VadaTech VT850
User Manual

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Revision History

Doc Rev	Description of Change	Revision Date
1.0	Document Created	02/23/2009

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1   Overview

The VT850 is a 1U MicroTCA carrier that provides twelve AMC mid-height slots. This manual describes the configuration and operation of the VT850 chassis.

Figure 1: VT850

The VT850 uses a modified ATCA AMC layout.
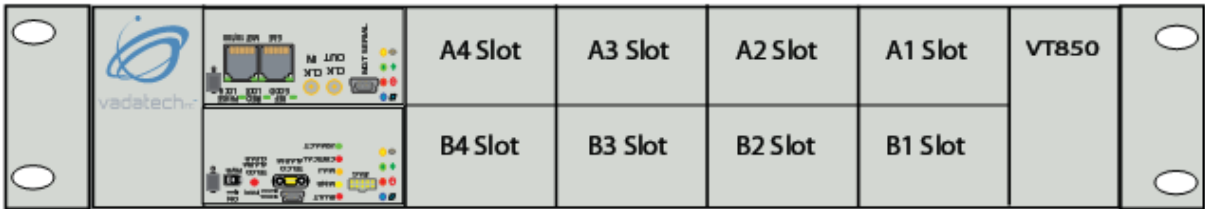
Figure 2: Front Side AMC Slot Numbering

Figure 3: Back Side AMC Slot Numbering

Slot	IPMB-L Address	FRU
A1	0x72	5
B1	0x74	6
A2	0x76	7
B2	0x78	8
A3	0x7A	9
B3	0x7C	10
A4	0x7E	11
B4	0x80	12
A5	0x82	13
B5	0x84	14
A6	0x86	15
B6	0x88	16

Table 1: AMC Slot Numbering

1.1 Document References

- PICMG Specification MTCA.0 R1.0 (MicroTCA)
- VadaTech VT850 data sheet
- VadaTech MicroTCA MCH Getting Started Guide
- VadaTech MicroTCA Shelf Command Line Interface Reference Manual
- VadaTech MicroTCA Carrier Command Line Interface Reference Manual
- VadaTech MicroTCA Management Interface Specification
- VadaTech MicroTCA Carrier SNMP Interface Reference Manual
- VadaTech MicroTCA Shelf SNMP Interface Reference Manual
- VadaTech MicroTCA PM Command Line Interface Reference Manual

1.2 Acronyms Used in this Document

Acronym	Description
AMC	Advanced Mezzanine Card
CU	Cooling Unit
JTAG	Joint Test Action Group
JSM	JTAG Switch Module
MCH	MicroTCA Carrier Hub
PEM	Power Entry Module (hot-swappable power supply)
PM	Power Module

Table 2: Acronyms

2   Components

The VT850 carrier includes a MicroTCA Carrier Hub (MCH), a MicroTCA Power Module (PM) and two MircoTCA Cooling Units (CUs). Two removable modules provide front-panel access to these components. The DA122 provides Ethernet and serial access to the MCH, and Telco Clock functionality. The DA123 provides LEDs and serial access for the PM, Telco Alarm functionality, and a JTAG Switch Module for the AMCs.

2.1   MicroTCA Carrier Hub

The VT850 carrier includes an integrated MCH. The MCH acts as both the Shelf Manager and Carrier Manager. Access to this MCH is provided by a removable module, the DA122.

Figure 4: DA122 MCH Interface

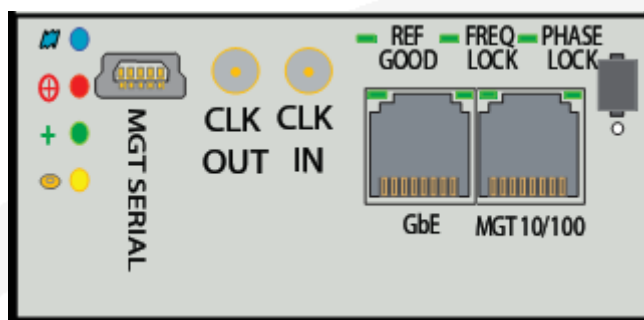### 2.1.1   ATCA LEDs

The four LEDs farthest from the handle are ATCA-controlled LEDs.

- Blue: MCH Hot-Swap, per MicroTCA
- Red: Fault
- Green: Healthy
- Amber: General-purpose

2.1.2   Clock Interface

CLK IN and CLK OUT are the clock signals. REF GOOD, FREQ LOCK, and PHASE LOCK indicate the clock state. Refer to VadaTech UTC001 and VT850 Telco - GPS Clock Configuration Guide for details.

2.1.3 Data Interfaces

The MGT SERIAL port provides console access to the MCH. The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the VT850, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81). The MGT10/100 provides Ethernet access to the MCH. This MCH supports SSH, RMCP, SNMP and HTTP connections. Refer to the VadaTech MicroTCA manuals listed in section 1.1 for details. The GbE port provides access to the Ethernet fabric switch, which is connected to the AMCs and the MCH.

2.1.4 Command Line Interface

The VT850 MCH implements a Command Line Interface (CLI) to view the Carrier and Shelf system resources and configuration.

Please refer to the VadaTech MicroTCA Carrier Manager Command Line Interface Reference Manual and VadaTech MicroTCA Shelf Manager Command Line Interface Reference Manual.

2.2 Cooling Units

The VT850 carrier includes two integrated MicroTCA CUs. Each of these CUs provides the following sensors:

Number	Type	Name	Description
0x10	0x01	VT 850 CU T1	Temperature (LM75)
0x28	0x01	VT 850 CU T2	Temperature (ADT 7462 internal)
0x29	0x04	FAN1 RPM	RPM
0x2A	0x04	FAN2 RPM	RPM
0x2B	0x04	FAN3 RPM	RPM
0x2C	0x04	FAN4 RPM	RPM
0x2D	0x04	FAN5 RPM	RPM
0x2E	0x04	FAN6 RPM	RPM
0x2F	0x04	FAN7 RPM	RPM
0x30	0x01	VT 850 CU T3	Temperature (ADT 7462 external)
0x31	0x01	VT 850 CU T4	Temperature (ADT 7462 external)
0x32	0x01	VT 850 CU T5	Temperature (ADT 7462 external)
0x33	0x01	VT 850 CU T6	Temperature (ADT 7462 external)
0x34	0x01	VT 850 CU T7	Temperature (ADT 7462 external)
0x35	0x01	VT 850 CU T8	Temperature (ADT 7462 external)
0x90	0xF2	VT 850 CU HS	AMC Hot Swap Handle
0x91	0xF1	VT 850 CU IPMB	ATCA IPMB-0 Status

Table 3: Common Cooling Unit Sensors

CU1 provides the Telco function, and supports this additional sensor:

Number	Type	Name	Description
0x3F	0xF4	TELCO ALARM	Telco Alarm Status

Table 4: Cooling Unit 1 Sensors

2.3   Power Module

The VT850 includes an integrated MicroTCA PM. The PM gets its power from two hot-swappable power supplies, also called Power Entry Modules or PEMs. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability. PEMs are hot-swappable, but the new PEM must have the same power capabilities as the one that was removed. PEMs are treated as redundant power feeds. That is, if each PEM provides 650 watts, the power capability reported by the PM is 650 watts, rather than 1300 watts. Access to the PM is provided by the DA123.
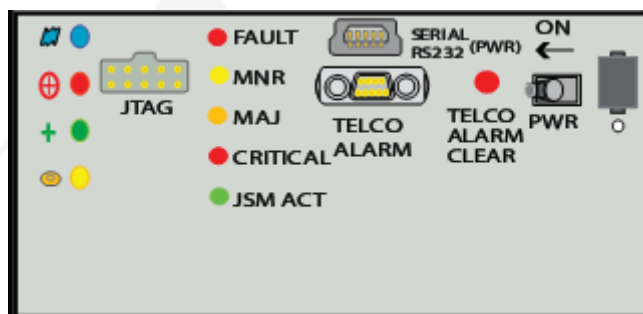

Figure 5: DA123 PM, JTAG, and Telco Interface

2.3.1   PWR switch

In order for the VT850 to run, the PWR switch must be in the "ON" position. The Power Switch directly controls the removable power supplies. When the switch is turned off, power is turned off to the entire Carrier, except for PM management power.

2.3.2   ATCA LEDs

The LEDs farthest from the handle are standard ATCA-controlled LEDs.

- Blue: Hot-Swap, per MicroTCA. Note that the PM is not removable.
- Red: Fault. The PM cannot provide power to modules, per MicroTCA
- Green: Healthy. The PM can provide power.
- Amber: Upgrade. This LED goes on when the PM is out-of-service during a firmware upgrade.

2.3.3   Command Line Interface

The VT850 PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the DA123. The serial port is a female micro-USB connector. To

connect this serial port to a standard DB9 connector, use the cable provided with the VT850, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual. In addition to the common functions, this version of the CLI provides the status of the removable power supplies as shown below:

Figure 6: Power Module Status Display

The following status is shown for each Power Entry Module (PEM):

- **Present: Yes** or **No**. If the PEM is not present, the remaining fields will not be displayed.
- **Temperature: OK** or **Over Temp**. This is the PEM's internal temperature status.
- **Fan: OK** or **Failed**. This is the status of the PEM's internal fans.
- **AC Input: Absent** or **Present**. This is the status of the external power connector on the PEM.
- **DC Output: OK** or **Bad**. This is the status of the power between the PEM and the VT850. This status can be **Bad** as a result of a temperature, fan or AC Input failure.

Any of the status fields may also be reported as "**Unknown**", which indicates a failure of the PM's Management Controller.

The PM will report changes in PEM status as they occur, regardless of which screen is displayed.

2.3.4 Sensors

This PM provides the following sensors:

Number	Type	Name	Description
0x10	0x01	PM tIN	Incoming Air Temperature
0x11	0x01	PM tOUT1	Outgoing Air Temperature
0x12	0x01	PM tOUT2	Outgoing Air Temperature
0x13	0x01	PM tOUT3	Outgoing Air Temperature
0x14	0x02	850 PM 12V	12V DC Power Output
0x90	0xF2	PM HOT SWAP	AMC Hot Swap Handle
0x91	0xF1	VT850 IPMB	ATCA IPMB-0 Status
0x94	0x08	PM STATUS	MicroTCA Power Module Status
0x95	0xF3	PM NOTIFICATION	MicroTCA Power Module Notification (Event-Only)
0x96	0x08	850 PM PWR IN	Input Power Redundancy (Based on PEM status)

Table 5: PM Sensors

2.4   JTAG Switch Module

The DA123 also contains a JTAG Switch Module (JSM) which provides JTAG support to all JTAG-capable Modules in the system. The front connector is a standard 0.1 header which mates to most JTAG modules. The module provides transparent communication between the Master and a selected secondary port. All configuration modes use an IEEE1149.1 TAP controller. The JTAG can operate with a clock up to 50MhZ.
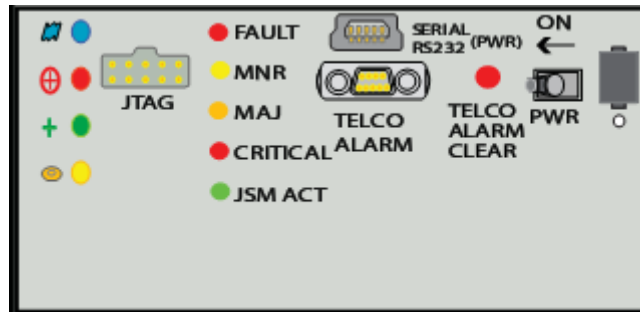

Figure 7: DA123 PM, JTAG, and Telco Interface

2.4.1   JTAG Backplane Topology

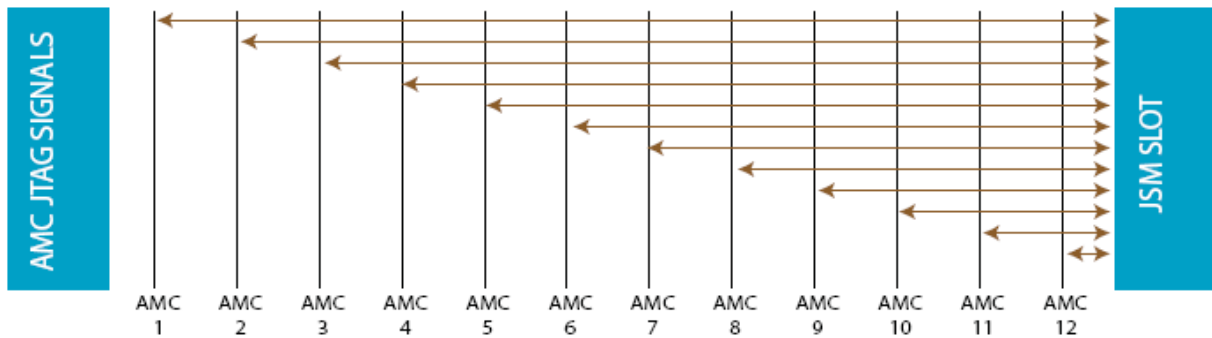The DA123 is fully connected to the AMC slots.

Figure 8: VT850 JTAG topology

2.5 Telco Alarm Interface

The DA123 provides a Telco Alarm Interface.

2.5.1 Front Panel

The Telco Alarm Connector is used to relay alarm information to an external alarm device.

- The Critical, Major, and Minor Alarm LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The TELCO ALARM CLEAR button is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the Carrier Manager or Shelf CLI. When disengaged, the external Telco alarms will turn back on.

2.5.2 Telco Alarm Connector

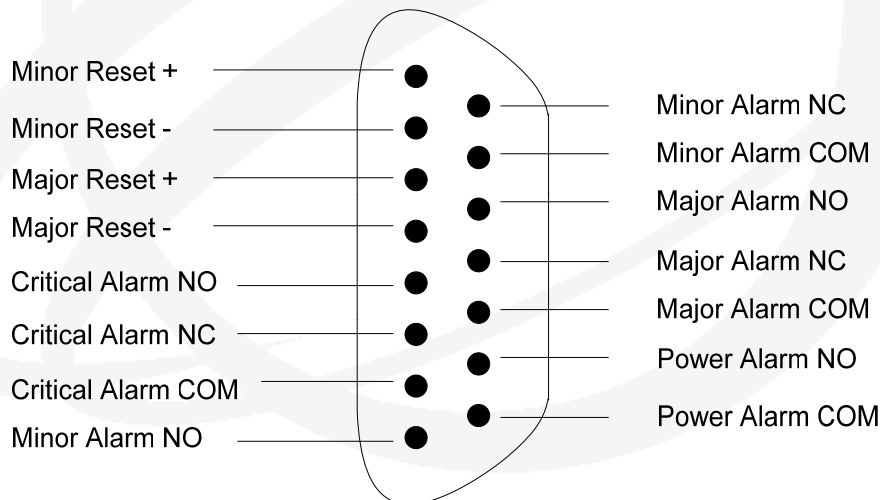This connector is used to drive an external alarm device.

Figure 9: Telco Alarm Connector

Name	Description
Minor Reset +	minor alarm reset, positive polarity
Minor Reset -	minor alarm reset, negative polarity
Major Reset +	major alarm reset, positive polarity
Major Reset -	major alarm reset, negative polarity
Critical Alarm NO	critical alarm relay, normally open
Critical Alarm NC	critical alarm relay, normally closed
Critical Alarm COM	critical alarm relay, common path
Minor Alarm NO	minor alarm relay, normally open
Minor Alarm NC	minor alarm relay, normally closed
Minor Alarm COM	minor alarm relay, common path
Major Alarm NO	major alarm relay, normally open
Major Alarm NC	major alarm relay, normally closed
Major Alarm COM	major alarm relay, common path
Power Alarm NO	power alarm relay, normally open
Power Alarm COM	power alarm relay, common path

Table 6: Telco Alarm Pinout

3   Carrier Number Configuration

If multiple Carriers are configured with an external Shelf Manager, make sure that each Carrier has a unique Carrier number. To set the Carrier number for the VT850, set the Chassis Locator switch (SW2) on the DA122 according to Table 7. The Chassis Locator switch is on the top of the DA122, as shown in Figure 10.

The Carrier number can also be set through the Carrier Manager CLI `set_carrier_number` command. The Carrier Number set through the CLI takes precedence over the Carrier number set in the Chassis Locator switch.

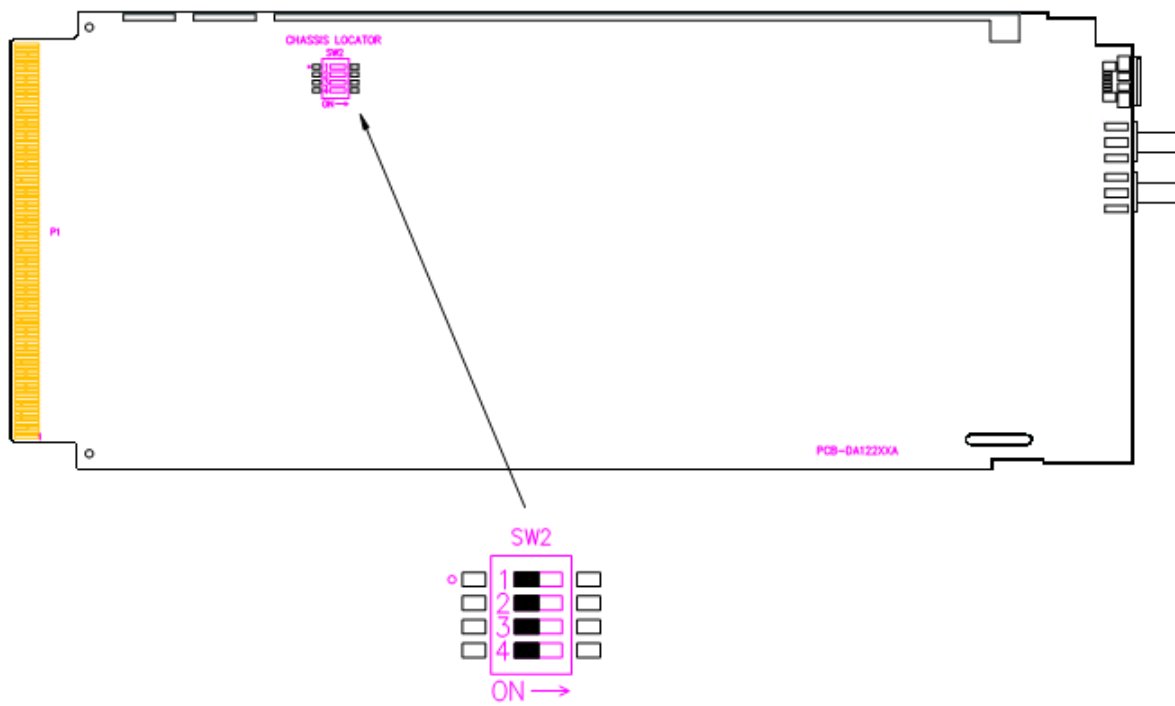| Carrier Number	Switch 1	Switch 2	Switch 3	Switch 4
1	On	On	On	On
2	On	On	On	Off
3	On	On	Off	On
4	On	On	Off	Off
5	On	Off	On	On
6	On	Off	On	Off
7	On	Off	Off	On
8	On	Off	Off	Off
9	Off	On	On	On
10	Off	On	On	Off
11	Off	On	Off	On
12	Off	On	Off	Off
13	Off	Off	On	On
14	Off	Off	On	Off
15	Off	Off	Off	On
16	Off	Off	Off	Off

Table 7: Carrier Number Configuration

Figure 10: DA122 Chassis Locator Switch

4   Backplane Topology

The VT850 provides a dual-redundant IPMB-0 bus among the MCH, CU1, CU2, and PM modules. The IPMB-L bus is radial.

MCH Fabric A is connected to port 0 on all of the AMCs, and MCH Fabric B is connected to port 1 on all of the AMCs.
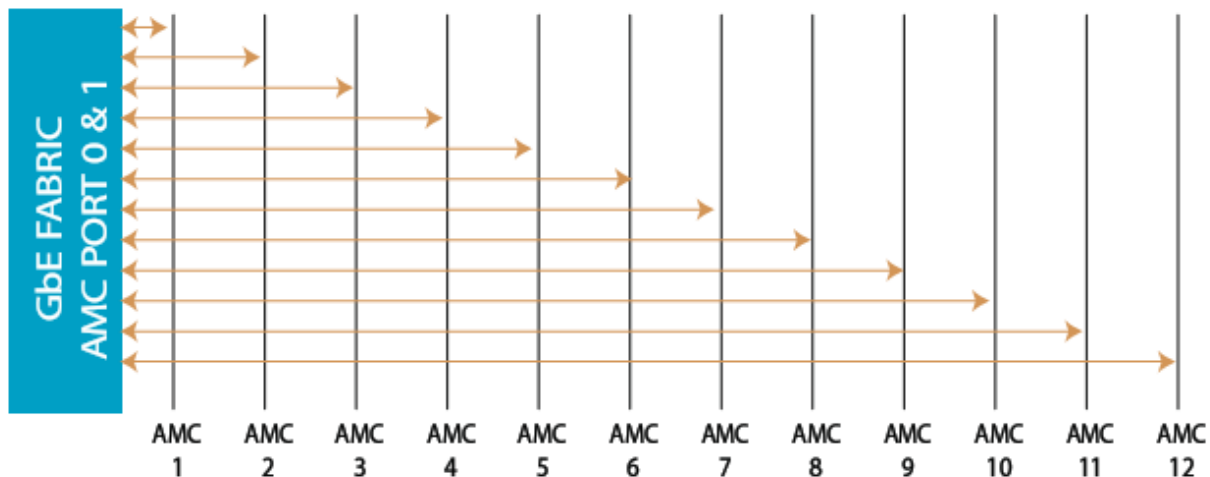

Figure 11: VT850 topology for AMC ports 0 and 1

AMC ports 2 and 3 (SAS / SATA) are routed directly between AMCs. AMC A1 port 2 is connected to AMC B1 port 2. AMC A1 port 3 is connected to AMC B2 port 2. In the same way, AMC A3 is connected to AMC B3 and AMC B4, and AMC A5 is connected to AMC B5 and AMC B6.
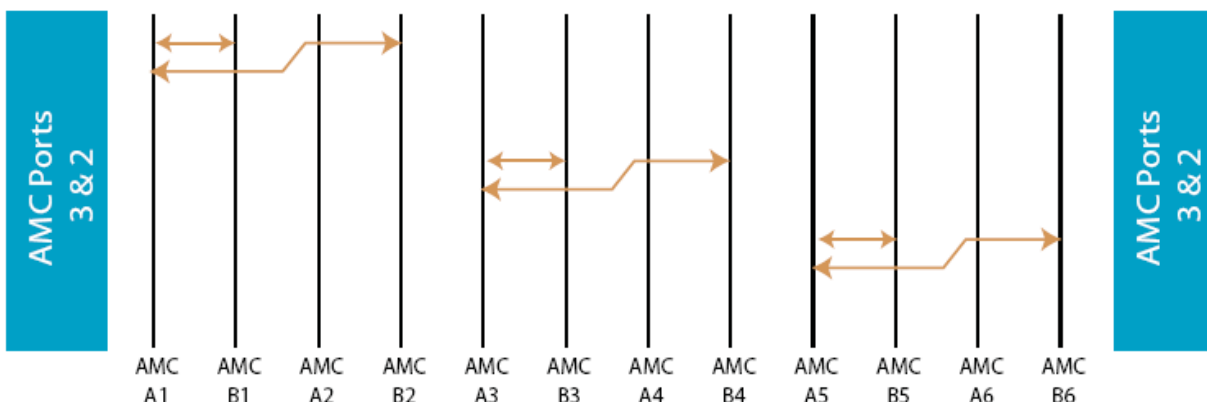

Figure 12: VT850 topology for AMC ports 2 and 3

In the fat pipes region, MCH fabrics D through G are connected to AMC ports 4 through 7.
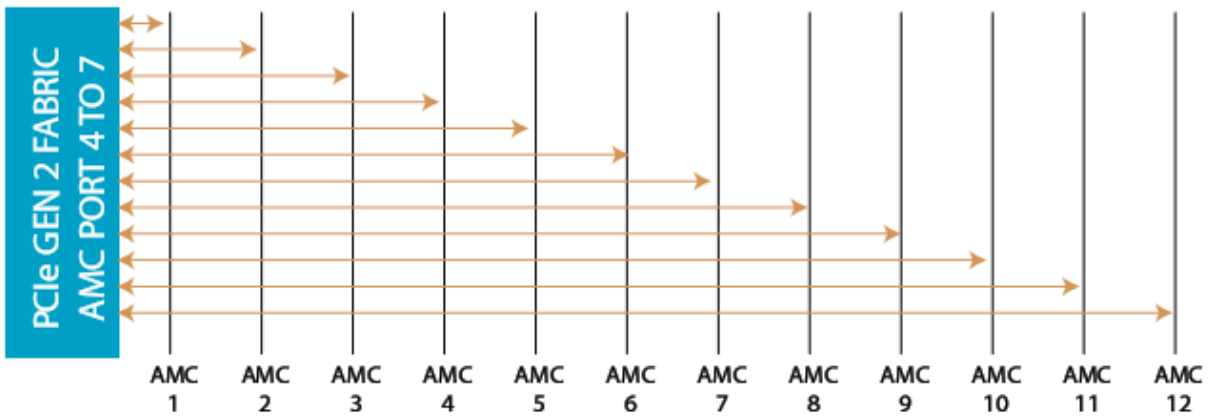

Figure 13: VT850 topology for fat pipes region

Depending on the clock options selected, some fabrics may not be routed. Refer to the VT850 data sheet for details.