

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.

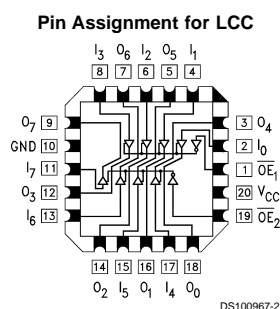
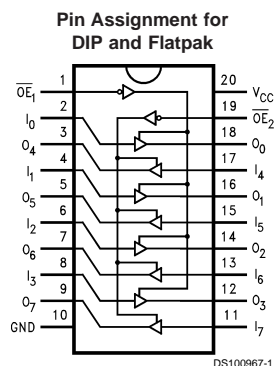
Features

- 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

\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

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

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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)	–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

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	($\Delta V/\Delta t$)
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		±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 2.0 ms, one output loaded at a time.

AC Electrical Characteristics for 'FCT Family Devices

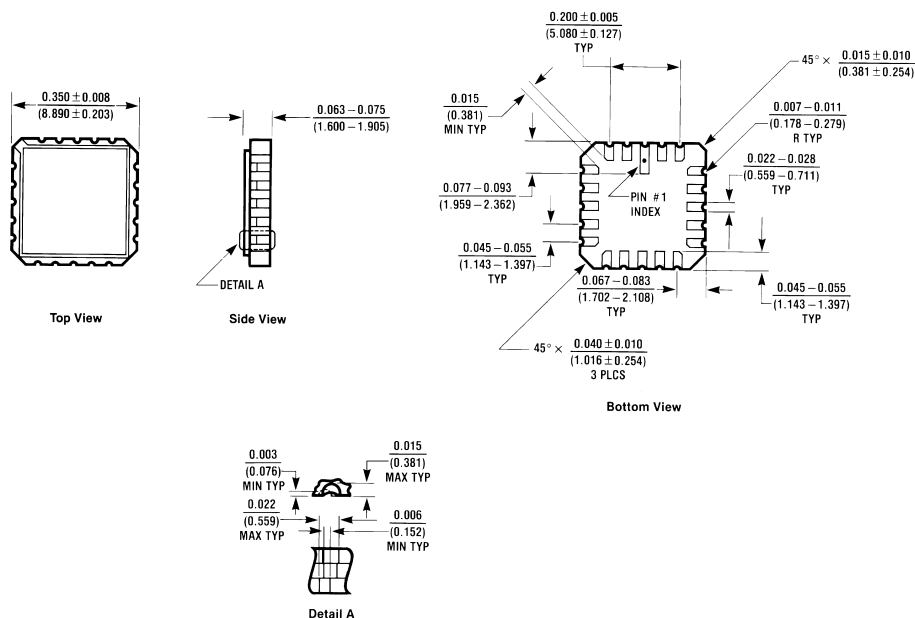
Symbol	Parameter	54FCT		Units	Fig. No.
		T _A = −55°C to +125°C V _{CC} = 4.5V–5.5V C _L = 50 pF			
		Min	Max		
t _{PLH}	Propagation Delay	1.5	7.5	ns	
t _{PHL}	Data to Outputs	1.5	7.5		
t _{PZH}	Output Enable	1.5	10.5	ns	
t _{PZL}	Time	1.5	10.5		
t _{PHZ}	Output Disable	1.5	8.0	ns	
t _{PLZ}	Time	1.5	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	$V_{CC} = 5.0\text{V}$

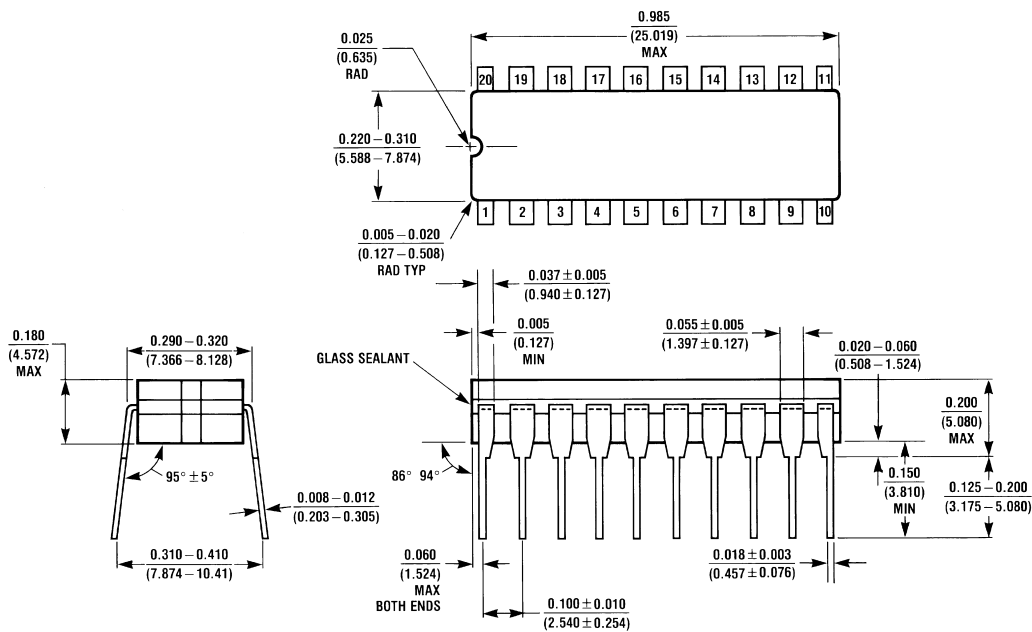
Note 5: C_{OUT} is measured at frequency $f = 1\text{ MHz}$, per MIL-STD-883B, Method 3012.

Physical Dimensions inches (millimeters) unless otherwise noted



E20A (REV D)

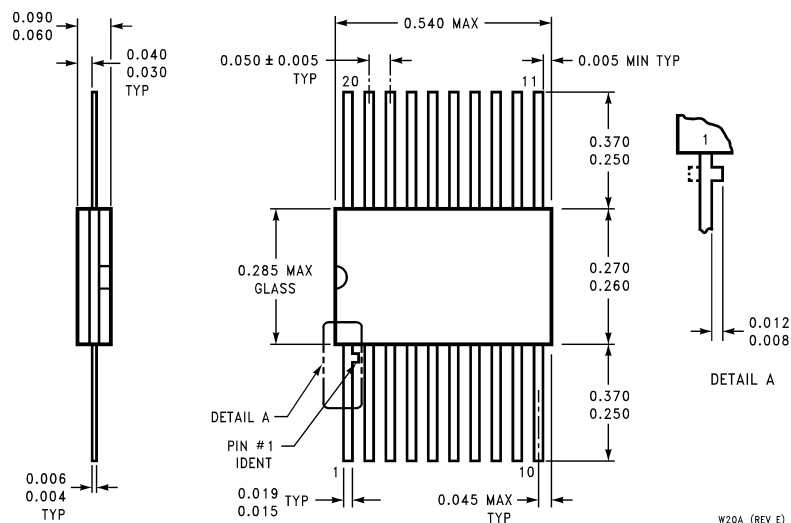
20-Terminal Ceramic Chip Carrier (L)
NS Package Number E20A



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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