
HD74HC354

8-to-1-line Data Selectors/Multiplexer Register
(with 3-state outputs)

HITACHI

Description

This data selectors/multiplexers contains full on-chip binary decoding to select one of eight data sources. The data select address is stored in transparent latches that are enabled by a low level address on pin 11, Select Control. Data on the 8 input lines is stored in a parallel input/output register which in the HD74HC354 is composed of 8 transparent latches enabled by a low level on pin 9, Data Control. Both true (Y) and complementary (W) 3-state outputs are available.

Features

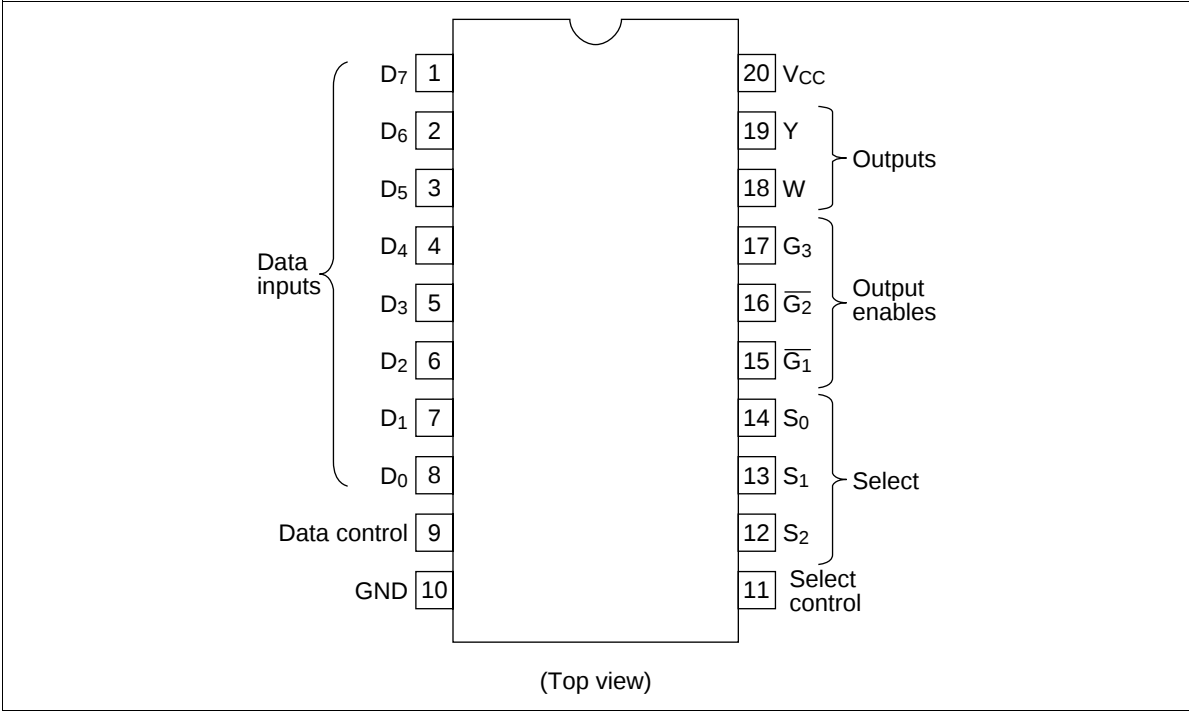
- High Speed Operation: t_{pd} (DC to W, Y) = 23 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 2$ to 6 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)

HD74HC354

Function Table

Inputs								
Select			Data Control	Output Enable			Outputs	
S ₁	S ₂	S ₀	DC	$\overline{\text{G}}1$	$\overline{\text{G}}2$	G3	W	Y
X	X	X	X	H	X	X	Z	Z
X	X	X	X	X	H	X	Z	Z
X	X	X	X	X	X	L	Z	Z
L	L	L	L	L	L	H	$\overline{\text{D}}0$	D0
L	L	L	H	L	L	H	$\overline{\text{D}}0\text{n}$	D0n
L	L	H	L	L	L	H	$\overline{\text{D}}1$	D1
L	L	H	H	L	L	H	$\overline{\text{D}}1\text{n}$	D1n
L	H	L	L	L	L	H	$\overline{\text{D}}2$	D2
L	H	L	H	L	L	H	$\overline{\text{D}}2\text{n}$	D2n
L	H	H	L	L	L	H	$\overline{\text{D}}3$	D3
L	H	H	H	L	L	H	$\overline{\text{D}}3\text{n}$	D3n
H	L	L	L	L	L	H	$\overline{\text{D}}4$	D4
H	L	L	H	L	L	H	$\overline{\text{D}}4\text{n}$	D4n
H	L	H	L	L	L	H	$\overline{\text{D}}5$	D5
H	L	H	H	L	L	H	$\overline{\text{D}}5\text{n}$	D5n
H	H	L	L	L	L	H	$\overline{\text{D}}6$	D6
H	H	L	H	L	L	H	$\overline{\text{D}}6\text{n}$	D6n
H	H	H	L	L	L	H	$\overline{\text{D}}7$	D7
H	H	H	H	L	L	H	$\overline{\text{D}}7\text{n}$	D7n

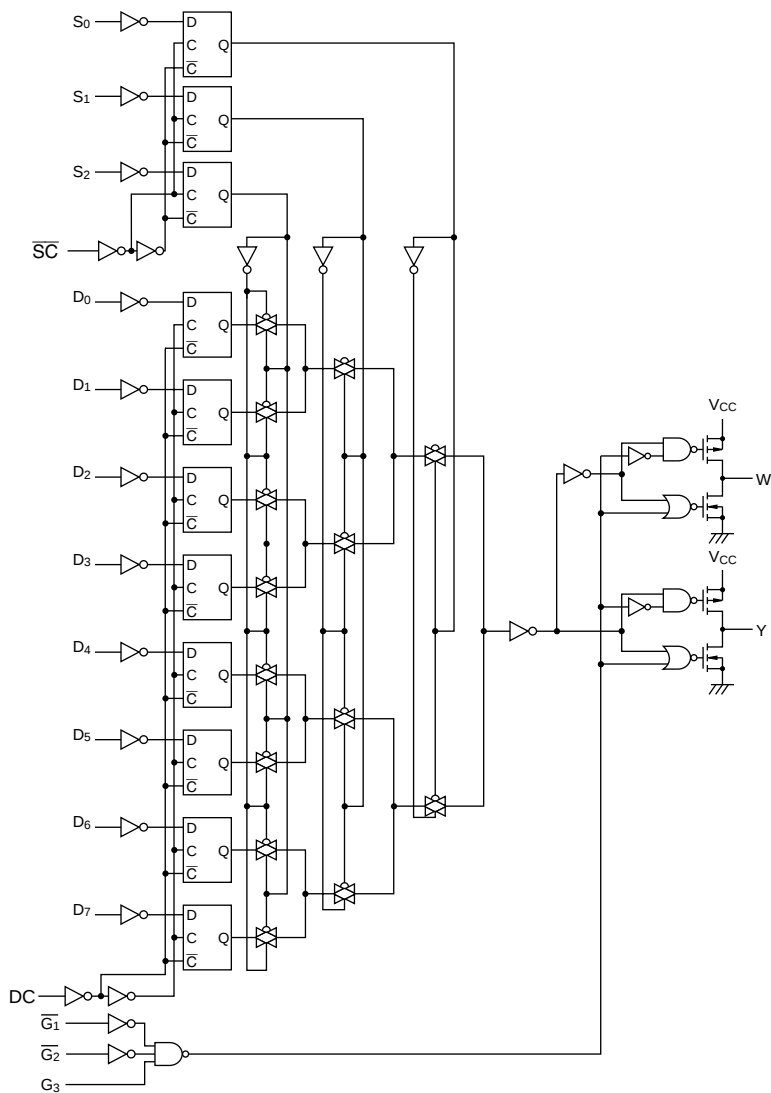
Pin Arrangement



Absolute Masimum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to +7.0	V
Input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	V
Output current	I_{OUT}	± 35	mA
DC current drain per V_{CC} , GND	I_{CC} , I_{GND}	± 75	mA
DC input diode current	I_{IK}	± 20	mA
DC output diode current	I_{OK}	± 20	mA
Power dissipation per package	P_T	500	mW
Storage temperature	Tstg	-65 to +150	°C

Block Diagram

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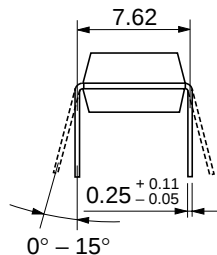
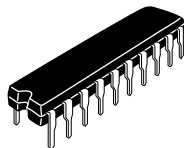
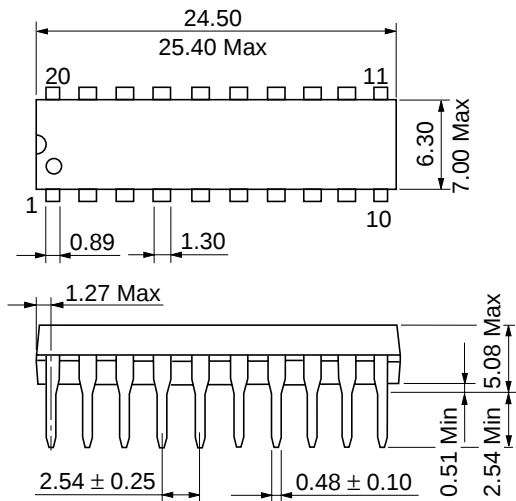
DC Characteristics

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = −40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V _{IH} or V _{IL} I _{OH} = −20 μA	
		4.5	4.4	4.5	—	4.4	—			
		6.0	5.9	6.0	—	5.9	—			
		4.5	4.18	—	—	4.13	—			I _{OH} = −6 mA
		6.0	5.68	—	—	5.63	—			I _{OH} = −7.8 mA
	V _{OL}	2.0	—	0.0	0.1	—	0.1	V	Vin = V _{IH} or V _{IL} I _{OL} = 20 μA	
		4.5	—	0.0	0.1	—	0.1			
		6.0	—	0.0	0.1	—	0.1			
		4.5	—	—	0.26	—	0.33			I _{OL} = 6 mA
		6.0	—	—	0.26	—	0.33			I _{OL} = 7.8 mA
Off-state output current	I _{OZ}	6.0	—	—	±0.5	—	±5.0	μA	Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND	
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND	
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, Iout = 0 μA	

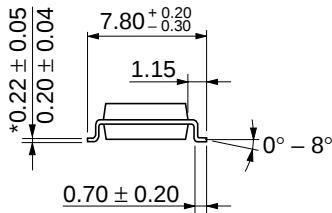
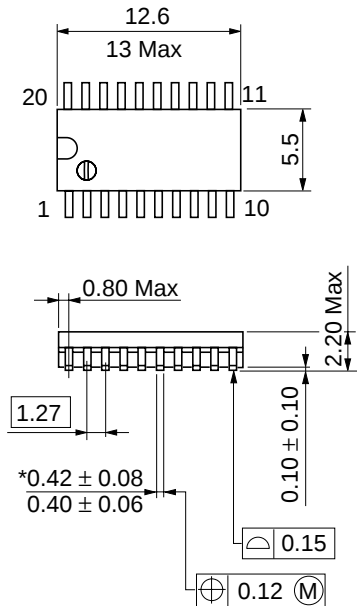
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AC Characteristics (C_L = 50 pF, Input t_r = t_f = 6 ns)

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t _{PLH}	2.0	—	—	235	—	295	ns	D ₀ – D ₇ to output
		4.5	—	23	47	—	59		
		6.0	—	—	40	—	50		
	t _{PHL}	2.0	—	—	270	—	340	ns	Data control to output
		4.5	—	26	54	—	68		
		6.0	—	—	46	—	58		
	t _{PLH}	2.0	—	—	285	—	355	ns	S ₀ – S ₂ to output
		4.5	—	26	57	—	71		
		6.0	—	—	48	—	60		
	t _{PHL}	2.0	—	—	300	—	375	ns	Select control to output
		4.5	—	26	60	—	75		
		6.0	—	—	51	—	64		
Output enable time	t _{ZH}	2.0	—	—	150	—	190	ns	
	t _{ZL}	4.5	—	12	30	—	38		
		6.0	—	—	26	—	33		
Output disable time	t _{LZ}	2.0	—	—	165	—	205	ns	
	t _{HZ}	4.5	—	15	33	—	41		
		6.0	—	—	28	—	35		
Setup time	t _{su}	2.0	50	—	—	65	—	ns	D ₀ – D ₇ to Data control, S ₀ – S ₇ to Select control
		4.5	10	2	—	13	—		
		6.0	10	—	—	13	—		
Hold time	t _h	2.0	5	—	—	5	—	ns	D ₀ – D ₇ to Data control, S ₀ – S ₇ to Select control
		4.5	5	0	—	5	—		
		6.0	5	—	—	5	—		
Pulse width	t _w	2.0	80	—	—	100	—	ns	Select control or Data control
		4.5	16	4	—	20	—		
		6.0	14	—	—	17	—		
Output rise/fall time	t _{TLH}	2.0	—	—	60	—	75	ns	
	t _{THL}	4.5	—	4	12	—	15		
		6.0	—	—	10	—	13		
Input capacitance	C _{in}	—	—	5	10	—	10	pF	



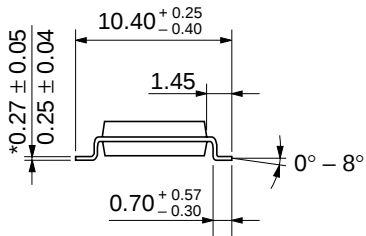
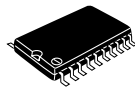
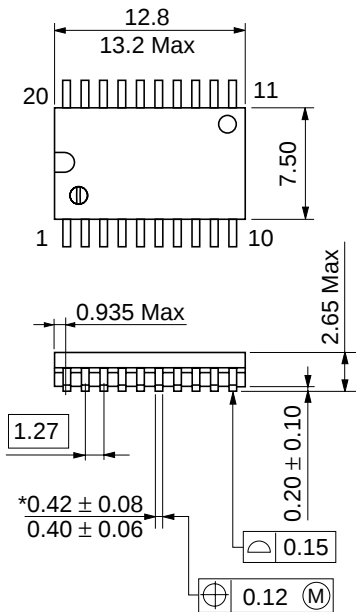
Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.31 g

Unit: mm



Hitachi Code	FP-20DB
JEDEC	Conforms
EIAJ	—
Weight (reference value)	0.52 g

$$\frac{\text{*Dimension including the plating thickness}}{\text{Base material dimension}}$$

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