

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Added an additional source of supply. Made standoffs optional. Correction to table I.	10 Nov 87	Randy Larson
B	Added additional source of supply. Added assistance paragraph. Changed the requirements for inspection of product for delivery.	5 Aug 88	Randy Larson
C	Added note 6 to figure 1. Expanded 3.29. Deleted vendors 56289 and 92912. Added vendors 20933 and 16714. Editorial changes throughout. JW	2 Oct 92	D. Moore
D	Incorporated editorial and boilerplate updates.	23 Jun 08	Michael A. Radecki
E	Incorporated editorial and boilerplate updates. Replaced cancelled reference of MIL-DTL-31000 to MIL-STD-31000.	10 Jan 14	Michael A. Radecki

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

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REV STATUS OF PAGES	REV	E	E	E	E	E	E	E	E	E	E							
	PAGES	1	2	3	4	5	6	7	8	9	10							
PMIC N/A	PREPARED BY Dan McGrath							DESIGN ACTIVITY DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OH 45444-5000										
Original date of drawing 6 Nov 85	CHECKED BY Dan McGrath							TITLE DELAY LINES, ACTIVE, PROGRAMMABLE 3 BIT, 16 PIN DIP COMPATIBLE, EMITTER-COUPLED LOGIC (ECL)										
	APPROVED BY Ivan R. Jones																	
	SIZE A	CODE IDENT. NO. 14933						DWG NO. 85078										
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1. SCOPE

1.1 Scope. This drawing describes the requirements for a family of programmable 3 bit, 16 pin compatible, emitter-coupled logic (ECL) delay lines.

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.

(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 Non-Government publications. The following documents 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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL (ASTM)

- ASTM-B339 - Pig Tin.
- ASTM-B545 - Electrodeposited Coatings of Tin.

(Copies of this document are available on <http://www.astm.org> or from American Society for Testing and Materials International (ASTM), 100 Barr Harbor Drive, P. O. Box C700, West Conshohocken, PA, 19428-2959.)

2.4 Order of precedence. 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.

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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 Dimensions and configuration. The dimensions and configuration shall be in accordance with [figure 1](#).
- 3.4 Terminal material. The terminal material shall be copper-nickel or alloy 42, tin plated in accordance with [ASTM - B339](#) and [ASTM -B545](#).
- 3.5 Temperature coefficient of delay. The temperature coefficient of delay shall be +150 ppm/°C maximum.
- 3.6 Maximum delay time. The maximum delay time shall be in accordance with [table I](#).
- 3.7 Delay tolerance. The delay tolerance shall be in accordance with [table I](#).
- 3.8 Rise time. The rise time shall be 5 ns maximum when measured from 20 percent to 80 percent pulse amplitude.
- 3.9 Pulse width. For dash numbers 01 through 05, the pulse width shall be 20 ns. For all other dash numbers, the pulse width shall be 150 ns.
- 3.10 Supply voltage (V_{EE}). The supply voltage shall be -5.2 V ±5 percent.
- 3.11 Supply current. The supply current shall be 120 mA maximum.
- 3.12 Logic 1 input at +25°C. The voltage shall be -0.98 V minimum and the current shall be 25 mA maximum.
- 3.13 Logic 0 input at +25°C. The voltage shall be -1.63 V maximum and the current shall be 0.5 µA minimum.
- 3.14 Logic 1 output at +25°C. The voltage shall be -0.96 V minimum.
- 3.15 Logic 0 output at +25°C. The voltage shall be -1.65 V maximum.
- 3.16 Delay line fan-out. The delay lines are capable of driving 70 emitter-coupled logic dc loads.
- 3.17 Thermal shock. Thermal shock test shall be as specified in [MIL-PRF-83532](#).
- 3.18 Sealing. The sealing test shall be in accordance with [MIL-PRF-83532](#).
- 3.19 Terminal strength. Terminal strength test shall be as specified in [MIL-PRF-83532](#).
- 3.20 Vibration. The vibration test shall be in accordance with [MIL-PRF-83532](#).
- 3.21 Shock. Shock test shall be as specified in [MIL-PRF-83532](#).
- 3.22 Immersion. The immersion test shall be in accordance with [MIL-PRF-83532](#).

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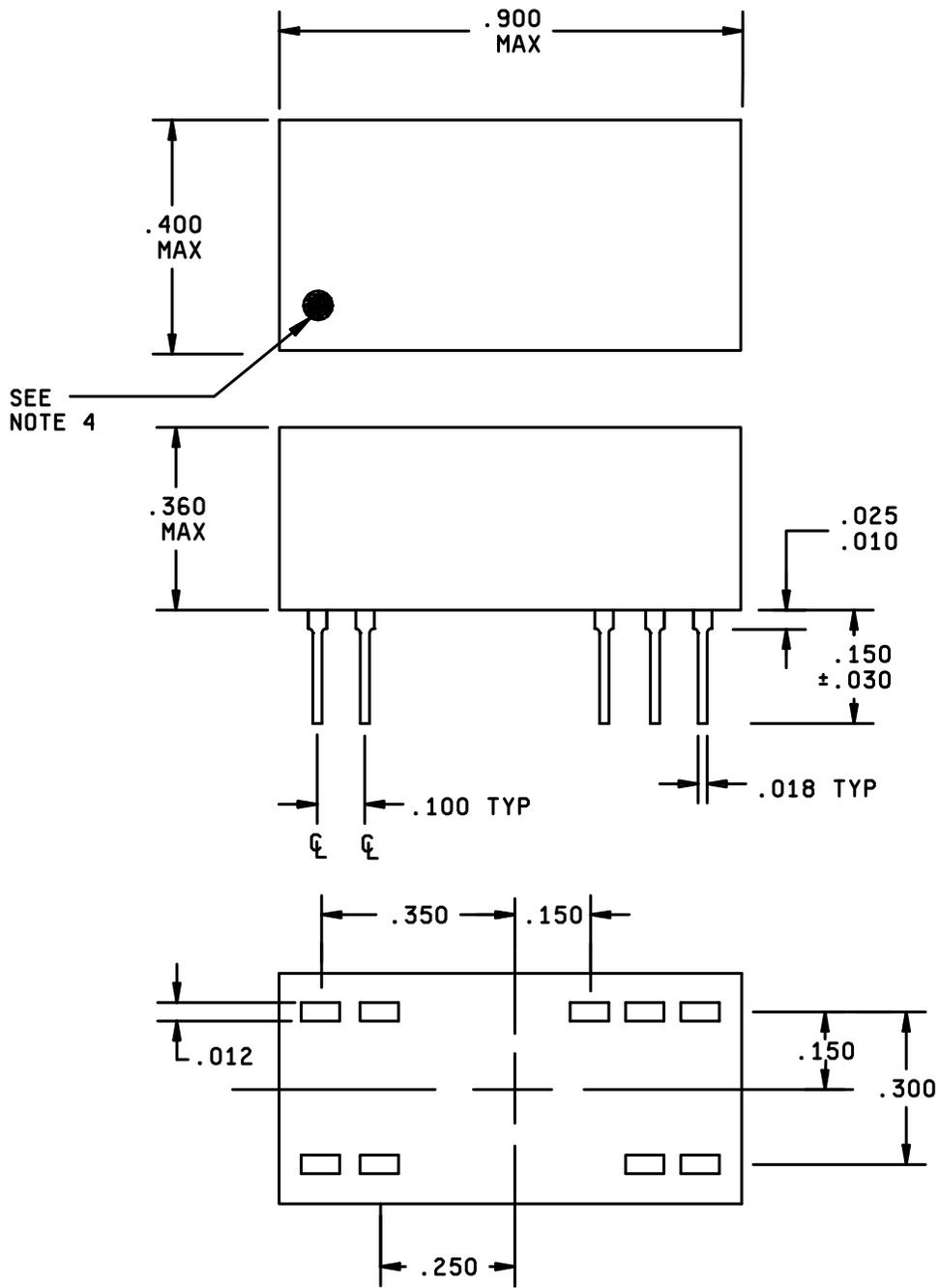
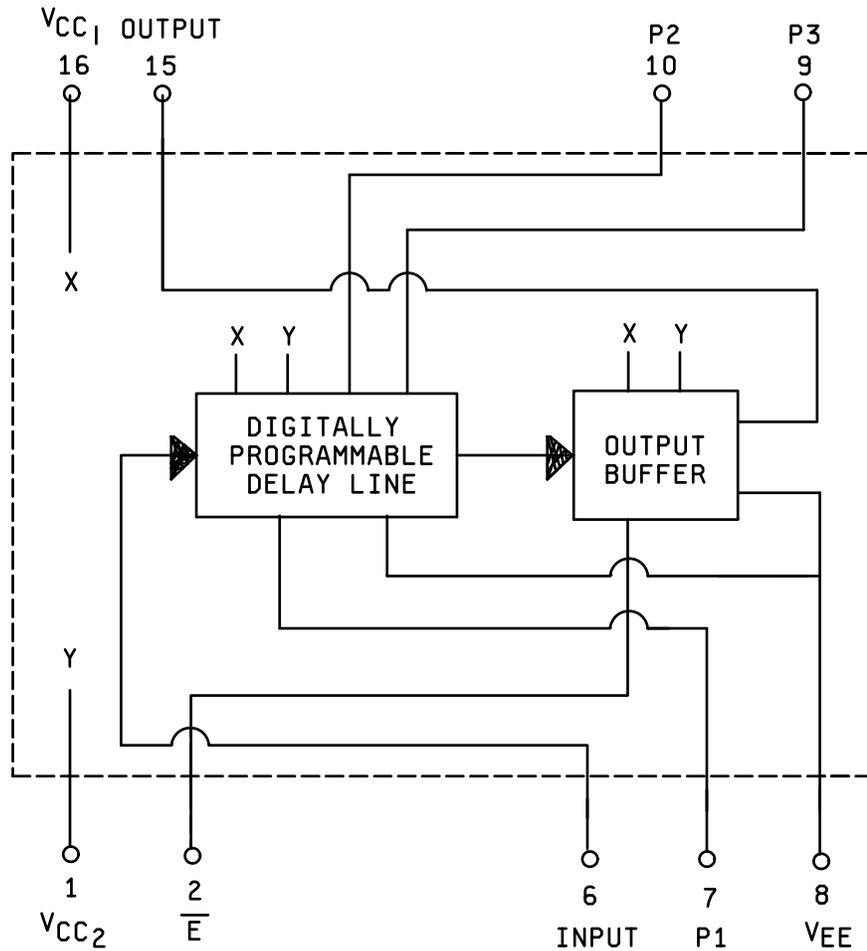


FIGURE 1. Dimensions and configuration.

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NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.010 (0.25 mm).
4. Orientation dot appears over pin 1.
5. Location and shape of standoffs are optional. Height shall be as indicated.
6. Leads shall be free of case meniscus and other foreign material and shall be solderable for a minimum of .010 inch above the seating plane of the delay line.

Inches	mm
.010	0.25
.012	0.30
.018	0.46
.025	0.64
.030	0.76
.150	3.81
.250	6.35
.300	7.62
.350	8.89
.360	9.14
.400	10.16
.900	22.86

FIGURE 1. Dimensions and configuration - Continued.

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TABLE I. PIN's and delay times. ^{1/}

PIN 85078-	^{2/} Step zero delay time (ns)	Maximum delay time (ns)	Delay change per step (ns)	^{3/} Maximum deviation from programmed delay (ns)
01	3.0 ±2.0	10	1 ±0.3	±0.5 or ±5% (whichever is greater)
02	"	17	2 ±0.4	"
03	"	24	3 ±0.5	"
04	"	31	4 ±0.5	"
05	"	38	5 ±0.5	"
06	"	45	6 ±0.6	"
07	"	52	7 ±0.7	"
08	"	59	8 ±0.8	"
09	"	66	9 ±0.9	"
10	"	73	10 ±1	"
11	"	108	15 ±1	"
12	"	143	20 ±1.5	"
13	"	178	25 ±1.5	"
14	"	213	30 ±2	"
15	"	248	35 ±2	"
16	"	283	40 ±2.5	"
17	"	318	45 ±2.5	"
18	"	353	50 ±2.5	"

^{1/} For maximum delay time, tabulation and truth table examples, a step zero delay time of 3 ns is assumed.

^{2/} Delay at step zero is referenced to the input pin.

^{3/} All delay times after step zero are referenced to step zero.

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TABLE II. Truth table.

Programming pins PIN 85078-	3	0	0	0	0	1	1	1	1
	2	0	0	1	1	0	0	1	1
	1	0	1	0	1	0	1	0	1
01	3	1	2	3	4	5	6	7	
02	3	2	4	6	8	10	12	14	
03	3	3	6	9	12	15	18	21	
04	3	4	8	12	16	20	24	28	
05	3	5	10	15	20	25	30	35	
06	3	6	12	18	24	30	36	42	
07	3	7	14	21	28	35	42	49	
08	3	8	16	24	32	40	48	56	
09	3	9	18	27	36	45	54	63	
10	3	10	20	30	40	50	60	70	
11	3	15	30	45	60	75	90	105	
12	3	20	40	60	80	100	120	140	
13	3	25	50	75	100	125	150	175	
14	3	30	60	90	120	150	180	210	
15	3	35	70	105	140	175	210	245	
16	3	40	80	120	160	200	240	280	
17	3	45	90	135	180	225	270	315	
18	3	50	100	150	200	250	300	350	

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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 Truth table. See [table II](#).

3.26 Operating temperature range. The operating temperature range shall be -55°C to +125°C.

3.27 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.

3.28 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.

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

3.30 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of resistor 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](#)).

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

3.32 Workmanship. Delay lines shall be processed in such a manner as to be uniform in quality and shall be free from defects that could affect life, serviceability or appearance.

4. VERIFICATION

4.1 Sampling and inspection. Unless otherwise specified, sampling and inspection procedures shall be performed in accordance with 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 contract or purchase order should specify the following:

- a. Complete PIN (see [1.2](#)).
- b. Requirements for delivery of one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.

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- c. Whether the manufacturer performs the group A inspection tests or provides a statement of compliance with group A requirements.
- d. Requirement for the manufacturer to notify the acquiring activity in the event of a change in 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 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.

DESC drawing PIN 85078-	Similar vendor PIN and CAGE ^{1/}		
	00222	16714	22519
01	96-88-1	DSP078-01	PDU108H-8542-1
02	96-88-2	DSP078-02	PDU108H-8542-2
03	96-88-3	DSP078-03	PDU108H-8542-3
04	96-88-4	DSP078-04	PDU108H-8542-4
05	96-88-5	DSP078-05	PDU108H-8542-5
06	96-88-6	DSP078-06	PDU108H-8542-6
07	96-88-7	DSP078-07	PDU108H-8542-7
08	96-88-8	DSP078-08	PDU108H-8542-8
09	96-88-9	DSP078-09	PDU108H-8542-9
10	96-88-10	DSP078-10	PDU108H-8542-10
11	96-88-11	DSP078-11	PDU108H-8542-11
12	96-88-12	DSP078-12	PDU108H-8542-12
13	96-88-13	DSP078-13	PDU108H-8542-13
14	96-88-14	DSP078-14	PDU108H-8542-14
15	96-88-15	DSP078-15	PDU108H-8542-15
16	96-88-16	DSP078-16	PDU108H-8542-16
17	96-88-17	DSP078-17	PDU108H-8542-17
18	96-88-18	DS9078-18	PDU108H-8542-18

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

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Vendor CAGE
number

Vendor name
and address

00222

ESC Electronics Incorporated
33 Comac Loop
Ronkonkoma, NY 11779-6858
Phone: (631) 467-5328

16714

Rhombus Industries, Incorporated
313 N Birch Street
Santa Ana, CA 92701-5263
Phone: (714) 898-0960

22519

Data Delay Devices Incorporated
3 Mt. Prospect Avenue
Clifton, NJ 07013-1915
Phone: (973) 773-2299

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