Arduino UNO ComponentTester

This device is originally designed by Markus Frejek, link and software by Karl-Heinz Kuebbeler (kh_kuebbeler@web.de). The Ardutester software is based on porting by Markus Reschke (madires@theca-tabellaria.de) and later improving by PighiXXX (info@pighixxx.com) and PaoloP.

My improvements for Ardutester software are:

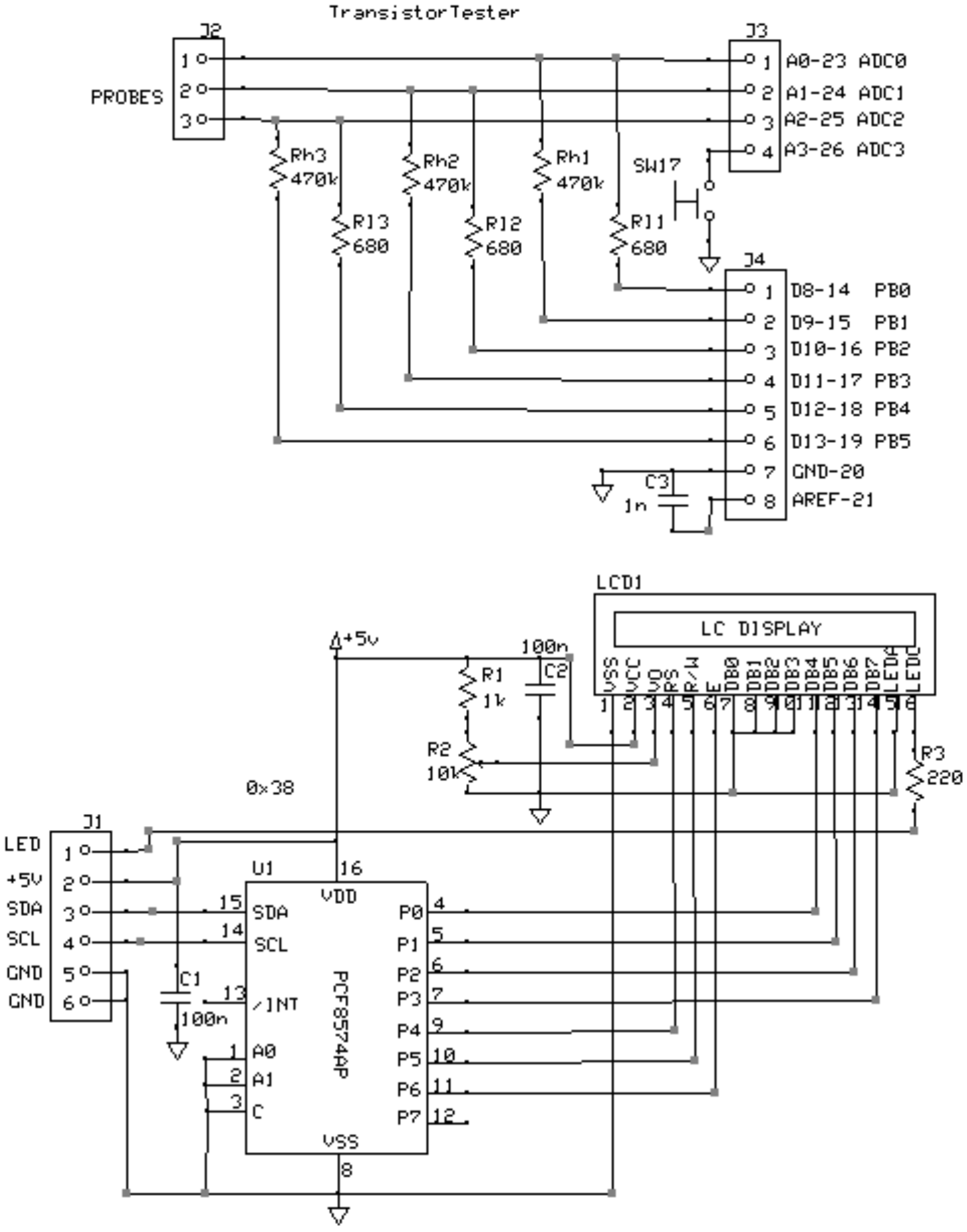
- displaying results into different display types for example DOGM128 display with SPI interface,

- restructuring software into header and class modules;

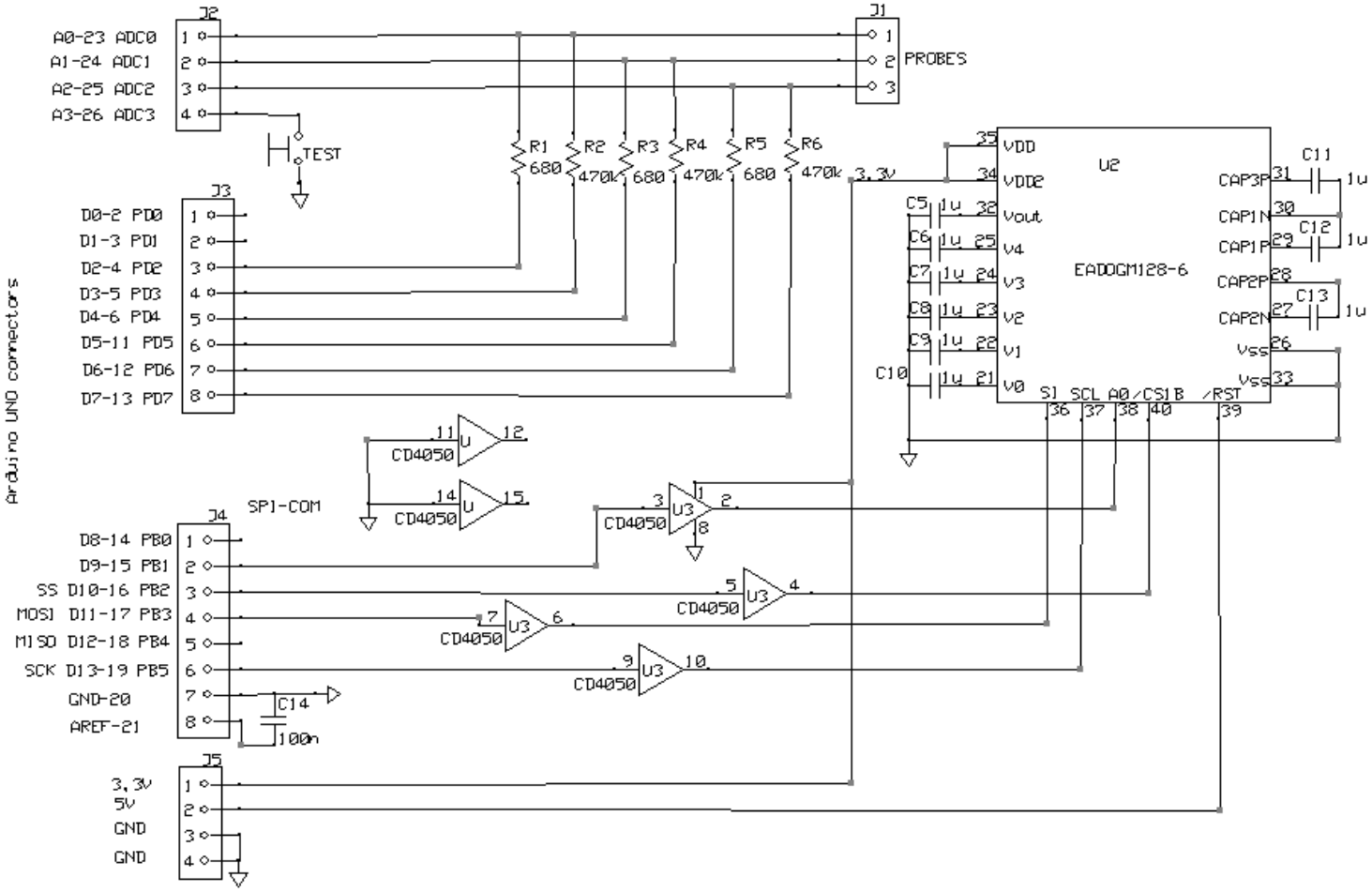
- some changes (for example PWM tool when SPI interface shares timer1 pin, frequency measuring function) and bug fixes;

Electronic Component Tester is based on Arduino UNO board.

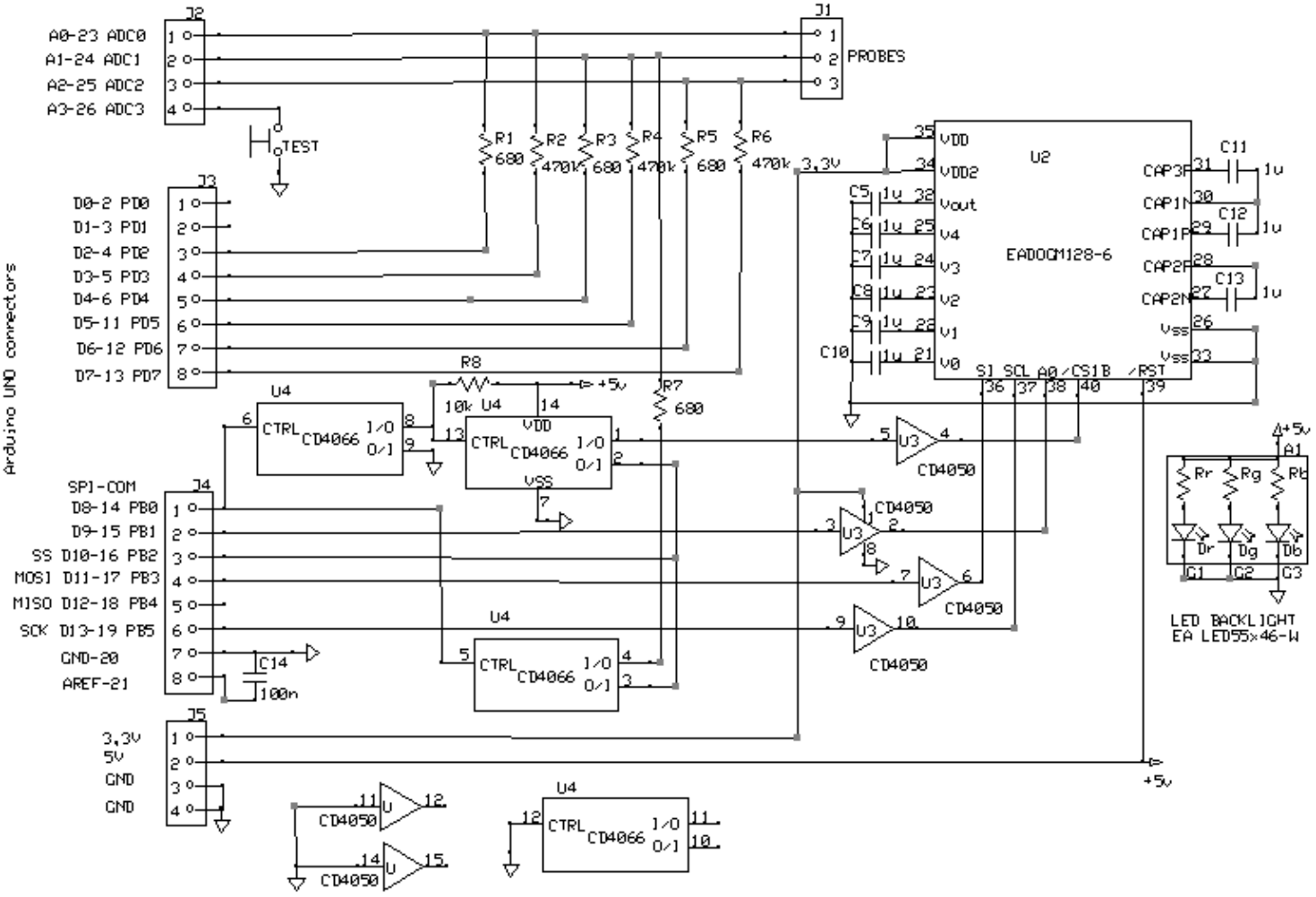
Electronic schematic diagram with I2C LCD Display.


TransistorTester
J2
PROBES
J3
A0-23 ADC0
A1-24 ADC1
A2-25 ADC2
A3-26 ADC3
Rh3 470k
Rh2 470k
Rh1 470k
SW17
R13 680
R12 680
R11 680
J4
D8-14 PB0
D9-15 PB1
D10-16 PB2
D11-17 PB3
D12-18 PB4
D13-19 PB5
GND-20
AREF-21
C3 1n
LCD1
LC DISPLAY
VSS VCC VO RS R/W E DB0 DB1 DB2 DB3 DB4 DB5 DB6 DB7 LEDA LEDC
+5v
100n
C2
R1 1k
R2 10k
R3 220
0x38
J1
LED
+5V
SDA
SCL
GND
GND
U1
VDD
SDA
SCL
/INT
A0
A1
C
VSS
PCF8574AP
P0
P1
P2
P3
P4
P5
P6
P7
C1 100n

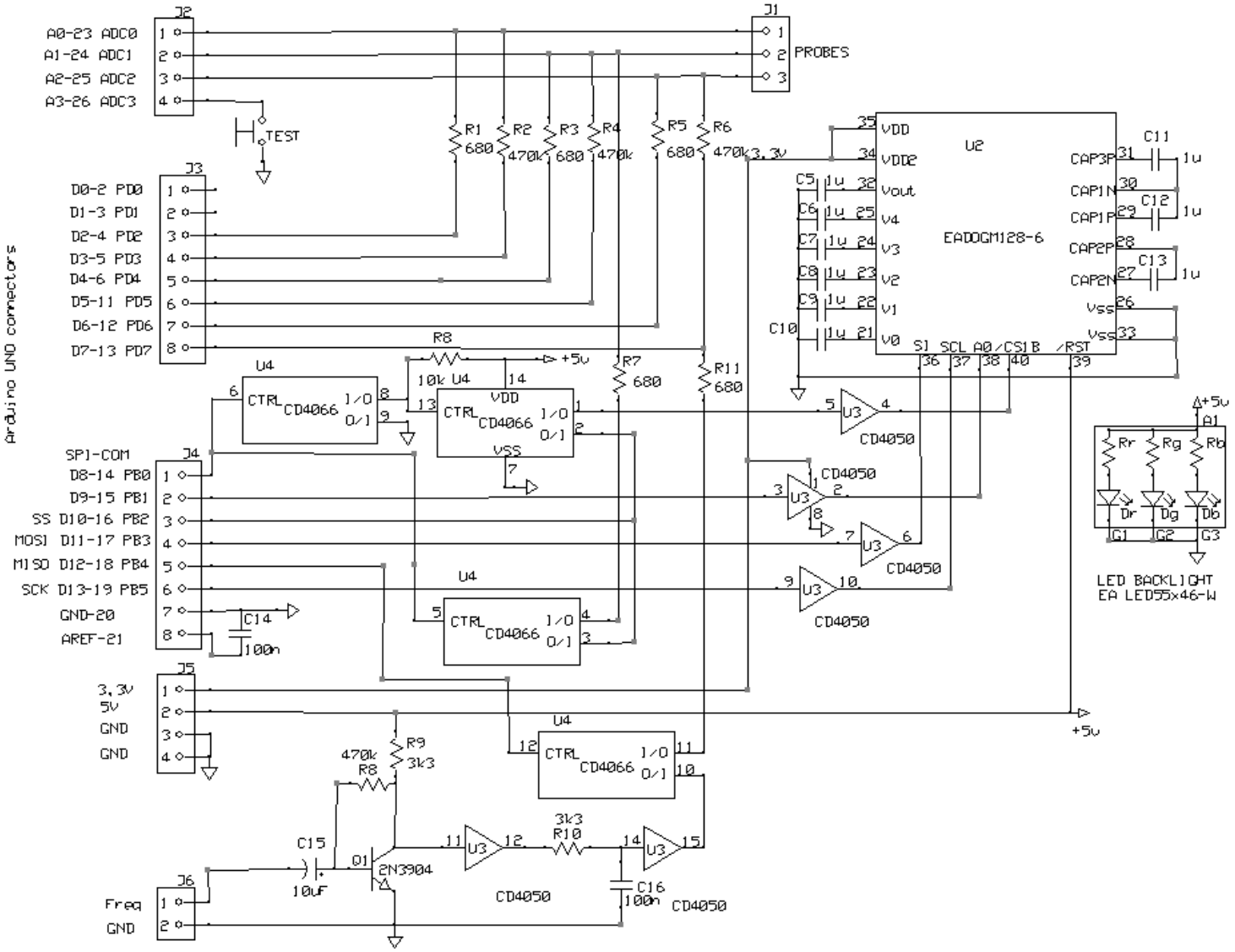
Schematics diagram with DOGM128 SPI interface LCD Display:



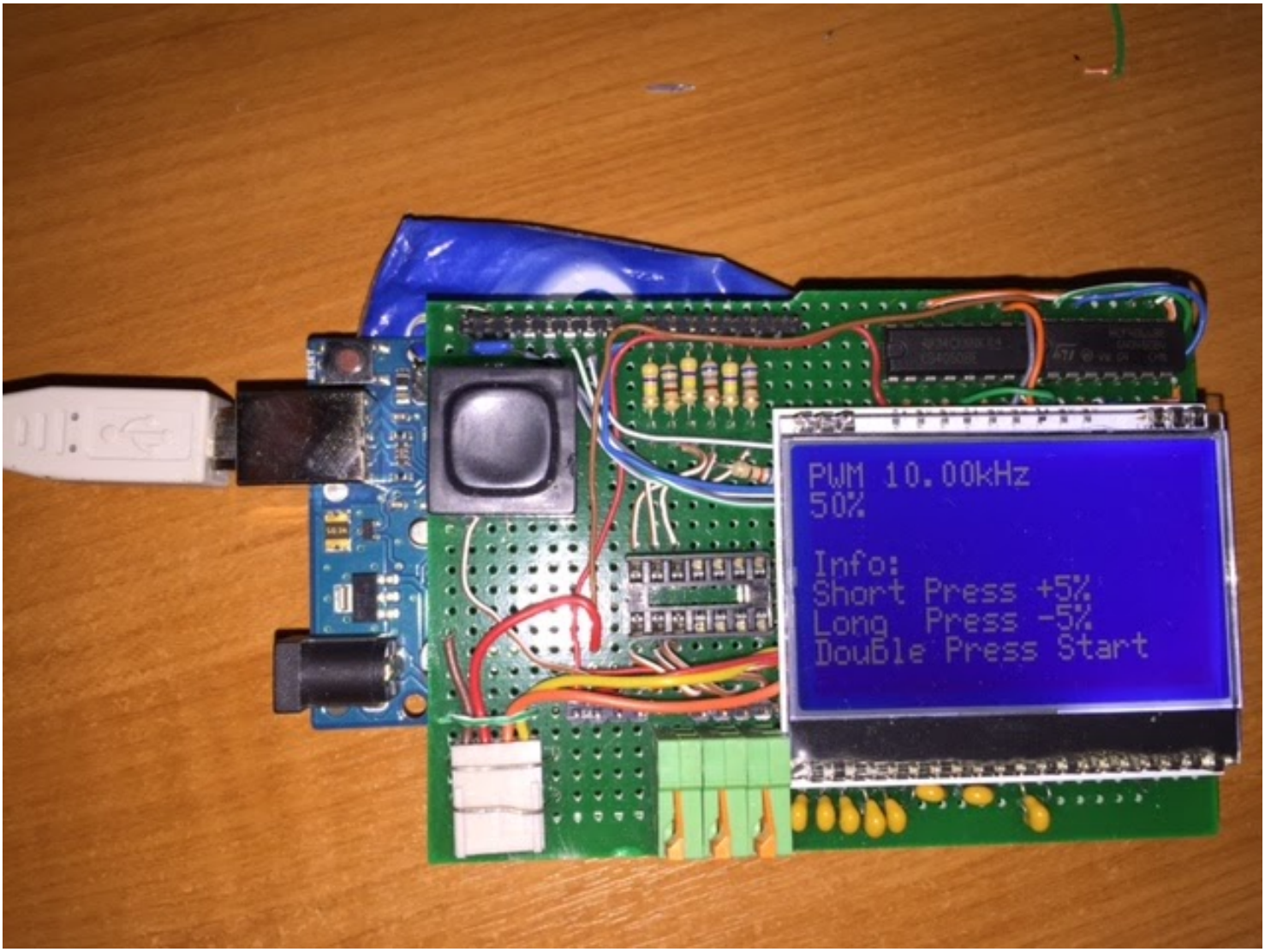
Schmatic diagram where was implemented also PWM tool functionality. Shares PB2 output between SPI and timer1 functionality. For this reason one electronic bidirectional switch CD4066 was included into schematic - switching with PB0 signal:



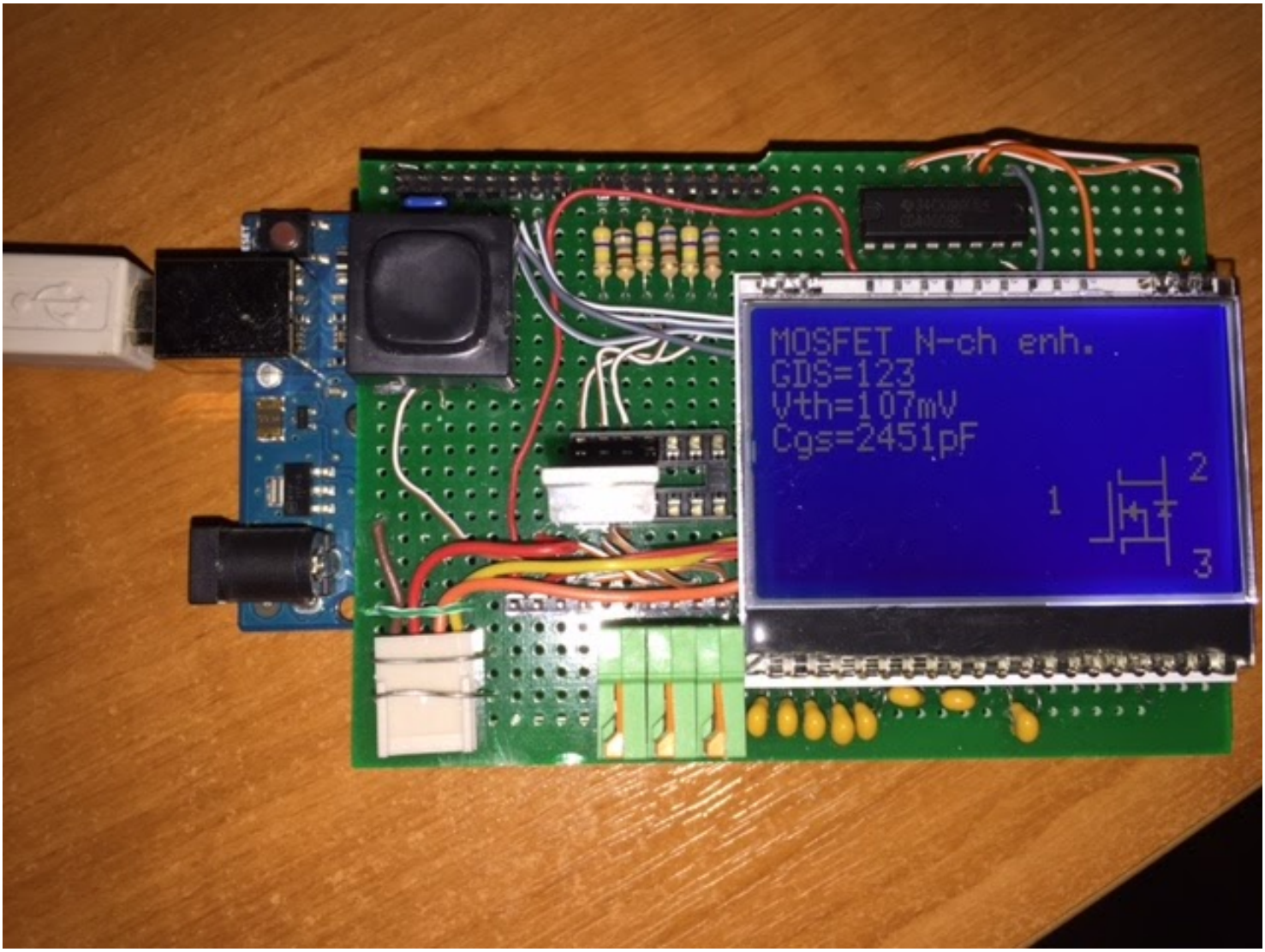
Schematic diagram with Frequency measurement input and amplifier (firmware version 1.1c):



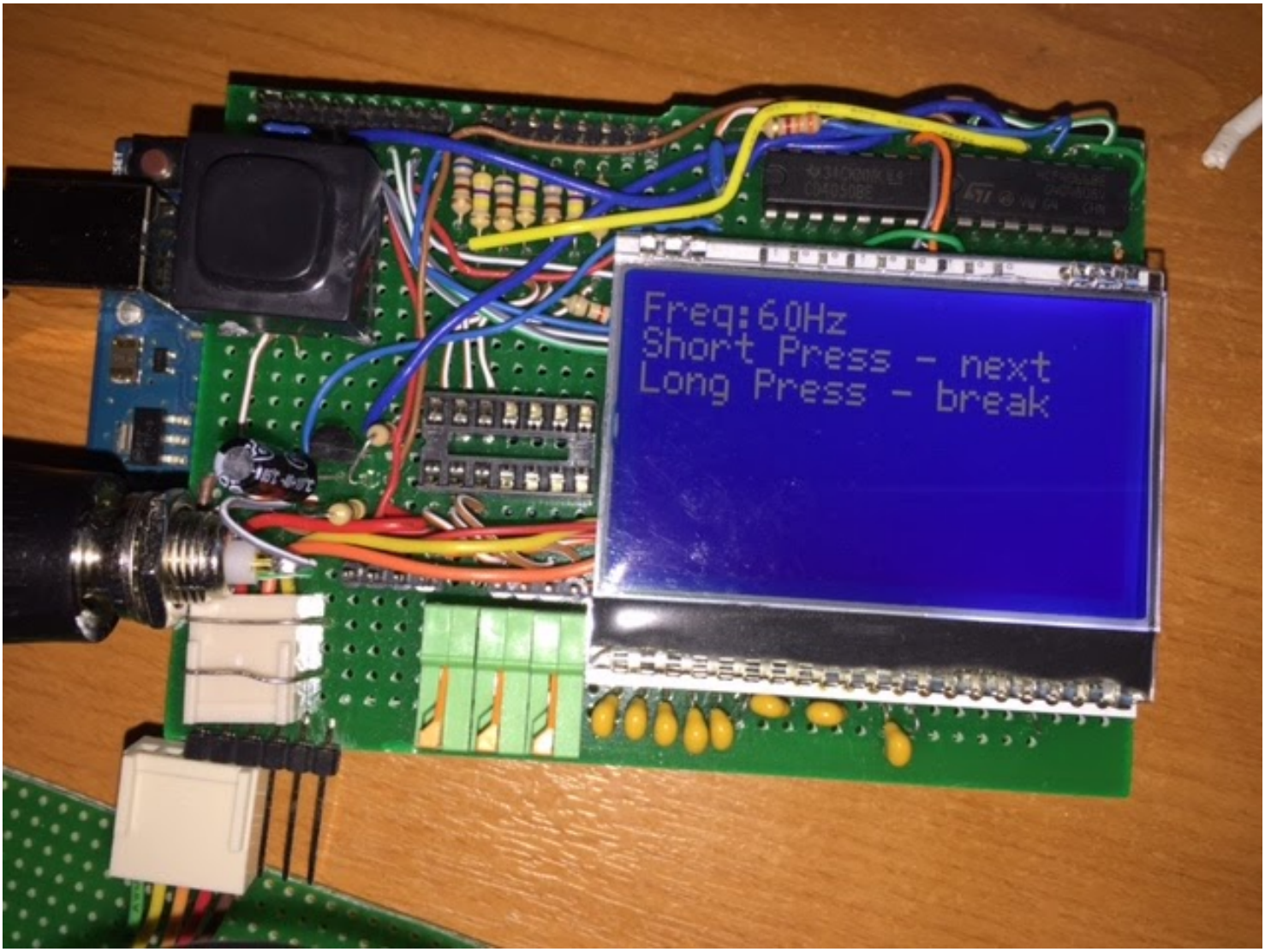
Prototype with DOGM128 LCD Display - PWM signal configuring and start:



Example of testing N channel MOSFET (CD4066 not yet included):



Frequency measurement additions:



Firmware project is implemented with Arduino IDE 1.6.6 and uploaded to here.

Project uses NewLiquidCrystal and U8GLIB libraries. Both libraries class files are modified litte bit.

Modification to NewLiquidCrystal library header file LiquidCrystal_I2C.h, added constructor without parameters:

LiquidCrystal_I2C ();

Second modification into LiquidCrystal_I2C.cpp file is this constructor implementation:

LiquidCrystal_I2C::LiquidCrystal_I2C()

{

config(0x38, EN, RW, RS, D4, D5, D6, D7);

}

,

Modification to U8Glib.h file was done into class U8GLIB_DOGM128 definition - added constructor without parameters:

U8GLIB_DOGM128() : U8GLIB(&u8g_dev_st7565_dogm128_hw_spi, 13, 11, 10, 9, 255){}

Small user manual

After starting device it is in component testing mode which is default mode.

Connect component with probes and short press to button.

If component is connected to probes then device tests it and displays results and graphic image with pin numbers if component was detected. If component was unknown or not connected to probes then message: "No component found!" will be displayed.

Long press to button will bring device into menu mode. Short press will display next menu choice. Long press will choose it.

When you choose PWM, device will offer frequencies starting at 100Hz. Other choices are 250, 500, 1000, 2500, 5000, 10000, 25000 Hz. Long press will choose frequency. Now you can choose duty cycle. Also Info will be displayed: Short press will increase duty cycle 5%, long press will decrease 5%. Double-click into button will start PWM. Pressing to button again will finish PWM.

When you choose Frequency Measurement, device starts measuring and displays to screen cycle count. When it finishes, it displays frequency measured at input connector. Short press to button will repeat measure cycle, Long press to button will terminate this task and device goes into tester mode. If frequency input connector is not connected to signal then device never finishes and you can break measuring with short button press.