HD26LS32A

Quadruple Differential Line Receivers With 3 State Outputs

REJ03D0296–0200Z
(Previous ADE-205-578 (Z))
Rev.2.00
Jul.16.2004

Description

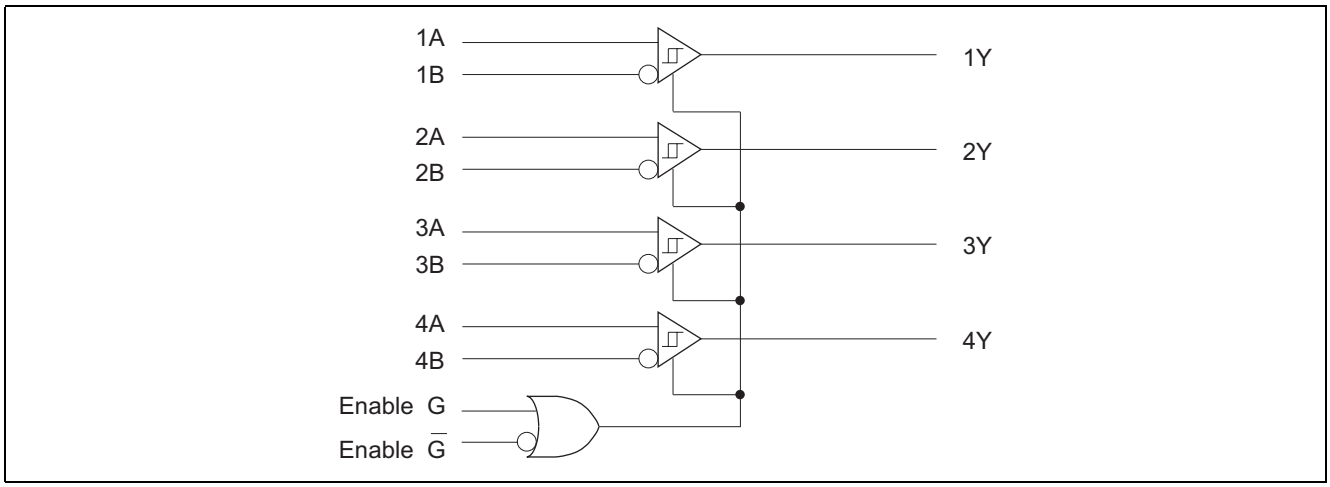
The HD26LS32A features quadruple line receivers designed to meet the specs of EIA standard RS-422A and RS-423. This device operates from a single 5 V power supply. The enable function is common to all four receivers and offers a choice of active high or active low input. Fail safe design ensures that if the inputs are open, the outputs will always be high.

Features

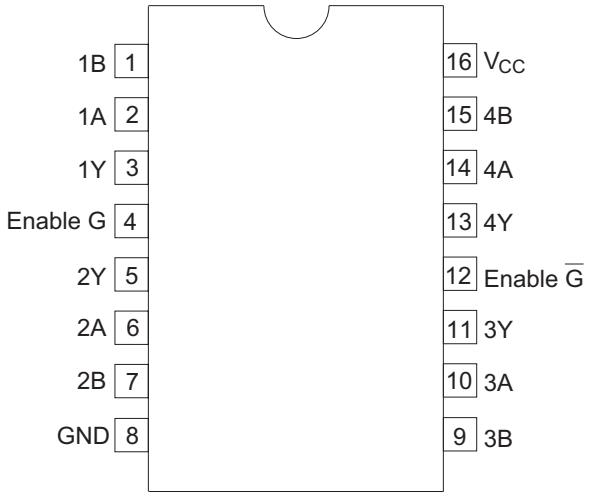
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD26LS32AP	DILP-16 pin (JEITA)	DP-16E, -16FV	P	—

Logic Diagram



Pin Arrangement



(Top view)

Function Table

Differential Input	Enable		Output
A – B	G	$\overline{G}$	Y
$V_{ID} \geq V_{TH}$	H	X	H
	X	L	H
$V_{TL} < V_{ID} < V_{TH}$	H	X	?
	X	L	?
$V_{ID} \leq V_{TL}$	H	X	L
	X	L	L
X	L	H	Z

H : High level
L : Low level
X : Immaterial
? : Irrelevant
Z : High impedance

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply Voltage	V_{CC}*1	7.0	V
Input Voltage A or B	V_{IN}	±25	V
Differential Input Voltage	V_{ID}*2	±25	V
Enable Input Voltage	V_{IN}	7	V
Output Sink Current	Iout	50	mA
Continuous Total Dissipation	P_T	1	W
Operating Temperature	Topr	0 to +70	°C
Storage Temperature	Tstg	–65 to 150	°C

Notes: 1. All voltage values except for differential input voltage are with respect to network ground terminal.
2. Differential input voltage is measured at the noninverting input with respect to the corresponding inverting input.
3. The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.00	5.25	V
In Phase Input Voltage	V_{IC}	—	—	±7.0	V
Output Current	I_{OH}	—	—	–440	µA
	I_{OL}	—	—	8	mA
Operating Temperature	Topr	0	—	70	°C

Electrical Characteristics (Ta = 0 to +70°C)

Item	Symbol	Min	Typ*[1]	Max	Unit	Conditions	
Differential Input High Threshold Voltage	V_{TH}	—	—	0.2	V	V_{IC} = –7 to +7 V	V_{OH} = 2.7V, I_{OH} = –440 µA
Differential Input Low Threshold Voltage	V_{TL}	—	—	–0.2			V_{OL} = 0.4 V, I_{OL} = 4 mA
		—	—	–0.2			V_{OL} = 0.45 V, I_{OL} = 8 mA
Input Hysteresis*[2]	$V_{TH} – V_{TL}$	—	50	—	mV		
Enable Input Voltage	V_{IH}	2.0	—	—	V		
	V_{IL}	—	—	0.8			
Enable Input Clamp Voltage	V_{IK}	—	—	–1.5		V_{CC} = 4.75 V, I_{IN} = –18 mA	
Output Voltage	V_{OH}	2.7	—	—		V_{CC} = 4.75 V	V_{ID} = 1 V, I_{OH} = –440 µA
	V_{OL}	—	—	0.4		V_{IL} ($\overline{G}$) = 0.8 V	V_{ID} = –1 V, I_{OL} = 4 mA
		—	—	0.45			V_{ID} = –1 V, I_{OL} = 8 mA
Off State (High Impedance) Output Current	I_{OZ}	—	—	20	µA	V_{CC} = 5.25 V	V_O = 2.4 V
		—	—	–20			V_O = 0.4 V
Line Input Current	II	—	—	1.2	mA	V_I = 15 V, Other Inputs –10 to +15 V	
		—	—	–1.7		V_I = –15 V, Other Inputs –15 to +10 V	
Enable Input Current	I_I (EN)	—	—	100	µA	V_I = 5.5 V	
	I_{IH}	—	—	20		V_I = 2.7 V	
	I_{IL}	—	—	–0.36	mA	V_I = 0.4 V	
Input Resistance	ri	12	15	—	kΩ	V_{IC} = –15 to +15 V (Other Inputs AC GND)	
Short Circuit Output Current	I_{OS}*[3]	–15	—	–85	mA	V_{CC} = 5.25 V	
Supply Current	I_{CC}	—	52	70		V_{CC} = 5.25 V, V_I = 0 V (All Outputs Disable)	

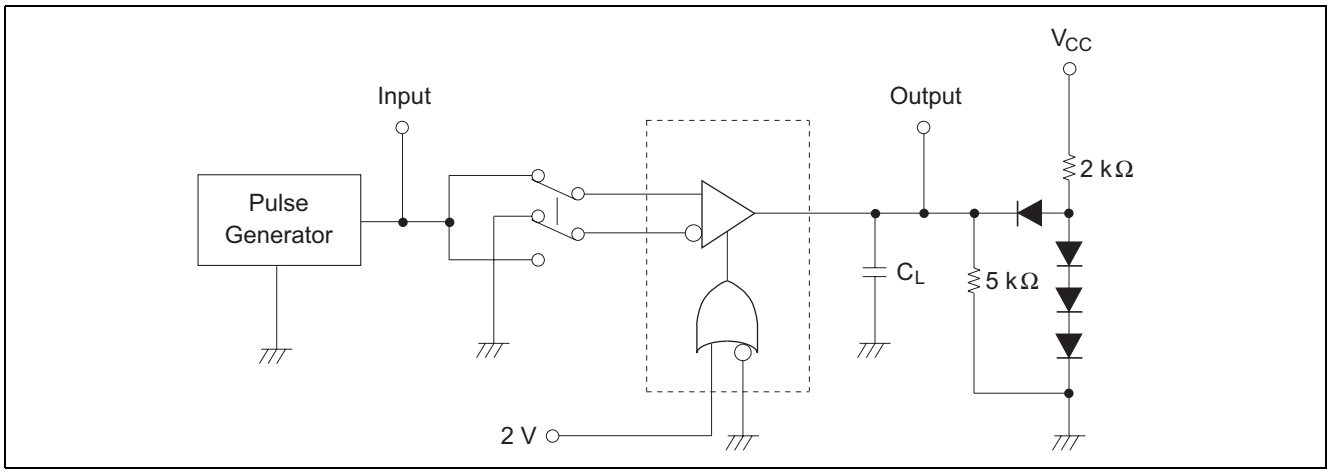
Notes: 1. All typical values are at V_{CC} = 5 V, Ta = 25°C, V_{IC} = 0.
2. Hysteresis is the differential between the positive going input threshold voltage and the negative going input threshold voltage.
3. Not more than one output should be shorted at a time.

Switching Characteristics (V_{CC} = 5 V, Ta = 25°C)

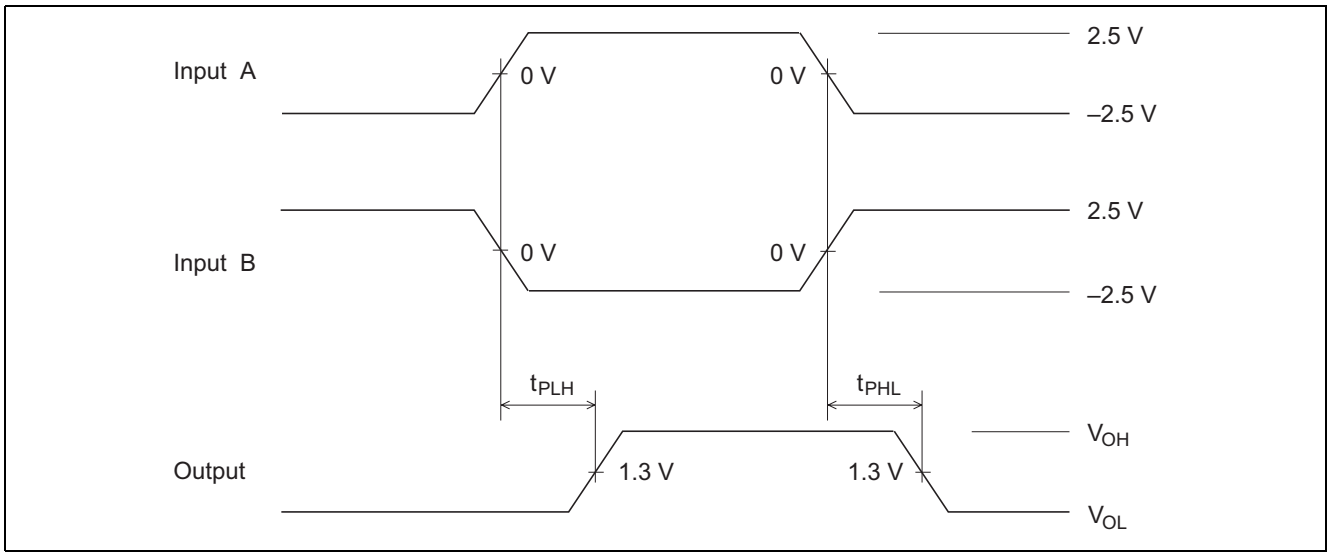
Item	Symbol	Min	Typ	Max	Unit	Conditions
Propagation Delay Time	t_{PLH}	—	20	35	ns	C_L = 15 pF
	t_{PHL}	—	22	35		
Output Enable Time	t_{ZH}	—	17	22	ns	C_L = 15 pF
	t_{ZL}	—	20	25		
Output Disable Time	t_{HZ}	—	21	30	ns	C_L = 5 pF
	t_{LZ}	—	30	40		

1. t_{PLH}, t_{PHL}

Test circuit

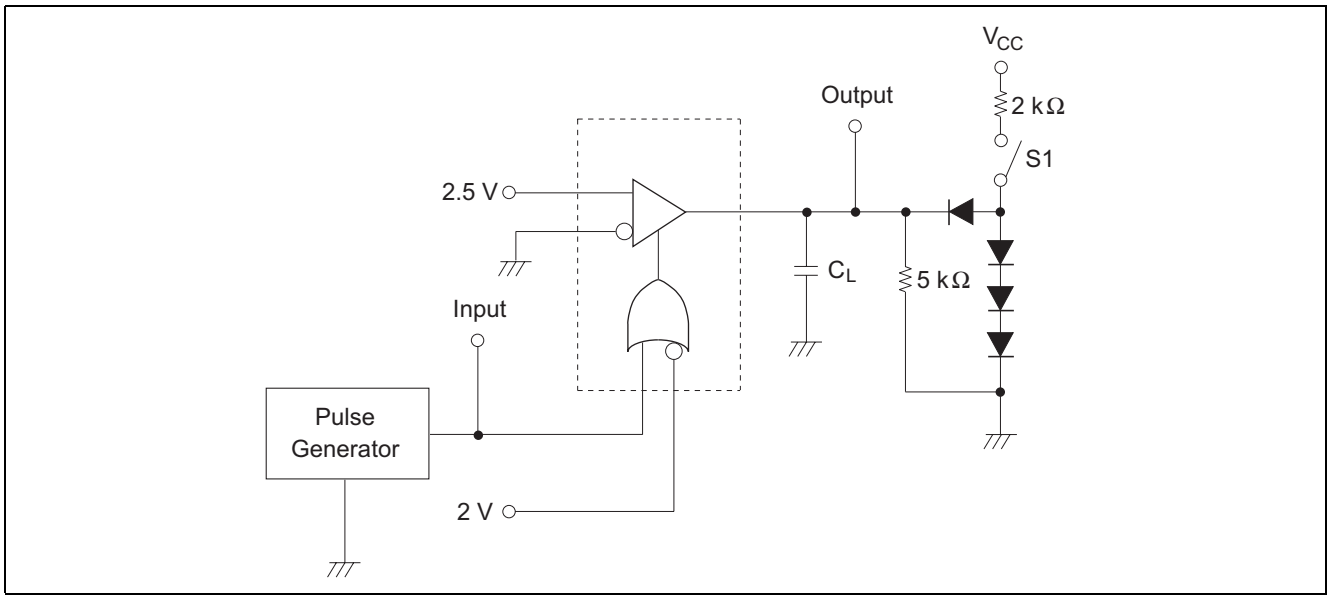


Waveforms

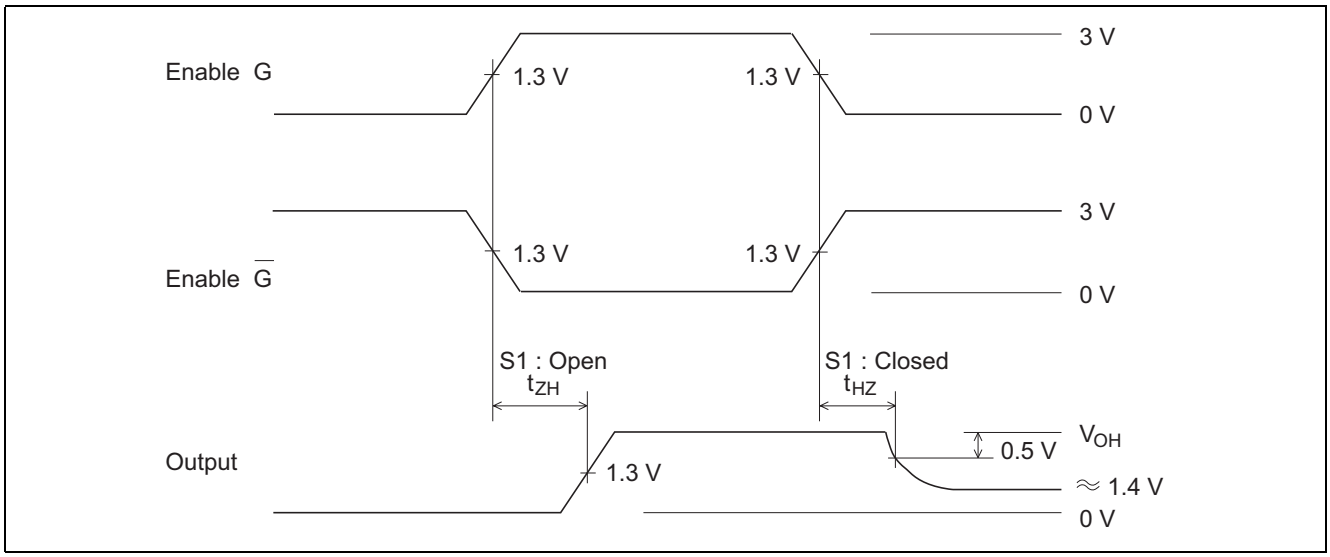


2. t_{HZ}, t_{ZH}

Test circuit

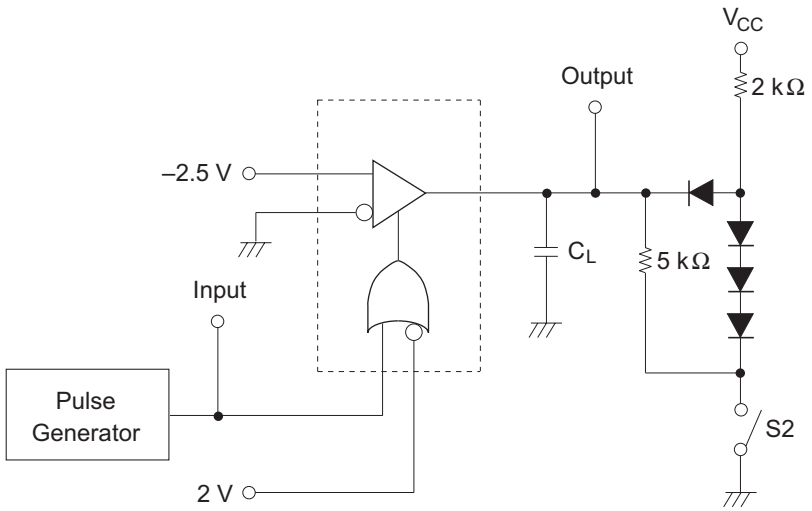


Waveforms

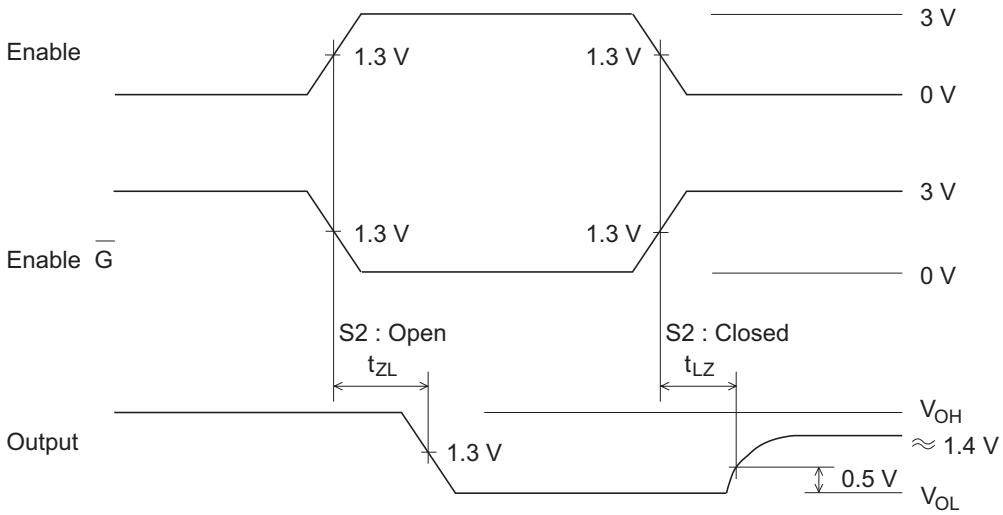


3. t_{LZ}, t_{ZL}

Test circuit



Waveforms

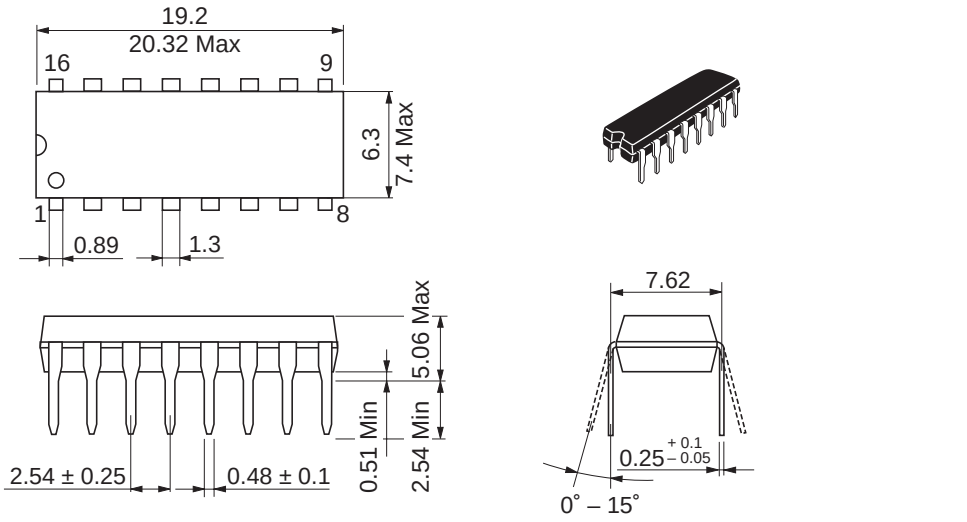


Notes:
1. The pulse generator has the following characteristics:
   PRR = 1 MHz, 50% duty cycle, t_r≤ 6 ns, t_f≤ 6 ns, Zout = 50 Ω.
2. C_L includes probe and jig capacitance.
3. All diodes are 1S2074(H).
4. To test G input, ground G input and apply an inverted input waveform.

Package Dimensions

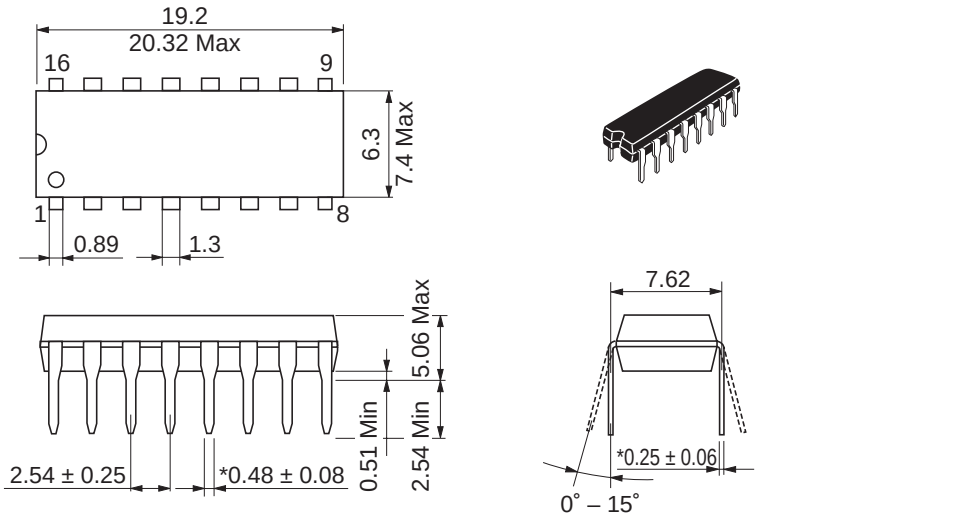
As of January, 2003

Unit: mm



Package Code	DP-16E
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	1.05 g

Unit: mm



Package Code	DP-16FV
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	1.05 g

*NI/Pd/AU Plating

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