



VISHAY INTERTECHNOLOGY, INC.

CAPACITORS

## INDUSTRY-FOCUSED SOLUTIONS WITH ALUMINUM CAPACITORS

Special Leadforming Capabilities

CAPABILITIES





# Special Leadforming Capabilities

In today's electronics manufacturing, there is a clear trend towards supplying components ready for use in assembly lines. Below, we provide a number of examples of how Vishay addresses this trend with added-value lead frame modifications for its aluminum capacitor products.

## Keyed Polarity

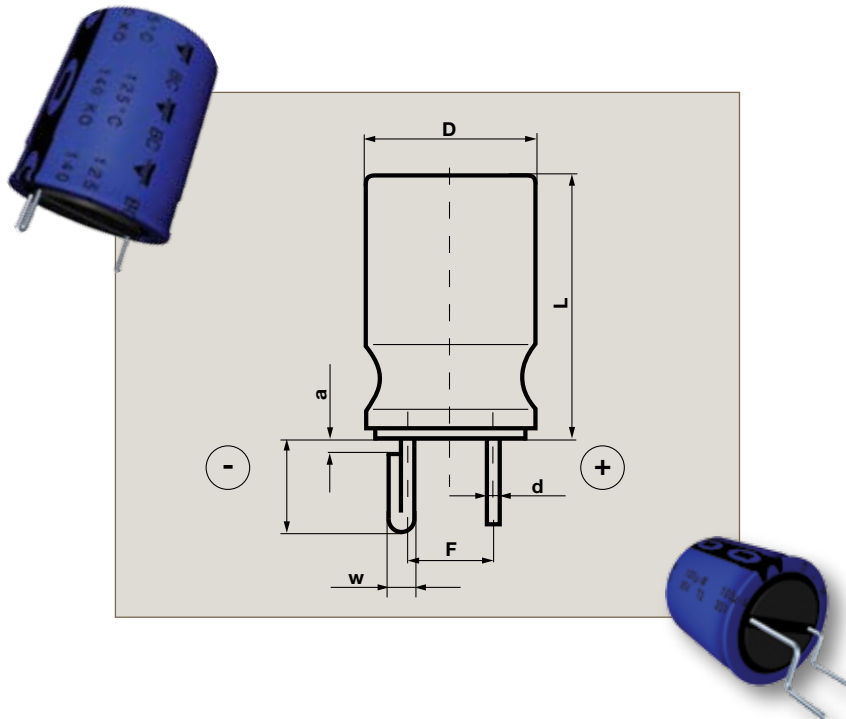
Because of their size, leaded aluminum capacitors frequently are placed manually on printed circuit boards. Since these "alu-caps" are polarized components, it is essential that they be designed in such a way as to prevent inverse polarity. A foolproof design solution has been developed: Provide different hole diameters for the plus and minus terminals in the circuit board, and fold the component wire for the larger hole by 180°, thereby doubling the diameter of that wire (the "J-lead"). This simple configuration prevents inverse polarity, since the folded wire will not fit into the smaller hole.

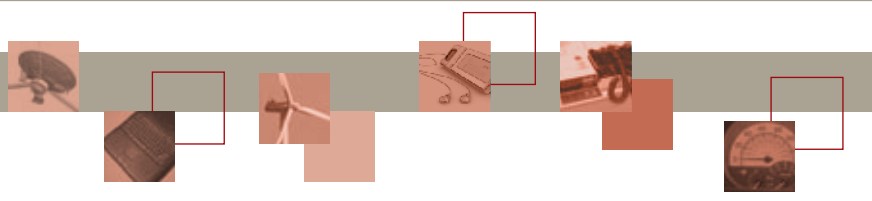
## Special Lead Forms

If an upright-placed radial component is too high on the board, it can be placed horizontally. This requires bent leads for proper placement ("L-form").

Often, aluminum capacitors, being rather bulky components, are no longer placed on printed circuit boards using traditional methods, but instead are fitted, clamped, or glued onto a lead frame, mounting array, housing, or the like, with the leads welded to the connecting material. These mounting configurations require pre-formed leads that are adapted to specific mechanical conditions. All these special lead forms are now available from Vishay Intertechnology. In our manufacturing process, the devices are fully tested both before and after an automatic lead bending/forming operation. To facilitate pick-and-place operations (manual or automatic placement), the products are supplied in trays and polarity-aligned upon request. In addition, this kind of packing is a useful protection against mechanical shock during transport and handling.




To help minimize their environment impact, Vishay invites its customers to ship back empty trays so they can be re-used.





## Benefit

Added-value mechanical configurations help customers to lower their costs by skipping production steps. No investment in lead-bending machines is needed.

| Problem  | Solution  | Products   |
|--|---|--|
| Keyed polarity needed                              | One lead bent backwards 180° or V-shaped                              |   |
| Horizontal placement of radial capacitors          | Leads bent by 90°   |   |
| Assembly of capacitors on lead frames (welding)    | Leads bent to customer's configuration (e.g., shaped like T, Z, or L) |  |
| Capacitors have to be adapted for special housings |   |  |

Depending on assembly processes, the packaging can be adapted to special needs. Examples include:

- Bulk packaging: most cost-effective for manual insertion
- In trays: polarity-aligned for easier positioning of the capacitors, or automated pick-and-place processes

Quality assurance in accordance with ISO/TS16949:2002



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