



1108 West Evelyn Ave., Sunnyvale, CA 94086
 Cage Code: 0ZHS4
 (408) 735-7137
 files@protoexpress.com
 www.protoexpress.com

Certificate of Compliance

Customer	The University of Arizona	Revision:	2.0
Address	1303 E University Blvd, Box 5 Tucson AZ 85719	Date Code	2040
Part Number	GUSTO-UA-DWG-00013	Base Material	Isola 370 HR
Purchase Order #	559272/line 3, COIN 24101	Work Order	422223 - 1.00
Sierra Tool Number	171616	Date Shipped	10/6/2020
Number of Layers	8		
Surface Finish	HAL		
Quantity of PCB Shipped:	5		

(Plus solder sample if required.)

Compliance to:

Master Drawing	None		
Specification / Rev / Amd	IPC-6012 Rev D Amd 1, Class 3	and IPC-1601, IPC-A-600 (latest revision)	
Lead Free	No	NASA Outgassing	No
RoHS / REACH *	Yes, with exception of Lead in surface finish.	Positive Etch Back	No
UL	---	Halogen Free	No
Special ID, marking, comments	None		

Specific paragraphs and inspection items:

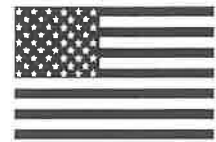
<p>3.2 Material</p> <p>Visual</p> <p>3.3.1 Edges of Printed Board</p> <p>3.3.2 Laminate Imperfections</p> <p>3.3.3 Plating and Coating Voids in the Hole</p> <p>3.3.4 Lifted Lands</p> <p>3.3.5 Marking and Traceability</p> <p>3.3.9 Workmanship</p> <p>Solderability</p> <p>3.3.6 Surface</p> <p>3.3.6 Plated Through Holes</p> <p>Dimensional</p> <p>3.4 Printed Board Dimensional</p> <p>3.4.1 Hole Size</p> <p>3.4.1 Hole Pattern Accuracy</p> <p>3.4.1 Pattern feature accuracy</p> <p>3.4.2 Annular ring (external)</p> <p>3.4.3 Bow and twist</p> <p>3.7 Solder Mask Coverage</p> <p>3.6.2.11 Plating / coating thickness</p> <p>Conductor Width & Spacing</p> <p>3.5.1 Internal and External Width</p> <p>2.5.2 Internal and External Spacing</p>	<p>IPC-6012</p>	<p>Conductor Surfaces</p> <p>3.3.8 junction of gold plate to solder finish</p> <p>3.5.4.1 Nick, dents, pinholes</p> <p>3.4.4.5 - 7 Dewetting / nonwetting / final finish coverage</p> <p>3.5.4.4 Edge printed board connector</p> <p>3.5.4.2 Surface mount</p> <p>Physical</p> <p>3.3.7 Plating adhesion</p> <p>3.7.2 Solder mask cure and adhesion</p> <p>Structural Integrity After Thermal Stress</p> <p>3.6.2.1 Plating integrity</p> <p>3.6.2.3 Laminate voids</p> <p>3.6.2.6 & 8 Etchback / negative etchback</p> <p>3.6.2.9 Annular ring and Breakout (internal)</p> <p>3.6.2.10 Lifted Lands</p> <p>3.6.2.11 Hole plating thickness</p> <p>3.6.2.15 Surface plating and conductor thickness</p> <p>3.6.2.14 Copper foil thickness (internal)</p> <p>3.6.2.16 Metal core spacing</p> <p>3.6.2.17 Dielectric thickness</p> <p>3.6.2.18 Material fill of Blind and Buried Vias</p> <p>Cleanliness</p> <p>3.9.1 Cleanliness prior to solder mask application</p> <p>Foreign Object Debris (FOD)</p>
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The above order has been both visually inspected, microsection, tested, and conformed to the customer specification, customer's master drawings, and purchase order.

All material used in the manufacture of the above order meet the material and manufacturing specifications as specified on the customer's drawings and purchase order subject to subsequent communication / agreement. Sierra Circuits hereby certifies that the item was last substantially transformed ("Substantially Transformed") in the United States of America. Sierra hereby certifies that the information is accurate and TAA Compliant, which is defined to mean that the article is wholly the growth, product or manufacture of the U.S.A. or Substantially Transformed in the U.S.A.

"RoHS / REACH" Compliant: Manufactured to the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) as regulated by the European Union dated 18 December 2006. Furthermore, they do not contain any of the 174 materials that are considered substance of very high concern (SVHC), updated on July 7, 2017. (refer to URL: <http://ec.europa.eu/environment/>)

MADE IN



U. S. A.

Bhupinder Kaur

Inspector

October 6, 2020

Date



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Electrical Test Certificate of Compliance

Customer	The University of Arizona		Revision	2.0
Address	1303 E University Blvd. Box 5 Tucson AZ 85719		Date Code	2040
Part Number	GUSTO-UA-DWG-00013		Base Material	Isola 370 HR
Purchase Order #	559272/line 3, COIN 24101		Work Order	422223 - 1.00
Sierra Tool Number	171616		Date Tested	10/5/2020
Number of boards Passed	21			

Boards shipped might be less then the boards that passed electrical test.

Compliance to:

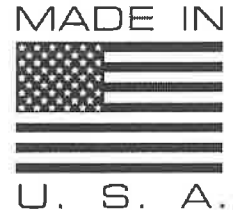
Master Drawing None
 Specification / Rev / Amd IPC-6012 Rev D Amd 1, Class 3
 Test Level C
 Test Method Resistive

Test Stamp:

Stamped on PCB

Resistive Test Parameters:

Isolation (Shorts/Leakage) Meg Ohms 10
 Continuity (Open) 10
 Voltage 40
Adjacency Used Yes
 Horizontal Distance 0.05
 Vertical Distance 0.05
 Source Data Used Net List from Gerber Data
 Additional Comments None



High Potential (Hi-Pot):

Voltage No Requirement

Comments or addition results: None

Sierra Circuits, Inc. certifies that this work order has been electrically tested in accordance with IPC-9252 "Guidelines and Requirements for Electrical Testing of Unpopulated Printed Boards"
 The above order has been electrical tested, and conformed to the order specifications and the customer's drawings & purchase order.

710-Mandeep Kaur

October 5, 2020

Inspector

Date



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Boards that Passed Electrical Test to IPC Specifications

Customer: The University of Arizona		Boards shipped per C of C =	21
Address 1303 E University Blvd, Box 5 Tucson AZ 85719	Tool Number 171616	Boards shipped per this form =	21
Part # GUSTO-UA-DWG-00013	Revision 2.0	Specification / Rev / Amd:	
PO # 559272line 3, COIN 24101	Date Code 2040	IPC-6012 Rev D Amd 1, Class 3	
	Work Order 422223 - 1.00		
	Boards per Panel 6		

Delete the board serial numbers that did not pass electrical test.

Panel SN#	Board SN#								
S/N: 1	1	2	3	4	5	6			
S/N: 2	1	2	3	4	5	6			
S/N: 3	1	2	4	5	6				
S/N: 4	1	3	5	6					



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Certificate of Compliance - Dimension

Customer The University of Arizona
 Address 1303 E University Blvd. Box 5 Tucson AZ 85719
 Part Number GUSTO-UA-DWG-00013
 Purchase Order # 559272/line 3, COIN 24101
 PCB Type Type 3
 Sierra Tool Number 171616

Lot Conformance Inspection (LCI)

Revision 2.0
 Date Code 2040

Manufactured Work Order 422223 - 1.00
 Number of Pnl in Work Order 4
 Number of Bds Released 24
 Boards per Panel 6
Sample Size Required 1

Compliance to:

Master Drawing None

Specification / Rev / Amd IPC-6012 Rev D Amd 1, Class 3

Disposition: Accept Reject

Comments:

Bhupinder Kaur

October 6, 2020

Inspector

Date

Item	Nominal (Print Spec)	Tolerance		Measurement from Boards					Measurement Tool Serial Number & Calibration Date
		+	-	Board #1	Board #2	Board #3	Board #4	Board #5	
1	6.290	0.005	0.005	6.290					CALIPER/DR7305/5-20-21
2	6.290	0.005	0.005	6.290					CALIPER/DR7305/5-20-21
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									

Certificate of Compliance - Bow & Twist

Customer The University of Arizona
 Address 1303 E University Blvd, Box 5 Tucson AZ 85719
 Part Number GUSTO-UA-DWG-00013
 Purchase Order # 559272/line 3, COIN 24101

Lot Conformance Inspection (LCI)

Revision: 2.0
 Date Code 2040
 Work Order 422223 - 1,00

Board Length 6.30 inches
 Board Width 6.30 inches
 Panels in lot 4
 # of Samples 1

Sierra Tool Number 171616

Compliance to:

Master Drawing None
 Specification / Rev / Amd IPC-6012 Rev D Amd 1, Class 3
 Design Surface mount components

Specification 0.75%

Bow									
Board #	S/N #	Length (L)	Width (W)	Go/No-Go gauge for sample length R_L	Go/No-Go gauge for sample width R_W	Max. height off table along Brd length (inches) R_L	Max. height off table along Brd width (inches) R_W	% Bow _L	% Bow _W
1	004-001	6.300	6.300	0.047	0.047	0.000	0.000	0.00%	0.00%
2									
3									
4									
5									

Calculations for Bow:

$R_L = L(B) / 100$ % Bow_W = $(R_W / W) \times 100$
 $R_W = W(B) / 100$ % Bow_L = $(R_L / L) \times 100$

Where:

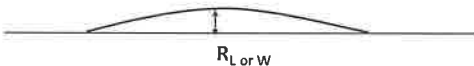
R_L = Go/No-Go feeler / pin gage size for sample length
 R_W = Go/No-Go feeler / pin gage size for sample width
 L = Board Length measurement
 W = Board Width measurement
 B = Maximum allowable Bow %

Calculations for Twist:

% Twist = $(R / (2 * D)) \times 100$

Where:

L = length of board (inches)
 W = width of board (inches)
 R_D = max. height off table along diagonal board length (inches)
 D = diagonal board length (inches)
 R = max. corner height above table (inches)



Note: Any R values of 10 mils or less are considered negligible and are listed as "0"

Twist						Overall Rating	
Board #	S/N #	Diagonal Length (D)	Go/No-Go gauge for sample length R_D	Max. corner height above table (inches) R	% Twist	Bow & Twist Pass / Fail	Remarks / Comments
1	004-001	8.910	0.134	0.000	0.00%	PASS	
2							
3							
4							
5							

Measurement Tool Used	GRANITE	Serial Number	AA0474	Calibration Date:	5/20/2021
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Comments:

Any board rejection requires 100% sort and retest.

Bhupinder Kaur
 Inspector

October 6, 2020
 Date



Sierra Circuits Inc
Certificate of Compliance - XRF

Analysis Report

9/30/2020 6:45:25 PM

Analysis Title

Hard Au-Ni-Cu(12mil)

Analysis Device

Bowman XRF

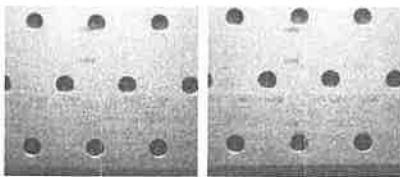
S/N: P1819203

Customer	the university of arizona	Part Number	gusto-ua-dwg-00013
Work Order	422223 1.00	Tool Number	171616
Operator	raul Lemus	Number	5068

Analysis Results

		1	2
		μ in	μ in
	Result	Au	Ni
	1	55.1	226.0
	2	53.4	213.3
Mean		54.2	219.7
Min		53.4	213.3
Max		55.1	226.0
Range		1.7	12.7
StdDev		1.20	8.96
% StdDev		2.21	4.08
Cp		----	----
Cpk		----	----
Cg		0.0	0.0
Cgk		----	----

Sample Images



Sample 1

Sample 2

Date: 10/26/20



Sierra Circuits Inc
Certificate of Compliance - XRF

Analysis Report
9/30/2020 5:45:19 PM

Analysis Title
Hard Au-Ni-Cu(12mil)

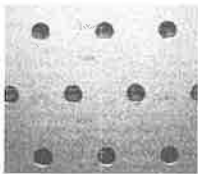
Analysis Device
Bowman XRF
S/N: P1819203

Customer	the university of arizona	Part Number	gusto-ua-dwg-00013
Work Order	422223 1.00	Tool Number	2.0
Operator	raul Lemus	Number	171616
			5063

Analysis Results

		1	2
		μin	μin
	Result	Au	Ni
	1	55.3	199.9

Sample Images



Sample 1

SB

Date: 10/06/20

SIERRA CIRCUITS

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Customer Coupon Retention

Customer The University of Arizona
Address 1303 E University Blvd. Box 5 Tucson AZ 85719
Part Number GUSTO-UA-DWG-00013
Purchase Order # 559272/line 3, COIN 24101

Revision: 2.0
Date Code 2040
Base Material Isola 370 HR
Work Order 422223 - 1.00

Sierra Tool Number 171616
Number of Layers 8
Surface Finish HAL

Coupon Shipped Number SN.1 X/Y

Date Shipped 10/6/2020

This coupon has been given to the customer upon their request. The customer is responsible for the retention of this coupon as required by all specifications and regulations. Sierra Circuits might not have any additional retention coupons.

Arthur Torres

October 6, 2020

Inspector

Date

Attach coupon below

