

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
<b>Certification Type:</b>	Listing
<b>CCN:</b>	NWQG, NWGQ7 (Information Technology Equipment Including Electrical Business Equipment)
<b>Product:</b>	Accessory PCI Express RAID Adapter
<b>Model:</b>	25190 Model may contain non-safety related prefixes and/or suffixes.
<b>Rating:</b>	Electrical ratings not required (not for direct connection to mains)
<b>Applicant Name and Address:</b>	AVAGO TECHNOLOGIES 1320 RIDDER PARK DR SAN JOSE CA 95131 UNITED STATES

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared by: David Feusier

Reviewed by: Walid Beytoughan

### Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
  - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
  - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
  - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

### Product Description

Electronic components were mounted on PWB and supplied by SELV via the end-product Server's main board.

### Model Differences

N/A

### Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : not directly connected to the mains
- Operating condition : continuous
- Access location : operator accessible
- Over voltage category (OVC) : N/A
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class III (supplied by SELV)
- Considered current rating of protective device as part of the building installation (A) : N/A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : up to 2000 m
- Altitude of test laboratory (m) : less than 2000 m
- Mass of equipment (kg) : maximum 0.13 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of: 55°C
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 (which includes all European national differences, including those specified in this Test Report)
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual

- Ultracapacitor Module:: The product contains an SuperCap Module that complies with the Standard for Electrochemical Capacitors, UL810A.
- Fire enclosure, electrical enclosure, and mechanical enclosure to be provided in the end-product.

**Additional Information**

The Marking Plate Label provided is representative of all models in this Test Report. The manufacturer's name or trademark may be silk-screened on the PCB or on a separate label on the product or packaging. Model numbers may be silk-screened on the PCB or on a separate label on the product or packaging.

Avago is the owner of the LSI trademark.

SuperCap Module (Tecate Industries Inc., Type17-0005-4483) rated 6.4F, 13.5V.

According to clause 2.1.1.5.

$$E = 0.5 * CU^2 * 10^{(-6)}$$

$$E = 182.25 J > 20 J$$

**Additional Standards**

The product fulfills the requirements of: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013

**Markings and instructions**

Clause Title	Marking or Instruction Details
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Accessory Instructions	Accessory Marking is required. Statement "For use only with compatible UL Listed server that have Installation Instructions detailing user installation of card cage accessories" or similar statement is provided in the operation/user's manual and/or on the equipment.

**Special Instructions to UL Representative**

N/A

**Production-Line Testing Requirements**

**Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.**

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A						

**Earthing Continuity Test Exemptions - This test is not required for the following models:**

25190 Model may contain non-safety related prefixes and/or suffixes.

**Electric Strength Test Exemptions - This test is not required for the following models:**

25190 Model may contain non-safety related prefixes and/or suffixes.

**Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:**

**Sample and Test Specifics for Follow-Up Tests at UL**

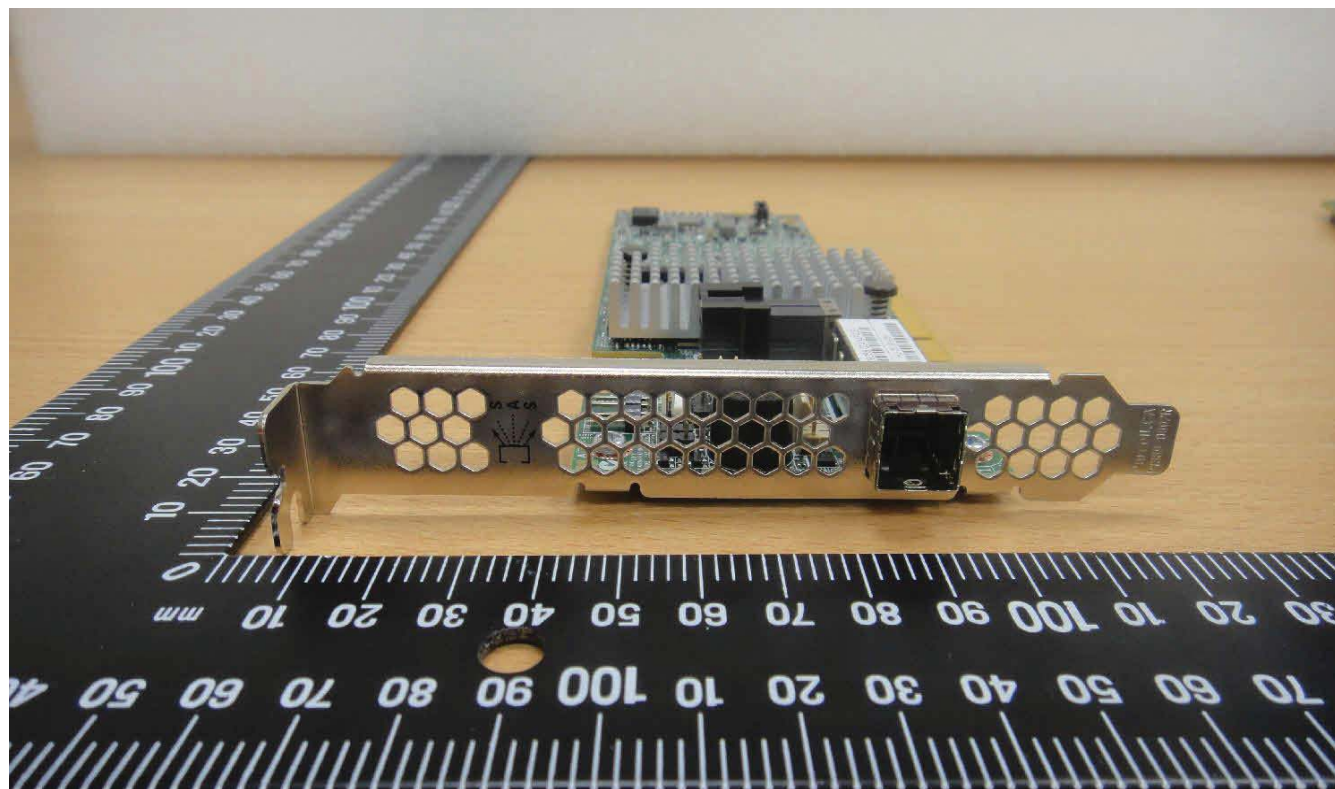
Model	Component	Material	Test	Sample(s)	Test Specifics
N/A					

<b>TABLE: list of critical components</b>							Pass
Object/part or Description	Manufacturer/ trademark	type/model	technical data	Product Category CCN(s)	Required Marks of Conformity	Supplement ID	
01. PWB	Interchangeable	Interchangeable	Minimum V-1, minimum 105 degree C.	ZPMV2	UL		
02. Heat Sink (on U2A1)	--	--	Aluminum. See Enclosure Id. 4-04 for details.	--	--		
06. SuperCap Module (Optional)	Tecate Industries Inc.	17-0007-4483	13.5Vdc, 2F	BBBG2	UL		
06a. SuperCap Module (Alternate) (Optional)	Tecate Industries Inc.	17-0005-4483	13.5Vdc, 6.4F	BBBG2	UL		
06b. SuperCap Module (Alternate) (Optional)	Tecate Industries Inc.	17-0017-4483	13.5Vdc, 6.4F	BBBG2	UL		
06c. SuperCap Module (Alternate) (Optional)	Palladium Energy	FBU02	13.5Vdc, 8.0F	BBBG2	UL		
08. Marking Plate Label (Marking on PWB)	--	--	Printed by ink.	--	--		
10. Glue/Epoxy on Daughter Board (for SuperCap Module) (Optional)	Interchangeable	Interchangeable	Minimum V-2. Covered on conductive parts of U6 pin 1, pin 2; U15 pin 11; C25 pin 1; C1 pin 1; J1 pin 1, pin 2; Q3 pin 4; Q1-pin 5, pin 6. See Enclosure Id. 4-06 for details.	--	UL		

## Enclosures

<u>Type</u>	<u>Supplement Id</u>	<u>Description</u>
Photographs	3-01	Overall View - 1
Photographs	3-02	Overall View - 2 (with Openings)
Photographs	3-03	Overall View - 3 (with Daughter Board)
Photographs	3-15	Overall View - 4 (with Daughter Board and SuperCap Module)
Photographs	3-16	Overall View - 5 (with Daughter Board and SuperCap Module)
Photographs	3-17	Overall View - 6 (with Daughter Board and SuperCap Module)
Photographs	3-18	Overall View - 7
Photographs	3-19	Overall View of Daughter Board for SuperCap Module - 1
Photographs	3-20	Overall View of Daughter Board for SuperCap Module - 2
Diagrams	4-02	Dimension of Bracket with Openings - 1
Diagrams	4-03	Dimension of Bracket with Openings - 2 (Alternate)
Diagrams	4-04	Dimension of Heatsink
Diagrams	4-06	Glue Locations

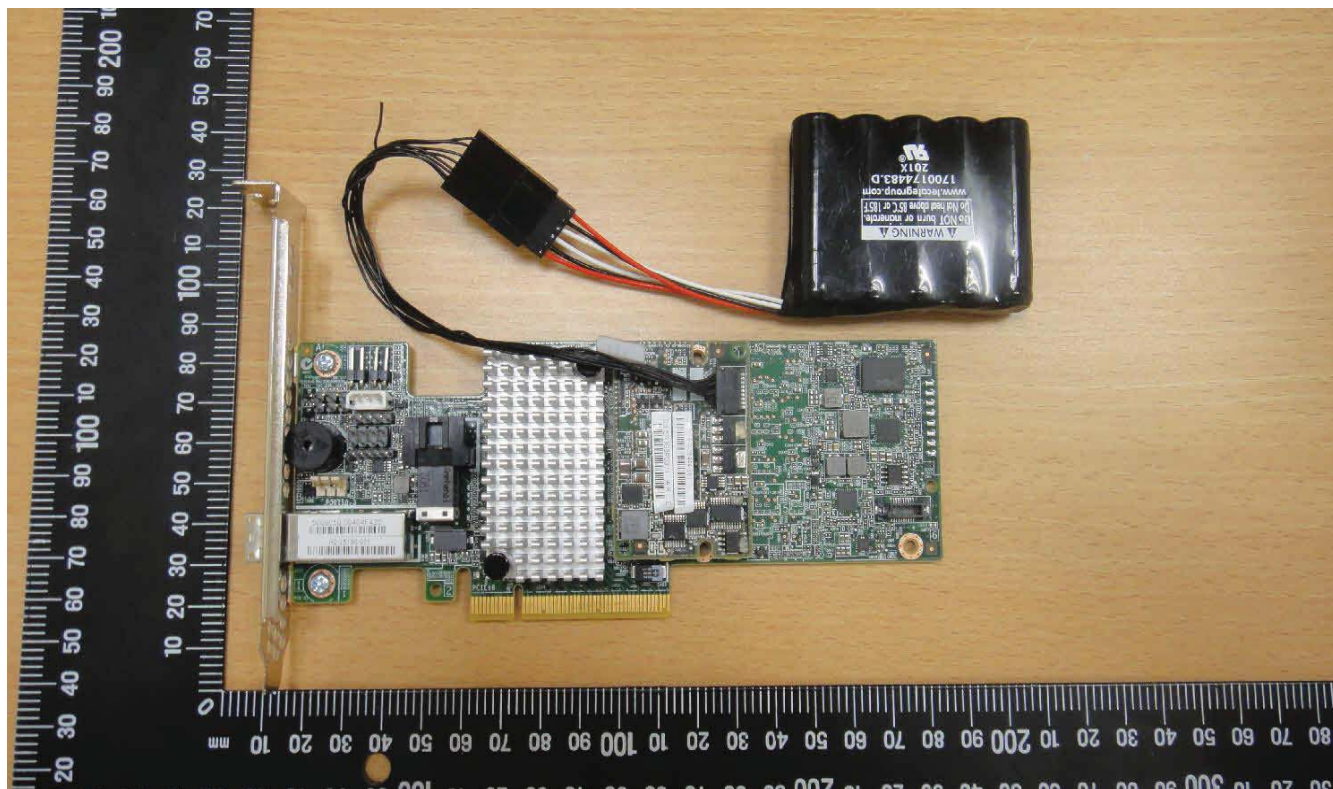


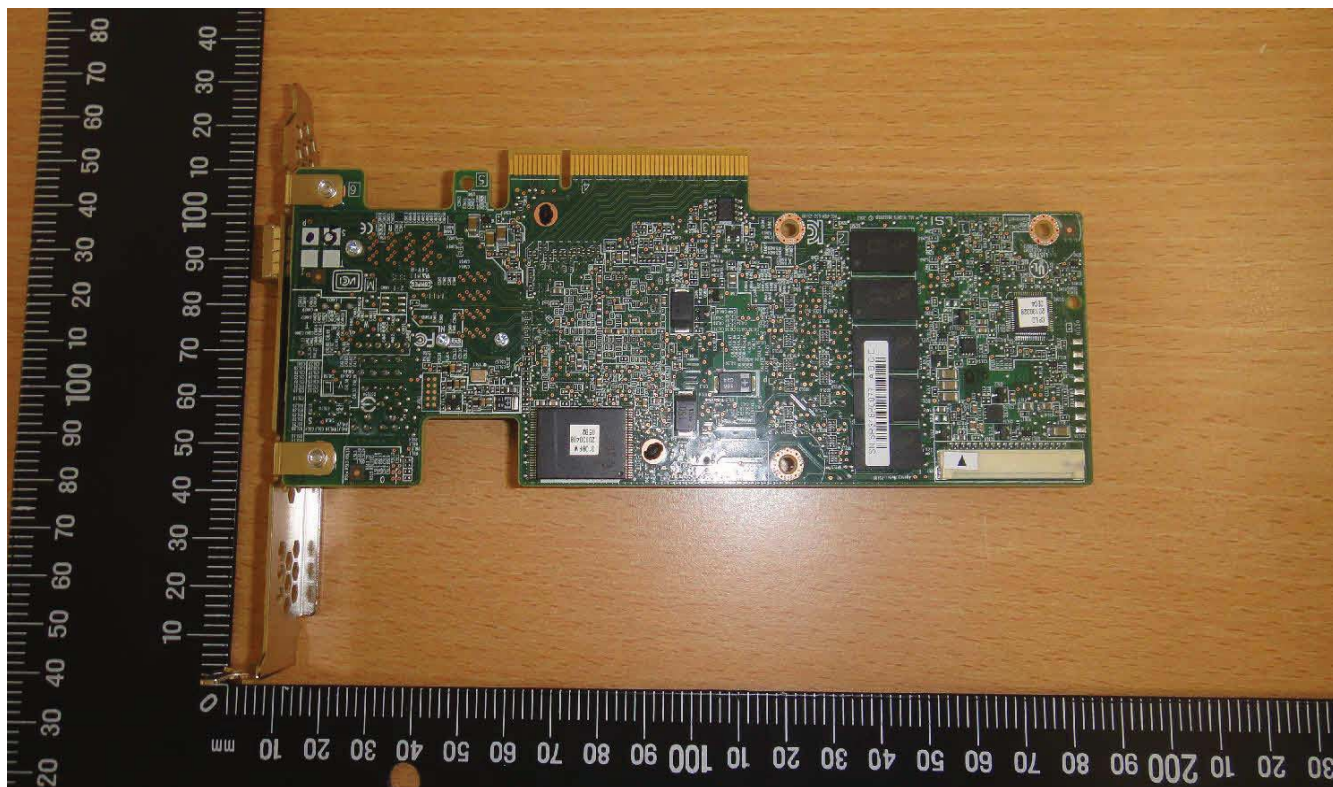


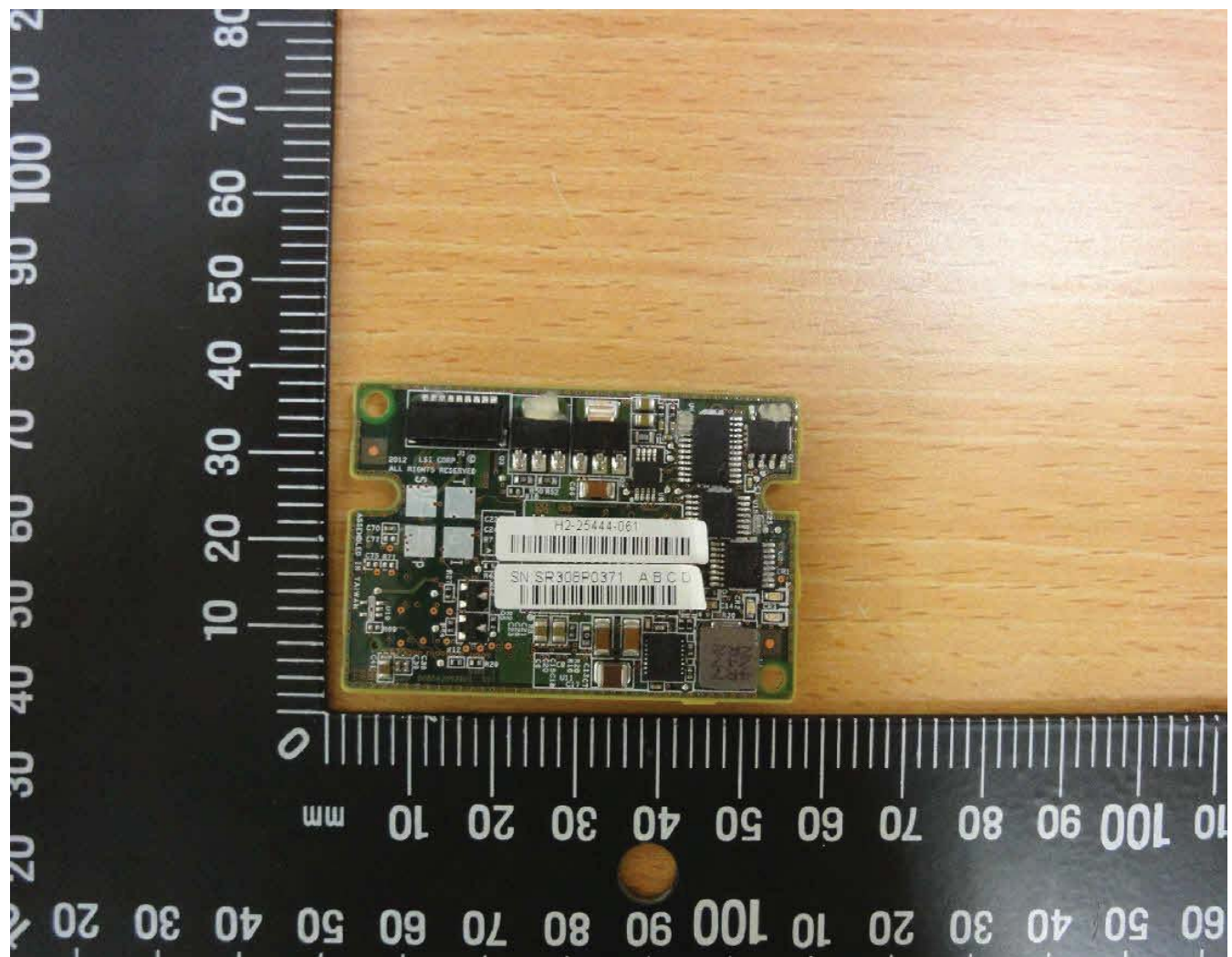


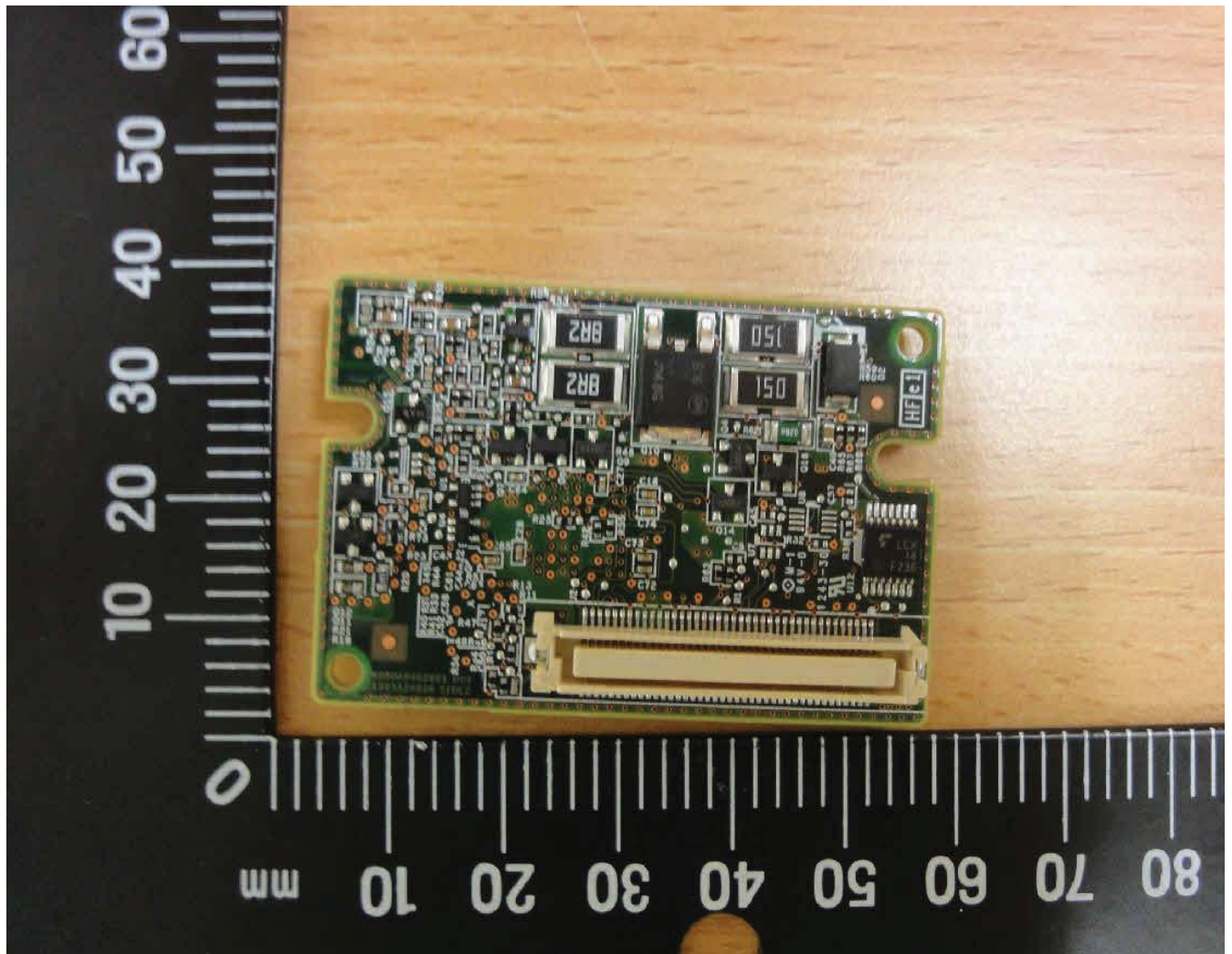












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E257743 26  
Vol. X7  
Sec. A34  
PHO-27  
Issued:  
2015-10-26

sue Date:

Revision 2015-10-  
Date 26

The following supplement has been removed from this report:

Enclosure: Photographs

ID: 3-27

Description: Overall View - 6 (with daughter board and battery pack)

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Sec. A34  
DIA-02  
Issued:  
2015-10-26

sue Date:

Revision 2015-10-  
Date 26

The following supplement has been removed from this report:

Enclosure: Diagrams  
ID: 4-02  
Description: Dimension of bracket with openings - 1

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E257743 26  
Vol. X7  
Sec. A34  
DIA-03  
Issued:  
2015-10-26

sue Date:

Revision 2015-10-  
Date 26

The following supplement has been removed from this report:

Enclosure: Diagrams  
ID: 4-03  
Description: Dimension of bracket with openings - 2 (Alternate)

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E257743 26  
Vol. X7  
Sec. A34  
DIA-04  
Issued:  
2015-10-26

sue Date:

Revision 2015-10-  
Date 26

The following supplement has been removed from this report:

Enclosure: Diagrams  
ID: 4-04  
Description: Dimension of Heatsink

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E257743 26  
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DIA-06  
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Date 26

The following supplement has been removed from this report:

Enclosure: Diagrams  
ID: 4-06  
Description: Glue location

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E257743 26  
Vol. X7  
Sec. A34  
MIS-10  
Issued:  
2015-10-26

sue Date:

Revision 2015-10-  
Date 26

The following supplement has been removed from this report:

Enclosure: Misc  
ID: 7-10  
Description: WMT Equipment List

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E257743 26  
Vol. X7  
Sec. A34  
MIS-11  
Issued:  
2015-10-26

sue Date:

Revision 2015-10-  
Date 26

The following supplement has been removed from this report:

Enclosure: Misc  
ID: 7-11  
Description: Letter of Assurance

Issue Date: 2015-10-26

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Report Reference #

E257743-A34-UL

Revision Date: 2016-06-06

Test Record

### **Test Record No. 1**

No tests were deemed necessary to transfer report E238623-A146 to this report. No other changes were made to the product as part of this transfer.

**Test Record No. 2**

Testing was not considered necessary to upgrade report to UL/CSA 60950-1, Second Edition, revised 2014-10-14, based upon review of previous evaluations.

In addition, Applicant and Manufacturer Name changed from LSI Corp. to Avago Technologies.

The following tests were conducted:

Test	Testing Location/Comments
Input: Single-Phase (1.6.2)	Evaluated under original CB Scheme investigation. See CBTR Ref. No. E238623-A148 - CB Test Certificate Ref. No. DK-34863-UL.
Energy Hazard Measurements (2.1.1.5, 2.1.2, 1.2.8.10)	Evaluated under original CB Scheme investigation. See CBTR Ref. No. E238623-A148 - CB Test Certificate Ref. No. DK-34863-UL.
Limited Power Source Measurements (2.5)	Evaluated under original CB Scheme investigation. See CBTR Ref. No. E238623-A148 - CB Test Certificate Ref. No. DK-34863-UL.
Component Failure (5.3.1, 5.3.4, 5.3.7)	Evaluated under original CB Scheme investigation. See CBTR Ref. No. E238623-A148 - CB Test Certificate Ref. No. DK-34863-UL.

Test results are valid only for the tested equipment. These tests are considered representative of the products covered by this Test Report. The test methods and results of the above tests have been reviewed and found to be in accordance with the requirements in the Standard(s) referenced at the beginning of this Test Report.

### **Test Record No. 3**

Test Record covers modifications as follows:

1. Addition of statement "Model may contain non-safety related prefixes and/or suffixes." to Test Report.
2. Deletion of Battery Pack from Test Report.

Issue Date: 2015-10-26

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Report Reference #

E257743-A34-UL

Revision Date: 2016-06-06

Test Record

#### **Test Record No. 4**

Testing of alternate SuperCap Module (Optional) - Palladium Energy, Model FBU02.was not considered necessary based on the results of previous certification of the SuperCap Module.