New issue

ESP resets when USB disconnects while battery installed and charged #85

Closed

Labels bug hardware stale

FransOv opened on Feb 21, 2024 · edited by FransOv Edits

The T-A7608 (https://www.lilygo.cc/products/t-a7608e-h)is powered via usb and the installed battery is charged. When the battery voltage reaches 4V I switch off the usb power to protect the battery from overcharging. When the usb power is disconnected the brownout detector is triggered and the ESP resets. Sometimes, not always, there then occurs a second reset and the ESP enters download mode although nothing is connected to GPIO0.

```
Brownout detector was triggered

ets Jul 29 2019 12:21:46

rst:0xc (SW_CPU_RESET),boot:0x12 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
ets Jul 29 2019 12:21:46

rst:0x10 (RTCWDT_RTC_RESET),boot:0x2 (DOWNLOAD_BOOT(UART0/UART1/SDIO_REI_FEO_V2))
waiting for download
```

Rikests on Mar 4, 2024

This might be related to the other Brownout issue, where ESP32 brownouts when IO12 is pulled high to connect battery power to the modem.
You can try adding a 220uA or bigger cap on ESP32 power pins and see if that helps.

FransOv on Mar 4, 2024 Author ···

I tried with 1000 µF and with 2200 µF capacitor on the 3V3 rail, but the ESP32 still resets. Soldered an external pull-up resistor to GPIO0 to prevent resetting into download firmware mode. Now I have only the problem of a reset about every 20 to 24 hours. I suppose I can accept that.

lewisxhe on Mar 5, 2024 Contributor ···

It seems to be caused by unstable power supply. Excessive capacitance may cause the DC power-on current to be very large and may be destroyed. 220uF may be a better choice.

If GPIO0 is not used, there is no need for an external pull-up resistor, because GPIO0 defaults to an internal pull-up.

FransOv on Mar 5, 2024 · edited by FransOv Edits ▾ Author ···

Same result with 220 µF capacitor. ESP still resets when usb power is disconnected. GPIO0 is not used in my setup. I know that GPIO0 has an internal pull-up resistor and in normal situations it will restart normally, but after the reset caused by disconnecting usb power it will 9 out of 10 times end up "Waiting for download". With the external pull-up it will always restart normally.

👍 1

github-actions on Apr 5, 2024 ···

This issue is stale because it has been open for 30 days with no activity.

github-actions added **stale** on Apr 5, 2024

pacmac on Apr 8, 2024 · edited by pacmac Edits ▾ ···

I have the same problem, every time the modem is powered on it gets a brownout. I have fully charged 18650 3200mah battery and alternatively supplying power via VBAT pin and a good quality power supply ever time the modem is powered on, from a powered off state, I get a brownout.

I added a 100uf cap and that made no difference, I see the comments above about 200uf, but this is obviously a design issue and right now the board is useless to me unless it can sleep and wake and power on and off the modem reliably.

Just to reiterate, this happens every time the modem is powered on, not just once every 24 hours.

👍 1

pacmac on Apr 8, 2024

Yes this is a problem.

The power Pin must be set high at boot time, if you set it after boot you will get immediate brownout.

And this means that the modem must always be powered on when waking from deep sleep, this is a show stopper for me, that is just not viable.

I want to control when the modem comes on, it cannot come on every time after wakeup, that is totally impractical.

👍 1

github-actions removed **stale** on Apr 9, 2024

pacmac on Apr 10, 2024

Is there a solution to this ?

Whenever Power Pin is set high (GPIO12) the device brownouts no matter whether connected to battery or USB. Adding capacitors across the supply makes no difference at all.

At the moment I have 2 new boards and because of this they are unusable ??

Thanks

lewisxhe on Apr 11, 2024 Contributor

@pacmac Hi, Do you mean that if you set GPIO12 after startup, the power will be cut off immediately? Are you using the T-A7670 ESP32 version?

lewisxhe added a commit that references this issue on Apr 11, 2024

`Added Modem power off/on test example #85` 38c88d4

lewisxhe on Apr 11, 2024 Contributor

There is no problem with my test here

☺

pacmac on Apr 11, 2024

I am using the T-A7608, it was delivered a week ago.

Yes, as soon as you enable GPIO12 high, it will force a brownout and device reset.

This happens every time the modem is enabled by setting GPIO12 high.

I have 2 boards, it happens the same to both of them, it is impossible to power on the modem without the ESP32 brownout and rebooting itself.

```
#define POW_PIN  (12)
pinMode(POW_PIN, OUTPUT);
digitalWrite(POW_PIN,HIGH);
```

```
Brownout detector was triggered

ets Jul 29 2019 12:21:46

rst:0x8 (TG1WDT_SYS_RESET),boot:0x12 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0030,len:1344
load:0x40078000,len:13964
load:0x40080400,len:3600
entry 0x400805f0
```

☺ 👍 1

pacmac on Apr 11, 2024

```
  #define BOARD                           "ESP32 Wrover Module"
  #define MON                             Serial
  #define SIM                             Serial1

  #define PWRKEY_PIN                      (4)
  #define MODEM_RESET_PIN                 (5)
  #define POW_PIN                         (12)
  #define MODEM_DTR_PIN                   (25)
  #define MODEM_TX_PIN                    (26)
  #define MODEM_RX_PIN                    (27)
  #define MODEM_RING_PIN                  (33)
  #define VBAT_PIN                        (35)
```

```
const int SER_BAUD =                          115200;

void setup() {

  // Serial Setup
  MON.begin(SER_BAUD);
  while(!MON){delay(100);}
  MON.println("Serial Started");

  // SIM Serial
  SIM.begin(SER_BAUD, SERIAL_8N1, MODEM_RX_PIN, MODEM_TX_PIN);
  while(!SIM){delay(100);}

  delay(1000);
  pinMode(POW_PIN, OUTPUT);
  digitalWrite(POW_PIN,LOW);

}

void loop() {
  delay(2000);
  MON.println("Looping");
  digitalWrite(POW_PIN,HIGH);
}
```

```
Looping
Looping
Looping
Looping
Looping
Looping
xxxx�x�x�x���x��x�x��������x�x�x�xx�x���xLooping

Brownout detector was triggered

ets Jul 29 2019 12:21:46

rst:0xc (SW_CPU_RESET),boot:0x12 (SPI_FAST_FLASH_BOOT)
configsip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0030,len:1344
load:0x40078000,len:13964
```

31 remaining items

Load more

lewisxhe added a commit that references this issue on Apr 15, 2024

`Update DeepSleep example #85` c6c541d

pacmac on Apr 15, 2024

I will try later, but if you short out the 2 pins then you cannot power off the modem, GPIO12 will always be HIGH.

Also, you have to sleep for 5 minutes, as it appears that the modem has capacitors that hold charge and if you sleep for such a short time you will not always see the problem.

lewisxhe on Apr 15, 2024 Contributor

The current version cannot turn off the MODEM power supply, and can only be shut down through PWRKEY. If you want to keep the MOS tube, the problem will still occur.

lewisxhe on Apr 15, 2024 Contributor

Sleep time does not affect it because it can be easily tested

lewisxhe added bug on Apr 15, 2024

pacmac on Apr 15, 2024 · edited by pacmac Edits

so your solution is to hold the MODEM reset pin high during sleep & release it on wakeup.

Wouldn't that also work on the POW_PIN ?

```
 void simHoldReset(){
   digitalWrite(MODEM_RESET_PIN, LOW);           // Inverted High
   gpio_hold_en((gpio_num_t)MODEM_RESET_PIN);
   gpio_deep_sleep_hold_en();
 }

 void simReleaseReset(){
   gpio_hold_dis((gpio_num_t)MODEM_RESET_PIN);
 }
```

lewisxhe on Apr 15, 2024 Contributor

Yes, the same applies. But if you don't remove the MOS, the power consumption may increase. You can try this. At present, I think the reliable solution is to maintain DC power supply and switch the power on and off through PWRKEY.

pacmac on Apr 15, 2024

The SIMCOM hardware manual says that the reset sequence is only required if the modem becomes unresponsive to the PWK KEY and it is not necessary to run that sequence every time to power on.

github-actions on May 16, 2024

This issue is stale because it has been open for 30 days with no activity.

github-actions added **stale** on May 16, 2024

github-actions on May 30, 2024

This issue was closed because it has been inactive for 14 days since being marked as stale.

github-actions closed this as completed on May 30, 2024

kgmuzungu mentioned this on Sep 13, 2024

A7670E not working on battery or external power #141

lewisxhe added hardware on Sep 14, 2024

kgmuzungu on Sep 14, 2024

@pacmac how did you get the serial monitor without having USB connected?

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Closed ESP resets when USB disconnects while battery installed and charged #85