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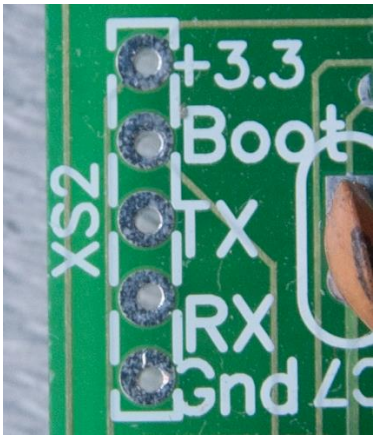
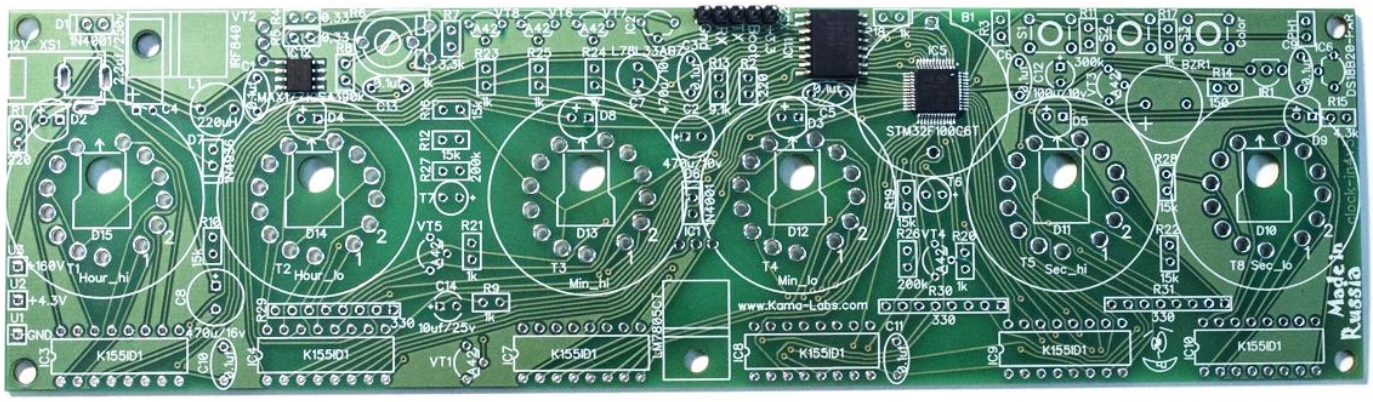
ASSEMBLY MANUAL FOR SONYA IN-4 v5 CLOCK

Be very careful with static electricity. If clock not work after build its mean that they been damaged by static electricity in process of assemble.

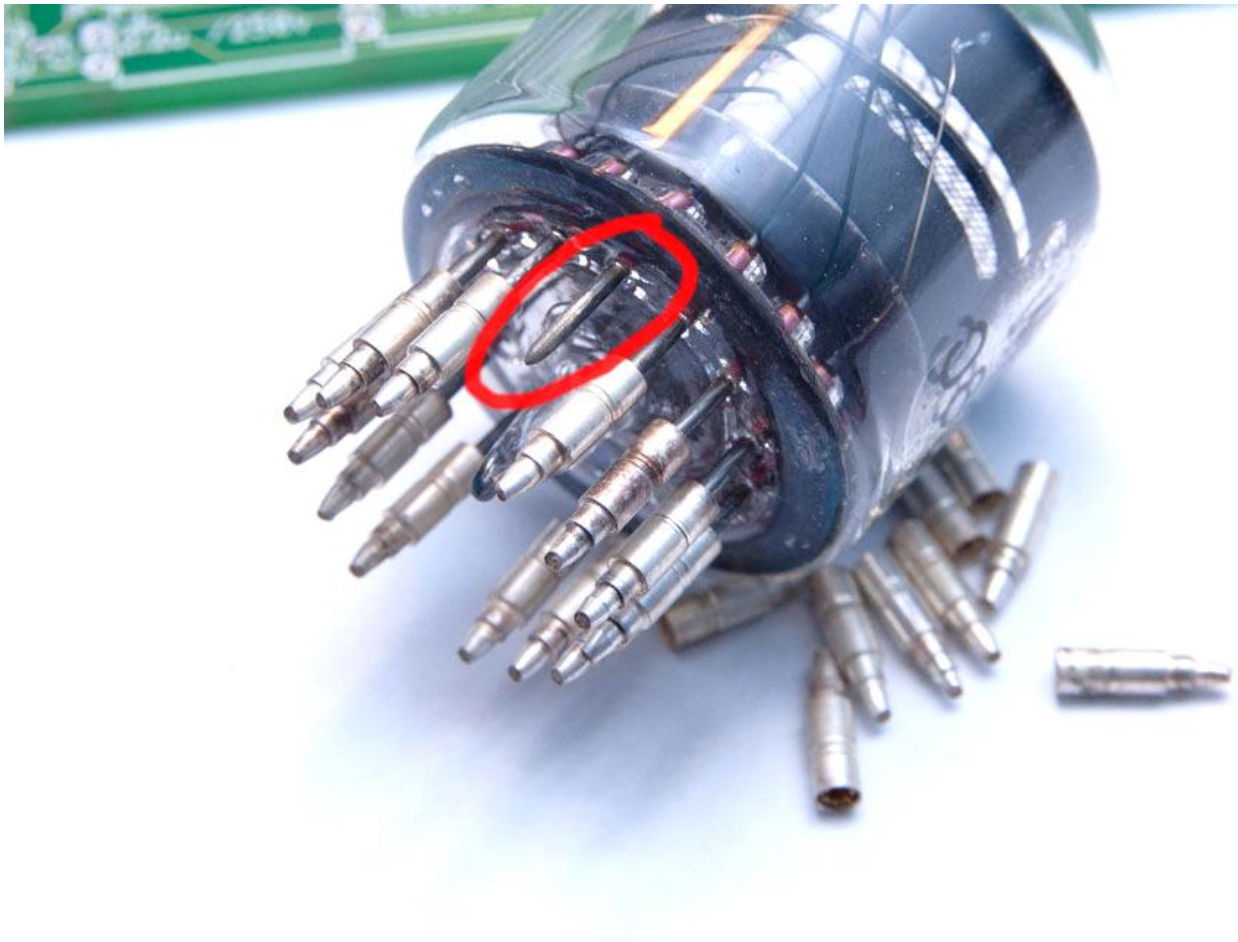


Check resistance between +3.3 and GND pins of XS2. The resistance should be more than 1kOhm.

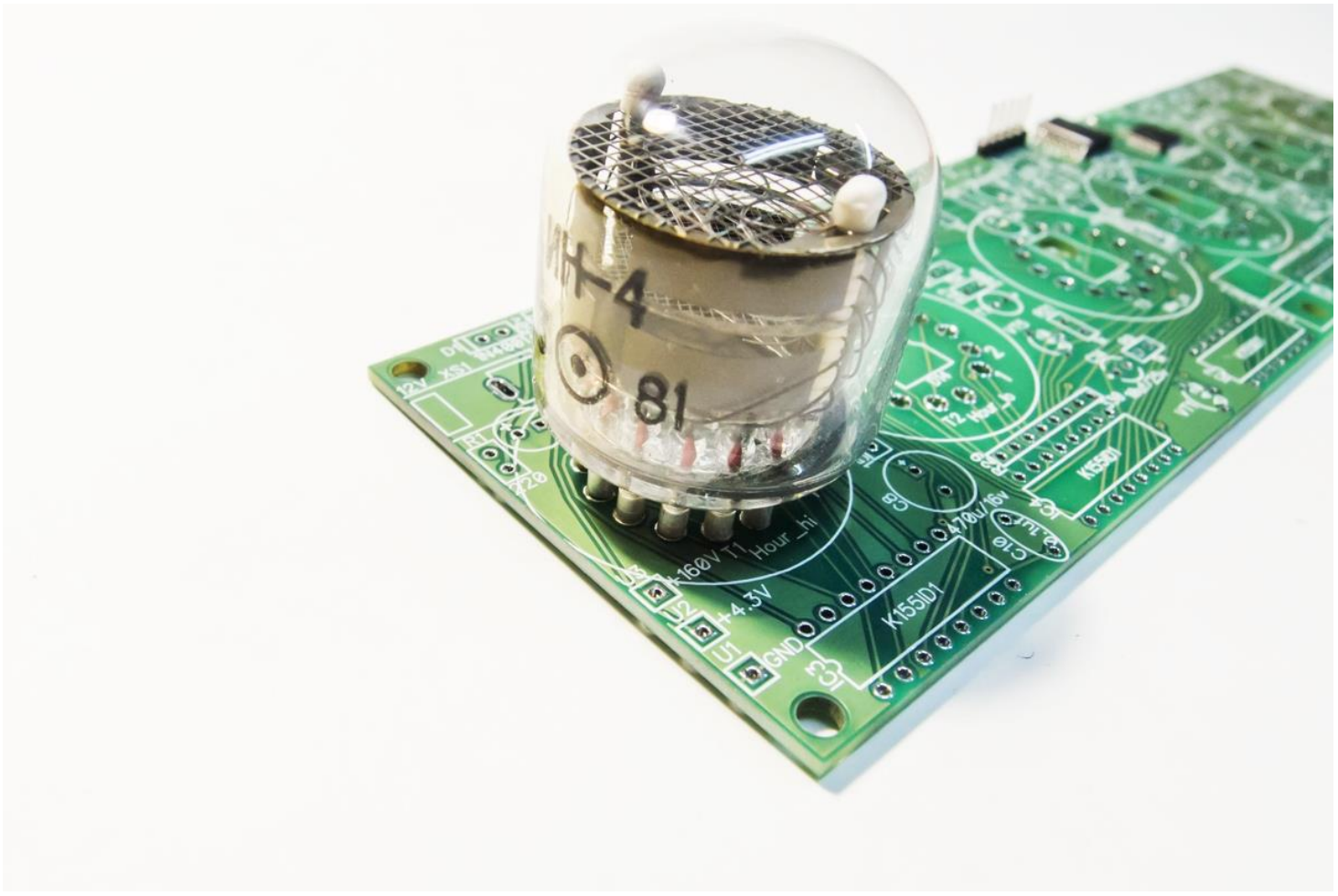
1) You have a PCB with ICs:

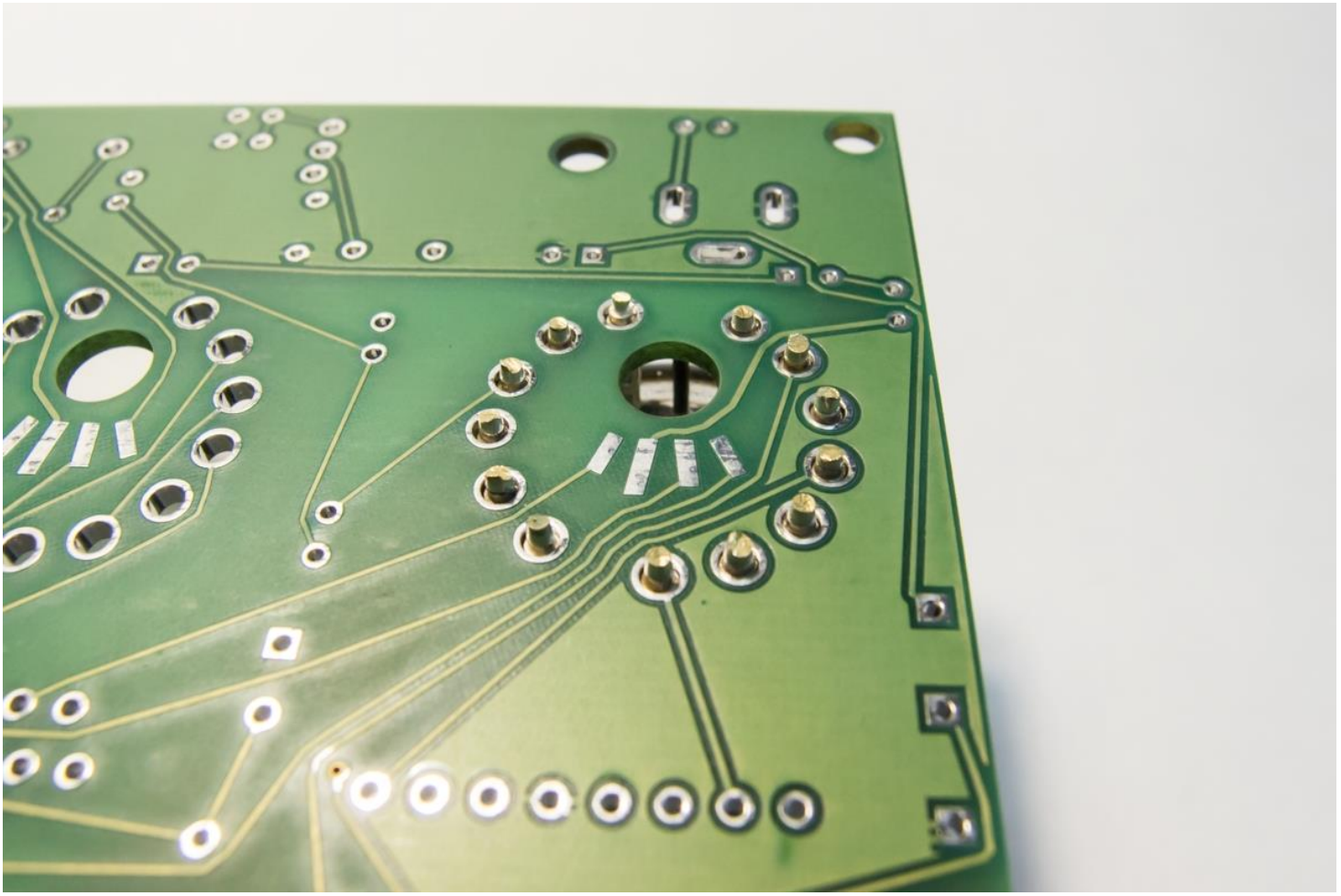


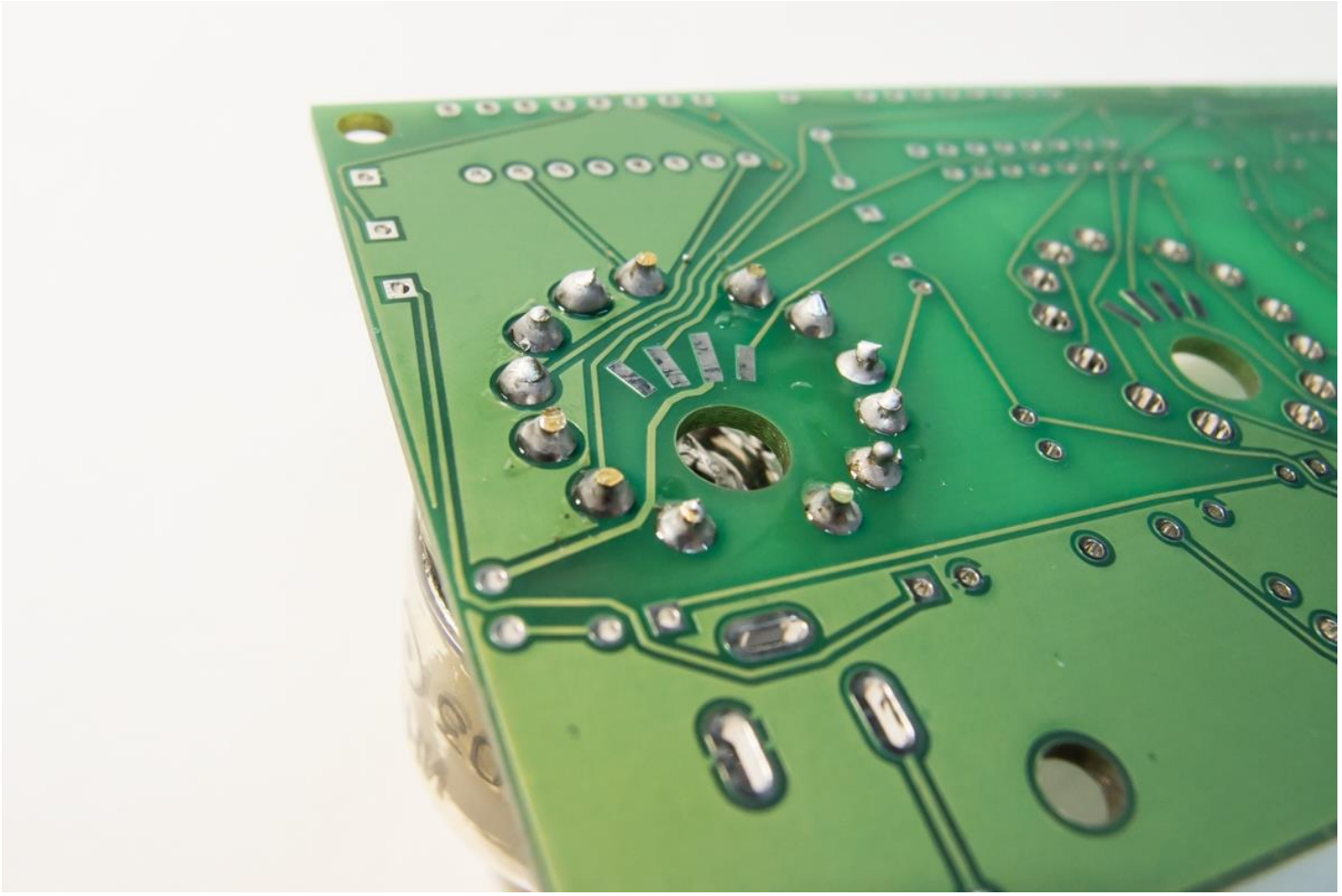
2) Take IN-4 tube with broken glass nipple and put on pins. Then solder the pins:

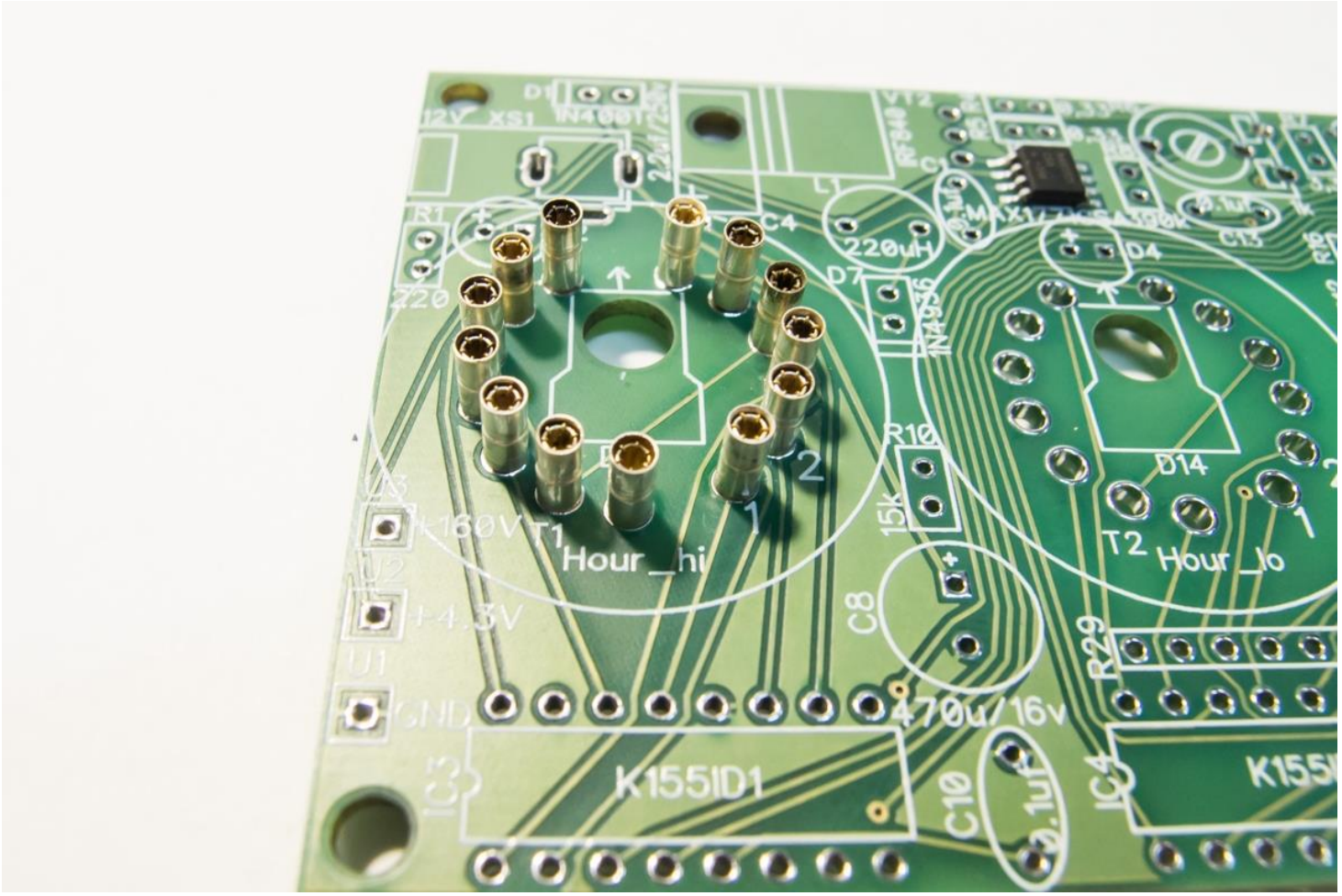


82


+4
81
+160V T1
Hour_hi
+4.3V
GND
K155ID1
C10
C8
470u/16v
K155ID1

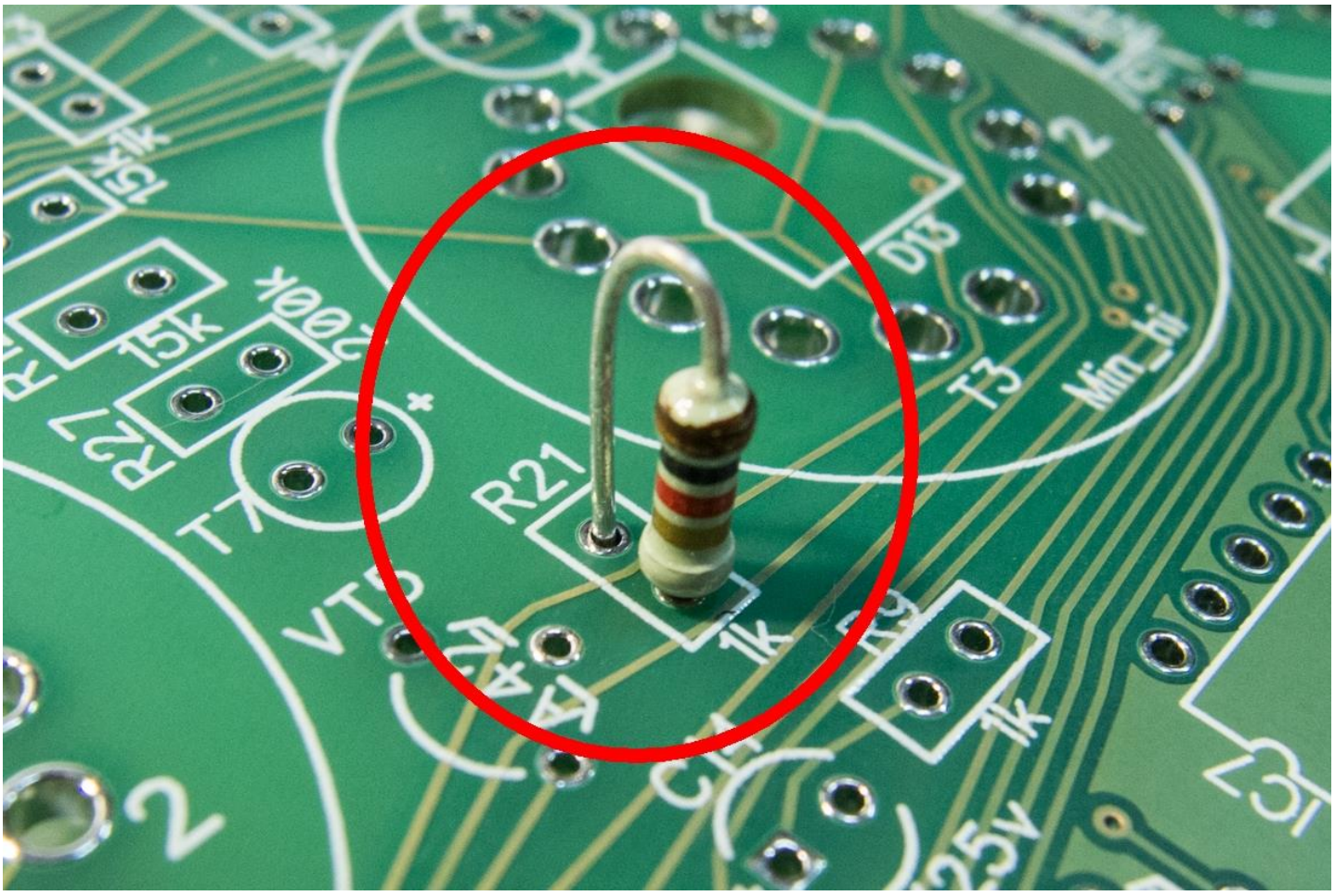




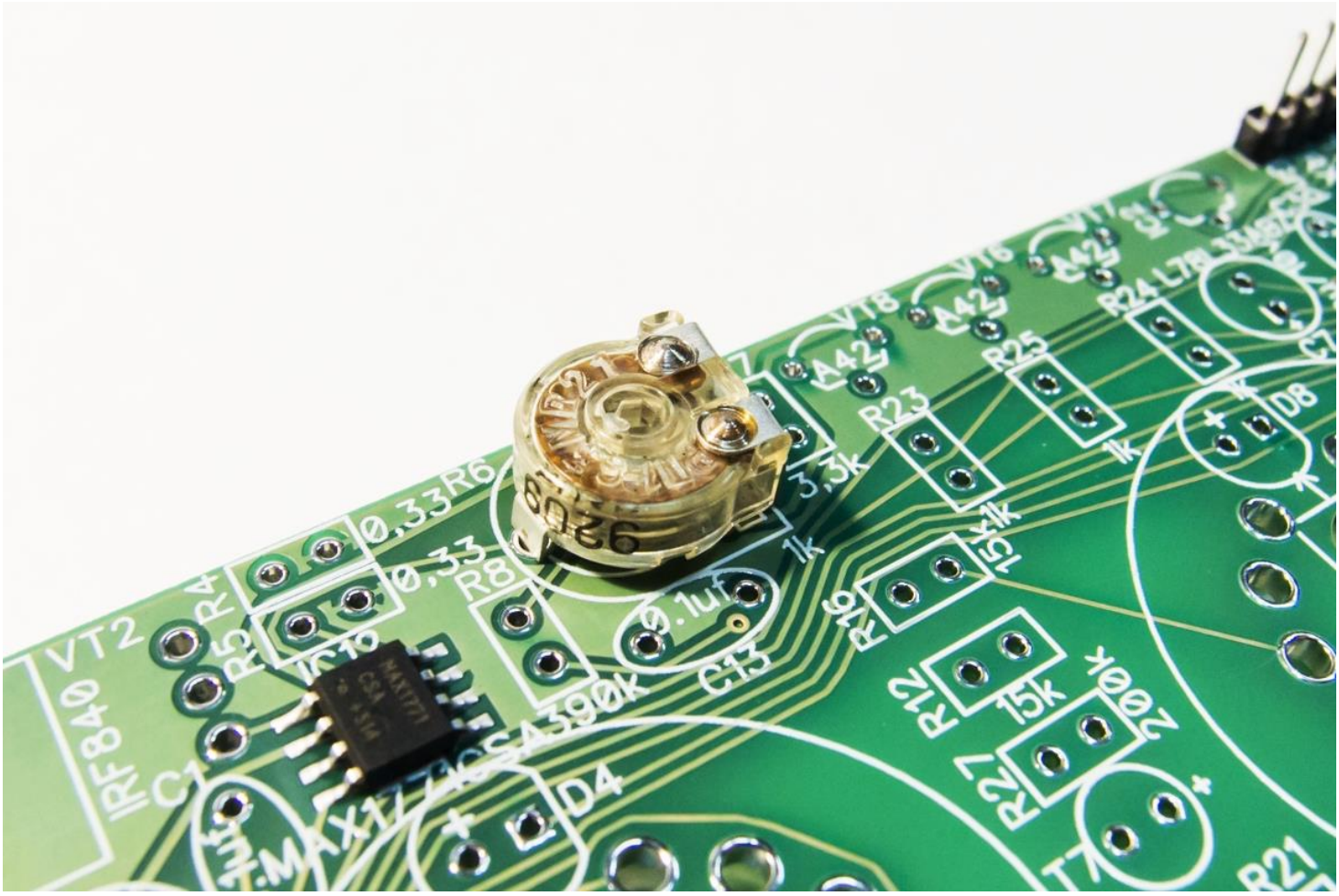


7-th pin of IN-4 did not use, so you can cut it.

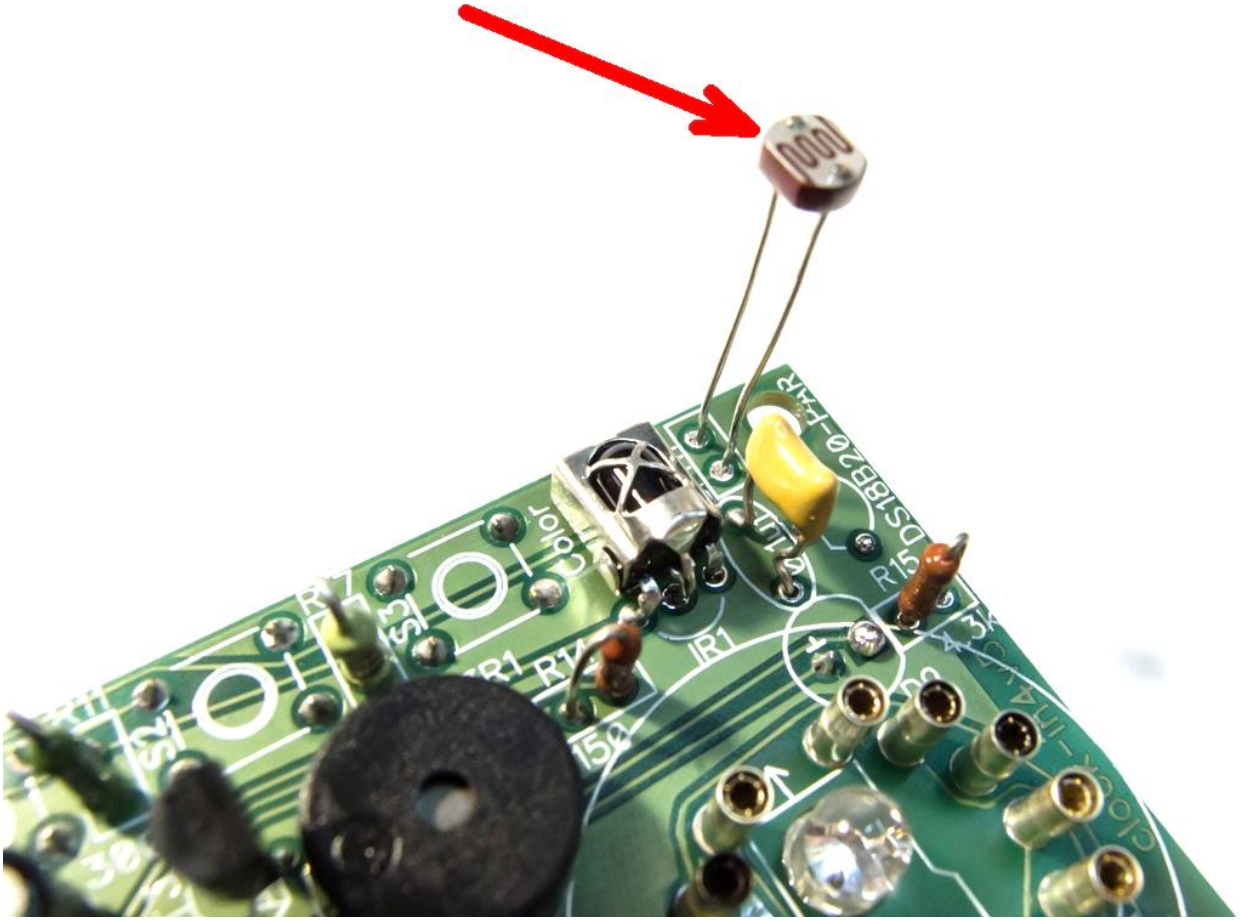
2) Place all resistors verticals.



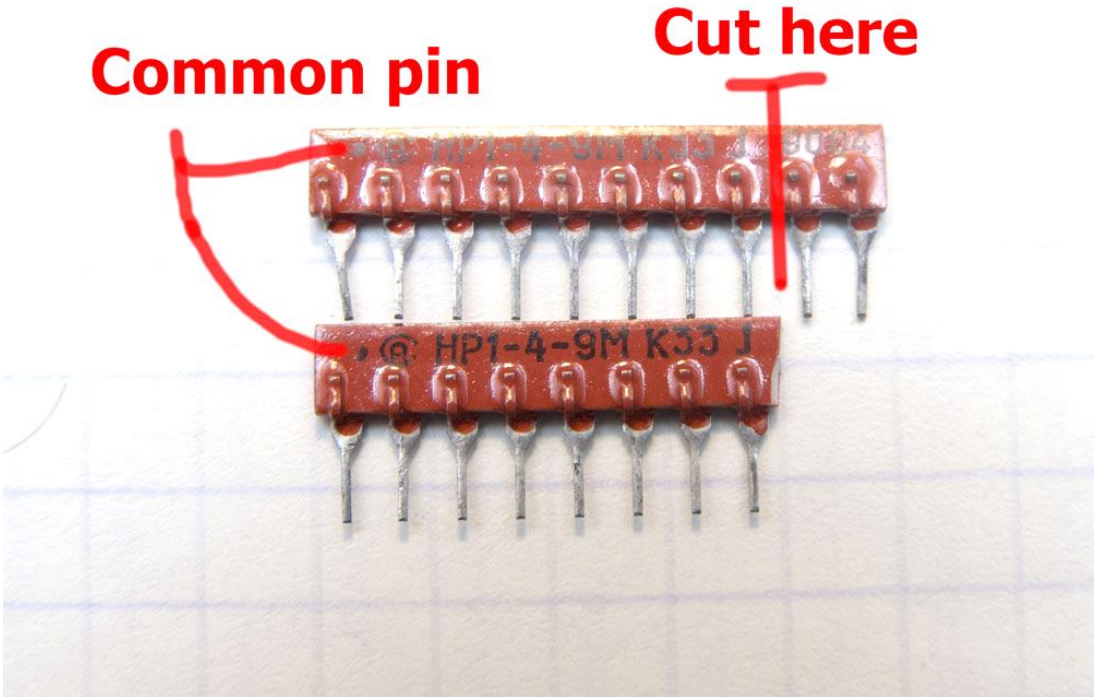
3) Place potentiometer:

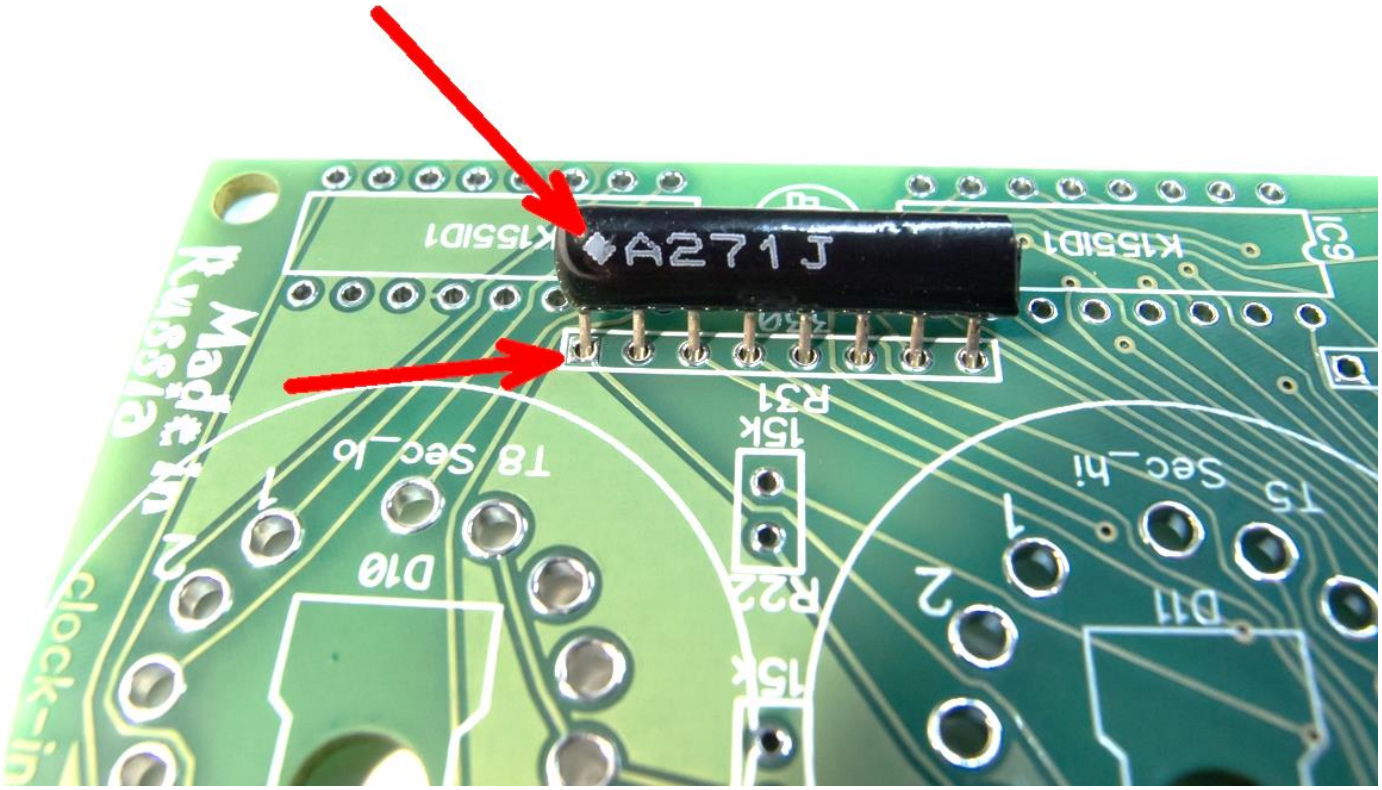


4) Place photoresistor:

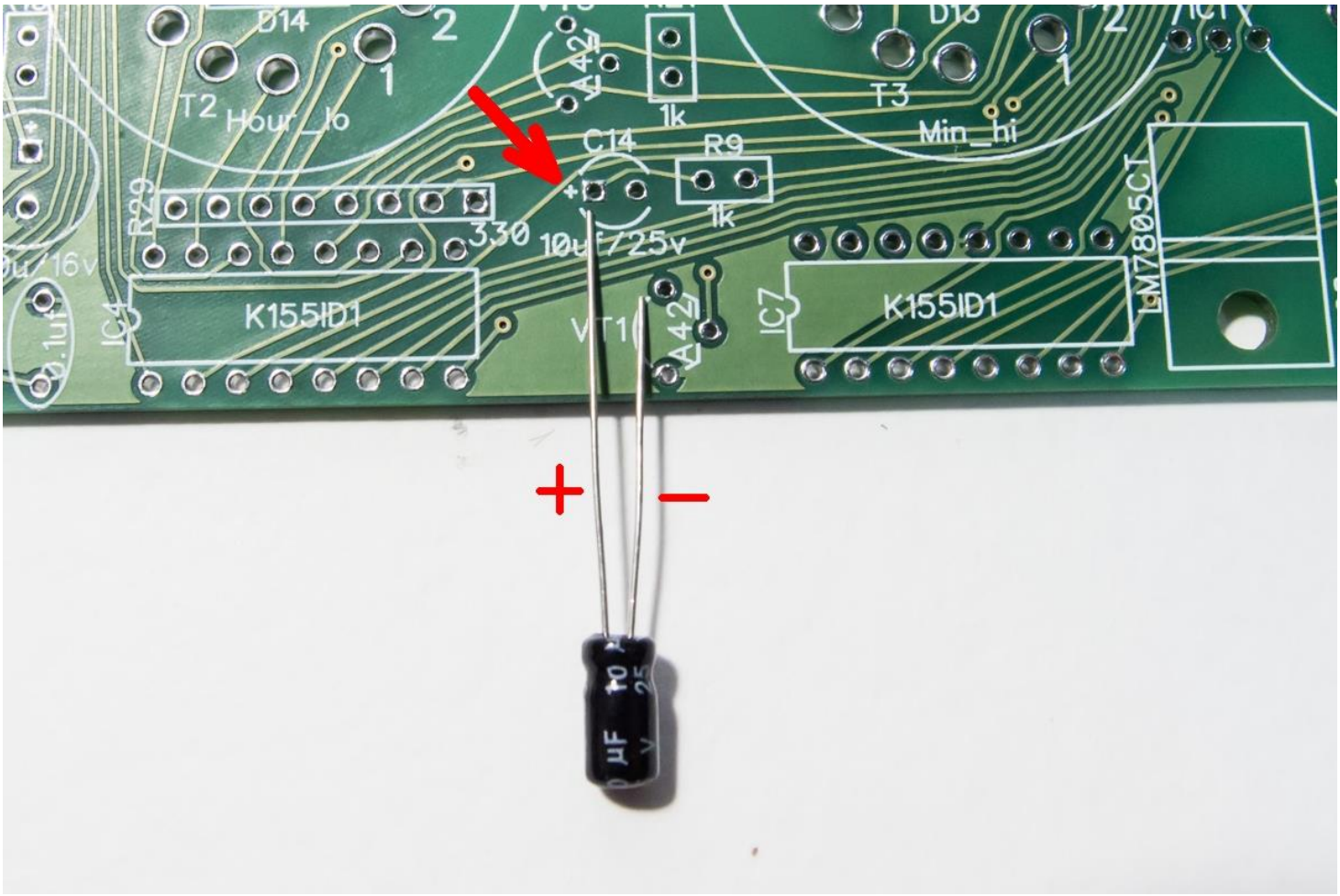


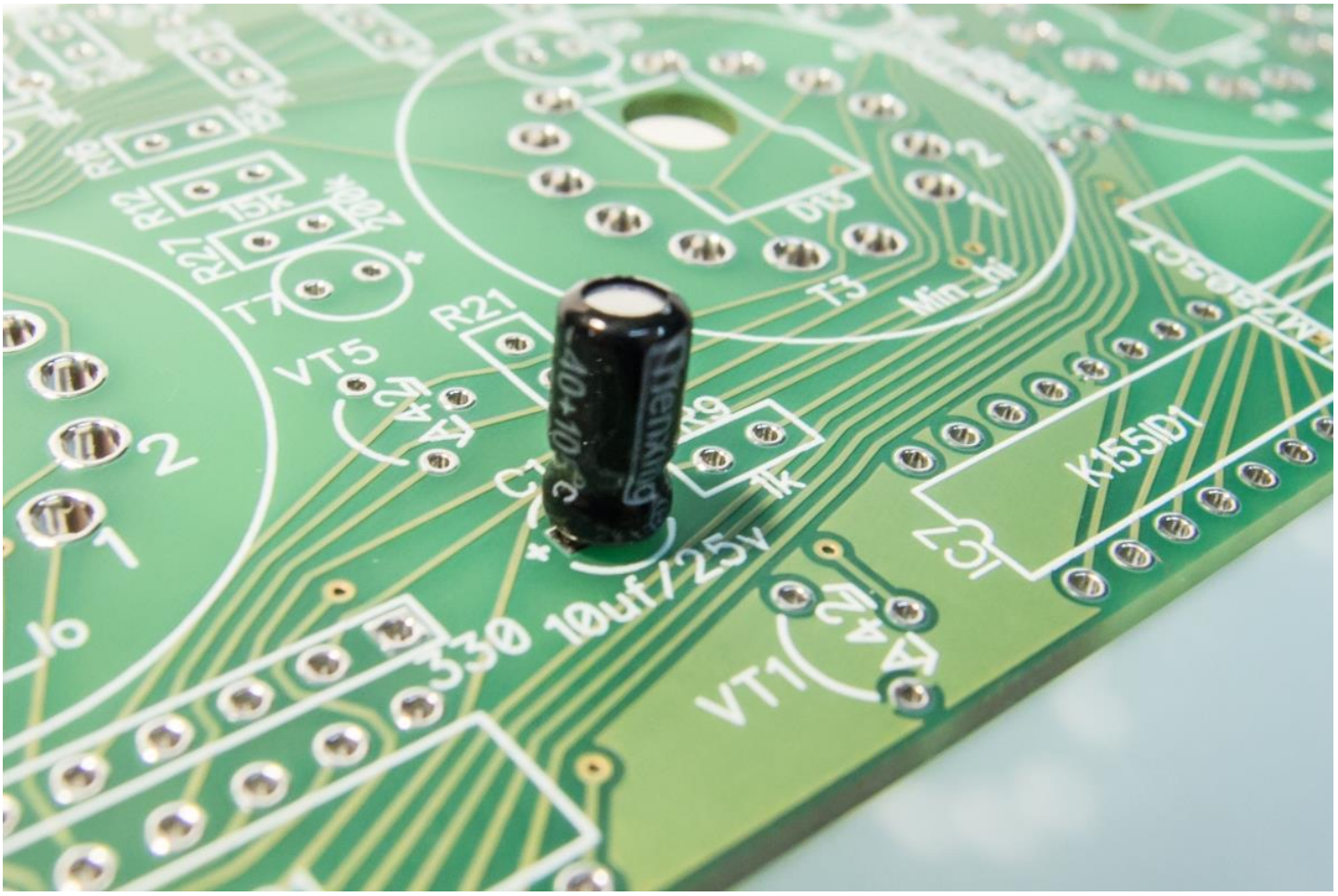
5) Place net.resistors. Common pin (marked with DOT) to SQUARE pad:

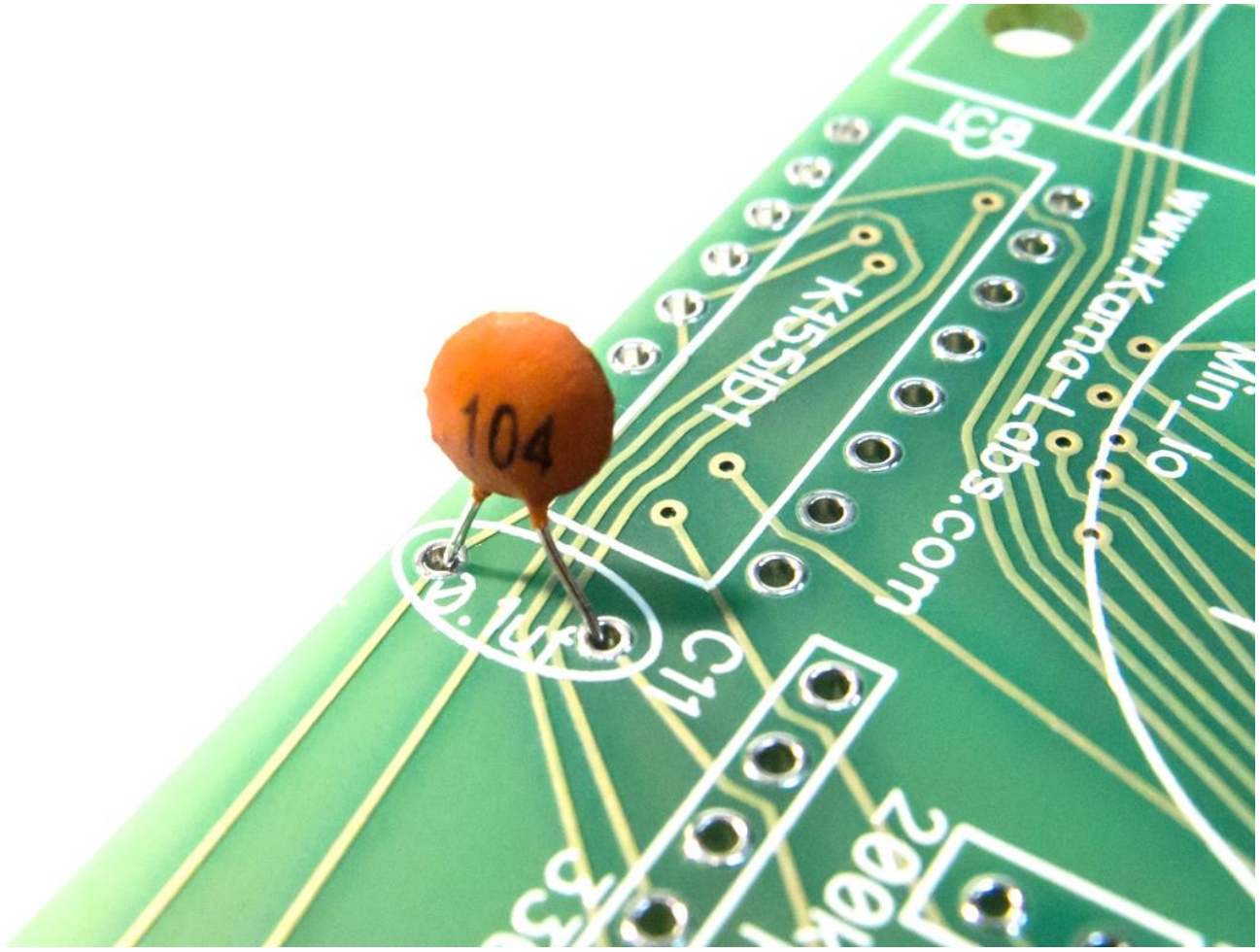




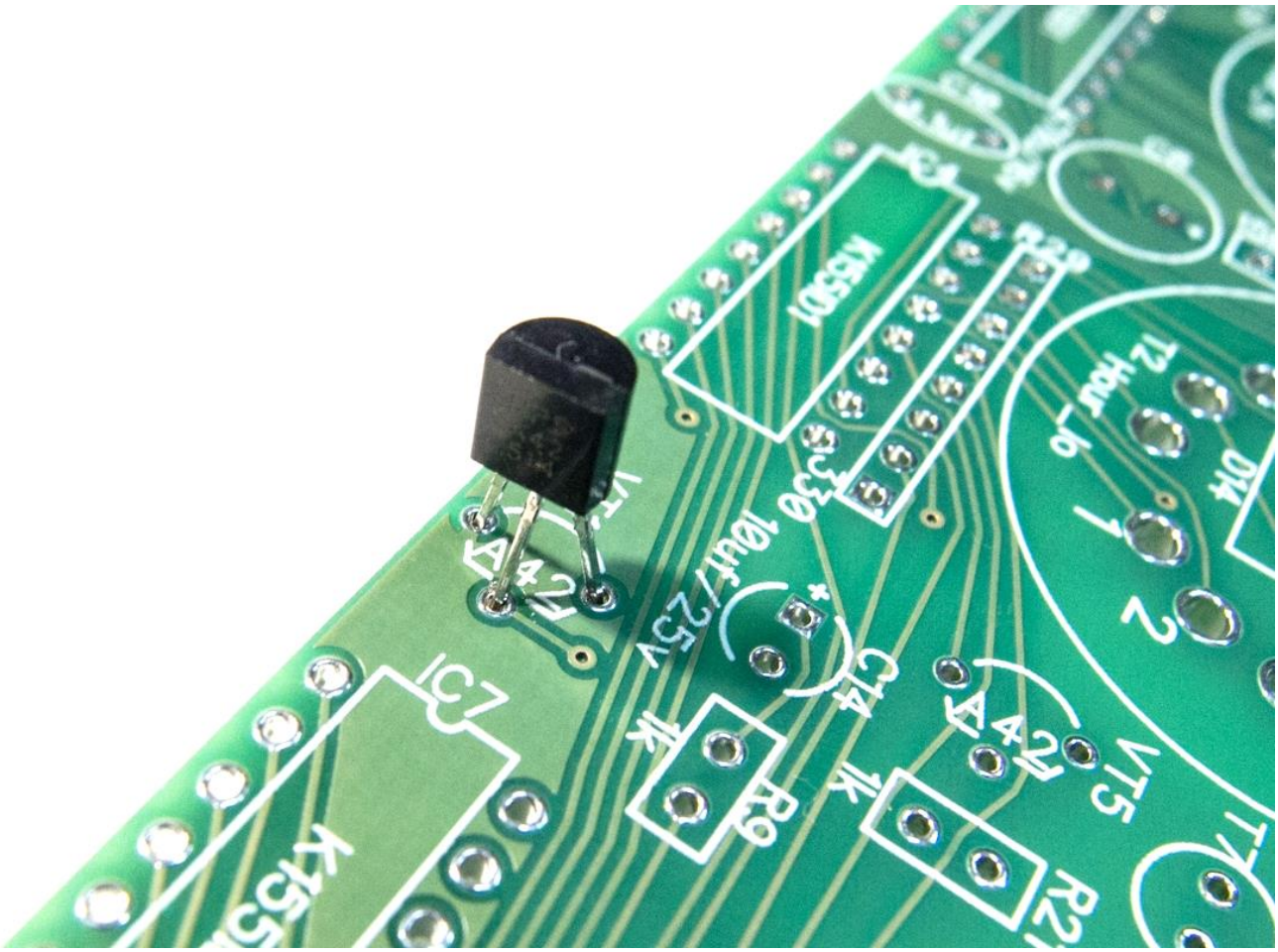
6) Place all capacitors. Be careful with polarity!

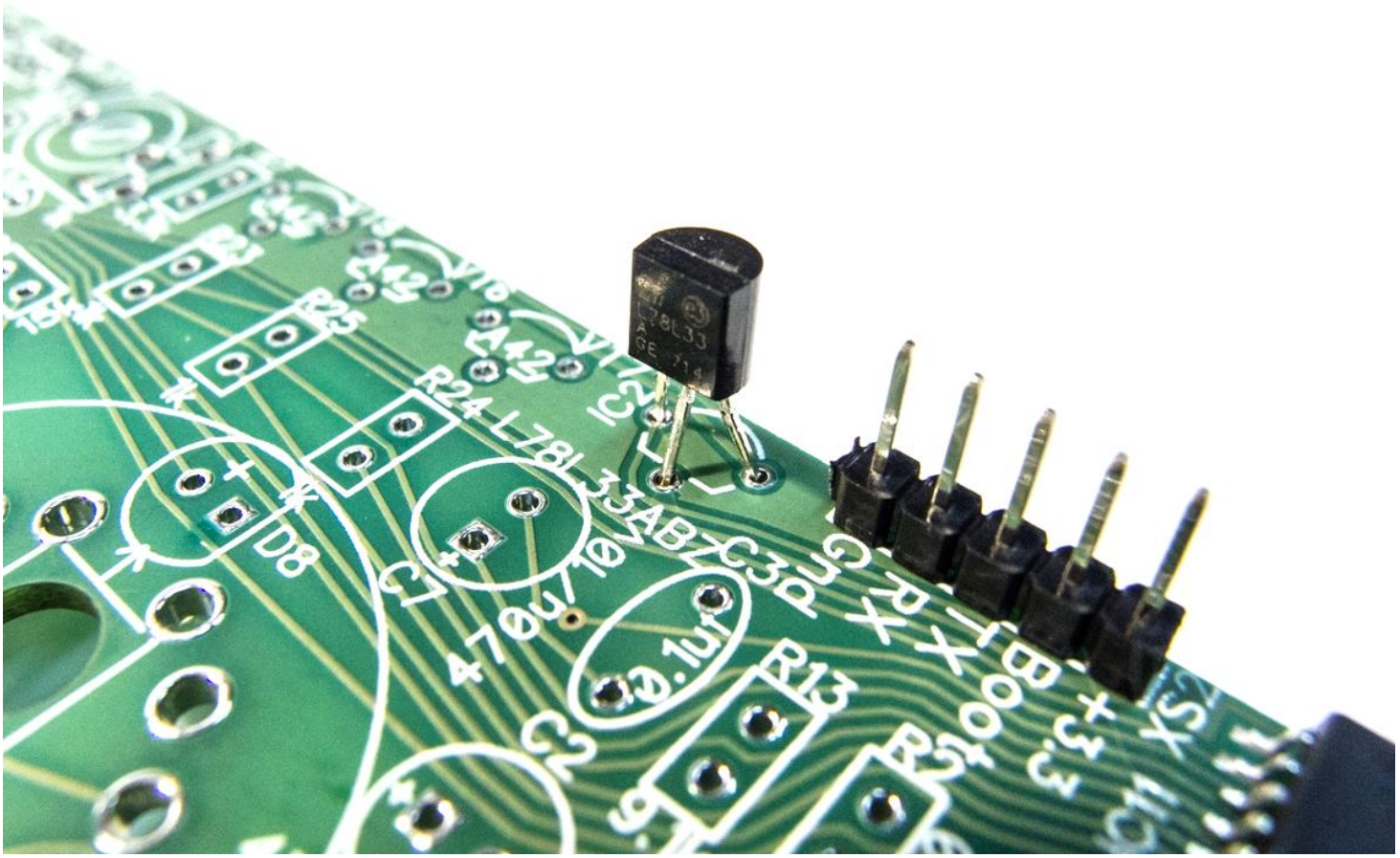



R21
VT5
T7
T3
K155ID1
IC7
VT1
330
10uf/25v
1k

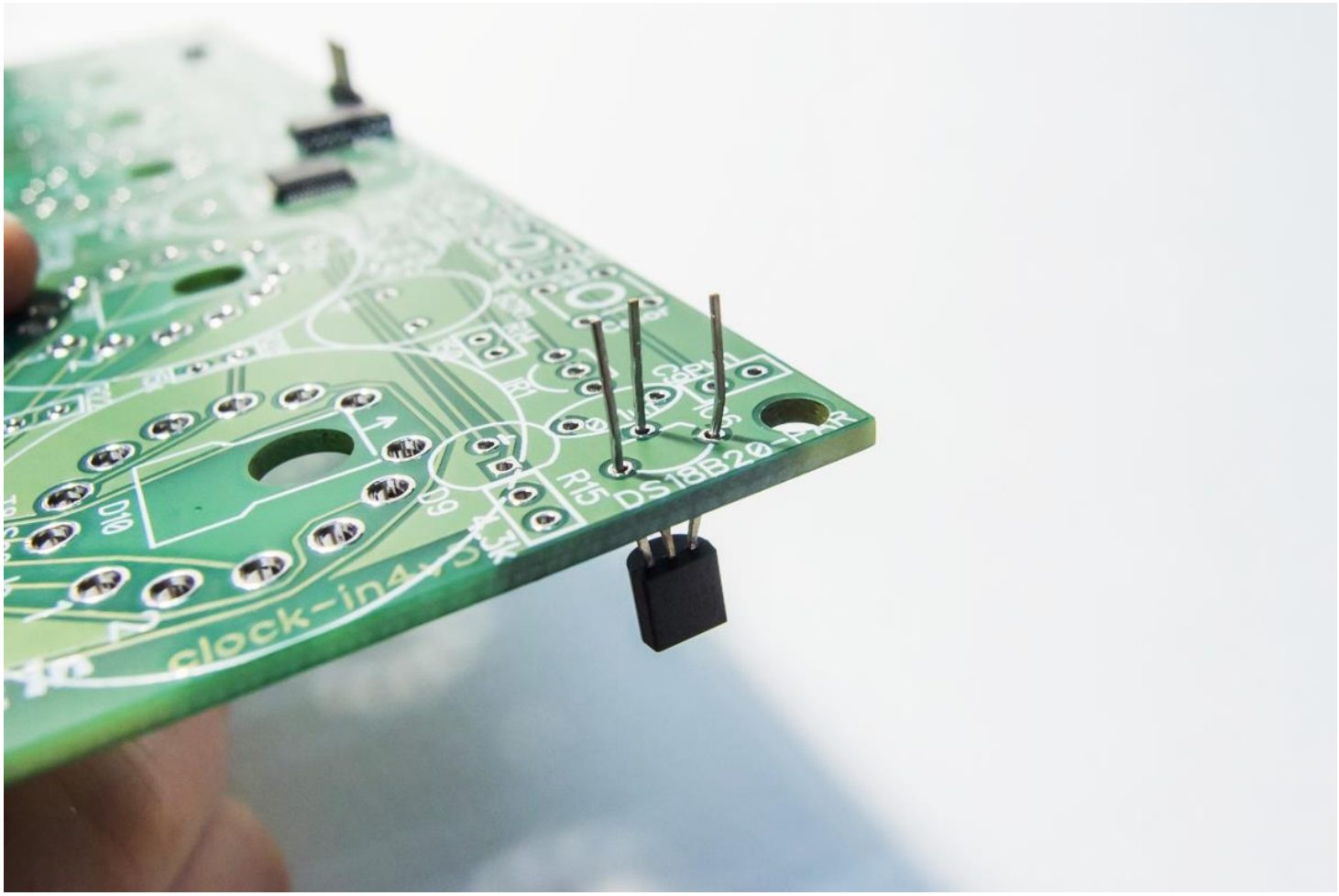

104
K155ID1
IC8
C11
www.kama-Labs.com

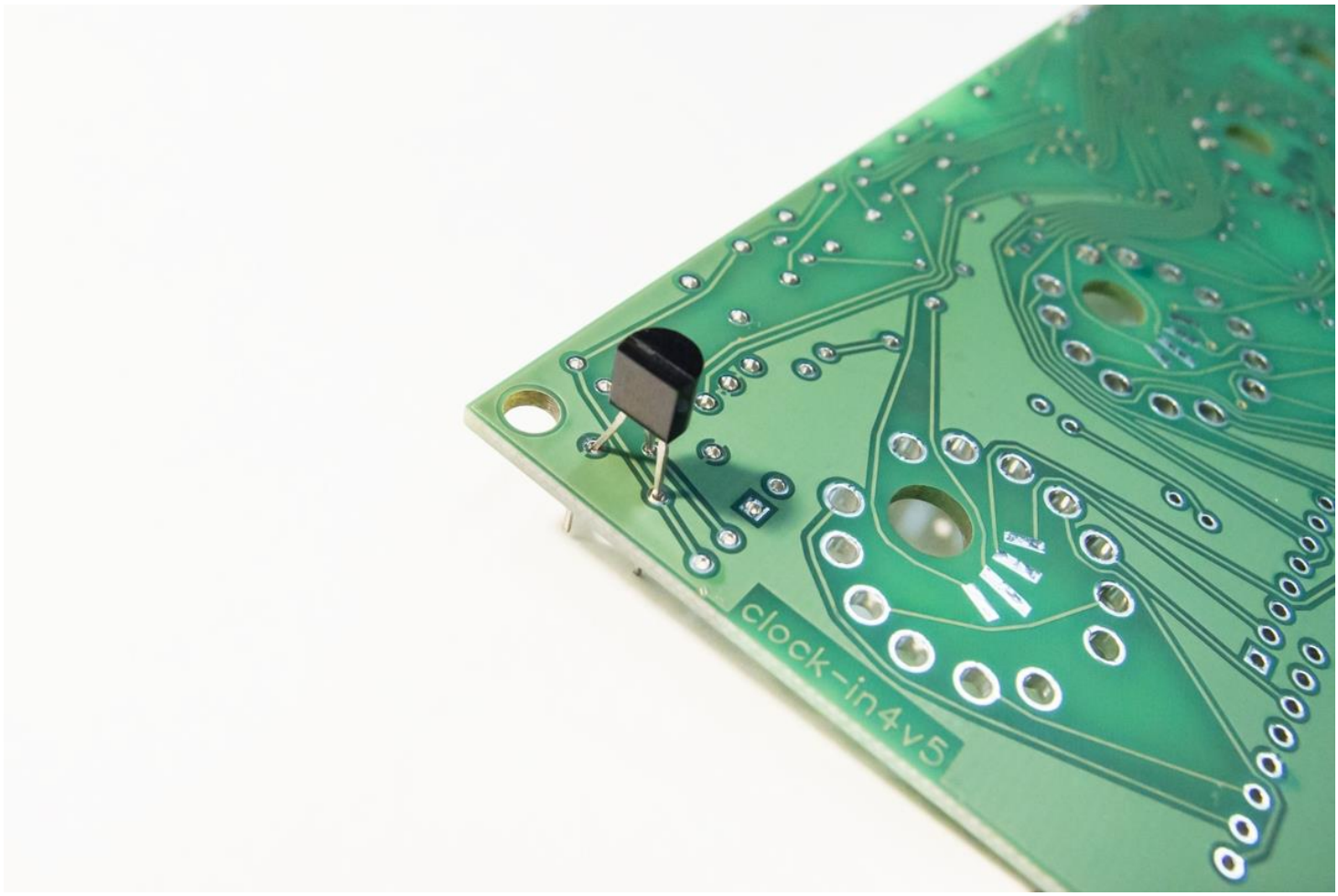
7) Place all trancsistors, voltage stabilizer(L78L33,LM7805) and temperature sensor(DS18B20):



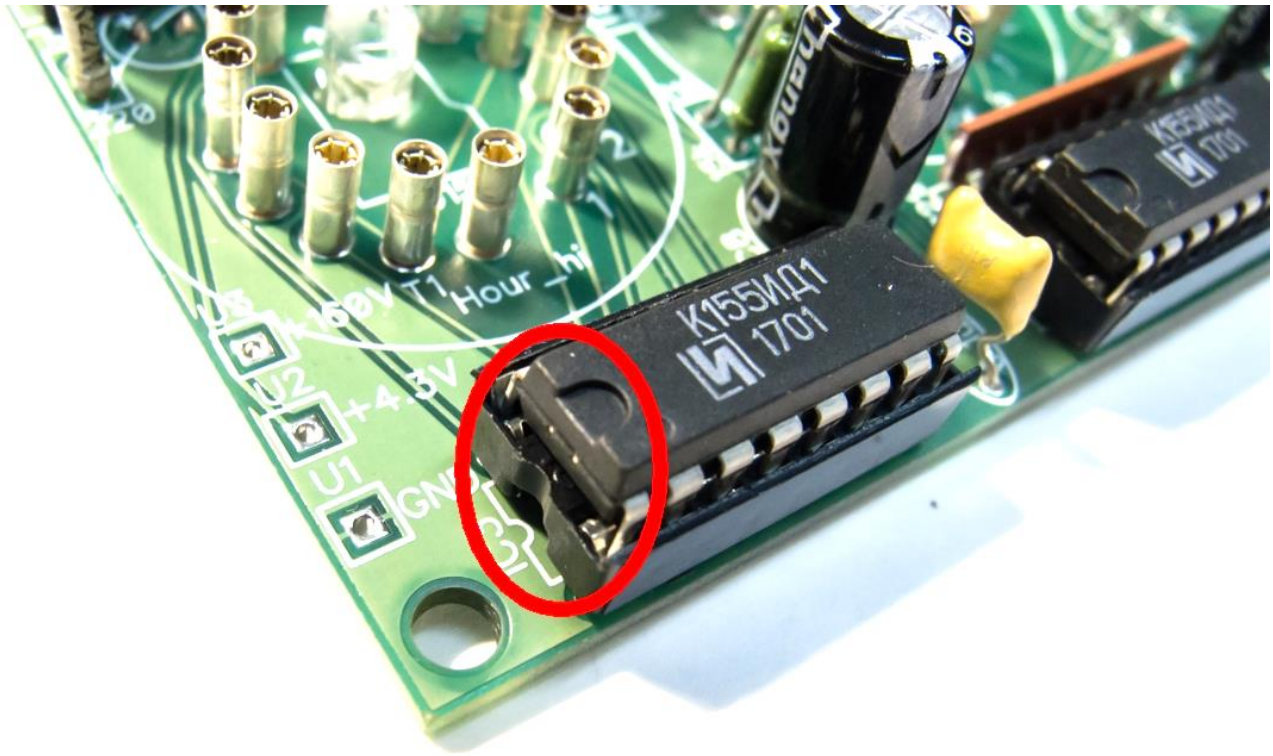


Temperature sensor(DS18B20) should be install on back side of PCB:

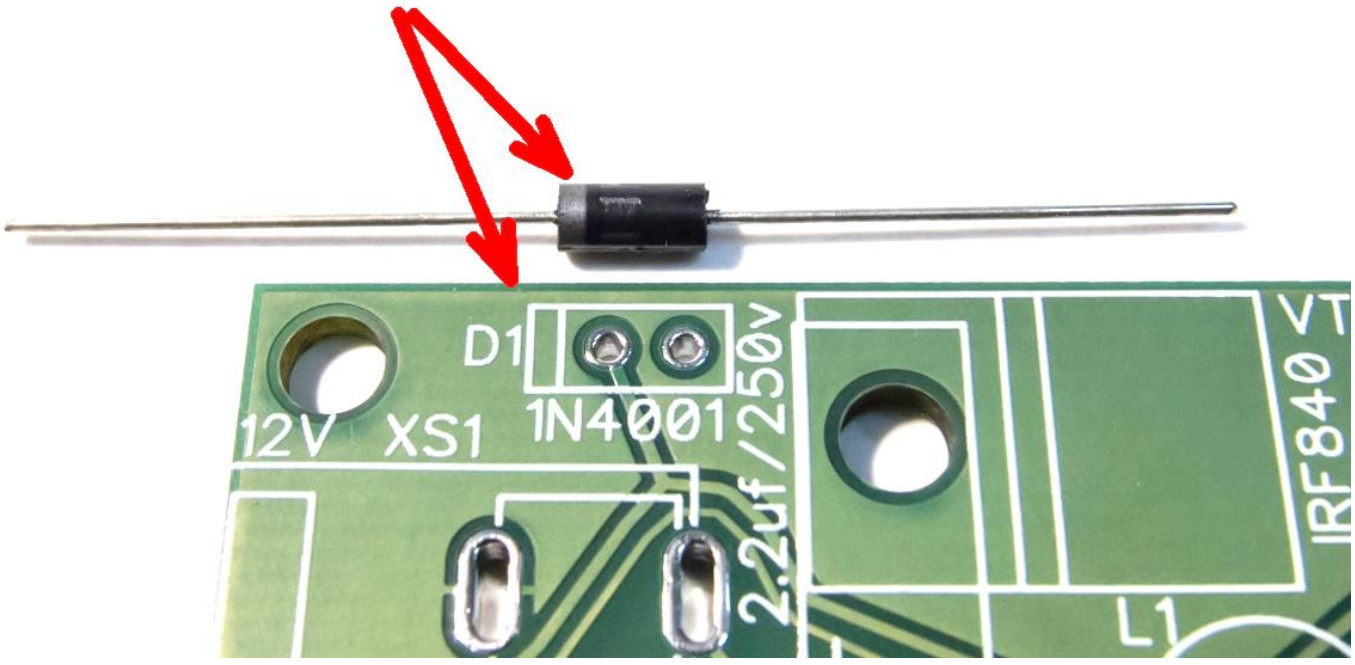


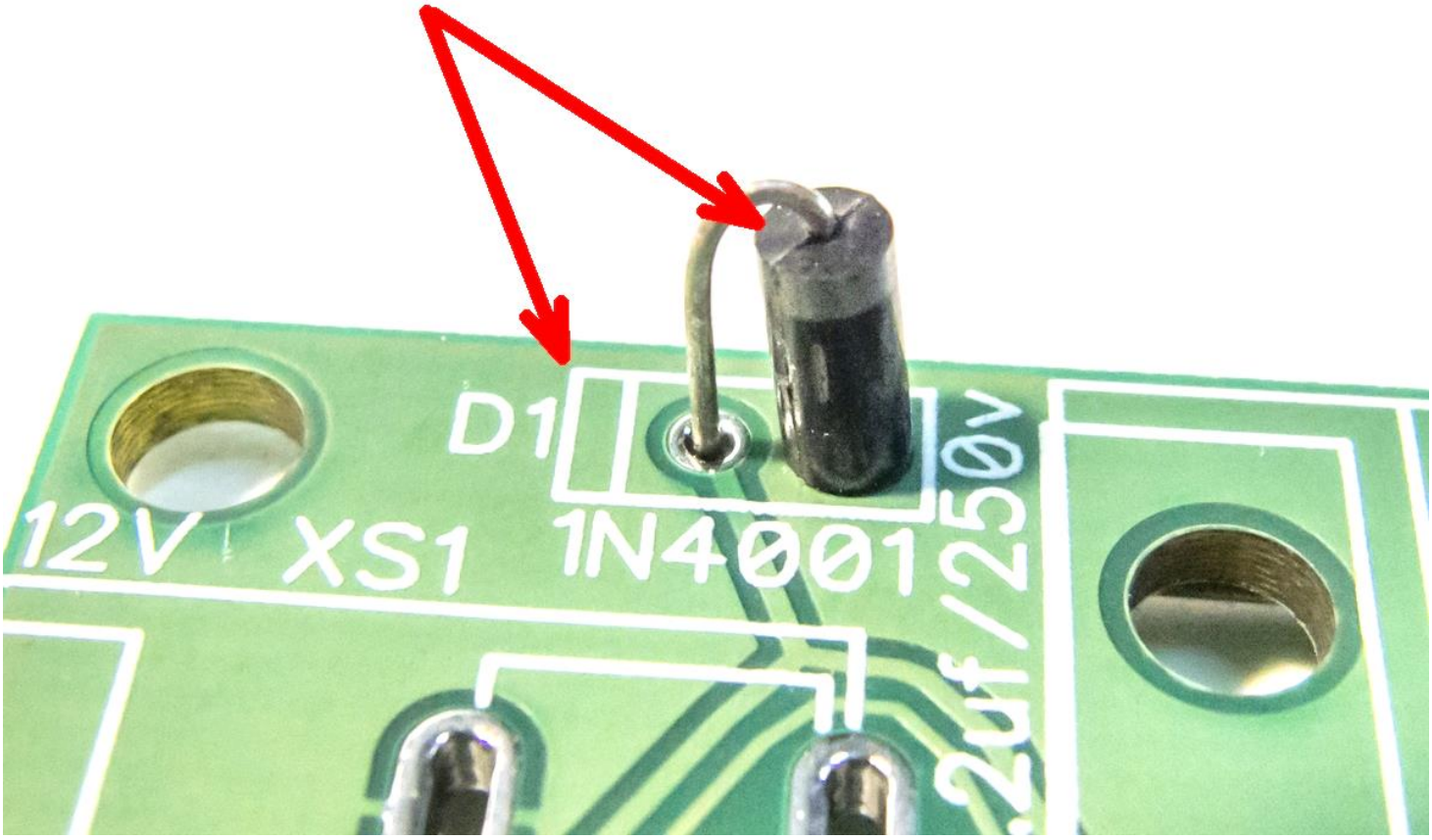


8) Place sockets for ICs:

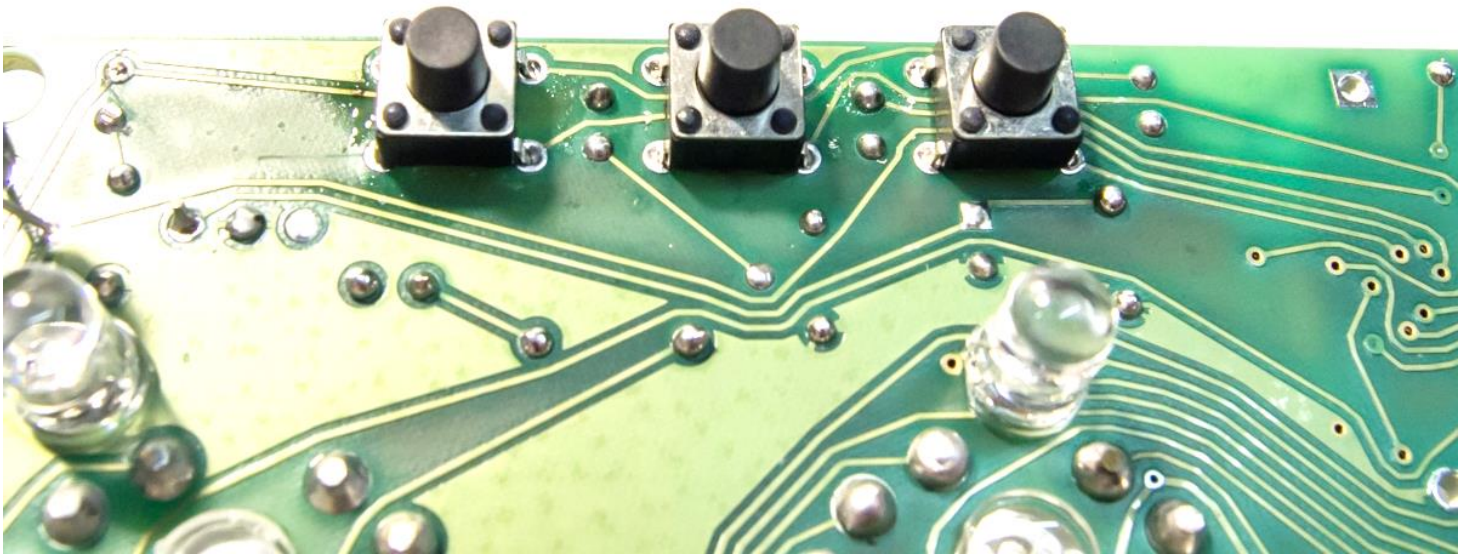


9) Place diodes and be careful with polarity:

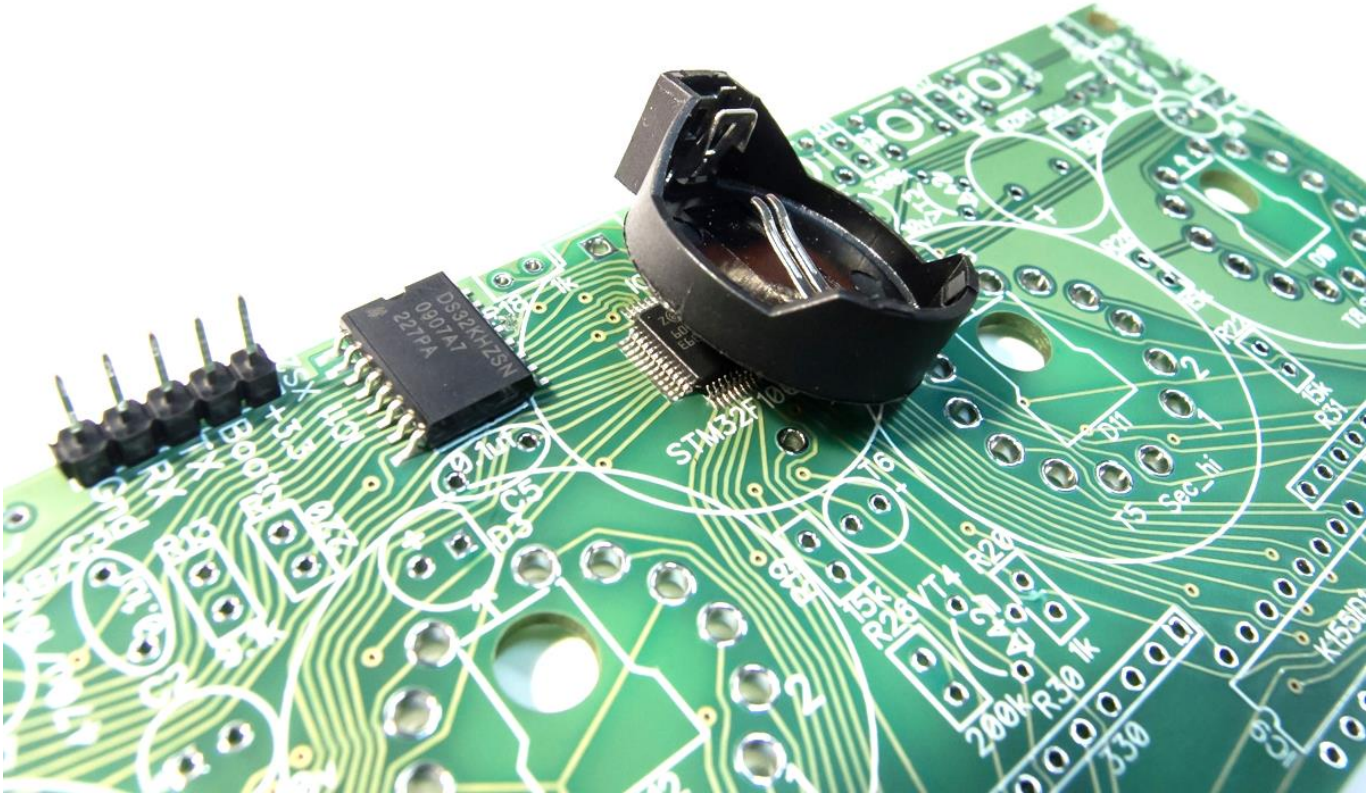


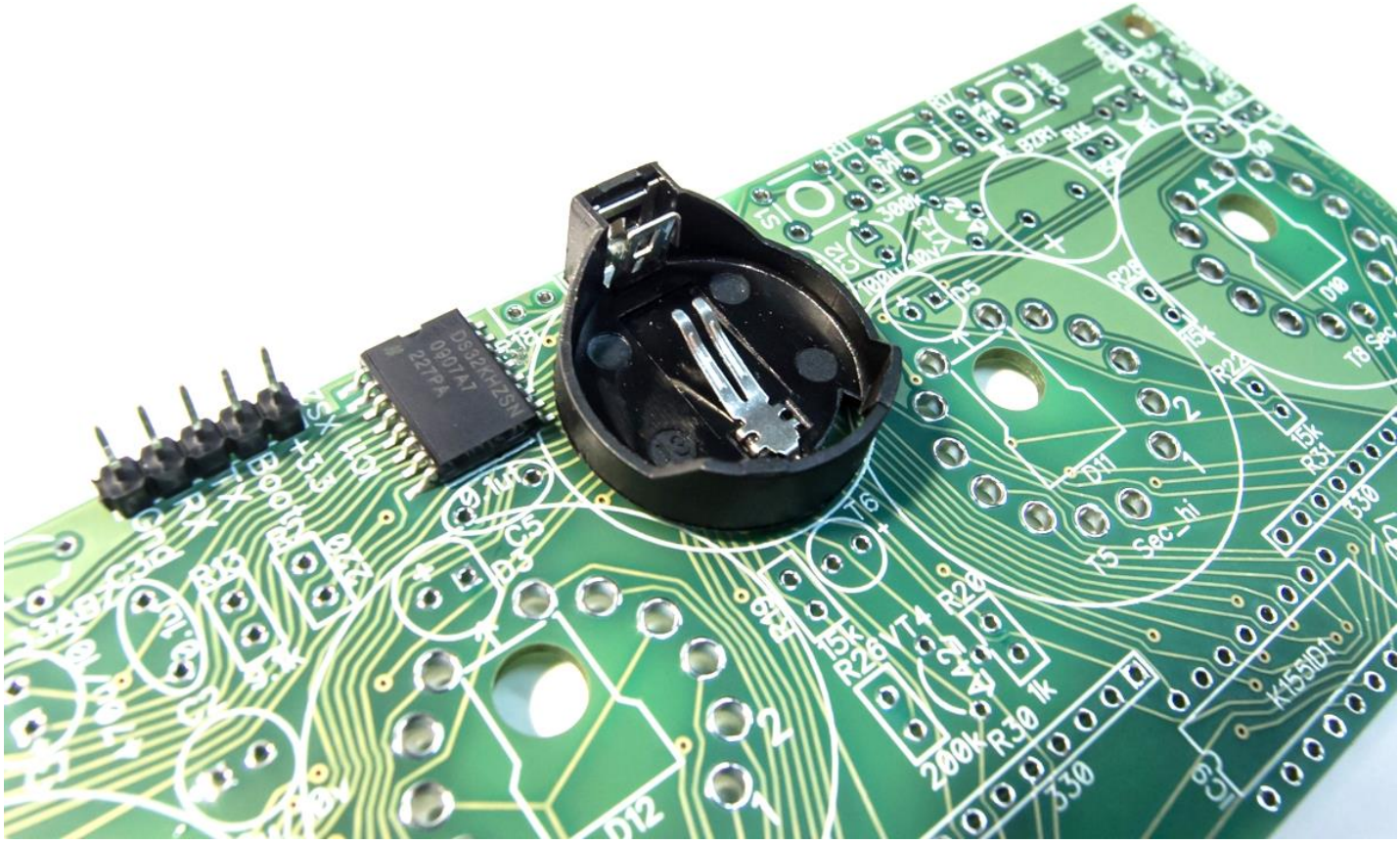


10) Place 3 buttons on back side:

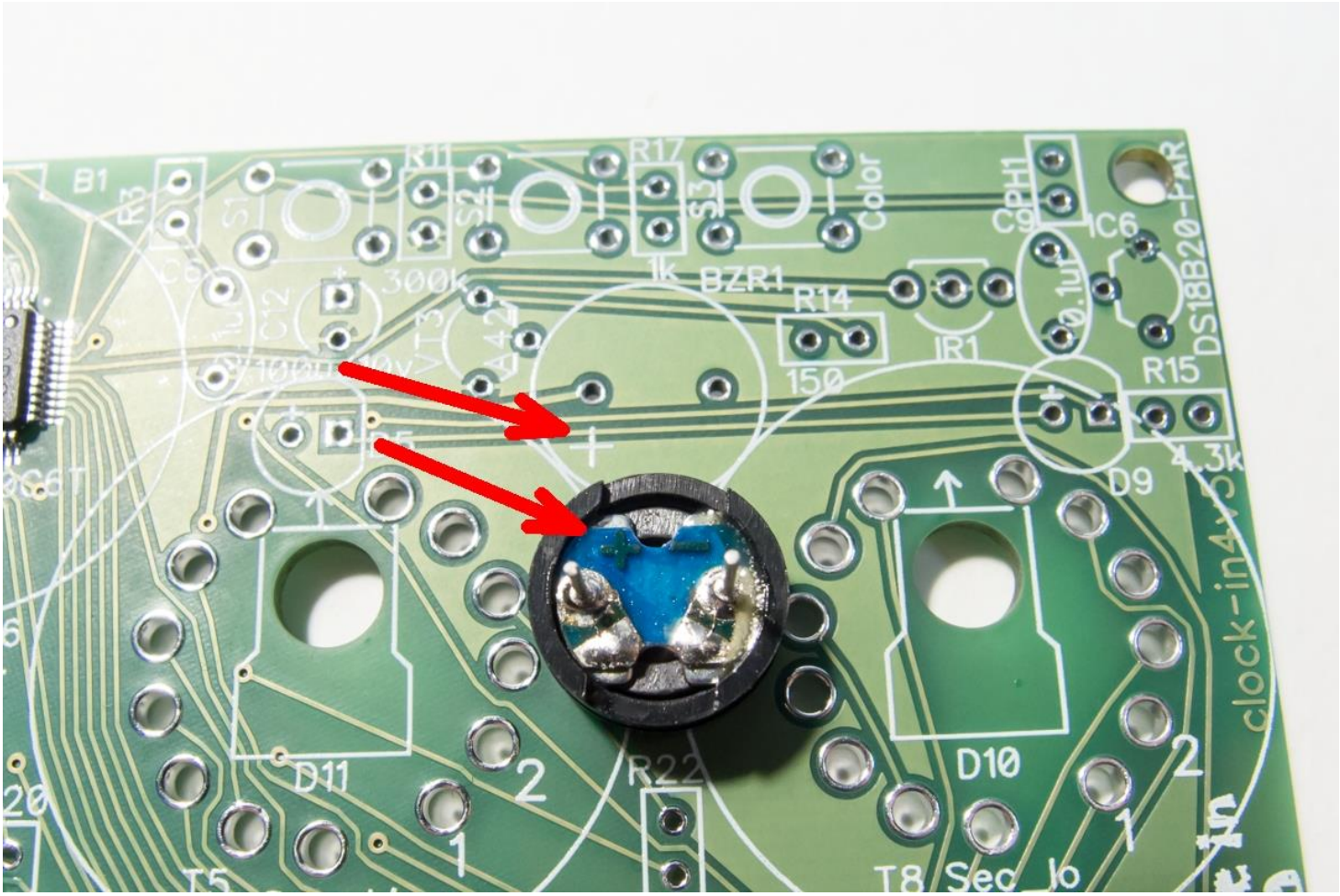


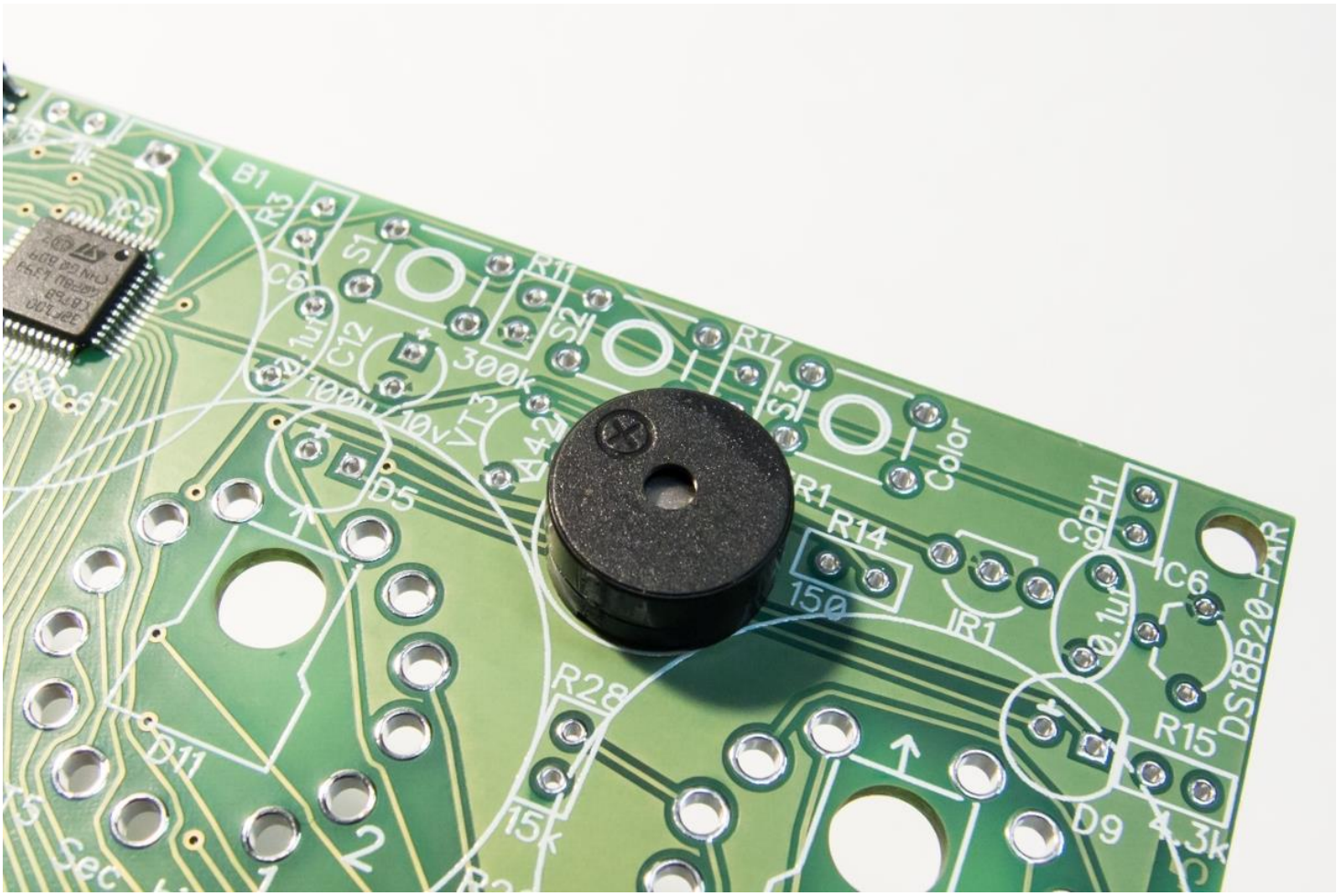
11) Place battery holder and insert battery when cock will assembled completely:



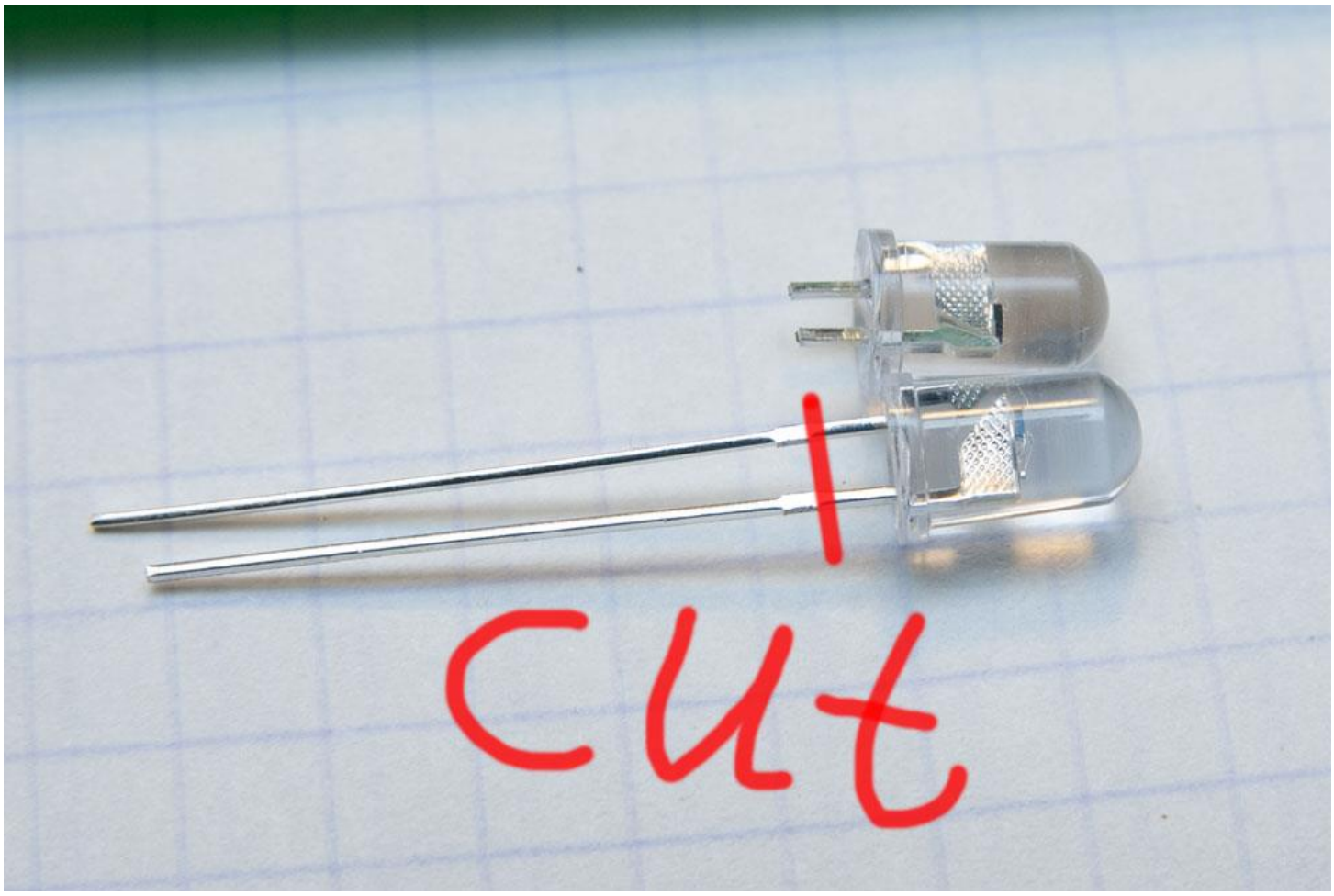


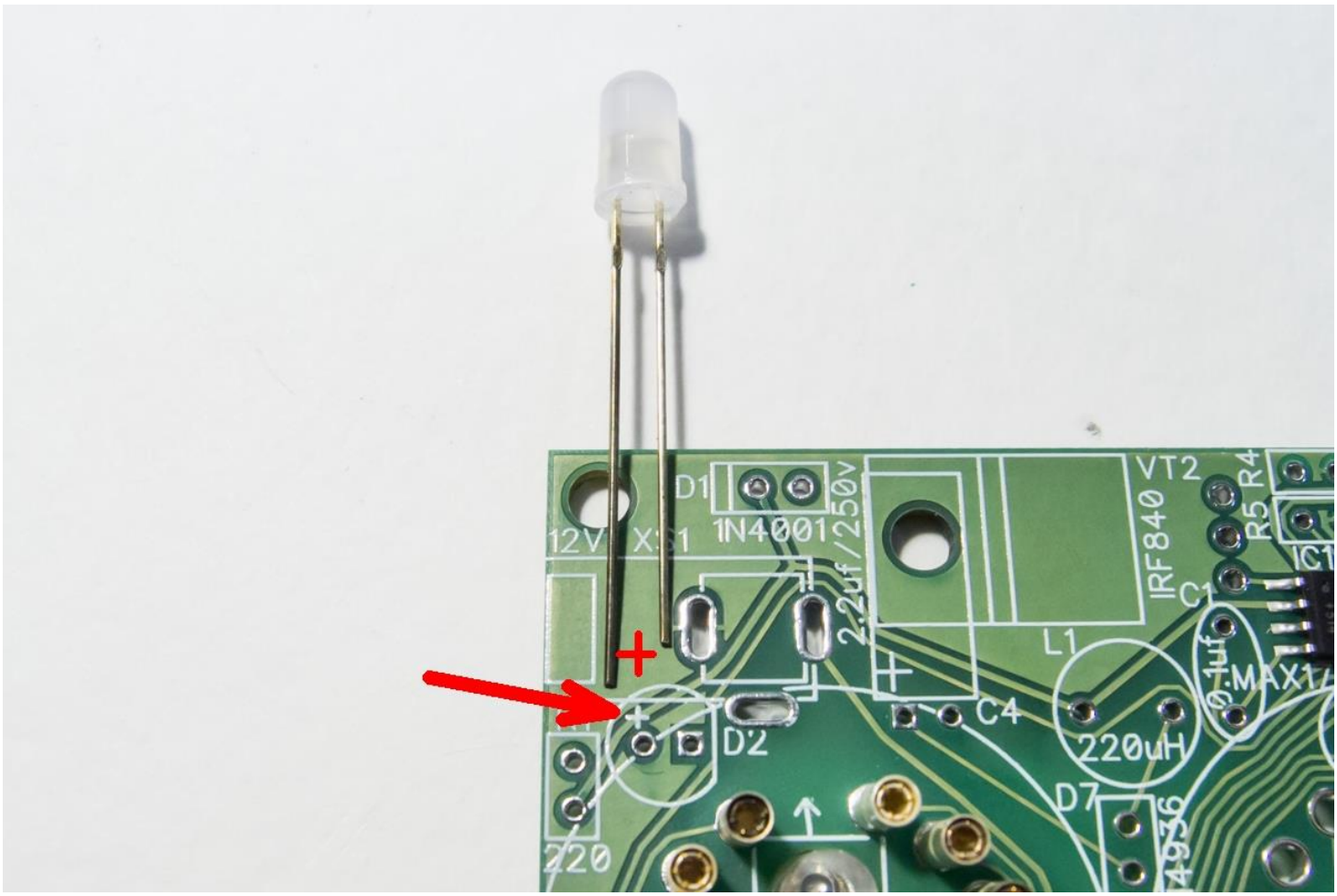
12) Place buzzer and be careful with polarity:

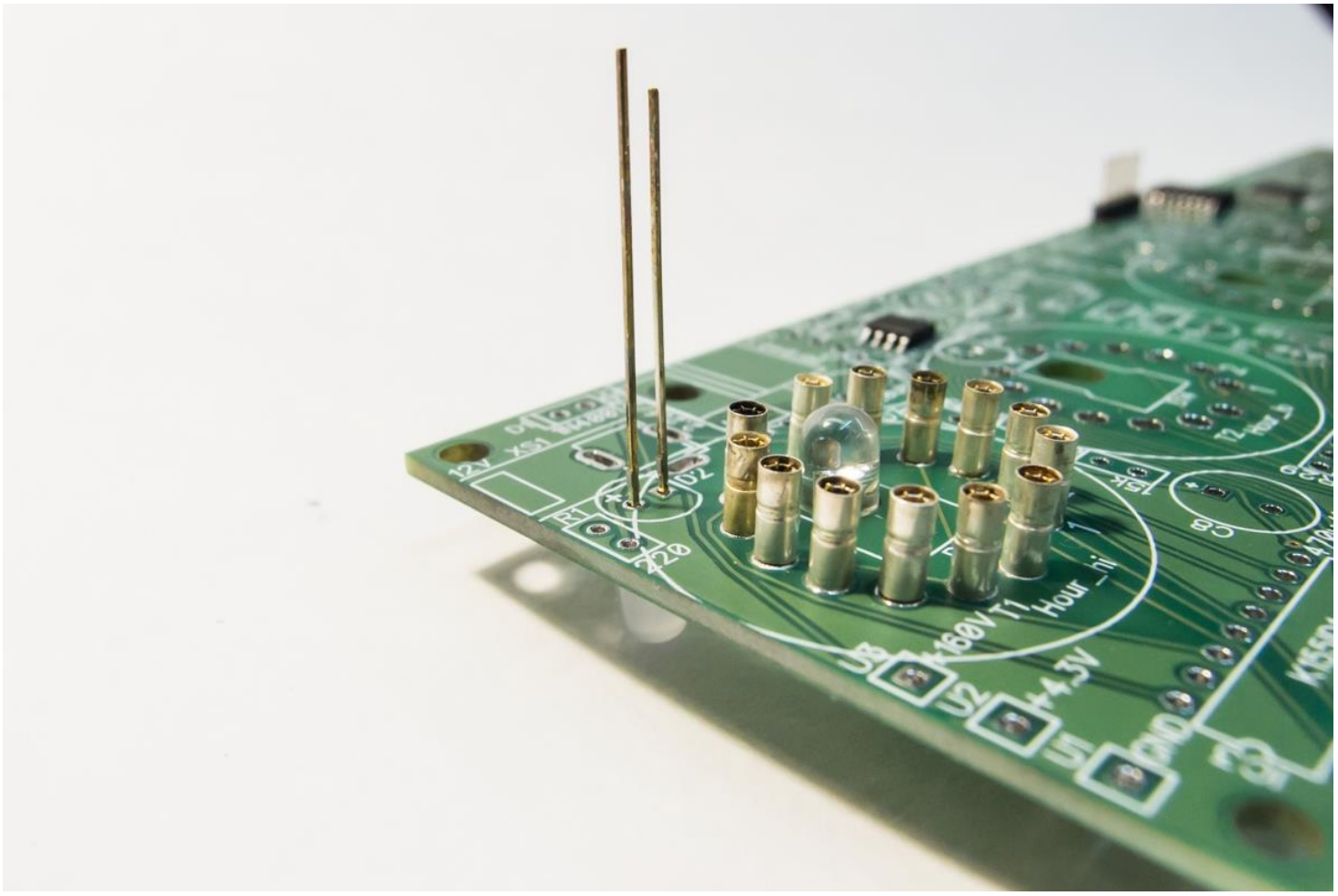


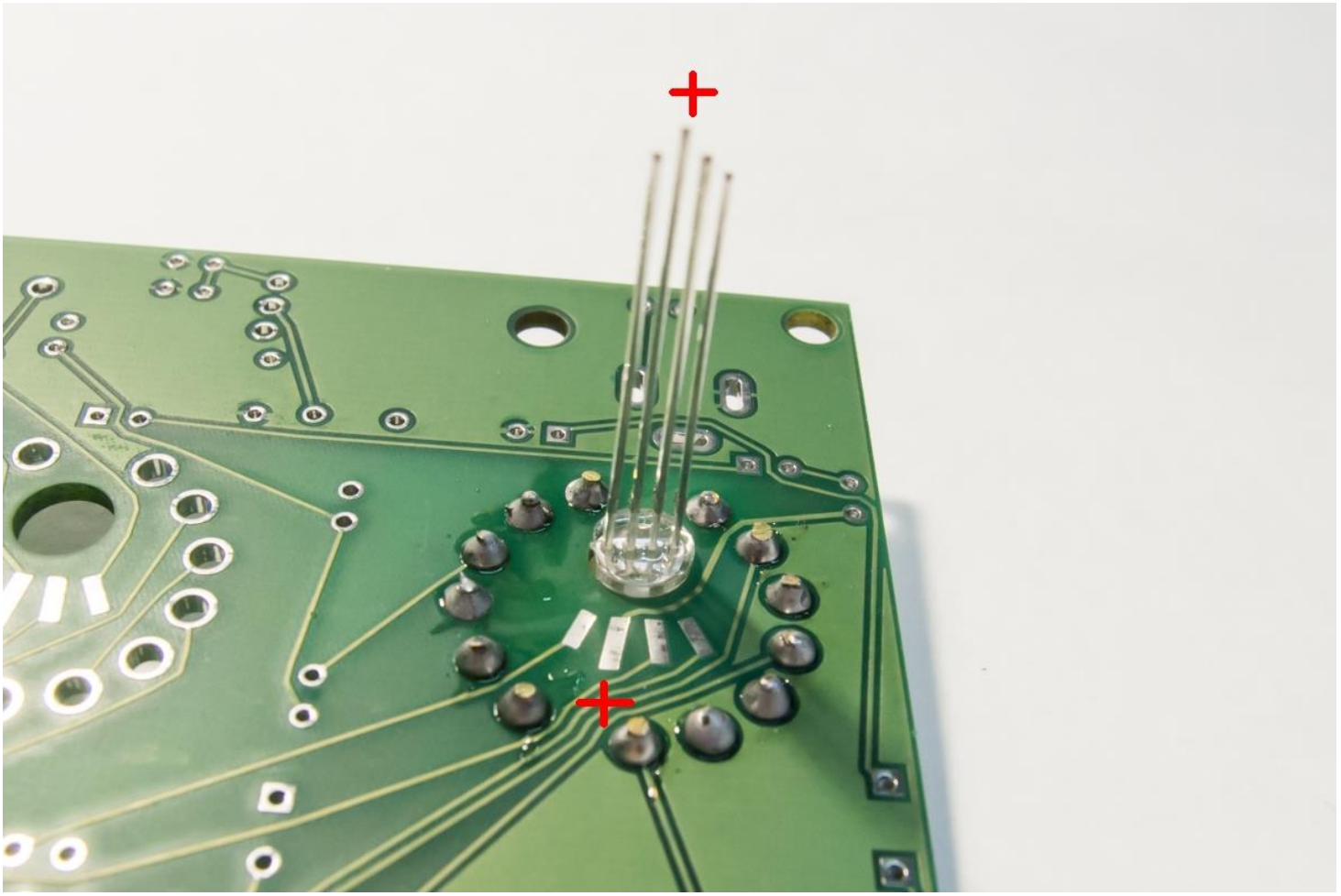


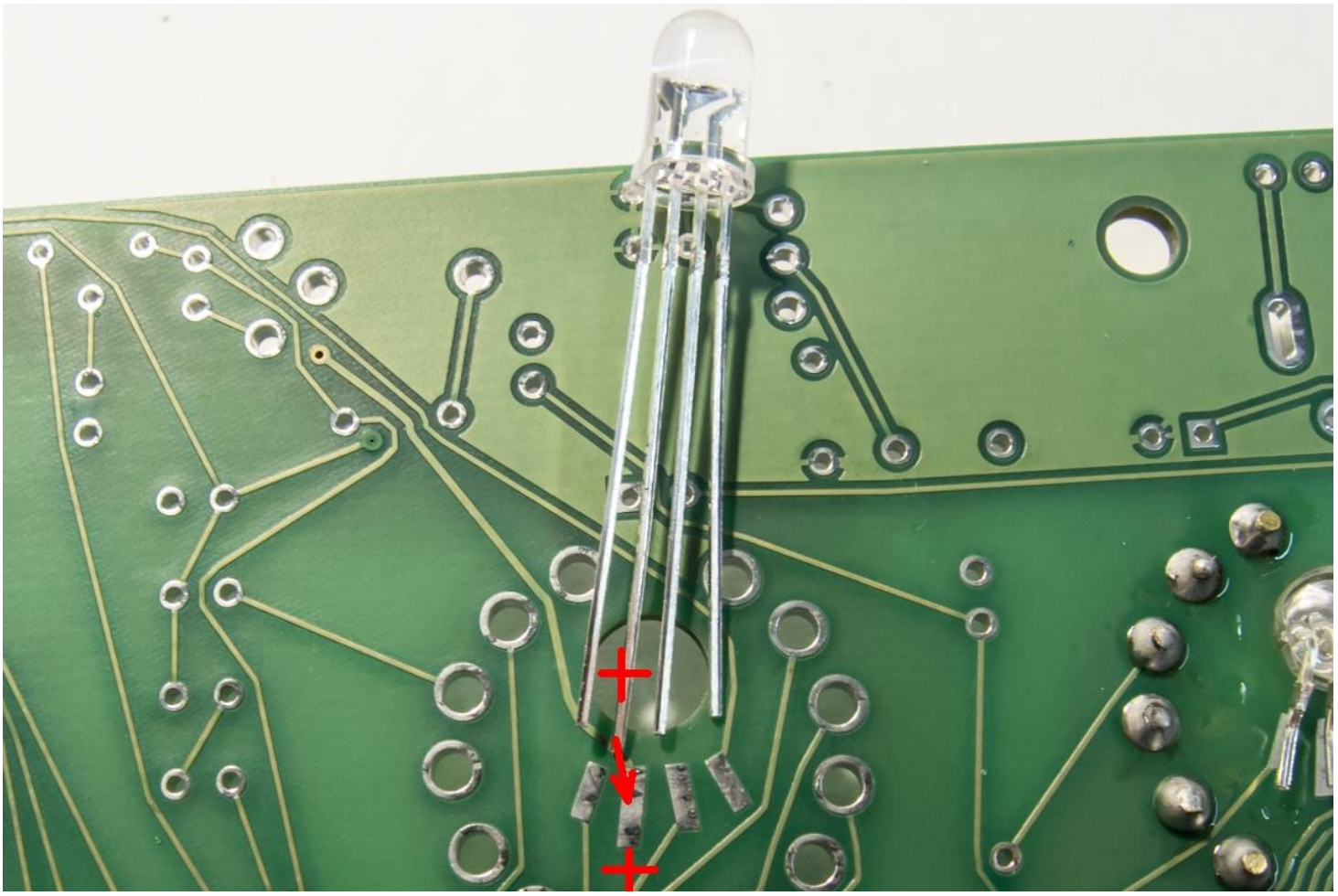
13) Insert 6 LEDs:

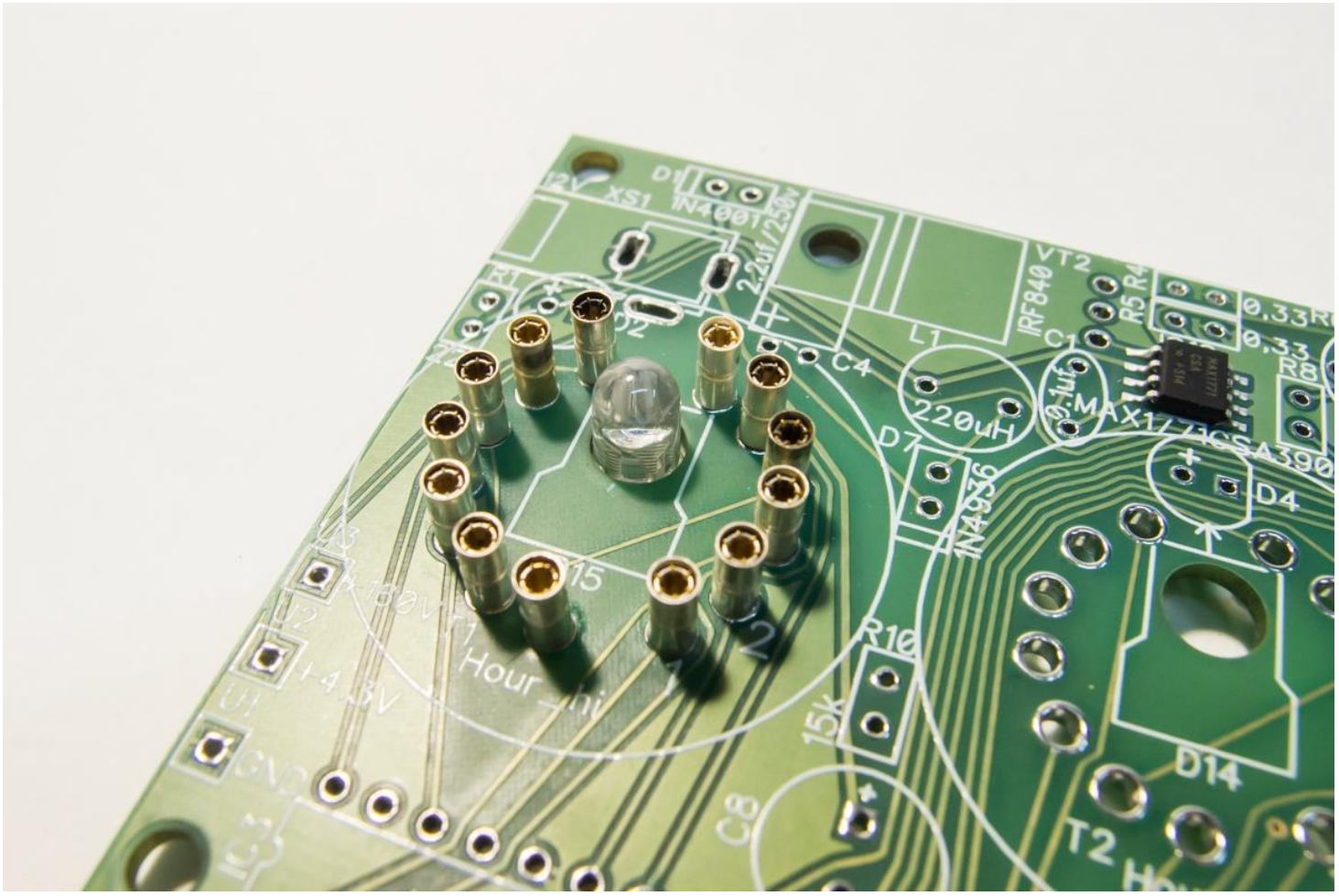


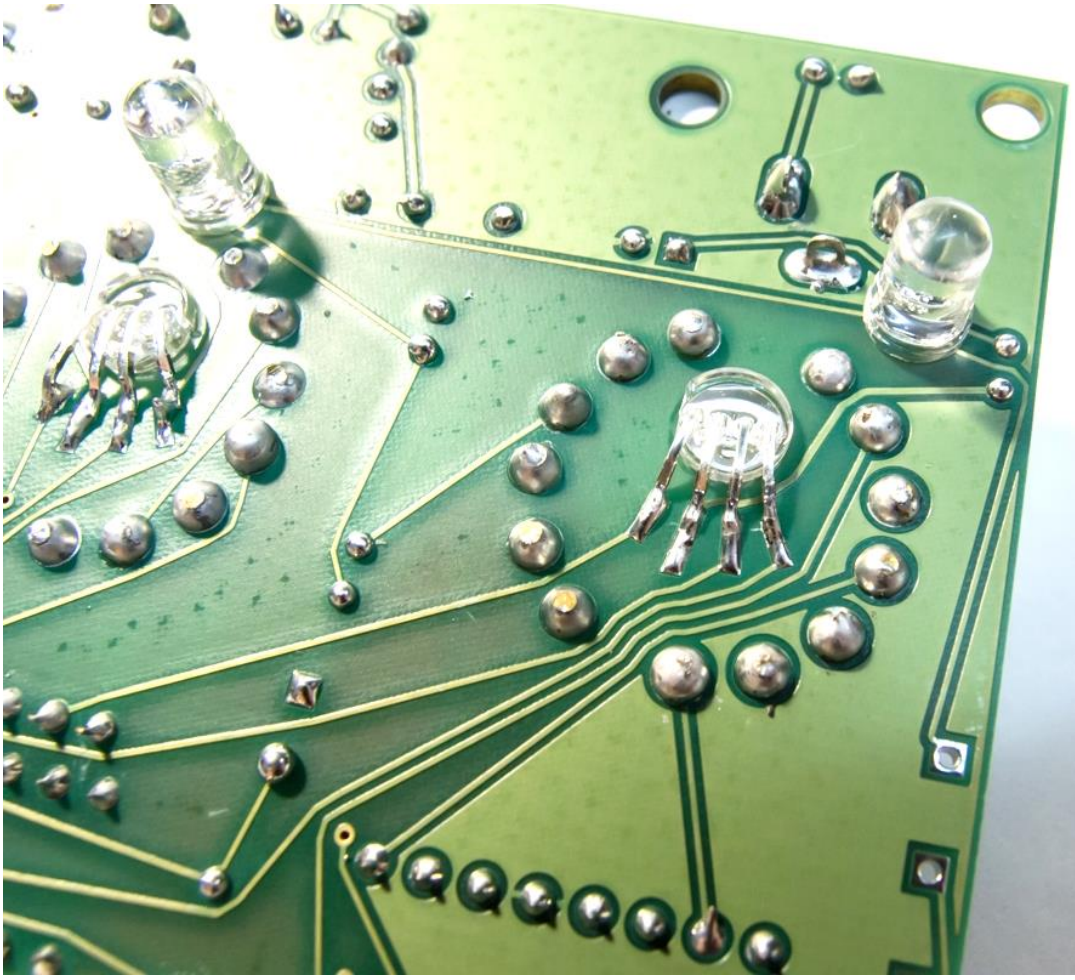



Hour_hi
+4.3V
PWD

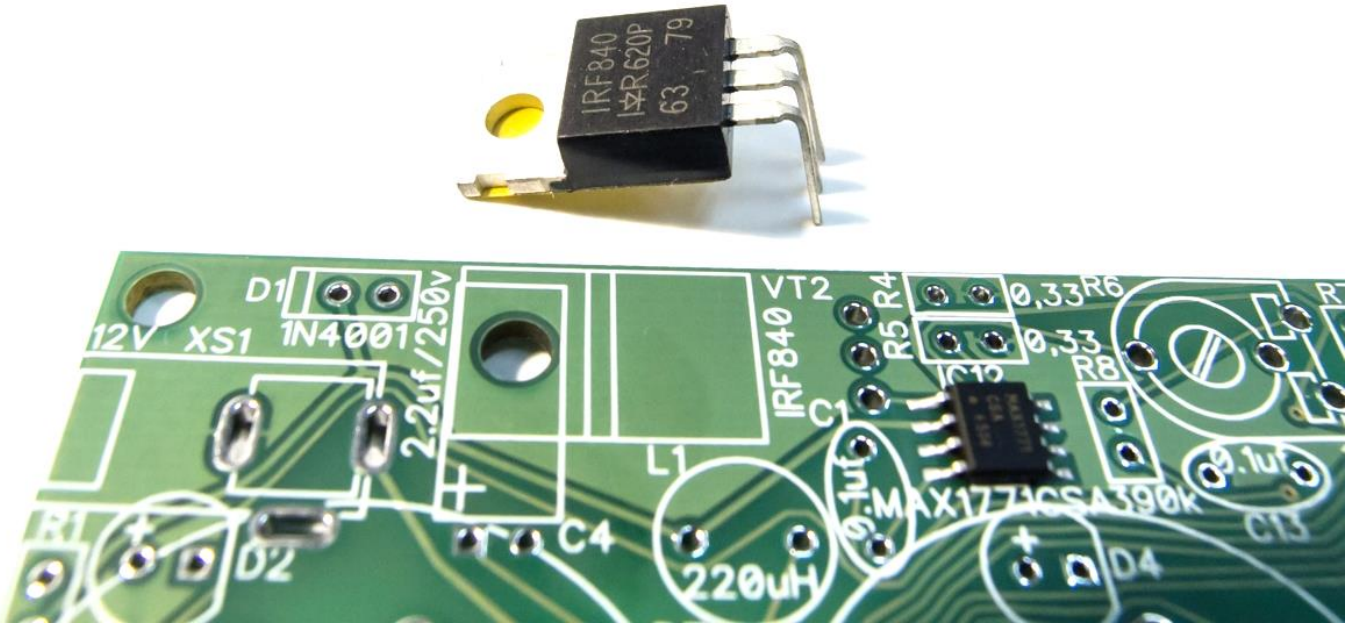


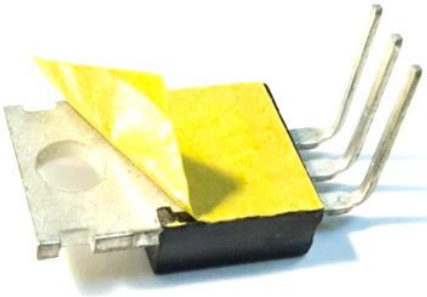


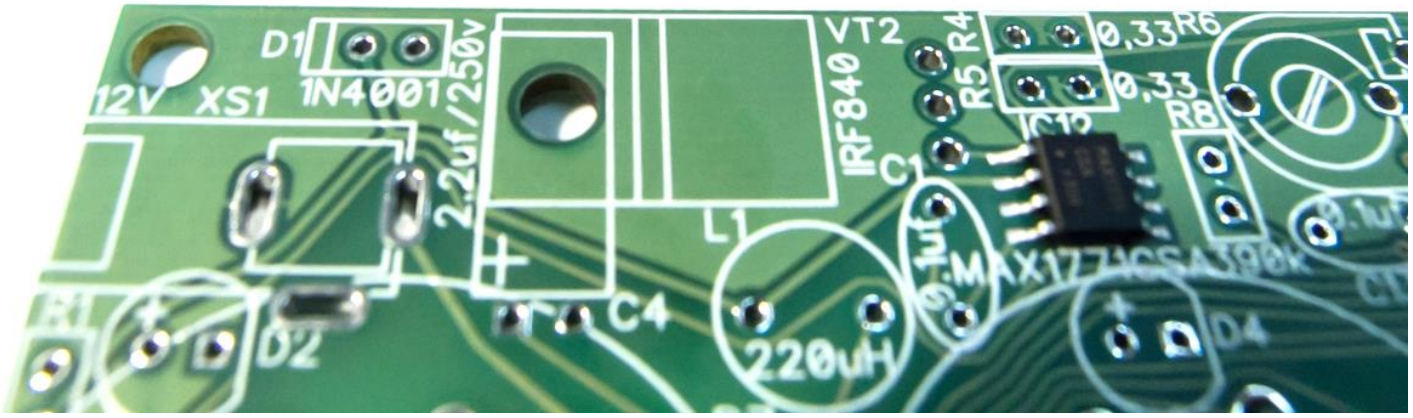

XS1
1N4001
2.2uf/250v
VT2
IRF840
L1
C1
C4
220uH
D7
1N4936
R10
15k
C8
D4
D14
T2
R8
0.33
Hour_hi

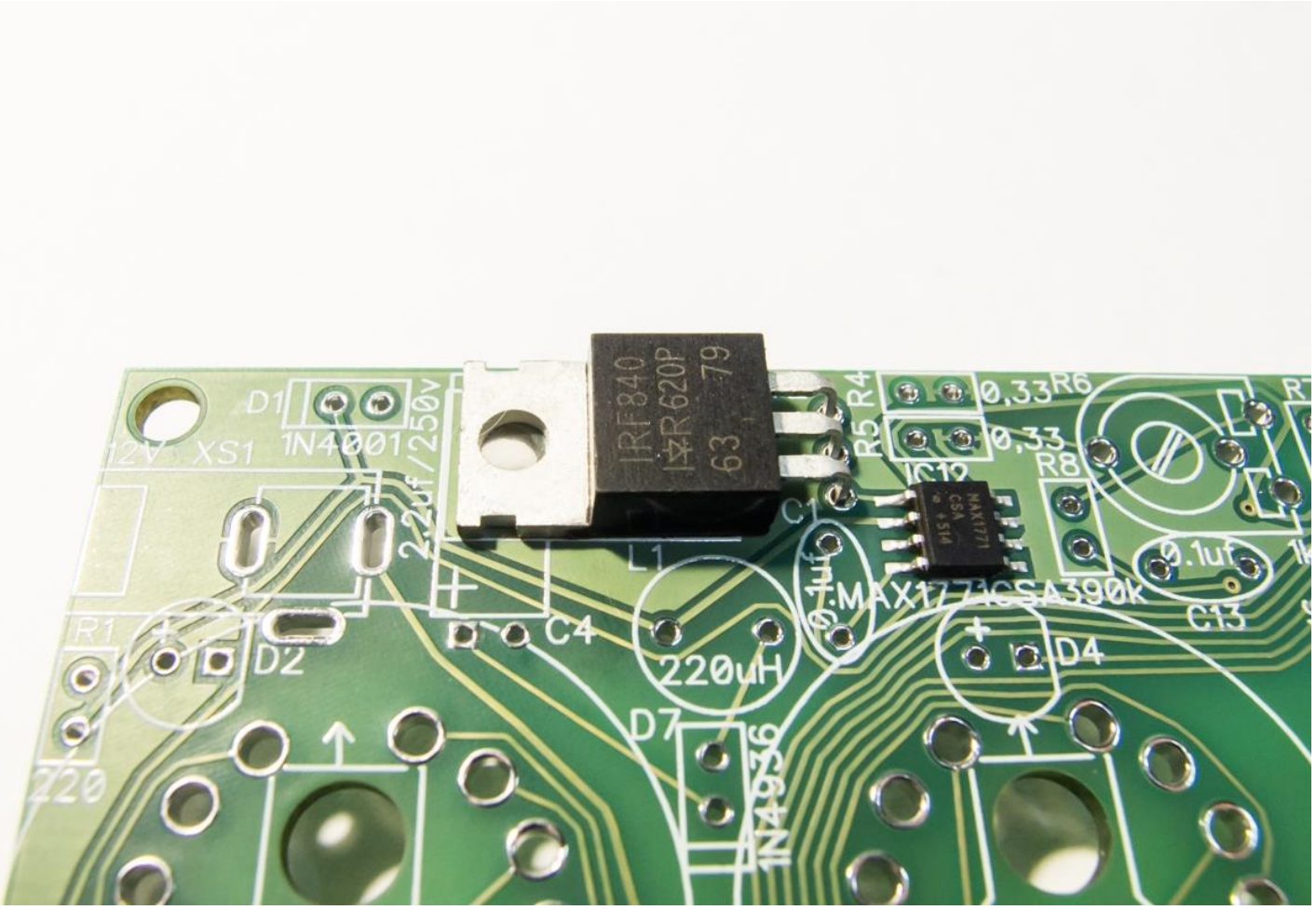


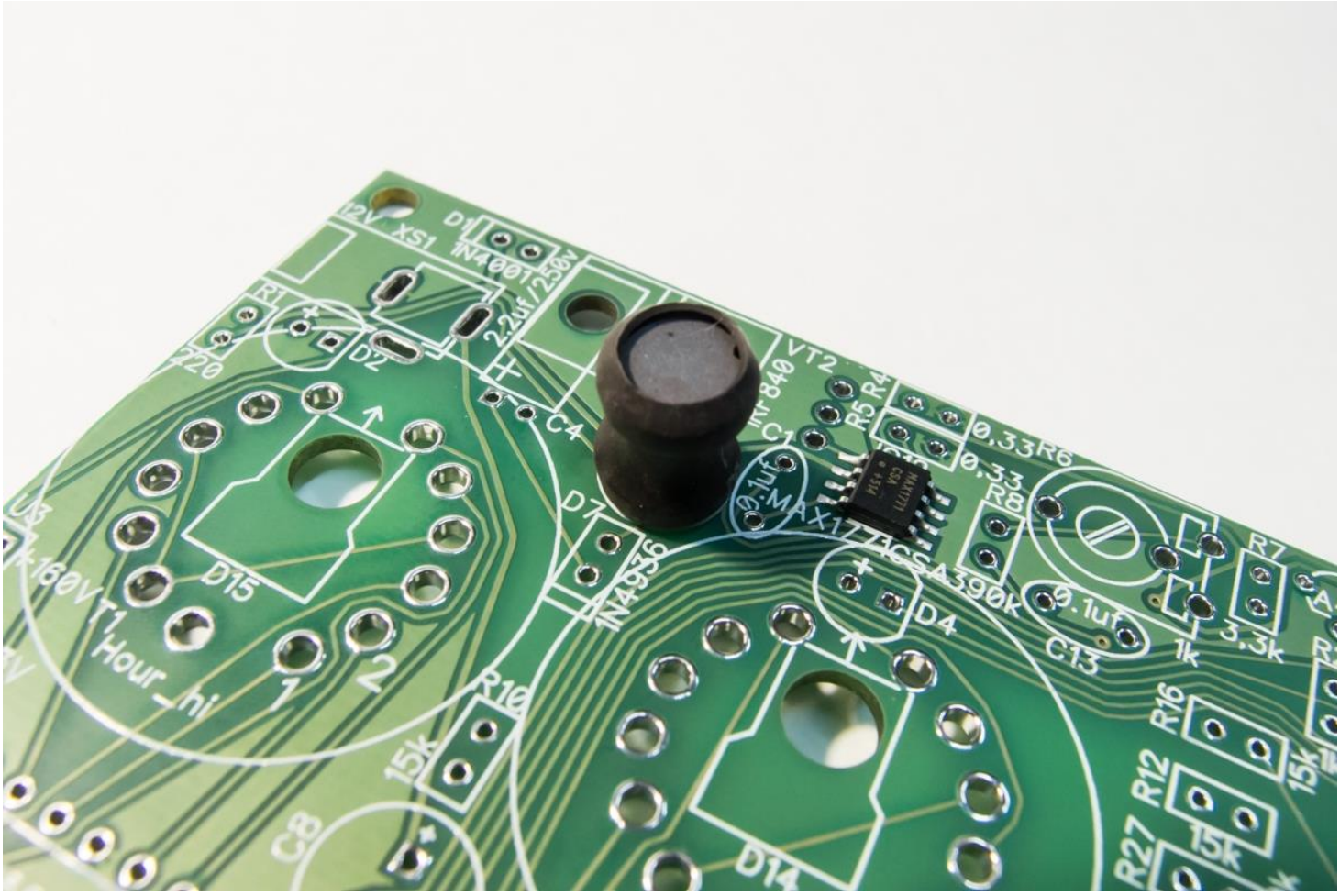
14) Place big transistor and L1 inductor. Use double side adhesive tape for fix transistor to PCB:



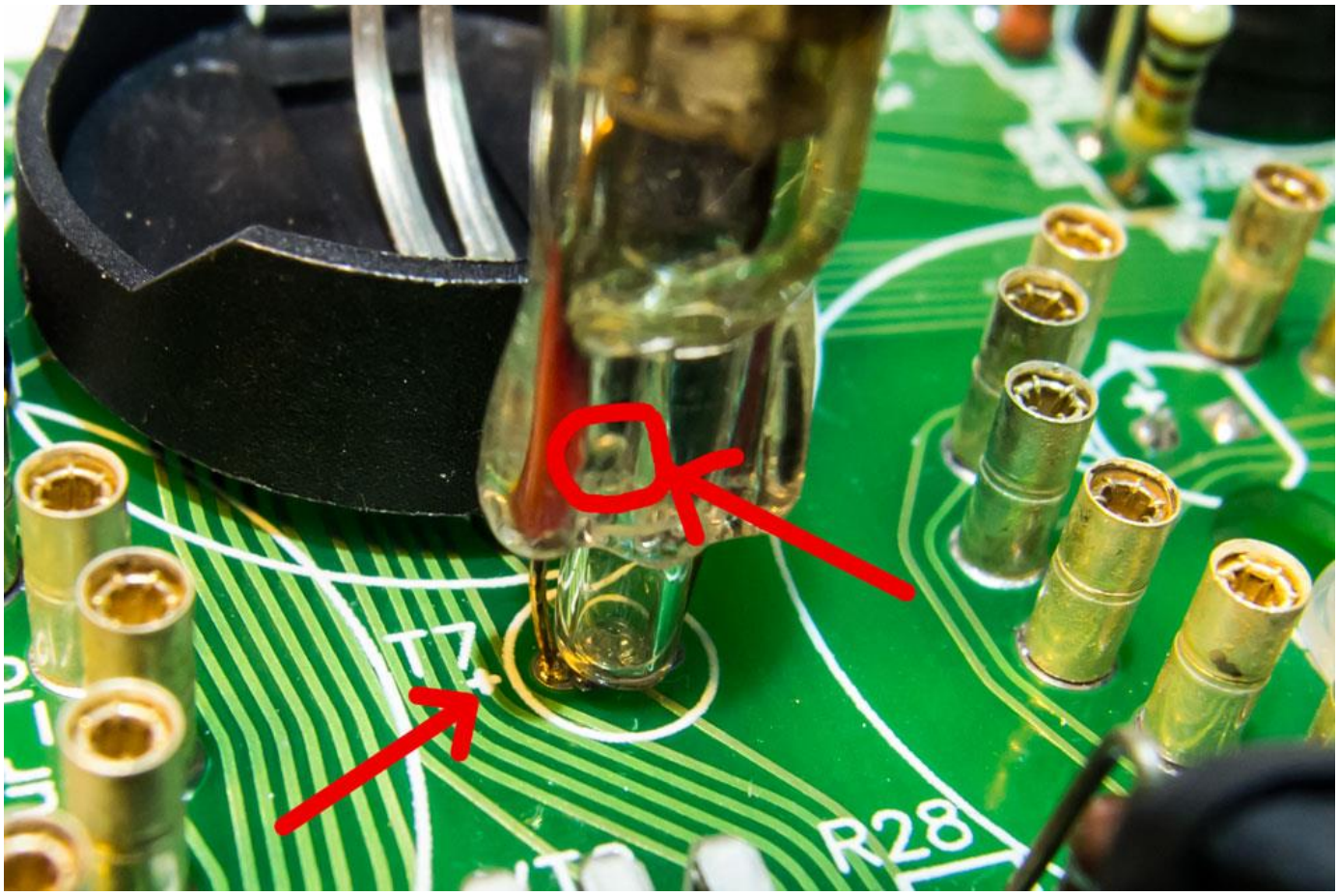



D1
1N4001
12V
XS1
2.2uf/250v
VT2
IRF840
R4
R5
0,33
R6
0,33
R8
IC12
C1
L1
C4
220uH
D2
D4
MAX1771CSA390k

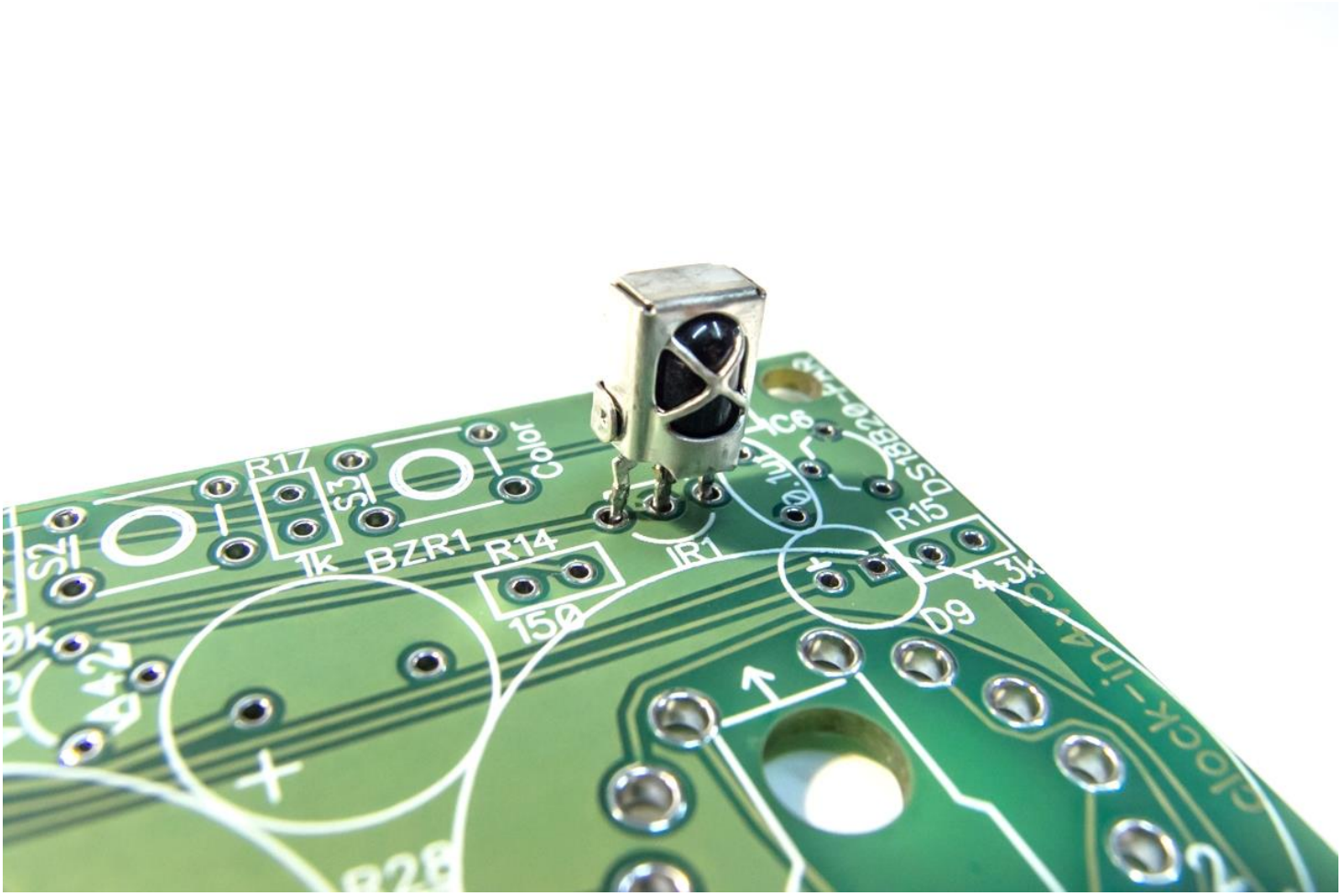

D1
1N4001
12V
XS1
2.2uf/250v
IRF840
R4
R5
0,33
R6
0,33
R8
IC12
C1
L1
C4
220uH
D2
D4
D7
1N4936
MAX1771CSA390k
0.1uf
C13
R1
220

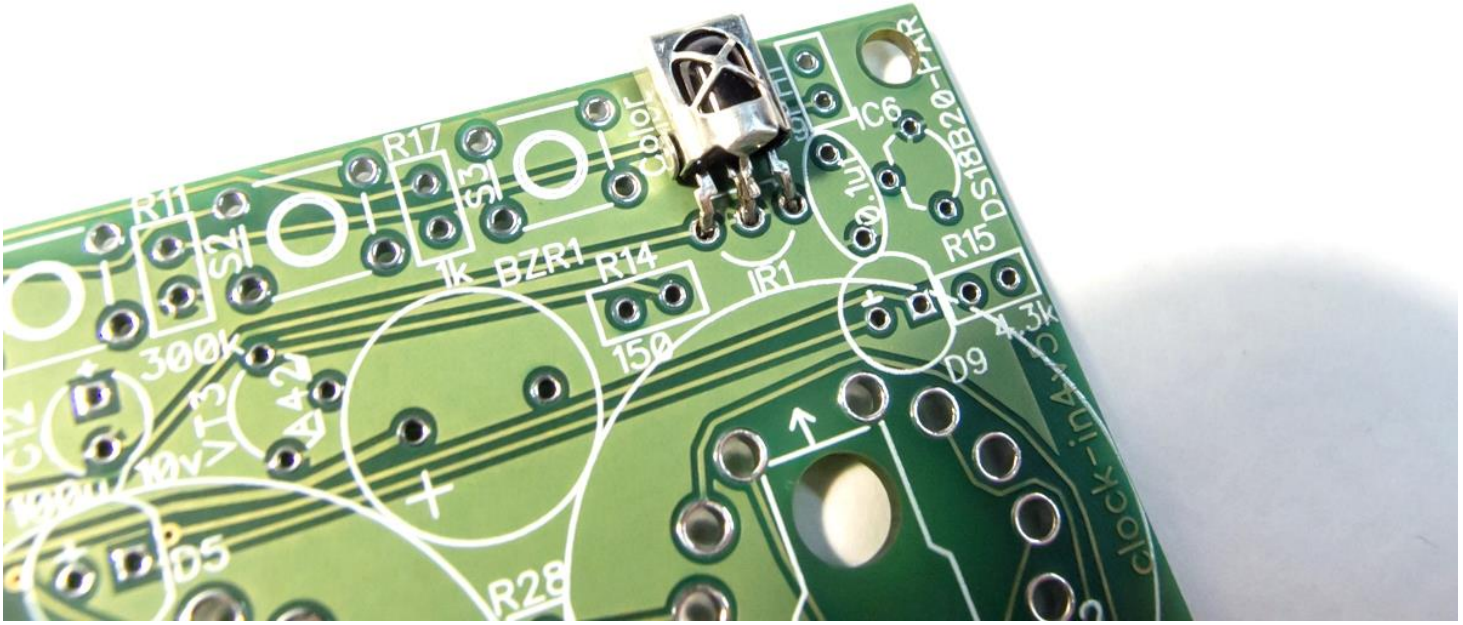


15) Place 2 INS-1 tubes. See the glass dot on INS tube; it should be placed to ‘+’ on PCB.

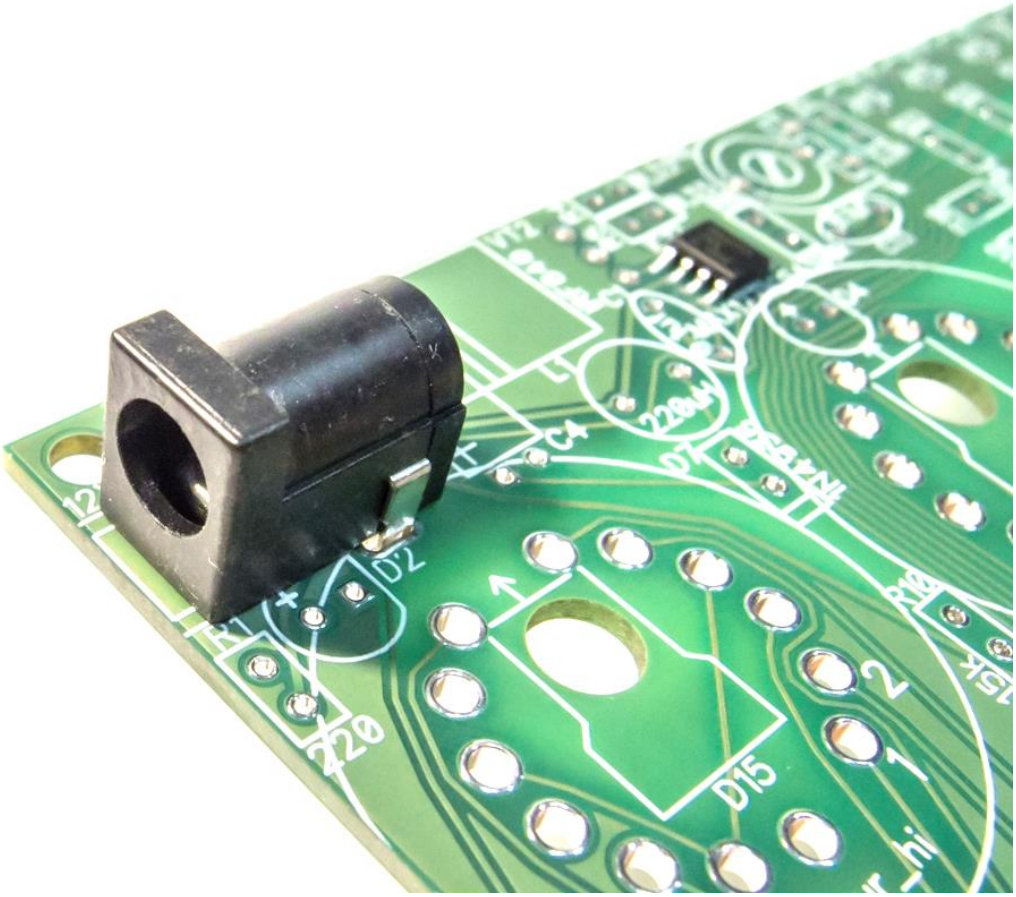


16) Place IR-receiver:

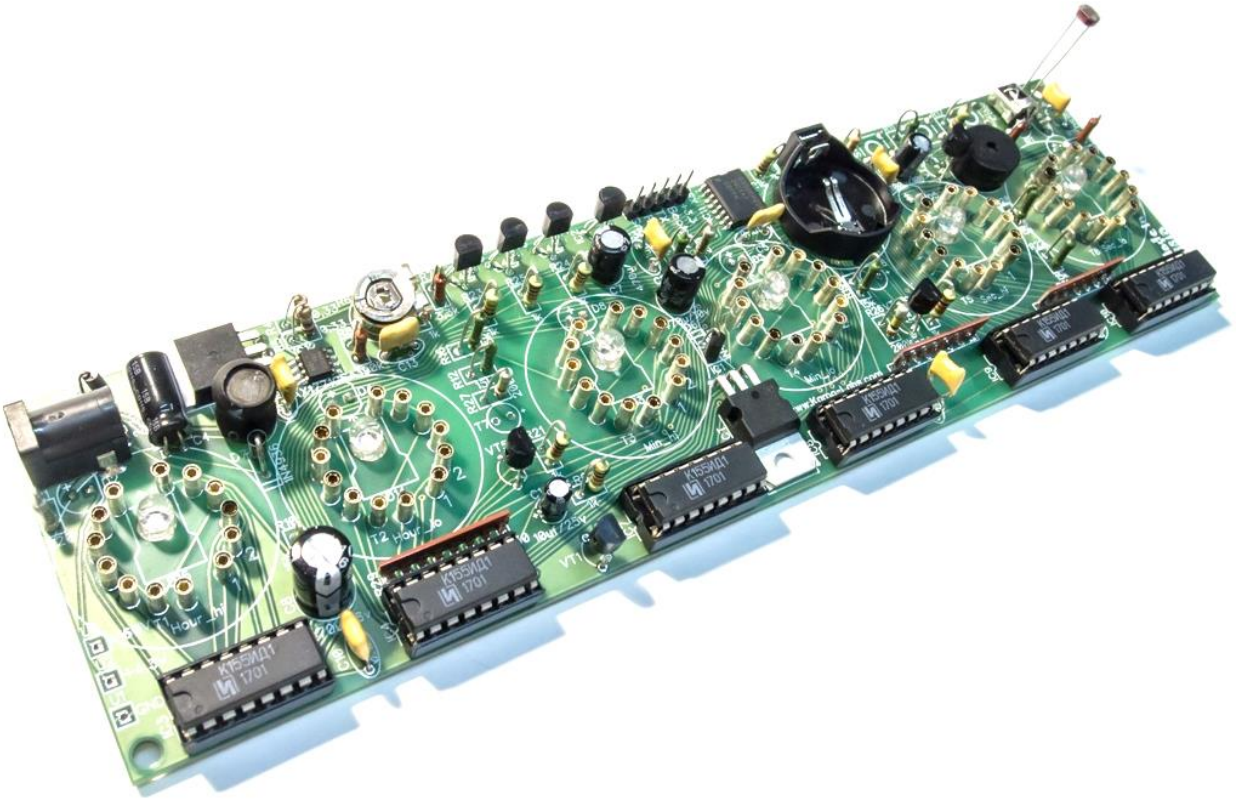


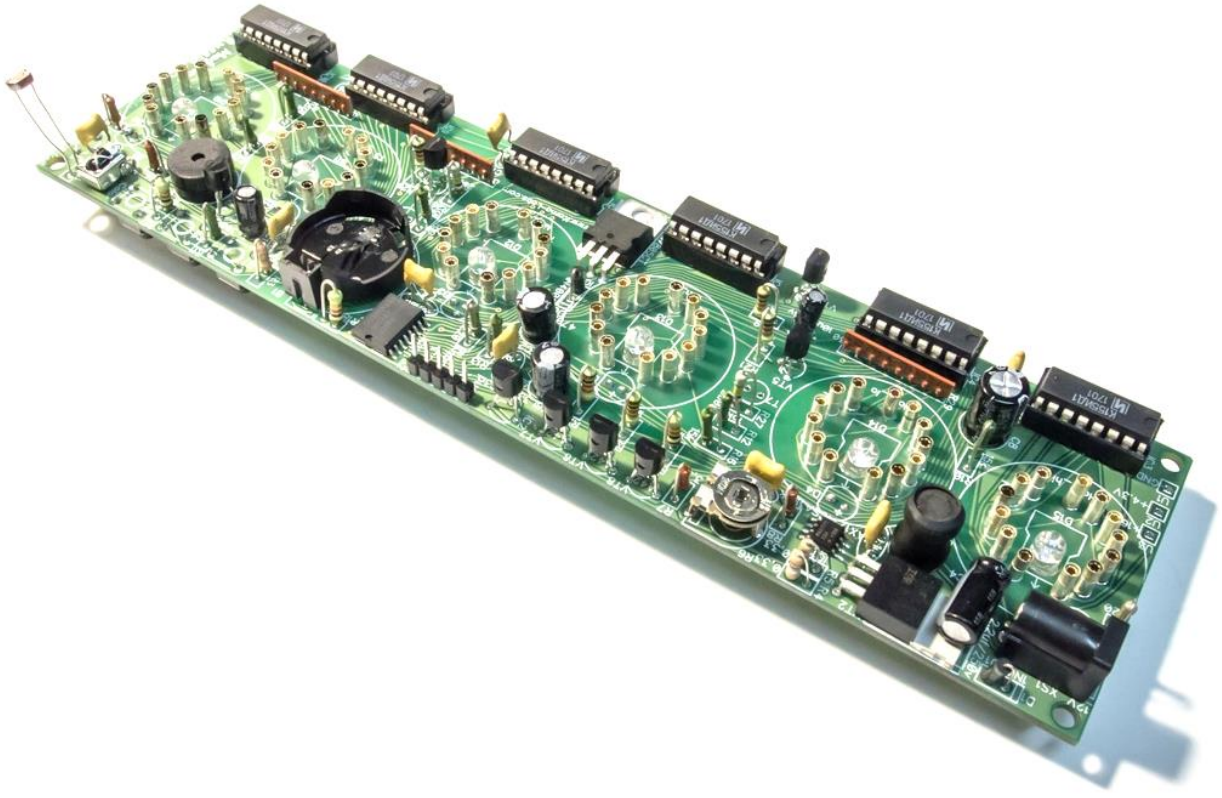


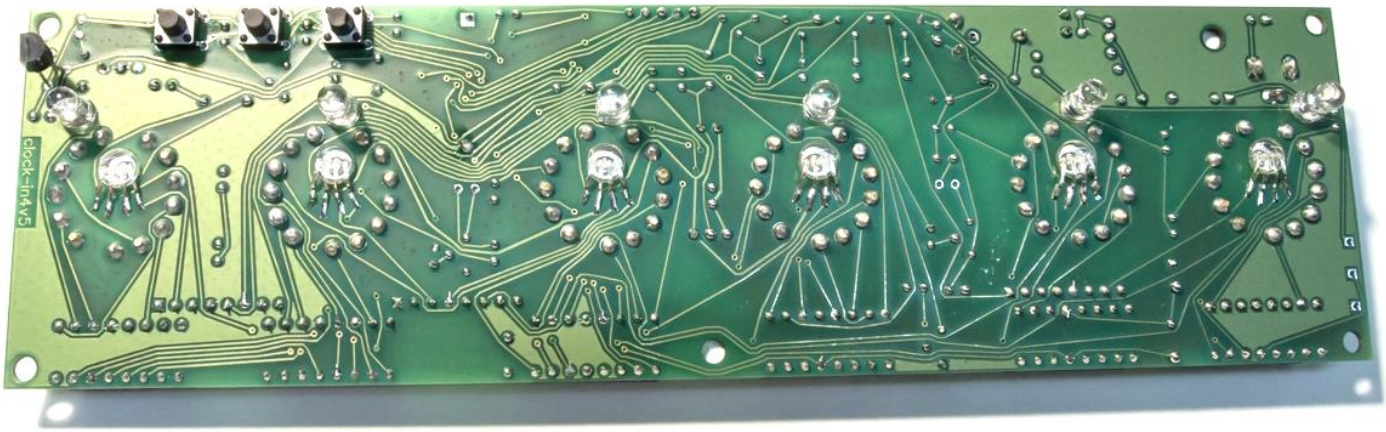
17) Install power plug:



18) The assembled board should looks like this:

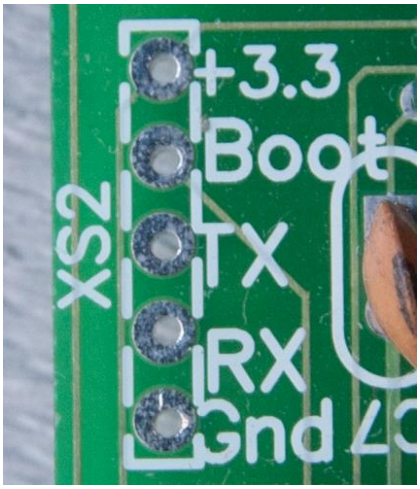


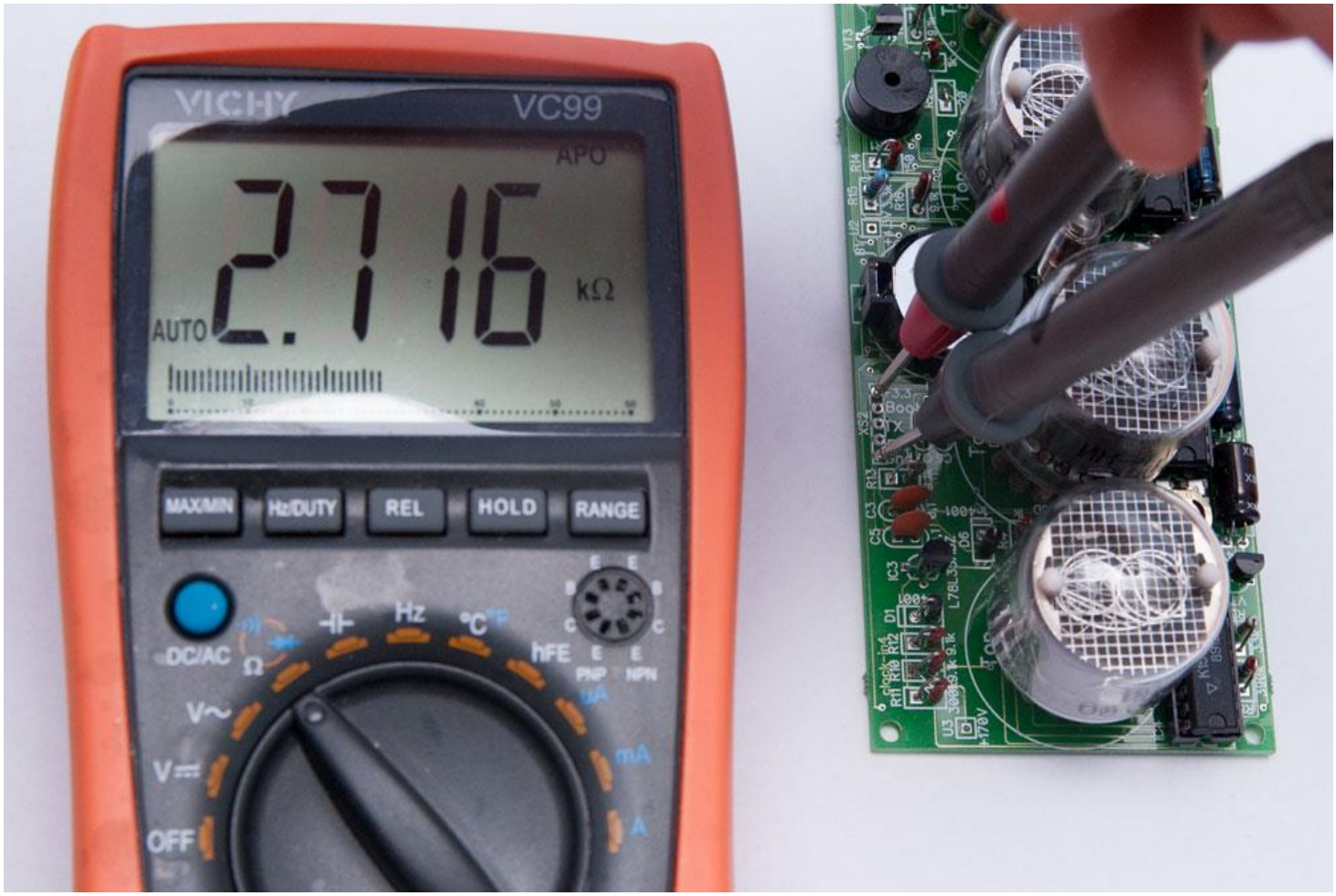


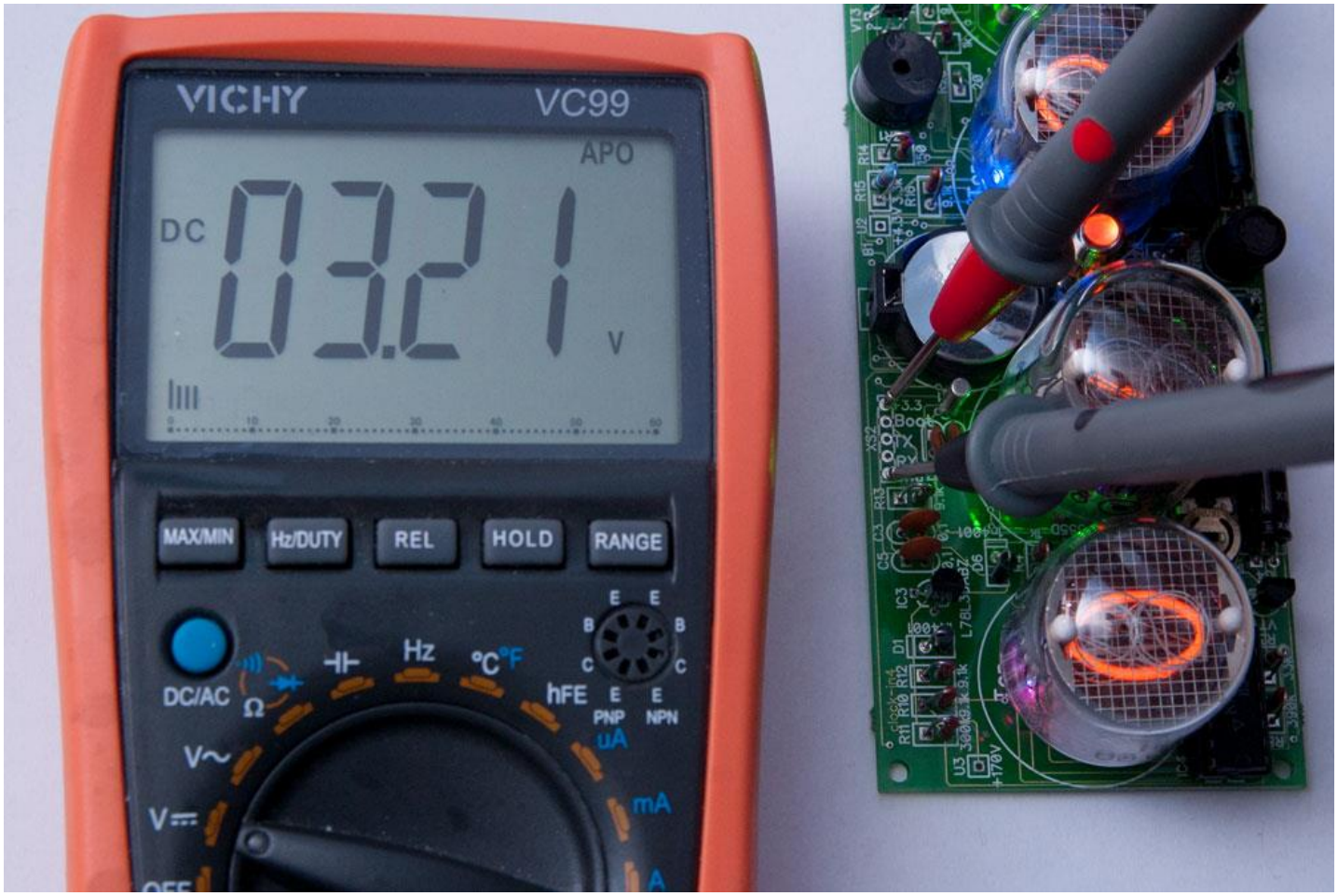


19) Then check the resistance between GND and +3.3V pins of XS2 again. It is should not lower 1kOhm.

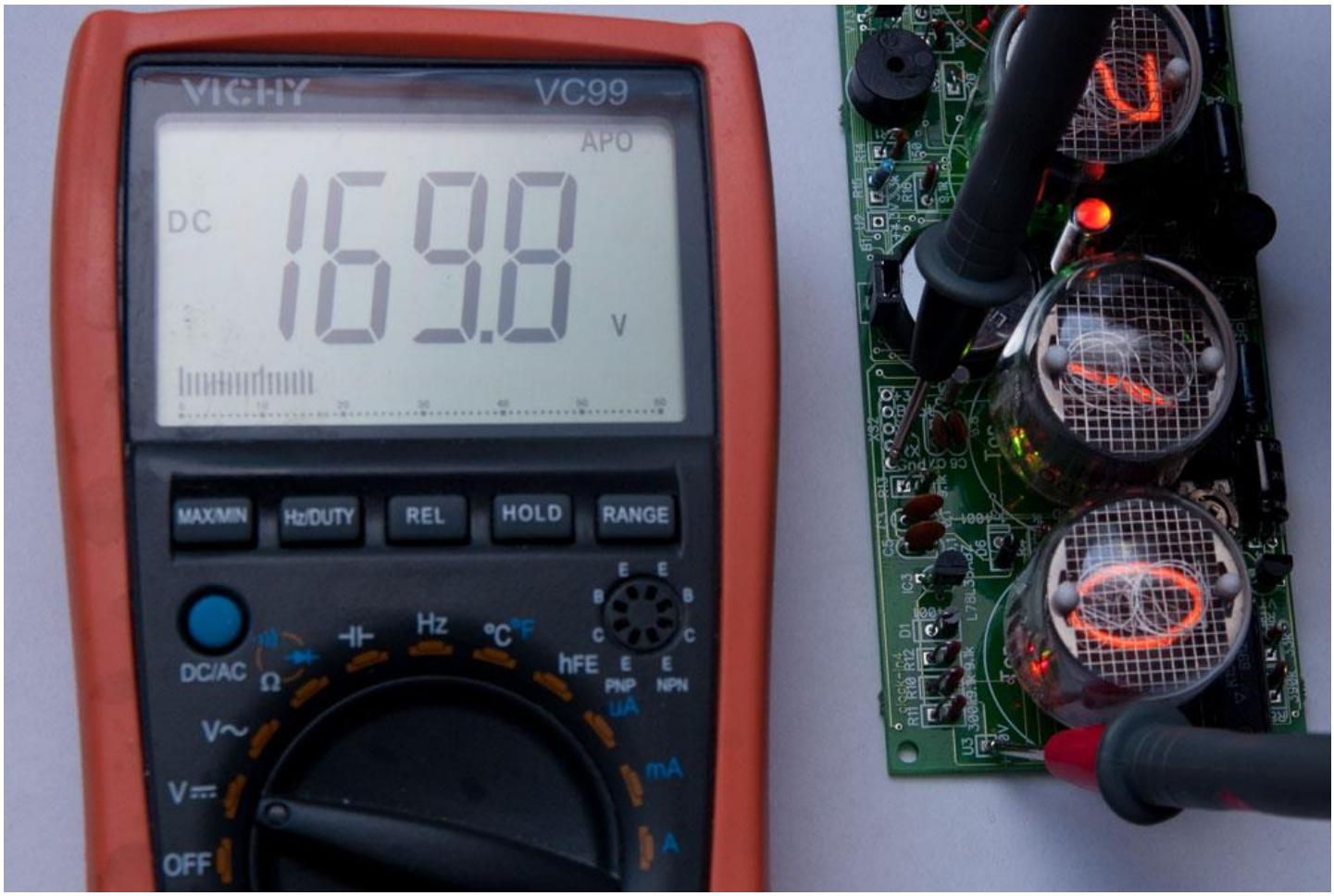
20) Then plug 12V DC adapter. The microcontroller starts work and you will hear short melody. If it not happens, check the 3.3V on XS2 between GND and +3.3 pins.




VICHY
VC99
APO
2716
AUTO
kΩ
MAX/MIN
Hz/DUTY
REL
HOLD
RANGE
DC/AC
Hz
°C°F
hFE
PNP
NPN
uA
mA
A
V~
V⎓
OFF


VICHY
VC99
APO
DC
03.21
V
MAX/MIN
Hz/DUTY
REL
HOLD
RANGE
DC/AC
Hz
°C°F
hFE
PNP
NPN
uA
mA
A
V~
V⎓

21) And now check high voltage on U3 pad. It should be ~160-170V. Use R6 potentiometer for adjusting.



CONGRATULATIONS!

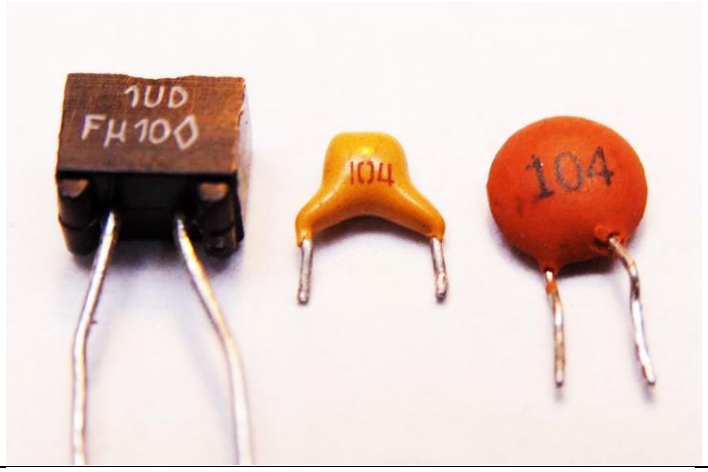
(^_^)

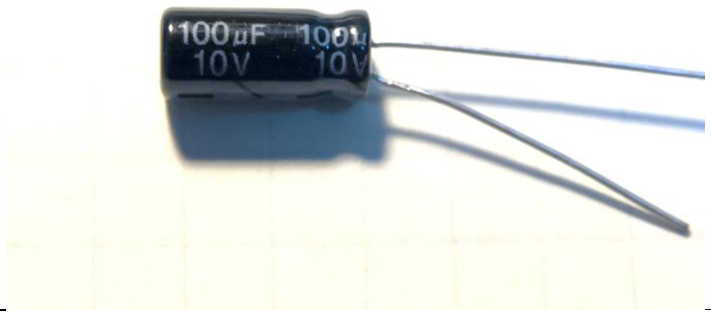
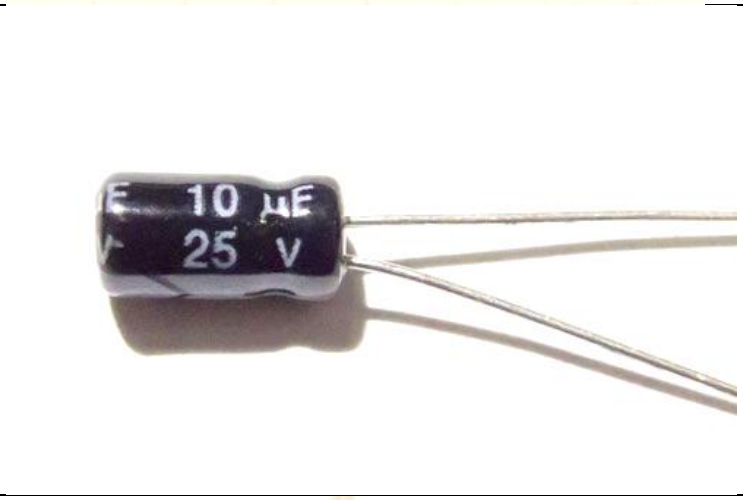
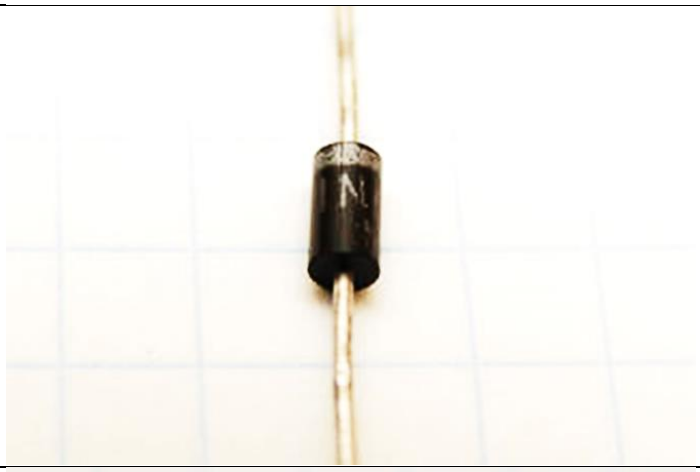
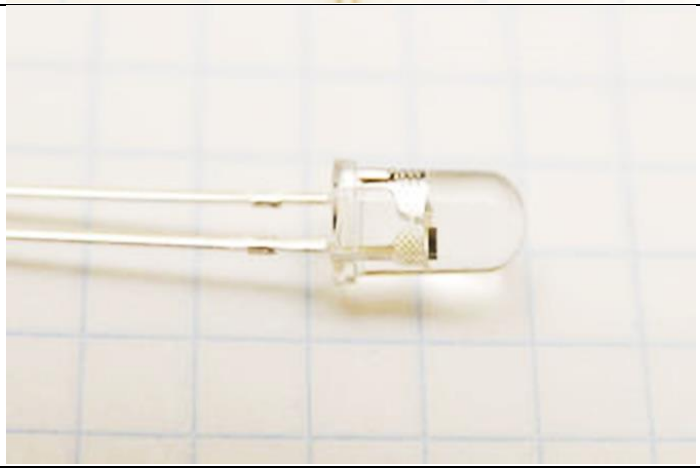
SPECIFICATION

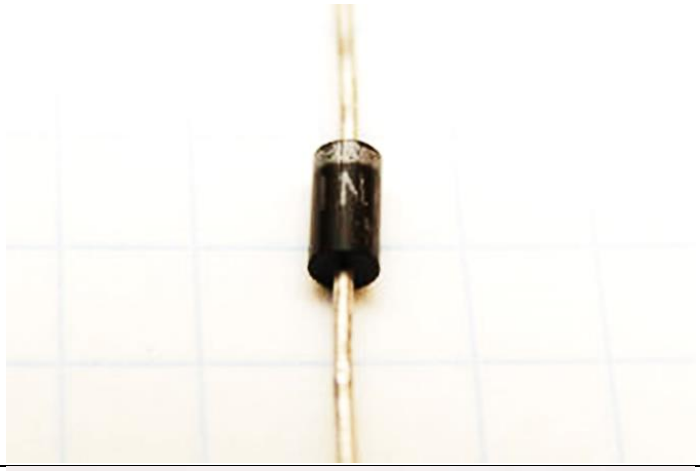
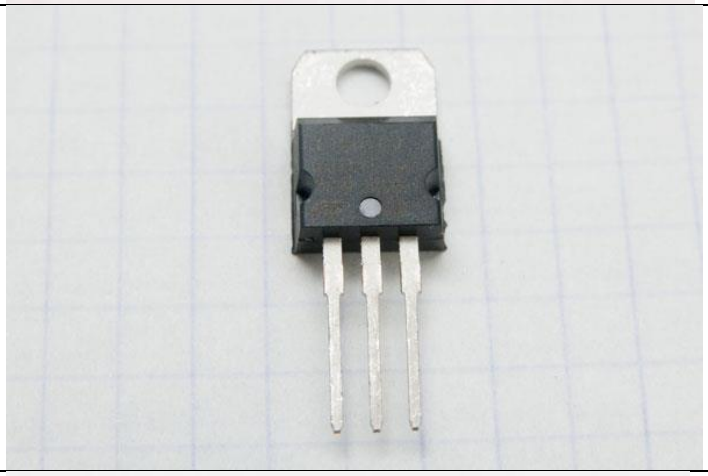
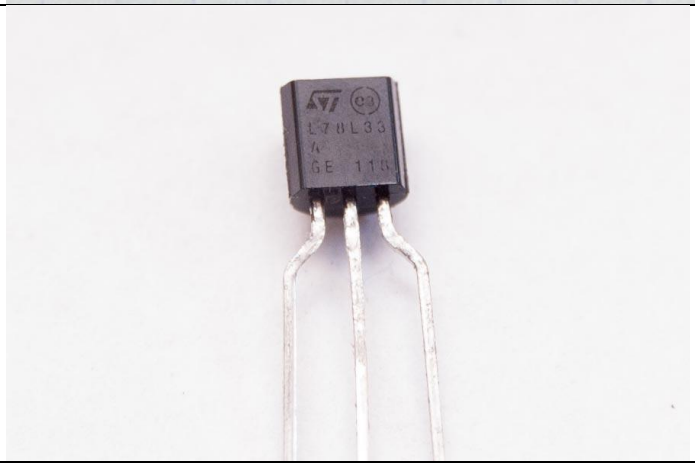
Please note, that elements in kit can be a little different. If you doubt value of element, check it with multimeter.

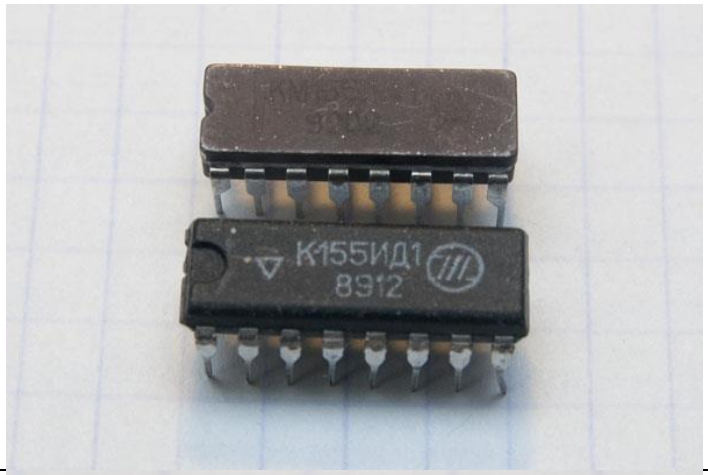
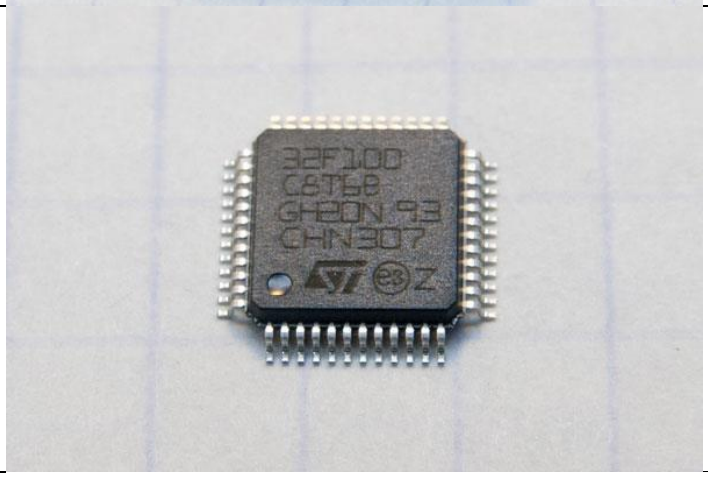
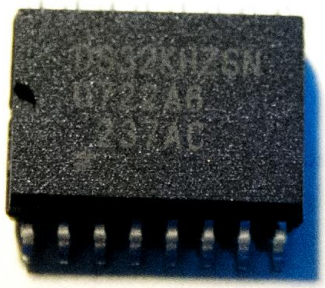
IF VALUE OF ELEMENT IN SPECIFICATION AND ON PCB IS DEFFERENT, PLEASE USE VALUES FROM SPECIFICATION or SCHEMATIC.

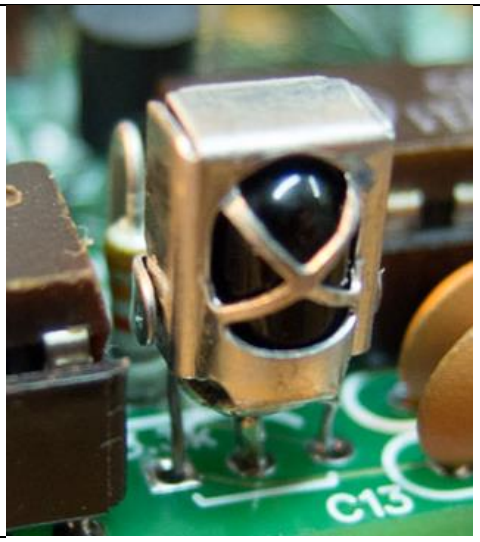
Label	Qty.	Value	Photo
B1		Bat. CR2032	
BZR1		Buzzer	

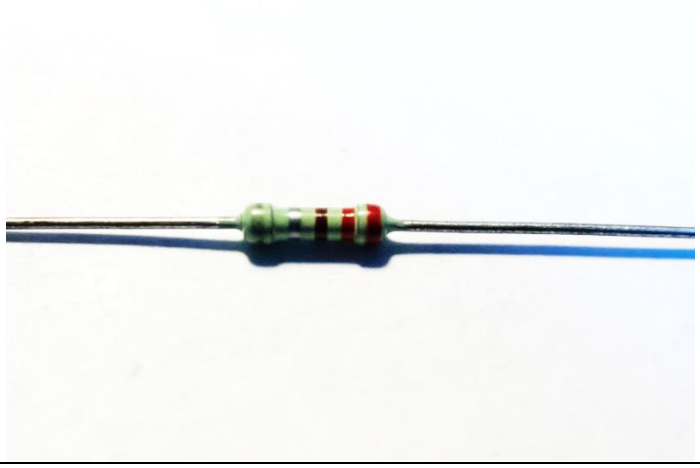
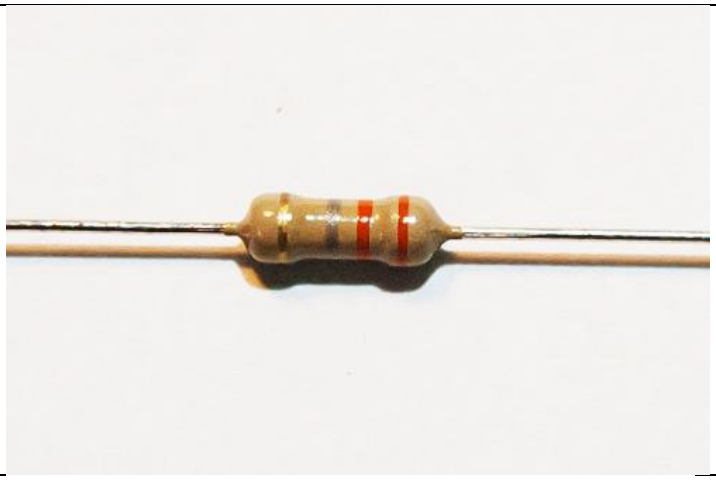
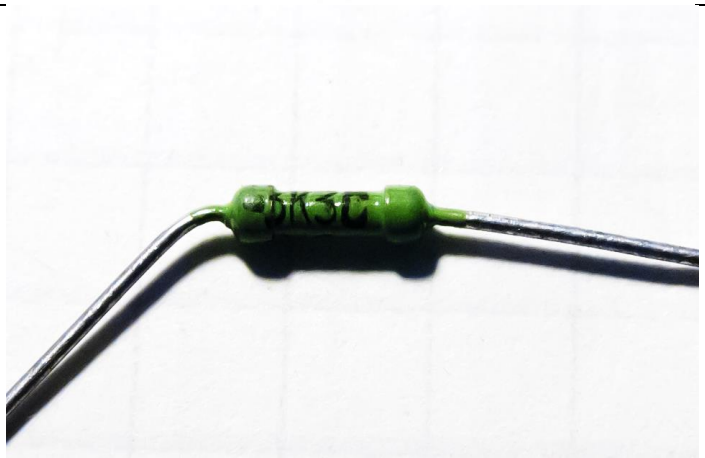
C1, C13, C3, C5, C6, C9, C10, C11	**8**	0.1uf	
C2, C7	**2**	470u/10v	
C4		2.2uf/250v or 4.7uf/250v	
C8		470u/16v	

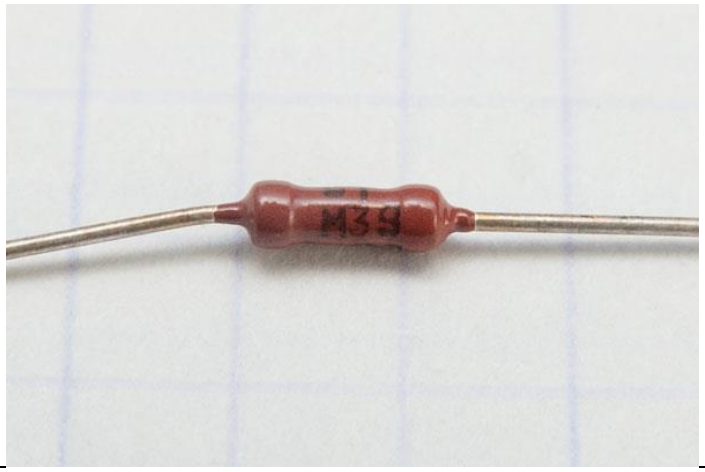
C12		100u/10v	
C14		10uf/25v	
D1, D6	**2**	1N4001	
D2, D3, D4, D5, D8, D9	**6**	LED auto	

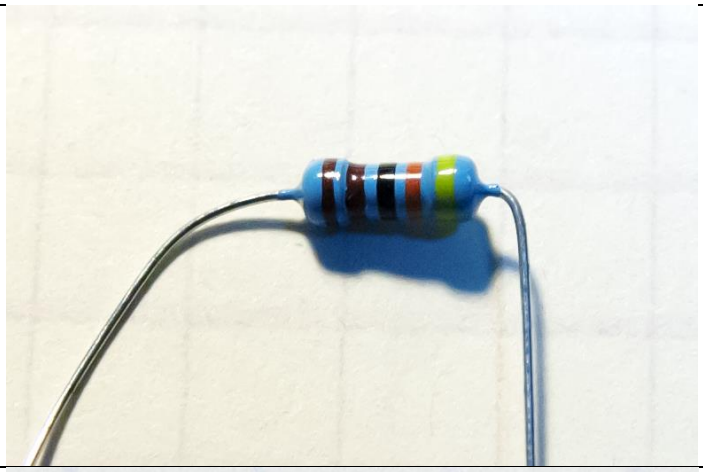
D7		1N4936	
D10-D15	**6**	RGB Led	
IC1		LM7805CT	
IC2		L78L33ABZ	

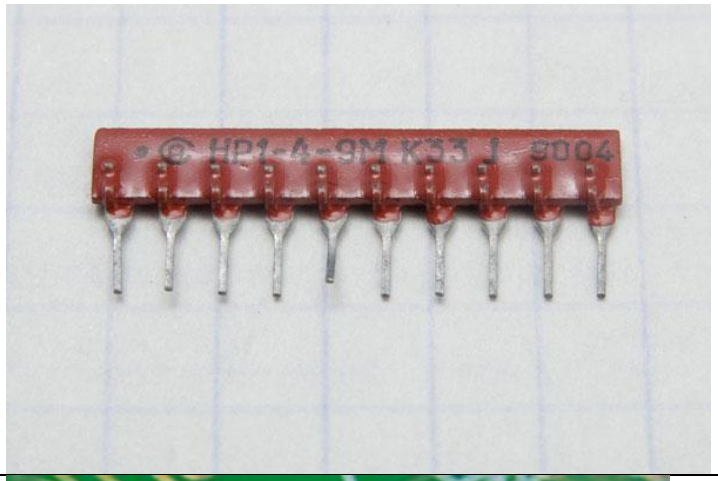
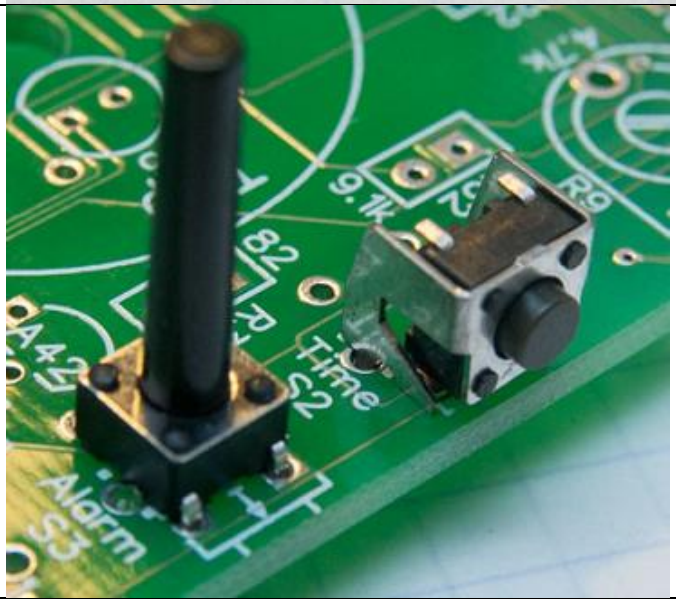
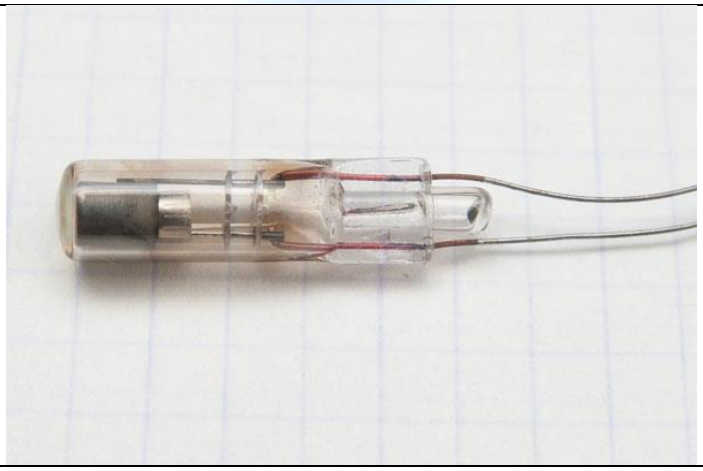
IC3,IC4,IC7-IC10	**6**	K155ID1	
IC5		STM32F100C6T	
IC6		DS18B20-PAR	
IC11		DS32kHz	

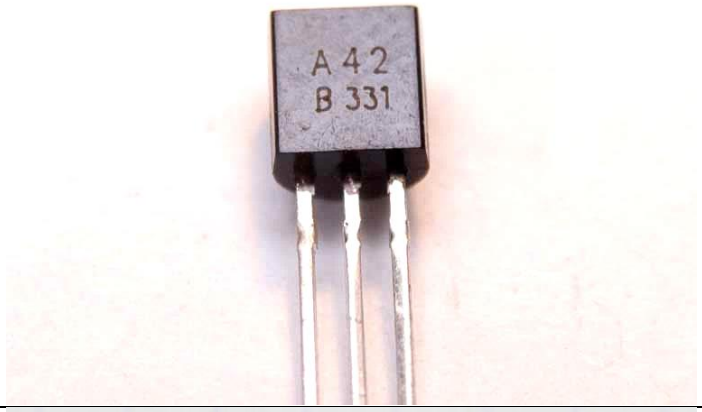
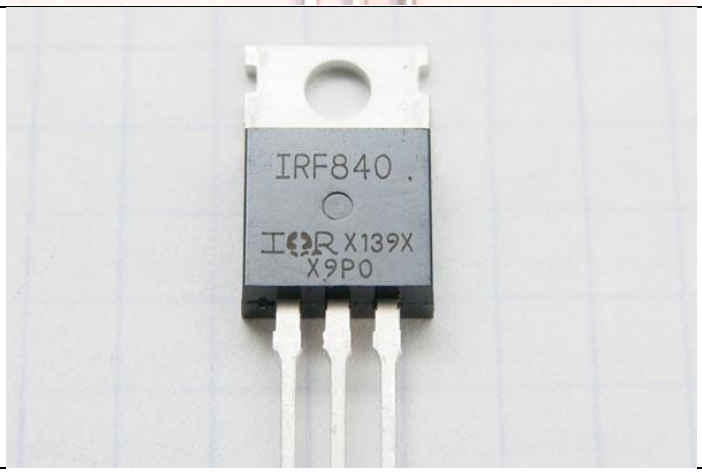
IC12		MAX1771CSA	
IR1		IR-sensor	
L1		220uH	
PH1		SF2-1	

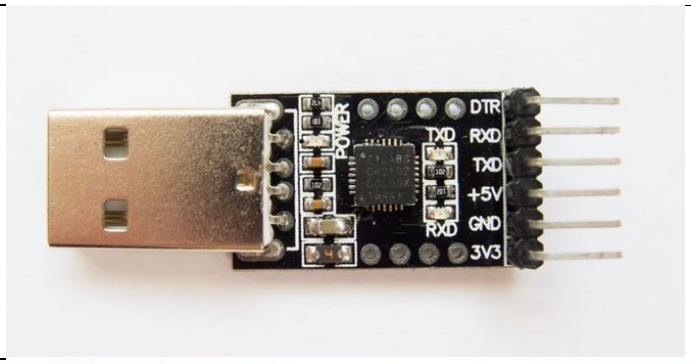
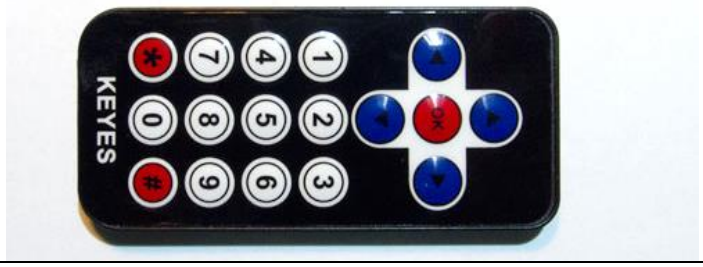
R1, R2	**2**	220	
R3		47	
R4, R5	**2**	0.33	
R6		1k pot.	
R7		3.3k	

R8		390k	
R9, R17, R18, R20, R21, R23, R24, R25	**8**	1k	
R10, R12, R16, R19, R22, R28	**6**	15k	
R11		300k	

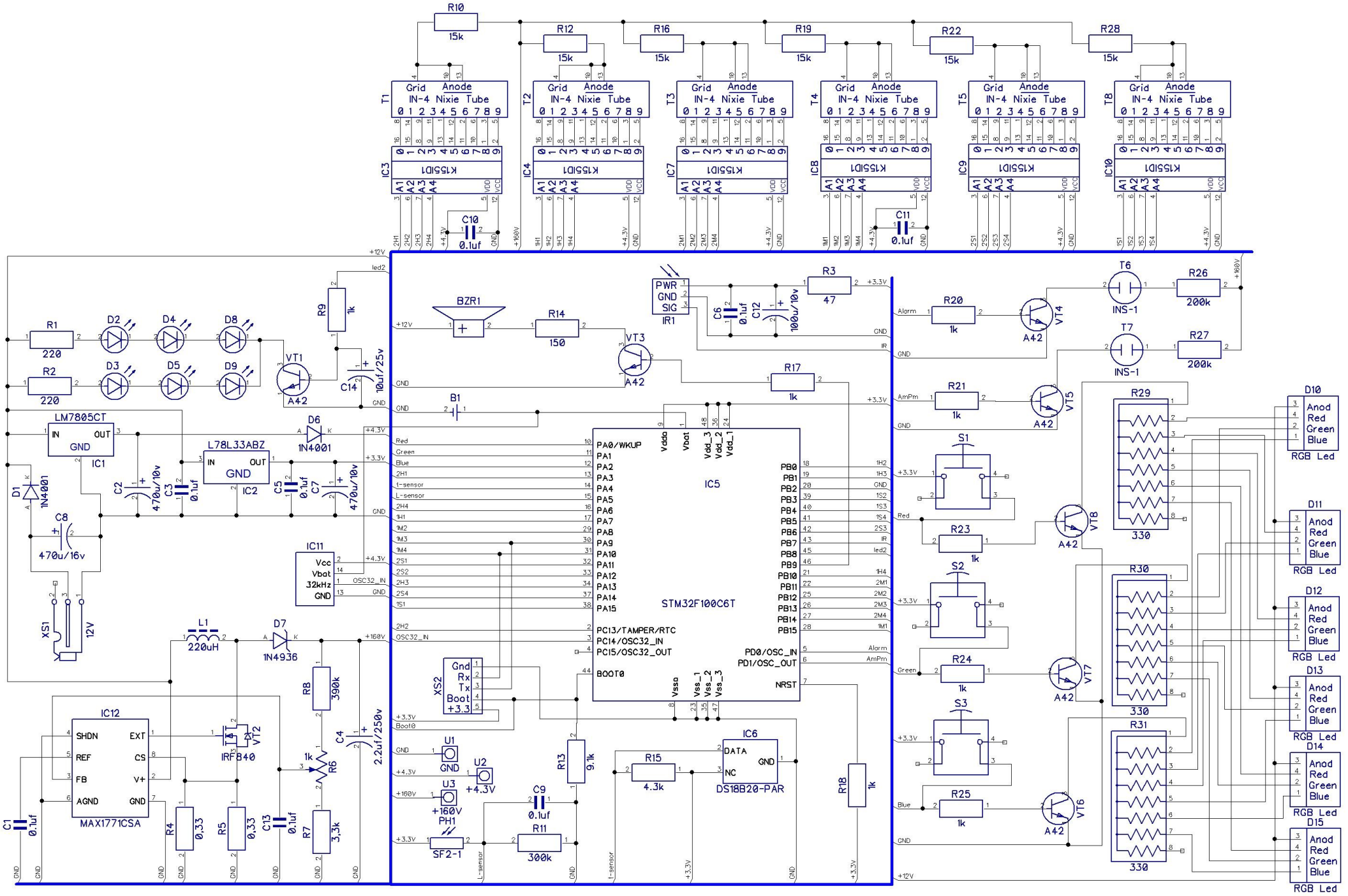
R13		9.1k	
R14		150 or 160	
R15		4.3k	
R26, R27	**2**	200k	

R29, R30, R31	**3**	330 res.array	
S1-S3	**3**	Buttons	
T1-T5, T8	**6**	IN-4 tubes	
T6, T7	**2**	INS-1 tubes	

VT1, VT3-VT8	**7**	A42	
VT2		IRF840 or IRF740	
XS1		Power socket	
Pins	**78**		

Bat. holder			
Socket 16-pin	**6**		
USB-UART			
Remote control			

12V power supply			


R10 15k
R12 15k
R16 15k
R19 15k
R22 15k
R28 15k
T1 Grid Anode IN-4 Nixie Tube 0 1 2 3 4 5 6 7 8 9
T2 Grid Anode IN-4 Nixie Tube 0 1 2 3 4 5 6 7 8 9
T3 Grid Anode IN-4 Nixie Tube 0 1 2 3 4 5 6 7 8 9
T4 Grid Anode IN-4 Nixie Tube 0 1 2 3 4 5 6 7 8 9
T5 Grid Anode IN-4 Nixie Tube 0 1 2 3 4 5 6 7 8 9
T8 Grid Anode IN-4 Nixie Tube 0 1 2 3 4 5 6 7 8 9
IC3 K155ID1
IC4 K155ID1
IC7 K155ID1
IC8 K155ID1
IC9 K155ID1
IC10 K155ID1
C10 0.1uf
C11 0.1uf
+12V
led2
R1 220
R2 220
D2
D3
D4
D5
D8
D9
R9 1k
VT1 A42
C14 10uf/25v
LM7805CT
IC1
L78L33ABZ
IC2
D6 1N4001
D1 1N4001
C2 470u/10v
C3 0.1uf
C5 0.1uf
C7 470u/10v
C8 470u/16v
XS1
12V
IC11
Vcc
Vbat
32kHz
GND
OSC32_IN
L1 220uH
D7 1N4936
+160V
IC12
SHDN
REF
FB
AGND
EXT
CS
V+
GND
MAX1771CSA
IRF840
VT2
R8 390k
R6 1k
R4 0,33
R5 0,33
R7 3,3k
C1 0.1uf
C13 0.1uf
C4 2.2uf/250v
BZR1
R14 150
VT3 A42
PWR
GND
SIG
IR1
C6 0.1uf
C12 100u/10v
R3 47
R17 1k
B1
STM32F100C6T
IC5
PA0/WKUP
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13
PA14
PA15
PC13/TAMPER/RTC
PC14/OSC32_IN
PC15/OSC32_OUT
BOOT0
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15
PD0/OSC_IN
PD1/OSC_OUT
NRST
Vdda
Vbat
Vdd_3
Vdd_2
Vdd_1
Vssa
Vss_1
Vss_2
Vss_3
Red
Green
Blue
2H1
t-sensor
L-sensor
2H4
1H1
1M2
1M3
1M4
2S1
2S2
2H3
2S4
1S1
2H2
OSC32_IN
Boot0
XS2
Gnd
Rx
Tx
Boot
+3.3
U1 GND
U2 +4.3V
U3 +160V
PH1
SF2-1
R13 9.1k
R15 4.3k
IC6
DATA
GND
NC
DS18B20-PAR
C9 0.1uf
R11 300k
R18 1k
T6 INS-1
T7 INS-1
R26 200k
R27 200k
R20 1k
R21 1k
VT4 A42
VT5 A42
VT8 A42
VT7 A42
VT6 A42
Alarm
AmPm
S1
S2
S3
R23 1k
R24 1k
R25 1k
R29 330
R30 330
R31 330
D10 Anod Red Green Blue RGB Led
D11 Anod Red Green Blue RGB Led
D12 Anod Red Green Blue RGB Led
D13 Anod Red Green Blue RGB Led
D14 Anod Red Green Blue RGB Led
D15 Anod Red Green Blue RGB Led