

HD74LS251

1 of 8 Data Selector / Multiplexer (with strobe and three-state outputs)

REJ03D0467-0300

Rev.3.00

Jul.15.2005

This data selector / multiplexer contains full on-chip binary decoding to select one-of-eight data sources and features a strobe-controlled 3-state output.

The strobe must be at a low logic level to enable this device. The 3-state outputs permit a number of outputs to be connected to a common bus.

When the strobe input is high, both outputs are in a high-impedance state in which both the upper and lower transistors of each totem-pole output are off, and the output neither drives nor loads the bus significantly. When the strobe is low, the outputs are activated and operate as standard TTL totem-pole outputs.

To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output control circuitry is designed so that the average output disable time is shorter than the average output enable time.

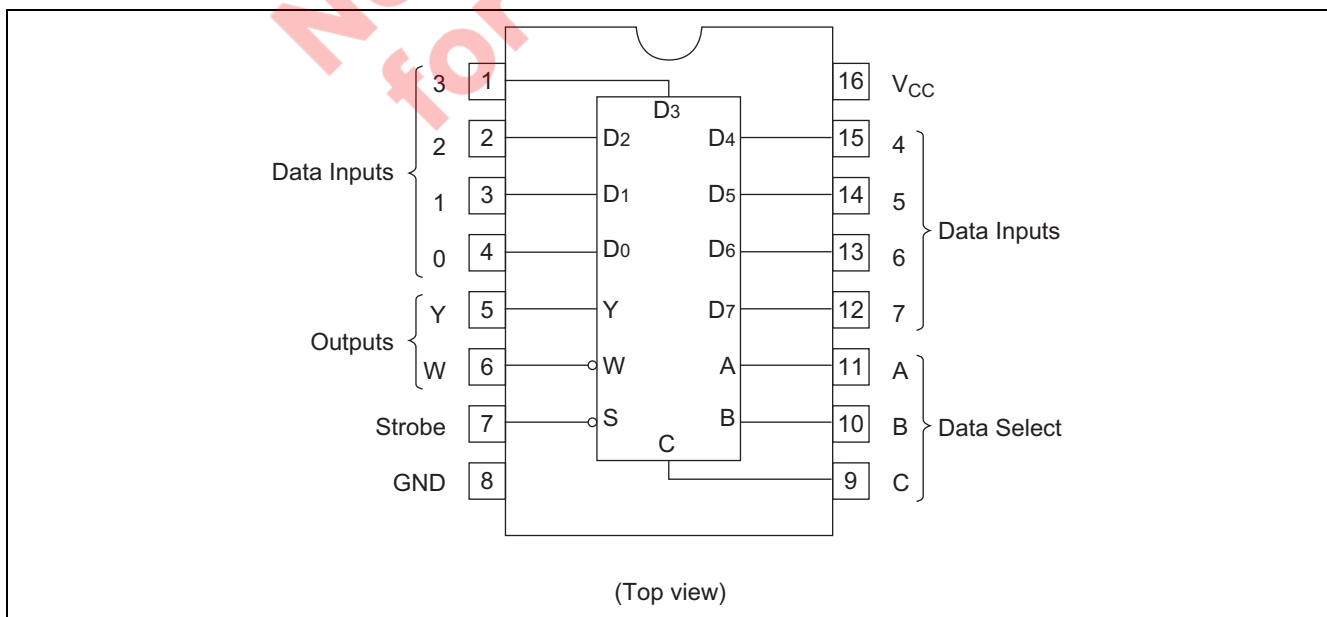
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS251P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS251FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

Pin Arrangement

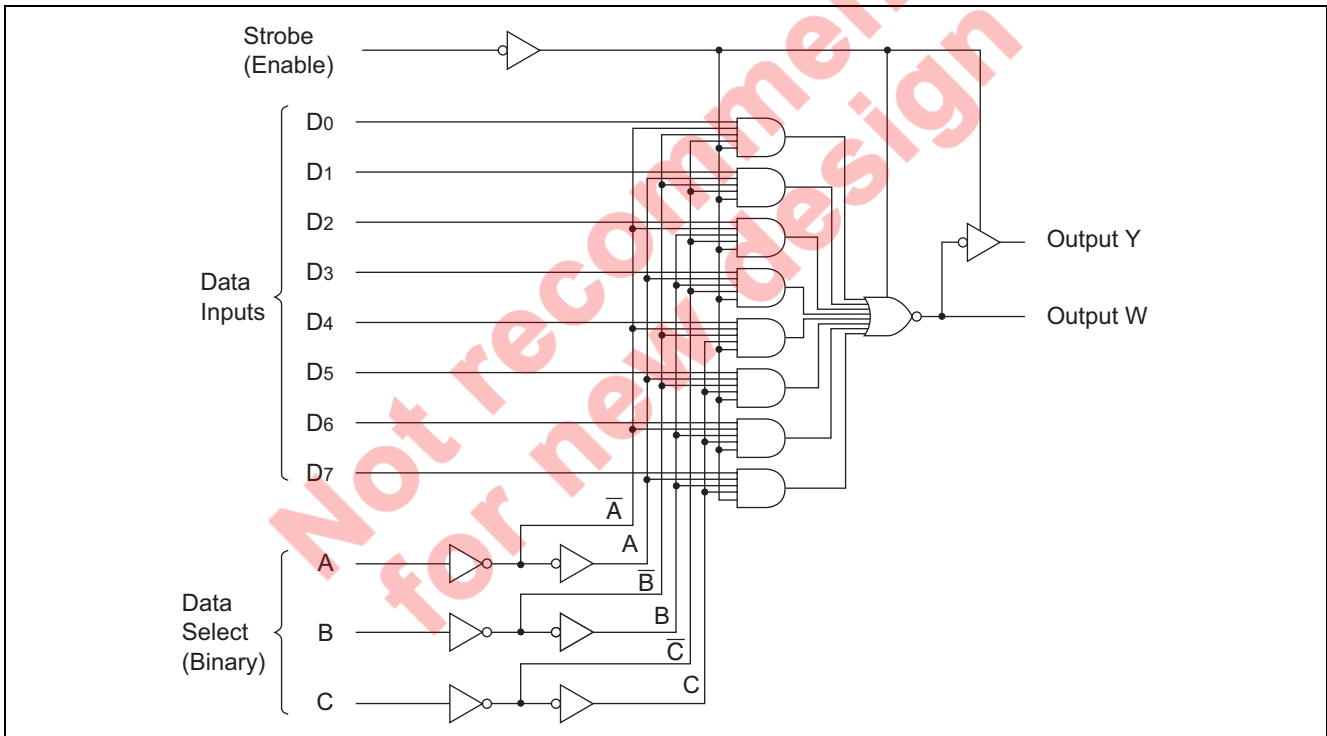


Function Table

Inputs				Outputs	
Select			Strobe	Y	W
C	B	A	S		
X	X	X	H	Z	Z
L	L	L	L	D ₀	\overline{D}_0
L	L	H	L	D ₁	\overline{D}_1
L	H	L	L	D ₂	\overline{D}_2
L	H	H	L	D ₃	\overline{D}_3
H	L	L	L	D ₄	\overline{D}_4
H	L	H	L	D ₅	\overline{D}_5
H	H	L	L	D ₆	\overline{D}_6
H	H	H	L	D ₇	\overline{D}_7

- Notes: 1. H; high level, L; low level, X; irrelevant
 2. Z; high impedance (off-state)
 3. D₀ through D₇; the level of the respective D input.

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V _{CC}	7	V
Input voltage	V _{IN}	7	V
Output voltage (off-state)	V _{O (off)}	5.5	V
Operating temperature	T _{opr}	-20 to +75	°C
Power dissipation	P _T	400	mW
Storage temperature	T _{stg}	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V _{CC}	4.75	5.00	5.25	V
Output current	I _{OH}	—	—	-2.6	mA
	I _{OL}	—	—	8	mA
Operating temperature	T _{opr}	-20	25	75	°C

Electrical Characteristics

(T_a = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	V _{IH}	2.0	—	—	V	
	V _{IL}	—	—	0.8	V	
Output voltage	V _{OH}	2.4	—	—	V	V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = -2.6 mA
	V _{OL}	—	—	0.4	V	I _{OL} = 4 mA, V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V
—		—	0.5			
Input current	I _{IH}	—	—	20	μA	V _{CC} = 5.25 V, V _I = 2.7 V
	I _{IL}	—	—	-0.4	mA	V _{CC} = 5.25 V, V _I = 0.4 V
	I _I	—	—	0.1	mA	V _{CC} = 5.25 V, V _I = 7 V
Output current	I _{OZ}	—	—	20	μA	V _O = 2.7 V, V _{CC} = 5.25 V, V _{IH} = 2 V
		—	—	-20		
Short-circuit output current	I _{OS}	-30	—	-130	mA	V _{CC} = 5.25 V
Supply current**	I _{CC}	—	6.1	10	mA	Condition A
		—	7.1	12		Condition B
Input clamp voltage	V _{IK}	—	—	-1.5	V	V _{CC} = 4.75 V, I _{IN} = -18 mA

Notes: * V_{CC} = 5 V, T_a = 25°C

** I_{CC} is measured with the outputs open and all data and select inputs at 4.5 V under the following conditions.
A; Strobe grounded, B; Strobe at 4.5 V

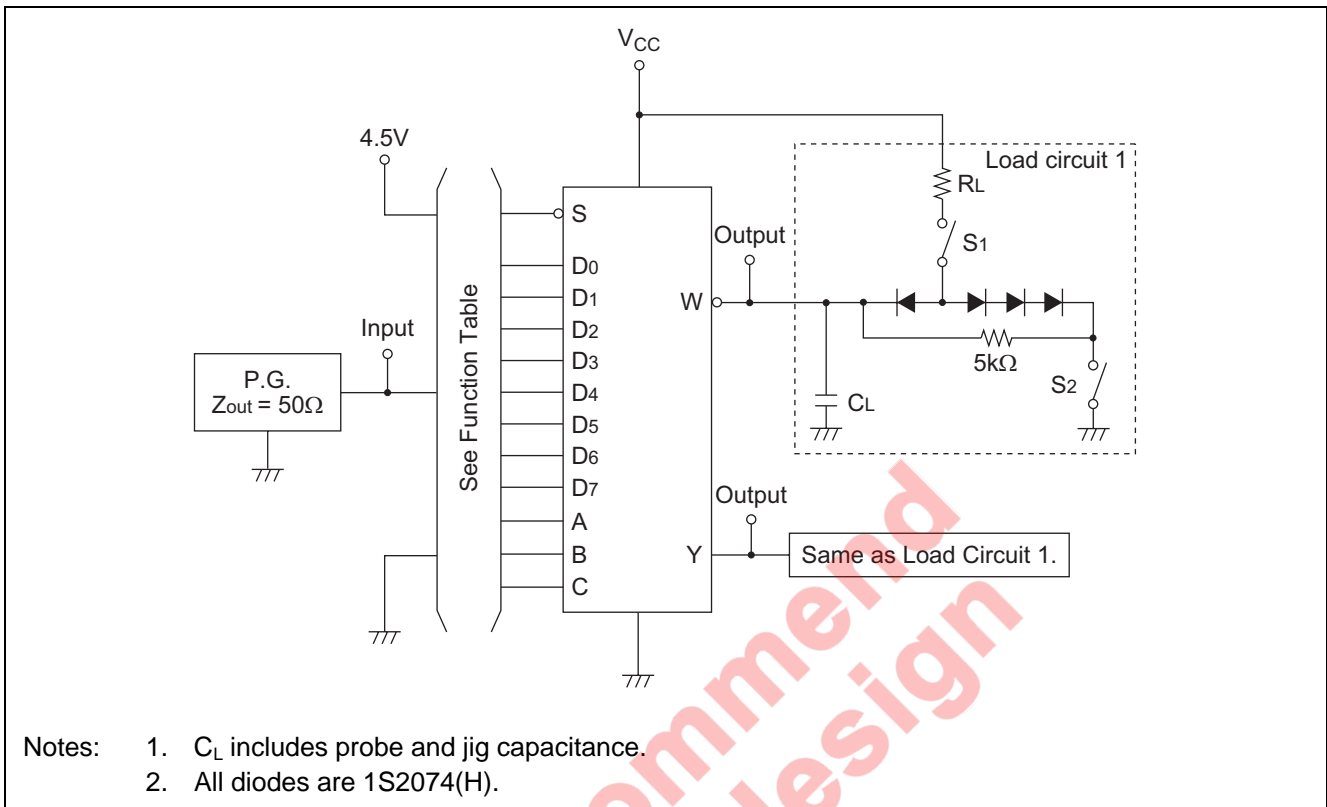
Switching Characteristics

(V_{CC} = 5 V, T_a = 25°C)

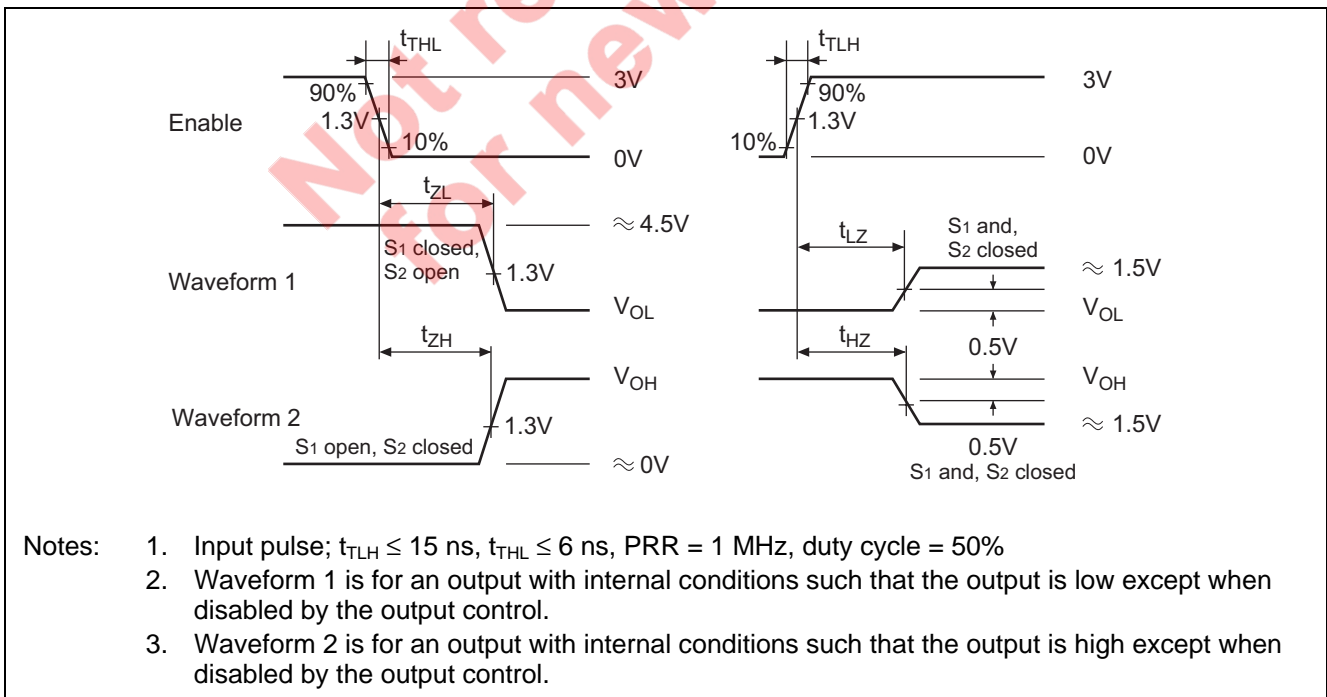
Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	t _{PLH}	A, B, C (4 level)	Y	—	29	45	ns	C _L = 15 pF, R _L = 2 kΩ
	t _{PHL}			—	28	45		
	t _{PLH}	A, B, C (3 level)	W	—	20	33		
	t _{PHL}			—	21	33		
	t _{PLH}	Data	Y	—	17	28		
	t _{PHL}			—	18	28		
	t _{PLH}	Data	W	—	10	15		
t _{PHL}	—			9	15			
Output enable time	t _{ZH}	Strobe	Y	—	30	45	ns	
	t _{ZL}			—	26	40		
	t _{ZH}	Strobe	W	—	17	27		
	t _{ZL}			—	24	40		
Output disable time	t _{HZ}	Strobe	Y	—	30	45	ns	C _L = 5 pF, R _L = 2 kΩ
	t _{LZ}			—	15	25		
	t _{HZ}	Strobe	W	—	37	55		
	t _{LZ}			—	15	25		

Testing Method

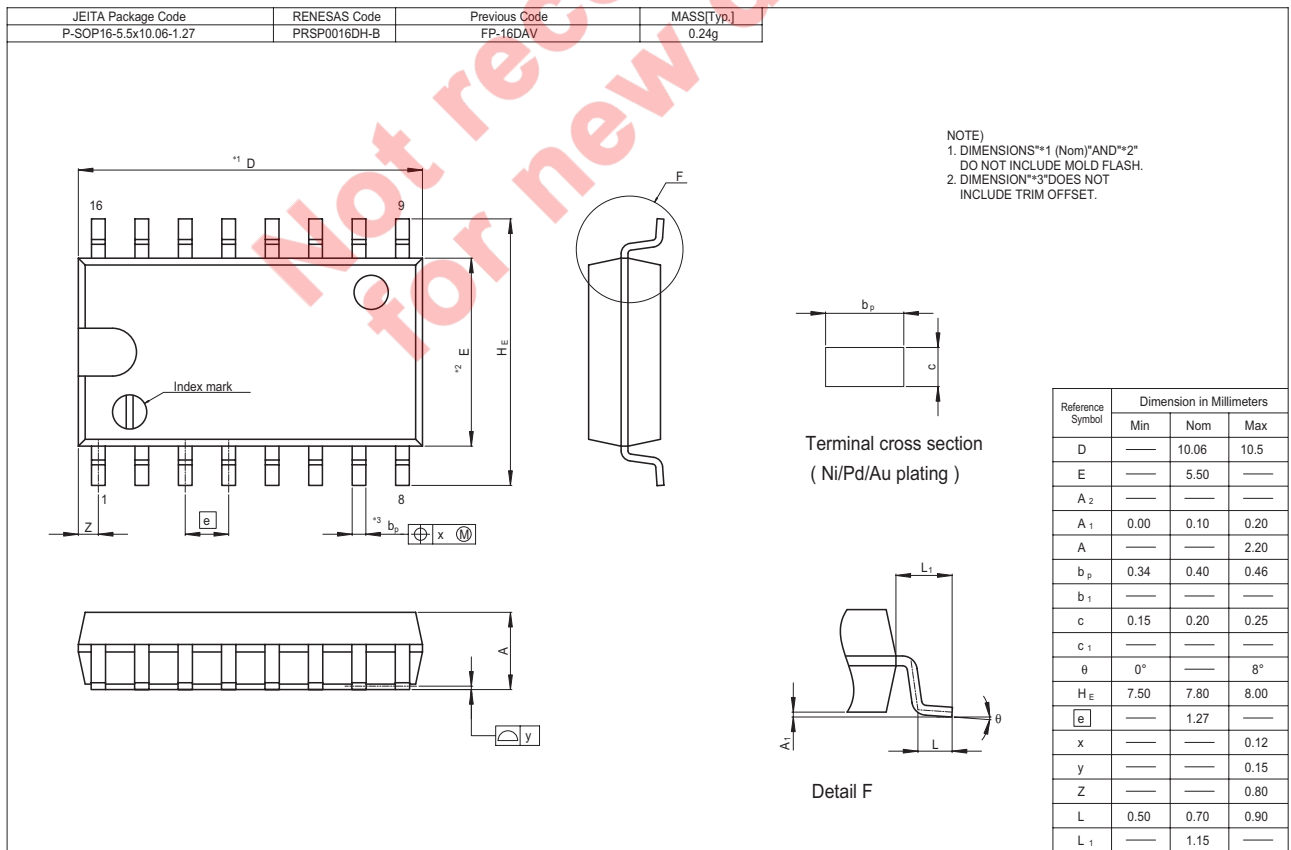
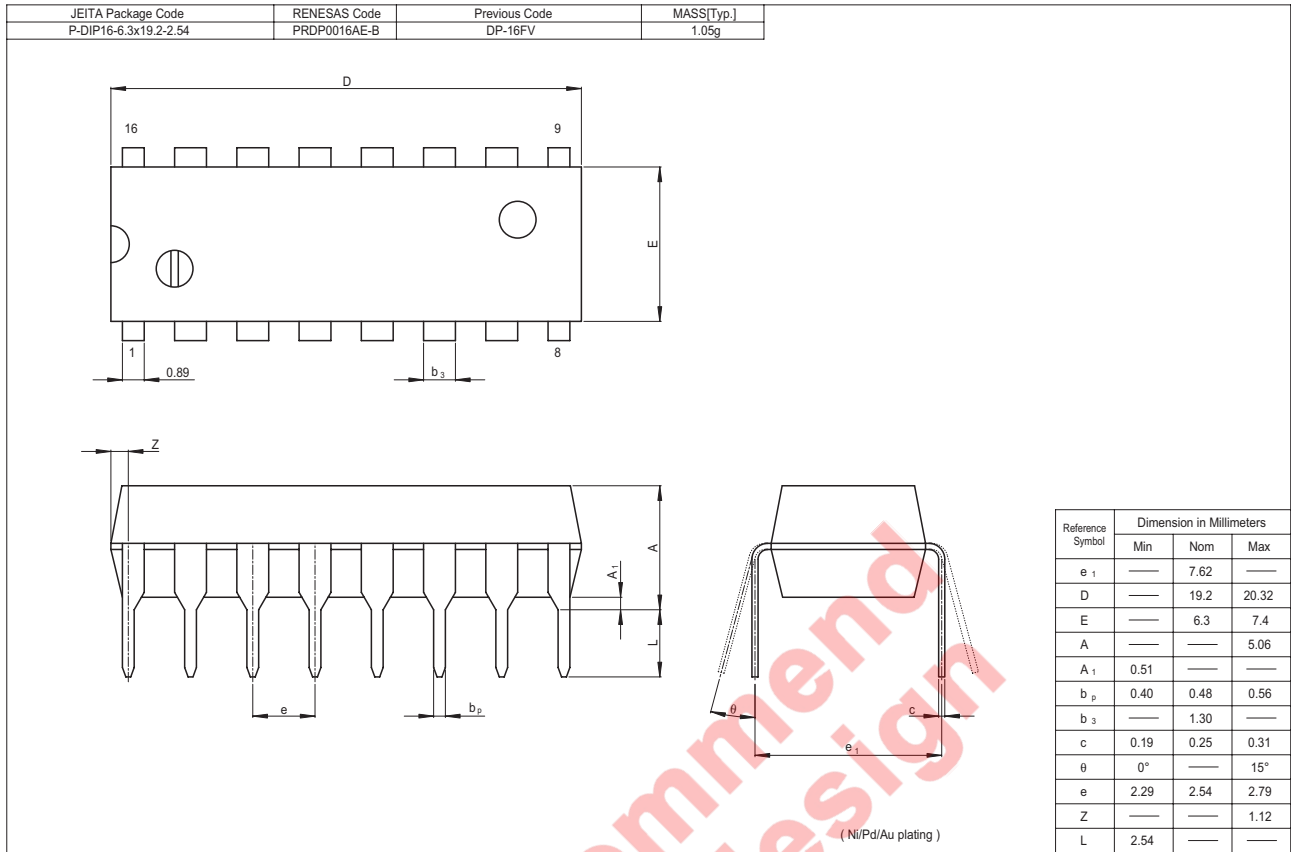
Test Circuit



Waveform



Package Dimensions



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