ECU Reverse Engineering Step 1 - Another ECU

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As I mentioned in the previous post, I had been sent the 1995 ECU BPL9-18-881B by an online seller, so I ended up buying an ECU from a 1999 NB Miata with the model number BP5R-18-881. This ECU came in today, so I quickly opened it up to take some pictures and find datasheets.

Similar to the BPL9 ECU, this one also has a metallic case (*Figure 1*) which I opened to reveal the back (*Figure 4*) and the front (*Figure 2* and *Figure 3*) to show the details.

Figure 1. The ECU is enclosed in a secure aluminum box

Figure 2. This is the top (front) view of the ECU board

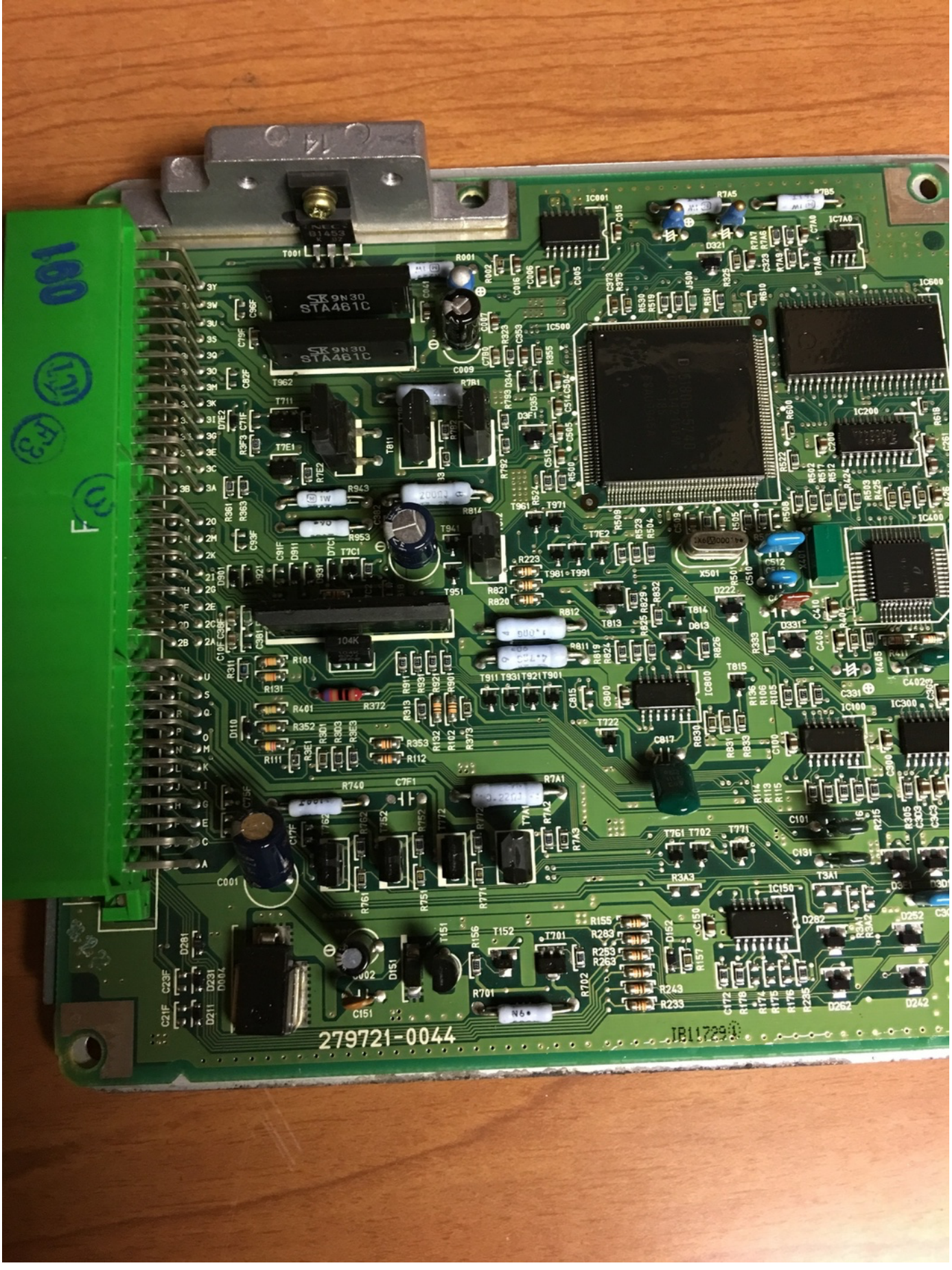

Figure 3. This is the top (front) view of the ECU board shown so we can see the board number

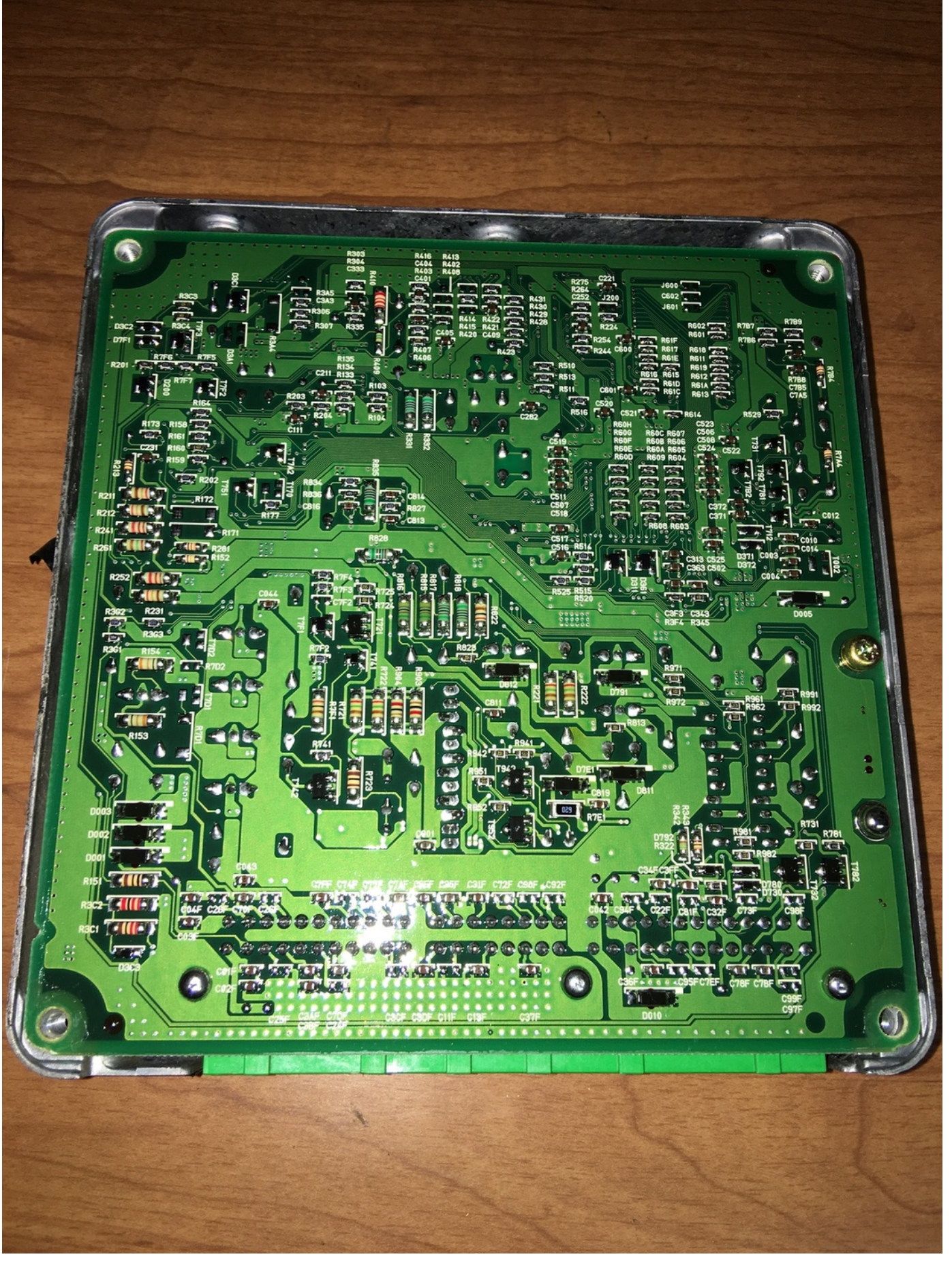

Figure 4. This is the bottom (back) view of the ECU board

The CPU and the EEPROM chips were coated in a compound that made it difficult to take pictures directly, but I held them close to the light and was able to do so as you can see in *Figure 5* and *Figure 6*.


R500
C503
R509
C509
R505
R508
R522
R600
R502
R517
R512
C200
R424
R503
R425
IC200
IC400
R426
R427
C407
C241
C261
R618
R530
R519
R518
R610
IC600
D15180G-5740
SC43142IVFM
185
SSAU9945A
JAPAN
29F200BA-90-J GT
9936 Z32
74HC244A

Figure 5. This chip is the CPU of the board

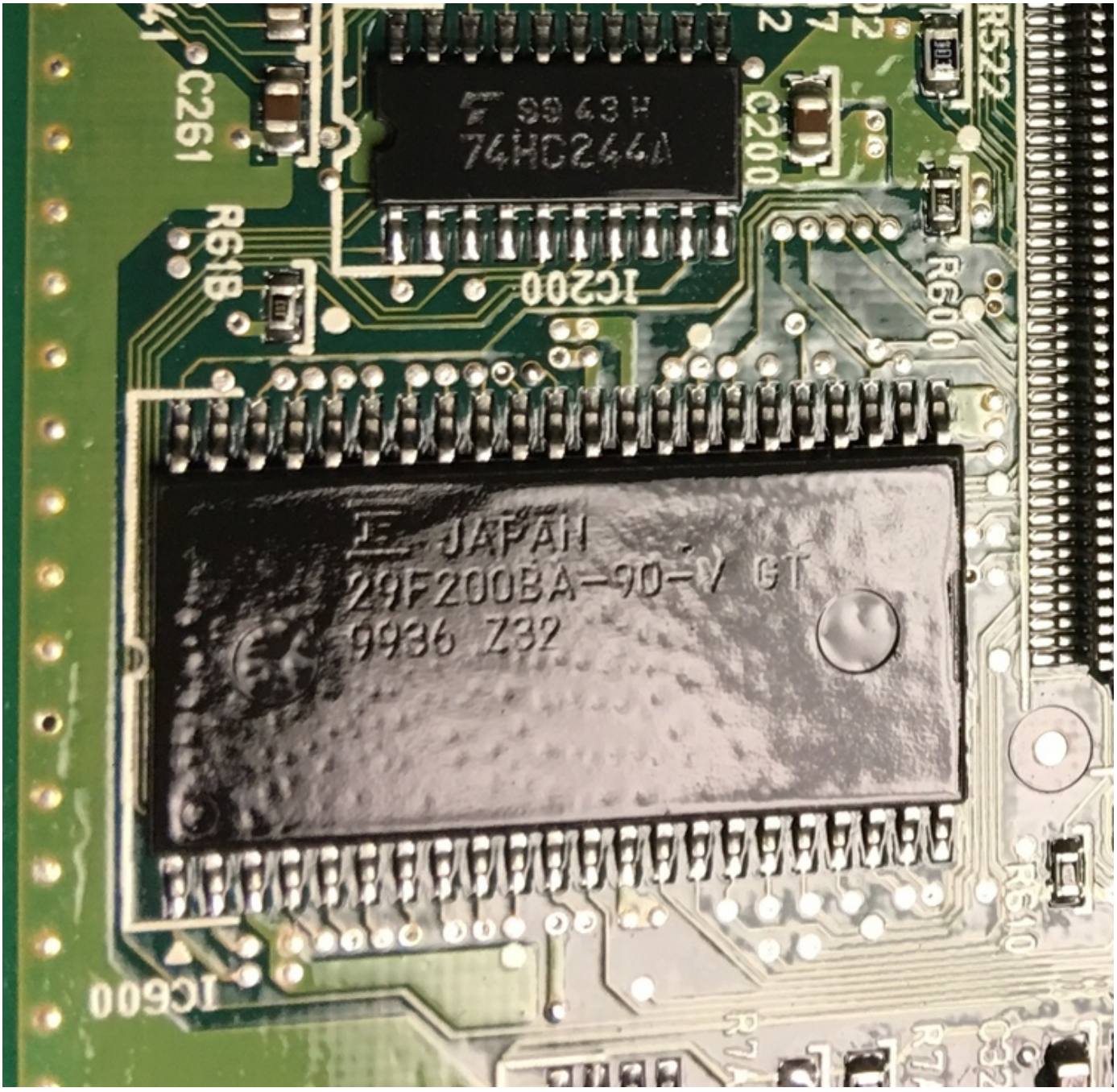

Figure 6. This chip points to the EEPROM on the board (IC600)

As you may see that the CPU is a semi-custom chip with the numbers *D151806-5740* or *SC431421VFM185* or *SSAU9945A* and has 160 pins. From forums listed in the previous post, it is guessed that this is a Motorola/Freescale M68H16 variant, and the 160-pins match the model

MC68HC16Y1TS(mirror). The EEPROM chip (*IC600* on the board) has the numbers *29F200BA-90-V GT*, is made by Fujitsu, and has 44 pins. This also matches with the *MBA29F200BA* chip which is a 2 Mbit chip with 44 pins and rectangular package shape.

I found a couple of different datasheets for this model: DSA00442610, FJSUS04981-1. I should be able to dump the contents of the chip based on these two datasheets.

Figure 7 shows a 44-pin chip marked *IC400* which has the number *11U19 MG8461* and its purpose is unknown to me at this moment.

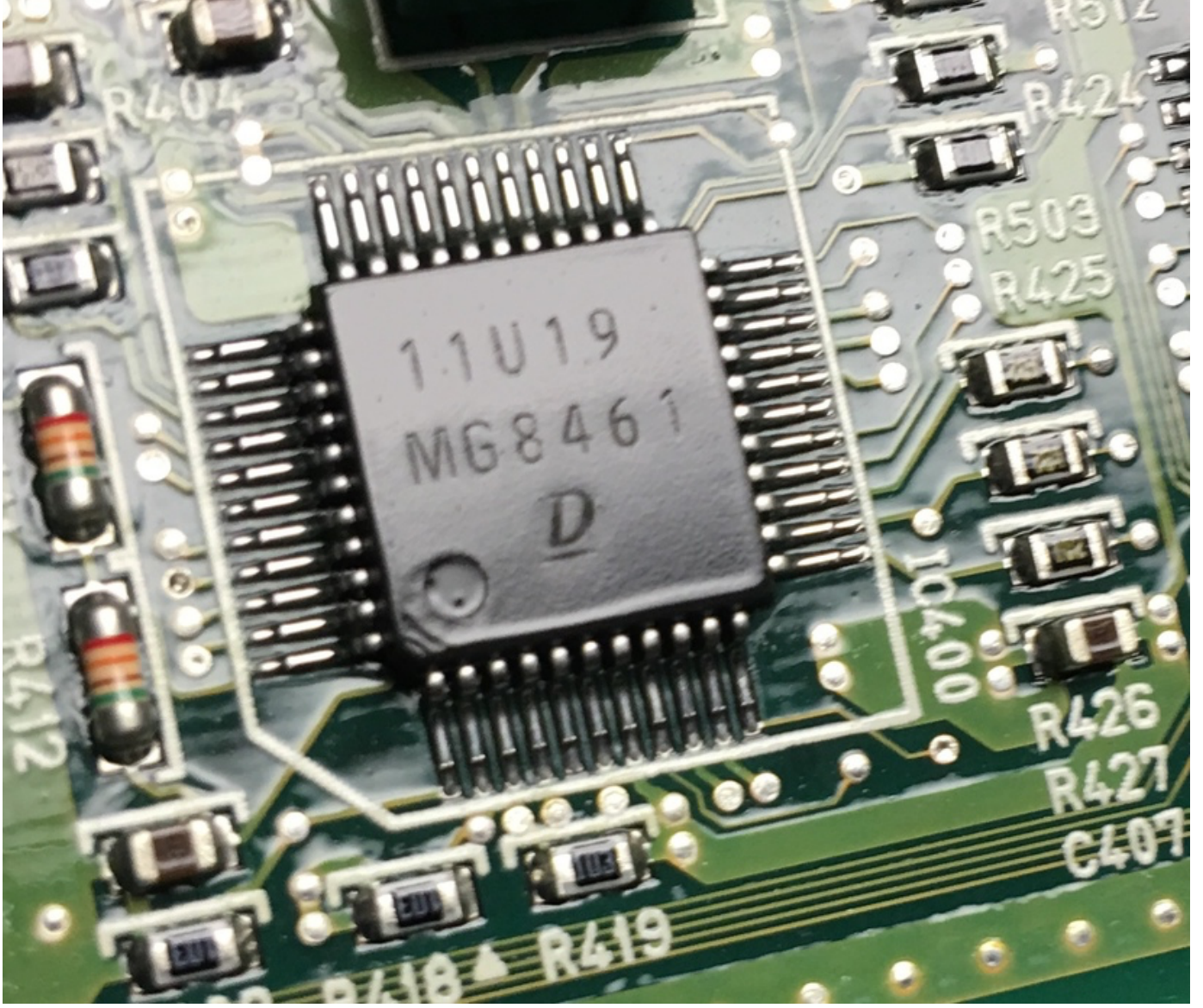

Figure 7. IC400 on the board

With this information, now the next steps are to verify that the chips match the data sheets. Stay tuned for the upcoming posts.