

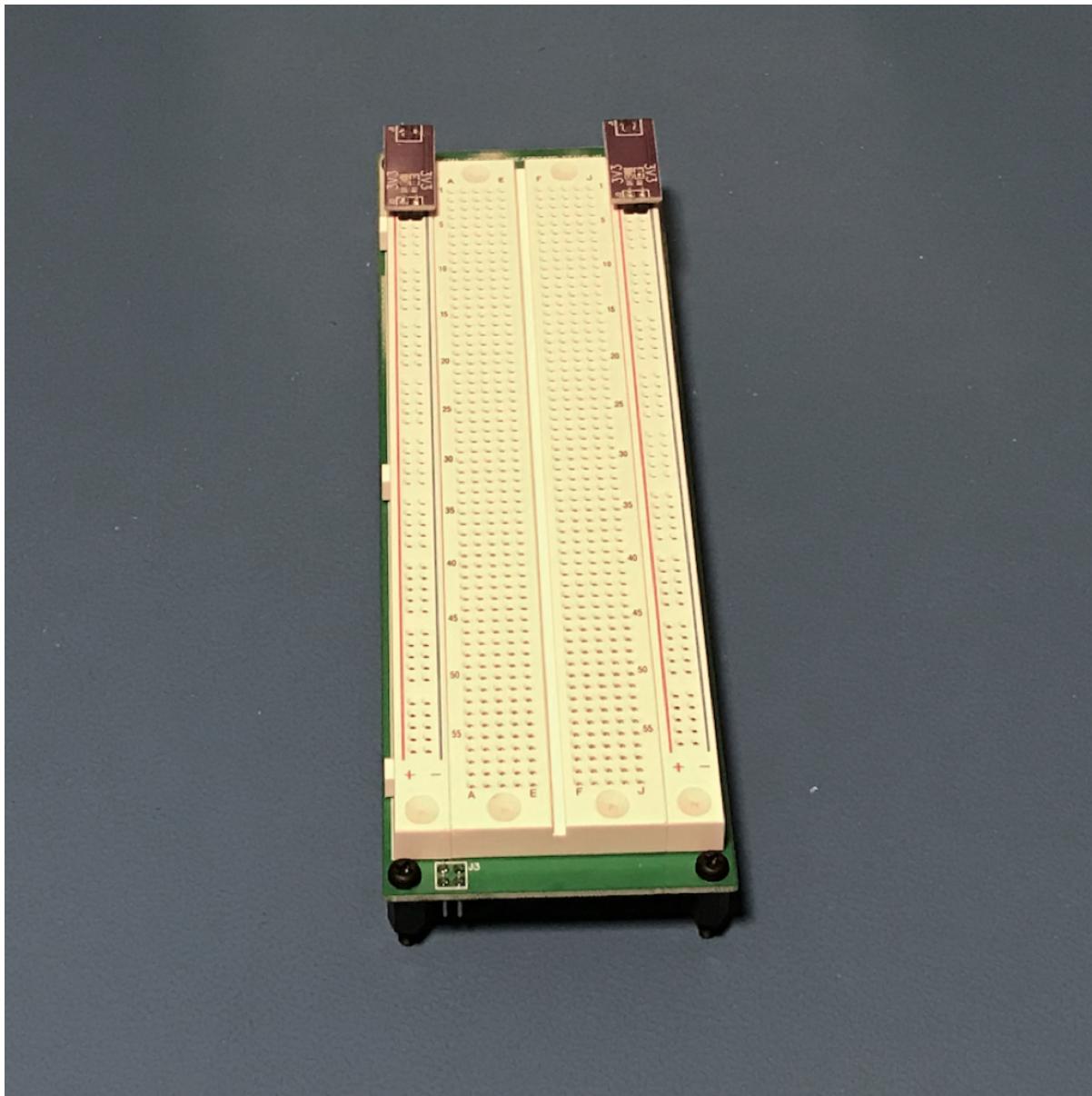
1

# ASSEMBLY INSTRUCTIONS

2

3

## 1012A Vertical Breadboard Stamp



5 Document control number: 1012-8010

6 Document date: 2022-10-27

7 Document revision: v1.0.0-draft.1

8 ABSTRACT: This document provides instructions on how to assembly and test a 1012A vertical breadboard  
9 stamp. A complete bill of materials is included as an annex.

10 Suggestions and corrections should be directed to <http://www.github.com/dslik/protonema/issues>

11 Serial number: Assembly date: Assembled by:

12 USAGE

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21 Source location: <https://github.com/dslik/protonema/tree/main/stamps/1012A>

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24 "Based on the Protonema Electronics Prototyping and Learning System by David Slik -  
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51 Revision history

Table 1: Document Revisions

Version	Date	Change	Approver
1.0.0-draft.1	2022-10-28	Initial draft (missing packaging photos)	D. Slik

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185

## **Part I**

186

# **1012A assembly instructions**

## 187 Section 1

# 188 Overview

189 This document describes the materials, processes, outcomes and verifications required to successfully assemble  
190 and test a 1012A vertical breadboard stamp, a sub-component of the Protonema electronics prototyping and learning  
191 system.

192 A first-time reader should carefully review section 2 - prerequisites, and section 3 - preparation before beginning  
193 the assembly process.

194 This document serves both as instructions and as a record of the assembly of the product. When you finish each  
195 step in this document, sign your name (or apply your stamp) in the "Signature/Stamp" box on the right to provide a  
196 record of completion.

197 When things go wrong, this document provides guidance for common issues that have been encountered in the  
198 past. When this document does not provide guidance, please contact your quality management representative,  
199 who will help you fill out an exception report. These reports help improve process quality and product quality, and  
200 these reports are incorporated into future revisions of this document.

201 Always remember: If you are unable to successfully complete these instructions, that means the processes sup-  
202 porting you (including this document) have failed you. Our processes are built for your success, and by improving  
203 our processes, we help everyone succeed.

## 204 Section 2

# 205 Prerequisites

### 206 2.1 Required safety training

- 207 The following safety training units must be completed before assembling this product.  
208 By signing (or applying your stamp) on the right, you indicate that you have completed the following training:

Table 2: Safety training

Item #	Description	Signature/Stamp
1	0102-0100 - Safety reporting policies and procedures training  Key topics: Understanding policies and procedures around how to identify, contain and report a safety-related issue in the workplace, including damaged or malfunctioning equipment, leaks, spills, and other occupational hazards.	Stamp or sign here
2	0102-0101 - Material safety data sheets training  Key topics: Understanding how to read material safety data sheets (MSDS) for materials you will be handling during product assembly, how they can affect your health and the health of the environment, how to safely handle and dispose of them, and what to do if there is a spill or accidental exposure.	Stamp or sign here
3	0102-0102 - Solder handling and disposal policies and procedures training  Key topics: Understanding policies and procedures related to handling solder and solder paste, stencil cleaning, and solder disposal.	Stamp or sign here
4	0102-0105 - Electro-static discharge controls policies and procedures training  Key topics: Understanding policies and procedures related to protecting equipment and components from electro-static discharge, including clothing, protective equipment, material handling and labelling.	Stamp or sign here

## 2.2 Required skills training

- 209 The following skills training units must be completed before assembling this product.
- 211 By signing (or applying your stamp) on the right, you indicate that you have completed the following training:

Table 3: Skills training

Item #	Description	Signature/Stamp
1	0103-0202 - ANSI/ESD S20.20 Electro-static discharge controls  Key topics: Understanding of ESD safety, the ESD control program, equipment and personnel grounding, EPAs, packaging and marking.	Stamp or sign here
2	0103-0203 - General components handling  Key topics: Understanding of safe component handling, including reeled components, components in JEDEC trays, and loose components. Includes avoiding contamination, moisture control, and component inventory management.	Stamp or sign here
3	0103-0414 - 5040-XTS reflow station  Key topics: Safe and effective use of the 5040-XTS reflow station, including use of the pre-heater, the hot air system, and the soldering iron. Covers inspection and verification, cleaning, preferred settings and best practice techniques.	Stamp or sign here
4	0103-0301 - IPC-A-610G - Acceptability of electronic assemblies  Key topics: Covers visual acceptability requirements for electronic assemblies, including handling considerations, hardware installation, component placement, soldering, terminal connections, wiring, marking and cleanliness.	Stamp or sign here
5	0103-0302 - IPC-J-STD-001F - Soldered electrical connections  Key topics: Covers soldering materials, general soldering and assembly requirements, wire and terminal connections, through-hole mounting, surface mounting of components, cleaning process requirements, PCB requirements, coatings and product assurance.	Stamp or sign here

## 212 Section 3

# 213 Preparation

### 214 3.1 Workspace

- 215 Before starting assembly, check out an assembly desk for a minimum of one hour. A single unit can be assembled in ten minutes, with an additional ten minutes per additional unit.

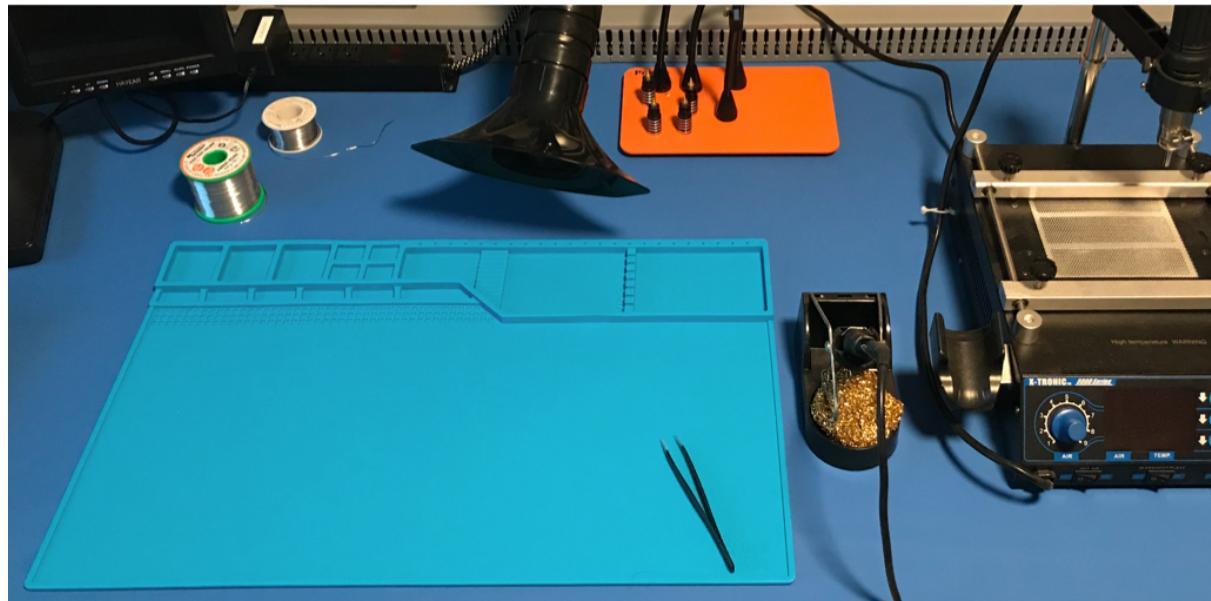


Fig. 1: Assembly Desk

Table 4: Prepare workspace

Step	Description	Signature/Stamp
3.1.1	Verify that the workspace has a clean assembly mat and anti-static mat, and that the cleaning record has been signed since last use.	<div style="text-align: center;"> <span>Stamp or sign here</span> </div>
3.1.2	Verify that the HEPA fume extractor turns on, and you can feel air suction from the nozzle.	<div style="text-align: center;"> <span>Stamp or sign here</span> </div>

continues on next page

Table 4 – continued from previous page

Step	Description	Signature/Stamp
3.1.3	Verify that the 5040-XTS rework station soldering iron tip is not worn down. If it is worn down, obtain a new 900M-T-I tip from the stores department.	Stamp or sign here

## 217 3.2 Project consumables

- 218 Obtain each of the below consumable items from the stores department:

Table 5: Assembly consumables

Item #	Description	Signature/Stamp
3.2.1	 <p>Fig. 2: 1 pair ESD gloves If you prefer to use your own pair of ESD gloves, make sure they are tested before use.</p>	Stamp or sign here
3.2.2	 <p>Fig. 3: 1 spool MG Chemicals 4900 Lead Free No-Clean Wire Solder Sn96.2Ag2.8Cu0.4 (96.2/2.8/0.4) 20 AWG</p>	Stamp or sign here

### 219 3.3 Project tools

- 220 Obtain a tools container labelled "1XXX Assembly Tools" from the 1XXX section of the stores supply shelf. At your assembly desk, use [Table 6](#) to verify that all the required tools are present.
- 221 If any required tools are missing, return all tools and the tools container to the stores department, and obtain another tools container.



Fig. 4: Tools Container

- 224 Remove each of the following tools from the tools container, and place them on the anti-static mat of the assembly desk:

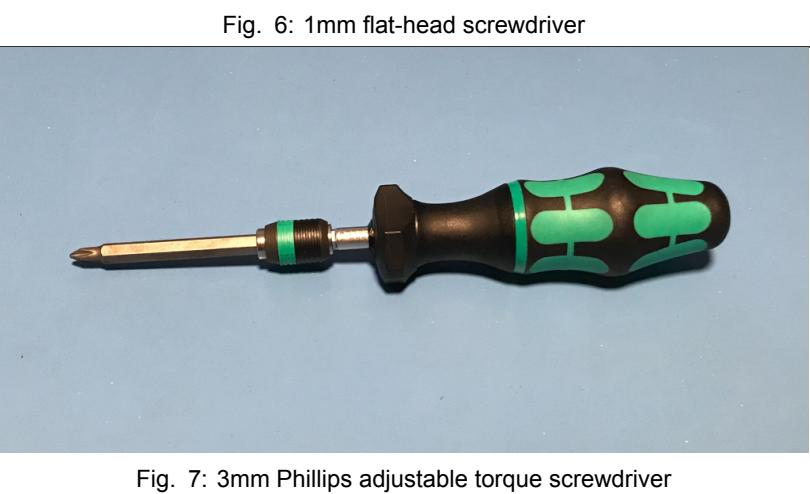
Table 6: Assembly tools

Item #	Description	Signature/Stamp
3.3.1		<span>Stamp or sign here</span>

Fig. 5: Hozan F-23 components tray

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Table 6 – continued from previous page

Item #	Description	Signature/Stamp
3.3.2	 A photograph of a 1mm flat-head screwdriver with a black and green handle, lying diagonally on a light blue background.	 A circular placeholder for a stamp or signature.
3.3.3	 A photograph of a 3mm Phillips adjustable torque screwdriver with a black and green handle, lying horizontally on a light blue background.	 A circular placeholder for a stamp or signature.
3.3.4	 A photograph of a set of ESD tweezers in a black and blue padded case, showing several pairs of tweezers of different sizes and tips.	 A circular placeholder for a stamp or signature.

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Table 6 – continued from previous page

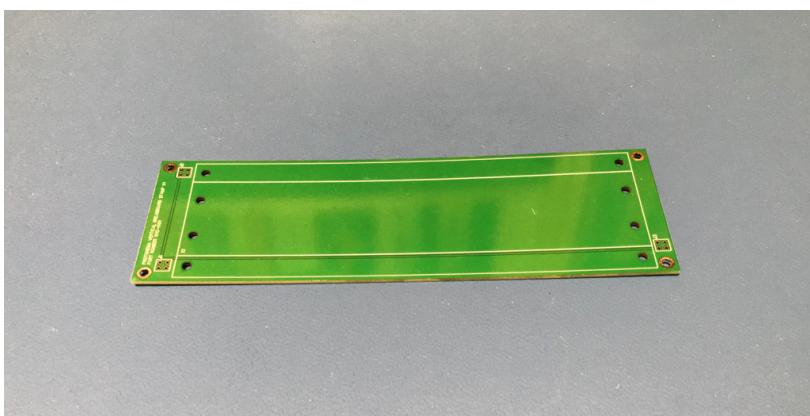
Item #	Description	Signature/Stamp
3.3.5		<p>Stamp or sign here</p>
3.3.6		<p>Stamp or sign here</p>

## 226 3.4 Parts preparation

### 227 3.4.1 PCBs and PCBAs

- 228 NOTICE: All PCBs and PCBAs must be handled with gloves to prevent marking with skin oils.
- 229 NOTICE: PCBs are removed from manufacturer packaging only when needed.

Table 7: PCBs and PCBAs

Item #	Description	Signature/Stamp
3.4.1.1	No marking required  Fig. 11: 1x 1012-0101 v1.0 - Vertical Breadboard Stamp PCB	Stamp or sign here

### 230 3.4.2 Loose components

- 231 All loose components are stored on the shelf labelled “1XXX Components”. Take the components tray and obtain  
 232 the following quantities of the following parts:

Table 8: Loose components

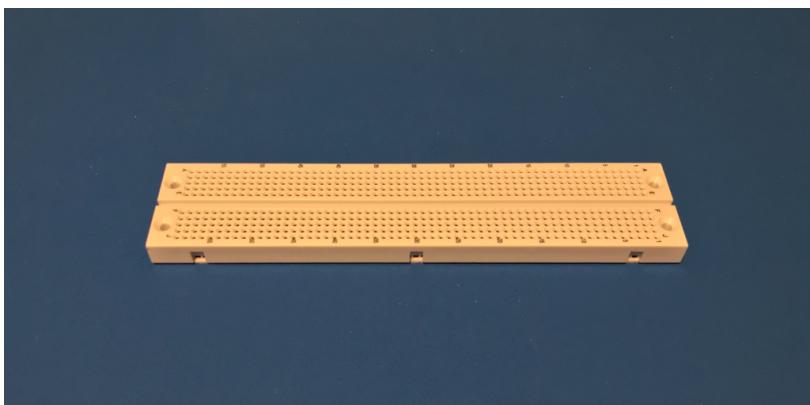
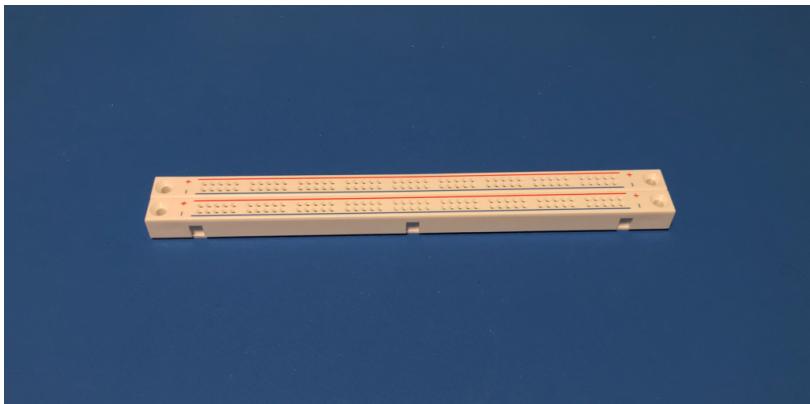
Item #	Description	Signature/Stamp
3.4.2.1	No marking required 	Stamp or sign here
3.4.2.2	No marking required 	Stamp or sign here
3.4.2.3	No marking required 	Stamp or sign here

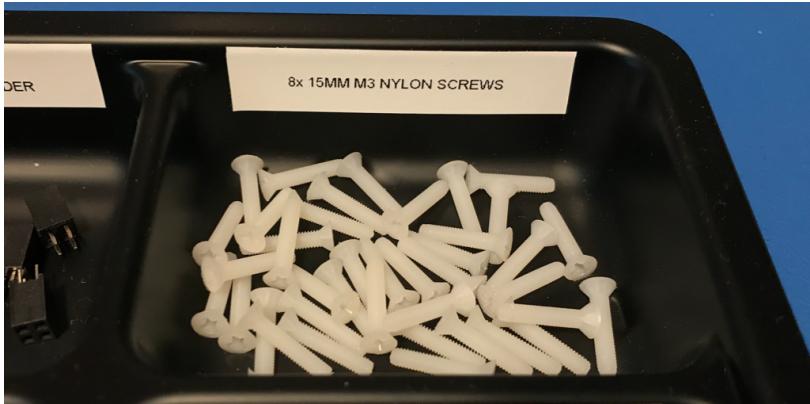
Fig. 12: 1x GS-630A - 630 Tie-Point Solderless Breadboard

Fig. 13: 1x GS-090 - 90 Tie-Point Solderless Breadboard (2 pieces)

Fig. 14: 1x 0010897041 - Straight 2x4 2.54mm Black Pin Header

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Table 8 – continued from previous page

Item #	Description	Signature/Stamp
3.4.2.4	No marking required    Fig. 15: 2x DS1023-2*2SF11 - 2.54mm by 2.54mm Straight 2x2P Female Headers	Stamp or sign here
3.4.2.5	No marking required    Fig. 16: 8x M3 15mm White Nylon Phillips Socket Flat Head Screws	Stamp or sign here
3.4.2.6	No marking required    Fig. 17: 12x M3 Black Nylon Nuts	Stamp or sign here

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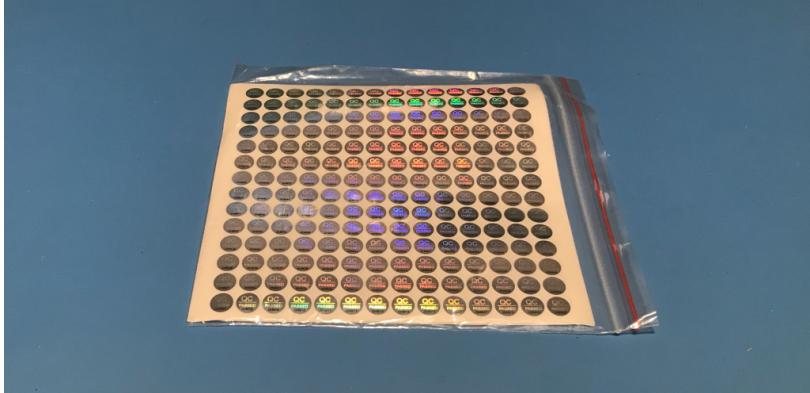
Table 8 – continued from previous page

Item #	Description	Signature/Stamp
3.4.2.7	<p>No marking required</p>  <p>Fig. 18: 4x M3 5mm Black Nylon Phillips Socket Button Head Screws</p>	<div style="text-align: center; border: 1px solid lightgray; border-radius: 50%; width: 50px; height: 50px; margin: auto;"> <span style="font-size: 10px; margin-top: 10px;">Stamp or sign here</span> </div>
3.4.2.8	<p>No marking required</p>  <p>Fig. 19: 4x M3 11mm+6 Black Nylon Standoffs</p>	<div style="text-align: center; border: 1px solid lightgray; border-radius: 50%; width: 50px; height: 50px; margin: auto;"> <span style="font-size: 10px; margin-top: 10px;">Stamp or sign here</span> </div>

### 233 3.4.3 Packaging materials

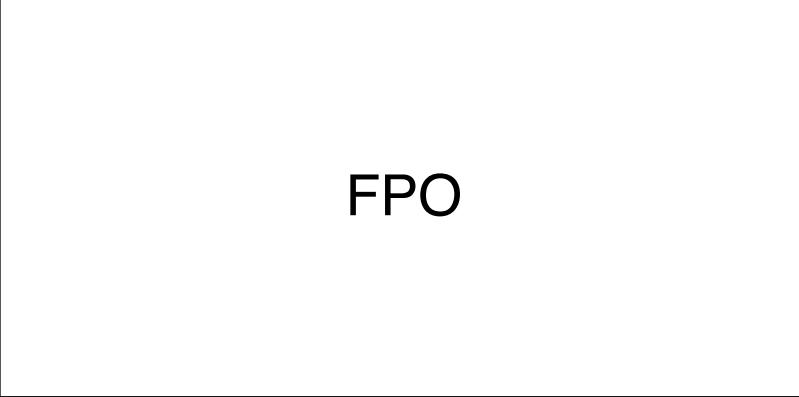
- 234 All packaging materials are stored on the shelf labelled "1XXX Components". Take the packaging box and obtain  
 235 the following quantities of the following materials:

Table 9: Packaging materials

Item #	Description	Signature/Stamp
3.4.3.1	No marking required   Fig. 20: 1x QC Sticker	Stamp or sign here
3.4.3.2	No marking required   Fig. 21: 1x Long size anti-static bag	Stamp or sign here
3.4.3.3	No marking required   Fig. 22: 1x Small size anti-static bag	Stamp or sign here

continues on next page

Table 9 – continued from previous page

Item #	Description	Signature/Stamp
3.4.3.4	<p>No marking required</p> 	<p>Stamp or sign here</p>
3.4.3.5	<p>No marking required</p> 	<p>Stamp or sign here</p>
3.4.3.6	<p>No marking required</p> 	<p>Stamp or sign here</p>

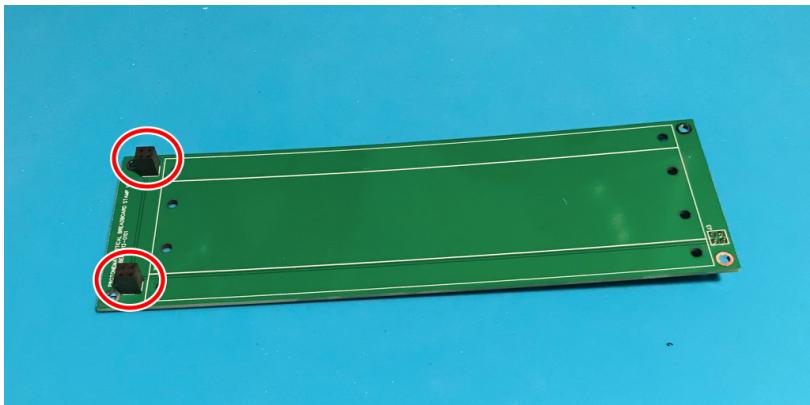
## 236 Section 4

# 237 Assembly

### 238 4.1 1012A assembly

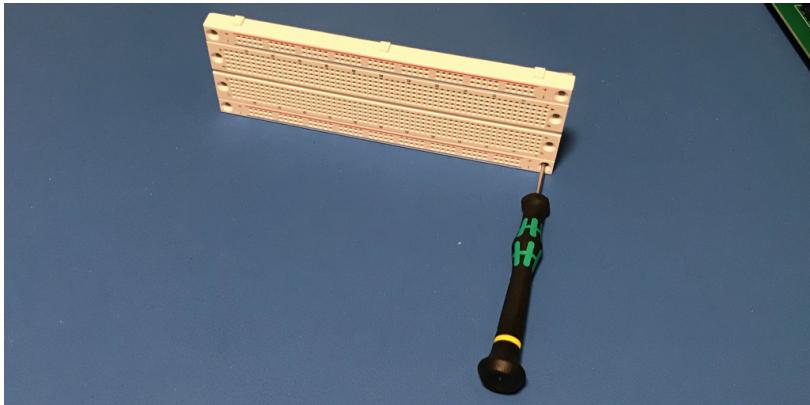
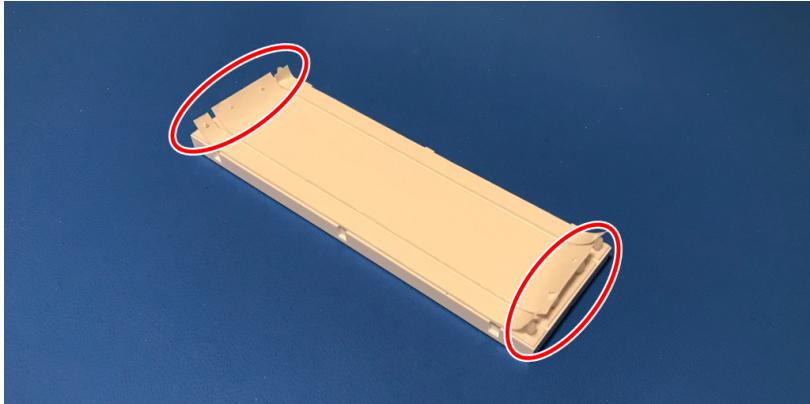
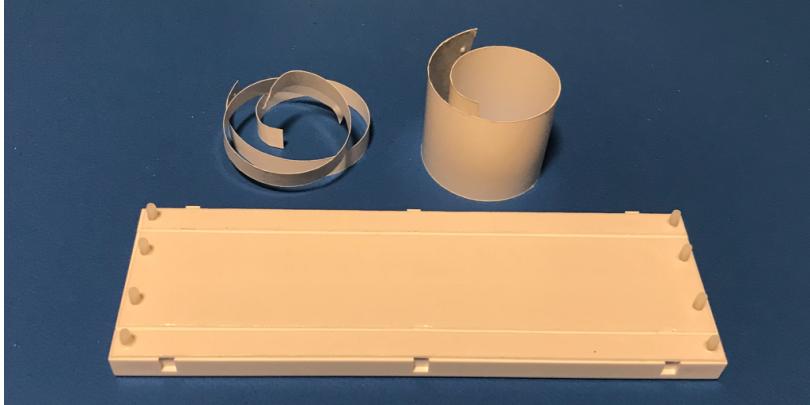
239 This assembly step takes 5 minutes.

Table 10: 1012A assembly steps

Step #	Description	Signature/Stamp
4.1	<p>Solder J3 onto the 1012-0101 PCB.</p>  <p>Fig. 26: 1012-0101 PCB with rear-mounted connector soldered on.</p>	<input type="text"/> <small>Stamp or sign here</small>
4.2	<p>Solder J1 and J2 onto the 1012-0101 PCB. Note that if the connectors are rectangular, they should be aligned with the longer side facing the longer side of the PCB, as shown below.</p>  <p>Fig. 27: 1012-0101 PCB with front-mounted connectors soldered on.</p>	<input type="text"/> <small>Stamp or sign here</small>

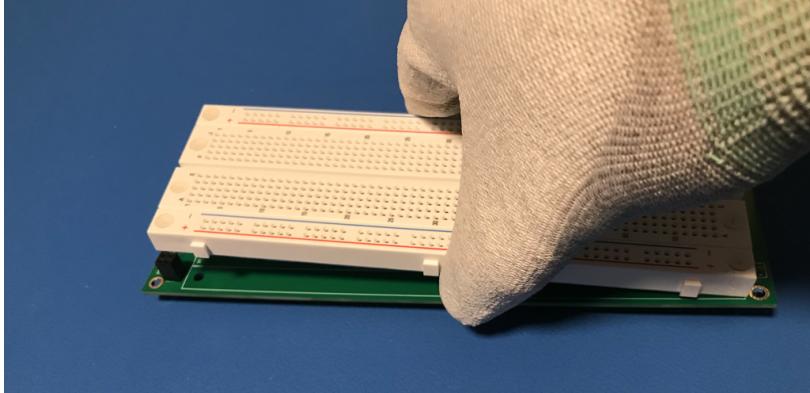
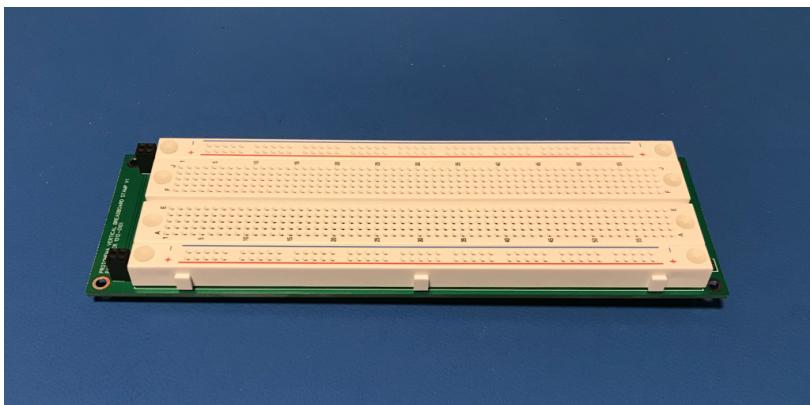
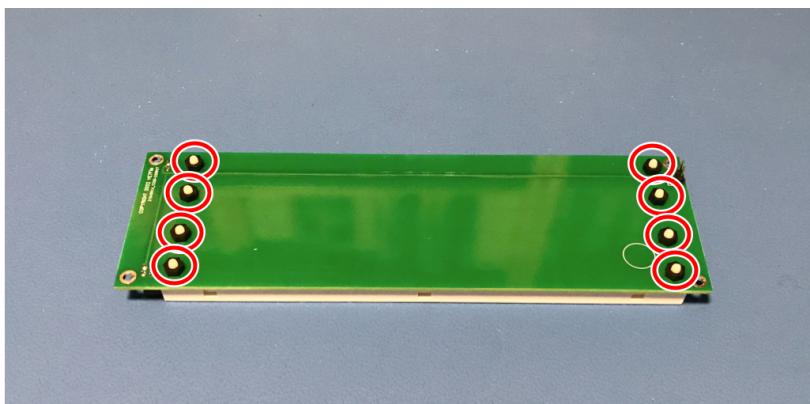
continues on next page

Table 10 – continued from previous page

Step #	Description	Signature/Stamp
4.3	<p>Snap the two distribution strips (X2, X3) on to each side of the main breadboard (X1). Using the slotted screwdriver, make eight holes in the adhesive backing of the breadboard.</p>  <p>Fig. 28: Breadboard with screwdriver used to make holes in the adhesive backing.</p>	Stamp or sign here
4.4	<p>Push the eight white screw through the adhesive layer from the front of the breadboard. While pushing the screw through, you may need to prevent the adhesive from peeling off by holding it with the screwdriver.</p>  <p>Fig. 29: Breadboard with eight screws.</p>	Stamp or sign here
4.5	<p>Remove the protective paper from the breadboard's adhesive layer.</p>  <p>Fig. 30: Breadboard with protective paper removed.</p>	Stamp or sign here

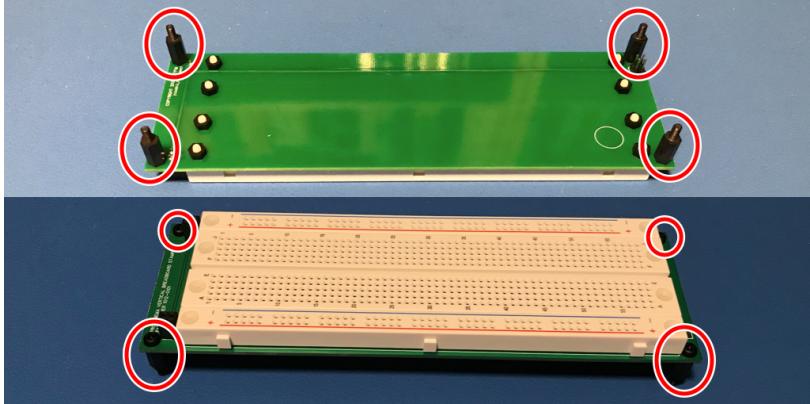
continues on next page

Table 10 – continued from previous page

Step #	Description	Signature/Stamp
4.6	Align the eight screws with the 1012-0101 PCB, making sure that the text on the breadboard is aligned with the text on the PCB.	
	 <p>Fig. 31: 1012-0101 PCB with aligned breadboard.</p>	
4.7	Attach the breadboard to the 1012-0101 PCB by pushing it evenly against the PCB.	
	 <p>Fig. 32: 1012-0101 PCB with attached breadboard.</p>	
4.8	Screw eight nuts onto the rear of the eight breadboard screws. Do not screw too tightly (finger-tight).	
	 <p>Fig. 33: 1012-0101 PCB with nuts attached to breadboard screws.</p>	

continues on next page

Table 10 – continued from previous page

Step #	Description	Signature/Stamp
4.8	Screw four short screws into four standoffs for each of the four corners of the breadboard. Do not screw too tightly (finger-tight).   Fig. 34: 1012-0101 PCB with short screws attached to corner standoffs.	Stamp or sign here

## 240 Section 5

### 241 Test

#### 242 5.1 Visual inspection

243 This test process takes 2 minutes.

Table 11: 1012A visual inspection

Step #	Description	Signature/Stamp
1	Verify that there are no loose parts.	Stamp or sign here
2	Verify that there are no visible fingerprints.	Stamp or sign here

## 244 5.2 QC final check

245 This test process takes 2 minutes.

Table 12: 1012A QC final check

Step #	Description	Signature/Stamp
1	<p>Connect the 1012A to a baseboard, and connect power. Using a 1510-0201 and a 1510-0301 board, verify 5V and 3.3V for each breadboard power rail.</p> <p>If test does not pass, write down the unexpected behaviour in the "Signature/Stamp" column on the right.</p>  <p>FPO</p>	<p>Stamp or sign here</p>

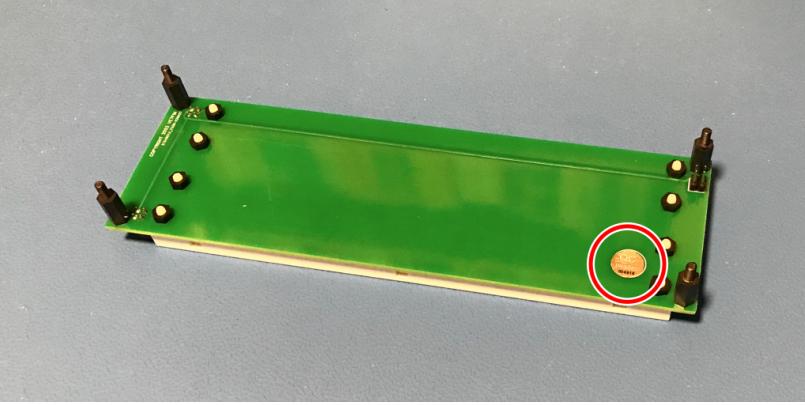
Fig. 35: Powered 1012-0101 PCB with illuminated 1510-0201 and 1510-0301 boards

## 246 5.3 QC PASS

<sup>247</sup> Only perform these steps if all QC checks have passed.

<sup>248</sup> This test process takes 1 minutes.

Table 13: 1012A QC approval

Step #	Description	Signature/Stamp
1	<p>Using the tweezers, affix QC Passed sticker in location shown below, then write down the serial number from the QC sticker below the "Signature/Stamp" in the column to the right.</p> 	<div style="text-align: center;"> <span>Stamp or sign here</span> </div>
2	<p>Take two photographs, one of the front of the 1012A, and one of the back of the 1012A.</p>	<div style="text-align: center;"> <span>Stamp or sign here</span> </div>

## 249 5.4 QC FAIL

- 250 Only perform these steps if any QC check have failed.  
251 This test process takes 2 minutes.

Table 14: 1012A QC fail

Step #	Description	Signature/Stamp
1	Place the 1012A module in the anti-static bag. 	 Stamp or sign here
2	Take an A4 plastic bag, and place the 1012A, along with this document, in the "QC Fail" bin 	 Stamp or sign here

## 252 Section 6

# 253 Packaging

### 254 6.1 1012A packing

255 This packaging process takes 3 minutes.

Table 15: 1012A packaging

Step #	Description	Signature/Stamp
6.1.1	Place the 1012A module in the anti-static bag.  	Stamp or sign here
6.1.2	Place four nylon nuts in a small anti-static bag, and add the bottom of the bag to the bag the 1012A module is in.  	Stamp or sign here

Fig. 39: 1012A in anti-static bag.

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Table 15 – continued from previous page

Step #	Description	Signature/Stamp
6.1.3	Seal the anti-static bag with a 1012A sticker.    FPO	
6.1.4	Using the Sharpie pen, Write down the serial number of the 1012A on the sticker, at the end of the line listing the 1012A.    FPO	
6.1.5	Place 1012A bag in the box on top of the bottom foam padding.    FPO	
6.1.6	Take a photograph of the 1012A in the box.	

continues on next page

Table 15 – continued from previous page

Step #	Description	Signature/Stamp
6.1.7	<p>Using the ESD tape, secure the lid of the box.</p>  <p style="text-align: center;"><b>FPO</b></p>	 <p>Stamp or sign here</p>
6.1.8	<p>Affix a 1012A sticker to the lid of the box.</p>  <p style="text-align: center;"><b>FPO</b></p>	 <p>Stamp or sign here</p>
6.1.9	<p>Using the Sharpie pen, Write down the serial number of the 1012A on the sticker, at the end of the line listing the 1012A.</p>  <p style="text-align: center;"><b>FPO</b></p>	 <p>Stamp or sign here</p>
6.1.10	<p>Take a photograph of the sealed 1012A box.</p>	 <p>Stamp or sign here</p>

## <sup>256</sup> Section 7

### <sup>257</sup> Clean-up

#### <sup>258</sup> 7.1 Consumables

<sup>259</sup> This packaging process takes 5 minutes.

Table 16: Consumables cleanup

Step #	Description	Signature/Stamp
1	If the ESD gloves have contacted solder paste, or are soiled, they shall be disposed of in the standard waste bin.	 Stamp or sign here
2	If there is unused solder wire on the spool, it shall be returned to stores.	 Stamp or sign here
3	Loose component packaging shall be disposed of in the standard waste bin.	 Stamp or sign here

#### <sup>260</sup> 7.2 Tools

<sup>261</sup> This cleanup process takes 5 minutes.

Table 17: Tools cleanup

Step #	Description	Signature/Stamp
1	All tools shall be returned to the assembly tools container, and returned to the stores supply shelf.  If any tools are damaged or worn, return the container to stores, and let the manager know which tool is damaged or worn.	 Stamp or sign here

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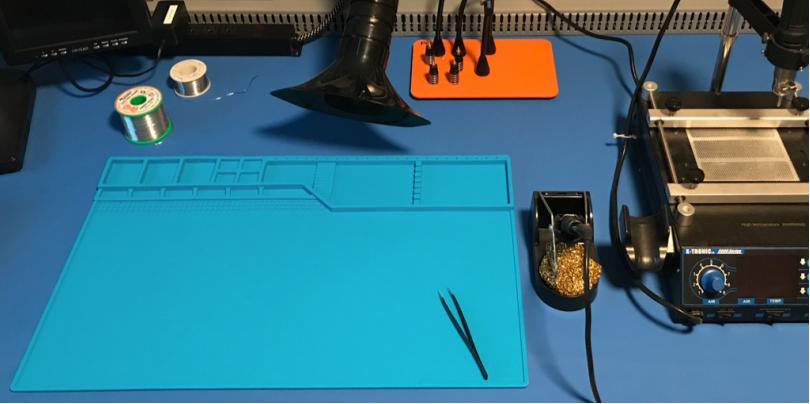
Table 17 – continued from previous page

Step #	Description	Signature/Stamp
2	Remove this document from the springback binder.	
3	Print a new copy of this document, and insert it into the springback binder that this document was originally in.	
4	Return the springback binder with the newly printed document to the 1012A section of the store supply shelf.	

## 262 7.3 Workspace

263 This packaging process takes 5 minutes.

Table 18: Workspace cleanup

Step #	Description	Signature/Stamp
1	<p>Make sure that the workspace is clean and as it was when you started the assembly.</p>  <p>Fig. 47: Clean assembly workstation</p>	Stamp or sign here

## 264 Section 8

# 265 Record keeping

### 266 8.1 1012A record keeping

267 This packaging process takes 5 minutes.

Table 19: 1012A record keeping

Step #	Description	Signature/Stamp
1	<p>Write the serial number, the date, and your first and last name in large print on the bottom of the front cover of this document.</p> <div style="text-align: center; border: 1px solid black; padding: 10px; margin-top: 10px;"> <b>FPO</b> </div>	 <p>Stamp or sign here</p>
2	Create a new folder under the 1012A folder, named with the serial number.	 <p>Stamp or sign here</p>
3	Copy all photos taken during the assembly process into the newly created folder in step #2.	 <p>Stamp or sign here</p>
4	Remove this document from the binding clamps, scan the document, and save the scanned PDF into the newly created folder in step #2, with the name "1012A-SNAAAAAA.pdf", where AAAAAA is replaced with the serial number.	 <p>Stamp or sign here</p>

continues on next page

Table 19 – continued from previous page

Step #	Description	Signature/Stamp
5	Three-hole punch the document, then file it at the end of the current month's assembly records binder.	 Stamp or sign here
6	Add an entry to the assembly records binder, "<Date> - 1012A - SN# AAAAAAA - <Your Name>", where <Date> is replaced with today's date in ISO-8601 YYYY-MM-DD, where AAAAAAA is replaced with the serial number of the 1012A, and where <Your Name> is replaced with your first and last name.	 Stamp or sign here

268 **Section 9**

269 **Process improvement**

270 **9.1 Feedback**

271 Please submit an issue to the [Protonema Issue Repository](http://www.github.com/dslik/protonema/issues) (<http://www.github.com/dslik/protonema/issues>) if you  
272 encounter any of the below situations:

- 273 • Error in this document
- 274 • Unclear directions
- 275 • Suggested process improvements
- 276 • Results of QC failure investigations
- 277 • Tool change suggestions

278 Quality processes and documentation is a team effort. This document would not exist without the participation and  
279 contributions of the entire assembly team.

280 Thank you for reading this assembly instructions document.

281 End of document.

282

## **Part II**

283

# **1012A Annexes**

284 **Section 10**

285 **Printed Circuit Boards**

286 **10.1 1012-0101 PCB**

Table 20: 1012-0101 PCB

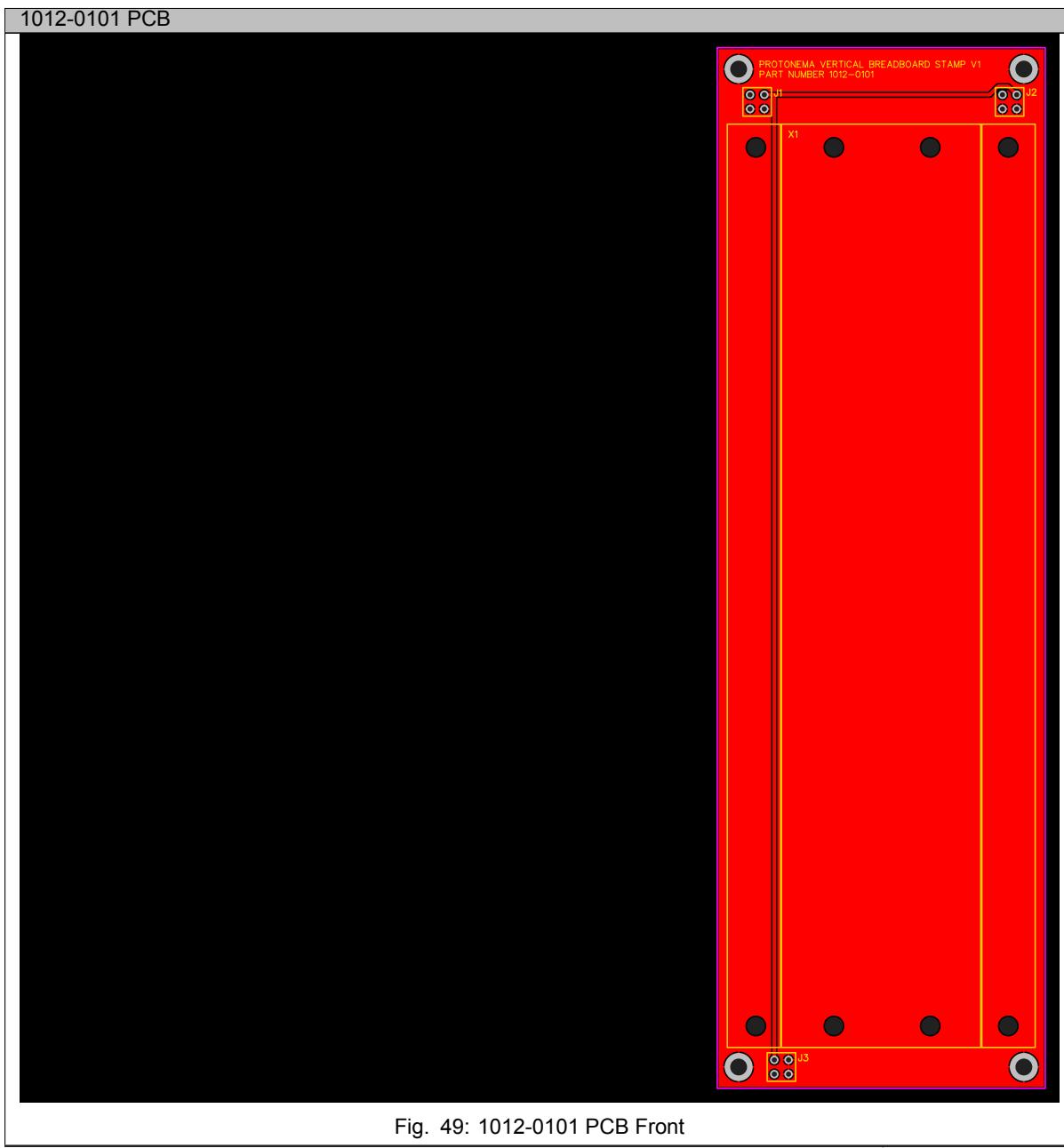


Fig. 49: 1012-0101 PCB Front

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Table 20 – continued from previous page

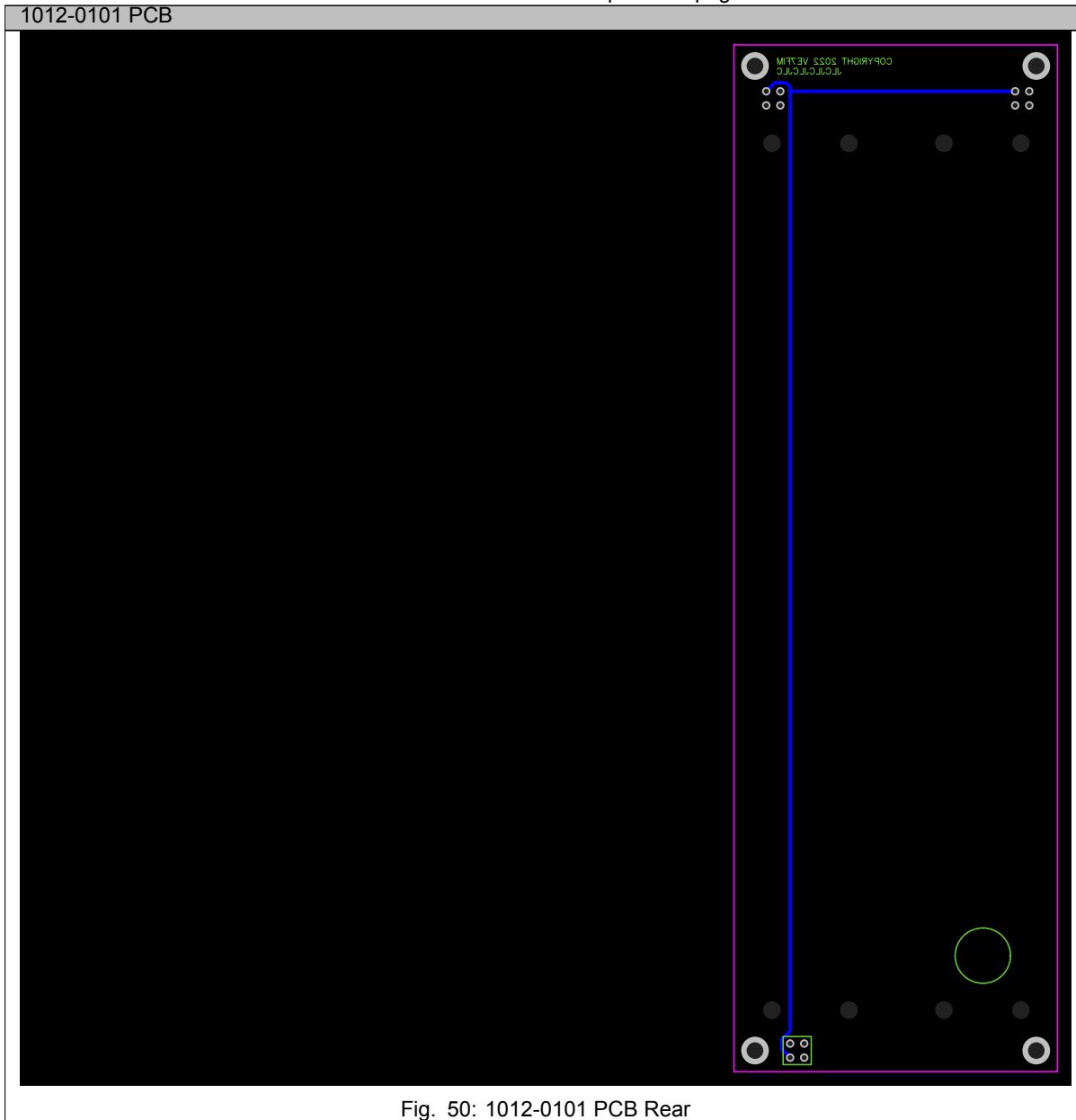


Fig. 50: 1012-0101 PCB Rear

## 287 Section 11

### 288 Bill of materials

#### 289 11.1 1012A Vertical Breadboard Stamp

290 The parts required to assemble a 1012A are listed in Table 21.

Table 21: 1012A parts

Reference Designation	Qty	Description	Manufacturer	Manufacturer Part Number	Supplier	Cost
1012-0101	1	Stamp PCB	JLCPCB	Y339-2154951A	JL-CPCB	\$1.26 CAD
X1	1	630 Tie-Point Solderless Breadboard	Global Specialties	GS-630	Digikey	\$9.37
X2, X3	1	90 Tie-Point Solderless Breadboard (2 pieces)	Global Specialties	GS-090	Digikey	\$6.14
J3	1	Straight 2x4 2.54mm Black Pin Headers	Molex	0010897041	Digikey	\$0.68 CAD
J1, J2	3	2.54mm by 2.54mm Straight 2x2P Female Header	CONNFLY Elec	DS1023-2*2SF11	LCSC	\$0.23 CAD
MP1 - MP8	8	Screw - M3 15mm White Nylon Phillips Socket Flat Head	Order By Description			\$0.66 CAD
MP9 - MP16, MP25 - MP28	8	Nut - M3 Black Nylon	Order By Description			\$0.95 CAD
MP17 - MP20	4	Screw - M3 5mm Black Nylon Phillips Socket Button Head	Order By Description			\$0.25 CAD
MP21 - MP24	4	Standoff - M3 11mm+6 Black Nylon	Order By Description			\$0.30 CAD
SK1	1	QC Sticker	Order by Description			\$0.0094 CAD
Total						\$19.85 CAD

#### 291 11.2 1012A Packaging

292 The parts required to package a 1012A are listed in Table 22.

Table 22: 1012A packing parts

Reference Designation	Qty	Description	Manufacturer	Manufacturer Part Number	Supplier	Cost
N/A	1	Static Shielding Bag 5" X 10"	SCS	100510	Digikey	\$0.22 CAD
N/A	1	Static Shielding Bag 1.5" X 2.8" Ziplock	Order by Description			\$0.06 CAD

continues on next page

Table 22 – continued from previous page

Reference Designation	Qty	Description	Manufacturer	Manufacturer Part Number	Supplier	Cost
N/A	1	CORREC-PAK SHIPPER 9 X 7.5 X 1.5" ID	Conductive Containers, Inc.	3180-3	Digikey	\$11.83 CAD
1012-7001	2	1012A ESD Sticker	Jukebox Print			\$4.00 CAD
Total						\$13.04 CAD

## <sup>293</sup> **Section 12**

# <sup>294</sup> **Reduction of Hazardous Materials**

<sup>295</sup> Compliance declarations, in BOM order.

296 **12.1 MG Chemicals 4900**

Table 23: MG Chemicals 4900 RoHS Compliance

Declaration for MG Chemicals 4900 -  
<https://www.mgchemicals.com/downloads/msds/01%20English%20Can-USA%20SDS/sds-4900-4917.pdf>



**ISO 9001:2015 Quality Management System**  
 SAI Global File #004008  
 Burlington, Ontario, Canada

**SAC305 NO CLEAN SOLDER WIRE**

**4900-4917**

**California Proposition 65** (Chemicals known to cause cancer or reproductive toxicity, USA)

This product does not contain any of the listed substances.

**Europe**

**RoHS** (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

**WEEE** (Waste Electrical and Electronic Equipment Directive)

This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

**Section 16: Other Information**

**SDS Prepared by** MG Chemical's Regulatory Department

**Date of Review** 06 March 2020

**Supersedes** 09 July 2019

**Reason for Changes:** Update to the emergency phone number information.

**Reference**

1) ACGIH 2017 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2017).

2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

*Section continued on the next page*

Page **12 of 13**

Date of Revision: 06 March 2020 / Ver. 3.01

## 12.2 JLC lead-free PCB

297

Table 24: JLC PCB RoHS Compliance

Declaration for JLCPBCB lead-free PCBs - <https://s3.amazonaws.com/helpscout.net/docs/assets/59f1de7804286313cffbb22c/images/5d4d09562c7d3a036965d6a3/ROHS-Certificate-of-Compliance.jpg>

ROHS-Certificate-of-Compliance.jpg 566x800 pixels

2022-08-16, 23:45



298 **12.3 Global Specialties GS-630**

Table 25: Global Specialties GS-630

Declaration for Global Specialties GS-630 - N/A



### Certificate of Compliance

This is to certify that all products and models manufactured or marketed by Cal Test Electronics, which include the following brand names:

- Cal Test Electronics
- Global Specialties
- Elditest

Are compliant to the Directive 2011/65/EU of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and the Commission Delegation Directive (EU) 2015/863 of 31 March 2015, amending Annex II of Directive 2011/65/EU as regards to the list of restricted substances. This directive is introducing 4 new substances (Phthalates) to the original 6 restricted substances.

#### **Substances:**

1. Lead (Pb) <0.1% = < 1,000 ppm
2. Mercury (Hg) <0.1% = <1,000 ppm
3. Hexavalent Chromium (CR VI) <0.1% = <1,000 ppm
4. Cadmium (Cd) <0.01% = <100 ppm
5. Polybrominated Biphenyls (PBB) <0.1% = <1,000 ppm
6. Polybrominated Diphenyl Ethers (PBDE) <0.1% = <1,000 ppm
7. Bis(2-ethylhexyl) Phthalate (DEHP) <0.1% = <1,000 ppm
8. Butyl Benzyl Phthalate (BBP) <0.1% = <1,000 ppm
9. Dibutyl Phthalate (DBP) <0.1% = <1,000 ppm
10. Diisobutyl Phthalate (DIBP) <0.1% = <1,000 ppm

#### **Exemptions:**

1. Annex III, 6(c) – Copper alloy contains up to 4% lead by weight

Marco A. León

A handwritten signature in black ink, appearing to read "Marco A. León".

Cal Test Electronics, Inc.

13-FEB-2018

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Cal Test Electronics  
22820 Savi Ranch Parkway  
Yorba Linda, CA 92887  
caltestelectronics.com

U.S. Toll Free: 800-572-1028  
Phone: 714-221-9330  
Fax: 714-921-9849  
info@caltestelectronics.com

299 **12.4 Global Specialties GS-090**

Table 26: Global Specialties GS-090

Declaration for Global Specialties GS-090 - N/A



### Certificate of Compliance

This is to certify that all products and models manufactured or marketed by Cal Test Electronics, which include the following brand names:

- Cal Test Electronics
- Global Specialties
- Elditest

Are compliant to the Directive 2011/65/EU of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and the Commission Delegation Directive (EU) 2015/863 of 31 March 2015, amending Annex II of Directive 2011/65/EU as regards to the list of restricted substances. This directive is introducing 4 new substances (Phthalates) to the original 6 restricted substances.

**Substances:**

1. Lead (Pb) <0.1% = < 1,000 ppm
2. Mercury (Hg) <0.1% = <1,000 ppm
3. Hexavalent Chromium (CR VI) <0.1% = <1,000 ppm
4. Cadmium (Cd) <0.01% = <100 ppm
5. Polybrominated Biphenyls (PBB) <0.1% = <1,000 ppm
6. Polybrominated Diphenyl Ethers (PBDE) <0.1% = <1,000 ppm
7. Bis(2-ethylhexyl) Phthalate (DEHP) <0.1% = <1,000 ppm
8. Butyl Benzyl Phthalate (BBP) <0.1% = <1,000 ppm
9. Dibutyl Phthalate (DBP) <0.1% = <1,000 ppm
10. Diisobutyl Phthalate (DIBP) <0.1% = <1,000 ppm

**Exemptions:**

1. Annex III, 6(c) – Copper alloy contains up to 4% lead by weight

Marco A. León

A handwritten signature in black ink, appearing to read "Marco A. León".

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13-FEB-2018

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300 **12.5 Molex 0010897041**

Table 27: Molex 0010897041 RoHS Compliance

Declaration for Molex 0010897041 - [https://www.molex.com/datasheets/rohspdf/0010897041\\_rohs.pdf](https://www.molex.com/datasheets/rohspdf/0010897041_rohs.pdf)**RoHS Certificate of Compliance**

07/11/2022

Molex is committed to managing the use of chemical substances in accordance with governmental regulations, industry standards, and customer-specific requirements in order to protect the environment. For each part listed, this document provides:

- EU RoHS Compliance Status.** EU RoHS status is declared per Directive 2011/65/EU and its subsequent amendments, including the Directive EU 2015/863 which additionally prohibited four phthalates. Homogeneous materials of parts that are compliant to this legislation have less than 0.1% by weight each of lead, mercury, hexavalent chromium, PBB, PBDE, DBP, BBP, DIBP, DEHP, and 0.01% by weight of cadmium. In situations where an exemption applies, the preceding limits, corresponding to the exempted substance(s), may be higher.

Molex's sole liability for incorrectly certifying a product shall be either replacement of the Molex product or, alternatively and in the sole discretion of Molex, return of the purchase price paid for the relevant Molex product.

For additional information regarding Molex's environmental initiatives and further explanation of this information, please visit [www.molex.com](http://www.molex.com)

Haim Eliyahu  
Director, Global Product Stewardship

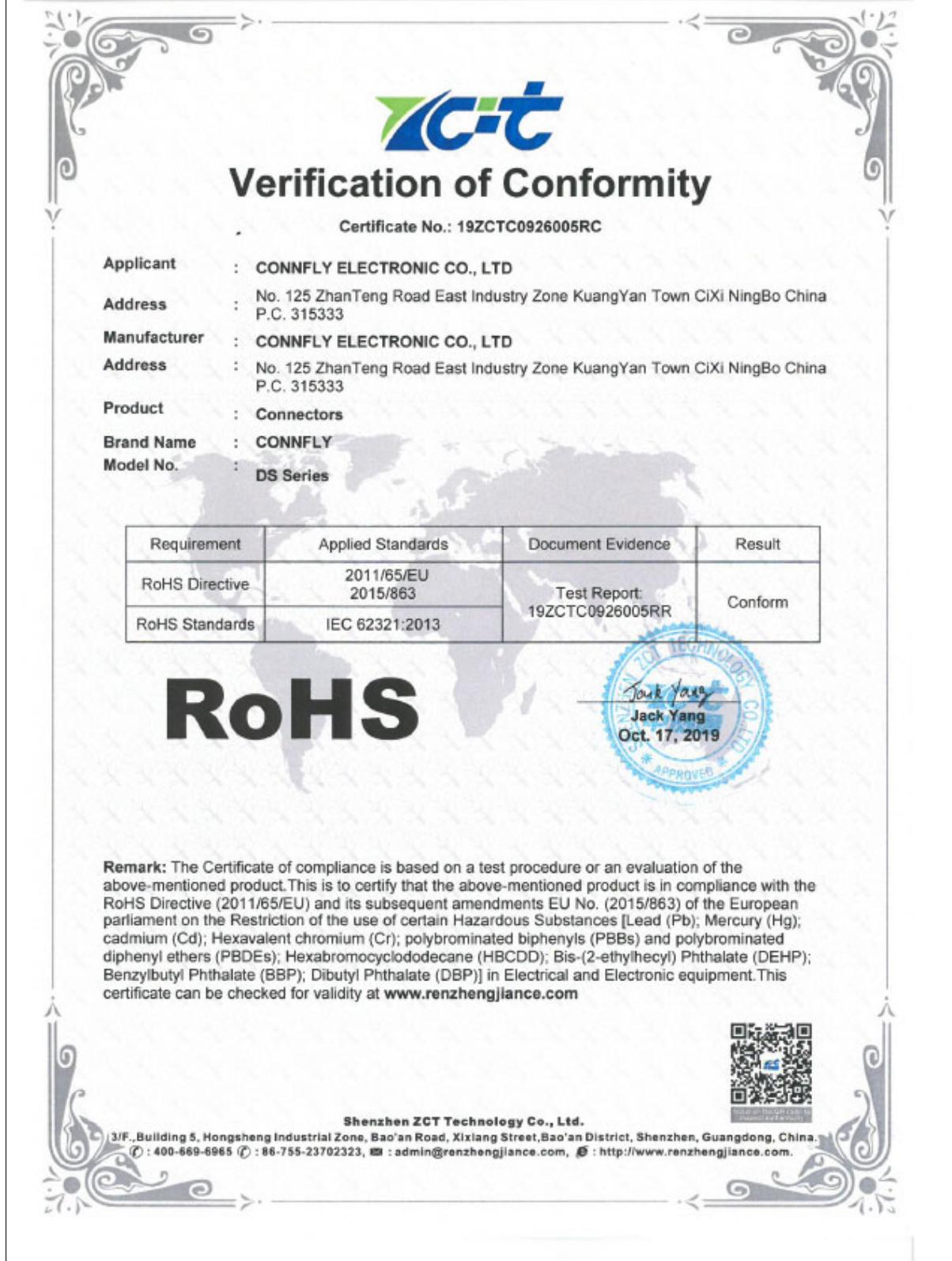
**Table A**

Molex Part Number	Part Description	RoHS Compliance Status
0010897041	2.54mm Pitch C-Grid Breakaway Header, Dual Row, Vertical, High Temperature, 4 Circuits, Tin (Sn) Plating, 2.72mm PC Tail Length	Compliant

301 **12.6 Connfly DS1023-2\*2SF11**

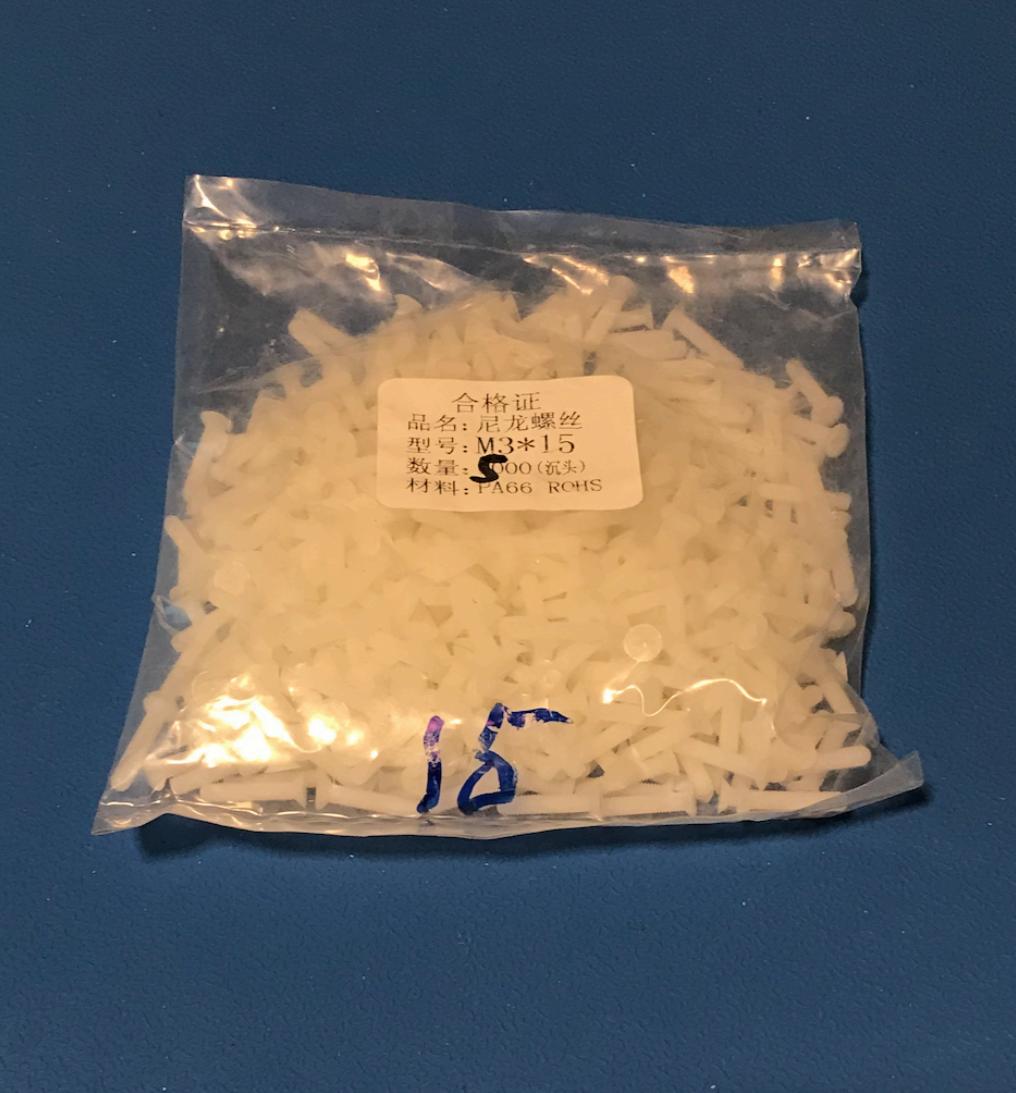
Table 28: Connfly DS1023-2\*2SF11 Compliance

Declaration for Connfly DS1023-2\*2SF11 -  
<http://en.connfly.group/static/upload/image/ico/RoHS□□□Connectors□.jpg>



302 **12.7 M3 16mm Nylon Screw**

Table 29: M3 15mm Nylon Screw RoHS Compliance

Declaration for M3 15mm Nylon Screw - N/A


303 **12.8 M3 11mm Nylon Standoff**

Table 30: M3 11mm Nylon Standoff RoHS Compliance

Declaration for M3 11mm Nylon Standoff - N/A

304 **12.9 M3 8mm Nylon Screw**

Table 31: M3 8mm Nylon Screw RoHS Compliance

Declaration for M3 8mm Nylon Screw - N/A
 <p>A photograph showing a clear plastic bag filled with numerous small, black, cylindrical M3 8mm Nylon Screws. A white rectangular label is pinned to the top center of the bag. The label contains the following text in Chinese:</p> <p>合格证 品名:尼龙螺丝 型号:十字M3*8 数量: 1000 材料: PA66 ROHS</p>

305 **12.10 M3 Nylon Bolt**

Table 32: M3 Nylon Bolt RoHS Compliance

Declaration for M3 Nylon Bolt - N/A