

Re: Another Novice Q. – recharging – Volts and Amps

Source: <http://sci.tech–archive.net/Archive/sci.electronics.basics/2008–06/msg00678.html>

- *From:* Kris Krieger <me@xxxxxxxxxx>
 - *Date:* Mon, 30 Jun 2008 15:27:33 –0500
-

ehsjr <e.h.s.j.r.removethespampunctuation@xxxxxxxxxxxxxxxxxxxx> wrote in [rfd9k.9\\$dz.4@trndny01](mailto:rfd9k.9$dz.4@trndny01):>[news:rfd9k.9\\$dz.4@trndny01](mailto:rfd9k.9$dz.4@trndny01):

Kris Krieger wrote:

ehsjr <e.h.s.j.r.removethespampunctuation@xxxxxxxxxxxxxxxxxxxx> wrote in [8vU8k.58\\$BR.4@trnddc06](mailto:8vU8k.58$BR.4@trnddc06):>[news:8vU8k.58\\$BR.4@trnddc06](mailto:8vU8k.58$BR.4@trnddc06):

Kris Krieger wrote:

ehsjr
<e.h.s.j.r.removethespampunctuation@xxxxxxxxxxxxxxxxxxxx>
wrote in
[u3E8k.54\\$WJ.12@trnddc04](mailto:u3E8k.54$WJ.12@trnddc04):>[news:u3E8k.54\\$WJ.12@trnddc04](mailto:u3E8k.54$WJ.12@trnddc04):

[edited]

Only *after* I know all that, can I select the
specific cells, and
configuration thereof...

– Kris

As you said, you are working backwards. You don't yet
understand
that doing it that way can result in a specification for cells
that are "unobtainium".

Ed

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"Unobtainium"??, it's a modest LED night-lamp, not an airport beacon
:p

I *already* know the batteries and their output, and the input needed by the LED driver and what it will output to run the LEDs (which will run off the batteries at night) – those are not the problem.

To charge my 4 little 1.2V AA NiMH batteries, I have seen the following solar cells (and more, this isn't an all-inclusive list):

0.5V, 200mA
0.5V, 450mA
0.5V, 800mA
0.5V, 2000mA
1V, 200mA
2V, 200mA
3V, 400mA
4V, 25mA
etc.

I also know that, depending upon how I connect cells, I can up the Volts or up the Amps, or both if it's a series-parallel combination. The biggest Q. is the volts. I read that, using a 5V solar cell, charging time would be the battery mA divided by the cell mA, but what if it was a 2V cell, or a .5V cell?

Well, I'll write to Maxim, since it's their components I'm interested in. They can prob. best tell me the input I need for the battery-management IC.

– Kris

Sorry, Kris, but in terms of the necessary specifications, you have posted nothing useful to make an informed design decision. That is not an attack on you, it is just that you are working in an area that is new to you.

I found teh answer to my question here:

<http://www.solar-world.com/SolarMini-Panels&Motors.htm>

Specifically:

"...the solar operating voltage must be higher than the battery voltage..."

That was all I was asking.

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Netting your problem out, you want to drive an unknown
(in terms of voltage and current) load

The Q was not about the "load", it was *simply* and *specifically*, I'll repeat, this:

Given NiMH batteries, size AA, rated at 1.2V and 1500mA, what would I need in terms of solar cell output to charge them using a battery charge/control/protection IC (the Maxim DS2715).

I don't understand what in that is "unknown" or otherwise unspecified.

for an unknown amount
of time with an unknown number (but less than 5)

I'd repeatedly specified "between 3 and 4"...

NiMh AA
cells of unknown capacity, said NiMh's to be charged with an
unknown number of solar cells of unknown capacity in an
unknown environment.

Of course the number of solar cells was unknown – anyway, the "number" is not relevant, what is relevant is the *output*, and my Q. was specifically about *needed output*, so that I could go back to the catalogues, look at the sizes/ratings, and determine what I'd need in terms of numbers, and arrangements.

As for environment, not relevant to the question – the question dealt with ratings. I'm not so stupid that I think SOLAR cells will "work" at night or in deep shade, or that they generate the same power on cloudy days as on bright, sunny days. But I did not ask about differences in output on cloudy versus sunny days, I asked, based purely upon ratings, about charging a specifically-described battery.

The key design question is: how much input power will be available?

No, the key design question was, as Tom Biasi had noted when I first began asking my Solar Light questions, was:

"One place to start would be to determine how much illumination you need. Find LEDs that can give you that. What voltage and current do you need to

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power the LEDs for the period of time that you would like? What battery will provide that?"

The question I asked in this thread was the final question of Tom's initial input:

"What solar arrangement can charge the battery in the time that you want?"

I didn't know how to do the math. Now I think I might know it.

The surface area of your device that will be exposed to direct sunlight and that you are willing to dedicate to solar cells will determine that, in terms of the maximum that can be achieved.

THat wasn't what I was asking. I was asking what output (from the cells) I'd need to charge the specified batteries. I didn't ask about sruface area – I already knew that, which is why I listed several of the available solar cell outputs, which I'd selected because their footprint fell within the size limits I wanted. So the surface area was not the concern and was not at all related to the simple question I was asking.

Obviously, the power will be less if the device is in the shade or the cells receive less than full sunlight for some other reason.

Not to be rude, but, duuuuuuuuh... Again, tho', not what I was asking.

You are here asking for help – but ONLY you can answer that question.

Well, between all the different solar–cell–related websites, electronics–related websites, the Tech Support folk at Maxim, and so on, yeah, you're right, I finally *am* answering the question I'd asked in this thread about what Solar Cell output is required to charge the specified batteries.

If we don't know how much power is available, it is not possible to say definitively if your idea is even feasible, let alone specify how to do it.

You can't figure out whether it's feasible to run 4 regular (i.e. discrete

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5mm dome) LEDs off of a solar-charged battery pack of 3 NiMH AA 1500mA batteries?, or up to 6 (same type) LEDs off a solar-charged battery pack of 3 or 4 NiMH AA 1500mA batteries?, or what output V and mA you'd need from solar cells (obviously placed in the sun :p) to charge even one 1.2V/1500mA NiMH battery? You can't even determine whether that is *possible*?

OK, whatever...

Thankfully, there were a couple of folks who were very helpful and got me going in the right direction, whom I'm thanking in a separate post.

– Kris