

54FCT241

Octal Buffer/Line Driver with TRI-STATE® Outputs

General Description

The FCT241 is an octal buffer and line driver with 3-STATE outputs designed to be employed as a memory and address driver, clock driver, or bus-oriented transmitter/receiver.

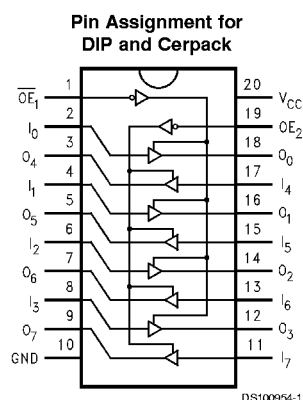
Features

- TTL input and output level compatible
- CMOS power consumption
- Non-inverting buffers
- Output sink capability of 48 mA, source capability of 12 mA

Ordering Code

Military	Package Number	Package Description
54FCT241DMQB	J20A	20-Lead Ceramic Dual-In-Line
54FCT241FMQB	W20A	20-Lead Cerpack
54FCT241LMQB	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

Connection Diagram

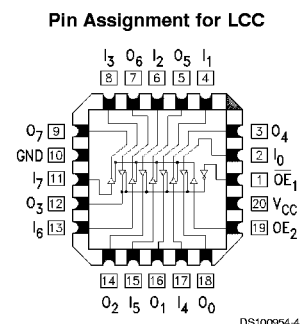


Pin Names	Description
$\overline{OE}_1$	Output Enable Input (Active Low)
OE_2	Output Enable Input (Active High)
I_0-I_7	Inputs
O_0-O_7	Outputs

Truth Table

$\overline{OE}_1$	I_{0-3}	O_{0-3}	$\overline{OE}_2$	I_{4-7}	O_{4-7}
H	X	Z	L	X	Z
L	H	H	H	H	H
L	L	L	H	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 (Over Comm Operating Range)	–500 mA
Over Voltage Latchup (I/O)	10V

Recommended Operating Conditions

Free Air Ambient Temperature	–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

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.

DC Electrical Characteristics

Symbol	Parameter	Min	Typ	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} = –3 mA
		54FCT	2.4		V	Min	I _{OH} = –12 mA
V _{OL}	Output LOW Voltage	54FCT	0.2		V	Min	I _{OL} = 300 μA
		54FCT	0.5		V	Min	I _{OL} = 48 mA
I _{IH}	Input HIGH Current		5		μA	Max	V _{IN} = 2.7V (Note 3) V _{IN} = V _{CC}
I _{IL}	Input LOW Current		–5		μA	Max	V _{IN} = 0.5V (Note 3) V _{IN} = 0.0V
I _{OZH}	Output Leakage Current		10		μA	0 – 5.5V	V _{OUT} = 2.7V; $\overline{OE}_n$ = 2.0V
I _{OZL}	Output Leakage Current		–10		μA	0 – 5.5V	V _{OUT} = 0.5V; $\overline{OE}_n$ = 2.0V
I _{OS}	Output Short-Circuit Current	–60			mA	Max	V _{OUT} = 0.0V
I _{COH}	Power Supply Current		160		μA	Max	All Outputs HIGH
I _{CCL}	Power Supply Current		160		μA	Max	All Outputs LOW
I _{CCZ}	Power Supply Current		160		μA	Max	$\overline{OE}_n$ = V _{CC} , All Others at V _{CC} or Ground
I _{CC1}	Additional I _{CC} /Input Outputs Enabled		2.0		mA	Max	V _I = V _{CC} – 2.1V
I _{CCD}	Dynamic I _{CC} No Load		0.4		mA/MHz	Max	Outputs Open, $\overline{OE}_n$ = GND, One Bit Toggling, 50% Duty Cycle

Note 3: Guaranteed, but not tested.

AC Electrical Characteristics

Symbol	Parameter	T _A = –55°C to +125°C V _{CC} = 4.5V–5.5V C _L = 50 pF		Units	Fig. No.
		Min	Max		
t _{PLH}	Propagation Delay	1.5	9.0	ns	
t _{PHL}	Data to Outputs	1.5	9.0	ns	
t _{PZH}	Output Enable	1.5	9.5	ns	

AC Electrical Characteristics (Continued)

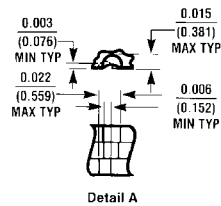
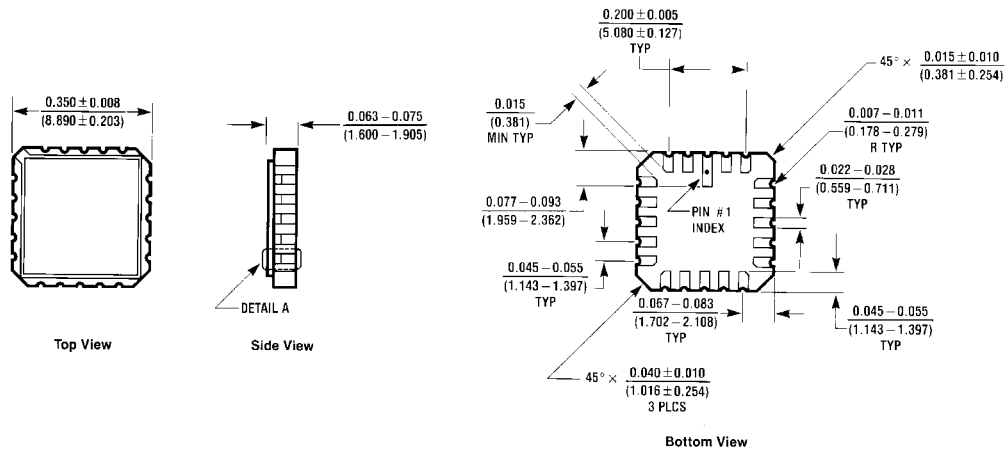
Symbol	Parameter	$T_A = -55^{\circ}\text{C to } +125^{\circ}\text{C}$ $V_{CC} = 4.5\text{V} - 5.5\text{V}$ $C_L = 50\text{ pF}$		Units	Fig. No.
		Min	Max		
t_{PZL}	Time	1.5	12.5		
t_{PHZ}	Output Disable	1.5	11.5	ns	
t_{PLZ}	Time	1.5	11.5		

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 4)	Output Capacitance	12.0	pF	$V_{CC} = 5.0\text{V}$

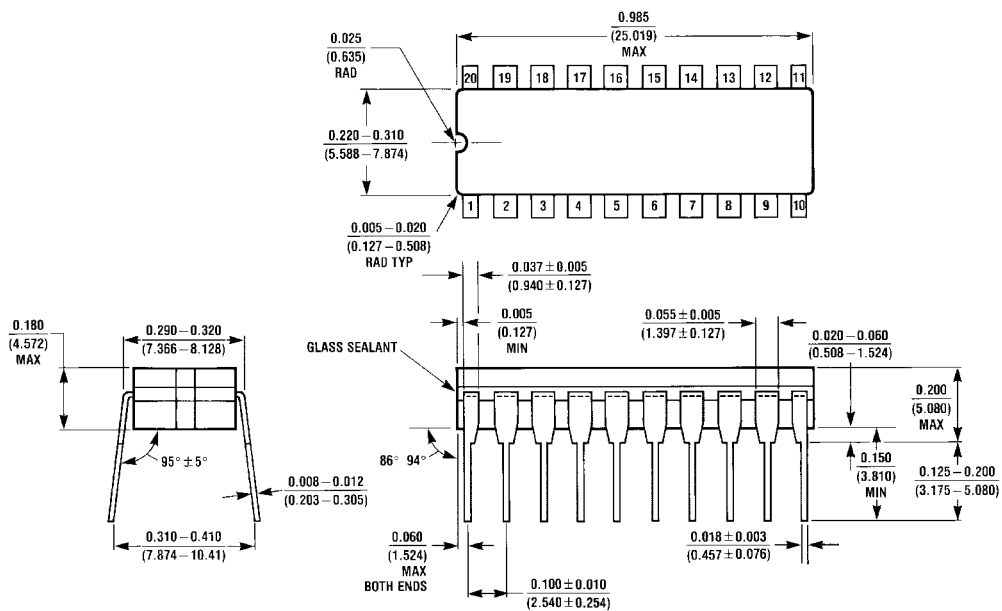
Note 4: C_{OUT} is measured at frequency $f = 1\text{ MHz}$, per MIL-STD-883B, Method 3012.

Physical Dimensions inches (millimeters) unless otherwise noted



E20A (REV D)

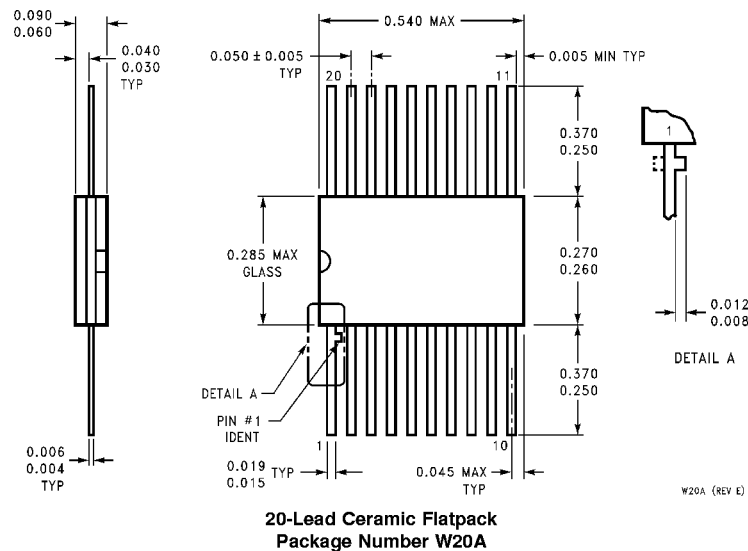
**20-Lead Ceramic Leadless Chip Carrier
Package Number E20A**



J20A (REV M)

**20-Lead Ceramic Dual-In-Line
Package Number J20A**

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



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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