

- HD74HC442** ● Quad. Tridirectional Bus Transceiver (with noninverted 3-state outputs)
- HD74HC443** ● Quad. Tridirectional Bus Transceiver (with inverted 3-state outputs)
- HD74HC444** ● Quad. Tridirectional Bus Transceiver (with noninverted/inverted 3-state outputs)

These bus transceivers are designed for asynchronous three-way communication between four-line data buses. They give the designer a choice of selecting inverting, noninverting, or a combination of inverting and noninverting data paths with 3-state outputs.

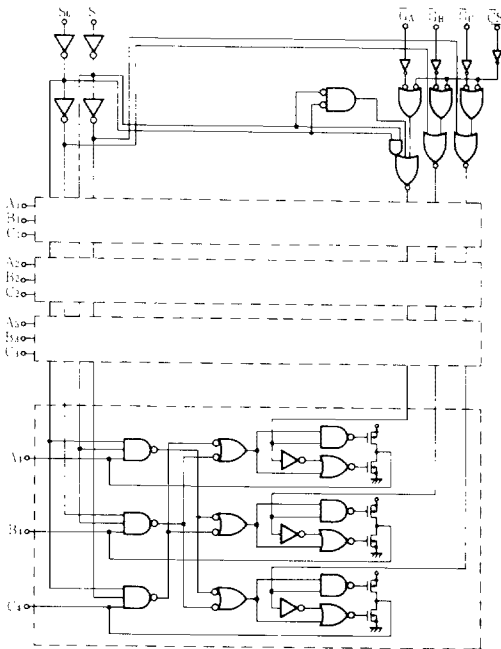
The S_0 and S_1 inputs select the bus from which data are to be transferred. The \bar{G} inputs enable the bus or buses to which data are to be transferred. The port for any bus selected for input and any other bus not enabled for output will be at high impedance.

FEATURES

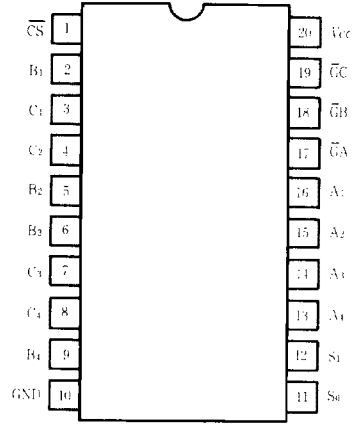
- High Speed Operation
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC}=2\sim 6V$
- Low Input Current: $1\mu A$ max.
- Low Quiescent Supply Current: I_{CC} (static) = $4\mu A$ max. ($T_a=25^\circ C$)

LOGIC DIAGRAM

HD74HC442

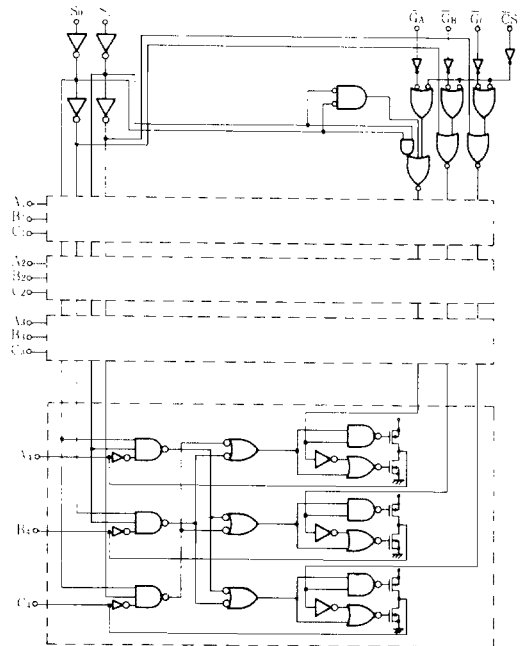


PIN ARRANGEMENT



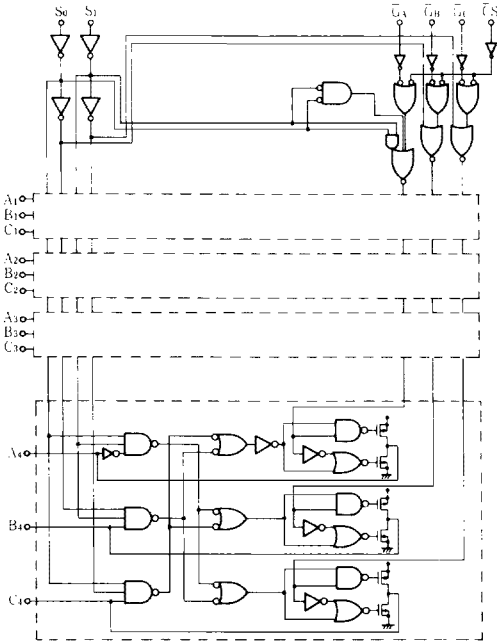
(Top View)

HD74HC443



LOGIC DIAGRAM

HD74HC444



FUNCTION TABLE

Inputs						Transfers Between Buses		
CS	S ₁	S ₀	GA	GB	GC	HD74HC442	HD74HC443	HD74HC444
H	X	X	X	X	X	None	None	None
X	H	H	X	X	X	None	None	None
X	X	X	H	H	H	None	None	None
X	L	L	X	H	H	None	None	None
X	L	H	H	X	H	None	None	None
X	H	L	H	H	X	None	None	None
L	L	L	X	L	L	A→B, A→C	\bar{A} →B, \bar{A} →C	\bar{A} →B, \bar{A} →C
L	L	H	L	X	L	B→C, B→A	\bar{B} →C, \bar{B} →A	B→C, \bar{B} →A
L	H	L	L	L	X	C→A, C→B	\bar{C} →A, \bar{C} →B	\bar{C} →A, C→B
L	L	L	X	L	H	A→B	\bar{A} →B	\bar{A} →B
L	L	H	H	X	L	B→C	\bar{B} →C	B→C
L	H	L	L	H	X	C→A	\bar{C} →A	\bar{C} →A
L	L	L	X	H	L	A→C	\bar{A} →C	\bar{A} →C
L	L	H	L	X	H	B→A	\bar{B} →A	B→A
L	H	L	H	L	X	C→B	\bar{C} →B	C→B

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Supply Voltage Range	V_{CC}	-0.5~+7.0	V
Input Voltage	V_{IN}	-0.5~ V_{CC} +0.5	V
Output Voltage	V_{OUT}	-0.5~ V_{CC} +0.5	V
Output Current	I_{OUT}	±35	mA
DC Current Drain per V_{CC} , GND	I_{CC} , I_{GND}	±75	mA
DC Input Diode Current	I_{IK}	±20	mA
DC Output Diode Current	I_{OK}	±20	mA
Power Dissipation per Package	P_T	500	mW
Storage Temperature	T_{stg}	-65~+150	°C

DC CHARACTERISTICS

Item	Symbol	$V_{CC}(V)$	Test Conditions	$T_a = -25^\circ C$			$T_a = -40 \sim +85^\circ C$		Unit		
				min	typ	max	min	max			
Input Voltage	V_{IH}	2.0		1.5	—	—	1.5	—	V		
		4.5		3.15	—	—	3.15	—			
		6.0		4.2	—	—	4.2	—			
	V_{IL}	2.0		—	—	0.5	—	0.5	V		
4.5		—	—	1.35	—	1.35					
6.0		—	—	1.8	—	1.8					
Output Voltage	V_{OH}	2.0	$V_{in} = V_{IH}$ or V_{IL}	$I_{OH} = -20\mu A$	1.9	2.0	—	1.9	—	V	
		4.5			4.4	4.5	—	4.4	—		
		6.0			5.9	6.0	—	5.9	—		
	V_{OL}	4.5		$V_{in} = V_{IH}$ or V_{IL}	$I_{OL} = 20\mu A$	4.18	—	—	4.13	—	V
		6.0				5.68	—	—	5.63	—	
		2.0				—	0.0	0.1	—	0.1	
		4.5	—			0.0	0.1	—	0.1		
		6.0	—			0.0	0.1	—	0.1		
Off-state output current	I_{OZ}	6.0	$V_{in} = V_{IH}$ or V_{IL} , $V_{out} = V_{CC}$ or GND	—	—	±0.5	—	±5.0	μA		
		6.0		—	—	±0.1	—	±1.0			
Input Current	I_{in}	6.0	$V_{in} = V_{CC}$ or GND	—	—	±0.1	—	±1.0	μA		
Quiescent Supply Current	I_{CC}	6.0	$V_{in} = V_{CC}$ or GND, $I_{out} = 0\mu A$	—	—	4.0	—	40	μA		

■ AC CHARACTERISTICS ($C_L=50\text{pF}$, Input $t_r=t_f=6\text{ns}$)

Item	Symbol	$V_{CC}(\text{V})$	Test Conditions	$T_a=25^\circ\text{C}$			$T_a=-40\sim+85^\circ\text{C}$		Unit
				min.	typ.	max.	min.	max.	
Propagation Delay Time	t_{PLH} t_{PHL}	2.0		—	—	200	—	250	ns
		4.5		—	—	40	—	50	
		6.0		—	—	34	—	43	
Output Enable Time	t_{ZH} t_{ZL}	2.0		—	—	150	—	190	ns
		4.5		—	—	30	—	38	
		6.0		—	—	26	—	33	
Output Disable Time	t_{HZ} t_{LZ}	2.0		—	—	150	—	190	ns
		4.5		—	—	30	—	38	
		6.0		—	—	26	—	33	
Output Rise/Fall Time	t_{TLH} t_{THL}	2.0		—	—	60	—	75	ns
		4.5		—	—	12	—	15	
		6.0		—	—	10	—	13	
Input Capacitance	C_{in}	—		—	5	10	—	10	pF