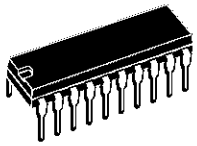
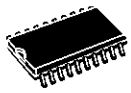
SGS-THOMSON MICROELECTRONICS

74ACT240

OCTAL BUS BUFFER WITH 3 STATE OUTPUTS (INVERTED)

- HIGH SPEED: t_{PD} = 5 ns (TYP.) at V_{CC} = 5V
- LOW POWER DISSIPATION: I_{CC} = 8 μA (MAX.) at T_A = 25 °C
- COMPATIBLE WITH TTL OUTPUTS V_{IH} = 2V (MIN), V_{IL} = 0.8V (MAX)
- 50Ω TRANSMISSION LINE DRIVING CAPABILITY
- SYMMETRICAL OUTPUT IMPEDANCE: $|I_{OH}| = I_{OL}$ = 24 mA (MIN)
- BALANCED PROPAGATION DELAYS: $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE: V_{CC} (OPR) = 4.5V to 5.5V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 240
- IMPROVED LATCH-UP IMMUNITY





B (Plastic Package) **M** (Micro Package)

ORDER CODES :

74ACT240B 74ACT240M

DESCRIPTION

The ACT240 is an advanced CMOS OCTAL BUS BUFFER (3-STATE) fabricated with sub-micron silicon gate and double-layer metal wiring C^2MOS technology. It is ideal for low power applications mantaining high speed operation similar to equivalent Bipolar Schottky TTL.

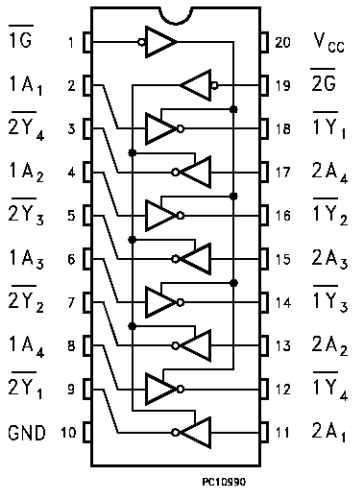
$\overline{G}$ control output governs four BUS BUFFERs.

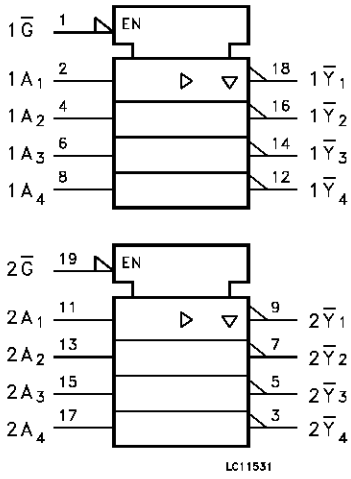
This device is desibned to be used with 3 state memory address drivers, etc.

The device is designed to interface directly High Speed CMOS systems with TTL, NMOS and CMOS output voltage levels.

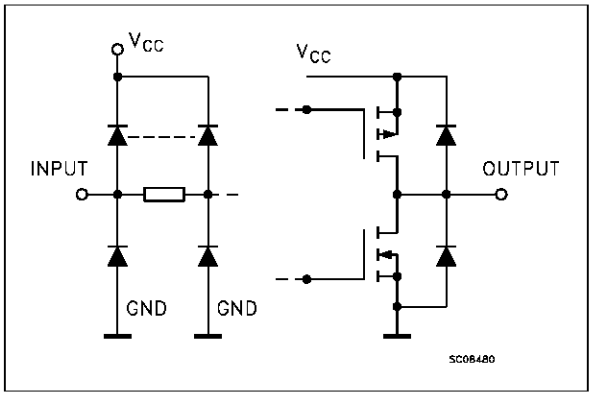
All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

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	$\overline{2Y1}$ to $\overline{2Y4}$	Data Outputs
11, 13, 15, 17	2A1 to 2A4	Data Inputs
18, 16, 14, 12	$\overline{1Y1}$ to $\overline{1Y4}$	Data Outputs
19	$\overline{2G}$	Output Enabel Input
10	GND	Ground (0V)
20	V_{CC}	Positive Supply Voltage

TRUTH TABLE

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

X: "H" or "L"
Z: High impedance

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.5 to +7	V
V_I	DC Input Voltage	-0.5 to V_{CC} + 0.5	V
V_O	DC Output Voltage	-0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current	± 20	mA
I_{OK}	DC Output Diode Current	± 20	mA
I_O	DC Output Current	± 50	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 400	mA
T_{stg}	Storage Temperature	-65 to +150	°C
T_L	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
V_{CC}	Supply Voltage	4.5 to 5.5	V
V_I	Input Voltage	0 to V_{CC}	V
V_O	Output Voltage	0 to V_{CC}	V
T_{op}	Operating Temperature:	-40 to +85	°C
dt/dv	Input Rise and Fall Time V_{CC} = 4.5 to 5.5V (note 1)	8	ns/V

1) V_{IN} from 0.8 V to 2.0 V

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	4.5	V_O = 0.1 V or V_{CC} - 0.1 V		2.0	1.5		2.0		V
		5.5			2.0	1.5		2.0		
V_{IL}	Low Level Input Voltage	4.5	V_O = 0.1 V or V_{CC} - 0.1 V			1.5	0.8		0.8	V
		5.5				1.5	0.8		0.8	
V_{OH}	High Level Output Voltage	4.5	V_I(*) = V_{IH} or V_{IL}	I_O=-50 µA	4.4	4.49		4.4		V
		5.5		I_O=-50 µA	5.4	5.49		5.4		
		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	4.5	V_I(*) = V_{IH} or V_{IL}	I_O=50 µA		0.001	0.1		0.1	V
		5.5		I_O=50 mA		0.001	0.1		0.1	
		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_{CCT}	Max I_{CC} /Input	5.5	V_I = V_{CC} -2.1 V			0.6			1.5	mA
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_{OHD}			V_{OHD} = 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 pF, R_L = 500 Ω, Input $t_r = t_f$ = 3 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	5.0(*)		1.5	5.0	7.5	1.5	8.5	ns
t_{PZL} t_{PZH}	Output Enable Time	5.0(*)		1.5	6.0	8.5	1.5	9.5	ns
t_{PLZ} t_{PHZ}	Output Disable Time	5.0(*)		1.5	6.5	10.0	1.5	10.5	ns

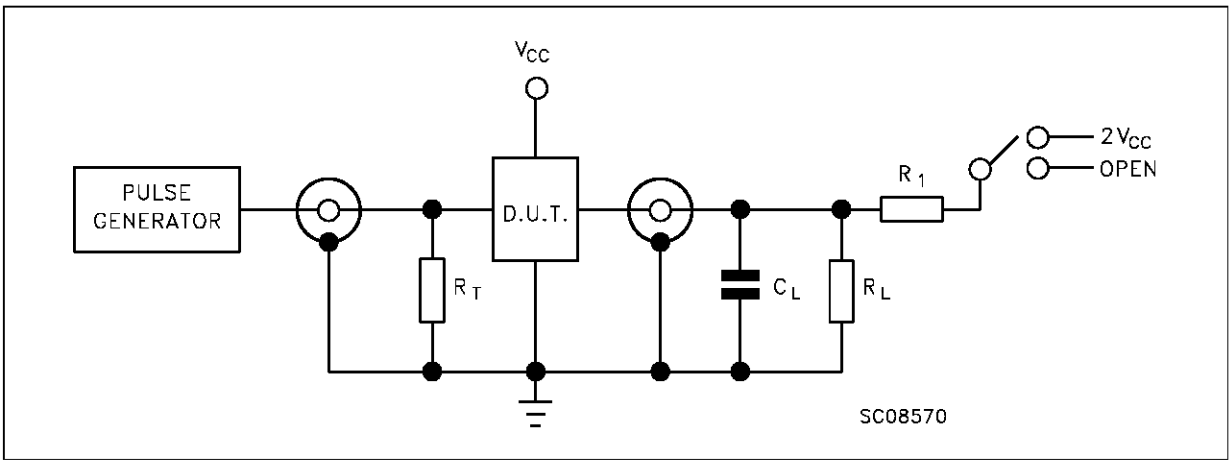
(*) Voltage range is 5V ± 0.5V

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. $I_{CC}(opr) = C_{PD} \bullet V_{CC} \bullet f_{IN} + I_{CC}/n$ (per circuit)

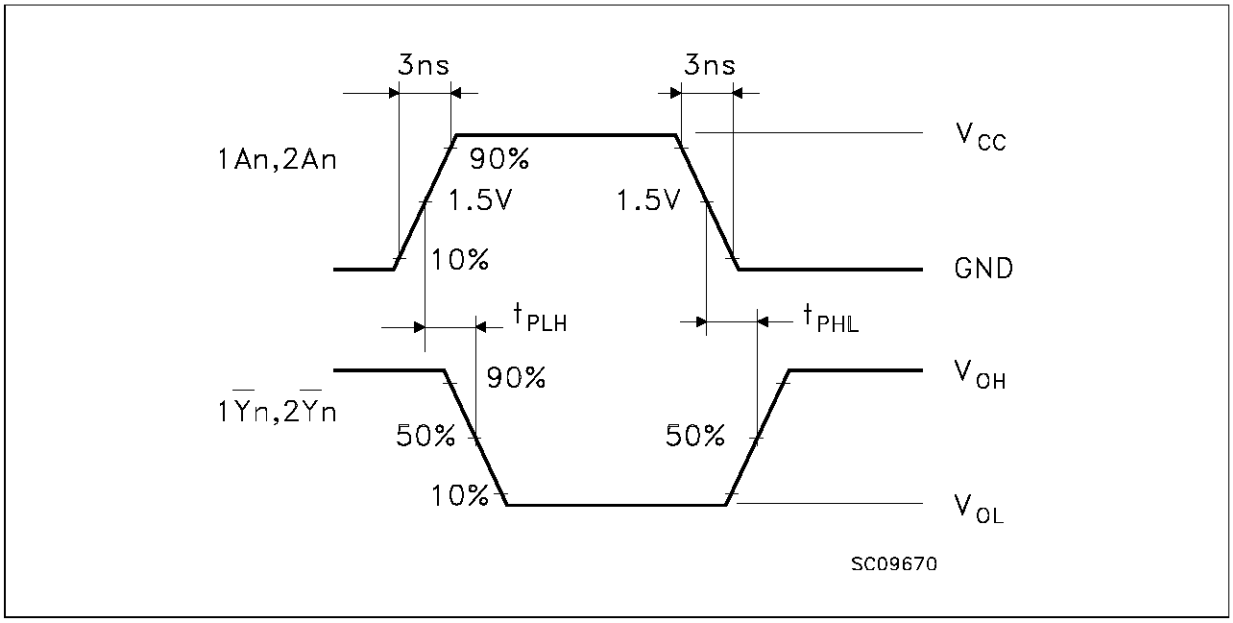
TEST CIRCUIT



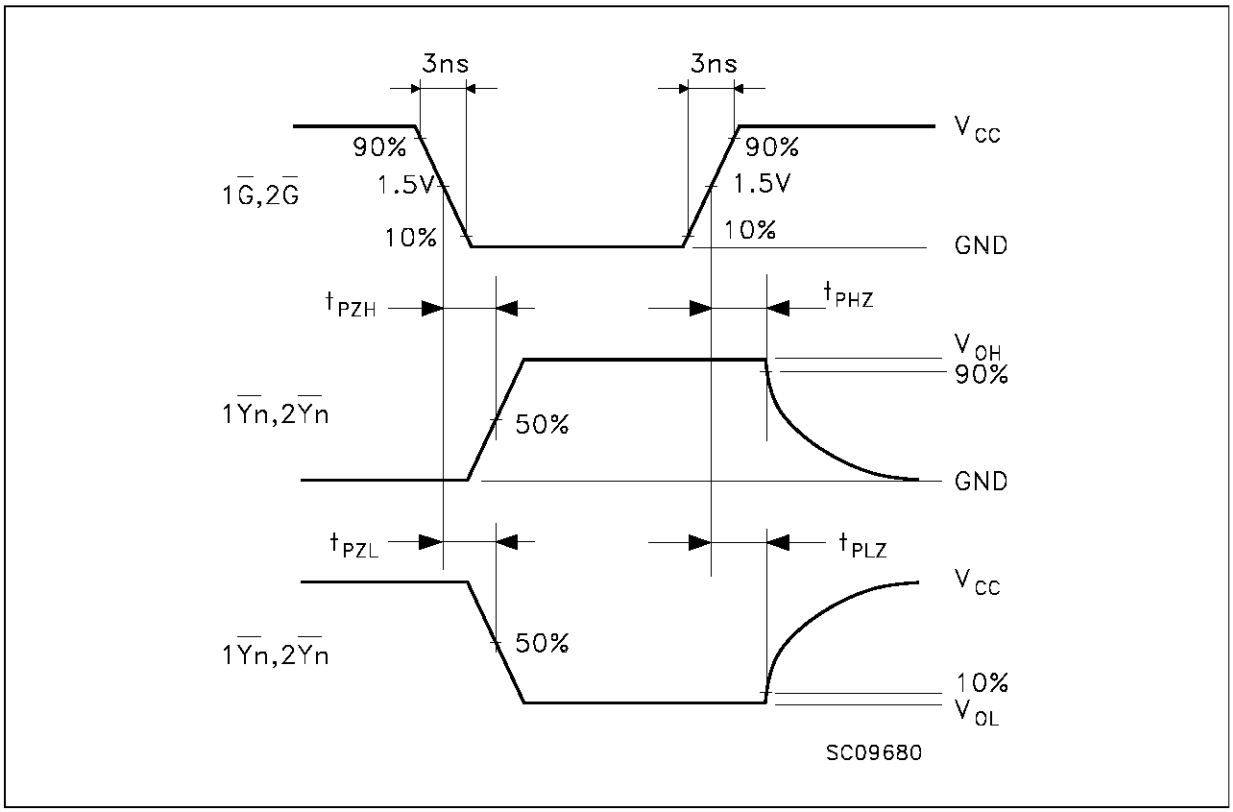
TEST	SWITCH
t_{PLH}, t_{PHL}	Open
t_{PZL}, t_{PLZ}	$2V_{CC}$
t_{PZH}, t_{PHZ}	Open

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

WAVEFORM 1: PROPAGATION DELAYS (f=1MHz; 50% duty cycle)

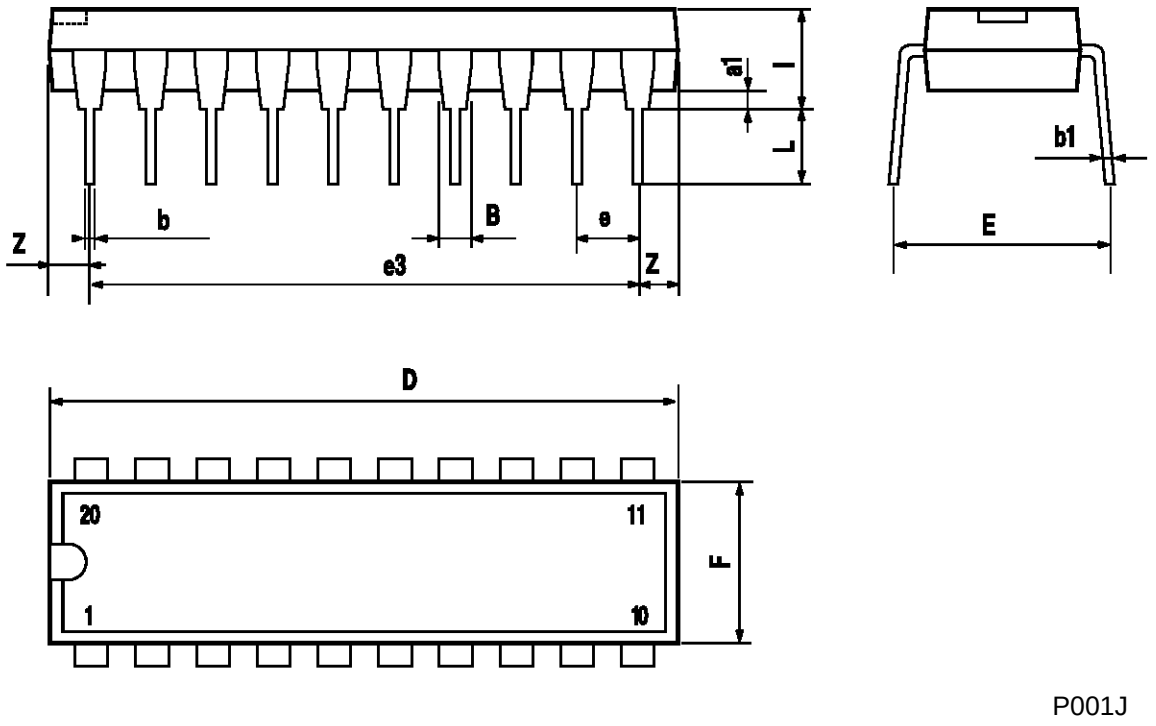


WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME (f=1MHz; 50% duty cycle)



Plastic DIP20 (0.25) MECHANICAL DATA

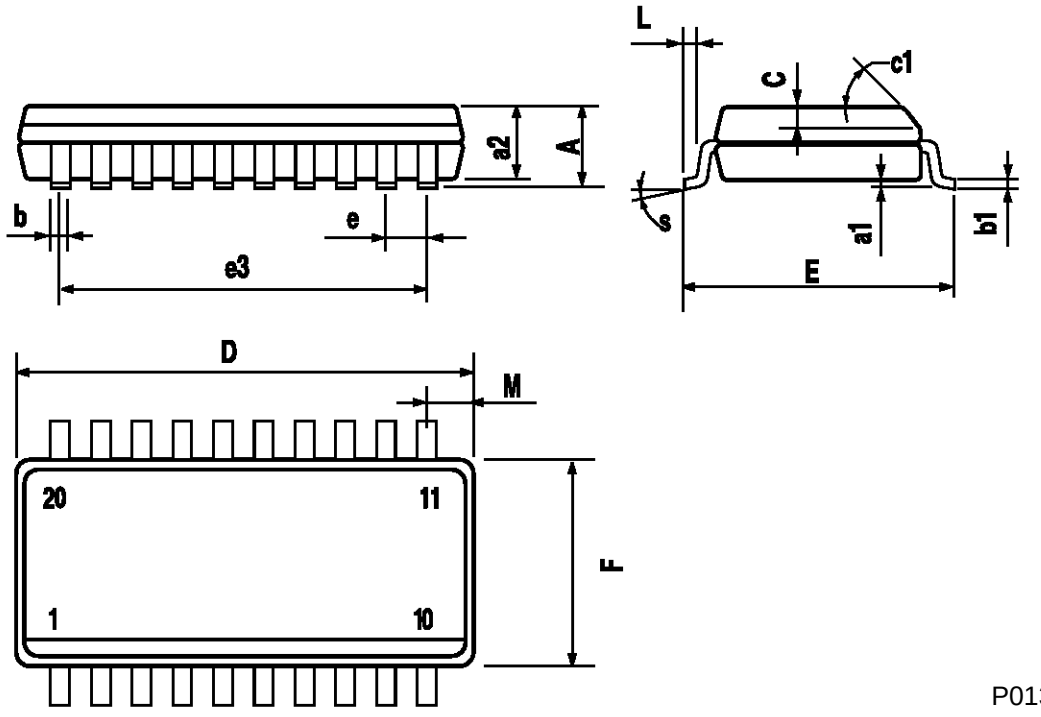
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
I			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053



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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.)					



P013L

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