

DATA SHEET

For a complete data sheet, please also download:

- The IC06 74HC/HCT/HCU/HCMOS Logic Family Specifications
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Information
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Outlines

Datasheet.Directory

74HC/HCT4051 8-channel analog multiplexer/demultiplexer

Product specification
File under Integrated Circuits, IC06

December 1990

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

FEATURES

- Wide analog input voltage range: ± 5 V.
- Low "ON" resistance:
 - 80 Ω (typ.) at $V_{CC} - V_{EE} = 4.5$ V
 - 70 Ω (typ.) at $V_{CC} - V_{EE} = 6.0$ V
 - 60 Ω (typ.) at $V_{CC} - V_{EE} = 9.0$ V
- Logic level translation:
 - to enable 5 V logic to communicate with ± 5 V analog signals
- Typical "break before make" built in
- Output capability: non-standard
- I_{CC} category: MSI

GENERAL DESCRIPTION

The 74HC/HCT4051 are high-speed Si-gate CMOS devices and are pin compatible with the "4051" of the

"4000B" series. They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT4051 are 8-channel analog multiplexers/demultiplexers with three digital select inputs (S_0 to S_2), an active LOW enable input (\bar{E}), eight independent inputs/outputs (Y_0 to Y_7) and a common input/output (Z).

With \bar{E} LOW, one of the eight switches is selected (low impedance ON-state) by S_0 to S_2 . With \bar{E} HIGH, all switches are in the high impedance OFF-state, independent of S_0 to S_2 .

V_{CC} and GND are the supply voltage pins for the digital control inputs (S_0 to S_2 , and \bar{E}). The V_{CC} to GND ranges are 2.0 to 10.0 V for HC and 4.5 to 5.5 V for HCT. The analog inputs/outputs (Y_0 to Y_7 , and Z) can swing between V_{CC} as a positive limit and V_{EE} as a negative limit. $V_{CC} - V_{EE}$ may not exceed 10.0 V.

For operation as a digital multiplexer/demultiplexer, V_{EE} is connected to GND (typically ground).

QUICK REFERENCE DATA

$V_{EE} = \text{GND} = 0$ V; $T_{\text{amb}} = 25$ °C; $t_r = t_f = 6$ ns

SYMBOL	PARAMETER	CONDITIONS	TYPICAL		UNIT
			HC	HCT	
t_{PZH}/t_{PZL}	turn "ON" time \bar{E} to V_{OS} S_n to V_{OS}	$C_L = 15$ pF; $R_L = 1$ k Ω ; $V_{CC} = 5$ V	22	22	ns
			20	24	ns
t_{PHZ}/t_{PLZ}	turn "OFF" time \bar{E} to V_{OS} S_n to V_{OS}		18	16	ns
			19	20	ns
C_I	input capacitance		3.5	3.5	pF
C_{PD}	power dissipation capacitance per switch	notes 1 and 2	25	25	pF
C_S	max. switch capacitance independent (Y) common (Z)		5	5	pF
			25	25	pF

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μ W):

$$P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum \{ (C_L + C_S) \times V_{CC}^2 \times f_o \} \text{ where:}$$

f_i = input frequency in MHz

f_o = output frequency in MHz

$\sum \{ (C_L + C_S) \times V_{CC}^2 \times f_o \}$ = sum of outputs

C_L = output load capacitance in pF

C_S = max. switch capacitance in pF

V_{CC} = supply voltage in V

2. For HC the condition is $V_I = \text{GND}$ to V_{CC}
For HCT the condition is $V_I = \text{GND}$ to $V_{CC} - 1.5$ V

8-channel analog multiplexer/demultiplexer

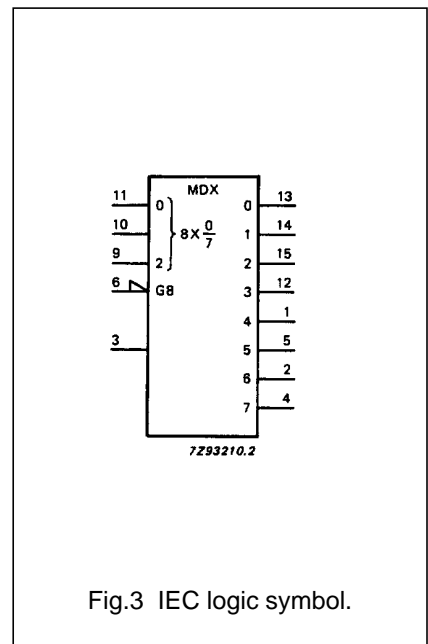
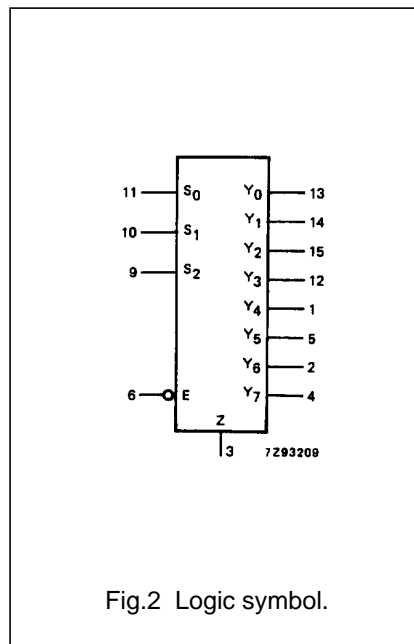
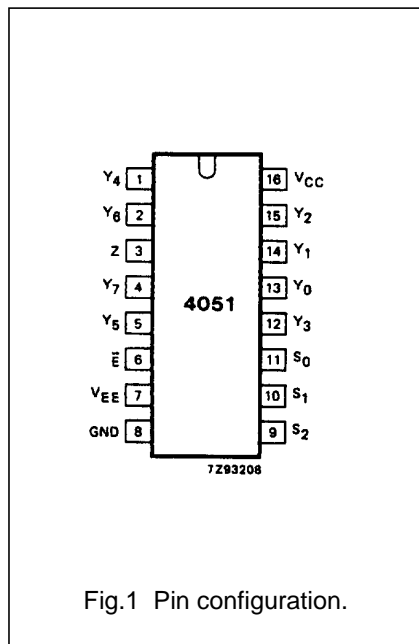
74HC/HCT4051

ORDERING INFORMATION

See "74HC/HCT/HCU/HCMOS Logic Package Information".

PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
3	Z	common input/output
6	\bar{E}	enable input (active LOW)
7	V_{EE}	negative supply voltage
8	GND	ground (0 V)
11, 10, 9	S_0 to S_2	select inputs
13, 14, 15, 12, 1, 5, 2, 4	Y_0 to Y_7	independent inputs/outputs
16	V_{CC}	positive supply voltage



8-channel analog multiplexer/demultiplexer

74HC/HCT4051

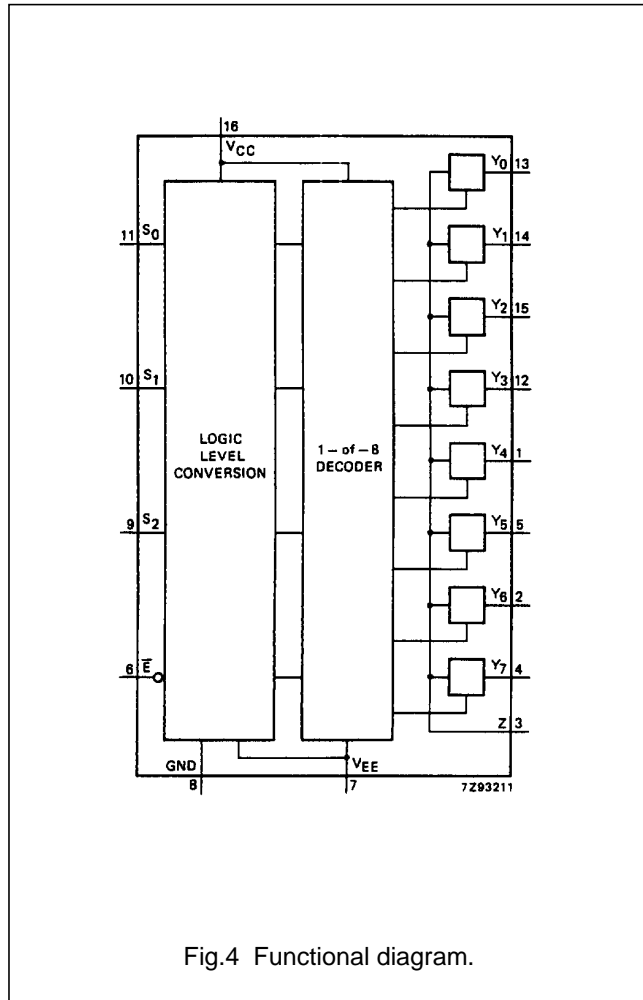


Fig.4 Functional diagram.

APPLICATIONS

- Analog multiplexing and demultiplexing
- Digital multiplexing and demultiplexing
- Signal gating

FUNCTION TABLE

INPUTS				channel ON
\bar{E}	S_2	S_1	S_0	
L	L	L	L	$Y_0 - Z$
L	L	L	H	$Y_1 - Z$
L	L	H	L	$Y_2 - Z$
L	L	H	H	$Y_3 - Z$
L	H	L	L	$Y_4 - Z$
L	H	L	H	$Y_5 - Z$
L	H	H	L	$Y_6 - Z$
L	H	H	H	$Y_7 - Z$
H	X	X	X	none

Notes

1. H = HIGH voltage level
L = LOW voltage level
X = don't care

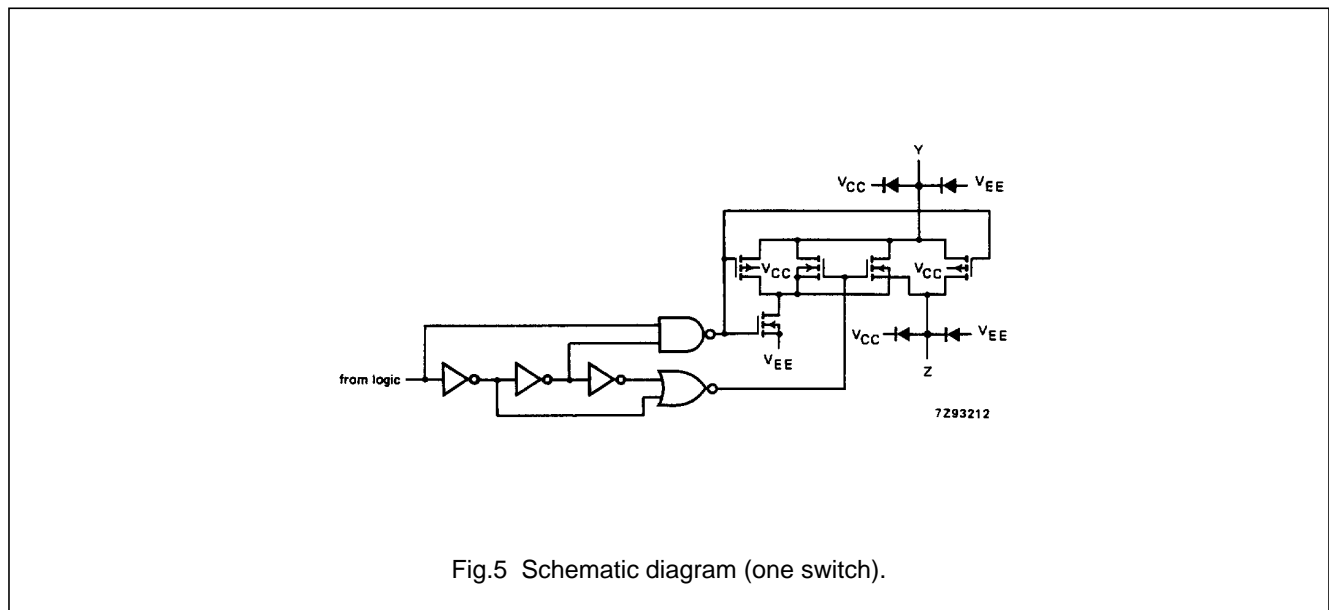


Fig.5 Schematic diagram (one switch).

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Voltages are referenced to $V_{EE} = \text{GND}$ (ground = 0 V)

SYMBOL	PARAMETER	MIN.	MAX.	UNIT	CONDITIONS
V_{CC}	DC supply voltage	-0.5	+11.0	V	
$\pm I_{IK}$	DC digital input diode current		20	mA	for $V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$
$\pm I_{SK}$	DC switch diode current		20	mA	for $V_S < -0.5 \text{ V}$ or $V_S > V_{CC} + 0.5 \text{ V}$
$\pm I_S$	DC switch current		25	mA	for $-0.5 \text{ V} < V_S < V_{CC} + 0.5 \text{ V}$
$\pm I_{EE}$	DC V_{EE} current		20	mA	
$\pm I_{CC}; \pm I_{GND}$	DC V_{CC} or GND current		50	mA	
T_{stg}	storage temperature range	-65	+150	°C	
P_{tot}	power dissipation per package				for temperature range: -40 to +125 °C 74HC/HCT
	plastic DIL		750	mW	above +70 °C: derate linearly with 12 mW/K
	plastic mini-pack (SO)		500	mW	above +70 °C: derate linearly with 8 mW/K
P_S	power dissipation per switch		100	mW	

Note to ratings

- To avoid drawing V_{CC} current out of terminal Z, when switch current flows in terminals Y_n , the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into terminal Z, no V_{CC} current will flow out of terminals Y_n . In this case there is no limit for the voltage drop across the switch, but the voltages at Y_n and Z may not exceed V_{CC} or V_{EE} .

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	74HC			74HCT			UNIT	CONDITIONS
		min.	typ.	max.	min.	typ.	max.		
V_{CC}	DC supply voltage $V_{CC} - \text{GND}$	2.0	5.0	10.0	4.5	5.0	5.5	V	see Figs 6 and 7
V_{CC}	DC supply voltage $V_{CC} - V_{EE}$	2.0	5.0	10.0	2.0	5.0	10.0	V	see Figs 6 and 7
V_I	DC input voltage range	GND		V_{CC}	GND		V_{CC}	V	
V_S	DC switch voltage range	V_{EE}		V_{CC}	V_{EE}		V_{CC}	V	
T_{amb}	operating ambient temperature range	-40		+85	-40		+85	°C	see DC and AC CHARACTERISTICS
T_{amb}	operating ambient temperature range	-40		+125	-40		+125	°C	
t_r, t_f	input rise and fall times		6.0	1000 500 400 250		6.0	500	ns	$V_{CC} = 2.0 \text{ V}$ $V_{CC} = 4.5 \text{ V}$ $V_{CC} = 6.0 \text{ V}$ $V_{CC} = 10.0 \text{ V}$

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

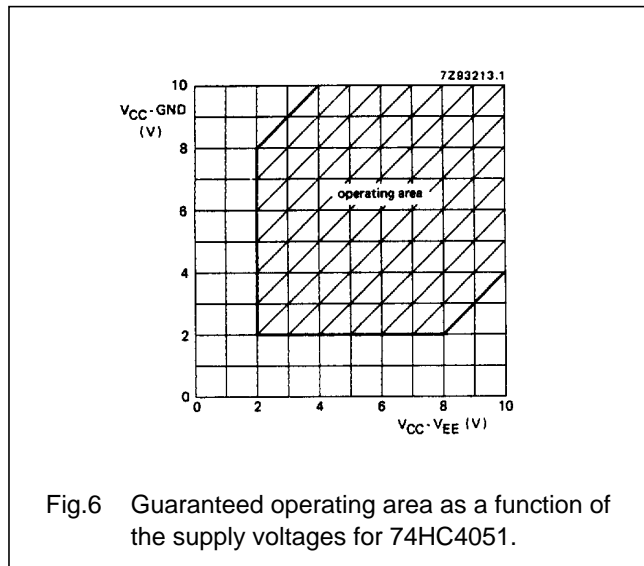


Fig.6 Guaranteed operating area as a function of the supply voltages for 74HC4051.

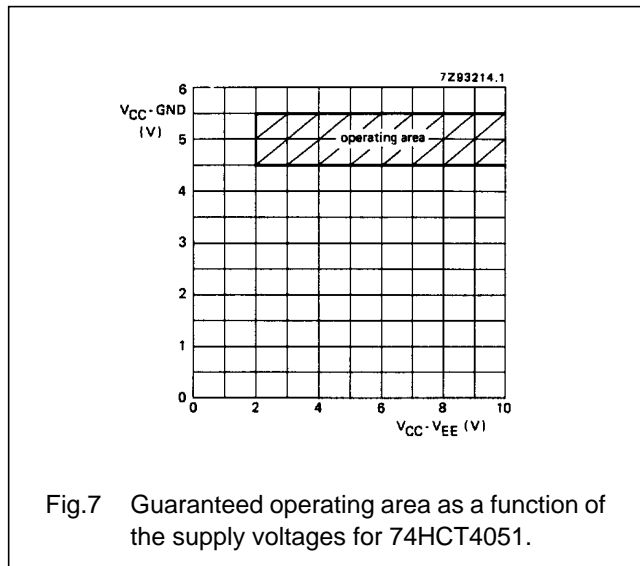


Fig.7 Guaranteed operating area as a function of the supply voltages for 74HCT4051.

DC CHARACTERISTICS FOR 74HC/HCT

For 74HC: $V_{CC} - GND$ or $V_{CC} - V_{EE} = 2.0, 4.5, 6.0$ and 9.0 V

For 74HCT: $V_{CC} - GND = 4.5$ and 5.5 V; $V_{CC} - V_{EE} = 2.0, 4.5, 6.0$ and 9.0 V

SYMBOL	PARAMETER	T_{amb} (°C)						UNIT	TEST CONDITIONS					
		74HC/HCT							V_{CC} (V)	V_{EE} (V)	I_S (μA)	V_{is}	V_I	
		+25			-40 to +85		-40 to +125							
		min.	typ.	max.	min.	max.	min.		max.					
R_{ON}	ON resistance (peak)		—	—		—		—	Ω	2.0	0	100	V_{CC} to V_{EE}	V_{IH} or V_{IL}
			100	180		225		270	Ω	4.5	0	1000		
			90	160		200		240	Ω	6.0	0	1000		
			70	130		165		195	Ω	4.5	-4.5	1000		
R_{ON}	ON resistance (rail)		150	—		—		—	Ω	2.0	0	100	V_{EE}	V_{IH} or V_{IL}
			80	140		175		210	Ω	4.5	0	1000		
			70	120		150		180	Ω	6.0	0	1000		
			60	105		130		160	Ω	4.5	-4.5	1000		
R_{ON}	ON resistance (rail)		150	—		—		—	Ω	2.0	0	100	V_{CC}	V_{IH} or V_{IL}
			90	160		200		240	Ω	4.5	0	1000		
			80	140		175		210	Ω	6.0	0	1000		
			65	120		150		180	Ω	4.5	-4.5	1000		
ΔR_{ON}	maximum ΔON resistance between any two channels		—						Ω	2.0	0		V_{CC} to V_{EE}	V_{IH} or V_{IL}
			9						Ω	4.5	0			
			8						Ω	6.0	0			
			6						Ω	4.5	-4.5			

Notes to DC characteristics

- At supply voltages ($V_{CC} - V_{EE}$) approaching 2.0 V the analog switch ON-resistance becomes extremely non-linear. Therefore it is recommended that these devices be used to transmit digital signals only, when using these supply voltages.
- For test circuit measuring R_{ON} see Fig.8.

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

DC CHARACTERISTICS FOR 74HC

Voltages are referenced to GND (ground = 0 V)

SYMBOL	PARAMETER	T _{amb} (°C)							UNIT	TEST CONDITIONS			
		74HC								V _{CC} (V)	V _{EE} (V)	V _i	OTHER
		+25			-40 to +85		-40 to +125						
		min.	typ.	max.	min.	max.	min.	max.					
V _{IH}	HIGH level input voltage	1.5 3.15 4.2 6.3	1.2 2.4 3.2 4.7		1.5 3.15 4.2 6.3		1.5 3.15 4.2 6.3		V	2.0 4.5 6.0 9.0			
V _{IL}	LOW level input voltage		0.8 2.1 2.8 4.3	0.5 1.35 1.8 2.7		0.5 1.35 1.8 2.7		0.5 1.35 1.8 2.7	V	2.0 4.5 6.0 9.0			
± I _I	input leakage current			0.1 0.2		1.0 2.0		1.0 2.0	µA	6.0 10.0	0 0	V _{CC} or GND	
± I _S	analog switch OFF-state current per channel			0.1		1.0		1.0	µA	10.0	0	V _{IH} or V _{IL}	V _S = V _{CC} - V _{EE} Fig.10
± I _S	analog switch OFF-state current all channels			0.4		4.0		4.0	µA	10.0	0	V _{IH} or V _{IL}	V _S = V _{CC} - V _{EE} Fig.10
± I _S	analog switch ON-state current			0.4		4.0		4.0	µA	10.0	0	V _{IH} or V _{IL}	V _S = V _{CC} - V _{EE} Fig.11
I _{CC}	quiescent supply current			8.0 16.0		80.0 160.0		160.0 320.0	µA	6.0 10.0	0 0	V _{CC} or GND	V _{is} = V _{EE} or V _{CC} ; V _{os} = V _{CC} or V _{EE}

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

AC CHARACTERISTICS FOR 74HC

GND = 0 V; $t_r = t_f = 6$ ns; $C_L = 50$ pF

SYMBOL	PARAMETER	T_{amb} (°C)							UNIT	TEST CONDITIONS		
		74HC								V_{CC} (V)	V_{EE} (V)	OTHER
		+25			-40 to +85		-40 to +125					
		min.	typ.	max.	min.	max.	min.	max.				
t_{PHL}/t_{PLH}	propagation delay V_{is} to V_{os}		14	60		75		90	ns	2.0	0	$R_L = \infty$; $C_L = 50$ pF (see Fig.17)
			5	12		15		18		4.5	0	
			4	10		13		15		6.0	0	
			4	8		10		12		4.5	-4.5	
t_{PZH}/t_{PZL}	turn "ON" time \bar{E} to V_{os}		72	345		430		520	ns	2.0	0	$R_L = 1$ k Ω ; $C_L = 50$ pF (see Fig.18, 19 and 20)
			29	69		86		104		4.5	0	
			21	59		73		88		6.0	0	
			18	51		64		77		4.5	-4.5	
t_{PZH}/t_{PZL}	turn "ON" time S_n to V_{os}		66	345		430		520	ns	2.0	0	$R_L = 1$ k Ω ; $C_L = 50$ pF (see Fig.18, 19 and 20)
			28	69		86		104		4.5	0	
			19	59		73		88		6.0	0	
			16	51		64		77		4.5	-4.5	
t_{PHZ}/t_{PLZ}	turn "OFF" time \bar{E} to V_{os}		58	290		365		435	ns	2.0	0	$R_L = 1$ k Ω ; $C_L = 50$ pF (see Fig.18, 19 and 20)
			31	58		73		87		4.5	0	
			17	49		62		74		6.0	0	
			18	42		53		72		4.5	-4.5	
t_{PHZ}/t_{PLZ}	turn "OFF" time S_n to V_{os}		61	290		365		435	ns	2.0	0	$R_L = 1$ k Ω ; $C_L = 50$ pF (see Fig.18, 19 and 20)
			25	58		73		87		4.5	0	
			18	49		62		74		6.0	0	
			18	42		53		72		4.5	-4.5	

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

DC CHARACTERISTICS FOR 74HCT

Voltages are referenced to GND (ground = 0)

SYMBOL	PARAMETER	T_{amb} (°C)							UNIT	TEST CONDITIONS			
		74HCT								V_{CC} (V)	V_{EE} (V)	V_i	OTHER
		+25			-40 to +85		-40 to +125						
		min.	typ.	max.	min.	max.	min.	max.					
V_{IH}	HIGH level input voltage	2.0	1.6		2.0		2.0		V	4.5 to 5.5			
V_{IL}	LOW level input voltage		1.2	0.8		0.8		0.8	V	4.5 to 5.5			
$\pm I_I$	input leakage current			0.1		1.0		1.0	μA	5.5	0	V_{CC} or GND	
$\pm I_S$	analog switch OFF-state current per channel			0.1		1.0		1.0	μA	10.0	0	V_{IH} or V_{IL}	$ V_S = V_{CC} - V_{EE}$ (see Fig.10)
$\pm I_S$	analog switch OFF-state current all channels			0.4		4.0		4.0	μA	10.0	0	V_{IH} or V_{IL}	$ V_S = V_{CC} - V_{EE}$ (see Fig.10)
$\pm I_S$	analog switch ON-state current			0.4		4.0		4.0	μA	10.0	0	V_{IH} or V_{IL}	$ V_S = V_{CC} - V_{EE}$ (see Fig.11)
I_{CC}	quiescent supply current			8.0 16.0		80.0 160.0		160.0 320.0	μA	5.5 5.0	0 -5.0	V_{CC} or GND	$V_{is} = V_{EE}$ or V_{CC} ; $V_{os} = V_{CC}$ or V_{EE}
ΔI_{CC}	additional quiescent supply current per input pin for unit load coefficient is 1 (note 1)		100	360		450		490	μA	4.5 to 5.5	0	$V_{CC} - 2.1$ V	other inputs at V_{CC} or GND

Note to HCT types

- The value of additional quiescent supply current (ΔI_{CC}) for a unit load of 1 is given here. To determine ΔI_{CC} per input, multiply this value by the unit load coefficient shown in the table below.

INPUT	UNIT LOAD COEFFICIENT
S_n	0.50
\overline{E}	0.50

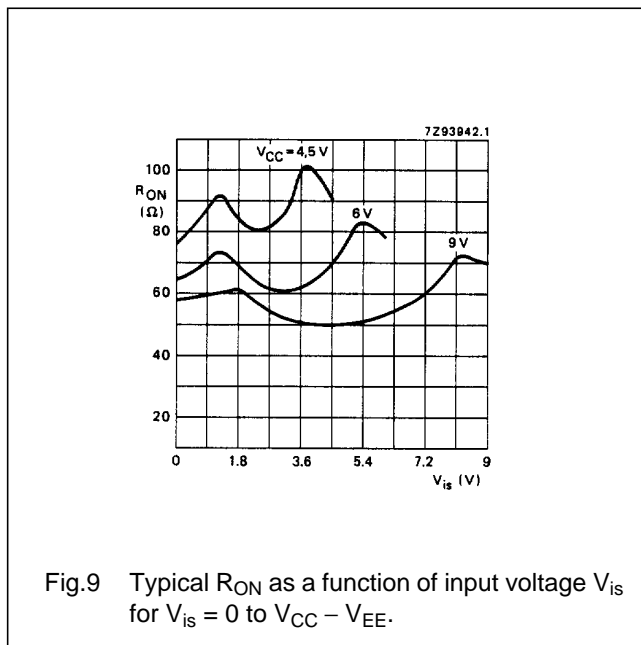
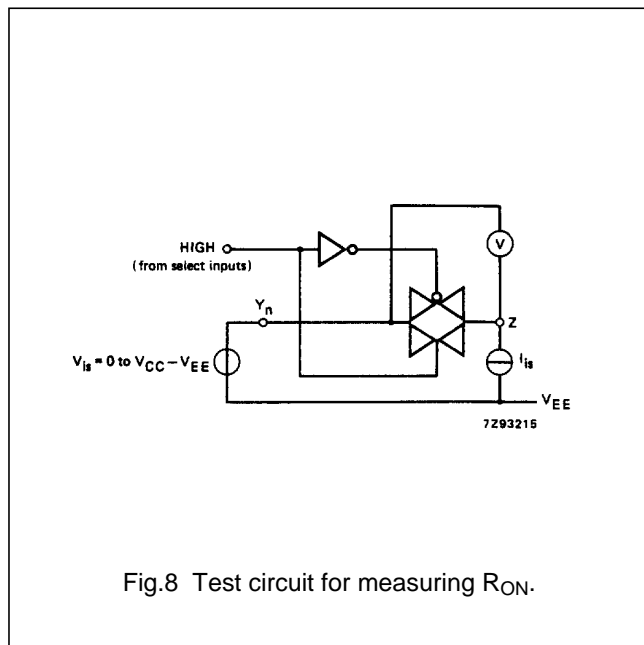
8-channel analog multiplexer/demultiplexer

74HC/HCT4051

AC CHARACTERISTICS FOR 74HCT

GND = 0 V; $t_r = t_f = 6$ ns; $C_L = 50$ pF

SYMBOL	PARAMETER	T _{amb} (°C)						UNIT	TEST CONDITIONS		
		74HCT							V _{CC} (V)	V _{EE} (V)	OTHER
		+25			-40 to +85		-40 to +125				
		min.	typ.	max.	min.	max.	min.		max.		
t _{PHL} / t _{PLH}	propagation delay V _{is} to V _{os}	5	12	12	15	15	18	ns	4.5	0	R _L = ∞; C _L = 50 pF (see Fig.17)
t _{PZH} / t _{PZL}	turn "ON" time \bar{E} to V _{os}	26	55	55	69	69	83	ns	4.5	0	R _L = 1 kΩ; C _L = 50 pF (see Fig.18, 19 and 20)
t _{PZH} / t _{PZL}	turn "ON" time S _n to V _{os}	28	55	55	69	69	83	ns	4.5	0	R _L = 1 kΩ; C _L = 50 pF (see Fig.18, 19 and 20)
t _{PHZ} / t _{PLZ}	turn "OFF" time \bar{E} to V _{os}	19	45	45	56	56	68	ns	4.5	0	R _L = 1 kΩ; C _L = 50 pF (see Fig.18, 19 and 20)
t _{PHZ} / t _{PLZ}	turn "OFF" time S _n to V _{os}	23	45	45	56	56	68	ns	4.5	0	R _L = 1 kΩ; C _L = 50 pF (see Fig.18, 19 and 20)



8-channel analog multiplexer/demultiplexer

74HC/HCT4051

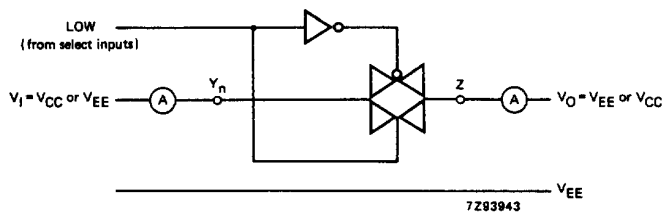


Fig.10 Test circuit for measuring OFF-state current.

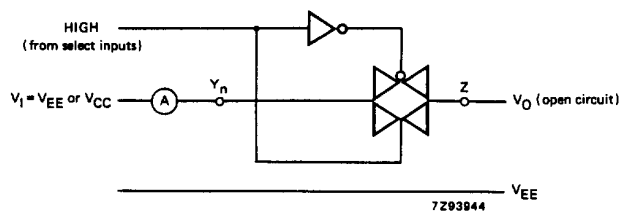


Fig.11 Test circuit for measuring ON-state current.

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

ADDITIONAL AC CHARACTERISTICS FOR 74HC/HCT

Recommended conditions and typical values

GND = 0 V; T_{amb} = 25 °C

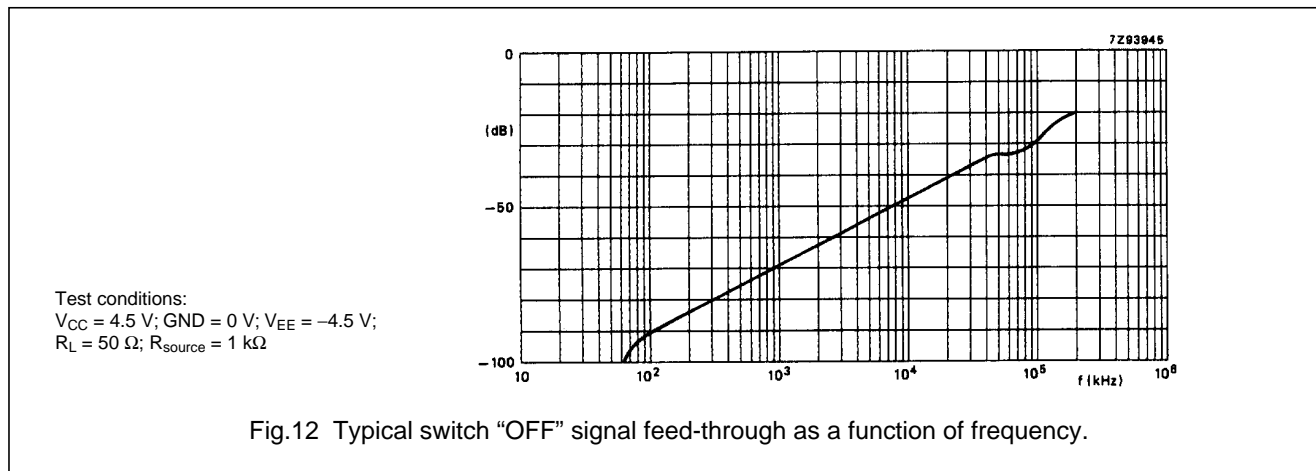
SYMBOL	PARAMETER	typ.	UNIT	V _{CC} (V)	V _{EE} (V)	V _{is(p-p)} (V)	CONDITIONS
	sine-wave distortion f = 1 kHz	0.04 0.02	% %	2.25 4.5	-2.25 -4.5	4.0 8.0	R _L = 10 kΩ; C _L = 50 pF (see Fig.14)
	sine-wave distortion f = 10 kHz	0.12 0.06	% %	2.25 4.5	-2.25 -4.5	4.0 8.0	R _L = 10 kΩ; C _L = 50 pF (see Fig.14)
	switch "OFF" signal feed-through	-50 -50	dB dB	2.25 4.5	-2.25 -4.5	note 1	R _L = 600 Ω; C _L = 50 pF (see Figs 12 and 15)
V _(p-p)	crosstalk voltage between control and any switch (peak-to-peak value)	110 220	mV mV	4.5 4.5	0 -4.5		R _L = 600 Ω; C _L = 50 pF; f = 1 MHz (\bar{E} or S _n), square-wave between V _{CC} and GND, t _r = t _f = 6 ns (see Fig.16)
f _{max}	minimum frequency response (-3dB)	170 180	MHz MHz	2.25 4.5	-2.25 -4.5	note 2	R _L = 50 Ω; C _L = 10 pF (see Fig.13 and 14)
C _S	maximum switch capacitance independent (Y) common (Z)	5 25	pF pF				

Notes to AC characteristics

1. Adjust input voltage V_{is} to 0 dBm level (0 dBm = 1 mW into 600 Ω).
2. Adjust input voltage V_{is} to 0 dBm level at V_{os} for 1 MHz (0 dBm = 1 mW into 50 Ω).

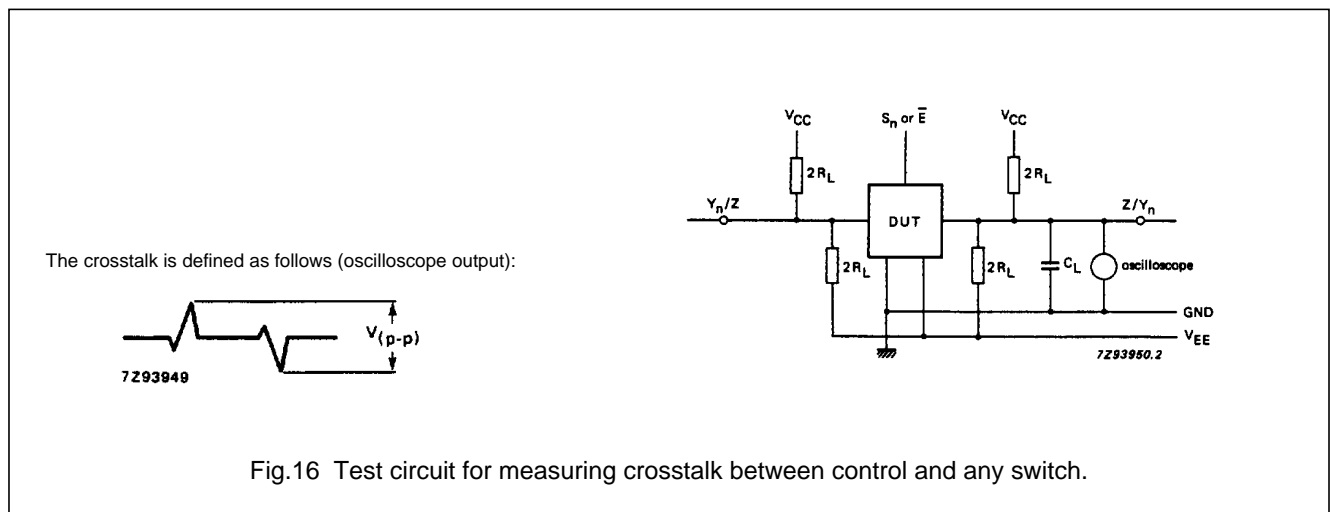
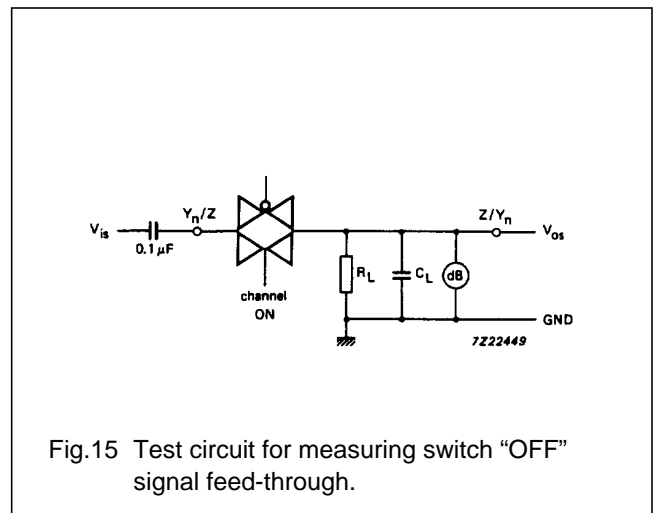
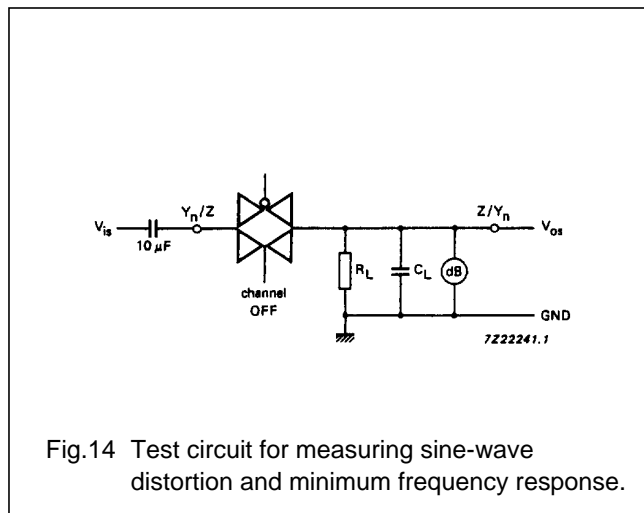
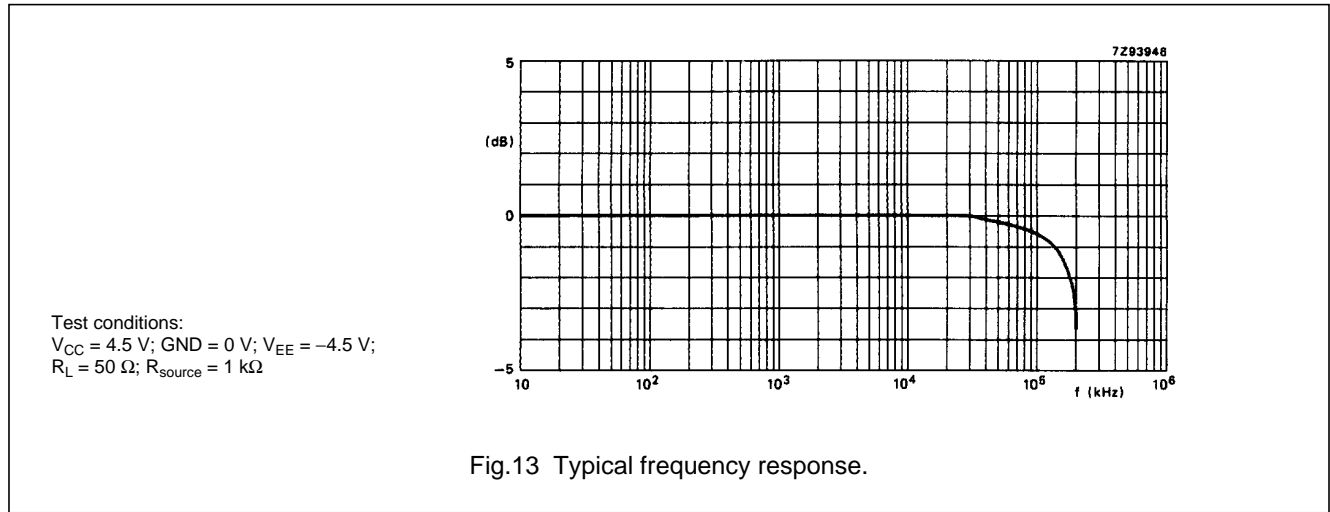
General note

V_{is} is the input voltage at a Y_n or Z terminal, whichever is assigned as an input.
V_{os} is the output voltage at a Y_n or Z terminal, whichever is assigned as an output.



8-channel analog multiplexer/demultiplexer

74HC/HCT4051



8-channel analog multiplexer/demultiplexer

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AC WAVEFORMS

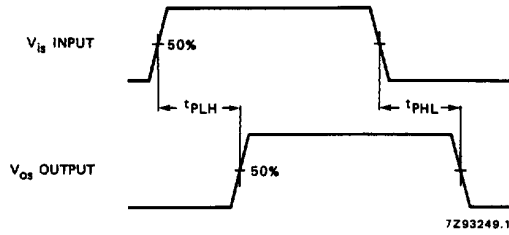
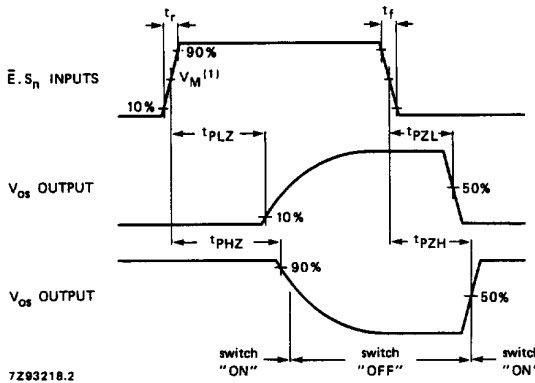


Fig.17 Waveforms showing the input (V_{is}) to output (V_{os}) propagation delays.



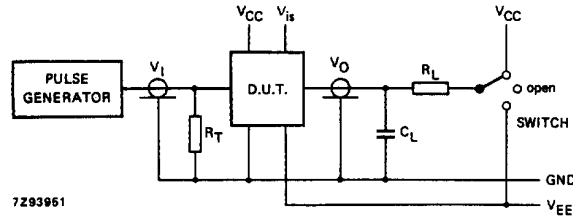
(1) HC : $V_M = 50\%$; $V_I = \text{GND to } V_{CC}$.
 HCT: $V_M = 1.3 \text{ V}$; $V_I = \text{GND to } 3 \text{ V}$.

Fig.18 Waveforms showing the turn-ON and turn-OFF times.

8-channel analog multiplexer/demultiplexer

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TEST CIRCUIT AND WAVEFORMS



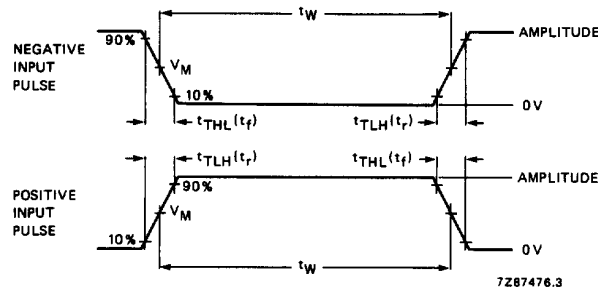
Conditions

TEST	SWITCH	V _{is}
t _{PZH}	V _{EE}	V _{CC}
t _{PZL}	V _{CC}	V _{EE}
t _{PHZ}	V _{EE}	V _{CC}
t _{PLZ}	V _{CC}	V _{EE}
others	open	pulse

FAMILY	AMPLITUDE	V _M	t _r ; t _f	
			f _{max} ; PULSE WIDTH	OTHER
74HC	V _{CC}	50%	< 2 ns	6 ns
74HCT	3.0 V	1.3 V	< 2 ns	6 ns

C_L = load capacitance including jig and probe capacitance (see AC CHARACTERISTICS for values).
 R_T = termination resistance should be equal to the output impedance Z_O of the pulse generator.
 t_r = t_f = 6 ns; when measuring f_{max}, there is no constraint to t_r, t_f with 50% duty factor.

Fig.19 Test circuit for measuring AC performance.



Conditions

TEST	SWITCH	V _{is}
t _{PZH}	V _{EE}	V _{CC}
t _{PZL}	V _{CC}	V _{EE}
t _{PHZ}	V _{EE}	V _{CC}
t _{PLZ}	V _{CC}	V _{EE}
others	open	pulse

FAMILY	AMPLITUDE	V _M	t _r ; t _f	
			f _{max} ; PULSE WIDTH	OTHER
74HC	V _{CC}	50%	< 2 ns	6 ns
74HCT	3.0 V	1.3 V	< 2 ns	6 ns

C_L = load capacitance including jig and probe capacitance (see AC CHARACTERISTICS for values).
 R_T = termination resistance should be equal to the output impedance Z_O of the pulse generator.
 t_r = t_f = 6 ns; when measuring f_{max}, there is no constraint to t_r, t_f with 50% duty factor.

Fig.20 Input pulse definitions.

8-channel analog multiplexer/demultiplexer

74HC/HCT4051

PACKAGE OUTLINES

See *"74HC/HCT/HCU/HCMOS Logic Package Outlines"*.

74HC/HCT4051; 8-channel analog multiplexer/demultiplexer

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General description

The 74HC/HCT4051 are high-speed Si-gate CMOS devices and are pin compatible with the '4051' of the '4000B' series. They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT4051 are 8-channel analog multiplexers/demultiplexers with three digital select inputs (S_0 to S_2), an active LOW enable input (E), eight independent inputs/outputs (Y_0 to Y_7) and a common input/output (Z).

With E LOW, one of the eight switches is selected (low impedance ON-state) by S_0 to S_2 . With E HIGH, all switches are in the high impedance OFF-state, independent of S_0 to S_2 .

V_{CC} and GND are the supply voltage pins for the digital control inputs (S_0 to S_2 , and E). The V_{CC} to GND ranges are 2.0 to 10.0 V for HC and 4.5 to 5.5 V for HCT. The analog inputs/outputs (Y_0 to Y_7 , and Z) can swing between V_{CC} as a positive limit and V_{EE} as a negative limit.


$V_{CC} - V_{EE}$ may not exceed 10.0 V.

For operation as a digital multiplexer/demultiplexer, V_{EE} is connected to GND (typically ground).

▣ Features




- Wide analog input voltage range: ± 5 V.
- Low 'ON' resistance:
 - 80 Ω (typ.) at $V_{CC} - V_{EE} = 4.5$ V
 - 70 Ω (typ.) at $V_{CC} - V_{EE} = 6.0$ V
 - 60 Ω (typ.) at $V_{CC} - V_{EE} = 9.0$ V
- Logic level translation: to enable 5 V logic to communicate with ± 5 V analog signals
- Typical 'break before make' built in
- Output capability: non-standard
- I_{CC} category: MSI

▣ Datasheet

<u>Type number</u>	<u>Title</u>	<u>Publication release date</u>	<u>Datasheet status</u>	<u>Page count</u>	<u>File size (kB)</u>	<u>Datasheet</u>
74HC/HCT4051	8-channel analog multiplexer/demultiplexer	12/1/1990	Product specification	16	118	 Download

Additional datasheet info

To complete the device datasheet with package and family information, also download the following PDF files. The "Logic Package Information" document is required to determine in which package(s) this device is available.

<u>Document</u>	<u>Description</u>
1  HCT_FAMILY_SPECIFICATIONS	HC/T Family Specifications, The IC06 74HC/HCT/HCMOS Logic Family Specifications
2  HCT_PACKAGE_INFO	HC/T Package Info, The IC06 74HC/HCT/HCMOS Logic Package Information
3  HCT_PACKAGE_OUTLINES	HC/T Package Outlines, The IC06 74HC/HCT/HCMOS Logic Package Outlines

▣ Parametrics


Type number	Package	Description	Propagation Delay(ns)	Voltage	No. of Pins	Power Dissipation Considerations	Logic Switching Levels	Output Drive Capability
74HC4051D	SOT109 (SO16)	8-Channel Analog Multiplexer/Demultiplexer	10~15	5 Volts +	16	Low Power or Battery Applications	CMOS	Low
74HC4051DB	SOT338-1 (SSOP16)	8-Channel Analog Multiplexer/Demultiplexer	10~15	5 Volts +	16	Low Power or Battery Applications	CMOS	Low
74HC4051N	SOT38-1 (DIP16)	8-Channel Analog Multiplexer/Demultiplexer	10~15	5 Volts +	16	Low Power or Battery Applications	CMOS	Low
74HC4051PW	SOT403-1 (TSSOP16)	8-Channel Analog Multiplexer/Demultiplexer	10~15	5 Volts +	16	Low Power or Battery Applications	CMOS	Low
74HCT4051D	SOT109 (SO16)	8-Channel Analog Multiplexer/Demultiplexer; TTL Enabled	10~15	5 Volts +	16	Low Power or Battery Applications	TTL	Low
74HCT4051DB	SOT338-1 (SSOP16)	8-Channel Analog Multiplexer/Demultiplexer; TTL Enabled	10~15	5 Volts +	16	Low Power or Battery Applications	TTL	Low
74HCT4051N	SOT38-1 (DIP16)	8-Channel Analog Multiplexer/Demultiplexer; TTL Enabled	10~15	5 Volts +	16	Low Power or Battery Applications	TTL	Low

❑ Products, packages, availability and ordering

<u>Type number</u>	<u>North American type number</u>	<u>Ordering code (12NC)</u>	<u>Marking/Packing</u> Discretes packing info	<u>Package</u>	<u>Device status</u>	<u>Buy online</u>
74HC4051D	74HC4051D	9337 148 20652	Standard Marking * Bulk Pack, CECC	SOT109 (SO16)	Full production	order this <input type="checkbox"/>
	74HC4051D-T	9337 148 20653	Standard Marking * Reel Pack, SMD, 13", CECC	SOT109 (SO16)	Full production	order this <input type="checkbox"/>
74HC4051DB	74HC4051DB	9351 738 10112	Standard Marking * Bulk Pack	SOT338-1 (SSOP16)	Full production	order this <input type="checkbox"/>
	74HC4051DB-T	9351 738 10118	Standard Marking * Reel Pack, SMD, 13"	SOT338-1 (SSOP16)	Full production	order this <input type="checkbox"/>
74HC4051N	74HC4051N	9336 697 40652	Standard Marking * Bulk Pack, CECC	SOT38-1 (DIP16)	Full production	order this <input type="checkbox"/>
74HC4051PW	74HC4051PW	9351 874 80112	Standard Marking * Bulk Pack	SOT403-1 (TSSOP16)	Full production	order this <input type="checkbox"/>
	74HC4051PW-T	9351 874 80118	Standard Marking * Reel Pack, SMD, 13"	SOT403-1 (TSSOP16)	Full production	order this <input type="checkbox"/>
74HCT4051D	74HCT4051D	9337 153 00112	Standard Marking * Bulk Pack	SOT109 (SO16)	Full production	order this <input type="checkbox"/>
	74HCT4051D-T	9337 153 00118	Standard Marking * Reel Pack, SMD, 13"	SOT109 (SO16)	Full production	order this <input type="checkbox"/>
74HCT4051DB	74HCT4051DB	9351 738 00112	Standard Marking * Bulk Pack	SOT338-1 (SSOP16)	Full production	order this <input type="checkbox"/>
	74HCT4051DB-T	9351 738 00118	Standard Marking * Reel Pack, SMD, 13"	SOT338-1 (SSOP16)	Full production	order this <input type="checkbox"/>
74HCT4051N	74HCT4051N	9336 703 70112	Standard Marking * Bulk Pack	SOT38-1 (DIP16)	Full production	order this <input type="checkbox"/>

74HCT4051PW		9352 704 18112	Standard Marking * Bulk Pack	SOT403	Full production	-
		9352 704 18118	Standard Marking * Reel Pack, SMD, 13"	SOT403	Full production	-

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 [74HC/HCT4051](#) links to the similar products page containing an overview of products that are similar in function or related to the type number(s) as listed on this page. The similar products page includes products from the same catalog tree(s), relevant selection guides and products from the same functional category.

Support & tools

 [HC/T Family Specifications, The IC06 74HC/HCT/HCMOS Logic Family Specifications](#)(date 01-Mar-98)

 [HC/T User Guide](#)(date 01-Nov-97)

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