

	I _{OH} Typical (Source Current)	I _{OL} Typical (Sink Current)		Typical Propagation Delay Times	Typical Enable Times	Typical Disable Times
SN54S*	-12 mA	48 mA	'S740	4 ns	10 ns	6 ns
			'S741	6 ns	10 ns	11 ns
SN74S*	-15 mA	64 mA	'S744	6 ns	10 ns	10 ns

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- P-N-P Inputs Reduce D-C Loading
- Typical Input and Output Capacitances ≤ 10 pF

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, and less than 10-picofarad capacitance at inputs and outputs.

'S740 FUNCTION TABLE

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

'S741 FUNCTION TABLE

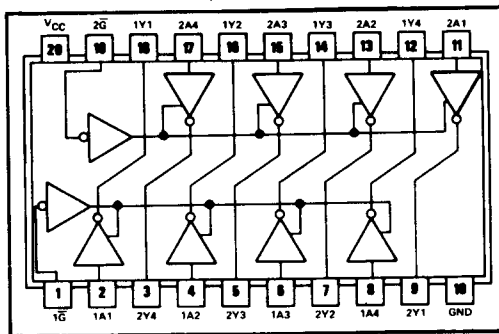
$\bar{1G}$	$\bar{2G}$	1Y OUTPUTS	2Y OUTPUTS
H	H	Z	Enabled
H	L	Z	Z
L	H	Enabled	Enabled
L	L	Enabled	Z

'S744 FUNCTION TABLE

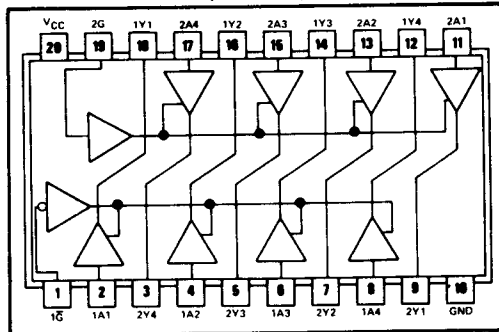
$\bar{1G}$	$\bar{2G}$	1Y OUTPUTS	2Y OUTPUTS
H	H	Z	Z
H	L	Z	Enabled
L	H	Enabled	Z
L	L	Enabled	Enabled

Z ≡ high impedance (output off)

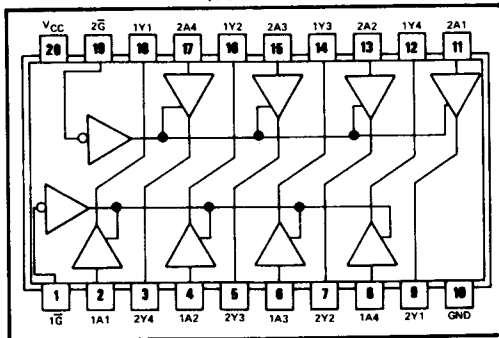
SN54S740 ... J PACKAGE
SN74S740 ... J OR N PACKAGE
(TOP VIEW)



SN54S741 ... J PACKAGE
SN74S741 ... J OR N PACKAGE
(TOP VIEW)



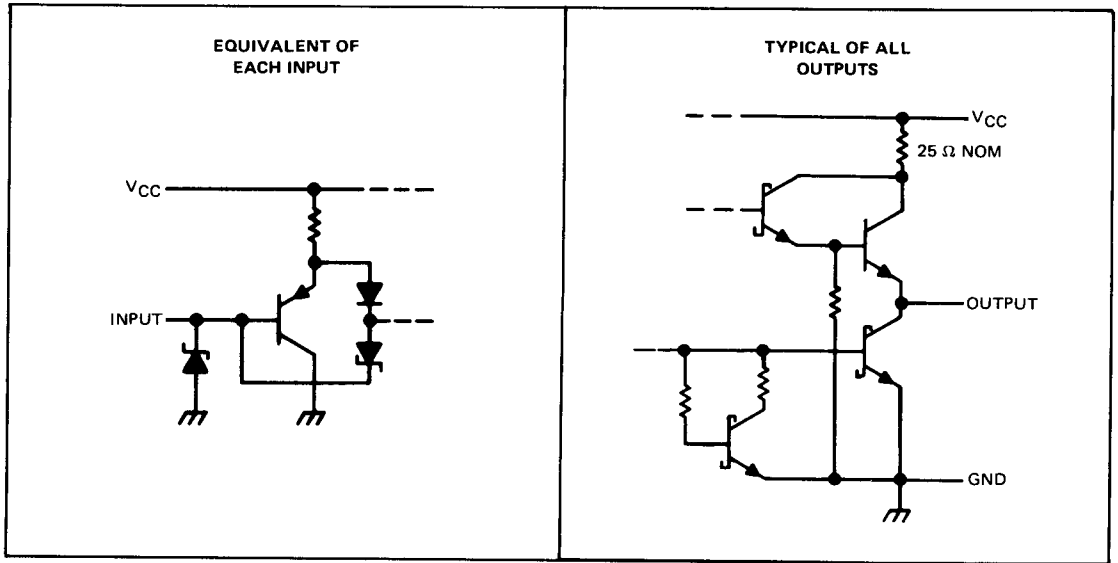
SN54S744 ... J PACKAGE
SN54S744 ... J OR N PACKAGE
(TOP VIEW)



TYPES SN54S740, SN54S741, SN54S744, SN74S740, SN74S741, SN74S744

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: SN54LS'	-55°C to 125°C
SN74LS'	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

PARAMETER	SN54S'			SN74S'			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC} (see Note 1)	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			-12			-15	mA
Low-level output current, I_{OL}			48			64	mA
Operating free-air temperature, T_A	-55		125	0		70	°C

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

TYPES SN54S740, SN54S741, SN54S744, SN74S740, SN74S741, SN74S744

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

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

PARAMETER		TEST CONDITIONS†	'S740			'S741, 'S744			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V _{IH}	High-level input voltage		2			2			V
V _{IL}	Low-level input voltage					0.8			V
V _{IK}	Input clamp voltage					-1.2			V
V _{OH}	High-level output voltage	V _{CC} = MIN, I _I = -18 mA	2.4			2.4			V
		V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = -1 mA	2.4			3.4			
		V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = -3 mA	2.4			2.4			
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 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 _O = 2.4 V	50			50			μA
I _{OZL}	Off-state output current, low-level voltage applied	V _{CC} = MAX, V _{IL} = 0.8 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	-250			-250			μA
		Any G or \bar{G}	-250			-250			
I _{OS}	Short-circuit output current‡	V _{CC} = MAX	-50			-225			mA
I _{CC}	Supply current	V _{CC} = MAX, Outputs open	Outputs high	SN54S'	25	60	60	90	mA
				SN74S'	23	60	55	90	
			Outputs low	SN54S'	100	145	118	160	
				SN74S'	97	140	111	155	
			Outputs disabled	SN54S'	69	110	72	110	
		SN74S'	64	100	68	100			

† 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.

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

PARAMETER	TEST CONDITIONS	'S740			'S741			'S744			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
t _{PLH}	C _L = 50 pF, R _L = 90 Ω, See Note 2	4 7			6 9			6 9			ns
t _{PHL}		4 7			5 8			5 8			ns
t _{PZL}		10 15			10 16			10 15			ns
t _{PZH}		7 11			8 13			7 11			ns
t _{PLZ}	C _L = 5 pF, R _L = 90 Ω, See Note 2	6 11			11 18			10 16			ns
t _{PHZ}		3 6			5 9			3 6			ns

NOTE 2: Load circuit and voltage waveforms are shown on page 1-14.

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

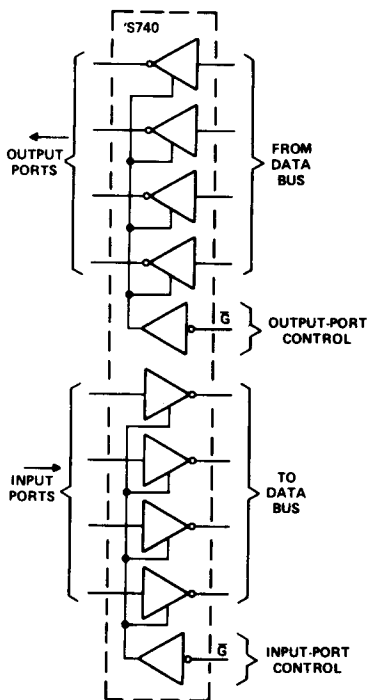
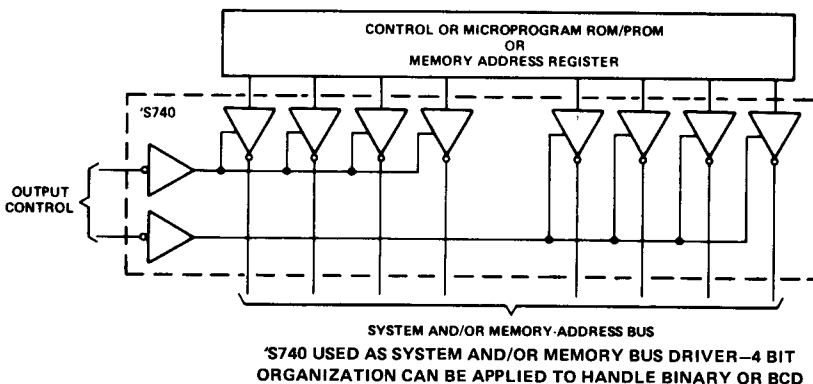
t_{PLZ} ≡ Output disable time from low level

t_{PHZ} ≡ Output disable time from high level

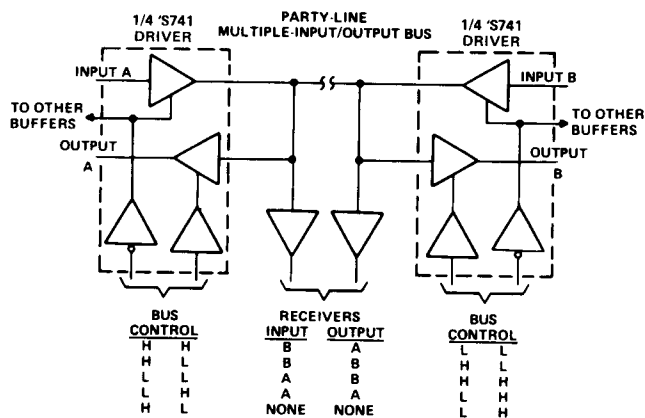
TYPES SN54S740, SN54S741, SN54S744, SN74S740, SN74S741, SN74S744

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

TYPICAL APPLICATION DATA



**INDEPENDENT 4-BIT BUS DRIVERS/RECEIVERS
IN A SINGLE PACKAGE**



PARTY-LINE BUS SYSTEM

WITH MULTIPLE INPUTS, OUTPUTS, AND RECEIVERS

External resistance between any input and ground or V_{CC} must not exceed 40 k Ω .