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1 ;====================================================================

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3 ; Author : ADI - Apps

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5 ; Date : January 2001

6 ;

7 ; File : Tx11to20.asm

8 ;

9 ; Hardware : ADuC816

10 ;

11 ; Description : This slave program transmits the numbers 11-20 in

12 ; binary form continuously down the spi port after

13 ; receiving a clock signal.

14 ;

15 ; After the transmission of each byte the incoming

16 ; byte is saved in order at a internal RAM address

17 ; between #40h and #50h

18 ;

19 ; This program can be used with the master program

20 ; Tx1to10.asm (which generates a clock signal for

21 ; the slave)

22

23 ; The Slave program (Tx11to20.asm) should be started

24 ; after the master program (Tx1to10.asm) but within

25 ; the time delay of 5s in order that the slave

26 ; program is synchronised by the first outputted

27 ; clock of the master.

28 ;

29 ; The clock is inputted at sclock (pin 26)

30 ; The data is outputted at MISO (pin 14)

31 ; The data is inputted at sdata/MOSI (pin 27)

32 ;

33 ;====================================================================

34 ;

35 $MOD816 ;Use 8052 / ADuC816predefined Symbols

36

00B4 37 LED EQU P3.4

0000 38 FLAG BIT 00H

39

40

41 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

42 ; BEGINNING OF CODE

---- 43 CSEG

0000 44 ORG 0000H

45

0000 020060 46 JMP MAIN

47 ;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

48 ; SPI INTERRUPT ROUTINE

003B 49 ORG 003BH

003B C200 50 CLR FLAG ; Clear flag to leave loop

51

003D A7F7 52 MOV @R1, SPIDAT ; move input into memory

003F 09 53 INC R1 ; increment memory location so new

54 ; data is stored in new address

55

0040 B95002 56 CJNE R1, #50H, CONT ; reset memory location to 40h when

57 ; memory location reaches 50h saving

58 ; 16 bytes of data

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0043 7940 59 MOV R1, #40H

0045 32 60 CONT: RETI

61

62

63 ;====================================================================

64

0060 65 ORG 0060H ; Start code at address above interrupts

66

0060 67 MAIN: ; Main program

68

0060 75F824 69 MOV SPICON,#24h ; Initialise SPICON to have

70 ; -Enable SPI serial port

71 ; -slave mode select

72 ; -CPOL=0, clk idling low

73 ; -CPHA=1

74

75 ; note: it is important to have CPHA in the master and the slave

76 ; program equal, otherwise uncertainty will exist, as the input

77 ; will be measued during its change of state, and not is at

78 ; its final value.

79

0063 75A901 80 MOV IEIP2, #01h ; Enable SPI interrupt

81

0066 780A 82 MOV R0, #0AH ; initialise R0 to 10 to start

83 ; transmission from 11

0068 7940 84 MOV R1, #40h ; initialise R1 to 40 to store the

85 ; input data from memory location 40

86

006A D2AF 87 SETB EA ; Enable interrupts

88

006C 89 TRNSMT:

006C 08 90 INC R0

006D 88F7 91 MOV SPIDAT, R0 ; transmit the current value on R0

006F D200 92 SETB FLAG ; set flag so that we wait here until

93 ; the spi interrupt routine clears

94 ; the FLAG

95

0071 2000FD 96 JB FLAG, $ ; stay here until flag is cleared

97 ; by interrupt

98

99 ; check if R0 is equal to 20. If so the number 20 has been

100 ; transmitted and we should reset R0 to 10 to start transmission

101 ; from 11 again.

0074 E8 102 MOV A, R0

0075 B414F4 103 CJNE A, #14H, TRNSMT ; if R0 is not 20, jump to TRNSMT

0078 780A 104 MOV R0, #0AH ; if R0=20 make R0=10 & jump to TRNSMT

007A 80F0 105 JMP TRNSMT

106

107 END

VERSION 1.2h ASSEMBLY COMPLETE, 0 ERRORS FOUND

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CONT . . . . . . . . . . . . . . C ADDR 0045H

EA . . . . . . . . . . . . . . . B ADDR 00AFH PREDEFINED

FLAG . . . . . . . . . . . . . . B ADDR 0000H

IEIP2. . . . . . . . . . . . . . D ADDR 00A9H PREDEFINED

LED. . . . . . . . . . . . . . . NUMB 00B4H NOT USED

MAIN . . . . . . . . . . . . . . C ADDR 0060H

P3 . . . . . . . . . . . . . . . D ADDR 00B0H PREDEFINED

SPICON . . . . . . . . . . . . . D ADDR 00F8H PREDEFINED

SPIDAT . . . . . . . . . . . . . D ADDR 00F7H PREDEFINED

TRNSMT . . . . . . . . . . . . . C ADDR 006CH