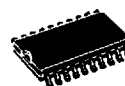


OCTAL BUS BUFFER WITH 3 STATE OUTPUTS (NON INVERTED)

- **HIGH SPEED:** $t_{PD} = 4 \text{ ns (TYP.)}$ at $V_{CC} = 5V$
- **LOW POWER DISSIPATION:**
 $I_{CC} = 8 \mu A \text{ (MAX.)}$ at $T_A = 25^\circ C$
- **HIGH NOISE IMMUNITY:**
 $V_{NIH} = V_{NIL} = 28\% V_{CC} \text{ (MIN.)}$
- **50Ω TRANSMISSION LINE DRIVING CAPABILITY**
- **SYMMETRICAL OUTPUT IMPEDANCE:**
 $|I_{OH}| = |I_{OL}| = 24 \text{ mA (MIN.)}$
- **BALANCED PROPAGATION DELAYS:**
 $t_{PLH} \approx t_{PHL}$
- **OPERATING VOLTAGE RANGE:**
 $V_{CC} \text{ (OPR)} = 2V \text{ to } 6V$
- **PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 244**
- **IMPROVED LATCH-UP IMMUNITY**

DESCRIPTION

The AC244 is an advanced CMOS OCTAL BUS BUFFER (3-STATE) fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology. It is ideal for low power applications



M
(Micro Package)

ORDER CODES :
74AC244M

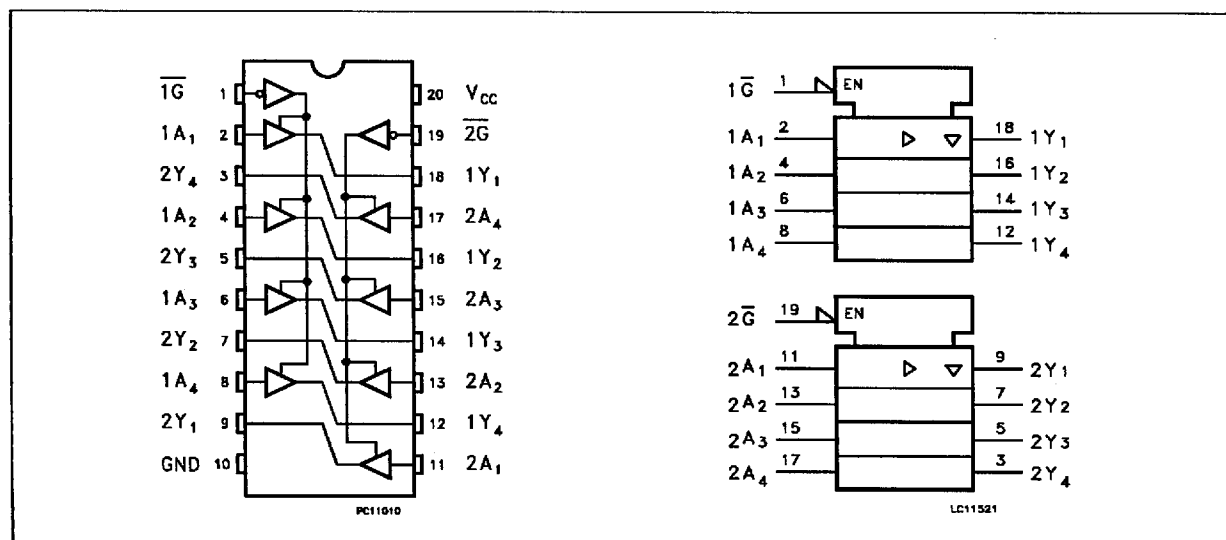
maintaining high speed operation similar to equivalent Bipolar Schottky TTL.

G control output governs four BUS BUFFERS.

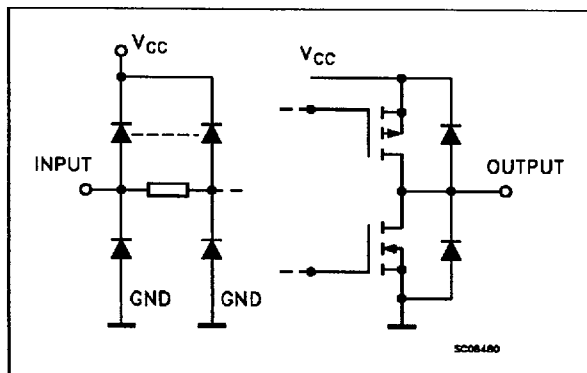
This device is designed to be used with 3 state memory address drivers, etc.

All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS



INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1	$\overline{1G}$	Output Enable Input
2, 4, 6, 8	1A1 to 1A4	Data Inputs
9, 7, 5, 3	2Y1 to 2Y4	Data Outputs
11, 13, 15, 17	2A1 to 2A4	Data Inputs
18, 16, 14, 12	1Y1 to 1Y4	Data Outputs
19	$\overline{2G}$	Output Enabel Input
10	GND	Ground (0V)
20	Vcc	Positive Supply Voltage

TRUTH TABLE

INPUT		OUTPUT
$\overline{G}$	An	Yn
L	L	L
L	H	H
H	X	Z

X: "H" or "L"

Z: High impedance

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vcc	Supply Voltage	-0.5 to +7	V
Vi	DC Input Voltage	-0.5 to Vcc + 0.5	V
Vo	DC Output Voltage	-0.5 to Vcc + 0.5	V
Iik	DC Input Diode Current	± 20	mA
Iok	DC Output Diode Current	± 20	mA
Io	DC Output Current	± 50	mA
Icc or Ignd	DC Vcc or Ground Current	± 400	mA
Tstg	Storage Temperature	-65 to +150	°C
TL	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Value	Unit
Vcc	Supply Voltage		2 to 6	V
Vi	Input Voltage		0 to Vcc	V
Vo	Output Voltage		0 to Vcc	V
T _{op}	Operating Temperature:		-40 to +85	°C
dt/dv	Input Rise and Fall Time (note 1)	Vcc = 3 V	0 to 150	ns/V
		Vcc = 4.5 V	0 to 40	
		Vcc = 5.5 V	0 to 25	

1) ViN from 30% to 70% of Vcc

DC SPECIFICATIONS

Symbol	Parameter	Test Conditions		Value					Unit
		V _{CC} (V)		T _A = 25 °C			-40 to 85 °C		
				Min.	Typ.	Max.	Min.	Max.	
V _{IH}	High Level Input Voltage	3.0	V _O = 0.1 V or V _{CC} - 0.1 V	2.1	1.5		2.1		V
		4.5		3.15	2.25		3.15		
		5.5		3.85	2.75		3.85		
V _{IL}	Low Level Input Voltage	3.0	V _O = 0.1 V or V _{CC} - 0.1 V		1.5	0.9		0.9	V
		4.5			2.25	1.35		1.35	
		5.5			2.75	1.65		1.65	
V _{OH}	High Level Output Voltage	3.0	V _I ^(*) = V _{IH} or V _{IL}	I _O = 50 μA	2.9	2.99		2.9	V
		4.5		I _O = 50 μA	4.4	4.49		4.4	
		5.5		I _O = 50 μA	5.4	5.49		5.4	
		3.0		I _O = 12 mA	2.56			2.46	
		4.5		I _O = 24 mA	3.86			3.76	
		5.5		I _O = 24 mA	4.86			4.76	
V _{OL}	Low Level Output Voltage	3.0	V _I ^(*) = V _{IH} or V _{IL}	I _O = 50 μA		0.002	0.1	0.1	V
		4.5		I _O = 50 μA		0.001	0.1	0.1	
		5.5		I _O = 50 μA		0.001	0.1	0.1	
		3.0		I _O = 12 mA			0.36	0.44	
		4.5		I _O = 24 mA			0.36	0.44	
		5.5		I _O = 24 mA			0.36	0.44	
I _I	Input Leakage Current	5.5	V _I = V _{CC} or GND			±0.1		±1	μA
I _{OZ}	3 State Output Leakage Current	5.5	V _I = V _{IH} or V _{IL} V _O = V _{CC} or GND			±0.5		±5	μA
I _{CC}	Quiescent Supply Current	5.5	V _I = V _{CC} or GND			8		80	μA
I _{OLD}	Dynamic Output Current (note 1, 2)	5.5	V _{OLD} = 1.65 V max					75	mA
I _{OH}			V _{OH} = 3.85 V min					-75	mA

1) Maximum test duration 2ms, one output loaded at time

2) Incident wave switching is guaranteed on transmission lines with impedances as low as 50 Ω.

(*) All outputs loaded.

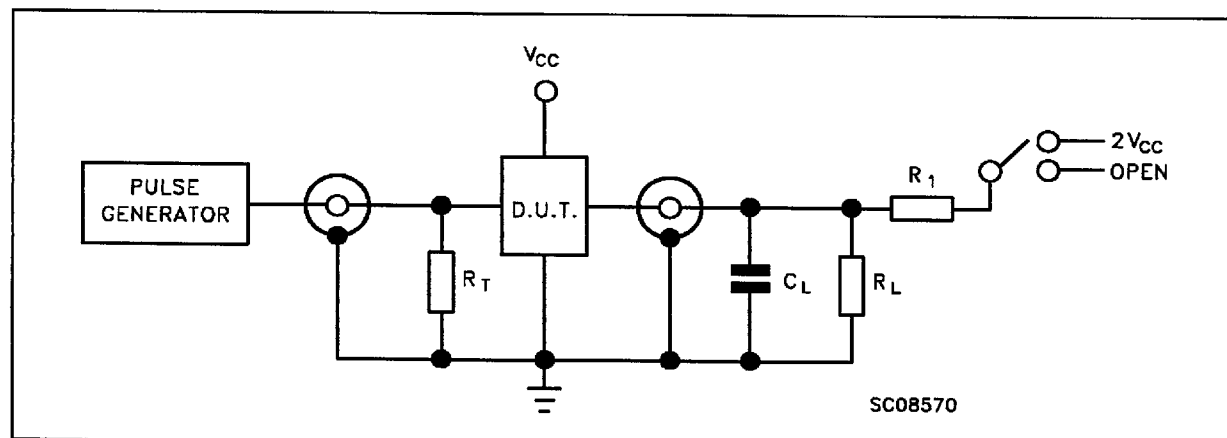
AC ELECTRICAL CHARACTERISTICS ($C_L = 50 \text{ pF}$, $R_L = 500 \Omega$, Input $t_r = t_f = 3 \text{ ns}$)

Symbol	Parameter	Test Condition		Value					Unit
		V _{CC} (V)		T _A = 25 °C			-40 to 85 °C		
				Min.	Typ.	Max.	Min.	Max.	
t _{PLH} t _{PHL}	Propagation Delay Time	3.3 ^(*) 5.0 ^(**)		1.5 1.5	5 4	9 7	1.5 1.5	10 7.5	ns
t _{PZL} t _{PZH}	Output Enable Time	3.3 ^(*) 5.0 ^(**)		1.5 1.5	6 4	10 8	1.5 1.5	11 8.5	
t _{PLZ} t _{PHZ}	Output Disable Time	3.3 ^(*) 5.0 ^(**)		1.5 1.5	7 5.5	11 9	1.5 1.5	12 10	ns

(*) Voltage range is $3.3\text{V} \pm 0.3\text{V}$ (**) Voltage range is $5\text{V} \pm 0.5\text{V}$ **CAPACITIVE CHARACTERISTICS**

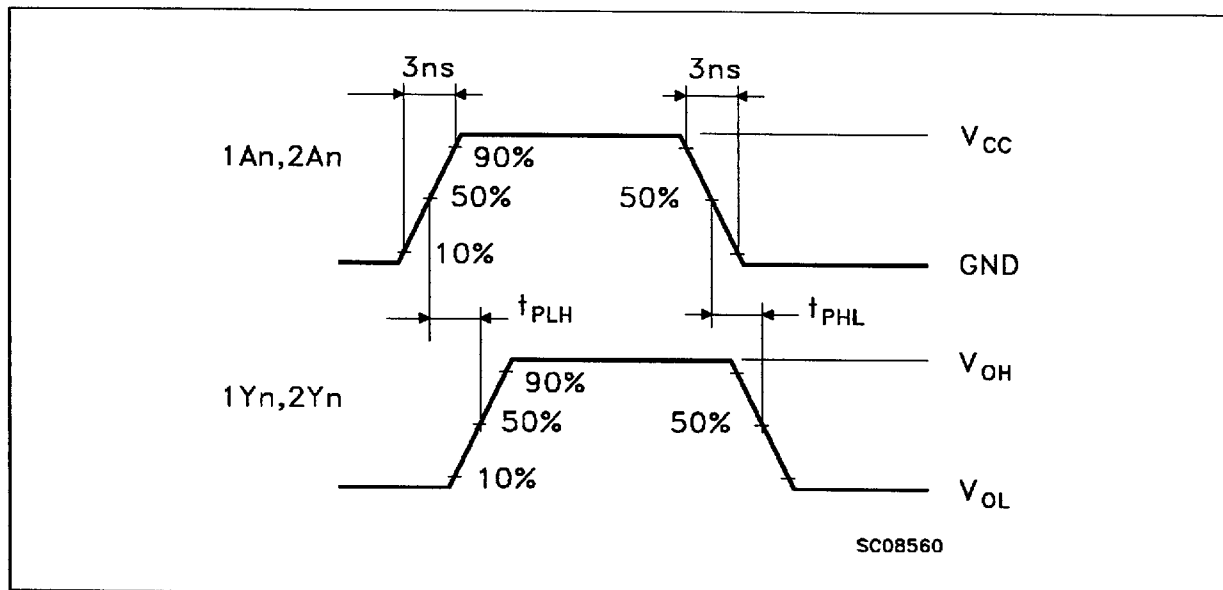
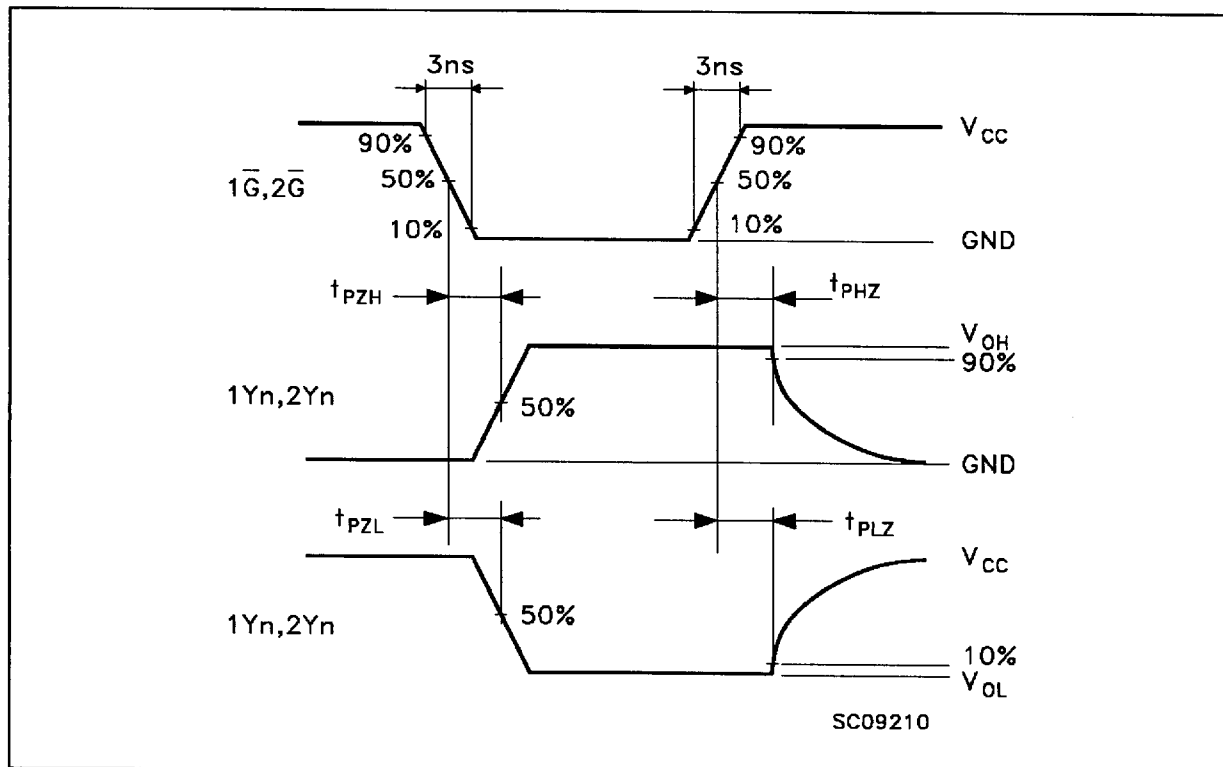
Symbol	Parameter	Test Conditions		Value					Unit
		V _{CC} (V)		T _A = 25 °C			-40 to 85 °C		
				Min.	Typ.	Max.	Min.	Max.	
C _{IN}	Input Capacitance	5.0			4				pF
C _{OUT}	Output Capacitance	5.0			8				pF
C _{PD}	Power Dissipation Capacitance (note 1)	5.0			21				pF

1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/n$ (per circuit)

TEST CIRCUIT

TEST	SWITCH
t_{PLH} , t_{PHL}	Open
t_{PZL} , t_{PLZ}	$2V_{CC}$
t_{PZH} , t_{PHZ}	Open

 $C_L = 50 \text{ pF}$ or equivalent (includes jig and probe capacitance) $R_L = R_1 = 500\Omega$ or equivalent $R_T = Z_{out}$ of pulse generator (typically 50Ω)

WAVEFORM 1: PROPAGATION DELAYS ($f=1\text{MHz}$; 50% duty cycle)**WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME** ($f=1\text{MHz}$; 50% duty cycle)

SO20 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.10		0.20	0.004		0.007
a2			2.45			0.096
b	0.35		0.49	0.013		0.019
b1	0.23		0.32	0.009		0.012
C		0.50			0.020	
c1	45° (typ.)					
D	12.60		13.00	0.496		0.512
E	10.00		10.65	0.393		0.419
e		1.27			0.050	
e3		11.43			0.450	
F	7.40		7.60	0.291		0.299
L	0.50		1.27	0.19		0.050
M			0.75			0.029
S	8° (max.)					

