



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES®

IPC-1710A

OEM Standard for Printed Board Manufacturers' Qualification Profile

Developed by the OEM council of the IPC, the MQP sets the standard for assessing PWB manufacturers capabilities and allows PWB manufacturers to more easily satisfy customer requirements.

IPC-1710A
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A standard developed by IPC

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The material in this standard was developed by the OEM Council of the Institute for Interconnecting and Packaging Electronic Circuits.

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FOREWORD

It is not intended that this Manufacturers' Qualification Profile (MQP) satisfies all the requirements of the customer, however, conscientious maintenance of this document and or registration to ISO 9000 requirements should satisfy the major concerns. Thus, audits should be simpler, required less frequently, and facilitate less paper work as customers and suppliers work closer to meeting each others needs.

ACKNOWLEDGMENTS

The IPC is indebted to the members of the OEM council who participated in the development of this document. A note of thanks is also expressed to the members of the IPC Presidents Council for their review and critique and construction recommendations in finalizing the principles developed for the MQP.

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SECTION 1.1

COMPANY DESCRIPTION

DATE COMPLETED

2/25/21

GENERAL INFORMATION

LEGAL NAME Circuit Connect, Inc			
PHYSICAL ADDRESS 4 State Street			
CITY Nashua	STATE NH	ZIP 03063	
PROVINCE	COUNTRY USA		
TELEPHONE NUMBER 603-880-7447	FAX NUMBER 603-880-7975	TELEX NUMBER	
E-MAIL ADDRESS jenniferb@circuit-connect.com	MODEM NUMBER N/A	DATE FOUNDED 1990 <input type="checkbox"/> PUBLIC <input checked="" type="checkbox"/> PRIVATE	
INTERNET URL www.Circuit-Connect.com	FTP SITE N/A		

MANAGEMENT

PRESIDENT
CHIEF OPERATING OFFICER Richard G Clutz
MANUFACTURING David Leith
QUALITY Janet Gagnon
MARKETING/SALES
CUSTOMER SERVICE Jennifer Burke
WASTE TREATMENT (POLLUTION PREVENTION) David Leith

CORPORATE DESCRIPTION	NUMBER OF EMPLOYEES		COMMENTS
	CORPORATE	SITE	
DESIGN AND DEVELOPMENT		0	Performed by Administrators
ENGINEERING		2	
MANUFACTURING CONTROL		0	Performed by Administrators
MANUFACTURING	DIRECT	9	
	INDIRECT	1	
QUALITY CONTROL	QUALITY ENGINEERS	0	
	INTERNAL AUDITORS	2	Shared Quality / Manufacturing
	GENERAL MANAGEMENT	1	
ADMINISTRATION		4	
TOTAL		19	

SECTION 1.2

SITE DESCRIPTION

(TO BE COMPLETED FOR EACH SITE)

DATE COMPLETED 2/25/21
ATTACH APPROPRIATE CHARTS (OPTIONAL)

MANUFACTURING FACILITY			
COMPANY NAME		Circuit Connect, Inc.	
PHYSICAL ADDRESS		4 State Street	
CITY	Nashua	STATE	NH
PROVINCE		ZIP	
TELEPHONE NUMBER		603-880-7447	
E-MAIL ADDRESS		jenniferb@circuit-connect.com	
MODEM NUMBER		N/A	
YEARS IN BUSINESS		Since 1990	
INTERNET URL		www.circuit-connect.com	
FTP		N/A	
PRINCIPLE PRODUCTS/SERVICES/SPECIALTIES		BUSINESS CHARACTERIZATION (HIGH VOLUME, QUICK TURN-AROUND, ETC.)	
Bare, ready to assemble rigid Printed Circuit Boards and related services. UL listed, NPI, ITAR, RoHS, ConMin-Free IPC class 2&3, ISO Certifications		High mix, prototype, quick turn around. We are a SAM-registered small business serving commercial, institutional and governmental contracts. PCB based R&D product specialists	

FACILITY MANAGEMENT	TITLE	REPORTS TO (Function/Job Title)
OVERALL OPERATION RESPONSIBILITY FOR THIS SITE Richard G. Clutz	CEO	N/A
MANUFACTURING David Leith	Production Manager	CEO
TECHNICAL/ENGINEERING Richard Clutz	CEO	N/A
MATERIALS/PRODUCTION CONTROL David Leith	David Leith	CEO
PURCHASING Melanie Hunt	Purchasing Agent	CEO
QUALITY Janet Gagnon	Quality Manager	CEO
SALES REPRESENTATIVE Jennifer Burke	Accounts Manager	CEO
WASTE MANAGEMENT David Leith	Production Manager	CEO

BUILDINGS	SYSTEMS (INDICATE % COVERAGE)									
	AGE	AREA (Sq. Ft.)	Construction (Wood/Brick)	Power Conditioning	Heating	Ventilation	Air Conditioning	Sprinklers	Waste Treatment	Other
Office	1990	3K	Brick	70	100	100	100	100	N/A	
Manufacturing	1990	25K	Brick	50	100	100	60	100	100	
Storage										
Planned additions										

SAFETY AND REGULATORY AGENCY REQUIREMENTS			
Are fire extinguishers functional and accessible to employees?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	What is the distance to the nearest fire station? (in minutes)
Do you conform to local/federal environment protection agency requirements?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Date of last OSHA visit Date of last EPA visit
Are you currently operating under a waiver or in violation of local government requirements?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	Other Agency Audits, UL, ISO 9000, NECQ, CSA Approval and Number
Do you have a safety program? Describe below.	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Hazardous Waste Number Trade Waste Account Number

PLANT PERSONNEL (TOTAL EMPLOYEES)										
Regular	Contract	Office	Technical/Engineering	Production	Full-Time QA	Part-Time QA	Union	Non-Union	Union Name	Contract Expires (Date)
19	0	7	2	10	2	0	0	19	N/A	N/A

COMMENTS

SECTION 2.1

PROCESS

DATE COMPLETED
2/25/21

This section is intended to provide overview information on the processes used to fabricate printed board products.

Site Capability Snapshot (Please Check all that apply)

Designators			Remarks
A	Conductor Forming Processes	<input type="checkbox"/> Subtractive <input type="checkbox"/> Thin Foil Subtractive less than .5 oz. <input type="checkbox"/> Semi-Additive <input type="checkbox"/> Additive (Electro-less) <input type="checkbox"/> Black Hole <input type="checkbox"/> Thick Film Paste and Fire <input type="checkbox"/> Thin Film Semi-conductor Sputtering <input checked="" type="checkbox"/> Other: Direct metallization	<i>Shadow™</i>
B	PTH Materials and Processes	<input checked="" type="checkbox"/> Acid Copper <input type="checkbox"/> Pyro-Phosphate Copper <input type="checkbox"/> Full Built Electro-Less <input type="checkbox"/> Gold Paste <input type="checkbox"/> Copper Paste <input type="checkbox"/> Gold Conductor Sputtering <input type="checkbox"/> Nickel Conductor Sputtering <input type="checkbox"/> Other:	
C	Permanent Over-plating	<input checked="" type="checkbox"/> Tin <input type="checkbox"/> Tin-Lead <input type="checkbox"/> Tin-Nickel Alloy <input type="checkbox"/> Nickel <input type="checkbox"/> Nickel Gold (Hard) <input type="checkbox"/> Nickel Gold (Soft) <input type="checkbox"/> Nickel Rhodium <input type="checkbox"/> Conductive Polymer <input type="checkbox"/> Other:	

D	Permanent Selective Plating	<input checked="" type="checkbox"/> Tin <input type="checkbox"/> Tin-Lead <input type="checkbox"/> Tin-Nickel Alloy <input checked="" type="checkbox"/> Nickel <input checked="" type="checkbox"/> Nickel Gold (Hard) <input checked="" type="checkbox"/> Nickel Gold (Soft) <input type="checkbox"/> Nickel Rhodium <input type="checkbox"/> Other:	Card Edge connectors ENIG
E	Permanent Mask or Coating	<input type="checkbox"/> Photo Dry Film <input checked="" type="checkbox"/> Photo Liquid <input type="checkbox"/> Image Transfer Screen Mask <input type="checkbox"/> Conformal Coating Solder Mask <input checked="" type="checkbox"/> Cover Coat <input checked="" type="checkbox"/> Other: Ink Jet legend printing	
F	Other Surface Finishes	<input type="checkbox"/> Tin-Lead Fused <input checked="" type="checkbox"/> Electroplated Tin <input checked="" type="checkbox"/> Solder Leveled <input checked="" type="checkbox"/> ENIG (Electroless Nickel, Immersion Gold) <input checked="" type="checkbox"/> Immersion Silver <input type="checkbox"/> Solder Bumped Lands <input type="checkbox"/> Solder Paste Fused <input type="checkbox"/> Azole Organic Protective Covering <input type="checkbox"/> Flux Protective Covering <input type="checkbox"/> Other:	Lead Free

SECTION 2.2

ELECTRICAL TEST EQUIPMENT

DATE COMPLETED 2/25/21

This section is intended to provide overview information on the test equipment and testing capability of the manufacturer.

Site Capability Snapshot (Please Check the column that applies furthest to the right.)

Designators			Remarks
A	Number of Nets	<input type="checkbox"/> <200 <input type="checkbox"/> 200 <input type="checkbox"/> 500 <input type="checkbox"/> 1000 <input type="checkbox"/> 2000 <input type="checkbox"/> 3000 <input type="checkbox"/> 4000 <input type="checkbox"/> 5000 <input checked="" type="checkbox"/> >5000 <input type="checkbox"/> Other:	
B	Number of Nodes	<input type="checkbox"/> <500 <input type="checkbox"/> 500 <input type="checkbox"/> 1000 <input type="checkbox"/> 2000 <input type="checkbox"/> 3000 <input type="checkbox"/> 4000 <input type="checkbox"/> 5000 <input type="checkbox"/> 6000 <input checked="" type="checkbox"/> >6000 <input type="checkbox"/> Other:	
C	Probe Point Pitch	<input type="checkbox"/> >1.0 [.040] <input type="checkbox"/> 1.0 [.040] <input type="checkbox"/> 0.8 [.032] <input type="checkbox"/> 0.65 [.025] <input type="checkbox"/> 0.50 [.020] <input type="checkbox"/> 0.40 [.016] <input type="checkbox"/> 0.30 [.012] <input type="checkbox"/> 0.20 [.008] <input checked="" type="checkbox"/> <0.20 [.008] <input type="checkbox"/> Other:	Flying Probe limit

D	Test % Single Pass	<input type="checkbox"/> None <input type="checkbox"/> <60% <input type="checkbox"/> 60% <input type="checkbox"/> 70% <input type="checkbox"/> 80% <input type="checkbox"/> 90% <input type="checkbox"/> 95% <input type="checkbox"/> 99% <input type="checkbox"/> 100% <input type="checkbox"/> Other:	
E	Probe Accuracy (DTP)	<input type="checkbox"/> >0.2 [.008] <input type="checkbox"/> 0.2 [.008] <input type="checkbox"/> 0.15 [.006] <input type="checkbox"/> 0.125 [.005] <input type="checkbox"/> 0.1 [.004] <input type="checkbox"/> 0.075 [.003] <input checked="" type="checkbox"/> <0.075 [.003] <input type="checkbox"/> Other:	
F	Grid Density	<input type="checkbox"/> Single Side Grid <input type="checkbox"/> Double Sided Grid <input type="checkbox"/> Double Density Grid <input type="checkbox"/> Double Density Double Sided <input type="checkbox"/> Quad Density <input type="checkbox"/> Double Sided Quad Density <input checked="" type="checkbox"/> Flying Probe <input type="checkbox"/> Other:	
G	Netlist Capability	<input type="checkbox"/> Golden Board <input checked="" type="checkbox"/> IPC-D-356 <input checked="" type="checkbox"/> Net List Extraction <input checked="" type="checkbox"/> CAD/CAM Net List Compare <input type="checkbox"/> Other:	

H	Test Voltage	<input type="checkbox"/> <20 VDC <input type="checkbox"/> 20 VDC <input type="checkbox"/> 40 VDC <input type="checkbox"/> 60 VDC <input type="checkbox"/> 80 VDC <input type="checkbox"/> 100 VDC <input checked="" type="checkbox"/> 500 VDC <input type="checkbox"/> 1000 VDC <input type="checkbox"/> >1000 VDC <input type="checkbox"/> Other:	
J	Impedance Meas	<input type="checkbox"/> Micro Section <input checked="" type="checkbox"/> Inboard Circuit <input checked="" type="checkbox"/> Coupon <input checked="" type="checkbox"/> Manual TDR <input type="checkbox"/> Automated TDR <input type="checkbox"/> Other:	
K	Impedance Tolerance	<input type="checkbox"/> None <input type="checkbox"/> >20% <input type="checkbox"/> 20% <input type="checkbox"/> 15% <input checked="" type="checkbox"/> 10% <input type="checkbox"/> 7% <input type="checkbox"/> 5% <input type="checkbox"/> 2% <input type="checkbox"/> <2% <input type="checkbox"/> Other:	

SECTION 2.3

PRODUCT TYPE

DATE COMPLETED 2/25/21

This section is intended to provide overview information on the printed board product types being fabricated by the manufacturer.

Site Capability Snapshot (Please Check all that apply.)

Designators		Remarks
A	Product Type	<input checked="" type="checkbox"/> Rigid Printed Board <input type="checkbox"/> Flex Printed Board <input type="checkbox"/> Rigid/Flex Board <input checked="" type="checkbox"/> Rigid Back Plane <input type="checkbox"/> Molded Product <input type="checkbox"/> Ceramic Printed Board <input type="checkbox"/> Multichip Module <input type="checkbox"/> Laminated Multichip Module <input type="checkbox"/> Deposited Dielectric Multichip Modules <input checked="" type="checkbox"/> Other: PCB based products (e.g. motor stator)
B	Circuit Mounting Type	<input checked="" type="checkbox"/> Single Sided <input checked="" type="checkbox"/> Double Sided <input checked="" type="checkbox"/> Multilayer <input type="checkbox"/> Single-sided Bonded to Substrate <input type="checkbox"/> Double-sided Bonded to Substrate <input type="checkbox"/> Multilayer Bonded to Substrate <input type="checkbox"/> Constrained Multilayer <input type="checkbox"/> Distributed Plane Multilayer <input type="checkbox"/> Other:
C	Via Technology	<input checked="" type="checkbox"/> No-Vias <input checked="" type="checkbox"/> Thru Hole Vias <input checked="" type="checkbox"/> Buried Vias <input checked="" type="checkbox"/> Blind Vias <input checked="" type="checkbox"/> Thru Hole & Blind Vias <input checked="" type="checkbox"/> Thru Hole & Buried Vias <input checked="" type="checkbox"/> Thru Hole Buried & Blind Vias <input checked="" type="checkbox"/> Buried & Blind Vias <input type="checkbox"/> Other:

D	Laminate Material	<input type="checkbox"/> Phenolic <input checked="" type="checkbox"/> Epoxy Paper <input checked="" type="checkbox"/> Epoxy Glass <input checked="" type="checkbox"/> Modified Epoxy Composite <input checked="" type="checkbox"/> Polyimide Film & Reinforce <input checked="" type="checkbox"/> Cyanate Ester <input checked="" type="checkbox"/> Teflon <input type="checkbox"/> Ceramic Glass Types <input checked="" type="checkbox"/> Various Combinations <input type="checkbox"/> Other:	
E	Core Material	<input type="checkbox"/> No Core <input type="checkbox"/> Polymer <input checked="" type="checkbox"/> Copper <input type="checkbox"/> Aluminum <input type="checkbox"/> Graphite <input checked="" type="checkbox"/> Copper Invar/Copper <input type="checkbox"/> Copper Moly/Copper <input type="checkbox"/> Other:	
F	Copper Thickness (Oz.)	<input type="checkbox"/> 1/8 Minimum <input type="checkbox"/> 1/4 Minimum <input type="checkbox"/> 3/8 Minimum <input checked="" type="checkbox"/> 1/2 Nominal <input checked="" type="checkbox"/> 1 Nominal <input checked="" type="checkbox"/> 2 Nominal <input type="checkbox"/> 3-5 Max <input type="checkbox"/> 6-9 Max <input checked="" type="checkbox"/> >10 <input type="checkbox"/> Other:	
G	Construction	<input type="checkbox"/> ≤4 Planes <input checked="" type="checkbox"/> >4 Planes <input checked="" type="checkbox"/> THK to TOL ≤0.2 mm <input type="checkbox"/> THK to TOL >0.2 mm <input checked="" type="checkbox"/> Bow/Twist ≤1% <input type="checkbox"/> Bow/Twist >1% <input checked="" type="checkbox"/> ≤0.3 mm Profile Tolerance <input type="checkbox"/> 0.3 mm Profile Tolerance <input type="checkbox"/> Other:	

H	Coatings and Markings	<input checked="" type="checkbox"/> ≤0.1 mm Mask Clearance <input type="checkbox"/> >0.1 mm Mask Clearance <input checked="" type="checkbox"/> One Side (Legend) <input checked="" type="checkbox"/> Two Side (Legend) <input type="checkbox"/> None (Legend) <input type="checkbox"/> UL Material Logo <input checked="" type="checkbox"/> U.L. V ₀ Logo <input type="checkbox"/> U.L. V ₁ Logo <input type="checkbox"/> U.L. V ₂ Logo <input checked="" type="checkbox"/> Other: RoHS compliance; Lead Free ; Serialization; Bar Coding	
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SECTION 2.4

PRODUCT COMPLEXITY

DATE COMPLETED 2/25/21

This section is intended to provide overview information on product complexity being fabricated by the manufacturer.

(Please check the column that applies farthest to the right)

Designators			Remarks
A	Board Size Diagonal	<input type="checkbox"/> <250 [10.00] <input type="checkbox"/> 250 [10.00] <input type="checkbox"/> 350 [14.00] <input type="checkbox"/> 450 [17.50] <input type="checkbox"/> 550 [21.50] <input type="checkbox"/> 650 [25.50] <input type="checkbox"/> 750 [29.50] <input checked="" type="checkbox"/> 850 [33.50] <input type="checkbox"/> >850 [33.50] <input type="checkbox"/> Other:	31.89
B	Total Board Thickness	<input type="checkbox"/> 1,0 [.040] <input type="checkbox"/> 1,0 [.040] <input type="checkbox"/> 1,6 [.060] <input type="checkbox"/> 2,0 [.080] <input type="checkbox"/> 2,5 [.100] <input type="checkbox"/> 3,5 [.135] <input type="checkbox"/> 5,0 [.200] <input type="checkbox"/> 6,5 [.250] <input type="checkbox"/> >6,5 [.250] <input checked="" type="checkbox"/> Other:	.350
C	Number Conductive Layers	<input type="checkbox"/> 1-4 <input type="checkbox"/> 5-6 <input type="checkbox"/> 7-8 <input type="checkbox"/> 9-12 <input type="checkbox"/> 13-16 <input type="checkbox"/> 17-20 <input type="checkbox"/> 21-24 <input type="checkbox"/> 25-28 <input type="checkbox"/> >28 <input checked="" type="checkbox"/> Other:	42

D	Dia Drilled Holes	<input type="checkbox"/> >0,5 [.020] <input type="checkbox"/> 0,5 [.020] <input type="checkbox"/> 0,4 [.016] <input type="checkbox"/> 0,35 [.014] <input type="checkbox"/> 0,30 [.012] <input type="checkbox"/> 0,25 [.010] <input type="checkbox"/> 0,20 [.008] <input checked="" type="checkbox"/> 0,15 [.006] <input type="checkbox"/> <0,15 [.006] <input type="checkbox"/> Other:	Delimited by aspect ratio and material type
E	Total PTH TOL (Max-Min)	<input type="checkbox"/> >0,250 [.010] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.006] <input type="checkbox"/> 0,125 [.005] <input type="checkbox"/> 0,100 [.004] <input checked="" type="checkbox"/> 0,075 [.003] <input checked="" type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	[± .003] for HASL Finish [±.002] for Immersion Finishes
F	Hole Location TOL DTP	<input type="checkbox"/> >0,50 [.020] <input type="checkbox"/> 0,50 [.020] <input type="checkbox"/> 0,40 [.016] <input type="checkbox"/> 0,30 [.012] <input type="checkbox"/> 0,25 [.010] <input type="checkbox"/> 0,20 [.008] <input type="checkbox"/> 0,15 [.006] <input checked="" type="checkbox"/> 0,10 [.004] Hole to Hole <input type="checkbox"/> <0,10 [.004] <input type="checkbox"/> Other:	
G	Internal Layer Clearance (Min)	<input type="checkbox"/> >0,350 [.014] <input type="checkbox"/> 0,350 [.014] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.005] <input type="checkbox"/> 0,125 [.005] <input checked="" type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> <0,075 [.003] <input type="checkbox"/> Other:	On ½ ounce copper

H	Internal Layer Conductor Width (Min)	<input type="checkbox"/> >0,250 [.010] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.006] <input type="checkbox"/> 0,125 [.005] <input checked="" type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	On ½ ounce copper
J	Internal Layer Process Allowance	<input type="checkbox"/> >0,100 [.004] <input type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> 0,040 [.0015] <input type="checkbox"/> 0,030 [.0012] <input type="checkbox"/> 0,025 [.001] <input checked="" type="checkbox"/> 0,020 [.0008] <input type="checkbox"/> <0,020 [.0008] <input type="checkbox"/> Other:	
K	External Layer Clearance (Min)	<input type="checkbox"/> >0,350 [.014] <input type="checkbox"/> 0,350 [.014] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.006] <input type="checkbox"/> 0,125 [.005] <input checked="" type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> <0,075 [.003] <input type="checkbox"/> Other:	On ½ ounce copper
L	External Layer Conductor Width (Min)	<input type="checkbox"/> >0,250 [.010] <input type="checkbox"/> 0,250 [.010] <input type="checkbox"/> 0,200 [.008] <input type="checkbox"/> 0,150 [.006] <input type="checkbox"/> 0,125 [.005] <input checked="" type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	On ½ ounce copper

M	External Layer Process Allowance	<input type="checkbox"/> >0,100 [.004] <input type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> 0,040 [.0015] <input type="checkbox"/> 0,030 [.0012] <input type="checkbox"/> 0,025 [.001] <input checked="" type="checkbox"/> 0,020 [.0008] <input type="checkbox"/> <0,020 [.0008] <input type="checkbox"/> Other:	
N	Feature Location DTP	<input type="checkbox"/> >0,50 [.020] <input type="checkbox"/> 0,50 [.020] <input type="checkbox"/> 0,40 [.016] <input type="checkbox"/> 0,30 [.012] <input type="checkbox"/> 0,25 [.010] <input type="checkbox"/> 0,20 [.008] <input type="checkbox"/> 0,15 [.006] <input checked="" type="checkbox"/> 0,10 [.004] Internal feature –to- feature <input type="checkbox"/> <0,10 [.004] <input type="checkbox"/> Other:	

All Dimensions are in millimeters [inches shown in brackets]

SECTION 2.5

QUALITY DEVELOPMENT

DATE COMPLETED 2/25/21

This section is intended to provide overview information on the quality systems in place in the manufacturing facility.

Site Capability Snapshot (Please Check all that apply.)

Designators		Remarks
A	Strategic Plan	<input type="checkbox"/> Functional Steering Committee Formed <input checked="" type="checkbox"/> TQM Plan & Philosophy Established & Published <input checked="" type="checkbox"/> Documented Quality Progress Review <input checked="" type="checkbox"/> Implementation & review of Project Team Recommendations <input checked="" type="checkbox"/> TQM Communicated throughout organization <input checked="" type="checkbox"/> Controlled New process Start-up <input checked="" type="checkbox"/> Management Participates in TQM Audits <input checked="" type="checkbox"/> Employee Recognition Program <input checked="" type="checkbox"/> Total TQM Plan/Involvement Customer Training <input type="checkbox"/> Other:
B	Employee Involvement	<input checked="" type="checkbox"/> Certified Training Available <input checked="" type="checkbox"/> Training of Employee Base <input checked="" type="checkbox"/> TQM Team Trained <input type="checkbox"/> Design of Experiment Training and Use <input checked="" type="checkbox"/> New Process Implementation Training <input checked="" type="checkbox"/> Support Personnel Training <input type="checkbox"/> Advanced Statistical Training <input checked="" type="checkbox"/> Quality Functional Deployment <input checked="" type="checkbox"/> Ongoing Improvement Program for Employees <input type="checkbox"/> Other:
C	Quality Manual	<input type="checkbox"/> Quality Manual Started <input type="checkbox"/> Generic Quality Manual for Facility <input type="checkbox"/> 10% of manufacturing depts. have process specifications <input type="checkbox"/> 25% of manufacturing depts. have process specifications <input type="checkbox"/> 50% of manufacturing depts. have process specifications <input type="checkbox"/> Non-manufacturing Manuals Developed <input type="checkbox"/> 25% of all departments have quality manuals <input type="checkbox"/> 50% of all departments have quality manuals <input checked="" type="checkbox"/> All Manufacturing and support depts. have controlled quality manual <input type="checkbox"/> Other:

D	Instructions	<input type="checkbox"/> Work Instructions Started <input type="checkbox"/> Quality Instructions Started <input type="checkbox"/> 10% Work Instructions Completed <input type="checkbox"/> 10% Quality Instructions Completed <input type="checkbox"/> 25% Work Instructions Completed, Controlled <input type="checkbox"/> 25% Quality Instructions Completed, Controlled <input type="checkbox"/> 50% Work Instructions Completed, Controlled <input type="checkbox"/> 50% Quality Instructions Completed, Controlled <input checked="" type="checkbox"/> Quality and work Instruct. Completed, Controlled <input type="checkbox"/> Other:	
E	SPC Implementation IPC-PC-90	<input type="checkbox"/> Plan Exists <input type="checkbox"/> Training Started <input type="checkbox"/> Process Data Collected & Analyzed <input type="checkbox"/> All Employees Trained <input type="checkbox"/> First Process Stable & Capable <input type="checkbox"/> Several Major Processes Stable & Capable <input type="checkbox"/> Continued Improvement of Stable Processes <input type="checkbox"/> Additional Mfg Processes under Control <input checked="" type="checkbox"/> All Processes Under Control <input type="checkbox"/> Other:	
F	Supplier Programs/Controls	<input type="checkbox"/> Supplier Rating Program <input type="checkbox"/> Monthly Analysis Program <input type="checkbox"/> Key Problems Identified <input type="checkbox"/> Supplier Reviews Performance Data provided <input type="checkbox"/> TQM Acceptance by suppliers <input type="checkbox"/> 10% of Suppliers Using SPC <input type="checkbox"/> 25% of Suppliers Using SPC <input type="checkbox"/> 50% of Suppliers Using SPC <input type="checkbox"/> All Key Suppliers using Certified parts program <input type="checkbox"/> Other:	
G	Third Party IPC-QS-95	<input type="checkbox"/> Instrument Controls in Place <input type="checkbox"/> Measurement System in Control IPC-PC-90 <input checked="" type="checkbox"/> Document Controls in Place <input checked="" type="checkbox"/> Reduced Lot Sampling <input type="checkbox"/> 10% of Processes Under Audit Control <input type="checkbox"/> 50% or Greater of Processes Under Audit Control <input type="checkbox"/> ISO-9003 Certified <input type="checkbox"/> ISO-9002 Certified <input type="checkbox"/> ISO-9001 <input type="checkbox"/> Other:	

SECTION 3**EQUIPMENT PROFILE (Pre-Site Audit)**

DATE COMPLETED

2/25/21

* Examples of equipment limitations include:
min/max board size & min/max working area

3.1 PHOTOTOOL CAPABILITY	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMS
A) AOI of phototool	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1	≤ 0.001
B) AOI CAD reference (CAM)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1	≤ 0.001
C) Photoplotting	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Photo reductions	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Film scan and conversion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ScanFAB	1	11" x 17"
F) Film processing <input type="checkbox"/> air-dried <input type="checkbox"/> force-dried <input type="checkbox"/> processed in automatic processor	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
G) Media types <input type="checkbox"/> silver halide film <input type="checkbox"/> glass <input type="checkbox"/> diazo	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.2 DRILLING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMS
A) Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bridgeport	1	Application limited to non-standard features
B) Optical (single spindle)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pluritec	1	X-Ray Drill
C) N.C. drill	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Excellon	1	0.006" Drill diameter

3.3 ROUTING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMS
A) Edge beveler	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bevel Mate	1	0.062 thick PCB's
B) Hand router (pin router)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) N.C. router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Excellon	3	
D) N.C. driller/router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Excellon	1	
E) Scoring (profile)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
F) Scoring (straight line)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Accu-Systems	1	Jump Capability

3.4 MECHANICAL EQUIPMENT	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Punch press	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Shear	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pexto	1	Limited to Laminate Shearing
C) Milling machine	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.5 HOLE PREPARATION (DESMEAR)	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Permagnate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electrochemical	1	21"x24" panels
B) Plasma	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Advanced Plasma Systems	1	21"x24" panels
C) Mechanical	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Etchback	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Advanced Plasma Systems	1	21"x24" panels

3.6 PRIMARY IMAGE APPLICATION	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Dry film	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Morton 1600 auto cut-sheet Dynachem vacuum laminator	1 1	No Practical Limits Small quantity / non-std. processing
B) Hand screening	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Machine screening	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Wet film	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Liquid photoimageable	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.7 TYPE OF TREATMENT FOR MULTILAYER INNERLAYERS	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Black oxide	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Red oxide	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Copper scrub	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pluritic pumic scrub	1	2 mil cores
D) Durabond	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COBRA bond™; generic line Double Treat material	1	21" x 24" panel

3.8 LAMINATION	YES	NO	EQUIPMENT	QTY	EQUIPMENT UNITS
A) High pressure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FR4 Polyimide	1	Burkle 6 Platen
B) High temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FR4 Polyimide	1	Burkle 6 Platen
C) Vacuum	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FR4 Polyimide	1	Burkle 6 Platen
D) Vacuum assist	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Foil heat assist	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
F) Separate cool-down	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FR4 Polyimide	1	Burkle 6 Platen

3.9 ELECTROLESS COPPER PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT UNITS
A) Fully additive application	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Electroless deposition (semiadditive)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Western Tech	1	Direct Metalization <i>Shadow</i> ®
C) Through-hole and via	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.10 COPPER ELECTROPLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT UNITS
A) Copper sulfate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Manual , hoist system Fully addressible	1	≥ 6 oz. plating
B) Pyrophosphate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Manual, hoist system	1	
C) Copper fluoborate	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.11 TIN/LEAD SURFACE PLATINGS/COATINGS	YES	NO	EQUIPMENT	QTY	EQUIPMENT UNITS
A) Tin/lead electroplated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Manual, hoist system	1	21" x 24"
B) Immersion tin or tin/lead (electroless)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Hot air solder leveled (HASL)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Teledyne HALCO 175	1	Lead Free Solder

3.12 FUSING PROCESSES	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) I.R. reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Hot oil reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Horizontal (hot air level)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Teledyne HALCO 175	1	Lead Free Solder
D) Vertical (hot air level)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.13 NICKEL SURFACE PLATING	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Electroless nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Manual , hoist system	1	21" x 24" panels
B) Electroplated nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Manual , Tab Line	1	Card Edge Connectors

3.14 GOLD SURFACE PLATING	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Electroless gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1	21" x 24" panels
B) Electroplated gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1	Card Edge Connectors

3.15 PALLADIUM SURFACE PLATING	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Electroless palladium (immersion)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Electroplated palladium	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.16 SOLDERMASK	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Screened deposited image	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Manual Screen Station	1	21" x 24" panels
B) Dry film photoimageable	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Liquid photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DP-1500 with Tunnel tack oven	1	21" x 24" panels
D) Dry film/liquid combination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maskless Imaging unit	2	21" x 24" panels

3.17 ORGANIC SURFACE PROTECTION	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Benzotriazole	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Imidazole	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Benzimidazole	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.18 MICROSECTION CAPABILITY	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Buehler	1	IPC Class 3
B) Single cavity automated	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Multiple cavity automated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Buehler	1	IPC Class 3
D) Plating thickness analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Optical metallurgical scope	1	IPC Class 3

3.19 CHEMICAL ANALYSIS	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Etching chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B) Plating chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
C) Effluent (PPM) analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.20 ELECTRICAL TEST EQUIPMENT	YES	NO	EQUIPMENT	QUANTITY	EQUIPMENT LIMITS
A) Continuity and shorts	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Fixture development	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Flying probe test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ATG Micronic	3 1	
D) Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Polar TDR	1	

MASTER EQUIPMENT LISTING

FORM MQP 10

DATE COMPLETED 2/25/21

Please complete a Master Equipment List. You may use your own form or the MQP Form 10.

IDENTIFICATION	EQUIPMENT NAME/DESCRIPTION	MANUFACTURER TYPE/MODEL	EQUIPMENT LIMITS	ACCURACY	CALIBRATION FREQUENCY	REMARKS
<h1 style="color: blue; text-shadow: 2px 2px 4px #ccc;">OUR LIST IS ATTACHED</h1>						

SECTION 4

TECHNOLOGY PROFILE SPECIFICS


DATE COMPLETED 2/25/21

4.1 ADMINISTRATION

4.1.1 CAPACITY PROFILE	UNITS COMMENTS	
A) Total annual capacity in square meters (surface area) per month	39 K sq ^m	
B) Presently running at 33 % of capacity		

4.1.2 PERCENTAGE OF DOLLAR VOLUME	UNITS COMMENTS	
A) Single sided (rigid)	4	
B) Double sided (rigid)	20	
C) Multilayer (rigid)	56	
D) Single side (unreinforced-flex)		
E) Double sided (unreinforced-flex)		
F) Multilayer (unreinforced-flex)		
G) Multilayer (rigid/flex)		

4.1.3 PANEL PRODUCTION PROFILE	UNITS COMMENTS	
A) Size of a production lot in panels		
1) Normal	20	
2) Smallest	1	
B) Number of panels per month		
1) High Production	300	
2) Medium Production	2500	
3) Low Production	1000	
3) Short run	450	
4) Prototype	85	

C) Average lead time (delivery) as defined in B)			
1) High Production		4 + weeks	
2) Medium Production		4 weeks	
3) Low Production		3 weeks	
3) Short run		2 weeks	
4) Prototype		1 week	
Quick turn - No. of days <u>5</u>			
D) Product delivered in full panel or array sub-panel format			
1) Total in panel or array format		25-45%	
2) Scored format		25-45%	
3) Tab breakaway format		25-45%	
4) Other		55-75%	
5) Total to customer layout		40-60%	
6) Total to manufacturing layout		40-60%	
E) Product delivered in board format			
1) Total in board format		40-60%	
2) Extracted: scored to size		40-60%	
3) Extracted: sheared to size		0	
4) Extracted: routed to size		40-60%	
4.1.4 APPROVAL AND CERTIFICATION	YES	NO	
A) Company approvals			
1) UL approval	<input checked="" type="checkbox"/>	<input type="checkbox"/>	94V -0
2) Canadian standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3) MIL-P-55110	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4) MIL-P-50884	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5) ISO-9002	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6) ISO-9001	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7) ISO-14000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8) BABT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9) EEC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
10) Customer satisfaction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B) Other certification information			
1)Laminate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2)Quality standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3)Equipment calibration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4.1.5 CUSTOMER INTERFACE PROFILE	YES	NO	COMMENTS
A) Modem capability	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
B) Baud rate			
C) Data verification technique	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
D) Engineering change order process	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E) Job status reporting to customers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4.1.6 OTHER CAPABILITIES	YES	NO	COMMENTS
A) Facility research and development	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B) (Automated) On-line shop floor control/MRP system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C) Process control system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D) Operator training system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4.2 PROCESS ORIENTATION

4.2.1 LAMINATE MATERIAL	PERCENT	COMMENTS
A) Most commonly used laminates (G10, FR4, etc.)	40% 40% 10% 5 %	Brand name Ventec Type FR-4 High Temp Brand name Isola Type FR-4 CAF- rated Brand name Rogers Type RF-rated Brand name Nelco Type N4000 series
B) Other laminate material	5%	
1) Planar resistor layers		UL approved <input type="checkbox"/>
2) BT epoxy		UL approved <input type="checkbox"/>
3) Kevlar		UL approved <input type="checkbox"/>
4) Teflon		UL approved <input type="checkbox"/>
5) Polyimide	5	UL approved <input checked="" type="checkbox"/>
6) Cyanate ester		UL approved <input type="checkbox"/>
7) Other		UL approved <input type="checkbox"/>
C) Specification to which laminate is purchased (check all that apply) <input type="checkbox"/> MIL-P-13949 <input checked="" type="checkbox"/> IPC-4204 <input checked="" type="checkbox"/> IPC-4101 <input checked="" type="checkbox"/> UL Approved <input type="checkbox"/> IPC-4103 <input checked="" type="checkbox"/> Other <input type="checkbox"/> IPC-4202 <input type="checkbox"/> IPC-4203		
D) Laminate storage <input type="checkbox"/> Uncontrolled <input type="checkbox"/> Humidity controlled <input checked="" type="checkbox"/> Temperature controlled <input type="checkbox"/> Dry box <input type="checkbox"/> JIT inventory		
E) Panel size configurations in X, Y dimensions maximum X _____ Y _____ mm minimum X _____ Y _____ mm other X _____ Y _____ mm		21" x 24 " 18" x 24 " 16" x 21 "

4.2.2 PROCESS PRECISION SPECIFICS	YES	NO	VALUE	COMMENTS
A) Maximum printed board thickness built in volume				
1) Single sided	<input checked="" type="checkbox"/>		0.300	
2) Double sided	<input checked="" type="checkbox"/>		0.300	
3) Multilayer	<input checked="" type="checkbox"/>		0.300	
4) Rigid flex				
B) Printed board electrical performance capability				
1) Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	± 10% std.	TDR verification
2) Capacitance control	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3) Microstrip boards	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
C) Tooling system description				
1) Same holes in panels used for all processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2) Optical registration	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Process: Direct Imaging - Camera targets Inner layers X-Ray
3) Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

4.2.3 OTHER PROCESS ORIENTATION SPECIFICS	YES	NO	SYSTEM	COMMENTS
A) Solder mask over bare copper	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Direct Image masks DP-1500 coater	
B) Plating/coating information				
1) Tin/lead reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
2) Hot air leveling	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3) Azole organic	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4) Conductive	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
C) Hole formation				
1) Hole cleaning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plasma Desmear	
2) Hole cleanliness verified	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

4.3 PRODUCT DESCRIPTION

*CONSISTENCY IMPLIES YIELDS IN EXCESS OF 80%

4.3.1. THROUGH HOLE INSERTION	TEST	SIZE (MM)	TOL	COMMENTS
A) Smallest conductor width and tolerance produced with consistency				
1) Outer layers (print and etch)	4	Size <u>0.004"</u> Tol \pm <u>20%</u>		
2) Inner layers (print and etch)	10	Size <u>0.004"</u> Tol \pm <u>20%</u>		
3) Outer layers (plated)	96	Size <u>0.004"</u> Tol \pm <u>20%</u>		
4) Inner layers (plated)	N/A			
5) Outer layers (additive plating)	N/A			
6) Inner layers (additive plating)	N/A			
B) Smallest plated-through hole (PTH) and tolerance consistently produced in 1.5mm thickness material or multilayer board	0.010	+0.003 / -0.010		
1) Minimum PTH diameter		Size <u>.006"</u> Tol \pm <u>+0.003"/-0.006"</u>		
2) Largest panel where this hole can be controlled (across diagonal)		Size <u>18" x 24"</u>		
C) Largest hole size that can be drilled and plated through in a 1.25mm diameter land while maintaining an annular ring of 0.125mm in large/small boards				
1) Largest board size (across diagonal)				No Limit by hole size
2) Largest hole diameter				0.250 by CNC Drill Unlimited by CNC Rout
3) Smallest board size (across diagonal)		Size <u>0.354"</u>		.250" x 0.250" (LxW)
4) Largest hole diameter				0.250 by CNC Drill Unlimited by CNC Rout
D) Surface mount land pattern pitch (check all that apply)				
<input checked="" type="checkbox"/> 1.27mm [.050] <input checked="" type="checkbox"/> 0.63mm [.025]				
<input checked="" type="checkbox"/> 0.5mm [.020] <input checked="" type="checkbox"/> 0.4mm [.016]				
<input checked="" type="checkbox"/> 0.3mm [.012] <input checked="" type="checkbox"/> 0.25mm [.010]				
<input type="checkbox"/> Other _____				

E) Solder mask dam between lands (check all that apply) <input checked="" type="checkbox"/> 1.27mm [.050] <input checked="" type="checkbox"/> 0.63mm [.025] <input checked="" type="checkbox"/> 0.5mm [.020] <input checked="" type="checkbox"/> 0.4mm [.016] <input checked="" type="checkbox"/> 0.3mm [.012] <input checked="" type="checkbox"/> 0.25mm [.010] <input type="checkbox"/> Other ____ .			4-mil dam width std. 3-mil dam width / limited production
F) Flatness tolerance (bow & twist) after reflow or solder coating <input type="checkbox"/> 1.5% <input type="checkbox"/> 1.0% <input type="checkbox"/> 0.5% <input type="checkbox"/> Other ____			

4.3.2 PRODUCT QUALITATIVE AND QUANTITATIVE INFORMATION	YES	NO	QUANTITY OF NUMBER OF PANELS / LOTS / LOTS		COMMENTS
A) Multilayer layer count					
1) Maximum layers fabricated in volume (Maximum Lot)			100 pnls	42 lys	Production tested Larger orders managed in multiple lots
2) Maximum layers fabricated in prototype (Minimum Lot)			2 pnls	42 lys	
B) Buried vias produced consistently in volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size				0.010 0.006	-typical - min
2) Number of layers				2-4 lys 4-12 lys	- Typical - Atypical range
B) Blind vias produced consistently in volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size				0.010 0.006	-Typical -min
2) Number of layers				2-4 lys 4-12 lys	- Typical - Atypical range
1) Controlled depth drilling	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2) Total number of layers				2-4 lys 4-12 lys	- Typical - Atypical range

4.4. TESTING CAPABILITY

4.4.1 TEST AND TEST EQUIPMENT CAPABILITY	YES	NO	COMMENTS	
A) SMT centerline pitch that can be electrically tested <input checked="" type="checkbox"/> 0.63mm [.025] <input checked="" type="checkbox"/> 0.5mm [.020] <input checked="" type="checkbox"/> 0.4mm [.016] <input checked="" type="checkbox"/> 0.3mm [.012] <input type="checkbox"/> 0.25mm [.010] <input type="checkbox"/> Other				
B) Double sided simultaneous electrical testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1) Equipment type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Flying Probe	
2) X-ray fluorescence inspection equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3) TDR equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4) Hi-pot test equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
5) Four-wire kelvin tester	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
6) Capacitance meter	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
7) Cleanliness testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

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4.4.2 AUTOMATED OPTICAL INSPECTION USAGE	COUNT	COMMENTS
A) Before etching	0	
B) After etching	100	
C) Internal layers	100	
D) Final inspection	5	
E) Other	0	
F) Conductor/clearance normally inspected by AOI equipment		
1) <input checked="" type="checkbox"/> 0.05mm [.002]	100	
2) <input checked="" type="checkbox"/> 0.05-.10mm [.002-.004]	100	
3) <input checked="" type="checkbox"/> >.10mm [.004]	100	
4) <input checked="" type="checkbox"/> Planes	100	
G) CAD download to AOI	100	

SECTION 5

QUALITY PROFILE

DATE COMPLETED 2/25/21

GENERAL INFORMATION

COMPANY NAME Circuit Connect, Inc.	
CONTACT Janet Gagnon	
TELEPHONE NUMBER 603-880-7447	FAX NUMBER 603-880-7975

This section of the Manufacturer's Qualification Profile is intended to describe the Total Quality Management (TQM) activity in place of being implemented at the manufacturing facility identified in the site description of this MQP.

To ease in the task of identifying the TQM program being planned or underway at the manufacturing site, the activities have been divided into twenty sections which when completed, provide the total picture of the posture toward managing quality issues. Each section contains a number of questions with regard to the topic under review.

It is not the intent to have the questions be all encompassing, nor is every question applicable to all manufacturers. However, identification of the status, related to each questions, when considered as a whole will convey an impression of the progress that the company has achieved in adopting the principles of total quality management.

The twenty sections, in order of the occurrence are:

- | | |
|---------------------------------------|--|
| 5.1 General Quality Programs | 5.11 Statistical Process Control |
| 5.2 New Products/Technical Services | 5.12 Problem Solving |
| 5.3 Customer Satisfaction | 5.13 In-Process Control |
| 5.4 Computer Integrated Manufacturing | 5.14 Receiving Inspection |
| 5.5 Process Documentation | 5.15 Material Handling |
| 5.6 Quality Records | 5.16 Non-Conforming Material Control |
| 5.7 Skill, Training & Certification | 5.17 Inspection and Test Plan |
| 5.8 Subcontractor Control | 5.18 Product Inspection/Final Audit |
| 5.9 Calibration Control | 5.19 Tooling Inspection, Handling, & Storage |
| 5.10 Internal Audits | 5.20 Corrective Action |

Each section provides a status report related to each question. The question may not be applicable, no activity has started as yet, or the company may have developed an approach to the issues raised by the questions. An (X) is indicated in the appropriate column. If deployment/implementation has started, the status is reported as percent deployment; this is indicated in column 4. The percentage number closely approximates the status of deployment. If deployment exists, the percentage results that have been achieved is indicated in column 5. Results are based on expected goals. Not providing percent information in either the deployment or results column implies a lack of activity in the particular area.

The quality descriptions requested are completed on the following pages by checking (X) the appropriate column to reflect the status of the manufacturing facility TQM program. Additional information may be provided as comments shown below, or on individual sections, or additional sheets as necessary.

COMMENTS
Level 1 Quality Manual available

5.1 GENERAL QUALITY PROGRAMS		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are quality objectives and responsibilities clearly stated, widely distributed and understood through the company?					100
2.	Is there a quality function or well defined organization which provides customer advocate guidance to the total organization and is this position fully supported by management?					100
3.	Does a quality measurement system exist with clearly defined metrics and is it utilized as a management tool?					100
4.	Are work instructions approved and controlled; and are they under revision control?					100
5.	Are the quality procedures and policies current and available at the point of application; and are they under revision control?					100
6.	Are benchmark and customer satisfaction studies done to determine best in class for all products, services, and administrative functions; and are quality goals set?					100
7.	Are Statistical Process Control (SPC) principles understood by all levels of management?					100
8.	Are there programs with sufficient resources assigned to support corrective actions and prevention?					100
9.	Does management solicit and accept feedback from the work force?					100
10.	Is there management support of ongoing training (including quality training), and is it documented by an organizational training plan?					100
11.	Are there regular management reviews of elements of the quality improvement process, including feedback for corrective action, and are the results acted upon?					100
12.	Are the quality and reliability goals aggressive relative to customer expectations and targeted at continuous improvement?					100
13.	Are the people who are responsible for administering the quality assurance function technically informed?					100
14.	Does Management have a "defect prevention" attitude to achieve continuous improvement?					100

5.2 NEW PRODUCTS/TECHNICAL SERVICES		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Do new product/technology/service development policies and procedures exist, and do they result in clearly defined project plans with appropriate measureables and approvals?					100
2.	Is quantitative benchmarking used to evaluate all new products/technologies/services in comparison to best-in-class offerings?					100
3.	Does a roadmap exist to ensure continued development of leading edge, best-in-class products/technology/services?					100
4.	Is the capability of each operation which controls critical-to-function characteristics for new products, fully certified?					100
5.	Are statistical tools used in the development of robust (high yield) new processes, products, and services?					100
6.	When new product/technology/service requires a new process, is it developed jointly and concurrently with the customer and/or suppliers?					100
7.	Are design reviews conducted on a scheduled basis which properly address the process capability indices of critical-to-function and product/service characteristics?					100
8.	Is the new product/technology/service, as produced by the process, verified to meet all customer satisfaction requirements?					100

COMMENTS

5.3 CUSTOMER SATISFACTION		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Is there a measurement system in place to assess the customer's perception of complete performance?					100
2.	Is an independent (unbiased) customer survey routinely conducted?					100
3.	Is there an internal measurement system within the organization which correlates to the level of customer satisfaction?					100
4.	Are there specific goals for achieving Total Customer Satisfaction, both internal and external?					100
5.	To what extent are customer satisfaction goals disseminated and understood by everyone in the organization?					100
6.	Does management regularly review and assess all operating systems to determine if barriers to customer satisfaction exist and are appropriate action plans then implemented?					100
7.	Is there a method in place to obtain future customer requirements?					100
8.	Are all findings of customer dissatisfaction reported back to the proper organization for analysis and corrective action?					100
9.	Are customer satisfaction requirements formally defined and documented, and are they based on customer input?					100
10.	Do all support organizations understand their role in achieving total customer satisfaction?					100

5.4 COMPUTER INTEGRATED MANUFACTURING		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are systems integrated to allow electronic transfer of information between multiple systems to eliminate redundant data entry?					100
2.	Can customers electronically transfer CAD/CAM directly into manufacturing?		X			
3.	Can customers electronically transfer order information directly into the business system?		X			
4.	Is data electronically shared between shop floor control and process control systems (i.e., CNC, SPC, Electrical Test, AOI, etc.)?					100
5.	Are planning systems (MRP, forecasting, capacity planning, financial planning, etc.) electronically integrated with operation systems (order processing, purchasing, inventory management, shop floor control, financial/cost control, etc.)?				75	
6.	Is information available from system processes in real time (vs. batch processing)?					100
7.	Are processes and procedures documented and available on-line?					100
8.	Do all functional departments have system access to key financial, manufacturing, sales, and operational data, as it relates to their functional objectives?					100
9.	Are computer simulation and design tools used to the maximum extent practicable in the design of new products/technologies/services					100

COMMENTS						

5.5 PROCESS DOCUMENTATION		STATUS				
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DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are manufacturing product, process, and configuration documents under issue control?					100
2.	Are "preliminary" and "special product" specifications controlled?					100
3.	Does the system ensure that the most current customer specifications are available to the manufacturing personnel?					100
4.	Does the system ensure that the most current material specifications are available to the procurement function?					100
5.	Are incoming orders reviewed for revisions and issue changes?					100
6.	Is conformance to customer specifications assured before an order is accepted?					100
7.	Is customer feedback provided when designs do not meet manufacturability requirements?					100
8.	Are critical characteristics classified, relative to impact on product performance?					100
9.	Are customers informed of changes made to products controlled by customer drawings or specifications?					100
10.	Is there an effective internal deviation control procedure and, are customer requested deviations documented and followed?					100
11.	Do new product development procedures exist, and are they followed in the design development process?					100

5.6 QUALITY RECORDS		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are records of inspection and process control maintained and available for review?					100
2.	Are records of equipment and equipment maintenance kept?					100
3.	Is the record and sample retention program defined?					100
4.	Are quality data used as a basis for corrective action?					100
5.	Are quality data used in reporting performance and trends to management?					100
6.	Are quality data used in supporting certifications of quality furnished to customers?					100
7.	Is field information used for corrective action?					100
8.	Does a cost of quality measurement system exist?					100
9.	Are customer reported quality problems responded to, and resolved in the time period requested?					100
10.	Is quality information on production material rejects provided to sub-suppliers with required corrective action?					100
11.	Are computers used to collect and analyze quality data?					100
COMMENTS						
5.7 SKILLS, TRAINING, & CERTIFICATION		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results

1.	Does management ensure that all personnel are trained in their role for achieving Total Customer Satisfaction?					100
2.	Do all personnel understand how their performance impacts internal and external customer satisfaction?					100
3.	Do all personnel who contact external customers reflect quality improvement programs?					100
4.	Do personnel participate in professional societies and growth programs?					100
5.	Are all personnel trained in sufficient detail to support key initiatives?					100
6.	Are the results of training evaluated and indicated program changes made?					100
7.	Does a policy exist which encourages the cross training and rotation of personnel, and is this policy used as the basis of job progression?					100
8.	Are performance standards participatively developed, and regularly applied for all personnel?					100
9.	Are Total Customer Satisfaction programs and resulting successes publicized to all personnel?					100
10.	Do goal setting and reward/incentive programs support the quality improvement process?					100

5.8 SUBCONTRACTOR CONTROL		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are requirements defined, communicated, and updated to ensure that the supplier understands expectations?					100
2.	Does a system exist which measures the performance of the supplier and communicates such information to the supplier? (i.e., supplier rating system)					100
3.	Have the organization's processes been characterized to identify the critical requirements for the suppliers products?					100
4.	Have the capabilities of the supplier's processes been assessed and considered in the establishment of the requirements?					100
5.	Have partnerships been established with suppliers, and is assistance provided to ensure that each supplier has the capability to consistently supply conforming products?					100
6.	Have quality and cycle time metrics and improvement goals been established participatively with the supplier?					100
7.	Has a system been established with the supplier for identification and verification of corrective action?					100
8.	Have the requirements for supplier materials been properly characterized and specified to ensure conformance of the product/service to the customer satisfaction requirements?					100
9.	Is there a supplier certification program or equivalent procured material/service continuous quality improvement program?			X		
10.	Can all personnel who contract suppliers properly reflect appropriate quality improvement programs and status to them?					100

COMMENTS					

5.9 CALIBRATION CONTROL		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are calibration and preventative maintenance programs in place and documented?					100

2.	Are calibration and maintenance personnel trained?					100
3.	Is traceability to NIST maintained?					100
4.	Is quality measurement and control equipment current, effective, and sufficiently integrated with production equipment?					100
5.	Is the history of quality measurement and control equipment documented?					100
6.	Has repeatability of measuring devices and inspection or testing processes been established and monitored; are gauge capability studies conducted and GR&R ratios acceptable(<10%)?					100
7.	Are calibration and preventative maintenance cycles on schedule?					100
8.	Is the use of non-calibrated equipment for design and production purposes prohibited?					100
9.	Are tools and fixtures used as criteria or acceptability of product/work fully qualified and identified?					100
10.	Are calibration intervals defined in accordance with industry standards or manufacturer's recommendations and the calibration history of the equipment?					100

5.10 INTERNAL AUDITS		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are regular reviews of the product/process conducted and are goals/plans established to continually improve?					100
2.	Are the processes/products properly documented and controlled? Do they include appropriate customer requirements and are they executed in conformance to the documentation?					100
3.	Are the required quality checks built into the operations within the manufacturing, field installation, and service process, and is the resulting data maintained and promptly acted upon?					100
4.	Are all pertinent methods of statistical quality control properly, effectively and efficiently used?					100
5.	Does a process change control system exist, and are customers informed of changes made to products and processes with customer approval prior to the change, when required?					100
6.	Are the operators within the process provided with written work instructions and are they trained?					100
7.	Is the receipt, handling, storage, packaging and release of all material, including customer provided items, at all stages, specified and controlled to prevent damage or deterioration, and to address obsolete material?					100
8.	Is there a first in/first out (FIFO) system in place, and is it followed?					100

COMMENTS	

5.11 STATISTICAL PROCESS CONTROL						
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Have the personnel who will be responsible for guiding the implementation of SPC been designated?					100
2.	Are statistical techniques used to reduce variation in the engineering process before the start of production?					100
3.	Is the quality system dependent upon process rather than product controls?					100
4.	Is the capability of critical processes and machines measured and monitored with CPK's >1.5, and targeted with CP of 2.0?			X		
5.	Are incapable processes or machines targeted for improvement or replacement?					100
6.	Is SPC implemented for all critical processes?					100
7.	Are procedures that control the reaction to out-of-control situations adequate and effective?					100
8.	Are operators trained in the use of appropriate statistical techniques, and are they properly applying them?					100
9.	Are advanced problem solving techniques used by engineers to solve problems? (Design of Experiments, planned experimentation, advanced diagnostic tools, etc.)		X			
10.	Are control charts and other process controls properly implemented?					100
11.	Is statistical process control being practiced in work centers and are yields being recorded and plotted on a scheduled basis, with respect to upper and lower control limits?					100

5.12 PROBLEM SOLVING						
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are employees trained in problem solving techniques, in comparison to the needs of the organization?					100
2.	Does the organization utilize participative problem solving techniques to identify, measure and resolve internal and external problems?					100
3.	Are problem solving efforts timely and effective?					100
4.	Are applied resources sufficient to remove problem solving constraints?					100
5.	Are statistical techniques used for problem solving?					100
6.	Are quality data used to identify barriers, and to determine the priority of problems?					100
7.	Is there a policy/procedure that includes the use of problem solving techniques to systematically drive reduction in variability?		X			

5.13 IN-PROCESS CONTROL		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are process capabilities established and maintained on all major processes? (critical parameters)					100
2.	Are in-process inspections, test operations, and processes properly specified and performed?					100
3.	Are in-process inspection facilities and equipment adequate?					100
4.	Are the results of in-process inspections used in the promotion of effective preventative action and corrective action?					100
5.	Is preventative maintenance performed on the equipment and facilities?					100
6.	Are housekeeping procedures adequate and how well are they followed?					100
7.	Are process management plans established, and are critical parameters followed?					100
8.	Are work areas uncluttered and free of excess work-in-process, supplies, debris, etc? Is the environment conducive to producing quality work? Is proprietary information adequately protected?					100
9.	Are certifications and in-process inspection results used in making final acceptance decisions?					100
10.	Are methods and procedures for the control of metallurgical, chemical, and other special processes established and followed?					100

5.14 RECEIVING INSPECTION		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are receiving inspection facilities and equipment adequately and properly maintained?					100
2.	Are receiving inspection procedures documented and followed?					100
3.	Are receiving inspection results used for corrective and preventive action?					100
4.	Are the procedures for storage and timely disposition of discrepant material in place and followed?					100

COMMENTS	

5.15 MATERIAL HANDLING						
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are procured material releases from receiving inspection clearly identified, as to acceptance status?					100
2.	Are procedures to facilitate limited life materials, such as prepreg, in place, properly controlled, and monitored?					100
3.	Are procured items identified with some means of traceability (serial number, lot number, date code, etc.)?					100
4.	Are procedures and facilities adequate for storage, release and control of materials?					100
5.	Are in-store and in-process materials properly identified and controlled?					100
6.	Is in-process material protected from corrosion, deterioration, and damage?					100

5.16 NON-CONFORMING MATERIAL CONTROL						
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Is non-conforming material identified, segregated from regular production material, and properly dispositioned?					100
2.	Are non-conforming materials properly identified and controlled to prevent inadvertent use?					100
3.	Is the review and disposition of non-conforming materials defined, and are provisions made for inclusion of the customer in disposition decision?					100
4.	Are procedures for controlling non-conforming materials, and for ensuing corrective action, in place and followed?					100
5.	Do procedures provide for material review by a committee consisting of Quality and Engineering (as a minimum), to determine the disposition of non-conforming materials? (deviating from drawings or specification)					100
6.	Do supplier's procedures and controls for corrective action prevent recurrence of non-conformances?					100
7.	Is there a system for coordinating necessary corrective action with purchasing personnel?					100
8.	Does the corrective action extend to all applicable causes of non-conformance (e.g., design, workmanship, procedures, equipment, etc.)?					100

COMMENTS	

5.17 INSPECTION AND TEST PLAN		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are statistical techniques used in determining the acceptability of finished goods to customer requirements?		X			
2.	Are periodic tests conducted to audit reliability and environmental performance of the final product?			X		
3.	Is CPK tracking performed for critical characteristics, with plans to achieve CPK = 1.5 with a target of CP of 2.0?			X		
4.	Is root cause failure analysis performed for internal and external failures, and is appropriate corrective action implemented?					100
5.	Are test and inspection personnel trained in the procedures of their operations, and are those procedures being followed?					100
6.	Is the new product/technology/service, as produced by the processes, verified to meet all customer satisfaction requirements?					100

5.18 PRODUCT INSPECTION/FINAL AUDIT		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are final product acceptance procedures documented and followed?					100
2.	Are all specific customer product audits conducted, as required?					100
3.	Are inspectors trained for the tasks performed?					100
4.	Are flow charts or milestones developed with checkpoints readily available?					100
5.	Is a system in place which denotes inspection performed; e.g., use of initials, stamps, labels, bar codes, etc., affixed to production documentation?					100
6.	Is a quality system established and maintained for control of product/production documentation?					100
7.	Is "accept/reject" criteria defined and available for use?					100
8.	Is a final audit performed to ensure that all required verifications and tests, from receipt of materials through point of product completion, have been accomplished?					100
9.	Are packing and order checking procedures documented and followed?					100

COMMENTS						

5.19 TOOLING INSPECTION, HANDLING, & STORAGE		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are temperature, humidity, laminar flow controls in place to prevent contamination, and to assure dimensional stability?					100
2.	Do operators use hairnets, gloves & lab coats in all photolab and photoexposure areas?					100
3.	Are work instructions and related forms in place to control all applicable tooling requirements, as stated in the customer's purchase order?					100
4.	Are customer provided artworks controlled with regard to handling, storage, revision control and relationship to converted production phototools (working films)?					100
5.	Are production phototools (working films) controlled with regard to handling, storage, use life, and relationship to customer purchase order?					100
6.	Are customer provided artworks and production phototools (working films) inspected, including dimensional checks?					100
7.	Are all tools, fixtures, and other devices, used for tooling inspection and control, maintained under the calibration control procedure?					100
8.	Are records showing initial acceptance, periodic checks, and any needs for rework and/or modification available?					100

5.20 CORRECTIVE ACTION		STATUS				
DESCRIPTION OF PROGRAM		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
1.	Are final acceptance inspection results used for corrective and preventative action?					100
2.	Is root-cause analysis performed for non-conformances? This includes, but is not limited to, non-conformances (problems) caused by suppliers, found/caused "in-house" during processing, or those reported by the customer.					100
3.	Is positive action taken to prevent recurrence of problems, and are there documented reports/records of each occasion?					100
4.	Do procedures and systems provide for ensuring that replies are made to customer requests for correction action within the time limit specified?					100
5.	Is corrective action controlled and documented for all applicable work centers?					100
6.	When corrections are made, is their effectiveness subsequently reviewed and monitored?					100

COMMENTS	

SECTION 6

MANUFACTURING HISTORY (See Section 2 Site Capability)

DATE COMPLETED 2/25/21

- Order histories are not made public but can be available for on-site review

SECTION 7

IDENTIFICATION OF PREVIOUS AUDITS (Optional)

- Client audit information is kept Company Confidential. Identification of previous ISO Audits are available on- site

SECTION 8

FINANCIAL REVIEW (OPTIONAL)

- Financial information is kept Company Confidential.

Circuit Connect, Inc.

MASTER EQUIPMENT LIST | 2019-10-28

ITEM/DEVICE	BRAND	FUNCTION	QUANTITY	NOTES
AOI	CIMS	Inspection/validation	1	Automated Optical Inspection
CAM software	Frontline	Graphical editing	3	Genesis 2000
CAM software	Numerical	pre-production DRC/DfM	4	Fab 3000 by Numerical Innovations
Film Processor	Rapidline	silver film developer	1	Kodak, et al
Optical Image	ORC	optical imaging system	1	non-standard processing
Direct Image	Maskless/C.B.	digital imaging system	2	L.E.D. source
Scanner	Scan-FAB	Reverse Engineering	1	PCB-to-Gerber conversion
CNC Drill	Excellon	computer controlled drilling	4	Mark VI, Century
CNC Rout	Excellon	computer controlled routing	4	individual cutouts and palleting
CNC Score	Löhr-Hermann	creates v-score lines	1	jump-score capable
CNC Score	Accu-Systems	creates v-score lines	1	jump-score capable
X-Ray Drill	Pluritec	multilayer tooling	1	install/optimize tooling holes
X-Ray Camera	Glenbrook	hole/inner layer viewing	1	real-time registration analysis
Edge Beveller	Bevelmate	bevel card edge connectors	1	AKA, gold finger beveller
Drill Press	Bridgeport	milling, drilling	1	manually operated
Shearer	Pexto	laminare shearing	1	manually operated
Process Line	Electrochemical	permanganate desmear	1	Auto-regen; Chem. etchback option
Process Line	Western Tech	direct metallization	1	MacDermid <i>Shadow</i> [®]
Process Line	generic	electro-copper and tin	1	manually addressable to >6 ounces
Process Line	generic	ENIG final finish coating	1	Electroless nickel/immersion gold
Process Line	generic	Silver final finish coating	1	<i>Sterling</i> [™] immersion silver
Process Line	generic	inner layer surface prep.	1	<i>COBRA Bond</i> ^{™™}
Process Line	generic	hard nickel/gold plating	1	electroplating card-edge connectors
Etch Line	Phoenix	Copper etching	1	horizontal processor
Plasma Chamber	Adv. Plasma Sys.	Plasma desmear/etchback	1	performs to MIL-grade
Image Resist-Coat	Morton	direct-image film coating	1	Model 1600 cut sheet laminator
Image Resist-Coat	Dynachem	direct-image film coating	1	Vacuum laminator, model EX724
Developer	ASI	image resist developer	1	Advanced Systems, Inc.
Developer	Microplate	solder mask developer	1	vertical processor
Scrubber	Pluritec	abrasive surface treatment	1	I.S. Pumiflex pumice; conveyORIZED
Laminare Press	Bürkle	multi-layer binding	1	6 platen; programmable
Solder Coating	Teledyne HALCO	Hot Air Solder Leveling	1	horizontal application, lead-free
Inkjet Imaging	Orbotech	nomenclature/legend	1	High resolution inkjet printing
Mask Coater	Circuit Automation	solder mask application	1	DP-1500 w/tunnel tack oven
Micro-Section	Buehler	micro-section processing	1	high capacity semi-automatic system
XRF Instrument	Cambridge	metal measurement	1	x-ray fluorescence: Ni, Au, Ag, Sn, Cu
Impedance Inst.	Polar	impedance verification	1	TDR unit w/printout
Electrical Test	ATG	continuity/leakage testing	3	Flying Probe
Electrical Test	Micronic	continuity/leakage testing	1	Flying Probe
Waste Treatment	Memtek	whole-facility system	1	metals extraction; pH correction
Air Compressor	Kaeser	whole-facility system	2	twin 75 HP (77 cfm - 374 cfm each)
Oven, convection	Grieve	various curing, baking tasks	2	high capacity/fast recovery roll-in
Oven, U.V. cure	Argus	curing various U.V. inks	1	model 7125
Post-etch tooling	Multiline Tech	multilayer registration system	1	model: <i>Optiline PE</i>