QUALIFICATIONS VALIDATED
EVERY TWO YEARS

QML-31032-16
6 May 2004
SUPERSEDING
QML-31032-15
14 November 2003

QUALIFIED MANUFACTURERS LIST

OF

PRODUCTS QUALIFIED UNDER PERFORMANCE SPECIFICATION

MIL-PRF-31032

PRINTED CIRCUIT BOARD / PRINTED WIRING BOARD,

GENERAL SPECIFICATION FOR

This list has been prepared for use by or for the Government in the acquisition of printed circuit boards / printed wiring boards (hereafter referred to as printed boards) covered by Department of Defense Performance Specification MIL-PRF-31032. Listing of a manufacturer is not intended to and does not connote endorsement of the manufacturer by the Department of Defense. All listings herein have been qualified under the requirements as specified in the latest effective issue of MIL-PRF-31032. This list is subject to change without notice; revision or amendment of this list will be issued as necessary. The listing of a manufacturer does not in any way release the manufacturer from compliance with the individual item specification requirements.

THE ACTIVITY RESPONSIBLE FOR THIS QML IS THE DEFENSE SUPPLY CENTER COLUMBUS (DSCC-VQE), 3990 EAST BROAD STREET, COLUMBUS, OH 43216-5000.

If a manufacturer desires to have test data considered for qualification, it must be certified and meet all qualification test requirements of MIL-PRF-31032 and the applicable associated specification.

The listing of printed board manufacturing lines in the QML applies only to printed boards produced in the plant(s) specified herein. Therefore, only those printed boards that have been manufactured and tested on the certified/qualified lines listed herein can be supplied as QML printed boards.

QML-31032 is available from the DSCC-VQ World Wide Web pages at the following addresses:

Web pages: http://www.dscc.dla.mil/offices/sourcing_and_qualification/

QML: http://www.dscc.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=31032

DSCC contacts for QML companies can be located in the file “31032 main points-of-contact” at website:

http://www.dscc.dla.mil/offices/sourcing and qualification/offices.asp?section=VQE

QML is a definition of a manufacturer's verified capabilities. Manufacturers may use the add-on qualification process to qualify capabilities that are not currently listed on the QML. The user is encouraged to contact the manufacturer or DSCC to make arrangements for QML availability.

SECTION I

LIST OF MANUFACTURERS BY ASSOCIATED SPECIFICATION

MIL-PRF-31032/1 - Printed Wiring Board, Rigid, Multilayered, Woven E-Glass Reinforced Thermosetting Resin Base Material, With Plated Through Holes, For Soldered Part Mounting.

Ambitech, Inc.
8944 Fullbright Avenue
Chatsworth, CA 91311-6123

Calumet Electronics Corp.
25830 Depot Street
Calumet, MI 49913-1985

Colonial Circuits, Inc.
1026 Warrenton Road
Fredericksburg, VA 22406-6200

Coretec Denver, Inc.
10570 Bradford Road
Littleton, CO 80127

Coretec, Inc. (Ellesmere Location)
2020 Ellesmere Road
Scarborough, Ontario, Canada M1H 2Z8

Coretec, Inc. (Lawrence Location)
6530 Lawrence Avenue, E.
Scarborough, Ontario, Canada M1C 4A7

Crown Circuits, Inc.
6070 Avenida Encinas
Carlsbad, CA 92009-1001

Diversified Systems
3939 W. 56th Street
Indianapolis, IN 46254

Dynamic & Proto Circuits, Inc.
869 Barton Street
Stoney Creek, Ontario L8E 5G6 Canada

Dynamic Details, Inc.
1200 Severn Way
Dulles, VA 20166-8904

Endicott Interconnect Technologies, Inc.
1701 North Street
Endicott, NY 13760

Geometric Circuits, Inc.
11 Michael Avenue
Farmingdale, NY 11735

Hans Brockstedt GmbH
Leiterplattenschnelldienst
Clara-Immerwahr-Strape 7
24145 Kiel, Germany

Lockheed Martin Corp.
Missiles and Fire Control Orlando
5600 West Sandlake Road
Orlando, FL 32819-8907

Lockheed Martin Systems Integration-Owego
1801 State Route 17C
Owego, NY 13827

Lone Star Circuits
901 Hensley Drive
Wylie, TX 75098

Micom Corp.
475 Old Highway 8 NW
New Brighton, MN 55112

PCT Interconnect
1165 NW 55 Street
Fort Lauderdale, FL 33309

Philway Products, Inc.
701 Virginia Avenue
Ashland, OH 44806

Printed Circuits, Inc.
1200 W. 96th Street
Bloomington, MN 55431-2699

Proto Circuit, Inc.
7 Ascot Parkway
Cuyahoga Falls, OH 44223

Sanmina – SCI (Costa Mesa)
2945 Airway Avenue
Costa Mesa, CA 92626

Sanmina SCI (Phoenix)
5020 South 36th Street
Phoenix, AZ 85040

Sanmina – SCI (Wilmington)
One Jewell Drive
Wilmington, MA

SECTION I

LIST OF MANUFACTURERS BY ASSOCIATED SPECIFICATION

MIL-PRF-31032/1 - Printed Wiring Board, Rigid, Multilayered, Woven E-Glass Reinforced Thermosetting Resin Base Material, With Plated Through Holes, For Soldered Part Mounting.

Sovereign Circuits, Inc.
12080 DeBartolo Drive
North Jackson, OH 44451

Teradyne, Inc.
Connection Systems Division
91 Northeastern Boulevard
Nashua, New Hampshire 03062

Tyco Printed Circuits Group
Santa Clara Division
400 Matthew Street
Santa Clara, CA 95050

Tyco Printed Circuits Group
Stafford Division
4 Old Monson Road
P.O. Box 145
Stafford, CT 06075

Tyco Printed Circuits Group
Austin Division
12501 Research Boulevard, Module 1
Austin, TX 78759

SECTION I

LIST OF MANUFACTURERS BY ASSOCIATED SPECIFICATION

MIL-PRF-31032/2 - Printed Wiring Board, Rigid, Single and Double Layer, Woven E-Glass Reinforced Thermosetting Resin Base Material, With Plated Through Holes, For Soldered Part Mounting.

Calumet Electronics Corp.
25830 Depot Street
Calumet, MI 49913-1985

Coretec, Inc. (Ellesmere Location)
2020 Ellesmere Road
Scarborough, Ontario, Canada M1H 2Z8

Coretec, Inc. (Lawrence Location)
6530 Lawrence Avenue, E.
Scarborough, Ontario, Canada M1C 4A7

Crown Circuits, Inc.
6070 Avenida Encinas
Carlsbad, CA 92009-1001

Diversified Systems
3939 W. 56th Street
Indianapolis, IN 46254

Dynamic & Proto Circuits, Inc.
869 Barton Street
Stoney Creek, Ontario L8E 5G6 Canada

Dynamic Details, Inc.
1200 Severn Way
Dulles, VA 20166-8904

Endicott Interconnect Technologies, Inc.
1701 North Street
Endicott, NY 13760

Geometric Circuits, Inc.
11 Michael Avenue
Farmingdale, NY 11735

Hans Brockstedt GmbH
Leiterplattenschnelldienst
Clara-Immerwahr-Strape7
24145 Kiel, Germany

Lockheed Martin Co rp.
Missiles and Fire Control Orlando
5600 West Sandlake Road
Orlando, FL 32819-8907

Lockheed Martin Systems Integration-Owego
1801 State Route 17C
Owego, NY 13827

Lone Star Circuits
901 Hensley Drive
Wylie, TX 75098

Micom Corp.
475 Old Highway 8 NW
New Brighton, MN 55112

PCT Interconnect
1165 NW 55 Street
Fort Lauderdale, FL 33309

Printed Circuits, Inc.
1200 W. 96th Street
Bloomington, MN 55431-2699

Sanmina – SCI (Costa Mesa)
2945 Airway Avenue
Costa Mesa, CA 92626

Sanmina – SCI (Wilmington)
One Jewell Drive
Wilmington, MA

Sovereign Circuits, Inc.
12080 DeBartolo Drive
North Jackson, OH 44451

Teradyne, Inc.
Connection Systems Division
91 Northeastern Boulevard
Nashua, NH 03062

Tyco Printed Circuits Group
Santa Clara Division
400 Matthew Street
Santa Clara, CA 95050

Tyco Printed Circuits Group
Stafford Division
4 Old Monson Road
P.O. Box 145
Stafford, CT 06075

Tyco Printed Circuits Group
Austin Division
12501 Research Boulevard, Module 1
Austin, TX 78759

SECTION I

LIST OF MANUFACTURERS BY ASSOCIATED SPECIFICATION

MIL-PRF-31032/3 – Printed Wiring Board, Flexible, Single and Double Layer, With or Without Plated Holes, With or Without Stiffiners, for Soldered Part Mounting

Hans Brockstedt GmbH
Leiterplattenschnelldienst
Clara-Immerwahr-Strape 7
24145 Kiel, Germany

Lockheed Martin Systems Integration-Owego
1801 State Route 17C
Owego, NY 13827

Printed Circuits, Inc.
1200 W. 96th Street
Bloomington, MN 55431-2699

Proto Circuit, Inc.
7 Ascot Parkway
Cuyahoga Falls, OH 44223

Sovereign Circuits, Inc.
12080 DeBartolo Drive
North Jackson, OH 44451

StrataFLEX Corp.
11 Dohme avenue
Toronto, Ontario, Canada M4B 1Y7

Tyco Printed Circuits Group
Santa Clara Division
400 Matthew Street
Santa Clara, CA 95050

Tyco Printed Circuits Group
Stafford Division
4 Old Monson Road
P.O. Box 145
Stafford, CT 06075

Tyco Printed Circuits Group
Austin Division
12501 Research Boulevard, Module 1
Austin, TX 78759

SECTION I

LIST OF MANUFACTURERS BY ASSOCIATED SPECIFICATION

MIL-PRF-31032/4 – Printed Wiring Board, Rigid-Flex or Flexible, Multilayer with Plated Holes, With or Without Stiffiners, for Soldered Part Mounting

Colonial Circuits, Inc.
1026 Warrenton Road
Fredericksburg, VA 22406-6200

Hans Brockstedt GmbH
Leiterplattenschnelldienst
Clara-Immerwahr-Strape 7
24145 Kiel, Germany

Lockheed Martin Systems Integration-Owego
1801 State Route 17C
Owego, NY 13827

Printed Circuits, Inc.
1200 W. 96th Street
Bloomington, MN 55431-2699

Proto Circuit, Inc.
7 Ascot Parkway
Cuyahoga Falls, OH 44223

Sovereign Circuits, Inc.
12080 DeBartolo Drive
North Jackson, OH 44451

StrataFLEX Corp.
11 Dohme avenue
Toronto, Ontario, Canada M4B 1Y7

Tyco Printed Circuits Group
Santa Clara Division
400 Matthew Street
Santa Clara, CA 95050

Tyco Printed Circuits Group
Stafford Division
4 Old Monson Road
P.O. Box 145
Stafford, CT 06075

Tyco Printed Circuits Group
Austin Division
12501 Research Boulevard, Module 1
Austin, TX 78759

SECTION I

LIST OF MANUFACTURERS BY ASSOCIATED SPECIFICATION

MIL-PRF-31032/CUSTOM TECHNOLOGIES

MIL-PRF-31032/Custom - Printed Wiring Board, Rigid, Multilayered, PTFE Resin Ceramic Filler Base Material, with Plated Holes Through Holes, For Soldered Part Mounting

Colonial Circuits, Inc.
1026 Warrenton Road
Fredericksburg, VA 22406-6200

MIL-PRF-31032/Custom - Printed Wiring Board, Rigid, Multilayered, E-Glass Reinforced Hydrocarbon Resin Ceramic Filler Base Material, with Plated Holes Through Holes, For Soldered Part Mounting

Colonial Circuits, Inc.
1026 Warrenton Road
Fredericksburg, VA 22406-6200

SECTION II

COMMON ABBREVIATIONS

The following abbreviations are used in this section:

Ag	Silver
Au	Gold
CAGE	Commercial and Government Entity (Code)
Cu	Copper
ENIG	Electroless Nickel Immersion Gold
HASL	Hot Air Solder Level
IR	Infrared
LPI	Liquid Photoimageable
MIX	Mix of SMT and THM
Ni	Nickel
OSP	Organic Surface Protection
Pb	Lead
Pd	Palladium
SMOBC	Solder Mask Over Bare Copper
SMT	Surface-Mount Technology
Sn	Tin
THM	Through-Hole Mounting

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 51484
Ambitech, Inc. 8944 Fullbright Avenue Chatsworth, CA 91311-6123	Same	CONTACT: Grace Ben PHONE #: 818-882-5550 FAX #: 818-882-9408 EMAIL: grace.ben@ambi.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-02-2464
Panel Size	24" X 30"	
Max/Min. Board Thickness	0.264"/0.025"	
Max/Min. Base Cu Thickness	0.00056/0.00035"	
Max/Min Hole Size	0.281"/0.008" (0.006 sub assy)	
Aspect Ratio	12:1	
Max. Number of Layers	36	
Min. Dielectric Thickness	0.002"	
Min. Conductor Width	0.0035"	
Min. Conductor Spacing	0.0035"	
Part Mounting	SMT/THM/MIX	
Base Material	GF (Woven E-glass Epoxy Resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL, Immersion Ag, Fuse Following SnPb Plate, OSP, Electrolytic Ni/Au or Ni/Pd/Au	
Solder Resist	LPI, Dry Film	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Acid Copper	
Controlled Impedance	100/56 ohm ±10%	
Alternate Construction	Sequential Lamination for Blind & Buried Vias	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65337
Calumet Electronics Corp. 25830 Depot Street Calumet, MI 49913-1985	Same	CONTACT: Robert Hall PHONE #: 906-337-1305 FAX #: 906-337-5359 EMAIL: rhall@cec-up.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-4657
Panel Size	18" X 24"	
Max/Min. Board Thickness	0.125"	
Max/Min Hole Size	0.125"/0.016"	
Aspect Ratio	8:1	
Max. Number of Layers	10	
Min. Conductor Width	0.006"	
Min. Conductor Spacing	0.003"	
Part Mounting	THM/SM	
Base Material	GF (Woven E-glass Epoxy Resin)	
Finish System	HASL, Au , Ni	
Hole Preparation	Chemical Etchback	
Copper Plating	Electrodeposited Acid Copper	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 6T499
Colonial Circuits, Inc. 1026 Warrenton Road Fredericksburg, VA 22406-6200	Same	CONTACT: Mike Hill PHONE #: 540-753-5511, X125 FAX #: 540-752-2109 EMAIL: quality@colonialcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-04-6002

Panel Size	18" X 24"
Max. Board Thickness	0.127"
Max/Min Hole Size	0.228"/0.015"
Aspect Ratio	8.5:1
Max. Number of Layers	12
Min. Conductor Width	0.008"
Min. Conductor Spacing	0.005"
Part Mounting	PTH, SMT
Base Material	GF (Woven E-glass, Epoxy Resin)
Finish System	Tin/Lead HASL
Hole Preparation	Plasma Desmear
Copper Plating	Electrolytic Acid Copper
Solder Resist	LPI
Controlled Impedance	55 ohms (±10%)

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 6T499
Colonial Circuits, Inc. 1026 Warrenton Road Fredericksburg, VA 22406-6200	Same	CONTACT: Mike Hill PHONE #: 540-753-5511, X125 FAX #: 540-752-2109 EMAIL: quality@colonialcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-04-6002

Panel Size	18" X 24"
Max. Board Thickness	0.088"
Max/Min Hole Size	0.052"/0.021"
Aspect Ratio	4.2:1
Max. Number of Layers	14
Min. Conductor Width	0.006"
Min. Conductor Spacing	0.005"
Part Mounting	PTH, SMT
Base Material	GI (Woven E-glass, Polyimide Resin)
Finish System	Tin/Lead HASL
Hole Preparation	Plasma Desmear and Etchback
Copper Plating	Electrolytic Acid Copper
Solder Resist	LPI

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 6T499
Colonial Circuits, Inc. 1026 Warrenton Road Fredericksburg, VA 22406-6200	Same	CONTACT: Mike Hill PHONE #: 540-753-5511, X125 FAX #: 540-752-2109 EMAIL: quality@colonialcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/4		VQE-04-6002
Panel Size	12" X 18"	
Max. Board Thickness	0.093"	
Max/Min Hole Size	0.045"/0.025"	
Aspect Ratio	3.7:1	
Max. Number of Layers	10	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	PTH, SMT	
Base Material	GI (Woven E-glass, Polyimide Resin)	
Finish System	Tin/Lead Reflow	
Hole Preparation	Plasma Desmear and Etchback	
Copper Plating	Electrolytic Acid Copper	
Solder Resist	LPI	
Flex Base Material	IPC-FC-241/1 (Adhesive)	

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 6T499
Colonial Circuits, Inc. 1026 Warrenton Road Fredericksburg, VA 22406-6200	Same	CONTACT: Mike Hill PHONE #: 540-753-5511, X125 FAX #: 540-752-2109 EMAIL: quality@colonialcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/Custom		VQE-04-6002
Base Material	Rogers 4003	
Panel Size	12" X 18"	
Max. Board Thickness	0.083"	
Max/Min Hole Size	0.045"/0.020"	
Aspect Ratio	4.15:1	
Max. Number of Layers	4	
Min. Conductor Width	0.010"	
Min. Conductor Spacing	0.011"	
Part Mounting	PTH, SMT	
Finish System	Tin/Lead HASL	
Hole Preparation	Plasma Desmear	
Copper Plating	Electrolytic Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 6T499
Colonial Circuits, Inc. 1026 Warrenton Road Fredericksburg, VA 22406-6200	Same	CONTACT: Mike Hill PHONE #: 540-753-5511, X125 FAX #: 540-752-2109 EMAIL: quality@colonialcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/Custom		VQE-04-6002

Base Material	Rogers 6010LM
Panel Size	12" X 18"
Max. Board Thickness	0.031"
Max/Min Hole Size	0.117"/0.020"
Aspect Ratio	1.55:1
Max. Number of Layers	2
Min. Conductor Width	0.025"
Min. Conductor Spacing	0.010"
Part Mounting	SMT
Finish System	Tin/Lead HASL
Hole Preparation	Plasma Desmear
Copper Plating	Electrolytic Acid Copper
Solder Resist	LPI

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 75815
Coretec Denver, Inc. 10570 Bradford Road Littleton, CO 80127	Same	CONTACT: Douglas N. Berry PHONE #: 303-904-6119 FAX #: 303-933-2934 EMAIL: dberry@coretec-denver.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-02-0317
Panel Size	18" X 24"	
Max. Board Thickness	0.100"	
Max. Base Cu Thickness	0.001"	
Max/Min Hole Size	0.044"/0.024"	
Aspect Ratio	4:1	
Max. Number of Layers	10	
Min. Conductor Width	0.010"	
Min. Conductor Spacing	0.010"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin) GM (Woven E-glass, Triazine and/or Bismaleimide Modified Epoxy Resin)	
Finish System	HASL, IR Reflow following SnPb Plate	
Hole Preparation	Permanganate Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI, Dry Film	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 3AF82
Coretec, Inc. (Ellesmere Location) 2020 Ellesmere Road Scarborough, Ontario, Canada M1H 2Z8 Coretec, Inc. (Lawrence Location) 6530 Lawrence Avenue, E. Scarborough, Ontario, Canada M1C 4A7	Same	CONTACT: Bryan Clark PHONE #: 416-208-2100 FAX #: 416-208-2196 EMAIL: baclark@coretec-inc.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-6240
Panel Size	18" X 24"	
Max. Board Thickness	0.080"	
Min. PTH Size (as drilled)	Mech. Drill 0.0098" (Min)	
Aspect Ratio	7:1	
Max. Number of Layers	14	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL, ENIG	
Hole Preparation	Non FR4: Permanganate Desmear/Etchback FR4: Chemical Desmear	
Copper Plating	Electroless and electrolytic copper	
Solder Resist	LPI, Hole Plug	
Alternative Construction	N/A	
Controlled Impedence	Characteristics (±10%) Differential (±10%)	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65882
Crown Circuits, Inc. 6070 Avenida Encinas Carlsbad, CA 92009-1001	Same	CONTACT: Ellen Araneta PHONE #: 760-431-1124 FAX #: 760-431-1462 EMAIL: sales@crowncircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-02-2305
Panel Size	18" X 24"	
Max. Board Thickness	0.110"	
Max/Min Hole Size	0.250"/0.013"	
Aspect Ratio	8:1	
Max. Number of Layers	14	
Min. Conductor Width	0.0035"	
Min. Conductor Spacing	0.0035"	
Part Mounting	SMT, THM	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	(HASL), Soft and Hard Gold Over Nickel, Immersion Gold Over Electroless Gold, Enteck-organic Coating	
Hole Preparation	Plasma Etchback	
Copper Plating	Electrodeposited Acid Copper	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 5S706
Diversified Systems 3939 W. 56th Street Indianapolis, IN 46254	Same	CONTACT: Janet Smith PHONE #: 317-299-9547, x159 FAX #: 317-298-2055 EMAIL: janet.smith&divsys.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-01-0309 VQE-02-0015
Panel Size	18" X 24"	
Max. Board Thickness	0.110"	
Min. Hole Size	0.012"	
Aspect Ratio	5.5:1	
Max. Number of Layers	14	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT/THM	
Base Material	GF (Woven E-glass, Epoxy Resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL	
Solder Resist	LPI, Dry Film	
Hole Preparation	Permanganate Desmear/Etchback	
Copper Plating	Electro-deposited Acid Copper	
Controlled Impedance	Embedded Stripline & Microstrip	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 38898
Dynamic & Proto Circuits, Inc. 869 Barton Street Stoney Creek, Ontario L8E 5G6 Canada	Same	CONTACT: Mr. David Foster PHONE #: 905-643-9900 FAX #: 905-643-9911 EMAIL: dfoster@dapc.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-98-1143, VQE-00-0007 VQE-01-0311, VQE-02-0818
Panel Size	16"X18"	
Max. Board Thickness	0.125"	
Max/Min Hole Size	0.039"/0.018" (0.0135" drilled)	
Aspect Ratio	9:3:1	
Max. Number of Layers	16	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy resin) GI (Woven E-Glass, Polyimide resin)	
Finish System	HASL	
Hole Preparation	Plasma Etch	
Copper Plating	Acid Copper	
Solder Resist	LPI, Dry film solder resist plugs	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS Dynamic Details, Inc. 1200 Severn Way Dulles, VA 20166-8904	PLANT LOCATION Same	CAGE CODE: 0K703 CONTACT: Mr. Mike Hill PHONE #: 703-652-2202 FAX #: 703-652-2271 EMAIL: ddiglobal.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-3545
Panel Size	18"X24"	
Max. Board Thickness	0.1003"	
Max./Min. Hole Size	0.038"/0.024" (0.150" max. non-PTH)	
Aspect Ratio	6:8:1	
Max. Number of Layers	20	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.003"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy resin) GI (Woven E-Glass, Polyimide resin)	
Finish System	HASL	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Electrolytic Acid Copper	
Alternate Construction	Blind Vias	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 3ECL3
Endicott Interconnect Technologies, Inc. 1701 North Street, P.O. Box 658 Endicott, NY 13760	Same	CONTACT: Jeff McKeveny PHONE #: 607-755-1990 FAX #: 607-755-2113 EMAIL: mckeveny@eitny.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-5311 VQE-04-5508
Panel Size	24"X28"	
Max. Board Thickness	0.116"	
Max./Min. Hole Size	0.010"	
Aspect Ratio	12:1	
Max. Number of Layers	30	
Min. Conductor Width	0.0030"	
Min. Conductor Spacing	0.0040"	
Part Mounting	MIX	
Base Material	GF (Woven E-Glass, Epoxy resin)	
Finish System	HASL	
Hole Preparation	Permanganate Desmear	
Copper Plating	Electrolplated Acid Copper	
Solder Resist	LPI	

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 3ECL3
Endicott Interconnect Technologies, Inc. 1701 North Street, P.O. Box 658 Endicott, NY 13760	Same	CONTACT: Jeff McKeveny PHONE #: 607-755-1990 FAX #: 607-755-2113 EMAIL: mckeveny@eitny.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-5509
Panel Size	19.5"X24"	
Max. Board Thickness	0.084"	
Max./Min. Hole Size	0.012"	
Aspect Ratio	7:1	
Max. Number of Layers	12	
Min. Conductor Width	0.0045"	
Min. Conductor Spacing	0.0040"	
Part Mounting	MIX	
Base Material	GI (Woven E-Glass, Polyimide Resin)	
Finish System	HASL	
Hole Preparation	Permanganate Desmear	
Copper Plating	Electrolplated Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65423
Geometric Circuits, Inc. 11 Michael Avenue Farmingdale, NY 11735	Same	CONTACT: Phil Cate PHONE #: 631-249-0230 FAX #: 631-249-0286 EMAIL: phil@geometriccircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-4303
Panel Size	18"X24"	
Max. Board Thickness	0.100"	
Max./Min. PTH Hole Size	0.100"/0.025" (drill)	
Aspect Ratio	4:1	
Max. Number of Layers	10	
Min. Conductor Width	0.007"	
Min. Conductor Spacing	0.007"	
Part Mounting	SM, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy resin)	
Finish System	HASL	
Hole Preparation	Permanganate Desmear/Etchback	
Copper Plating	Electrolytic Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: C4831
Hans Brockstedt GmbH Leiterplattenschnelldienst Clara-Immerwahr-Strape 7 24145 Kiel Federal Republic of Germany	Same	CONTACT: Hilmar Klammer PHONE #: 0049-431-71966-0, -30 FAX #: 0049-431-71966-29 EMAIL: klammer@brockstedt.de

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-2619
Panel Size	9"X13", 13"x20", 15"x21", 18"x24"	
Max. Board Thickness	0.200"	
Max/Min Hole Size	Mech. Drilled: 0.01" Laser Drilled: 0.004"	
Aspect Ratio	6:1 (Blind Vias 1:1)	
Max. Number of Layers	10	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Internal Connections	Blind Vias, Buried Vias, Laser Drilled Vias	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy resin) GI (Woven E-Glass, Polyimide resin)	
Finish System	Fused SnPb, Electroplated SnPb, HASL, Electroless Sn, Electroplated Nickel/Gold, Electroless Nickel/Gold	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-03-2619
Panel Size	9"X13", 13"x20"	
Max. Board Thickness	0.200"	
Max/Min Hole Size	Mech. Drilled: 0.01" Laser Drilled: 0.004"	
Aspect Ratio	6:1 (Blind Vias 1:1)	
Max. Number of Layers	10	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Internal Connections	Blind Vias, Buried Vias, Laser Drilled Vias	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy resin) GI (Woven E-Glass, Polyimide resin)	
Finish System	Fused SnPb, Electroplated SnPb, HASL, Electroless Sn, Electroplated Nickel/Gold, Electroless Nickel/Gold	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 04939
Lockheed Martin Corp. Missiles & Fire Control Orlando 5600 West Sandlake Road Orlando, FL 32819-8907	Same	CONTACT: Vijay Kumar PHONE #: 407-356-0282 FAX #: 407-356-8291 EMAIL: vijay.kumar@lmco.com CONTACT: Paul Rose PHONE #: 407-356-5537 EMAIL: paul.b.rose@lmco.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-00-0734 VQE-02-0254
Panel Size	12" X 18"	
Max. Board Thickness	0.100" (nominal)	
Max/Min Hole Size	0.250"/0.018"	
Aspect Ratio	5.5:1	
Max. Nuber of Layers	12	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM	
Base Material	GI (Woven E-glass Polyimide Resin)	
Finish System	Reflow Solder, HASL	
Hole Preparation	Plasma Desmear	
Copper Plating	Electro-deposited Acid Copper	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-00-0193
Panel Size	12" X 18"	
Max. Board Thickness	0.076"	
Max/Min Hole Size	0.052"/0.012"	
Aspect Ratio	6:1	
Max. Nuber of Layers	14	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT	
Base Material	GF (Woven E-glass Epoxy Resin)	
Finish System	HASL	
Hole Preparation	Plasma Desmear	
Copper Plating	Electro-deposited Acid Copper	
Solder Resist	LPI, Dry Film, SMOBC	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 04939
Lockheed Martin Corp. Missiles & Fire Control Orlando 5600 West Sandlake Road Orlando, FL 32819-8907	Same	CONTACT: Vijay Kumar PHONE #: 407-356-0282 FAX #: 407-356-8291 EMAIL: vijay.kumar@lmco.com CONTACT: Paul Rose PHONE #: 407-356-5537 EMAIL: paul.b.rose@lmco.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-02-0960
Panel Size	12" X 18"	
Max. Board Thickness	0.051" (nominal)	
Max/Min Hole Size	0.038"/0.016"	
Aspect Ratio	3:1	
Max. Number of Layers	7	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM	
Base Material	SC (Woven S-glass Cyanate Ester)	
Finish System	Reflow Solder	
Hole Preparation	Plasma Desmear	
Copper Plating	Electro-deposited Acid Copper	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-5489
Panel Size	12" X 18"	
Max. Board Thickness	0.078"	
Max/Min Hole Size	0.014"	
Aspect Ratio	4.5:1	
Max. Number of Layers	12	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT	
Base Material	BI (IPC-4101/53) can be combined with GI (IPC-4101/40)	
Finish System	Reflow Solder	
Hole Preparation	Plasma Desmear	
Copper Plating	Electro-deposited Acid Copper	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 03640
Lockheed Martin Systems Integration-Owego 1801 State Route 17C Owego, NY 13827	Same	CONTACT: Chris Conklin PHONE #: 607-751-4251 FAX #: 607-751-7714 EMAIL: c.j.conklin@lmco.com

CAPABILITIES BY TECHNOLOGY/ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-99-0130 VQE-00-0961
Panel Size	18" X 24"	
Max. Board Thickness	0.200"	
Min Hole Size	0.020"	
Aspect Ratio	8:1	
Max. Number of Layers	16	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM	
Base Material	GF (Woven E-glass Epoxy Resin) GI (Woven E-glass, Polyimide Resin) AF (Woven Aramid, Epoxy Resin)	
Finish System	Fused SnPb, HASL	
Hole Preparation	Permanganate Desmear, Plasma Etchback	
Copper Plating	Electro-deposited Copper	
Solder Resist	LPI	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-01-0539
Panel Size	18" X 24"	
Max. Board Thickness	0.095"	
Min Hole Size	0.014"	
Aspect Ratio	6.8:1	
Max. Number of Layers	14	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM	
Base Material	BI (Aramid fabric, Nonwoven, Polyimide Resin)	
Finish System	Fused SnPb, HASL, NiAu	
Hole Preparation	Permanganate Desmear	
Copper Plating	Electro-deposited Cu	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 03640
Lockheed Martin Systems Integration-Owego 1801 State Route 17C Owego, NY 13827	Same	CONTACT: Chris Conklin PHONE #: 607-751-4251 FAX #: 607-751-7714 EMAIL: c.j.conklin@lmco.com

CAPABILITIES BY TECHNOLOGY/ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-01-0540
Panel Size	18" X 24"	
Max. Board Thickness	0.111"	
Min Hole Size	0.022"	
Aspect Ratio	5.05: 1	
Max. Number of Layers	14	
Min. Conductor Width	0.0045"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM	
Base Material	GC (Glass Base, Woven E-reinforcement, Majority Cyanate Ester, Flame Resistant)	
Finish System	Fused SnPb, HASL, NiAu	
Hole Preparation	Permanganate Desmear	
Copper Plating	Electro-deposited Cu	
Solder Resist	LPI	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-00-0684
Panel Size	18" X 24"	
Max. Board Thickness	0.110"	
Min Hole Size	0.040"	
Aspect Ratio	2.75:1	
Max. Number of Layers	10	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM	
Rigid Base Material	GF (Woven E-glass, Epoxy Resin) GI (Woven E-glass, Polyimide Resin)	
Flex Base Material	IPC-FC-241/1 through /4 IPC-FC-241/11	
Finish System	Fused SnPb, HASL	
Hole Preparation	Permanganate Desmear/Plasma Etchback	
Copper Plating	Electro-deposited Acid Copper	
Solder Resist	UV-Cured Wet Screen	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 04RV5
Lone Star Circuits 901 Hensley Drive Wylie, TX 75098	Same	PHONE #: 972-771-1930 FAX #: 972-771-0360 EMAIL: sales@lonestar-circuits.com

CAPABILITIES BY TECHNOLOGY/ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-4341 VQE-04-5599 VQE-04-5891
Panel Size	18" X 24"	
Max. Board Thickness	0.100"	
Min Hole Size	0.0100"	
Aspect Ratio	7.5: 1	
Max. Number of Layers	12	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.005"	
Part Mounting	MIX	
Base Material	GF (Woven E-Glass, Epoxy Resin)	
Finish System	HASL	
Hole Preparation	Permanganate Desmear/Plasma Etchback	
Copper Plating	Electrodeposited Acid Copper	
Solder Resist	LPI, Dry Film	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-4957
Panel Size	18" X 24"	
Max. Board Thickness	0.070"	
Min Hole Size	0.018"	
Aspect Ratio	3.89:1	
Max. Number of Layers	6	
Min. Conductor Width	0.016"	
Min. Conductor Spacing	0.008"	
Part Mounting	MIX	
Rigid Base Material	GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL	
Hole Preparation	Plasma Etchback	
Copper Plating	Electrodeposited Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 34076
Micom Corp. 475 Old Highway 8 NW New Brighton, MN 55112	Same	CONTACT: Larry Leonard PHONE #: 651-604-2639 FAX #: 651-636-1352 EMAIL:lleonard@micomcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-2980
Panel Size	18" X 24"	
Max. Board Thickness	0.239"	
Max./Min. Plated Hole Size	0.0079"	
Aspect Ratio	11:1	
Max. Number of Layers	28	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM	
Base Material	GF (Woven E-Glass, Epoxy resin) GI (Woven E-Glass, Polyimide resin)	
Finish System	HASL, Fuse Following SnPb Plate	
Hole Preparation	Plasma Desmear/Etchback, Permanganate Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI, Dry Film	
Controlled Impedance	Characteristic (±10%) Differential (±10%)	
Alternate Construction	Blind & Buried Vias	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 66321
PCT Interconnect 1165 NW 55 Street Fort Lauderdale, FL 33309	Same	CONTACT: Marc Mitchell PHONE #: 954-776-5600 FAX #: 954-776-5615 EMAIL: mmitchell@pctinterconnect.com

CAPABILITIES BY TECHNOLOGY/ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-6119
Panel Size	20" X 24"	
Max. Board Thickness	0.100"	
Min Hole Size	0.0120"	
Aspect Ratio	8: 1	
Max. Number of Layers	14	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy Resin)	
Finish System	HASL, Ni/Au	
Hole Preparation	Permanganate Desmear/Plasma Etchback	
Copper Plating	Electrodeposited Acid Copper	
Solder Resist	LPI	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-04-6119
Panel Size	20" X 24"	
Max. Board Thickness	0.100"	
Min Hole Size	0.0310"	
Aspect Ratio	3.2:1	
Max. Number of Layers	10	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	MIX	
Rigid Base Material	GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL, Ni/Au	
Hole Preparation	Permanganate Desmear/Plasma Etchback	
Copper Plating	Electrodeposited Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 21971
Philway Products, Inc. 701 Virginia Avenue Ashland, OH 44806	Same	CONTACT: Ted Norris PHONE #: 419-281-7777 FAX #: 419-289-3447 EMAIL:TedN@philway.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-99-1107
Panel Size	18" X 21"	
Max. Board Thickness	0.090"	
Max. Base Cu Thickness	0.002"	
Max/Min Plated Hole Size	0.044"/0.012	
Aspect Ratio	4:1	
Max. Number of Layers	12	
Min. Conductor Width	0.005"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-Glass, Epoxy resin) GI (Woven E-Glass, Polyimide resin) GM (Woven E-Glass, Triazine and/or Bismaleimide Modified Epoxy resin)	
Finish System	HASL, IR Reflow following SnPb plate	
Hole Preparation	Permanganate Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65114
Printed Circuits, Inc. 1200 W. 96th Street Bloomington, MN 55431-2699	Same	CONTACT: Dennis Cantwell PHONE #: 612-888-7900 FAX #: 612-888-2719 EMAIL: dcant@printedcircuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2 MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-01-0024
Panel Size	12" X 18", 18" X 24"	
Max. Board Thickness	0.120"	
Min. Hole Size	0.010"	
Aspect Ratio	10:1	
Max. Number of Layers	16	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-glass, Epoxy Resin) GI (Woven, E-glass, Polyimide Resin) IPC-FC-241/1 through /4 IPC-FC-241/11	
Finish System	Fused SnPb, HASL, Electroplated Nickel/Gold, Electroless Nickel/Gold	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI, Dry Film, SMOBC	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 7Z463
Proto Circuit, Inc. 7 Ascot Parkway Cuyahoga Falls, OH 44223	Same	CONTACT: Peter Menuez PHONE #: 330-572-3400 FAX #: 330-572-3434 EMAIL: peter.b.menuez@protocircuit.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-00-0289 VQE-01-0910
Panel Size	18" X 24"	
Max. Board Thickness	0.126"	
Min Hole Size	0.014"	
Aspect Ratio	5:1	
Max. Number of Layers	16	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT/THM	
Base Material	GF (Woven E-glass Epoxy resin) GI (Woven E-glass Polyimide Resin) AF (Woven Aramid Epoxy Resin) BI (Non-woven Aramid Polyimide Resin	
Finish System	HASL, Fused Tin Lead Plate, Selective Solder Strip-Tin Lead Plate	
Hole Preparation	Plasma Etchback	
Copper Plating	Acid Copper	
Controlled Impedance	100/50 ohm ±5%	
Alternate Construction	Sequential Lamination for Blind & Buried Vias (8 layer max)	

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-01-0909
Panel Size	18" X 24"	
Max. Board Thickness	0.126"	
Min Hole Size	0.017"	
Aspect Ratio	10:1	
Max. Number of Layers	11	
Min. Conductor Width	0.003"	
Min. Conductor Spacing	0.003"	
Part Mounting	SMT/THM	
Base Material		
Rigid	GF (Woven E-glass Epoxy resin) GI (Woven E-glass Polyimide Resin)	
Flex	Adhesiveless Construction	
Finish System	HASL	
Hole Preparation	Plasma Etchback	
Copper Plating	Acid Copper	
Flexibility Class	Class A	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 3BKL5
Sanmina –SCI (Costa Mesa) 2945 Airway Avenue Costa Mesa, CA 92626	Same	CONTACT: Terry Lichte PHONE #: 714-371-2847 FAX #: 714-371-2833 email: terry.lichte@sanmina-sci.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-3327
Panel Size	12" X 18"	
Max. Board Thickness	0.093"	
Min Thru Hole Size	0.010"	
Min. Blind Via	0.005" Laser Controlled Depth	
Min. Buried Via	0.006" Mechanical Drill	
Aspect Ratio	7:1	
Max. Number of Layers	18	
Min. Conductor Width	0.002"	
Min. Conductor Spacing	0.003"	
Part Mounting	SMT, THM	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL, Electroless Nickel Immersion Gold (ENIG), Electrolytic Soft Bondable Gold	
Hole Preparation	Desmear, Etchback	
Copper Plating	Acid Copper	
Solder Resist	LPI	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 1V6J6
Sanmina –SCI (Phoenix) 5020 South 36th Street Phoenix, AZ 85040	Same	CONTACT: Alfred Macha PHONE #: 602-824-8456 FAX #: 602-824-8674 EMAIL: Macha@sanmina-sci.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1		VQE-03-4646
Panel Size	18" X 24"	
Max. Board Thickness	0.0925"	
Min Hole Size	0.013" (TH)	
Aspect Ratio	5.7:1	
Max. Number of Layers	16	
Min. Conductor Width	0.006"	
Min. Conductor Spacing	0.005"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL, Electrolytic Nickel Gold, Electroless Nickel/ Immersion Gold, Immersion Silver	
Hole Preparation	Desmear	
Copper Plating	Acid Copper	
Solder Resist	LPI	
Controlled Impedance	200/28 ohms ± 10%	
Hypot Test	Max Voltage: 1000V	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65359
Sanmina –SCI (Wilmington) One Jewel Drive Wilmington, MA 01887-3390	Same	CONTACT: John Adams PHONE #: 978-933-1920 FAX #: 978-933-1818 email: john.Adams@sanmina-sci.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-3935 VQE-03-4769
Panel Size	18" X 24"	
Max. Board Thickness	0.230"	
Min . Hole Size	0.098" (TH) 0.008" (Buried Via)	
Aspect Ratio	10:1	
Max. Number of Layers	28	
Min. Conductor Width	0.0035"	
Min. Conductor Spacing	0.0035"	
Part Mounting	SMT, THM, MIX	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin)	
Finish System	HASL, Reflowed Solder, Electroless Nickel Immersion Gold (ENIG), Immersion Tin, Immersion Silver, OSP	
Hole Preparation	Desmear	
Copper Plating	Acid Copper	
Solder Resist	LPI	
Special	Buried Vias	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 0GN71
Sovereign Circuits, Inc. 12080 DeBartolo Drive North Jackson, OH 44551	Same	CONTACT: Scott Bowles PHONE #: 330-538-3900 FAX #: 330-538-3820 EMAIL:bowles@sovereign-circuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-3120 VQE-03-3213
Panel Size	18" X 24"	
Max. Board Thickness	0.160"	
Max./Min. Hole Size	0.008"	
Aspect Ratio	10:1	
Max. Number of Layers	20	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM, MIX, Press Fit	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin) BI (Non-woven Aramid, Reinforced Polyimide) QIL (Woven Quartz Reinforced Polyimide)	
Finish System	HASL, Fused, SnPb, Immersion White Tin, Ni/Au, Ni/Pd/Au, OSP, Reflowed Pure Tin	
Hole Preparation	Plasma Desmear/Etchback, Permanganate Desmear/Etchback	
Copper Plating	Electroless & Electroplated Acid Copper	
Solder Resist	LPI, Dry Film	
Controlled Impedance	Range 30-150 ohms (± 10%), Microstrip, Embedded Microstrip, Dual Stripline, Characteristic, Differential	
Alternate Construction	Blind & Buried Vias	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 0GN71
Sovereign Circuits, Inc. 12080 DeBartolo Drive North Jackson, OH 44551	Same	CONTACT: Scott Bowles PHONE #: 330-538-3900 FAX #: 330-538-3820 EMAIL:bowles@sovereign-circuits.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-03-3121 VQE-03-3214

Panel Size	18" X 24"
Max. Board Thickness	0.160"
Max./Min. Hole Size	0.008"
Aspect Ratio	10:1
Max. Number of Layers	20
Min. Conductor Width	0.003"
Min. Conductor Spacing	0.003"
Part Mounting	SMT, THM, MIX, Press Fit
Rigid Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide Resin)
Flex Base Material	IPC-FC-241/1 (Acrylic Adhesive) IPC-FC-241/11 (Adhesiveless)
Finish System	HASL, Fused, SnPb, Immersion White Tin, Ni/Au, OSP, Reflowed Pure Tin
Hole Preparation	Plasma Desmear/Etchback Permanganate Dsmear/Etchback
Solder Resist	LPI, Dry Film
Copper Plating	Electroless & Electroplated Acid Copper
Controlled Impedance	Range 30-150 ohms (± 10%), Microstrip, Embedded Microstrip, Dual Stripline, Characteristic, Differential
Flexibility Class	Class A (Flex During Installation Class B (Continuous Flexing)
Alternate Construction	Blind & Buried Vias

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65337
StrataFLEX Corp. 11 Dohme Avenue Toronto, Ontario, Canada M4B 1Y7	Same	CONTACT: Robert Gleaves PHONE #: 416-752-2224 FAX #: 416-752-6719 EMAIL: rgleaves@strataflex.ca
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-04-5354
Panel Size	12" X 18"	
Max. Board Thickness	0.035"	
Max./Min. Hole Size	0.011"	
Aspect Ratio	3:1	
Max. Number of Layers	7	
Min. Conductor Width	0.007"	
Min. Conductor Spacing	0.007"	
Part Mounting	SMT THM	
Base Material	Flexible Polyimide Clad (IPC-4204/1) Flexible Polyimide Film (IPC-4202/1) Flexible Polyimide Film/Acrylic (IPC-4203/1) FR4-IPC-4101/21	
Finish System	HASL	
Hole Preparation	Plasma Etchback	
Copper Plating	Electrodeposited Acid Copper	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 3T000
Teradyne, Inc. Connection Systems Division 91 Northeastern Boulevard Nashua, New Hampshire 03062	Same	CONTACT: Melissa Baker PHONE #: 603-879-3818 FAX #: 603-879-2818 email: melissa.k.baker@teradyne.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-97-0649 VQE-97-0721
Panel Size	24" X 36"	
Max. Board Thickness	0.322"	
Min. Hole Size	0.016"	
Aspect Ratio	8:1	
Max. Number of Layers	27	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	THM, Compliant Pin, SMT	
Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide resin)	
Finish System	Fused SnPB, Nickel, Gold	
Hole Preparation	Permanganate Desmear/Etchback	
Copper Plating	Acid Copper	
Solder Resist	Thermal Cured Soldermask and SMOBC	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 65916
Tyco Printed Circuits Group Santa Clara Division 400 Matthew Street Santa Clara, CA 95050	Same	CONTACT: Nellie Gurierrez PHONE #: (408) 486-3184 FAX #: (408) 727-1003 EMAIL: nellie.gutierrez@tycoelectronics.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-3888 VQE-04-5823
Panel Size	18" X 24"	
Max. Board Thickness	0.120"	
Min Hole Size	0.191"/0.012"	
Aspect Ratio	9:1	
Max. Number of Layers	20	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM, MIX	
Base Material	BI (Nonwoven Aramid Reinforced Polyimide resin) GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide resin)	
Finish System	HASL, Immersion Ni/Au	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Electrolytic Acid Copper	
Solder Resist	LPI, Screen Printed	
Controlled Impedance	Range 30-150 ohms (±10%), Microstrip, Embedded Microstrip, Dual Stripline, Characteristic, Differential	
Alternate Construction	Blind Vias	

MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-03-3895
Panel Size	18" X 24"	
Max./Min. Board Thickness	0.0120"	
Max./Min. PTH Hole Size	0.191"/0.012"	
Aspect Ratio	9:1	
Max.Number of Layers	10	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	SMT, THM, MIX	
Rigid Base Material	GF (Woven E-glass, Epoxy resin)	
Flex Base Material	GI (Woven E-glass, Polyimide resin)	
Finish System	HASL, Immersion Ni/Au	
Hole Preparation	Plasma Desmear/Etchback	
Copper Plating	Electro-deposited Acid Copper	

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 5L706
Tyco Printed Circuits Group Stafford Division 4 Old Monson Road, P.O. Box 145 Stafford, CT 06075	Same	CONTACT: Mr. Robert Lucey PHONE #: (860) 684-5881 FAX #: (860) 684-7425 EMAIL: robert.lucey@tycoelectronics.com EMAIL: michele.hebert@tycoelectronics.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-03-3348

Panel Size	30" X 54"
Max. Board Thickness	1.088"
Max./Min,.Hole Size	0.09510"/0.221" drilled
Aspect Ratio	10:1
Buried Via Aspect Ratio	1:1
Max. Number of Layers	68
Min. Conductor Width	0.004"
Min. Conductor Spacing	0.004"
Part Mounting	SMT, THM, MIX, Press Fit
Base Material	AF (Woven Aramid, Epoxy Resin) BF (Nonwoven, Aramid Fabric, BI EpoxyResin) (Nonwoven Aramid Reinforced Polyimide Resin) GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide resin) GM (Woven E-Glass, Triazine/Bismaleimide Modified Epoxy Resin) SC (Woven S-glass Cyanate Ester)
Finish System	HASL, SMOBC, Reflowed Solder, Electroless Nickel/Immersion Gold, Electrolytic Hard and Soft Gold, Electrolytic Nickel, Bright Tin, Immersion Tin
Hole Preparation	Plasma Etchback
Copper Plating	Electroless and Electrolytic Copper
Solder Resist	LPI, Dry Film, Wet Mask, Hole Fill, Hole Plug
Controlled Impedance	Range 30-150 ohms (± 10%), Microstrip, Embedded Microstrip, Dual Stripline, Characteristic, Differential
Alternate Construction	Copper Invar Copper, Blind and Buried Vias, Micro Vias, Buried Resistors, Multiple Laminations

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 5L706
Tyco Printed Circuits Group Stafford Division 4 Old Monson Road, P.O. Box 145 Stafford, CT 06075	Same	CONTACT: Mr. Robert Lucey PHONE #: (860) 684-5881 FAX #: (860) 684-7425 EMAIL:robert.lucey@tycoelectronics.com EMAIL:michele.hebert@tycoelectronics.com
CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-03-3349

Panel Size	30" X 54"
Max. Board Thickness	0.300"/0.003"
Max./Min,.Hole Size	0.221"/0.0095" drilled
Aspect Ratio	9:1
Buried Via Aspect Ratio	5:1
Max. Number of Layers	28
Min. Conductor Width	0.004"
Min. Conductor Spacing	0.004"
Part Mounting	SMT, THM, MIX
Flex Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide resin) IPC-4204/1 Acrylic Adhesive IPC-4204/11 Adhesiveless SC (Woven S-glass Cyanate Ester)
Finish System	HASL, SMOBC, Reflowed Solder, Electroless Nickel/Immersion Gold, Electrolytic Hard and Soft Gold, Electrolytic Nickel, Bright Tin, Immersion Tin
Hole Preparation	Plasma Etchback
Copper Plating	Electroless and Electrolytic Copper
Solder Resist	LPI, Dry Film, Wet Mask, Hole Fill, Hole Plug
Controlled Impedance	Range 30-150 ohms (± 10%), Microstrip, Embedded Microstrip, Dual Stripline, Characteristic, Differential
Alternate Construction	Copper Invar Copper, Blind and Buried Vias, Micro Vias, Buried Resistors, Multiple Laminations
Flexibility Class	Class A (Flex During Installation) Class B (Continuous Flexing)

SECTION II

LIST OF MANUFACTURERS' QUALIFIED CAPABILITIES FOR EACH TECHNOLOGY

MANUFACTURER NAME & ADDRESS	PLANT LOCATION	CAGE CODE: 1EHD4
Tyco Printed Circuits Group Austin Division 12501 Research Blvd., Module 1 Austin, TX 78759	Same	CONTACT: Scott Johnson PHONE #: 512-250-6070 FAX #: 512-250-7097 EMAIL: Scott.Johnson@tycoelectronics.com

CAPABILITIES BY TECHNOLOGY / ASSOCIATED SPECIFICATION:		QUALIFICATION LETTER:
MIL-PRF-31032/1 MIL-PRF-31032/2		VQE-97-0509 VQE-97-0718 VQE-04-6226
Panel Size	18" X 24"	
Max. Board Thickness	0.150"	
Min. Hole Size	0.010"	
Aspect Ratio	9:1	
Max. Number of Layers	20	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	THM, SM	
Base Material	BI (Nonwoven Aramid Reinforced Polyimide resin) GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide resin)	
Finish System	Fused SnPb, HASL, OSP, Nickel, Gold	
Hole Preparation	Plasma Desmear/Etchback, Permanganate Chemical Desmear	
Copper Plating	Electroless Copper Deposition/Electrolytic Copper Flash	
Solder Resist	LPI (Spray Coated and Screen Printed), Dry Film Photo Imageable, UV-Cured Wet Screen, SMOBC	
MIL-PRF-31032/3 MIL-PRF-31032/4		VQE-99-0933 VQE-00-0935 VQE-04-6226
Panel Size	18" X 26"	
Max. Board Thickness	0.150"	
Min. Hole Size	0.010"	
Aspect Ratio	9:1	
Min. Conductor Width	0.004"	
Min. Conductor Spacing	0.004"	
Part Mounting	THM, SMT	
Rigid Base Material	GF (Woven E-glass, Epoxy resin) GI (Woven E-glass, Polyimide resin)	
Flex Base Material	IPC-FC-241/1 IPC-FC-241/11	
Finish System	Fused SnPb, HASL, OSP, Nickel, Gold, Immersion Silver	
Hole Preparation	Plasma Desmear/Etchback, Permanganate Chemical Desmear	
Copper Plating	Electroless Copper Deposition/Electrolytic Copper Flash	
Solder resist	LPI (Spray Coated and Screen Printed), Dry Film Photo Imageable, UV-Cured Wet Screen, SMOBC	
Usage	Class A	

SECTION III
ALPHABETICAL LIST OF QUALIFIED MANUFACTURERS

MANUFACTURER'S NAME & ADDRESS	PLANT LOCATION	OTHER INFORMATION
Ambitech, Inc. 8944 Fullbright Avenue Chatsworth, CA 91311-6123	Same	CAGE CODE: 51484 CONTACT: Grace Ben PHONE #: 818-882-5550 FAX #: 818-882-9408 EMAIL: grace.ben@ambi.com
Calumet Electronics Corp. 25830 Depot Street Calumet, MI 49913-1985	Same	CAGE CODE: 65337 CONTACT: Robert Hall PHONE #: 906-337-1305 FAX #: 906-337-5359 EMAIL: rhall@cec-up.com
Colonial Circuits, Inc. 1026 Warrenton road Fredericksburg, VA 22406-6200	Same	CAGE CODE: 6T499 CONTACT: Mike Hill PHONE #: 540-753-5511, X125 FAX #: 540-752-2109 EMAIL: quality@colonialcircuits.com
Coretec Denver, Inc. 10570 Bradford Road Littleton, CO 80127	Same	CAGE CODE: 75815 CONTACT: Douglas N. Berry PHONE #: 303-904-6119 FAX #: 303-933-2934 EMAIL: dberry@coretec-denver.com
Coretec, Inc. (Ellesmere Location) 2020 Ellesmere road Scarborough, Ontario, Canada M1H 2Z8 Coretec, Inc. (Lawrence Location) 6530 Lawrence Avenue, E. Scarborough, Ontario, Canada M1C 4A7	Same	CAGE CODE: 3AF82 CONTACT: Bryan Clark PHONE #: 416-208-2100 FAX #: 416-208-2196 EMAIL: baclark@coretec-inc.com
Crown Circuits, Inc. 6070 Avenida Encinas Carlsbad, CA 92009-1001	Same	CAGE CODE: 65882 CONTACT: Ellen Araneta PHONE #: 760-431-1124, x161 FAX #: 760-431-1462 EMAIL: sales@crowncircuits.com
Diversified Systems 3939 W. 56th Street Indianapolis, IN 46254	Same	CAGE CODE: 5S706 CONTACT: Janet Smith PHONE #: 317-299-9547, x159 FAX #: 317-298-2055 EMAIL: janet.smith@divsys.com
Dynamic & Proto Circuits, Inc. 869 Barton Street Stoney Creek, Ontario L8E 5G6 Canada	Same	CAGE CODE: 38898 CONTACT: Mr. David Foster PHONE #: 905-643-9900 FAX #: 905-643-9911 EMAIL: dfoster@dapc.com
Dynamic Details, Inc. 1200 Severn Way Dulles, VA 20166-8904	Same	CAGE CODE: 0K703 CONTACT: Mike Hill PHONE #: 703-652-2202 FAX #: 703-652-2271 EMAIL: ddiglobal.com
Endicott Interconnect Technologies, Inc. 1701 North Street, P.O. Box 658 Endicott, NY 13760	Same	CAGE CODE: 3ECL3 CONTACT: Jeff McKeveny PHONE #: 607-755-1990 FAX #: 607-755-2113 EMAIL: mckeveny@eitny.com

SECTION III
ALPHABETICAL LIST OF QUALIFIED MANUFACTURERS

MANUFACTURER'S NAME & ADDRESS	PLANT LOCATION	OTHER INFORMATION
Geometric Circuits, Inc. 11 Michael Avenue Farmingdale, NY 11735	Same	CAGE CODE: 65423 CONTACT: Phil Cate PHONE #: 631-249-0230 FAX #: 631-249-0286 EMAIL: phil@geometriccircuits.com
Hans Brockstedt GmbH Leiterplattenschnelldienst Clara-Immerwahr-Strape 7 24145 Kiel, Germany	Same	CAGE CODE: C4831 CONTACT: Hilmar Klammer PHONE #: 0049-431-71966-0, -30 FAX #: 0049-431-71966-29 EMAIL: klammer@brockstedt.de
Lockheed Martin Corp. Missiles & Fire Control Orlando 5600 Sandlake Road Orlando, FL 32819-8907	Same	CAGE CODE: 09205 CONTACT: Vijay Kumar PHONE #: 407-356-0282 FAX #: 407-356-8291 EMAIL: vijay.kumar@lmco.com CONTACT: Paul Rose PHONE #: 407-356-5537 EMAIL: paul.b.rose@lmco.com
Lockheed Martin Systems Integration-Owego 1801 State Route 17C Owego, NY 13827	Same	CAGE CODE: 03640 CONTACT: Chris Conklin PHONE #: 607-751-4251 FAX #: 607-751-7714 EMAIL: c.j.conklin@lmco.com
Lone Star Circuits 901 Hensley Drive Wylie, TX 75098	Same	CAGE CODE: 04RV5 PHONE #: 972-771-1930 FAX #: 972-771-0360 EMAIL: sales@lonestar-circuits.com
Micom Corp. 475 Old Highway 8 NW New Brighton, MN 55112	Same	CAGE CODE: 34076 CONTACT: Larry Leonard PHONE #: 651-604-2639 FAX #: 651-636-1352 EMAIL:lleonard@micomcircuits.com
PCT Interconnect 1165 NW 55 Street Fort Lauderdale, FL 33309	Same	CAGE CODE: 66321 CONTACT: Marc Mitchell PHONE #: 954-776-5600 FAX #: 954-776-5615 EMAIL: mmitchell@pctinterconnect.com
Philway Products, Inc. 701 Virginia Avenue Ashland, OH 44806	Same	CAGE CODE: 21971 CONTACT: Ted Norris PHONE #: 419-281-7777 FAX #: 419-289-3447 EMAIL: TedN@philway.com

SECTION III
ALPHABETICAL LIST OF QUALIFIED MANUFACTURERS

MANUFACTURER'S NAME & ADDRESS	PLANT LOCATION	OTHER INFORMATION
Printed Circuits, Inc. 1200 W. 96th Street Bloomington, MN 55431-2699	Same	CAGE CODE: 65114 CONTACT: Dennis Cantwell PHONE #: 612-888-7900 FAX #: 612-888-2719 EMAIL: dcant@printedcircuits.com
Proto Circuit, Inc. 7 Ascot Parkway Cuyahoga Falls, OH 44223	Same	CAGE CODE: 7Z463 CONTACT: Peter Menuez PHONE #: 330-572-3400 FAX #: 330-572-3434 EMAIL: peter.b.menuez@protocircuit.com
Sanmina – SCI (Costa Mesa) 2945 Airway Avenue Costa Mesa, CA 92626	Same	CAGE CODE: 3BKL5 CONTACT: Terry Lichte PHONE #: 714-371-2847 FAX #: 714-371-2833 EMAIL: terry.lichte@sanmina-sci.com
Sanmina – SCI (Phoenix) 5020 South 36th Street Phoenix, AZ 85040	Same	CAGE CODE: 1V6J6 CONTACT: Alfred Macha PHONE #: 602-824-8456 FAX #: 602-824-8674 EMAIL: Macha@sanmina-sci.com
Sanmina – SCI (Wilmington) One Jewel Drive Wilmington, MA 01887-3390	Same	CAGE CODE: 65359 CONTACT: John Adams PHONE #: 978-933-1920 FAX #: 978-933-1818 EMAIL: john.adams@sanmina-sci.com
Sovereign Circuits, Inc 12080 DeBartolo Drive North Jackson, OH 44451	Same	CAGE CODE: 0GN71 CONTACT: Scott Bowles PHONE #: 330-538-3900 FAX #: 330-538-3820 EMAIL:bowles@sovereign-circuits.com
StrataFLEX Corp. 11 Dohme Avenue Toronto, Ontario, Canada M4B 1Y7	Same	CAGE CODE: 65337 CONTACT: Robert Gleaves PHONE #: 416-752-2224 FAX #: 416-752-6719 EMAIL: rgleaves@strataflex.ca
Teradyne, Inc. Connection Systems Division 91 Northeastern Boulevard Nashua, NH 03062	Same	CAGE CODE: 3T000 CONTACT: Melissa Baker PHONE #: 603-879-3818 FAX #: 603-879-2818 EMAIL: melissa.k.baker@teradyne.com

SECTION III
ALPHABETICAL LIST OF QUALIFIED MANUFACTURERS

MANUFACTURER'S NAME & ADDRESS	PLANT LOCATION	OTHER INFORMATION
Tyco Printed Circuits Group Santa Clara Division 400 Matthew Street Santa Clara, CA 95050	Same	CAGE CODE: 65916 CONTACT: Nellie Gutierrez PHONE #: 408-486-3184 FAX #: 408-727-1003 EMAIL: nellie.gurierrez@tycoelectronics.com
Tyco Printed Circuits Group Stafford Division 4 Old Monson Road P.O. Box 145 Stafford, TX 06075	Same	CAGE CODE: 5L706 CONTACT: Mr. Robert Lucey PHONE #: (860) 684-5881 FAX #: (860) 684-7425 EMAIL: robert.lucey@tycoelectronics.com EMAIL: michele.hebert@tycoelectronics.com
Tyco Printed Circuits Group Austin Division 12501 Research Blvd., Module 1 Austin, TX 78759	Same	CAGE CODE: 1EHD4 CONTACT: Scott Johnson PHONE #: 512-250-6070 FAX #: 512-250-7097 EMAIL: scott.johnson@tycoelectronics.com