

FPGA Boot Camp \$20 FPGA kit with full user IO, some assembly required: soldering & breadboard wiring

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item	avail	web link	2nd web link	need	part #	high vol unit price	quant	min quant price	# per unit	dx mm	dy mm	IO	K LUTs	Mb block RAM	MB DRAM	MB flash	Q	vendor	mfg	comments
Seeed Tang Nano-9K	no	https://www.seeedstudio.com/Tang-Nano-9K-FPGA-board-Go	https://www.cnx-software.com/	FPGA board	GW1N-9	\$14.900	1	\$14.90	1	25.4	60.0	36	8.6	0.48	8.0	8.0	Y	Seeed	gowinsemi	2PB, 6LED, HDMI & LCD conn, 27MHz osc
8 7-seg, 8 PB, 8 LED	yes	https://handsontec.com/index.php/product/tm1638-7-segment-display-keypadled-modul		User IO	TM1638 7-Segment Dis	\$2.900	1	\$2.90	1	50.8	76.2	5 pins						HandsOn Tech		all user IO except slide switches
16 PCS 400 Pin Solderless Board	yes	https://www.amazon.com/MCIGICM-Breadboard-Solderless-Prototype-Protoboard/dp/B		Breadboard	MCIGICM Breadboard 4	\$1.250	16	\$1.25	1	102.6	152.4							amazon	MCIGICM	connectable
12 position DIP switch	yes	https://www.mouser.com/ProductDetail/CUI-Devices/DS01C-254-L-09BE?qs=wnTfsH77X		~10 slide switches	490-DS01C-254-L-09BE	\$0.458	2508	\$1.02	1	10.2	30.5							mouser	CUI	bend out the pins for 2 sets of five
iceFUN FPGA Board	yes	https://www.robotshop.com/en/icefun-fpga-board.html			ICE40			\$31.46		22.9	66.0	45	7.7	0.13						includes PIC16 & 4x8 LED array
pico-ice		https://github.com/tinyvision:ai-inc/pico-ice	https://tinyvision.ai/		ICE40UP5K					22.9	50.8	80	5.3	0.12	8.0	4.0				RP2040 & iCE, 4 column IO, RGB LED
6 PCS 400 Pin Solderless Board	yes	https://www.amazon.com/dp/B08DR91Y15/ref=sspa_dk_detail_7?pf_rd_p=46bad5f6-1f0a-4167-9a8b-c8a82f2		400 Pin		\$1.500	6	\$1.50										amazon		connectable
8 7-seg, 16 PB	yes	https://handsontec.com/index.php/product/tm1638/						\$4.60												used in appliances
rotary dip switch	yes	https://www.digikey.com/en/products/detail/cts-electrocomponents/220ADC16/474385		HEX rotary switch	CT3070-ND	\$1.151	5000	\$2.28										digikey	ctscorp	has knob, also surface mount
9 position DIP switch	yes			~8 slide switches		\$0.477	2500	\$0.91										mouser	CUI	knockout middle for 2 sets of four
12 position DIP switch	yes	https://www.digikey.com/en/products/detail/cts-electrocomponents/210-12MS/250378		~10 slide switches	CT21012MS-ND	\$0.549	5000	\$1.06										digikey	ctscorp	knockout legs for 2 sets of five
Breadboard Jumper Cables Kit	yes	https://www.amazon.com/Elegoo-EL-CP-004-Multicolored-Breadboard-arduino/dp/B01E		120 jumpers	Elegoo-EL-CP-004	\$1.396	5	\$6.98										amazon	ELEGOO	8X M/M, M/F, F/F per kit?
make-male Jumper Cables	yes	https://tinkererssupply.com/products/10-cm-40-pin-solderless-jumper-wires-male-to-ma		(40) m/m jumpers	10 CM 40 Pin Solderless	\$0.625	4	\$2.49										tinkersupply		10 per kit?
narrow FPGA boards		https://shop.trenz-electronic.de/en/Products/Trenz-Electronic/																		
cheap FPGA boards		https://www.joelw.id.au/FPGA/CheapFPGADevelopmentBoards																		

DIP switch mounted spanning plugboard ground bus and rows connected to FPGA IOs

Gowin IDE has low level placement tools, wonder about P&R abilities, does support VHDL, Verilog and constraint files

Seeed Tang Nano-9K includes unsoldered pins, USB cable & case; has 27MHz oscillator

Required parts \$19.508

DIP switch only item with high volume price break

FPGA board has DRAM, Flash & SD socket