



## DEFENSE LOGISTICS AGENCY

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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;

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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 /

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Note: This draft dated 12 July 2004, prepared by Defense Supply Center Columbus (DSCC-VAI) has not been approved and is subject to modification. DO NOT USE PRIOR TO APPROVAL. (Project 5935-4457-000)

INCH-POUND

MIL-DTL-55302/170B  
 DRAFT  
 SUPERSEDING  
 MIL-C-55302/170A(USAF)  
 10 June 1986

DETAIL SPECIFICATION SHEET

CONNECTORS, PRINTED CIRCUIT SUBASSEMBLY AND ACCESSORIES:  
 LOW MATING FORCE, FEMALE BRUSH, RIGHT ANGLE, POLARIZED,  
 FOR MULTILAYERED PRINTED WIRING BOARD (.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.

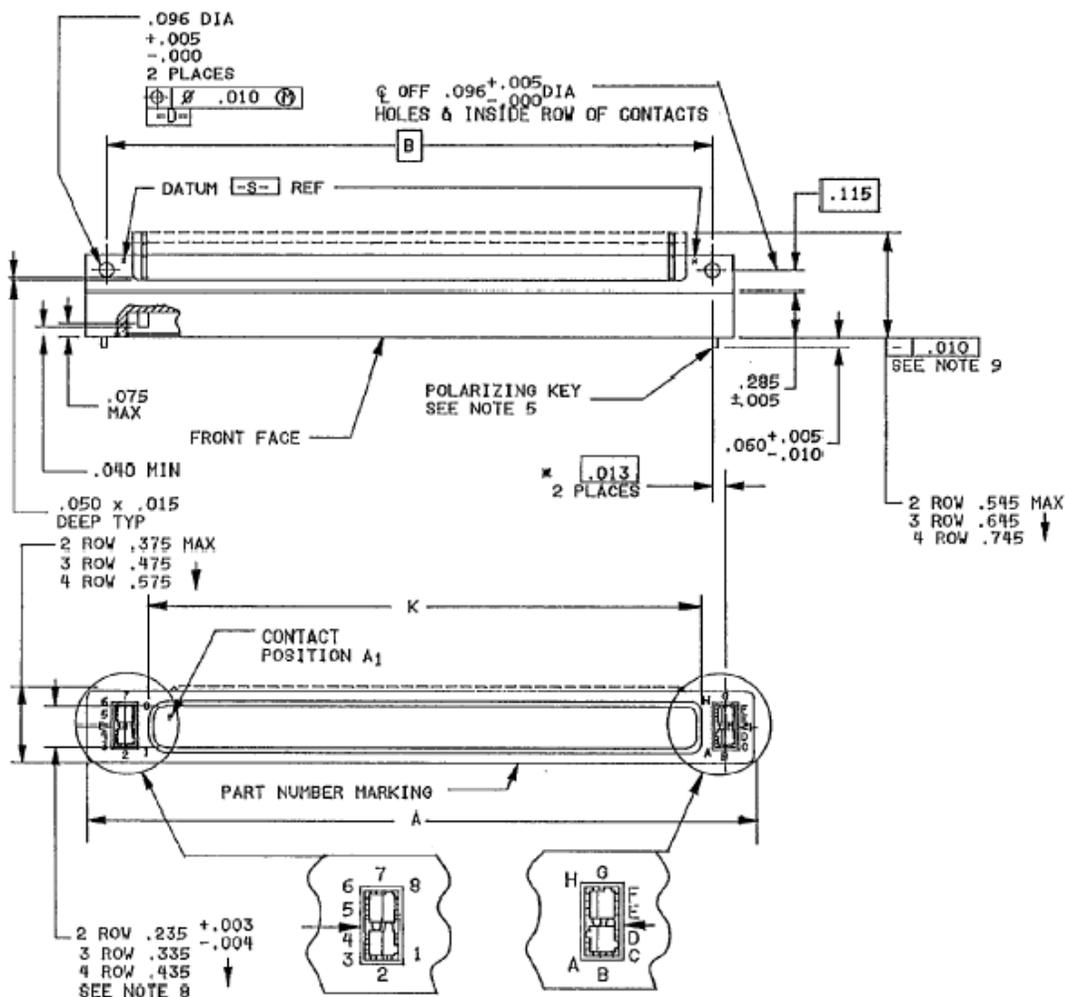
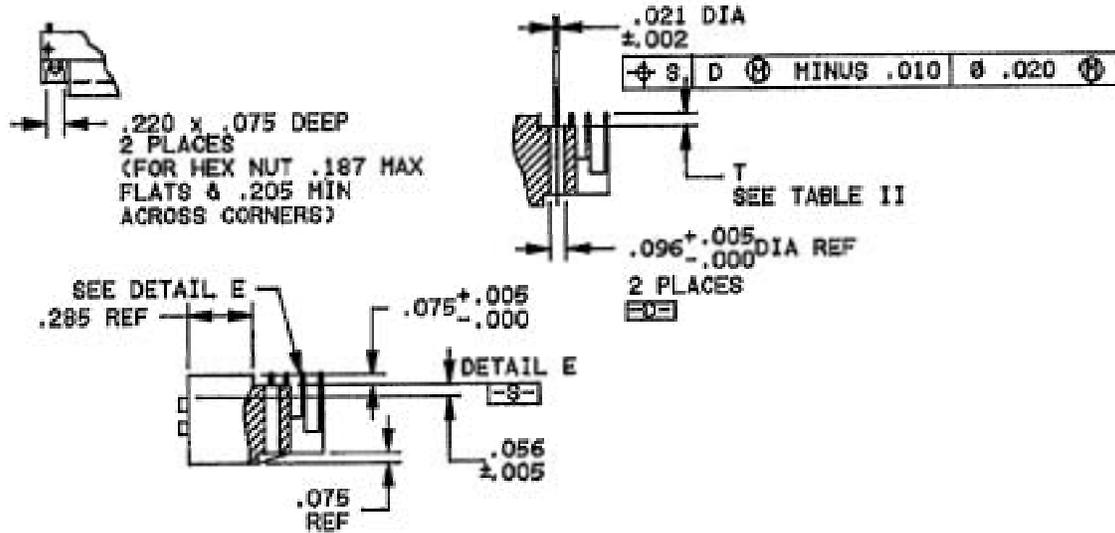


FIGURE 1. Connector, female brush, right angle for multilayered printed wiring boards .100 (2.54 mm) spacing.

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Inches		mm		Inches		mm		Inches		mm	
.002	0.05	.021	0.53	.115	2.92	.375	9.55	.003	0.08	.040	1.02
.004	0.10	.050	1.27	.205	5.21	.475	12.07	.005	0.13	.056	1.42
.010	0.25	.060	1.52	.235	5.97	.575	14.61	.015	0.38	.075	1.90
.020	0.51	.096	2.44	.335	8.51	.645	18.92				

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. 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.
8. 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).
9. Perfect form at MMC not required. Dimension for user installation purposes only.

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

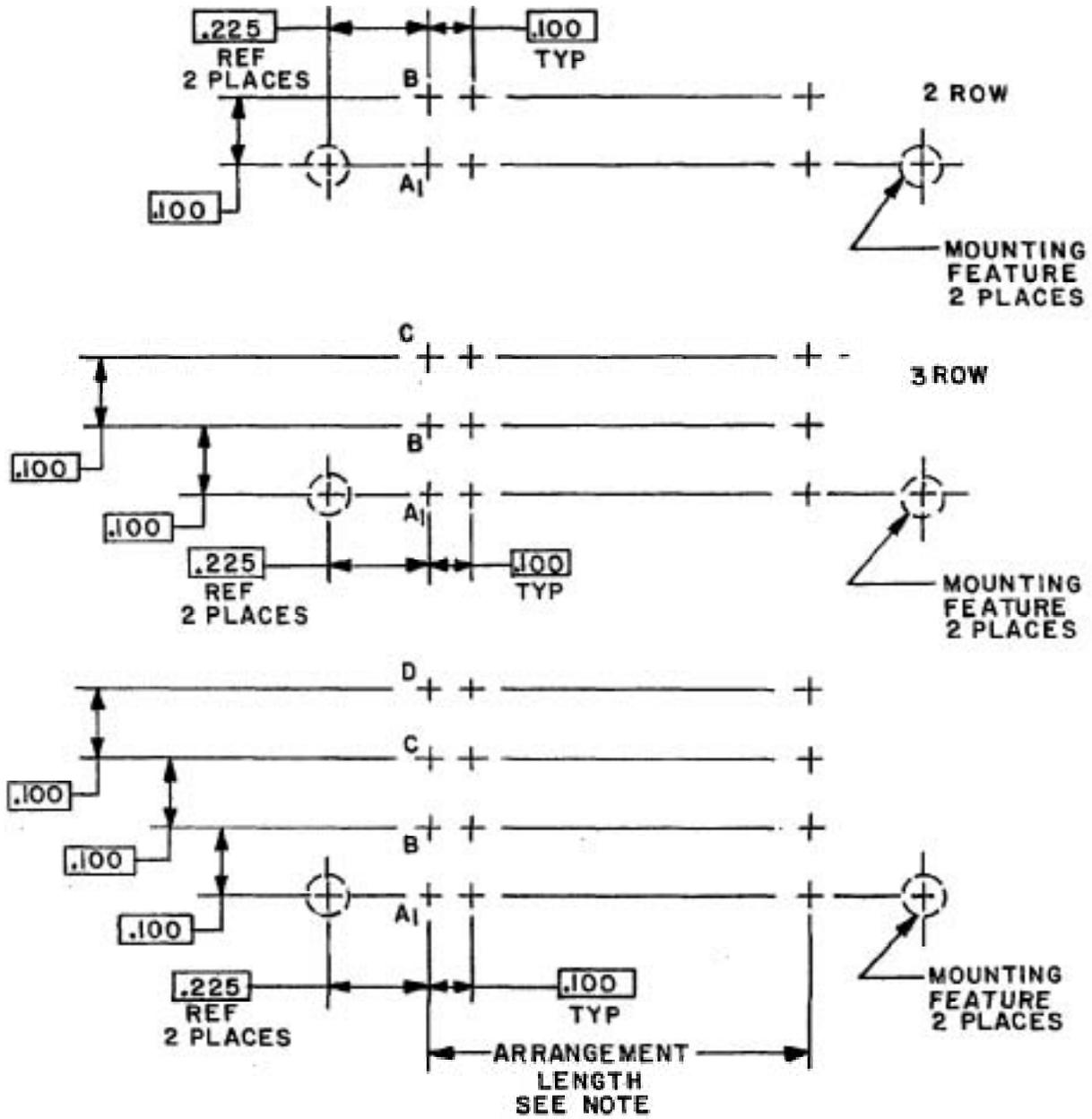
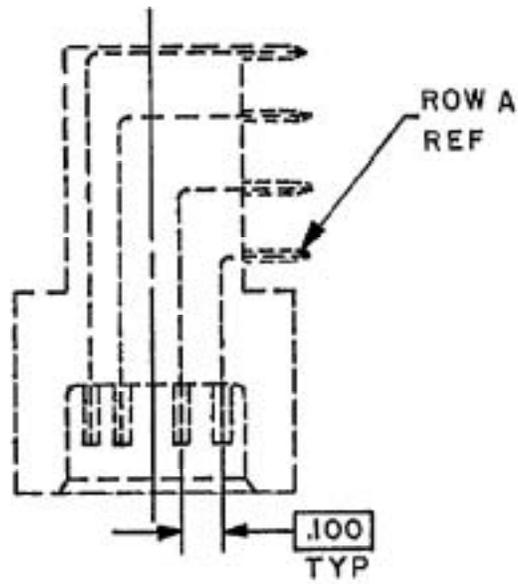


FIGURE 2. Insert arrangement for .100 (2.54 mm) contact spacing, female brush right angle connectors (PCB mounting side).



Inches	mm
.050	1.27
.100	2.54
.150	3.81
.225	5.71

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 right angle connectors (PCB mounting side) – Continued.

REQUIREMENTS:

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

Contacts: Each contact 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.

Contacts: In accordance with MIL-C-55302 or ASTM-B187 AND ASTM-B272.

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 7) 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: Not applicable.

Vibration: Vibration shall be per MIL-DTL-55302 except test condition V, letter H shall apply. Duration shall be 4 hours in each of three mutually perpendicular directions, 12 hours total.

Dielectric withstanding voltage:

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

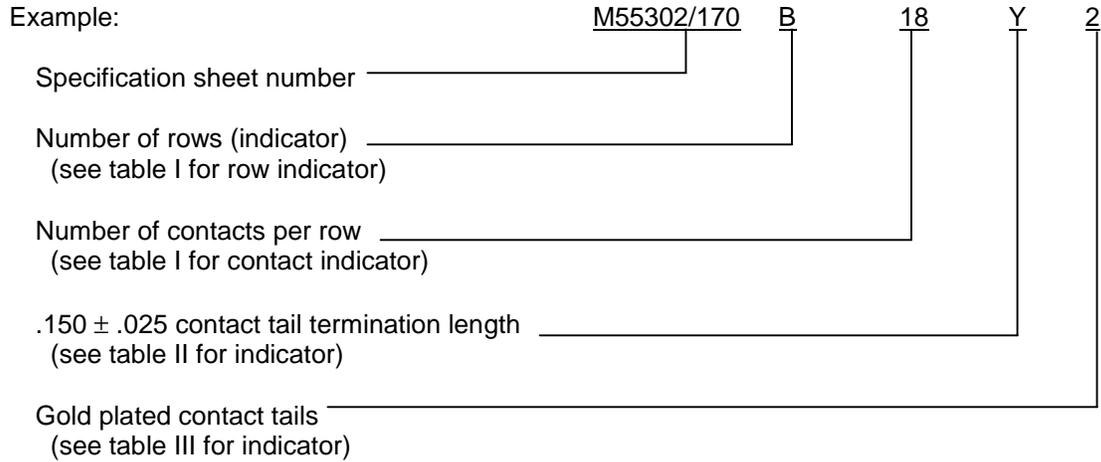
High altitude: 325 volts rms, 60 Hz, ac.

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.

Insert arrangement: See figure 2.

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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.

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	Indicator	Total contacts	Indicator
A10 <sup>±</sup>	20	B10 <sup>±</sup>	30	C10 <sup>±</sup>	40	1.680 42.67	1.350 34.29	1.120 28.45
A11	22	B11	33	C11	44	1.780 45.21	1.450 36.83	1.220 30.99
A12	24	B12	36	C12	48	1.880 47.75	1.550 39.37	1.320 33.53
A13	26	B13	39	C13	52	1.980 50.29	1.650 41.91	1.420 36.07
A14	28	B14	42	C14	56	2.080 52.83	1.750 44.45	1.520 38.61
A15	30	B15	45	C15	60	2.180 55.37	1.850 46.99	1.620 41.15
A16	32	B16	48	C16	64	2.280 57.91	1.950 49.53	1.720 43.69
A17	34	B17	51	C17	68	2.380 60.45	2.050 52.07	1.820 46.23
A18	36	B18	54	C18	72	2.480 62.99	2.150 54.61	1.920 48.77
A19	38	B19	57	C19	76	2.580 65.53	2.250 57.15	2.020 51.31
A20	40	B20	60	C20	80	2.680 68.07	2.350 59.69	2.120 53.85
A21	42	B21	63	C21	84	2.780 70.61	2.450 62.23	2.220 56.39
A22	44	B22	66	C22	88	2.880 73.15	2.550 64.77	2.320 58.93
A23	46	B23	69	C23	92	2.980 75.69	2.650 67.31	2.420 61.47
A24	48	B24	72	C24	96	3.080 78.23	2.750 69.85	2.520 64.01
A25	50	B25	75	C25	100	3.180 80.77	2.850 72.39	2.620 66.55

See footnotes at end of the table

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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
A26	52	B26	78	C26	104	3.280 83.31	2.950 74.93	2.720 69.01
A27	54	B27	81	C27	108	3.380 85.85	3.050 77.47	2.820 71.63
A28	56	B28	84	C28	112	3.480 88.39	3.150 80.01	2.920 74.17
A29	58	B29	87	C29	116	3.580 90.93	3.250 82.55	3.020 76.71
A30	60	B30	90	C30	120	3.680 93.47	3.350 85.09	3.120 79.25
A31	62	B31	93	C31	124	3.780 96.01	3.450 87.63	3.220 81.79
A32	64	B32	96	C32	128	3.880 98.55	3.550 90.17	3.320 84.33
A33	66	B33	99	C33	132	3.980 101.09	3.650 92.17	3.420 86.87
A34	68	B34	102	C34	136	4.080 103.63	3.750 93.98	3.520 89.41
A35	70	B35	105	C35	140	4.180 106.17	3.850 97.79	3.620 91.95
A36	72	B36	108	C36	144	4.280 108.71	3.950 100.33	3.720 94.49
A37	74	B37	111	C37	148	4.380 111.25	4.050 102.87	3.820 97.03
A38	76	B38	114	C38	152	4.480 113.79	4.150 105.41	3.920 99.57
A39 <sup>z</sup>	78	B39 <sup>z</sup>	117	C39 <sup>z</sup>	156	4.580 116.33	4.250 107.95	4.020 102.11
A40	80	B40	120	C40	160	4.680 118.87	4.350 110.49	4.120 104.65
A42	82	B41	123	C41	164	4.780 121.41	4.450 113.03	4.220 107.19
A42	84	B42	126	C42	168	4.880 123.95	4.550 115.57	4.320 109.73
A43	86	B43	129	C43	172	4.980 126.49	4.650 118.11	4.420 112.27
A44	88	B44	132	C44	176	5.080 129.03	4.750 120.65	4.520 114.81
A45	90	B45	135	C45	180	5.180 131.57	4.850 123.19	4.620 117.35
A46	92	B46	138	C46	184	5.280 134.11	4.950 125.73	4.720 119.89
A47	94	B47	141	C47	188	5.380 136.65	5.050 128.27	4.820 122.43
A48	96	B48	144	C48	192	5.480 139.19	5.150 130.81	4.920 124.97
A49	98	B49	147	C49	196	5.580 141.73	5.250 133.35	5.020 127.51
A50	100	B50	150	C50	200	5.680 144.27	5.350 135.89	5.120 130.05
A51	102	B51	153	C51	204	5.780 146.81	5.450 138.43	5.220 132.59
A52	104	B52	156	C52	208	5.880 149.35	5.550 140.97	5.320 135.13
A53	106	B53	159	C53	212	5.980 151.89	5.650 143.51	5.420 137.67
A54	108	B54	162	C54	216	6.080 154.43	5.750 146.05	5.520 140.21
A55	110	B55	165	C55	220	6.180 156.97	5.850 148.59	5.620 142.75

See footnotes at end of the table

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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
A56	112	B56	168	C56	224	6.280 159.51	5.950 151.13	5.720 145.29
A57	114	B57	171	C57	228	6.380 162.05	6.050 153.67	5.820 147.83
A58	116	B58	174	C58	232	6.480 164.59	6.150 156.21	5.920 150.37
A59	118	B59	177	C59	236	6.580 167.13	6.250 158.75	6.020 152.91
A60	120	B60	180	C60	240	6.680 169.67	6.350 161.29	6.120 155.45
A61	122	B61	183	C61	244	6.780 172.21	6.450 163.83	6.220 157.99
A62	124	B62	186	C62	248	6.880 174.75	6.550 166.37	6.320 160.53
A63	126	B63	189	C63	252	6.980 177.29	6.650 168.91	6.420 163.07
A64	128	B64	192	C64	256	7.080 179.83	6.750 171.45	6.520 165.61
A65	130	B65	195	C65	260	7.180 182.37	6.850 173.99	6.620 168.15
A66	132	B66	198	C66	264	7.280 184.91	6.950 176.53	6.720 170.69
A67	134	B67	201	C67	268	7.380 187.45	7.050 179.07	6.820 173.23
A68	136	B68	204	C68	272	7.480 189.99	7.150 181.61	6.920 175.77
A69	138	B69	207	C69	276	7.580 192.53	7.250 184.15	7.020 178.31
A70	140	B70	210	C70	280	7.680 195.07	7.350 186.69	7.120 180.85
A71	142	B71	213	C71	284	7.780 197.61	7.450 189.23	7.220 183.39
A72	144	B72	216	C72	288	7.880 200.15	7.550 191.77	7.320 185.93
A73	146	B73	219	C73	292	7.980 202.69	7.650 194.31	7.420 188.47
A74	148	B74	222	C74	296	8.080 205.23	7.750 196.85	7.520 191.01
A75	150	B75	225	C75	300	8.180 207.77	7.850 199.39	7.620 193.55
A76	152	B76	228	C76	304	8.280 210.31	7.950 201.93	7.720 196.01
A77	154	B77	231	C77	308	8.380 212.85	8.050 204.47	7.820 198.63
A78	156	B78	234	C78	312	8.480 215.39	8.150 207.01	7.920 201.17
A79	158	B79	237	C79	316	8.580 217.93	8.250 209.55	8.020 203.71
A80	160	B80	240	C80	320	8.680 220.47	8.350 212.09	8.120 206.25
A81	162	B81	243	C81	324	8.780 223.01	8.450 214.63	8.220 208.79
A82	164	B82	246	C82	328	8.880 225.55	8.550 217.17	8.320 211.33
A83	166	B83	249	C83	332	8.980 228.09	8.650 219.71	8.420 213.87
A84	168	B84	252	C84	336	9.080 230.63	8.750 222.25	8.520 216.41
A85	170	B85	255	C85	340	9.180 233.17	8.850 224.79	8.620 218.95

See footnotes at end of table.

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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
A86 <sup>2/</sup>	172	B86 <sup>2/</sup>	258	C86 <sup>2/</sup>	344	9.280 235.71	8.950 227.33	8.720 221.49
A87	174	B87	261	C87	348	9.380 238.25	9.050 229.87	8.820 224.03
A88	176	B88	264	C88	352	9.480 240.79	9.150 232.41	8.920 226.57
A89	178	B89	267	C89	356	9.580 243.33	9.250 234.95	9.020 229.11
A90	180	B90	270	C90	360	9.680 245.87	9.350 237.49	9.120 231.65
A91	182	B91	273	C91	364	9.780 248.41	9.450 240.03	9.220 234.19
A92	184	B92	276	C92	368	9.880 250.95	9.550 242.57	9.320 236.73
A93	186	B93	279	C93	372	9.980 253.49	9.650 245.11	9.420 239.27
A94	188	B94	282	C94	376	10.080 256.03	9.750 247.65	9.520 241.81
A95	190	B95	285	C95	380	10.180 258.57	9.850 250.19	9.620 244.35
A96	192	B96	288	C96	384	10.280 261.11	9.950 252.73	9.720 246.89
A97	194	B97	291	C97	388	10.380 263.65	10.050 255.27	9.820 249.43
A98	196	B98	294	C98	392	10.480 266.19	10.150 257.81	9.920 251.97
A99	198	B99	297	C99	396	10.580 268.73	10.250 260.35	10.020 254.51
A00	200	B00	300	C00	400	10.680 271.27	10.350 262.89	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 II. Contact tail termination length.

Indicator	T dimension
Z	.120 ± .025
Y	.150 ± .025
X	.300 ± .025

TABLE III. Contact tail plating.

Indicator	Plating
1	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> plating
2	Gold in accordance with <u>ASTM B488</u> , type II, code C, class 0.51 over nickel in accordance with <u>SAE-AMS-QQ-N-290</u>

MIL-DTL-55302/170B

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

MIL-DTL-55302/78  
MIL-DTL-55302/166  
MIL-DTL-55302/167  
MIL-DTL-55302/168  
MIL-I-81969/14  
ASTM B488  
ASTM D5948  
SAE-AMS-2418  
SAE-AMS-QQ-N-290  
SAE-AMS-P-81728

CONCLUDING MATERIAL

Custodian:  
Air Force – 11  
DLA – CC

Preparing activity:  
DLA - CC

(Project 5935-4457-000)

Review activities:  
Air Force – 19, 99

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