An economical approach to product development -

M68HC12 Evaluation Board

The M68HC12A4EVB Evaluation Board (EVB) is an economical tool for designing and debugging code for, and evaluating the operation of, the MC68HC812A4 MCU. By providing the essential MCU timing and I/O circuitry, the EVB simplifies user evaluation of prototype hardware and software.

The EVB features a prototype area, which allows custom interfacing with the MCU's I/O and bus lines. These connections are broken out via on-board headers, which are immediately adjacent to the prototype area.

Optionally, the EVB can accommodate various types and configurations of external memory to suit a particular application's requirements. These custom configurations are effected by installing the appropriate memory chips in the EVB's memory sockets and by setting jumpers on the EVB to correctly establish the MC68HC812A4's memory-access operations.

The figure below shows the EVB's layout and locations of the major components, as viewed from the component side of the board..

Features

- *+3 to +5 Vdc operation*
- *RS-232C interfaces*
- *64K of on-board EPROM with resident D-Bug12 monitor/debugger program*
- *16K of on-board SRAM*
- *Jumper-selectable support for multiple memory device types and sizes*
- *Header connectors for access to the MCU's I/O and bus lines*
- *On board prototype area for customized interfacing with the MCU*
- *Low voltage inhibit protection*
- *Background mode operation*
- *Full support for either dumb-terminal or host-computer terminal interface*
- *MCUasm assembly language development toolkit*
- *File-transfer capability from a host computer, allowing off-board code generation*

MCU I/O and Bus Signal Connectors

Memory Sockets

Power Supply Connector

Serial Connector

MCU Socket
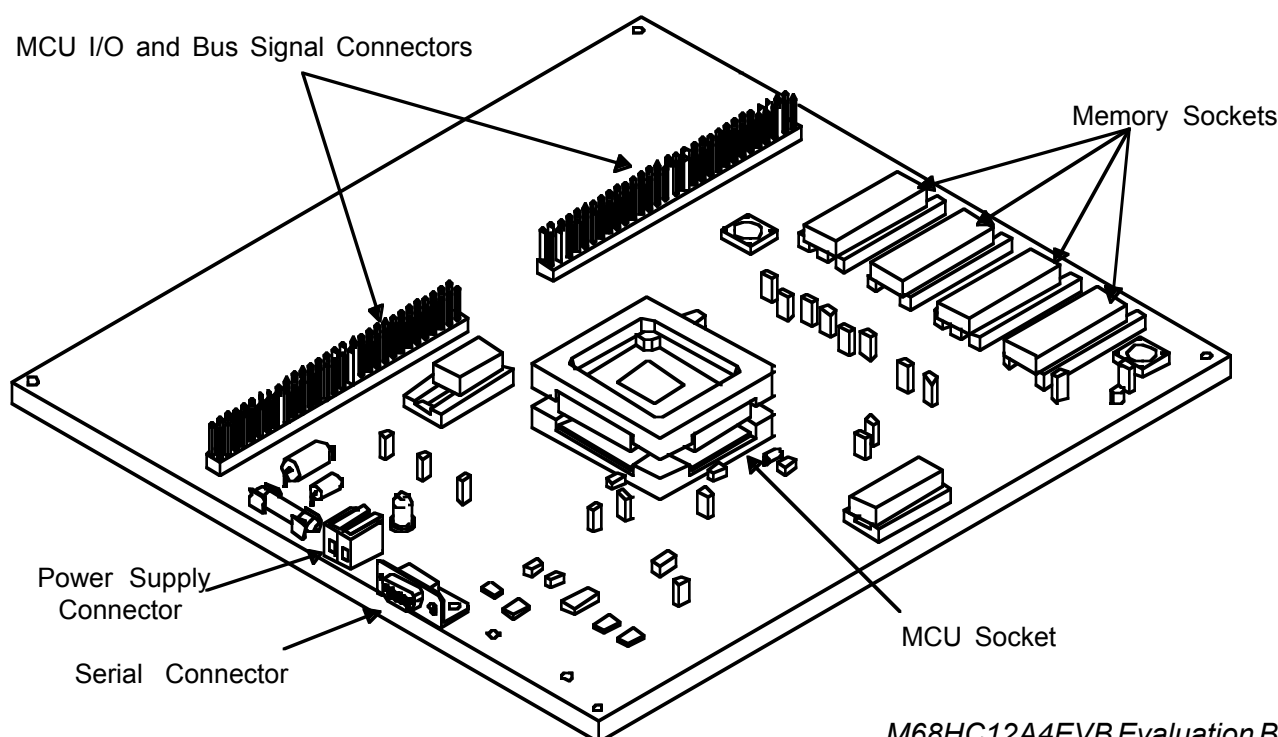
M68HC12A4EVB Evaluation Board

EVBOVERVIEW

The EVB is composed of three components:

1. Hardware – the board consists of an 8-inch by 8-inch multi-layer printed circuit board that provides the platform for interface and power connections to the MC68HC812A4 MCU chip, which is installed in a production socket.

2. Firmware – D-Bug12, the EVB's firmware-resident monitor program, provides a self-contained operating environment that allows writing, evaluation, and debugging of user programs.

    The hardware is factory-configured to execute D-Bug12 without further configuration by the user. It is ready for use with an RS-232C terminal for writing and debugging user code.

    D-Bug12 allows programming of the MC68HC812A4's on-chip EEPROM through commands that directly alter memory.

    Commands are typed on the terminal's D-Bug12 prompt line and executed when the carriage-return (ENTER) key is pressed. D-Bug12 then displays either the appropriate response to the command or an error indication.

3. Software – the MCUasm assembly language toolset provides an integrated development environment which includes a project manager (MCUproject), a relocatable macro-assembler (MASM), a linker (MLINK), a librarian (AR), a Motorola S-Record generator (HEX) and a variety of other tools.

There are two methods to generate EVB user code:

1. For small programs or subroutines, D-Bug12's single-line assembler/disassembler may be used to place object code directly into the EVB's memory.

2. For larger programs, the Motorola MCUasm assembler may be used on a host computer to generate S-Record object files, which can then be loaded into the EVB's memory using D-Bug12's LOAD command.

If the M68HC812A4's background debug mode (BDM) interface serves as the user interface, both of the SCI ports become available for user applications. This mode requires a background debug development tool, such as Motorola's SDI™ Interface, and a host computer with the appropriate interface software. Note: D-Bug12 does not use the BDM interface.

The EVB can begin operation in either of two jumper-selectable modes at reset:

1. In normal mode, D-Bug12 immediately issues its command prompt on the terminal display and waits for a user entry.

2. In the alternate mode, execution begins directly with the user code in on-chip EEPROM. This hardware function is also available for customized use in the prototype area.

SPECIFICATIONS SUMMARY

The tables below summarize EVB specifications and minimum host PC requirements.

EVB Specifications

Characteristic	Specification	Characteristic	Specification
MCU	MC68HC812A4	Communications ports	Two RS-232C DCE ports
MCU I/O ports	HCMOS compatible	Board dimensions	8 x 8 in.

EPROM:
    Wide mode
    Narrow mode
 	
EEPROM:
    Wide mode
    Narrow mode
	64, 128, 256, 512, or 1024 KB
	32, 64, 128, 256, or 512 KB
	
	64, 128, 256, or 512 KB
	32, 64, 128, or 256 KB
		SRAM:
		    Wide mode
		    Narrow mode
			16, 64, 256, or 1024 KB
			8, 32, 128, or 512 KB

Minimum Requirements

Characteristic	Specification
Terminal	RS-232C compatible terminal
Host PC (optional)	386-based PC or higher with an RS-232C serial port. Requires a user-supplied communications program capable of emulating a dumb terminal.
Input/Output	Serial communication port
Cable	RS-232C compatible
External Power Supply	+3.5 to +5.0 Vdc @ 150 mA (max.), fuse-protected @ 1.5 A

ORDERING INFORMATION

EVB Part Number

Evaluated MCU	EVB Part Number	Software
MC68HC812A4	M68HC12A4EVB	MCUasm (included with the EVB)

WARRANTY INFORMATION

Motorola provides a one year limited warranty.

CUSTOMER SUPPORT

For information about a Motorola distributor or sales office near you call:

AUSTRALIA, Melbourne – (61-3)887-0711
    Sydney – 61(2)906-3855

BRAZIL, Sao Paulo – 55(11)815-4200

CANADA, B. C., Vancouver – (604)606-8502
    ONTARIO, Toronto – (416)497-8181
    ONTARIO, Ottawa – (613)226-3491
    QUEBEC, Montreal – (514)333-3300

CHINA, Beijing – 86-10-68437222

DENMARK – (45)43488393

FINLAND, Helsinki – 358-9-6824-400

FRANCE, Paris – 33134 635900

GERMANY, Langenhagen/Hannover – 49(511)786880
    Munich – 49 89 92103-0
    Nuremberg – 49 911 96-3190
    Sindelfingen – 49 7031 79 710
    Wiesbaden – 49 611 973050

HONG KONG, Kwai Fong – 852-6106888
    Tai Po – 852-6668333

INDIA, Bangalore – (91-80)5598615

ISRAEL, Herzlia – 972-9-590222

ITALY, Milan – 39(2)82201

JAPAN, Fukuoka – 81-92-725-7583
    Gotanda – 81-3-5487-8311
    Nagoya – 81-52-232-3500
    Osaka – 81-6-305-1802
    Sendai – 81-22-268-4333
    Takamatsu – 81-878-37-9972
    Tokyo – 81-3-3440-3311

KOREA, Pusan – 82(51)4635-035
    Seoul – 82(2)554-5118

MALAYSIA, Penang – 60(4)2282514

MEXICO, Mexico City – 52(5)282-0230
    Guadalajara – 52(36)21-8977

PUERTO RICO, San Juan – (809)282-2300

SINGAPORE – (65)4818188

SPAIN, Madrid – 34(1)457-8204

SWEDEN, Solna – 46(8)734-8800

SWITZERLAND, Geneva – 41(22)799 11 11
    Zurich – 41(1)730-4074

TAIWAN, Taipei – 886(2)717-7089

THAILAND, Bangkok – 66(2)254-4910

UNITED KINGDOM, Aylesbury – 441(296)395-252

UNITED STATES, Phoenix, AZ – 1-800-441-2447

For a list of the Motorola sales offices and distributors: **http://www.mcu.motsps.com/sale_off.html**