MCS8140

Network USB Processor

Design Kit / Quick Start Guide

1. Getting Started

The MosChip MCS8140 is a highly integrated general-purpose network processor that can be used in a variety of products that require network connectivity.
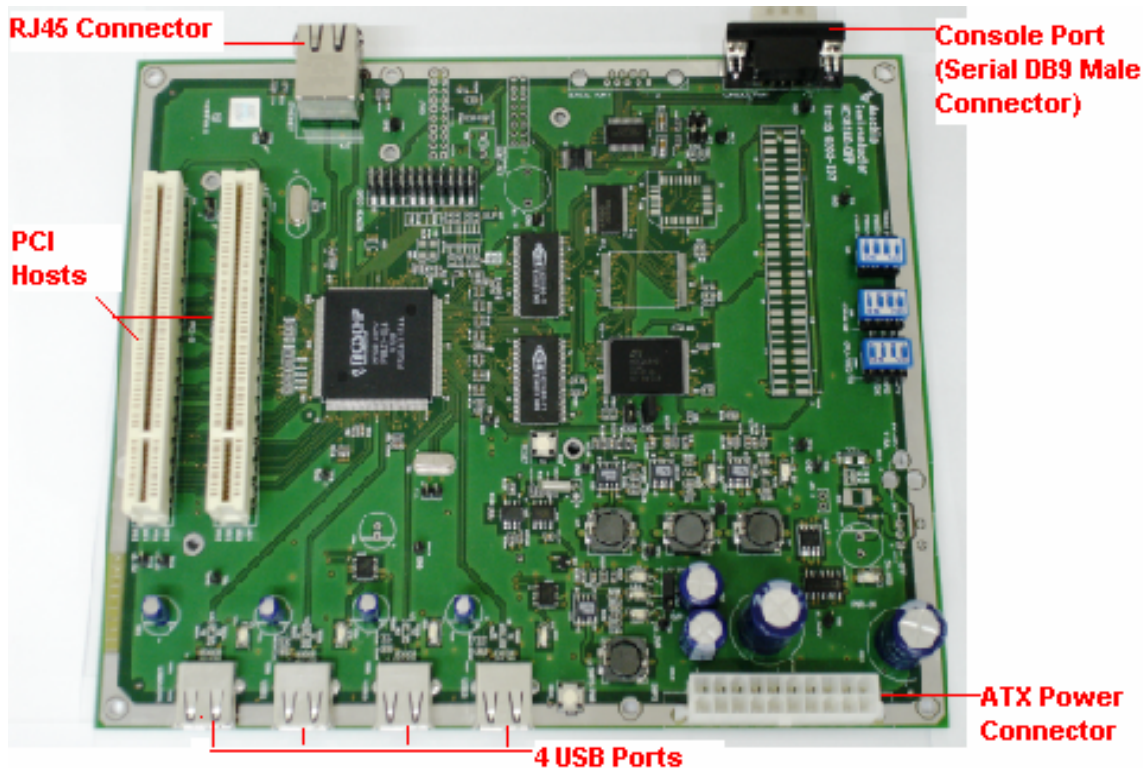
This quick start guide provides basic information about MCS8140, details on technical documentation & evaluation deliverables available from Moschip as design kit. This manual also guides the user on how to get started with the MCS8140 EVB. This manual is to be used in conjunction with the MCS8140 Data Sheet, Software User manuals & other Application Notes.

2. MCS8140 Design Kit - Contents

- MCS8140 Evaluation kit consists of following
    a. MCS8140 EVB – Details in Section 3
    b. One Null Modem Serial cable
    c. One Ethernet Straight Cable
    d. DC Power adapter – Not enclosed with MCS8140-Combo-EVB

- Technical documentation – Details in Section 5

- System design data – Details in Section 6

- Software Support – Details in Section 7

- Linux BSP – Details in Section 8

- Additional support – Details in Section 9

3. MCS8140 EVB Board details : Following evaluation boards are available from MosChip for MCS8140

a) MCS8140-Combo-EVB : This EVB supports RJ45 Ethernet, 4 x USB Host Ports, 2 x PCI Host Slots, 32MB SDRAM, 16MB Flash, Serial Console, GPIO header & ATX Power Connector.
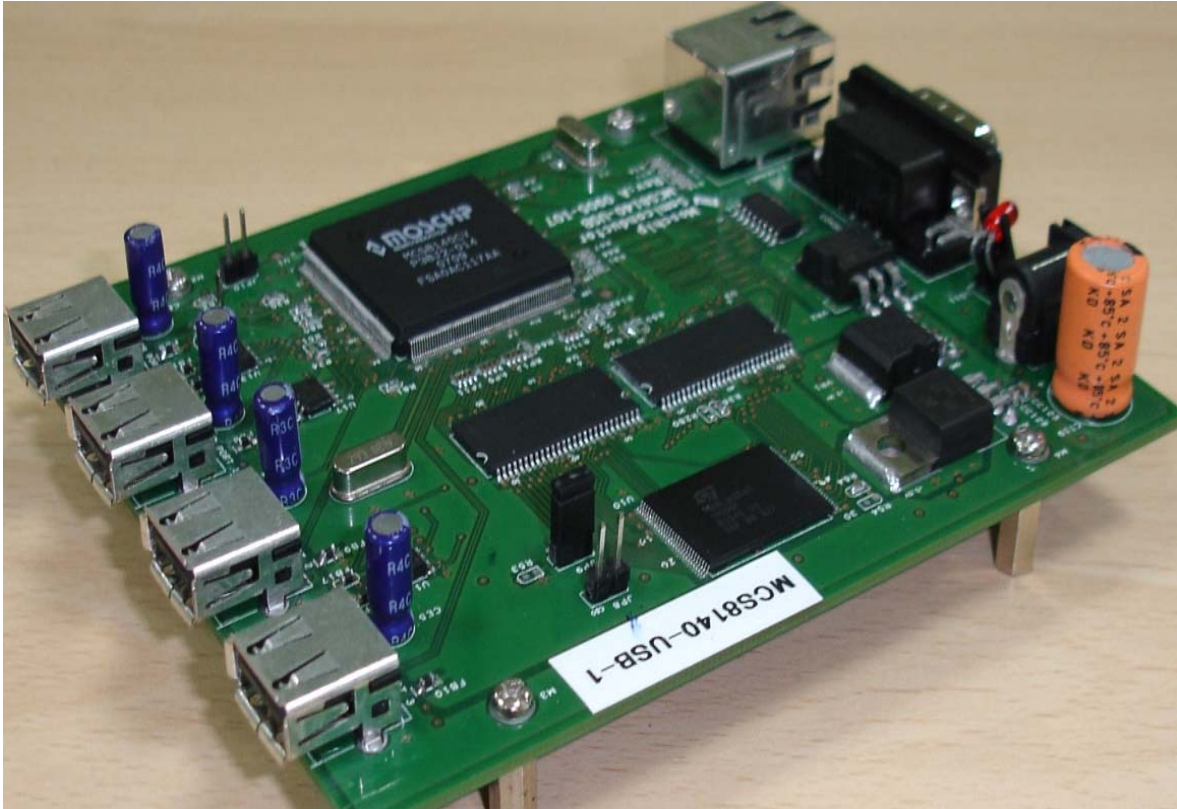

USB Port Power control implemented as per USB specification requirements. PCI bus can be used to support PCI based WiFi cards, PCI to SATA Controller, PCI to IDE controller, PCI to Audio controllers etc.,

5V and 3.3V Power supplies are available on PCI connectors. +12V & -12V voltage supplies are not wired to PCI connectors in this board & hence PCI cards which require +12V / -12V can't be used on this EVB. Use PC SMPS (ATX Power supply) for powering this board.

Note : External MII Phy can be used on this EVB, Daughter Card available from Moschip for Fiber based Ethernet connection in place of RJ45.

EVB User manual for MCS8140-Combo-EVB can be downloaded from
http://www.moschip.com/data/products/MCS8140/MCS8140_EVB_Combo.pdf

b) MCS8140-USB-EVB : This EVB supports RJ45 Ethernet, 4 x USB Host Ports, 32MB SDRAM, 8MB Flash, Serial Console & DC Socket for external wall adapter. Wall adapter with 7.5V / 4A rating needed for this EVB.
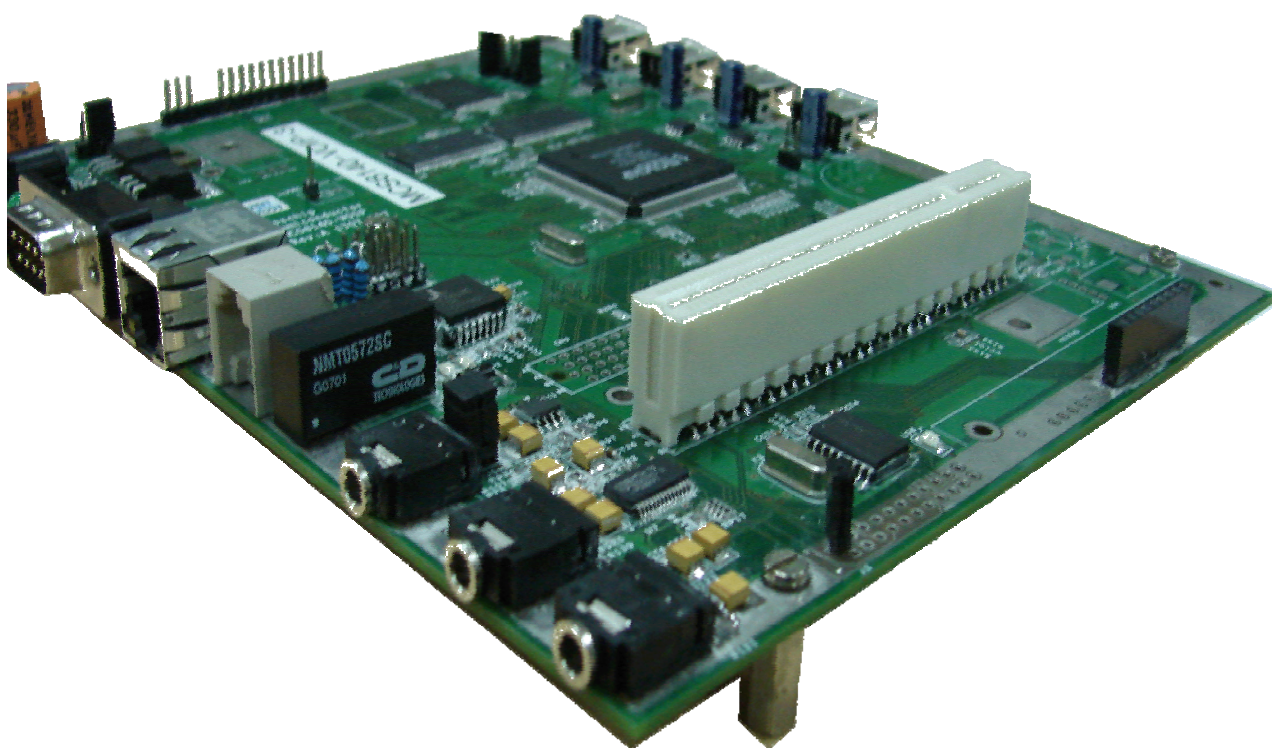

Note :

- MCS8140-USB-EVB doesn't have PCI interface

- This design executed in 4-Layered PCB

- This EVB can be used with USB-Server, Print Server & Serial Server applications

- NAS & Combo applications requires 16MB Flash size & this EVB can't be used on for these applications.

EVB User manual for MCS8140-USB-EVB can be downloaded from http://www.moschip.com/data/products/MCS8140/MCS8140_EVB_USB.pdf

c) MCS8140-VoIP-EVB : This EVB supports RJ45 Ethernet, 4 x USB Host Ports, 2 x PCI Host Slots, One Mini-PCI Type III provision on one of the PCI slots, 32MB SDRAM, 16MB Flash, Serial Console & DC Socket for external wall adapter. Wall adapter with 7.5V / 4A rating needed for this EVB (Minimum rating assuming no device on PCI Host interface)

This EVB has following on-board provisions through external peripherals : Slic HC55185 interface with onboard DC-DC converter for battery voltage generation, RJ11, Audio Codec, DC-DC Converter, 16 X 2 LCM module, 25-key Key Pad, DTMF decoder, Real time clock & Audio IN/OUT jacks with on-board amplifier.

USB Port Power control implemented as per USB specification requirements. PCI Slot and Mini-PCI slot can be used to support Mini-PCI based Wireless Cards, PCI to 802.11g, PCI to SATA Controller, PCI to IDE controller, PCI to Audio controllers etc.,

5V and 3.3V Power supplies are available on PCI connectors. +12V & -12V voltage supplies can be derived by using DC - DC converter available on-board. Hence this board can be used for PCI cards needing +12V & -12V voltages also.

EVB User manual for MCS8140-VoIP-EVB can be downloaded from
http://www.moschip.com/data/products/MCS8140/MCS8140_EVB_VOIP.pdf

4. Getting started with MCS8140 EVB

The MCS8140 evaluation boards shipped with preloaded USB Server Firmware. Firmware on EVB can be changed or updated to latest version, if needed.

For quick installation and setup of USB-Server, see the USB-Server User Manual on MosChip Web site. This user manual plus USB Server Client Utility can be downloaded from following links on MosChip web site.

For Windows XP + Vista OS :
http://www.moschip.com/data/products/MCS8140/MCS8140_US_Windows.zip

For Macintosh 10.4.9 & above :
http://www.moschip.com/data/products/MCS8140/MCS8140_US_MAC.zip

For Linux Kernel 2.6.15 & above :
http://www.moschip.com/data/products/MCS8140/MCS8140_US_Linux.tar.gz

If you wish to work either with NAS / USB-Print Server / Combo / Serial Server applications of MCS8140, you need to download the required Firmware build from MosChip Website and upgrade the firmware on the board.

Please go through the Firmware upgrade manual available on MosChip Web site, for directions to upgrade the firmware on MosChip EVB

http://www.moschip.com/data/products/MCS8140/MCS8140_FW_Upgrade.pdf

5. Technical documentation

Following technical documentation available from MosChip for MCS8140

a) <u>Short Form</u> : This document provides brief description of MCS8140 features
http://www.moschip.com/data/products/MCS8140/Short%20Form_8140.pdf

b) <u>Brochure</u> **:** Color Brochure showing few application scenarios with MCS8140
http://www.moschip.com/data/products/MCS8140/Brochure_8140.pdf

c) <u>White Paper</u>: This white paper explains USB over Network & advantages of
MCS8140 in enabling same.
http://www.moschip.com/data/products/MCS8140/MCS8140_WP.pdf

c) <u>Data Sheet</u> : Detailed Product Data Sheet, contains complete feature details, Pin-
out information, Pin description, Electrical & Mechanical characteristics. This
document suffices the requirements of system designers.

Data Sheet can be shared with interested OEM customers on request, contact
marketing@moschip.com or support-8140@moschip.com for same.

d) <u>Hardware Manual</u> : This document contains information on complete register
set, required for SW developer who is porting different operating system.

This document being shared under <u>NDA</u> after business opportunity assessment /
under standing the need of OEM customer & the reason for asking such data.

e) <u>Application Notes</u>

MII Application Note explains on how to use external Ethernet phy with
MCS8140.
http://www.moschip.com/data/products/MCS8140/MCS8140_MII_AN.pdf

Power application Note has details on how to arrive at Power budgeting, this is
meant for system designer while designing their power supply design.
http://www.moschip.com/data/products/MCS8140/MCS8140_Power_AN.pdf

Memory application note has details on memory sizes supported on MCS8140. It
also has details on different Memory devices confirmed at MosChip
http://www.moschip.com/data/products/MCS8140/MCS8140_Memory_AN.pdf

Application Notes Contd….

Frequently asked questions on MCS8140 ASIC & hardware
http://www.moschip.com/data/products/MCS8140/MCS8140_FAQ_HW.pdf

Application Note to arrive at Mini-PCI interface with MCS8140
http://www.moschip.com/data/products/MCS8140/MCS8140_MiniPCI_AN.pdf

PCB Design/Layout Guidelines for PCB Layout designers:
http://www.moschip.com/data/products/MCS8140/MCS8140_Layout_Guide.pdf

6. System design related Data

System design data detailed below can be shared on request, contact support-8140@moschip.com

Schematics : MCS8140 EVB schematics can be shared on request either in PDF format or in OrCad format.

PCB layout Files : MosChip EVB layout files can be given either in Gerber format or as Allegro board file.

EVB Bill of Material : MCS8140 EVB BOM can be shared on request in Excel format.

7. Software Support

MosChip is providing software Support for following applications

- USB Server : To enable USB device virtualization over Network. Refer to product brief of MCS8140-USB Server for more details
  http://www.moschip.com/data/products/MCS8140/MCS8140_PB_US.pdf

- Network attached Storage (NAS) – To add storage space on Network. Refer to product brief of MCS8140-NAS for more details
  http://www.moschip.com/data/products/MCS8140/MCS8140_PB_NAS.pdf

- Combo application : Here both USB Server & NAS applications are supported in single Firmware build. Refer to product brief of MCS8140-Combo for more details
  http://www.moschip.com/data/products/MCS8140/MCS8140_PB_Combo.pdf

- USB Print Server : To enable USB Printer as Network Printer. Refer to product brief of MCS8140-Print Server for more details
  http://www.moschip.com/data/products/MCS8140/MCS8140_PB_PS.pdf

- Serial Server : This application assumes MCS7840 being connected to MCS8140 over USB interface & enables the virtualization of MCS7840 Serial Ports over Network. Refer to product brief of MCS8140-Serial Server for more details
  http://www.moschip.com/data/products/MCS8140/MCS8140_PB_SS.pdf

Download links for Software Binaries + User Manual on MosChip Web site

I. USB-Server Software Binaries + User Manual

USB Server Firmware Build
http://www.moschip.com/data/products/MCS8140/MCS8140_USB_Server.zip

USB Server Client for Windows XP , Vista OS + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_US_Windows.zip

USB Server Client for Macintosh 10.4.9 & above + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_US_MAC.zip

USB Server Client for Linux Kernel 2.6.15 & above + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_US_Linux.tar.gz

II. Combo Software Binaries + User Manual

Combo Firmware Build + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_Combo_FW.zip

USB Server Client for Windows XP + Vista OS + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_US_Windows.zip

USB Server Client for Macintosh 10.4.9 & above + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_US_MAC.zip

USB Server Client for Linux Kernel 2.6.15 & above + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_US_Linux.tar.gz

III. NAS Software Binaries + User Manual

NAS Firmware Build + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_NAS.zip

IV. USB Print Server Software Binaries + User Manual

USB- Print Server Firmware Build + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_USB_PrintServer.zip

V. Serial Server Software Binaries + User Manual

Serial Server Firmware Build + Windows Administrative Client utility for 32bit XP / SP2 OS + User Manual
http://www.moschip.com/data/products/MCS8140/MCS8140_SS.zip

V. Firmware Upgrade Manual

This documents explains how to upgrade firmware on MCS8140 EVB
http://www.moschip.com/data/products/MCS8140/MCS8140_FW_Upgrade.pdf

VI. Frequently asked Questions - Software

Frequently asked questions on MCS8140 Software Support
http://www.moschip.com/data/products/MCS8140/MCS8140_FAQ_SW.pdf

8. Linux BSP

MCS8140 can run Linux as Embedded Operating System. Moschip Offers Linux 2.6.15 based BSP for advanced developers who wish to develop custom applications on top of the BSP.

Linux BSP offered by MosChip is a plain Linux operating system with basic drivers required for it to boot on the MCS8140 EVB.

Customers equipped with good programming knowledge and Linux know how can develop their own applications on top of the BSP given by MosChip. ARM Tool Chain is also shared as binary for customers compile their applications & port them on to MCS8140 EVB.

Following contents shared as Linux BSP for MCS8140 <mark>under NDA</mark>

Source   : Linux kernel 2.6.15 source Files with basic Flash File System

ARM Tool Chain : Pre-compiled ARM tool chain

Documentation   :

Initial Setup : Includes the Basic sequence of steps for bringing up the board with the custom Linux kernel and flash file system and the basic steps required for the initial setup of the MCS8140 board.

Peripheral drivers : Linux drivers developed for the on-board peripherals of MCS8140 like I^{2}S, SPI & PCI Host interfaces.

Software Manual : This document describes installation, configuration of Arm-tool set and steps to build a Linux kernel image. It also describes how to modify ARM Linux 2.6.15 kernel to run on the MosChip MCS8140. The document also introduces the MCS8140 peripheral drivers and describes the variation of these drivers from the mainline Linux device drivers. It also explains the MCS8140 board booting sequence and the available boot loader commands .

9. Additional offerings & Support

Sources files of software applications supported by MosChip can be shared to Customers for their customizations at advanced stage of business opportunity, under software license agreement.

Source files of USB-Server / NAS / Combo / Print Server / Serial Server embedded software application can be shared as source files for customers customizations.

Write to support-8140@moschip.com for more details on above & to initiate for software agreement.

Contact information

Contact support-8140@moschip.com for any further technical information. sales@moschip.com can be contacted for commercial queries.

Revision History

Revision	Date	Remarks
1.0	July 13, 2007	Initial Draft
1.1	18th Sept 2007	Document updated with additional data and software applications

Important Notice

All information in this document is believed to be accurate as of the publish date.

MosChip Semiconductor products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of MosChip Semiconductor, Ltd.

MosChip Semiconductor believes the information in this document to be accurate and reliable. However, it is subject to change without notice. MosChip Semiconductor assumes no responsibility for its use, or for infringement of patent or other rights of third parties. No part of this document may be reproduced, or transmitted in any form or by any means without prior consent of MosChip Semiconductor, Ltd.