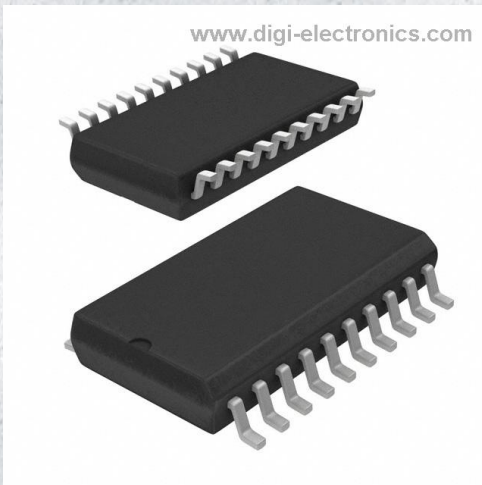


74VHCT244ATTR Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	74VHCT244ATTR-DG
Manufacturer	STMicroelectronics
Manufacturer Product Number	74VHCT244ATTR
Description	IC BUFFER NON-INVERT 5.5V 20SO
Detailed Description	Buffer, Non-Inverting 2 Element 4 Bit per Element 3-State Output 20-SO

This model 74VHCT244ATTR is available at DiGi Electronics.

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Purchase and inquiry

Manufacturer Product Number:

74VHCT244ATTR

Series:

74VHCT

Logic Type:

Buffer, Non-Inverting

Number of Bits per Element:

4

Output Type:

3-State

Voltage - Supply:

4.5V ~ 5.5V

Mounting Type:

Surface Mount

Supplier Device Package:

20-SO

Manufacturer:

STMicroelectronics

Product Status:

Obsolete

Number of Elements:

2

Input Type:

-

Current - Output High, Low:

8mA, 8mA

Operating Temperature:

-55°C ~ 125°C (TA)

Package / Case:

20-SOIC (0.295", 7.50mm Width)

Base Product Number:

74VHCT244

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



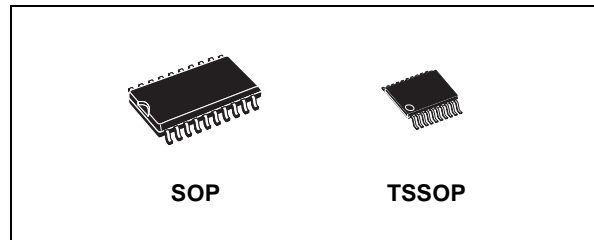
74VHCT244A

OCTAL BUS BUFFER WITH 3 STATE OUTPUTS (NON INVERTED)

- HIGH SPEED: $t_{PD} = 5.4 \text{ ns}$ (TYP.) at $V_{CC} = 5V$
- LOW POWER DISSIPATION:
 $I_{CC} = 4 \mu\text{A}$ (MAX.) at $T_A = 25^\circ\text{C}$
- COMPATIBLE WITH TTL OUTPUTS:
 $V_{IH} = 2V$ (MIN.), $V_{IL} = 0.8V$ (MAX)
- POWER DOWN PROTECTION ON INPUTS & OUTPUTS
- SYMMETRICAL OUTPUT IMPEDANCE:
 $|I_{OH}| = I_{OL} = 8 \text{ mA}$ (MIN)
- BALANCED PROPAGATION DELAYS:
 $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE:
 $V_{CC}(\text{OPR}) = 4.5V \text{ to } 5.5V$
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 244
- IMPROVED LATCH-UP IMMUNITY
- LOW NOISE: $V_{OLP} = 0.9V$ (MAX.)

DESCRIPTION

The 74VHCT244A is an advanced high-speed CMOS OCTAL BUS BUFFER (3-STATE) fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology. \overline{G} enable input governs four BUS BUFFERS.



ORDER CODES

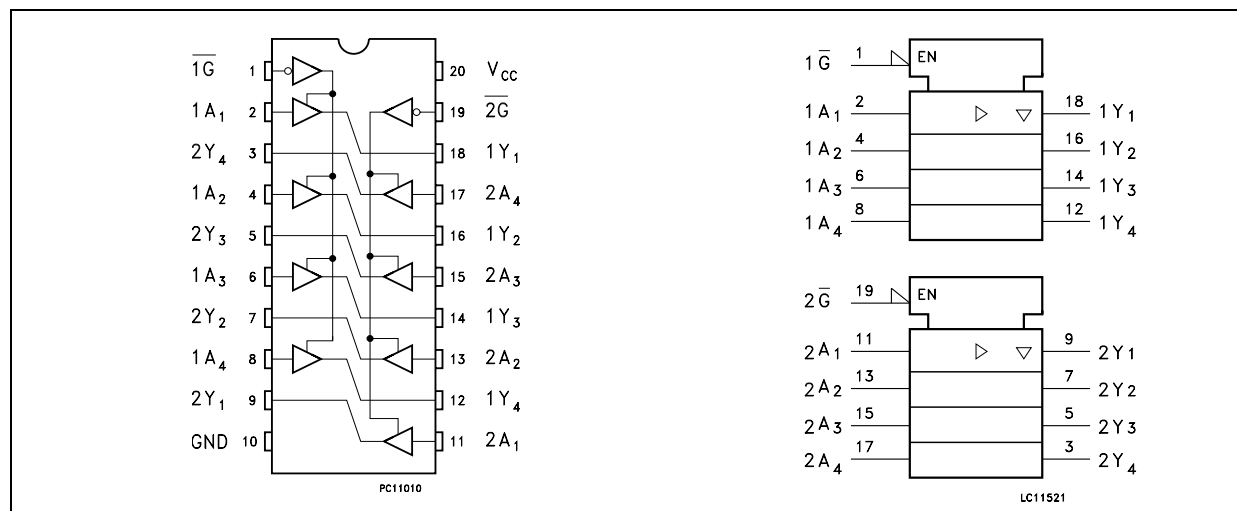
PACKAGE	TUBE	T & R
SOP	74VHCT244AM	74VHCT244AMTR
TSSOP		74VHCT244ATTR

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

Power down protection is provided on all inputs and outputs and 0 to 7V can be accepted on inputs with no regard to the supply voltage. This device can be used to interface 5V to 3V since all inputs are equipped with TTL threshold.

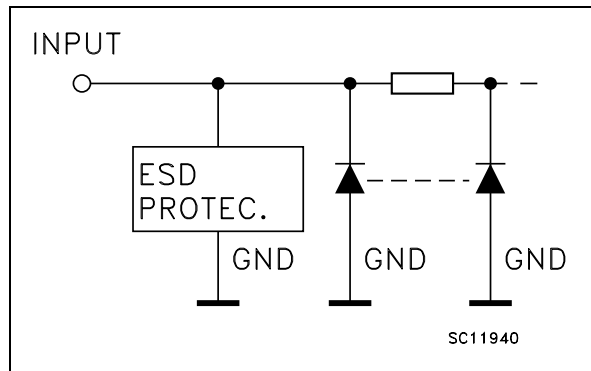
All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS



74VHCT244A

INPUT 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 Enable Input
10	GND	Ground (0V)
20	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

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 (see note 1)	-0.5 to +7.0	V
V_O	DC Output Voltage (see note 2)	-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	± 25	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 50	mA
T_{stg}	Storage Temperature	-65 to +150	$^{\circ}C$
T_L	Lead Temperature (10 sec)	300	$^{\circ}C$

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

- 1) Output in OFF State
- 2) High or Low State

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	4.5 to 5.5	V
V_I	Input Voltage	0 to 5.5	V
V_O	Output Voltage (see note 1)	0 to 5.5	V
V_O	Output Voltage (see note 2)	0 to V_{CC}	V
T_{op}	Operating Temperature	-55 to 125	°C
dt/dv	Input Rise and Fall Time (see note 3) ($V_{CC} = 5.0 \pm 0.5V$)	0 to 20	ns/V

1) Output in OFF State

2) High or Low State

3) V_{IN} from 0.8V to 2V

DC SPECIFICATIONS

Symbol	Parameter	Test Condition		Value						Unit	
		V_{CC} (V)		$T_A = 25^\circ C$			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
V_{IH}	High Level Input Voltage	4.5 to 5.5		2			2		2		V
V_{IL}	Low Level Input Voltage	4.5 to 5.5				0.8		0.8		0.8	V
V_{OH}	High Level Output Voltage	4.5	$I_O = -50 \mu A$	4.4	4.5		4.4		4.4		V
		4.5	$I_O = -8 mA$	3.94			3.8		3.7		
V_{OL}	Low Level Output Voltage	4.5	$I_O = 50 \mu A$		0.0	0.1		0.1		0.1	V
		4.5	$I_O = 8 mA$			0.36		0.44		0.55	
I_{oz}	High Impedance Output Leakage Current	4.5 to 5.5	$V_I = V_{IH}$ or V_{IL} $V_O = 0V$ to 5.5V			± 0.25		± 2.5		± 2.5	μA
I_I	Input Leakage Current	0 to 5.5	$V_I = 5.5V$ or GND			± 0.1		± 1.0		± 1.0	μA
I_{CC}	Quiescent Supply Current	5.5	$V_I = V_{CC}$ or GND			2		20		20	μA
ΔI_{CC}	Additional Worst Case Supply Current	5.5	One Input at 3.4V, other input at V_{CC} or GND			1.35		1.5		1.5	mA
I_{OPD}	Output Leakage Current	0	$V_{OUT} = 5.5V$			0.5		5.0		5.0	μA

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3ns$)

Symbol	Parameter	Test Condition			Value						Unit	
		V_{CC} (*) (V)	C_L (pF)		$T_A = 25^\circ C$			-40 to 85°C		-55 to 125°C		
					Min.	Typ.	Max.	Min.	Max.	Min.		Max.
t_{PLH} t_{PHL}	Propagation Delay Time	5.0	15			5.4	7.4	1.0	8.5	1.0	8.5	ns
		5.0	50			5.9	8.4	1.0	9.5	1.0	9.5	
t_{PLZ} t_{PHZ}	Output Disable Time	5.0	15	$R_L = 1K\Omega$		7.7	10.4	1.0	12.0	1.0	12.0	ns
		5.0	50			8.2	11.4	1.0	13.0	1.0	13.0	
t_{PZL} t_{PZH}	Output Enable Time	5.0	50	$R_L = 1K\Omega$		8.8	11.4	1.0	13.0	1.0	13.0	ns

(*) Voltage range is 5.0V \pm 0.5V

74VHCT244A

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Test Condition		Value						Unit	
				T _A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
C _{IN}	Input Capacitance		6	10		10		10	pF		
C _{OUT}	Output Capacitance		10						pF		
C _{PD}	Power Dissipation Capacitance (note 1)		18						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. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/8$ (per gate)

DYNAMIC SWITCHING CHARACTERISTICS

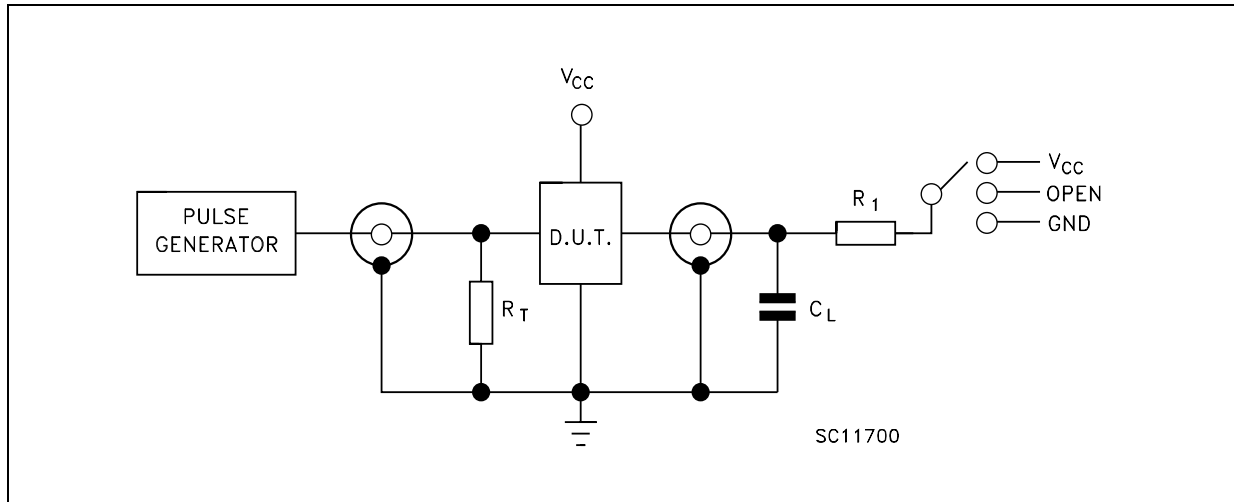
Symbol	Parameter	Test Condition		Value						Unit		
				V _{CC} (V)	T _A = 25°C			-40 to 85°C			-55 to 125°C	
					Min.	Typ.	Max.	Min.	Max.		Min.	Max.
V _{OLP}	Dynamic Low Voltage Quiet Output (note 1, 2)	5.0	C _L = 50 pF		0.9	1.1					V	
V _{OLV}				-1.1	-0.9							
V _{IHD}	5.0	2.0										
V _{ILD}	5.0				0.8							

1) Worst case package.

2) Max number of outputs defined as (n). Data inputs are driven 0V to 3.0V, (n-1) outputs switching and one output at GND.

3) Max number of data inputs (n) switching. (n-1) switching 0V to 3.0V. Inputs under test switching: 3.0V to threshold (V_{ILD}), 0V to threshold (V_{IHD}), f=1MHz.

TEST CIRCUIT

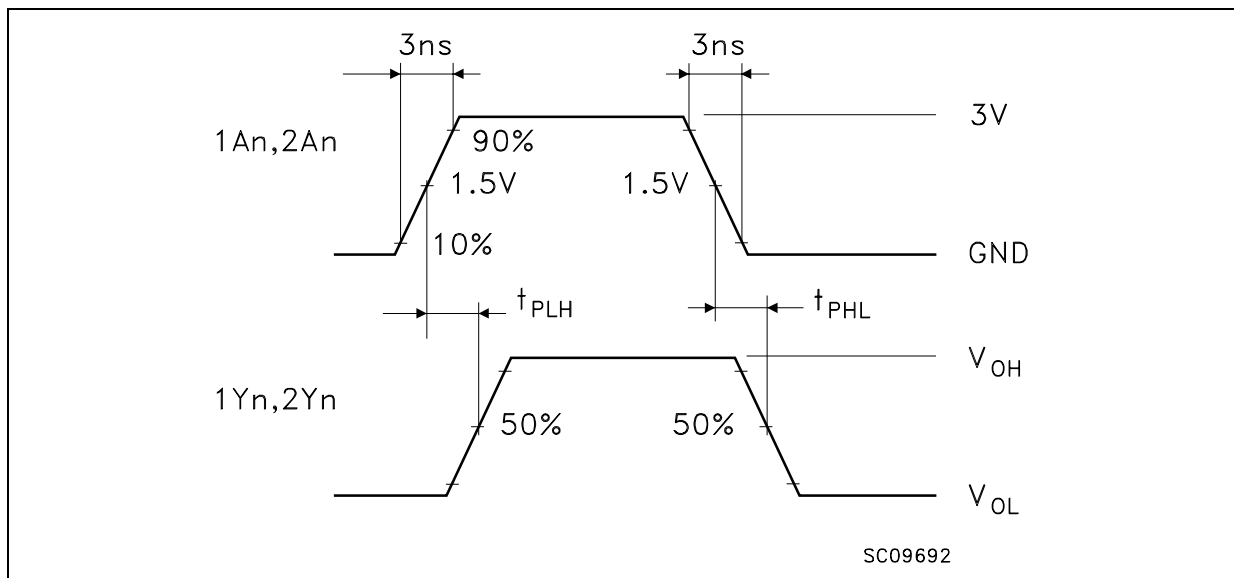


TEST	SWITCH
t_{PLH} , t_{PHL}	Open
t_{PZL} , t_{PLZ}	V_{CC}
t_{PZH} , t_{PHZ}	GND

$C_L = 15/50\text{pF}$ or equivalent (includes jig and probe capacitance)

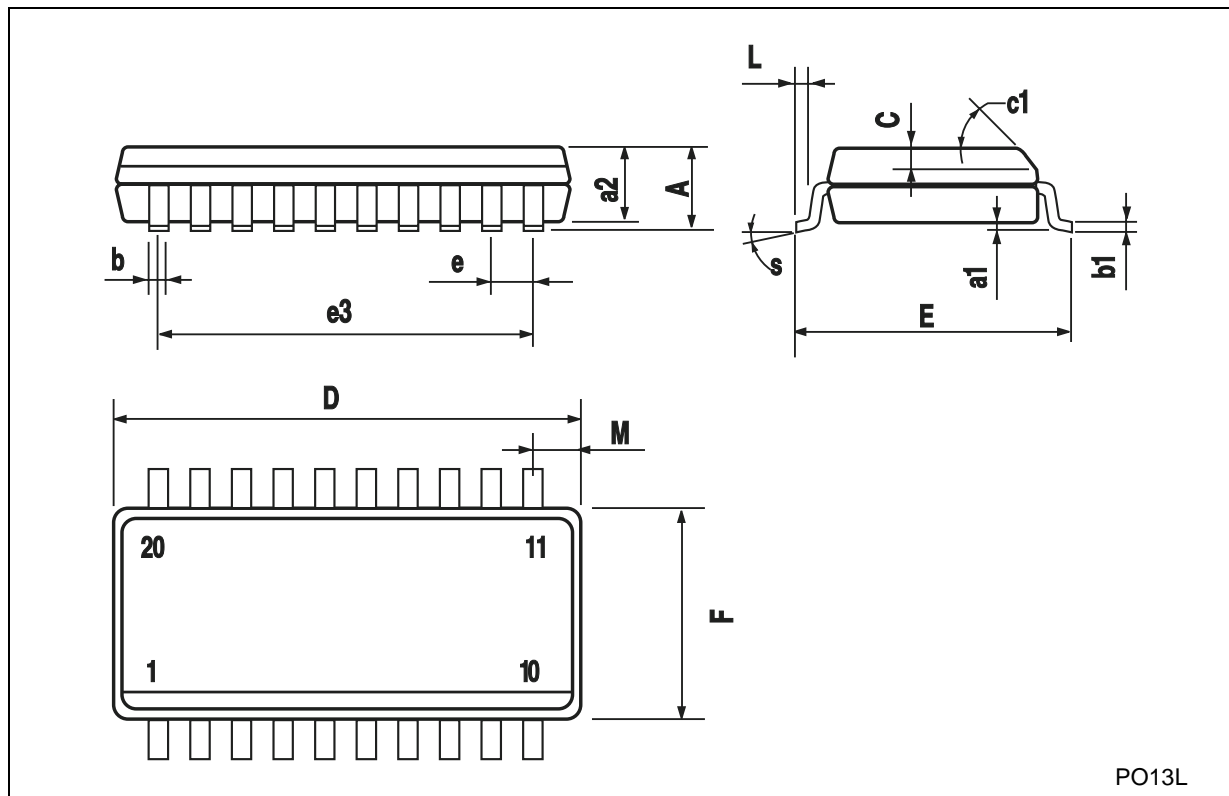
$R_L = R_1 = 1\text{K}\Omega$ or equivalent

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

WAVEFORM 1: PROPAGATION DELAYS ($f=1\text{MHz}$; 50% duty cycle)

SO-20 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.2	0.004		0.008
a2			2.45			0.096
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.012
C		0.5			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		0.300
L	0.50		1.27	0.020		0.050
M			0.75			0.029
S	8° (max.)					

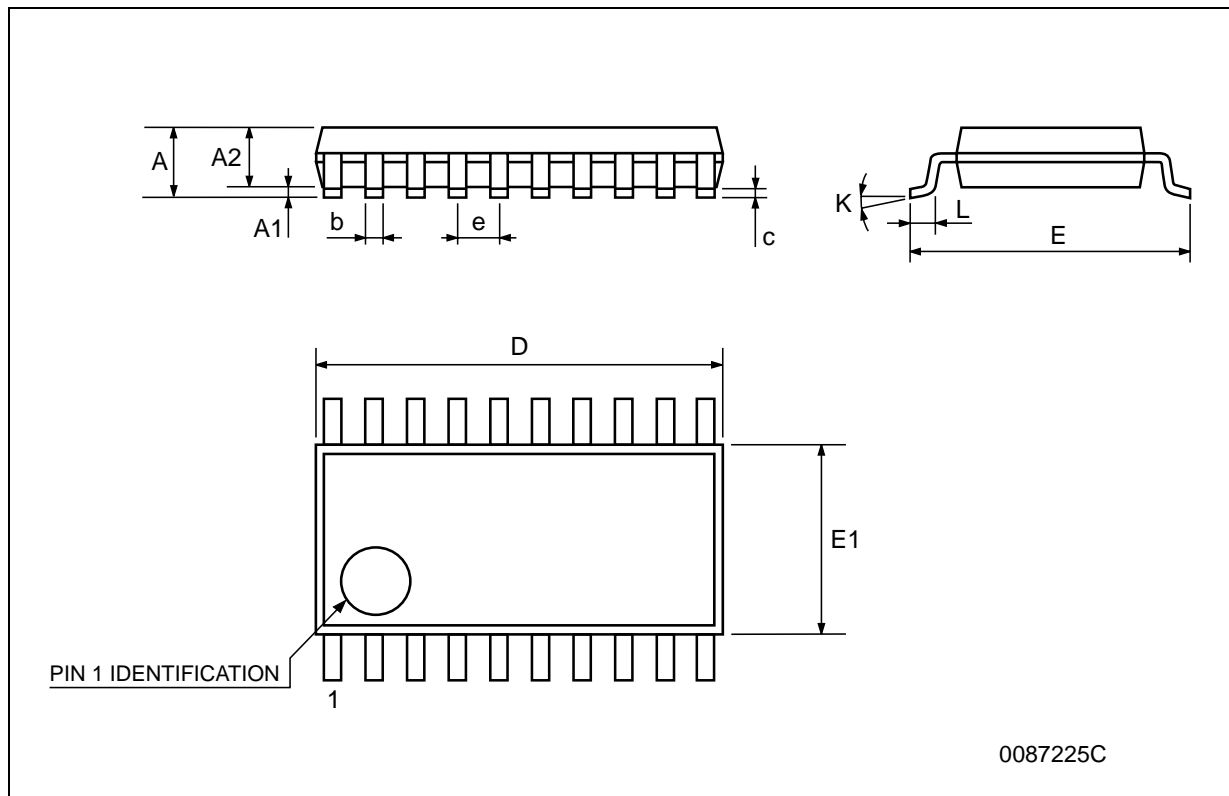


PO13L

74VHCT244A

TSSOP20 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.2			0.047
A1	0.05		0.15	0.002	0.004	0.006
A2	0.8	1	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.012
c	0.09		0.20	0.004		0.0089
D	6.4	6.5	6.6	0.252	0.256	0.260
E	6.2	6.4	6.6	0.244	0.252	0.260
E1	4.3	4.4	4.48	0.169	0.173	0.176
e		0.65 BSC			0.0256 BSC	
K	0°		8°	0°		8°
L	0.45	0.60	0.75	0.018	0.024	0.030



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