



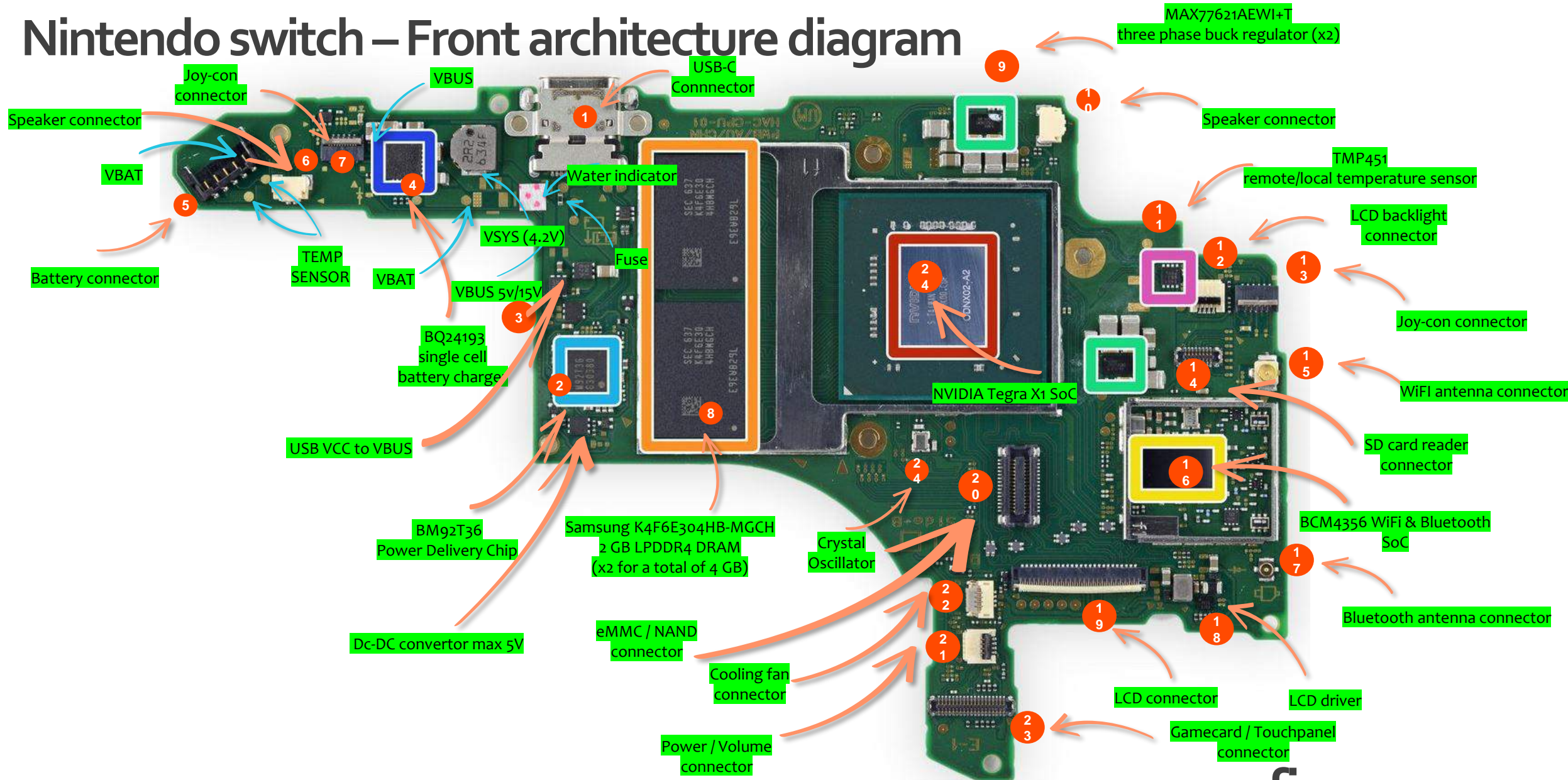
# How to repair nintendo switch



**fixmyapp**  
Research

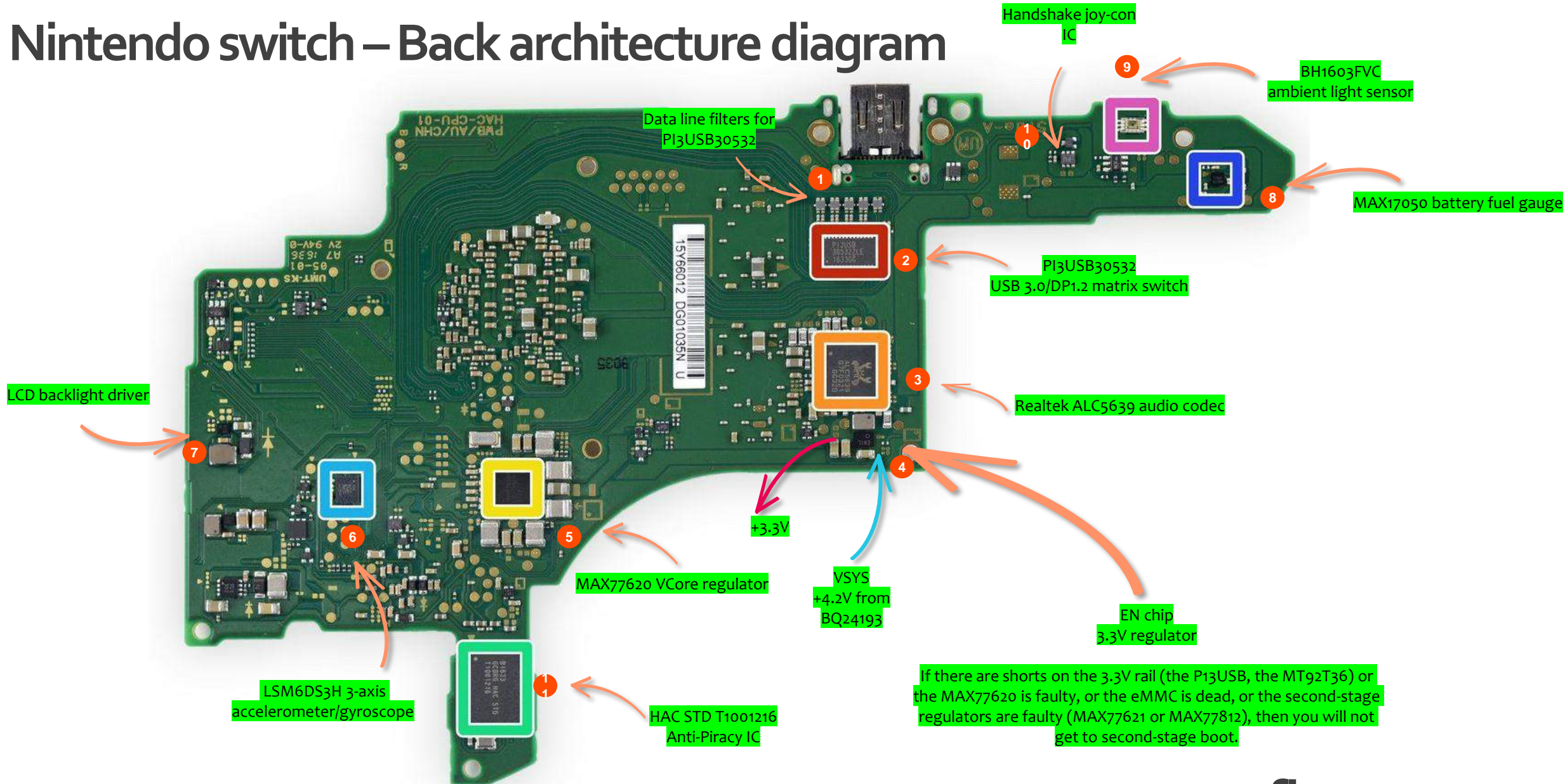
<https://www.youtube.com/@fixmyappjim>

# Nintendo switch – Front architecture diagram

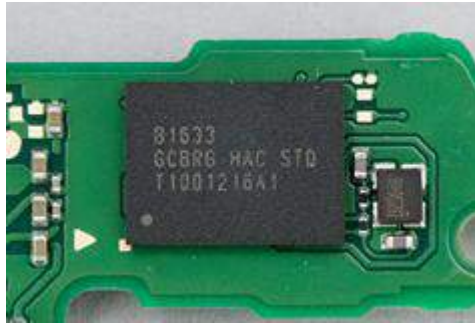




# Nintendo switch – Back architecture diagram



# Nintendo switch – IC's uniquely paired together during the manufacturing process.



HAC STD T1001216  
Anti-Piracy IC



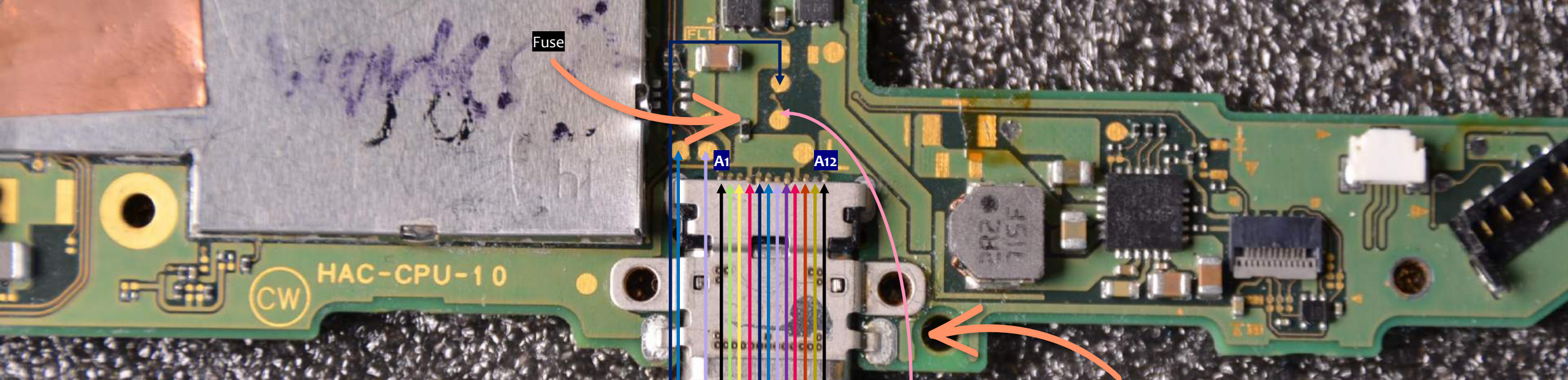
NVIDIA Tegra X1 SoC



eMMC

If one of these IC's is damaged then it is game over  
you have a donor motherboard





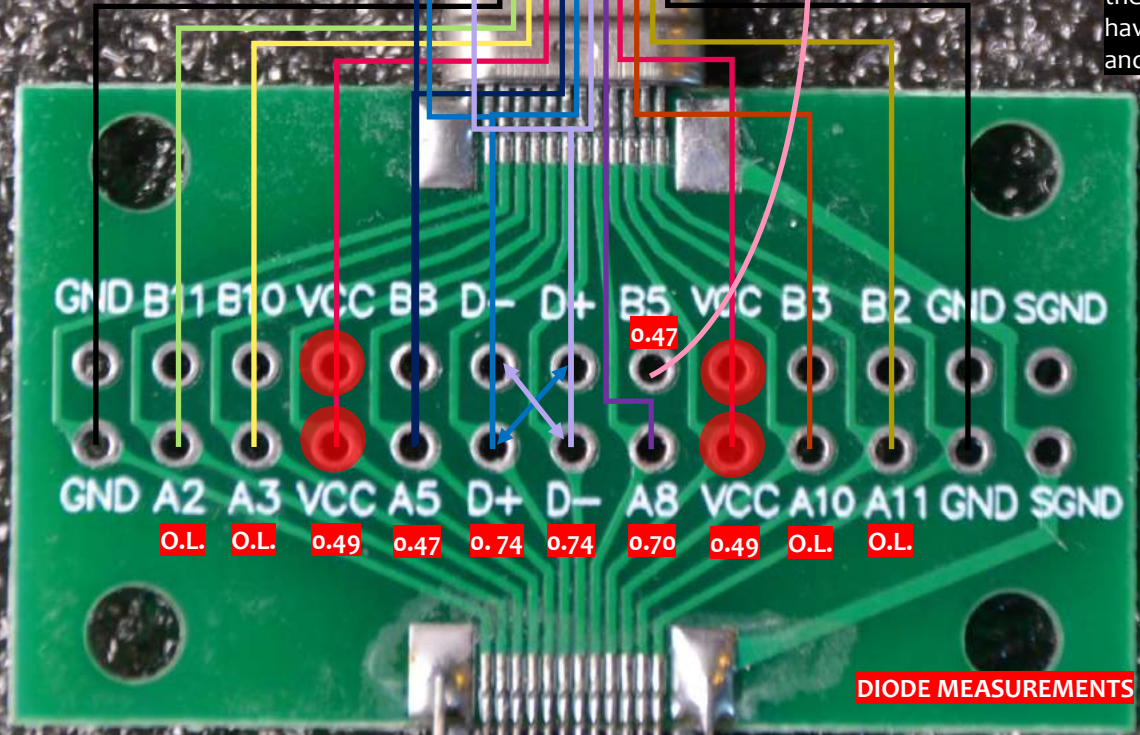
First check all pin's are not shorted, then measure all pins to the correct pad. If there is a signal that is incorrect then you have to remove / replace the USB port before proceeding and analysing the Nintendo Switch

### USB Type-C Connector Pin Assign

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
GND	TX1+	TX1-	V+	CC1	D+	D-	SBV1	V+	RX2+	RX2-	GND
GND	RX1+	RX1-	V+	SBV2	D-	D+	CC2	V+	TX2+	TX2-	GND
B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1

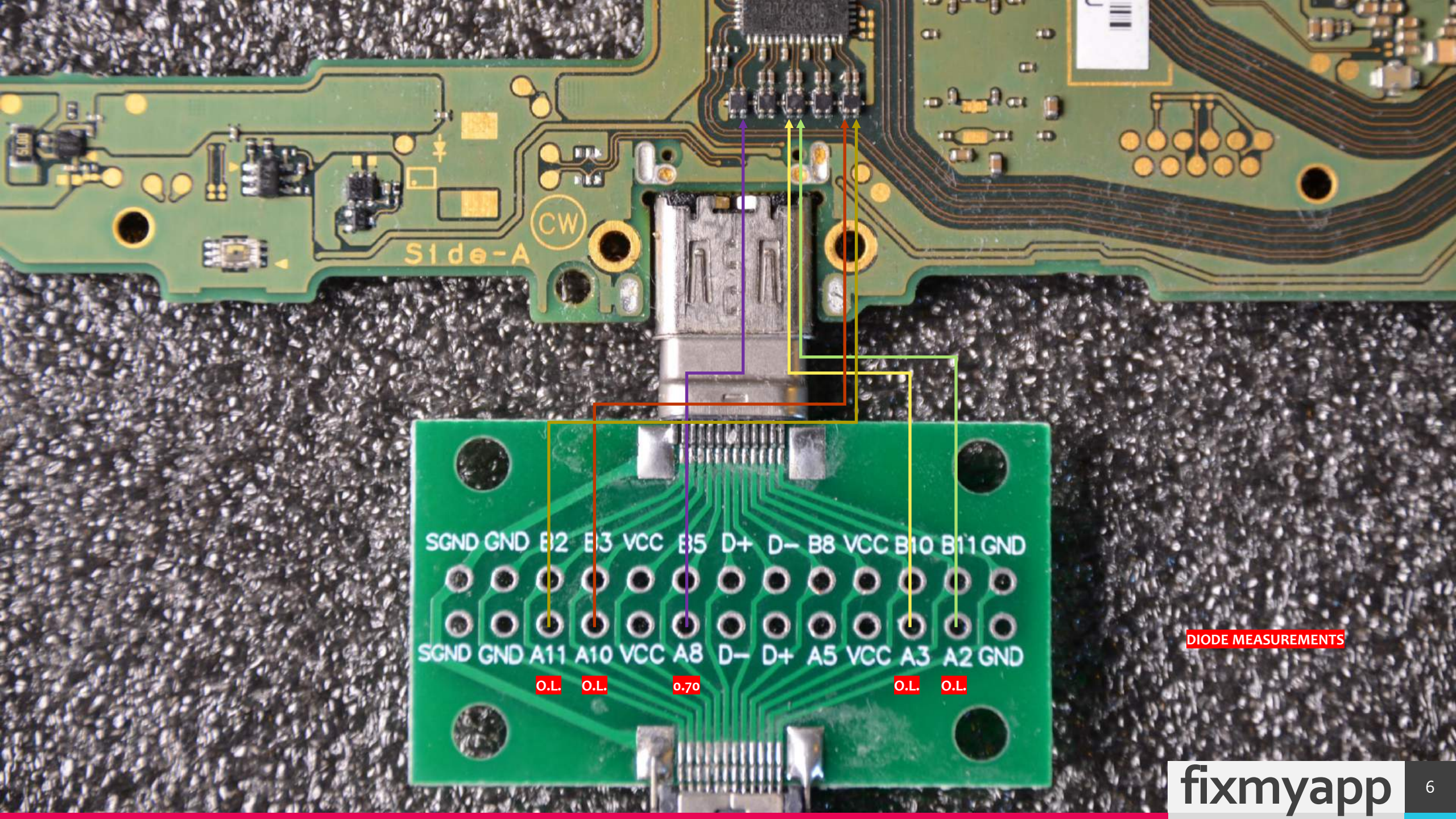
  

USB3.1 Super speed + 10Gbps	Secondary Bus
USB2.0 High speed 480Mbps	USB Power Delivery Communication



DIODE MEASUREMENTS





Side-A

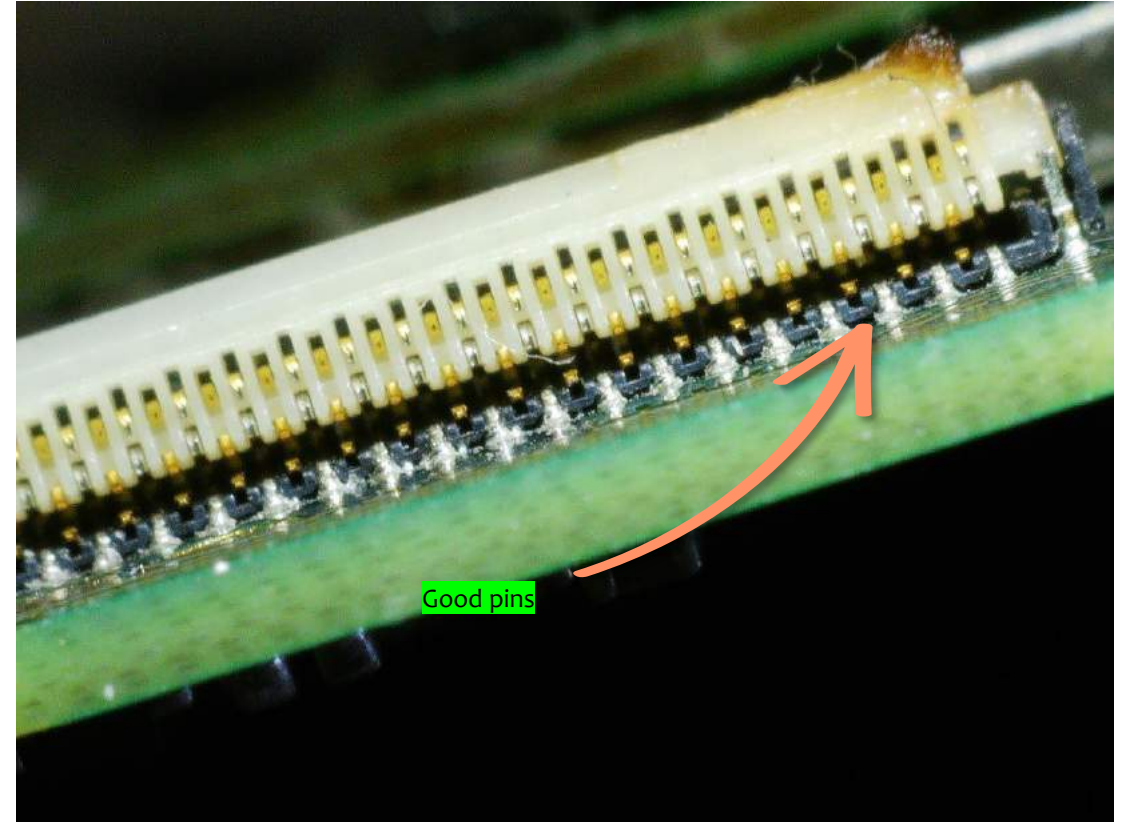
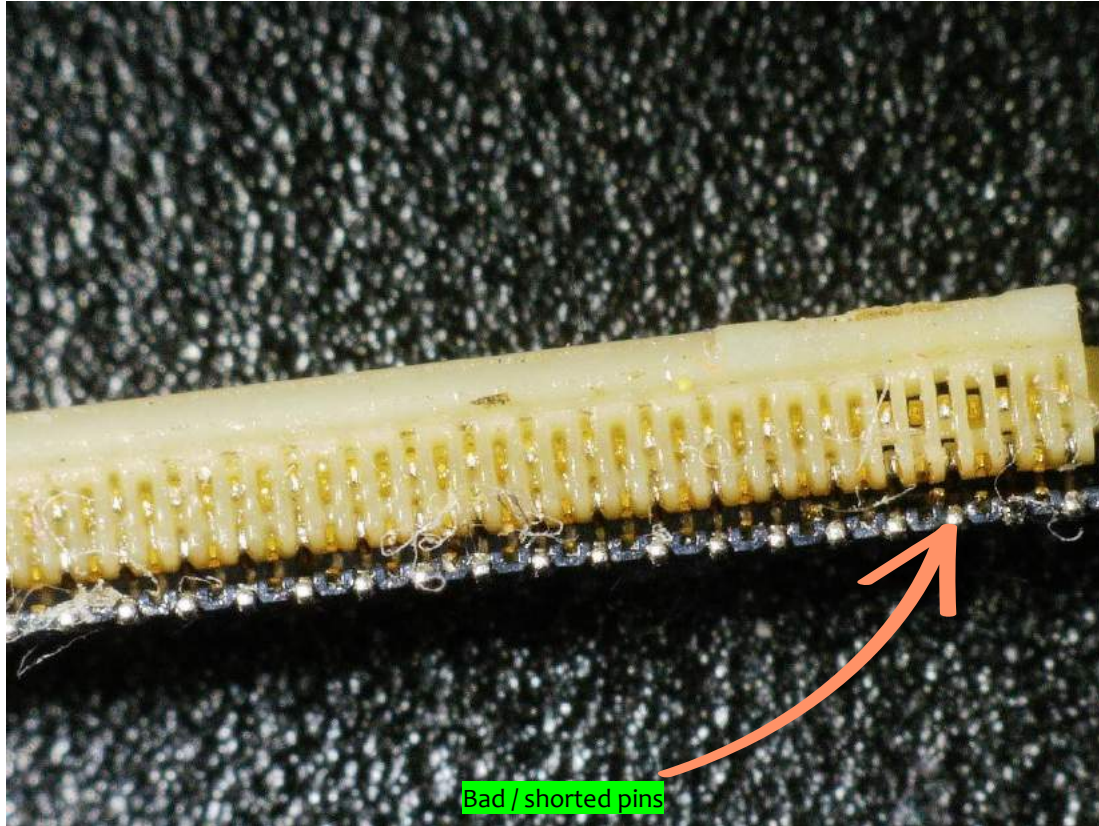
CW

SGND	GND	B2	B3	VCC	B5	D+	D-	B8	VCC	B10	B11	GND
SGND	GND	A11	A10	VCC	A8	D-	D+	A5	VCC	A3	A2	GND
		O.L.	O.L.		0.70					O.L.	O.L.	

DIODE MEASUREMENTS



# Check pins on LCD connector





## M92T36

The M92T36 is a power management IC (integrated circuit) used in the Nintendo Switch console. It is responsible for regulating power supply and charging functions.

The M92T36 has been known to develop faults or failures in some Nintendo Switch units, leading to issues such as charging problems, battery drain, or power-related issues.

Measure all caps for shorts

Short on this capacitor can mean that the PI3USB30532 IC can be faulty

Short on this capacitor after removing M92T36 IC  
Could be a faulty SoC chip, then it is not fixable

DIODE MEASUREMENT

<https://www.youtube.com/@fixmyappjim>

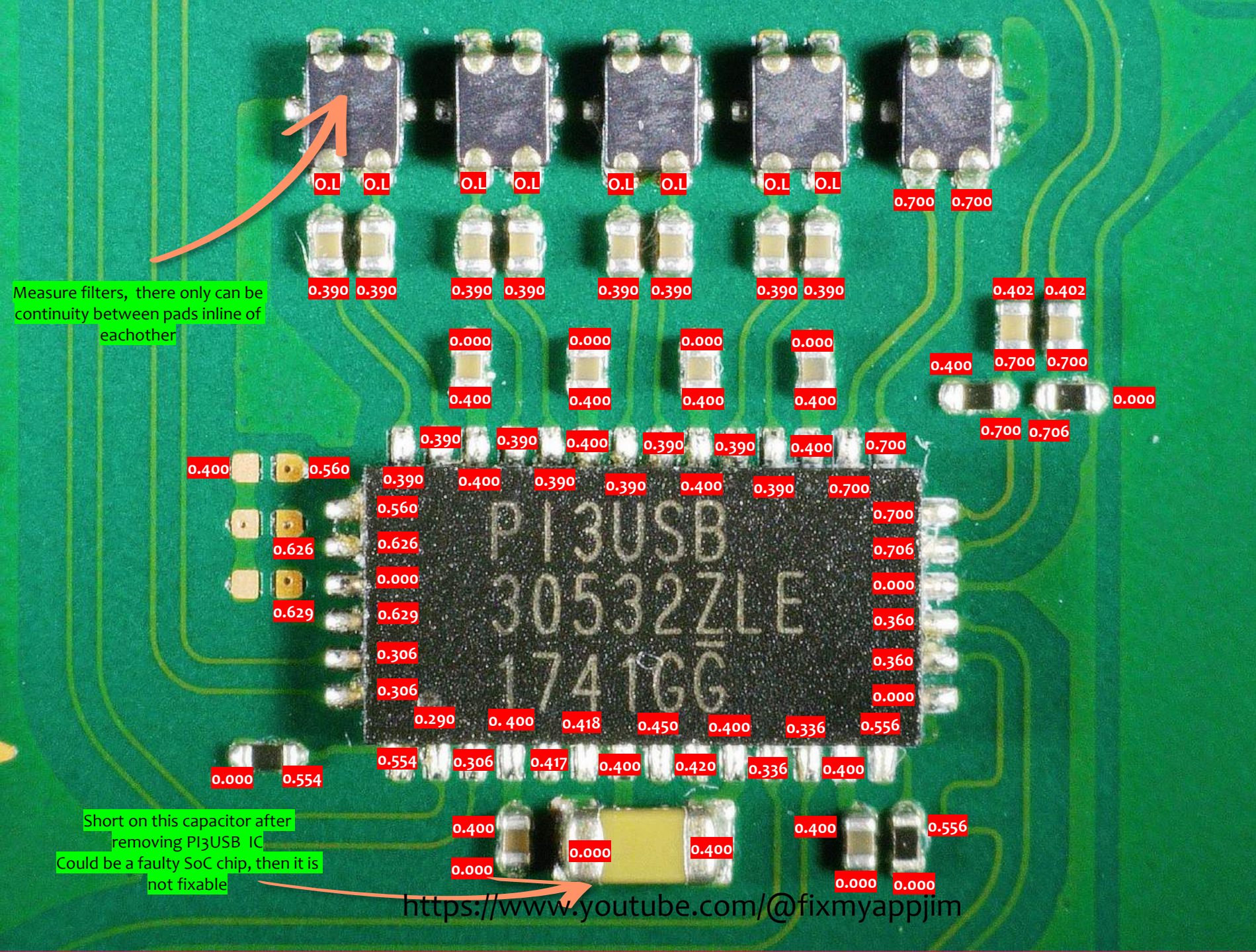


## PI3USB

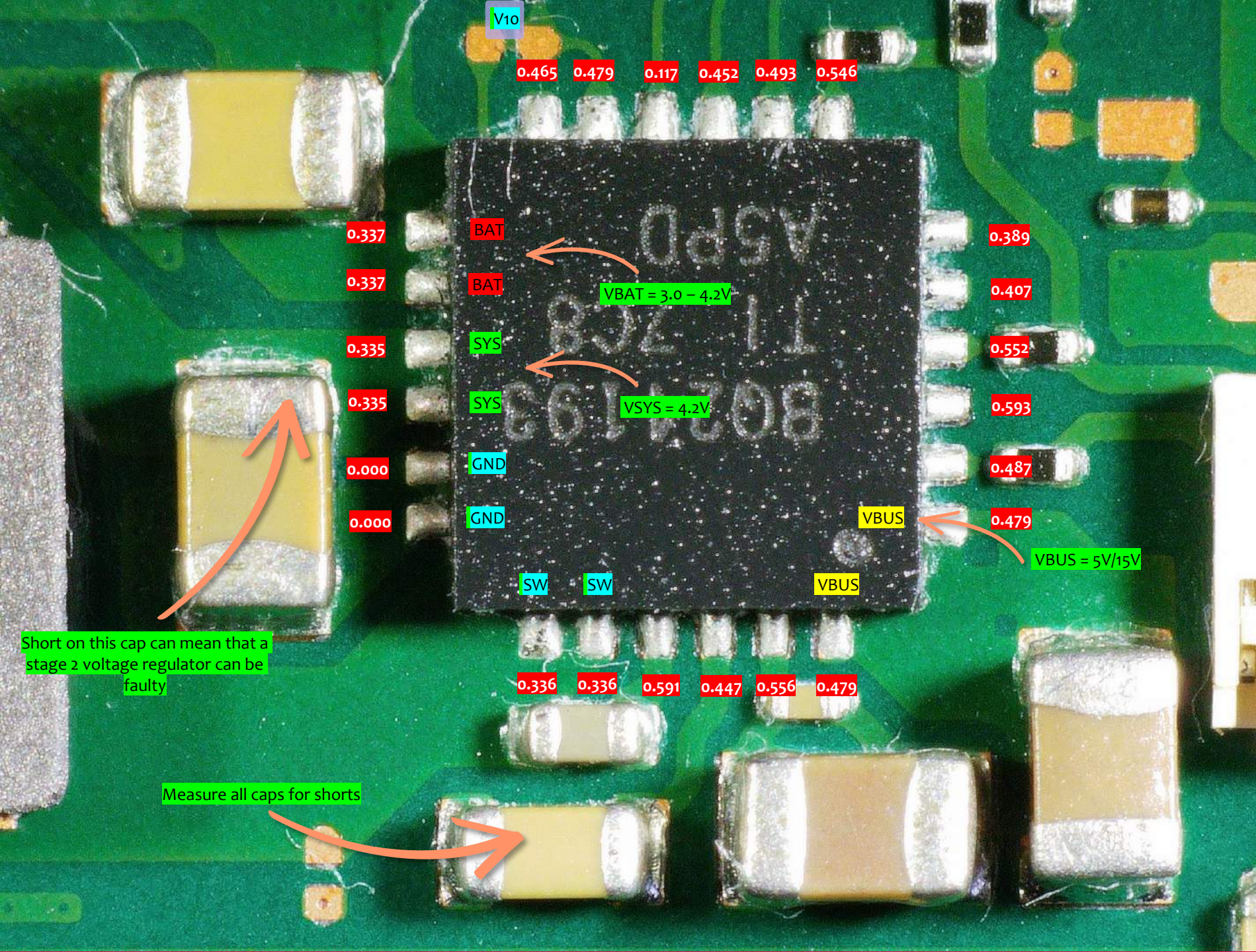
The PI3USB3 could potentially serve as a USB switch to handle USB data and power connections between different components of the console.

This could involve routing USB signals between the console's USB-C port, internal circuitry, and possibly external accessories or the docking station.

### DIODE MEASUREMENT

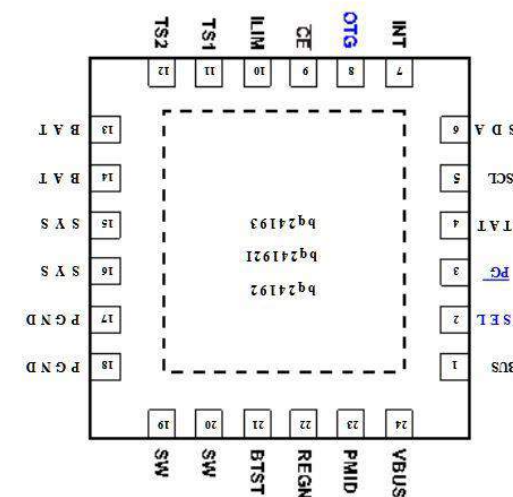






## BQ24193

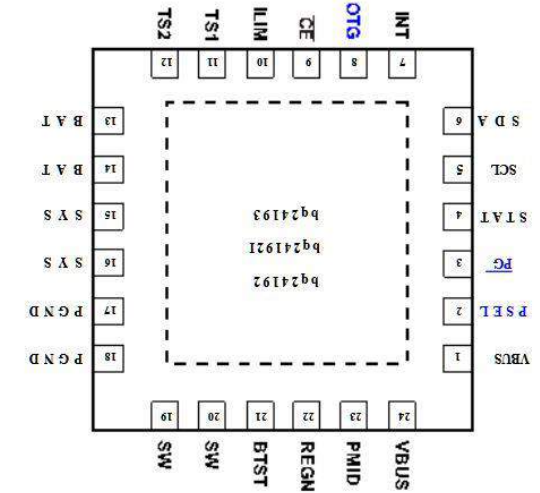
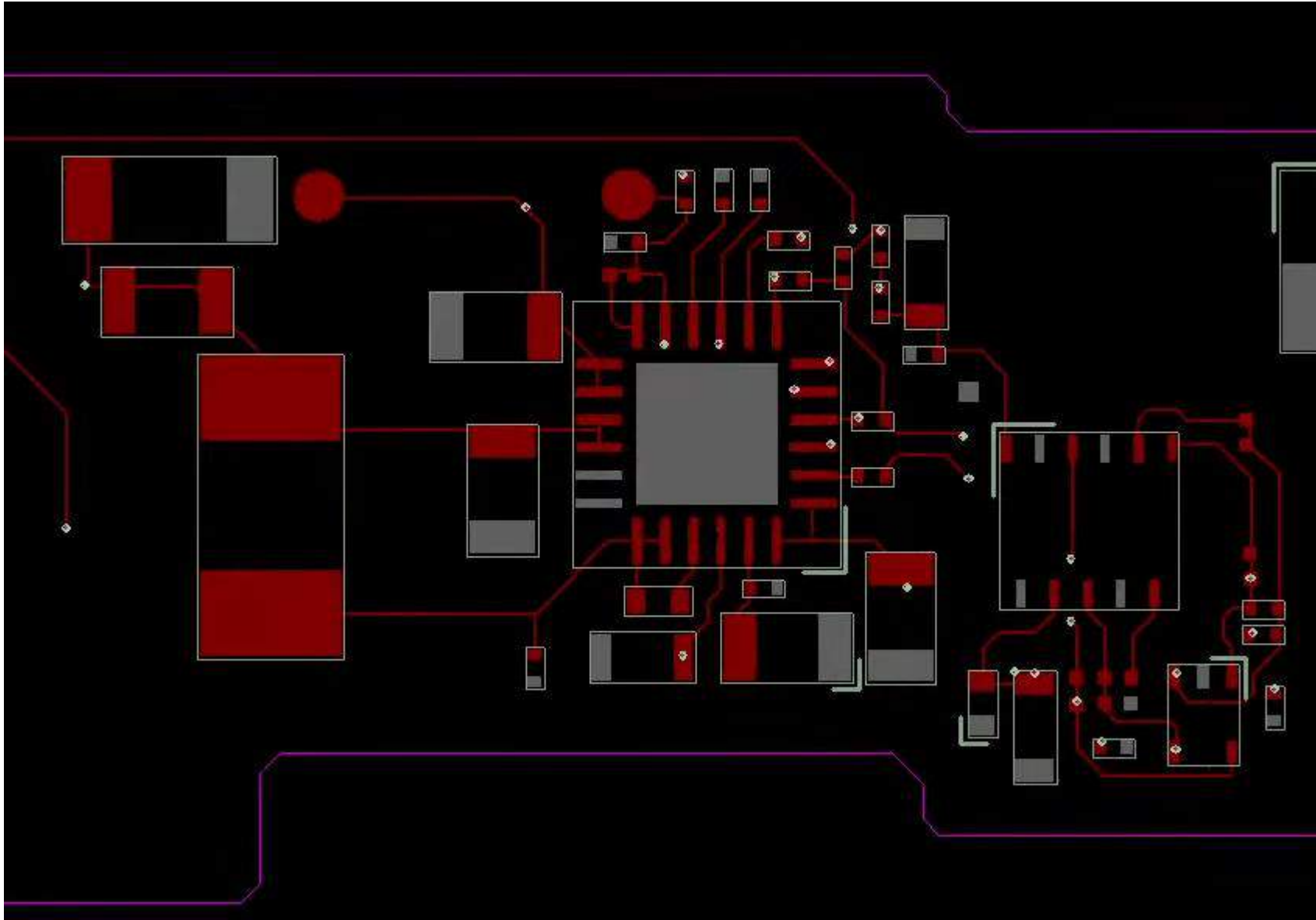
One of the notable functions of the BQ24193 is its ability to provide a charging profile that is optimized for the battery used in the Nintendo Switch. It supports various charging modes, including pre-conditioning, constant current charging, and constant voltage charging, ensuring that the battery is charged in a controlled manner.



DIODE MEASUREMENT

RESISTANCE MEASUREMENT

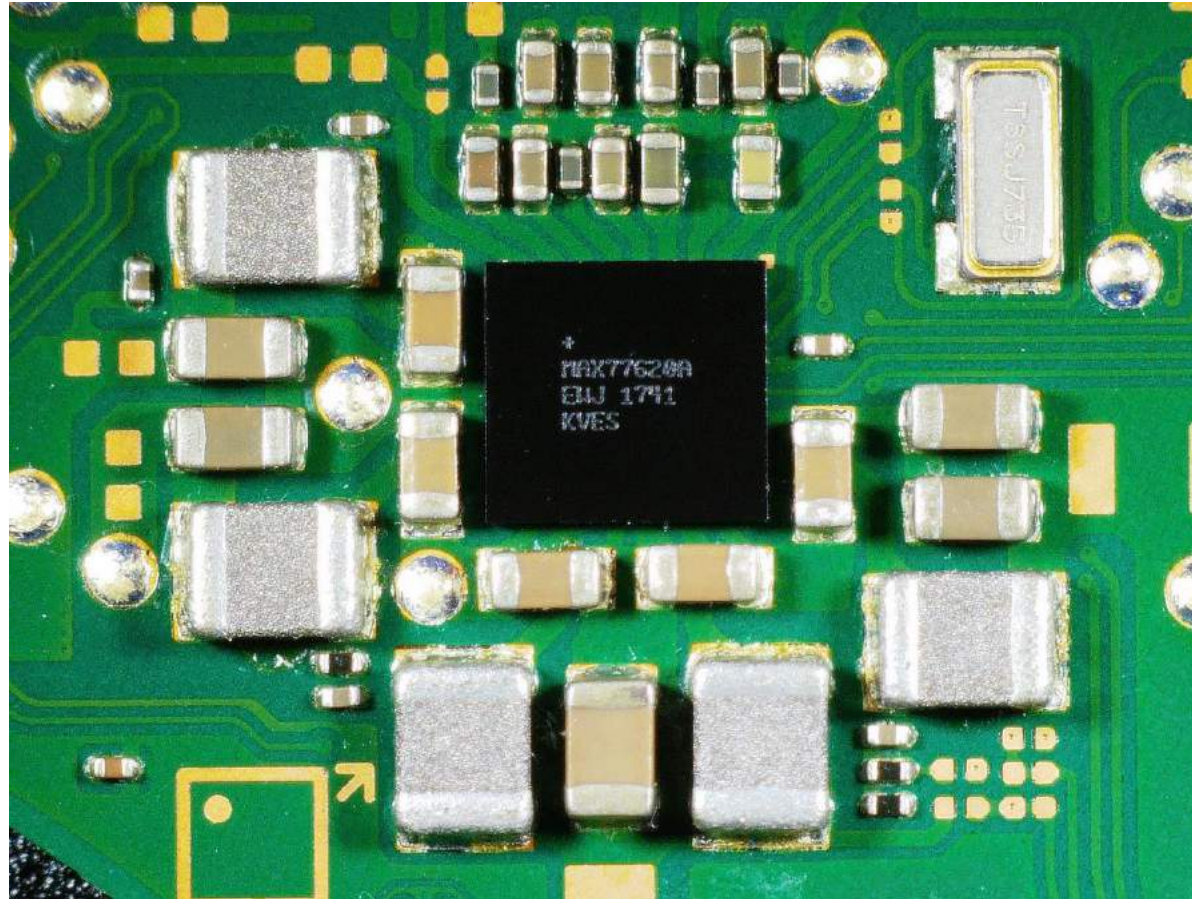






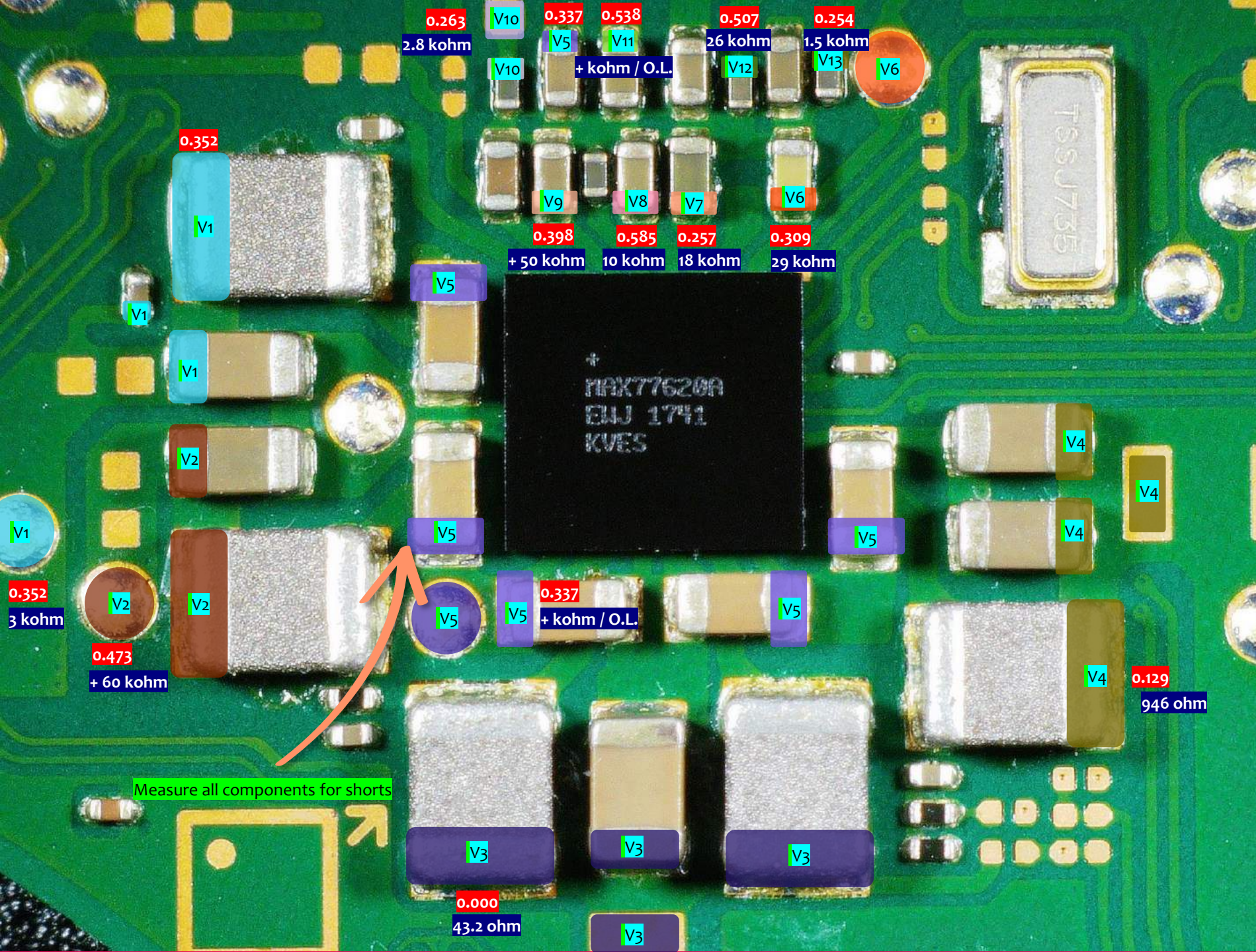
# MAX77620 Voltage regulator (Vcore)

This voltage regulator is responsible for generating the most important voltages to core component: Vcore, Vmem and other components. It will send an enable signal to the second stage voltage regulators MAX77621



<https://www.youtube.com/@fixmyappjim>





## MAX77620 Voltage regulator (Vcore)

1 - boot    1 + 2 - boot    2 - boot

V6 = 1.05V	V1 = 1.8V	V8 = 3.3V
	V2 = 1.3V	V11 = 2.9V
	V3 = 1.0V	V12 = 1.3V
	V4 = 1.1V	V13 = 1.05V
	V7 = 1.05V	
	V9 = 3.3V (input)	
	V10 = 1.0V	

Always present

V5 = VSYS = 4.2V

DIODE MEASUREMENT

RESISTANCE MEASUREMENT

Source:  
<https://www.retrosix.wiki>

**fixmyapp**  
 Research



## MAX77621AEWI

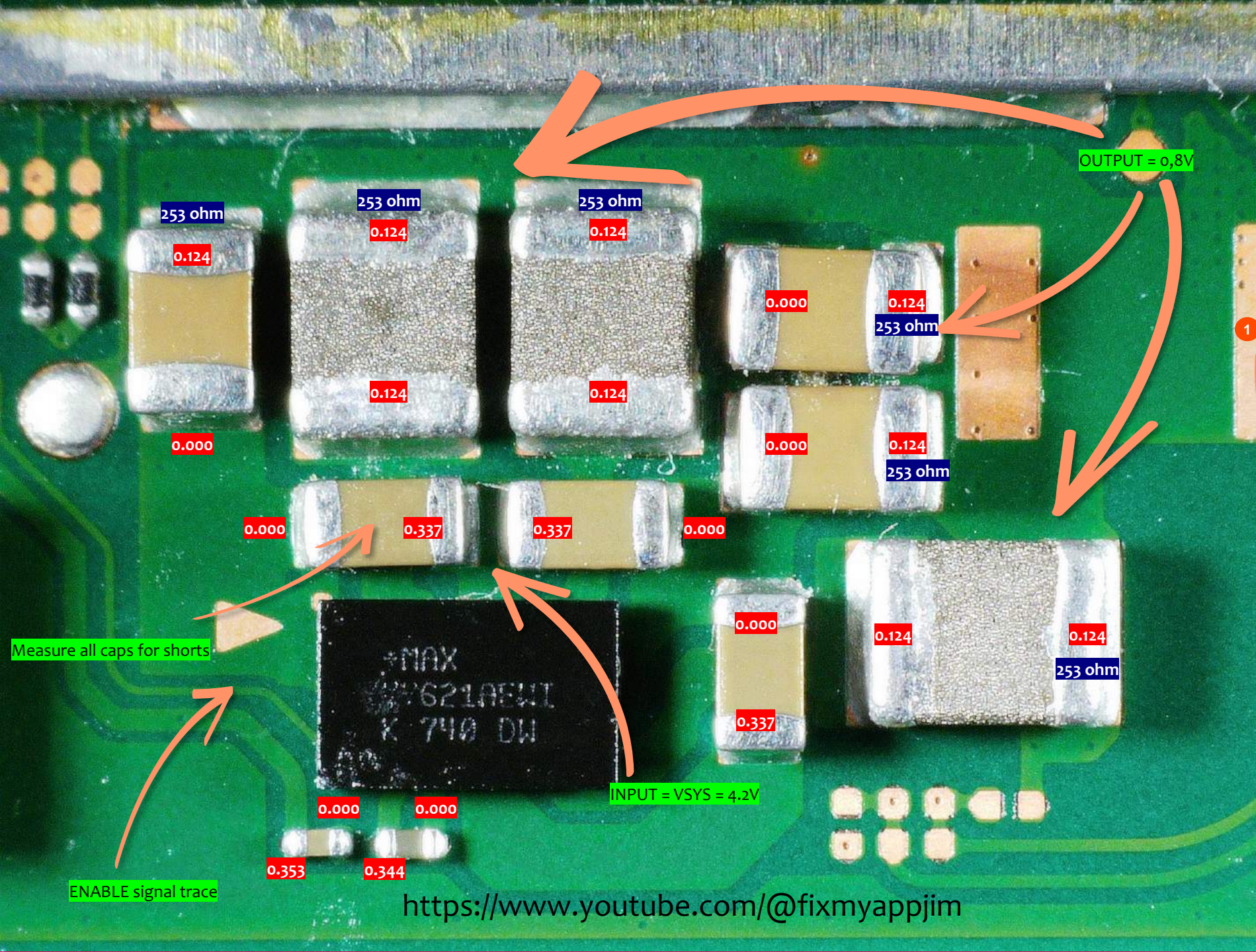
If eMMC is not working, then this voltage regulator will not turn on as this is a second stage voltage regulator.

Low impedance power rails can deliver power to the CPU/GPU with minimal resistance. When measuring capacitors in diode mode will give a beep but remember the resistance is **LOW** measure it with a **OHM meter**.

You can solder a wire with a max voltage of **+1V** to test for shorts

**DIODE MEASUREMENT**

**RESISTANCE MEASUREMENT**

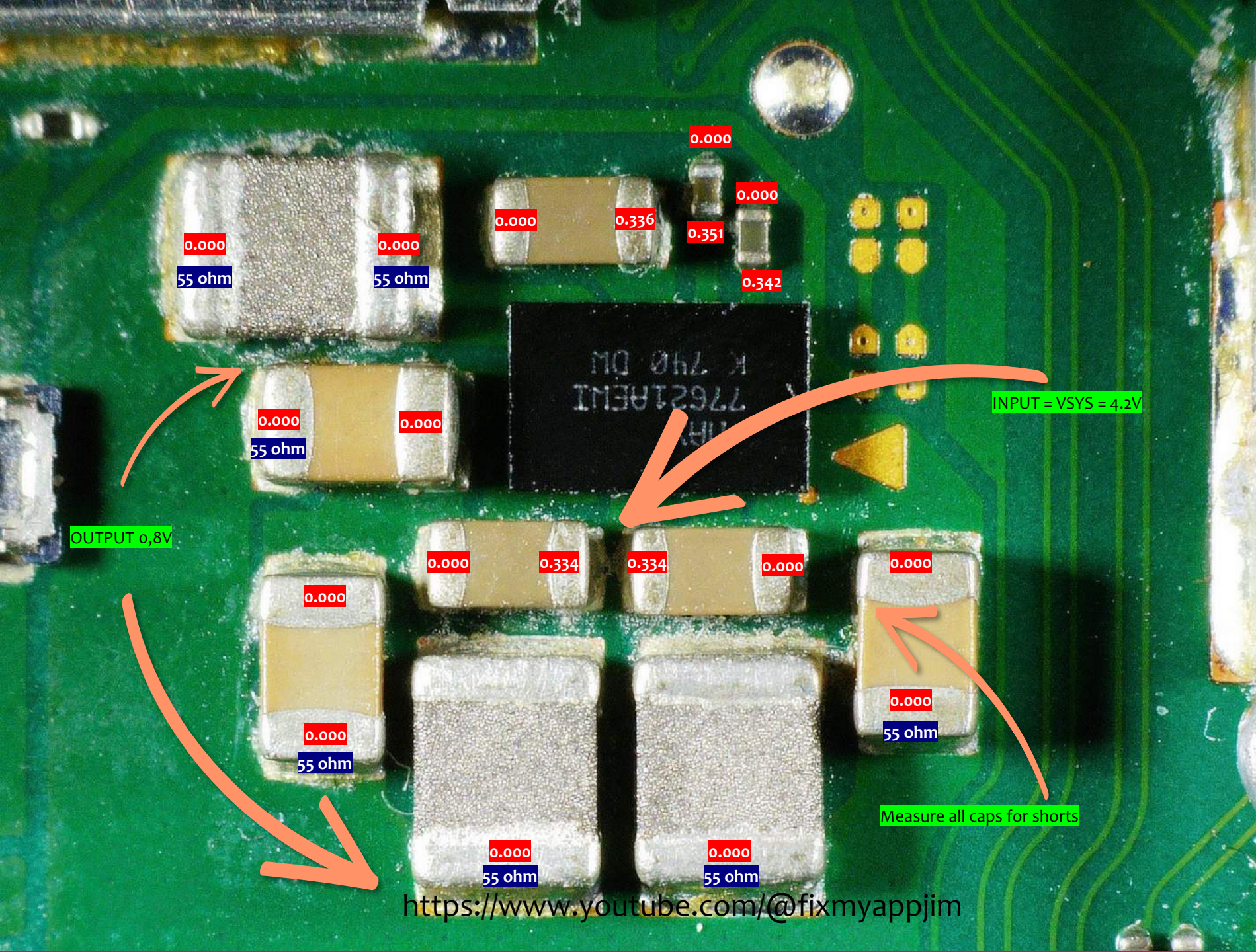


<https://www.youtube.com/@fixmyappjim>



## MAX77621AEWI

If eMMC is not working, then this voltage regulator will not turn on as this is a second stage voltage regulator.



INPUT = VSYS = 4.2V

OUTPUT 0.8V

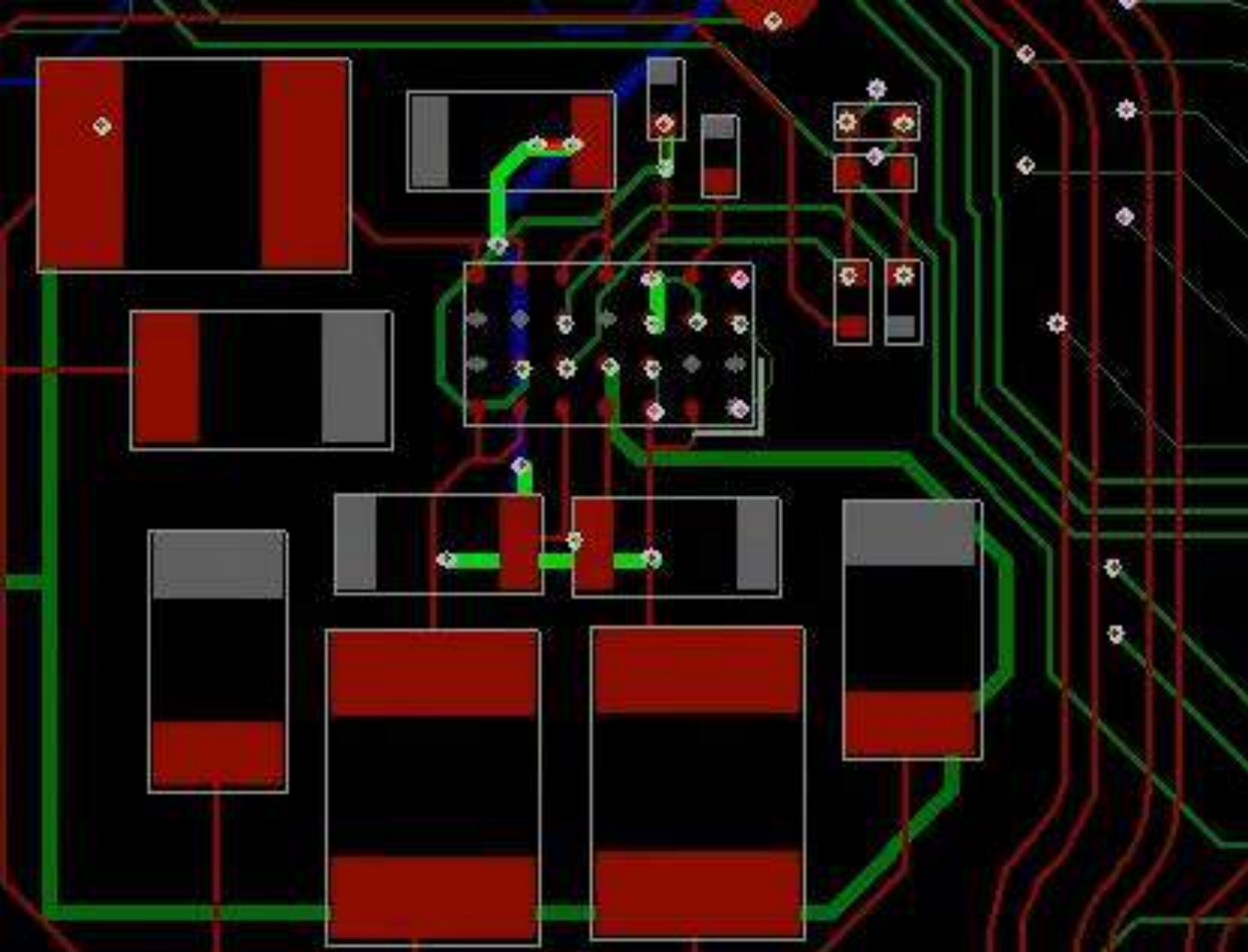
Measure all caps for shorts

DIODE MEASUREMENT

RESISTANCE MEASUREMENT

<https://www.youtube.com/@fixmyappjim>





## MAX77621AEWI

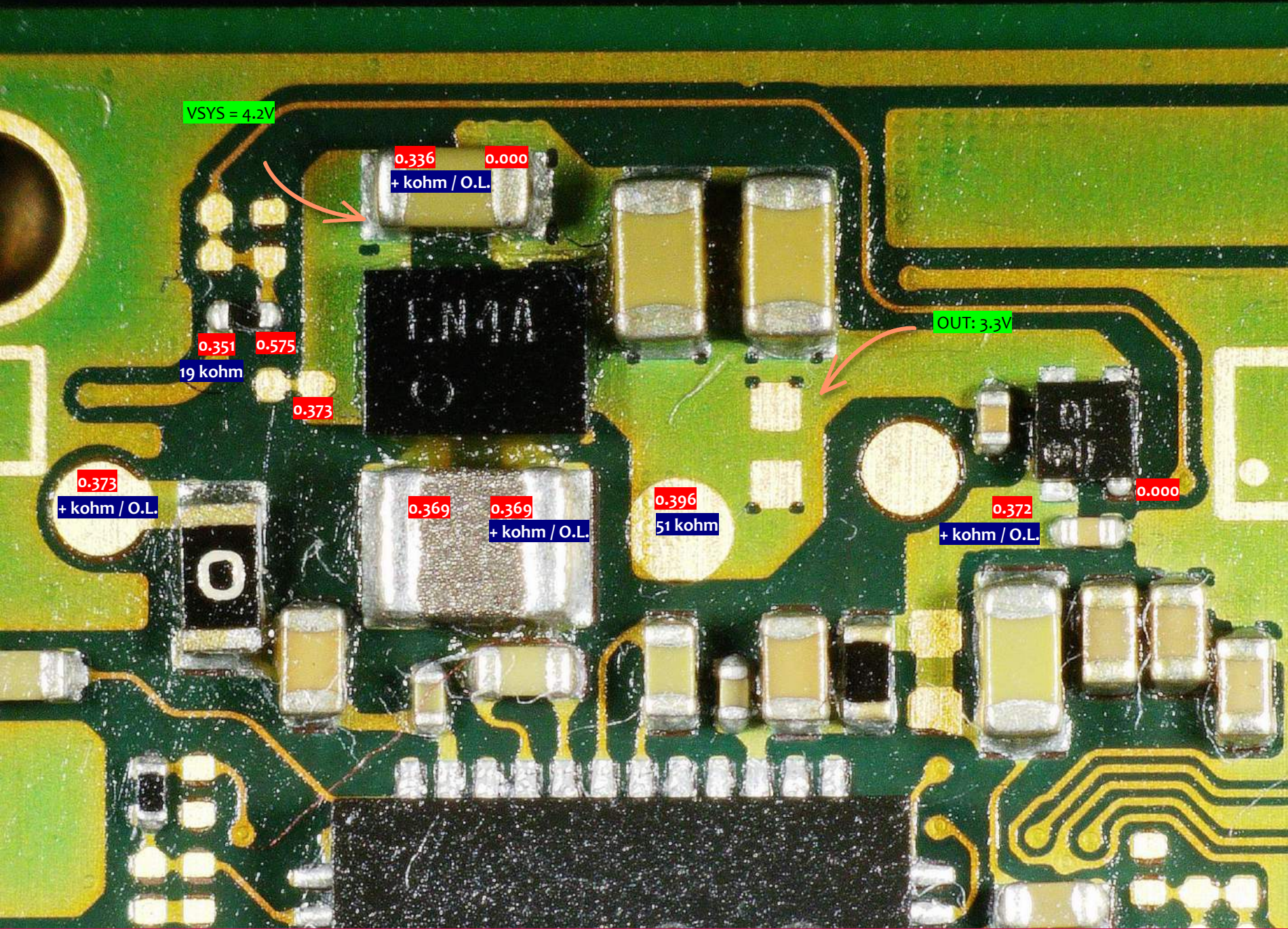
If eMMC is not working, then this voltage regulator will not turn on as this is a second stage voltage regulator.

<https://www.youtube.com/@fixmyappjim>



## EN4A 3.3 Voltage regulator

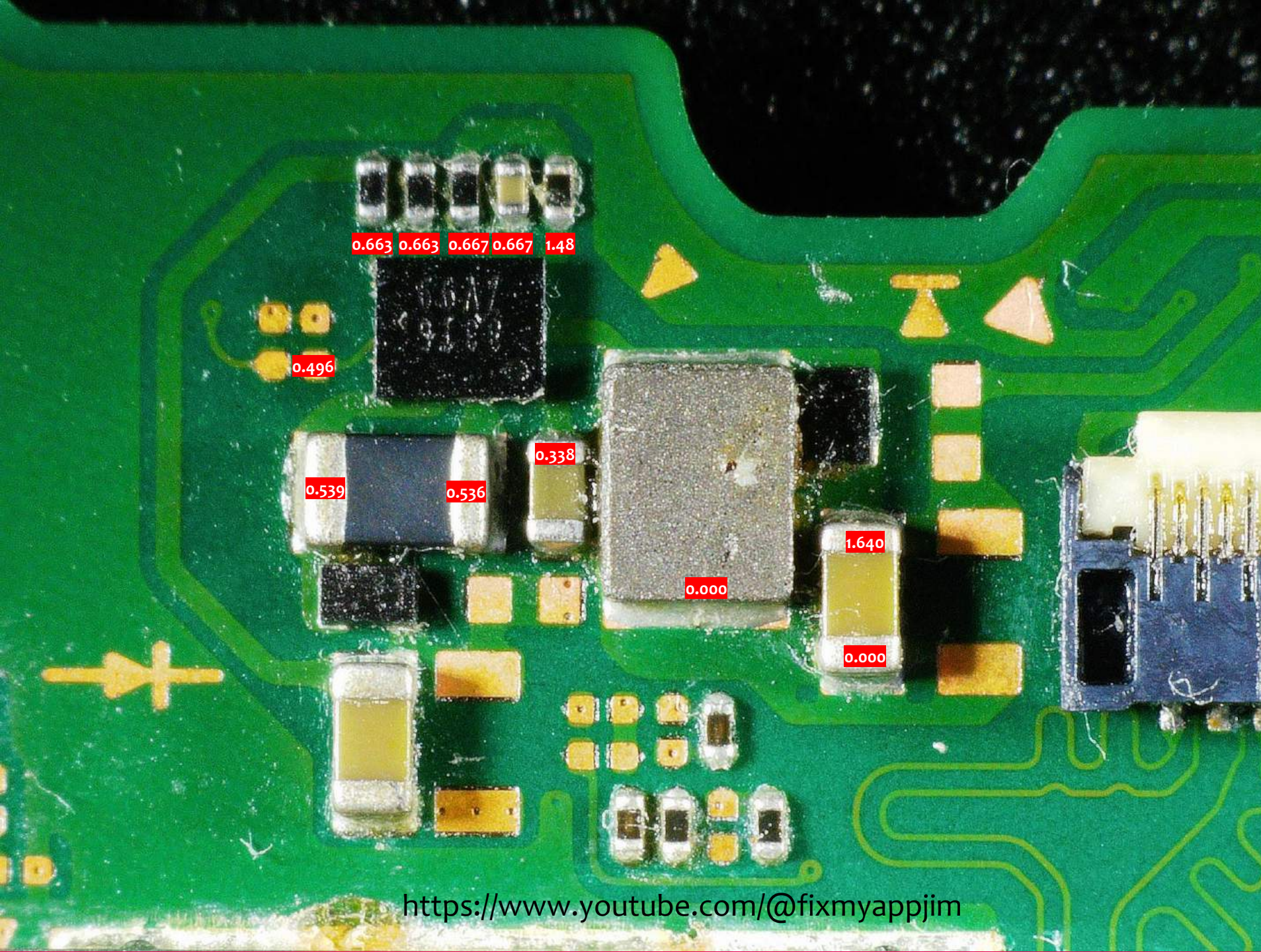
If the power rail 3.3V is shorted, then you can inject 1V by soldering a wire to the capacitor and check which component is shorted on the power rail by using a thermal camera or isopropyl alcohol.



DIODE MEASUREMENT

RESISTANCE MEASUREMENT





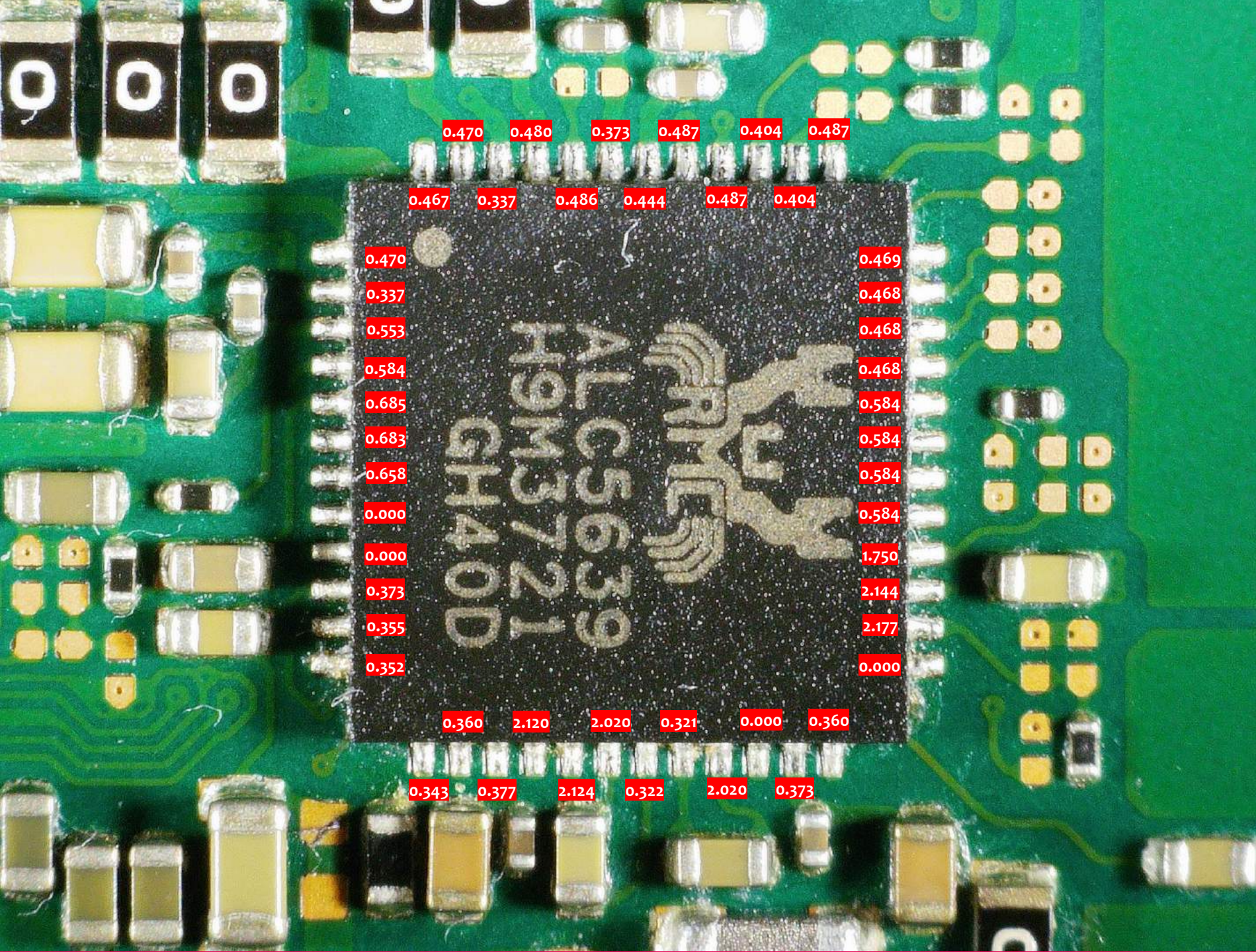
## LCD driver

The LCD driver in the Nintendo Switch is responsible for controlling the display on the console's screen.

DIODE MEASUREMENT

<https://www.youtube.com/@fixmyappjim>





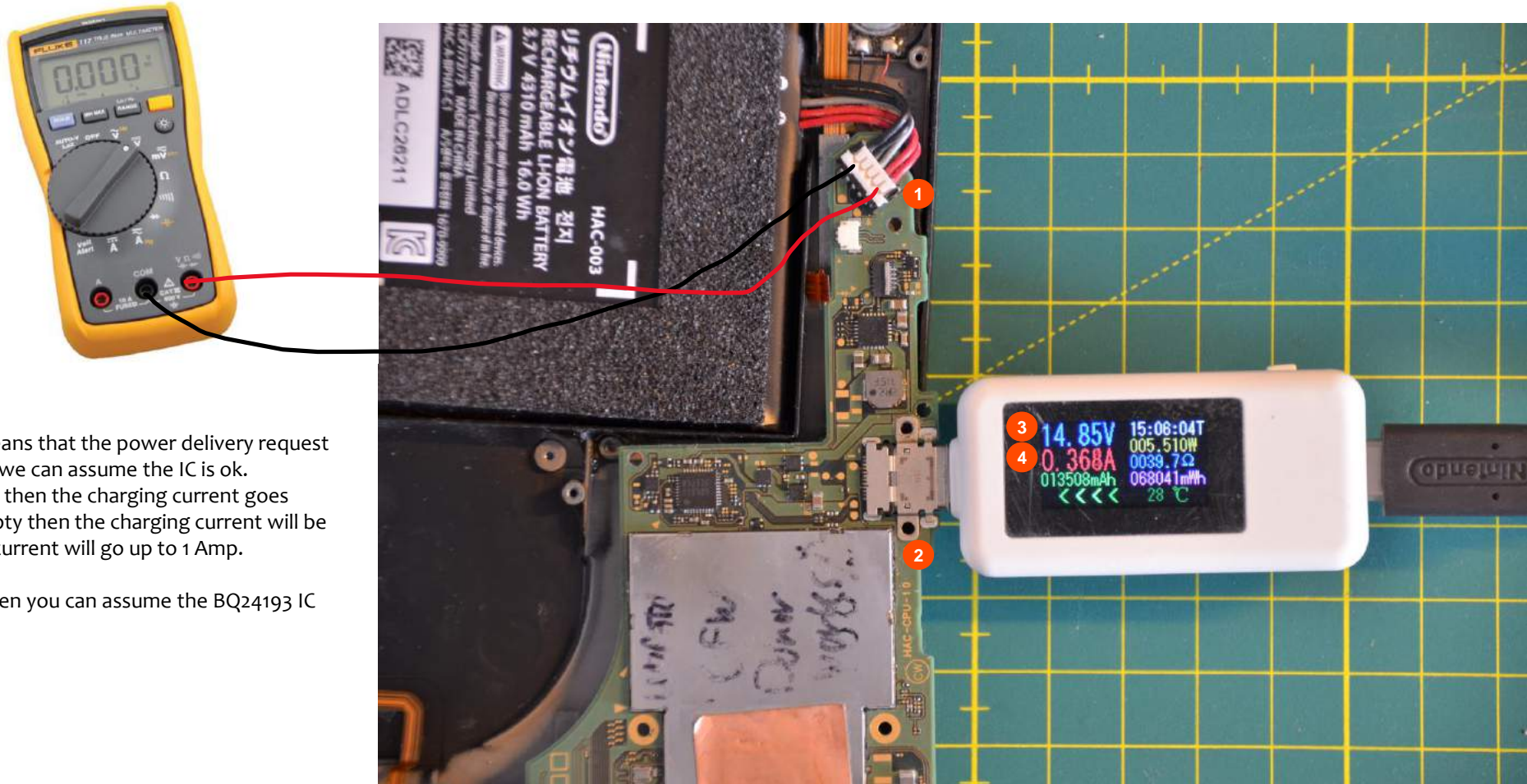
## Realtek ALC5639 audio codec

ALC5639 is responsible for converting digital audio signals from the console's internal audio processing unit into analog audio signals for output through the built-in speakers or headphone jack. It might also provide audio input capabilities for features like voice chat or microphone support.

DIODE MEASUREMENT



# Nintendo switch – Battery charging test

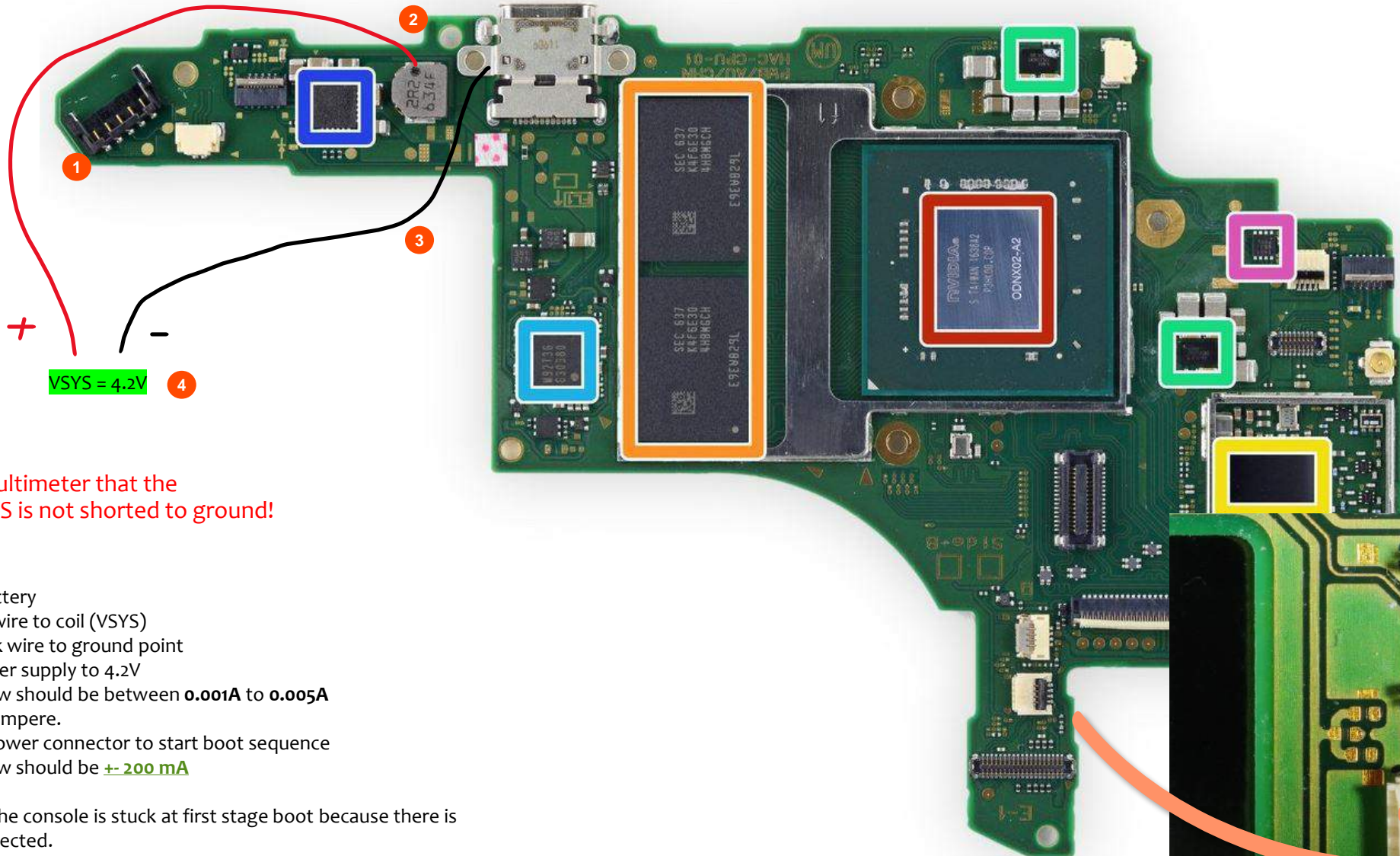


1. Connect battery
2. Connect USB-C current meter
3. Charging voltage is 15V, this means that the power delivery request with MT92T36 IC is working so we can assume the IC is ok.
4. Charging current. Battery is full then the charging current goes down. When the Battery is empty then the charging current will be low after a while the charging current will go up to 1 Amp.

When you see a current is drawn then you can assume the BQ24193 IC is working.



# Nintendo switch – First stage boot – Test no shorts



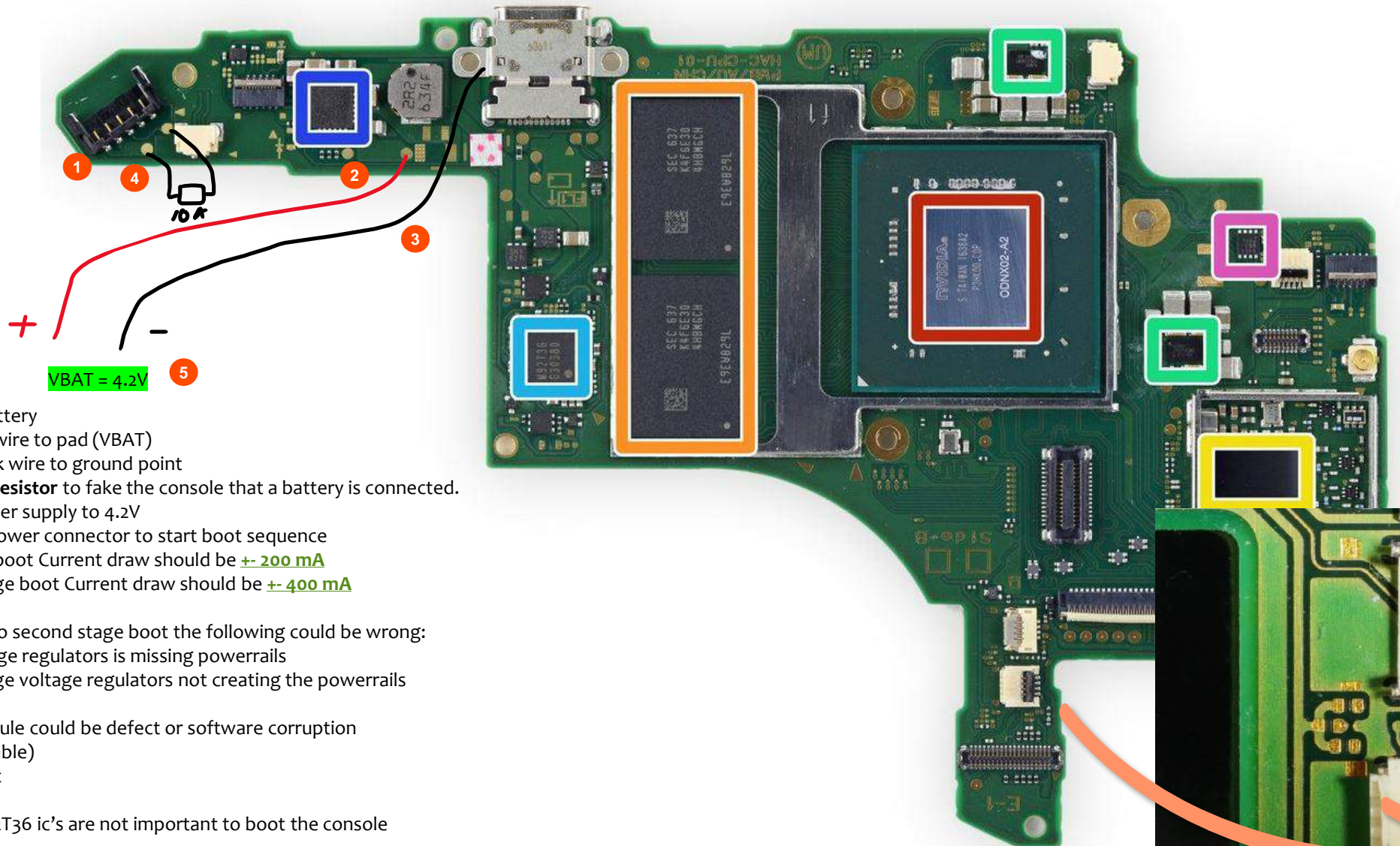
Check with multimeter that the  
powerrail VSYS is not shorted to ground!

1. Remove battery
2. Solder red wire to coil (VSYS)
3. Solder black wire to ground point
4. Set lab power supply to 4.2V
5. Current draw should be between **0.001A** to **0.005A** (1 to 5mA) ampere.
6. Jump the power connector to start boot sequence
7. Current draw should be **+ - 200 mA**

This is good as the console is stuck at first stage boot because there is **no battery** connected.

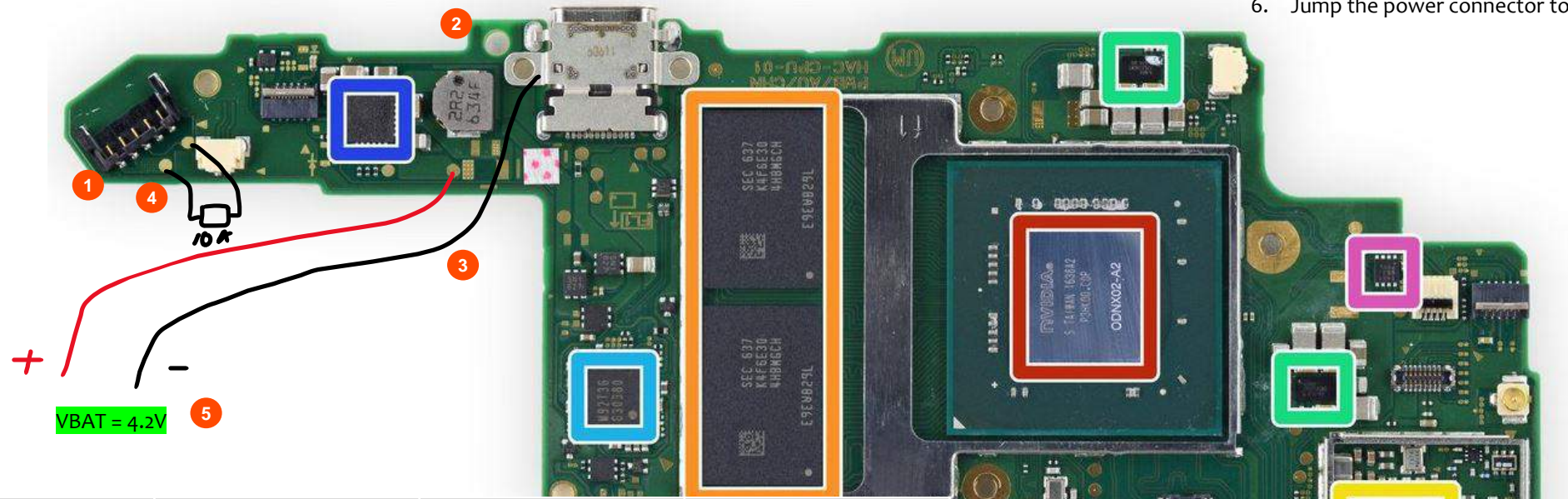


# Nintendo switch – Second stage boot – Fake battery connected



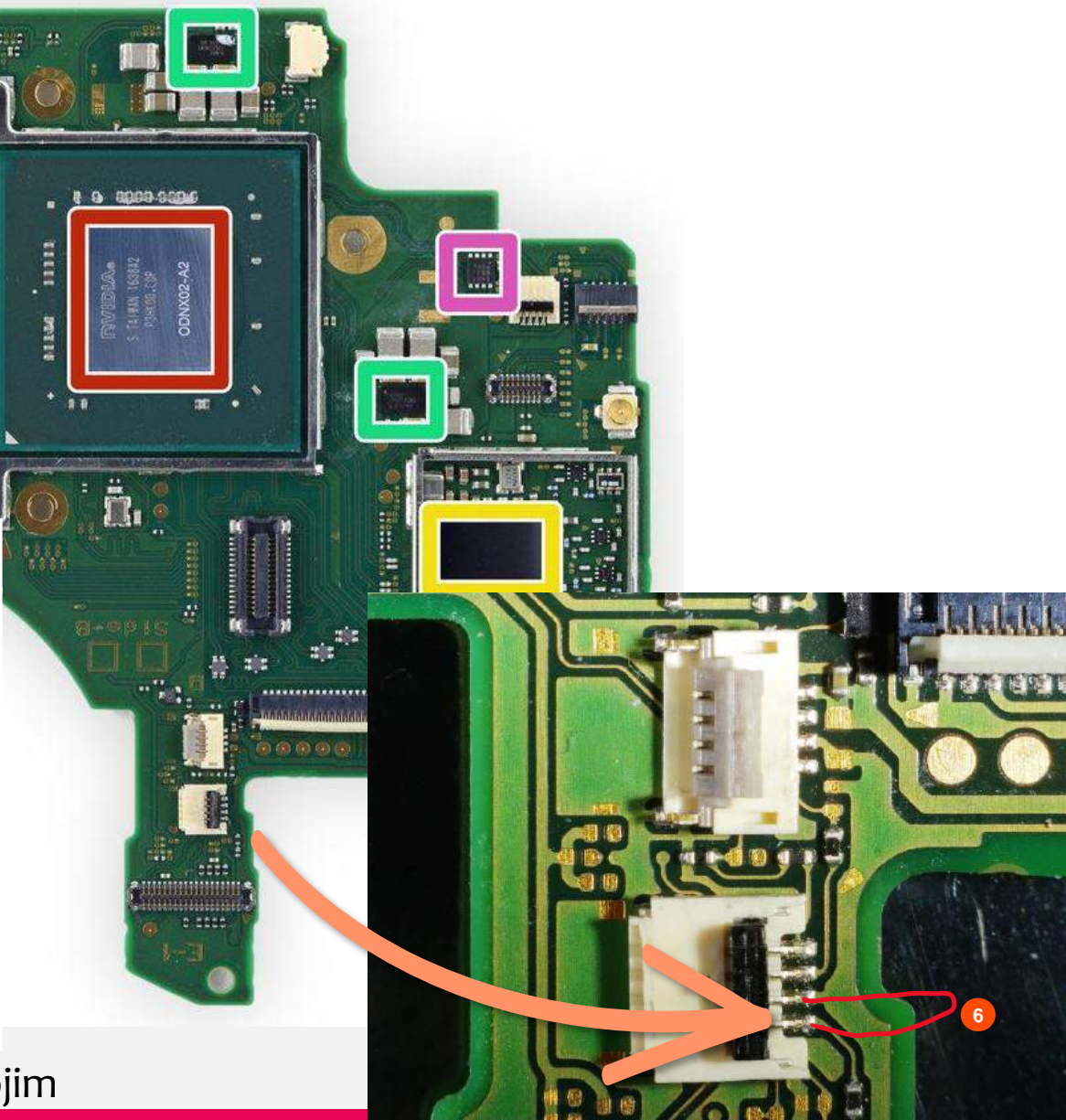


# Current draw diagnostic table



- 1. Remove battery
- 2. Solder red wire to pad (VBAT)
- 3. Solder black wire to ground point
- 4. Solder 10k resistor to fake the console that a battery is connected.
- 5. Set lab power supply to 4.2V
- 6. Jump the power connector to start boot sequence

Cause	1nd - boot	2nd - boot	Sleep
Short	Max current.	-	-
Working	+ 200mA	400 – 500mA	+ 8mA
LCD / Backlight driver defect	+ 200mA	400 – 500mA	+ 8mA
eMMC / CPU / RAM defect	+ 200mA	-	-
MAX77621 defect	+ 100mA	-	-
M92T36 defect	+ 200mA	300 – 700mA (boot loop between 300 – 700 mA and then back to 200mA)	-





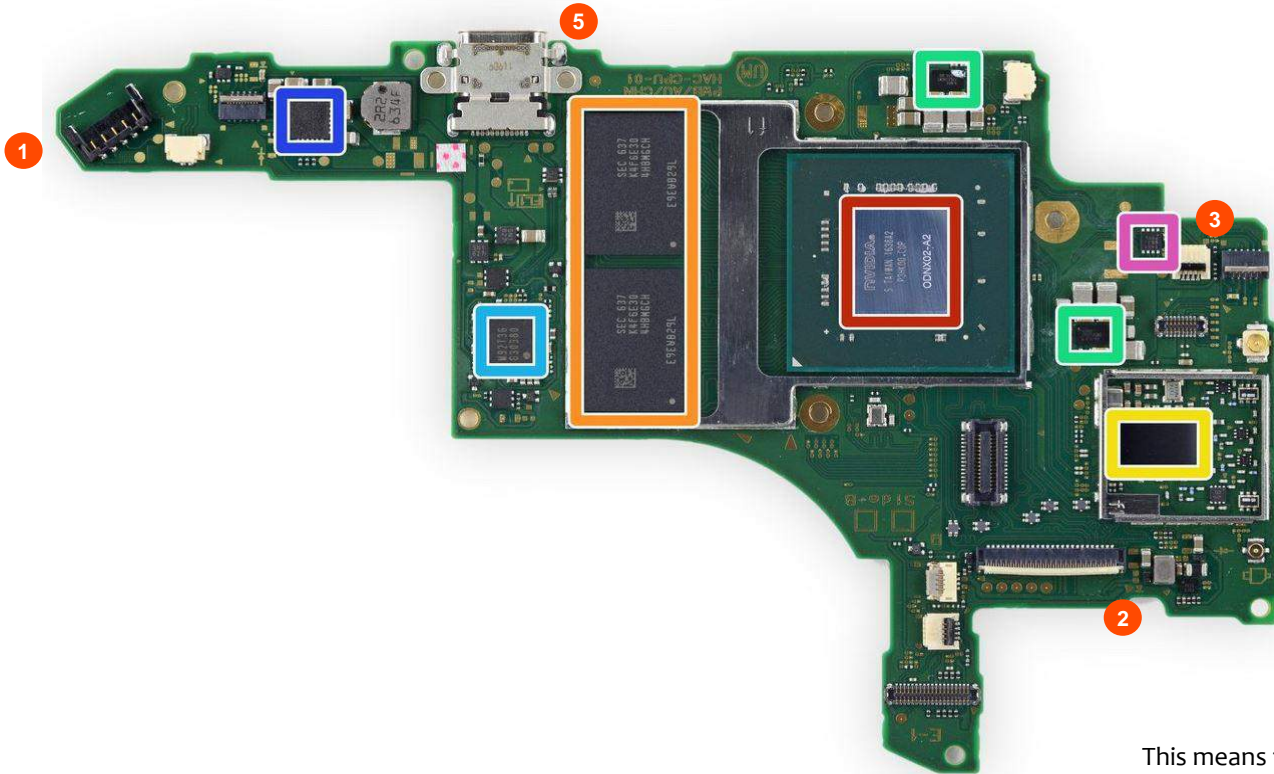
# Troubleshooting eMMC or Short witch Tegra RCM software

1. Connect battery
2. Connect LCD
3. Connect Backlight LCD

Use the RCM mode of the Nintendo Switch to diagnose / narrowing down problem area by using Tegra RCM software.

Download Tegra RCM software

4. Install Tegra RCM
5. Connect USB-C cable to the computer
6. You will get one of the pictures below



This means the Nintendo switch is in a **recovery mode** because it can't read the eMMC

Possible cause:

- Bad eMMC module
- Bad M92T36 IC



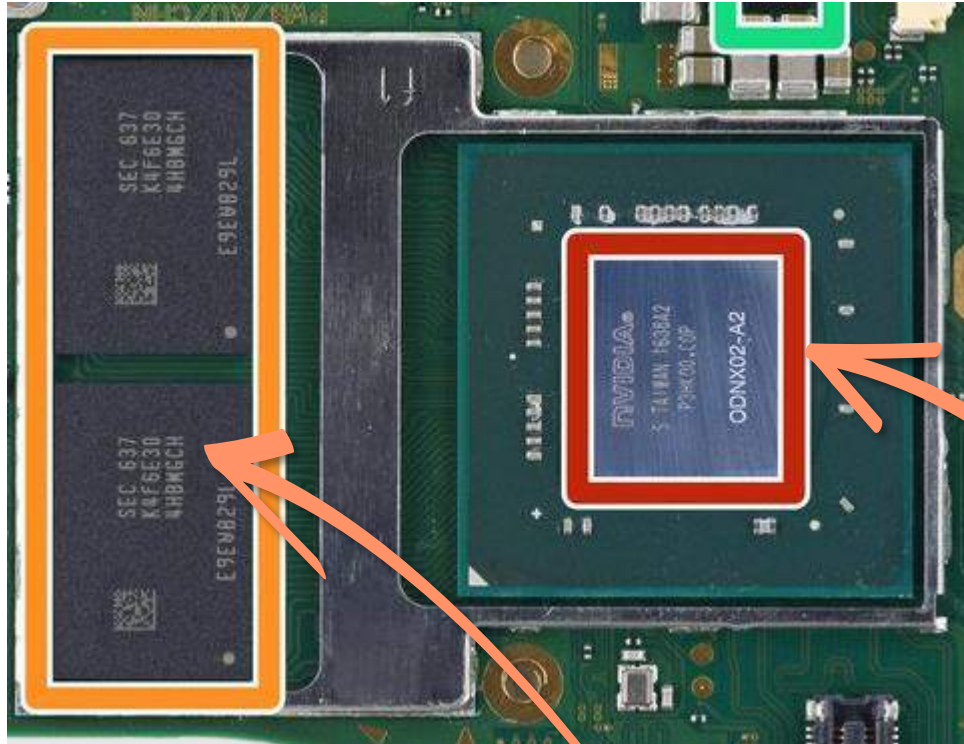
This means there can be an short or component that is bad

Possible cause:

- Short on motherboard
- Defect IC (M92T36, PI3USB, BQ24193, MAX IC etc)



# Blue Screen of Death (BLOD)



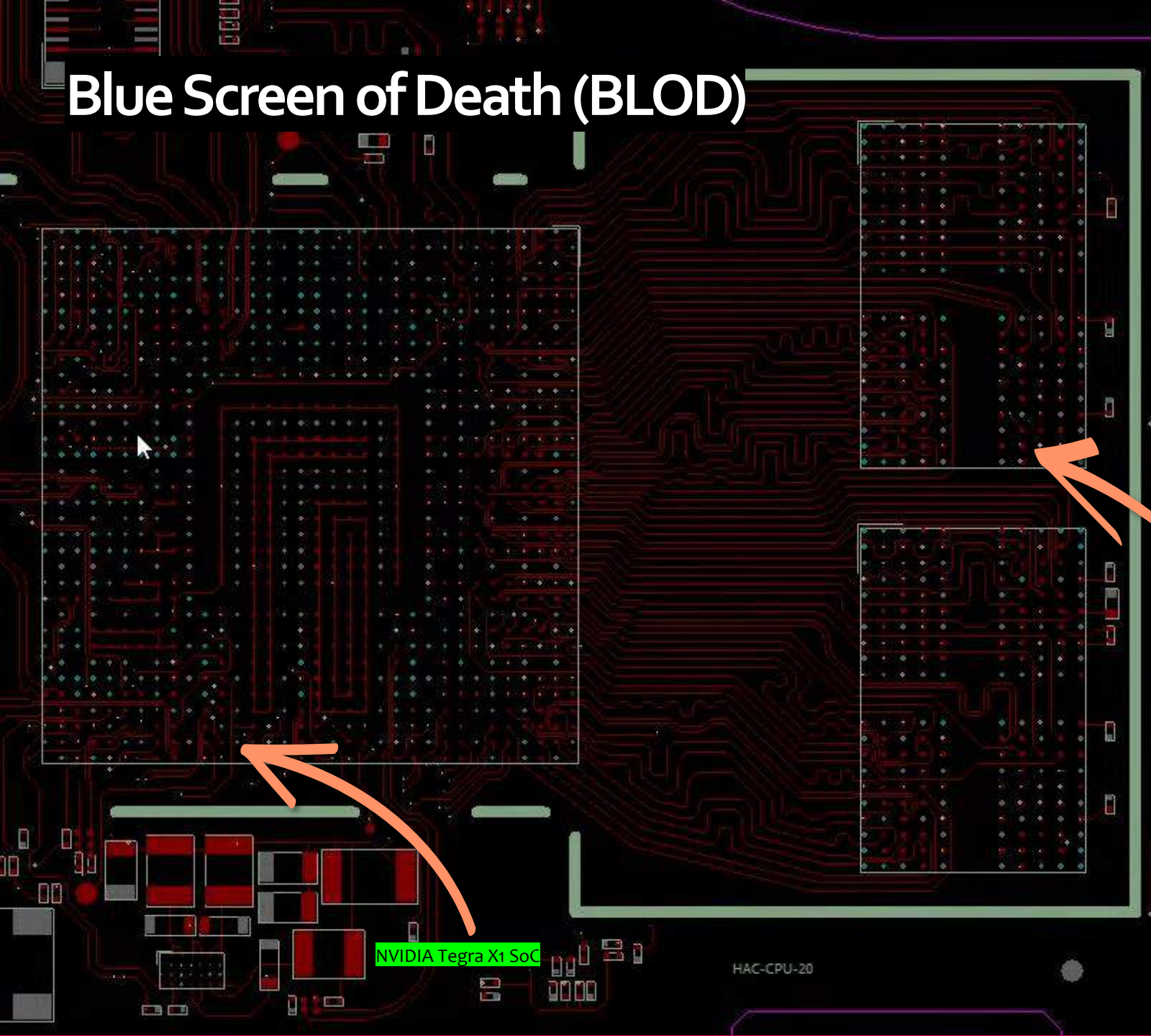
NVIDIA Tegra X1 SoC

eMMC

2 GB LPDDR4 DRAM



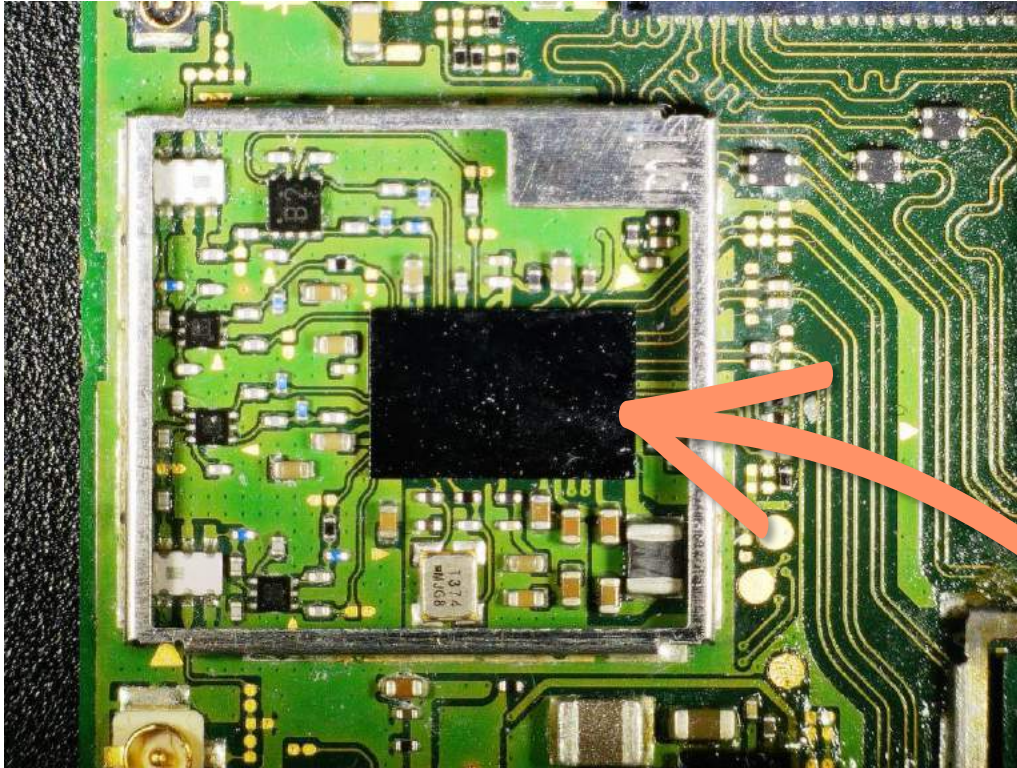
# Blue Screen of Death (BLOD)



2 GB LPDDR4 DRAM



# Orange Screen of Death



If the Wi-Fi and Bluetooth functionality is not working on a Nintendo Switch you can get a orange screen of death.

Replace or reflow the WiFi IC.

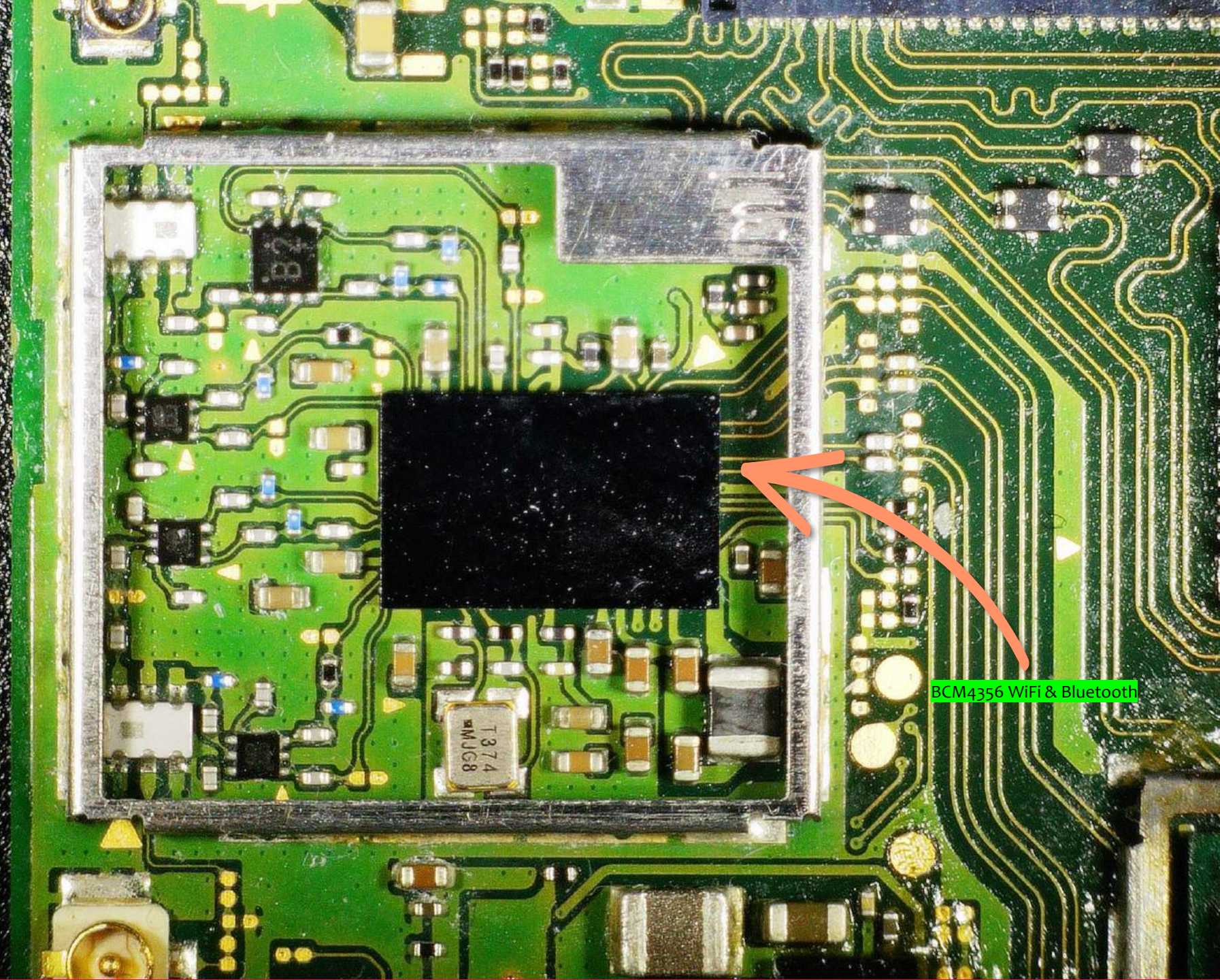
BCM4356 WiFi & Bluetooth



## WiFi / Bluetooth communication problems

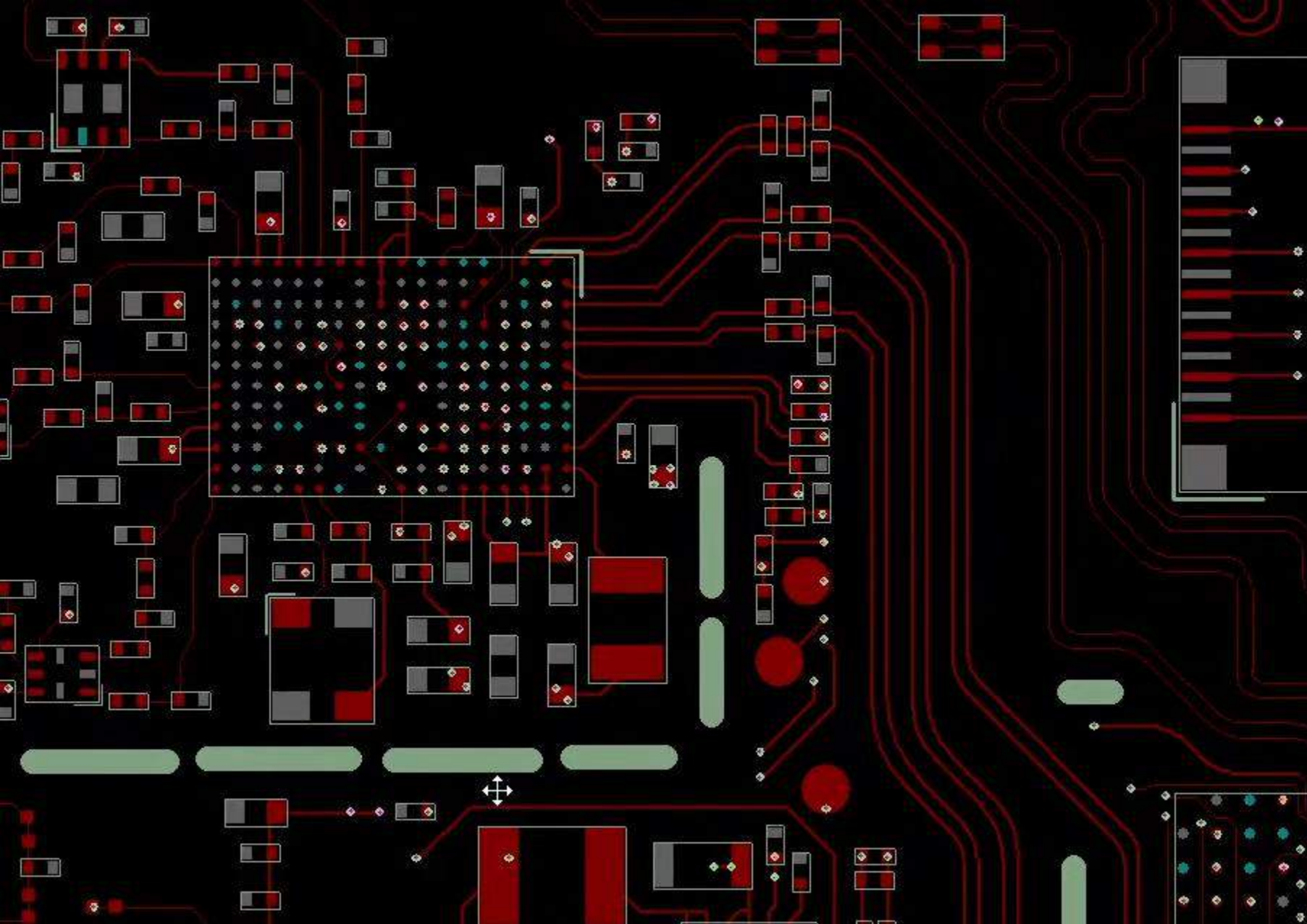
If the Wi-Fi and Bluetooth functionality is not working on a Nintendo Switch, it is possible that the underlying issue lies with the wireless communication chip.

The Nintendo Switch uses a combined Wi-Fi and Bluetooth chip for wireless connectivity.



BCM4356 WiFi & Bluetooth





## WiFi / Bluetooth communication problems

If the Wi-Fi and Bluetooth functionality is not working on a Nintendo Switch, it is possible that the underlying issue lies with the wireless communication chip.

The Nintendo Switch uses a combined Wi-Fi and Bluetooth chip for wireless connectivity.

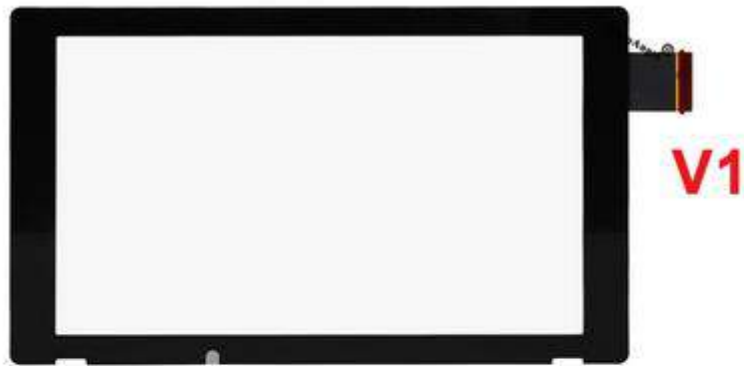


## Touchscreen V1 / V2

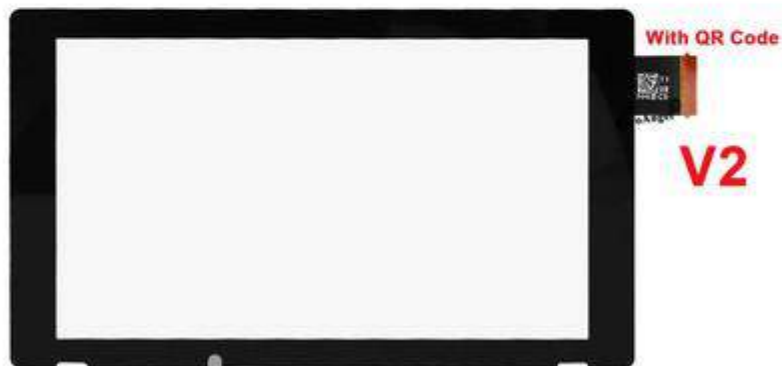
If the touchscreen is not working be aware that you have to get the right version.

Check the old touchscreen if there is no QR code then you need a version 1 touchscreen.

If you bought the wrong version the touchscreen will behave strange.



New version:with QR Code  
Old version:Numbers



**For Switch V1    For Switch V2**

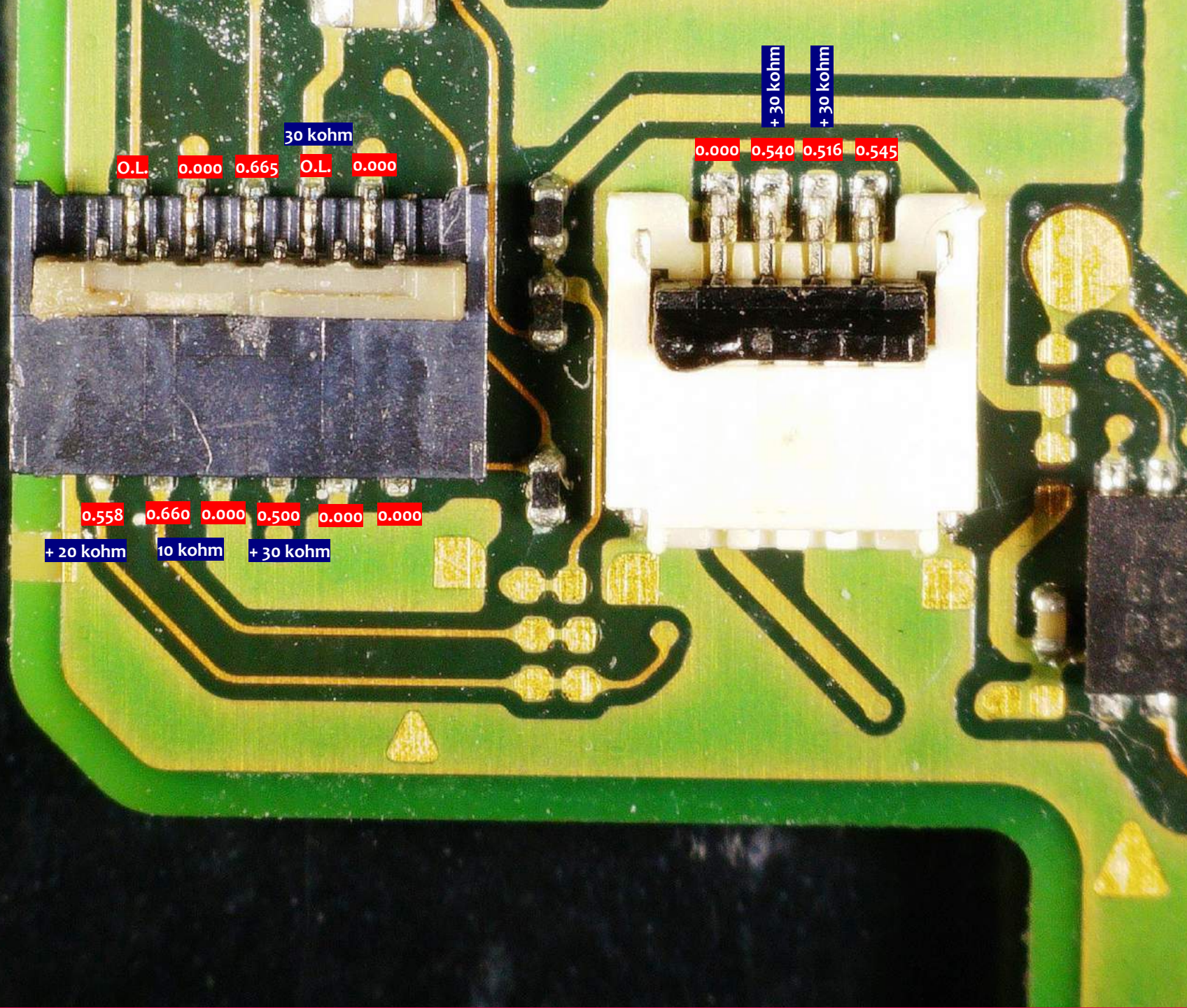


[illegible]

## RESISTANCE MEASUREMENT



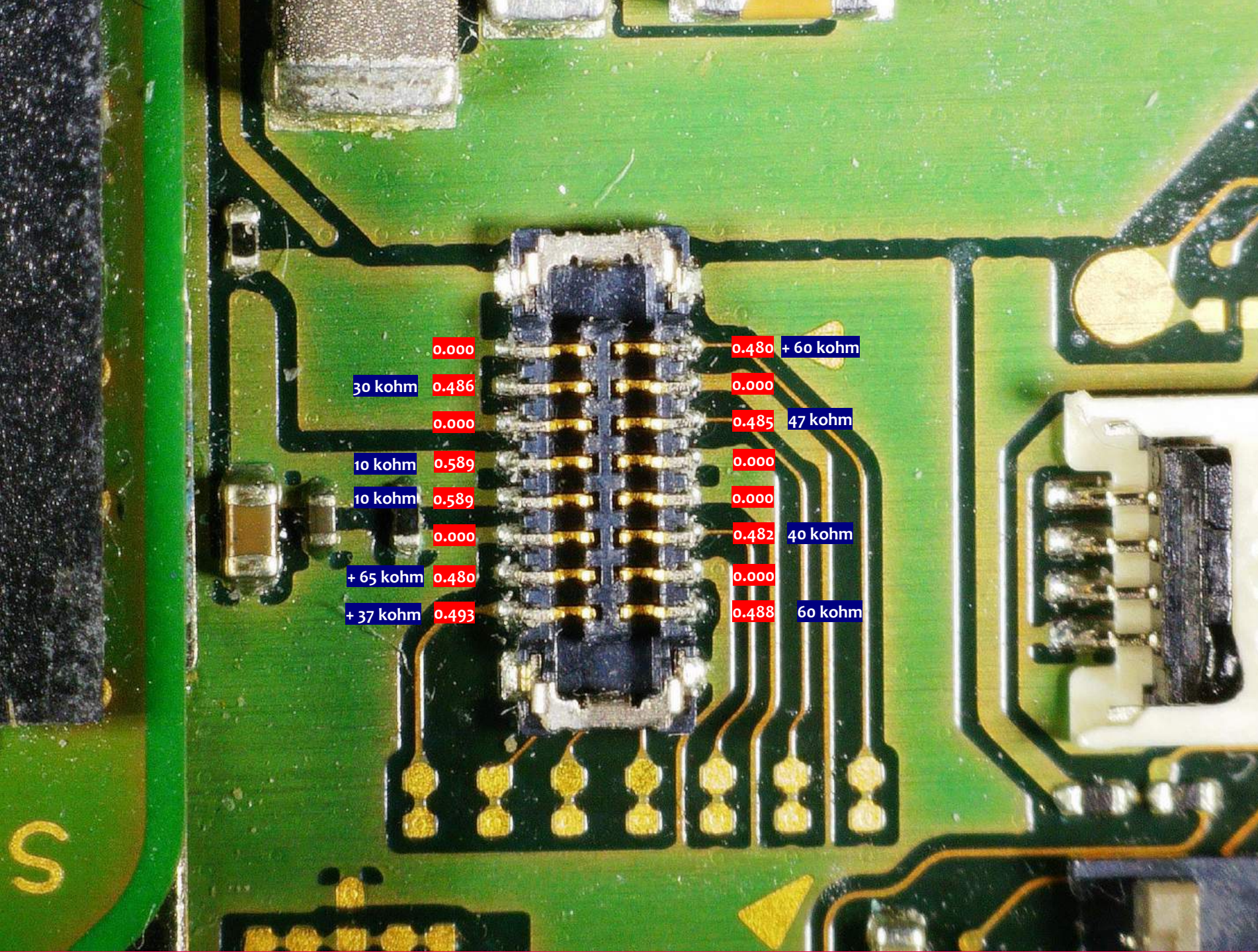
Joy-con connector (left)  
Back-light connector (right)



DIODE MEASUREMENT

RESISTANCE MEASUREMENT





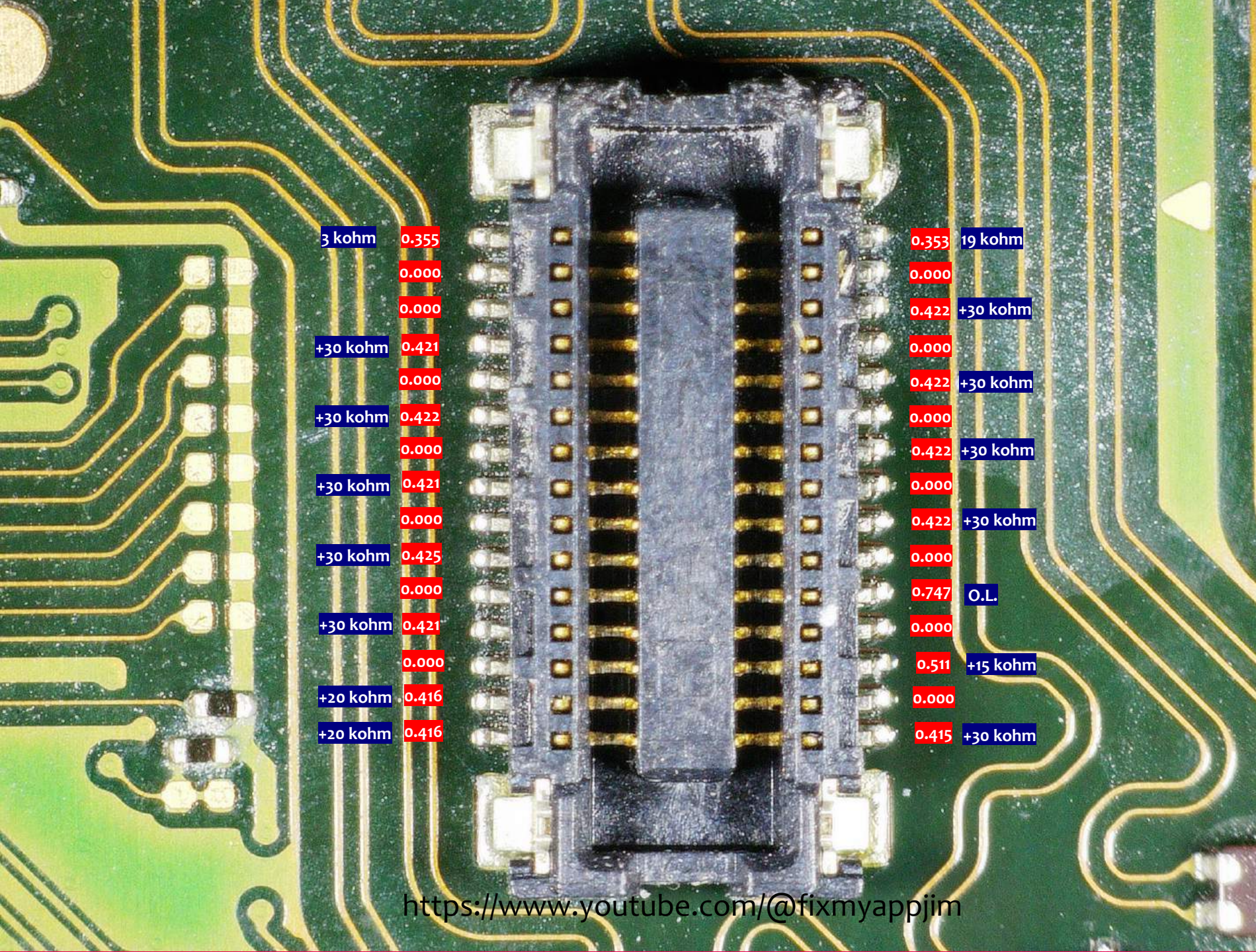
DIODE MEASUREMENT

RESISTANCE MEASUREMENT



## RESISTANCE MEASUREMENT



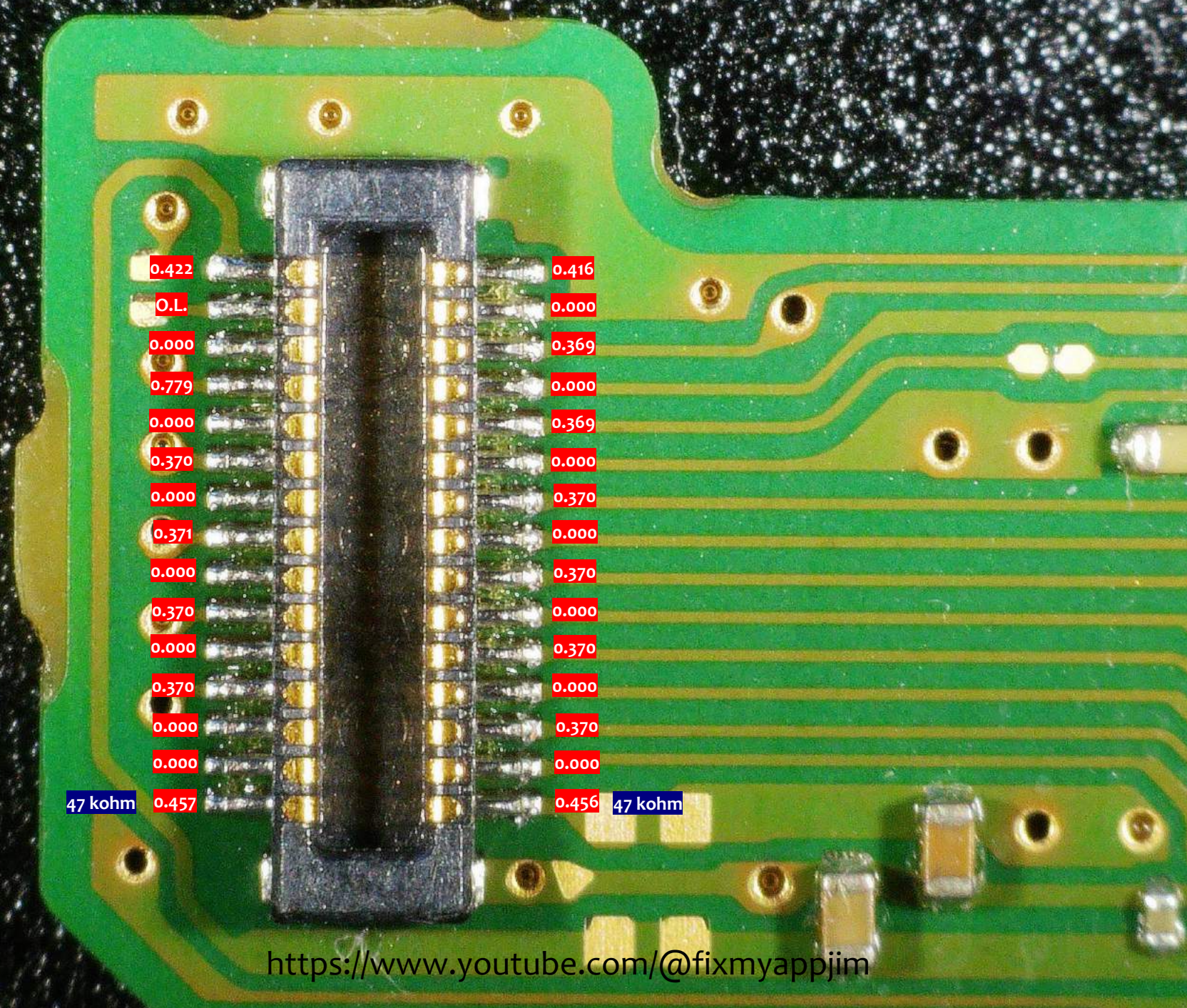


3 kohm	0.355	0.353	19 kohm
	0.000	0.000	
	0.000	0.422	+30 kohm
+30 kohm	0.421	0.000	
	0.000	0.422	+30 kohm
+30 kohm	0.422	0.000	
	0.000	0.422	+30 kohm
+30 kohm	0.421	0.000	
	0.000	0.422	+30 kohm
+30 kohm	0.425	0.000	
	0.000	0.747	O.L.
+30 kohm	0.421	0.000	
	0.000	0.511	+15 kohm
+20 kohm	0.416	0.000	
+20 kohm	0.416	0.415	+30 kohm

DIODE MEASUREMENT  
RESISTANCE MEASUREMENT



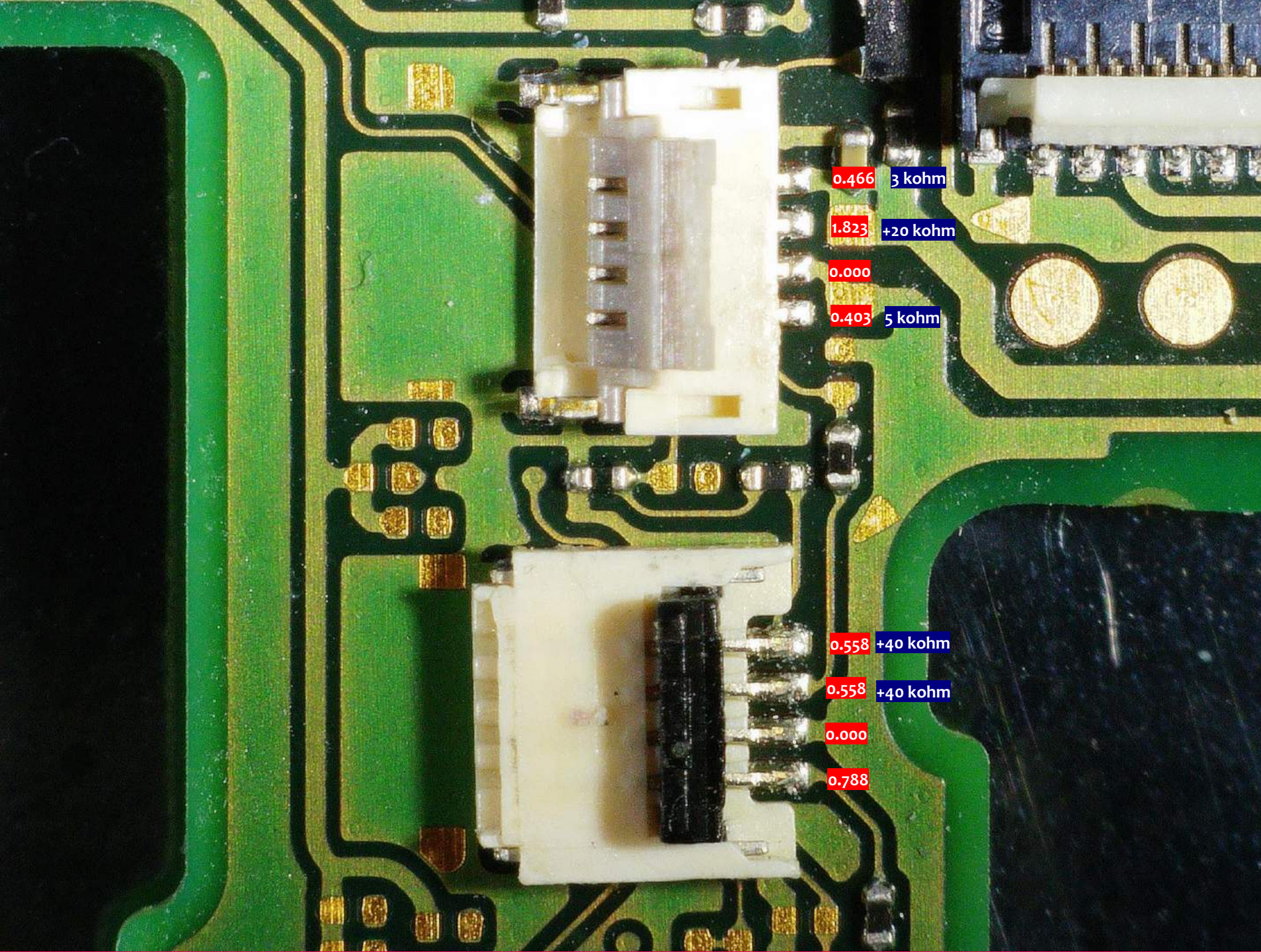
## eMMC connector on module



## DIODE MEASUREMENT

## RESISTANCE MEASUREMENT





Fan connector (top)  
Power / volume connector (bottom)

0.466 3 kohm

1.823 +20 kohm

0.000

0.403 5 kohm

0.558 +40 kohm

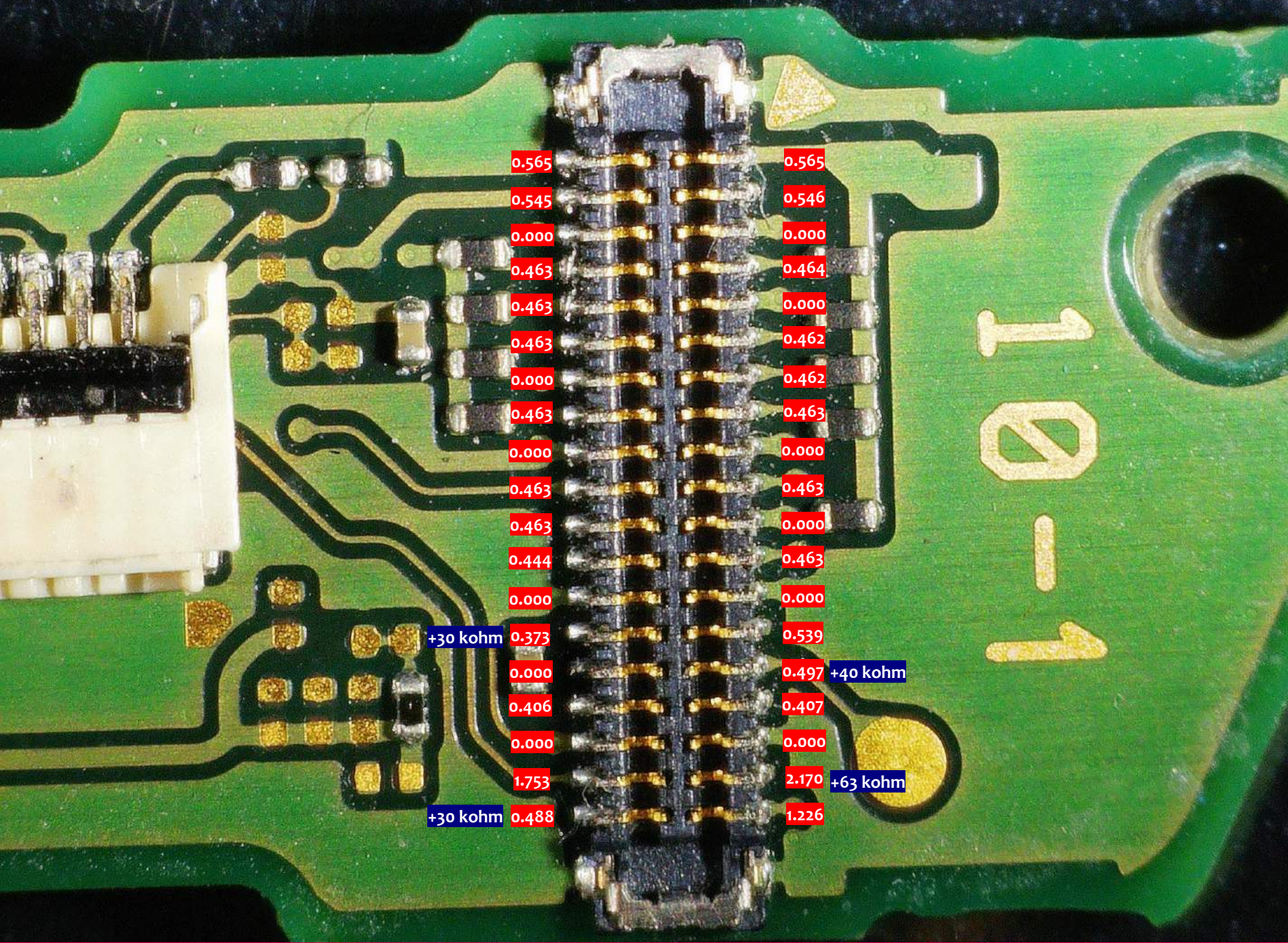
0.558 +40 kohm

0.000

0.788

DIODE MEASUREMENT  
RESISTANCE MEASUREMENT





DIODE MEASUREMENT  
RESISTANCE MEASUREMENT