

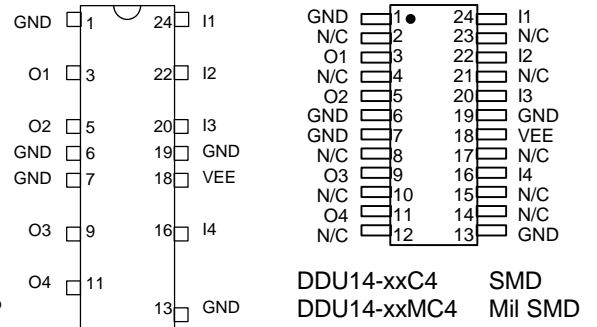
# QUAD, ECL-INTERFACED FIXED DELAY LINE (SERIES MDU14)



## FEATURES

- Four independent delay lines
- Fits 24-pin (400mil) DIP socket
- Auto-insertable
- Input & outputs fully 100K-ECL interfaced & buffered

## PACKAGES



MDU14-xx DIP  
MDU14-xxM Military DIP

DDU14-xxC4 SMD  
DDU14-xxMC4 Mil SMD

## FUNCTIONAL DESCRIPTION

The MDU14-series device is a 4-in-1 digitally buffered delay line. The signal inputs (I1-I4) are reproduced at the outputs (O1-O4), shifted in time by an amount determined by the device dash number (See Table). The delay lines function completely independently of each other.

## PIN DESCRIPTIONS

- I1-I4 Signal Inputs
- O1-O4 Signal Outputs
- VEE -5 Volts
- GND Ground

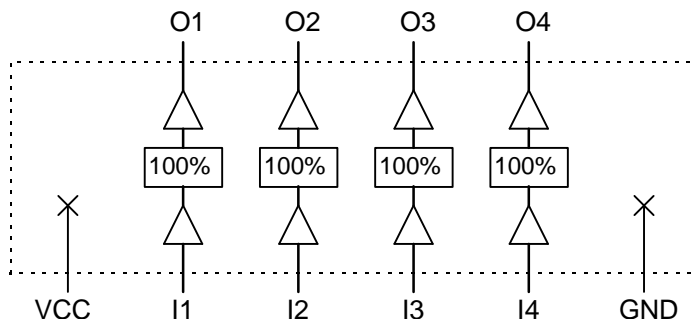
## SERIES SPECIFICATIONS

- **Minimum input pulse width:** 40% of total delay
- **Output rise time:** 2ns typical
- **Supply voltage:** -5VDC  $\pm$  5%
- **Power dissipation:** 500mw typical (no load)
- **Operating temperature:** 0° to 85° C
- **Temp. coefficient of total delay:** 100 PPM/°C

## DASH NUMBER SPECIFICATIONS

Part Number	Total Delay (ns)
MDU14-2	2.0 $\pm$ 1.0
MDU14-2.5	2.5 $\pm$ 1.0
MDU14-3	3.0 $\pm$ 1.0
MDU14-4	4.0 $\pm$ 1.0
MDU14-5	5.0 $\pm$ 1.0
MDU14-6	6.0 $\pm$ 1.0
MDU14-7	7.0 $\pm$ 1.0
MDU14-8	8.0 $\pm$ 1.0
MDU14-9	9.0 $\pm$ 1.0
MDU14-10	10.0 $\pm$ 1.0
MDU14-12.5	12.5 $\pm$ 1.0
MDU14-15	15.0 $\pm$ 1.0
MDU14-20	20.0 $\pm$ 1.0
MDU14-25	25.0 $\pm$ 1.2

NOTE: Any dash number between 2 and 25 not shown is also available.



Functional block diagram

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## APPLICATION NOTES

### HIGH FREQUENCY RESPONSE

The MDU14 tolerances are guaranteed for input pulse widths and periods greater than those specified in the test conditions. Although the device will function properly for pulse widths as small as 40% of the total delay and periods as small as 80% of the total delay (for a symmetric input), the delays may deviate from their values at low frequency. However, for a given input condition, the deviation will be repeatable from pulse to pulse. Contact technical support at Data

Delay Devices if your application requires device testing at a specific input condition.

### POWER SUPPLY BYPASSING

The MDU14 relies on a stable power supply to produce repeatable delays within the stated tolerances. A 0.1uf capacitor from VEE to GND, located as close as possible to the VEE pin, is recommended. A wide VEE trace and a clean ground plane should be used.

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## DEVICE SPECIFICATIONS

### TABLE 1: ABSOLUTE MAXIMUM RATINGS

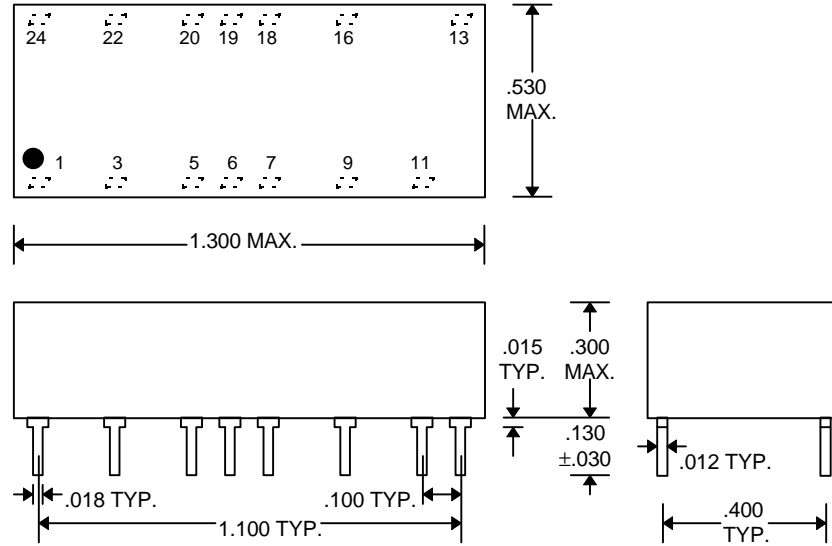
PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTES
DC Supply Voltage	$V_{EE}$	-7.0	0.3	V	
Input Pin Voltage	$V_{IN}$	$V_{EE} - 0.3$	0.3	V	
Storage Temperature	$T_{STRG}$	-55	150	C	
Lead Temperature	$T_{LEAD}$		300	C	10 sec

### TABLE 2: DC ELECTRICAL CHARACTERISTICS

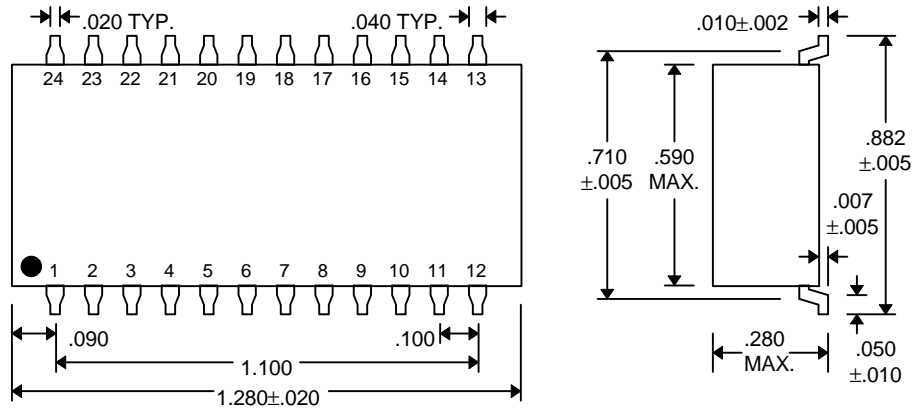
(0C to 85C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
High Level Output Voltage	$V_{OH}$	-1.025		-0.880	V	$V_{IH} = \text{MAX}, 50\Omega$ to -2V
Low Level Output Voltage	$V_{OL}$	-1.810		-1.620	V	$V_{IL} = \text{MIN}, 50\Omega$ to -2V
High Level Input Voltage	$V_{IH}$	-1.165		-0.880	V	
Low Level Input Voltage	$V_{IL}$	-1.810		-1.475	V	
High Level Input Current	$I_{IH}$			340	$\mu\text{A}$	$V_{IH} = \text{MAX}$
Low Level Input Current	$I_{IL}$	0.5			$\mu\text{A}$	$V_{IL} = \text{MIN}$

**PACKAGE DIMENSIONS**



**MDU14-xx (Commercial DIP)**  
**MDU14-xxM (Military DIP)**



**MDU14-xxC4 (Commercial SMD)**  
**MDU14-xxMC4 (Military SMD)**

**DELAY LINE AUTOMATED TESTING**

**TEST CONDITIONS**

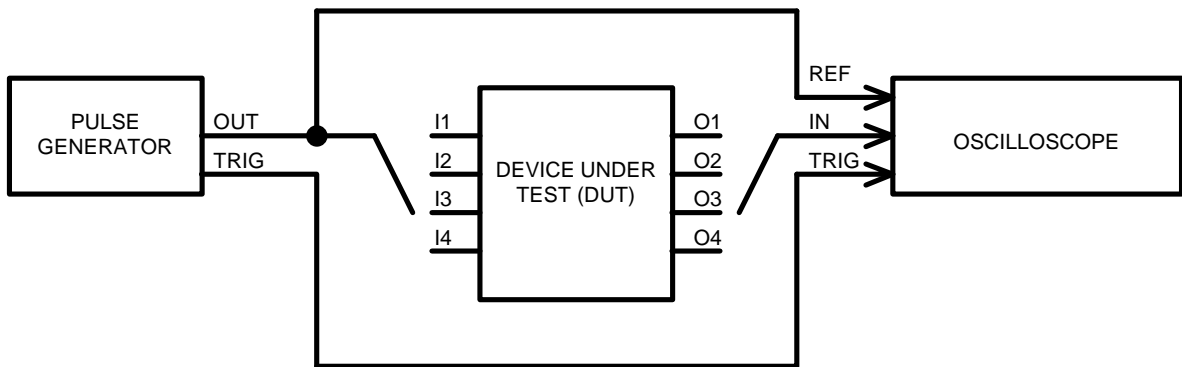
**INPUT:**

**Ambient Temperature:**  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
**Supply Voltage (Vcc):**  $-5.0\text{V} \pm 0.1\text{V}$   
**Input Pulse:** Standard 10KH ECL levels  
**Source Impedance:**  $50\Omega$  Max.  
**Rise/Fall Time:** 2.0 ns Max. (measured between 20% and 80%)  
**Pulse Width:**  $\text{PW}_{\text{IN}} = 1.5 \times \text{Total Delay}$   
**Period:**  $\text{PER}_{\text{IN}} = 10 \times \text{Total Delay}$

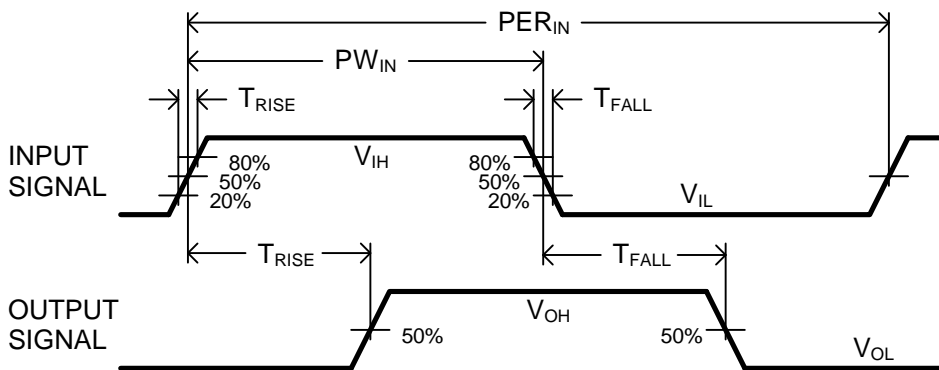
**OUTPUT:**

**Load:**  $50\Omega$  to  $-2\text{V}$   
**C<sub>load</sub>:**  $5\text{pf} \pm 10\%$   
**Threshold:**  $(V_{\text{OH}} + V_{\text{OL}}) / 2$   
 (Rising & Falling)

**NOTE:** The above conditions are for test only and do not in any way restrict the operation of the device.



**Test Setup**



**Timing Diagram For Testing**