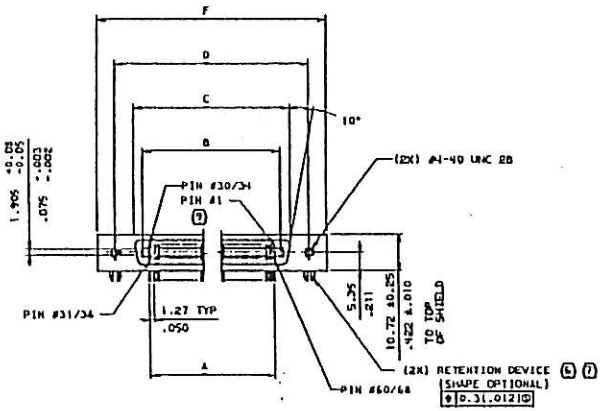
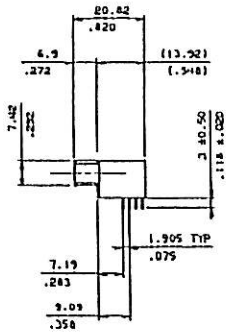
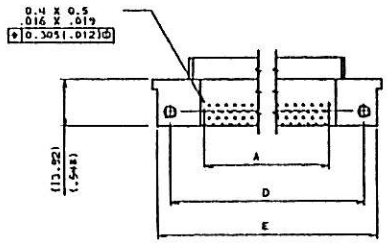
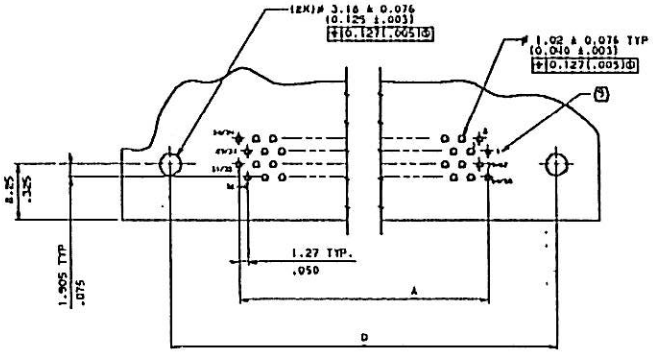
REL FOR ASM	QTY	TECHNICAL APPROVAL			DATE	EC NO.		DATE	EC NO.	PART NO. 91F7275
		ELECTRICAL		REL	15FEB91	C008844				
		MATERIAL	JS							DEVELOPMENT NO. Q/H
		SAFETY	JDF							





NOTES:
1. MATERIALS: SEE ENGINEERING SPEC 64F4686
2. PLATINGS: SEE ENGINEERING SPEC 64F4686
3. MUST BE PURCHASED FROM IBM APPROVED SUPPLIER LIST.
4. HOUSING MATERIAL MUST BE UL RECOGNIZED.
5. SUPPLIERS NAME, LOGO OR PART NUMBER TO BE MOLDED IN OR STAMPED ON BODY OF CONNECTOR PER IBM SPEC 893654
6. 'D' SHELL/ FACE PLATE/ GROUND STRAPS/ RETENTION DEVICES TO BE FORMED FROM ONE PIECE OR BE AN IBM DEVELOPMENT ENGINEERING APPROVED ALTERNATE CONSTRUCTION .
7. AFTER CONNECTOR IS INSTALLED ON THE BOARD, THE RETENTION DEVICES MUST HOLD THE CONNECTOR FLUSH TO AND FIRMLY AGAINST THE PC BOARD THROUGH THE SOLDERING OPERATION.
8. CONNECTOR MUST MEET APPLICATION REQUIREMENTS IMPLEMENTING SCSI .
9. PIN DESIGNATIONS FOR REFERENCE PURPOSES.





RECOMMENDED PCB MOUNTING SPECIFICATION
COMPONENT SIDE
SCALE: 4/1

NO. OF POS.	DIMENSIONS						PART NUMBERS
	A	B	C	D	E	F	
60	36.83/1.450	40.64/1.600	45.92/1.808	57.15/2.250		67.31/2.650	64F4632
68	41.91/1.450	45.72/1.800	51.0/2.008	62.23/2.450	49.72/2.745	72.39/2.850	91F7274

IBM MATERIAL NO. (1)		MUST CONFORM TO ENG SPEC: 2347777 (5)		SCALE: 2/1	PART NO. 91F7275	IBM
MATL ALTERNATE NO.		TOLERANCES UNLESS NOTED			TITLE MINI RIBBON D SHELL SHIELDED AT ANGLE PCB CONN.	
CASE DEPTH		LINEAR ±	0.127(.005)		DESIGNER TAM	31AUG90
HARDNESS		ANGLES ±	0.5°		CHECKED JN	03SEP90
SURFACE TREATMENT	CODE NO. (2)	RADII UNLESS NOTED			APPROVED KLH	04SEP90
		EDGE/CORNER BREAKS OUTSIDE MAX			CLASS KLH	04SEP90
		EDGE/CORNER BREAKS INSIDE MAX				

SI unit A0

91F7275

277

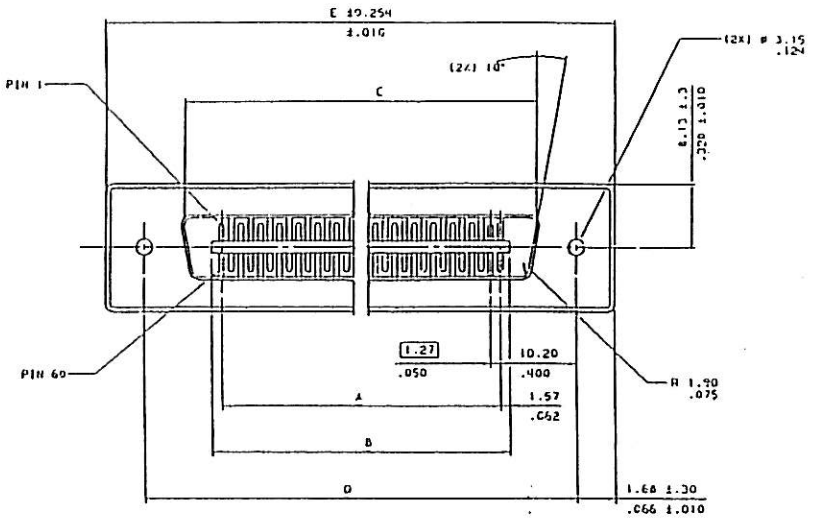
X378.2/92-52

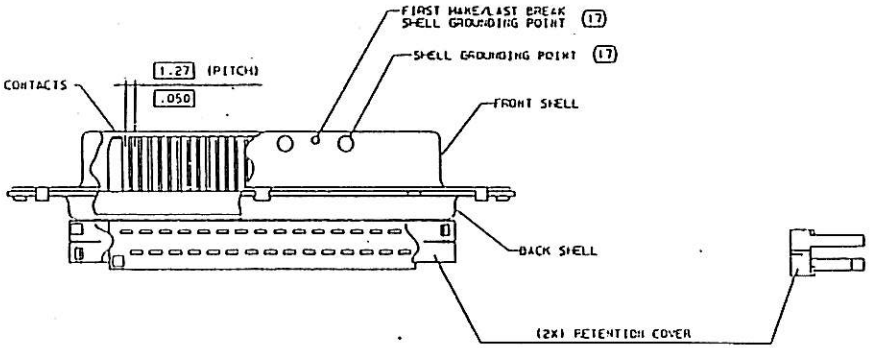
REL	QTY	TECHNICAL APPROVAL			REL	DATE	EC NO.	DATE	EC NO.
		ELECTRICAL				15FEB91	C0026H		
		MATERIAL							

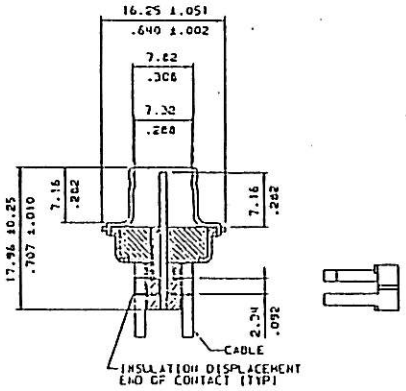
NO. 91F9539

DEVELOPMENT NO.

NON-RELEASED







NOTES:

(1) CONTACT MATERIAL: PHOSPHOR BRONZE
CONTACT PLATING:
- MATING END) 0.00076mm (.000030in.) MIN GOLD OVER 0.00127mm (.000050in.) MIN NICKEL.
- TIDE END) 0.00254mm (.000100in.) MIN SOLDER OVER 0.00127mm (.000050in.) MIN NICKEL.
- BACKSHELL AND SHELL .00381mm (.000150in.) MIN NICKEL.
OR IBM DEVELOPMENT ENGINEERING APPROVED EQUIVALENTS
- INTERNAL MOLDED COMPONENTS - THERMOPLASTIC PPS (UL94V-0)

2 MUST BE PURCHASED FROM IBM APPROVED SUPPLIER LIST.

3 OPERATING AMBIENT TEMPERATURE: 0°C TO +70°C.

4 THERMAL SHOCK: CONNECTOR SHALL BE TESTED UNMATED FOR 5 CYCLES AT TEMPERATURE -40°C TO 150°C.

(5) TEMPERATURE HUMIDITY: IBM SPEC C-H-6-0430-005.

(6) DURABILITY: 250 MATING CYCLES WITHOUT DEGREDATION IN MECHANICAL OR ELECTRICAL SPECS

7 CONTACT RETENTION: EACH INDIVIDUAL CONTACT SHALL WITHSTAND A 1.36Kg (3 lb.) MIN AXIAL LOAD WITHOUT DISLODGING OR DAMAGING THE CONTACT.

8 MATING FORCE: 170g (6 oz.) MAX PER CONTACT

9 CONTACT RESISTANCE (LOW SIGNAL LEVEL): 25 MILLIOHMS MAX WITH 10 MILLIOHM MAX. CHANGE OVER 50 CYCLE TEST OF C-H-6-0430-005 AFTER (5) AND (6).

10 INSULATION RESISTANCE: SHALL BE GREATER THAN 1000 MEGOHMS

11 DIELECTRIC WITHSTANDING VOLTAGE: 1000 VAC RMS MINIMUM WITH NO EVIDENCE OF BREAKDOWN

12 CAPACITANCE: 2 pf MAX @ 1 MEGAHERTZ PIN TO PIN

13 CURRENT RATING: 2 AMP WITH LESS THAN 30°C TEMPERATURE RISE ABOVE AMBIENT.

14 HOUSING MAT'L MUST BE UL RECOGNIZED.

(15) SUPPLIERS NAME, LOGO OR PART NUMBER TO BE MOLDED IN OR STAMPED ON BODY OF CONNECTOR PER IBM SPEC 099654

16 CONNECTOR MUST MEET APPLICATION REQUIREMENTS IMPLEMENTING SCSI. PER ANSI X3.131-1986

(17) SHELL MUST PROVIDE IBM DEVELOPMENT ENGINEERING APPROVED EMC GROUND INDENTS/CONTACTS WITH MATING RECEPTACLE.

18 MUST MATE WITH CONNECTOR P/N 15F6610.

NO. OF POS.	DIMENSIONS						PART NUMBERS
	A	B	C	D	E		
60	36.83/1.450	40.21/1.583	46.48/1.830	57.15/2.250	63.70/2.508		15F6744
68	41.91/1.650	45.22/1.783	51.56/2.030	62.23/2.450	68.78/2.708		91F9538

IBM MATERIAL NO. (1)	MUST CONFORM TO ENG SPEC: 2343999 (15)	SCALE: NONE	PART NO. 91F9539
METAL ALTERNATE NO.	TOLERANCES UNLESS NOTED		TLE TAB DWG, D SHELL
	LINEAR ± 0.127/.005		NNECTOR (SHIELDED)
CASE DEPTH	ANGLES ± .5°		DRAWN TAH 26NOV90
HARDNESS	FINISH UNLESS NOTED		CHECKED JAH 26NOV90
SURFACE TREATMENT CODE NO.	EDGE/CORNER RADIUS MAX		APPROVED PLH 27NOV90

91F9539

RIBBON "D" SHELL CONNECTOR SPECIFICATION

Document Number 64F4686

APPROVALS
ORIGINATOR: J. Neer
DEPT: 24H
MANAGER: F. Tantillo
DEPT: 24H
SYSTEM DEVELOPMENT: R. Nelson
DEPT: 24H
TECHNICAL SERVICES: J. Healey
DEPT: 2K3

LOCATION OF CONTROL (96C) BOCA RATON

Contents

1.0 SCOPE

This specification defines the materials characteristics, lists the approved materials, and defines the performance characteristics which apply to ribbon "D" shell connectors.

2.0 REFERENCES

The latest EC level is implied for the following references.

- Engineering Specification #61X5965 (Contact Spring and Pin Plating Requirements).
- Engineering Specification #00F2829 (Connector Process Compatibility), exclusive of the mechanical requirements dealing with alignment, height, length, pin stick through, polarization, solder tails, retention, standoff, tilt, and drainage.
- Military Standard 202 (Test Methods For Electronic and Electrical Component Parts).
- Military Standard 1344A (Test Methods For Electrical Connectors).
- Engineering Specification #81X8468 (Connector Test Specification).
- Engineering Specification #11F8545 (Connector Test Stability Criteria).

The documents are cited in Section 7.0 and 10.0.

3.0 PRECEDENCE

Should a conflict between this specification and the IBM part drawing exist, the part drawing shall take precedence.

4.0 DOCUMENT ADMINISTRATION

This document was prepared by the ESD Boca Raton Materials Engineering department and the ESD Boca Raton Interconnector Commodity Team. Any deviation to the document requires written approval from both organizations.

5.0 ENGINEERING APPROVAL

Engineering approval is based upon conformance to the materials and performance requirements outlined in this specification. Engineering approval may be withdrawn, and parts may be rejected, under the following conditions:

a. materials analysis and/or performance tests indicate that specification and/or drawing requirements are not met;

b. the manufacturer, without prior notification to IBM, moves the manufacturing facilities supporting the production of IBM connectors; and/or,

c. the manufacturer, without prior notification to IBM, changes connector design, connector materials, or the connector manufacturing process.

If the manufacturer desires, at any time, to relocate the manufacturing facilities or to change connector design, connector materials, or the connector manufacturing process, a statement describing the proposed changes, along with appropriate justification, shall be submitted to IBM. Before shipping parts to fulfill a production purchase order the manufacturer is also required to submit new samples to IBM, incorporating all changes, for evaluation.

6.0 STIPULATIONS

The manufacturer is not required to reveal any proprietary information. However, upon request the manufacturer shall permit IBM access to manufacturing facilities and any non-proprietary information concerning parts ordered by IBM.

The manufacturer is not required to perform any test contained in this specification.

7.0 MATERIALS CHARACTERISTICS

7.1 Housing Material

The housing material must have a minimum flammability rating of UL 94V-1 at a thickness of 1.5 mm. (0.059 in.)

The housing material shall have the necessary properties to provide for a high quality molding. There shall be no cracks when viewed at 7X magnification, no knit lines, no pits, no sink marks, and no sprue marks. There shall also be no mold flash/fibers that could break loose during handling, that could bridge two or more contacts, or that extends below the bottom surface of the housing.

7.2 Contact Platings

Gold, gold flash over palladium, and gold flash over palladium-nickel contact platings must be deposited over a nickel plating and must conform to the requirements of Engineering Specification #61F5965 (Contact Spring and Pin Plating Requirements).

7.2.1 Contact Plating Thickness on Qualification Test Samples

Qualification test samples shall be manufactured according to production practices on production manufacturing lines. It is expected that contact plating thicknesses will not greatly exceed the minimum requirements which are specified on the part drawing or in Engineering Specification #61X5965 (Contact Spring and Pin Plating Requirements). Test samples not conforming to the applicable maximum contact plating thicknesses defined below may not be tested.

a. Gold – minimum + 25%

b. Gold flash over palladium – minimum +25% (gold flash not exceed 10 u")

c. Gold flash over palladium-nickel – minimum + 25% (gold flash not to exceed 10 u")

d. Nickel underplating – 100 u"

Contact plating thicknesses shall be measured in an area defined on the part drawing. If no area is defined, measurements shall be taken in the area of contact between fully mated members. IBM will use cross-section/SEM as the method of measurement. The manufacturer may employ alternative methods which should be defined in the certification report accompanying the test samples.

7.3 Other Materials

As-received connectors must be free of dirt, flux, grease, lubricant, metal/plastic shavings, mold release, oil, packaging material, or any other contaminant that may cause premature failure.

The materials used to construct PCB mount connectors must conform to the manufacturability requirements outlined in Engineering Specification #00F2829 (Connector Process Compatibility), exclusive of the mechanical requirements dealing with alignment, height, length, pin stick through, polarization, solder tails, retention, standoff, tilt, and drainage.

The chemical, mechanical, and physical properties of the materials used in the construction of the connectors must insure compliance with the performance tests outlined in Section 10.0 of this specification.

8.0 APPROVED MATERIALS FOR CLASS B (WAVE SOLDERABLE) CONNECTORS

Connectors fabricated from the materials contained in this section have PASSED qualification testing. The use of any other materials must be approved by IBM development engineering.

8.1 Housing Materials, Contact Materials, and Contact Platings

Engineering approval is based upon the materials package for a given option (see below). Substitution of housing materials, contact materials, and/or contact platings is not permissible.

8.1.1 1.27 mm (0.050 in.) C/L PCB Mount

Option #1 – Ryton R-4 (*), Phosphor Bronze UNS C51000 (extra hard), flash Au over 40 u" min. Pd-Ni over 50 u" min. Ni

Mating Connector - 1.27 mm (0.050 in.) C/L IDC Cable Plug

Option #1 – Valox DR48 (*), Phosphor Bronze UNS C51000 (spring, modified for more elongation), 30 u" min. Au over 50 u" min. Ni

Option #2 – Celanex 3314 (*), Phosphor Bronze UNS C51000 (extra hard), 30 u" min. Au over 50 u" min. Ni

Option #3 – Ryton R-4 (*), Phosphor Bronze UNS C51000 (extra hard), 30 u" min. Au over 50 u" min. Ni

8.1.2 2.16 mm (0.085 in.) C/L Panel Mount

Option #1 – Noryl 990 (*), Copper-Nickel-Tin UNS C72500 (spring), 30 u" min. Au over 50 u" min. Ni

Mating Connector - 2.16 mm (0.085 in.) C/L IDC Cable Plug

Option #1 – Noryl HS2000 (*), Phosphor Bronze UNS C51000 (hard), 30 u" min. Au over 50 u" min. Ni

(*) Registered Trademarks of:

- Phillips 66 Co. (Ryton R-4);
- General Electric Co. (Valox DR48, Noryl 990, and Noryl HS2000); and,
- Hoechst Celanese (Celanex 3314)

8.2 Other Materials

The shell should be low carbon steel plated with 150 u" min. Ni (for Option #1 of Section 8.1.1, mating connector Option #2 and #3 of Section 8.1.1, and mating connector Option #1 of Section 8.1.2) or low carbon steel plated with 200 u" min. Ni over 100 u" min Cu (for mating connector Option #1 of Section 8.1.1) or zinc die cast AG40A plated with 300 u" min. Ni over 300 u" min. Cu (for Option #1 of Section 8.1.2).

IDC area should be plated with 100 u" min. Sn-Pb over 50 u" min. Ni.

All other materials used in the construction of the connector must not degrade manufacturability or performance as approved by IBM at the time of qualification.

9.0 APPROVED MATERIALS FOR CLASS A (REFLOW SOLDERABLE) CONNECTORS

None (qualification testing has not been performed).

10.0 PERFORMANCE CHARACTERISTICS

Tests requiring mating connectors shall be performed with those from approved manufacturers. Some tests must be performed sequentially. They are: durability followed by environmental life followed by meteorology.

10.1 Thermal

The connector shall withstand operating temperatures of 0° - 70° C.

10.2 Electrical

10.2.1 Insulation Resistance

The insulation resistance must be a minimum of 1,000 megaohms per Military Standard 202 (Test Methods For Electronic and Electrical Component Parts), Method 302, Condition B.

10.2.2 Dielectric Voltage

The dielectric withstanding voltage must be a minimum of 500 VAC RMS with no evidence of breakdown per Military Standard 1344A (Test Methods For Electrical Connectors), Method 3001.1, Condition I.

10.2.3 Capacitance

The capacitance must be a maximum of 2 pf at 1 MHz contact to contact.

10.2.4 Current Rating

The current rating must be a minimum of 1 amp per contact with less than a 30° C temperature rise above ambient.

10.2.5 Contact Resistance

The initial contact resistance (low signal level) must be a maximum of 25 milliohms.

10.3 Mechanical

10.3.1 Meteorology

The connectors shall meet the dimensional requirements of the part drawing.

10.3.2 Contact Retention

Each contact shall withstand a 1362 gram (3 lb.) minimum axial load. The maximum allowable displacement shall be 0.127 mm. (0.005 in.) per Military Standard 1344A (Test Methods For Electrical Connectors), Method 2007.1.

10.3.3 Contact Normal Force

The minimum contact normal force shall be 75 grams.

10.3.4 Mating Force

The mating force per contact pair shall be a maximum of 170.4 grams (6 oz.), measured with a 1.57 mm. (0.062 in) PCB. The unmating force per contact pair shall be a minimum of 34.1 grams (1.2 oz.), measured with a 1.37 mm. (0.054 in.) PCB.

10.3.5 PCB Retention

PCB retention devices shall permit manual insertion of the connector to the PCB. No tools/equipment shall be required. They shall insure that the connector-to-board spacing requirement is maintained during all manufacturing processes. They shall also permit withdrawal of the connector from the PCB with a minimal force.

10.3.6 Contact Hertz Stress

The contact hertz stress must be a minimum of 120 kpsi.

10.4 Electro-mechanical

10.4.1 Durability

The connector shall withstand a minimum of 250 mating/unmating cycles without wear through the contact platings to the contact material (base metal), without breakage, and without loss of electrical, mechanical, or electro-mechanical function as defined in this document.

10.4.2 Environmental Life

The connector, in both the mated and unmated condition, must withstand stress testing according to Engineering Specification #81X8468 (Connector Test Specification) to an equivalent field life of 5 years. There shall be no degradation in electrical characteristics, as indicated by Engineering Specification #11F8545 (Connector Test Stability Criteria).

10.4.3 Mechanical Shock

The connector shall withstand 10 shocks of 50 G's at 27.18 mm. (1.07 in.) along the three perpendicular axes. There shall be no breakage or loss of electrical, mechanical, or electro-mechanical function as defined in this document.

10.4.4 Vibration

The connector shall withstand 4 G's at 5 - 500 Hz with a 15 minute up-sweep, a 15 minute down-sweep, and a 30 minute dwell on all of the peaks. Testing will be performed along all 3 axes with an applied current of 100 milliamps. There shall be no discontinuities greater than 1 microsecond.