



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
May 2004

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 11/16/2009

GENERAL INFORMATION

LEGAL NAME Circuit Express, Inc.			
PHYSICAL ADDRESS 229 S. Clark Drive			
CITY Tempe	STATE Arizona	ZIP 85281	
PROVINCE	COUNTRY USA		
TELEPHONE NUMBER 480-966-5894	FAX NUMBER 480-966-5896	TELEX NUMBER	
E-MAIL ADDRESS sales@circuitexpress.com	MODEM NUMBER N/A	DATE FOUNDED 1987 <input type="checkbox"/> PUBLIC <input checked="" type="checkbox"/> PRIVATE	
INTERNET URL www.circuitexpress.com	FTP SITE ftp.circuitexpress.com		

MANAGEMENT

PRESIDENT Travis Bice
CHIEF OPERATING OFFICER Travis Bice
DIRECTOR OF MANUFACTURING Kevin McClelland
MANAGER OF QUALITY Joe Lefebure
DIRECTOR OF MARKETING/SALES Chris King
MANAGER OF CUSTOMER SERVICE Chris King
WASTE TREATMENT MANAGER (POLLUTION PREVENTION) Jim Michelin

CORPORATE DESCRIPTION	NUMBER OF EMPLOYEES		COMMENTS
	CORPORATE	SITE	
DESIGN AND DEVELOPMENT	0	2	
ENGINEERING	0	14	
MANUFACTURING CONTROL	0	1	
MANUFACTURING	DIRECT	0	92
	INDIRECT	0	13
QUALITY CONTROL	QUALITY ENGINEERS	0	2
	INTERNAL AUDITORS	0	1
	GENERAL MANAGEMENT	0	1
ADMINISTRATION	0	8	
TOTAL		134	

SECTION 1.2

SITE DESCRIPTION

(TO BE COMPLETED FOR EACH SITE)

 DATE COMPLETED **11/16/2009**
 ATTACH APPROPRIATE CHARTS (OPTIONAL)

MANUFACTURING FACILITY			
COMPANY NAME	Circuit Express, Inc.		
PHYSICAL ADDRESS	229 S. Clark Drive		
CITY	Tempe	STATE	Arizona
PROVINCE		COUNTRY	USA
TELEPHONE NUMBER	480-966-5894	FAX NUMBER	480-966-5896
E-MAIL ADDRESS	sales@circuitexpress.com	MODEM NUMBER	N/A
		YEARS IN BUSINESS	22
INTERNET URL	www.circuitexpress.com	FTP	ftp.circuitexpress.com
PRINCIPLE PRODUCTS/SERVICES/SPECIALTIES	Bare Printed Circuit Board Manufacturing		
	BUSINESS CHARACTERIZATION (HIGH VOLUME, QUICK TURN-AROUND, ETC.) Quick-Turn, Prototype, Low Volume Manufacturing		

FACILITY MANAGEMENT	TITLE	REPORTS TO (Function/Job Title)
OVERALL OPERATION RESPONSIBILITY FOR THIS SITE Travis Bice	President/CEO	N/A
MANUFACTURING Kevin McClelland	Director of Operations	President
TECHNICAL/ENGINEERING Alex Chandy	Product Engineering Manager	President
MATERIALS/PRODUCTION CONTROL Joan O Leary	Production Control Manager	Director of Operations
PURCHASING Lynn Hawkins	Buyer	Director of Operations
QUALITY Joe Iefebure	QA Manager	President
INSIDE SALES REPRESENTATIVE Chris King	Director of Sales	President
WASTE MANAGEMENT Jim Michelin	Environmental & Safety Manager	Director of Operations

BUILDINGS	SYSTEMS (INDICATE % COVERAGE)									
	AGE	AREA (Sq. Ft.)	Construction (Wood/Brick)	Power Conditioning	Heating	Ventilation	Air Conditioning	Sprinklers	Waste Treatment	Other
Office	20	8,000	Block	Yes	100	100	100	100	0	0
Manufacturing	25	25,000	Block	Yes	75	100	50	100	100	0
Storage	25	2,000	Block	Yes	25	0	75	100	0	0
Planned additions	N/A									

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) 3 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 2005 Date of last EPA visit 2007
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 <input checked="" type="checkbox"/> UL # E78104 <input checked="" type="checkbox"/> ISO 9000# 9001/AS9100 <input type="checkbox"/> CSA # _____ <input checked="" type="checkbox"/> Other DESC, Mil 55110 OSX42
Do you have a safety program? Describe below.	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Hazardous Waste Number AZD983466673 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)
134	0	8	14	92	8	0	0	All	N/A	N/A

COMMENTS
CEI conducts annual OSHA & Right to Know training for all employees, and quarterly safety instructions

SECTION 2.2

ELECTRICAL TEST EQUIPMENT

DATE COMPLETED
11/16/2009

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:	

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 checked="" 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 checked="" type="checkbox"/> Double Sided Grid <input checked="" 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 checked="" 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 type="checkbox"/> 500 VDC <input checked="" type="checkbox"/> 1000 VDC <input type="checkbox"/> >1000 VDC <input type="checkbox"/> Other:	
J	Impedance Meas	<input type="checkbox"/> Micro Section <input type="checkbox"/> Inboard Circuit <input type="checkbox"/> Coupon <input checked="" type="checkbox"/> Manual TDR <input type="checkbox"/> Automated TDR <input type="checkbox"/> Other:	Coupon
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 10/13/2009

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 type="checkbox"/> Other:
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 type="checkbox"/> Epoxy Paper <input checked="" type="checkbox"/> Epoxy Glass <input type="checkbox"/> Modified Epoxy Composite <input checked="" type="checkbox"/> Polyimide Film & Reinforce <input 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 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 checked="" type="checkbox"/> 1/4 Minimum <input checked="" 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 checked="" type="checkbox"/> 3-5 Max <input type="checkbox"/> 6-9 Max <input 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 checked="" type="checkbox"/> None (Legend) <input checked="" type="checkbox"/> UL Material Logo <input checked="" type="checkbox"/> U.L. V ₀ Logo <input checked="" type="checkbox"/> U.L. V ₁ Logo <input type="checkbox"/> U.L. V ₂ Logo <input type="checkbox"/> Other:	
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SECTION 2.4

PRODUCT COMPLEXITY

DATE COMPLETED 10/13/2009

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 checked="" type="checkbox"/> 750 [29.50] <input type="checkbox"/> 850 [33.50] <input type="checkbox"/> >850 [33.50] <input type="checkbox"/> Other:	
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 checked="" type="checkbox"/> 5,0 [.200] <input type="checkbox"/> 6,5 [.250] <input type="checkbox"/> >6,5 [.250] <input type="checkbox"/> Other:	
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 checked="" type="checkbox"/> >28 <input type="checkbox"/> Other:	

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 checked="" type="checkbox"/> Other: Laser =.003"	Outside service
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 type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input checked="" type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	
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] <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:	

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 type="checkbox"/> 0,100 [.004] <input checked="" type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	
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:	
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 type="checkbox"/> 0,100 [.004] <input checked="" type="checkbox"/> 0,075 [.003] <input type="checkbox"/> 0,050 [.002] <input type="checkbox"/> <0,050 [.002] <input type="checkbox"/> Other:	

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 [0.0008] <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 type="checkbox"/> 0,10 [.004] <input checked="" 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
10/13/2009

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 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 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 type="checkbox"/> TQM Team Trained <input type="checkbox"/> Design of Experiment Training and Use <input checked="" type="checkbox"/> New Process Implementation Training <input 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 checked="" 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 checked="" type="checkbox"/> Other:	QA Manual meets and is approved to AS9100 (B)
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 checked="" type="checkbox"/> Plan Exists <input type="checkbox"/> Training Started <input checked="" type="checkbox"/> Process Data Collected & Analyzed <input type="checkbox"/> All Employees Trained <input type="checkbox"/> First Process Stable & Capable <input checked="" type="checkbox"/> Several Major Processes Stable & Capable <input checked="" 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 checked="" type="checkbox"/> Supplier Rating Program <input type="checkbox"/> Monthly Analysis Program <input checked="" type="checkbox"/> Key Problems Identified <input checked="" type="checkbox"/> Supplier Reviews Performance Data provided <input checked="" 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 checked="" 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 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 checked="" type="checkbox"/> ISO-9001 <input checked="" type="checkbox"/> Other: AS9100 Rev B Cert	ISO9001:2008 Date 2-18-09 Expire 2-17-12

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

DATE COMPLETED 11/16/2009
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* Examples of equipment limitations include:
min/max board size & min/max working area

3.1	PHOTOTOOL CAPABILITY	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	AOI of phototool	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Barco, Argos 8000	1	To .00025
B)	AOI CAD reference (CAM)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Lavenir / Pentalogix / UCAM	1	Non-Intelligent
C)	Photoplotting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EIE SA RP204-NT	1	2 mil on 2 mil 2000-8000 DPI
D)	Photo reductions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A		
E)	Film scan and conversion	<input checked="" type="checkbox"/>	<input type="checkbox"/>			Outside Service
F)	Film processing <input type="checkbox"/> air-dried <input type="checkbox"/> force-dried <input checked="" type="checkbox"/> processed in automatic processor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Multilith Pro.	1	
G)	Media types <input checked="" type="checkbox"/> silver halide film <input type="checkbox"/> glass <input checked="" type="checkbox"/> diazo	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FUGI HPR 1-S DPC-HCP		

3.2	DRILLING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Manual	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B)	Optical (single spindle)	<input type="checkbox"/>	<input type="checkbox"/>			
C)	N.C. drill	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pluritec Single Spindle Mark VI 5 Spindle machines	6 2	150k spindles

3.3	ROUTING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Edge beveler	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Barnaby model 202	1	Manual
B)	Hand router (pin router)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C)	N.C. router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Excellon MK-5 (3 spindle)	2	
D)	N.C. driller/router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EX-200 (2 spindle)	1	
E)	Scoring (profile)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EX-200 (2 Spindle)	1	
F)	Scoring (straight line)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EX-200 (2 Spindle)	1	

3.4	MECHANICAL EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Punch press	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B)	Shear	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Tennsmith	1	
C)	Milling machine	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mark IV Driller/Router	2	

3.5	HOLE PREPARATION (DESMEAR)	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Permanganate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Solution Tech HN 402 Potassium Permanganate	1	
B)	Plasma	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Advanced Plasma 2500 Watts	1	
C)	Mechanical	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D)	Etchback	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Advanced Plasma 2500 Watts	1	

3.6	PRIMARY IMAGE APPLICATION	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Dry film	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dupont HRL24	1	
				Western Magnum XRL 240	2	
				Anti Static Auto Cleaner	1	
				Expose Colight	3	
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	QTY	EQUIPMENT LIMITS
A)	Black oxide	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid Multibond 100	1	
B)	Red oxide	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C)	Copper scrub	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D)	Durabond	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E)	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.8	LAMINATION	YES	NO	MATERIAL	QTY	APPLICATION TECHNIQUE
A)	High pressure	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
B)	High temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	OEM Vacuum	1	700 F
C)	Vacuum	<input checked="" type="checkbox"/>	<input type="checkbox"/>	OEM Vacuum		
D)	Vacuum assist	<input checked="" type="checkbox"/>	<input type="checkbox"/>	OEM Vacuum	2	
E)	Foil heat assist	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
F)	Separate cool-down	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.9	ELECTROLESS COPPER PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Fully additive application	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B)	Electroless deposition (semiadditive)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C)	Through-hole and via	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DOW 3000-1	2	

3.10	COPPER ELECTROPLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Copper sulfate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DOW 1100	2	
B)	Pyrophosphate	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
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 LIMITS
A)	Tin/lead electroplated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	McDermid	1	
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"/>	Avalon 700	1	Vertical Machine

3.12	FUSING PROCESSES	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	I.R. reflow	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
B)	Hot oil reflow	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Standard	1	
C)	Horizontal (hot air level)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D)	Vertical (hot air level)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Avalon 700	1	

3.13	NICKEL SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Electroless nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid Planar	1	
B)	Electroplated nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Technic HT	1	

3.14	GOLD SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Electroless gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid Planar	1	
B)	Electroplated gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Technic Orosene	1	

3.15	PALLADIUM SURFACE PLATING	YES	NO	EQUIPMENT	QTY	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	QTY	EQUIPMENT LIMITS
A)	Screened deposited image	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

B)	Dry film photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dupont		Outside Service
C)	Liquid photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DP-1500 DP-10 Electra Carapace EMP110AS TAIYO HB #PSR-4000BN (HV)	1 1	
D)	Dry film/liquid combination	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

3.17	ORGANIC SURFACE PROTECTION	YES	NO	EQUIPMENT	QTY	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	QTY	EQUIPMENT LIMITS
A)	Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Buehler and Allied Grinders	2	
B)	Single cavity automated	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C)	Multiple cavity automated	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D)	Plating thickness analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nikon Scope Boeckler Scale Oxford XRX, Silver, Gold, Nickel, Solder	2 2 1	

3.19	CHEMICAL ANALYSIS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Etching chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cupric Amonical	1 1	
B)	Plating chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Acid cu, Sn, Au, Ni, Ag	all	
C)	Effluent (PPM) analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Perkin Elmer AA	1	

3.20	ELECTRICAL TEST EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A)	Continuity and shorts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CircuitLine 2S CircuitLine 48	1 1	80 Mil 100 Mil
B)	Fixture development	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Pentalogix (Lavenir)	2	
C)	Flying probe test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EMMA ELX6146	3	
D)	Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Polar CITS 5005	1	

MASTER EQUIPMENT LISTINGDATE COMPLETED
11/16/2009**FORM MQP 10**

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
2101	Photo Plotter	RP208NT				
	Film Processor	Multilith Pro				
	Exposure Machine	GraphicTechnical				
724	Artwork Punch	Spartanics 83-0000BCE				
32683	Vacuum Laminating Press (3 opening)	OEM 336/05/02/32642/HCLC1				
	Vacuum Laminating Press (4 opening)	OEM				
	Deep Throat micrometer measuring table	Carter				
377110	Shear	Tennsmith				Shear
05405396-1 05406796-1	Pluritek Drill 2 (150k spindles)					
07006800 07006801 07005100 07005200	Pluritek Drill 4(150k spindles)					
6278	Excellon Drill 5 spindle	Mark VI				
333	Excellon Drill 5 spindle	Mark VI				
165	Ex200 Driller/Router	EX200DR				
128	Ex200 Driller/Router	EX200DR				
427	Excellon SL-3 3 head driller/router	XL-3DR				
168	Excellon Driller/Router	Mark V				
04XX	Ex200 Flash Router	EX200DR				
128	Ex300 Flash Router	EX300D				
477C	Barnaby Pinning machine	802				
4153	Barnaby Pinning machine	802E				
925	Barnaby Bevel machine	202				
A00010671S	X-Ray	RTX-113 Glennbrook Technology				
	Plasma Etch	March Plasma System				
7415-232	Exposure Machine	Colight DMVL-1600 UV 5-KW				
7409-317	Exposure Machine	Colight DMVL-1630 UV 8-KW				
7409-296	Exposure Machine	Colight DMVL-1630 UV 8-KW				
896	Hot Roll Laminator	Dupont HRL-24				

IDENTIFICATION	EQUIPMENT NAME/DESCRIPTION	MANUFACTURER TYPE/MODEL	EQUIPMENT LIMITS	ACCURACY	CALIBRATION FREQUENCY	REMARKS
377	Hot Roll Laminator	Western Magnum XRL240				
266	Hot Roll Laminator	Western Magnum XRL240				
1298	Auto Cleaner	Anti StaticCMN600				
95015	Conveyorized Clean Line	Marseco Harliquin Series Css24REB				
707161	Dryfilm Resist Developer	Chemcut 547XLI				
707162	Cupric Etcher	Chemcut 547XLI				
707164	Amonical Etcher	Chemcut 547XLI				
707163	Resist Stripper	Chemcut 547SLI				
570-5954	Tin Strip	Chemcut LX110-30				
	Plate Scrubber (sander)	Marseco (plate scrubber)				
	Deburr	Marseco				
	Electroless Line with oscillation and Vibration	Custom				
	Desmear line with oscillation and vibration	Custom				
	Electrolytic Copper Plate tank	6 cell dual rectification				
	Electrolytic Copper Plate tank	4 cell dual rectification				
	Bright Acid Tin plate tank	Custom				
	Tin/Lead plating tank	Custom				
	Deep /Tip Nickel Electroplate line	Custom				
	Deep/Tip Hard Gold Electrplate line	Custom				
	Immersion Silver plate line	Custom				
	Electroless Ni/Au plating line	Custom				
	Fluxer	Avalon				
	Hot Air Solder Level	Avalon AVTEC4000				
	Tin/Lead reflow	Custom				
123599	Pumice Scrub	IS Pumiflex 24				
158283	Pumice Filter	IS Filtrex II				
30050	Soldermask Developer	VCM 4X3SXDD				
	Screening Tables (3)					
51113	LPI Dual Side screening machine	DP1500-2X				
4554	Tacky Clean machine	CM40600RP/110/60				
	Oven	Blue-M R1010				
P6-845	Oven	Blue-M POM-246F				
621-700001	Oven	C-Sun SMO-7A				
621-700157-1	Oven	C-Sun SMO-7A				

IDENTIFICATION	EQUIPMENT NAME/DESCRIPTION	MANUFACTURER TYPE/MODEL	EQUIPMENT LIMITS	ACCURACY	CALIBRATION FREQUENCY	REMARKS
621-110069	Oven	C-sun SMO-7A				
53544	Oven	Grieve 343				
52289	Oven	Grieve 11-300				
M350	Digital Legend Printer	Printar LPG-509				
9257	IR Legend tack cure machine	BBC Ind. H-24T08-4				
D15A-002-M035	Panel stacker	D15A				
FA176400	Flying Probe tester (250 volt)	Microcraft ELX-6146				
E276400	Flying Probe tester (250 volt)	Microcraft ELX-6146				
D6746400	Flying Probe tester (1000 volt)	Microcraft ELX-6146				
24B009	Bed of nails tester (250 volt)	Precise (single sided)				
26B024	Bed of nails tester (250 volt)	Precise (double sided)				
	Test Repair stations (2)					
	Cross Section Grinding Machine	Allied M-Prep4				
	Cross Section Grinding Machine	Buehler Auto met 2				
	Cross Section Grinding Machine	Buehler Auto met 2				
	Solder Float pots (2)					
	X-section punch	Roper Whitney				
11530	X-section measuring scope	Nikon EPIPHOT				
R0081505	X-section measuring scope	Nikon EPIPHOT 200				
14209571	Electronic measurment scale	Beckler GR-120				
4050060102	Atomic Absorption Spectrometer	Perkin AANALYST 100				
336001	Spectronic Genesys 5	336001				
159D	AOI Machine	Mania Barco ARGOS 8008				
97853	Xray surface thickness measurement	CMI XRX CMI 900				
96968	CMI copper thickness measurement	CMI MFX-CMI				
56112	Ionic Contamination	Omega Meter				
6203	Measuring system	Micro-view 9050A M3210855				
10154361	Controlled Impedance Tester	Polar CITS 500S				
968456	Surface plate	Starrett				

771206	Shrink wrap machine	Prefered Packaging Systems PP1519EC				
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SECTION 4

TECHNOLOGY PROFILE SPECIFICS

DATE COMPLETED
11/16/2009

4.1 ADMINISTRATION

4.1.1 CAPACITY PROFILE	EST %	COMMENTS
A) Total annual capacity in square meters (surface area) per month	35,000	
B) Presently running at ____ % of capacity	55	

4.1.2 PERCENTAGE OF DOLLAR VOLUME	EST %	COMMENTS
A) Single sided (rigid)	.2	
B) Double sided (rigid)	22	
C) Multilayer (rigid)	78	
D) Single side (unreinforced-flex)	0	
E) Double sided (unreinforced-flex)	0	
F) Multilayer (unreinforced-flex)	0	
G) Multilayer (rigid/flex)	0	

4.1.3 PANEL PRODUCTION PROFILE	UNITS PER MONTH
A) Size of a production lot in panels	
1) Normal	5, 12" x 18"
2) Smallest	1, 9" x 12"
B) Number of panels per month	
1) High Production	0
2) Medium Production	250
3) Low Production	1000
3) Short run	500
4) Prototype	2,000

C) Average lead time (delivery) as defined in B)				
1) High Production	N/A			
2) Medium Production	15 Days			
3) Low Production	10 Days			
3) Short run	5 Days			
4) Prototype	3 Days			
Quick turn - No. of days <u>3</u>				
D) Product delivered in full panel or array sub-panel format				
1) Total in panel or array format	10%			
2) Scored format	5.0%			
3) Tab breakaway format	5.0%			
4) Other	0			
5) Total to customer layout	5%			
6) Total to manufacturing layout	95%			
E) Product delivered in board format				
1) Total in board format	90%			
2) Extracted: scored to size	10%			
3) Extracted: sheared to size	0			
4) Extracted: routed to size	90%			
4.1.4	APPROVAL AND CERTIFICATION	YES	NO	COMMENTS
A) Company approvals				
1) UL approval	<input checked="" type="checkbox"/>	<input type="checkbox"/>	94V Level ___ UL V0	
2) Canadian standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3) MIL-P-55110	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>	
8) BABT	<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"/>	IPC-4101
2)Quality standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AS9100 Rev B
3)Equipment calibration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ANSI/NCSL Z540-1-1994

4.1.5	CUSTOMER INTERFACE PROFILE	YES	NO	COMMENTS
A)	Modem capability	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B)	Baud rate			
C)	Data verification technique	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DFM AND DRC ON EACH JOB. NETLIST COMPARISON
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"/>	REAL TIME JOB TRACKING SYSTEM

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"/>	BACON SOFTWARE REAL TIME SYSTEM
C)	Process control system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LAB WIZARD
D)	Operator training system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Certified Operator Program

4.2 PROCESS ORIENTATION

4.2.1 LAMINATE MATERIAL	EST %	COMMENTS
A) Most commonly used laminates (G10, FR4, etc.)	70.0 5.0 5.0	Brand name Isola IPC/4101/24 Type GFG, RoHs, FR4 Brand name Isola 408 Type GIL Brand name Rogers 4350, 5880, 4003 Type Duroid Brand name Type
B) Other laminate material		
1) Planar resistor layers	0	UL approved <input type="checkbox"/>
2) BT epoxy	0	UL approved <input type="checkbox"/>
3) Kevlar	0	UL approved <input type="checkbox"/>
4) Teflon	1.0%	UL approved <input type="checkbox"/>
5) Polyimide	15%	UL approved <input checked="" type="checkbox"/>
6) Cyanate ester	0	UL approved <input type="checkbox"/>
7) Other Rogers	5%	UL approved <input checked="" type="checkbox"/> Mixed FR4/4350
C) Specification to which laminate is purchased (check all that apply) <input type="checkbox"/> MIL-P-13949 <input type="checkbox"/> IPC-4204 <input checked="" type="checkbox"/> IPC-4101 <input checked="" type="checkbox"/> UL Approved <input type="checkbox"/> IPC-4103 <input type="checkbox"/> Other <input type="checkbox"/> IPC-4202 <input type="checkbox"/> IPC-4203		
D) Laminate storage <input type="checkbox"/> Uncontrolled <input checked="" type="checkbox"/> Humidity controlled <input checked="" type="checkbox"/> Temperature controlled <input type="checkbox"/> Dry box <input checked="" type="checkbox"/> JIT inventory		
E) Panel size configurations in X, Y dimensions maximum X <u>457</u> Y <u>660</u> mm minimum X <u>228</u> Y <u>304</u> mm other X <u>457</u> Y <u>607</u> mm X <u>303</u> Y <u>457</u> mm		

4.2.2	PROCESS PRECISION SPECIFICS	YES	NO	VALUE	COMMENTS
A)	Maximum printed board thickness built in volume				
	1) Single sided	X		.200	
	2) Double sided	X		.200	
	3) Multilayer	X		.200	
	4) Rigid flex		X		
B)	Printed board electrical performance capability				
	1) Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Polar Cits500s
	2) Capacitance control	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	3) Microstrip boards	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>		Process:
	3) Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5 Pin Multilayer Registration System

4.2.3	OTHER PROCESS ORIENTATION SPECIFICS	YES	NO	SYSTEM	COMMENTS
A)	Solder mask over bare copper	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
B)	Plating/coating information				
	1) Tin/lead reflow	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>		
C)	Hole formation				
	1) Hole cleaning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plasma & Permanganate, High pressure rinsing	
	2) Hole cleanliness verified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Light table back light inspection	

4.3 PRODUCT DESCRIPTION

*CONSISTENCY IMPLIES YIELDS IN EXCESS OF 80%

4.3.1. THROUGH HOLE INSERTION	EST %	SIZE (MM) - +/- TOL	COMMENTS
A) Smallest conductor width and tolerance produced with consistency			
1) Outer layers (print and etch)		Size <u>.101</u> mm Tol \pm <u>.025</u> .mm	.003 +/- .0005
2) Inner layers (print and etch)		Size <u>.101</u> mm Tol \pm <u>.025</u> .mm	.003 +/- .0005
3) Outer layers (plated)		Size <u>.101</u> mm Tol \pm <u>.025</u> .mm	.003 +/- .0005
4) Inner layers (plated)		Size <u>.101</u> mm Tol \pm <u>.025</u> .mm	.003 +/- .0005
5) Outer layers (additive plating)	N/A	Size _____ mm Tol \pm _____ .mm	
6) Inner layers (additive plating)	N/A	Size _____ mm Tol \pm _____ .mm	
B) Smallest plated-through hole (PTH) and tolerance consistently produced in 1.5mm thickness material or multilayer board			
1) Minimum PTH diameter		Size <u>.10</u> mm Tol \pm <u>.025</u> .mm	
2) Largest panel where this hole can be controlled (across diagonal)		Size <u>.762</u> mm Tol \pm _____ .mm	
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)		Size <u>.690</u> mm	
2) Largest hole diameter		Size <u>.762</u> mm	
3) Smallest board size (across diagonal)		Size <u>.36</u> mm	
4) Largest hole diameter		Size <u>.762</u> mm	
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 ____ .						
F) Flatness tolerance (bow & twist) after reflow or solder coating						
<input checked="" type="checkbox"/> 1.5% <input checked="" type="checkbox"/> 1.0% <input checked="" type="checkbox"/> 0.5% <input type="checkbox"/> Other ____						
4.3.2 PRODUCT QUALITATIVE AND QUANTITATIVE INFORMATION		YES	NO	QUANTITY OF PANELS	NUMBER of DIMENSION	COMMENTS
A) Multilayer layer count						
1) Maximum layers fabricated in volume (Maximum Lot)		X		50	30 Layers	
2) Maximum layers fabricated in prototype (Minimum Lot)		X		10	30 Layers	
B) Buried vias produced consistently in volume		<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size					406mm x 558 mm	
2) Number of layers				30	30	
B) Blind vias produced consistently in volume		<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size					406 mm x 558 mm	
2) Number of layers				30	30	
1) Controlled depth drilling		<input checked="" type="checkbox"/>	<input type="checkbox"/>			Laser & Mechanical
2) Total number of layers				30	30	

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 checked="" type="checkbox"/> 0.25mm [.010] <input checked="" type="checkbox"/> Other			.003" Flying Probe
B) Double sided simultaneous electrical testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1) Equipment type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(1) Circuitline 2/S, (1) Circuitline 24, Flying Probe EMMA ELX6146 (Microcraft) (3 machines)
2) X-ray fluorescence inspection equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Oxford CMI, Model XRX
3) TDR equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Polar CITS500S
4) Hi-pot test equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Performed on Flying Probe Microcraft machine.
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"/>	Omegameter Model OM600

4.4.2 AUTOMATED OPTICAL INSPECTION USAGE	EST %	COMMENTS
A) Before etching	0	
B) After etching	100%	
C) Internal layers	100%	
D) Final inspection	15%	
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	80%	
G) CAD download to AOI	100%	

SECTION 5

QUALITY PROFILE

DATE COMPLETED 11/16/2009
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GENERAL INFORMATION

COMPANY NAME Circuit Express, Inc.	
CONTACT Travis Bice, President	
TELEPHONE NUMBER 480-966-5894	FAX NUMBER 480-966-5896

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

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?			X	100	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?			X	100	100
3.	Does a quality measurement system exist with clearly defined metrics and is it utilized as a management tool?			X	100	100
4.	Are work instructions approved and controlled; and are they under revision control?			X	100	100
5.	Are the quality procedures and policies current and available at the point of application; and are they under revision control?			X	100	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?			X	100	100
7.	Are Statistical Process Control (SPC) principles understood by all levels of management?			X	100	100
8.	Are there programs with sufficient resources assigned to support corrective actions and prevention?			X	100	100
9.	Does management solicit and accept feedback from the work force?			X	100	100
10.	Is there management support of ongoing training (including quality training), and is it documented by an organizational training plan?			X	100	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?			X	100	100
12.	Are the quality and reliability goals aggressive relative to customer expectations and targeted at continuous improvement?			X	100	100
13.	Are the people who are responsible for administering the quality assurance function technically informed?			X	100	100
14.	Does Management have a "defect prevention" attitude to achieve continuous improvement?			X	100	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?	X				
2.	Is quantitative benchmarking used to evaluate all new products/technologies/services in comparison to best-in-class offerings?	X				
3.	Does a roadmap exist to ensure continued development of leading edge, best-in-class products/technology/services?			X	80	80
4.	Is the capability of each operation which controls critical-to-function characteristics for new products, fully certified?	X				
5.	Are statistical tools used in the development of robust (high yield) new processes, products, and services?			X	80	80
6.	When new product/technology/service requires a new process, is it developed jointly and concurrently with the customer and/or suppliers?			X	100	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?			X	100	100
8.	Is the new product/technology/service, as produced by the process, verified to meet all customer satisfaction requirements?			X	100	100

COMMENTS	

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

5.4 COMPUTER INTEGRATED MANUFACTURING		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are systems integrated to allow electronic transfer of information between multiple systems to eliminate redundant data entry?			X	100	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.)?			X	100	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.)?			X	100	100
6.	Is information available from system processes in real time (vs. batch processing)?			X	100	100
7.	Are processes and procedures documented and available on-line?	X				
8.	Do all functional departments have system access to key financial, manufacturing, sales, and operational data, as it relates to their functional objectives?			X	100	100
9.	Are computer simulation and design tools used to the maximum extent practicable in the design of new products/technologies/services	X				

COMMENTS

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

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

COMMENTS						

5.7 SKILLS, TRAINING, & CERTIFICATION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Does management ensure that all personnel are trained in their role for achieving Total Customer Satisfaction?			X	100	100
2.	Do all personnel understand how their performance impacts internal and external customer satisfaction?			X	100	100
3.	Do all personnel who contact external customers reflect quality improvement programs?			X	100	100
4.	Do personnel participate in professional societies and growth programs?			X	100	50
5.	Are all personnel trained in sufficient detail to support key initiatives?			X	100	100
6.	Are the results of training evaluated and indicated program changes made?			X	100	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?			X	100	90
8.	Are performance standards participatively developed, and regularly applied for all personnel?			X	100	100
9.	Are Total Customer Satisfaction programs and resulting successes publicized to all personnel?			X	100	100
10.	Do goal setting and reward/incentive programs support the quality improvement process?			X	100	100

5.8 SUBCONTRACTOR CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are requirements defined, communicated, and updated to ensure that the supplier understands expectations?			X	100	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)			X	100	100
3.	Have the organization's processes been characterized to identify the critical requirements for the suppliers products?			X	100	100
4.	Have the capabilities of the supplier's processes been assessed and considered in the establishment of the requirements?			X	100	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?			X	100	100
6.	Have quality and cycle time metrics and improvement goals been established participatively with the supplier?			X	100	100
7.	Has a system been established with the supplier for identification and verification of corrective action?			X	100	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?			X	100	100
9.	Is there a supplier certification program or equivalent procured material/service continuous quality improvement program?			X	100	100
10.	Can all personnel who contract suppliers properly reflect appropriate quality improvement programs and status to them?			X	100	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?			X	100	100
2.	Are calibration and maintenance personnel trained?	X				
3.	Is traceability to NIST maintained?			X	100	100
4.	Is quality measurement and control equipment current, effective, and sufficiently integrated with production equipment?			X	100	100
5.	Is the history of quality measurement and control equipment documented?			X	100	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%)?			X	100	100
7.	Are calibration and preventative maintenance cycles on schedule?			X	100	100
8.	Is the use of non-calibrated equipment for design and production purposes prohibited?			X	100	100
9.	Are tools and fixtures used as criteria or acceptability of product/work fully qualified and identified?			X	100	100
10.	Are calibration intervals defined in accordance with industry standards or manufacturer's recommendations and the calibration history of the equipment?			X	100	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?			X	100	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?			X	100	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?			X	100	100
4.	Are all pertinent methods of statistical quality control properly, effectively and efficiently used?			X	100	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?			X	100	100
6.	Are the operators within the process provided with written work instructions and are they trained?			X	100	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?			X	100	100
8.	Is there a first in/first out (FIFO) system in place, and is it followed?			X	100	100

COMMENTS						

5.11 STATISTICAL PROCESS CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Have the personnel who will be responsible for guiding the implementation of SPC been designated?			X	100	100
2.	Are statistical techniques used to reduce variation in the engineering process before the start of production?			X	100	100
3.	Is the quality system dependent upon process rather than product controls?			X	100	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?			X	100	100
6.	Is SPC implemented for all critical processes?			X	100	100
7.	Are procedures that control the reaction to out-of-control situations adequate and effective?			X	100	100
8.	Are operators trained in the use of appropriate statistical techniques, and are they properly applying them?			X	100	100
9.	Are advanced problem solving techniques used by engineers to solve problems? (Design of Experiments, planned experimentation, advanced diagnostic tools, etc.)			X	100	100
10.	Are control charts and other process controls properly implemented?			X	100	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?			X	100	100

5.12 PROBLEM SOLVING		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are employees trained in problem solving techniques, in comparison to the needs of the organization?			X	100	100
2.	Does the organization utilize participative problem solving techniques to identify, measure and resolve internal and external problems?			X	100	100
3.	Are problem solving efforts timely and effective?			X	100	100
4.	Are applied resources sufficient to remove problem solving constraints?			X	100	100
5.	Are statistical techniques used for problem solving?			X	100	85
6.	Are quality data used to identify barriers, and to determine the priority of problems?			X	100	100
7.	Is there a policy/procedure that includes the use of problem solving techniques to systematically drive reduction in variability?			X	100	100

COMMENTS						

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

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

COMMENTS	

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

5.16 NON-CONFORMING MATERIAL CONTROL		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Is non-conforming material identified, segregated from regular production material, and properly dispositioned?			X	100	100
2.	Are non-conforming materials properly identified and controlled to prevent inadvertent use?			X	100	100
3.	Is the review and disposition of non-conforming materials defined, and are provisions made for inclusion of the customer in disposition decision?			X	100	100
4.	Are procedures for controlling non-conforming materials, and for ensuing corrective action, in place and followed?			X	100	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)			X	100	100
6.	Do supplier's procedures and controls for corrective action prevent recurrence of non-conformances?			X	100	100
7.	Is there a system for coordinating necessary corrective action with purchasing personnel?			X	100	100
8.	Does the corrective action extend to all applicable causes of non-conformance (e.g., design, workmanship, procedures, equipment, etc.)?			X	100	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?			X	100	100
5.	Are test and inspection personnel trained in the procedures of their operations, and are those procedures being followed?			X	100	100
6.	Is the new product/technology/service, as produced by the processes, verified to meet all customer satisfaction requirements?			X	100	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?			X	100	100
2.	Are all specific customer product audits conducted, as required?			X	100	100
3.	Are inspectors trained for the tasks performed?			X	100	100
4.	Are flow charts or milestones developed with checkpoints readily available?			X	100	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?			X	100	100
6.	Is a quality system established and maintained for control of product/production documentation?			X	100	100
7.	Is "accept/reject" criteria defined and available for use?			X	100	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?			X	100	100
9.	Are packing and order checking procedures documented and followed?			X	100	100

COMMENTS						

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

5.20 CORRECTIVE ACTION		STATUS				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are final acceptance inspection results used for corrective and preventative action?			X	100	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.			X	100	100
3.	Is positive action taken to prevent recurrence of problems, and are there documented reports/records of each occasion?			X	100	100
4.	Do procedures and systems provide for ensuring that replies are made to customer requests for correction action within the time limit specified?			X	100	100
5.	Is corrective action controlled and documented for all applicable work centers?			X	100	100
6.	When corrections are made, is their effectiveness subsequently reviewed and monitored?			X	100	100

COMMENTS	

DATE COMPLETED
11/16/2009

SECTION 6 (CHECK ONE IN EACH LINE THAT APPLIES)

MANUFACTURING HISTORY (See Section 2 Site Capability)

Please complete as many history profiles so that the total descriptions of products you manufacture account for production orders that reflect 70% of your business. History profiles are for board or board family (board types may be grounded together if they are similar).

BOARD TYPE	DATE OF ORDER	MATERIAL	HISTORY #
VIA TYPE	PRODUCTION QUANTITY	TOTAL YEARLY PRODUCTION %	

Dimensions in millimeters (inches in brackets)

BOARD			HOLES		
BOARD SIZE DIAGONAL	TOTAL BOARD THICKNESS	NUMBER CONDUCTIVE LAYERS	DIA DRILLED HOLES	TOTAL PTH TOL (MAX-MIN)	LOCATION TOL DTP
<input type="checkbox"/> <250 [<10.00]	<input type="checkbox"/> <1,0 [$<.040$]	<input type="checkbox"/> 1-4 [1-4]	<input type="checkbox"/> >0,5 [$>.020$]	<input type="checkbox"/> >0,250 [$>.010$]	<input type="checkbox"/> >0,50 [$>.020$]
<input type="checkbox"/> 250 [10.00]	<input type="checkbox"/> 1,0 [.040]	<input type="checkbox"/> 5-6 [5-6]	<input type="checkbox"/> 0,5 [.020]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 350 [14.00]	<input type="checkbox"/> 1,6 [.060]	<input type="checkbox"/> 7-8 [7-8]	<input type="checkbox"/> 0,4 [.016]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 450 [17.50]	<input type="checkbox"/> 2,0 [.080]	<input type="checkbox"/> 9-12 [9-12]	<input type="checkbox"/> 0,35 [.014]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 550 [21.50]	<input type="checkbox"/> 2,5 [.100]	<input type="checkbox"/> 13-16 [13-16]	<input type="checkbox"/> 0,30 [.012]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 650 [25.50]	<input type="checkbox"/> 3,5 [.135]	<input type="checkbox"/> 17-20 [17-20]	<input type="checkbox"/> 0,25 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,20 [.008]
<input type="checkbox"/> 750 [29.50]	<input type="checkbox"/> 5,0 [.200]	<input type="checkbox"/> 21-24 [21-24]	<input type="checkbox"/> 0,20 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 850 [33.50]	<input type="checkbox"/> 6,5 [.250]	<input type="checkbox"/> 25-28 [25-28]	<input type="checkbox"/> 0,15 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> >850 [>33.50]	<input type="checkbox"/> >6,5 [$>.250$]	<input type="checkbox"/> >28 [>28]	<input type="checkbox"/> <0,15 [.006]	<input type="checkbox"/> <0,050 [$<.002$]	<input type="checkbox"/> <0,10 [$<.004$]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

CONDUCTORS

INTERNAL ELEC CLEARANCE (MIN)	INTERNAL COND WIDTH (MIN)	INTERNAL PROCESS ALLOWANCE	EXTERNAL ELEC CLEARANCE (MIN)	EXTERNAL COND WIDTH (MIN)	EXTERNAL PROCESS ALLOWANCE	FEATURE LOCATION DTP
<input type="checkbox"/> >0,350 [$>.014$]	<input type="checkbox"/> >0,250 [$>.010$]	<input type="checkbox"/> >0,100 [$>.004$]	<input type="checkbox"/> >0,350 [$>.014$]	<input type="checkbox"/> >0,250 [$>.010$]	<input type="checkbox"/> >0,100 [$>.004$]	<input type="checkbox"/> >0,50 [$>.020$]
<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,350 [.014]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,50 [.020]
<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,250 [.010]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,40 [.016]
<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,200 [.008]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 0,150 [.005]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,25 [.010]
<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,030 [.0012]	<input type="checkbox"/> 0,20 [.008]
<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input type="checkbox"/> 0,100 [.004]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,025 [.001]	<input type="checkbox"/> 0,15 [.006]
<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,075 [.003]	<input type="checkbox"/> 0,050 [.002]	<input type="checkbox"/> 0,020 [.0008]	<input type="checkbox"/> 0,10 [.004]
<input type="checkbox"/> <0,075 [$<.003$]	<input type="checkbox"/> <0,050 [$<.002$]	<input type="checkbox"/> <0,020 [$<.0008$]	<input type="checkbox"/> <0,075 [$<.003$]	<input type="checkbox"/> <0,050 [$<.002$]	<input type="checkbox"/> <0,020 [$<.0008$]	<input type="checkbox"/> <0,10 [$<.004$]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

SECTION 7

DATE COMPLETED 11/16/2009

IDENTIFICATION OF PREVIOUS AUDITS (Optional)

Please complete as many forms as you feel reflect the intensity of your customer visits.

COMPANY AUDITORS	DATE OF AUDIT
AUDIT TEAM MEMBERS	AUDITOR REMARKS
	SPECIFICATIONS USED IN AUDIT
LENGHT OF AUDIT	
TEAM MEMBERS MAY BE CONTACTED AT	
COMPANY AUDITORS	DATE OF AUDIT
AUDIT TEAM MEMBERS	AUDITOR REMARKS
	SPECIFICATIONS USED IN AUDIT
LENGHT OF AUDIT	
TEAM MEMBERS MAY BE CONTACTED AT	
COMPANY AUDITORS	DATE OF AUDIT
AUDIT TEAM MEMBERS	AUDITOR REMARKS
	SPECIFICATIONS USED IN AUDIT
LENGHT OF AUDIT	
TEAM MEMBERS MAY BE CONTACT AT	

*REPEAT THIS FORM AS NECESSARY

SECTION 8

DATE COMPLETED

11/16/2009

FINANCIAL REVIEW (OPTIONAL)

Please complete the following financial information that coincides with the company description and site information provided in section 1.

COMPANY FINANCIAL DESCRIPTION

LEGAL NAME

Circuit Express, Inc.

TAXPAYER ID NUMBER

86-0593005

DUNS NUMBER

185428075

TRADING SYMBOL

N/A

ANNUAL SALES

\$16,000,000 2009

PRIOR YEAR

\$18,700,000 2008

YEAR-TO-DATE

FISCAL YEAR

BANK

Johnson Bank

ACCOUNT NUMBER

BANK ADDRESS

STATE

Arizona

ZIP

PROVINCE

COUNTRY

BANK TELEPHONE NUMBER

602-977-9909

FAX NUMBER

COMMENTS

SITE FINANCIAL DESCRIPTION

SITE NAME

TAXPAYER ID NUMBER

DUNS NUMBER

TRADING SYMBOL

ANNUAL SALES

PRIOR YEAR

YEAR-TO-DATE

FISCAL YEAR

BANK

ACCOUNT NUMBER

BANK ADDRESS

STATE

ZIP

PROVINCE

COUNTRY

BANK TELEPHONE NUMBER

FAX NUMBER

COMMENTS

SECTION 9

MQP ELECTRONIC EDITING

This MS Word template comes with editable fields. IPC has made this electronic document available for ease of completing, updating, and filing the MQP, as well as to give the laminate manufacturer and customer a common interface. Using the template enables laminate manufacturers to maintain several customer specific files without the endless stream of paperwork.

Editable fields are highlighted in gray. To complete the fields in the template, use the TAB key to toggle from field to field, entering the information as instructed in the introductory text for each section.

The developers of this MQP strongly suggest the person at the laminate manufacturing facility responsible for creating and maintaining the MQP write protect the file to be sent.