innodisk

EGPL-21S3

M.2 2230 to Single Isolated 2.5GbE LAN Horizontal Module

Customer: ____________________________

Customer Part Number: ____________________________

Innodisk Part Number: ____________________________

Innodisk Model Name: ____________________________

Date: ____________________________

Innodisk Approver	Customer Approver

Total Solution For Embedded Peripherals

Table of Contents

REVISION HISTORY

Revision	**Description**	**Date**
1.0	First Released	Jul, 2023

List of Tables

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1. Product Introduction

1.1. Overview

Innodisk EGPL-21S3 is designed with M.2 2230 form factor with A-E key, EGPL-21S3 supports PCIe Gen 2.1 with a single lane to single isolated 2.5GbE LAN, optimized for higher performance and lower power, which brings you a flexible expansion solution for embedded systems.

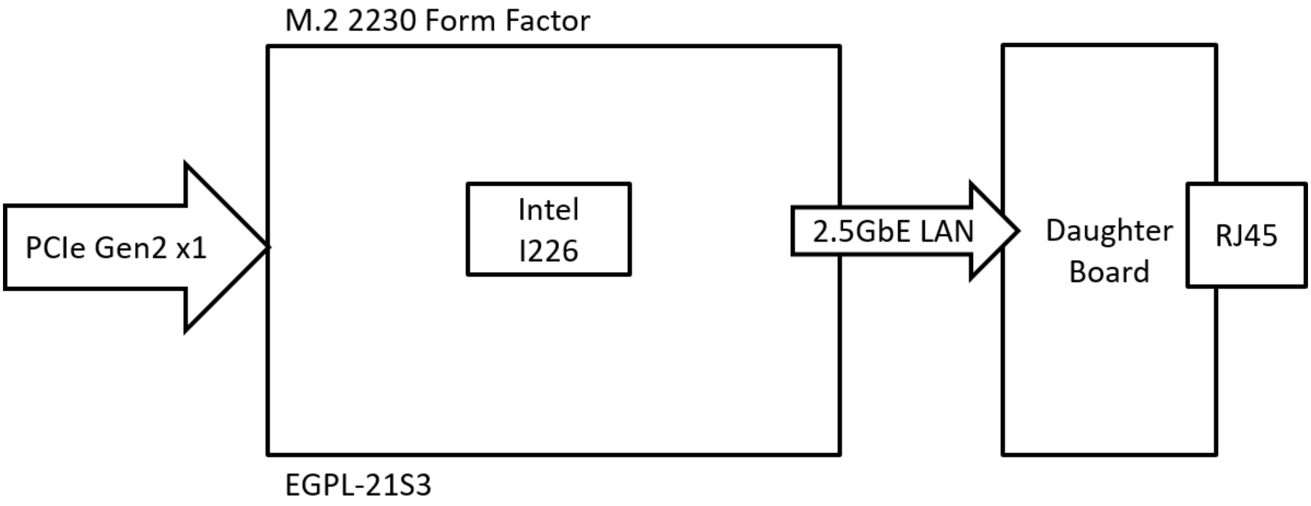


Figure 1: Block Diagram

1.2. Features

- Single isolated 2.5GbE LAN port
- Complies with EN61000-4-5 2kV surge protection
- Complies with IEC 60950-1:2005 + A1: 2009 + A2:2013 2kV HiPOT protection
- Complies with EN61000-4-2 (ESD) Air-15kV, Contact-8kV
- Flexible daughter board with cable to fit into different system
- Industrial temperature -40 ºC to 85 ºC
- Industrial design, manufactured in Innodisk Taiwan

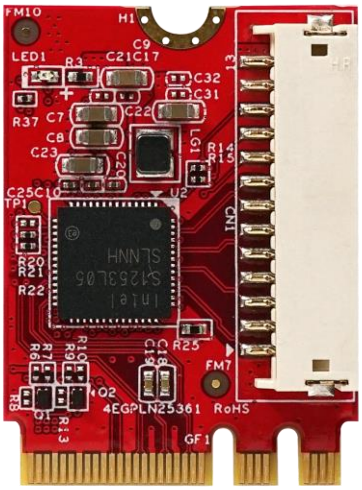


Figure 2: M.2 2230 Board Picture

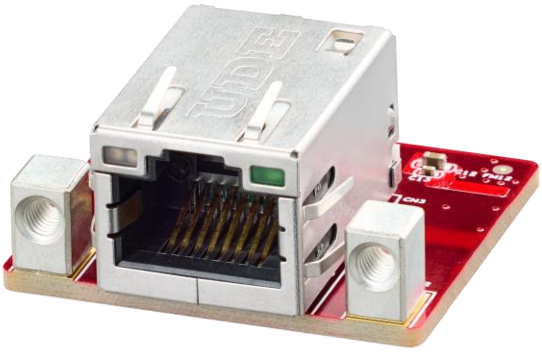


Figure 3: Mounting Hole Daughter Board Picture (EGPL-21S3-C1/W1)

2. Product Specifications

2.1. Device Parameters

Table 1: Device Parameters

Form Factor	M.2 2230 A-E
Input I/F	PCI Express 2.1 x 1
Output I/F	Single 2.5GbE LAN
Output Connector	RJ45 x 1
Dimension (WxLxH)	M.2 Board: 22 x 30 x 5.95 mm Daughter Board: 28 x 32 x 19.2 mm

2.2. Electrical Specifications

2.2.1. Power Requirement

Table 2: Power Requirement

Item	Connector	Rating
Input voltage	M.2 Golden Finger	+3.3 DC +-5%

2.2.2. Power Consumption

Table 3: Power Consumption

Voltage(V)	RMS(mA)	Max (mA)
3.3	213	325

2.3. Environmental Specifications

2.3.1. Temperature Ranges

Table 4: Temperature Ranges

Temperature	Range
Operating	Standard Grade: 0°C to +70°C Industrial Grade: -40°C to +85°
Storage	-55°C to +95°

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)
EGPL-21S3-C1/W1	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	14,375,859

2.4. CE and FCC Compatibility

EGPL-21S3 conforms to CE and FCC requirements.

2.5. RoHS Compliance

EGPL-21S3 is fully compliant with RoHS directive.

2.6. Hardware

2.6.1. Layout

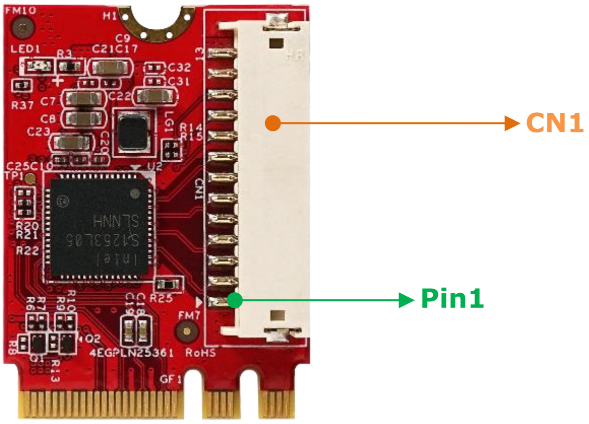
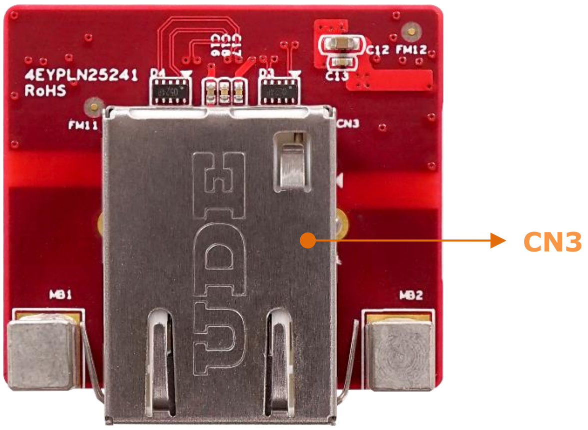


Table 7: M.2 2230 PCB Layout Legend

Label	Connector Type	Function
CN1	Wire to board SMD 1*13P 90° P:1.5mm	GbE LAN Signal 10/100/1000 LED Signal



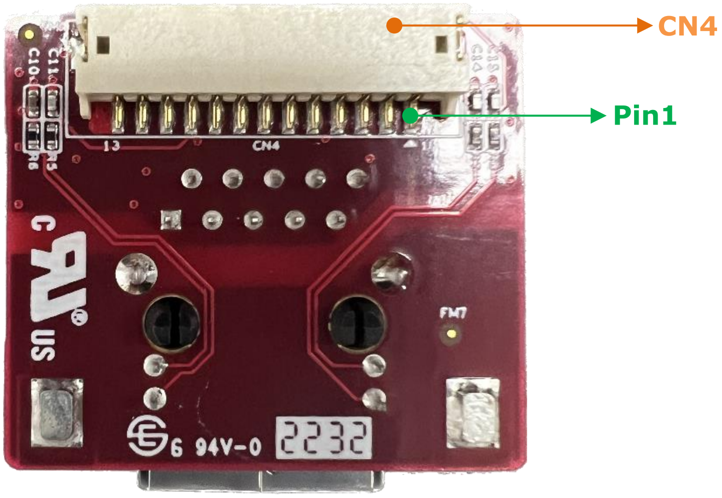
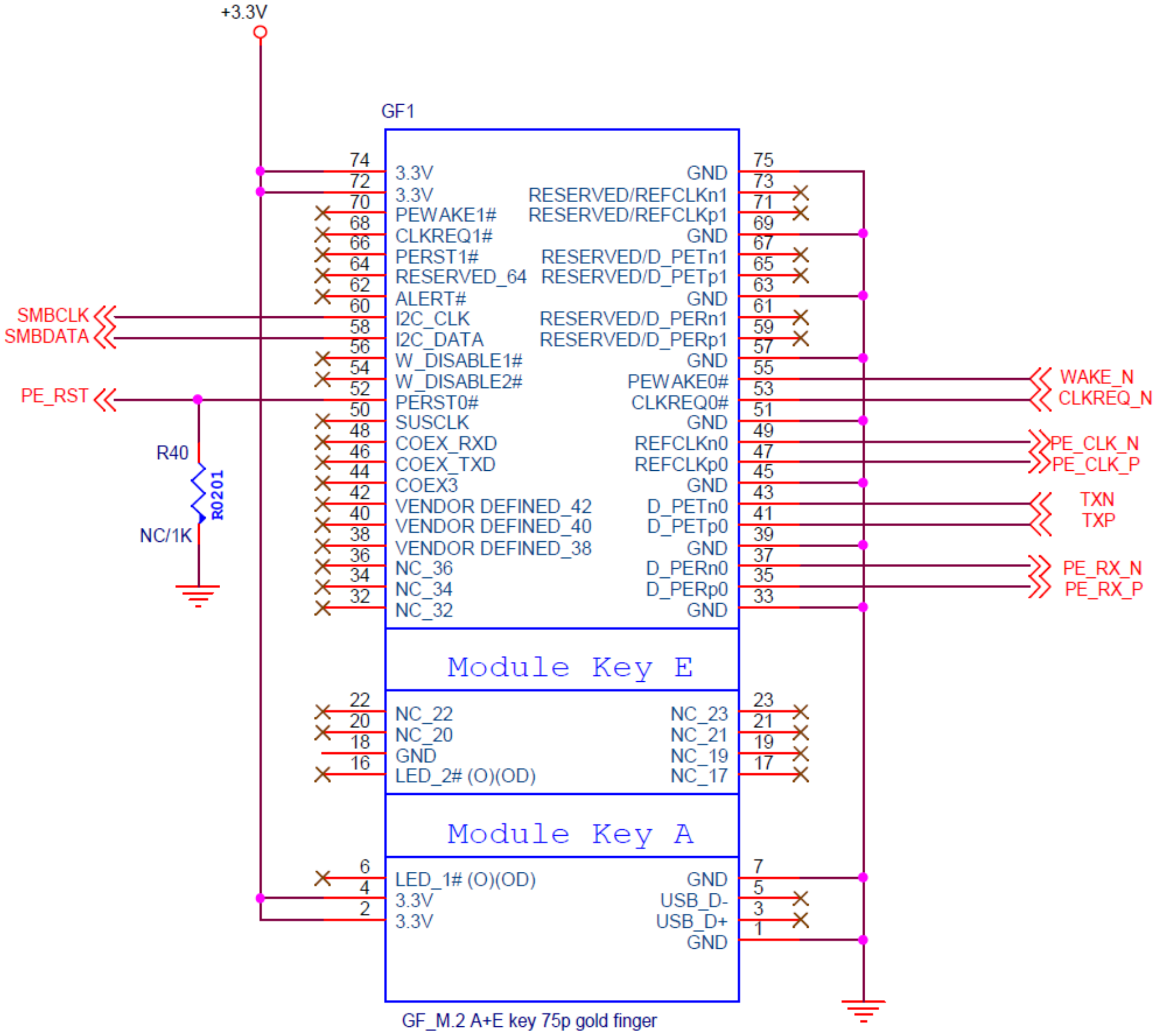


Table 8: Daughter Board PCB Layout Legend

Label	Connector Type	Function
CN3	RJ45/T/U 2.5G Base-T DIP 10P8C 90° LED: Green-Orange/Green	LAN Port LED Indicator
CN4	Wire to board SMD 1*13P 90° P:1.5mm	LAN and LED Signal

2.6.2. Pin Define

Table 9: M.2 A-E Key Pin Define



2.6.3. I/O Connector Mechanical Drawing & Pin Defines

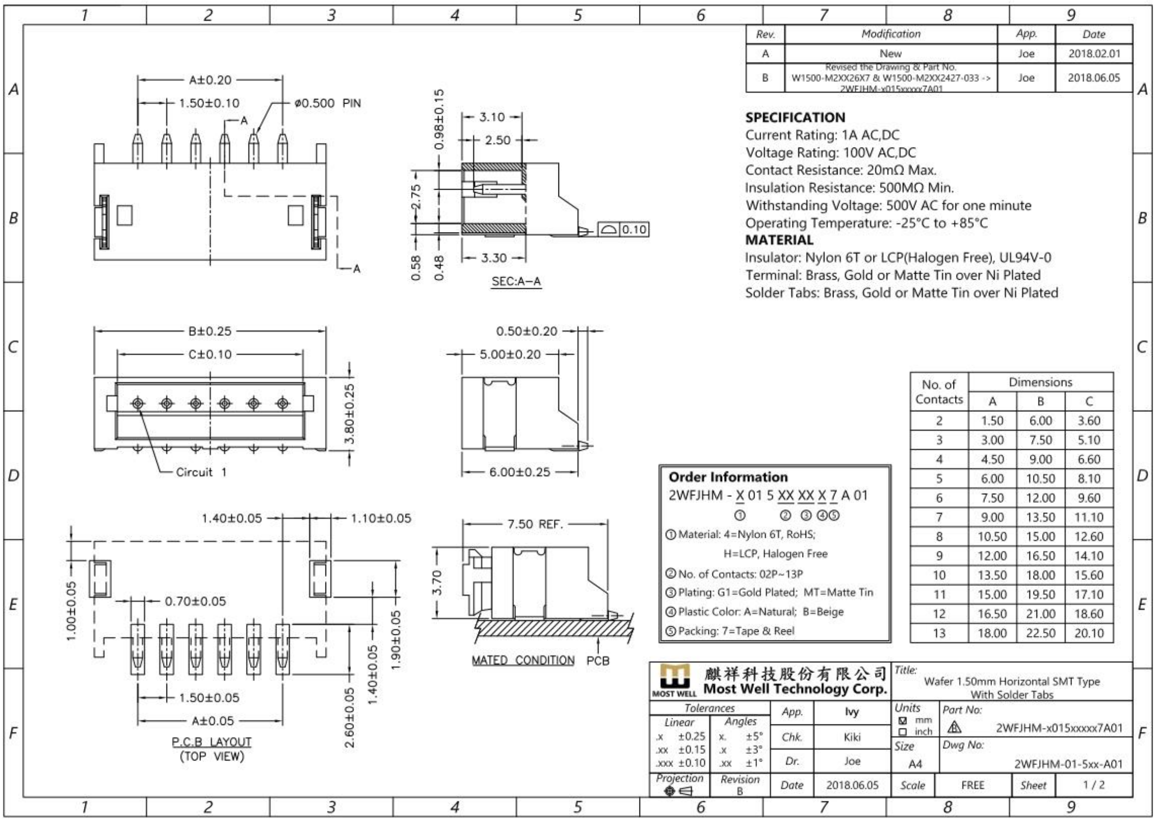


Figure 4: Wire to Board SMD 1*13P Connector Drawing

Table 10: Wire to Board SMD 1*13P Connector Pin Define

Pin #	Signal Name
1	MDI0P_IC
2	MDI0N_IC
3	MDI1P_IC
4	MDI1N_IC
5	MDI2P_IC
6	MDI2N_IC
7	MDI3P_IC
8	MDI3N_IC
9	B_SPEED_2500#
10	B_LINK_ACT_N
11	B_SPEED_1000#
12	GND
13	3.3V

1. MECHANICAL DIMENSION

Product Dimension

Unit:mm	General Tolerance :	X.X : ± 0.38 X.XX : ± 0.20

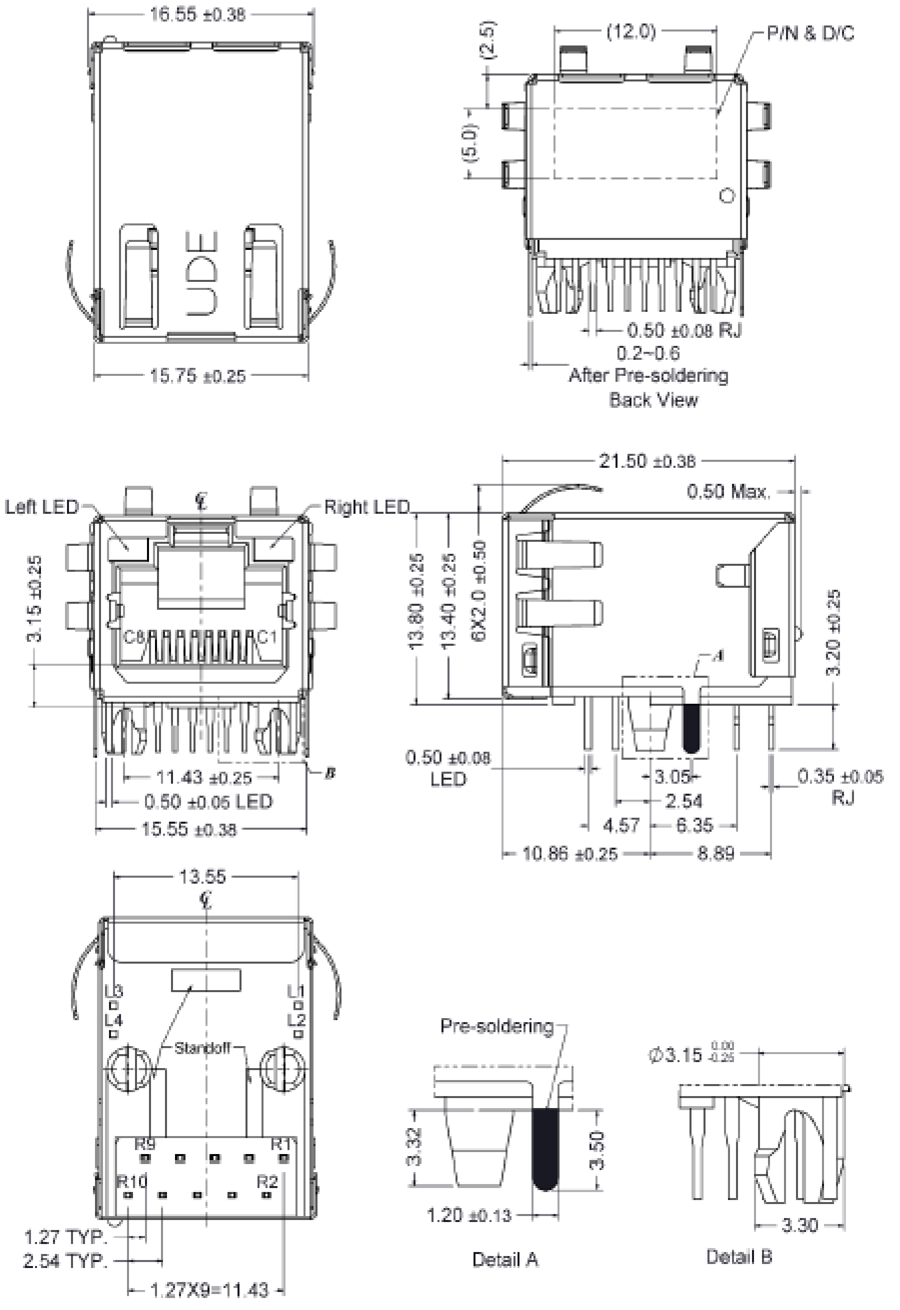
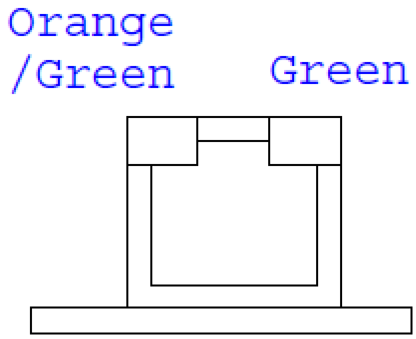


Figure 5: RJ45 Connector Drawing

Table 11: RJ45 LAN LED Table



Speed LED	
10M	OFF
100M	OFF
1G	Orange
2.5G	Green
Link-Activity LED	
Link-up	Green
Tx/Rx Activity	Blinking Green

2.6.4. EGPL-21S3 Mechanical Drawing

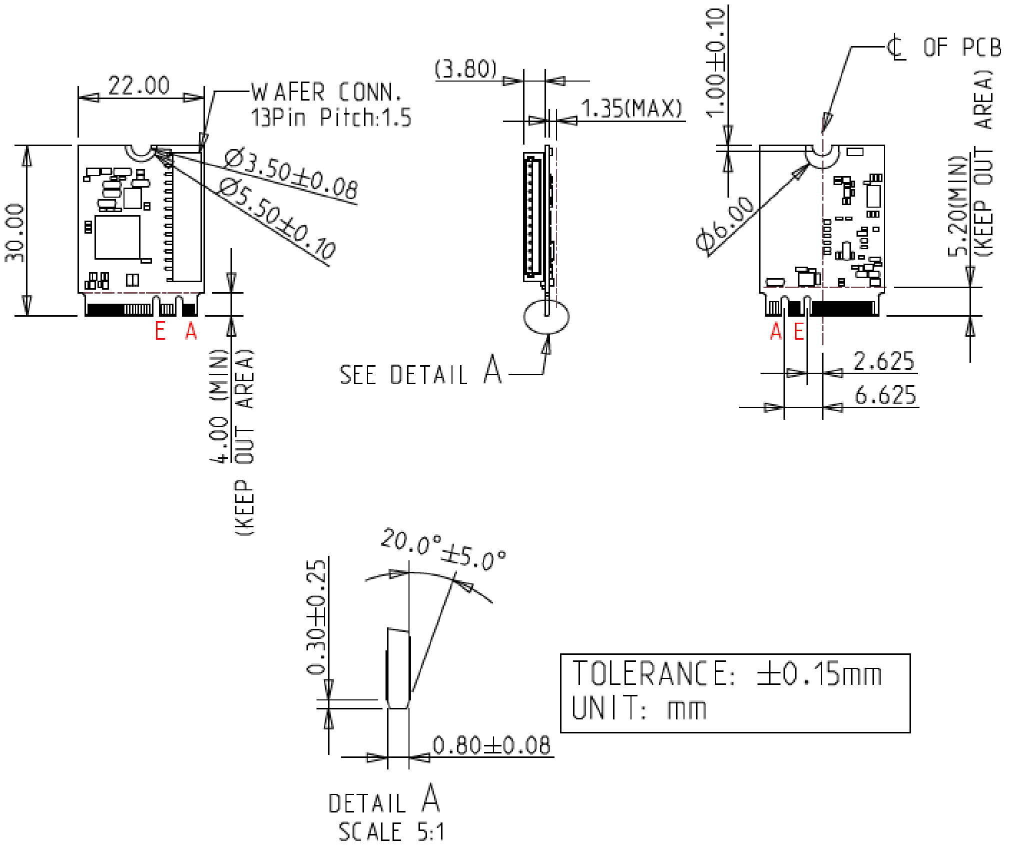


Figure 6: EGPL-21S3 M.2 Board Drawing

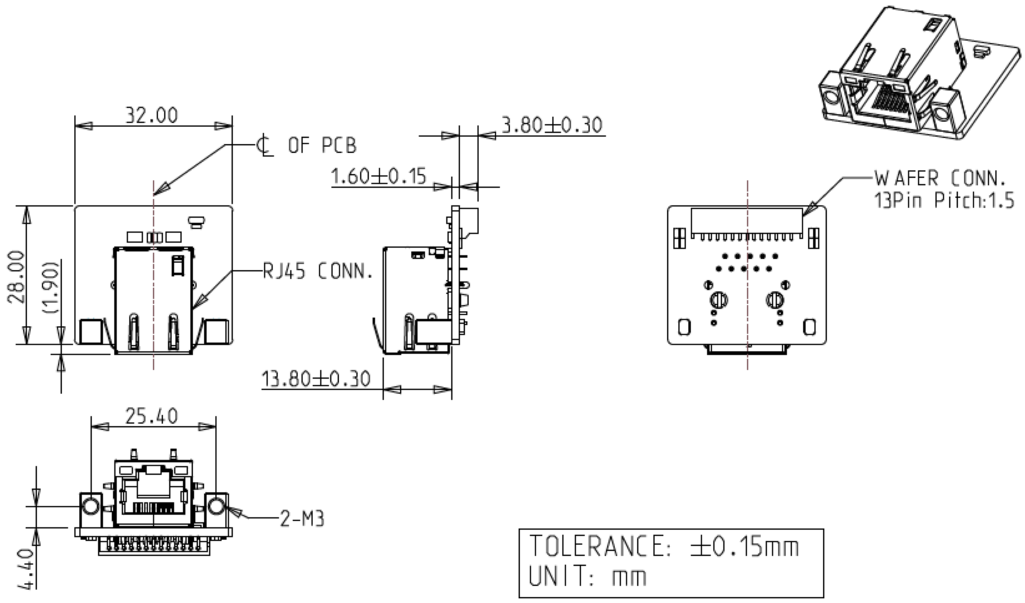
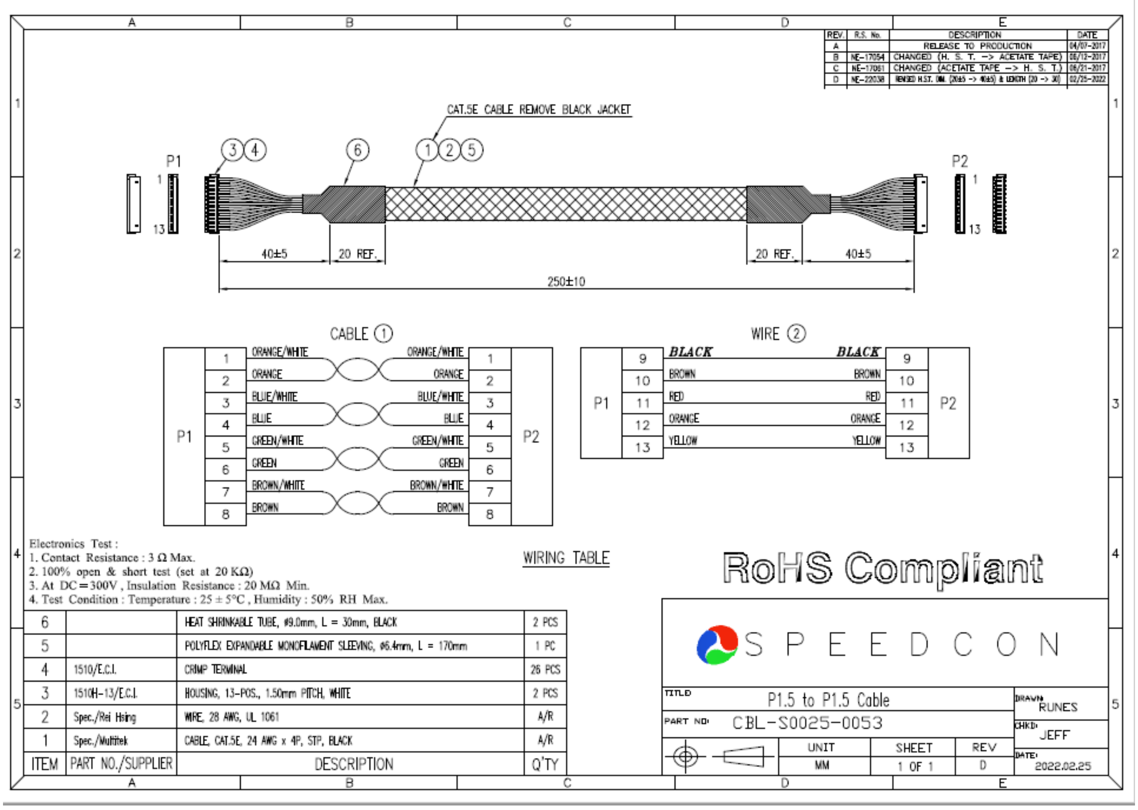


Figure 7: Mounting Hole Daughter Board Drawing (EGPL-21S3-C1/W1)

2.6.5. Cable Mechanical Drawing



REV.	R.S. No.	DESCRIPTION	DATE
A		RELEASE TO PRODUCTION	04/07-2017
B	NE-17054	CHANGED (H. S. T. –> ACETATE TAPE)	06/12-2017
C	NE-17061	CHANGED (ACETATE TAPE –> H. S. T.)	06/21-2017
D	NE-22038	REVISED H.S.T. DIM. (20±5 –> 40±5) & LENGTH (20 –> 30)	02/25-2022

CABLE ①

P1	Color	Color	P2
1	ORANGE/WHITE	ORANGE/WHITE	1
2	ORANGE	ORANGE	2
3	BLUE/WHITE	BLUE/WHITE	3
4	BLUE	BLUE	4
5	GREEN/WHITE	GREEN/WHITE	5
6	GREEN	GREEN	6
7	BROWN/WHITE	BROWN/WHITE	7
8	BROWN	BROWN	8

WIRE ②

P1	Color	Color	P2
9	BLACK	BLACK	9
10	BROWN	BROWN	10
11	RED	RED	11
12	ORANGE	ORANGE	12
13	YELLOW	YELLOW	13

Electronics Test :
1. Contact Resistance : 3 Ω Max.
2. 100% open & short test (set at 20 KΩ)
3. At DC=300V , Insulation Resistance : 20 MΩ Min.
4. Test Condition : Temperature : 25 ± 5°C , Humidity : 50% RH Max.

ITEM	PART NO./SUPPLIER	DESCRIPTION	Q'TY
6		HEAT SHRINKABLE TUBE, ø9.0mm, L = 30mm, BLACK	2 PCS
5		POLYFLEX EXPANDABLE MONOFLAMENT SLEEVING, ø6.4mm, L = 170mm	1 PC
4	1510/E.C.I.	CRIMP TERMINAL	26 PCS
3	1510H-13/E.C.I.	HOUSING, 13-POS., 1.50mm PITCH, WHITE	2 PCS
2	Spec./Rei Hsing	WIRE, 28 AWG, UL 1061	A/R
1	Spec./Multitek	CABLE, CAT.5E, 24 AWG x 4P, STP, BLACK	A/R

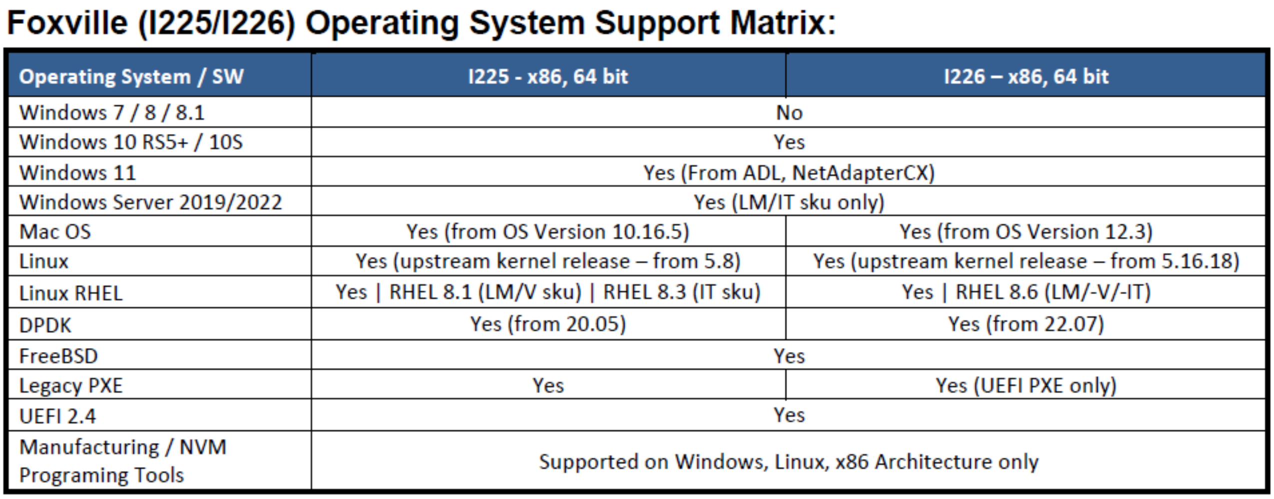
TITLE: P1.5 to P1.5 Cable
PART NO: CBL-S0025-0053
UNIT: MM
SHEET: 1 OF 1
REV: D
DRAWN: RUNES
CHKD: JEFF
DATE: 2022.02.25

Figure 8: Board to Board LAN Cable Drawing

2.6.6. Packing List

- EGPL-21S3 M.2 Board x 1
- EGPL-21S3 Daughter Board x 1
- Board to Board LAN Cable x 1

2.7. Software Support



Foxville (I225/I226) Operating System Support Matrix:

<table>
<tr><th>Operating System / SW</th><th>I225 - x86, 64 bit</th><th>I226 – x86, 64 bit</th></tr>
<tr><td>Windows 7 / 8 / 8.1</td><td colspan="2">No</td></tr>
<tr><td>Windows 10 RS5+ / 10S</td><td colspan="2">Yes</td></tr>
<tr><td>Windows 11</td><td colspan="2">Yes (From ADL, NetAdapterCX)</td></tr>
<tr><td>Windows Server 2019/2022</td><td colspan="2">Yes (LM/IT sku only)</td></tr>
<tr><td>Mac OS</td><td>Yes (from OS Version 10.16.5)</td><td>Yes (from OS Version 12.3)</td></tr>
<tr><td>Linux</td><td>Yes (upstream kernel release – from 5.8)</td><td>Yes (upstream kernel release – from 5.16.18)</td></tr>
<tr><td>Linux RHEL</td><td>Yes | RHEL 8.1 (LM/V sku) | RHEL 8.3 (IT sku)</td><td>Yes | RHEL 8.6 (LM/-V/-IT)</td></tr>
<tr><td>DPDK</td><td>Yes (from 20.05)</td><td>Yes (from 22.07)</td></tr>
<tr><td>FreeBSD</td><td colspan="2">Yes</td></tr>
<tr><td>Legacy PXE</td><td>Yes</td><td>Yes (UEFI PXE only)</td></tr>
<tr><td>UEFI 2.4</td><td colspan="2">Yes</td></tr>
<tr><td>Manufacturing / NVM Programing Tools</td><td colspan="2">Supported on Windows, Linux, x86 Architecture only</td></tr>
</table>

3. Installation Guide

Please download driver from Myinnodisk web site.
https://myinnodisk.innodisk.com/myinnodisk/Login.aspx

Windows driver still can be downloaded from intel official website.
https://www.intel.com/content/www/us/en/download/15084/intel-ethernet-adapter-complete-driver-pack.html

Intel dosen't provide i226 Linux driver for download.
Up Stream Kernel Release from 5.16.18.

4. Appedix

宜鼎國際股份有限公司

Innodisk Corporation

REACH Declaration

Tel:(02)7703-3000 Fax:(02) 7703-3555 Internet: https://www.innodisk.com/

Innodisk Corporation pursues its social responsibility for global environmental preservation by committing to be compliant with REACH regulation (REGULATION (EC) No 1907/2006).

We hereby confirm that the product(s),

Scope: Flash Memory, DRAM Module and Embedded Peripherals Products.

- The standard products of **not listed in** the ***Appendix2*** meet the requirements of REACH SVHC regulations(SVHCs < 0.1% in Article), as described in the candidate list table currently including 233 substances (release date: 17-Jan-2023) and shown on the ECHA website. https://echa.europa.eu/candidate-list-table
- The standard products listed in the ***Appendix2*** contain(s) one or more hazardous substances or constituents exceeding 0.1 % by weight in article if not otherwise specified in candidate list table.
  Where the threshold value is exceeded, the substances in question are to be declared in accompanying. (SVHCs > 0.1% in Article).
- Comply with REACH Annex XVII.

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： Yichuan Chen 陳怡全

Company Representative Title 公司代表人職稱： QA Manager 品保經理

Date 日期：2023 / 02 / 09

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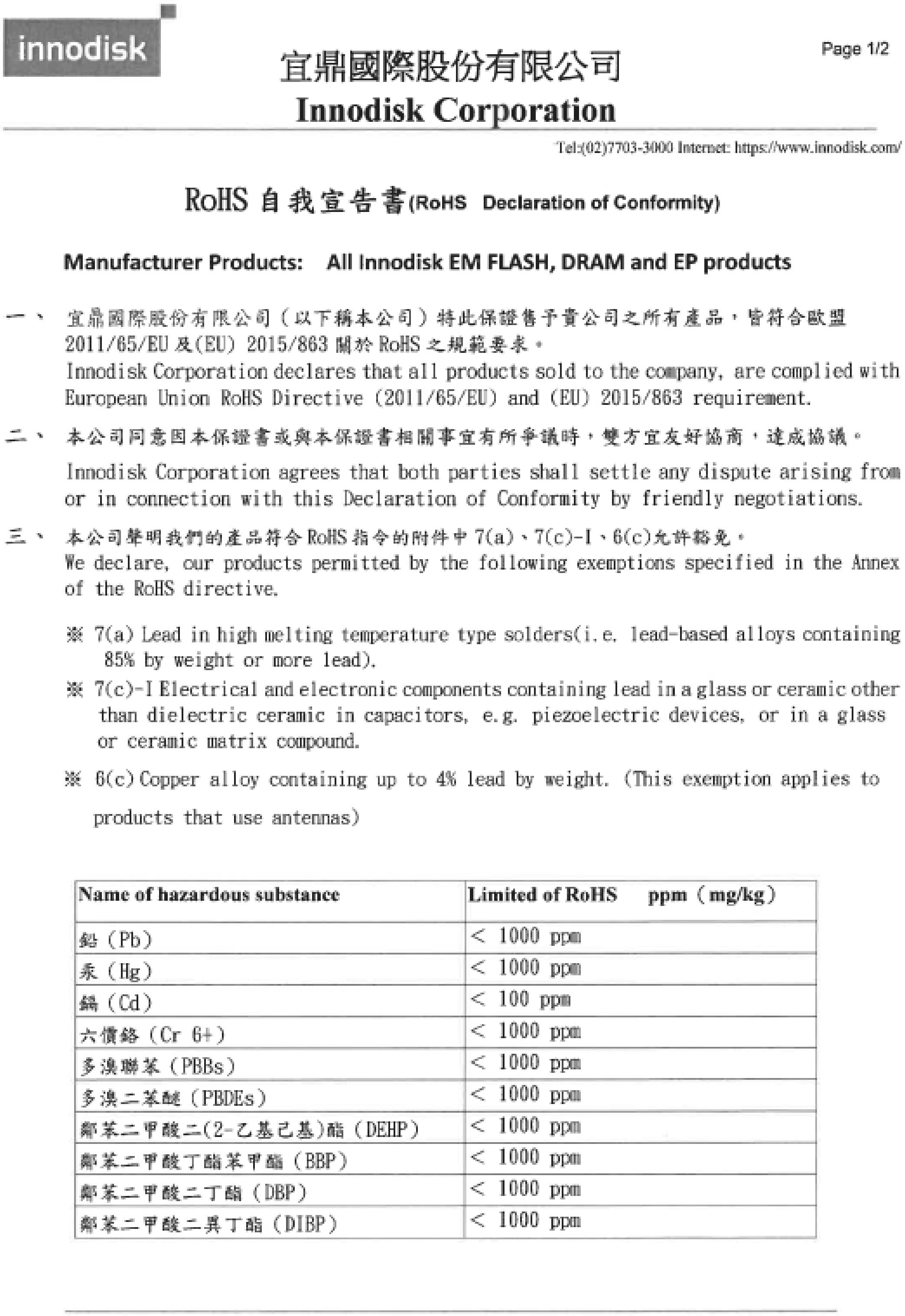

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宜鼎國際股份有限公司
Innodisk Corporation

Tel:(02)7703-3000 Internet: https://www.innodisk.com/

RoHS 自我宣告書(RoHS Declaration of Conformity)

Manufacturer Products: All Innodisk EM FLASH, DRAM and 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.

三、本公司聲明我們的產品符合 RoHS 指令的附件中 7(a)、7(c)-I、6(c)允許豁免。
We declare, our products permitted by the following exemptions specified in the Annex of the RoHS directive.

※ 7(a) Lead in high melting temperature type solders(i.e. lead-based alloys containing 85% by weight or more lead).

※ 7(c)-I Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound.

※ 6(c) Copper alloy containing up to 4% lead by weight. (This exemption applies to products that use antennas)

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

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宜鼎國際股份有限公司
Innodisk Corporation

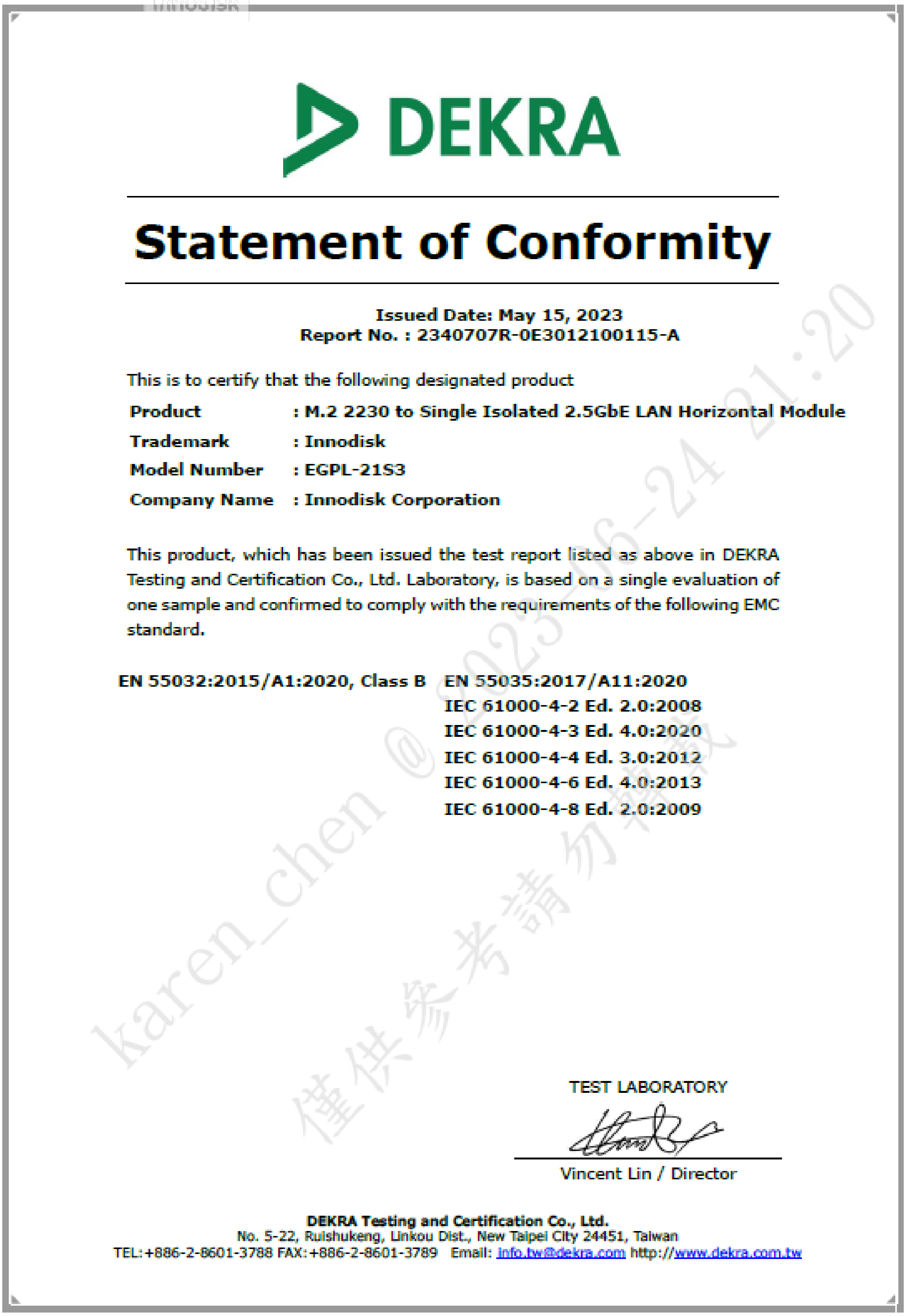
立保證書人 (Guarantor)

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：簡川勝

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

Date 日期：2023 / 06 / 14



Statement of Conformity

Issued Date: May 15, 2023
Report No. : 2340707R-0E3012100115-A

This is to certify that the following designated product

Product	**: M.2 2230 to Single Isolated 2.5GbE LAN Horizontal Module**
Trademark	**: Innodisk**
Model Number	**: EGPL-21S3**
Company Name	**: Innodisk Corporation**

This product, which has been issued the test report listed as above in DEKRA Testing and Certification Co., Ltd. Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.

EN 55032:2015/A1:2020, Class B	**EN 55035:2017/A11:2020**
	IEC 61000-4-2 Ed. 2.0:2008
	IEC 61000-4-3 Ed. 4.0:2020
	IEC 61000-4-4 Ed. 3.0:2012
	IEC 61000-4-6 Ed. 4.0:2013
	IEC 61000-4-8 Ed. 2.0:2009

TEST LABORATORY

Vincent Lin / Director

DEKRA Testing and Certification Co., Ltd.
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TEL:+886-2-8601-3788 FAX:+886-2-8601-3789 Email: info.tw@dekra.com http://www.dekra.com.tw

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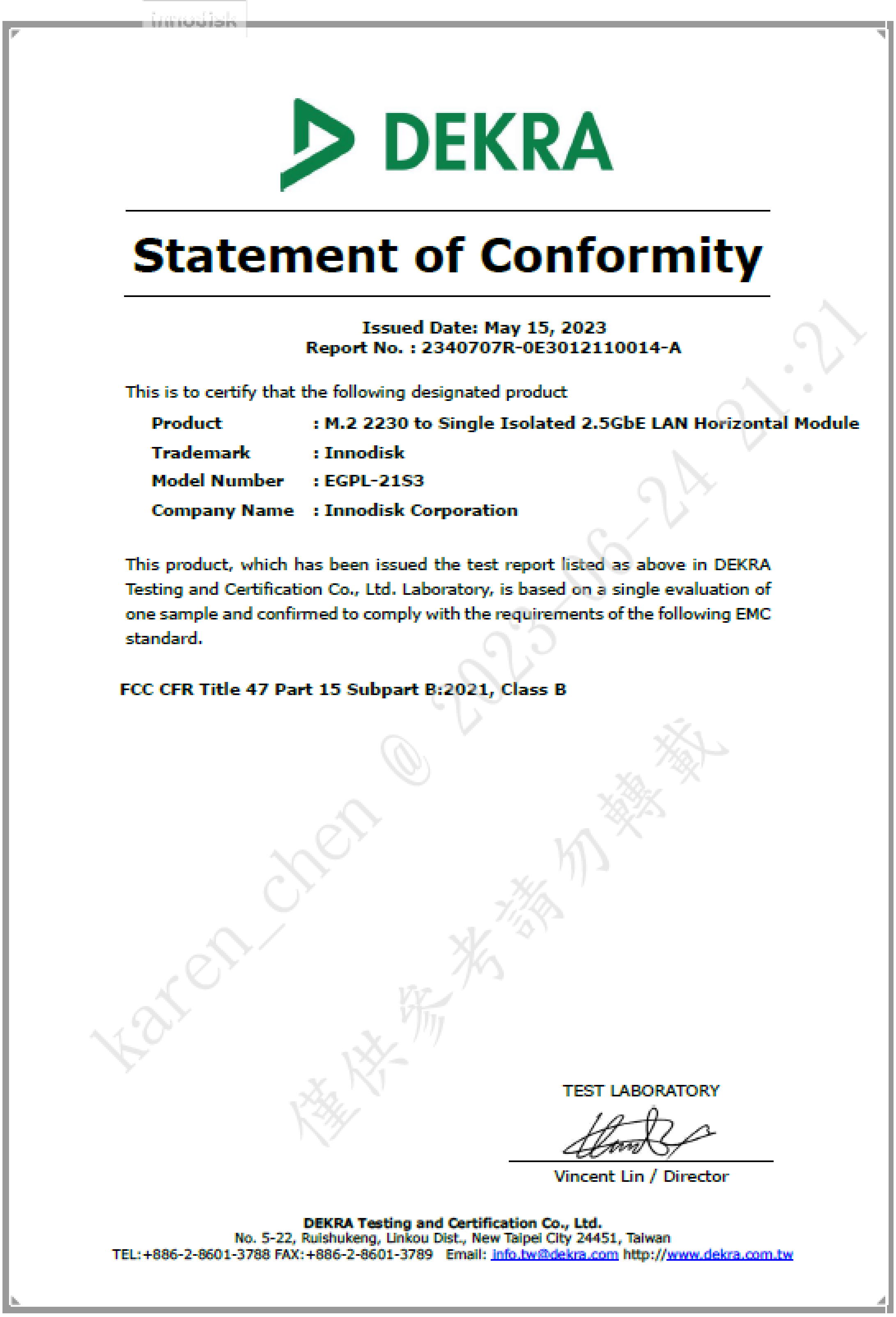

DEKRA

Statement of Conformity

Issued Date: May 15, 2023
Report No. : 2340707R-0E3012110014-A

This is to certify that the following designated product

Product	**: M.2 2230 to Single Isolated 2.5GbE LAN Horizontal Module**
Trademark	**: Innodisk**
Model Number	**: EGPL-21S3**
Company Name	**: Innodisk Corporation**

This product, which has been issued the test report listed as above in DEKRA Testing and Certification Co., Ltd. Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.

FCC CFR Title 47 Part 15 Subpart B:2021, Class B

TEST LABORATORY

Vincent Lin / Director

DEKRA Testing and Certification Co., Ltd.
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TEL:+886-2-8601-3788 FAX:+886-2-8601-3789 Email: info.tw@dekra.com http://www.dekra.com.tw

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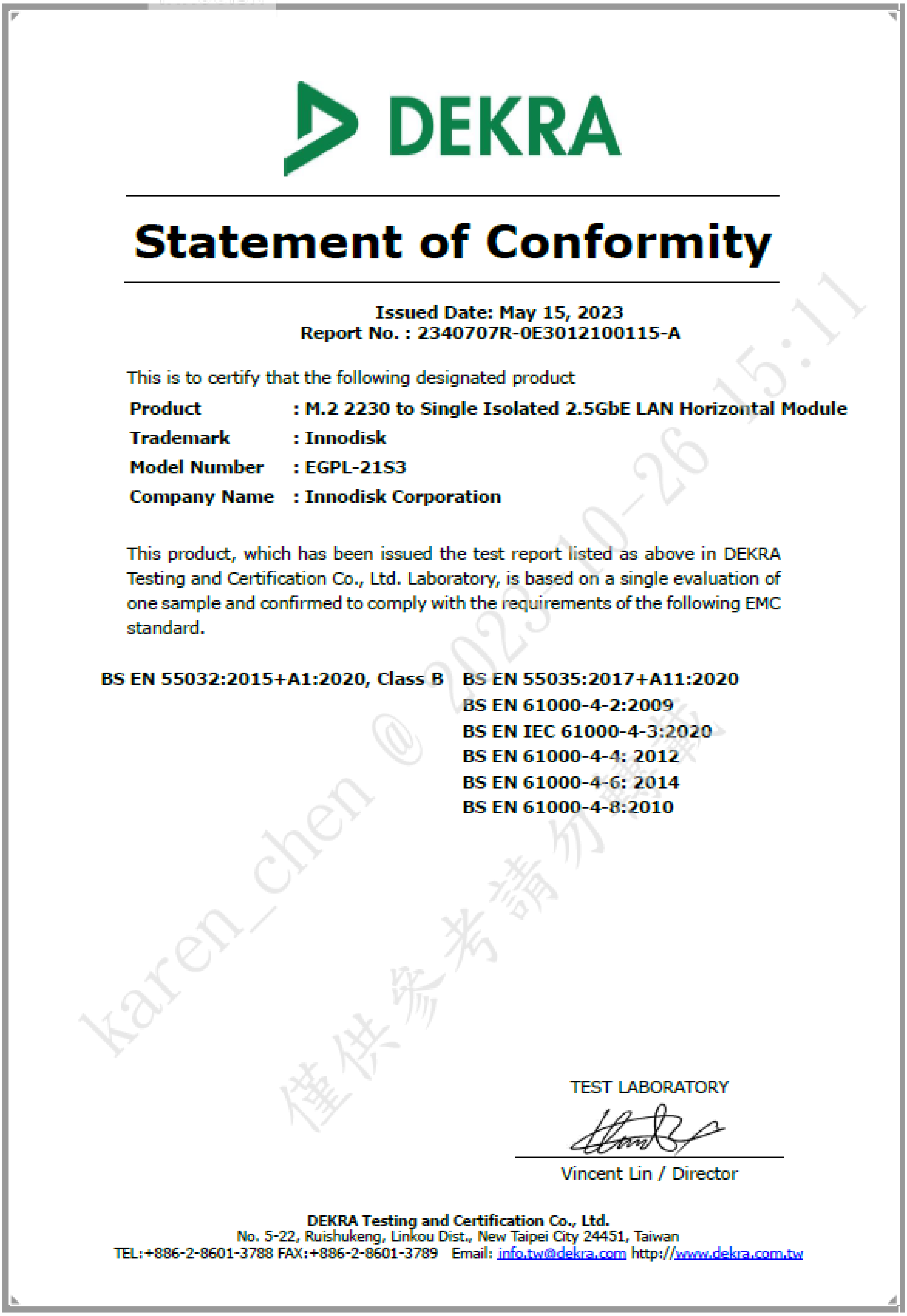

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Report No. : 2340707R-0E3012100115-A

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Trademark : **Innodisk**
Model Number : **EGPL-21S3**
Company Name : **Innodisk Corporation**

This product, which has been issued the test report listed as above in DEKRA Testing and Certification Co., Ltd. Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.

BS EN 55032:2015+A1:2020, Class B

BS EN 55035:2017+A11:2020
BS EN 61000-4-2:2009
BS EN IEC 61000-4-3:2020
BS EN 61000-4-4: 2012
BS EN 61000-4-6: 2014
BS EN 61000-4-8:2010

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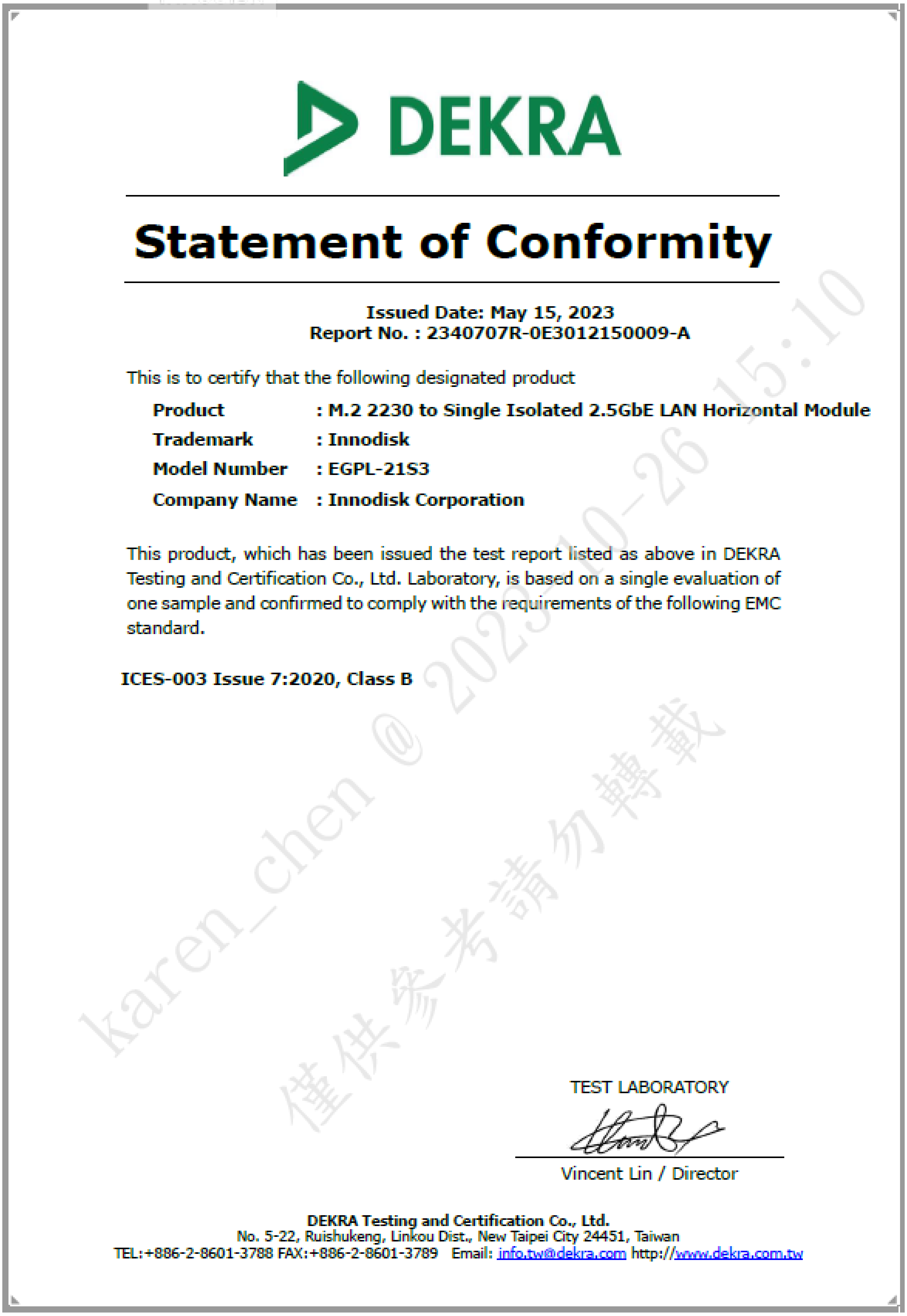

Statement of Conformity

Issued Date: May 15, 2023
Report No. : 2340707R-0E3012150009-A

This is to certify that the following designated product

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Model Number	**: EGPL-21S3**
Company Name	**: Innodisk Corporation**

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ICES-003 Issue 7:2020, Class B

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February 21, 2024