

8961724 TEXAS INSTR (LIN/INTFC)

91D 76022 D

**SN55326, SN55327
MEMORY CORE DRIVERS**

D1496, SEPTEMBER 1973—REVISED SEPTEMBER 1986

Common Features

- Inputs Compatible with TTL Logic Levels
- Minimum Time Skew Between Strobe and Output-Current Rise
- Compatible with High-Speed Magnetic Core Memories

SN55326 Features

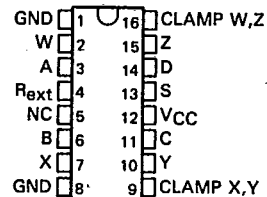
- Quad Positive-OR Sink Driver
- 600-mA Output Current Sink Capability
- 24-V Output Capability
- Output Clamp Voltage Variable to 24 V

SN55327 Features

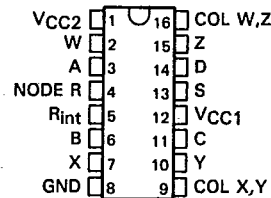
- Quad Positive-OR Source Driver
- 600-mA Output Source Capability
- VCC2 Voltage Variable to 24 V
- Output Capable of Swinging Between VCC2 and Ground

**SN55326 . . . J PACKAGE
(TOP VIEW)**

T-52-15



**SN55327 . . . J PACKAGE
(TOP VIEW)**



NC—No internal connection

description

The SN55326 and SN55327 are monolithic integrated circuit quadruple memory core drivers. These devices accept standard TTL decoder input signals and provide high-current and high-voltage output levels suitable for driving magnetic memory elements. Output transistor selection is determined by using one of the four address inputs and the common timing strobe.

The SN55326 memory core driver can sink up to 600 milliamperes and operate from a single 5-volt supply. Each driver is similar to the sink drivers of the SN55325. The four output transistors share a common base-drive resistor and it is recommended that only one of the four driver gates be selected at a time. Output-transistor base current may be increased by connecting an external resistor between R_{ext} (pin 4) and V_{CC}. Each output collector is protected from voltage surges during inductive switching by a clamping diode in parallel with its internal pull-up resistor. The two clamp pins may be returned to a power supply of from 4.5 volts to 24 volts.

The SN55327 memory core switch can source or sink up to 600 milliamperes and operate from two supplies; one of five volts and the other from 4.5 volts to 24 volts. Each switch is similar to the source drivers of the SN55325. They can function as either sink drivers or source drivers since the voltages at the output transistor terminals are capable of swinging between V_{CC2} and ground. The four output transistors share a common base-drive resistor and it is recommended that only one of the four outputs be selected at a time. An internal base-drive resistor is available on the chip and can be used by connecting Node R (pin 4) to R_{int} (pin 5). This resistor provides adequate base current to the output transistors for output sink currents

FUNCTION TABLE

INPUTS					OUTPUTS			
ADDRESS				STROBE	W	X	Y	Z
A	B	C	D	S				
L	H	H	H	L	ON	OFF	OFF	OFF
H	L	H	H	L	OFF	ON	OFF	OFF
H	H	L	H	L	OFF	OFF	ON	OFF
H	H	H	L	L	OFF	OFF	OFF	ON
H	H	H	H	X	OFF	OFF	OFF	OFF
X	X	X	X	H	OFF	OFF	OFF	OFF

H = high level, L = low level, X = irrelevant

NOTE: Not more than one output is to be on at any one time.

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**SN55326, SN55327
MEMORY CORE DRIVERS**

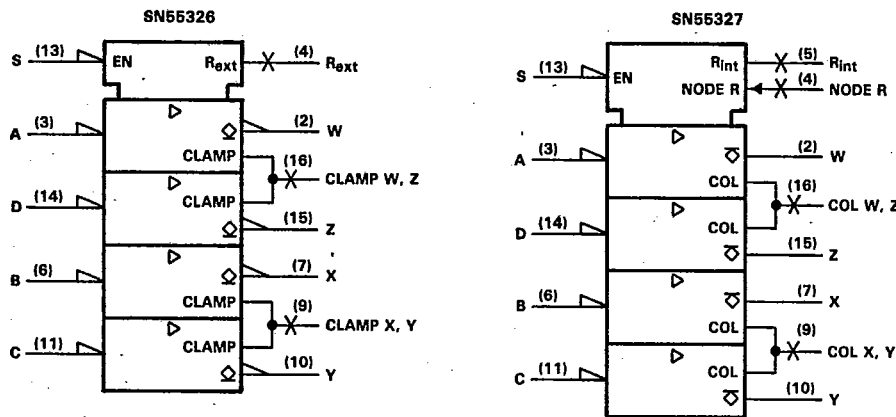
T-52-15

description (continued)

up to 375 milliamperes with VCC2 at 15 volts or 600 milliamperes with VCC2 at 24 volts. Base current can be regulated to within ± 5 percent by substituting for this resistor an external resistor connected between Node R (pin 4) and VCC2 with R_{int} (pin 5) remaining open. This method is preferable in high-duty-cycle, high-power applications since the power dissipated in this resistor is outside the package. When a source current and VCC2 voltage other than the above values are required, it is recommended that the base drive be supplied through an external resistor of the appropriate value calculated using Equation 1 shown in the SN55325 data sheet.

The SN55326 and SN55327 circuits are characterized for operation over the full military temperature range of -55°C to 125°C .

logic symbols†



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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 Memory Interface Circuits

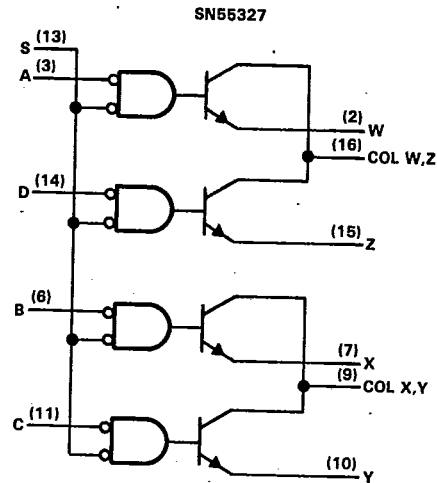
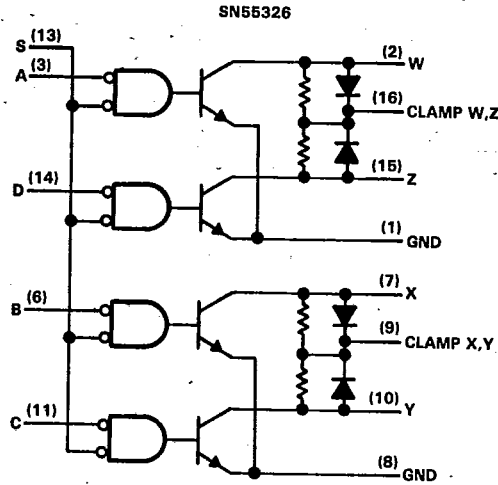
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91D 76024 D

**SN55326, SN55327
MEMORY CORE DRIVERS**

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logic diagrams (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

	SN55326	SN55327	UNIT
Supply voltage, V _{CC} or V _{CC1} (see Note 1)	7	7	V
Supply voltage, V _{CC2}		25	V
Input voltage, any address or strobe	5.5	5.5	V
Output collector voltage	25	25	V
Output clamp voltage	25		V
Output collector current	750	750	mA
Continuous total dissipation at (or below) 25°C free-air temperature (see Note 2)	1375	1375	mW
Operating free-air temperature range	-55 to 125	-55 to 125	°C
Storage temperature range	-65 to 150	-65 to 150	°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds	300	300	°C

NOTES: 1. Voltage values are with respect to the network ground terminal(s).
2. For operation above 25°C free-air temperature, derate linearly at the rate of 11.0 mW/°C.

recommended operating conditions

	SN55326			SN55327			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V _{CC} or V _{CC1}	4.5	5	5.5	4.5	5	5.5	V
Supply voltage, V _{CC2}				4.5		24	V
High-level input voltage, V _{IH}	2			2			V
Low-level input voltage, V _{IL}			0.8			0.8	V
Output collector voltage			24			24	V
Output clamp voltage, V _(clamp)	4.5		24				V
Output collector current			600			600	mA
Operating free-air temperature, T _A	-55		125	-55		125	°C

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**SN55326
MEMORY CORE DRIVER**

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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	SN55326			UNIT
		MIN	TYP‡	MAX	
V _{IK} Input clamp voltage	V _{CC} = 4.5 V, I _I = -10 mA, T _A = 25°C	-1	-1.7		V
V _{OH} High-level output voltage	V _{CC} = 4.5 V, I _O = 0	19	23		V
V _(sat) Saturation voltage	V _{CC} = 4.5 V, R _L = 23 Ω to V _{CC} , I _(sink) ≈ 600 mA [§] , See Notes 3 and 4	Full range		0.9	V
	T _A = 25°C	0.43	0.7		
V _{F(clamp)} Output-clamp-diode forward voltage	V _(clamp) = 0, I _(clamp) = -10 mA, T _A = 25°C			1.5	V
I _(clamp) Output-clamp-current, one output on	I _(sink) = 50 mA, T _A = 25°C	5	7		mA
I _I Input current at maximum input voltage	V _I = 5.5 V	Address	1		mA
		Strobe	4		
I _{IH} High-level input current	V _I = 2.4 V	Address	40		μA
		Strobe	160		
I _{IL} Low-level input current	V _I = 0.4 V	Address	-1	-1.6	mA
		Strobe	-4	-6.4	
I _{CC(off)} Supply current, all outputs off	All inputs at 5 V, T _A = 25°C	18	25		mA
I _{CC(on)} Supply current, one output on	I _(sink) = 50 mA, T _A = 25°C	58	75		mA

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER [¶]	TO (OUTPUT)	TEST CONDITIONS [§]	MIN	TYP	MAX	UNIT
t _{PLH}	W, X, Y, or Z	V _S = V _(clamp) = 15 V, R _L = 24 Ω, C _L = 25 pF, See Figure 3	40	50		ns
t _{PHL}			35	50		
t _{TLH}	W, X, Y, or Z	See Figure 3	10	15		ns
t _{THL}			15	20		
t _s	W, X, Y, or Z		30	35		ns
V _{OH}	W, X, Y, or Z	V _S = V _(clamp) = 24 V, I _(sink) = 500 mA, See Figure 3	V _S -1			mV

† Unless otherwise noted, V_{CC} = 5.5 V, V_(clamp) = 24 V. See Figure 1.

‡ All typical values are at T_A = 25°C.

§ Under these conditions, not more than one output is to be on at any one time.

¶ t_{PLH} = propagation delay time, low-to-high-level output

t_{PHL} = propagation delay time, high-to-low-level output

t_{TLH} = transition time, low-to-high-level output

t_{THL} = transition time, high-to-low-level output

t_s = storage time

V_{OH} = high-level output voltage (after switching)

NOTES: 3. These parameters must be measured using pulse techniques. t_w = 200 μs, duty cycle ≤ 2%.

4. R_{ext} is connected to V_{CC} through a 40-Ω resistor.

Memory Interface Circuits

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91D 76026 D

SN55327
MEMORY CORE DRIVER

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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	SN55327			UNIT	
		MIN	TYP‡	MAX		
V _{IK} Input clamp voltage	V _{CC} = 4.5 V, I _I = -10 mA, T _A = 25°C	-1	-1.7		V	
I _(off) Collectors terminal off-state current	V _{CC1} = 4.5 V, V _(col) = 24 V, T _A = 25°C	Full range			500	µA
					150	
V _(sat) Saturation voltage	V _{CC1} = 4.5 V, V _O = 0, R _L = 25 Ω to 15 V, I _(source) ≈ -600 mA [§] , See Notes 3 and 5, T _A = 25°C	Full range			0.9	V
		0.43	0.7			
I _I Input current at maximum input voltage	Address: V _I = 5.5 V, Strobe				1	mA
					4	
I _{IH} High-level input current	Address: V _I = 2.4 V, Strobe				40	µA
					160	
I _{IL} Low-level input current	Address: V _I = 0.4 V, Strobe				-1	mA
					-1.6	
I _{CC(off)} Supply current, all outputs off	From V _{CC1} , From V _{CC2} , All inputs at 5 V, T _A = 25°C				-4	mA
					-6.4	
I _{CC(on)} Supply current, one output on	From V _{CC1} , From V _{CC2} , V _(col) = 6 V, T _A = 25°C, I _(source) = -50 mA, See Note 3				7	mA
					10	
					13	mA
					20	
					8	mA
					12	
					36	mA
					55	

switching characteristics, V_{CC1} = 5 V, T_A = 25°C

PARAMETER†	TO (OUTPUT)	TEST CONDITIONS [§]	MIN	TYP	MAX	UNIT	
t _{PLH}	Collectors	V _S = V _{CC2} = 15 V, R _L = 24 Ω, C _L = 25 pF, See Figure 3 and Note 5		35	55	ns	
t _{PHL}	W, Z or X, Y			30	55		
t _{TLH}	W, X, Y, or Z	V _(col) = V _{CC2} = 20 V, R _L = 100 Ω, C _L = 25 pF, See Figure 4 and Note 5				30	ns
t _{THL}						10	
VOH	Collectors	V _S = V _{CC2} = 24 V, R _L = 47 Ω, C _L = 25 pF, I _(sink) = 500 mA, See Figure 3 and Note 5	V _S -1			mV	

† Unless otherwise noted, V_{CC1} = 5.5 V, V_{CC2} = 24 V. See Figure 2.

‡ All typical values are at T_A = 25°C.

§ Under these conditions, not more than one output is to be on at any one time.

¶ t_{PLH} = propagation delay time, low-to-high-level output

t_{PHL} = propagation delay time, high-to-low-level output

t_{TLH} = transition time, low-to-high-level output

t_{THL} = transition time, high-to-low-level output

VOH = high-level output voltage (after switching)

NOTES: 3. These parameters must be measured using pulse techniques. t_w = 200 µs, duty cycle ≤ 2%.

5. A 350-Ω resistor is connected between node R (pin 4) and V_{CC2} (pin 1) with R_{int} (pin 5) open.

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Memory Interface Circuits



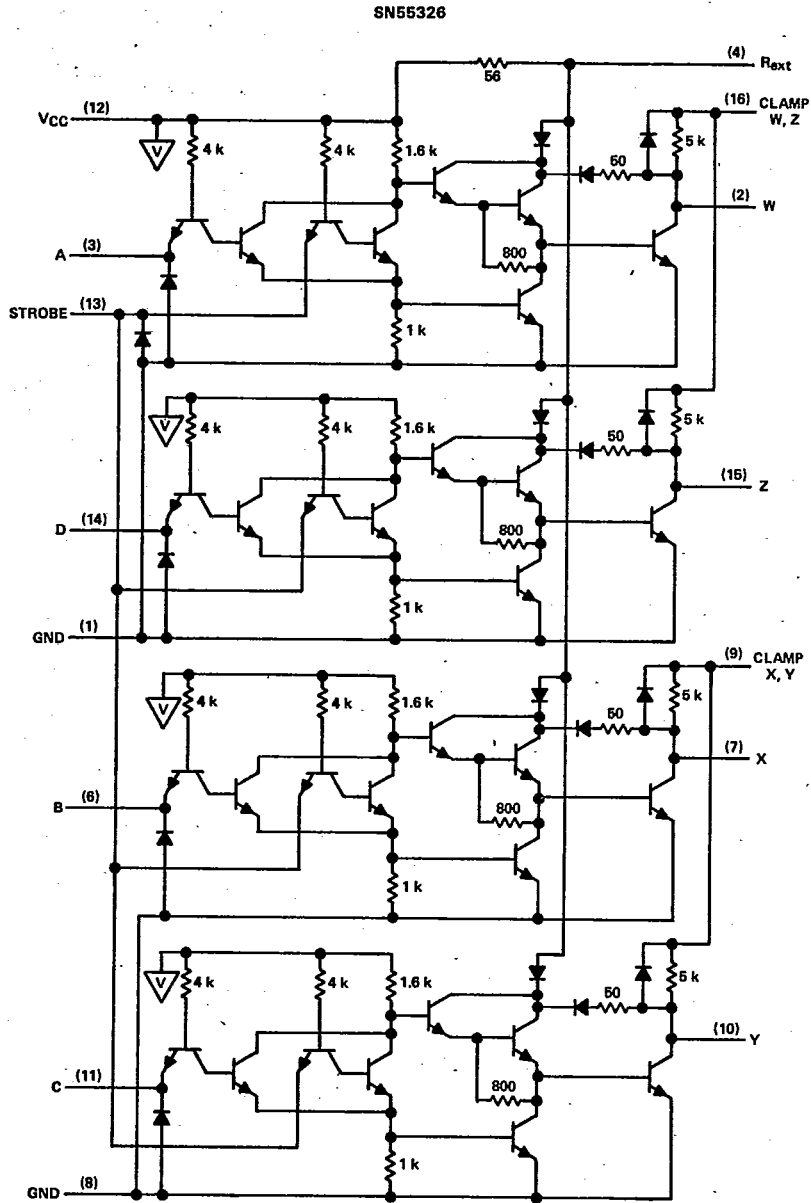
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**SN55326
MEMORY CORE DRIVER**

T-5a-15

schematic



Resistor values shown are nominal and in ohms.



Memory Interface Circuits

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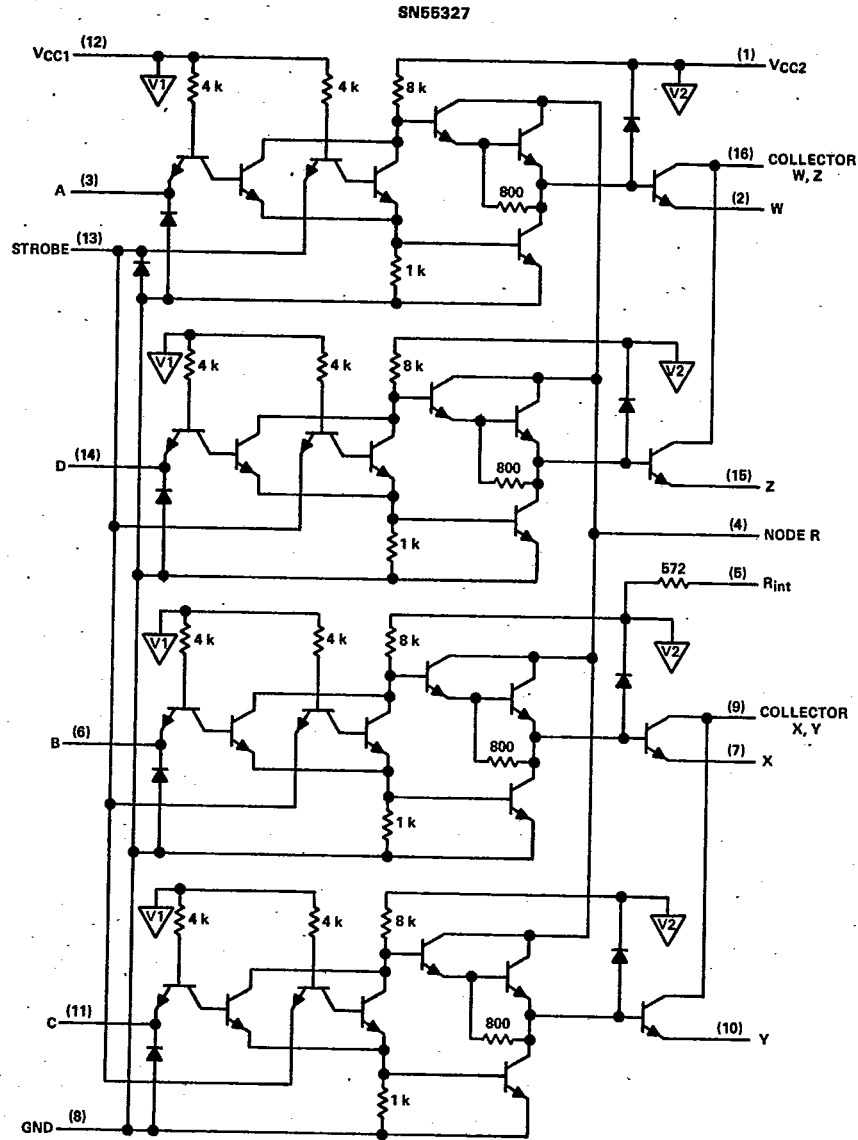
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**SN55327
MEMORY CORE DRIVER**

T-52-15

schematic



Resistor values shown are nominal and in ohms.



Memory Interface Circuits

**TEXAS
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SN55326, SN55327
MEMORY CORE DRIVERS

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PARAMETER MEASUREMENT INFORMATION

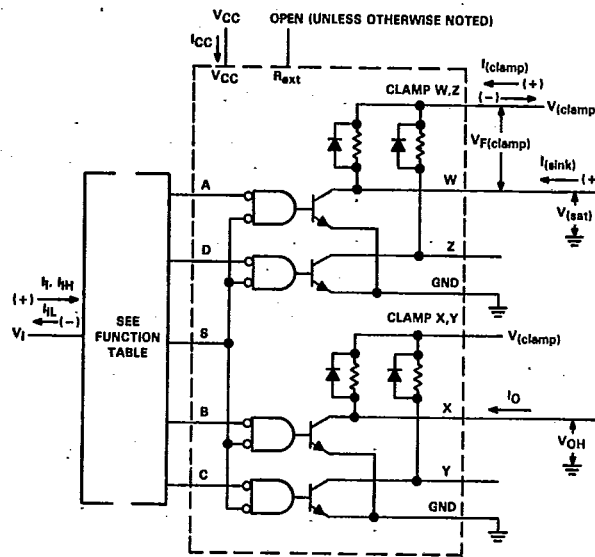
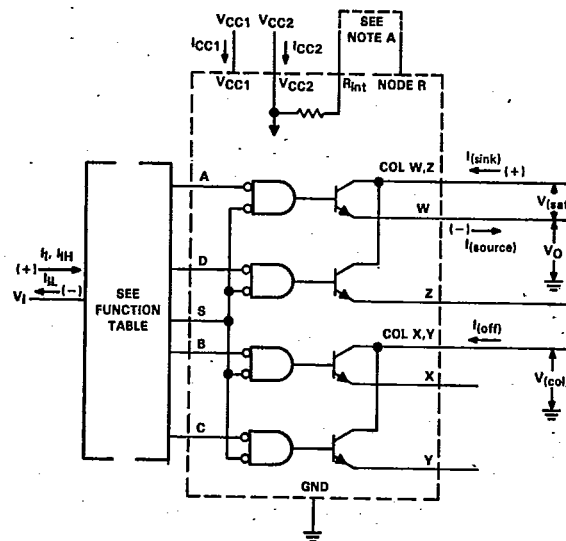


FIGURE 1. GENERALIZED TEST CIRCUIT FOR SN55326



NOTE A: R_{int} is connected to Node R unless otherwise noted.

FIGURE 2. GENERALIZED TEST CIRCUIT FOR SN55327



Memory Interface Circuits

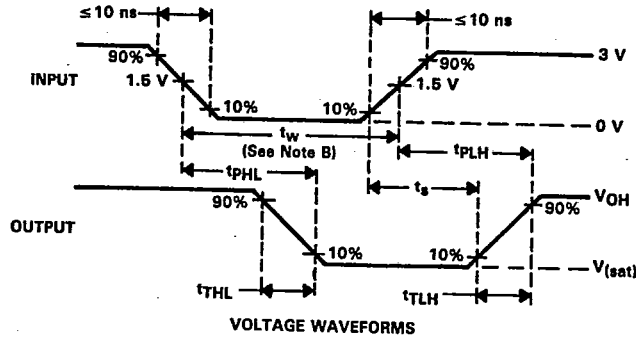
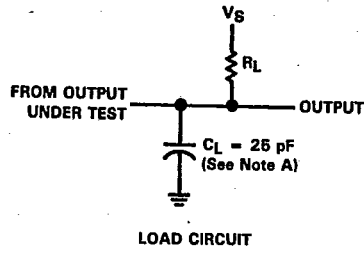
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SN55326, SN55327
MEMORY CORE DRIVERS

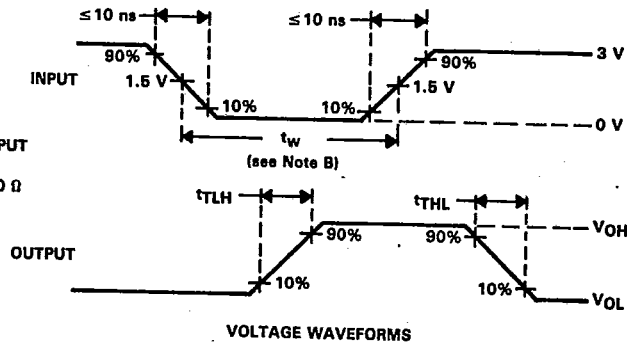
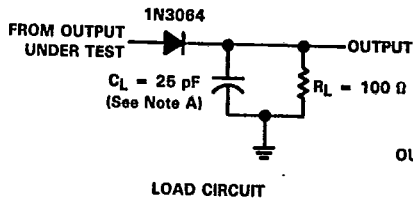
T-52-15

PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: $Z_{out} = 50 \Omega$. For testing V_{OH} (after switching), $t_w = 40 \mu s$, $PRR \leq 12.5 \text{ kHz}$. For all other tests, $t_w = 200 \text{ ns}$, duty cycle $\leq 1\%$.

FIGURE 3. SWITCHING TIMES



NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: $Z_{out} = 50 \Omega$, $t_w = 200 \text{ ns}$, duty cycle $\leq 1\%$.

FIGURE 4. SWITCHING TIMES

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