


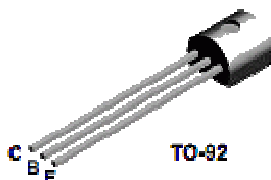















Check	Designation	Component	Marking	Category	Orientation	Notes	Circuit
<input type="checkbox"/>	C01	4.7 uF 10%	475	Ceramic			Build Stage
<input type="checkbox"/>	C02	0.1 uF	black stripe 	SMT 1206			Build Stage
<input type="checkbox"/>	C03	0.1 uF	black stripe 	SMT 1206			Build Stage
<input type="checkbox"/>	C04	0.1 uF	black stripe 	SMT 1206			Build Stage
<input type="checkbox"/>	D1	<a href="#">BZX55C3V6 zener</a>	BZX55C	Axial	flat-horiz		Build Stage
<input type="checkbox"/>	D2	<a href="#">BZX55C3V6 zener</a>	BZX55C	Axial	flat-horiz		Build Stage
<input type="checkbox"/>	Q1	<a href="#">2N3906 PNP transistor</a>	2N3906 	TO-92			Build Stage
<input type="checkbox"/>	R01	68 1/6W 5%	bl-gry-blk-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R02	68 1/6W 5%	bl-gry-blk-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R03	2.2 k 1/6W 5%	r-r-r-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R04	1 M 1/6W 5%	brn-blk-grn-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R05	4.7 k 1/4 W 5%	y-v-r-gld 	1/4W	flat-horiz		Build Stage
<input type="checkbox"/>	R06	4.7 k 1/4 W 5%	y-v-r-gld 	1/4W	flat-horiz		Build Stage
<input type="checkbox"/>	R07	68 1/6W 5%	bl-gry-blk-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R08	68 1/6W 5%	bl-gry-blk-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R09	4.7 k 1/4 W 5%	y-v-r-gld 	1/4W	flat-horiz		Build Stage
<input type="checkbox"/>	R10	68 1/6W 5%	bl-gry-blk-gld 	1/6W	flat-horiz		Build Stage
<input type="checkbox"/>	R11	2.2 k 1/6W 5%	r-r-r-gld 	1/6W	flat-horiz		Build Stage

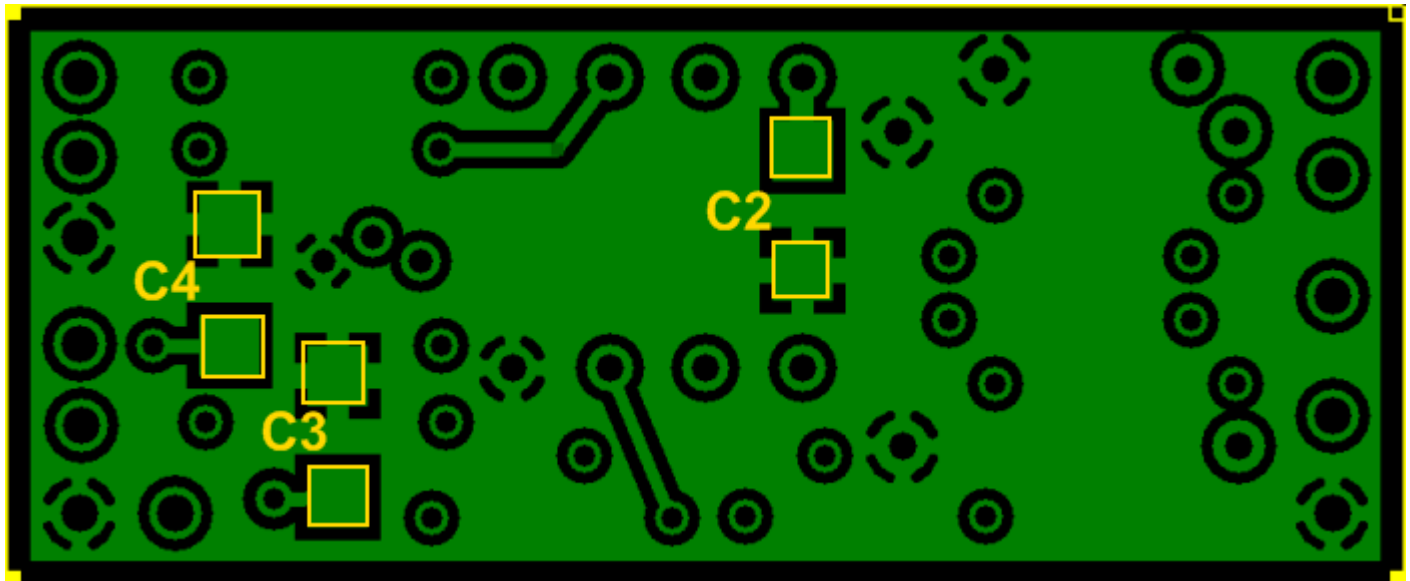
□	SO1	8 pin dip socket		socket			Build Stage
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## Build Stage Summary Build Notes

- Mount SMT Caps
- Mount the Diodes
- Mount R1 and R3
- Mount R2 and R4
- Mount remaining resistors
- Mount C01, SO1, and Q1
- 
- [Test the Stage](#)

## Build Stage Detailed Build Notes




### Bottom of the Board



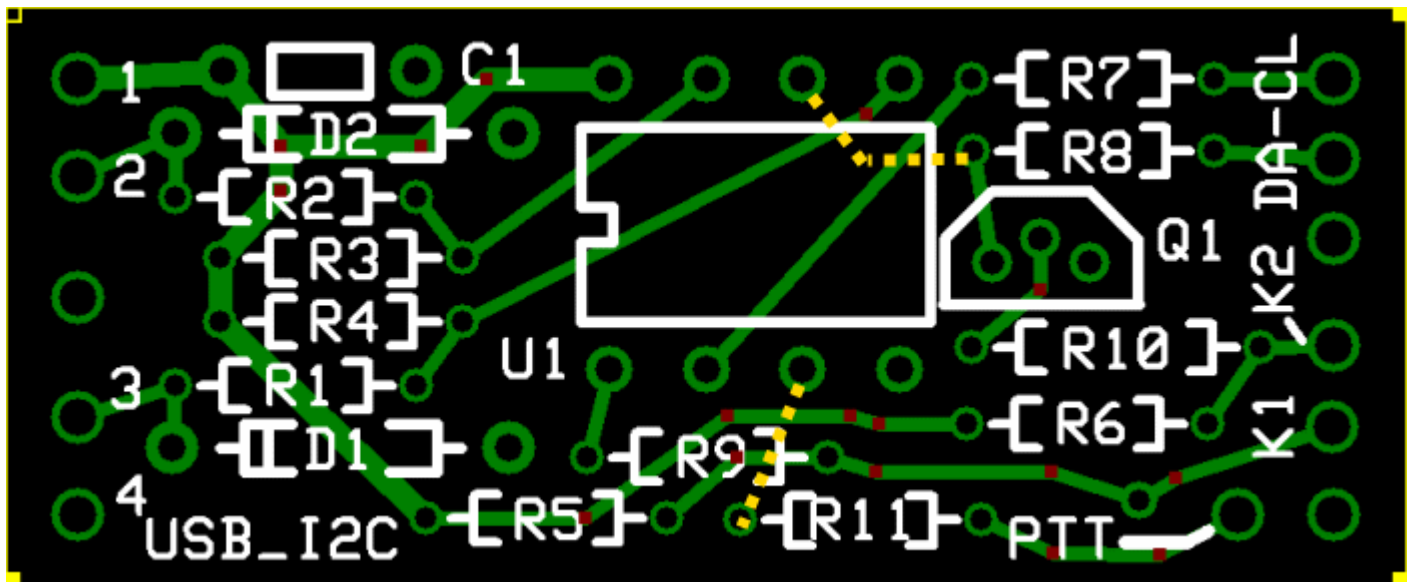
### Mount SMT Caps

Mount SMT caps C02-C04 to the bottom side. Take care not to "launch" one off into space - you'll never find it. Tony has packed one extra in the kit, just for that contingency.

The image above shows the bottom-side location of the mounting pads for each of the 3 capacitors (highlighted in yellow)

Check	Designation	Component	Marking	Category	Orientation	Notes
<input type="checkbox"/>	C02	0.1 uF	black stripe 	SMT 1206		
<input type="checkbox"/>	C03	0.1 uF	black stripe 	SMT 1206		
<input type="checkbox"/>	C04	0.1 uF	black stripe 	SMT 1206		

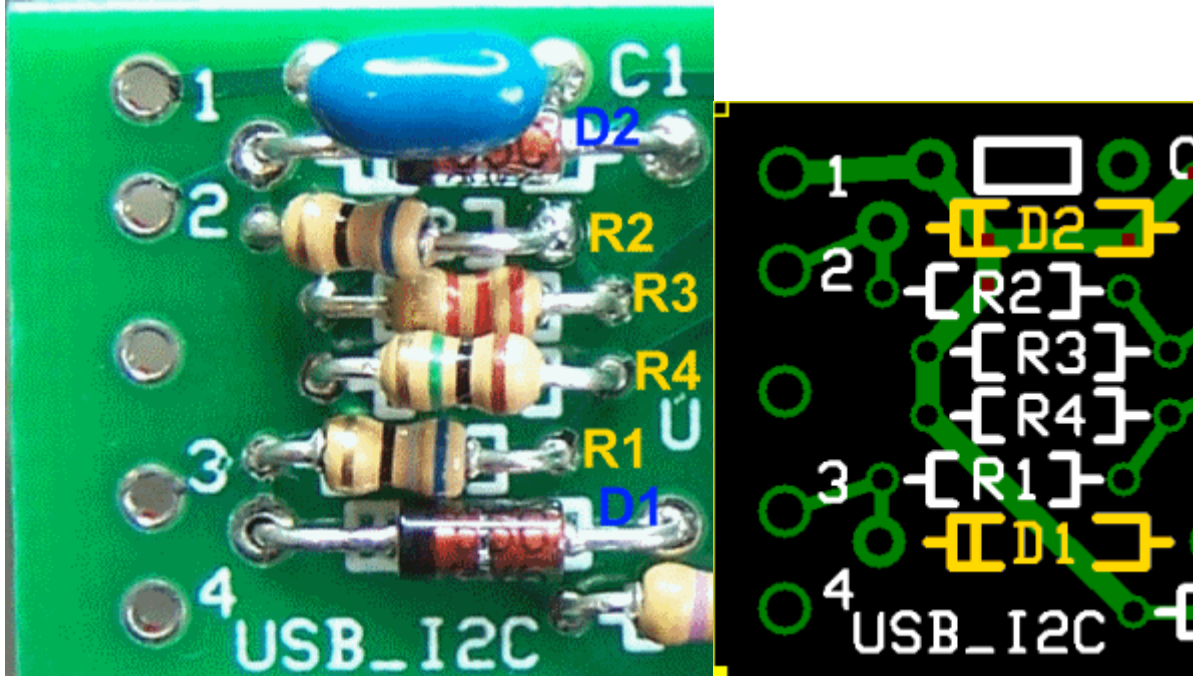
### Top of the Board



### Mount the Diodes

Look very carefully at the photo of the top of the board. Depicted as faint yellow dashed lines are two traces from the bottom of the board which, together with the traces at the top, cover all the circuit traces. These are provided visually here should you have a need to trace signals on the board.

Space is quite constrained in the area of the diodes and resistors R1-R4. Components will have to be mounted in a sort of vertically "stacked" fashion in order to fit all of them in. See the photo below:



Mount D1 and D2, flush to the board. Banded end toward the left-hand edge of the board

Check	Designation	Component	Marking	Category	Orientation	Notes
<input type="checkbox"/>	D2	<a href="#">BZX55C3V6</a> zener	BZX55C	Axial	flat-horiz	
<input type="checkbox"/>	D1	<a href="#">BZX55C3V6</a> zener	BZX55C	Axial	flat-horiz	

Mount R1 and R3

Mount R1 and R3 flush to the board



Check	Designation	Component	Marking	Category	Orientation	Notes
<input type="checkbox"/>	R01	68 1/6W 5%	bl-gry- blk-gld	1/6W	flat-horiz	
<input type="checkbox"/>	R03	2.2 k 1/6W 5%	r-r-r-gld	1/6W	flat-horiz	

#### Mount R2 and R4

Mount R2 and R4, raised slightly above the board, to provide separation between resistor bodies.

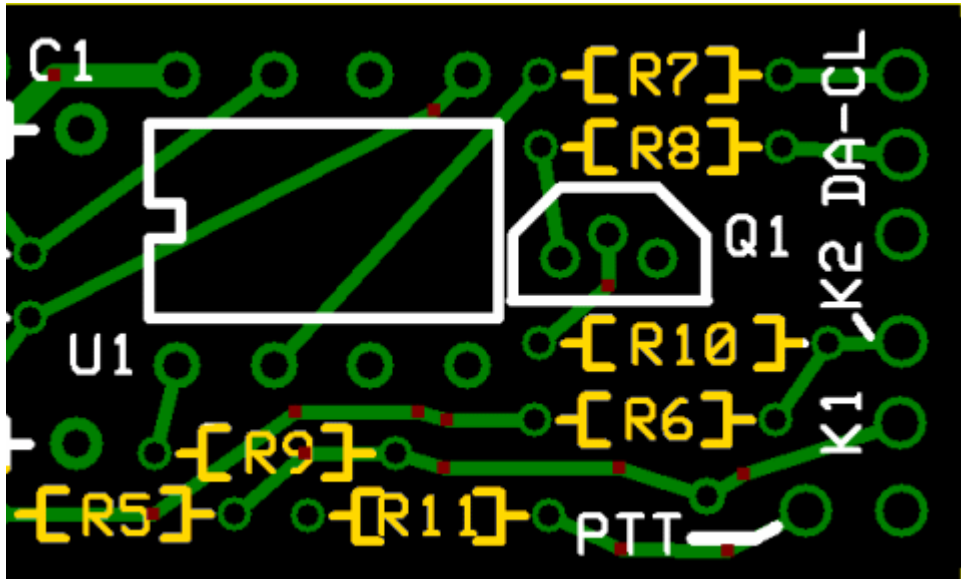


Check	Designation	Component	Marking	Category	Orientation	Notes
<input type="checkbox"/>	R04	1 M 1/6W	brn-blk-	1/6W	flat-horiz	

		5%	grn-gld			
<input type="checkbox"/>	R02	68 1/6W 5%	bl-gry- blk-gld	1/6W	flat-horiz	

### Mount remaining resistors

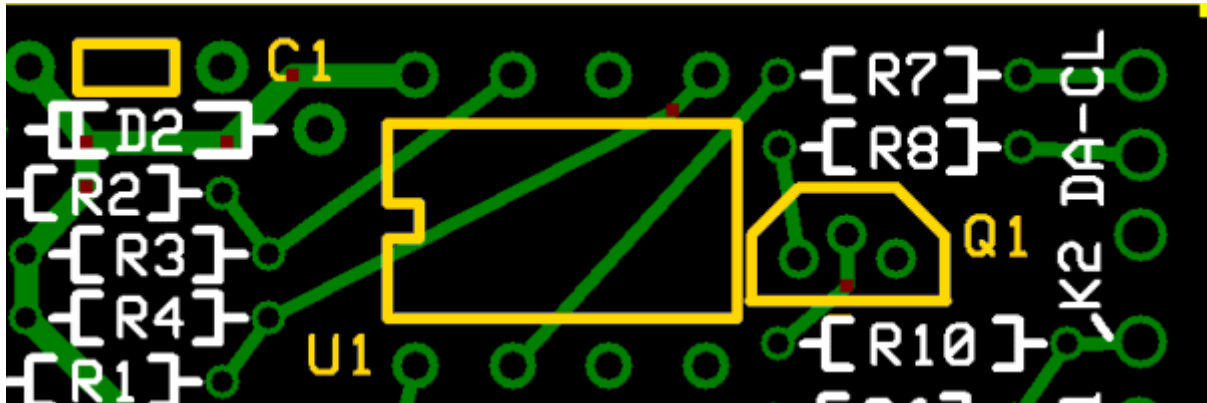
### Mount remaining resistors flush to the board

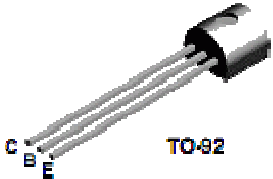


Check	Designation	Component	Marking	Category	Orientation	Notes
<input type="checkbox"/>	R05	4.7 k 1/4 W 5%	y-v-r-gld	1/4W	flat-horiz	
<input type="checkbox"/>	R06	4.7 k 1/4 W 5%	y-v-r-gld	1/4W	flat-horiz	
<input type="checkbox"/>	R07	68 1/6W 5%	bl-gry- blk-gld	1/6W	flat-horiz	
<input type="checkbox"/>	R08	68 1/6W 5%	bl-gry- blk-gld	1/6W	flat-horiz	
<input type="checkbox"/>	R09	4.7 k 1/4 W 5%	y-v-r-gld	1/4W	flat-horiz	
<input type="checkbox"/>	R10	68 1/6W 5%	bl-gry- blk-gld	1/6W	flat-horiz	
<input type="checkbox"/>	R11	2.2 k 1/6W 5%	r-r-r-gld	1/6W	flat-horiz	

## Mount C01, SO1, and Q1

Mount the ceramic cap, the socket for U1, and the 2N3906 transistor



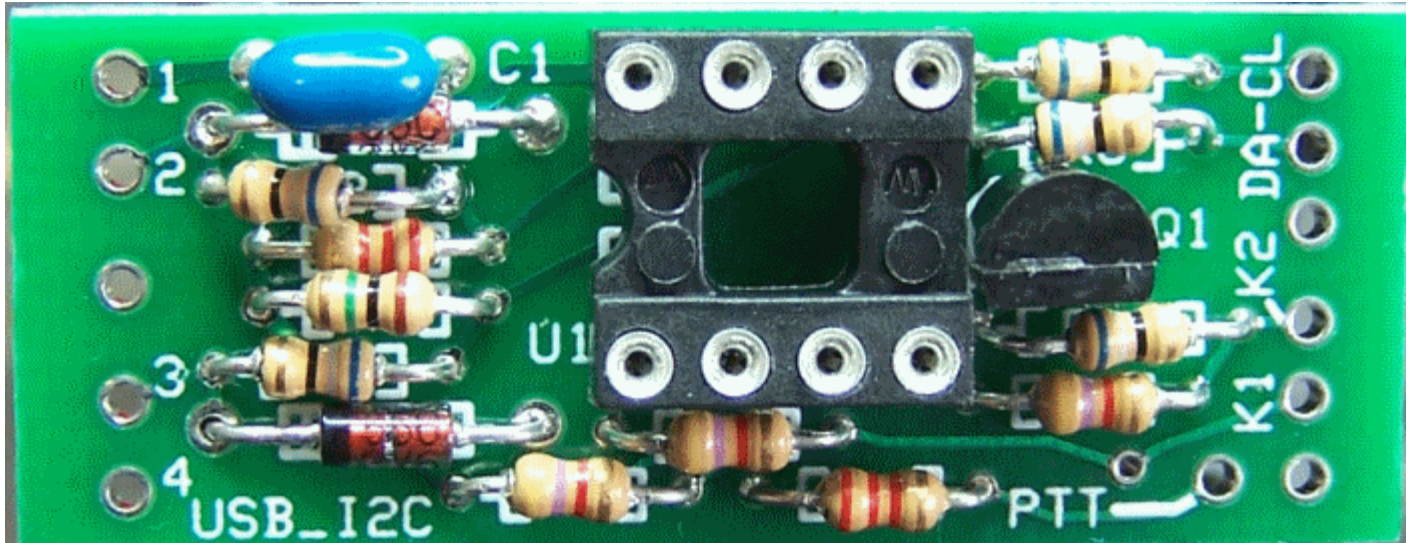
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<input type="checkbox"/>	C01	4.7 uF 10%	475	Ceramic		
<input type="checkbox"/>	SO1	8 pin dip socket		socket		
<input type="checkbox"/>	Q1	<a href="#">2N3906 PNP transistor</a>	2N3906 	TO-92		

End of stage

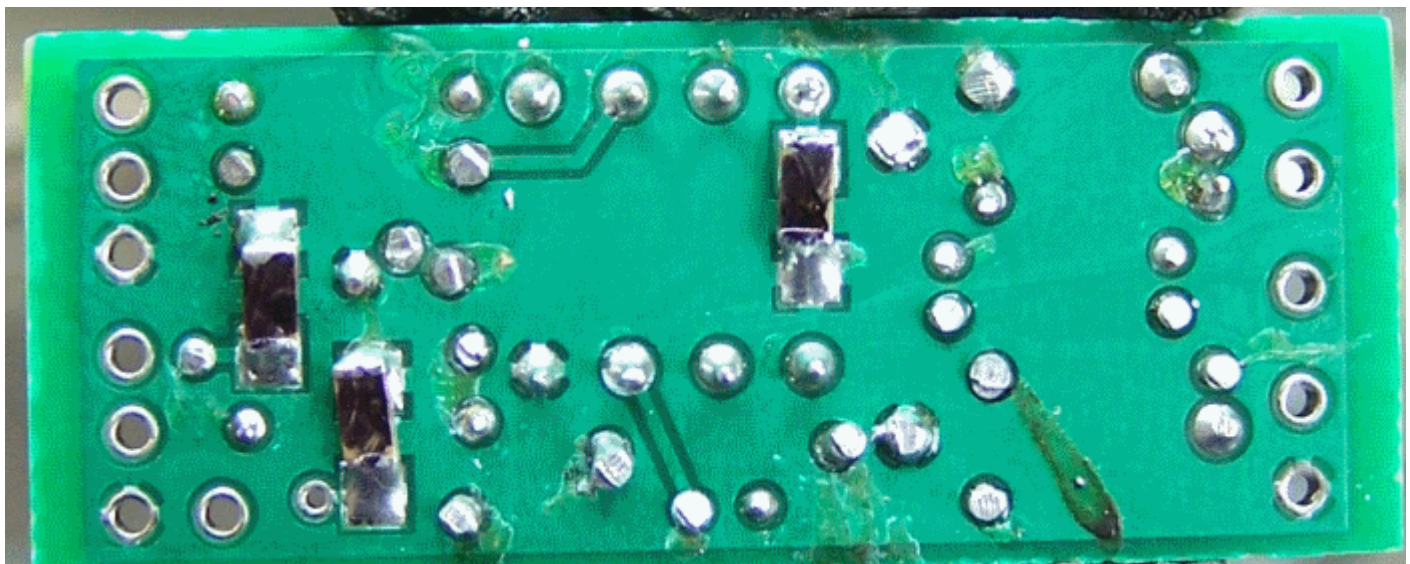
Check Designation Component Marking Category Orientation Notes

**Build Stage Completed Stage**

Top of the Board



Bottom of the Board



## Build Stage Testing

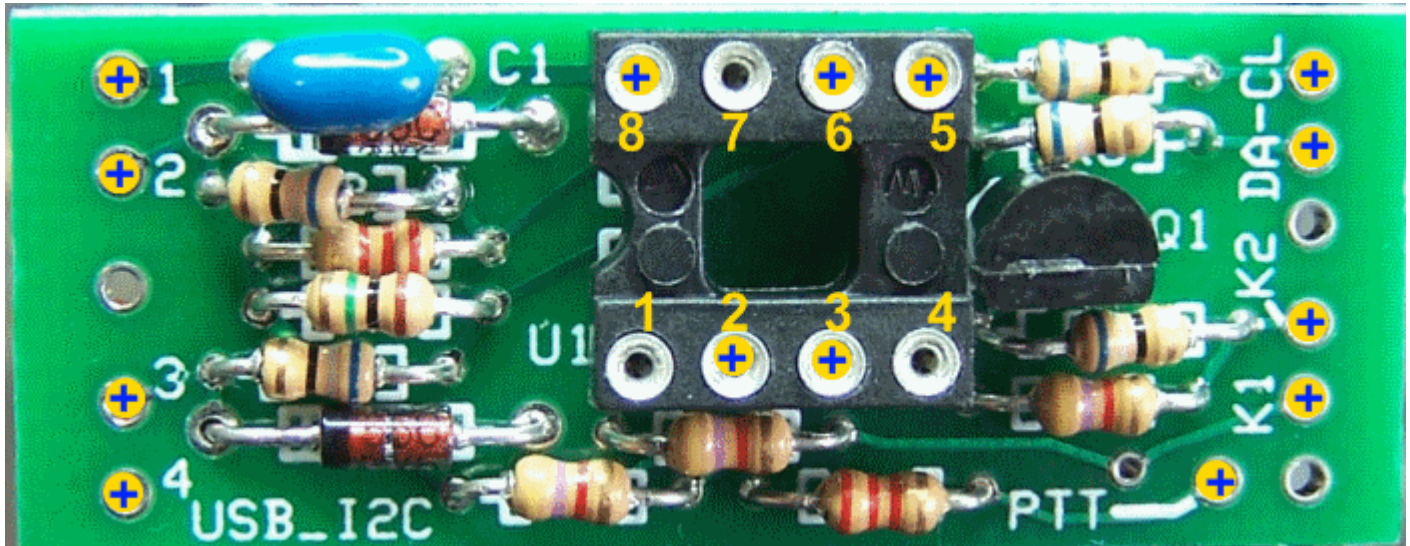
### Resistance Tests

#### Test Setup

Perform this test with the ATTINY (U1) UNPLUGGED from SO1

- Measure resistances between the test points indicated in the table below
- Note: the resistance measurements should be within plus or minus 5% of the nominal value

In the next stage, we will connect the USB cable and apply power, via the USB port, to the board, with, and without U1 installed, measuring the voltages.



### Test Measurements

Testpoint	Units	Nominal Value	Author's	Yours
U1-3 to PTT	k ohm	2.2	2.18	_____
U1-2 to CL	ohm	68	67	_____
U1-6 to DA	ohm	68	67	_____
USB-1 to K1	k ohm	4.7	4.6	_____
USB-1 to K2	k ohm	4.7	4.6	_____
USB-1 to U1-8	ohm	0	0	_____
USB-2 to U1-7	ohm	68	66.8	_____
USB-2 to USB-1	k ohm	2.268	2.27	_____
USB-3 to U1-5	ohm	68	66.8	_____
USB-3 to USB-1	k ohm	950 - 1,050	968	_____
USB-4 to U1-6	M ohm	off the scale	off the scale	_____

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