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STANDARD

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# EIA STANDARD

EIA-468-A

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## Lead Taping of Components in the Radial Configuration for Automatic Handling

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ELECTRONIC INDUSTRIES ASSOCIATION  
ENGINEERING DEPARTMENT



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## LEAD TAPING OF COMPONENTS IN THE RADIAL CONFIGURATION FOR AUTOMATIC HANDLING

(Revision of EIA Standard 468, formulated under the cognizance of the EIA Automated Component Handling (ACH) Committee, under Standards Proposal 2199.)

### 1.0 PURPOSE

This Standard was formulated to provide dimensions and tolerances necessary to lead tape components such that they may be automatically handled in the radial format.

### 2.0 SCOPE

This Standard covers the lead taping requirements for components having radial configured leads, provided these components may be taped in accordance with the requirements of this document.

### 3.0 GENERAL REQUIREMENTS

- 3.1 Lead tape requirements for radial configured components are defined in Figures 2 and 3, Tables 1, 1A and 1B and associated notes.
- 3.2 Procurement documents and quotation requests should include the following information:
  - (a) Reference to this Standard by title and number.
  - (b) Missing component criteria if different from Note 11.
  - (c) Container Type.
  - (d) Orientation of polarized components (Note 7).
  - (e) Marking requirements if different than specified in Note 12.
  - (f) Dimension H, Figures 2 and 3, for straight leaded components.
  - (g) Lead spacing and component pitch as per Tables 1A and 1B.
- 3.3 Dimensions contained in this Standard are expressed in metric terms with English equivalents. Metric dimensions shall govern.
- 3.4 For intermediate packaging and final packaging, refer to EIA-383-A, "Preparation for Delivery of Electrical and Electronic Components", and EIA-541 "Packaging Material Standards for ESD Sensitive Items"

#### 4.0 DIMENSIONS

##### 4.1 Dimensions common to tapes and taped components with unidirectional leads.

The abscissa is a straight line through the (correct) centers of the sprocket holes in the direction of unreeling. The ordinate is a line at right angles to the abscissa through the center of the sprocket hole that precedes the component to be checked.

The following coordinate system is used:

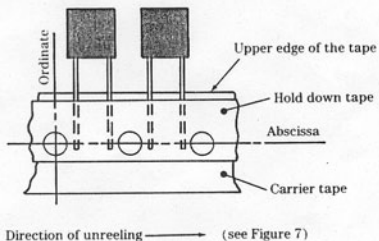


Figure 1

Note: All dimensions referencing component leads are to the center line of the lead.

### 5.0 LEAD TAPING REQUIRMENTS

#### TWO LEADED COMPONENT

#### EXAMPLE

COMPONENT OUTLINE  
SHOWN FOR REF. ONLY.  
THERE ARE OTHER COMP.  
CONFIGURATIONS.

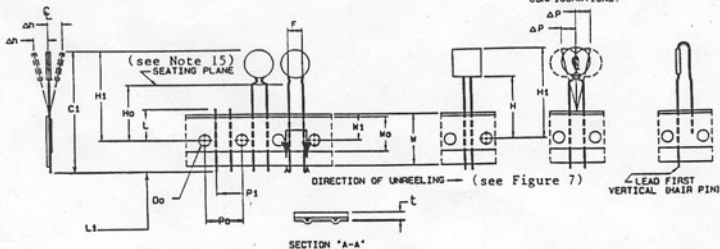


Figure 2

#### THREE LEADED COMPONENT

#### EXAMPLE

COMPONENT OUTLINE  
SHOWN FOR REF. ONLY

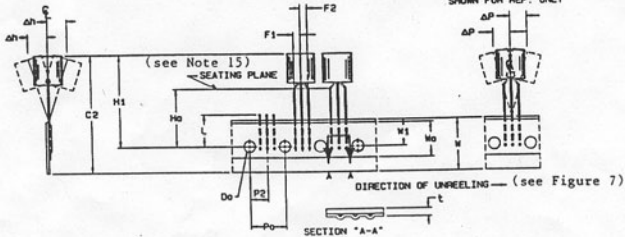


Figure 3

Table 1

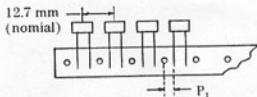
SYMBOL	DESCRIPTION	DIMENSIONS (mm)	REFERENCE
L	Cut Out Length	11 mm [.443] max.	
H	Height to Seating Plane (Straight Leads)	16 mm [.630] min.	See Note 16
H <sub>0</sub>	Height to Seating Plane (Formed Leads)	16 mm [.630] ± 0.5 mm [.020]	
H <sub>1</sub>	Overall Height above Abscissa	32 mm [1.260] max.	For automatic insertion only
Δh	Front to Back Deviation	0 mm ± 1.0 mm [.039] max.	
Δp	Plane Deviation	+1.0 mm max.	
W	Carrier Tape Width	18 mm [0.709] +1.05 [ + 039,-020]	See Notes 4 & 6
W <sub>1</sub>	Sprocket Hole Position	9 mm [0.354] +0.75, -05 [+030, -020]	
W <sub>0</sub>	Hold Down Tape Width	This dimension is governed by the retention of the components in the tape. the hold down tape shall not protrude beyond the carrier tape.	See Notes 4 & 6
F	Component Lead Spacing (Two-leaded Components)	Multiples of 2.54 mm [0.100] See Table 1A	See Figure 2 and Note 14
P <sub>0</sub>	Sprocket Hole Pitch	12.7 mm [0.500] ± 0.3 [.012]	See Note 3
P <sub>1</sub>	Component Lead to Ordinate (Two-leaded Components)	See Table 1A	See Figure 2 and Note 2
D <sub>0</sub>	Sprocket Hole Diameter	4.0 mm [0.157] ± 0.3 [.012]	
L <sub>1</sub>	Lead Protrusion	11.2 mm max	
t	Composite Tape Thickness	0.9 mm [0.035]	See Note 5
F <sub>1</sub> , F <sub>2</sub>	Lead Spacing (Three-leaded Component)	2.54 mm [0.100] +0.4, -0.1 [+016, -004]	See Figure 3 and Note 2
P <sub>2</sub>	Center Lead to Ordinate (Three-leaded Components)	6.35 mm [0.250] ± 0.7 [.028]	See Figure 3 and Note 2
C <sub>1</sub>	Overall Component Tape Width	43.2 mm max.	See Figure 2 and Note 13
C <sub>2</sub>	Overall Component Tape Width	42.5 mm max.	See Figure 3 and Note 13

TABLE 1A

COMPONENT SPACING FOR VARIOUS LEAD SPACINGS			
LEAD SPACING F; see Figure 2 (e = 2.54mm)	*P <sub>1</sub>	FIGURE	NOMINAL COMPONENT PITCH (Single Pitch) (see Note 14)
1e	5.08 mm ± 0.7 mm [0.150] ± [0.028]	A	12.7 mm [0.500]
2e	3.81 mm + 0.7 mm [0.150] + [0.028]	A	12.7 mm [0.500]
2.5e	3.17 mm ± 0.7 mm [0.125] ± [0.026]	A	12.7 mm [0.500]
3e (short leads)	2.54 mm ± 0.7 mm [0.100] ± 0.028	A	12.7 mm [0.500]

\*P<sub>1</sub> is the distance between the ordinate and the first lead of the following component (in the direction of unreeling). See Figure 2 and Note 2.

Figure 1A  
SINGLE PITCH  
COMPONENT TAPING

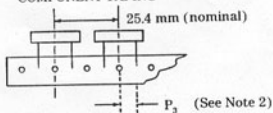


(Reference only; see Figure 2 & Note 2)

TABLE 1B

	P <sub>2</sub>	FIGURE	NOMINAL COMPONENT PITCH (Double Pitch)
3e	3.81 mm ± 0.7 mm [0.150] ± [0.026]	B	25.4 mm [1.00]
4e	5.08 mm + 0.7 mm [0.200] + [0.028]	B	25.4 mm [1.00]
5e	6.35 mm ± 0.7 mm [0.250] ± [0.028]	B	25.4 mm [1.00]
6e	7.62 mm ± 0.7 mm [0.300] ± [0.028]	B	25.4 mm [1.00]

Figure 1B  
DOUBLE PITCH  
COMPONENT TAPING



(See Note 2)

#### NOTES

1. The wire terminations of the taped component shall be free from kinks or bends from the seating plane or reference plane downwards to the carrier tape.
2.  $F_1$ ,  $F_2$ , are measured at the lead egress from the carrier strip on the component side.  $P_1$ ,  $P_2$ , and  $P_3$ , are measured at the seating plane.
3. Cumulative sprocket hole pitch tolerance shall not exceed  $\pm 1.0$  mm [.039] over 20 consecutive pitches.
4. No adhesive may be exposed.
5. Splices shall be equal in strength to the original tape (15 Newtons, minimum break force) and shall not hamper the transport and the cutting of the tape. When splicing is applied, the misalignment of the holes at each side of the splice shall not be more than  $\pm 0.3$  mm [0.012] in any direction. Splices shall not interfere with sprocket feed holes nor shall the overall thickness (including lead wires) exceed 1.5 mm [0.059]. Staples may be used, but shall not interfere with the transport and cutting operations.
6. The components shall be held sufficiently in the tape so that their position remains within the permitted tolerances. The extraction force for components in the tape plane, vertically to the direction of unreeling, shall be greater than 5 Newtons (5N).
7. All polarized components shall be oriented in one direction.
8. Protection between layers of components shall be provided for the length necessary to prevent component damage and lead distortion. All materials used for lead taping, container and packing shall not cause deterioration of the component of lead solderability.
9. Quantity of parts shall be controlled so that the taped components and final cover do not extend beyond the smallest open container dimension.
10. Maximum reel size: 360 mm diameter x 55 mm overall width.  
Maximum cassette size: 372 x 372 x 55 mm.  
Maximum fanfold (ammunition box): 340 x 340 x 55 mm.
11. Empty places in the tape (i.e. missing components) shall not exceed 0.1% of the total number of components per container. No consecutive empty places are allowed.
12. Minimum container label marking shall consist of:
  - Customer Part Number
  - Customer Traceability Number
  - Quantity of Components
  - Manufacturer's Name and Trade Mark
  - Taping Date
  - Date Codes (where applicable)
  - Vendor Type or Part Number (where applicable)
  - Electrical Value (where applicable)
  - Tolerance (where applicable)
  - Polarity (where applicable)



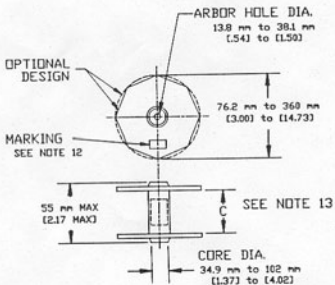


Figure 4

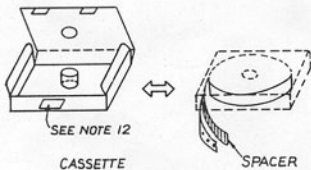


Figure 5

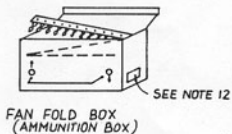


Figure 6

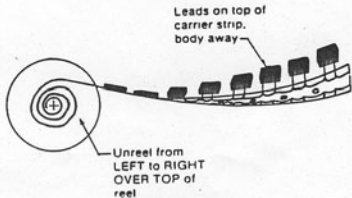


Figure 7

**NOTES** (continued)

13. The "C" dimension between the reel flanges as shown in Figure 4 shall be governed by the overall width "C<sub>1</sub>" of the taped components as shown in Figure 2 and Figure 3. The "C" dimension between the flanges of the component reel shall be 1.5 mm [0.059] to 8.0 mm [0.315] greater than the overall taped component width "C<sub>1</sub>".
14. Lead spacing ("F", Figure 2) for two-leaded components shall be maintained within +0.6 mm [0.024] and -0.4 mm [0.016] of the nominal lead spacing as listed in Tables 1A and 1B.
15. The seating plane is the top of the straight lead portion of a formed lead, the top of the free of coating portion of any non-formed lead, or the bottom of any built-in standoff on either the lead or the component body.
16. Dimension H will increase with the component thickness or diameter to a maximum of 21 mm [.827] for automatic insertion.