

SuperMOS –SOP8 30V BV<sub>DSS</sub>, 9mΩ R<sub>DS(ON)</sub>, N-channel MOSFET

1. Description

The AO4468-ES is N-Channel enhancement MOS Field Effect Transistor. Using advanced trench technology and design to provide excellent R<sub>DS(ON)</sub> with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product AO4468-ES is Pb-free.

2. Features

- 30V, R<sub>DS(ON)</sub>=9mΩ(Typ.) @V<sub>GS</sub>=10V  
R<sub>DS(ON)</sub>=13mΩ(Typ.) @V<sub>GS</sub>=4.5V
  - High density cell design for low R<sub>DS(on)</sub>
  - Material: Halogen free
- Reliable and rugged
  - Avalanche Rated
  - Low leakage current

3. Applications

- PWM applications
  - Load switch
  - Power management in portable/desktop PCs
  - DC/DC conversion
- 100% UIS TESTED

4. Ordering Information

| Part Number | Package | Marking   | Material     | Packing     | Quantity per Tube | Flammability Rating | Reel size |
|-------------|---------|-----------|--------------|-------------|-------------------|---------------------|-----------|
| AO4468-ES   | SOP8    | 4430B/LOT | Halogen free | Tape & Reel | 3,000 PCS         | UL 94V-0            | 13 inches |

5. Pin Configuration and Functions

| Pin     | Function | Outline                       | Circuit Diagram |
|---------|----------|-------------------------------|-----------------|
| 4       | Gate     | <div>Note b</div> <div></div> | <div></div>     |
| 1/2/3   | Source   |                               |                 |
| 5/6/7/8 | Drain    |                               |                 |

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

| Parameter                                   |                           | Symbol     | Limit      | Unit               |
|---------------------------------------------|---------------------------|------------|------------|--------------------|
| Drain-Source Voltage                        |                           | $BV_{DSS}$ | 30         | V                  |
| Gate-Source Voltage                         |                           | $V_{GS}$   | $\pm 20$   | V                  |
| Continuous Drain Current                    | $T_A=25^{\circ}\text{C}$  | $I_D$      | 12         | A                  |
|                                             | $T_A=100^{\circ}\text{C}$ |            | 8          |                    |
| Maximum Power Dissipation                   |                           | $P_D$      | 3.1        | W                  |
| Pulsed Drain Current                        |                           | $I_{DM}$   | 48         | A                  |
| Single Pulsed Avalanche Energy <sup>a</sup> |                           | $E_{AS}$   | 36         | mJ                 |
| Operating Junction Temperature              |                           | $T_J$      | 150        | $^{\circ}\text{C}$ |
| Lead Temperature                            |                           | $T_L$      | 260        | $^{\circ}\text{C}$ |
| Storage Temperature Range                   |                           | $T_{stg}$  | -55 to 150 | $^{\circ}\text{C}$ |

### Thermal resistance ratings

| Single Operation                       |                 |         |         |                      |
|----------------------------------------|-----------------|---------|---------|----------------------|
| Parameter                              | Symbol          | Typical | Maximum | Unit                 |
| Junction-to-Ambient Thermal Resistance | $R_{\theta JA}$ |         | 40      | $^{\circ}\text{C/W}$ |

Notes:

- EAS condition: Starting  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=15\text{V}$ ,  $V_G=10\text{V}$ ,  $R_G=25\Omega$ ,  $L=0.5\text{mH}$ ,  $I_{AS}=12\text{A}$
- This diagram is only an electrical schematic, and the actual pin size is based on POD.

## Electrical Characteristics

At TA = 25°C unless otherwise specified

| Parameter                                 | Symbol              | Test Conditions                                                                        | Min. | Typ. | Max. | Unit |
|-------------------------------------------|---------------------|----------------------------------------------------------------------------------------|------|------|------|------|
| OFF CHARACTERISTICS                       |                     |                                                                                        |      |      |      |      |
| Drain-to-Source Breakdown Voltage         | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                             | 30   |      |      | V    |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                                              |      |      | 1    | uA   |
| Gate-to-source Leakage Current            | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                             |      |      | ±100 | nA   |
| ON CHARACTERISTICS                        |                     |                                                                                        |      |      |      |      |
| Gate Threshold Voltage                    | V <sub>GS(TH)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                               | 1.0  | 1.5  | 2.2  | V    |
| Drain-to-source On-resistance             | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =10A                                              |      | 9    | 11   | mΩ   |
|                                           |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                              |      | 13   | 16   |      |
| CHARGES, CAPACITANCES AND GATE RESISTANCE |                     |                                                                                        |      |      |      |      |
| Input Capacitance                         | C <sub>ISS</sub>    | V <sub>GS</sub> =0V, f=1MHz,<br>V <sub>DS</sub> =15V                                   |      | 1060 |      | pF   |
| Output Capacitance                        | C <sub>OSS</sub>    |                                                                                        |      | 122  |      |      |
| Reverse Transfer Capacitance              | C <sub>RSS</sub>    |                                                                                        |      | 102  |      |      |
| Total Gate Charge                         | Q <sub>G(TOT)</sub> | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V,<br>I <sub>D</sub> =10A                     |      | 21   |      | nC   |
| Gate-to-Source Charge                     | Q <sub>GS</sub>     |                                                                                        |      | 3    |      |      |
| Gate-to-Drain Charge                      | Q <sub>GD</sub>     |                                                                                        |      | 5    |      |      |
| SWITCHING CHARACTERISTICS                 |                     |                                                                                        |      |      |      |      |
| Turn-On Delay Time                        | t <sub>d(ON)</sub>  | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V,<br>I <sub>D</sub> =10A, R <sub>G</sub> =3Ω |      | 4    |      | ns   |
| Rise Time                                 | t <sub>r</sub>      |                                                                                        |      | 2    |      |      |
| Turn-Off Delay Time                       | t <sub>d(OFF)</sub> |                                                                                        |      | 13   |      |      |
| Fall Time                                 | t <sub>f</sub>      |                                                                                        |      | 7    |      |      |
| BODY DIODE CHARACTERISTICS                |                     |                                                                                        |      |      |      |      |
| Forward Voltage                           | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =10A                                               |      |      | 1.5  | V    |

## 8. Typical Characteristics

Figure 1: Output Characteristics

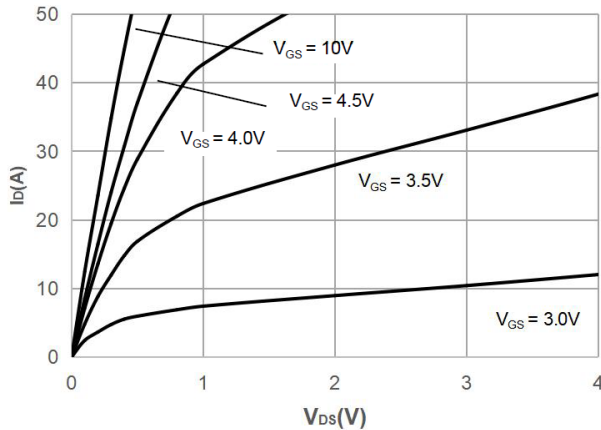


Figure 2: Typical Transfer Characteristics

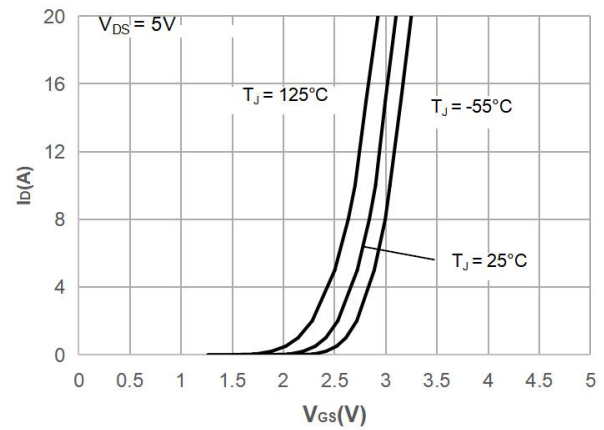


Figure 3: On-resistance vs. Drain Current

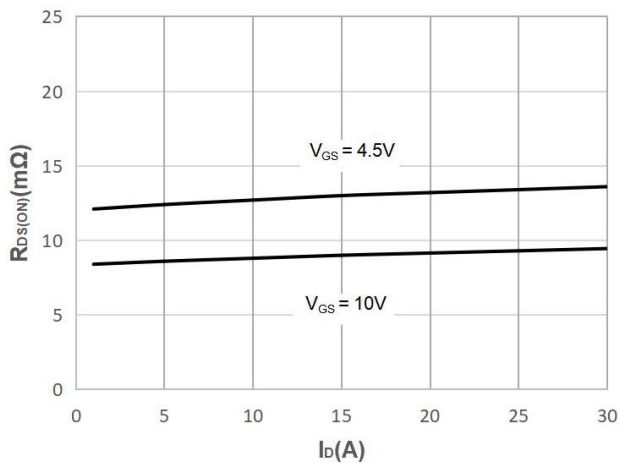


Figure 4: Body Diode Characteristics

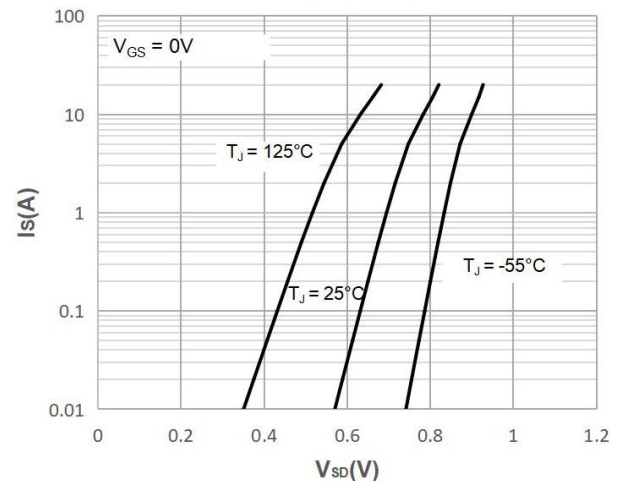


Figure 5: Capacitance Characteristics

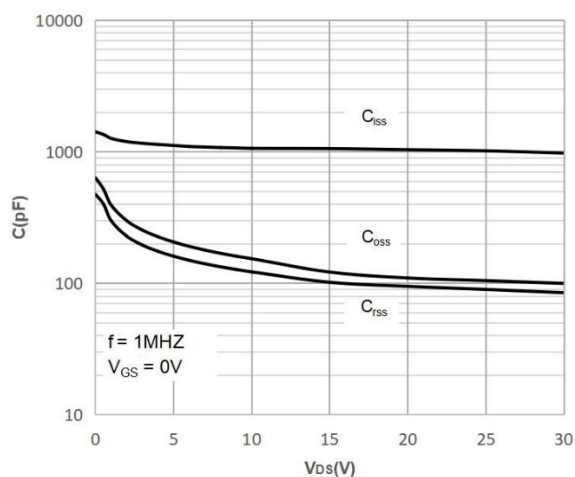
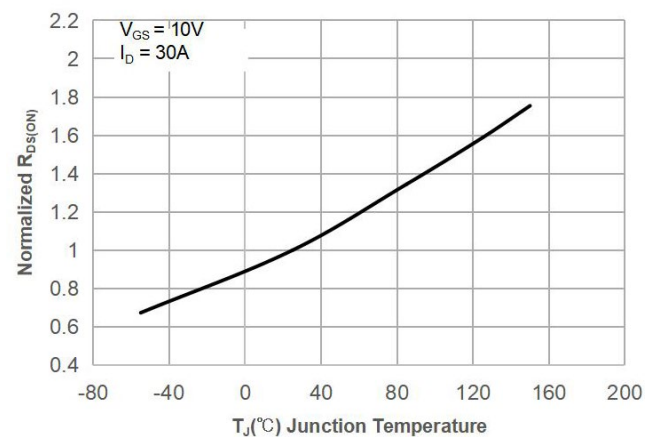
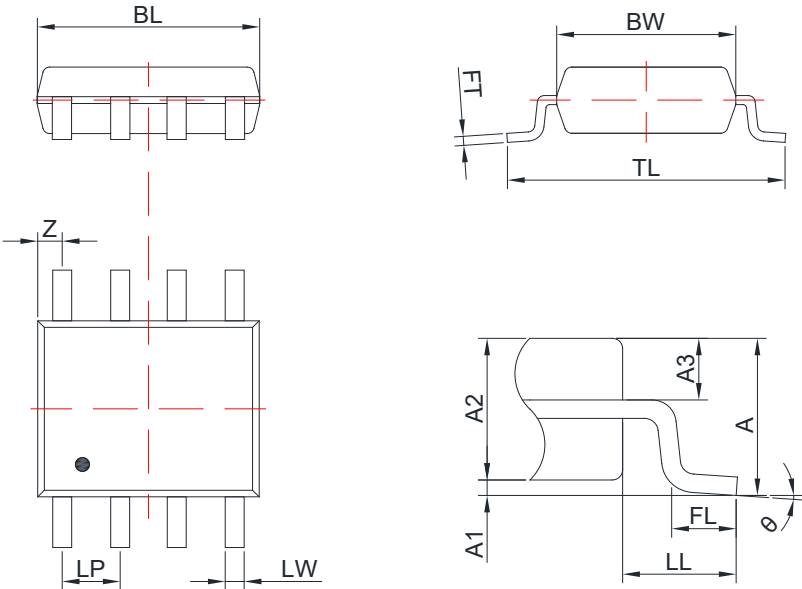


Figure 6: Normalized on Resistance vs. Junction Temperature



9. Dimension (SOP8)

POD A(Y)



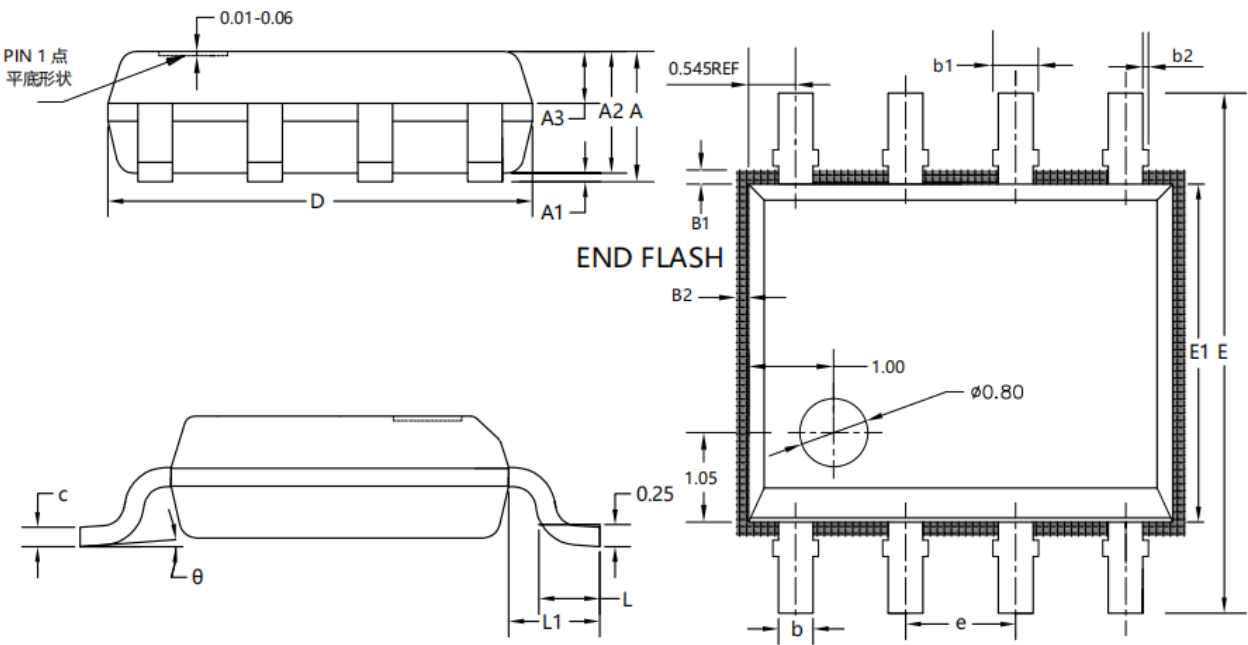
COMMON DIMENSIONS: UNITS OF MEASURE=MILLIMETER

| Symbol | Dimensions |      | Symbol   | Dimensions |      |
|--------|------------|------|----------|------------|------|
|        | Min.       | Max. |          | Min.       | Max. |
| A      | 1.75       |      | FL       | 0.50       | 0.80 |
| A1     | 0.05       | 0.15 | LP       | 1.25       | 1.30 |
| A2     | 1.40       | 1.50 | LL       | 1.1 BSC    |      |
| A3     | 0.623 BSC  |      | LW       | 0.38       | 0.43 |
| BL     | 4.92       | 5.08 | TL       | 5.90       | 6.10 |
| BW     | 3.70       | 4.10 | Z        | 0.54       |      |
| FT     | 0.20       | 0.21 | $\theta$ | 0°         | 8°   |

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POD B(C)



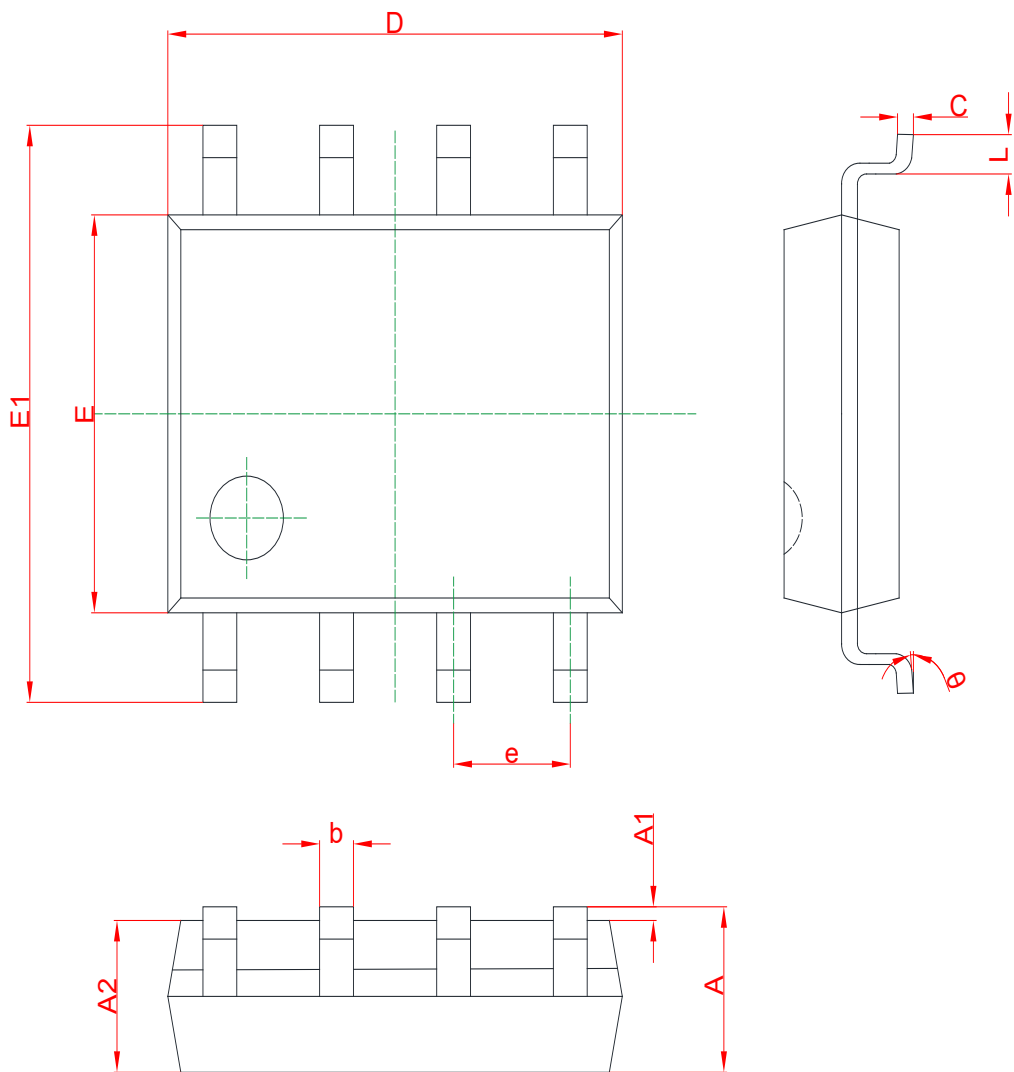
COMMON DIMENSIONS: UNITS OF MEASURE=MILLIMETER

| Symbol | Dimensions |      |      | Symbol   | Dimensions |      |      |
|--------|------------|------|------|----------|------------|------|------|
|        | Min.       | NOM. | Max. |          | Min.       | NOM. | Max. |
| A      | 1.55       | 1.65 | 1.75 | L        | 0.50       | 0.60 | 0.70 |
| A1     | 0.06       | 0.11 | 0.16 | L1       | 0.90       | 1.05 | 1.20 |
| A2     | 1.35       | 1.45 | 1.55 | $\theta$ | 0°         | 4°   | 8°   |
| A3     | 0.60       | 0.70 | 0.80 | B1       | 0.14MAX    |      |      |
| b      | 0.30       | 0.40 | 0.50 | B2       | 0.12MAX    |      |      |
| c      | 0.17       | 0.20 | 0.25 | b1       | 0.66MAX    |      |      |
| D      | 4.80       | 4.90 | 5.00 | b2       | 0          | 0.04 | 0.08 |
| E      | 5.80       | 6.00 | 6.20 | e        | 1.27BSC    |      |      |
| E1     | 3.80       | 3.90 | 4.00 |          |            |      |      |

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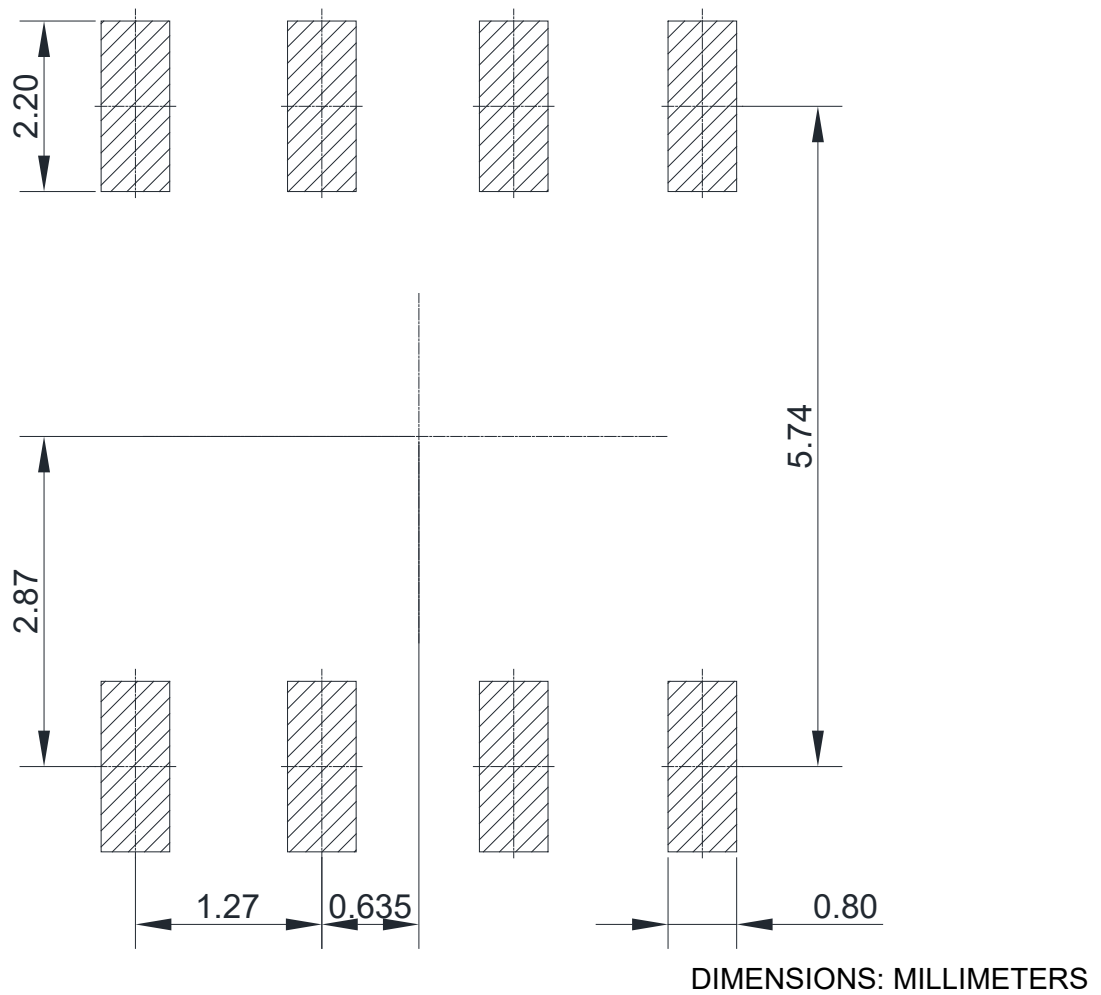
Rev-1.2

POD C(X)



| Symbol | Dimensions |      | Symbol | Dimensions |      |
|--------|------------|------|--------|------------|------|
|        | Min.       | Max. |        | Min.       | Max. |
| L      | 0.40       | 0.60 | e      | 1.27 TYP   |      |
| D      | 4.95       | 5.05 | c      | 0.15       | 0.25 |
| E      | 3.8        | 4.0  | A2     | 1.33       | 1.50 |
| E1     | 5.80       | 6.20 | A1     | 0.04       | 0.20 |
| b      | 0.4 TYP    |      | θ      | 0°         | 8°   |

## 10. Recommended Soldering Footprint



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