

# SN54251, SN54LS251 SN54S251, SN74251, SN74LS251, (TIM9905), SN74S251 DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

- Three-State Versions of '151, 'LS151, 'S151
- Three-State Outputs Interface Directly with System Bus
- Perform Parallel-to-Serial Conversion
- Permit Multiplexing from N-lines to One Line
- Complementary Outputs Provide True and Inverted Data
- Fully Compatible with Most TTL Circuits

TYPE	MAX NO. OF COMMON OUTPUTS	TYPICAL AVG PROP DELAY TIME (D TO Y)	TYPICAL POWER DISSIPATION
SN54251	49	17 ns	250 mW
SN74251	129	17 ns	250 mW
SN54LS251	49	17 ns	35 mW
SN74LS251	129	17 ns	35 mW
SN54S251	39	8 ns	275 mW
SN74S251	129	8 ns	275 mW

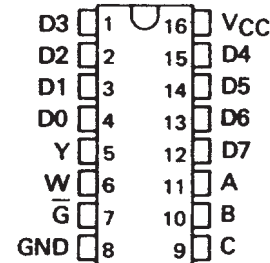
## description

These monolithic data selectors/multiplexers contain full on-chip binary decoding to select one-of-eight data sources and feature a strobe-controlled three-state output. The strobe must be at a low logic level to enable these devices. The three-state outputs permit a number of outputs to be connected to a common bus. When the strobe input is high, both outputs are in a high-impedance state in which both the upper and lower transistors of each totem-pole output are off, and the output neither drives nor loads the bus significantly. When the strobe is low, the outputs are activated and operate as standard TTL totem-pole outputs.

To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output control circuitry is designed so that the 'average output disable time is shorter than the average output enable time. The SN54251 and SN74251 have output clamp diodes to attenuate reflections on the bus line.

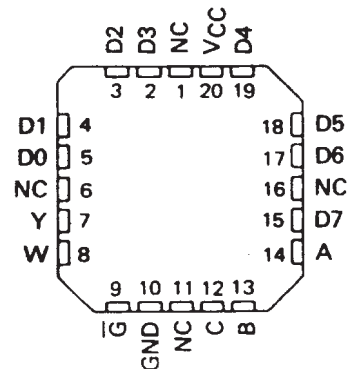
SN54251, SN54LS251, SN54S251 . . . J OR W PACKAGE  
SN74251 . . . N PACKAGE  
SN74LS251, SN74S251 . . . D OR N PACKAGE

(TOP VIEW)



SN54LS251, SN54S251 . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

FUNCTION TABLE

INPUTS				OUTPUTS	
SELECT			ENABLE	Y	W
C	B	A	$\bar{G}$		
X	X	X	H	Z	Z
L	L	L	L	D0	$\bar{D0}$
L	L	H	L	D1	$\bar{D1}$
L	H	L	L	D2	$\bar{D2}$
L	H	H	L	D3	$\bar{D3}$
H	L	L	L	D4	$\bar{D4}$
H	L	H	L	D5	$\bar{D5}$
H	H	L	L	D6	$\bar{D6}$
H	H	H	L	D7	$\bar{D7}$

H = high logic level, L = low logic level

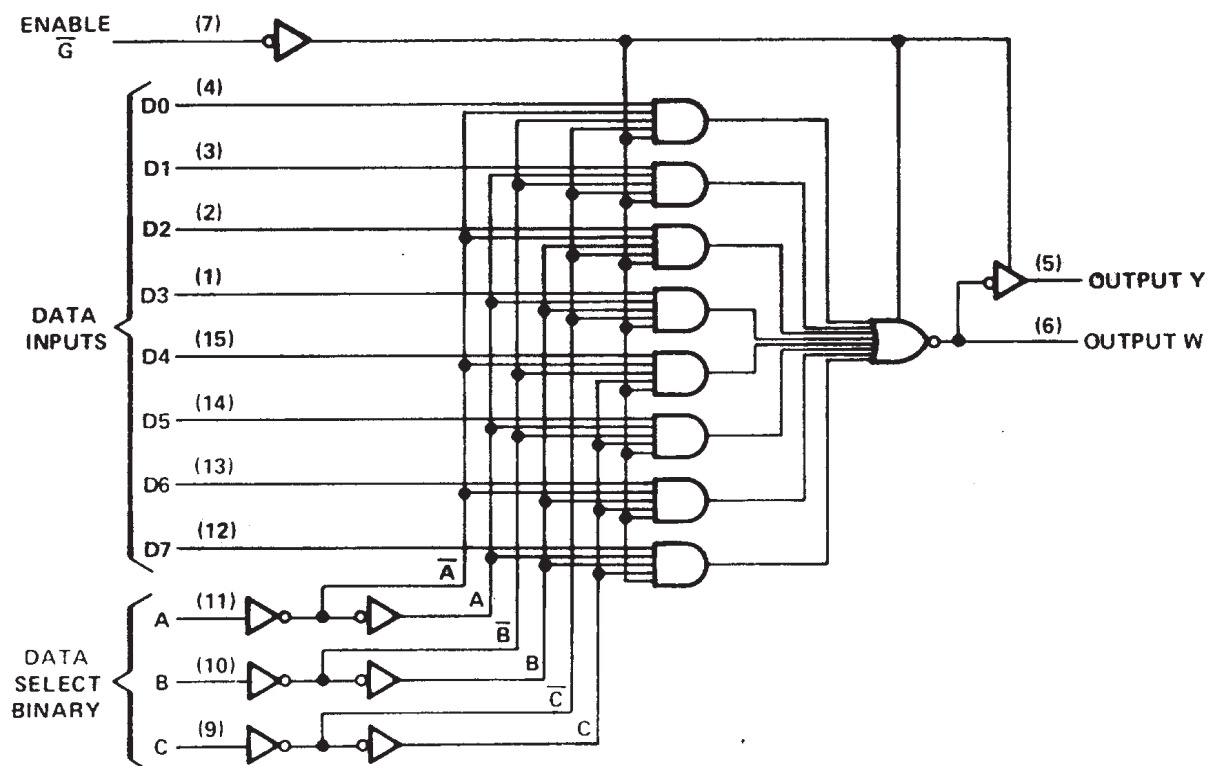
X = irrelevant, Z = high impedance (off)

D0, D1 . . . D7 = the level of the respective D input

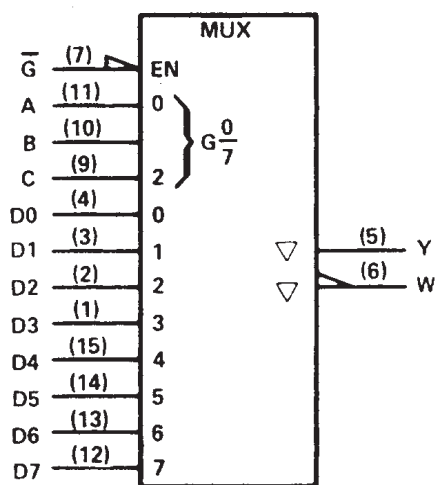
**SN54251, SN54LS251 SN54S251,  
SN74251, SN74LS251, (TIM9905), SN74S251  
DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS**

SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

**logic diagram (positive logic)**



**logic symbol†**



†This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.  
Pin numbers shown are for D, J, N, and W packages.

# SN54251 SN74251, DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

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: SN54251	–55°C to 125°C
SN74251	0°C to 70°C
Storage temperature range	–65°C to 150°C

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

recommended operating conditions

	SN54251			SN74251			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, $V_{CC}$	4.5	5	5.5	4.75	5	5.25	V
High-level output current, $I_{OH}$			–2			–5.2	mA
Low-level output current, $I_{OL}$			16			16	mA
Operating free-air temperature, $T_A$	–55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS†		MIN	TYP‡	MAX	UNIT
$V_{IH}$	High-level input voltage			2			V
$V_{IL}$	Low-level input voltage					0.8	V
$V_{IK}$	Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -12 \text{ mA}$				–1.5	V
$V_{OH}$	High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OH} = \text{MAX}$		2.4	3.2		V
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OL} = 16 \text{ mA}$			0.2	0.4	V
$I_{OZ}$	Off-state (high-impedance-state) output current	$V_{CC} = \text{MAX}, V_{IH} = 2 \text{ V}$	$V_O = 2.4 \text{ V}$			40	$\mu\text{A}$
			$V_O = 0.4 \text{ V}$			–40	
$V_O$	Output clamp voltage	$V_{CC} = \text{MAX}, V_{IH} = 4.5 \text{ V}$	$I_O = -12 \text{ mA}$			–1.5	V
			$I_O = 12 \text{ mA}$			$V_{CC} + 1.5$	
$I_I$	Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$				1	mA
$I_{IH}$	High-level input current	$V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$				40	$\mu\text{A}$
$I_{IL}$	Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$				–1.6	mA
$I_{OS}$	Short-circuit output current§	$V_{CC} = \text{MAX}$		–18		–55	mA
$I_{CC}$	Supply current	$V_{CC} = \text{MAX},$ All inputs at 4.5 V, All outputs open			38	62	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.

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

§ Not more than one output should be shorted at a time.



SN54251 SN74251,  
DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

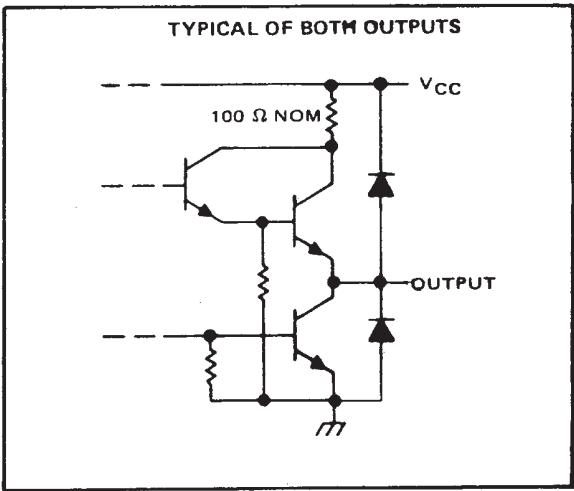
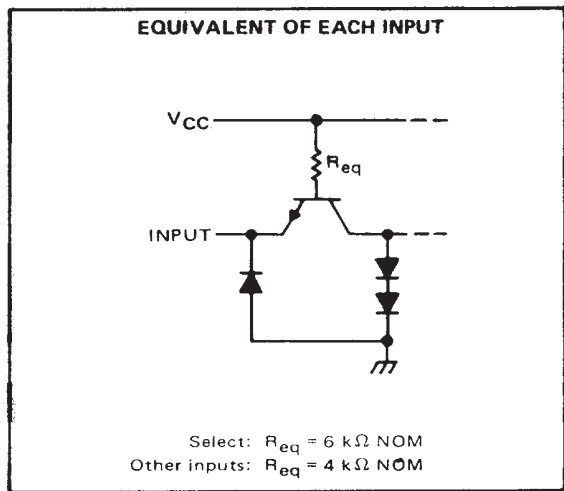
switching characteristics,  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$

PARAMETER†	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
tPLH	A, B, or C (4 levels)	Y	CL = 50 pF, RL = 400 Ω, See Note 2	29	45	ns	
tPHL				28	45		
tPLH	A, B, or C (3 levels)	W		20	33	ns	
tPHL				21	33		
tPLH	Any D	Y		17	28	ns	
tPHL				18	28		
tPLH	Any D	W		10	15	ns	
tPHL				9	15		
tPZH	G̅	Y		17	27	ns	
tPZL				26	40		
tPZH	G̅	W		17	27	ns	
tPZL				24	40		
tPHZ	G̅	Y	CL = 5 pF, RL = 400 Ω, See Note 2	5	8	ns	
tPLZ				15	23		
tPHZ	G̅	W		5	8	ns	
tPLZ				15	23		

†tPLH = Propagation delay time, low-to-high-level output  
tPHL = Propagation delay time, high-to-low-level output  
tPZH = Output enable time to high level  
tPZL = Output enable time to low level  
tPHZ = Output disable time from high level  
tPLZ = Output disable time from low level

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

schematics of inputs and outputs



# SN54LS251 SN74LS251, DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

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

Supply voltage, $V_{CC}$ (see Note 1)	7 V
Input voltage	7 V
Off-state output voltage	5.5 V
Operating free-air temperature range: SN54LS251	55°C to 125°C
SN74LS251	0°C to 70°C
Storage temperature range	–65°C to 150°C

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

## recommended operating conditions

	SN54LS251			SN74LS251			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
$V_{CC}$ Supply voltage	4.5	5	5.5	4.75	5	5.25	V
$V_{IH}$ High-level input voltage	2			2			V
$V_{IL}$ Low-level input voltage			0.7			0.8	V
$I_{OH}$ High-level output current			– 1			– 2.6	mA
$I_{OL}$ Low-level output current			4			8	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†		SN54LS251		SN74LS251		UNIT
				MIN	TYP ‡	MAX	MIN	
V <sub>IK</sub>		V <sub>CC</sub> = MIN, I <sub>I</sub> = – 18 mA		– 1.5		– 1.5		V
V <sub>OH</sub>		V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = MAX I <sub>OH</sub> = MAX		2.4	3.4	2.4	3.1	V
V <sub>OL</sub>		V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = MAX		I <sub>OL</sub> = 4 mA		0.25 0.4		V
				I <sub>OL</sub> = 8 mA		0.35 0.5		
I <sub>OZ</sub>		V <sub>CC</sub> = MAX, V <sub>IH</sub> = 2 V		V <sub>O</sub> = 2.7 V		20		μA
				V <sub>O</sub> = 0.4 V		– 20		
I <sub>I</sub>		V <sub>CC</sub> = MAX, V <sub>I</sub> = 7 V		0.1		0.1		mA
I <sub>IH</sub>		V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V		20		20		μA
I <sub>IL</sub>	Enable $\overline{G}$	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4		– 0.2		– 0.2		mA
	All other			– 0.4		– 0.4		
I <sub>OS</sub> §		V <sub>CC</sub> = MAX		– 30	– 130	– 30	– 130	mA
I <sub>CC</sub>		V <sub>CC</sub> = MAX, See Note 3		Condition A	6.1 10	6.1 10	mA	
				Condition B	7.1 12	7.1 12		

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.

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

§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

NOTE 3:  $I_{CC}$  is measured with the outputs open and all data and select inputs at 4.5 V under the following conditions:

- A. Enable grounded.
- B. Strobe at 4.5 V.

SN54LS251 SN74LS251, (TIM9905),  
DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

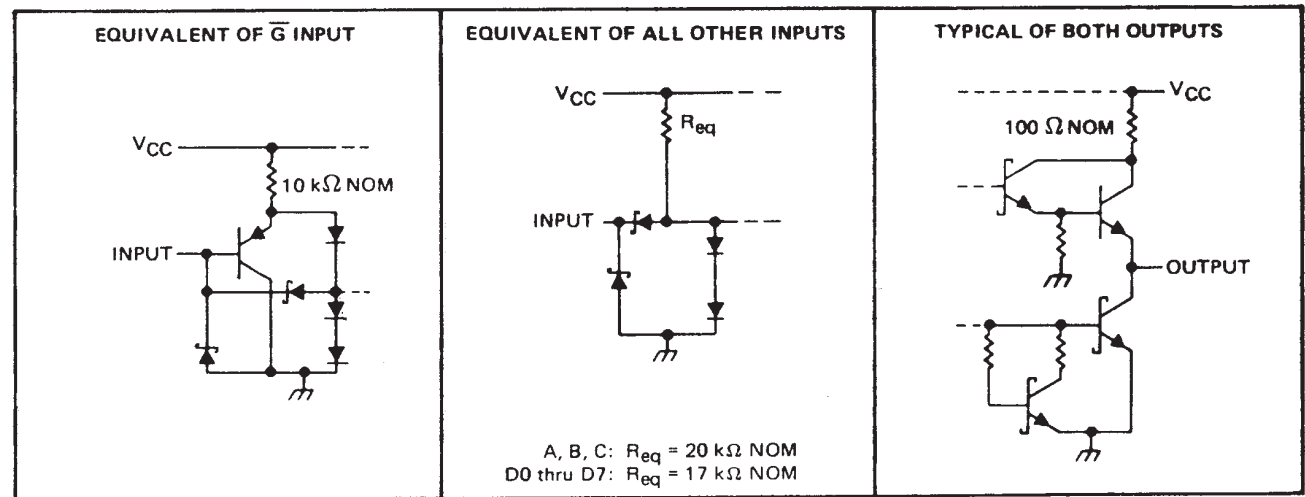
SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

switching characteristics,  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$

PARAMETER†	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
tPLH	A, B, or C (4 levels)	Y	CL = 15 pF, RL = 2 kΩ, See Note 2	29	45	ns	
tPHL				28	45		
tPLH	A, B, or C (3 levels)	W		20	33	ns	
tPHL				21	33		
tPLH	Any D	Y		17	28	ns	
tPHL				18	28		
tPLH	Any D	W		10	15	ns	
tPHL				9	15		
tPZH	G̅	Y		30	45	ns	
tPZL				26	40		
tPZH	G̅	W		17	27	ns	
tPZL				24	40		
tPHZ	G̅	Y	CL = 5 pF, RL = 2 kΩ, See Note 2	30	45	ns	
tPLZ				15	25		
tPHZ	G̅	W		37	55	ns	
tPLZ				15	25		

$t_{PLH}$  = Propagation delay time, low-to-high-level output  
 $t_{PHL}$  = Propagation delay time, high-to-low-level output  
 $t_{PZH}$  = Output enable time to high level  
 $t_{PZL}$  = Output enable time to low level  
 $t_{PHZ}$  = Output disable time from high level  
 $t_{PLZ}$  = Output disable time from low level  
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

schematics of inputs and outputs



# SN54S251 SN74S251, DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

## 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: SN54S251	–55°C to 125°C
SN74S251	0°C to 70°C
Storage temperature range	–65°C to 150°C

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

## recommended operating conditions

	SN54S251			SN74S251			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, $V_{CC}$	4.5	5	5.5	4.75	5	5.25	V
High-level output current, $I_{OH}$			–2			–6.5	mA
Low-level output current, $I_{OL}$			20			20	mA
Operating free-air temperature, $T_A$	–55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS†		MIN	TYP‡	MAX	UNIT
$V_{IH}$ High-level input voltage			2			V
$V_{IL}$ Low-level input voltage					0.8	V
$V_{IK}$ Input clamp voltage	$V_{CC} = \text{MIN},$	$I_I = -18 \text{ mA}$			–1.2	V
$V_{OH}$ High-level output voltage	$V_{CC} = \text{MIN},$ $V_{IL} = 0.8 \text{ V},$	$V_{IH} = 2 \text{ V},$ $I_{OH} = \text{MAX}$	SN54S'		2.4 3.4	V
			SN74S'		2.4 3.2	
$V_{OL}$ Low-level output voltage	$V_{CC} = \text{MIN},$ $V_{IL} = 0.8 \text{ V},$	$V_{IH} = 2 \text{ V},$ $I_{OL} = 20 \text{ mA}$			0.5	V
$I_{OZ}$ Off-state (high-impedance-state) output current	$V_{CC} = \text{MAX},$ $V_{IH} = 2 \text{ V}$	$V_O = 2.4 \text{ V}$			50	$\mu\text{A}$
		$V_O = 0.5 \text{ V}$			–50	
$I_I$ Input current at maximum input voltage	$V_{CC} = \text{MAX},$	$V_I = 5.5 \text{ V}$			1	mA
$I_{IH}$ High-level input current	$V_{CC} = \text{MAX},$	$V_I = 2.7 \text{ V}$			50	$\mu\text{A}$
$I_{IL}$ Low-level input current	$V_{CC} = \text{MAX},$	$V_I = 0.5 \text{ V}$			–2	mA
$I_{OS}$ Short-circuit output current§	$V_{CC} = \text{MAX}$		–40		–100	mA
$I_{CC}$ Supply current	$V_{CC} = \text{MAX},$	All inputs at 4.5 V, All outputs open		55	85	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.

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

§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

# SN54S251 SN74S251, DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

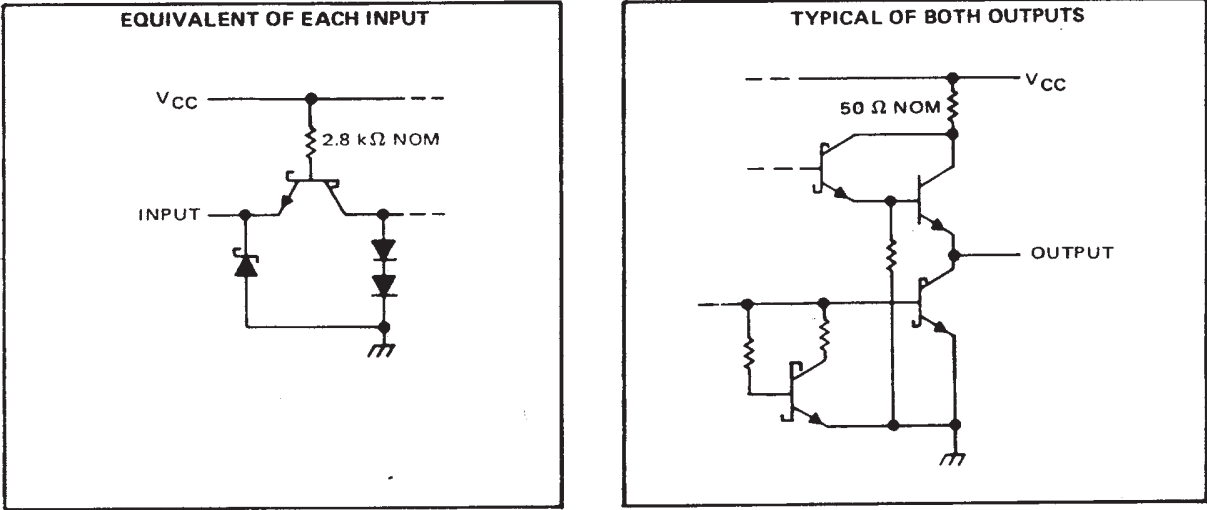
SDLS085 – DECEMBER 1972 – REVISED MARCH 1988

switching characteristics,  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^{\circ}\text{C}$

PARAMETER†	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
tPLH	A, B, or C (4 levels)	Y	CL = 15 pF, RL = 280 Ω, See Note 2	12	18	ns	
tPHL				13	19.5		
tPLH	A, B, or C (3 levels)	W		10	15	ns	
tPHL				9	13.5		
tPLH	Any D	Y		8	12	ns	
tPHL				8	12		
tPLH	Any D	W		4.5	7	ns	
tPHL				4.5	7		
tPZH	G̅	Y	CL = 50 pF, RL = 280 Ω, See Note 2	13	19.5	ns	
tPZL				14	21		
tPZH	G̅	W		13	19.5	ns	
tPZL				14	21		
tPHZ	G̅	Y	CL = 5 pF, RL = 280 Ω, See Note 2	5.5	8.5	ns	
tPLZ				9	14		
tPHZ	G̅	W		5.5	8.5	ns	
tPLZ				9	14		

†t<sub>PLH</sub> = Propagation delay time, low-to-high-level output  
t<sub>PHL</sub> = Propagation delay time, high-to-low-level output  
t<sub>PZH</sub> = Output enable time to high level  
t<sub>PZL</sub> = Output enable time to low level  
t<sub>PHZ</sub> = Output disable time from high level  
t<sub>PLZ</sub> = Output disable time from low level  
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## schematics of inputs and outputs





## PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">7601601EA</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601EA SNJ54LS251J
<a href="#">7601601FA</a>	Active	Production	CFP (W)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601FA SNJ54LS251W
<a href="#">7601601FA</a>	Active	Production	CFP (W)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601FA SNJ54LS251W
<a href="#">JM38510/30905BEA</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30905BEA
<a href="#">JM38510/30905BEA</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30905BEA
JM38510/30905BEA.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30905BEA
JM38510/30905BEA.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30905BEA
<a href="#">M38510/30905BEA</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30905BEA
<a href="#">M38510/30905BEA</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30905BEA
<a href="#">SN54LS251J</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS251J
<a href="#">SN54LS251J</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS251J
SN54LS251J.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS251J
SN54LS251J.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS251J
<a href="#">SN74LS251D</a>	Obsolete	Production	SOIC (D)   16	-	-	Call TI	Call TI	0 to 70	LS251
<a href="#">SN74LS251D</a>	Obsolete	Production	SOIC (D)   16	-	-	Call TI	Call TI	0 to 70	LS251
<a href="#">SN74LS251DR</a>	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS251
<a href="#">SN74LS251DR</a>	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS251
SN74LS251DR.A	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS251
SN74LS251DR.A	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS251
<a href="#">SN74LS251N</a>	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS251N
<a href="#">SN74LS251N</a>	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS251N
SN74LS251N.A	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS251N

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN74LS251N.A	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS251N
SN74LS251NE4	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS251N
SN74LS251NE4	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS251N
<a href="#">SN74LS251NSR</a>	Active	Production	SOP (NS)   16	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS251
<a href="#">SN74LS251NSR</a>	Active	Production	SOP (NS)   16	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS251
SN74LS251NSR.A	Active	Production	SOP (NS)   16	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS251
SN74LS251NSR.A	Active	Production	SOP (NS)   16	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS251
<a href="#">SNJ54LS251FK</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 251FK
<a href="#">SNJ54LS251FK</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 251FK
SNJ54LS251FK.A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 251FK
SNJ54LS251FK.A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 251FK
<a href="#">SNJ54LS251J</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601EA SNJ54LS251J
<a href="#">SNJ54LS251J</a>	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601EA SNJ54LS251J
SNJ54LS251J.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601EA SNJ54LS251J
SNJ54LS251J.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601EA SNJ54LS251J
<a href="#">SNJ54LS251W</a>	Active	Production	CFP (W)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601FA SNJ54LS251W
<a href="#">SNJ54LS251W</a>	Active	Production	CFP (W)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601FA SNJ54LS251W
SNJ54LS251W.A	Active	Production	CFP (W)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601FA SNJ54LS251W
SNJ54LS251W.A	Active	Production	CFP (W)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	7601601FA SNJ54LS251W

<sup>(1)</sup> **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

**Important Information and Disclaimer:** The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF SN54LS251, SN74LS251 :**

- Catalog : [SN74LS251](#)
- Military : [SN54LS251](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LS251DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS251NSR	SOP	NS	16	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LS251DR	SOIC	D	16	2500	353.0	353.0	32.0
SN74LS251NSR	SOP	NS	16	2000	353.0	353.0	32.0

## TUBE



\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
7601601FA	W	CFP	16	25	506.98	26.16	6220	NA
SN74LS251N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS251N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS251N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS251N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS251NE4	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS251NE4	N	PDIP	16	25	506	13.97	11230	4.32
SNJ54LS251FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS251FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS251W	W	CFP	16	25	506.98	26.16	6220	NA
SNJ54LS251W.A	W	CFP	16	25	506.98	26.16	6220	NA

W (R-GDFP-F16)

CERAMIC DUAL FLATPACK



- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only.
  - Falls within MIL STD 1835 GDFP2-F16

## GENERIC PACKAGE VIEW

**FK 20**

**LCCC - 2.03 mm max height**

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



4229370VA\



J (R-GDIP-T\*\*)

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



PINS ** DIM	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package is hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



PINS ** DIM	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



4040049/E 12/2002

NOTES:

- A. All linear dimensions are in inches (millimeters).  
B. This drawing is subject to change without notice.  
C Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).  
D The 20 pin end lead shoulder width is a vendor option, either half or full width.



NS0016A

# PACKAGE OUTLINE

SOP - 2.00 mm max height

SOP



4220735/A 12/2021

## NOTES:

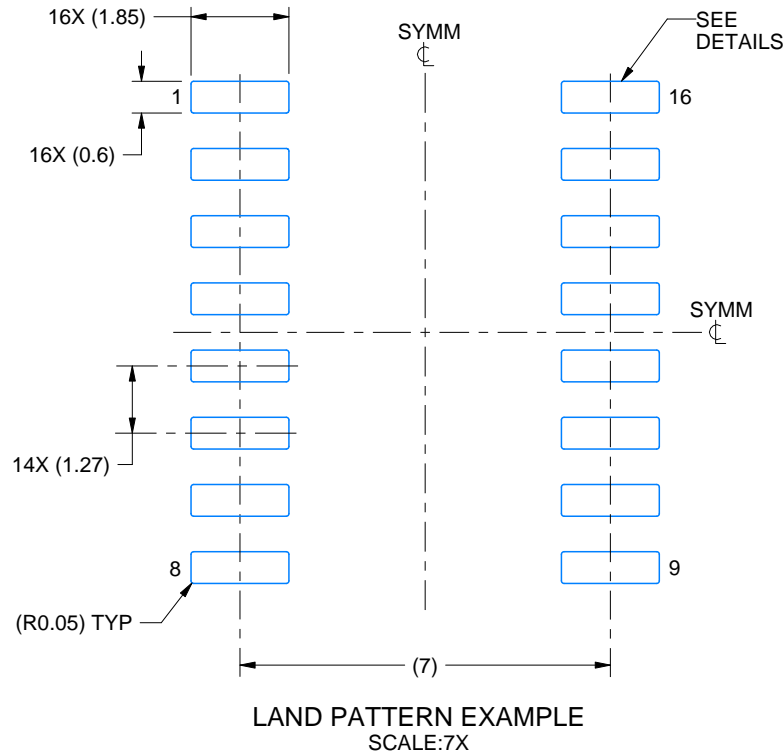
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm, per side.

# EXAMPLE BOARD LAYOUT

NS0016A

SOP - 2.00 mm max height

SOP



4220735/A 12/2021

NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.

6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

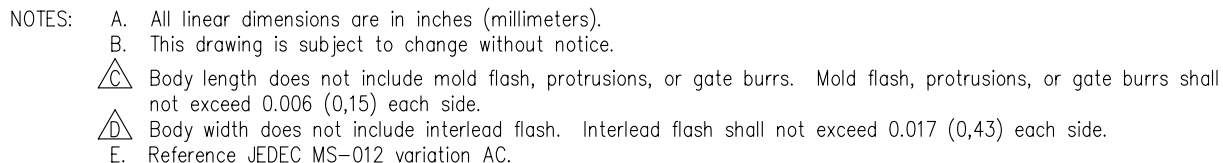


**SOLDER PASTE EXAMPLE**  
 BASED ON 0.125 mm THICK STENCIL  
 SCALE:7X

4220735/A 12/2021

NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.



# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2025, Texas Instruments Incorporated