

## 54FCT244

### Octal Buffer/Line Driver with TRI-STATE® Outputs

#### General Description

The 54FCT244 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

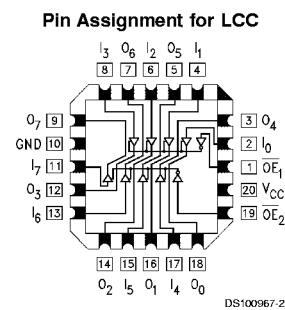
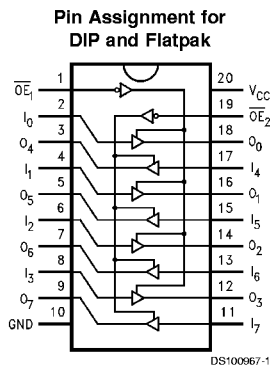
- Non-inverting buffers

- 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

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## 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 <sub>CC</sub> 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 <sub>CC</sub>

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

**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		

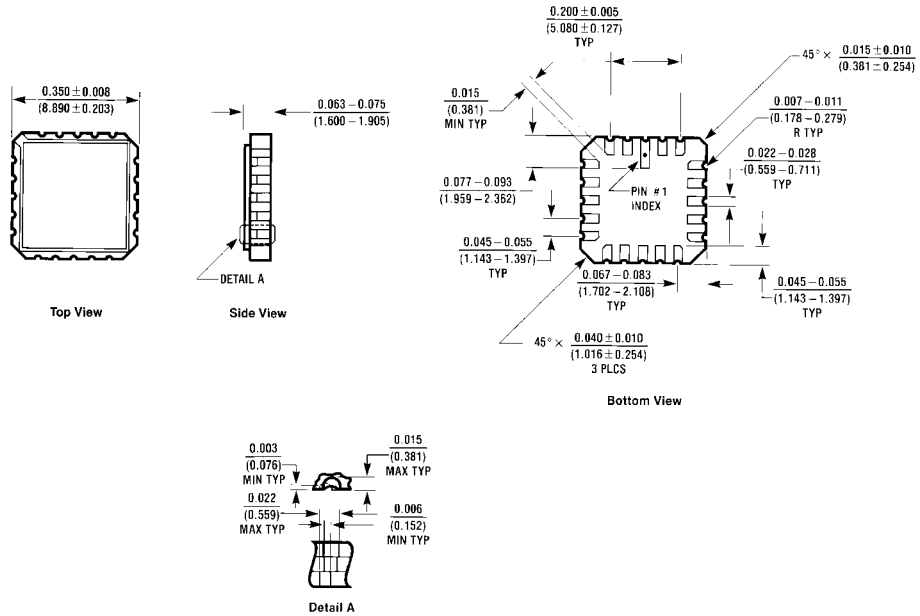
## Capacitance

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.

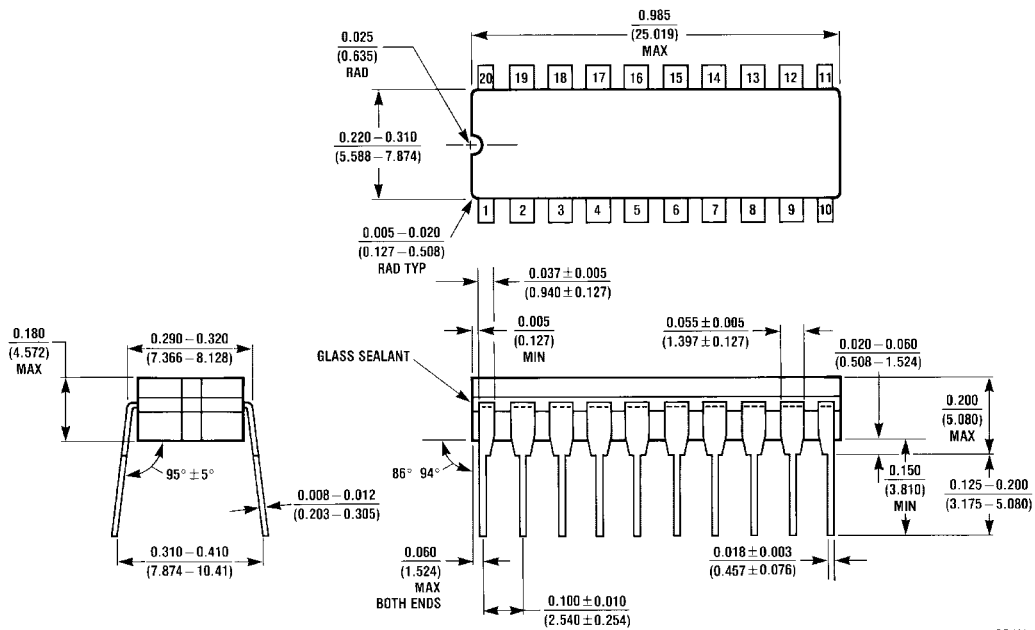


**Physical Dimensions** inches (millimeters) unless otherwise noted



L20A (REV D)

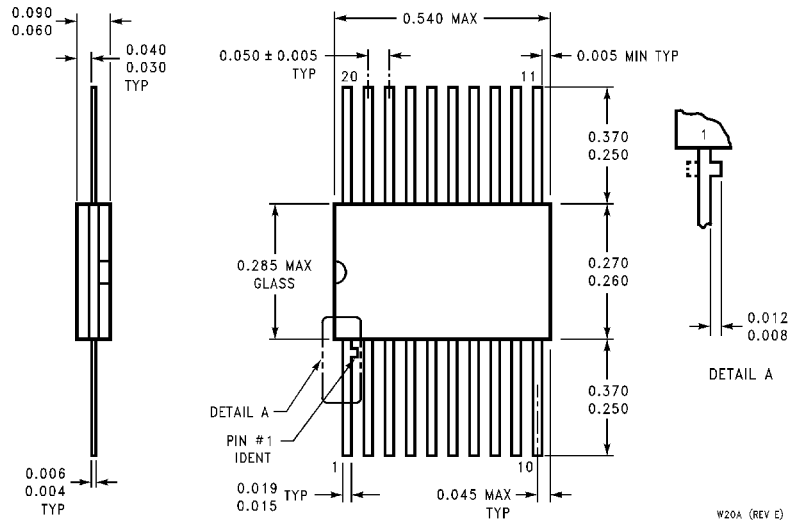
**20-Terminal Ceramic Chip Carrier (L)**  
**NS Package Number E20A**



J20A (REV M)

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

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



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