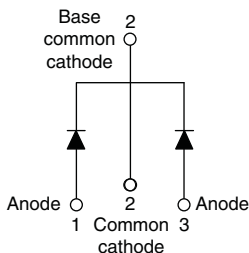
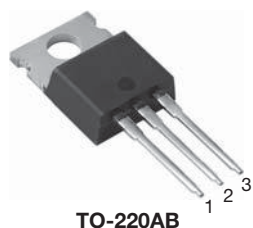


Schottky Rectifier, 2 x 15 A



FEATURES

- 175 °C T_J operation
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- AEC-Q101 qualified
- Meets JESD 201 class 2 whisker test
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



PRODUCT SUMMARY

| | |
|-----------------|------------------|
| Package | TO-220AB |
| $I_{F(AV)}$ | 2 x 15 A |
| V_R | 80 V, 100 V |
| V_F at I_F | 0.67 V |
| I_{RM} max. | 7.0 mA at 125 °C |
| T_J max. | 175 °C |
| Diode variation | Common cathode |
| E_{AS} | 7.50 mJ |

DESCRIPTION

The center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform | 30 | A |
| V_{RRM} | | 80/100 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 850 | A |
| V_F | 15 A _{pk} , $T_J = 125$ °C (per leg) | 0.67 | V |
| T_J | Range | - 55 to 175 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | VS-30CTQ080HN3 | VS-30CTQ100HN3 | UNITS |
|--------------------------------------|-----------|----------------|----------------|-------|
| Maximum DC reverse voltage | V_R | 80 | 100 | V |
| Maximum working peak reverse voltage | V_{RWM} | | | |

ABSOLUTE MAXIMUM RATINGS

| ABSOLUTE MAXIMUM RATINGS | | | | | | |
|--|-------------|---|---|--------|-------|--|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS | |
| Maximum average forward current <div>per device</div> <div>See fig. 5</div> <div>per leg</div> | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 129\text{ }^{\circ}\text{C}$, rectangular waveform | | 30 | A | |
| | | | | 15 | | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | Following any rated load condition and with rated V_{RRM} applied | 850 | A | |
| | | 10 ms sine or 6 ms rect. pulse | | 275 | | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 0.50\text{ A}$, $L = 60\text{ mH}$ | | 7.50 | mJ | |
| Repetitive avalanche current per leg | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | | 0.50 | A | |

**ELECTRICAL SPECIFICATIONS**

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS | |
|---|----------------|---|-------------------------------------|--------|------------|--|
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | 15 A | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.86 | V | |
| | | 30 A | | 1.05 | | |
| | | 15 A | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.67 | | |
| | | 30 A | | 0.82 | | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | $V_R = \text{Rated } V_R$ | 0.55 | mA | |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | | 7.0 | | |
| Maximum junction capacitance per leg | C_T | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ | | 500 | pF | |
| Typical series inductance per leg | L_S | Measured lead to lead 5 mm from package body | | 8.0 | nH | |
| Maximum voltage rate of change | dV/dt | Rated V_R | | 10 000 | V/ μ s | |

Note(1) Pulse width < 300 μ s, duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|--|----------------|--------------------------------------|-------------|----------------------|
| Maximum junction and storage temperature range | T_J, T_{Stg} | | - 55 to 175 | $^{\circ}\text{C}$ |
| Maximum thermal resistance, junction to case per leg | R_{thJC} | DC operation | 3.25 | $^{\circ}\text{C/W}$ |
| Maximum thermal resistance, junction to case per package | | | 1.63 | |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | 0.50 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Mounting torque | minimum | | 6 (5) | kgf · cm |
| | maximum | | 12 (10) | (lbf · in) |
| Marking device | | Case style TO-220AB | 30CTQ080H | |
| | | | 30CTQ100H | |

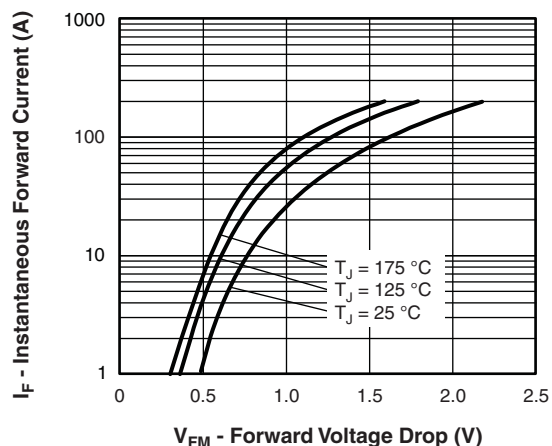


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

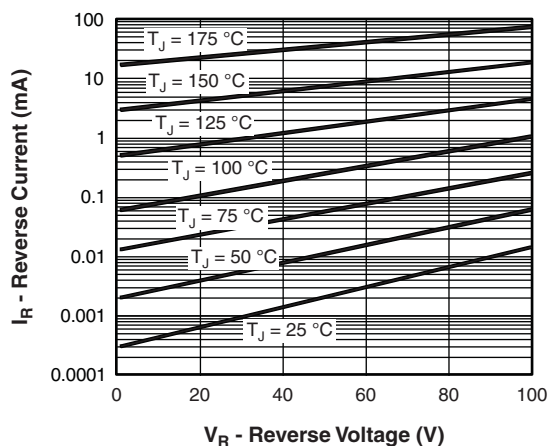


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

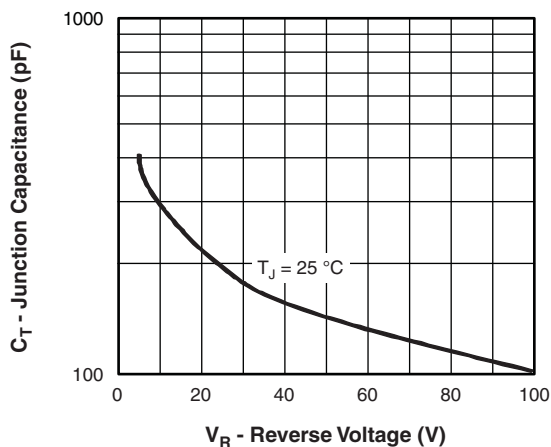


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

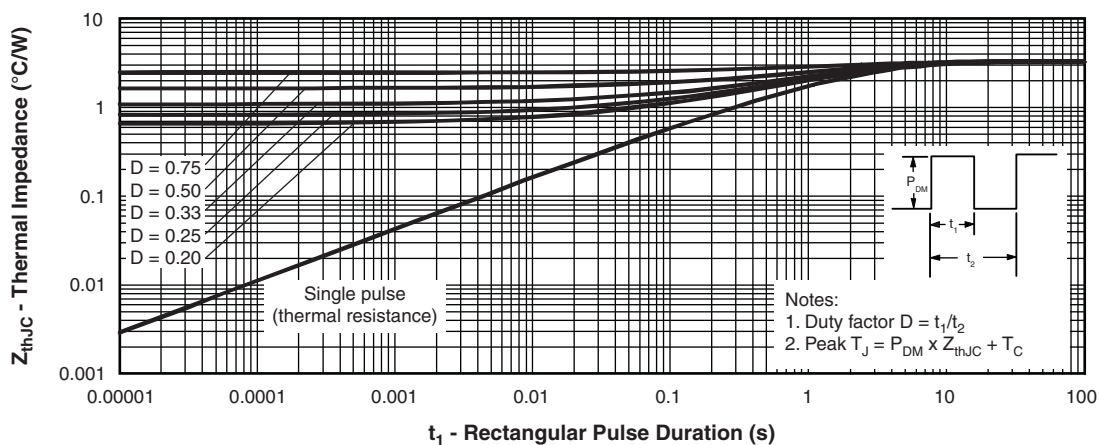


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

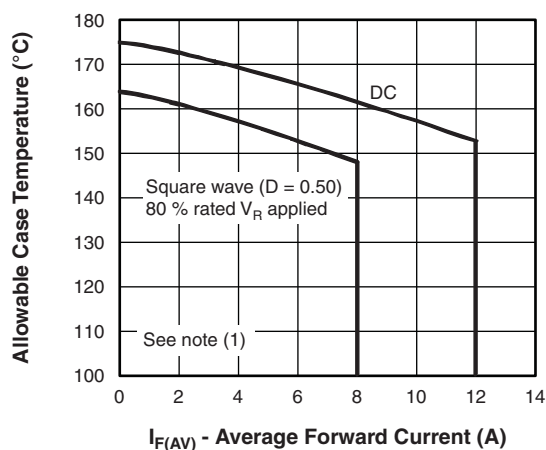


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

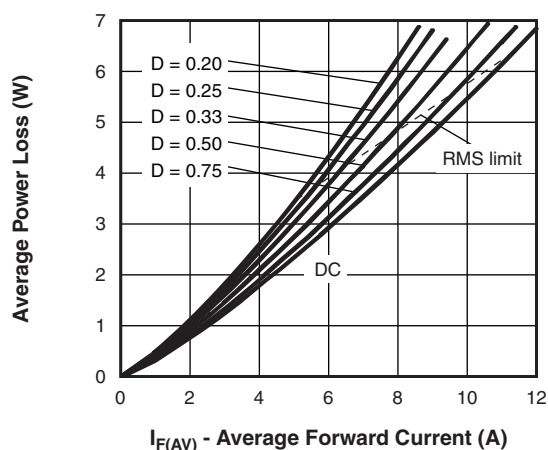


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

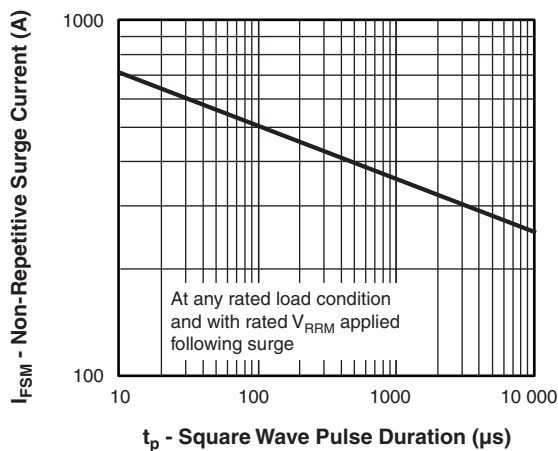


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 10$ V



ORDERING INFORMATION TABLE

| | | | | | | | | |
|-------------|-----|----|---|---|---|-----|---|----|
| Device code | VS- | 30 | C | T | Q | 100 | H | N3 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

- 1** - Vishay Semiconductors product
- 2** - Current rating (30 = 30 A)
- 3** - Circuit configuration:
C = Common cathode
- 4** - Package:
T = TO-220
- 5** - Schottky "Q" series
- 6** - Voltage ratings

080 = 80 V
100 = 100 V
- 7** - H = AEC-Q101 qualified
- 8** - Environmental digit
 - N3 = Halogen-free, RoHS-compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)

| PREFERRED P/N | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
|----------------|------------------|------------------------|-------------------------|
| VS-30CTQ080HN3 | 50 | 1000 | Antistatic plastic tube |
| VS-30CTQ100HN3 | 50 | 1000 | Antistatic plastic tube |

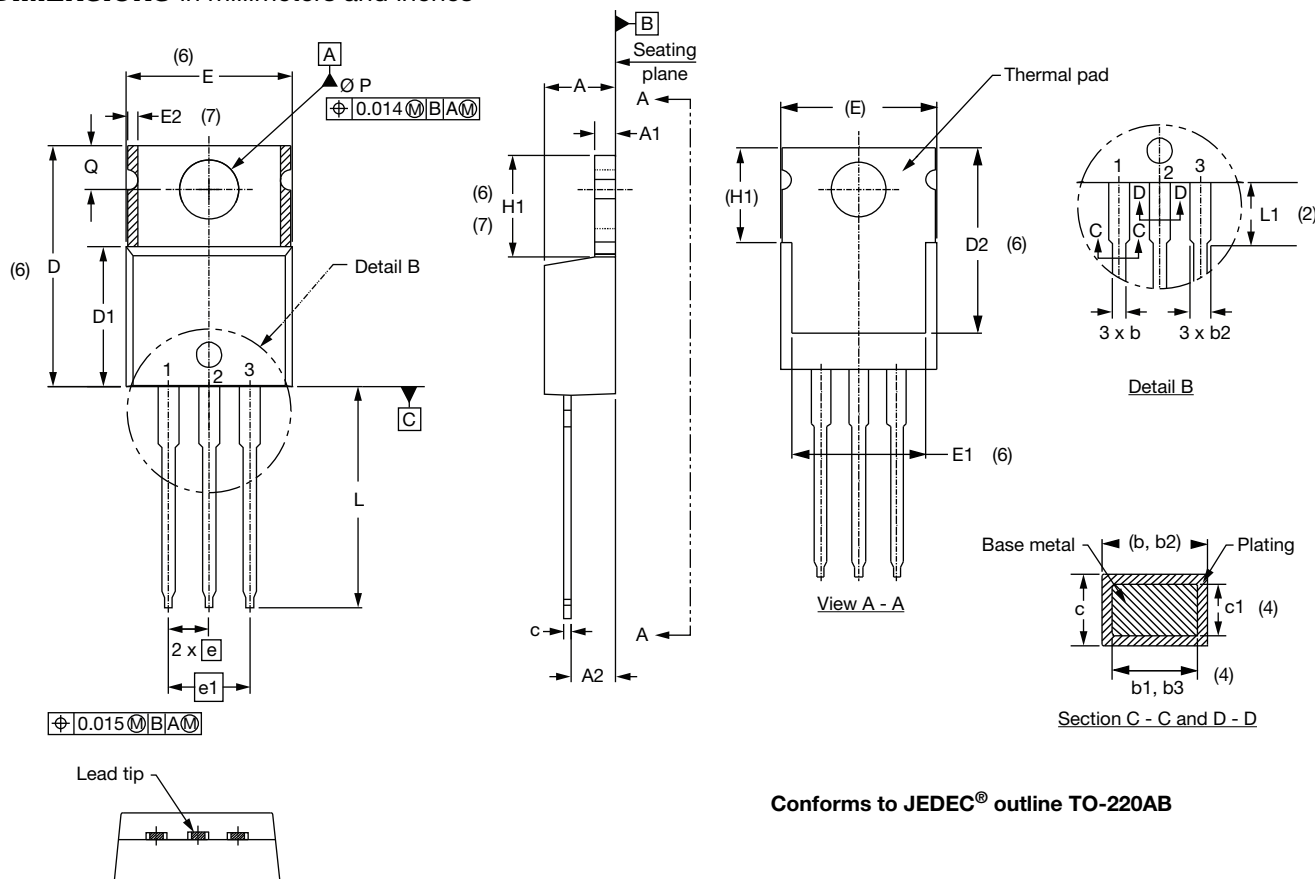
LINKS TO RELATED DOCUMENTS

| | |
|--------------------------|---|
| Dimensions | www.vishay.com/doc?95222 |
| Part marking information | TO-220AB -N3 www.vishay.com/doc?95028 |



TO-220AB

DIMENSIONS in millimeters and inches



Conforms to JEDEC® outline TO-220AB

| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.25 | 4.65 | 0.167 | 0.183 | |
| A1 | 1.14 | 1.40 | 0.045 | 0.055 | |
| A2 | 2.56 | 2.92 | 0.101 | 0.115 | |
| b | 0.69 | 1.01 | 0.027 | 0.040 | |
| b1 | 0.38 | 0.97 | 0.015 | 0.038 | 4 |
| b2 | 1.20 | 1.73 | 0.047 | 0.068 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.36 | 0.61 | 0.014 | 0.024 | |
| c1 | 0.36 | 0.56 | 0.014 | 0.022 | 4 |
| D | 14.85 | 15.25 | 0.585 | 0.600 | 3 |
| D1 | 8.38 | 9.02 | 0.330 | 0.355 | |
| D2 | 11.68 | 12.88 | 0.460 | 0.507 | 6 |
| E | 10.11 | 10.51 | 0.398 | 0.414 | 3, 6 |
| E1 | 6.86 | 8.89 | 0.270 | 0.350 | 6 |
| E2 | - | 0.76 | - | 0.030 | 7 |
| e | 2.41 | 2.67 | 0.095 | 0.105 | |
| e1 | 4.88 | 5.28 | 0.192 | 0.208 | |
| H1 | 5.84 | 6.86 | 0.230 | 0.270 | 6, 7 |
| L | 13.52 | 14.02 | 0.532 | 0.552 | |
| L1 | 3.32 | 3.82 | 0.131 | 0.150 | 2 |
| Ø P | 3.54 | 3.73 | 0.139 | 0.147 | |
| Q | 2.60 | 3.00 | 0.102 | 0.118 | |

Notes

- Dimensioning and tolerancing as per ASME Y14.5M-1994
- Lead dimension and finish uncontrolled in L1
- Dimension D, D1 and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- Dimension b1, b3 and c1 apply to base metal only
- Controlling dimensions: inches
- Thermal pad contour optional within dimensions E, H1, D2 and E1
- Dimensions E2 x H1 define a zone where stamping and singulation irregularities are allowed
- Outline conforms to JEDEC® TO-220, except A2 (maximum) and D2 (minimum) where dimensions are derived from the actual package outline



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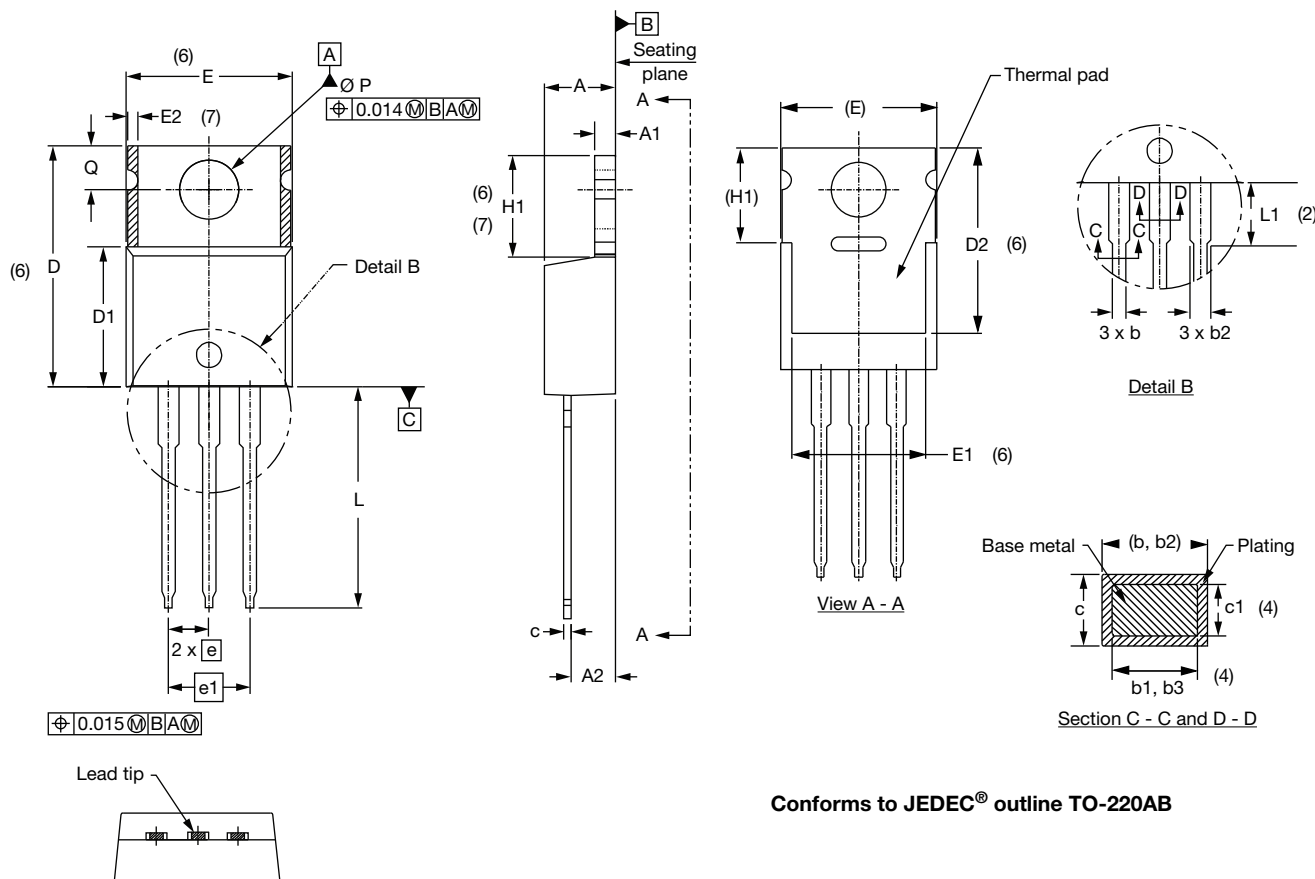
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TO-220AB

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