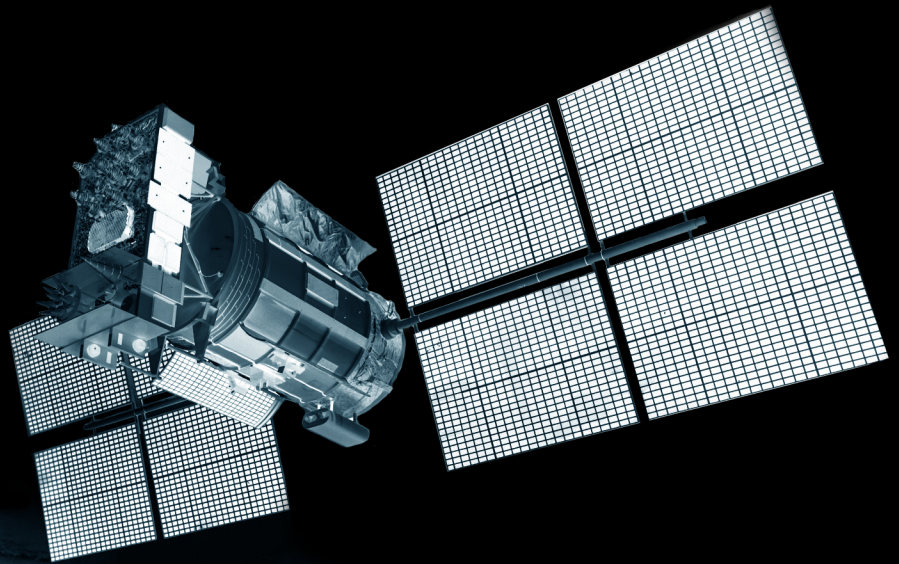


MCX / MMCX

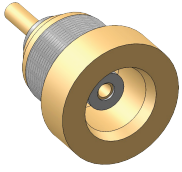
High Performance
Board and Cable
Interconnects





DELTA
Electronics Mfg. Corp.

MCX Series



High Performance Board and Cable Interconnects



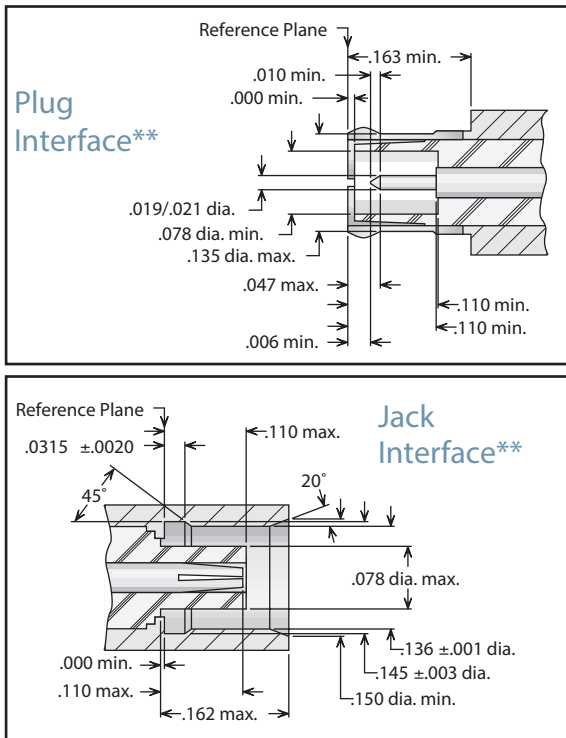
Introduction

Delta MCX connectors are subminiature, 50Ω impedance connectors with snap-on coupling. They are best suited for use with cables in the range of .070" to .120" diameter, such as RG-178 and RG-316/U. These connectors provide small size, light weight, and economy with the convenience of snap-on mating and the ability to rotate connector pairs after mating for precise alignment. All Delta MCX connectors are available with gold-plated bodies, or with nickel-plated bodies for economy. As with our other connector series-Delta's customer-driven design results in MCX series connectors with practical and unique features that make your design and assembly process easier. Some of these include:

- PressMount receptacles mount securely in a single round hole, saving space on your components and reducing your housing fabrication costs.
- P. C. board receptacles with a choice of through-hole, edge mounting, or surface mounting.
- P. C. board jack receptacle that fit flush with the edge of boards, ideal for daughterboard applications.

Our MCX series product line is still growing, so please call if you don't see what you need.

Interfaces



**Some proportions altered to illustrate detail.

Specifications

Electrical Specifications:

Nominal Impedance: 50 ohms.
Frequency Range: DC–6 GHz.
Voltage Rating: 250-335 volts RMS (dependent on cable).
Voltage : 750–1000 volts RMS (dependent on cable).
Insulation Resistance: 1,000 megohms.

Materials / Finishes:

Insulators: Teflon per ASTM D1710.
Male Contacts: Brass per ASTM B16, or
Beryllium Copper per ASTM B196.
Female Contacts: Beryllium Copper per ASTM B196.
Contact Plating: Gold per MIL-G-45204.
Gaskets: Silicone rubber per ZZ-R-765, Class II, Grade 50.
Other Metal Parts: Brass per ASTM B16 or equivalent;
plated gold per MIL-G-45204, or nickel per QQ-N-290.

All other specifications are in accordance with the latest issues of CECC 22220, series MCX.

*These specifications are typical and may not apply to all connectors. Detailed specifications for individual connectors are available on request.

Applications

GPS
Base Stations
Wireless
Instrumentation
Automotive

Antennas
Satcom
Telecom
Broadband
PCS



AS9100 / ISO9001
QMS CERTIFIED

DFARS
COMPLIANT

ROHS
COMPLIANT

ITAR
COMPLIANT

JCP
REGISTERED

Straight and Right Angle Cable Plugs

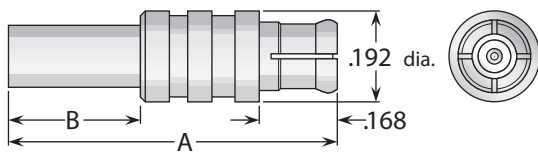


Figure 1

(Crimp type for flexible cable)

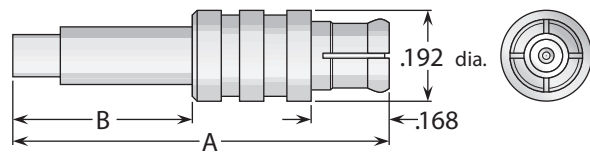


Figure 2

(Crimp type for flexible cable)

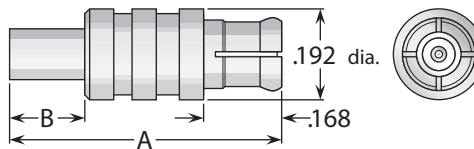


Figure 3

(Direct solder for semi-rigid cable)

Cable Group	Figure	Dimensions		Plating		Delta P/N	Assembly Procedure/ Trim Code
		A	B	Body	Contact		
9	1	.69	.27	Gold*	Gold	9803037G000-500	B/32
10	1	.69	.27	Gold*	Gold	9803100G000-500	B/32
11	2	.79	.37	Gold*	Gold	9803038G000-500	B/33
14	3	.58	.16	Gold*	Gold	9801025G003-500	H/03

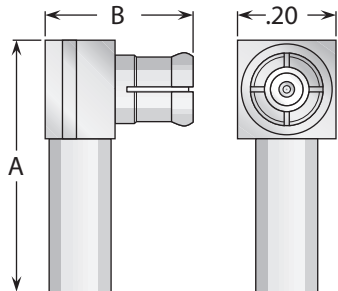


Figure 1

(Crimp type for flexible cable)

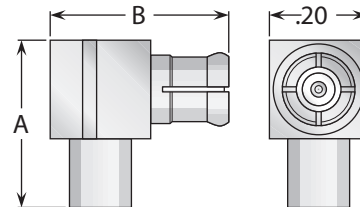


Figure 2

(Direct solder for semi-rigid cable)

Cable Group	Figure	Dimensions		Plating		Delta P/N	Assembly Procedure/ Trim Code
		A	B	Body	Contact		
9	1	.52	.31	Gold*	Gold (C)	9807100G001-500	L/04
10	1	.52	.31	Gold*	Gold (C)	9807100G001-500	L/04
11	1	.47	.31	Gold*	Gold (C)	9807038G001-500	L/04
13	2	.38	.37	Gold*	Gold (C)	9805031G003-500	J/03
14	2	.38	.37	Gold*	Gold (C)	9805025G003-500	J/03

Cable Groups

9	RG-174, 179, 187, 188, 316; M17/94, 136, 152	13	.141" semi-rigid; RG-402; M17/130
10	Double-Shielded RG-174, 316; M17/152	14	.085" semi-rigid; RG-405; M17/133
11	RG-178, 178A, 178B, 196, 196A; M17/93		

* Also available with nickel-plated body—change G in Delta part number to N.
 (C) in contact plating column indicates captive contact. Assembly procedures start on page 6.

Straight Cable Jacks

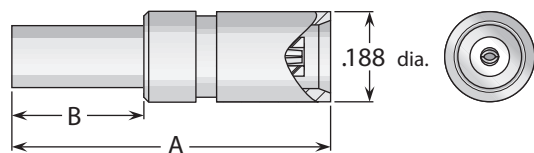


Figure 1
(Crimp type for flexible cable)

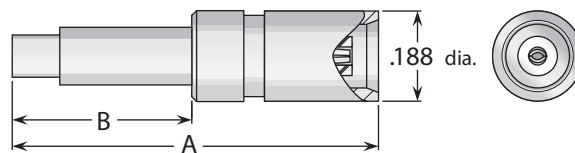


Figure 2
(Crimp type for flexible cable)

Cable Group	Figure	Dimensions		Plating		Delta P/N	Assembly Procedure/ Trim Code
		A	B	Body	Contact		
9	1	.66	.27	Gold*	Gold (C)	9810037G001-500	B/34
10	1	.66	.27	Gold*	Gold (C)	9810100G001-500	B/34
11	2	.78	.37	Gold*	Gold (C)	9810038G001-500	B/35

Straight Bulkhead Jack—For Flexible Cable

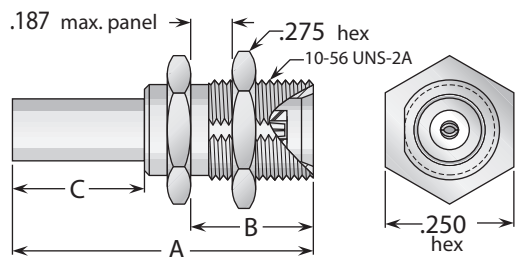


Figure 1
(Crimp type for flexible cable)

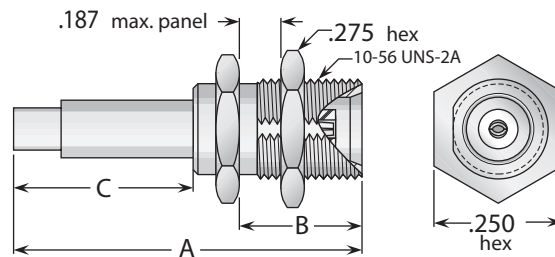


Figure 2
(Crimp type for flexible cable)

Cable Group	Fig.	Dimensions			Mounting Figure	Plating		Delta P/N	Assembly Procedure/ Trim Code
		A	B	C		Body	Contact		
9	1	.69	.307	.27	68	Gold*	Gold (C)	9819037G681-500	B/36
10	1	.69	.307	.27	68	Gold*	Gold (C)	9819100G681-500	B/36
11	2	.79	.307	.37	68	Gold*	Gold (C)	9819038G681-500	***

Cable Groups

9	RG-174, 179, 187, 188, 316; M17/94, 136, 152	13	.141" semi-rigid; RG-402; M17/130
10	Double-Shielded RG-174, 316; M17/152	14	.085" semi-rigid; RG-405; M17/133
11	RG-178, 178A, 178B, 196, 196A; M17/93		

* Also available with nickel-plated body—change G in Delta part number to N. • See page 7 for mounting dimensions.
(C) in contact plating column indicates captive contact.

Assembly procedures start on page 6. • ***Contact factory for assembly procedures.

Straight Printed-Circuit Board Jack Receptacles

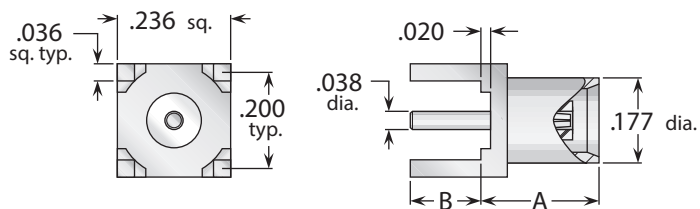


Figure 1
(Through-hole mount)

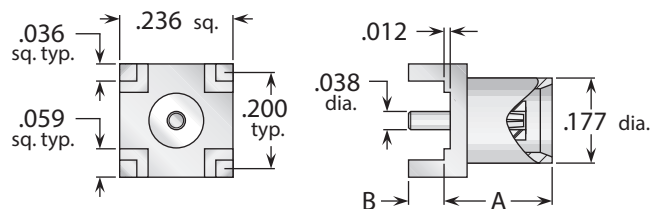


Figure 2
(Through-hole mount)

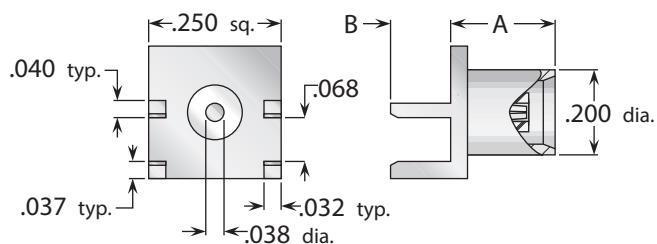


Figure 3
(Edge mount, for .062" thick board)

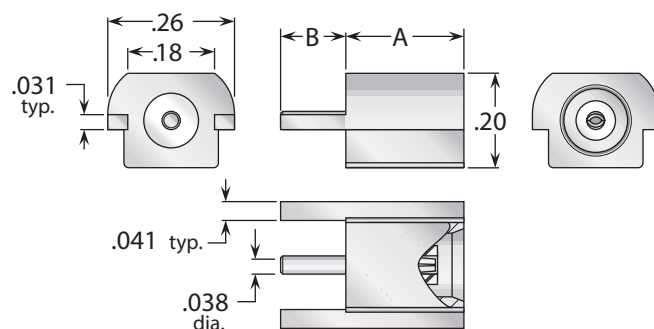


Figure 4
(Flush edge mount)

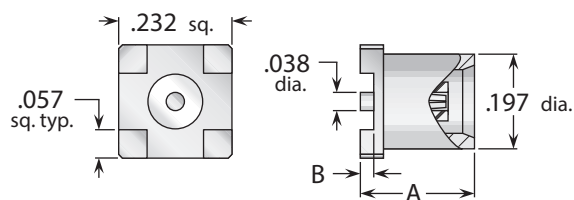


Figure 5
(Surface mount)

Figure	Dimensions		Max. Board	Mounting Figure	Plating		Delta P/N
	A	B			Body	Contact	
1	.218	.155	.100	PCB06	Gold*	Gold (C)	9867000G001-500
2	.240	.059	.040	PCB06	Gold*	Gold (C)	9867000G001-501
3	.250	.125	N/A	***	Gold*	Gold (C)	9867000G91P-500
4	.246	.120	N/A	***	Gold*	Gold (C)	9867000G001-503
5	.236	.016	N/A	***	Gold*	Gold (C)	9867000G001-504

* Also available with nickel-plated body—change G in Delta part number to N. • See page 7 for mounting dimensions.
 (C) in contact plating column indicates captive contact. • ***Contact factory for mounting information.

Right Angle Printed-Circuit Board Jack Receptacle

Figure 1
(Through-hole mount)

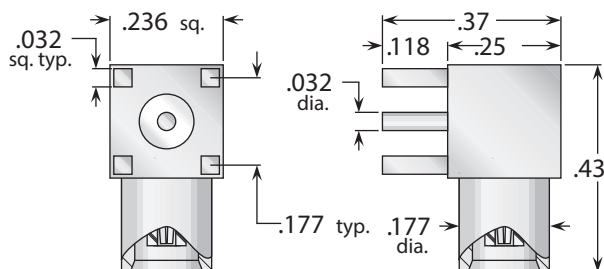


Figure	Max. Board Thickness	Mounting Figure	Plating		Delta P/N
			Body	Contact	
1	.062	PCB07	Gold*	Gold (C)	9869000G001-500

Printed-Circuit Board Plug Receptacles

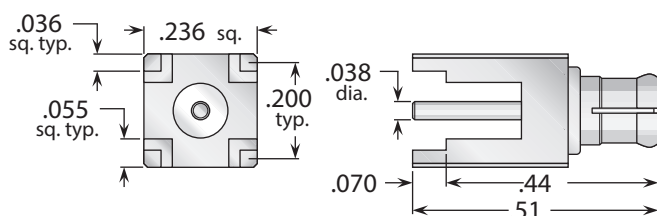


Figure 1
(Straight—through-hole mounting)

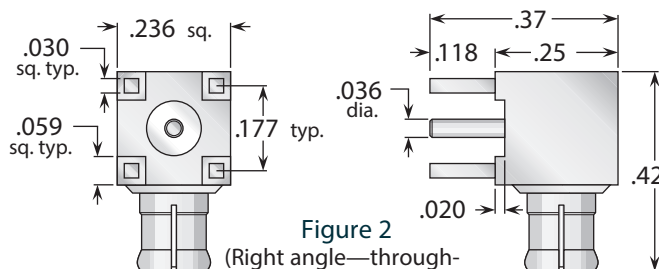
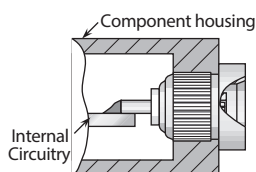


Figure 2
(Right angle—through-hole mounting)

Figure	Max. Board Thickness	Mounting Figure	Plating		Delta P/N
			Body	Contact	
1	.050	PCB06	Gold*	Gold (C)	9868000G001-500
2	.062	PCB07	Gold*	Gold (C)	9870000G001-500

PressMount Receptacles



Delta PressMount Receptacles

These connectors eliminate the need for complicated mounting hole patterns and mounting hardware. They are simply pressed into a single through hole, and the precisely-engineered knurled mounting section provides retention strength far greater than normal mating and unmating forces. An integral shoulder provides a positive stop when mounting.

Figure 1 (Post contact)

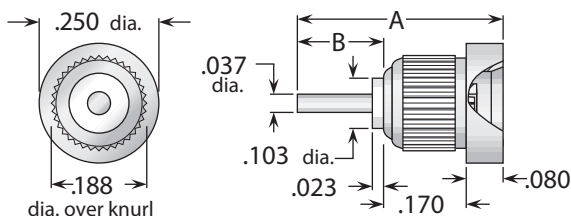
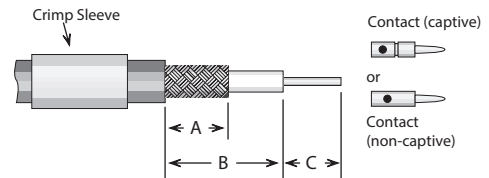


Figure	Dimensions		Min. Panel	Mounting Hole	Plating		Delta P/N
	A	B			Body	Contact	
1	.40	.15	.100	.184 ±.001 dia.	Gold*	Gold (C)	9820000G911-001
1	.73	.48	.100	.184 ±.001 dia.	Gold*	Gold (C)	9820000G911-008

* Also available with nickel-plated body—change G in Delta part number to N. • See page 7 for mounting dimensions.
(C) in contact plating column indicates captive contact.

Assembly Procedure B

- 1) Trim cable per chart. Slide crimp sleeve back onto cable.



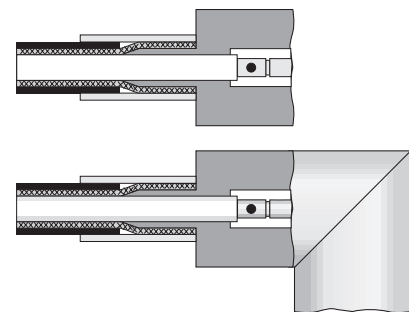
- 2) If support insulator is provided for RG-62 or 71 cable, insert into hollow in dielectric. Solder contact onto center conductor; back of contact flush with trimmed end of cable dielectric (omit this step for right angle connectors with access caps). Flare cut end of braid slightly by rotating dielectric.



- 3) Insert cable/contact into rear of body, with all braid wires on outside of crimp tail.
 - a) For captive contact connectors, push cable in until contact snaps into insulator.
 - b) For noncaptive contact connectors, push cable in until cable dielectric bottoms in connector.
 - c) For right angle or tee connectors with access caps, push cable in until end of braid touches connector body shoulder, and cable center conductor rests in contact slot.

Trim excess braid wires even with shoulder of body. Slide crimp sleeve forward until flush with body and crimp (see page 13 for hex die sizes).

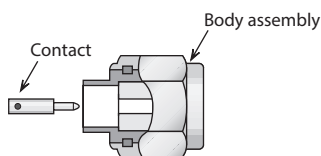
For right angle or tee connectors with access caps: Solder center conductor into contact slot, assemble insulator disc (if supplied), then press cap into body until seated or screw into place.



Trim Codes For Assembly Procedure B

Code	A	B	C
B/32	.175	.260	.095
B/33	.195	.270	.045
B/34	.150	.250	.105
B/36	.150	.325	.090
B/37	.195	.295	.075

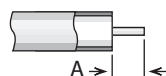
Assembly Procedure H



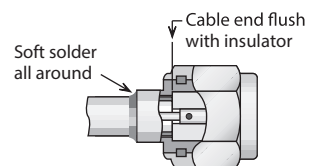
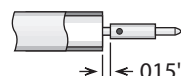
Trim Codes

Code	A
H/01	.090
H/02	.060
H/03	.115
H/04	.150

- 1) Trim cable as shown. Remove any burrs from jacket and center conductor.



- 2) Solder contact to center conductor, fixturing to maintain gap as shown. Remove any excess solder from outside of contact.

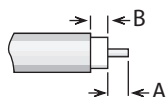


- 3) Insert cable into body and solder cable jacket to body, keeping end of cable flush with insulator as shown.

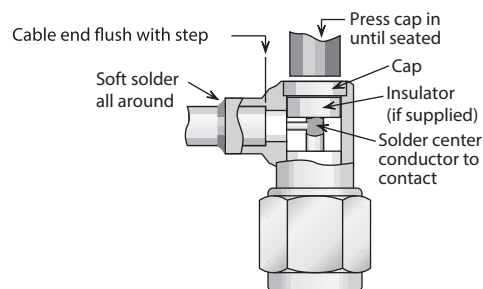
Plug body assembly and contact shown; procedure is identical for jack connectors.

Assembly Procedure J

Trim Codes		
Code	A	B
J/01	.109	.047
J/02	.059	.039
J/03	.059	.079
J/04	.050	.059

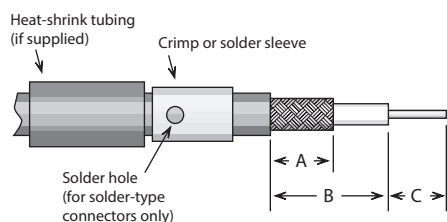


1) Trim cable as shown. Remove any burrs from jacket and center conductor.



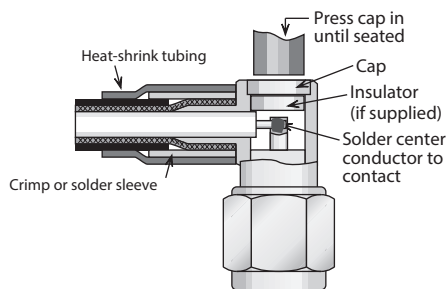
2) Soft solder cable jacket to body, making sure that end of cable is flush with step in body. Solder center conductor into contact slot, assemble insulator disc (if supplied), then press cap into body until seated or screw into place.

Assembly Procedure L



1) Trim cable per chart. Slide crimp (or solder) sleeve and heat-shrink tubing (if supplied) back onto cable.

Trim Codes			
Code	A	B	C
L/01	.250	.438	.109
L/02	.125	.219	.109
L/03	.234	.344	.109
L/04	.195	.270	.050
L/05	.095	.155	.050



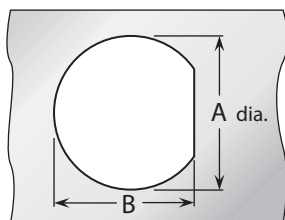
2) Insert cable into rear of body, with all braid wires on outside of crimp tail. Push cable in until end of braid touches connector body shoulder and center conductor rests in contact slot. Trim excess braid wires even with shoulder of body.

Slide crimp sleeve forward until flush with body and crimp (see page 13 for hex die sizes). (For solder-type connectors, solder braid to body and sleeve through hole in sleeve.)

Slide heat-shrink tubing into place and shrink with hot-air gun. Solder center conductor into contact slot, assemble insulator disc (if supplied), then press cap into body until seated or screw into place.

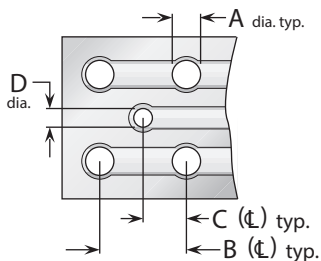
Panel Cutouts

(Bulkhead mounted connectors)



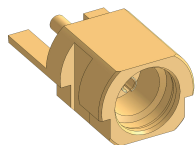
D-Hole		
Figure	A	B
68	.195	.176

P.C. Board Drilling



Coaxial connectors

Figure	A	B	C	D
PCB06	.067	.200	.100	.045
PCB07	.045	.177	.088	.045
PCB08	.032	.100	.050	.032



MicroMiniature Connectors



Introduction

Delta MMCX connectors are microminiature, 50Ω impedance connectors with snap-on coupling. They are best suited for use with cables in the range of .070" to .120" diameter, such as RG-178 and RG-316/U. These connectors provide small size, light weight, and economy with the convenience of snap-on mating and the ability to rotate connector pairs after mating for precise alignment. Their non-slotted outer contact provides for low RF leakage. All Delta MMCX connectors are available with gold-plated bodies, or with nickel-plated bodies for economy. As with our other connector series- Delta's customer-driven design results in MMCX series connectors, with practical and unique features that make your design and assembly process easier. Some of these include:

- MMCX P. C. board receptacles with a choice of through-hole, edge mounting, or surface mounting.
- P. C. board jack receptacles that fit flush with the edge of boards, ideal for daughterboard applications.

Our MMCX series product line is still growing, so please call if you don't see what you need.

Specifications

Electrical Specifications:

Nominal Impedance: 50 ohms.
 Frequency Range: DC–6 GHz.
 Voltage Rating: 170 volts RMS.
 Dielectric Withstanding Voltage: 500 volts RMS.
 Insulation Resistance: 1,000 megohms.

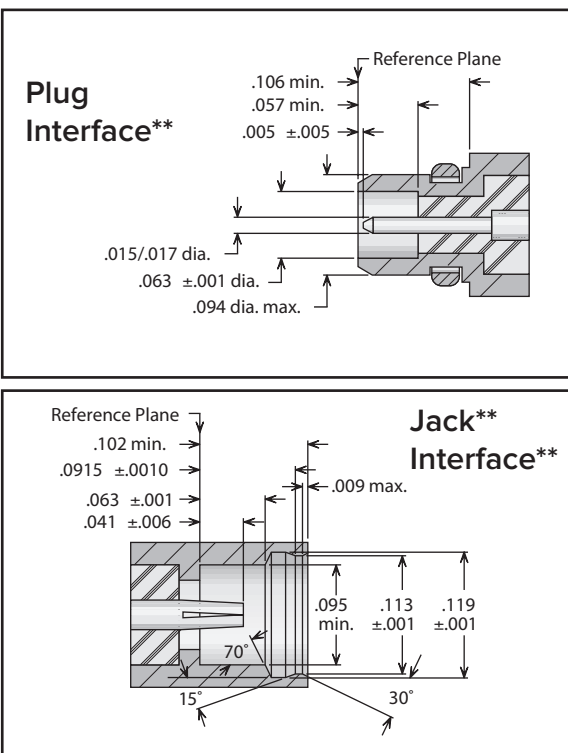
Materials / Finishes:

Insulators: Teflon per ASTM D1710.
 Male Contacts: Brass per ASTM B16, or Beryllium Copper per ASTM B196.
 Female Contacts: Beryllium Copper per ASTM B196.
 Contact Plating: Gold per MIL-G-45204.
 Gaskets: Silicone rubber per ZZ-R-765, Class II, Grade 50.

Other Metal Parts: Brass per ASTM B16 or equivalent; plated gold per MIL-G-45204, or nickel per QQ-N-290. All other specifications are in accordance with the latest issues of CECC 22000.

* These specifications are typical and may not apply to all the connectors. Detailed specifications for individual connectors are available on request.

Interfaces



**Some proportions altered to illustrate detail.

Applications

GPS
 Base Stations
 Wireless
 Instrumentation
 Automotive

Antennas
 Satcom
 Telecom
 Broadband
 PCS



Straight and Right Angle Cable Plugs

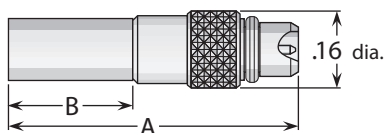


Figure 1
(Straight crimp type for flexible cable)

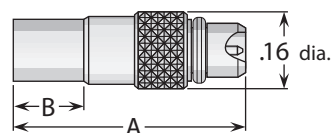


Figure 2
(Straight direct solder for semi-rigid cable)

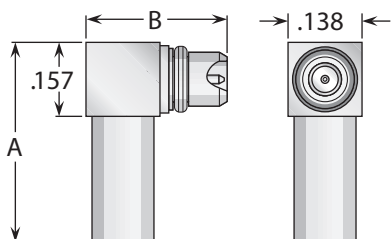


Figure 3
(Right angle crimp type for flexible cable)

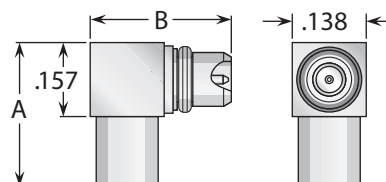


Figure 4
(Right angle direct solder for semi-rigid cable)

Cable Group	Figure	Dimensions		Plating		Delta P/N	Assembly Procedure/ Trim Code
		A	B	Body	Contact		
9	1	.61	.27	Gold*	Gold	9503037G000-500	B/37
9	3	.43	.27	Gold*	Gold (C)	9507037G001-500	L/04
11	1	.61	.27	Gold*	Gold	9503038G000-500	B/37
11	3	.43	.27	Gold*	Gold (C)	9507038G001-500	L/05
14	2	.49	.16	Gold*	Gold	9501025G003-500	H/03
14	4	.30	.27	Gold*	Gold (C)	9505025G003-500	J/04

Straight Cable Jacks

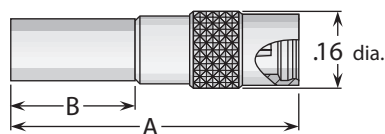


Figure 1
(Crimp type for flexible cable)

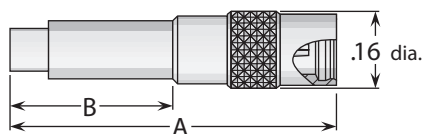


Figure 2
(Crimp type for flexible cable)

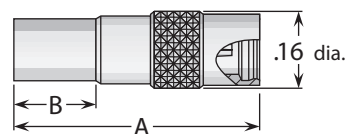


Figure 3
(Direct solder for semi-rigid cable)

Cable Group	Figure	Dimensions		Plating		Delta P/N	Assembly Procedure/ Trim Code
		A	B	Body	Contact		
9	1	.61	.27	Gold*	Gold	9510037G000-500	B/38
11	2	.70	.37	Gold*	Gold	9510038G000-500	B/39
14	3	.51	.16	Gold*	Gold	9510025G003-500	H/03

Cable Groups

9	RG-174, 179, 187, 188, 316; M17/94, 136, 152	14	.085" semi-rigid; RG-405; M17/133
11	RG-178, 178A, 178B, 196, 196A; M17/93		

* Also available with nickel-plated body—change G in Delta part number to N.
(C) in contact plating column indicates captive contact.

Printed-Circuit Board Jack Receptacles

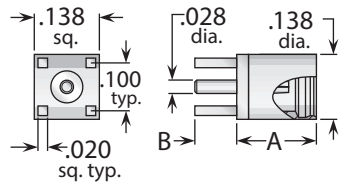


Figure 1
(Straight through-hole mount)

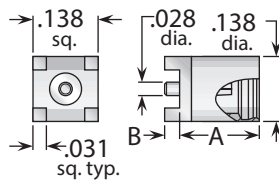


Figure 2
(Straight surface mount)

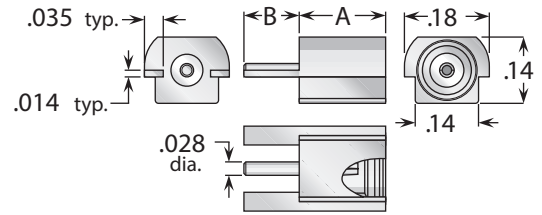


Figure 3
(Straight flush edge mount)

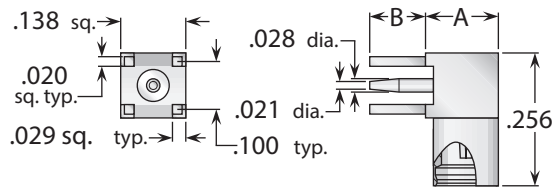


Figure 4
(Right angle through-hole mount)

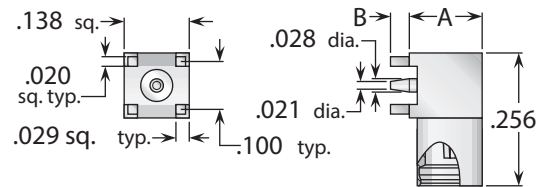


Figure 5
(Right angle surface mount)

Figure	Dimensions		Max. Board	Mounting Figure	Plating		Delta P/N
	A	B			Body	Contact	
1	.171	.120	.100	PCB08	Gold*	Gold (C)	9567000G001-500
1	.166	.031	.020	PCB08	Gold*	Gold (C)	9567000G001-501
2	.166	.031	N/A	**	Gold*	Gold (C)	9567000G001-503
3	.171	.120	N/A	**	Gold*	Gold (C)	9567000G001-502
4	.150	.118	.100	PCB08	Gold*	Gold (C)	9569000G001-500
5	.150	.031	N/A	**	Gold*	Gold (C)	9569000G001-501

Printed-Circuit Board Plug Receptacles

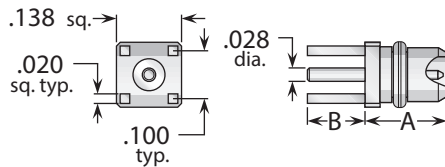


Figure 1
(Straight through-hole mount)

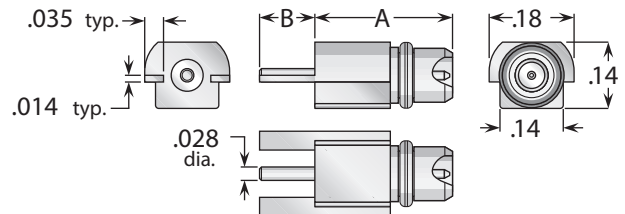


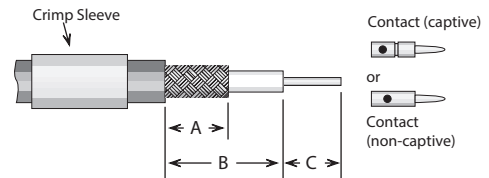
Figure 2
(Straight flush edge mount)

Figure	Dimensions		Max. Board	Mounting Figure	Plating		Delta P/N
	A	B			Body	Contact	
1	.171	.120	.100	PCB08	Gold*	Gold (C)	9568000G001-500
2	.282	.120	N/A	**	Gold*	Gold (C)	9568000G001-501
2	.173	.120	N/A	**	Gold*	Gold (C)	9568000G001-502

* Also available with nickel-plated body—change G in Delta part number to N.
 (C) in contact plating column indicates captive contact. • ***Contact factory for assembly procedures.

Assembly Procedure B

- 1) Trim cable per chart. Slide crimp sleeve back onto cable.



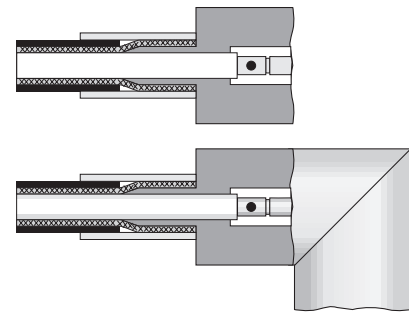
- 2) If support insulator is provided for RG-62 or 71 cable, insert into hollow in dielectric. Solder contact onto center conductor; back of contact flush with trimmed end of cable dielectric (omit this step for right angle connectors with access caps). Flare cut end of braid slightly by rotating dielectric.



- 3) Insert cable/contact into rear of body, with all braid wires on outside of crimp tail.
 - a) For captive contact connectors, push cable in until contact snaps into insulator.
 - b) For noncaptive contact connectors, push cable in until cable dielectric bottoms in connector.
 - c) For right angle or tee connectors with access caps, push cable in until end of braid touches connector body shoulder, and cable center conductor rests in contact slot.

Trim excess braid wires even with shoulder of body. Slide crimp sleeve forward until flush with body and crimp (see page 176 for hex die sizes).

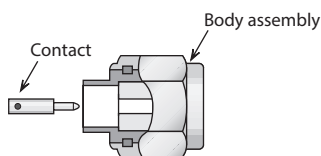
For right angle or tee connectors with access caps: Solder center conductor into contact slot, assemble insulator disc (if supplied), then press cap into body until seated or screw into place.



Trim Codes For Assembly Procedure B

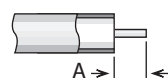
Code	A	B	C
B/32	.175	.260	.095
B/33	.195	.270	.045
B/34	.150	.250	.105
B/36	.150	.325	.090
B/37	.195	.295	.075

Assembly Procedure H

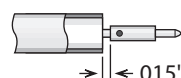


Trim Codes

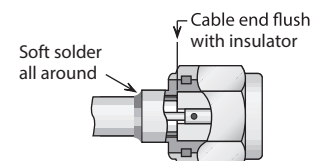
Code	A
H/01	.090
H/02	.060
H/03	.115
H/04	.150



- 1) Trim cable as shown. Remove any burrs from jacket and center conductor.



- 2) Solder contact to center conductor, fixturing to maintain gap as shown. Remove any excess solder from outside of contact.

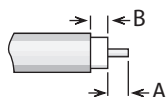


- 3) Insert cable into body and solder cable jacket to body, keeping end of cable flush with insulator as shown.

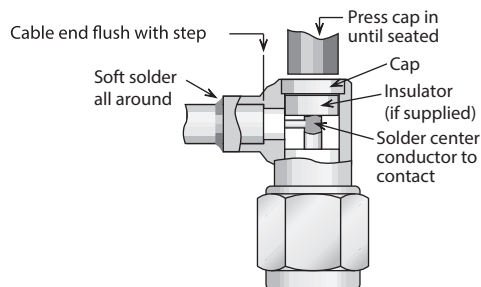
Plug body assembly and contact shown; procedure is identical for jack connectors.

Assembly Procedure J

Trim Codes		
Code	A	B
J/01	.109	.047
J/02	.059	.039
J/03	.059	.079
J/04	.050	.059

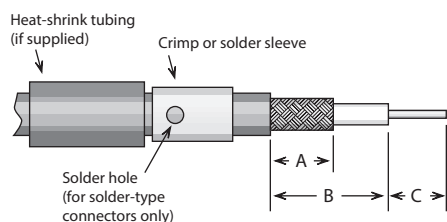


- 1) Trim cable as shown. Remove any burrs from jacket and center conductor.



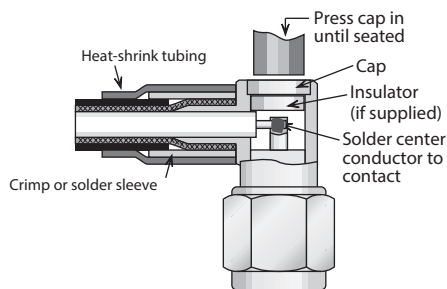
- 2) Soft solder cable jacket to body, making sure that end of cable is flush with step in body. Solder center conductor into contact slot, assemble insulator disc (if supplied), then press cap into body until seated or screw into place.

Assembly Procedure L



- 1) Trim cable per chart. Slide crimp (or solder) sleeve and heat-shrink tubing (if supplied) back onto cable.

Trim Codes			
Code	A	B	C
L/01	.250	.438	.109
L/02	.125	.219	.109
L/03	.234	.344	.109
L/04	.195	.270	.050
L/05	.095	.155	.050

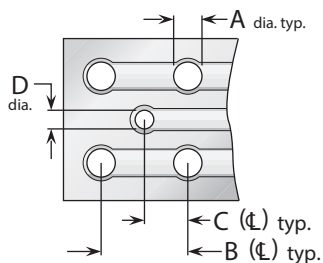


- 2) Insert cable into rear of body, with all braid wires on outside of crimp tail. Push cable in until end of braid touches connector body shoulder and center conductor rests in contact slot. Trim excess braid wires even with shoulder of body.

Slide crimp sleeve forward until flush with body and crimp (see page 176 for hex die sizes). (For solder-type connectors, solder braid to body and sleeve through hole in sleeve.)

Slide heat-shrink tubing into place and shrink with hot-air gun. Solder center conductor into contact slot, assemble insulator disc (if supplied), then press cap into body until seated or screw into place.

P.C. Board Drilling



Coaxial connectors

Figure	A	B	C	D
PCB08	.032	.100	.050	.032

Crimp Tools for Flexible Cable

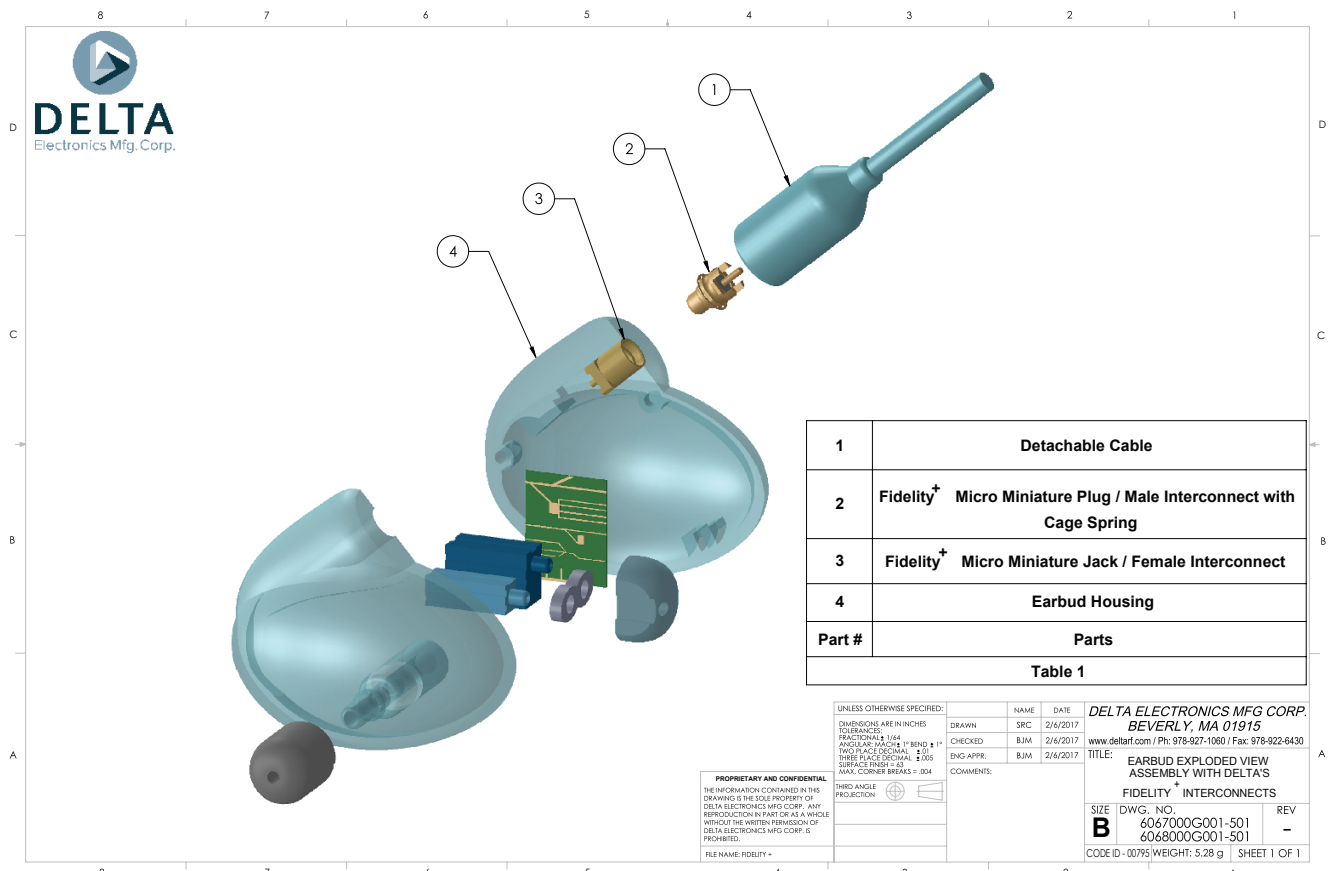


* For Delta cable groups. See MIL-PRF-39012 specifications for dies sizes used with M39012 cable groups.

Frame only—P/N	M22520/5-01	—Use with interchangeable dies listed below.	
Cable Group*	Hex Die Size	Die Set P/N	Closure
2, 3, 4	.429 hex, .400 wide	M22520/5-61	A
5, 6	.213 hex, .400 wide	M22520/5-19	B
7	.255 hex, .400 wide	M22520/5-19	A
9	.128 hex, .400 wide	M22520/5-35	B
10	.151 hex, .400 wide	M22520/5-37	B
11	.105 hex, .400 wide	M22520/5-33	B

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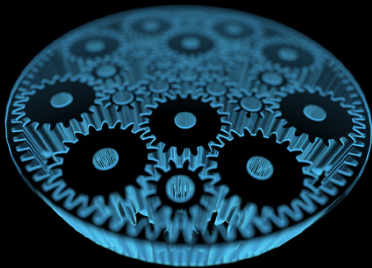
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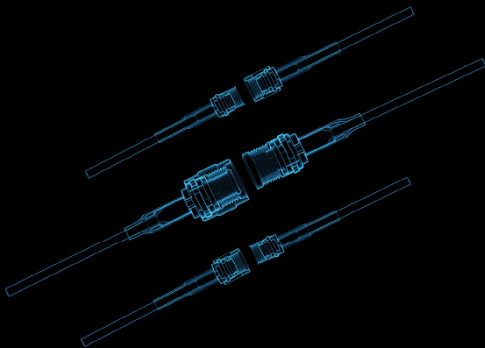
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