1 GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Electrical, Rectangular, Microminiature Connectors with Removable Crimp Contacts, based on type MDMA. It shall be read in conjunction with:

- ESCC Generic Specification No. 3401, Connectors, Electrical, Rectangular and Circular.
- ESCC Detail Specification No. 3401/032, Accessories for Connectors, Microminiature, 3401/029, 3401/077 and Connector Savers 3401/041.
- ESCC Detail Specification No. 3401/078, Contacts, Electrical, Crimp, for 3401/077 Microminiature Connectors based on type MDMA.
- ESCC Detail Specification No. 3401/087, Lightweight Accessories for Rectangular, Microminiature Connectors, 3401/029 and 3401/077.

the requirements of which are supplemented herein.

1.2 COMPONENT TYPE VARIANTS AND RANGE OF COMPONENTS

The different sizes of the basic type connectors specified herein, together with their mechanical characteristics, are scheduled 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 derating information applicable to the connectors specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

The physical characteristics of the connectors specified herein are shown in Figure 2.

1.6 CONTACT ARRANGEMENTS

Contact arrangements are shown in Figure 3.

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, Connectors, Electrical, Circular and Rectangular.
(b) ESCC Detail Specification No. 3401/032, Accessories for Connectors, Microminiature, 3401/029, 3401/077 and Connector Savers 3401/041.
(c) ESCC Detail Specification No. 3401/078, Contacts, Electrical, Crimp for 3401/077 Microminiature Connectors based on type MDMA.
(d) ESCC Detail Specification No. 3401/087, Lightweight Accessories for Rectangular, Microminiature Connectors, 3401/029 and 3401/077.
(e) MIL-DTL-45204, Gold Plating, Electro-deposited.
(f) ~~MIL-G-14550, Copper Plating, Electro-deposited.~~

3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply.

TABLE 1(a) – COMPONENT TYPE VARIANTS AND RANGE OF COMPONENTS

Variants		Shell Size Note 1	Weight Max. g Note 2	Mating Force N Max.	Unmating Force	
Shell Finish						
Nickel	Gold				N Max.	N Min.
01	02	9	2.3	20	20	1.3
01	02	15	3.1	33	33	2
01	02	21	3.9	47	47	2.9
01	02	25	4.4	55	55	3.5
01	02	31	5.2	69	69	4.3
01	02	37	6	82	82	5.1

NOTES:
1. See Figures 2.1(a) and 2.1(b).
2. Weight without cables, Backshell,floating eyelets, captive nut and contacts (see Para. 4.5.4.4). Add 0.4 grammes for connectors with floating mounts and 1 gramme for connectors with captive nuts.
   See Figures 2.3 and ESCC 3901/002 and 3901/013 for the weight of cable and ESCC Detail Specification No. 3401/078 for contact weights.

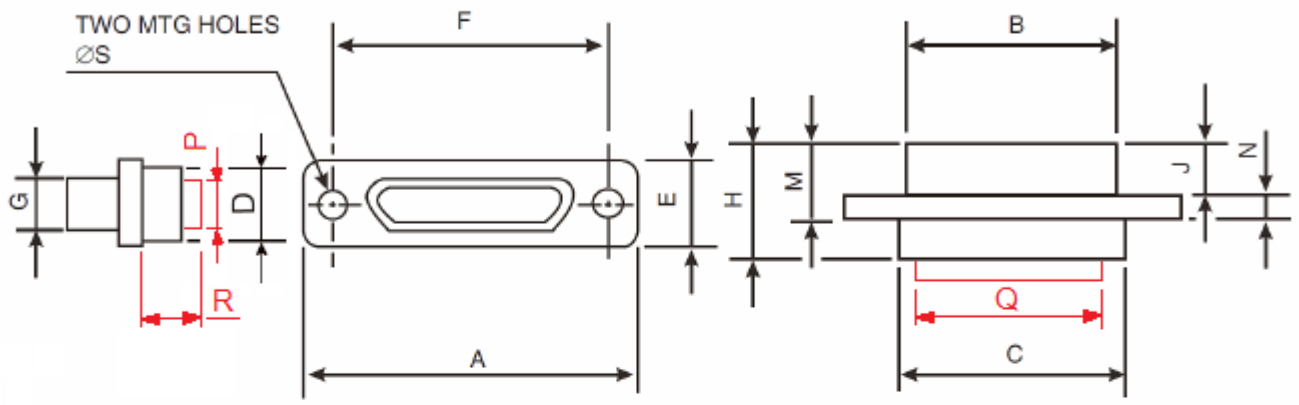
TABLE 1(b) - MAXIMUM RATINGS

No.	Characteristic	Symbol	Maximum Rating	Unit	Remarks
1	Working Voltage	U_R	150	Vrms	Note 1
2	Rated Current with	I_R		A	Note 2
	AWG24 wire		3.5		
	AWG26 and uninsulated solid wire		2.5		
	AWG28 wire		1.5		
3	Operating Temperature Range	T_{op}	-55 to +125	°C	T_{amb}
4	Storage Temperature Range	T_{stg}	-65 to +125	°C	-

NOTES:
1. At Sea Level, between contacts, and contact and shell. U_R requires derating at altitudes above sea level. See Figure 1(a).
2. I_R requires derating if the number of carrying contacts in the connector is 2 or greater. See Figure 1(b).

FIGURE 2 - PHYSICAL DIMENSIONS

Figure 2.1(a) – Connector Shells - Plug (Male Contacts)



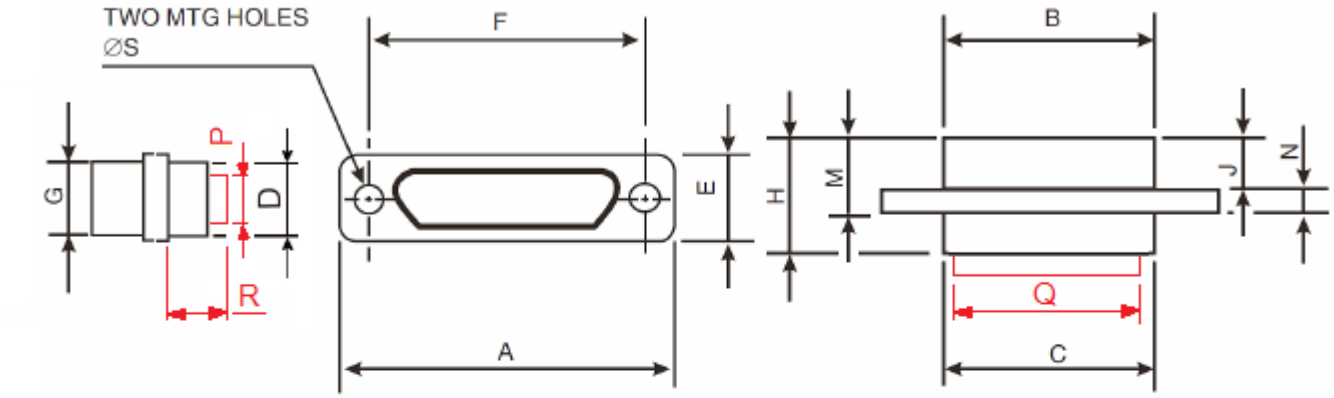
Shell Size	A Max.	B Max.	C Max.	D Max.	E Max.	F		G Max.	H Max.	J Max.	M Max.	N		ØS	
						Min.	Max.					Min.	Max.	Min.	Max.
9	19.94	8.46	10.16	6.86	7.82	14.22	14.48	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
15	23.75	12.27	13.97	6.86	7.82	18.03	18.29	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
21	27.56	16.08	17.78	6.86	7.82	21.84	22.1	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
25	30.1	18.62	20.32	6.86	7.82	24.38	24.64	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
31	33.91	22.43	24.13	6.86	7.82	28.19	28.45	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
37	37.72	26.24	27.94	6.86	7.82	32	32.26	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39

Shell Size	P Max.	Q Max.	R Max.
9	4,4	7,8	5,7
15	4,4	11,6	5,7
21	4,4	15,4	5,7
25	4,4	17,95	5,7
31	4,4	21,75	5,7
37	4,4	25,6	5,7

NOTES:

1. All dimensions are in millimetres.

Figure 2.1(b) – Connector Shells - Receptacle (Female Contacts)



Shell Size	A Max.	B Max.	C Max.	D Max.	E Max.	F		G Max.	H Max.	J Max.	M Max.	N		ØS	
						Min.	Max.					Min.	Max.	Min.	Max.
9	19.94	10.16	10.16	6.86	7.82	14.22	14.48	6.38	10.9	5.05	7.59	2.23	2.49	2.23	2.39
15	23.75	13.97	13.97	6.86	7.82	18.03	18.29	6.38	10.9	5.05	7.59	2.23	2.49	2.23	2.39
21	27.56	17.78	17.78	6.86	7.82	21.84	22.1	6.38	10.9	5.05	7.59	2.23	2.49	2.23	2.39
25	30.1	20.32	20.32	6.86	7.82	24.38	24.64	6.38	10.9	5.05	7.59	2.23	2.49	2.23	2.39
31	33.91	24.13	24.13	6.86	7.82	28.19	28.45	6.38	10.9	5.05	7.59	2.23	2.49	2.23	2.39
37	37.72	27.94	27.94	6.86	7.82	32	32.26	6.38	10.9	5.05	7.59	2.23	2.49	2.23	2.39

Shell Size	P Max.	Q Max.	R Max.
9	4,4	7,8	5,7
15	4,4	11,6	5,7
21	4,4	15,4	5,7
25	4,4	17,95	5,7
31	4,4	21,75	5,7
37	4,4	25,6	5,7

NOTES:
1. All dimensions are in millimetres.

FIGURE 4 - CONTACT REMOVABLE TOOL

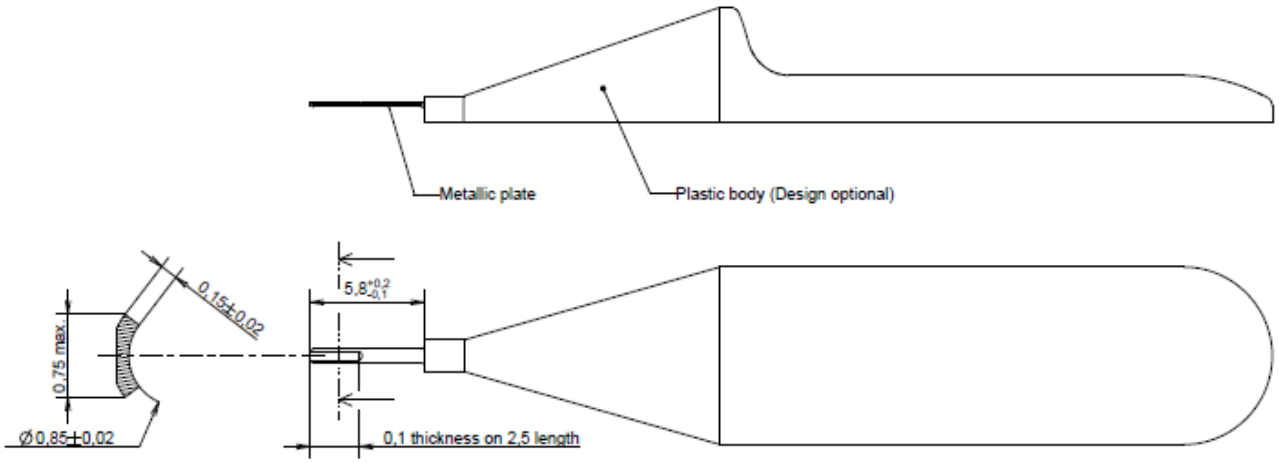
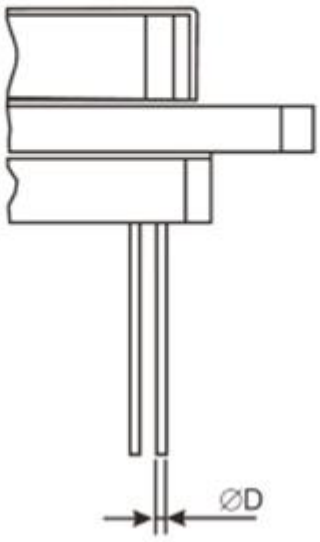


FIGURE 2.3 – UNINSULATED SOLID WIRES ACCEPTED



Wire Size AWG	25
Max Diameter D mm	0,51
Min Diameter D mm	0,4
Min Gold Plating Thickness µm	0.5
Max. Weight g/m	1.6

FIGURE 2.4 – INSULATED SOLID WIRES ACCEPTED

		ESCC 3901/002			ESCC 3901/013		
		Wire Size AWG					
		24	26	28	24	26	28
Conductor Characteristics	Maximum Diameter mm	0.64	0.53	0.43	0.62	0.5	0.42
	~~Nominal Cross-section mm²~~	~~0.21~~	~~0.15~~	~~0.1~~	~~0.22~~	~~0.11~~	~~0.1~~
Wire Characteristics	Maximum Diameter mm	0.88	0.78	0.68	1.04	0.89	0.82
	~~Maximum Weight g/m~~	~~2.61~~	~~1.93~~	~~1.29~~	~~3.34~~	~~2.3~~	~~1.6~~

4 REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the connectors specified herein are stated in this specification and ESCC Generic Specification No. 3401. Deviations from the Generic Specification, applicable to this specification only, are listed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

4.2.1 Deviations from Special In-process Controls

None.

4.2.2 Deviations from Final Production Tests (Chart II)

(a) Para. 9.5, Magnetism Level: Not applicable.

(b) Para 9.2, Mating verification: Not applicable

(c) Para 9.3, Contact retainer test : Replaced by 100% visual inspection with dedicated equipment

4.2.3 Deviations from Burn-in and Electrical Measurements (Chart III)

Chart III is not applicable.

4.2.4 Deviations from Qualification Tests (Chart IV)

(a) Para. 9.9, Seal Test: Not applicable.
(b) Para. 9.29, Oversize Pin Exclusion: Not applicable.
(c) Para. 9.30, Probe Damage: Not applicable.
(d) Para. 9.31, Solderability: Not applicable.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

(a) Para. 9.9, Seal Test: Not applicable.
(b) Para. 9.29, Oversize Pin Exclusion: Not applicable.
(c) Para. 9.30, Probe Damage: Not applicable.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the connectors specified herein shall be verified in accordance with the requirements set out in Para. 9.6 of ESCC Generic Specification No. 3401 and shall conform to those shown in Figure 2 of this specification. Only the underlined dimensions shall be checked during procurement.

4.3.2 Weight

The maximum weight of the connectors specified herein, without contacts and interfacial seals, shall be in accordance with the values given in Table 1(a) of this specification.

4.3.3 Contact Capability

As specified in ESCC Detail Specification No. 3401/078.

4.3.4 Contact Retention (In insert)

As specified in ESCC Detail Specification No. 3401/078.

4.3.5 Mating and Unmating Forces
The forces applied for the mating and unmating of the connectors shall conform to the values specified in Table 1(a).

4.3.6 Insert Retention (In shell)
Connector inserts shall withstand a pressure of 34.4N/cm^2 applied from the mating side to the rear side.

4.3.7 Jackscrew Retention
Not applicable.

4.3.8 Contact Insertion and Withdrawal Forces
As specified in ESCC Detail Specification No. 3401/078 with removal tool define in Figure 4

4.3.9 Engagement and Separation Forces (Male Contacts)
As specified in ESCC Detail Specification No. 3401/078.

4.3.10 Oversize Pin Exclusion
Not applicable.

4.3.11 Probe Damage
Not applicable.

4.3.12 Solderability
Not applicable.

4.4 MATERIALS AND FINISHES
The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the components specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

4.4.1 Shells
Shells shall be made of aluminium alloy. Variant 01 shall have a minimum plating thickness of 25.4µm of electroless nickel. The plating for Variant 02 shall be 0.7µm minimum of gold with 25.4µm minimum electroless nickel underplating.

4.4.2 Inserts
Inserts shall be made of a suitable thermoplastic material.

4.4.3 Contacts
As specified in ESCC Detail Specification No. 3401/078.

4.4.4 Contact Retaining Clip
The retaining clip shall be made of beryllium copper.