

5404 / 7404 Hex Inverter

	Schottky TTL				High-Speed TTL				Low-Power Schottky TTL				Standard TTL				Low-Power TTL											
	Device Type	Package			Device Type	Package			Device Type	Package			Device Type	Package			Device Type	Package										
		C	P	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF								
T.I.	SN54S04	J	⓪		W	SN54H04	J	⓪		W	SN54LS04	J	⓪		W	SN5404	J	⓪		W	SN54L04	J	⓪	N	⓪	T	2	
	SN74S04	J	⓪	N		SN74H04	J	⓪	N		SN74LS04	J	⓪	N		SN7404	J	⓪	N		SN74L04	J	⓪	N	⓪	T	2	
FAIRCHILD	FM54S04/FM9S04	D	⓪			FMS4H04/FM9H04	D	⓪		F	FMS4LS04/FM9LS04	D	⓪		F	FM5404/FM9N04	D	⓪		F								
	FC74S04/FC9S04	D	⓪	P		FC74H04/FC9H04	D	⓪	P		FC74LS04/FC9LS04	D	⓪	P		FM7404/FC9N04	D	⓪	P									
MOTOROLA						MC3108	L	⓪		F					MC5404	L	⓪			F								
						MC3008	L	⓪	P		SN74LS04		P		MC7404	L	⓪	P		F								
N. S. C.						DM54H04	J	⓪	N		DM54LS04				DM5404	J	⓪	N		W	DM54L04	J	⓪	N	⓪	T	2	
	DM74S04		N			DM74H04	J	⓪	N		DM74LS04				DM7404	J	⓪	N			DM74L04	J	⓪	N	⓪	T	2	
PHILIPS	N74S04					N74H04					N74LS04				FJH241/7404													
SIGNETICS	S54S04	F	⓪	A	⓪	S54H04	F	⓪	A	⓪	S54LS04	F	⓪	A	⓪	S5404	F	⓪	A	⓪	S54L04	F	⓪	A	⓪	W	2	
	N74S04	F	⓪	A	⓪	N74H04	F	⓪	A	⓪	N74LS04	F	⓪	A	⓪	N7404	F	⓪	A	⓪								
SIEMENS															FLH211													
FUJITSU											74LS04		M	⓪	MB418													
HITACHI	HD74S04										HO74LS04		P	⓪	HD7404/HD2522													
MITSUBISHI	M55004										M74LS04		P	⓪	M53204													
NEC	74S04										74LS04		C	⓪	μPB235													
TOSHIBA														TD3404A														

Electrical Characteristics SN54LS04/SN74LS04
absolute maximum ratings over operating free-air temperature range

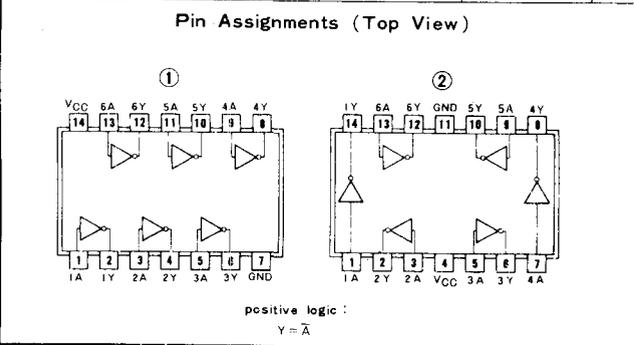
Supply voltage, V _{CC}	7V	Operating free-air temperature range	SN54LS	-55°C to 125°C
Input voltage	7V		SN74LS	0°C to 70°C
		Storage temperature range		-65°C to 150°C

recommended operating conditions

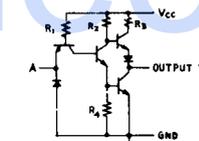
	SN54LS04			SN74LS04			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V _{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I _{OH}			-400			-400	μA
Low-level output current, -I _{OL}			4			8	mA
Operating free-air temperature, T _A	55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range

PARAMETER	TEST CONDITIONS †	MIN	TYP ‡	MAX	UNIT	
V _{IH}	High-level input voltage		2		V	
V _{IL}	Low-level input voltage			0.8	V	
V _I	Input clamp voltage	V _{CC} = MIN, I _I = -18 mA		-1.5	V	
V _{OH}	High-level output voltage	V _{CC} = MIN, I _{OH} = MAX, V _{IL} = V _{IL} max.	2.7	3.4	V	
V _{OL}	Low-level output voltage	V _{CC} = MIN, I _{OL} = 4 mA, V _{IH} = 2V.		0.4	V	
I _I	Input current at maximum input voltage	V _{CC} = MAX, V _I = 7V		0.1	mA	
I _{IH}	High-level input current	V _{CC} = MAX, V _{IH} = 2.7V		20	μA	
I _{IL}	Low-level input current	V _{CC} = MAX, V _{IL} = 0.4V		-0.4	mA	
I _{OS}	Short-circuit output current	V _{CC} = MAX	54LS Family	-20	mA	
			74LS Family	-20	mA	
I _{CC} H	Supply current	V _{CC} = MAX	Total, outputs high	1.2	2.4	mA
I _{CC} L	Supply current	V _{CC} = MAX	Total, outputs low	3.6	6.6	mA
I _{CC}	Supply current	V _{CC} = 5V	Average per gate (50% duty cycle)	0.4		mA
t _{PLH}	Propagation delay time, low-to-high-level output	V _{CC} = 5V, C _L = 15PF, T _A = 25°C, R _L = 2KΩ		9	15	ns
t _{PHL}	Propagation delay time, high-to-low-level output			10	15	ns

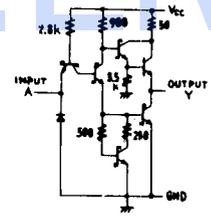


Schematics (each gate)

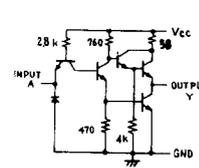


CIRCUIT	R1	R2	R3	R4
'04	4k	1.6k	130	1k
'L04	40k	20k	500	12k

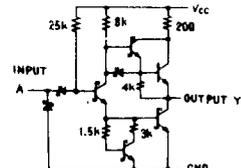
Input clamp diodes not on SN54L/SN74L* circuits.
'04, 'L04 CIRCUITS



'S04 CIRCUIT



'H04 CIRCUIT



'LS04 CIRCUIT

Resistor values shown are nominal and in ohms.

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5V, T_A = 25°C.

* Not more than one output should be shorted at a time, and for SN54H/SN74H* and SN54S/SN74S*, duration of short-circuit should not exceed 1 second.