Re: 66MIPS 8bit microcontroller

Source: http://coding.derkeiler.com/Archive/General/comp.arch.embedded/2007−07/msg00955.html

- *From*: steve <bungalow_steve@xxxxxxxxx>
- *Date*: Sat, 28 Jul 2007 18:18:02 −0700

On Jul 27, 12:47 pm, moja...@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx (Everett M. Greene) wrote:

> "Wilco Dijkstra" <Wilco_dot_Dijks...@xxxxxxxxxxxx> writes:
>
> > "Steve at fivetrees" <st...@xxxxxxxxxxxxxxxxxxxx> wrote
> >
> > > "Anton Erasmus" <nob...@xxxxxxxxxxxxxxxx> wrote
> > >
> > > http://www.tezzaron.com/OtherICs/Super_8051.htm
> > >
> > > I see that they say that their 200MHz almost
> > > 1 cycle per instruction
> > > with hardware IEEE floating point support
> > > runs almost 3x faster than
> > > a standard 8051 computing a mandelbrot
> > > pattern. Am I missing
> > > something, or is this just slightly short of
> > > pathetic ? Just based on
> > > the clock frequency and less clock cycles per
> > > machine cycle, their
> > > 8051 should be close to 150x faster.
> >
> > Given that they also say "up to 100 MFlops", I suspect
> > they're comparing with/without the hardware IEEE on the
> > same
> > "standard" 8051 at the same clock speed. Although even
> > then, I think I'd expect slightly better...
>
> A quick look at the datasheet shows that a floating point operation takes
> 8 moves to set up the input operands, 1 to set the operation and 4 to store

> the result (which is valid after 4 cycles). So that's 8 * 4 + 3 + 4 * 4 + 4 = 55 cycles for one floating point operation. This gives 3.6MFlops at 200MHz, a little lower than the claimed 100MFlops. Similarly the 200MIPS maximum speed is more like 75MIPS on actual code as few instructions execute in 1 cycle.
>
> A software floating point implementation on this 8−bit core might take around
> 200 cycles on average for addition/multiply, so getting a factor 3 speedup from the floating point hardware sounds feasible. Not very impressive indeed.

I think you'll find that float operations on an 8−bit micro are
going to require much more than 200 cycles. Addition will be of
the order of 1000 cycles and multiply/divide/sqrt nearer 3000.− Hide quoted text −

− Show quoted text −

200 cycles is about right for add, substract and multiply, see Keil's
Complier peformance benchmarks for the 8051

http://www.keil.com/benchmarks/c51_tm_small.asp

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