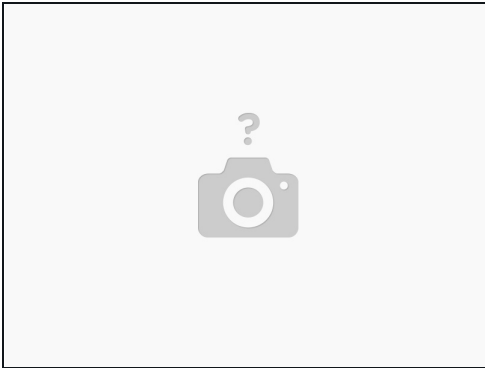




# Replacing Through Hole Electrolytic Capacitors

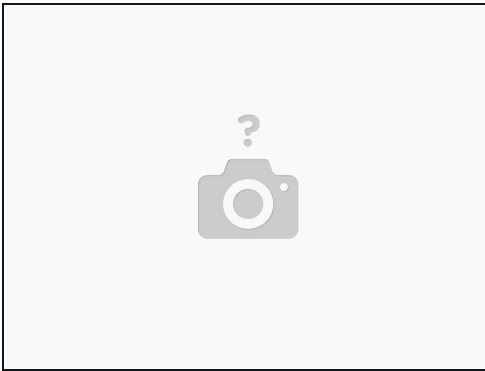
Written By: Andrew S

## Step 1 — Checking If the Capacitor is Bad



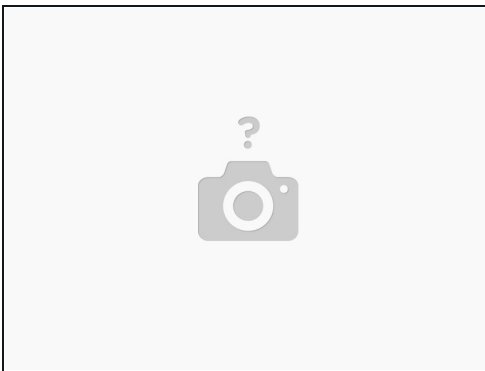
- Identify which capacitors are bad. There are 2 ways to do this:
  - 1. By Look/Feel: Look for a bulged top on the capacitor. You may also feel that the vent has burst. One way to confirm suspicion of a bulged capacitor is to place a ruler on top of the capacitor with the edge touching the top. If the ruler will not stay flat, the capacitor is bulged.
  - 2. (Preferred) Using an ESR meter: You can also use an ESR meter to check for bad capacitors. Once you get the ESR reading, compare it against a table of readings (usually included with the meter) or the capacitor's datasheet.

## Step 2 — Checking Capacitor Details



- Before desoldering the capacitor, note its details
  - These details should include capacitance( $\mu\text{F}$ ), voltage (V), Brand (e.g. Nichicon) and series(e.g. HM). You should also note the diameter(D) and length/height(l) of the capacitor.

## Step 3 — Finding a Datasheet



- The easiest way to find out what replacement capacitors to buy is to find the original capacitor datasheet.
  - Sometimes you can find capacitor datasheets by going to a company website. You can find some capacitor company websites [here](#)
  - The [badcaps forum](#) is also a good place to find information about capacitors.
- When you get the datasheet, look at the provided information on diameter, length, ripple current, and ESR (for low ESR capacitors).

## Step 4 — Choosing an Electronic Components Distributor



- Before buying new capacitors, you will need to find an electronic components distributor.
- Some popular electronic components distributors in the USA are [DigiKey](#) and [Mouser](#)
- For other electronic components distributors, you can check [this list](#)

## Step 5 — Getting Replacement Capacitors

**Aluminum Electrolytic Capacitors**

Results: 114,537

Search Within Results

Filters **Stacked** Scrolling

Capacitance	Tolerance	Voltage - Rated	ESR (Eq
0.001 $\mu$ F	-10%, +100%	2.5 V	1.5mOhm @
0.1 $\mu$ F	-10%, +150%	3 V	2m0hm @ 1
0.15 $\mu$ F	-10%, +20%	4 V	3m0hm @ 1
0.22 $\mu$ F	-10%, +30%	5 V	3.3m0hm @
0.33 $\mu$ F	-10%, +40%	5.5 V	3.4m0hm @
0.47 $\mu$ F	-10%, +50%	6 V	3.5m0hm @
0.56 $\mu$ F	-10%, +75%	6.3 V	3.6m0hm @
0.68 $\mu$ F	0%, +20%	7 V	3.7m0hm @
1 $\mu$ F	0%, +30%	7.5 V	3.9m0hm @
1.5 $\mu$ F	0%, +50%		4m0hm @ 1

Min Max  $\mu$ F

Min Max V

View Prices At:  Enter Quantity

**Stocking Options**

☒ In Stock

☐ Normally Stocking

☐ New Product

**Media**

☐ Datasheet

☐ Photo

☐ EDA/CAD Models

**Environmental Options**

☐ RoHS Compliant

☐ Non-RoHS Compliant

**Marketplace Product**

☐ Exclude

**Apply All**

- Now we will start searching for replacement capacitors.
- First, go to the website of your electric components distributor and go to the Aluminum Electrolytic Capacitors section.
- Narrow the search by entering the capacitance( $\mu$ F) and voltage (V) values of the old capacitor. You may also want to check the box to only show components that are in stock.
- Narrow the search by price. On DigiKey's website, you can do this by entering how many components you will need, located in the filters section.
- Look for a capacitor from Elna, Nichicon, Nippon Chemi-Con/United Chemi-Con, Panasonic, Rubycon or Wurth Elektronik with the same temperature rating as the old capacitor.

## Step 6

定格電圧 Rated Voltage (Vdc)	静電容量 Capacitance ( $\mu$ F)	外形寸法 Size $\phi$ D x L (mm)	定格リプル電流 Rated Ripple Current	インピーダンス ( $\Omega$ MAX) Impedance	
				20°C, 100kHz	-10°C, 100kHz
→6.3	220	5×11	345	0.22	0.80
	470	6.3×11	540	0.094	0.35
	820	8×11.5	945	0.056	0.19
	1200	8×16	1250	0.045	0.15
	1200	10×12.5	1330	0.039	0.14
	1500	8×20	1500	0.029	0.11
	1800	10×16	1760	0.028	0.10
	2200	10×20	1960	0.020	0.060
	2700	10×23	2250	0.018	0.054
	3900	12.5×20	2480	0.017	0.043

1,150 In Stock

Can ship immediately

QUANTITY

Quantity

Add to Cart

Add to List

All prices are in USD

Bulk

QTY	UNIT PRICE	EXT PRICE
1	\$0.70000	\$0.70
10	\$0.49800	\$4.98
50	\$0.37640	\$18.82
100	\$0.32790	\$32.79
500	\$0.24288	\$121.44
1,000	\$0.20645	\$206.45

8 = \$5.60

- Now take a look at the datasheet. If the ripple current is the same or higher (at the same temperature and frequency [Hz/KHz]) the ESR is the same or lower (at the same temperature and frequency [Hz/KHz]) (if applicable), and the capacitor is the same size or smaller (you can use a bigger capacitor if it will fit), then the capacitor will meet your needs.
- Make sure to check pricing. Sometimes it can be the same price or cheaper to buy 10 capacitors instead of 8.

## Step 7 — Replacing the Capacitors



- First, make sure the circuit board is oriented so you can see the top of the capacitor you're replacing.
- Next, use a black Sharpie or similar permanent marker to mark where the negative stripe of the capacitor meets the PCB.
- Now you can remove the electrolytic capacitors. There are 2 methods you can use:
  - 1. Heat one capacitor lead and lift the capacitor lead slightly out of the board. Keep doing this until the capacitor is free from the circuit board
  - 2. Desolder both legs of the capacitor, then pull the capacitor out of the circuit board.

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To reassemble your device, follow these instructions in reverse order.