

74FR2240

Octal Buffer/Line Driver with 25Ω Series Resistors in the Outputs

General Description

The 'FR2240 is an inverting octal buffer and line driver designed to drive capacitive inputs of MOS memory devices, address and clock lines or act as a low undershoot general purpose bus driver.

Features

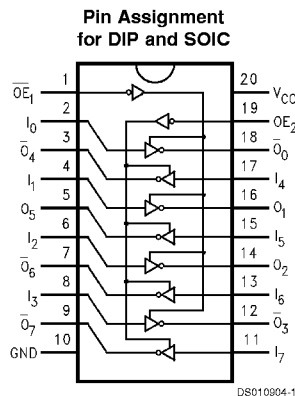
- 3-STATE outputs drive bus lines or buffer memory address registers
- Outputs sink 12 mA and source 15 mA
- 25Ω series resistors in outputs eliminate the need for external resistors
- Designed to drive the capacitive inputs of MOS devices
- Guaranteed 4000V minimum ESD protection

Ordering Code:

Commercial	Package Number	Package Description
74FR2240PC	N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
74FR2240SC (Note 1)	M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC

Note 1: Devices also available in 13" reel. Use suffix = SCX.

Connection Diagram



Pin Descriptions

Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input (Active Low)
I_0-I_7	Inputs
O_0-O_7	Outputs

Truth Tables

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

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

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

74FR2240 Octal Buffer/Line Driver with 25Ω Series Resistors in the Outputs

Absolute Maximum Ratings (Note 2)

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias Plastic	-55°C to +150°C
V _{CC} Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 3)	-0.5V to +7.0V
Input Current (Note 3)	-30 mA to +5.0 mA
Voltage Applied to Output in High State (with V _{CC} = 0V)	
Standard Output	-0.5V to V _{CC}
3-STATE Output	-0.5V to +5.5V
Current Applied to Output in Low State (Max)	Twice the Rated I _{OL} (mA)

ESD Last Passing Voltage
(Min)

4000V

Recommended Operating Conditions

Free Air Ambient Temperature Commercial	0°C to +70°C
Supply Voltage Commercial	+4.5V to +5.5V

Note 2: 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 3: Either voltage limit or current limit is sufficient to protect inputs.

DC Electrical Characteristics

Symbol	Parameter	74FR			Units	V _{CC}	Conditions
		Min	Typ	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	2.4			V	Min	I _{OH} = -3 mA
		2.0			V	Min	I _{OH} = -15 mA
V _{OL}	Output Low Voltage		0.5		V	Min	I _{OL} = 1 mA
			0.75		V	Min	I _{OL} = 12 mA
I _{IH}	Input High Current			5	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input High Current Breakdown Test			7	μA	Max	V _{IN} = 7.0V
I _{IL}	Input Low Current			-150	μA	Max	V _{IN} = 0.5V
I _{ID}	Input Leakage Test	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OD}	Output Circuit Leakage Current			3.75	μA	0.0	V _{IOD} = 150 mV All Other Pins Grounded
I _{OZH}	Output Leakage Current			20	μA	Max	V _{OUT} = 2.7V
I _{OZL}	Output Leakage Current			-20	μA	Max	V _{OUT} = 0.5V
I _{OS}	Output Short-Circuit Current	-100		-225	mA	Max	V _{OUT} = 0.0V
I _{CEX}	Output High Leakage Current			50	μA	Max	V _{OUT} = V _{CC}
I _{ZZ}	Bus Drainage Test			100	μA	0.0	V _{OUT} = 5.25V
I _{COH}	Power Supply Current		9	13	mA	Max	All Outputs High
I _{CCL}	Power Supply Current		37	45	mA	Max	All Outputs Low
I _{CCZ}	Power Supply Current		30	38	mA	Max	Outputs 3-STATE

AC Electrical Characteristics

Symbol	Parameter	74FR			74FR		Units
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A = Comm V _{CC} = Comm C _L = 50 pF		
		Min	Typ	Max	Min	Max	
t _{PLH}	Propagation Delay	1.7	3.3	4.7	1.7	4.7	ns
t _{PHL}	A _n to B _n or B _n to A _n	1.7	2.9	4.7	1.7	4.7	
t _{PZH}	Output Enable Time	2.6	4.0	8.5	2.6	8.5	ns
t _{PZL}		2.6	6.3	8.5	2.6	8.5	
t _{PHZ}	Output Disable Time	2.1	3.9	6.6	2.1	6.6	ns
t _{PLZ}		2.1	3.4	6.6	2.1	6.6	

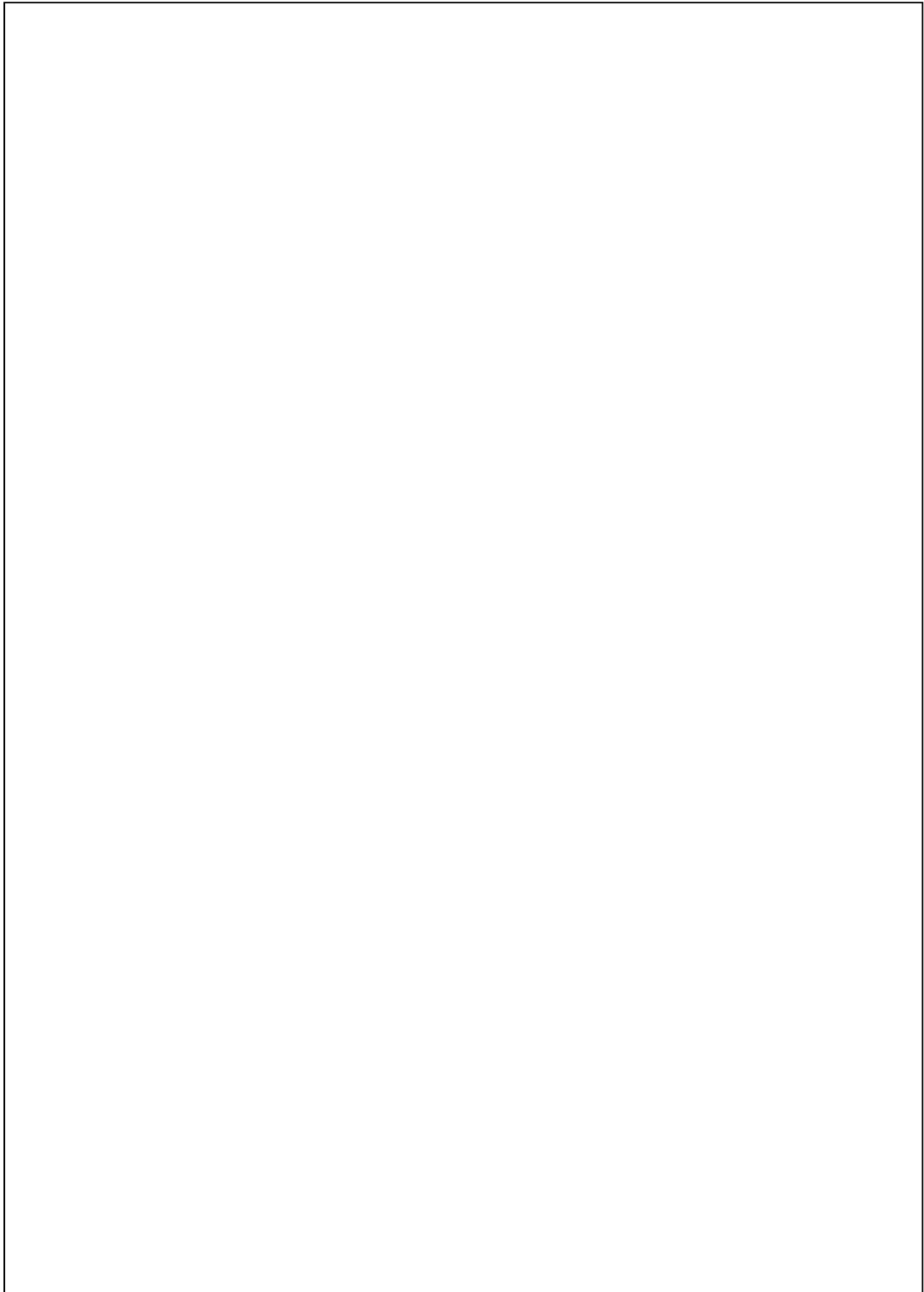
Extended AC Characteristics

Symbol	Parameter	74FR		74FR		Units
		T _A = Comm V _{CC} = Comm C _L = 50 pF Eight Outputs Switching (Note 5)		T _A = Comm V _{CC} = Comm C _L = 250 pF (Note 6)		
		Min	Max	Min	Max	
t _{PLH}	Propagation Delay	1.7	6.4	4.2	8.6	ns
t _{PHL}	A _n to B _n or B _n to A _n	1.7	6.4	4.2	8.6	
t _{PZH}	Output Enable Time	2.6	8.9			ns
t _{PZL}		2.6	8.9			
t _{PHZ}	Output Disable Time	2.1	6.8			ns
t _{PLZ}		2.1	6.8			
t _{OSSL} (Note 4)	Pin to Pin Skew for HL Transitions		1.0			ns
t _{OSLH} (Note 4)	Pin to Pin Skew for LH Transitions		1.1			ns
t _{OST} (Note 4)	Pin to Pin Skew for HL/LH Transitions		3.0			ns

Note 4: Skew is defined as the absolute value of the difference between the actual propagation delays for any two outputs of the same device. The specification applies to any outputs switching high to low, (t_{OSSL}), low to high, (t_{OSLH}), or high to low and/or low to high, (t_{OST}). Specifications guaranteed with all outputs switching in phase.

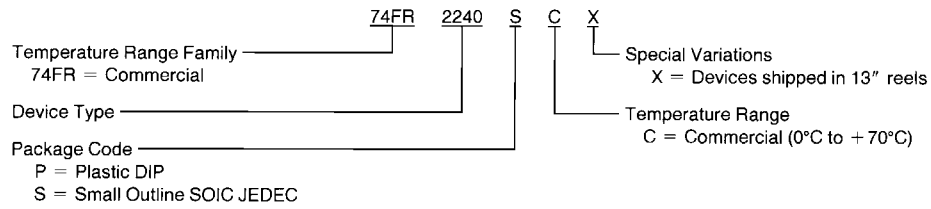
Note 5: This specification is guaranteed but not tested. The limits apply to propagation delays for all paths described switching in phase, i.e., all low-to-high, high-to-low, 3-STATE-to-high, etc.

Note 6: These specifications guaranteed but not tested. The limits represent propagation delays with 250 pF load capacitors in place of the 50 pF load capacitors in the standard AC load. This specification pertains to single output switching only.



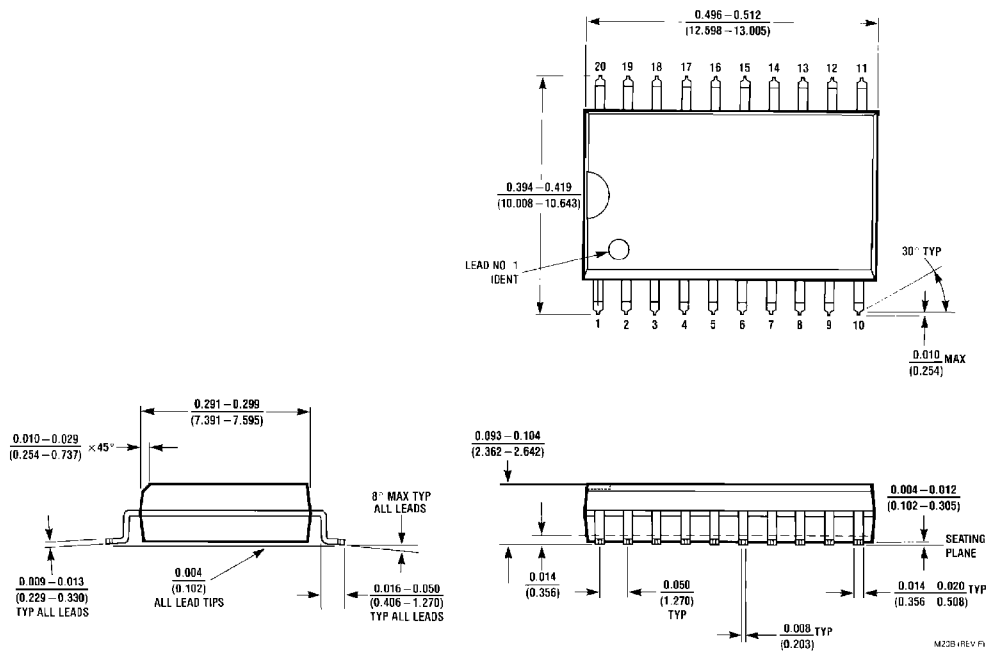
Ordering Information

The device number is used to form part of a simplified purchasing code where a package type and temperature range are defined as follows:



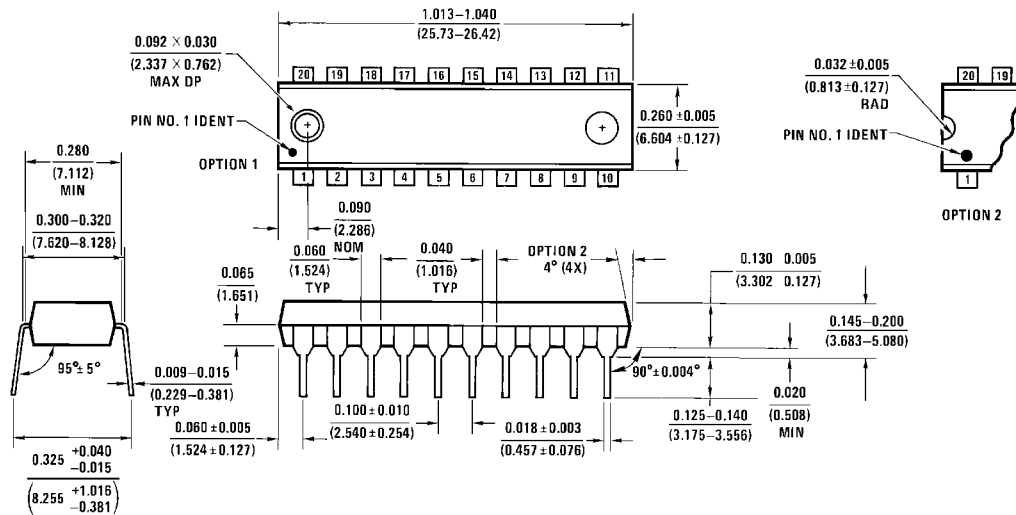
DS010904-2

Physical Dimensions inches (millimeters) unless otherwise noted



**20-Lead (0.300" Wide) Molded Small Outline Package, JEDEC (S)
Package Number M20B**

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



20-Lead Molded Dual-In-Line Package (P)
Package Number N20A

N20A (REV G)

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