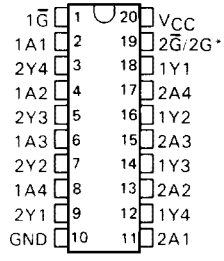
OCTAL BUFFERS AND LINE DRIVERS WITH OPEN-COLLECTOR OUTPUTS

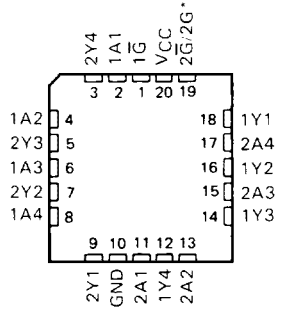
DECEMBER 1983—REVISED MAY 1986

- **Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**
- **'ALS762 and 'AS762 Have True and Complementary Outputs**
- **'ALS763 and 'AS763 Have Complementary G and $\overline{G}$ Inputs**
- **Open-Collector Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **Eliminates the Need for 3-State Overlap Protection**
- **Current Sinking Capability Up to 64 mA**
- **Dependable Texas Instruments Quality and Reliability**

SN54ALS', SN54AS' . . . J PACKAGE
SN74ALS', SN74AS' . . . DW OR N PACKAGE
(TOP VIEW)



SN54ALS', SN54AS' . . . FK PACKAGE
(TOP VIEW)



*2$\overline{G}$ for 'ALS762, 'AS762 and 2G 'ALS763, 'AS763

description

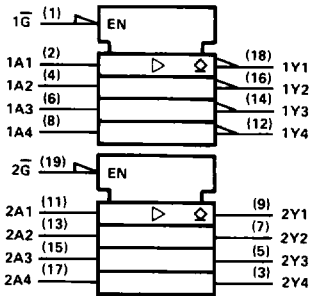
These octal buffers and line drivers are designed specifically to improve the performance of three-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters by eliminating the need for 3-state overlap protection. The designer has a choice of selected combinations of inverting and noninverting outputs, symmetrical $\overline{G}$ (active-low output control) inputs, and complementary G and $\overline{G}$ inputs.

The -1 versions of the SN74ALS' parts are identical to their standard versions except that the recommended maximum I_{OL} is increased to 48 milliamperes. There are no -1 versions of the SN54ALS' parts.

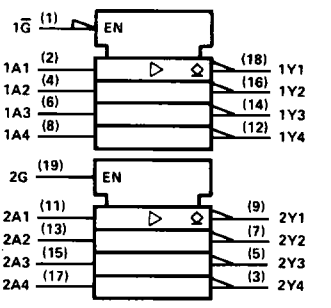
The SN54' family is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74' family is characterized for operation from 0°C to 70°C.

logic symbols†

'ALS762, 'AS762



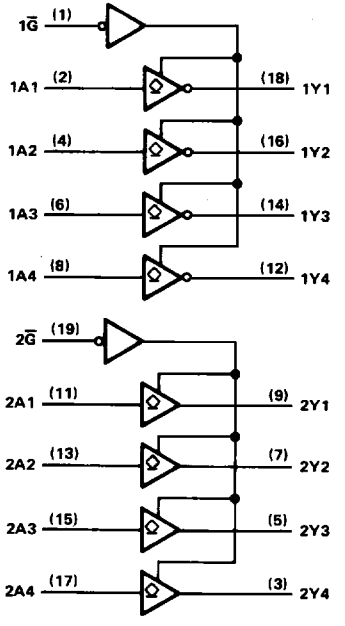
'ALS763, 'AS763



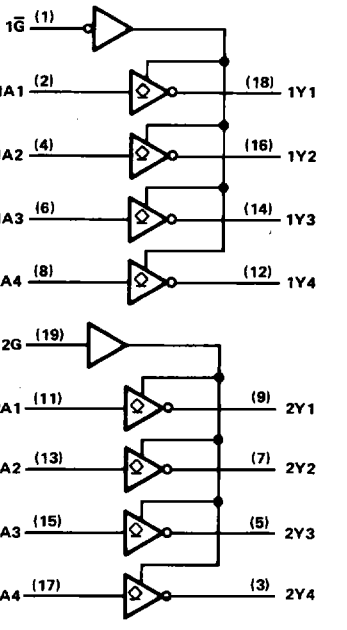
†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagrams (positive logic)

'ALS762, 'AS762



'ALS763, 'AS763



TEXAS INSTRUMENTS
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage . . . . . 7 V
Off-state output voltage . . . . . 7 V
Operating free-air temperature range: SN54ALS762 . . . . . −55°C to 125°C
SN74ALS762 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54ALS762			SN74ALS762			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
V_{OH}	High-level output voltage			5.5			5.5	V
I_{OL}	Low-level output current			12			24	mA
							48†	
T_A	Operating free-air temperature	−55		125	0		70	°C

†The extended limits apply only if V_{CC} is maintained between 4.75 V and 5.25 V.
The 48-mA limit applies for the SN74ALS762-1 only.

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

PARAMETER		TEST CONDITIONS		SN54ALS762			SN74ALS762			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}		V_{CC} = 4.5 V, I_I = −18 mA				−1.2			−1.2	V
I_{OH}		V_{CC} = 4.5 V, V_{OH} = 5.5 V				0.1			0.1	mA
V_{OL}		V_{CC} = 4.5 V, I_{OL} = 12 mA			0.25	0.4		0.25	0.4	V
		V_{CC} = 4.5 V, I_{OL} = 24 mA (I_{OL} = 48 mA for -1 versions)						0.35	0.5	
I_I		V_{CC} = 5.5 V, V_I = 7 V				0.1			0.1	mA
I_{IH}		V_{CC} = 5.5 V, V_I = 2.7 V				20			20	μA
I_{IL}		V_{CC} = 5.5 V, V_I = 0.4 V				−0.1			−0.1	mA
I_{CC}	'ALS762	V_{CC} = 5.5 V	Outputs high		11			11		mA
			Outputs low		18			18		

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

'ALS762 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_L = 680 Ω, T_A = 25°C	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 680 Ω, T_A = MIN to MAX			UNIT
			'ALS762	SN54ALS762		SN74ALS762	
			TYP	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	17					ns
t_{PHL}			6					
t_{PLH}	$\overline{G}$	Y	14					ns
t_{PHL}			18					

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage . . . . . 7 V
Off-state output voltage . . . . . 7 V
Operating free-air temperature range: SN54ALS763 . . . . . −55°C to 125°C
SN74ALS763 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54ALS763			SN74ALS763			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
V_{OH}	High-level output voltage			5.5			5.5	V
I_{OL}	Low-level output current			12			24	mA
							48†	
T_A	Operating free-air temperature	−55		125	0		70	°C

†The extended limits apply only if V_{CC} is maintained between 4.75 V and 5.25 V.
The 48-mA limit applies for the SN74ALS763-1 only.

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

PARAMETER		TEST CONDITIONS		SN54ALS763			SN74ALS763			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
I_{OH}		V_{CC} = 4.5 V,	V_{OH} = 5.5 V			0.1			0.1	mA
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.25	0.4		0.25	0.4	V
		V_{CC} = 4.5 V, (I_{OL} = 48 mA for -1 versions)	I_{OL} = 24 mA					0.35	0.5	
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}		V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	μA
I_{IL}		V_{CC} = 5.5 V,	V_I = 0.4 V			−0.1			−0.1	mA
I_{CC}	'ALS763	V_{CC} = 5.5 V	Outputs high		7	11		7	11	mA
			Outputs low		14	22		14	22	

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

'ALS763 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_L = 680 Ω, T_A = 25°C	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 680 Ω, T_A = MIN to MAX				UNIT
			'ALS763	SN54ALS763		SN74ALS763		
			TYP	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	16	7	28	7	25	ns
t_{PHL}			5	2	11	2	9	
t_{PLH}	$\overline{G}$	Y	18	8	28	9	25	ns
t_{PHL}			13	5	25	5	21	
t_{PLH}	G	Y	18	8	28	9	25	ns
t_{PHL}			13	5	25	5	21	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage . . . . . 7 V
Off-state output voltage . . . . . 7 V
Operating free-air temperature range: SN54AS762, SN54AS763 . . . . . −55°C to 125°C
SN74AS762, SN74AS763 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54AS762 SN54AS763			SN74AS762 SN74AS763			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
V_{OH}	High-level output voltage			5.5			5.5	V
I_{OL}	Low-level output current			48			64	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS		SN54AS762 SN54AS763			SN74AS762 SN74AS763			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
I_{OH}		V_{CC} = 4.5 V,	V_{OH} = 5.5 V			0.1			0.1	mA
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 48 mA			0.55				V
		V_{CC} = 4.5 V,	I_{OL} = 64 mA						0.55	
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}		V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	μA
I_{IL}	'AS762 2A inputs only	V_{CC} = 5.5 V,	V_I = 0.4 V			−1			−1	mA
	All others					−0.5			−0.5	
I_{CC}	'AS762	V_{CC} = 5.5 V	Output high		15	23		15	23	mA
			Output low		55	87		55	87	
	'AS763	V_{CC} = 5.5 V	Output high		10	16		10	16	
			Output low		52	82		52	82	

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

'AS762 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS762		SN74AS762		
			MIN	MAX	MIN	MAX	
t_{PLH}	1A	1Y	3	20	3	19	ns
t_{PHL}			1	7	1	6	
t_{PLH}	2A	2Y	3	19.5	3	18.5	ns
t_{PHL}			1	7	1	6	
t_{PLH}	$\overline{G}$	1Y	3	22	3	19.5	ns
t_{PHL}			1	8	1	7.5	
t_{PLH}	$\overline{G}$	2Y	3	20	3	19	ns
t_{PHL}			1	8	1	7	

'AS763 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS763		SN74AS763		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	3	20	3	19	ns
t_{PHL}			1	7	1	6	
t_{PLH}	$\overline{G}$	Y	3	22	3	19.5	ns
t_{PHL}			1	8.5	1	7.5	
t_{PLH}	G	Y	3	22	3	20	ns
t_{PHL}			1	8.5	1	8	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

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