CENTRO UNIVERSITÁRIO DA FEI

Smart Car Race Brazil 2011 Technical Update

MicroFEI Team

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CONTENT

CAR CHANGES

Some modifications were made in the car prototype in order to solve some performance issues. Hardware was modified in a few points while the software was just adjusted in the system parameters.

RCA CAMERA:

The previous CCD camera was changed by a CMOS camera which provides the same signal standard. The new camera provides a lower quality image, but it is small and works with 5V, instead the 9-12V as the previous camera. By that the voltage supply in the camera connector was changed to 5V source.

DC MOTORS:

The DC motors were producing some electrical noises, and it was causing the power supply voltage to drop. This problem was solved adding three capacitors near to the motors in order to reduce any noise that motors were producing. One 1 µF capacitor is soldered across the motors terminals and one 0.47 µF from each motor terminal to the motor casing, as shown in Figure 1.

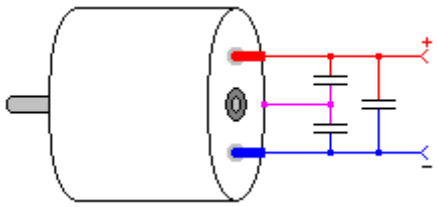

Figure 1: three-capacitor motor filter (1)

As this is a common problem when using DC motors and digital systems together, it might be a good idea to add this recommendation to the Application Notes from Freescale.

VELOCITY (BACK EMF) SENSORS:

As the time was short, the back EMF sensors are not being using. The hardware is implemented, but the software is not completed.

SERVOMOTOR:

A 100 nF capacitor was added to servomotor connector in order to filter possible servomotor electrical noises.

BIBLIOGRAPHY

1. *stefanv.com.* [Online] http://www.stefanv.com/rcstuff/qf200005.html.

ANNEXES

ANNEX A: PCB LAYERS

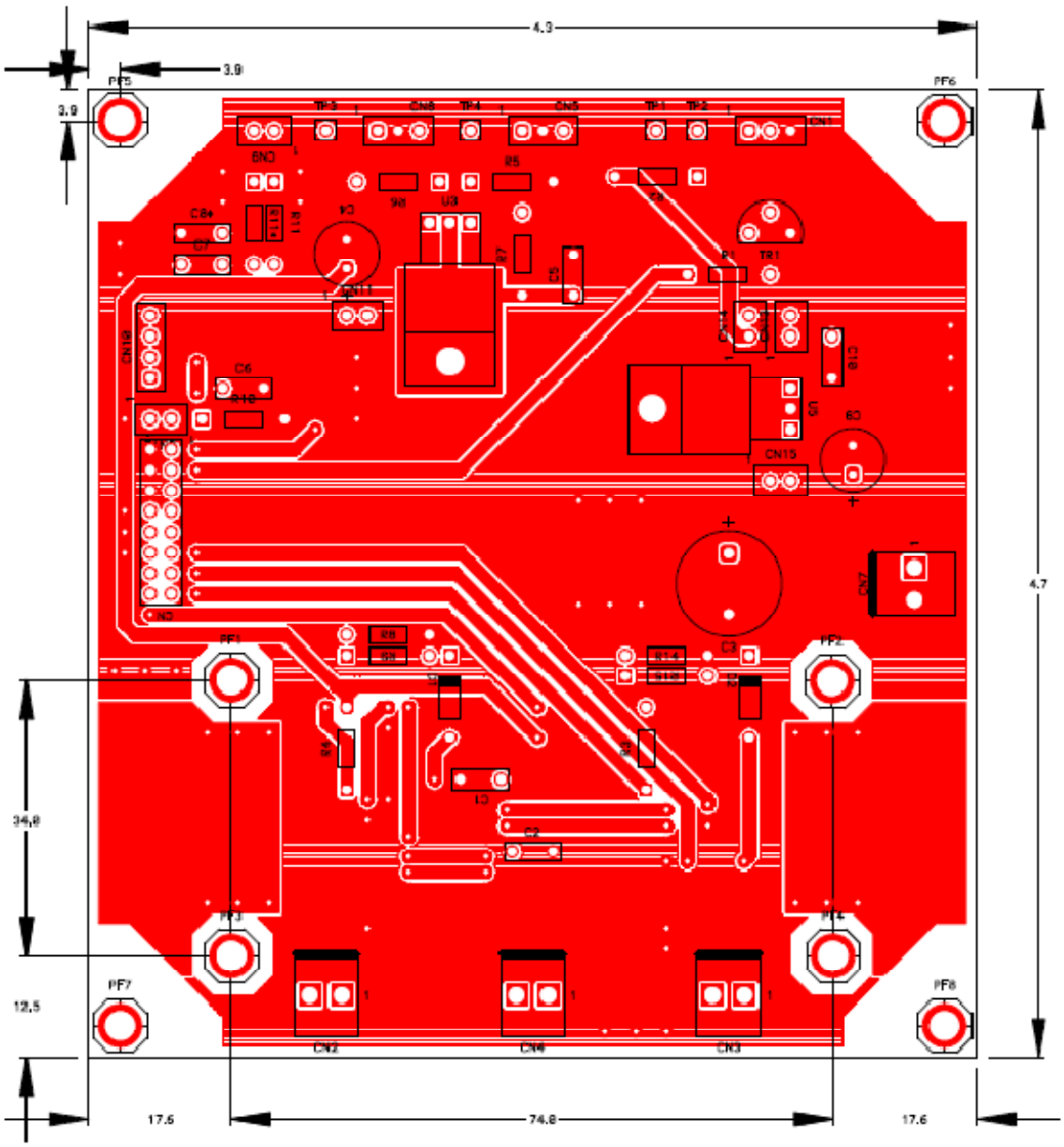

Figure 2: PCB top layer

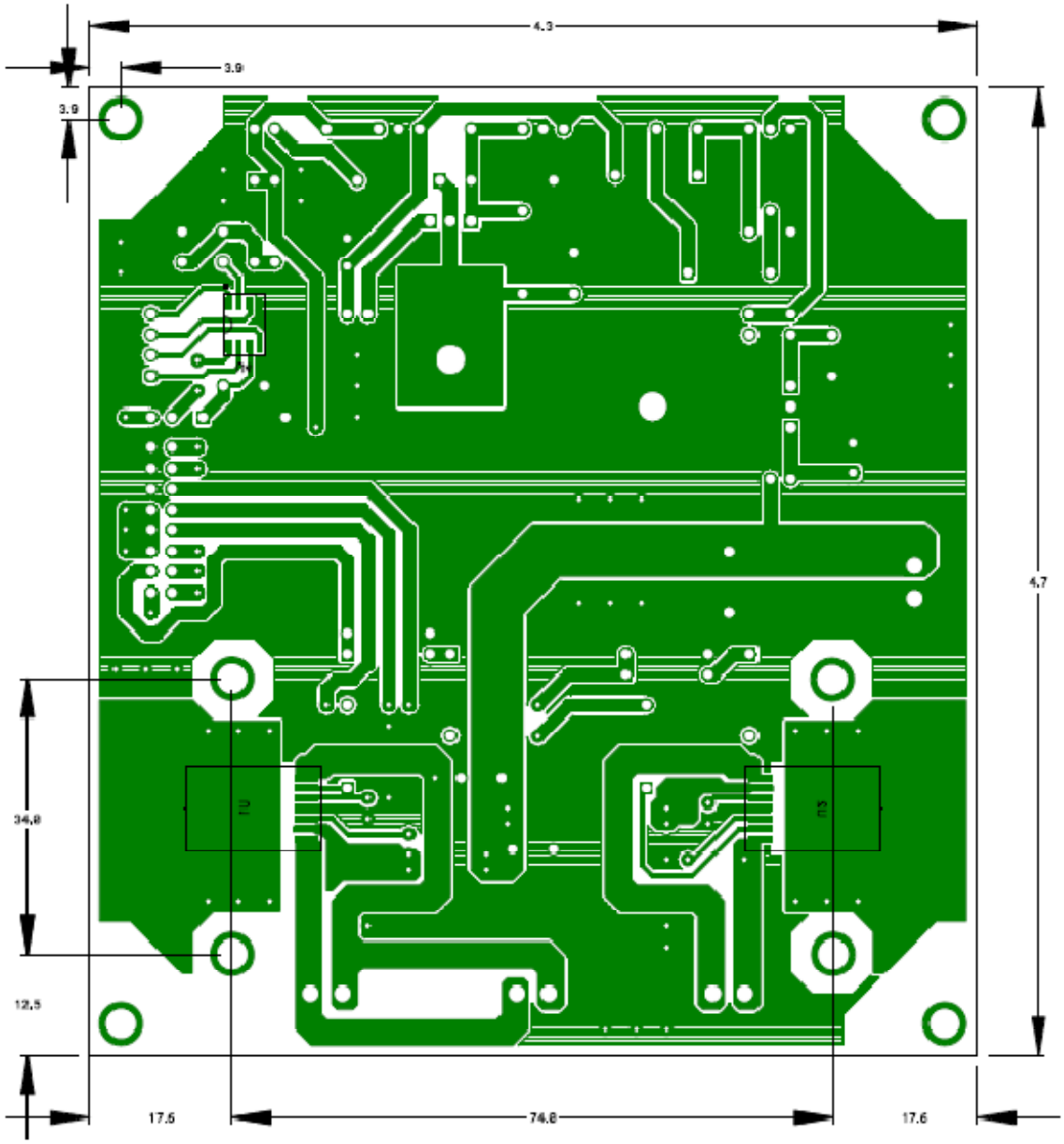

Figure 3: PCB bottom layer