

5-TAP, ECL-INTERFACED FIXED DELAY LINE (SERIES DDU11H)

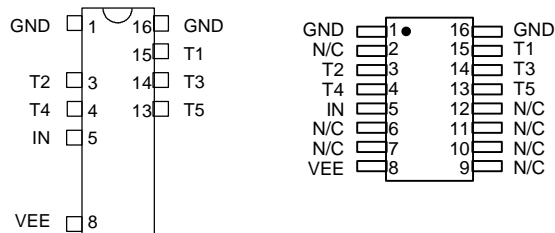
**data
delay
devices, inc.**



FEATURES

- Five equally spaced outputs
- Fits standard 16-pin DIP socket
- Auto-insertable
- Input & outputs fully 10KH-ECL interfaced & buffered

PACKAGES



DDU11H-xx DIP DDU11H-xxC3 SMD
DDU11H-xxM Military DIP DDU11H-xxMC3 Mil SMD

FUNCTIONAL DESCRIPTION

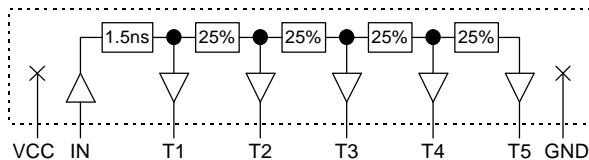
The DDU11H-series device is a 5-tap digitally buffered delay line. The signal input (IN) is reproduced at the outputs (T1-T5), shifted in time by an amount determined by the device dash number (See Table). For dash numbers less than 10, the total delay of the line is measured from T1 to T5. The nominal tap-to-tap delay increment is given by one-fourth of the total delay, and the inherent delay from IN to T1 is nominally 1.5ns. For dash numbers greater than or equal to 10, the total delay of the line is measured from IN to T5. The nominal tap-to-tap delay increment is given by one-fifth of this number.

PIN DESCRIPTIONS

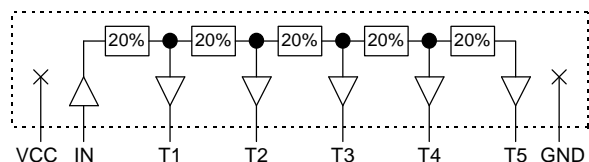
IN Signal Input
T1-T5 Tap Outputs
VEE -5 Volts
GND Ground

SERIES SPECIFICATIONS

- **Minimum input pulse width:** 20% of total delay
- **Output rise time:** 2ns typical
- **Supply voltage:** -5VDC \pm 5%
- **Power dissipation:** 200mw typical (no load)
- **Operating temperature:** -30° to 85° C
- **Temp. coefficient of total delay:** 100 PPM/°C



Functional diagram for dash numbers < 10



Functional diagram for dash numbers \geq 10

DASH NUMBER SPECIFICATIONS

Part Number	Total Delay (ns)	Delay Per Tap (ns)
DDU11H-4	2 \pm 1.0 *	0.5 \pm 0.3
DDU11H-5	4 \pm 1.0 *	1.0 \pm 0.3
DDU11H-8	6 \pm 2.0 *	1.5 \pm 0.4
DDU11H-10	10 \pm 2.0	2.0 \pm 0.4
DDU11H-20	20 \pm 3.0	5.0 \pm 1.0
DDU11H-25	25 \pm 3.0	5.0 \pm 2.0
DDU11H-50	50 \pm 3.0	10.0 \pm 2.0
DDU11H-75	75 \pm 4.0	15.0 \pm 2.0
DDU11H-100	100 \pm 5.0	20.0 \pm 2.0
DDU11H-150	150 \pm 7.5	30.0 \pm 2.0
DDU11H-200	200 \pm 10.0	40.0 \pm 2.0
DDU11H-250	250 \pm 12.5	50.0 \pm 2.5
DDU11H-300	300 \pm 15.0	60.0 \pm 3.0
DDU11H-400	400 \pm 20.0	80.0 \pm 4.0
DDU11H-500	500 \pm 25.0	100.0 \pm 5.0

* Total delay is referenced to first tap output
Input to first tap = 1.5ns \pm 1ns

NOTE: Any dash number between 4 and 500 not shown is also available.

APPLICATION NOTES

HIGH FREQUENCY RESPONSE

The DDU11H 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 20% of the total delay and periods as small as 40% 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 DDU11H relies on a stable power supply to produce repeatable delays within the stated tolerances. A 0.1 μ f 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.

DEVICE SPECIFICATIONS

TABLE 1: ABSOLUTE MAXIMUM RATINGS

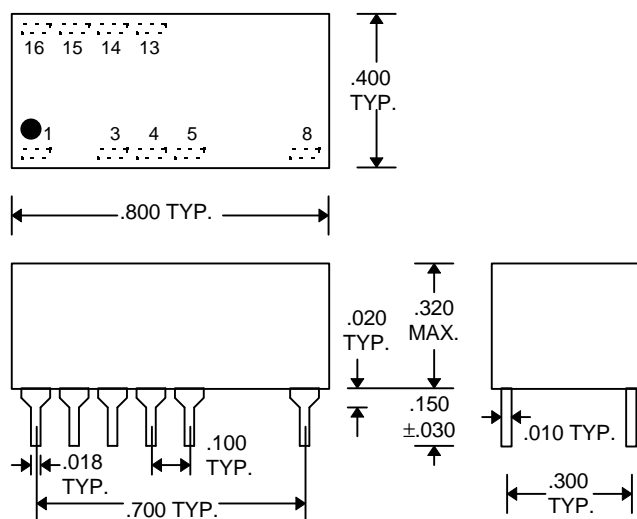
PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTES
DC Supply Voltage	V_{EE}	-7.0	0.3	V	
Input Pin Voltage	V_{IN}	$V_{EE} - 0.3$	0.3	V	
Storage Temperature	T_{STRG}	-55	150	C	
Lead Temperature	T_{LEAD}		300	C	10 sec

TABLE 2: DC ELECTRICAL CHARACTERISTICS

(0C to 75C)

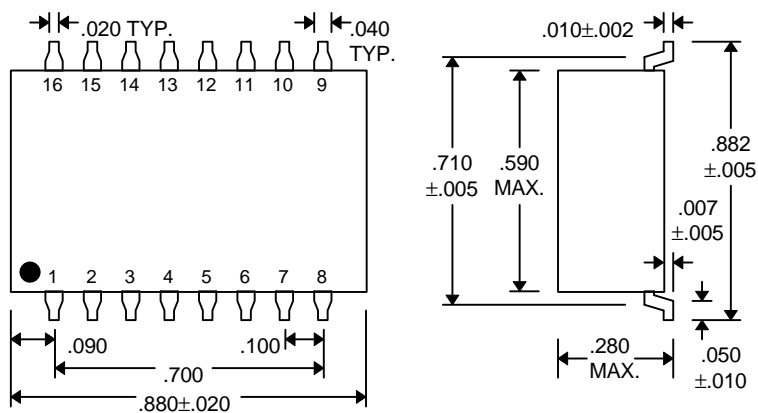
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
High Level Output Voltage	V_{OH}	-1.020		-0.735	V	$V_{IH} = \text{MAX}, 50\Omega$ to -2V
Low Level Output Voltage	V_{OL}	-1.950		-1.600	V	$V_{IL} = \text{MIN}, 50\Omega$ to -2V
High Level Input Voltage	V_{IH}			-1.070	V	
Low Level Input Voltage	V_{IL}	-1.480			V	
High Level Input Current	I_{IH}			475	μ A	$V_{IH} = \text{MAX}$
Low Level Input Current	I_{IL}	0.5			μ A	$V_{IL} = \text{MIN}$

PACKAGE DIMENSIONS



DDU11H-xx (Commercial DIP)

DDU11H-xxM (Military DIP)



DDU11H-xxC3 (Commercial SMD)

DDU11H-xxMC3 (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: 50Ω 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: $\text{PER}_{\text{IN}} = 10 \times \text{Total Delay}$

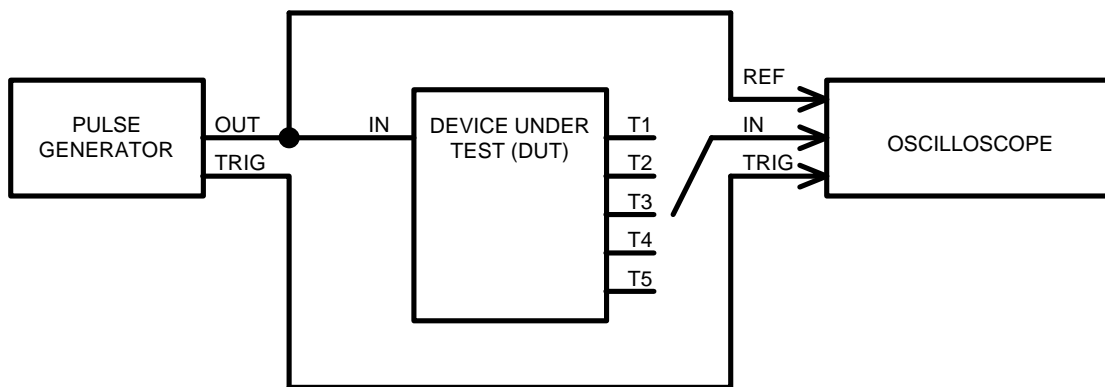
OUTPUT:

Load: 50Ω to -2V

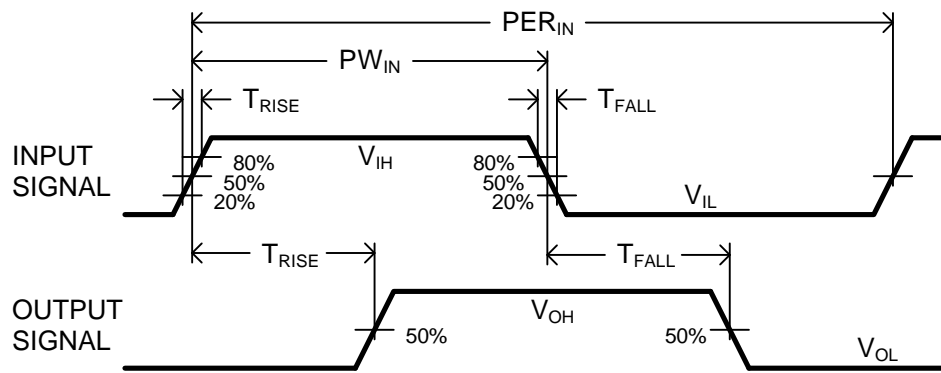
C_{load}: $5\text{pf} \pm 10\%$

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