

EMPL-G201

mPCIe to dual isolated

GbE LAN Module

Customer:

Customer

Part Number:

Innodisk

Part Number:

Innodisk

Model Name:

Date:

Innodisk	Customer
Approver	Approver

Total Solution For
Embedded Peripherals

Table of Contents

TABLE OF CONTENTS	I
REVISION HISTORY	II
LIST OF TABLES	1
LIST OF FIGURES	2
1. PRODUCT INTRODUCTION	3
1.1. OVERVIEW	3
1.2. FEATURES	3
2. PRODUCT SPECIFICATIONS	5
2.1. DEVICE PARAMETERS	5
2.2. ELECTRICAL SPECIFICATIONS.....	5
2.2.1.POWER REQUIREMENT.....	5
2.2.2.POWER CONSUMPTION	5
2.3. ENVIRONMENTAL SPECIFICATIONS	5
2.3.1.TEMPERATURE RANGES.....	5
2.3.2.HUMIDITY	6
2.3.3.SHOCK AND VIBRATION	6
2.3.4.MEAN TIME BETWEEN FAILURE (MTBF)	6
2.4. CE AND FCC COMPATIBILITY.....	6
2.5. RoHS COMPLIANCE	6
2.6. HARDWARE.....	7
2.6.1.LAYOUT.....	7
2.6.2.PIN DEFINE	8
2.6.3.I/O CONNECTOR MECHANICAL DRAWING & PIN DEFINES	9
2.6.4.EMPL-G201 MECHANICAL DRAWING	12
2.6.5.CABLE MECHANICAL DRAWING.....	14
2.6.6.PACKING LIST	14
2.7. SOFTWARE SUPPORT.....	14
3. INSTALLATION GUIDE	15
4. APPEDIX	16
CONTACT US	21

REVISION HISTORY

Revision	Description	Date
1.0	First Released	Sep, 2018
1.1	mPCIe Pin Define 3.3V => 3.3V AUX	Mar, 2020
1.2	PCIe Switch Revision	May, 2025

List of Tables

TABLE 1: DEVICE PARAMETERS	5
TABLE 2: POWER REQUIREMENT.....	5
TABLE 3: POWER CONSUMPTION	5
TABLE 4: TEMPERATURE RANGES.....	5
TABLE 5: SHOCK AND VIBRATION	6
TABLE 6: MEAN TIME BETWEEN FAILURE (MTBF).....	6
TABLE 7: mPCIe PCB LAYOUT LEGEND.....	7
TABLE 8: DAUGHTER BOARD PCB LAYOUT LEGEND	7
TABLE 9: mPCIe PIN DEFINE	8
TABLE 10: WIRE TO BOARD SMD 2*10P CONNECTOR PIN DEFINE.....	9
TABLE 11: RJ45 LAN LED TABLE.....	11

List of Figures

FIGURE 1: BLOCK DIAGRAM 3

FIGURE 2: mPCIe BOARD PICTURE..... 4

FIGURE 3: MOUNTING HOLE DAUGHTER BOARD PICTURE (EMPL-G201-C3/W3) 4

FIGURE 4: BRACKET DAUGHTER BOARD PICTURE (EMPL-G201-C4/W4) 4

FIGURE 5: WIRE TO BOARD SMD 2*10P CONNECTOR DRAWING 9

FIGURE 6: RJ45 CONNECTOR DRAWING 10

FIGURE 7: EMPL-G201 mPCIe BOARD DRAWING 12

FIGURE 8: MOUNTING HOLE DAUGHTER BOARD DRAWING (EMPL-G201-C3/W3)..... 12

FIGURE 9: BRACKET DAUGHTER BOARD DRAWING (EMPL-G201-C4/W4) 13

FIGURE 10: BRACKET DRAWING 13

FIGURE 11: BOARD TO BOARD LAN CABLE DRAWING..... 14

1. Product Introduction

1.1. Overview

Innodisk EMPL-G201 is designed with standard Mini PCI Express form factor, EMPL-G201 supports PCIe Gen 2.1 with a single lane to dual independent isolated GbE LAN, optimized for higher performance and lower power, which brings you a flexible expansion solution for embedded systems.

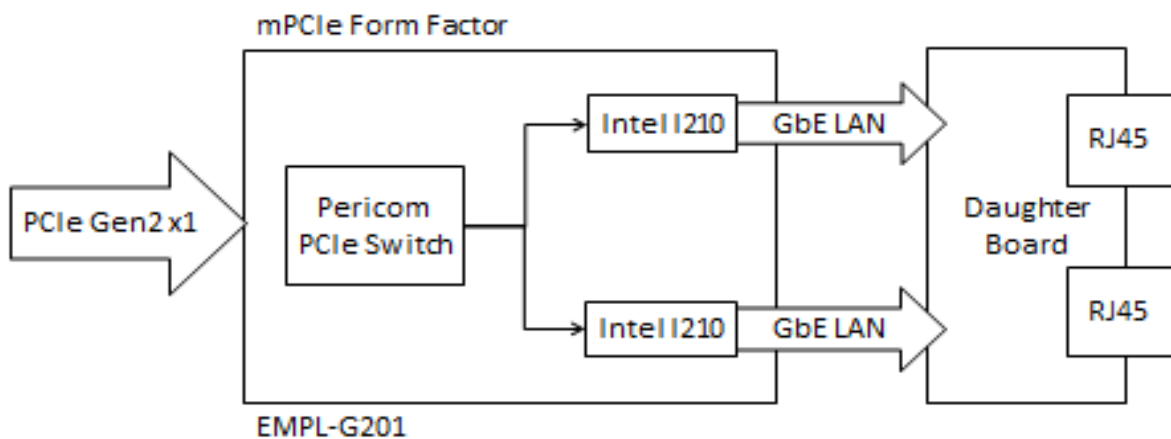


Figure 1: Block Diagram

1.2. Features

- Dual isolated GbE LAN ports
- Complies with EN61000-4-5 1kV 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
- Optional terminal mounting hole or bracket for daughter board

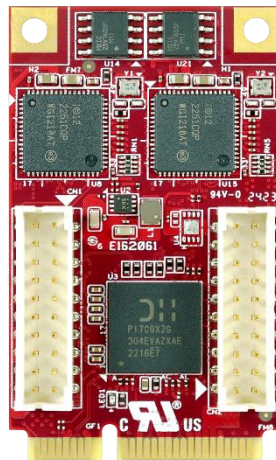


Figure 2: mPCIe Board Picture



Figure 3: Mounting Hole Daughter Board Picture (EMPL-G201-C3/W3)



Figure 4: Bracket Daughter Board Picture (EMPL-G201-C4/W4)

2. Product Specifications

2.1. Device Parameters

Table 1: Device Parameters

Form Factor	mPCIe
Input I/F	PCI Express 2.1 x 1
Output I/F	GbE LAN x 2
Output Connector	RJ45 x 2
Dimension (WxLxH)	mPCIe Board: 30 x 50.9 x 7.6 mm Daughter Board: 30 x 59.95 x 19.37

2.2. Electrical Specifications

2.2.1. Power Requirement

Table 2: Power Requirement

Item	Connector	Rating
Input voltage	mPCIe Golden Finger	+3.3 DC +-5%

2.2.2. Power Consumption

Table 3: Power Consumption

Full Load (mA)	Voltage (V)
450	3.3

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)
EMPL-G201	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	3,566,007

2.4. CE and FCC Compatibility

EMPL-G201 conforms to CE and FCC requirements.

2.5. RoHS Compliance

EMPL-G201 is fully compliant with RoHS directive.

2.6. Hardware

2.6.1. Layout

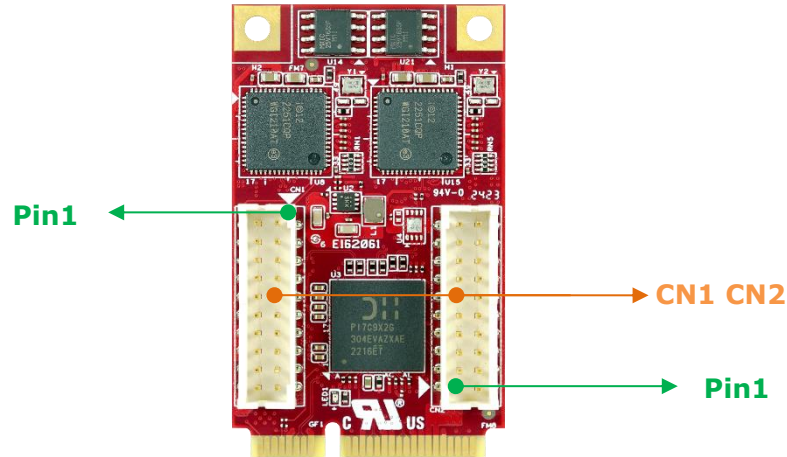


Table 7: mPCIe PCB Layout Legend

Label	Connector Type	Function
CN1	Wire to board SMD 2*10P 180° P:2.00mm H:4.0mm	GbE LAN Signal 10/100/1000 LED Signal
CN2	Wire to board SMD 2*10P 180° P:2.00mm H:4.0mm	GbE LAN Signal 10/100/1000 LED Signal

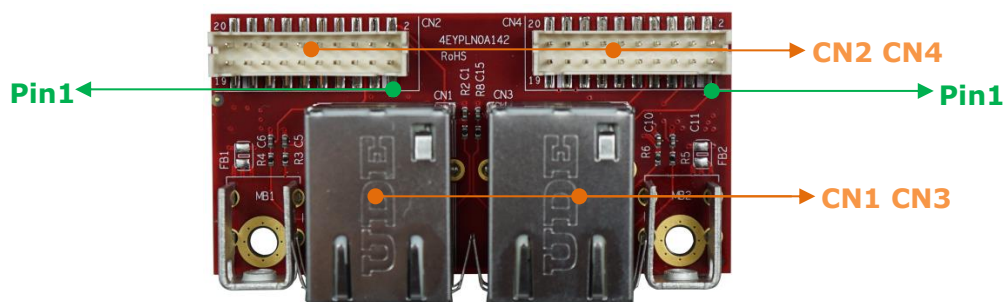


Table 8: Daughter Board PCB Layout Legend

Label	Connector Type	Function
CN1	10/100/1000 Base-T RJ45 DIP 10P8C 90° LED: Green-Orange/Green	GbE LAN Port 10/100/1000 LED Indicator

CN2	Wire to board SMD 2*10P 180° P:2.00mm H:4.0mm	GbE LAN Signal 10/100/1000 LED Signal
CN3	10/100/1000 Base-T RJ45 DIP 10P8C 90° LED: Green-Orange/Green	GbE LAN Port 10/100/1000 LED Indicator
CN4	Wire to board SMD 2*10P 180° P:2.00mm H:4.0mm	GbE LAN Signal 10/100/1000 LED Signal

2.6.2. Pin Define

Table 9: mPCIe Pin Define

Signal Name	Pin #	Pin #	Signal Name
NC	51	52	3.3V AUX
NC	49	50	GND
NC	47	48	NC
NC	45	46	NC
GND	43	44	NC
3.3V AUX	41	42	NC
3.3V AUX	39	40	GND
GND	37	38	NC
GND	35	36	NC
RX+	33	34	GND
RX-	31	32	SMBDATA
GND	29	30	SMBCLK
GND	27	28	NC
TX+	25	26	GND
TX-	23	24	3.3V AUX
GND	21	22	PERST#
NC	19	20	NC
NC	17	18	GND
GND	15	16	NC
CLK+	13	14	NC
CLK-	11	12	NC

GND	9	10	NC
GND	7	8	NC
NC	5	6	NC
NC	3	4	GND
PE_WAKE_N	1	2	3.3V AUX

2.6.3. I/O Connector Mechanical Drawing & Pin Defines

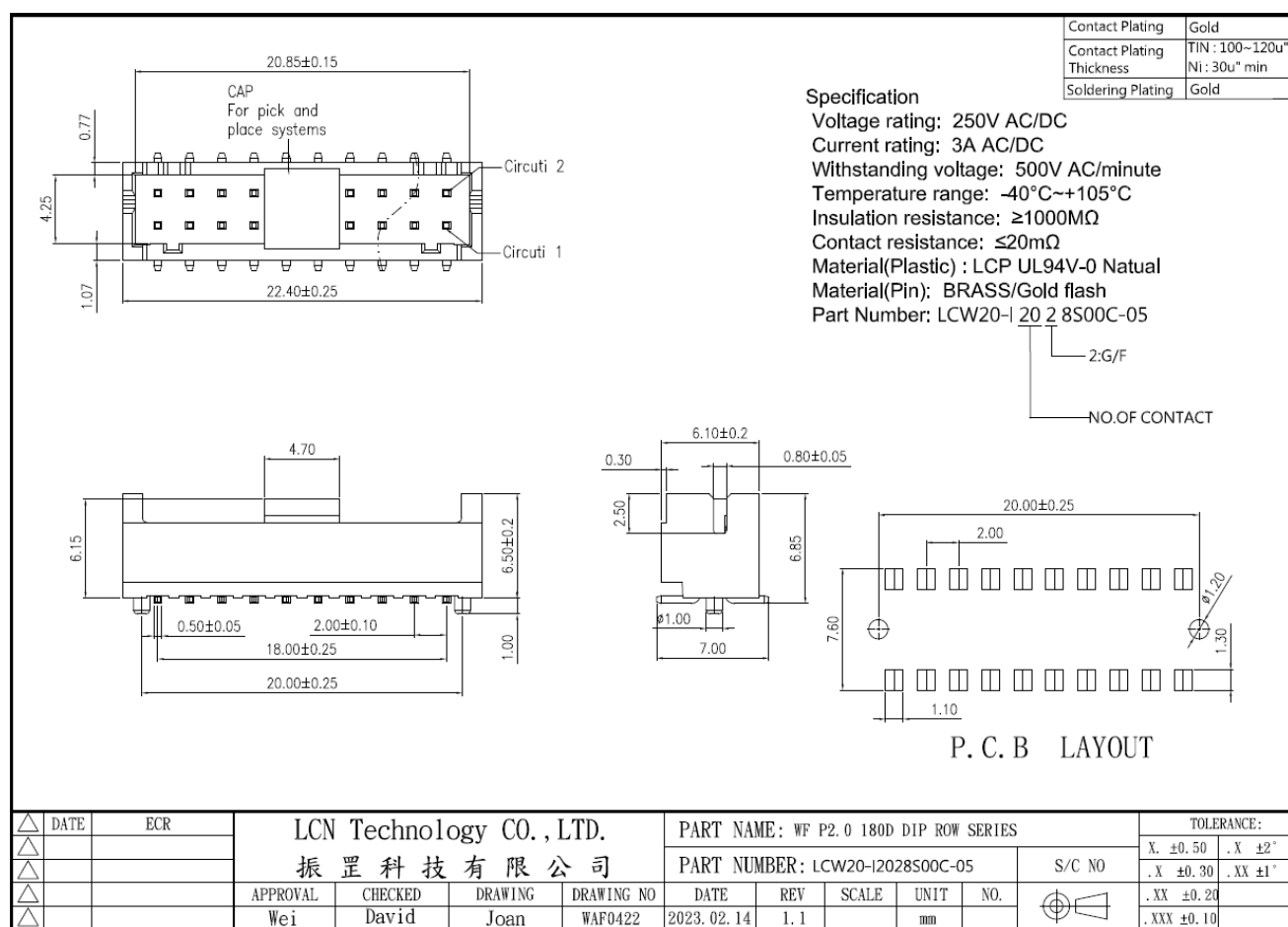


Figure 5: Wire to Board SMD 2*10P Connector Drawing

Table 10: Wire to Board SMD 2*10P Connector Pin Define

Signal Name	Pin #	Pin #	Signal Name
LINK_100_N	2	1	MDI0P_IC
LINK_ACT_N	4	3	MDI0N_IC
LINK_1000_N	6	5	MDI1P_IC
GND	8	7	MDI1N_IC

GND	10	9	MDI2P_IC
GND	12	11	MDI2N_IC
3.3V	14	13	MDI3P_IC
3.3V	16	15	MDI3N_IC
NC	18	17	NC
NC	20	19	NC

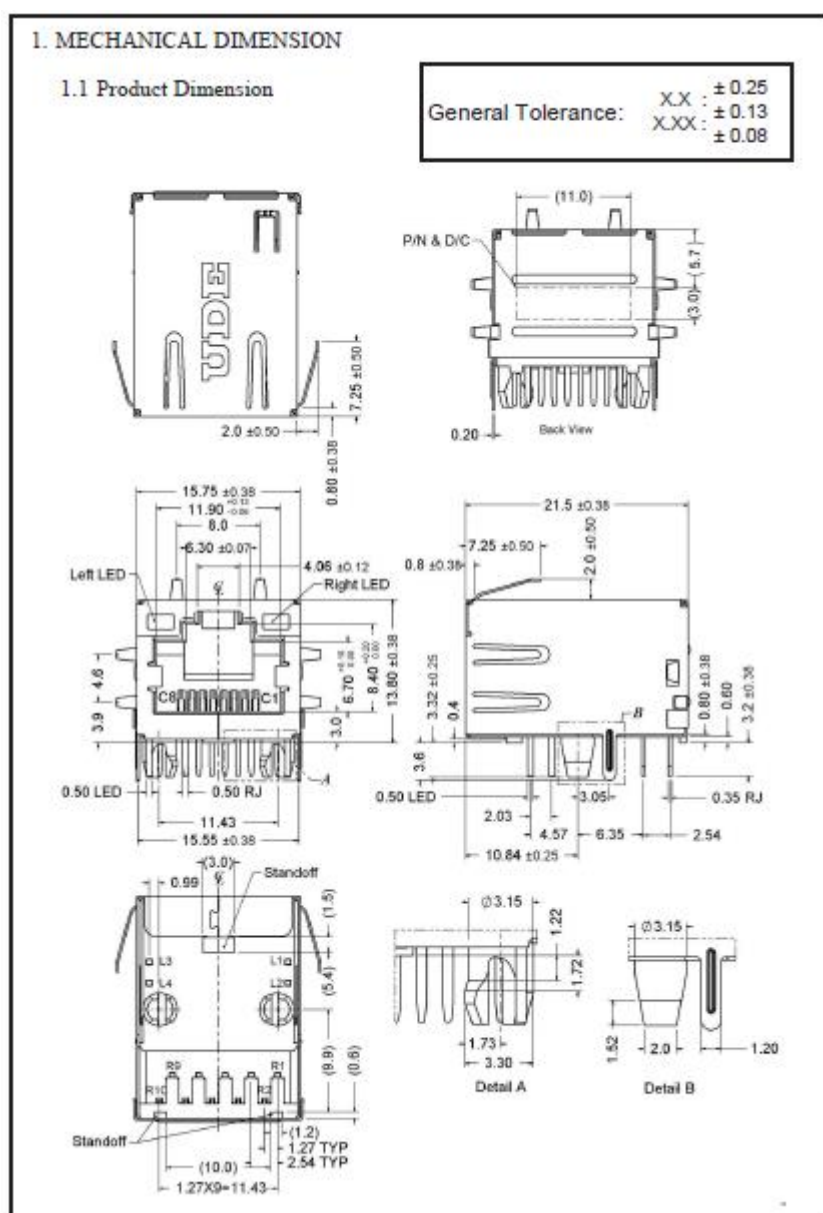
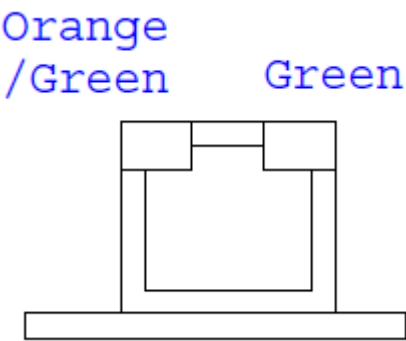


Figure 6: RJ45 Connector Drawing

Table 11: RJ45 LAN LED Table



Speed	Orange/Green (Status)	Green (Active/Link)
10M	OFF	Flash
100M	ON (Green)	Flash
1G	ON (Orange)	Flash

2.6.4. EMPL-G201 Mechanical Drawing

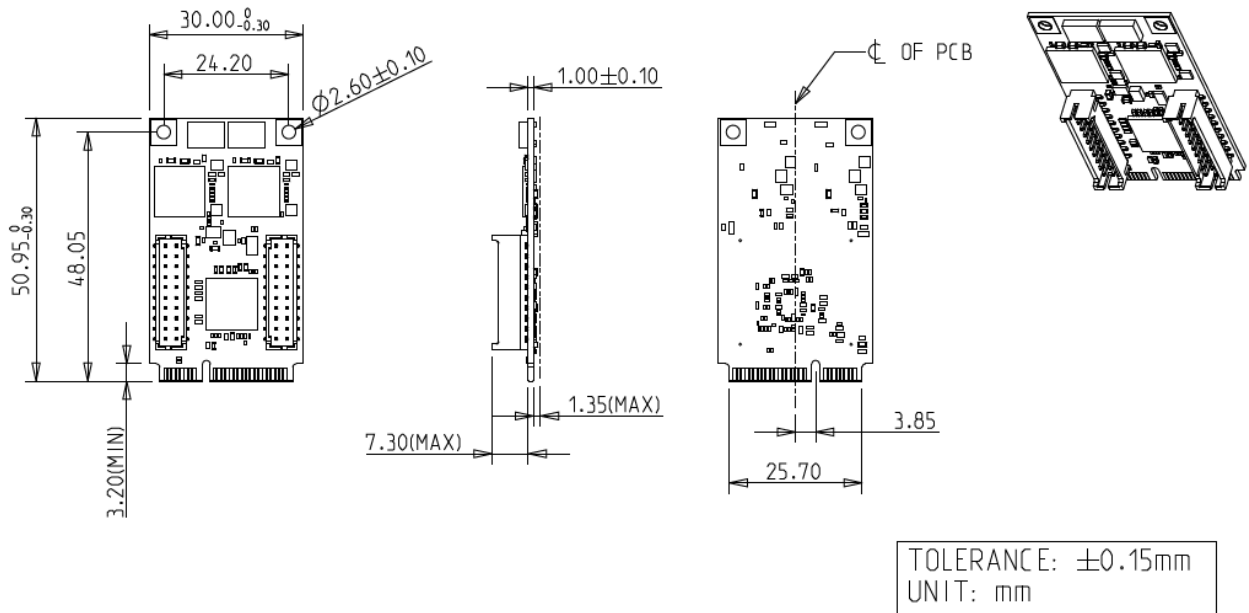


Figure 7: EMPL-G201 mPCIe Board Drawing

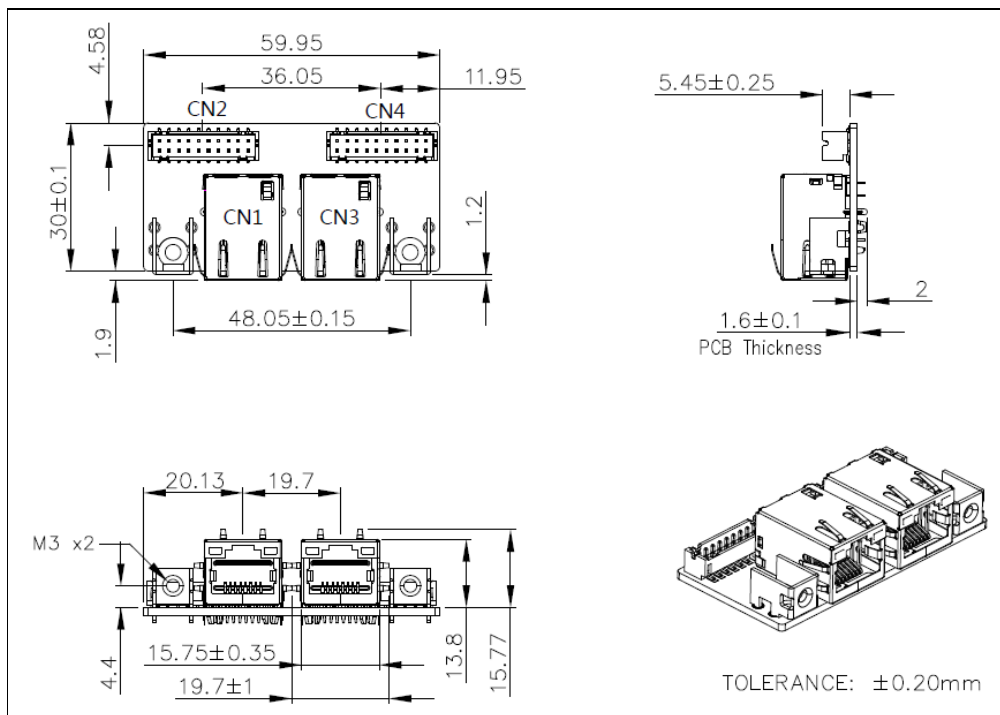


Figure 8: Mounting Hole Daughter Board Drawing (EMPL-G201-C3/W3)

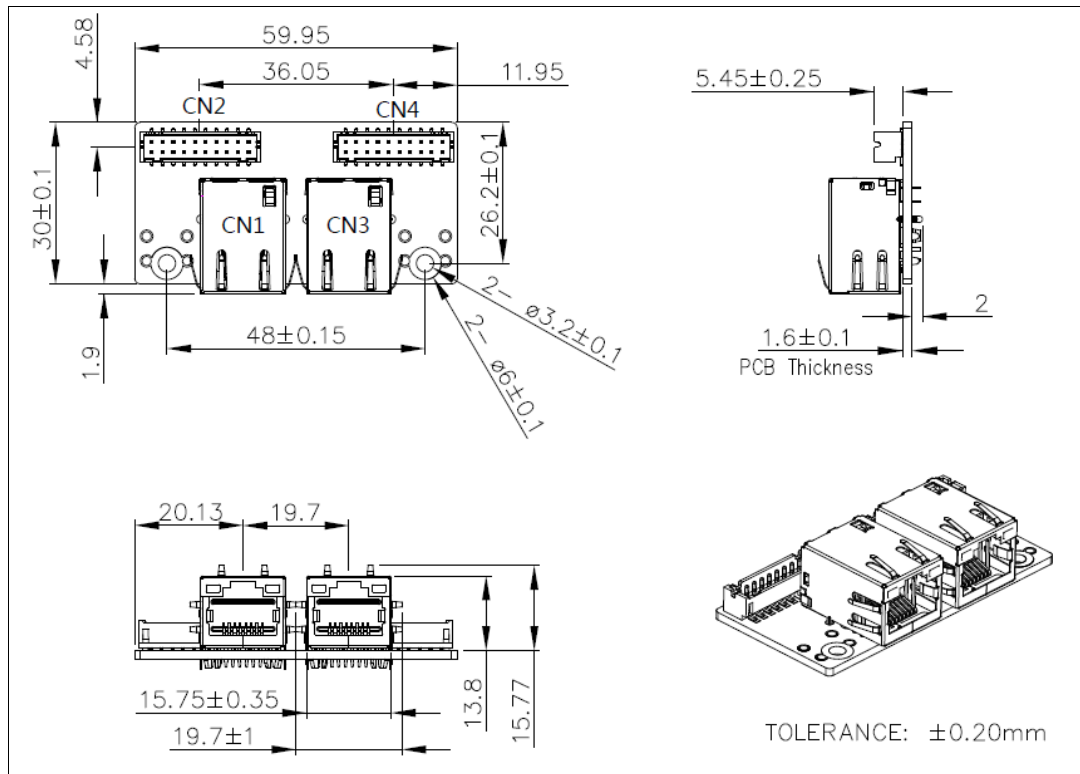


Figure 9: Bracket Daughter Board Drawing (EMPL-G201-C4/W4)

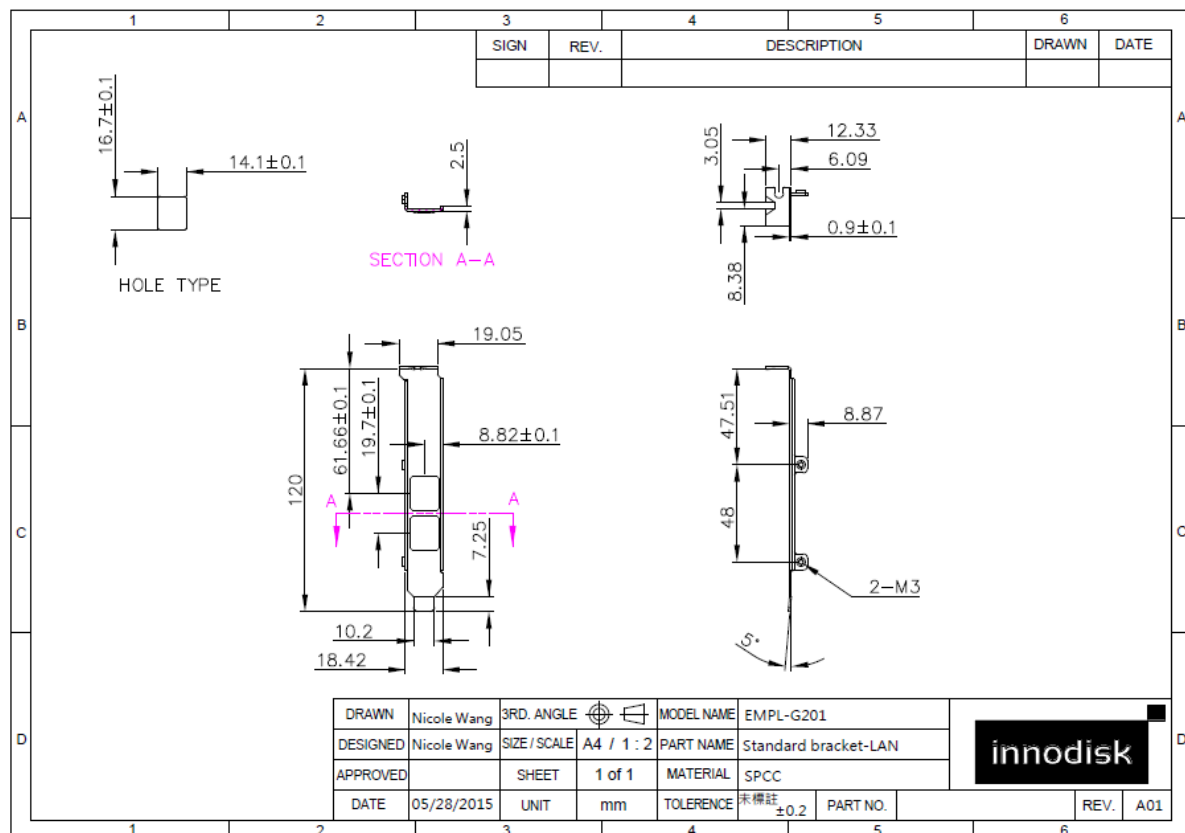


Figure 10: Bracket Drawing

2.6.5. Cable Mechanical Drawing

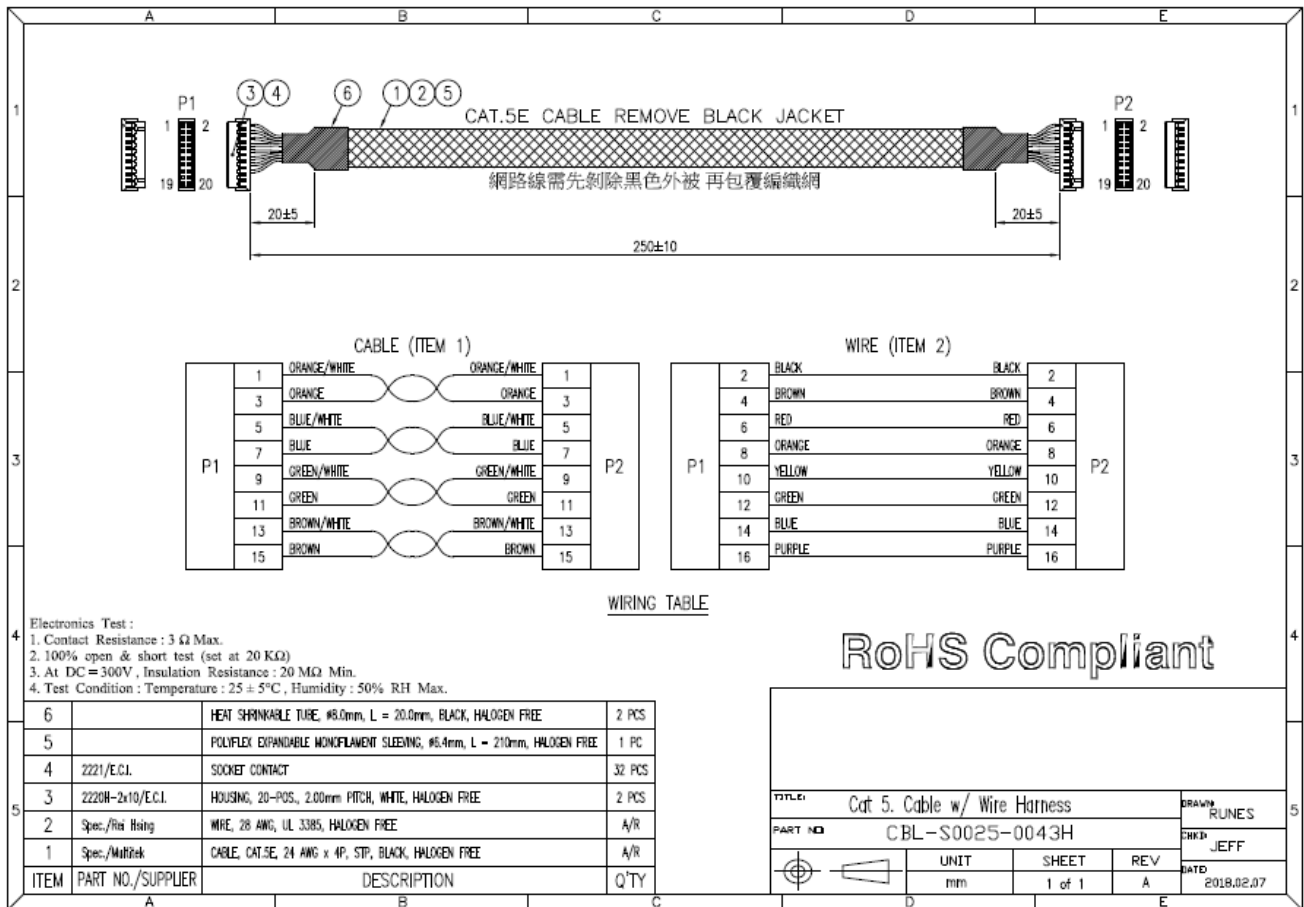


Figure 11: Board to Board LAN Cable Drawing

2.6.6. Packing List

- EMPL-G201 mPCIe Board x 1
- EMPL-G201 Daughter Board x 1
- Board to Board LAN Cable x 2
- Bracket x 1 (EMPL-G201-C2/W2 only)
- Screw M3*5 Silver x 2 (EMPL-G201 C2/W2 only)

2.7. Software Support

- Windows: XP(32bit), 7(32/64bit), 8/8.1(32/64 bit), 10(32/64bit), and above version
- Linux: Kernel 2.4 above.

3. Installation Guide

Please download driver from Myinnodisk web site.

<https://myinnodisk.innodisk.com/myinnodisk/Login.aspx>

Or you can download intel i210 chip driver from intel official web site directly.

<https://downloadcenter.intel.com/product/64399/Intel-Ethernet-Controller-I210-Series>

4. Appedix

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宜鼎國際股份有限公司 Innodisk Corporation REACH Declaration

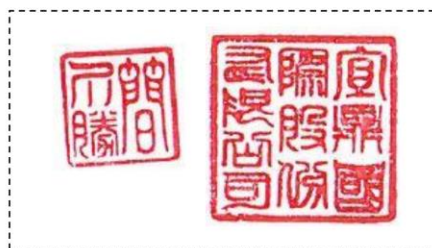
Tel:(02)7703-3000 Fax:(02) 7703-3555 Internet: <http://www.innodisk.com/>

We hereby confirm that the product(s) delivered to

Innodisk P/N	Description
All Innodisk EP Products	

- ☐ contain(s) **no** hazardous substances or constituents exceeding the defined threshold 0.1 % by weight in homogenous material if not otherwise specified, as described in the candidate list table currently including 197 substances and shown on the ECHA website (<http://echa.europa.eu/de/candidate-list-table>).
- ☒ contain(s) one or more hazardous substances or constituents exceeding 0.1 % by weight in homogenous material if not otherwise specified in candidate list table. Where the threshold value is exceeded, the substances in question are to be declared in accompanying Appendix A & B.

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： 2019 / 01 / 31

宜鼎國際股份有限公司 Innodisk Corporation

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

RoHS 自我宣告書 (RoHS Declaration of Conformity)

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.
- 三、 本公司聲明我們的產品符合 RoHS 指令的附件中 (7a)、(7c-I) 允許豁免。
We declare, our products permitted by the following exemptions specified in the Annex of the RoHS directive.
 - ※ (7a) Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead).
 - ※ (7C-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.

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

宜鼎國際股份有限公司
Innodisk Corporation

Page 2/2

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

Date 日期： 2018 / 07 / 01



Certificate

Issue Date: January 16, 2015

Ref. Report No. ISL-15LE019CE

Product Name : LAN Module
 Model(s) : E%PL-G*01-*1 (% : 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 :



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
 Jim Chu / Director

☐ Hsi-Chih LAB:

No. 65, Gu Dai Keng Street, Hsi-Chih Dist.,
 New Taipei City 221, Taiwan
 Tel: 886-2-2646-2550; Fax: 886-2-2646-4641



☒ Lung-Tan LAB:

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.,
 Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
 Tel: 886-3-407-1718; Fax: 886-3-407-1738



Certificate

Issue Date: January 16, 2015

Ref. Report No. ISL-15LE019FB

Product Name : LAN Module
 Model(s) : E%PL-G*01-*1 (% : 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
 Jim Chu / Director

☐ Hsi-Chih LAB:

No. 65, Gu Dai Keng Street, Hsi-Chih Dist.,
 New Taipei City 221, Taiwan
 Tel: 886-2-2646-2550; Fax: 886-2-2646-4641



☒ Lung-Tan LAB:

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.,
 Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
 Tel: 886-3-407-1718; Fax: 886-3-407-1738



Contact us

Headquarters (Taiwan)

5F., No. 237, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Tel: +886-2-77033000

Email: sales@innodisk.com

Branch Offices:

USA

usasales@innodisk.com

+1-510-770-9421

Europe

eusales@innodisk.com

+31-40-3045-400

Japan

jp_sales@innodisk.com

+81-3-6667-0161

China

sales_cn@innodisk.com

+86-755-2167-3689

www.innodisk.com

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