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MSI

TYPES SN74S340, SN74S341, SN74S344 OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

BULLETIN NO. DL-S 12710, JUNE 1979 - REVISED AUGUST 1979

	I_{OL} Typical (Sink Current)	I_{OH} Typical (Source Current)	Typical Propagation Delay Times	Typical Enable Times	Typical Disable Times
'S340	64 mA	15 mA	8 ns	17 ns	11 ns
'S341	64 mA	15 mA	9 ns	14 ns	16 ns
'S344	64 mA	15 mA	9 ns	14 ns	14 ns

- Pin-for-Pin Compatible With SN74S240 Series
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Typical Input and Output Capacitances, ≤ 10 pF
- 300 mV Guaranteed Hysteresis at Inputs Improves Noise Margins

description

These octal buffers and line drivers are designed specifically to improve both the performance and density of three-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. The designer has a choice of selected combinations of inverting and noninverting outputs, symmetrical \bar{G} (active-low output control) inputs, and complementary G and \bar{G} inputs. These devices feature high fan-out, improved fan-in, 700-mV typical noise margin, and the capability of driving lines with terminations as low as 133 ohms.

SN74S340 FUNCTION TABLE

$1\bar{G}$	$2\bar{G}$	1Y OUTPUTS	2Y OUTPUTS
H	H	Z	Z
H	L	Z	Enabled (Inverting)
L	H	Enabled (Inverting)	Z
L	L	Enabled (Inverting)	Enabled (Inverting)

SN74S341 FUNCTION TABLE

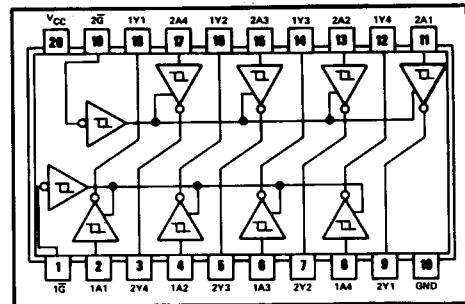
$1\bar{G}$	$2\bar{G}$	1Y OUTPUTS	2Y OUTPUTS
H	H	Z	Enabled
H	L	Z	Z
L	H	Enabled	Enabled
L	L	Enabled	Z

SN74S344 FUNCTION TABLE

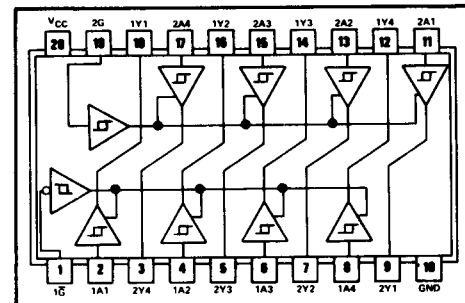
$1\bar{G}$	$2\bar{G}$	1Y OUTPUTS	2Y OUTPUTS
H	H	Z	Z
H	L	Z	Enabled
L	H	Enabled	Z
L	L	Enabled	Enabled

Z \equiv high impedance (output off)

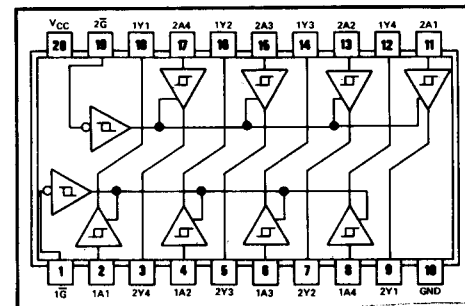
SN74S340 ... J OR N PACKAGE
(TOP VIEW)



SN74S341 ... J OR N PACKAGE
(TOP VIEW)



SN74S344 ... J OR N PACKAGE
(TOP VIEW)

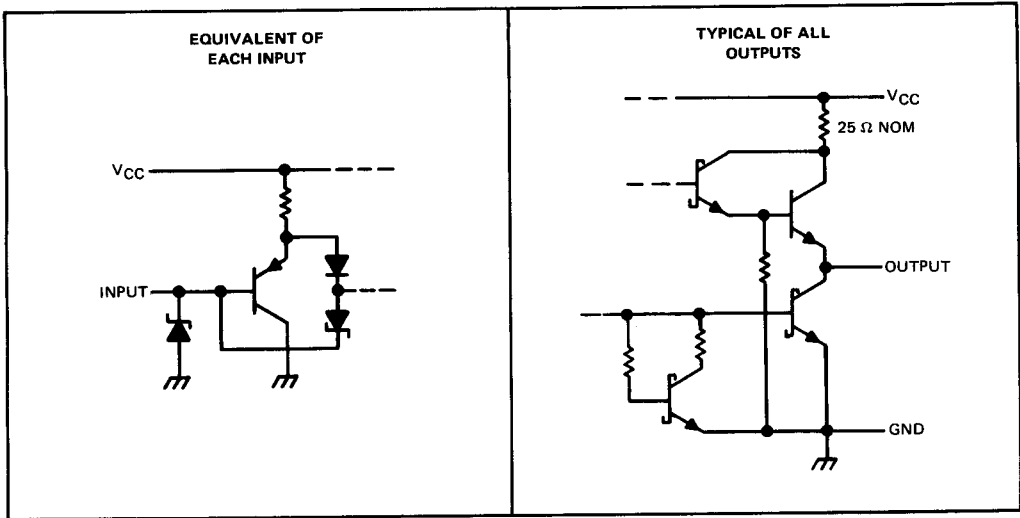


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TYPES SN74S340, SN74S341, SN74S344

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

schematics of inputs and outputs



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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	5.5 V
Off-state output voltage	5.5 V
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C

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recommended operating conditions

PARAMETER	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC} (see Note 1)	4.75	5	5.25	V
High-level output current, I_{OH}			-15	mA
Low-level output current, I_{OL}			64	mA
Operating free-air temperature, T_A	0		70	°C

NOTE 1: Voltage values are with respect to network ground terminal.

TYPES SN74S340, SN74S341, SN74S344

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

electrical characteristics over recommended operating conditions (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	SN74S340			SN74S341, SN74S344			UNIT	
		MIN	TYP‡	MAX	MIN	TYP‡	MAX		
V _{T+}	Positive-going threshold voltage	1.3	1.5	1.9	1.3	1.5	1.9	V	
V _{T-}	Negative-going threshold voltage	0.6	0.85	1.05	0.6	0.85	1.05	V	
	Hysteresis (V _{T+} - V _{T-})	0.3	0.65		0.3	0.65		V	
V _{IK}	Input clamp voltage	V _{CC} = MIN, I _I = -18 mA			-1.2			-1.2	V
V _{OH}	High-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.5 V, I _{OH} = -1 mA		2.4		2.4		V	
		V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.5 V, I _{OH} = -3 mA		2.4 3.4		2.4 3.4			
		V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.5 V, I _{OH} = MAX		2		2			
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.5 V, I _{OL} = MAX		0.55		0.55		V	
I _{OZH}	Off-state output current, high-level voltage applied	V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0 V, V _O = 2.4 V		50		50		μA	
I _{OZL}	Off-state output current, low-level voltage applied	V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0 V, V _O = 0.5 V		-50		-50			
I _I	Input current at maximum input voltage	V _{CC} = MAX, V _I = 5.5 V		1		1		mA	
I _{IH}	High-level input current, any input	V _{CC} = MAX, V _I = 2.7 V		50		50		μA	
I _{IL}	Low-level input current	Any A	V _{CC} = MAX, V _I = 0.5 V		-250		-250		μA
		Any G or G	V _{CC} = MAX, V _I = 0.5 V		-250		-250		μA
I _{OS}	Short-circuit output current*	V _{CC} = MAX		-50		-225		mA	
I _{CC}	Supply current	V _{CC} = MAX, Outputs high		75		135		mA	
		V _{CC} = MAX, Outputs low		170		180			
		V _{CC} = MAX, Outputs disabled		110		145			

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

* Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

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

PARAMETER	TEST CONDITIONS	SN74S340		SN74S341		SN74S344		UNIT	
		MIN	TYP	MAX	MIN	TYP	MAX		
t _{PLH}	C _L = 50 pF, R _L = 90 Ω, See Note 2	7	11		10	15	10	15	ns
t _{PHL}		8	12		8	12	8	12	ns
t _{PZL}		17	25		14	21	14	21	ns
t _{PZH}		11	16		11	17	11	17	ns
t _{PLZ}	C _L = 5 pF, R _L = 90 Ω, See Note 2	11	17		16	25	14	23	ns
t _{PHZ}		5	9		8	13	5	9	ns

NOTE 2: Load circuit and voltage waveforms are shown on page 3-10.

t_{PLH} ≡ Propagation delay time, low-to-high-level input

t_{PHL} ≡ Propagation delay time, high-to-low-level input

t_{PZL} ≡ Output enable time to low level

t_{PZH} ≡ Output enable time to high level

t_{PLZ} ≡ Output disable time from low level

t_{PHZ} ≡ Output disable time from high level