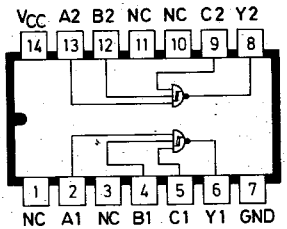
TYPES SN49LS813N/SN49LS713N/SN49LS813N-S1/SN49LS713N-S1
DUAL HIGH INPUT IMPEDANCE SCHMITT TRIGGER

Features

- Maximum input current at all inputs:
  1 μA for high logic level
  50 μA or 10 μA (NS1) for low logic level
- Operation from very slow edges
- Temperature-compensated threshold levels
- Temperature-compensated hysteresis, typically 0.8 V
- High noise immunity



Application

The SN49LS713N (S1), SN49LS813N (S1) is especially suited for applications where high input impedance is required.
Typical applications are level detecting of integrators, low frequency generators, generation of long delay times or driving from low contact current shaft encoders.

Absolute maximum ratings over operating free-air temperature range

Supply voltage, V_{CC} ..... 6 V
Input voltage, V_I ..... 7 V
Operating free-air temperature range ☐ SN49LS813N(S1) ..... −25°C to + 85°C
☐ SN49LS713N(S1) ..... − 0°C to + 70°C
Storage temperature range ..... −65°C to +150°C

Recommended operating conditions

	SN49LS813N(S1) MIN	NOM	MAX	SN49LS713N(S1) MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	4.75	5	5.25	V
High level output current, I_{OH}			−1			−1	mA
Low level output current, I_{OL}			16			16	mA
Operating free-air temperature, T_A	−25		+85	0		+70	°C

Electrical characteristics over recommended operating free air temperature range

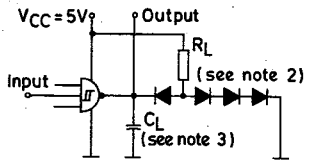
PARAMETER	TEST CONDITIONS*		MIN	TYP**	MAX	UNIT
V_{T+} Positiv-going threshold	V_{CC} = 5 V		1.6	1.8	2.1	V
V_{T-} Negativ-going threshold	V_{CC} = 5 V		0.8	1.0	1.3	V
$V_{T+} - V_{T-}$ Hysteresis	V_{CC} = 5 V		0.4	0.8		V
V_{IK} Input clamp voltage	V_{CC} = MIN, I_I = − 18 mA				−1.5	V
V_{OH} High level output voltage	V_{CC} = MIN, V_{IL} = 0.8 V, I_{OH} = MAX		2.7	3.4		V
V_{OL} Low level output voltage	V_{CC} = MIN, V_{IH} = 2.1 V, I_{OL} = MAX			0.35	0.5	V
I_I, Input current at max. input voltage	V_{CC} = MAX, V_I = 7.0 V				10	μA
I_{IH} High level input current	V_{CC} = MAX, V_{IH} = 2.7 V				−1	μA
I_{IL} Low level input current	V_{CC} = MAX	SN49LS713N/813N			−50	μA
	V_{IL} = 0.4 V	SN49LS713NS1/813NS1			−10	μA
I_{OS} Short circuit output current	V_{CC} = MAX	see Note 1	−20	−50	−100	mA
I_{CCH} Supply current, high-level output	V_{CC} = MAX, all inputs at V_I = OV			3.5	6.0	mA
I_{CCL} Supply current, low-level output	V_{CC} = MAX, all inputs at V_I = 4.5 V			6.1	9.0	mA

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions
** All typical values are at V_{CC} = 5 V, T_A = 25 °C
Note 1: Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

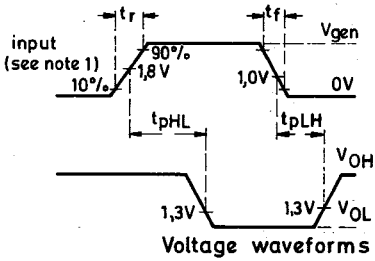
Switching characteristics, V_{CC} = 5 V, T_A = 25 °C

PARAMETER		TESTCONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	propagation delay time low to high level output	C_L = 15 pF, R_L = 400 Ω see Figure 1		15	25	ns
t_{PHL}	propagation delay time high to low level output			36	50	ns

PARAMETER MEASUREMENT INFORMATION



Test circuit



Voltage waveforms

Notes: 1. Input pulse has the following characteristics: V_{gen} = 3.0 V, PRR = 1 MHz, t_r = 15 ns, t_f = 6 ns.
2. All diodes are 1 N 3064 or 1N916
3. C_L includes probe and jig capacitance

FIGURE 1