



User manual

chips with 48, 64, 100 and 144 pins with 0,5 mm pitch. It is very important that you exactly follow these manual.

Thank you for buying these probably the smartest development board. It is universal and can handle all LPC2000 family in TQFP, LQFP and PQFP

WARNING! It is presupposed that you are expernced electronic technician and know how to deal with modern high tech electronic components.

If you have any answers please use email or gmail chat: po.labs@gmail.com . You should do that, before you make an irreparable error due to the lack of electronics skills or experience. For reference look also on www.poscope.com. KITS and assembled boards are also available.

Assembling

As you can see from the scematic diagram, this board is divided into sections. It is recommended that you solder components only in sections, that you are going to use. Please follow the steps in order. To simplify your work, solder connectors at the end.

1. Microcontroller

This is the most important component and the reason you use this board. If you look at the board or Figure 2: Top assembly on page 4, you will see how to position your microcontroller. Pin 1 is marked and it is at the same position for all sizes. Center microcontroller and solder two pins at the oposite corners. Carefully check if your microcontroller's pins are preciselly centered to the pads. If they are not, you can easily adjust them. When more than two pins are soldered it is almost impossible to do adjustments. After all pins are exactly adjusted to the pads, you can apply solder flux (we prefer paste not liquid) to one side of microcontroller. Carefully solder all pins and check them. Continue with other sides until all pins are soldered. If you have made some short circuits, aply some flux and absorb surplus solder with solder wicker wire.

All pins of your microcontroller are available on the header around it. Pins numbers which are marked on PCB are valid only for the 144 pins package. For other packages look at the reference table bellow.

ATTENTION!! Now it is time to carefully read the data sheet of your microcontroller if you had not done that before.

2. Power supply

Power is taken from USB port. LED diode „POWER“ lights when the board is connected to supply. IC1, R1, R7, C1 and C2 are needed to stabilize 5V from USB to 3,3V. Components IC2, R2, R3, C6 and C7 is used when you need additional 1,8 V. C5 should always be mounted.

3,3V is available on SUP1, 3,3V and GND is available on SUP3 header. 3,3V and 1,8V is available on SUP2.

You should connect voltages as needed to microcontrollers header with short wires. For correct connection, please look in data sheet of your microcontroller. Do not connect GND pins at this point. They are connected in step 10.

3. Crystal section

Q1, C3 and C4 are used for microcontrollers clock. Q2, C9 and C10 are used for real time clock. Solder the components that you need and connect them to proper pins of microcontroller.

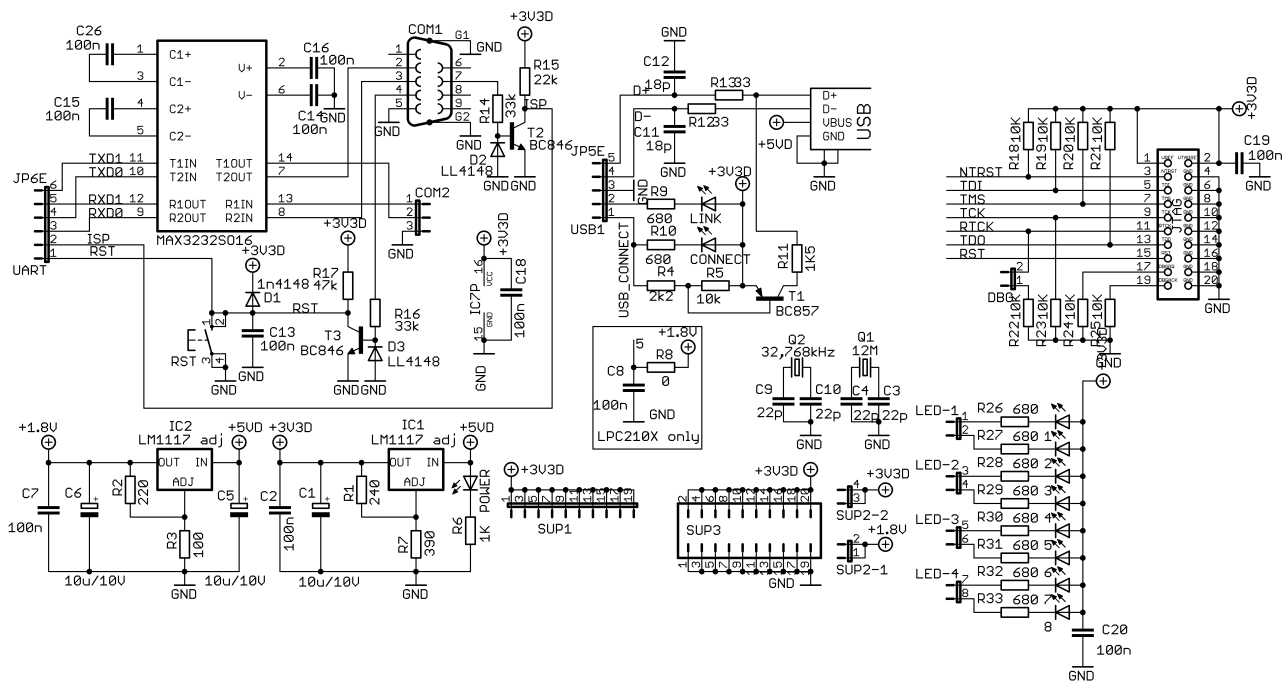


Figure 1: Schematic diagram

4. LED section

R26 – R33 are used to limit current through LED1 – LED8. C20 can also be installed. Connect them to microcontrollers outputs using short wires. Which microcontrollers outputs will drive LEDs is depended on your application.

5. JTAG

If you will use JTAG for debugging and / or programming solder C19, DBG jumper, R19 – R25 and JTAG connector. Connect appropriate pins to microcontrollers header on the bottom side.

6. LPC210X

If your microcontroller is LPC210X solder R8 and C8. Instead of R8 some solder will work OK also.

7. USB section

This section is prepared if you use microcontroller with USB interface (e.g. LPC2148, LPC2368, LPC2378....). Solder R4, R5, R9 – R13, C11, C12 and T1. Connect USB1 header to appropriate pins of microcontrollers header with short wires. USB connector should be soldered at the end. Even if you will not use USB communication it is necessary to solder the USB connector for the power supply.

8. RESET

D1, R17, C13 and RST button is used to properly reset your microcontroller. Connect pin 1 of UART header to reset pin of your microcontroller.

9. RS232 section

It is made around MAX3232. Also solder C14 - C16, C18 and C26. Female DB9 connector is provided only for COM1. COM2 is on the header with the same name.

R14, R15, D2 and T2 are used for level adapting of RTS line. Second level shifter for DTR signal is composed by R16,

R17, D3 and T3. It is connected to reset line. In NXP's LPC2000 family they are used as ISP and reset signal for programming via serial port.

Connect UART header to microcontroller header with short wires.

10. Bottom section

On the bottom side of PCB you can connect blocking capacitors. Their size is 0603 SMD. They can be connected to every pin, but normally only some pins are used. Look in microcontroller's data sheet for reference. Now you can also connect microcontroller's pins to GND. Use some solder or SMD0603 0 ohm resistors.

11. Connectors

Now it is time to solder the connectors. USB connector is needed for power supply. It depends on your application if you will solder other connectors.

How is microcontroller's pins connected to header															
pin	100	64	48	pin	100	64	48	pin	100	64	48	pin	100	64	48
1	1	1	1	37	26	17	13	83	-	-	-	119	-	-	-
2	2	2	2	38	27	18	14	84	51	-	-	120	76	-	-
3	3	3	3	39	28	19	15	85	52	-	-	121	77	-	-
4	4	4	4	40	29	20	16	86	53	-	-	122	78	-	-
5	5	5	5	41	30	21	17	87	54	-	-	123	79	-	-
6	6	6	6	42	31	22	18	88	55	-	-	124	80	-	-
7	7	7	7	43	32	23	19	89	56	-	-	125	81	-	-
8	8	8	8	44	33	24	20	90	57	-	-	126	82	-	-
9	9	9	9	45	34	25	21	91	58	-	-	127	83	-	-
10	10	10	10	46	35	26	22	92	59	-	-	128	84	-	-
11	11	11	11	47	36	27	23	93	60	33	-	129	85	49	-
12	12	12	12	48	37	28	24	94	61	34	-	130	86	50	-
13	13	13	-	49	38	29	-	95	62	35	-	131	87	51	-
14	14	14	-	50	39	30	-	96	63	36	-	132	88	52	-
15	15	15	-	51	40	31	-	97	64	37	25	133	89	53	37
16	16	16	-	52	41	32	-	98	65	38	26	134	90	54	38
17	17	-	-	53	42	-	-	99	66	39	27	135	91	55	39
18	18	-	-	54	43	-	-	100	67	40	28	136	92	56	40
19	19	-	-	55	44	-	-	101	68	41	29	137	93	57	41
20	20	-	-	56	45	-	-	102	69	42	30	138	94	58	42
21	21	-	-	57	46	-	-	103	70	43	31	139	95	59	43
22	22	-	-	58	47	-	-	104	71	44	32	140	96	60	44
23	23	-	-	59	48	-	-	105	72	45	33	141	97	61	45
24	24	-	-	60	49	-	-	106	73	46	34	142	98	62	46
25	25	-	-	61	50	-	-	107	74	47	35	143	99	63	47
26	-	-	-	62	-	-	-	108	75	48	36	144	100	64	48

BOM Part	Value	Package	Qty.
IC1, IC2	LM1117 adj	SOT223	2
IC7	MAX3232	SO16	1
T1	BC857	SOT23	1
T2, T3	BC847	SOT23	2
D1	LL4148	SOD80C	1
D2, D3	LL4148	SOD80C	2
1 - 8, CONNECT, LINK, POWER	SMD LED 0805	SMD 0805	11
R8	0	R0805	1
R12, R13	33	R0805	2
R3	100	R0805	1
R2	220	R0805	1
R1	240	R0805	1
R7	390	R0805	1
R9, R10, R26 - R33	680	R0805	10
R6	1k	R0805	1
R11	1k5	R0805	1
R4	2k2	R0805	1
R5, R18 - R25	10k	R0805	9
R15	22k	R0805	1
R14, R16	33k	R0805	2
R17	47k	R0805	1
C11, C12	18p	C0805	2
C3, C4, C9, C10	22p	C0805	4
C2, C7, C8, C13 - C20	100n	C0805	11
C1, C5, C6	10u/10V tantal	SMD 3528	3
Q1	12M	HC49/S	1
Q2	32,768kHz	TC26V	1
DBG	Jumper 2 pin	JP1	1
JTAG	2,54 mm two rows header	20 pins	1
USB	USB-B-H	USB-B-H	1
COM1	Female SUB D connector	F09HP	1
RST	Tact switch	B3F-10XX	1

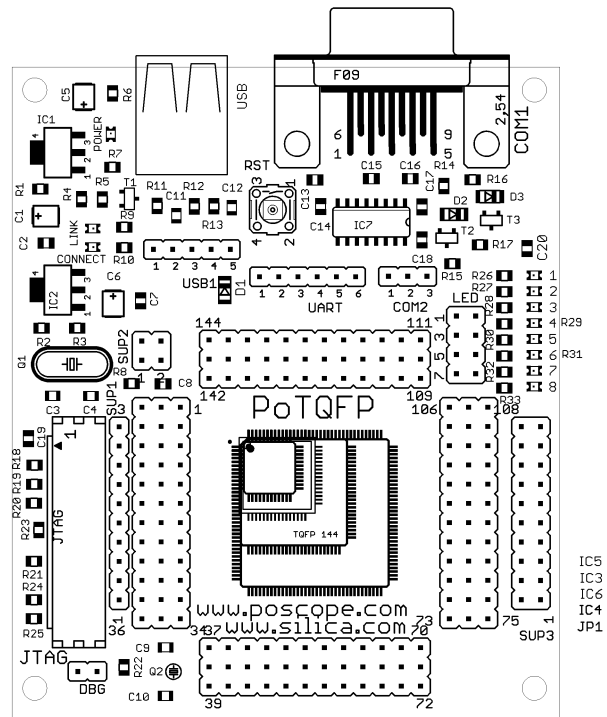


Figure 2: Montage top



User manual