

August 1998

54AC244 • 54ACT244 Octal Buffer/Line Driver with TRI-STATE® Outputs

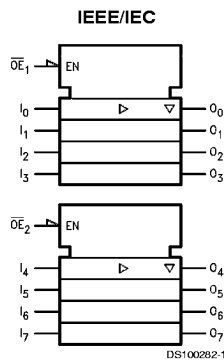
General Description

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%
- TRI-STATE outputs drive bus lines or buffer memory address registers
- Outputs source/sink 24 mA
- 'ACT244 has TTL-compatible inputs
- Standard Microcircuit Drawing (SMD)
 - 'AC244: 5962-87552
 - 'ACT244: 5962-87760

Logic Symbol

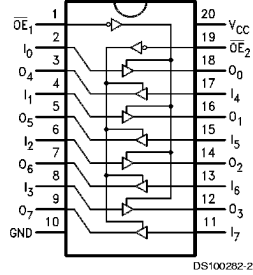


Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	TRI-STATE Output Enable Inputs
I_0-I_7	Inputs
O_0-O_7	Outputs

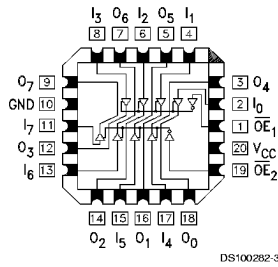
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FACT® is a registered trademark of Fairchild Semiconductor Corporation.

Connection Diagrams

Pin Assignment for DIP and Flatpak



Pin Assignment for LCC



Truth Tables

Inputs		Outputs
OE ₁	I _n	(Pins 12, 14, 16, 18)
L	L	L
L	H	H
H	X	Z

H = HIGH Voltage Level
L = LOW Voltage Level

Inputs		Outputs
OE ₂	I _n	(Pins 3, 5, 7, 9)
L	L	L
L	H	H
H	X	Z

X = Immaterial
Z = High Impedance

Absolute Maximum Ratings (Note 1)			Recommended Operating Conditions		
<p>If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.</p>			<p>Supply Voltage (V_{CC})</p>		
Supply Voltage (V_{CC})		-0.5V to +7.0V	'AC		2.0V to 6.0V
DC Input Diode Current (I_{IK})			'ACT		4.5V to 5.5V
$V_I = -0.5V$		-20 mA	Input Voltage (V_I)		0V to V_{CC}
$V_I = V_{CC} + 0.5V$		+20 mA	Output Voltage (V_O)		0V to V_{CC}
DC Input Voltage (V_I)		-0.5V to $V_{CC} + 0.5V$	Operating Temperature (T_A)		
DC Output Diode Current (I_{OK})			54AC/ACT		-55°C to +125°C
$V_O = -0.5V$		-20 mA	Minimum Input Edge Rate ($\Delta V/\Delta t$)		
$V_O = V_{CC} + 0.5V$		+20 mA	'AC Devices		
DC Output Voltage (V_O)		-0.5V to $V_{CC} + 0.5V$	V_{IN} from 30% to 70% of V_{CC}		
DC Output Source			V_{CC} @ 3.3V, 4.5V, 5.5V		125 mV/ns
or Sink Current (I_O)		± 50 mA	Minimum Input Edge Rate ($\Delta V/\Delta t$)		
DC V_{CC} or Ground Current			'ACT Devices		
per Output Pin (I_{CC} or I_{GND})		± 50 mA	V_{IN} from 0.8V to 2.0V		
Storage Temperature (T_{STG})		-65°C to +150°C	V_{CC} @ 4.5V, 5.5V		125 mV/ns
Junction Temperature (T_J)			<p>Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. National does not recommend operation of FACT® circuits outside databook specifications.</p>		
CDIP		175°C			
DC Characteristics for 'AC Family Devices					
Symbol	Parameter	V_{CC} (V)	54AC	Units	Conditions
			$T_A =$ -55°C to +125°C		
			Guaranteed Limits		
V_{IH}	Minimum High Level Input Voltage	3.0	2.1	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		4.5	3.15		
		5.5	3.85		
V_{IL}	Maximum Low Level Input Voltage	3.0	0.9	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		4.5	1.35		
		5.5	1.65		
V_{OH}	Minimum High Level Output Voltage	3.0	2.9	V	$I_{OUT} = -50 \mu A$
		4.5	4.4		
		5.5	5.4		
		3.0	2.4		
4.5	3.7	I_{OH}	-12 mA		
5.5	4.7	I_{OH}	-24 mA		
V_{OL}	Maximum Low Level Output Voltage	3.0	0.1	V	$I_{OUT} = 50 \mu A$
		4.5	0.1		
		5.5	0.1		
		3.0	0.50		
4.5	0.50	I_{OL}	12 mA		
5.5	0.50	I_{OL}	24 mA		
I_{IN}	Maximum Input Leakage Current	5.5	± 1.0	μA	$V_I = V_{CC}, GND$

DC Characteristics for 'AC Family Devices (Continued)					
Symbol	Parameter	V _{CC} (V)	54AC	Units	Conditions
			T _A = -55°C to +125°C		
			Guaranteed Limits		
I _{OZ}	Maximum TRI-STATE Current	5.5	±5.0	μA	V _I (OE) = V _{IL} , V _{IH} V _I = V _{CC} , V _{GND} V _O = V _{CC} , GND
I _{OLD}	(Note 3) Minimum Dynamic Output Current	5.5	50	mA	V _{OLD} = 1.65V Max
I _{OHD}		5.5	-50	mA	V _{OHD} = 3.85V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	80.0	μA	V _{IN} = V _{CC} or GND
<p>Note 2: All outputs loaded; thresholds on input associated with output under test.</p> <p>Note 3: Maximum test duration 2.0 ms, one output loaded at a time.</p> <p>Note 4: I_{IN} and I_{CC} @ 3.0V are guaranteed to be less than or equal to the respective limit @ 5.5V V_{CC}.</p> <p>Note 5: I_{CC} for 54AC @ 25°C is identical to 74AC @ 25°C.</p>					
DC Characteristics for 'ACT Family Devices					
Symbol	Parameter	V _{CC} (V)	54ACT	Units	Conditions
			T _A = -55°C to +125°C		
			Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	4.5	2.0	V	V _{OUT} = 0.1V or V _{CC} - 0.1V
5.5		2.0			
V _{IL}	Maximum Low Level Input Voltage	4.5	0.8	V	V _{OUT} = 0.1V or V _{CC} - 0.1V
5.5		0.8			
V _{OH}	Minimum High Level Output Voltage	4.5	4.4	V	I _{OUT} = -50 μA
		5.5	5.4		
	4.5	3.70	V	(Note 6) V _{IN} = V _{IL} or V _{IH} I _{OH} -24 mA	
5.5	4.70		-24 mA		
V _{OL}	Maximum Low Level Output Voltage	4.5	0.1	V	I _{OUT} = 50 μA
		5.5	0.1		
	4.5	0.50	V	(Note 6) V _{IN} = V _{IL} or V _{IH} I _{OL} 24 mA	
5.5	0.50		24 mA		
I _{IN}	Maximum Input Leakage Current	5.5	±1.0	μA	V _I = V _{CC} , GND
I _{OZ}	Maximum TRI-STATE Current	5.5	±5.0	μA	V _I = V _{IL} , V _{IH} V _O = V _{CC} , GND
I _{CCCT}	Maximum I _{CC} /Input	5.5	1.6	mA	V _I = V _{CC} - 2.1V
I _{OLD}	(Note 7) Minimum Dynamic Output Current	5.5	50	mA	V _{OLD} = 1.65V Max
I _{OHD}		5.5	-50	mA	V _{OHD} = 3.85V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	80.0	μA	V _{IN} = V _{CC} or GND
<p>Note 6: All outputs loaded; thresholds on input associated with output under test.</p> <p>Note 7: Maximum test duration 2.0 ms, one output loaded at a time.</p> <p>Note 8: I_{CC} for 54ACT @ 25°C is identical to 74ACT @ 25°C.</p>					

AC Electrical Characteristics					
Symbol	Parameter	V _{CC} (V) (Note 9)	54AC		Units
			T _A = -55°C to +125°C C _L = 50 pF		
			Min	Max	
t _{PLH}	Propagation Delay	3.3	1.0	12.5	ns
	Data to Output	5.0	1.0	9.5	
t _{PHL}	Propagation Delay	3.3	1.0	12.0	ns
	Data to Output	5.0	1.0	9.0	
t _{PZH}	Output Enable Time	3.3	1.0	11.5	ns
		5.0	1.0	9.0	
t _{PZL}	Output Enable Time	3.3	1.0	13.0	ns
		5.0	1.0	10.5	
t _{PHZ}	Output Disable Time	3.3	1.0	12.5	ns
		5.0	1.0	10.5	
t _{PLZ}	Output Disable Time	3.3	1.0	13.0	ns
		5.0	1.0	11.0	

Note 9: Voltage Range 3.3 is 3.3V ±0.3V
Voltage Range 5.0 is 5.0V ±0.5V

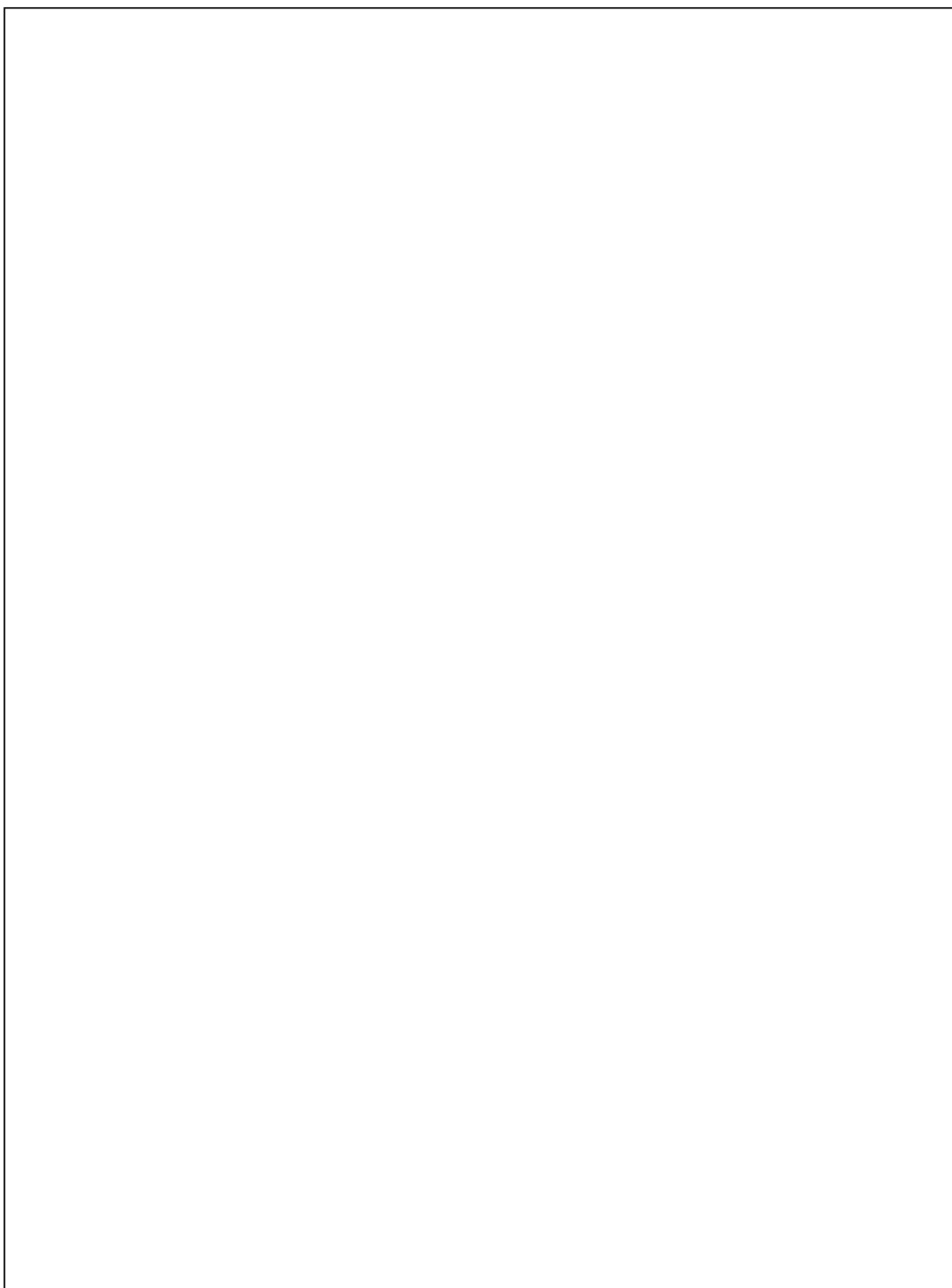
AC Electrical Characteristics					
Symbol	Parameter	V _{CC} (V) (Note 10)	54ACT		Units
			T _A = -55°C to +125°C C _L = 50 pF		
			Min	Max	
t _{PLH}	Propagation Delay	5.0	1.0	10.0	ns
	Data to Output				
t _{PHL}	Propagation Delay	5.0	1.0	10.0	ns
	Data to Output				
t _{PZH}	Output Enable Time	5.0	1.0	9.5	ns
t _{PZL}	Output Enable Time	5.0	1.0	11.0	ns
t _{PHZ}	Output Disable Time	5.0	1.0	11.0	ns
t _{PLZ}	Output Disable Time	5.0	1.0	11.5	ns

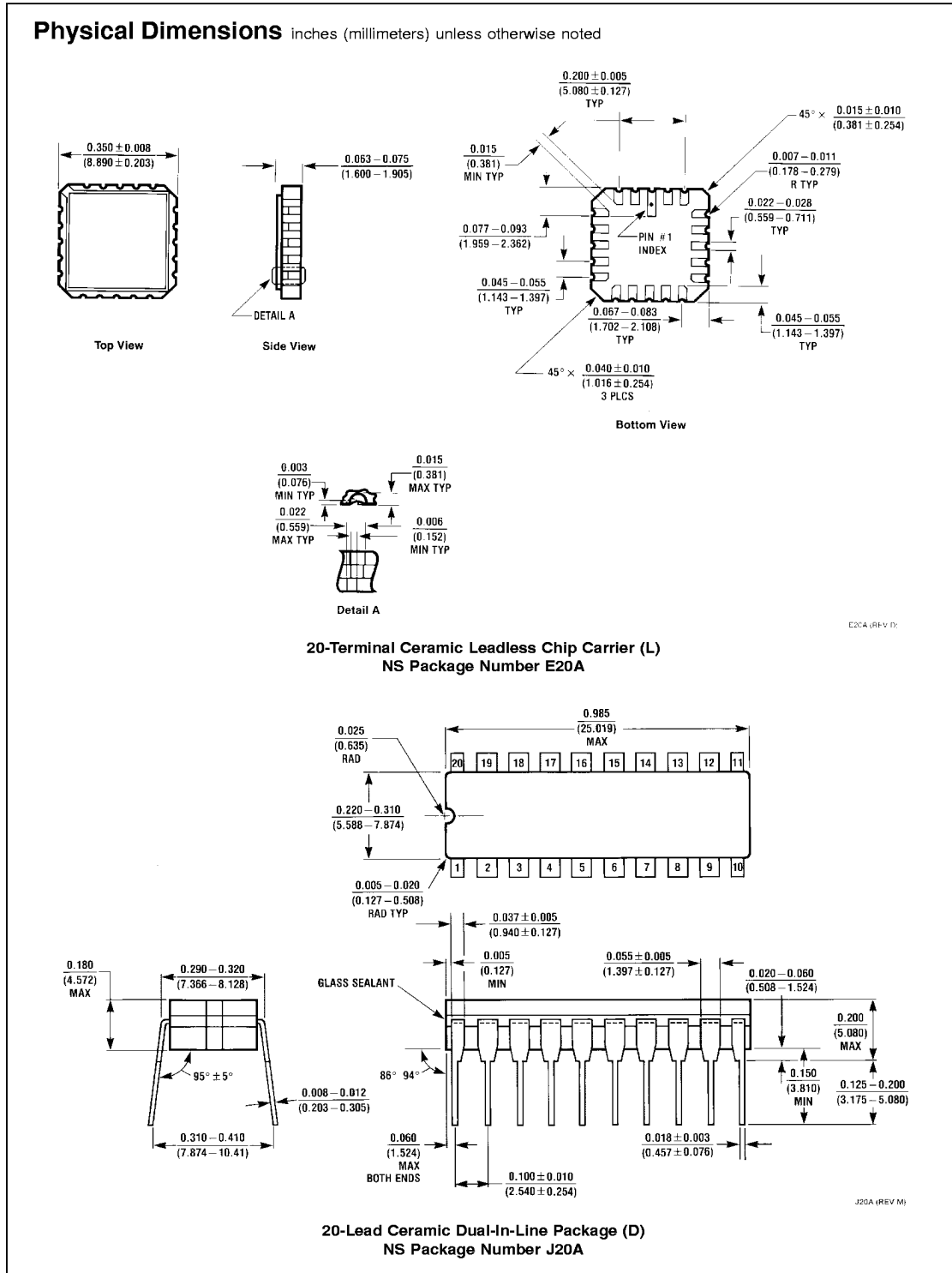
Note 10: Voltage Range 5.0 is 5.0V ±0.5V

Capacitance

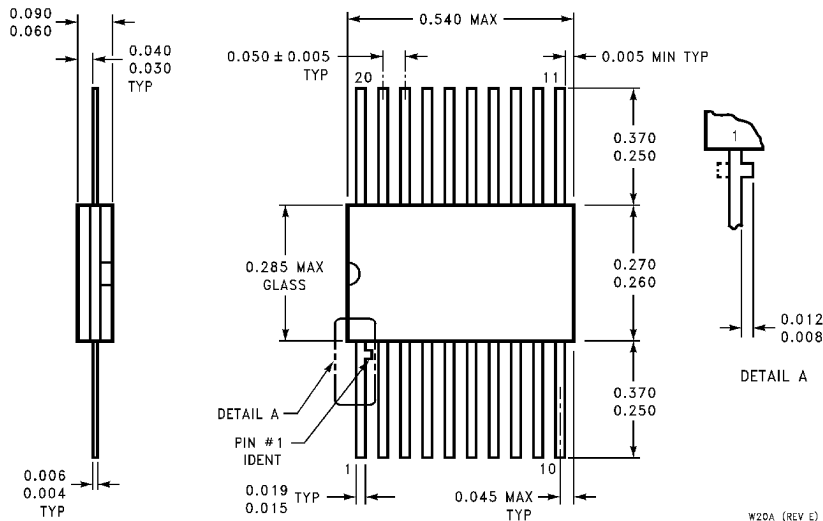
Symbol	Parameter	Typ	Units	Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = OPEN
C _{PD}	Power Dissipation Capacitance	45.0	pF	V _{CC} = 5.0V

[查询"54ACT244DMQB"供应商](#)





Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



**20-Lead Ceramic Flatpak (F)
NS Package Number W20A**

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