

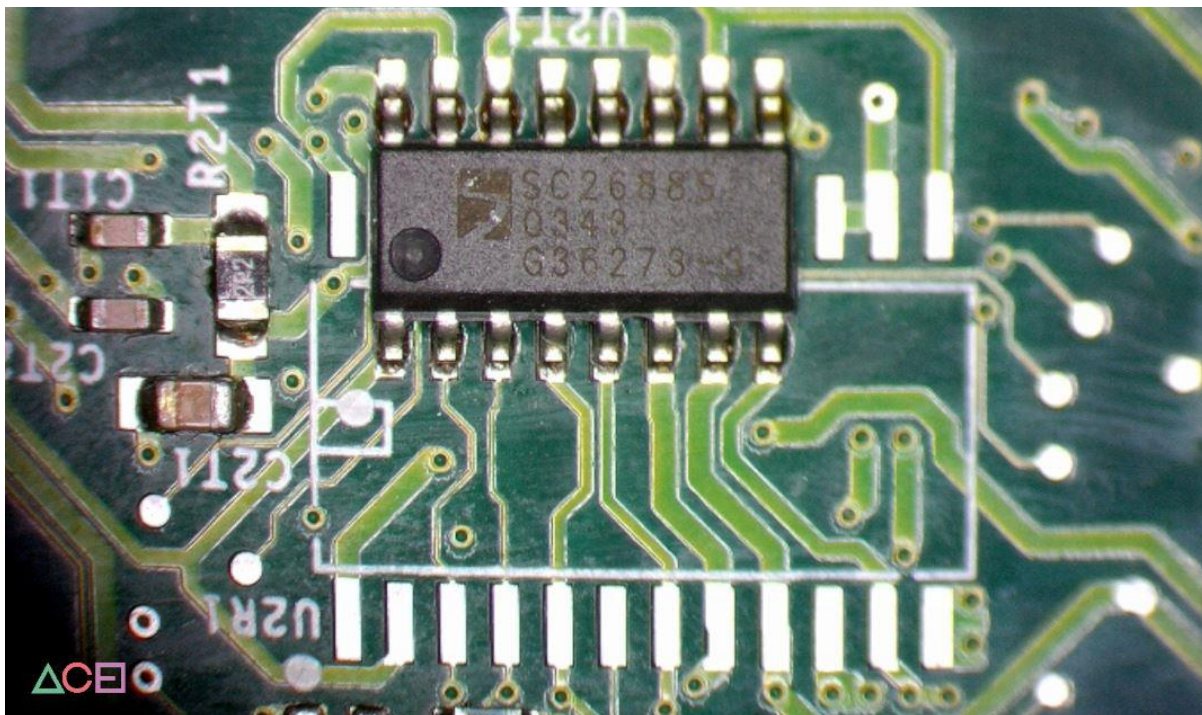
21/06/23

XBOX V1.2 – V1.3 1.45V CPUCORE and V1.4 1.50V CPUCORE PIII TUALATIN V_CPUCORE 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.

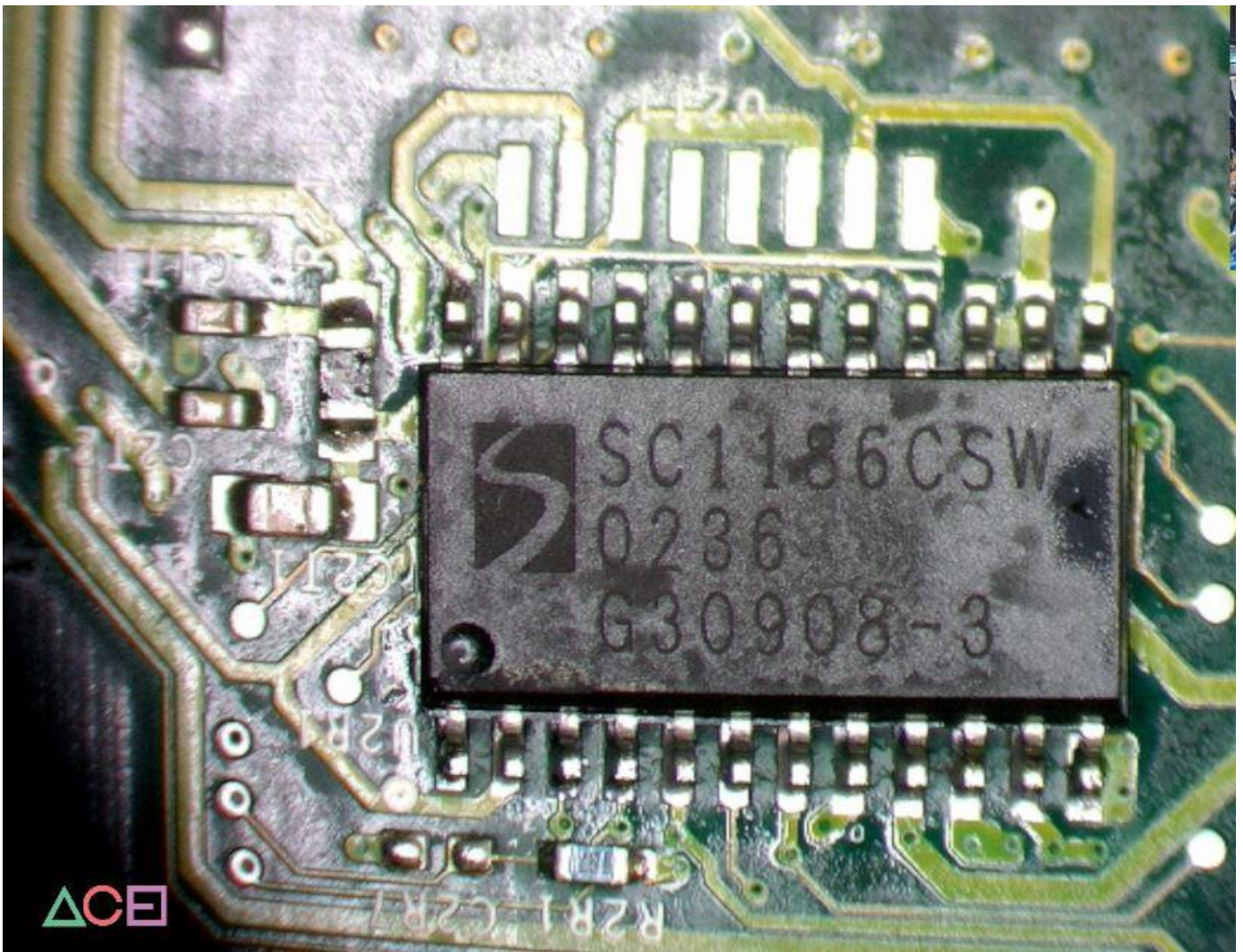
Firstly you need to check what DC/DC voltage convertor is installed on your xbox. There are 2 revisions, SC2688 (U2T1) and SC1186 (U2R1). Here is a picture of the area and it populated with the SC2688.

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 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*****

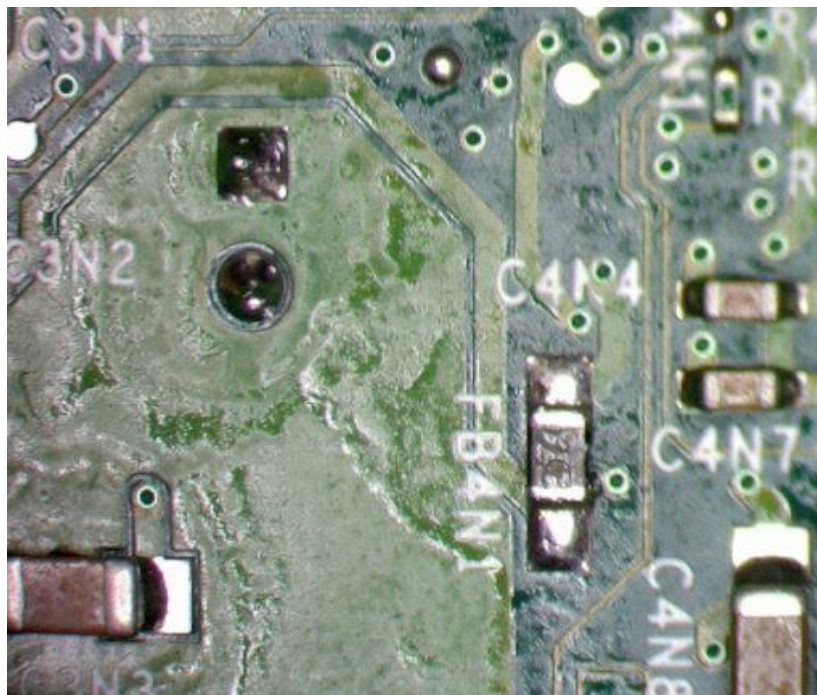
STEP 3: *FOR V1.2/V1.3 R2E3 and R2E4 need to be populated with 0ohm 0603 resistors. This is the VID setting for V1.45 to the core. Populating R2E3 and R2E4 will set the VID V_CPUCORE at V1.45. You can adjust it as desired. I recommend using the PIII default core voltage of V1.45 though. Change it at your own risk! Below is the VID table for the SC1186. This is different to the V1.4 as V1.2/1.3 have the Conexant Encoder which requires 3V VCC.

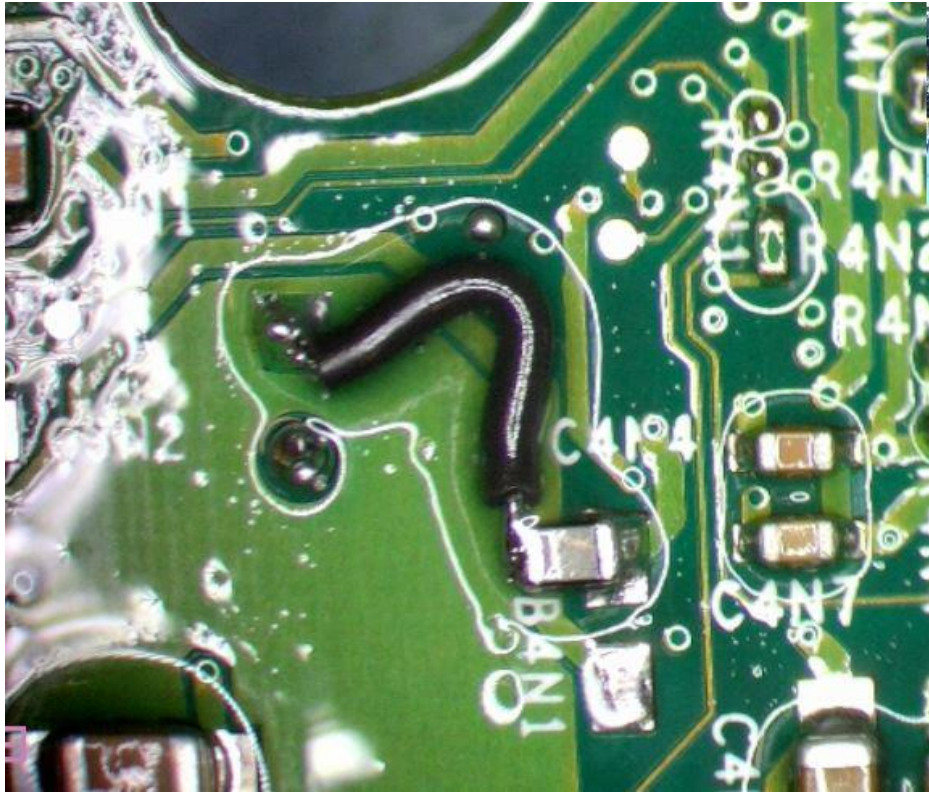
******This adjustment is required for the FOCUS Encoder in V1.4 revision ONLY******

STEP 3: *FOR V1.4 ONLY *– This option allows full control over the VID adjustments whilst still supplying V1.5 to the FOCUS Encoder which by default is reliant on the CPU_VCORE to be running at V1.5. 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 V1.5 to the FOCUS Encoder. Then adjust your VID as desired!

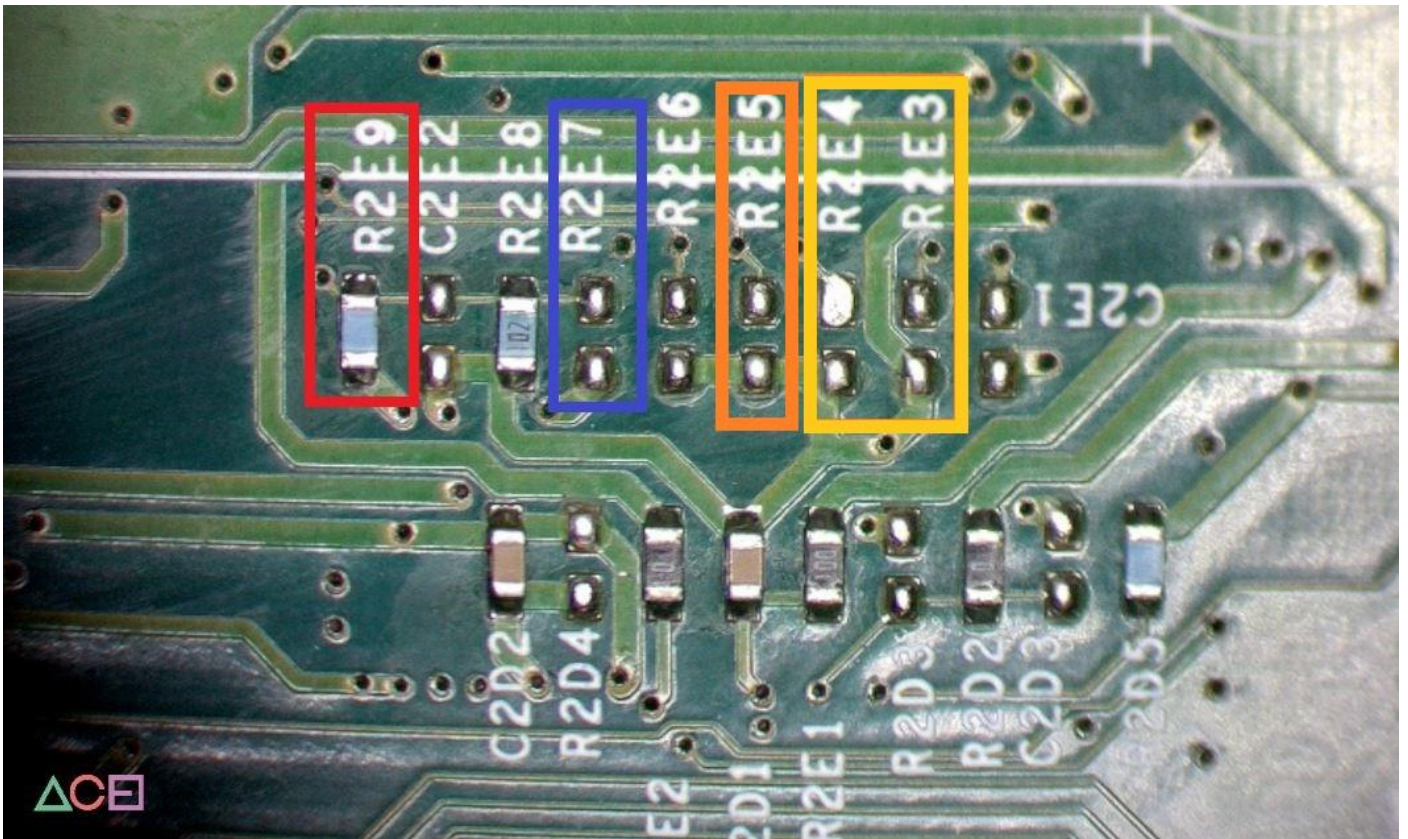
For V1.40 CPU_CORE populate R2E4 with an 0ohm 0603 resistor. See the below VID table and SC1186 pinout for other VCORE adjustments

**** POPULATING R2E5 will drop the VCORE to V1.50 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 V1.8 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 operate.

Required components.

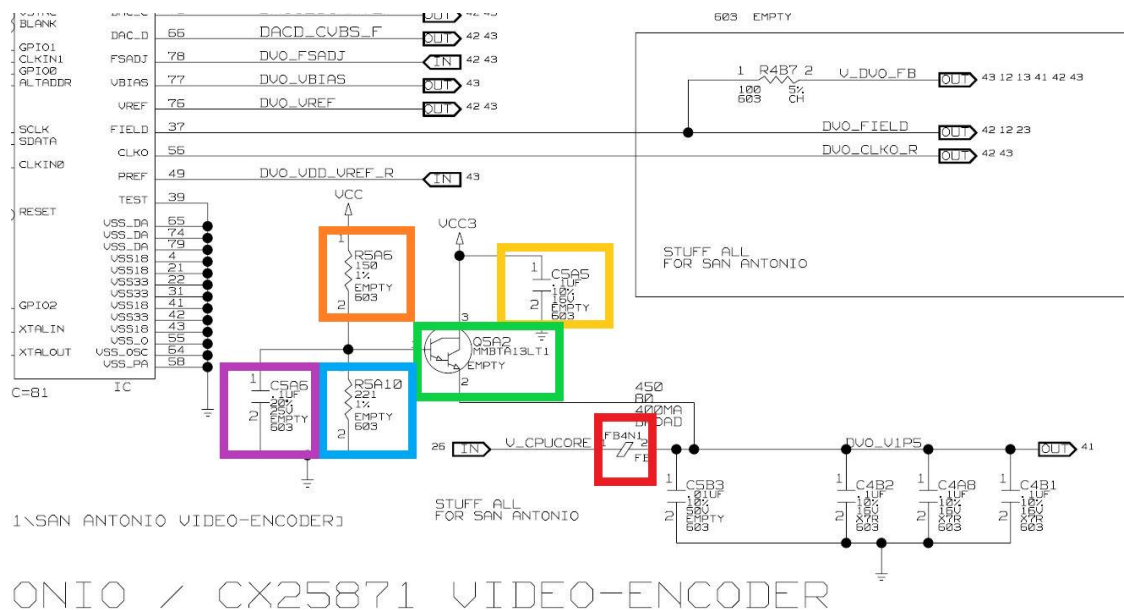
1: MMBTA13LT1 Mosfet

2: 150 ohm 0603 Resistor x1 (R5A6)

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

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

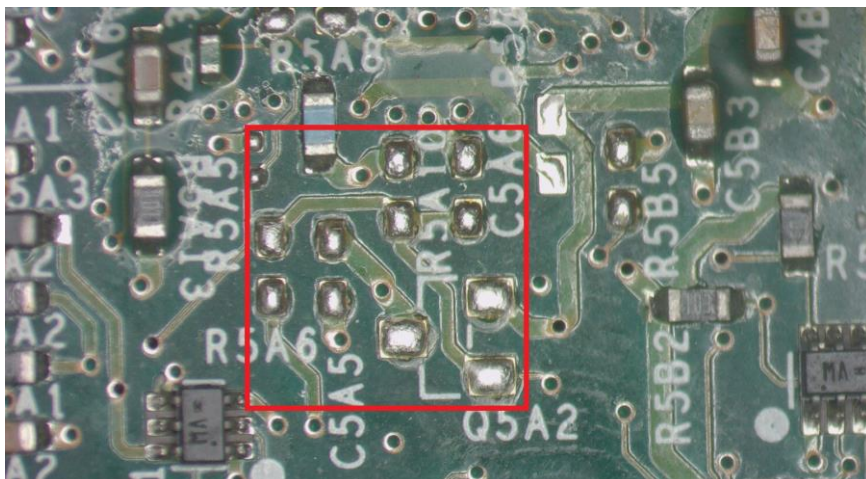
5: 221 ohm 0603 resistor (R5A10)



****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 V1.50 on the CPU_VCORE will produce a grainy picture from the Focus Encoder



POWER MANAGEMENT

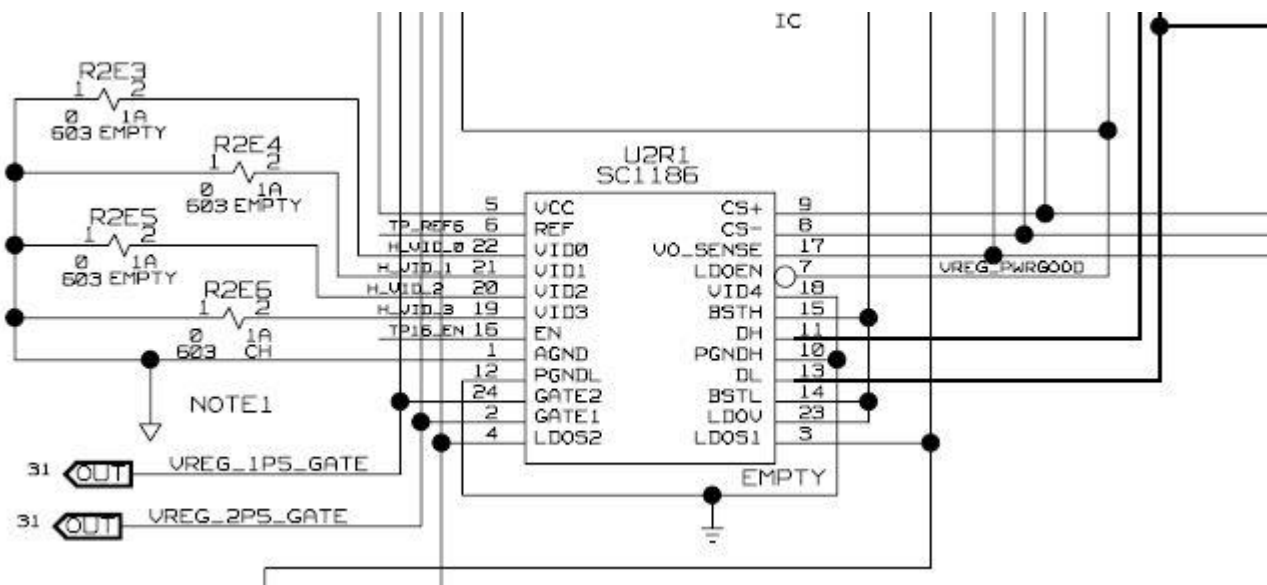
Applications Information - Output Voltage Table

Unless specified: $4.75V < V_{CC} < 5.25V$; $GND = PGND = 0V$; $VOSENSE = V_O$; $0mV < (CS+ - CS-) < 60mV$; $= 0^{\circ}C < T_J < 85^{\circ}C$

Parameter	Conditions	Vid 43210	Min	Typ	Max	Units
Output Voltage ⁽¹⁾	I _o = 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!