AT89ISP Programmer Cable

1. Introduction

This application note describes the Atmel AT89ISP cable interface. This in-system programmer cable communicates serially with Atmel's AT89S/AT89LP microcontrollers and reprograms them in the circuit without removal. For surface-mounted devices, eliminating this step greatly reduces the possibility of damages caused by insertion/removal of delicate leads, and allows for design changes and software/parameter updates in the field.

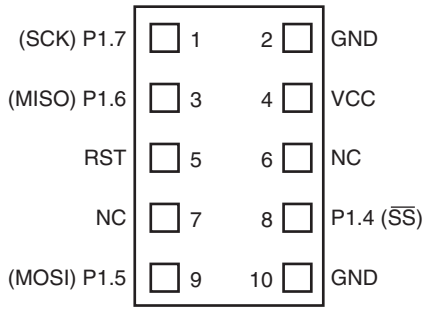
2. AT89ISP Software

The AT89ISP software is the primary means for performing in-system programming (ISP) of Atmel AT89S/AT89LP devices. It provides an intuitive interface for in-system programming that can be run from a personal computer. The software will run under the Windows® 9x/ME/2000/XP, Windows NT® operating systems. The software has a comprehensive set of features that allows a user to view, program, and erase data from an Atmel AT89S/AT89LP device. A detailed Adobe® Acrobat® document describing the features/functions of the software accompanies it.

3. AT89ISP Cable

In order to use the AT89ISP software, the user will need to have an Atmel AT89ISP cable. This cable can be purchased directly from Atmel or authorized Atmel representatives. The ISP cable's pins need to be connected to an AT89S/AT89LP device in the manner shown in Figure 4-1 on page 2. The 25-pin male connector plugs into the parallel port of the user's personal computer. The 10-pin female IDC header plugs into a 10-pin male header in the user's target board. A **polarized** 10-pin receptacle male header is highly recommended to avoid an erroneous connector mating. The pinout shown below represents the target 10-pin male header connector in the user's board as viewed from the top. **Please note that connection of the $\overline{SS}$ pin (P1.4) is required for all the AT89LP (single-cycle core) derivatives, but not for the AT89S derivatives.**

Figure 3-1. AT89ISP Cable 10-pin **Male** Header Pinout



Note: NC = Not Connected.

AT89ISP Programmer Cable

Application Note

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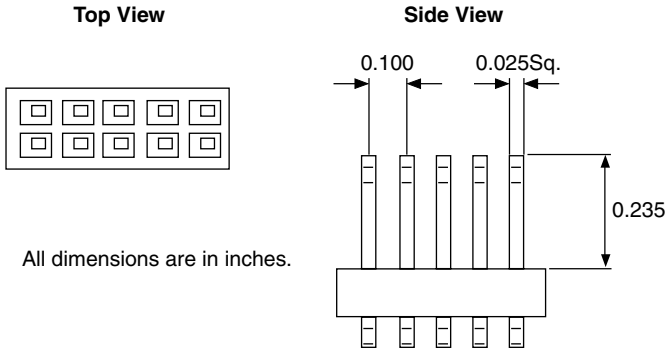
4. Header Dimensions

Figure 4-1 shows the receptacle male header dimensions.

Figure 4-1. 10-pin **Male** Header Dimensions



5. Connection

The correct way to connect the female header end of the AT89ISP cable to the 10-pin receptacle male header is to align the connector “arrow” towards pin 1, as illustrated in Figure 5-1. On the cable casing end, make sure the connector “arrow” sits visible next to the side of the small PC board (not away from it).

Figure 5-1. Proper Cable Alignment

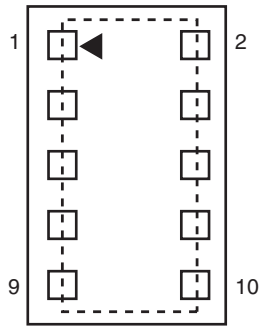
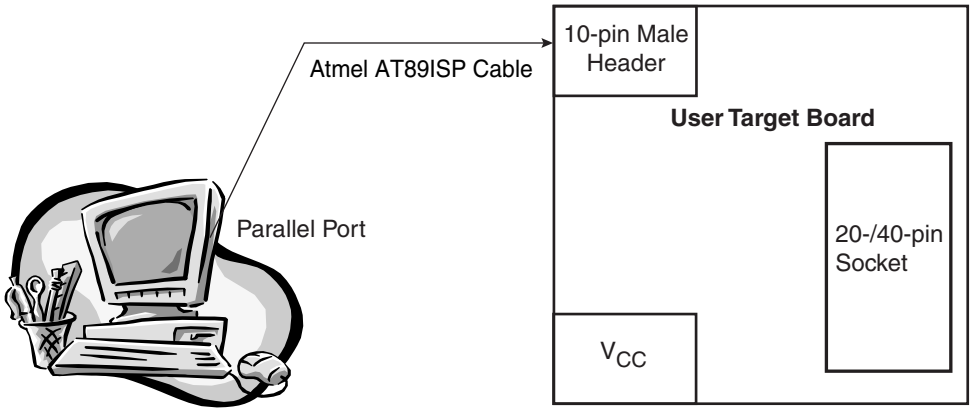


Table 5-1. Atmel AT89ISP Cable Pinout

Pin	Name	Comment
1	SCK	Serial Clock
3	MISO	Master In – Slave Out
4	V_{CC}	Target Power Supply
5	RST	Target MCU Reset
8	$\overline{SS}$	Slave Select
9	MOSI	Master Out – Slave In
2, 10	GND	Common Ground
6, 7	NC	No Connection

Figure 5-2. AT89ISP Target Board Sample Connection



6. Voltage Levels

The AT89ISP cable requires a regulated DC supply from the user target board. The cable should operate correctly between the specified operating voltage limits. The current operating V_{CC} voltage range for the AT89ISP cable is 2.7V to 5.5V.

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