OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

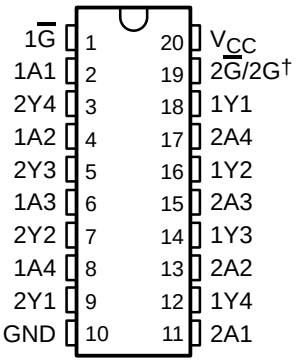
SDLS144B – APRIL 1985 – REVISED FEBRUARY 2002

- **3-State Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **PNP Inputs Reduce DC Loading**
- **Hysteresis at Inputs Improves Noise Margins**

description

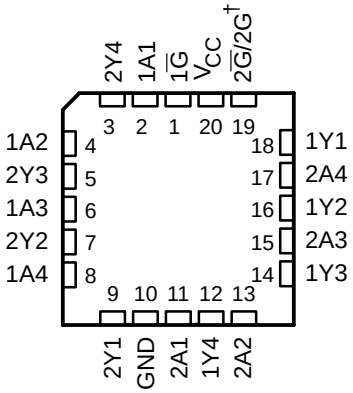
These octal buffers and line drivers are designed specifically to improve both the performance and density of three-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. The designer has a choice of selected combinations of inverting and noninverting outputs, symmetrical, active-low output-control ($\overline{G}$) inputs, and complementary output-control (G and $\overline{G}$) inputs. These devices feature high fan-out, improved fan-in, and 400-mV noise margin. The SN74LS' and SN74S' devices can be used to drive terminated lines down to 133 Ω.

SN54LS', SN54S' . . . J OR W PACKAGE
SN74LS240, SN74LS244 . . . DB, DW, N, OR NS PACKAGE
SN74LS241 . . . DW, N, OR NS PACKAGE
SN74S' . . . DW OR N PACKAGE
(TOP VIEW)



† 2G for 'LS241 and 'S241 or $2\overline{G}$ for all other drivers.

SN54LS', SN54S' . . . FK PACKAGE
(TOP VIEW)



† 2G for 'LS241 and 'S241 or $2\overline{G}$ for all other drivers.

ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	PDIP – N	Tube	SN74LS240N	SN74LS240N
			SN74LS241N	SN74LS241N
			SN74LS244N	SN74LS244N
			SN74S240N	SN74S240N
			SN74S241N	SN74S241N
			SN74S244N	SN74S244N
	SOIC – DW	Tube	SN74LS240DW	LS240
		Tape and reel	SN74LS240DWR	
		Tube	SN74LS241DW	LS241
		Tape and reel	SN74LS241DWR	
		Tube	SN74LS244DW	LS244
		Tape and reel	SN74LS244DWR	
		Tube	SN74S240DW	S240
		Tape and reel	SN74S240DWR	
		Tube	SN74S241DW	S241
		Tape and reel	SN74S241DWR	
		Tube	SN74S244DW	S244
		Tape and reel	SN74S244DWR	
	SOP – NS	Tube	SN74LS240NSR	74LS240
			SN74LS241NSR	74LS241
			SN74LS244NSR	74LS244
	SSOP – DB	Tape and reel	SN74LS240DBR	LS240
			SN74LS244DBR	LS244

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
SN74LS241NSR	ACTIVE	SO	NS	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SN74LS244DBR	ACTIVE	SSOP	DB	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SN74LS244DBRE4	ACTIVE	SSOP	DB	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SN74LS244DW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74LS244DWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74LS244J	OBSOLETE	CDIP	J	20		TBD	Call TI	Call TI
SN74LS244N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS244N3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI
SN74LS244NSR	ACTIVE	SO	NS	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SN74S240DW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74S240DWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74S240N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74S240N3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI
SN74S241DW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74S241DWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74S241J	OBSOLETE	CDIP	J	20		TBD	Call TI	Call TI
SN74S241N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74S241N3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI
SN74S244DW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74S244DWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74S244J	OBSOLETE	CDIP	J	20		TBD	Call TI	Call TI
SN74S244N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74S244N3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI
SNJ54LS240FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS240J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS240W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS241FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS241J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS241W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS244FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS244J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54LS244W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
SNJ54S240FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S240J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S240W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S241FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S241J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S241W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S244FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S244J	ACTIVE	CDIP	J	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54S244W	ACTIVE	CFP	W	20	1	TBD	Call TI	Level-NC-NC-NC

[1] The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

[2] Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.