



## DEFENSE LOGISTICS AGENCY

DEFENSE SUPPLY CENTER, COLUMBUS  
POST OFFICE BOX 3990  
COLUMBUS, OHIO 43218-3990

IN REPLY

REFER TO DSCC -VAI (Mr. Antonelli/ (DSN 850) 614-692-0576/ra)

August 5, 2004

SUBJECT: Initial Drafts of MIL-DTL-55302/166B, /167B, /168B, /169B, /170B and /171B, Connectors, Printed Circuit Subassembly and Accessories, Low Mating Force, Male and Female Brush, Various, Polarized for Multilayered Printed Wiring Boards (.100 inch spacing), Project number 5935-4553-000 through 4558-000.

Military/Industry Distribution

The initial drafts for the subject documents, which are being revised for conversion to detail status in accordance with acquisition reform and to replace obsolete references, have been placed on the DSCC-VAI website for you to review and comment. The website address is;

<http://www.dsccl.dla.mil/Programs/Milspec/DocSearch.asp>

If these documents are of interest to you, please provide your comments or suggested changes by e-mail to [ralph.antonelli@dla.mil](mailto:ralph.antonelli@dla.mil) or by fax at (614) 692-6940. You may also send comments or suggested changes on Compilation of Comments form 155, shown at the end of the draft documents posted on the web.

Comments or suggested changes that are not editorial in nature should include justification. Industrial activities should indicate whether they are commenting from the standpoint of a "User" or "Manufacturer." Military review activities should forward their comments to their custodians in sufficient time to allow for consolidating the departmental reply. Military departments must identify their comments as either "Essential" or "Suggested." Essential comments, which must be accepted or withdrawn, should be supported by test data unless they obviously require no data.

Please return comments to this Center no later than 45 days from the date of this letter. Any further coordination concerning this document will be circulated only to firms and organizations that furnish comments or reply that they have an interest.

If you do not have access to the world wide web or you have problems downloading this document, please notify Mr. Ralph Antonelli at either the above e-mail address or fax number or by telephone at (614) 692-0576.

Sincerely,

/ signed /

RICHARD L. TAYLOR  
Chief  
Interconnection Devices Team

cc:  
VQP (Tony Carnevlæ)  
CDAB (Dave Barman)  
AF -11 (Jim Arnold - 88 OSS/OSE)

INCH-POUND

MIL-C-55302/169B  
 DRAFT  
 SUPERSEDING  
 MIL-C-55302/169A(USAF)  
 10 June 1986

DETAIL SPECIFICATION SHEET

CONNECTORS, PRINTED CIRCUIT SUBASSEMBLY AND ACCESSORIES:  
 LOW MATING FORCE, FEMALE BRUSH, STRAIGHT-THROUGH, POLARIZED,  
 (.100 SPACING)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-DTL-55302.

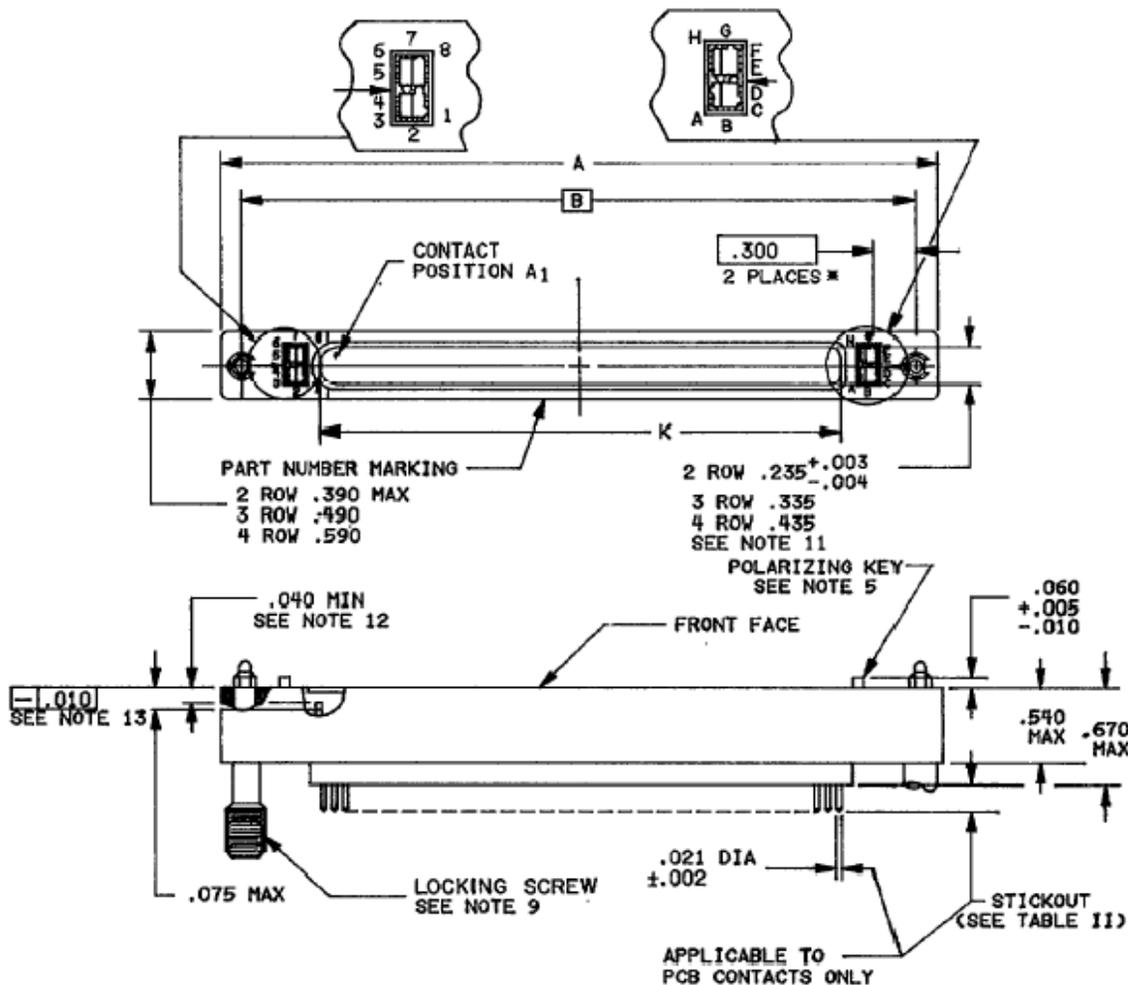


FIGURE 1. Connector, female brush, straight-through for multilayered printed wiring boards .100 (2.54 mm) spacing.

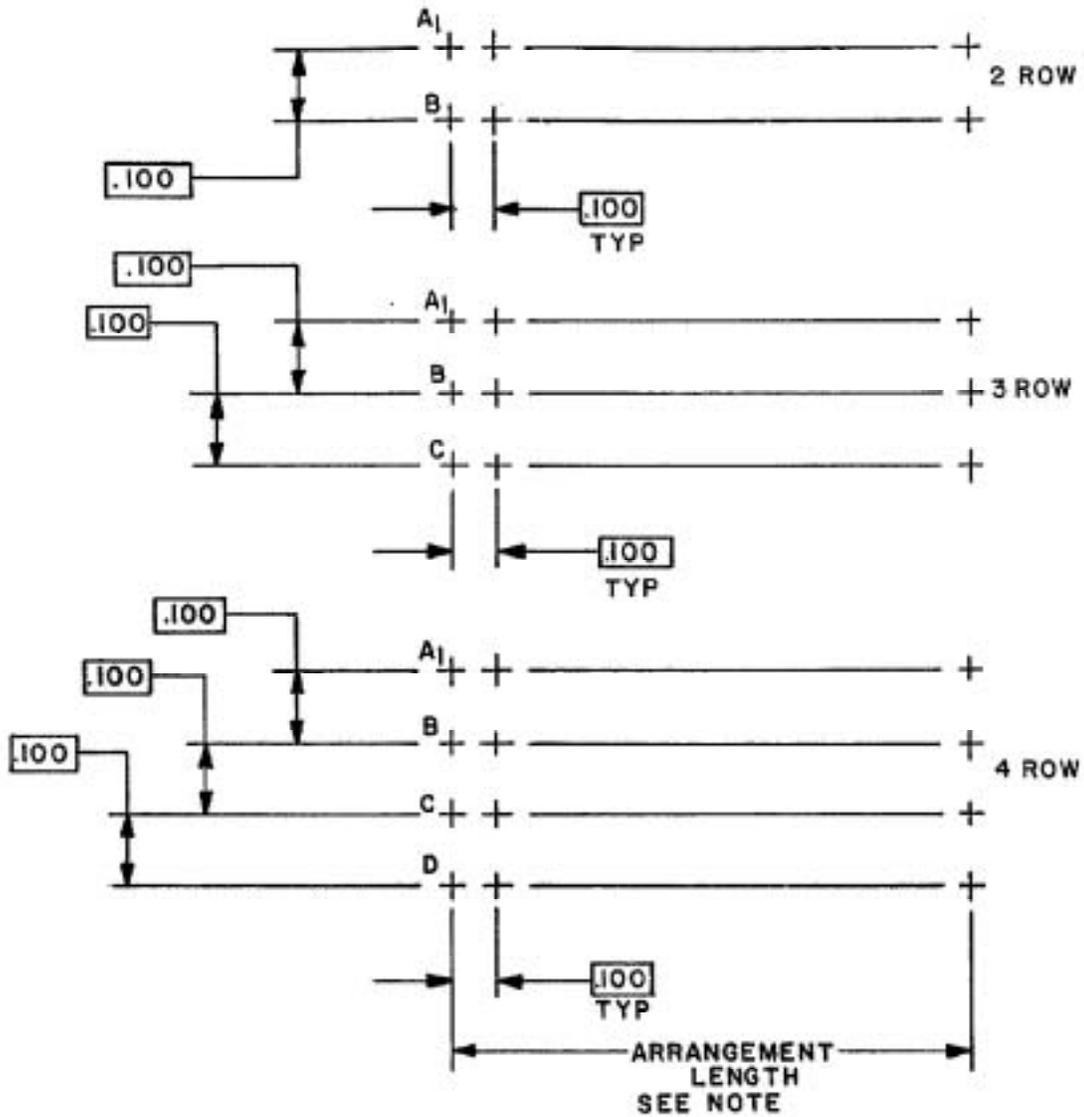
MIL-DTL-55302/169B

Inches	mm	Inches	mm	Inches	mm
.002	0.05	.075	1.91	.490	12.45
.003	0.08	.112	2.84	.540	13.72
.004	0.10	.220	5.59	.590	14.99
.005	0.13	.235	5.97	.650	16.51
.010	0.25	.300	7.62	.670	17.02
.021	0.53	.335	8.51	.785	19.94
.040	1.02	.390	9.91		
.060	1.52	.435	11.05		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm .010$  (0.25 mm).
4. These connectors mate with connectors specified in MIL-DTL-55302/166, MIL-DTL-55302/167 and MIL-DTL-55302/168 and are primarily for use with single-sided, double-sided, or multilayered printed wiring boards.
5. The polarization feature, utilizing four M55302/78-02 polarizing keys which are not supplied with the connector, will provide 256 unique polarizing positions.
6. For dimensions A through K, see table I.
7. Crimp contacts only are removable and replaceable from the rear.
8. When crimp contacts are specified (indicators 1 and 2, table II), a quantity of at least 102 percent of the normal complement but not less than 2 spare contacts shall be supplied unassembled with each connector.
9. Locking screws are not supplied with the connector. See MIL-DTL-55302/172.
10. Contact rows are identified by molded letters on the front and rear face. Numbers indicating every fifth contact per row appear on rear face, except for arrangements consisting of 10 contacts per row which lack numerals. Up to 9 contact locations at the high numeral end of the contact row will not be identified.
11. Indicated dimension shall occur at least at one point within each of the following zones. The zones are defined as areas of the feature containing contact positions 1 through 5, 16 through 20, 46 through 50, 76 through 80, and the zone containing the highest five contact positions. The tolerance for the areas not described above shall be  $+ .010$  (0.25 mm)  $- .004$  (0.10 mm).
12. Dimension pertains when contact is seated against retention system rearward.
13. Perfect form at MMC not required. Dimension for user installation purposes only.

FIGURE 1. Connector, female brush, straight-through for multilayered printed wiring boards .100 (2.54 mm) spacing – Continued.



NOTES:

1. The arrangement length is determined by subtracting one contact from the number of contacts per row (see table I) and multiplying the result by 0.100 inch (2.54 mm).
2. Arrangement length = 0.100(2.54 mm) times (N-1), where N equals the number of contacts per row.

FIGURE 2. Insert arrangement for .100 (2.54 mm) contact spacing, female brush connectors (engaging face).

MIL-DTL-55302/169B

REQUIREMENTS:

Dimensions and configuration: See figure 1 and tables I and II.

Crimp contacts: All crimp contacts shall be in accordance with MIL-DTL-55302/171.

PCB contacts: All PCB contacts shall contain 7 brush wires with a tolerance limit of  $\pm 1$  providing the average outgoing quality limit (AOQL) at each tolerance extreme does not exceed 1 percent. Each brush wire diameter shall be .0073 to .0085 inch (0.185 mm to 0.216 mm).

Material:

Body: Glass filled thermoplastic molding material in accordance with ASTM D5948, type GPT-15F.

Crimp contacts: In accordance with MIL-DTL-55302/171.

PCB contacts: In accordance with MIL-DTL-55302.

Plating: The contact termination plating shall be in accordance with table III. Brush wire plating shall be gold in accordance with ASTM B488, type II, code C, class 1.27 over nickel in accordance with SAE-AMS-QQ-N-290. Cut ends or brush wires need not be plated.

Contact identification: See figure 1 (note 10) and figure 2.

Oversized pin exclusion: Not applicable.

Contact engagement and separation forces: Not applicable, see mating and unmating.

Mating and unmating: The maximum mating and unmating force shall be 1.5 ounces times the total number of contacts.

Contact current rating: The connector may have any combination of current flow and ambient temperature provided the contact or connector temperature does not exceed 125°C. The test current shall be 5 amperes for individually connected contacts and 3 amperes for series wired contacts.

Contact resistance: The average resistance of all contact pairs measured on row A contacts shall not exceed 0.016 ohm, and no individual pair shall have a resistance exceeding 0.020 ohm. To allow for increased terminal lengths, add 0.001 ohm for each contact row beyond row A. The point of measurement shall be the point of terminal exit from the printed wiring board.

Contact retention: 3 pounds per contact minimum when the force is applied in the forward direction. The displacement shall not exceed 0.005 (0.13 mm). The displacement shall be recorded after a 1 pound preload is used to determine the zero displacement reference.

Dielectric withstanding voltage:

Sea level: 1,300 volts rms, 60 Hz, ac.

High altitude: 325 volts rms, 60 Hz, ac.

Extended contact life: Connector shall meet the performance requirements of MIL-DTL-55302, contact life, when subjected to 20,000 insertion and withdrawal cycles during qualification inspection. Locking screws shall not be attached during contact life cycling.

MIL-DTL-55302/169B

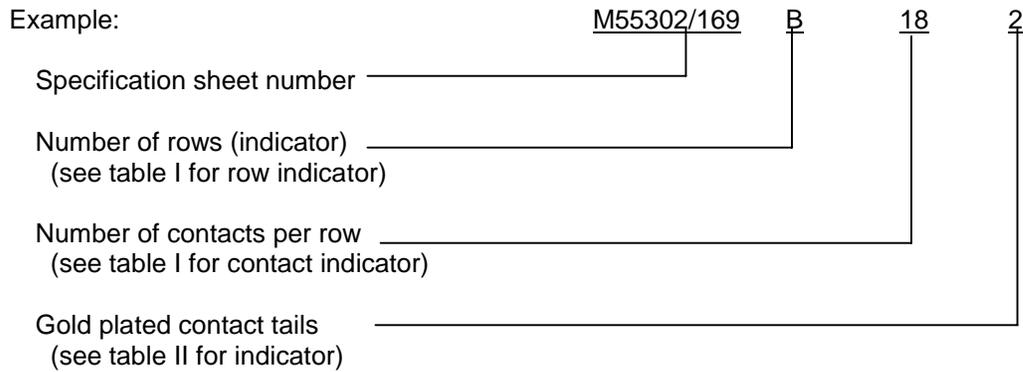
Insert arrangement: See figure 2.

Contact tools for crimp only:

Extraction tool: See ~~MS27509R22~~ M81969/14-09.

Insertion tool: See ~~MS27509A22~~ M81969/14-09.

Part or identifying number(PIN): Consists of the letter M, the basic number of the specification sheet, and a dash number compiled as follows:



User instructions: Each shipment of connectors shall include, as a minimum, instructions for: Coupling/mounting bushing usage, polarization key usage and electrical probing information.

MIL-DTL-55302/169B

TABLE I. Indicators and dimensions.

2 Contact rows		3 Contact rows		4 Contact rows		Dimensions 1/		
Indicator	Total contacts	Indicator	Total contacts	Indicator	Total contacts	A Max	B	+ .010 K - .000
A10 <sup>2/</sup>	20	B10 <sup>2/</sup>	30	C10 <sup>2/</sup>	40	2.295 (58.29)	1.975 (50.17)	1.120 28.45
A11	22	B11	33	C11	44	2.396 (60.86)	2.075 52.71	1.220 30.99
A12	24	B12	36	C12	48	2.495 (63.37)	2.175 55.25	1.320 33.53
A13	26	B13	39	C13	52	2.595 (65.91)	2.275 57.79	1.420 36.07
A14	28	B14	42	C14	56	2.695 (68.45)	2.375 60.33	1.520 38.61
A15	30	B15	45	C15	60	2.795 (70.99)	2.475 62.87	1.620 41.15
A16	32	B16	48	C16	64	2.895 (73.53)	2.575 65.41	1.720 43.69
A17	34	B17	51	C17	68	2.995 (76.07)	2.675 67.95	1.820 46.23
A18	36	B18	54	C18	72	3.095 (78.61)	2.775 70.49	1.920 48.77
A19	38	B19	57	C19	76	3.195 (81.15)	2.875 73.03	2.020 51.31
A20	40	B20	60	C20	80	3.295 (83.69)	2.975 75.57	2.120 53.85
A21	42	B21	63	C21	84	3.395 (86.23)	3.075 78.11	2.220 56.39
A22	44	B22	66	C22	88	3.495 (88.77)	3.175 80.65	2.320 58.93
A23	46	B23	69	C23	92	3.595 (91.31)	3.275 83.19	2.420 61.47
A24	48	B24	72	C24	96	3.695 (93.85)	3.375 85.73	2.520 64.01
A25	50	B25	75	C25	100	3.795 (96.39)	3.475 88.27	2.620 66.55
A26	52	B26	78	C26	104	3.895 (98.93)	3.575 90.81	2.720 69.01
A27	54	B27	81	C27	108	3.995 (101.47)	3.675 93.35	2.820 71.63
A28	56	B28	84	C28	112	4.095 (104.01)	3.775 95.89	2.920 74.17
A29	58	B29	87	C29	116	4.195 (106.55)	3.875 98.43	3.020 76.71
A30	60	B30	90	C30	120	4.295 (109.09)	3.975 100.97	3.120 79.25
A31	62	B31	93	C31	124	4.395 (111.63)	4.075 103.51	3.220 81.79
A32	64	B32	96	C32	128	4.495 (114.17)	4.175 106.05	3.320 84.33
A33	66	B33	99	C33	132	4.595 (116.71)	4.275 108.59	3.420 86.87
A34 <sup>2/</sup>	68	B34 <sup>2/</sup>	102	C34 <sup>2/</sup>	136	4.695 119.25	4.375 111.13	3.520 89.41
A35	70	B35	105	C35	140	4.795 (121.79)	4.475 113.67	3.620 91.95
A36	72	B36	108	C36	144	4.895 (124.33)	4.575 116.21	3.720 94.49
A37	74	B37	111	C37	148	4.995 (126.87)	4.675 118.75	3.820 97.03
A38	76	B38	114	C38	152	5.095 (129.41)	4.775 121.29	3.920 99.57

See footnotes at end of table.

MIL-DTL-55302/169B

TABLE I. Indicators and dimensions – Continued.

2 Contact rows		3 Contact rows		4 Contact rows		Dimensions 1/		
Indicator	Total contacts	Indicator	Total contacts	Indicator	Total contacts	A Max	B	+ .010 K - .000
A39	78	B39	117	C39	156	5.195 131.95	4.875 123.83	4.020 102.11
A40	80	B40	120	C40	160	5.295 134.49	4.975 126.37	4.120 104.65
A42	82	B41	123	C41	164	5.395 137.03	5.075 128.91	4.220 107.19
A42	84	B42	126	C42	168	5.495 139.57	5.175 131.45	4.320 109.73
A43	86	B43	129	C43	172	5.595 142.11	5.275 133.99	4.420 112.27
A44	88	B44	132	C44	176	5.695 144.65	5.375 136.53	4.520 114.81
A45	90	B45	135	C45	180	5.795 147.19	5.475 139.07	4.620 117.35
A46	92	B46	138	C46	184	5.895 149.73	5.575 141.61	4.720 119.89
A47	94	B47	141	C47	188	5.995 152.27	5.675 144.15	4.820 122.43
A48	96	B48	144	C48	192	6.095 154.81	5.775 146.69	4.920 124.97
A49	98	B49	147	C49	196	6.195 157.35	5.875 149.23	5.020 127.51
A50	100	B50	150	C50	200	6.295 159.89	5.975 151.77	5.120 130.05
A51	102	B51	153	C51	204	6.395 162.43	6.075 154.31	5.220 132.59
A52	104	B52	156	C52	208	6.495 164.97	6.175 156.85	5.320 135.13
A53	106	B53	159	C53	212	6.595 167.51	6.275 159.39	5.420 137.67
A54	108	B54	162	C54	216	6.695 170.05	6.375 161.93	5.520 140.21
A55	110	B55	165	C55	220	6.795 172.59	6.475 164.47	5.620 142.75
A56	112	B56	168	C56	224	6.895 175.13	6.575 167.01	5.720 145.29
A57	114	B57	171	C57	228	6.995 177.67	6.675 169.55	5.820 147.83
A58	116	B58	174	C58	232	7.095 180.21	6.775 172.09	5.920 150.37
A59	118	B59	177	C59	236	7.195 182.75	6.875 174.63	6.020 152.91
A60	120	B60	180	C60	240	7.295 185.29	6.975 177.17	6.120 155.45
A61	122	B61	183	C61	244	7.395 187.83	7.075 179.71	6.220 157.99
A62	124	B62	186	C62	248	7.495 190.37	7.175 182.25	6.320 160.53
A63	126	B63	189	C63	252	7.595 192.91	7.275 184.79	6.420 163.07
A64	128	B64	192	C64	256	7.695 195.45	7.375 187.33	6.520 165.61
A65	130	B65	195	C65	260	7.795 197.99	7.475 189.87	6.620 168.15
A66	132	B66	198	C66	264	7.895 200.53	7.575 192.41	6.720 170.69

See footnotes at end of table.

MIL-DTL-55302/169B

TABLE I. Indicators and dimensions – Continued.

2 Contact rows		3 Contact rows		4 Contact rows		Dimensions 1/		
Indicator	Total contacts	Indicator	Total contacts	Indicator	Total contacts	A Max	B	+ .010 K - .000
A67	134	B67	201	C67	268	7.995 203.07	7.675 194.95	6.820 173.23
A68	136	B68	204	C68	272	8.095 205.61	7.775 197.49	6.920 175.77
A69	138	B69	207	C69	276	8.195 208.15	7.875 200.03	7.020 178.31
A70	140	B70	210	C70	280	8.295 210.69	7.975 202.57	7.120 180.85
A71	142	B71	213	C71	284	8.395 213.23	8.075 205.11	7.220 183.39
A72	144	B72	216	C72	288	8.495 215.77	8.175 207.65	7.320 185.93
A73	146	B73	219	C73	292	8.595 218.31	8.275 210.19	7.420 188.47
A74	148	B74	222	C74	296	8.695 220.85	8.375 212.73	7.520 191.01
A75	150	B75	225	C75	300	8.795 223.39	8.475 215.27	7.620 193.55
A76	152	B76	228	C76	304	8.895 225.93	8.575 217.81	7.720 196.01
A77	154	B77	231	C77	308	8.995 228.47	8.675 220.35	7.820 198.63
A78	156	B78	234	C78	312	9.095 223.10	8.775 222.89	7.920 201.17
A79	158	B79	237	C79	316	9.195 233.55	8.875 225.43	8.020 203.71
A80	160	B80	240	C80	320	9.295 236.09	8.975 227.97	8.120 206.25
A81 <sup>2/</sup>	162	B81 <sup>2/</sup>	243	C81 <sup>2/</sup>	324	9.395 238.63	9.075 230.51	8.220 208.79
A82	164	B82	246	C82	328	9.495 241.17	9.175 233.05	8.320 211.33
A83	166	B83	249	C83	332	9.595 243.71	9.275 235.59	8.420 213.87
A84	168	B84	252	C84	336	9.695 246.25	9.375 238.13	8.520 216.41
A85	170	B85	255	C85	340	9.795 248.79	9.475 240.67	8.620 218.95
A86	172	B86	258	C86	344	9.895 251.33	9.575 243.21	8.720 221.49
A87	174	B87	261	C87	348	9.995 253.87	9.675 245.75	8.820 224.03
A88	176	B88	264	C88	352	10.095 256.41	9.775 248.29	8.920 226.57
A89	178	B89	267	C89	356	10.195 258.95	9.875 250.83	9.020 229.11
A90	180	B90	270	C90	360	10.295 261.49	9.975 253.37	9.120 231.65
A91	182	B91	273	C91	364	10.395 264.03	10.075 255.91	9.220 234.19
A92	184	B92	276	C92	368	10.495 266.57	10.175 258.45	9.320 236.73
A93	186	B93	279	C93	372	10.595 269.11	10.275 260.99	9.420 239.27
A94	188	B94	282	C94	376	10.695 271.65	10.375 263.53	9.520 241.81
A95	190	B95	285	C95	380	10.795 274.19	10.475 266.07	9.620 244.35

See footnotes at end of table.

MIL-DTL-55302/169B

TABLE I. Indicators and dimensions – Continued.

2 Contact rows		3 Contact rows		4 Contact rows		Dimensions 1/		
Indicator	Total contacts	Indicator	Total contacts	Indicator	Total contacts	A Max	B	+ .010 K - .000
A96	192	B96	288	C96	384	10.895 276.73	10.575 268.61	9.720 246.89
A97	194	B97	291	C97	388	10.995 279.27	10.675 271.15	9.820 249.43
A98	196	B98	294	C98	392	11.095 281.81	10.775 273.69	9.920 251.97
A99	198	B99	297	C99	396	11.195 284.35	10.875 276.23	10.020 254.51
A00	200	B00	300	C00	400	11.295 286.89	10.975 278.77	10.120 257.05

1/ All dimensions are in inches. Metric equivalents may be calculated based on 1 inch = 25.4 mm.

2/ Indicators consist of, a letter designating number of contact rows and two digits indicating number of contacts per row. Indicators A00, B00, and C00 denotes 100 contacts per row.

TABLE III. Contact option.

Indicator	Option	Contact type
1	Termination plating: Tin lead in accordance with <u>SAE-AMS-P-81728</u> , 50 to 70 percent tin, .0001 minimum thick over copper per <u>MIL-C-14550</u>	Crimp
2	Termination plating: Gold in accordance with <u>ASTM B488</u> , type II, <u>code C</u> , class 1.27 over copper in accordance with <u>SAE-AMS2418</u> per <u>MIL-C-14550</u> .	Crimp
3	Connectors supplied less contacts	--
4	Termination plating: Tin lead in accordance with <u>SAE-AMS-P-81728</u> , 50 to 70 percent tin, .0001 minimum thick over copper in accordance with <u>SAE-AMS2418</u> per <u>MIL-C-14550</u> .	Printed circuit board w/.145 ± .025 stickout

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Referenced documents. In addition to MIL-DTL-55302, this document references the following:

- MIL-DTL-55302/78
- MIL-DTL-55302/169
- MIL-DTL-55302/170
- MIL-DTL-55302/171
- MIL-DTL-55302/172
- MIL-I-81969/14
- ASTM B488
- ASTM D5948
- SAE-AMS-2418
- SAE-AMS-QQ-N-290
- SAE-AMS-P-81728

MIL-DTL-55302/169B

CONCLUDING MATERIAL

Custodian:  
Air Force – 11  
DLA – CC

Preparing activity:  
DLA - CC

(Project 5935-4456-000)

Review activities:  
Air Force – 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://www.dodssp.daps.mil>.

PROJECT NUMBER		COMPILATION OF COMMENTS		COMMENT NUMBER
DOCUMENT		COMMENTOR IND NAME OR CODE	[ ] MFR [ ] USER [ ] IND ASSOC	
DOD USE ONLY	DEPT	[ ] A [ ] N [ ] AF [ ] DLA [ ] NSA [ ] CNDN [ ] NASA	[ ] ESSENTIAL [ ] SUGGESTED	
RECOMMENDED DISPOSITION OF COMMENT:		[ ] ACCEPTANCE [ ] NON-ACCEPTED-SEE REASON [ ] WITHDRAW [ ] MODIFY [ ] DISCUSS		
FINAL DISPOSITON OF COMMENT:		[ ] ACCEPTED [ ] NON-ACCEPTED [ ] WITHDRAW [ ] MODIFY		

DESC FORM 155

PROJECT NUMBER		COMPILATION OF COMMENTS		COMMENT NUMBER
DOCUMENT		COMMENTOR IND NAME OR CODE	[ ] MFR [ ] USER [ ] IND ASSOC	
DOD USE ONLY	DEPT	[ ] A [ ] N [ ] AF [ ] DLA [ ] NSA [ ] CNDN [ ] NASA	[ ] ESSENTIAL [ ] SUGGESTED	
RECOMMENDED DISPOSITION OF COMMENT:		[ ] ACCEPTANCE [ ] NON-ACCEPTED-SEE REASON [ ] WITHDRAW [ ] MODIFY [ ] DISCUSS		
FINAL DISPOSITON OF COMMENT:		[ ] ACCEPTED [ ] NON-ACCEPTED [ ] WITHDRAW [ ] MODIFY		

DESC FORM 155