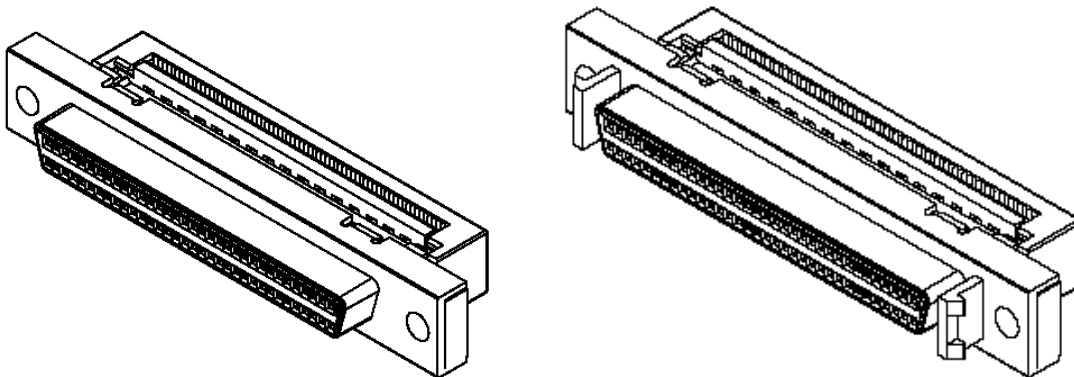

SPECIFICATION AND PERFORMANCE CHARACTERISTICS OF CONNECTOR SCSI INTERFACE NFDS & NFDP SERIES

“RoHS Compliant”:

MEET THE REQUIREMENTS OF THE EUROPEAN PARLIAMENT AND THE RESTRICTION OF THE USE OF CERTAIN HAZARDOUS SUBSTANCES IN ELECTRICAL AND ELECTRONIC EQUIPMENT. (RoHS)



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NOTE: *In this specification all numerical values are metric units and dimensions are millimeters.*

1.0 SCOPE

- 1.1 This specification establishes the performance, test and quality requirements for the CA SCSI Interface NFDS and NFDP Connectors using 30AWG solid and stranded wire. These series consist of shielded and unshielded connectors that are compatible with SCSI-2, SCSI-3 and EIA RS-232 standards and terminate with 0.635 centerline flat unshielded cable and single conductor cable having various insulations: such as Polypropylene, FEP, TPE, and PVC.
- 1.2 Should any difference occur between this specification and any document specification and any document specified in Section 2, this specification shall prevail. In addition, if any difference occurs between this specification and the individual part drawings, then the part drawings shall prevail.

2.0 APPLICABLE DOCUMENTS

Reference documents listed below shall be the latest revision unless otherwise specified. Should a conflict occur between this specification and any of the listed documents then this specification shall prevail.

- | | |
|--------------|--|
| EIA-364-B | Electrical Connector Test Procedures Including Environmental Classifications |
| MIL-STD-1334 | Test Methods for Electrical Connectors |
| 610288-XX | Connector Assembly 68 Position – Shielded High density IDC Socket .050” CL, CA-NFDS Series |
| 620349-XX | Connector Assembly 50 Position – Shielded High density IDC Socket .050” CL, CA-NFDS Series |
| 620351-XX | Connector Assembly – Unshielded High Density IDC Plug .050” CL, CA-NFDP Series. |

CA - 68 NFDS - X - X - XX

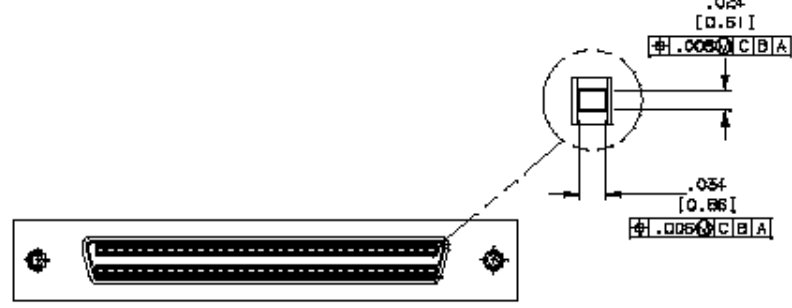
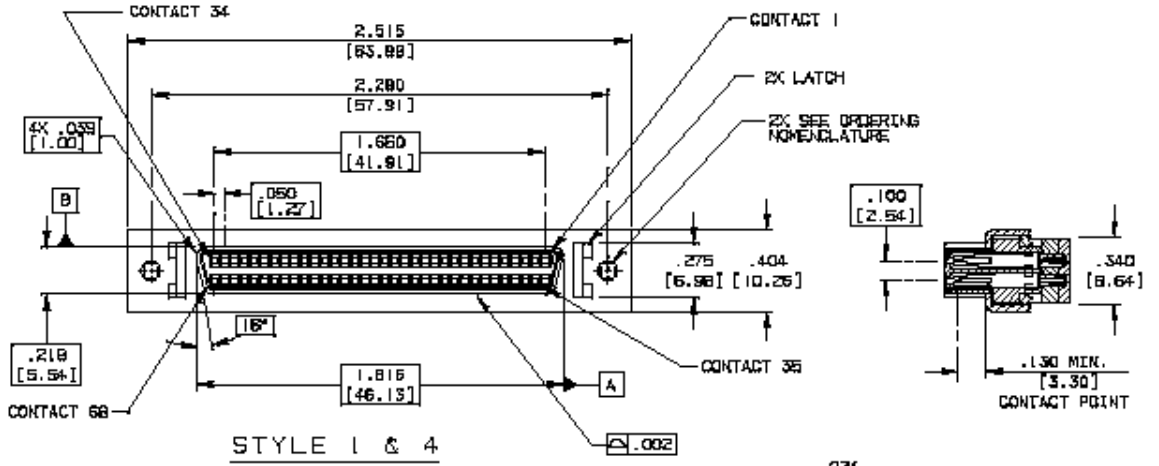
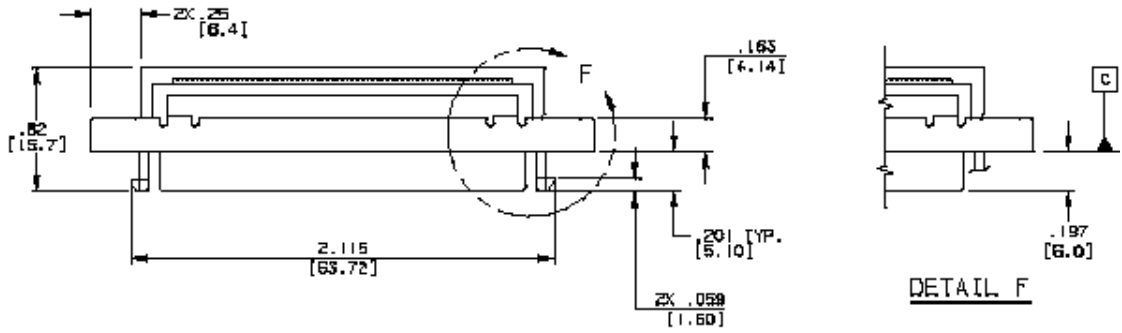
NUMBER OF CONTACT POSITIONS _____

INSULATION DISPLACEMENT D-TYPE SOCKET _____

PLATING : _____
 C = .000015 [.00038] GOLD CONTACT AREA
 E = .000030 [.00076] GOLD CONTACT AREA
 SEE BELOW FOR IDT AREA PLATING

STYLE : _____
 0 = NO LATCH AND 4-40 THREADED NUT 3 = NO LATCH AND 2-56 THREADED NUT
 1 = LATCH AND 2-56 THREADED NUT 4 = LATCH AND 4-40 THREADED NUT

CONTACT MATERIAL : _____
 BLANK = PHOSPHOR BRONZE, IDT PLATING : TIN
 BC = BERYLLIUM COPPER, IDT PLATING : GOLD FLASH



STYLE 0 & 3

CA - XX NFDS - X - X - XX

NUMBER OF CONTACT POSITIONS _____

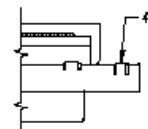
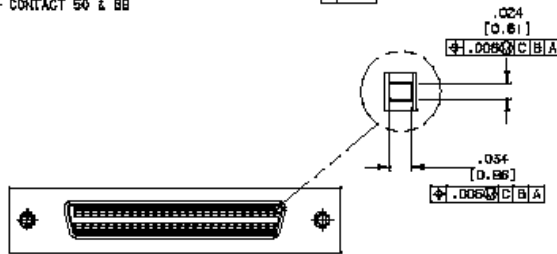
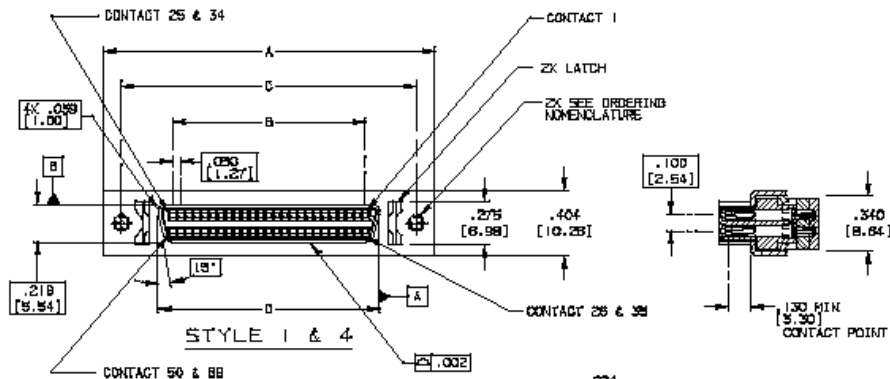
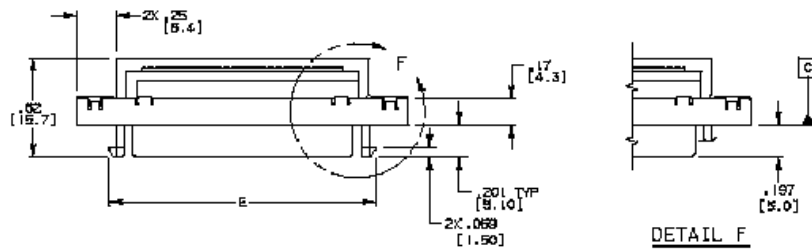
INSULATION DISPLACEMENT D-TYPE SOCKET _____

PLATING : _____
 C = .000015 [.00038] GOLD CONTACT AREA
 E = .000030 [.00076] GOLD CONTACT AREA
 SEE BELOW FOR IDT AREA PLATING

STYLE : _____
 0 = NO LATCH AND 4-40 THREADED NUT 3 = NO LATCH AND 2-56 THREADED NUT
 1 = LATCH AND 2-56 THREADED NUT 4 = LATCH AND 4-40 THREADED NU

 B = NO LATCH, NO NUT, NO NUT BLOCK 4

CONTACT MATERIAL : _____
 BLANK = PHOSPHOR BRONZE, IDT PLATING : TIN



STYLE 0 & 3

STYLE 5

TABULATION:

NO. OF PDS	A		B		C		D		E ±.004	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
50	2.085	52.45	1.200	30.48	1.850	46.99	1.386	34.70	1.655	42.30

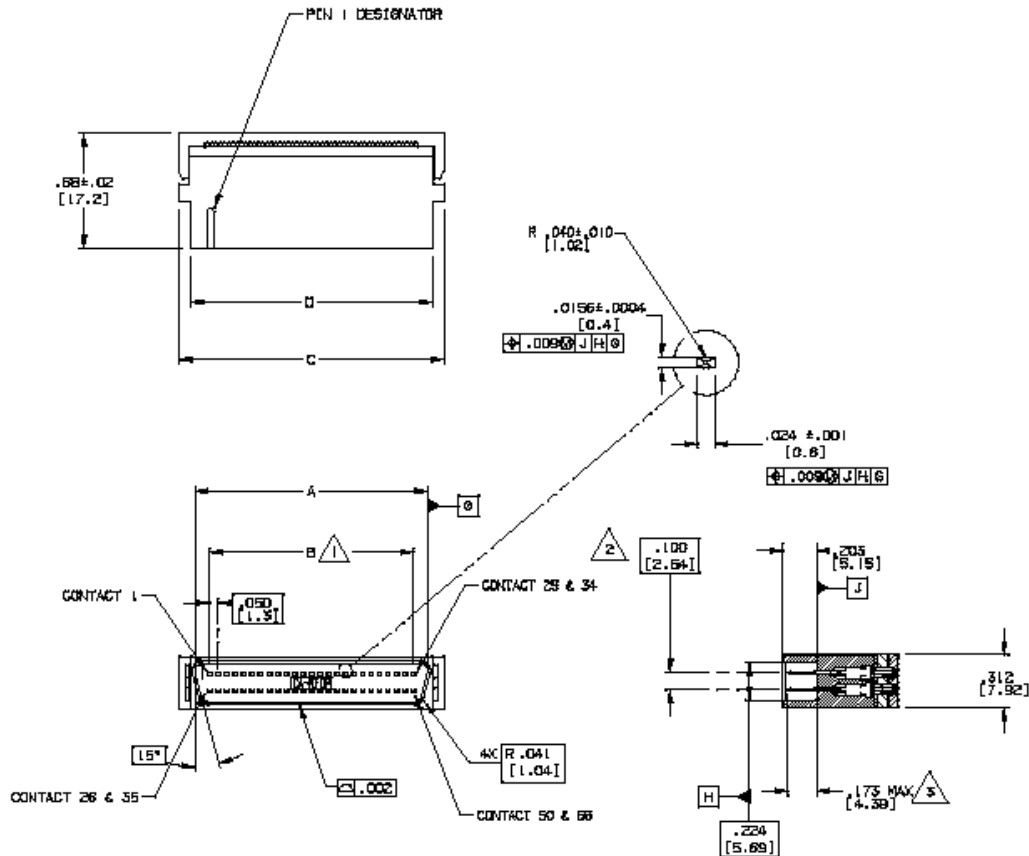
CA - XX NFDP - X - P

NUMBER OF CONTACT POSITIONS _____

INSULATION DISPLACEMENT D-TYPE PLUG _____

PLATING : _____
 C = .000015 [.00038] GOLD CONTACT AREA
 E = .000030 [.00076] GOLD CONTACT AREA

STYLE : _____
 P = ALL PLASTIC



TABULATION:

NO. OF POSITIONS	A		B		C		D	
	IN	MM	IN	MM	IN	MM	IN	MM
50	1.372	34.85	1.200	30.48	1.588	39.83	1.425	36.19
88	1.822	45.28	1.550	41.91	2.018	51.26	1.885	47.85

3.0 REQUIREMENTS

3.1 DESIGN AND CONSTRUCTION:

The design of this connector is intended for use in Class 1.3 environments per ANSI/EIA 364. The test results will meet or exceed those requirements when tested as shown in 3.5.

3.1.2 Materials: **Shielded Socket**

Housing 30% Glass filled Polyester (PBT), Black, UL94V-0.

Contact Phosphor Bronze or,
Beryllium Copper

Contact Plating C = .000015 Gold – contact area, .000100 Tin
E = .000030 Gold – contact area, .000100 Tin
12G = .000012 Gold – contact area, .000012 Gold
GG = .000030 Gold – contact area, .000030 Gold
Underplate = .000075 ± .000025 Nickel

Frame & Latch For 68 Position only: Zinc alloy, .000075 Nickel over .000200 Copper underplate

For 50 Position only: Cold Rolled Steel, bright Tin .000200/.000300 over Nickel Sulfamate .000050/.000100

Shell Material Cold Rolled Steel, .000150 bright Tin over .000075 Nickel Sulfamate Dull

3.1.3 Materials: **Unshielded Plug**

Housing 30% Glass filled Polyester (PBT), Black, ULV94V-0

Contact Phosphor Bronze

Contact Plating C = .000015 Gold – contact area, .000100 Tin
E = .000030 Gold – contact area, .000100 Tin
GG = .000030 Gold – contact area, .000030 Gold

3.2 INTERFACE

- 3.2.1 Socket to Mating Plug: The socket is designed to mate with plugs that conform to SCSI-2 and SCSI-3 (to be known in the future as FAS-20) requirements having contacts on a 1.27 X 2.54 grid.
- 3.2.2 IDC Connection: The three blade, four contact point configuration of the IDC contact is designed accept single conductor or flat unshielded cable on 0.635 centers having 30AWG solid or stranded conductors with insulations such as Polypropylene, FEP, TPE and PVC.

3.3 RATINGS

- 3.3.3 Socket and Mating Plug Connectors:
See "Requirements" in Connector Performance Criteria Section 3.5
- 3.3.4 Socket and Mating Plug Cable Assemblies:
Voltage: 30 VAC - Rating is based on testing approvals by UL, C-UL and CSA Wiring Harness Component Programs.
Current: 1 Amp per contact unless limited by the cable being used
Temperature: -55°C to 105°C unless limited by the cable being used
- 3.3.5 UL Recognition and CSA Certification
- 3.3.5.1 Connectors:
- | | |
|------|---|
| UL | Product Category ECBT2
Connectors For Use In Data, Signal, Control And Power Applications
File No. E95981 |
| C-UL | Product Category ECBT8
Connectors For Use In Data, Signal, Control And Power Applications
Certified for Canada
File No. E95981 |
| CSA | Product Class 6233 01
Receptacles – Attachment Plug Type and Plugs
File No. LR 65050 |
- 3.3.5.2 Cable Assemblies:
- | | |
|------|--|
| UL | Product Category ZPFW2
Wiring Harnesses
File No. E55138 |
| C-UL | Product Category ZPFW8
Wiring Harnesses Certified for Canada
File No. E55138 |
| CSA | Product Class 5852 01
Wiring Harnesses
File No. LR 65051 |

3.4 PERFORMANCE AND TEST DESCRIPTION

The NFDS and NFDV Series of Connectors is designed to meet or exceed the electrical, mechanical, and environmental performance requirements as specified in ANSI/EIA 364 Test Procedures. Unless otherwise specified, all tests are performed at ambient environmental conditions.

3.5 CONNECTOR PERFORMANCE CRITERIA

To verify the performance requirements the following performance groups are established:

- Performance Group I: Basic Mechanical Conformance and Electrical Functionality when subjected to Vibration and Mechanical Shock
- Performance Group II: Low Level Contact Resistance when subjected to Thermal Shock and Humidity Stress
- Performance Group III: Contact Resistance and Mating & Unmating Force when subjected to Temperature Life Cycle
- Performance Group IV: Contact Life and Durability when subjected to Mechanical Cycling and Corrosive Atmosphere
- Performance Group V: General Tests – Cable Flexing and Axial Pull Tests
- Performance Group VI: Mixed Flowing Gas

The following charts define the Test Requirements and the EIA 364 Test Procedure used to verify those requirements

3.5.1 Sample Preparation

Samples are removed at random from Final Inspection (current production) and are prepared according to the requirements and severity of the tests to be conducted as specified in ANSI/EIA 364 or other referenced documents. Where tests require the use of connectors with cable attached the PVC or FEP insulated, 30 AWG, 7/38 stranded, unshielded flat cable on 0.635 centers is used

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Performance Group I: Basic Mechanical Conformance and Electrical Functionality when subjected to Vibration and Mechanical Shock

		Test		Measurements to be Performed		Requirements
Phase	Title	ID No.	Severity or Conditions	Title	ID No.	Performance Level
I.1	Visual & Dimensional Inspection	364-18	Unmated Connectors	Visual & Dimensional Inspection	See Fig. 1 and Fig. 2	No defects
I.2	Plating Thickness					Record Thickness See 3.1.2
I.3	None			Low Level Contact Resistance	364-23	15 mΩ max. initial per contact pair
I.4	Vibration See Note 1	364-28	Condition III	Continuity	364-46	No discontinuity greater than 1 micro second
I.5	None			Low Level Contact Resistance	364-23	10 mΩ max. change from original per contact pair
I.6	Mechanical Shock See Note 1	364-27	Condition G See Note 1	Continuity	364-46	No discontinuity greater than 1 micro second
I.7	None			Low Level Contact Resistance	364-23	10 mΩ max. change from original per contact pair

Notes:

1. Vibration and Shock – Socket is installed in a fixture which is mounted on the Vibration/Shock table in a manner that simulates typical usage. The Plug is mated to the mounted Socket with the cable being suspended from the connector mating interface and a cable clamp located 200mm apart.
2. Typical of all Performance charts, the Phase number is listed in the sequence in which tests are performed

Performance Group II: Low Level Contact Resistance when subjected to Thermal Shock and Humidity Stress

Phase	Test			Measurements to be Performed		Requirements
	Title	ID No.	Severity or Conditions	Title	ID No.	Performance Level
II.1	None			Low Level Contact Resistance	364-23	15 mΩ max. initial per contact pair
II.2	Insulation Resistance	364-21	Test voltage 500VDC ± 50V, applied for 1 minute between adjacent contacts & contacts & shell	Insulation Resistance	364-21	1GΩ min.
II.3	Withstanding Voltage	364-20	Method C Test voltage 500VDC ± 50V applied for 1 minute	Withstanding Voltage	364-20	No flashover No sparkover No breakdown No leakage greater than 0.5mA DC
II.4	Thermal Shock	364-32	Condition IV 10 cycles at -55°C to +125°C	Withstanding Voltage. Same condition as II.3	364-20	No flashover No sparkover No breakdown No leakage greater than 0.5mA DC
II.5	Insulation Resistance	364-21	Same as condition II.2	Insulation Resistance	364-21	1GΩ min.
II.6	Humidity	364-31	Condition A (96 hours) Method III Non-energized. Omit 7a & b	Insulation Resistance	364-21	1GΩ min.
II.7	None			Low Level Contact Resistance	364-23	10 mΩ max. change from original per contact pair

Performance Group III: Contact Resistance and Mating & Unmating Force when subjected to Temperature Life Cycle

		Test		Measurements to be Performed		Requirements
Phase	Title	ID No.	Severity or Conditions	Title	ID No.	Performance Level
III.1	Mating and Unmating Force	364-13	Mating: Auto rate at 25mm/min	Mating Only	364-13	100 grams per contact max.
			Unmating: Auto Rate at 25mm/min	Unmating Only		35 grams per contact min.
III.2	Frame Push out force	364-18	Unmated connectors	Push out	364-18	40 lbs. minimum
III.3	None			Low Level Contact Resistance	364-23	15 mΩ max. initial per contact pair
III.4	Temperature Life	364-17	Condition IV 125°C for 250 hours Method A	Low Level Contact Resistance	364-23	10 mΩ max. change from original per contact pair
III.5	Mating and Unmating Force	364-13	Same condition as III.1	Mating and Unmating	364-13	Same levels as III.1

Performance Group IV: Contact Life and Durability when subjected to Mechanical Cycling and Corrosive Atmosphere

Phase	Test			Measurements to be Performed		Requirements
	Title	ID No.	Severity or Conditions	Title	ID No.	Performance Level
IV.1	Mating and Unmating Force	364-13	Mating: Auto rate at 25mm/min	Mating Only	364-13	100 grams per contact max.
			Unmating: Auto Rate at 25mm/min	Unmating Only		35 grams per contact max.
IV.2	Withstanding Voltage	364-20	Method C Test voltage 500VDC ± 50V applied for 1 minute	Withstanding Voltage	364-20	No flashover No sparkover No breakdown No leakage greater than 0.5mA DC
IV.3	Insulation Resistance	364-21	Test voltage 500VDC ± 50V, applied for 1 minute between adjacent contacts & contacts & shell	Insulation Resistance	364-21	1GΩ min.
IV.4	None			Low Level Contact Resistance	364-23	15 mΩ max. initial per contact pair
IV.5	Durability	364-09	Auto cycle to 500 cycles max. rate 300 cycles/hr	Mating Only	364-13	100 grams per contact max.
				Unmating Only		35 grams per contact max.
IV.6	None			Low Level Contact Resistance	364-23	10 mΩ max. change from original per contact pair
IV.7	Withstanding Voltage	364-20	Same as IV.2	Withstanding Voltage	364-20	Same as IV.2
IV.8	Corrosive Atmosphere	364-26	MIL-STD 1344A Method 1001.1 48hrs. 5% salt fog	Low Level Contact Resistance	364-23	10 mΩ max. change from original per contact pair

Performance Group V: General Tests – Cable Flexing and Axial Pull Tests

		Test		Measurements to be Performed		Requirements
Phase	Title	ID No.	Severity or Conditions	Title	ID No.	Performance Level
V.1	Cable Flexing	364-41	Condition II, 20 cycles. Attached weight to cable equiv. To 1.0kg per 25.4mm of cable width, 300mm from flex axis	Continuity	364-46	No discontinuity greater than 1 micro second
V.2	Cable Axial Pull Test	364-38	Applied load is at rate angles to axis of cable thru connector. Load is equivalent to 225grms per number of positions. Load is maintained for 1 minute at 300mm from cable exit	Continuity	364-466	No Discontinuity greater than 1 micro second

Performance Group VI: Mixed Flowing Gas

		Test		Measurements to be Performed		Requirements
Phase	Title	ID No.	Severity or Conditions	Title	ID No.	Performance Level
VI.1	None			Low Level Contact Resistance	364-23	15mΩ max. initial per contact pair
VI.2	Mate & Unmate	364-09	Exercise contacts for 50 cycles. Auto rate at 25mm/min	Low Level Contact Resistance	364-23	10mΩ max. change from original per contact pair
VI.3	Mixed Flowing Gas	ASTM B827	*10ppb chlorine *10 ppb hydrogen sulfide *200 ppb sulfur dioxide *200 ppb nitrogen dioxide 20 days 70% RH at 30°C	Low Level Contact Resistance	364-23	15mΩ max. increase from/per contact pair

4.0 QUALITY PROVISIONS

- 4.1 Acceptance of the NFDS and NFDS Series connectors is based on meeting the Performance Criteria as detailed in Section 3.5 of this specification.
- 4.2 During the production of these products Quality/Inspection will insure that all inspection requirements as defined in the respective product Inspection Criteria and Work Instructions are adhered to.
- 4.3 Re-qualification will be a requirement when there are significant changes to form, fit or function, materials, or changes to production process that would effect the performance requirements of these products.

4.4 Inspection data shall be recorded, evaluated, and maintained as evidence of performance to these provisions.

Initiated By:	Date:	Engineering Approval:	Date:	Quality Approval:	Date:
Pete Haar	4/11/95	Art Jochen	4/11/95	John McAllister	4/11/95

REV.	DESCRIPTION	DATE	INITIALS
A	INITIAL RELEASE	4/11/95	AJ
B	SEE ECO 2452	12/22/95	JM
C	SEE ECO 2539	5/14/96	JM
D	SEE ECO 2611	10/10/96	PH
E	SEE DO 3034	4/23/98	JM
F	SEE DO 4870	6/05/02	C.C.L
G	SEE DO 5717	3/30/05	I.M.
H	SEE DO 6419	5/15/07	A.J.
J	SEE DO 7551	2/14/20	T.L.