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PUBLICATION 100

REGISTERED AND STANDARD

MECHANICAL OUTLINES

FOR

ELECTRONIC PARTS

DRAFT FOR P-PANEL REVIEW

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REGISTERED AND STANDARD OUTLINES FOR ELECTRONIC PARTS

(Formulated under the cognizance of the P-4 Committee on Electronics Part Mechanical Outlines).

PREFACE

This publication contains passive product outlines (including Electro-mechanical outlines) and other associated drawings that have been registered and assigned a formal designation. Product outlines that have been accepted as standards are indicated by the numbering system. Rules and other information required to explain or prepare outlines (and gauge drawings) are included in this publication.

To be registered, an outline must be sponsored by two or more companies (or by one company and a committee), apply to a part actually produced and be processed through and approved by the P-4 Committee on Mechanical Outlines.

To qualify as a standard, additional approval steps are necessary. After an outline has been registered and has gained sufficient industry recognition and usage, the Committee may then propose it for standardization. This is a formal procedure involving the various steps associated with normal development of standards.

Any manufacturer desiring to register a new outline of the type contained in this Publication should submit it to the chairman of the P-4 Committee or as otherwise indicated in this Publication.

PREPARATION AND SUBMISSION OF PASSIVE PRODUCT OUTLINE DRAWINGS

1. INTRODUCTION

This section is a guide to manufacturers of passive electronic products for the preparation and submission of outline drawings of packages (Here-in-after referred to as outlines) for outline registration.

2. INITIAL AND FINAL DRAWINGS

The initial outline drawings submitted for outline registration are used as working documents and for letter ballots of the P-4 Committee. They should, therefore, follow the minimum requirements of this section as closely as possible to avoid misunderstandings and to save time after submission to the Committee. It is, however, not necessary for the initial "working copy" drawings to be as neat and clean as the final approved drawings that are used as masters for the Publication.

3. PURPOSE OF OUTLINES

3.1 An outline should show all the dimensions and geometric characteristics of a package needed to assure mechanical interchangeability with all other packages conforming to the same outline.

3.2 An outline should serve a package user by specifying the general package configuration; the size, location and number designation of terminals; the space required by the package; the size and location of surfaces for mounting; body size for mechanical handling; etc.

4. DEFINITIONS

4.1 Registered Outline

A registered outline is one that has been (1) assigned a PDP-100 outline designation and (2) announced to the Industry through the EIA Type Registration.System. The Registered product outlines are compiled in an outline publication.

4.2 Seating Plane

The reference plane which designates the interface between the package or its terminals and the surface on which it is mounted.

4.3 Base Plane

A plane parallel to the seating plane through the lowest point on the body of the package. It way coincide with the seating plane.

4.4 Gauge Plane

A plane perpendicular to the terminal leads located at a defined distance from the seating plane. The location of the terminals is measured in the gauge plane.

4.5 Body

That part of the package or device exclusive of electrical terminals, studs, leads, etc.

4.6 Terminal

That part of the package or device primarily used in making electrical, mechanical or thermal connection. Examples of terminals are flexible leads, rigid leads and studs.

4.7 Visual Index

A reference mark, chamfer, notch, tab etc., which identifies the number of terminal position.

4.8 Mechanical Index

A mark, chamfer, notch, tab, flat, etc., which allows mechanical, optical, electrical or pheumatic sensing during mechanical handling. It may or may not identify the number of terminal position.

4.9 Index Area

The area in which a portion or all of the visual and mechanical indices must lie.

5. PREPARATION OF OUTLINES

5.1 Views

The outline drawing shall include all views needed to clearly show the dimensional and geometric features of the package. Enlarged detail views may be used.

5.2 Notes

Descriptive notes may be used at the bottom of or adjacent to the outlines with proper reference to the body of the drawing.

5.3 Dimensions

5.3.1 All dimensions on the outline shall show the maximum and minimum limits to the required number of decimal places or be properly referenced such as to a thread standard.

5.3.2 Open ended dimensions, i.e., maximum only or a minimum only, shall be avoided.

5.3.3 Nominal dimensions, i.e., dimensions without tolerances, may be used, but shall be followed either by the letters “RFE” when used for general information or by “TP” or

"BSC" when used to specify true geometrical positions by means of linear or angular dimensions.

5.3.4 ANSI document ANSI Y14.5 Dimensioning and Tolerancing (latest revision) will be used as the definitive reference on all outlines.

5.3.5 Outline drawings may be submitted for balloting on either the decimalized—inch or the metric system. Conversions to the other system must be made to the other system before publication.

5.3.6 Identification of units—both millimeter and inch dimensions shall be tabulated in separate tables. Each table and drawing shall have a note as follows:

Note 1/ Controlling dimension: MILLIMETERS or
Note 2/ Controlling dimension: INCH

5.4 Indexes (indices)

The outlines shall show the nature and location of the visual index used for terminal numbering, and if present the mechanical index used for package sensing or orientation.

5.5 Planes

Where applicable, the outline shall show the location of the base, gauge and seating plane.

5.6 Terminals

Terminal designations shall be by number only. No reference to electrical connection such as emitter, base, etc., or internal connections shall be made.

5.7 Internal Structure

No details of internal structure shall be shown except where such details may affect mechanical interchangeability such as in the case of photosensitive or light emitting devices.

5.8 Threads

Thread features shall be designated in the Unified System of Class 2A or 2B as applicable to plated finishes per ANSI B1.1-1960.

6.0 FORMAT OF OUTLINE DRAWINGS

6.1 Published registered outlines should be used as a guide for outline preparation.

6.2 The outline drawing consists of two parts: (1) A dimensioned drawing of the device along with applicable notes: and (2) a tabular listing relating the drawing symbols to the actual dimensional values.

6.3 The drawing and the tabular listing shall be 8½" X 11" black and white originals or black and white copies of suitable contrast to assure readable reproduction. Both parts of the outline may be on the same sheet if space permits.

6.4 No lettering shall be smaller than 1/8" in height and shall read parallel to the 8½" side of the sheet.

6.5 The drawing should include at the bottom of the sheet(s): the title of the drawing, the revision level, the revision date and the Type Designation Number.

6. OUTLINE SUBMISSION

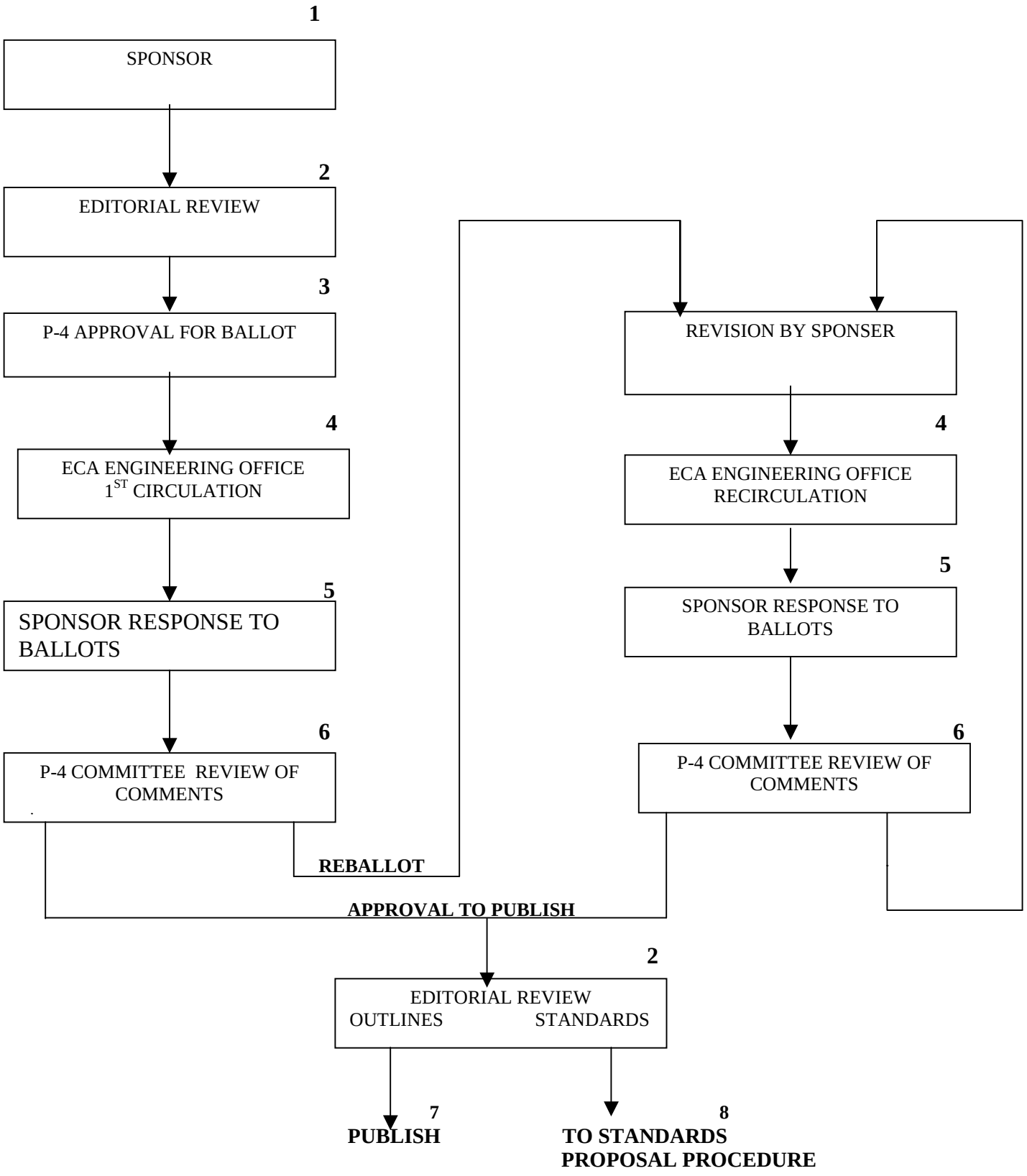
Outlines for registration should be submitted with an appropriate cover letter to:

P-4 Committee On Mechanical Outlines
ECA at EIA
2500 Wilson Boulevard
Arlington VA 22201-3834

PROCEDURES FOR REGISTRATION/ STANDARDIZATION OF OUTLINES
SEE FLOW CHART ON PAGE 6

STAGE		PROCEDURE
1	→	The Sponsor must initiate the action for registration or standardization of an outline.
	→	The Sponsor may be an individual company, a parts committee, a working group or any Ad Hoc Group.
	→	The Sponsor must have the following: a. One piece of hardware b. A Co-Sponsor (required for individual companies only) c. A proposed outline in the PDP-100 outline format/drafting procedure and the Request for Registration (one copy of each to: the P-4 Chair, the EIA-ECA Office, the Chair of the Editorial Committee).
2	→	The Editorial Review consists of checking the format, details of drafting procedure and other editorial matters. If not proper, the outline is returned to the Sponsor for modification until it is acceptable.
3	→	The P-4 Chair must approve all outlines for ballot. When it seems desirable the Chair may ask the entire P-4 Committee to review and approve an outline before ballot.
4	→	The ECA Engineering Office will maintain a list of outline proposals and a list of P-4 voting members. When outlines are approved for ballot they will be circulated to all voting members with a requested response time of 30 days. A letter ballot number is assigned the items are placed on the item log. Approval requires two-thirds majority of those voting (abstentions are not counted). All negative responses must have reasons given in written form. Responses postmarked after the expiration date may not be accepted.
5	→	The Sponsor must address each negative vote in writing for the purpose of having the vote changed to a positive one. A determination shall be made as to what the requirement would be for a change to a positive vote. Every reasonable attempt must be made to resolve all comments.
6	→	The Sponsor must prepare the complete summary response of the ballot to be presented to the P-4 Committee. This shall include the ballot results by company and a complete list of the comments made. Items should be prepared for screen projection to the entire group along with a projection of the original outline and any changes proposed. Copies of the total summary should be made available to P-4 Secretary. Editorial or other minor changes may be voted on at the P-4 Meeting. The results of the ballot, of the negative resolution efforts and Committee determination shall be recorded in the minutes. The Committee decisions shall be to: a. Approve to publish b. Cancel the proposal c. Approval to revise and reballot.
7	→	For registered outlines, after P-4 Committee approval and a review by the Editorial Committee, the outline shall be published in the PDP-100.
8	→	for standard outline after P-4 approval and review by the Editorial Committee, the outline is submitted to the ECA Engineering Office for the standards approval procedure which is used for all standards. This includes a circulation to Industry for comment and approval by the EIA Engineering Department Executive Committee. After these approvals the outline is published as a standard in the PDP-100.

COMMITTEE ON MECHANICAL OUTLINES
PROCEDURE FOR REGISTRATION OF OUTLINES
(SEE PAGE 5)



P-4 COMMITTEE SCOPE

To develop and publish a series of mechanical drawings of outlines of commonly used passive electronic parts. These outlines will be in two categories: (a) Registered Outlines which indicate there is some use of the part in the Electronics Industry and (b) Standard Outlines which have acquired broad usage in the Industry and have completed the ECA Standardization process.

The Committee will attempt to discourage proliferation of outlines and will serve to encourage cooperation between manufacturers and users to provide the best possible descriptions. Special efforts will be made to encourage new technology and new techniques for packaging parts.

MEMBERSHIP

All individuals representing the Electronic Industry are encouraged to participate. Broad representation is planned from the parts users, parts producers, government agencies and general interest Industry members.

Members of ECA Parts Panels may participate by request to the P-4 Chair. Companies that are not members my request membership and pay a participation fee.

ORGANIZATION

The Committee will be directed by a Chair elected by the Committee membership or appointed by the P-Panel Chair. The term of Office is one year and may be extended on a yearly basis by the Committee membership with the concurrence of the P-Panel Chair. A Vice-Chair should be appointed by the Committee to serve in the absence of the Chair.

Subcommittees or working groups may be appointed by the Chair to work on specific product areas and/or to perform specific tasks. All subcommittees and working should report their activity at each committee meeting.

The Committee organization and activity is responsible to the P-Panel Chair and to ECA.

MEETINGS

Meetings will be held on a regularly scheduled basis several time each year. Balloting and other urgent business will be conducted electronically (telephone and E-mail).

TYPE DESIGNATION SYSTEM
FOR
PASSIVE ELECTRONIC PART MECHANICAL OUTLINES

This type designation system is intended to provide a part outline numbering system which will allow easy identification and retrieval of specific outlines both manually and by automated systems.

1. Designation

Each primary outline sheet shall be designated by an 8 character number. The variations within that sheet are described by an additional 2 characters. The designation number shall be determined as follows:

S	O	J	M	3216	AA
Mounting	Registered or Standard	Termination Type	Numerical Format	Numerical Descriptor	Outline Variations
Para. 2	Para. 3	Para. 4	Para. 5	Para. 5	Para. 6

2. Mounting

This character shall be an alphabetic letter designating the type of mounting or attachment method to the electronic circuit.

S = Surface mounted by soldering, welding or other adhesion technique.
T = Wire or pin mounted thru a circuit board or other carrier.

3. Registered or Standard

All outlines are classified as a registered outline (Accepted by P-4) or a standard outline (recognized by the Electronics Industry as a widely used standard).

O = Outline Registration
S = Standard Outline

4. Termination Types

This character identifies the general configuration of the body or electrical contact portion of the body with the circuit.

Surface Mount

A = Attached mechanically to a board
C = Flat chip with end band termination
F = Flat Pack
G = “Gull Wing” or “L” Lead
I = “I” (Butt) lead
J = “J” Bend lead
L = leadless chip with multiple pads

M = Cylindrical body with end band terminations (MELF)
P = Right Angle contact pads

Thru Hole

T = Rectangular or cylindrical terminal pins
W = Wire leads

5. Numerical Format and numerical descriptors

The character in position four identifies the type of numbering system used for the four digit numbering system in position five. Format identifiers are as follows:

M = The four digit number is used as follows

The first two digits indicate the approximate length of the part in tenths of a millimeter.
The third and fourth digits indicate the approximate width of the part in tenths of a millimeter.
Example: a part 3.2 mm by 1.6 mm has the descriptor “3216”.

C = The four digit number is used as follows

The first two digits indicate the approximate length of the part in millimeters.
The third and fourth digits indicate the approximate width the part in millimeters.

N = The four digits are not significant. The numbers are issued sequentially for parts that have similar features.

5. Outline Variations

Variations of outlines may be listed on a single sheet. Variations must not require changes in the principle drawing but may only indicate one or two variations in the table of dimensions. Examples are variations in the number of terminations, variations in seated height, etc. Variations shall be designated by 2 alphabetic characters starting with AA and continuing AB, AC, etc..