

www.Kama-Labs.com

ASSEMBLY MANUAL FOR

ALENA / MARIA

IN-14 / IN-8-2 CLOCK v7

If you will have any questions, contact
with me here:

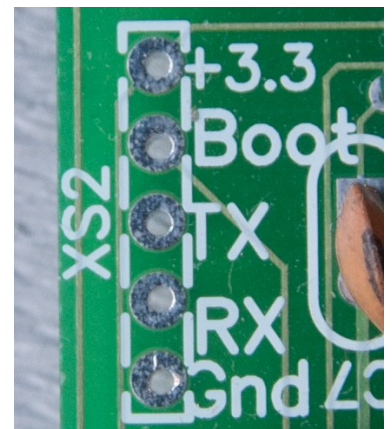
info@kama-labs.com

GOOD LUCK!

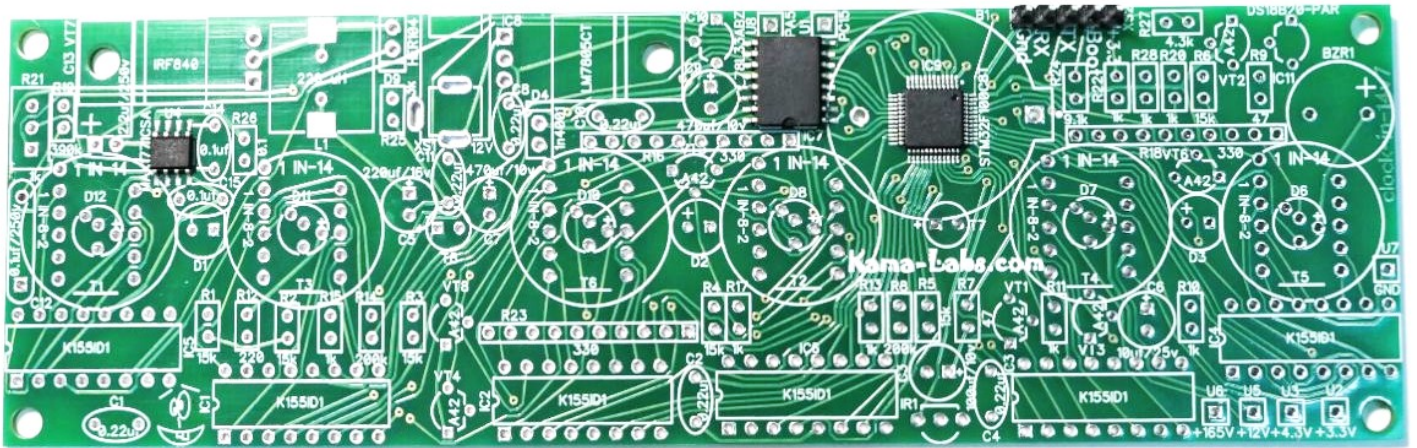


Be very careful with static electricity. If clock
not work after build its mean that they been
damaged by static electricity in
process of assemble.

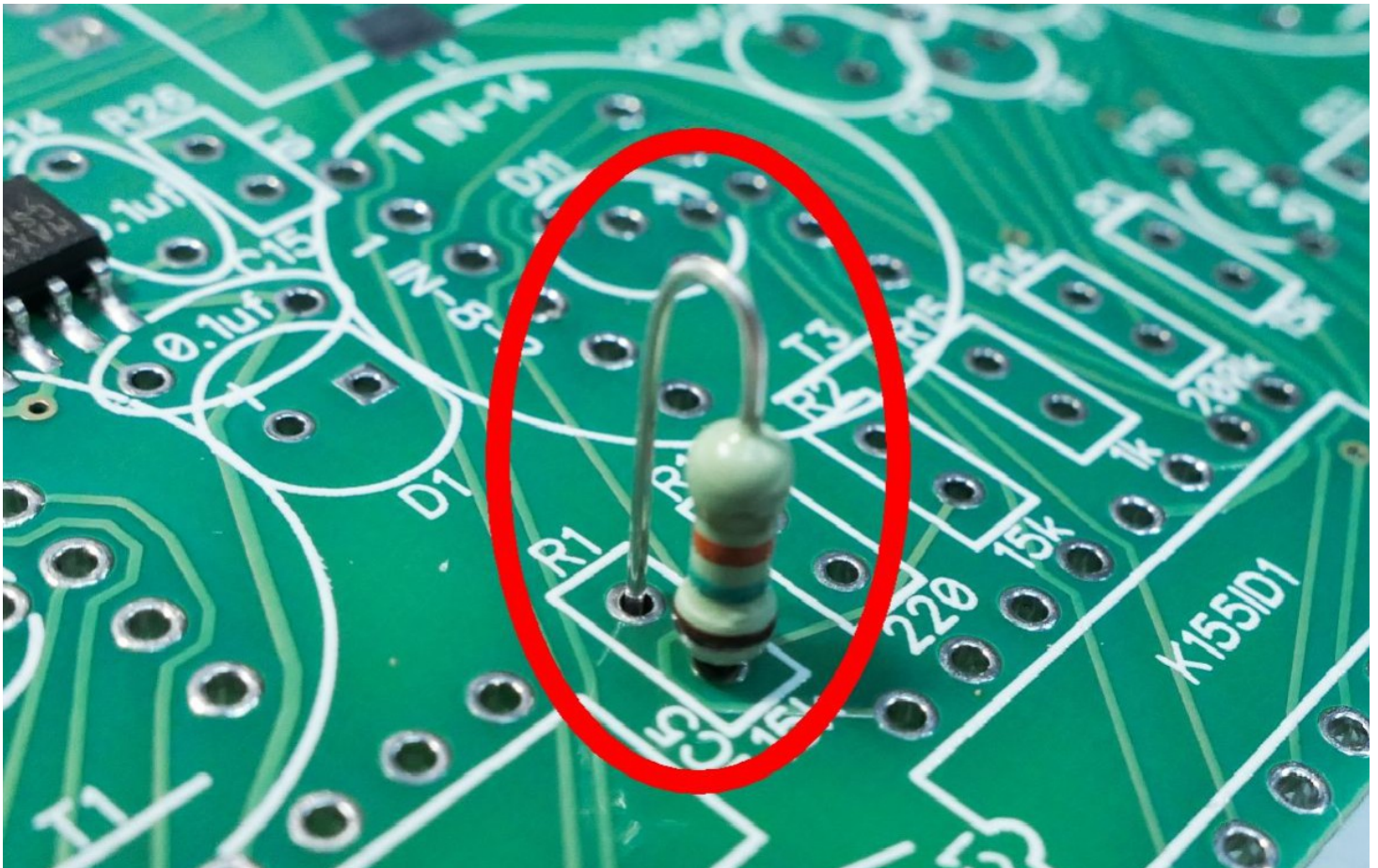
Check resistance between +3.3 and
GND pins of XS2. The resistance
should be not less than 1kOhm.



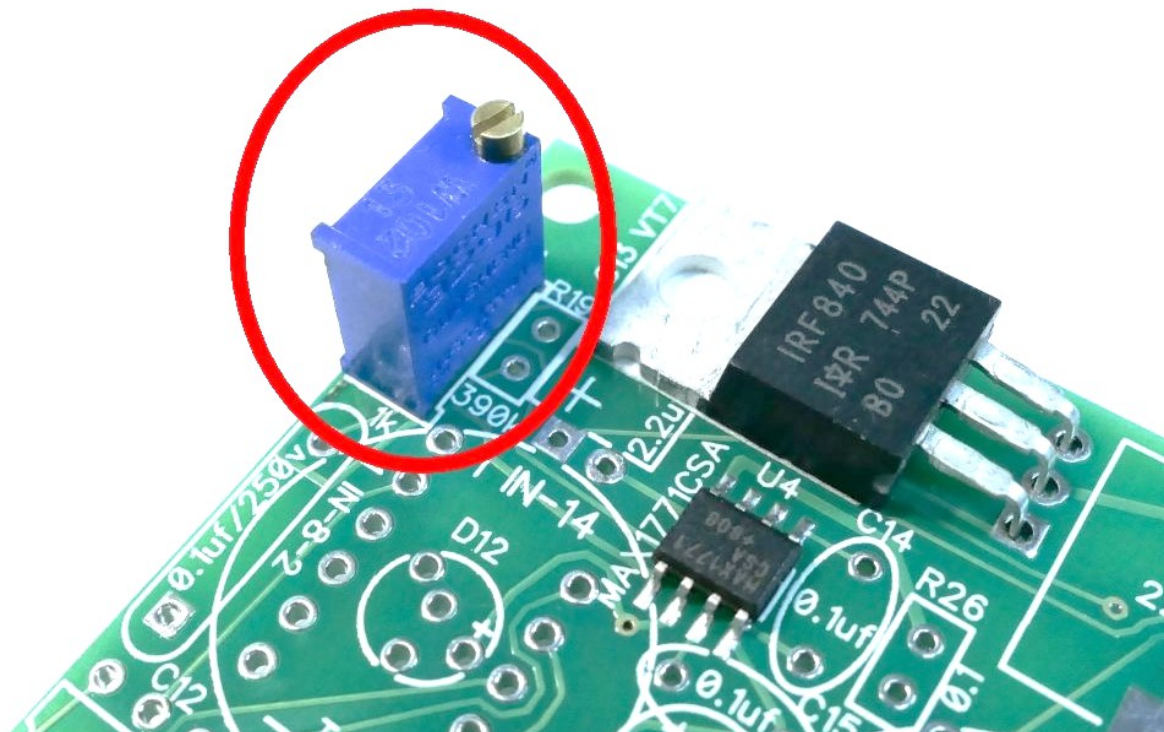
1) You have a PCB with ICs:



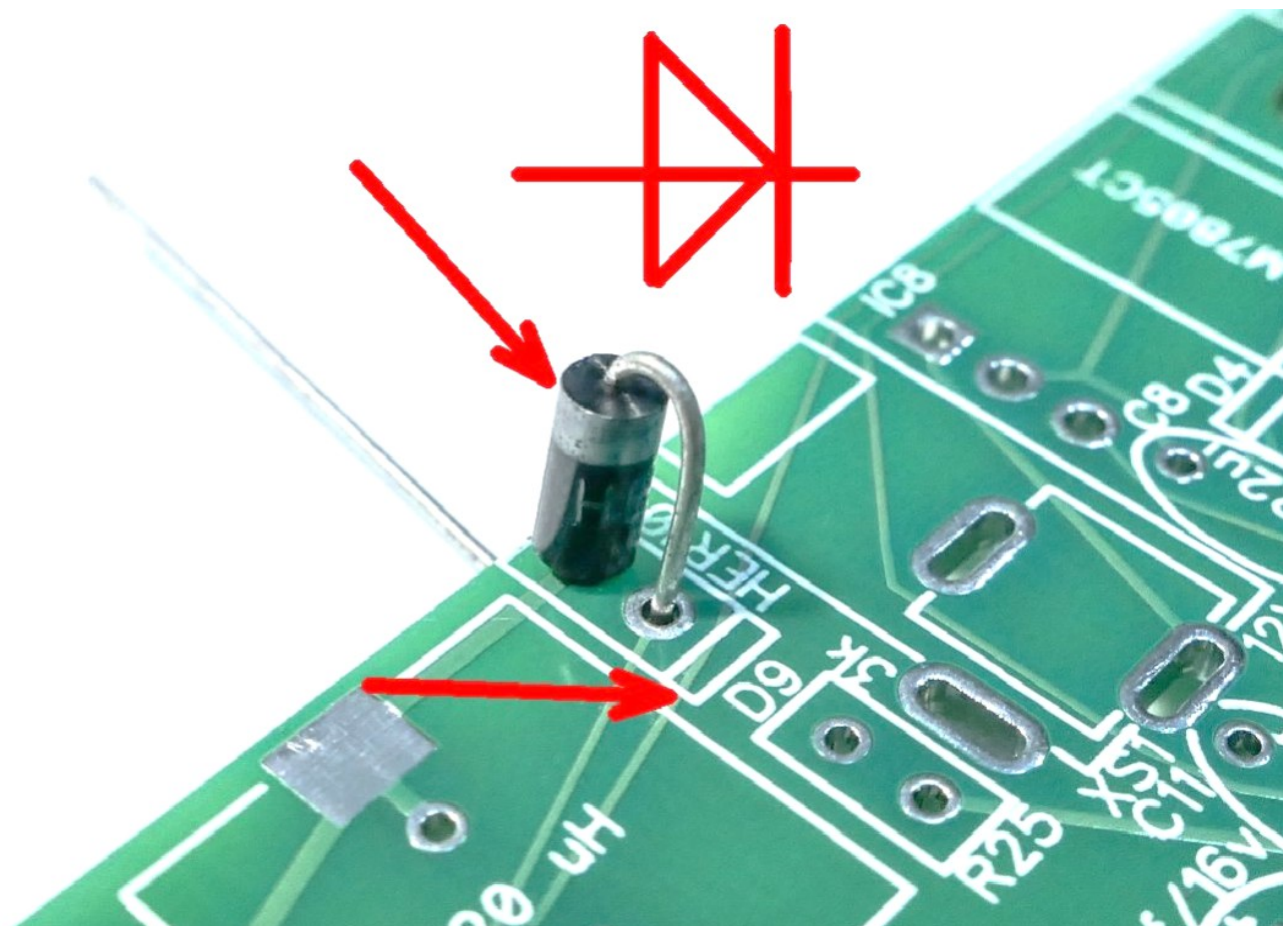
2) Place all resistors vertical:



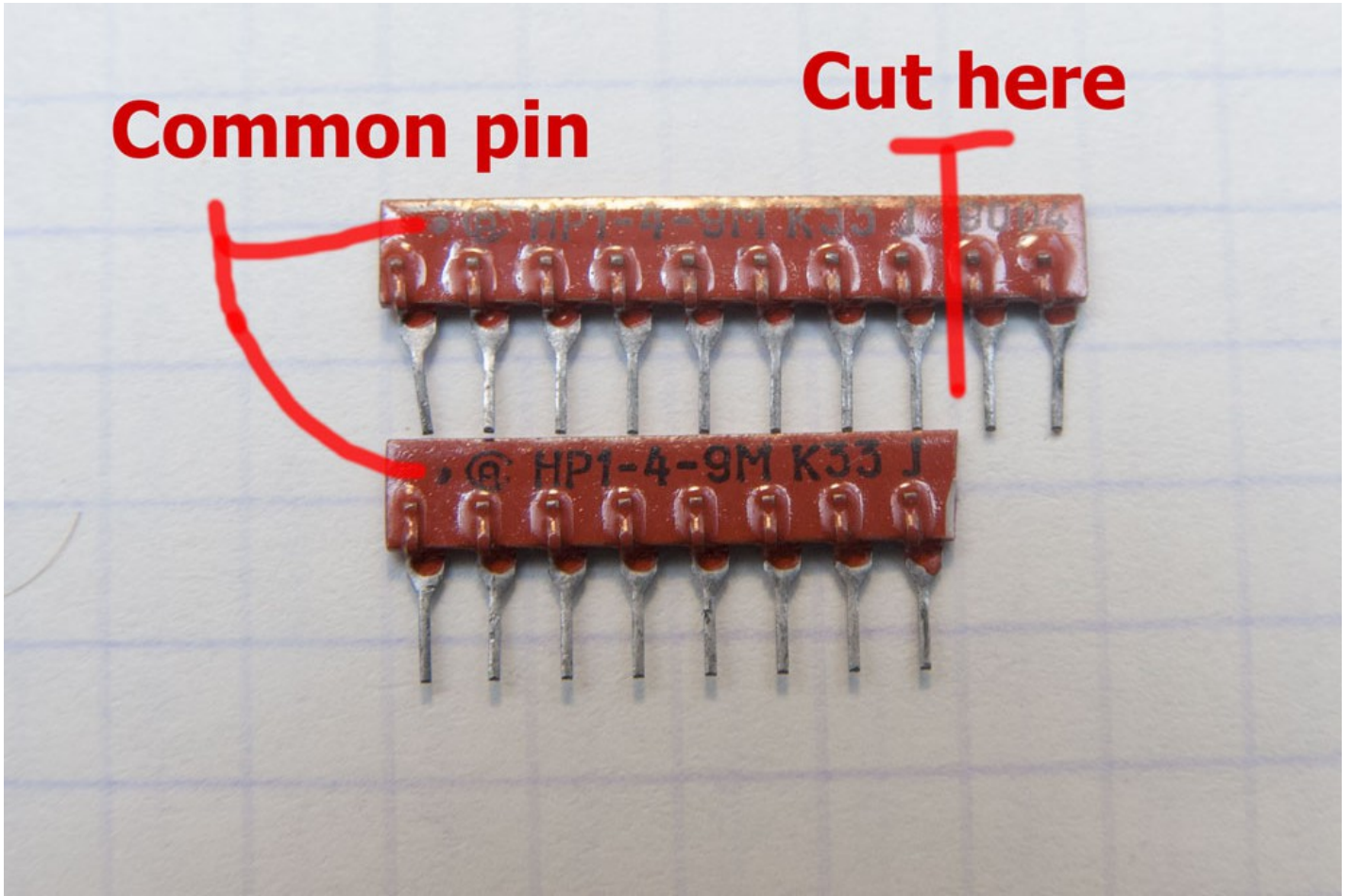
Place potentiometer R21:



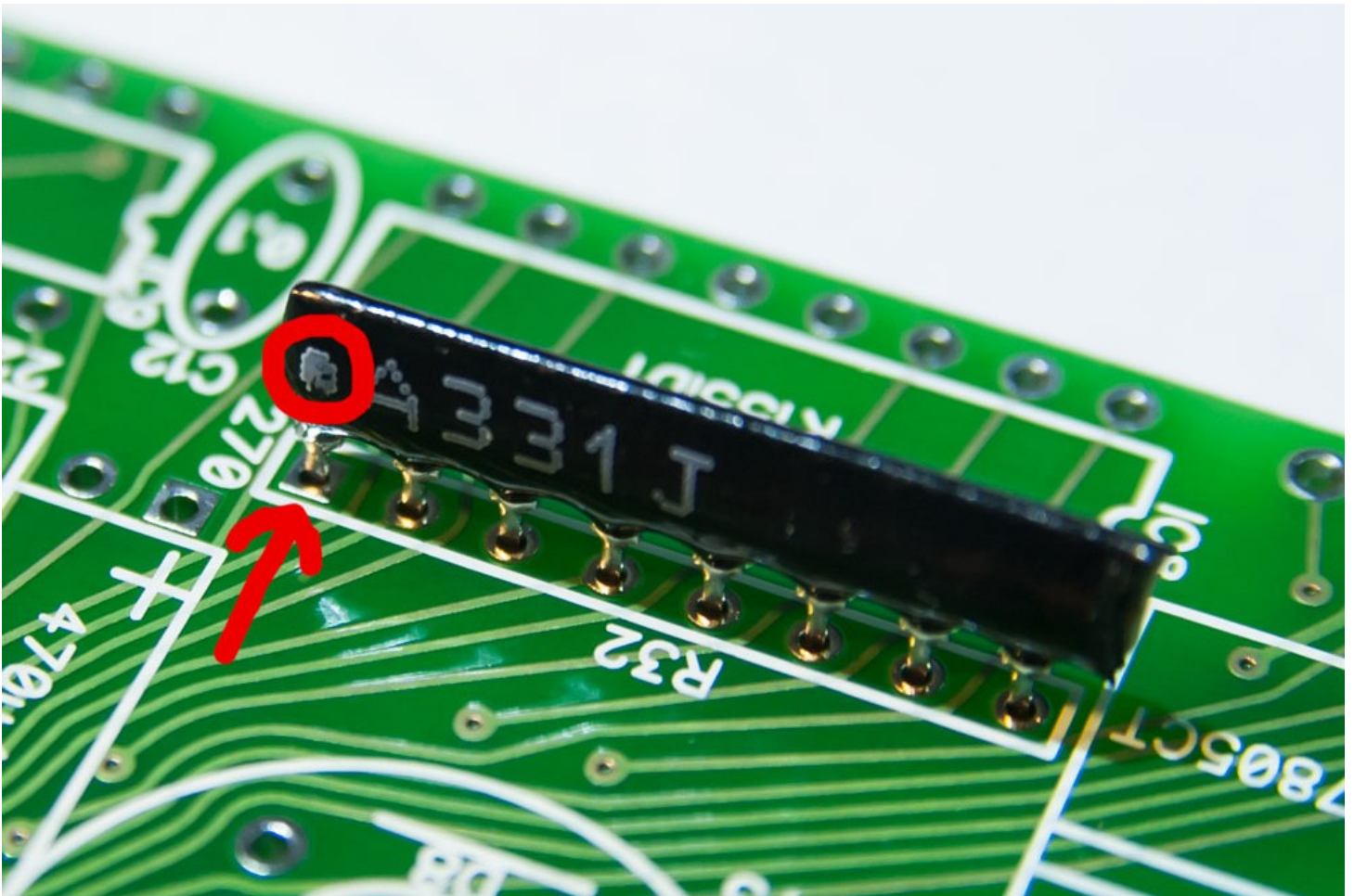
3) Place diodes according marking on PCB:

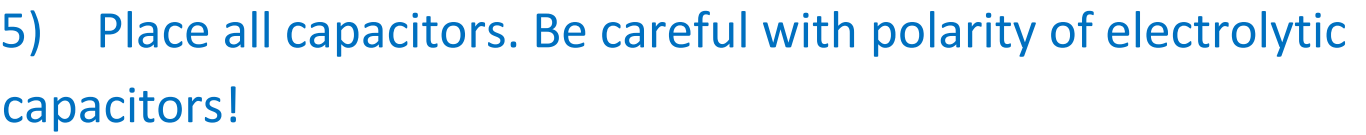


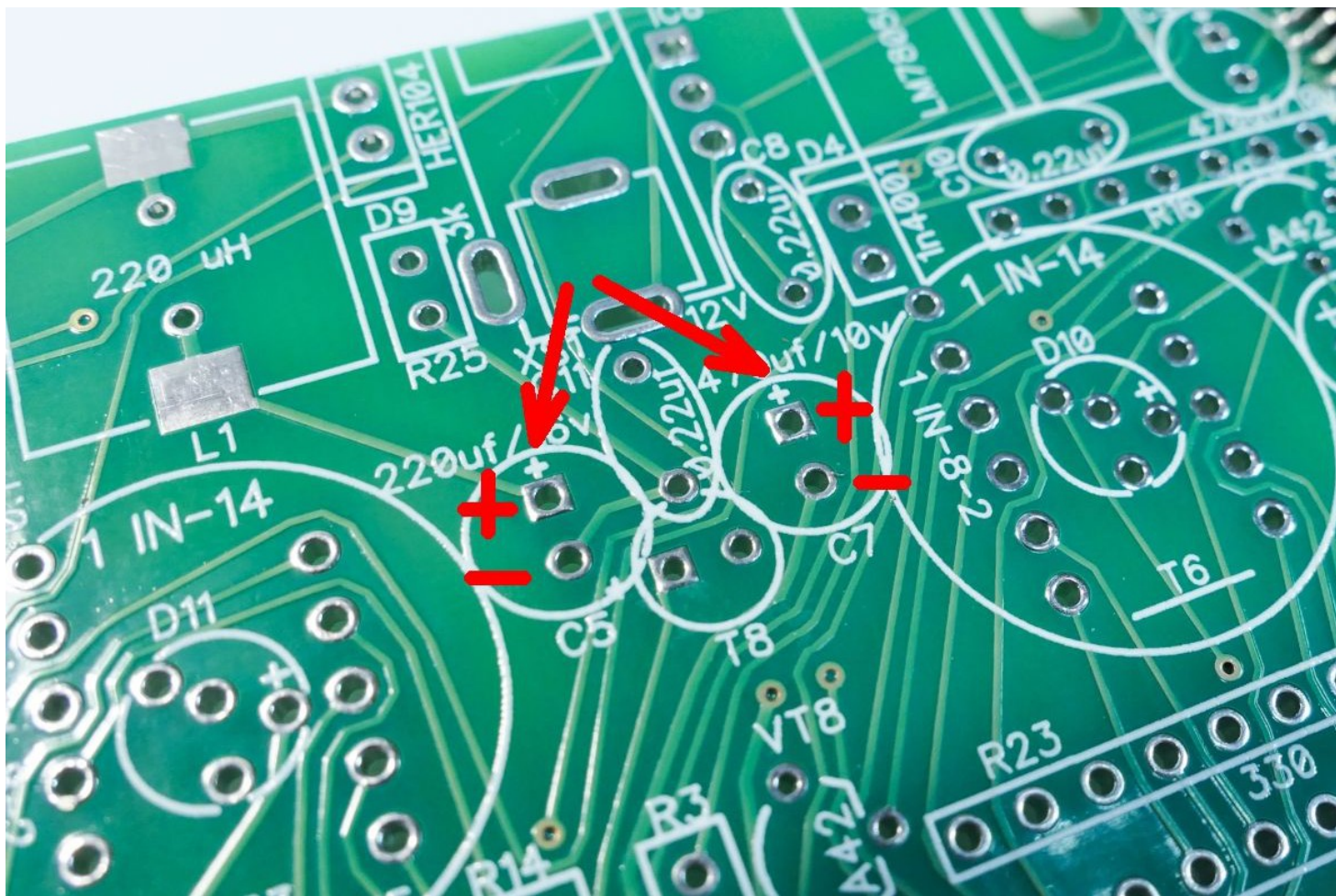
4) Place net.resistors:

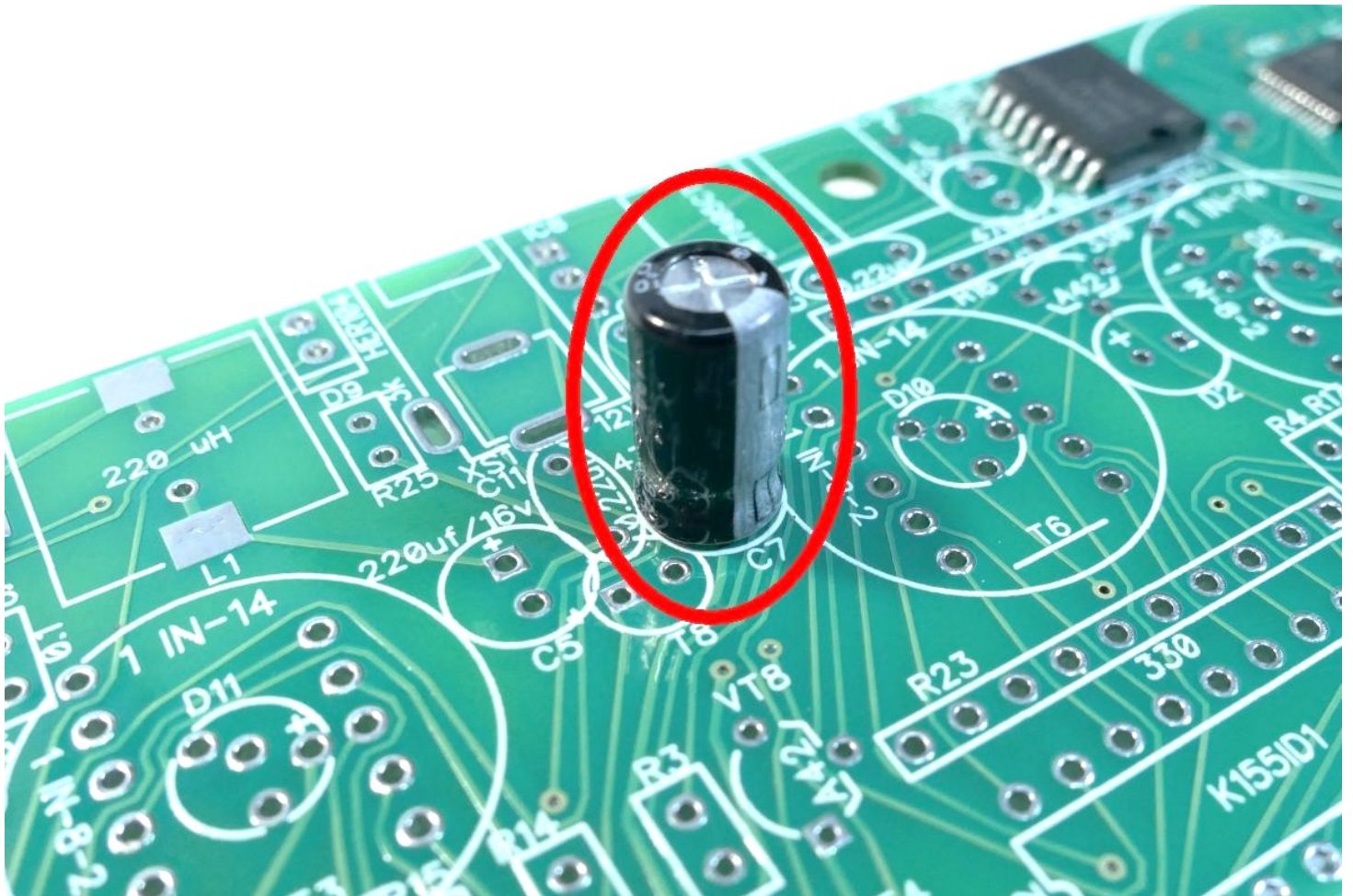
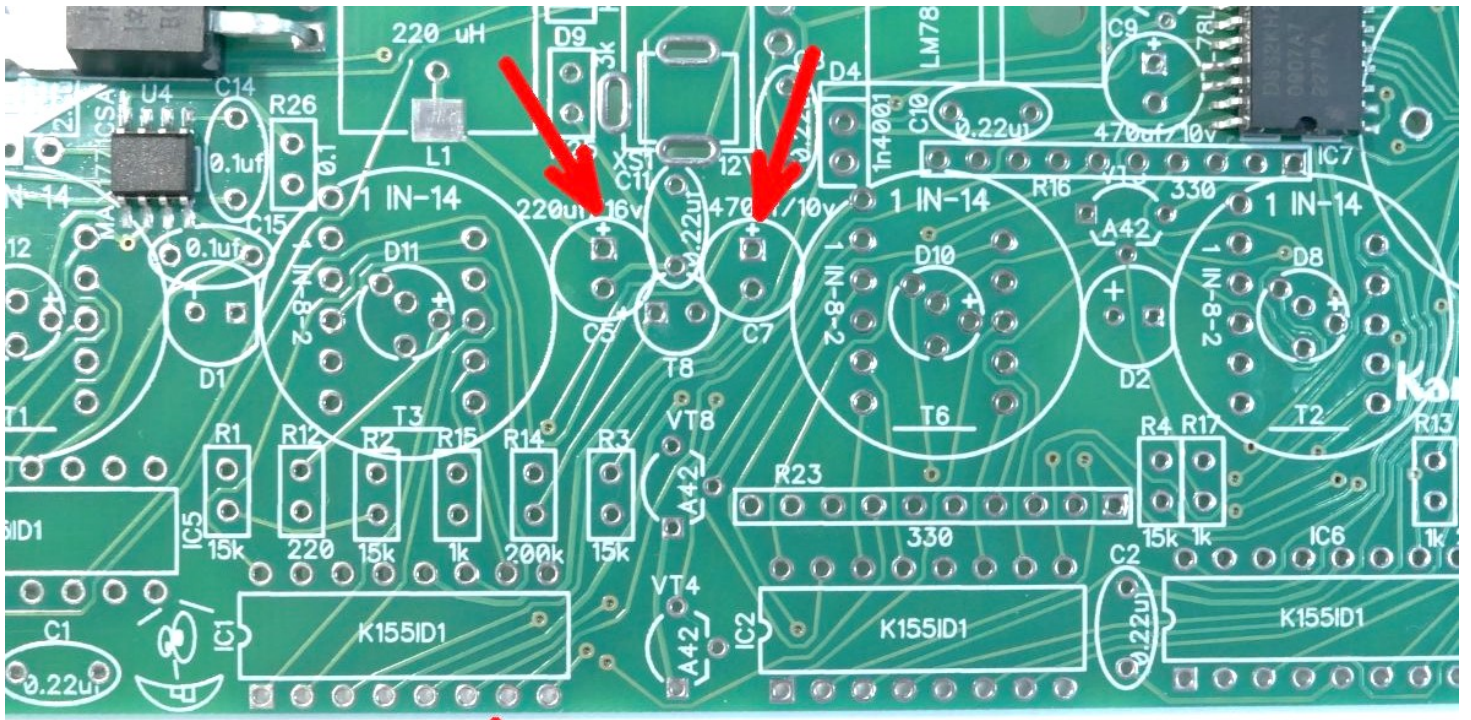


Common pin to square pad.

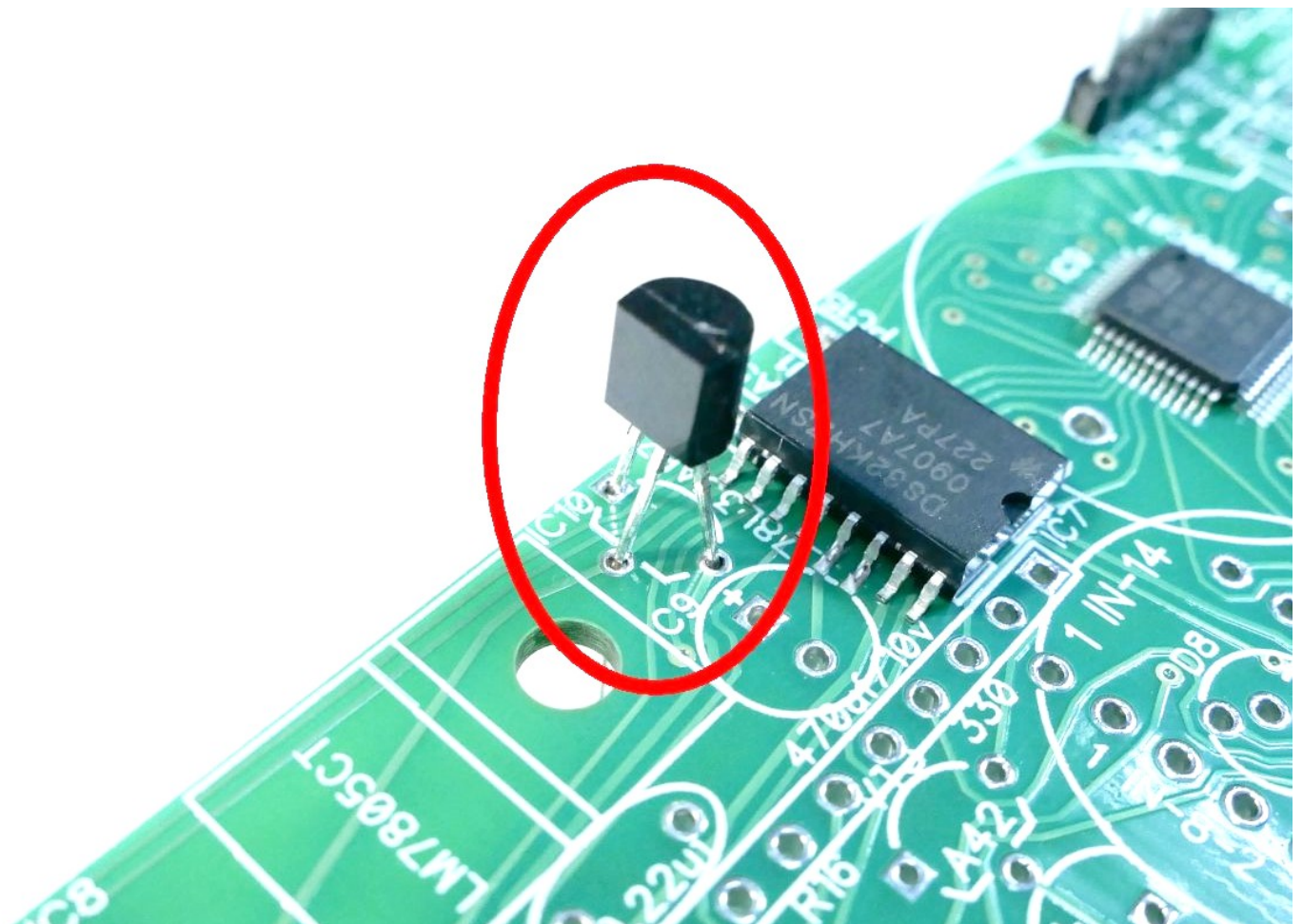
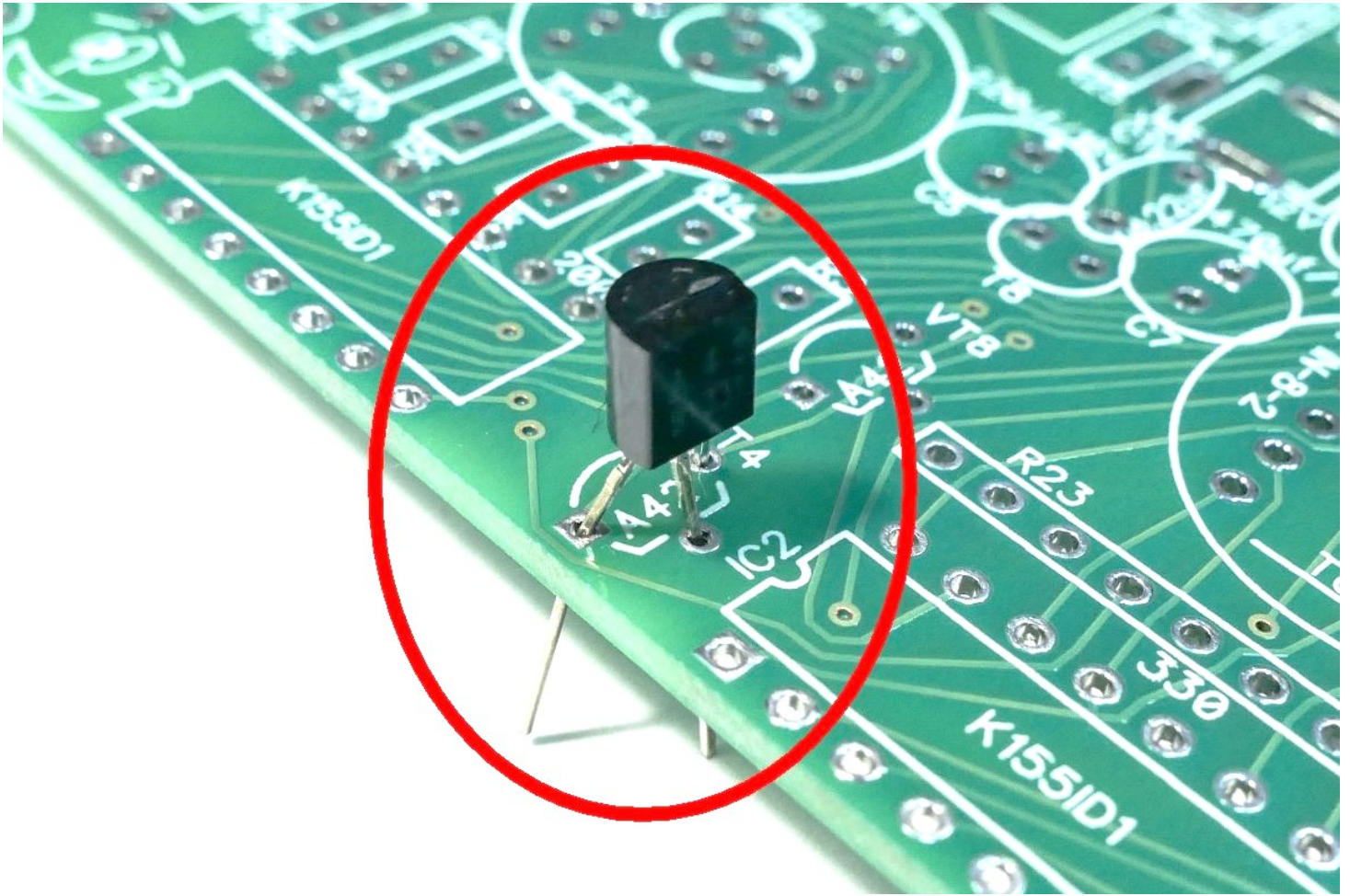




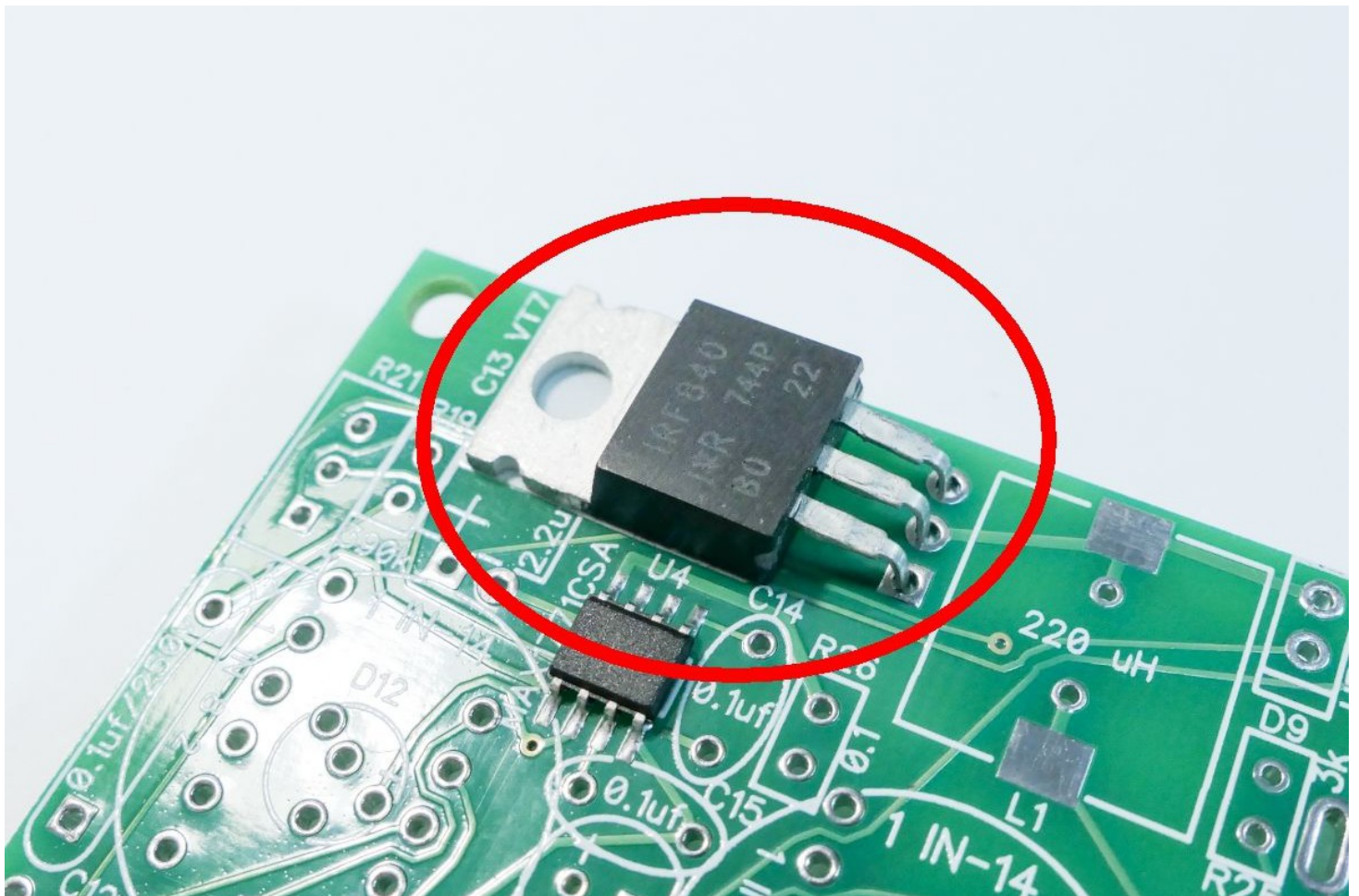
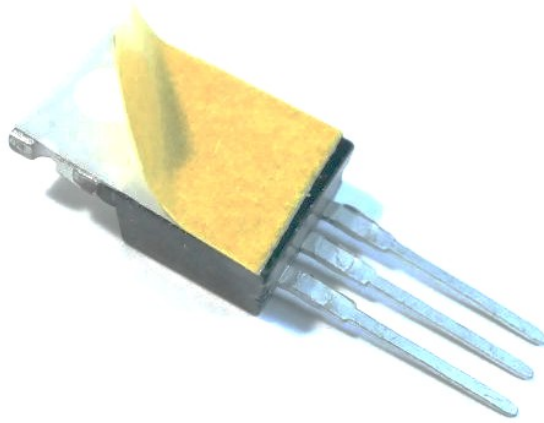




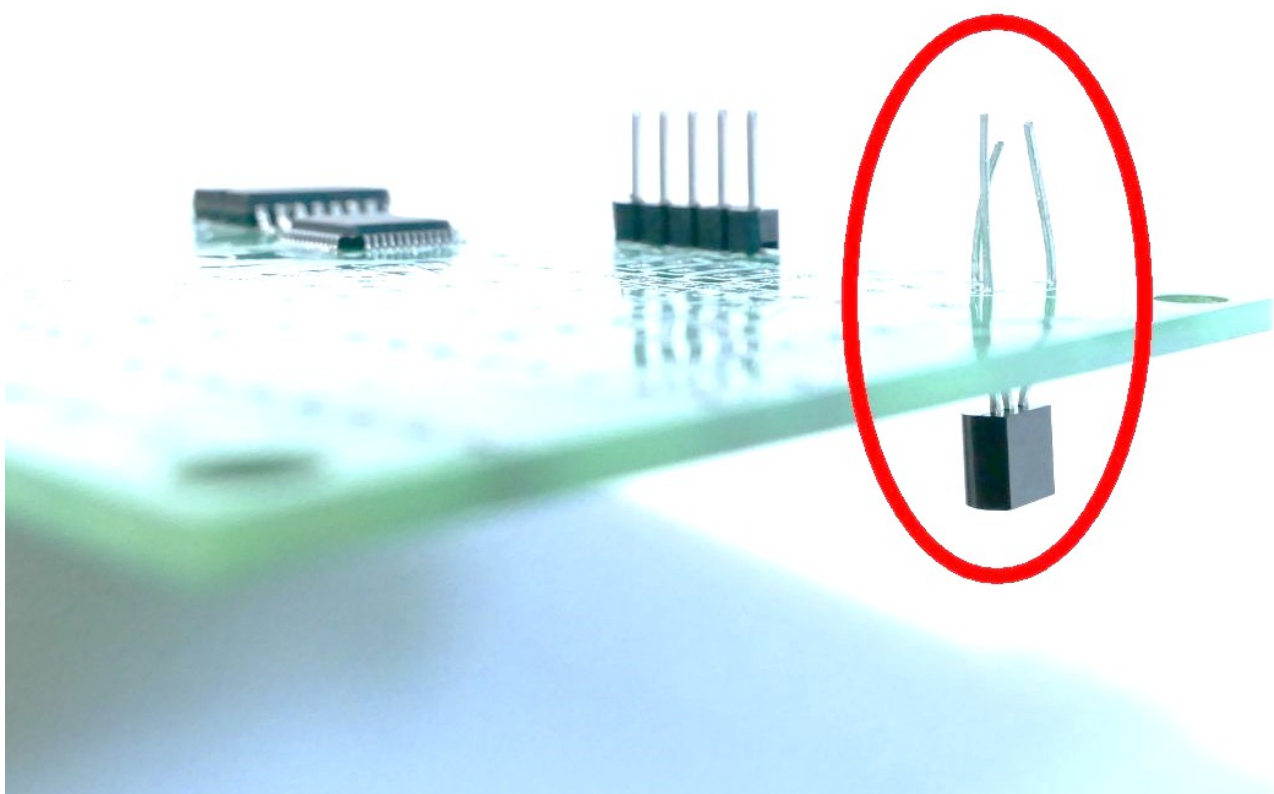
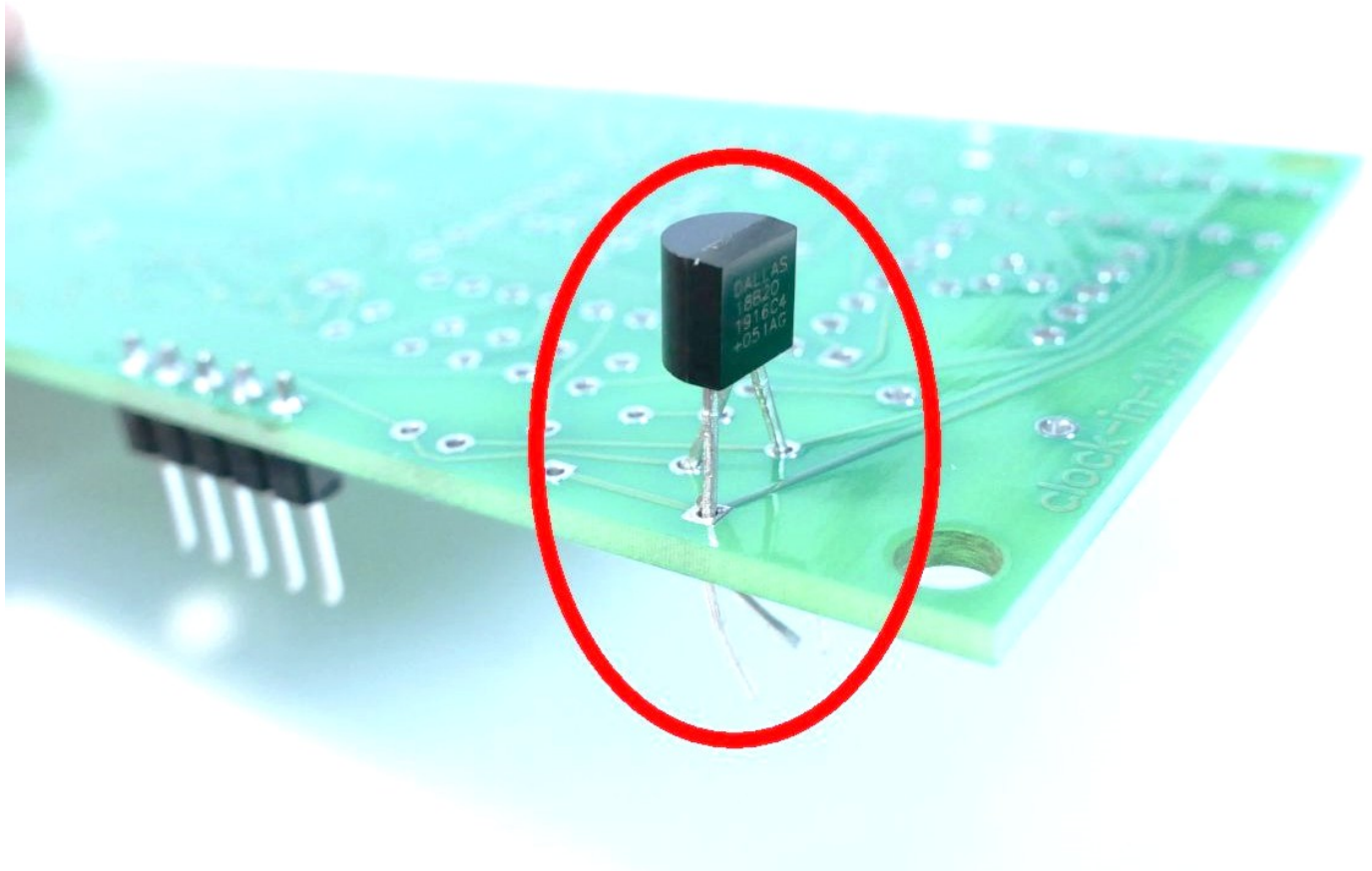
6) Place all transistors, IC10 and IC13 according marking on PCB:

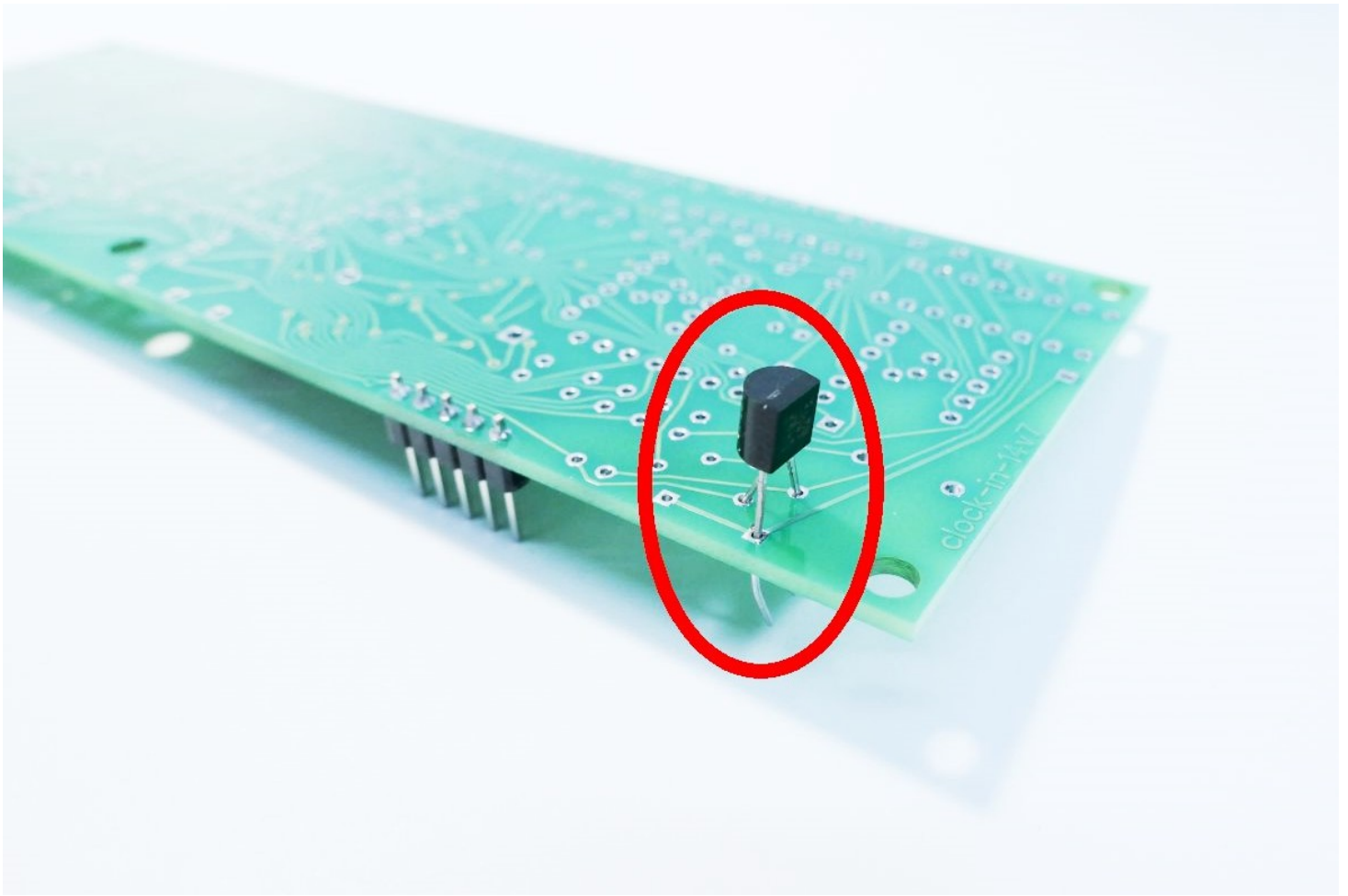


Place IC8 and VT7. I use double side adhesive tape like heatsink:

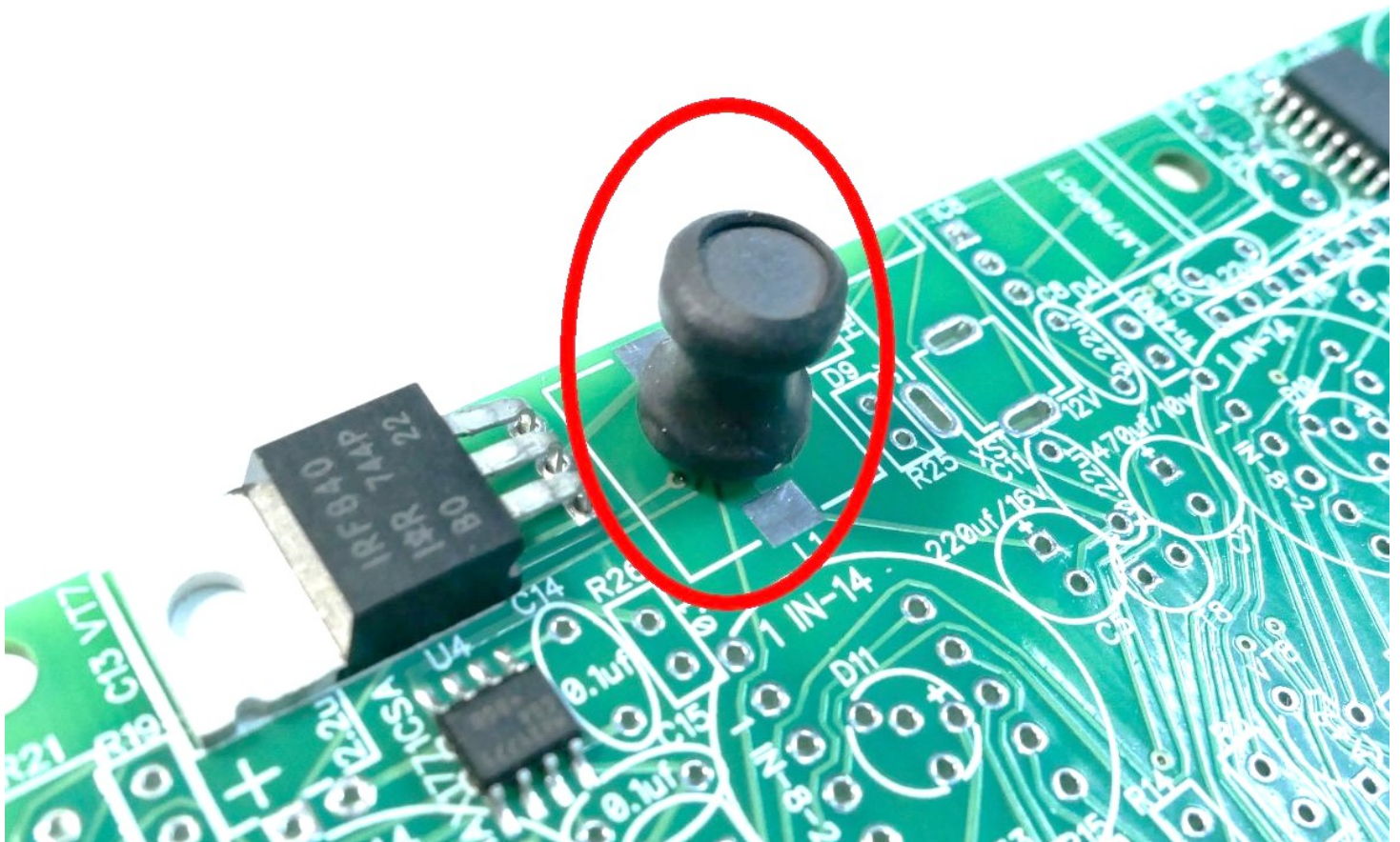


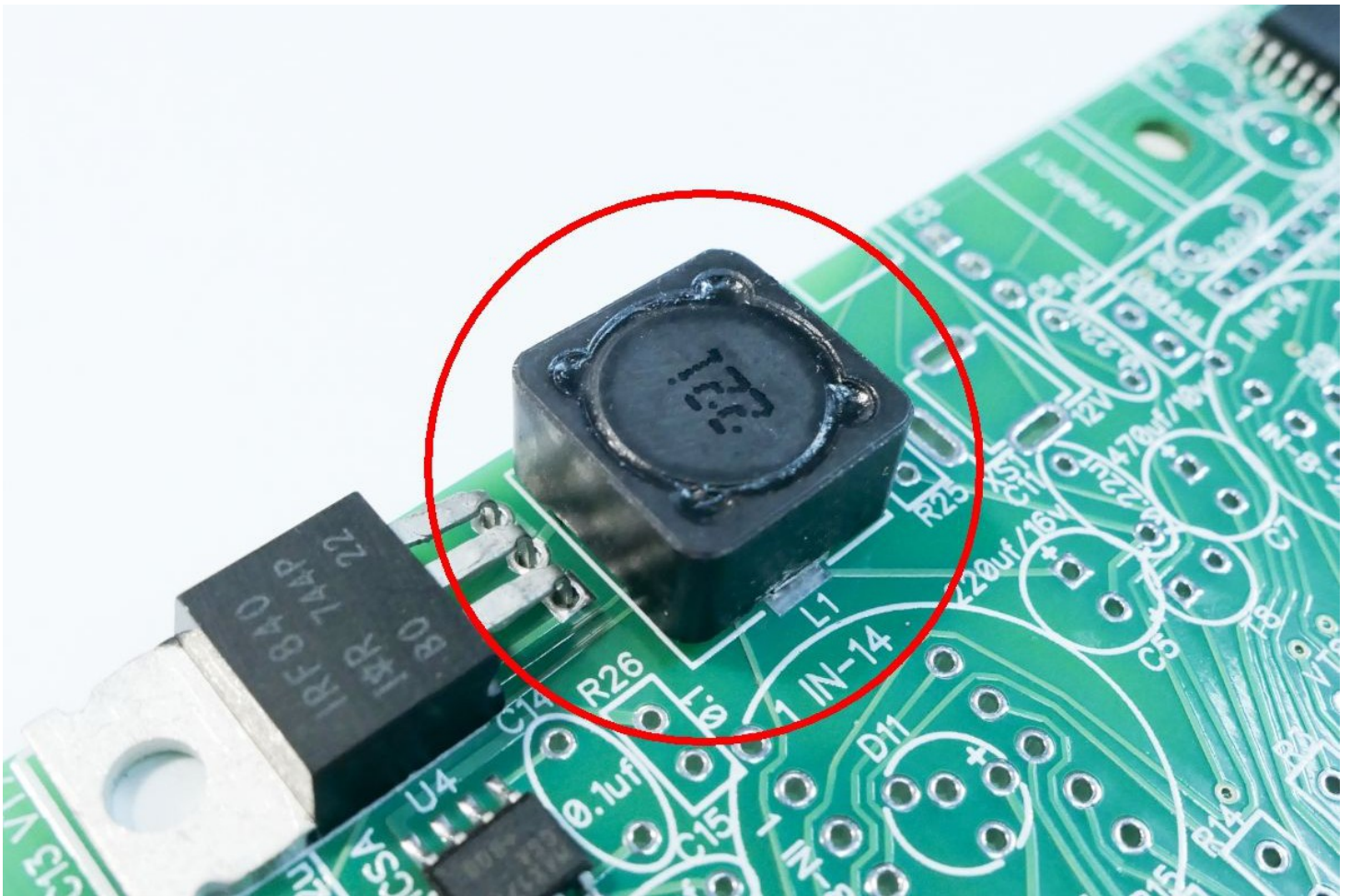
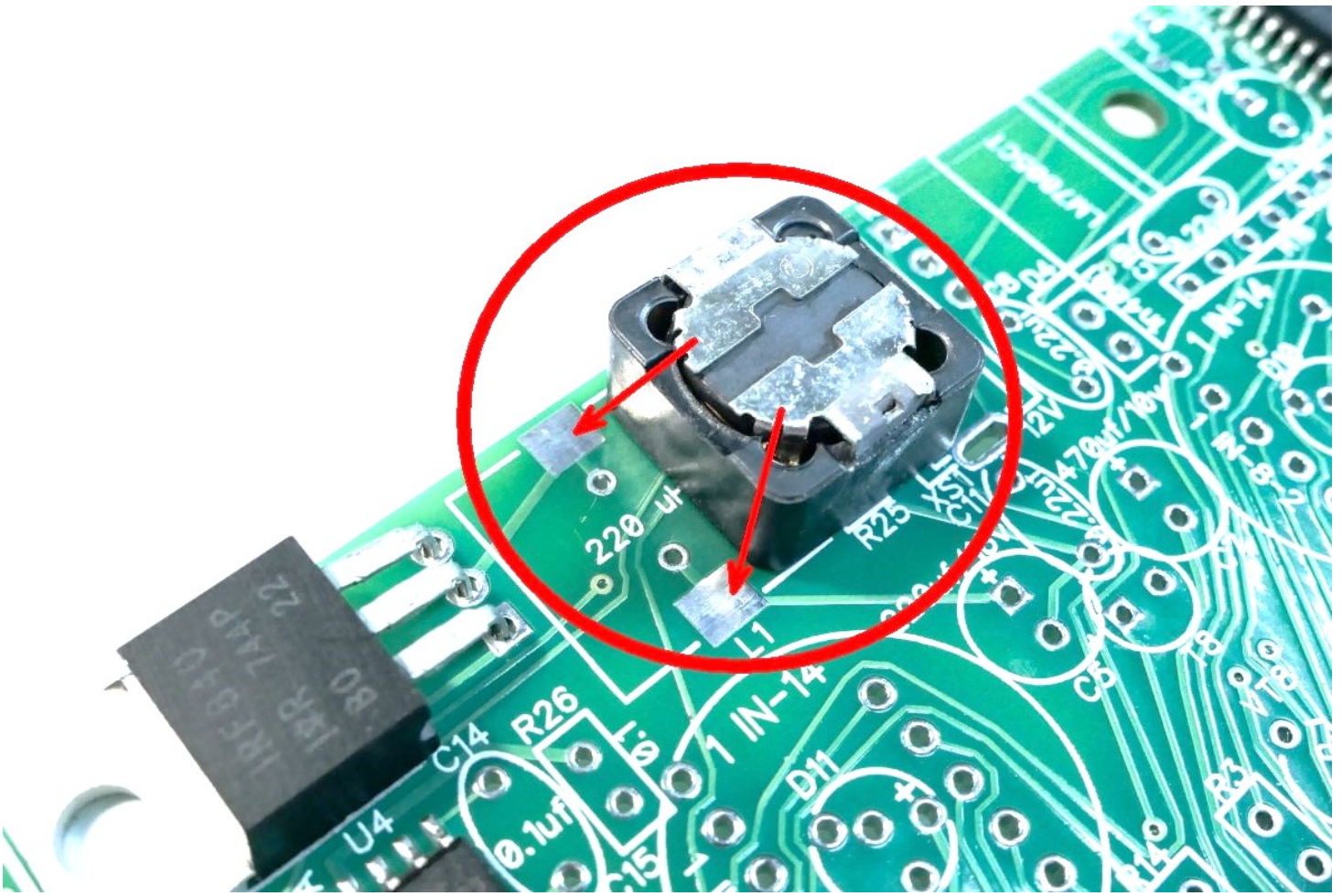
Temperature sensor IC11 should be place upside-down at bottom side of board. See photo:



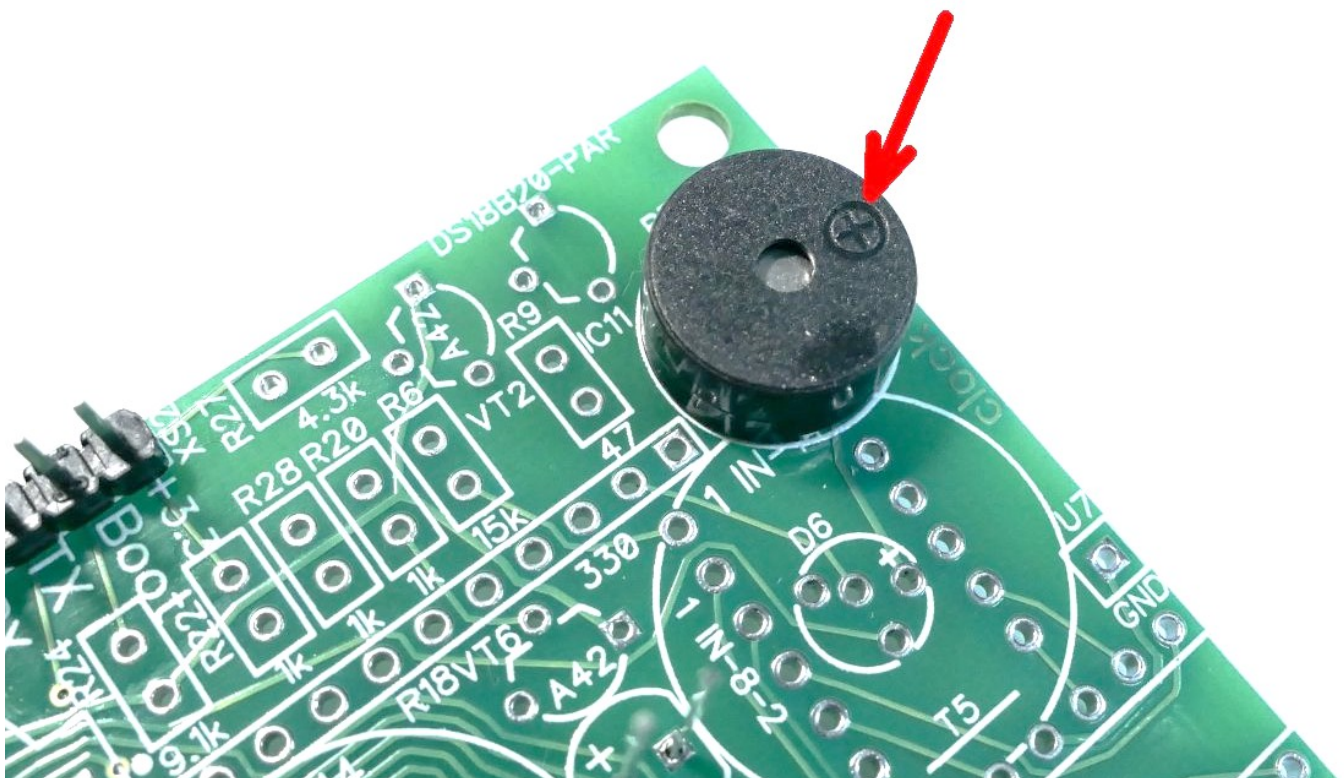
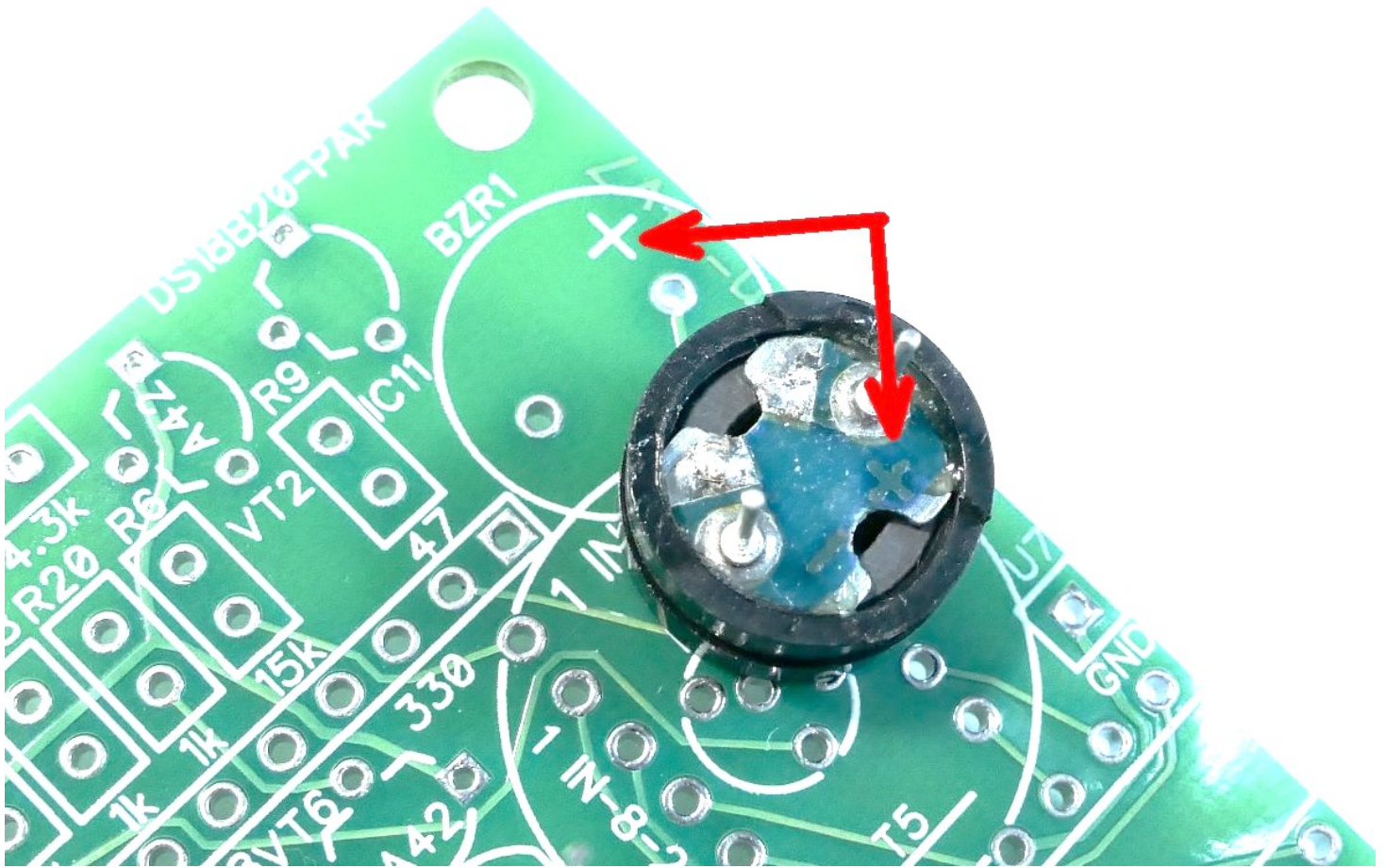


7) Place inductor:

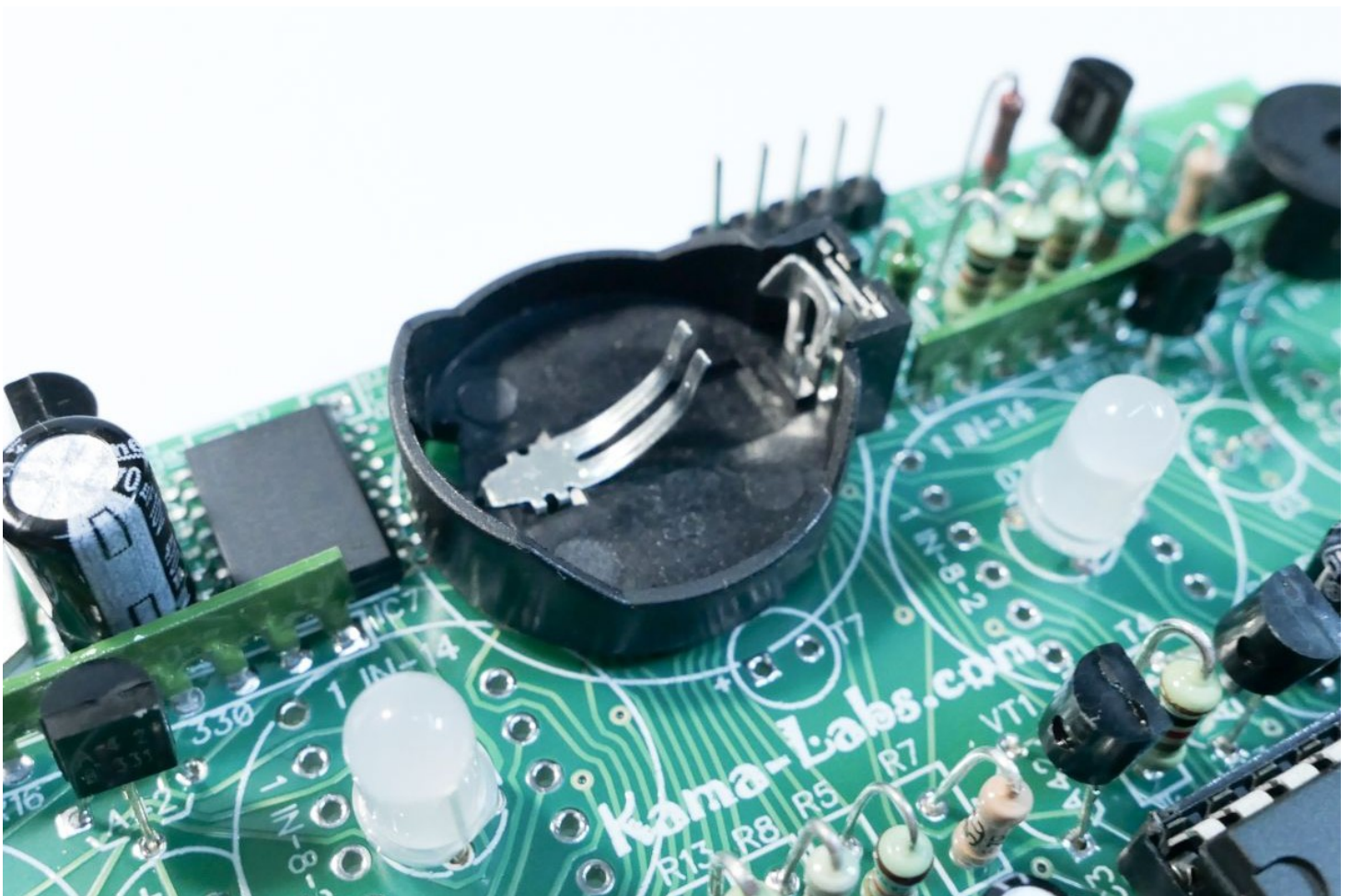
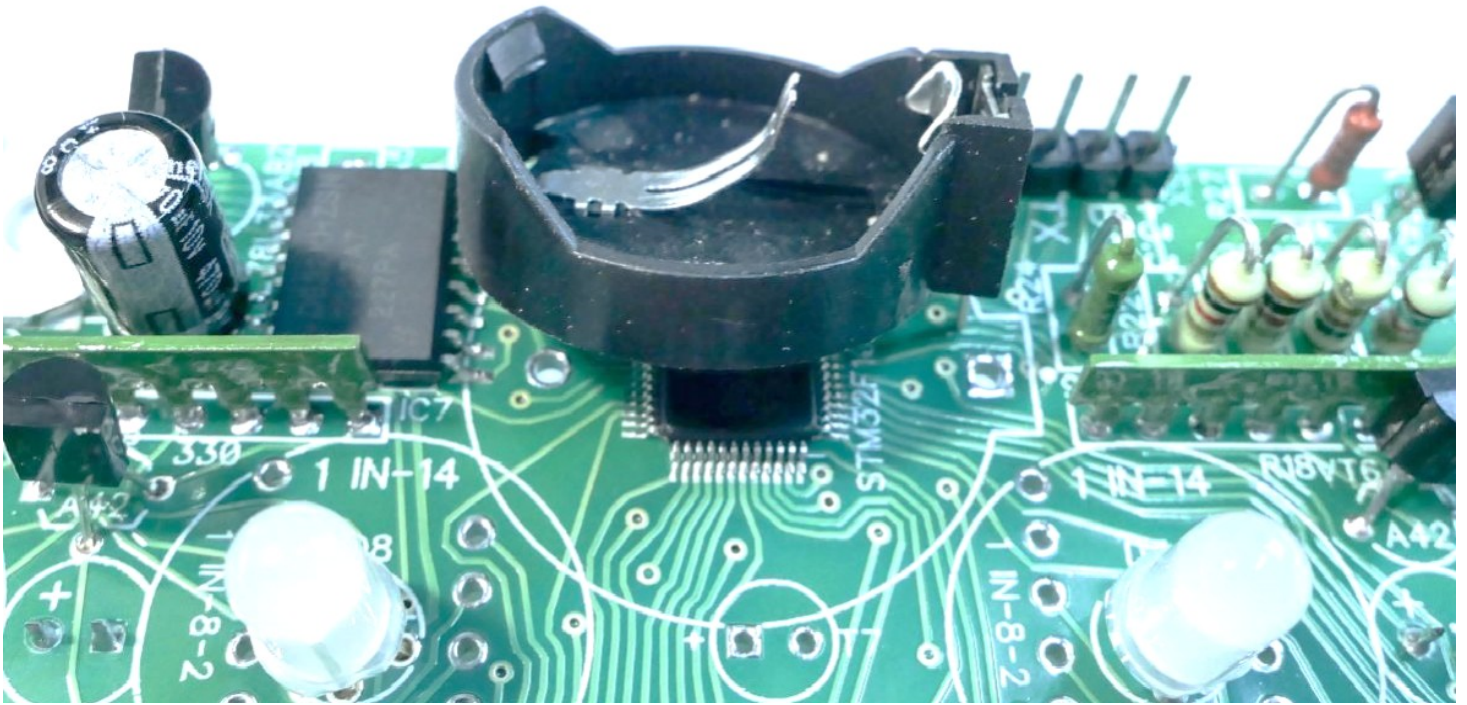




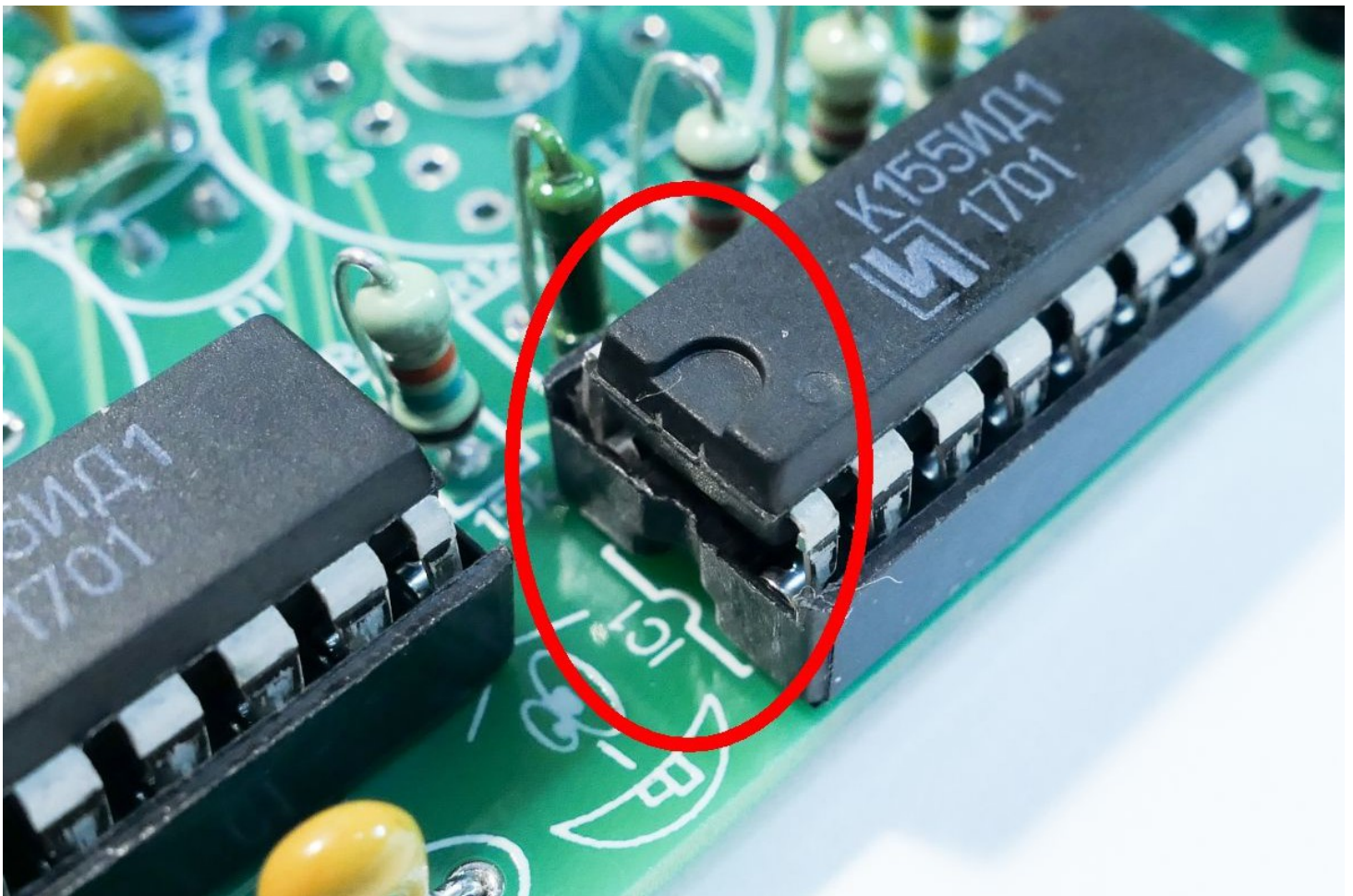
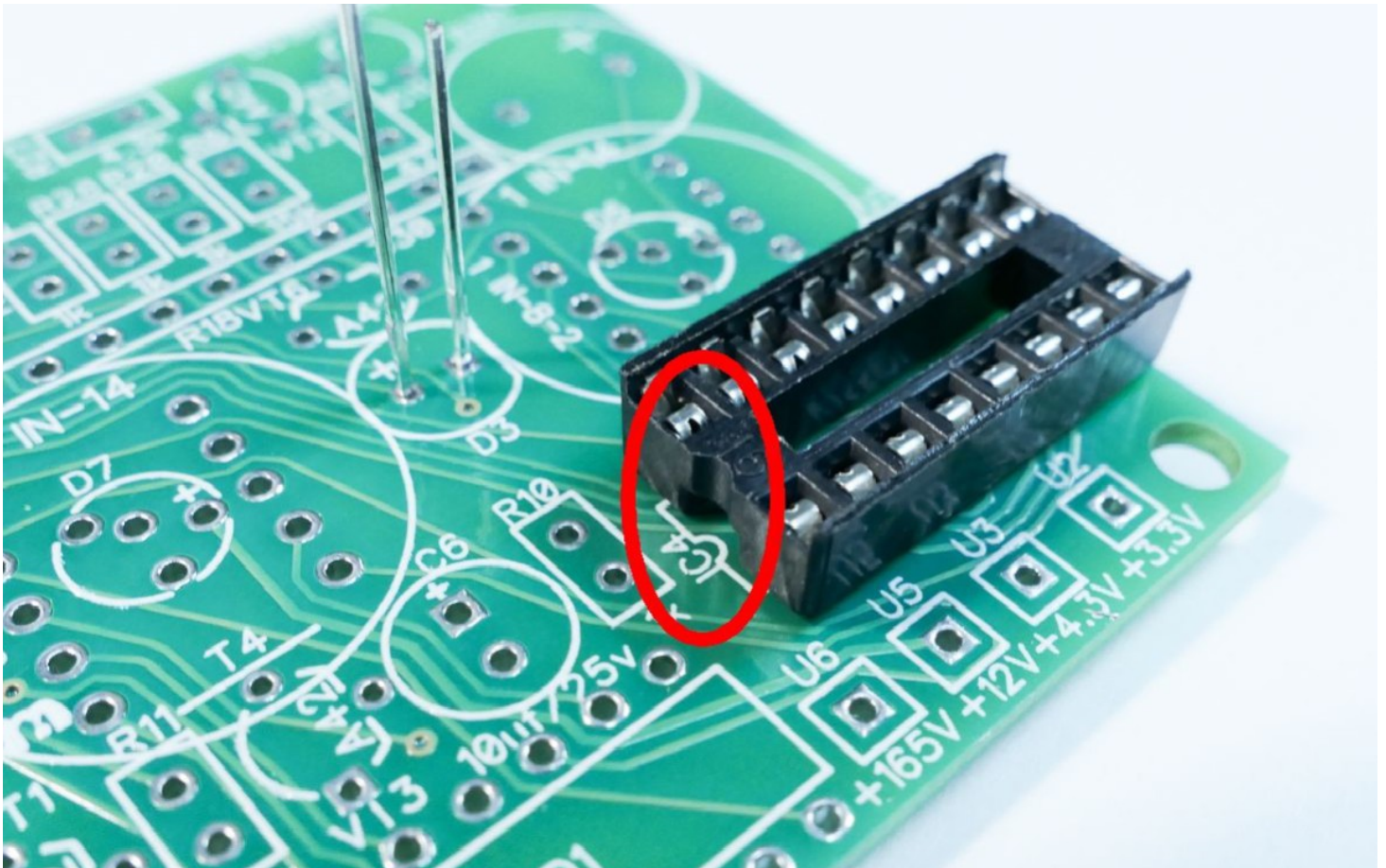
8) Install buzzer:



9) Place battery holder and insert battery when clock will be fully assembled:

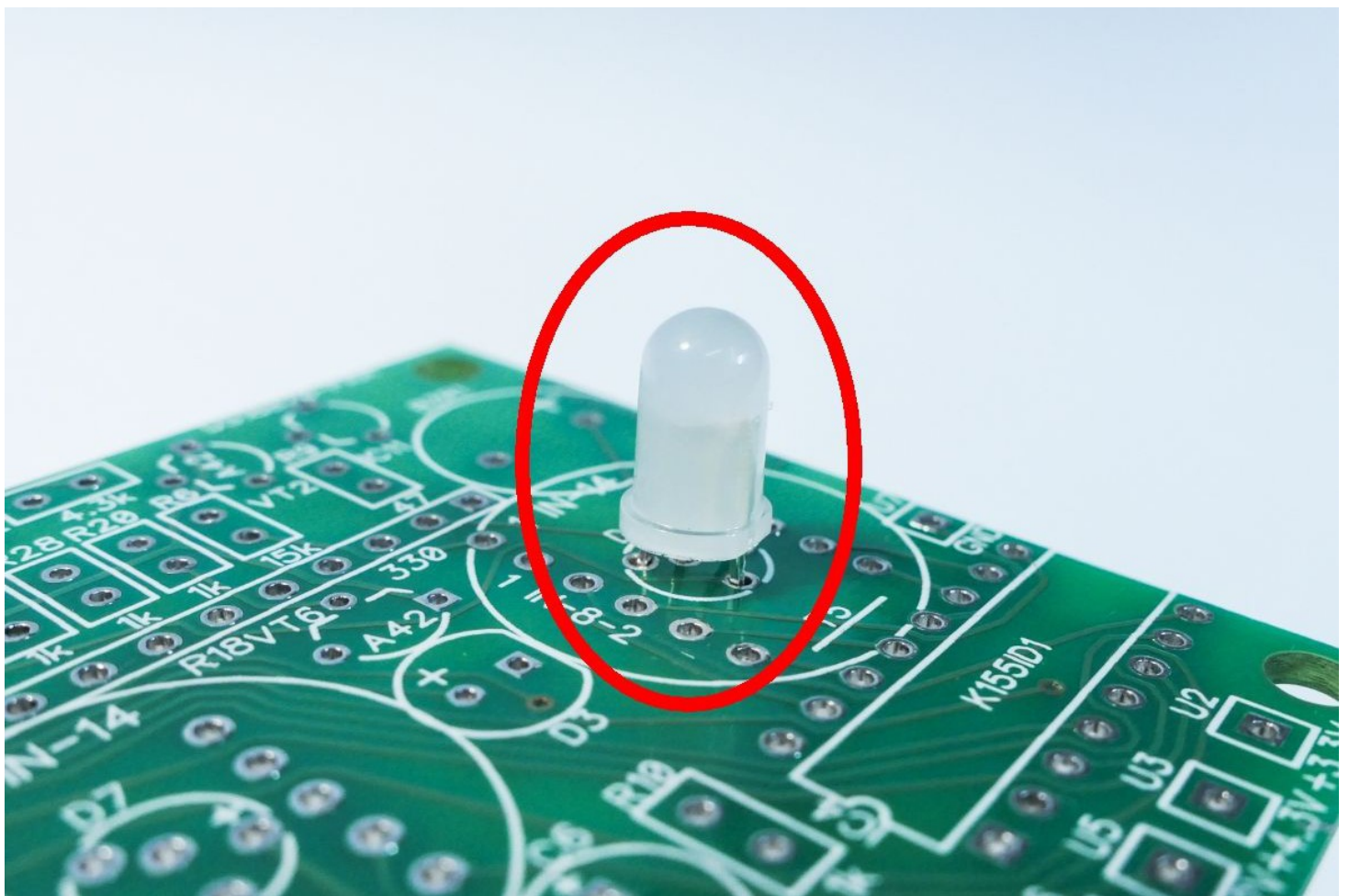
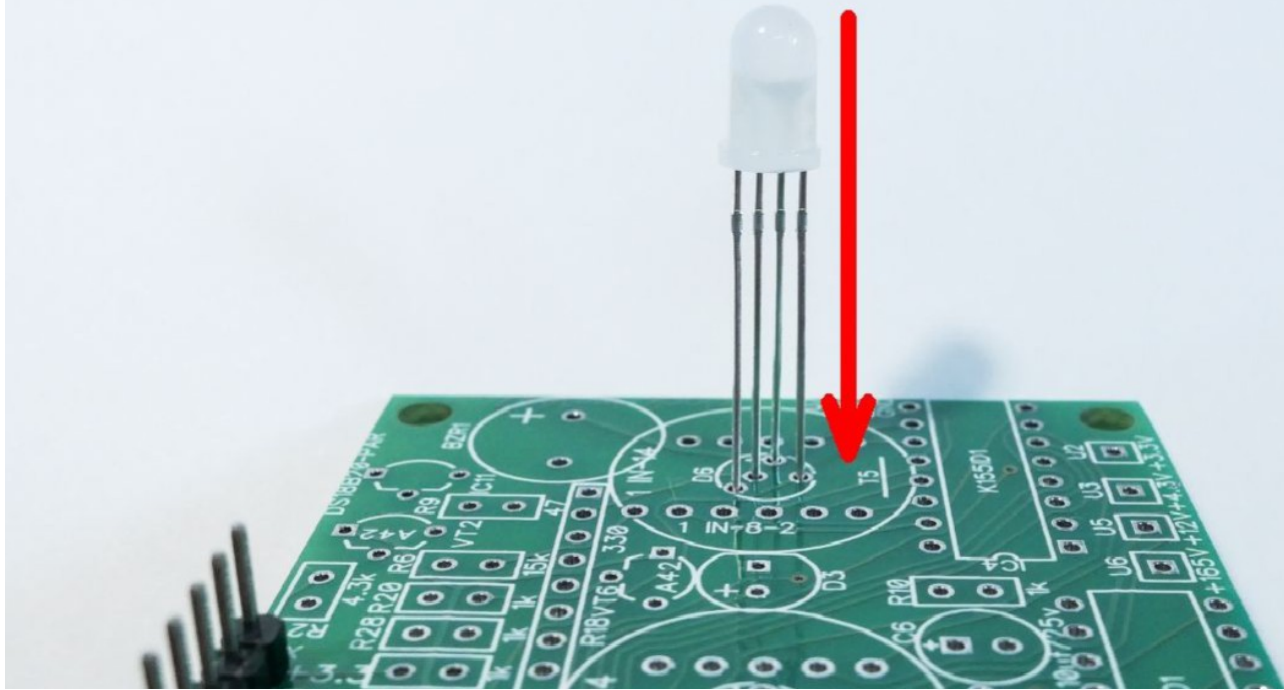


10) Place sockets for ICs. Insert K155ID1 chips at the end of assembling process:



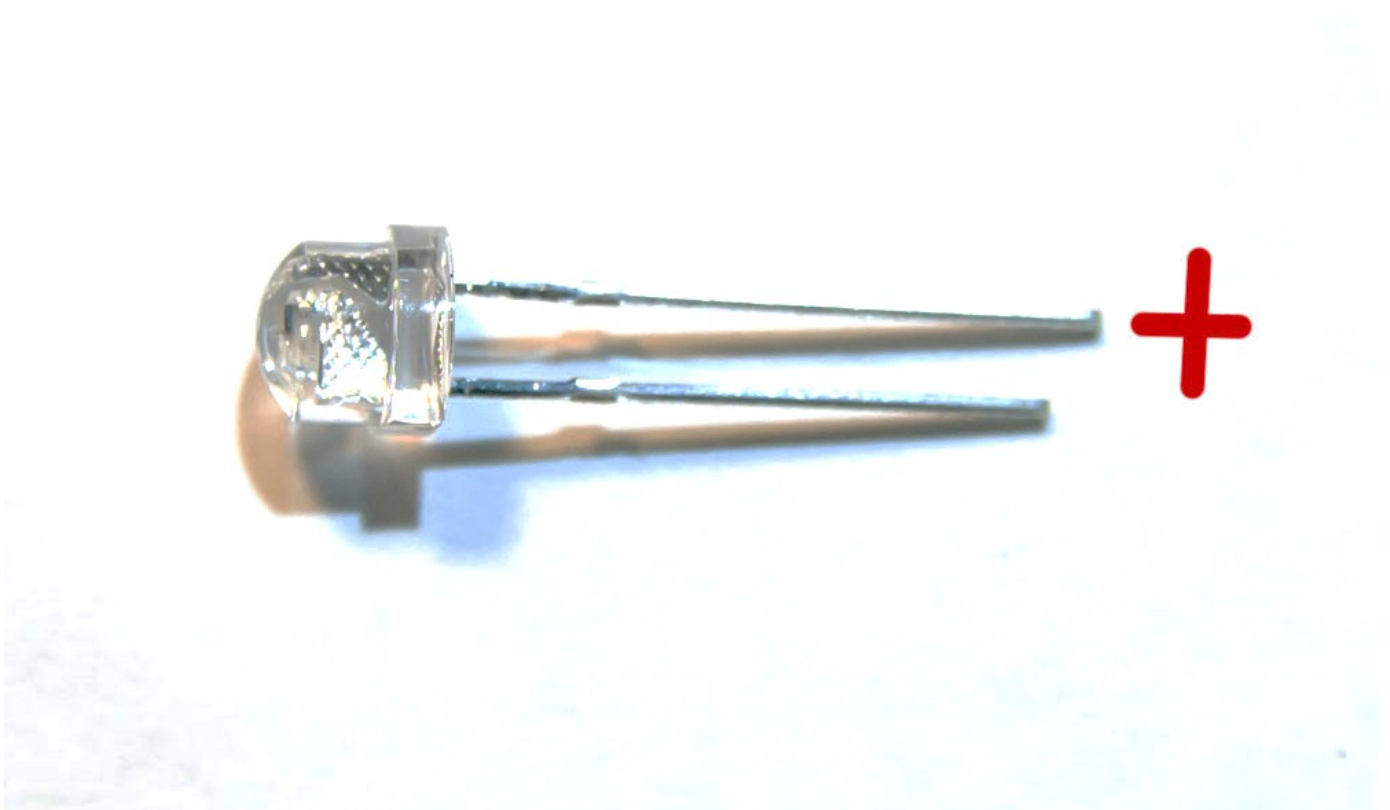
A photograph of a green PCB with various components and a red arrow pointing to a specific pin. The PCB has several components labeled: DS18B20-PAR, BZR1, IC11, R9, 47, 1 IN-1, D6, T5, U7, GND, K155ID1, U3, U2, U5, 2V+4.3V +3.3V. A red arrow points to a pin on the D6 component. A red '+' sign is also visible on the PCB.

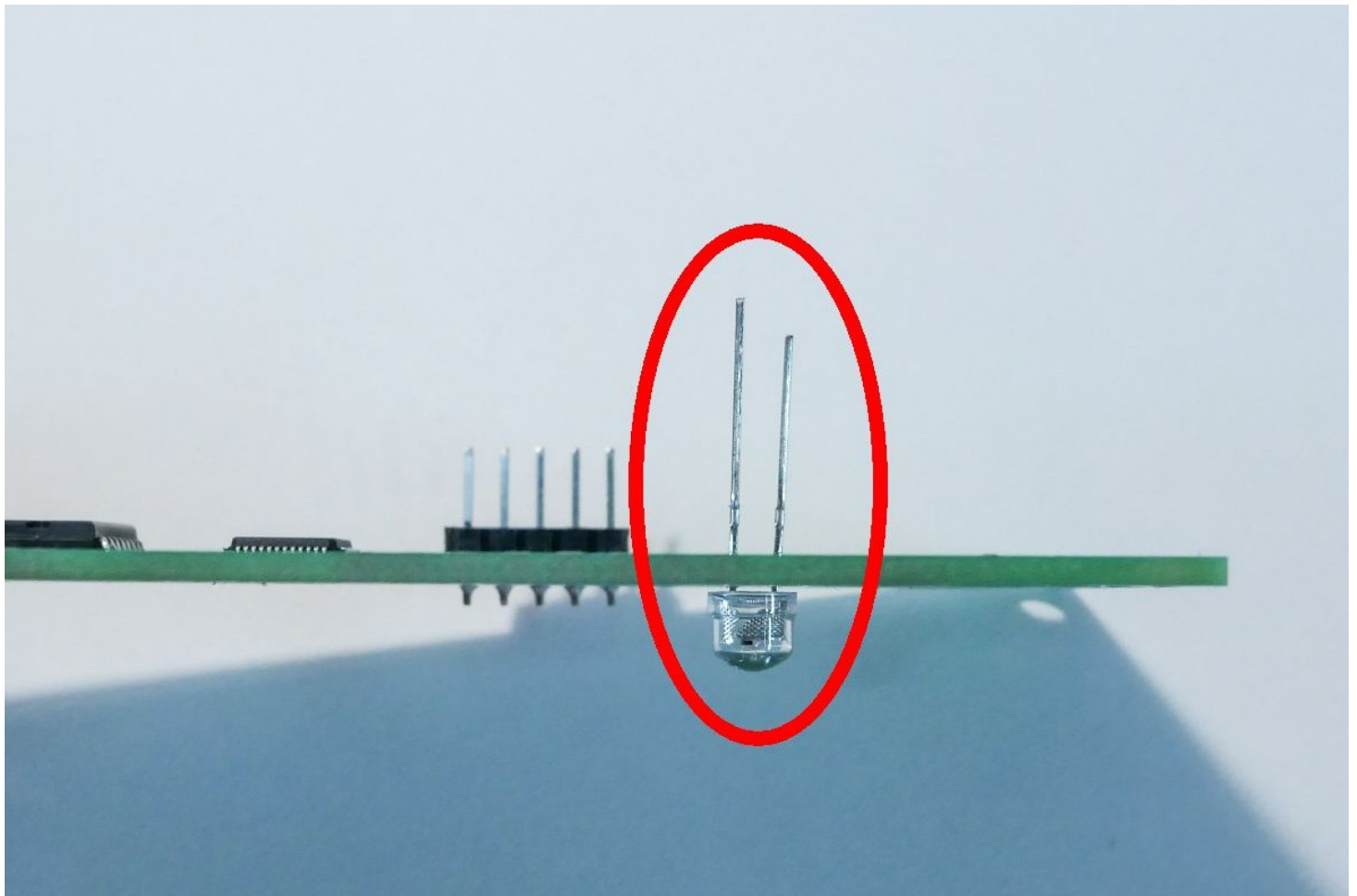
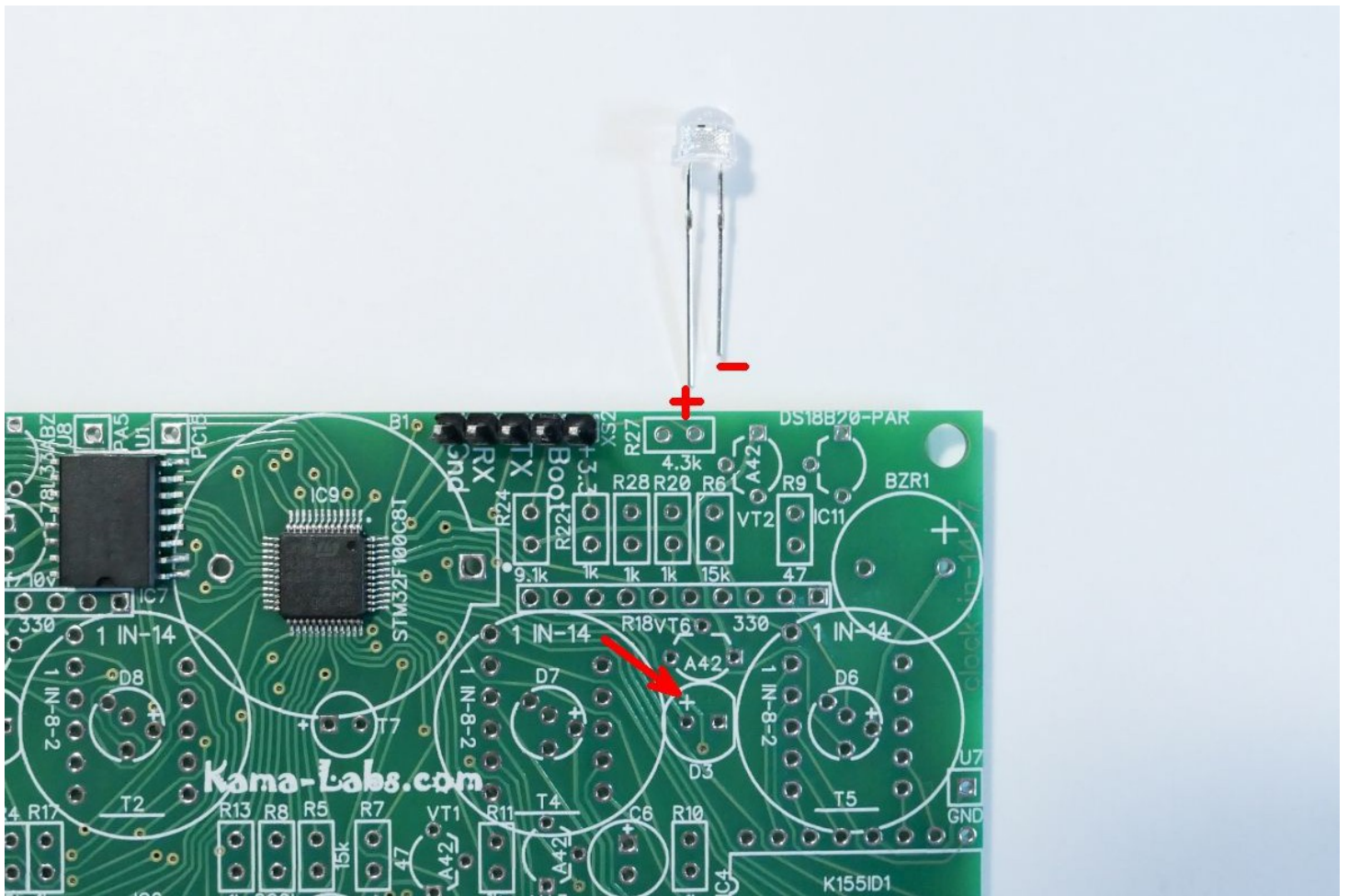
Press

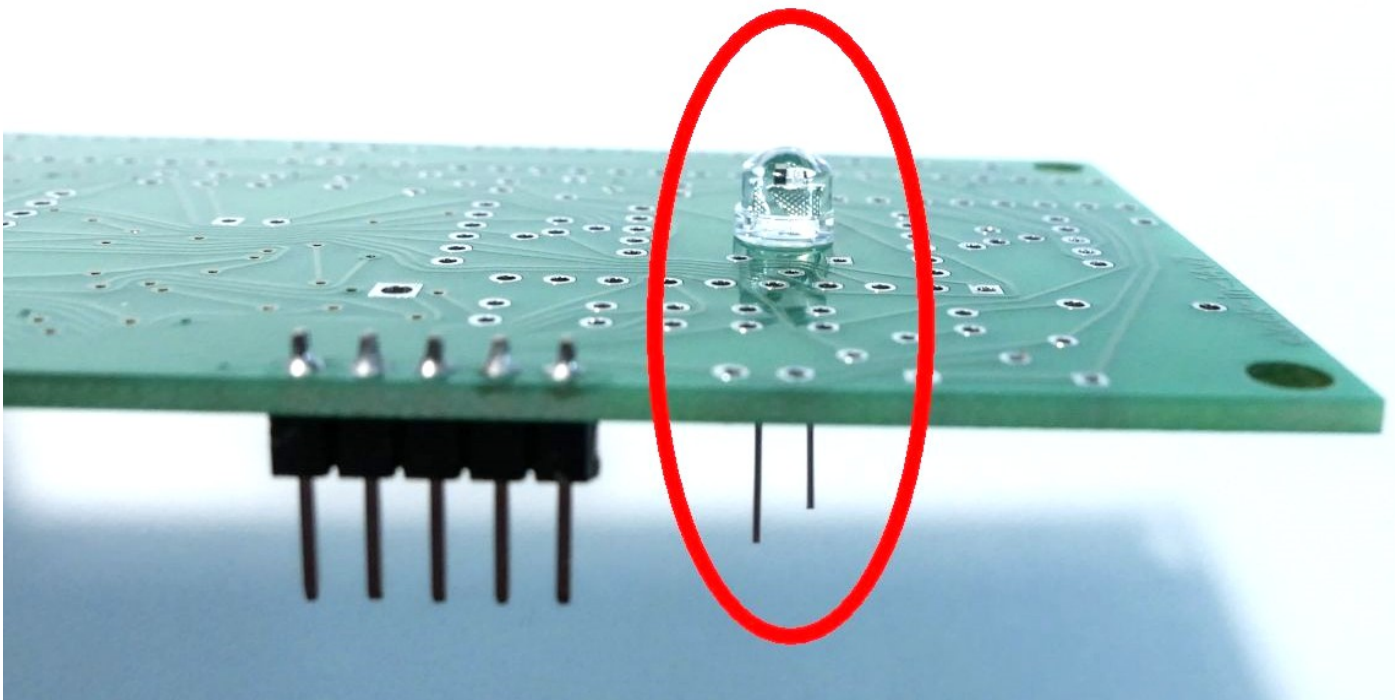




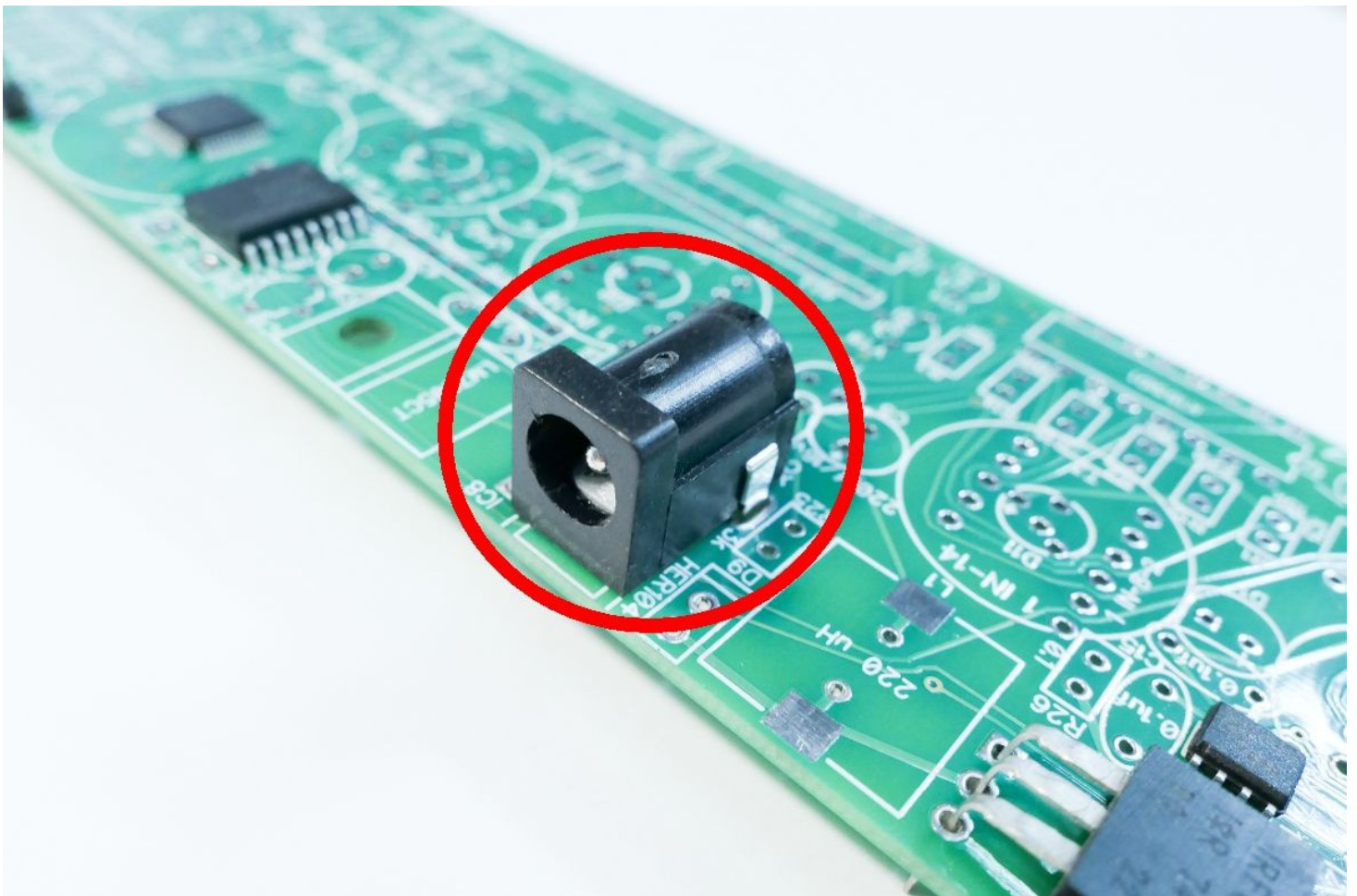
13) Prepare and install AUTO leds. This LEDs can be placed on both sides of PCB also:



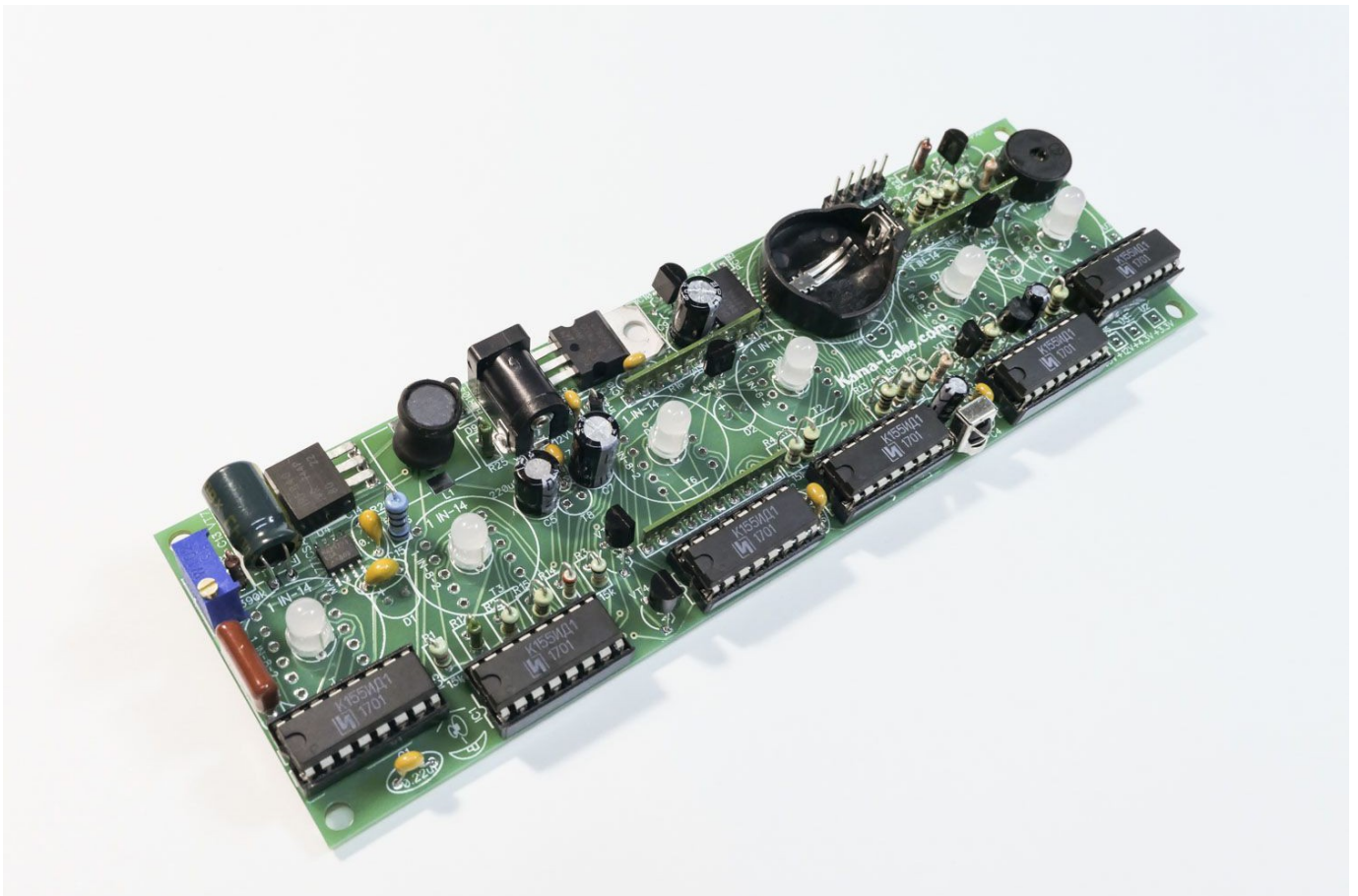
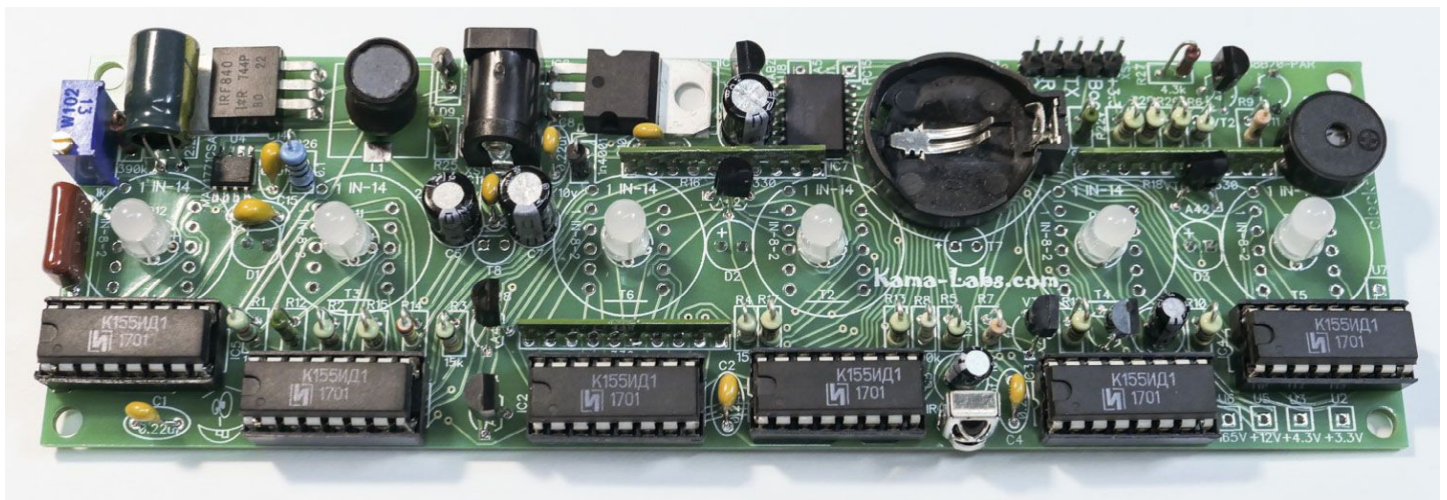
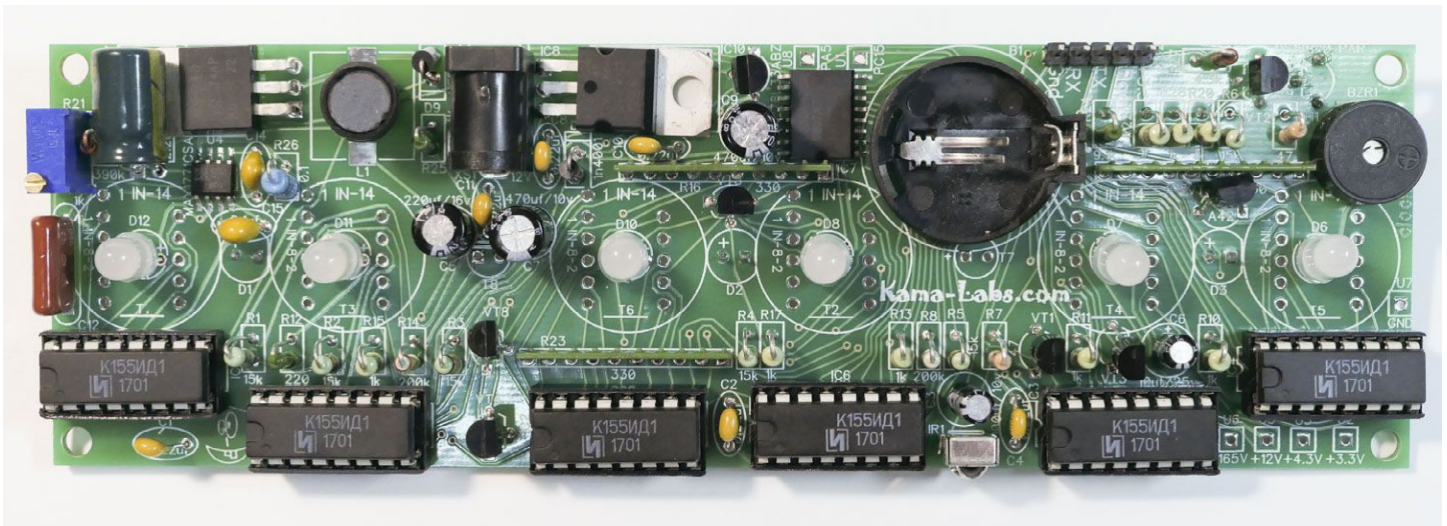


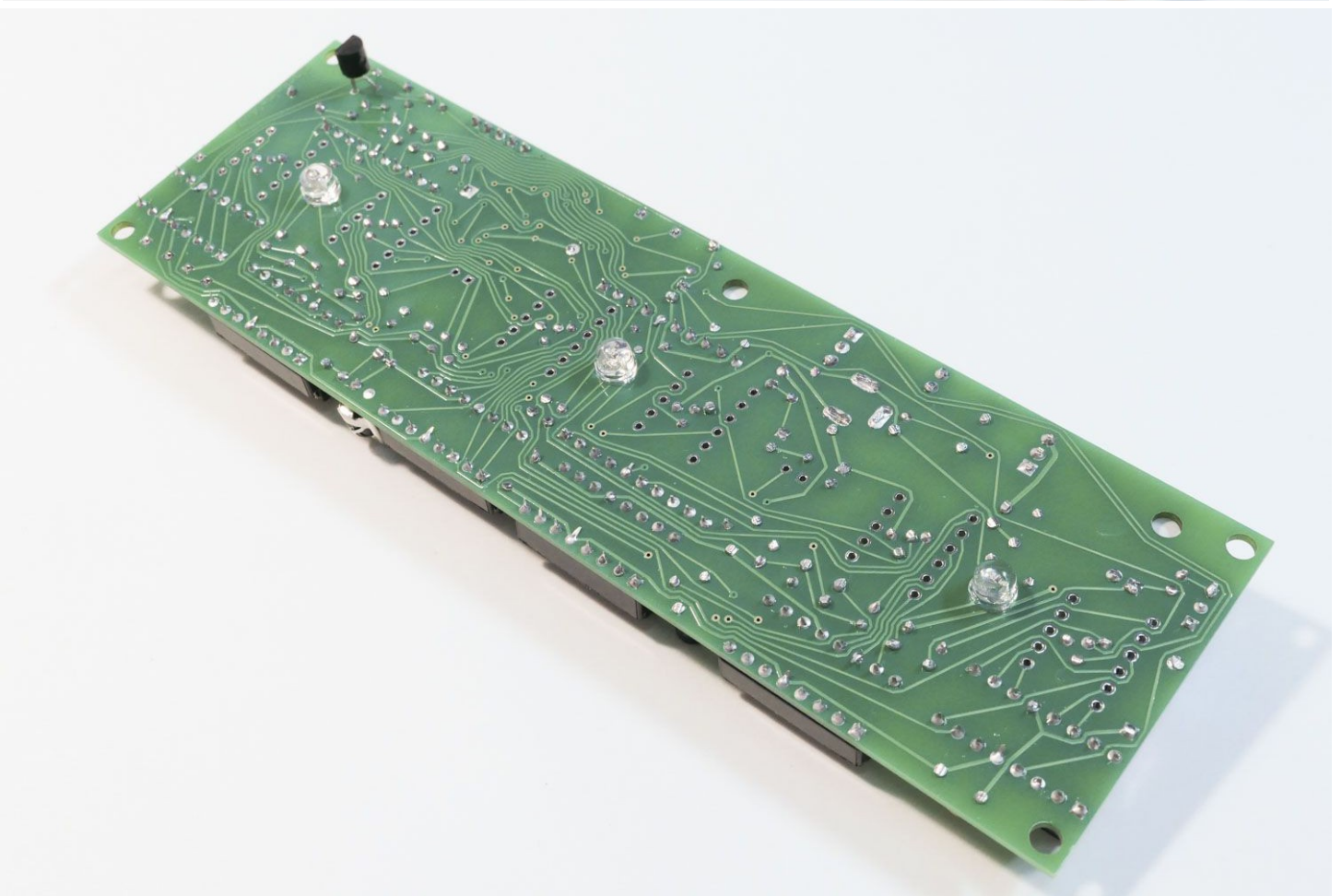


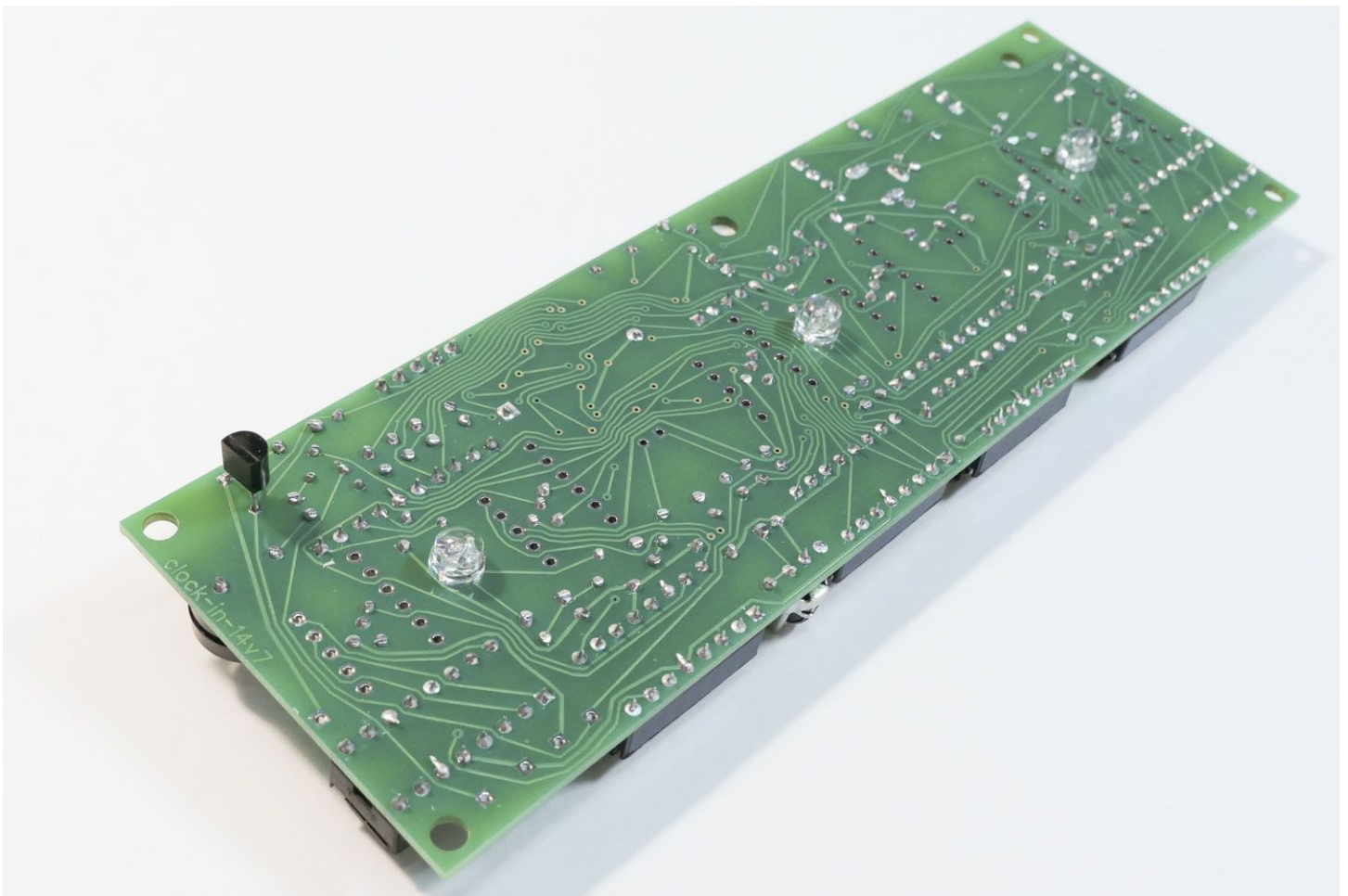
14) Install socket for power supply:



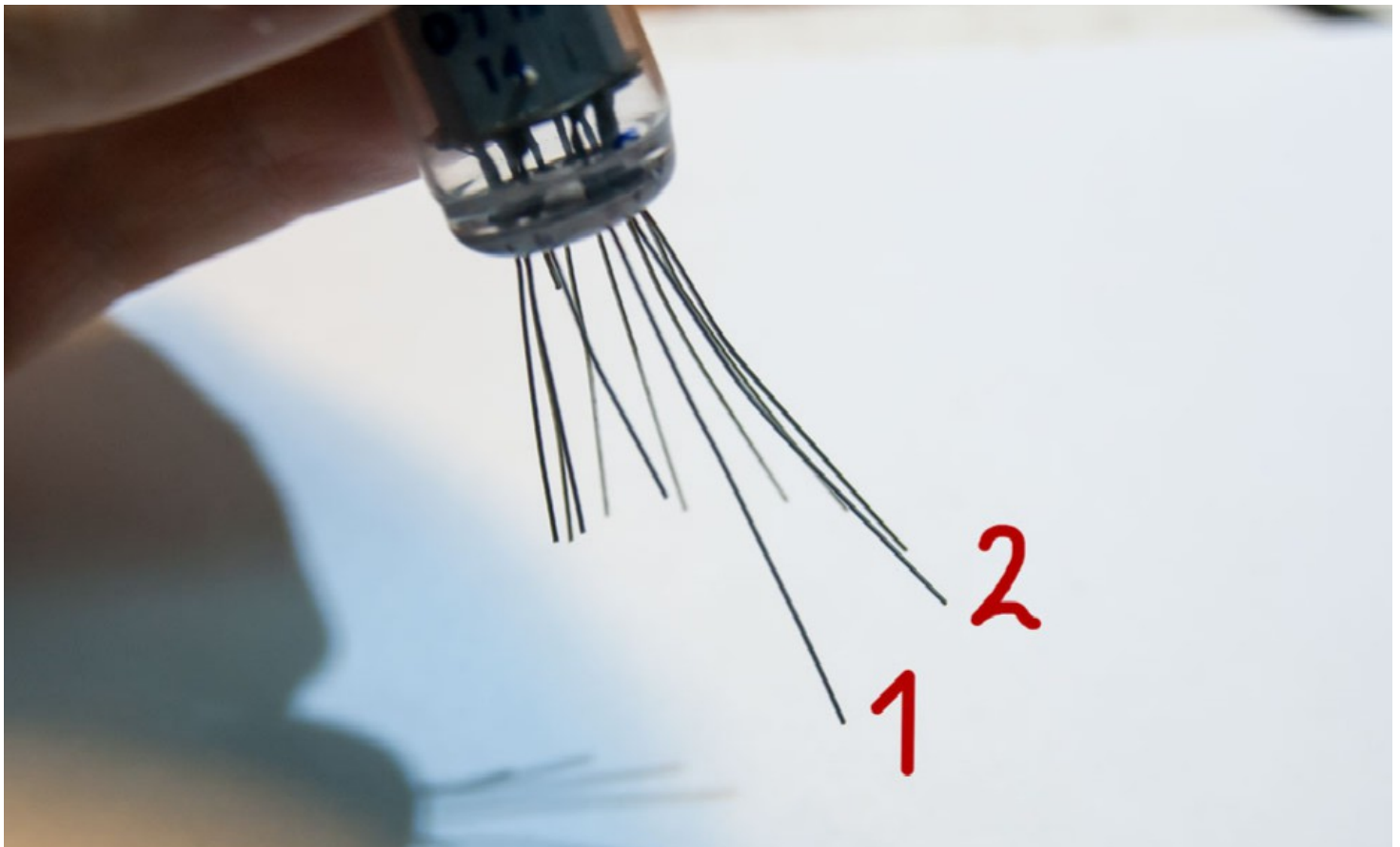
15) After all, your clock should look like on photo:

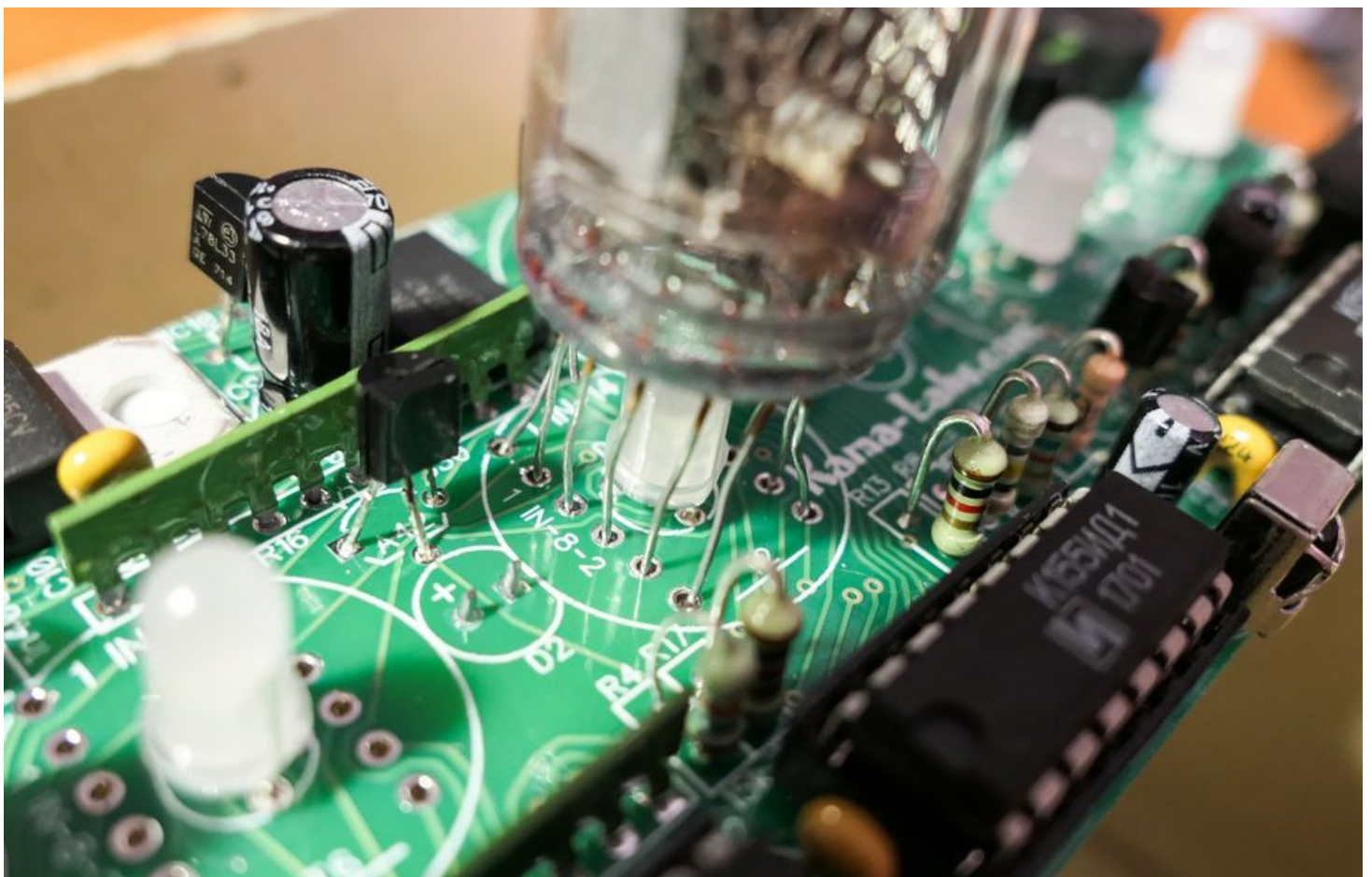
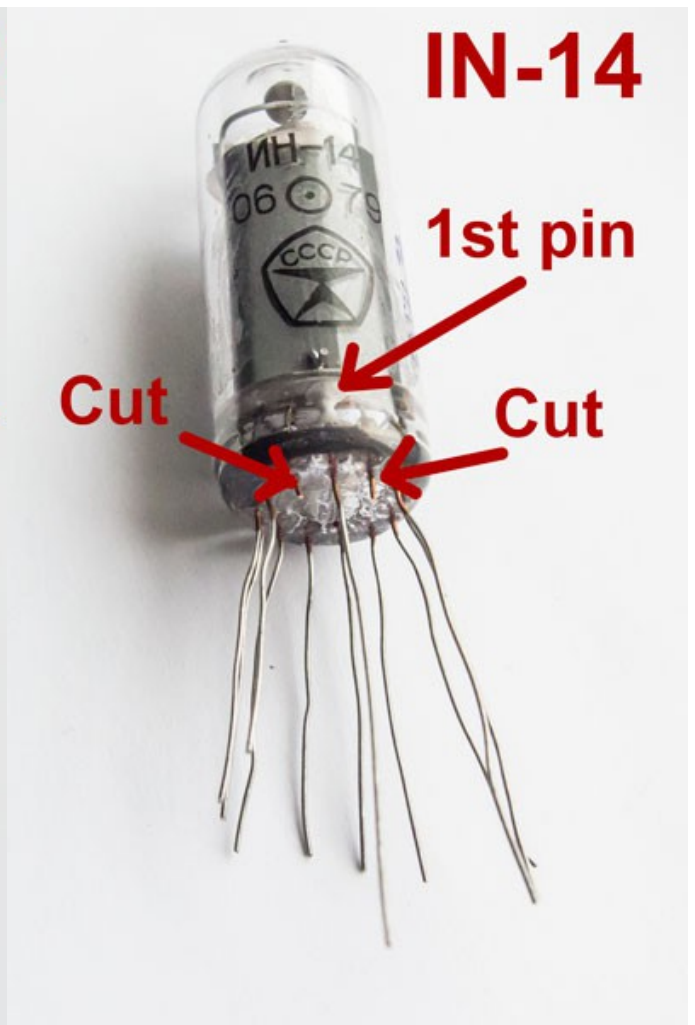
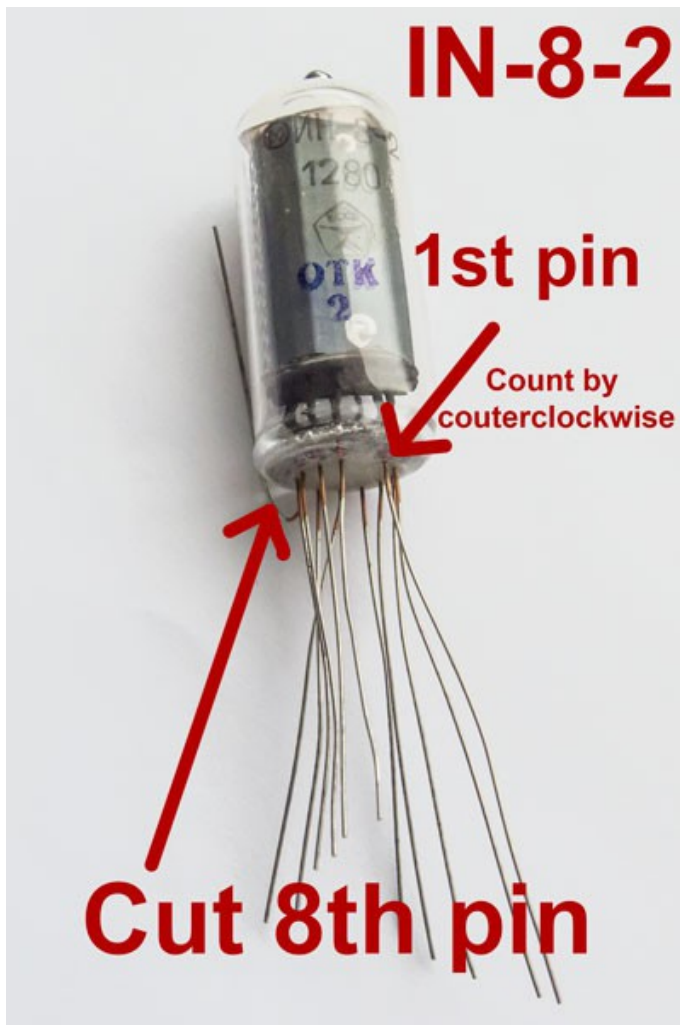




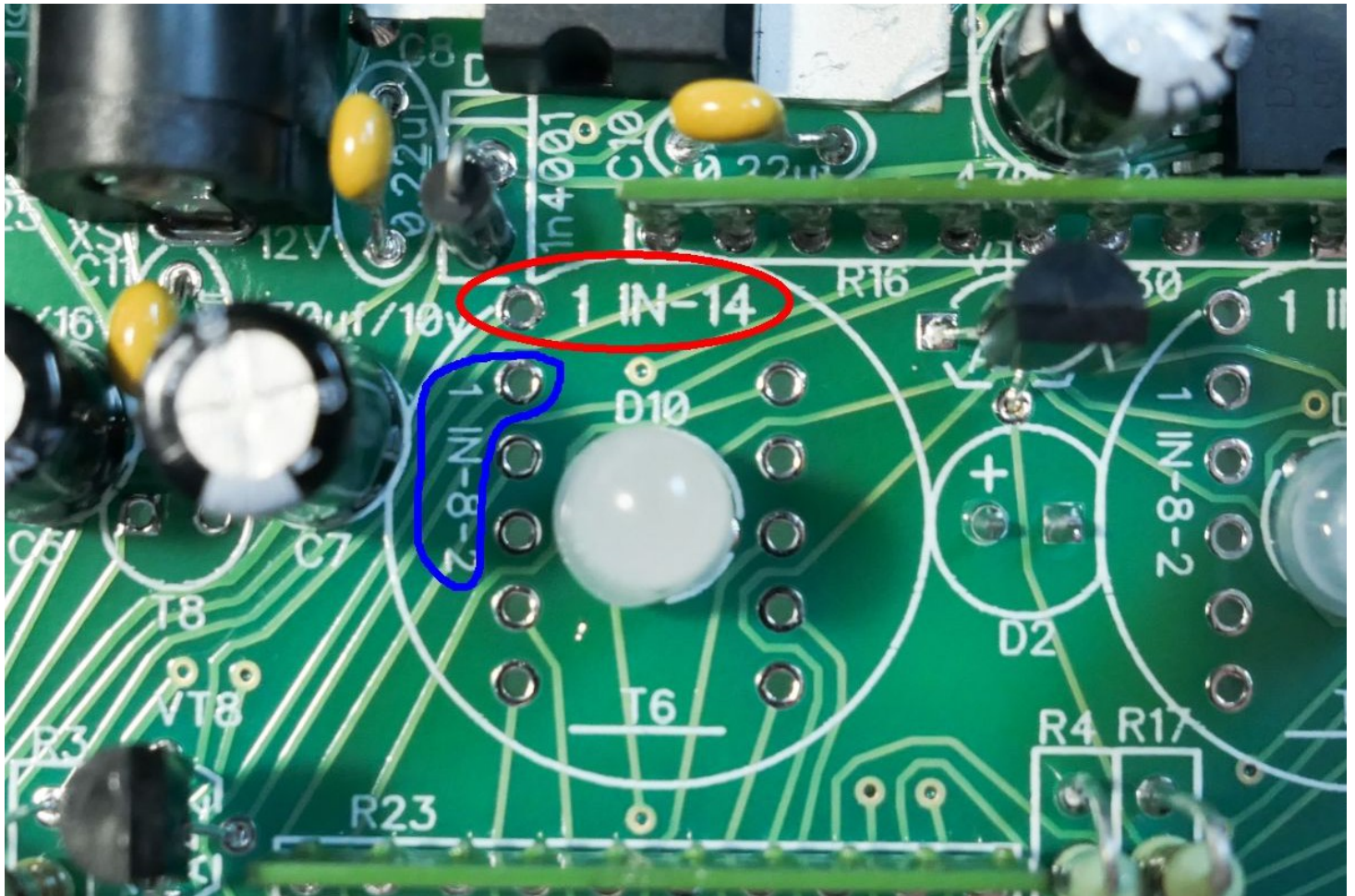


16) Prepare and install all IN-14 or IN-8-2 tubes. You can see that pins of tubes cuts spiral already. The longest pin – first pin:

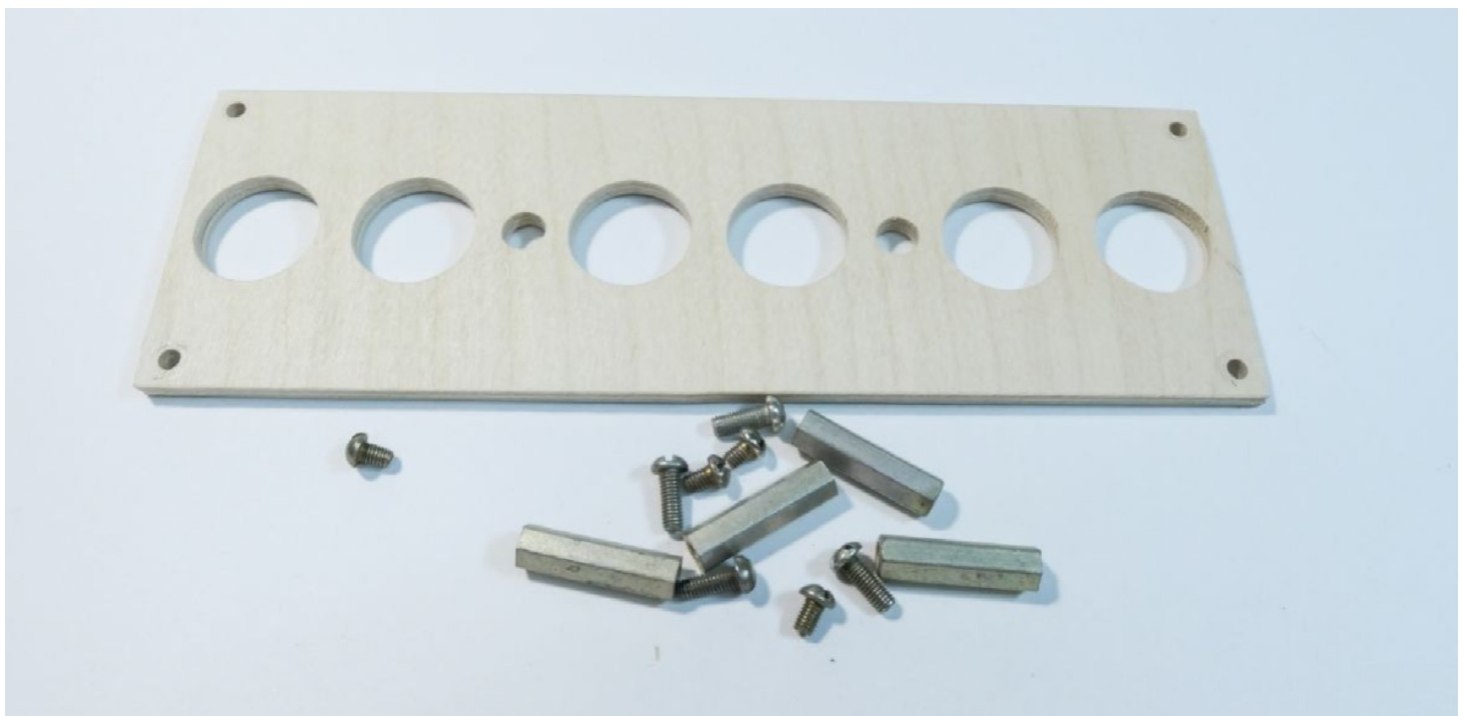


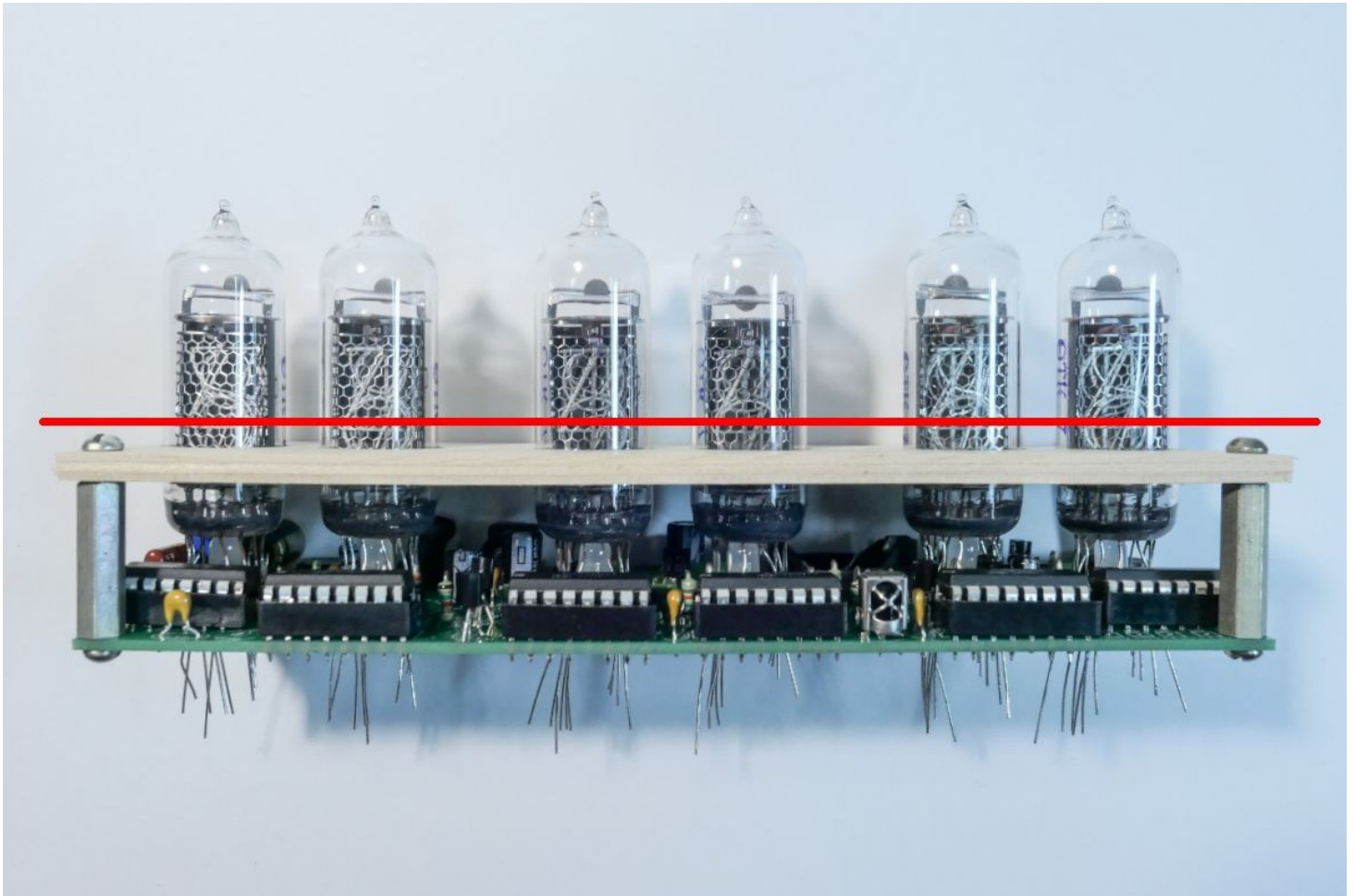
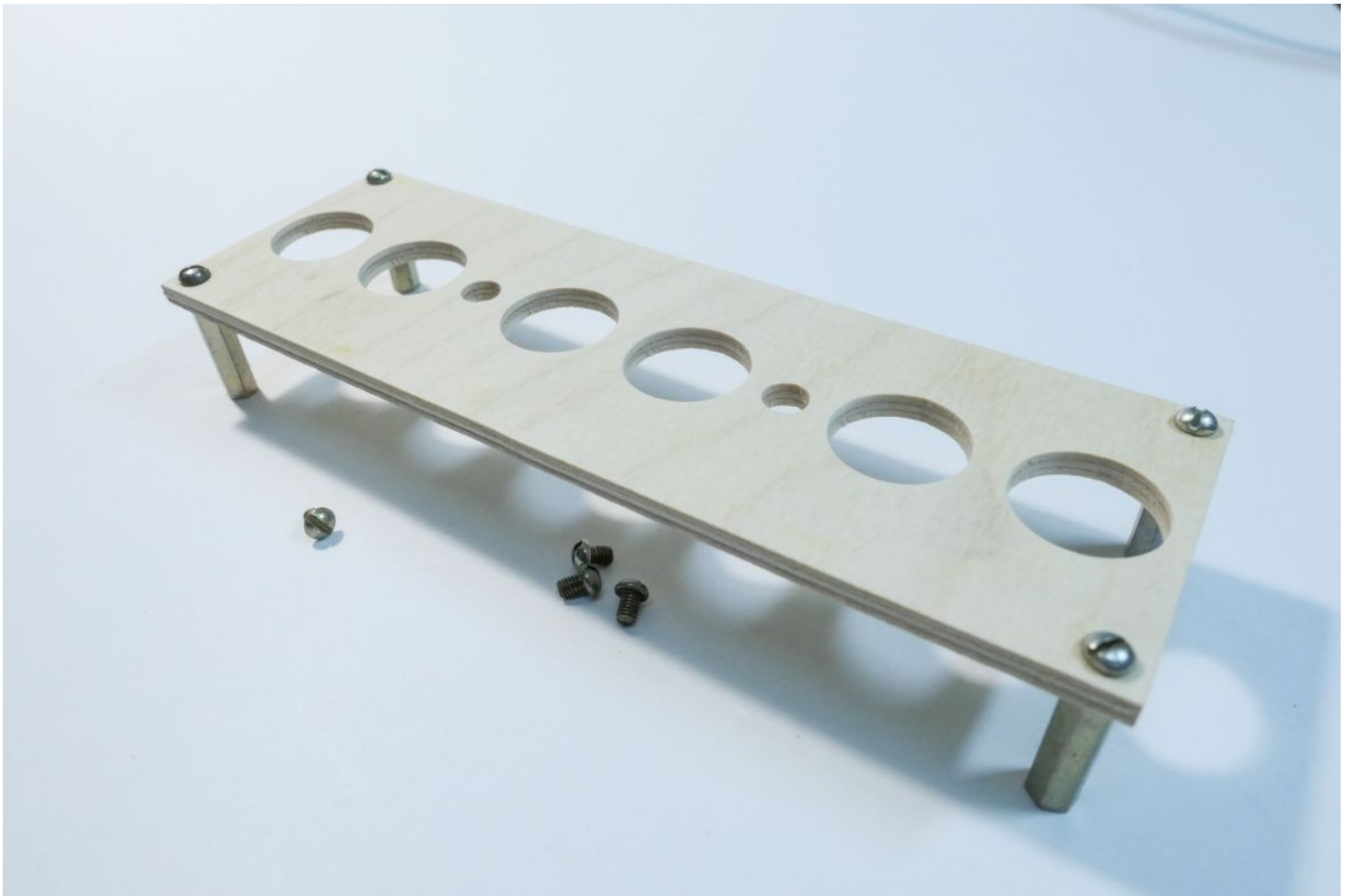


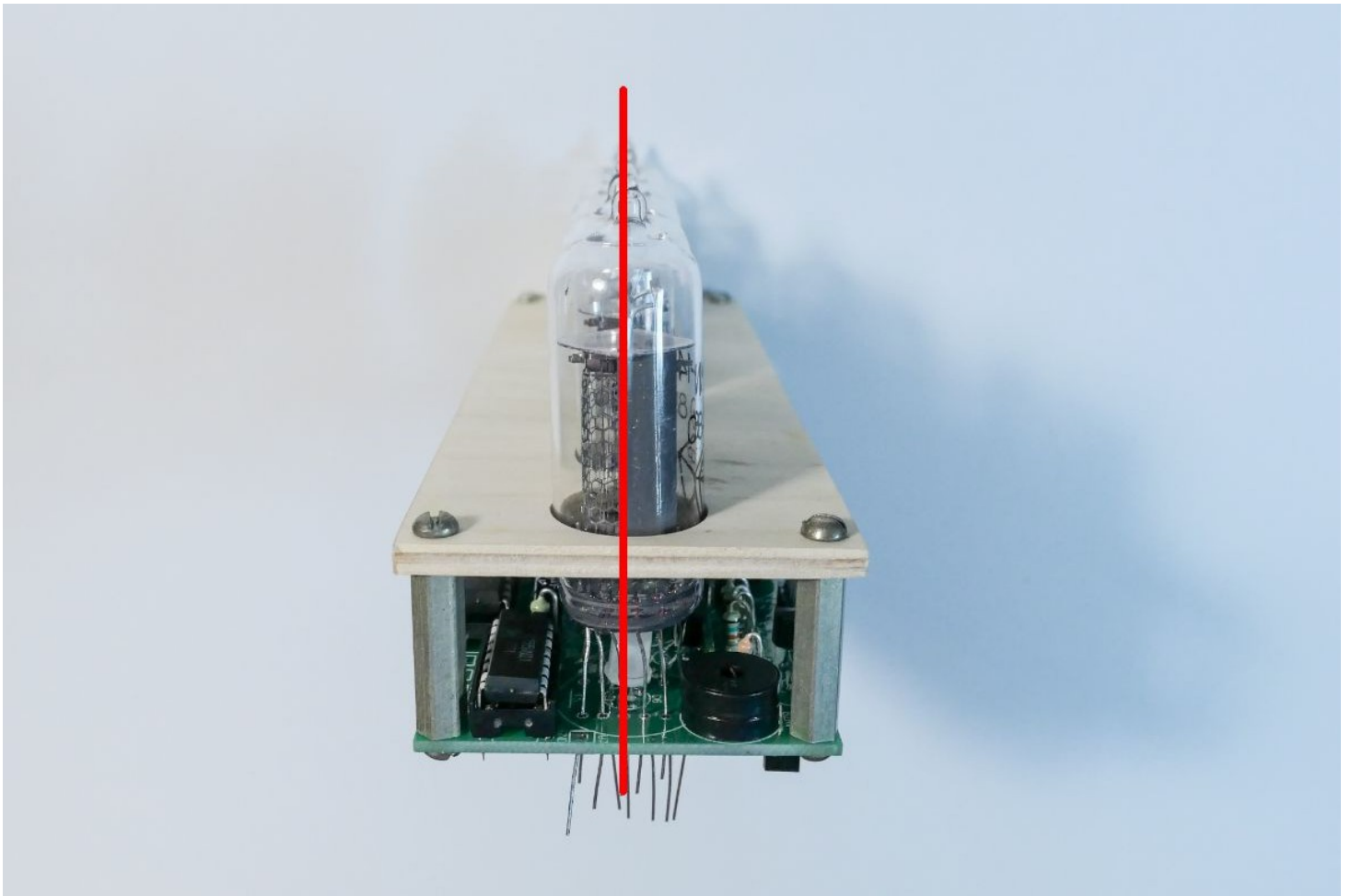
See next photo. For IN-14 tubes, I did make red selection for show first pin on PCB. For IN-8 tubes, I used blue selection. Therefore, the longest pin of tube IN-14 tube should be insert to the 1 hole. First pin of IN-8 tube to the second hole.



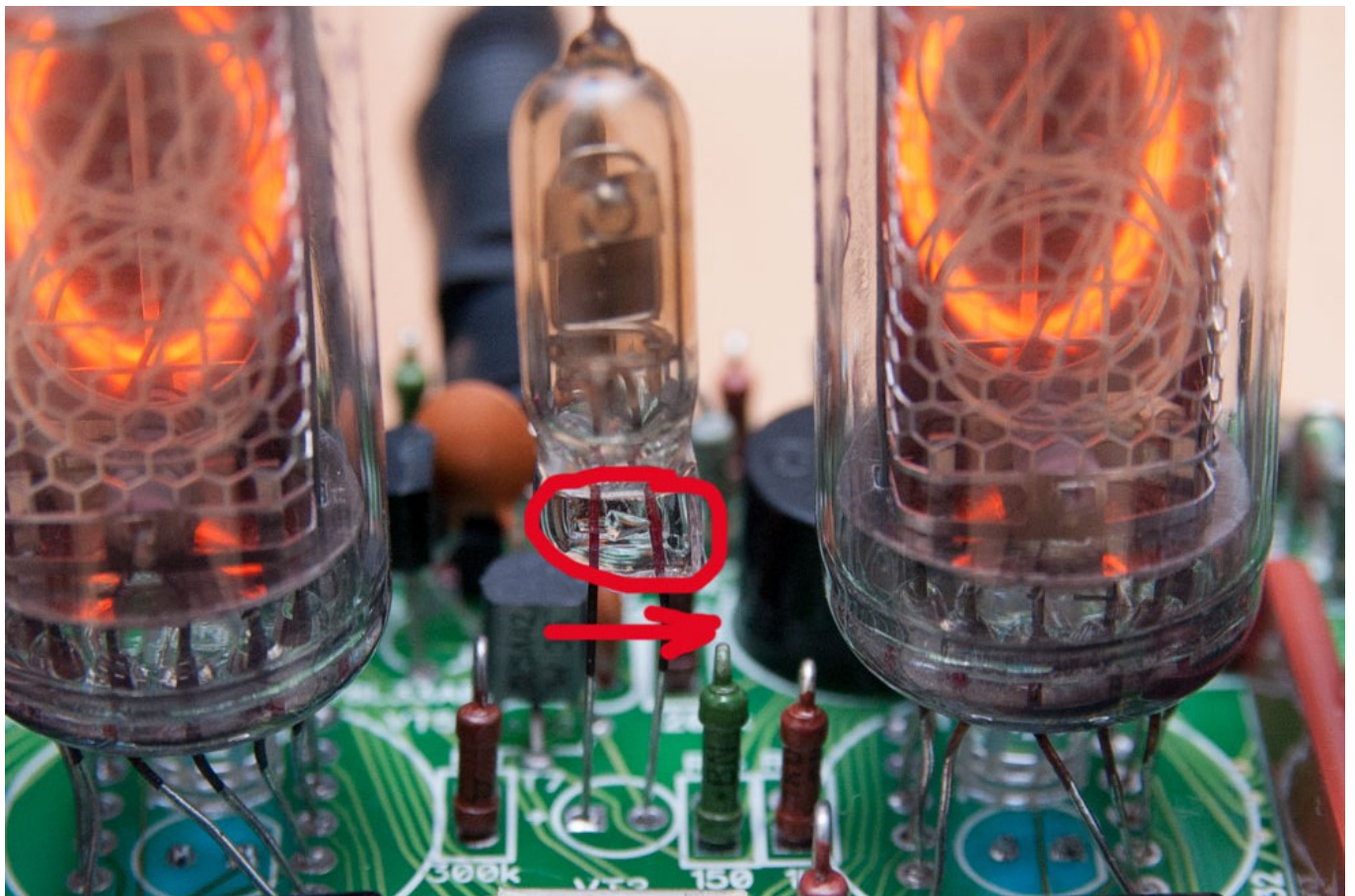
This wooden plate will help you align tubes straight.







17) Place two IN-3 tubes. Arrow on tube must point to the right:



18) Now check the resistance between GND (U7) and +3.3V(U2) pads again. It should be $\sim 3\text{k}\Omega$. However, not less than $1\text{k}\Omega$.



Then plug 12V DC adapter. The microcontroller starts work and you will hear short melody.

If it not happens, check the 3.3 volts between GND and +3.3 pins.

Now check high voltage on U6 pad. It should be $\sim 160\text{--}170\text{V}$. Use R21 potentiometer for adjusting.




CONGRATULATIONS!

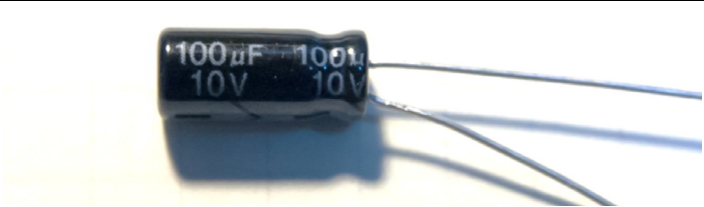

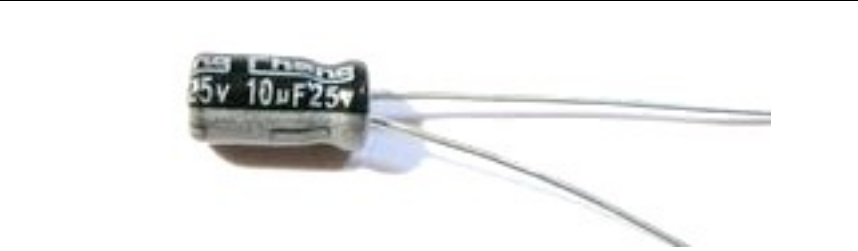
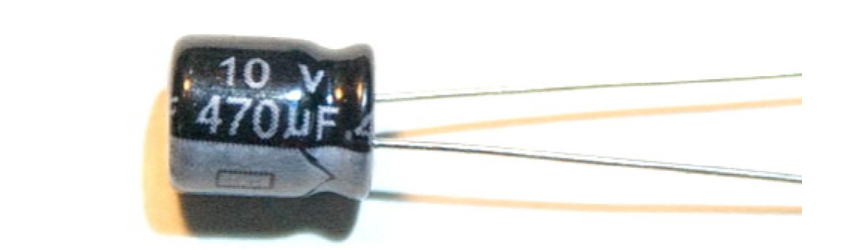

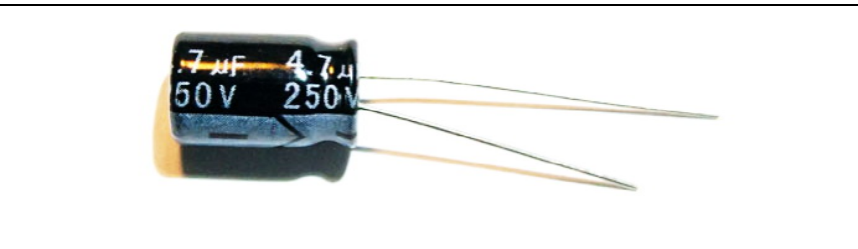
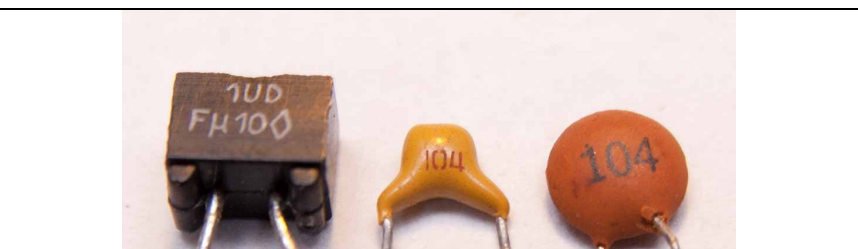



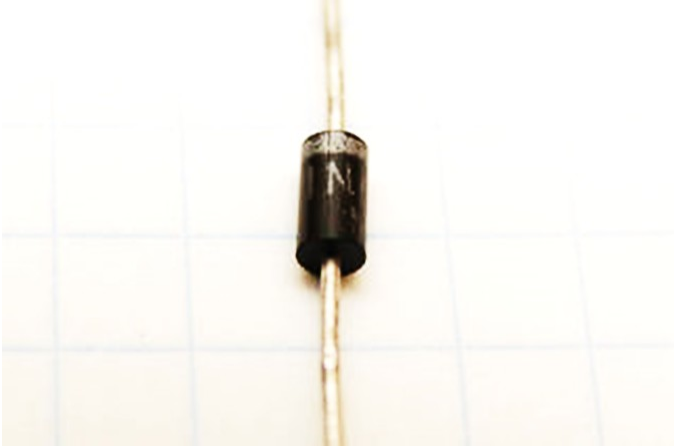

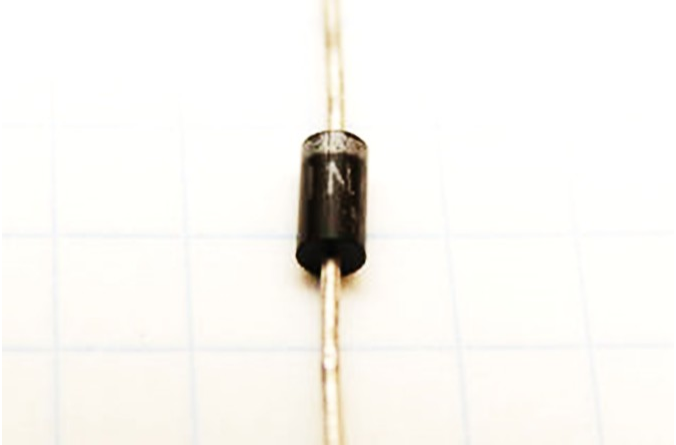
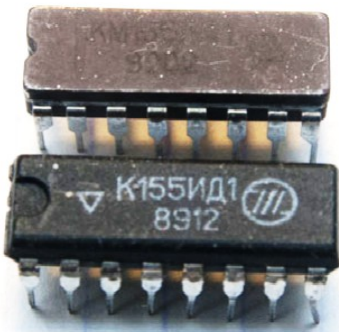
SPECIFICATION

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

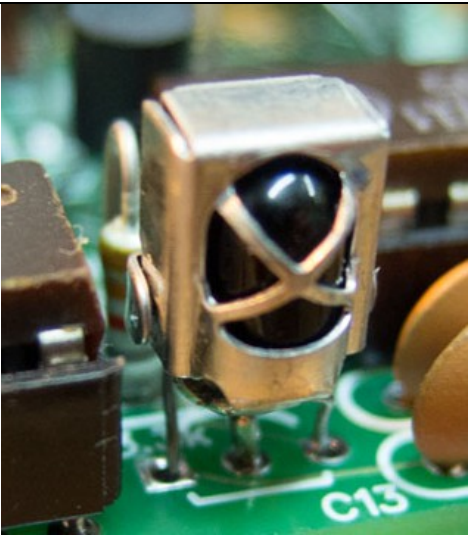



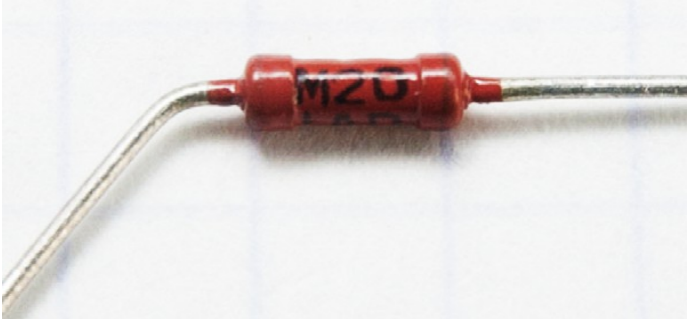


IF VALUE OF ELEMENT IN SPECIFICATION AND ON PCB IS DEFFERENT, PLEASE USE VALUES FROM SPECIFICATION AND SCHEMATIC.

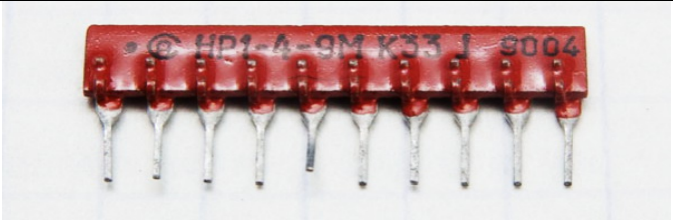

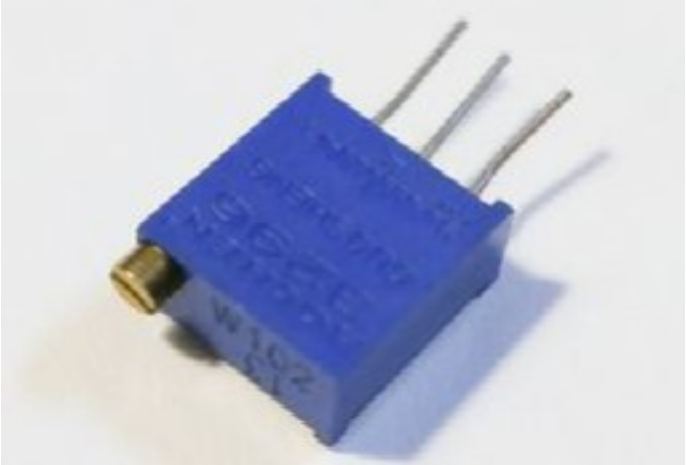




Label	Qty	Value	Photo
B1	1	CR2032	
BZR1	1	Buzzer	
C1, C2, C4, C8, C10, C11	6	0.22uf	

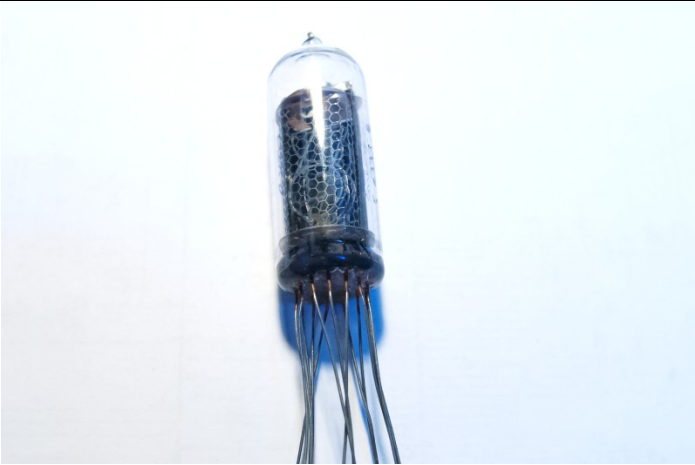

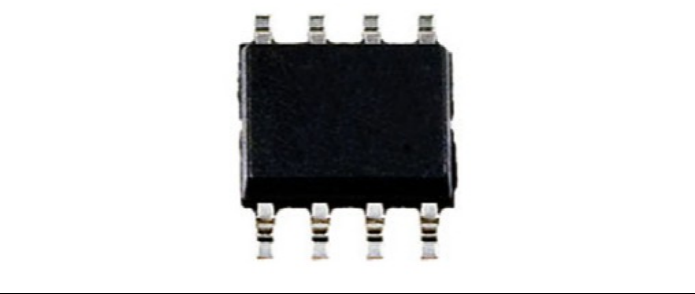
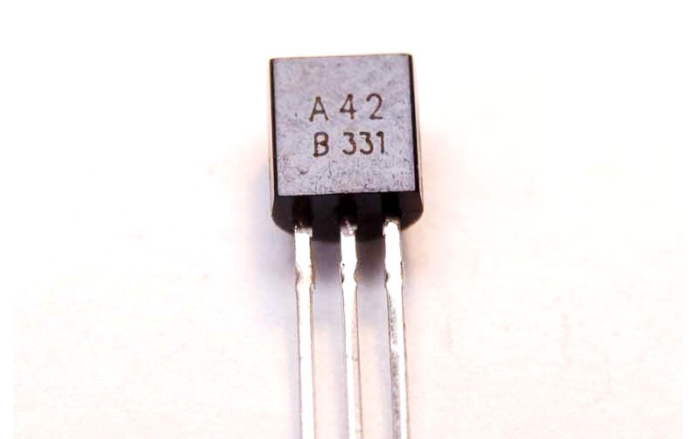
C3	1	100uf/10v	
C5	1	220uf/16v	
C6	1	10uf/25v	
C7, C9	2	470uf/10v	
C12	1	0.1uf/250v	
C13	1	2.2uf/250v 4.7uf/250V	
C14, C15	2	0.1uf	

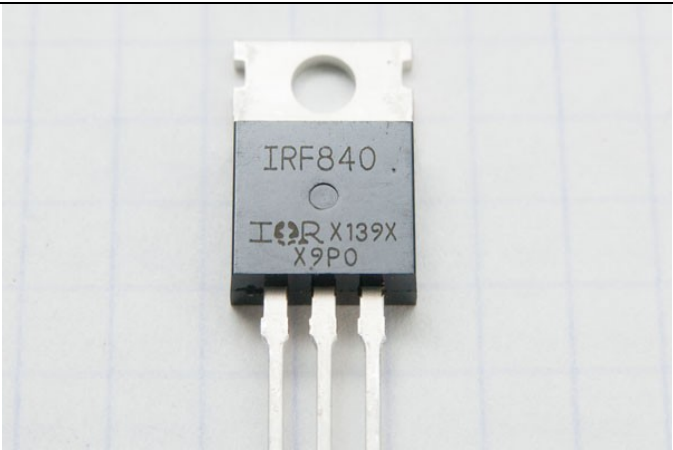


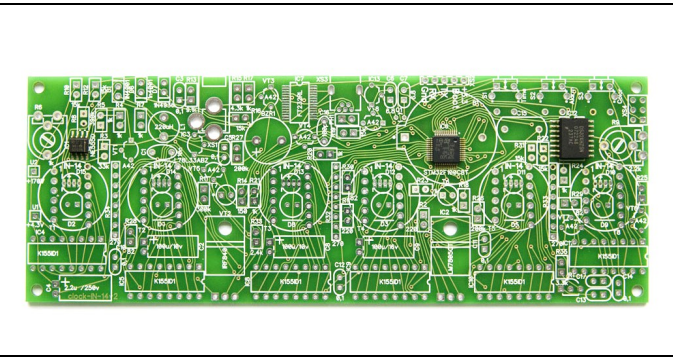
D1, D2, D3	3	Led Auto	
D4	1	1n4001	
D6, D7, D8, D10, D11, D12	6	RGB Led	
D9	1	HER104	
IC1-IC6	6	K155ID1	



IC7	1	DS32kHz	
IC8	1	LM7805CT	
IC9	1	STM32F100C8 T	
IC10	1	L78L33ABZ	
IC11	1	DS18B20-PAR	

IR1	1	IR-sensor	
L1	1	220 uH	
R1, R2, R3, R4, R5, R6	6	15k	
R7, R9	2	47	
R8, R14	2	200k	
R10, R11, R13, R15, R17, R20, R22, R28	8	1k	
R12	1	220	

R16, R18, R23	3	330 net.resistor	
R19	1	390k	
R21	1	1k potentiometer	
R24	1	9.1k	
R25	1	3k	
R26	1	0.1	
R27	1	4.3k	

T1, T2, T3, T4, T5, T6	6	ИН-14 лампы	
T7-T8	1	LAMPNEON	
U4	1	MAX1771CSA	
VT1, VT2, VT3, VT4, VT5, VT6, VT8	7	A42	

VT7	1	IRF840	
XS1	1	Power socket	
Battery holder	1	CR2032	
PCB	1		

Plastic/wooden case			
Power supply	1	12V / 2A	
USB-Uart coverter	1	For firmware update	