DOCUMENT CHANGE REQUEST

DCR number 646	Changes required for: N/A	Originator: Olivier Masson
Date: 2011/11/10	Date sent: 2011/02/04	Organisation: CNES
Status: IMPLEMENTED		

Title:	Connectors Electrical Rectangular Non-Removable Solder Bucket PCB and Wire-Wrap Contacts		
Number:	3401/001	Issue:	5

Other documents affected:

Page:

Pages 4, 5, 6, 8, 9, 10, 18, 34(new page), 35(new page), 36(new page),37(new page), 41.

Paragraph:

Pages 4, 5, 6, 8, 9, 10, 18, 34(new page), 35(new page), 36(new page),37(new page), 41.

Original wording:

Proposed wording:

See attached draft

Justification:

Introduction of new variants of 90 PCB Solder cup (US footprint)
Extension of the option "E" (captive nut) to the size F
Introduction of 3401/085 (fast locking system) in paragraphs related to locking devices

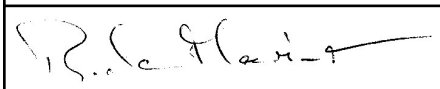
Attachments:

3401001_Proposal.pdf, null

Modifications:

N/A

Approval signature:



Date signed:

2011-11-10

TABLE OF CONTENTS

1.	**GENERAL**	**6**
1.1	Scope	6
1.2	Range of Components and Component Type Variants	6
1.3	Maximum Ratings	6
1.4	Parameter Derating Information	6
1.5	Physical Dimensions	6
2.	**APPLICABLE DOCUMENTS**	**6**
3.	**TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS**	**7**
4.	**REQUIREMENTS**	**38**
4.1	General	38
4.2	Deviations from Generic Specification	38
4.2.1	Deviations from Special In-Process Controls	38
4.2.2	Deviations from Final Production Tests (Chart II)	38
4.2.3	Deviations from Burn-in and Electrical Measurements (Chart III)	38
4.2.4	Deviations from Qualification Tests (Chart IV)	38
4.2.5	Deviations from Lot Acceptance Tests (Chart V)	38
4.3	Mechanical Requirements	39
4.3.1	Dimension Check	39
4.3.2	Weight	39
4.3.3	Contact Capability	39
4.3.4	Contact Retention (in insert)	39
4.3.5	Mating and Unmating Forces	39
4.3.6	Insert Retention (in Shell)	39
4.3.7	Jackscrew Retention	39
4.3.8	Contact Insertion and Withdrawal Forces	39
4.3.9	Engagement and Separation Forces	39
4.3.10	Oversize Pin Exclusion	40
4.3.11	Probe Damage	40
4.3.12	Solderability	40
4.4	Material and Finishes	40
4.4.1	Shells	41
4.4.2	Inserts	41
4.4.3	Contacts	41
4.4.4	Contact Retaining Clip	41
4.4.5	Guiding and Locking Devices	41
4.4.6	Magnetism Level	41
4.5	Marking	41
4.5.1	General	41
4.5.2	Contact Position	41
4.5.3	The ESCC Component Number	42
4.5.4	Characteristics	42
4.5.4.1	Series	42
4.5.4.2	Shell Size	42
4.5.4.3	Insert Type	43
4.5.4.4	Mounting	43
4.5.4.5	Contact Arrangement	43
4.5.4.6	Type of Contact	44
4.5.4.7	Magnetism Level	44
4.5.4.8	Contact Termination Code	45
4.5.4.9	Modification Code	45

4.5.5	Traceability Information	49 45
4.6	Electrical Measurements	45
4.6.1	Electrical Measurements at Room Temperature	45
4.6.2	Electrical Measurements at High and Low Temperatures	45
4.6.3	Circuit for Electrical Measurements (Figure 4)	46
4.7	Burn-in and Electrical Measurements	50 46
4.8	Environmental and Endurance Tests (Charts IV and V of ESCC Generic Specification No. 3401)	46
4.8.1	Measurements and Inspections on Completion of Environmental Tests	46
4.8.2	Measurements and Inspections at Intermediate Points during Endurance Tests	46
4.8.3	Measurements and Inspections on Completion of Endurance Tests	46
4.8.4	Conditions for Operating Life Test (Part of Endurance Testing)	46
4.8.5	Electrical Circuits for Operating Life Test (Figure 5)	46
4.8.6	Conditions for High Temperature Storage Test (Part of Endurance Testing)	46
APPENDIX A		55 51
APPENDIX B		56 52

1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Connectors, Electrical, Rectangular, Non-removable Solder Bucket, PCB and Wire-wrap Contacts and removable Coaxial and Power Contacts, based on type D*M. It shall be read in conjunction with:

ESCC Generic Specification No. 3401, Connectors, Electrical, Non-Filtered, Circular and Rectangular.

ESCC Detail Specification No. 3401/004, Contacts, Coaxial, Crimp-Type, Solder-Type and PCB-Type for 3401/001 Connectors and Male/Female-Type for 3401/080 Connector Savers.

ESCC Detail Specification No. 3401/022, Accessories for Rectangular Connectors 3401/001, 3401/002 and Connector Savers 3401/020 and 3401/080.

ESCC Detail Specification No. 3401/040, Contacts, Power, Crimp-Type, Solder-Type and PCB-Type for 3401/001 Connectors and Male/Female-Type for 3401/080 Connector Savers.

ESCC Detail Specification No. 3401/085, Fast-locking Screw Lock assemblies for Rectangular Connectors 3401/001, 3401/002 and Connector Savers 3401/020, 3401/080.

the requirement of which are supplemented herein.

1.2 RANGE OF COMPONENTS AND COMPONENT TYPE VARIANTS

The different sizes of the connectors and contact types specified herein, which are also covered by this specification, together with their mechanical characteristics, are given in Table 1(a).

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the connectors specified herein, are given in Table 1(b).

1.4 PARAMETER DERATING INFORMATION

The applicable derating information for the connectors specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the connectors specified herein and the available contact arrangements are shown in Figure 2.

2. APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:

(a) ESCC Generic Specification No. 3401 for Connectors, Electrical, Non-Filtered, Circular and Rectangular.
(b) ESCC Detail Specification No. 3401/004, Contacts, Coaxial, Crimp-Type, Solder-Type and PCB-Type for 3401/001 Connectors and Male/Female-Type for 3401/080 Connector Savers.
(c) ESCC Detail Specification No. 3401/022, Accessories for Rectangular Connectors, 3401/001, 3401/002 and Connector Savers 3401/020 and 3401/080.
(d) ESCC Detail Specification 3401/040, Contacts, Power, Crimp-Type, Solder-Type and PCB-Type for 3401/001 Connectors and Male/Female-Type for 3401/080 Connector Savers.
(e) **ESCC Detail Specification No. 3401/085, Fast-locking Screw Lock assemblies for Rectangular Connectors 3401/001, 3401/002 and Connector Savers 3401/020, 3401/080.**
(f) MIL-DTL-24308, Rack and Panel Connectors, Miniature.
(g) NASA/GSFC Specification S-311-P-10, Connectors, Electrical, Rectangular, Miniature, Polarised

Contact Codes		Contact Types (4)	Maximum Weight of Contacts (g)			
Tail 0.60	Tail 0.76		Variant 01		Variant 02	
			Male	Female	Male	Female
			0.28 (9)	0.34 (9)	-	-
			0.32 (10)	0.37 (10)	-	-
1CON	-	Gauge 22 90° PCB solder contact (1.98mm row spacing shell sizes E, A, B and C)	-	-	0.16 (11)	0.21 (11)
			-	-	0.18 (12)	0.23 (12)
		Only 3 rows with shell sizes E,A,B,C ---------->	-	-	0.2 (13)	0.25 (13)
					~~0.22 (14)~~	~~0.27 (14)~~
			~~-~~	~~-~~	~~0.24 (15)~~	~~0.29 (15)~~
1DON	-	Gauge 22 90° PCB solder contact (2.08mm row spacing shell sizes D and F)	-	-	0.16 (11)	0.21 (11)
			-	-	0.18 (12)	0.23 (12)
			-	-	0.2 (13)	0.25 (13)
			-	-	0.22 (14)	0.27 (14)
			-	-	0.24 (15)	0.29 (15)
1(16)7N	2(16)7N	Gauge 20 90° PCB solder contact equipped with 90° bracket and screwlocks 4-40 (17)	0.24 (8)	0.29 (8)	-	-
			0.28 (9)	0.34 (9)	-	-
			0.32 (10)	0.37 (10)	-	-
1(16)9N	2(16)9N	Gauge 20 90° PCB solder contact equipped with 90° bracket and screwlocks M3 (17)	0.24 (8)	0.29 (8)	-	-
			0.28 (9)	0.34 (9)	-	-
			0.32 (10)	0.37 (10)	-	-
1C7N	-	Gauge 22 90° PCB solder contact equipped with 90° bracket and screwlocks 4-40 (1.98mm row spacing shell sizes E, A, B and C)(17)	-	-	0.16 (11)	0.21 (11)
			-	-	0.18 (12)	0.23 (12)
			-	-	0.2 (13)	0.25 (13)
1C9N	-	Gauge 22 90° PCB solder contact equipped with 90° bracket and screwlocks M3 (1.98mm row spacing shell sizes E, A, B and C) (17)	-	-	0.16 (11)	0.21 (11)

Contact Codes		Contact Types (4)	Maximum Weight of Contacts (g)			
Tail 0.60	Tail 0.76		Variant 01		Variant 02	
			Male	Female	Male	Female
			-	-	0.18 (12)	0.23 (12)
			-	-	0.2 (13)	0.25 (13)
1D7N	-	Gauge 22 90° PCB solder contact equipped with 90° bracket and screwlocks 4-40 (2.08mm row spacing shell sizes D and F)(17)	-	-	0.16 (11)	0.21 (11)
			-	-	0.18 (12)	0.23 (12)
			-	-	0.2 (13)	0.25 (13)
			-	-	0.22 (14)	0.27 (14)
			-	-	0.24 (15)	0.29 (15)
1D9N	-	Gauge 22 90° PCB solder contact equipped with 90° bracket and screwlocks M3 (2.08mm row spacing shell sizes D and F) (17)	-	-	0.16 (11)	0.21 (11)
			-	-	0.18 (12)	0.23 (12)
			-	-	0.2 (13)	0.25 (13)
			-	-	0.22 (14)	0.27 (14)
			-	-	0.24 (15)	0.29 (15)
-	P	Gauge 20 90° PCB solder contact (2.84mm row spacing) Narrow Profile	0.22 (8)	0.27 (8)	-	-
			0.26 (9)	0.32 (9)	-	-
			0.3 (10)	0.35 (10)	-	-
-	L7	Gauge 20 90° PCB solder contact equipped with 90° bracket and screwlocks 4-40 (18) Narrow Profile	0.22 (8)	0.27 (8)	-	-
			0.26 (9)	0.32 (9)	-	-
			0.3 (10)	0.35 (10)	-	-
-	L9	Gauge 20 90° PCB solder contact equipped with 90° bracket and screwlocks M3 (18) Narrow Profile	0.22 (8)	0.27 (8)	-	-
			0.26 (9)	0.32 (9)	-	-
			0.3 (10)	0.35 (10)	-	-
F179A		Gauge 20 wire-wrap contact for wire sizes AWG 26 to 30	0.28	0.34	-	-
-		Power and Coaxial contacts (19)	(20)	(20)	-	-

NOTES:

1. See Figure 2(b)
2. Weights without contacts or accessories
3. Total maximum weight may be calculated from:
   - connector weight.
   - contact weight for all contacts including brackets and nuts (as applicable) (see Table 1(a) Contact Types and/or the relevant Detail Specification).
   - Accessories weight given in ESCC Detail Specification No. 3401/022 and No. 3401/085 (if applicable).
4. See Figure 2(c)
5. Weight of contact for the external rows (all sizes).
6. Weight of contact for the middle rows except for the middle row of size F.
7. For size F only, weight of contact in the middle row.
8. Weight of contact in row nearest the connector mounting plane (Ref. Plane)
9. Weight of contact in row farthest from connector mounting plane (Ref. Plane), except for size D, where it is the middle row.
10. For size D only, weight of contact in row farthest from connector mounting plane (Ref. Plane).
11. Weight of contact in row nearest the connector mounting plane (Ref. Plane)
12. Weight of contact in row after the row specified in (11).
13. Weight of contact in row after the row specified in (12).
14. Weight of contact in row after the row specified in (13).
15. For size F only, weight of contact in row farthest from connector mounting plane (Ref. Plane).
16. A or B, as applicable.
17. Maximum Weight of brackets and nuts:
    Shell sizes E, A, B and C : 3.1g (Var. 01), 3.95g (Var. 02)
    Shell size D : 3.8g (Var. 01), 4.4g (Var. 02)
    Shell size F : 5g (Var. 02)
18. Maximum Weight of brackets and nuts:
    Shell sizes E, A, B and C : 3g (Var. 01)
    Shell size D : 3.6g (Var. 01)
19. Power and coaxial contacts shall be ordered separately in accordance with ESCC Detail Specification Nos. 3401/040 and 3401/004 respectively.
20. See ESCC Detail Specification Nos. 3401/004 and 3401/040 for coaxial and power contacts.

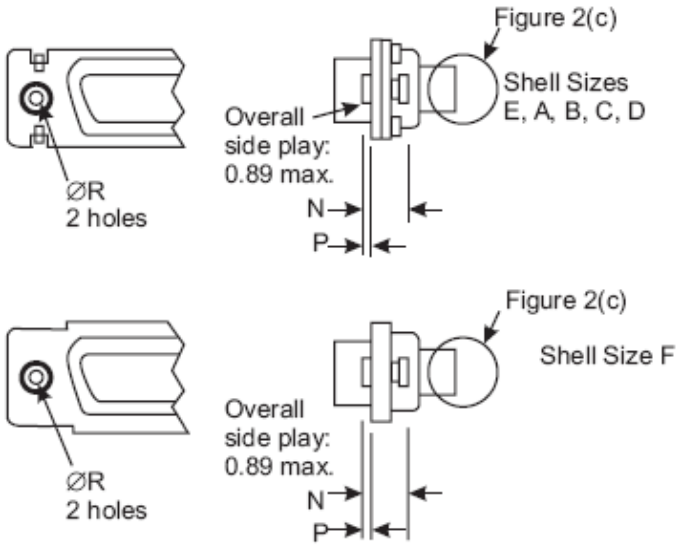
TABLE 1(b) - MAXIMUM RATINGS

No.	Characteristics	Symbol	Maximum Ratings	Unit	Remarks
1	Working Voltage Sea Level -Gauge 20 Contacts -Gauge 22 Contacts -Power Contacts -Coaxial Contacts	U_R	 300 250 250 Note 2	Vrms	Note 1
2	Rated Current -Gauge 20 Contacts -Gauge 22 Contacts -Power Contacts -Coaxial Contacts	I_R	 7.5 3 Note 3 Note 2	A	-
3	Operating Temperature Range	T_{op}	-55 to +125	°C	T_{amb}
4	Storage Temperature Range	T_{stg}	-65 to +125	°C	-
5	Soldering Temperature	T_{sol}	+260	°C	Note 4

NOTES:

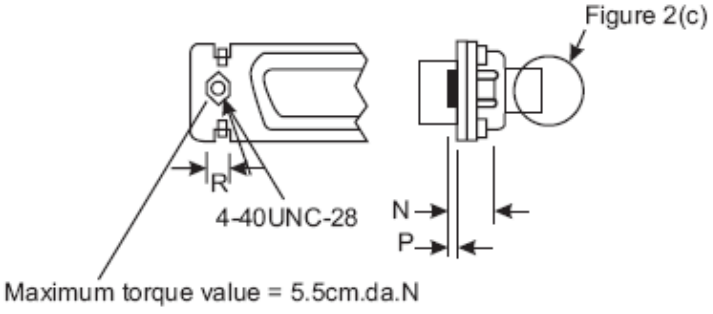
1. Between contact and shell.
2. See ESCC Detail Specification No. 3401/004 for coaxial contacts.
3. See ESCC Detail Specification No. 3401/040 for power contacts.
4. Duration 10 seconds maximum and the same contacts shall not be resoldered until 3 minutes have elapsed.

OTHER MOUNTING TYPES
Floating Mount - Type 'Y'
Shell Sizes E, A, B, C, D and F



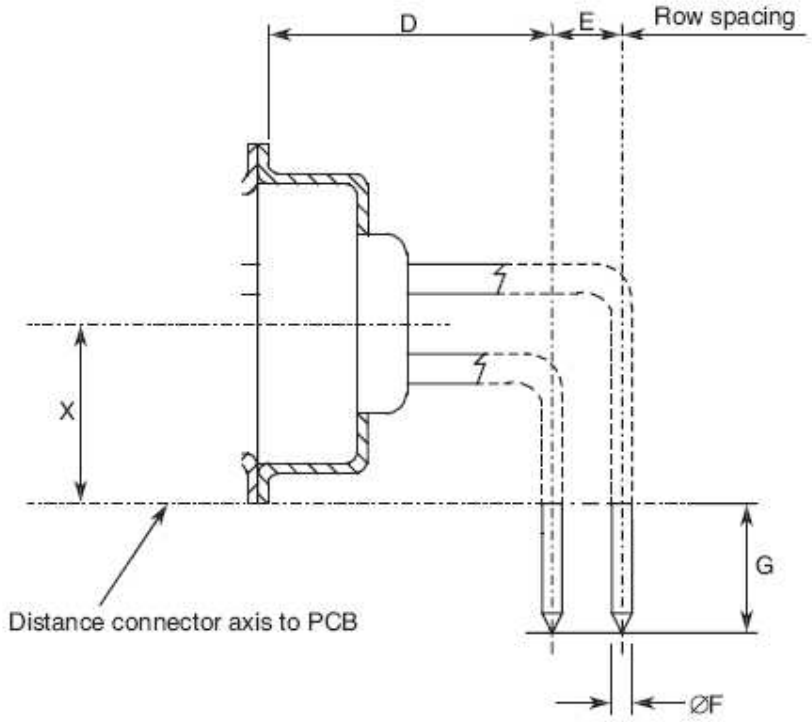
Contact Type	Symbol/Dim.	N	P	ØR
Male	min.	2.4	0.76	2.2
	max.	3.3	0.86	2.3
Female	min.	2.4	0.76	2.2
	max.	3.3	0.86	2.3

Captive Nut - Type 'E'
Shell Sizes E, A, B, C, D and F



Contact Type	Symbol/Dim.	N	P	R
Male	min.	3.4	0	4.3
	max.	4.2	0.4	4.7

Gauge 20 90° PCB Solder Contacts (Sizes E, A, B and C) (Code P)



Pitch between contacts

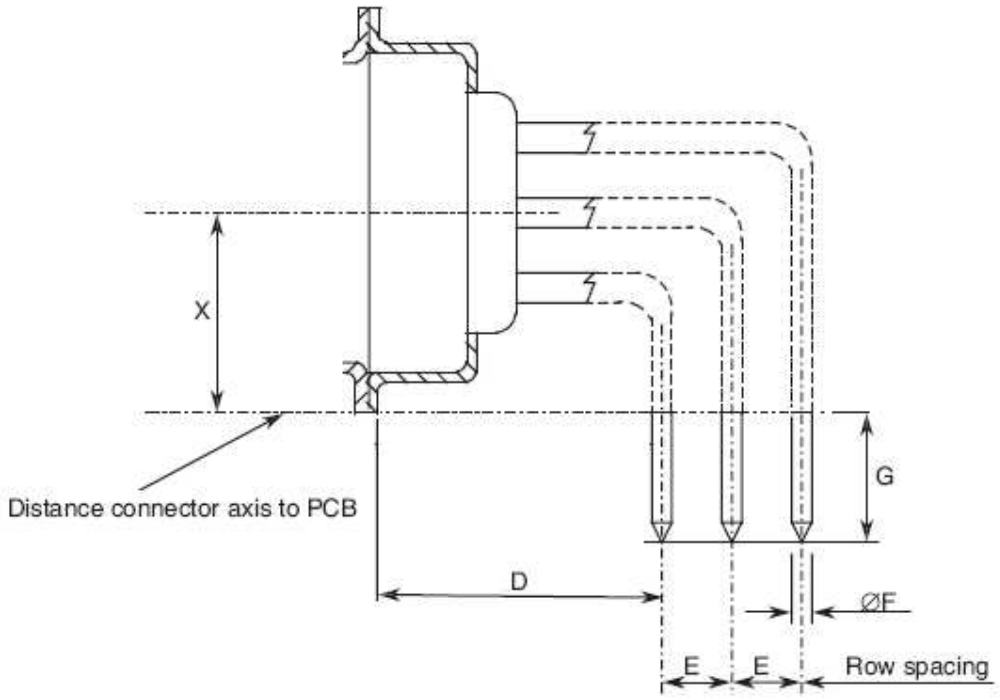
Connector shell sizes E and A: 2.74.
Connector shell sizes B and C: 2.76.

Symbol/Dim	D (2)	E (3)	ØF (4)	G	X (5)
min.	6.94	2.79	0.69	3.9	6.2
max.	7.44	2.89	0.84	4.7	6.5

NOTES:

1. All dimensions are in mm.
2. Typical = 7.19.
3. Typical = 2.84.
4. Typical = 0.76.
5. Typical = 6.35.

Gauge 20 90° PCB Solder Contacts (Size D) (Code P)



Pitch between contacts

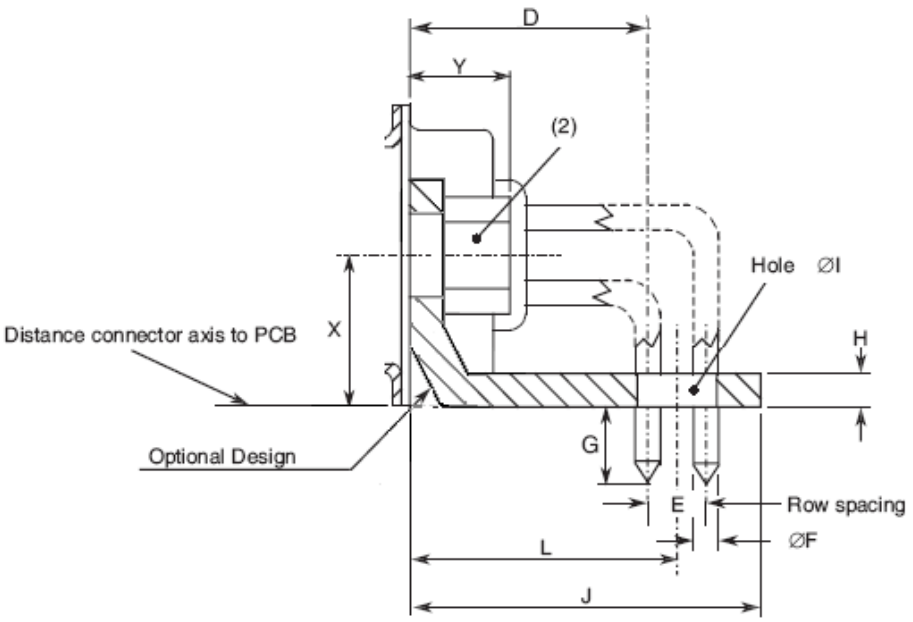
Connector shell size D = 2.76.

Symbol/Dim	D (2)	E (3)	ØF (4)	G	X (5)
min.	6.94	2.79	0.69	3.9	7.6
max.	7.44	2.89	0.84	4.7	7.9

NOTES:

1. All dimensions are in mm.
2. Typical = 7.19.
3. Typical = 2.84.
4. Typical = 0.76.
5. Typical = 7.75.

Gauge 20 90° PCB Solder Contacts with 90° Bracket and Screw Locks (Sizes E, A, B and C)
(Codes L7, L9)



Pitch between contacts

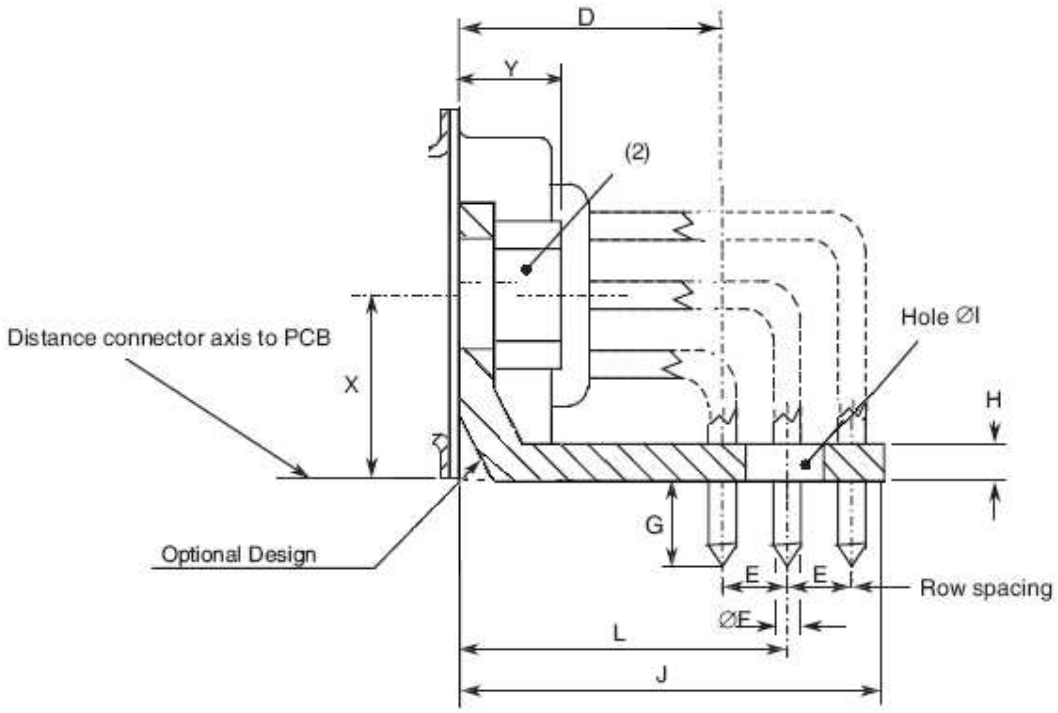
Connector shell sizes E and A: 2.74.
Connector shell sizes B and C: 2.76.

Symbol/Dim.	D (3)	E (4)	ØF (5)	G	H	ØI	J	L	X (6)	Y
min.	6.94	2.79	0.69	3.9	1	3.12	11.4	8.5	6.2	-
max.	7.44	2.89	0.84	4.7	3.2	3.32	11.8	8.7	6.5	7

NOTES:

1. All dimensions are in mm.
2. **Code L7**: Nut 4-40.
   Code **L9**: Nut M3.
3. Typical = 7.19.
4. Typical = 2.84.
5. Typical = 0.76.
6. Typical = 6.35.

Gauge 20 90° PCB Solder Contacts with 90° Bracket and Screw Locks (Size D)
(Codes L7, L9)



Pitch between contacts

Connector shell size D = 2.76.

Symbol/Dim	D (3)	E (4)	ØF (5)	G	H	ØI	J	L	X (6)	Y
min.	6.94	2.79	0.69	3.9	1	3.12	12.8	9.95	7.6	-
max.	7.44	2.89	0.84	4.7	3.2	3.32	13.2	10.15	7.9	7

NOTES:

1. All dimensions are in mm.
2. Code L7: Nut 4-40.
   Code L9: Nut M3.
3. Typical = 7.19.
4. Typical = 2.84.
5. Typical = 0.76.
6. Typical = 7.75.

4.4.1 Shells

Shells of shell sizes E, A, B, C and D shall be made of brass. The plating shall be 0.7µm minimum of gold over 1µm minimum of copper.

Shells of shell size F shall be made of aluminium alloy. The plating shall be either 25.4µm minimum of electroless nickel (Modification Code A174) or 0.7µm minimum of gold with 25.4µm minimum electroless nickel underplating (Modification Code FR172).

4.4.2 Inserts

Inserts shall be made of glass-fibre filled diallylphthalate resin or a suitable thermoplastic material.

4.4.3 Contacts

The contact body shall be made of copper alloy with an underplate of 1µm minimum of copper, gold plated with 1.27µm minimum of gold.

The female contact spring element shall be made of copper alloy with an underplate of 1µm minimum of nickel or copper, gold plated with 1.27µm minimum of gold.

4.4.4 Contact Retaining Clip

Not applicable to gauge 20 and 22 contacts.

See ESCC Detail Specification Nos. 3401/004 and 3401/040 for coaxial and power contacts.

4.4.5 Guiding and Locking Devices

As specified in ESCC Detail Specification No. 3401/022 and No. 3401/085.

4.4.6 Magnetism Level

The allowable value of magnetism shall not exceed that specified for the relevant level (see Para. 4.5.4.7). Only magnetism levels NMC and NMD are verified.

4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and the following paragraphs. When the component is too small to accommodate all of the marking specified, as much as space permits shall be marked and the marking information, in full, shall accompany the component in its primacy package.

The information to be marked and the order of precedence, shall be as follows:

(a) Contact Position.
(b) The ESCC Component Number.
(c) Characteristics.
(d) Traceability information.

4.5.2 Contact Position

Contact position shall be marked on the inserts in accordance with Figure 2(b)