



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# High-Speed Contacts Product Guide

FOR HIGH-SPEED CONTACTS, CONNECTORS, AND CABLE ASSEMBLIES

## Contacts



## Connectors



## Cables Assemblies



Space-Grade Solutions

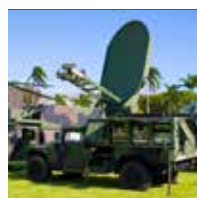
# Table of Contents

## Contents

High-Speed Contacts Overview	2	Quadrax Rectangular Connectors (General Description)	41
How to Choose, Cable Usage Guide, Testing	3	High Speed Contacts for Rack & Panel (ARINC 600 & R27)	42
OCS (Oval Contact System) Connectors	4	Insert Arrangements-MIL-DTL-38999 (Incorporating Coax, Twinax and Triax Contacts)	43-45
OCS - Contact Eye Pattern at 10 Gbps	5	Coaxial Contacts (General Description)	46
OCS - How to Order	6	Coaxial Contacts (Contact Part Number Guide by Cable)	47-50
OCS - Insert Arrangements - Front face of pins illustrated	7	Matched Impedance Coaxial Contacts - MIL-DTL-38999	51-52
OCS - TVP00 - Crimp, Metal & CTVP00 -Wall Mounting	8	High Frequency Coax Contacts (Series III Circular General Description)	53
OCS - TV06 - Crimp, Metal & CTV06R - Straight Plug	9	High Frequency Coax Contacts Concentric Twinax Contacts (General Description, Application Data - Size 8)	54 55
OCS - TV07R - Crimp, Metal & CTV07R - Jam Nut Rec	10	Concentric Twinax Contacts (Contact Part Number Guide by Cable)	56-59
Insert Arrangements-Series III Incorporating Octonet, Quadrax & Differential Twinax Contacts	11-12	Triax Contacts (Contact Part Number Guide by Cable)	60
Octonet Contacts	13-14	Coax, Twinax & Triax PC Tail Contacts (General Description, Application Data)	61
Signal Integrity Contact Data, Insertion and Return Loss	15-16	Coax, Twinax & Triax PC Tail Contacts (Contact Part Number Guide)	62-63
CTF-Quad (Copper to Fiber) Media Converter	17	MRC Connectors (High Speed Micro-Miniature Series)	64
CTF-QUAD, How to Order	18	MRC - 9 Pin Mount Plug (How to Order)	65
Quadrax Contacts, Series III, General Description	19	Ethernet Cable Assemblies (How to Order)	66
How to Order D38999, Series III Connectors with 100 Ohm	20	9 Pin Pig Tail Cable Assemblies (How to Order)	67
Quadrax Contacts	21-22	USB 2.0 / 3.0 Cable Assemblies (How to Order)	68
Quadrax Contacts (Series III, Guide by Cable)	23-24	19 Pin HDMI Chassis Mount Plug (How to Order)	69
Quadrax Contacts (Series III, Contact Guide for PCB)	25	HDMI Cable Assemblies (How to Order)	70
Quadrax Transition Adapters (General Description)	25	19 Pin Pig Tail Cable Assemblies (How to Order)	71
Quadrax Transition Adapters (Series III, Part Number Guide)	26-28	MRC - Protection Cap for Plug	72
Split-Pair Quadrax Contacts & Cables (Features & Benefits/ How to Order)	29	Connector Options	73
Split-Pair Quadrax Contacts (PCB Contacts & Transition Adapter Contacts)	30	High-Speed/High Frequency Contact Design Form	74
Split-Pair Quadrax Contacts (Frequencies & Performance Data)	31-32		
Differential Twinax Contacts (General Description)	33		
Differential Twinax Contacts (Series III, Contact Part Number Guide by Cable)	34-35		
Differential Twinax Transition Adapters (Series III, Attachment to PC Boards Data)	36-37		
Micro Differential Twinax Transition Adapters (Push-Pull Interconnects)	38-40		

### High-Speed Contacts Typical Markets:

**Military & Commercial Aviation, Military Vehicles, Missiles & Ordnance, C4ISR**



# High-Speed Contacts

## Overview

Amphenol has the broadest and most reliable contact solutions when you need superior electrical performance, plus shielding to eliminate interference from outside electrical sources, in a connector. Our expertise in connector and cable solutions ensures that your contacts will mate and perform to the proper application specifications.

Contact Options	Product	Page	Description
	<b>Oval Contact System</b>	4-10	Our newest contact for high-speed data transmission up to 10 Gbps per pair. Applications include: 10G Base T, 40G Base T, HDMI, Fibre Channel (AI), SATA 2.0, 3.0, and others.
	<b>Octonet Contacts</b>	13-15	Size 8 pin and socket contacts. 8 strategically-spaced inner contacts form 4 100 Ohm matched impedance differential pairs.
	<b>CTF-Quad</b>	17-18	The CTF-QUAD product line is fiber to copper and copper to fiber media conversion in quadrax form factor pins for standard D38999 quadrax insert arrangements.
	<b>Quadrax Contacts</b>	19-32	Size 8 pin and socket contacts. An outer contact with 4 strategically spaced inner contacts forming two 100 or 150 Ohm matched impedance differential pairs.
	<b>Transition Adapters</b>	25-28, 30 36-40	Matched impedance quadrax and twinax transition adapters provide a method of launching from the high speed connectors to PCB boards.
	<b>Differential Twinax Contacts</b>	33-40	Size 8 pin and socket contacts. An outer contact with 2 inner contacts spaced to form one 100 or 150 Ohm matched impedance differential pair.
	<b>Coaxial Contacts</b>	46-52	Sizes 4, 8, 12 & 16 pin and socket contacts designed for RF/microwave and shielded wire applications.
	<b>High Frequency</b>	53-54	Size 8 Coaxial contacts that provide high frequencies (DC to 65 GHz). Unique "Float Mount" technology maintains tight mechanical tolerances.
	<b>Concentric Twinax Contacts</b>	55-58	Sizes 8 & 12 pin and socket contacts designed for protection from magnetic and electro-static interference including nuclear electromagnetic pulse.
	<b>Triax Contacts</b>	59-60	Sizes 8, 10 & 12 pin and socket contacts designed for shielded wire applications with 3 conductors.
	<b>MRC</b>	64-72	MRC is a micro-miniature connector ideal for Commercial, Industrial and Military Communication Systems. This series is capable of running Gigabit Ethernet, USB 2.0/USB 3.0, HDMI and 10 Gigabit Ethernet when specified and designated to a specific configuration.

### GENERAL ORDERING INFORMATION

This catalog is primarily for high-speed contact solutions used in MIL-DTL-38999 Series, I, II, and III connectors. Other connectors that incorporate high-speed contacts include:

- MIL-DTL-22992 Heavy Duty Circular Connectors: Coax contacts
- Low-Mating Force Rectangular Connectors: Coax contacts in hybrid arrangements
- LRM Interconnects – Rectangular module and backplane connectors: Coax contacts in hybrid arrangements
- ARINC 600 and R27 Rack & Panel Connectors: Quadrax, Twinax, Differential Twinax, and Coax contacts
- MIL-DTL-26482 Series 1 Connectors: Coax contacts
- MIL-DTL-5015 Connectors: Coax contacts

# How to Choose, Cable Usage Guide, Capabilities & Testing

## HOW TO CHOOSE HIGH-SPEED PRODUCTS

3-Step process to select the right solution for your design needs

**1.**

### FIND YOUR CABLE AND CORRESPONDING HIGH-SPEED CONTACT

Locate your cable using our Cable Guide in each high-speed contact section. Match the cable to the proper specifications needed, such as contact size and impedance, then choose the correct contact part number.

**2.**

### CHOOSE THE DESIRED INSERT PATTERN

D38999 Series III Insert arrangements for Quadrax and Differential Twinax contacts are shown on pgs. 11-12. D38999 Series I, II, and III insert arrangements for Coax, Twinax, and Triax contacts are shown on pgs. 42-44.

**3.**

### CONTACT AMPHENOL FOR THE CONNECTOR OR CABLE PART NUMBER

Once the contact and the insert arrangement have been selected, contact Amphenol Aerospace to get the proper connector or cable assembly part number.

## CABLE USAGE GUIDE

In general, for D38999 Connectors, the size 8, 12 and 16 Coax, Quadrax, Twinax and Triax will terminate cable in the following ranges.

### SIZE 8

.012 / .0395 Center Conductor (Stranded)
.055 / .133 Dielectric
.180 Max Outer braid (must be round for crimp termination)
.201 Max. Jacket

### SIZE 16

.012 / .0215 Center Conductor (Stranded)
.031 / .066 Dielectric
.085 Max Outer braid (must be round for crimp termination)
.102 Max. Jacket

### SIZE 12

.012 / .0215 Center Conductor (Stranded)
.031 / .105 Dielectric
.126 Max Outer braid (must be round for crimp termination)
.145 Max. Jacket

Special coax contacts may be available for cables outside of ranges shown. Consult Amphenol Aerospace for further assistance in selection of coax contact cables.



## CABLE CAPABILITIES

Amphenol provides a large array of cable assemblies with high-speed quadrax and differential twinax contacts, as well as coax and concentric twinax contacts. Amphenol offers customers the most up-to-date range of cable assemblies in the market. Amphenol can design and supply your cable needs for high speed contacts and connector, from a simple point-to-point cable to a multi-branch cable system. Contact Amphenol Aerospace for assistance in designing the best cable assembly to fit your design needs.

## CABLE TESTING

Rigid testing is performed on 100% of the cable assemblies at Amphenol before they're shipped, to make sure they meet customer requirements, including DWV, insulation resistance, and continuity. Amphenol has the background experience and understanding of harsh environmental testing to assure reliable "end-to-end" interconnect solutions.

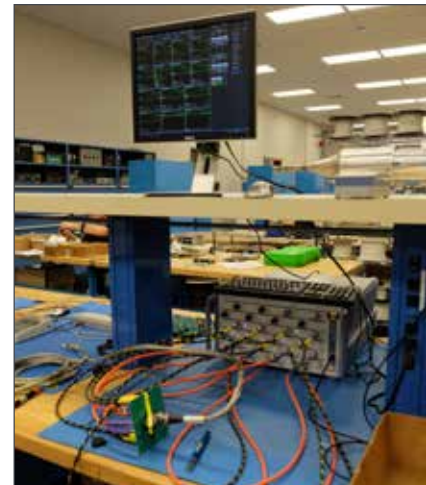
## TESTING CAPABILITIES

**Single-Ended (50 ohm) measurements to 20 GHz include:**

- Insertion loss
- Return loss
- VSWR
- Electrical length
- Phase-matching capability
- Impedance
- Touchstone files

**Differential measurement to 20 GHz include:**

- Insertion loss
- Return loss
- Intra-pair skew
- Inter-pair skew
- Differential impedance
- Common mode conversion
- Touchstone files



# OCS (Oval Contact System) Connectors

## OVERVIEW

The OCS (Oval Contact System) is the newest 38999 Interconnect Product offering that provides many advantages for high speed data transmission.

### OCS MECHANICAL/PHYSICAL PROPERTIES

- Mating Cycles 500 (min.)
- Operating temperature -65C to 175C
- Contact materials and platings consistent w/AS39029
- IR 500 VDC
- DWV 500 VAC rms

Max Current Rating:

- 1.5 amps inner contacts
- 3.0 amps outer contacts

### OCS SIGNAL INTEGRITY PERFORMANCE

- Data rate:** 10Gbps per pair  
**Insertion loss:** <0.3 dB up to 5 GHz  
**Return loss:** >20 dB up to 5 GHz  
**NEXT and FEXT:** >40 dB up to 5 GHz  
**Differential to common mode conversion:** >50 dB up to 5 GHz

### FEATURES AND BENEFITS

- A wide variety of insert arrangements available
- Patterns range from (1) to (21), 100 Ohm differential pairs capable of delivering data transfer speeds of 10Gbps per pair
- MIL-DTL-38999 shell styles available from size 9 to 25
- Front-release, rear-removable contact system for easy repair
- Meets environmental requirements of MIL-DTL-38999
- Uses off-the-shelf Mil Spec backshells
- PCB Tails contacts available, sockets only, epoxy backfilled.

### APPLICATIONS

High Speed Applications-for use with, but not limited to, the following electrical protocols\*:

- 10G Base T
- HDMI
- Fibre Channel (AI)
- 40G Base-T
- SATA 2.0
- SATA 3.0 (limited to 3 meters max)
- Serial RapidIO
- PCI Express 3.0

\* Cable selection may limit data rate of protocols.



Plug



Receptacle



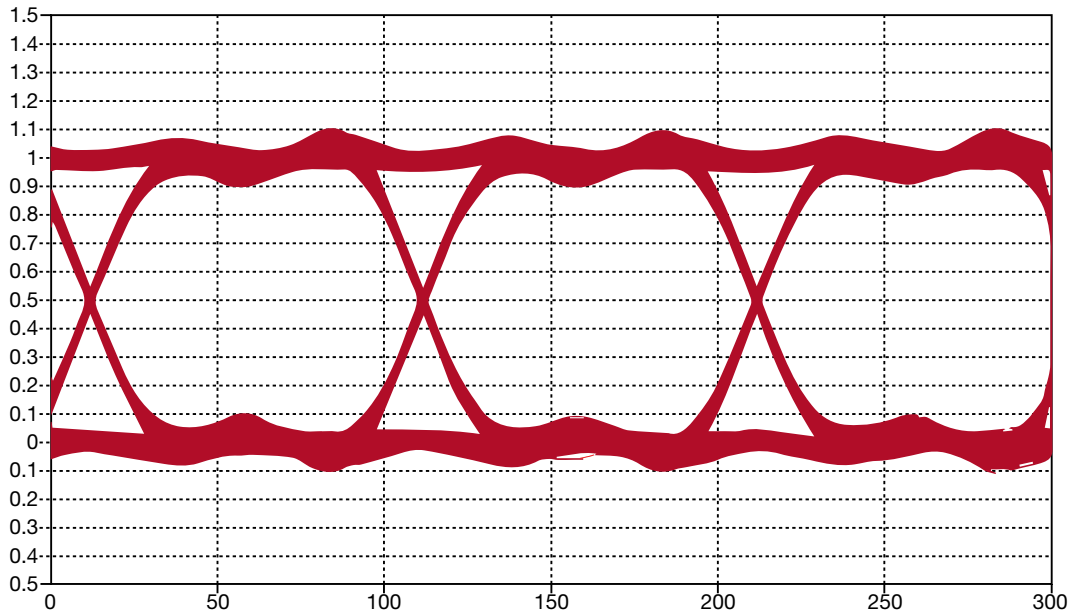
Four of Amphenol's OCS Contacts fit into the 38999 Connector shell size 13



# OCS (Oval Contact System) Connectors

Contact Eye Pattern at 10 Gbps

## EYE DIAGRAM (REAL PART)



Individually Shielded Twinax cable is recommended for use with the OCS connectors. Other type of wires can be used, but will not be compatible with the rear accessory supplied with the connectors. Below is a list of recommended cables. Additional cables can be used if they meet specifications.

The provided grommet assembly will accommodate cable diameters ranging from Ø.124 to Ø.175. Larger diameters may work based on cable construction.

Impedance (Ohms)	Conductor (AWG)	Pairs	Cable Part Number
100	24	1	Tensolite 24463/9P025X-2(LD)
			Thermax MX100-24
			PIC E10224
			Gore GSC-05-82559-00 (space rated)
			Gore DXN2602
	24	4	Gore RCN 9034-24 (CAT6A Ethernet)*
	26	4	Gore RCN 9034-26 (CAT6A Ethernet)*
1		Spectra Strip 160-2699-952	

\*Optimized for 13-53 insert pattern.

OCS cable assemblies available, please consult Amphenol Aerospace for details.

# OCS (Oval Contact System) Connectors

How to Order

1.	2.	3.	4.	5.	6.
Connector Type and Shell Style	Service Class	Shell Size – Insert Arrangement	Contact Type	Alternate Keying Position	Suffix Code
<b>TVP00</b>	<b>RZW</b>	<b>13-53</b>	<b>P</b>	<b>B</b>	<b>(595)</b>

1. CONNECTOR TYPE	
<b>TVP00</b>	Wall Mount Back panel mounted receptacle with metal shells
<b>CTVP00</b>	Wall Mount Back panel mounted receptacle with composite shells
<b>TV06</b>	Straight Plug
<b>CTV06</b>	Straight Plug composite shells
<b>TV07</b>	Jam Nut
<b>CTV07</b>	Jam Nut composite shells

2. SERVICE CLASS		
(Z) Threaded Backshell Style	(W) Integral Backshell Style*	Description
<b>RZF</b>	<b>RWF</b>	Electroless nickel plated
<b>RGZF</b>	<b>RGWF</b>	Electroless nickel plated ground plane
<b>RZW</b>	<b>RWW</b>	Olive drab cadmium plate
<b>RGZW</b>	<b>RGWW</b>	Olive drab cadmium plated ground plane
<b>RZB</b>	<b>RWB</b>	NiAlBronze
<b>RGZB</b>	<b>RGWB</b>	NiAlBronze ground plane
<b>RZK</b>	<b>RWK</b>	Corrosion resistance stainless steel
<b>RGZK</b>	<b>RGWK</b>	Stainless steel ground plane
<b>ZDT</b>	<b>WDT</b>	Durmalon plated, Nickel-PTFE alternative to cadmium
<b>GZDT</b>	<b>GWDT</b>	Groundplane Durmalon
<b>ZDZ</b>	<b>WDZ</b>	Black Zinc

\* Integral Backshell - an integral backshell style eliminates the need for costly backshell accessories, and allows the user to attach the shield of their cable directly to the backshell. The integral shell style also provides superior EMI shielding and ease for overmold applications.

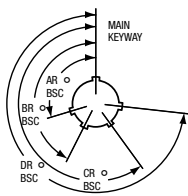


For unused OCS connector cavities:

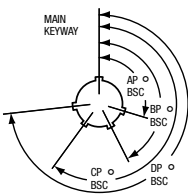
- Leave the contact insert cavity empty in the connector.
- Size 12 MS27488-12-2 (orange color) sealing plug can be installed into the grommet of the backshell large end first.



RECEPTACLE (front face shown)



PLUG (front face shown)



### 3. Select a Shell Size and Insert Arrangement

Shell Size and Insert Arrangement are together. First number represents Shell Size, second number is the Insert Arrangement. See page 7 for Insert Arrangements.

4. CONTACT TYPE	
<b>P</b>	Pin contacts 21-033585-001
<b>S</b>	Socket contacts 21-033586-001

Inner contacts accept 28, 26, and 24 awg cable.

### 5. Select an Alternate Keying Position

Alternate Positions below "N" not required for normal position

#### Tri-Start Alternate Positions:

A plug with a given rotation letter will mate with a receptacle with the same rotation letter.

SHELL SIZE	KEY & KEYWAY ARRANGEMENT IDENTIFICATION LETTER	AR° OR AP° BSC	BR° OR BP° BSC	CR° OR CP° BSC	DR° OR DP° BSC
9	N*	105	140	215	265
	A	102	132	248	320
	B	80	118	230	312
	C	35	140	205	275
	D	64	155	234	304
11, 13, and 15	N*	95	141	208	236
	A	113	156	182	292
	B	90	145	195	252
	C	53	156	220	255
	D	119	146	176	298
17 and 19	N*	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
21, 23, and 25	N*	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
21, 23, and 25	N*	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280

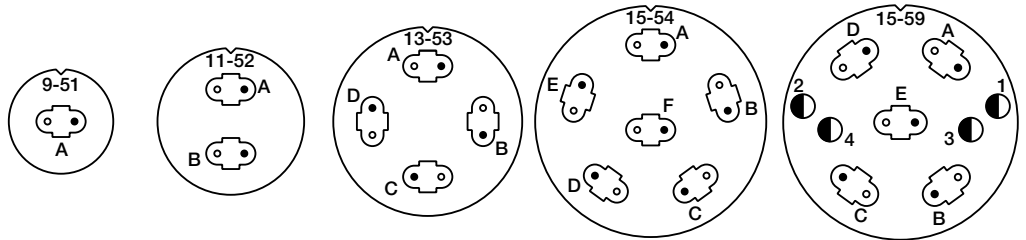
6. SUFFIX CODE	
<b>595</b>	Space Grade
<b>591</b>	Space Grade with critical dimensions verified at 100%

Order information for Removal Tool OCS Contact  
**10-6460C1-001**

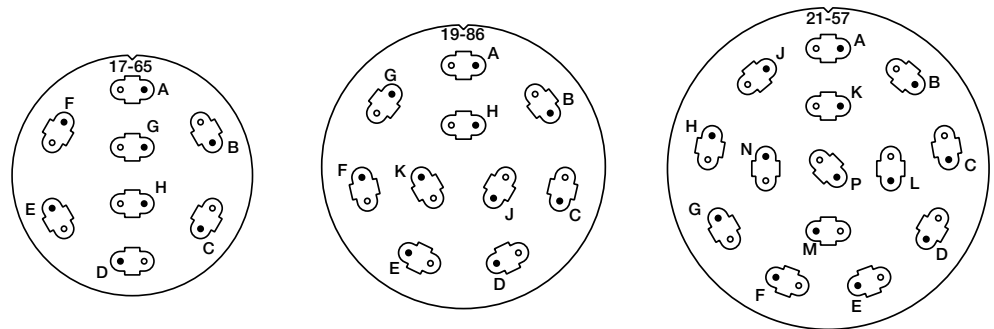


# OCS (Oval Contact System) Connectors

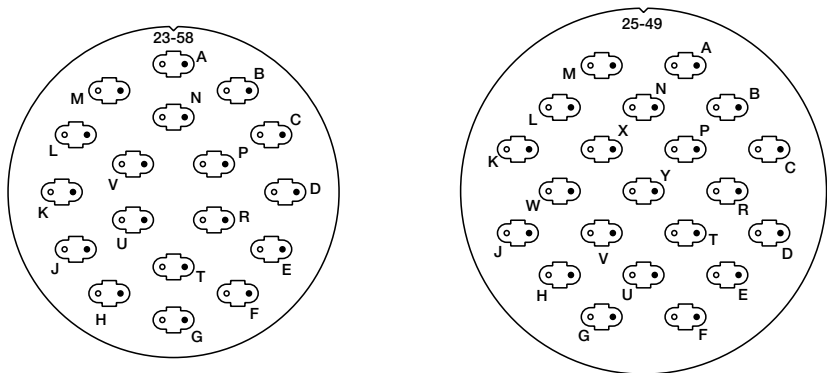
Insert Arrangements - Front face of pins illustrated



Insert Arrangement	9-51	11-52	13-53*	15-54	15-59*
Number of Contacts	1	2	4	6	5 OCS, 4 22D



Insert Arrangement	17-65	19-86*	21-57*
Number of Contacts	8	10	14



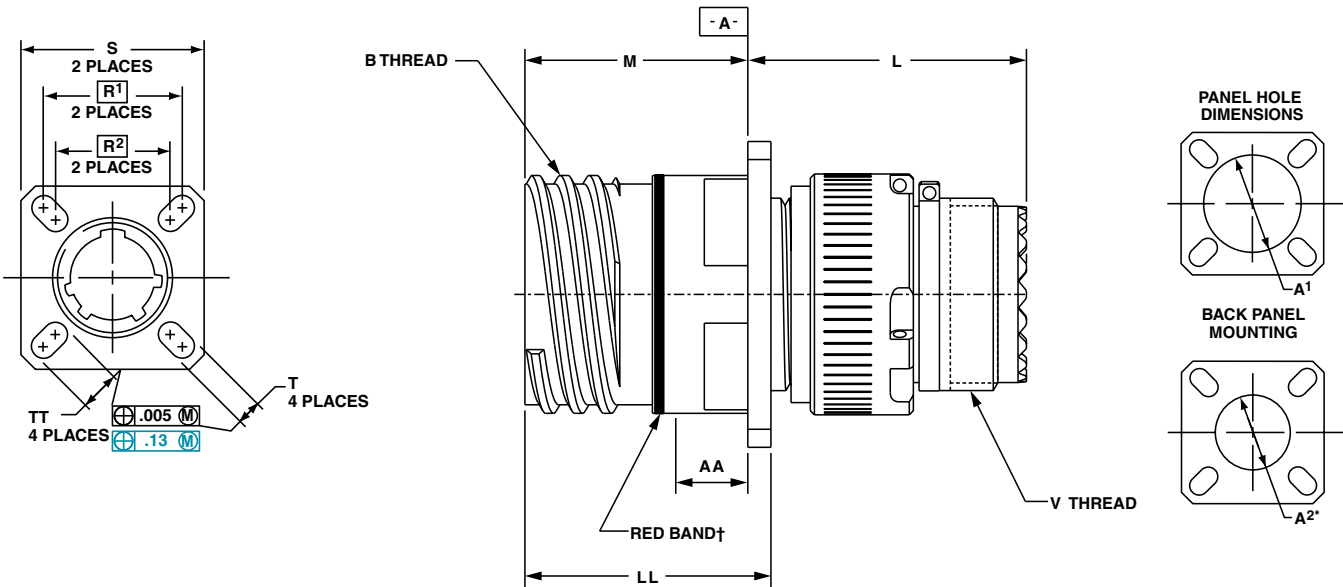
Insert Arrangement	23-58*	25-49*
Number of Contacts	18	21

\* Indicates Insert currently tooled

• Designates pin 1 location within the OCS contact assembly

# OCS (Oval Contact System) Connectors

TVP00 - Crimp, Metal & CTVP00 - Crimp, Composite Wall Mounting



Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	L Max. (TV)	L' Max. (CTV)	M +.000 - .005 (TV)	M' +.000 - .005 (CTV)	R <sup>1</sup>	R <sup>2</sup>	S Max.	T ±.008	A <sup>1</sup> Back Panel Mount	A <sup>2</sup> Front Panel Mount	AA Max. Panel Thickness	LL +.006 - .000 (TV)	LL ±.005 (CTV)	TT ±.008	V Thread Metric
9	.6250	1.039	1.086	.820	.773	.719	.594	.948	.128	.655	.845	.234	.905	.908	.216	M12X1-6g
11	.7500	1.039	1.086	.820	.773	.812	.719	1.043	.128	.796	.963	.234	.905	.908	.194	M15X1-6g
13	.8750	1.039	1.086	.820	.773	.906	.812	1.137	.128	.922	1.081	.234	.905	.908	.194	M18X1-6g
15	1.0000	1.039	1.086	.820	.773	.969	.906	1.232	.128	1.047	1.239	.234	.905	.908	.173	M22X1-6g
17	1.1875	1.039	1.086	.820	.773	1.062	.969	1.323	.128	1.219	1.357	.234	.905	.908	.194	M25X1-6g
19	1.2500	1.039	1.086	.820	.773	1.156	1.062	1.449	.128	1.297	1.475	.234	.905	.908	.194	M28X1-6g
21	1.3750	1.069	1.118	.790	.741	1.250	1.156	1.575	.128	1.442	1.593	.204	.905	.904	.194	M31X1-6g
23	1.5000	1.069	1.118	.790	.741	1.375	1.250	1.701	.154	1.547	1.711	.204	.905	.904	.242	M34X1-6g
25	1.6250	1.069	1.118	.790	.741	1.500	1.375	1.823	.154	1.672	1.829	.204	.905	.904	.242	M37X1-6g

† Red band indicates fully mated

\* A2 dimensions are larger than standard D38999 dimensions to accommodate backshell. All dimensions for reference only.

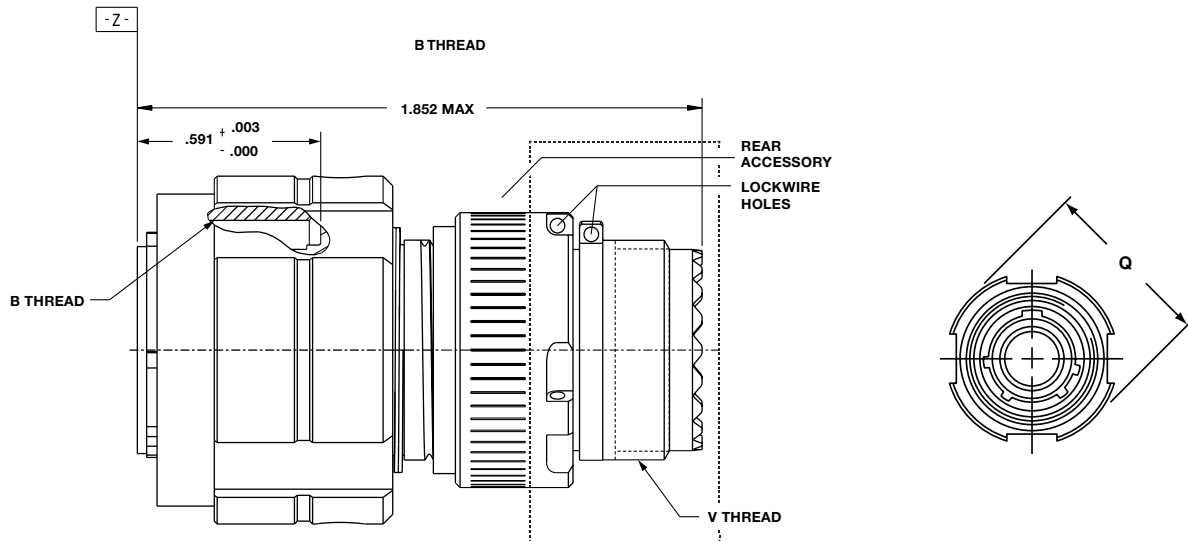
The rear accessory shown above is provided kitted with each connector and is for environmental sealing. The grommet included is insert arrangement specific, shown at right is the 13-53 pattern.

The provided grommet assembly will accommodate cable diameters ranging from Ø.124 to Ø.175. Larger diameters may work based on cable construction.



# OCS (Oval Contact System) Connectors

TV06 - Crimp, Metal & CTV06R - Crimp, Composite Straight Plug



Shell Size	B Thread 0.1P-0.3L-TS-2B (Plated)	Q Dia. Max.	V Thread Metric
9	.6250	.858	M12X1-6g
11	.7500	.984	M15X1-6g
13	.8750	1.157	M18X1-6g
15	1.0000	1.280	M22X1-6g
17	1.1875	1.406	M25X1-6g
19	1.2500	1.516	M28X1-6g
21	1.3750	1.642	M31X1-6g
23	1.5000	1.768	M34X1-6g
25	1.6250	1.890	M37X1-6g

All dimensions for reference only.

The rear accessory shown above is provided kitted with each connector and is for environmental sealing. The grommet included is insert arrangement specific, shown at right is the 13-53 pattern.

The provided grommet assembly will accommodate cable diameters ranging from Ø.124 to Ø.175. Larger diameters may work based on cable construction.

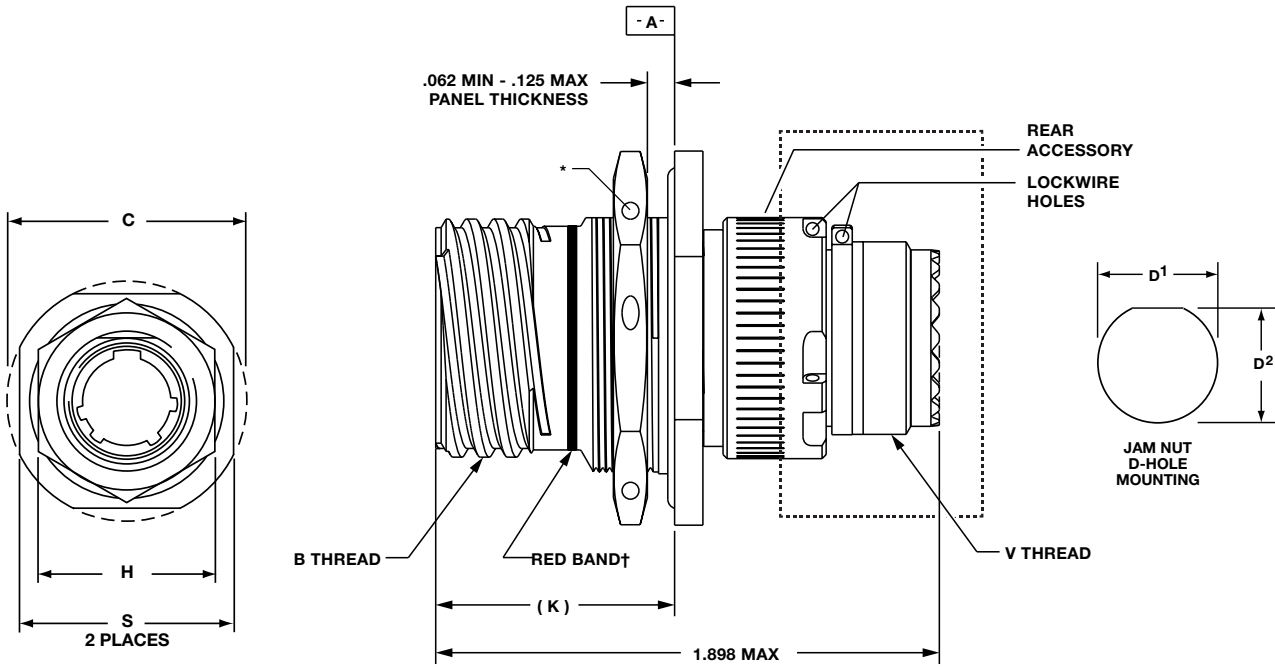


*Integral Backshell Style*

*Theded Backshell Style*

# OCS (Oval Contact System) Connectors

TV07R - Crimp, Metal & CTV07R - Crimp, Composite Jam Nut Receptacle



All dimensions for reference only.

Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	C Max.	D <sup>1</sup> +.010 - .000	D <sup>2</sup> +.000 - .010	H Hex +.017 - .016	K Ref.	S ±.010	V Thread Metric
9	.6250	1.199	.693	.657	.875	.871	1.062	M12X1-6g
11	.7500	1.386	.825	.770	1.000	.871	1.250	M15X1-6g
13	.8750	1.511	1.010	.955	1.188	.878	1.375	M18X1-6g
15	1.0000	1.636	1.135	1.085	1.312	.878	1.500	M22X1-6g
17	1.1875	1.761	1.260	1.210	1.438	.878	1.625	M25X1-6g
19	1.2500	1.949	1.385	1.335	1.562	.878	1.812	M28X1-6g
21	1.3750	2.073	1.510	1.460	1.688	.878	1.938	M31X1-6g
23	1.5000	2.199	1.635	1.585	1.812	.878	2.062	M34X1-6g
25	1.6250	2.323	1.760	1.710	2.000	.878	2.188	M37X1-6g

† Red band indicates fully mated  
 \* .059 dia min., 3 lockwire holes, Formed lockwire hole design (6 holes) is optional

The rear accessory shown above is provided kitted with each connector and is for environmental sealing. The grommet included is insert arrangement specific, shown at right is the 13-53 pattern.

The provided grommet assembly will accommodate cable diameters ranging from Ø.124 to Ø.175. Larger diameters may work based on cable construction.



Integral Backshell Style



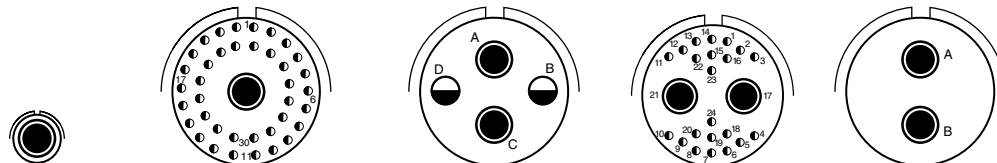
Threaded Backshell Style

# Insert Arrangements-MIL-DTL-38999, Series III

Incorporating Octonet, Quadrax & Differential Twinax Contacts

This illustrated listing represents the most readily available patterns incorporating Octonet, Quadrax and Differential Twinax contacts within D38999, Series III connectors. If you require other arrangements than what are shown here, consult Amphenol for further availability. In most cases, unless otherwise stated, size 8 cavities can be filled with Quadrax or Differential Twinax contacts. Arrangements can be mixed with any size 8 coax, and/or Concentric Twinax or Triax contacts.

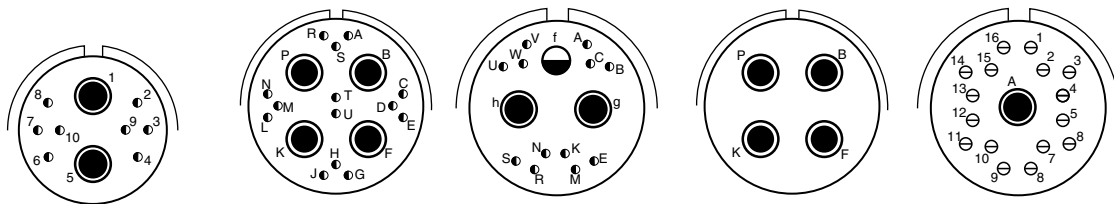
## Front face of pin inserts illustrated



Insert Arrangement	9-5		17-2		17-22		17-25		17-52	
Number of Contacts	1		38		2		2		2	
Contact Size	8		22D		8		12		8	

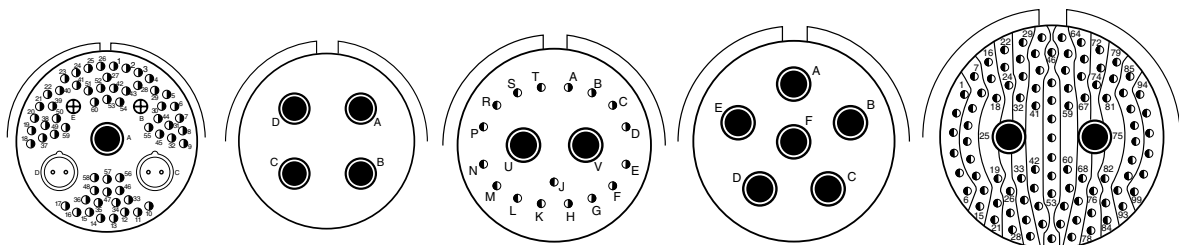
Grounded

Meets Boeing Specification



Insert Arrangement	17-60		19-18		19-31			19-AB		19-AD		
Number of Contacts	8		2		14		4		12		1	
Contact Size	22D		8		22D		12		8		8	

Note: 19-AB same as 19-18 but no 22D contacts.  
Ground plane only.



Insert Arrangement	21-65				21-75		21-79		23-6		25-7	
Number of Contacts	1				2		2		60		4	
Contact Size	8				10D		16		23		8	

### CONTACT LEGEND

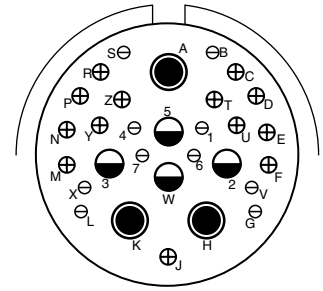
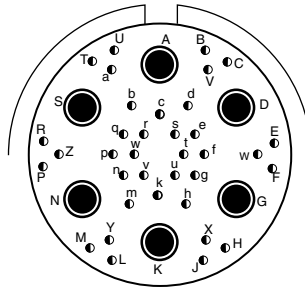
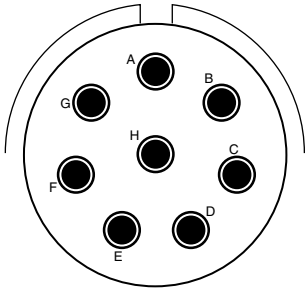


Quadrax or Differential Twinax

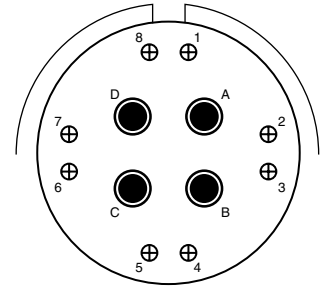
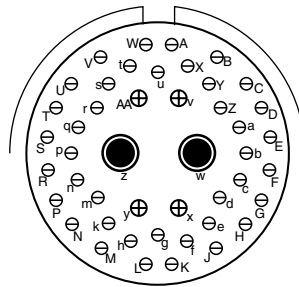
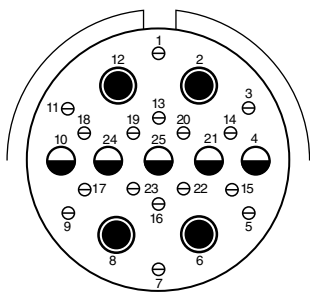
# Insert Arrangements - for MIL-DTL-38999

Incorporating Octonet, Quadrax & Differential Twinax Contacts

Front face of pin inserts illustrated

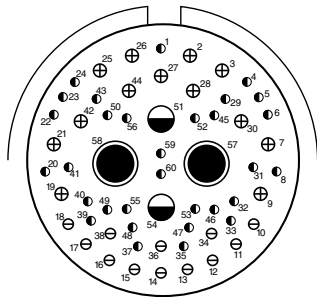


Insert Arrangement	25-8		25-17		25-20			
Number of Contacts	8		36	6	10	13	3	4
Contact Size	8		22D	8	20	16	8	12



Insert Arrangement	25-26			25-46			25-62	
Number of Contacts	16	5	4	40	4	2	8	4
Contact Size	20	12	8	20	16	8	16	8

Ground plane only



Insert Arrangement	25-AT				
Number of Contacts	2	2	13	12	31
Contact Size	8	12	16	20	22D

### CONTACT LEGEND



## OVERVIEW

Eight strategically spaced inner contacts form four 100 Ohm matched impedance differential pairs.



Pin for 24 awg



Socket for 24 awg



Pin PCB Tail



Socket PCB Tail



\*Not limited to cables shown

## FEATURES

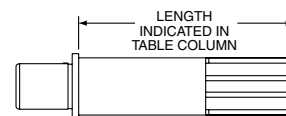
- Available in size 8 crimp termination style
- Also available in PC Tails
- Can be installed in existing size 8 Quadrax cavities
- Meets performance specifications of CAT-6A cable
- 10G Ethernet compliant
- Overall higher bandwidth than standard CAT5E Quadrax-supports up to 4.0 Gbps per pair
- Enhanced crosstalk performance (compared to standard Quadrax)
- Supports wire ranges 26 to 24 gauge
- Requires modification of MIL-DTL-38999 connector to accommodate keyed contacts
- Operating Temp -65°C to 175°C
- Requires special backshell. See page 19 for backshell guide

## BENEFITS

- Easy drop-in replacement to installed connectors no need to redesign
- Self removing contact feature - no extra contact extraction tool needed (24 Gauge only)

Pin	Socket	*Cable	AWG
21-032904-001	21-032905-001	Thermax: MX10G-24HP	24
21-032904-011	21-032905-011	W.L.Gore: RCN8966-24	
21-032904-021	21-032905-021	PIC E6A3824, Harbour E10024065, E10024064	
21-032904-031	21-032905-031	W.L.Gore: GSC-03-84043-01	
21-032904-041	21-032905-041	Axon P542810	
21-032904-051	21-032905-051	PIC E6A6826	
21-032904-061	21-032905-061	Thermax MX10G-24FLX4	
21-032906-001	21-032907-001	Pin .884 / Socket 1.024	
PCB Pin	PCB Socket	L Dimension + or - 15	
21-032906-011	21-032907-011	.884	
21-032906-021	21-032907-021	.884	
21-032906-031	21-032907-031	.950	
21-032906-041	21-032907-041	.859	
21-032906-051	21-032907-051	.518	
21-032906-061	21-032907-061	.788	

PCB L dimension length given in chart is the distance from the rear of the contact retention shoulder to the tip of the PCB tails.



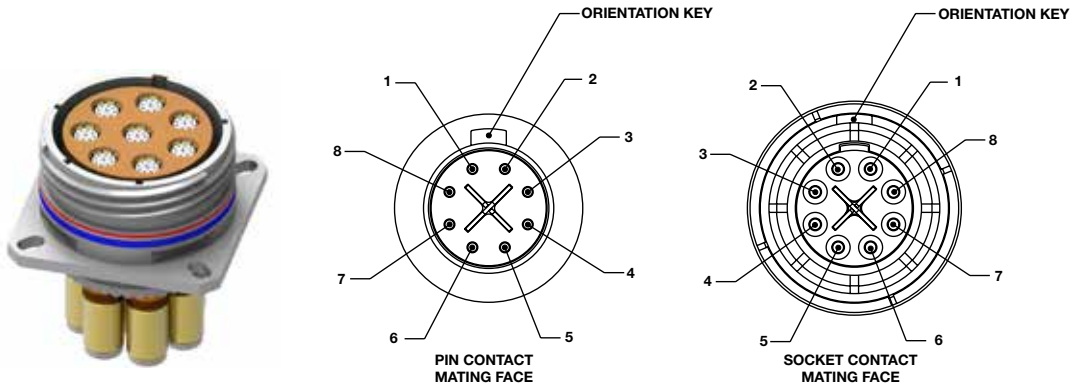
Note: it does not indicate stickout length when installed in D38999 connector.

## SPECS

<b>Environmental Sealing:</b>	IAW connector specification
<b>Corrosion Resistance:</b>	500 hours salt spray
<b>EMI Shielding:</b>	360 degree shielding on each pair
<b>Mating Cycles:</b>	500 cycles
<b>Voltage Rating:</b>	500 Vrms max @ sea level
<b>Dielectric Withstanding Voltage:</b>	500 VAC RMS sea level

# Octonet Contacts

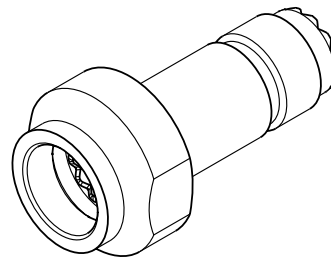
Superior Ethernet Contact System for MIL-DTL-38999, Series III



Differential Pairing	
Pair #	Contact ID
1	1-2
2	3-4
3	5-6
4	7-8

## BACKSHELL EXTENDER

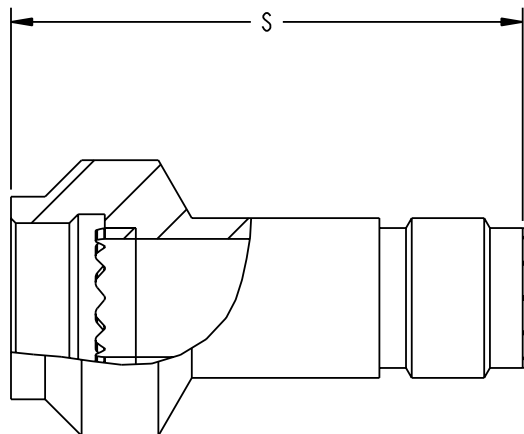
Due to the protrusion of the Octonet Contacts through the rear of the grommet, a Backshell Extender must be used. The Extender is compatible with any Mil-Spec Backshell. Consult the factory for more information.



Part Number	Shell Size
FX-646409-01 ( )	9
FX-646409-02 ( )	11
FX-646409-03 ( )	13
FX-646409-04 ( )	15
FX-646409-05 ( )	17
FX-646409-06 ( )	19
FX-646409-07 ( )	21
FX-646409-08 ( )	23
FX-646409-09 ( )	25

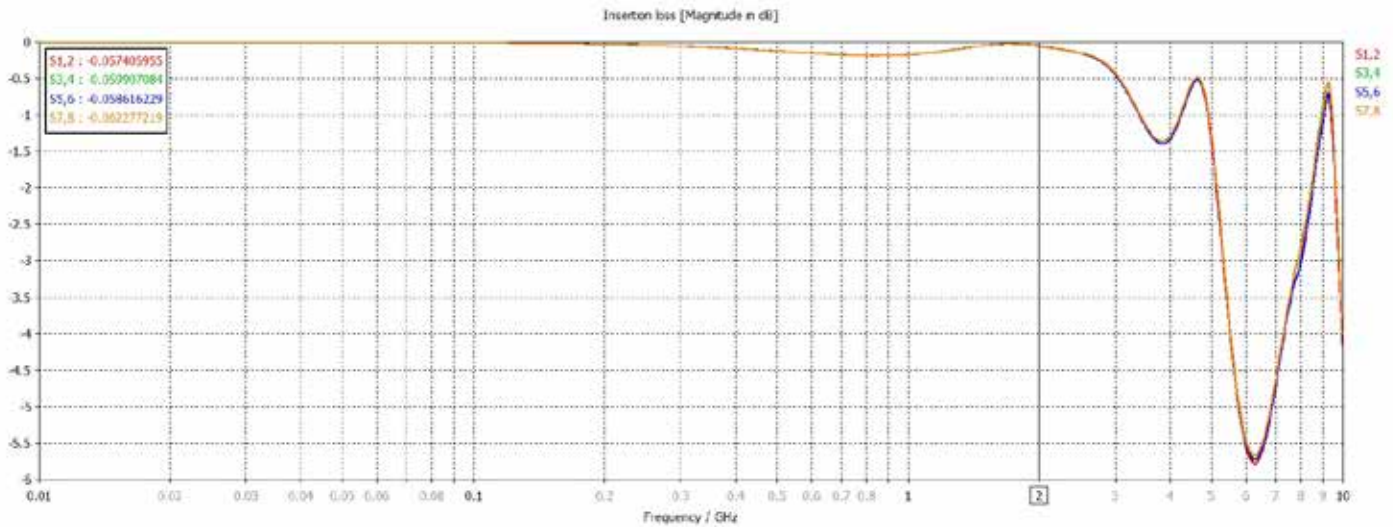
FINISH TABLE	
Prefix	Description
F2	Black Zinc Nickel
F4	Green Zinc Nickel
F7	Durmaol
F9	Thick OD Cadmium plate, Nickle Base
FH	Thick Electroless Nickel
FJ	Black Electroless Nickel

LENGTH TABLE	
Prefix	S ±.060
3	1.500
4	2.000
5	2.500
6	3.000
7	3.500
8	4.000
9	4.500

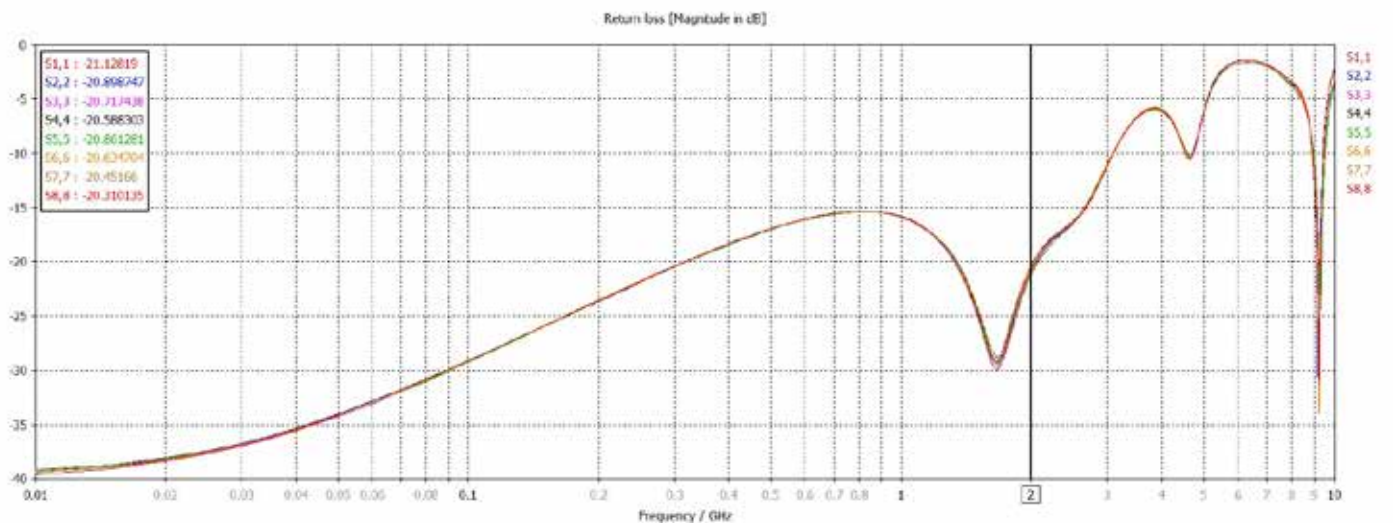




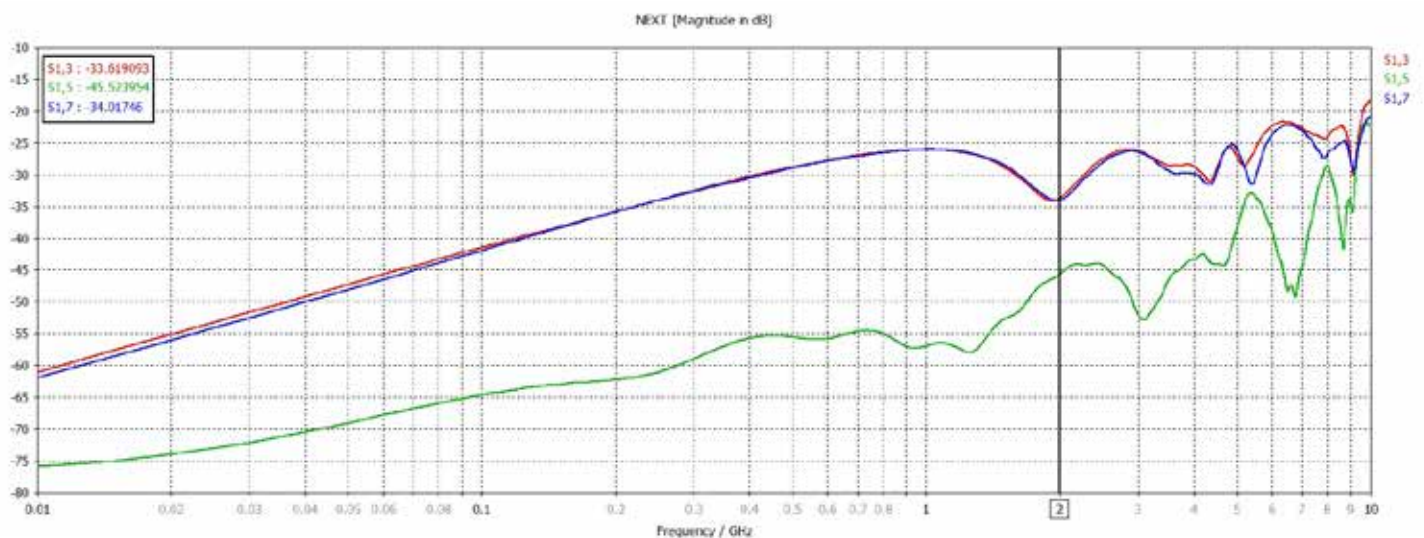
### CONTACT DIFFERENTIAL INSERTION LOSS



### CONTACT DIFFERENTIAL RETURN LOSS

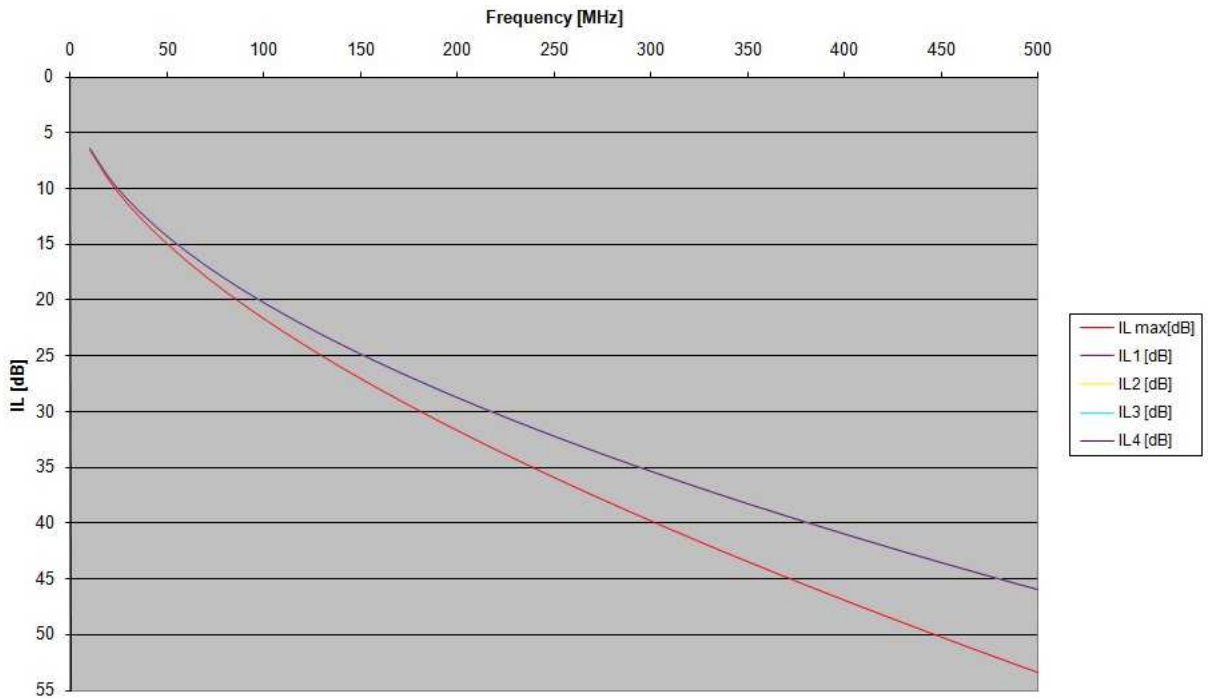


### CONTACT DIFFERENTIAL REAR-END CROSSTALK



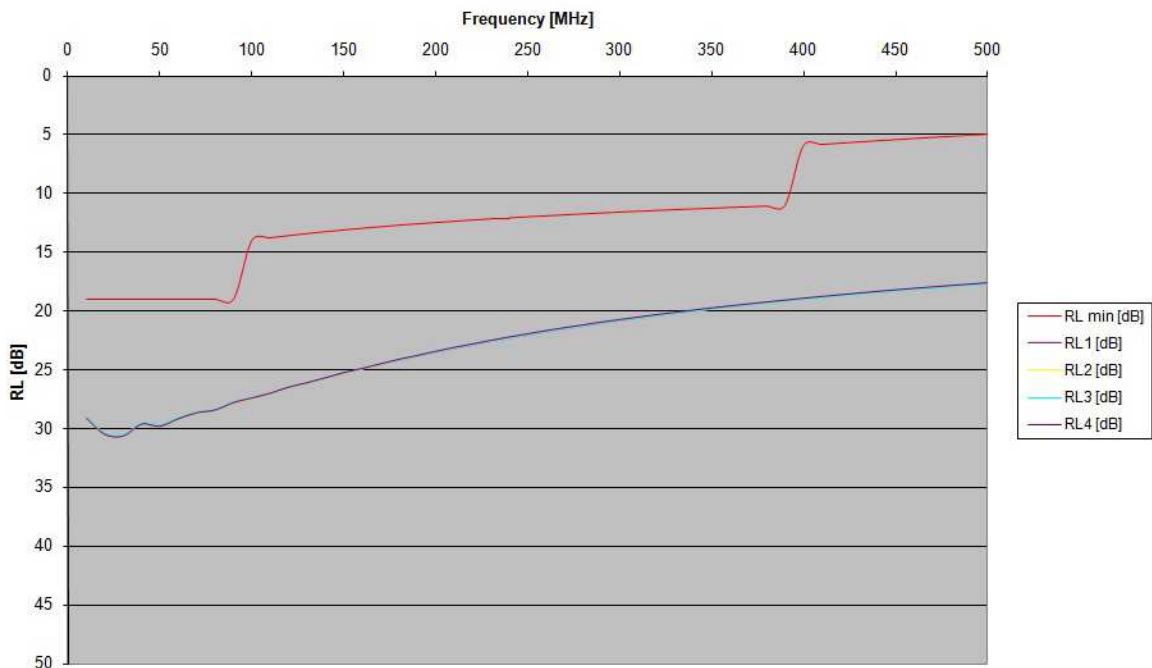
# Signal Integrity Contact Data

## 10GBASE-T DATA (TWO MATED CONTACTS ON EACH END OF 100 METER CAT6A CABLE) INSERTION LOSS



Cable assembly near-end crosstalk

## RETURN LOSS



Cable assembly return loss

# CTF-Quad (Copper to Fiber) Media Converter

Quadrax form factor pins

## OVERVIEW

Amphenol Aerospace adds CTF-QUAD to the CTF (Copper to Fiber) media converter product family. This product line utilizes standard Quadrax receptacle connectors and inserts.

The CTF-QUAD product line is fiber to copper and copper to fiber media conversion in Quadrax form factor pins for standard D38999 Quadrax insert arrangements.



## FEATURES

- Quadrax form factor embedded fiber optic transmitters and receivers
- Replace any Quadrax pin in receptacle and configure with media conversion copper to fiber and fiber to copper
- Utilizes standard Quadrax receptacle connectors and inserts



## FIBER INTERFACE

- Industry standard 1.25mm fiber optic ferrules (LC & ARINC-801)
- Plug/socket side utilizes Quadrax socket to ARINC-801 pin adapter for system fiber connection



## COPPER INTERFACE

- Speed support from DC to 10 Gbps in both transmitter and receiver
- PCB lead connection to customer circuit board or PCB lead connection to flex with nano

## RUGGEDIZATION

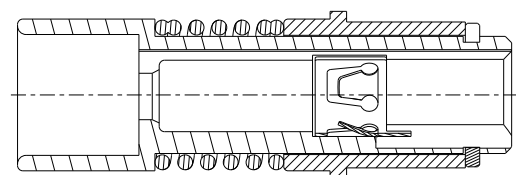
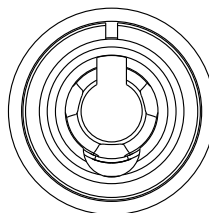
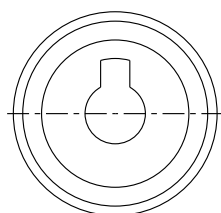
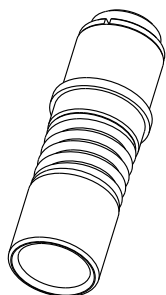
- Industry standard rugged transmitters and receivers -40°C to +85°C
- Components epoxy sealed in place
- Refer to page 3 for additional details



## ARINC-801 SIZE 8 SOCKET ADAPTER

Quadrax ARINC-801 Fiber Adapter part number – CF-198201-000

Multi-mode ARINC-801 Termini for the Adapter – CF-198148-1128



# CTF-QUAD

## How to Order

Ordering procedure is shown below using part number CTF-5Q90A1-04TN

1.	2.	3.	4.	5.	6.	7.	8.	9.
Connector Type	Material	Quadrax Contact	Finish	Shell Style	Shell Size-Insert Arrangement	Mode	Device Type	Rotation
<b>CTF</b>	<b>5</b>	<b>Q</b>	<b>Z</b>	<b>0</b>	<b>A1</b>	<b>04</b>	<b>T</b>	<b>N</b>

1. CONNECTOR TYPE	
<b>CTF</b>	Copper to Fiber Product Family

2. MATERIAL	
<b>5</b>	Aluminum Shell
<b>6</b>	Composite Shell
<b>8</b>	Stainless Steel Shell

3. QUADRAX CONTACTS	
<b>Q</b>	Quadrax Size 8 Contact Active Device

4. FINISH	
<b>T</b>	Aluminum Durmalon
<b>Z</b>	Aluminum Black Zinc Nickel
<b>F</b>	Aluminum Electroless Nickel
<b>M</b>	Composite Electroless Nickel
<b>W</b>	Aluminum OD Cad
<b>J</b>	Composite OD Cad
<b>L</b>	Stainless Steel Electrodeposited Nickel
<b>Y</b>	Stainless Steel Passivated*

\* Environmental only-not hermetic

Note: There is not a Mil-Spec finish for environmental passivated steel-only hermetic, hence the asterisk.

5. SHELL STYLE	
<b>0</b>	Wall Mount
<b>N</b>	Wall Mount w/ Clinch Nuts
<b>7</b>	Jam Nut

Note: All with Stand-off

6. SHELL SIZE-INSERT ARRANGEMENT	
<b>A1</b>	9-5
<b>E2</b>	17-52
<b>F4</b>	21-75
<b>H6</b>	23-6
<b>J8</b>	25-8

7. MODE	
<b>04</b>	4 Gb/s multimode
<b>08</b>	8 Gb/s multimode
<b>10</b>	10 Gb/s multimode

8. DEVICE TYPE	
<b>T</b>	Transmit
<b>R</b>	Receive
<b>X</b>	Transceiver

9. ROTATION	
<b>N</b>	Normal
<b>A</b>	
<b>B</b>	
<b>C</b>	
<b>D</b>	
<b>E</b>	

## CTF-QUAD MATING PLUG

Ordering procedure is shown below using part number CTF-5P96A1-000N (kit w/ connector and appropriate number of A801 cavity adapters)

1.	2.	3.	4.	5.	6.	7.
Connector Type	Material	Quadrax Contact	Finish	Shell Style	Shell Size-Insert Arrangement	Rotation
<b>CTF</b>	<b>5</b>	<b>P</b>	<b>Z</b>	<b>6</b>	<b>A1</b>	<b>N</b>

1. CONNECTOR TYPE	
<b>CTF</b>	Copper to Fiber Product Family

2. MATERIAL	
<b>5</b>	Aluminum Shell
<b>6</b>	Composite Shell
<b>8</b>	Stainless Steel Shell

3. QUADRAX CONTACTS	
<b>P</b>	Quadrax Size 8 Contact Adapter for ARINC 801 Contact

4. FINISH	
<b>T</b>	Aluminum Durmalon
<b>Z</b>	Aluminum Black Zinc Nickel
<b>F</b>	Aluminum Electroless Nickel
<b>M</b>	Composite Electroless Nickel
<b>W</b>	Aluminum OD Cad
<b>J</b>	Composite OD Cad
<b>L</b>	Stainless Steel Electrodeposited Nickel
<b>Y</b>	Stainless Steel Passivated*

5. SHELL STYLE	
<b>6</b>	Straight Plug

Note: No Stand-off, accessory threads

6. SHELL SIZE-INSERT ARRANGEMENT	
<b>A1</b>	9-5
<b>E2</b>	17-52
<b>F4</b>	21-75
<b>H6</b>	23-6
<b>J8</b>	25-8

7. ROTATION	
<b>N</b>	Normal
<b>A</b>	
<b>B</b>	
<b>C</b>	
<b>D</b>	
<b>E</b>	

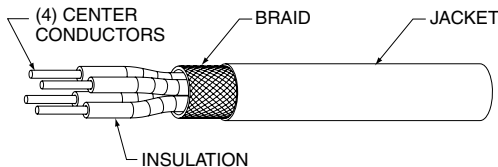
\* Environmental only-not hermetic

Note: There is not a Mil-Spec finish for environmental passivated steel-only hermetic, hence the asterisk.

**AMPHENOL QUADRAX CONTACTS**

Offers several advantages for high data transfer rates, low power consumption, and excellent EMI compatibility. Four strategically spaced inner contacts form two 100 or 150 Ohm matched impedance differential pairs. The Outer contact has a rugged wall section for durability. Available in size 8 crimp termination style. Also available in size 8 with PC tails (see pages 22-23). Requires modification of MIL-DTL-38999 connector to accommodate keyed contacts.

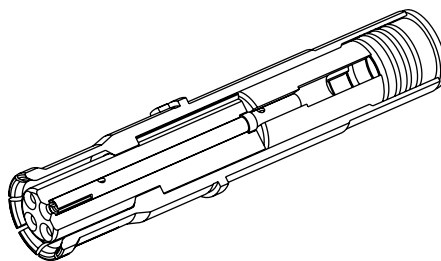
**CABLE ILLUSTRATION - QUADRAX CONTACT**



Quadrax Pin with 8P8C "RJ45" Jack

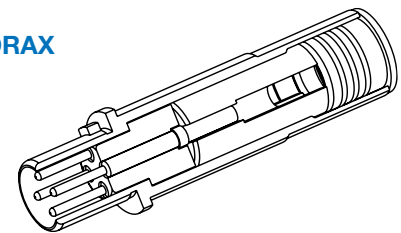
**TYPICAL QUADRAX SOCKET CONTACT**

Has socket outer contact with a socket inner contact



**TYPICAL QUADRAX PIN CONTACT**

Has pin outer contact with a pin inner contact



**QUADRAX CONTACTS ARE GOLD PLATED, CRIMP TERMINATION**

Finish of mating contact parts: supplied with 0.000050 min. gold over nickel on mating interface.

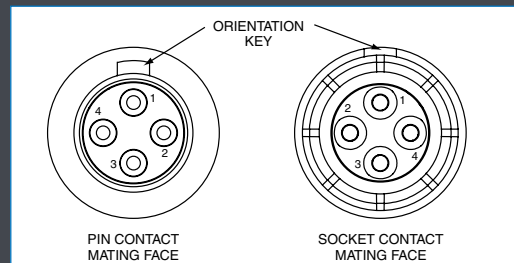
**QUADRAX SIZE 8 CONTACT PERFORMANCE:**

- Bandwidth:** Up to 1.25 GHz
- Data Rate:** Exceeding 2.5 Gbps.
- Voltage Rating:** 500 Vrms max. @ sea level

**Dielectric Withstanding Voltage:**

1000 VAC rms between all inner contacts @ sea level, 500 VAC rms between inner and outer contacts @ sea level

**Suggested Numbering for Quadrax Contacts**



Differential Pairs, contacts 1-3, 2-4.

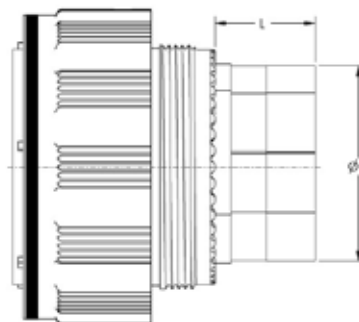
Quadrax differential pairs are 1 and 3, 2 and 4.

See page 19 for part number ordering of popularly used 38999 Series III connectors with 100 ohm quadrax contacts.

**GUIDE FOR SELECTING A BACKSHELL:**

See required backshell dimensions to avoid interference between piggyback grommets used on size 8 cavities and the backshell.

Backshell extender is also available see page 14. This can be used with any mil-spec backshell.



Size	A Dia Min	L Min
17	.734	.540
19	.869	.540
21	.869	.540
23	1.088	.540
25	1.234	.540

# How to Order D38999, Series III Connectors with Standard 100 Ohm Quadrax Contacts

21-033385-051 Socket, 21-033384-051 Pin Contacts\*

For all other quadrax contacts or differential twinax contacts, please consult Amphenol Aerospace for part numbers.

1.	2.	3.	4.	5.	6.
Connector Type	Shell Type	Service Class	Shell Size – Insert Arrangement	Contact Type	Alternate Keying Position
<b>TVP</b>	<b>00</b>	<b>RQW</b>	<b>21-75</b>	<b>P</b>	<b>B</b>

1. CONNECTOR TYPE	
<b>TV</b>	Tri-Start series connector with metal shells
<b>TVP</b>	Back panel mounted receptacle with metal shells
<b>CTV</b>	Tri-Start series connector with composite shells
<b>CTVP</b>	Back panel mounted receptacle with composite shells

2. SHELL STYLE	
<b>00</b>	Wall mount receptacle
<b>02</b>	Box mount receptacle available only with the PCB tails and epoxy backfilled (non-removable)
<b>06</b>	Straight plug
<b>07</b>	Jam nut receptacle

3. SERVICE CLASS WITH QUADRAX	
<b>RQF</b>	Electroless nickel plated
<b>RGQF</b>	Electroless nickel plated ground plane
<b>RQW</b>	Olive drab cadmium plate
<b>RGQW</b>	Olive drab cadmium plated ground plane
<b>RQK</b>	Corrosion resistance stainless steel
<b>RGQK</b>	Stainless steel ground plane
<b>QDT</b>	Durmalon plated, Nickel-PTFE alternative to cadmium
<b>GQDT</b>	Groundplane Durmalon
<b>QDZ</b>	Zinc nickel black conductive
<b>RQS</b>	Stainless steel
<b>JFW</b>	Aluminum Bronze

**4. Select a Shell Size and Insert Arrangement**  
See insert arrangements available with Quadrax contacts on pages 11-12. Shell size and insert arrangements are together in one chart. First number represents shell size, second number is the insert arrangement.

5. CONTACT TYPE	
<b>P</b>	Pin contacts
<b>S</b>	Socket contacts

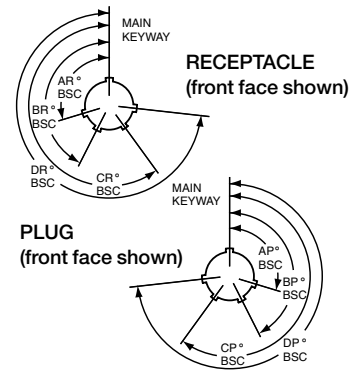
\* The incorporation of Quadrax or Differential Twinax contacts requires a modified connector to accommodate keyed contacts.

## 6. Alternate Keying Position

Locksmith keying—rotation of minor keys. See Series III alternate positions below “N” not required for normal position.

### Tri-Start Alternate Positions

A plug with a given rotation letter will mate with a receptacle with the same rotation letter. The angles for a given connector are the same whether it contains pins or sockets. Inserts are not rotated in conjunction with the master key/keyway.



Shell Size	Key & Keyway Arrangement Identification Letter	AR° or AP° BSC	BR° or BP° BSC	CR° or CP° BSC	DR° or DP° BSC
9	<b>N</b>	105	140	215	265
	<b>A</b>	102	132	248	320
	<b>B</b>	80	118	230	312
	<b>C</b>	35	140	205	275
	<b>D</b>	64	155	234	304
11, 13, and 15	<b>E</b>	91	131	197	240
	<b>N</b>	95	141	208	236
	<b>A</b>	113	156	182	292
	<b>B</b>	90	145	195	252
	<b>C</b>	53	156	220	255
17 and 19	<b>D</b>	119	146	176	298
	<b>E</b>	51	141	184	242
	<b>N</b>	80	142	196	293
	<b>A</b>	135	170	200	310
	<b>B</b>	49	169	200	244
21, 23, and 25	<b>C</b>	66	140	200	257
	<b>D</b>	62	145	180	280
	<b>E</b>	79	153	197	272
	<b>N</b>	80	142	196	293
	<b>A</b>	135	170	200	310
25L, 33, and 37	<b>B</b>	49	169	200	244
	<b>C</b>	66	140	188	257
	<b>D</b>	62	145	188	280
	<b>E</b>	79	153	188	272
	<b>N</b>	80	142	188	293

QUADRAX CONTACTS FOR USE IN TV-R CONNECTORS					
Impedance (Ohms)	Inner Conductor (AWG)	Electrical Protocol††	Cable	Contact Part Number (Termination Instruction Sheet)**	
				Pin	Socket
90		USB2.0 (480 Mbps)	USB2 (28433/02171LX-4)	21-033384-101† (L-2119-EK)	21-033385-101† (L-2119-EK)
	24		PIC USB2422	21-033384-381 (L-2119-EU)	21-033385-381 (L-2119-EU)
100	22	Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps)	GORE RCN 7688	21-033384-061 (L-2119-H)	21-033385-061 (L-2119-H)
			NF22Q100-01		
			Tensolite NF22Q100		
			Thermax 956-5		
	Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps)	Gore RCN8513	21-033384-171 (L-2119-BN)	21-033385-171 (L-2119-BN)	
		JSFY18-3			
Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps)	Tensolite NF22Q100 Special Box pattern, only mates with 21-03333( )-181	21-033384-181 (L-2119-BP)	21-033384-181 (L-2119-BP)		
100	24		S280W502-4/BMS13-72T03C04G024	21-033384-141 (BACC47GM1)	21-033385-141 (BACC47GN1)
		Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps)	Tensolite NF24Q100-01 (same as 21-03338( )-51, uses EMI Piggyback)	21-033384-161 (L-2119-BE)	21-033385-161 (L-2119-BE)
		Ethernet, 1000 Base-T Gigabit Ethernet	ABS0972 KB24	21-033384-021 (L-2119-A)	21-033385-021 (L-2119-A)
			ABS1503 KD 24		
			Draka Fileca F-4703-3		
			Draka Fileca F-4704-5		
			F4704-4		
			Filotex ET 2PC236		
			Filotex ET 2PF870		
			PIC Wire E50424		
		Tensolite 23450/04090X-4(LD)			
		Ethernet, 1000 Base-T Gigabit Ethernet	24443/03130X-4(LD)	21-033384-051 (L-2119-D)	21-033385-051 (L-2119-D)
			24443/03166X-4(LD)		
			24443/9P025X-4(LD)		
			24443/C20714X-4(LD)		
			24450/0120X-4(LD)		
			BMS13-72T03C04G024		
			GORE GSC-01-81869-01		
			NF24-2Q100		
			NF24Q100-01		
			NF24Q100-01-200C (Space)		
			Pic Wire E51424		
			S280W502-4		
			Tensolite NF24Q100		
			Thermax MX100Q-24		
			Thermax T956-4T200		
		TYCO CEC-RWC-18664			
		Harbour Q10024016			
Serial FPDP Applications (2.5 Gbps) (Typical app run at 150 Ohms) HDMI 1.3	Tensolite NF24Q100	21-033384-191 (L-2119-BS)	21-033385-191 (L-2119-BS)		
Meets EN3155-074	ABS1503KD24	21-033384-281 (L-2119-DL)	21-033385-281 (L-2119-DL)		
	F-4703				
	Gore RCN9034	21-033384-391 (L-2119-EY)	21-033385-391 (L-2119-EY)		
	NF24Q100-01				
	Gore RCN8752	21-033384-421	21-033385-421		
	Madison 1016423	21-033384-431	21-033385-431		

# Quadrax Contacts

MIL-DTL-38999, Series III\*, Contact Part Number Guide by Cable

QUADRAX Contacts

QUADRAX CONTACTS FOR USE IN TV-R CONNECTORS					
Impedance (Ohms)	Inner Conductor (AWG)	Electrical Protocol††	Cable	Contact Part Number (Termination Instruction Sheet)**	
				Pin	Socket
100	26	Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps)	PIC E51426	21-033384-071 (L-2119-AB)	21-033385-071 (L-2119-AB)
			Tensolite NF26-2Q100		
			Tensolite NF26Q100		
			Tensolite NF26Q100-01		
		Wirenetics W-3714-379			
		Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps)	Draka Fileca F-4704-6	21-033384-151 (L-2119-AW)	21-033385-151 (L-2119-AW)
Gore RCN 8672					
110	24		Cable RCN 8422	21-033384-291 (L-2119-DR)	21-033385-291 (L-2119-DR)
			Gore RCN 8647	21-033384-301 (L-2119-DR)	21-033385-301 (L-2119-DR)
			Gore RCN 8687		
		IEEE 1394B Firewire	Gore RCN8647	21-033384-211 (L-2119-CD)	21-033385-211 (L-2119-CD)
			Tensolite 24450/03089X-4(LD)		
		IEEE 1394B Firewire	JSFY02-1	21-033384-221 (L-2119-FF)	21-033385-221 (L-2119-FF)
			JSFY18		
		IEEE 1394B Firewire	Gore RCN8487	21-033384-231 (L-2119-CR)	21-033385-231 (L-2119-CR)
			JSFY18		
		IEEE 1394B Firewire	Tensolite 24450/03089X-4(LD) Same as 21-03338( )-211 but Box pattern, mates with 21-03338( )-241 only	21-033384-241†	21-033385-241†
150	24		Gore RCN7625	21-033384-271 (L-2119-CT)	21-033385-271 (L-2119-CT)
			Harbour Data Master Q150-24 (19)	21-033450-051 (L-2119-DV)	21-033451-051 (L-2119-DV)
	Tensolite 24483/02006X-4 (LD)				
	26		Tensolite 26473/02006X-4(LD)/Gore RCN8328 (not for new designs, use 21-033450/1 series)	21-033384-031 (L-2119-B)	21-033385-031 (L-2119-B)
			Gore RCN8328		
		Tensolite 26473/02006X-4(LD) Same as 21-033384/5-31 but box pattern (not for new designs, use 21-033450/1 series) Gore RCN8328	21-033384-201†	21-033385-201†	
		Fibre-Channel (1 GBPS, 2 GBPS, 1G/2G), 1000 Base-CX (1.25 GBPS), SCSI-2 (3.2 GBPS)	Gore RCN8328	21-033450-001 (L-2119-BW)	21-033451-001 (L-2119-BW)
			Tensolite 26473/02006X-4(LD)		
		Fibre-Channel (1 GBPS, 2 GBPS, 1G/2G), 1000 Base-CX (1.25 GBPS), SCSI-2 (3.2 GBPS)	Gore RCN8328 (same as 21-033450/1-1 except box pattern). Mates with 21-033450/1-11 only.	21-033450-011† (L-2119-CS)	21-033451-011† (L-2119-CS)
			Tensolite 26473/02006X-4(LD)		
			Harbour Data Master Q150-24(19)SS	21-033450-051 (L-2119-DV)	21-033451-051 (L-2119-DV)
		Gore RCN7625	21-033450-061 (L-2119-GH)	21-033451-061 (L-2119-GH)	

Daniels crimping tools are available from Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

\* Requires modified connector to accommodate keyed contacts.

\*\* Termination instructions are packaged with each contact and can be found on-line at: [www.amphenol-aerospace.com/serviceinstructions.asp](http://www.amphenol-aerospace.com/serviceinstructions.asp)

† Consult Amphenol Aerospace for current release of this contact or instruction sheet if applicable.

†† Test reports available for indicated protocols. Consult Amphenol Aerospace.



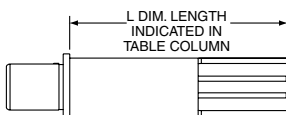
QUADRAX PCB CONTACTS				
Impedance (Ohms)	L Dim	Pretinned	Contact Part Number	
			Pin	Socket
100	.36		21-033398-391	21-033397-391
	.418		21-033398-491	21-033397-491
	.428 ± .015		21-033398-751	21-033397-751
	.494		21-033398-231	21-033397-231
	.552 ± .015		21-033398-741	21-033397-741
	.582		21-033398-521	21-033397-521
	.580 ± .015		21-033398-661	21-033397-661
	.605		21-033398-191	21-033397-191
	.615		21-033398-141	21-033397-141
	.647 ± .015		21-033398-761	21-033397-761
	.666		21-033398-531	21-033397-531
	.672		21-033398-371	21-033397-371
	.689 ± .015		21-033398-721	21-033397-721
	100/150	.699		21-033398-511
100	.708		21-033398-111	21-033397-111
	.721		21-033398-581	21-033397-581
	.740 ± .015		21-033398-771	21-033397-771
	.741		21-033398-241	21-033397-241
	.741		21-033398-271	21-033397-271
	.761		21-033398-461	21-033397-461
	.770 ± .015		21-033398-691	21-033397-691
	.775		21-033398-221	21-033397-221
	.788	X	21-033398-551	21-033397-551
	.788		21-033398-251	21-033397-251
	.788 ± .015		21-033398-731	21-033397-731
	.806		21-033398-281	21-033397-281
	.815		21-033398-561	21-033397-561
	.815 ± .015		21-033398-631	21-033397-631
	.819		21-033398-431	21-033397-431
	.836		21-033398-301	21-033397-301
	.84	X	21-033398-091	21-033397-091
	.859		21-033398-121	21-033397-121
	.866		21-033398-031	21-033397-031
	.866 ± .015		21-033398-681	21-033397-681
	.871		21-033398-351	21-033397-351
	.875		21-033398-501	21-033397-501
	.889		21-033398-471	21-033397-471

QUADRAX PCB CONTACTS				
Impedance (Ohms)	L Dim	Pretinned	Contact Part Number	
			Pin	Socket
100	.901		21-033398-341	21-033397-341
	.914		21-033398-381	21-033397-381
	.928 ± .015		21-033398-641	21-033397-641
	.928 ± .015		21-033398-671	21-033397-671
	.939		21-033398-601	21-033397-601
	.939		21-033398-361	21-033397-361
100/150	.939		21-033398-591	21-033397-591
100	.94		21-033398-311	21-033397-311
	.946		21-033398-541	21-033397-541
	.971		21-033398-481	21-033397-481
	.991 ± .015		21-033398-701	21-033397-701
	1.009		21-033398-401	21-033397-401
	1.035	X	21-033398-021	21-033397-021
	1.035		21-033398-291	21-033397-291
	1.035 ± .015		21-033398-651	21-033397-651
1.169		21-033398-421	21-033397-421	
1.196 ± .015		21-033398-621	21-033397-621	
1.366		21-033398-611	21-033397-611	
110	TBD		21-033398-711	21-033397-711

Daniels crimping tools are available from  
Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

\* Requires modified connector to accommodate keyed contacts.

Indicated length given in chart is the distance from the rear of the contact retention shoulder to the tip of the PCB tails.



Note: It does not indicate stickout length when installed in D38999 connector.

# Quadrax Contacts

MIL-DTL-38999, Series III\*, Contact Part Number Guide for PCB Contacts

QUADRAX PCB CONTACTS				
Impedance (Ohms)	L Dim	Pretinned	Contact Part Number	
			Pin	Socket
150	.494 (mates to 21-033450/51 series)		21-033452-051	21-033453-051
	.494		21-033398-451	21-033397-451
	.494	X	21-033398-071	21-033397-071
	.582 (mates to 21-033450/51 series)		21-033452-061	21-033453-061
	.699		21-033398-511	21-033397-511
	.780	X	21-033398-081	21-033397-081
	.780	X	21-033398-131	21-033397-131
	.815		21-033398-151	21-033397-151
	.815	X	21-033398-211	21-033397-211
	.815 (mates to 21-033450/51 series)		21-033452-021	21-033453-021
	.815 (mates to 21-033450/51 series)	X	21-033452-031	21-033453-031
	.866		21-033398-411	21-033397-411
	.866 (mates to 21-033450/51 series)		21-033452-041	21-033453-041
	.939		21-033398-591	21-033397-591
	.939 (mates to 21-033450/51 series)		21-033452-071	21-033453-071
	1.035 (mates to 21-033450/51 series)		21-033452-011	21-033453-011
	1.035		21-033398-061	21-033397-061

Daniels crimping tools are available from  
Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

\* Requires modified connector to accommodate keyed contacts.

\*\*\* Must be used with 21-033321-005 piggyback grommet seal.

SEALING PLUGS	
Sealing Plugs for use with D38999 Connectors using Quadrax Contacts - Size 8 Cavities	Part Number
***Standard Plastic (Not recommended for Pin Connectors)	T3-4008-59P
Standard Plastic to be used with PCB tails (shorter tail length)	T3-4008-59P1
***Metal sealing plug - can be used when mating with contacts on mating half	21-033899-8Q1
Metal sealing plug used with PCB's and mating contact on mating half	21-033899-8Q2

PIGGYBACK GROMMET	
Grommet for use with D38999 using Quadrax Contacts	Part Number
Metallized piggyback grommet	21-033321-023