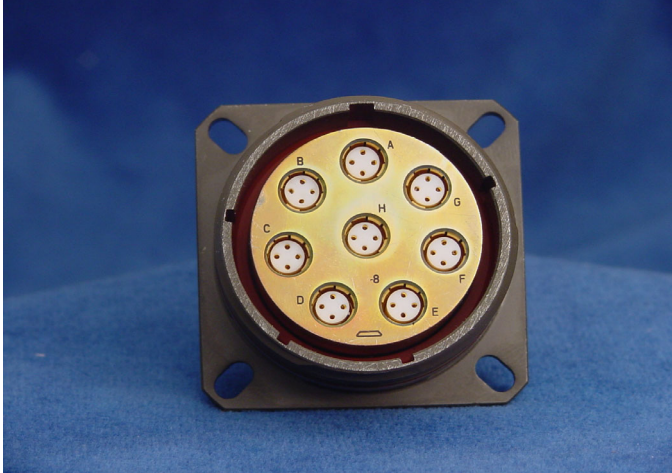
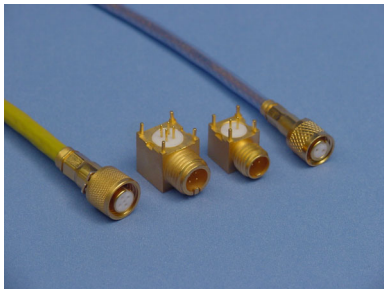


Amphenol Aerospace

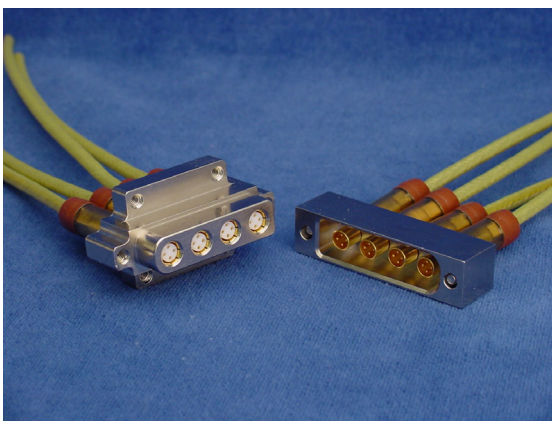
Size 8 High Speed Quadrax and Differential Twinax Contacts For use in MIL-DTL-38999 Subminiature Cylindrical and Arinc 600 Rectangular Connectors.



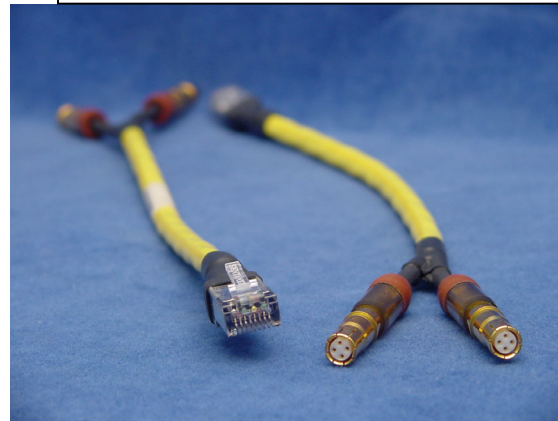
D38999 Series III Groundplane
Connector with Quadrax PCB
Sockets Installed



Quadrax and Twinax
Transition plugs and
receptacle adapters



Four bay Rectangular with Quadrax



Eight wire Gigabit Ethernet Assembly

- Quadrax contacts consist of an outer contact with four strategically spaced inner contacts forming two 100 or 150 Ohm matched impedance differential pairs.
- Differential Twinax consist of an outer contact with two inner contacts spaced to form one 100 or 150 Ohm matched impedance differential pair.

**Contacts can be used in connectors for
Ethernet 100 Base-T- 100 Ohm
Gigabit Ethernet 1000 Base-T- 100 Ohm
Fibre-Channel -150 Ohm
IEEE 1394B FireWire- 110 Ohm
applications.**

Typical Electrical Performance:

Bandwidth: Up to 3 Gigahertz.

Data Rate: Exceeding 2 Gbits/sec

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.

Below is a list of contact part numbers available but not limited to the cables listed. All contacts are available kitted with or installed into ARINC 600 and specially modified MIL-DTL-38999 connectors. Consult factory for cables not listed.

| D38999 | | | |
|--------------------|---|--|------------------|
| Description | Part Number | Cable Part Number | Impedance |
| Quadrax Socket | 21-33385-21 | Draka Fileca F-4703-3, F4704-4, Filotex ET 2PC236, Filotex ET2PF870, PIC Wire E50424 | 100 Ohm |
| | 21-33385-31 | Tensolite 26473/02006X-4(LD)/ Gore RCN8328 | 150 Ohm |
| | 21-33385-51 | Tensolite NF24Q100, NF24Q100-01, 24443/9P025X-4(LD), S280W502-4, 24443/03130X-4(LD), Thermax 956-4TN, Tensolite 24450/01201X-4(LD), NF24-2Q100 | 100 Ohm |
| | 21-33385-61 | Tensolite NF22Q100, NF22Q100-01, Thermax 956-5, Draka Fileca F-4704-5, GORE RCN 7688 | 100 Ohm |
| | 21-33385-61 | Tensolite 24450/03089X-4(LD) | 110 Ohm |
| | 21-33385-71 | Tensolite NF26Q100, NF26Q100-01, NF26-2Q100 | 100 Ohm |
| | 21-33385-91 | JSFY02-1 | 110 Ohm |
| | 21-33385-111 | Gore RCN8487, JSFY18 | 110 Ohm |
| | 21-33385-141 Ref Boeing BACC47GN1 | S280W502-4 | 100 ohm |
| | 21-33385-151 | Draka Fileca F-4704-6 | 100 Ohm |
| PCB Socket | 21-33397-21 | PCB (1.035 Length) | 100 Ohm |
| | 21-33397-31 | PCB (.866 Length) | 100 Ohm |
| | 21-33397-61 | PCB (1.035 Length) | 150 Ohm |
| Quadrax Pin | 21-33384-21 | Draka Fileca F-4703-3, F4704-4, Filotex ET 2PC236, PIC Wire E50424 | 100 Ohm |
| | 21-33384-31 | Tensolite 26473/02006X-4(LD)/ Gore RCN8328 | 150 Ohm |
| | 21-33384-51 | Tensolite NF24Q100, NF24Q100-01, 24443/9P025X-4(LD), S280W502-4, 24443/03130X-4(LD), Thermax 956-4TN, Tensolite 24450/01201X-4(LD), NF24-2Q100 | 100 Ohm |
| | 21-33384-61 | Tensolite NF22Q100 , NF22Q100-01, Thermax 956-5, Draka Fileca F-4704-5 | 100 Ohm |
| | 21-33384-61 | Tensolite 24450/03089X-4(LD) | 110 Ohm |
| | 21-33384-71 | Tensolite NF26Q100, NF26Q100-01, NF26-2Q100 | 100 Ohm |
| | 21-33384-91 | JSFY02-1 | 110 Ohm |
| | 21-33384-111 | Gore RCN8487, JSFY18 | 110 Ohm |
| | 21-33384-141 Ref Boeing BACC47GMI | S280W502-4 | 100 ohm |
| | 21-33384-151 | Draka Fileca F-4704-6 | 100 Ohm |
| PCB Pin | 21-33398-21 | PCB (1.035 Length) | 100 Ohm |
| | 21-33398-31 | PCB (.866 Length) | 100 Ohm |
| | 21-33398-61 | PCB (1.035 Length) | 150 Ohm |
| | 21-33425-1 | Right Angle Special PCB | 100 Ohm |
| | 21-33398-271 | PCb Special (.430 Length) | 100 Ohm |

| Description | Part Number | Cable Part Number | Impedance |
|----------------------------|--------------------|---|------------------|
| Transition Adapters | 21-33836-21 | Plug contact, Tensolite 26473/02006X-4(LD)/ Gore RCN8328 | 150 Ohm |
| | 21-33837-31 | PCB Receptacle Straight | 150 Ohm |
| | 21-33837-21 | PCB receptacle 90 degree | 150 Ohm |
| | 21-33836-31 | Plug contact, Tensolite NF24Q100 | 100 Ohm |
| | | | |
| | 21-33836-41 | Plug contact ,Tensolite NF22Q100, NF22Q100- 01, Thermax 956-5 | 100 Ohm |
| | 21-33836-51 | Plug contact Draka Fileca F-4703-3, F-4704-4 | 100 Ohm |
| | 21-33836-61 | Plug contact, NF26Q100 cable | 100 Ohm |
| | | | |
| | 21-33837-41 | PCB receptacle 90 degree | 100 Ohm |
| | 21-33837-51 | PCB receptacle straight | 100 Ohm |
| | 21-33837-61 | PCB receptacle straight , special tail length (.200) | 100 Ohm |
| | 21-33837-71 | Cable to board 90 degree adapter | 150 Ohm |
| | 21-33837-91 | Straight in line recept (threaded) NF24Q100 cable | 100 Ohm |
| | 21-33837-101 | Straight PCB cable to board adapter NF24Q100 cable | 100 Ohm |
| | 21-33837-111 | Straight PCB cable to board adapter 26473/02006X-4(LD) cable | 150 Ohm |
| | 21-33837-141 | Cable to board 90 degree adapter | 100 Ohm |
| | | | |
| Sealing Plugs | T3-4008-59P | Standard Plastic | |
| | T3-4008-59P1 | Standard Plastic to be used with PCB tails (shorter tail length) | |
| | 21-33899-8 | Metal sealing plug (same as T3-4008-59P) | |
| | 21-33899-8Q1 | Metal sealing plug can be used when mating with contacts on mating half | |
| | 21-33899-8Q2 | Metal sealing plug used with PCB's and mating contact on mating half | |
| | 21-33321-23 | Metalized piggyback grommet | |
| | | | |
| Differential Twinax Socket | 21-33388-21 | Tensolite 24463/9P025X-2(LD), Thermax 12814, ST5M1284-003 (98 Ohm), 26463/70460X-2 (98 Ohm), PIC E10224 | 100 Ohm |
| | 21-33388-31 | Tensolite 26483/03071X-2(LD) | 150 Ohm |
| | 21-33388-41 | Tensolite 26453/03184X-2(LD), Thermax 956- 626Z, GORE GSC-05-827300-00 | 100 Ohm |
| | 21-33388-51 | GORE GSC-05-827300-00 Vacuum Degassed | 100 Ohm |
| | 21-33388-61 | 23460/05114X-2LD | 100 Ohm |
| | 21-03388-71 | Raychem 0026A0024 | 100 Ohm |
| | | | |
| Twinax Socket PCB | 21-33835-1 | PCB (1.035 Length) | 100 Ohm |
| | 21-33835-21 | PCB (1.035 Length) | 150 Ohm |
| | | | |
| Differential Twinax Pin | 21-33387-21 | Tensolite 24463/9P025X-2(LD), Thermax 12814, ST5M1284-003 (98 Ohm), 26463/70460X-2 (98 Ohm), PIC E10224 | 100 Ohm |
| | 21-33387-31 | Tensolite 26483/03071X-2(LD) | 150 Ohm |

| | | | |
|---------------------------------|--------------|--|---------|
| Differential Twinax Pin (Con't) | 21-33387-41 | Tensolite 26453/03184X-2(LD), Thermax 956-626Z, GORE GSC-05-827300-00 | 100 Ohm |
| | 21-33387-51 | GORE GSC-05-827300-00 Vacuum Degassed | |
| | 21-33387-61 | 23460/05114X-2LD | 100 Ohm |
| | 21-03388-71 | Raychem 0026A0024 | 100 Ohm |
| | | | |
| Twinax Pin PCB | 21-33834-1 | PCB (1.035 Length) | 100 Ohm |
| | 21-33834-21 | PCB (1.035 Length) | 150 Ohm |
| | | | |
| Transition Adapters-Twinax | 21-33833-31 | Straight receptacle | 100 Ohm |
| | 21-33833-21 | 90 degree Receptacle | 100 Ohm |
| | 21-33833-91 | 90 degree Receptacle (smaller profile) | 100 Ohm |
| | 21-33833-51 | 90 degree PCB cable to board, cable 224463/9P025X-2 | 100 Ohm |
| | 21-33833-121 | 90 degree Receptacle (small profile .310) | 150 Ohm |
| | 21-33832-21 | Plug for 24463/9P025X-2(LD) | 100 Ohm |
| | 21-33832-81 | Plug for M17/176-00002 | 78 Ohm |
| | 21-33833-101 | 90 degree PCB cable to board , cable 26483/03071X-2 | 150 Ohm |
| | 21-33832-91 | Plug for 26483/03071X-2 | 150 Ohm |
| | 21-33833-111 | 90 degree Receptacle | 150 Ohm |
| | 21-33832-101 | Plug for 26483/03071X-2 (mates to 21-33833-121) | 150 Ohm |
| | | | |
| ARINC 600 | | | |
| Quadrax Socket | 21-33383-21 | Tensolite NF24Q100, 24443/9P025X-4(LD), S280W502-4, 24443/03130X-4(LD) | 100 Ohm |
| | 21-33383-31 | Draka Fileca F-4703-3 | 100 Ohm |
| | 21-33383-61 | Tensolite 26473/02006X-4(LD), Gore RCN8328 | 150 Ohm |
| | 21-33383-71 | JSFY02-1 | 110 Ohm |
| | 21-33383-101 | Draka Fileca F-4704-5, NF22Q100 | 100 Ohm |
| | | | |
| Socket PCB | 21-33397-1 | PCB (1.037 Length) | 100 Ohm |
| | | | |
| Quadrax Pin | 21-33382-21 | Tensolite NF24Q100, 24443/9P025X-4(LD), S280W502-4, 24443/03130X-4(LD) | 100 Ohm |
| | 21-33382-31 | Draka Fileca F-4703-3 | 100 Ohm |
| | 21-33382-61 | Tensolite 26473/02006X-4(LD), Gore RCN8328 | 150 Ohm |
| | 21-33382-71 | JSFY02-1 | |
| | 21-33382-101 | Draka Fileca F-4704-5, NF22Q100 | 100 Ohm |
| | | | |
| Pin PCB | 21-33398-41 | PCB (.296 Length) | 100 Ohm |
| | 21-33398-1 | PCB (1.037 Length) | 100 Ohm |
| | 21-33398-51 | PCB (.296 Length) | 100 Ohm |
| | | | |
| Differential Twinax Socket | 21-33379-21 | ABS0386WF24 | 100 Ohm |
| | 21-33379-31 | ASNE0272TK22 | 100 Ohm |
| | 21-33379-41 | ASNE0272TK24 | 100 Ohm |
| | 21-33379-51 | Tensolite 24463/9P025X-2(LD) | 100 Ohm |
| | | | |
| Differential Twinax Pin | 21-33378-21 | ABS0386WF24 | 100 Ohm |
| | 21-33378-31 | ASNE0272TK22 | 100 Ohm |
| | 21-33378-41 | ASNE0272TK24 | 100 Ohm |
| | 21-33378-51 | Tensolite 24463/9P025X-2(LD) | 100 Ohm |

How to Order

Amphenol Quadrax Connectors can be ordered by coded part number. The below connectors are kitted with the 100 Ohm Quadrax 21-033385-051 Socket and 21-033384-051 Pin contacts only. For contacts other than the above please consult factory for part numbers.

Example **TVP00RQW21-75P**

Connector Type

TV designates Tri-Start Series Connector
TVP designates back panel mounted receptacle

Shell Style

00 designates wall mount receptacle
02 designates box mount receptacle available only with PCB tails and epoxy backfilled (non-removable)
06 designates straight plug
07 designates jam nut receptacle

Service Class

RQF electroless nickel plated aluminum
RGQF electroless nickel plated ground plane aluminum
RQW olive drab cadmium plate
RGQW olive drab cadmium plated ground plane aluminum
RQB NiAlBronze
RGQB NiAlBronze ground plane
RQK corrosion resistance stainless steel
RGQK stainless steel ground plane

Shell Size / Insert arrangement available

MIL-DTL-38999, Sizes 9-25 (see attached page 4 with specific inserts available)

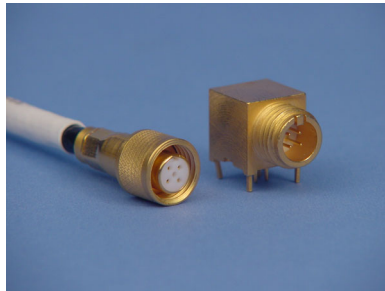
Contact Type

P designates pin contacts
S designates socket contacts

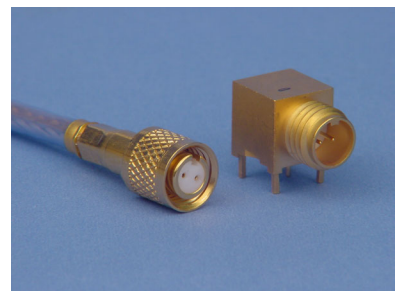
Also available are matched impedance Quadrax and Twinax Transition Adapters, which provide a method of launching from the High Speed connectors to the PCB boards. Non-threaded adapters for launching direct from the cable end to the board are also available. Part numbers vary depending on cable. Consult factory for more information.



Straight Quadrax
Receptacle Contact



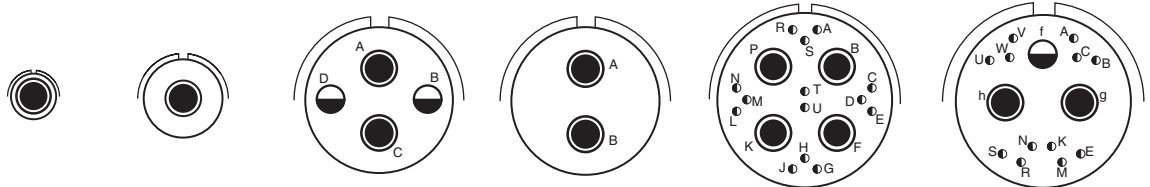
90 Degree Quadrax
receptacle contact and
transition plug



90 Degree Twinax
receptacle contact
and transition plug

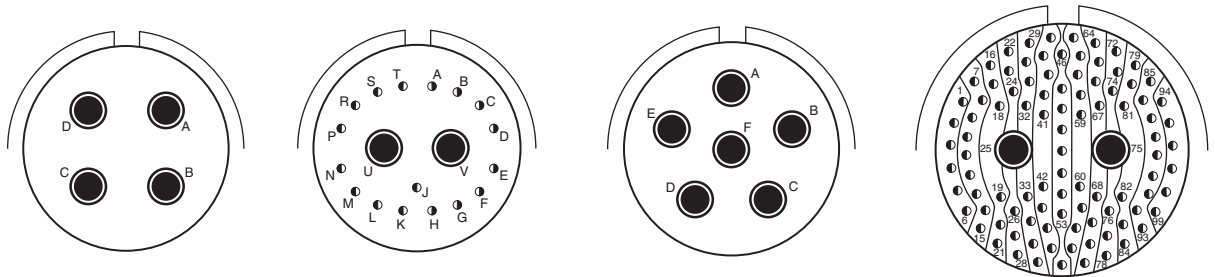
Quadrax & Differential Twinax Contact insert arrangements for MIL-DTL-38999

front face of pin inserts illustrated

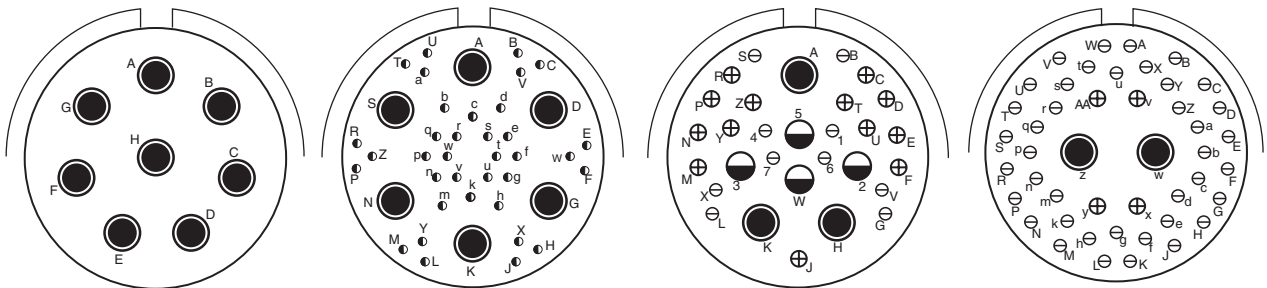


| | | | | | | | | | | |
|--------------------|-----|------|-------|---|-------|-------|---|-------|----|-----|
| Insert Arrangement | 9-5 | 11-1 | 17-22 | | 17-52 | 19-18 | | 19-31 | | |
| Number of Contacts | 1 | 1 | 2 | 2 | 2 | 14 | 4 | 2 | 1 | 12 |
| Contact Size | 8 | 8 | 12 | 8 | 8 | 22D | 8 | 8 | 12 | 22D |

Grounded Meets Boeing 17-82 Specification



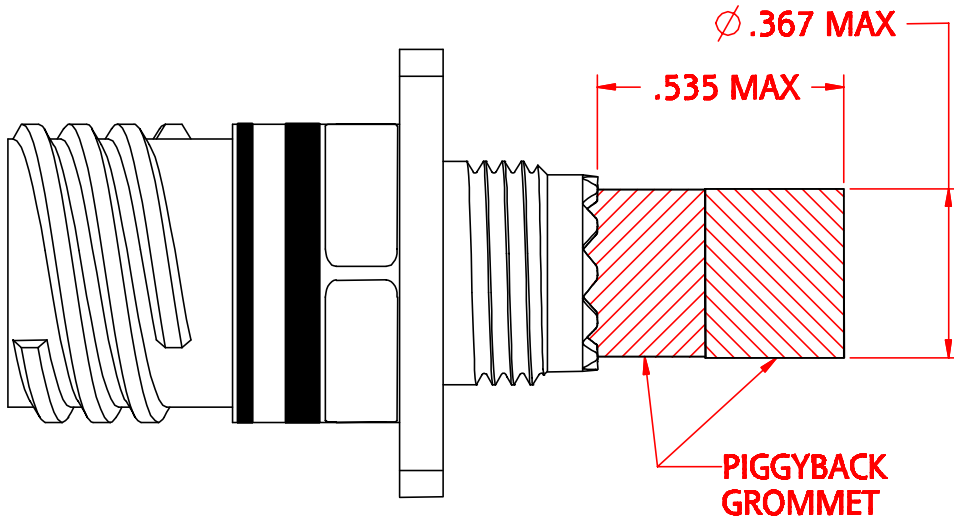
| | | | | | | |
|--------------------|-------|-------|---|------|------|---|
| Insert Arrangement | 21-75 | 21-79 | | 23-6 | 25-7 | |
| Number of Contacts | 4 | 17 | 2 | 6 | 97 | 2 |
| Contact Size | 8 | 22D | 8 | 8 | 22D | 8 |



| | | | | | | | | | | |
|--------------------|------|-------|---|-------|----|---|----|-------|----|---|
| Insert Arrangement | 25-8 | 25-17 | | 25-20 | | | | 25-46 | | |
| Number of Contacts | 8 | 36 | 6 | 10 | 13 | 3 | 4 | 40 | 4 | 2 |
| Contact Size | 8 | 22D | 8 | 20 | 16 | 8 | 12 | 20 | 16 | 8 |



Suggested Strain Relief



Due to the piggyback grommet interference with normal strain reliefs on the shell size 9 only, the recommended strain relief for the connector is :

Glenair Part number G65217 –Size 9 only

Sunbank S5430 Series . This series is recommended for all shell sizes.

Suggested Numbering for Quadrax and Twinax Contacts

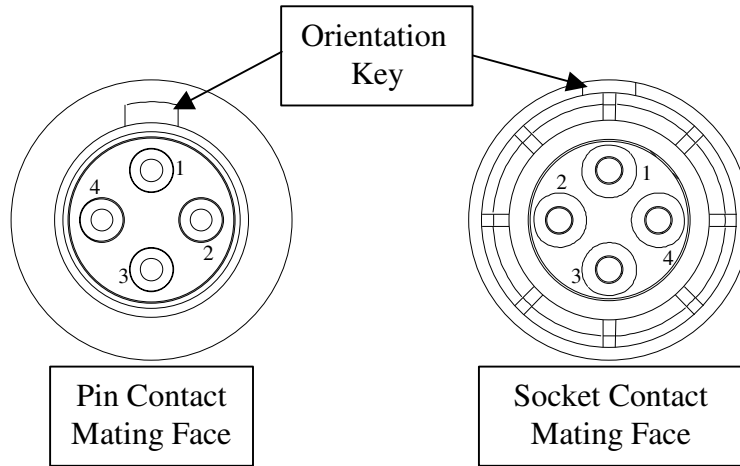


Figure 1 - Inner Contact Numbering, Quadrax

Differential pairs
1&3
2&4

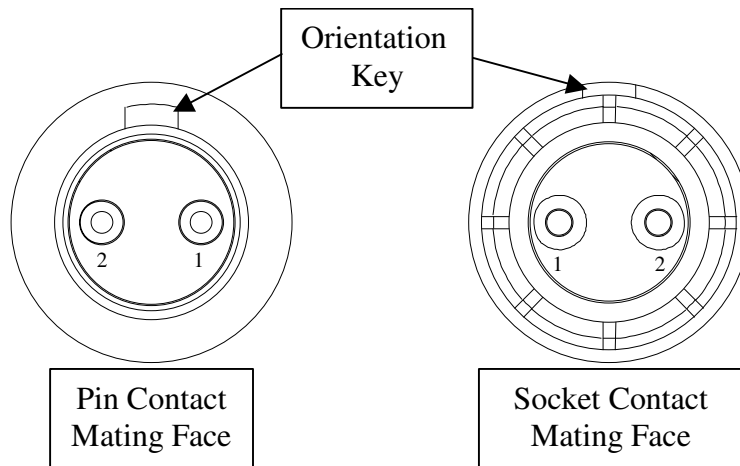


Figure 2 - Inner Contact Numbering, Twinax

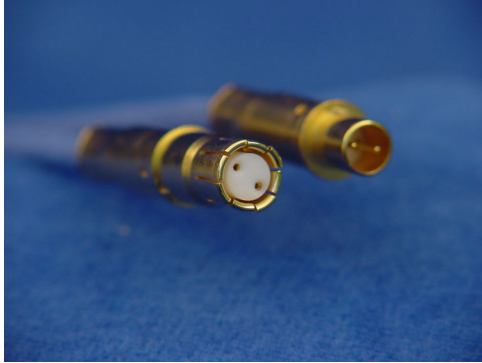
Size 8 Quadrx mated pair terminated to Tensolite Cable NF24Q100

| | | |
|---|---|--|
| Differential Impedance: | 100 Ohm +/-10 | Ethernet 100 Base-T Cable IEEE1394 FireWire Cable |
| Attenuation on 22.5 Ft: | 100 MHz : 1.78 dB 400 MHz : 3.94 dB 1.0 GHz : 7.55 dB 2.5 GHz : 15.8 dB 3.0 GHz : 19.1 dB | |
| Far End Cross Talk (FEXT) ² | > -30 dB up to 3.5 GHz | |
| Eye Pattern ¹ | The minimum output eye opening with a 1-volt p-p input shall be 408 mV p-p measured at 50% of the period. | |
| ¹ Differential mode, 22.5 feet test length, 100 ps rise time (20%-80%), 1.65 Gb/sec. | | |
| ² 22.5 feet test length, tested on HP8753ES Network Analyzer | | |

Size 8 Quadrx mated pair terminated to Tensolite Cable 26473/02006X-4(LD)

| | | |
|---|---|---------------------|
| Differential Impedance: | 150 Ohm +/-30 | Fibre Channel Cable |
| Attenuation on 22.5 Ft: | 512 MHz : 4.41 dB 1.06 GHz : 7.02 dB 1.65 GHz : 10.72 dB 2.00 GHz : 12.65 dB | |
| Far End Cross Talk (FEXT) ² | > -30 dB up to 3.5 GHz | |
| Eye Pattern ¹ | The minimum output eye opening with a 1-volt p-p input shall be 438 mV p-p measured at 50% of the period. | |
| ¹ Differential mode, 35 feet test length, 100 ps rise time (20%-80%), 1.65 Gb/sec. | | |
| ² 35 feet test length, tested on HP8753ES Network Analyzer | | |

Size 8 Differential Twinax mated pair terminated
Tensolite Cable 24463/9P025X-2(LD)



Ethernet 100 Base-T Cable
IEEE1394 FireWire Cable

Differential Impedance: 100 Ohm +/-10

Attenuation on 22.5 Ft:

| | |
|------------|----------|
| 608 MHz : | 32.22 dB |
| 1.85 GHz : | 23.98 dB |
| 2.31 GHz : | 23.30 dB |
| 3.31 GHz : | 23.90 dB |

Eye Pattern¹ The minimum output eye opening with a 1-volt p-p input shall be 434 mV p-p measured at 50% of the period.

¹ Differential mode, 22.5 feet test length, 100 ps rise time (20%-80%), 1.65 Gb/sec.