

54F827,74F827,74F828

54F827 74F827 74F828 10-Bit Buffers/Line Drivers



Literature Number: SNOS218A

54F/74F827 • 74F828 10-Bit Buffers/Line Drivers

General Description

The 'F827 and 'F828 10-bit bus buffers provide high performance bus interface buffering for wide data/address paths or buses carrying parity. The 10-bit buffers have NOR output enables for maximum control flexibility.

The 'F827 and 'F828 are functionally- and pin-compatible to AMD's Am29827 and Am29828. The 'F828 is an inverting version of the 'F827.

Features

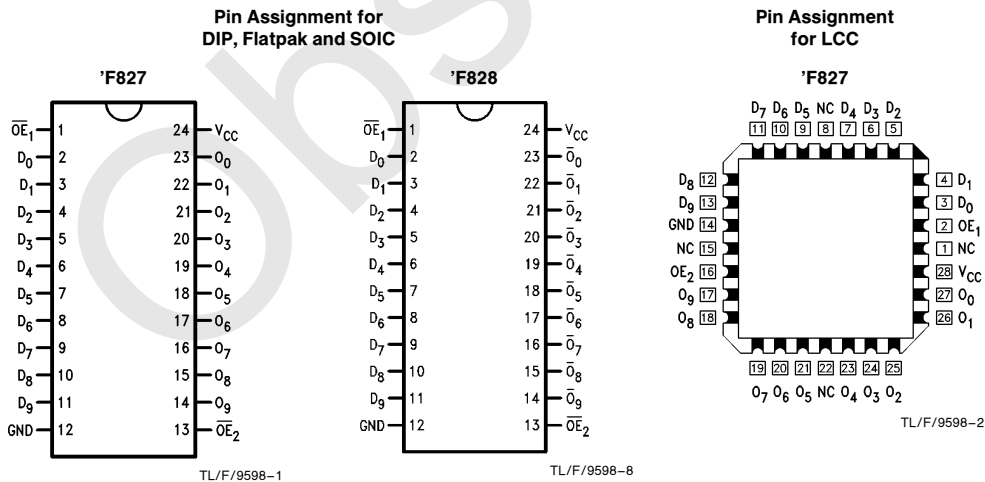
- TRI-STATE® output
- 'F828 is inverting
- Direct replacement for AMD's Am29827 and Am29828

Commercial	Military	Package Number	Package Description
74F827SPC		N24C	24-Lead (0.300" Wide) Molded Dual-In-Line
	54F827SDM (Note 2)	J24F	24-Lead (0.300" Wide) Ceramic Dual-In-Line
74F827SC (Note 1)		M24B	24-Lead (0.300" Wide) Molded Small Outline, JEDEC
	54F827FM (Note 2)	W24C	24-Lead Cerpack
	54F827LM (Note 2)	E28A	24-Lead Ceramic Leadless Chip Carrier, Type C
74F828SPC		N24C	24-Lead (0.300" Wide) Molded Dual-In-Line
74F828SC (Note 1)		M24B	24-Lead (0.300" Wide) Molded Small Outline, JEDEC

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

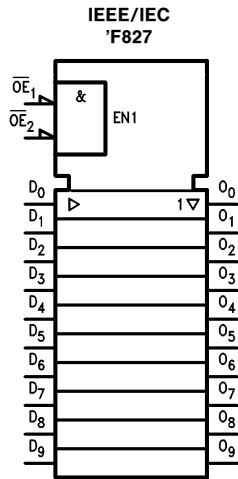
Note 2: Military grade device with environmental and burn-in processing. Use suffix = SDM QB, FM QB and LM QB.

Connection Diagrams

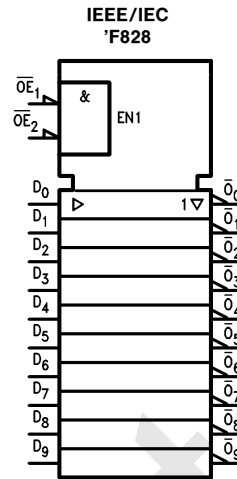


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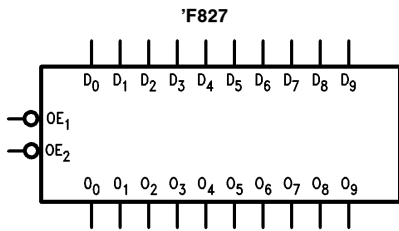
Logic Symbols



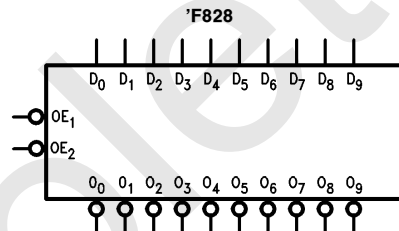
TL/F/9598-6



TL/F/9598-7



TL/F/9598-3



TL/F/9598-10

Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input	1.0/1.0	20 μA / -0.6 mA
D_0-D_7	Data Inputs	1.0/1.0	20 μA / -0.6 mA
O_0-O_7	Data Outputs, TRI-STATE	600/106.6 (80)	-12 mA/64 mA (48 mA)

Functional Description

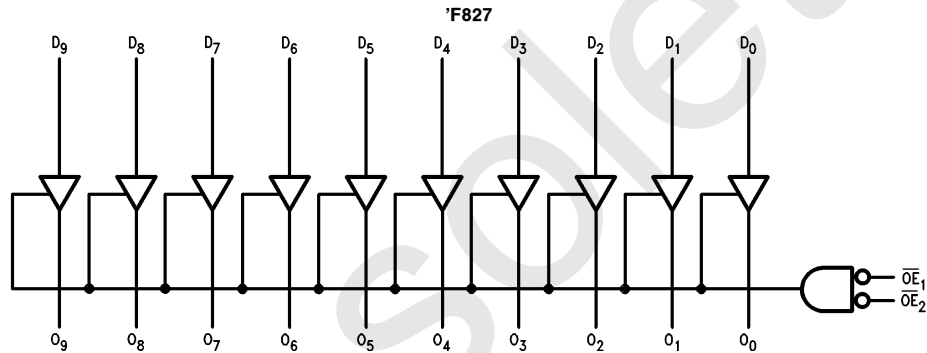
The 'F827 and 'F828 are line drivers designed to be employed as memory address drivers, clock drivers and bus-oriented transmitters/receivers which provide improved PC board density. The devices have TRI-STATE outputs controlled by the Output Enable (\overline{OE}) pins. The outputs can sink 64 mA (48 mA mil) and source 15 mA. Input clamp diodes limit high-speed termination effects.

Function Table

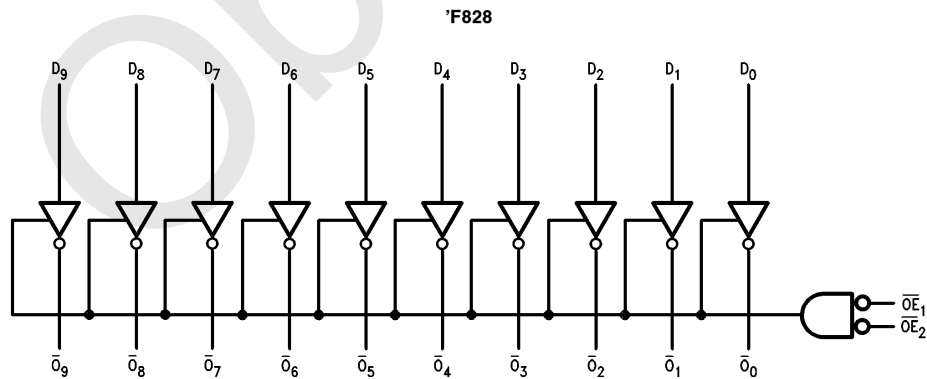
\overline{OE}	D_n	Outputs		Function
		O_n		
		'F827	'F828	
L	H	H	L	Transparent
L	L	L	H	Transparent
H	X	Z	Z	High Z

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

Logic Diagrams



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

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)

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} 54F 10% V _{CC} 74F 10% V _{CC} 74F 10% V _{CC} 74F 5% V _{CC}	2.4 2.0 2.4 2.0 2.7		V	Min	I _{OH} = -3 mA I _{OH} = -12 mA I _{OH} = -3 mA I _{OH} = -15 mA I _{OH} = -3 mA
V _{OL}	Output LOW Voltage	54F 10% V _{CC} 74F 10% V _{CC}		0.55 0.55	V	Min	I _{OL} = 48 mA I _{OL} = 64 mA
I _{IH}	Input HIGH Current	54F 74F		20.0 5.0	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input HIGH Current Breakdown Test	54F 74F		100 7.0	μA	Max	V _{IN} = 7.0V
I _{CEX}	Output HIGH Leakage Current	54F 74F		250 50	μA	Max	V _{OUT} = V _{CC}
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			-0.6	mA	Max	V _{IN} = 0.5V
I _{OZH}	Output Leakage Current			50	μA	Max	V _{OUT} = 2.7V
I _{OZL}	Output Leakage Current			-50	μA	Max	V _{OUT} = 0.5V
I _{OS}	Output Short-Circuit Current			-100	mA	Max	V _{OUT} = 0V

DC Electrical Characteristics (Continued)

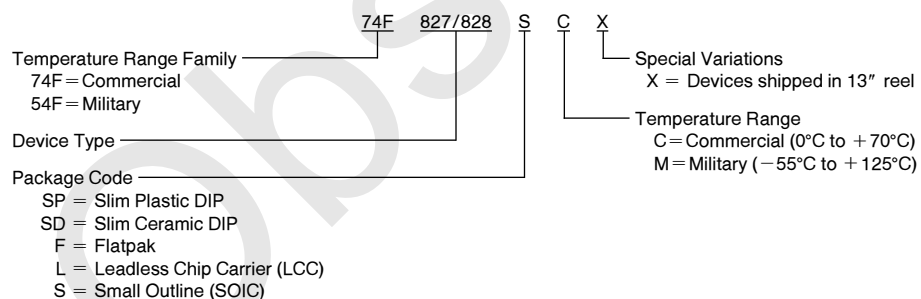
Symbol	Parameter	54F/74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V
I _{CC} H	Power Supply Current ('F827)		30	45	mA	Max	V _O = HIGH
I _{CC} L	Power Supply Current ('F827)		60	90	mA	Max	V _O = LOW
I _{CC} Z	Power Supply Current ('F827)		40	60	mA	Max	V _O = HIGH Z
I _{CC} H	Power Supply Current ('F828)		14	20	mA	Max	V _O = HIGH
I _{CC} L	Power Supply Current ('F828)		56	85	mA	Max	V _O = LOW
I _{CC} Z	Power Supply Current ('F828)		35	50	mA	Max	V _O = HIGH Z

AC Electrical Characteristics

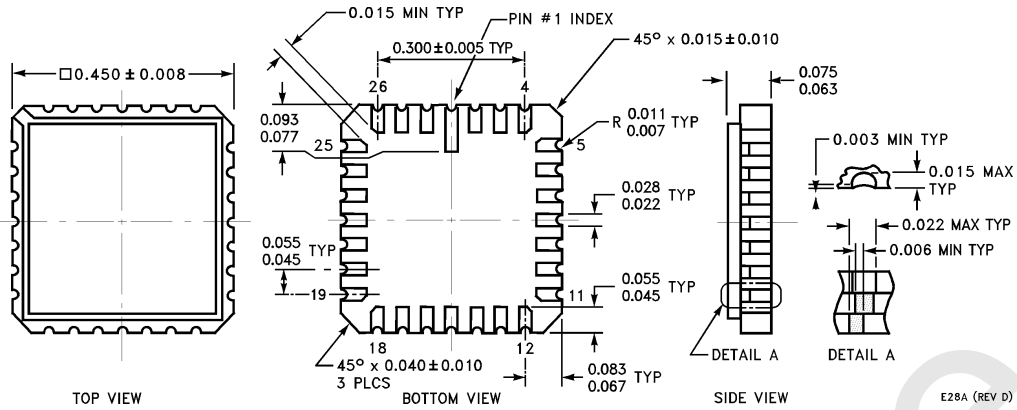
Symbol	Parameter	74F			54F		74F		Units
		T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A , V _{CC} = Mil C _L = 50 pF		T _A , V _{CC} = Com C _L = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay Data to Output ('F827)	1.0 1.5	3.0 3.3	5.5 5.5	1.0 1.5	7.5 7.0	1.0 1.5	6.5 6.0	ns
t _{PLH} t _{PHL}	Propagation Delay Data to Output ('F828)	1.0 1.0	3.0 2.0	5.0 4.0			1.0 1.0	5.5 4.0	ns
t _{PZH} t _{PZL}	Output Enable Time \overline{OE} to O _n	3.0 3.5	5.7 6.8	9.0 11.5	2.5 3.0	10.0 12.5	2.5 3.0	9.5 12.0	ns
t _{PHZ} t _{PLZ}	Output Disable Time \overline{OE} to O _n	1.5 1.0	3.3 3.5	8.0 8.0	1.5 1.0	9.0 9.0	1.5 1.0	8.5 8.5	ns

Ordering Information

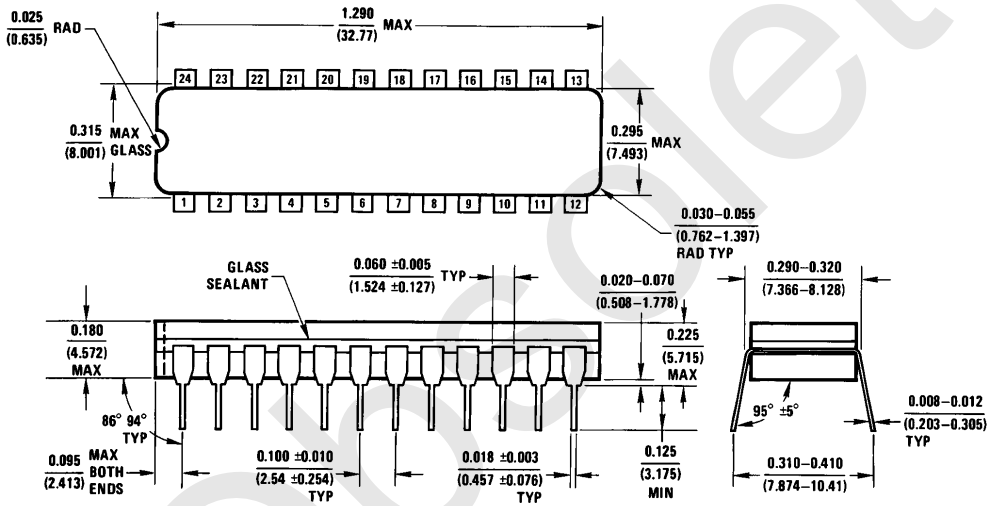
The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:



Physical Dimensions inches (millimeters)

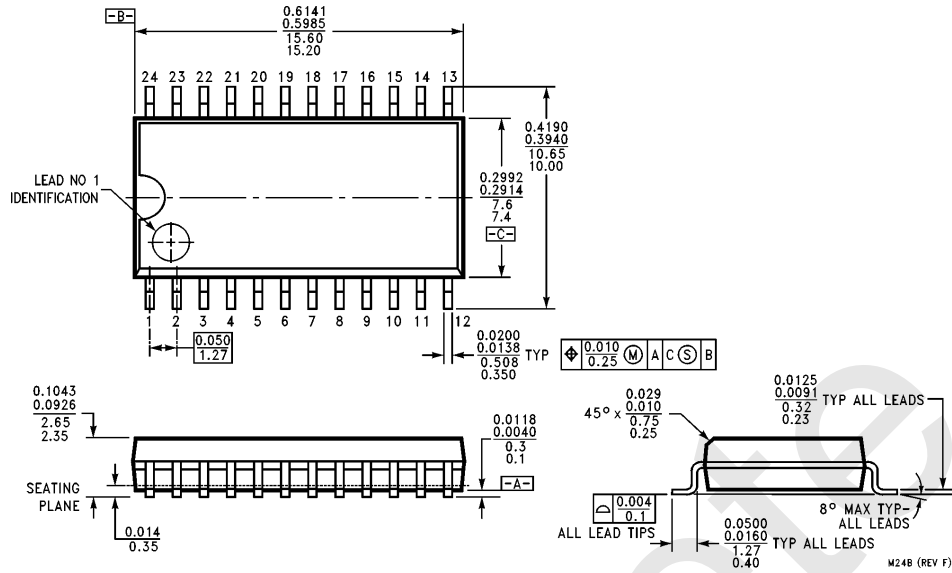


**28-Lead Ceramic Leadless Chip Carrier (L)
NS Package Number E28A**

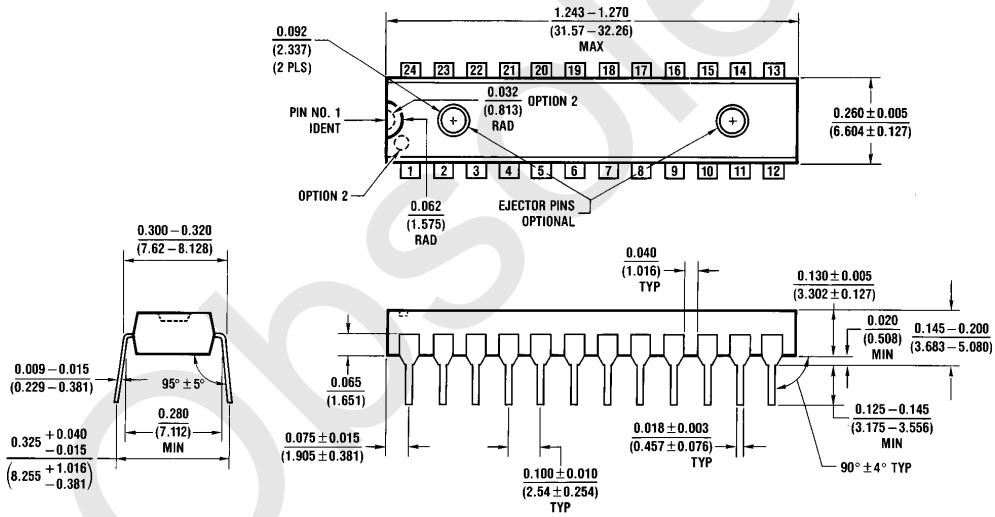


**24-Lead (0.300" Wide) Ceramic Dual-In-Line Package (SD)
NS Package Number J24F**

Physical Dimensions inches (millimeters) (Continued)

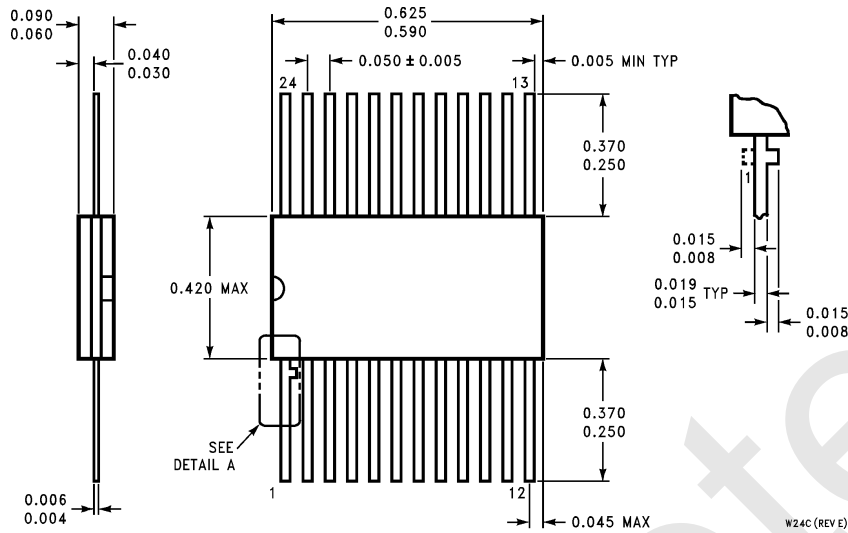


**24-Lead Small Outline Integrated Circuit (S)
NS Package Number M24B**



**24-Lead Plastic Slim (0.300" Wide) Dual-In-Line Package (SP)
NS Package Number N24C**

Physical Dimensions inches (millimeters) (Continued)



**24-Lead Ceramic Flatpak (F)
NS Package Number W24C**

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