

| REVISIONS |  |               |                    |
|-----------|--|---------------|--------------------|
| LTR       | DESCRIPTION  | DATE          | APPROVED           |
| A         | Added notes 4, 5, and 6 to figure 1. Clarified quality assurance provisions. Replaced references to MIL-D-23589 and MIL-D-83532. Deleted group B test requirement. Added vendors. Changed pin length and case length on figure 1. Changed two electrical requirements. | 1988 Aug 19   | Randy Larson       |
| B         | Changes in accordance with NON 5999-R002-92.   | 1992 Sep 09   | D. Moore           |
| C         | Corrected MIL-S-14941 references to read MIL-S-19491. Clarified location of index mark on figure 1. Added 4.4 Editorial changes throughout.  | 1994 Aug 05   | D. Moore           |
| D         | Incorporated boilerplate updates.  | 2008 Feb 12   | Michael A. Radecki |
| E         | Incorporated boilerplate updates.  | 2014 April 02 | Michael A. Radecki |

CURRENT DESIGN ACTIVITY CAGE CODE 037Z3  
 DEFENSE LOGISTICS AGENCY  
 LAND AND MARITIME  
 COLUMBUS, OHIO 43218-3990

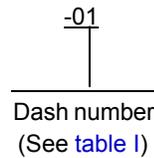
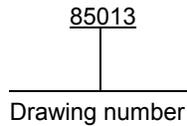
Prepared in accordance with ASME Y14.100

| REV STATUS OF PAGES                       | REV                          | E                        | E | E | E | E | E | E   | E                    | E |  |  |  |  |  |  |  |  |  |
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|   | PAGES                        | 1                        | 2 | 3 | 4 | 5 | 6 | 7   | 8                    |   |  |  |  |  |  |  |  |  |  |
| PMIC N/A                                  | PREPARED BY<br>Chris Rauch   |                          |   |   |   |   |   | DESIGN ACTIVITY<br>DEFENSE ELECTRONICS SUPPLY CENTER<br>DAYTON, OH 45444-5000 |                      |   |  |  |  |  |  |  |  |  |  |
| Original date of drawing<br><br>30 Aug 85 | CHECKED BY<br>Randy Larson   |                          |   |   |   |   |   | TITLE<br><br>DELAY LINES, 5 TAPS, 14 PIN DIP COMPATIBLE, TTL INTERFACED       |                      |   |  |  |  |  |  |  |  |  |  |
|   | APPROVED BY<br>Ivan R. Jones |                          |   |   |   |   |   |   |                      |   |  |  |  |  |  |  |  |  |  |
|   | SIZE<br>A                    | CODE IDENT. NO.<br>14933 |   |   |   |   |   |   | DWG NO.<br><br>85013 |   |  |  |  |  |  |  |  |  |  |
|   | REV E                        |                          |   |   |   |   |   | PAGE 1 OF 9   |                      |   |  |  |  |  |  |  |  |  |  |

1. SCOPE

1.1 Scope. This drawing describes the requirement for a family of active 5-tap DIP compatible, TTL interfaced delay lines.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as follows:



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents in sections 3 and 4 of this specification, whether or not they are listed.

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 cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

- MIL-DTL-19491 - Semiconductor Devices, Packaging of.
- MIL-PRF-83532 - Delay Lines, Active, General Specification for.

(Copies of these documents are available online at <http://quicksearch.dla.mil/> or <https://assist.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

- 3.1 Interface and physical dimensions.
- 3.2 Case material. In accordance with MIL-PRF-83532.
- 3.3 Terminal material. In accordance with MIL-PRF-83532.
- 3.4 Design and dimensions. See figure 1.
- 3.5 Temperature coefficient of delay. 550 PPM/°C maximum.
- 3.6 PIN's and delay times. See table I.
- 3.7 Delay tolerance. ±2 ns or 5 percent, whichever is greater.

|   |                   |                                 |                          |
|---|-------------------|---------------------------------|--------------------------|
| <b>DEFENSE ELECTRONICS SUPPLY CENTER<br/>DAYTON, OHIO</b> | <b>SIZE<br/>A</b> | <b>CODE IDENT NO.<br/>14933</b> | <b>DWG NO.<br/>85013</b> |
|   |                   | <b>REV E</b>                    | <b>SHEET 2</b>           |

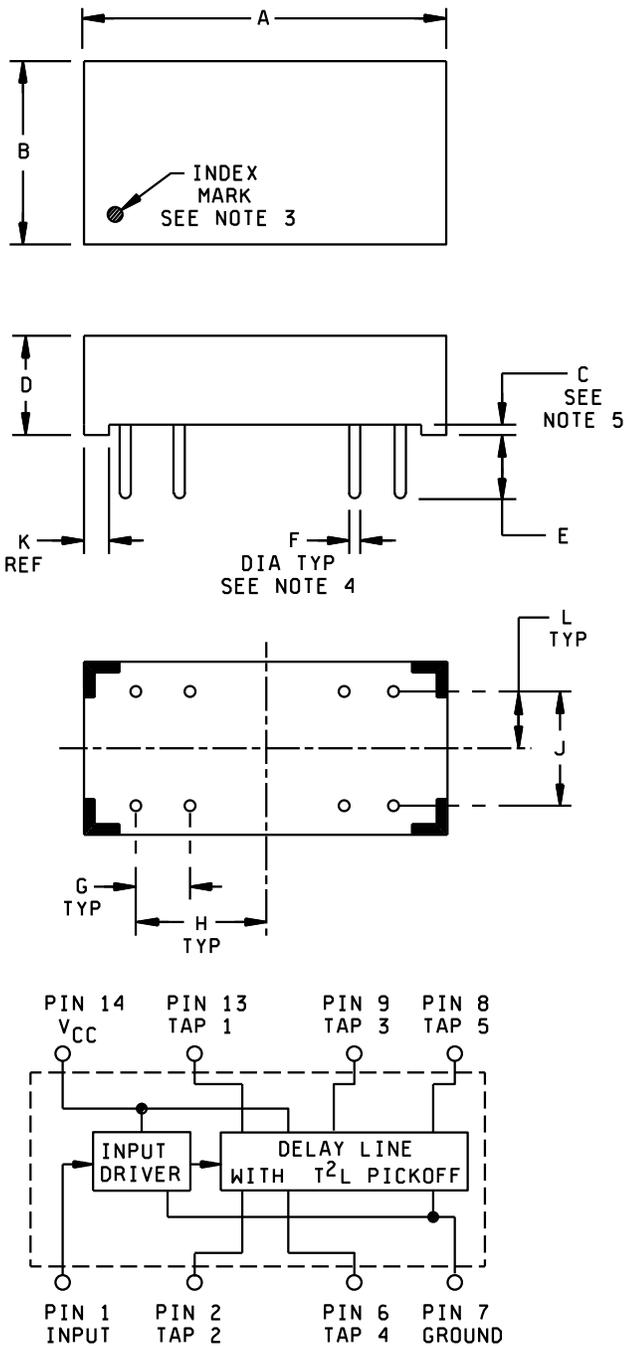


FIGURE 1. Design and dimensions.

|   |                         |                                       |                                |
|---|-------------------------|---------------------------------------|--------------------------------|
| <b>DEFENSE ELECTRONICS SUPPLY CENTER</b><br><b>DAYTON, OHIO</b> | <b>SIZE</b><br><b>A</b> | <b>CODE IDENT NO.</b><br><b>14933</b> | <b>DWG NO.</b><br><b>85013</b> |
|   |                         | <b>REV E</b>                          | <b>SHEET 3</b>                 |

| Ltr | Inches |      | Millimeters |       |
|-----|--------|------|-------------|-------|
|     | Min    | Max  | Min         | Max   |
| A   | ---    | .805 | ---         | 20.45 |
| B   | ---    | .400 | ---         | 10.16 |
| C   | .025   | .035 | 0.64        | 0.89  |
| D   | ---    | .260 | ---         | 6.60  |
| E   | .125   | .200 | 3.18        | 5.08  |
| F   | .145   | .155 | 3.68        | 3.94  |
| G   | .095   | .105 | 2.41        | 2.67  |
| H   | .295   | .305 | 7.49        | 7.75  |
| J   | .295   | .305 | 7.49        | 7.75  |
| K   | .055   | .065 | 1.40        | 1.65  |
| L   | .145   | .155 | 3.68        | 3.94  |

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Contrasting index mark represents location of pin one.
4. Flat pins are optional. If used, dimensions shall be  $.018 \pm .002$  by  $.010 \pm .002$ . The  $.018$  side shall be parallel to the case length.
5. Location and shape of standoffs are optional. Height shall be as indicated.
6. Unless otherwise indicated, tolerance is  $\pm .005$  (0.13 mm).
7. Leads shall be free of case meniscus and other foreign material and shall be solderable for a minimum of .010 inch (0.25 mm) above the seating plane of the delay line.

FIGURE 1. Design and dimensions - Continued.

|   |             |                       |                |
|---|-------------|-----------------------|----------------|
| <b>DEFENSE ELECTRONICS SUPPLY CENTER<br/>DAYTON, OHIO</b> | <b>SIZE</b> | <b>CODE IDENT NO.</b> | <b>DWG NO.</b> |
|   | <b>A</b>    | <b>14933</b>          | <b>85013</b>   |
|   |             | <b>REV E</b>          | <b>SHEET 4</b> |

TABLE I. PIN's and delay times.

| PIN<br>85013 | Delay time (ns) |       |       |       |        |
|--------------|-----------------|-------|-------|-------|--------|
|              | Tap 1           | Tap 2 | Tap 3 | Tap 4 | Output |
| 01           | 5               | 10    | 15    | 20    | 25     |
| 02           | 6               | 12    | 18    | 24    | 30     |
| 03           | 7               | 14    | 21    | 28    | 35     |
| 04           | 8               | 16    | 24    | 32    | 40     |
| 05           | 9               | 18    | 27    | 36    | 45     |
| 06           | 10              | 20    | 30    | 40    | 50     |
| 07           | 15              | 30    | 45    | 60    | 75     |
| 08           | 20              | 40    | 60    | 80    | 100    |
| 09           | 25              | 50    | 75    | 100   | 125    |
| 10           | 30              | 60    | 90    | 120   | 150    |
| 11           | 35              | 70    | 105   | 140   | 175    |
| 12           | 40              | 80    | 120   | 160   | 200    |
| 13           | 45              | 90    | 135   | 180   | 225    |
| 14           | 50              | 100   | 150   | 200   | 250    |
| 15           | 60              | 120   | 180   | 240   | 300    |
| 16           | 70              | 140   | 210   | 280   | 350    |
| 17           | 80              | 160   | 240   | 320   | 400    |
| 18           | 90              | 180   | 270   | 360   | 450    |
| 19           | 100             | 200   | 300   | 400   | 500    |

3.8 Rise time. 4 ns maximum.

3.9 Pulse width. Input pulse width of 40 percent minimum of total delay.

3.10 Supply voltage ( $V_{CC}$ ). 4.50 to 5.50 V dc.

3.11 Supply current ( $I_{CC}$ ).

Constant "0" in - 60 mA typically.

Constant "1" in - 20 mA typically.

3.12 Logic 1 input voltage. 2 V minimum; 5.5 V maximum.

3.13 Logic 0 input voltage. 0.8 V maximum.

3.14 Logic 1 input current. 2.4 V = 50  $\mu$ A maximum; 5.5 V = 1 mA maximum.

3.15 Logic 0 input current. -2 mA maximum.

3.16 Logic 1,  $V_{OUT}$ . 2.4 V minimum.

3.17 Logic 0,  $V_{OUT}$ . 0.4 V maximum.

3.18 Logic 1 fan-out. 20/tap maximum (1 tap is capable of driving 20 TTL inputs).

3.19 Logic 0 fan-out. 10/tap maximum (1 tap is capable of driving 10 TTL inputs).

3.20 Thermal shock. In accordance with [MIL-PRF-83532](#).

**DEFENSE ELECTRONICS SUPPLY CENTER**  
**DAYTON, OHIO**

**SIZE**  
**A**

**CODE IDENT NO.**  
**14933**

**DWG NO.**  
**85013**

REV E

SHEET 5

3.21 Sealing. In accordance with [MIL-PRF-83532](#).

3.22 Terminal strength. In accordance with [MIL-PRF-83532](#).

3.23 Vibration. In accordance with [MIL-PRF-83532](#).

3.24 Shock. In accordance with [MIL-PRF-83532](#).

3.25 Moisture resistance. In accordance with [MIL-PRF-83532](#).

3.26 Solderability. In accordance with [MIL-PRF-83532](#).

3.27 Resistance to solvents. In accordance with [MIL-PRF-83532](#).

3.28 Operating temperature range. -55°C to +125°C.

3.29 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.30 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the [MIL-PRF-83532](#) Qualified Product List for at least one part, or perform the Group A inspection specified herein on a sample of parts agreed upon by the manufacturer and DLA Land and Maritime-VA.

3.31 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.

3.32 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of delay line components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see [6.3](#)).

3.33 Marking. In accordance with [MIL-PRF-83532](#), except the PIN shall be as specified in [1.2](#) herein. JAN marking is not applicable.

3.34 Workmanship. The delay lines shall be uniform in quality and free from any defects that will affect life, serviceability, or appearance.

#### 4. VERIFICATION

4.1 Sampling and inspection. Inspection of product for delivery shall consist of compliance with the group A inspection for level A as specified in [MIL-PRF-83532](#).

#### 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see [6.2](#)), or [MIL-DTL-19491](#). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

#### 6. NOTES

6.1 Intended use. Devices conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application.

|   |             |                       |                |
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|   | <b>A</b>    | <b>14933</b>          | <b>85013</b>   |
|   |             | <b>REV E</b>          | <b>SHEET 6</b> |

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete PIN (see 1.2).
- b. Requirement for the manufacturer to include one copy of the quality conformance inspection data with each shipment of parts.
- c. Whether the manufacturer performs the group A tests or provides a statement of compliance with the group A requirements (see 4.1).
- d. Requirement for the manufacturer to notify the acquiring activity in the event of a change in the product.
- e. Requirements for packaging and packing.

6.3 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to [ASTM-B545](#) (Standard Specification for Electrodeposited Coatings of Tin).

6.4 Users of record. Coordination of this document for future revisions is coordinated only with the approved source(s) of supply and the users of record of this document. Requests to be added as a recorded user of this drawing may be achieved online at <mailto:relay@dla.mil> or if in writing to: DLA Land and Maritime, ATTN: DLA Land and Maritime-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4481 or DSN 850-4481.

6.5 Approved source(s) of supply. Approved source(s) of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at <mailto:relay@dla.mil>, or by contacting DLA Land and Maritime, ATTN: DLA Land and Maritime-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4481 or DSN 850-4481.

|   |             |                       |                |
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|   | <b>A</b>    | <b>14933</b>          | <b>85013</b>   |
|   |             | <b>REV E</b>          | <b>SHEET 7</b> |

| PIN<br>85013- | Similar vendor PIN <u>1/</u> |               |               |
|---------------|------------------------------|---------------|---------------|
|               | CAGE<br>00222                | CAGE<br>16714 | CAGE<br>22519 |
| 01            | 96-84-01                     | DSP013-01     | DDU6-8823-1   |
| 02            | 96-84-02                     | DSP013-02     | DDU6-8823-2   |
| 03            | 96-84-03                     | DSP013-03     | DDU6-8823-3   |
| 04            | 96-84-04                     | DSP013-04     | DDU6-8823-4   |
| 05            | 96-84-05                     | DSP013-05     | DDU6-8823-5   |
| 06            | 96-84-06                     | DSP013-06     | DDU6-8823-6   |
| 07            | 96-84-07                     | DSP013-07     | DDU6-8823-7   |
| 08            | 96-84-08                     | DSP013-08     | DDU6-8823-8   |
| 09            | 96-84-09                     | DSP013-09     | DDU6-8823-9   |
| 10            | 96-84-10                     | DSP013-10     | DDU6-8823-10  |
| 11            | 96-84-11                     | DSP013-11     | DDU6-8823-11  |
| 12            | 96-84-12                     | DSP013-12     | DDU6-8823-12  |
| 13            | 96-84-13                     | DSP013-13     | DDU6-8823-13  |
| 14            | 96-84-14                     | DSP013-14     | DDU6-8823-14  |
| 15            | 96-84-15                     | DSP013-15     | DDU6-8823-15  |
| 16            | 96-84-16                     | DSP013-16     | DDU6-8823-16  |
| 17            | 96-84-17                     | DSP013-17     | DDU6-8823-17  |
| 18            | 96-84-18                     | DSP013-18     | DDU6-8823-18  |
| 19            | 96-84-19                     | DSP013-19     | DDU6-8823-19  |

1/ Parts must be purchased to the DLA Land and Maritime PIN to assure that all performance requirements and tests are met.

| <u>Vendor CAGE number</u> | <u>Vendor name and address</u>  |
|---------------------------|---|
| 00222                     | ESC Electronics Corporation<br>33 Comac Loop<br>Ronkonkoma, NY 11779-6858<br><u>Plant:</u><br>ESC Control Electronics<br>77 Windsor Place, Suite 18<br>Central Islip, NY 11722-3334 |
| 16714                     | Rhombus Industries<br>313 N Birch Street<br>Santa Ana, CA 92701-5263  |
| 22519                     | Data Delay Devices, Incorporated<br>3 Mt. Prospect Avenue<br>Clifton, NJ 07013-1916   |

|   |                   |                                 |                          |
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|   |                   | <b>REV E</b>                    | <b>SHEET 8</b>           |