

● General Description

The AGM206D 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

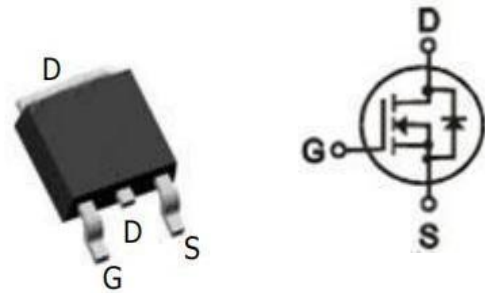
● Application

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

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|-----|
| 20V | 3.5mΩ | 85A |

TO-252 Pin Configuration



Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|---------|----------------|-----------|------------|----------|
| AGM206D | AGM206D | TO-252 | ----- | ----- | 2500 |

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) | ±12 | V |
| ID | Drain Current-Continuous(Tc=25°C) (Note 1) | 85 | A |
| | Drain Current-Continuous(Tc=100°C) | 59 | A |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 2) | 300 | A |
| PD | Maximum Power Dissipation(Tc=25°C) | 72 | w |
| | Maximum Power Dissipation(Tc=100°C) | 29 | 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 | --- | 1.72 | °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 | -- | -- | 1.0 | μA |
| IGSS | Gate-Body Leakage Current | VGS=±12V,VDS=0V | -- | -- | ±100 | nA |
| VGS(th) | Gate Threshold Voltage | VDS=VGS,ID=250μA | 0.5 | 0.7 | 1.1 | V |
| gFS | Forward Transconductance | VDS=5V,ID=15A | -- | 40 | -- | S |
| RDS(on) | Drain-Source On-State Resistance | VGS=4.5V, ID=20A | -- | 3.5 | 4.8 | mΩ |
| | | VGS=2.5V, ID=15A | -- | 6.0 | 7.0 | mΩ |
| Dynamic Characteristics | | | | | | |
| Ciss | Input Capacitance | VDS=15V,VGS=0V, F=1MHZ | -- | 2800 | -- | pF |
| Coss | Output Capacitance | | -- | 353 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 265 | -- | 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 RL=0.75Ω,RGEN=3Ω | -- | 17 | -- | nS |
| tr | Turn-on Rise Time | | -- | 49 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 74 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 26 | -- | nS |
| Qg | Total Gate Charge | VGS=4.5V, VDS=10V, ID=12A | -- | 32 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 3.0 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 11 | -- | nC |
| Source-Drain Diode Characteristics | | | | | | |
| ISD | Source-Drain Current(Body Diode) | | -- | -- | 85 | A |
| VSD | Forward on Voltage | VGS=0V,IS=20A | -- | -- | 1.2 | V |
| trr | Reverse Recovery Time | IF=20A , dI/dt=100A/μs , TJ=25°C | -- | 23 | -- | ns |
| Qrr | Reverse Recovery Charge | | -- | 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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics

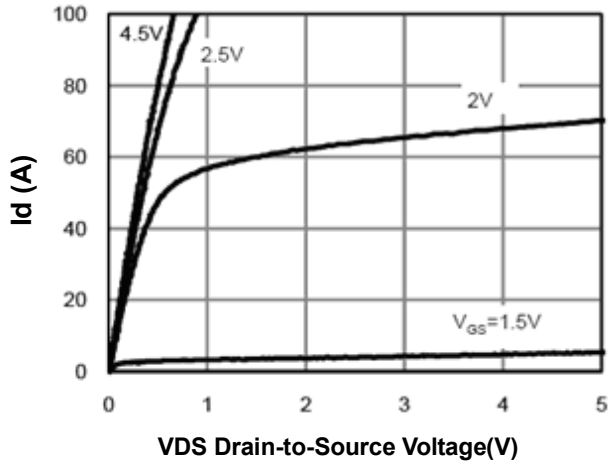


Figure 2. Transfer Characteristics

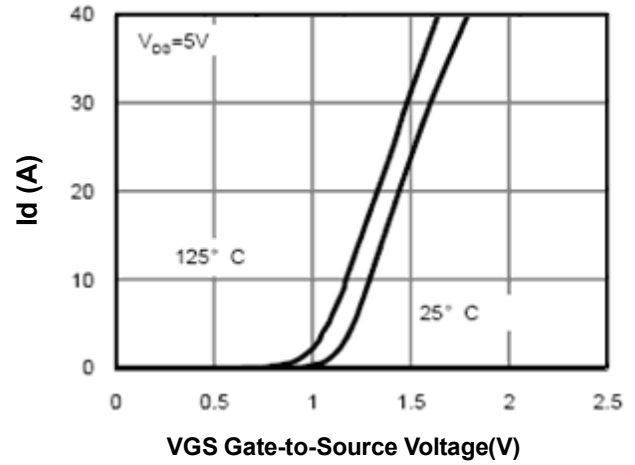
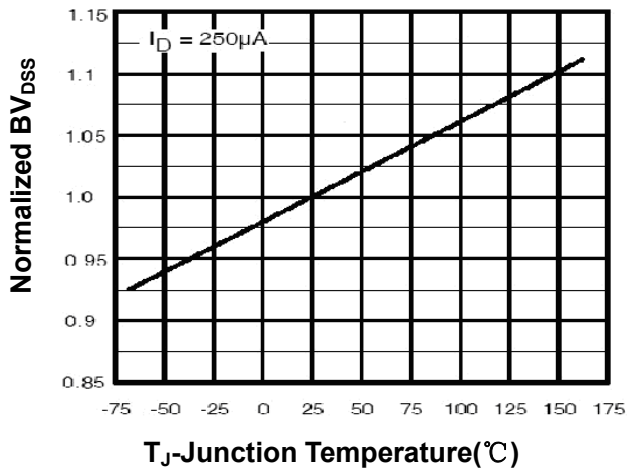

 Figure 3. Max BV_{DSS} vs Junction Temperature


Figure 4. Drain Current

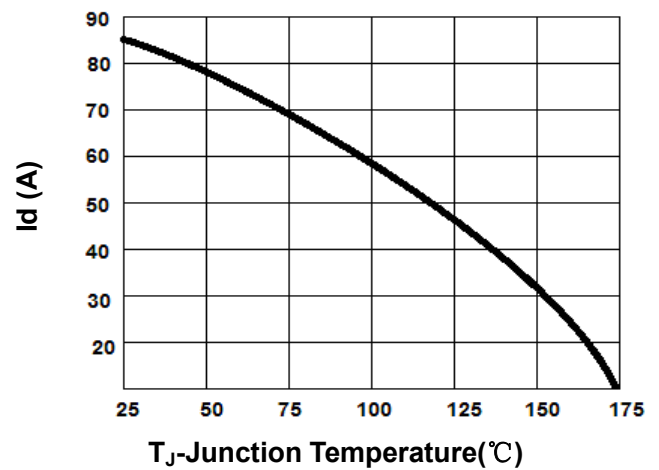
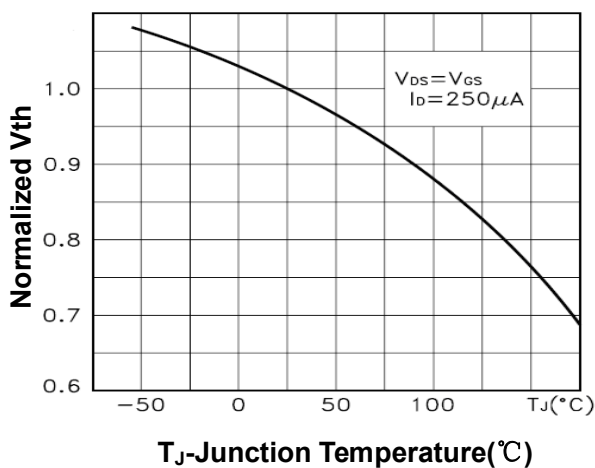
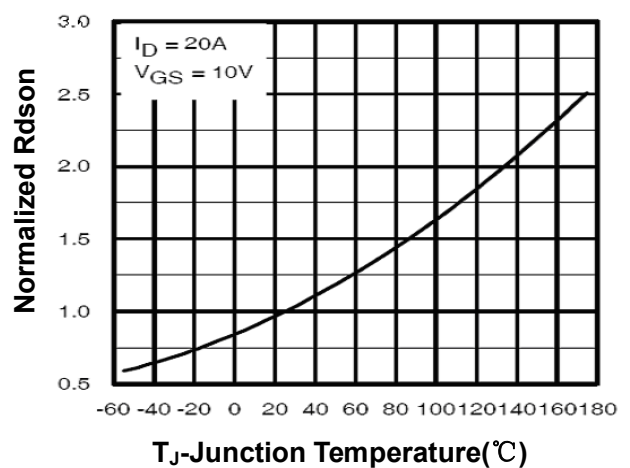

 Figure 5. $V_{GS(th)}$ vs Junction Temperature

 Figure 6. $R_{DS(on)}$ vs Junction Temperature


Figure 7. Gate Charge Waveforms

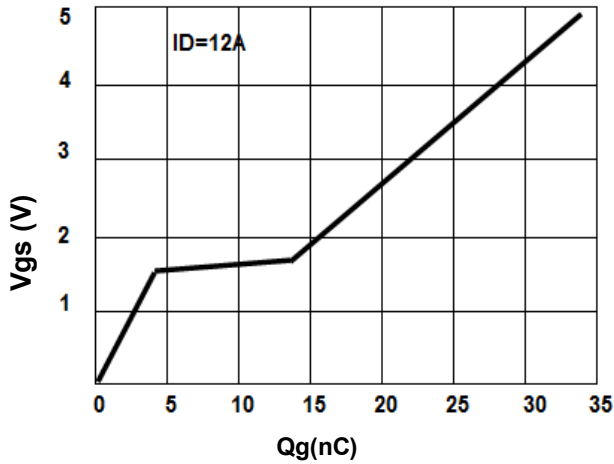


Figure 8. Capacitance

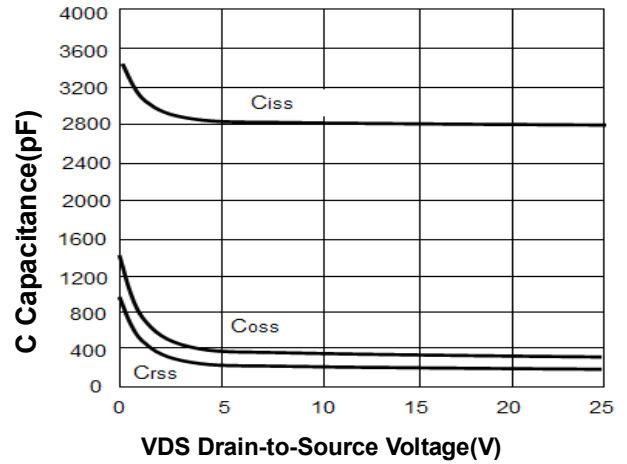


Figure 9. Body-Diode Characteristics

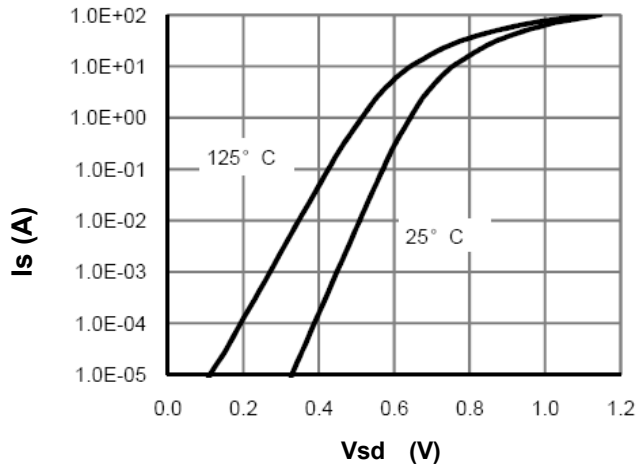


Figure 10. Maximum Safe Operating Area

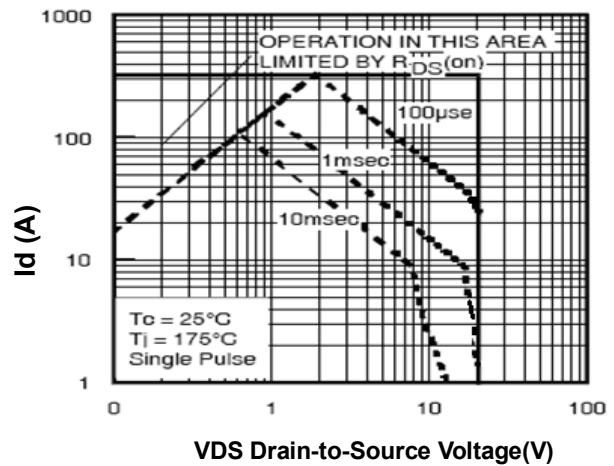
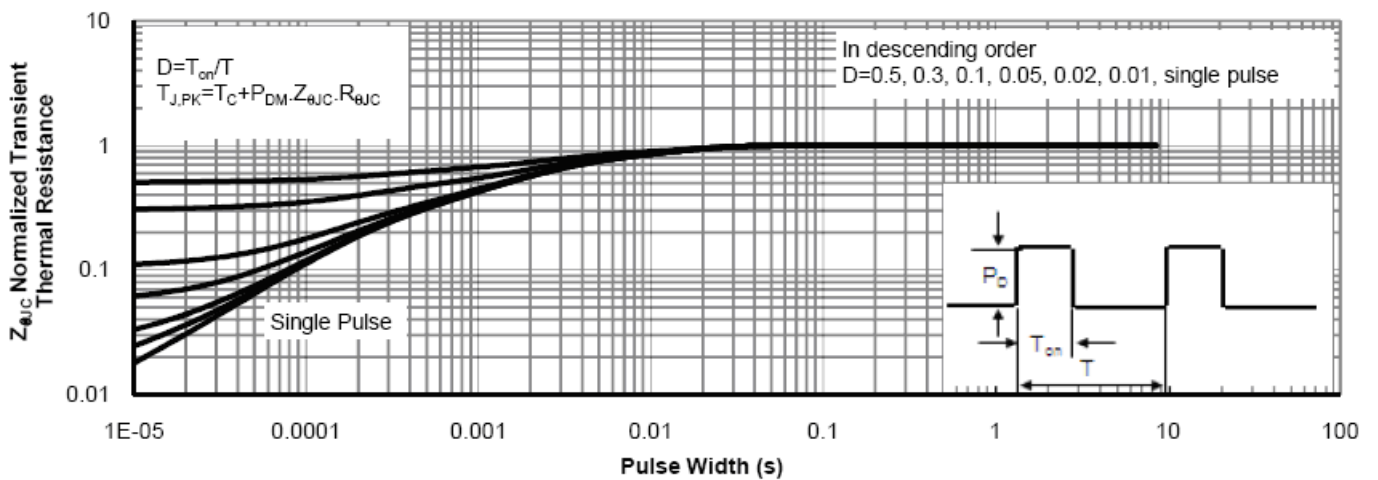
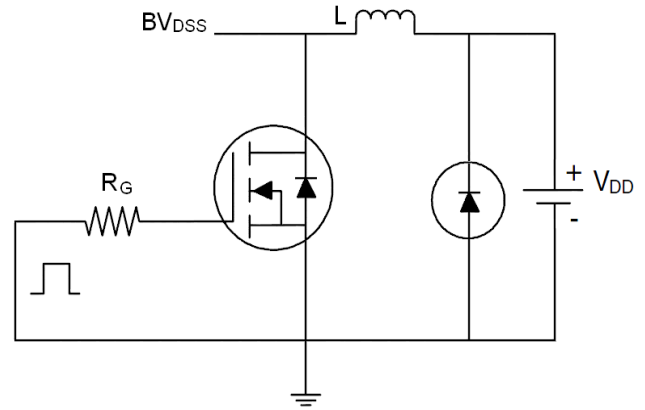
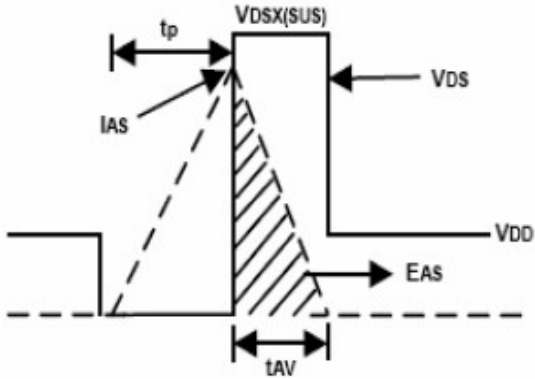


Figure 11. Normalized Maximum Transient Thermal Impedance

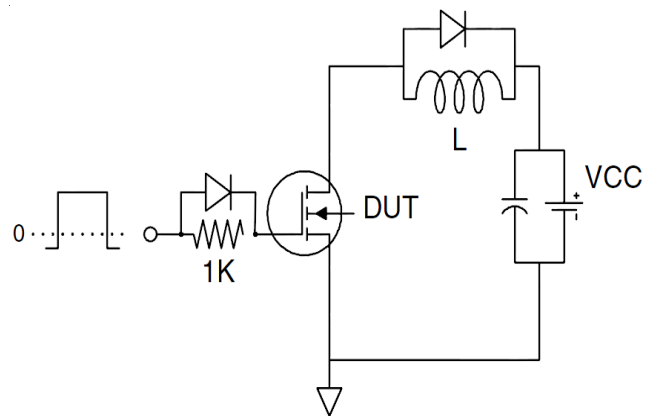
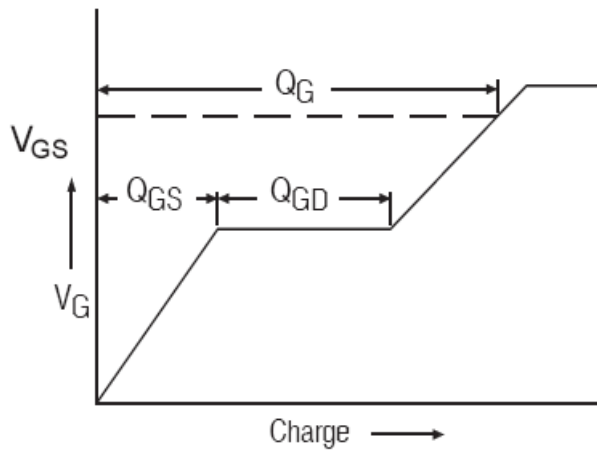


Test Circuit

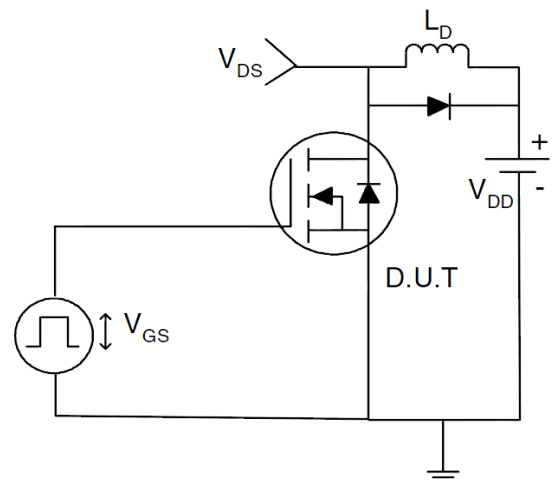
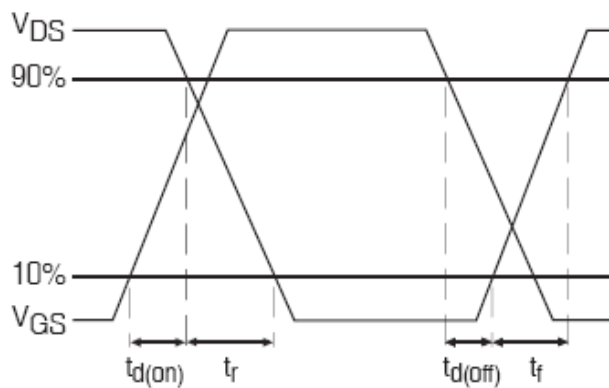
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:

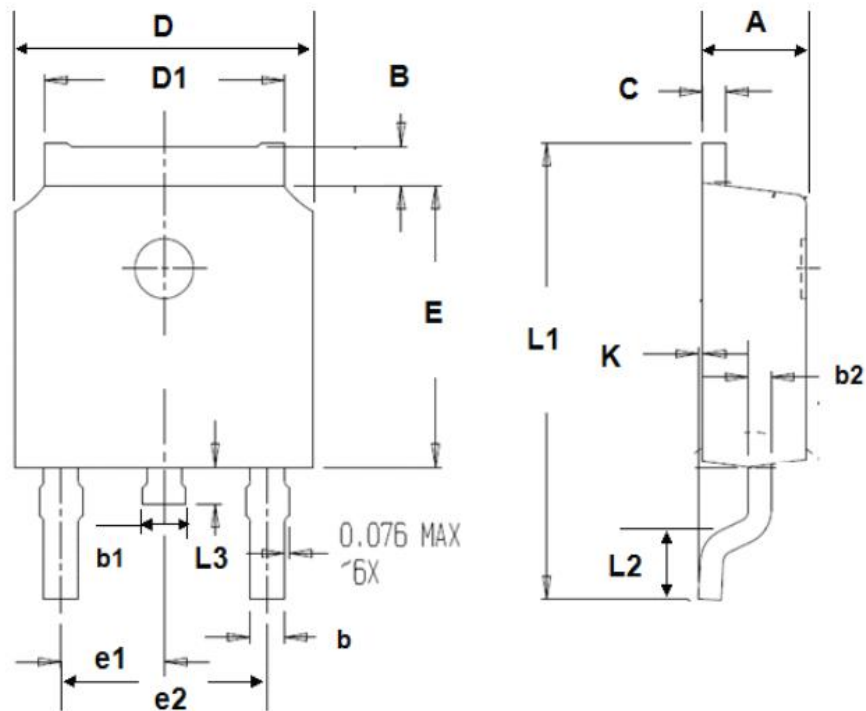


3) Switch Time Test Circuit:



• Dimensions

| SYMBOL | min | max | SYMBOL | min | max |
|--------|------|-------|--------|------|------|
| A | 2.10 | 2.50 | B | 0.85 | 1.25 |
| b | 0.50 | 0.80 | b1 | 0.50 | 0.90 |
| b2 | 0.45 | 0.70 | C | 0.45 | 0.70 |
| D | 6.30 | 6.75 | D1 | 5.10 | 5.50 |
| E | 5.30 | 6.30 | e1 | 2.25 | 2.35 |
| L1 | 9.20 | 10.60 | e2 | 4.45 | 4.75 |
| L2 | 0.90 | 1.75 | L3 | 0.60 | 1.10 |
| K | 0.00 | 0.23 | | | |




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