

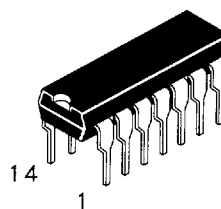
Available Q2, 1995

Dual 4-Input AND Gate

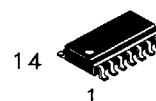
This device contains two independent gates, each of which performs the logic AND function.

- 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 $+85^{\circ}\text{C}$

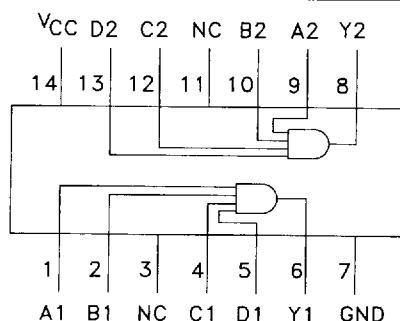
DV74AC21
DV74ACT21



N Suffix
Plastic DIP
AVG-001 Case



D Suffix
Plastic SOP
AVG-002 Case



NC = No Connection

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 $+150$	$^{\circ}\text{C}$

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	'AC	2.0	5.0	V
		'ACT	4.5	5.0	
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	$V_{CC} @ 3.0 \text{ V}$		150	ns/V
		$V_{CC} @ 4.5 \text{ V}$		40	ns/V
		$V_{CC} @ 5.5 \text{ V}$		25	ns/V

1-800-AVG-SEMI

6 - 21

DV74AC21, DV74ACT21

9010118 0000611 561

21

GUARANTEED OPERATING CONDITIONS (continued)

Symbol	Parameter	Min	Typ	Max	Unit
t_r, t_f	Input Rise and Fall Time (Note 2) ACT Devices	$V_{CC} @ 4.5 V$		10	ns/V
		$V_{CC} @ 5.5 V$		8.0	ns/V
T_A	Operating Ambient Temperature Range	-40	25	85	°C
C_{IN}	Input Capacitance $V_{CC} = 5.0 V$	$V_{CC} = 5.0 V$	4.5		pF
C_{PD}	Power Dissipation Capacitance	$V_{CC} = 5.0 V$	30		pF

1. V_{IN} from 30% to 70% V_{CC}

2. V_{IN} 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	1.5	2.1	2.1	V		
			4.5	2.25	3.15	3.15			
			5.5	2.75	3.85	3.85			
VIL	Maximum Low Level Input Voltage	VOUT = 0.1V or VCC - 0.1 V	3.0	1.5	0.9	0.9	V		
			4.5	2.25	1.35	1.35			
			5.5	2.75	1.65	1.65			
VOH	Minimum High Level Output Voltage	IOUT= -50 μA	3.0	2.99	2.9	2.9	V		
			4.5	4.49	4.4	4.4			
			5.5	5.49	5.4	5.4			
		VIN = VIL or VIH				2.56	2.46	V	
									-12mA
									I OH -24mA
									-24mA
VOL	Maximum Low Level Output Voltage	IOUT = 50 μA	3.0	0.002	0.1	0.1	V		
			4.5	0.001	0.1	0.1			
			5.5	0.001	0.1	0.1			
		VIN = VIL or VIH				0.36	0.44	V	
									12mA
									I OL 24mA
									24mA
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	1.5	7.5	1.0	8.0	ns
		5.0	1.5	6.0	1.0	6.5	
tPHL	Propagation Delay	3.3	1.5	7.5	1.0	8.0	ns
		5.0	1.5	6.5	1.0	7.0	

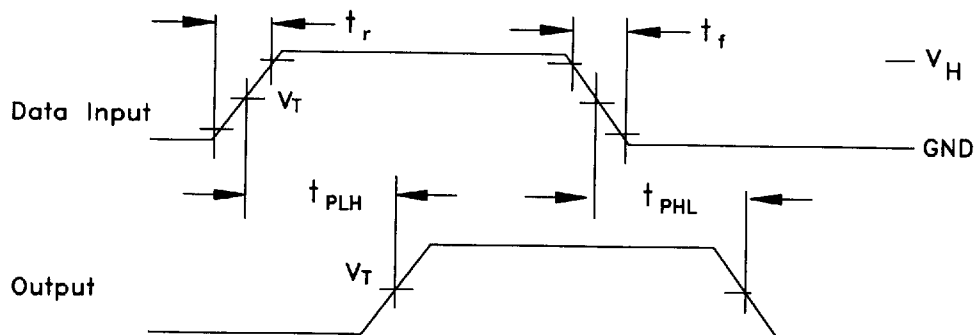
DC ELECTRICAL CHARACTERISTICS

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
			T _A = +25°C C _L = 50 pF		T _A = − 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



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