

**INCH-POUND**

MIL-HDBK-1861  
October 30, 1998

# DEPARTMENT OF DEFENSE HANDBOOK

SELECTION AND USE OF  
ELECTRICAL AND ELECTRONIC ASSEMBLIES,  
BOARDS, CARDS, AND ASSOCIATED HARDWARE



This handbook is for guidance only.  
Do not cite this document as a requirement.

AMSC N/A

FSC 5998

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### FOREWORD

1. This Department of Defense (DoD) Handbook is approved for use by all Departments and Agencies of the Department of Defense.
2. This handbook is for guidance only. This handbook cannot be cited as a requirement. If it is, the contractor does not have to comply.
3. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAC, 3990 East Broad Street, Columbus, OH 43216-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
4. This handbook provides a list of electrical and electronic assemblies, boards, cards, and associated hardware for use in the design of DoD equipment. The application information and performance characteristics contained in this handbook are offered for guidance and are not to be considered as binding. Additions to this handbook will be made periodically as the referenced documents are updated.

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## 1. SCOPE

1.1 Scope. This handbook provides criteria for the design and treatment of printed wiring boards, circuit card assemblies, and associated hardware. This handbook is for guidance only. This handbook cannot be cited as a requirement. If it is, the contractor does not have to comply.

1.2 Purpose. The purpose of this handbook is to:

- a. Provide the designers of new equipment with a selection of handbook items for DoD applications.
- b. Minimize the variety of items used in DoD equipment in order to facilitate logistic support of the equipment in the field.
- c. Outline criteria pertaining to the use of items for design purposes for new equipment.

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed below are not necessarily all of the documents referenced herein, but are the ones that are needed in order to fully understand the information provided by this handbook.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the latest issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto.

## SPECIFICATIONS

## FEDERAL

A-A-55563 - Holders, Electrical Card, Metal Card Guide, General Requirements for.

## DEPARTMENT OF DEFENSE

MIL-A-24741 - Assemblies, Metal Electrical Backplane, One and Two Layer, General Specification for.  
 MIL-A-28870 - Assemblies, Electrical Backplane, Printed Wiring, General Specification for.  
 MIL-PRF-31032 - Printed Circuit Board/Printed Wiring Board Manufacturing, General Specification for.

## STANDARDS

## DEPARTMENT OF DEFENSE

MIL-STD-2118 - Flexible and Rigid-Flex Wiring for Electronic Equipment, Design Requirements for.  
 MIL-STD-2119 - Design Requirements for Printed Wiring Electrical Backplane Assemblies.  
 MIL-STD-2198 - Design Requirements for Metal Electrical Backplane Assemblies.

## HANDBOOKS

## FEDERAL

H2-2 - Cataloging Handbook.  
 H6 - Alphabetic Index of Names.

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(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk , Building 4D (DPM-DoDSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein.

## DRAWINGS

83023	-	Extractor, Electrical Card, Plastic.
84006	-	Electrical Card Holders.
84101	-	Electrical Card Holders.
84103	-	Electrical Card Holders, Retainers.
84168	-	Electrical Card Holders/Retainers.
84191	-	Extractor, Electrical Card, Metal.
85020	-	Holder, Electrical Card.
85021	-	Holder, Electrical Card.
85033	-	Holder, Electrical Card.
85034	-	Holder, Electrical Card.
85067	-	Electrical Card Holders.
85068	-	Holder, Electrical Card.
86092	-	Holder, Electrical Card, Retainer.
88052	-	Holder, Electrical Card, Screw Actuated.
89024	-	Holder, Electrical Card, Retainer, 5-Piece.
89029	-	Holder, Electrical Card, Anti-vibration.
89064	-	Holder, Electrical Card, Retainer, 5-Piece Wedge Lock.

(Copies of Defense Supply Center, Columbus (DSCC) drawings are available from the Defense Supply Center, Columbus, ATTN: DSCC-VT, 3990 East Broad Street, Columbus, OH 43216 -5000)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the latest issue of the DoDISS and supplement thereto

## INSTITUTE FOR INTERCONNECTING AND PACKAGING ELECTRONIC CIRCUITS (IPC)

IPC-D-275	-	Design Standard for Rigid Printed Boards and Rigid Printed Board Assemblies.
IPC-DW-425/11	-	Design and End Product Requirements for Discrete Wiring Boards/ Plated-Through Hole Connection.
IPC-T-50	-	Terms and Definitions for Interconnecting and Packaging Electronic Circuits.

(Application for copies should be addressed to the Institute for Interconnecting and Packaging Electronic Circuits, 2215 Sanders Road, Northbrook, IL 60062-6135.)

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## 3. DEFINITIONS

3.1 Definitions of item names (H-6). Definitions of item names are in the Federal Item Name Directory for Supply Cataloging, H-6, section A.

3.2 List of item names (H2-2). A complete list of item names in FSC 5998 can be found in Cataloging Handbook H2-2.

3.3 Definitions. The meanings of terms used in this handbook are in accordance with DoD specifications and DSCC drawings.

3.3.1 Commercial Item Description (CID). A simplified product description that describes, by functional or performance characteristics, the available, acceptable commercial products that will satisfy the Government's needs.

3.3.2 DSCC drawing. A standardization document developed by and available from the Defense Supply Center, Columbus.

3.3.3 Part or Identifying number (PIN). Formerly part number (P/N).

3.3.4 Qualified Manufacturer List (QML). A document maintained by the government qualifying activity which lists vendors who are officially approved by the Government.

3.3.5 Qualified Products List (QPL). A document maintained by the government qualifying activity which lists vendors whose products are officially approved by the Government.

3.4 Other Terms and Definitions. Other terms and definitions may be found in IPC-T-50.

## 4. GENERAL GUIDANCE

4.1 Item identification. PIN's and type designations are used to identify the items listed in this handbook and in the individual specifications.

4.2 Conflict of requirements. In the event of conflict between the technical requirements of items described in this handbook and the applicable specification or DSCC drawing, the specification or DSCC drawing shall govern.

4.3 Criteria for inclusion in this handbook. The criteria for inclusion in this handbook are as follows:

- a. The item(s) are classified in FSC 5998.
- b. The item(s) are for general use in DoD equipment.
- c. The item(s) are covered by CIDs, DoD specifications, or DSCC drawings.
- d. The item(s) are available from at least one source.
- e. The item(s) are to be used for design purposes in new equipment.

4.4 Order of preference. The order of preference is as follows:

- a. Non-Government Standard parts
- b. CID parts
- c. DoD QML specification parts.
- d. DoD QPL specification parts.
- e. DoD drawing parts.
- f. Other parts.

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## 5. DESIGN GUIDANCE

5.1 Printed wiring board size. Whenever cost and technical requirements permit, preferred rigid printed wiring board sizes should be used. These printed wiring board sizes will facilitate the development and use of standardized insertion and extraction tools. The preferred printed wiring board sizes, extractor hole size, and location are shown on figure 1.

5.2 Rigid printed wiring and printed wiring boards. Rigid printed wiring and printed wiring boards for single-sided, double-sided, and multilayer printed wiring design and conformance information can be found in IPC-D-275 and MIL-PRF-31032.

5.3 Flexible and rigid-flex wiring. Flexible and rigid-flex printed wiring design and conformance information can be found in MIL-STD-2118 and MIL-PRF-31032.

5.4 Discrete wiring boards. Discrete wiring boards with plated-through holes design information can be found in IPC-DW-425/11.

5.5 Backplane assemblies, printed wiring. Electrical backplane printed wiring assemblies design and conformance information can be found in MIL-STD-2119 and MIL-A-28870.

5.6 Metal electrical backplane assemblies. Metal electrical backplane assemblies design and conformance information can be found in MIL-STD-2198 and MIL-A-24741.

5.7 Associated hardware.

5.7.1 Holders. Circuit card holder and guide selections are found in tables I through IX for metals, and tables X through XIII for plastics.

5.7.2 Extractors and retainer-ejectors. Extractor and retainer-ejector selections are found in tables XIV and XV.



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TABLE I. Holders, electrical card, retainer, metal, 3 wedge bodies.

Mounting length (inch) (mm)		Number of mounting holes	Mounting method	DSCC drawing PIN
2.8	71.12	2	Rivets	84103-01, 08, 15, 18, 25, 32, 38
3.0	76.20	"	"	84103-02, 09, 19, 26, 39, 45
3.5	88.90	"	"	84103-03, 10, 20, 27, 40, 46
3.8	96.52	"	"	84103-04, 11, 16, 21, 28, 33, 41
4.0	101.60	"	"	84103-47
4.5	114.30	"	"	84103-48
4.8	121.92	"	"	84103-05, 12, 17, 22, 29, 34, 42
5.0	127.00	"	"	84103-49
5.3	134.62	"	"	84103-06, 13, 23, 30, 43
5.8	147.32	"	"	84103-07, 14, 24, 31, 44
6.1	154.94	"	"	84103-36
6.7	170.18	"	"	84103-37

TABLE II. Holders, electrical card, retainer, metal, 5 wedge bodies.

Mounting length (inch) (mm)		Number of mounting holes	Mounting method	DSCC drawing PIN
2.8	71.12	2	Rivets or screws	89024-01, 11
3.0	76.20	"	"	89024-02, 12
3.5	88.90	"	"	89024-03, 13
3.8	96.52	"	"	89024-04, 14
4.0	101.60	"	"	89024-05, 15
4.5	114.30	"	"	89024-06, 16
4.8	121.92	"	"	89024-07, 17; 89064-01 to 04, 89064-09 to 12, 17 to 20
5.0	127.00	2	Rivets or screws	89024-08, 18
5.5	139.70	"	"	89024-09, 19
5.8	147.32	"	"	89024-10, 20; 89064-05 to 08, 89064-13 to 14, 21 to 24

TABLE III. Electrical card holders, metal, slot width .0312 inch (0.79 mm).

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN	CID classification PIN
2.0	50.80	2	85020-002*	AA55563/08BA20*
2.5	63.50	"	85020-026*	AA55563/08BA25*
3.0	76.20	"	85020-050*	AA55563/08BA30*
3.5	88.90	"	85020-074*	AA55563/08BA35*
4.0	101.60	"	85020-098*	AA55563/08BA40*
4.5	114.30	"	85020-122*	AA55563/08BA45*
5.0	127.00	"	85020-146*	AA55563/08BA50*
5.5	139.70	"	85020-170*	AA55563/08BA55*
6.0	152.40	"	85020-194*	AA55563/08BA60*

\* Indicates finish

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TABLE IV. Electrical card holders, metal, slot width .0625 inch (1.59 mm).

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN	CID classification PIN
2.0	50.80	2	85020-005*	AA55563/08BB20*
2.25	57.15	"	85034-01	N/A
2.5	63.50	"	85020-029*	AA55563/08BB25*
2.5	63.50	"	85021-002	AA55563/01BC25B
3.0	76.20	2	84168-002	N/A
3.0	76.20	"	85020-053*	AA55563/08BB30*
3.0	76.20	"	85021-017	AA55563/01BC30B
3.25	82.55	3	85034-03	N/A
3.5	88.90	2	84168-010	N/A
3.5	88.90	"	85020-077*	AA55563/08BB35*
3.5	88.90	"	85021-032	AA55563/01BC35B
4.0	101.60	2	84168-018	N/A
4.0	101.60	"	85020-101*	AA55563/08BB40*
4.0	101.60	"	85021-047	AA55563/01BC40B
4.25	107.95	4	85034-05	N/A
4.5	114.30	2	84168-026	N/A
4.5	114.30	"	85020-125*	AA55563/08BB45*
4.5	114.30	3	85033-001	N/A
5.0	127.00	3	84168-034	N/A
5.0	127.00	2	85020-149*	AA55563/08BB50*
5.0	127.00	"	85021-062	AA55563/01BC50B
5.25	133.35	5	85034-07	N/A
5.5	139.70	3	84168-042	N/A
5.5	139.70	2	85020-173*	AA55563/08BB55*
6.0	152.40	3	84168-050	N/A
6.0	152.40	2	85020-197*	AA55563/08BB60*
6.0	152.40	"	85021-077	AA55563/01BC60B
6.0	152.40	4	85033-017	N/A
6.25	158.75	6	85034-09	N/A
7.0	177.80	3	84168-058	N/A
7.5	190.50	"	84168-066	N/A
8.25	209.55	8	85034-11	N/A
8.5	215.90	3	84168-074	N/A

\* Indicates finish

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TABLE V. Electrical card holders, metal, slot width .0937 inch (2.38 mm).

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN	CID classification PIN
1.5	38.10	2	85033-135	N/A
2.0	50.80	"	85020-008*	AA55563/08BC20*
2.25	57.15	"	85034-02	N/A
2.5	63.50	"	85020-032*	AA55563/08BC25*
2.5	63.50	"	85021-005	AA55563/01BB25C
3.0	76.20	2	84168-004	N/A
3.0	76.20	"	85020-056*	AA55563/08BC30*
3.0	76.20	"	85021-020	AA55563/01BC30C
3.0	76.20	3	85033-147	N/A
3.25	82.55	"	85034-04	N/A
3.5	88.90	2	84168-012	N/A
3.5	88.90	"	85020-080*	AA55563/08BC35*
3.5	88.90	"	85021-035	AA55563/01BC35C
4.0	101.60	2	84168-020	N/A
4.0	101.60	"	85020-104*	AA55563/08BC40*
4.0	101.60	"	85021-050	AA55563/01BC40C
4.25	107.95	4	85034-06	N/A
4.5	114.30	2	84168-028	N/A
4.5	114.30	"	85020-128*	AA55563/08BC45*
4.5	114.30	3	85033-005	N/A
5.0	127.00	3	84168-036	N/A
5.0	127.00	"	85020-152*	AA55563/08BC50*
5.0	127.00	2	85021-065	AA55563/01BC50C
5.25	133.35	5	85034-08	N/A
5.5	139.70	2	84168-044	N/A
5.5	139.70	3	85020-176*	AA55563/08BC55*
6.0	152.40	3	84168-052	N/A*
6.0	152.40	2	85020-200*	AA55563/08BC60*
6.0	152.40	"	85021-080	AA55563/01BC60C
6.0	152.40	4	85033-020	N/A
6.25	158.75	6	85034-10	N/A
7.0	177.80	3	84168-060	N/A
7.5	190.50	"	84168-068	N/A
8.25	209.55	8	85034-12	N/A
8.5	215.90	3	84168-076	N/A

\* Indicates finish

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TABLE VI. Electrical card holders, metal, slot width .125 inch (3.18 mm).

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN
1.5	38.10	2	85033-185
2.0	50.80	"	85033-189
2.5	63.50	"	85033-031
3.0	76.20	3	85033-035
3.5	88.90	"	85033-039
4.0	101.60	"	85033-043
4.5	114.30	"	85033-047
5.0	127.00	4	85033-051
5.5	139.70	"	85033-054
6.0	152.40	"	85033-057

TABLE VII. Electrical card holders, metal, slot width .025 to .079 inch (0.64 to 2.01 mm)

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN
3.0	76.20	2	88052-001*, 002*, 005*, 006*
3.5	88.90	"	88052-009*, 010*, 013*, 014*
4.0	101.60	"	88052-017*, 018*, 021*, 022*
4.5	114.30	"	88052-025*, 026*, 029*, 030*
5.0	127.00	3	88052-033*, 034*, 037*, 038*
5.5	139.70	"	88052-041*, 042*, 045*, 046*
6.0	152.40	"	88052-049*, 050*, 053*, 054*
6.5	165.10	"	88052-057*, 058*, 061*, 062*
7.0	177.80	"	88052-065*, 066*, 069*, 070*
7.5	190.50	"	88052-073*, 074*, 077*, 078*
8.0	203.20	4	88052-081*, 082*, 085*, 086*
8.5	215.90	"	88052-089*, 090*, 093*, 094*
9.0	228.60	"	88052-097*, 098*, 101*, 102*
9.5	241.30	"	88052-105*, 106*, 109*, 110*
10.0	254.00	"	88052-113*, 114*, 117*, 118*
10.5	266.70	"	88052-121*, 122*, 125*, 126*
11.0	279.40	5	88052-129*, 130*, 133*, 134*
11.5	292.10	"	88052-137*, 138*, 141*, 142*
12.0	304.80	"	88052-145*, 146*, 149*, 150*

\* Indicates housing finish

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TABLE VIII. Electrical card holders, metal, slot width .080 to .145 inch (2.03 to 3.68 mm)

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN
3.0	76.20	2	88052-003*, 004*, 007*, 008*
3.5	88.90	"	88052-011*, 012*, 015*, 016*
4.0	101.60	"	88052-019*, 020*, 023*, 024*
4.5	114.30	"	88052-027*, 028*, 031*, 032*
5.0	127.00	3	88052-035*, 036*, 039*, 040*
5.5	139.70	"	88052-043*, 044*, 047*, 048*
6.0	152.40	"	88052-051*, 052*, 055*, 056*
6.5	165.10	"	88052-059*, 060*, 063*, 064*
7.0	177.80	"	88052-067*, 068*, 071*, 072*
7.5	190.50	"	88052-075*, 076*, 079*, 080*
8.0	203.20	4	88052-083*, 084*, 087*, 088*
8.5	215.90	"	88052-091*, 082*, 095*, 096*
9.0	228.60	"	88052-099*, 100*, 103*, 104*
9.5	241.30	"	88052-107*, 108*, 111*, 112*
10.0	254.00	"	88052-115*, 116*, 119*, 120*
10.5	266.70	"	88052-123*, 124*, 127*, 128*
11.0	279.40	5	88052-131*, 132*, 135*, 136*
11.5	292.10	"	88052-139*, 140*, 143*, 144*
12.0	304.80	"	88052-147*, 148*, 151*, 152*

\* Indicates housing finish

TABLE IX. Electrical card holders, metal, slot width .211 inch (5.36 mm) + PCB thickness

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN
3.0	76.20	2	86092-01, 02, 03, 04
3.5	88.90	"	86092-05, 06, 07, 08
4.0	101.60	"	86092-09, 10, 11, 12
4.5	114.30	"	86092-13, 14, 15, 16
5.0	127.00	3	86092-17, 18, 19, 20
5.5	139.70	"	86092-21, 22, 23, 24
6.0	152.40	"	86092-25, 26, 27, 28
7.0	177.80	"	86092-29, 30, 31, 32
7.5	190.50	"	86092-33, 34, 35, 36
8.0	203.20	4	86092-37, 38, 39, 40

TABLE X. Electrical card holders, plastic, slot width .063 inch (1.60 mm).

Overall length (inch) (mm)		Number of mounting holes	DSCC drawing PIN
2.0	50.80	2	85068-01
3.5	88.90	"	85068-02
5.0	127.00	"	85068-03

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TABLE XI. Electrical card holders, plastic, slot width .078 inch (1.98 mm).

Overall length (inch) (mm)		Number of snap pylons	DSCC drawing PIN
2.5	63.50	2	84006-01
3.0	76.20	"	84006-02
3.5	88.90	"	84006-03
4.0	101.60	"	84006-04
4.5	114.30	"	84006-05
5.0	127.00	"	84006-06
5.5	139.70	"	84006-07
6.0	152.40	"	84006-08
6.5	165.10	"	84006-09
7.0	177.80	"	84006-10
7.5	190.50	"	84006-11
8.0	203.20	"	84006-12
8.5	215.90	3	84006-13
9.0	228.60	"	84006-14
9.5	241.30	"	84006-15
10.0	254.00	"	84006-16
10.5	266.70	"	84006-17
11.0	279.40	"	84006-18
11.5	292.10	"	84006-19
12.0	304.80	"	84006-20
12.5	317.50	"	84006-21
13.0	330.20	"	84006-22
13.5	342.90	"	84006-23
14.0	355.60	"	84006-24

TABLE XII. Electrical card holders, plastic, deep slot.

Overall length (inch) (mm)		Number of snap pylons	Slot width (inch) (mm)		DSCC drawing PIN
2.5	63.50	2	.080	2.03	84101-01
4.5	114.30	"	.080	2.03	84101-02
6.0	152.40	"	.080	2.03	84101-03
8.0	203.20	3	.080	2.03	84101-04
4.5	114.30	2	.132	3.35	84101-22
6.0	152.40	"	.132	3.35	84101-23
8.0	203.20	3	.132	3.35	84101-24

TABLE XIII. Electrical card holders, plastic, slot width .050 to .100 inch(1.27 to 2.54 mm).

Overall length (inch) (mm)		Number of snap pylons	DSCC drawing PIN
2.5	63.50	2	85067-08, 09, 12
3.5	88.90	"	85067-07, 11
4.0	101.60	"	89029-01
4.125	104.78	"	85067-05, 06, 10
5.5	139.70	"	85067-04
6.0	152.40	"	89029-02
6.375	161.93	"	85067-03
6.875	174.63	"	85067-02
7.0	177.80	"	85067-01

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TABLE XIV. Extractor, electrical card, plastic.

Material	Slot width		DSCC drawing PIN
	(inch)	(mm)	
Nylon	.075	1.91	83023-01*
Nylon	.075	1.91	83023-02*
Nylon	.075	1.91	83023-03*
Nylon	.075	1.91	83023-04*
Nylon	.105	2.67	83023-05*
Nylon	.105	2.67	83023-06*
Nylon	.105	2.67	83023-07*
Nylon	.100	2.54	83023-08*
Glass filled nylon	.075	1.91	83023-09*
Glass filled nylon	.140	3.56	83023-10*
Glass filled nylon	.075	1.91	83023-11*
Glass filled nylon	.075	1.91	83023-12*
Nylon	.070	1.78	83023-13*
Glass filled polycarbonate	.075	1.91	83023-14*
Nylon	.070	1.78	83023-15*
Nylon	.100	2.54	83023-16*
Glass filled polycarbonate	.140	3.56	83023-17*
Nylon	.070	1.78	83023-18*
Nylon	.075	1.91	83023-19*
Nylon	.100	2.54	83023-20*
Nylon	.140	3.56	83023-21*
Nylon	.075	1.91	83023-22*
Nylon	.075	1.91	83023-23*

\* Indicates color.

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TABLE XV. Extractor, electrical card, metal.

Slot width (inch) (mm)		Configuration	DSCC drawing PIN
.040	1.02	Angled handle, no lock tab	84191-01*#
.040	1.02		84191-02*#
.075	1.91		84191-03*#
.075	1.91		84191-04*#
.105	2.67		84191-05*#
.105	2.67		84191-06*#
.142	3.61		84191-07*#
.142	3.61		84191-08*#
.165	4.19		84191-33*#
.165	4.19		84191-34*#
.040	1.02	Angled handle, with lock tab	84191-09*#
.040	1.02		84191-10*#
.075	1.91		84191-11*#
.075	1.91		84191-12*#
.105	2.67		84191-13*#
.105	2.67		84191-14*#
.142	3.61		84191-15*#
.142	3.61		84191-16*#
.165	4.19		84191-35*#
.165	4.19		84191-36*#
.040	1.02	Straight handle, with lock tab	84191-17*#
.040	1.02		84191-18*#
.075	1.91		84191-19*#
.075	1.91		84191-20*#
.105	2.67		84191-21*#
.105	2.67		84191-22*#
.142	3.61		84191-23*#
.142	3.61		84191-24*#
.165	4.19		84191-37*#
.165	4.19		84191-38*#
.040	1.02	Straight handle, no lock tab	84191-25*#
.040	1.02		84191-26*#
.075	1.91		84191-27*#
.075	1.91		84191-28*#
.105	2.67		84191-29*#
.105	2.67		84191-30*#
.142	3.61		84191-31*#
.142	3.61		84191-32*#
.165	4.19		84191-39*#
.165	4.19		84191-40*#

\* Indicates finish.

# Indicates material.

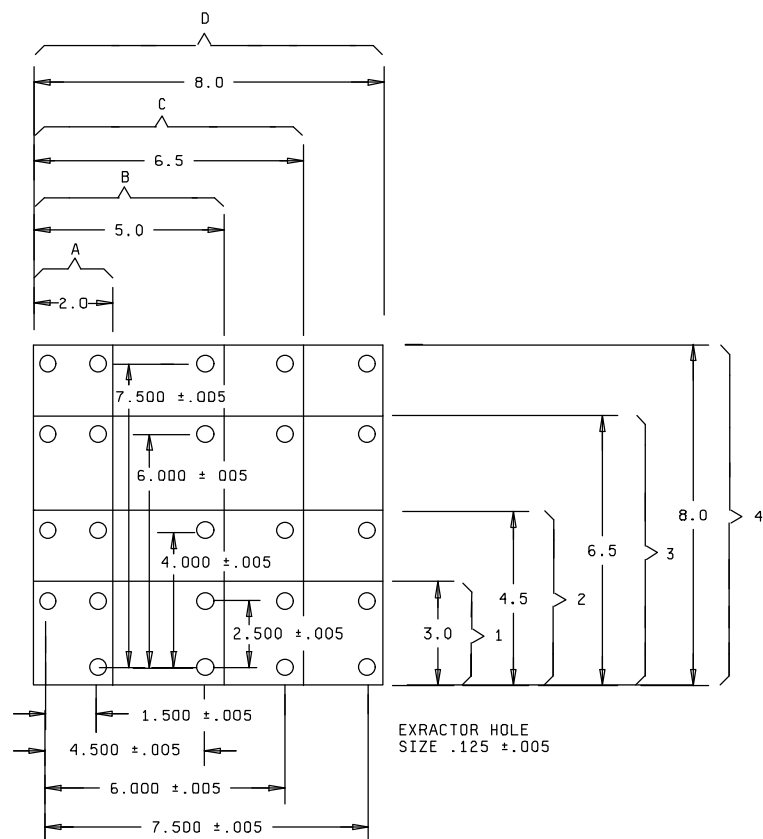


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Preferred thickness	
Thickness	Tolerance
.062	$\pm .001$
.093	$\pm .0015$
.125	$\pm .002$

Inches	mm
.001	0.03
.0015	0.038
.002	0.05
.005	0.13
.015	0.38
.062	1.57
.093	2.36
.125	3.18
1.5	38.1
2.0	50.8
2.5	63.5
3.0	76.2
4.0	101.6
4.5	114.3
5.0	127.0
6.0	152.4
6.5	165.1
7.5	190.5
8.0	203.2

Board number	Printed wiring board size in nominal inches $\pm .015$
A1	2.0 x 3.0
A2	2.0 x 4.5
A3	2.0 x 6.5
A4	2.0 x 8.0
B1	5.0 x 3.0
B2	5.0 x 4.5
B3	5.0 x 6.5
B4	5.0 x 8.0
C1	6.5 x 3.0
C2	6.5 x 4.5
C3	6.5 x 6.5
C4	6.5 x 8.0
D1	8.0 x 3.0
D2	8.0 x 4.5
D3	8.0 x 6.5
D4	8.0 x 8.0



## NOTES:

- Dimensions are in inches.
- Metric equivalents are for general information only.

FIGURE 1. Preferred printed wiring board sizes.

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## 6. NOTES

6.1 Intended use. The purpose of this handbook is to provide standardized guidance in the preparation of DoD standards, handbooks, drawings, and bulletins to ensure the inclusion of data and descriptions essential to the selection and application of items and processes, and to aid in the use and analysis of DoD standardization documents.

6.2 Subject term (key word) listings.

- Backplane assembly
- Circuit card assembly
- Discrete wiring board
- Extractor, electrical card
- Holder, electrical card
- Printed circuit board
- Printed wiring board
- Retainer-ejector, electrical card

## CONCLUDING MATERIAL

## Custodians:

- Army - CR
- Navy - EC
- Air Force - 85

Preparing activity:  
DLA-CC

(Project 5998-1825)

## Review activities:

- Army - ME
- Air Force - 17, 99
- DLA-CC

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### 3. DOCUMENT TITLE

SELECTION AND USE OF ELECTRICAL AND ELECTRONIC ASSEMBLIES, BOARDS, CARDS, AND ASSOCIATED HARDWARE.

### 4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

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(If applicable)

### 8. PREPARING ACTIVITY

a. NAME

David Corbett  
david\_corbett@dsccl.dla.mil

b. TELEPHONE (Include Area Code)

(1) Commercial (614) 692-0526 (2) AUTOVON 850-0526  
URL <http://www.dsccl.dla.mil>

c. ADDRESS (Include Zip Code)

DSCC-VAC  
3990 E. Broad St.  
Columbus, OH 43216-5000

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