

ACTIVE SUPPLIER ASSESSMENT PROGRAM
(ASAP)

CORE SUPPLIERS LISTING

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Active Supplier Assessment Program (ASAP)

The Core Suppliers Listing (CSL) is a listing of manufacturers who are considered preferred suppliers of monolithic microcircuits, hybrid microcircuits, transistors or diodes by NASA. The CSL will eventually consist of two parts, i.e., Part I and Part II.

Part I follows, and includes only those suppliers who satisfy the following criteria:

- Are listed in QML-38535 (Qualified Manufacturers List of Advanced Microcircuits Qualified Under Military Specification MIL-PRF-38535), QML-38534 (“Qualified Manufacturers List of Custom Hybrid Microcircuits Qualified under Military Specification List of Custom Hybrid Microcircuits Qualified under Military Specification MIL-H-38534”) or QPL-19500 (“Qualified Products List of Products Qualified under Military Specification MIL-S-19500)
- Offer one or more products which are currently listed in either MIL-STD-975 or the GSFC PPL
- Offer QML/QPL products to quality assurance levels which are considered suitable for spaceflight use
- Have established a history of providing high reliability parts to NASA.

(The CSL, Part II, will be published later and will include active part suppliers, who are not necessarily QML/QPL-certified, but who satisfy the following criteria:

- Manufacturers parts on DESC certified and qualified lines
- Have compiled a satisfactory history of supplying high reliability parts which are currently procured through contractor (or OEM) SCDs
- Manufacture parts to NASA specifications
- Are certified and qualified by ESA/NASDA to provide parts to ESA/SCC or NASDA specifications)

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The CSL is intended to assist NASA project management, parts/reliability engineers and designers in avoiding EEE part reliability/mission schedule problems which can result when parts are procured from unproven suppliers or suppliers who show recent trends indicative of unsatisfactory performance.

For each manufacturer listed in the CSL, Part I, herein, there is accompanying information related to the processing technologies and product lines for which the manufacturer is considered a core supplier and the name/phone number of a company representative to whom questions may be directed.

The information described in this report was obtained from NASA GSFC Preferred Parts List (PPL-21), NASA Standard Electrical, Electronic and Electromechanical parts list (MIL-STD-975), Qualified Manufacturers List for Monolithic Microcircuits (QML-38535), Qualified Manufacturers list for Custom Hybrid Microcircuits (QML-38534), and Qualified Products List for Diodes and Transistors (QPL-19500).

For convenience, the listings have been grouped by part commodity. Introductory remarks for each section provide an explanation of the information contained therein. Please note that the manufacturer's listing and the accompanying information are considered accurate at the time of issue of this document. However, the semiconductor industry is one known for rapid change of technology and development including fabrication processes and assembly locations. As a result, the listings are subject to change without notice; revisions or amendments will be issued, as necessary.

For additional information regarding this Core Suppliers Listing, please contact:

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Section I
Microcircuits

Microcircuits

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Monolithic Microcircuits

Introduction

The manufacturers listed herein meet all of the requirements of MIL-PRF-38535 which supersedes MIL-M-38510. MIL-PRF-38535, which is a performance-based specification which contains criteria for verifying compliance, instead of methods and requirements. The accompanying information provided for each manufacturer is explained below:

Address,
Cage Code,
and Contact: Self-explanatory.

QML Status: "Full QML Certification/Qualification" --- Manufacturer meets all MIL-PRF-38535 certification and qualification requirements.

"Transitional QML Certification/Qualification" --- An allowance granted to JAN MIL-M-38510 manufacturers to transition their QPL, SMD, and MIL-STD-883 compliant devices to the QML-38535 program. This allowance is based on information provided by the JAN manufacturers that the included facilities and products have been and are meeting MIL-STD-883 Screening Method 5004 and Quality Conformance Inspection Method 5005. To be eligible for transitional certification, the JAN manufacturer must have submitted a plan for achieving full MIL-PRF-38535 QML within a specified period of time.

Note: Both full and transitional QML certified/qualified manufacturers are authorized to use the "QML" or "Q" certification mark on each microcircuit produced under the certified QML envelope of processes, materials, and facilities.

Manufacturer
Audits/Surveys: Lists dates of audits and/or surveys performed at the suppliers' facilities and the name of the agency/company which was responsible; also indicates whether or not the suppliers were approved.

Note: Information contained herein is subject to change by the manufacturer at any time.

Monolithic Microcircuits (con't.)

QML Class: A single letter which identifies the quality assurance level of the QML microcircuit. This identifier is dependent upon whether or not the manufacturer is a former MIL-M-38510 QPL supplier. There are four letters which can be used to differentiate products of importance to NASA. Following is a brief explanation (for additional information, see MIL-PRF-38535):

- “B” --- Designates a microcircuit which meets the Class B requirements of Appendix A of MIL- PRF - 38535. This quality assurance level is applicable to MIL-M-38510 parts manufactured by MIL-M-38510 suppliers who have transitioned or who are transitioning to QML. It was formerly MIL-M-38510 Class B.
- “S” --- Designates a microcircuit which meets the Class S requirements of Appendix A of MIL- PRF - 38535. This quality assurance level is also applicable to MIL-M-38510 parts manufactured by MIL-M-38510 suppliers who have transitioned or who are transitioning to QML. It was formerly MIL-M-38510 Class S.
- “Q” --- Designates a standard QML MIL- PRF -38535 microcircuit. This quality assurance level is applicable to parts which meet the standard requirements of MIL- PRF-38535. When “Q” is used in the part identification number (PIN), it should not be confused with the “Q” or “QML” certification logo which is also marked on each package and which is separate from the part number.
- “V” --- Designates a space level QML MIL- PRF-38535 microcircuit. This quality assurance level is applicable to parts which meet the standard requirements of MIL- PRF-38535 as supplemented by Appendix B of this document.

Note: Specification MIL-M-38510 has been inactivated for new designs.

Technology: Wafer process technology which has been certified/qualified.

Product Type: Generic functional description of products which have been QML certified/qualified.

**Certified/
Qualified**

Facility: Location of certified/qualified facility (ies) which is (are) currently listed in QML-38535.

Note: Information contained herein is subject to change by the manufacturer at any time.

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American Microsystems, Inc.

Address	Cage Code	QML Status	MFR Audits/Surveys	Class	Contact
2300 Buckskin Road Pocatello, ID 83201	31471	Full QML Certification/ Qualification	DESC QML -1/94 (Approved)	Q	Dave Locke 208-234-6708

Technology: 1.25 μ m Dual Layer Metal (DLM) CMOS	Product Type: Gate Arrays
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Pocatello, ID	San Jose, CA	Pocatello, ID	Pocatello, ID

Package Information:

Package Type:	PGA	Chip Carrier
Lead Count:		28-256
Matrix Size:	64-476	Gold
Lead Finish:	Gold	

Note: Information contained herein is subject to change by the manufacturer at any time.

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Analog Devices

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
804 Wilburn Street Wilmington, MA 01887	51640	Transitional QML Certification/ Qualification	DESC QM-1/94 (Approved)	B,Q	Jim Kaufman 617-937-2470

Technology: Bipolar FLASH (high speed bipolar) STAT I (high speed bipolar-ECL compatible) Complementary Bipolar BIMOS ABCMOS (MOS-double polysilicon capacitors)	Product Type: Data converters References
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Wilmington, MA	Wilmington, MA Manila, Philippines	Wilmington, MA Manila, Philippines	Wilmington, MA Manila, Philippines

Package Information:

Package Type:	Flat Pack	DIP	Chip Carrier	Metal Can
Lead Count:	2	14-28	20-44	02-12
Lead Finish:	Gold	Solder	Solder	Solder
Lead Pitch:	.050 inch	1 inch	0.050 inch	1 to 4 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

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Cypress Semiconductor

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
3901 North First Street San Jose, CA 95134-1599	65786	Transitional QML Certification/ Qualification	DESC QML-2/94 (Approved)	B,Q	Bill Bennett 617-937-2470

Technology: 1.2µm, 1.0µm, 0.8µm, and 0.64µm Single Layer Metal (SLM) and Dual Layer Metal (DLM) CMOS and BICMOS	Product Type: SRAMs
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Round Rock, TX Bloomington, MN	Alphatek - Bangkok, Thailand	San Jose, CA Alphatek - Bangkok, Thailand	San Jose, CA

Package Information:

Package Type:	DIP
Lead Count:	16-18
Lead Finish:	Solder Dip
Lead Pitch:	0.014-0.026 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

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Harris Semiconductor Products

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
2401 Palm Bay Road Northeast Palm Bay, FL 32905	34371	Transitional QML Certification/ Qualification	DESC QML-8/93 (Approved)	Q,V, B,S	Peter Brooks 407-724-7783

Technology: Bipolar CMOS Linear CMOS Self Aligned Junction Isolation (SAJI)	Product Type: Memories Logics Switches
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Palm Bay, FL Findlay, OH	Palm Bay, FL Kuala Lumpur, Malaysia	Palm Bay, FL Kuala Lumpur, Malaysia	Palm Bay, FL Kuala Lumpur, Malaysia

Package Information:

Package Type:	Chip Carrier	PGA	DIP	Metal Can
Lead Count:	20-44		8-40	8-12
Matrix Size:		68-85	N/A	N/A
Lead Finish:	Solder/Gold	Solder	Solder/Gold	Solder/Gold
Lead Pitch:	0.050 inch	0.100 inch	0.100 inch	N/A

Note: Information contained herein is subject to change by the manufacturer at any time.

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Honeywell SSEC

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
12001 State Highway 55 Plymouth, MN 55441-4799	34168	Full QML Certification/ Qualification	DESC QML-5/92 (Approved)	Q,V	Bret Rinehart 612-954-2956

Technology: 1.2µm RICMOS III 0.8µm RICMOS IV (Note 1)	Product Type: SRAMs Custom, semi-custom, standard cell, gate array ASIC
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Note 1: RICMOS is a registered trademark used to describe Honeywell's radiation insensitive CMOS process

Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Plymouth, MN	Plymouth, MN	Plymouth, MN	Plymouth, MN

Package Information:

Package Type:	Flat Pack
Lead Count:	36-256
Lead Finish:	Gold
Lead Pitch:	0.020-0.040 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

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Intel Corporation

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
500 West Chandler Boulevard Chandler, AZ 85226-4702	34649	Full QML Certification/ Qualification	DESC QML-10/90 (Approved)	Q,B	Greg Mather 602-554-8450

Technology: 1.0µm and 0.8µm CMOS 1.5µm HMOS III (Note 1)	Product Type: Microprocessors Micro-peripherals
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Note: HMOS III is Intel's terminology used to describe their enhanced third generation MOS process.

Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Rio Rancho, NM Chandler, AZ	Chandler, AZ Manila, Philippines Penang, Malaysia	Chandler, AZ Aloha, OR Manila, Philippines Penang, Malaysia	Chandler, AZ Manila, Philippines Penang, Malaysia

Package Information:

Package Type:	Pin Grid	Flat Pack	DIP	Chip Carrier
Lead Count:	N/A	68-196	18-48	28-244
Matrix Size:	62-208	N/A	N/A	N/A
Lead Finish:	Solder	Solder	Solder	Solder
Lead Pitch:	0.100 inch	0.025-0.050 inch	3-6 inch	0.050 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Linfinity

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
11861 Western Avenue Garden Grove, CA 92641-2119	34333	Transitional QML Certification/ Qualification	DESC QML - 8/93 (Approved)	B,Q	Tim Miller 714-898-8121

Technology: Bipolar	Product Type: Regulators Operational amplifiers Drivers Transistor arrays
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Garden Grove, CA	Garden Grove, CA Philippines (PSI)	Garden Grove, CA	Garden Grove, CA

Package Information:

Package Type:	Flat Pack	DIP	Chip Capacitor	Metal Can
Lead Count:	10-24	08-18	20	3-12
Lead Finish:	Solder/Gold	Solder	Solder	Solder
Lead Pitch:	03-.05 inch	0.0100	05 inch	

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Loral Federal Systems Corporation

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
9500 Godwin Drive Manassas, VA 22110-4198	52088	Full QML Certification/ Qualification	DESC QML -12/91 (Approved)	Q,V	Paul Nixon 703-367-1378

Technology: 1.0µm Radiation Hardened CMOS (RHCMOS) 0.8 µm RHCMOS-E VLSI Chip on Silicon (VCOS) 0.5 µm “Half Micron” CMOS (HMCMOS)	Product Type: SRAMs Memories Microprocessors Custom and gate array ASICs
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Manassas, VA	Manassas, VA	Manassas, VA	Manassas, VA

Package Information:

Package Type:	Flat Pack
Lead Count:	32-308
Lead Finish:	Gold
Lead Pitch:	0.250 - 0.6 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

National Semiconductor Corporation

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
2900 Semiconductor Drive Santa Clara, CA 95052-8090	27014	Full QML Certification/ Qualification	DESC QML-4/95 (Approved)	B,S, Q,V	Susan Davis 408-721-3161

Technology: Bipolar Linear CMOS	Product Type: Standard products Logics Memories Interfaces Gate arrays
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Santa Clara, CA West Jordan, UT South Portland, ME Arlington, TX Greenock, Scotland	South Portland, ME Singapore Exchange OFS, Philippines Malacca, Malaysia	Santa Clara, CA South Portland, ME Singapore	South Portland, ME Singapore Exchange OFS, Philippines Santa Clara, CA

Package Information:

Package Type:	Flat Pack	DIP	PGA	Chip Carrier	Metal Can
Lead Count:	10-256	8-52		20-84	2-15
Matrix Size:	-		8x8/21x21		N/A
Lead Finish:	Gold/Solder	Gold/Solder	Gold	Solder/Dip	Gold/Solder
Lead Pitch:	0.020-0.050 inch	0.100 inch	0.100 inch	0.050 inch	0.100-0.600 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

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Philips Semiconductor

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
811 East Arques Avenue Sunnyvale, CA 94088	18324	Transitional QML Certification/ Qualification	DESC QML-3/94 (Approved)	B,Q	Lou Johnson 408-991-2720

Technology: Bipolar memory Linear MCO (bipolar-microcontroller)	Product Type: Standard products Memories Linears Microcontrollers
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Albuquerque, NM Sunnyvale, CA	Alphatek - Bangkok, Thailand	Bangkok, Thailand Sunnyvale, CA Alphatek - Bangkok, Thailand ISE IN - San Jose, CA Albuquerque, NM	QPL Labs Bangkok, Thailand Alphatek - Bangkok, Thailand

Package Information:

Package Type:	DIP	Flat Pack
Lead Count:	16-24	24
Lead Finish:	Solder	Solder

Note: Information contained herein is subject to change by the manufacturer at any time.

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Siliconix

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
2201 Laurelwood Road Santa Clara, CA 95056-0951	17856	Transitional QML Certification/ Qualification	DESC QML-10/93 (Approved)	B,Q	Liz Korntved 408-970-5260

Technology: Bipolar Metal Gate II Silicon Gate I C/DMOS (Note 1)	Product Type: Analog switches
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Note: C/DMOS is Siliconix' terminology used to describe the combination of CMOS (logic) and DMOS (power) elements in a single MOS process.

Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Santa Clara, CA	Dynesem - Manila, Philippines Santa Clara, CA	Santa Clara, CA Siliconix - Manila, Philippines	Dynesem - Manila, Philippines Santa Clara, CA Siliconix - Manila, Philippines

Package Information

Package Type:	Flat Pack	DIP	Chip Carrier	Metal Can
Lead Count:	14-16	8-28	20	10
Lead Finish:	Solder/Gold	Solder/Gold	Gold/Solder	Gold/Solder

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Texas Instruments

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
Post Office Box 60448 Midland, TX 79711-0448	01295	Full QML Certification/ Qualification	DESC QML-7/92 (Approved)	B,Q	Steve Miller 915-561-6614

Technology: Bipolar Linear CMOS	Product Type: Standard products Logics
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Sherman, TX Dallas, TX Houston, TX	Taipei, Taiwan	Taipei, Taiwan	Taipei, Taiwan

Package Information:

Package Type:	Flat Pack	DIP	Chip Carrier
Lead Count:	14-24	8-24	20
Lead Finish:	Solder	Solder	Solder

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

United Technologies Microelectronics Center

Address	Cage Code	QML Status	Mfr. Audits/Surveys	Class	Contact
1575 Garden of the Gods Road Colorado Springs, CO 80907-3486	5342	Transitional QML Certification/ Qualification	DESC QML-9/93 (Approved)	Q,V	Myles Standish 719-594-8000

Technology: 1.5µm and 1.2µm CMOS	Product Type: Memories CMOS gate arrays Bus Interfaces
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Certified/Qualified Facilities:

Wafer Fabrication	Assembly	Electrical Test	Environmental Test
Colorado Springs, CO	Colorado Springs, CO	Colorado Springs, CO	Colorado Springs, CO

Package Information:

Package Type:	Flat Pack	PGA	DIP
Package Size:	28-304	68-281	24-40
Matrix Size:		8x8/18x18	
Lead Finish:	Solder/Gold	Solder/Gold	Solder/Dip
Lead Pitch	020-.050 MIL	1 inch	0.50 inch

Note: Information contained herein is subject to change by the manufacturer at any time.

Section II
Hybrid Microcircuits

Hybrid Microcircuits

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Hybrid Microcircuits Introduction

Two (Hewlett-Packard Company and Micropac Industries, Incorporated) of the three manufacturers listed herein meet the certification and qualification requirements of MIL-H-38534 for quality assurance level (class) K. Currently these manufacturers are not offering any off-the-shelf K level hybrids. They are manufacturing custom/semi-custom hybrids for high reliability and space applications.

The remaining manufacturer (Interpoint) listed herein meets all of the certification and qualification requirements of MIL-H-38534 : quality assurance level (class) H. This manufacturer is included in the Core Suppliers Listing because several of their products have passed Goddard Space Flight Center (GSFC) qualification testing, including radiation (total dose and SEE) and life tests.

The accompanying information, provided for each manufacturer, is explained below.

Address,

Cage Code: Self-explanatory.

QML Class: A single letter which identifies the quality assurance level of the QML hybrid microcircuit.
“K”--- Designates the highest reliability level provided for in MIL-H-38534. It is intended for space applications.
“H”---Designates the standard minimum military quality level.

Product Type Generic functional description of products which have been certified/qualified.

Certified/
Qualified

Facility: Location of certified/qualified facility(ies) which is (are) currently listed in QML ~~338~~

Package

Information Characteristics of qualified hybrid packages.

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Manufacturing

Audits/Surveys: Lists dates of audits and/or surveys performed at the suppliers' facilities and the name of the agency/company which was responsible; also indicates whether or not the suppliers were approved.

Note: Information contained herein is subject to change by the manufacturer at any time.

Hewlett - Packard Company

Address	Cage Code	Mfr. Audits/Surveys	Class	Contact
Optical Communications Div 370 West Trimble Rd. San Jose, CA 95131	50434	DESC QML-9/94 (Approved)	K	Dick Fellows 408-435-6519

Product Type
Optocoupler

Certified/Qualified Facilities:

Substrate Fabrication	Assembly
San Jose, CA	San Jose, CA

Package Information:

Package Type:	Ceramic DIP	LCC
Seal Method:	Solder	Solder
Lead Count:	16	20
Seal Perimeter:	1.28 inch	0.92 inch
Lead Finish:	Gold; solder	Solder

Note: Information contained herein is subject to change by the manufacturer at any time.

Micropac Industries, Incorporated

Address	Cage Code	Mfr. Surveys/Audits	Class	Contact
905 East Walnut St. Garland, TX 75040	31757	DESC QML-12/93 (Approved)	K	Shirley Large 214-272-3571

Product Type
Optopower

Certified/Qualified Facilities:

Substrate Fabrication	Assembly
Garland, TX	Garland, TX

Package Information:

Opto:

Package Type:	Ceramic DIP	LCC	TO can
Seal Method:	Solder	Solder	Projection weld
Lead Count:	16	24	8
Seal Perimeter:	1.89 inch	1.60 inch	2.27 inch
Lead Finish:	Gold; solder	Solder	Gold; solder

Note: Information contained herein is subject to change by the manufacturer at any time.

Interpoint Corporation

Address	Cage Code	Mfr. Audits/Surveys	Class	Contact
Interpoint Corporation 10301 Willows Road Redmond, WA 98073	50821	DESC QML-4/87 (Approved)	H	Mike Friends 206-882-3100

Product Type
DC/DC Converters

Certified/Qualified Facilities:

Substrate Fabrication	Assembly
Redmond, WA	Redmond, WA

Package Information:

Package Type:	Metal with peripheral leads
Seal Method:	Seam weld
Lead Count:	12
Seal Perimeter:	8.0 inch
Lead Finish:	Gold & Silver

Note: Information contained herein is subject to change by the manufacturer at any time.

Section III
Diodes

Diodes

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Note: Information contained herein is subject to change by the manufacturer at any time.

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Note: Information contained herein is subject to change by the manufacturer at any time.

Diodes Introduction

The manufacturers listed herein meet all of the requirements of MIL-S-19500. As a minimum, these manufacturers meet a JANTX quality assurance level and have at least one part type listed in the current version of MIL-STD-975 (NASA Standard Parts List) or the GSFC PPL (Preferred Parts List). The accompanying information provided for each manufacturer is explained below:

Address,
Cage Code: Self-explanatory.

Manufacturer
Audits/Surveys: Lists dates of a last audit/survey performed at the suppliers' facilities and the name of the agency/company which was responsible, also indicates whether or not the suppliers were approved.

Product
Assurance
Level: Product assurance level(s) for which the manufacturer is qualified. The JAN product assurance level is not listed, because this level is not preferred for NASA applications.

Technology: Wafer process technology which has been certified/qualified.

Contact: Self-explanatory.

Product Type: Generic functional description of products which have been certified/qualified.

Facility: Location of facility(ies) which is (are) currently used to manufacture MIL-S-19500 JANTX, JANTXV, or JANS products, as applicable.

Note: Information contained herein is subject to change by the manufacturer at any time.

American Power Devices

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
69 BennettSt. Lynn, MA 01905-3003	50273	DESC QPL-11/94 (Approved)	JANTX, JANTXV	Paul X. Flaherty 617-592-6090

Technology: Silicon, alloy junction	Product Type: Zener Voltage reference
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Lynn, MA	Lynn, MA	Lynn, MA	Lynn, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

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BKC Semiconductors, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
6 Lake St. Lawrence, MA 01841-3011	66891	DESC QPL-10/94 (Approved)	JANTX, JANTXV	Ed Sullivan 508-681-0392

Technology:	Silicon, planar diffused Silicon, mesa diffused	Product Type:	Fast recovery rectifier Switching Zener Unidirectional transient suppressor Small signal
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Lawrence, MA	Lawrence, MA	Lawrence, MA	Lawrence, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

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Compensated Devices, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
166 Tremont St. Melrose, MA 02176-2296	55801	DESC QPL -8/93 (Approved)	JANTX, JANTXV, JANS	Thomas Kachel 617-665-1071 X120

Technology:	Silicon, planar, double diffused with guard ring MESA	Product Type:	Switching Zener Voltage reference Current regulator Schottky diodes Schottky rectifier
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Melrose, MA	Melrose, MA	Melrose, MA	Melrose, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

International Rectifier Corporation

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
Semiconductor Div. 233 Kansas St. El Segundo, CA 90245-4382	59993	DESC QPL-6/95 (Approved)	JANTX, JANTXV	Fred Rubi 310-607-8883

Technology: Diffused guard ring Schottky	Product Type: Schottky barrier rectifier
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
El Segundo, CA	El Segundo, CA	El Segundo, CA	El Segundo, CA

Note: Information contained herein is subject to change by the manufacturer at any time.

Knox Semiconductor, Inc.

Address	Cage Code	Mfr. Audits/surveys	Product Assurance Level	Contact
P. O. Box 609 Rockport, ME 04856-9999	61322	DESC QPL-12/94 (Approved)	JANTX, JANTXV	Bill Gilbert 207-236-6076

Technology:	Silicon, planar diffused, field effect (regulators) Silicon, planar diffused (varactors)	Product Type:	Current regulator Varactor
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Rockport, ME	Rockport, ME	Rockport, ME	Rockport, ME

Note: Information contained herein is subject to change by the manufacturer at any time.

Linfinity Microelectronics, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
11861 Western Ave. Garden Grove, CA 92641-2119	34333	DESC QPL-3/95 (Approved)	JANTX, JANTXV	Gary Hancock 714-898-8121

Technology: Isolated silicon, monolithic	Product Type: Multiple diode array
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
(Note 1)	Garden Grove, CA	Garden Grove, CA Manila, Philippines	Garden Grove, CA

Note 1: No ongoing design activity

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

M/A - COM, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
1011 Pawtucket Blvd. P.O. Box 3295 Lowell, MA 01853-3295	96341	DESC QPL-3/94 (Approved)	JANTX	Charlie Howell 617-564-3038

Technology: Silicon mesa, PIN	Product Type: Switching
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Burlington, MA	Burlington, MA	Burlington, MA	Burlington, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Micropac Industries, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
P.O. Box 469017 Garland, TX 75046-9017	31757	DESC QPL-3/94 (Approved)	JANTX	Jennifer Ritchie 214-272-3571 X274

Technology: GaAsP on GaP GaP on GaP	Product Type: LED
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Garland, TX	Garland, TX	Garland, TX Juarez, Mexico	Garland, TX

Note: Information contained herein is subject to change by the manufacturer at any time.

Microsemi Corporation - Scottsdale Division

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
8700 East Thomas Rd. Scottsdale, AZ 85252-1008	12954	DESC QPL-5/95 (Approved)	JANTX, JANTXV, JANS	Dottie Fields 602-941-6488

Technology:	Silicon, planar diffused Silicon, mesa diffused Silicon planar, alloy junction Silicon, mesa planar stack Silicon, epitaxial pad	Product Type:	Fast recovery rectifier Switching Zener Voltage reference Unidirectional transient suppressor Bidirectional transient suppressor
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Santa Ana, CA Scottsdale, AZ	Santa Ana, CA Scottsdale, AZ	Scottsdale, AZ Foton, Hong Kong	Scottsdale, AZ Ennis, Ireland

Note: Information contained herein is subject to change by the manufacturer at any time.

Microsemi Corporation - Santa Ana Division

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
2830 South Farview St. Santa Ana, CA 92704-1390	14552	ISO 9001 & DESC QPL-2/95 (Approved)	JANTX, JANTXV, JANS	Dick Martin 714-979-8220 X295

Technology:	Silicon, planar diffused Silicon, mesa diffused Silicon planar, alloy junction Silicon, mesa planar stack Silicon, epitaxial pad	Product Type:	Power rectifier Fast recovery rectifier Switching Zener Voltage reference Bi-directional transient suppressor Unidirectional transient suppressor Full wave bridge rectifier Small signal
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Santa Ana, CA	Santa Ana, CA	Santa Ana, CA Foton, Hong Kong	Santa Ana, CA Ennis Ireland Hong Kong

Note: Information contained herein is subject to change by the manufacturer at any time.

Microsemi Corporation - Colorado Division

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
800 Hoyt St. Broomfield, CO 80020-1008	59377	ISO 9001 (Approved) DESC QPL-5/94 (Approved)	JANTX, JANTXV, JANS	Jerry Hopp 303-469-2161 X220

Technology:	Silicon, planar diffused Silicon, mesa diffused	Product Type:	Power rectifier Fast recovery rectifier Schottky barrier rectifier Silicon controlled rectifier
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Broomfield, CO	Broomfield, CO	Broomfield, CO	Broomfield, CO

Note: Information contained herein is subject to change by the manufacturer at any time.

Microsemi Corporation - Watertown Division

Address	Cage Code	Product Assurance Level	Contact
Microsemi Corporation Watertown 580 Pleasant Street Watertown, MA 02172-2497	12969	JANTX, JANTXV	Bob Stachowski 617-926-0404

Technology:	Silicon, planar diffused Silicon, mesa diffused	Product Type:	Power rectifier Schottky barrier rectifier Fast recovery rectifier Switching Zener Unidirectional transient suppressor Thyristor Full wave bridge rectifier Small signal
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Watertown, MA	Watertown, MA	Watertown, MA Ennis, Ireland	Watertown, MA Ennis, Ireland

Note: Information contained herein is subject to change by the manufacturer at any time.

National Semiconductor Corporation

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
333 Western Ave. South Portland, ME 04106-0022	27014	DESC QPL-11/93 (Approved)	JANTX, JANTXV	Randy Wyatt (Santa Clara) 408-721-4796

Technology: Isolated silicon monolithic	Product Type: Multiple diode array
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
(Note 1)	(Note 1)	(Note 2)	(Note 2)

Note 1: No ongoing design/wafer fabrication activities. Existing inventory is being sold.

Note 2: Assembly/test currently performed by Microsemi Corporation in Watertown, MA.

Note: Information contained herein is subject to change by the manufacturer at any time.

Semicon Components, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
10 North Ave. Burlington, MA 01803-3396	11961	DESC QPL-1/93 (Approved)	JANTX, JANTXV	Don Masson 617-272-9015

Technology:	Silicon, planar diffused Silicon, mesa diffused	Product Type:	Power rectifier Fast recovery rectifier Zener Bi-directional transient suppressor Unidirectional transient suppressor
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Burlington, MA	Burlington, MA	Burlington, MA	Burlington, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

Semtech Corporation

Address	Cage Code	Mfr. Surveys/Audits	Product Assurance Level	Contact
652 Mitchell Rd. Newbury Park, CA 91320-2289	14099	DESC QPL-3/95 (Approved)	JANTX, JANTXV	Tom Short 805-498-2111 X251

Technology:	Silicon, mesa diffused	Product Type:	Power rectifier Fast recovery rectifier Bi-directional transient suppressor Unidirectional transient suppressor Full wave bridge rectifier
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Newbury Park, CA	Newbury Park, CA Corpus Christi, TX	Newbury Park, CA Reynosa, Mexico	Newbury Park, CA

Note: Information contained herein is subject to change by the manufacturer at any time.

Sensitron Semiconductor

Address	Cage Code	Mfr. Audits/Survey	Product Assurance Level	Contact
Sensitron Semiconductor Division of RSM Electron Power, Inc. 221 West Industry Ct. Deer Park, NY 11729-4681	13409	DESC QPL-6/92 (Approved)	JANTX, JANTXV	Christine Cullinan 516-586-7600 X230

Technology: Silicon, planar diffused	Product Type: Power rectifier Fast recovery rectifier Full wave bridge rectifier
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Deer Park, NY	Deer Park, NY	Deer Park, NY	Deer Park, NY

Note: Information contained herein is subject to change by the manufacturer at any time.

Voltage Multipliers, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
8711 West Roosevelt Ave. Visalia, CA 93291-9458	60211	DESC QPL-7/94 (Approved)	JANTX, JANTXV	Karen Spano 209-651-1402 X15

Technology: Silicon, planar diffused	Product Type: Power rectifier Fast recovery rectifier High voltage diode
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Visalia, CA	Visalia, CA	Visalia, CA	Visalia, CA

Note: Information contained herein is subject to change by the manufacturer at any time.

Section IV
Transistors

Transistors

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Transistors Introduction

The manufacturers listed herein meet all of the requirements of MIL-S-19500. As a minimum, these manufacturers meet a JANTX quality assurance level and have at least one part type listed in the current version of MIL-STD-975 (NASA Standard Parts List) or the GSFC PPL (Preferred Parts List). The accompanying information provided for each manufacturer is explained below:

Address,
Cage Code: Self-explanatory.

Manufacturer
Audits/Surveys: Lists date of last audit/survey performed at the suppliers' facilities and the name of the agency/company which was responsible; also indicates whether or not the suppliers were approved.

Product
Assurance
Level: Product assurance level(s) for which the manufacturer is qualified. The JAN product assurance level is not listed, because this level is not preferred for NASA applications.

Contact: Self-explanatory.

Technology: Wafer process technology which has been certified/qualified.

Product Type: Generic functional description of products which have been certified/qualified.

Facility: Location of facility(ies) which is (are) currently used to manufacture MIL-S-19500 JANTX, JANTXV, or JANS products, as applicable.

Note: Information contained herein is subject to change by the manufacturer at any time.

Advanced Power Technology

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
405 Southwest Columbia St. Bend, OR 97702-1000	ODY74	ISO 9001-10/95 DESC QPL-5/94 (Approved)	JANTX, JANTXV	Mark Sorensen 503-382-8028 X115

Technology: Power MOS IV	Product Type: N-channel power MOSFET
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Bend, OR	Bend, OR	Bend, OR	Bend, OR

Note: Information contained herein is subject to change by the manufacturer at any time.

A. P. I. Electronics, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
375 Rabro Drive Hauppauge, NY 11788-4227	52333, 30045 (Note 1)	DESC QML-1/93 (Approved)	JANTX, JANTXV	Gordon Newman 516-582-6767

Note 1: A.P.I. Electronics has acquired Solid Power Corporation and their cage code.

Technology:	Bipolar, silicon planar (single diffused and triple diffused)	Product Type:	NPN low power PNP low power NPN high power NPN Darlington
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Hauppauge, NY	Hauppauge, NY	Hauppauge, NY	Hauppauge, NY

Note: Information contained herein is subject to change by the manufacturer at any time.

Harris Semiconductor

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
Route 202 Somerville, NJ 08876-9999	18722	DESC QPL-3/95 (Approved)	JANTX, JANTXV (Note 1)	Al Todd (@ Mountaintop, PA facility) 717-474-3252

Note 1: Harris has recently received JANS certification from DESC; as yet, no JANS products have been qualified.

Technology: Enhancement mode, silicon gate MOS	Product Type: N-channel power MOSFET P-channel power MOSFET
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Mountaintop, PA	Mountaintop, PA	Mountaintop, PA	Mountaintop, PA

Note: Information contained herein is subject to change by the manufacturer at any time.

International Rectifier Corporation

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
Semiconductor Div. 233 Kansas St. El Segundo, CA 90245-4382	59993	DESC QPL-9/95 (Approved)	JANTX, JANTXV, JANS	Fred Rubi 310-607-8883

Technology: HEXFET (Note 1)	Product Type: N-channel power MOSFET P-channel power MOSFET
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Note 1: HEXFET is a registered trademark used to describe International Rectifier Corporation's power MOSFET process.

Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
El Segundo, CA	El Segundo, CA (Note 2) Temecula, CA	El Segundo, CA	El Segundo, CA

Note 2: Only the El Segundo facility is approved for JANS products.

Note: Information contained herein is subject to change by the manufacturer at any time.

M/A - COM, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
1011 Pawtucket Blvd. P.O. Box 3295 Lowell, MA 01853-3295	96341	DESC QPL-3/94 (Approved)	JANTX, JANTXV	Charlie Howell 617-564-3038

Technology: Bipolar, silicon planar diffused	Product Type: RF
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Burlington, MA	Burlington, MA	Burlington, MA	Burlington, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Micropac Industries, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
P.O. Box 469017 Garland, TX 75046-9017	31757	DESC QPL-3/94 (Approved)	JANTX, JANTXV, JANS	Jennifer Ritchie 214-272-3571 X274

Technology: GaAs diode coupled to NPN silicon phototransistor	Product Type: Optocoupler
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Garland, TX	Garland, TX	Garland, TX Juarez, Mexico	Garland, TX Juarez, Mexico

Note: Information contained herein is subject to change by the manufacturer at any time.

Microsemi Corporation - Watertown Division

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
Microsemi Corporation Watertown 580 Pleasant Street Watertown, MA 02172-2497	12969, 07933 (Note 1)	DESC QPL-7/95 (Approved)	JANTX, JANTXV	Bob Stachowski 617-926-0404

Note 1: Microsemi-Watertown has acquired Raytheon’s MIL-S-19500 product line and their cage code.

Technology: Bipolar, silicon, planar diffused	Product Type: NPN low power PNP low power RF Dual complementary
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
(Note 2)	(Note 2)	(Note 2)	(Note 2)

Note 2: Microsemi is in a transition phase. No design or wafer fabrication is ongoing. They are selling finished goods under Raytheon’s name and are assembling and testing Raytheon die. They are currently seeking qualification to complete processing of Raytheon wafers and sell the parts under their own name. Eventually, Microsemi-Watertown plans to become a qualified manufacturer for these parts.

Note: Information contained herein is subject to change by the manufacturer at any time.

New England Semiconductor

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
6 Lake Street Lawrence, MA 01841-3011	43611	DESC QPL-6/95 (Approved)	JANTX, JANTXV	Kare Karlson 508-794-7557

Technology: Bipolar, silicon planar diffused Bipolar, silicon mesa diffused	Product Type: NPN low power PNP low power NPN high power PNP high power NPN Darlington PNP Darlington
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Lawrence, MA	Lawrence, MA	Lawrence, MA	Lawrence, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

Optek Technology, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
1215 West Crosby Rd. Carrollton, TX 75006-6989	32694	DESC QPL-10/94 (Approved)	JANTX, JANTXV	Brian Harding 214-323-2272

Technology:	Silicon, planar epitaxial GaAs or GaAlAs diode coupled to silicon planar epitaxial phototransistor	Product Type:	NPN low power PNP low power Dual complementary Optocoupler
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Carrollton, TX	Carrollton, TX	Carrollton, TX Zarogosa, Mexico	Carrollton, TX

Note: Information contained herein is subject to change by the manufacturer at any time.

PPC Products Corp.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
7516 Central Industrial Dr. Riviera Beach, FL 33404-3499	33178	DESC QPL-9/94 (Approved)	JANTX, JANTXV, JANS	Carl Mowry 407-848-9606

Technology: Bipolar, silicon planar epitaxial and triple diffused	Product Type: NPN low power PNP low power NPN high power PNP high power
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Riviera Beach, FL	Riviera Beach, FL	Riviera Beach, FL	Riviera Beach, FL

Note: Information contained herein is subject to change by the manufacturer at any time.

Active Supplier Assessment Program (ASAP)

Semicoa Semiconductors

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
333 McCormick Ave. Costa Mesa, CA 92626-2613	34156	DESC QPL-12/94 (Approved)	JANTX, JANTXV, JANS	Don Felder 714-979-1900

Technology:	Bipolar, silicon planar diffused Silicon planar diffused	Product Type:	NPN low power PNP low power NPN high power PNP high power RF Photodiode
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Costa Mesa, CA	Costa Mesa, CA	Costa Mesa, CA Manila, Philippines	Costa Mesa, CA

Note: Information contained herein is subject to change by the manufacturer at any time.

Silicon Transistor Corporation

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
27 Katrina Road Chelmsford, MA 01824-2842	07256	DESC QPL-12/93 (Approved)	JANTX, JANTXV	Jerry Levine 508-256-3321

<p>Technology: Bipolar, silicon planar diffused Bipolar, silicon mesa diffused</p>	<p>Product Type: NPN low power PNP low power NPN high power PNP high power NPN Darlington PNP Darlington</p>
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Chelmsford, MA	Chelmsford, MA	Chelmsford, MA	Chelmsford, MA

Note: Information contained herein is subject to change by the manufacturer at any time.

Siliconix, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
2201 Laurelwood Road Santa Clara, CA 95054-1593	17856	DESC QPL-1/91 (Approved)	JANTX, JANTXV	Bob Kehl 408-970-3957

Technology:	Silicon MOSFET Bipolar, silicon, depletion-mode JFET Bipolar, silicon, enhancement-mode JFET	Product Type:	N-channel power MOSFET P-channel power MOSFET N-channel FET P-channel FET
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
Santa Clara, CA	Santa Clara, CA	Santa Clara, CA Manila, Philippines	Santa Clara, CA

Note: Information contained herein is subject to change by the manufacturer at any time.

Solitron Devices, Inc.

Address	Cage Code	Mfr. Audits/Surveys	Product Assurance Level	Contact
3301 Electronics Way West Palm Beach, FL 33407-4636	21845	DESC QPL-5/93 (Approved)	JANTX, JANTXV	David Harrison 407-848-4311 X220

Technology:	Bipolar, silicon planar diffusion Low power enhancement-mode JFET	Product Type:	NPN low power PNP low power NPN high power PNP high power N-channel FET P-channel FET
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Certified/Qualified Facilities:

Design	Wafer Fabrication	Assembly	Test
West Palm Beach, FL			

Note: Information contained herein is subject to change by the manufacturer at any time.