



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.

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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

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CONTENTS

<u>Sections:</u>	<u>Pages:</u>
1.1 Company Description	1
1.2 Site Description	2
2.1 Process	3-4
2.2 Electrical Test Equipment	5-7
2.3 Product Type	8-10
2.4 Product Complexity	11-14
2.5 Quality Development	15-16
3.0 Equipment Profile	17-21
Master Equipment Listing	22
4.0 Technology Profile Specifics	23-30
5.0 Quality Profile	31-41
6.0 Manufacturing History	42
7.0 Identification of Previous Audits	43
8.0 Financial Review	44
9.0 MQP Electronic Editing	45

SECTION 1.1

COMPANY DESCRIPTION

DATE COMPLETED 09/2009

GENERAL INFORMATION			
LEGAL NAME Unicircuit, Inc. (subsidiary of Anaren Corporation)			
PHYSICAL ADDRESS 8192 Southpark Lane			
CITY Littleton	STATE CO	ZIP 80120	
PROVINCE	COUNTRY U.S.A.		
TELEPHONE NUMBER 303-730-0505	FAX NUMBER 303-730-0606	TELEX NUMBER	
E-MAIL ADDRESS sales@unicircuit.com	MODEM NUMBER 303-730-9846	DATE FOUNDED 1979 <input checked="" type="checkbox"/> PUBLIC <input type="checkbox"/> PRIVATE	
INTERNET URL www.unicircuit.com	FTP SITE csn.net ftp/Unicircuit		

MANAGEMENT
GENERAL MANAGER Kerry Bode
ACCOUNTING MANAGER Tara Bennett
DIRECTOR OF OPERATIONS Bob Whitehouse
QUALITY ASSURANCE MANAGER Bob Lageman
VICE PRESIDENT OF SALES AND ADVANCED TECHNOLOGY Lance Riley
VICE PRESIDENT OF ENGINEERING Ty Gragg
ENVIRONMENTAL HEALTH AND SAFETY MANAGER Gary Wolf

CORPORATE DESCRIPTION	NUMBER OF EMPLOYEES		COMMENTS
	CORPORATE	SITE	
SALES		6	
ENGINEERING		19 full-time 1 part-time	Includes CAM, Methods, Process Engineering
MANUFACTURING CONTROL		8	Includes Cell Mgrs, Production Control
MANUFACTURING	DIRECT	87 full-time 3 part-time	
	INDIRECT	13 full-time 1 part-time	Includes Waste Treatment, Maintenance, IT, Shipping, Wet Lab
QUALITY CONTROL	QUALITY DIRECT	16 full-time 1 part-time	Includes Inspection, Micro Lab, QEs, Doc Control
	INTERNAL AUDITORS	(5)	(part time from Micro Lab, QE, PE, Methods, EH &S)
	GENERAL MANAGEM	1	Quality Control Manager
ADMINISTRATION		7	Includes IT, Accounting, Purchasing,
TOTAL		167	Includes Management Team

SECTION 1.2

SITE DESCRIPTION

(TO BE COMPLETED FOR EACH SITE)

DATE COMPLETED 09/2009
ATTACH APPROPRIATE CHARTS (OPTIONAL)

MANUFACTURING FACILITY			
COMPANY NAME Unicircuit, Inc.			
PHYSICAL ADDRESS 8192 Southpark Lane			
CITY Littleton	STATE CO	ZIP 80120	
PROVINCE		COUNTRY U.S.A.	
TELEPHONE NUMBER 303-730-0505		FAX NUMBER 303-730-0606	TELEX
E-MAIL ADDRESS sales@unicircuit.com		MODEM NUMBER 303-730-9846	YEARS IN BUSINESS 30
INTERNET URL www.unicircuit.com		FTP csn.net ftp/Unicircuit	
PRINCIPAL PRODUCTS/SERVICES/SPECIALTIES Manufacture of Printed Circuit Boards		BUSINESS CHARACTERIZATION (HIGH VOLUME, QUICK TURN-AROUND, ETC.) Quick Turn-Around, High Technology, High Reliability, Small to Medium Volume	

FACILITY MANAGEMENT	TITLE	REPORTS TO (Function/Job Title)
OVERALL OPERATION RESPONSIBILITY FOR THIS SITE Kerry Bode	General Manager	Anaren President/CEO
MANUFACTURING Bob Whitehouse	Director of Operations	General Manager
TECHNICAL/ENGINEERING Ty Gragg	VP of Engineering	General Manager
MATERIALS/PRODUCTION CONTROL Mark Bonnett	Production Control Manager	Director of Operations
PURCHASING Geoff Osowski	Purchasing Agent	Accounting Manager
QUALITY Bob Lageman	Quality Assurance Manager	General Manager
SALES REPRESENTATIVE Lance Riley	VP of Sales & Advanced Technology	General Manager
WASTE MANAGEMENT Gary Wolf	Environmental Health & Safety Manager	General Manager

BUILDINGS				SYSTEMS (INDICATE % COVERAGE)						
	AGE	AREA (Sq. Ft.)	Construction (Wood/Brick)	Power Conditioning	Heating	Ventilation	Air Conditioning	Sprinklers	Waste Treatment	Other
Office (2 bldgs)	10	6K	concrete	100	100	0	100	100	0	
Manufacturing (2 bldgs)	10	28K	concrete	50	100	40	100	100	100	
Planned additions	10	15K	Concrete	100	100	0	100	100	0	

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) 5 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 EPA last visit 09/08
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 # E75414 <input checked="" type="checkbox"/> ISO 9000# 9001 <input checked="" type="checkbox"/> Other AS9100 <input checked="" type="checkbox"/> Other DSCC - MIL-PRF-31032
Do you have a safety program? Describe below.	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	Hazardous Waste Number Trade Waste Account Number EPA I.D. #COR000013482

PLANT PERSONNEL (TOTAL EMPLOYEES)										
Regular	Contract	Office	Technical/Engineering	Production	Full-Time QA	Part-Time QA	Union	Non-Union	Union Name	Contract Expires (Date)
167	2	7	19	87	15	1	-	-	-	-

COMMENTS:
All employees receive Health and Safety training in accordance with documented work instructions. The level of training is based on employee job function. RCRA training is required for all employees handling or generating hazardous waste.

SECTION 2.1

PROCESS

DATE COMPLETED 09/2009

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 checked="" type="checkbox"/> Subtractive <input checked="" 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 type="checkbox"/> Other:	
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 checked="" type="checkbox"/> Other: Conductive and Non-conductive Hole Fill	Via Fill
C	Permanent Over-plating	<input type="checkbox"/> Tin <input checked="" 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"/> Conductive Polymer <input checked="" type="checkbox"/> Other: Immersion Silver	

D	Permanent Selective Plating	<input type="checkbox"/> Tin <input checked="" 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 checked="" type="checkbox"/> Other: Immersion Silver	
E	Permanent Mask or Coating	<input checked="" type="checkbox"/> Photo Dry Film <input checked="" type="checkbox"/> Photo Liquid <input checked="" type="checkbox"/> Image Transfer Screen Mask <input type="checkbox"/> Conformal Coating Solder Mask <input checked="" type="checkbox"/> Cover Coat <input type="checkbox"/> Other:	
F	Other Surface Finishes	<input checked="" type="checkbox"/> Tin-Lead Fused <input checked="" type="checkbox"/> Immersion Tin <input checked="" type="checkbox"/> Immersion Silver <input checked="" type="checkbox"/> Solder Leveled <input type="checkbox"/> Roll Soldered <input type="checkbox"/> Electro-less Solder Fused <input type="checkbox"/> Solder Bumped Lands <input type="checkbox"/> Solder Paste Fused <input type="checkbox"/> Flux Protective Covering <input type="checkbox"/> Other:	

SECTION 2.2

ELECTRICAL TEST EQUIPMENT

DATE COMPLETED 09/2009

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 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:	.005

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 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 type="checkbox"/> IPC-D-356 <input checked="" type="checkbox"/> Net List Extraction <input 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 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 type="checkbox"/> 10% <input type="checkbox"/> 7% <input checked="" type="checkbox"/> 5% <input type="checkbox"/> 2% <input type="checkbox"/> <2% <input type="checkbox"/> Other:	

SECTION 2.3

PRODUCT TYPE

DATE COMPLETED 09/2009

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 checked="" type="checkbox"/> Flex Printed Board <input checked="" 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: Hybrid Mixed Dielectrics
B	Circuit Mounting Type	<input checked="" type="checkbox"/> Single Sided <input checked="" type="checkbox"/> Double Sided <input checked="" type="checkbox"/> Multilayer <input checked="" type="checkbox"/> Single-sided Bonded to Substrate <input checked="" type="checkbox"/> Double-sided Bonded to Substrate <input checked="" type="checkbox"/> Multilayer Bonded to Substrate <input checked="" type="checkbox"/> Constrained Multilayer <input checked="" 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 checked="" type="checkbox"/> Other: Laser vias

D	Laminate Material	<input checked="" type="checkbox"/> Phenolic <input 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 checked="" 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 checked="" type="checkbox"/> 1/4 Minimum <input type="checkbox"/> 3/8 Minimum <input type="checkbox"/> 1/2 Nominal <input type="checkbox"/> 1 Nominal <input type="checkbox"/> 2 Nominal <input type="checkbox"/> 3-5 Max <input type="checkbox"/> 6-9 Max <input checked="" type="checkbox"/> >10 <input checked="" type="checkbox"/> Other: Copper Core \geq .040	<input type="checkbox"/>
G	Construction	<input type="checkbox"/> \leq 4 Planes <input checked="" type="checkbox"/> >4 Planes <input type="checkbox"/> THK to TOL \leq 0.2 mm <input checked="" type="checkbox"/> THK to TOL >0.2 mm <input checked="" type="checkbox"/> Bow/Twist \leq 1% <input type="checkbox"/> Bow/Twist >1% <input checked="" type="checkbox"/> \leq 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: MIL-PRF-31032 QML Marking	
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SECTION 2.4

PRODUCT COMPLEXITY

DATE COMPLETE 09/2009

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 type="checkbox"/> 5,0 [.200] <input type="checkbox"/> 6,5 [.250] <input checked="" type="checkbox"/> >6,5 [.250] <input checked="" type="checkbox"/> Other: Have product .500 thick	
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:	Layer count limited only by overall board thickness

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 checked="" type="checkbox"/> 0,20 [.008] <input type="checkbox"/> 0,15 [.006] <input type="checkbox"/> <0,15 [.006] <input checked="" type="checkbox"/> Other: Laser Drill Capabilities	Microvias \leq .004
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 type="checkbox"/> 0,050 [.002] <input 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 checked="" type="checkbox"/> 0,15 [.006] <input 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 type="checkbox"/> 0,100 [.004] <input checked="" type="checkbox"/> 0,075 [.003] <input type="checkbox"/> <0,075 [.003] <input checked="" type="checkbox"/> Other: C-Ply = .0006	

<p>H</p>	<p>Internal Layer Conductor Width (Min)</p>	<p><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:</p>	
<p>J</p>	<p>Internal Layer Process Allowance</p>	<p><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 type="checkbox"/> 0,020 [.0008] <input type="checkbox"/> <0,020 [.0008] <input checked="" type="checkbox"/> Other: .0005</p>	
<p>K</p>	<p>External Layer Clearance (Min)</p>	<p><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 type="checkbox"/> 0,100 [.004] <input type="checkbox"/> 0,075 [.003] <input checked="" type="checkbox"/> <0,075 [.003] <input type="checkbox"/> Other:</p>	

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 type="checkbox"/> 0,020 [[.0008] <input type="checkbox"/> <0,020 [.0008] <input checked="" type="checkbox"/> Other: .0005	
N	Feature Location DTP <input type="checkbox"/>	<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 checked="" type="checkbox"/> 0,15 [.006] <input type="checkbox"/> 0,10 [.004] <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 09/2009

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 checked="" type="checkbox"/> Functional Steering Committee Formed <input 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 type="checkbox"/> TQM Communicated throughout organization <input checked="" type="checkbox"/> Controlled New process Start-up <input 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 checked="" 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 type="checkbox"/> Quality Functional Deployment <input type="checkbox"/> Ongoing Improvement Program for Employees <input type="checkbox"/> Other:	Process Engineering Process Engineering
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 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 checked="" 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 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 type="checkbox"/> TQM Acceptance by suppliers <input type="checkbox"/> 10% of Suppliers Using SPC <input type="checkbox"/> 25% of Suppliers Using SPC <input checked="" type="checkbox"/> 50% of Suppliers Using SPC <input type="checkbox"/> All Key Suppliers using Certified parts program <input checked="" type="checkbox"/> Other: Quarterly Supplier Analysis	
G	Third Party IPC-QS-95	<input checked="" type="checkbox"/> Instrument Controls in Place <input checked="" 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 type="checkbox"/> Other:	

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

DATE COMPLETED 09/2009

* 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 type="checkbox"/>	<input checked="" type="checkbox"/>			
B) AOI CAD reference (CAM)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Orbotech (reflective)	2	
C) Photoplotting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Orbotech Mania	2	
D) Photo reductions	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
E) Film scan and conversion	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
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"/>	Glunz & Jenson	1	
G) Media types <input checked="" type="checkbox"/> silver halide film <input type="checkbox"/> glass <input type="checkbox"/> diazo	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See above		

3.2 DRILLING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Manual	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Drill Press - 1 Craftsman - 2	3	
B) Optical (single spindle)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N/A		
C) N.C. drill	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Trudrill 406, 408, 2500 - 3 UniLine 2000 - 2	5	

3.3 ROUTING EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Edge beveler	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Porter Cable	1	
B) Hand router (pin router)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) N.C. router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Excellon EX300 - 2 Kennard - 1	3	
D) N.C. driller/router	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N/A (EX300 used as routers)		
E) Scoring (profile)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N/A (Routers)		
F) Scoring (straight line)	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

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"/>	Di Arco (hand) – 1 Famco (foot) - 1	2	
C) Milling machine	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

3.5 HOLE PREPARATION (DESMEAR)	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Permanganate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid	1	
B) Plasma	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plasma Etch	2	
C) Mechanical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Time Saver	1	
D) Etchback	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See above - Plasma		

3.6 PRIMARY IMAGE APPLICATION	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Dry film	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dupont Laminators –2 CIS Cutsheet Laminator -1 Exposure Units – 4 Laser Direct Imager - 1		
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 type="checkbox"/>	<input checked="" type="checkbox"/>			
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 type="checkbox"/>			
E) Other: Brown Oxide Multibond	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid	3	

3.8 LAMINATION	YES	NO	MATERIAL	QTY	APPLICATION TECHNIQUE
A) High pressure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TMP 4-opening - 2 TMP 2-opening/manual - 1	3	
B) High temperature	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Vacuum	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See above		
D) Vacuum assist	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See above		
E) Foil heat assist	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
F) Separate cool-down	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TMP	2	

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 checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid	12	
C) Through-hole and via	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid	12	

3.10 COPPER ELECTROPLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Copper sulfate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Learonal, Inc.	4 cells	Dual rectification 8 500-amp. rectifiers
B) Pyrophosphate	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Copper fluoborate	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
D) Other: PPR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid	1	2 cells 4 Baker 600-amp rectifiers

3.11 TIN/LEAD SURFACE PLATINGS/COATINGS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Tin/lead electroplated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid	1	1 rapid 500-amp. rectifier
B) Immersion tin or tin/lead (electroless)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MacDermid		
C) Hot air solder leveled (HASL)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Avalon Av-Tech 2000	1	

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"/>	PMC Pot	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	1	

3.13 NICKEL SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Electroless nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	UIC	1	
B) Electroplated nickel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Technic	2 cells	

3.14 GOLD SURFACE PLATING	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Electroless gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	UIC	1	
B) Electroplated gold	<input checked="" type="checkbox"/>	<input type="checkbox"/>	UIC	2 cells	

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 type="checkbox"/>	<input checked="" type="checkbox"/>			
B) Dry film photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dynachem Vacuum Laminator	1	
C) Liquid photoimageable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DP 2500	1	
			Screen table	1	
D) Dry film/liquid combination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See above		

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"/>	Polimet grinding station	1	
B) Single cavity automated	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
C) Multiple cavity automated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Beuhler Eccomet 4000		
D) Plating thickness analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Unimet microscope - 1 Axiovert microscope - 1	2	

3.19 CHEMICAL ANALYSIS	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Etching chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Titrations Etch Rate		
B) Plating chemistry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Titrations CUS ECI, Inc.		
C) Effluent (PPM) analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Perkin Elmer Atomic Absorption	1	

3.20 ELECTRICAL TEST EQUIPMENT	YES	NO	EQUIPMENT	QTY	EQUIPMENT LIMITS
A) Continuity and shorts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See below		
B) Fixture development	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ECT 9090 Bare Board ET Tester		
C) Flying probe test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ATG 16-probe testers	3	
D) Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Polar	1	

SECTION 4

TECHNOLOGY PROFILE SPECIFICS

DATE COMPLETED 09/2009

4.1 ADMINISTRATION

4.1.1 CAPACITY PROFILE	EST %	COMMENTS
A) Total annual capacity in square meters (surface area) per month	51,000 sq. meters	
B) Presently running at ____ % of capacity	90%	

4.1.2 PERCENTAGE OF DOLLAR VOLUME	EST %	COMMENTS
A) Single sided (rigid)	< 1%	
B) Double sided (rigid)	2 – 5%	
C) Multilayer (rigid)	85 %	Includes: Blind, Buried, Sequential Lamination
D) Single side (unreinforced-flex)	< 1%	
E) Double sided (unreinforced-flex)	< 1%	
F) Multilayer (unreinforced-flex)	< 1%	
G) Multilayer (rigid/flex)	5 %	

4.1.3 PANEL PRODUCTION PROFILE	UNITS PER MONTH
A) Size of a production lot in panels	8
1) Normal	8
2) Smallest	1-2
B) Number of panels per month	1200
1) High Production	120 panels
2) Medium Production	240 panels
3) Low Production	480 panels
3) Short run	240 panels
4) Prototype	120 panels

C) Average lead time (delivery) as defined in B)			
1) High Production			45 days (technology-driven)
2) Medium Production			20 days
3) Low Production			20 days
3) Short run			20 days
4) Prototype Quick turn - No. of days <u>3</u> .			3 – 10 days
D) Product delivered in full panel or array sub-panel format			Customer-driven
1) Total in panel or array format			10%
2) Scored format			10%
3) Tab breakaway format			20%
4) Other			10%
5) Total to customer layout			100%
6) Total to manufacturing layout			If there is no defined customer format
E) Product delivered in board format			
1) Total in board format			5 – 10%
2) Extracted: scored to size			5 – 10%
3) Extracted: sheared to size			N/A
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 <u>V0</u>
2) Canadian standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3) MIL-P-55110	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MIL-PRF-31032/MIL-PRF-55110 qualified
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"/>	ISO 9001-2000 and AS9100B Cert # 205521
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"/>	Certificates of conformance and analysis maintained
2)Quality standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ISO 9001:2000 and AS9100 Cert. # 205521
3)Equipment calibration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Certificates of calibration maintained

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"/>	CAD Netlist Compare Software
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"/>	As required by contract

4.1.6 OTHER CAPABILITIES	YES	NO	COMMENTS
A) Facility research and development	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fully equipped labs Beta site for raw material suppliers
B) (Automated) On-line shop floor control/MRP system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Paradigm / Cimnet
C) Process control system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	True Chem software
D) Operator training system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

4.2 PROCESS ORIENTATION

4.2.1 LAMINATE MATERIAL	EST %	COMMENTS
A) Most commonly used laminates (G10, FR4, etc.)	15% 5% 25% 25%	Brand name N4000-6 Type Multifunctional Epoxy Brand name N5000 Type BT Brand name N7000 Type -2VO Polyimide Brand name Rogers Type 4000/6000 Series
B) Other laminate material	30%	
1) Planar resistor layers	10%	UL approved <input type="checkbox"/> Thick and thin capability
2) Kevlar	1%	UL approved <input type="checkbox"/>
3) Teflon	8%	UL approved <input type="checkbox"/>
4) Cyanate ester	4%	UL approved <input type="checkbox"/>
5) Other	7%	UL approved <input type="checkbox"/> Rogers – all; Arlon – all; Taconic – TLY, TLX, Tacpreg
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 checked="" type="checkbox"/> IPC-4103 <input checked="" type="checkbox"/> Other <input checked="" type="checkbox"/> IPC-4202 customer reqm'ts <input checked="" 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 <u>508</u> Y <u>660</u> mm minimum X <u>305</u> Y <u>305</u> mm other X _____ Y _____ mm		

4.2.2 PROCESS PRECISION SPECIFICS	YES	NO	VALUE	COMMENTS
A) Maximum printed board thickness built in volume	<input checked="" type="checkbox"/>		.360	
1) Single sided	<input checked="" type="checkbox"/>		.360	
2) Double sided	<input checked="" type="checkbox"/>		.360	
3) Multilayer	<input checked="" type="checkbox"/>		.360	
4) Rigid flex	<input checked="" type="checkbox"/>		.110	
B) Printed board electrical performance capability				
1) Impedance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2) Capacitance control	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3M C-Ply
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"/>		PEP
2) Optical registration	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Process: AOI
3) Other	<input type="checkbox"/>	<input 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"/>	Screening – DP 2500, manual, DFSM	
B) Plating/coating information				
1) Tin/lead reflow	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electrolytic tin/lead plate, hot oil reflow	
2) Hot air leveling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hot vertical process	
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"/>	P100	
2) Hole cleanliness verified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	In –process microsection analysis	

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>.004</u> in. Tol \pm <u>.0005</u> in	
2) Inner layers (print and etch)		Size <u>.003</u> in. Tol \pm <u>.0005</u> in.	
3) Outer layers (plated)		Size <u>.003</u> in. Tol \pm <u>.0005</u> in.	
4) Inner layers (plated)		Size <u>.003</u> in. Tol \pm <u>.0005</u> in.	
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>.008</u> in. Tol +0, <u>.008</u> in.	
2) Largest panel where this hole can be controlled (across diagonal)		Size <u>.30</u> in. 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		.039 mils	
1) Largest board size (across diagonal)		Size <u>32.8</u> in.	
2) Largest hole diameter		Size <u>.256</u> in. – drilled .500 in. - routed	
3) Smallest board size (across diagonal)		Size <u>17</u> in.	
4) Largest hole diameter		Size <u>.256</u> in. – drilled .500 in. - routed	
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 _____ .			Design-dependent

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 checked="" type="checkbox"/> Other .145mm (.005)			
F) Flatness tolerance (bow & twist) after reflow or solder coating <input type="checkbox"/> 1.5% <input type="checkbox"/> 1.0% <input checked="" type="checkbox"/> 0.5% <input checked="" type="checkbox"/> Other .3%			Design-driven

4.3.2 PRODUCT QUALITATIVE AND QUANTITATIVE INFORMATION	YES	NO	QUANTITY OF PANELS	NUMBER of DIMENSION	COMMENTS
A) Multilayer layer count	<input checked="" type="checkbox"/>			42	
1) Maximum layers fabricated in volume (Maximum Lot)	<input checked="" type="checkbox"/>			42	
2) Maximum layers fabricated in prototype (Minimum Lot)	<input checked="" type="checkbox"/>			42	
B) Buried vias produced consistently in volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size	<input checked="" type="checkbox"/>			8 mil	
2) Number of layers	<input checked="" type="checkbox"/>			720	
B) Blind vias produced consistently in volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
1) Size	<input checked="" type="checkbox"/>			8 mil	
2) Number of layers	<input checked="" type="checkbox"/>			720	
1) Controlled depth drilling	<input checked="" type="checkbox"/>	<input type="checkbox"/>			Several depths
2) Total number of layers	<input checked="" type="checkbox"/>				Several layer counts

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 type="checkbox"/> Other	<input checked="" type="checkbox"/>		
B) Double sided simultaneous electrical testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dual-sided Netlist test capability
1) Equipment type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ATG 16-head flying probe ECT 9090 Bare Board ET Tester
2) X-ray fluorescence inspection equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CMI
3) TDR equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Polar
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"/>	

4.4.2 AUTOMATED OPTICAL INSPECTION USAGE	EST %	COMMENTS
A) Before etching	10%	AOI blue-resist verifications performed prior to etch – design-dependent
B) After etching	100%	AOI inspection performed for inners/outers/subs after etch and resist strip
C) Internal layers	100%	
D) Final inspection	30%	Design dependent
E) Other	100%	Sub composites
F) Conductor/clearance normally inspected by AOI equipment		
1) <input type="checkbox"/> 0.05mm [.002]		
2) <input checked="" type="checkbox"/> 0.05-.10mm [.002-.004]	40%	
3) <input checked="" type="checkbox"/> >.10mm [.004]	60%	
4) <input checked="" type="checkbox"/> Planes	100%	AOI all plane layers, no sample
G) CAD download to AOI	100%	CAM data used for AOI inspection

SECTION 5

QUALITY PROFILE

DATE COMPLETED 09/2009

GENERAL INFORMATION

COMPANY NAME Unicircuit, Inc.	
CONTACT Bob Lageman	
TELEPHONE NUMBER 303-730-0505	FAX NUMBER 303-730-0606

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

Unicircuit is registered to ISO 9001:2000 and AS9100B through Bureau Veritas, Certification #205521, expires 1/12/2010. Unicircuit is also approved for MIL-PRF-31032/MIL-PRF-55110 through Defense Supply Center Columbus for epoxy and polyimide materials. Qualification letters VQE-09-17422 (epoxy) and VQE-07-13789 (polyimide)

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	75	75
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	50	50
7.	Are Statistical Process Control (SPC) principles understood by all levels of management?			X	100	80
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	80
10.	Is there management support of ongoing training (including quality training), and is it documented by an organizational training plan?			X	80	80
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	80	80
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	80	80

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	80	80
2.	Is quantitative benchmarking used to evaluate all new products/technologies/services in comparison to best-in-class offerings?			X	80	80
3.	Does a roadmap exist to ensure continued development of leading edge, best-in-class products/technology/services?			X	100	100
4.	Is the capability of each operation which controls critical-to-function characteristics for new products, fully certified?			X	75	75
5.	Are statistical tools used in the development of robust (high yield) new processes, products, and services?			X	90	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	90
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	100	100
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	80	80
5.	To what extent are customer satisfaction goals disseminated and understood by everyone in the organization?			X	100	80
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	80
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	80

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	100	100
3.	Can customers electronically transfer order information directly into the business system?			X	100	100
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	100	100
8.	Do all functional departments have system access to key financial, manufacturing, sales, and operational data, as it relates to their functional objectives?			X	80	80
9.	Are computer simulation and design tools used to the maximum extent practicable in the design of new products/technologies/services			X	80	80

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	90	70
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? *** Technology-driven			X	50	50

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	80	80
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	75	75
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	80
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	90	90
5.	Are all personnel trained in sufficient detail to support key initiatives?			X	100	90
6.	Are the results of training evaluated and indicated program changes made?			X	75	70
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	90	70
8.	Are performance standards participatively developed, and regularly applied for all personnel?			X	100	90
9.	Are Total Customer Satisfaction programs and resulting successes publicized to all personnel?			X	100	90
10.	Do goal setting and reward/incentive programs support the quality improvement process?			X	100	90

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	80
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	90	90
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	90	90
6.	Have quality and cycle time metrics and improvement goals been established participatively with the supplier?			X	75	75
7.	Has a system been established with the supplier for identification and verification of corrective action?			X	100	80
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	95
9.	Is there a supplier certification program or equivalent procured material/service continuous quality improvement program?			X	75	75
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				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
1.	Are calibration and preventative maintenance programs in place and documented?			X	100	100
2.	Are calibration and maintenance personnel trained?			X	100	100
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				
		Not Applicable	Not Started	Approach Developed	Percent Deployed	Percent Results
DESCRIPTION OF PROGRAM						
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	75	75
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				
		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?			X	90	90
2.	Are statistical techniques used to reduce variation in the engineering process before the start of production?			X	80	80
3.	Is the quality system dependent upon process rather than product controls?			X	75	75
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	80	60
5.	Are incapable processes or machines targeted for improvement or replacement?			X	100	90
6.	Is SPC implemented for all critical processes?			X	80	80
7.	Are procedures that control the reaction to out-of-control situations adequate and effective?			X	100	80
8.	Are operators trained in the use of appropriate statistical techniques, and are they properly applying them?			X	80	25
9.	Are advanced problem solving techniques used by engineers to solve problems? (Design of Experiments, planned experimentation, advanced diagnostic tools, etc.)			X	80	50
10.	Are control charts and other process controls properly implemented?			X	75	75
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	50	50

5.12 PROBLEM SOLVING		STATUS				
		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?			X	100	80
2.	Does the organization utilize participative problem solving techniques to identify, measure and resolve internal and external problems?			X	90	80
3.	Are problem solving efforts timely and effective?			X	100	90
4.	Are applied resources sufficient to remove problem solving constraints?			X	90	90
5.	Are statistical techniques used for problem solving?			X	75	60
6.	Are quality data used to identify barriers, and to determine the priority of problems?			X	90	80
7.	Is there a policy/procedure that includes the use of problem solving techniques to systematically drive reduction in variability?			X	50	50

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	90
5.	Is preventative maintenance performed on the equipment and facilities?			X	90	80
6.	Are housekeeping procedures adequate and how well are they followed?			X	100	90
7.	Are process management plans established, and are critical parameters followed?			X	100	95
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	95
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	95
7.	Is there a system for coordinating necessary corrective action with purchasing personnel?			X	100	95
8.	Does the corrective action extend to all applicable causes of non-conformance (e.g., design, workmanship, procedures, equipment, etc.)?			X	100	90

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	100	85
2.	Are periodic tests conducted to audit reliability and environmental performance of the final product?			X	100	100
* 3.	Is CPK tracking performed for critical characteristics, with plans to achieve CPK = 1.5 with a target of CP of 2.0? *** Limited application due to product type variability			X	50	33
4.	Is root cause failure analysis performed for internal and external failures, and is appropriate corrective action implemented?			X	100	90
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	95
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	95
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	95
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	75	65

COMMENTS

SECTION 6 (CHECK ONE IN EACH LINE THAT APPLIES)

MANUFACTURING HISTORY (See Section 2 Site Capability)

DATE COMPLETED 09/2009

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 Multilayer	DATE OF ORDER N/A	MATERIAL Epoxy, Polyimide, Rogers 4000/6000	HISTORY # N/A
VIA TYPE Through vias/blind vias	PRODUCTION QUANTITY 840 pnls/month	TOTAL YEARLY PRODUCTION % 70 %	

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 checked="" 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 checked="" type="checkbox"/> 2,0 [.080]	<input type="checkbox"/> 9-12 [9-12]	<input type="checkbox"/> 0,35 [.014]	<input checked="" type="checkbox"/> 0,150 [.006]	<input type="checkbox"/> 0,30 [.012]
<input type="checkbox"/> 550 [21.50]	<input type="checkbox"/> 2,5 [.100]	<input checked="" type="checkbox"/> 13-16 [13-16]	<input checked="" 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 checked="" 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 checked="" 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 checked="" type="checkbox"/> 0,125 [.005]	<input type="checkbox"/> 0,040 [.0015]	<input type="checkbox"/> 0,150 [.006]	<input checked="" 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 checked="" 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 checked="" type="checkbox"/> 0,025 [.001]	<input checked="" 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 [<.008]	<input type="checkbox"/> <0,10 [<.004]
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input checked="" type="checkbox"/> Other: .0005 in	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:

SECTION 7

DATE COMPLETED 09/2009

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

*REPEAT THIS FORM AS NECESSARY

SECTION 8

DATE COMPLETED 09/2009

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		
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		

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.