



Die Datasheet, Logic Gate Device

74AC138

1-of-8 Decoder/Demultiplexer

Die Source:



44 mils x 50 mils x 14 mils

Backside : Silicon
Topside Metal: Aluminum

General Description:

The 74AC138 is a member of the Industries 74xxx series of Logic devices. The 74AC138 is a device description which contains (1) 1-of-8 Decoder/Demultiplexer.

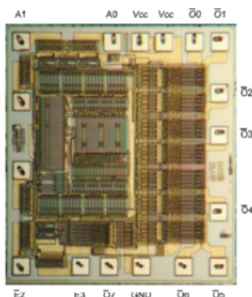
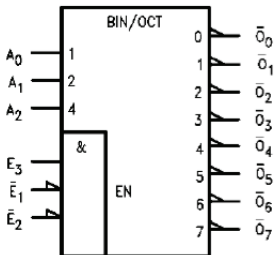
ABSOLUTE MAXIMUM RATINGS

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		± 50.0	mA
DC VCC Current	I_{CC}		± 50.0	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	AC	V_{CC}	2.0 to 6.0	V
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 Edge Rate	AC	$\Delta V/\Delta t$	125	mV/ns

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	AC	V_{IH}	3.0	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	2.10	2.10	V	
			4.5		3.15	3.15		
			5.5		3.85	3.85		
Maximum LOW level Input Voltage	AC	V_{IL}	3.0	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	0.90	0.90	V	
			4.5		1.35	1.35		
			5.5		1.65	1.65		
Minimum HIGH level Output Voltage	AC	V_{OH}	3.0	$I_{OUT} = -50\mu A$	2.90	2.90	V	
			4.5		4.40	4.40		
			5.5		5.40	5.40		
	AC	V_{OH}	3.0	$V_{IN} = V_{IL}$ or V_{IH} , $I_{OL} = -12mA$	2.56	2.46	V	1
			4.5	$V_{IN} = V_{IL}$ or V_{IH} , $I_{OL} = -12mA$	3.86	3.76		
			5.5	$V_{IN} = V_{IL}$ or V_{IH} , $I_{OL} = -24mA$	4.86	4.76		



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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	AC	V _{OL}	3.0	I _{OUT} = -50uA	0.1	0.1	V	
			4.5		0.1	0.1		
			5.5		0.1	0.1		
	AC	V _{OL}	3.0	V _{IN} = V _{IL} or V _{IH} , I _{OL} = -12mA	0.36	0.44	V	1
			4.5	V _{IN} = V _{IL} or V _{IH} , I _{OL} = -24mA	0.36	0.44		
			5.5	V _{IN} = V _{IL} or V _{IH} , I _{OL} = -24mA	0.36	0.44		
Maximum Input Leakage Current	AC	I _{IN}	5.5	V _I = V _{CC} or GND	±0.1	±1.0	uA	2
Minimum Dynamic Output Current	AC	I _{OLD}	5.5	V _{OLD} = 1.65V Max	--	75	mA	
	AC	I _{OHD}	5.5	V _{OHD} = 3.85V Min	--	-75	mA	
Maximum Quiescent Supply Current	AC	I _{CC}	5.5	V _{IN} = V _{CC} or GND	4	40	uA	2

- Note(s):
1. All Outputs Loaded; thresholds on input associated with output under test
 2. I_{IN} and I_{CC} @ 3.0V are guaranteed to be less than or equal to the respective limit @ 5.5V VCC

AC ELECTRICAL CHARACTERISTICS

PARAMETER	TECH	SYMBOL	VCC (V)	CONDITIONS	Guarenteed Limits		Guarenteed Limits		UNITS
					Min@25C	Max@25C	Min@85C	Max@85C	
Propagation Delay: An to $\bar{O}n$	AC	t _{PLH}	5.0	C _L = 50pF	1.5	9.5	1.5	10.5	ns
	AC	t _{PHL}	5.0	C _L = 50pF	1.5	9.0	1.5	10.5	ns
Propagation Delay: E1 or E2 to $\bar{O}n$	AC	t _{PLH}	5.0	C _L = 50pF	1.5	11.0	1.5	12.0	ns
	AC	t _{PHL}	5.0	C _L = 50pF	1.5	9.5	1.5	10.5	ns
Propagation Delay: E3 to $\bar{O}n$	AC	t _{PLH}	5.0	C _L = 50pF	1.5	11.0	1.5	12.5	ns
	AC	t _{PHL}	5.0	C _L = 50pF	1.5	8.0	1.0	9.5	ns