

**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.<br>Bend, OR<br>97702-1000 | ODY74     | ISO 9001-10/95<br>DESC QPL-5/94<br>(Approved) | JANTX, JANTXV           | Mark Sorensen<br>503-382-8028 X115 |

|                          |                                      |
|--------------------------|--------------------------------------|
| Technology: Power MOS IV | Product Type: N-channel power MOSFET |
|--------------------------|--------------------------------------|

#### 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<br>Hauppauge, NY<br>11788-4227 | 52333,<br>30045<br>(Note 1) | DESC QML-1/93<br>(Approved) | JANTX, JANTXV           | Gordon Newman<br>516-582-6767 |

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

|             |  |               |  |
|-------------|--|---------------|--|
| Technology: | Bipolar, silicon planar<br>(single diffused and triple diffused) | Product Type: | NPN low power<br>PNP low power<br>NPN high power<br>NPN Darlington |
|-------------|--|---------------|--|

**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<br>Somerville, NJ<br>08876-9999 | 18722     | DESC QPL-3/95<br>(Approved) | JANTX, JANTXV<br>(Note 1) | Al Todd<br>(@ Mountaintop, PA<br>facility)<br>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<br>P-channel power MOSFET |
|--|--|

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

|                               |  |
|-------------------------------|--|
| Technology:   HEXFET (Note 1) | Product Type:   N-channel power MOSFET<br>P-channel power MOSFET |
|-------------------------------|--|

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)<br>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.<br>P.O. Box 3295<br>Lowell, MA<br>01853-3295 | 96341     | DESC QPL-3/94<br>(Approved) | JANTX, JANTXV           | Charlie Howell<br>617-564-3038 |

|   |                  |
|---|------------------|
| Technology: Bipolar, silicon planar<br>diffused | Product Type: RF |
|---|------------------|

**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)

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**Micropac Industries, Inc.**

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

|  |                           |
|--|---------------------------|
| Technology: GaAs diode coupled to NPN<br>silicon phototransistor | Product Type: Optocoupler |
|--|---------------------------|

**Certified/Qualified Facilities:**

| Design      | Wafer Fabrication | Assembly                      | Test                          |
|-------------|-------------------|-------------------------------|-------------------------------|
| Garland, TX | Garland, TX       | Garland, TX<br>Juarez, Mexico | Garland, TX<br>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<br>580 Pleasant Street<br>Watertown, MA<br>02172-2497 | 12969,<br>07933<br>(Note 1) | DESC QPL-7/95<br>(Approved) | JANTX, JANTXV           | Bob Stachowski<br>617-926-0404 |

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

|  |  |
|--|--|
| Technology: Bipolar, silicon, planar<br>diffused | Product Type: NPN low power<br>PNP low power<br>RF<br>Dual complementary |
|--|--|

#### 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<br>Lawrence, MA<br>01841-3011 | 43611     | DESC QPL-6/95<br>(Approved) | JANTX, JANTXV           | Kare Karlson<br>508-794-7557 |

|             |  |               |  |
|-------------|--|---------------|--|
| Technology: | Bipolar, silicon planar diffused<br>Bipolar, silicon mesa diffused | Product Type: | NPN low power<br>PNP low power<br>NPN high power<br>PNP high power<br>NPN Darlington<br>PNP Darlington |
|-------------|--|---------------|--|

**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.<br>Carrollton, TX<br>75006-6989 | 32694     | DESC QPL-10/94<br>(Approved) | JANTX, JANTXV           | Brian Harding<br>214-323-2272 |

|             |   |               |   |
|-------------|---|---------------|---|
| Technology: | Silicon, planar epitaxial<br>GaAs or GaAlAs diode<br>coupled to silicon planar<br>epitaxial phototransistor | Product Type: | NPN low power<br>PNP low power<br>Dual complementary<br>Optocoupler |
|-------------|---|---------------|---|

**Certified/Qualified Facilities:**

| Design         | Wafer Fabrication | Assembly                           | Test           |
|----------------|-------------------|------------------------------------|----------------|
| Carrollton, TX | Carrollton, TX    | Carrollton, TX<br>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.<br>Riviera Beach, FL<br>33404-3499 | 33178     | DESC QPL-9/94<br>(Approved) | JANTX, JANTXV,<br>JANS  | Carl Mowry<br>407-848-9606 |

|   |  |
|---|--|
| Technology: Bipolar, silicon planar epitaxial and triple diffused | Product Type: NPN low power<br>PNP low power<br>NPN high power<br>PNP high power |
|---|--|

**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.**

**Semicoa Semiconductors**

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

|             |  |               |  |
|-------------|--|---------------|--|
| Technology: | Bipolar, silicon planar<br>diffused<br>Silicon planar diffused | Product Type: | NPN low power<br>PNP low power<br>NPN high power<br>PNP high power<br>RF<br>Photodiode |
|-------------|--|---------------|--|

**Certified/Qualified Facilities:**

| Design         | Wafer Fabrication | Assembly                              | Test           |
|----------------|-------------------|---------------------------------------|----------------|
| Costa Mesa, CA | Costa Mesa, CA    | Costa Mesa, CA<br>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<br>Chelmsford, MA<br>01824-2842 | 07256     | DESC QPL-12/93<br>(Approved) | JANTX, JANTXV           | Jerry Levine<br>508-256-3321 |

|             |  |               |  |
|-------------|--|---------------|--|
| Technology: | Bipolar, silicon planar diffused<br>Bipolar, silicon mesa diffused | Product Type: | NPN low power<br>PNP low power<br>NPN high power<br>PNP high power<br>NPN Darlington<br>PNP Darlington |
|-------------|--|---------------|--|

#### 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<br>Santa Clara, CA<br>95054-1593 | 17856     | DESC QPL-1/91<br>(Approved) | JANTX, JANTXV           | Bob Kehl<br>408-970-3957 |

|             |  |               |  |
|-------------|--|---------------|--|
| Technology: | Silicon MOSFET<br>Bipolar, silicon, depletion-mode JFET<br>Bipolar, silicon, enhancement-mode JFET | Product Type: | N-channel power MOSFET<br>P-channel power MOSFET<br>N-channel FET<br>P-channel FET |
|-------------|--|---------------|--|

**Certified/Qualified Facilities:**

| Design          | Wafer Fabrication | Assembly                               | Test            |
|-----------------|-------------------|--|-----------------|
| Santa Clara, CA | Santa Clara, CA   | Santa Clara, CA<br>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<br>West Palm Beach, FL<br>33407-4636 | 21845     | DESC QPL-5/93<br>(Approved) | JANTX, JANTXV           | David Harrison<br>407-848-4311 X220 |

|             |  |               |  |
|-------------|--|---------------|--|
| Technology: | Bipolar, silicon planar diffusion<br>Low power enhancement-mode JFET | Product Type: | NPN low power<br>PNP low power<br>NPN high power<br>PNP high power<br>N-channel FET<br>P-channel FET |
|-------------|--|---------------|--|

**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.**