

Acorn Electron ULA - MAX 10 Board - V1.02

Bill of Materials

**Note: This board can only be fitted to a PGA68 socket on the Electron board. This requires that the original ULA and socket are removed and replaced with a turned pin PGA68 socket**

[https://www.ebay.co.uk/i/292483310138?chn=ps&norover=1&mkevt=1&mkrld=710-134428-41853-0&mkcid=2&itemid=292483310138&targetid=908661474856&device=c&mkttype=pla&googleloc=9046613&poi=&campaignid=10195651586&mkgroupid=107296210212&rsatarget=pla-908661474856&abclid=1145987&merchantid=7398364&gclid=EAlaIqobChMl6ru5t-WQ6glVzoKyCh1oBwxlEAAQYCIABEglmjvD\\_BwE](https://www.ebay.co.uk/i/292483310138?chn=ps&norover=1&mkevt=1&mkrld=710-134428-41853-0&mkcid=2&itemid=292483310138&targetid=908661474856&device=c&mkttype=pla&googleloc=9046613&poi=&campaignid=10195651586&mkgroupid=107296210212&rsatarget=pla-908661474856&abclid=1145987&merchantid=7398364&gclid=EAlaIqobChMl6ru5t-WQ6glVzoKyCh1oBwxlEAAQYCIABEglmjvD_BwE)

- Tips
- 1. Fit the ULA socket pins last (15). I would recommend "tinning" the pins which go into the ULA socket before fitting to the board otherwise they are a loose fit in the socket. **Check on your socket before doing this though just in case**
  - 2. I recommend using a gel like flux for the SMD chips. Run plenty along each row of pads and then align the chip correctly, the gel helps keep the chip in place. Tag each corner by soldering one or two pins and then drag solder the rest. See guide below
  - 3. All the passives (capacitors, resistors), comparator and regulator etc are best done with solder flux and a hot air gun. I would avoid doing this to the SW1 switch however as it may melt it. The switch is best done with the soldering iron

Excellent drag soldering guide here "<https://www.youtube.com/watch?v=nyele3Cis-U>"

Id	Designator	Package	Quantity	Designation	Description	Supplier and ref
1	D2,D1	D_SOD-323_HandSoldering	2	Schottky Diode	BAT54	<a href="https://www.digikey.co.uk/product-detail/en/on-semiconductor/BAT54HT1G/BAT54HT1G05CT-ND/917809">https://www.digikey.co.uk/product-detail/en/on-semiconductor/BAT54HT1G/BAT54HT1G05CT-ND/917809</a>
2	U10	TSSOP-14_4.4x5mm_P0.65mm	1	74HCT125D	Quad Buffer	<a href="https://www.digikey.co.uk/product-detail/en/hexperia-usa-inc/74HCT125PW,118/1727-4087-1-ND/1965389">https://www.digikey.co.uk/product-detail/en/hexperia-usa-inc/74HCT125PW,118/1727-4087-1-ND/1965389</a>
3	R25,R20,R24,R23,R22,R21,R19,R18,R17,R16,R15,R14,R13,R12,R11,R10,R9,R8,R7	R_0603_1608Metric_Pad1.05x0.95mm_HandSolder	19	10K Resistor		
4	SW1	SW_DIP_SPSTx04_Slide_Copal_CHS-04B_W7.62mm_P1.27mm	1	SW_DIP_x04	Configuration Switch	<a href="https://www.digikey.co.uk/product-detail/en/nidec-copal-electronics/CHS-04TB/563-1008-1-ND/948417">https://www.digikey.co.uk/product-detail/en/nidec-copal-electronics/CHS-04TB/563-1008-1-ND/948417</a>
5	J1	PinHeader_1x02_P2.54mm_Vertical	1	Conn_01x02	5V Power Input Normal Square Pins	
6	JTAG1	PinHeader_2x05_P2.54mm_Vertical	1	Conn_02x05_Odd_Even	JTAG Pins Normal Square Pins	
7	C29,C27,C25,C23,C22,C21,C19,C18,C13,C12,C10,C8,C6,C4,C9,C7,C5,C3,C2,C1,C16,C30,C17,C15,C14,C1	C_0603_1608Metric_Pad1.05x0.95mm_HandSolder	26	0.1uF Capacitor		
8	X1	Crystal_SMD_7050_4pads	1	Oscillator	16Mhz Oscillator	Not required unless Electron 16Mhz signal is very poor. FPGA will require an update to use the on board 16Mhz signal
9	C28	C_0805_2012Metric_Pad1.15x1.40mm_HandSolder	1	10uF Capacitor Tantalum		
10	U8	SOT-223	1	AP2114H-3.3TRG1	Regulator	<a href="https://www.digikey.co.uk/product-detail/en/diodes-incorporated/AP2114H-3.3TRG1/AP2114H-3.3TRG1DICT-ND/4505142?utm_adgroup=PMIC%20-%20Voltage%20Regulators%20-%20Linear&amp;utm_source=google&amp;utm_medium=cpc&amp;utm_campaign=Google%20Shopping_Integrated%20Circuits%20%28ICs%29&amp;utm_term=&amp;productid=4505142&amp;gclid=EAlaIqobChMlkoq-teuO6glVC4myCh007woeEAQYASABEglojvFD_BwE">https://www.digikey.co.uk/product-detail/en/diodes-incorporated/AP2114H-3.3TRG1/AP2114H-3.3TRG1DICT-ND/4505142?utm_adgroup=PMIC%20-%20Voltage%20Regulators%20-%20Linear&amp;utm_source=google&amp;utm_medium=cpc&amp;utm_campaign=Google%20Shopping_Integrated%20Circuits%20%28ICs%29&amp;utm_term=&amp;productid=4505142&amp;gclid=EAlaIqobChMlkoq-teuO6glVC4myCh007woeEAQYASABEglojvFD_BwE</a>
11	C20,C26,C31	C_0805_2012Metric_Pad1.15x1.40mm_HandSolder	3	0.1uF Capacitor		
12	R2,R1,R5,R4,R3	R_0805_2012Metric_Pad1.15x1.40mm_HandSolder	5	10K Resistor		
13	U1	EQFP	1	10M08SCE144C8G	Intel MAX 10 FPGA	<a href="https://www.digikey.co.uk/products/en?keywords=10M08SCE144C8G">https://www.digikey.co.uk/products/en?keywords=10M08SCE144C8G</a>
14	U5,U7,U3,U6,U4,U2	TSSOP-24_4.4x7.8mm_P0.65mm	6	74LVC4245APW	Octal Transceiver	<a href="https://www.digikey.co.uk/product-detail/en/hexperia-usa-inc/74LVC4245APW-118/1727-4308-1-ND/2209918">https://www.digikey.co.uk/product-detail/en/hexperia-usa-inc/74LVC4245APW-118/1727-4308-1-ND/2209918</a>
15	U9	ULA Socket Pins - 1x40 - 2.54mm Pin Headers	2	PGA 68 Pin Layout	ULA Socket Pins Turned Pin Type	<a href="https://hobbycomponents.com/connectors/439-01-254mm-40way-sil-turned-pin-m-m-headers-pack-of-5">https://hobbycomponents.com/connectors/439-01-254mm-40way-sil-turned-pin-m-m-headers-pack-of-5</a>
16	CMP1	SOT-23-5	1	MIC7221YM5-TR	Comparator	<a href="https://www.digikey.co.uk/product-detail/en/microchip-technology/MIC7221YM5-TR/576-2901-1-ND">https://www.digikey.co.uk/product-detail/en/microchip-technology/MIC7221YM5-TR/576-2901-1-ND</a>
17	R6	R_0805_2012Metric_Pad1.15x1.40mm_HandSolder	1	100R Resistor		