

TYPES SN54ALS1240, SN54ALS1241, SN74ALS1240, SN74ALS1241 OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

D2661, DECEMBER 1982—REVISED DECEMBER 1983

- Low-Power Version of 'ALS240 and 'ALS241
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- P-N-P Inputs Reduce DC Loading
- Dependable Texas Instruments Quality and Reliability

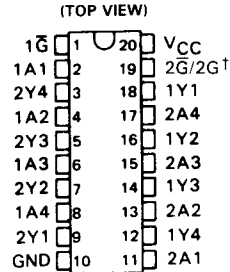
description

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 non-inverting outputs, symmetrical \bar{G} (active-low output control) inputs, and complementary G and \bar{G} inputs. These devices feature high fan-out and improved fan-in.

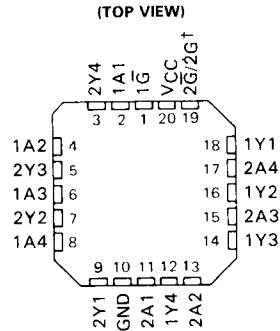
The -1 versions of the SN64ALS' parts are identical to the standard versions except that the recommended maximum I_{OL} is increased to 24 milliamperes. There are no -1 versions of the SN54ALS' parts.

The SN54ALS1240 and SN54ALS1241 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1240 and SN74ALS1241 are characterized for operation from 0°C to 70°C .

SN54ALS1240, SN54ALS1241 . . . J PACKAGE
SN74ALS1240, SN74ALS1241 . . . N PACKAGE



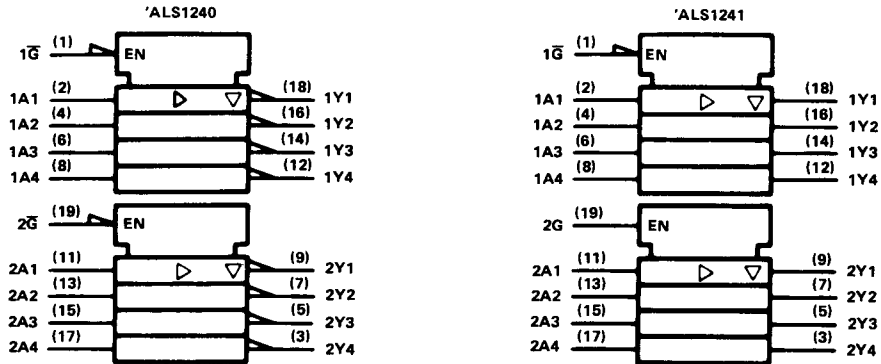
SN54ALS1240, SN54ALS1241 . . . FH PACKAGE
SN74ALS1240, SN74ALS1241 . . . FN PACKAGE



$\dagger 2\bar{G}$ for 'ALS1240 or 2G for 'ALS1241

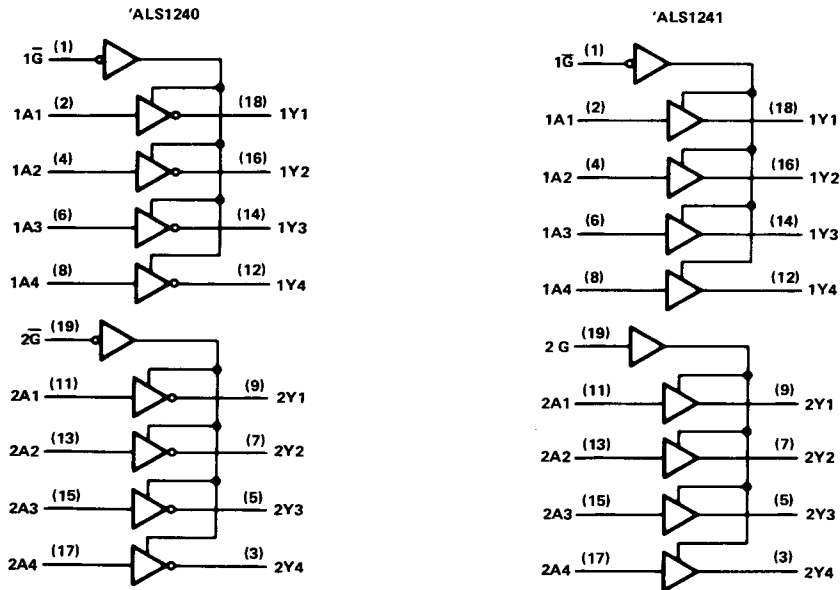
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logic symbols



Pin numbers shown are for J and N packages.

functional block diagrams (positive logic)



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ALS AND AS CIRCUITS

TYPES SN54ALS1240, SN54ALS1241, SN74ALS1240, SN74ALS1241 OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

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

Supply voltage, V_{CC}	7 V
Input voltage	7 V
Voltage applied to a disabled 3-state output	5.5 V
Operating free-air temperature range: SN54ALS1240, SN54ALS1241	-55 °C to 125 °C
SN74ALS1240, SN74ALS1241	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

		SN54ALS1240			SN74ALS1240			UNIT		
		SN54ALS1241			SN74ALS1241					
		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			V		
I_{OH}	High-level output current				-12			mA		
I_{OL}	Low-level output current				8			mA		
					16			mA		
					24 [†]			mA		
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 24-mA limit applies for the SN74ALS1240-1 and SN74ALS1241-1 only.

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

PARAMETER	TEST CONDITIONS	SN54ALS1240			SN74ALS1240			UNIT
		SN54ALS1241			SN74ALS1241			
		MIN	TYP [‡]	MAX	MIN	TYP [‡]	MAX	
V_{IK}	$V_{CC} = 4.5$ V, $I_I = -18$ mA	-1.5			-1.5			V
V_{OH}	$V_{CC} = 4.5$ V to 5.5 V, $I_{OH} = -0.4$ mA	$V_{CC} - 2$			$V_{CC} - 2$			V
	$V_{CC} = 4.5$ V, $I_{OH} = -3$ mA	2.4	3.2	2.4 3.2				
	$V_{CC} = 4.5$ V, $I_{OH} = -12$ mA	2						
	$V_{CC} = 4.5$ V, $I_{OH} = -15$ mA				2			
V_{OL}	$V_{CC} = 4.5$ V, $I_{OL} = 8$ mA	0.25 0.4			0.25 0.4			V
	$V_{CC} = 4.5$ V, $I_{OL} = 16$ mA ($I_{OL} = 24$ mA for -1 versions)				0.35 0.5			
I_{OZH}	$V_{CC} = 5.5$ V, $V_O = 2.7$ V	20			20			μ A
I_{OZL}	$V_{CC} = 5.5$ V, $V_I = 0.4$ V	-20			-20			μ A
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			μ A
I_{IL}	$V_{CC} = 5.5$ V, $V_I = 0.4$ V	-0.1			-0.1			mA
I_O^{\S}	$V_{CC} = 5.5$ V, $V_O = 2.25$ V	-30			-112			mA
I_{CC}	$V_{CC} = 5.5$ V	Outputs high			6.5			mA
		Outputs low			10			
		Outputs disabled			12			

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

[§]The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

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ALS AND AS CIRCUITS

**TYPES SN54ALS1240, SN54ALS1241, SN74ALS1240, SN74ALS1241
OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS**

***ALS1240 switching characteristics (see Note 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$						UNIT
			SN54ALS1240			SN74ALS1240			
			MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
t _{PLH}	A	Y	9			9			ns
t _{PHL}			9			9			
t _{PZH}	\bar{G}	Y	17			17			ns
t _{PZL}			19			19			
t _{PHZ}	\bar{G}	Y	7			7			ns
t _{PLZ}			6			6			

***ALS1241 switching characteristics (see Note 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$						UNIT
			SN54ALS1241			SN74ALS1241			
			MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
t _{PLH}	A	Y	9			9			ns
t _{PHL}			9			9			
t _{PZH}	\bar{G} or G	Y	17			17			ns
t _{PZL}			19			19			
t _{PHZ}	\bar{G} or G	Y	7			7			ns
t _{PLZ}			6			6			

[†]All typical values are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}.$

NOTE 1: For load circuit and voltage waveforms, see page 1-12.