CMOS Digital Integrated Circuits Silicon Monolithic

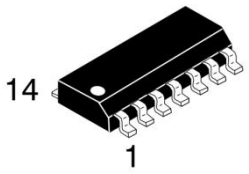
Features

High speed: tpd = 15 ns (typ.) at V_{CC} = 5 V

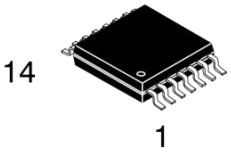
Low power dissipation: I_{CC} = 4.0μA (max) at Ta = 25

Balanced propagation delays: $t_{PLH} \approx t_{PHL}$

Wide operating voltage range: $V_{CC(opr)}$ = 2.0 to 6.0 V



SOP-14



TSSOP-14

Functional Description

- 8-Channel Multiplexer

Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
74HC151M/TR	SOP-14	74HC151	REEL	2500pcs/reel
74HC151MT/TR	TSSOP-14	74HC151	REEL	2500pcs/reel

Genearl Description

The 74HC151 is a high speed CMOS 8-CHANNEL MULTIPLEXER fabricated with silicon gate C2MOS technology.

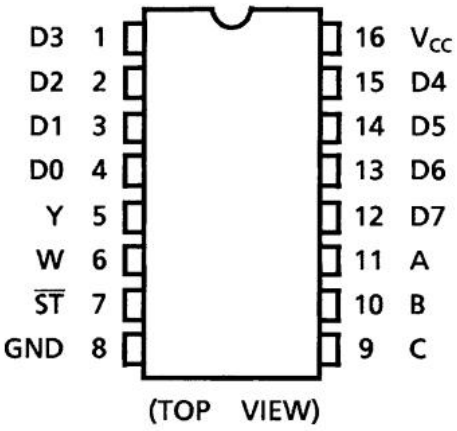
It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.

One of eight date input signals (D0-D7) is selected by decoding of the three-bit address input (A, B, C). The selected data appears on two outputs: non-inverting (Y) and inverting (W).

The strobe input provides two output conditions; a low level on the strobe input transfers the selected data to the outputs. A high level on the strobe input sets the Y output low and the W output high without regard to the data or select input conditions.

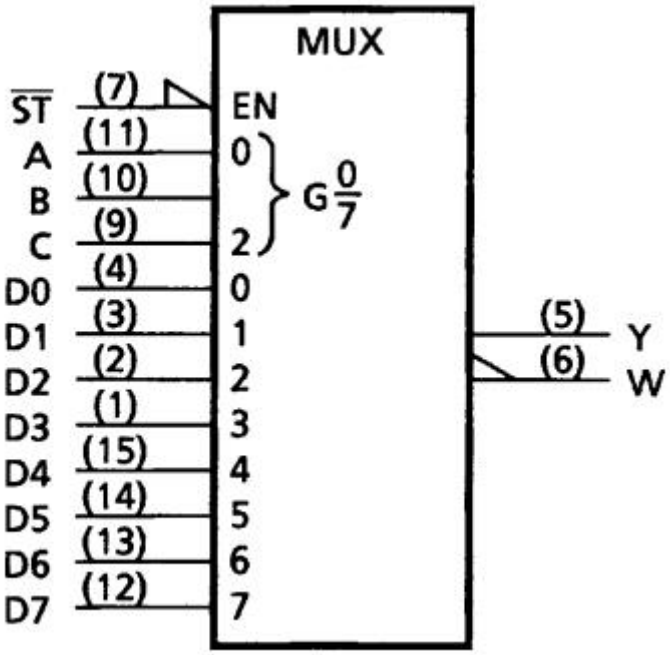
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

Pin Assignment



SOP14/TSSOP14

IEC Logic Symbol

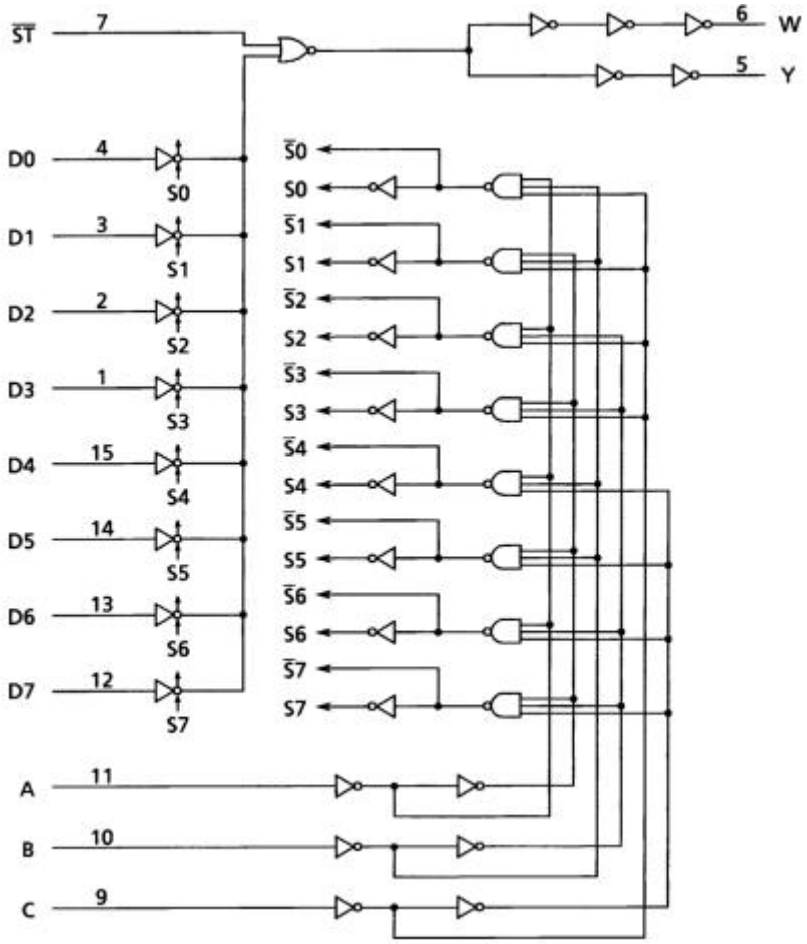


Truth Table

Inputs				Outputs	
Select			Strobe	Y	W
C	B	A	$\overline{ST}$		
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

X:Don`t care

System Diagram



Absolute Maximum Ratings (Note)

Characteristics	Symbol	Note	Rating	Unit
Supply voltage	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
Input diode current	I_{IK}		20	mA
Output diode current	I_{OK}		20	mA
Output current	I_{OUT}		25	mA
VCC/ground current	I_{CC}		50	mA
Power dissipation	P_D	(Note 1)	500	mW
Storage temperature	Tstg		-65 to 150	°C

Note: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.

Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: PD derates linearly with -8 mW/ above 85

Operating Ranges (Note)

Characteristics	Symbol	Test Condition	Rating	Unit
Supply voltage	V_{CC}		2.0 to 6.0	V
Input voltage	V_{IN}		0 to VCC	V
Output voltage	V_{OUT}		0 to VCC	V
Operating temperature	Topr		-40 to 85	°C
Input rise and fall times	tr,tf		0 to 50	μs

Note: The operating ranges must be maintained to ensure the normal operation of the device.

Unused inputs must be tied to either VCC or GND.

Electrical Characteristics

DC Characteristics (Unless otherwise specified, Ta = 25°C)

Characteristics	Symbol	Test Condition		V_{CC} (V)	Min	Typ.	Max	Unit
High-level input voltage	V_{IH}			2.0	1.50			V
				4.5	3.15			
				6.0	4.20			
Low-level input voltage	V_{IL}			2.0			0.50	V
				4.5			1.35	
				6.0			1.80	
High-level output voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -20μA	2.0	1.9	2.0		V
				4.5	4.4	4.5		
				6.0	5.9	6.0		
			I_{OH} = -4 mA	4.5	4.18	4.31		
			I_{OH}=-5.2 mA	6.0	5.68	5.80		
Low-level output voltage	V_{OL}	V_{IN} = V_{IH} or V_{IL}	I_{OL}=20μA	2.0		0.0	0.1	V
				4.5		0.0	0.1	
				6.0		0.0	0.1	
			I_{OL}=4 mA	4.5		0.17	0.26	
			I_{OL}=5.2 mA	6.0		0.18	0.26	
Input leakage current	I_{IN}	V_{IN} = V_{CC} or GND		6.0			±0.1	μA
Quiescent supply current	I_{CC}	V_{IN} = V_{CC} or GND		6.0			4.0	μA

DC Characteristics (Unless otherwise specified, Ta = -40 to 85°C)

Characteristics	Symbol	Test Condition		V_{CC} (V)	Min	Max	Unit
High-level input voltage	V_{IH}			2.0	1.50		V
				4.5	3.15		
				6.0	4.20		
Low-level input voltage	V_{IL}			2.0		0.50	V
				4.5		1.35	
				6.0		1.80	
High-level output voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -20μA	2.0	1.9		V
				4.5	4.4		
				6.0	5.9		
			I_{OH} = -4 mA	4.5	4.13		
			I_{OH}=-5.2 mA	6.0	5.63		
Low-level output voltage	V_{OL}	V_{IN} = V_{IH} or V_{IL}	I_{OL}=20μA	2.0		0.1	V
				4.5		0.1	
				6.0		0.1	
			I_{OL}=4 mA	4.5		0.33	
			I_{OL}=5.2 mA	6.0		0.33	
Input leakage current	I_{IN}	V_{IN} = V_{CC} or GND		6.0		±1.0	μA
Quiescent supply current	I_{CC}	V_{IN} = V_{CC} or GND		6.0		40.0	μA

AC Characteristics

(Unless otherwise specified, C_L = 15 pF, V_{CC} = 5 V, Ta = 25°C, Input: tr = tf = 6 ns)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Output transition time	t_{TLH},t_{THL}			4	8	ns
Propagation delay time (D-Y)	t_{PLH},t_{PHL}			15	24	ns
Propagation delay time (D-W)	t_{PLH},t_{PHL}			15	24	ns
Propagation delay time (ST-Y)	t_{PLH},t_{PHL}			10	17	ns
Propagation delay time (ST-W)	t_{PLH},t_{PHL}			10	17	ns
Propagation delay time (A, B, C-Y)	t_{PLH},t_{PHL}			19	31	ns
Propagation delay time (A, B, C-W)	t_{PLH},t_{PHL}			19	31	ns

AC Characteristics

(Unless otherwise specified, CL = 50 pF, Ta = 25°C, Input: tr = tf = 6 ns)

Characteristics	Symbol	Note	V_{CC} (V)	Min	Typ.	Max	Unit
Output transition time	t_{TLH},t_{THL}		2.0		30	75	ns
			4.5		8	15	
			6.0		7	13	
Propagation delay time (D-Y)	t_{PLH},t_{PHL}		2.0		65	140	ns
			4.5		18	28	
			6.0		15	24	
Propagation delay time (D-W)	t_{PLH},t_{PHL}		2.0		65	140	ns
			4.5		18	28	
			6.0		15	24	
Propagation delay time (ST-Y)	t_{PLH},t_{PHL}		2.0		36	100	ns
			4.5		12	20	
			6.0		10	17	
Propagation delay time (ST-W)	t_{PLH},t_{PHL}		2.0		36	100	ns
			4.5		12	20	
			6.0		10	17	
Propagation delay time (A, B, C-Y)	t_{PLH},t_{PHL}		2.0		80	180	ns
			4.5		23	36	
			6.0		19	31	
Propagation delay time (A, B, C-W)	t_{PLH},t_{PHL}		2.0		80	180	ns
			4.5		23	36	
			6.0		19	31	
Input capacitance	C_{IN}				3		pF
Power dissipation capacitance	C_{PD}	(Note 1)			15		pF

Note 1: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation.

$I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$

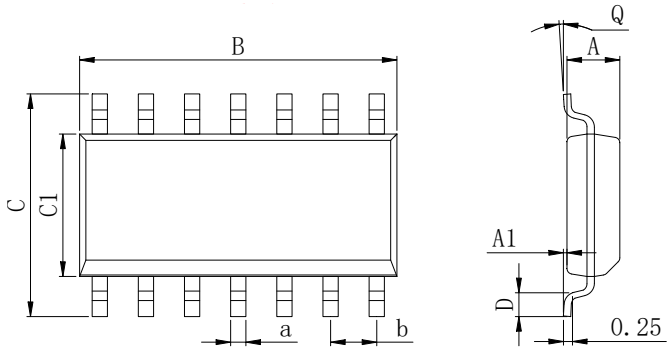
AC Characteristics

(Unless otherwise specified, C_L = 50 pF, T_a = -40 to 85°C, Input: $t_r = t_f$ = 6 ns)

Characteristics	Symbol	V_{CC} (V)	Min	Max	Unit
Output transition time	t_{TLH},t_{THL}	2.0		95	ns
		4.5		19	
		6.0		16	
Propagation delay time (D-Y)	t_{PLH},t_{PHL}	2.0		175	ns
		4.5		35	
		6.0		30	
Propagation delay time (D-W)	t_{PLH},t_{PHL}	2.0		175	ns
		4.5		35	
		6.0		30	
Propagation delay time (ST-Y)	t_{PLH},t_{PHL}	2.0		125	ns
		4.5		25	
		6.0		21	
Propagation delay time (ST-W)	t_{PLH},t_{PHL}	2.0		125	ns
		4.5		25	
		6.0		21	
Propagation delay time (A, B, C-Y)	t_{PLH},t_{PHL}	2.0		225	ns
		4.5		45	
		6.0		38	
Propagation delay time (A, B, C-W)	t_{PLH},t_{PHL}	2.0		225	ns
		4.5		45	
		6.0		38	

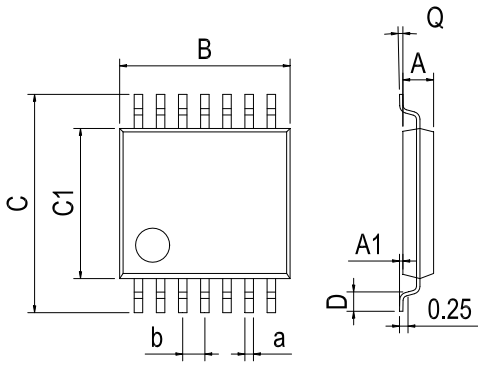
Physical Dimensions

SOP14



Dimensions In Millimeters(SOP14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	8.55	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	8.75	6.20	4.00	0.80	8°	0.45	

TSSOP14



Dimensions In Millimeters(TSSOP14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	

重要声明：

华冠半导体保留未经通知更改所提供的产品和服务。客户在订货前应获取最新的相关信息，并核实这些信息是否最新且完整的。华冠半导体对篡改过的文件不承担任何责任或义务。

客户在使用华冠半导体产品进行系统设计和整机制造时有责任遵守安全标准并采取安全措施。您将自行承担以下全部责任： 针对您的应用选择合适的华冠半导体产品； 设计、验证并测试您的应用；确保您的应用满足相应标准以及任何其他安全、安保或其他要求。以避免潜在风险可能导致人身伤害或财产损失情况的发生。

华冠半导体产品未获得生命支持、军事、航空航天等领域应用之许可，华冠半导体将不承担产品在这些领域应用造成的后果。

华冠半导体所生产半导体产品的性能提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做出任何明示或暗示的担保，测试和其他质量控制技术的使用只限于华冠半导体的质量保证范围内。每个器件并非所有参数均需要检测。

华冠半导体的文档资料，授权您仅可将这些资源用于研发本资料所述的产品的应用。您无权使用任何其他华冠半导体知识产权或任何第三方知识产权。严禁对这些资源进行其他复制或展示，您应全额赔偿因在这些资源的使用中对华冠半导体及其代理造成的任何索赔、损害、成本、损失和债务，华冠半导体对此概不负责。

IMPORTANT STATEMENT:

Huaguan Semiconductor reserves the right to change its products and services without notice. Before ordering, the customer shall obtain the latest relevant information and verify whether the information is up to date and complete. Huaguan Semiconductor does not assume any responsibility or obligation for the altered documents.

Customers are responsible for complying with safety standards and taking safety measures when using Huaguan Semiconductor products for system design and machine manufacturing. You will bear all the following responsibilities: select the appropriate Huaguan Semiconductor products for your application; Design, validate and test your application; Ensure that your application meets the appropriate standards and any other safety, security or other requirements. To avoid the occurrence of potential risks that may lead to personal injury or property loss.

Huaguan Semiconductor products have not been approved for applications in life support, military, aerospace and other fields, and Huaguan Semiconductor will not bear the consequences caused by the application of products in these fields.

The technical and reliability data (including data sheets), design resources (including reference designs), application or other design suggestions, network tools, safety information and other resources provided for the performance of semiconductor products produced by Huaguan Semiconductor are not guaranteed to be free from defects and no warranty, express or implied, is made. The use of testing and other quality control technologies is limited to the quality assurance scope of Huaguan Semiconductor. Not all parameters of each device need to be tested.

The documentation of Huaguan Semiconductor authorizes you to use these resources only for developing the application of the product described in this document. You have no right to use any other Huaguan Semiconductor intellectual property rights or any third party intellectual property rights. It is strictly forbidden to make other copies or displays of these resources. You should fully compensate Huaguan Semiconductor and its agents for any claims, damages, costs, losses and debts caused by the use of these resources. Huaguan Semiconductor accepts no liability for any loss or damage caused by infringement.

单击下面可查看定价，库存，交付和生命周期等信息

>>HGSEMI(华冠)