



# TingARM Board

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Silicon Valley Forth Interest Group

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Chen-Hanson Ting



# Summary

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- ADuC7024 Microconverter
- TingARM Board
- eForth for ARM7
- I/O Interfacing
- Demonstrations
- Concluding Remarks



# ADuC7024 Microconverter

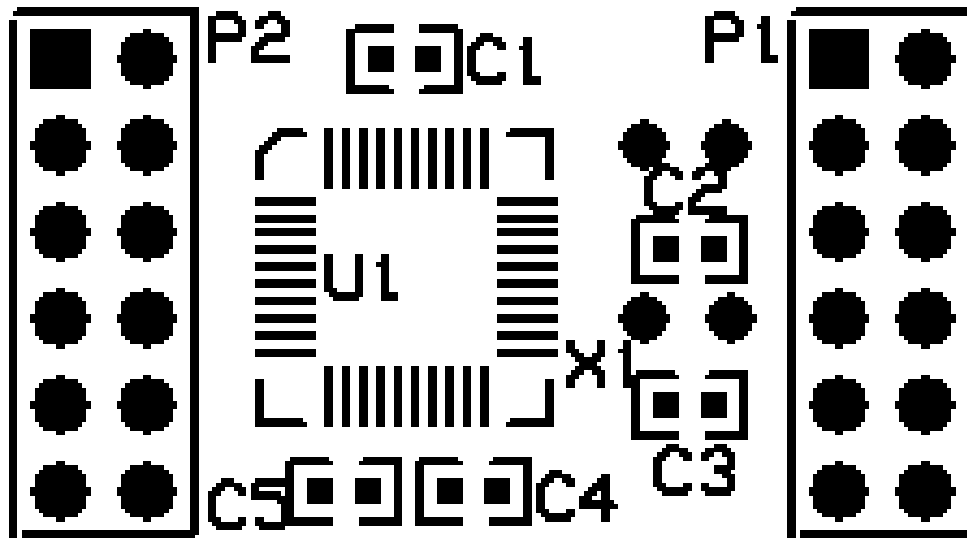
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- **45 MHz ARM7 core**
- **64 Kbytes Flash RAM**
- **8 Channels of 12-bit A/D**
- **4 Channel 12-bit D/A**
- **Serial Port**
- **Parallel Port**
- **Counters, Timers, Interrupt Controller**

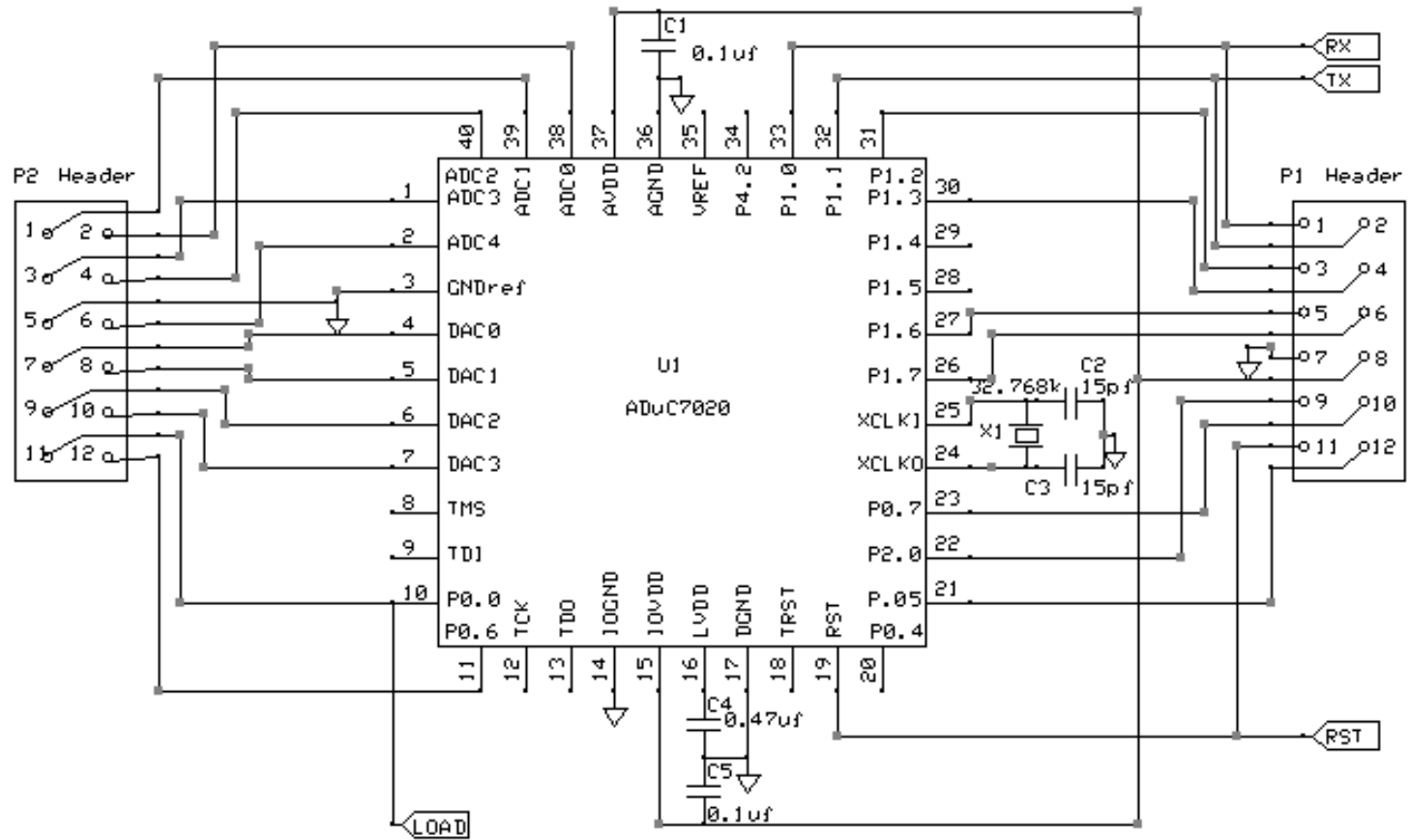


# TingARM Board

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# TingARM Board



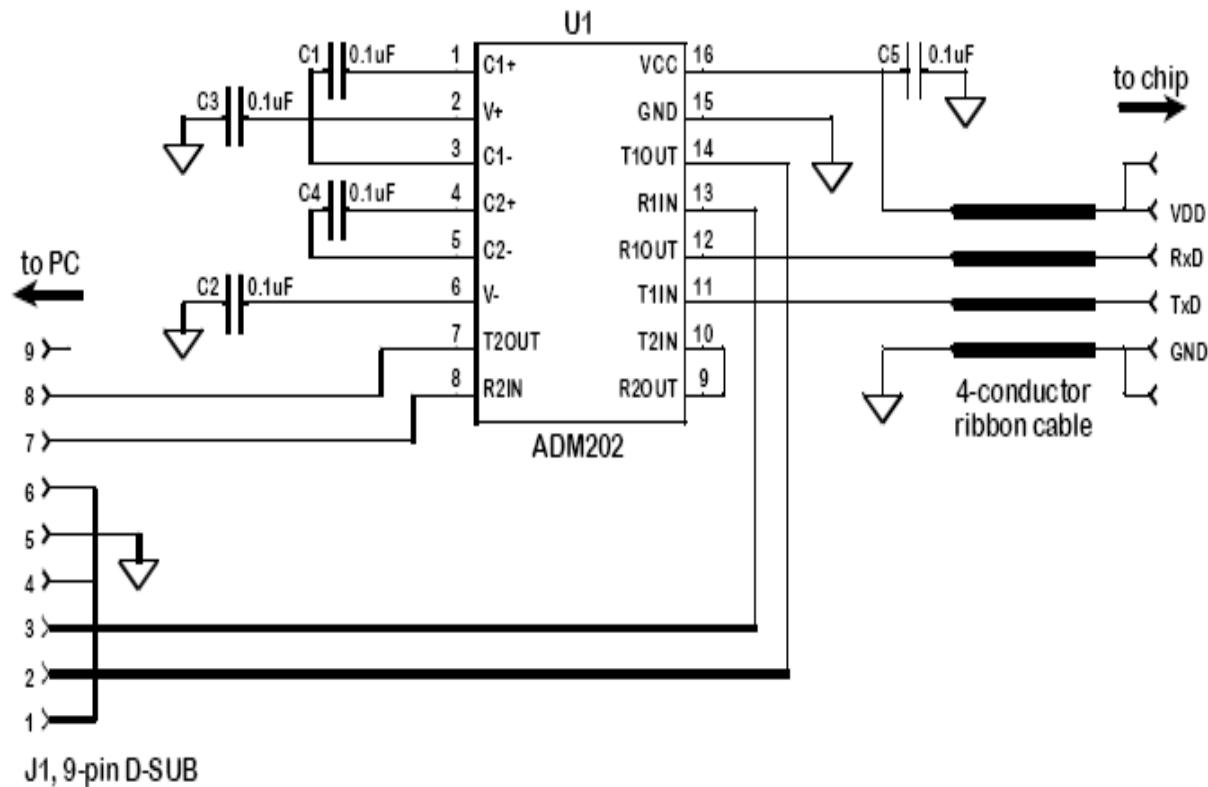


# I/O Interfacing

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- UART
- GPIO
- DAC
- ADC

# TingARM UART Interface





# ARM7 eForth for ADuC

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- Implemented in assembler AS
- Subroutine threading
- Fully optimized
- All ADuC registers are defined as constants
- Interrupt driven ADC sampling





# eForth Demonstration

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WORDS

HEX 0 200 DUMP

SEE WORDS

HERE .

1 2 + .



# eForth Demonstration

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```
: TEST1 1 2 3 4 5 ;  
TEST1 .S  
: TEST2 10 FOR R@ . NEXT ;  
TEST2  
: TEST3 IF 1 ELSE 2 THEN . ;  
0 TEST3  
1 TEST3  
: TEST4 CR ." HELLO, WORLD!" ;  
TEST4
```



# GPIO Demonstration

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HEX

0 GPIOCON !

20000000 GP0DAT !

20200000 GP0DAT !

GP0DAT ?

Set up port P0

Output 0V on P0.5

Output 3.3V on P0.5

Read P0 port



# DAC Demonstration

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13 DAC0CON !

Set up DAC0 to  
output in 0-3.3V range

0 DAC0DAT !

Output 0V

4000000 DAC0DAT !

Output 0.8V

8000000 DAC0DAT !

Output 1.6V

FF00000 DAC0DAT !

Output 3.3V



# ADC Demonstration

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20 ADCCON !

0 ADCCP !

E3 ADCCON !

0 DAC0DAT !

ADCDAT ?

800000 DAC0DAT !

ADCDAT ?

FF00000 DAC0DAT !

ADCDAT ?

Turn on ADC

Select ADC0 as input channel

Start ADC0

Output 0V

Read conversion results

Output 1.6V

Read conversion results

Output 3.3V

Read conversion results



# Concluding Remarks

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- ADuC7020 is a true single-chip computer
- TingARM is a true single-board, single-chip computer
- ADuC7020 and ADM202 can be embedded in a DB9 connector to form a very small computer running from a PC COM port

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- Thank you very much.