HD14529B

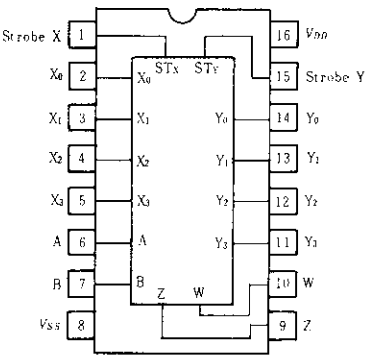
Dual 4-Channel Analog Data Selector

The HD14529B analog data selector is a dual 4-channel or single 8-channel device depending on the input coding. The device is suitable for digital as well as analog application, including various one-of-four and one-of-eight data selector functions. Since the device has bidirectional analog characteristics it can also be used as a dual binary to 1-of-4 or a binary to 1-of-8 decoder.

■ FEATURES

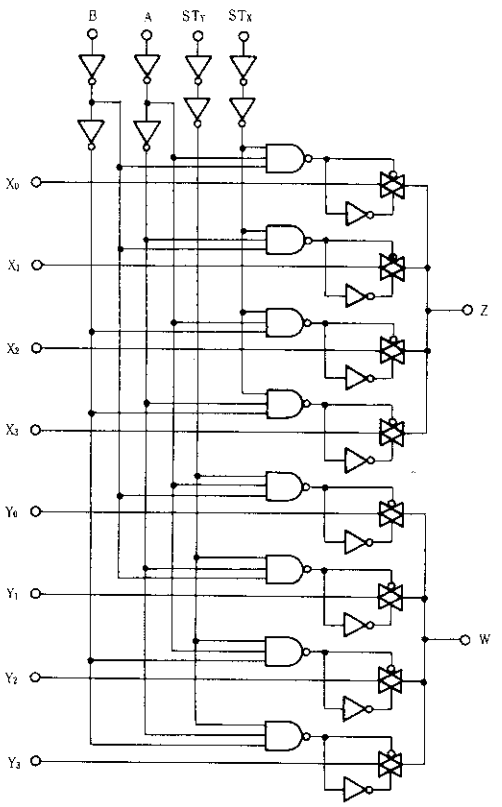
- Data Paths are Bidirectional
- Quiescent Current = 1nA/pkg typ. @5V
- 10MHz Operation (typ.)
- 3-state Outputs
- Linear "ON" Resistance
- "ON" Resistance 120Ω typ. @15V
- Low Noise = 12nV $\sqrt{\text{Cycle}}$, f ≧ 1kHz typ.
- Supply Voltage Range = 3 to 18V
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

■ PIN ARRANGEMENT



(Top View)

■ LOGIC DIAGRAM



■ TRUTH TABLE

Strobe X	Strobe Y	B	A	Z	W	Mode
1	1	0	0	X_0	Y_0	Dual 4-Channel 2 Output
1	1	0	1	X_1	Y_1	
1	1	1	0	X_2	Y_2	
1	1	1	1	X_3	Y_3	
1	0	0	0	X_0		Single 8-Channel 1 Output (Z and W tied together)
1	0	0	1	X_1		
1	0	1	0	X_2		
1	0	1	1	X_3		
0	1	0	0	Y_0		
0	1	0	1	Y_1		
0	1	1	0	Y_2		
0	1	1	1	Y_3		
0	0	×	×	High Impedance		

× = Don't Care

■ ELECTRICAL CHARACTERISTICS

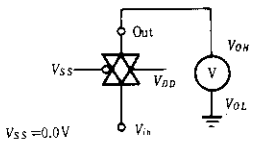
Characteristic	Symbol	Test Circuit	V_{SS}(V)	V_{DD}(V)	Test Conditions		−40℃ min	−40℃ max	25℃ min	25℃ typ	25℃ max	85℃ min	85℃ max	Unit
Output Voltage	V_{OL}	1	0	5.0	$V_{in}=V_{DD}$ or 0		—	0.05	—	0	0.05	—	0.05	V
				10			—	0.05	—	0	0.05	—	0.05	
				15			—	0.05	—	0	0.05	—	0.05	
	V_{OH}		0	5.0	$V_{in}=0$ or V_{DD}		4.95	—	4.95	5.0	—	4.95	—	V
				10			9.95	—	9.95	10	—	9.95	—	
				15			14.95	—	14.95	15	—	14.95	—	
Noise Immunity	V_{NL}	2	0	5.0	$I_{out}\leqq 10\mu A$		1.5	—	1.5	2.25	—	1.4	—	V
				10			3.0	—	3.0	4.50	—	2.9	—	
				15			4.0	—	4.5	6.75	—	4.4	—	
	V_{NH}		0	5.0	$I_{out}\geqq 10\mu A$		1.4	—	1.5	2.25	—	1.5	—	V
				10			2.9	—	3.0	4.50	—	3.0	—	
				15			4.4	—	4.5	6.75	—	4.5	—	
Input Current	I_{in}		0	15			—	±0.3	—	±0.00001	±0.3	—	±1.0	μA
Input Capacitance: Control	C_{in}		0				—	—	—	5.0	7.5	—	—	pF
Input Capacitance: Switch Input							—	—	—	8.0	—	—	—	
Input Capacitance: Switch Output							—	—	—	20	—	—	—	
Input Capacitance: Feed Through							—	—	—	0.3	—	—	—	
Quiescent Current	I_{DD}	3		5.0	Zero Signal, per Package		—	5.0	—	0.001	5.0	—	70	μA
				10			—	5.0	—	0.002	5.0	—	70	
				15			—	10	—	0.003	10	—	140	
ON Resistance	R_{ON}	4	−5.0	5.0	$V_C=V_{DD}$, $R_L=10k\Omega$	$V_{in}=+5.0V$	—	410	—	200	480	—	560	Ω
						$V_{in}=-5.0V$	—	410	—	200	480	—	560	
						$V_{in}=\pm 0.25V$	—	410	—	190	480	—	560	
			−7.5	7.5	$V_C=V_{DD}$, $R_L=10k\Omega$	$V_{in}=+7.5V$	—	250	—	160	270	—	350	
						$V_{in}=-7.5V$	—	250	—	160	270	—	350	
						$V_{in}=\pm 0.25V$	—	250	—	120	270	—	350	
			0	10	$V_C=V_{DD}$, $R_L=10k\Omega$	$V_{in}=+10V$	—	410	—	180	480	—	560	
						$V_{in}=+0.25V$	—	410	—	180	480	—	560	
						$V_{in}=+5.6V$	—	410	—	220	480	—	560	
			0	15	$V_C=V_{DD}$, $R_L=10k\Omega$	$V_{in}=+15V$	—	250	—	180	270	—	350	
						$V_{in}=+0.25V$	—	250	—	180	270	—	350	
						$V_{in}=+9.3V$	—	250	—	215	270	—	350	
△ON Resistance Between Any Two Channels	$\triangle R_{ON}$		−5.0	5.0	$V_{in}=\pm 5.0V$		—	—	—	15	—	—	—	Ω
			−7.5	7.5	$V_{in}=\pm 7.5V$		—	—	—	10	—	—	—	

■ SWITCHIHG CHARACTERISTICS (Ta=25°C)

Characteristic		Symbol	Test Circuit	V_{SS}(V)	V_{DD}(V)	Test Conditions	typ	max	Unit
Propagation Delay Time	V_{in} to V_{out}	t_{PLH}, t_{PHL}	5	0	5.0	C_L=50pF, R_L=1.0kΩ	20	60	ns
					10		10	30	
					15		8.0	25	
	Control to Output		6	0	5.0	V_{in}=V_{DD} or V_{SS}, V_{in}≦10V, C_L=50pF, R_L=1.0kΩ	200	600	
					10		80	240	
					15		50	180	
Crosstalk (Control to Output)			7	0	5.0	C_L=50pF, R_L=1.0kΩ, R_{out}=10kΩ	5.0	—	mV
					10		5.0	—	
					15		5.0	—	
Maximum Control Input Pulse Frequency			8	0	5.0	C_L=50pF, R_L=1.0kΩ	5.0	—	MHz
					10		10	—	
					15		12	—	
Noise Voltage			9	0	5.0	f=100Hz	24	—	nV/√Hz
					10		25	—	
					15		30	—	
					5.0	f=100kHz	12	—	
					10		12	—	
					15		15	—	
Sine Wave(Distortion)				−5.0	5.0	V_{in}=1.77V, R_L=10kΩ, f=1.0kHz	0.36	—	%
Input/Output Leakage Current				−5.0	5.0	V_{in}=+5.0V, V_{out}=−5.0V	±0.001	±125	nA
				−5.0	5.0	V_{in}=−5.0V, V_{out}=+5.0V	±0.001	±125	
				−7.5	7.5	V_{in}=+7.5V, V_{out}=−7.5V	±0.0015	±250	
				−7.5	7.5	V_{in}=−7.5V, V_{out}=+7.5V	±0.0015	±250	
Insertion Loss				−5.0	5.0	V_{in}=1.77V, f=1MHz, I_{loss}=$20\log_{10}\frac{V_{out}}{V_{in}}$	R_L=1.0kΩ	2.0	—	dB
							R_L=10kΩ	0.8	—	
							R_L=100kΩ	0.25	—	
							R_L=1.0MΩ	0.01	—	
Bandwidth		BW		−5.0	5.0	V_{in}=1.77V	R_L=1.0kΩ	35	—	MHz
							R_L=10kΩ	28	—	
							R_L=100kΩ	27	—	
							R_L=1.0MΩ	26	—	
Feedthrough and Crosstalk				−5.0	5.0	$20\log_{10}\frac{V_{out}}{V_{in}}$=−50dB	R_L=1.0kΩ	850	—	kHz
							R_L=10kΩ	100	—	
							R_L=100kΩ	12	—	
							R_L=1.0MΩ	1.5	—	

■ DC CHARACTERISTIC TEST CIRCUIT

1.



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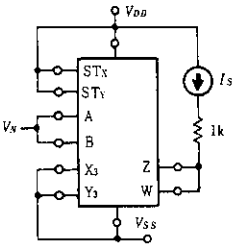
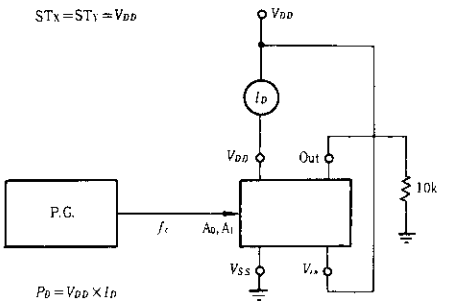


$V_{NL} = V_N$ (when $I_S \rightarrow 10\mu A$)
$V_{NH} = V_{DD} - V_N$ (when $I_S = 10\mu A$)
Pins 2, 3, 4, 12, 13 and 14 are left open.

3.



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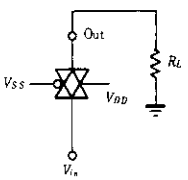

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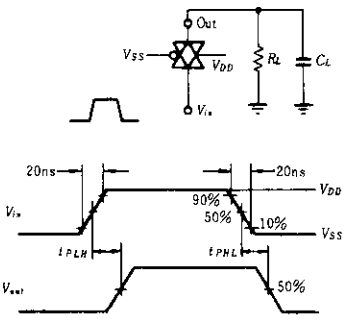

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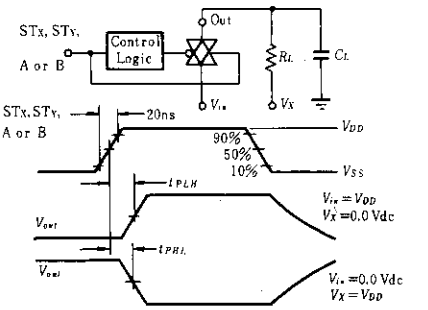

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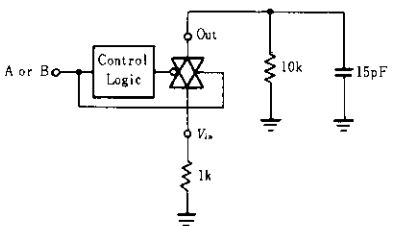

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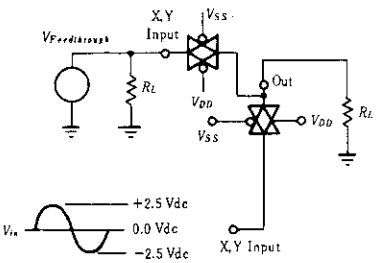

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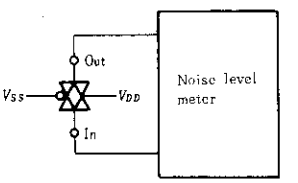
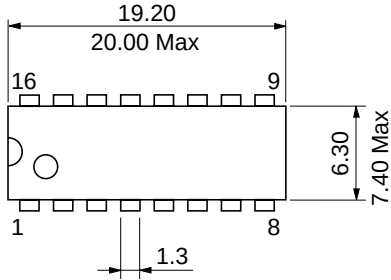
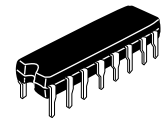
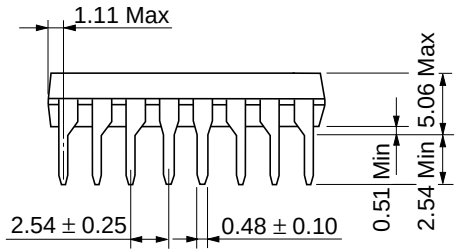
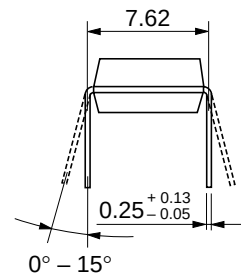


Unit: mm









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