

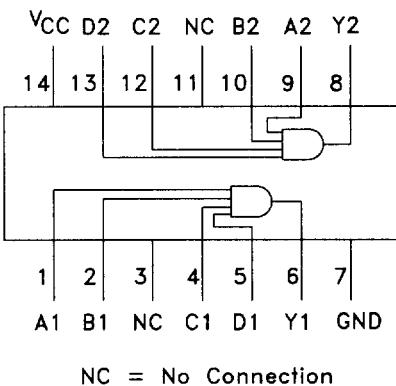
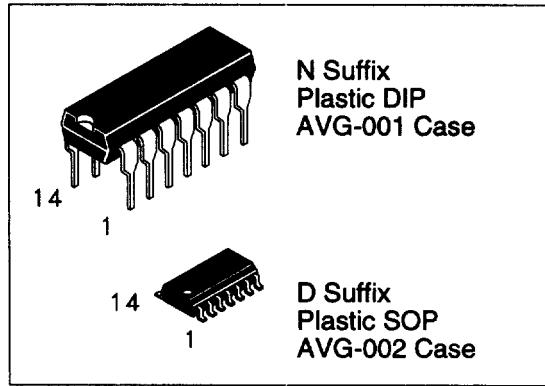
Available Q2, 1995

Dual 4-Input AND Gate

This device contains two independent gates, each of which performs the logic AND function.

- Advanced very high speed CMOS
- Outputs source/sink 24 mA
- Transmission line driving 50 ohms
- ACT has TTL compatible inputs
- Operation from 2 to 6 volts guaranteed
- DC & AC Parameters guaranteed over -40 to +85°C

**DV74AC21
DV74ACT21**



TRUTH TABLE

Inputs				Output
A	B	C	D	Y
L	X	X	X	L
X	L	X	X	L
X	X	L	X	L
X	X	X	L	L
H	H	H	H	H

H=High Logic Level

L=Low Logic Level

X=Don't Care

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	AC21, ACT21	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	- 0.5 to +7.0	V
V _{IN}	DC Input Voltage (Referenced to GND)	- 0.5 to V _{CC} + 0.5	V
V _{OUT}	DC Output Voltage (Referenced to GND)	- 0.5 to V _{CC} + 0.5	V
I _{IN}	DC Input Current, per Pin	± 20	mA
I _{OUT}	DC Output Sink/Source Current, per Pin	± 50	mA
I _{CC}	DC V _{CC} or GND Current per Output Pin	± 50	mA
T _{STG}	Storage Temperature	- 65 to +150	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V _{CC}	Supply Voltage	'AC	2.0	5.0	6.0
		'ACT	4.5	5.0	5.5
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage, (Ref. to GND)	0		V _{CC}	V
t _r , t _f	Input Rise and Fall Time (Note 1) AC Devices	V _{CC} @ 3.0 V		150	ns/V
		V _{CC} @ 4.5 V		40	ns/V
		V _{CC} @ 5.5 V		25	ns/V

GUARANTEED OPERATING CONDITIONS (continued)

Symbol	Parameter		Min	Typ	Max	Unit
tr, tf	Input Rise and Fall Time (Note 2) ACT Devices	Vcc @ 4.5 V			10	ns/V
		Vcc @ 5.5 V			8.0	ns/V
TA	Operating Ambient Temperature Range		-40	25	85	°C
CIN	Input Capacitance Vcc = 5.0 V		Vcc = 5.0 V	4.5		pF
CPD	Power Dissipation Capacitance		Vcc = 5.0 V	30		pF

1. VIN from 30% to 70% VCC

2. VIN from 0.8 to 2.0 V

AC — 21

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Vcc (V)	AC21			Unit
				TA = +25°C		TA = -40 to +85°C	
				Typ	Guaranteed Limits		
VIH	Minimum High Level Input Voltage	VOUT = 0.1V or Vcc - 0.1 V	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	V
VIL	Maximum Low Level Input Voltage	VOUT = 0.1V or Vcc - 0.1 V	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	V
VOH	Minimum High Level Output Voltage	IOUT = -50 μA	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	V
		VIN = VIL or VIH -12mA IOL -24mA -24mA	3.0 4.5 5.5		2.56 3.86 4.86	2.46 3.76 4.76	V
VOL	Maximum Low Level Output Voltage	IOUT = 50 μA	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	V
		VIN = VIL or VIH 12mA IOL 24mA 24mA	3.0 4.5 5.5		0.36 0.36 0.36	0.44 0.44 0.44	V
IIN	Maximum Input Leakage Current	VIN = VCC or GND	5.5		±0.1	±1.0	μA
ICC	Maximum Quiescent Supply Current	VIN = VCC or GND	5.5		4.0	40	μA

AC CHARACTERISTICS over full operating conditions

Symbol	Parameter	Vcc ±10% (V)	AC21				Unit	
			TA = +25°C CL = 50 pF		TA = -40°C to +85°C CL = 50 pF			
			Min	Max	Min	Max		
tPLH	Propagation Delay	3.3 5.0	1.5 1.5	7.5 6.0	1.0 1.0	8.0 6.5	ns	
tPHL	Propagation Delay	3.3 5.0	1.5 1.5	7.5 6.5	1.0 1.0	8.0 7.0	ns	

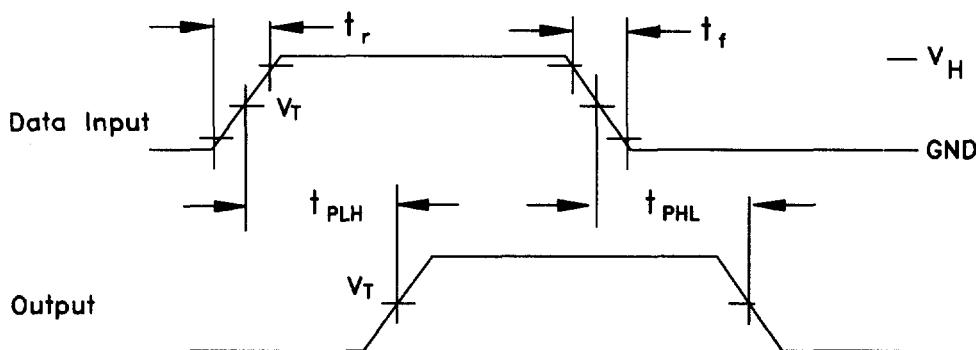
DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	ACT21			Unit
				TA = +25°C		TA = -40 to +85°C	
				Typ	Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V
V _{IL}	Maximum Low Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V
V _{OH}	Minimum High Level Output Voltage	I _{OUT} = -50 μA	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V
		V _{IN} = V _{IL} or V _{IH} I _{OH} -24mA -24 mA	4.5 5.5		3.86 4.86	3.76 4.76	V
V _{OL}	Maximum Low Level Output Voltage	I _{OUT} = 50 μA	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V
		V _{IN} = V _{IL} or V _{IH} I _{OL} 24mA 24 mA	4.5 5.5		0.36 0.36	0.44 0.44	V
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	5.5		±0.1	±1.0	μA
ΔI _{CCT}	Additional Max I _{CC} /Input	V _{IN} = V _{CC} - 2.1 V	5.5	0.6		1.5	mA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5		4.0	40	μA

AC CHARACTERISTICS over full operating conditions

Symbol	Parameter	V _{CC} ±10% (V)	ACT21				Unit	
			TA = +25°C C _L = 50 pF		TA = -40°C to +85°C C _L = 50 pF			
			Min	Max	Min	Max		
t _{PLH}	Propagation Delay	5.0	1.5	8.5	1.0	9.0	ns	
t _{PHL}	Propagation Delay	5.0	1.5	9.5	1.0	10	ns	

SWITCHING WAVEFORMS



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Input and output threshold voltage:
 V_T = 50% V_{CC} for AC; 1.5V for ACT
 V_H = V_{CC} for AC, 3V for ACT