



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

74F675A

16-Bit Serial-In, Serial/Parallel-Out Shift Register

General Description

The 74F675A contains a 16-bit serial in/serial out shift register and a 16-bit parallel out storage register. Separate serial input and output pins are provided for expansion to longer words. By means of a separate clock, the contents of the shift register are transferred to the storage register. The contents of the storage register can also be loaded back into the shift register. A HIGH signal on the Chip Select input prevents both shifting and parallel loading.

Features

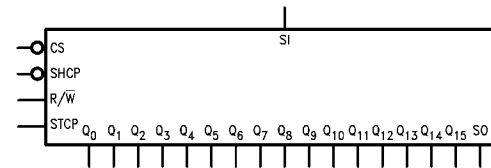
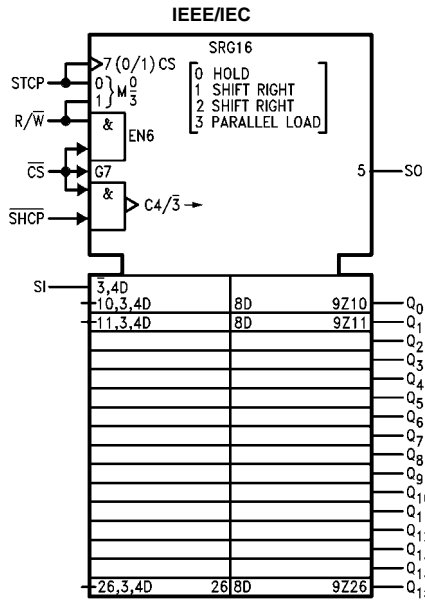
- Serial-to-parallel converter
- 16-Bit serial I/O shift register
- 16-Bit parallel out storage register
- Recirculating parallel transfer
- Expandable for longer words
- Slim 24 lead package
- 74F675A version prevents false clocking through CS or R/W inputs

Ordering Code:

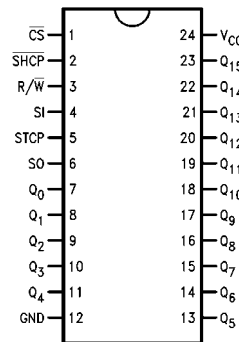
Order Number	Package Number	Package Description
74F675ASC	M24B	24-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
74F675APC	N24A	24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-011, 0.600 Wide
74F675ASPC	N24C	24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbols



Connection Diagram



Unit Loading/Fan Out

Pin Names	Description	U.L.	
		HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
SI	Serial Data Input	1.0/1.0	20 μ A/-0.6 mA
\overline{CS}	Chip Select Input (Active LOW)	1.0/1.0	20 μ A/-0.6 mA
\overline{SHCP}	Shift Clock Pulse Input (Active Falling Edge)	1.0/1.0	20 μ A/-0.6 mA
STCP	Store Clock Pulse Input (Active Rising Edge)	1.0/1.0	20 μ A/-0.6 mA
$\overline{R/\overline{W}}$	Read/Write Input	1.0/1.0	20 μ A/-0.6 mA
SO	Serial Data Output	50/33.3	-1 mA/20 mA
Q_0-Q_{15}	Parallel Data Outputs	50/33.3	-1 mA/20 mA

Functional Description

The 16-Bit shift register operates in one of four modes, as determined by the signals applied to the Chip Select (\overline{CS}), Read/Write ($\overline{R/\overline{W}}$) and Store Clock Pulse (STCP) input. State changes are indicated by the falling edge of the Shift Clock Pulse (\overline{SHCP}). In the Shift Right mode, data enters D_0 from the Serial Input (SI) pin and exits from Q_{15} via the Serial Data Output (SO) pin. In the Parallel Load mode, data from the storage register outputs enter the shift register and serial shifting is inhibited.

The storage register is in the Hold mode when either \overline{CS} or $\overline{R/\overline{W}}$ is HIGH. With \overline{CS} and $\overline{R/\overline{W}}$ both LOW, the storage register is parallel loaded from the shift register on the rising edge of STCP.

To prevent false clocking of the shift register, \overline{SHCP} should be in the LOW state during a LOW-to-HIGH transition of \overline{CS} . To prevent false clocking of the storage register, STCP should be LOW during a HIGH-to-LOW transition of \overline{CS} if $\overline{R/\overline{W}}$ is LOW, and should also be LOW during a HIGH-to-LOW transition of $\overline{R/\overline{W}}$ if \overline{CS} is LOW.

Shift Register Operations Table

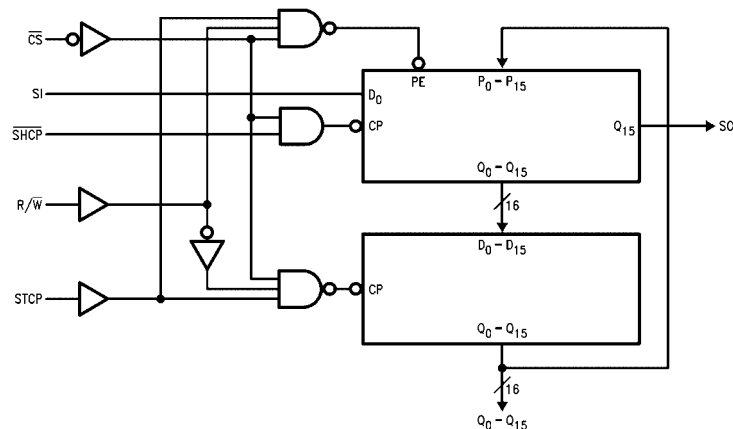
Control Inputs				Operating Mode
\overline{CS}	$\overline{R/\overline{W}}$	\overline{SHCP}	STCP	
H	X	X	X	Hold
L	L	\sim	X	Shift Right
L	H	\sim	L	Shift Right
L	H	\sim	H	Parallel Load, No Shifting

Storage Register Operations Table

Inputs			Operating Mode
\overline{CS}	$\overline{R/\overline{W}}$	STCP	
H	X	X	Hold
L	H	X	Hold
L	L	\swarrow	Parallel Load

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
 \sim = HIGH-to-LOW Transition
 \swarrow = LOW-to-HIGH Transition

Logic Diagram



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)

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias	-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}

3-STATE Output -0.5V to +5.5V

Current Applied to Output

in LOW State (Max) twice the rated I_{OL} (mA)**Recommended Operating Conditions**

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

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.

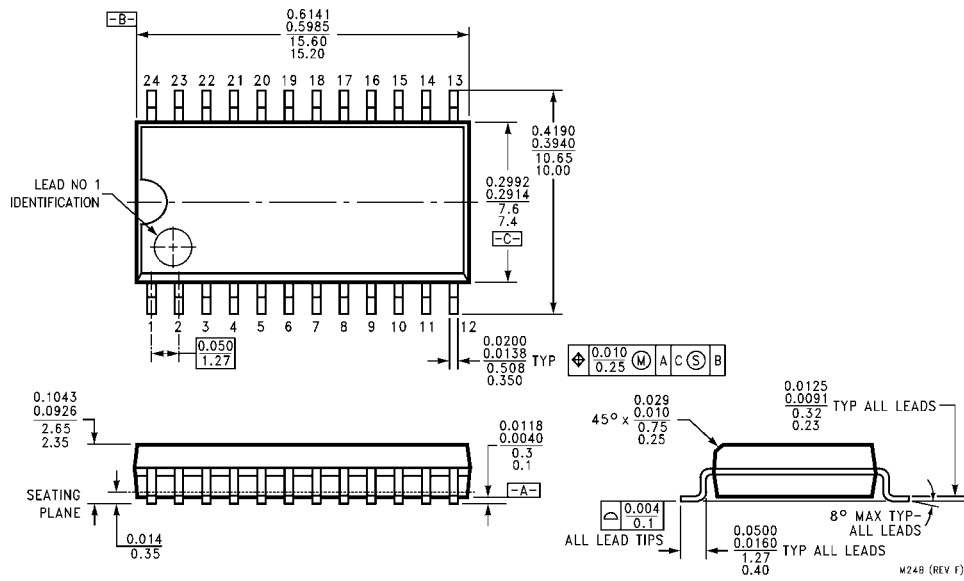
Note 2: Either voltage limit or current limit is sufficient to protect inputs.

DC Electrical Characteristics

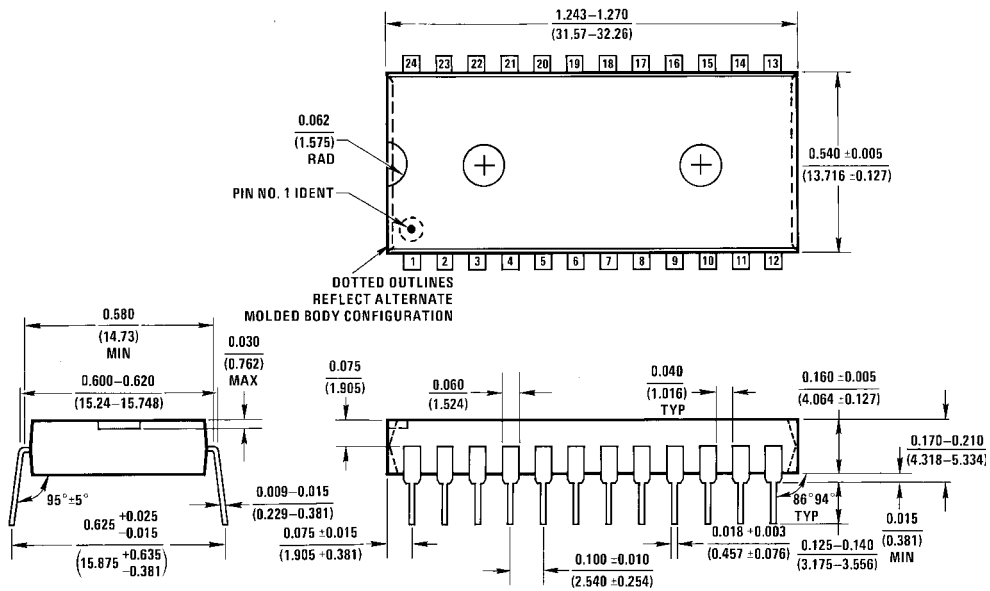
Symbol	Parameter	Min	Typ	Max	Units	V _{CC}	Conditions
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V _{IL}	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	10% V _{CC} 5% V _{CC}	2.5 2.7		V	Min	I _{OH} = -1 mA I _{OH} = -1 mA
V _{OL}	Output LOW Voltage	10% V _{CC}		0.5	V	Min	I _{OL} = 20 mA
I _{IH}	Input HIGH Current			5.0	μA	Max	V _{IN} = 2.7V
I _{BVI}	Input HIGH Current Breakdown Test			7.0	μA	Max	V _{IN} = 7.0V
I _{CEX}	Output HIGH Leakage Current			50	μA	Max	V _{OUT} = V _{CC}
V _{ID}	Input Leakage Test	4.75			V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OD}	Output Leakage Circuit Current			3.75	μA	0.0	V _{IDP} = 150 mV All Other Pins Grounded
I _{IL}	Input LOW Current			-0.6	mA	Max	V _{IN} = 0.5V
I _{OS}	Output Short-Circuit Current	-60		-150	mA	Max	V _{OUT} = 0V
I _{CCH}	Power Supply Current		106	160	mA	Max	V _O = HIGH
I _{CCL}	Power Supply Current		106	160	mA	Max	V _O = LOW

AC Electrical Characteristics							
Symbol	Parameter	T _A = +25°C V _{CC} = +5.0V C _L = 50 pF			T _A = 0°C to +70°C V _{CC} = +5.0V C _L = 50 pF		Units
		Min	Typ	Max	Min	Max	
f _{MAX}	Maximum Clock Frequency	100	130		85		MHz
t _{PLH}	Propagation Delay	3.0	8.0	10.5	2.5	12.0	ns
t _{PHL}	STCP to Q _n	3.0	10.5	13.5	2.5	15.0	
t _{PLH}	Propagation Delay	4.0	7.0	9.5	3.5	10.5	ns
t _{PHL}	SHCP to SO	4.5	8.0	10.5	4.0	12.0	
AC Operating Requirements							
Symbol	Parameter	T _A = +25°C V _{CC} = +5.0V		T _A = 0°C to +70°C V _{CC} = +5.0V		Units	
		Min	Max	Min	Max		
t _S (H)	Setup Time, HIGH or LOW	3.5		4.0		ns	
t _S (L)	CS or R/W to STCP	5.5		6.5			
t _H (H)	Hold Time, HIGH or LOW	0		0			
t _H (L)	CS or R/W to STCP	0		0		ns	
t _S (H)	Setup Time, HIGH or LOW	3.0		3.5			
t _S (L)	SI to SHCP	3.0		3.5			
t _H (H)	Hold Time, HIGH or LOW	3.0		3.5		ns	
t _H (L)	SI to SHCP	3.0		3.5			
t _S (H)	Setup Time, HIGH or LOW	6.5		7.5			
t _S (L)	R/W to SHCP	9.0		10.0		ns	
t _H (H)	Hold Time, HIGH or LOW	0		0			
t _H (L)	R/W to SHCP	0		0			
t _S (H)	Setup Time, HIGH or LOW	7.0		8.0		ns	
t _S (L)	STCP to SHCP	7.0		8.0			
t _H (H)	Hold Time, HIGH or LOW	0		0			
t _H (L)	STCP to SHCP	0		0		ns	
t _S (H)	Setup Time, HIGH or LOW	3.0		3.5			
t _S (L)	CS to SHCP	3.0		3.5			
t _H (H)	Hold Time, HIGH or LOW	3.0		3.5		ns	
t _H (L)	CS to SHCP	3.0		3.5			
t _W (H)	SHCP Pulse Width	5.0		6.0			
t _W (L)	HIGH or LOW	5.0		6.0		ns	
t _W (H)	STCP Pulse Width	6.0		7.0			
t _W (L)	HIGH or LOW	5.0		6.0			
t _S (L)	SHCP to STCP	8.0		9.0		ns	
t _H (H)	SHCP to STCP	0.0		0.0		ns	

Physical Dimensions inches (millimeters) unless otherwise noted

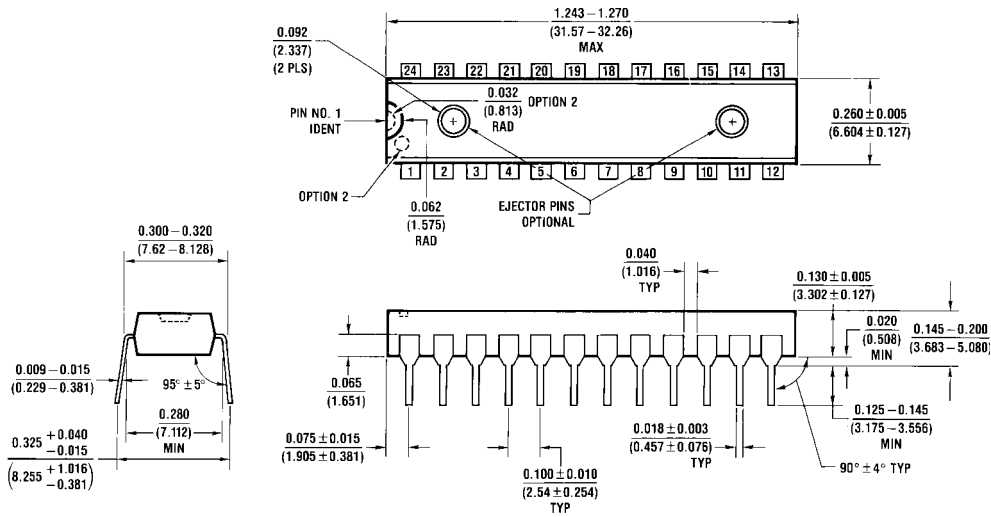


**24-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
Package Number M24B**



**24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-011, 0.600 Wide
Package Number N24A**

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



24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N24C

N24C (REV F)

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

www.fairchildsemi.com

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative