National Semiconductor

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54FCT240
Octal Buffer/Line Driver with TRI-STATE® Outputs

General Description

The 54FCT240 is an octal buffer and line driver designed to be employed as a memory address driver, clock driver and bus oriented transmitter or receiver which provides improved PC board density.

Features

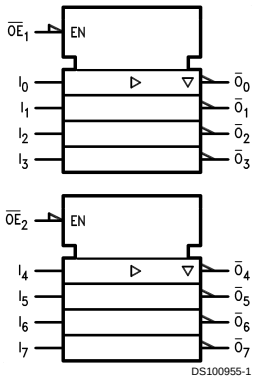
- Inverting TRI-STATE outputs drive bus lines or buffer memory address registers
- Output sink capability of 32 mA, source capability of 12 mA
- TTL input and output compatible levels
- CMOS power consumption
- Standard Microcircuit Drawing (SMD) 5962-8765501

Ordering Code:

Military	Package Number	Package Description
54FCT240DMQB	J20A	20-Lead Ceramic Dual-In-Line
54FCT240FMQB	W20A	20-Lead Cerpak
54FCT240LMQB	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

Logic Symbol

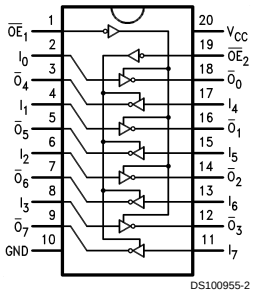
IEEE/IEC



DS100955-1

Connection Diagrams

Pin Assignment for DIP and Flatpak



DS100955-2

Pin Names	Description
$\overline{OE}_1$, $\overline{OE}_2$	TRI-STATE Output Enable Inputs
I_0–I_7	Inputs
$\overline{O}_0$–$\overline{O}_7$	Outputs

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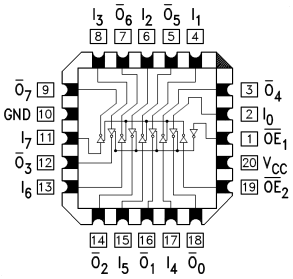
FACT® is a registered trademark of Fairchild Semiconductor Corporation.

Connection Diagrams (Continued)

Pin Assignment for LCC



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Truth Tables

Inputs		Outputs
$\overline{OE}_1$	I_n	(Pins 12, 14, 16, 18)
L	L	H
L	H	L
H	X	Z

Inputs		Outputs
$\overline{OE}_2$	I_n	(Pins 3, 5, 7, 9)
L	L	H
L	H	L
H	X	Z

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

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 1) −0.5V to +7.0V
Input Current (Note 1) −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)

Recommended Operating Conditions

Free Air Ambient Temperature
Military −55˚C to +125˚C
Supply Voltage
Military +4.5V to +5.5V

Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. National does not recommend operation of FACT® circuits outside databook specifications.

DC Characteristics for 'FCT Family Devices

Symbol	Parameter		FCT240 Min	FCT240 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		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} = 32 mA
I_{IH}	Input HIGH Current			5	µA	Max	V_{IN} = 5.5V
I_{IL}	Input LOW Current			−5	µA	Max	V_{IN} = 0.0V
I_{OZH}	High Impedance Output Current			10	µA	Max	V_{IN} = 5.5V
I_{OZL}	High Impedance Output Current			-10	µA	Max	V_{IN} = 0.0V
I_{OS}	Output Short-Circuit Current			−60	mA	Max	V_{OUT} = 0.0V
I_{CCQ}	Power Supply Current			1.5	mA	Max	V_{IN} = 0.2V or V_{IN} = 5.3V
ΔI_{CC}	Power Supply Current			2.0	mA	Max	V_{IN} = 3.4V
I_{CCT}	Total Power Supply Current			4.8	mA	Max	V_{IN} = 3.4V or V_{IN} = GND, $\overline{OE}$ = GND, f_i = 10Mhz, outputs open, one bit toggling - 50% duty cycle
				4.0	mA	Max	V_{IN} = 5.3V or V_{IN} = 0.2V,$\overline{OE}$ = GND, f_i = 10Mhz, outputs open, one bit toggling - 50% duty cycle
I_{CCD}	Dynamic I_{CC}	No Load		0.25	mA/MHz	Max	Outputs Open, $\overline{OE}$ = GND, One Bit Toggling, 50% Duty Cycle

AC Electrical Characteristics

Symbol	Parameter	54FCT240 T_A = −55˚C to +125˚C, V_{CC} = 4.5V–5.5V, C_L = 50 pF Min	54FCT240 Max	Units	Fig. No.
t_{PLH}	Propagation Delay	1.5	9.0	ns	
t_{PHL}	Data to Outputs	1.5	9.0		
t_{PZH}	Output Enable	1.5	10.5	ns	
t_{PZL}	Time	1.5	10.5		

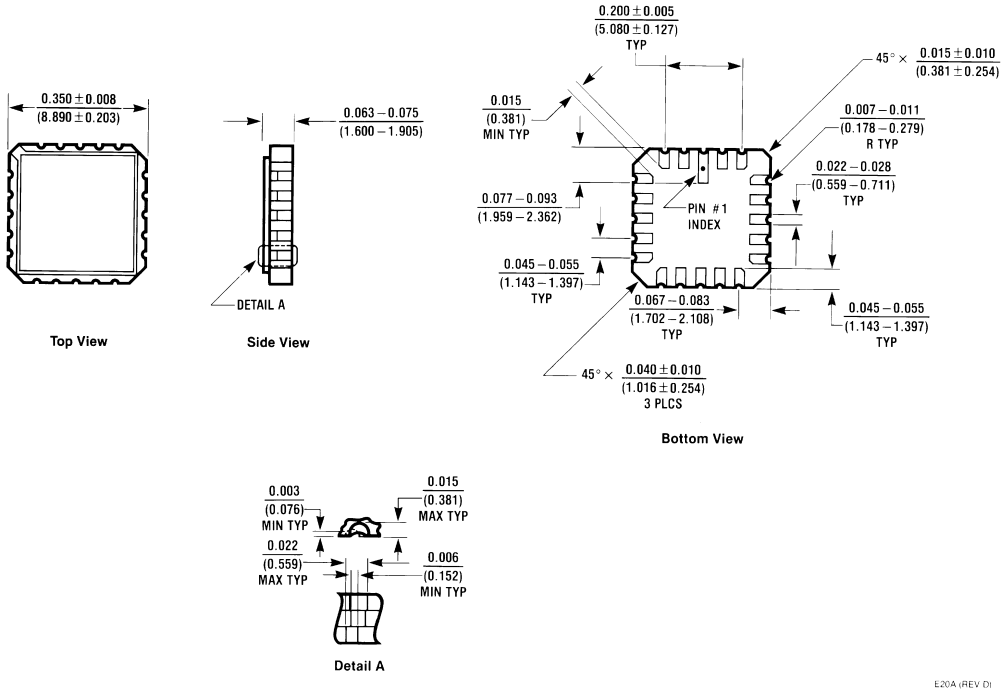
AC Electrical Characteristics (Continued)

Symbol	Parameter	54FCT240		Units	Fig. No.
		T_A = −55°C to +125°C V_{CC} = 4.5V−5.5V C_L = 50 pF			
		Min	Max		
t_{PHZ}	Output Disable	1.5	12.5	ns	
t_{PLZ}	Time	1.5	12.5		

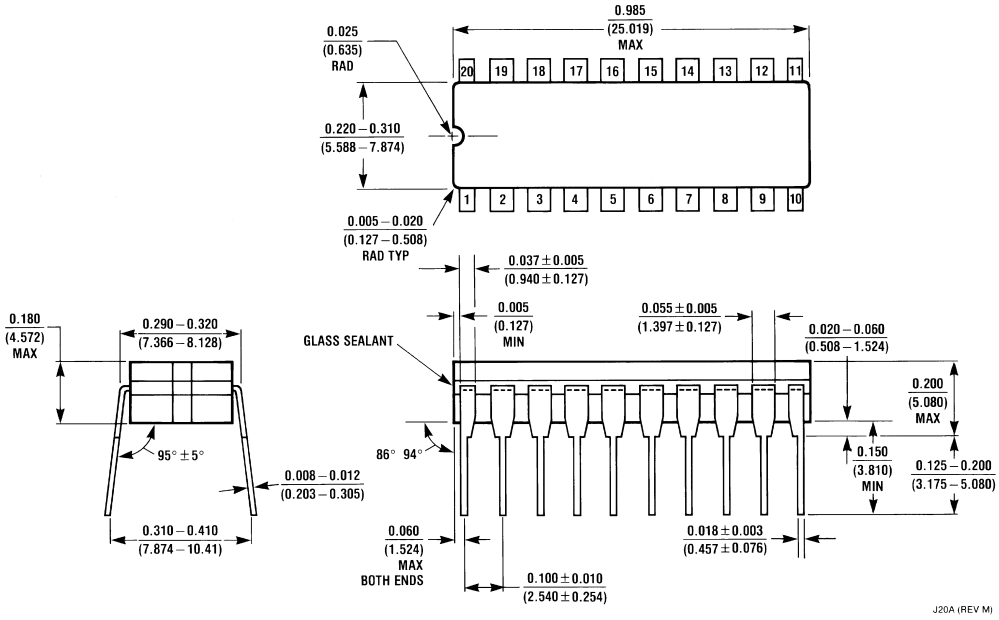
Capacitance

Symbol	Parameter	Max	Units	Conditions
C_{IN}	Input Capacitance	10	pF	V_{CC} = OPEN
C_{PD}	Power Dissipation Capacitance	12	pF	V_{CC} = 5.0V

Physical Dimensions inches (millimeters) unless otherwise noted

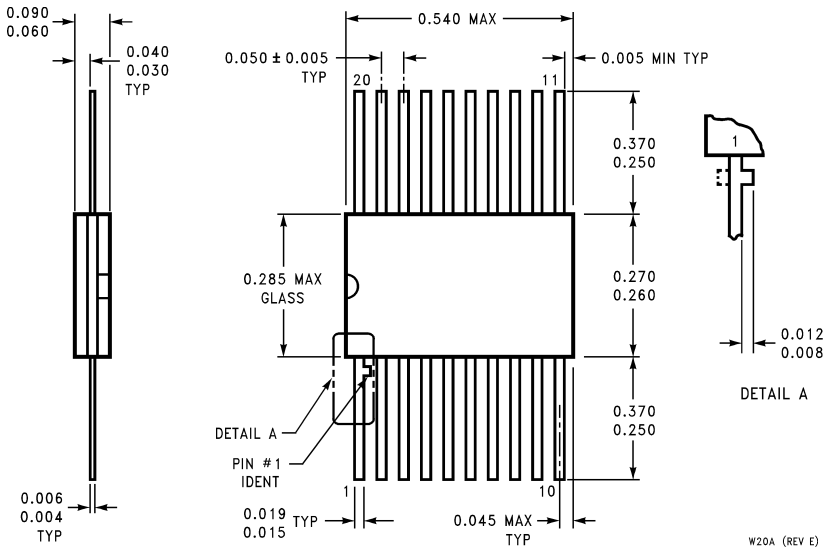


20 Terminal Ceramic Leadless Chip Carrier (L)
NS Package Number E20A



20 Lead Ceramic Dual-In-Line Package (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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