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INTRODUCTION TO THE ESP32 GUIDE SERIES

ESP32 Dev Kit Power Options

In this lesson, you will learn how to power your ESP32 dev kit.

ESP32 Power options

1: USB



ESP32 for busy people



In this lesson, you will learn how to power your ESP32 dev kit.

You can watch the video, or if you are the “reading” type, you can read the text below.



Option 1: USB

The easiest way to power your ESP32 dev kit is to use the USB port. The dev kit includes a micro USB port through which you can both supply power to the board, and implement serial communication with the host computer for uploading a sketch.



The easiest way to power your ESP32 dev kit is via the USB port.

Just plug one end of the cable into your computer's USB port or to a USB compatible power, the other end to the USB port of the ESP32 dev kit, and you're good to go.

Option 2: Unregulated power to GND and 5V pins

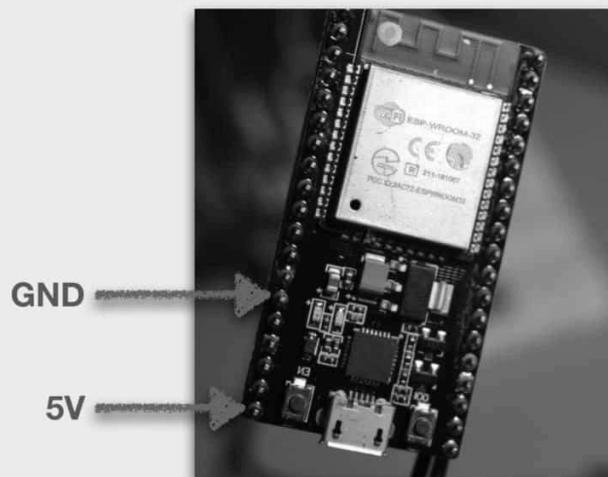
The second option is to connect an external unregulated power supply to the 5V pin and ground pins. Anything between around 5 and 12 Volts should work.

But it is best to keep the input voltage to around 6 or 7 Volts to avoid losing too much power as heat on the voltage regulator.

ESP32 Power options

2: 5V / GND header pins

CAUTION: Keep input voltage below 12V to reduce heat on the voltage regulator

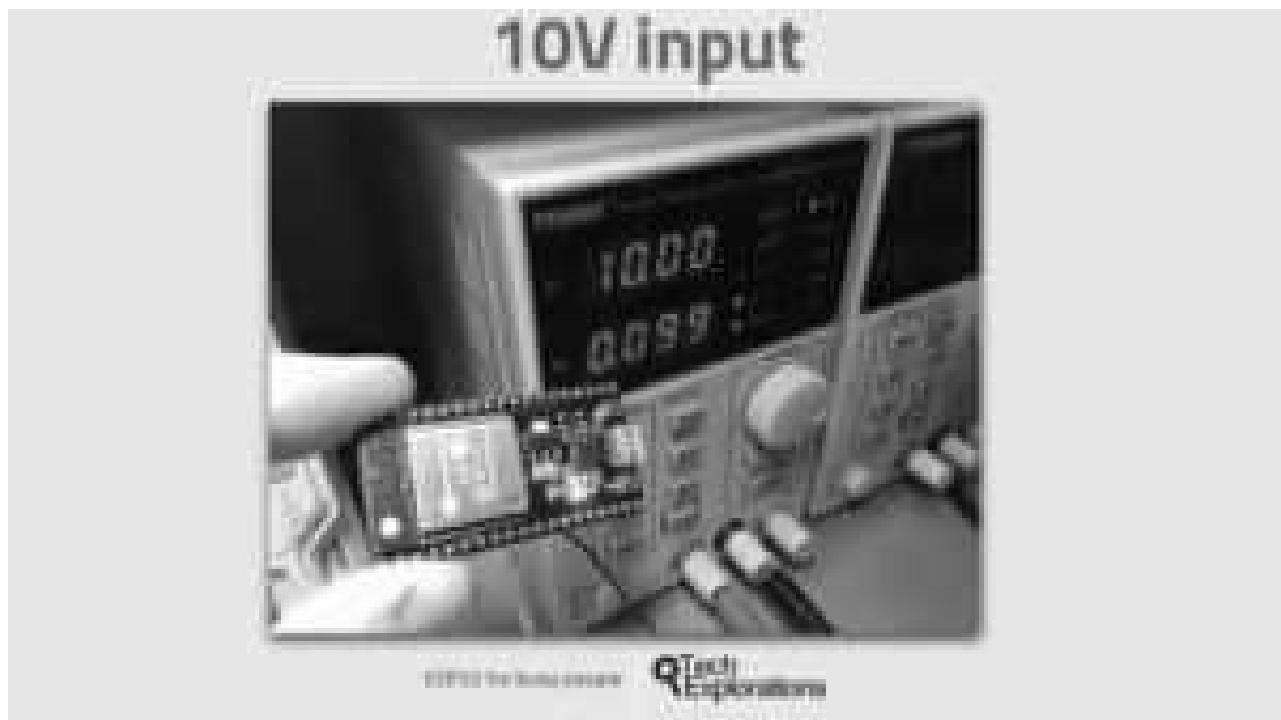


You can connect external power via the 5V and GND pins. Beware of the voltage limits.

I did some experimentation using my bench power supply. I supplied voltage between 5V and 10V and observed the current draw. The ESP32 was running a sketch with an empty loop.

At 10V input voltage, the current draw was 0.099 A (or 99.9mA).

At 5V, the current draw was a little higher, at 0.128 A (or 128mA).



At 10V input voltage, the current draw was 99.9mA.



At 5V, the current draw was 128mA.

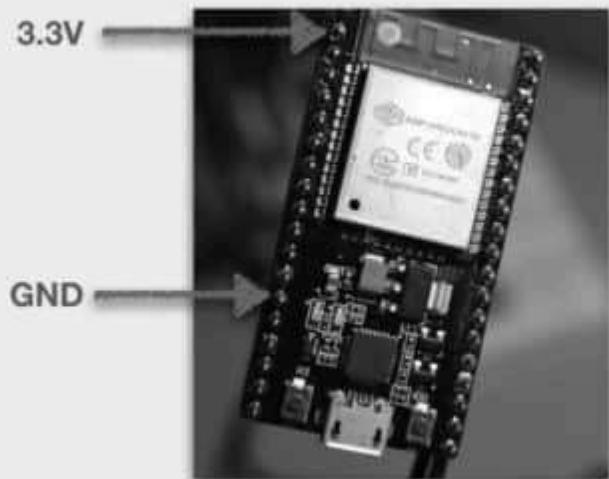
Option 3: Regulated power to GND and 3.3V pins

Another option that you have is to power your ESP32 is to use a 3.3V regulated power supply. For this, you will use the 3.3 Volt and GND pins.

ESP32 Power options

3: 3.3V / GND header pins

CAUTION: Voltage must be regulated externally. Do not provide more than 3.3V on the 3.3V pin!



ESP32 for busy people  Tech Explorations

You can connect a regulated 3.3V voltage supply to the 3.3V and GND pins.

The 3.3 volts pin is at the top left of the board right next to the antenna.

You have to be **very** careful when you do that. If you power your ESP32 this way, you're bypassing the on-board voltage regulator that is on board the dev kit, and therefore your module has no protection against over-voltage.

Again: Be very careful to make sure that your input voltage on the 3.3V pin is regulated and safe.

Power: conclusion

To power your ESP32 dev kit, you have three options:

1. Via the USB port.
2. Using unregulated voltage between 5V and 12V, connected to the 5V and GND pins. This voltage is regulated on-board.
3. Using regulated 3.3V voltage, connected to the 3.3V and GND pins. Be very careful with that: do not exceed the 3.3V limit, or your ESP32 module will be damaged.

Attention: be very, very careful to **only use one of those options at the same time**.

For example, do not power your ESP32 dev kit via the 5V pin using a 10V input while at the same time you have the module connected to your computer via USB. This will surely damage your module, and perhaps even your computer.

With this, you should have a good understanding of what the ESP32 is, and you must be eager to get hands-on with it. I totally understand :-). Let's proceed with the next lesson, where I'll show you how to set up the ESP32-Arduino Core on the Arduino IDE.

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People**

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but... WOW

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V VedPrakash 9 days ago (Edited)

Hi I Am Using Esp32 C3 Super Mini Can You Guide Me On That

My Question Is That That Board Has 5v, G, 3.3v Pins So I Brought A 3.7v Lipo Battery Of 500mAh So Can I Connect It To 5v Pin On The Board And -ve To The Ground And Will It Work Fine?

Also, here is the data sheet for this board:
<https://dl.artronshop.co.th/ESP32-C3%20SuperMini%20datasheet.pdf>

拇指 0 回复 0 Reply



Peter Moderator 9 days ago

Hello, as there are many “official” and “cloned” ESP32 C3 Super Mini boards, it is difficult to know for sure if it is OK to connect a 3.7v Lipo battery to the 3.3V pin.

To be safe, I would connect the battery to the 5V pin to make use of the regulator.

拇指 0 回复 0 Reply

I lila 4 months ago

Hi Peter, is it true if we power ESP32 with the 5V pin and the pinout voltage will around 3V not 5V?

Then what should I do if the components that I use is need 5V from the pinout?

Thank you!

拇指 0 回复 0 Reply



Peter Moderator 4 months ago

Hi Lila,

Yes, it is true that if you power the ESP32 with 5V, the GPIO pin output voltage will be around 3.3V, not 5V. The ESP32 operates at 3.3V logic levels.

You asked: "what should I do if the components that I use is need 5V from the pinout?". This depends. If the peripheral is operates on 5V, you can power it from the 5V pin of the ESP32. Then, you will need to use a bidirectional level shifter module for signals to convert the 3.3V signals (of the ESP32 board) to 5V (of the peripheral).

拇指 0 回复 0 Reply

P Pep 6 months ago

Hi, is it possible to power the esp32 with the output 5V of an L298N (5V of the L298N to 5V of the ESP32) ?

What if I connect the USB cable to upload a program without cutting the 5V from the L298N?

Thank you very much for this lesson

拇指 0 回复 0 Reply



Peter Moderator 6 months ago

Hi Josep,

There are many ESP32 boards, but generally speaking, yes, you can power an ESP32 using the 5V output of an L298N motor driver. L298N is commonly used to control motors with a microcontroller, and it also provides a convenient 5V output that can be used to power other devices in your project. This 5V output can be connected to the 5V input pin of the ESP32.

You must be careful, especially if you will be running motors plus the ESP32.

You can add a diode (like the 1N4007) to the 5V output from the L298N to prevent current from back-flowing to the motor driver when the USB is also connected.

I recommend only connecting the ESP32 to one power source at a time during programming. Disconnect the 5V from the L298N when you connect the ESP32 to the USB. I have had USB + external battery connected by mistake a few times, and nothing bad happened, but still, the risk exists, especially for the cheaper kits.

拇指 0 回复

K Kei 6 months ago

P/S: With esp32 devkit V1, we can power it (about 7-12) with what is the maximum/minimum current?

拇指 0 回复



Peter Moderator 6 months ago

Hi Kei, The ESP32 Dev Kit V1 in deep sleep mode (and nothing else connected) can consume as low as 10 µA. In light sleep mode, it typically consumes around 0.8 mA to 1 mA.

When the ESP32 is running at full load with Wi-Fi and Bluetooth enabled, the current consumption can peak at approximately 500 mA.

拇指 0 回复

K Kei 6 months ago

We can power about 7-12 with maximum current - what is the minimum for esp32 devkit V1?

拇指 0 回复 0 Reply



Peter Moderator 6 months ago (Edited)

Please see this answer:

<https://techexplorations.com/guides/esp32-begin/power?ht-comment-id=14733253>

拇指 0 回复 0 Reply

R

Riku 7 months ago

Hi everyone. I am starting to use my ESP32 dev board and would like to utilize the 3.3v pin to power it up. I am using my LiPo battery which is connected to my HT7833 LDO regulator to supply exactly 3.3V. I also already have connected capacitors between the ESP32's 3.3v pin and GND pin for protection purposes for any spikes that will occur. However, why is the dev board not turning on when I connect my power supply to the 3.3V pin and the GND pin? I mean isn't the led indicator should at least turn on to indicate the ESP32 is now working? But surprisingly, nothing happens. I'm not sure why. hoping to get bright insights in this website. Thank you everyone!

拇指 0 回复 0 Reply



Peter Moderator 7 months ago

Hi Riku,

Several factors could be at play when an ESP32 development board does not power on. The setup you describe seems correct (i.e. using a 3.3V power supply from an HT7833 LDO regulator coupled with capacitors for voltage stabilization).

Here are some steps to diagnose and resolve the issue:

Check Voltages (I suspect your problem is one of the following two points)...

- * Double-check the output voltage of your HT7833 regulator using a multimeter. It should be a stable 3.3V.
- * Ensure the LiPo battery is fully charged. A depleted battery might not provide enough voltage for the regulator to maintain a stable 3.3V output. For the HT7833 to operate correctly, I believe its input voltage (from the battery) must be a minimum of 4.3 V.

If the above don't fix the issue, here's a few other things to try:

- * Loose connections between the battery, regulator, capacitors, and the ESP32 can cause intermittent or no-power issues. Confirm that all connections are solid and secure.
- * Reversing the polarity can prevent the board from powering up and potentially damage the components. Ensure the positive and negative leads are correctly connected to the ESP32's 3.3V and GND pins.

Also, you should check that the board is not damaged:

- * Try powering the ESP32 using a USB connection to rule out issues with the development board itself.
- * Directly power the ESP32 with a known-good 3.3V source to eliminate the HT7833 regulator as a potential cause.

I hope this helps!

Peter

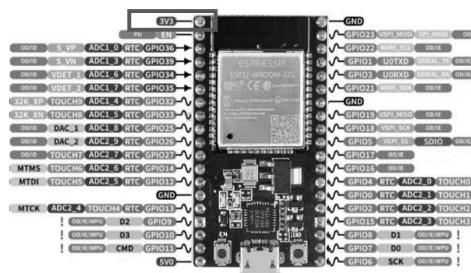
0 0 Reply

Riku 7 months ago

Hi Peter, thanks so much for your response. I double-checked the Vout of my LDO regulator, which is 3.3V. Also, I have ticked all your advice, but still nothing has happened. But I have one thing to confirm if I am connecting it to the right pinout of my ESP32 dev board. I have attached a screenshot below where I connect the Vout of my HT7833 and then connect both in the same GND pin. Is this correct? I also think this might be an output pin of the ESP32 dev board for other modules to supply 3.3V. So I am unsure where is the Vin of the ESP32 for 3.3V. My ESP32 is KeeYees ESP32 ESP-32S Development Board 2.4 GHz Dual Core WLAN WiFi + Bluetooth 2-in-1 Microcontroller ESP-WROOM-32 Chip CP2102. Hoping to hear from you once again. Thanks so much, Peter!

拇指 0 反馈 0 回复

R Riku 7 months ago



拇指 0 反馈 0 回复

Peter Moderator
R Riku 6 months ago

Hello Riku, I'm sorry for the late reply. I'm working on the new KiCad book, and it is taking up all of my time.

Yes, you are using the correct pin (3V3) to power the devkit from the HT7833.

I am unsure what you mean by “I also think this might be an output pin of the ESP32 dev board for other modules to supply 3.3V”. I suspect you want to power 3.3V peripherals like sensors. In that case, take power from the same output of the HT7833 regulator. It will work if the total draw is within the regulator’s capability.

Don't forget the capacitors if you use the radios (Wifi, BT).

拇指 0 回复 0 Reply

Riku ↗ Peter 6 months ago

Hi Peter, thanks for your response.

However I changed my schematic to power up the ESP32 with an external 5V source to the Vin pin.

My power source is from LiPo batteries connected in parallel (3.8V, around 6A using multimeter). Then I connect this to a step-up booster converter (bought from Amazon - DCV-R43 MT3608 LM2577 DC-DC Boost Converter Voltage Regulator Step Up Power Supply Module) to reach 5V. The output current from the Vout of the step-up converter is around 600mA.

Now the issue is when I connect it to the Vin pin 5V of the ESP32, it just turns the LED on but does not operate anything. But when using the USB cable to power on the ESP32, it operates normally and runs the uploaded code. I have read several advice from other forums like adding a 10uF from EN pin to the GND and also connecting pull-up 10k ohm from GPIO 0 (that is BOOT button signal) to 3V3. But still, the same issue occurs. It just turns on the led but no operation from the ESP32.

Many forums have similar issues but I cannot see a clear solution for this. Hoping for support here. Thank you so much in advance!

My ESP32 was from Amazon - KeeYees ESP32 ESP-32S Development Board 2.4 GHz Dual Core WLAN WiFi + Bluetooth 2-in-1 Microcontroller ESP-WROOM-32 Chip CP2102 for Arduino

Hoping you could help me with this issue.

Thank you!

拇指 0 回复 0 Reply

Riku 6 months ago

Hi, just a quick update. I have now resolved it. I've rearranged the circuit and it just worked perfectly fine. Probably the issue

prior was it needed to have fewer wires to make sure the current would provide enough.

0 0 Reply

W WheatChen

6 months ago

I have same problem. Can you help me?

0 0 Reply

D Dave Skowron

11 months ago

LOVED BY TECH EXPLORATIONS

Hello. I realize this is an old thread but I wanted to add something that wasn't discussed here. I built a BLE-enabled MIDI controller using the ESP32-WROOM-32 board. It is very small and uses a membrane with four switches. I use it for controlling the transport in Ardour and OBS Studio. I specifically wanted a wireless solution for this project so powering it via USB is not an option. I do not have a 3.3v battery source and didn't want to use an external regulator even though they can be very small - the regulator plus two capacitors are more than I want to deal with. So I used a 3.7v Lipo battery on the Vin pin. This works very well HOWEVER - once the voltage drops to about 3.3 volts the MIDI will disconnect. I imagine this is because the Vin pin is expecting at least 5 volts in order to keep the internal regulator alive. The device itself is more like a remote control as it does nothing other than keep itself connected to my computer until I need to manipulate the transport in one of the programs I use. So it is consuming very low amount power. I have read that using a 9-volt battery isn't good because it will be drained very fast. I am experimenting with that now to see just how long it will take to drain with the controller just sitting there "idling". In real-world use the controller would be on for

maybe 4 to 6 hours at a time depending on how long my recording session might be. It really doesn't do much so I would imagine the 9-volt battery will last a fairly long time. Anyway, I just wanted to bring this up since this thread is all about the power requirements of the ESP32.

I also wanted to commend everyone on their civility in this thread (I have not yet read any others - I just now signed up). I found this thread in a search result when I was looking for suggestions on how to power this device. You folks are kind to one another - unlike places whose names start with the word "stack". Thank you for that. It is refreshing.

Dave Skowron

拇指 0 口 0 Reply

Riku 7 months ago

Hi Dave/Peter, just budging on this topic. So does it mean even though we connect a supply voltage to the Vin pin (5Vpin) of the ESP32 that is less than 5V but greater than 3.3V, the ESP32 will totally work fine? Hoping to hear from you guys soon. Thank you!

拇指 0 口 0 Reply



Peter Moderator 11 months ago

Hello Dave,

You are right; this page and discussion thread have been around for a while, but it is vibrant with evergreen content.

And the fact that makers like you continue to contribute is amazing.

Your hack is very clever and something that I had not thought of. Do you have a page where you have documented it? I'm

sure that many people would be interested in the details.

Also, thank you for acknowledging that people contributing here and on our other pages are always kind. I don't remember having to delete comments for being rude (only the rare spam). I think it's just people wanting to learn and help others learn.

拇指 0 回复 0 Reply

D **Dave Skowron** 11 months ago
Hi Peter,

I don't have a page for this project - I don't usually document my projects like that. BTW, the "Anonymous" reply is me. For some reason I could not get back here to the discussion. The page only showed the lesson about the power. Now all of a sudden, here it is so I am replying again.

Ultimately I am going to use an Adafruit Huzzah Feather board for this due to its fantastic feature of having a 3.7v LiPo battery connected via the JST plug. This board will also recharge that battery through its USB port so it's a great way to do what I want.

拇指 0 回复 0 Reply

 **Peter** Moderator
◀ D Dave Skowron 11 months ago

Hi Dave, no worries, thank you again.

拇指 0 回复 0 Reply

A **Anonymous** 11 months ago

Hi. For some reason I cannot get to the discussion on the site so I am answering the email I received with your reply. The 9-volt battery did not last overnight. Once it was drawn down to around 6.8 volts it could not produce enough current to start the BLE radio. That is understandable since a 9-volt battery does not have much energy density capability. My next step is to connect 2 LiPo batteries in series (for 7.4v) and see how long that lasts. I propose that it should last quite a bit longer.

拇指 0 回复 0 Reply

C **Chacapamac** 1 year ago

Thanks for the great info here. First time connecting an addressable led strip to an ESP32-WROOM-32D. Anybody know where to plug the data wire?

拇指 0 回复 0 Reply

P **Peter Dalmaris** 1 year ago

Hi, not sure which led strip you have. I'll assume its the WS2812 (very common). usually needs to be connected to a GPIO (General Purpose Input/Output) pin on the ESP32-WROOM-32D module. You can choose any suitable GPIO that can output data. However, it's best to avoid GPIO 6 to GPIO 11 as they are connected to the integrated SPI flash and are not typically used for other digital I/O. A commonly used GPIO for such purposes is GPIO 5. Of course, your code will have to match the actual wiring. Remember to also connect the ground (GND) of the LED strip to the ground of the ESP32. Power for the LED strip should typically be supplied separately, as the ESP32 can't provide enough

current to power more than a few LEDs. Make sure the power supply matches the voltage required by the LED strip (commonly 5V).

🕒 0 🗑 0 Reply

C **Chacapamac** 1 year ago

Thanks Peter, this is the first time I'm doing a project like that. First time with LED, first time with ESP 32 and I really appreciate your input.

I end up with this strip —> 1 meter —> COB LED Strip Light 720leds/m Pixel sk6812 WS2811 RGB IC Addressable Digital 12v<https://www.ebay.ca/itm/374...>

—> The Strip Power consumption is originally 30 Watt by meter (100cm) I choose my Power supply with that equation:— I use 75cm = 22.5 Watt x 1.2 (for buffer) = 27 watts Rounded UP to 30 Watts—> Divide by Voltage (12v) to get the amperage ÷ 12V = 2.5 Amp (round to) 3 Amp This is the 30Watts 12Volt 3 Amp Power Supply I want to use<https://www.amazon.ca/dp/B0...>

I also buy a Step-down Buck converter from 12V to 3.3v to power separately the ESP32 (by the 3.3V pin) & Ground and the 12V led strip (with the same Power Supply)<https://www.amazon.ca/dp/B0...>

I will use WLED as software — I need to control each Led (or small group of led) and modified their color and brilliance (light output) hour by hour, every days.

- QUESTION: You said —> “Remember to also connect the ground (GND) of the LED strip to the ground of the ESP32.” • Because I'm

using the step down converter the power coming from the Power Supply (+ -) will be connected to the "IN" (+ -) of the converter, and from there power directly the LED Strip. The Converter "OUT" (+ -) will power the ESP and I was thinking that I just have to connect the LED strip Data wire to the ESP (You Said GPIO 5...) ?

- Do I have to run another Ground wire directly from the LED Strip to the ESP (I guess another ground than the one used coming from the converter "OUT" to the ESP to power it?)

Not sure if I'm OK or completely wrong —Sorry for the long post, Newbie Alert.... :)

0 Reply

D **DavidSG** 1 year ago

Powering these boards is a vexing issue. Executive summary: I suspect the lore that says you cannot have multiple simultaneous power supplies is just that: Lore. Here's why I think that.

[Background: I am a retired, battle scarred electronics engineer, but have very little specific subject knowledge on the ESP32 as such. I do know how to read a schematic diagram and a data sheet!]

I am currently designing a gadget using an ESP32 30 pin "dev" board, and I need power supply flexibility. So I have been deep diving as far as I can into the scant information that's available. I have 3 different versions of board in my collection, two 30 pin types and one 38 pin type, bought on Ali Express, provenance unknown. The first problem is that I cannot find dependable schematics.

[Well, I finally found one from Espressif themselves for "ESP32-C3-DevKitC-02". It

has the right number of external pins and other bits. But then again, sheet 1, the block diagram, shows an RGB LED while sheet 2, the actual schematic, shows only a RED LED. It's a bit rough when the authoritative source is not very authoritative!

[https://dl.espressif.com/dl...\]](https://dl.espressif.com/dl...)

Let's look first at the lore on allowable supply voltage to the Vin pin. Espressif, BTW, call it Vcc-5V or EXT-5V in various schematics I have found. I found nothing at Expressif about allowing up to 12V!

The 5V to 3.3V onboard regulator is in a SOT-223-3 package, with the output on the heat

SHOW MORE

拇指 0 回复 0 Reply

P **Peter Lebbing** 1 year ago
Hello David,

The AMS1117 5V regulator is specifically described as not being vulnerable to 3.3V applied to the output with nothing on the input. (Older regulators are not that robust).

Could you please provide a link to where this is specifically described? I cannot find it in the datasheet! I can find where it says:

Unlike older regulators, the AMS1117 family does not need any protection diodes between the adjustment pin and the output and from the output to the input to prevent over-stressing the die.

but that seems more about transient conditions (discharging capacitors when power is removed) rather than continuous operating conditions, which backpowering would be.

It would be very useful to know that it can be backpowered, but I'd like an authoritative source on that :-).

Also, you give Espressif quite some flack about a missing RGB LED, but unless they happened to add it in the last 24 days I don't understand what made you angry. It's clearly there, bottom middle of the page, component D6, specified as an SK68XXMINI-HS, so it's either an SK6805 or an SK6812.

BTW, you could look on AliExpress specifically for the Ai-Thinker (or NodeMCU) dev boards. Their datasheets and schematics are easy to find, and many AliExpress sellers carry them for very pleasant prices. Watch out for those "let's replace a diode by a zero ohm resistor" shenanigans I just read about in the comments here though :-).

0 0 Reply

D DavidSG 1 year ago

Hi Peter,
It was in fact the statement in the data sheet

the AMS1117 family does not need any protection diodes

that I based my evaluation on, reinforced by the fact that if there's nothing connected to the V(in) pin there's nowhere for "backpower" to go.

The Schottky diode on the USB port guarantees the computer USB port is never in any danger from backfeed. I consider the computer port much more valuable than an ESP module. Anyhow, I have now started spinning up my first board, fitted with a 3.3V switchmode regulator connected to the ESP32 dev kit's 3.3V pin, driven off 12V. There has been no smoke released with simultaneous USB power and 12V power.

Yup, I missed the addressable RGB LED. Thanks.

Since my post I have found a schematic that tallies well with the actual 30-pin ESP32 Dev kits I have a bunch of. I traced out the power supply part of the circuit, and it matches.

<https://uploads.disquscdn.c...>

拇指 0 回复 0 回复

P Peter Lebbing
← DavidSG

1 year ago

Peter Dalmaris, I think I provided a useful reply but it seems to have been marked as spam automatically because I linked to another site. I don't really see a better way to contact you than through this message. Could you please take a look at the marked message? Disqus says *To prevent this from happening further, contact the moderator(s) of the site(s) in question where your comments are disappearing.*, so here we are...

拇指 0 回复 0 回复

P

Peter Dalmaris

1 year
ago

Hello @peterlebbing:disqus, I see the problem.
The discussion tool classified your last post (10 hours ago) as spam.
I have approved your comment, and also marked you as a trusted user.
Thank you for your contributions to this page.
Also, if you need help with anything, please feel free to raise a support ticket. You will find a link at the bottom of every page on our website.

拇指 0 回复 0 Reply

P

Peter Lebbing

1 year
ago

Hi David,
Right, so if the AMS1117 has a builtin protection diode, that means that even though $V_{out} > V_{in}$, this voltage differential is limited to the forward voltage of the protection diode. I'm not knowledgeable enough to assert this means the regulator itself won't be damaged by this even in continuous operation, but it does sound reasonable.
However! We're talking about modules bought on AliExpress. You might end up with a module with one of these "AMS1117"s mounted. It doesn't seem to do "protection". Of any sort. So maybe it is still better to desolder the wretched thing?
Of course there are reputable manufacturers and sellers on

AliExpress; the trick is to discern them from the shops selling components like the regulators in the linked story...

BTW, a final little note. In your nice analysis of the temperature of the regulator, you mention 180 mA when the WiFi is transmitting. But the number in my datasheet is much higher; it goes up to 335 mA when transmitting at 21 dBm. ESP32-C3 Series Datasheet v1.4, section 4.6.1 RF Current Consumption in Active Mode, page 35.

拇指 0 言论 0 回复

P **Peter Dalmaris** 1 year ago

Hello David, and thank you for your excellent analysis. You have gone much further than me in the article, and your results are very helpful.

In relation to the 12V, the keyword is that such voltage is "tolerated" but not appropriate. Your numbers clearly show why.

Also, your example calculations at the different temperatures are again very helpful.

拇指 0 言论 0 回复

D **DavidSG** 1 year ago

Thanks, @peterdalmaris:disqus. It's frustrating that solid information is so hard to find. The ESP32 and its siblings are remarkable products, but there are a lot of rough edges. IMO clear signs of a company focussed on getting a product out the door quickly, probably designed in an "Agile" environment. That's not the best approach for a complex system,

and I hope Boeing never do it - or did they with the 737MAX? The ADC is clear evidence of a company with a software leaning c.f. hardware. Then the waters get muddied further by people making knockoff application boards which deviate from the recipe but fail to document the differences.

拇指 0 回复

D **Dan26** 2 years ago

Something strange happens to my ESP32 DEV KIT board. I run a program with deep sleep mode. When the power is only external (7 volts in Vin pin) it draws in sleep state 9mA (a lot!). If I have the usb connected at the same time (both external and usb power are connected), and DISCONNECT the usb power, the ESP32 draws only 1,8mA, if I wake up the board via my wake up source pin, the program does a task and after comes back to deep sleep mode. The draw is still only 1.8mA !!! Only when the power is off and comes back again it draws 9mA like it did before the usb connection.

拇指 0 回复

M **Marko Dukši** 1 year ago

This is interesting. Did you get to the root of this observation?

My interest is due to some vague recollection of some dev boards being more optimized for deep sleep power consumption than others. I don't think you should realistically expect the deep sleep current of this dev board to go below cca 10 mA because that's pretty much the draw of the linear regulator on your Vin pin when Vin is your 7 V source. Which is what you normally observe.

So my best guess would be that your USB connection charged a capacitor somewhere on the board and for a limited (though considerable) time you could observe lower deep sleep current while the ESP was consuming whatever power was stored in the capacitor. Properly shutting down the board should drain capacitors in a controlled fashion.

Anyway, I'm asking more than I'm actually answering since it's inconvenient at the moment to actually search for and check through schematic if there even is such a capacitor that could be responsible for your observation.

拇指 0 抬手 0 Reply

P **Peter Dalmaris** 1 year ago

Hi Dan (sorry for replying so late),
This is interesting.
At 9mA, likely, the board is not really sleeping.
I wonder if sleep mode depends on the power source. I have not seen something relevant in the documentation.

拇指 0 抬手 0 Reply

B **Bx Dobs** 2 years ago

Recently purchased some esp32 boards off amazon and received 4 esp32 wroom 32 devkit1 boards ... at issue: D1 (ss14) had been replaced with a zero ohm resistor (MEANING) these boards cannot accept VIN > 5.8V ... as we were using these in 12V apps 3 of these boards have died. All CP2102 pins have a MAX rating of 5.8 V ... D1 is supposed to block VIN from getting to the CP2102. With no diode (zero ohm resistor) the CP2102 is destroyed with VIN = 12V ... buyer beware.

拇指 0 抬手 0 Reply

Peter Dalmaris 2 years ago

That's annoying. If you don't mind, could you share a picture of the burned board to help others avoid it (or at least know about it)?

Thank you for sharing; much appreciated.

 0 0 Reply

Bx Dobs 2 years ago

There is nothing physically burned to share ... the boards still look pristine. ... CP2102s just no longer function ... one of the boards failed with a short between VIN and GND the others no longer provide a comport connection when plugged in to a USB port on my PC

I have a 3.3 V Serial board that I am going to use in attempt to bypass the CP2102 to hopefully still be able to use the piggy backed ESP32 module.

 0 0 Reply

D DavidSG 1 year ago

I think what

@peterdalmaris:disqus intended was to be able to identify, if possible, the manufacturer. Maybe he should have said 'dodgy', not 'burned'. In the very least, when buying a board one can try and check for something looking like a diode (a component with a strip one end) close to the USB socket on the picture on the seller's website. BTW, @Bx Dobs, lucky it didn't smoke your connected computer!

拇指 0 反馈 0 回复

G **Gavin Naylor** 2 years ago
NodeMCU-32S usb/Vin raw power diagram.

拇指 0 反馈 0 回复

P **Peter Dalmaris** 2 years ago
Hi Gavin, I am not sure what you mean.
Are you asking something?

拇指 0 反馈 0 回复

S **Sujit Vasanth** 2 years ago
thanks provided just the infomsation i needed!
拇指 0 反馈 0 回复

D **Davi Mirales** 2 years ago
I need know the model of ESP32 because the source change with the components and resources of models of ESP32. Sorry my english

拇指 0 反馈 0 回复

S **stevon ritchie** 2 years ago
Hi
Do you think it would be possible to power and program the esp32-cam via a battery charging board like the tp4056 ?Powering works fine, but i was wondering what happens to the the 2 data lines when you plug the usb cable in, i can't see any data out from the board.Is there a reason they don't exist ?
steve

拇指 0 反馈 0 回复

P **Peter Dalmaris** 2 years ago
Hi Stevon, I don't think this is possible. The TP4056 takes power only from the USB cable, and passes this power to the ESP32 board and battery. To program the ESP32 you will need to plug a data USB cable to your computer, or (if you really need to leave the TP4056

connected), you can figure out a way to use the ESP32's other on-board programming options (serial, JTAG, maybe?).

拇指 0 回复

S stevon ritchie 2 years ago

yeah, i do not think it is possible. the data lines from the usb cable do not appear to be connected to the tp4065 board at all.

拇指 0 回复

T Tajwar Kumar 2 years ago

Hi i want to connect the scanner of 12V DC ground along with ESP32. I already connected the 3.3V,5V supply with the ESP32. Now can i connect that scanner (12VDC) ground with ESP32 ground .

拇指 0 回复

D DraISoft Widmore 3 years ago

--

拇指 0 回复

D DraISoft Widmore 3 years ago

Hello,

I'm trying to power an ESP32 with 2 AA alcaline batteries and using a step up DC-DC (MT3608) to make it to 5V. The red led blinks all the time non stop.

This setup works for the NodeMCU ESP8266. It also works using a simple phone charger.

Any ideas?

拇指 0 回复

D DraISoft Widmore 3 years ago

Hi Peter, thanks for anwering,

I measured from the 5v pin and one of the GND pin of the board:

Connected to the USB it measures exactly 5v
Connected to the batteries it measured 4.8v, so I increased the voltage to 5.5v and it measured 5v, still same result, blinking and not connecting. Also tried with the 3.3v pin providing 3.3v, no luck

I got to try with the 2 batteries only but i have to unweld the cables..

<https://uploads.disquscdn.c...>

拇指 0 回复 0 Reply

P **Peter Dalmaris** 3 years ago

Thank you for the photo, it helps a lot.

I still suspect that the AA battery setup might not be able to provide sufficient current to allow the device to boot. When you measure the voltage, you probably see a steady voltage after the device has tried (and failed) to boot.

Do you have a LiPo battery or a bench power supply around? You can use those to replace the AA batteries (but keep the step-up power supply). See if the device boots this way. Both the LiPo battery and the bench power supply will be able to provide sufficient current for the boot up process.

拇指 0 回复 0 Reply

P **Peter Dalmaris** 3 years ago

Hi,
could you provide information on how you have connected the MT3608 to the ESP32 module?

I suspect that the current provided from the batteries is insufficient to power up the ESP32. The draw increases when Wifi is in use.

Do this experiment: power your ESP32 module via a phone charger or USB (whichever works). Use a multi-meter to measure the current draw during normal operation (value "1"). Then replace the power source with the battery + step up supply. What is the power draw now (value "2")?

If value "1" > value "2", then the battery setup is insufficient.

Another thing you can try is to not use the step up power supply. Just connect the 2xAA batteries to the ESP32 module's 3.3V pin. This should provide enough current to allow the ESP32 to operate until the voltage drops below ~ 2V (depending what else is connected, see <https://www.espressif.com/s...> page 42).

拇指 0 回复 0 Reply



Myint 3 years ago

Hello Peter, Thank you for sharing this article. Could you please explain the advantages of choosing option 3 for 3.3V instead of option 2 for 5V-10V? I have seen people decrease incoming signals to the ESP32 to 3.3V and increase all outgoing signals from the ESP32 to 5V to ensure the signal is compatible with the control systems. I do not understand why we do that, especially when we have option 2, where we will not need to increase or decrease the voltage.

拇指 0 回复 0 Reply



Peter 3 years ago

Hi Myint, in general, lowering the supply voltage results in lower power consumption. This is important particularly for battery powered applications. For a device that transmits, if the supply voltage is too low, it is possible that when the device transmits, the voltage will drop too low cause a brown

out, and eventually reboot. This is probably what is happening in the scenario you describe.

拇指 0 质疑 0 回复

A AZ 3 years ago

That is a very good article for the beginners. The only major problem with it is that it should mention that ESP32 is very power greedy on startup. Your typical small 3.3V power regulator would provide 100-150 mA tops and the ESP32 will not be able to start. Whatever powering option you choose, make sure you have enough current capability, at least 300 mA (well, USB has it by design).

拇指 0 质疑 0 回复

P Peter 3 years ago

Thank you, that's a good tip.

拇指 0 质疑 0 回复

D Dick 3 years ago

You can safely use USB and vin if you add a schottky diode in the +ve side of vin, there is one already in the USB derived line

拇指 0 质疑 0 回复

P Peter 3 years ago

Thank you for the tip, I appreciate it.

拇指 0 质疑 0 回复

M Max Bursell 3 years ago

Hi. Have you ever had the issue where your ESP32 won't connect to wifi when using external power supply? im using the "doit esp32 Devkit V1". the Wifi works fine as long the board is connected to my PC. But if I power it from an original apple phone charger or any other phone charger, it sometimes works and other times not. its seems a bit random. But when powering the board from

"VIN" with 5V , the Wifi NEVER works. Have you had the same issue? if so, I will be very greatfull if you could explain how you fixed it. Thank you for creating the amazing content you are sharing.

拇指 0 回复

W **Wagner Fontes** 2 years ago

Hi everyone, Same issue here, My ESP32 works fine when powered by the USB connector (and any source - computer, Samsung phone charger, generic phone charger), but does not connect to WiFi when powered at VIN/GND pins. I used an ATX power supply, checked the voltage using a meter (5.0V), the red LED on the ESP turns on, but the WiFi connection never happens. This ESP has a lot of LEDs (12 connected to different PWM pins) and a few touch and button sensors connected to it. It all works fine when the power comes from the USB. It would be very nice to use the ATX PSU to power the ESP32, if anyone could solve this issue...

拇指 0 回复

P **Peter Dalmaris** 2 years ago

Hi Wagner,
this problem may be due to the large load on the ESP32 during WiFi communications, considering the LEDs, sensors, etc that are also connected. A momentary voltage drop is enough to disrupt WiFi.
Try attaching a ~10uF capacitor directly to the Vin and ground pins of your board. This should provide decoupling capacitance and assist your power supply when power requirements increase.

拇指 0 回复

T

Tony Kavanagh 3 years ago

max did you ever get this issue resolved I have exactly the same problem it all works great whilst the usb is connected to my computer but as soon as I change over to stand alone power supply the wifi does not connect.PS I am a complete novice so any help would be appreciated

0 0 Reply

P

Peter 3 years ago

Hello Max,

I have a similar setup, which is the deliverable from my ESP32 IoT project (see <https://techexplorations.co...> for a photo).

The ESP32 (similar to yours), is also connected to an 12W Apple charger/power supply. The supply is enough for the ESP32 plus a sensor and display (as per the project).

I have not noticed any problems, and the gadget has been working well since I completed that course.

What rating is your power supply? It is possible that if it is a smaller one (like 5W), it may not be able to supply enough current during peak draw when Wifi is working.

Your computer can easily supply peak current, so it works fine.

Do you have another USB power supply you can use to test?

I note you mentioned "any other phone charger".

What are their power ratings?

Is there anything else connected to your ESP32 (sensors, displays etc)?

0 0 Reply

g

gI 2 years ago

I've seen this before, and while I can't remember for sure, it may be that the power supply is too noisy/dirty and that is interfering with the Wifi and/or the stability of the chip. you'll need an oscilloscope to check for sure, but you can also just try another PSU. Or try the cap that Peter mentioned above, that might clean it up.

拇指 0 回复

P **Paul** 3 years ago

Hi Peter, Thank you for very interesting article. I am interested to supply my Node MCU esp32 wroom via 5vin pin and use usb to upload sketch. I was using an old laptop psu with a buck converter (LM25965) to regulate the input to 5v. Since the voltage should be approx the same for vin and usb, can I use both at the same time?

I am using 3 external relays and using 3v logic to relay inputs, with separate 5v supply to coils. Also using 3 temp sensors (ds18b20) with 3v, but my 3v pin shows 5v on the multimeter! Would the common ground between 5v and 3v cause this? Also powering a 16x2 lcd. My sketch sends data via WiFi every 5 mins. Will the board be able to run all of these from the 3v pin, or should I power these direct from 5v output on buck converter? Does the buck converter need the capacitors on output, as you suggest? Is there a better way to power this ? Thanks for your suggestions, Paul

拇指 0 回复

P **Peter** 3 years ago

Hi Paul,

You have a few questions together, I'll try to address each one:

1. "can I use both at the same time?" --

No, I wouldn't do that. 5V from one

source will be exactly 5V from another source. If the difference is small, you might get lucky and not burn out your MCU.2. "Would the common ground between 5v and 3v cause this?" - I don't know for sure, but if the 3V pin shows 5V (assuming you have grounded the multi-meter and everything else correctly), then you are passing 5V to the MCU's 3V pin. Check the wiring again!3. "Will the board be able to run all of these from the 3v pin" - You are pushing it a bit. The 3.3V pin can provide safely up to around 50mA. Consider measuring the current draw of everything connected to the 3.3V pin (one at a time, unless you have several multimeters) and confirm you are not drawing too much.4. "should I power these direct from 5v output on buck converter?" - Yes, you should consider an external power supply for these devices.5. "buck converter need the capacitors on output" - I would look for a suitable power supply module that takes care of the details. A good one would include capacitors. Which one to get depends on your circumstances. Are you using a mains power supply? An alkaline battery pack? LiPo?

0 Reply

P **Paul B** 3 years ago

Peter, looking at the circuit you linked there is a zener between the VIN and the USB 5V/3.3V. That means that as long as the VIN voltage is higher than the USB voltage it is quite safe to have both connected. The potential issue is if the USB voltage is higher than what you put on VIN then it will overload the USB supply. Most USB ports tend to be fail safe today. I have an

ESP32 board arriving later today and in the interests of science I will connect a 12V supply to VIN and connect my USB at the same time. If I don't report back it's because my computer caught fire...

拇指 0 反馈 0 回复

B **Bx Dobs** 2 years ago

↳ P Paul B ago

D1 per the DevKit 1 online schematics is a SS14 which from Vishay datasheet is a Schottky diode (not a zener) ... this diode basically blocks any VIN Voltage from getting to the CP2102 VBus pin but allows both the USB VBUS and VIN pins to connect to the 1117 3.3V regulator Vi pin ... Schottky has a low forward bias approx .3V which drops the 5.1 USB VBUS to around 4.8 V for the 1117 Vi pin ... this is critical because the regulator starts loosing regulation around 4.5V which would happen with a generic silicon diode like 1N4007 or a zener was used.

拇指 0 反馈 0 回复

P **Peter** 3 years ago

↳ P Paul B 3 years ago

Hi Paul,
I hope your computer did not explode.
I note it has been two days since your last message :-)

拇指 0 反馈 0 回复

P **Paul** 3 years ago

Hi Peter, Thank you for your very helpful reply. (This is my 3rd attempt at trying to reply to yours, for some

reason when I press send, the comment disappears!)

Anyway, to answer your question, the project runs off mains. I had an old laptop PSU which I ran to the buck converter, but it seemed to run erratically, so I adjusted the buck capacitor and it kicked in too many volts and bang.....RIP ESP. So I have rewired with a 5v USB charger and removed the buck converter. I am still struggling to figure out how will the ESP drive the 3V3 logic signals to the 3 temp sensors and 3 relays. If they exceed 50mA, what other options do I have? As I said I have a separate feed to the coils on the relays at 5v and to the 5VIN on the LCD display. Should I tie all DC circuits to a common ground? Thanks again, Paul

拇指 0 回复 0 回复

P Peter ↗ P Paul 3 years ago

Hi Paul,
I would use something like this (a low cost power supply I just found on Aliexpress).
I've ordered a few to test myself.
It can supply 5V and 3V simultaneously.
Yes, all circuits must be tied to the same ground.

拇指 0 回复 0 回复

J Joe Magee 3 years ago

i need to power my system using a 3.7V power supply (thats all thats available to me). Can i use the 5V input pin as 3.7 exceeds the 3.3V option

拇指 0 回复 0 回复

P

Peter 3 years ago

Hi Joe,

please refer to the datasheet:

<https://www.espressif.com/s...>

In page 16, see the function for pin #37,
"VDD3P3_CPU".

There, we learn that this pin has a
tolerance of 2.7V to 3.6V.

Your 3.7V input is slightly above that. You
can still consider using a voltage divider
to get this input voltage within the safe
use range.

拇指 0 回复 0 Reply

I

Lurian 3 years ago

Hi, I have COM port problem: when esp32 is connected via usb to the computer, the COM port does not appear, although all types of drivers for the cp2102 are installed, perhaps because the pc's usb does not have enough current to power the esp32. So how to load a sketch if I have to power the esp32 with an external power supply but 2 power supplies cannot be together (pc's usb + external power supply)?

拇指 0 回复 0 Reply

J

JimA 3 years ago

Had a similar problem (Windows 10) had to uninstall and reinstall the driver then all was fine

拇指 0 回复 0 Reply

P

Peter 3 years ago

Hi Lurian,

if your ESP32 board has a power and activity LED, do those turn on when you plug the board to your computer's USB port?

The ESP32 takes very little current from the USB port. Therefore, I doubt that power is the problem.

If you are certain that the USB drivers are correctly installed on your computer, and the board does not respond, then the board may not be functioning properly. Damaged ESP32 boards are rare, but possible.

If you have a second computer available, use it to confirm that.

If you have a second ESP32 board, try that to rule out a problem with the USB port. If the second board also does not work, then the problem may be incorrect USB drivers (assuming that the port itself works with other devices).

拇指 0 回复 0 Reply

a amanda 4 years ago

I am trying to power a 12lb combat robot, and instead of using a receiver due to possible wifi at home controls, we are using an Arduino UNO and esp 32. If my Arduino is powered by a battery, and I am trying to power on the esp 32 from the Arduino's power, is it possible to use a double headed (male) usb cord to transfer that power.

拇指 0 回复 0 Reply

P Peter 4 years ago

Hi Amanda,
yes, it is possible.

However, please keep in mind:

1. The Arduino Uno needs 5V, while the ESP32 needs 3.3V. For the ESP32 you can go through its USB port (5V).2. Use a Lipo battery with at least two cells so that can deliver > 5V.3. Use two pairs of 100nF and 100uF capacitors on the power pins of the ESP32 and the Arduino to help with voltage spikes and drops.

I hope this helps.

拇指 0 回复 0 Reply

B Bill 4 years ago

This is helpful, but I would really like to see the schematic, so that deeper questions can be answered. For example, is the 5V pin directly wired to the usb connector, or is it diode coupled into the circuitry? And, which pins are off limits because they are wired to LEDs, buttons or other stuff?

If you update this article, please include current requirements. I read a spec that indicated 400 mA (probably a worst case with everything cranking plus some margin). Showing beginners your measurements of about 100 mA is misleading.

拇指 0 反馈 0 Reply

P Peter 4 years ago

Hi Bill, you can look at this reference schematic for the v4 of the ESP32 devkit here: <https://dl.espressif.com/dl...>

There are many more details I can include in this article. I will consider an update soon.

Can you point me to the spec that mentions the 400mA figure so I can check?

Also, can you please point me to the location in the article where I mention the 100mA figure?

拇指 0 反馈 0 Reply

J Justa 4 years ago

The captions under the images of the ammeters have not been updated ; they still state '12.8mA' and '9.9mA' instead of the correct '128mA' and '99mA' that were stated in the text above.

拇指 0 反馈 0 Reply

P Peter 4 years ago

Hi Justa, thank you for this, I have updated the article.

拇指 0 回复 0 Reply

L LuigiChi 4 years ago

Many Thanks!

拇指 0 回复 0 Reply

H Harry P. 4 years ago

Hi, Why i don't connect the ESP in USB port and plug 5v power supply at the same time?
In arduino it's possible. Its good from that case the ESP consume more current than PC USB port can supply, and the user need upload a sketch for example.

Thanks

拇指 0 回复 0 Reply

P Peter 4 years ago

Hi Harry,
the risk in doing so is that unless the USB power and the 5V pin power are at the exact same voltage level, there will be low resistance between the two power supplies. Low resistance (i.e. almost zero ohms) means high currents, which can damage the power supplies and the ESP32.

So, best to not take the chance.

拇指 0 回复 0 Reply

D Darrell Pelan 2 years ago

When I power the USB with a 5V supply and use a power blocker (no connection on the 5v USB line) on the USB cable, the PC does not recognize the ESP32 COM port. Using a Schottky diode on the 5v power supply to isolate the power supplies allows me to use a normal USB cable which allows the PC to recognize the COM port. Is this expected behavior?

拇指 0 回复 0 Reply

P **Peter Dalmaris** 2 years ago
↳ D Darrell Pelan

Hi Darren,
I have not done something like that, and I have not seen any relevant documentation. Aside from that, yes, I would expect to see what you see. Perhaps you will have the same behaviour if you simply connect the USB GND to the ESP32 GND instead of the diode.

拇指 0 回复 0 Reply

D **Darrell Pelan** 2 years ago
↳ P Peter Dalmaris

Thank you for your reply. The ESP32 is on an interface card in a Heathkit H-89 to provide a WiFi interface for my 1980 era computer. The ESP32 is powered by the H-89 5v supply. I needed to connect a USB cable for programming while developing the interface card. The Schottky diode is to isolate the two 5v power supplies (H-89 and PC USB cable) based on the concern about using only one source of power for the ESP32

拇指 0 回复 0 Reply

M **MB** 4 years ago

Hi!
For option 2, does the esp32 regulate the power itself or do I have to regulate it myself?
Thanks!

拇指 0 回复 0 Reply

P **Peter** 4 years ago
Hi MB,

Option 2 power goes through the on-board voltage regulator.

So, the answer to your question is "yes".

拇指 0 回复 0 Reply

J Jose Luis g 4 years ago

Hi. Yesterday i used a unregulated voltage universal 30w. I choose 5v and perfect. But then changed to 6v. It smell burned. Yet not working my esp32. What amp is neccesary? 30w is a lot? 30w/6v--> 5amps. Thanks

拇指 0 回复 0 Reply

P Peter 4 years ago

Hi Jose,
If you are bypassing the onboard voltage regulator (option 3), what is important is to ensure that voltage does not exceed 3.3V. There is a bit of margin, but you should not go too far above 3.3V. The "wattage" of the power supply indicates how much power it can supply. How did you power your board?

拇指 0 回复 0 Reply

M MRC 4 years ago

Hi, what board are you using?
I've connected a DOIT ESP32 DEVKIT V1, and I can't power it through the VIN. Tried with 5, 7 and 12V

拇指 0 回复 0 Reply

P Peter 4 years ago

I'm using a generic ESP32 Devkit with 38 pins. I think I got it from Aliexpress.
Do you have a link to the DOIT you are using? I can have a look.

拇指 0 回复 0 Reply

V Veer 4 years ago

Hey! In the second option, I'm considering using this , 7.4 V Rechargeable Lithium-ion

Battery Pack (2400 mAh). Let me know if it can work

拇指 0 回复 0 Reply

P Peter 4 years ago

Hi Veer, as long as you regulate the 7.4V output of the battery to the 3.3V of the 3.3V pin (option 2), it will work. Don't connect it directly!

拇指 0 回复 0 Reply

M MJ 4 years ago

HelloMy program runs fine off first option (USB) but when I use the second option I am having problems. when I have 5V connected to 5V and GND; board starts up but when it gets to the part of my program where I am initializing my WIFI the board resets, resetting happens a few more times until it is finally to get through WIFI part. Any idea what's going on?thanks

拇指 0 回复 0 Reply

P Peter 4 years ago

Hi MJ,
can you please describe what kind of 5V power supply you are using? It is likely that when the Wifi kicks in, there is a voltage drop that causes the problem.
Try increasing the voltage from 5V to 6V on the 5V pin to see if that improves reliability.

拇指 0 回复 0 Reply

R Rashmi Mahadevaiah 4 years ago

In option 3, how to provide regulated 3.3V voltage using AA batteries to ensure current requirements are met ? in series or parallel?
how many AA ? What is the power supply circuit for this ?

拇指 0 回复 0 Reply

P

Peter 4 years ago

There is a bit of tolerance around 3.3V but you should not really use unregulated voltage on that pin. At 3.3V, your best option is to use a Lipo battery with an efficient voltage regulator. A good options is this: <https://amzn.to/3eHa4sv>, or even this: <https://www.banggood.com/cu...>

拇指 0 回复 0 Reply

R

Rashmi Mahadevaiah 4 years ago

Using option 2, how can I connect AA battery to power ESP32 and operate WiFi and bluetooth modes normally? Which AA battery is to be used ?

拇指 0 回复 0 Reply

P

Peter 4 years ago

Hi Rashmi,
you will need a battery pack with at least 4 AA cells and option 2. BT and Wifi should operate normally, give it a try.

拇指 0 回复 0 Reply

R

Rashmi Mahadevaiah 4 years ago

In Option2, with 4AA cells, the current will not be enough as peak WiFi operation will require 300-400mA. How to ensure required current is provided ?

拇指 0 回复 0 Reply

A

Ahmed Al Bayati

4 years ago

← Rashmi Mahadevaiah

I have yet to understand why it wouldn't be enough to supply 300-400 mA. I was able to make my WiFi module work just fine with 4 AA cells?

拇指 0 回复 0 Reply

P **Peter** 4 years

◀ A Ahmed Al Bayati ago

I have not done specific measurements to determine a range for wifi consumption. Wifi consumption is not constant, as it depends on the environment (distance, obstacles etc), data rates, etc. In my experience, otherwise explainable issues with ESP32 operation are often relating to "brownouts" due to a spike in Wifi power draw. So, it's good to have a capacitor and a decent power supply.

拇指 0 回复 Reply

P **Peter** 4 years

◀ R Rashmi ago
Mahadevaiah

Try using a capacitor, 10uF or larger, that will be able to supply enough current at peak Wifi. Or, you can use a Lipo battery that should be able to cover peak current without a capacitor.

拇指 0 回复 Reply

D **Dudi86748** 4 years ago

If I use a usb maximum power how many volts and amps? Is 5v 6a secure via usb micro?

拇指 0 回复 Reply

P **Peter** 4 years ago

On the power supply side, the maximum Voltage that USB can provide is 5V, at 5A (see the latest USB Type-C rev2.0). On the ESP32, you can easily damage the board if you are not careful, i.e. by accidentally shorting pins etc.

If you need to drive large loads, consider things like relays and transistors connected to an appropriate power supply.

拇指 0 回复 0 Reply

T **Tiago** 4 years ago

Hi, Peter.

Related with the USB option, let me put another question. What's the limit, regarding amps? I have a few smartphone / tablet power supplies lying around, but I'm always concerned if it is too much.

In a nutshell, via the USB:
Max voltage? Max amps? Max power?

Best regards, and sorry for my poor english.

拇指 0 回复 0 Reply

P **Peter** ← T **Tiago** 4 years ago

Hi Tiago,
A certified USB power supply/charger will always be 5V.

The ESP32 will just draw the power that it needs.

As long as the power supply can provide this power, the ESP32 will work.

Again, as long as the USB power supply is certified (i.e. of decent quality), it will not damage any USB device you connect to it, including an ESP32 dev kit.

拇指 0 回复 0 Reply

L **Lukas** 4 years ago

At 10V input voltage, the current draw was 0.099 A (or 9.99mA). - 0.099A = 99mA
At 5V,

the current draw was a little higher, at 0.128 A
(or 12.8mA). - 0.128A = 128mA

拇指 0 回复 0 Reply

P Peter 4 years ago

Hi Lukas,

Thank you for letting me know about this error in the calculation. I have fixed it in the article.

拇指 0 回复 0 Reply

A Austin Gosling 4 years ago

Sorry, brain not engaged - 640mW > 100mW - interesting, I'll check this out.

拇指 0 回复 0 Reply

S Simon 4 years ago
Austin Gosling

For 10V it's $10V * 100mA = 1000mW = 1W$ So 640mW (5V supply) < 1000mW (10V supply) as expected!

拇指 0 回复 0 Reply

A Austin Gosling 4 years ago

You do realise, though that the power used at 10V $\approx 100mW$, while the power when supplied with 5V is $5 * 0.128 = 640mW$.

拇指 0 回复 0 Reply

by Hyvor Talk



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