

Re: Best capacitor for back-up applications

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- *From:* redbelly <redbelly98@xxxxxxxxxx>
 - *Date:* Sun, 05 Aug 2007 18:52:32 -0700
-

On Aug 5, 5:54 pm, Chris Jones <lugnut...@xxxxxxxxxxxxxxxxxxxx> wrote:

Eeyore wrote:

Chris Jones wrote:

Eeyore wrote:

AJ wrote:

"Eeyore" wrote

AJ wrote:

I
was
just
wondering
what
the
best
type
of
capacitor
I
should
use
for
a
back-up
application
(>
5uA).
I

Re: Best capacitor for back-up applications

am
looking
for
something
surface
mount
around
the
100–330uF
range
with
a
low
profile
and
as
cheap
as
possible.
Any
suggestions?

A coin cell
?

I would rather use a cap as I
only need an hour or so of
back-up time.

Well..... 330uF won't do it.

$$dV/dt = I/C = 5\mu A/330\mu F = 15mV/sec$$

In even 100 seconds, the voltage on the cap
will have dropped by 1.5V.
So to get a reasonable voltage drop after an
hour, you're probably
looking at ~ 33000uF. In other words
nothing small.

Re: Best capacitor for back-up applications

Use a coin cell.

Or one of those super-capacitors that they put in VCRs for running the clock during power cuts. You can get them in values between 0.1 Farad and a couple of Farads. They are usually cylindrical about 20mm or 3/4 inch diameter and about 12mm high (half inch).

<http://www.pollin.de/shop/shop.php?cf=detail.php&pg=OA==&a=NTc0OTg3OT...>

That's hardly small is it ?

They're expensive too. A coin cell can be had for ~ 30c.

Graham

Well if you don't need a whole Farad, then it would be smaller. Whether it is worthwhile probably depends on whether the power drain is such that being rechargeable would be an advantage.

Chris

Recharging shouldn't be necessary for the battery, though it would need replacement after it's 5-10 year shelf life has expired. He's only drawing ">5 uA" for "an hour or so" at a time. Let's use 10 uA and 2 hours for a conservative estimate. That's 0.02 mA-hours. A 2032 coin cell has about 200 mA-hr of charge, which equates to 10 thousand outages-worth. It will self drain, sitting there over the course of it's shelf life, rather than become discharged from the outages.

As for the cap, roughly 100,000 uF would be required (ballpark calculation, based on 3V, 10 uA, and dropping by 25% of the 3V over 2 hours). Digikey has them for 7 to 10 \$US, not too cheap, and not too small at over an inch in size:

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Digikey # P10002-ND

100,000 uF, 16V, 35mm dia. x 80mm long, 10.11 \$US

<http://www.digikey.com/scripts/DkSearch/dksus.dll?Detail?name=P10002-ND>

http://www.panasonic.com/industrial/components/pdf/PIC_T-UP_SERIES_DNE.pdf

Digikey # 565-2588-ND

100,000 uF, 6.3V, 35mm dia x 45 mm, 7.15 \$US

<http://www.digikey.com/scripts/DkSearch/dksus.dll?Detail?name=565-2588-ND>

<http://rocky.digikey.com/WebLib/United%20Chemi-Con/Web%20Data/SMH.pdf>

As Graham said, coin cells are around 0.30 \$US:

<http://www.digikey.com/scripts/DkSearch/dksus.dll?Detail?name=P189-ND>

Regards,

Mark

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