

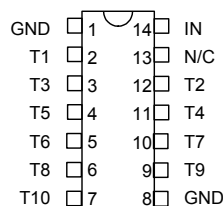
# 10-TAP DIP/SMD DELAY LINE

$T_D/T_R = 5$   
(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.

## 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 nanoseconds (ns)  
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      |

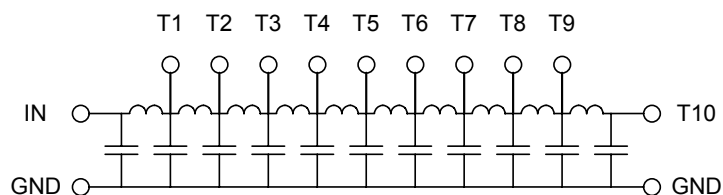
## DELAY SPECIFICATIONS

| $T_D$<br>(ns) | $T_1$<br>(ns) | $T_R$<br>(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  $\pm 2\text{ns}$ , whichever is greater  
Tolerance on  $T_1 = \pm 5\%$  or  $\pm 1\text{ns}$ , whichever is greater  
"N/A" indicates that delay is not available at this Z

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## FUNCTIONAL DIAGRAM

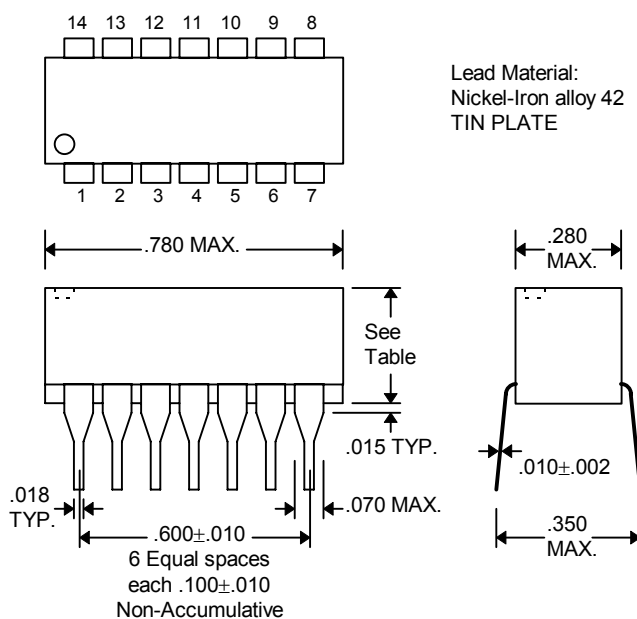


## MOUNTING HEIGHT CODES

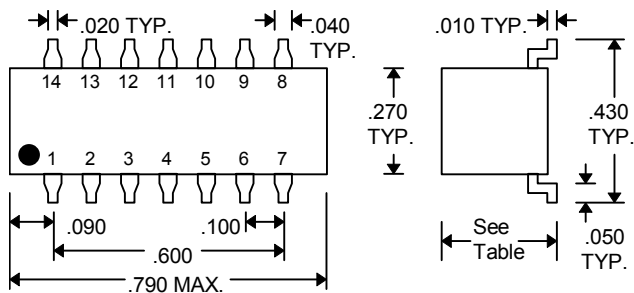
| CODE | HEIGHT (MAX) | DIP | SMD |
|------|--------------|-----|-----|
| A    | 0.187        | Yes | No  |
| B    | 0.240        | Yes | Yes |
| C    | 0.290        | Yes | Yes |

**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:

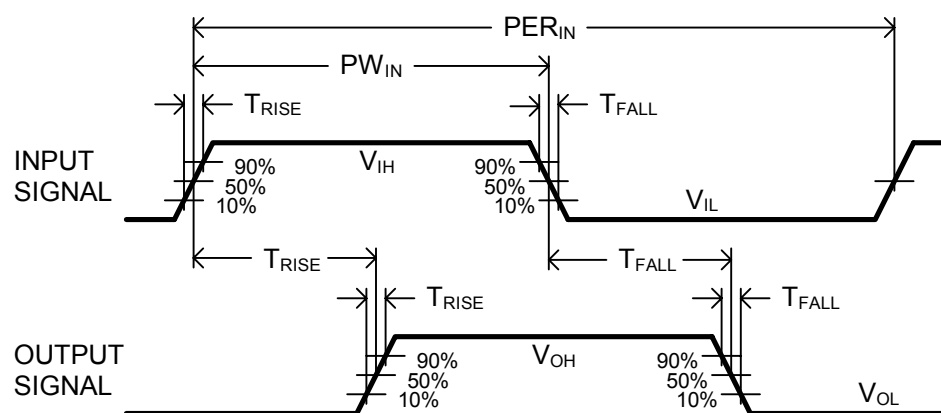
**Ambient Temperature:**  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
**Input Pulse:** High = 3.0V typical  
 Low = 0.0V typical  
**Source Impedance:**  $50\Omega$  Max.  
**Rise/Fall Time:** 3.0 ns Max. (measured at 10% and 90% levels)

#### OUTPUT:

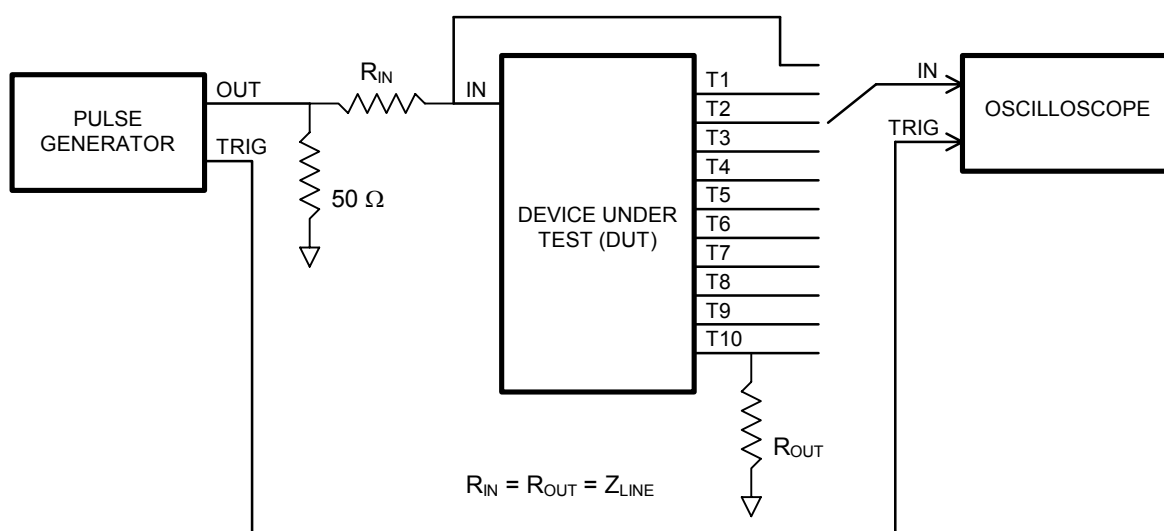
**$R_{\text{load}}$ :**  $10\text{M}\Omega$   
 **$C_{\text{load}}$ :** 10pf  
**Threshold:** 50% (Rising & Falling)

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

**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**