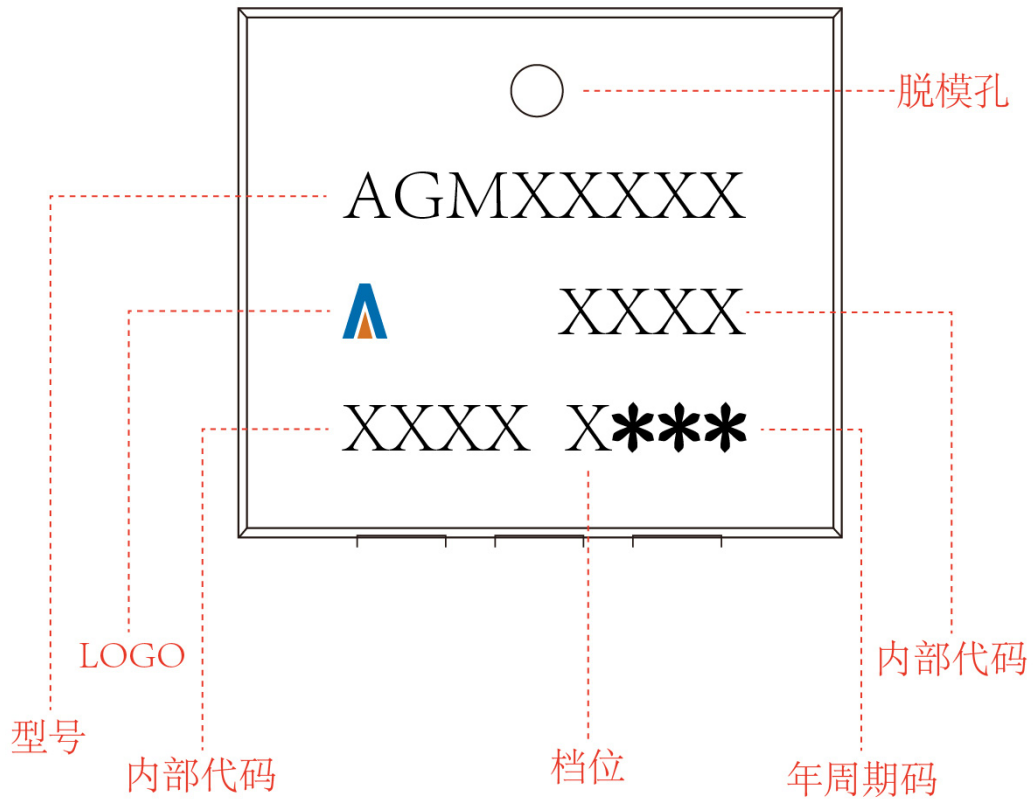


| Dim. | Min. | Max. |
|------|---------|------|
| A | 9.8 | 10.2 |
| B | 6.1 | 6.7 |
| C | 1.1 | 1.4 |
| D | 0.5 | 1.0 |
| E | 4.6 | 5.0 |
| F | 1.4 | 1.6 |
| G | 0.7 | 0.9 |
| H | 1.17 | 1.37 |
| I | Typ2.54 | |
| J | 9 | 9.2 |
| K | 4.3 | 4.7 |
| L | 1.25 | 1.35 |
| M | 0.02 | 0.23 |
| N | 2.2 | 2.8 |
| O | 0.45 | 0.55 |

All Dimensions in millimeter

TO-263

Marking Instructions:




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