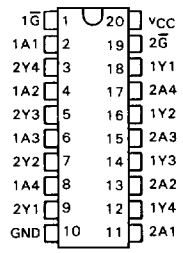
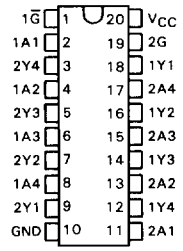
D2661, DECEMBER 1982—REVISED DECEMBER 1983

- Included among the Package Options Are 20-Pin DIPs and Both Plastic and Ceramic Chip Carriers
- 'AS230 Has True and Complementary Outputs
- 'AS231 Has Complementary G and $\overline{G}$ Inputs
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- High Capacitive Drive Capability
- Current Sinking Capability Up to 64 mA
- Dependable Texas Instruments Quality and Reliability

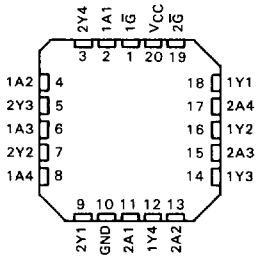
SN54AS230 . . . . J PACKAGE
SN74AS230 . . . . N PACKAGE
(TOP VIEW)



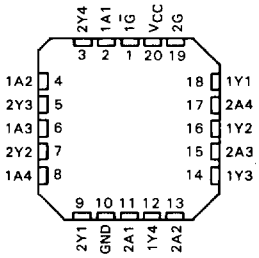
SN54AS231 . . . . J PACKAGE
SN74AS231 . . . . N PACKAGE
(TOP VIEW)



SN54AS230 . . . . FH PACKAGE
SN74AS230 . . . . FN PACKAGE
(TOP VIEW)



SN54AS231 . . . . FH PACKAGE
SN74AS231 . . . . FN PACKAGE
(TOP VIEW)



description

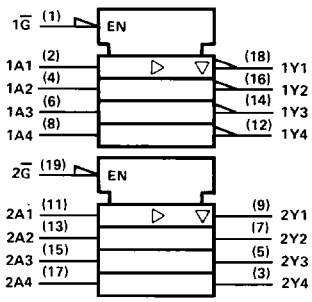
These octal buffers and line drivers are designed specifically to improve the performance of three-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. The designer has a choice of selected combinations of inverting and noninverting outputs, symmetrical $\overline{G}$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

The SN74AS230 and SN74AS231 can be used to drive terminated lines down to 133 ohms.

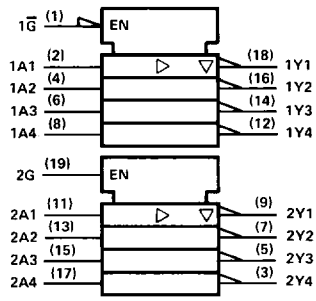
The SN54AS230 and SN54AS231 are characterized for operation over the full military temperature range of −55°C to 125°C. The SN74AS230 and SN74AS231 are characterized for operation from 0°C to 70°C.

logic symbols

'AS230



'AS231



Pin numbers shown are for J and N packages.

absolute maximum ratings over operating free-air temperature range

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: SN54AS230, SN54AS231 . . . . . −55°C to 125°C
SN74AS230, SN74AS231 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54AS230 SN54AS231			SN74AS230 SN74AS231			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
I_{OH}	High-level output current			−12			−15	mA
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		SN54AS230 SN54AS231			SN74AS230 SN74AS231			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = −2 mA	V_{CC}−2			V_{CC}−2			V
		V_{CC} = 4.5 V,	I_{OH} = −3 mA	2.4	3.4		2.4	3.4		
		V_{CC} = 4.5 V,	I_{OH} = −12 mA	2.4						
		V_{CC} = 4.5 V,	I_{OH} = −15 mA				2.4			
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 48 mA		0.27	0.55				V
		V_{CC} = 4.5 V	I_{OL} = 64 mA					0.31	0.55	
I_{OZH}		V_{CC} = 5.5 V,	V_O = 2.7 V			50			50	μA
I_{OZL}		V_{CC} = 5.5 V,	V_O = 0.4 V			−50			−50	μA
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}	'AS230 2A	V_{CC} = 5.5 V,	V_I = 0.4 V			−1			−1	mA
	All others					−0.5			−0.5	
I_O‡		V_{CC} = 5.5 V,	V_O = 2.25 V	−50		−150	−50		−150	mA
I_{CC}	'AS230	V_{CC} = 5.5 V	Outputs high		16	25		16	25	mA
			Outputs low		55	87		55	87	mA
			Outputs disabled		29	46		29	46	mA
	'AS231	V_{CC} = 5.5 V	Outputs high		12	18		12	18	mA
			Outputs low		52	82		52	82	
			Outputs disabled		25	39		25	39	

†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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'AS230 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS230		SN74AS230		
			MIN	MAX	MIN	MAX	
t_{PLH}	1A	1Y	2.5	7	2.5	6.5	ns
t_{PHL}			2	6	2	5.7	
t_{PLH}	2A	2Y	2.5	9	2.5	6.2	ns
t_{PHL}			2	7	2	6.2	
t_{PZH}	$1\overline{G}$	1Y	2	7	2	6.4	ns
t_{PZL}			2	9	2	8.5	
t_{PHZ}			2	5.5	2	5	
t_{PLZ}			2	12.5	2	9.5	
t_{PZH}	$2\overline{G}$	2Y	2	10	2	9	ns
t_{PZL}			2	8	2	7.5	
t_{PHZ}			2	6.5	2	6	
t_{PLZ}			2	10.5	2	9	

'AS231 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS231		SN74AS231		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	2	7	2	6.5	ns
t_{PHL}			2	6	2	5.7	
t_{PZH}	$\overline{G}$	Y	2	7	2	6.4	ns
t_{PZL}			2	9	2	8.5	
t_{PHZ}			2	5.5	2	5	
t_{PLZ}			2	12.5	2	9.5	
t_{PZH}	G	Y	3	7	3	6	ns
t_{PZL}			3	10	3	9	
t_{PHZ}			3	6.5	3	6	
t_{PLZ}			3	13.5	3	7	

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