

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Added three sources for all dash numbers.	05 Sep 85	Ivan R. Jones
B	Added note 4 to figure 1. Eliminated references to MIL-D-23859 and replaced with references to MIL-PRF-83532.	19 Oct 87	Randy Larson
C	Added suggested sources of supply and changed requirements for inspection of product for delivery.	05 Aug 88	Randy Larson
D	Changed paragraph 3.2. Changed two dimensions on figure 1 and added note 5. Added paragraphs 3.26 and 3.30. Deleted vendor CAGE 56289. Editorial changes throughout.	11 Jun 93	D. Moore
E	Incorporated boilerplate updates.	17 Jun 08	Michael A. Radecki
F	Incorporated boilerplate updates. Eliminated reference to MIL-DTL-31000 and replaced with reference to MIL-STD-31000. Removed approved source of supply.	05 Mar 14	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

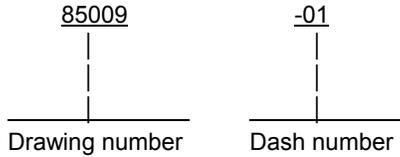
REV STATUS OF PAGES	REV	F	F	F	F	F	F	E	F	F								
	PAGES	1	2	3	4	5	6	7	8	9								

PMIC N/A	PREPARED BY Randy Larson	DESIGN ACTIVITY DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OH 45444-5000	
Original date of drawing 30 Aug 85	CHECKED BY Randy Larson	TITLE DELAY LINES, ACTIVE, TWO DELAY LINES, 14-PIN DIP, TTL INTERFACED	
	APPROVED BY Ivan R. Jones		
	SIZE A	CODE IDENT. NO. 14933	DWG NO. 85009
	REV F		PAGE 1 OF 9

1. SCOPE

1.1 Scope. This drawing describes the requirements for a family of 14-pin delay lines with two delay lines per package.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as shown in the following example:



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-STD-31000](#) - Technical Data Packages.

[MIL-PRF-83532](#) - Delay Lines, Active, General Specification for.

DEPARTMENT OF DEFENSE STANDARD

[MIL-STD-202](#) - Test Methods, Standard Electronic and Electrical Component Parts.

(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. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence. Nothing in this drawing, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

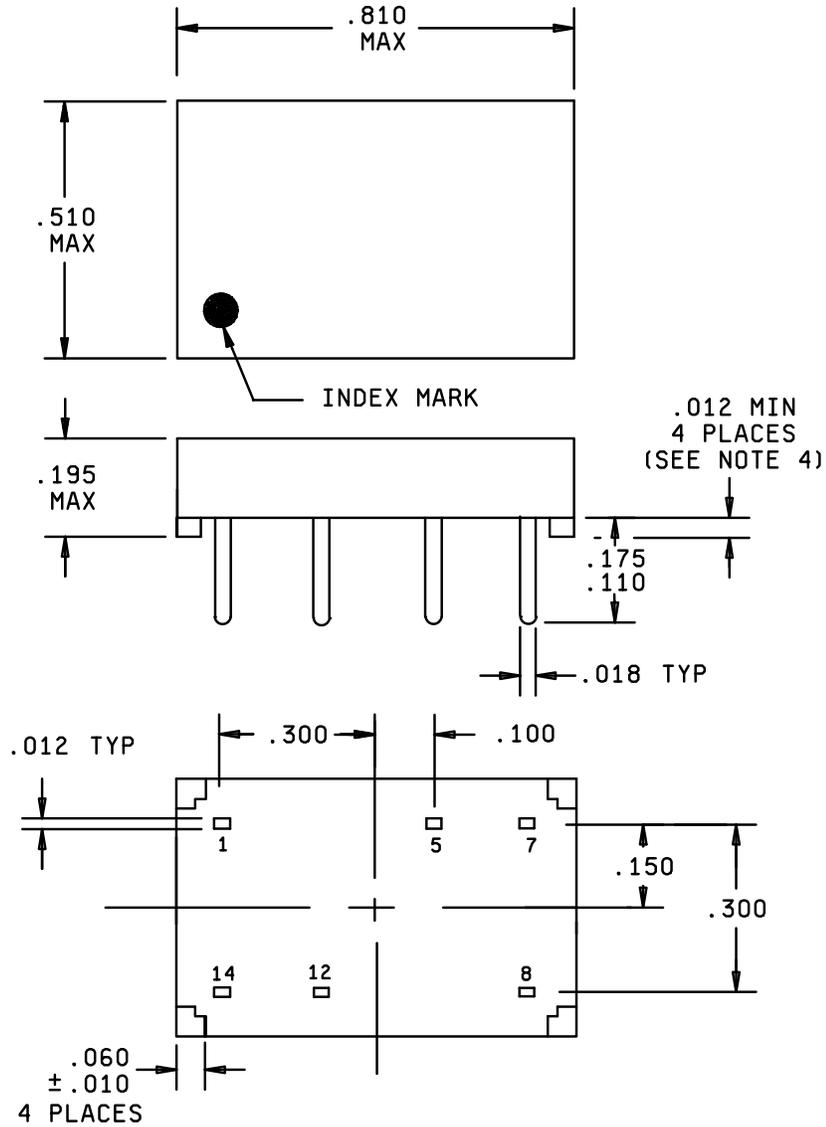
3. REQUIREMENTS

3.1 Drawing precedence. This drawing takes precedence over documents referred to herein and shall be interpreted in accordance with [MIL-STD-31000](#).

3.2 Case material. The case material shall be molded diallyl phthalate or encapsulated epoxy and shall be in accordance with [MIL-PRF-83532](#).

3.3 Design and dimensions. The design and dimensions shall be in accordance with [figure 1](#).

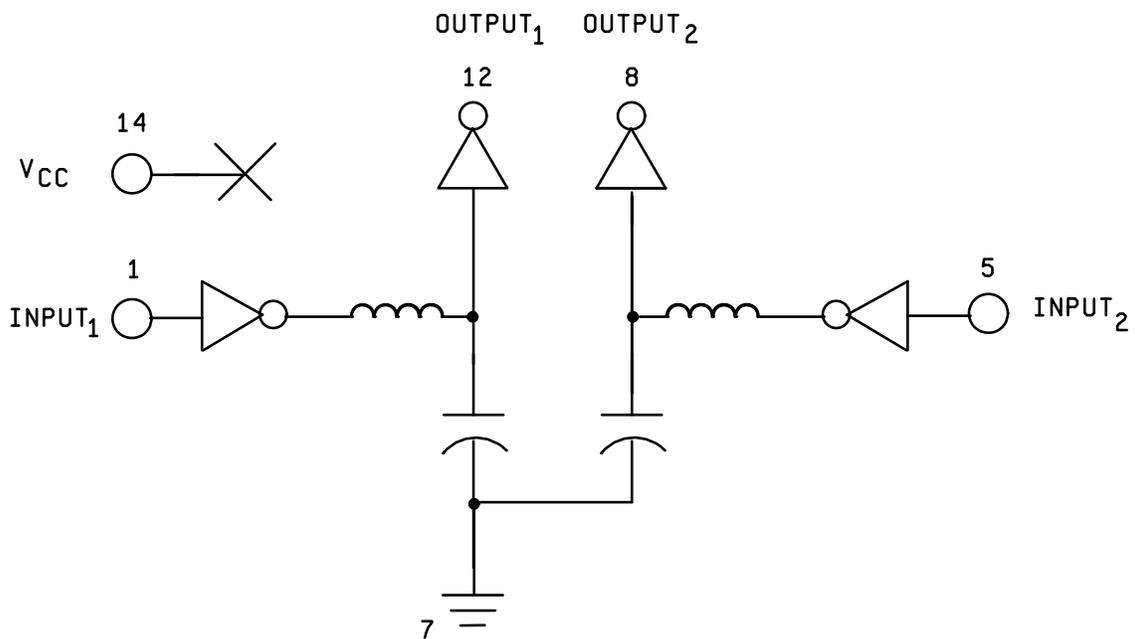
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Inches	mm
.012	0.30
.018	0.46
.060	1.52
.100	2.54
.110	2.79
.175	4.45
.195	4.95
.300	7.62
.510	12.95
.810	20.57

FIGURE 1. Design and dimensions.

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CIRCUIT DIAGRAM

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.005 (0.13 mm).
4. Location, shape, and dimensions of standoffs are optional. Height shall be as indicated.
5. 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.

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- 3.4 Terminals. The terminal material and finish shall be in accordance with [MIL-PRF-83532](#).
- 3.5 Temperature coefficient of delay. The temperature coefficient of delay shall be +1200 ppm/°C maximum.
- 3.6 Total delay time. The total delay time shall be in accordance with [table I](#).

TABLE I. PIN's and delay times.

DLA Land and Maritime PIN 85009-	Delay per line (ns)	DLA Land and Maritime PIN 85009-	Delay per line (ns)
01	5	22	30
02	6	23	35
03	7	24	40
04	8	25	45
05	9	26	50
06	10	27	55
07	11	28	60
08	12	29	65
09	13	30	70
10	14	31	75
11	15	32	80
12	16	33	85
13	17	34	90
14	18	35	95
15	19	36	100
16	20	37	125
17	21	38	150
18	22	39	175
19	23	40	200
20	24	41	225
21	25	42	250

- 3.7 Delay tolerance. The delay tolerance shall be ± 2 ns or ± 5 percent, whichever is greater (at +25°C with $V_{CC} = 5.0$ V dc).
- 3.8 Rise time. The rise time shall be 4 ns maximum.
- 3.9 Pulse width. The minimum input pulse width shall be 100 percent of the total delay.
- 3.10 Supply voltage (V_{CC}). The supply voltage shall be 4.75 V dc to 5.25 V dc.
- 3.11 Supply current:
 - a. Constant "0" in 60 mA maximum.
 - b. Constant "1" in 20 mA maximum.

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- 3.12 Logic 1 input. The logic 1 input shall be 50 μ A maximum at 2.4 volts or 1.0 mA maximum at 5.5 volts.
- 3.13 Logic 0 input. The logic 0 input shall be -2 mA maximum at 0.8 volt maximum.
- 3.14 Logic 1, V_{OUT} . The logic 1, V_{OUT} shall be 2.4 volts minimum.
- 3.15 Logic 0, V_{OUT} . The logic 0, V_{OUT} shall be 0.4 volt minimum.
- 3.16 Fan-out. The fan-out shall be 10 maximum (each delay line is capable of driving 10 TTL).
- 3.17 Thermal shock. The thermal shock test shall be in accordance with method 107, test condition A, of [MIL-STD-202](#), 5 minutes at temperature extremes and as specified in [MIL-PRF-83532](#).
- 3.18 Seal. The seal test shall be in accordance with [MIL-PRF-83532](#).
- 3.19 Terminal strength. The terminal strength test shall be in accordance with method 211, test condition C of [MIL-STD-202](#), and as specified in [MIL-PRF-83532](#).
- 3.20 Vibration. The vibration test shall be in accordance with method 204, test condition B of [MIL-STD-202](#), and as specified in [MIL-PRF-83532](#).
- 3.21 Shock. The shock test shall be in accordance with method 213, test condition D of [MIL-STD-202](#) and as specified in [MIL-PRF-83532](#).
- 3.22 Immersion. The immersion test shall be in accordance with method 104, test condition A of [MIL-STD-202](#), and as specified in [MIL-PRF-83532](#).
- 3.23 Moisture resistance. The moisture resistance test shall be as specified in [MIL-PRF-83532](#).
- 3.24 Solderability. The solderability test shall be as specified in [MIL-PRF-83532](#).
- 3.25 Resistance to solvents. The resistance to solvents test shall be as specified in [MIL-PRF-83532](#).
- 3.26 Check for internal shorts. When a test signal is applied to any input, a delay signal should be detected at the output for that line only. For example, when input 1 is tested, there shall be no signal detected at output 2. Both inputs shall be checked in this manner to ensure there are no shorts between lines.
- 3.27 Temperature range. The operating temperature range shall be -55°C to +125°C.
- 3.28 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.
- 3.29 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 and Group B inspections specified herein on a sample of parts agreed upon by the manufacturer and DLA Land and Maritime-VA.
- 3.30 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.
- 3.31 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see [6.3](#)).

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3.32 Marking. Marking shall be in accordance with [MIL-PRF-83532](#), except that the military PIN shall be as specified in 1.2.

3.33 Workmanship. Parts shall be free of flash pits, voids, excessive mold marks, and other defects that could affect the performance of the parts. Visible parting line is acceptable.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Inspection of product for delivery shall consist of compliance with the group A inspection for level A of [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). 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.

6.2 Ordering data. The acquisition document should specify the following as a minimum:

- a. Complete DLA Land and Maritime PIN (see 1.2).
- b. Requirement for the manufacturer to deliver one copy of the quality conformance inspection data with each shipment of parts.
- c. Requirement for the manufacturer to notify the acquiring activity in the event of a change in product.
- d. 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, Columbus, 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, Columbus, 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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DLA Land and Maritime drawing PIN 85009-	Similar vendor PIN and CAGE code - Continued 1/	
	CAGE 00222	CAGE 22519
01	96-75-1	MDU2-8513-1
02	96-75-2	MDU2-8513-2
03	96-75-3	MDU2-8513-3
04	96-75-4	MDU2-8513-4
05	96-75-5	MDU2-8513-5
06	96-75-6	MDU2-8513-6
07	96-75-7	MDU2-8513-7
08	96-75-8	MDU2-8513-8
09	96-75-9	MDU2-8513-9
10	96-75-10	MDU2-8513-10
11	96-75-11	MDU2-8513-11
12	96-75-12	MDU2-8513-12
13	96-75-13	MDU2-8513-13
14	96-75-14	MDU2-8513-14
15	96-75-15	MDU2-8513-15
16	96-75-16	MDU2-8513-16
17	96-75-17	MDU2-8513-17
18	96-75-18	MDU2-8513-18
19	96-75-19	MDU2-8513-19
20	96-75-20	MDU2-8513-20
21	96-75-21	MDU2-8513-21
22	96-75-22	MDU2-8513-22
23	96-75-23	MDU2-8513-23
24	96-75-24	MDU2-8513-24
25	96-75-25	MDU2-8513-25
26	96-75-26	MDU2-8513-26
27	96-75-27	MDU2-8513-27
28	96-75-28	MDU2-8513-28
29	96-75-29	MDU2-8513-29
30	96-75-30	MDU2-8513-30
31	96-75-31	MDU2-8513-31

See footnote at end of table.

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DLA Land and Maritime drawing PIN 85009-	Similar vendor PIN and CAGE code - Continued 1/	
	CAGE 00222	CAGE 22519
32	96-75-32	MDU2-8513-32
33	96-75-33	MDU2-8513-33
34	96-75-34	MDU2-8513-34
35	96-75-35	MDU2-8513-35
36	96-75-36	MDU2-8513-36
37	96-75-37	MDU2-8513-37
38	96-75-38	MDU2-8513-38
39	96-75-39	MDU2-8513-39
40	96-75-40	MDU2-8513-40
41	96-75-41	MDU2-8513-41
42	96-75-42	MDU2-8513-42

[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 534 Bergen Boulevard Palisades Park, NJ 07650 (201) 947-0400
22519	Data Delay Devices, Incorporated 3 Mt. Prospect Avenue Clifton, NJ 07013 (201) 773-2299

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