



Die Datasheet, Logic Gate Device

74HC4051

8 – CHANNEL ANALOG MULTIPLEXER / DEMULTIPLEXER

Die Source:



70 mils x 79 mils x 14 mils

Backside : Silicon
Topside Metal: Aluminum

General Description:

The 74HC4051 is a member of the Industries 74xxx series of Logic devices. The 74HC4051 is a device description which contains an 8-Channel Analog multiplexer/demultiplexer.

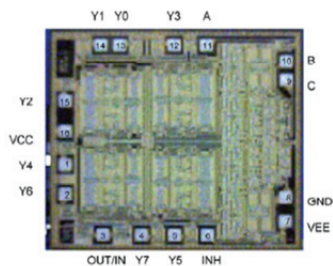
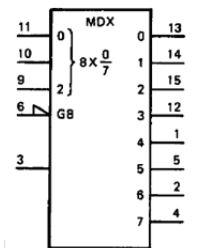
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	CONDITIONS	LIMIT	UNITS
Supply Voltage	V_{CC}		-0.5 to +7.0	V
DC Input Diode Current	I_{IK}	$V_I = -0.5V$	-20.0	mA
		$V_I = V_{CC} + 0.5V$	20.0	mA
DC Input Voltage	V_I		-0.5 to $V_{CC} + 0.5$	V
DC Output Diode Current	I_{OK}	$V_O = -0.5V$	-20.0	mA
		$V_O = V_{CC} + 0.5V$	20.0	mA
DC Output Voltage	V_O		-0.5 to $V_{CC} + 0.5$	V
DC Output Source or Sink Current	I_O		± 25.0	mA
DC VCC Current	I_{CC}		+50	mA
DC GND Current	I_{DD}		-50.0	mA
Storage Temp	T_{STG}		-65.0 to +150	$^{\circ}C$
Max Junction Temp	T_J		150.0	$^{\circ}C$

RECOMMENDED OPERATING CONDITIONS

PARAMETER	TECH	SYMBOL	LIMIT	UNITS
Supply Voltage		V_{CC}	2.0 to 6.0	V
	HC			
Input Voltage		V_I	0 to V_{CC}	V
Output Voltage		V_O	0 to V_{CC}	V
Operating Temperature		T_A	-40 to +85	$^{\circ}C$
Minimum Input Rise & Fall times (@5.0V \pm 0.5V)		$\Delta T/\Delta V$	500	ns/V
	HC			

IEEE / IEC LOGIC SYMBOL



DC ELECTRICAL CHARACTERISTICS

PARAMETER	TECH	SYMBOL	VCC (V)	CONDITIONS	Guarenteed Limits		UNITS	NOTE
					Min@25C	Min@85C		
Minimum HIGH level Input Voltage	HC	V_{IH}	2.0		1.50	1.50	V	
			4.5		3.15	3.15		
			6.0		4.20	4.20		
Maximum LOW level Input Voltage	HC	V_{IL}	2.0		0.50	0.50	V	
			4.0		1.35	1.35		
			4.5		1.80	1.80		
Minimum HIGH level Output Voltage	HC	V_{OH}	2.0	$I_{OUT} = -20\mu A$	1.90	1.90	V	
			4.5		4.40	4.40		
			6.0		5.90	5.90		
	HC	V_{OH}	4.5	$V_{IN} = V_{IL} \text{ or } V_{IH}, I_{OL} = -4mA$	3.98	3.84	V	
			6.0	$V_{IN} = V_{IL} \text{ or } V_{IH}, I_{OL} = -5.2mA$	5.48	5.34		



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DC ELECTRICAL CHARACTERISTICS - CONT'D

PARAMETER	TECH	SYMBOL	VCC (V)	CONDITIONS	Guarenteed Limits		UNITS	NOTE
					Min@25C	Min@85C		
Maximum LOW level Output Voltage	HC	V _{OL}	2.0	I _{OUT} = 20uA	0.1	0.1	V	
			4.5		0.1	0.1		
			6.0		0.1	0.1		
	HC	V _{OL}	4.5	V _{IN} = V _{IL} or V _{IH} , I _O = 4mA	0.36	0.44	V	
			6.0	V _{IN} = V _{IL} or V _{IH} , I _O = 5.2mA	0.36	0.44		
	Maximum Input Leakage Current	HC	I _{IN}	6.0	V _I = V _{CC} or GND	±0.1	±1.0	uA
3-State Output OFF Current	HC	I _{OZ}	6.0	V _I = V _{IH} or V _{IL} , V _O = V _{CC} or GND	--	±5.0	uA	
Maximum Quiescent Supply Current	HC	I _{CC}	6.0	V _{IN} = V _{CC} or GND	--	20	uA	

AC ELECTRICAL CHARACTERISTICS

PARAMETER	TECH	SYMBOL	VCC (V)	CONDITIONS	Guarenteed Limits		Guarenteed Limits		UNITS
					Min@25C	Max@25C	Min@85C	Max@85C	
Propagation Delay, Vis to Vos	HC	t _{PLH}	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	60.0	--	75.0	ns
			4.5		--	12.0	--	15.0	
			6.0		--	10.0	--	13.0	
	HC	t _{PHL}	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	60.0	--	75.0	ns
			4.5		--	12.0	--	15.0	
			6.0		--	10.0	--	13.0	
Turn ON Time, E\ to Vos	HC	t _{PLH}	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	345.0	--	430.0	ns
			4.5		--	69.0	--	86.0	
			6.0		--	59.0	--	73.0	
	HC	t _{PHL}	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	345.0	--	430.0	ns
			4.5		--	69.0	--	86.0	
			6.0		--	59.0	--	73.0	
Turn ON Time, Sn to Vos	HC	t _{PZH}	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	345.0	--	430.0	ns
			4.5		--	69.0	--	86.0	
			6.0		--	59.0	--	73.0	
	HC	t _{PZL}	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	345.0	--	430.0	ns
			4.5		--	69.0	--	86.0	
			6.0		--	59.0	--	73.0	
HC	t _{PZL}	4.5	Above Plus VEE = -4.5V	--	51.0	--	64.0	ns	



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AC ELECTRICAL CHARACTERISTICS - CONT'D

PARAMETER	TECH	SYMBOL	VCC (V)	CONDITIONS	Guarenteed Limits		Guarenteed Limits		UNITS
					Min@25C	Max@25C	Min@85C	Max@85C	
Turn OFF Time, E\ to Vos	HC	tPHZ	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	290.0	--	365.0	ns
			4.5		--	58.0	--	73.0	
			6.0		--	49.0	--	62.0	
			4.5		Above Plus VEE = -4.5V	--	42.0	--	
	HC	tPLZ	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	290.0	--	365.0	ns
			4.5		--	58.0	--	73.0	
			6.0		--	49.0	--	62.0	
			4.5		Above Plus VEE = -4.5V	--	42.0	--	
Turn OFF Time, Sn to Vos	HC	tTLH	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	290.0	--	365.0	ns
			4.5		--	58.0	--	73.0	
			6.0		--	49.0	--	62.0	
			4.5		Above Plus VEE = -4.5V	--	42.0	--	
	HC	tTHL	2.0	GND = 0V, tr = tf = 6ns, CL = 50pF	--	290.0	--	365.0	ns
			4.5		--	58.0	--	73.0	
			6.0		--	49.0	--	62.0	
			4.5		Above Plus VEE = -4.5V	--	42.0	--	