

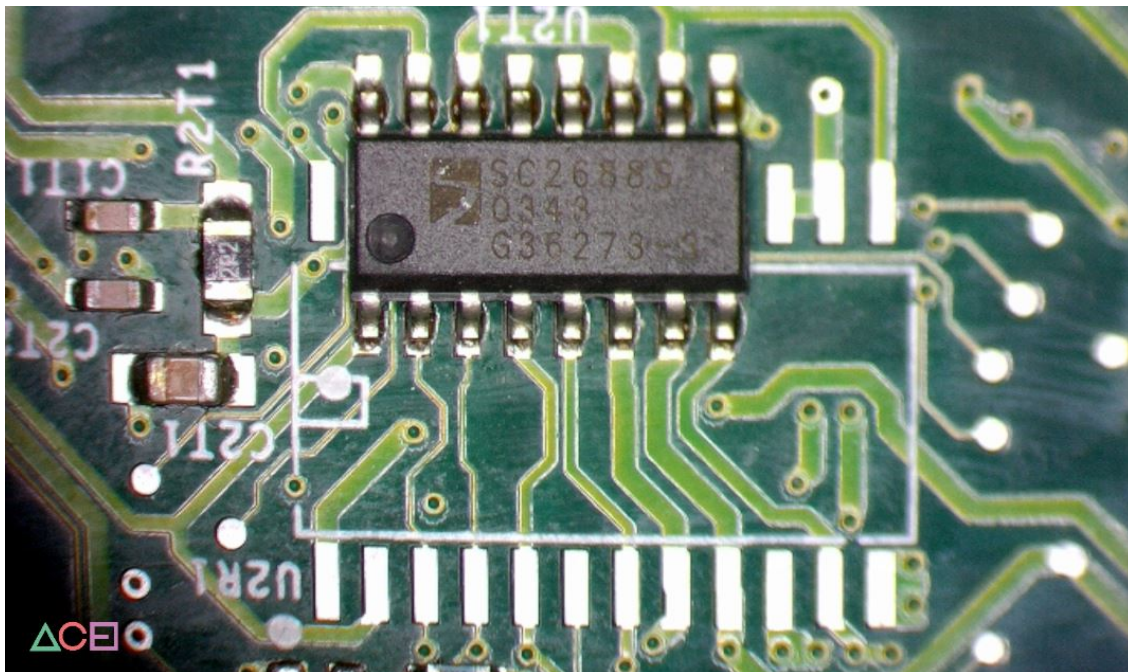
21/06/23

## **XBOX V1.2 /1.3 1.45v CPUCORE and V1.4 1.50v CPU\_CORE PIII TUALATIN V\_CPU\_CORE PIII VOLTAGE ADJUSTMENT**

This document will show you and explain how to adjust the V\_CPUCORE voltage for the PIII Tualatin CPU upgrade for the Original Xbox for motherboard revisions V1.2 to V1.4. Please be aware that you may damage your console if done incorrectly and I take no responsibility whatsoever if you happen to.

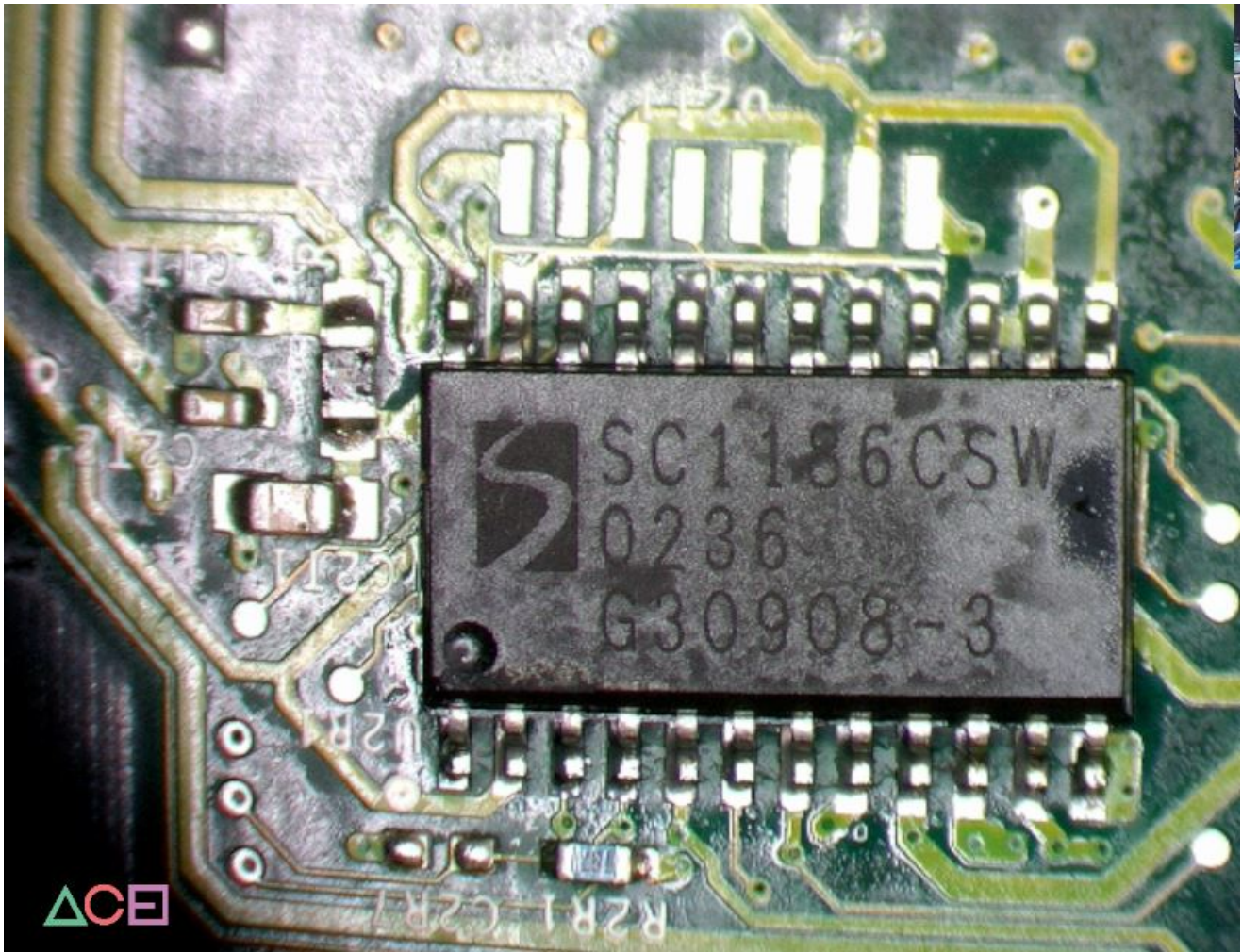
Firstly you need to check what DC/DC voltage convertor is installed on your xbox. There are 2 revisions, SC2688 (U2T1) and SC1186 (U2R1). Here is a picture of the area and it populated with the SC2688.

V1.2 and V1.3 may have either IC installed from factory. If you already have SC1186 installed you can skip to STEP 3.



U2T1 is the smaller package and you can see in the above picture U2R1 is for a larger package(SOP24). Essentially you need to remove U2T1/SC2688 and populate U2R1 with the SC1186 package. The SC1186 are available on the usual platforms for purchase at the time of writing this and they are also available to harvest on the V1.0 and V1.1 boards.

Below is a picture of the SC1186 installed on a V1.4 Xbox.



Once you have removed U2T1 and populated U2R1, there are a few more resistor modifications that need to be carried out.

**STEP 1: R2E9** needs to be removed and replaced with a 75ohm 0603 resistor, it is populated with an 357ohm by default with the SC2688. This will be already populated with an 75ohm resistor if your V1.2 or V1.3 Xbox already has the SC1186.

**STEP 2: R2E7** needs to be populated with an 10ohm 0603 resistor as it is unpopulated by default with the SC2688.

**\*\*\*\*USE STEP 3 AS REQUIRED FOR YOUR REVISION OF XBOX\*\*\*\***

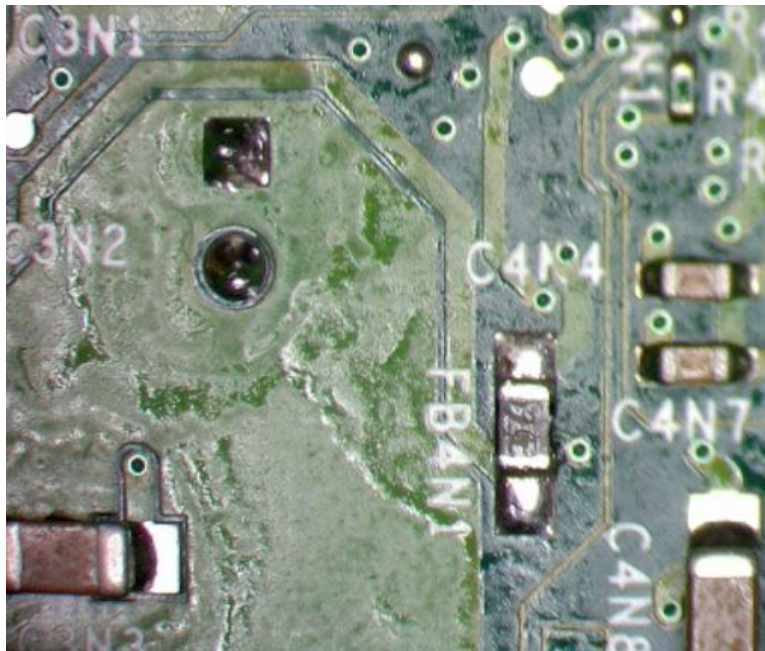
**STEP 3: \*FOR V1.2/V1.3 Xbox - R2E3 and R2E4** need to be populated with 0ohm 0603 resistors. This is the VID setting for 1.45v to the core. Populating R2E3 and R2E4 will set the VID V\_CPUCORE at 1.45v. You can adjust it as desired. I recommend using the PIII default core voltage of 1.45v though. Change it at your own risk! Below is the VID table for the SC1186. This is different to the V1.4 Xbox as V1.2/1.3 have the Conexant Encoder which requires 3V VCC to operate.

**\*\*\*\*This adjustment is required for the FOCUS Encoder in V1.4 revision ONLY\*\*\*\***

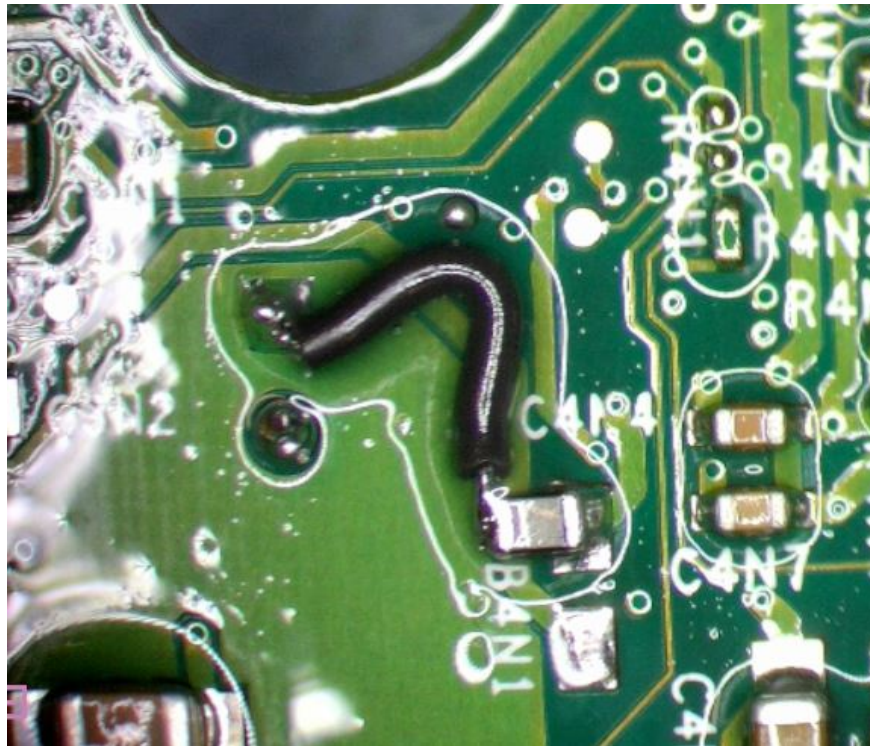
**STEP 3: \*FOR V1.4 Xbox ONLY \***– This option allows full control over the VID adjustments whilst still supplying 1.5v to the FOCUS Encoder which by default is reliant on the CPU\_VCORE to be running at 1.7v. You need to remove FB4N1 and turn it 90 deg on the input pad as pictured. Then run a jumper from the FB to the positive pin of the capacitor leg as pictured to supply 1.5v to the FOCUS Encoder. Then adjust your VID as desired!

For 1.40v CPU\_CORE populate R2E4 with an 0ohm 0603 resistor. See the below VID table and SC1186 pinout for other VCORE adjustments

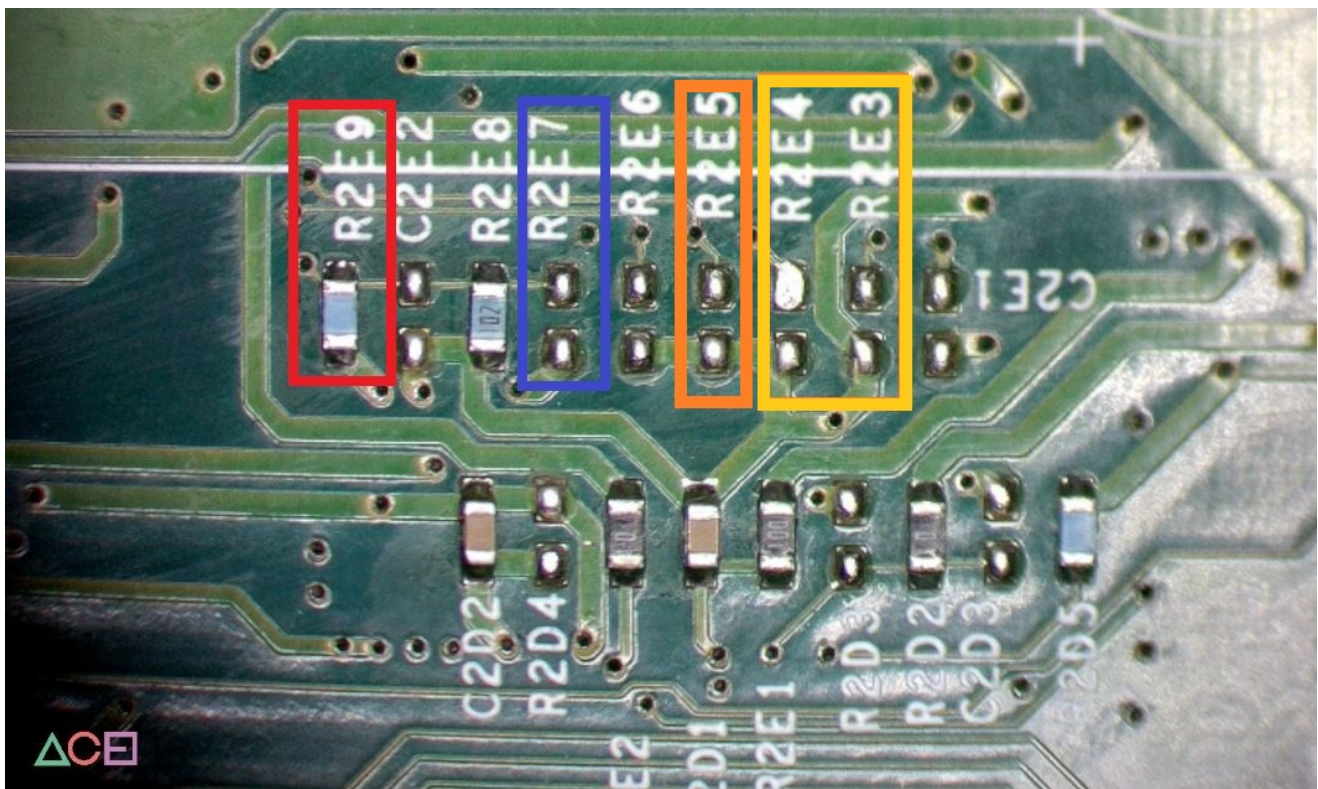
**\*\* POPULATING R2E5 will drop the VCORE to 1.50v and you will not be required to do the FB modification\*\***







^^^This adjustment is required for the FOCUS Encoder in V1.4 revision ONLY^^^



**\*\* OPTION 2 For 1.8v Focus Encoder VCC \*\***

This is an option to power the Focus encoder on it's own rail. Microsoft put the rail on the board by default but never used it to power the Focus Encoder and by default the Focus encoder relies on the CPU\_VCORE rail to be at 1.70v to operate.

Required components.

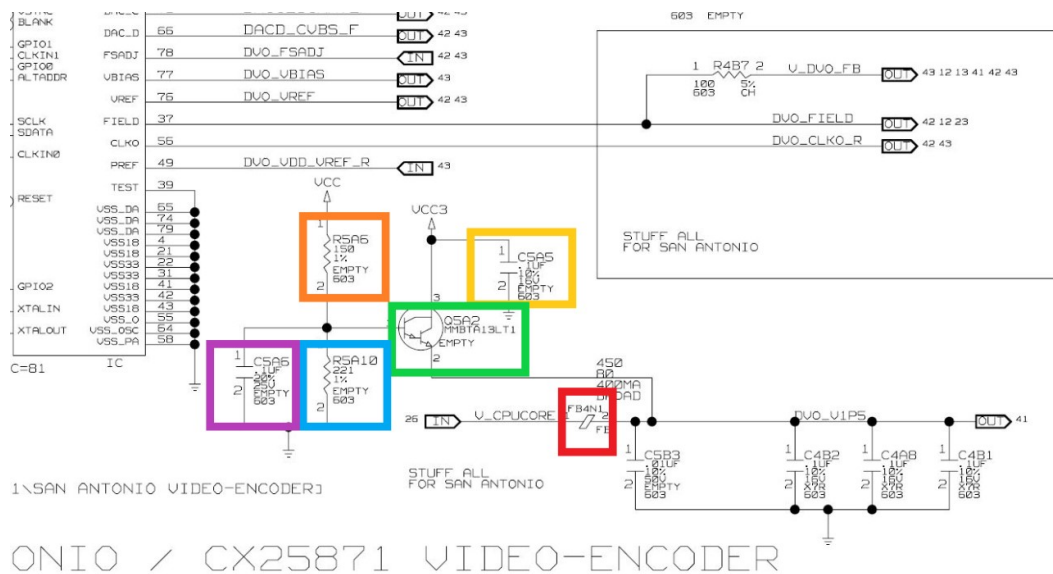
1: MMBTA13LT1 Mosfet

2: 150 ohm 0603 Resistor x1 (R5A6)

3: 0.1uf 25v 0603 MLCC capacitor (C5A6)

4: 0.1uf 16v 0603 MLCC capacitor (C5A5)

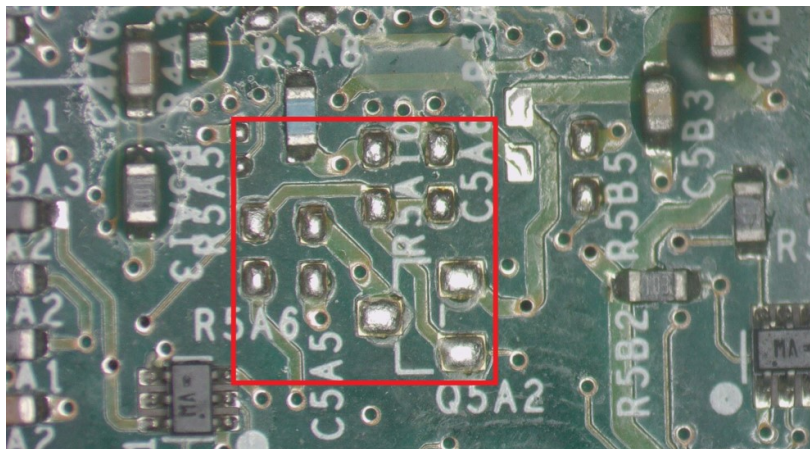
5: 221 ohm 0603 resistor (R5A10)



**\*\*You MUST remove FB4N1 from the bottom of the motherboard\*\***

Then you just need to populate the area on the board with the components listed above in their locations show below in the picture. The area that needs populating is behind the AV port on top of the motherboard

You can then safely adjust the CPU\_VCORE to your desire without affecting the output from the Focus encoder. Anything below 1.50v on the CPU\_VCORE will produce a grainy picture from the Focus Encoder



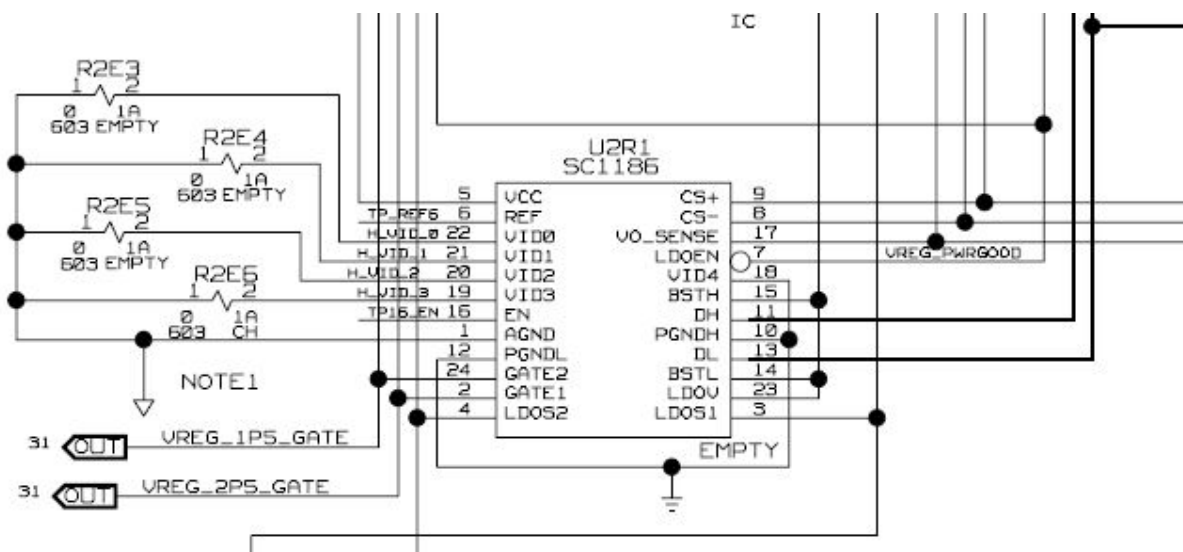
**POWER MANAGEMENT**
**Applications Information - Output Voltage Table**

Unless specified: 4.75V < VCC < 5.25V; GND = PGND = 0V; VOSENSE = V<sub>O</sub>; 0mV < (CS+ - CS-) < 60mV; = 0°C < T<sub>J</sub> < 85°C

| Parameter                     | Conditions  | Vid<br>43210 | Min   | Typ   | Max   | Units |
|-------------------------------|---|--------------|-------|-------|-------|-------|
| Output Voltage <sup>(1)</sup> | I <sub>O</sub> = 2A in Application circuit (Figure 1) | 01111        | 1.277 | 1.300 | 1.323 | V     |
|                               |   | 01110        | 1.326 | 1.350 | 1.374 |       |
|                               |   | 01101        | 1.375 | 1.400 | 1.425 |       |
|                               |   | 01100        | 1.424 | 1.450 | 1.476 |       |
|                               |   | 01011        | 1.478 | 1.500 | 1.523 |       |
|                               |   | 01010        | 1.527 | 1.550 | 1.573 |       |
|                               |   | 01001        | 1.576 | 1.600 | 1.624 |       |

0 = populated with a 0ohm resistor 1 = open line – no population

Below is the pinout/pad locations for the VID adjustments



CREDITS: #ACE (myself) and #Andr0 (AndrZero) #WaCKeDMaN probably chimed in too!