Summary of Preferred Connectors (Note 1) (Page 1 of 2)

Type Designation	Description	Specification	Grade	Refer To Page No.
NLS	Circular, High Density, Miniature, Low Outgassing	MSFC 40M38277	1, 2	02-3
NBS	Circular, Miniature, Low Outgassing	MSFC 40M38298	1, 2	02-4
NB	Circular, Miniature, Low Outgassing	MSFC 40M39569	1, 2	02-5
MS27XXX	Circular, Miniature, Series I, Bayonet Coupled	MIL-C-38999	1, 2	02-7
MS27XXX	Circular, Low Silhouette, Miniature, Series II (Note 2)	MIL-C-38999	1, 2	02-7
D38999/XX	Circular, Miniature, Series III, Self Locking Coupling	MIL-C-38999	1, 2	02-9
D38999/XX	Circular, Miniature, Series IV, Breech Coupling	MIL-C-38999	1, 2	02-9
MS34XX	Circular, Miniature, Series 2 (Notes 3, 4)	MIL-C-26482	2	02-11
MS345X	Circular, Crimp Rear Release Contacts (Note 4)	MIL-C-5015	2	02-13
311P409	D-Subminiature Type, Removal Crimp Contacts, Low Residual Magnetism	GSFC S-311-P-4/09	1, 2	02-14, 02-17
311P407	D-Subminiature Type, High Density, Crimp Removable Contacts, Low Residual Magnetism	GSFC S-311-P-4/07	1, 2	02-14, 02-18
311P405	D-Subminiature Type, Combination Power, Coaxial and High Voltage Contacts, Low Residual Magnetism	GSFC S-311-P-4/05	1, 2	02-14, 02-20
311P10	D-Subminiature Type, Solder Contacts, Low Residual Magnetism Standard Power and Combination Inserts	GSFC S-311-P-10	1, 2	02-15, 02-19, 02-20
M24308/XX	D-Type Subminiature Solder or Removable Crimp Contacts (Note 5)	MIL-C-24308	2	02-16, 02-17, 02-18, 02-19
M55302/XX	Printed Circuit	MIL-C-55302	2	02-21
M39012/XX	Coaxial, Radio Frequency, Series SMA (Note 6)	MIL-C-39012	2	02-24
M83517/X	Transmission Line, Radio Frequency, Series SMA	MIL-C-83517	2	02-27
M83513/XX	Microminiature, Pre-Terminated Crimp or Solder Contacts	MIL-C-83513	2	02-29
M83513/XX	Microminiature, Printed Circuit Connectors	MIL-C-83513	2	02-30
700-42	Power Connectors, Satellite Interface, Crimp Removable Contacts	GSFC S-311-P-718	1, 2	02-31
M39029/XX	Contacts, Electrical Connector	MIL-C-39029	2	02-37
M85049/XX	Backshell Connector Accessories	MIL-C-85049	1, 2	02-39

See notes on page 02-2.

Index of Preferred Connectors (Note 1) (Page 2 of 2)

Notes:

1. The use of connectors with cadmium or zinc plating, which tends to sublimate in a vacuum, is prohibited. Gold over nickel or electroless nickel are the preferred platings for GSFC applications. For contacts, gold plating with a 50 microinch thickness over the engagement area is the GSFC preferred finish.
2. Use MSFC NLS type as first choice where low outgassing is a requirement.
3. Use MSFC NB type as first choice where low outgassing is a requirement.
4. For circular connectors were outgassing is not a concern, use MIL-C-38999 connectors as a first choice. Use MIL-C-5015 where large contacts and high currents are a requirement.
5. Use GSFC S-311-P-4 or S-311-P-10 for first choice were low residual magnetism is a requirement.
6. MIL-C-39012 Series N and TNC are not preferred parts for GSFC programs due to concerns with atomic oxygen corrosion of the silver plating when used in earth orbits.

MSFC 40M38277 Circular Connectors, High Density, (Notes 1 and 2)
Low Silhouette, Low Outgassing, Bayonet Coupled, -150°C to +200°C

Part Number Explanation:

NLS	X(X)	X	X(X)	—35	X(X)	X
Series Prefix	Shell Style (Table 02-3-1)	Class (Seal) E = Environmental with straight compression ring backshell H = Hermetic (Note 3) T = Environmental without backshell (Note 4) (Table 02-3-2)	Shell Size	Arrangement Number Insert Arrangement (Table 02-3-3) (Note 5)	Contact Type P = Pins S = Sockets PS = Pin Socket Feed thru (Style 5 only)	Insert Polarization (Blank) = Normal A, B, C, D = Alternate Positions

Table 02-3-1 Connector Styles

0 = Receptacle flange mount	6 = Plug, cable mount
3 = Receptacle, solder mount hermetic	6G = Plug, cable mount with RFI Grounding finders
5 = Bulkhead feedthrough, hermetic jam nut mount (Double sided connector)	6W = Plug, cable mount, without coupling ring & backshell
	7 = Receptacle, jam nut mount

Table 02-3-2

Backshells for 40M38277 Class T Connectors

Part Number Explanation:

NLS	X(XX)	X(X)	X(X)
Series Prefix	Style	Shell Size 8 thru 24	Clamp Size 1 thru 16 (Style RFI only)

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 = 45° angle with cable tie strain relief
RFI = Straight RFI shield termination.

Table 02-3-3

Insert Arrangement	No. of Contacts (All 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

Notes:

1. Connectors may be used in Grade 1 and 2 applications.
2. Connectors are supplied with contacts.
3. Temperature range for hermetically sealed connectors is -100°C to +150°C.
4. Backshell strain relief must be procured separately for Class T connectors.
5. Insert arrangement designation consists of shell size and arrangement number. For 40M38277 connectors, only size 22D contacts are available.

MSFC 40M38298 Circular Connectors, Miniature, (Note 1)
Low Outgassing, Bayonet Coupled, -150°C to +200°C

Part Number Explanation:

NBS	X(X)	X	8	—X	X	X
Series Prefix	Shell Style (Table 02-4-1)	Class (Seal) E = Environmental H = Hermetic (Note 2)	Shell Size	Arrangement Number	Contact Type P = Pins S = Sockets	Insert Polarization N = Normal A through H = Alternate Positions

Insert Arrangement (Table 02-4-3)

Table 02-4-1 Connector Styles

0	=	Receptacle, flange mount hermetic	6G	=	Plug, cable mount with RFI grounding fingers (Notes 3, 4)	8G	=	Plug, cable mount, with right angle RFI backshell and RFI grounding fingers
3	=	Receptacle, surface mount hermetic	7	=	Receptacle, jam nut mount (Notes 3, 4)	9	=	Plug with straight RFI backshell (Notes 5, 6)
6	=	Plug, cable mount (Notes 3, 4)	8	=	Plug cable mount, with right angle RFI backshell	9G	=	Plug with straight RFI backshell and RFI grounding fingers (Notes 5, 6)

Table 02-4-2

Backshells for 40M38298 Connectors (Styles 6, 6G & 7) (Note 4)

Part Number Explanation:

NBS	X(XX)	8
Series Prefix	Style	Shell Size (Use 8R with RFI Style only for 90° RFI backshell)

S = Straight with strain relief clamp
R = Right Angle with strain relief clamp
C = Straight compression ring
RFI = Straight RFI shield termination. (Note 6)

Table 02-4-3 (Note 7)

Insert Arrangement	No. of Contacts (All size 20)
8 - 2	2
8 - 3	3
8 - 4	4

Notes:

1. Connectors may be used in Grade 1 and Grade 2 applications. They are supplied with contacts.
2. Temperature range for hermetically sealed connectors is -100°C to +150°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. See Table 02-4-2.
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, only size 20 contacts ar e available.

MSFC 40M39569 Circular Connectors, (Notes 1 through 3) (Page 1 of 2)
Low Outgassing, Bayonet Coupled, -150°C to +200°C

Part Number Explanation:

NB	X(X)	X	X(X)	—X(X)	X(X)	X	X	X
Series Prefix	Shell Style (Table 02-5-1)	Class (Seal) E = Environmental H = Hermetic	Shell Size	Arrangement Number	Contact Type (Table 02-5-2)	Insert Polarization N = Normal W, X, Y, Z =	Backshell Accessory	Temp Class (N/A
Hermetics)	(Table	(Note 4)	Insert Arrangement (Table 02-6-1)			Alternate Positions	(Table 02-5-3)	02-5-4)

Table 02-5-1 Connector Styles

0 =	Receptacle, flange mount Narrow	6 =	Plug, cable mount
3 =	Receptacle, Solder Mount, Hermetic	6G =	Plug, cable mount, with RFI grounding fingers
4 =	Receptacle Flange Mount, Wide flange	7 =	Receptacle, jam nut mount
5 =	Bulkhead feed thru, hermetic, jam nut mount	8 =	Receptacle, jam nut mount, extended pin

Table 02-5-2 Contacts

P = Pins
S = Sockets
CP = Coaxial Pin
CS = Coaxial Socket
PS = Pin-Socket feedthrough (Style 5 only)

Table 02-5-3 Backshells

C = Straight, compression ring
S = Straight, with cable clamp
R = Right Angle, cable clamp
T = No backshell

Table 02-5-4 Temperature

Blank = Gen'l Purpose (-100°C to +200°C)
2 = Vacuum thermal cycled (-150°C to +200°C)
3 = Atmosphere Thermal cycled (-150°C to +200°C)

See notes on page 02-6.

MSFC 40M39569 Circular Connectors, (Notes 1 and 2) (Page 2 of 2)
Low Outgassing, Bayonet Coupled, -150°C to +200°C

Table 02-6-1 Insert Arrangements for 40M39569 Connectors (Note 3)

Insert Arrangement	No. of Contacts (By Contact Size)			
	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			

Insert Arrangement	No. of Contacts (By Contact Size)			
	20	16	12	Coax
18-8			8	
18-11		11		
18-30	29	1		
18-32	32			
20-16		16		
20-39	37	2		
20-41	41			
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

Notes:

1. Connectors may be used in Grade 1 or 2 applications.
2. Connectors are supplied with contacts.
3. Insert arrangement designation consists of shell size and arrangement number. For 40M39569 connectors, insert arrangements with a variety of contact sizes are available.
4. Temperature range for hermetically sealed connectors is -100°C to +150°C.

MIL-C-38999 Series I & II, (Notes 1 through 4) (Page 1 of 2)
Circular Connectors, Bayonet Coupled, -65°C to +200°C

Part Number Explanation:

MS27XXX — Military Specification Number (Table 02-7-1)

X — Class (Note 5)
T = Environmental without backshell (N/A MS27508)
E = Environmental Resisting (MS27508 only)
Y = Hermetic

X(X) — Shell Size

X — Finish (Table 02-7-2)

—X(X) — Arrangement Number

Insert Arrangement (Table 02-8-1)

X — Contact Type (Note 6)
All Styles
P = Pin S = Socket
Hermetic Alternate Styles
Y = Pins with eyelet
Z = Sockets with eyelet

X — Insert Polarization
Blank = Normal
A, B, C, D = Alternate Positions

Table 02-7-1 Connector Styles

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

Table 02-7-2 GSFC Preferred Finish

CLASS T, E
F = Electroless Nickel

CLASS Y
D = Tin (150°C)
E = Passivated Stainless Steel

Notes: (Continued on page 02-8)

1. Connectors require additional processing for contamination control due to outgassing. Special low outgassing Series I and II connectors may be procured to GSFC Specification S-311-P-768.
2. Connectors may be used in Grade 1 and 2 applications.
3. Accessories such as strain relief backshells must be provided separately. Refer to Page 02-40 for a selection list.
4. Series I and Series II connectors are not intermateable.
5. Specify Class T for all type except hermetic and MS27508 connectors. Specify Class E for MS27508 only. Class E is not preferred for all other specifications and is inactive for new design.
6. Connectors are supplied with contacts. Refer to Page 02-37 for a selection of replacement contact part numbers.

Table 02-8-1 Insert Arrangements for MIL-C-38999 Series I & II Connectors (Notes 7, 8)

Insert Arrangement		No. of Contacts (By Contact Size)			
Series I	**Series II**	**22D**	**20**	**16**	**12**
9-35	8-35	6			
9-98	8-98		3		
11-4	N/A		4		
11-5	10-5		5		
11-35	10-35	13			
11-98	10-98		6		
11-99	10-99		7		
N/A	12-3			3	
13-4	12-4			4	
13-8	12-8		8		
13-35	12-35	22			
13-98	12-98		10		
15-5	14-5			5	
15-15	14-15		14	1	
15-18	14-18		18		
15-19	N/A		19		
15-35	14-35	37			
15-97	14-97		8	4	
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	
9-11	18-11			11	
N/A	18-28		26	2	
N/A	18-30		29	1	
19-32	18-32		32		
19-35	18-35	66			
N/A	18-96				9
21-11	N/A				11
21-16	20-16			16	
21-35	20-35	79			
21-39	20-39		37	2	
21-41	20-41		41		
23-21	22-21			21	
N/A	22-32		32		
23-35	22-35	100			
23-53	N/A		53		
23-55	22-55		55		
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	N/A		23	20	
25-61	24-61		61		

Notes:

7. Consult latest MIL-C-38999 Qualified Products List 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.

MIL-C-38999 Series III & IV, (Notes 1 through 5) (Page 1 of 2)
Circular Connectors, -65°C to +200°C

Part Number Explanation:

D38999/XX	X	X	XX	Contact Type (Note 4)	X
Military Specification Number (Table 02-9-1)	Class (Table 02-9-2)	Shell Size	Arrangement Number	All Styles P = Pin S = Socket Hermetic Alternate Styles Y = Pins with eyelets Z = Sockets with eyelets	Insert Polarization N = Normal A, B, C, D, E = Alternate Positions (E N/A Series IV)

Insert Arrangement (Page 02-10)

Table 02-9-1 Connector Detail Specifications

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

Table 02-9-2

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

Notes: (Continued on page 02-10)

1. Connectors require additional processing for contamination control due to outgassing. Special low outgassing Series III connectors may be procured to GSFC Specification S-311-P-768.
2. Connectors may be used in Grade 1 and 2 applications.
3. Accessories such as strain relief backshells must be provided separately. Refer to Page 02-40 for a selection list.
4. Connectors are supplied with contacts. Refer to Page 02-37 for a selection of replacement contact part numbers.
5. Series III and Series IV connectors are not intermateable, nor are they intermateable with Series I or II.

Table 02-10-1 Insert Arrangements for MIL-C-38999 Series III & IV Connectors (Notes 6, 7)

Insert Arrangement			No. of Contacts (By Contact Size)			
Number	**Series III**	**Series IV**	**22D**	**20**	**16**	**12**
A35	X	N/A	6			
A98	X	N/A		3		
B4	X	N/A		4		
B5	X	X		5		
B35	X	X	13			
B98	X	N/A		6		
B99	X	X		7		
C4	X	X			4	
C8	X	N/A		8		
C35	X	X	22			
C98	X	X		10		
D5	X	X			5	
D15	X	N/A		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	

Insert Arrangement			No. of Contacts (By Contact Size)			
Number	**Series III**	**Series IV**	**22D**	**20**	**16**	**12**
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	N/A		37	2	
G41	X	X		41		
H21	X	X			21	
H35	X	X	100			
H53	X	N/A		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	N/A		23	20	
J61	X	X		61		

Notes:

6. Insert arrangement designation consists of shell size designator and arrangement number. Insert arrangements with a variety of contact sizes are available. Insert arrangement shell size designations are as follows: A=Shell size 9, B=11, C=13, D=15, E=17, F=19, G=21, H=23, J=25
7. Consult latest MIL-C-38999 Qualified Products List for availability. Other insert arrangements are available but are not preferred due to limited QPL availability.

MIL-C-26482 Series 2, Circular Connectors, (Notes 1 through 4) (Page 1 of 2)
Bayonet Coupled, -55°C to +200°C

Part Number Explanation:

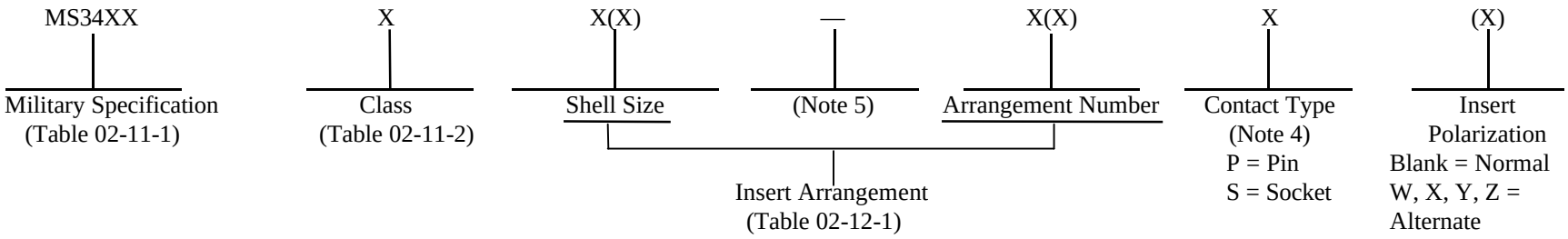


Table 02-11-1 Configuration Styles

MS3470 = Receptacle, Flange Mount, Narrow Flange

MS3472 = Receptacle, Flange Mount, Wide Flange

MS3474 = Receptacle, Jam Nut Mount

MS3475 = Plug, Cable Mount, RFI Shielded

MS3476 = Plug, Cable Mount

MS3449 = Receptacle, Hermetic

Table 02-11-2 Class

L = Fluid Resistant, Electroless Nickel Finish (Preferred)

A = Grommet Seal, Non-Conductive Anodic Coating (Not for use with MS3475 Plug)

H = Hermetic Seal, Steel Shell, Tin over Nickel Finish or stainless steel shell, passivated

Table 02-11-3 MS3449 Termination Type

Code	Description	Shell Mat'l
A	Solder cup	Stainless Steel
B	Eyelet	Stainless Steel
C	Soldercup	Cold Rolled Steel

Notes: (Continued on page 02-12)

1. Connectors require additional processing for contamination control due to outgassing. Special low outgassing connectors may be procured to GSFC Specification S-311-P-768.
2. Connectors are preferred for Grade 2 applications where outgassing is not a concern. Consult Appendix A for additional testing required in Grade 1.
3. Accessories such as strain relief backshells must be provided separately. Refer to Page 02-40 for a selection list.
4. Connectors are supplied with contacts. Refer to Page 02-37 for a selection of replacement contact part numbers.
5. For MS3449 Hermetic Connectors, replace the "—" with the code designation from Table 02-11-3 to specify solder contact terminations types. Only pin type contacts are available with hermetic connectors.

MIL-C-26482 Series 2, Circular Connectors, (Page 2 of 2)
Bayonet Coupled, -55°C to +200°C

Table 02-12-1 Insert Arrangements for MIL-C-26482 Connectors (Notes 6, 7)

Insert	No. of Contacts (By Contact Size)			Insert	No. of Contacts (By Contact Size)		
Arrangement	20	16	12	Arrangement	20	16	12
8-33	3			18-8			8
8-98	3			18-11		11	
10-6	6			18-30	29	1	
12-3		3		18-32	32		
12-8	8			20-16		16	
12-10	10			20-24	24		
14-4			4	20-39	37	2	
14-5		5		20-41	41		
14-9	5		4	22-12			12
14-12	8	4		22-21		21	
14-15	14	1		22-32	32		
14-18	18			22-41	27	14	
14-19	19			22-55	55		
16-8		8		22-95	26		6
16-14	8		6	24-19			19
16-23	22	1		24-31		31	
				24-61	61		

Notes:

6. Insert arrangement designation consists of shell size designator and arrangement number. Insert arrangements with a variety of contact sizes are available.
7. Consult latest MIL-C-26482 qualified products list for availability. Other insert arrangements are available but are not preferred due to limited availability.

MIL-C-5015, Circular Connectors, (Notes 1 through 4)
Threaded Coupling, Rear Release Contacts, -55°C to +200°C

Part Number Explanation:

MS345X	L	—	XX	(X)X(X)	X	X
Military Specification Number (Table 02-13-1)	Class L = Fluid Resistant Electroless Nickel Finish	Material Designator Blank = Aluminum Alloy	Shell Size	Arrangement Number	Contact Type P = Pin S = Socket	Insert Polarization Blank = Normal W, X, Y, Z = Alternate Positions

Insert Arrangement (Table 02-13-2)

Table 02-13-1 Connector Styles (Note 5)

MS3450 = Receptacle, Wall Mount	MS3456 = Plug, Cable Mount
MS3452 = Receptacle, Box Mount (No Provision for backshell Attachment)	MS3459 = Plug, Cable Mount, Self Locking Coupling Ring
MS3454 = Receptacle, Jam Nut Mount	

Notes:

1. Connectors require additional processing for contamination control due to outgassing.
2. Connectors are preferred for Grade 2. Consult Appendix A for additional testing required in Grade 1 applications.
3. Connectors are supplied with contacts. Refer to Page 02-37 for a selection of replacement contact part numbers.
4. Accessories such as strain relief backshells must be provided separately. Refer to Page 02-40 for a selection list.
5. These MIL-C-5015 connectors supersede MIL-C-83723 Series II connectors per MIL-C-83723/19 through MIL-C-83723/24. MS345X connectors are fully intermateable and intermountable with MIL-C-83723 Series II connectors.
6. Insert arrangement designation consists of shell size designator and arrangement number. Insert arrangements with a variety of contacts sizes are available. Only GSFC preferred insert arrangements are shown. Other insert arrangements are available. Consult latest MIL-C-5015 Qualified Products List for availability.

Table 02-13-2 Preferred MIL-C-5015 Insert Arrangements (Note 6)

	Number of Contacts (By Contact Size)				
Insert Arrangement	**16**	**12**	**8**	**4**	**0**
14S2 (Short Shell)	4				
14S5 (Short Shell)	5				
14S7 (Short Shell)	3				
16S1 (Short Shell)	7				
18-1	10				
20-4		4			
20-27	14				
22-2			3		
22-14	19				
22-22			4		
24-10			7		
24-28	24				
28-21	37				
32-17				4	
36-5					4
36-10	48				
36-52	52				

GSFC S-311-P-4 D-Subminiature Connectors, Crimp Removable Contacts, -55°C to +125°C (Notes 1 through 4)

Part Number Explanation:

311P4	0X	-X	X	-X	-XX
GSFC Procurement Specification Prefix	Detail Specification 09 = Standard Density (Size 20 contacts, (Page 02-17) 07 = High Density (Size 22D contacts) Page 02-18) 05 = Combination Inserts (Note 5)	Insert Arrangement	Contact Type S = Sockets P = Pins	Residual Magnetism Level B = 200 Gamma	Mounting Hole Size 12 = .120 in 15 = .150 in

Notes:

1. a. 311P409 connectors are described in detail on page 02-17 and are compared with MIL-C-24308 connectors with size 20 crimp contacts.
   b. 311P407 connectors are described in detail on page 02-18 and are compared with MIL-C-24308 connectors with size 22D crimp contacts.
   c. 311P405 connectors and insert arrangements are described in detail on page 02-20.
2. Connectors may be used in Grade 1 and Grade 2 applications.
3. 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.
4. Connectors satisfy GSFC outgassing requirements of 1 percent Total Mass Loss (TML) and 0.1 percent Collected Volatile Condensable Material (CVCM).
5. Connectors are offered with combination type inserts which offer a variety of insert arrangements for use with coaxial and high voltage contacts with No. 20 power contacts. Insert arrangements and contact part numbers are given on page 02-20.

GSFC S-311-P-10 D-Subminiature Connectors, Solder Contacts, -55°C to +125°C (Notes 1 through 4)

Part Number Explanation:

311P10	(B)	-X	X	-X	-XX
GSFC Procurement Specification Prefix	Socket Contact Designator (Not applicable to pin contacts) No digit = contact springs B = split finger sleeved (first choice)	Insert Arrangement Page 02-19 for Standard Density. Page 02-20 for combination insert arrangements.	Contact Type P = Pins S = Sockets	Residual Magnetism Level B = 200 Gamma C = 20 Gamma	Mounting Hole Size 12 = .120 inch 15 = .150 inch

Notes:

1. 311P10 connectors with insert arrangements 1 through 5 are described in detail on page 02-19, and are compared with equivalent MIL-C-24308 connectors with size 20 solder contacts. 311P10 connectors with insert arrangements 6 through 25 are shown in detail on page 02-20, and are compared to equivalent 311P405 combination insert connectors.
2. Connectors may be used in Grade 1 or Grade 2 applications.
3. 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.
4. Connectors satisfy GSFC outgassing requirements of 1 percent Total Mass Loss (TML) and 0.1 percent Collected Volatile Condensable Material (CVCM).

MIL-C-24308 D-Subminiature Connectors, -55°C to +125°C (Notes 1 through 5)

Part Number Explanation:

M24308	/X	-XXX
Military Specification Number	Detail Specification	Dash Number Unique number defining connector Options (Note 6)

/1 = Receptacle, Nickel Plated, Solder Contacts (Page 02-19)
/2 = Receptacle, Nickel Plated, Crimp Contacts (Pages 02-17 & 02-18)
/3 = Plug, Nickel Plated, Solder Contacts (Page 02-19)
/4 = Plug, Nickel Plated, Crimp Contacts (Pages 02-17 & 02-18)
/5 = Receptacle, Gold Plated, Solder Contacts (Page 02-19)
/6 = Receptacle, Gold Plated, Solder Contacts (Pages 02-17 & 02-18)
/7 = Plug, Gold Plated, Solder Contacts (Page 02-19)
/8 = Plug, Gold Plated, Crimp Contacts (Pages 02-17 & 02-18)

Notes:

1. Connectors are described in detail on page 02-17 (size 20 crimp contacts), 02-18 (size 22D crimp contacts), and 02-19 (size 20 solder contacts), and are referenced to corresponding GSFC S-311 specification.
2. Consult Appendix A for additional testing required for Grade 1 applications.
3. MIL-C-24308 connectors are supplied with 0.120 inch mounting holes or 0.086 float mount bushings.
4. Hardware such as screwlocks, jackscrews, and jackposts are required to properly secure mated connector pairs, and must be provided separately.
5. Connectors satisfy GSFC outgassing requirements of 1 percent Total Mass Loss (TML) and 0.1 percent Collected Condensable Volatile Material (CCVM).
6. MIL-C-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 on page 02-17, 02-18 and 02-19.

GSFC S-311-P-4/09 and MIL-C-24308 D-Subminiature Connectors
Standard Density Size 20 Crimp Contacts (Note 1)

	Description	General Purpose	Non-Magnetic	Non-Magnetic Controlled Low Residual Magnetism
	Shell Finish	**Nickel**	**Gold**	**Gold**
	Grade	**2**	**2**	**1 and 2**
	Specification	**MIL-C-24308/2**	**MIL-C-24308/6**	**GSFC S-311-P-4/09**
	Number of Contacts (All Size 20)	Part Number (Note 2)	Part Number (Note 2)	Part Number (Note 3)
Receptacle, Socket Contacts	9	M24308/2-516	M24308/6-502	311P409-1S-B-12
	15	M24308/2-517	M24308/6-503	311P409-2S-B-12
	25	M24308/2-518	M24308/6-504	311P409-3S-B-12
	37	M24308/2-519	M24308/6-505	311P409-4S-B-12
	50	M24308/2-520	M24308/6-506	311P409-5S-B-12
	Specification	**MIL-C-24308/4**	**MIL-C-24308/8**	**GSFC S-311-P-4/09**
	Number of Contacts (All Size 20)	Part Number (Note 2)	Part Number (Note 2)	Part Number (Note 3)
Plug, Pin Contacts	9	M24308/4-335	M24308/8-335	311P409-1P-B-12
	15	M24308/4-336	M24308/8-336	311P409-2P-B-12
	25	M24308/4-337	M24308/8-337	311P409-3P-B-12
	37	M24308/4-338	M24308/8-338	311P409-4P-B-12
	50	M24308/4-339	M24308/8-339	311P409-5P-B-12

Notes:

1. The following MIL-C-24308 numbers are also preferred parts for Grade 2 applications:
   M24308/2 -521 to -525 (kit); -560 to -564 (less contacts); -585 to -589, -596 to -600, -607 to -611 (.086 DIA float mount bushings in lieu of .120 DIA mounting holes).
   M24308/4 -340 to -344 (Kit), -357 to -361 (less contacts), -401 to -405, -412 to -416, -423 to -427 (float mount).
   M24308/6 -507 to -511 (Kit), -540 to -544 (less contacts), -551 to -555, -562 to -566, -573 to -577 (float mount).
   M24308/8 -340 to -344 (Kit), -357 to -361 (less contacts), -401 to -405, -412 to -416, -423 to -427 (float mount).
2. MIL-C-24308 Connectors are supplied with contacts. Replacement contact part numbers are M39029/63-368 for sockets and M24308/64-367 for pins.
3. GSFC connectors are supplied without contacts. Procure P/N G10S1 for socket contacts and G10SP1 for pin contacts per GSFC specification S-311-P-4/10.

GSFC S-311-P-4/07 and MIL-C-24308 D-Subminiature Connectors
High Density Size 22D Crimp Contacts (Note 1)

	Description	General Purpose	Non-Magnetic	Non-Magnetic Controlled Low Residual Magnetism
	Shell Finish	**Nickel**	**Gold**	**Gold**
	Grade	**2**	**2**	**1 and 2**
	Specification	**MIL-C-24308/2**	**MIL-C-24308/6**	**GSFC S-311-P-4/07**
	Number of Contacts (All Size 22D)	Part Number (Note 2)	Part Number (Note 2)	Part Number (Note 3)
Receptacle, Socket Contacts	15	M24308/2-526	M24308/6-512	311P407-1S-B-12
	26	M24308/2-527	M24308/6-513	311P407-2S-B-12
	44	M24308/2-528	M24308/6-514	311P407-3S-B-12
	62	M24308/2-529	M24308/6-515	311P407-4S-B-12
	78	M24308/2-530	M24308/6-516	311P407-5S-B-12
	104	M24308/2-531	M24308/6-517	311P407-6S-B-12
	Specification	**MIL-C-24308/4**	**MIL-C-24308/8**	**GSFC S-311-P-4/07**
	Number of Contacts (All Size 22D)	Part Number (Note 2)	Part Number (Note 2)	Part Number (Note 3)
Plug, Pin Contacts	15	M24308/4-345	M24308/8-345	311P407-1P-B-12
	26	M24308/4-346	M24308/8-346	311P407-2P-B-12
	44	M24308/4-347	M24308/8-347	311P407-3P-B-12
	62	M24308/4-348	M24308/8-348	311P407-4P-B-12
	78	M24308/4-349	M24308/8-349	311P407-5P-B-12
	104	M24308/4-350	M24308/8-350	311P407-6P-B-12

Notes:

1. The following MIL-C-24308 numbers are also preferred parts for Grade 2 applications:
   M24308/2 -532 to -537 (Kit); -565 to -570 (less contacts); -590 to -595, -601 to -606, -612 to -617 (.086 DIA float mount bushings in lieu of .120 DIA mounting holes).
   M24308/4 -351 to -356 (Kit), -362 to -367 (less contacts), -406 to -411, -417 to -422, -428 to -433 (float mount).
   M24308/6 -518 to -523 (Kit), -545 to -550 (less contacts), -556 to -561, -567 to -572, -578 to -583 (float mount).
   M24308/8 -351 to -356 (Kit), -362 to -367 (less contacts), -406 to -411, 417 to -422, -428 to -433 (float mount).
2. MIL-C-24308 Connectors are supplied with contacts. Replacement contact part numbers are M39029/57-354 for sockets and M24308/58-360 for pins.
3. GSFC connectors are supplied without contacts. Procure P/N G08S1for socket contacts and G08P1 for pin contacts per GSFC specification S-311-P-4/08.

GSFC S-311-P-10 and MIL-C-24308 D-Subminiature Connectors, Standard Density Size 20 Solder Contacts (Note 1)

	Description	General Purpose	Non-Magnetic	Non-Magnetic Controlled Low Residual Magnetism
	Shell Finish	Nickel	Gold	Gold
	Grade	2	2	1 and 2
	Specification	MIL-C-24308/1	MIL-C-24308/5	GSFC S-311-P-10
	Number of Contacts (All Size 20)	Part Number	Part Number	Part Number
Receptacle, Socket Contacts	9	M24308/1-34	M24308/5-34	311P10-1S-B-12
	15	M24308/1-35	M24308/5-35	311P10-2S-B-12
	25	M24308/1-36	M24308/5-36	311P10-3S-B-12
	37	M24308/1-37	M24308/5-37	311P10-4S-B-12
	50	M24308/1-38	M24308/5-38	311P10-5S-B-12
	Specification	MIL-C-24308/3	MIL-C-24308/7	GSFC S-311-P-10
	Number of Contacts (All Size 20)	Part Number	Part Number	Part Number
Plug, Pin Contacts	9	M24308/3-23	M24308/7-23	311P10-1P-B-12
	15	M24308/3-24	M24308/7-24	311P10-2P-B-12
	25	M24308/3-25	M24308/7-25	311P10-3P-B-12
	37	M24308/3-26	M24308/7-26	311P10-4P-B-12
	50	M24308/3-27	M24308/7-27	311P10-5P-B-12

Notes:

1. The following part number which offer .086 diameter float mount bushings in lieu of .120 diameter mounting holes are also preferred connectors for Grade 2 applications: M24308/1 -56 through -60; M24308/3-39 through -43; M24308/5-56 through -60; M24308/7-34 through -38.

GSFC S-311-P-4/05 and S-311-P-10 D-Subminiature Connectors, (Notes 1 and 2)
Combination Power, Coaxial and High Voltage Contacts

Table 02-20-1 Insert Arrangements

Insert Arrangement		Number of Contacts (Note 4)	
GSFC Number (Note 3)	Generic	Size 20 Standard Power	Coaxial and/or High Voltage
-6	5W1	4	1
-7	3W3	0	3
-8	7W2	5	2
-9	11W1	10	1
-10	5W5	0	5
-11	9W4	5	4
-12	13W3	10	3
-13	17W2	15	2
-14	21W1	20	1
-15	8W8	0	8
-16	13W6	7	6
-17	17W5	12	5
-18	21WA4	17	4
-19 (Cancelled)	N/A	17	4
-20	25W3	22	3
-21	N/A	25	2
-22	24W7	17	7
-23	36W4	32	4
-24	43W2	41	2
-25	N/A	46	1

Table 02-20-2 Coaxial and High Voltage Contact Part Numbers

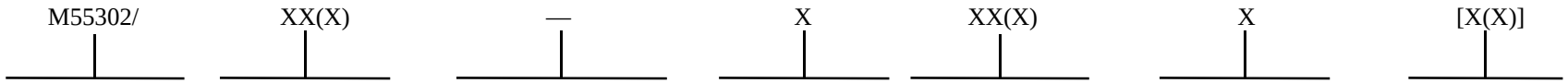
Part Number	Description	Standard Cable Part No.
GCP1	Coaxial Plug	M17/93-RG-178
GCP2		M17/94-RG-179, M17/113-RG-316
GCP3		M17/95-RG-180
GCRP1	Coaxial Right Angle Plug	M17/93-RG-178
GCRP2		M17/94-RG-179, M17/113-RG-316
GRRP3		M17/95-RG-180
GCS1	Coaxial Receptacle	M17/93-RG-178
GCS2		M17/94-RG-179, M17/113-RG-316
GCS3		M17/95-RG-180
GCRS1	Coaxial Right Angle	M17/93-RG-178
GCRS2	Receptacle	M17/94-RG-179, M17/113-RG-316
GCRS3		M17/95-RG-180
GHP6	High Voltage Plug	20 AWG through
GHS6	High Voltage Receptacle	26 AWG conductor
GHRP6	High Voltage Right Angle Plug	
GHRS6	High Voltage Right Angle Receptacle	

Notes:

1. Coaxial contacts should be used for signals of 1 Mhz frequency or less. Use MIL-C-39012 connectors for higher frequencies.
2. Some suppliers use a nylon insulator material in their high voltage contacts. The nylon insulator may not meet program outgassing limits.
3. Connectors utilizing GSFC insert arrangements 1 through 5 are for standard density inserts with size 20 solder contacts, and are listed on page 02-19.
4. Coaxial, high voltage and Crimp standard power contacts must be supplied separately. Refer to Table 02-20-02. Coaxial and high voltage contact part numbers referenced in Table 02-20-2 are procured per GSFC specification S-311-P-4/06. For Crimp type standard power contacts, procure P/N G10S1 for socket contacts and G10P1 for pin contacts per GSFC specification S-311-P-4/10.

MIL-C-55302 Printed Circuit Connectors, -65°C to +125°C (Notes 1 through 3) (Page 1 of 3)

Part Number Explanation:



M55302/	XX(X)	—	X	XX(X)	X	[X(X)]
Military Specification Number	Detail Specification	Socket Contact Type (Omit for Pin Contacts) - = Normal insertion force (N/A/190/192) L = Low Insertion Force	Terminal Type	Number of Contacts	Type of Mounting Hardware	Optional Polarization Code for Hardware Style "Y" (Note 4)

Part Number	Type Description	Terminal Type	No. of Contacts	Mounting Hardware Options (Table 2-22-4)
.100 Inch Spacing Between Contacts				
M55302/55XXXXX	Plug, Socket Contacts, Straight	Table 2-22-2	10, 14, 20 34, 26, 30, 36, 40, 44 50, 54, 56 60, 66, 70	L, M, S, H
M55302/56-XXXX	Receptacle, Pin Contacts	Table 2-22-2		Jackset
M55302/57-XXXX	Plug, Pin Contacts, Right Angle	Table 2-22-1		X, Y, S, H
M55302/58XXXXX	Receptacle, Socket Contacts	Table 2-22-2		X, Y, F, S, H
M55302/61-XXXX	Plug, Pin contacts, Right Angle	Table 2-22-1		Jackset
M55302/62XXXXX	Receptacle, Socket Contacts	Table 2-22-2		L, M, S, H
M55302/63-XXXX	Plug, Pin Contacts, Straight	Table 2-22-2		L, M, S, F, H, X, Y
M55302/64XXXXX	Receptacle, Socket Contacts	Table 2-22-2		F, X, Y
M55302/65XXXXX	Receptacle, Socket Contacts	Crimp Removable (Note 5)		X, Y, F, S, H
M55302/66XXXXX	Receptacle, Socket Contacts	Crimp Removable (Note 5)		L, M, S, F, H
M55302/59-XXXX	Plug, Pin Contacts, Right Angle	Table 2-22-1	90, 100, 120	X, Y, F, S, H
M55302/60XXXXX	Receptacle, Socket Contacts	Table 2-22-2		
M55302/138XXXXX	Plug, Pin Contacts, Right Angle	Table 2-22-1	160	
M55302/139XXXXX	Receptacle, Socket Contacts	See Detail Spec.		
.075 Inch Spacing Between Contacts				
M55302/190LXXXX	Receptacle, Socket Contacts	Table 2-22-3	100	X, Y, F, S, N, L, M
M55302/191XXXXX	Plug, Pin Contacts, Right Angle	Table 2-22-1		
M55302/192LXXXX	Receptacle, Socket Contacts	Table 2-22-3	122, 152	
M55302/193XXXXX	Plug, Pin Contacts, Right Angle	Table 2-22-1		

See notes on page 02-23.

Table 02-22-1 Contact Terminations Options for /57, /59, /61, /138, /191, /193
A = .109L Dip Terminal
B = .140L Dip Terminal
C = .172L Dip Terminal

Table 02-22-2 Contact Terminations Options for /55, /56, /58, /60, /62, /63, /64 (Note 6)
A = Solder Cup
B = .140L Dip Terminal
C = .172L Dip Terminal
F = .100 Flex Circuit Terminal (Not applicable to /60, /63)

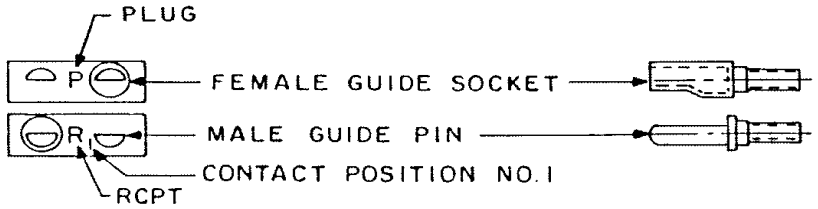
Table 02-22-3 Contact Terminations Options for /190 & /192 (Note 6)
A = Solder Cup
B = .109L Dip Terminal
C = .140L Dip Terminal
D = .172L Dip Terminal
E = .093 Flex Circuit Terminal

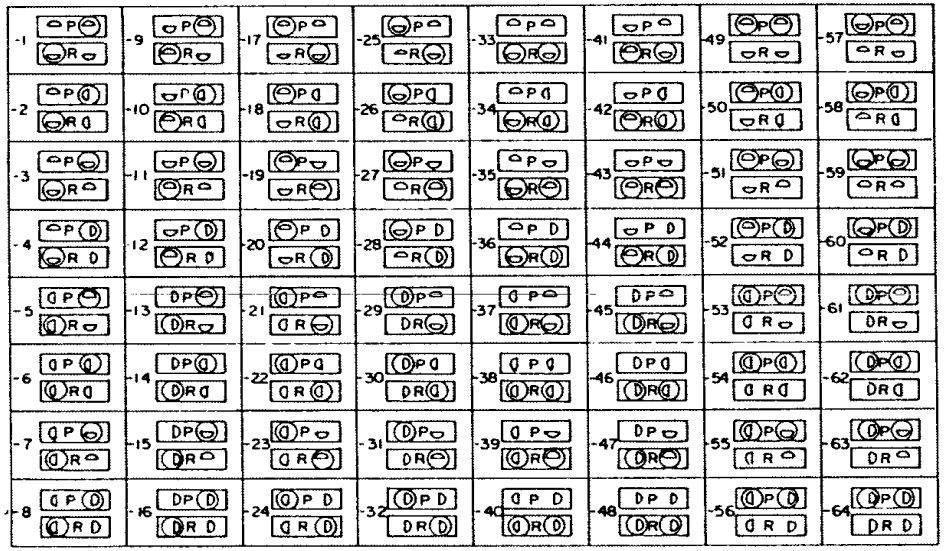
Table 02-22-4 Mounting Hardware Option
L = Long Slotted Turning Jackscrew (.700)
M = Medium Slotted Turning Jackscrew (.500)
S = Short Slotted Turning Jackscrew (.200) (Note 7)
F = Fixed Jackscrew
H = Short Hex Turning Jackscrew (.200) (Note 7)
X = Full Round Guidepins
Y = D Shaped Guidepins
N = Turning Hex Jackset

Table 02-22-5. Mating Information

Plug Detail Specification	Mating Receptacle Details Specification
/55	/56
/57, /61, /63	/58, /62, /64, /65, /66
/138	/139
/191	/190
/193	/192

Table 02-22-6 Connector Polarization with D Shaped Guide Pins and Sockets (Style





See notes on page 02-23.

MIL-C-55302 Printed Circuit Connectors, -65°C to +125°C (Page 3 of 3)

Notes:

1. Connectors are preferred for use in Grade 2 applications. Consult Appendix A for additional testing required in Grade 1 applications.
2. Connectors are available with 0.075 and 0.100 inch spacing between contacts and satisfy GSFC outgassing requirements.
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 polarization Table 02-22-6 shown on page 02-22. 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 .135 inches rather than .200 inches.

MIL-C-39012 Radio Frequency Connectors, (Notes 1 through 4) (Page 1 of 3)
SMA Series Coaxial, 50 Ohms

Part Number Explanation:

- M39012: Military Specification Number
- /XX: Detail Specification
- X: - = Field Replaceable (Standard); B = Non-Field Replaceable Not Preferred (Note 5)
- XXXX: Dash Number; -3XXX = Corrosion Resistant Steel Shell, Passivated Finish; -4XXX = Beryllium Copper Shell, Gold Finish

Part Numbers(s)		Configuration	Frequency, Max	Applicable Cable Type
Detail Specification	**Dash Number**			
M39012/55	-3006, -3025, -4006, -4025	Plug, Pin Contact, Cable Mount	12.4 GHz	M17/93-RG178
	-3007, -3026, -4007, -4026			M17/113-RG316
	-3009, -3028, -4009, -4028			M17/60-RG142
	-3010, -3029, -4010, -4029			M17/111-RG303
	-3030			M17/152-00001
	-3502, -4502			M17/128-RG400
M39012/56	-3006, -3025, -4006	Plug, Pin Contact, Right Angle, Cable Mount	12.4 GHz	M17/93-RG178
	-3007, -3026, -4007			M17/113-RG316
	-3009, -3028, -4009, -4028			M17/60-RG142
	-3010, -3029, -4010			M17/111-RG303
	-3030			M17/152-00001
	-3502, -4502			M17/128-RG400
M39012/57	-3006, -3025, -4006, -4025	Receptacle, Socket Contact, Cable Mount	12.4 GHz	M17/93-RG178
	-3007, -3026, -4007, -4026			M17/113-RG316
	-3009, -3028, -4009, -4028			M17/60-RG142
	-3010, -3029, -4010, -4029			M17/111-RG303
	-3030			M17/152-00001
	-3502, -4502			M17/128-RG400

See notes on page 02-26.

MIL-C-39012 Radio Frequency Connectors, (Notes 1 through 4) (Page 2 of 3)
SMA Series Coaxial, 50 Ohms

Part Numbers(s)		Configuration	Frequency, Max	Applicable Cable Type
Detail Specification	**Dash Number**			
M39012/58	-3006, -3025, -4006	Receptacle, Socket Contact, 4 Hole Flange Mount	12.4 GHz	M17/93-RG178
	-3007, -3026, -4007			M17/113-RG316
	-3009, -3028, -4009			M17/60-RG142
	-3010, -3029, -4010			M17/111-RG303
	-3030			M17/152-00001
	-3502, -4502			M17/128-RG400
M39012/59	-3006, -3025, -4006, -4025	Receptacle, Socket Contact, D-Hole Jam Nut Mount	12.4 GHz	M17/93-RG178
	-3007, -3026, -4007, -4026			M17/113-RG316
	-3009, -3028, -4009, -4028			M17/60-RG142
	-3010, -3029, -4010, -4029			M17/111-RG303
	-3030			M17/152-00001
	-3502, -4502			M17/128-RG400
M39012/60	-3001, -4001 (4 Hole) -3002 (2 Hole)	Receptacle, Socket Contact, Solder Cup, 4-Hole or 2-Hole Rear Flange Mount	Not Rated	All Flexible Cable Types
M39012/61	-3001, -4001 (Rear Mount) -3002, -4002 (Front Mount)	Receptacle, Socket Contact, Solder Cup, Rear or Front D-Hole Jam Nut Mount	Not Rated	All Flexible Cable Types
M39012/62	-3001, -4001 (Rear Mount) -3002, -4002 (Front Mount)	Receptacle, Socket Contact Hermetic Seal, Solder Lug Rear or Front D-Hole Jam Nut Mount	Not Rated	All Flexible Cable Types
M39012/79	-3009, -3007, -3207 -3010, -3008, -3208	Plug, Pin Contact, Cable Mount, Semirigid	18 GHz	M17/133-RG405 M17/130-RG402
M39012/80	-3009, -3005, -3007, -3207	Plug, Pin Contact, Right Angle, Semirigid	18 GHz	M17/133-RG405
	-3010, -3006, -3008, -3208			M17/130-RG402
M39012/81	-3007, -3011, -3207	Receptacle, Socket Contact, Cable Mount, Semirigid	18 GHz	M17/133-RG405
	-3008, -3012, -3208			M17/130-RG402

See notes on page 02-26.

MIL-C-39012 Radio Frequency Connectors, (Notes 1 through 4) (Page 3 of 3)
SMA Series Coaxial, 50 Ohms

Part Numbers(s)		Configuration	Frequency, Max	Applicable Cable Type
Detail Specification	**Dash Number**			
M39012/82	-3007, -3011, -3207 (4 Hole) -3013 (2 Hole)	Receptacle, Socket Contact, 4 Hole or 2 Hole Flange Mount, Semirigid	18 GHz	M17/133-RG405
	-3008, -3012, -3028, (4 Hole) -3014 (2 Hole)			M17/130-RG402
M39012/83	-3009, -3007, -3011, -3207 -3010, -3008, -3012, -3208	Receptacle, Socket Contact, Rear D Hole Jam Nut Mount, Semirigid	18 GHz	M17/133-RG405 M17/130-RG402
M39012/93	-3001 (.155L Solder Terminal) -3002 (.125L Solder Terminal) -3003 (.093L Solder Terminal)	Receptacle, Socket Contact, PC Mount	500 MHz to 18 GHz	PC Board Mount
M39012/94	-3001 (.155L Solder Terminal) -3002 (.125L Solder Terminal) -3003 (.093L Solder Terminal)	Receptacle, Socket Contact, PC Mount, Right Angle	500 MHz to 18 GHz	PC Board Mount

Notes:

1. Connectors are preferred for use in Grade 2 applications. Consult Appendix A for additional testing required in Grade 1 applications.
2. 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 or replacement of the silicone rubber O-Rings with fluorosilicone O-Rings which meet outgassing requirements.
3. Temperature range for flexible and semirigid connectors is -65°C to +165°C. Temperature range for PC mounted connectors is -65°C to +105°C.
4. The use of safety wire is recommended to secure mated connectors together.
5. B designated non-field replaceable connectors are not preferred. Most are inactive for new design.

MIL-C-83517 Radio Frequency Connectors (Notes 1 and 2) (Page 1 of 2)
Series SMA Transmission Line, 50 Ohms

Part Number Explanation:

M83517 /X XXXXX

Military Specification Number

Detail Specification

Dash Number
-31XXX = Corrosion Resistant Steel Shell, Passivated Finish
-32XXX = Corrosion Resistant Steel Shell, Gold Plated
-33XXX = Corrosion Resistant Steel Shell, Gold Plated Body and Passivated Coupling Nut

Part Number		Flange Mount Configuration		Solder Tab Configuration	
Detail Specification	**Dash Number**	**Body Style**	**No. of Mounting Holes**	**Dimensions**	**Insulator Protrusion From Flange**
M83517/1	-31001, 32001	Receptacle, Socket Contact	2	.005 x .020	Flush
	-31002, -32002			.005 x .050	
	31003, -32003		4	005 x .020	
	31004, 32004			.005 x .050	
M83517/2	-31001, 32001	Plug, Pin Contact	2	.005 x .020	
	-31002, -32002			.005 x .050	
	31003, -32003		4	005 x .020	
	31004, 32004			.005 x .050	
M83517/3	-31001, 32001	Receptacle, Socket Contact	2	.050 dia x .012 slot	
	-31002, -32002			.050 dia x .018 slot	
	-31003, -32003			.050 dia x .028 slot	
	-31007, -32007, -33007			.050 dia x .025 slot	.035 inches
	-31004, -32004		4	.050 dia x .012 slot	Flush
	-31005, -32005, -33005			.050 dia x .018 slot	
	-31006, -32006, -33006			.050 dia x .025 slot	

See notes on page 02-28.

MIL-C-83517 Radio Frequency Connectors (Notes 1 and 2) (Page 2 of 2)
Series SMA Transmission Line, 50 Ohms

Part Number		Flange Mount Configuration		Solder Tab Configuration	
Detail Specification	**Dash Number**	**Body Style**	**No. of Mounting Holes**	**Dimensions**	**Insulator Protrusion From Flange (inches)**
M83517/4	-31001, 32001	Receptacle, Socket Contact	2	.010 dia	.057
	-31002, -32002				.125
	-31003, -32003		4		.057
	-31004, -32004				.125
	-31005, -32005			.050	.590
M83517/5	-31001, -32001, -33001	Plug, Pin Contact	4	.050	.330

Notes:

1. Connectors are preferred for use in Grade 2 applications. Consult Appendix A for additional testing required in Grade 1 applications.
2. Temperature range is -65°C to +105°C. Frequency range is 0 to 18GHz.

MIL-C-83513 Microminiature Connectors, Pre-Terminated (Notes 1 through 5)
Crimp Contacts or Solder Contacts, -55°C to +125°C

Part Number Explanation:

M83513	/0X-	X	XX	N
Military Specification Number	Detail Specification (Table 02-29-1)	Insert Arrangement (Number of Contacts) A = 9 C = 21 E = 31 G = 51 B = 15 D = 25 F = 37 H = 100	Wire Type (Table 02-29-2) (Not applicable to solder contacts)	Shell Finish N = Electroless Nickel

Table 02-29-1 Connector Styles

Part Number	Type	Termination	Shell
M83513/1-XN	Plug, Pin Contacts	Soldercup	Aluminum, Electroless Nickel Plated
M83513/2-XN	Receptacle, Socket Contacts		
M83513/3-XXXN	Plug, Pin Contacts	Wire Pigtails	
M83513/4-XXXN	Receptacle, Socket Contacts		
M83513/6-X	Plug, Pin Contacts	Soldercup	All Plastic
M83513/7-X	Receptacle, Socket Contacts		
M83513/8-XX	Plug, Pin Contacts	Wire Pigtails	
M83513/9-XXX	Receptacle, Socket Contacts		

Table 02-29-2 Wire Pigtail Termination Types

Code	Wire	Length
01	M22759/33-26-9 (Note 6)	18”L
02		36”L
03	M22759/33-26-X (Notes 6, 7)	18”L
04		36”L
05	QQ-W-343, Solid 25 AWG, Gold Plated	.5”L
06		1.0”L
07	QQ-W-343, Solid 25 AWG, Tin Plated	.5”L
08		1.0”L
09	M22759/33-26-9	18”L
10		36”L
11	M22759/33-26-X	18”L
12		36”L
13	M22759/11-26-9	72”L
14	M22759/11-26-X (Note 7)	
15	M22759/33-26-9	
16	M22759/33-26-X (Note 7)	

Notes:

1. Connectors are preferred for Grade 2 applications. Consult Appendix A for additional testing required in Grade 1 applications.
2. MIL-C-83513 metal shell receptacle connectors contain a thin silicone rubber interface seal which may represent an outgassing concern. The seal is 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.
3. All contacts are on .050 inch centers between contacts and are size 24.
4. Metal shell connectors are not intermateable with plastic shell connectors.
5. Mounting hardware must be supplied separately. For insert arrangements A through G, use MIL-C-83513/5 configurations A or B. For insert arrangement H, use MIL-C-83513/5 configuration C.
6. Detail specification sheets require M22759/33-26 wire to be substituted for M22759/11-22 wire when connectors with finish “N” are used.
7. Optional color coding in accordance with MIL-STD-681, as modified by detail specification, may be used.

MIL-C-83513 Microminiature (Notes 1 through 3)
Printed Circuit Connectors, -55°C to +125°C

Part Number Explanation:

M83513	/XX-	X	OX	N	X
Military Specification Number	Detail Specification (Table 02-30-1)	Insert Arrangement A = 9 D = 25 G = 51 B = 15 E = 31 H = 100 C = 21 F = 37	PC Termination Length (inches) 01 = .109L 02 = .140L 03 = 172L	Shell Finish N = Electroless Nickel	Hardware N = No Jackpost P = Jackpost (Attached)

Table 02-30-1 Connector Styles

Part Number	Mounting	Type	Applicable Insert Arrangement
M83513/10-XOXNX	Right Angle	Plug, with Pin Contacts, Narrow Profile (Note 4)	A, B, C, D, E, F
M83513/11-GOXNX			G
M83513/12-HOXNX			H
M83513/13-XOXNX		Receptacle, Socket Contacts, Narrow Profile (Note 4)	A, B, C, D, E, F
M83513/14-GOXNX			G
M83513/15- HOXNX			H
M83513/16- XOXNX		Plug, Pin Contacts, Standard Profile	A, B, C, D, E, F
M83513/17- GOXNX			G
M83513/18- HOXNX			H
M83513/19- XOXNX		Receptacle, Socket Contacts, Standard Profile	A, B, C, D, E, F
M83513/20- GOXNX			G
M83513/21- HOXNX			H
M83513/22- XOXNX	Straight	Plug, Pin Contacts, Standard Profile	A, B, C, D, E, F
M83513/23- GOXNX			G
M83513/24- HOXNX			H
M83513/25- XOXNX		Receptacle, Socket Contacts, Standard Profile	A, B, C, D, E, F
M83513/26- GOXNX			G
M83513/27- HOXNX			H

Notes:

1. Connectors are preferred for Grade 2 applications. Consult Appendix A for additional testing required in Grade 1 applications.
2. MIL-C-83513 metal shell receptacle connectors contain a thin silicone rubber interface seal which may represent an outgassing concern. The seal is pressed in place and may be carefully removed to avoid outgassing. Otherwise, additional processing such as a bake is recommended to control outgassing. All other materials have good outgassing characteristics.
3. All contacts are on .050 inch centers between contacts and are size 24. PC terminations are solid No. 24 AWG copper wire.
4. Narrow profile connectors have contact terminations arranged so that additional rows are used in order to reduce overall connector length.

GSFC S-311-P-718 Satellite Interface Connectors (Notes 1 and 2) (Page 1 of 5)
Receptacle, Rectangular, Polarized Shell, EMI Shielded, Crimp Removable Pin Contacts

Part Number Explanation:

700-42/	X	-X	-X
GSFC Prefix	Detail Specification No.	Insert Arrangement	Contact Type P = Pin S = Socket

GSFC Part Number	GSFC Specification	Shell Size	Pin Contacts, Crimp (Note 3)		GSFC Contact Part Number	For Use With Wire Size (AWG)
			Qty.	Size		
700-42/3-1-P	S-311-P-718/3	1	8	8	GPP17	8
					GPP18	12
					GPP19	10
			58	16	GPP20	16, 18, 20
					GPP21	22, 24, 26
			6	RG393 (Note 4)	GCP14	M17/127-RG393
			6	RG142 (Note 4)	GCP15	M17/60-RG142
700-42/3-2-P		1	26	8	GPP17	8
					GPP18	12
					GPP19	10
			86	16	GPP20	16, 18, 20
					GPP21	22, 24, 26
			2	RG142 (Note 4)	GCP15	M17/60-RG142
700-42/3-3-P		1	244	16	GPP20	16, 18, 20
					GPP21	22, 24, 26
700-42/3-4-P		1	20	8	GPP17	8
					GPP18	12
					GPP19	10
			144	16	GPP20	16, 18, 20
					GPP21	22, 24, 26

See notes on page 02-35.

GSFC S-311-P-718 Satellite Interface Connectors (Notes 1 and 2) (Page 2 of 5)
Receptacle, Rectangular, Polarized Shell, EMI Shielded, Crimp Removable Pin Contacts

GSFC Part Number	GSFC Specification	Shell Size	Pin Contacts, Crimp (Note 3)		GSFC Contact Part Number	For Use With Wire Size (AWG)
			Qty.	Size		
700-42/5-1-P		2	10	16	GPP22	16, 18, 20
					GPP23	22, 24, 26
			4	20	GPP24	20, 22, 24
			88	22	GPP25	22, 24, 26
				RG122 (Notes 4, 5)	GCP29	M17/54-RG122 (Note 5)
700-42/5-2-P	S-311-P-718/5	2	16	16	GCP22	16, 18, 20
					GCP23	22, 24, 26
			52	20	GPP24	20, 22, 24
			2 (Note 6)	RG142 (Note 4)	GCP28	M17/60-RG142
				Triaxial	GTP26	Raychem 9530D5117
				Databus	GDP27	Champion 51-05091
700-42/6-1-P	S-311-P-718/6	3	8	16	GPP22	16, 18, 20
					GCP23	22, 24, 26
			12	20	GPP24	20, 22, 24
			20	22	GPP25	22, 24, 26
700-42/6-2-P		3	28	20	GPP24	20, 22, 24
			1	RG393 (Note 4)	GCP14	M17/127-RG393

See notes on page 02-35.

GSFC S-311-P-718 Satellite Interface Connectors (Notes 1 and 2) (Page 3 of 5)
Plug, Rectangular, Polarized Shell, EMI Shielded, Crimp Removable Socket Contacts

GSFC Part Number	GSFC Specification	Shell Size	Pin Contacts, Crimp (Note 3)		GSFC Contact Part Number	For Use With Wire Size (AWG)
			Qty.	Size		
700-42/3-1-S	S-311-P-718/3	1	8	8	GPS10	8
					GPS11	12
					GPS16	10
			58	16	GPS20	16, 18, 20
					GPS21	22, 24, 26
			6	RG393 (Note 4)	GCC14	M17/127-RG393
				RG142 (Note 4)	GCS15	M17/60-RG142
700-42/3-2-S		1	26	8	GPS10	8
					GPS11	12
					GPS16	10
			86	16	GPS20	16, 18, 20
					GPS21	22, 24, 26
			2	RG142 (Note 4)	GCS15	M17/60-RG142
700-42/3-5-S		1	244	16	GPS20	16, 18, 20
					GPS21	22, 24, 26
700-42/3-4-S		1	20	8	GPS10	8
					GPS11	12
					GPS16	10
			144	16	GPS20	16, 18, 20
					GPS21	22, 24, 26

See notes on page 02-35.

GSFC S-311-P-718 Satellite Interface Connectors (Notes 1 and 2) (Page 4 of 5)
Plug, Rectangular, Polarized Shell, EMI Shielded, Crimp Removable Socket Contacts

GSFC Part Number	GSFC Specification	Shell Size	Pin Contacts, Crimp (Note 3)		GSFC Contact Part Number	For Use With Wire Size (AWG)
			Qty.	Size		
700-42/5-1-S	S-311-P-718/5	2	10	16	GPS22	16, 18, 20
					GPS23	22, 24, 26
			4	20	GPS24	20, 22, 24
			88	22	GPS25	22, 24, 26
			1	RG122 (Notes 4, 5)	GCS29	M17/54-RG122 (Note 5)
700-42/5-2-S		2	16	16	GPS22	16, 18, 20
					GPS23	22, 24, 26
			52	20	GPS24	20, 22, 24
			2 (Note 6)	RG142 (Note 4)	GCS28	M17/60-RG142
				Triaxial	GTS26	Raychem 9530D5117
				Databus	GDS27	Champlain 51-05091
700-42/6-1-S	S-311-P-718/6	3	8	16	GPS22	16, 18, 20
					GPS23	22, 24, 26
			12	20	GPS24	20, 22, 24
			20	22	GPS25	22, 24, 26
700-42/6-2-S		3	28	20	GPS24	20, 22, 24
			1	RG393 (Note 4)	GCS14	M17/127-RG393

See notes on page 02-35.

GSFC S-311-P-718 Satellite Interface Connectors (Page 5 of 5)

Notes:

1. Connectors are for Grade 1 and Grade 2 applications. Connectors are intended to be used for power and signal interfaces between satellite main structure and subsystem modules. Temperature range for these connectors is -65°C to +125°C.

2. Strain relief backshell kits shall be procured to GSFC Specification S-311-P-718/4. Part numbers are as follows:

Part Number	Accommodating GSFC Connector P/N	Shell Size	Description
G1R	700-42/3-X-X	1	Kit, EMI Backshell with Clamp, Round Entry Hole
G1S	700-42/3-X-X	1	Kit, EMI Backshell with Clamp, Square Entry Hole
G2R	700-42/5-X-X	2	Kit, EMI Backshell with Clamp, Round Entry Hole
G3R	700-42/6-X-X	3	Kit, EMI Backshell with Clamp, Round Entry Hole

3. Connectors are supplied without contacts. Contacts shall be procured to GSFC Specification S-311-P-718/2.

Example of Contact Part Number:

G	X	X	XX
GSFC Prefix	Contact Description P = Power T = Triaxial C = Coaxial D = Databus	Contact Type P = Pin S = Socket	Two Digit Designator from S-311-P-718/2

4. Designates coaxial contact for use with coaxial cable from MIL-C-17. Refer to S-311-P-718/2 for coaxial contact installation details.

5. RG122 is for reference only and is not space compatible.

6. Coaxial, triaxial or databus contacts may be used with this connector.

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MIL-C-39029 Contacts, Electrical Connector (Notes 1 through 3) (Page 1 of 2)
Crimp Removable

Part Number Explanation:

M39029 /XX -XXX

- M39029: Military Specification Number
- /XX: Detail Specification
- -XXX: Basic Identification Number (BIN Code)

Part Number	Control Specification	Connector Accommodation Specification	Contact Size		Wire Sizes
			Pins	Sockets	
M39029/4-110	MIL-C-39029/4	MIL-C-26482 Series 2	20		20, 22, 24
M39029/4-111			16		16, 18, 20
M39029/4-113			12		12, 14
M39029/5-115	MIL-C-39029/5			20	20, 22, 24
M39029/5-116				16	16, 18, 20
M39029/5-118				12	12, 14
M39029/29-212	MIL-C-39029/29	MIL-C-5015	16		16, 18, 20
M39029/29-213			12		12, 14
M39029/29-214			8		8, 10 (Note 4)
M39029/29-215			4		4, 6 (Note 4)
M39029/29-216			0		0, 1, 2 (Note 4)
M39029/30-218	MIL-C-39029/30			16	16, 18, 20
M39029/30-219				12	12, 14
M39029/30-220				8	8, 10 (Note 4)
M39029/30-221				4	4, 6 (Note 4)
M39029/30-222				0	0, 1, 2 (Note 4)
M39029/56-348	MIL-C-39029/56	MIL-C-38999 Series I, III, & IV		22D	22, 24, 26
M39029/56-351				20	20, 22, 24
M39029/56-352				16	16, 18, 20
M39029/56-353				12	12, 14

See notes on page 02-38.

MIL-C-39029 Contacts, Electrical Connector (Notes 1 through 3) (Page 2 of 2)
Crimp Removable

Part Number	Control Specification	Connector Accommodation Specification	Contact Size		Wire Sizes
			Pins	Sockets	
M39029/57-354	MIL-C-39029/57	MIL-C-38999 Series II		22D	22, 24, 26
M39029/57-357				20	20, 22, 24
M39029/57-358				16	16, 18, 20
M39029/57-359				12	12, 14
M39029/58-360	MIL-C-39029/58	MIL-C-38999 Series I, II, III, & IV	22D		22, 24, 26
M39029/58-363			20		20, 22, 24
M39029/58-364			16		16, 18, 20
M39029/58-365			12		12, 14
M39029/63-368	MIL-C-39029/63	MIL-C-24308	—	20	20, 22, 24
M39029/64-369	MIL-C-39029/64		20	—	20, 22, 24
M39029/57-354	MIL-C-39029/57		—	22D	22, 24, 26
M39029/58-360	MIL-C-39029/58		22D	—	22, 24, 26

Notes:

1. Contacts are preferred for Grade 2 applications. Consult Appendix A for additional screening required in Grade 1 applications.
2. Identification color bands on these contacts may be an outgassing concern. Additional processing may be required for outgassing control.
3. Contacts have gold finish per MIL-C-45204, Type II, Grade C, Class 1 (50 microinches, minimum) applied to the contact engagement area. The entire contact is finished in Gold.
4. Electrically conductive bushings as provided in MS3348 should be used when crimping wire sizes 10, 6, and 2 in contact sizes 8, 4, and 0 respectively. Example of P/N: MS3348-8-10 where 8 is contact wire barrel size and 10 is wire size.

MIL-C-85049 Connector Accessories, Electrical (Notes 1 through 3) (Page 1 of 2)

Part Number Explanation: (Refer to detail specification for shell sizes):

M85049	/10 /15 /36 /76	- S -	XX XX XX XX	N N N N	XX XX	X
Military Specification Number	Detail Specification	S = Self Locking Type Only (Not Available for all Types)	Connector Shell Size	Nickel Finish	Clamp Size	Backshell Length

Notes:

1. Refer to page 02-40 for a table of preferred backshell connector accessories.
2. Preferred for Grades 1 and 2. All backshells in this section are nickel plated and are rated -65°C to +200°C. Consult latest Qualified Products List (QPL) for availability.
3. The use of safety wire is recommended to secure backshells which are not self-locking.
4. When procuring backshell accessories for use with MIL-C-38999 Series I connectors, complete the part number by specifying the equivalent Series II shell size. For example, when ordering Series I shell size 9, specify Series II shell size 8. For shell size 11, specify shell size 10, etc.
5. Environmentally sealed backshells contain a silicone rubber grommet and O ring which represents an outgassing concern. Additional processing for outgassing control, such as a bake, is recommended.
6. Backshell is equipped with an arm which extends from the rear of the backshell body. Strain relief is accomplished through the use of Tefzel tie wraps, lacing twine, or lacing tape, which is tied to the arm, and must be provided separately.
7. Backshell requires M85049/26-2-XX crimp ferrule ring to terminate shield to backshell. Ring is supplied with M85049/26-3, but must be provided separately for M85049/20 and M85049/33-2 backshells. Backshell M85049/26-1 may be used in lieu of M85049/26-3, but crimp ferrule ring M85049/26-2 must be provided separately. Ferrule requires Thomas & Betts Crimp Tool No. 13640 or equivalent and appropriate size die.
8. Ring type backshells have a chamfered edge which, when installed to the rear of the connector, compresses the connector's silicone rubber grommet seal around the exiting wires to provide limited seal and strain relief. Intended for unit mounted connector receptacles only.
9. Backshell is used to terminate the shields of individually shielded wires, or to terminate the shields of several MIL-C-27500 type shielded cables.

MIL-C-85049 Connector Accessories, Electrical (Notes 1 through 3) (Page 2 of 2)

Part Number	Notes	Applicable Connector Procurement Specification				Backshell Description			Strain Relief Type			Configuration		
		5015 Crimp	26482 Series 2	38999 Series I & II (Note 4)	38999 Series III & IV	Sealed	Self Locking	Shield Termination	Clamp	Tie Wrap	Ring	Straight	45°	90°
M85049/6-XXN	(Note 5)	X	X			X		X	X				X	
M85049/7-XXN	(Note 5)	X	X			X			X				X	
M85049/8-XXN	(Note 5)	X	X			X		X	X					X
M85049/9-XXN	(Note 5)	X	X			X			X					X
M85049/10-XXN	(Note 5)	X	X			X		X	X			X		
M85049/11-XXN	(Note 5)	X	X			X			X			X		
M85049/15SXXN	(Note 6)				X		X			X			X	
M85049/16SXXN	(Note 6)				X		X			X				X
M85049/17XXNXXX	(Note 5)			X		X		X	X			X		
M85049/18XXNXXX	(Note 5)				X	X		X	X			X		
M85049/19XXNXXX					X			X				X		
M85049/20-XXN	(Note 7)				X			X (Crimp Ring)				X		
M85049/23-XXN		X	X					X	X				X	
M85049/24-XXN		X	X					X	X					X
M85049/25-XXN		X	X					X	X			X		
M85049/26-3-XXN	(Note 7)	X	X					X (Crimp Ring)				X		
M85049/27SXXN	(Note 8)			X (Series II Only)			X				X	X		
M85049/30-XXN	(Note 9)			X				X (Daisy Chain)				X		
M85049/31SXXN	(Note 8)	X	X				X				X	X		
M85049/33-2-XXN	(Note 7)			X				X (Crimp Ring)				X		
M85049/36XXNXXX				X				X	X			X		
M85049/38SXXN					X		X		X			X		
M85049/39SXXN					X		X		X					X
M85049/43-XXN		X	X						X				X	
M85049/47SNXX				X			X		X					X
M85049/49-2SXXN				X			X		X			X		
M85049/51SXXN		X	X				X		X					X
M85049/52SXXN		X	X				X		X			X		
M85049/56-XXN	(Note 6)			X						X		X		
M85049/57SXXN	(Note 6)			X			X			X			X	
M85049/63SXXN	(Note 6)			X			X			X				X
M85049/76-XXNXX	(Note 5)			X		X		X	X					X
M85049/77-XXNXX	(Note 5)			X		X		X	X				X	
M85049/78-XXNXX	(Note 5)				X	X		X	X				X	
M85049/79-XXNXX	(Note 5)				X	X		X	X					X

See notes on page 02-39.