

Category	Vendor	Item Number	Item Description	Quantity Per Package	Cost Per Package	Number of Packages	Item Total Cost	Part Link	Symbol, Layout, & 3D Model Link	Comments	Designation on Mouse 7.0 Test	Designation on Mouse 7.0 PCB
Power	Amazon	B096G4D6ZX	URGENEX 7.4V	2	\$19.99	1	\$19.99	https://www.amazon.com/dp/B096G4D6ZX		- 7.4V LiPo battery, 900mAh, 46g, 30C - JST PH 2.0 pitch 2 position for power, 3 position for charging - 53mm x 16mm x 29mm (l x h x w)		
	Amazon	B09DP9FZTX	CQRobot 50 Set	50	\$7.99	1	\$7.99	https://www.amazon.com/dp/B09DP9FZTX		- JST PH 2.0 pitch 2 position pack both male and female TH - 50 male, 50 female		
										- schottky diode for everything except vacuum that needs 5A - prevents up to 30V and allows 5A to pass for 3.3V, 5V, 12V, and 3.2V regulators - small 370mV forward drop		
	Digikey	CMS04(TE12LQI	DIODE SCHOTT	1	\$0.76	4	\$3.04	https://www.digikey.com	https://app.ultralibrari.com			
	Digikey	296-53563-1-ND	DC DC CONVER	1	\$3.48	1	\$3.48	https://www.digikey.com	https://app.ultralibrari.com	- 3.7V 2A regulator for vacuum motor - schematic generated w/ TI tool: HERE HERE		
	Digikey	445-7665-1-ND	CAP CER 22UF	1	\$0.39	2	\$0.78	https://www.digikey.com	n/a	- Cin for vacuum fan regulator circuit - 0805 package - 22uF		
	Digikey	445-8239-1-ND	CAP CER 47UF	1	\$0.79	3	\$2.37	https://www.digikey.com	n/a	- Cout for vacuum fan regulator circuit - 0805 package - 47uF		
	Digikey	399-C0402C331	CAP CER 330PF	1	\$0.24	1	\$0.24	https://www.digikey.com	n/a	- Cff for vacuum fan regulator circuit - 0402 package - 330pF		
	Digikey	541-10.0KLCT-N	RES SMD 10K C	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Rfbl for vacuum fan regulator circuit - 0402 package - 10k Ohm resistor		
	Digikey	541-1.91KLCT-N	RES SMD 1.91K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Rfbb for vacuum fan regulator circuit - 0402 package - 1.91k Ohm resistor		
	Digikey	296-TPS61288R	IC REG BOOST	1	\$5.89	1	\$5.89	https://www.digikey.com	https://app.ultralibrari.com	- 12V 3A regulator for wheel motor driver - schematic generated w/ TI tool: https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=AA120		
	Digikey	445-4042-1-ND	CAP CER 10UF	1	\$0.30	1	\$0.30	https://www.digikey.com	n/a	- Cin for wheel motor regulator circuit - 1206 package - 10uF		
	Digikey	445-1314-1-ND	CAP CER 0.1UF	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Cinx for wheel motor regulator circuit - 0603 package - 0.1uF		
	Coilcraft	XAL7070-332	XAL7070-332ME	1	\$3.25	1	\$3.25	https://www.coilcraft.com	https://app.ultralibrari.com	- L1 for wheel motor regulator circuit		
	Digikey	445-4952-1-ND	CAP CER 0.1UF	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Cbst for wheel motor regulator circuit - 0402 package - 0.1uF		
	Digikey	445-9097-1-ND	CAP CER 2.2UF	1	\$0.29	1	\$0.29	https://www.digikey.com	n/a	- Cvcv for wheel motor regulator circuit - 0402 package - 2.2uF		
	Digikey	541-34.0KLCT-N	RES SMD 34K C	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Rcomp for wheel motor regulator circuit - 0402 package - 34k Ohms		
	Digikey	490-16432-1-ND	CAP CER 0.039F	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Ccomp for wheel motor regulator circuit - 0402 package - 39nF		
	Digikey	399-11256-1-ND	CAP CER 82PF	1	\$0.49	1	\$0.49	https://www.digikey.com	n/a	- Ccomp2 for wheel motor regulator circuit - 0402 package - 82pF		
	Digikey	541-931KLCT-N	RES SMD 931K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Rfbl for wheel motor regulator circuit - 0402 package - 931k Ohms		
	Digikey	541-48.7KLCT-N	RES SMD 48.7K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- Rfbb for wheel motor regulator circuit - 0402 package - 48.7k Ohms		
	Digikey	490-16309-1-ND	CAP CER 47UF	1	\$0.52	3	\$1.56	https://www.digikey.com	n/a	- Cout for wheel motor regulator circuit - 1210 package - 47uF		
	Digikey	EG5554-ND	SWITCH ROCKE	1	\$1.64	1	\$1.64	https://www.digikey.com	https://www.mouser.com	- switch for on/off of entire mouse - rated for 15A (AC), can hopefully handle 9A DC		
	Digikey	283-5179-1-ND	FUSE BRD MNT	1	\$0.91	1	\$0.91	https://www.digikey.com	https://www.mouser.com	- 10A fuse for entire mouse		Extra new
	Digikey	P122314CT-ND	CAP ALUM 1200	1	\$0.49	1	\$0.49	https://www.digikey.com	https://www.mouser.com	- 3A for wheels + 2A for vacuum + 1A for 3.3V + 1A for 5V = 7A - 1.2mF 16V bulk cap for entire mouse		Extra new
	Digikey	296-39450-1-ND	IC REG BUCK 5V	1	\$1.36	1	\$1.36	https://www.digikey.com	https://app.ultralibrari.com	- 5V, 500mA switching regulator - used to power Sharp sensors		
	Digikey	296-39449-1-ND	IC REG BUCK 3V	1	\$1.36	1	\$1.36	https://www.digikey.com	https://app.ultralibrari.com	- 3.3V, 500mA switching regulator - used to power MCU		
	Digikey	445-6857-1-ND	CAP CER 10UF	1	\$0.31	2	\$0.62	https://www.digikey.com	n/a	- 10uF ceramic cap needed for 5V and 3.3V switching regulator - between VIN and PGND (pg 21 pdf of datasheet) - 0805 package		

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	Digikey	445-7665-1-ND	CAP CER 22UF	1	\$0.39	2	\$0.78	https://www.digikey.com	n/a	- 22uF ceramic cap needed for 5V and 3.3V switching regulator - between SW and FB (pg 21 pdf of datasheet)		
	Digikey	541-100KHCT-N	RES SMD 100K	1	\$0.10	2	\$0.20	https://www.digikey.com	n/a	- 100k Ohm resistor needed for 5V and 3.3V switching regulator - between SW/VOS and PG (pg 21 pdf of datasheet) - smaller 0603 package		
	Digikey	732-2613-1-ND	FIXED IND 2.2UH	1	\$1.64	2	\$3.28	https://www.digikey.com	https://www.mouser.com	- 2.2uH inductor needed for 5V and 3.3V switching regulator - between SW and 100k Ohm resistor (pg 21 pdf of datasheet)	(NEW, old dupe)	
	Digikey	296-TLV9301IDB	IC OPAMP GP 1	1	\$0.58	1	\$0.58	https://www.digikey.com	https://app.ultralibrary.com	- low battery voltage indicator op amp - to be used as comparator to turn on/off regulators		
	Digikey	P118KLCT-ND	RES SMD 118K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- R2 for low battery voltage comparator circuit - 0402 package - 118k Ohms		
	Digikey	541-100KLCT-N	RES SMD 100K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- R1 for low battery voltage comparator circuit - 0402 package - 100k Ohms		
	Digikey	541-10.0KLCT-N	RES SMD 10K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- R1 for comparator output divider - 0402 package - 10k ohms	(NEW, dupe)	
	Digikey	P3.74KLCT-ND	RES SMD 3.74K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- R2 for comparator output divider - 0402 package - 3.74k ohms	NEW	
Wheel Motor Related	Digikey	61FG8ELCT-ND	IC MOTOR DRIV	1	\$3.51	1	\$3.51	https://www.digikey.com	https://app.ultralibrary.com	- H bridge PWM interface brushed motor driver - 10-36V supply, 3A output max, 30-BSOP		
	Digikey	445-7456-1-ND	CAP CER 0.1uF	1	\$0.11	1	\$0.11	https://www.digikey.com	n/a	- C2 0.1uF cap for 5V output from motor driver - datasheet pg 8: HERE - 0603 package		
	Digikey	P121394CT-ND	CAP ALUM HYB	1	\$1.45	1	\$1.45	https://www.digikey.com	https://www.mouser.com	- C1 47uF polymer cap for motor driver supply - datasheet pg 8		
	Servocity	638103	Gear Motor with	1	\$19.99	2	\$39.98	https://www.servocity.com		- Gear motors, 4900rpm w/ encoders - 6 position 1.5 pitch ZH JST		
	Pololu	1087	Black plastic whe	2	\$4.95	1	\$4.95	https://www.pololu.com	https://www.jst-mfg.com	- Wheels, 32mm diameter, 3mm D output shaft - we'll use just the rubber tire and make a custom wheel		
	Amazon	B09NCCXP	GMPGM CQRobot 100 Se	100	\$9.58	1	\$9.58	https://www.amazon.com	https://app.ultralibrary.com	- JST ZH 6 position male (receptacle) TH connector		
	Amazon	B07FW18RQY	uxcell 683ZZ Bal	20	\$7.99	1	\$7.99	https://www.amazon.com		- 3mm ball bearings to be embedded into custom wheels		
	Servocity	1500-0010-0003	1500 Series Plas	12	\$1.87	1	\$1.87	https://www.servocity.com		- 3mm plastic spacers to put between wheel and mount		
	Amazon	B0BKQSMFL	FOLIV 700PCS M	10-50	\$15.29	1	\$15.29	https://www.amazon.com		- M3 button head screws to serve as wheel axels		
	Digikey	1727-7806-1-ND	DIODE SCHOTT	1	\$0.39	8	\$3.12	https://www.digikey.com	https://app.ultralibrary.com	- Flyback diodes for EMF protection		
Vacuum Fan Related	Amazon	B08RMQP6YP	1.25mm Male an	20	\$18.99	1	\$18.99	https://www.amazon.com	n/a	- Molex picoblade connector various positions, - includes 3 position 1.25mm pitch male and female connector, 20 of each - includes 10cm precrimped wire - to be used to extend HQLRC wire		
	Digikey	DMN3200U-7DI	C MOSFET N-CH 3	1	\$0.45	1	\$0.45	https://www.digikey.com	https://www.mouser.com	- 2.2A 30V MOSFET to switch on/off regulator power to vacuum fan	NEW	
	Digikey	P17216CT-ND	RES 47 OHM 1%	1	\$0.23	1	\$0.23	https://www.digikey.com	n/a	- 47 Ohm gate resistor for MOSFET to limit surge current	NEW	
	Digikey	541-10.0KLCT-N	RES SMD 10K	1	\$0.10	1	\$0.10	https://www.digikey.com	n/a	- 10k Ohm resistor for pulling down input to MOSFET to ensure low	(NEW, dupe)	
	Digikey	493-3813-1-ND	RNE1C101MDS	1	\$0.76	1	\$0.76	https://www.digikey.com	https://app.ultralibrary.com	- 100uF capacitor for vacuum fan driver		
	Digikey	4988-NMC0805X	CAP SMT08050.	1	\$0.24	1	\$0.24	https://www.digikey.com	n/a	- 0.1uF cap for brushless motor driver - 0805 package		
	Amazon	B07CFQMFM1	8pcs 8520 Motor	8	\$18.99	1	\$18.99	https://www.amazon.com	n/a	- 15000KV brushed DC motor for vacuum fan - 2p 1.25mm pitch picoblade connector		
	Digikey	WM1731-ND	CONN HEADER	1	\$0.23	1	\$0.23	https://www.digikey.com	https://app.ultralibrary.com	- motor to board connector for vacuum fan		
	Digikey	1727-7806-1-ND	DIODE SCHOTT	1	\$0.39	2	\$0.78	https://www.digikey.com	https://www.molex.com	- 2p 1.25mm pitch picoblade connector - Flyback diodes for EMF protection		
Ball Caster, nuts, screws	Amazon	B08TYDZVM8	1 Oz (23 Grams)	1	\$6.99	1	\$6.99	https://www.amazon.com		- superglue to attach 3D printed mounts to PCB		

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IR Sensing	Digikey	1855-1027-ND	SENSOR OPTIC	1	\$8.45	4	\$33.80	https://www.digik	https://www.mouser.c	- Sharp IR distance sensor 2-15cm - shortest range sharp IR sensor available - connects w/ 3 position ZH JST connector - needs 10uF cap			
	Amazon	B09NC8Y2PK	CQRobot 100 Se	50	\$11.99	1	\$11.99	https://www.ama	https://www.jst-mfg.cc	- JST ZH 1.5 pitch 3 position pack both male and female TH - 50 male, 50 female			
	Digikey	490-GRM155R6	CAP CER 10UF	1	\$0.13	4	\$0.52	https://www.digik	n/a	- 10uF ceramic capacitor, SMD 0402 - needed for Sharp IR sensors	NEW		
	Digikey	CAY16-1001F4LI	RES ARRAY 4 R	1	\$0.10	1	\$0.10	https://www.digik	https://app.ultralibrari	- R1 resistor array to drop 2.5V max from IR sensor output to 1.8V - 1k Ohm resistor array, 4 resistors			
	Digikey	CAY16-2201F4LI	RES ARRAY 4 R	1	\$0.10	1	\$0.10	https://www.digik	https://app.ultralibrari	- R2 resistor to drop 2.5V max from IR sensor output to 1.8V - 2.2k Ohms calculated w/ voltage divider equation - resistor array, 4 resistors			
MCU	Digikey	1175-1733-ND	CONN HEADER	1	\$0.68	1	\$0.68	https://www.digik	https://www.arrow.com	- 2x5 TH JTAG programming header - small 1.27 pitch w/ key slot and shroud			
	Digikey	2151-RT3215-32	CRYSTAL 32.768	1	\$0.42	1	\$0.42	https://www.digik	https://app.ultralibrari	- 32.768kHz external crystal			
	Digikey	490-GQM1555C	CAP CER 22PF ;	1	\$0.61	2	\$1.22	https://www.digik	https://app.ultralibrari	- 22pF caps for external crystal - needed on each crystal terminal	NEW		
	Amazon	B07BJJC3R6	NOYITO TTL to f	1	\$7.99	1	\$7.99	https://www.ama	not needed	- TTL to DB-9 (DE-9) translator for serial out			
	Amazon	B0759HSLP1	OIKWAN USB to	1	\$11.99	1	\$11.99	https://www.ama	not needed	- DB-9 (DE-9) to USB A for serial out			
	Digikey	AT32UC3L0256-	IC MCU 32BIT 2K	1	\$10.19	1	\$10.19	https://www.digik	https://app.ultralibrari	- AT32UC3L0256 AVR MCU to replace Arduino - 50MHz, faster than controller above, operates on 3.3V - 12b ADC, PWM, programmed via JTAG and aWire - schematic checklist: HERE			
	Digikey	490-GRM155R6	CAP CER 10UF	1	\$0.13	1	\$0.13	https://www.digik	n/a	- 10uF capacitor for AT32UC3L0256 VDDin - page 4 of schematic checklist - small 0402 package	NEW		
	Digikey	445-4952-1-ND	CAP CER 0.1UF	1	\$0.10	3	\$0.30	https://www.digik	n/a	- 0.1uf ceramic cap for AT32UC3L0256 VDDin, VDDio, and VDDcore - page 4 of schematic checklist - 0402 package	(NEW, dupe)		
	Digikey	445-9097-1-ND	CAP CER 2.2UF	1	\$0.29	1	\$0.29	https://www.digik	n/a	- 2.2uF ceramic cap for AT32UC3L0256 VDDio, and VDDcore - page 4 of schematic checklist - 0402 package	(NEW, dupe)		
	Digikey	445-4952-1-ND	CAP CER 0.1UF	1	\$0.10	1	\$0.10	https://www.digik	n/a	- 0.1uF ceramic cap for AT32UC3L0256 VDDana and ADVREF - page 5 of schematic checklist - 0402 package	(NEW, dupe)		
	Digikey	732-7426924115	WE-TMSB SMT I	1	\$0.13	1	\$0.13	https://www.digik	https://app.ultralibrari	- ferrite bead for AT32UC3L0256 VDDana and ADVREF - page 5 of schematic checklist, and page 15 on xplained dev board schematic: HERE	NEW		
	Digikey	445-4952-1-ND	CAP CER 0.1UF	1	\$0.10	1	\$0.10	https://www.digik	n/a	- 0.1uF ceramic cap for JTAG on AT32UC3L0256 - 0402 package	(NEW, dupe)		
	Digikey	541-10.0KLCT-N	RES SMD 10K C	1	\$0.10	1	\$0.10	https://www.digik	n/a	- 10k resistor for pulling down enable signal - 0402 package	(NEW, dupe)		
	Bluetooth	Digikey	1965-ESP32-PIC RF TXRX MOD E		1	\$3.50	1	\$3.50	https://www.digik	https://www.mouser.c https://app.ultralibrari	- ESP32 bluetooth module to serve as a serial bridge between mouse and laptop - perfect for our application- Sparkfun has a dev board doing exactly what we want		Extra Extra new
		Digikey	445-9077-1-ND	CAP CER 22UF	1	\$0.34	1	\$0.34	https://www.digik	n/a	- 22uF cap to decouple ESP32 module power - 0603 package		Extra Extra new
Digikey		445-4952-1-ND	CAP CER 0.1UF	1	\$0.10	1	\$0.10	https://www.digik	n/a	- 0.1uF cap to decouple ESP32 module power - 0402 package	(NEW, dupe)		
Digikey		541-10.0KLCT-N	RES SMD 10K C	1	\$0.10	1	\$0.10	https://www.digik	n/a	- 10k resistor to slow down ESP32 module power up - 0402 package	(NEW, dupe)		
Digikey		445-9086-1-ND	CAP CER 1UF 1	1	\$0.10	1	\$0.10	https://www.digik	n/a	- 1uF cap to slow down ESP32 module power up - 0402 package		Extra Extra new	
Digikey		2449-CS1213AG SWITCH TACTIL		1	\$0.40	1	\$0.40	https://www.digik	https://app.ultralibrari	- pushbutton for ESP32 module boot option	(NEW, dupe)		
Digikey		PPPC041LGBN-	CONN HDR 4PC	1	\$0.68	1	\$0.68	https://www.digik	https://octopart.com/p	- female 2.54mm pitch connector to connect to mouse		Extra Extra new	
Misc	Digikey	2449-CS1213AG SWITCH TACTIL		1	\$0.40	1	\$0.40	https://www.digik	https://app.ultralibrari	- 3.9mm x 2.9mm smd pushbutton for config - 2mm high	NEW	Extra new	
	Digikey	754-1105-1-ND	LED YELLOW CL	1	\$0.41	1	\$0.41	https://www.digik	https://app.ultralibrari	- yellow SMD LED 0402 package for debug	NEW		
	Digikey	754-2123-1-ND	LED RED CLEA	1	\$0.52	1	\$0.52	https://www.digik	https://app.ultralibrari	- red SMD LED 0402 package for error indication	NEW		
	Digikey	754-1503-1-ND	LED GREEN CL	1	\$0.70	1	\$0.70	https://www.digik	https://app.ultralibrari	- green SMD LED 0402 package for debug	NEW		
	Digikey	754-1504-1-ND	LED BLUE CLEA	1	\$0.51	1	\$0.51	https://www.digik	https://app.ultralibrari	- blue SMD LED 0402 package for debug	NEW		
	Digikey	CAY16-1001F4LI	RES ARRAY 4 R	1	\$0.10	1	\$0.10	https://www.digik	https://app.ultralibrari	- 1k Ohm resistor array, 4 resistors			
	Digikey	952-2664-1-ND	PC TEST POINT	1	\$0.31		\$0.00	https://www.digik	https://www.mouser.c	- TH testpoint to probe mouse			

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PCB	JLC PCB	n/a	PCB prototype:Y	5	\$2.00	1	\$2.00	https://jlcpcb.com		- solid and cheap PCB vendor - no issues so far, purple nice and deep purple		