

General Description

The 74HC/HCT153 is a dual 4-input multiplexer. The device features independent enable inputs ($n\bar{E}$) and common data select inputs (S0 and S1). For each multiplexer, the select inputs select one of the four binary inputs and routes it to the multiplexer output (nY). A HIGH on \bar{E} forces the corresponding multiplexer outputs LOW. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of V_{CC} .

Features

- Input levels:
For 74HC153: CMOS level
For 74HCT153: TTL level
- Non-inverting outputs
- Separate enable input for each output
- Common select inputs
- Permits multiplexing from n lines to 1 line
- Enable line provided for cascading (n lines to 1 line)
- Specified from -40°C to +105°C
- Packaging information: DIP16/SOP16/TSSOP16

ORDERING INFORMATION

DEVICE	Package Type	MARKING	Packing	Packing QTY
SN74HC153N	DIP-16	74HC153N	Tube	1000/Box
SN74HC153DTR	SOP-16	74HC153	Tape	2500/Reel
SN74HCT153DTR	SOP-16	74HCT153	Tape	2500/Reel
SN74HCT153TDTR	TSSOP-16	74HCT153	Tape	3000/Reel

Block Diagram And Pin Description

Block Diagram

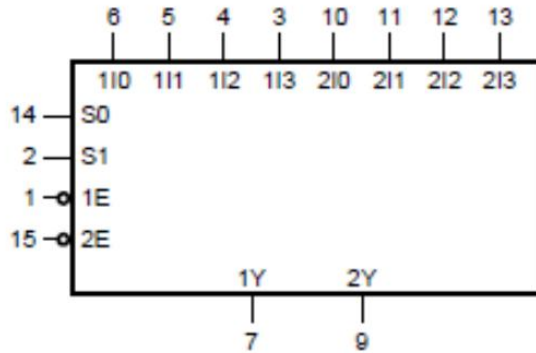


Figure 1. Logic symbol

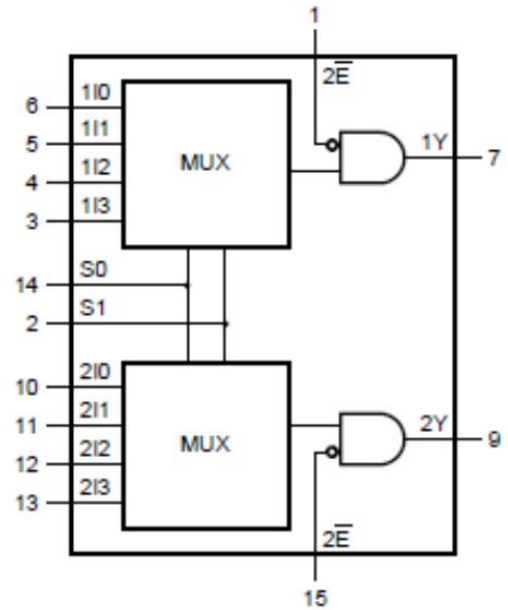


Figure 2. Functional diagram

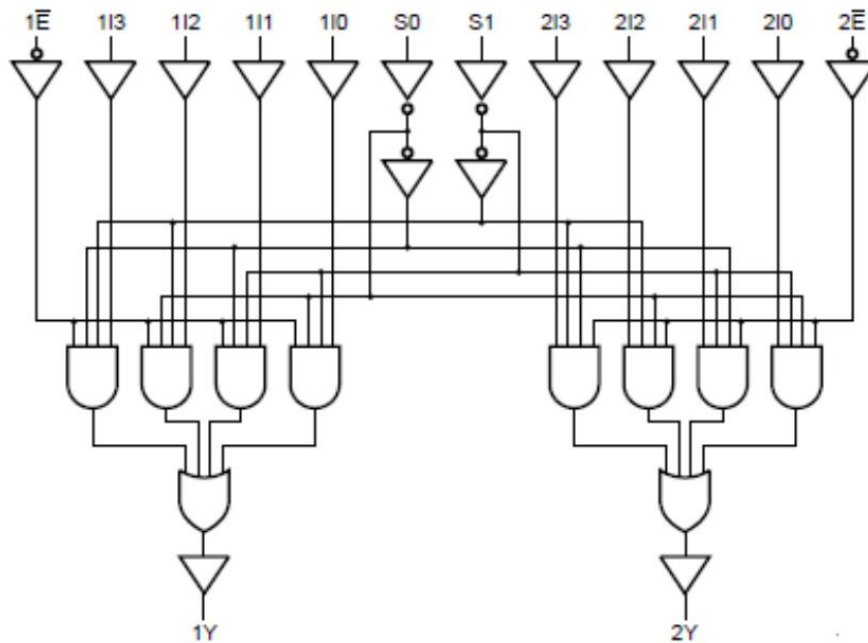
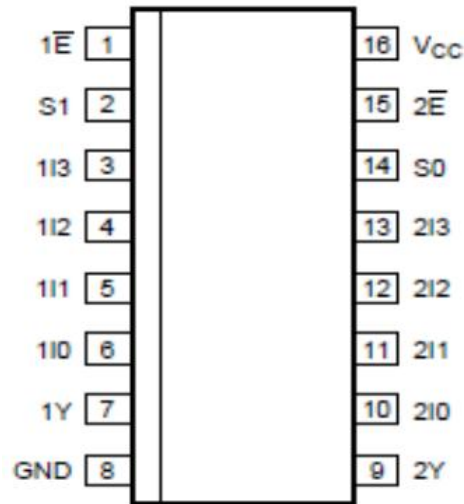


Figure 3. Logic diagram

Pin Configurations



Pin Description

Pin No.	Pin Name	Description
1	$1\bar{E}$	out enable input(active LOW)
2	S1	data select input
3	1I3	data input source1
4	1I2	data input source1
5	1I1	data input source1
6	1I0	data input source1
7	1Y	multiplexer output source1
8	GND	ground(0V)
9	2Y	multiplexer output source2
10	2I0	data input source2
11	2I1	data input source2
12	2I2	data input source2
13	2I3	data input source2
14	S0	data select input
15	$2\bar{E}$	out enable input(active LOW)
16	V _{CC}	supply voltage

Function Table

Select Input		Input				Output Enable	Output
S0	S1	nI0	nI1	nI2	nI3	n \bar{E}	nY
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
H	L	X	L	X	X	L	L
H	L	X	H	X	X	L	H
L	H	X	X	L	X	L	L
L	H	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

Note: H=HIGH voltage level; L=LOW voltage level; X=don't care.

Electrical Parameter

Absolute Maximum Ratings (Voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V _{CC}	-	-0.5	+7.0	V
input clamping current	I _{IK}	V _I < -0.5V or V _I > V _{CC} +0.5V	-	±20	mA
output clamping current	I _{OK}	V _O < -0.5V or V _O > V _{CC} +0.5V	-	±20	mA
output current	I _O	-0.5V < V _O < V _{CC} +0.5V	-	±25	mA
supply current	I _{CC}	-	-	50	mA
ground current	I _{GND}	-	-50	-	mA
storage temperature	T _{stg}	-	-65	+150	°C
total power dissipation	P _{tot}	-	-	500	mW
soldering temperature	T _L	10s	DIP	245	°C
			SOP	250	

Note:

- [1] For DIP16 packages: above 70°C the value of P_{tot} derates linearly with 12mW/K.
- [2] For SOP16 packages: above 70°C the value of P_{tot} derates linearly with 8mW/K.
- [3] For (T)SSOP16 packages: above 60°C the value of P_{tot} derates linearly with 5.5mW/K.

Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
74HC153						
supply voltage	V _{CC}	-	2.0	5.0	6.0	V
input voltage	V _I	-	0	-	V _{CC}	V
output voltage	V _O	-	0	-	V _{CC}	V
input transition rise and fall rate	$\Delta t/\Delta V$	V _{CC} =2.0V	-	-	625	ns/V
		V _{CC} =4.5V	-	1.67	139	ns/V
		V _{CC} =6.0V	-	-	83	ns/V
ambient temperature	T _{amb}	-	-40	-	+105	°C
74HCT153						
supply voltage	V _{CC}	-	4.5	5.0	5.5	V
input voltage	V _I	-	0	-	V _{CC}	V
output voltage	V _O	-	0	-	V _{CC}	V
input transition rise and fall rate	$\Delta t/\Delta V$	V _{CC} =4.5V	-	1.67	139	ns/V
ambient temperature	T _{amb}	-	-40	-	+105	°C

Electrical Characteristics

DC Characteristics 1 (T_{amb}=25°C, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
74HC153							
HIGH-level input voltage	V _{IH}	V _{CC} =2.0V	1.5	1.2	-	V	
		V _{CC} =4.5V	3.15	2.4	-	V	
		V _{CC} =6.0V	4.2	3.2	-	V	
LOW-level input voltage	V _{IL}	V _{CC} =2.0V	-	0.8	0.5	V	
		V _{CC} =4.5V	-	2.1	1.35	V	
		V _{CC} =6.0V	-	2.8	1.8	V	
HIGH-level output voltage	V _{OH}	V _I =V _{IH} or V _{IL}	I _O =-20uA; V _{CC} =2.0V	1.9	2.0	-	V
			I _O =-20uA; V _{CC} =4.5V	4.4	4.5	-	V
			I _O =-20uA; V _{CC} =6.0V	5.9	6.0	-	V
			I _O =-4.0mA; V _{CC} =4.5V	3.98	4.32	-	V
			I _O =-5.2mA; V _{CC} =6.0V	5.48	5.81	-	V
LOW-level output voltage	V _{OL}	V _I =V _{IH} or V _{IL}	I _O =20uA; V _{CC} =2.0V	-	0	0.1	V
			I _O =20uA; V _{CC} =4.5V	-	0	0.1	V
			I _O =20uA; V _{CC} =6.0V	-	0	0.1	V
			I _O =4.0mA; V _{CC} =4.5V	-	0.15	0.26	V
			I _O =5.2mA; V _{CC} =6.0V	-	0.16	0.26	V
input leakage current	I _I	V _I =V _{CC} or GND; V _{CC} =6.0V	-	-	±0.1	μA	

supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=6.0V$	-	-	8.0	μA	
input apacitance	C_I	-	-	3.5	-	pF	
74HCT153							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V$ to 5.5V	2.0	1.6	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V$ to 5.5V	-	1.2	0.8	V	
HIGH-level output voltage	V_{OH}	$V_I=V_{IH}$ or V_{IL} $V_{CC}=4.5V$	$I_O=-20\mu A$	4.4	4.5	-	V
			$I_O=-4.0\mu A$	3.98	4.32	-	V
LOW-level output voltage	V_{OL}	$V_I=V_{IH}$ or V_{IL}	$I_O=20\mu A$; $V_{CC}=4.5V$	-	0	0.1	V
			$I_O=5.2\mu A$; $V_{CC}=6.0V$	-	0.15	0.26	V
input leakage current	I_I	$V_I=V_{CC}$ or GND; $V_{CC}=5.5V$	-	-	± 0.1	μA	
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=5.5V$	-	-	8.0	μA	
Additional Supply current	ΔI_{CC}	$V_I=V_{CC}-2.1V$; other inputs at V_{CC} or GND; $I_O=0V$; $V_{CC}=4.5V$ to 5.5V	1In,2In	-	45	162	μA
			$n\bar{E}$	-	60	216	μA
			Sn	-	135	486	μA
input apacitance	C_I	-	-	3.5	-	pF	

DC Characteristics 2

($T_{amb}=-40^{\circ}C$ to $+85^{\circ}C$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
74HC153							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0V$	1.5	-	-	V	
		$V_{CC}=4.5V$	3.15	-	-	V	
		$V_{CC}=6.0V$	4.2	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0V$	-	-	0.5	V	
		$V_{CC}=4.5V$	-	-	1.35	V	
		$V_{CC}=6.0V$	-	-	1.8	V	
HIGH-level output voltage	V_{OH}	$V_I=V_{IH}$ or V_{IL}	$I_O=-20\mu A$; $V_{CC}=2.0V$	1.9	-	-	V
			$I_O=-20\mu A$; $V_{CC}=4.5V$	4.4	-	-	V
			$I_O=-20\mu A$; $V_{CC}=6.0V$	5.9	-	-	V
			$I_O=-4.0mA$; $V_{CC}=4.5V$	3.84	-	-	V
			$I_O=-5.2mA$; $V_{CC}=6.0V$	5.34	-	-	V
LOW-level output voltage	V_{OL}	$V_I=V_{IH}$ or V_{IL}	$I_O=20\mu A$; $V_{CC}=2.0V$	-	-	0.1	V
			$I_O=20\mu A$; $V_{CC}=4.5V$	-	-	0.1	V
			$I_O=20\mu A$; $V_{CC}=6.0V$	-	-	0.1	V
			$I_O=4.0mA$; $V_{CC}=4.5V$	-	-	0.33	V
			$I_O=5.2mA$; $V_{CC}=6.0V$	-	-	0.33	V
input leakage current	I_I	$V_i=V_{CC}$ or GND; $V_{CC}=6.0V$	-	-	± 1.0	μA	

supply current	I_{CC}	$V_i=V_{CC}$ or GND; $I_o=0A$; $V_{CC}=6.0V$		-	-	80	μA
74HCT153							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V$ to $5.5V$		2.0	-	-	V
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V$ to $5.5V$		-	-	0.8	V
HIGH-level output voltage	V_{OH}	$V_i=V_{IH}$ or V_{IL} $V_{CC}=4.5V$	$I_o=-20\mu A$	4.4	-	-	V
			$I_o=-4.0mA$	3.84	-	-	V
LOW-level output voltage	V_{OL}	$V_i=V_{IH}$ or V_{IL}	$I_o=20\mu A$; $V_{CC}=4.5V$	-	-	0.1	V
			$I_o=5.2mA$; $V_{CC}=6.0V$	-	-	0.33	V
input leakage current	I_I	$V_i=V_{CC}$ or GND; $V_{CC}=5.5V$		-	-	± 1.0	μA
supply current	I_{CC}	$V_i=V_{CC}$ or GND; $I_o=0A$; $V_{CC}=5.5V$		-	-	80	μA
additional supply current	ΔI_{CC}	$V_i=V_{CC}-2.1V$; other inputs at V_{CC} or GND; $I_o=0V$; $V_{CC}=4.5V$ to $5.5V$	$1I_n, 2I_n$	-	-	203	μA
			$n\bar{E}$	-	-	270	μA
			S_n	-	-	608	μA

DC Characteristics 3

($T_{amb}=-40^{\circ}C$ to $+105^{\circ}C$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
74HC153							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0V$	1.5	-	-	V	
		$V_{CC}=4.5V$	3.15	-	-	V	
		$V_{CC}=6.0V$	4.2	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0V$	-	-	0.5	V	
		$V_{CC}=4.5V$	-	-	1.35	V	
		$V_{CC}=6.0V$	-	-	1.8	V	
HIGH-level output voltage	V_{OH}	$V_i=V_{IH}$ or V_{IL}	$I_o=-20\mu A$; $V_{CC}=2.0V$	1.9	-	-	V
			$I_o=-20\mu A$; $V_{CC}=4.5V$	4.4	-	-	V
			$I_o=-20\mu A$; $V_{CC}=6.0V$	5.9	-	-	V
			$I_o=-4.0mA$; $V_{CC}=4.5V$	3.7	-	-	V
			$I_o=-5.2mA$; $V_{CC}=6.0V$	5.2	-	-	V
LOW-level output voltage	V_{OL}	$V_i=V_{IH}$ or V_{IL}	$I_o=20\mu A$; $V_{CC}=2.0V$	-	-	0.1	V
			$I_o=20\mu A$; $V_{CC}=4.5V$	-	-	0.1	V
			$I_o=20\mu A$; $V_{CC}=6.0V$	-	-	0.1	V
			$I_o=4.0mA$; $V_{CC}=4.5V$	-	-	0.4	V
			$I_o=5.2mA$; $V_{CC}=6.0V$	-	-	0.4	V

input leakage current	I_I	$V_I = V_{CC}$ or GND; $V_{CC}=6.0V$	-	-	± 1.0	μA	
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=6.0V$	-	-	160	μA	
74HCT153							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V$ to 5.5V	2.0	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V$ to 5.5V	-	-	0.8	V	
HIGH-level output voltage	V_{OH}	$V_I=V_{IH}$ or V_{IL} $V_{CC}=4.5V$	$I_O=-20\mu A$	4.4	-	-	V
			$I_O=-4.0mA$	3.7	-	-	V
LOW-level output voltage	V_{OL}	$V_I=V_{IH}$ or V_{IL}	$I_O=20\mu A$; $V_{CC}=4.5V$	-	-	0.1	V
			$I_O=5.2\mu A$; $V_{CC}=6.0V$	-	-	0.4	V
input leakage current	I_I	$V_I = V_{CC}$ or GND; $V_{CC}=5.5V$	-	-	± 1.0	μA	
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=5.5V$	-	-	160	μA	
additional supply current	ΔI_{CC}	$V_I=V_{CC}-2.1V$; other inputs at V_{CC} or GND; $I_O=0V$; $V_{CC}=4.5V$ to 5.5V	1In, 2In	-	-	221	μA
			$n\bar{E}$	-	-	294	μA
			Sn	-	-	662	μA

AC Characteristics 1 (Tamb=25°C, GND =0V; $t_r=t_f=6ns$; $C_L=50pF$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
74HC153							
Propagation delay	t_{pd}	1In to nY, 2In to nY; see Figure5 ^[1]	$V_{CC}=2.0V$	-	47	145	ns
			$V_{CC}=4.5V$	-	17	29	ns
			$V_{CC}=5.0V$; $C_L=15pF$	-	14	-	ns
			$V_{CC}=6.0V$	-	14	25	ns
		Sn to nY; see Figure6	$V_{CC}=2.0V$	-	50	150	ns
			$V_{CC}=4.5V$	-	18	30	ns
			$V_{CC}=5.0V$; $C_L=15pF$	-	15	-	ns
			$V_{CC}=6.0V$	-	14	26	ns
		$n\bar{E}$ to nY see Figure6	$V_{CC}=2.0V$	-	33	100	ns
			$V_{CC}=4.5V$	-	12	20	ns
			$V_{CC}=5.0V$; $C_L=15pF$	-	10	-	ns
			$V_{CC}=6.0V$	-	10	17	ns
transition time	t_t	see Figure5 ^[2]	$V_{CC}=2.0V$	-	19	75	ns
			$V_{CC}=4.5V$	-	7	15	ns
			$V_{CC}=6.0V$	-	6	13	ns
power dissipation capacitance	C_{PD}	per package; $V_I=GND$ to V_{CC} ^[3]	-	30	-	pF	

74HCT153							
HIGH to LOW propagation delay	t_{PHL}	1In to nY,2In to nY; see Figure5 ^[1]	$V_{CC}=4.5V$	-	19	34	ns
			$V_{CC}=5.0V;C_L=15pF$	-	16	-	ns
LOW to HIGH propagation delay	t_{PLH}	1In to nY,2In to nY; see Figure5	$V_{CC}=4.5V$	-	13	24	ns
			$V_{CC}=5.0V;C_L=15pF$	-	16	-	ns
Propagation delay	t_{pd}	Sn to nY see Figure6	$V_{CC}=4.5V$	-	20	34	ns
			$V_{CC}=5.0V;C_L=15pF$	-	17	-	ns
		n \bar{E} to nY see Figure6	$V_{CC}=4.5V$	-	14	27	ns
			$V_{CC}=5.0V;C_L=15pF$	-	11	-	ns
transition time	t_t	$V_{CC}=4.5V$;see Figure5 ^[2]		-	7	15	ns
power dissipation capacitance	C_{PD}	per package; $V_I=GND$ to $V_{CC}-1.5V$ ^[3]		-	30	-	pF

Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL} .

[2] t_t is the same as t_{THL} and t_{TLH} .

[3] C_{PD} is used to determine the dynamic power dissipation (P_D in uW).

$$P_D=C_{PD}\times V_{CC}^2\times f_i\times N+\sum(C_L\times V_{CC}^2\times f_o)$$
 where:

f_i =input frequency in MHz;

f_o =output frequency in MHz;

C_L =output load capacitance in pF;

V_{CC} =supply voltage in V;

N =number of inputs switching;

$\sum(C_L\times V_{CC}^2\times f)$ =sum of outputs.

AC Characteristics 2 ($T_{amb}=-40^\circ C$ to $+85^\circ C$, $GND=0V$; $t_r=t_f=6ns$; $C_L=50pF$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
74HC153							
Propagation delay	t_{pd}	1In to nY,2In to nY; see Figure5 ^[1]	$V_{CC}=2.0V$	-	-	180	ns
			$V_{CC}=4.5V$	-	-	36	ns
			$V_{CC}=6.0V$	-	-	31	ns
		Sn to nY; see Figure6	$V_{CC}=2.0V$	-	-	190	ns
			$V_{CC}=4.5V$	-	-	38	ns
			$V_{CC}=6.0V$	-	-	33	ns
		n \bar{E} to nY see Figure6	$V_{CC}=2.0V$	-	-	125	ns
			$V_{CC}=4.5V$	-	-	25	ns
			$V_{CC}=6.0V$	-	-	21	ns

transition time	t_t	see Figure5 ^[2]	$V_{CC}=2.0V$	-	-	95	ns
			$V_{CC}=4.5V$	-	-	19	ns
			$V_{CC}=6.0V$	-	-	16	ns
74HCT153							
HIGH to LOW propagation delay	t_{PHL}	1In to nY,2In to nY; see Figure5 ^[1]	$V_{CC}=4.5V$	-	-	43	ns
LOW to HIGH propagation delay	t_{PLH}	1In to nY,2In to nY; see Figure5	$V_{CC}=4.5V$	-	-	30	ns
Propagation delay	t_{pd}	Sn to nY see Figure6	$V_{CC}=4.5V$	-	-	43	ns
		$n\bar{E}$ to nY see Figure6	$V_{CC}=4.5V$	-	-	34	ns
transition time	t_t	$V_{CC}=4.5V$;see Figure5 ^[2]		-	-	19	ns

Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL} .

[2] t_t is the same as t_{THL} and t_{TLH} .

AC Characteristics 3 ($T_{amb}=-40^{\circ}C$ to $+105^{\circ}C$, $GND=0V$; $t_r=t_f=6ns$; $C_L=50pF$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
74HC153							
Propagation delay	t_{pd}	1In to nY,2In to nY; see Figure5 ^[1]	$V_{CC}=2.0V$	-	-	220	ns
			$V_{CC}=4.5V$	-	-	44	ns
			$V_{CC}=6.0V$	-	-	38	ns
		Sn to nY; see Figure6	$V_{CC}=2.0V$	-	-	225	ns
			$V_{CC}=4.5V$	-	-	45	ns
			$V_{CC}=6.0V$	-	-	38	ns
		$n\bar{E}$ to nY see Figure6	$V_{CC}=2.0V$	-	-	150	ns
			$V_{CC}=4.5V$	-	-	30	ns
			$V_{CC}=6.0V$	-	-	26	ns
transition time	t_t	see Figure5 ^[2]	$V_{CC}=2.0V$	-	-	110	ns
			$V_{CC}=4.5V$	-	-	22	ns
			$V_{CC}=6.0V$	-	-	19	ns
74HCT153							
HIGH to LOW propagation delay	t_{PHL}	1In to nY,2In to nY; see Figure5 ^[1]	$V_{CC}=4.5V$	-	-	51	ns
LOW to HIGH propagation delay	t_{PLH}	1In to nY,2In to nY; see Figure5	$V_{CC}=4.5V$	-	-	36	ns
Propagation delay	t_{pd}	Sn to nY see Figure6	$V_{CC}=4.5V$	-	-	51	ns
		$n\bar{E}$ to nY	$V_{CC}=4.5V$	-	-	41	ns

		see Figure6				
transition time	t_t	$V_{CC}=4.5V$; see Figure5 ^[2]		-	-	22 ns

Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL} .

[2] t_t is the same as t_{THL} and t_{TLH} .

Testing Circuit

AC Testing Circuit

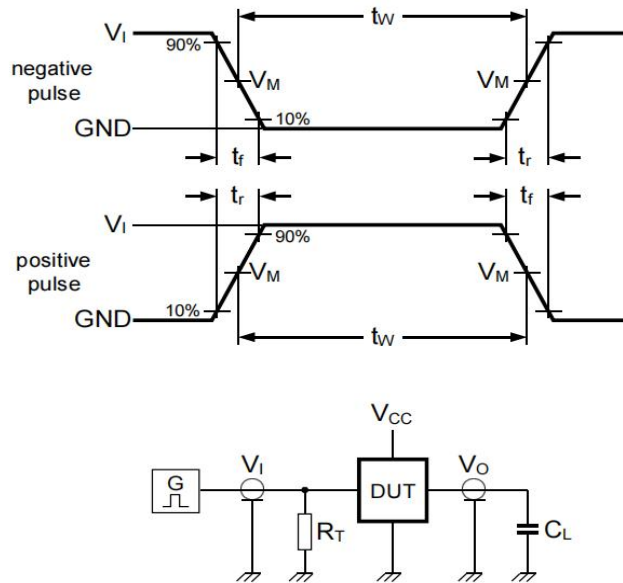


Figure 4. Test circuit for measuring switching times

Definitions for test circuit:

C_L =Load capacitance including jig and probe capacitance.

R_T =Termination resistance should be equal to the output impedance Z_o of the pulse generator.

AC Testing Waveforms

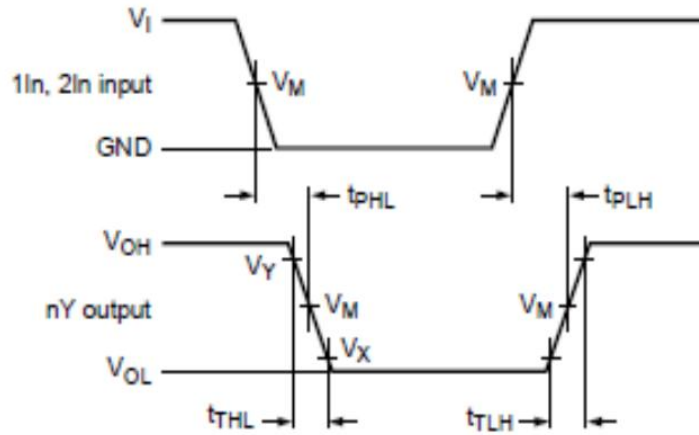


Figure 5. Waveforms showing the input (1In, 2In) to output (1Y, 2Y) propagation delays and output transition times

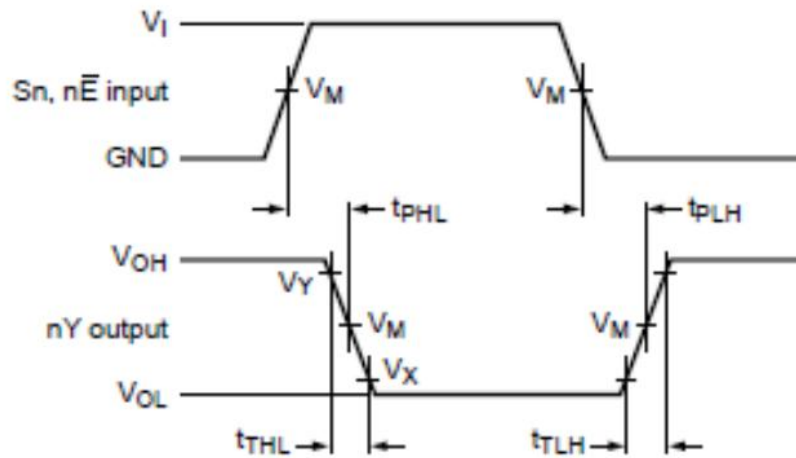


Figure 6. Waveforms showing input (Sn, nE) to output (nY) propagation delays

Measurement Points

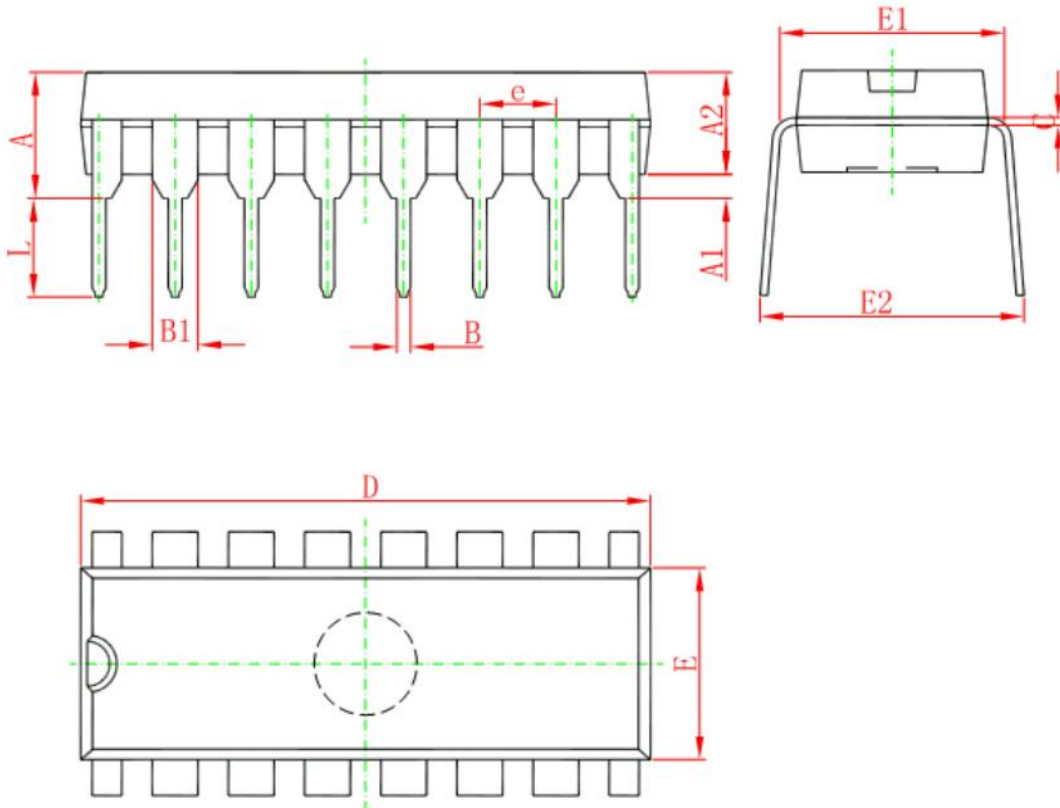
Type	Input	Output		
	V_M	V_M	V_X	V_Y
74HC153	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$
74HCT153	1.3V	1.3V	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$

Test Data

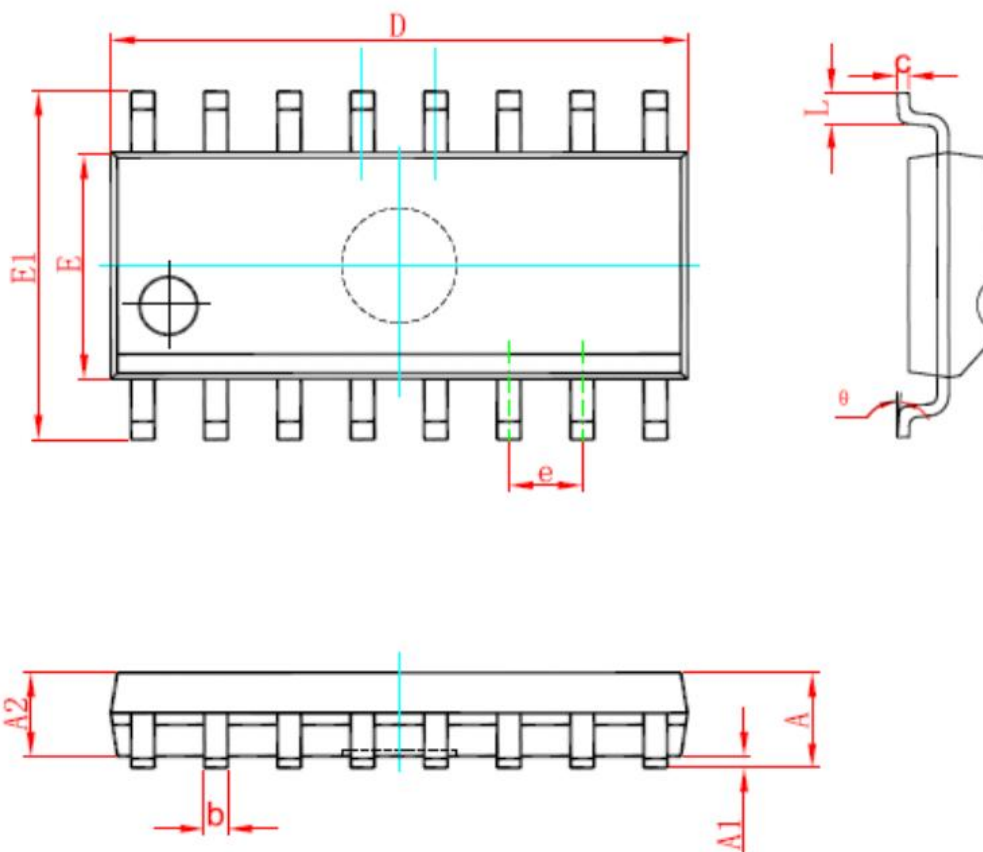
Type	Input		Load	Test
	V_I	t_r, t_f	C_L	
74HC153	V_{CC}	6.0ns	15pF, 50pF	t_{PHL}, t_{PLH}
74HCT153	3.0V	6.0ns	15pF, 50pF	t_{PHL}, t_{PLH}

Package Information

DIP16

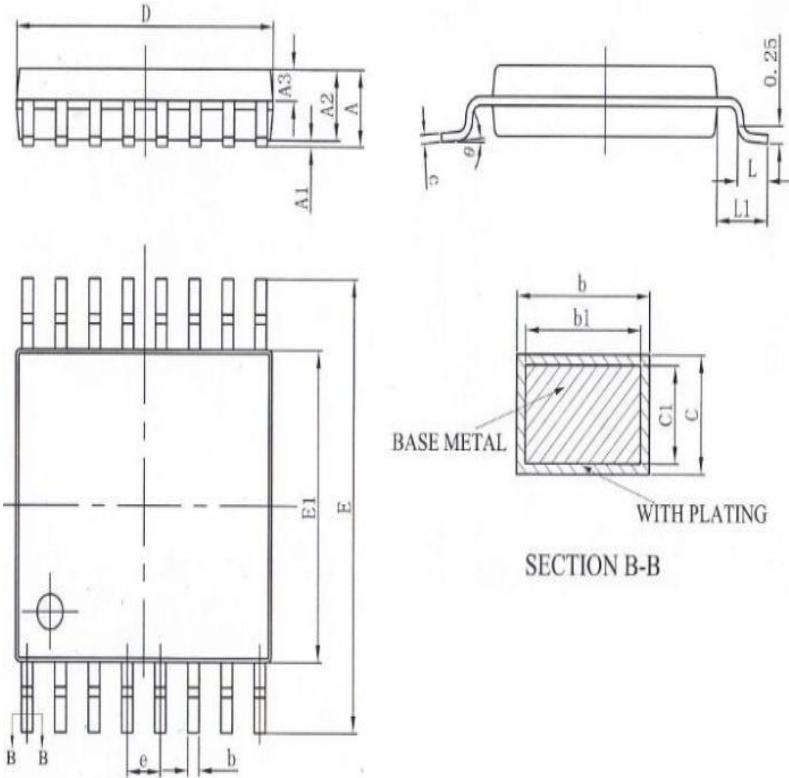


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
C	0.170	0.250	0.007	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

TSSOP16



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	-	1.20
A1	0.05	-	0.15
A2	0.90	1.00	1.05
A3	0.39	0.44	0.49
b	0.20	-	0.28
b1	0.19	0.22	0.25
c	0.13	-	0.17
cl	0.12	0.13	0.14
D	4.90	5.00	5.10
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	0.65BSC		
L	0.45	0.60	0.75
L1	1.00BSC		
θ	0	-	8°

Statements And Notes

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butyl benzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements									

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