innodisk

Total Solution For
Embedded Peripherals

E2SS-32R2

2.5” SSD to Dual M.2 RAID Module

Customer: _____

Customer Part Number: _____

Innodisk Part Number: _____

Innodisk Model Name: _____

Date: _____

Innodisk Approver	Customer Approver

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REVISION HISTORY

Revision	Description	Date
1.0	First Released	Aug, 2023
1.1	Correct the spec from mSATA to M.2	Jun, 2024

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1. Product Introduction

1.1. Overview

Innodisk E2SS-32R2 is designed with standard 2.5” form factor, E2SS-32R2 is compatible with SATAIII(6.0Gb/s) specification, E2SS-32R2 can be configured as 2 ports SATA Hardware striping & mirror & port multiplier functions, optimized for higher performance and ensure data integrity, which brings you a flexible expansion solution for embedded systems.

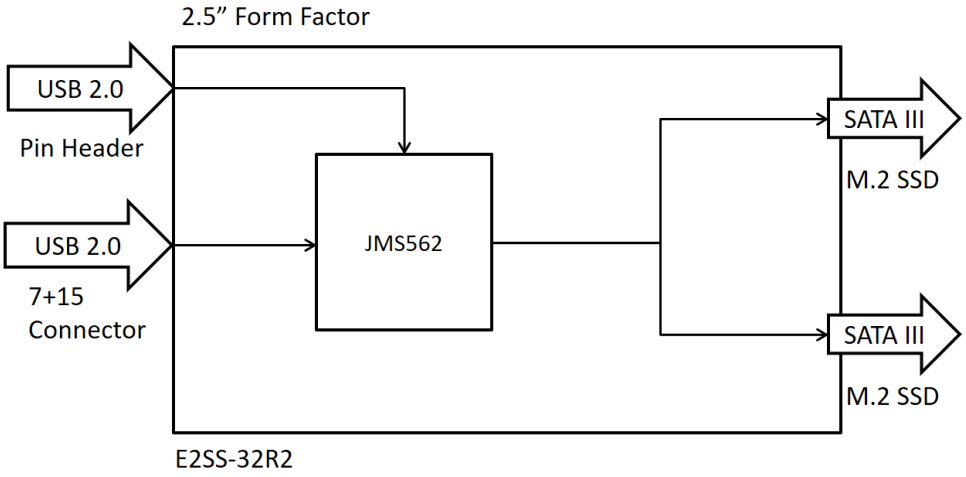


Figure 1: Block Diagram

1.2. Features

- Supports SATA to dual SATA III Port Multiplier
- Supports H/W RAID 0/1 over SATA
- Pin header for Access/Error LED connection
- 3 years warranty
- Industrial design, manufacture in innodisk Taiwan

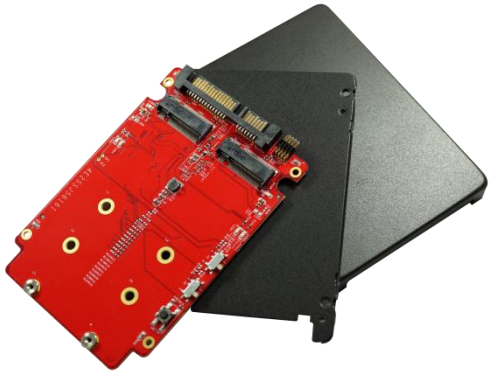


Figure 2: E2SS-32R2 Picture

2. Product Specifications

2.1. Device parameters

Table 1: Device parameters

Form Factor	2.5”
Input I/F	SATA III
Output I/F	SATA III
Output Connector	M.2 B-Key 2242/2260/2280 x 2
Dimension (WxLxH)	69.85 x 100 x 9.5mm

2.2. Electrical Specifications

2.2.1. Power Requirement

Table 2: Power Requirement

Item	Connector	Rating
Input voltage	7+15 Pin	+5V DC +-5%

2.2.2. Power Consumption

Table 3: Power Consumption

Full Load (mA)	Voltage (V)
800	5

2.3. Environmental Specifications

2.3.1. Temperature Ranges

Table 4: Temperature Ranges

Temperature	Range
Operating	Standard Grade: 0°C to +70°C
Storage	-55°C to +95°C

2.3.2. Humidity

Relative Humidity: 10-95%, non-condensing

2.3.3. Shock and Vibration

Table 5: Shock and Vibration

Reliability	Test Conditions	Reference Standards
Vibration	7 Hz to 2K Hz, 20G, 3 axes	IEC 68-2-6
Mechanical Shock	Duration: 0.5ms, 1500 G, 3 axes	IEC 68-2-27

2.3.4. Mean Time between Failure (MTBF)

Reliability prediction methodology provides the basis for reliability evaluation and analysis. The purpose of the prediction is to predict the life time of the product in units of failure rate and MTBF.

Table 6: Mean Time between Failure (MTBF)

Product	Condition	MTBF (Hours)
E2SS-32R2	The analysis is at 25°C ambient temperature by Telcordia SR-332, Issues 4, Method I, Case 3 under Ground Benign, Controlled environment, 50% operation stress	25,869,465

2.4. CE and FCC Compatibility

E2SS-32R2 conforms to CE and FCC requirements.

2.5. RoHS Compliance

E2SS-32R2 is fully compliant with RoHS directive.

2.6. Hardware

2.6.1. Layout

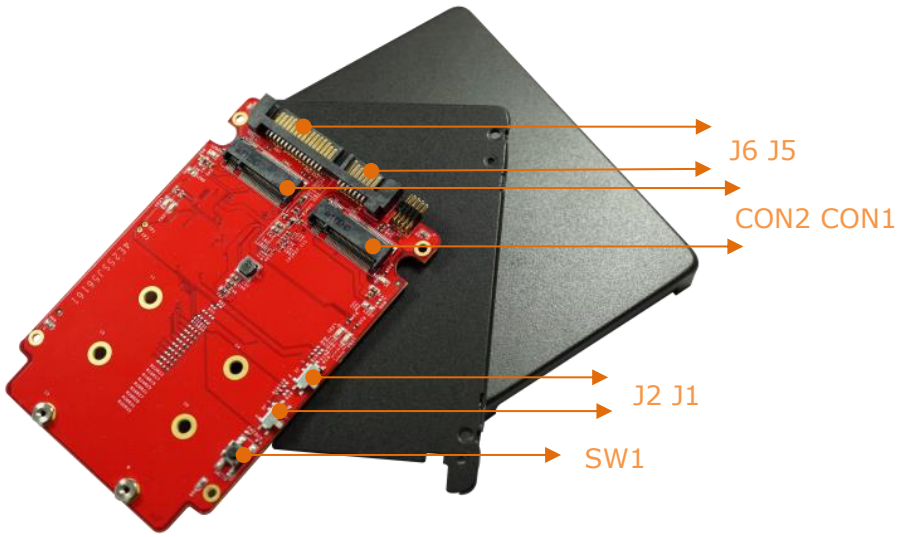


Table 7: PCB Layout Legend

Label	Connector Type	Function
J1 J2	Slide Switch SMD 3P 90°	RAID Level setting
J5	DIP 2*5P 90° P:1.27mm	USB 2.0 Input I/F LED access & error function
J6	7+15P 90° MALE H:4.0mm	SATA Input I/F
SW1	Tact switch SMD 4P 180°	RAID Level reset
CON1 **CON2**	M.2 SMD 2*67P	M.2 Output I/F

2.6.2. Pin Define

Table 8: M.2 Pin Define (CON1 CON2)

Signal Name	Pin #	Pin #	Signal Name
		75	GND
3.3V	**74**	**73**	GND
3.3V	**72**	**71**	GND
3.3V	**70**	**69**	GND
NC	**68**	**67**	NC
NC	**58**	**65**	NC
NC	**56**	**63**	NC
NC	**54**	**61**	NC
NC	**52**	**59**	NC
NC	**50**	**57**	GND
NC	**48**	**55**	NC
NC	**46**	**53**	NC
NC	**44**	**51**	GND
NC	**42**	**49**	TX+
NC	**40**	**47**	TX-
DEVSLP	**38**	**45**	GND
NC	**36**	**43**	RX-
NC	**34**	**41**	RX+
NC	**32**	**39**	GND
NC	**30**	**37**	NC
NC	**28**	**35**	NC
NC	**26**	**33**	GND
NC	**24**	**31**	NC
NC	**22**	**29**	NC
NC	**20**	**27**	GND
NOTCH B		**25**	NC
		23	NC
		21	GND

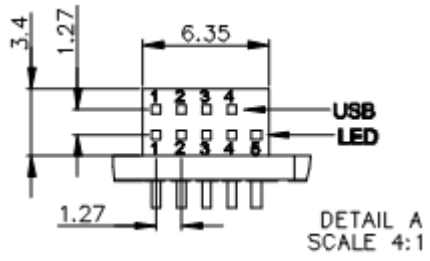
NOTCH B			
DAS/DSS	**10**	**11**	NC
NC	**8**	**9**	NC
NC	**6**	**7**	NC
3.3V	**4**	**5**	NC
3.3V	**2**	**3**	GND
		1	GND

Table 9: 7+15 SATA Pin Define (J6)

Pin #	Signal Name	Description
S1	GND	NA
S2	A+	Differential Signal Pair A
S3	A-	
S4	GND	NA
S5	B-	Differential Signal Pair B
S6	B+	
S7	GND	NA
P1	NC	N/A
P2	NC	N/A
P3	NC	N/A
P4	GND	N/A
P5	GND	N/A
P6	GND	N/A
P7	V5	5V Power, Pre-Charge
P8	V5	5V Power
P9	V5	5V Power
P10	GND	N/A
P11	DAS/DSS	Device Activity Signal / Disable Staggered

P12	GND	N/A
P13	NC	N/A
P14	NC	N/A
P15	NC	N/A

Table 10: USB 2.0 & LED Pin Define (J5)

Pin #	Signal Name (USB 2.0)	Signal Name (LED)	
1	GND	GND	
2	D+	CON2 Error	
3	D-	CON2 Access	
4	5V	CON1 Error	
5		CON1 Access	

2.6.3. I/O Connector Mechanical Drawing

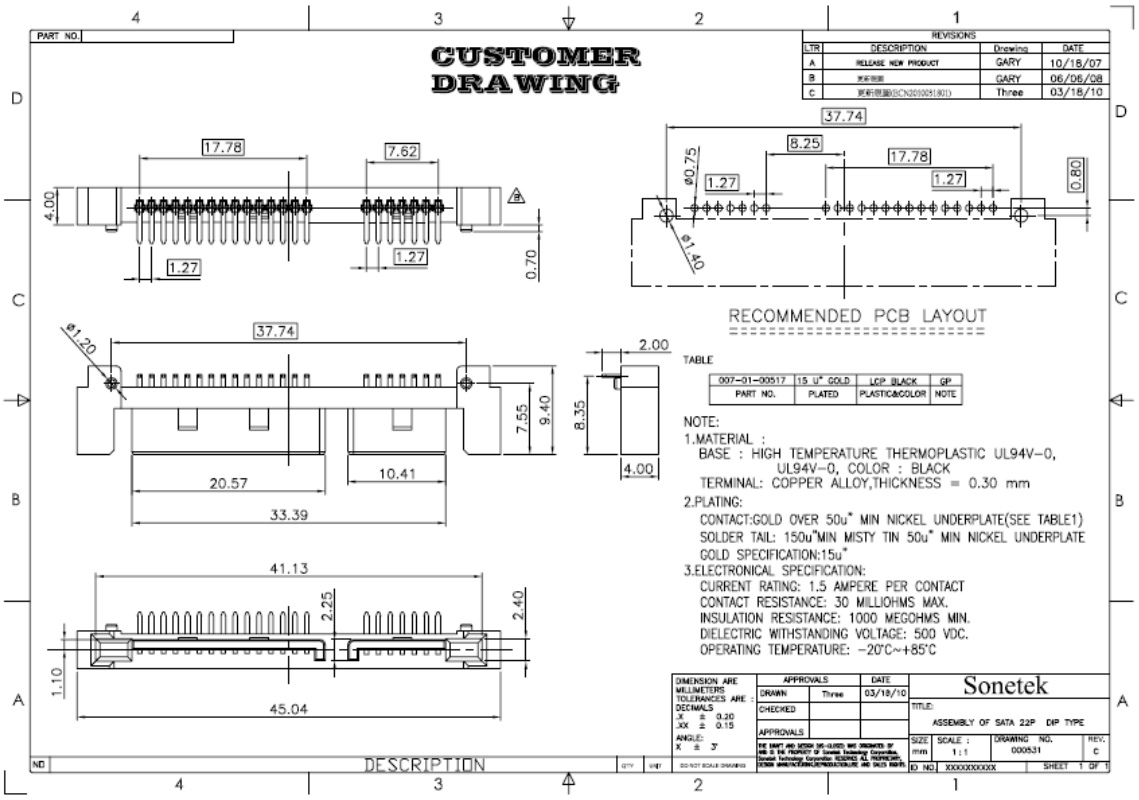


Figure 3: 7+15P SATA connector drawing

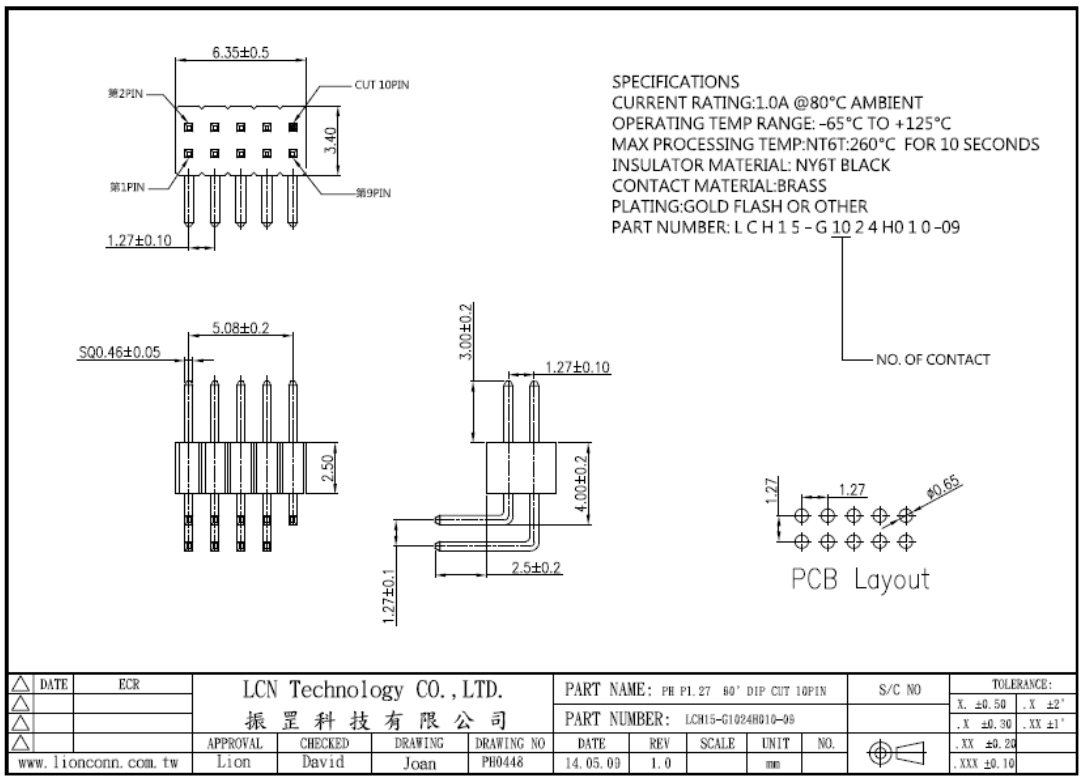


Figure 4: Pin Header 2*5P drawing

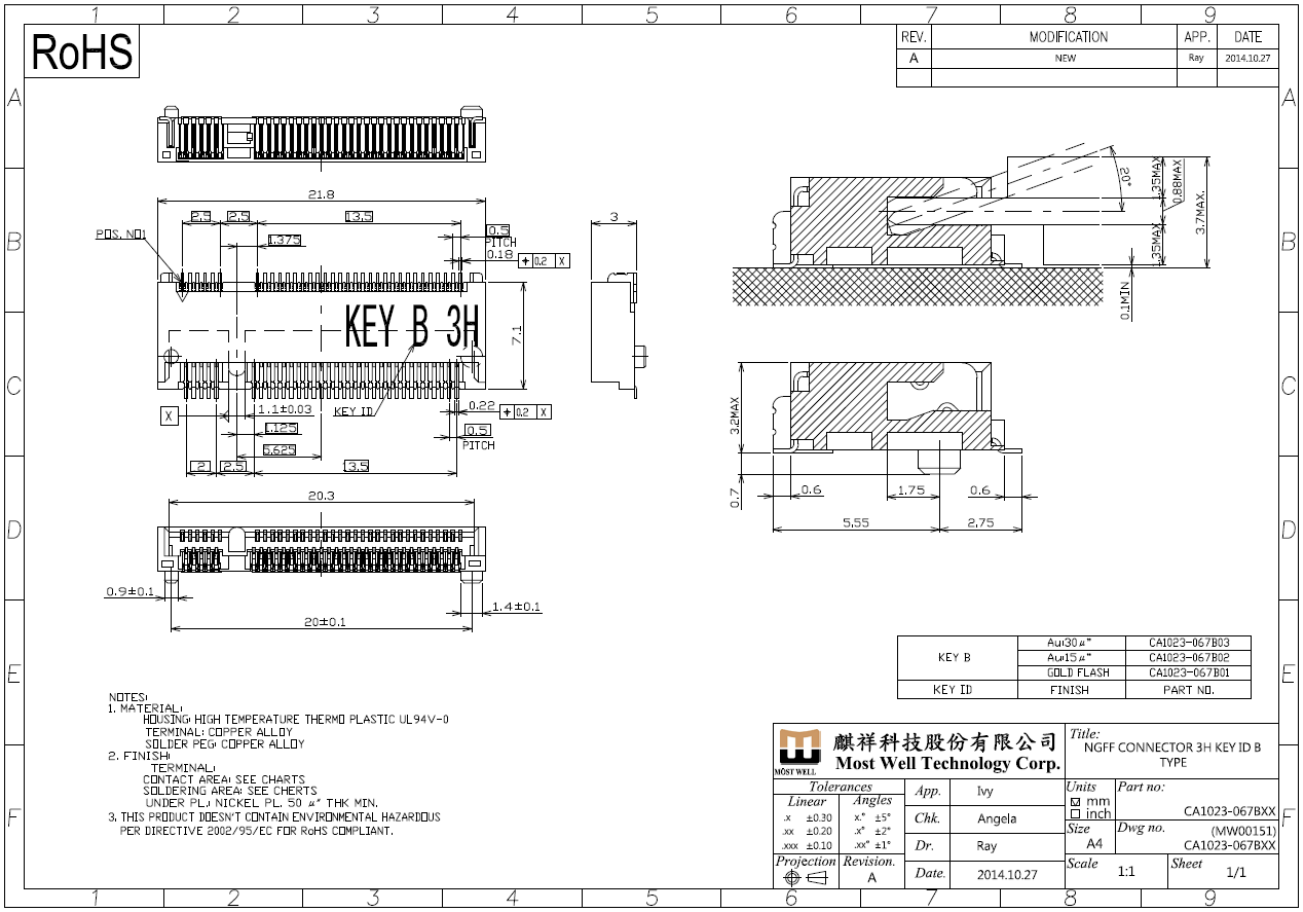


Figure 5: M.2 SMD 2*67P drawing

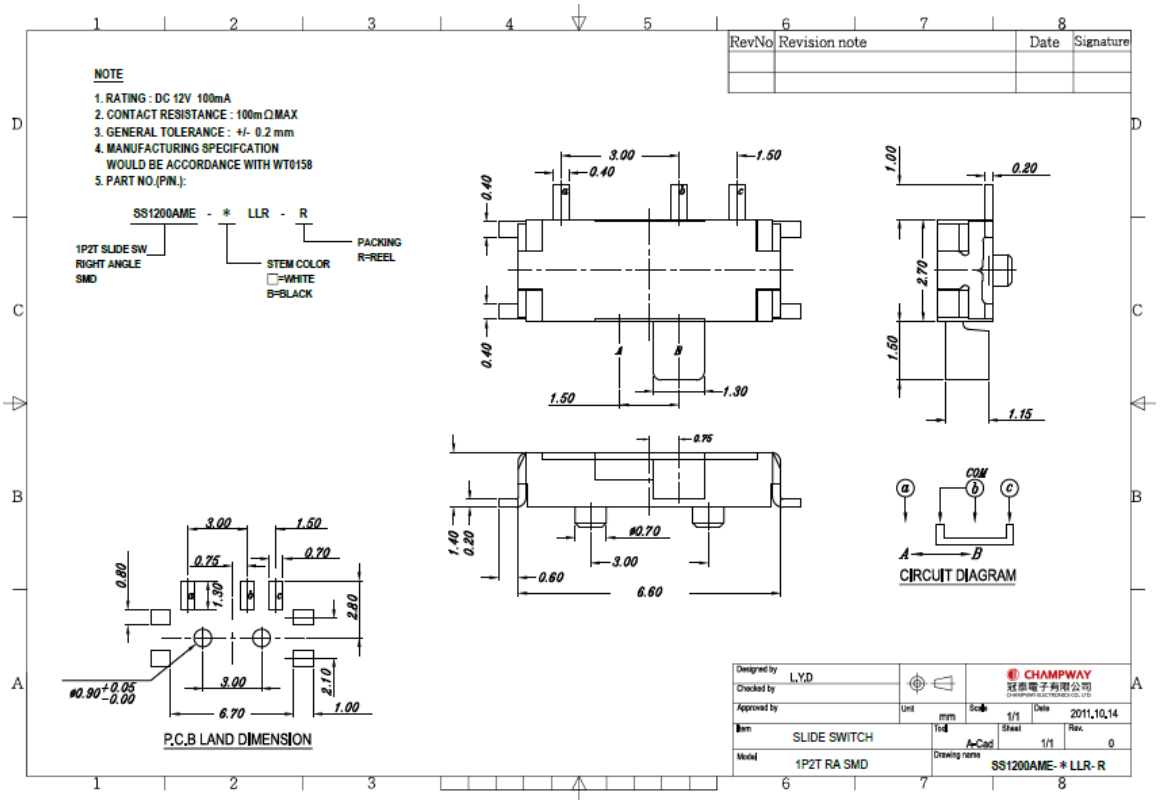


Figure 6: Switch SMD 3P drawing

2.6.4. E2SS-32R2 Mechanical drawing

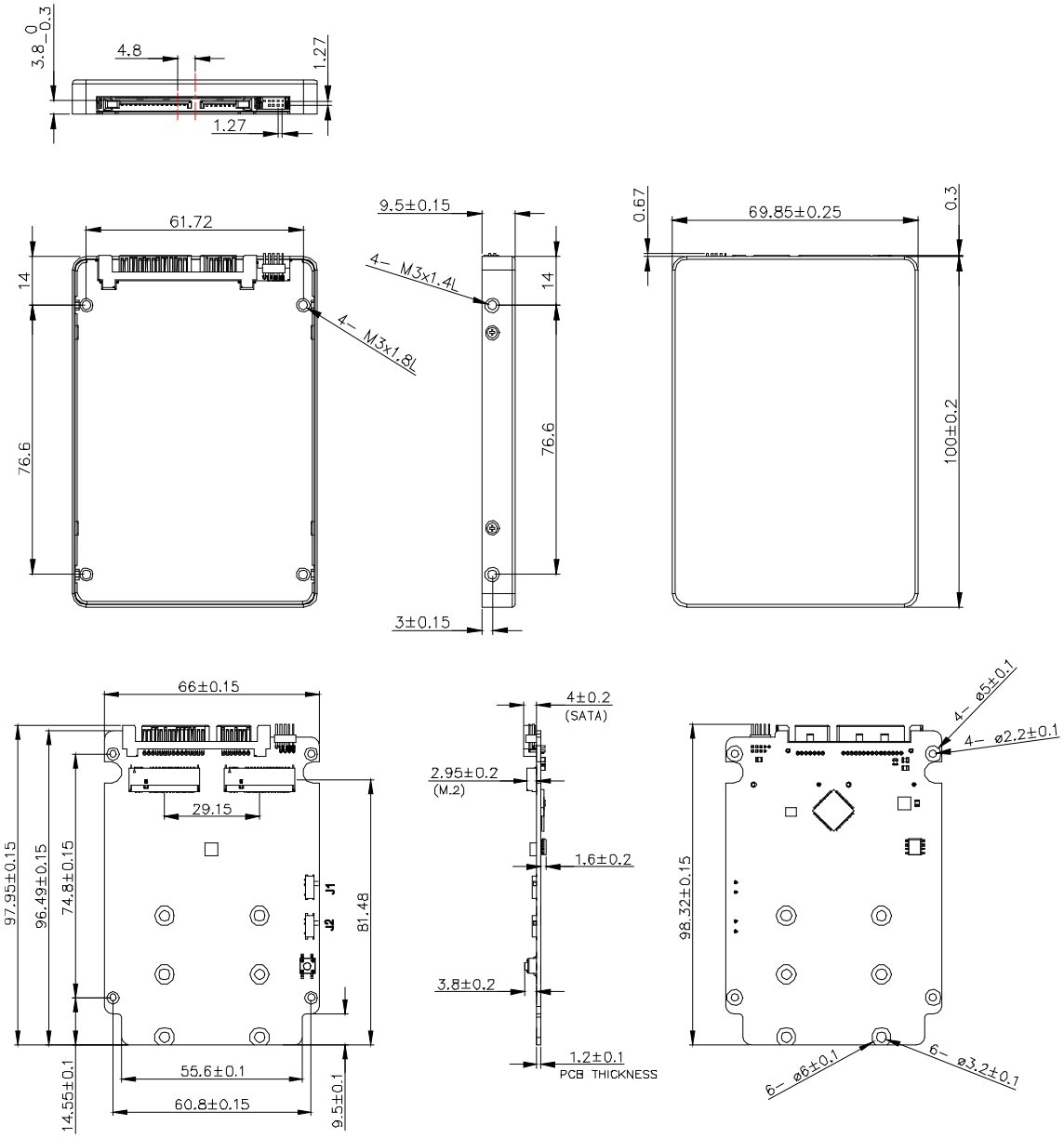


Figure 7: E2SS-32R2 drawing

2.6.5. RAID Level Setting

Refer to Table 12 the position of slide switch J1 J2 for RAID levels configuration.

Table 11: RAID Level setting

	J1	J2
RAID 0	2	2
RAID 1	1	2
Port multiplier	1	1

2.6.6. LED Indicator

Refer to Table 13 the LED indicator of status.

Table 12: LED Indicator

Color	Status
RED	Power on
Green	RAID Access
Blue	RAID Error
Green + Blue	RAID Rebuilding

2.7 Packing List

E2SS-32R2 2.5” Card x 1

Screw M2*3.5 Silver x 6

Screw M2*2.5 Black x 4

2.5” SSD Bottom cover x 1

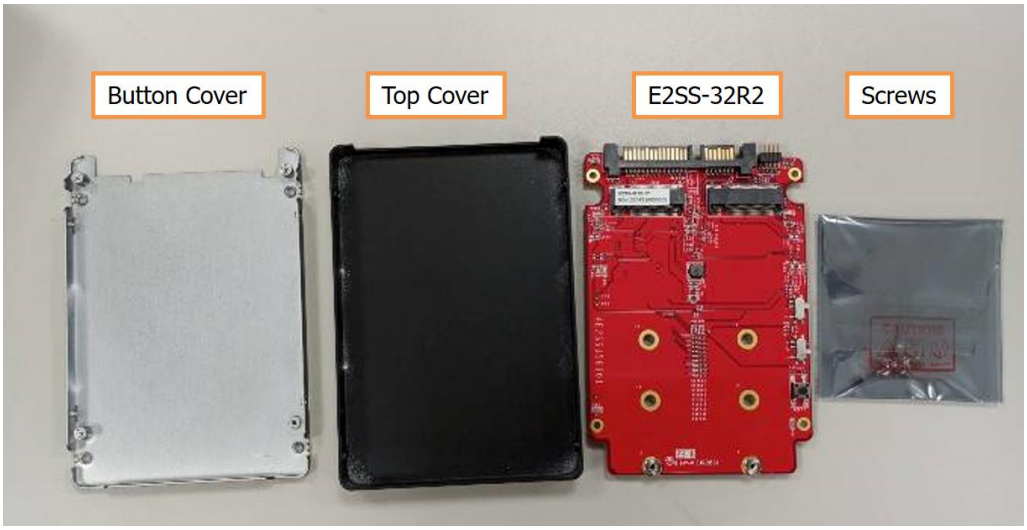
2.5” SSD Top cover x 1

2.8 Software Support

Use native AHCI driver for setting.

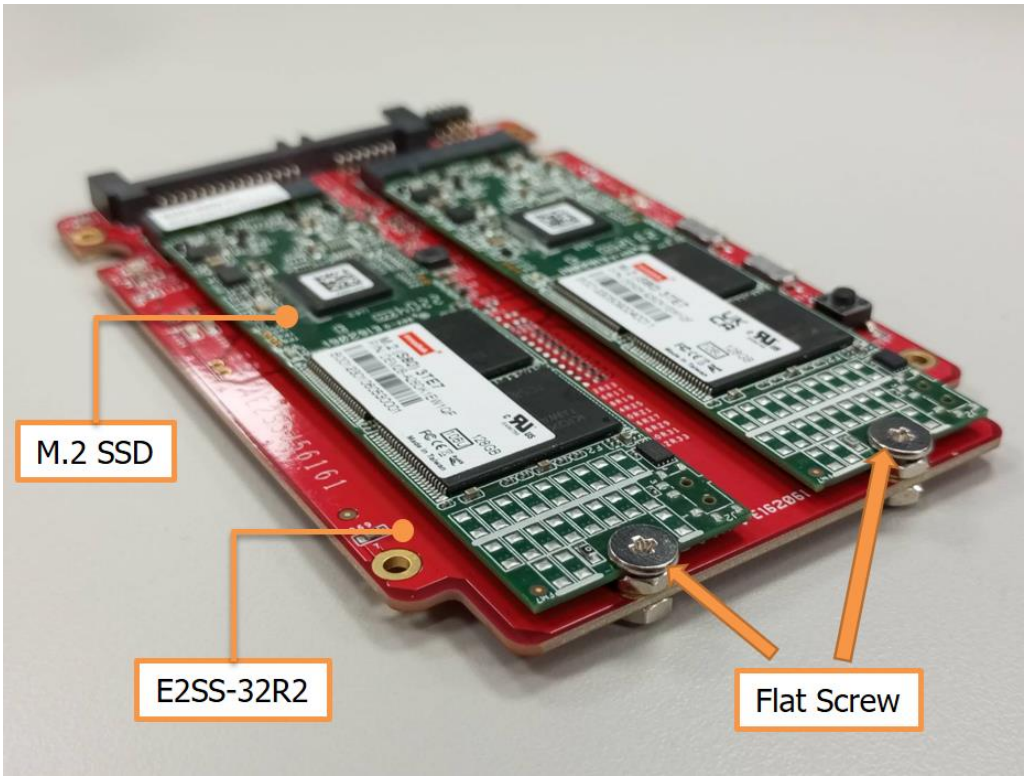
3. Quick Installation Guide

To install the M.2 storage, the following steps are required.

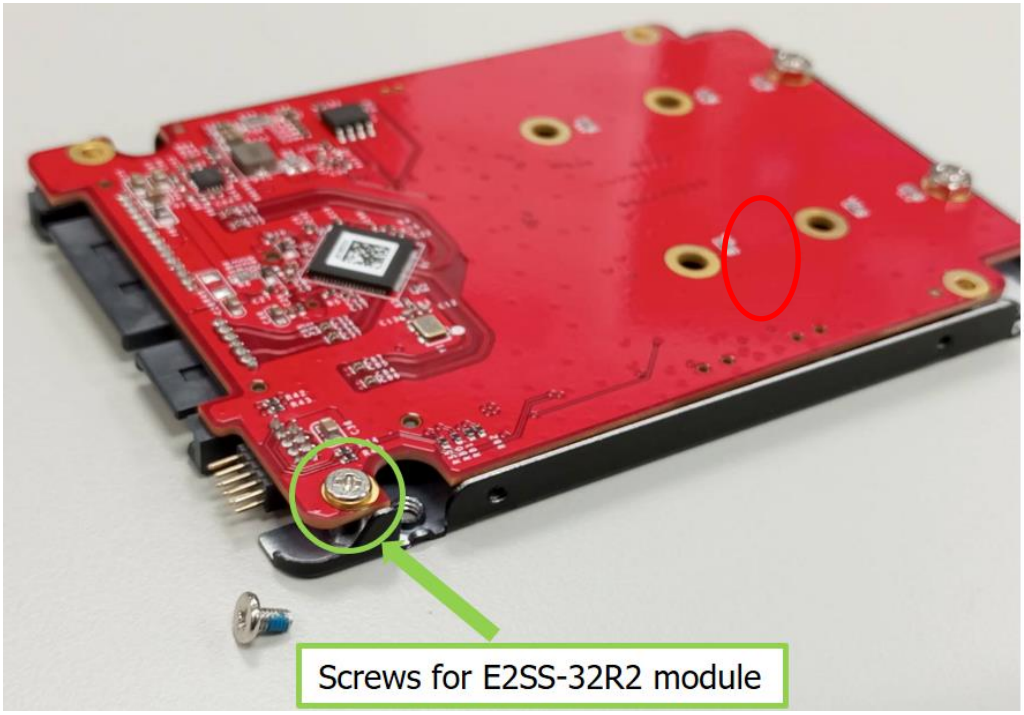


Check the component for button cover, top cover, E2SS-32R2, screws.

Check the screws for each part.



Use the flat screws to fix the M.2 SSD on the RAID module(E2SS-32R2).



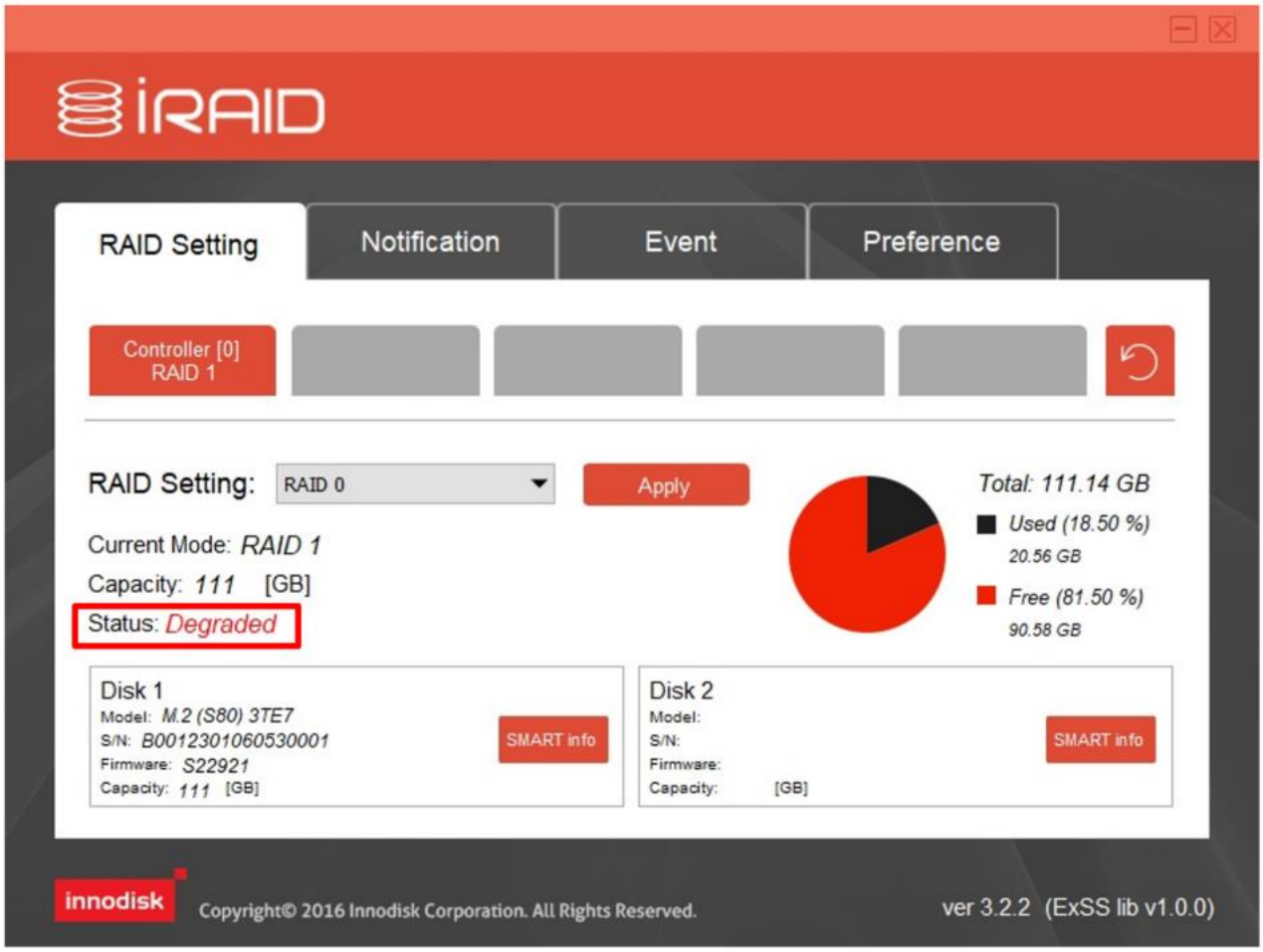
Use the screws for to fix the RAID module(E2SS-32R2) on the button cover.

Screw the top cover to the button cover.

4. E2SS Rebuild Disk SOP

The SOP is to instruct how to rebuild Disk of E2SS.

1. Prepare a new Disk with the same capacity.
2. Backup the Disk data.
3. If one of the Disk is damaged during RAID 1 mode, the RAID [Status] will be [Degraded], and then use iRAID Tool to confirm which Disk is damage. (The following example is Disk 2.)



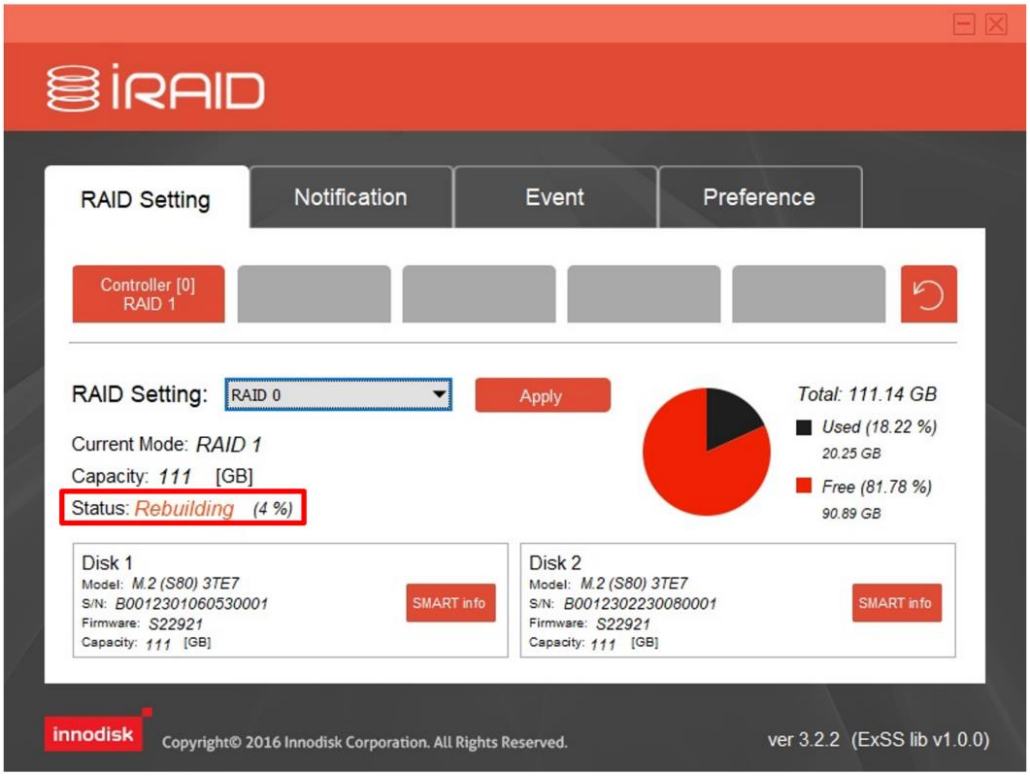
4. And then, shut down.

5. Take the following picture as an example, replace the broken Disk with a new one.

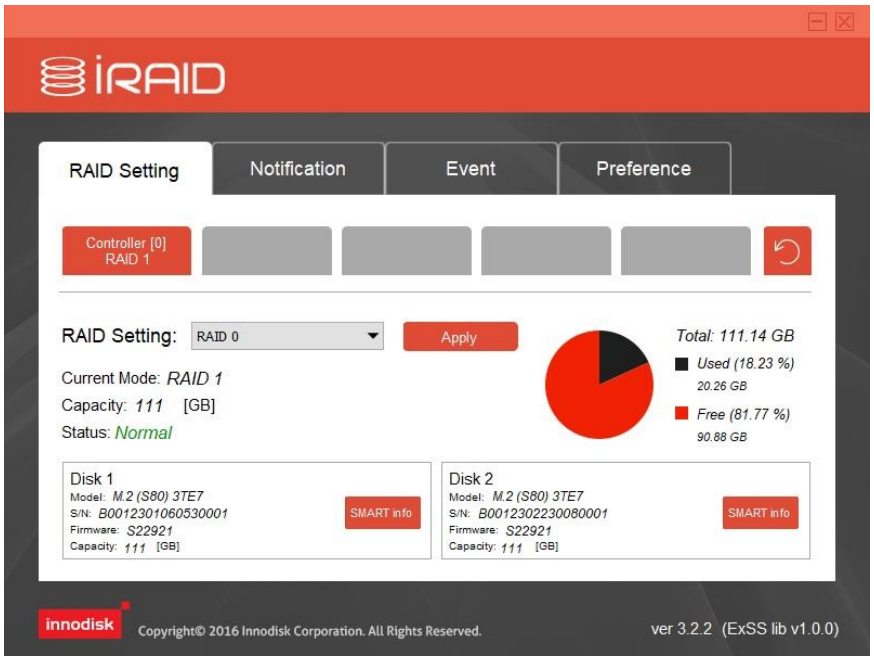
   The left side is Disk 2 (PCB print is CON2), so remove the CON2 Disk and install a new Disk to CON2.

6. Install the new Disk into CON2.

7. Power on.
8. The system will automatically execute “Rebuild” process at this time, and you can see the [Status] is [Rebuilding] via iRAID Tool. (And there is no need to press any buttons.)



9. Finally, it's completed. The [Status] will show [Normal].



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Innodisk Corporation

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REACH Declaration of Conformity

Manufacturer Product:All Innodisk EP products

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We Innodisk Corporation hereby declare that our products are in compliance with the requirements according to the REACH Regulation (http://www.echa.europa.eu/de/candidate-list-table **last updated: 15/01/2018**). Products include： 1) Product and raw material used by the product； 2) Packaging material ；3) Raw material used in the process of design, production and rework

2.本公司同意因本保證書或與本保證書相關事宜有所爭議時，雙方宜友好協商，達成協議。

InnoDisk Corporation agrees that both parties shall settle any dispute arising from or in connection with this Declaration of Conformity by friendly negotiations.

立 保 證 書 人 (Guarantor)

Company name 公司名稱：InnoDisk Corporation 宜鼎國際股份有限公司

Company Representative 公司代表人：Randy Chien 簡川勝

Company Representative Title 公司代表人職稱：Chairman 董事長

Date 日期：2018 / 02 / 08

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Manufacturer Product: All Innodisk EP products

一、 宜鼎國際股份有限公司（以下稱本公司）特此保證售予貴公司之所有產品，皆符合歐盟 2011/65/EU 及(EU) 2015/863 關於 RoHS 之規範要求。

Innodisk Corporation declares that all products sold to the company, are complied with European Union RoHS Directive (2011/65/EU) and (EU) 2015/863 requirement.

二、 本公司同意因本保證書或與本保證書相關事宜有所爭議時，雙方宜友好協商，達成協議。

Innodisk Corporation agrees that both parties shall settle any dispute arising from or in connection with this Declaration of Conformity by friendly negotiations.

Name of hazardous substance	Limited of RoHS ppm（mg/kg）
鉛（Pb）	< 1000 ppm
汞（Hg）	< 1000 ppm
鎘（Cd）	< 100 ppm
六價鉻（Cr 6+）	< 1000 ppm
多溴聯苯（PBBs）	< 1000 ppm
多溴二苯醚（PBDEs）	< 1000 ppm
鄰苯二甲酸二(2-乙基己基)酯（DEHP）	< 1000 ppm
鄰苯二甲酸丁酯苯甲酯（BBP）	< 1000 ppm
鄰苯二甲酸二丁酯（DBP）	< 1000 ppm
鄰苯二甲酸二異丁酯（DIBP）	< 1000 ppm

立 保 證 書 人 (Guarantor)

Company name 公司名稱： Innodisk Corporation 宜鼎國際股份有限公司

Company Representative 公司代表人： Randy Chien 簡川勝

Company Representative Title 公司代表人職稱： Chairman 董事長

Date 日期： 2018 / 02 / 08

Certificate

Issue Date: November 5, 2014
Ref. Report No. ISL-14LE468CE

Product Name	:	SATA RAID Module
Model(s)	:	E%SS-32R* (%： form factor (2: 2.5" SSD, 3. DDR3 DIMM, D: Dongle, G: NGFF, M.2, H: mPCIe Half, L: PCIe Low profile, M: mPCIe, S: PCIe Standard, X: Multi, Z: Others); *： Series (1~9, A~Z))
Responsible Party	:	Innodisk Corporation
Address	:	5F.No.237, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

We, **International Standards Laboratory**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in European Council Directive- EMC Directive 2004/108/EC. The device was passed the test performed according to :

CE

Standards:

EN 55022: 2010+AC2011 and CISPR 22: 2008 (modified)
EN 61000-3-2: 2006+A1:2009 +A2:2009 and IEC 61000-3-2: 2005+A1:2008 +A2:2009
EN 61000-3-3: 2013 and IEC 61000-3-3: 2013
EN 55024: 2010 and CISPR 24: 2010
EN 61000-4-2: 2009 and IEC 61000-4-2: 2008
EN 61000-4-3: 2006+A1: 2008 +A2: 2010 and IEC 61000-4-3:2006+A1: 2007+A2: 2010
EN 61000-4-4:2012 and IEC 61000-4-4:2012

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

International Standards Laboratory

Jim Chu / Director

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Nemko ELA113B

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Certificate

Issue Date: November 5, 2014
Ref. Report No. ISL-14LE468FB

Product Name	:	SATA RAID Module
Model(s)	:	E%SS-32R* (%： form factor (2: 2.5" SSD, 3. DDR3 DIMM, D: Dongle, G: NGFF, M.2, H: mPCIe Half, L: PCIe Low profile, M: mPCIe, S: PCIe Standard, X: Multi, Z: Others); *： Series (1~9, A~Z))
Applicant	:	Innodisk Corporation
Address	:	5F.No.237, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

We, **International Standards Laboratory**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (refer to Test Report if any modifications were made for compliance).

Standards:

FCC CFR Title 47 Part 15 Subpart B: 2012- Section 15.107 and 15.109
ANSI C63.4-2009
Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 5: 2012

Class B

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

International Standards Laboratory

Jim Chu / Director

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