SLAVE PAGE 1

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

2 ;

3 ; Author : ADI - Apps www.analog.com/MicroConverter

4 ;

5 ; Date : 30 April 1999

6 ;

7 ; File : slave.asm

8 ;

9 ; Hardware : ADuC812

10 ;

11 ; Description : Code for a slave in an I2C system.

12 ;

13 ; Reference : Tech Note, uC001: "Using the ADuC812 I2C Interface"

14 ; find it at www.analog.com/microconverter

15 ;

16 ;======================================================================

17

18 $MOD812 ; use ADuC812 & 8052 predefined symbols

19

0030 20 BYTECNT DATA 030h ; byte counter for I2C routines

21

0028 22 FLAGS DATA 28h

0040 23 GO BIT FLAGS.0 ; flag for all the interrupts

0041 24 RC BIT FLAGS.1 ; flag for Write mode interrupt

0042 25 TR BIT FLAGS.2 ; flag for Read mode interrupt

26

27 ;======================================================================

28

---- 29 CSEG

30

0000 31 ORG 0000H

32

0000 0200AB 33 JMP START

34

35 ;======================================================================

36

003B 37 ORG 003Bh ; I2C slave interrupt

38

003B 20413D 39 JB RC,RECEIVE ; depending on flags there

003E 204241 40 JB TR,TRANSMIT ; are two different interrupts

41

42 ;======================================================================

43

007B 44 ORG 007BH ; Subroutines

45

46 ;----------------------------------------------------------------------

47 ; RECEIVE: receive interrupt routine

48 ;----------------------------------------------------------------------

49

007B 50 RECEIVE:

007B D240 51 SETB GO

007D A79A 52 MOV @R1,I2CDAT ; move data on internal RAM

007F C2E8 53 CLR I2CI ; clear interrupt bit

0081 32 54 RETI

55

56 ;----------------------------------------------------------------------

57 ; TRANSMIT: transmit interrupt routine

58 ;----------------------------------------------------------------------

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59

0082 60 TRANSMIT:

0082 D240 61 SETB GO

0084 889A 62 MOV I2CDAT,R0

0086 C2E8 63 CLR I2CI ; clear interrupt bit

0088 32 64 RETI

65

66 ;----------------------------------------------------------------------

67 ; RCVBYTE2: receive byte routine for read mode

68 ;----------------------------------------------------------------------

69

0089 70 RCVBYTE2:

71

0089 00 72 NOP

008A 22 73 RET

74

75 ;----------------------------------------------------------------------

76 ; RCVBYTE: receive byte routine

77 ;----------------------------------------------------------------------

78

008B 79 RCVBYTE:

80

008B 3040FD 81 JNB GO,$ ; wait for the interrupt

008E 09 82 INC R1 ; next storage will be on 41h then 42h

008F C240 83 CLR GO ; flag cleared for the next interrupt

0091 22 84 RET

85

86 ;----------------------------------------------------------------------

87 ; RCVDATA: receive bytes routine

88 ;----------------------------------------------------------------------

89

0092 90 RCVDATA:

91

0092 753004 92 MOV BYTECNT,#4 ; 4 bytes : address + 3 datas

0095 118B 93 LOOP2: ACALL RCVBYTE

0097 D530FB 94 DJNZ BYTECNT,LOOP2

009A 22 95 RET

96

97 ;----------------------------------------------------------------------

98 ; SENDBYTE: byte transmit routine

99 ;----------------------------------------------------------------------

100

009B 101 SENDBYTE:

102

009B 3040FD 103 JNB GO,$ ; wait for the interrupt

009E 08 104 INC R0 ; 2nd data is 34h and 3rd data is 35h

009F C240 105 CLR GO

00A1 22 106 RET

107

108 ;----------------------------------------------------------------------

109 ;SENDATA:bytes transmit routine

110 ;----------------------------------------------------------------------

111

00A2 112 SENDATA:

113

00A2 753003 114 MOV BYTECNT,#3 ; 3 data will be send by the slave

00A5 119B 115 LOOP: ACALL SENDBYTE

00A7 D530FB 116 DJNZ BYTECNT,LOOP

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00AA 22 117 RET

118

119 ;======================================================================

120 ;Main program

121 ;======================================================================

122

00AB 123 START:

124

00AB C240 125 CLR GO ; clear flag used in the interrupt

00AD 759B44 126 MOV I2CADD,#044h ; slave address

00B0 758120 127 MOV SP,#020h

00B3 75A880 128 MOV IE,#80h ; enable all the interrupts

00B6 75A901 129 MOV IE2,#01h ; enable I2C interrupt

00B9 75E800 130 MOV I2CCON,#000h ; slave mode

131

132 ; code for write mode ( master-transmitter to slave-receiver )

133

134 ; SETB RC ; specific flag for interrupt routine

135 ; MOV R1,#040h ; first data to be stored in RAM at 40h

136 ; ACALL RCVDATA ; slave receives his address + 3 datas

137

138 ; code for read mode ( master reads slave immediately after 1st byte )

139

00BC D241 140 SETB RC ; specific flag for interrupt routine

00BE 7833 141 MOV R0,#033h ; first data send is 33h

00C0 1189 142 ACALL RCVBYTE2 ; slave receives address send by master

00C2 C241 143 CLR RC

00C4 D242 144 SETB TR

00C6 11A2 145 ACALL SENDATA ; slave sends 3 datas

146

00C8 D2B4 147 SETB P3.4 ; led is off, everything is OK

148

149 END

VERSION 1.2h ASSEMBLY COMPLETE, 0 ERRORS FOUND

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BYTECNT. . . . . . . . . . . . . D ADDR 0030H

FLAGS. . . . . . . . . . . . . . D ADDR 0028H

GO . . . . . . . . . . . . . . . B ADDR 0040H

I2CADD . . . . . . . . . . . . . D ADDR 009BH PREDEFINED

I2CCON . . . . . . . . . . . . . D ADDR 00E8H PREDEFINED

I2CDAT . . . . . . . . . . . . . D ADDR 009AH PREDEFINED

I2CI . . . . . . . . . . . . . . B ADDR 00E8H PREDEFINED

IE . . . . . . . . . . . . . . . D ADDR 00A8H PREDEFINED

IE2. . . . . . . . . . . . . . . D ADDR 00A9H PREDEFINED

LOOP . . . . . . . . . . . . . . C ADDR 00A5H

LOOP2. . . . . . . . . . . . . . C ADDR 0095H

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

RC . . . . . . . . . . . . . . . B ADDR 0041H

RCVBYTE. . . . . . . . . . . . . C ADDR 008BH

RCVBYTE2 . . . . . . . . . . . . C ADDR 0089H

RCVDATA. . . . . . . . . . . . . C ADDR 0092H NOT USED

RECEIVE. . . . . . . . . . . . . C ADDR 007BH

SENDATA. . . . . . . . . . . . . C ADDR 00A2H

SENDBYTE . . . . . . . . . . . . C ADDR 009BH

SP . . . . . . . . . . . . . . . D ADDR 0081H PREDEFINED

START. . . . . . . . . . . . . . C ADDR 00ABH

TR . . . . . . . . . . . . . . . B ADDR 0042H

TRANSMIT . . . . . . . . . . . . C ADDR 0082H