onsemi

74AC244, 74ACT244

General Description

The AC/ACT244 is an octal buffer and line driver designed to be employed as a memory address driver, clock driver and bus-oriented transmitter/receiver which provides improved PC board density.

Features

- I_{CC} and I_{OZ} Reduced by 50%
- 3-STATE Outputs Drive Bus Lines or Buffer Memory Address Registers
- Outputs Source/Sink 24 mA
- ACT244 has TTL-Compatible Inputs

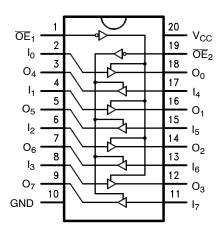


Figure 1. Connection Diagram

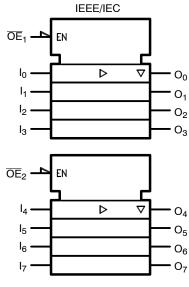
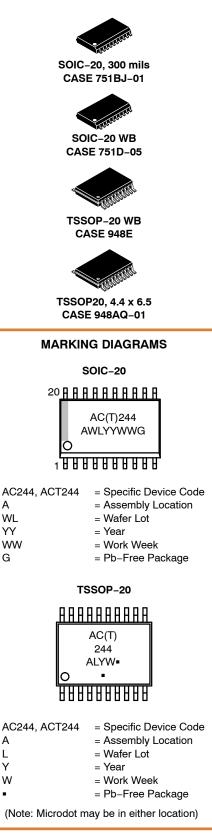


Figure 2. Logic Symbol



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

DATA SHEET www.onsemi.com

PIN DESCRIPTION

Pin Name	Description		
$\overline{OE}_1, \overline{OE}_2$	3-STATE Output Enable Inputs		
I ₀ -I ₇	Inputs		
0 ₀ -0 ₇	Outputs		

TRUTH TABLE

Inp	uts	Outputs
OE ₁	I _n	(Pins 12, 14, 16, 18)
L	L	L
L	н	Н
Н	х	Z

NOTE: X = Immaterial, Z = High Impedance

ABSOLUTE MAXIMUM RATINGS

Rating Unit Parameter Symbol Supply Voltage -0.5 to +7.0 V V_{CC} DC Input Diode Current I_{IK} mΑ . V_I = -0.5 V -20 $V_{\rm I}=V_{\rm CC}+0.5$ +20 DC Input Voltage v VI -0.5 to V_{CC} + 0.5 DC Output Diode Current mΑ lok $V_{O} = -0.5 V$ -20 $V_{I} = V_{CC} + 0.5 V$ +20 v DC Output Voltage Vo -0.5 to V_{CC} + 0.5 DC Output Source or Sink Current ±50 I_0 mΑ DC V_{CC} or Ground Current per Output Pin I_{CC} or I_{GND} ±50 mΑ °C Storage Temperature T_{STG} -65 to +150 Junction Temperature ТJ 140 °C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Rating	Unit
Supply Voltage AC	V _{CC}	2.0 to 6.0	V
ACT		4.5 to 5.5	
Input Voltage	VI	0 to V _{CC}	V
Output Voltage	V _O	0 to V _{CC}	V
Operating Temperature	T _A	-40 to +85	°C
Minimum Input Edge Rate, AC Devices: $V_{\rm IN}$ from 30% to 70% of $V_{\rm CC},V_{\rm CC}$ @ 3.3 V, 4.5 V, 5.5 V	$\Delta V / \Delta t$	125	mV/ns
Minimum Input Edge Rate, ACT Devices: V _{IN} from 0.8 V to 2.0 V, V _{CC} @ 4.5 V, 5.5 V	$\Delta V / \Delta t$	125	mV/ns

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

TRUTH TABLE (continued)

Inp	uts	Outputs
OE ₂	۱ _n	(Pins 3, 5, 7, 9)
L	L	L
L	Н	Н
Н	Х	Z

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DC ELECTRICAL CHARACTERISTICS FOR AC

				T _A = -	⊦25°C	T _A = −55°C to +125°C	T _A = −40°C to +85°C	
Symbol	Parameter	V _{CC} (V)	Conditions	Тур		Guaranteed L	imits	Unit
VIH	Minimum HIGH Level	3.0	$V_{OUT} = 0.1 V \text{ or}$	1.5	2.1	2.1	2.1	V
	Input Voltage	4.5	V _{CC} – 0.1 V	2.25	3.15	3.15	3.15	
		5.5		2.75	3.85	3.85	3.85	
V _{IL}	Maximum LOW Level	3.0	$V_{OUT} = 0.1 V \text{ or}$	1.5	0.9	0.9	0.9	V
	Input Voltage	4.5	V _{CC} – 0.1 V	2.25	1.35	1.35	1.35	
		5.5		2.75	1.65	1.65	1.65	
V _{OH}	Minimum HIGH Level	3.0	I _{OUT} = -50 μA	2.99	2.9	2.9	2.9	V
	Output Voltage	4.5		4.49	4.4	4.4	4.4	
		5.5		5.49	5.4	5.4	5.4	
		3.0	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OH} = 12 \text{ mA}$		2.56	2.40	2.46	
		4.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OH} = 24 \text{ mA}$		3.86	3.70	3.76	
		5.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OH} = 24 \text{ mA} \text{ (Note 1)}$		4.86	4.70	4.76	
V _{OL}	Maximum LOW Level	3.0	l _{OUT} = 50 μA	0.002	0.1	0.1	0.1	V
	Output Voltage	4.5		0.001	0.1	0.1	0.1	
		5.5		0.001	0.1	0.1	0.1	
		3.0	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OL} = 12 \text{ mA}$		0.36	0.50	0.44	
		4.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OL} = 24 \text{ mA}$		0.36	0.50	0.44	
		5.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OL} = 24 \text{ mA} \text{ (Note 1)}$		0.36	0.50	0.44	
I _{IN} (Note 2)	Maximum Input Leakage Current	5.5	V _I = V _{CC} , GND		±0.1	±1.0	±1.0	μA
I _{OZ}	Maximum 3-STATE Leakage Current	5.5			±0.25	±5.0	±2.5	μA
I _{OLD}	Minimum Dynamic	5.5	V _{OLD} = 1.65 V Max.			50	75	mA
I _{OHD}	Output Current (Note 3)	5.5	V _{OHD} = 3.85 V Min.			-50	-75	mA
I _{CC} (Note 2)	Maximum Quiescent Supply Current	5.5	$V_{IN} = V_{CC}$ or GND		4.0	80.0	40.0	μA

All outputs loaded; thresholds on input associated with output under test.
 I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V_{CC}.
 Maximum test duration 2.0 ms, one output loaded at a time.

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DC ELECTRICAL CHARACTERISTICS FOR ACT

				TA = -	+25°C	T _A = −55°C to +125°C	T _A = −40°C to +85°C	
Symbol	Parameter	V _{CC} (V)	Conditions	Тур		Guaranteed L	.imits	Unit
V _{IH}	Minimum HIGH Level	4.5	$V_{OUT} = 0.1 V \text{ or}$	1.5	2.0	2.0	2.0	V
	Input Voltage	5.5	V _{CC} – 0.1 V	1.5	2.0	2.0	2.0	
V _{IL}	Maximum LOW Level	4.5	$V_{OUT} = 0.1 V \text{ or}$	1.5	0.8	0.8	0.8	V
	Input Voltage	5.5	V _{CC} – 0.1 V	1.5	0.8	0.8	0.8	
V _{OH}	Minimum HIGH Level	4.5	I _{OUT} = -50 μA	4.49	4.4	4.4	4.4	V
	Output Voltage	5.5		5.49	5.4	5.4	5.4	
		4.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OH} = 24 \text{ mA}$		3.86	3.70	3.76	
		5.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OH} = 24 \text{ mA} \text{ (Note 4)}$		4.86	4.70	4.76	
V _{OL}	Maximum LOW Level	4.5	I _{OUT} = 50 μA	0.001	0.1	0.1	0.1	V
	Output Voltage	5.5		0.001	0.1	0.1	0.1	
		4.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OL} = 24 \text{ mA}$		0.36	0.50	0.44	
		5.5	$V_{IN} = V_{IL} \text{ or } V_{IH},$ $I_{OL} = 24 \text{ mA} \text{ (Note 4)}$		0.36	0.50	0.44	
I _{IN}	Maximum Input Leakage Current	5.5	V _I = V _{CC} , GND		±0.1	±1.0	±1.0	μΑ
I _{OZ}	Maximum 3-STATE Leakage Current	5.5	$V_{I} = V_{IL}, V_{IH};$ $V_{O} = V_{CC}, GND$		±0.25	±5.0	±2.5	μΑ
I _{CCT}	Maximum I _{CC} /Input	5.5	$V_{I} = V_{CC} - 2.1 V$	0.6		1.6	1.5	mA
I _{OLD}	Minimum Dynamic	5.5	V _{OLD} = 1.65 V Max.			50	75	mA
I _{OHD}	Output Current (Note 5)	5.5	V _{OHD} = 3.85 V Min.			-50	-75	mA
I _{CC}	Maximum Quiescent Supply Current	5.5	$V_{IN} = V_{CC}$ or GND		4.0	80.0	40.0	μΑ

All outputs loaded; thresholds on input associated with output under test.
 Maximum test duration 2.0 ms, one output loaded at a time.

AC ELECTRICAL CHARACTERISTICS FOR AC

		V _{CC} (V)	T, C	λ = +25°(℃L = 50 p	C, F	+12	55°C to 5°C 50 pF		10°C to 5°C 50 pF	
Symbol	Parameter	(Note 6)	Min	Тур	Max	Min	Max	Min	Max	Unit
t _{PLH}	Propagation Delay,	3.3	2.0	6.5	9.0	1.0	12.5	1.5	10.0	ns
	Data to Output	5.0	1.5	5.0	7.0	1.0	9.5	1.0	7.5	
t _{PHL}	Propagation Delay,	3.3	2.0	6.5	9.0	1.0	12.0	2.0	10.0	ns
	Data to Output	5.0	1.5	5.0	7.0	1.0	9.0	1.0	7.5	
t _{PZH}	Output Enable Time	3.3	2.0	6.0	10.5	1.0	11.5	1.5	11.0	ns
		5.0	1.5	5.0	7.0	1.0	9.0	1.5	8.0	
t _{PZL}	Output Enable Time	3.3	2.5	7.5	10.0	1.0	13.0	2.0	11.0	ns
		5.0	1.5	5.5	8.0	1.0	10.5	1.5	8.5	
t _{PHZ}	Output Disable Time	3.3	3.0	7.0	10.0	1.0	12.5	1.5	10.5	ns
		5.0	2.5	6.5	9.0	1.0	10.5	1.0	9.5	
t _{PLZ}	Output Disable Time	3.3	2.5	7.5	10.5	1.0	13.0	2.5	11.5	ns
		5.0	2.0	6.5	9.0	1.0	11.0	2.0	9.5	

6. Voltage range 3.3 is 3.3 V \pm 0.3 V. Voltage range 5.0 is 5.0 V \pm 0.5 V.

AC ELECTRICAL CHARACTERISTICS FOR ACT

		V _{CC} (V)		λ = +25° ℃L = 50 p		~	55°C to 5°C 50 pF	T _A = -4 +85 C _L = 5	5°C	
Symbol	Parameter	(Note 7)	Min	Тур	Max	Min	Max	Min	Max	Unit
t _{PLH}	Propagation Delay, Data to Output	5.0	2.0	6.5	9.0	1.0	10.0	1.5	10.0	ns
t _{PHL}	Propagation Delay, Data to Output	5.0	2.0	7.0	9.0	1.0	10.0	1.5	10.0	ns
t _{PZH}	Output Enable Time	5.0	1.5	6.0	8.5	1.0	9.5	1.0	9.5	ns
t _{PZL}	Output Enable Time	5.0	2.0	7.0	9.5	1.0	11.0	1.5	10.5	ns
t _{PHZ}	Output Disable Time	5.0	2.0	7.0	9.5	1.0	11.0	1.5	10.5	ns
t _{PLZ}	Output Disable Time	5.0	2.5	7.5	10.0	1.0	11.5	2.0	10.5	ns

7. Voltage range 5.0 is 5.0 V \pm 0.5 V.

CAPACITANCE

Symbol	Parameter Conditions		Тур	Unit
C _{IN}	Input Capacitance	V _{CC} = OPEN	4.5	pF
C _{PD}	Power Dissipation Capacitance	V _{CC} = 5.0 V	45.0	pF

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ORDERING INFORMATION

Order Number	Package	Shipping [†] (Qty / Packing)
74AC244SC	SOIC-20W (Pb-Free)	38 / Tube
74AC244SCX	SOIC-20W (Pb-Free)	1000 / Tape & Reel
74AC244MTC	TSSOP-20 (Pb-Free)	75 / Tube
74AC244MTCX	TSSOP-20 (Pb-Free)	2500 / Tape & Reel
74ACT244SC	SOIC-20W (Pb-Free)	38 / Tube
74ACT244SCX	SOIC-20W (Pb-Free)	1000 / Tape & Reel
74ACT244MTC	TSSOP-20 (Pb-Free)	75 / Tube
74ACT244MTCX	TSSOP-20 (Pb-Free)	2500 / Tape & Reel

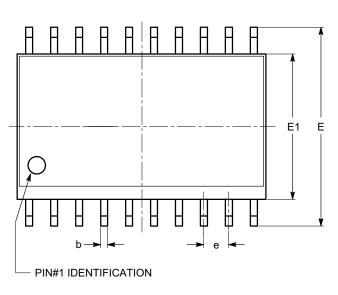
+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D

NOTE: All packages are lead free per JEDEC: J-STD-020B standard.

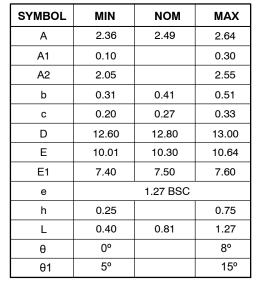


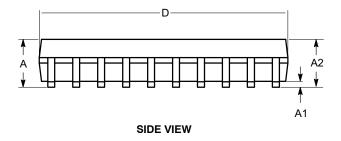
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TOP VIEW





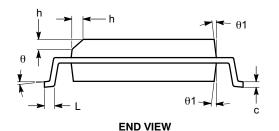
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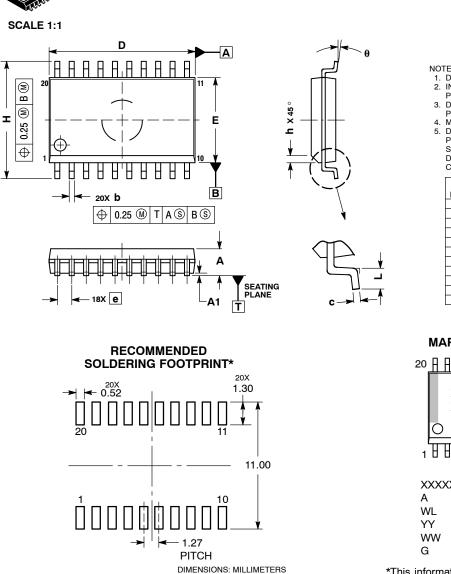
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*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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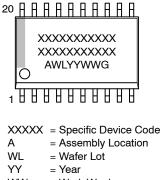
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	MILLIMETERS			
DIM	MIN	MAX		
Α	2.35	2.65		
A1	0.10	0.25		
b	0.35	0.49		
C	0.23	0.32		
D	12.65	12.95		
Е	7.40	7.60		
е	1.27	BSC		
Н	10.05	10.55		
h	0.25	0.75		
L	0.50	0.90		
θ	0 °	7 °		

GENERIC **MARKING DIAGRAM***

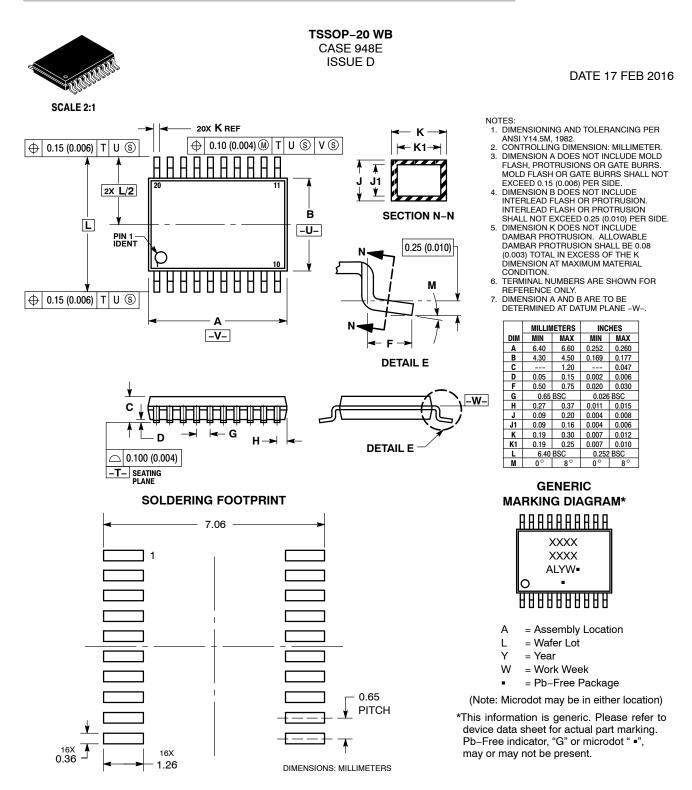


= Work Week = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb–Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

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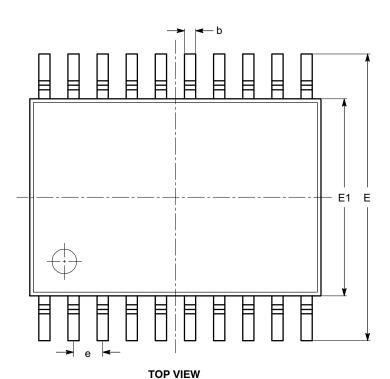
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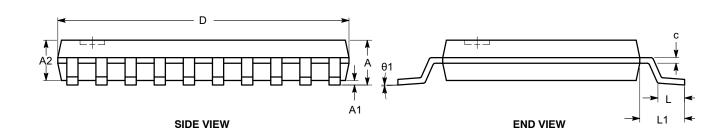


TSSOP20, 4.4x6.5 CASE 948AQ-01 ISSUE A

DATE 19 MAR 2009



SYMBOL	MIN	NOM	MAX
А			1.20
A1	0.05		0.15
A2	0.80		1.05
b	0.19		0.30
с	0.09		0.20
D	6.40	6.50	6.60
E	6.30	6.40	6.50
E1	4.30	4.40	4.50
е		0.65 BSC	
L	0.45	0.60	0.75
L1		1.00 REF	
θ	0°		8°



Notes:

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