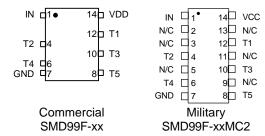
5-TAP, TTL-INTERFACED FIXED DELAY LINE (SERIES SMD99F)



FEATURES

- · Five equally spaced outputs
- Designed for surface mounting
- Low profile (0.175 maximum height)
- · Input & outputs fully TTL interfaced & buffered
- 10 T²L fan-out capability

PACKAGES



FUNCTIONAL DESCRIPTION

The SMD99F-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 5025, 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

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

PIN DESCRIPTIONS

total delay, and the inherent delay from IN to T1 is nominally 3.5ns. For dash numbers greater than or equal to 5025, 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.

SERIES SPECIFICATIONS

Minimum input pulse width: 40% of total delay

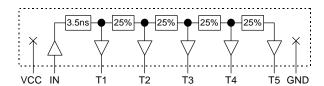
Output rise time: 2ns typical
Supply voltage: 5VDC ± 5%

• Supply current: I_{CCL} = 32ma typical

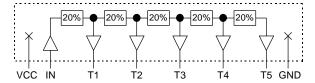
 $I_{CCH} = 7$ ma typical

• Operating temperature: 0° to 70° C

Temp. coefficient of total delay: 100 PPM/°C



Functional diagram for dash numbers < 5025



Functional diagram for dash numbers >= 5025

DASH NUMBER SPECIFICATIONS

Part	Total	Delay Per		
Number	Delay (ns)	Tap (ns)		
SMD99F-5004	4 ± 1.0 *	1.0 ± 0.5		
SMD99F-5006	6 ± 1.0 *	1.5 ± 0.5		
SMD99F-5008	8 ± 2.0 *	2.0 ± 1.0		
SMD99F-5010	10 ± 2.0 *	2.5 ± 1.0		
SMD99F-5012	12 ± 2.0 *	3.0 ± 1.0		
SMD99F-5016	16 ± 2.0 *	4.0 ± 1.5		
SMD99F-5020	20 \pm 3.0 *	5.0 ± 2.0		
SMD99F-5025	25 ± 3.0	5.0 ± 2.0		
SMD99F-5030	30 ± 3.0	6.0 ± 2.0		
SMD99F-5035	35 ± 3.0	7.0 ± 2.0		
SMD99F-5040	40 ± 3.0	8.0 ± 2.0		
SMD99F-5045	45 ± 3.0	9.0 ± 3.0		
SMD99F-5050	50 ± 3.0	10.0 ± 3.0		
SMD99F-5060	60 ± 3.0	12.0 ± 3.0		
SMD99F-5075	75 ± 4.0	15.0 ± 3.0		
SMD99F-5100	100 ± 5.0	20.0 ± 3.0		
SMD99F-5125	125 ± 6.5	25.0 ± 3.0		
SMD99F-5150	150 ± 7.5	30.0 ± 3.0		
SMD99F-5175	175 ± 8.0	35.0 ± 4.0		
SMD99F-5200	200 ± 10.0	40.0 ± 4.0		
SMD99F-5250	250 ± 12.5	50.0 ± 5.0		

^{*} Total delay is referenced to first tap output Input to first tap = 3.5ns ± 1 ns

NOTE: Any dash number between 5004 and 5250 not shown is also available.

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APPLICATION NOTES

HIGH FREQUENCY RESPONSE

The SMD99F 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 SMD99F relies on a stable power supply to produce repeatable delays within the stated tolerances. A 0.1uf capacitor from VCC to GND, located as close as possible to the VCC pin, is recommended. A wide VCC trace and a clean ground plane should be used.

DEVICE SPECIFICATIONS

TABLE 1: ABSOLUTE MAXIMUM RATINGS

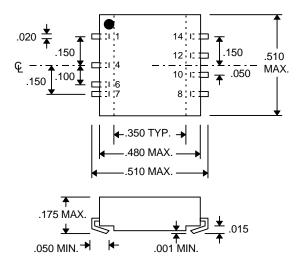
PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTES
DC Supply Voltage	V_{CC}	-0.3	7.0	V	
Input Pin Voltage	V_{IN}	-0.3	V _{DD} +0.3	V	
Storage Temperature	T_{STRG}	-55	150	С	
Lead Temperature	T_{LEAD}		300	С	10 sec

TABLE 2: DC ELECTRICAL CHARACTERISTICS

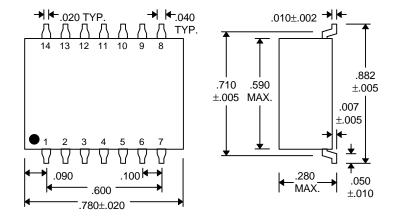
(0C to 70C, 4.75V to 5.25V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
High Level Output Voltage	V _{OH}	2.5	3.4		V	$V_{CC} = MIN, I_{OH} = MAX$
						$V_{IH} = MIN, V_{IL} = MAX$
Low Level Output Voltage	V_{OL}		0.35	0.5	V	$V_{CC} = MIN, I_{OL} = MAX$
						$V_{IH} = MIN, V_{IL} = MAX$
High Level Output Current	I _{OH}			-1.0	mA	
Low Level Output Current	I_{OL}			20.0	mA	
High Level Input Voltage	V_{IH}	2.0			V	
Low Level Input Voltage	V_{IL}			0.8	V	
Input Clamp Voltage	V_{IK}			-1.2	V	$V_{CC} = MIN, I_I = I_{IK}$
Input Current at Maximum	I_{IHH}			0.1	mΑ	$V_{CC} = MAX, V_I = 7.0V$
Input Voltage						
High Level Input Current	I_{IH}			20	μΑ	$V_{CC} = MAX, V_I = 2.7V$
Low Level Input Current	I _{IL}			-0.6	mA	$V_{CC} = MAX, V_I = 0.5V$
Short-circuit Output Current	I _{os}	-60		-150	mA	$V_{CC} = MAX$
Output High Fan-out				25	Unit	
Output Low Fan-out				12.5	Load	

PACKAGE DIMENSIONS



SMD99F-xx (Commercial)



SMD99F-xxMC2 (Military)

DELAY LINE AUTOMATED TESTING

TEST CONDITIONS

INPUT: OUTPUT:

Ambient Temperature: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ **Load:** 1 FAST-TTL Gate

Supply Voltage (Vcc): $5.0V \pm 0.1V$ **C**_{load}: $5pf \pm 10\%$

Input Pulse: High = $3.0V \pm 0.1V$ Threshold: 1.5V (Rising & Falling)

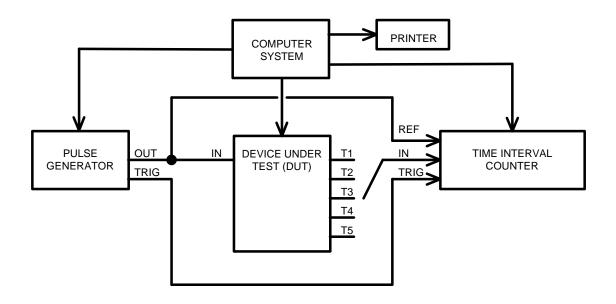
 $\label{eq:Low} \begin{array}{ll} \text{Low} = 0.0 \text{V} \pm 0.1 \text{V} \\ \text{Source Impedance:} & 50 \Omega \text{ Max}. \end{array}$

Rise/Fall Time: 3.0 ns Max. (measured

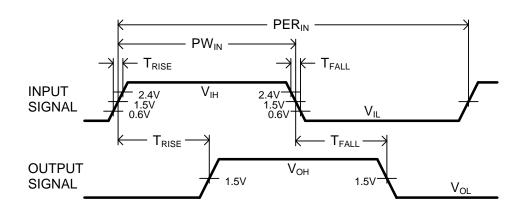
between 0.6V and 2.4V)

Pulse Width: $PW_{IN} = 1.5 \times Total Delay$ Period: $PER_{IN} = 10 \times Total Delay$

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