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XJ3000-4243

Expander on Board

SSG JBOD

Functionality Test Report

DVT

Preliminary Release

Initiated by	Reviewed by	Reviewed by	Approved by
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Originate Date	Revision	Release Status	
2012/3/29	A0	Preliminary Release	

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Revision History

Revisions

REV.	DESCRIPTION	DATE	Engineer
A0	XJ3000-4243 JBOD Functionality Test for DVT	03/29/2012	Jack Huang

If product change or information change/update, the report will be revised and released next edition.

Date of Test:

Test Started	Test Completed
03/08/2012	03/29/2012

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1 Introduction

1.1 Scope

This document is for demonstrating product conformance in the Various Development Phases of a project.

1.2 Purpose

Provide a formal and consistent process for measuring and validation the reliability of a given design. Identify any design discrepancies or electrical, mechanical, firmware and system issues.

1.3 Reference Information

The following documents form a part of this test plan to the extent specified herein.

- DVT Requirements Document
- Current Hardware Platform Evaluation Test Plan

Owner	Document List Review
PM	Application form for DVT functionality validation
PM	Product specification
EE1	Product EVT test report
QT	Board level compatibility EVT test report
EE1	PCB Schematic / Layout

2 Plan of Action Reference

2.1 Plan of Action Procedure

- Refer to this document or other identified specification to start product testing.
- Identify all necessary requirements and equipment for the test.
 - All equipment must be calibrated on an annual basis. Documentation of the calibration must be available.
 - Proper maintenance of equipment is required.
- Complete testing according to instructions or procedures contained in this document.
- Identify whether or not product or product component passes or fails.
- Report all test results to DQA designated personnel and database.
 - Within the Problem Tracking System, the function test shall be referenced in the short description of the issue.
- The EE design teams have the responsibility to resolve all issues and concerns by PVT date.
- Identified issues and concerns will be worked in order of priority and resolved according to the mechanical checklist and any associated documented specifications.
- The QAE team may identify resolution for an issue regarding a product in the design process, if it is deemed necessary for the QAE team to be involved.

2.2 Test Reporting

Throughout the process of development, all progress in testing must be tracked and communicated to the DQA weekly.

Each test shall be tracked as follows:

Definition	Description
Pass	All units were able to complete testing within the specified Pass Criteria.
Fail	UUT were not able to complete testing within the specified Fail Criteria
Bug	Unable to predict potential problems
Pending	Test initially failed but is able to pass after fixes were implemented

All Pass/Fail data results must be repeatable.

3 Product Specification

3.1 Product Features

Title	XJ3000-4243 Expander on Board
	XJ3000-4243 Entry-Level SAS/SATA 6G JBOD Series
Features	Enterprise JBOD
	High performance, redundancy & connectivity SAS interface
	High performance/availability SAS drives and high capacity/lower cost SATA drives in a single system, the flexibility to reduce total cost of ownership (true mix-and-match of drives in a single enclosure)
	Two 4-port connectors for host or expansion with automatic port speed detection and negotiation
	Scalable with expansion ports to couple with business growth
	Environment monitoring with SEP/SES support
	Redundant 6G expander modules and power supply, hot-swap drives and fans for high availability and easy maintenance

3.2 Product Specifications

GENERAL	
Number of Expander	Single/Dual
Expander Chip	LSISAS2x36
Host Interface	Single Mini SAS 4x connector
Expansion Interface	Single Mini SAS 4x connector
Transfer Speed	2,400MB/s per connector
DRIVES SUPPORTED	
Drive Interface	3.0/6.0 Gb dual ported SAS, 1.5/3.0/6.0 Gb single ported SATA
Drive RPM	Up to 15,000
Form Factor	3.5", 1" height
ADMINISTRATION / MANAGEMENT	
Admin/Firmware Upgrade	In-band & Out-of-band, Serial port via Hyperterminal
LED Indicators, Alarm	Yes
HOT-SWAP & REDUNDANCY	
Disk Drive	Hot-swap 24-bay
Cooling	3 x hot-swap fans
Power Supplies	600W 1+1 hot-swap redundant 80+ (Sliver)
Power Entry	Dual AC Inlet
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ELECTRICAL & ENVIRONMENTAL

Universal A/C Input	100~240V AC full range
Operating Environment	Temperature 0°C to 35°C, Relative humidity 20% to 80%
Non-operating Environment	Temperature -20°C to 60°C, Relative humidity 10% to 90%

PHYSICAL SPECIFICATION

Dimensions (W x D x H)	mm / inches	482.6 x 450 x 177 / 19 x 20 x 7
Gross Weight	w/ PSU; w/o Rail & Disks	28kgs / 61.6lbs
Packaging Dimension (W x D x H)	mm	600 x 730 x 376
Cubic Feet	5.8	
Reference Container Loading	20'	165
	40'	335
	40' H	405
Mounting Option	Adjust plate or 20" tool-less rail (optional)	

3.3 DUT 45° Photo



4 DUT Images



Front Angle



Top Open Angle

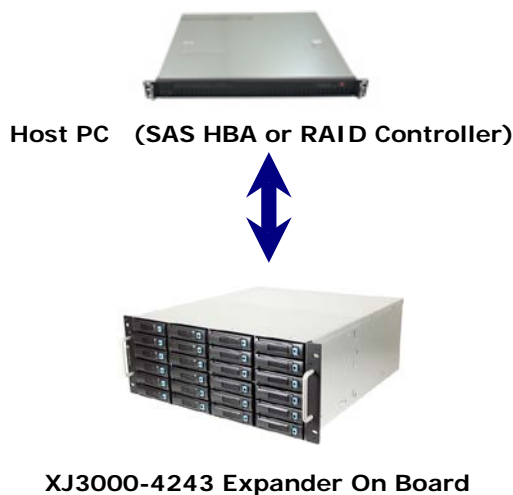


Rear Angle

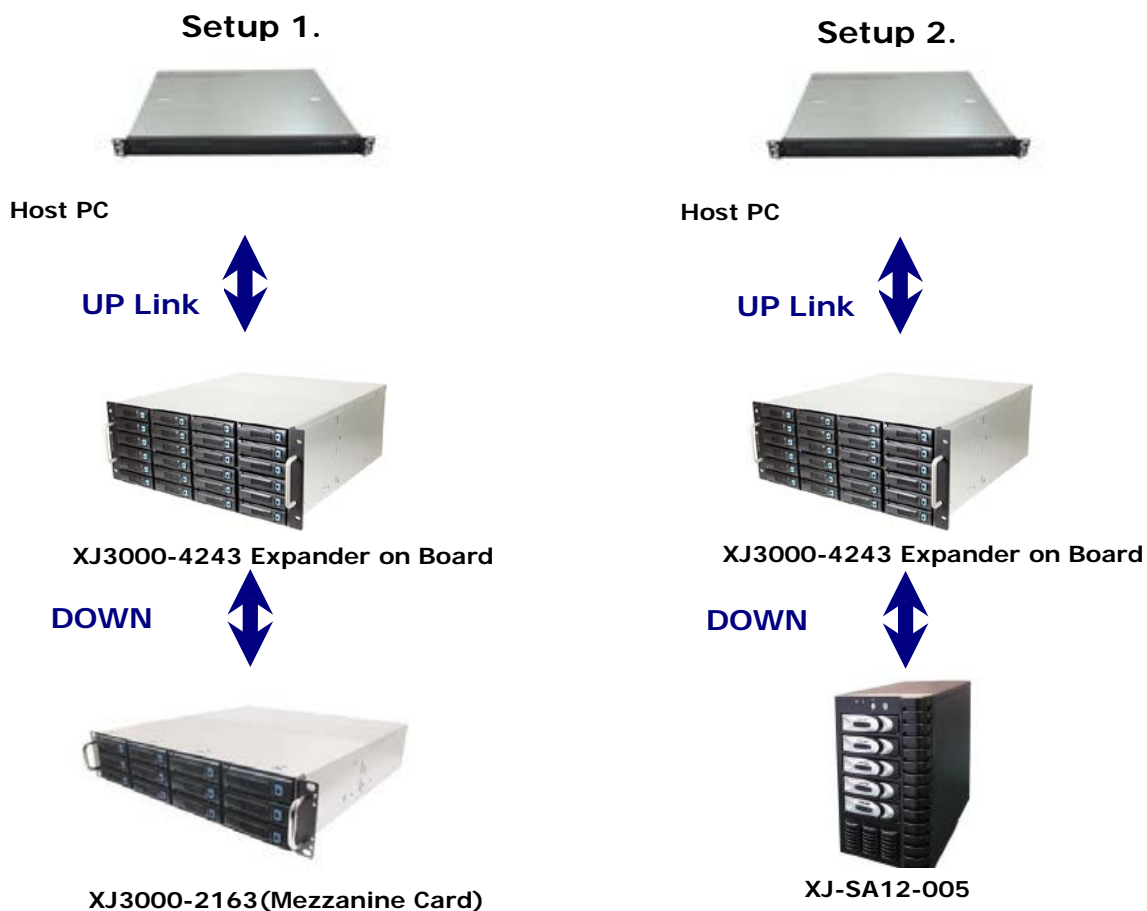
5 Target Device Configuration and Environment

5.1 Test Device Configuration Diagram

1. Single Host



2. Cascading



5.2 Table of Test Configuration

Host Configuration					
Item	Vender / Model		Detail		
Mortherboard	TYAN i5400PW S5397		Motherboard of the host		
Operation System	Microsoft Windows		Server 2003 Service Pack2 32bit		
CPU	Intel		Xeon L5410 2.33GHz *1		
Memory	Transcend		DDR2 667 FB-DIMM/ 1GB *2		
Hard Disk Drive	Seagate / ST9160511NS		SATA HDD / 160GB *1		
HBA/ RAID Card Configuration					
Card	Vender / Model	Firmware ver.	BIOS ver.	Driver ver.	GUI Software ver.
HBA Card	LSI 9211-8i	12.00.00.00-IR	7.23.01.00	5.0.52.0	6.90.0500
RAID Card	Intel RS2PI008	2.130.03-1332	3.20.00_4.11.05.00	5.2.103.0	11.06.00.0300
Setup 1. XJ3000-4243 Expander on Board HDDs Configuration					
Vender / Model		Interface	Detail		
Seagate / ST3600057SS		6Gb/s SAS	600GB* 6		
HITACHI / HUS156060VLS600		6Gb/s SAS	600GB* 7		
HITACHI / HUS154545VLS300		3Gb/s SAS	450GB* 11		
Setup 1. XJ3000-2163(Mezzanine Card) HDDs Configuration					
Vender / Model		Interface	Detail		
Seagate / ST3320418AS		3Gb/s SATA-2	320GB* 5		
Seagate / ST3300655SS		3Gb/s SAS	300GB * 4		
Seagate / ST3146855SS		3Gb/s SAS	146GB * 3		
Setup 2. XJ3000-4243 Expander on Board HDDs Configuration					
Vender / Model		Interface	Detail		
Seagate / ST3600057SS		6Gb/s SAS	600GB* 6		
HITACHI / HUS156060VLS600		6Gb/s SAS	600GB* 7		
HITACHI / HUS154545VLS300		3Gb/s SAS	450GB* 11		
Setup 2. XJ-SA12-005 HDDs Configuration					
Vender / Model		Interface	Detail		
WD / WD7500AYYS		3Gb/s SATA-2	750GB * 5		
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5.3 DUT Hardware Configuration

Item	Product Number	Quantity	Detail
Backplane	B40-4AMKTMXX00A000	1	4U24 SAS JBOD
Mezzanine Card	N/A	0	Expander On board
Power Module	Zippy MRW-3600V-R	2	AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)
Link Function PCBA(FAN)	B43-PLCFP52600A100	3	The PCBA combine with Fan
Link Function PCBA(FAN)	B43-PLCSD52600A100	3	For Hot-swap to fan
Transfer Card	EPB0002730 Ver.A1	1	Mini SAS 26Pin to 36Pin

6 Functional Test

Test Engineer	Jack Huang		
Model Name	XJ3000-4243 Expander on Board		
MFG	1.1.0.2		
Firmware	1.11.1.1		
Backplane	B40-4AMKTMXX00A000		
RAID Card	Intel ® RAID Controller RS2PI008	Driver	5.2.103.0
Power Housing	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Power Module	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Other			

Item Test	Test Procedure	Result
Power Module	Hot swap the power module 1 or power cord, check of the global fail LED, beeper and RS232 console status is work normally.	Pass
	Hot swap the power module 2 or power cord, check of the global fail LED, beeper and RS232 console status is work normally.	Pass
System FAN	Hot swap or start/ stop the FAN 0 check if global fail LED, fan fail LED, beeper and RS232 console status were work normally.	Pass
	Hot swap or start/ stop the FAN 1 check if global fail LED, fan fail LED, beeper and RS232 console status were work normally.	Pass
	Hot swap or start/ stop the FAN 2 check if global fail LED, fan fail LED, beeper and RS232 console status were work normally.	Pass
	When temperature sensor is gradual higher check Smart FAN Function is operative.	Pass
Voltage Sensor	To check if value of the voltage from the GUI showing the status is ok.	Pass

Fail Criteria: N/A

Item Test	Test Procedure	Result
Temperature Sensor	When temperature sensor \geq 50 degrees, the GUI will spring up warning message, and fan speed from the RS232 console showing the status is normal.	Pass
	When temperature sensor is higher than 55 degrees, check if global fail LED, temperature fail LED, beeper and fan speed from the RS232 console showing the status is normal.	Pass
	When temperature sensor settings in Celsius are T1, T2, warning threshold, and alarm (critical) threshold, configure the function is ok.	Pass
Expander Port	Connection primary expander's SFF-8087 Port(CN1) to SAS RAID card, check if HBA BIOS utility can see the Enclosure and all HDDs.	Pass
	Connection primary expander's SFF-8087 Port(CN2) to another SAS JBOD's Up-Link port, check if RAID card BIOS utility can see the Enclosure and HDDs.	Pass
	Connection Secondary expander's SFF-8087 Port(CN3) to SAS JBOD's Up-Link port, check if RAID card BIOS utility can see the Enclosure and all HDDs.	Pass
SAS Zoning	To verify two SAS zoning groups for expander by manual, check if SAS / SATA HDDs can be detected, create/ rebuild/ delete a RAID and doing I/O access by each sas zoning group.	Pass
Band Width	Setting up an Intel RS2PI008 SAS RAID card on a SAS Server. Two UP Links connect two 8088 ports of RS2PI008 with SFF-8088 cable, then Building RAID 5 for all HDDs and run IOmeter. Above the process was no error.	Pass
Fail Criteria: N/A		
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Item Test	Test Procedure	Result
Fail-over	<p>1. To setup an Intel RS2PI008 SAS RAID card on a SAS Server.</p> <p>2. Connect one Port of SAS RAID card (SAS Server) to Controller primary UP Link and one Port of Intel RS2PI008 SAS RAID card (SAS Server) to Controller Secondary UP Link. (see Fail-over Configuration)</p> <p>3. Create a RAID 5 volume for all HDs and run Iometer. Finally removed the UP Link of Primary or Secondary Expander.</p> <p>4. Use Intel Storage Manager to check if the RAID was existential and workable. The HDs should be workable and work correctly form Windows HD Manager.</p>	Pass
HDD Bays	Plug- in the SAS HDD to all HDD Bays then hot swap the HDDs check of all HDDs tray's activity/ data access LED, RS-232 console status is ok.	Pass
	Plug- in the SATA II HDD to all HDD Bays then hot swap the HDDs check of all HDDs tray's activity/ data access LED, RS-232 console status is ok.	Pass
	Plug- in the SAS with SATA II HDD to all HDD Bays then hot swap the HDDs check of all HDDs tray's activity/ data access LED, RS-232 console status is ok.	Pass
Mute Button	Hot swap the Power modules (1-2) check if mute button is ok	Pass
	Hot swap the FANS (1-3) check if mute button is ok	Pass
	To change the expander's temperature sensor while over the 55 degree and then check if mute button is ok	Pass
Cascading	To cascade the SAS JBOD device from level 0~1, check if Enclosure Name and SAS / SATA HDDs can be detect, create / rebuild / delete a RAID and doing I/O access by SAS HBA is ok.	Pass
Firmware Upgrade	To upgrade the firmware by Out-of-band mode then check if upgrade successfully.	Pass
Fail Criteria: N/A		
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Item Test	Test Procedure	Result
Burn-in Test	When powering up the enclosure, then insert HDDs and connect with SAS HBA and run Iometer burn-in 24 hours to 72 hours , check if performance status and PHY, FAN, Temperature status is normally by Console/Serial Port and SAS HBA GUI Utility.	Pass
Array Device Slot Control	To verify SES lighting signal , using utils tool to check lighting mode of each status is correct.	Pass
Cable shake Test	When powering up the enclosure and then used SAS Cable plug in backplane connector, then Gently shake SAS Cable connector, check if PHY status is normally.	Pass
Fail Criteria: N/A		

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7 RAID Card Test

Test Engineer	Jack Huang		
Model Name	XJ3000-4243 Expander on Board		
MFG	1.1.0.2		
Firmware	1.11.1.1		
Backplane	B40-4AMKTMXX00A000		
RAID Card	Intel RAID RS2PI008	Driver	5.2.103.0
HDD Type	6G SAS HDDs: HITACHI HUS156060VLS600 600GB *7 Seagate ST3600057SS 600GB*6 3G SAS HDDs: HITACHI HUS154545VLS300 450GB *11		
Power Housing	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Power Module	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Other			

RAID Function	Test Procedure	Result
Intel RS2PI008 RAID Function	Create/Remove a RAID 0 volume	Pass
	Create/Rebuild/Remove a RAID 1 volume	Pass
	Create/Rebuild/Remove a RAID 5 volume	Pass
	Create/Rebuild/Remove a RAID 6 volume	Pass
	Create/Remove a RAID 00 volume	Pass
	Create/Rebuild/Remove a RAID 10 volume	Pass
	Create/Rebuild/Remove a RAID 50 volume	Pass
	Create/Rebuild/Remove a RAID 60 volume	Pass
	Remove a crashed RAID 0 volume	Pass
	Remove a crashed RAID 1 volume	Pass
	Remove a crashed RAID 5 volume	Pass
	Remove a crashed RAID 6 volume	Pass
	Remove a crashed RAID 00 volume	Pass
	Remove a crashed RAID 10 volume	Pass
	Remove a crashed RAID 50 volume	Pass
	Remove a crashed RAID 60 volume	Pass

Fail Criteria: N/A

8 HBA Card Test

Test Engineer	Jack Huang		
Model Name	XJ3000-4243 Expander on Board		
MFG	1.1.0.2		
Firmware	1.11.1.1		
Backplane	B40-4AMKTMXX00A000		
RAID Card	LSI 9211-8i	Driver	2.0.52.0
HDD Type	6G SAS HDDs: HITACHI HUS156060VLS600 600GB *7 Seagate ST3600057SS 600GB*6 3G SAS HDDs: HITACHI HUS154545VLS300 450GB *11		
Power Housing	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Power Module	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Other			

HBA Function	Test Procedure	Result
LSI 9211-8i SAS HBA Card	While using LSI 9211-8i SAS HBA to connect with XJ3000-4243 Expander on Board SAS JBOD. Then check if all hard drives can be detect by LSI BIOS utility.	Pass
	While using LSI 9211-8i SAS HBA to connect with XJ3000-4243 Expander on Board SAS JBOD. Then check if all hard drives can be detect by LSI MSM.	Pass
	While using 9211-8i SAS HBA to connect with XJ3000-4243 Expander on Board SAS JBOD. Then check if all hard drives can be detect by OS Disk management.	Pass

Fail Criteria: N/A

9 Output Power

Test Engineer	Jack Huang		
Model Name	XJ3000-4243 Expander on Board		
MFG	1.1.0.2		
Firmware	1.11.1.1		
Backplane	B40-4AMKTMXX00A000		
RAID Card	Intel RAID RS2PI008	Driver	5.2.103.0
HDD Type	6G SAS HDDs: HITACHI HUS156060VLS600 600GB *7 Seagate ST3600057SS 600GB*6 3G SAS HDDs: HITACHI HUS154545VLS300 450GB *11		
Power Housing	MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Power Module	MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)		
Other			

◆Power on - Boot sequency: Measure the maximum current value of between JBOD power on and boot-up to console. (Plug- in the SAS HDD to all HDD Bays)

◆Idle mode: Measure the current value when JBOD without all HDD Bays.

◆Max. load: Measure the maximum current value which JBOD under maximum loa

Voltage /Condition	Power on - Boot Procedure	Idle Mode	Max. load
+12V	39.92A	1.70A	19.19A
+5V	21.99A	0.47A	19.83A
Total (Watt)	588.99W	22.75W	329.43W

Fail Criteria: N/A

10 Basic PSU Verification

Model Name	XJ3000-4243 Expander on Board
Power Housing	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)
Power Module	Zippy MRW-3600V-R AC input 100-240V 47-63Hz 9-4A DC output 600W(Max)

Item	Comment		Result
Alarm Reset Button	Hot swap the PSU0's power cord and check if audio alarm (buzzer sound)		Pass
	Hot swap the PSU1's power cord and check if audio alarm (buzzer sound)		Pass
Check Output Voltage	Output Voltage	SPEC.	
	+5V	4.75V ~5.25V	Pass
	+12V	11.4V~12.60V	Pass
	-12V	-11.4V ~ -12.60V	N/A
	-3.3V	3.13V~3.47V	N/A
	+5VSB	4.75V ~5.25V	N/A
Short Circuit	+3.3V	The power supply shall be latched in case any short circuit is taken place at +12V,-12V,+3.3V,+5V output	N/A
	+5V		Pass
	-12V		N/A
	+12V		Pass

11 Summary

Item	Descriptions	Result
Enclosure Function Test	Power Module	Pass
	System FAN	Pass
	Voltage Sensor	Pass
	Temperature Sensor	Pass
	Expander Port	Pass
	SAS Zoning	Pass
	Band Width	Pass
	Fail-over	Pass
	HDD Bays	Pass
	Mute Button	Pass
	Cascading	Pass
	Firmware Upgrade	Pass
	Burn-in Test	Pass
	Array Device Slot Control	Pass
	Cable shake Test	Pass
RAID Function Test	Intel RS2PI008 SAS RAID CARD	Pass
HBA Function Test	LSI 9211-8i SAS HBA	Pass
	Output Power - Zippy MRW-3600V-R	Pass
	Basic PSU Verification - Zippy MRW-3600V-R	Pass

**** Notes:** Test items and test contents depend on spec.