

Application

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

- Improved dv/dt Capability
- 100% Avalanche Tested

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|-----|
| 250V | 65mΩ | 48A |


Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|----------------|-----------|----------------|-----------|------------|----------|
| AGM65N25C | AGM65N25C | TO-220C | ---- | ---- | 1000 |
| AGM65N25F | AGM65N25F | TO-220F | ----- | ---- | 1000 |

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

| Parameter | Symbol | Value | | Unit |
|--|----------------|----------|--------|------------------|
| | | TO-220F | TO-220 | |
| Drain-Source Voltage ($V_{GS} = 0V$) | V_{DSS} | 250 | | V |
| Continuous Drain Current | I_D | 48 | | A |
| Pulsed Drain Current (note1) | I_{DM} | 180 | | A |
| Gate-Source Voltage | V_{GSS} | ± 20 | | V |
| Single Pulse Avalanche Energy (note2) | E_{AS} | 652 | | mJ |
| Avalanche Current (note1) | I_{AS} | 36 | | A |
| Repetitive Avalanche Energy (note1) | E_{AR} | 395.8 | | mJ |
| Power Dissipation ($T_C = 25^\circ\text{C}$) | P_D | 141 | | W |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55~+150 | | $^\circ\text{C}$ |

Thermal Resistance

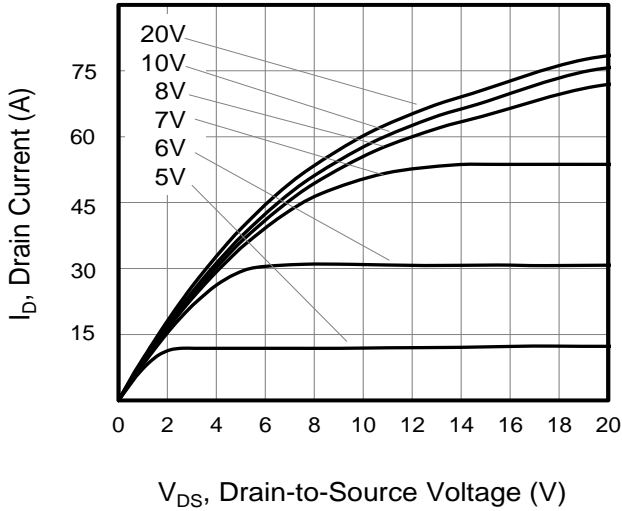
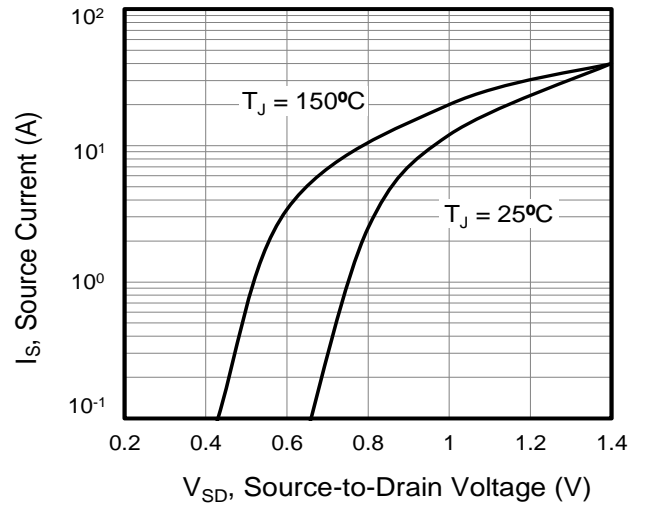
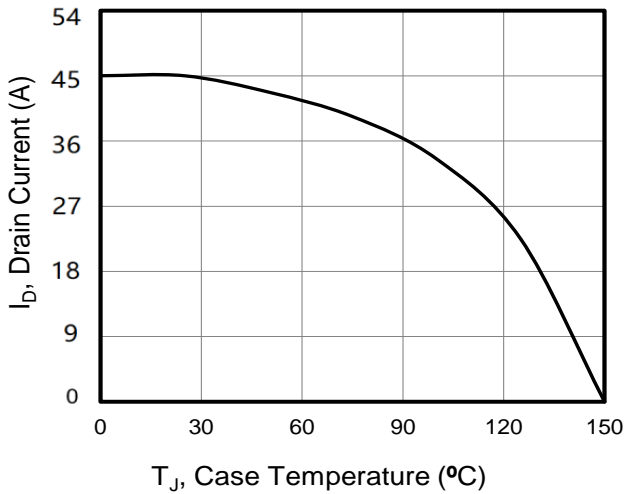
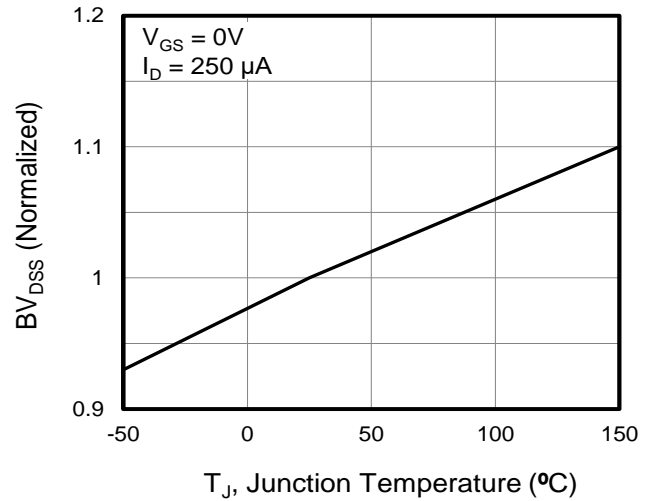
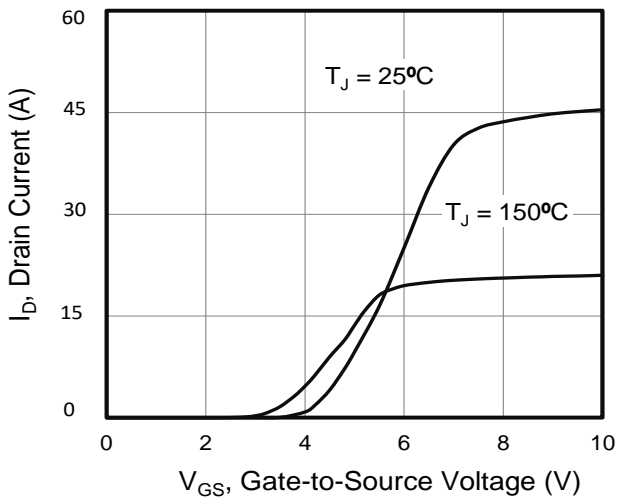
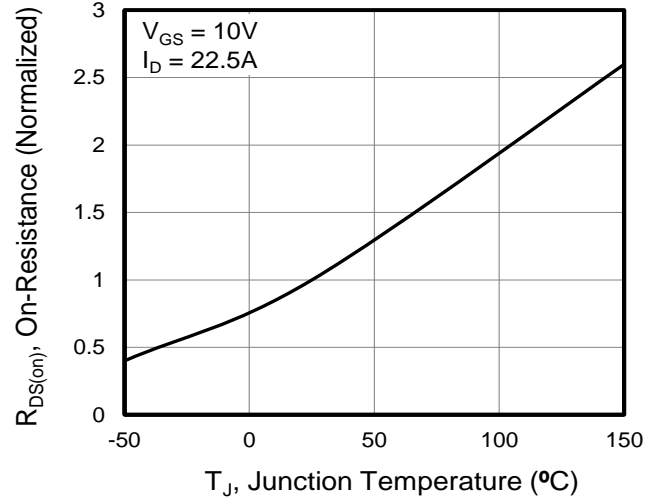
| Parameter | Symbol | Value | | Unit |
|---|------------|-------|--------|--------------------|
| | | TO-3P | TO-220 | |
| Thermal Resistance, Junction-to-Case | R_{thJC} | 0.89 | | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | 60 | | |

| Specifications $T_J = 25^{\circ}\text{C}$, unless otherwise noted | | | | | | |
|---|---------------|--|-------|------|-----------|---------------|
| Parameter | Symbol | Test Conditions | Value | | | Unit |
| | | | Min. | Typ. | Max. | |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ | 250 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 270\text{V}, V_{GS} = 0\text{V}, T_J = 25^{\circ}\text{C}$ | -- | -- | 1 | μA |
| Gate-Source Leakage | I_{GSS} | $V_{GS} = \pm 20\text{V}$ | -- | -- | ± 100 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ | 2 | -- | 4 | V |
| Drain-Source On-Resistance (Note3) | $R_{DS(on)}$ | $V_{GS} = 10\text{V}, I_D = 22.5\text{A}$ | -- | 65 | 80 | m Ω |
| Dynamic | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0\text{V},$ $V_{DS} = 25\text{V},$ $f = 1.0\text{MHz}$ | -- | 3519 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 515 | -- | |
| Reverse Transfer Capacitance | C_{rss} | | -- | 310 | -- | |
| Total Gate Charge | Q_g | $V_{DD} = 200\text{V}, I_D = 45\text{A},$ $V_{GS} = 10\text{V}$ | -- | 242 | -- | nC |
| Gate-Source Charge | Q_{gs} | | -- | 15 | -- | |
| Gate-Drain Charge | Q_{gd} | | -- | 143 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = 125\text{V}, I_D = 45\text{A},$ $R_G = 25\Omega$ | -- | 57 | -- | ns |
| Turn-on Rise Time | t_r | | -- | 145 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 962 | -- | |
| Turn-off Fall Time | t_f | | -- | 234 | -- | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_C = 25^{\circ}\text{C}$ | -- | -- | 48 | A |
| Pulsed Diode Forward Current | I_{SM} | | -- | -- | 182 | |
| Body Diode Voltage | V_{SD} | $T_J = 25^{\circ}\text{C}, I_{SD} = 22.5\text{A}, V_{GS} = 0\text{V}$ | -- | -- | 1.3 | V |
| Reverse Recovery Time | t_{rr} | $V_{GS} = 0\text{V}, I_S = 10\text{A},$ $di_F/dt = 100\text{A}/\mu\text{s}$ | -- | 262 | -- | ns |
| Reverse Recovery Charge | Q_{rr} | | -- | 3 | -- | μC |

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 1.0\text{mH}, V_{DD} = 50\text{V}, R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

Figure 2. Body Diode Forward Voltage

Figure 3. Drain Current vs. Temperature

Figure 4. BV_{DSS} Variation vs. Temperature

Figure 5. Transfer Characteristics

Figure 6. On-Resistance vs. Temperature


Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Capacitance

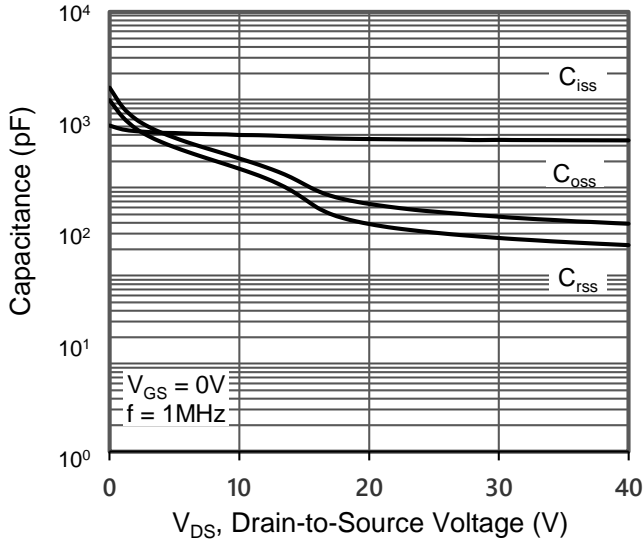


Figure 8. Gate Charge

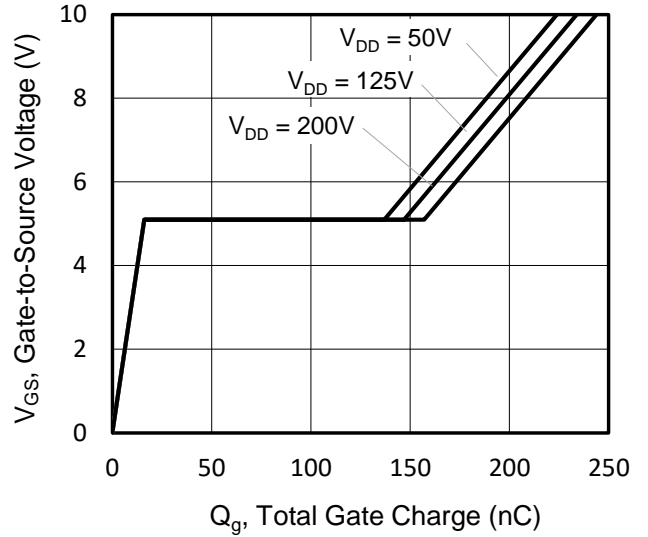


Figure 10. Transient Thermal Impedance
TO-3P, TO-220

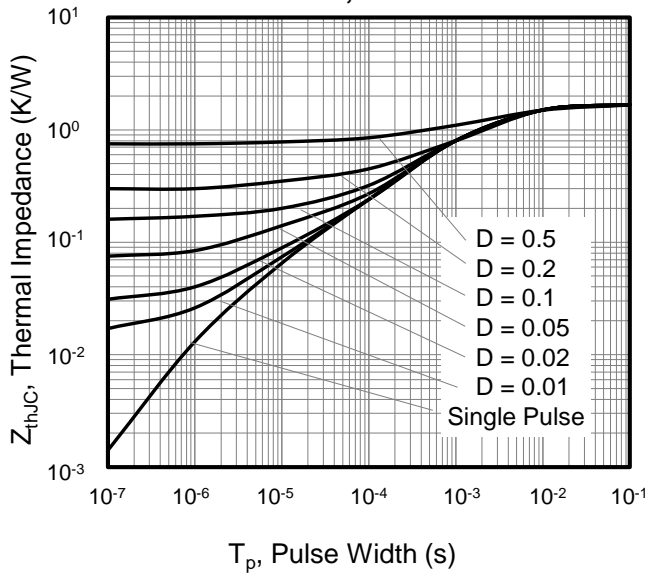


Figure A: Gate Charge Test Circuit and Waveform

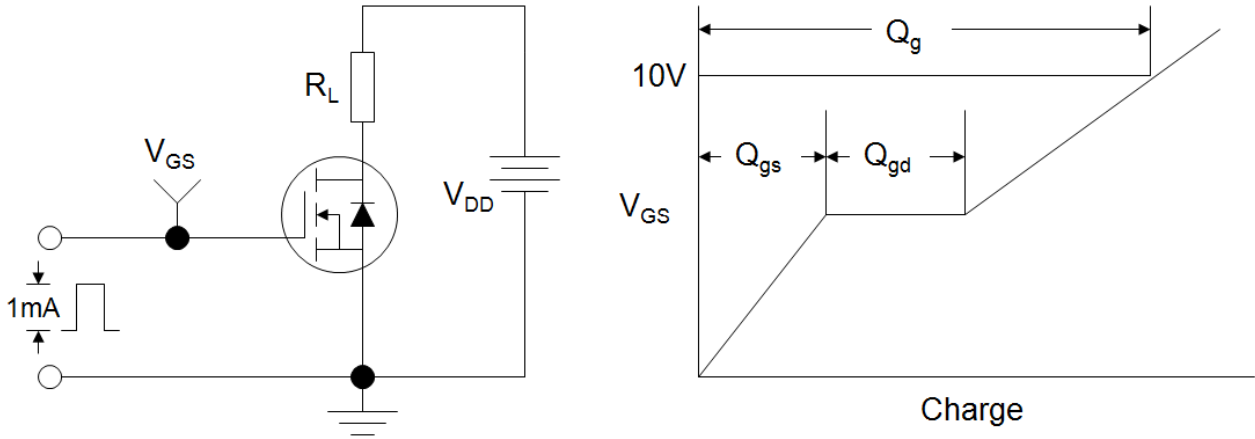


Figure B: Resistive Switching Test Circuit and Waveform

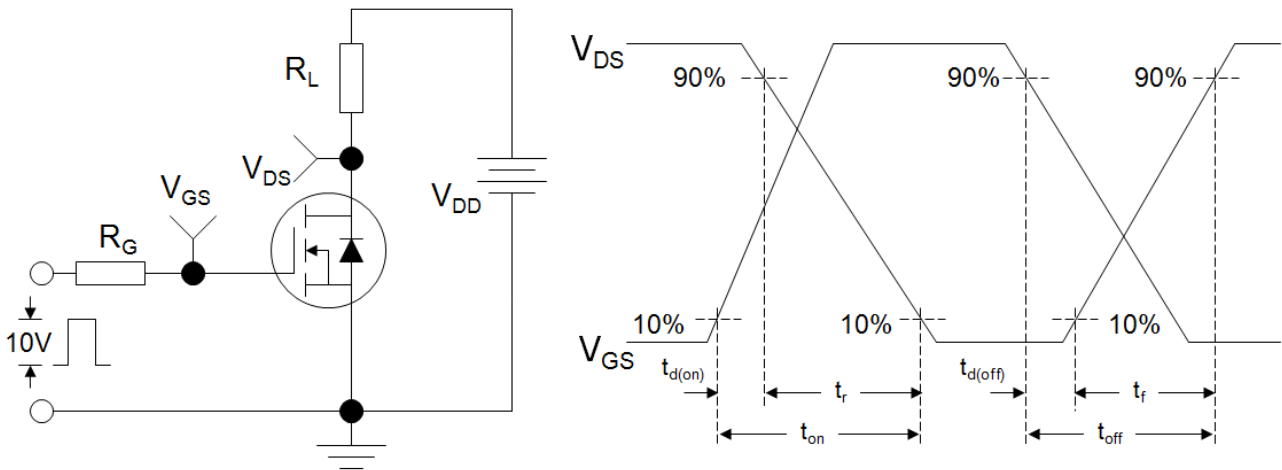
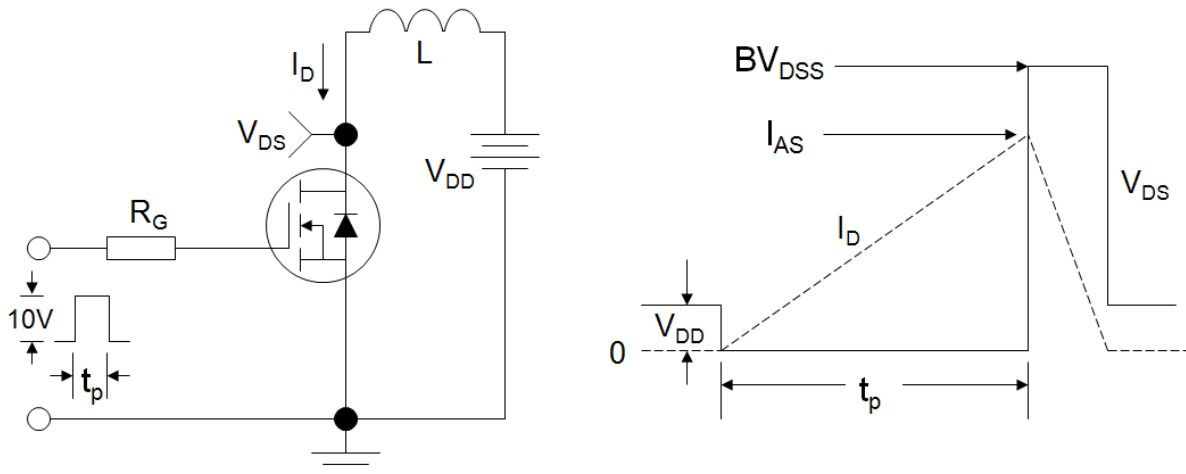
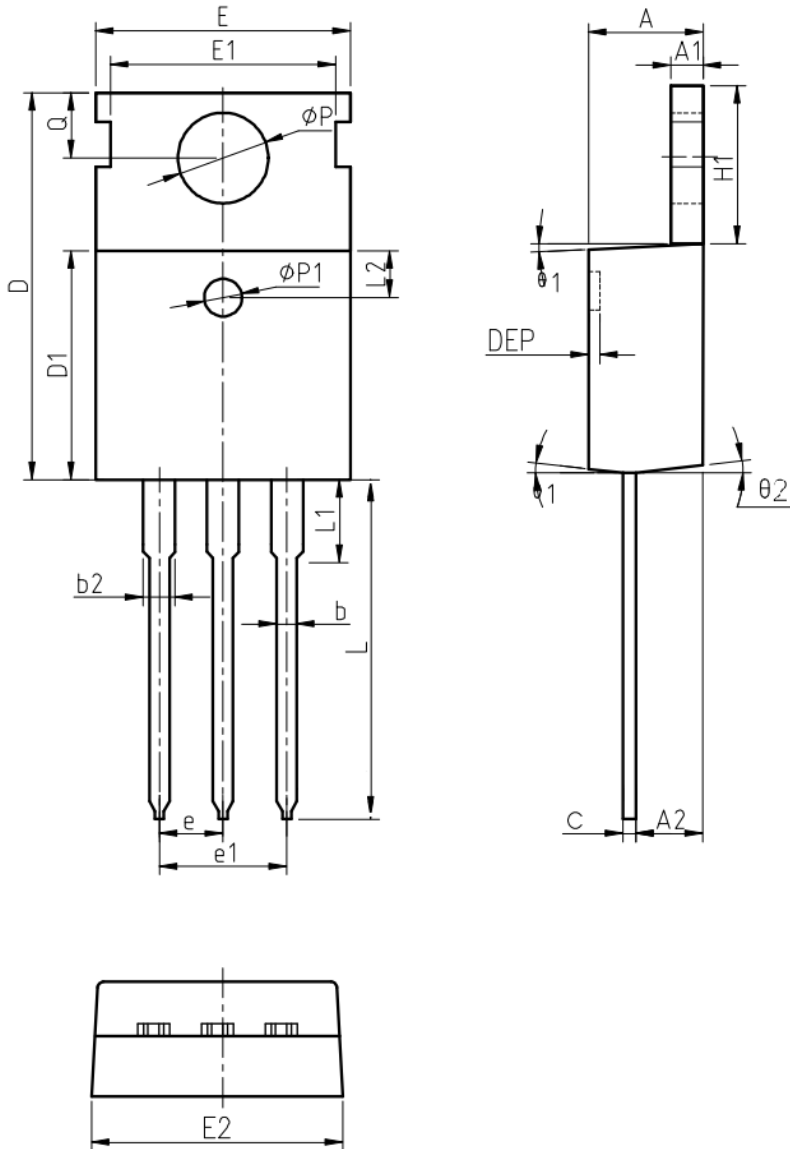


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



TO-220AB Package Outline Data


| Symbol | Dimensions (unit: mm) | | |
|------------|-----------------------|-------|-------|
| | Min | Typ | Max |
| A | 4.30 | 4.52 | 4.70 |
| A1 | 1.15 | 1.30 | 1.40 |
| A2 | 2.20 | 2.40 | 2.60 |
| b | 0.70 | 0.80 | 1.00 |
| b2 | 1.17 | 1.32 | 1.50 |
| c | 0.45 | 0.50 | 0.61 |
| D | 15.30 | 15.65 | 15.90 |
| D1 | 9.00 | 9.20 | 9.40 |
| DEP | 0.05 | 0.10 | 0.25 |
| E | 9.66 | 9.90 | 10.28 |
| E1 | - | 8.70 | - |
| E2 | 9.80 | 10.00 | 10.20 |
| $\phi P1$ | 1.40 | 1.50 | 1.60 |
| e | 2.54 BSC | | |
| e1 | 5.08 BSC | | |
| H1 | 6.40 | 6.50 | 6.80 |
| L | 12.70 | - | 14.27 |
| L1 | - | - | 3.95 |
| L2 | 2.40 | 2.50 | 2.60 |
| ϕP | 3.53 | 3.60 | 3.70 |
| Q | 2.70 | 2.80 | 2.90 |
| $\theta 1$ | 5 ° | 7 ° | 9 ° |
| $\theta 2$ | 1 ° | 3 ° | 5 ° |

Notes:

1. Refer to JEDEC TO-220 variation AB
2. Dimension "D" and "E" do NOT include mold flash. Mold flash shall not exceed 0.127mm per side.


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