
Sonne-8 Microcontroller
Reference Schematics
Rev. Myth
Chip "Footprint"
External Connections
Clock
Phases
ALU Instructions
(Results are pushed)
0 DUP ("Copy of A") A := A
1 SWAP ("Copy of X") A := X
2 NOTA ("One's Complement of A") A := ~A
3 NOTX ("One's Complement of X") A := ~X
4 SLA ("Shift left A") A := A<<1
5 SLX ("Shift left X") A := X<<1
6 SRA ("Shift right A") A := A>>1
7 SRX ("Shift right X") A := X >> 1
8 AND ("A boolean-and X") A := A & X
9 IOR ("A inclusive-or X") A := A | X
10 EOR ("A exclusive-or X") A := A ^ X
11 ADD ("Add X to A) A := A + X, bits 0-7
12 OVF ("Overflow bits of: A+B") A := Zero + B6:V + B7:CARRY
13 ALX ("A less than X") A := (A<X)? FFh:0
14 AEX ("A equal to X") A := (A==X)? FFh:0
15 AGX ("A greater than X") A := (A>X)? FFh:0
The accumulator is a two element push-down stack representing the input operands to the ALU.
The stack is formed by registers A (for Accumulator) and X.
Executing an ALU opcode pushes the result onto the accumulator stack.
This operation is a two-step process: (1) Store the previous value of A into X, overwriting X.
(2) Store the ALU result into A, overwriting A.
AX (Accumulator)
Zero detection
A Current value of accumulator
X Previous value of accumulator
ALU
D(OWN COUNTER)
Inner-loops
Branching
Instruction
Decoder
Scrounger
Pair DST Decoder
Pre-Decoders
PAIR Target
Instruction-Word Latch
Pair SRC Decoder
SYS Decoder
TRAP decoder
Immediate calls
GETPUT
Decoder
BOP Decoder
Opcode Type
Decoder
Start, latch
instruction or
interrupt vector
Control Tree
(PC Program Counter)
B:O Pointer
low
O (Page Offset
Register)
B:O Pointer
high
B (Base)
Page Index
BO Pointer
Registers
{PTRB[7..0]}
{DB[7..0]}
Input/Output
S Serial IO
E Device Enable
Register
P Parallel IO
L (Local Page Index
Register)
{LL[7..0]}
{LO[7..0]}
{HI[7..0]}
RAM/ROM
R (Resident
Page Index)
C (Code
Page Index)
Based on working prototype PCB: https://github.com/michaelmangelsdorf/sonne8
Rev. Step "LOx58"
Project homepage: https://github.com/michaelmangelsdorf/myth
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