

54FCT244

Octal Buffer/Line Driver with TRI-STATE® Outputs

General Description

The 'FCT244 is an octal buffer and line driver with TRI-STATE outputs designed to be employed as a memory and address driver, clock driver, or bus-oriented transmitter/receiver.

Features

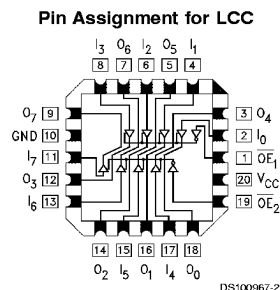
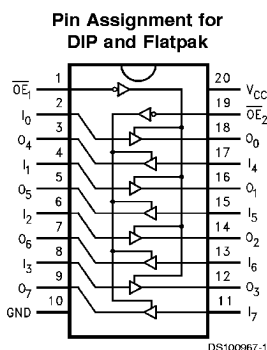
- Non-inverting buffers

- Output sink capability of 48 mA, source capability of 12 mA
- TRI-STATE outputs drive lines or buffer memory address registers
- TTL input and output level compatible
- CMOS power consumption
- Standard Microcircuit Drawing (SMD) 5962-8763001

Ordering Code

Military	Package Number	Package Description
54FCT244DMQB	J20A	20-Lead Ceramic Dual-In-Line
54FCT244FMQB	W20A	20-Lead Cerpack
54FCT244LMQB	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

Connection Diagrams



Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input (Active Low)
I_0-I_7	Inputs
O_0-O_7	Outputs

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
Z = High Impedance

Truth Table

$\overline{OE}_1$	I_{0-3}	O_{0-3}	$\overline{OE}_2$	I_{4-7}	O_{4-7}
H	X	Z	H	X	Z
L	H	H	L	H	H
L	L	L	L	L	L

TRI-STATE® is a registered trademark of National Semiconductor Corporation.

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

Storage Temperature	–65°C to +150°C
Ambient Temperature under Bias	–55°C to +125°C
Junction Temperature under Bias	
Ceramic	–55°C to +175°C
V _{CC} Pin Potential to Ground Pin	–0.5V to +7.0V
Input Voltage (Note 2)	–0.5V to +7.0V
Input Current (Note 2)	–30 mA to +5.0 mA
Voltage Applied to Any Output	
in the Disabled or	
Power-Off State	–0.5V to 5.5V
in the HIGH State	–0.5V to V _{CC}

Current Applied to Output	
in LOW State (Max)	twice the rated I _{OL} (mA)
DC Latchup Source Current	–500 mA
Over Voltage Latchup (I/O)	10V

Recommended Operating Conditions

Free Air Ambient Temperature	
Military	–55°C to +125°C
Supply Voltage	
Military	+4.5V to +5.5V
Minimum Input Edge Rate	(ΔV/Δt)
Data Input	50 mV/ns
Enable Input	20 mV/ns

DC Electrical Characteristics for 'FCT Family Devices

Symbol	Parameter	FCT244		Units	V _{CC}	Conditions
		Min	Max			
V _{IH}	Input HIGH Voltage	2.0		V		Recognized HIGH Signal
V _{IL}	Input LOW Voltage		0.8	V		Recognized LOW Signal
V _{CD}	Input Clamp Diode Voltage		–1.2	V	Min	I _{IN} = –18 mA
V _{OH}	Output HIGH Voltage	54FCT	4.3	V	Min	I _{OH} = –300 μA
		54FCT	2.4			I _{OH} = –12 mA
V _{OL}	Output LOW Voltage	54FCT	0.2	V	Min	I _{OL} = 300 μA
		54FCT	0.55			I _{OL} = 48 mA
I _{IH}	Input HIGH Current		5	μA	Max	V _{IN} = V _{CC}
I _{IL}	Input LOW Current		–5	μA	Max	V _{IN} = 0.0V
I _{OZ}	Maximum TRI-STATE Current HIGH or LOW		±10	μA	Max	V _{IN} = 0.0V or V _{IN} = V _{CC}
I _{OS}	Output Short-Circuit Current		–60	mA	Max	V _{OUT} = 0.0V
I _{CCQ}	Quiescent Power Supply Current		1.5	mA	Max	V _{IN} < 0.2V or V _{IN} 5.3V, V _{CC} = 5.5V
ΔI _{CC}	Quiescent Power Supply Current		2.0	mA	Max	V _I = 3.4V, V _{CC} = 5.5V
I _{CCD}	Dynamic I _{CC}		0.4	mA/MHz	Max	Outputs Open, V _{CC} = 5.5V, V _{IN} 5.3V or V _{IN} < 0.2V, One Bit Toggling, 50% Duty Cycle, $\overline{OE}$ = GND, LE = V _{CC}
I _{CTT}	Total Power Supply Current		6.0	mA	Max	Outputs Open, f _{CP} = 10 MHz, V _{CC} = 5.5V, V _{IN} 5.3V or V _{IN} < 0.2V, One Bit Toggling, 50% Duty Cycle, $\overline{OE}$ = GND, LE = V _{CC}

Note 1: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 2: Either voltage limit or current limit is sufficient to protect inputs.

Note 3: All outputs loaded; thresholds on input associated with output under test.

Note 4: Maximum test duration 2.0 ms, one output loaded at a time.

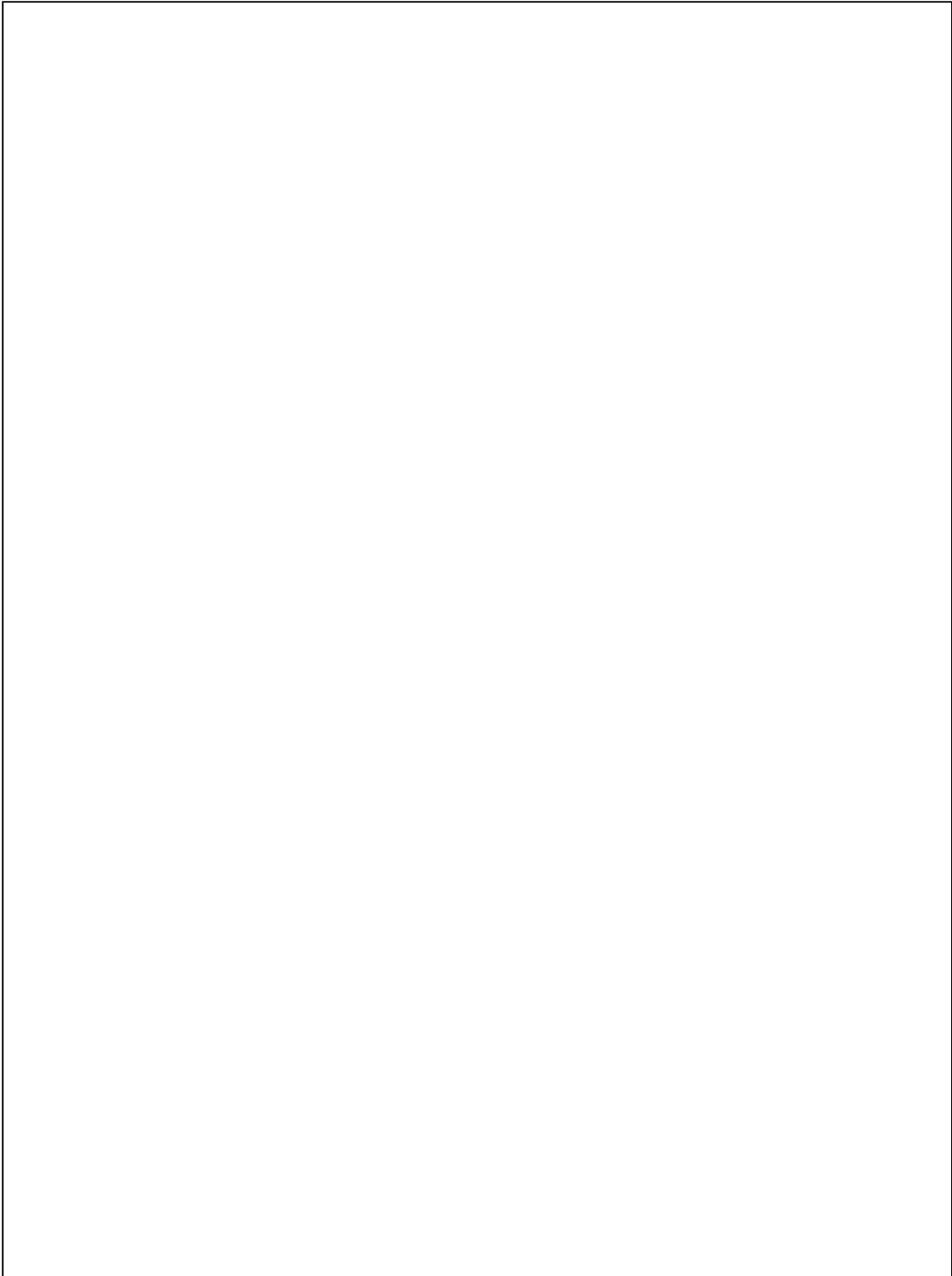
AC Electrical Characteristics for 'FCT Family Devices

Symbol	Parameter	54FCT		Units	Fig. No.
		$T_A = -55^{\circ}\text{C to } +125^{\circ}\text{C}$ $V_{CC} = 4.5\text{V} - 5.5\text{V}$ $C_L = 50\text{ pF}$			
		Min	Max		
t_{PLH}	Propagation Delay	1.5	7.5	ns	
t_{PHL}	Data to Outputs	1.5	7.5		
t_{PZH}	Output Enable	1.5	10.5	ns	
t_{PZL}	Time	1.5	10.5		
t_{PHZ}	Output Disable	1.5	8.0	ns	
t_{PLZ}	Time	1.5	8.0		

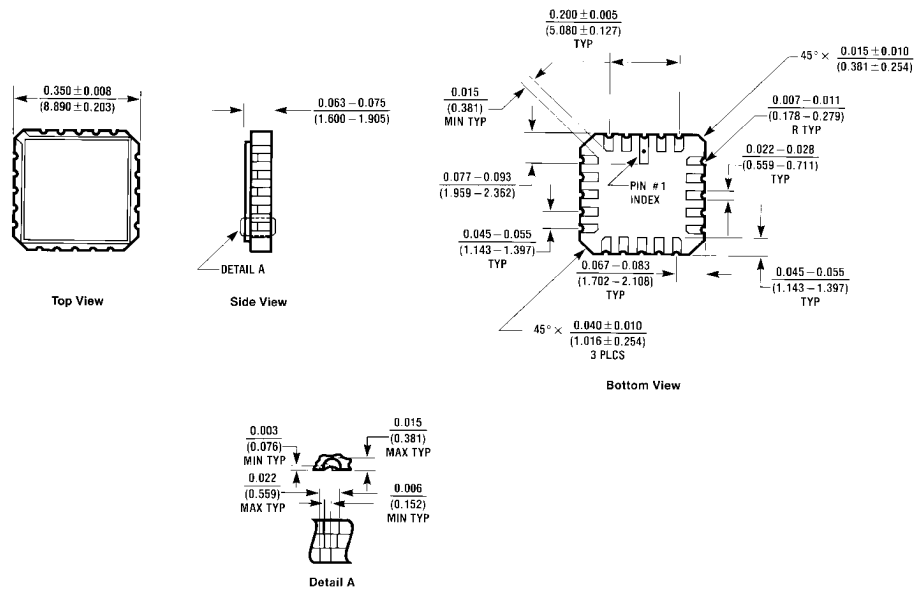
Capacitance

Symbol	Parameter	Max	Units	Conditions $T_A = 25^{\circ}\text{C}$
C_{IN}	Input Capacitance	10.0	pF	$V_{CC} = 0\text{V}$
C_{OUT} (Note 5)	Output Capacitance	12.0	pF	$V_{CC} = 5.0\text{V}$

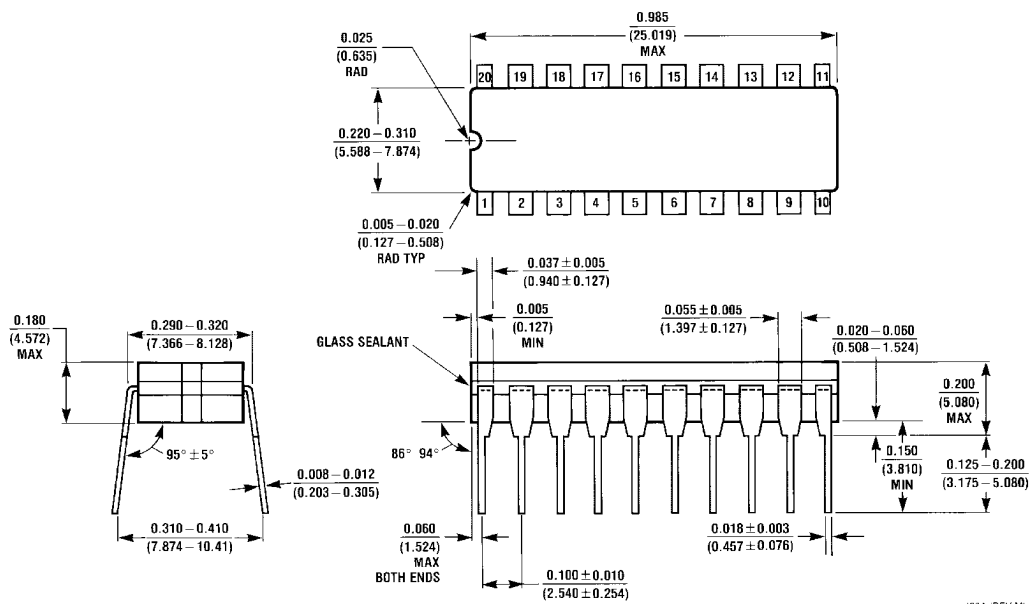
Note 5: C_{OUT} is measured at frequency $f = 1\text{ MHz}$, per MIL-STD-883B, Method 3012.



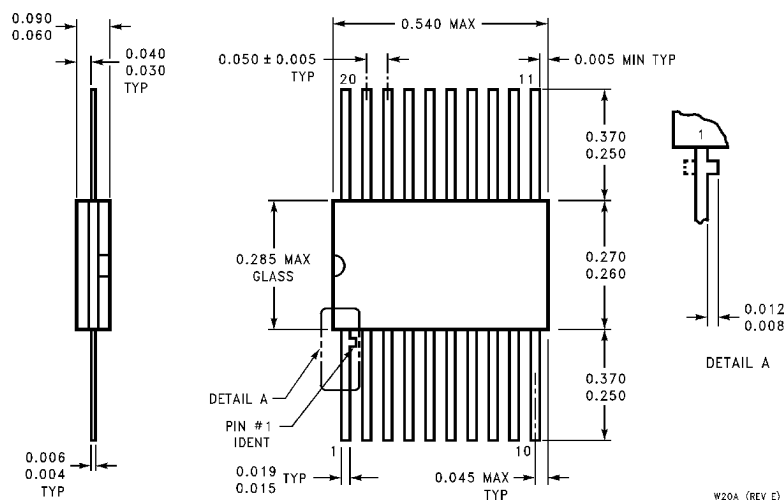
Physical Dimensions inches (millimeters) unless otherwise noted



20-Terminal Ceramic Chip Carrier (L)
NS Package Number E20A



20-Lead Ceramic Dual-In-Line (D)
NS Package Number J20A

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

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

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



National Semiconductor Corporation
Americas
Tel: 1-800-272-9959
Fax: 1-800-737-7018
Email: support@nsc.com

www.national.com

National Semiconductor Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 1 80-530 85 85
English Tel: +49 (0) 1 80-532 78 32
Français Tel: +49 (0) 1 80-532 93 58
Italiano Tel: +49 (0) 1 80-534 16 80

National Semiconductor Asia Pacific Customer Response Group
Tel: 65-2544466
Fax: 65-2504466
Email: sea.support@nsc.com

National Semiconductor Japan Ltd.
Tel: 81-3-5620-6175
Fax: 81-3-5620-6179

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.