National Semiconductor

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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

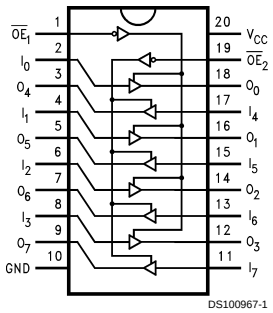
- Non-inverting buffers
- Output sink capability of 48 mA, source capability of 12 mA
- TRI-STATE outputs drive lines or buffer memory address registers
- TTL input and output level compatible
- CMOS power consumption
- Standard Microcircuit Drawing (SMD) 5962-8763001

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



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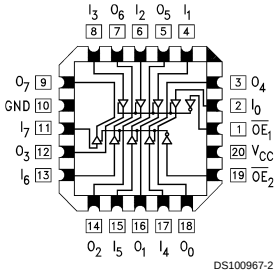
Pin Assignment for LCC



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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_{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 Min	FCT244 Max	Units	V_{CC}	Conditions
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_{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.

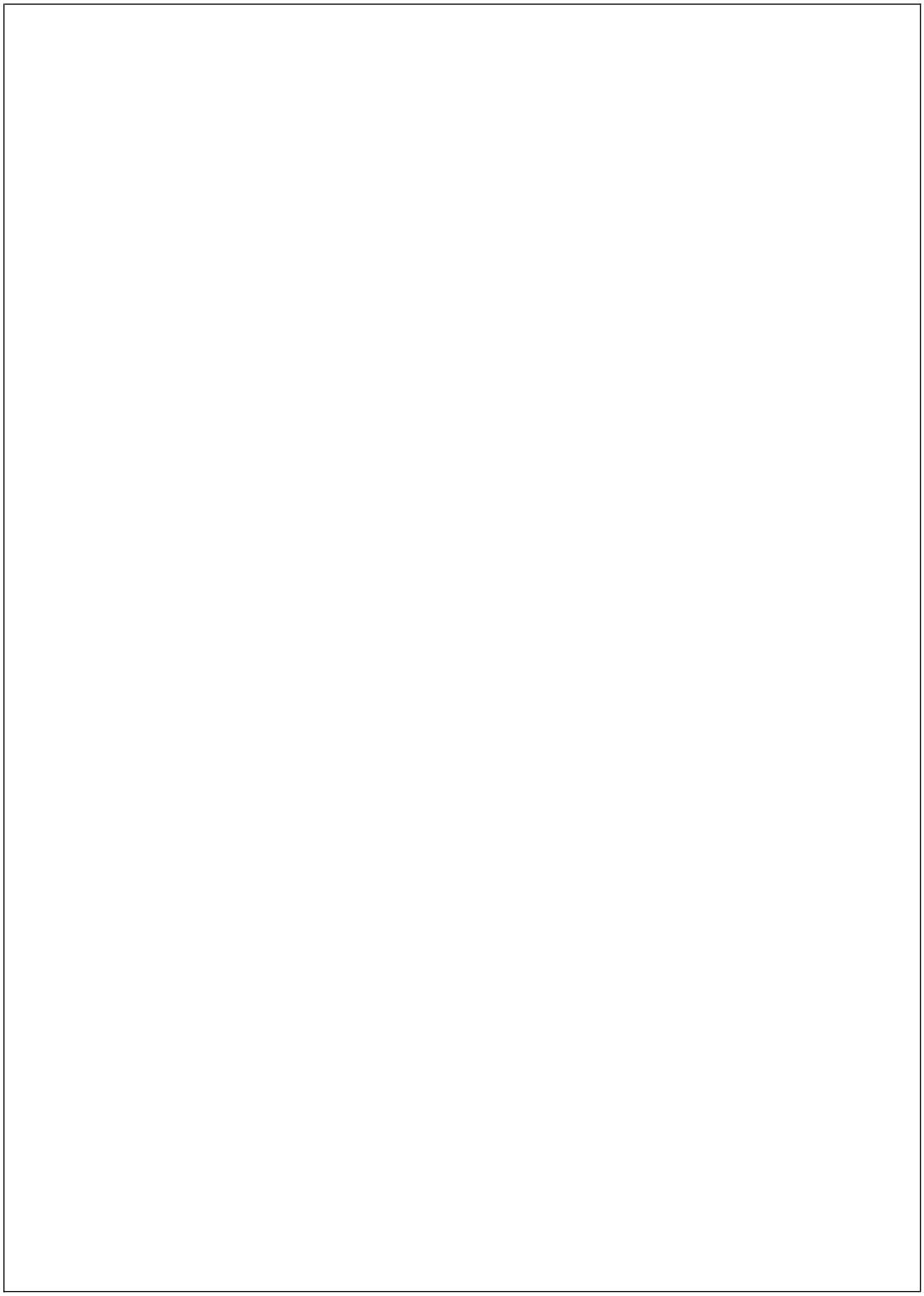
AC Electrical Characteristics for 'FCT Family Devices

Symbol	Parameter	54FCT $T_A = -55^\circ C$ to $+125^\circ C$, $V_{CC} = 4.5V-5.5V$, $C_L = 50$ pF		Units	Fig. No.
		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		

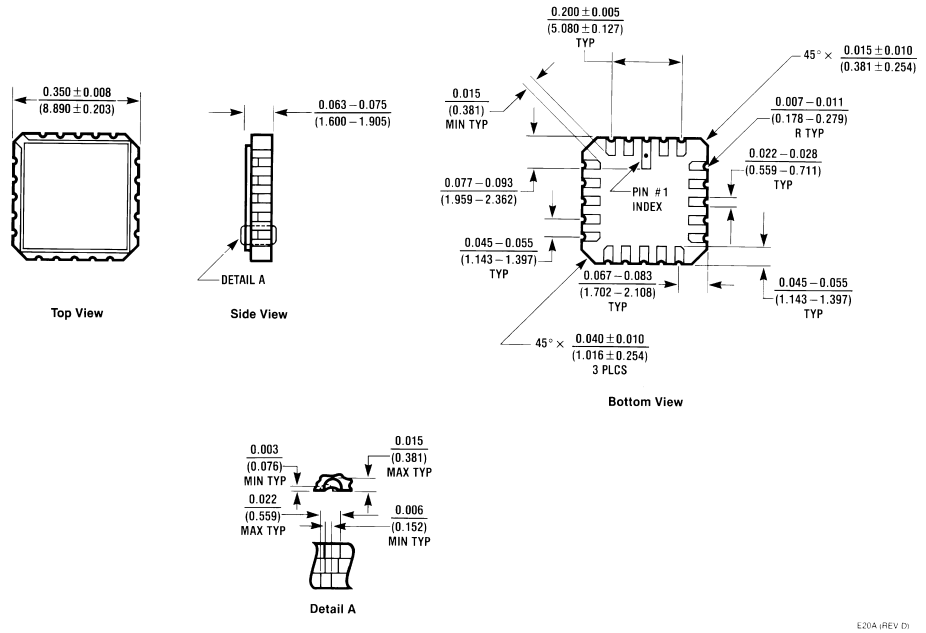
Capacitance

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

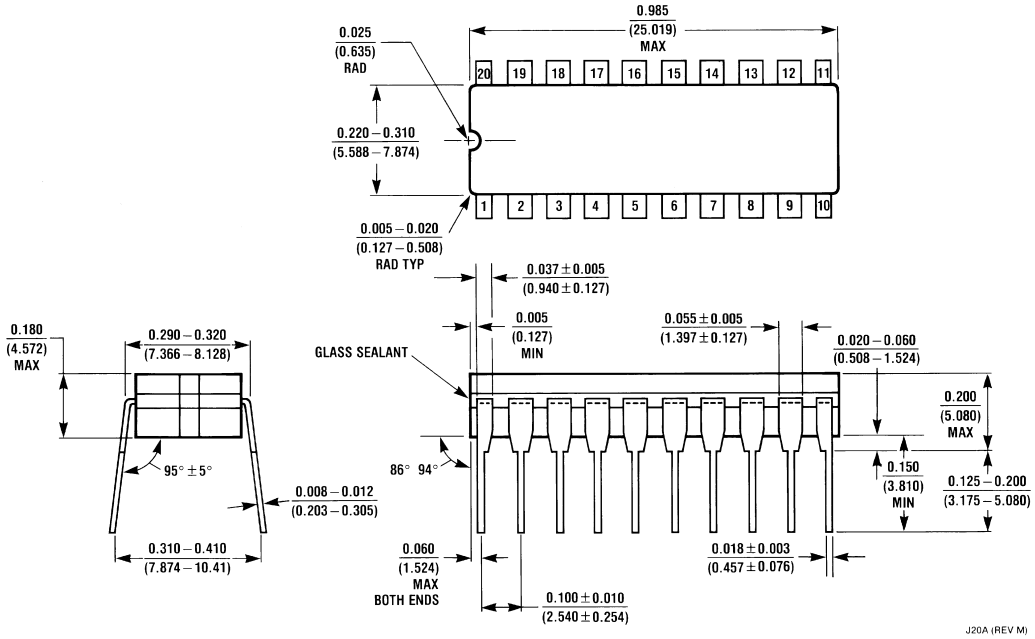
Note 5: C_{OUT} is measured at frequency f = 1 MHz, per MIL-STD-883B, Method 3012.



Physical Dimensions inches (millimeters) unless otherwise noted

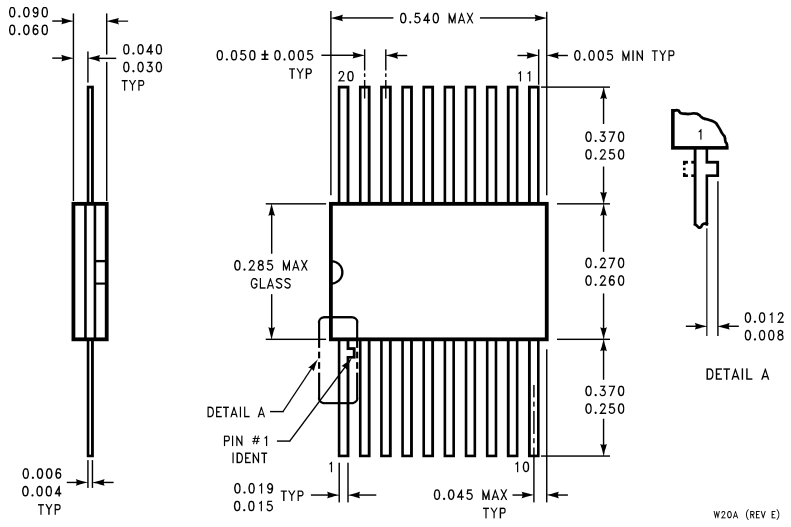


20-Terminal Ceramic Chip Carrier (L)
NS Package Number E20A



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

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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