

## Small soft core uP Inventory

Opencore and other soft core processors

Only cores in the "usable" category included

Highest KIPS per LUT or ALUT (above 200)		©2014 James Brakefield				
Work in progress: KIPS/LUT only approximate, many of the small designs will move down on the list						
Caution: these are bare cores, Fmax will probably drop with additional LUT count						
		wd sz	LUT-ALUT	KIPS/LUT	Fmax	style
cray1	homebrew Cray1	64	13463	<b>57</b>	127	RISC
fpgammix	clone of Knuth's MMIX	64	11605	<b>3</b>	94	RISC
s1_sparc	reduced version of OpenSPARC T1	64	52485	<b>2</b>	56	RISC
microblaze	Xilinx proprietary, area optimized, 70 configuration options, fltg-pt & MMU optional	32	546	<b>603</b>	320	RISC
ARM_Cortex_A9	ASIC, LUTs number based on relative area, dual issue, includes fltg-pt & MMU & caches	32	4500	<b>583</b>	1050	RISC
nios2	Altera proprietary, speed optimized, fltg-pt, cache & MMU optional	32	895	<b>390</b>	310	RISC
hive	4-8 symmetrical stacks, eight threads via pipeline barrel	32	905	<b>313</b>	284	stack
mblite	clone of microblaze, not all instructions implemented	32	941	<b>241</b>	227	RISC
microcore	Forth machine with indexing into return stack, auto inc/dec, variable length imm	32	644	<b>231</b>	149	stack
leros	Leros: A Tiny Microcontroller for FPGAs	16	112	<b>1089</b>	182	accum
Lutiac	Lutiac – Small Soft Processors for Small Programs (academic paper only)	16	140	<b>948</b>	198	register
iDEA	The iDEA DSP Block Based Soft Processor for FPGAs	16	321	<b>845</b>	405	RISC
octavo	Octavo: an FPGA-Centric Processor Family, eight thread barrel pipeline	16	500	<b>737</b>	550	register
cpu16	16-bit forth machine, 5-bit inst	16	367	<b>648</b>	355	forth
xr16	Jan Gray's handcrafted uP auto placed & routed into Kintex-7	16	273	<b>645</b>	263	RISC
msl16	16-bit forth machine, 4-bit inst	16	303	<b>566</b>	256	forth
alwcpu	small simple 16-bit RISC	16	298	<b>533</b>	237	RISC
micro16b	minimal	16	205	<b>349</b>	434	accum
atlas_core	ARM thumb like inst set, also MMU version	16	559	<b>286</b>	200	RISC
J1	16-bit forth machine with 16-bit inst, 38% code size of microblaze	16	333	<b>280</b>	117	forth
diogenes	student RISC system	16	807	<b>246</b>	297	RISC
sayeh_processor	simple educational RISC	16	479	<b>230</b>	164	RISC
usimplez	8 instructions, part of university course	12	48	<b>476</b>	134	accum
eric5	entner-electronics.com proprietary	9	110	<b>229</b>	60	forth
avr8	not a full AVR clone, doc is opencores page	8	174	<b>792</b>	418	AVR
mcpu	fits into 32 macrocell CPLD, only 8 inst	8	41	<b>749</b>	384	accum
myrisc1	RISC with 8-bit instructions	8	121	<b>629</b>	231	RISC
lw risc	ClaiRISC	8	88	<b>444</b>	230	accum
popcorn	small 8 bit uP	8	267	<b>428</b>	347	accum
risc16f84	PIC16 clone	8	331	<b>332</b>	333	PIC16
gumnut	from in Peter Ashenden's Digital Design book, both VHDL & Verilog source	8	388	<b>221</b>	259	RISC
p16c5x	PIC16 clone	8	378	<b>220</b>	252	PIC16
dfp	8-bitter, generates a custom VHDL stack machine, compiler is in Forth	8	297	<b>213</b>	192	forth
lem1_9	logic emulation machine, single stage pipe	1	63	<b>227</b>	358	accum