

74F563 Octal D-Type Latch with 3-STATE Outputs

General Description

The 'F563 is a high-speed octal latch with buffered common Latch Enable (LE) and buffered common Output Enable (\overline{OE}) inputs.

This device is functionally identical to the 'F573, but has inverted outputs.

Features

- Inputs and outputs on opposite sides of package allowing easy interface with microprocessors
- Useful as input or output port for microprocessors
- Functionally identical to 'F573

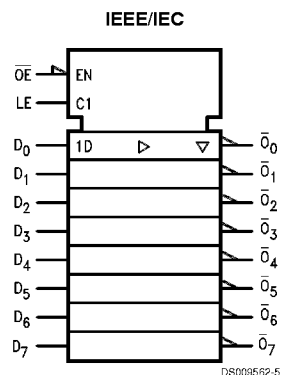
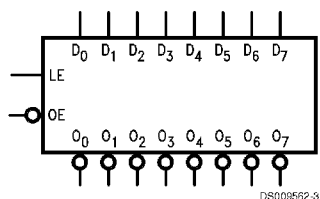
Ordering Code:

Commercial	Military	Package Number	Package Description
74F563PC		N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
	54F563DM (Note 2)	J20A	20-Lead Ceramic Dual-In-Line
74F563SC (Note 1)		M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC
74F563SJ (Note 1)		M20D	20-Lead (0.300" Wide) Molded Small Outline, EIAJ
	54F563FM (Note 2)	W20A	20-Lead Cerpack
	54F563LM (Note 2)	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

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

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

Logic Symbols

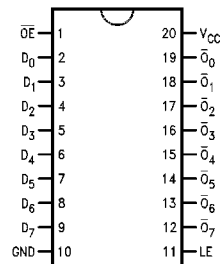


Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
D_0 - D_7	Data Inputs	1.0/1.0	20 μA /-0.6 mA
LE	Latch Enable Input (Active HIGH)	1.0/1.0	20 μA /-0.6 mA
\overline{OE}	3-STATE Output Enable Input (Active LOW)	1.0/1.0	20 μA /-0.6 mA
\overline{O}_0 - \overline{O}_7	3-STATE Latch Outputs	150/40 (33.3)	-3 mA/24 mA (20 mA)

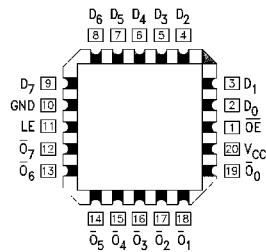
Connection Diagrams

Pin Assignment for
DIP, SOIC and Flatpak



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Pin Assignment
for LCC



DS009562-2

Functional Description

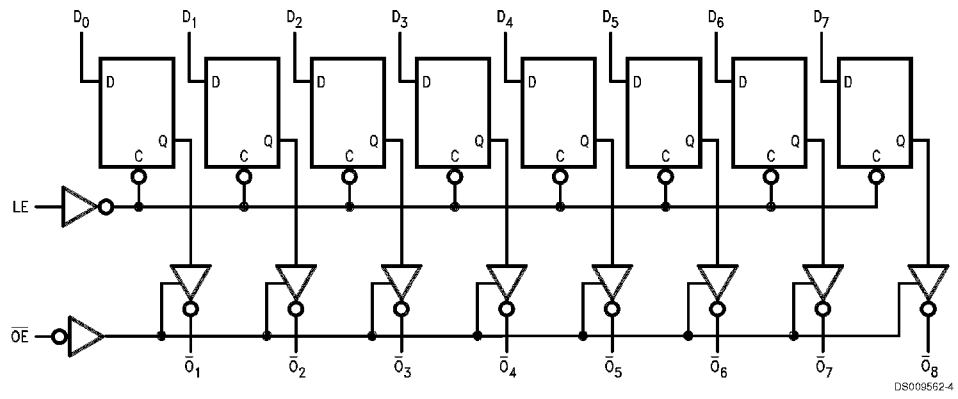
The 'F563 contains eight D-type latches with 3-STATE output buffers. When the Latch Enable (LE) input is HIGH, data on the D_n inputs enters the latches. In this condition the latches are transparent, i.e., a latch output will change state each time its D input changes. When LE is LOW the latches store the information that was present on the D inputs a setup time preceding the HIGH-to-LOW transition of LE. The 3-STATE buffers are controlled by the Output Enable (\overline{OE}) input. When \overline{OE} is LOW, the buffers are in the bi-state mode. When \overline{OE} is HIGH the buffers are in the high impedance mode but this does not interfere with entering new data into the latches.

Function Table

Inputs			Internal	Output	Function
\overline{OE}	LE	D	Q	O	
H	X	X	X	Z	High Z
H	H	L	H	Z	High Z
H	H	H	L	Z	High Z
H	L	X	NC	Z	Latched
L	H	L	H	H	Transparent
L	H	H	L	L	Transparent
L	L	X	NC	NC	Latched

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
Z = High Impedance
NC = No Change

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 3)

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 4)	-0.5V to +7.0V
Input Current (Note 4)	-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	
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

Note 3: 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 4: Either voltage limit or current limit is sufficient to protect inputs.

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}	2.5		V	Min	I _{OH} = -1 mA
		54F 10% V _{CC}	2.4				I _{OH} = -3 mA
		74F 10% V _{CC}	2.5				I _{OH} = -1 mA
		74F 10% V _{CC}	2.4				I _{OH} = -3 mA
		74F 5% V _{CC}	2.7				I _{OH} = -1 mA
		74F 5% V _{CC}	2.7				I _{OH} = -3 mA
V _{OL}	Output LOW Voltage	54F 10% V _{CC}		0.5	V	Min	I _{OL} = 20 mA
		74F 10% V _{CC}		0.5			I _{OL} = 24 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			-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		-60	-150	mA	Max	V _{OUT} = 0V
I _{ZZ}	Bus Drainage Test			500	μA	0.0V	V _{OUT} = 5.25V
I _{CCL}	Power Supply Current		40	61	mA	Max	V _O = LOW
I _{CCZ}	Power Supply Current		40	61	mA	Max	V _O = HIGH Z

AC Electrical Characteristics

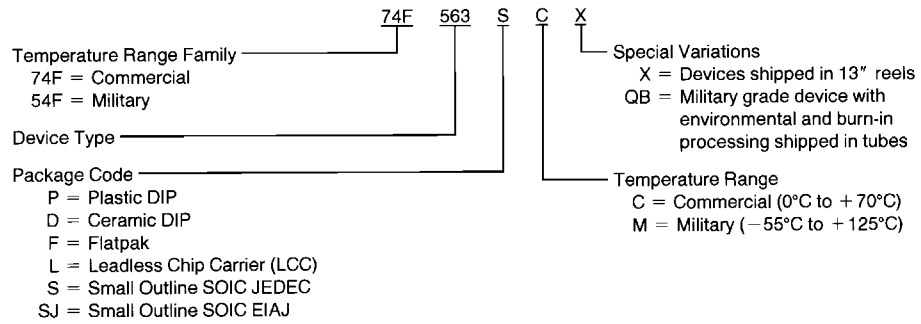
Symbol	Parameter	74F			54F		74F		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A, V_{CC} = \text{Mil}$ $C_L = 50\text{ pF}$		$T_A, V_{CC} = \text{Com}$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	Min	Max	
t_{PLH}	Propagation Delay	3.5		8.5	3.0	10.5	3.0	9.5	ns
t_{PHL}	D_n to \bar{O}_n	2.5		6.5	2.0	7.5	2.0	7.0	
t_{PLH}	Propagation Delay	4.5		9.5	4.0	11.0	4.0	10.5	ns
t_{PHL}	LE to \bar{O}_n	3.0		7.0	2.5	7.5	2.5	7.0	
t_{PZH}	Output Enable Time	2.0		7.5	2.0	9.5	2.0	9.0	ns
t_{PZL}	Output Disable Time	3.0		8.5	2.5	10.0	1.5	9.5	
t_{PHZ}	Output Disable Time	1.5		5.5	1.5	7.0	1.5	6.5	
t_{PLZ}	Output Disable Time	1.5		5.5	1.5	5.5	1.5	5.5	

AC Operating Requirements

Symbol	Parameter	74F		54F		74F		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$		$T_A, V_{CC} = \text{Mil}$		$T_A, V_{CC} = \text{Com}$		
		Min	Max	Min	Max	Min	Max	
$t_s(H)$	Setup Time, HIGH or LOW	2.0		2.0		2.0		ns
$t_s(L)$	D_n to LE	2.0		2.0		2.0		
$t_h(H)$	Hold Time, HIGH or LOW	3.0		3.0		3.0		ns
$t_h(L)$	D_n to LE	3.0		3.0		3.0		
$t_w(H)$	LE Pulse Width, HIGH	4.0		4.0		4.0		ns

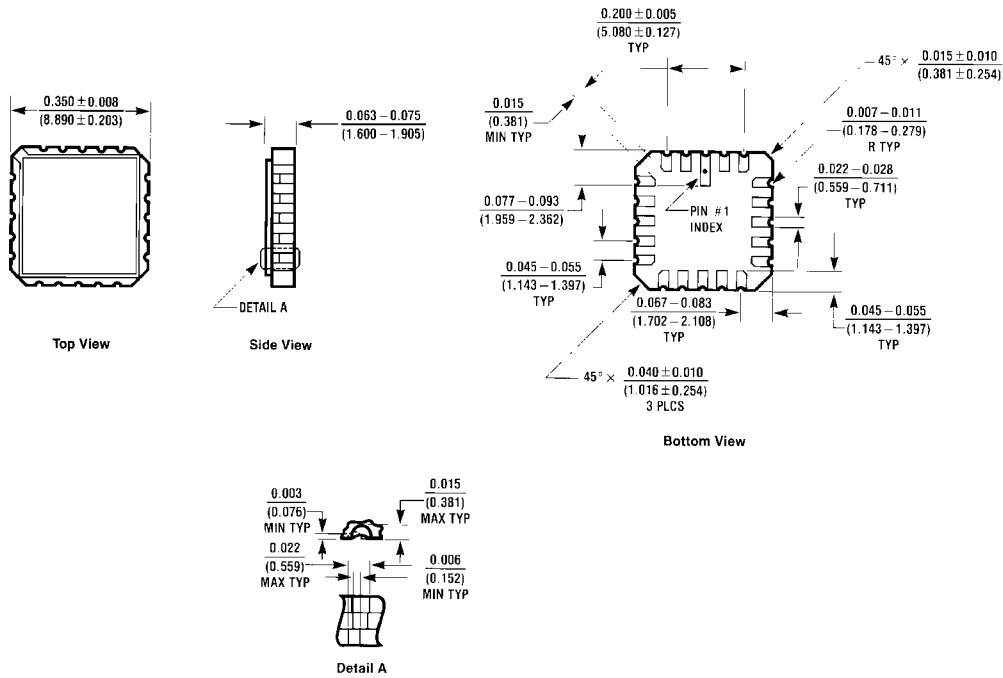
Ordering Information

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

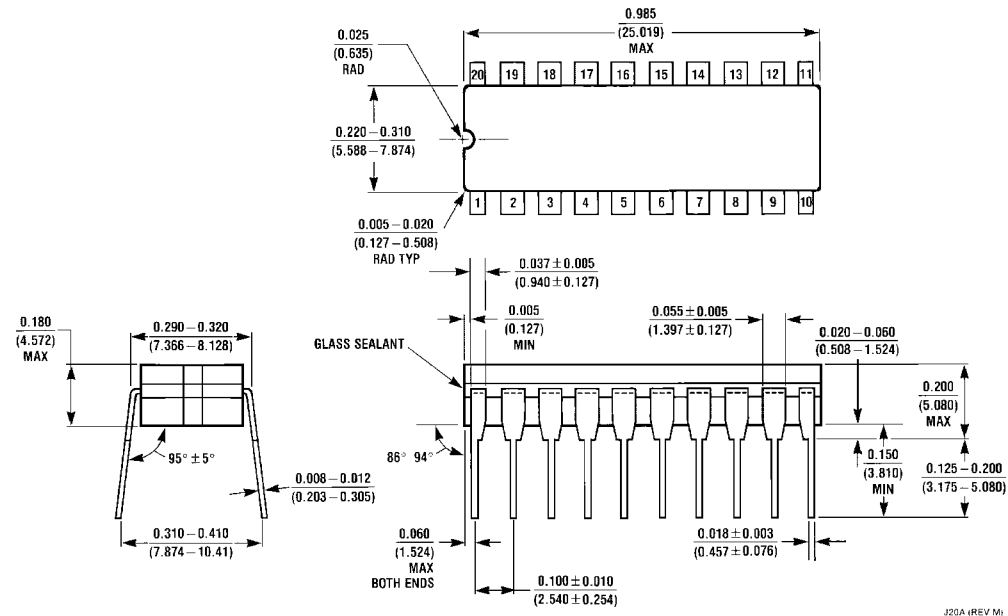


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Physical Dimensions inches (millimeters) unless otherwise noted

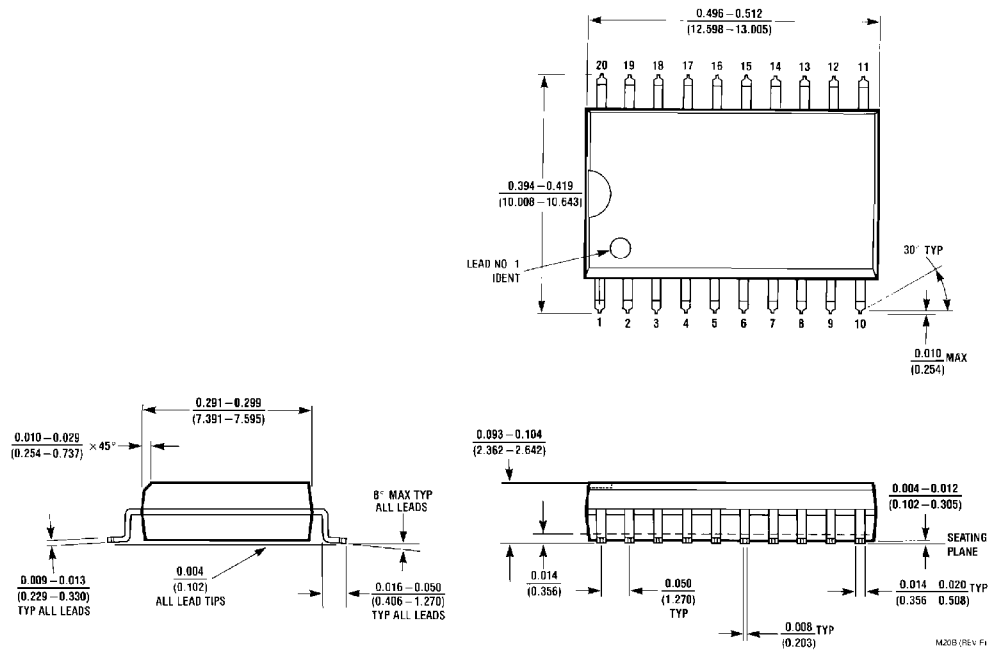


**20-Lead Ceramic Leadless Chip Carrier (L)
Package Number E20A**



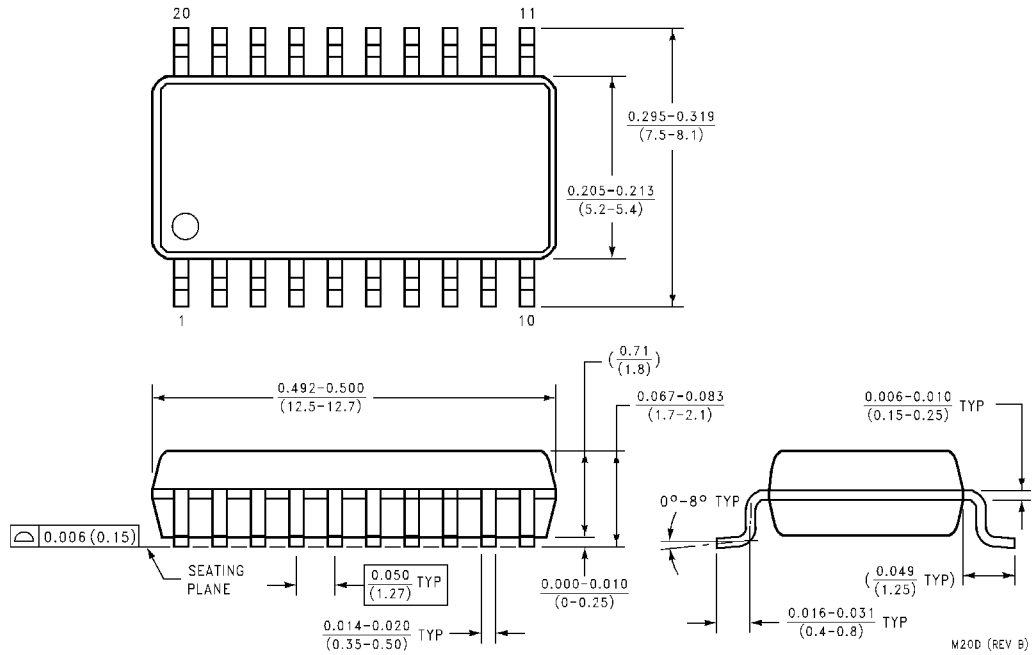
**20-Lead Ceramic Dual-In-Line Package (D)
Package Number J20A**

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

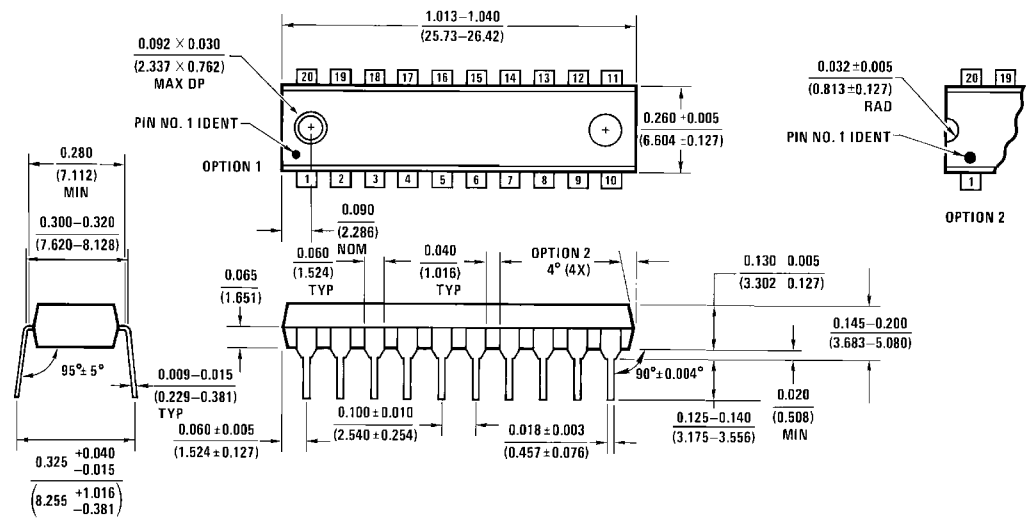


**20-Lead (0.300" Wide) Molded Small Outline Package, JEDEC (S)
Package Number M20B**

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

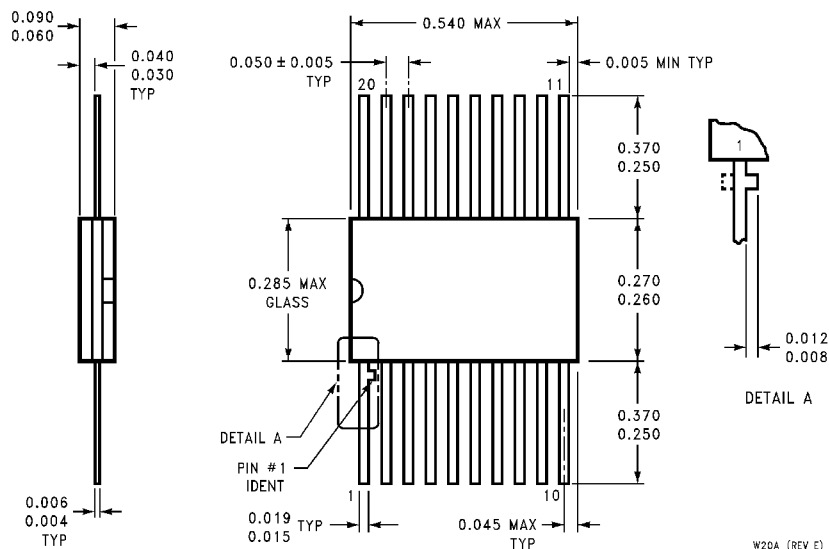


**20-Lead (0.300" Wide) Molded Small Outline Package, EIAJ
Package Number M20D**



**20-Lead (0.300" Wide) Molded Dual-In-Line Package (P)
Package Number N20A**

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



**20-Lead Ceramic Flatpak (F)
Package Number W20A**

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