

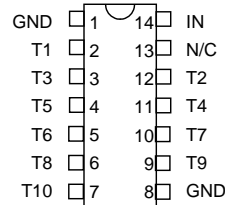
# 10-TAP DIP/SMD DELAY LINE

$T_D/T_R = 5$   
(SERIES 1520)



## FEATURES

- 10 taps of equal delay increment
- Delays to 1000ns
- Low profile
- Epoxy encapsulated
- Meets or exceeds MIL-D-23859C



## PACKAGES

IN Signal Input  
T1-T10 Tap Outputs  
GND Ground

**Note: Standard pinout shown**  
Other pinouts available

## FUNCTIONAL DESCRIPTION

The 1520-series device is a fixed, single-input, ten-output, passive delay line. The signal input (IN) is reproduced at the outputs (T1-T10) in equal increments. The delay from IN to T10 ( $T_D$ ) and the characteristic impedance of the line ( $Z$ ) are determined by the dash number. The rise time ( $T_R$ ) of the line is 20% of  $T_D$ , and the 3dB bandwidth is given by  $1.75 / T_D$ . The device is available in a 14-pin DIP (1520) or a 14-pin SMD (1520S), and a wide range of pinouts may be specified.

Part numbers are constructed according to the scheme shown at right. For example, 1520C-101-500B is a 290 mil DIP, 100ns, 50Ω delay line with pinout code B. Similarly, 1520SB-201-251 is a 240 mil SMD, 200ns, 250Ω delay line with standard pinout.

For the SMD version (1520S), hand-soldering is recommended. The industry standard of maximum 300C for no more than 10 seconds on each terminal applies.

## PART NUMBER CONSTRUCTION

1520(S)m - xxx - zzz p

**MOUNTING HEIGHT CODE**  
See Table

**DELAY TIME**  
Expressed in nanoseconds (ns)  
First two digits are significant figures  
Last digit specifies # of zeros to follow

**IMPEDANCE**  
Expressed in ohms  
First two digits are significant figures  
Last digit specifies # of zeros to follow

**PINOUT CODE**  
See Table  
Omit for STD pinout

## SERIES SPECIFICATIONS

- **Dielectric breakdown:** 50 Vdc
- **Distortion @ output:** 10% max.
- **Operating temperature:** -55°C to +125°C
- **Storage temperature:** -55°C to +125°C
- **Temperature coefficient:** 100 PPM/°C

## PINOUT CODES

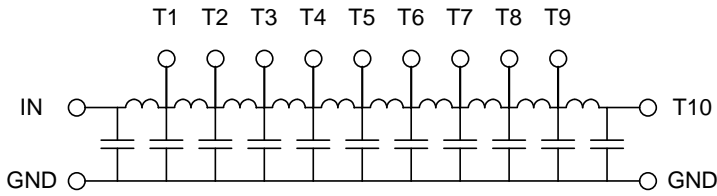
CODE	IN	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	GND
STD	14	2	12	3	11	4	5	10	6	9	7	1,8
A	1	2	13	3	12	4	10	5	9	6	7	14
B	2	3	4	5	6	7	9	10	11	12	13	1,14
C	7	9	6	10	5	11	12	3	13	2	14	1,8
D	1	13	2	12	3	11	4	10	5	9	6	7,8,14
E	2	3	4	5	6	7,8	9	10	11	12	13	1,14
F	1	13	2	12	3	11	4	10	5	9	6	7
G	2	13	3	12	4	11	5	10	6	9	7	8,14
H	2	3	4	12	6	7	9	10	11	12	13	1
I	1	13	2	12	3	11	5	10	6	9	7	8,14
J	1	2	13	3	12	4	10	5	9	6	7	8,14
K	1	2	3	4	5	6	12	11	10	9	8	7
L	13	12	11	10	9	7,8	6	5	4	3	2	1,14
N	1	2	3	4	5	6	10	11	12	13	14	7
P	1	13	3	12	4	11	5	10	6	9	7	8,14
T	1	2	3	4	5	6	9	10	11	12	13	7,14
U	2	3	4	5	6	8	9	10	11	12	13	1,7
V	2	3	4	5	6	8	9	10	11	12	13	1
W	1	13	2	12	3	11	4	10	5	9	6	7,14
Z	1	13	3	12	4	11	5	10	6	9	8	7

## DELAY SPECIFICATIONS

$T_D$ (ns)	$T_1$ (ns)	$T_R$ (ns)	ATTENUATION (%) TYPICAL				
			Z=50Ω	Z=100Ω	Z=200Ω	Z=300Ω	Z=500Ω
10	1.0	3.0	3	5	N/A	N/A	N/A
20	2.0	5.5	3	5	5	N/A	N/A
30	3.0	6.5	3	5	5	N/A	N/A
40	4.0	8.0	3	5	5	5	N/A
50	5.0	10.0	3	5	5	5	7
60	6.0	12.0	3	5	5	5	7
75	7.5	15.0	3	5	5	5	7
100	10.0	20.0	3	5	5	7	7
120	12.0	24.0	3	5	6	7	8
150	15.0	30.0	3	5	6	7	8
180	18.0	36.0	4	5	6	7	8
200	20.0	40.0	4	5	6	7	8
220	22.0	44.0	4	5	6	7	8
250	25.0	50.0	4	5	6	7	8
300	30.0	60.0	N/A	5	8	10	10
375	37.5	75.0	N/A	7	8	10	10
500	50.0	100.0	N/A	8	10	12	12
600	60.0	120.0	N/A	N/A	N/A	15	15
750	75.0	150.0	N/A	N/A	N/A	15	20
1000	100.0	200.0	N/A	N/A	N/A	N/A	20

**Notes:**  $T_1$  represents nominal tap-to-tap delay increment  
Tolerance on  $T_D = \pm 5\%$  or  $\pm 2ns$ , whichever is greater  
Tolerance on  $T_1 = \pm 5\%$  or  $\pm 1ns$ , whichever is greater  
“N/A” indicates that delay is not available at this Z

**FUNCTIONAL DIAGRAM**

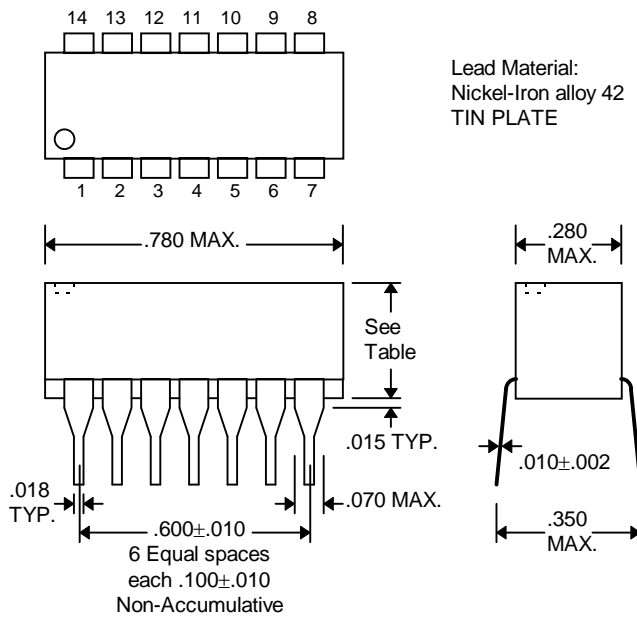


**MOUNTING HEIGHT CODES**

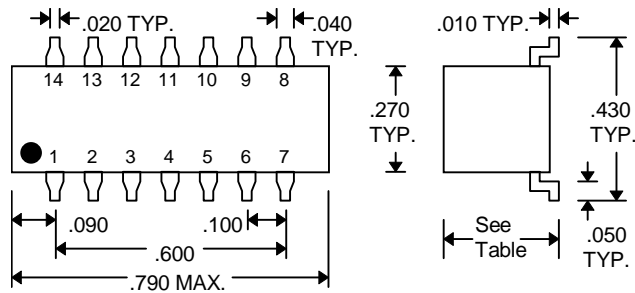
CODE	HEIGHT (MAX)	DIP	SMD
A	0.187	Yes	No
B	0.240	Yes	Yes
C	0.290	Yes	Yes

**Note:** Codes A and B are not available for all values of  $T_D$   
Contact technical staff for details

**PACKAGE DIMENSIONS**



**1520-xx (DIP)**



**1520S-xx (Gull-Wing)**

## PASSIVE DELAY LINE TEST SPECIFICATIONS

### TEST CONDITIONS

#### INPUT:

**Ambient Temperature:**  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
**Input Pulse:** High = 3.0V typical  
 Low = 0.0V typical

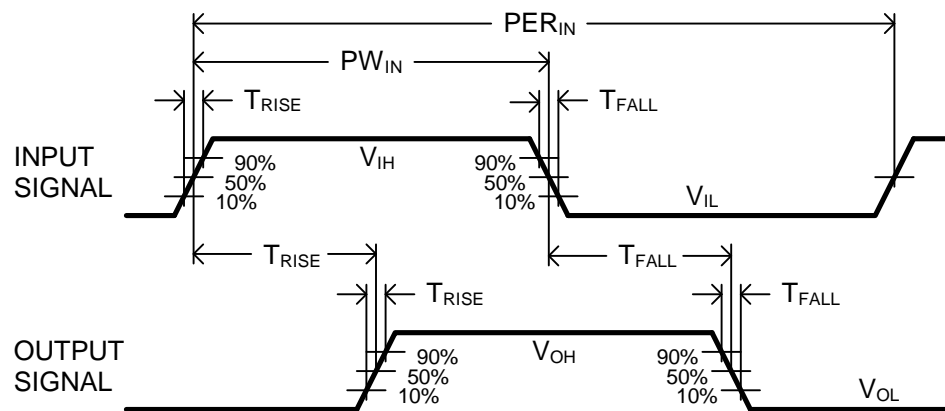
**Source Impedance:** 50Ω Max.  
**Rise/Fall Time:** 3.0 ns Max. (measured at 10% and 90% levels)

**Pulse Width ( $T_D \leq 75\text{ns}$ ):**  $PW_{IN} = 100\text{ns}$   
**Period ( $T_D \leq 75\text{ns}$ ):**  $PER_{IN} = 1000\text{ns}$   
**Pulse Width ( $T_D > 75\text{ns}$ ):**  $PW_{IN} = 2 \times T_D$   
**Period ( $T_D > 75\text{ns}$ ):**  $PER_{IN} = 10 \times T_D$

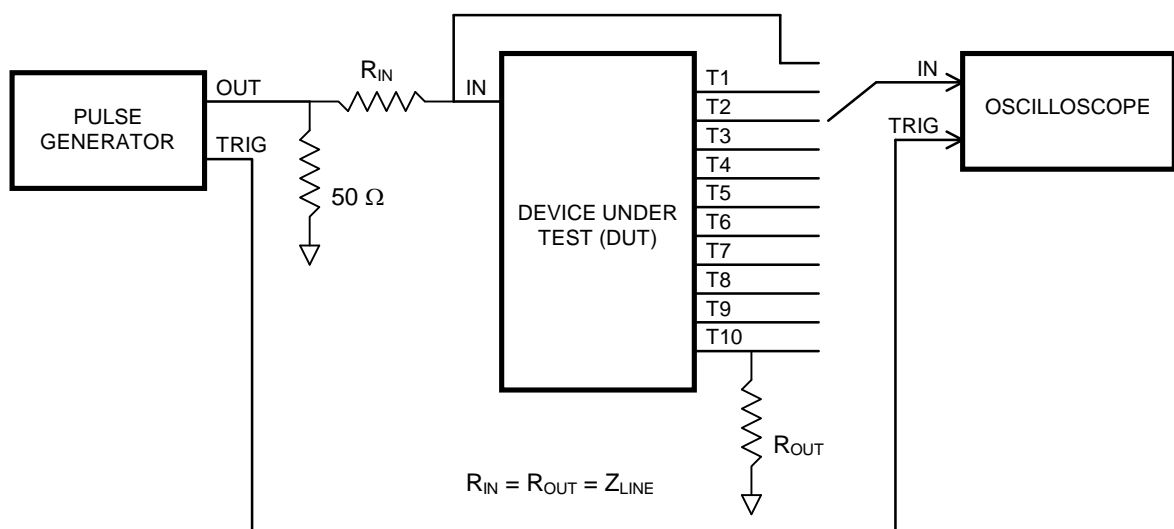
#### OUTPUT:

**$R_{load}$ :** 10MΩ  
 **$C_{load}$ :** 10pf  
**Threshold:** 50% (Rising & Falling)

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



Timing Diagram For Testing



Test Setup