

54F/74F2244

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

General Description

The 'F2244 is an octal buffer/line driver designed to drive the capacitive inputs of MOS memory drivers, address drivers, clock drivers and bus-oriented transmitters/receivers.

The 25Ω series resistors in the outputs reduce ringing and eliminate the need for external resistors.

Features

- TRI-STATE® outputs drive bus lines or buffer memory address registers
- 12 mA source current
- 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

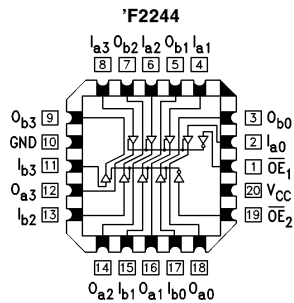
Commercial	Military	Package Number	Package Description
74F2244PC		N20B	20-Lead (0.300" Wide) Molded Dual-In-Line
	54F2244DM (Note 2)	J20A	20-Lead Ceramic Dual-In-Line
74F2244SC (Note 1)		M20B	20-Lead (0.300" Wide) Molded Small Outline JEDEC
74F2244MSA (Note 1)		MSA20	20-Lead Molded Shrink Small Outline EIAJ Type II
	54F2244FM (Note 2)	W20A	20-Lead Cerpak
	54F2244LM (Note 2)	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

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

Note 2: Military grade device with environmental and burn-in processing. Use suffix = DMQB, FMQB and LMQB.

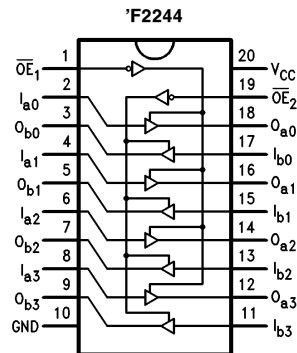
Connection Diagrams

Pin Assignment for LCC



TL/F/9499-3

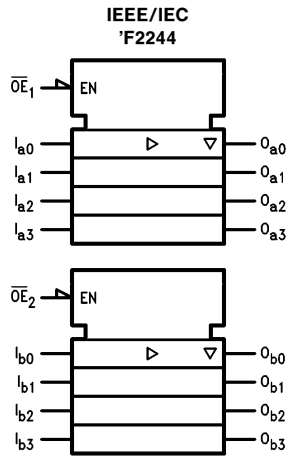
Pin Assignment for DIP, SOIC and SSOP



TL/F/9499-4

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Logic Symbol



TL/F/9499-6

Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
$\overline{OE}_1, \overline{OE}_2$	TRI-STATE Output Enable Input (Active LOW)	1.0/1.667	20 μA / -1 mA
OE_2	TRI-STATE Output Enable Input (Active HIGH)	1.0/1.667	20 μA / -1 mA
I_{an}, I_{bn}	Inputs	1.0/2.667*	20 μA / -1.6 mA
O_{an}, O_{bn}	Outputs	750/20	-15 mA / 12 mA

*Worst-case 'F2244 disabled

Truth Table

'F2244

\overline{OE}_1	I_{an}	O_{an}	\overline{OE}_2	I_{bn}	O_{bn}
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

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	-55°C to +175°C
Plastic	-55°C to +150°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 Output in HIGH State (with V _{CC} = 0V)	
Standard Output	-0.5V to V _{CC}
TRI-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

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.

Recommended Operating Conditions

Free Air Ambient Temperature	
Military	-55°C to +125°C
Commercial	0°C to +70°C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V

DC Electrical Characteristics

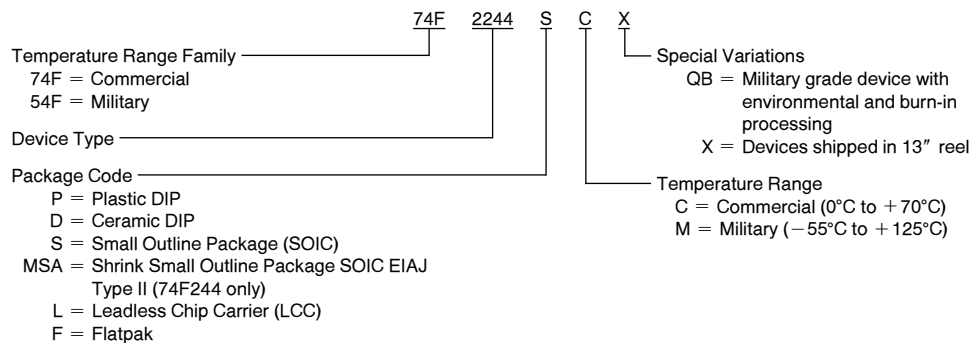
Symbol	Parameter	54F/74F			Units	V _{CC}	Conditions	
		Min	Typ	Max				
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal	
V _{IL}	Input LOW Voltage	0.8			V		Recognized as a LOW Signal	
V _{CD}	Input Clamp Diode Voltage	-1.2			V	Min	I _{IN} = -18 mA	
V _{OH}	Output HIGH Voltage	54F 10% V _{CC}	2.4		V	Min	I _{OH} = -3 mA	
		54F 10% V _{CC}	2.0				I _{OH} = -12 mA	
		74F 10% V _{CC}	2.4				I _{OH} = -3 mA	
		74F 10% V _{CC}	2.0				I _{OH} = -15 mA	
		74F 5% V _{CC}	2.7				I _{OH} = -3 mA	
V _{OL}	Output LOW Voltage	0.50 0.75			V	Min	I _{OL} = 1 mA I _{OL} = 12 mA	
I _{IH}	Input HIGH Current	54F	20.0		μA	Max	V _{IN} = 2.7V	
		74F	5.0					
I _{BVI}	Input HIGH Current Breakdown Test	54F	100		μA	Max	V _{IN} = 7.0V	
		74F	7.0					
I _{CEX}	Output HIGH Leakage Current	54F	250		μA	Max	V _{OUT} = V _{CC}	
		74F	50					
V _{ID}	Input Leakage Test	74F	4.75		V	0.0	I _{ID} = 1.9 μA All other pins grounded	
I _{OD}	Output Leakage Circuit Current	74F	3.75		μA	0.0	V _{IOD} = 150 mV All other pins grounded	
I _{IL}	Input LOW Current				mA	Max	V _{IN} = 0.5V ($\overline{OE}_1, \overline{OE}_2, OE_2$) V _{IN} = 0.5V (I _n)	
I _{OZH}	Output Leakage Current				μA	Max	V _{OUT} = 2.7V	
I _{OZL}	Output Leakage Current				μA	Max	V _{OUT} = 0.5V	
I _{OS}	Output Short-Circuit Current	-100			-225	mA	Max	V _{OUT} = 0V
I _{CCH}	Power Supply Current	40			60	mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current	60			90	mA	Max	V _O = LOW
I _{CCZ}	Power Supply Current	60			90	mA	Max	V _O = HIGH Z

AC Electrical Characteristics

Symbol	Parameter	74F			54F		74F		Units
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Mil C _L = 50 pF		T _A , V _{CC} = Com C _L = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
t _{PLH}	Propagation Delay	1.5		7.0	2.0	6.5	1.5	7.0	ns
t _{PHL}	Data to Output	2.5		8.0	2.0	7.0	2.0	8.0	
t _{PZH}	Output Enable Time	1.5		9.0	2.0	7.0	1.0	9.5	ns
t _{PZL}		2.5		11.5	2.0	8.5	2.5	12.0	
t _{PHZ}	Output Disable Time	1.5		9.0	2.0	7.0	1.0	9.5	ns
t _{PLZ}		1.5		8.5	2.0	7.5	1.5	9.5	

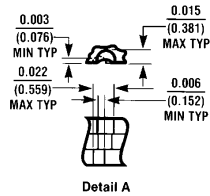
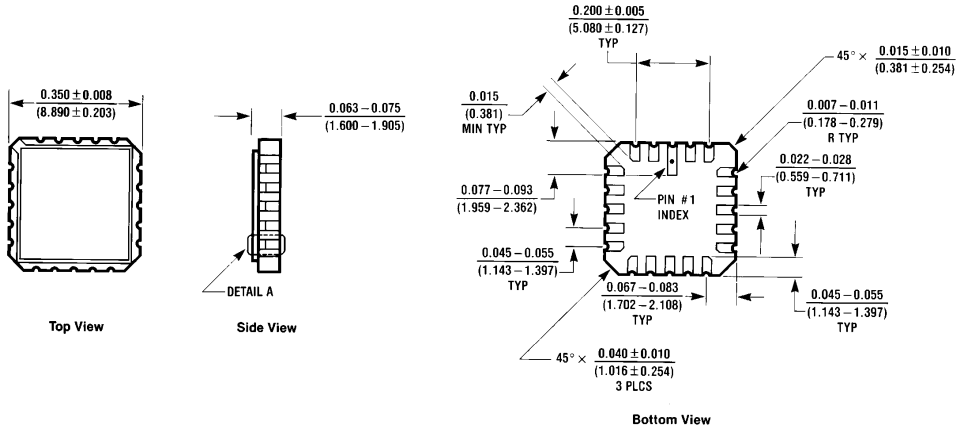
Ordering Information

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



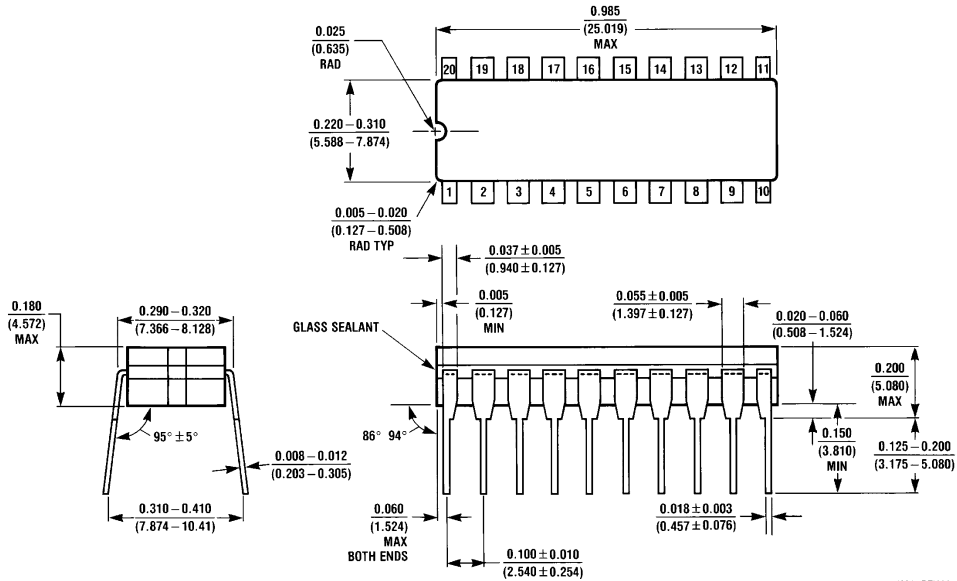


Physical Dimensions inches (millimeters)



20-Lead Ceramic Leadless Chip Carrier, Type C (L)
 NS Package Number E20A

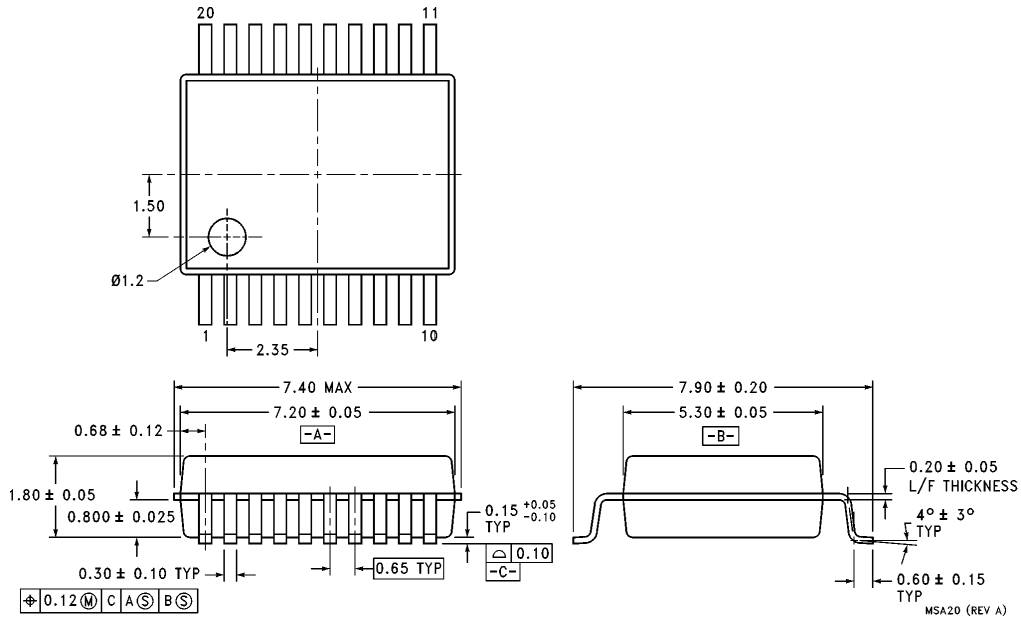
E20A (REV D)



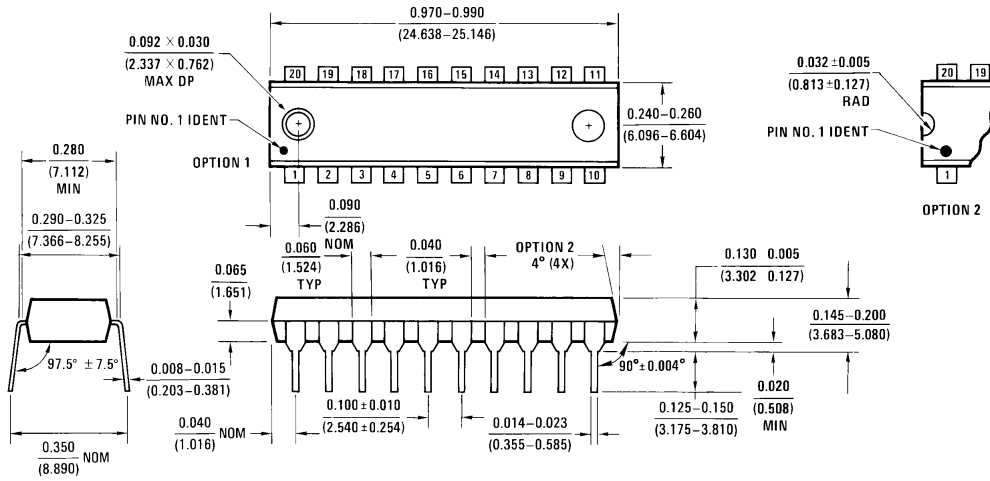
20-Lead Ceramic Dual-In-Line Package (D)
 NS Package Number J20A

J20A (REV M)

Physical Dimensions inches (millimeters) (Continued)

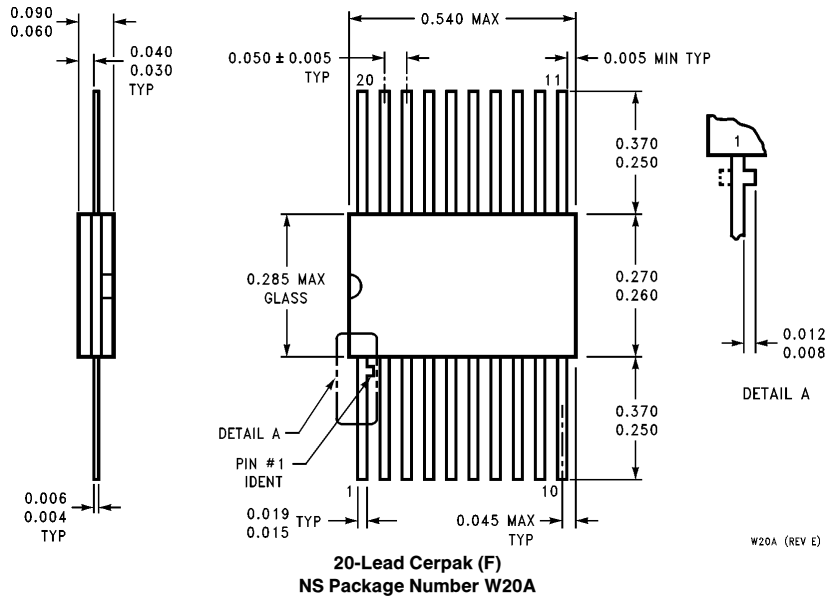


20-Lead Molded Shrink Small Outline Package, EIAJ Type II (MSA)
NS Package Number MSA20



20-Lead (0.300" Wide) Molded Dual-In-Line Package (P)
NS Package Number N20B

Physical Dimensions inches (millimeters) (Continued)



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National Semiconductor Corporation
1111 West Bardin Road
Arlington, TX 76017
Tel: 1(800) 272-9959
Fax: 1(800) 737-7018

National Semiconductor Europe
Fax: (+49) 0-180-530 85 86
Email: cnjwge@tevm2.nsc.com
Deutsch Tel: (+49) 0-180-530 85 85
English Tel: (+49) 0-180-532 78 32
Français Tel: (+49) 0-180-532 93 58
Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
19th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: (852) 2737-1600
Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
Tel: 81-043-299-2309
Fax: 81-043-299-2408

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