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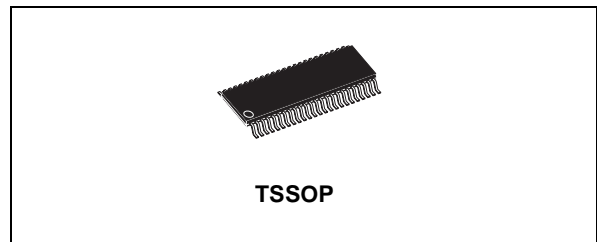
sales@integrated-circuit.com



74AC16244

16-BIT BUS BUFFER WITH 3-STATE OUTPUTS (NON INVERTED)

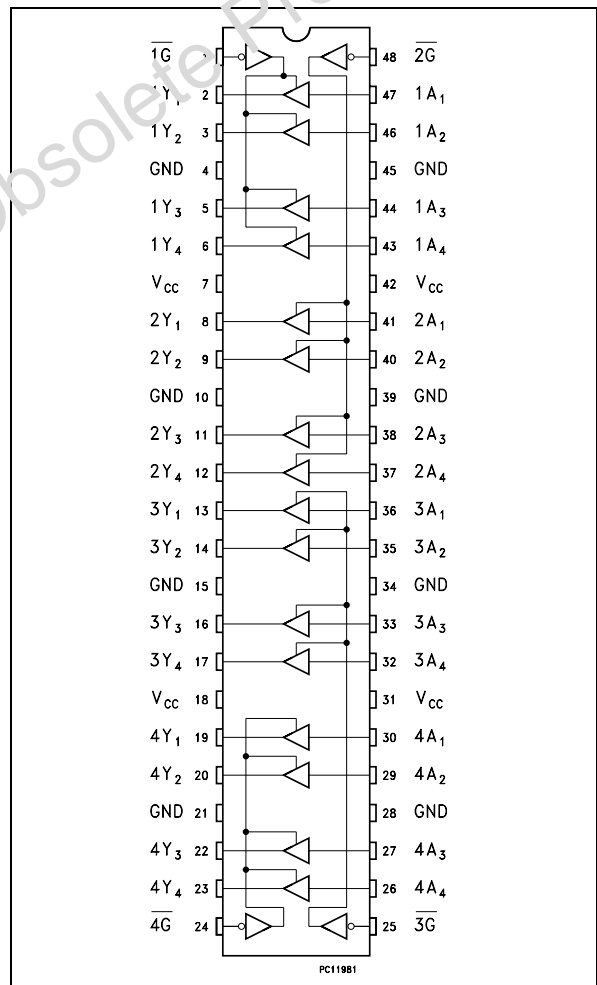
- HIGH SPEED:
 $t_{PD} = 4.5 \text{ ns (TYP.) at } V_{CC} = 5V$
- LOW POWER DISSIPATION:
 $I_{CC} = 8 \mu\text{A (MAX.) at } T_A = 25^\circ\text{C}$
- HIGH NOISE IMMUNITY:
 $V_{NIH} = V_{NIL} = 28\% V_{CC} \text{ (MIN.)}$
- POWER DOWN PROTECTION ON INPUTS
- SYMMETRICAL OUTPUT IMPEDANCE:
 $|I_{OH}| = I_{OL} = 24 \text{ mA (MIN)}$
- BALANCED PROPAGATION DELAYS:
 $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE:
 $V_{CC(OPR)} = 2V \text{ to } 6V$
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 16244
- IMPROVED LATCH-UP IMMUNITY



ORDER CODES

PACKAGE	TUBE	T & F.
TSSOP		74AC16244TTR

PIN CONNECTION



DESCRIPTION

The 74AC16244 is an advanced high-speed CMOS 16-BIT BUS BUFFER (3-STATE) fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology.

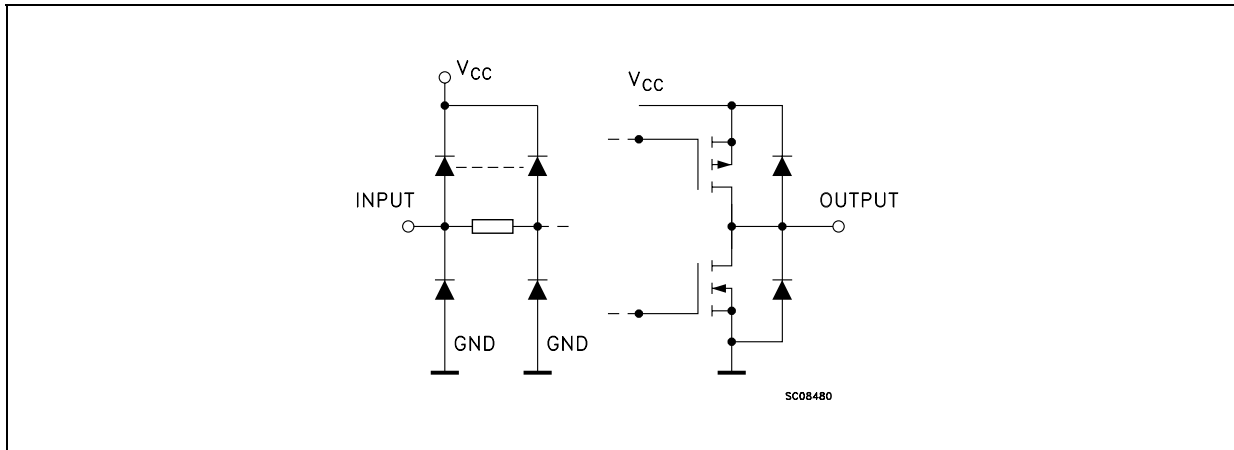
Any nG output control governs four BUS BUFFERS. Output Enable inputs (nG) tied together give full 16 bit operation.

When nG is LOW, the outputs are enabled. When nG is HIGH, the output are in high impedance state.

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

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INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

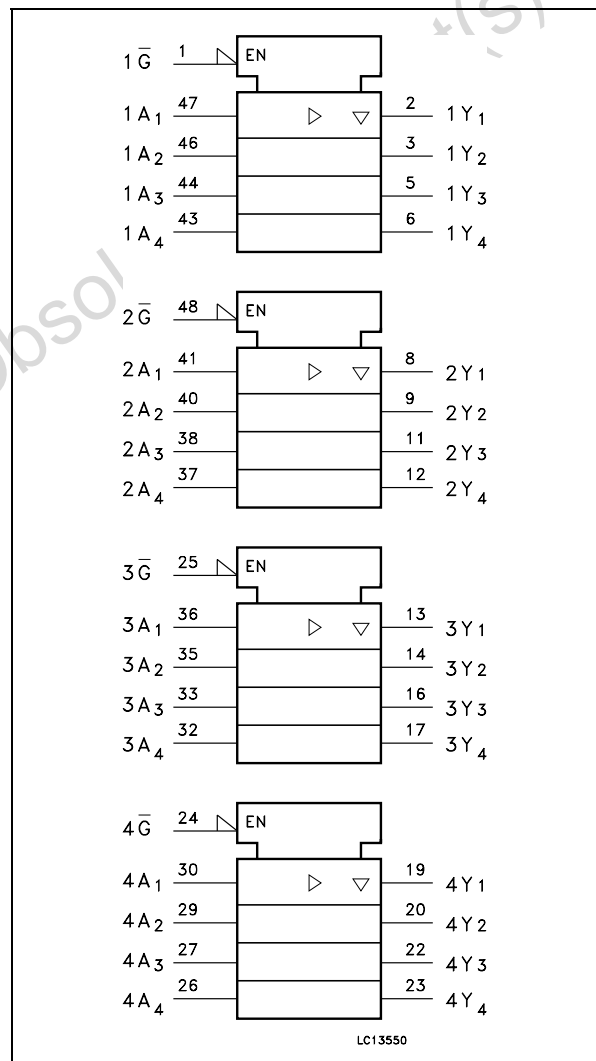
PIN No	SYMBOL	NAME AND FUNCTION
1	$\overline{1G}$	Output Enable Input
2, 3, 5, 6	1Y1 to 1Y4	Data Outputs
8, 9, 11, 12	2Y1 to 2Y4	Data Outputs
13, 14, 16, 17	3Y1 to 3Y4	Data Outputs
19, 20, 22, 23	4Y1 to 4Y4	Data Outputs
24	4G	Output Enable Input
25	3G	Output Enable Input
30, 29, 27, 26	4A1 to 4A4	Data Outputs
36, 35, 33, 32	3A1 to 3A4	Data Outputs
41, 40, 38, 37	2A1 to 2A4	Data Outputs
47, 46, 44, 43	1A1 to 1A4	Data Outputs
48	$\overline{2G}$	Output Enable Input
4, 10, 15, 21, 28, 34, 39, 45	GND	Ground (0V)
7, 18, 31, 42	V _{CC}	Positive Supply Voltage

TRUTH TABLE

INPUTS		OUTPUT
\overline{G}	A _n	Y _n
L	L	L
L	H	H
H	X	Z

X : Don't Care
Z : High Impedance

IEC LOGIC SYMBOLS



74AC16244

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	-0.5 to +7.0	V
V _I	DC Input Voltage	-0.5 to +7.0	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	± 50	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 conditions is not implied

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	2 to 6	V
V _I	Input Voltage	0 to V _{CC}	V
V _O	Output Voltage	0 to V _{CC}	V
T _{op}	Operating Temperature	-55 to 125	°C
dt/dv	Input Rise and Fall Time (note 1) V _{CC} = 3.0, 4.5 or 5.5	0 to 8	ns/V

1) V_{IN} from 30% to 70% of V_{CC}

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DC SPECIFICATIONS

Symbol	Parameter	Test Condition		Value						Unit	
		V _{CC} (V)		T _A = 25 °C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
V _{IH}	High Level Input Voltage	3.0	V _O = 0.1 V or V _{CC} -0.1V	2.1	1.5		2.1		2.1		V
		4.5		3.15	2.25		3.15		3.15		
		5.5		3.85	2.75		3.85		3.85		
V _{IL}	Low Level Input Voltage	3.0	V _O = 0.1 V or V _{CC} -0.1V		1.5	0.9		0.9		0.9	V
		4.5			2.25	1.35		1.35		1.35	
		5.5			2.75	1.65		1.65		1.65	
V _{OH}	High Level Output Voltage	3.0	I _O =-50 μA	2.9	2.99		2.9		2.9		V
		4.5	I _O =-50 μA	4.4	4.49		4.4		4.4		
		5.5	I _O =-50 μA	5.4	5.49		5.4		5.4		
		3.0	I _O =-12 mA	2.56			2.46		2.46		
		4.5	I _O =-24 mA	3.86			3.76		3.76		
		5.5	I _O =-24 mA	4.86			4.76		4.76		
V _{OL}	Low Level Output Voltage	3.0	I _O =50 μA		0.002	0.1		0.1		0.1	V
		4.5	I _O =50 μA		0.001	0.1		0.1		0.1	
		5.5	I _O =50 μA		0.001	0.1		0.1		0.1	
		3.0	I _O =12 mA			0.36		0.44		0.44	
		4.5	I _O =24 mA			0.36		0.44		0.44	
I _I	Input Leakage Current	5.5	V _I = V _{CC} or GND			± 0.1		± 1		± 1	μA
I _{OZ}	High Impedance Output Leakage Current	5.5	V _I = V _{IH} or V _{IL} V _O = V _{CC} or GND			± 0.5		± 5		± 5	μA
I _{CC}	Quiescent Supply Current	5.5	V _I = V _{CC} or GND			8		80		80	μA

AC ELECTRICAL CHARACTERISTICS (C_L = 50 pF, R_L = 500 Ω, Input t_r = t_f = 3n)

Symbol	Parameter	Test Condition		Value						Unit	
		V _{CC} (V)	C _L (pF)	T _A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
t _{PLH} t _{PHL}	Propagation Delay Time A to Y	3.3(*)			6	8.5		11.5		11.5	ns
		5.0(**)			4.5	7.0		9.0		9.0	
t _{PZL} t _{PZH}	Output Enable Time	3.3(*)			8	10.5		14.0		14.0	ns
		5.0(**)			5.5	8.0		10.0		10.0	
t _{PLZ} t _{PHZ}	Output Disable Time	3.3(*)			7.3	9.0		11.5		11.5	ns
		5.0(**)			5.5	8.0		14.0		14.0	

(*) Voltage range is 3.3V ± 0.3V

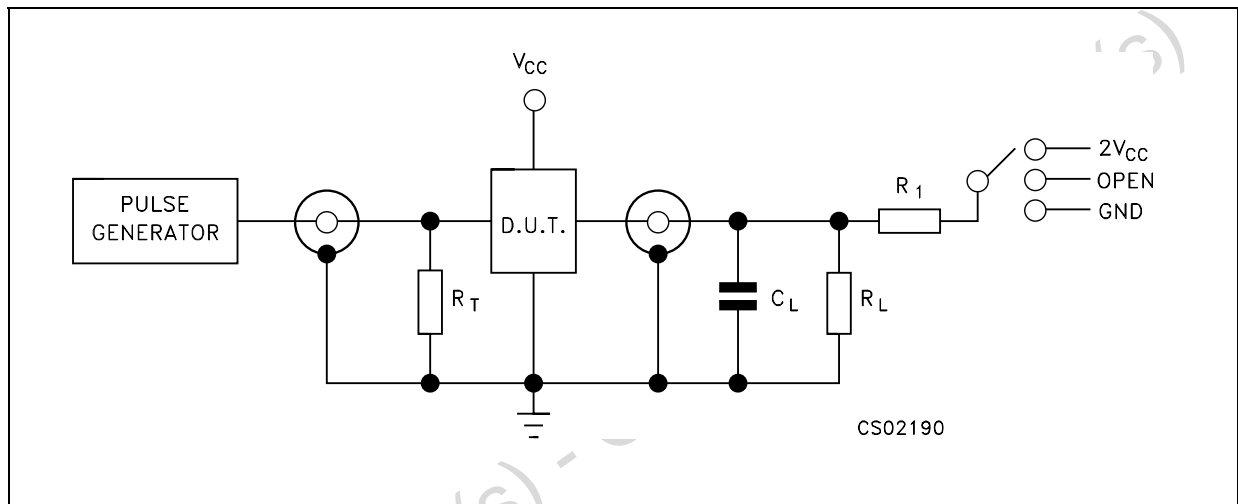
(**) Voltage range is 5.0V ± 0.5V

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Test Condition		Value						Unit	
		V _{CC} (V)		T _A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
C _{IN}	Input Capacitance				7	10		10		10	pF
C _{OUT}	Output Capacitance				14						pF
C _{PD}	Power Dissipation Capacitance (note 1)	5.0	f _{IN} = 10MHz		25						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} × V_{CC} × f_{IN} + I_{CC}/16(per Latch)

TEST CIRCUIT



TEST	SWITCH
t _{PLH} , t _{PHL}	Open
t _{PZL} , t _{PLZ}	V _{CC}
t _{PZH} , t _{PHZ}	GND

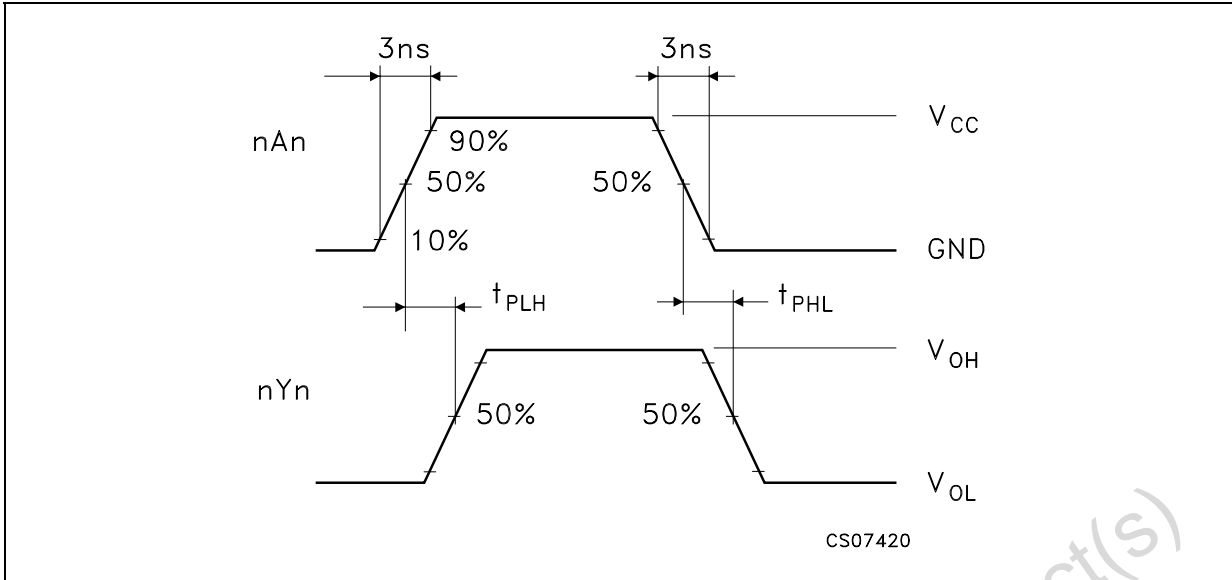
C_L = 50 pF or equivalent (includes jig and probe capacitance)

R_L = R₁ = 500Ω or equivalent

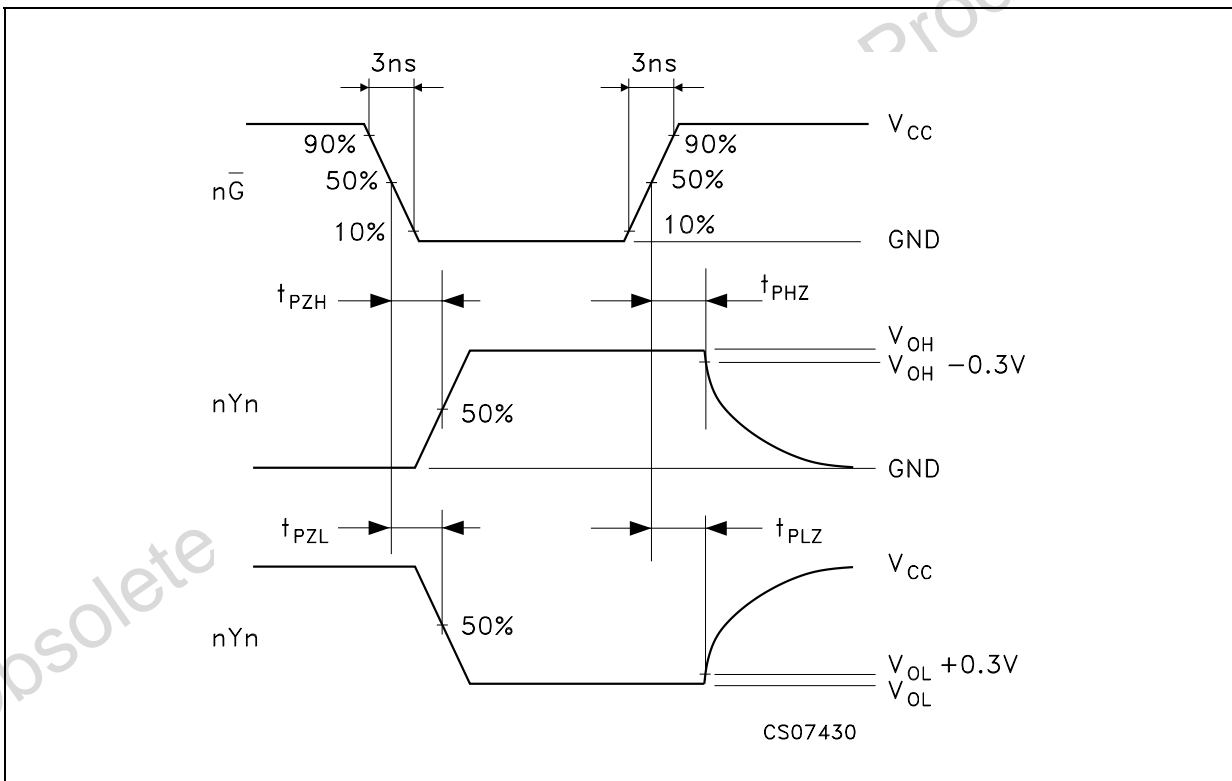
R_T = Z_{OUT} of pulse generator (typically 50Ω)

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



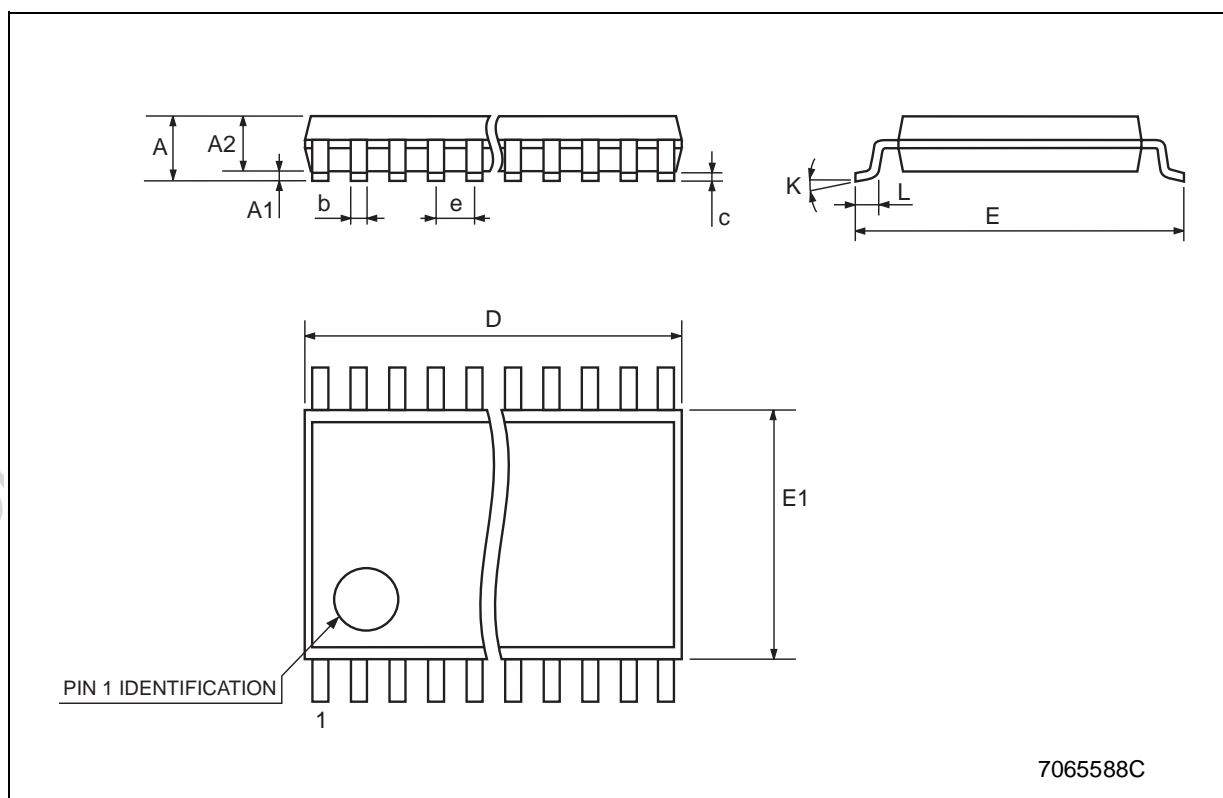
WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME (f=1MHz; 50% duty cycle)



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TSSOP48 MECHANICAL DATA

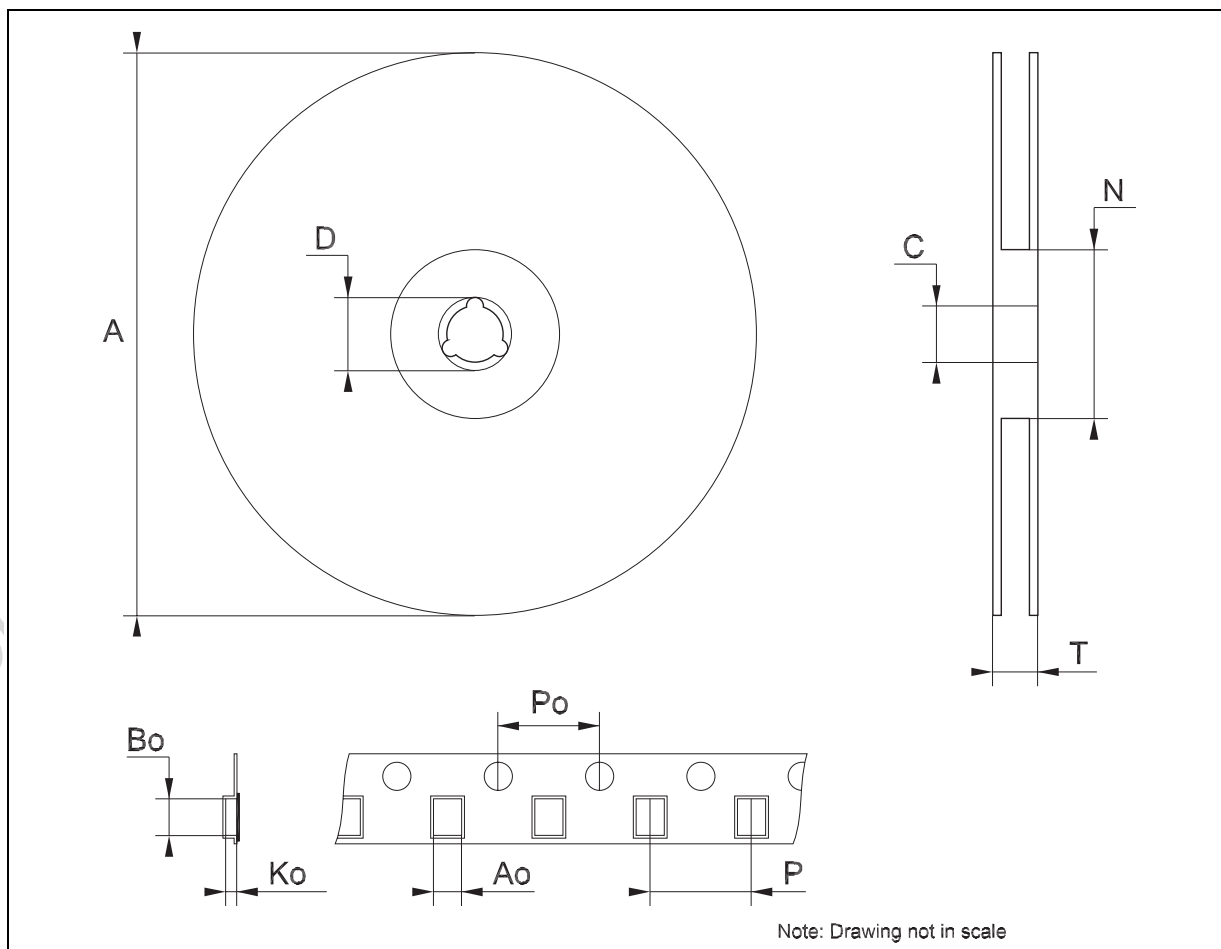
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.2			0.047
A1	0.05		0.15	0.002		0.006
A2		0.9			0.035	
b	0.17		0.27	0.0067		0.011
c	0.09		0.20	0.0035		0.0079
D	12.4		12.6	0.488		0.496
E		8.1 BSC			0.318 BSC	
E1	6.0		6.2	0.236		0.244
e		0.5 BSC			0.0197 BSC	
K	0°		8°	0°		8°
L	0.50		0.75	0.020		0.030



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Tape & Reel TSSOP48 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			30.4			1.197
Ao	8.7		8.9	0.343		0.350
Bo	13.1		13.3	0.516		0.524
Ko	1.5		1.7	0.059		0.067
Po	3.9		4.1	0.153		0.161
P	11.9		12.1	0.468		0.476



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