MSC8144AMC-S Getting Started Guide

This document describes how to connect the MSC8144AMC-S card and verify its basic operation. Settings for the switches and jumpers are provided as well as instruction for connecting peripheral devices. Instructions for connecting the MSC8144AMC-S to an integrated development environment (IDE), such as Freescale CodeWarrior™ IDE, are included; however, instructions for working with the IDE are beyond the scope of this document.

Contents

1   Required Reading

It is assumed that the reader is familiar with the MSC8144 DSP and the content of the *MSC8144AMC-S Advanced Mezzanine Card User Manual*.

2 Definitions, Acronyms, and Abbreviations

Table 1. Definitions, Acronyms, and Abbreviations

AMC	Advanced Mezzanine Card
ATCA	Advanced Telecommunications Computing Platform
BDM	Background Debug Mode
CPLD	Complex Programmable Logic device
DIP	Dual In Line Package
DSP	Digital Signal Processor
EEPROM	Electrically Erasable, Programmable Read Only Module
GETH	Gigabit Ethernet
HW	Hardware
I^2C (bus)	Inter-IC bus
MMC	Module Management Controller
RCW	Reset Configuration Source
UART	Universal Asynchronous Receiver/Transmitter
uTCA	Micro Telecommunications Computing Platform

3 Check Switches

Use the following steps to verify the switch settings on the board:

1. Check the default positions and verify the board is operational before changing the switches. The settings for the switches are shown with their default positions in Figure 1 and are described in Table 2.

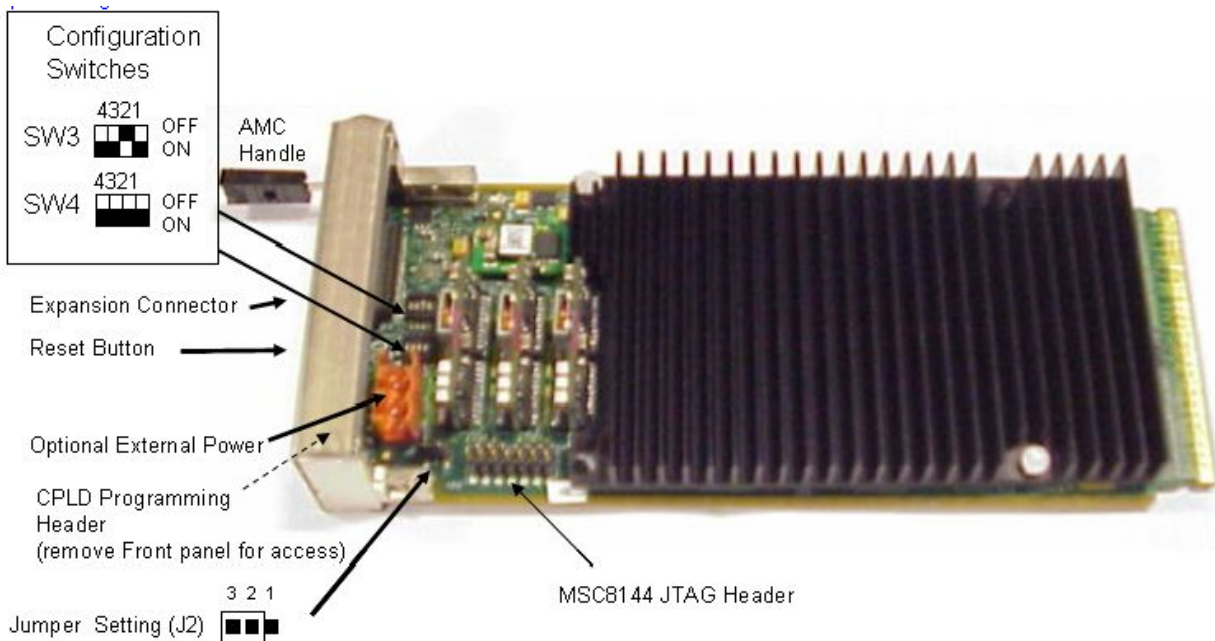2. The jumper should remain in its default position. This is used for CPLD programming.


Figure 1. Default Switch Settings

Table 2. Default Switch Settings

Feature	Settings [OFF=1 ON=0]	Comments
SW3.1	ON	Tundra Serial RapidIO Switch set to 3.125 GHz
SW3.2	OFF	
SW3.3	ON	CPLD controlled Power Up (no MMC)
SW3:4	ON	Future use.
SW4.1	ON	Select MSC8144 UART output: DSP1
SW4.2	ON	
SW4.3	ON	RCW Source from I^{2}C, Boot Port = Serial RapidIO Interface
SW4.4	ON	MSC8144 Debug Mode is Off [EE0=0]
Jumper J2	Position 2-3	Full CPLD JTAG Chain

4   Assemble and Connect the Board

Use the following steps to assemble and connect the board:

1. Freescale recommends running the AMC in an ATCA, uTCA, picoTCA chassis or equivalent. This delivers the correct power and air flow to the board. The board should be inserted into the carrier chassis as per the specific carrier instructions. An example is shown in Figure 2.
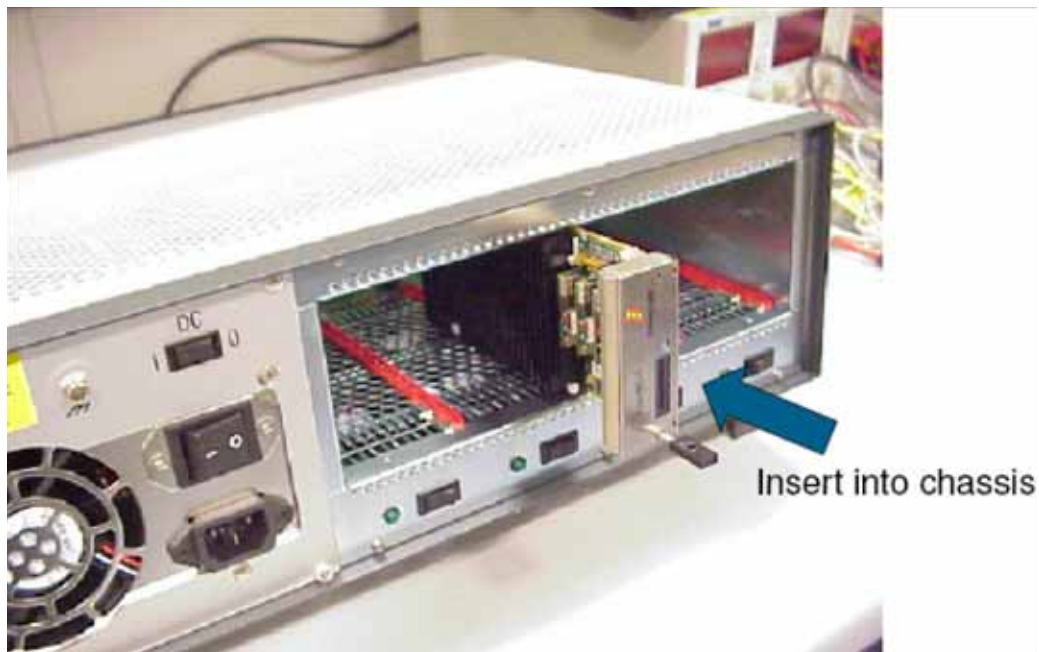
Figure 2. Inserting AMC into Chassis

2. An external power supply connector (P2) is supplied for stand-alone operation (see Figure 3). In this mode, make sure that adequate cooling is provided for the board.
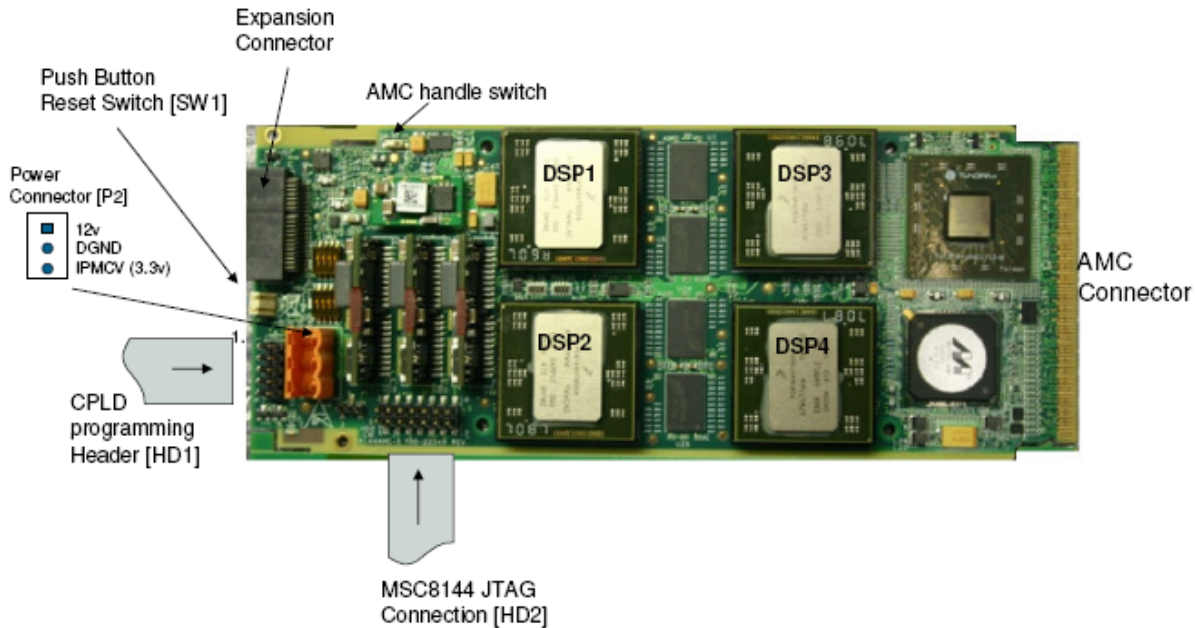

Figure 3. Connector and Push-Button Locations

3. Make sure that the heat sink is fitted.

5   Perform Initial Board Power-Up and Check LEDs

Use the following steps to apply power to the board and check the LED operation:

1. Switch on the power to the chassis (or to the standalone connector).
2. Check for completion of the reset sequence indicated by the LEDs (see Figure 4 for locations). A full description of the LED operation is given in Table 3.
3. When powered up:
   a) The Power Good and 3.3 V LEDs light and stay on.
   b) In standalone mode, the BLUE LED comes on. In a chassis with MMC, the BLUE LED flashes and then switches off.
   c) The four MSC8144 RGMII activity LEDs switch on then off.
   d) Ethernet port activity LEDs switch on to indicate any Ethernet link to the backplane (system-dependent).
   e) The DSP HRESET and PORESET LEDs switch on then off to indicate the reset sequence is complete.
4. Pressing the Front panel Reset button (SW1) power cycles the board and starts the reset sequence.
5. Pressing the Reset button (SW2) resets the board and starts the reset sequence.

Table 3. LED operation

| Description	Ref	Color	LED On	LED Off
Power Good	LD601	Green	Power good	Power supply fail
3.3 V (IPMCV) present	LD602	Yellow	IPMCV power on	IPMCV power off
Blue LED	LD603	Blue	Hot Swap State	Hot Swap State
Red LED	LD5	Red	Fault Condition	Normal operation
PORESET	LD609	Green	PORESET asserted	PORESET deasserted
HRESET	LD612	Yellow	HRESET asserted	HRESET deasserted
DSP1 User Programmable	LD600	Yellow	User programmable	User programmable
DSP2 User Programmable	LD611	Yellow	User programmable	User programmable
DSP3 User Programmable	LD604	Yellow	User programmable	User programmable
DSP4 User Programmable	LD613	Yellow	User programmable	User programmable
DSP1 RGMII Activity	LD610	Yellow	Ethernet activity	No Ethernet activity
DSP2 RGMII Activity	LD606	Yellow	Ethernet activity	No Ethernet activity
DSP3 RGMII Activity	LD607	Yellow	Ethernet activity	No Ethernet activity
DSP4 RGMII Activity	LD608	Yellow	Ethernet activity	No Ethernet activity
Front Panel Ethernet Activity	LD605	Yellow	Ethernet activity	No Ethernet activity
AMC Port 0 Ethernet Activity	LD615	Yellow	Ethernet activity	No Ethernet activity
AMC Port 1 Ethernet activity	LD614	Yellow	Ethernet activity	No Ethernet activity
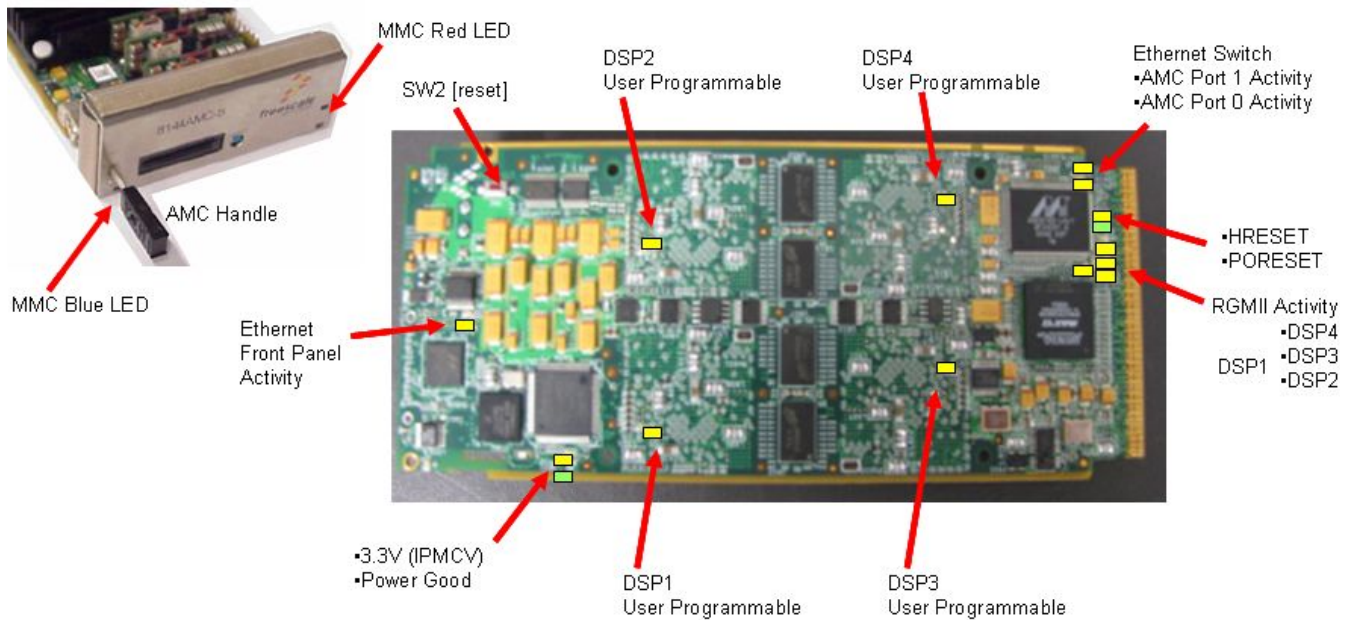
Figure 4. LED Locations

6   Connect the JTAG Connectivity Unit to the Board

The JTAG connectivity unit (USB tap) enables the CodeWarrior software to work with the board. Use the following steps to complete this connection:

1. Connect the JTAG connectivity unit to the JTAG/OCE 14-pin connector (HD2) (see Figure 5).
2. Switch on power to the board.
3. Check for completion of the reset sequence (see step 3).
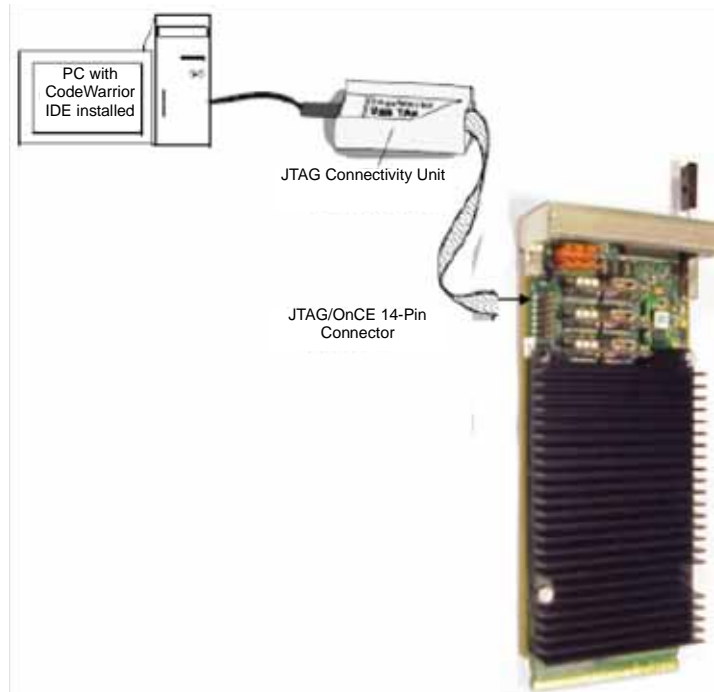4. Continue as per standard CodeWarrior instructions.

Figure 5. USB TAP Connection

7   Set the Board for User-Specific Development

There are a number of configurations that can be selected depending on the user mode of application. The available settings are listed in Table 4. Figure 6 and Figure 7 shows the locations of switches, connectors, and LEDs.

NOTE

Use the following guidelines when setting up specific configuration:

– To use the MSC8144 Serial RapidIO interface, SW4.3 and SW4.4 must be set to ON.
– With SW4.3 set to OFF and SW4.4 set to ON, all four MSC8144s boot from the I^2C EEPROM and run a short program to flash their LEDs 3 times.

There are two main programming/test headers on the board, as follows:

- HD1 is used to program the Reset and System CPLDs.

- J1 is the expansion connector, designed to offload programming headers and test interfaces from the board. An expansion card, Figure 8, can be fitted to the connector, giving access to the following:
  — MSC8144 UART
  — ColdFire® (MMC) UART
  — Front panel Ethernet RJ45
  — Ethernet Switch EEPROM programming header
  — External I^2C EEPROM programming header
  — ColdFire (MMC) BDM

Table 4. User Option Switch Settings

| Feature	Settings [OFF=1 ON=0]	Comments
SW3.1 SW3.2	SW3.1/SW3.2 ON ON ON OFF OFF ON OFF OFF	SP_IO_SPEED[0:1]: Select TSI578 Serial RapidIO Speed 00: 1.25 GHz 01: 3.125 GHz 10: 2.5 GHz 11: Reserved
SW3.3	ON OFF	Reset CPLD controlled Power Up ColdFire microprocessor-controlled MMC [Future Use]
SW3.4	ON	Leave in default position.
SW4.1 SW4.2	SW4.1/SW4.2 ON/ON ON/OFF OFF/ON OFF/OFF	Select MSC8144 UART output 00 – DSP1 01 – DSP2 10 – DSP3 11 – DSP4
WSW4.3	ON OFF	RCW Source from I^2C pins/Boot Port= RCW Source from External pins /Boot Port = I^2C
SW4.4	ON OFF	MSC8144 Debug Mode off [EE0=0] MSC8144 Debug Mode on [EE0=1]
Jumper J2	Position 1-2 Position 2-3	Reset CPLD in JTAG chain Reset and System CPLD in JTAG chain
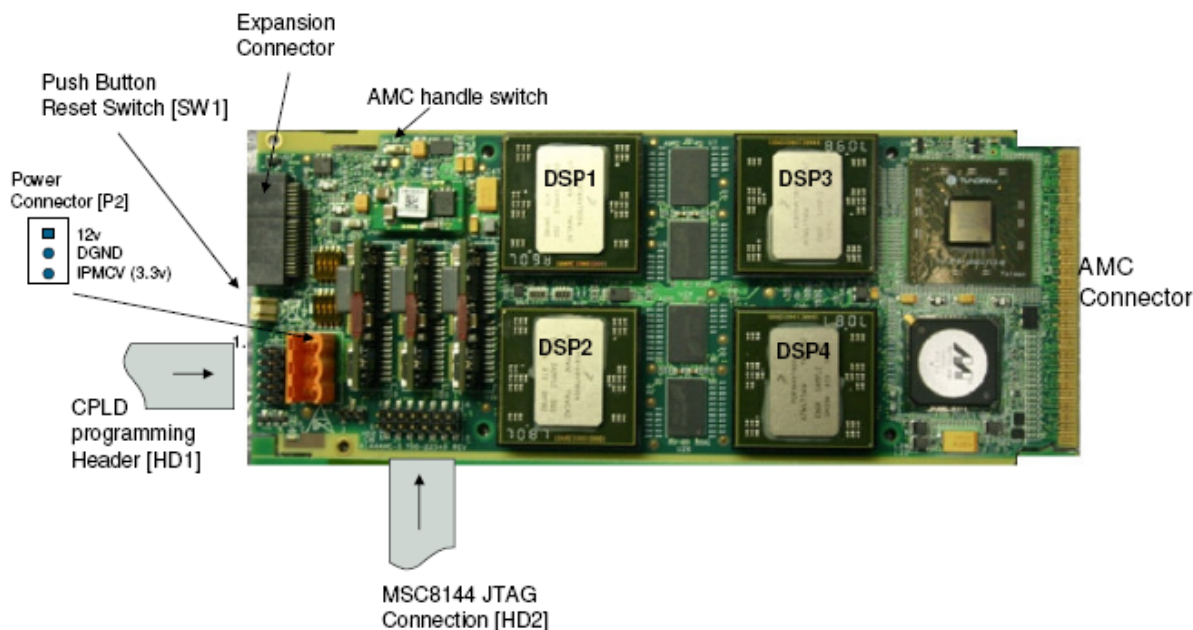
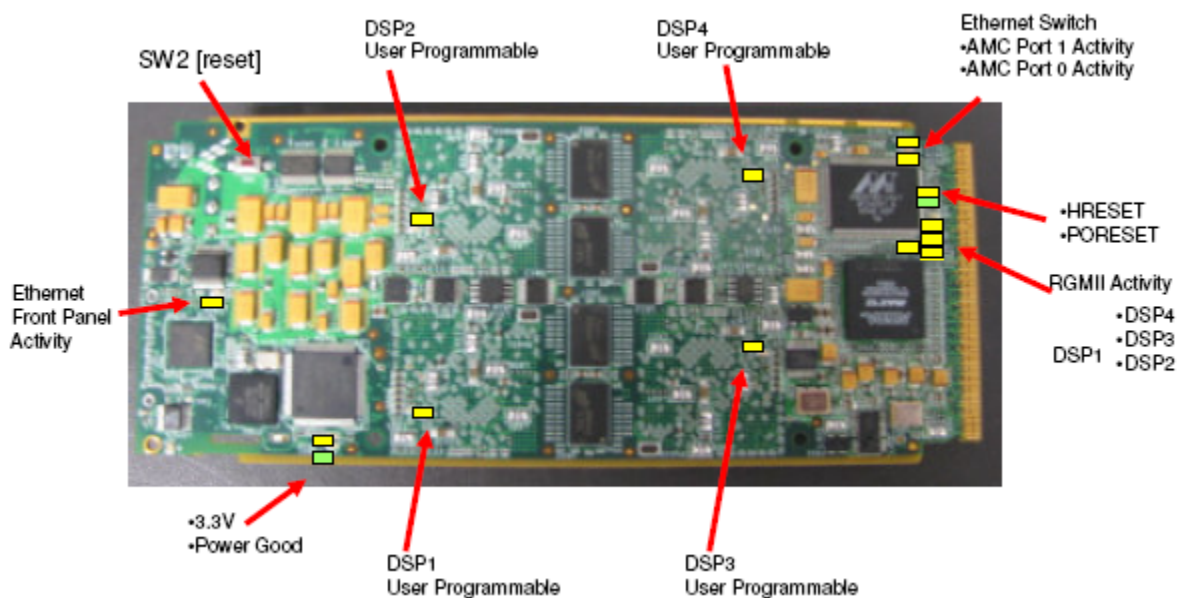**Figure 6. Primary Side Main Features (Shown without Heat Sink and Front Panel)**

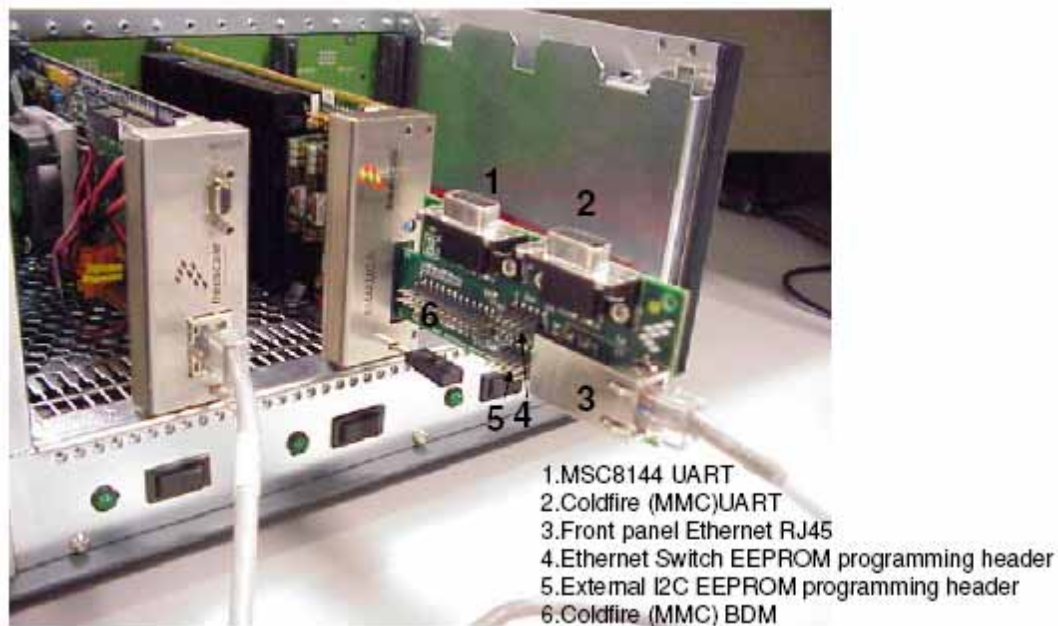**Figure 7. Secondary Side Main Features**

Figure 8. Expander Card Features

8   Module Management Controller

The MSC8144AMC-S contains a CorEdge enabled Module Management Controller that meets the PICMG and Intelligent Platform Management Interface (IPMI) AMC specifications. This allows the board to be hot-swapped in or out of an MMC-compliant system. To hot-swap a board, complete the steps listed in the following sections.

8.1   Hot-Swapping a Board In

Use the following steps to install the board when hot-swapping:

1. Set switch SW4.3 to OFF to select the MMC option.
2. Insert the AMC board with the handle extracted into an empty slot in the chassis. The BLUE LED switches ON once the board is inserted. The 3.3 V (IPMCV) also switches on
3. Close the handle. The BLUE LED flashes and then switches OFF. The board powers up in the following standard LED sequence.
   a) The 3.3V (IPMCV) stays ON.
   b) The Power Good lights and stays ON.
   c) The four MSC8144 RGMII activity LEDs switch ON and then OFF.
   d) Ethernet port activity LEDs switch ON to indicate any Ethernet link to the backplane (system-dependent).
   e) The DSP HRESET and PORESET LEDs switch ON and then OFF to indicate the reset sequence is complete.

8.2 Hot-Swapping a Board Out

Use the following steps to remove the board when hot-swapping:

1. Extract the hot swap handle.
2. The BLUE LED flashes and then stays ON. All LEDs except the 3.3 V (IPMCV) switch OFF.
3. When the BLUE LED is ON, the AMC can be removed from the chassis.

9 Revision History

Table 5. Document Revision History

Revision Number	Substantive Change(s)
0	Initial release.
1	Adding hot-swapping description Section 8.
2	• Updated Figure 1 and Table 2 with correct jumper settings. • Updated table reference to Table 3 in step 2 of Section 5.

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