THA and THAS, *Thinpack*, Aluminum Electrolytic Capacitors

Highest Energy-Density Electrolytic in a Very Low-Profile Design

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Welcome to the THA and THAS Thinpack Capacitor Training Module from Cornell Dubilier.

Introduction

- Purpose of this training module is to introduce THA and THAS, Thinpack, Aluminum Electrolytic Capacitors Capacitors, from Cornell Dubilier
- Objectives
  - Explain the differences between the new Thinpack capacitors and other electrolytics
  - Outline the exclusive features and benefits of the THA and THAS Series capacitors
- Highlight specifications and other attributes
- Content: 13 pages
- Learning Time: 8 minutes

This presentation will introduce two new Thinpack aluminum electrolytic capacitors from Cornell Dubilier.

The differences between these unique components and other aluminum electrolytics will be explained. Exclusive features and benefits will be described, along with how these relate to specific applications.

Specifications and other attributes of the two product series will be detailed and compared.

CDE THA and THAS Thinpack High-Energy Density Aluminum Electrolytic Capacitors.

Offers the highest energy density available in low-profile aluminum electrolytic technology.

- Ideal for the lowest-profile circuits
- Designed for high capacitance bulk storage and filtering applications
- Can replace arrays of SMT, radial or axial aluminum electrolytic and solid tantalum capacitors
- Increases reliability– one device vs. many; fewer PCB connection points
- THA offers 5,000 hr. life @ 85 °C
- THAS offers 5,000 hr. life @ 105 °C

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THA and THAS Thinpack Capacitors offer the highest energy density available in low-profile aluminum electrolytic technology. That's important because it opens the door to using aluminum electrolytics in space critical applications, previously dominated by other technologies.

They are Ideal for the lowest-profile circuits, requiring high-capacitance bulk storage and filtering .

A single Thinpack capacitor can replace arrays of SMT, radial or axial aluminum electrolytic and solid tantalum capacitors.

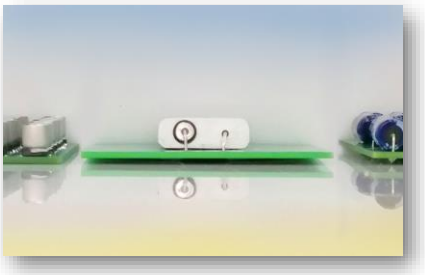
The use of a single component versus many, combined with fewer connection points, improves overall circuit reliability.

Thinpack capacitors are also rated for long life. The THA offers 5,000 hr. life @ 85 °C THAS offers 5,000 hr. life @ 105 °C

THA Thinpack Capacitors save space with high-energy density; very-low profile.

Just 8.2mm thin!

- Comparable in height to V-chip electrolytics, tantalums and board-mounted axials, but with much greater bulk storage capability for its size.
- Simplifies assembly
- Potential cost savings when compared to the cost of bulk storage arrays



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In most applications, there are significant cost, weight and space savings vs. a comparably rated bank of SMT or axial aluminum electrolytic capacitors.

At just 8.2mm thin, the THA is comparable in height to V-chip electrolytics, tantalums and board-mounted axials, but with much greater storage capability.

Having just one component to mount simplifies assembly, creating additional cost-saving opportunities, when compared to other bulk storage options.

THAS Thinpack Capacitors add a stainless-steel sleeve; performs to 105 °C

Just 9mm thin!

- 5,000 hour life @ 105 °C without derating
- Ruggedized with a stainless-sleeve
- Up to 0.9J/cc energy density
- Like the THA…as a single device, simplifies assembly
- Also has potential cost savings in comparison with bulk storage arrays

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The THAS Thinpack is designed for applications up to 105 degrees at full-rated voltage.

Just 9mm thin, it features a stainless-steel sleeve, to support the 105 degree, 5,000 hour rating, while adding ruggedness.

The energy density is up to 0.9 Joules per cubic centimeter.

Like the THA, it can simplify assembly operations and lower overall bulk storage costs.

Traditional methods of low-profile bulk storage consume too much PCB space!

Compare PCB space requirements for similar storage with axial electrolytics or v-chips…
(example shows: 5,800 µF, 35 Vdc at 85 °C)

- About 70% less board space than alternatives!
- Overall size and weight of finished board is reduced
- Eliminates wasted space between components in bulk arrays

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Compare PCB space requirements for similar storage with other capacitor types and it's easy to see the space-saving benefits of Thinpack technology.

This photo compares the space requirements of a single Thinpack capacitor vs. many axial electrolytics or v-chips to achieve 5,800 microfarad storage at 35 Vdc and 85 °C. About 70% less board space is required than the alternatives. This includes eliminating wasted space between components in the bulk arrays

In addition, overall size and weight of the finished board is reduced.

New design approach eliminates wasted space, while increasing operating life.

- Based on CDE's 20+ years of experience with type MLSG and MLPG MIL-grade flat electrolytics…now reengineered for tighter spaces and cost-effectiveness.
- Laser-welded aluminum case that eliminates the need for space wasting end-seal gaskets.
- Valve allows hydrogen gas to vent, reducing swelling by relieving internal pressure.

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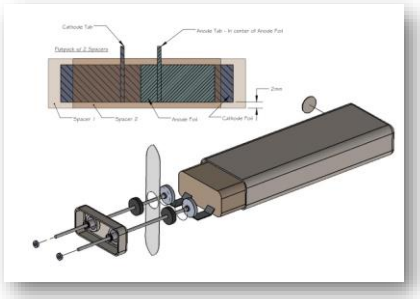
The benefits provided by the THA and THAS Series devices are possible because of a new design concept that eliminates wasted space and increases operating life.

This new design is an outgrowth of CDE's 20+ years of experience with MIL-grade flat electrolytics. Now reengineered for tighter spaces and cost-effectiveness, they use state-of-the-art technology, such as:
laser-welded aluminum cases to eliminate the need for space wasting end-seal gaskets; and
a valve to allow hydrogen gas to vent that reduces swelling by relieving internal pressure.

Keys to performance…

- Flat package design allows much higher energy density with a thin profile.
- High-performance foil and electrolyte
- Design eliminates the need for space-wasting end-seal gaskets
- THAS , 105 °C version has a 0.4mm stainless steel wrap-around sleeve to constrict swelling at elevated temperatures.



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The graphic shown illustrates some of the Thinpack's keys to performance.

The flat package design allows much higher energy density with a thin profile.

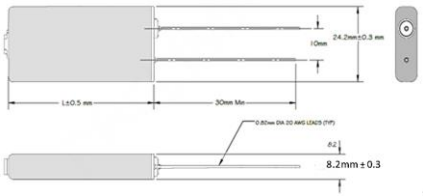
High-performance foil and electrolyte combine to maximize energy storage capacity.

The design eliminates the need for the space-wasting end-seal gaskets used on cylindrical electrolytics

The 105 °C THAS adds a 0.4mm stainless steel wrap-around sleeve to constrict swelling at elevated temperatures.

THA design characteristics.

- Dimensional characteristics
- Nominal lead lengths and gauge
- Reach and RoHS compliant



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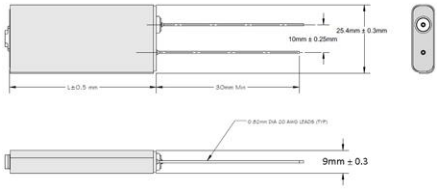
This mechanical drawing of a THA Series device highlights dimensional characteristics., nominal lead lengths and 20 gauge size.

Parts are Reach and RoHS compliant

THAS design characteristics.

- Dimensional characteristics
- Nominal lead lengths and gauge
- Very rugged construction, with 0.4mm stainless steel wrap-around sleeve
- Reach and RoHS compliment



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This mechanical drawing of a THAS Series shows the similarities to the THA, with the stainless steel sleeve.

The THAS Series is also Reach and RoHS compliant

THA and THAS Thinpack Series offer 72 value/voltage combinations each.

- Capacitance from 140µF @ 450Vdc to 18,000µF @ 10Vdc
- Excellent capacitance retention over full operating temperature

Part Numbering System:

THA	412	M	025	AA	0	C
Type	**Capacitance**	**Tolerance**	**Rated Voltage**	**Case Code**	**Insulation**	**Mounting Style**
THA	**322** =3200 µF **222** = 2200 µF **162** = 1600 µF	**M**=±20%	**025** = 25 Vdc **075** = 75 Vdc **150** = 150 Vdc **200** = 200 Vdc	**AA** = 36.4 mm **AB** = 45.9 mm **AC** = 53.8 mm **AD** = 66.5 mm	**0** = bare can **1** = polywrap	**C** = two leads

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The THA and THAS Thinpack Series offer 72 capacitance value and voltage combinations each.

Capacitance ranges from 140 microfarads at 450 volts DC to 18,000 microfarads at 10 volts DC.

Another strength of the design is the excellent capacitance retention over the full operating temperature range.

The part numbering system is straightforward, as show in this slide.

Designed for *maximum* capacitance in the *smallest* package.

THA and THAS Thinpack allows designers to create thinner, higher performance products...

- Tablets, laptops, specialized instruments
- LED driver modules
- Compact power supplies
- Drones and RPVs
- Set-top boxes
- Narrow, 1U rack-mounted devices
- Video monitors, displays
- Security systems

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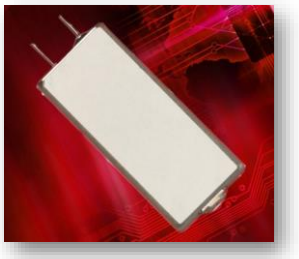
Because of their high-energy density, THA and THAS Thinpack capacitors allow designers to create thinner, higher-performance products...

These include such popular products as:
Tablets, laptops, specialized instruments
LED driver modules
Compact power supplies
Drones and RPVs
Set-top boxes
Narrow, 1U rack-mounted devices
Video monitors and displays
and
Security systems

CDE THA/THAS Thinpack Summary

- Both save board space with highest energy density of any low-profile aluminum electrolytic
- Ultra-thin package design
- Values from 140µF @ 450Vdc to 18,000µF @ 10Vdc, with 72 capacitance/voltage combinations
- Rated at 5,000 hours at 85 °C for the THA and 105 °C for the THAS
- Improves product reliability by reducing part count
- 125 °C option coming



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In summary, the CDE THA and THAS Series Thinpack Capacitors:

Save board space with highest energy density of any low-profile aluminum electrolytic capacitor.
Feature an ultra-thin package design
Offer a wide range of values, from 140µF @ 450Vdc to 18,000µF @ 10Vdc, with 72 capacitance/voltage combinations.
Are rated at 5,000 hours at 85 °C for the THA and 105 °C for the THAS
Can improve product reliability by reducing part count and connection points