

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

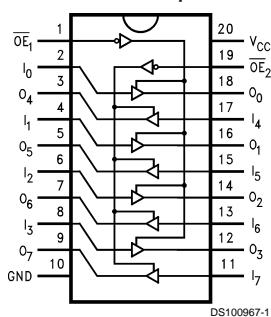
- Non-inverting buffers
- Output sink capability of 48 mA, source capability of 12 mA
- TRI-STATE outputs drive lines or buffer memory address registers
- TTL input and output level compatible
- CMOS power consumption
- Standard Microcircuit Drawing (SMD) 5962-8763001

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

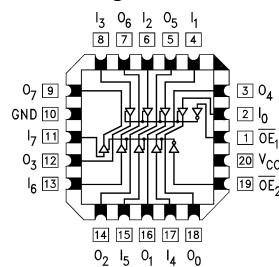
Connection Diagrams

Pin Assignment for
DIP and Flatpak



DS100967-1

Pin Assignment for LCC



DS100967-2

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

\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_{CC} Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	
Voltage Applied to Any Output in the Disabled or Power-Off State	-30 mA to +5.0 mA
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

Recommended Operating Conditions

Free Air Ambient Temperature	-55°C to +125°C
Supply Voltage	+4.5V to +5.5V
Minimum Input Edge Rate	($\Delta V / \Delta t$)
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 μ A
		54FCT	2.4			I _{OH} = -12 mA
V _{OL}	Output LOW Voltage	54FCT	0.2	V	Min	I _{OL} = 300 μ A
		54FCT	0.55			I _{OL} = 48 mA
I _{IH}	Input HIGH Current		5	μ A	Max	V _{IN} = V _{CC}
I _{IL}	Input LOW Current		-5	μ A	Max	V _{IN} = 0.0V
I _{OZ}	Maximum TRI-STATE Current HIGH or LOW		\pm 10	μ A	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
Δ I _{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 _{CCT}	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 3.0 ms, one output loaded at a time.

AC Electrical Characteristics for 'FCT Family Devices

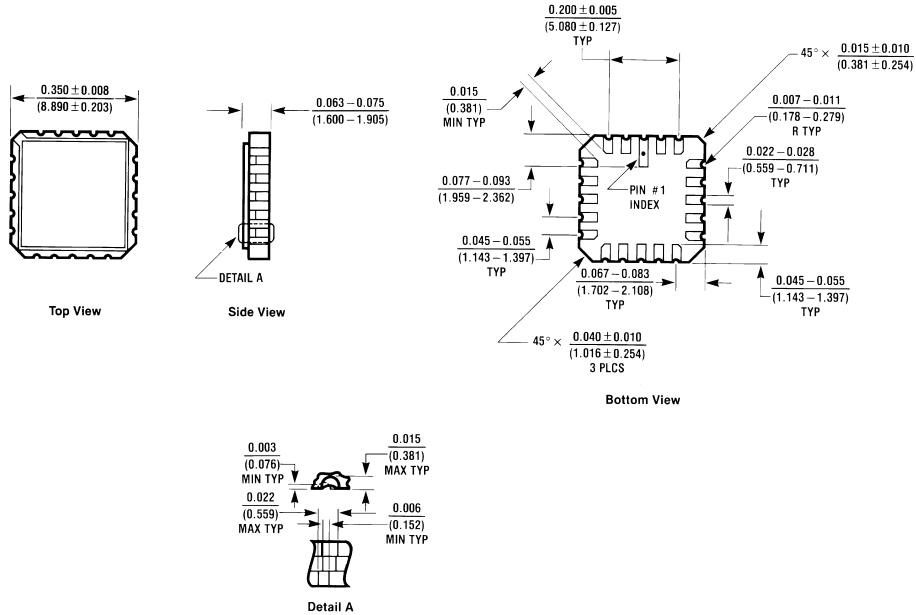
Symbol	Parameter	54FCT		Units	Fig. No.		
		$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$ $V_{CC} = 4.5\text{V}$ – 5.5V $C_L = 50 \text{ pF}$					
		Min	Max				
t_{PLH}	Propagation Delay	1.5	7.5	ns			
t_{PHL}	Data to Outputs	1.5	7.5				
t_{PZH}	Output Enable	1.5	10.5	ns			
t_{PZL}	Time	1.5	10.5				
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	$V_{CC} = 5.0\text{V}$

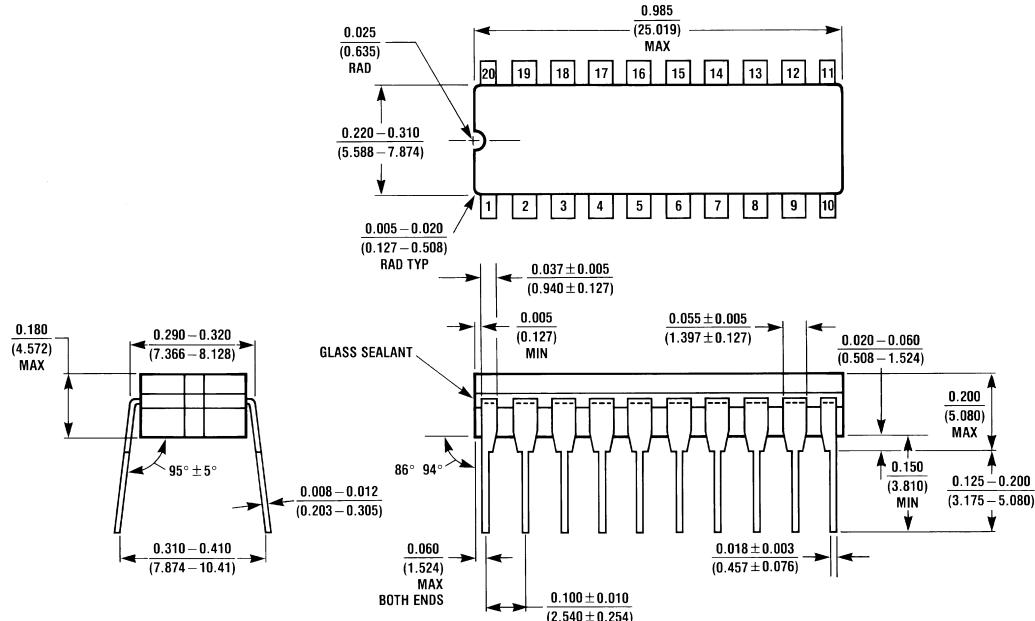
Note 5: C_{OUT} is measured at frequency $f = 1 \text{ MHz}$, per MIL-STD-883B, Method 3012.

Physical Dimensions inches (millimeters) unless otherwise noted



E20A (REV D)

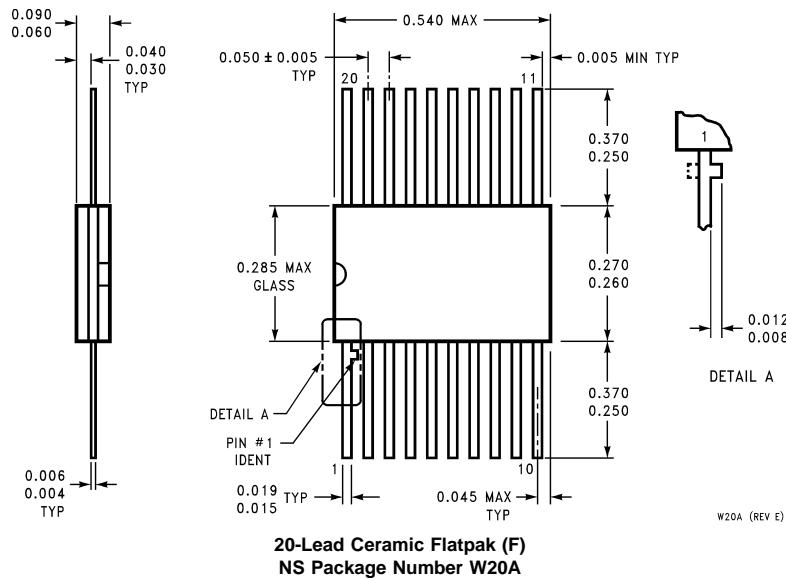
**20-Terminal Ceramic Chip Carrier (L)
NS Package Number E20A**



J20A (REV M)

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

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



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

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2. A critical component is 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.

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