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1.0 FOREWORD

The NASA EEE Parts Selection List (NPSL) has been developed as a "parts selection tool" specifically geared toward design and parts engineering organizations internal to NASA and to universities and original equipment manufacturers (OEMs) that do not have the resources for a dedicated quality and reliability infrastructure in parts engineering. The NPSL is a listing of electrical, electronic, and electromechanical (EEE) part types and advanced packaging technologies such as Multi-Chip Modules (MCM) which are produced under various government and/or industry quality systems.

Since NASA's Standard EEE Parts List, MIL-STD-975, was cancelled without replacement on May 3, 1998, the NPSL provides a viable alternative for parts selection. However, there are some key differences in the philosophy of these two documents which users must be aware of:

MIL-STD-975 NPSL

Defines "Standard" and "Non-Standard" Parts Leaves standardization up to the individual flight projects Defines a "Non-Standard Parts Approval Request" (NSPAR) policy Leaves it to the individual flight projects to approve parts for the intended application Intended to be invoked as a contract requirement Not intended to be invoked as a contract requirement Very stringent requirements for parts listings Designed to facilitate listing of newer, advanced technologies

OEMs that have an established parts engineering infrastructure may elect to use the NPSL to augment their own existing part selection lists. The NPSL may be chosen, in part or in its entirety, to be a subset of a Project Approved Parts List (PAPL) or equivalent. The decision to invoke the NPSL shall be made by the project based on the parts management and control requirements for that mission. The NPSL itself, should not be imposed as a contractual requirement, but the associated part listings may be established as approved selections by the project.

2.0 ABOUT THIS DOCUMENT

2.1 General:

The NPSL is a selection tool providing designers with a list of EEE parts intended to meet system design requirements and NASA Parts Program quality/reliability levels. It is not mandatory that the parts listed herein be the only selections used to design a system, but if a particular function is needed and a suitable part is listed, the NASA EEE Parts Assurance Group (NEPAG) recommends the listed part as the first order of precedence for selection. Selecting a part from the NPSL may provide cost savings/ avoidance for the project because:

The procurement specification already exists The manufacturer has had a NASA survey or government audit performed The parts are available under one or several NASA accepted quality assurance systems Part qualification has been successfully completed All or most of the parts engineering has already been performed

The parts listed are approved for use only if NASA flight project approval is given. The document lists parts according to established quality assurance levels and NASA Parts Program knowledge of the product and manufacturer such as qualification history, GIDEP and failure trends, and delivery performance. This combination allows NEPAG to make a technical assessment of the quality, availability, capability and reliability and to list parts at a corresponding quality level within this document.

2.2 World Wide Web Access to the NPSL

The NPSL has been developed and will be maintained as an on-line World Wide Web homepage accessible via http://nepp.nasa.gov/npsl. The primary objectives of using the WWW as the platform for maintaining the NPSL are to:

Provide broad and ready access by NASA affiliated organizations world wide Facilitate quick updates, modifications, and revisions Provide links to additional EEE part information

Users will have to access the NPSL on-line and be able to download the document if a printout is desired.

2.3 Configuration Management

Under Construction

2.4 Appendices:

Appendix A (when released) will contain guidelines for derating parts. In general, these guidelines are accepted by NEPAG for use on all projects. Flight projects may elect to further develop these guidelines into requirements. Appendix A may not contain derating criteria for all part types, but guidelines provided can be used as a baseline for project derating requirements.

Appendix B is a repository of useful WWW links to additional parts information databases which can be accessed to support parts selection and application issues.

3.0 USING THIS DOCUMENT

The NPSL has been structured into four primary sections to facilitate finding the information of interest:

Welcome and User Feedback Section (Banner Page) Use Policy Section Parts Listings by Commodity Type Sections Appendices

The Parts Listings by Commodity Type Sections contains the actual part selection listings. The part types which will be covered in the NPSL consist of advanced packaging technologies such as MCMs and the commodities defined as electrical, electronic, and electromechanical (EEE) parts. The commodity types are listed below according to the Federal Stock Classification (FSC) system.

Part Types FSC

Capacitors 5910 Circuit Breakers 5925 Connectors 5935 Crystals and Crystal Oscillators 5955 Fiber Optics 60GP Filters 5915 Fuses 5920 Inductors 5950 Microcircuits (Monolithic and Hybrid) 5962 Relays 5945 Resistors 5905 Semiconductors (Diode and Transistor) 5961 Thermistors 5905 Transformers 5950 Wire and Cable 6145

Within each commodity class the parts are listed in order by procurement specifications in existence as NASA, DoD, or other space agency (e.g. ESA or NASDA) specifications. The part listing for each specification begins with a detailed explanation of the part numbering system. These explanations and the part listings which follow help the user "build" the appropriate part number for the project application. General functional descriptions and generic part number cross-references are provided to assist the user in matching functionality. The part quality levels, radiation tolerance levels (if known), and the available manufacturer sources are also identified.

Although extensive efforts have been made to maintain the accuracy of the supplier information within the part listings, users are encouraged to visit the Defense Supply Center Columbus (DSCC), http://www.dscc.dla.mil/programs/qmlqpl/. DSCC is the Department of Defense agency responsible for certifying suppliers of military specification EEE parts. At this site, users can download the latest Qualified Products List (QPL) for the part type of interest.

4.0 GENERAL REQUIREMENTS

Selection of parts for inclusion in the device listings in this document is based on a review of technical data by the NASA EEE Parts Assurance Group (NEPAG) for quality and reliability trends. The major criteria used to evaluate candidate parts are:

o Quality system and assurance level the products are produced under

o Product performance

o Product workmanship assessments

o Destructive Physical Analysis results

o Failure histories

o Reliability trends

o GIDEP alert histories of the product and manufacturer

o Qualification and screening test results

o Product availability

o Manufacturer audit and survey results

o Manufacturer responsiveness to corrective actions

o Manufacturer delivery histories

Participation by the manufacturers in a quality program such as QPL, QML, and ISO 9000. will not automatically qualify their products for listing in the NPSL. Listings will be based on results from assessments of all the major criteria listed above. EEE parts-related activities throughout NASA provide recommendations for listing parts in this document.

NOTE: Unless specifically stated within the parts selection tables of the NPSL, listing of a device technology herein does NOT imply/guarantee Radiation Hardness Assurance (RHA). Applications concerned with a device's ability to tolerate exposure to various forms of space radiation (e.g., total ionizing dose, single event effects, etc.) should be reviewed and have the device assessed by the Program's radiation assurance experts. The following resources may also be consulted for initial guidance:

NASA Goddard Radiation Effects and Analysis Jet Propulsion Laboratory Radiation Effects

4.1 NASA Parts Levels

The NPSL lists products based on three quality levels defined by NEPAG: Level 1, Level 2, and Level 3. The definitions for each Level and the criteria used to list a part in a particular Level are not part approvals nor is this document a project approved parts list. The NPSL will not provide information on whether or not a part meets individual project flight requirements. Instead, it provides a list of products and associated manufacturers that meet recognized quality assurance baselines, qualification test regimens, and screening requirements necessary for space flight acceptance based on levels of risk. The part selected must be assessed independently by the project or the NASA center or OEM's parts organization to determine if it meets the requirements for the project. The parts engineering organizations at the NASA centers will assist users in making this determination. The Levels herein are not directly related to mission classification, cost, or schedule and users should make the appropriate Level tradeoffs when considering which parts to choose from the list.

4.1.1 Level 1:

Level 1 is the highest product assurance class assigned to parts listed in this document. Level 1 parts are those produced under assurance classes recognized by NASA as providing the highest possible level of quality and reliability (e.g. QML Class V K, JANS for discrete semiconductors, QPL Class S, Failure Rate Level (FRL) S), from NASA approved manufacturing sources, and meeting NASA space level parts and packaging program assessment criteria. The technical assessment results for Level 1 products will show that no known trends exist which have a negative impact on the quality, reliability, or performance for space flight applications. The Level 1 criteria is summarized as follows:

o The supplier's facility(s) must be certified under a recognized quality assurance system (e.g. QML, QPL, ISO 9000) and produce products to the space industry recognized highest assurance classes (e.g. QML V, JANS for discrete semiconductors, QPL Class S, FRL S, GSFC S311 specification) or equivalent. There are exceptions to these levels where this preferred part reliability level is unavailable; these exceptions are shown in the individual part listings.

o A Defense Supply Center Columbus (DSCC) audit or a NASA program manufacturer survey to the highest assurance classes must have been successfully completed within the past 2 years.

o A part procurement specification, containing the highest assurance class requirements, must exist. Parts must have been procured previously by a NASA project using this specification.

o Historical DPA and other parts analysis data on the manufacturer's products must be available and not reveal poor workmanship trends or rejection trends.

o Failure analyses history for the manufacturers products should not reveal problem trends attributed to part quality and reliability.

o No recent unresolved GIDEP Alerts (past 3 years) exist that have a major impact on the Level 1 products quality or reliability. No GIDEP Alert or NASA Parts Advisory trends exist on the manufacturer or product.

o Available data on manufacturer performance must show no trend for late delivery of products to NASA projects.

o Qualification to the requirements of the procurement specification must have been successfully completed. No qualification issues exist and no problem trends from previous qualifications exist.

4.1.2 Level 2:

Level 2 is the second highest product assurance class assigned to parts listed in this document. Level 2 parts are those produced under assurance classes recognized by NASA to have a high level of quality and reliability (e.g. QML Q H, QPL Class B, JANTXV for discrete semiconductors, FRL R or P), from NASA approved manufacturing sources, and meeting NASA space level parts and packaging program assessment criteria. The Level 2 criteria is summarized as follows:

o The supplier's facility(s) must be certified under a recognized quality assurance system (e.g. QML, QPL, ISO 9000) and produce products to space industry recognized high assurance classes (e.g. QML Q, QPL B, JANTXV for discrete semiconductors, FRL R or P, GSFC S311 specification) or equivalent. Any exceptions to these levels where the preferred part reliability level is unavailable, are shown in the individual part listings.

o A Defense Supply Center Columbus (DSCC) audit or a NASA program manufacturer survey must have been successfully completed within the past 2 years.

o A part procurement specification, containing the high assurance class requirements, must exist. Parts must have been procured previously by a NASA project using this specification.

o DPA and other parts analysis data on the manufacturer's products must be available and must not reveal any significant problems due to poor workmanship and must show minimal reject rates.

o Failure analyses history for the manufacturers products should not reveal problem trends attributed to part quality and reliability.

o No unresolved GIDEP Alert trends exist that have a major impact on the Level 2 products quality or reliability. No GIDEP Alert or NASA Parts Advisory trends exist on the manufacturer or product.

o Available data on manufacturer performance must show consistent on-time delivery of products to NASA projects.

o Qualification to the requirements of the procurement specification must have been successfully completed. Qualification issues and problems from previous qualifications must have been resolved (not by waiver).

4.1.3 Level 3:

Level 3 is the minimum product assurance class assigned to parts listed in this document. Level 3 contains many advanced electronic functions (from a space flight applications standpoint) and has been created to provide a technology insertion path into NASA flight projects. Parts listed are those produced by reputable manufacturers under a recognized quality assurance system (QML, QPL, ISO 9000) or their equivalent. Typically, only a limited amount of information is available to NEPAG for these parts and NASA has minimal visibility into the manufacturing and testing of Level 3 product. The parts are usually available commercially and have the capability to be used in space applications. The intent of Level 3 listings is to provide products that are newer, have greater functionality and enhanced performance characteristics, and provide higher levels of integration. Because the product has little or no

heritage in space flight application and data is unavailable or scarce, these parts are considered higher risk than the Level 1 and Level 2 parts. While the price of these parts may be less than the traditional Levels, more engineering evaluation may be needed to qualify the part for the project's application. The overall reliability and cost of ownership should be considered when selecting these parts. The Level 3 criteria is summarized as follows:

The manufacturer has supplied and qualified parts for several NASA space projects within the past 2 years. The parts and manufacturers have been recommended by one of the following NASA programs.

o PSAP o ASAP o ET o AIT

A NASA, DoD, or other space agency procurement specification (e.g. ESA SCC or NASDA QTS) exists. Available data on the manufacturer shows no significant problem trends such as GIDEP Alerts or NASA Parts Advisories, a low DPA rejection rate for the manufacturer's products in general, and no significant failures attributable to product quality and/or reliability.

NEPAG recommends selecting a Level 3 product when a higher Level part does not exist and/or enhanced functionality is required to meet system design requirements. Parts in this Level are not recommended for use in mission critical applications. Selecting these parts may require further engineering evaluation and approval by the project, but some heritage exists. Additionally, having more projects use these parts helps NEPAG acquire the technical data necessary for moving the parts into the higher Levels.

NASA Parts Selection List

Connectors

The following basic connector types are available for selection:

Circular

MSFC 40M38277 NLS
MSFC 40M38298 NBS
MSFC 40M39569 NB
MIL-DTL-38999 MS27XXX
MIL-DTL-38999 D38999/XX
MIL-C-26482 MS34XX
MIL-C-5015 MS345X

D Subminiature

GSFC S-311-P-4/09 S311P409

GSFC S-311-P-4/07 311P407

GSFC S-311-P-10 311P10

GSFC S-311-P-4/05 311P405

MIL-DTL-24308 M24308

RF

MIL-PRF-39012 M39012/XX

MIL-C-83517 M83517/X

Microminiature

MIL-PRF-83513 M83513/XX

Printed Circuit

MIL-C-55302 M55302/XX

Satellite Interface

GSFC S-311-P-718 700-42

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MIL-C-39029 M39029/XX

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MIL-C-85049 M85049/XX

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NEPP Program Manager:

Chuck Barnes, Jet Propulsion Laboratory

Responsible NASA Official:

Michael Sampson, NEPAG Manager

Website Comments:

Web Development Team

Last Modified:

August 8, 2001

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NASA Parts Selection List (NPSL)

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Connectors

| Circular Connectors

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Prohibited Materials

Parts Selection Table of Contents

Capacitors

Circuit Protection Devices

Fuses

Connectors

Filters

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Microcircuits

NEW!

Monolithics

Hybrids

Resistors

Semiconductors

(Summary)

Diodes

Transistors

Thermistors

Wire and Cable

Circular Connectors

The following circular connector types are available for selection:

Type Designation	Description	Specification
NLS	Circular, High Density, Miniature, Low Outgassing	MSFC 40M38277
NBS	Circular, Miniature, Low Outgassing, Special, Shell Size 8	MSFC 40M38298
NB	Circular, Miniature, Low Outgassing	MSFC 40M39569
MS27XXX	Circular, Miniature, Series I, Bayonet Coupled	MIL-DTL-38999
MS27XXX	Circular, Low Silhouette, Miniature, Series II	MIL-DTL-38999
D38999/XX	Circular, Miniature, Series III, Self Locking Coupling	MIL-DTL-38999
D38999/XX	Circular, Miniature, Series IV, Breech Coupling	MIL-DTL-38999
MS34XX	Circular, Miniature, Series 2	MIL-C-26482
MS345X	Circular, Crimp Rear Release Contacts	MIL-C-5015 <!-- #EndEditable -->

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Connectors

MSFC 40M39569 Connectors

Circular Connectors, Low Outgassing, Bayonet Coupled, -150deg.C to +200deg.C

Part Number/Ordering Explanation

Important! Application Notes

Available Sources

Recent NASA Parts Selection List Updates for MSFC 40M39569 Connectors

Initial Release:

01/28/98

MSFC 40M39569 Connectors

Circular Connectors, Low Outgassing, Bayonet Coupled, -150deg.C to +200deg.C

APPLICATION NOTES

1) Connectors are supplied with contacts.

2) Insert arrangement designation consists of shell size and arrangement number. For 40M39569 connectors, insert arrangements with a variety of contact sizes are available.

3) Temperature range for hermetically sealed connectors is -100deg.C to +150deg.C.

Recent NASA Parts Selection List Updates for

MSFC 40M39569 Connectors

01/28/98	Initial Release of MSFC 40M39569 Connector Section in the NPSL On-Line

MSFC 40M39569 Connectors

Circular Connectors, Low Outgassing, Bayonet Coupled, -150deg.C to +200deg.C

Part Number Ordering Information:

Example of P/N: NB6E8-98PNS2, where

NB	6	E	8	-98	P	N	S	2
Series Prefix	Shell Style	Class (Seal)	Shell Size	Arrangement Number	Contact Type	Insert Polarization	Backshell Accessory	Temp. Class

Shell Style Designator	Description
0	Receptacle, Flange Mount, Narrow
3	Receptacle, Solder Mount, Hermetic
4	Receptacle, Flange Mount, Wide Flange
5	Bulkhead Feed Thru, Hermetic, Jam Nut Mount
6	Plug, Cable Mount
6G	Plug, Cable Mount with RFI Grounding Fingers
7	Receptacle, Jam Nut Mount
8	Receptacle, Jam Nut Mount, Extended Pin

Class (Seal) Designator	Description
E	Environmental
H	Hermetic

Contact Type Designator	Description
P	Pins
S	Sockets
CP	Coaxial Pin
CS	Coaxial Socket
PS	Pin-Socket Feedthru (Shell Style 5 Only)

Insert Polarization Designator	Description
N	Normal
W	Alternate
X	Alternate
Y	Alternate
Z	Alternate

Backshell Accessory Designator	Description
C	Straight, Compression Ring
S	Straight, with Cable Clamp
R	Right Angle, Cable Clamp
T	No Backshell

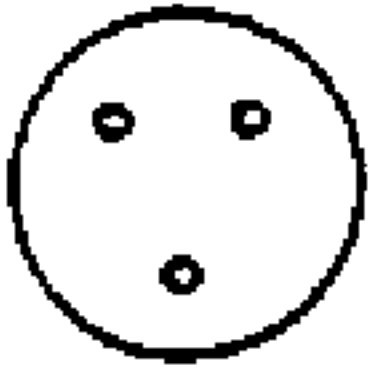
Temperature Class Designator	Description
Blank	General Purpose (-100deg.C to +200deg.C)
2	Vacuum Thermal Cycled (-150deg.C to +200deg.C)

3	Atmosphere Thermal Cycled (-150deg.C to +200deg.C)

No. of Contacts
(By Contact Size)

Insert Arrangement	20	16	12	Coax
8-98	3	-	-	-
10-6	6	-	-	-
12-3	-	3	-	-
12-8	8	-	-	-
12-10	10	-	-	-
14-4	-	-	4	-
14-5	-	5	-	-
14-12	8	4	-	-
14-15	14	1	-	-
14-18	18	-	-	-
14-19	19	-	-	-
16-8	-	-	8	-
16-23	-	22	1	-
16-26	26	-	-	-
18-8	-	-	8	-
18-11	-	11	-	-
18-30	29	1	-	-
18-32	32	-	-	-
20-16	-	16	-	-
20-41	37	2	-	-
22-12	-	-	12	-
22-21	-	21	-	-
22-41	27	14	-	-
22-55	55	-	-	-
24-19	-	-	19	-
24-31	-	31	-	
24-61	61	-	-	-
24-100	-	-	-	8

Shell Size 8 (Insert Arrangements)
Shell Sizes 10 (Insert Arrangements)
Shell Sizes 12 (Insert Arrangements)
Shell Sizes 14 (Insert Arrangements)
Shell Sizes 16 (Insert Arrangements)
Shell Sizes 18 (Insert Arrangements)
Shell Sizes 20 (Insert Arrangements)
Shell Sizes 22 (Insert Arrangements)



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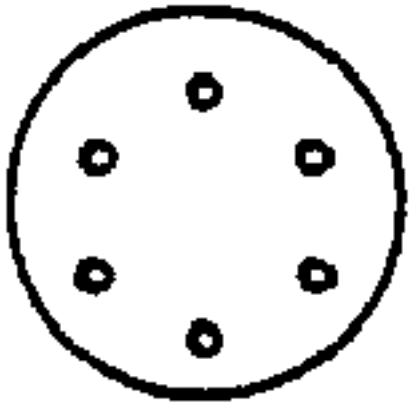

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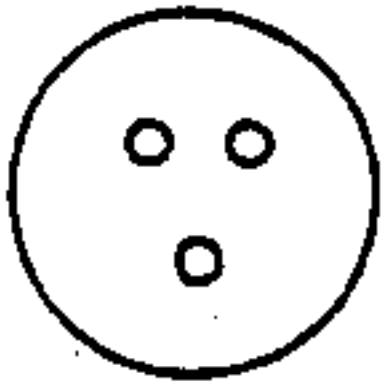

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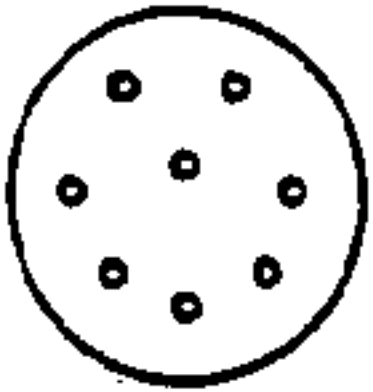

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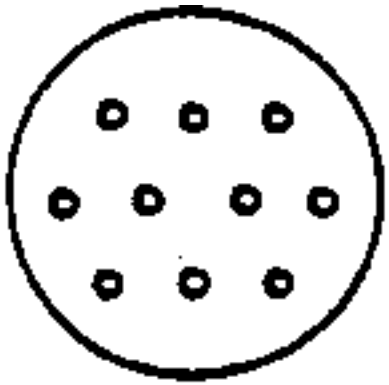

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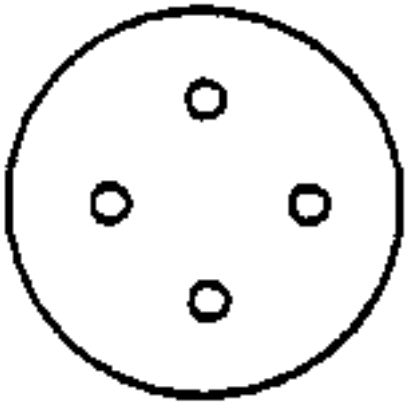

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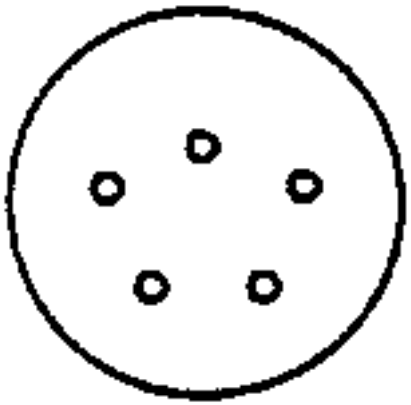

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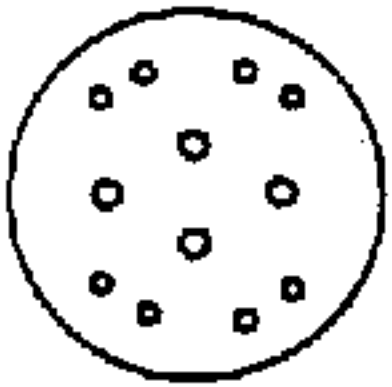

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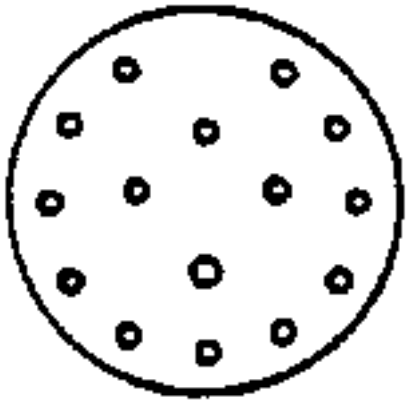

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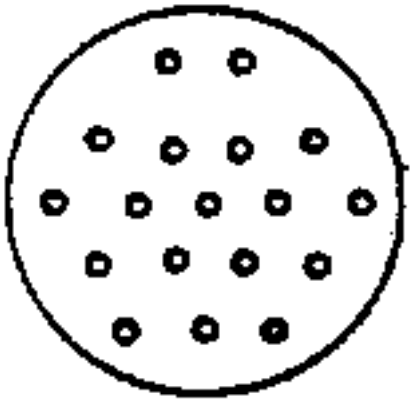

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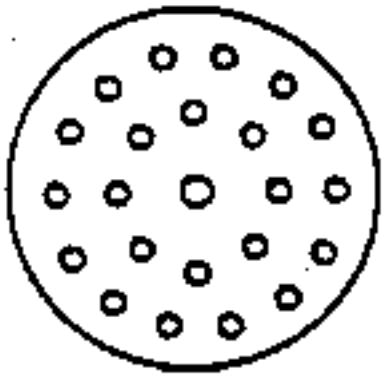

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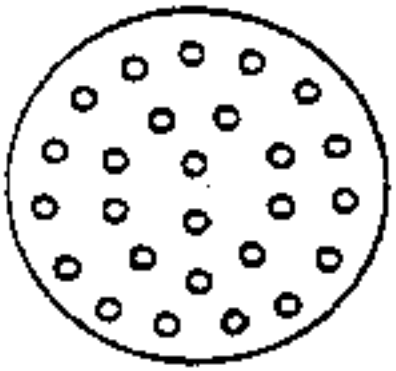

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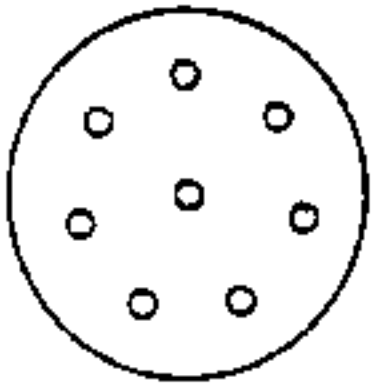

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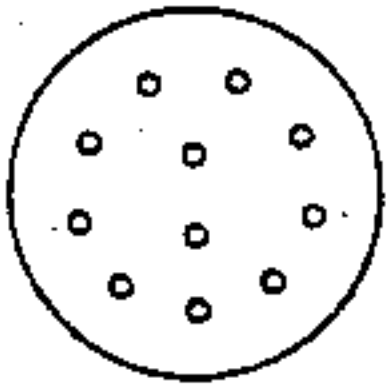

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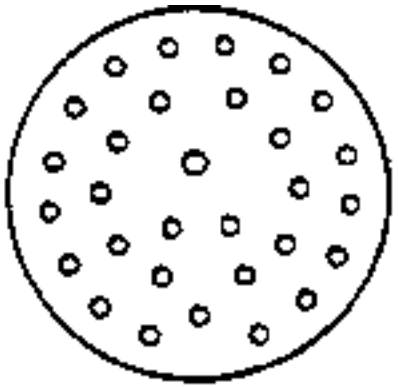

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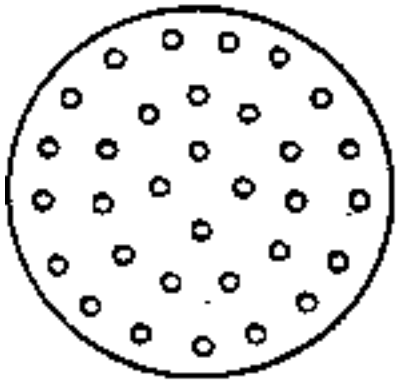

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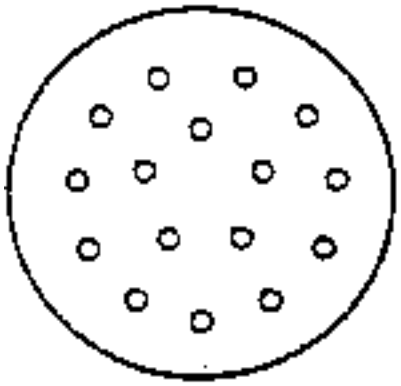

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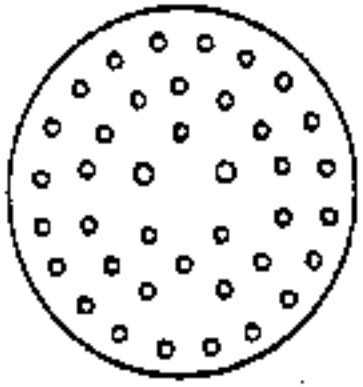

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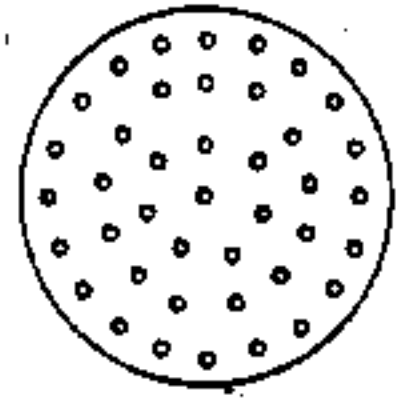

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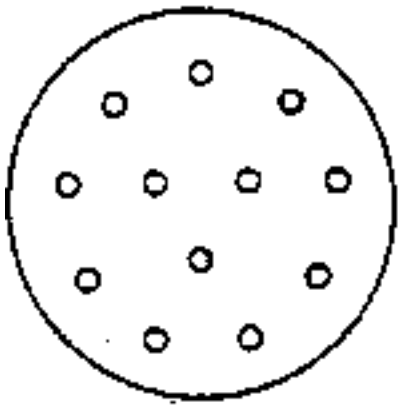

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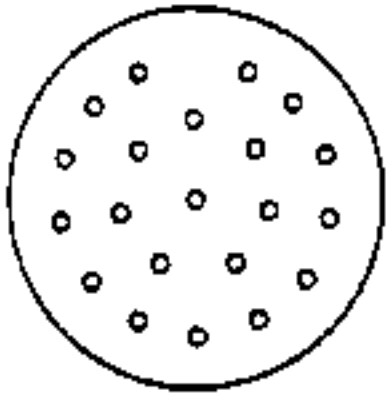

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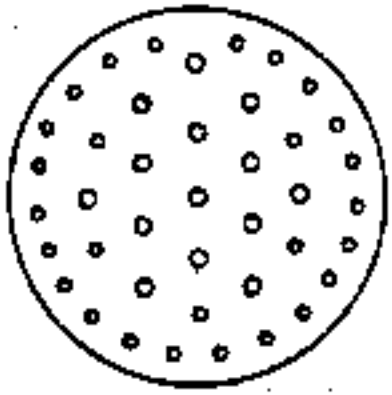

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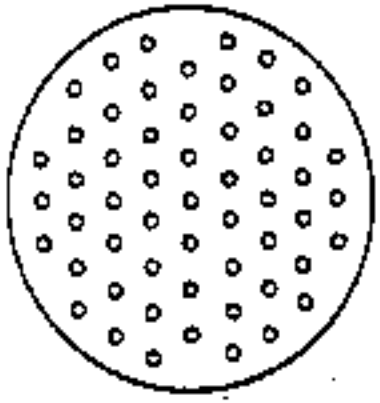

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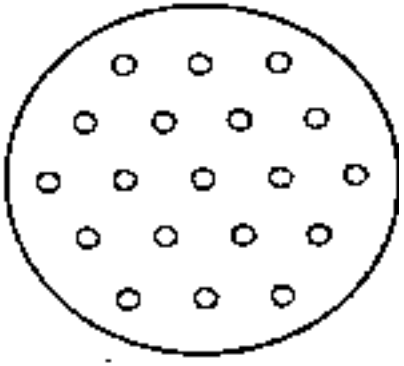

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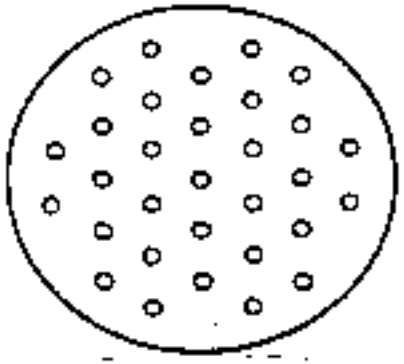

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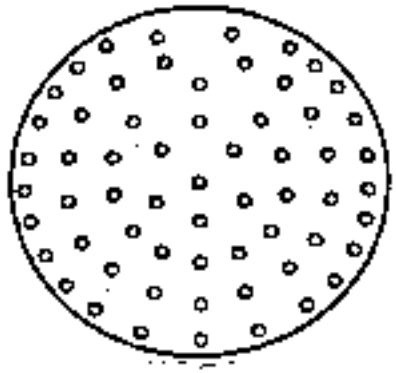

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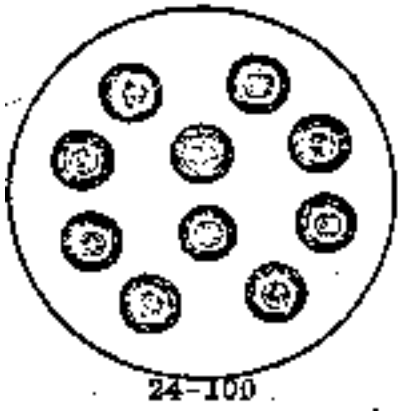

MSFC 40M39569 Connectors Manufacturer Listing

Links to Manufacturer Homepages

Click

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for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

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Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

Deutsch Engineered Connecting Devices

36033 Whittier Avenue

Hemet, CA 92545

Cage Code: 11139

Tel.: 909-765-2200

Glenair, Inc.

(Backshells Only)

1211 Air Way

Glen Dale CA 91201

Cage Code: 06324

Tel.: 818-247-6000

ITT Cannon

666 East Dyer Rd

Santa Ana, CA 92705

Cage Code: 71468

Tel.: 714-557-4700

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Connectors

MSFC 40M38298 Connectors

Circular Connectors, Miniature, Low Outgassing,

Bayonet Coupled, -150deg.C to +200deg.C

Part Number/Ordering Explanation

Important! Application Notes

Available Sources

Recent NASA Parts Selection List Updates for MSFC 40M38298 Connectors

Initial Release:

01/28/98

MSFC 40M38298 Connectors

Circular Connectors, Miniature, Low Outgassing,

Bayonet Coupled, -150deg.C to +200deg.C

APPLICATION NOTES

1) Connectors are supplied with contacts.

2) Temperature range for hermetically sealed connectors is -100deg.C to +150deg.C.

3) When styles 6, 6G and 7 are used in space shuttle missions, only polarization N, A, B, C, D shall be used.

4) For style 6, 6G and 7 procure strain relief backshell separately.

5) When styles 9 and 9G, are used in space shuttle missions, insert arrangement 8-2 with socket contacts and E, F, G H polarization shall be reserved for connection to NSI-1 (NASA standard initiator Type 1) pyrotechnic firing circuits.

6) Crimp type ferrule is required to terminate cable shield to the backshell and must be provided separately. Order Thomas Betts P/N GSC 17512NP or equivalent.

7) Insert arrangement designation consists of shell size and arrangement number. For 40M38298 connectors, all contacts are size 20.

Recent NASA Parts Selection List Updates for

MSFC 40M38298 Connectors

01/28/98	Initial Release of MSFC 40M38298 Connector Section in the NPSL On-Line

MSFC 40M38298 Connectors

Circular Connectors, Miniature, Low Outgassing,

Bayonet Coupled, -150deg.C to +200deg.C

Part Number Ordering Information:

Example of P/N: NBS6E8-2PN, where

NBS	6	E	8	-2	P	N
Series Prefix	Shell Style	Class (Seal)	Shell Size	Arrangement Number	Contact Type	Insert Polarization

Shell Style Designator	Description
0	Receptacle, Flange Mount
3	Receptacle, Solder Mount, Hermetic
5	Bulkhead Feed Thru, Hermetic, Jam Nut Mount (Double Sided Connector)
6	Plug, Cable Mount
6G	Plug, Cable Mount with RFI Grounding Fingers
6W	Plug, Cable Mount, without Coupling Ring & Backshell
7	Receptacle, Jam Nut Mount

Class (Seal) Designator	Description
E	Environmental
H	Hermetic

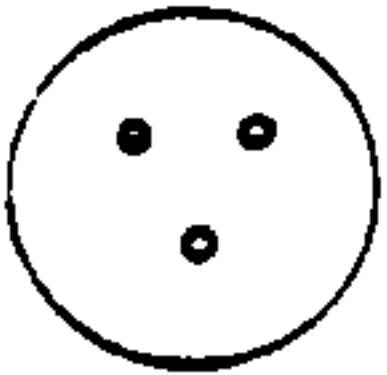
Contact Type Designator	Description
P	Pin
S	Socket

Insert Polarization Designator	Description
N	Normal
A through H	Alternate

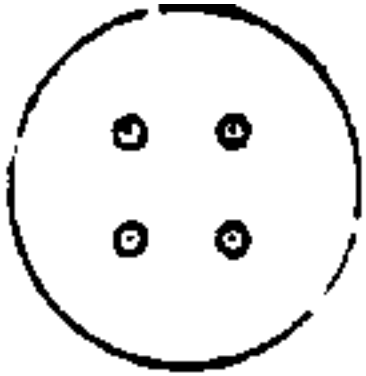
Insert Arrangement	Number of Contacts (All Contacts Size 20)
8-2	2

8-3	3
8-4	4

8-2



8-3



8-4

MSFC 40M38298 Connectors Manufacturer Listing

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ITT Cannon

666 East Dyer Rd

Santa Ana, CA 92705

Cage Code: 71468

Tel.: 714-557-4700

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Connectors

MSFC 40M38277 Connectors

Circular Connectors, Low Silhouette, Low Outgassing,

Bayonet Coupled, -150deg.C to +200deg.C

Part Number/Ordering Explanation

Important! Application Notes

Available Sources

Recent NASA Parts Selection List Updates for MSFC 40M38277 Connectors

Initial Release:

01/28/98

MSFC 40M38277 Connectors

Circular Connectors, Low Silhouette, Low Outgassing,

Bayonet Coupled, -150deg.C to +200deg.C

APPLICATION NOTES

1) Connectors are supplied with contacts.

2) Temperature range for hermetically sealed connectors is -100deg.C to +150deg.C.

3) Backshell strain relief must be procured separately for Class T connectors.

4) Insert arrangement designation consists of shell size and arrangement number. For 40M38277 connectors, all contacts are size 22D.

Recent NASA Parts Selection List Updates for

MSFC 40M38277 Connectors

01/28/98	Initial Release of MSFC 40M38277 Connector Section in the NPSL On-Line

MSFC 40M38277 Connectors

Circular Connectors, Low Silhouette, Low Outgassing,

Bayonet Coupled, -150deg.C to +200deg.C

Part Number Ordering Information:

Example of P/N: NLS6E8-35PA, where

NLS	6	E	8	-35	P	A
Series Prefix	Shell Style	Class (Seal)	Shell Size	Arrangement Number	Contact Type	Insert Polarization

Click Here for Part Number Explanation on Backshells for Class T Connectors (Only)

Shell Style Designator	Description
0	Receptacle, Flange Mount
3	Receptacle, Solder Mount, Hermetic
5	Bulkhead Feed Thru, Hermetic, Jam Nut Mount (Double Sided Connector)
6	Plug, Cable Mount
6G	Plug, Cable Mount with RFI Grounding Fingers
6W	Plug, Cable Mount, without Coupling Ring & Backshell
7	Receptacle, Jam Nut Mount

Class (Seal) Designator	Description
E	Environmental
H	Hermetic
T	Environmental without Backshell

Contact Type Designator	Description
P	Pin
S	Socket
PS	Pin Socket Feed Thru (Shell Style 5 Only)

Insert Polarization Designator	Description
Blank	Normal
A through D	Alternate Position

Insert Arrangement Click Here to See Insert Arrangements	Number of Contacts (All Contacts Size 22D)
8-35	6
10-35	13
12-35	22
14-35	37
16-35	55
18-35	66
20-35	79
22-35	100
24-35	128

Part Number Explanation for Backshells for 40M38277 Class T Connectors Only

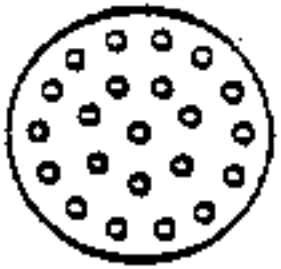
Example of P/N: NLSRFI86, where

NLS	RFI	8	6
Series Prefix	Style	Shell Size (Size 8 thru 24)	Clamp Size 1 thru 16 (Style RFI Only)

Backshell Style Designator	Description
S	Straight with Strain Relief Clamp
R	Right Angle with Strain Relief Clamp
C	Straight Compression Ring
SCT	Straight with Cable Tie Strain Relief
RCT	Right Angle with Cable Tie Strain Relief
FCT	45deg. Angle with Cable Tie Strain Relief
RFI	Straight RFI shield termination

8-35

10-35



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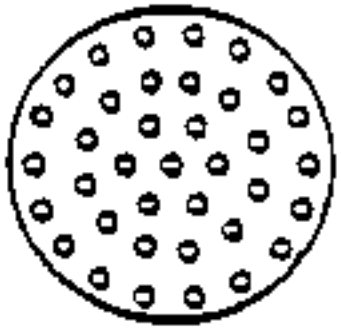

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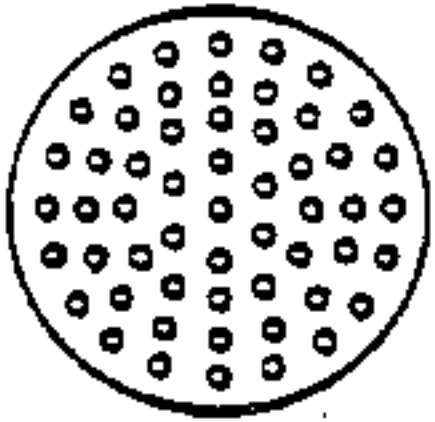

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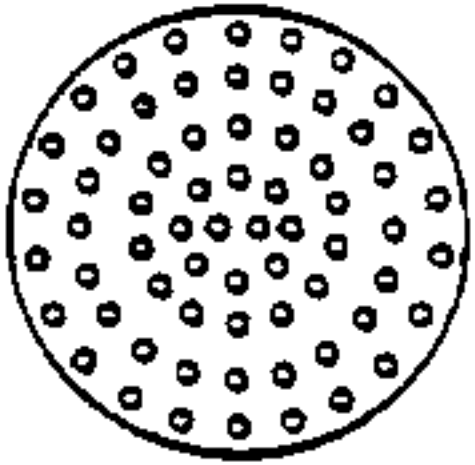

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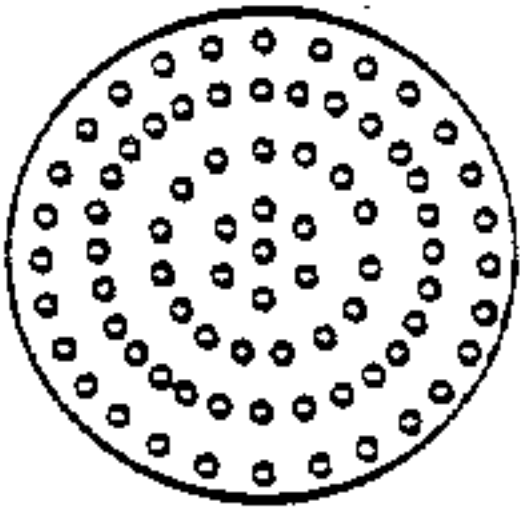

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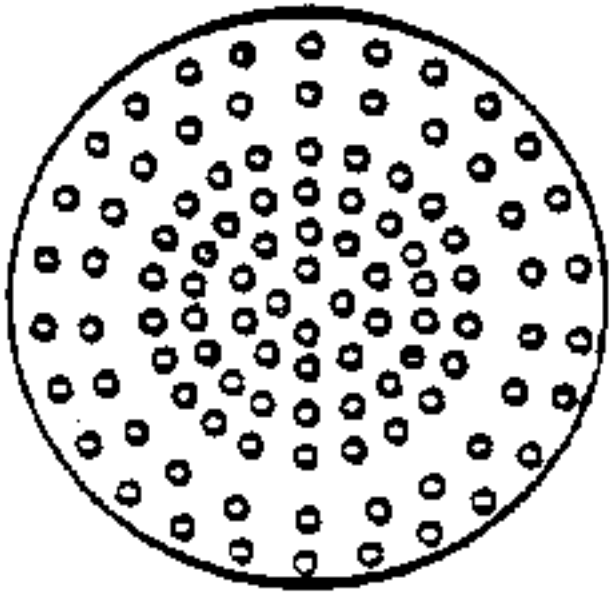

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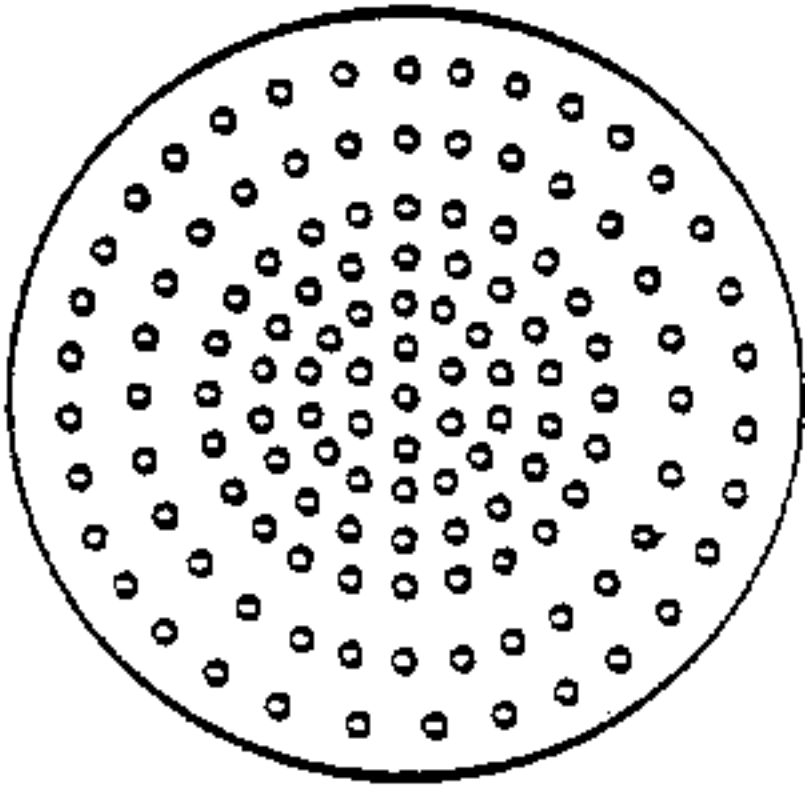

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MSFC 40M38277 Connectors Manufacturer Listing

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Amphenol Aerospace - Amphenol Connectors (Formerly Bendix)
40-60 Deleware Avenue
Sidney, NY 13838
Cage Code: 77820
Tel.: 607-563-5011
Glenair, Inc.
(Backshells Only)
1211 Air Way
Glen Dale CA 91201
Cage Code: 06324
Tel.: 818-247-6000
ITT Cannon
666 East Dyer Rd
Santa Ana, CA 92705
Cage Code: 71468
Tel.: 714-557-4700
Revision History for NASA Parts Selection List for MIL-DTL-38999

02/29/00	Changed specification reference to "MIL-DTL-38999" from "MIL-C-38999" throughout this section
12/09/97	Initial Release on MIL-DTL-38999 Section in the NPSL

MIL-DTL-38999 Connectors Series I II,
Circular Connectors, Bayonet Coupled, -65deg.C to +200deg.C
Part Number Ordering Information:

MS27XXX	X	X	X	XX	X	X
Military Specification Number	Class	Shell Size	Finish	Arrangement Number	Contact Type	Insert Polarization

		MILITARY SPECIFICATION NUMBER AND STYLE
Series I Scoop-Proof	Series II Low Silhouette	Style Description
MS27466	MS27472	Receptacle, Wall Mount Flange
MS27468	MS27474	Receptacle, Jam Nut Mount
MS27656	MS27497	Receptacle, Wall Mount, Back Panel Mount
--	MS27508	Receptacle, Box Mount, Back Panel Mount
--	MS27473	Plug
MS27467	MS27484	Plug with RFI Grounding Fingers
MS27470	MS27477	Receptacle, Jam Nut Mount, Hermetic
MS27471	MS27478	Receptacle, Solder Mount, Hermetic

CLASS DESCRIPTION	T = Environmental Without Backshell

E = Environmental Resisting (MS27508 Only)

Y = Hermetic

CONTACT TYPE
P = Pin
S = Socket
Y = Hermetic Pins with Eyelet
Z = Hermetic Sockets with Eyelet

INSERT POLARIZATION
Blank = Normal
A, B, C, D = Alternate Positions

FINISH (Preferred)

Class T, E
F = Electroless Nickel

Class Y
D = Tin (150deg.C)
E = Passivated Stainless Steel

					INSERT ARRANGEMENT
	Designation (First Digit Designates Shell Size/Subsequent Digits Desginate Contact Arrangement)				No. of Contacts (By Contact Size)
Series I	Series II	22D	20	16	12
					Shell Sizes 8 and 9 (Click to See Insert Arrangements)
9-35	8-35	6	-	-	-
9-98	8-98	-	3	-	-
					Shell Sizes 10 and 11 (Click to See Insert Arrangements)
11-4	--	-	4	-	-
11-5	10-5	-	5	-	-
11-35	10-35	13	-	-	-
11-98	10-98	-	6	-	-
11-99	10-99	-	7	-	-
					Shell Sizes 12 and 13 (Click to See Insert Arrangements)

--	12-3	-	-	3	-
13-4	12-4	-	-	4	-
13-8	12-8	-	8	-	-
13-35	12-35	22	-	-	-
13-98	12-98	-	10	-	-
					Shell Sizes 14 and 15 (Click to See Insert Arrangements)
15-5	14-5	-	-	5	-
15-15	14-15	-	14	1	-
15-18	14-18	-	18	-	-
15-19	--	-	19	-	-
15-35	14-35	37	-	-	-
15-97	14-97	-	8	4	-
					Shell Sizes 16 and 17 (Click to See Insert Arrangments)
17-6	16-6	-	-	-	6
17-8	16-8	-	-	8	-
17-26	16-26	-	26	-	-
17-35	16-35	55	-	-	-
17-99	16-99	-	21	2	-
					Shell Sizes 18 and 19 (Click to See Insert Arrangements)
19-11	18-11	-	-	11	-
--	18-28	-	26	2	-
--	18-30	-	29	1	-
19-32	18-32	-	32	-	-
19-35	18-35	66	-	-	-
--	18-96	-	-	-	9
					Shell Sizes 20 and 21 (Click to See Insert Arrangements)
21-11	--	-	-	-	11
21-16	20-16	-	-	16	-
21-35	20-35	79	-	-	-
21-39	20-39	-	37	2	-
21-41	20-41	-	41	-	-
					Shell Sizes 22 and 23 (Click to See Insert Arrangments)
23-21	22-21	-	-	21	-
--	22-32	-	32	-	-
23-35	22-35	100	-	-	-
23-53	--	-	53	-	-
23-55	22-55	-	55	-	-
					Shell Sizes 24 and 25 (Click to See Insert Arrangements)
25-4	24-4	-	48	8	-
25-19	24-19	-	-	-	19
25-24	24-24	-	-	12	12
25-29	24-29	-	-	29	-
25-35	24-35	128	-	-	-
25-43	--	-	23	20	-
25-61	24-61	-	61	-	-

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Connectors

MIL-DTL-38999 Connectors Series I II

Circular Connectors, Bayonet Coupled, -65deg.C to +200deg.C

Part Number/Ordering Explanation

Important! Application Notes

Available Sources

Revision History for NASA Parts Selection List for MIL-DTL-38999 Series I II

Last Update: 02/29/00

MIL-DTL-38999 Connectors Series I II

Circular Connectors, Bayonet Coupled

APPLICATION NOTES

1) Specify Class T for all types except for hermetic and MS27508 connectors. Specify Class E for MS27508 connectors only. Class E is not preferred for all other specifications and is inactive for new design.

2) In applications where contamination control is critical, military connectors require additional processing for contamination control due to outgassing. Processing generally consists of a bakeout of 125deg.C and some level of vacuum. A vacuum level of at least 10**-6 torr is preferred. Processing should also include removal of lubricant and replacement with a low outgassing lubricant such as Apiezon-M (manufactured by Metropolitan-Vickers). Removal of ink color bands on contacts may also be required. Some military QPL suppliers offer special low outgassing connectors under commercial part numbers.

3) Connectors may be used in Level 1 and 2 applications.

4) Accessories such as strain relief backshells and seal plugs must be provided separately. Refer to MIL-C-85049 for a selection list of backshells. Use of MS27488 seal plugs in unused contact cavities is recommended.

5) Series I, II, III and IV connectors are not intermateable.

6) Connectors are supplied with contacts. Refer to MIL-C-39029 for a selection of replacement contact part numbers.

7) Consult the latest MIL-DTL-38999 Qualified Products List (QPL) for availability. Other insert arrangements are available but are not preferred due to limited availability.

8) Insert arrangement designation consists of shell size and arrangement number. Inserts with a variety of contact sizes are available. For Series I connectors, the shell sizes are specified by odd numbers. For Series II connectors, the shell sizes are specified by even numbers.

Revision History for NASA Parts Selection List MIL-DTL-38999 Series I II Connectors

02/29/00	Changed All specification references to "MIL-DTL-38999" from "MIL-C-38999"
12/07/97	Initial Release.

MIL-DTL-38999 Connectors Series III IV,

Circular Connectors, -65deg.C to +200deg.C

Part Number Ordering Information:

D38999	/XX	X	X	XX	X	X

Military Specification Number	Specification Slash Sheet	Class	Shell Size	Arrangement Number	Contact Type	Insert Polarization

		MILITARY SPECIFICATION NUMBER AND STYLE
Series III Scoop-Proof 3 Way Self Locking Threaded Coupling	Series IV Scoop Proof Breech Coupling	Style Description
D38999/20	D38999/40	Receptacle, Wall Mount Flange
D38999/24	D38999/44	Receptacle, Jam Nut Mount
-	D38999/42	Receptacle, Box Mount
-	D38999/47	Plug
D38999/26	D38999/46	Plug, EMI Grounding Fingers
D38999/21	D38999/41	Receptacle, Box Mount, Hermetic
D38999/23	D38999/43	Receptacle, Jam Nut Mount, Hermetic
D38999/25	D38999/45	Receptacle, Solder Mount, Hermetic
D38999/27	D38999/48	Receptacle, Weld Mount, Hermetic

CLASS DESCRIPTION
F = Environment Resisting, Conductive Electroless Nickel Coating
N = Hermetically Sealed, Corrosion Resistant Steel, Conductive Electro-Deposited Nickel Finish
Y = Hermetically Sealed, Corrosion Resistant Steel, Conductive Passivated Finish

CONTACT TYPE
P = Pin
S = Socket
Y = Hermetic Pins with Eyelet
Z = Hermetic Sockets with Eyelet

INSERT POLARIZATION
Blank = Normal
A, B, C, D = Alternate Positions

	SHELL SIZE
Designator	Shell Size
A	9
B	11
C	13
D	15
E	17
F	19

G	21
H	23
J	25

SHELL SIZE AND INSERT ARRANGEMENT COMBINATIONS

Designation (Letter Indicates Shell Size/Number Indicates Arrangement)

No. of Contacts (By Contact Size)

Designator	Series III	Series IV	22D	20	16	12
A35	X	--	6	-	-	-
A98	X	--	-	3	-	-
B4	X	--	-	4	-	-
B5	X	X	-	5	-	-
B35	X	X	13	-	-	-
B98	X	--	-	6	-	-
B99	X	X	-	7	-	-
C4	X	X	-	-	4	-
C8	X	--	-	8	-	-
C35	X	X	22	-	-	-
C98	X	X	-	10	-	-
D5	X	X	-	-	5	-
D15	X	--	-	14	1	-
D18	X	X	-	18	-	-
D19	X	X	-	19	-	-
D35	X	X	37	-	-	-
D97	X	X	-	8	4	-
E6	X	X	-	-	-	6
E8	X	X	-	-	8	-
E26	X	X	-	26	-	-
E35	X	X	55	-	-	-
E99	X	X	-	21	2	-
F11	X	X	-	-	11	-
F32	X	X	-	32	-	-
F35	X	X	66	-	-	-
G11	X	X	-	-	-	11
G16	X	X	-	-	16	-
G35	X	X	79	-	-	-
G39	X	--	-	37	2	-
G41	X	X	-	41	-	-
H21	X	X	-	-	21	-
H35	X	X	100	-	-	-
H53	X	--	-	53	-	-
H55	X	X	-	55	-	-
J4	X	X	-	48	8	-
J19	X	X	-	-	-	19

J24	X	X	-	-	12	12
J29	X	X	-	-	29	-
J35	X	X	128	-	-	-
J43	X	--	-	23	20	-
J61	X	X	-	61	-	-

SHELL INSERT ARRANGEMENT COMBINATIONS
Shell Size F
Shell Size B
Shell Size C
Shell Size D
Shell Size E
Shell Size A
Shell Size G
Shell Size H
Shell Size J

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Connectors
MIL-DTL-38999 Connectors Series III IV
Circular Connectors, -65deg.C to +200deg.C
Part Number/Ordering Explanation
Important! Application Notes
Available Sources
Revision History for NASA Parts Selection List for MIL-DTL-38999 Series III IV
Last Update 02/29/00
MIL-DTL-38999 Connectors Series III IV
Circular Connectors
APPLICATION NOTES

1) In applications where contamination control is critical, military connectors require additional processing for contamination control due to outgassing. Processing generally consists of a bakeout of 125deg.C and some level of vacuum. A vacuum level of at least 10**-6 torr is preferred. Processing should also include removal of lubricant and replacement with a low outgassing lubricant such as Apiezon-M (manufactured by Metropolitan-Vickers). Removal of ink color bands on contacts may also be required. Some military QPL suppliers offer special low outgassing connectors under commercial part numbers.

2) Connectors may be used in Level 1 and 2 applications.

3) Accessories such as strain relief backshells and seal plugs must be provided separately. Refer to MIL-C-85049 for a selection list of backshells. Use of MS27488 seal plugs in unused contact cavities is recommended.

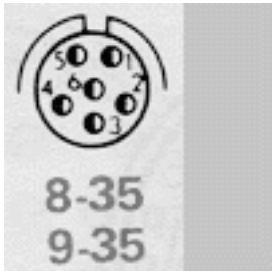
4) Series I, II, III and IV connectors are not intermateable.

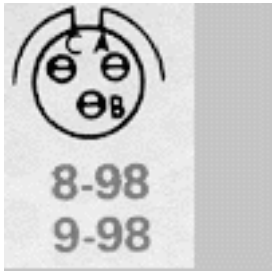
5) Connectors are supplied with contacts. Refer to MIL-C-39029 for a selection of replacement contact part numbers.

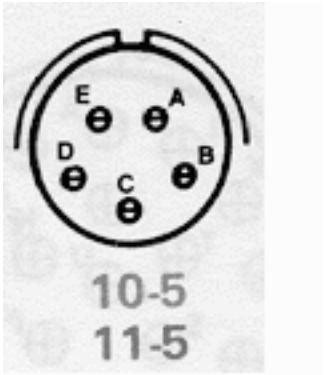
6) Consult the latest MIL-DTL-38999 Qualified Products List (QPL) for availability. Other insert arrangements are available but are not preferred due to limited availability.

Revision History for NASA Parts Selection List forr MIL-DTL-38999 Series III IV Connectors

02/29/00	Changed specification reference to "MIL-DTL-38999" from "MIL-C-38999" throughout this section
12/09/97	Initial Release



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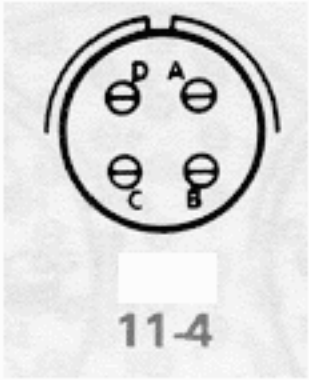
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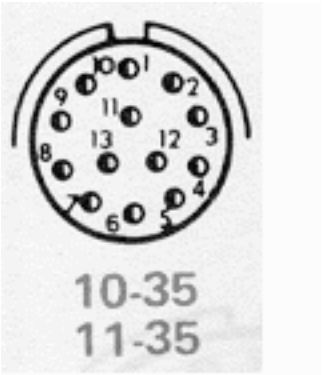

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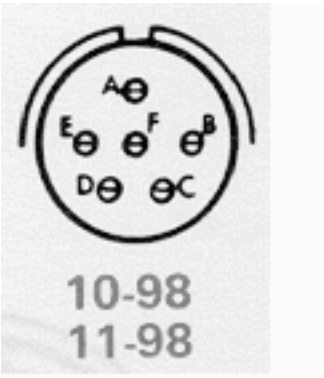

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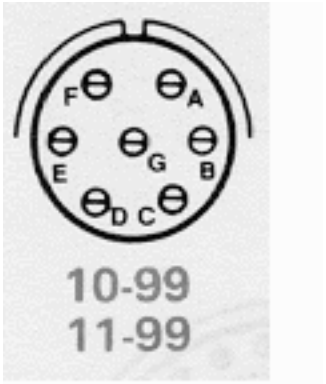

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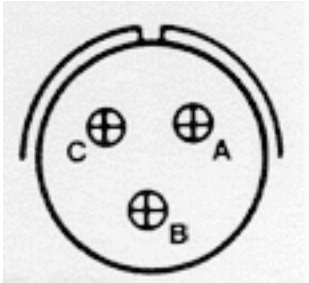

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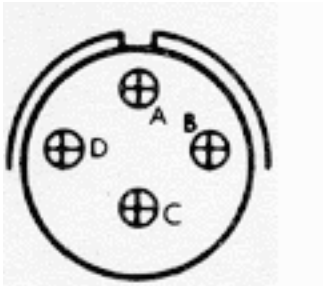

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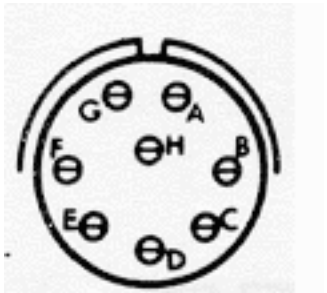

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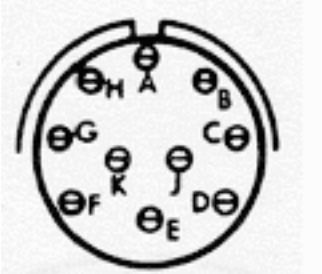

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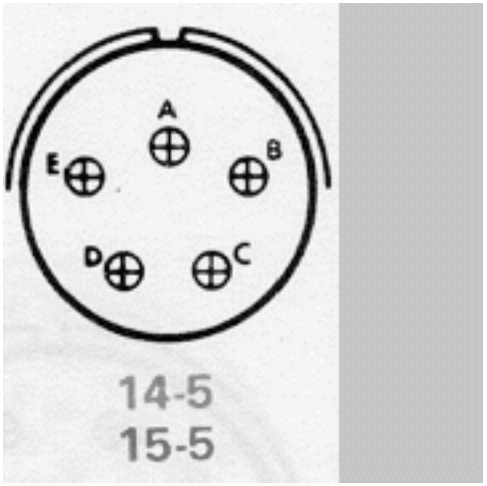

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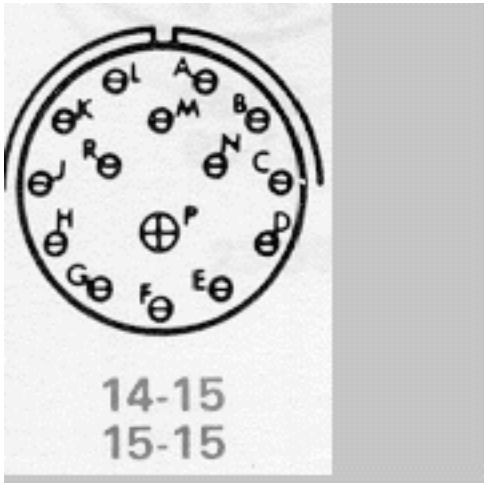

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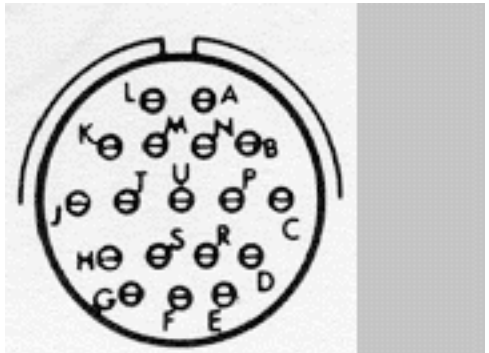

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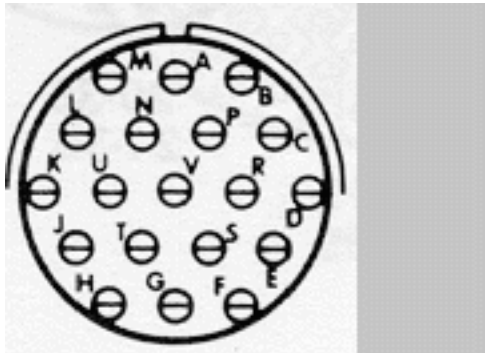

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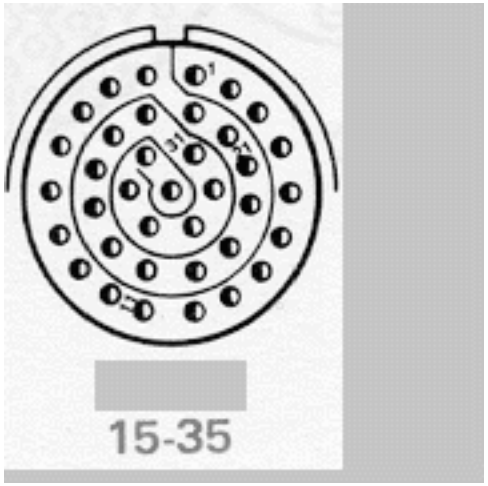

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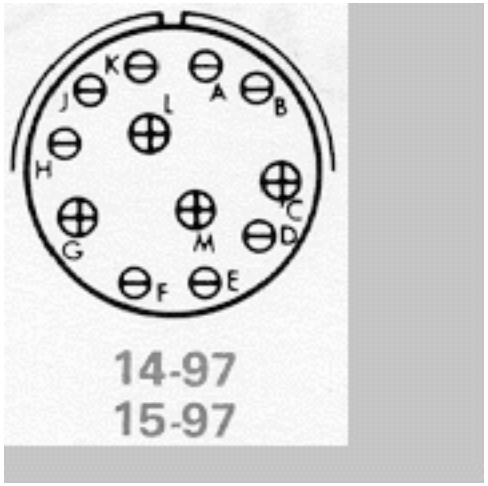

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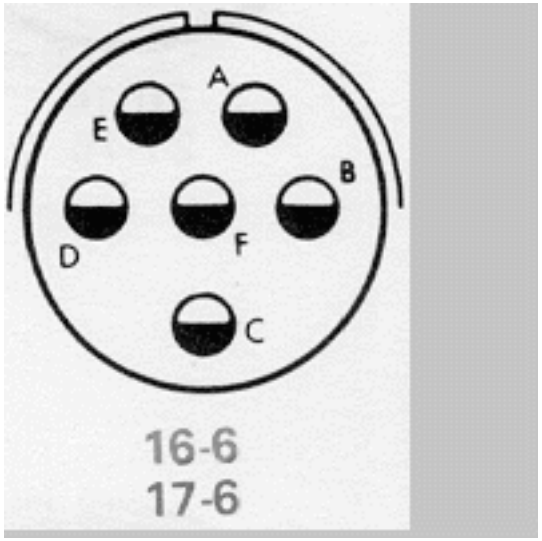

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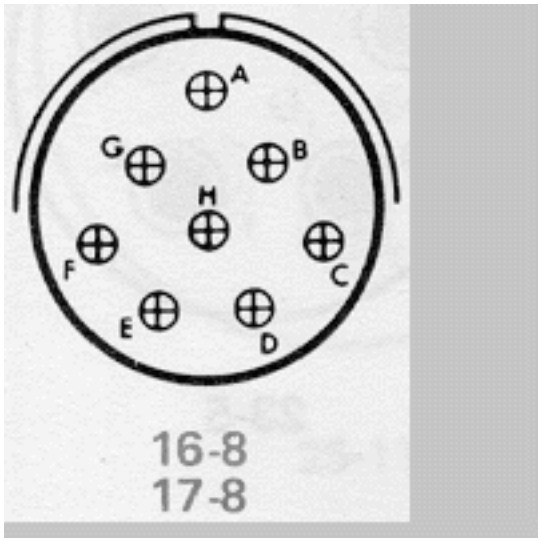

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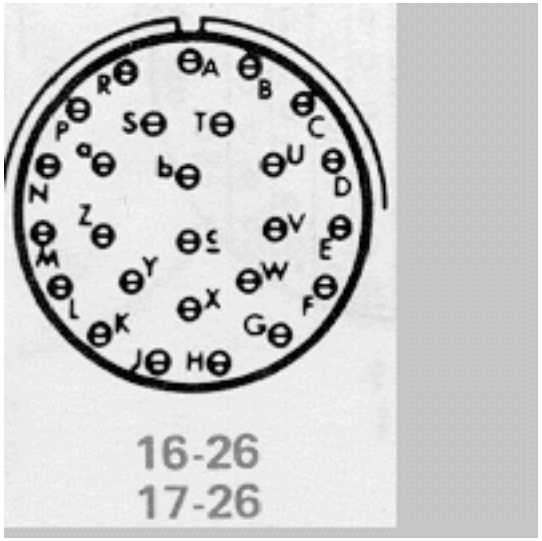
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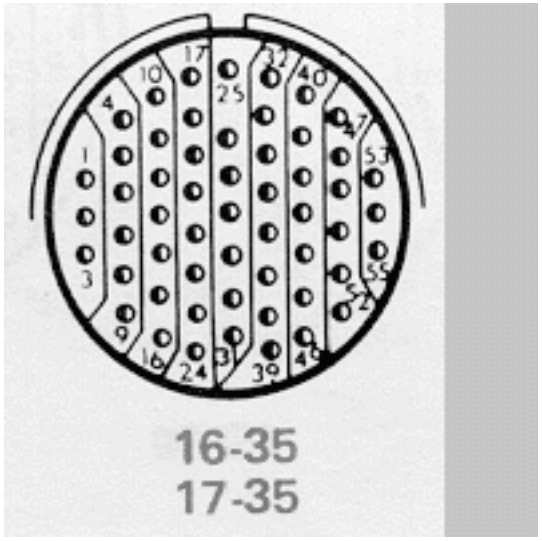
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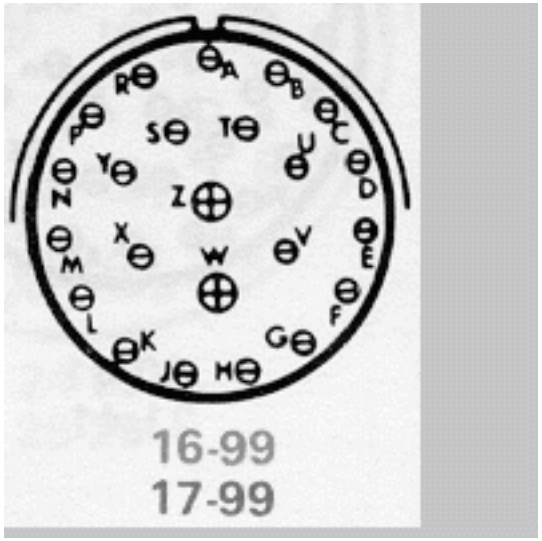
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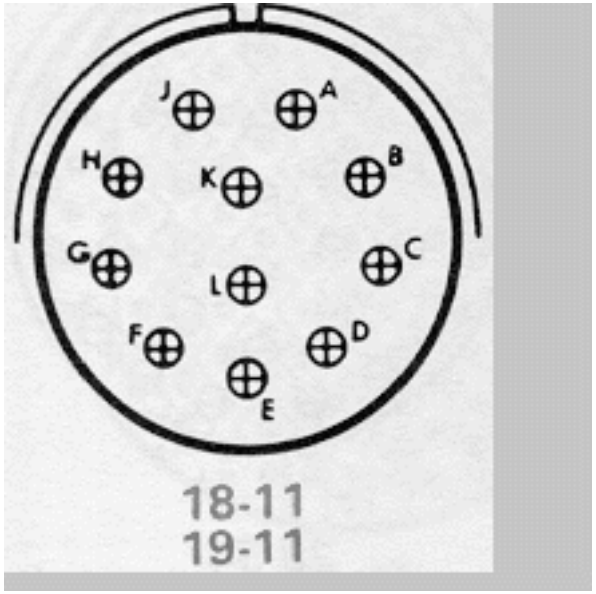
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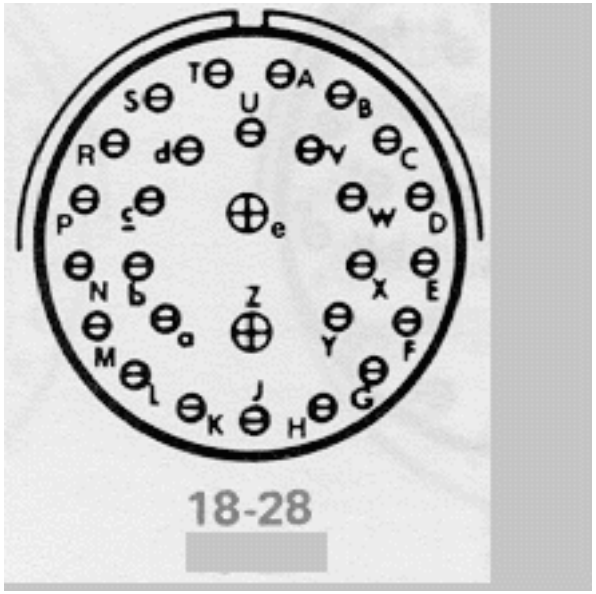
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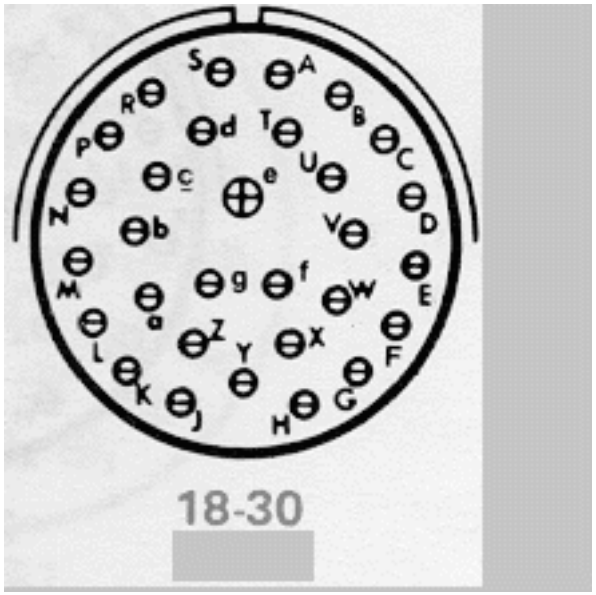
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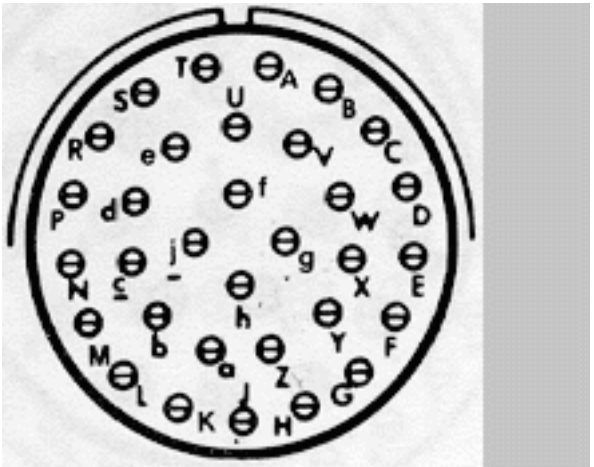
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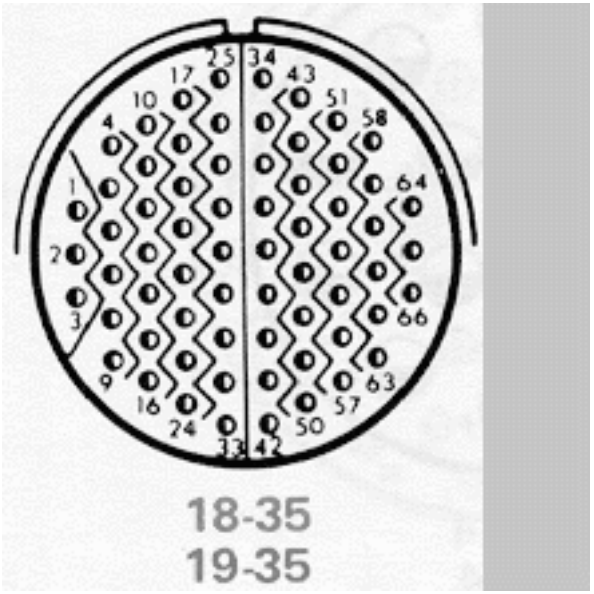
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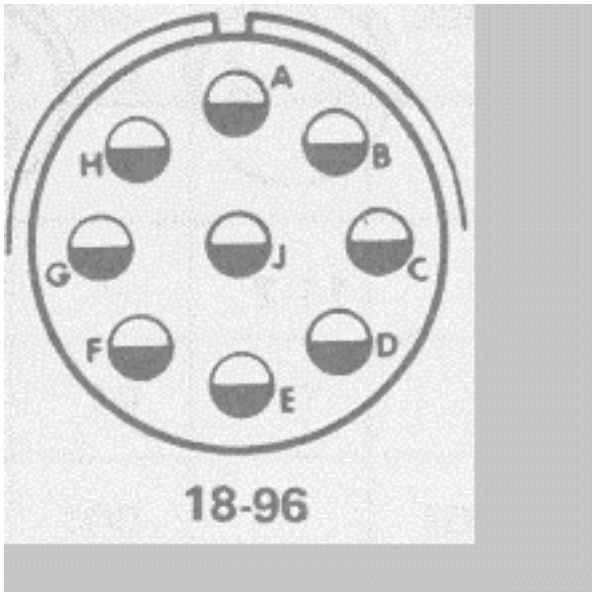
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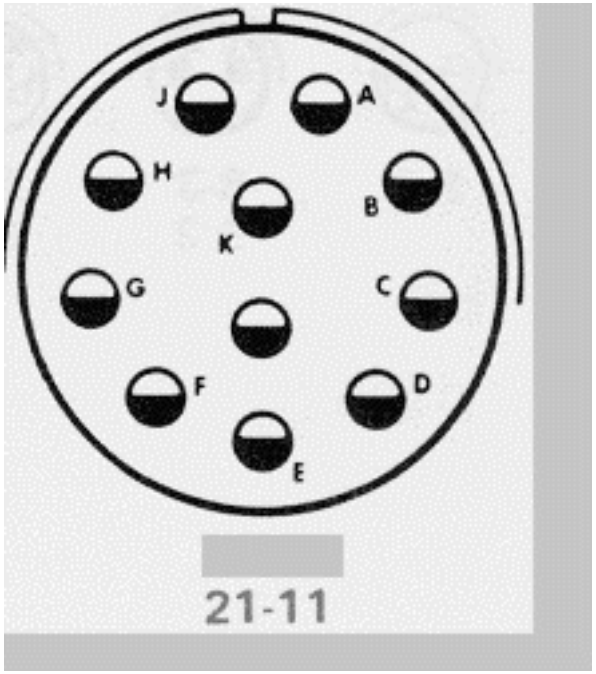
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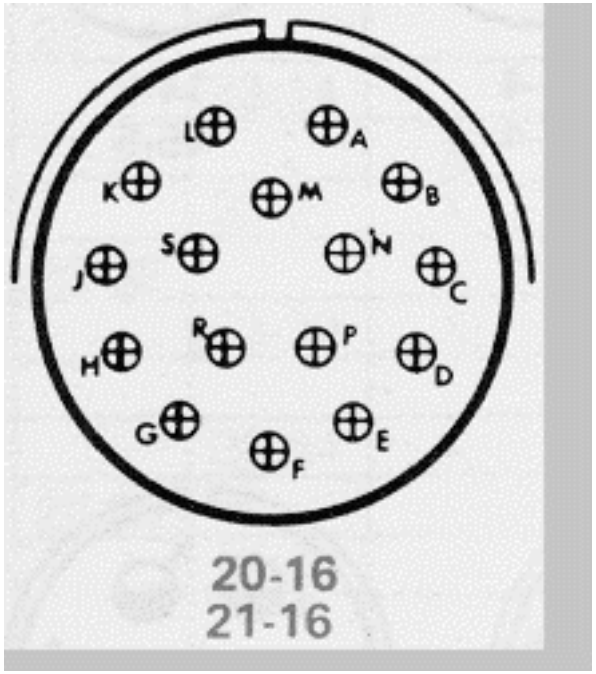
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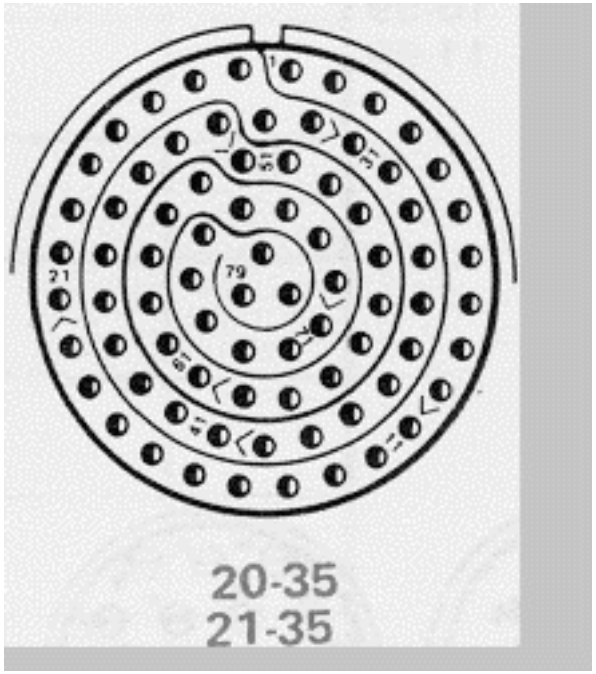
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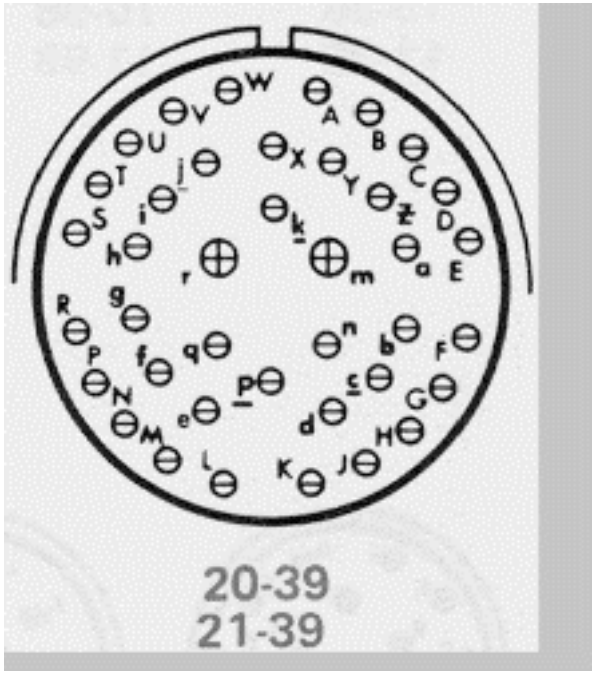
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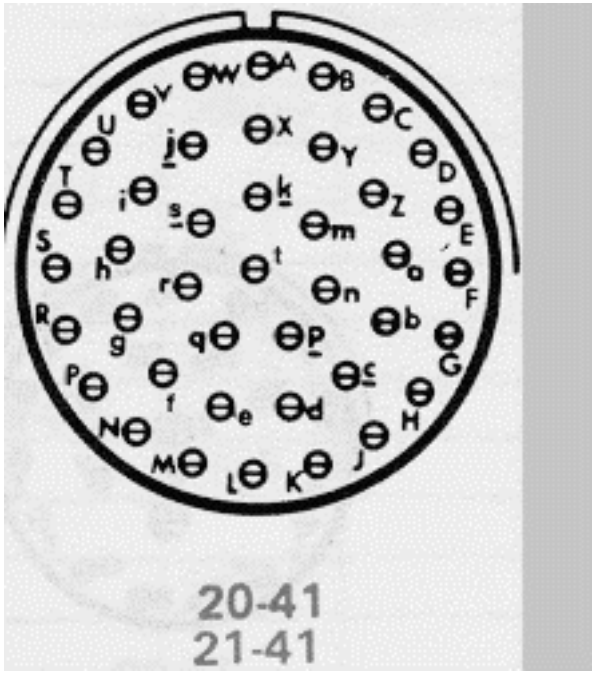
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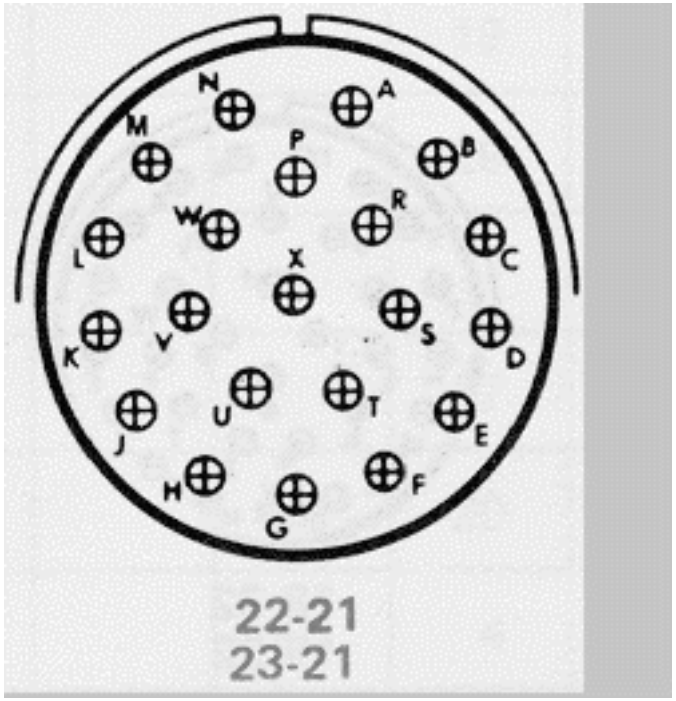

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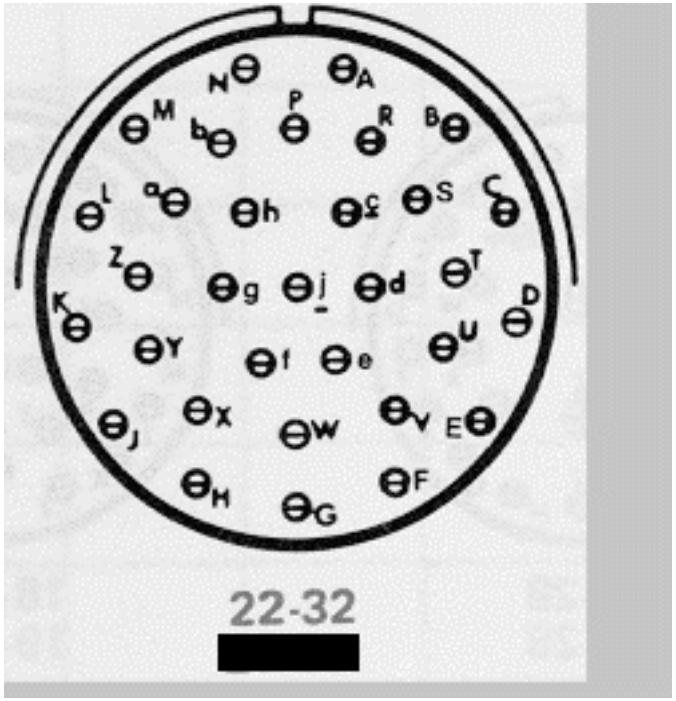
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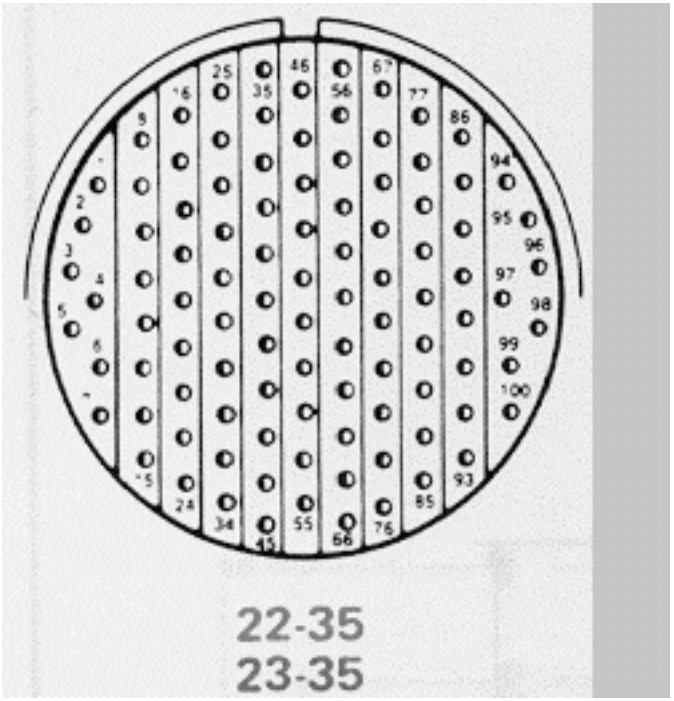
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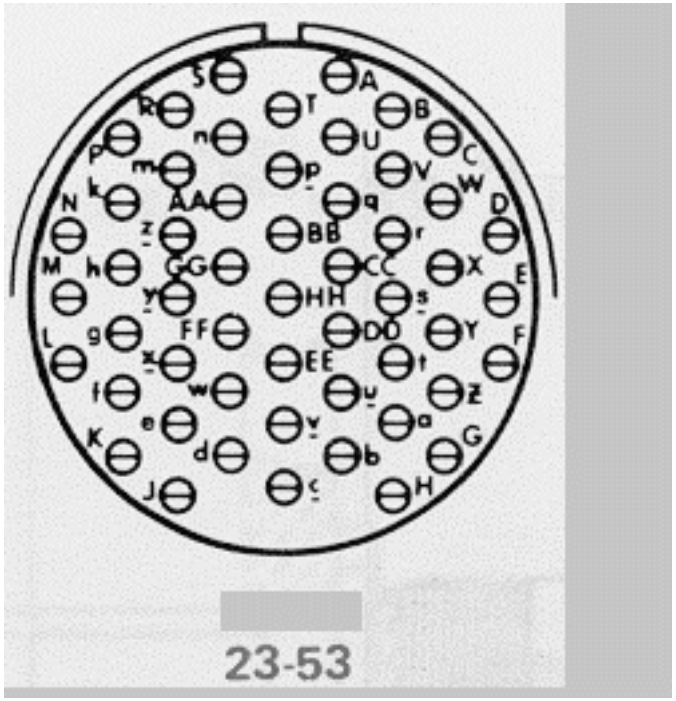
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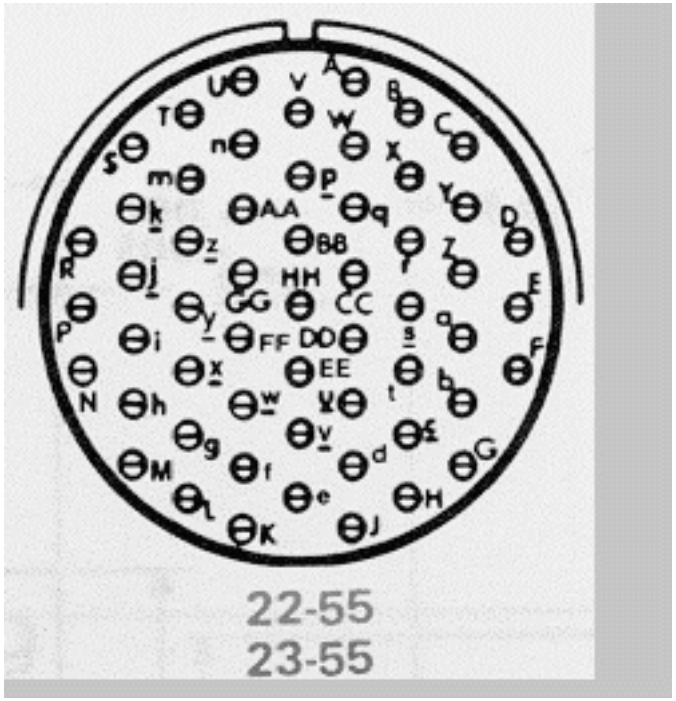
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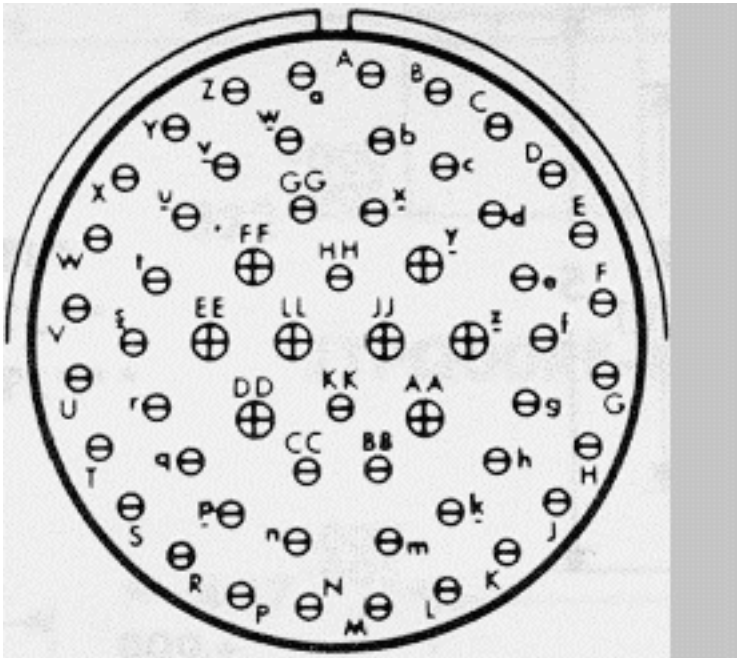
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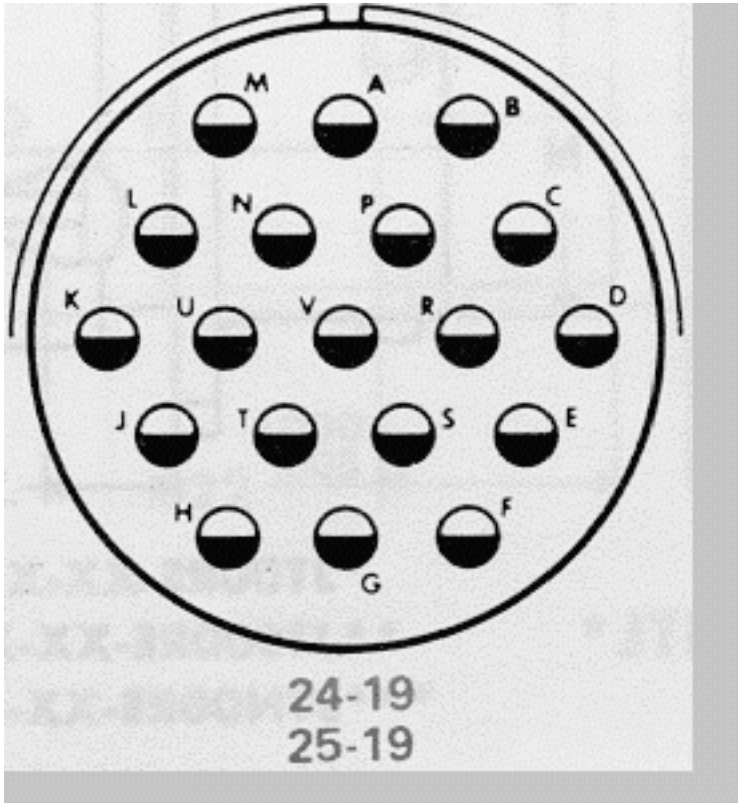
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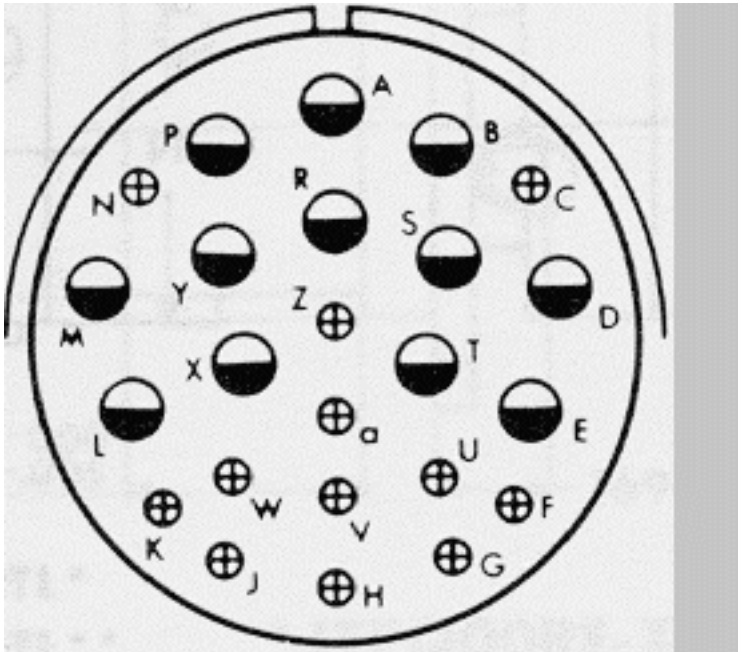

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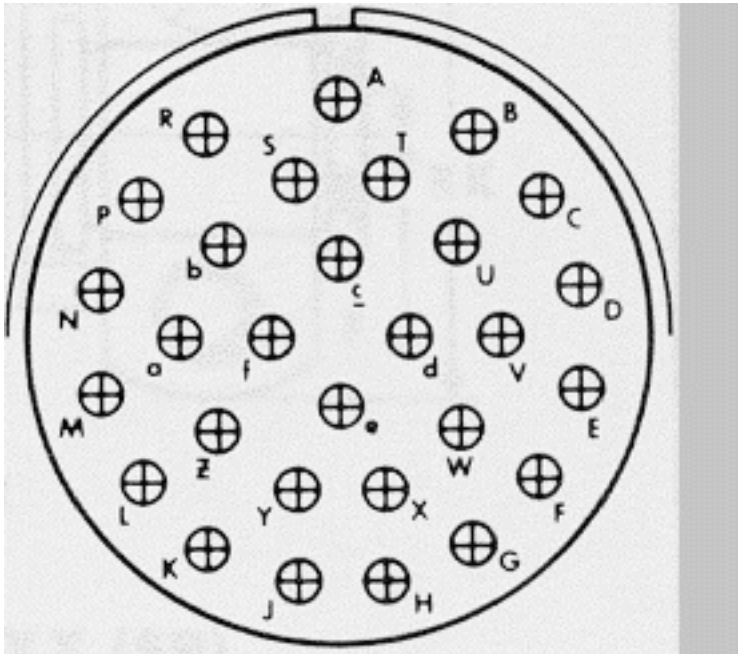
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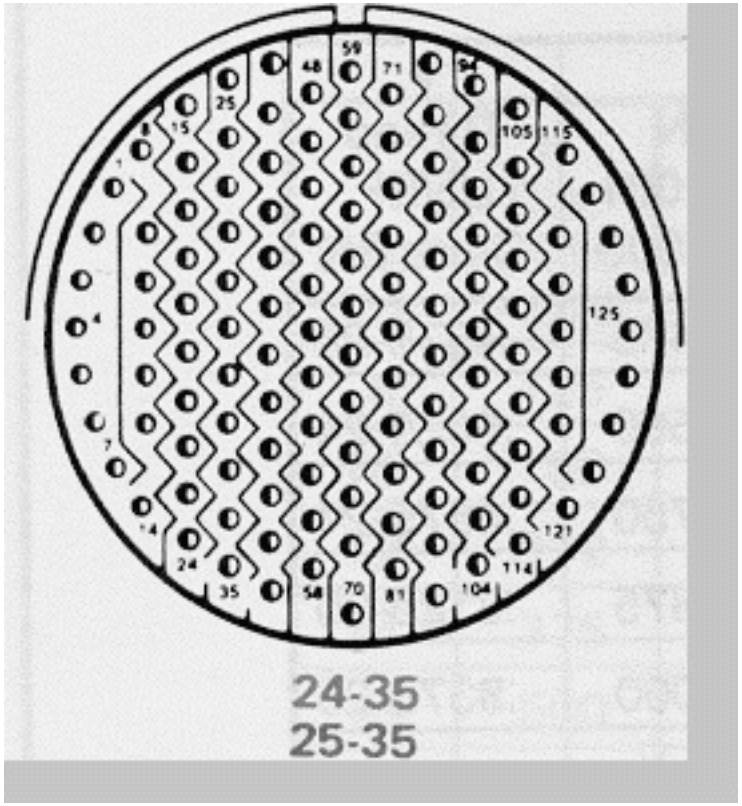
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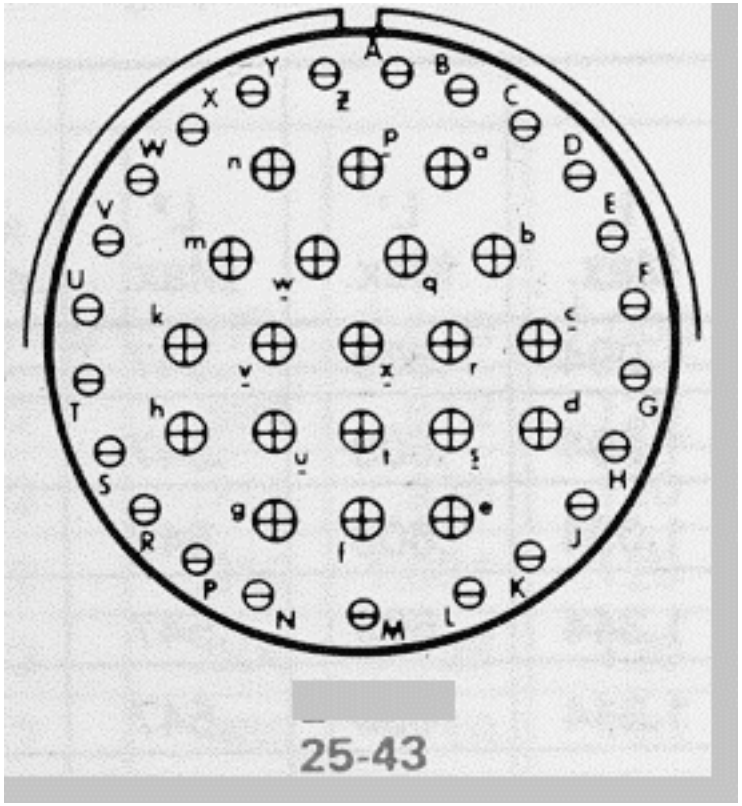
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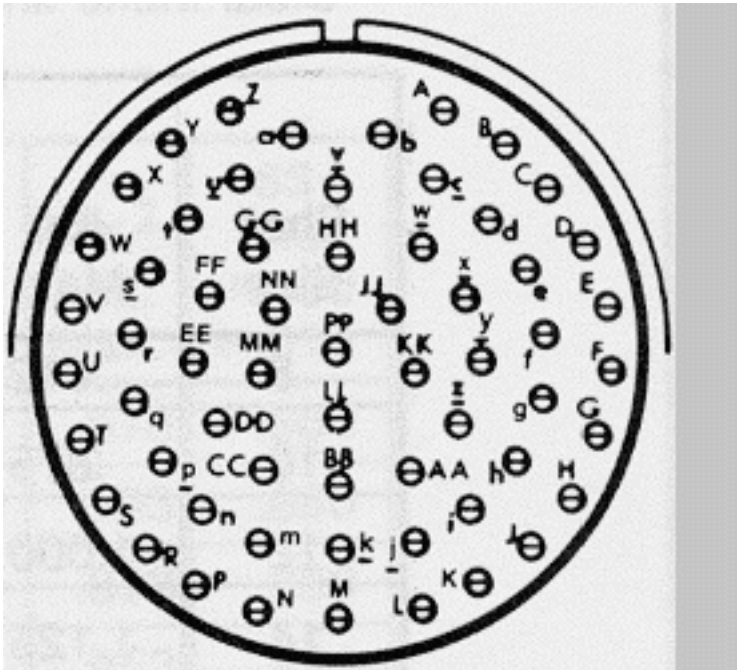
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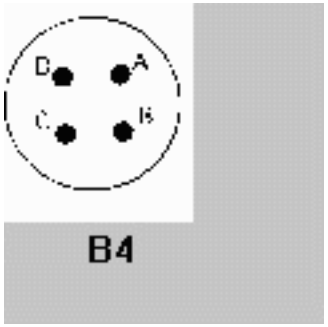
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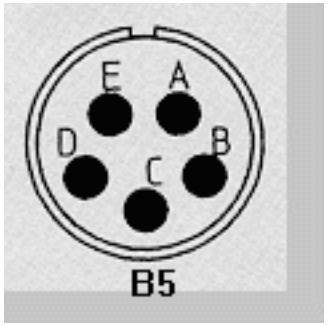

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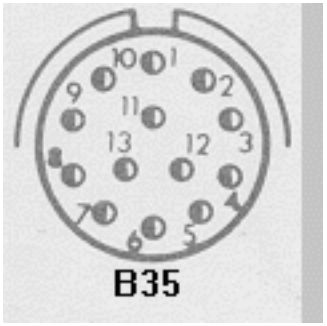

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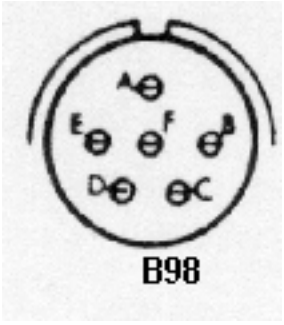

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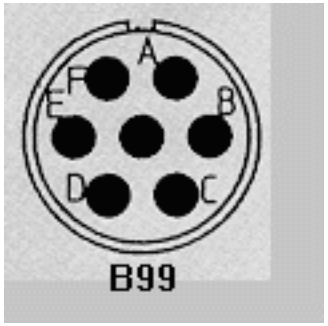
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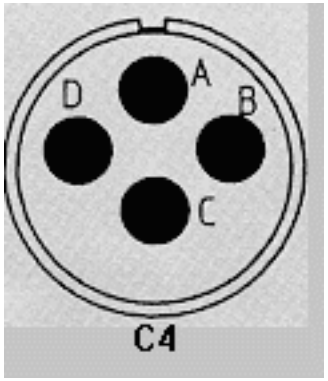
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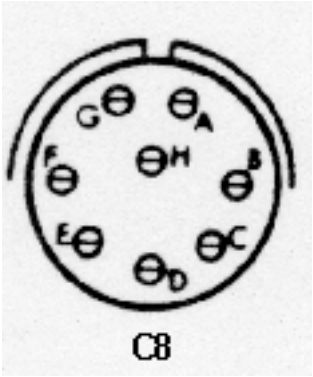

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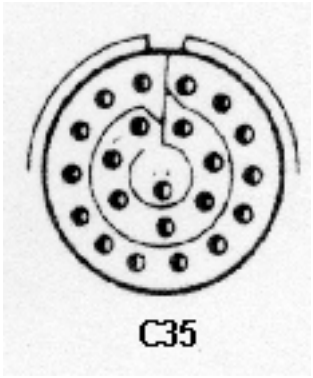
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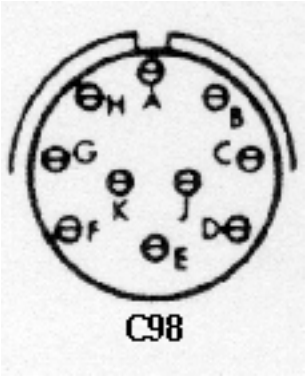

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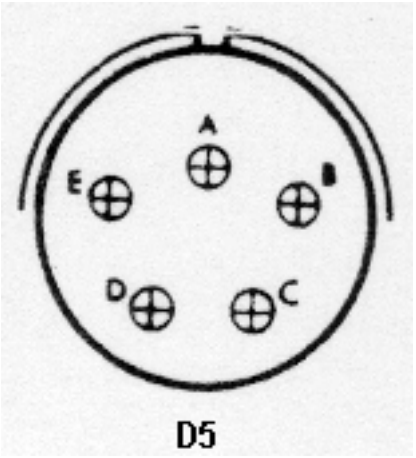

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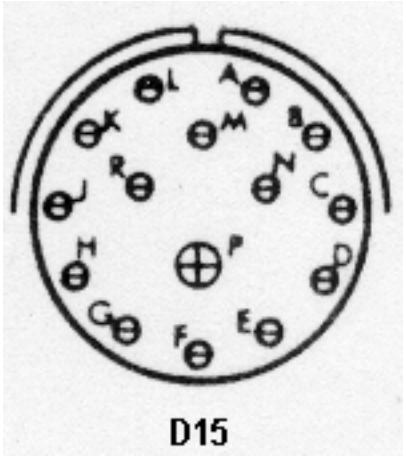

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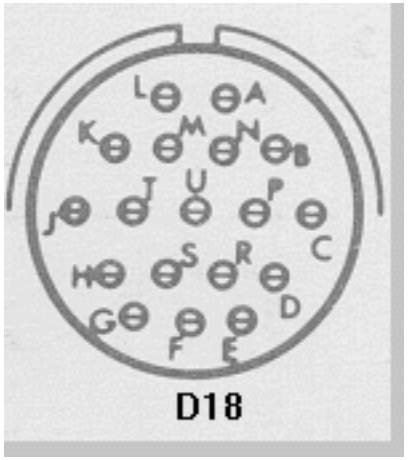

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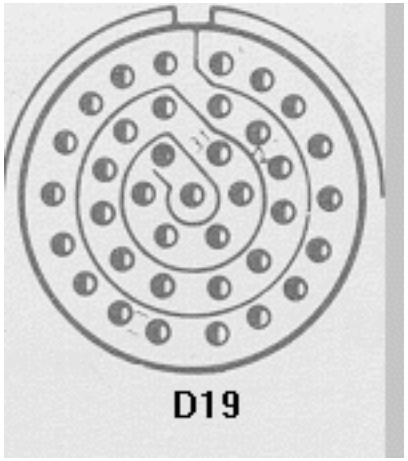
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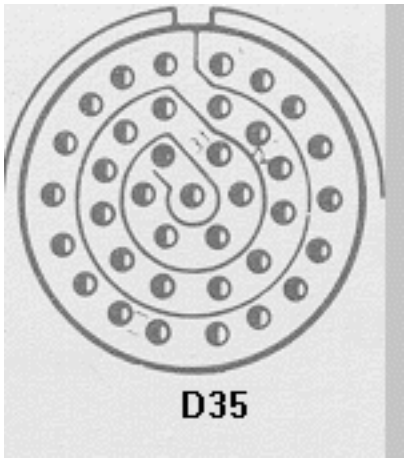
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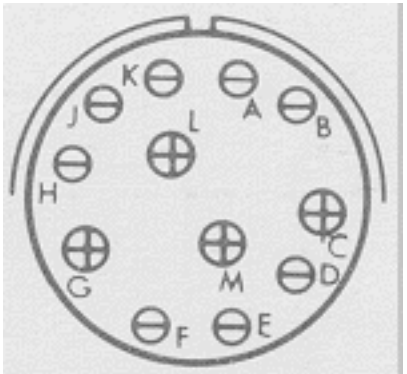

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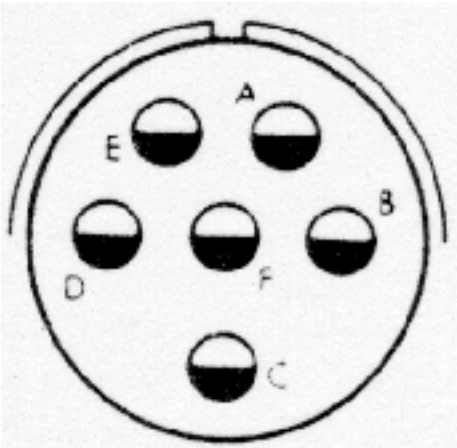

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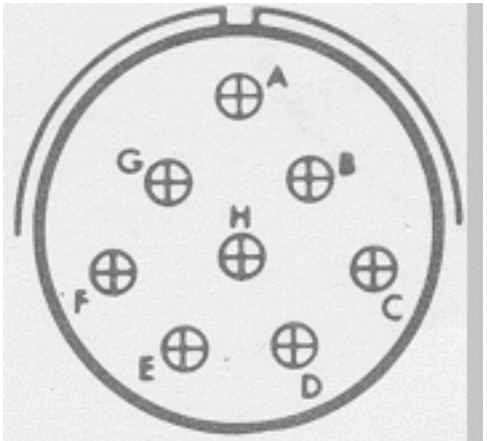

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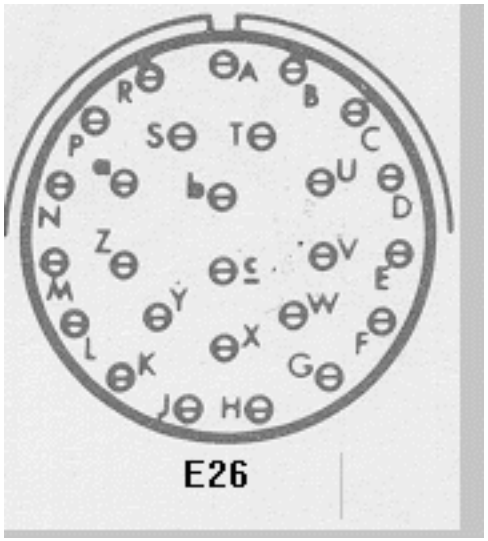

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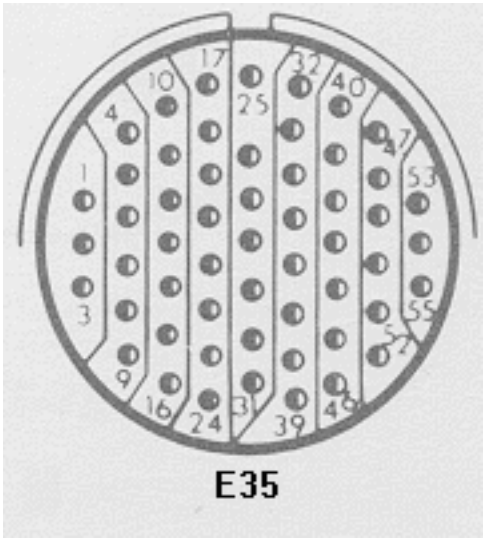

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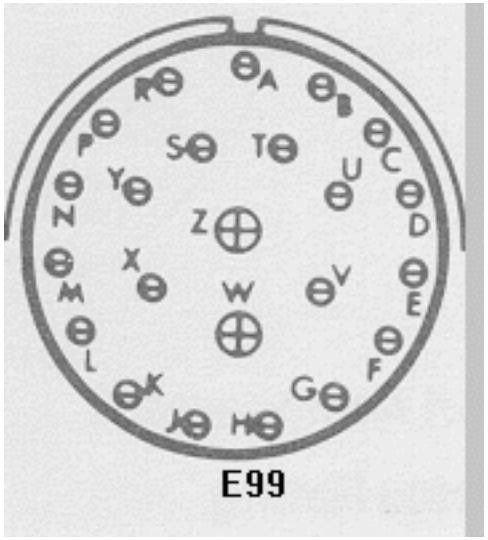

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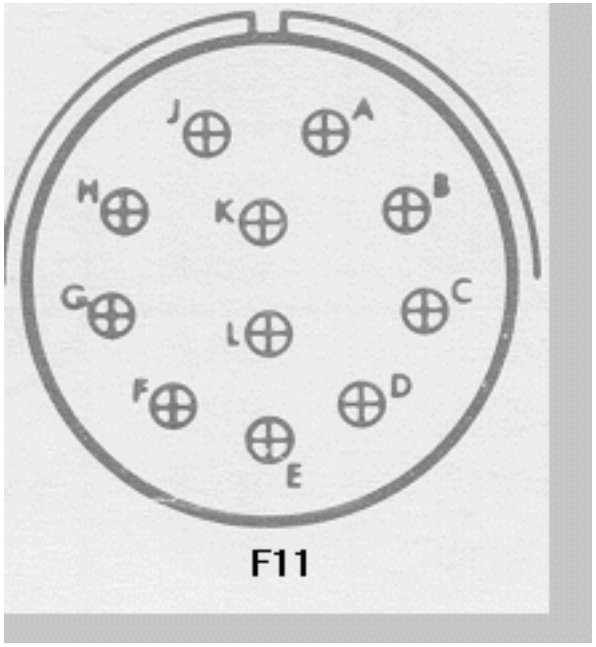

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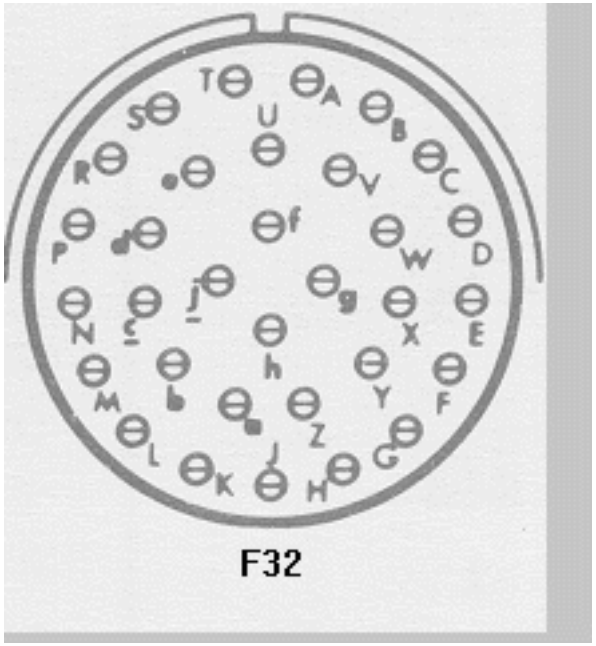

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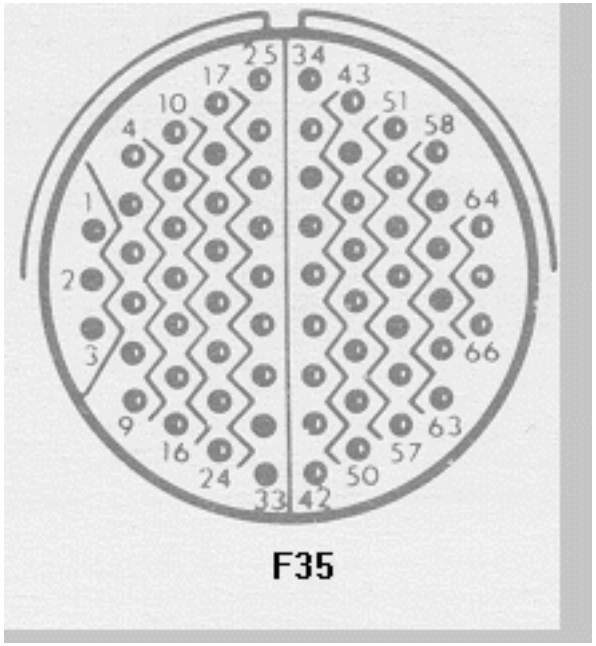

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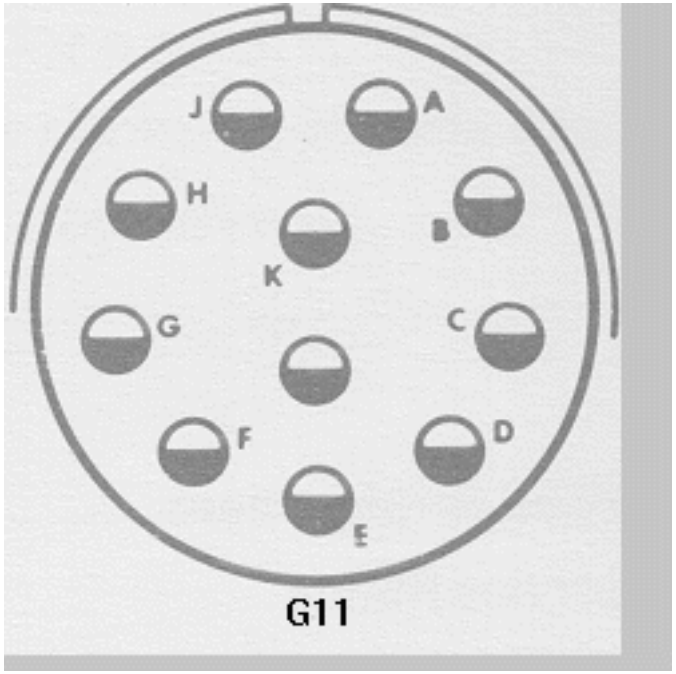

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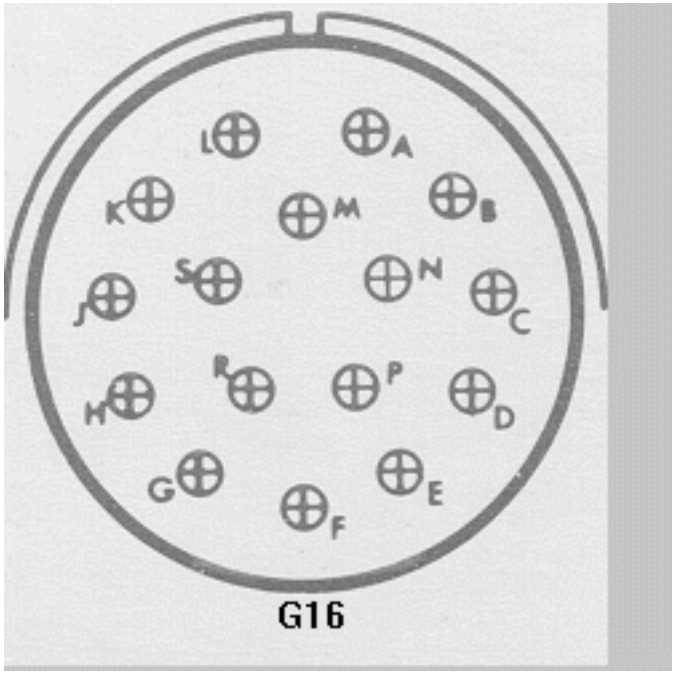

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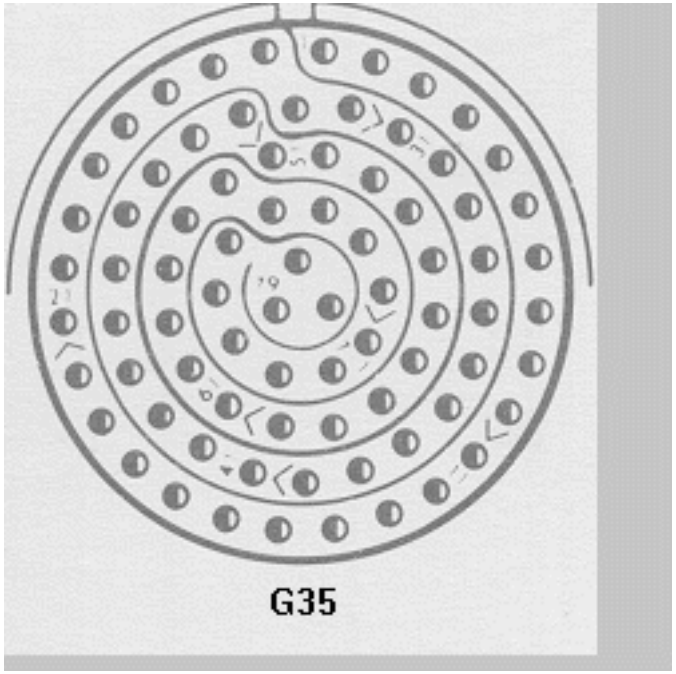

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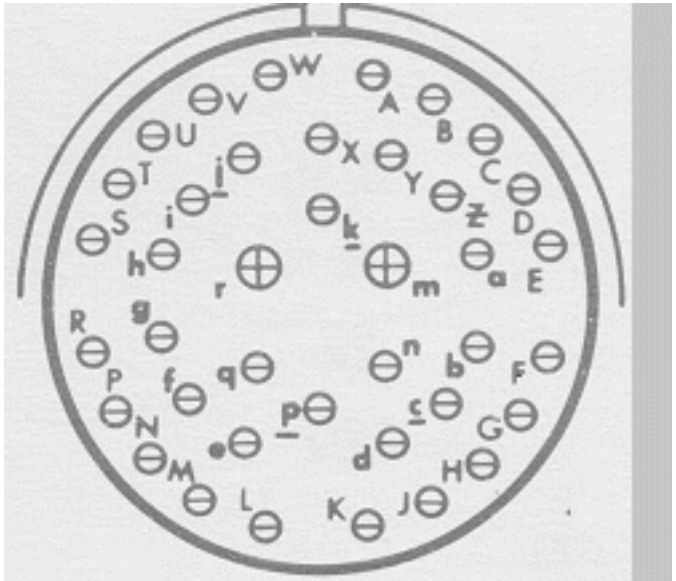

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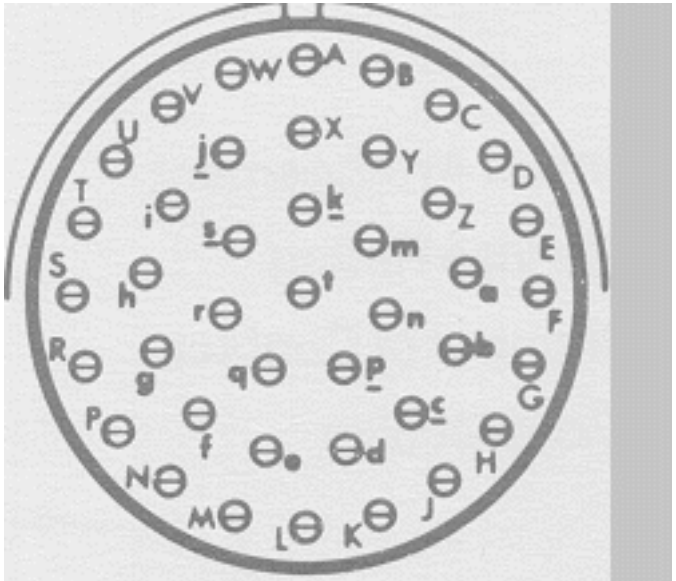

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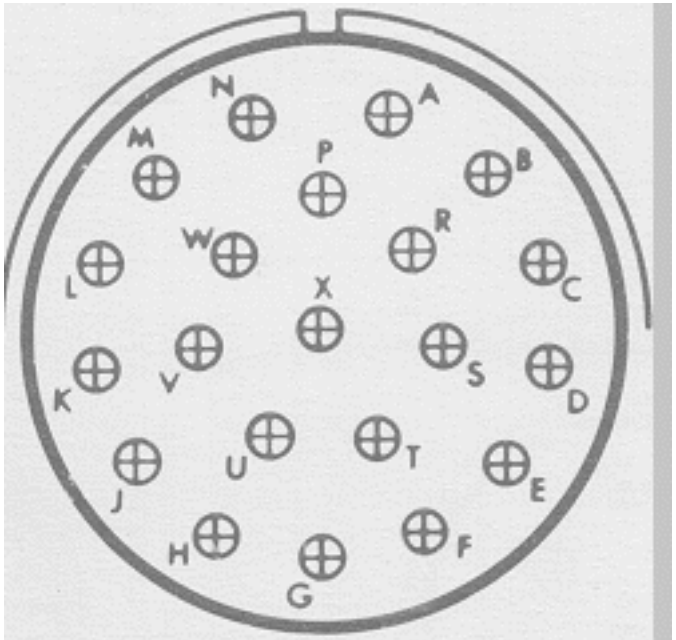

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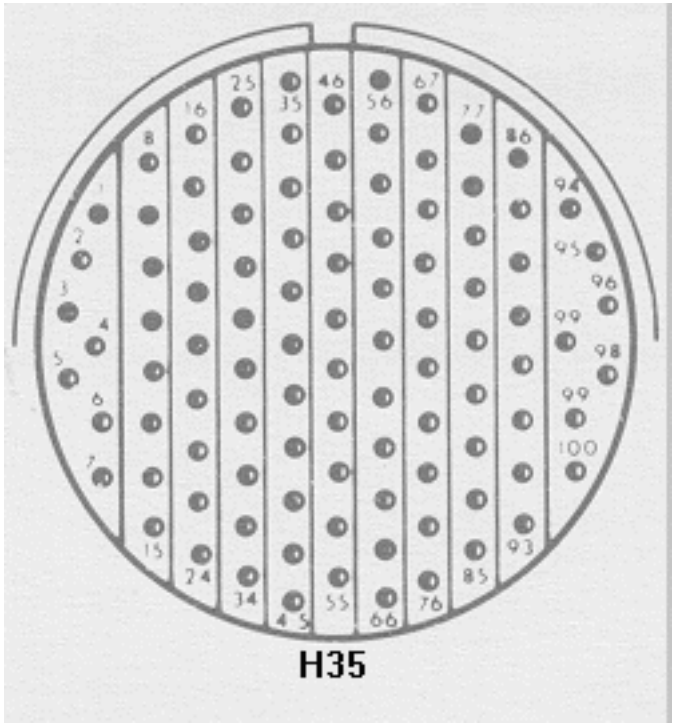
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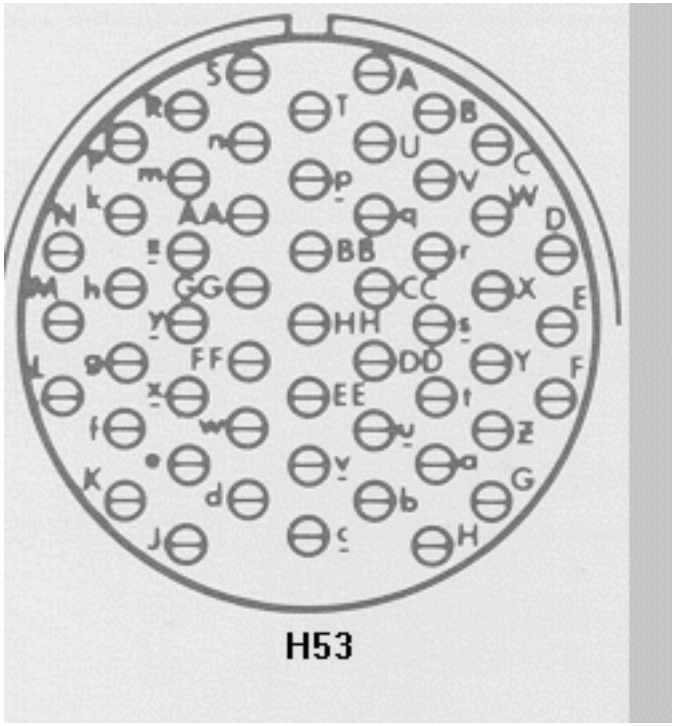
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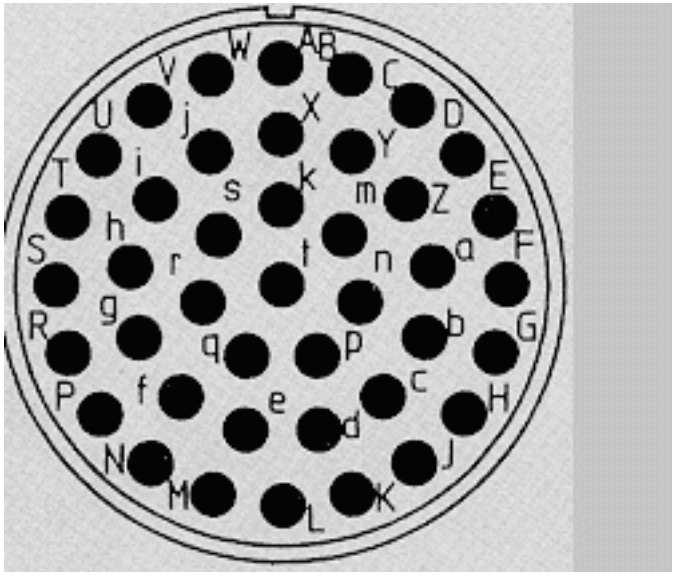

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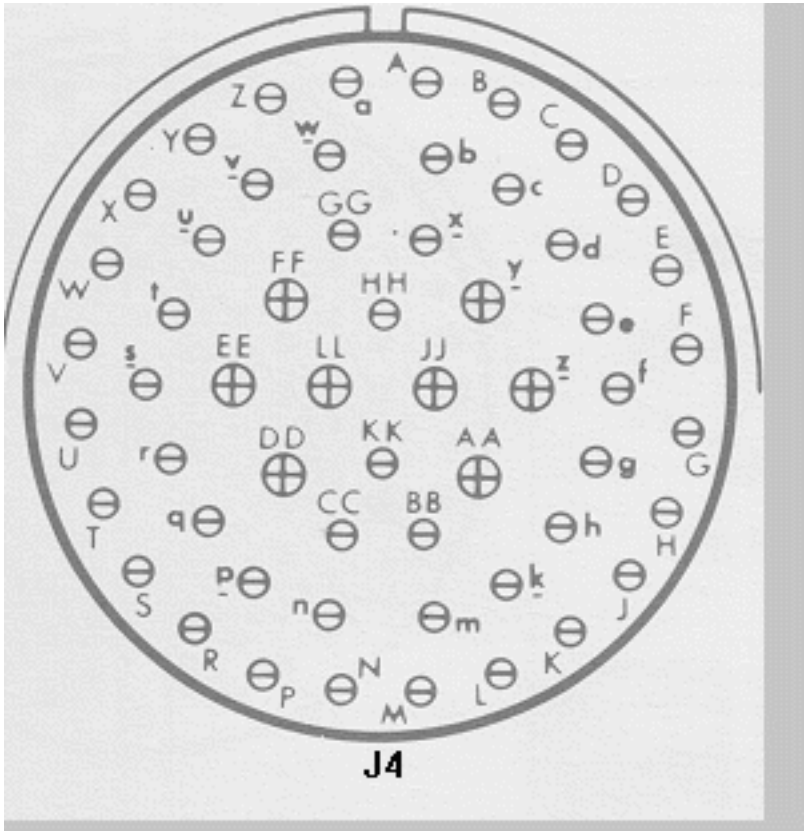
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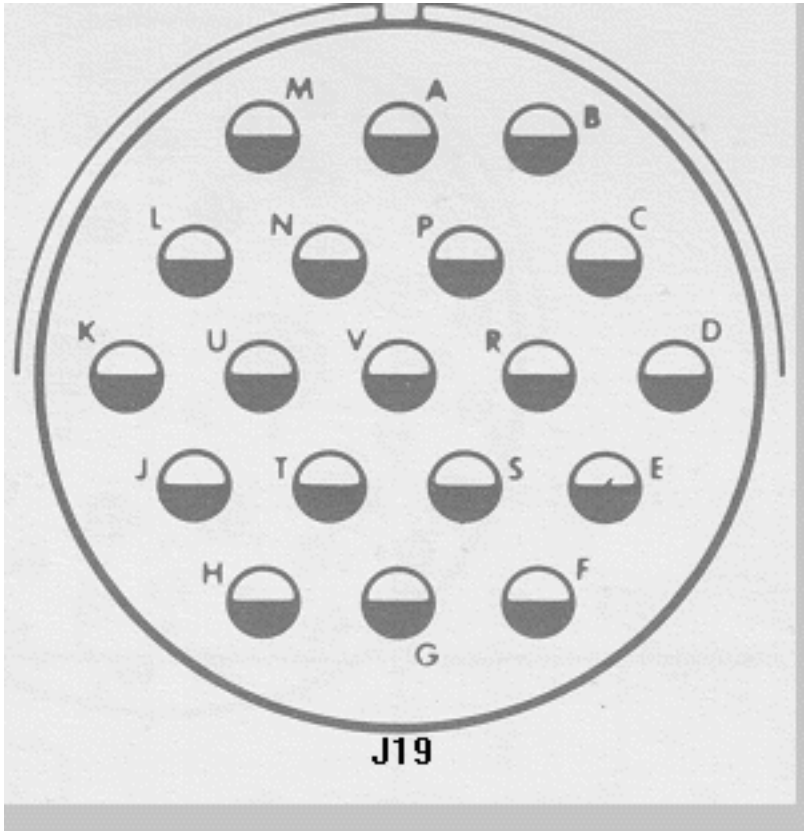
J4



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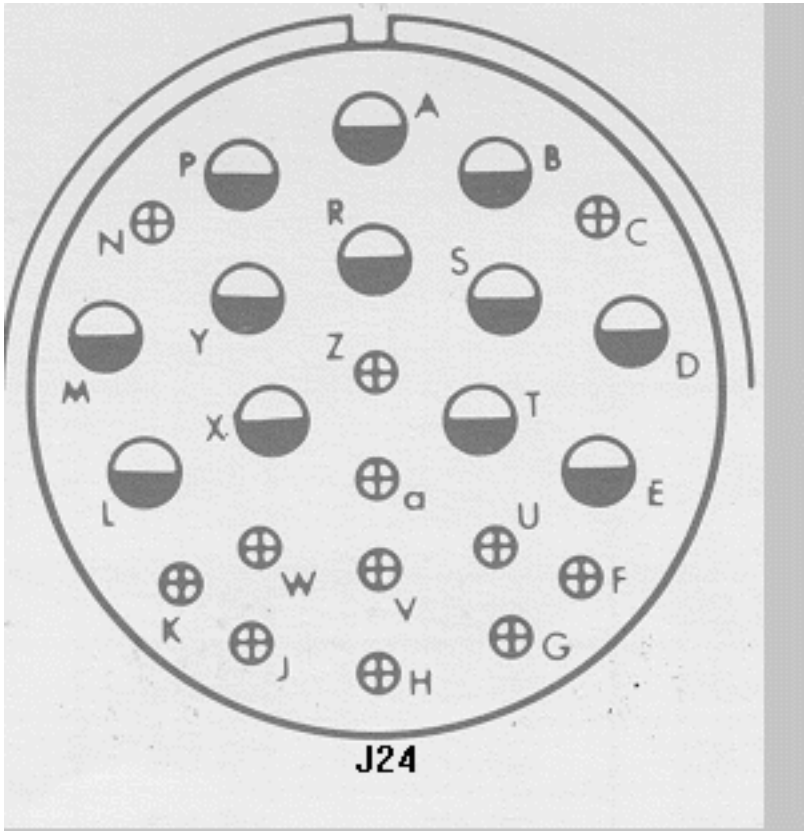

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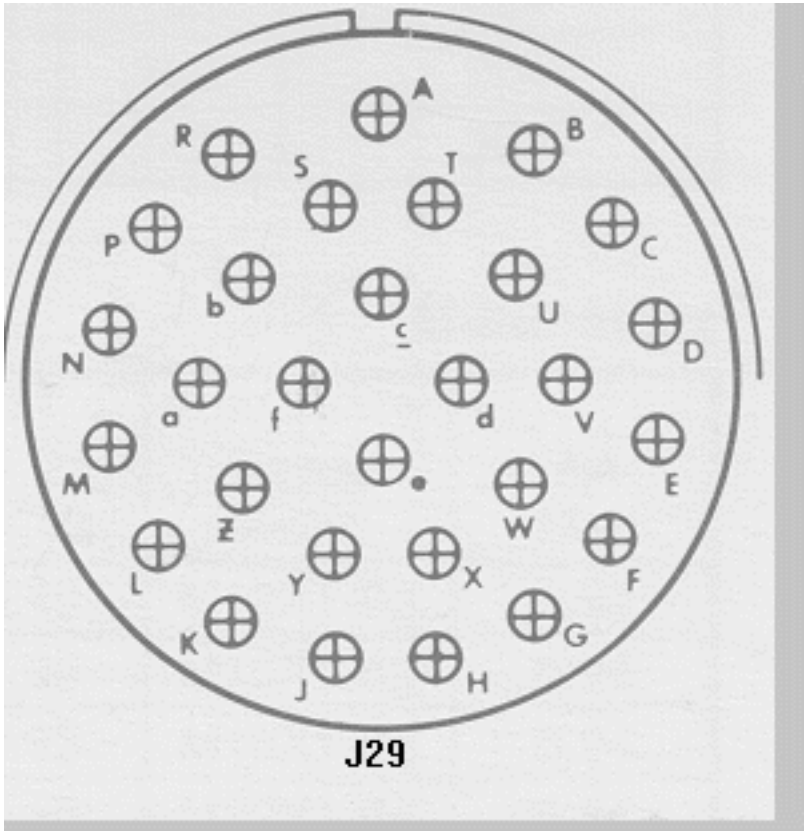

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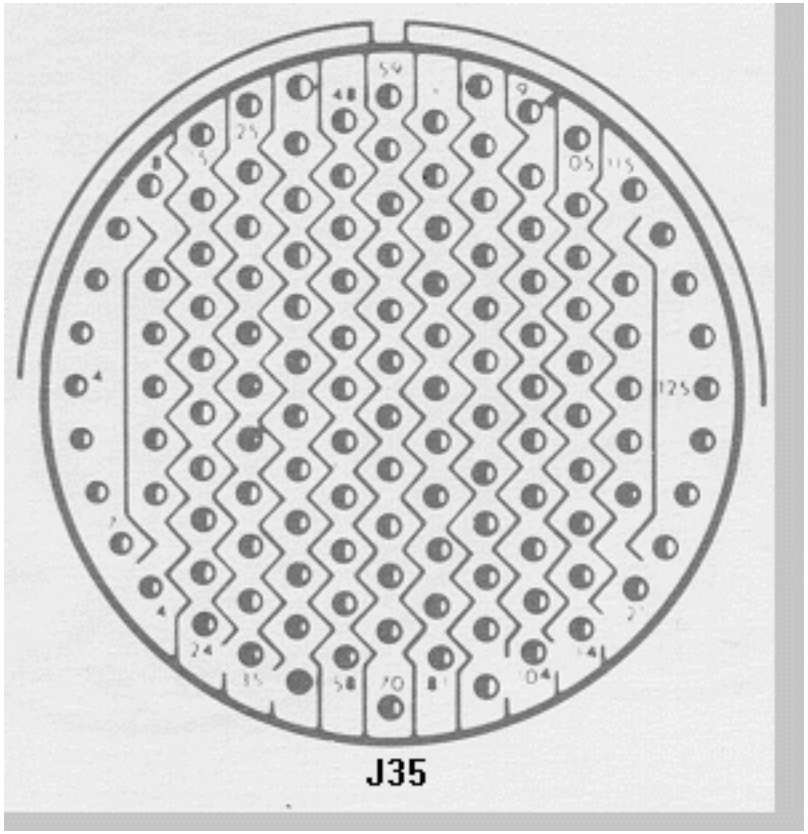
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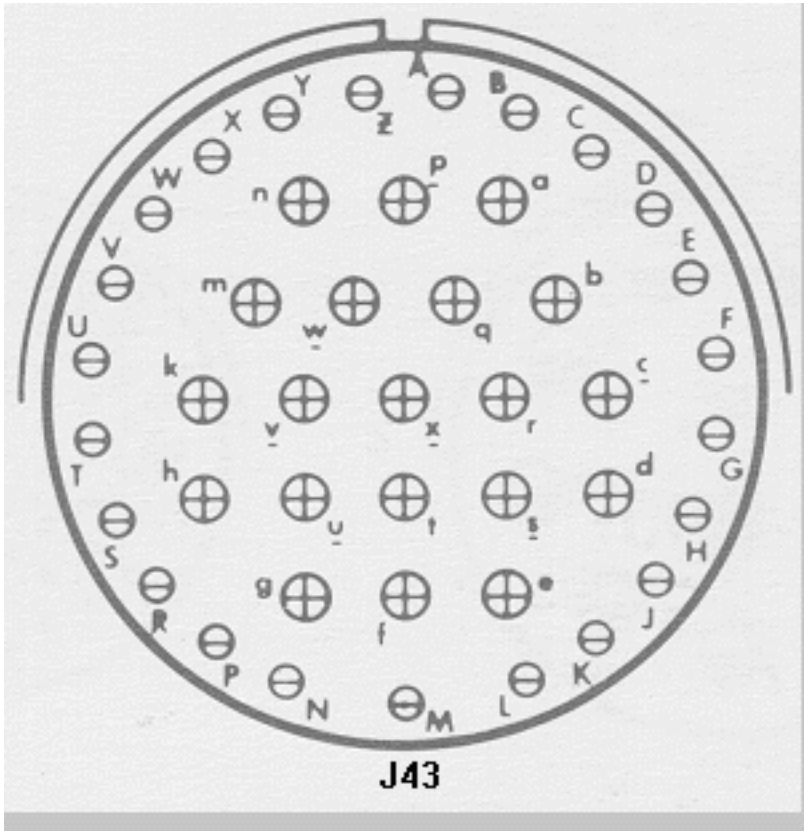

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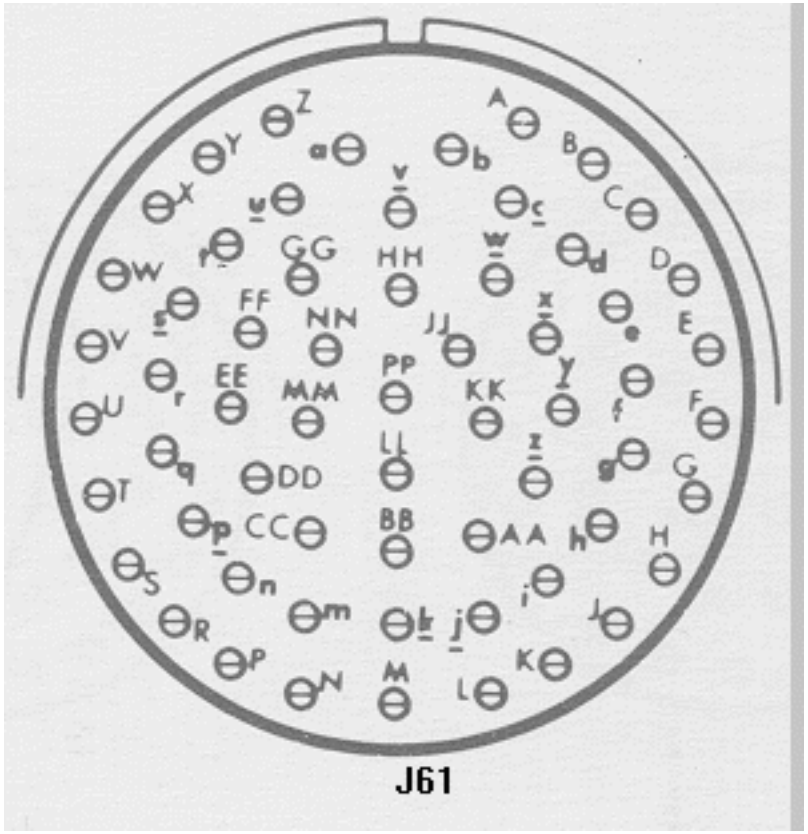

MIL-DTL-38999 Circular Connector Manufacturer Listing

And Links to Manufacturer Homepages

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

Aero Electric Connector, Inc.

16207 Carmenita Rd

Cerritos, CA 90701

Cage Code: 59976
Tel.: 310-404-8005
Amphenol Aerospace - Amphenol Connectors (Formerly Bendix)
40-60 Deleware Avenue
Sidney, NY 13838
Cage Code: 77820
Tel.: 607-563-5011
Amphenol Aerospace - Pyle National Connectors
40-60 Deleware Avenue
Sidney, NY 13838
Cage Code: 77820
Tel.: 607-563-5011
Deutsch Engineered Connecting Devices
36033 Whittier Avenue
Hemet, CA 92545
Cage Code: 11139
Tel.: 909-765-2200
Framatome Connectors France
145 Rue Yves Le Coz
F78035 Versailles, Cedex, France
Cage Code: F0225
Tel.: 011-33-1-39-49-21-83
G H Technology, Inc. (Aerospace Products Division)
750 West Ventura Blvd
Camarillo, CA 93010
Cage Code: 0D0V6
Tel.: 805-484-0543
Hermetic Seal Corporation
4232 Temple City BLlvd
Rosemead, CA 91770-1552
Cage Code: 04820
Tel.: 626-443-8931
ITT Cannon
666 East Dyer Rd
Santa Ana, CA 92705
Cage Code: 71468
Tel.: 714-557-4700
Sealtron, Inc.
9705 Reading Rd
CincinnatiI, OH 45215-3592

D-Subminiature Connectors

The following D-subminiature connector types are available for selection:

Type Designation	Description	Specification
311P409 M24308	D-Subminiature Type, Removable Crimp Contacts, Low Residual Magnetism	GSFC S-311-P-4/09 MIL-DTL-24308
311P407 M24308	D-Subminiature Type, High Density, Removable Crimp Contacts, Low Residual Magnetism	GSFC S-311-P-4/07 MIL-DTL-24308
311P10 311P405 M24308	D-Subminiature Type, Solder and Crimp Removable Contacts, Low Residual Magnetism, Standard Power, Coaxial, High Voltage and Combination Inserts	GSFC S-311-P-10 GSFC S-311-P-4/05 MIL-D

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Radiation
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Publications
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Calendar
|
Experts
Admin Login
|
Request Account
|
Feedback
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Site Map
|
Help
|
Search
NEPP Program Manager:
Chuck Barnes, Jet Propulsion Laboratory
Responsible NASA Official:
Michael Sampson, NEPAG Manager
Website Comments:
Web Development Team
Last Modified:

August 8, 2001
AETD IT Security Banner
NASA Privacy Statement
GSFC S-311-P-10, S-311-P-4/05 and MIL-DTL-24308
D-Subminiature Connectors
Click Here for List of Available Standard Density Connectors with Size 20 Solder Contacts
Click Here for List of Available Connectors with Combination Power Coaxial and High Voltage Contacts
Important! Application Notes
Available Sources
GSFC S-311-P-10 Part Number Explanation
GSFC S-311-P-4/05 Part Number Explanation
MIL-DTL-24308 Part Number Explanation
Revision History for NASA Parts Selection List for This Section
Last Updated 02/29/00

GSFC S-311-P-4/05 and S-311-P-10 Combination D-Subminiature Connectors

APPLICATION NOTES

For S-311-P-10 connectors, normal mounting hole diameter is 0.120". To specify a larger mounting hole diameter of 0.150", replace the "-12" in the part number with "-15". See

part number explanation

for details.

Hardware such as screwlocks, jackscrews, and jackposts are required to properly secure mated connector pairs and must be provided separately. Non-magnetic hardware is recommended to maintain controlled residual magnetism.

Connectors satisfy GSFC outgassing requirements of 1% Total Mass Loss (TML) and 0.1% Collected Volatile Condensable Material (CVCM).

Coaxial contacts should be used for signals of 1 GHz frequency or less. Use MIL-C-39012 connectors for higher frequencies.

Some suppliers use a nylon insulator material in their high voltage contacts. The nylon insulator may not meet program outgassing limits.

Coaxial, high voltage and crimp standard power contacts must be supplied separately. Coaxial and high voltage contact part numbers are procured per GSFC S-311-P-4/06. For crimp type standard power contacts (used with S-311-P-4/05 only), procure P/N G10S1 for socket contacts and G10P1 for pin contacts per GSFC specification S-311-P-4/10.

For S-311-P-10 connectors "C" level residual magnetism (20 Gamma) is available in lieu of "B" level (200 Gamma).

Revision History for NASA Parts Selection List for

S-311-P-10, S-311-P-4/05 and MIL-DTL-24308

02/29/00	Changed spec reference to MIL-DTL or MIL-PRF as appropriate
03/09/98	Completely revamped the application notes table (changed recommendation for using coaxial contacts to 1 GHz or less instead of 1 MHz or less, removed application notes which were not pertinent to this
01/06/98	Added S-311-P-4/05 Part Number Explanation
12/09/97	Initial Release of S-311-P-10, S-311-P-4/05 and MIL-C-24308 Section in the NPSL

GSFC S-311-P-10 D-Subminiature Connectors

Part Number Ordering Information:

311P10	(B)	-X	X	-X	-XX
GSFC Specification Number	Socket Contact Designator	Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size

Socket Contact Designator	Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size
(Not Applicable to Pin Contacts)	1 thru 25	P = Pins	B = 200 Gamma	12 = 0.120 inches
No Digit = Contact Springs		S = Sockets	C = 20 Gamma	15 = 0.150 inches
B = Split Finger Sleeved (First Choice)	Note: Insert Arrangement 19 has been Cancelled			

Click Here for Available Parts Listing

GSFC S-311-P-4/05 D-Subminiature Connectors

Combination Power, Coaxial and High Voltage Contacts

Part Number Ordering Information:

311P4	05	-X	X	-X	-XX
GSFC Specification Number	Detail Specification Sheet	Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size

Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size
6 thru 25	P = Pins	B = 200 Gamma	12 = 0.120 inches
	S = Sockets		15= 0.150 inches
Note: Insert Arrangement 19 has been Cancelled			

Click Here for Available Parts Listing

MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts, -55deg.C to +125deg.C

Part Number Ordering Information:

M24308	/X	-XXX
Military Specification Number	Detail Specification Sheet	Unique Dash Number Defining Connector Options

Detail Specification Sheet	Description
/1	Receptacle, Nickel Plated, Solder Contacts
/2	Receptacle, Nickel Plated, Crimp Contacts
/3	Plug, Nickel Plated, Solder Contacts
/4	Plug, Nickel Plated, Crimp Contacts
/5	Receptacle, Gold Plated, Solder Contacts
/6	Receptacle, Gold Plated, Solder Contacts
/7	Plug, Gold Plated, Solder Contacts
/8	Plug, Gold Plated, Crimp Contacts

Click Here for Available Parts Listing

GSFC S-311-P-10 and MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts

Receptacles, Socket Contacts

Plugs, Pin Contacts

Receptacles, Socket Contacts

Description	Non-Magnetic Controlled Low Residual Magnetism		General Purpose		Non-Magnetic
Shell Finish	Gold		Nickel		Gold
Grade	Level 1 and 2		Level 2		Level 2

Specification	GSFC S-311-P-10		MIL-DTL-24308/1		MIL-PRF-24308/5
Number of Contacts	Part Number		Part Number		Part Number
9	311P10-1S-B-12		M24308/1-34		M24308/5-34
15	311P10-2S-B-12		M24308/1-35		M24308/5-35
25	311P10-3S-B-12		M24308/1-36		M24308/5-36
37	311P10-4S-B-12		M24308/1-37		M24308/5-37
50	311P10-5S-B-12		M24308/1-38		M24308/5-38
9	-		M24308/1-56 (float mount)		M24308/5-56 (float mount)
15	-		M24308/1-57 (float mount)		M24308/5-57 (float mount)
25	-		M24308/1-58 (float mount)		M24308/5-58 (float mount)
37	-		M24308/1-59 (float mount)		M24308/5-59 (float mount)
50	-		M24308/1-60 (float mount)		M24308/5-60 (float mount)

Plugs, Pin Contacts

Description	Non-Magnetic Controlled Low Residual Magnetism		General Purpose		Non-Magnetic
Shell Finish	Gold		Nickel		Gold
Grade	Level 1 and 2		Level 2		Level 2
Specification	GSFC S-311-P-10		MIL-PRF-24308/3		MIL-PRF-24308/7
Number of Contacts	Part Number		Part Number		Part Number
9	311P10-1P-B-12		M24308/3-23		M24308/7-23
15	311P10-2P-B-12		M24308/3-24		M24308/7-24
25	311P10-3P-B-12		M24308/3-25		M24308/7-25
37	311P10-4P-B-12		M24308/3-26		M24308/7-26
50	311P10-5P-B-12		M24308/3-27		M24308/7-27
9	-		M24308/3-39 (float mount)		M24308/7-34 (float mount)
15	-		M24308/3-40 (float mount)		M24308/7-35 (float mount)
25	-		M24308/3-41 (float mount)		M24308/7-36 (float mount)
37	-		M24308/3-42 (float mount)		M24308/7-37 (float mount)
50	-		M24308/3-43 (float mount)		M24308/7-38 (float mount)

GSFC S-311-P-10 and S-311-P-4/05 D-Subminiature Connectors

Combination Power, Coaxial and High Voltage Contacts

Receptacles, Socket Contacts

Plugs, Pin Contacts

Receptacles, Socket Contacts

S-311-P-10	S-311-P-4/05			Number of Contacts
Part Number	Part Number	Generic Insert Arrangement Designator	Size 20 Standard Power	Coaxial and/or High Voltage
311P10-6S-B-12	311P405-6S-B-12	5W1	4	1
311P10-7S-B-12	311P405-7S-B-12	3W3	0	3
311P10-8S-B-12	311P405-8S-B-12	7W2	5	2
311P10-9S-B-12	311P405-9S-B-12	11W1	10	1

311P10-10S-B-12	311P405-10S-B-12	5W5	0	5
311P10-11S-B-12	311P405-11S-B-12	9W4	5	4
311P10-12S-B-12	311P405-12S-B-12	13W3	10	3
311P10-13S-B-12	311P405-13S-B-12	17W2	15	2
311P10-14S-B-12	311P405-14S-B-12	21W1	20	1
311P10-15S-B-12	311P405-15S-B-12	8W8	0	8
311P10-16S-B-12	311P405-16S-B-12	13W6	7	6
311P10-17S-B-12	311P405-17S-B-12	17W5	12	5
311P10-18S-B-12	311P405-18S-B-12	21WA4	17	4
311P10-20S-B-12	311P405-20S-B-12	25W3	22	3
311P10-21S-B-12	311P405-21S-B-12	27W2	25	2
311P10-22S-B-12	311P405-22S-B-12	24W7	17	7
311P10-23S-B-12	311P405-23S-B-12	36W4	32	4
311P10-24S-B-12	311P405-24S-B-12	43W2	41	2
311P10-25S-B-12	311P405-25S-B-12	47W1	46	1

Plugs, Pin Contacts

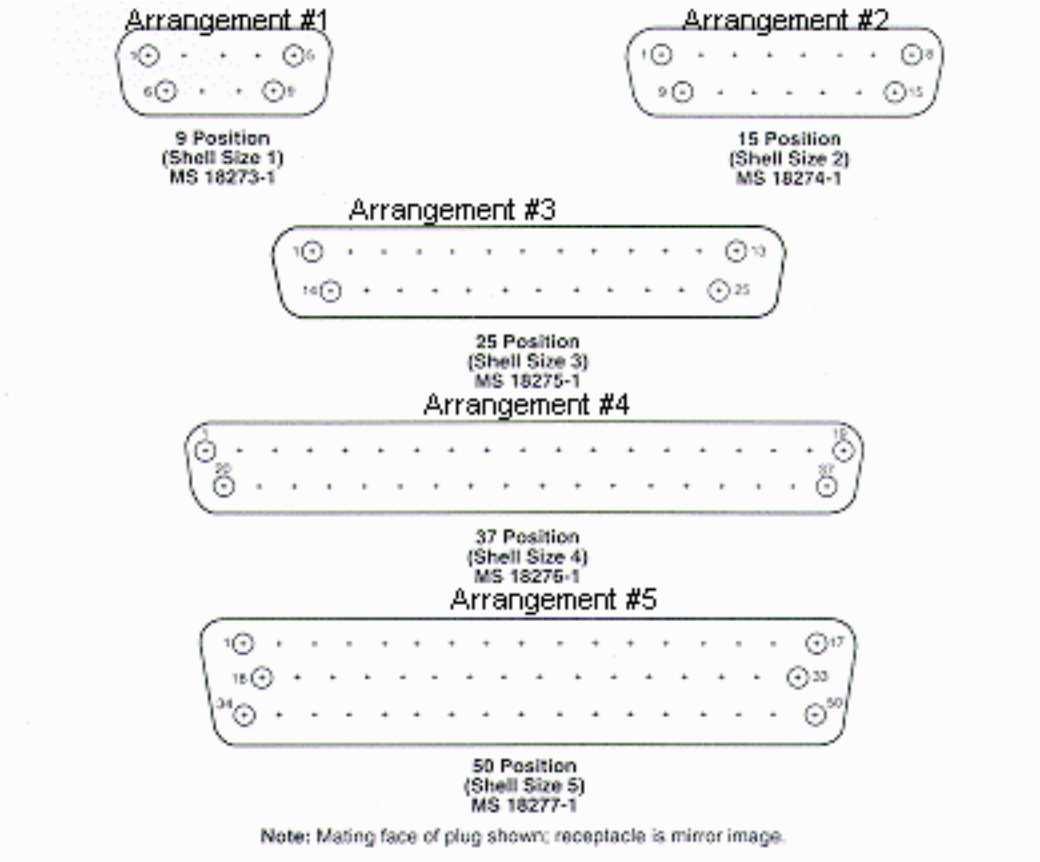
S-311-P-10	S-311-P-4/05			Number of Contacts
Part Number	Part Number	Generic Insert Arrangement Designator	Size 20 Standard Power	Coaxial and/or High Voltage
311P10-6P-B-12	311P405-6P-B-12	5W1	4	1
311P10-7P-B-12	311P405-7P-B-12	3W3	0	3
311P10-8P-B-12	311P405-8P-B-12	7W2	5	2
311P10-9P-B-12	311P405-9P-B-12	11W1	10	1
311P10-10P-B-12	311P405-10P-B-12	5W5	0	5
311P10-11P-B-12	311P405-11P-B-12	9W4	5	4
311P10-12P-B-12	311P405-12P-B-12	13W3	10	3
311P10-13P-B-12	311P405-13P-B-12	17W2	15	2
311P10-14P-B-12	311P405-14P-B-12	21W1	20	1
311P10-15P-B-12	311P405-15P-B-12	8W8	0	8
311P10-16P-B-12	311P405-16P-B-12	13W6	7	6
311P10-17P-B-12	311P405-17P-B-12	17W5	12	5
311P10-18P-B-12	311P405-18P-B-12	21WA4	17	4
311P10-20P-B-12	311P405-20P-B-12	25W3	22	3
311P10-21P-B-12	311P405-21P-B-12	27W2	25	2
311P10-22P-B-12	311P405-22P-B-12	24W7	17	7
311P10-23P-B-12	311P405-23P-B-12	36W4	32	4
311P10-24P-B-12	311P405-24P-B-12	43W2	41	2
311P10-25P-B-12	311P405-25P-B-12	47W1	46	1

GSFC S-311-P-10 and MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts

Insert Arrangements

Plug Face is Shown. Mating Socket Face is Mirror Image.

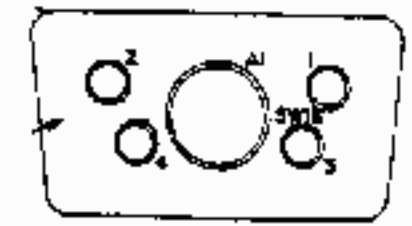


GSFC S-311-P-10 and S-311-P-4/05 D-Subminiature Connectors

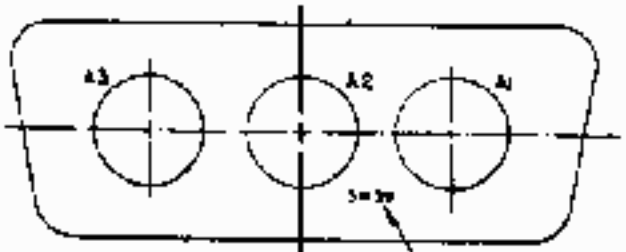
Combination Power, Coaxial and High Voltage Contacts

Insert Arrangements

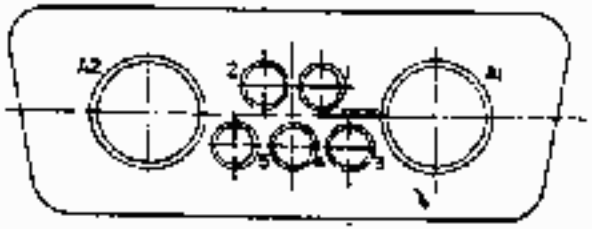
Socket Face is Shown. Mating Plug Face is Mirror Image.



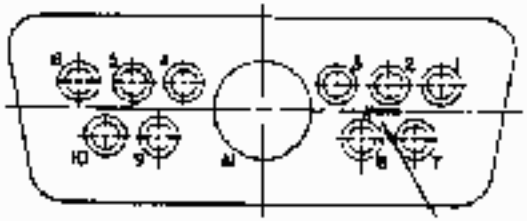
Arrangement #6 (5W1)



Arrangement #7 (3W3)

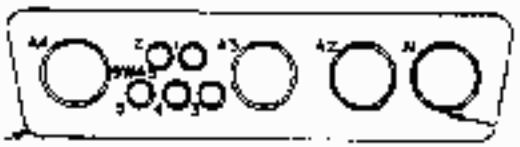


Arrangement #8 (7W2)

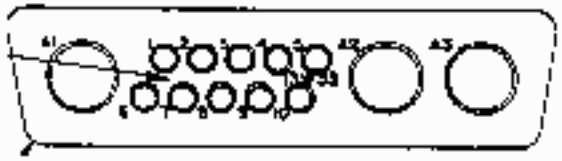


Arrangement #9 (11W1)

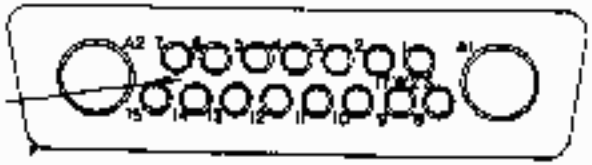
Arrangement #10 (5W5)



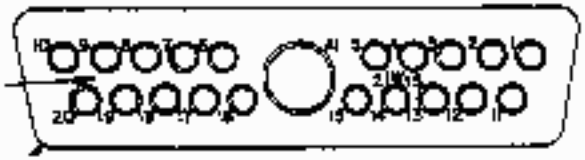
Arrangement #11 (9W4)



Arrangement #12 (13W3)

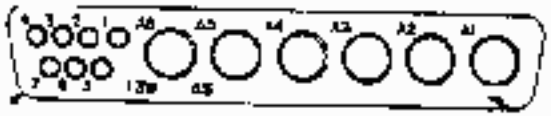


Arrangement #13 (17W2)

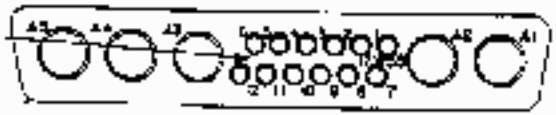


Arrangement #14 (21W1)

Arrangement #15 (8W8)

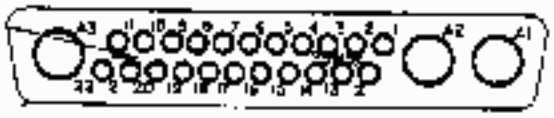


Arrangement #16 (13W6)



Arrangement #17 (17W5)

Arrangement #18 (21WA4)



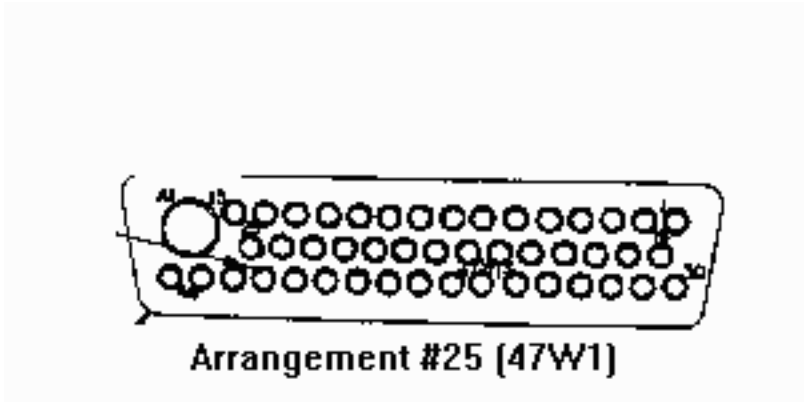
Arrangement #20 (25W3)

Arrangement #21 (27W2)

Arrangement #22 (24W7)

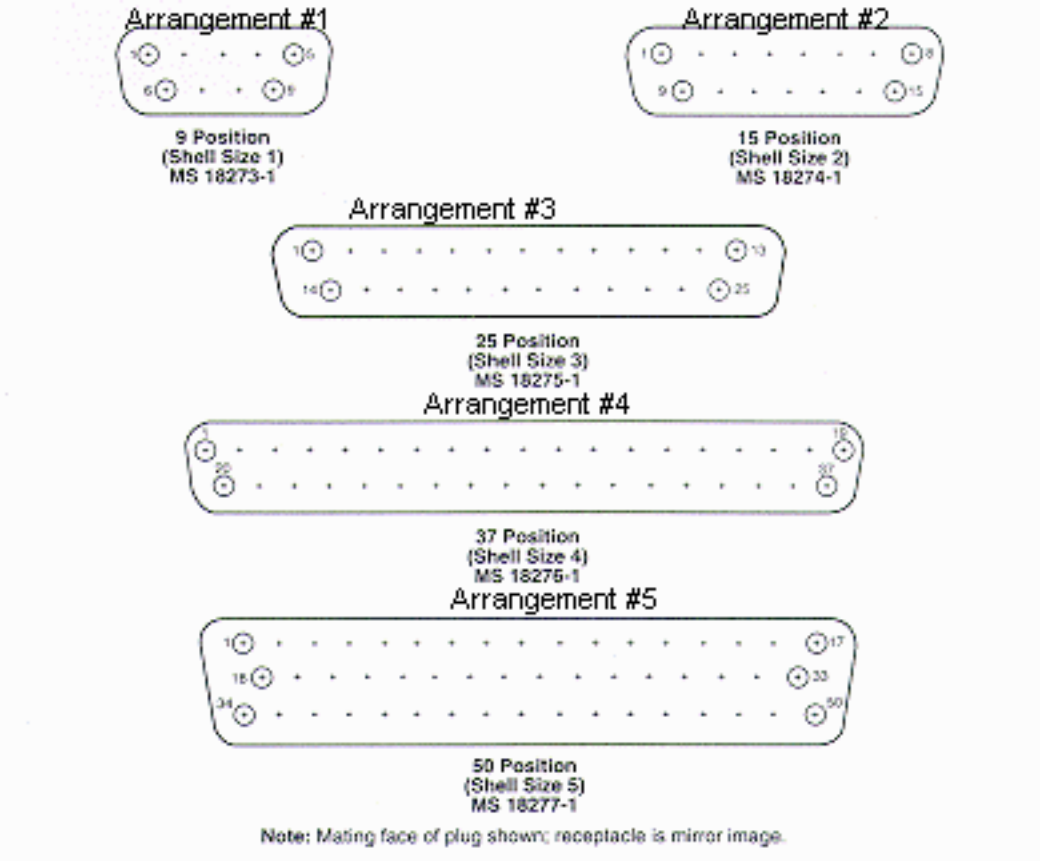
Arrangement #23 (36W4)

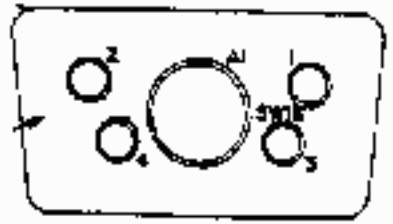
Arrangement #24 (43W2)



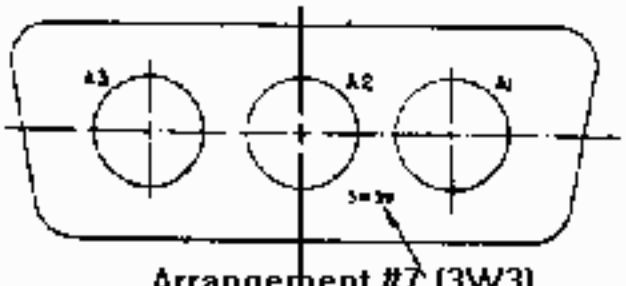
Insert Arrangements

Socket Face is Shown. Mating Plug Face is Mirror Image.

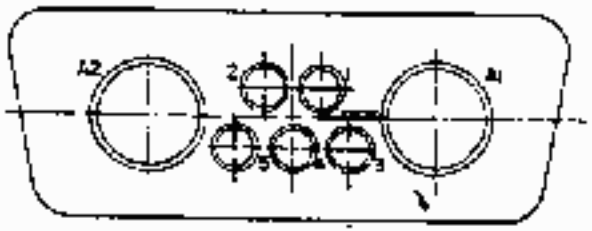




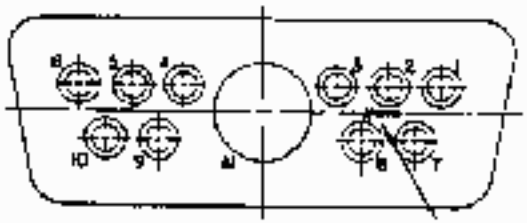
Arrangement #6 (5W1)



Arrangement #7 (3W3)

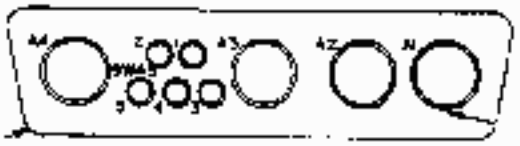


Arrangement #8 (7W2)

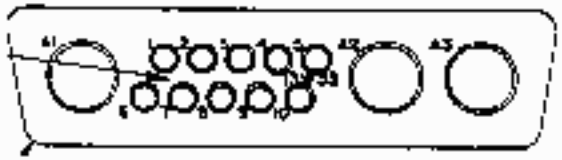


Arrangement #9 (11W1)

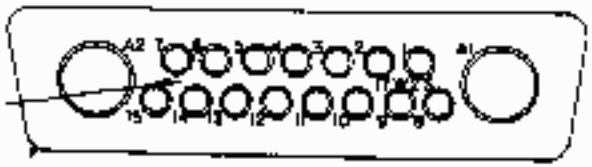
Arrangement #10 (5W5)



Arrangement #11 (9W4)



Arrangement #12 (13W3)



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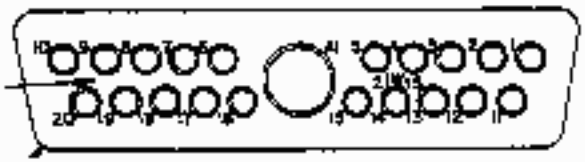
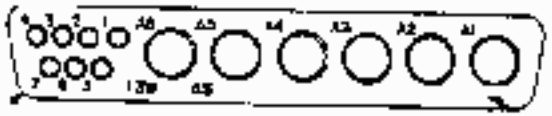
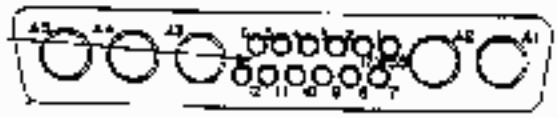


Arrangement #14 (21W1)

Arrangement #15 (8W8)

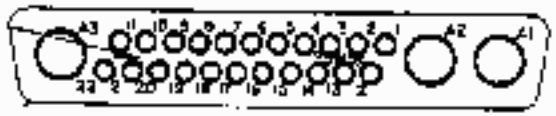


Arrangement #16 (13W6)



Arrangement #17 (17W5)

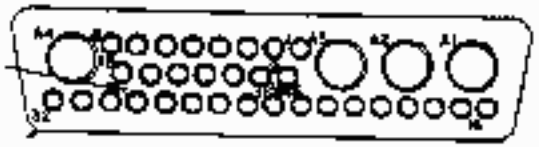
Arrangement #18 (21WA4)



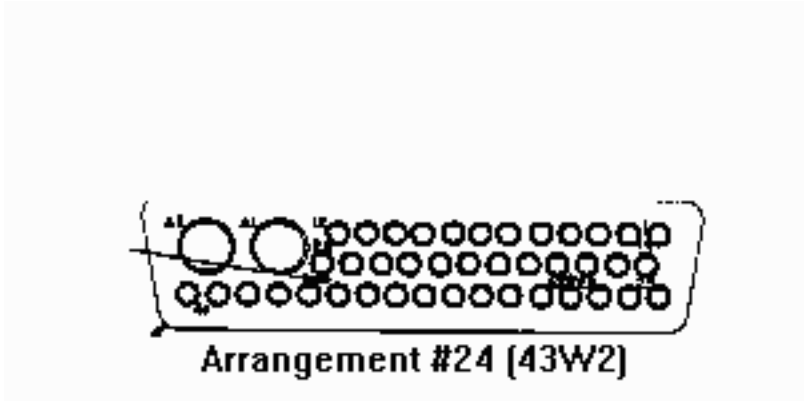
Arrangement #20 (25W3)

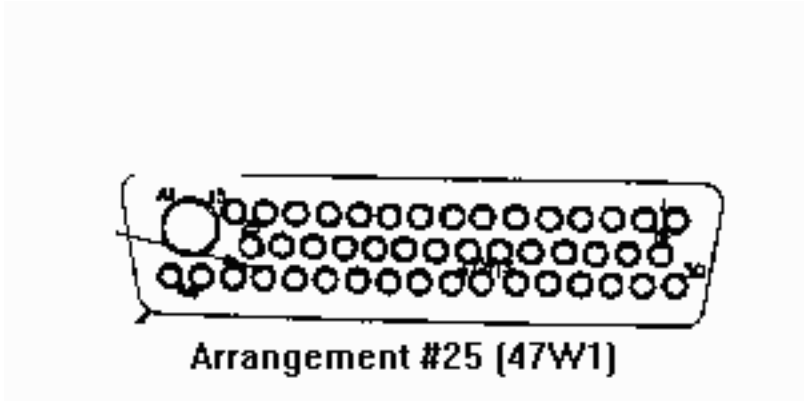
Arrangement #21 (27W2)

Arrangement #22 (24W7)



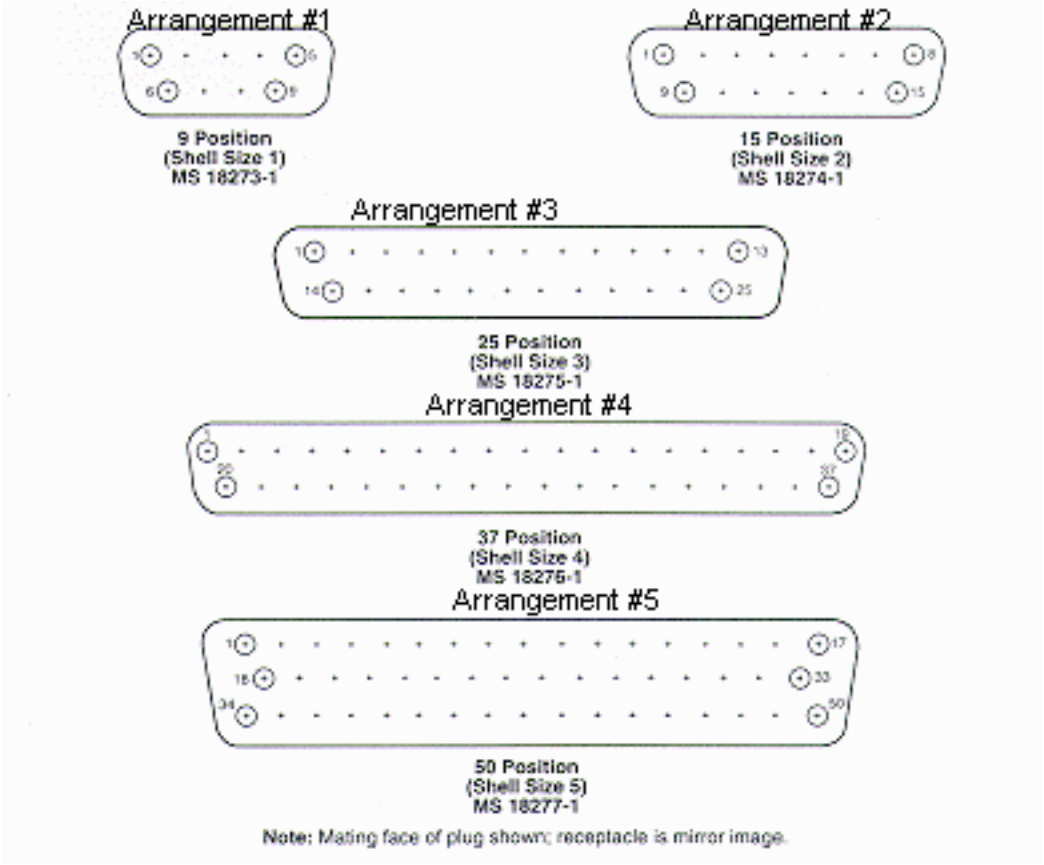
Arrangement #23 (36W4)

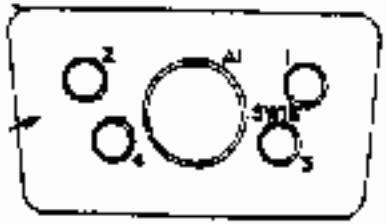




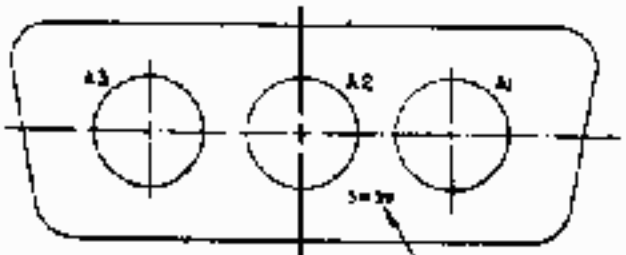
Insert Arrangements

Socket Face is Shown. Mating Plug Face is Mirror Image.

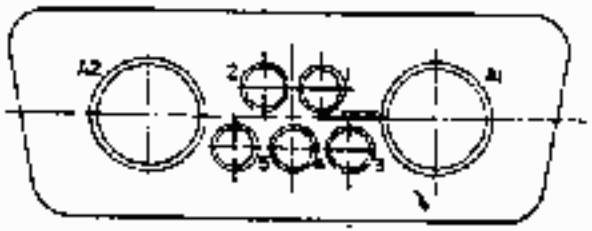




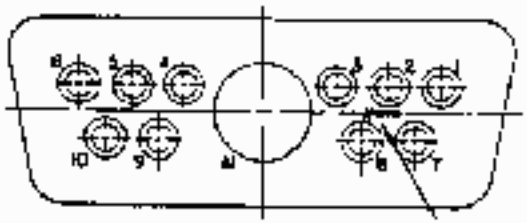
Arrangement #6 (5W1)



Arrangement #7 (3W3)

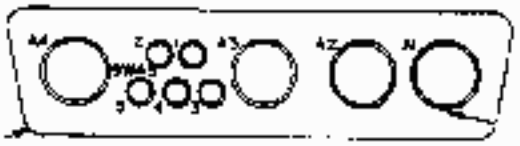


Arrangement #8 (7W2)

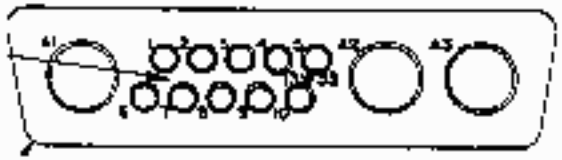


Arrangement #9 (11W1)

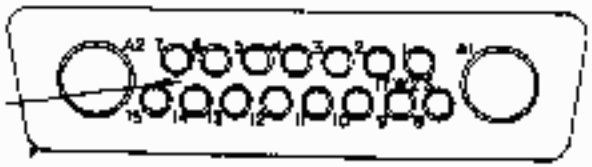
Arrangement #10 (5W5)



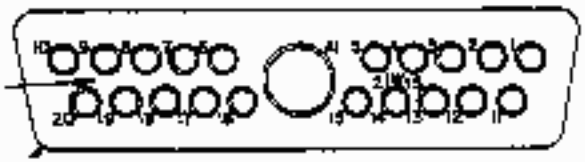
Arrangement #11 (9W4)



Arrangement #12 (13W3)

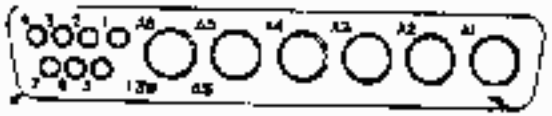


Arrangement #13 (17W2)

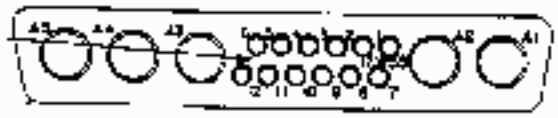


Arrangement #14 (21W1)

Arrangement #15 (8W8)

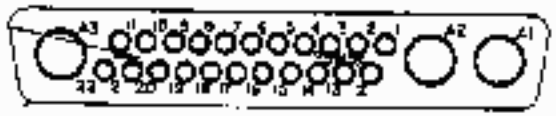


Arrangement #16 (13W6)



Arrangement #17 (17W5)

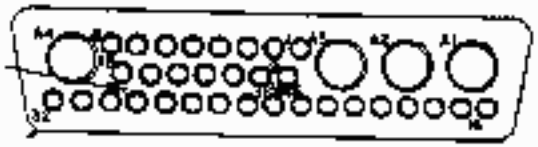
Arrangement #18 (21WA4)



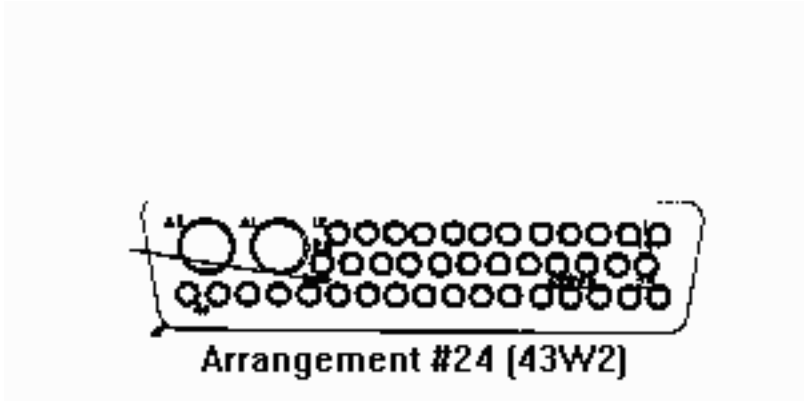
Arrangement #20 (25W3)

Arrangement #21 (27W2)

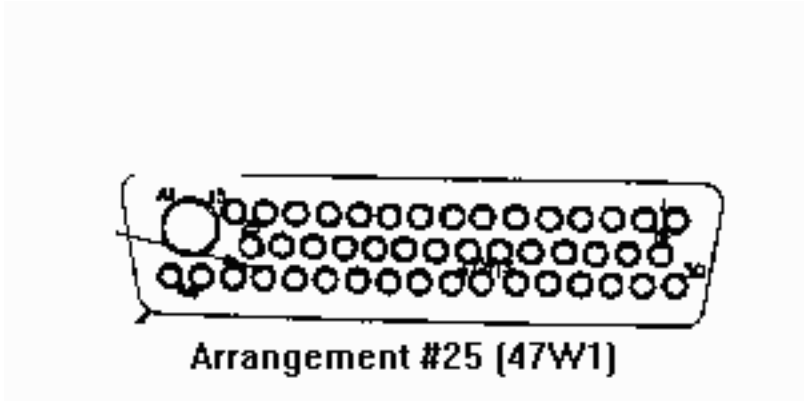
Arrangement #22 (24W7)



Arrangement #23 (36W4)



Arrangement #24 (43W2)



Arrangement #25 (47W1)

S-311-P-10, S-311-P-4/05 and MIL-DTL-24308 D-Subminiature Connector Manufacturer Listing

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

AMP INC.

EISENHOWER BLVD / MS210-20

HARRISBURG, PA 17105-2608

Cage Code: 00779

Tel.: 717-564-0100

ITT CANNON

666 EAST DYER RD

SANTA ANA, CA 92705

Cage Code: 71468

Tel.: 714-557-4700

POSITRONIC INDUSTRIES INC.

429 N. CAMPBELL STREET

SPRINGFIELD, MO 65801-8247

Cage Code: 28198

Tel.: 417-866-2322

SOURIAU ET CIE (FRANCE)

3 AVENUE DU MARECHAL DEVAUX

91550 PARAY VIELLE-POSTE, FRANCE

Cage Code: F0225

Parent Organization: FRAMATOME CONNECTORS INTERNATIONAL

Tel.: 011-33-1-46-87-23-23

GSFC S-311-P-4/07 and MIL-DTL-24308 D-Subminiature Connectors

High Density Size 22D Crimp Contacts, -55deg.C to +125deg.C

Click Here for List of Available Parts

Important! Application Notes

Available Sources

GSFC S-311-P-4/07 Part Number Explanation

MIL-DTL-24308 Part Number Explanation

Revision History for NASA Parts Selection List for This Section

Last Updated: 09/19/01

GSFC S-311-P-4/07 and MIL-DTL-24308 D-Subminiature Connectors

High Density Size 22D Crimp Contacts, -55deg.C to +125deg.C

APPLICATION NOTES

MIL-DTL-24308 connectors are supplied with 0.120" mounting holes or 0.086" float mount bushings.

For S-311-P-4/07 connectors, normal mounting hole diameter is 0.120". To specify a larger mounting hole diameter of 0.150", replace the "-12" in the part number with "-15". See

part number explanation

for details.

Hardware such as screwlocks, jackscrews, and jackposts are required to properly secure mated connector pairs and must be provided separately.

Connectors satisfy GSFC outgassing requirements of 1% Total Mass Loss (TML) and 0.1% Collected Volatile Condensable Material (CVCM).

MIL-DTL-24308 connectors are also available without contacts, with float mount bushings or as kits. Many of these part numbers are not preferred because they are cadmium plated. The preferred part numbers for the various contacts are listed herein.

MIL-DTL-24308 connectors are supplied with contacts. Replacement contact part numbers are M39029/57-354 for sockets and M39029/58-360 for pins.

GSFC connectors are supplied WITHOUT contacts. Procure P/N G08S1 for socket contacts and G08P1 for pin contacts per GSFC specification S-311-P-4/08. Contacts are non-magnetic and do not contain color band marking.

Revision History for NASA Parts Selection List for GSFC S-311-P-4/7

09/19/01	Corrected image for insert arrangements for high density 311P407 type connectors (insert arrangments were misnumbered).
02/29/00	Changed spec references from MIL-C-24308 to MIL-DTL-24308 or MIL-PRF-24308 as appropriate
03/09/98	Corrected Manufacturer Listing to Include only Amp, Positronic and Souriau
12/09/97	Initial Release on GSFC S-311-P-4/7 Section in the NPSL

GSFC S-311-P-4/07 D-Subminiature Connectors

High Density Size 22D Crimp Contacts, -55deg.C to +125deg.C

Part Number Ordering Information:

311P4	07	-X	X	-X	-XX
GSFC Specification Number	Detail Specification Sheet	Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size

Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size
1	P = Pins	B = 200 Gamma	12 = 0.120 inches
2	S = Sockets		15= 0.150 inches
3			
4			
5			
6			

Click Here for Available Parts Listing

MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts, -55deg.C to +125deg.C

Part Number Ordering Information:

M24308	/X	-XXX
Military Specification Number	Detail Specification Sheet	Unique Dash Number Defining Connector Options

Detail Specification Sheet	Description
/1	Receptacle, Nickel Plated, Solder Contacts
/2	Receptacle, Nickel Plated, Crimp Contacts
/3	Plug, Nickel Plated, Solder Contacts
/4	Plug, Nickel Plated, Crimp Contacts
/5	Receptacle, Gold Plated, Solder Contacts
/6	Receptacle, Gold Plated, Solder Contacts
/7	Plug, Gold Plated, Solder Contacts
/8	Plug, Gold Plated, Crimp Contacts

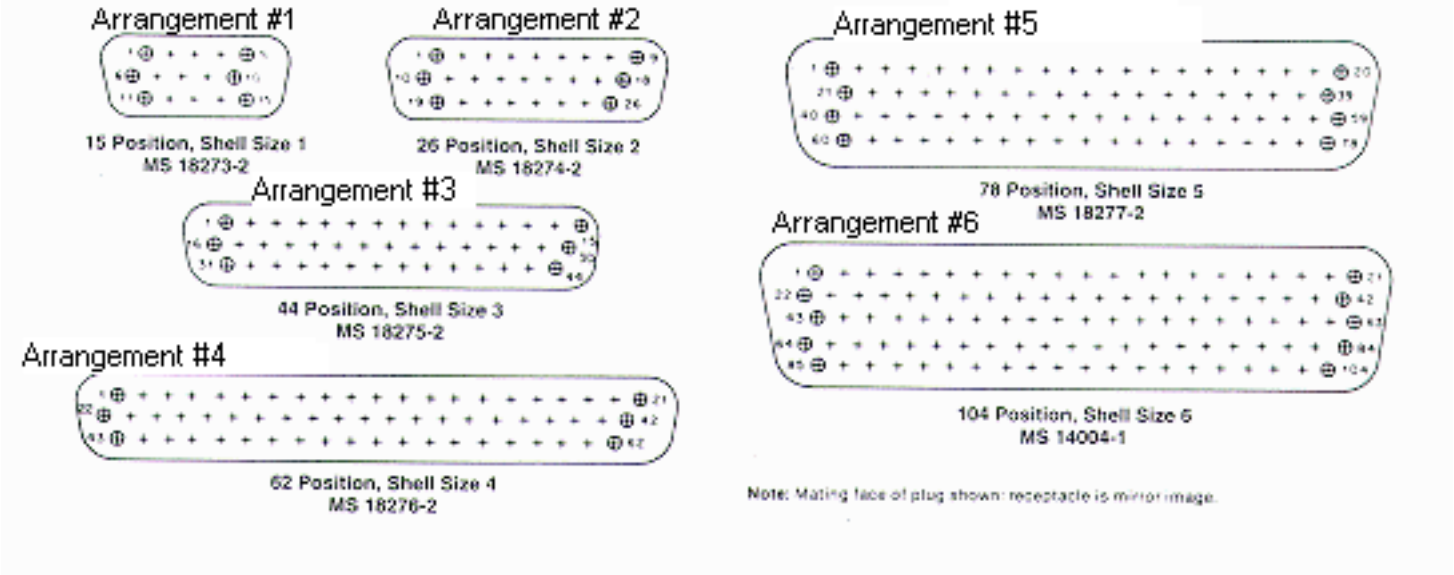
Click Here for Available Parts Listing

GSFC S-311-P-4/07 and MIL-DTL-24308 D-Subminiature Connectors

High Density Size 22D Crimp Contacts

Insert Arrangements

Mating Face of Plug is Shown. Mating Face of Receptacle is Mirror Image



GSFC S-311-P-4/07 and MIL-DTL-24308 D-Subminiature Connectors

High Density Size 22D Crimp Contacts

Receptacles, Socket Contacts

Plugs, Pin Contacts

Receptacles, Socket Contacts

Description	Non-Magnetic Controlled Low Residual Magnetism

General Purpose

Non-Magnetic

Shell Finish

Gold

Nickel

Gold

Grade

Level 1 and 2

Level 2

Level 2

Specification

GSFC S-311-P-4/07

MIL-DTL-24308/2

MIL-PRF-24308/6

Number of Contacts

Part Number

Part Number

Part Number

15

311P407-1S-B-12

M24308/2-526

M24308/6-512

26

311P407-2S-B-12

M24308/2-527

M24308/6-513

44

311P407-3S-B-12

M24308/2-528

M24308/6-514

62

311P407-4S-B-12

M24308/2-529

M24308/6-515

78

311P407-5S-B-12

M24308/2-530

M24308/6-516

104

311P407-6S-B-12

M24308/2-531

M24308/6-517

15

-

M24308/2-532 (kit)

M24308/6-518 (kit)

26

-

M24308/2-533 (kit)

M24308/6-519 (kit)

44

-

M24308/2-534 (kit)

M24308/6-520 (kit)

62

-

M24308/2-535 (kit)

M24308/6-521 (kit)

78

-

M24308/2-536 (kit)

M24308/6-522 (kit)

104

-

M24308/2-537 (kit)

M24308/6-523 (kit)

15

-

M24308/2-565 (w/o contacts)

M24308/6-545 (w/o contacts)

26

-

M24308/2-566 (w/o contacts)

M24308/6-546 (w/o contacts)

44

-

M24308/2-567 (w/o contacts)

M24308/6-547 (w/o contacts)

62

-

M24308/2-568 (w/o contacts)

M24308/6-548 (w/o contacts)

78

-

M24308/2-569 (w/o contacts)

M24308/6-549 (w/o contacts)

104

-

M24308/2-570 (w/o contacts)

M24308/6-550 (w/o contacts)

15

-

M24308/2-590 (float mount)

M24308/6-556 (float mount)

26

-

M24308/2-591 (float mount)

M24308/6-557 (float mount)

44

-

M24308/2-592 (float mount)

M24308/6-558 (float mount)

62

-

M24308/2-593 (float mount)

M24308/6-559 (float mount)

78

-

M24308/2-594 (float mount)

M24308/6-560 (float mount)

104

-

M24308/2-595 (float mount)

M24308/6-561 (float mount)

15

-

M24308/2-601 (float mount)

M24308/6-567 (float mount)

26

-

M24308/2-602 (float mount)

M24308/6-568 (float mount)

44

-

M24308/2-603 (float mount)

M24308/6-569 (float mount)

62

-

M24308/2-604 (float mount)

M24308/6-570 (float mount)

78

-

M24308/2-605 (float mount)

M24308/6-571 (float mount)

104

-

M24308/2-606 (float mount)

M24308/6-572 (float mount)

15

-

M24308/2-612 (float mount)

M24308/6-578 (float mount)

26

-

M24308/2-613 (float mount)

M24308/6-579 (float mount)

44

-

M24308/2-614 (float mount)

M24308/6-580 (float mount)

62

-

M24308/2-615 (float mount)

M24308/6-581 (float mount)

78

-

M24308/2-616 (float mount)

M24308/6-582 (float mount)

104

-

M24308/2-617 (float mount)

M24308/6-583 (float mount)

Plugs, Pin Contacts

Description	Non-Magnetic Controlled Low Residual Magnetism

General Purpose

Non-Magnetic

Shell Finish

Gold

Nickel

Gold

Grade

Level 1 and 2

Level 2

Level 2

Specification

GSFC S-311-P-4/07

MIL-PRF-24308/4

MIL-PRF-24308/8

Number of Contacts

Part Number

Part Number

Part Number

15

311P407-1P-B-12

M24308/4-345

M24308/8-345

26

311P407-2P-B-12

M24308/4-346

M24308/8-346

44

311P407-3P-B-12

M24308/4-347

M24308/8-347

62

311P407-4P-B-12

M24308/4-348

M24308/8-348

78

311P407-5P-B-12

M24308/4-349

M24308/8-349

104

311P407-6P-B-12

M24308/4-350

M24308/8-350

15

-

M24308/4-351 (kit)

M24308/8-351 (kit)

26

-

M24308/4-352 (kit)

M24308/8-352 (kit)

44

-

M24308/4-353 (kit)

M24308/8-353 (kit)

62

-

M24308/4-354 (kit)

M24308/8-354 (kit)

78

-

M24308/4-355 (kit)

M24308/8-355 (kit)

104

-

M24308/4-356 (kit)

M24308/8-356 (kit)

15

-

M24308/4-362 (w/o contacts)

M24308/8-362 (w/o contacts)

26

-

M24308/4-363 (w/o contacts)

M24308/8-363 (w/o contacts)

44

-

M24308/4-364 (w/o contacts)

M24308/8-364 (w/o contacts)

62

-

M24308/4-365 (w/o contacts)

M24308/8-365 (w/o contacts)

78

-

M24308/4-366 (w/o contacts)

M24308/8-366 (w/o contacts)

104

-

M24308/4-367 (w/o contacts)

M24308/8-367 (w/o contacts)

15

-

M24308/4-406 (float mount)

M24308/8-406 (float mount)

26

-

M24308/4-407 (float mount)

M24308/8-407 (float mount)

44

-

M24308/4-408 (float mount)

M24308/8-408 (float mount)

62

-

M24308/4-409 (float mount)

M24308/8-409 (float mount)

78

-

M24308/4-410 (float mount)

M24308/8-410 (float mount)

104

-

M24308/4-411 (float mount)

M24308/8-411 (float mount)

15

-

M24308/4-417 (float mount)

M24308/8-417 (float mount)

26

-

M24308/4-418 (float mount)

M24308/8-418 (float mount)

44

-

M24308/4-419 (float mount)

M24308/8-419 (float mount)

62

-

M24308/4-420 (float mount)

M24308/8-420 (float mount)

78

-

M24308/4-421 (float mount)

M24308/8-421 (float mount)

104

-

M24308/4-422 (float mount)

M24308/8-422 (float mount)

15

-

M24308/4-428 (float mount)

M24308/8-428 (float mount)

26

-

M24308/4-429 (float mount)

M24308/8-429 (float mount)

44

-

M24308/4-430 (float mount)

M24308/8-430 (float mount)

62

-

M24308/4-431 (float mount)

M24308/8-431 (float mount)

78

-

M24308/4-432 (float mount)

M24308/8-432 (float mount)

104

-

M24308/4-433 (float mount)

M24308/8-433 (float mount)

S-311-P-4/07 and MIL-DTL-24308 High Density D-Subminiature Connector

Manufacturer Listing

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

AMP INC.

EISENHOWER BLVD / MS210-20

HARRISBURG, PA 17105-2608

Cage Code: 00779

Tel.: 717-564-0100

POSITRONIC INDUSTRIES INC.

429 N. CAMPBELL STREET

SPRINGFIELD, MO 65801-8247

Cage Code: 28198

Tel.: 417-866-2322

SOURIAU ET CIE (FRANCE)

3 AVENUE DU MARECHAL DEVAUX

91550 PARAY VIELLE-POSTE, FRANCE

Cage Code: F0225

Parent Organization: FRAMATOME CONNECTORS INTERNATIONAL

Tel.: 011-33-1-46-87-23-23

GSFC S-311-P-4/09 and MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts, -55deg.C to +125deg.C

Click Here for List of Available Parts

Important! Application Notes

Available Sources

GSFC-S-311-P-4/09 Part Number Explanation

MIL-DTL-24308 Part Number Explanation

Revision History for NASA Parts Selection Updates for This Section

Last Updated: 02/29/00

GSFC S-311-P-4/09 and MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts, -55deg.C to +125deg.C

APPLICATION NOTES

1) MIL-DTL-24308 connectors are supplied with 0.120" mounting holes or 0.086" float mount bushings.

2) For S-311-P-4/09 connectors, normal mounting hole diameter is 0.120". To specify a larger mounting hole diameter of 0.150", replace the "-12" in the part number with "-15". See

part number explanation

for details.

3) Hardware such as screwlocks, jackscrews, and jackposts are required to properly secure mated connector pairs and must be provided separately.

4) Connectors satisfy GSFC outgassing requirements of 1% Total Mass Loss (TML) and 0.1% Collected Volatile Condensable Material (CVCM).

5) MIL-DTL-24308 connectors are also available without contacts, with float mount bushings or as kits. Many of these part numbers are not preferred because they are cadmium plated. The preferred part numbers for the various contacts are listed herein.

6) MIL-DTL-24308 connectors are supplied with contacts. Replacement contact part numbers are M39029/63-368 for sockets and M39029/64-367 for pins.

7) GSFC connectors are supplied WITHOUT contacts. Procure P/N G10S1 for socket contacts and G10P1 for pin contacts per GSFC specification S-311-P-4/10.

Contacts are non-magnetic and do not contain color band marking.

Revision History for NASA Parts Selection List for GSFC S-311-P-4/9

02/29/00	Changed spec reference to MIL-DTL or MIL-PRF from MIL-C-24308 as appropriate
03/09/98	Corrected the Manufacturer Listing in this Section to include only Amp, ITT, Positronic and Souriau.
12/09/97	Initial Release on GSFC S-311-P-4/9 Section in the NPSL

GSFC S-311-P-4/09 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts, -55deg.C to +125deg.C

Part Number Ordering Information:

311P4	09	-X	X	-X	-XX
GSFC Specification Number	Detail Specification Sheet	Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size

Insert Arrangement	Contact Type	Residual Magnetism	Mounting Hole Size
1	P = Pins	B = 200 Gamma	12 = 0.120 inches
2	S = Sockets		15= 0.150 inches
3			
4			
5			

Click Here for Available Parts Listing

MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts, -55deg.C to +125deg.C

Part Number Ordering Information:

M24308	/X	-XXX
Military Specification Number	Detail Specification Sheet	Unique Dash Number Defining Connector Options

Detail Specification Sheet	Description
/1	Receptacle, Nickel Plated, Solder Contacts
/2	Receptacle, Nickel Plated, Crimp Contacts
/3	Plug, Nickel Plated, Solder Contacts
/4	Plug, Nickel Plated, Crimp Contacts
/5	Receptacle, Gold Plated, Solder Contacts
/6	Receptacle, Gold Plated, Solder Contacts
/7	Plug, Gold Plated, Solder Contacts
/8	Plug, Gold Plated, Crimp Contacts

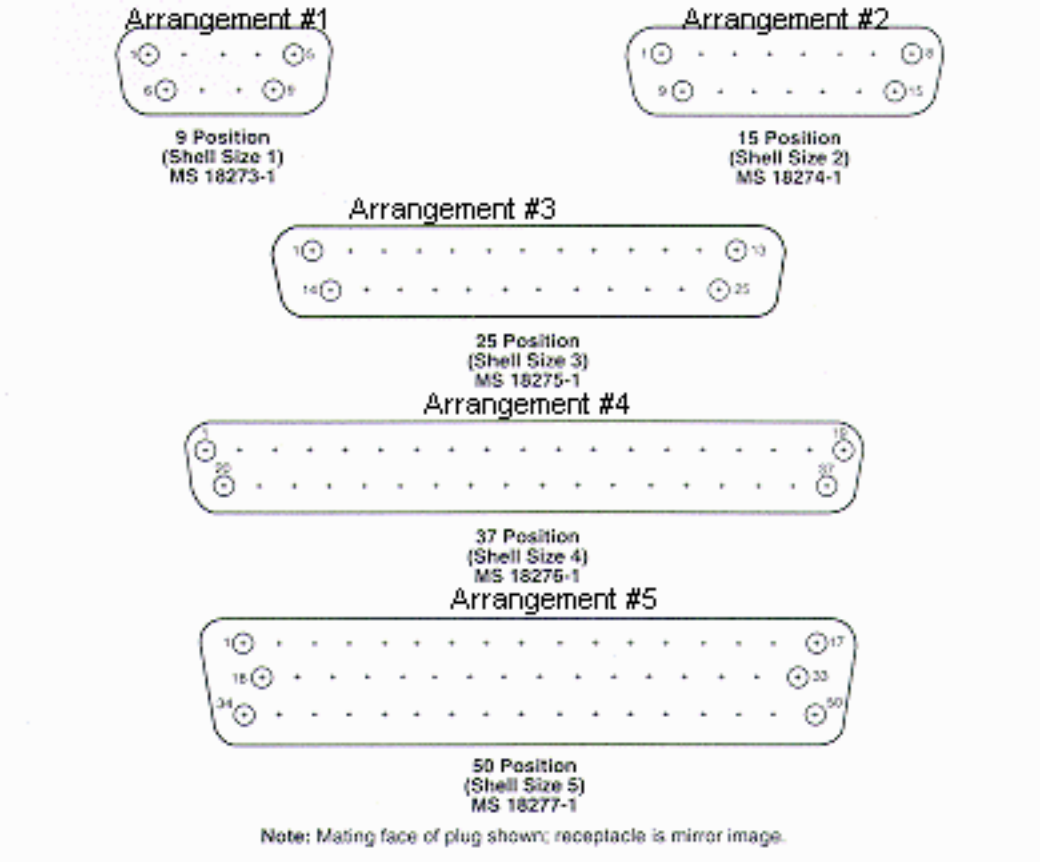
Click Here for Available Parts Listing

GSFC S-311-P-4/09 and MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts

Insert Arrangements

Mating Face of Plug is Shown. Mating Face of Receptacle is Mirror Image



GSFC S-311-P-4/09 and MIL-DTL-24308 D-Subminiature Connectors

Standard Density Size 20 Crimp Contacts

Receptacles, Socket Contacts

Plugs, Pin Contacts

Receptacles, Socket Contacts

Description	Non-Magnetic Controlled Low Residual Magnetism		General Purpose		Non-Magnetic
Shell Finish	Gold		Nickel		Gold
Grade	Level 1 and 2		Level 2		Level 2
Specification	GSFC S-311-P-4/09		MIL-DTL-24308/2		MIL-PRF-24308/6

Number of Contacts	Part Number		Part Number		Part Number
9	311P409-1S-B-12		M24308/2-516		M24308/6-502
15	311P409-2S-B-12		M24308/2-517		M24308/6-503
25	311P409-3S-B-12		M24308/2-518		M24308/6-504
37	311P409-4S-B-12		M24308/2-519		M24308/6-505
50	311P409-5S-B-12		M24308/2-520		M24308/6-506
9	-		M24308/2-521 (kit)		M24308/6-507 (kit)
15	-		M24308/2-522 (kit)		M24308/6-508 (kit)
25	-		M24308/2-523 (kit)		M24308/6-509 (kit)
37	-		M24308/2-524 (kit)		M24308/6-510 (kit)
50	-		M24308/2-525 (kit)		M24308/6-511 (kit)
9	-		M24308/2-560 (w/o contacts)		M24308/6-540 (w/o contacts)
15	-		M24308/2-561 (w/o contacts)		M24308/6-541 (w/o contacts)
25	-		M24308/2-562 (w/o contacts)		M24308/6-542 (w/o contacts)
37	-		M24308/2-563 (w/o contacts)		M24308/6-543 (w/o contacts)
50	-		M24308/2-564 (w/o contacts)		M24308/6-544 (w/o contacts)
9	-		M24308/2-585 (float mount)		M24308/6-551 (float mount)
15	-		M24308/2-586 (float mount)		M24308/6-552 (float mount)
25	-		M24308/2-587 (float mount)		M24308/6-553 (float mount)
37	-		M24308/2-588 (float mount)		M24308/6-554 (float mount)
50	-		M24308/2-589 (float mount)		M24308/6-555 (float mount)
9	-		M24308/2-596 (float mount)		M24308/6-562 (float mount)
15	-		M24308/2-597 (float mount)		M24308/6-563 (float mount)
25	-		M24308/2-598 (float mount)		M24308/6-564 (float mount)
37	-		M24308/2-599 (float mount)		M24308/6-565 (float mount)
50	-		M24308/2-600 (float mount)		M24308/6-566 (float mount)
9	-		M24308/2-607 (float mount)		M24308/6-573 (float mount)
15	-		M24308/2-608 (float mount)		M24308/6-574 (float mount)
25	-		M24308/2-609 (float mount)		M24308/6-575 (float mount)
37	-		M24308/2-610 (float mount)		M24308/6-576 (float mount)
50	-		M24308/2-611 (float mount)		M24308/6-577 (float mount)

Plugs, Pin Contacts

Description	Non-Magnetic Controlled Low Residual Magnetism		General Purpose		Non-Magnetic
Shell Finish	Gold		Nickel		Gold
Grade	Level 1 and 2		Level 2		Level 2
Specification	GSFC S-311-P-4/09		MIL-DTL-24308/4		MIL-DTL-24308/8
Number of Contacts	Part Number		Part Number		Part Number
9	311P409-1P-B-12		M24308/4-335		M24308/8-335
15	311P409-2P-B-12		M24308/4-336		M24308/8-336
25	311P409-3P-B-12		M24308/4-337		M24308/8-337
37	311P409-4P-B-12		M24308/4-338		M24308/8-338
50	311P409-5P-B-12		M24308/4-339		M24308/8-339
9	-		M24308/4-340 (kit)		M24308/8-340 (kit)

15	-		M24308/4-341 (kit)		M24308/8-341 (kit)
25	-		M24308/4-342 (kit)		M24308/8-342 (kit)
37	-		M24308/4-343 (kit)		M24308/8-343 (kit)
50	-		M24308/4-344 (kit)		M24308/8-344 (kit)
9	-		M24308/4-357 (w/o contacts)		M24308/8-357 (w/o contacts)
15	-		M24308/4-358 (w/o contacts)		M24308/8-358 (w/o contacts)
25	-		M24308/4-359 (w/o contacts)		M24308/8-359 (w/o contacts)
37	-		M24308/4-360 (w/o contacts)		M24308/8-360 (w/o contacts)
50	-		M24308/4-361 (w/o contacts)		M24308/8-361 (w/o contacts)
9	-		M24308/4-401 (float mount)		M24308/8-401 (float mount)
15	-		M24308/4-402 (float mount)		M24308/8-402 (float mount)
25	-		M24308/4-403 (float mount)		M24308/8-403 (float mount)
37	-		M24308/4-404 (float mount)		M24308/8-404 (float mount)
50	-		M24308/4-405 (float mount)		M24308/8-405 (float mount)
9	-		M24308/4-412 (float mount)		M24308/8-412 (float mount)
15	-		M24308/4-413 (float mount)		M24308/8-413 (float mount)
25	-		M24308/4-414 (float mount)		M24308/8-414 (float mount)
37	-		M24308/4-415 (float mount)		M24308/8-415 (float mount)
50	-		M24308/4-416 (float mount)		M24308/8-416 (float mount)
9	-		M24308/4-423 (float mount)		M24308/8-423 (float mount)
15	-		M24308/4-424 (float mount)		M24308/8-424 (float mount)
25	-		M24308/4-425 (float mount)		M24308/8-425 (float mount)
37	-		M24308/4-426 (float mount)		M24308/8-426 (float mount)
50	-		M24308/4-427 (float mount)		M24308/8-427 (float mount)

S-311-P-4/09 and MIL-DTL-24308 D-Subminiature Connector Manufacturer Listing

And Links to Manufacturer Homepages

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

AMP INC.

EISENHOWER BLVD / MS210-20

HARRISBURG, PA 17105-2608

CAGE Code: 00779

Tel.: 717-564-0100

ITT CANNON

666 EAST DYER RD

SANTA ANA, CA 92705

CAGE Code: 71468

Tel.: 714-557-4700

POSITRONIC INDUSTRIES INC.

429 N. CAMPBELL STREET

SPRINGFIELD, MO 65801-8247

CAGE Code: 28198

Tel.: 417-866-2322

SOURIAU ET CIE (FRANCE)

3 AVENUE DU MARECHAL DEVAUX

91550 PARAY VIELLE-POSTE, FRANCE

CAGE Code: F0225

Parent Organization: FRAMATOME CONNECTORS INTERNATIONAL

Tel.: 011-33-1-46-87-23-23

RF Connectors

The following RF connector types are available for selection:

Type Designation	Description	Specification
M39012/XX	Coaxial, Radio Frequency, Series SMA	MIL-C-39012
M83517/X	Transmission Line, Radio Frequency, Series SMA	MIL-C-83517 <!-- #EndEditable -->

Parts
|
Packaging
|
Radiation
|
Publications
|
Calendar
|
Experts
Admin Login
|
Request Account
|
Feedback
|
Site Map
|
Help
|
Search
NEPP Program Manager:
Chuck Barnes, Jet Propulsion Laboratory
Responsible NASA Official:
Michael Sampson, NEPAG Manager
Website Comments:
Web Development Team
Last Modified:

August 8, 2001
AETD IT Security Banner
NASA Privacy Statement
Go to -
NEPP

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NPSL

|

Connectors

MIL-DTL-39012 Radio Frequency Connectors

Part Number/Ordering Explanation

Important! Application Notes

Available Sources

Revision History for NASA Parts Selection List for MIL-DTL-39012

Last Updated: 02/29/00

Click on the Link Below to View the Associated Parts Listing:

Detail Specification	Configuration
M39012/55	Plug, Pin Contact, Cable Mount
M39012/56	Plug, Pin Contact, Right Angle Cable Mount
M39012/57	Receptacle, Socket Contact, Cable Mount
M39012/58	Receptacle, Socket Contact, 4 Hole Flange Mount
M39012/59	Receptacle, Socket Contact, D-Hole Jam Nut Mount
M39012/60	Receptacle, Socket Contact, Solder Cup, 4-Hole or 2-Hole Rear Flange Mount
M39012/61	Receptacle, Socket Contact, Solder Cup, Rear or Front D-Hole Jam Nut Mount
M39012/62	Receptacle, Socket Contact, Hermetic Seal, Solder Lug Rear or Front D-Hole Jam Nut Mount
M39012/79	Plug, Pin Contact, Cable Mount, Semirigid Cable
M39012/80	Plug, Pin Contact, Right Angle Cable Mount, Semirigid Cable
M39012/81	Receptacle, Socket Contact, Cable Mount, Semirigid Cable
M39012/82	Receptacle, Socket Contact, 4-Hole or 2-Hole Flange Mount, Semirigid Cable
M39012/83	Receptacle, Socket Contact, Rear D-Hole Jam Nut Mount, Semirigid Cable
M39012/93	Receptacle, Socket Contact, PC Board Mount
M39012/94	Receptacle, Socket Contact, PC Board Mount, Right Angle

MIL-DTL-39012 Radio Frequency Connectors

APPLICATION NOTES

1) Plug coupling nuts and cable nut mounted connectors may have silicone rubber O-Ring seals which are an outgassing concern. Connectors may require additional processing for outgassing control. This should include a bake of the connector and removal or replacement of the silicone rubber O-Rings with fluorosilicone

O-Rings which meet outgassing requirements.

2) Temperature range for flexible and semirigid connectors is -65deg.C to +165deg.C. Temperature range for PC mounted connectors is -65deg.C to +105deg.C.

3) The use of safety wire is recommended to secure mated connectors together.

4) B designated connectors which require special tooling for assembly are considered non-field

replaceable and are not preferred. Most are inactive for new design.

5) Only series SMA connectors are recommended for satellite use in lower earth orbits. Series N and TNC connectors are not recommended for use in lower earth orbits due to atomic oxygen corrosion concerns of their silver plating.

Revision History for NASA Parts Selection List for MIL-DTL-39012 Connectors

02/29/00	Changed specification reference to "MIL-DTL-39012" from "MIL-C-39012"
03/16/98	Added application note #5 regarding atomic oxygen concerns with Series N and TNC connectors in lower earth orbit.
03/09/98	Removed Cristek from list of available sources. Cristek does not make M39012 connectors
03/04/98	Initial Release of MIL-C-39012 Connector Section on the NPSL On-Line

MIL-DTL-39012 Radio Frequency Connectors

SMA Series Coaxial, 50 Ohms

Part Number Ordering Information:

Example of P/N: M39012/55-3006, where

M39012	/55	-	3006
Military Specification Number	Detail Specification	Replaceability	Dash Number

Detail Specification	Gender	Application
M39012/55	Plug, Pin Contact	Flexible Cable
M39012/56	Plug, Pin Contact	Flexible Cable
M39012/57	Receptacle, Socket Contact	Flexible Cable
M39012/58	Receptacle, Socket Contact	Flexible Cable, Box or Panel Mount
M39012/59	Receptacle, Socket Contact	Flexible Cable, Box or Panel Mount
M39012/60	Receptacle, Socket Contact	Flexible Cable, Box or Panel Mount
M39012/61	Receptacle, Socket Contact	Flexible Cable, Box or Panel Mount
M39012/62	Receptacle, Socket Contact, Hermetic Seal	Flexible Cable, Box or Panel Mount
M39012/79	Plug, Pin Contact	Semi-Rigid Cable
M39012/80	Plug, Pin Contact	Semi-Rigid Cable
M39012/81	Receptacle, Socket Contact	Semi-Rigid Cable
M39012/82	Receptacle, Socket Contact	Semi-Rigid Cable
M39012/83	Receptacle, Socket Contact	Semi-Rigid Cable
M39012/93	Receptacle, Socket Contact	Printed Circuit
M39012/94	Receptacle, Socket Contact	Printed Circuit

Replaceability Character	Description
-	Field Replaceable (Standard)
B	Non-Field Replaceable (Not Preferred)

Dash Number	Description
3XXX	Corrosion Resistant Steel Shell, Passivated Finish
4XXX	Beryllium Copper Shell, Gold Finish

MIL-PRF-39012/55 Radio Frequency Connectors

Plug, Pin Contact, Cable Mount

Maximum Frequency = 12.4 GHz

M17/93-RG178

M39012/55-4006

M17/93-RG178

M39012/55-4025

M17/93-RG178

M39012/55-3007

M17/113-RG316

M39012/55-3026

M17/113-RG316

M39012/55-4007

M17/113-RG316

M39012/55-4026

M17/113-RG316

M39012/55-3009

M17/60-RG142

M39012/55-3028

M17/60-RG142

M39012/55-4009

M17/60-RG142

M39012/55-4028

M17/60-RG142

M39012/55-3010

M17/111-RG303

M39012/55-3029

M17/111-RG303

M39012/55-4010

M17/111-RG303

M39012/55-4029

M17/111-RG303

M39012/55-3030

M17/152-00001

M39012/55-3502

M17/128-RG400

M39012/55-4502

M17/128-RG400

Part Number	Applicable Flexible Cable Type
M39012/55-3006	M17/93-RG178
M39012/55-3025	

MIL-PRF-39012/56 Radio Frequency Connectors

Plug, Pin Contact, Right Angle Cable Mount

Maximum Frequency = 12.4 GHz

Part Number	Applicable Flexible Cable Type
M39012/56-3006	M17/93-RG178
M39012/56-3025	M17/93-RG178
M39012/56-4006	M17/93-RG178
M39012/56-4025	M17/93-RG178
M39012/56-3007	M17/113-RG316
M39012/56-3026	M17/113-RG316
M39012/56-4007	M17/113-RG316
M39012/56-4026	M17/113-RG316
M39012/56-3009	M17/60-RG142
M39012/56-3028	M17/60-RG142
M39012/56-4009	M17/60-RG142
M39012/56-4028	M17/60-RG142
M39012/56-3010	M17/111-RG303
M39012/56-3029	M17/111-RG303
M39012/56-4010	M17/111-RG303
M39012/56-4029	M17/111-RG303
M39012/56-3030	M17/152-00001
M39012/56-3502	M17/128-RG400
M39012/56-4502	M17/128-RG400

MIL-PRF-39012/57 Radio Frequency Connectors

Receptacle, Socket Contact, Cable Mount

Maximum Frequency = 12.4 GHz

Part Number	Applicable Flexible Cable Type
M39012/57-3006	M17/93-RG178
M39012/57-3025	M17/93-RG178
M39012/57-4006	M17/93-RG178
M39012/57-4025	M17/93-RG178
M39012/57-3007	M17/113-RG316
M39012/57-3026	M17/113-RG316
M39012/57-4007	M17/113-RG316

M39012/57-4026	M17/113-RG316
M39012/57-3009	M17/60-RG142
M39012/57-3028	M17/60-RG142
M39012/57-4009	M17/60-RG142
M39012/57-4028	M17/60-RG142
M39012/57-3010	M17/111-RG303
M39012/57-3029	M17/111-RG303
M39012/57-4010	M17/111-RG303
M39012/57-4029	M17/111-RG303
M39012/57-3030	M17/152-00001
M39012/57-3502	M17/128-RG400
M39012/57-4502	M17/128-RG400

MIL-PRF-39012/58 Radio Frequency Connectors

Receptacle, Socket Contact, 4-Hole Flange Mount

Maximum Frequency = 12.4 GHz

Part Number	Applicable Flexible Cable Type
M39012/58-3006	M17/93-RG178
M39012/58-3025	M17/93-RG178
M39012/58-4006	M17/93-RG178
M39012/58-4025	M17/93-RG178
M39012/58-3007	M17/113-RG316
M39012/58-3026	M17/113-RG316
M39012/58-4007	M17/113-RG316
M39012/58-4026	M17/113-RG316
M39012/58-3009	M17/60-RG142
M39012/58-3028	M17/60-RG142
M39012/58-4009	M17/60-RG142
M39012/58-4028	M17/60-RG142
M39012/58-3010	M17/111-RG303
M39012/58-3029	M17/111-RG303
M39012/58-4010	M17/111-RG303
M39012/58-4029	M17/111-RG303
M39012/58-3030	M17/152-00001
M39012/58-3502	M17/128-RG400
M39012/58-4502	M17/128-RG400

MIL-PRF-39012/59 Radio Frequency Connectors

Receptacle, Socket Contact, D-Hole Jam Nut Mount

Maximum Frequency = 12.4 GHz

Part Number	Applicable Flexible Cable Type
M39012/59-3006	M17/93-RG178
M39012/59-3025	M17/93-RG178
M39012/59-4006	M17/93-RG178
M39012/59-4025	M17/93-RG178
M39012/59-3007	M17/113-RG316
M39012/59-3026	M17/113-RG316
M39012/59-4007	M17/113-RG316
M39012/59-4026	M17/113-RG316
M39012/59-3009	M17/60-RG142
M39012/59-3028	M17/60-RG142
M39012/59-4009	M17/60-RG142
M39012/59-4028	M17/60-RG142
M39012/59-3010	M17/111-RG303
M39012/59-3029	M17/111-RG303
M39012/59-4010	M17/111-RG303
M39012/59-4029	M17/111-RG303
M39012/59-3030	M17/152-00001
M39012/59-3502	M17/128-RG400
M39012/59-4502	M17/128-RG400

MIL-PRF-39012/60 Radio Frequency Connectors

Receptacle, Socket Contact, Solder Cup, Rear Flange Mount

Maximum Frequency = Not Rated

Part Number

Applicable Cable Type

Flange Configuration

M39012/60-3001

All Flexible Cable Types

4 Hole

M39012/60-4001

All Flexible Cable Types

4 Hole

M39012/60-3002

All Flexible Cable Types

2 Hole

MIL-PRF-39012/61 Radio Frequency Connectors

Receptacle, Socket Contact, Solder Cup, Rear or Front Mount

D-Hole Jam Nut Mount

Maximum Frequency = Not Rated

Part Number

Applicable Cable Type

Mount Configuration

M39012/61-3001

All Flexible Cable Types

Rear Mount

M39012/61-4001

All Flexible Cable Types

Rear Mount

M39012/61-3002

All Flexible Cable Types

Front Mount

M39012/61-4002

All Flexible Cable Types

Front Mount

MIL-PRF-39012/62 Radio Frequency Connectors

Receptacle, Socket Contact, Hermetic Seal, Solder Lug

Rear or Front D-Hole Jam Nut Mount

Maximum Frequency = Not Rated

Part Number

Applicable Cable Type

Mount Configuration

M39012/62-3001

All Flexible Cable Types

Rear Mount

M39012/62-4001

All Flexible Cable Types

Rear Mount

M39012/62-3002

All Flexible Cable Types

Front Mount

M39012/62-4002

All Flexible Cable Types

Front Mount

MIL-PRF-39012/79 Radio Frequency Connectors

Plug, Pin Contact, Cable Mount, Semirigid Cable

Maximum Frequency = 18 GHz

Part Number	Applicable Semi-Rigid Cable Type
M39012/79-3009	M17/133-RG405
M39012/79-3007	M17/133-RG405
M39012/79-3207	M17/133-RG405
M39012/79-3010	M17/130-RG402
M39012/79-3008	M17/130-RG402
M39012/79-3208	M17/130-RG402

MIL-PRF-39012/80 Radio Frequency Connectors

Plug, Pin Contact, Right Angle Cable Mount, Semirigid Cable

Maximum Frequency = 18 GHz

Part Number	Applicable Semi-Rigid Cable Type
M39012/80-3009	M17/133-RG405
M39012/80-3005	M17/133-RG405
M39012/80-3007	M17/133-RG405
M39012/80-3207	M17/133-RG405
M39012/80-3010	M17/130-RG402
M39012/80-3006	M17/130-RG402
M39012/80-3008	M17/130-RG402
M39012/80-3208	M17/130-RG402

MIL-PRF

-39012/81 Radio Frequency Connectors

Receptacle, Socket Contact, Cable Mount, Semirigid Cable

Maximum Frequency = 18 GHz

Part Number Applicable Semi-Rigid Cable Type	
M39012/81-3007	M17/133-RG405
M39012/81-3011	M17/133-RG405
M39012/81-3207	M17/133-RG405
M39012/81-3008	M17/130-RG402
M39012/81-3012	M17/130-RG402
M39012/81-3208	M17/130-RG402

MIL-PRF-39012/82 Radio Frequency Connectors

Receptacle, Socket Contact, 4-Hole or 2 Hole Flange Mount, Semirigid Cable

Maximum Frequency = 18 GHz

Part Number	Applicable Semi-Rigid Cable Type	Flange Configuration
M39012/82-3007	M17/133-RG405	4-Hole
M39012/82-3011	M17/133-RG405	4-Hole
M39012/82-3207	M17/133-RG405	4-Hole
M39012/82-3013	M17/133-RG405	2-Hole
M39012/82-3008	M17/130-RG402	4-Hole
M39012/82-3012	M17/130-RG402	4-Hole
M39012/82-3208	M17/130-RG402	4-Hole
M39012/82-3014	M17/130-RG402	2-Hole

MIL-PRF-39012/83 Radio Frequency Connectors

Receptacle, Socket Contact, Rear D-Hole Jam Nut Mount, Semirigid Cable

Maximum Frequency = 18 GHz

Part Number	Applicable Semi-Rigid Cable Type
M39012/83-3009	M17/133-RG405
M39012/83-3007	M17/133-RG405
M39012/83-3011	M17/133-RG405
M39012/83-3207	M17/133-RG405
M39012/83-3010	M17/130-RG402
M39012/83-3008	M17/130-RG402
M39012/83-3012	M17/130-RG402
M39012/83-3208	M17/130-RG402

MIL-PRF-39012/93 Radio Frequency Connectors

Receptacle, Socket Contact, PC Board Mount

Frequency = 500 MHz to 18 GHz

Part Number	Application	Solder Terminal Type
M39012/93-3001	PC Board Mount	.155L
M39012/93-3002	PC Board Mount	.125L
M39012/93-3003	PC Board Mount	.093L

MIL-PRF-39012/94 Radio Frequency Connectors

Receptacle, Socket Contact, PC Board Mount, Right Angle

Frequency = 500 MHz to 18 GHz

Part Number	Application	Solder Terminal Type
M39012/94-3001	PC Board Mount	.155L
M39012/94-3002	PC Board Mount	.125L
M39012/94-3003	PC Board Mount	.093L

MIL-DTL-39012 Radio Frequency Connector Manufacturer Listing

And Links to Manufacturer Homepages

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

AMPHENOL AEROSPACE - RF MICROWAVE CONNECTOR OPERATIONS

ONE KENNEDY AVENUE

DANBURY, CT 06810

Cage Code: 74868

Tel.: 1-800-627-7100

APPLIED ENGINEERING PRODUCTS

104 JOHN W. MURPHY DRIVE

NEW HAVEN, CT 06513

Cage Code: 19505

Tel: 203-776-2813

AUTOMATIC CONNECTOR, INC.

400 MORELAND ROAD

COMMACK, L.I., NY 11725

Cage Code: 94375

Tel.: 516-543-5000

CONNECTING DEVICES, INC. (CDI)

2400 GRAND AVENUE

LONG BEACH, CA 92619

Cage Code: 30990

Tel.: 213-498-0901

DELTA ELECTRONICS MANUFACTURING CORP.

416 CABOT STREET

BEVERLY, MA 01915

Cage Code: 00795

Tel.: 978-927-1060

HERMETIC SEAL CORP.
4232 TEMPLE CITY BLVD.
ROSEMEAD, CA 91770-1552
Cage Code: 04820
Tel.: 213-283-0411
ITT CANNON RF PRODUCTS (FORMERLY ITT SEALECTRO)
585 E. MAIN STREET
NEW BRITAIN, CT 06051
Cage Code: 98291
Tel.: 860-223-2700
KINGS ELECTRONICS COMPANY, INC.
40 MARBLEDALE ROAD
TUCKAHOE, NY 10707
Cage Code: 91836
Tel.: 213-596-4485
M/A COM, INC.- INTERCONNECT DIVISION (FORMERLY OMNI-SPECTRA)
140 FOURTH AVENUE
WALTHAM, MA 02254
Cage Code: 26805
Tel.: 617-890-4570
RADIALL, INC.
150 LONG BEACH BOULEVARD
STRATFORD, CT 06497
Cage Code: F0503
Tel.: 203-386-1030
SOLITRON/VECTOR MICROWAVE PRODUCTS, INC.
3301 ELECTRONICS WAY
WAST PALM BEACH, FL 33407-4697
Cage Code: 95077
Tel.: 407-848-4311

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Diodes
Transistors
Thermistors
Wire and Cable

Microminiature Connectors

The following microminiature connector types are available for selection:

Type Designation	Description	Specification
M83513/XX	Microminiature, Pre-Wiped Crimp Contacts, Solder Contacts or Printed Circuit Connectors	MIL-PRF-83513

Parts
|
Packaging
|
Radiation
|
Publications
|
Calendar
|
Experts
Admin Login
|
Request Account
|
Feedback
|

NEPP Program Manager:
Chuck Barnes, Jet Propulsion Laboratory
Responsible NASA Official:
Michael Sampson, NEPAG Manager
Website Comments:
Web Development Team
Last Modified:
August 8, 2001

MIL-PRF-83513 Microminiature Connectors
APPLICATION NOTES
1) CAUTION!!!
Some M83513 type connectors have the option of being supplied with pre-terminated crosslinked ETFE (Tefzel) insulated wire pigtails. Users are advised thate some fluoropolymer insulation materials such as ETFE may outgas trace amounts of fluorine over time. NASA GSFC Advisory
NA-GSFC-2003-03
(Dec. 2002) addresses corrosion concerns for metal shell connectors (especially microminiature and nanominiature types) and contacts that are terminated with
fluoropolymer insulated wire
AND
stored in sealed plastic/metal bags for several months or longer

. In sealed packages, Fluorine that is outgassed may react with moisture to form highly corrosive hydrofluoric acid. This acid is capable of corroding metals such as Nickel and Gold which are commonly used finishes for spaceflight connectors and contacts.

As a precaution for all flight hardware with pre-wired connector assemblies, the following mitigations are recommended by NA-GSFC-2003-03:

Projects should inspect the connectors upon receipt (both the shell and contacts) using appropriate magnification to verify that there is no corrosion. The existing inventory of pre-wired connector assemblies should be reinspected. In addition, all assemblies should be inspected before use. Inspect for darkening of the shiny metal surfaces. All connector interfaces should be covered with protective dust covers. For assemblies that have already been integrated into flight hardware and that were inspected and found to be acceptable before mating, there should be no concern for subsequent malfunction.

The pre-wired connector assemblies should be removed from sealed bags and stored in open packages that will allow any reactive fluorine compound (s) to escape. Connector assemblies should be stored in a controlled humidity environment. The preferable storage area for pre-wired connector assemblies would be in a dry nitrogen atmosphere.

2

) Connectors are preferred for use in Level 2 applications. The following additional testing is recommended for Level 1 applications:

100% Dielectric Withstanding Voltage and Insulation Resistance followed by

10 Cycles of Thermal Shock

Low Level Contact Resistance on One Sample Connector

3)

MIL-PRF-83513 metal shell receptacle connectors contain a thin silicone rubber or fluorosilicone rubber interface seal. The silicone rubber type may represent an outgassing concern. The seals are pressed in place and may be carefully removed to avoid outgassing. Otherwise, additional processing such as a bake may be required to control outgassing. All other materials have good outgassing characteristics.

4) All contacts are on .050 inch centers between contacts and are size 24. PC terminations are solid No. 24 AWG copper wire.

5) MIL-PRF-83513/10 through /15 narrow profile printed circuit connectors have contact terminations arranged so that additional rows are used in order to reduce overall connector length. Clearance for additional rows of right angle leads is accomplished by the manufacturer orienting the insert 180deg. from normal so that the wide row becomes the bottom row rather than the top row.

6) Metal shell connectors are not intermateable with plastic shell connectors.

7) For MIL-PRF-83513/1 through /4 and /6 through /9, mounting hardware must be supplied separately. For insert arrangements A through G, use MIL-PRF-83513/5 configurations A or B. For insert arrangement H, use MIL-PRF-83513/5 configuration C.

8) For connectors supplied with wire pigtails:

In a memo dated October 27, 1997, DSCC granted permission to all MIL-PRF-83513 QPL manufacturers to supply /3 and /4 connectors with M22759/11-26-X PTFE Teflon insulated wire when shell finish "N" is specified. Previously, the specifications were interpreted to mean that when finish "N" and M22759/11-26-X are specified, M22759/33-26-X would be provided in lieu of M22759/11-26-X.

For space flight the appropriate dash numbers that specify M22759/33-26-X should be selected over M22759/11-26-X.

The use of M22759/11-26-X PTFE Teflon insulated wire represents a few problems for space flight use:

a) PTFE Teflon insulation is more susceptible to cold flow phenomena and has poor cut through resistance.

b) PTFE Teflon insulated wire is not as tolerant of radiation environments as crosslinked ETFE insulated wire (M22759/33).

c) M22759/11-26-X wire has normal strength copper conductor, where M22759/33-26-X has high strength copper alloy conductor. NASA prefers the use of high strength copper for sizes 24 AWG and smaller in space environments. Normal strength copper may be more susceptible to wire strand breakage when exposed to severe temperature cycling.

9) Connectors terminated with 26 AWG leads may not meet design standards of NASA Technical Standard NASA-STD-8739.4 which prefers the use of 24 AWG or larger conductors in interconnect cables.

10) Optional color coding in accordance with

MIL-STD-681

, as modified by detail specification, may be used.

11) Insert arrangement Code H (100 contacts) is not applicable to plastic shell connectors (M83513/6 through M83513/9).

Recent NASA Parts Selection List Updates for MIL-PRF-83513 Connectors

01/14/04	Added Application Note (ref: NASA GSFC Advisory NA-GSFC-2003-03) on subject of Corrosion of Connectors and Contacts Due to Outgassing of Fluorine Compounds from Fluoropolymer Insulated Wire
05/24/99	Updated sections to indicate specification change to a "performance based" specification. This change affects the specification number (ie., MIL-C-83513 becomes MIL-PRF-83513). Military specification
03/31/98	Modified application Note #8 to correctly identify NASA-STD-8739.4 rather than NTS8739.(3G-2)
03/13/98	Initial Release of MIL-C-83513 Connector Section in the NPSL On-Line

MIL-PRF-83513 Microminiature Connector

Pre-Terminated Crimp Contacts or Solder Contacts

Part Number Ordering Information:

Example of P/N for Solder Contacts: M83513/01-AN,

M83513	/01	-A	N
Military Specification Number	Specification Slash Sheet	Insert Arrangement	Shell Finish

Example of P/N for Wire Pigtails: M83513/03-A01N

M83513	/03	-A	01	N
Military Specification Number	Specification Slash Sheet	Insert Arrangement	Wire Type (Not applicable to Solder Contacts)	Shell Finish

Detail Specification	Connector Type	Termination	Shell
M83513/01	Plug, Pin Contacts	Soldercup	Aluminum, Electroless Nickel Plated
M83513/02	Receptacle, Socket Contacts	Soldercup	Aluminum, Electroless Nickel Plated
M83513/03	Plug, Pin Contacts	Wire Pigtails	Aluminum, Electroless Nickel Plated
M83513/04	Receptacle, Socket Contacts	Wire Pigtails	Aluminum, Electroless Nickel Plated
M83513/06	Plug, Pin Contacts	Soldercup	All Plastic
M83513/07	Receptacle, Socket Contacts	Soldercup	All Plastic
M83513/08	Plug, Pin Contacts	Wire Pigtails	All Plastic
M83513/09	Receptacle, Socket Contacts	Wire Pigtails	All Plastic

Insert Arrangement Code (Click Here to See Insert Arrangements)	Number of Contacts
A	9

B	15
C	21
D	25
E	31
F	37
G	51
H	100

Wire Pigtail Termination Code	Pigtail Wire Specification	Length
01	M22759/11-26-9 (NOT PREFERRED FOR FLIGHT. USE TYPE "09" FOR FLIGHT)	18"L
02	M22759/11-26-9 (NOT PREFERRED FOR FLIGHT. USE TYPE "10" FOR FLIGHT)	36"L
03	M22759/11-26-X (NOT PREFERRED FOR FLIGHT. USE TYPE "11" FOR FLIGHT)	18"L
04	M22759/11-26-X (NOT PREFERRED FOR FLIGHT. USE TYPE "12" FOR FLIGHT)	36"L
05	QQ-W-343, Solid 25 AWG, Gold Plated	0.5"L
06	QQ-W-343, Solid 25 AWG, Gold Plated	1.0"L
07	QQ-W-343, Solid 25 AWG, Tin Plated	0.5"L
08	QQ-W-343, Solid 25 AWG, Tin Plated	1.0"L
09	M22759/33-26-9	18"L
10	M22759/33-26-9	36"L
11	M22759/33-26-X	18"L
12	M22759/33-26-X	36"L
13	M22759/11-26-9 (NOT PREFERRED FOR FLIGHT. USE TYPE "15" FOR FLIGHT)	72"L
14	M22759/11-26-X (NOT PREFERRED FOR FLIGHT. USE TYPE "16" FOR FLIGHT)	72"L
15	M22759/33-26-9	72"L
16	M22759/33-26-X	72"L

Shell Finish Code	Description
Blank	All Plastic
N	Electroless Nickel

MIL-PRF-83513 Microminiature Connector

Printed Circuit Connectors

Part Number Ordering Information:

Example of P/N: M83513/10-A01NP, where

M83513	/01	-A	01	N	P
Military Specification Number	Specification Slash Sheet	Insert Arrangement	PC Termination Length	Shell Finish	Hardware

Detail Specification	Connector Type	Mounting	Applicable Insert Arrangements

M83513/10	Plug, Pin Contacts, Narrow Profile	Right Angle	A, B, C, D, E, F
M83513/11	Plug, Pin Contacts, Narrow Profile	Right Angle	G
M83513/12	Plug, Pin Contacts, Narrow Profile	Right Angle	H
M83513/13	Receptacle, Socket Contacts, Narrow Profile	Right Angle	A, B, C, D, E, F
M83513/14	Receptacle, Socket Contacts, Narrow Profile	Right Angle	G
M83513/15	Receptacle, Socket Contacts, Narrow Profile	Right Angle	H
M83513/16	Plug, Pin Contacts, Standard Profile	Right Angle	A, B, C, D, E, F
M83513/17	Plug, Pin Contacts, Standard Profile	Right Angle	G
M83513/18	Plug, Pin Contacts, Standard Profile	Right Angle	H
M83513/19	Receptacle, Socket Contacts, Standard Profile	Right Angle	A, B, C, D, E, F
M83513/20	Receptacle, Socket Contacts, Standard Profile	Right Angle	G
M83513/21	Receptacle, Socket Contacts, Standard Profile	Right Angle	H
M83513/22	Plug, Pin Contacts, Standard Profile	Straight	A, B, C, D, E, F
M83513/23	Plug, Pin Contacts, Standard Profile	Straight	G
M83513/24	Plug, Pin Contacts, Standard Profile	Straight	H
M83513/25	Receptacle, Socket Contacts, Standard Profile	Straight	A, B, C, D, E, F
M83513/26	Receptacle, Socket Contacts, Standard Profile	Straight	G
M83513/27	Receptacle, Socket Contacts, Standard Profile	Straight	H

Insert Arrangement Code (Click Here to See Insert Arrangements)	Number of Contacts
A	9
B	15
C	21
D	25
E	31
F	37
G	51
H	100

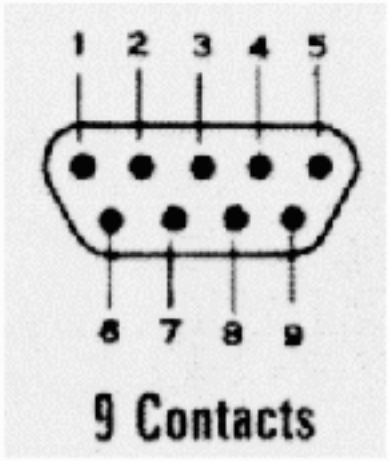
PC Termination Length Code	Length (Inches)
01	0.109L
02	0.140L
03	0.172L

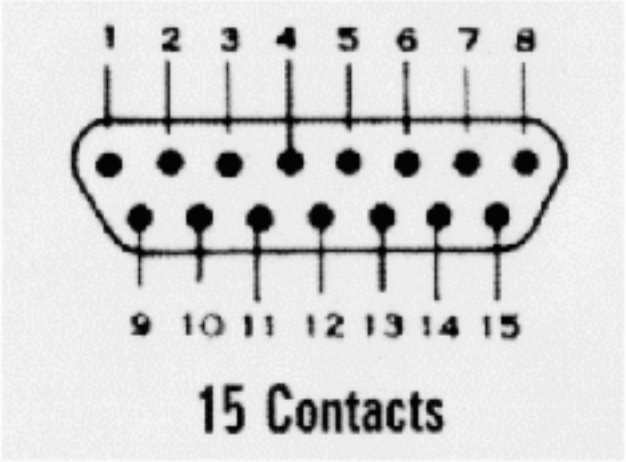
Shell Finish Code	Description
N	Electroless Nickel

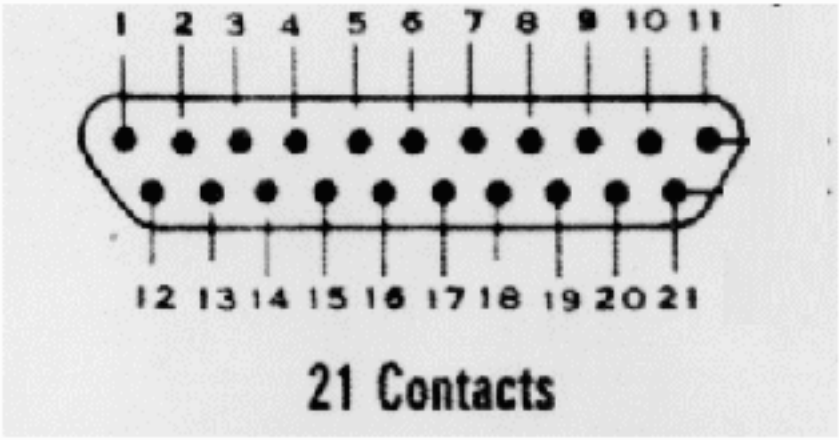
Hardware Code	Description
N	No Jackpost

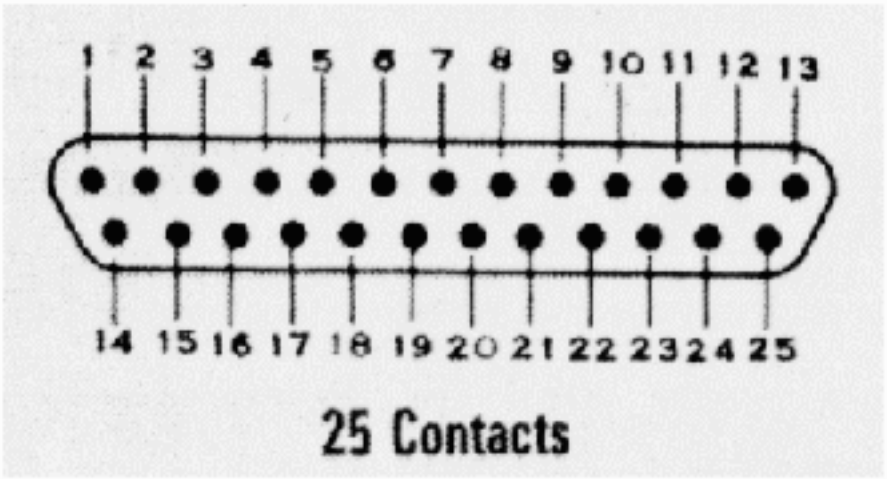
P	Jackpost (Attached)

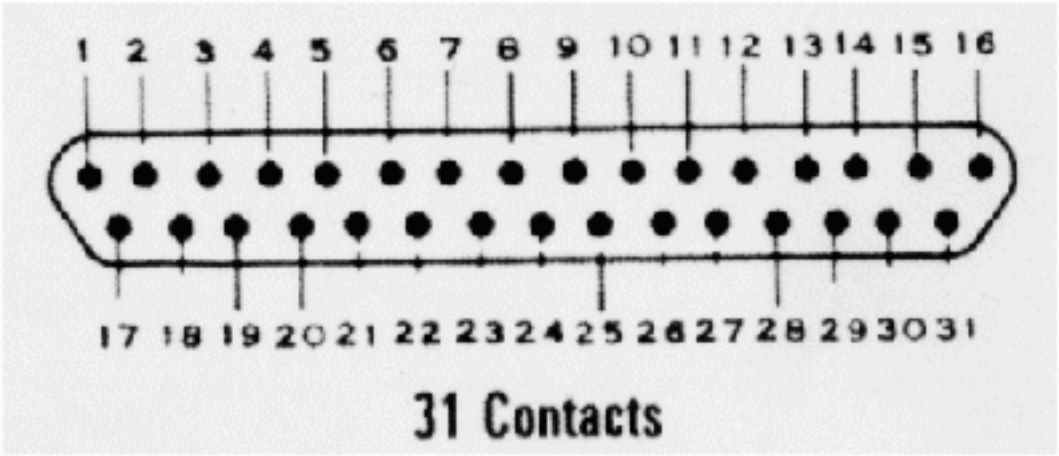
MIL-PRF-83513 Microminiature Connector
Pre-Terminated Crimp Contacts or Solder Contacts
Insert Arrangements

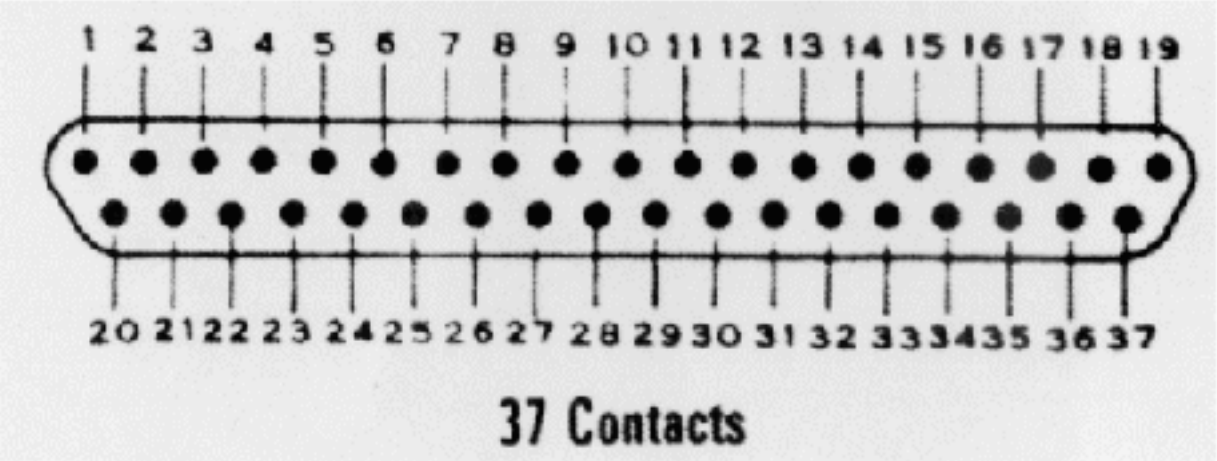


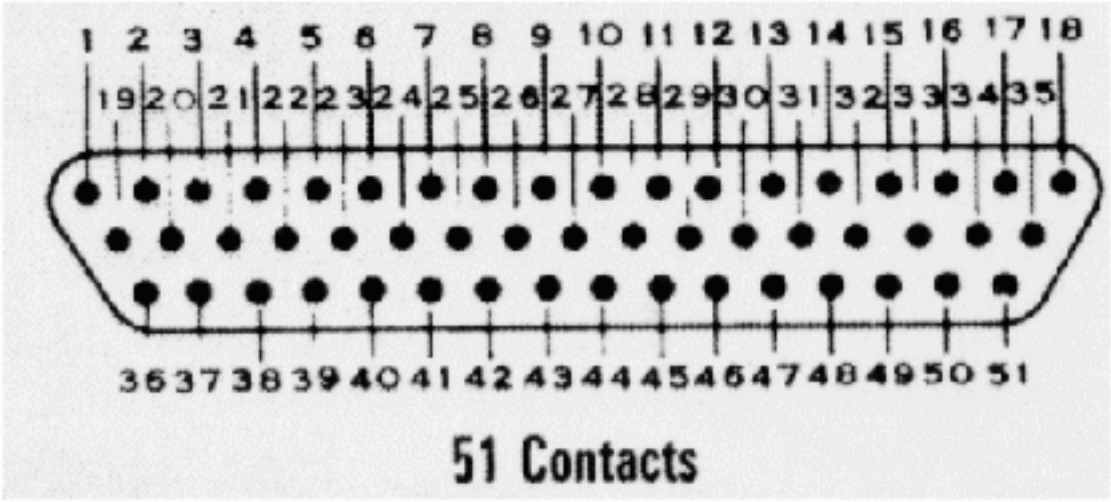

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15
15 Contacts

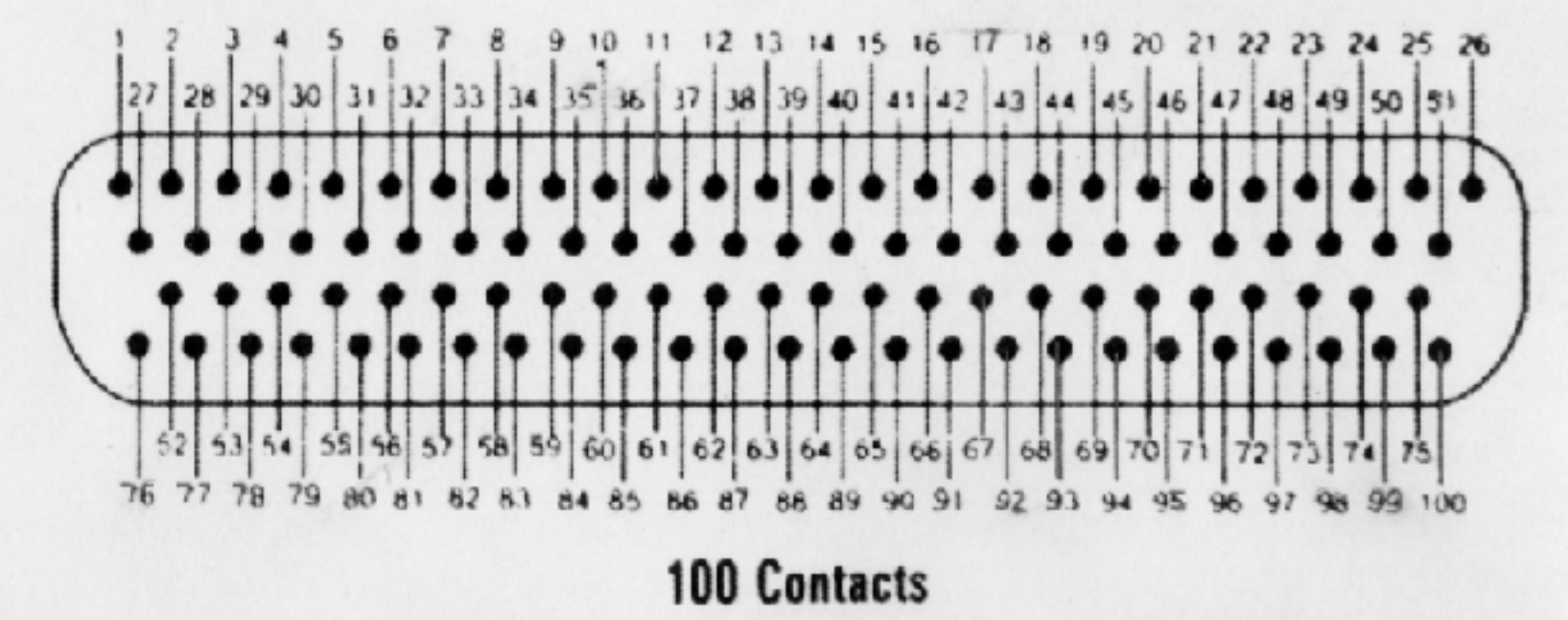

1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21
21 Contacts


1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16 17 18 19 20 21 22 23 24 25
25 Contacts


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
31 Contacts


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
37 Contacts


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51
51 Contacts



MIL-PRF-83513 Microminiature Connectors Manufacturer Listing

And Links to Manufacturer Homepages

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

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Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

AIRBORN, INC.

4321 AIRBORN DRIVE

ADDISON, TX 75001

CAGE Code: 10400

Tel.: 972-931-3200

CINCH CONNECTOR

1521 MORSE AVENUE

ELK GROVE VILLAGE, IL 60007

CAGE Code: 71785
Tel.: 708-981-6000
CRISTEK INTERCONNECTS INC.
1301 SOUTH LEWIS ST.
ANAHEIM, CA 92805
CAGE Code: 67720
Tel.: 714-970-9388
ITT CANNON
666 EAST DYER RD
SANTA ANA, CA 92705
CAGE Code: 71468
Tel.: 714-557-4700
ULTI MATE, INC.
641 N. POPLAR STREET
ORANGE, CA 92668
CAGE Code: 58967
Tel.: 714-973-9388

Diodes

Transistors

Thermistors

Wire and Cable

Printed Circuit Connectors

The following printed circuit connector types are available for selection:

Type Designation	Description	Specification
M55302/XX	Printed Circuit Connector	MIL-C-55302 <!-- #EndEditable -->

Parts

|

Packaging

|

Radiation

|

Publications

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NEPP Program Manager:

Chuck Barnes, Jet Propulsion Laboratory

Responsible NASA Official:

Michael Sampson, NEPAG Manager

Website Comments:

Web Development Team

Last Modified:

August 8, 2001

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NASA Privacy Statement

Go to -

NEPP

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NPSL

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Connectors

MIL-C-55302 Printed Circuit Connectors

-65deg.C to +125deg.C

Part Number/Ordering Explanation

Important! Application Notes

Available Sources

Recent NASA Parts Selection List Updates for MIL-C-55302 Connectors

Last Updated: 03/10/98

MIL-C-55302 Printed Circuit Connectors

-65deg.C to +125deg.C

APPLICATION NOTES

1) Connectors are preferred for use in Level 2 applications. The following is recommended for additional testing for Level 1 applications:

100% Dielectric Withstanding Voltage and Insulation Resistance Followed By

10 Cycles of Thermal Shock

Low Level Signal Contact Resistance on One Sample

2) MIL-C-55302/190 through /193 connectors have 0.075 inch spacing between contacts. All other connectors have 0.100 inch spacing between contacts.

3) Hand soldering of these connectors is recommended. The use of wave soldering or infrared reflow equipment may overheat connectors, resulting in warpage or shifting of contact positions, and may cause high mating force or insufficient contact engagements.

4) For "D" shaped guidepin hardware only, style "Y", a polarization code may be added to the part number. This part number may appear on parts lists for assembly or other documents required for procurement, but is not marked on the part. Polarization code may be 1 through 64 in accordance with the

polarization figure

shown in the part number/ordering explanation page. Unless otherwise specified, all connectors are supplied in the -1 polarization position, and may be repolarized by using the M55302/57-01 spanner wrench procured separately per MIL-C-55302/57. Hardware shall be secured with low-outgassing adhesive.

5) MIL-C-55302/65 and /66 connectors contain crimp removable socket contacts which are supplied with the connectors. Replacement contact part numbers per MIL-C-55302/65 are M55302/65-01 for normal insertion force and M55302/65-02 for low insertion force.

6) Other contact termination styles are available. However, the letter designations for these options are not consistent between the detail specifications, and these termination styles are not offered in each detail specification. Consult detail specification and latest MIL-C-55302 QPL for availability.

7) For MIL-C-55302/57, /59 and /138 hardware options S and H, jackscrew length is 0.135 inches rather than 0.200 inches.

8) Connector materials have good outgassing characteristics.

Recent NASA Parts Selection List Updates for MIL-C-55302

03/10/98	Added detail to Application Note 1 covering additional screening recommendations for Level 1 applications
03/05/98	Initial Release of MIL-C-55302 Connector Section in the NPSL On-Line

MIL-C-55302 Printed Circuit Connectors

-65deg.C to +125deg.C

Part Number Ordering Information:

Example of P/N:

M55302/58LA14Y15

, where

M55302	/58	L	A	14	Y	15
Military Specification Number	Detail Specification	Socket Contact Type (Omit for Pin Contacts)	Terminal Type	Number of Contacts	Mounting Hardware Type	Optional Polarization Code (for Hardware Style

Click Here for Mating Information

0.100 Inch Spacing Between Contacts

Part Number	Type Description	Terminal Type	No. of Contacts	Mounting Hardware Options
M55302/55XXXXX	Plug, Socket Contacts, Straight	See Table 2	10, 14, 20, 34, 26, 30, 36, 40, 44, 50, 54, 56, 60, 66, 70	L, M, S, H
M55302/56XXXX	Receptacle, Pin Contacts	See Table 2	"	Jackset
M55302/57XXXX	Plug, Pin Contacts, Right Angle	See Table 1	"	X, Y, S, H
M55302/58XXXXX	Receptacle, Socket Contacts	See Table 2	"	X, Y, F, S, H
M55302/61XXXX	Plug, Pin contacts, Right Angle	See Table 1	"	Jackset
M55302/62XXXXX	Receptacle, Socket Contacts	See Table 2	"	L, M, S, H
M55302/63XXXX	Plug, Pin Contacts, Straight	See Table 2	"	L, M, S, F, H, X, Y
M55302/64XXXXX	Receptacle, Socket Contacts	See Table 2	"	F, X, Y
M55302/65XXXXX	Receptacle, Socket Contacts	Crimp Removable	"	X, Y, F, S, H
M55302/66XXXXX	Receptacle, Socket Contacts	Crimp Removable	"	L, M, S, F, H
M55302/59XXXX	Plug, Pin Contacts, Right Angle	See Table 1	90, 100, 120	X, Y, F, S, H
M55302/60XXXXX	Receptacle, Socket Contacts	See Table 2	90, 100, 120	X, Y, F, S, H
M55302/138XXXXX	Plug, Pin Contacts, Right Angle	See Table 1	160	X, Y, F, S, H
M55302/139XXXXX	Receptacle, Socket Contacts	See Slash Sheet	160	X, Y, F, S, H

0.075 Inch Spacing Between Contacts

Part Number	Type Description	Terminal Type	No. of Contacts	Mounting Hardware Options
M55302/190LXXXX	Receptacle, Socket Contacts	See Table 3	100	X, Y, F, S, N, L, M
M55302/191XXXXX	Plug, Pin Contacts, Right Angle	See Table 1	100	X, Y, F, S, N, L, M
M55302/192LXXXX	Receptacle, Socket Contacts	See Table 3	122, 152	X, Y, F, S, N, L, M
M55302/193XXXXX	Plug, Pin Contacts, Right Angle	See Table 1	122, 152	X, Y, F, S, N, L, M

Socket Contact Type Code	Description

-	Normal Insertion Force (Not Available for /190 or /192)
L	Low Insertion Force

Table 1: Contact Termination Options for M55302/57, /59, /61, /138, /191, /193

Terminal Type Code	Description
A	.109L Dip Terminal
B	.140L Dip Terminal
C	.172L Dip Terminal

Table 2: Contact Termination Options for M55302/55, /56, /58, /60, /62, /63, /64

Terminal Type Code	Description
A	Solder Cup
B	.140L Dip Terminal
C	.172L Dip Terminal
F	.100 Flex Circuit Terminal (Not Applicable to /60, /63)

Table 3: Contact Termination Options for M55302/190, /192

Terminal Type Code	Description
A	Solder Cup
B	.109L Dip Terminal
C	.140L Dip Terminal
D	.172L Dip Terminal
E	.093 Flex Circuit Terminal

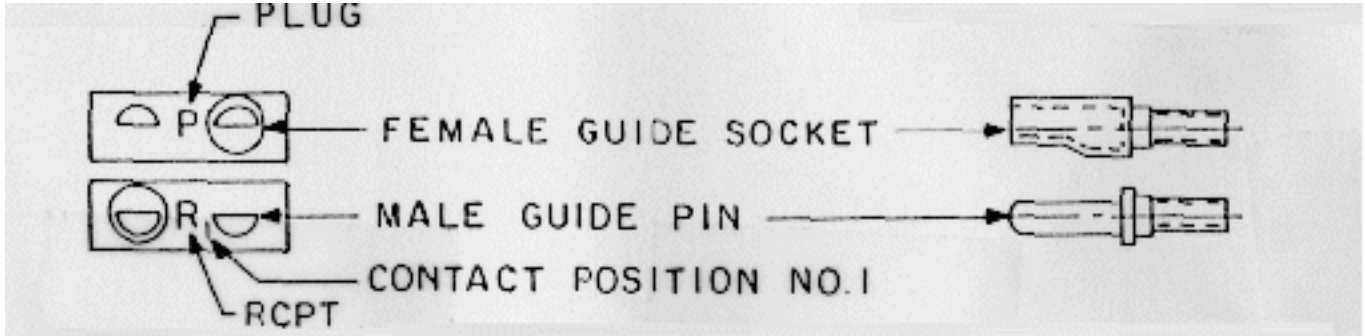
Mounting Hardware Option Code	Description
L	Long Slotted Turning Jackscrew (.700)
M	Medium Slotted Turning Jackscrew (.500)
S	Short Slotted Turning Jackscrew (.200); See Application Note 7
F	Fixed Jackscrew
H	Short Hex Turning Jackscrew (.200); See Application Note 7
X	Full Round Guidepins
Y	D Shaped Guidepins

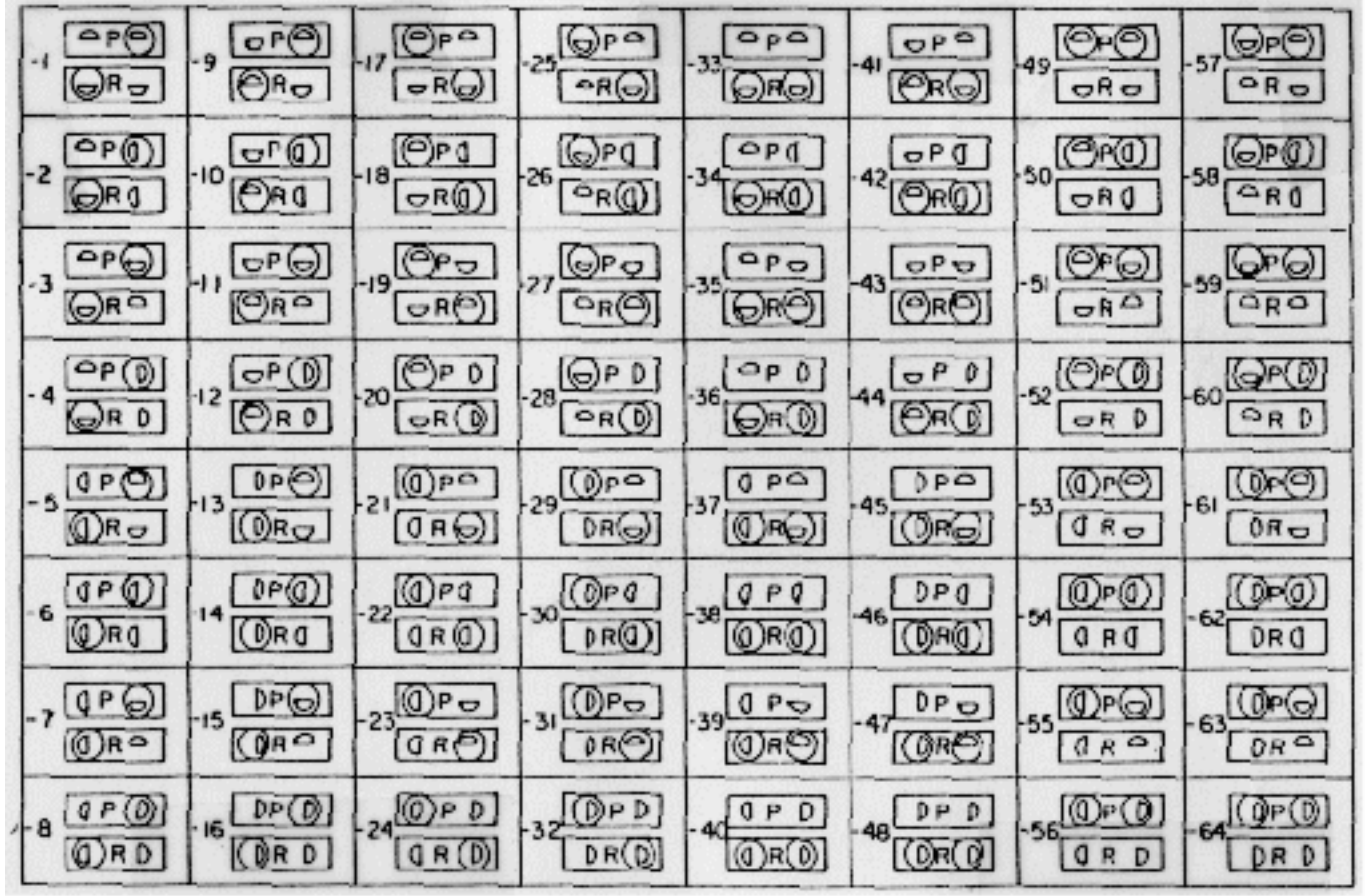
Mating Information

Plug Detail Specification	Mating Receptacle Detail Specification

/55	/56
/57, /61, /63	/58, /62, /64, /65, /66
/138	/139
/191	/190
/193	/192

Connector Polarization Code with D Shaped Guide Pins and Sockets for Hardware Style "Y"


PLUG
P
FEMALE GUIDE SOCKET
R
MALE GUIDE PIN
CONTACT POSITION NO.1
RCPT


1
9
17
25
33
41
49
57
2
10
18
26
34
42
50
58
3
11
19
27
35
43
51
59
4
12
20
28
36
44
52
60
5
13
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37
45
53
61
6
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22
30
38
46
54
62
7
15
23
31
39
47
55
63
8
16
24
32
40
48
56
64

MIL-C-55302 Printed Circuit Connectors Manufacturer Listing

And Links to Manufacturer Homepages

Click

here

for detailed information regarding part technologies offered by manufacturers listed in the

PSAP

Core Suppliers List

Listed below are links to manufacturer data sites that may provide additional part related information. The linked sites are not under the control of NPSL and NASA is not responsible for information contained in the linked site. We are providing these links for your convenience only.

AIRBORN, INC.

4321 AIRBORN DRIVE

ADDISON, TX 75001

Cage Code: 10400

Tel.: 972-931-3200

INDUSTRIAL ELECTRONIC HARDWARE CORP. (IEH)

140 58TH STREET -8E

BAY RIDGE, NY 11220

Cage Code: 97913

Tel.: 718-492-4440

TEXAS INSTRUMENTS, INC.

34 FOREST STREET

ATTLEBORO, MA 02703

Cage Code: 59350

Tel.: 508-236-3800

TRI-STAR ELECTRONICS

2201 ROSECRANE AVENUE

EL SEGUNDO, CA 90245

Cage Code: 55104

Tel.: 310-536-0444

WINCHESTER ELECTRONICS

400 PARK ROAD

WATERTOWN, CT 06795

Cage Code: 81312

Tel.: 860-945-5000

Satellite Interface Connectors

The following power connector types are available for selection:

Type Designation	Description	Specification
700-42	Satellite Interface Connectors, Crimp Removable Contacts	GSFC S-311-P-718
700-42/1	Connectors, Electrical, Rectangular, Polarized Shell	GSFC S-311-P-718 /1
	Contacts, Power and Coaxial, Removable for Electrical Connectors (Sizes 1, 2 and 3)	GSFC S-311-P-718 /2
700-42/3	Connectors, Electrical, Rectangular, Polarized Shell, EMI Shielding (Size 1)	GSFC S-311-P-718 /3
	Backshell Kits, Connector, Rectangular, EMI Shielding, Strain Relief (Sizes 1, 2 and 3)	GSFC S-311-P-718 /4
700-42/5	Connectors, Electrical, Rectangular, Polarized Shell, EMI Shielding (Size 2)	GSFC S-311-P-718 /5
700-42/6	Connectors, Electrical, Rectangular, Polarized Shell, EMI Shielding (Size 3)	GSFC S-311-P-718/6

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Experts
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Request Account
|
Feedback
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Chuck Barnes, Jet Propulsion Laboratory
Responsible NASA Official:
Michael Sampson, NEPAG Manager
Website Comments:
Web Development Team
Last Modified:
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Circuit Protection Devices
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Inductors
Microcircuits
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Monolithics
Hybrids
Resistors
Semiconductors
(Summary)
Diodes
Transistors
Thermistors
Wire and Cable

Connector Contacts

The following connector contact types are available for selection:

Type Designation	Description	Specification
M39029/XX	Contacts, Electrical Connector	MIL-C-39029 <!-- #EndEditable -->

Parts
|
Packaging
|
Radiation
|
Publications
|
Calendar
|
Experts
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|
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|

NEPP Program Manager:
Chuck Barnes, Jet Propulsion Laboratory
Responsible NASA Official:
Michael Sampson, NEPAG Manager
Website Comments:
Web Development Team
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Monolithics
Hybrids
Resistors
Semiconductors
(Summary)
Diodes
Transistors

Thermistors

Wire and Cable

Connector Accessories

The following connector accessory types are available for selection:

Type Designation	Description	Specification
M85049/XX	Backshell Connector Accessories	MIL-C-85049

Parts

|

Packaging

|

Radiation

|

Publications

|

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|

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NEPP Program Manager:

Chuck Barnes, Jet Propulsion Laboratory

Responsible NASA Official:

Michael Sampson, NEPAG Manager

Website Comments:

Web Development Team

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August 8, 2001

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Active Parts Core Suppliers List (CSL)

The Active Parts 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 consists of two parts:

Core Suppliers List Part I

Introduction Section I - Microcircuits Section II - Hybrids Section III - Diodes Section IV - Transistors

Core Suppliers List Part II

Japanese Space Agency (NASDA) Listings European Space Agency (ESA) Listings

NOTE: A Portable Document Format (PDF) reader will be needed to view the CSL files on this page. A PDF reader, along with installation instructions, can be obtained free from Adobe Systems Incorporated.

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, includes 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)

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:

Ashok Sharma NASA Goddard Space Flight Center Greenbelt, Maryland 20771 Attn: Ashok Sharma (Active Parts Specialist Code 562) (301) 286-6165 (301) 286-1695 (fax)

Appendix A Derating Criteria

Under Construction.

Appendix B Additional Parts Information Links

Listed below are some useful Links to other data sites that can be used in obtaining additional part related information:

NASA Parts and Packaging Program (NPPP)

Site managed by the Jet Propulsion Laboratory (JPL) -- This Site Contains Electronic Parts Reliability Information Studies of Emerging Microelectronics Technologies Radiation Effects Information JPL's Electronic Parts Information Network System (EPINS)

Electronic Parts Information Management System (EPIMS) User ID/Password Controlled -- This Site Contains GIDEP Alerts GSFC Parts Analysis Web System (PAWS) NASA Parts Advisories NASA Project Parts Lists Nonstandard Part Approval Requests Manufacturer CAGE code/address look up

GSFC SEU Radiation Data Bank

JPL's Radiation Data Bank

GSFC Procurement Specifications

Appendix C Prohibited Materials Section

The following section of the NASA Parts Selection List (NPSL) has been developed to identify materials often used in the manufacture and assembly of EEE parts that shall be prohibited from use in high reliability NASA electronic systems and flight hardware. Users are strongly urged to familiarize themselves with these issues to minimize the risk of introducing potential problems. In addition to the issues noted in this section, each commodity section within the NPSL has application notes that are unique to the commodity. Therefore, users should also review the application notes contained in each commodity section.

1. Pure Tin Plating 2. Cadmium Plating 3. Zinc Plating

Pure Tin Plating Prohibition

Policy:

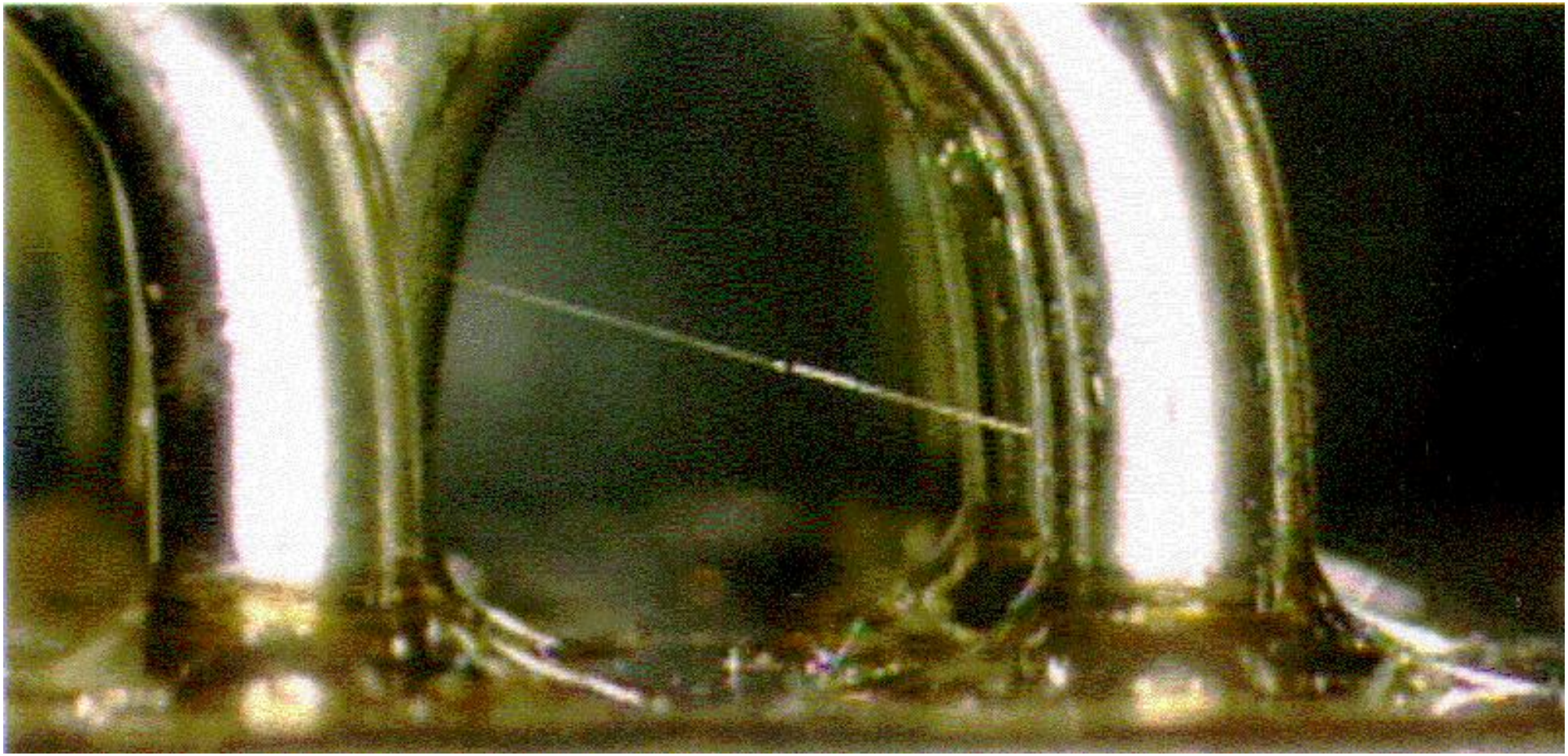
Pure tin plating is prohibited as a final finish on EEE parts and associated hardware

Reference:

NASA Advisory NA-044 October 23, 1998 NASA Advisory NA-044A December 17, 1998 NASA GSFC Tin Whisker Homepage

Rationale:

Pure tin finishes are susceptible to the spontaneous growth of electrically conductive single crystal structures known as tin whiskers. Over time these whiskers may grow to be several millimeters (mm) long. Tin whiskers are capable of causing electrical failures ranging from parametric deviations to sustained plasma arcing (in vacuum) that can result in catastrophic short circuits.



An Example of a Tin Whisker

Several instances have been reported where tin whiskers have caused system failures in both earth and space-based applications including at least 3 reports where a tin whisker induced short circuit resulted in complete failure of the commercial satellite.

The general risks fall into four categories:

Stable short circuits in low voltage, high impedance circuits.In such circuits there may be insufficient current available to fuse the whisker open and a stable short circuit results. Depending on the diameter and length of the whisker, it can take more than 50 milliamps (mA) to fuse one open. More typical is ~10mA Transient short circuits. At atmospheric pressure, if the available current exceeds the fusing current of the whisker, the circuit may only experience a transient glitch as the whisker fuses open. Plasma arcing in vacuum.In vacuum a much more destructive phenomenon can occur. If currents of above a few amps are available, the whisker will fuse open but the vaporized tin may initiate a plasma that can conduct over 200 amps. An adequate supply of tin from the plated surface is necessary to sustain the arc. This phenomenon is reported to have occurred on several commercial satellites resulting in blown fuses that rendered the spacecraft non-operational. Debris/Contamination.Whiskers or parts of whiskers may break loose and bridge isolated conductors or interfere with optical surfaces

Recommendations:

At this time, the only sure way of avoiding tin whiskers is not to use parts plated with pure tin. Despite procurement specification requirements that prohibit pure tin, errors sometimes occur resulting in pure tin plated components being delivered. Therefore, users are advised to independently test and analyze the plating composition of the products received as a verification that pure tin plating is not in use. Simple visual inspection is generally not sufficient because pure tin plating may appear similar to other plated finishes such as tin/lead or nickel.

Utilization of procurement specifications that have clear restrictions against the use of pure tin plating is still recommended. Most, but not all, of the commonly used military specifications currently have prohibitions against pure tin plating. Studies have shown that alloying tin with a second metal reduces the propensity for whisker growth. Alloys of tin and lead are acceptable where the alloy contains a minimum of 3% lead by weight.

In the event pure tin plated parts cannot be avoided, there are some additional processing techniques that may be used to reduce but not eliminate the risks associated with tin whiskers. The effectiveness of these approaches is variable and most require further evaluation to determine their suitability for long duration missions. Examples of these approaches include:

Solder dipping pure tin plated terminations and leads using a leaded solder. The effectiveness of this approach at covering all pure tin plated surfaces can be variable. Application of conformal coat material to pure tin plated surfaces. Conformal coat appears to reduce the growth rate of tin whiskers, but whiskers are still capable of growing through some conformal coat materials such as polyurethanes. For some device types manufacturers may be willing to replate surfaces using finishes such as tin/lead or nickel which are substantially less prone to whisker formation.

Cadmium Plating Prohibition

Policy:

Cadmium plating is prohibited on EEE parts and associated hardware. In some applications use of Cadmium plating may be acceptable via a Project approved waiver process that includes review and approval by both Materials and Parts Engineering disciplines.

Reference:

MSFC-HDBK-527, Materials Selection List for Space Hardware Systems JSC 11123, Space Transportation System Payload Safety Guidelines Handbook

Rationale:

There are several reasons for prohibiting the use of Cadmium plating in space flight electronic systems.

Cadmium is known to sublimate in a hard vacuum environment (especially at temperatures above 75°C). The sublimation products, which are conductive, can redeposit resulting in short circuits. The sublimation products may also interfere with sensitive optics. Cadmium is a toxic material that should not be used in manned spaceflight applications Cadmium is subject to the spontaneous growth of Cadmium whiskers. The propensity of Cadmium to grow whiskers

appears to be lower than that of zinc and especially tin. Cadmium whiskers (like tin whiskers) grow spontaneously and are capable of causing electrical failures ranging from parametric deviations to sustained plasma arcing that can result in catastrophic short circuits. See prohibition against pure tin plating for additional insight regarding the risks of metal whiskers.

Recommendations:

Cadmium plating is commonly used on connectors, connector hardware and mechanical hardware such as fasteners. It provides excellent resistance to salt corrosion and is therefore offered in many military specifications predominantly for use in naval applications. However, most NASA applications are not concerned with salt corrosion and the risks associated with use of Cadmium plating noted above outweigh the benefits of its use in spaceflight applications. There are several alternatives to Cadmium plating that are suited for spaceflight use. For connectors, electroless nickel plating is preferred. Gold plating is preferred when the application requires additional shielding effectiveness or low residual magnetism. Passivated stainless steel is the preferred material for hardware items such as fasteners. Consult your materials or parts specialists for suggested alternatives to Cadmium plating.

Zinc Plating Prohibition

Policy:

Zinc plating is prohibited on EEE parts and associated hardware. In some applications use of Zinc plating may be acceptable via a Project approved waiver process that includes review and approval by both Materials and Parts Engineering disciplines.

Reference: NA

Rationale:

There are several reasons for prohibiting the use of Zinc plating in space flight electronic systems.

Zinc is known to sublimate in a vacuum environment (especially at elevated temperatures). The sublimation products are conductive and can result in short circuits. Zinc is subject to the spontaneous growth of Zinc whiskers. Zinc whiskers (like tin whiskers) grow spontaneously and are capable of causing electrical failures ranging from parametric deviations to sustained plasma arcing that can result in catastrophic short circuits. See prohibition against pure tin plating for additional insight regarding the risks of metal whiskers

Recommendations:

Zinc (galvanized) plating is occasionally used on mechanical hardware such as fasteners for its corrosion resistant properties. By using alternative plating materials most NASA applications can avoid the risks associated with the use of Zinc plating while still achieving suitable corrosion resistance. Consult your materials or parts specialists for suggested alternatives to Zinc plating.