DIP/SOIC/TSSOP EEPROM Socket Board

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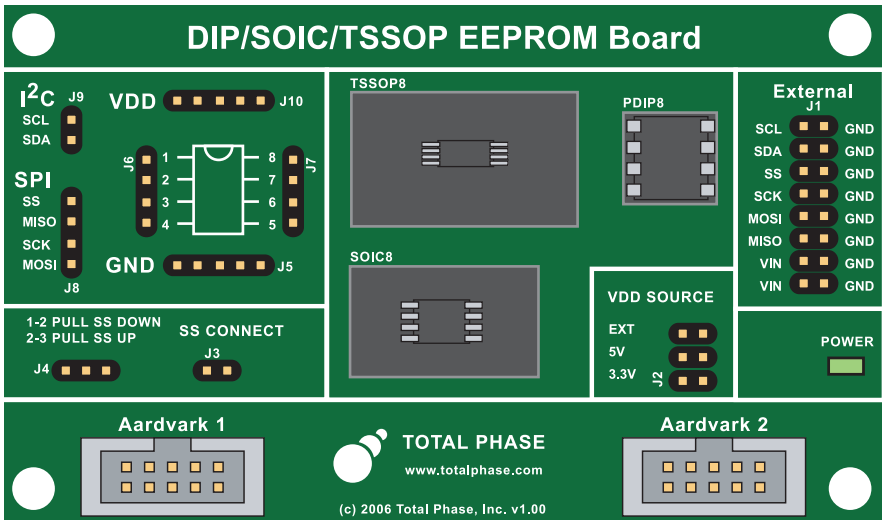

TOTAL PHASE

EEPROM Socket Board

AARDVARK I²C/SPI

CHEETAH SPI

Datasheet v1.10
February 1, 2010

Features

- Programming of stand-alone I²C- and SPI-based EEPROM memory chips
- DIP-8 socket
- SOIC-8 socket
- TSSOP-8 socket
- Multiple voltage options
- Multiple SPI Slave Select options

Summary

The EEPROM Socket Board allows a developer to flash and burn stand-alone I²C- or SPI-based EEPROM memory chips by using either an Aardvark™ I²C/SPI Host Adapter or a Cheetah™ SPI Host Adapter as an interface from a Windows or Linux computer. The EEPROM Socket Board supports three different standard chip packages: DIP8, SOIC8 and TSSOP8.

従来 の"Flash Socket Board"の名称を "EEPROM Socket Board" に変更しました。DIP,SOIC-8,TSSOP-8のソケットにジャンパ線で接続できるので、I2CやSPIの様々なデバイスのプログラミングに重宝します。ただし配線長が長くなることもあり、SPIのあまり高いクロック周波数での利用にはお薦めしません。高いクロック周波数でのSPI用には、別製品のSOIC-8/8W Flash Socket Board、SOIC-16 Flash Socket Boardをご検討ください。
立野電脳（株）(http://www.dsp-tdi.com）では、
これら3種類のSocketボードを標準在庫としています。

Contents

1 Overview

The EEPROM Socket Board provides embedded systems engineers with an easy and cost-effective method of programming I²C- and SPI-based memory devices. Using Total Phase's industry-leading host adapters and software, engineers can take full advantage of the Flash Center™ programming software along with the Aardvark™ I²C/SPI Host Adapter and the Cheetah™ SPI Host Adapter to program their Serial EEPROM memory chips.

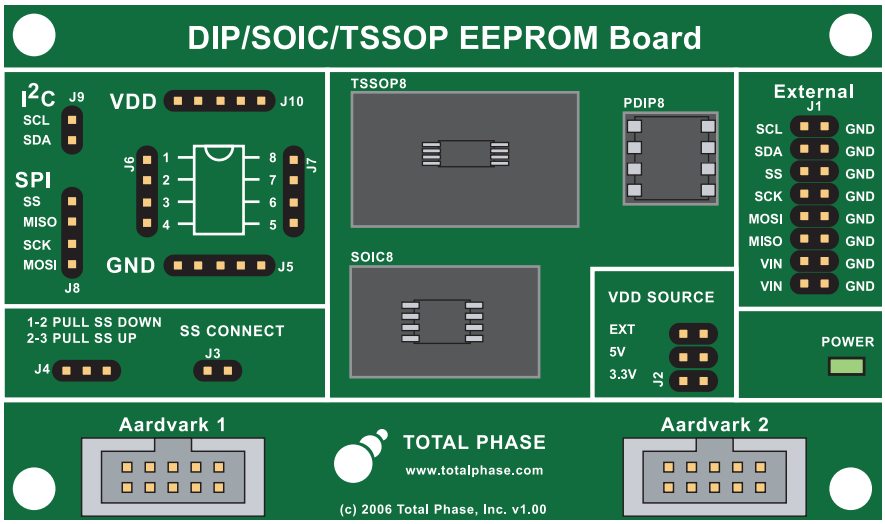

Figure 1: *Schematic of the EEPROM Socket Board*

1.1 Features

- Flash and burn I²C and SPI EEPROMs that are in any of these standard chip packages: DIP8, SOIC8 or TSSOP8.
- Specify 5V, 3.3V, or an external VDD Source at any voltage level.
- Connect or disconnect Slave Select (SS) and change the polarity of SS.
- Gang-Program multiple devices by using multiple socket board and programming adapter sets in parallel on the same host computer.

1.2 What's Included

The EEPROM Socket Board comes complete with:

- EEPROM Socket Board
- 8-pin split ribbon cable

1.3 Flash Center Software

The Flash Center Software is a free software package that allows engineers to quickly erase, program, and verify I^{2}C- and SPI-based EEPROM and Flash memory chips that are interfaced through an Aardvark I^{2}C/SPI Host Adapter and/or Cheetah SPI Host Adapter.

Figure 2: *The Flash Center Software is a free memory chip programming software*

Features

- **Fast speeds** - the Flash Center Software can read a typical 4 Megabyte flash memory in 0.7 seconds.
- **Gang programming support** - the Flash Center Software can program multiple devices in parallel by connecting to multiple Aardvark I^{2}C/SPI Host Adapters and/or Cheetah SPI Host Adapters on the same computer.
- **Extensible device support** - the Flash Center Software has an extensible XML-based memory device library. By adding or modifying the XML descriptions of target memory devices, developers can instantly support almost any I^{2}C- or SPI-based EEPROM or Serial Flash memory.

Minimum Requirements

- Linux (kernel 2.6 and above), Windows 2000 (SP4 or later), Windows XP (SP2 or later), Windows Vista 32-bit/64-bit, Windows 7 32-bit/64-bit
- One or more available High-speed USB 2.0 ports
- One or more Aardvark I^{2}C/SPI Host Adapters and/or Cheetah SPI Host Adapters

1.4 Aardvark I^{2}C/SPI Host Adapter

The Aardvark I^{2}C/SPI Host Adapter is a fast and powerful I^{2}C bus and SPI bus host adapter through USB. It allows a developer to interface a Linux or Windows PC to a downstream embedded system environment and transfer serial messages using the I^{2}C and SPI protocols.

Figure 3: *The Aardvark I²C/SPI Host Adapter is a USB to I²C and SPI adapter that allows developers to interface their computers to target embedded systems.*

Features

- I²C Master and Slave (1-800 kHz)
- SPI Master (up to 8 MHz) and Slave (up to 4 MHz)
- General Purpose I/O
- Windows and Linux support
- Free software and royalty-free API

1.5 Cheetah SPI Host Adapter

The Cheetah SPI Host Adapter is a high-speed SPI adapter that is capable of communicating over SPI at up to 40+ MHz. The Cheetah adapter is specifically designed to communicate with high-speed, SPI-based Flash memory. It is an ideal tool to develop, debug, and program SPI-based systems.

Figure 4: *The Cheetah SPI Host Adapter is a high-speed SPI Master-only adapter. It is capable of signaling from 1 to 40+ MHz with no inter-byte delays.*

Features

- SPI Master signaling up to 40+ MHz
- Maximum throughput with no inter-byte delays
- User-configurable timing delays
- Windows and Linux support
- Free software and royalty-free API

2 Sockets

The EEPROM Socket Board offers three different sockets to interface with your memory chip: DIP8, SOIC8 and TSSOP8. Please note that only one can be used at a time as they are all cross-connected.

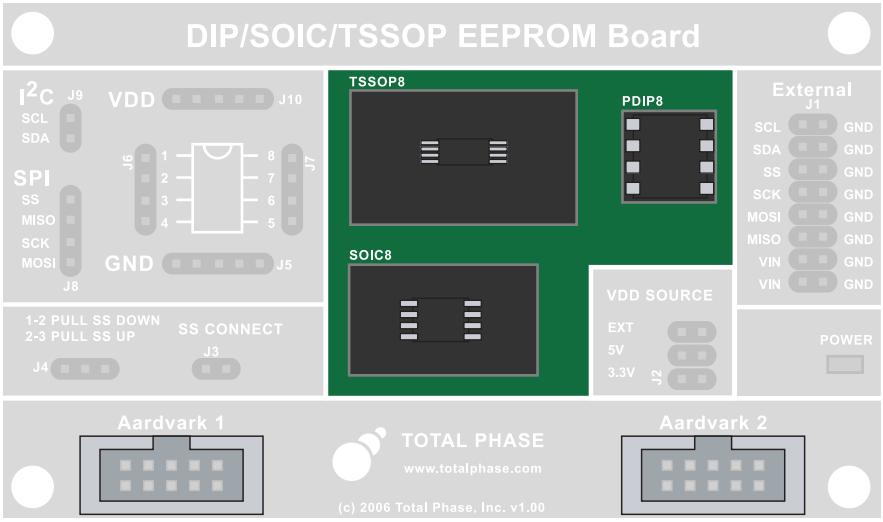

Figure 5: *The EEPROM Socket Board provides three different sockets for interfacing with your stand-alone memory chip.*

2.1 Compatible Chip Sizes

The three sockets of the EEPROM Socket Board are compatible with standard sized chip packages. Figure 6 provides information about the supported sizes for all the sockets. Please note that all measurements are in millimeters (mm).

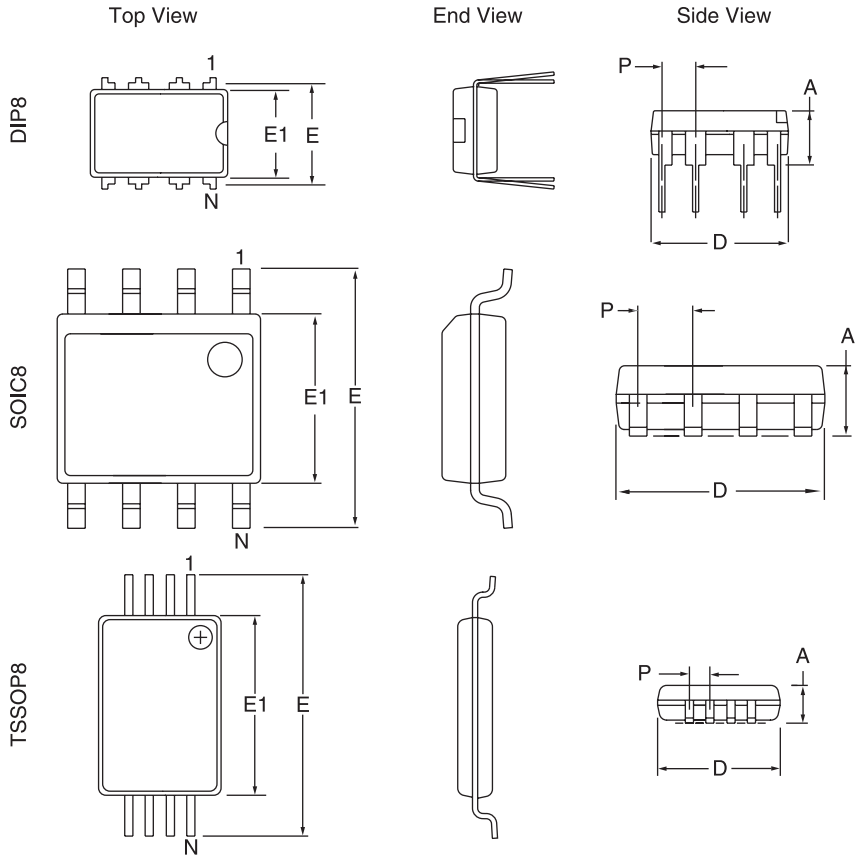

Figure 6: *Diagrams of the supported package sizes. Please note that the diagrams are not to scale.*

Compatible chip sizes for each of the sockets available on the EEPROM Socket Board. All measurements are in millimeters (mm).

		DIP8	SOIC8	TSSOP8
Pitch	(P)	2.54	1.27	0.65
Thickness	(A)	3.94	1.90	1.00
Lead Tip to Tip Width	(E)	7.94	6.00	6.40
Molded Package Width	(E1)	6.35	3.90	4.40
Overall Length	(D)	9.46	5.40	3.00

3 Connectors

3.1 Aardvark 1 and Aardvark 2

There are the two boxed connectors at the bottom of the EEPROM Socket Board which are used to connect the board to an Aardvark I^{2}C/SPI Host Adapter or a Cheetah SPI Host Adapter. These two connectors are cross-connected, so it does not matter which one is used. In most cases, you will only want to connect a single adapter to the EEPROM Socket Board at a time.

The second connector is available to connect to a protocol analyzer or to cross connect with another adapter for testing purposes. For example, an Aardvark adapter or a Cheetah adapter can be connected to the board through **Aardvark 1** to program the memory chip. At the same time, a Beagle I^{2}C/SPI Protocol Analyzer can be attached to **Aardvark 2** to monitor the bus while the chip is being programmed to ensure that the data on the bus is correct.

3.2 External

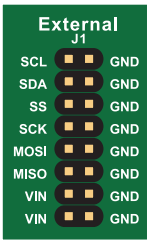

Figure 7: *The External Connector (J1) provides the developer with a quick and easy way to interface or monitor any or all of the EEPROM Socket Board signals.*

All the signals on the board are available for external monitoring through the **External** connector (J1). The two **VIN** pins allow a user to use an external power source to power the memory device. Please refer to the “Programming a Device” section for more information.

3.3 Powering the EEPROM Socket Board

To power the EEPROM Socket Board, the Cheetah or Aardvark adapter must be configured to send target power to the board. This can be accomplished via the Rosetta Language Bindings, the Flash Center software, the Aardvark Control Center Software or the Cheetah GUI Software. When powered-on, the board’s Power LED will be lit.

3.4 Cross Connecting Aardvark Adapters and/or Cheetah Adapters

When cross connecting two adapters, the board must be powered on. Otherwise, results may be unpredictable. If you experience problems, please make sure that the Power LED on the board is lit.

4 Programming a Device

I^{2}C EEPROMs and SPI EEPROMs can be programmed using the Flash Center Software in conjunction with an Aardvark adapter or a Cheetah adapter. Detailed technical information about all these products can be found on Total Phase's website.

4.1 Inserting and Removing Device

To program a chip, insert the chip into the appropriate socket. Please note that all the sockets are cross-connected, so it is only possible to use one socket at a time.

Whenever handling chips, always be sure to follow safe handling procedures to ensure that the chips are not damaged.

DIP8

To insert a DIP8 chip, simply align the pins with the socket and firmly press the chip into the socket.

To remove a DIP8 chip, we recommend that a DIP extractor tool is used to prevent damage to the chip and its pins.

SOIC8 and TSSOP8

Both the SOIC8 and TSSOP8 sockets are zero insertion force sockets and work on the same principle.

To insert a chip:

1. Press down on the top of the socket to raise the contact pins.
2. While pressing down on the socket, carefully place the chip into the socket and make sure that the orientation of the chip is correct (pin 1 should always be in the top left corner).
3. Once the chip is in place, release the top of the socket to allow the contact pins to drop and hold the chip in place.

At this point, the chip should be held securely in place. Please make sure that all the contact pins have made contact with the correct pins on the chip.

When removing the chip, we recommend using a vacuum pickup tool to prevent damage to the chip and its pins.

To remove a chip:

1. Press down on the top of the socket to raise the contact pins.
2. Carefully remove the chip using a vacuum pickup tool or equivalent tool.
3. Release the top of the socket.

4.2 Connecting the Pins

Since different chips have different pin configurations, the EEPROM Socket Board includes a 8-pin split ribbon cable to allow you to connect the pins to the correct sources.

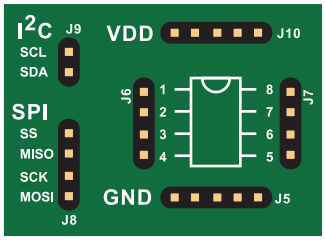

Figure 8: *The Pin Board connector provides the developer with a easy way to connect the correct signals to the appropriate pins of the memory chip that is to be programmed. The included 8-pin split cable can be used to connect the correct signal to the appropriate pin.*

In the top left side of the board, you will notice that there is a graphic representation of a chip with numbered pins from 1 to 8 (Figure 8). Along both sides of the drawing are two (2) banks of 4-pin headers. These banks are connected to the eight (8) pins of the chip in the socket. The pins of the chip should be connected to the appropriate sources as described by the chip's datasheet.

Various sources are provided around the chip diagram. Along the top of the chip are five (5) pins for VDD and along the bottom of the chip are five (5) pins for GND. To the left of the chip are sources for the I^2C and SPI pins. Each source is labeled along the left. Figure 9 shows a EEPROM Socket Board that has been configured to program an I^2C EEPROM.

4.3 Powering the Device

There are multiple options for powering the device to be programmed. The Aardvark adapter and Cheetah adapter are both able to send downstream power to the EEPROM Socket Board which can be used to power the chip. Two different voltages are available: 5V and 3.3V. To select one of these voltages, simply use a jumper to short the pins next to the appropriate voltage on the VDD Source connector (J2).

External Power Source

If a different voltage is needed, it is possible to use an external power supply to provide power to the target chip. To use an external power source, please use a jumper to short the pins next to "EXT" (position 3) on the VDD Source connector (J2). Power should be applied to the VIN pins on the **External (J1)** connector.

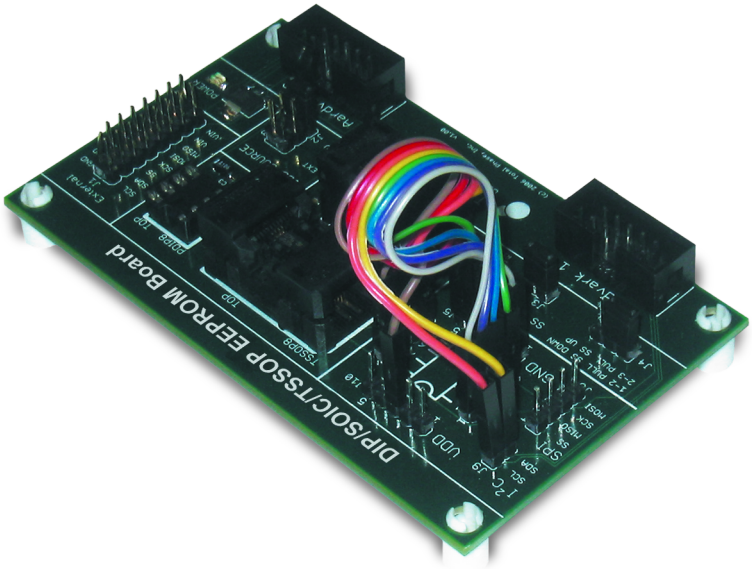

Figure 9: *This is the view from the top of the EEPROM Socket Board which has been configured to program an I^2C EEPROM which has been loaded into the TSSOP8 socket. One end of the supplied 8-pin ribbon cable has been connected to the eight (8) pins of Pin Board connector around the graphic of the chip. The other end has been connected to the appropriate sources as indicated by the device's datasheet.*

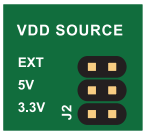

Figure 10: *The EEPROM Socket Board offers two different voltage levels: 5V and 3.3V. If another voltage level is desired, the develop can select "EXT" and attach an external power source to the board.*

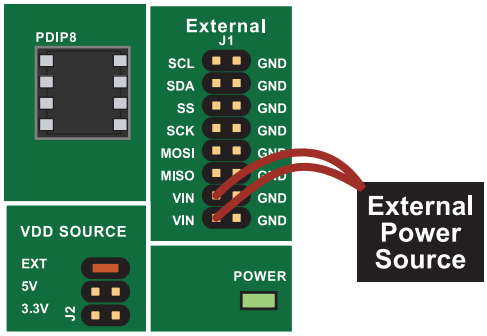

Figure 11: *When "EXT" is selected, an external power source can be applied to the VIN pins in the External connector (J1).*

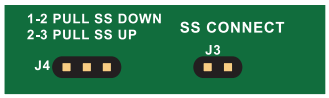

Figure 12: *The developer can connect or disconnect Slave Select (SS) pin as well as configure the polarity of SS on the board.*

4.4 SPI Slave Select

Connecting SS

Some SPI-based memory chips do not require the use of the Slave Select pin. In these cases, the SS pin can be disconnected. To do this, simply remove the jumper from the SS Connect header (J3).

SS Pull-down/Pull-up Resistors

The EEPROM Socket Board provides the ability either pull-down or pull-up the Slave Select line depending on the requirements of the target device by using a jumper to short pins on the (J4) connector.

To pull SS down, short pins 1 and 2.

To pull SS up, short pins 2 and 3.

5 Legal / Contact

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